

Pantheon Report

Generated at 2018-03-05 19:48:38 (UTC).

Data path: Colombia ppp0 (*remote*) → AWS Brazil 2 Ethernet (*local*).

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).

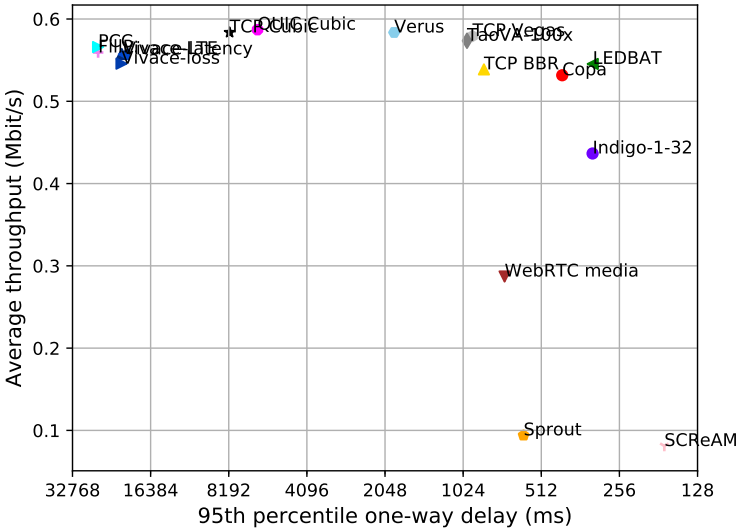
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

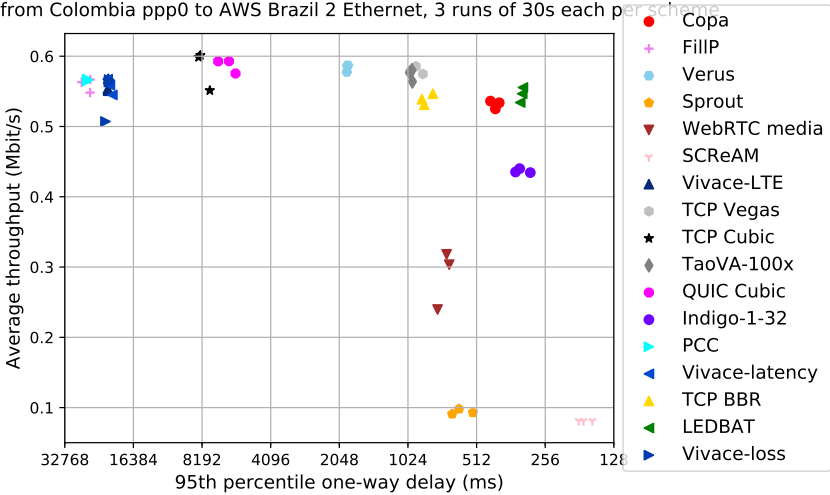
Git summary:

```
branch: master @ f12c42a2c63fdd9a862eefa0468859bf379b6623
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 828bbf95fd4941149b5cec90f281d1c69ae1a5c6
third_party/genericCC @ 9249eea3238475c4d8cca1443d28df70bff6c4a2
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeab30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

test from Colombia ppp0 to AWS Brazil 2 Ethernet, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from Colombia ppp0 to AWS Brazil 2 Ethernet, 3 runs of 30s each per scheme



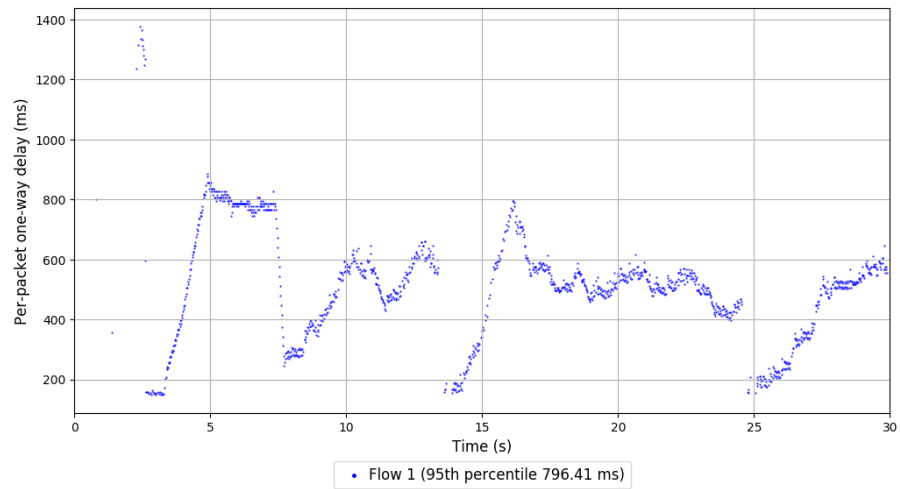
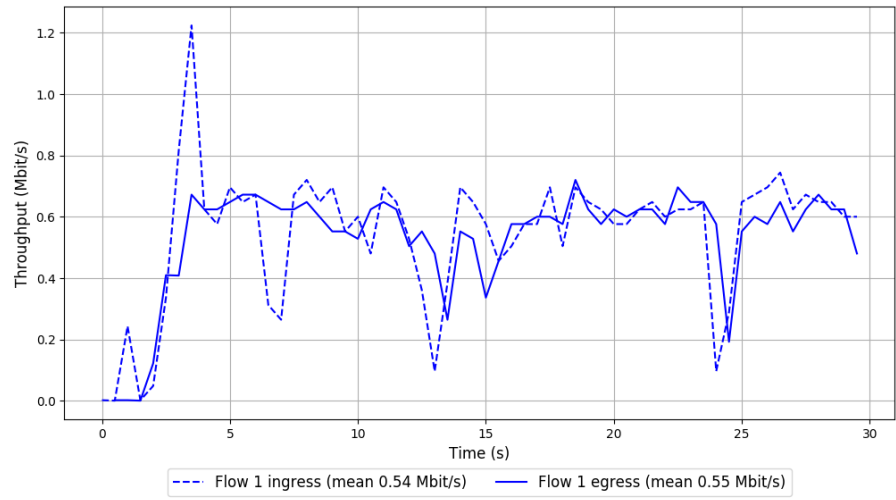
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	0.54	851.71	2.45
TCP Cubic	3	0.58	8130.89	30.98
LEDBAT	3	0.55	324.46	1.25
PCC	3	0.57	26110.88	98.54
QUIC Cubic	3	0.59	6346.17	27.51
SCReAM	3	0.08	171.87	0.65
WebRTC media	3	0.29	709.12	1.33
Sprout	3	0.09	599.19	1.45
TaoVA-100x	3	0.57	989.68	2.63
TCP Vegas	3	0.58	942.83	1.43
Verus	3	0.59	1888.43	5.79
Copa	3	0.53	425.23	4.05
FillP	3	0.56	26102.65	98.23
Indigo-1-32	3	0.44	324.84	1.33
Vivace-latency	3	0.56	20766.03	71.67
Vivace-loss	3	0.55	21209.06	89.48
Vivace-LTE	3	0.56	21156.70	72.17

Run 1: Statistics of TCP BBR

Start at: 2018-03-05 17:53:36
End at: 2018-03-05 17:54:06
Local clock offset: -8.266 ms
Remote clock offset: -1.418 ms

Below is generated by plot.py at 2018-03-05 19:48:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 796.413 ms
Loss rate: 2.43%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 796.413 ms
Loss rate: 2.43%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-03-05 18:14:40

End at: 2018-03-05 18:15:10

Local clock offset: -7.921 ms

Remote clock offset: -5.59 ms

Below is generated by plot.py at 2018-03-05 19:48:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 889.870 ms

Loss rate: 2.76%

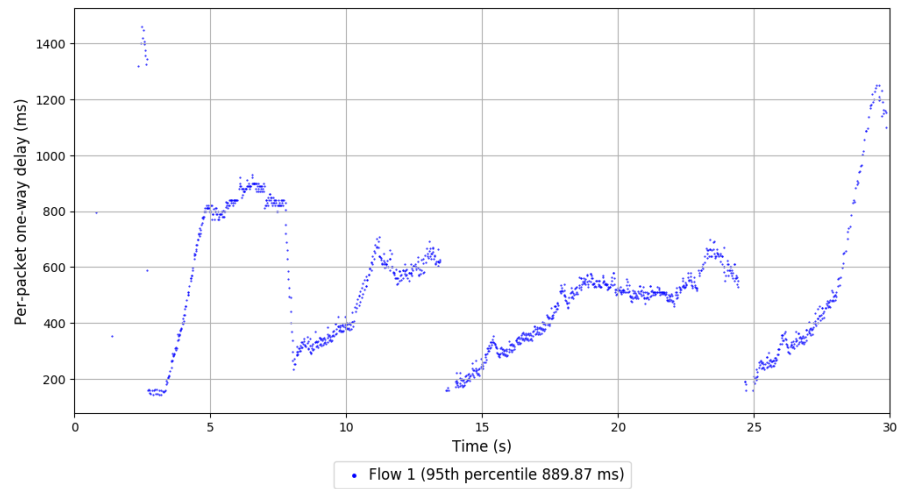
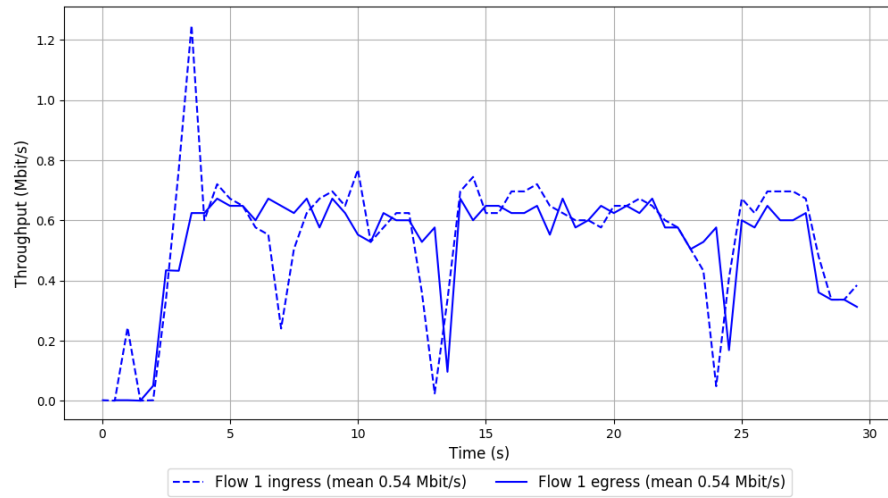
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 889.870 ms

Loss rate: 2.76%

Run 2: Report of TCP BBR — Data Link

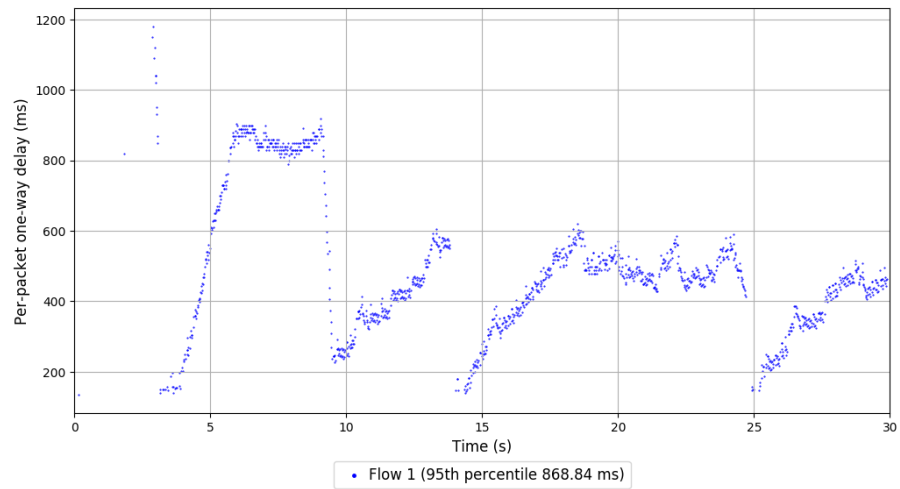
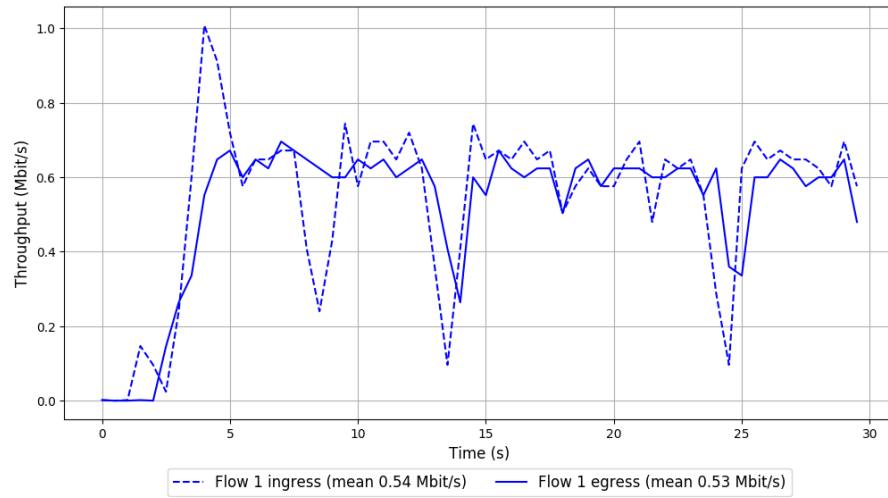


Run 3: Statistics of TCP BBR

Start at: 2018-03-05 18:35:49
End at: 2018-03-05 18:36:19
Local clock offset: -7.842 ms
Remote clock offset: -1.485 ms

Below is generated by plot.py at 2018-03-05 19:48:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 868.838 ms
Loss rate: 2.16%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 868.838 ms
Loss rate: 2.16%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-03-05 18:01:48

End at: 2018-03-05 18:02:18

Local clock offset: -7.796 ms

Remote clock offset: 0.135 ms

Below is generated by plot.py at 2018-03-05 19:48:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 7574.193 ms

Loss rate: 30.82%

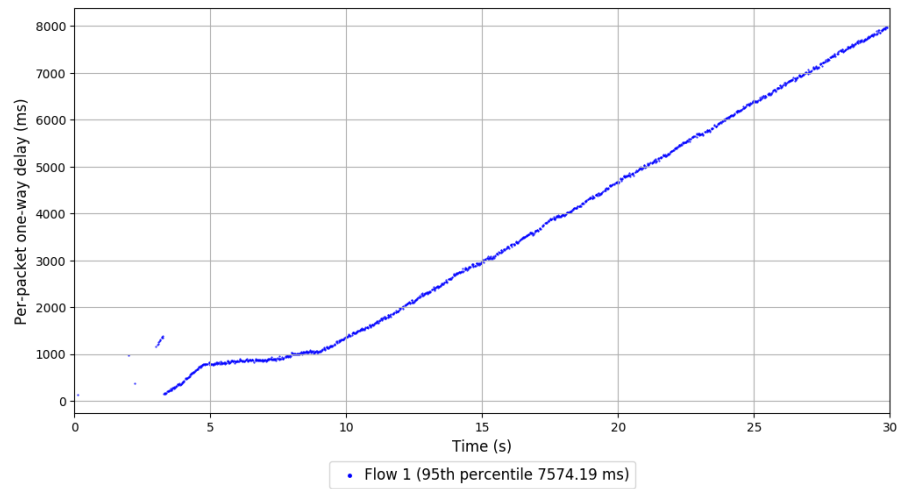
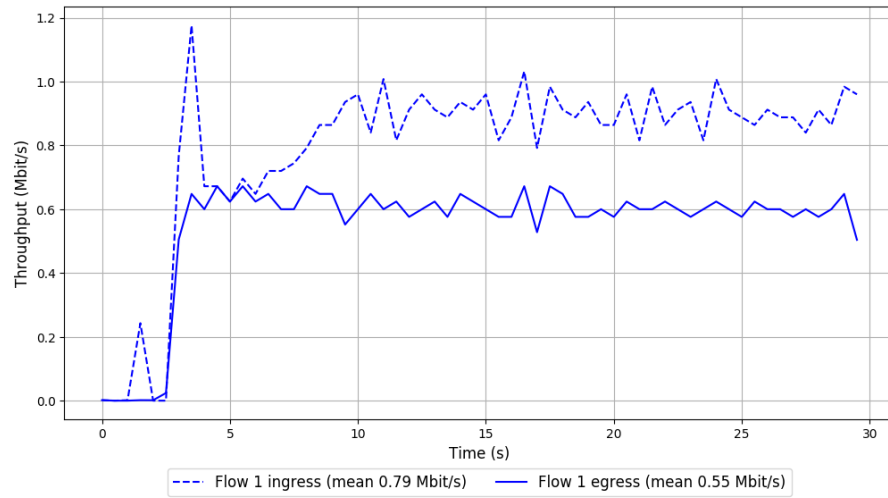
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 7574.193 ms

Loss rate: 30.82%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-03-05 18:22:57

End at: 2018-03-05 18:23:27

Local clock offset: -7.599 ms

Remote clock offset: -6.38 ms

Below is generated by plot.py at 2018-03-05 19:48:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 8337.725 ms

Loss rate: 30.98%

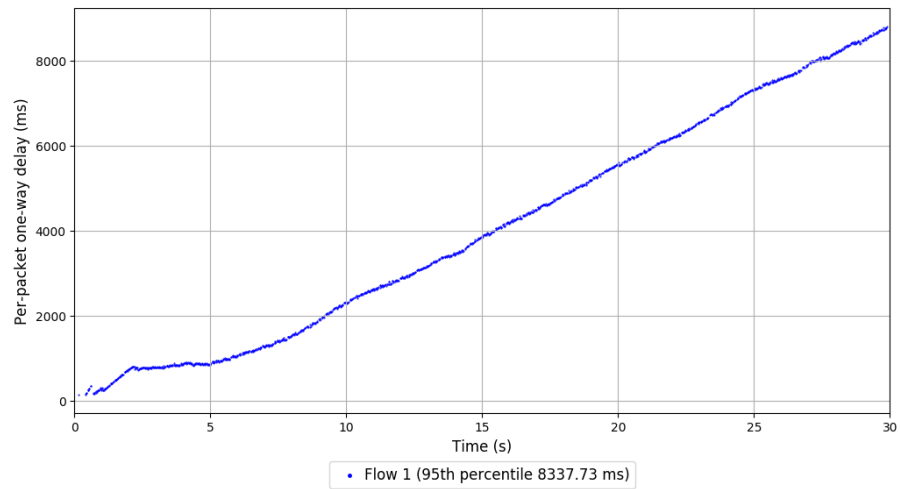
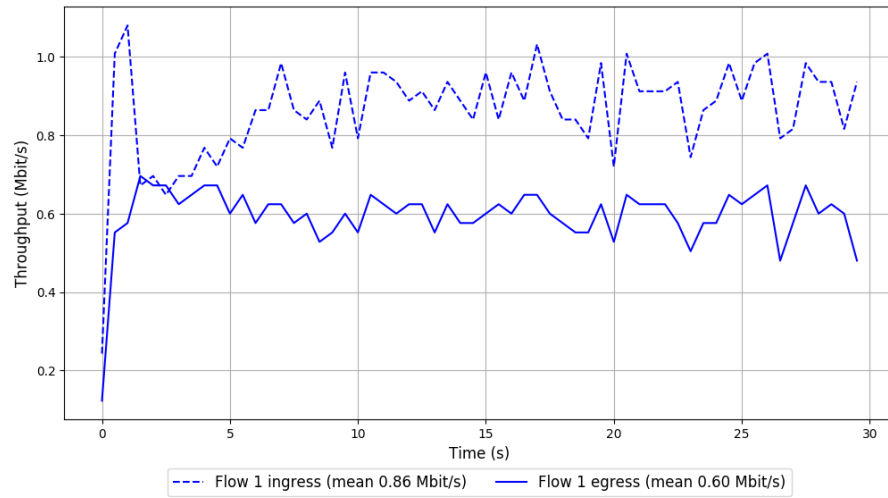
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 8337.725 ms

Loss rate: 30.98%

Run 2: Report of TCP Cubic — Data Link

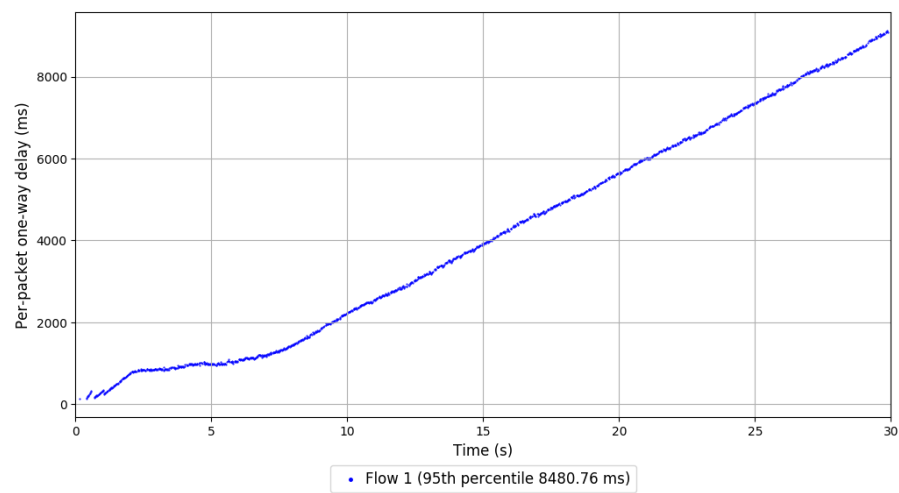
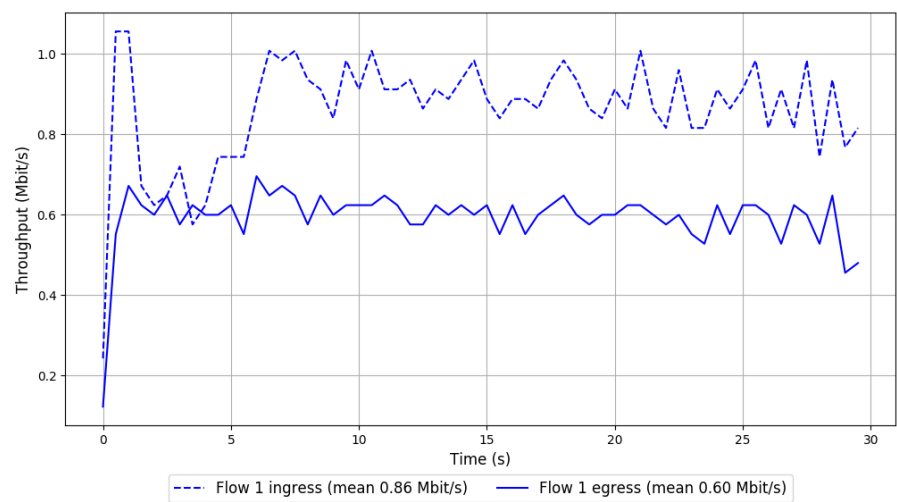


Run 3: Statistics of TCP Cubic

Start at: 2018-03-05 18:44:03
End at: 2018-03-05 18:44:33
Local clock offset: -8.161 ms
Remote clock offset: -6.456 ms

Below is generated by plot.py at 2018-03-05 19:48:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 8480.765 ms
Loss rate: 31.14%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 8480.765 ms
Loss rate: 31.14%

Run 3: Report of TCP Cubic — Data Link

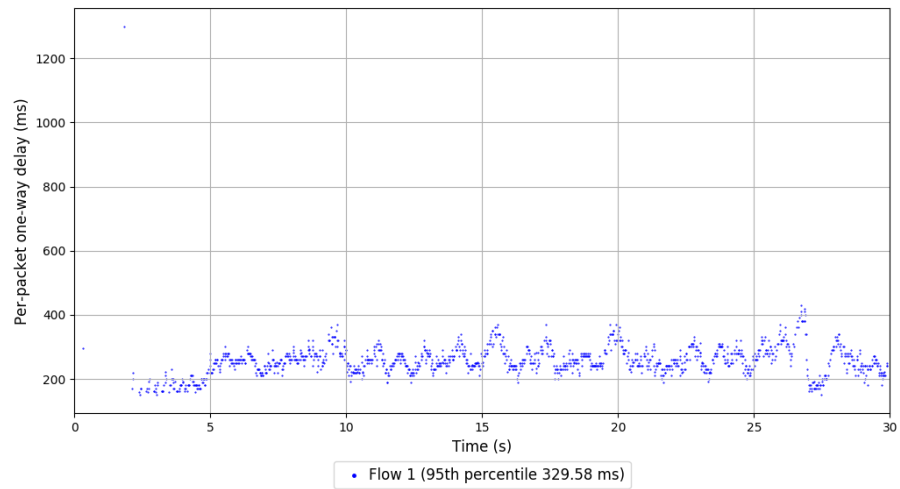
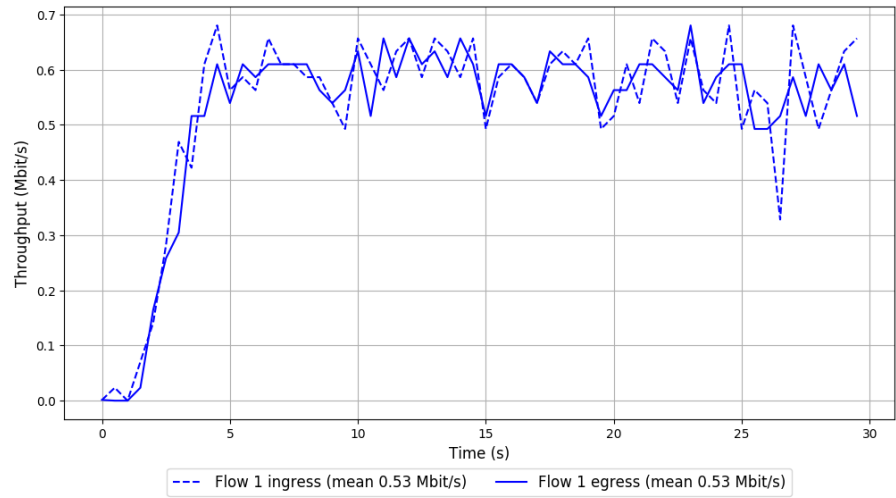


```
Run 1: Statistics of LEDBAT

Start at: 2018-03-05 17:55:56
End at: 2018-03-05 17:56:26
Local clock offset: -8.662 ms
Remote clock offset: -6.172 ms

# Below is generated by plot.py at 2018-03-05 19:48:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 329.582 ms
Loss rate: 1.25%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 329.582 ms
Loss rate: 1.25%
```


Run 1: Report of LEDBAT — Data Link

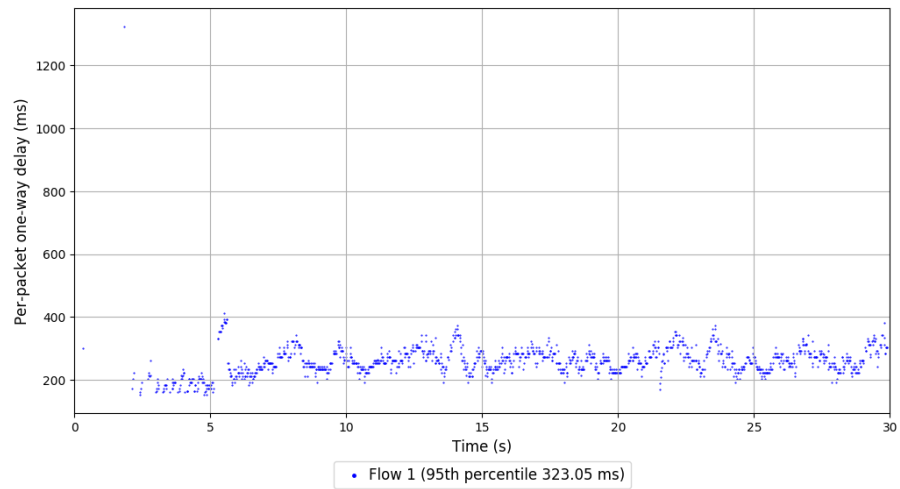
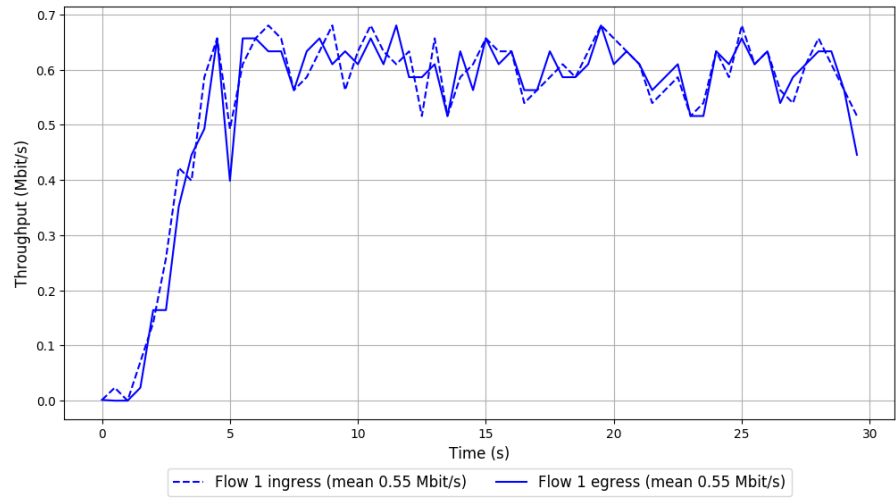


Run 2: Statistics of LEDBAT

Start at: 2018-03-05 18:17:00
End at: 2018-03-05 18:17:30
Local clock offset: -7.714 ms
Remote clock offset: -6.344 ms

Below is generated by plot.py at 2018-03-05 19:48:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 323.054 ms
Loss rate: 1.15%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 323.054 ms
Loss rate: 1.15%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2018-03-05 18:38:09

End at: 2018-03-05 18:38:39

Local clock offset: -7.88 ms

Remote clock offset: 0.076 ms

Below is generated by plot.py at 2018-03-05 19:48:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 320.759 ms

Loss rate: 1.34%

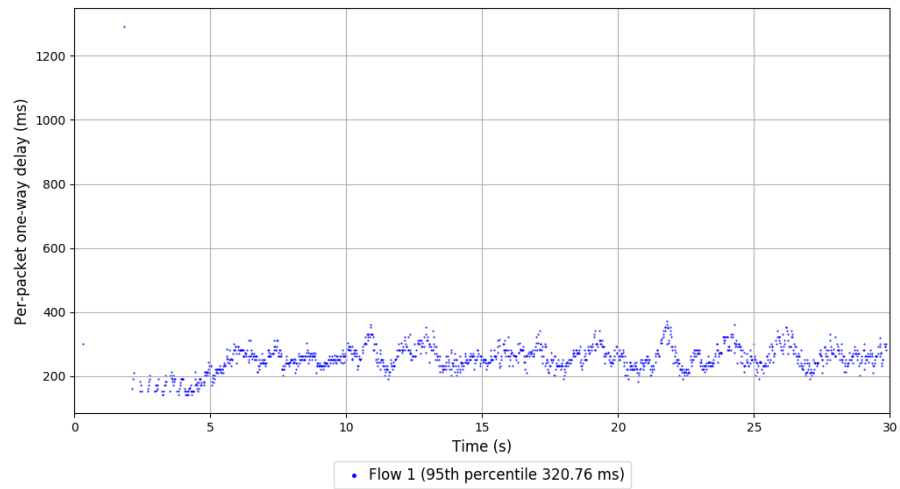
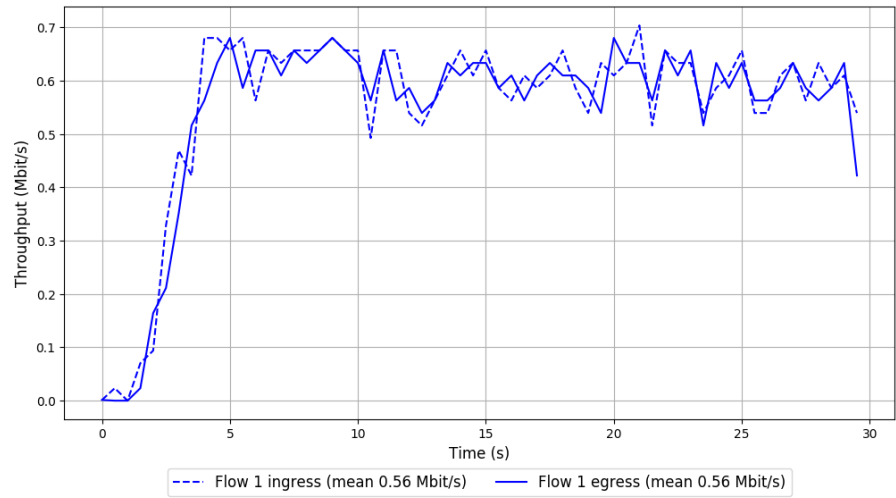
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 320.759 ms

Loss rate: 1.34%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC

Start at: 2018-03-05 17:57:06

End at: 2018-03-05 17:57:36

Local clock offset: -8.707 ms

Remote clock offset: -0.64 ms

Below is generated by plot.py at 2018-03-05 19:48:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 26082.098 ms

Loss rate: 98.56%

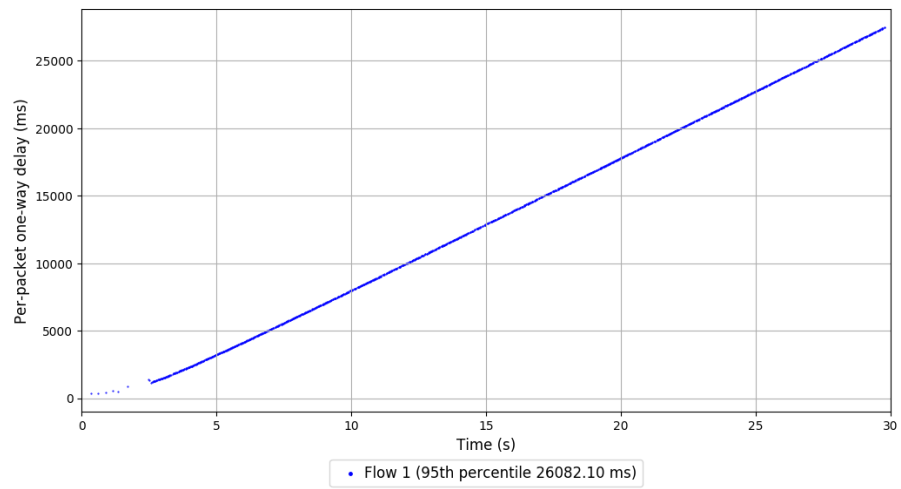
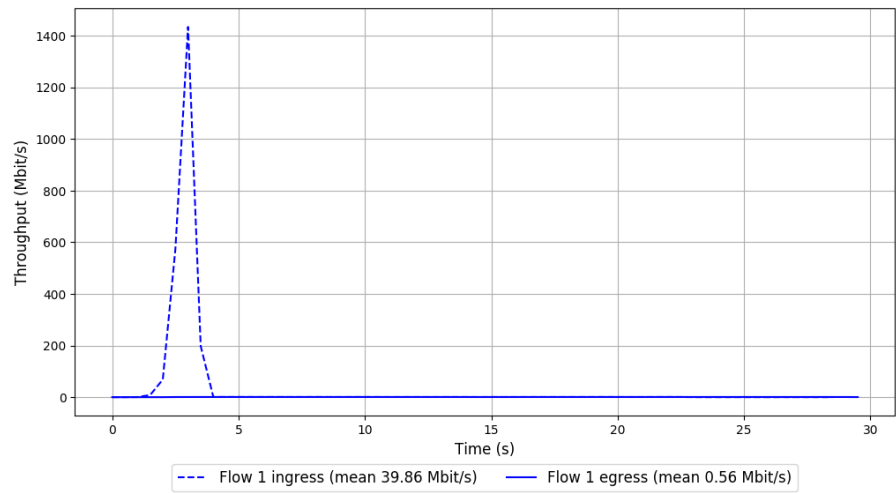
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 26082.098 ms

Loss rate: 98.56%

Run 1: Report of PCC — Data Link



Run 2: Statistics of PCC

Start at: 2018-03-05 18:18:10

End at: 2018-03-05 18:18:40

Local clock offset: -7.666 ms

Remote clock offset: 0.238 ms

Below is generated by plot.py at 2018-03-05 19:48:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26140.526 ms

Loss rate: 98.52%

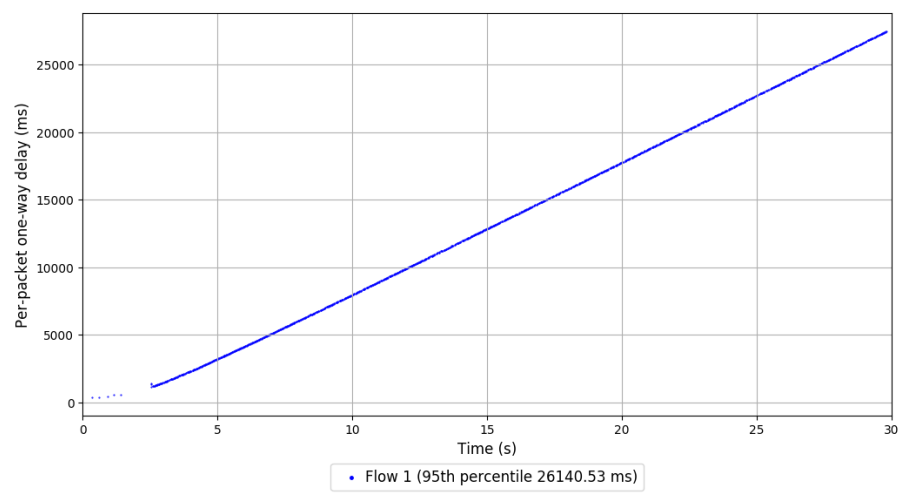
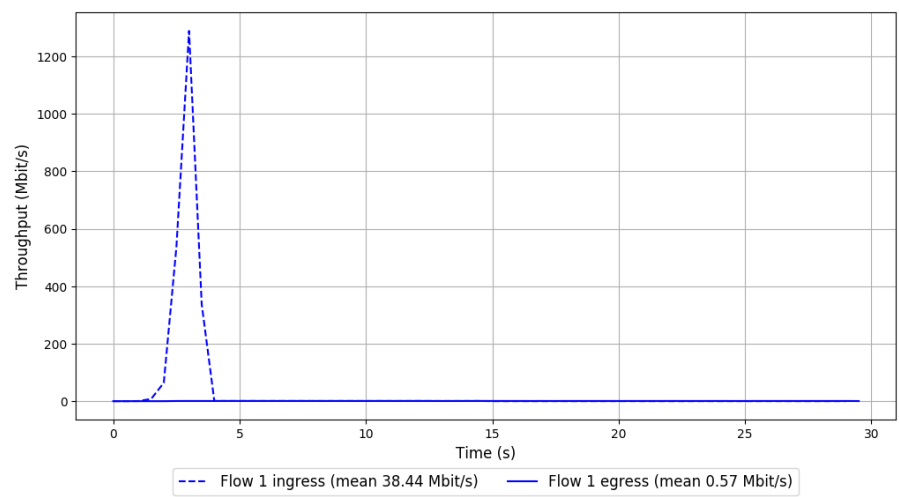
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26140.526 ms

Loss rate: 98.52%

Run 2: Report of PCC — Data Link

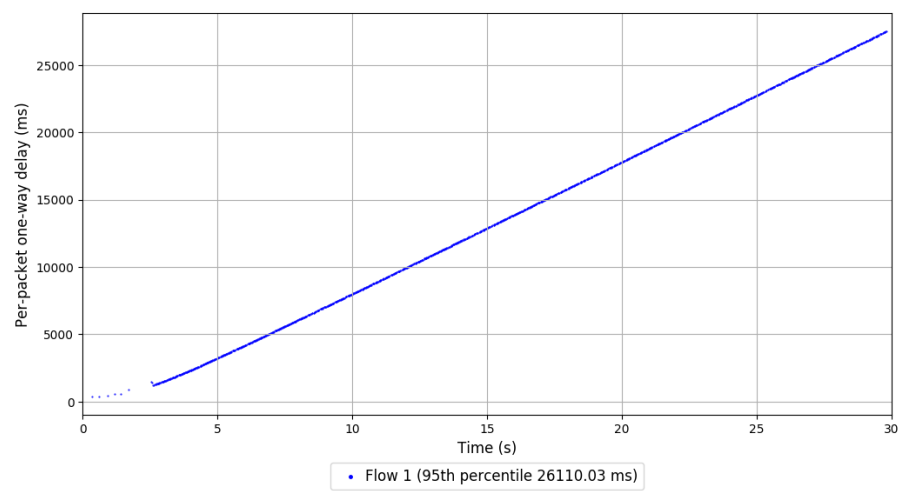
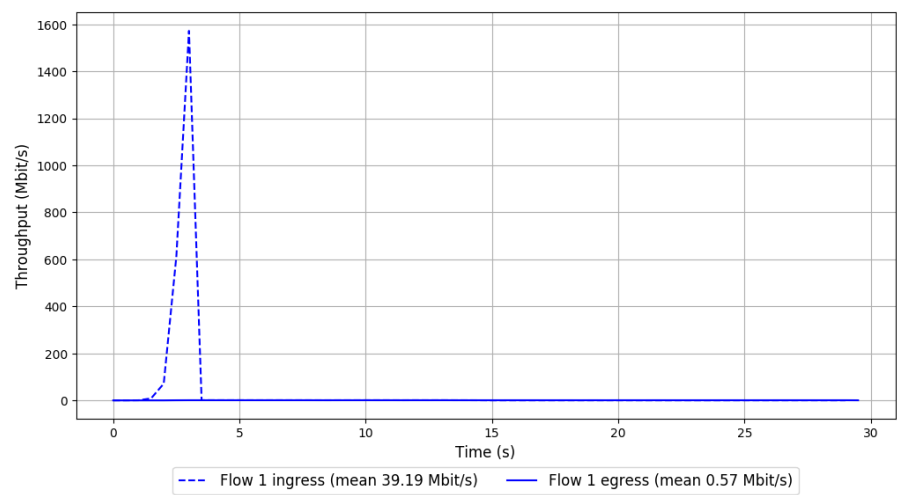


Run 3: Statistics of PCC

Start at: 2018-03-05 18:39:19
End at: 2018-03-05 18:39:49
Local clock offset: -7.921 ms
Remote clock offset: -5.628 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26110.031 ms
Loss rate: 98.54%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26110.031 ms
Loss rate: 98.54%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-03-05 17:46:35

End at: 2018-03-05 17:47:05

Local clock offset: -7.29 ms

Remote clock offset: -5.464 ms

Below is generated by plot.py at 2018-03-05 19:48:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 6960.163 ms

Loss rate: 29.26%

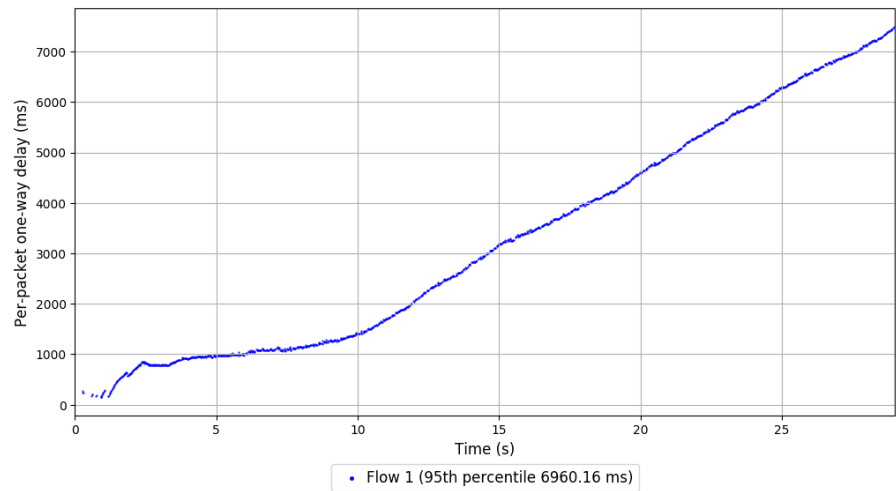
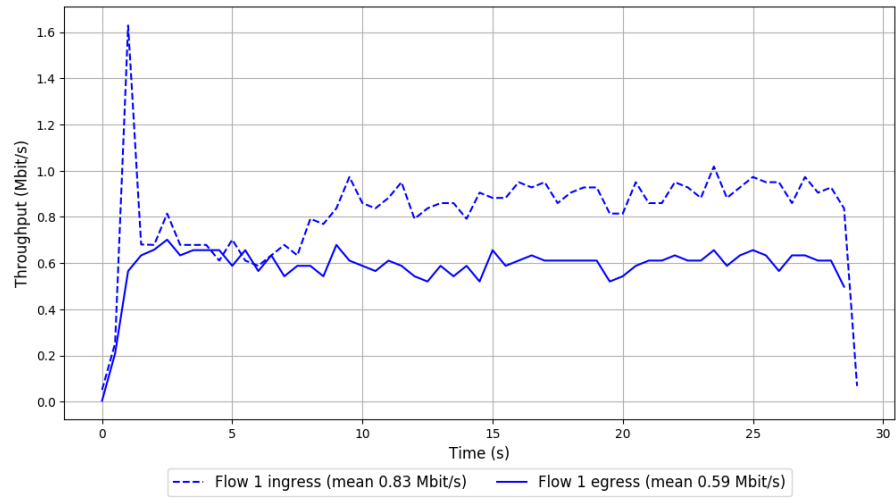
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 6960.163 ms

Loss rate: 29.26%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-03-05 18:07:39

End at: 2018-03-05 18:08:09

Local clock offset: -7.55 ms

Remote clock offset: -0.602 ms

Below is generated by plot.py at 2018-03-05 19:48:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 6235.589 ms

Loss rate: 26.78%

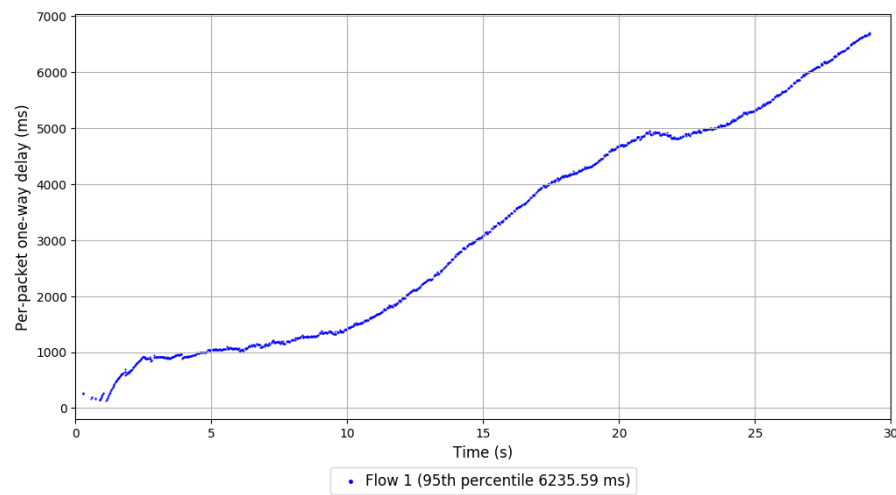
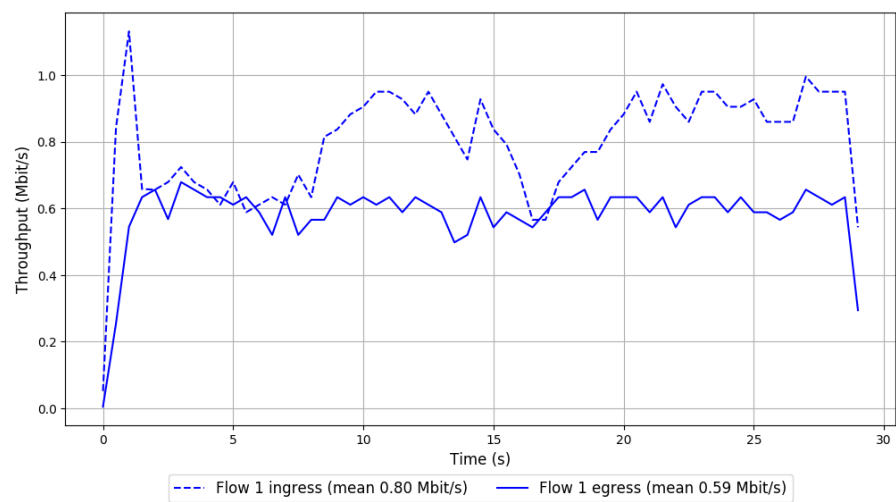
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 6235.589 ms

Loss rate: 26.78%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-03-05 18:28:48

End at: 2018-03-05 18:29:18

Local clock offset: -7.623 ms

Remote clock offset: -0.714 ms

Below is generated by plot.py at 2018-03-05 19:48:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 5842.766 ms

Loss rate: 26.49%

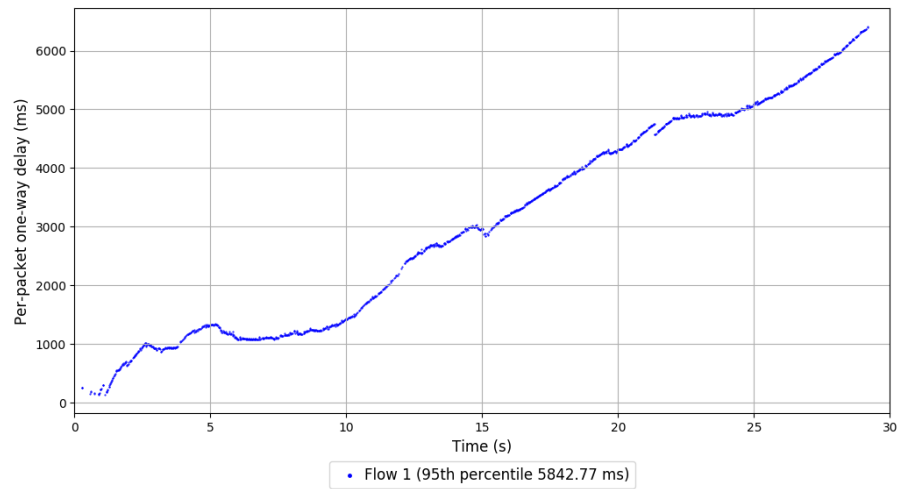
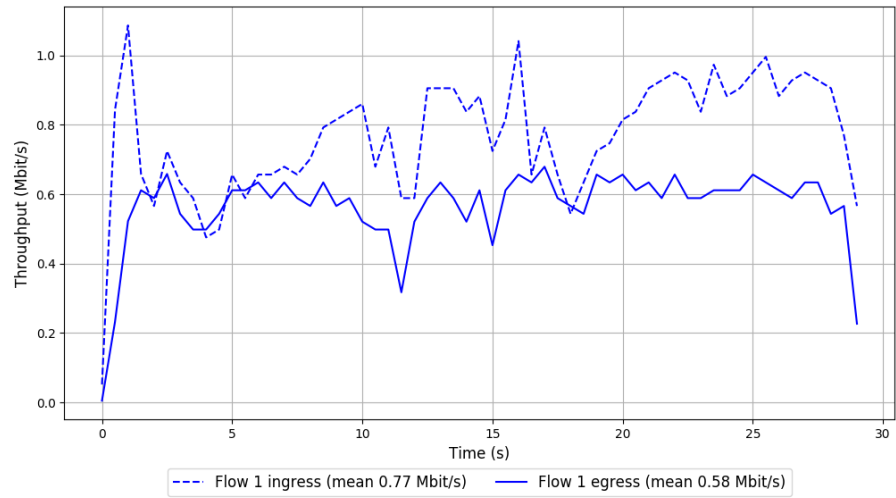
-- Flow 1:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 5842.766 ms

Loss rate: 26.49%

Run 3: Report of QUIC Cubic — Data Link

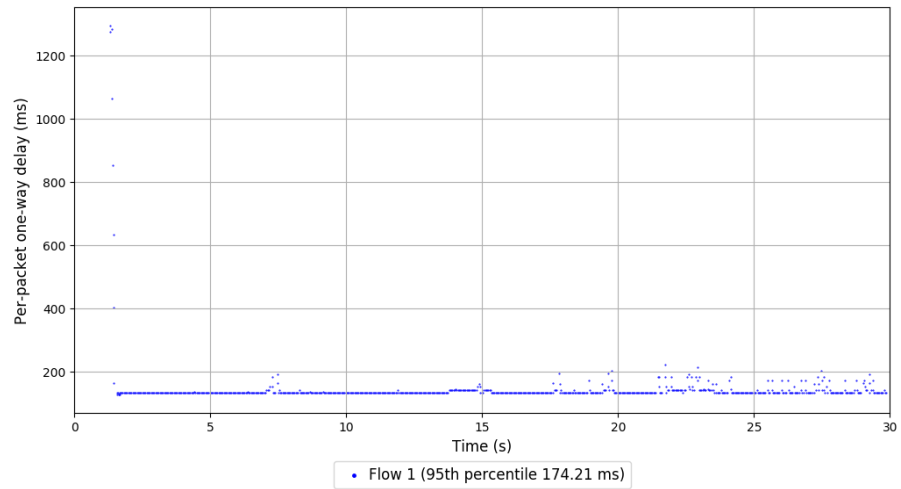
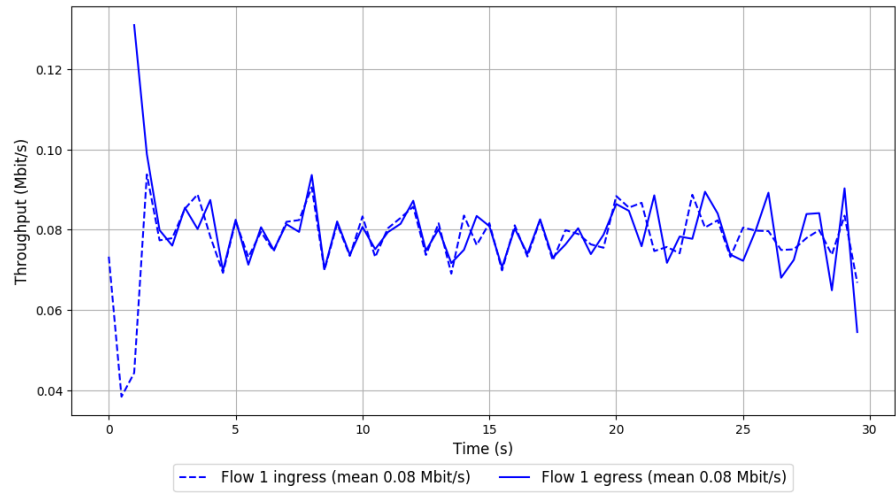


```
Run 1: Statistics of SCReAM

Start at: 2018-03-05 17:43:05
End at: 2018-03-05 17:43:35
Local clock offset: -6.958 ms
Remote clock offset: 0.289 ms

# Below is generated by plot.py at 2018-03-05 19:48:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 174.205 ms
Loss rate: 0.65%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 174.205 ms
Loss rate: 0.65%
```

Run 1: Report of SReAM — Data Link

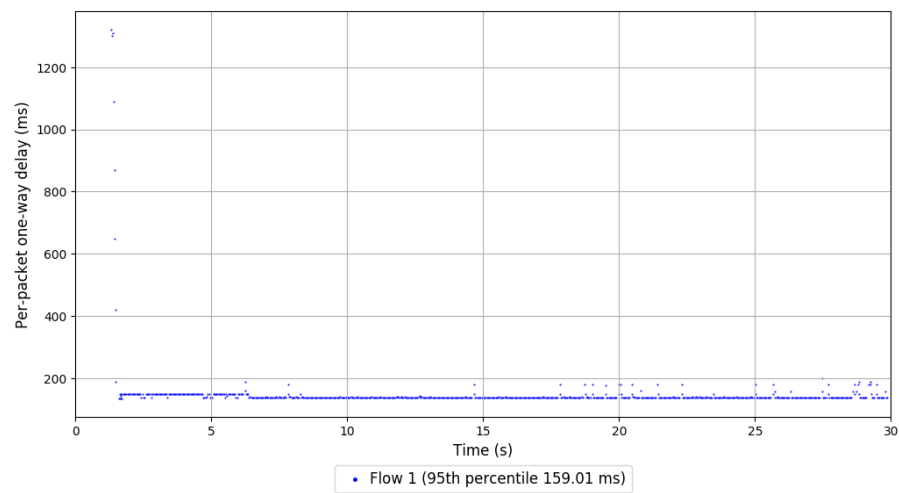
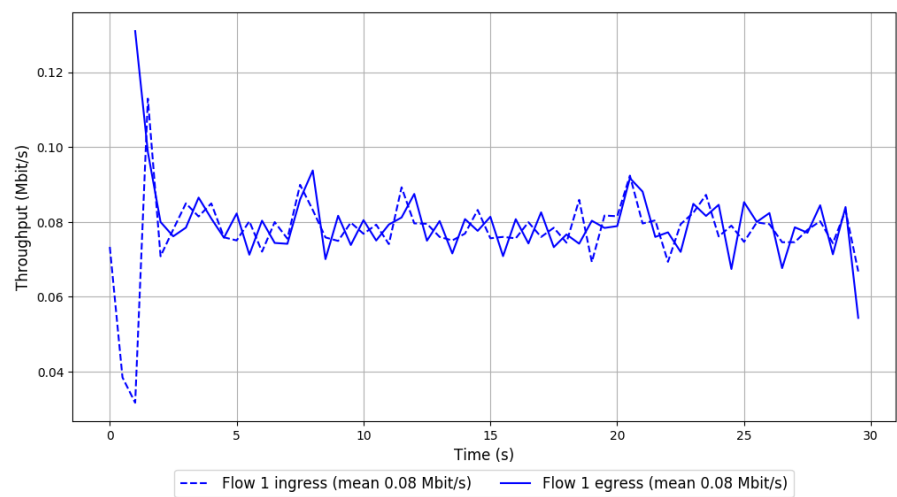


Run 2: Statistics of SCReAM

Start at: 2018-03-05 18:04:09
End at: 2018-03-05 18:04:39
Local clock offset: -7.572 ms
Remote clock offset: -6.284 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 159.010 ms
Loss rate: 0.65%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 159.010 ms
Loss rate: 0.65%

Run 2: Report of SReAM — Data Link

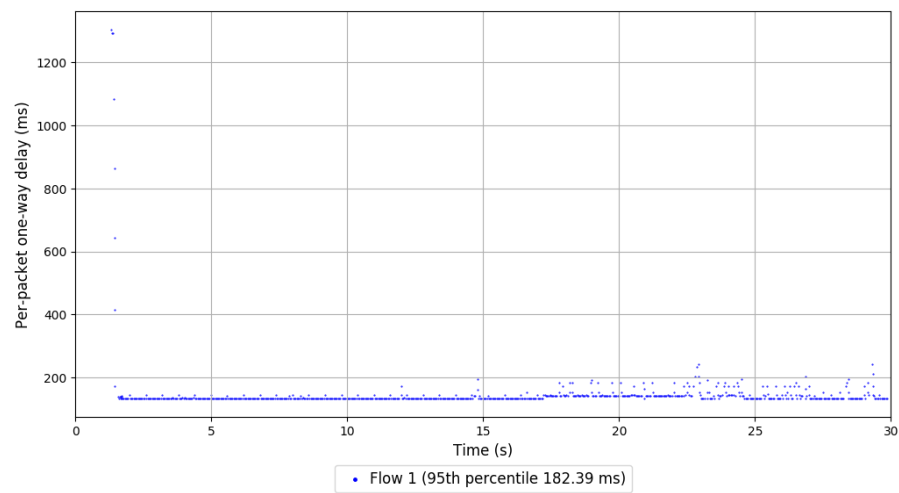
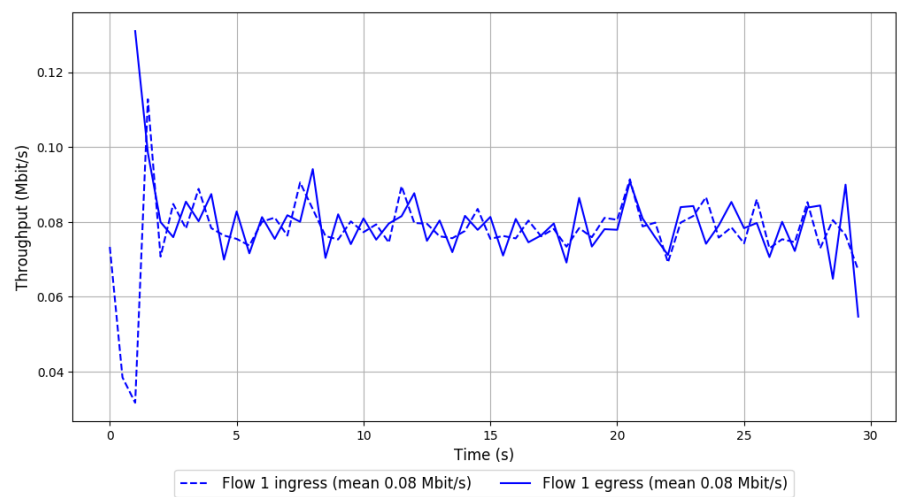


Run 3: Statistics of SCReAM

Start at: 2018-03-05 18:25:18
End at: 2018-03-05 18:25:48
Local clock offset: -7.581 ms
Remote clock offset: -5.461 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 182.390 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 182.390 ms
Loss rate: 0.66%

Run 3: Report of SReAM — Data Link

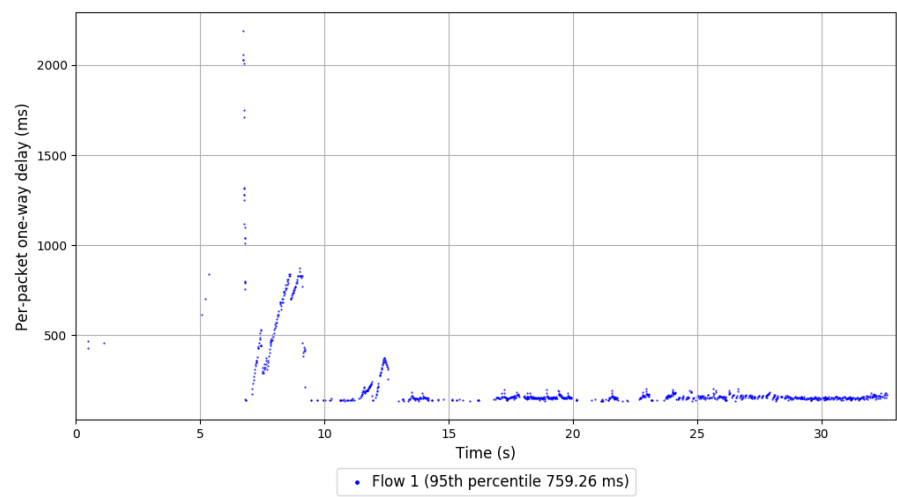
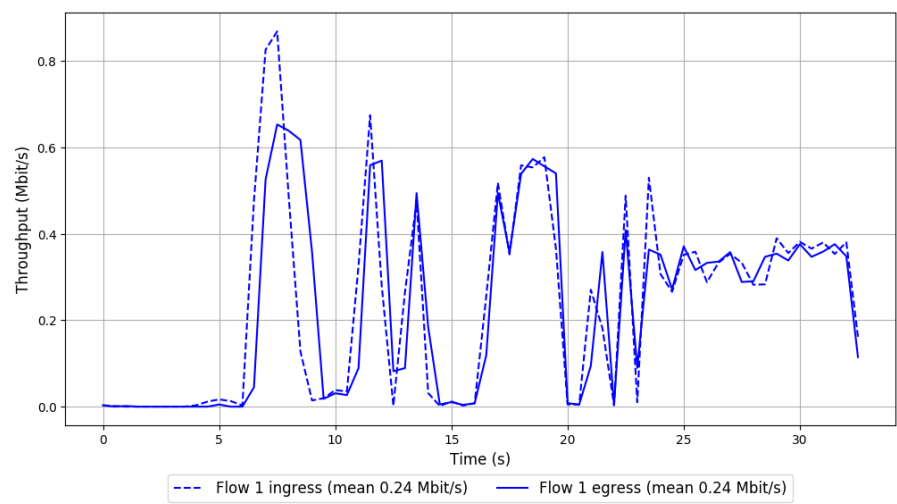


Run 1: Statistics of WebRTC media

Start at: 2018-03-05 17:41:55
End at: 2018-03-05 17:42:25
Local clock offset: -6.995 ms
Remote clock offset: -6.273 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 759.258 ms
Loss rate: 1.39%
-- Flow 1:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 759.258 ms
Loss rate: 1.39%

Run 1: Report of WebRTC media — Data Link

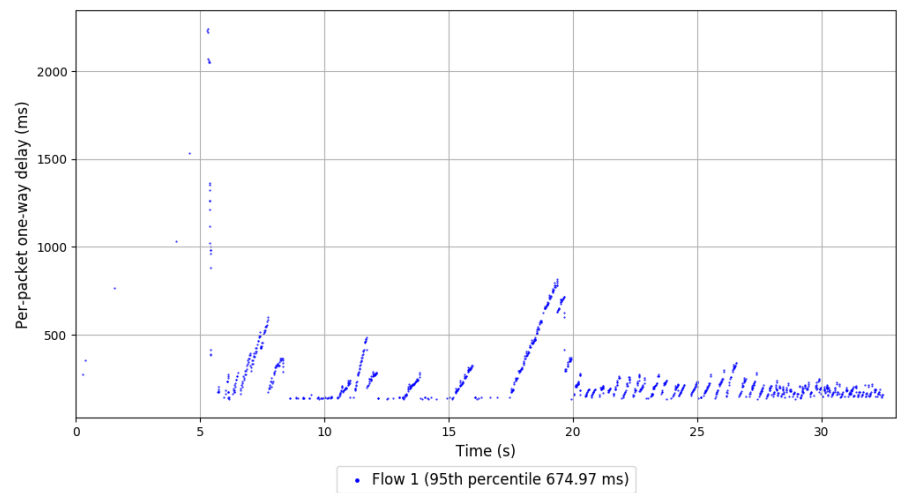
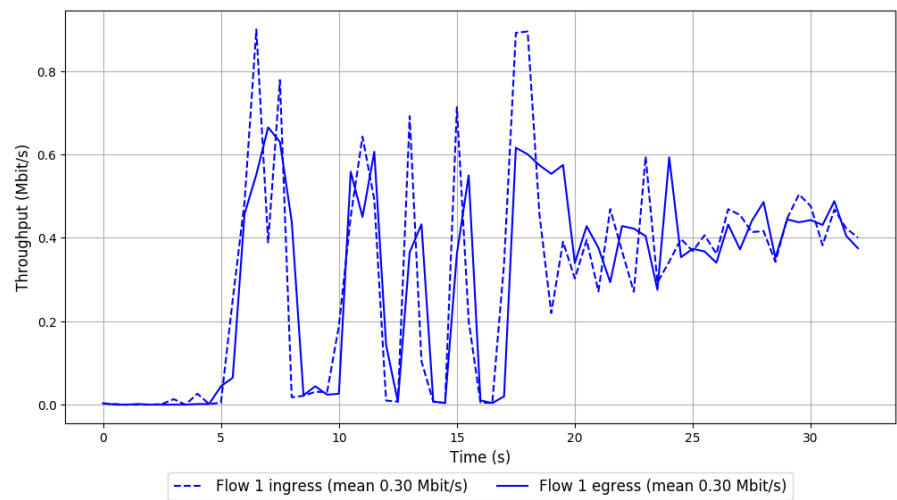


Run 2: Statistics of WebRTC media

Start at: 2018-03-05 18:02:59
End at: 2018-03-05 18:03:29
Local clock offset: -7.642 ms
Remote clock offset: -5.513 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 674.968 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 674.968 ms
Loss rate: 0.96%

Run 2: Report of WebRTC media — Data Link

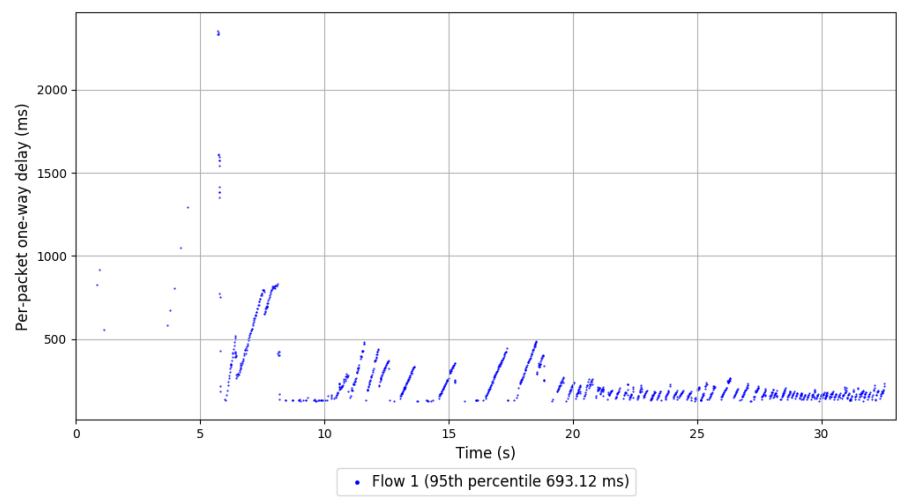
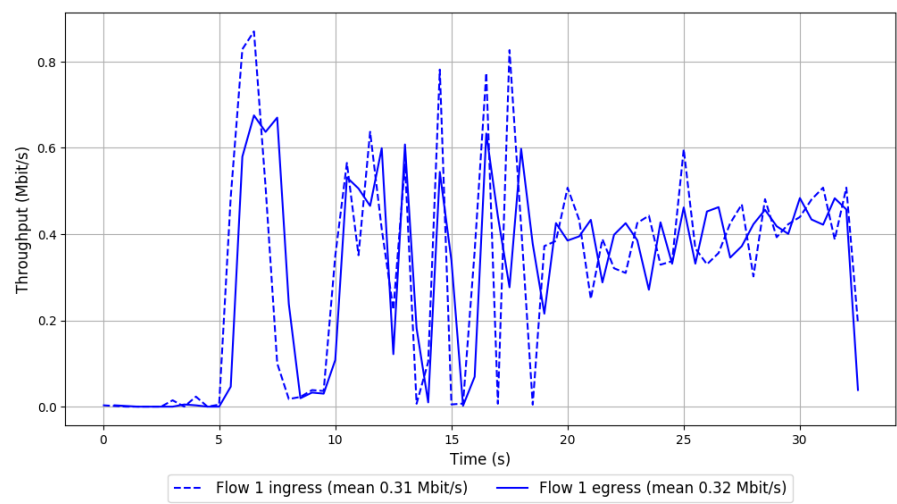


Run 3: Statistics of WebRTC media

Start at: 2018-03-05 18:24:08
End at: 2018-03-05 18:24:38
Local clock offset: -7.516 ms
Remote clock offset: -0.611 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 693.123 ms
Loss rate: 1.64%
-- Flow 1:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 693.123 ms
Loss rate: 1.64%

Run 3: Report of WebRTC media — Data Link

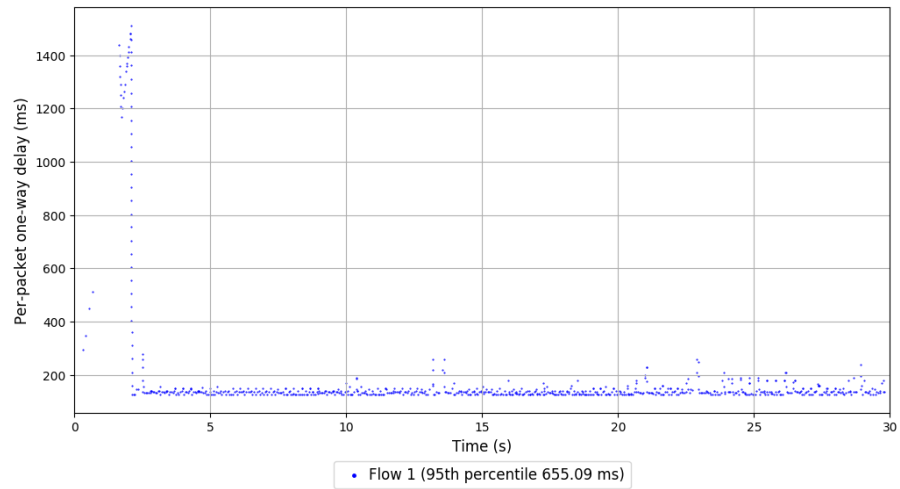
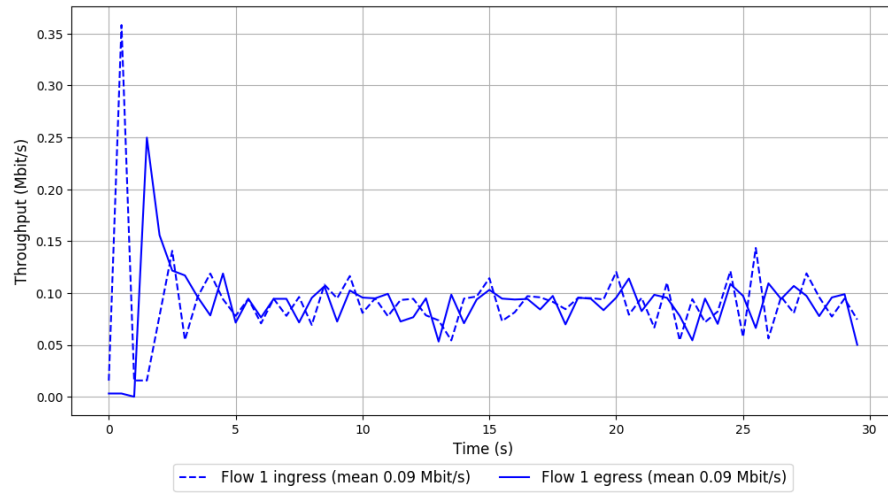


Run 1: Statistics of Sprout

Start at: 2018-03-05 17:48:55
End at: 2018-03-05 17:49:25
Local clock offset: -7.695 ms
Remote clock offset: -0.587 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 655.094 ms
Loss rate: 1.29%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 655.094 ms
Loss rate: 1.29%

Run 1: Report of Sprout — Data Link

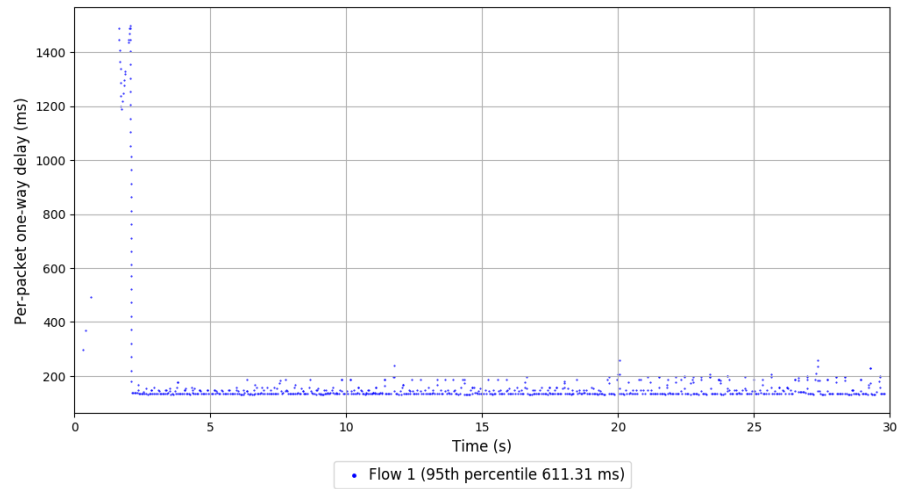
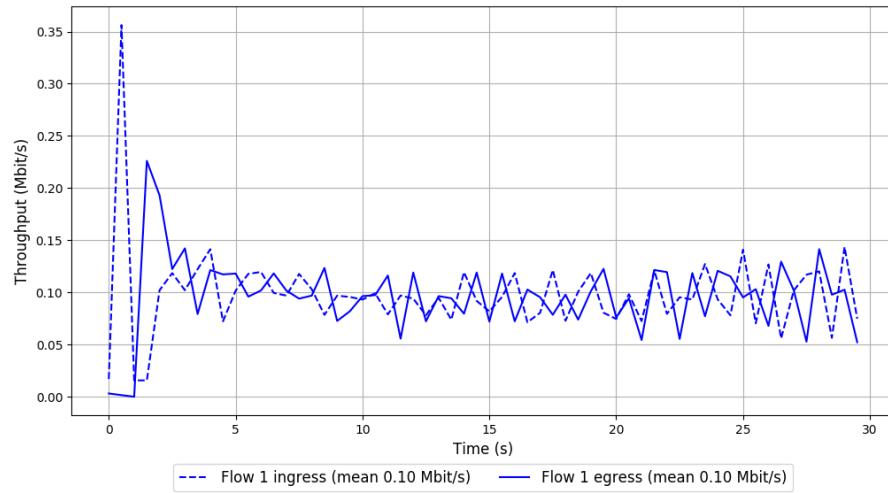


Run 2: Statistics of Sprout

Start at: 2018-03-05 18:09:59
End at: 2018-03-05 18:10:29
Local clock offset: -7.665 ms
Remote clock offset: -6.315 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 611.314 ms
Loss rate: 1.77%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 611.314 ms
Loss rate: 1.77%

Run 2: Report of Sprout — Data Link

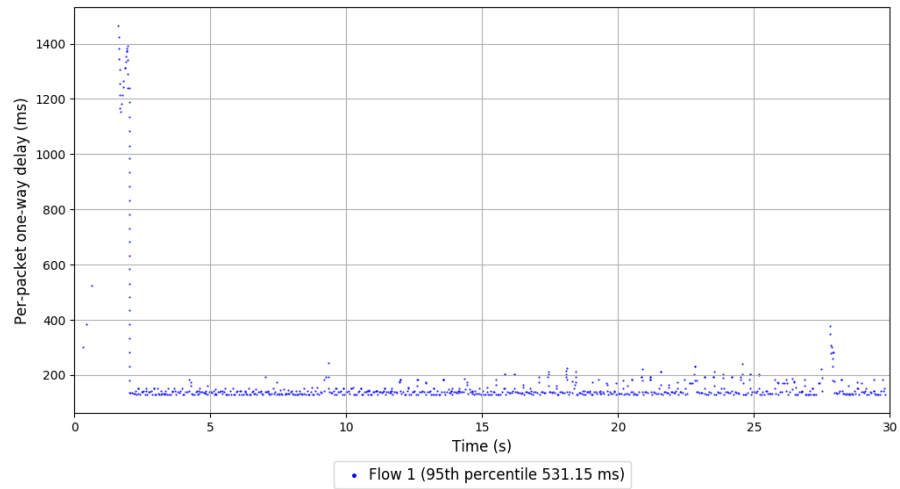
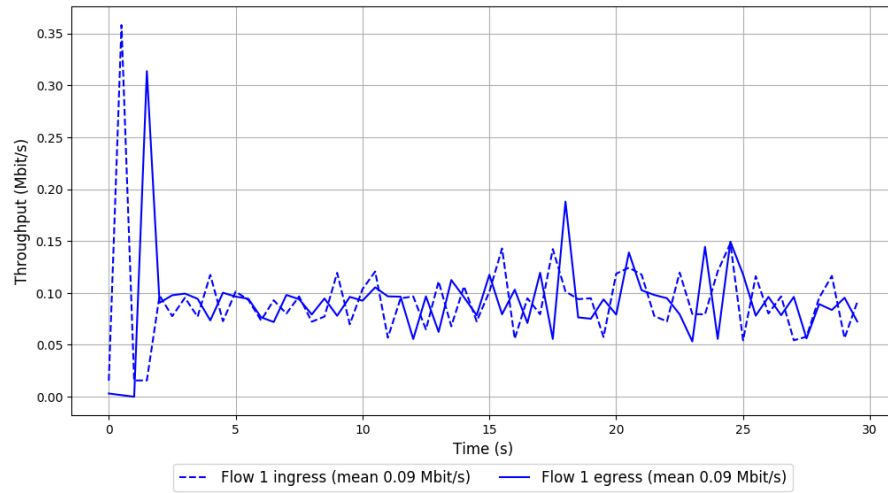


Run 3: Statistics of Sprout

Start at: 2018-03-05 18:31:08
End at: 2018-03-05 18:31:39
Local clock offset: -7.683 ms
Remote clock offset: -1.506 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 531.150 ms
Loss rate: 1.28%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 531.150 ms
Loss rate: 1.28%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-03-05 17:50:05

End at: 2018-03-05 17:50:35

Local clock offset: -7.789 ms

Remote clock offset: -0.589 ms

Below is generated by plot.py at 2018-03-05 19:48:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 979.154 ms

Loss rate: 2.72%

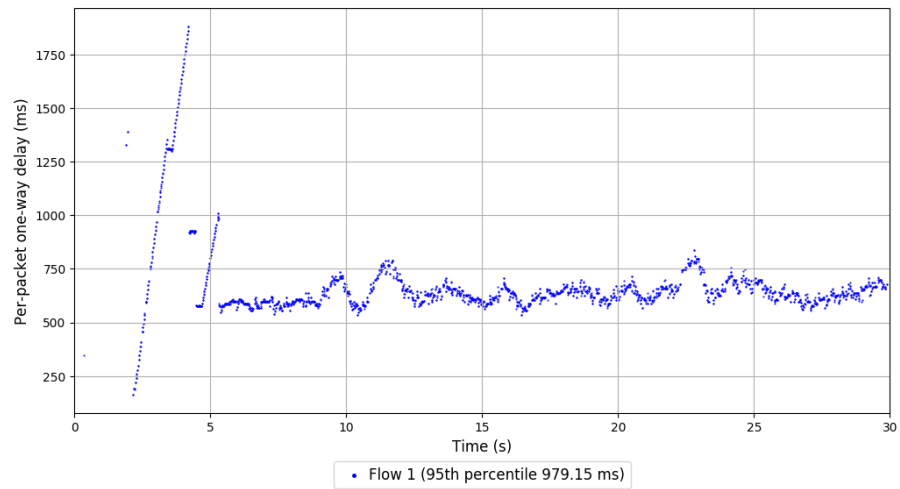
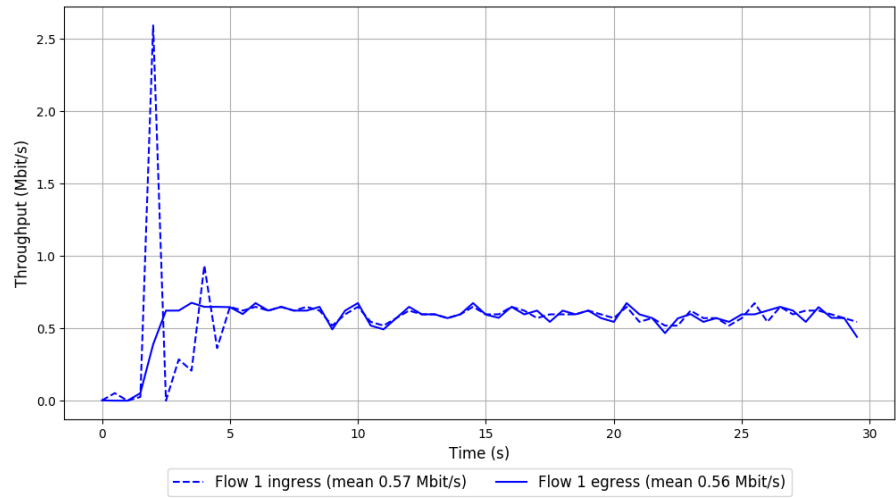
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 979.154 ms

Loss rate: 2.72%

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

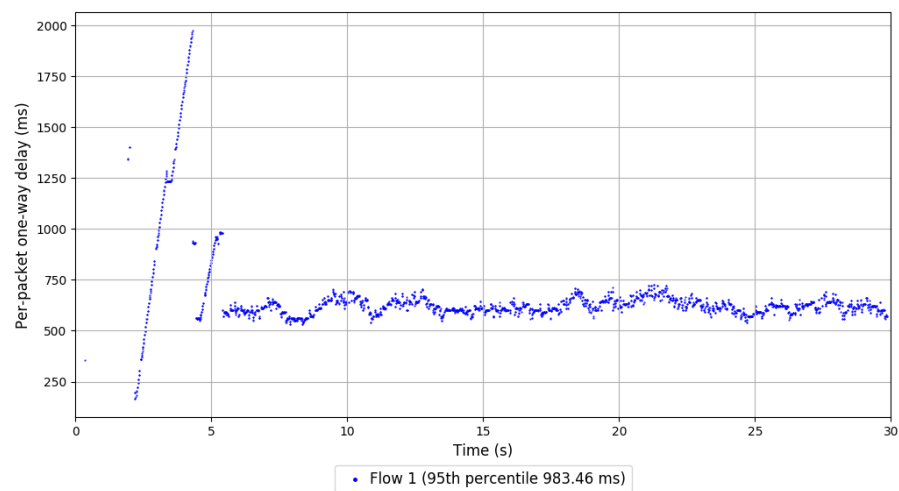
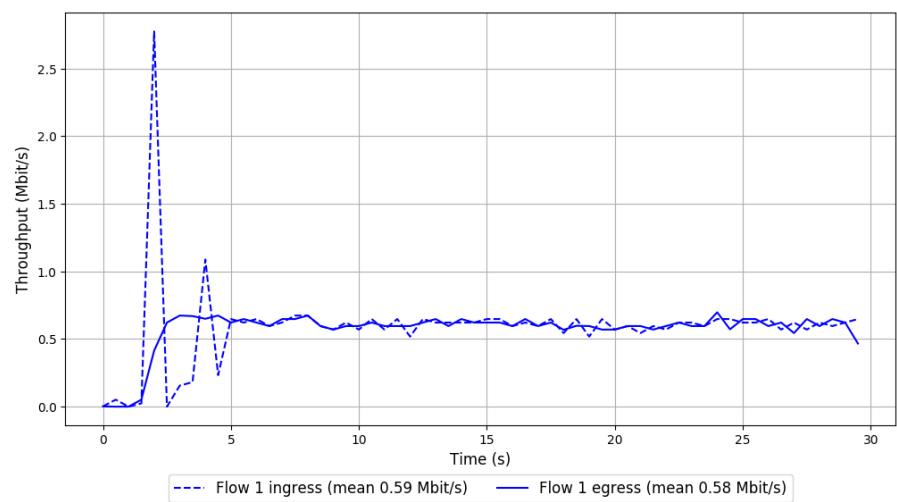


Run 2: Statistics of TaoVA-100x

Start at: 2018-03-05 18:11:09
End at: 2018-03-05 18:11:39
Local clock offset: -7.725 ms
Remote clock offset: -0.716 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 983.457 ms
Loss rate: 2.66%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 983.457 ms
Loss rate: 2.66%

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



Run 3: Statistics of TaoVA-100x

Start at: 2018-03-05 18:32:19

End at: 2018-03-05 18:32:49

Local clock offset: -7.66 ms

Remote clock offset: -6.334 ms

Below is generated by plot.py at 2018-03-05 19:48:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1006.418 ms

Loss rate: 2.52%

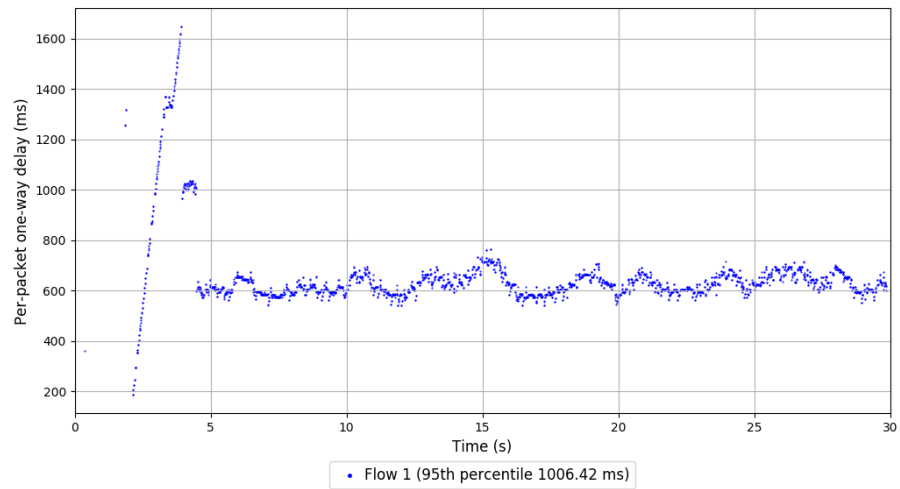
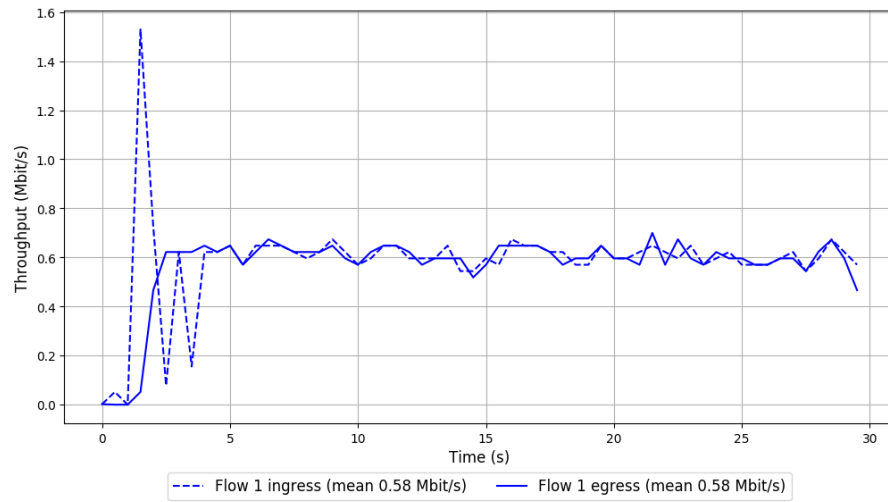
-- Flow 1:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1006.418 ms

Loss rate: 2.52%

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



Run 1: Statistics of TCP Vegas

Start at: 2018-03-05 17:44:15

End at: 2018-03-05 17:44:45

Local clock offset: -6.736 ms

Remote clock offset: -0.55 ms

Below is generated by plot.py at 2018-03-05 19:48:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 880.256 ms

Loss rate: 1.12%

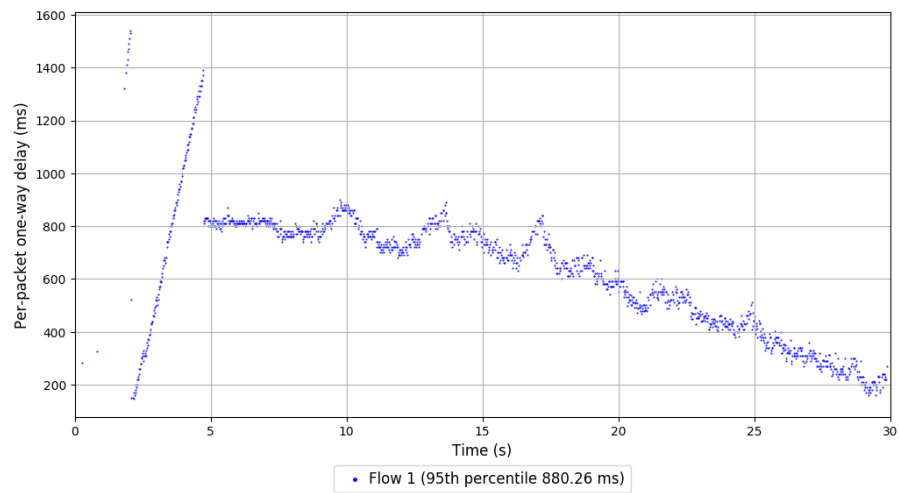
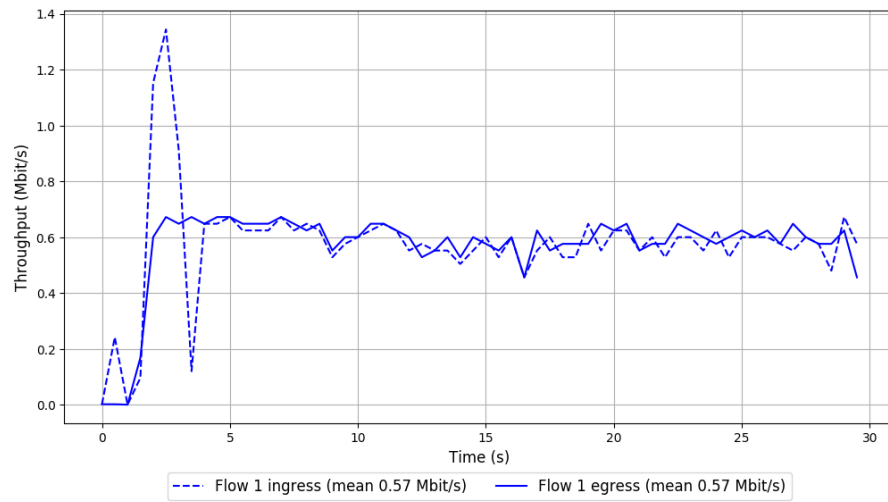
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 880.256 ms

Loss rate: 1.12%

Run 1: Report of TCP Vegas — Data Link

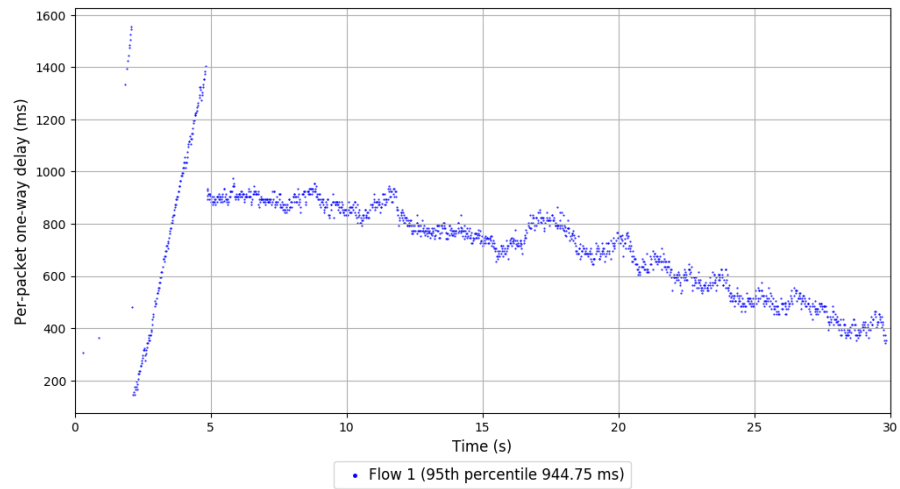
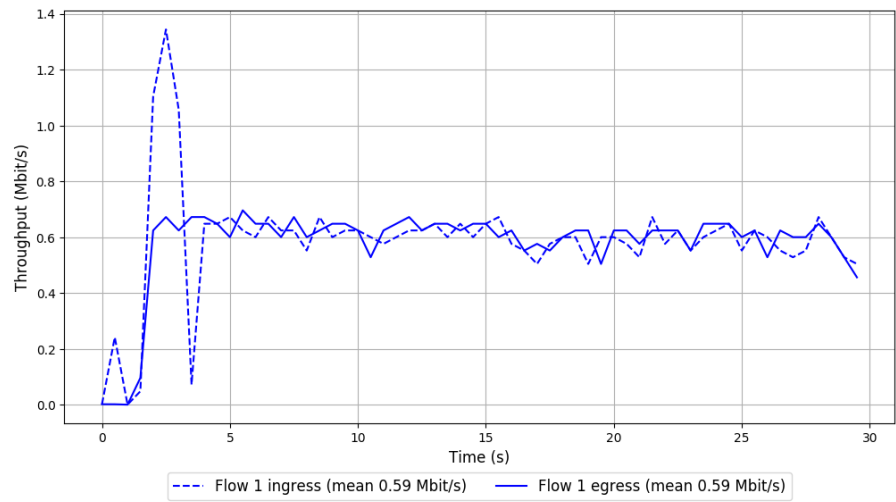


Run 2: Statistics of TCP Vegas

Start at: 2018-03-05 18:05:19
End at: 2018-03-05 18:05:49
Local clock offset: -7.558 ms
Remote clock offset: -6.291 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 944.755 ms
Loss rate: 1.50%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 944.755 ms
Loss rate: 1.50%

Run 2: Report of TCP Vegas — Data Link

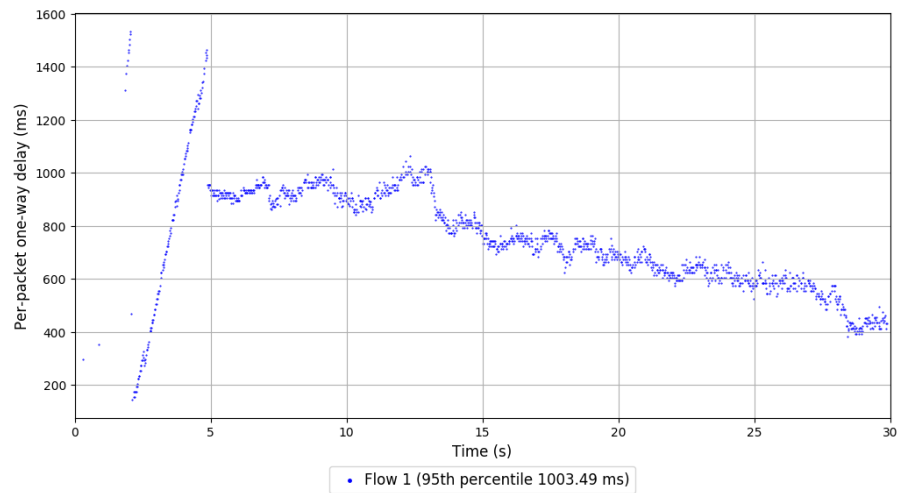
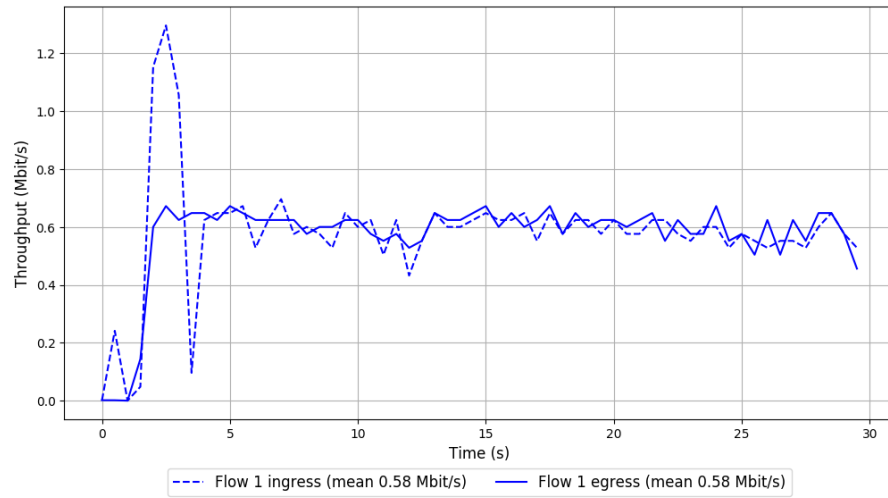


Run 3: Statistics of TCP Vegas

Start at: 2018-03-05 18:26:28
End at: 2018-03-05 18:26:58
Local clock offset: -7.535 ms
Remote clock offset: -0.685 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1003.491 ms
Loss rate: 1.66%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1003.491 ms
Loss rate: 1.66%

Run 3: Report of TCP Vegas — Data Link

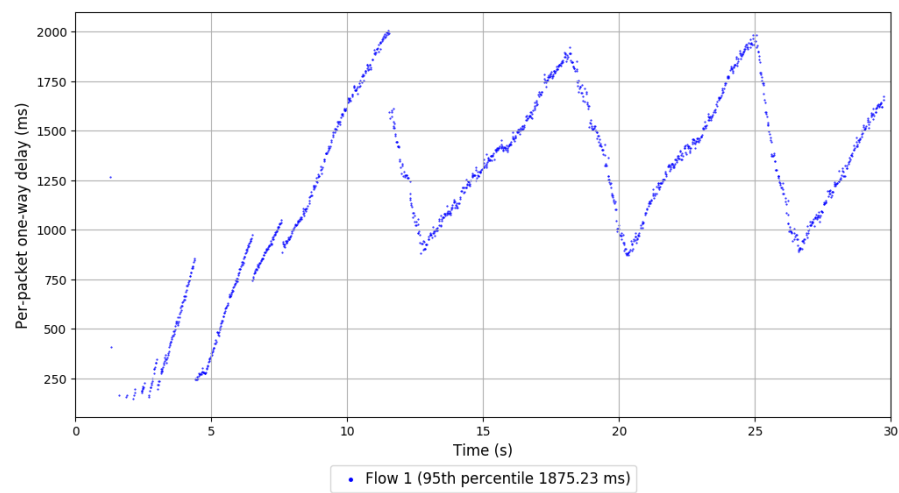
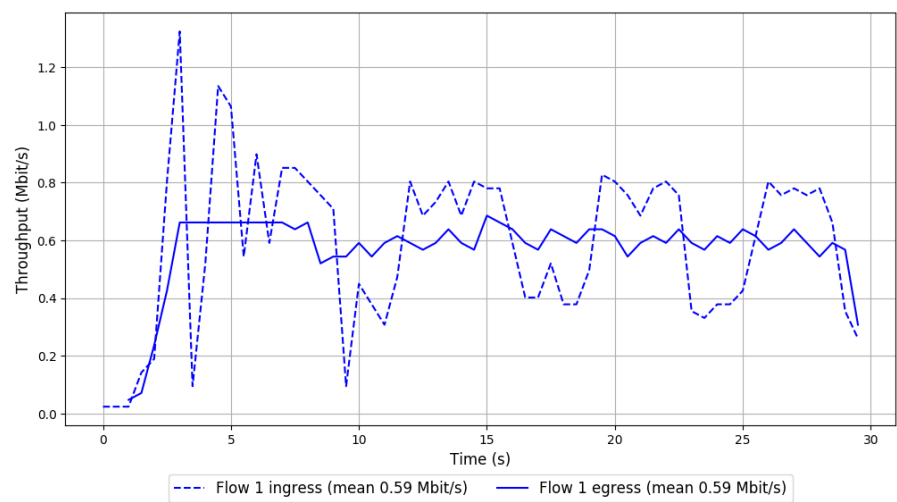


Run 1: Statistics of Verus

Start at: 2018-03-05 17:47:45
End at: 2018-03-05 17:48:15
Local clock offset: -7.491 ms
Remote clock offset: -5.415 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1875.235 ms
Loss rate: 5.48%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1875.235 ms
Loss rate: 5.48%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2018-03-05 18:08:49

End at: 2018-03-05 18:09:19

Local clock offset: -7.63 ms

Remote clock offset: -6.42 ms

Below is generated by plot.py at 2018-03-05 19:48:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 1890.815 ms

Loss rate: 5.69%

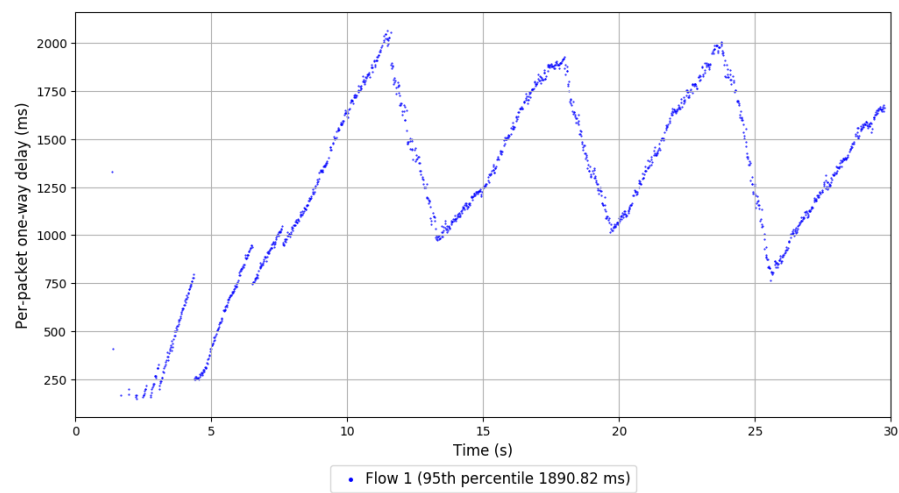
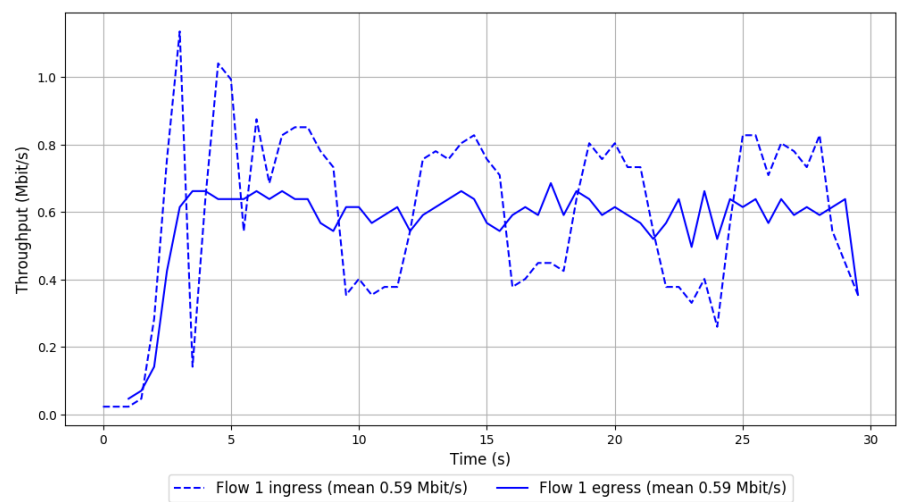
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 1890.815 ms

Loss rate: 5.69%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2018-03-05 18:29:58

End at: 2018-03-05 18:30:29

Local clock offset: -7.664 ms

Remote clock offset: 0.196 ms

Below is generated by plot.py at 2018-03-05 19:48:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1899.247 ms

Loss rate: 6.21%

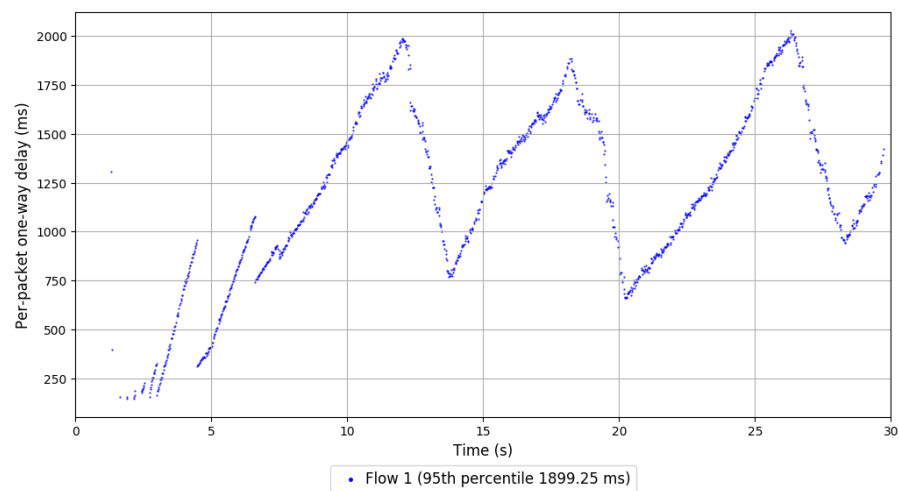
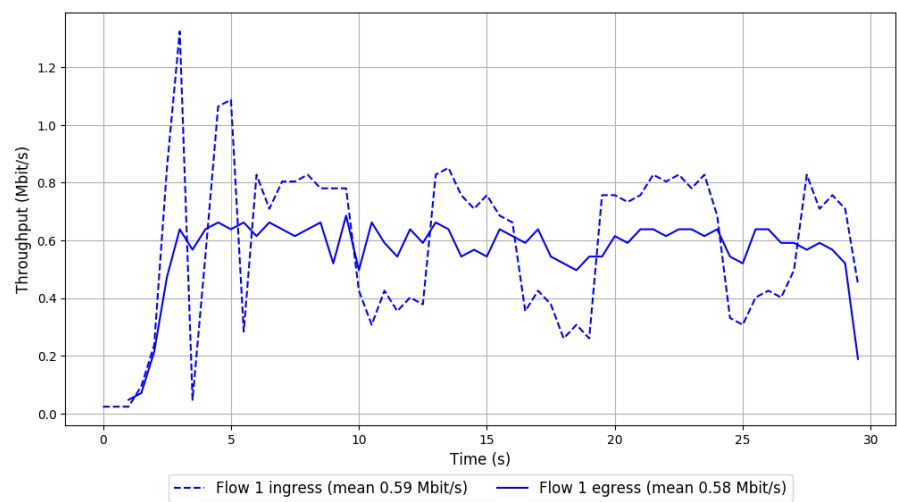
-- Flow 1:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1899.247 ms

Loss rate: 6.21%

Run 3: Report of Verus — Data Link

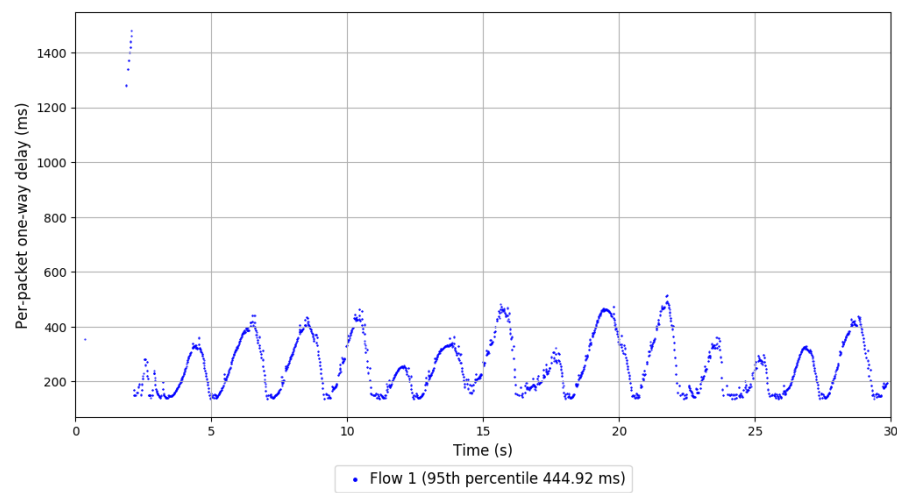
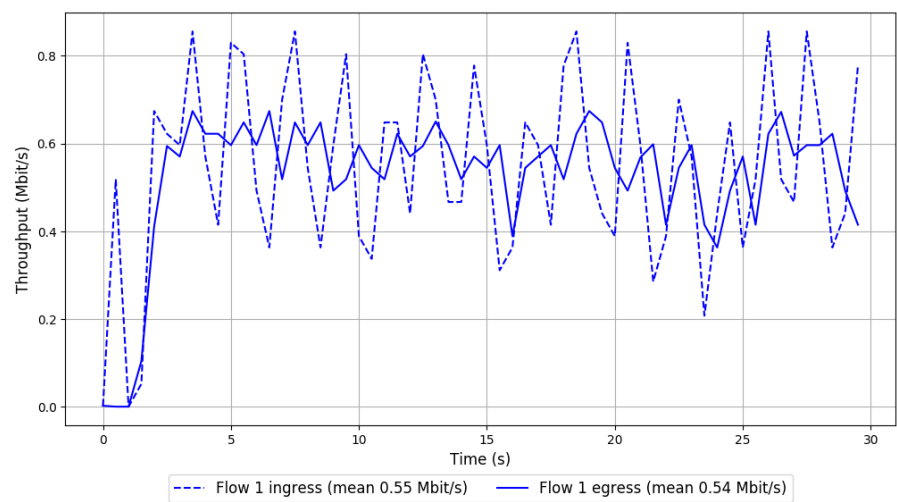


Run 1: Statistics of Copa

Start at: 2018-03-05 17:54:46
End at: 2018-03-05 17:55:16
Local clock offset: -8.454 ms
Remote clock offset: -0.625 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 444.923 ms
Loss rate: 3.42%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 444.923 ms
Loss rate: 3.42%

Run 1: Report of Copa — Data Link

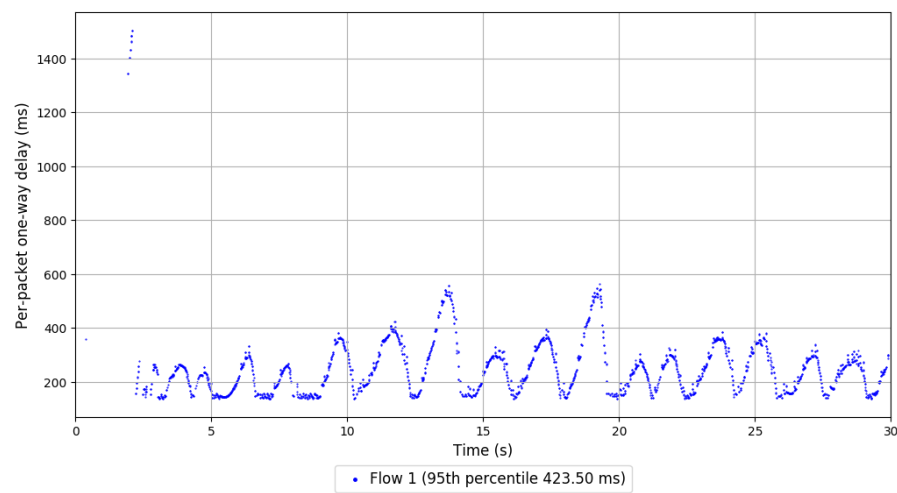
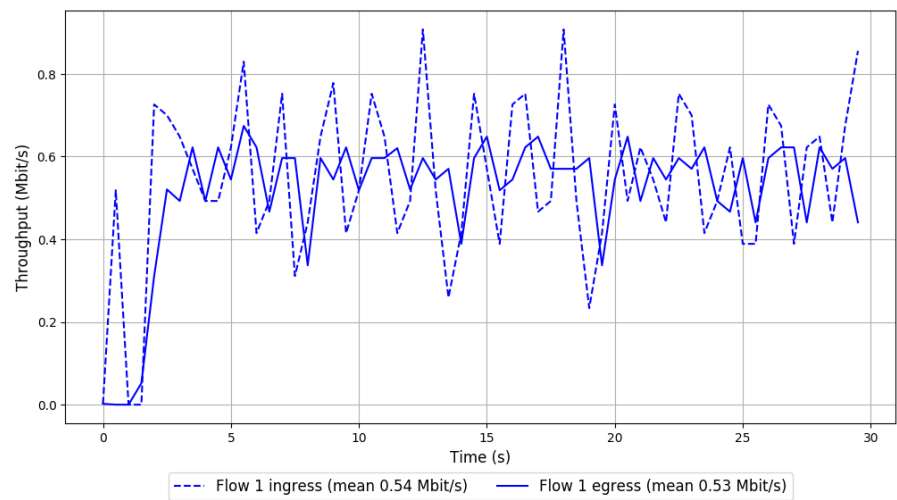


Run 2: Statistics of Copa

Start at: 2018-03-05 18:15:50
End at: 2018-03-05 18:16:20
Local clock offset: -7.855 ms
Remote clock offset: -1.528 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 423.505 ms
Loss rate: 4.85%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 423.505 ms
Loss rate: 4.85%

Run 2: Report of Copa — Data Link

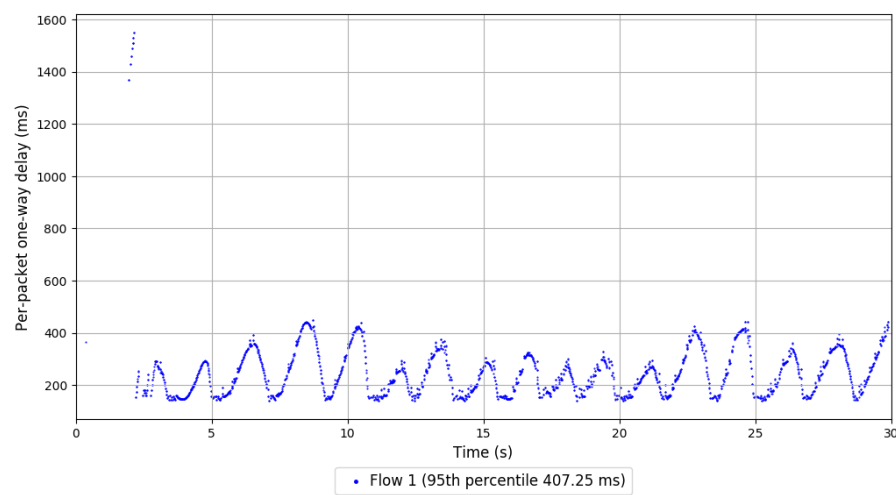
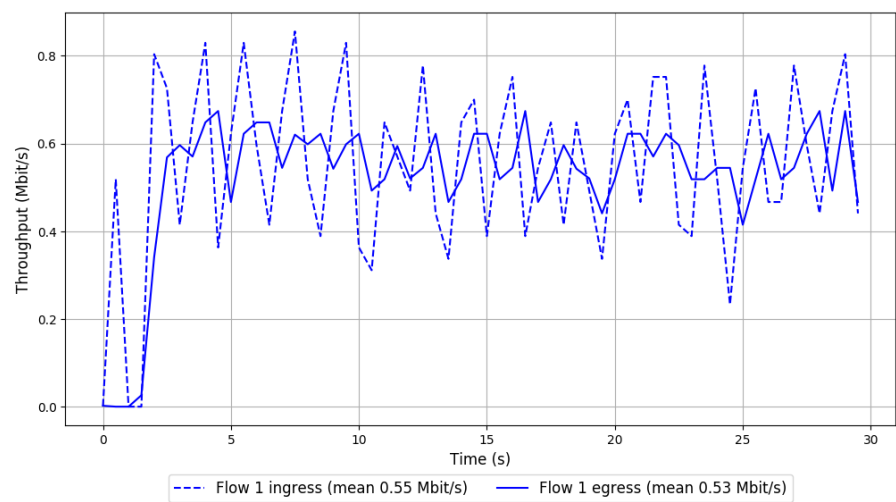


Run 3: Statistics of Copa

Start at: 2018-03-05 18:36:59
End at: 2018-03-05 18:37:29
Local clock offset: -7.895 ms
Remote clock offset: -1.577 ms

Below is generated by plot.py at 2018-03-05 19:48:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 407.255 ms
Loss rate: 3.87%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 407.255 ms
Loss rate: 3.87%

Run 3: Report of Copa — Data Link



Run 1: Statistics of FillP

Start at: 2018-03-05 17:59:28

End at: 2018-03-05 17:59:58

Local clock offset: -8.184 ms

Remote clock offset: 0.184 ms

Below is generated by plot.py at 2018-03-05 19:48:35

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 27606.500 ms

Loss rate: 98.01%

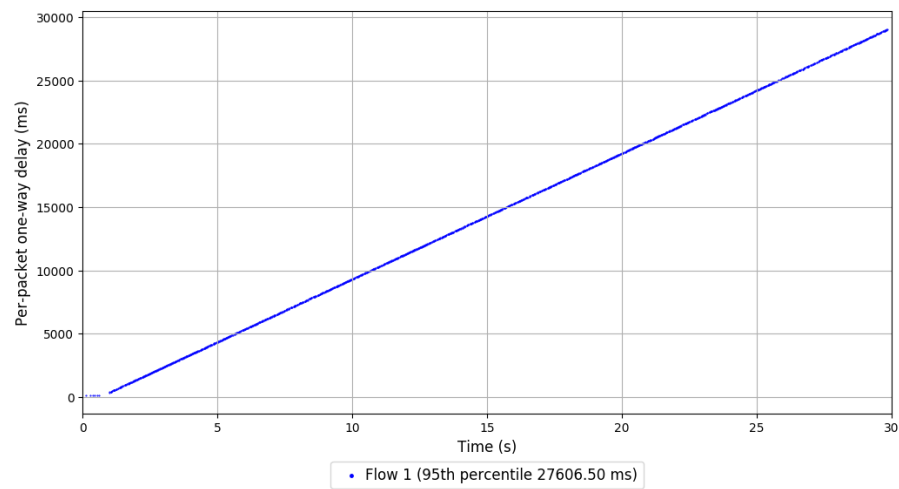
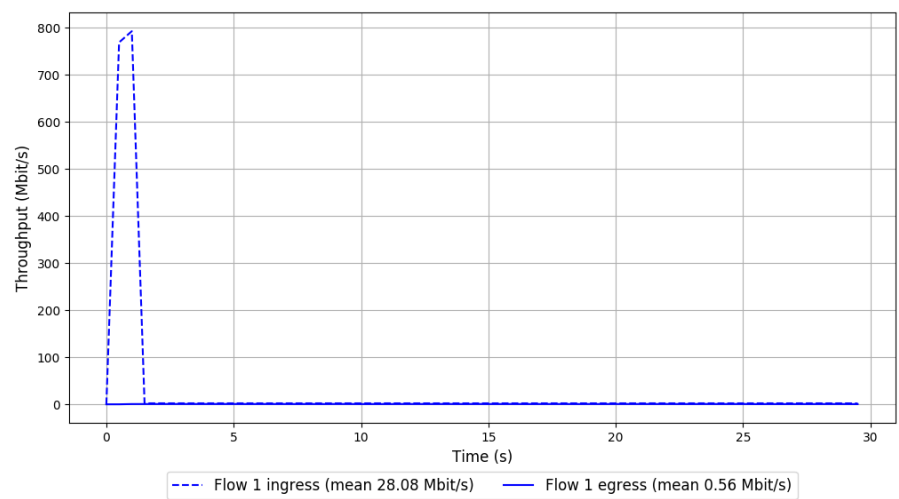
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 27606.500 ms

Loss rate: 98.01%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2018-03-05 18:20:31

End at: 2018-03-05 18:21:01

Local clock offset: -7.562 ms

Remote clock offset: 0.218 ms

Below is generated by plot.py at 2018-03-05 19:48:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 25374.516 ms

Loss rate: 98.34%

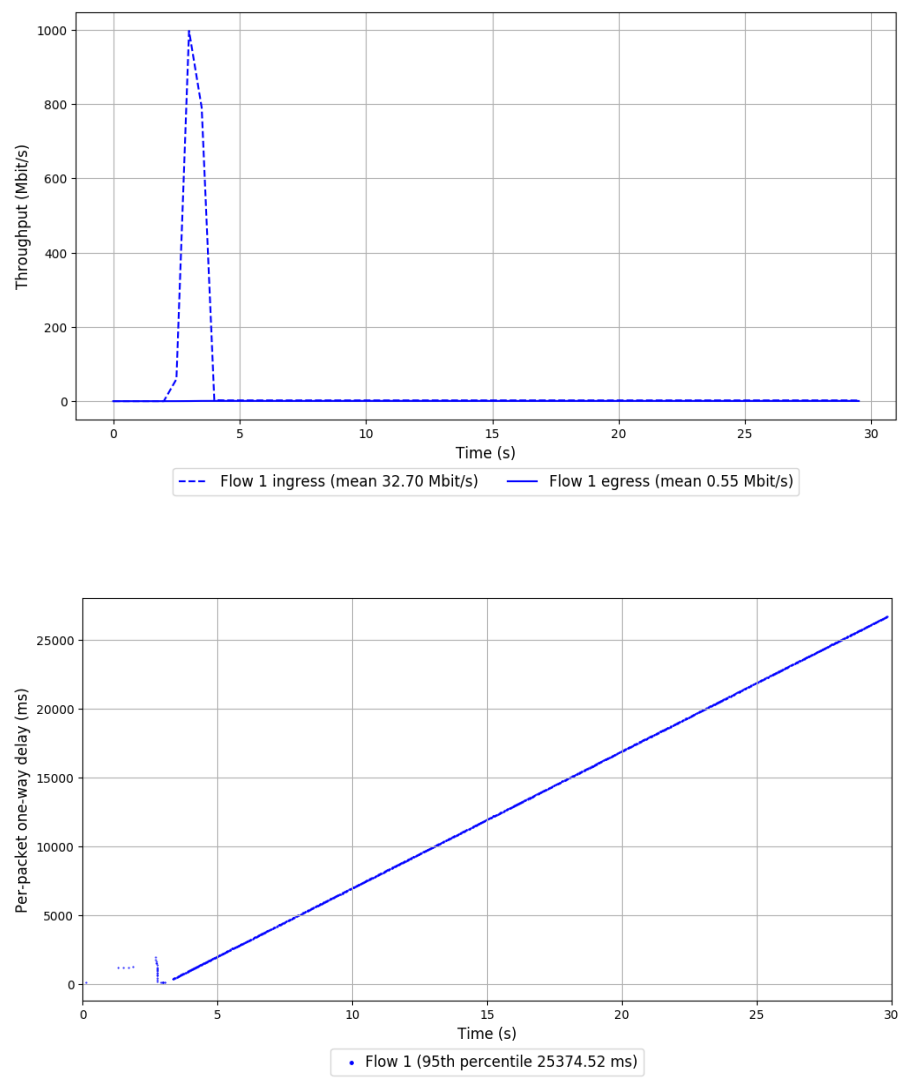
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 25374.516 ms

Loss rate: 98.34%

Run 2: Report of FillP — Data Link

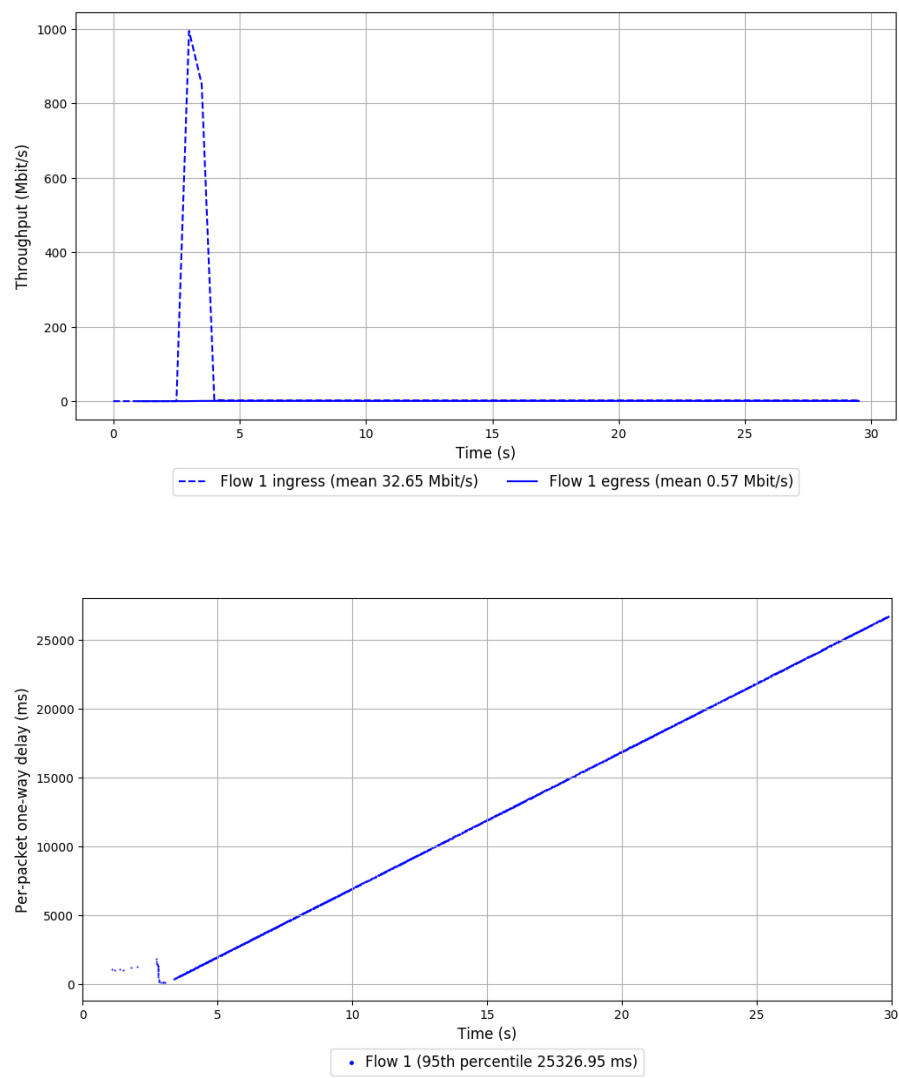


Run 3: Statistics of FillP

Start at: 2018-03-05 18:41:41
End at: 2018-03-05 18:42:11
Local clock offset: -8.049 ms
Remote clock offset: -5.458 ms

Below is generated by plot.py at 2018-03-05 19:48:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 25326.949 ms
Loss rate: 98.33%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 25326.949 ms
Loss rate: 98.33%

Run 3: Report of FillP — Data Link

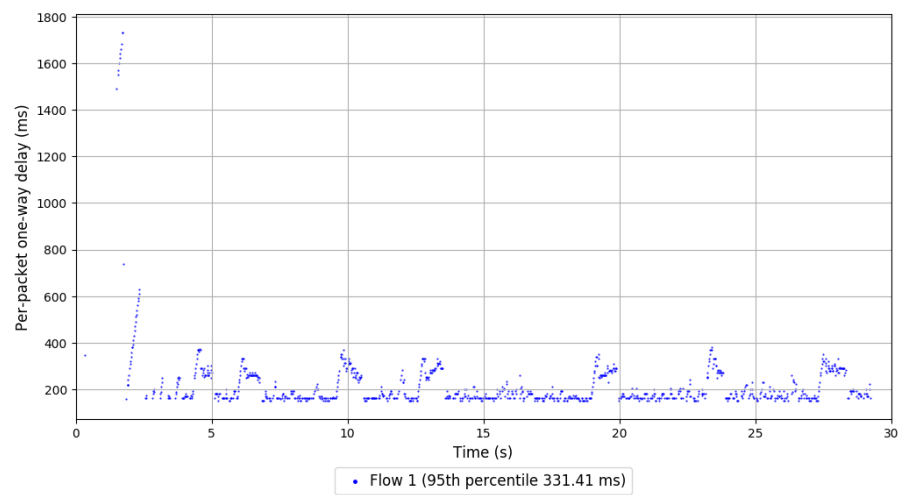
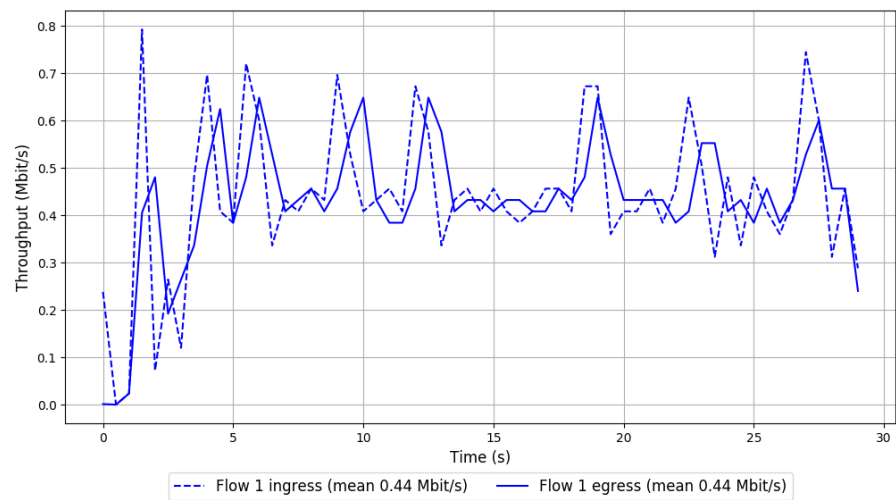


```
Run 1: Statistics of Indigo-1-32

Start at: 2018-03-05 17:45:25
End at: 2018-03-05 17:45:55
Local clock offset: -6.982 ms
Remote clock offset: -6.26 ms

# Below is generated by plot.py at 2018-03-05 19:48:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 331.411 ms
Loss rate: 1.49%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 331.411 ms
Loss rate: 1.49%
```

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

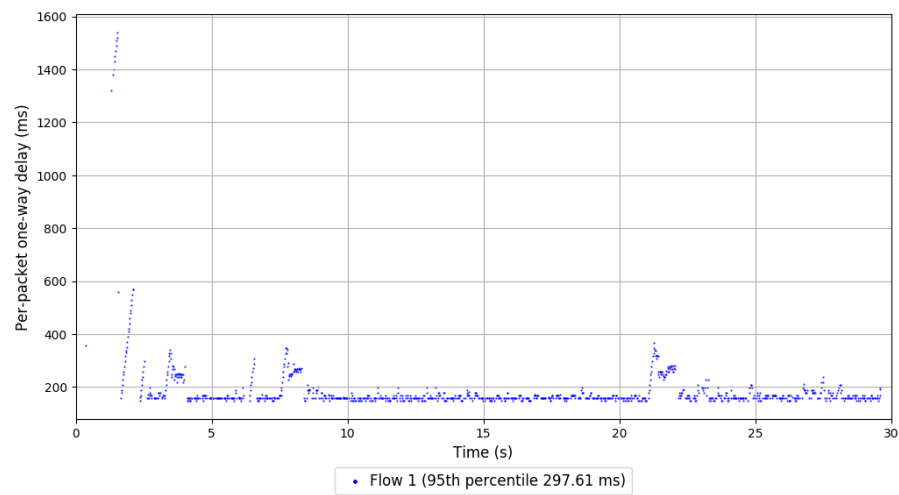
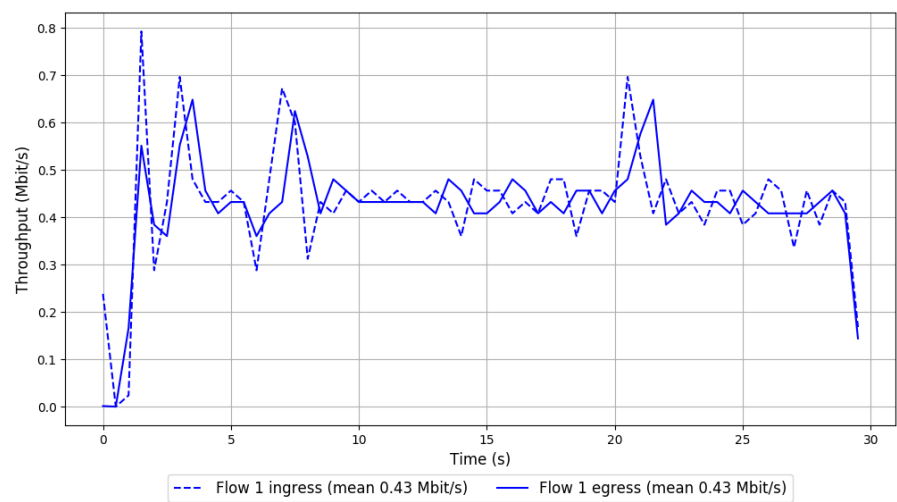


Run 2: Statistics of Indigo-1-32

Start at: 2018-03-05 18:06:29
End at: 2018-03-05 18:06:59
Local clock offset: -7.534 ms
Remote clock offset: -1.432 ms

Below is generated by plot.py at 2018-03-05 19:48:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 297.614 ms
Loss rate: 1.30%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 297.614 ms
Loss rate: 1.30%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-03-05 18:27:38

End at: 2018-03-05 18:28:08

Local clock offset: -7.547 ms

Remote clock offset: 0.243 ms

Below is generated by plot.py at 2018-03-05 19:48:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 345.490 ms

Loss rate: 1.21%

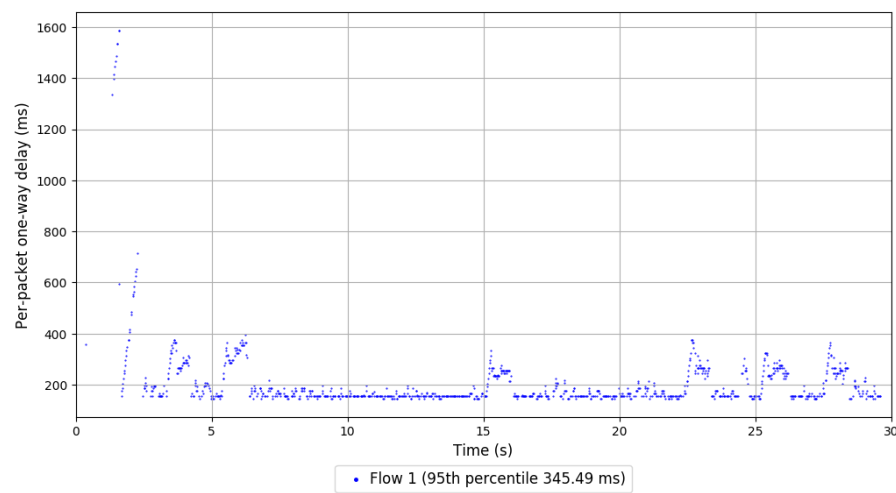
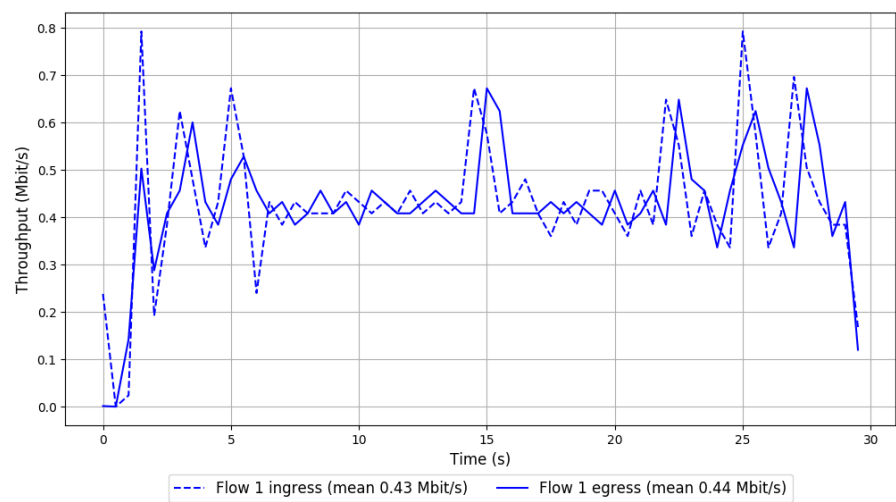
-- Flow 1:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 345.490 ms

Loss rate: 1.21%

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

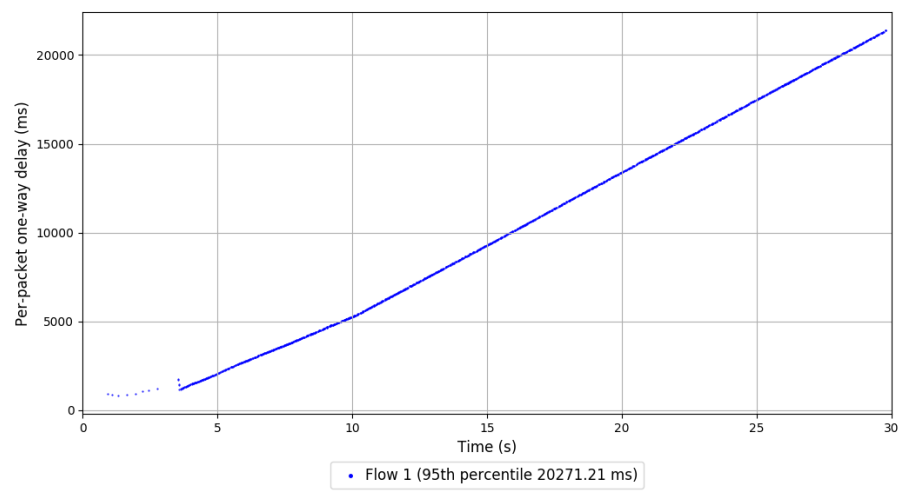
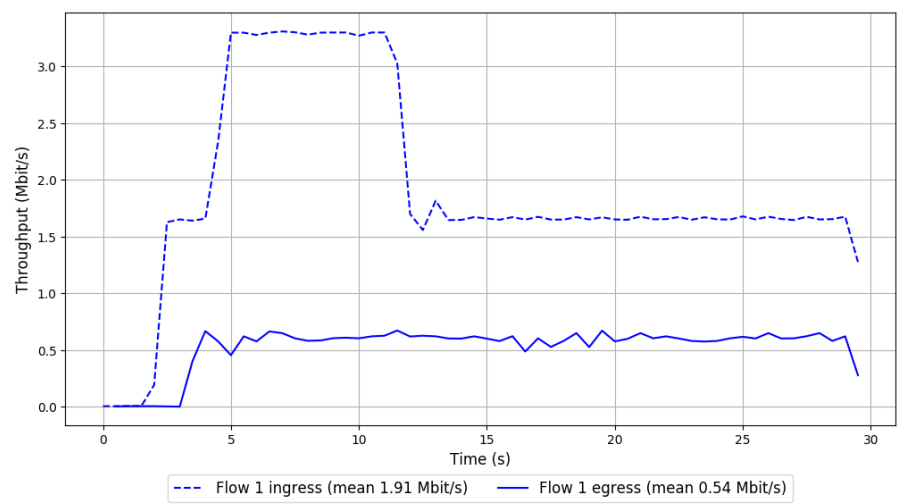


Run 1: Statistics of Vivace-latency

Start at: 2018-03-05 18:00:38
End at: 2018-03-05 18:01:08
Local clock offset: -7.987 ms
Remote clock offset: -0.655 ms

Below is generated by plot.py at 2018-03-05 19:48:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 20271.211 ms
Loss rate: 72.52%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 20271.211 ms
Loss rate: 72.52%

Run 1: Report of Vivace-latency — Data Link

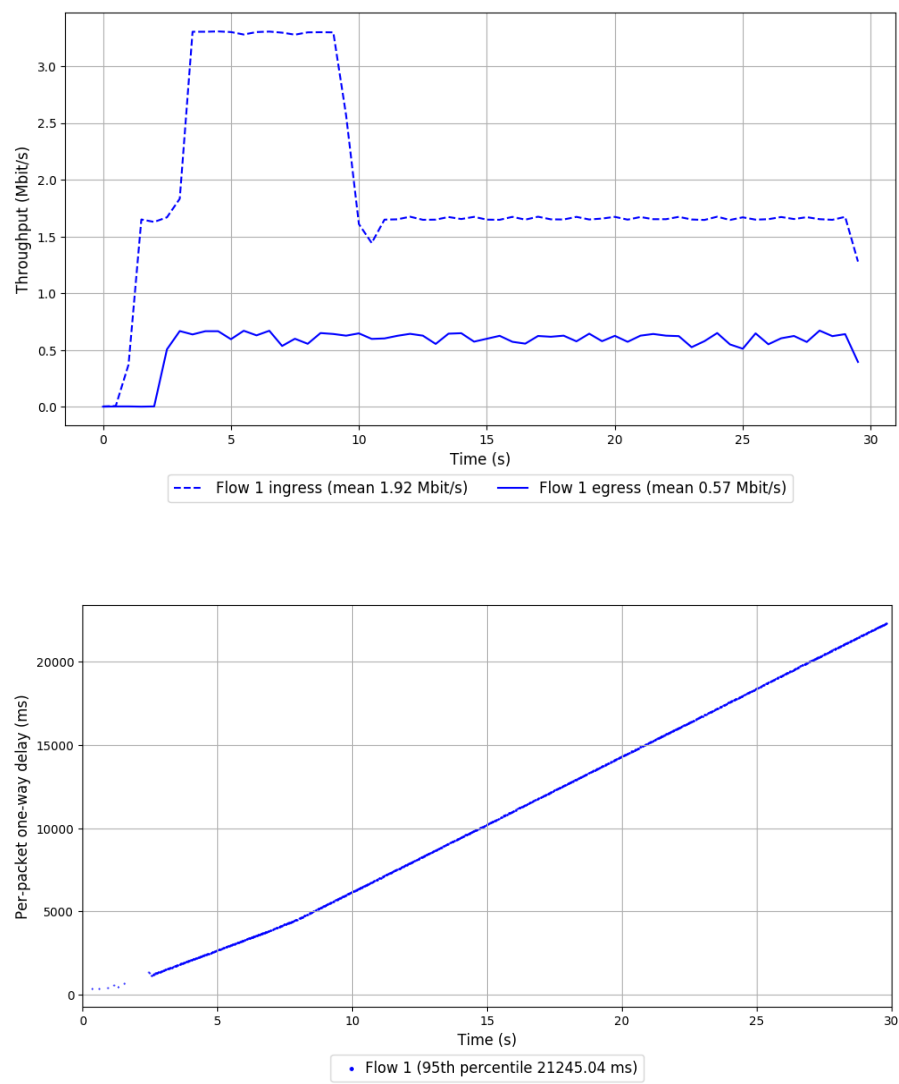


Run 2: Statistics of Vivace-latency

Start at: 2018-03-05 18:21:43
End at: 2018-03-05 18:22:14
Local clock offset: -7.543 ms
Remote clock offset: -6.329 ms

Below is generated by plot.py at 2018-03-05 19:48:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21245.038 ms
Loss rate: 70.96%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21245.038 ms
Loss rate: 70.96%

Run 2: Report of Vivace-latency — Data Link

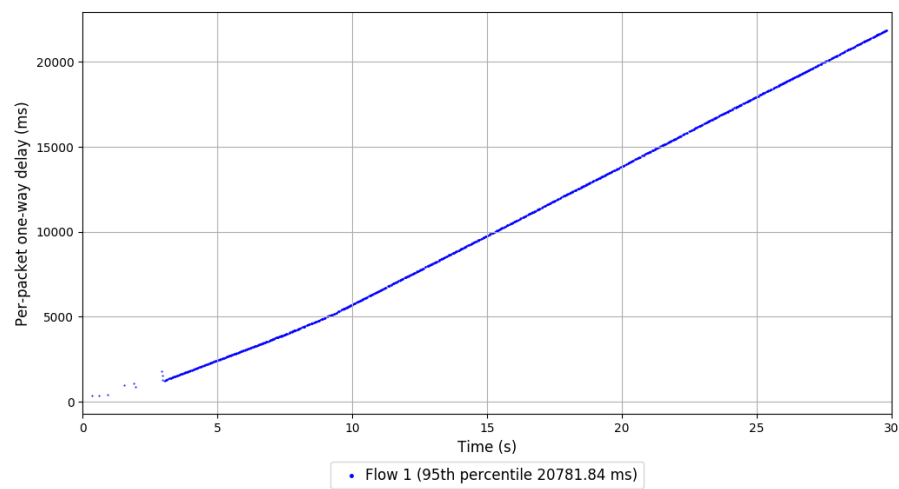
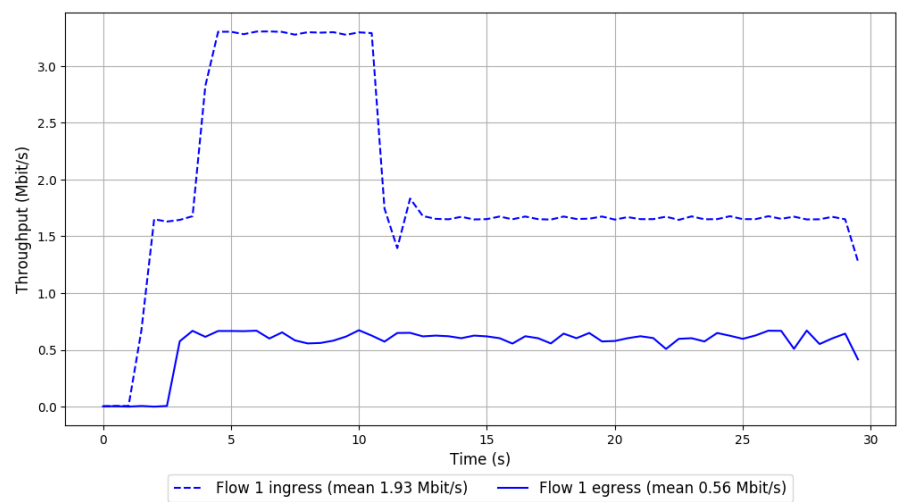


Run 3: Statistics of Vivace-latency

Start at: 2018-03-05 18:42:53
End at: 2018-03-05 18:43:23
Local clock offset: -8.085 ms
Remote clock offset: -6.357 ms

Below is generated by plot.py at 2018-03-05 19:48:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20781.840 ms
Loss rate: 71.54%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20781.840 ms
Loss rate: 71.54%

Run 3: Report of Vivace-latency — Data Link

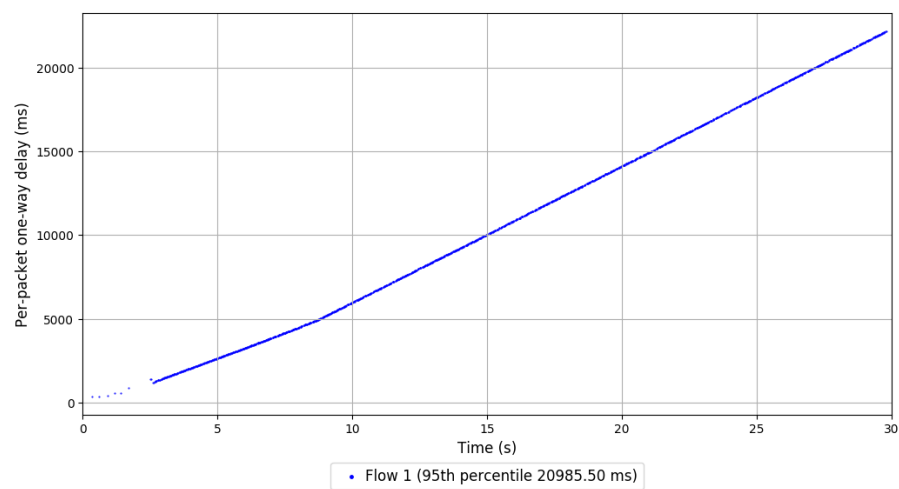
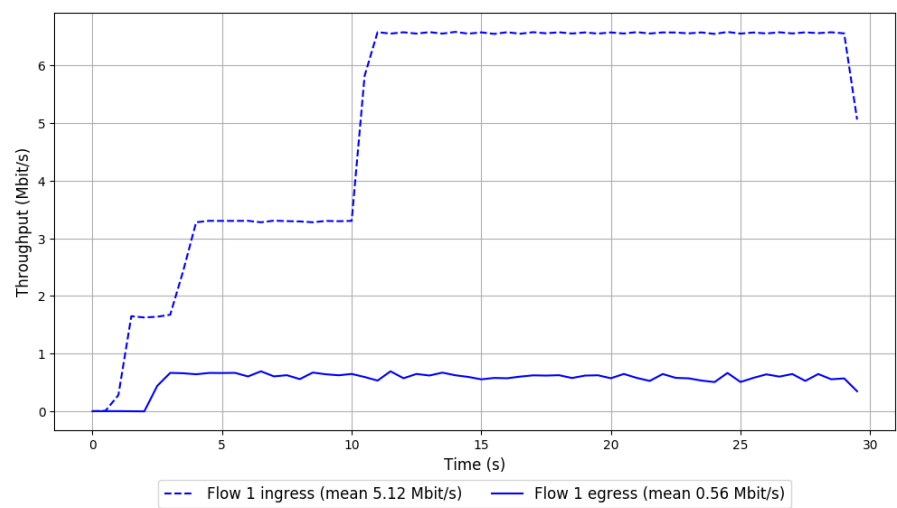


Run 1: Statistics of Vivace-loss

Start at: 2018-03-05 17:52:25
End at: 2018-03-05 17:52:55
Local clock offset: -8.155 ms
Remote clock offset: -6.271 ms

Below is generated by plot.py at 2018-03-05 19:48:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20985.497 ms
Loss rate: 89.16%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20985.497 ms
Loss rate: 89.16%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-03-05 18:13:29

End at: 2018-03-05 18:13:59

Local clock offset: -7.845 ms

Remote clock offset: -1.51 ms

Below is generated by plot.py at 2018-03-05 19:48:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 20923.089 ms

Loss rate: 89.16%

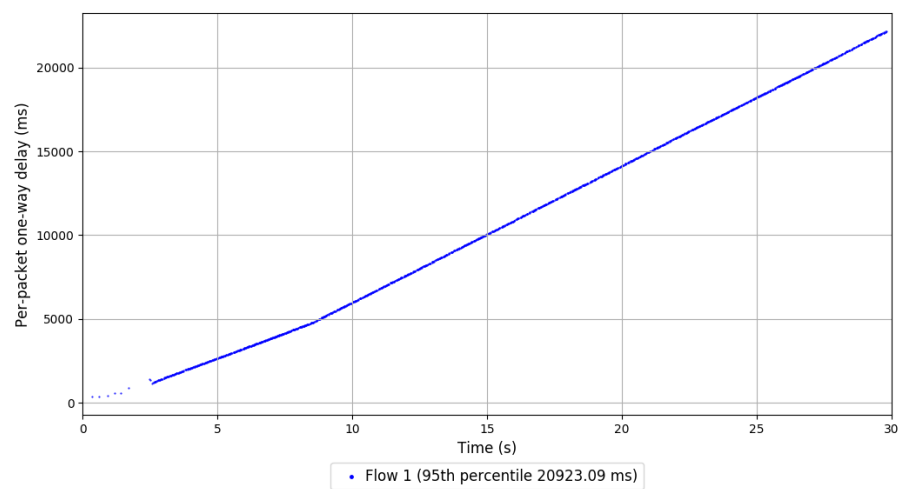
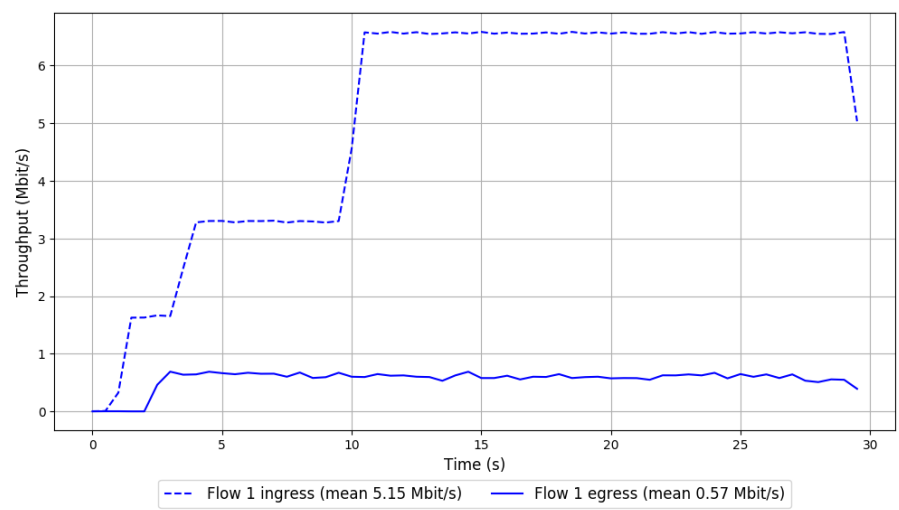
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 20923.089 ms

Loss rate: 89.16%

Run 2: Report of Vivace-loss — Data Link

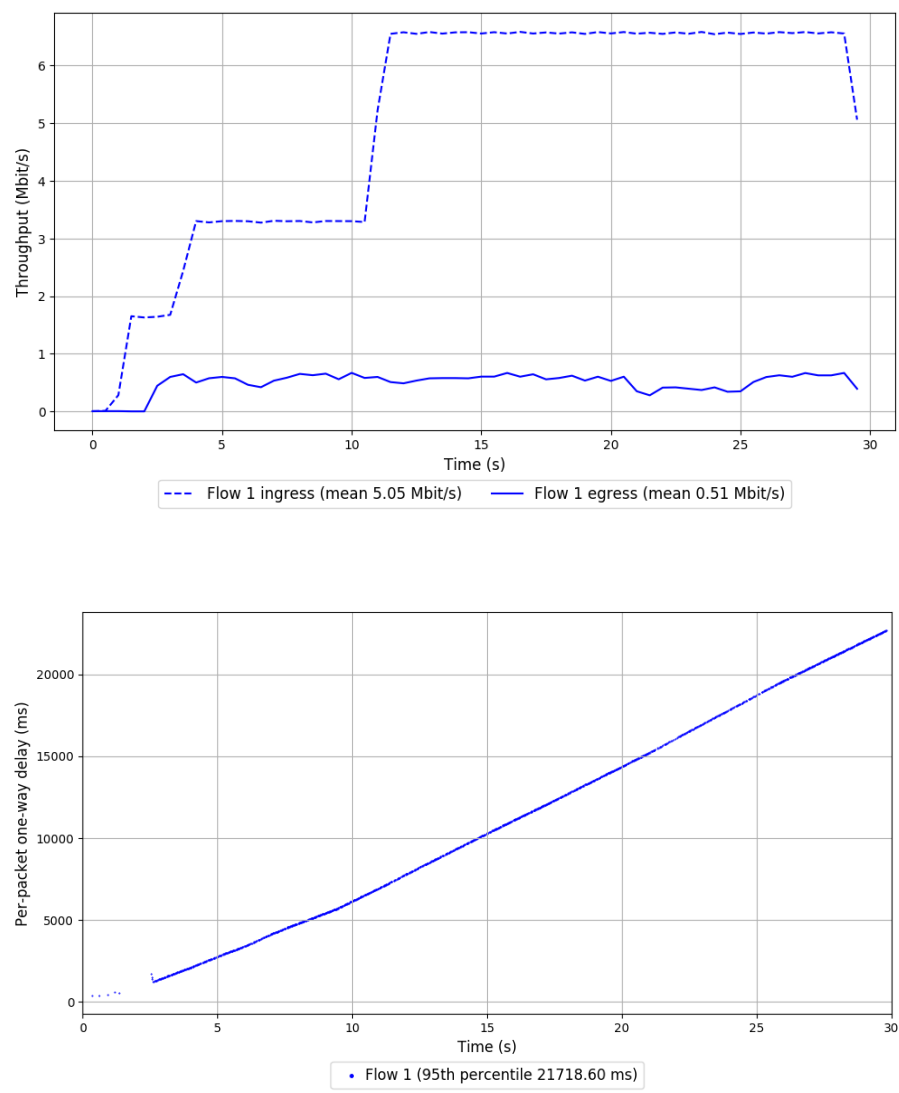


Run 3: Statistics of Vivace-loss

Start at: 2018-03-05 18:34:39
End at: 2018-03-05 18:35:09
Local clock offset: -7.799 ms
Remote clock offset: -0.787 ms

Below is generated by plot.py at 2018-03-05 19:48:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 21718.597 ms
Loss rate: 90.11%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 21718.597 ms
Loss rate: 90.11%

Run 3: Report of Vivace-loss — Data Link

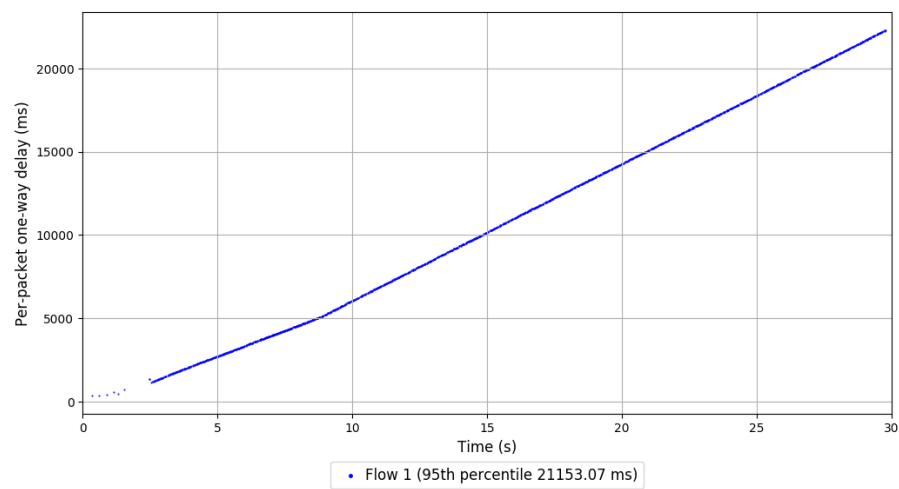
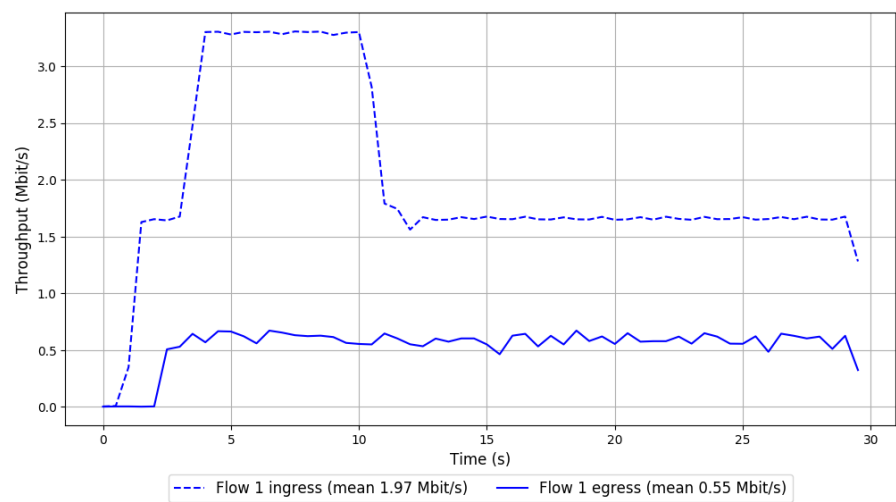


Run 1: Statistics of Vivace-LTE

Start at: 2018-03-05 17:58:17
End at: 2018-03-05 17:58:47
Local clock offset: -8.622 ms
Remote clock offset: -1.438 ms

Below is generated by plot.py at 2018-03-05 19:48:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 21153.072 ms
Loss rate: 72.52%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 21153.072 ms
Loss rate: 72.52%

Run 1: Report of Vivace-LTE — Data Link



Run 2: Statistics of Vivace-LTE

Start at: 2018-03-05 18:19:22

End at: 2018-03-05 18:19:52

Local clock offset: -7.574 ms

Remote clock offset: -6.31 ms

Below is generated by plot.py at 2018-03-05 19:48:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 21211.816 ms

Loss rate: 72.34%

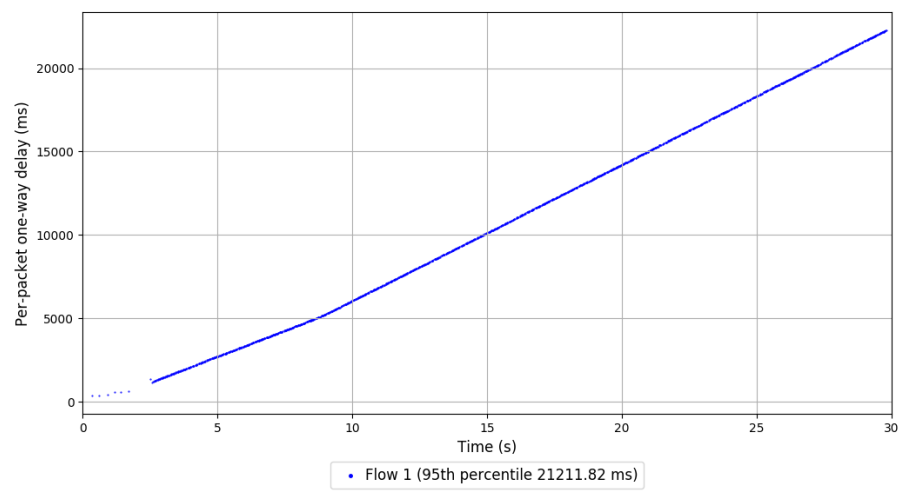
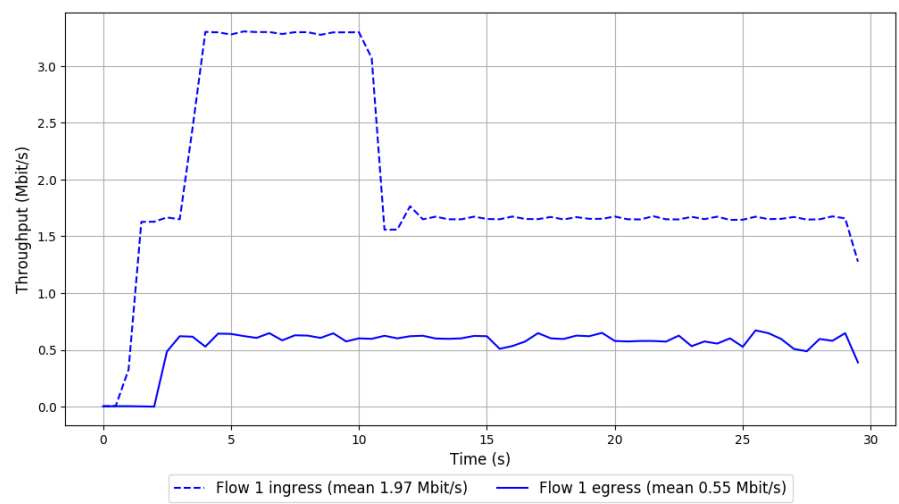
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 21211.816 ms

Loss rate: 72.34%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-03-05 18:40:31
End at: 2018-03-05 18:41:01
Local clock offset: -7.958 ms
Remote clock offset: -5.491 ms

Below is generated by plot.py at 2018-03-05 19:48:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21105.218 ms
Loss rate: 71.64%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21105.218 ms
Loss rate: 71.64%

Run 3: Report of Vivace-LTE — Data Link

