

Pantheon Report

Generated at 2018-02-19 18:21:24 (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).

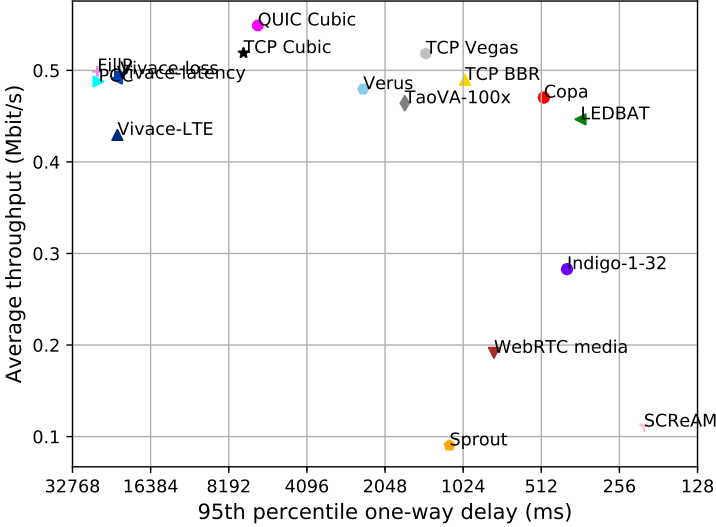
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

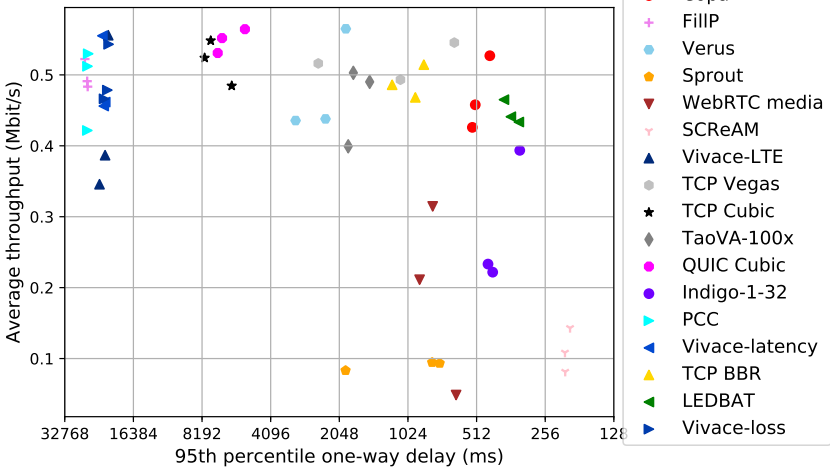
Git summary:

```
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



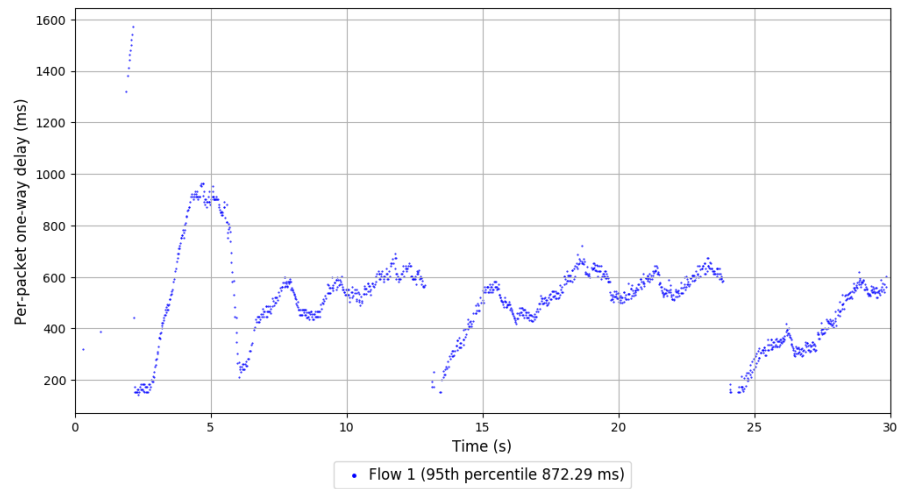
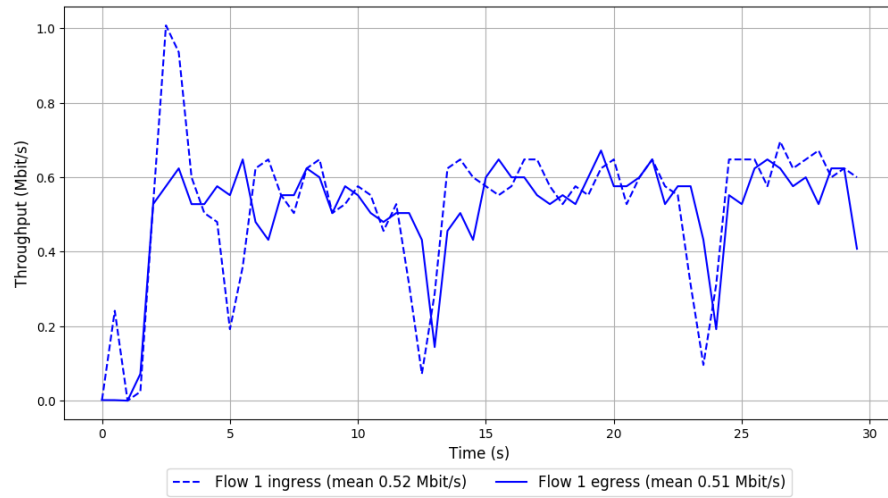
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	0.49	1007.82	2.60
TCP Cubic	3	0.52	7185.84	26.37
LEDBAT	3	0.45	361.59	1.26
PCC	3	0.49	25995.52	98.51
QUIC Cubic	3	0.55	6332.46	25.38
SCReAM	3	0.11	206.05	0.68
WebRTC media	3	0.19	779.23	5.32
Sprout	3	0.09	1155.96	2.03
TaoVA-100x	3	0.46	1718.88	3.16
TCP Vegas	3	0.52	1426.18	1.33
Verus	3	0.48	2485.33	11.75
Copa	3	0.47	500.37	3.75
FillP	3	0.50	26287.78	98.70
Indigo-1-32	3	0.28	407.48	1.71
Vivace-latency	3	0.49	22103.36	76.30
Vivace-loss	3	0.50	21466.70	89.88
Vivace-LTE	3	0.43	22000.43	80.15

Run 1: Statistics of TCP BBR

Start at: 2018-02-19 16:23:57
End at: 2018-02-19 16:24:27
Local clock offset: -10.012 ms
Remote clock offset: 1.591 ms

Below is generated by plot.py at 2018-02-19 18:20:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 872.286 ms
Loss rate: 2.84%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 872.286 ms
Loss rate: 2.84%

Run 1: Report of TCP BBR — Data Link

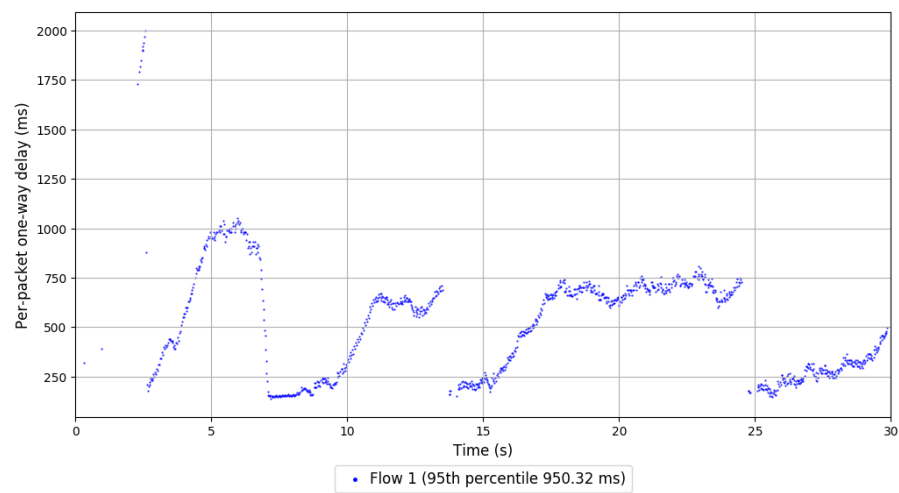
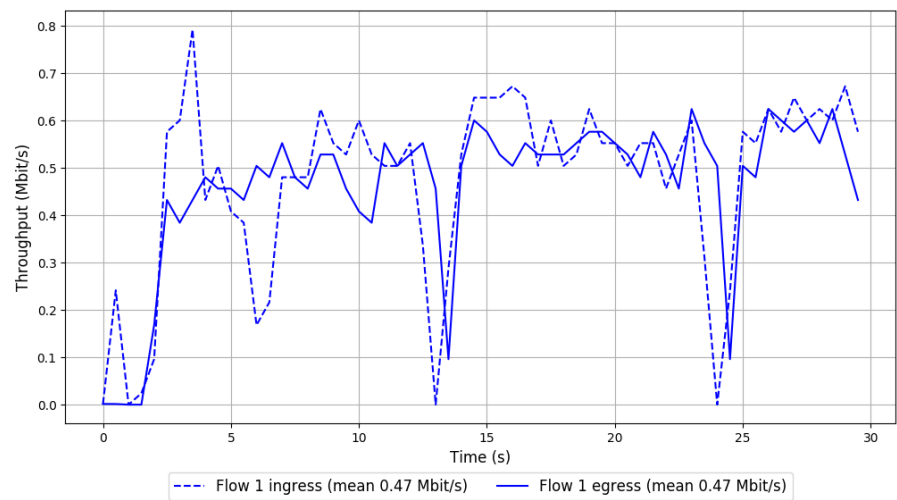


Run 2: Statistics of TCP BBR

Start at: 2018-02-19 16:45:35
End at: 2018-02-19 16:46:05
Local clock offset: -13.234 ms
Remote clock offset: 1.941 ms

Below is generated by plot.py at 2018-02-19 18:20:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 950.323 ms
Loss rate: 2.37%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 950.323 ms
Loss rate: 2.37%

Run 2: Report of TCP BBR — Data Link

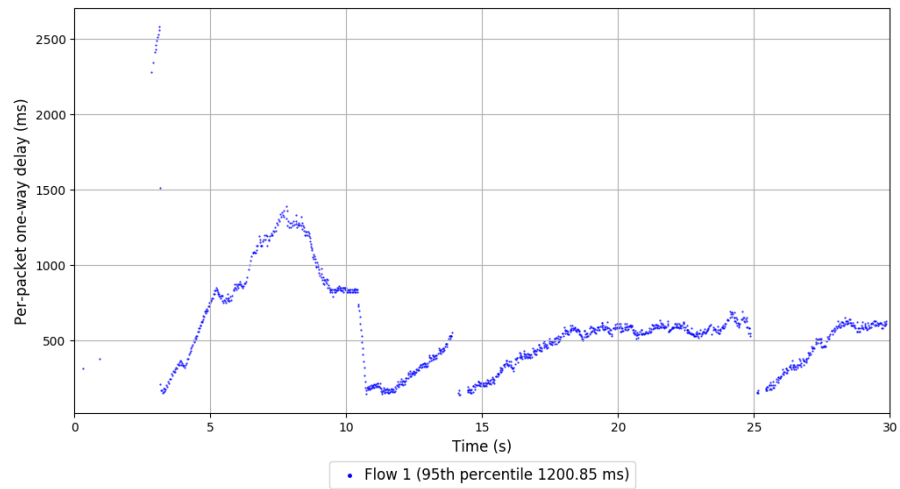
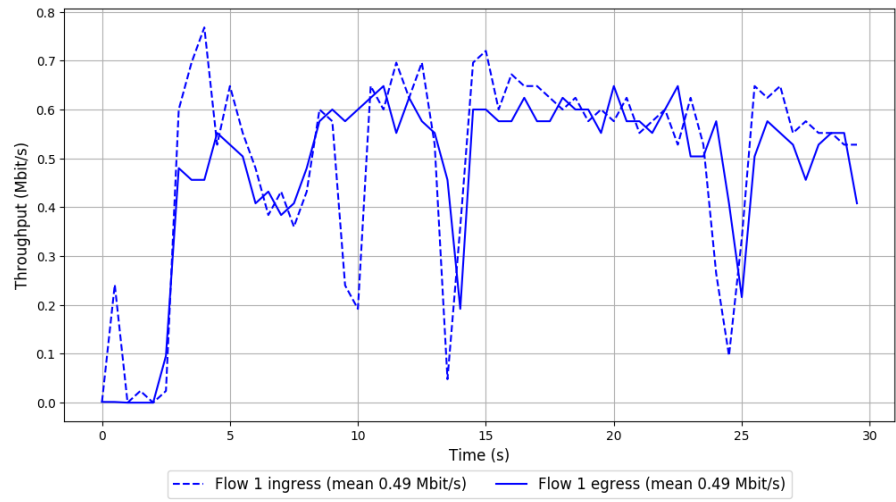


Run 3: Statistics of TCP BBR

Start at: 2018-02-19 17:07:00
End at: 2018-02-19 17:07:30
Local clock offset: -15.022 ms
Remote clock offset: 1.39 ms

Below is generated by plot.py at 2018-02-19 18:20:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 1200.845 ms
Loss rate: 2.60%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 1200.845 ms
Loss rate: 2.60%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-02-19 16:21:34

End at: 2018-02-19 16:22:04

Local clock offset: -8.737 ms

Remote clock offset: -0.02 ms

Below is generated by plot.py at 2018-02-19 18:20:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 7982.280 ms

Loss rate: 31.07%

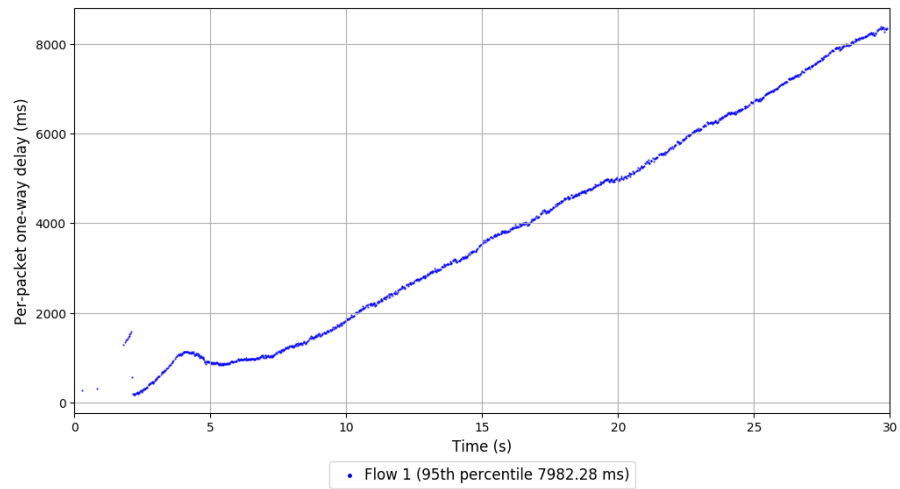
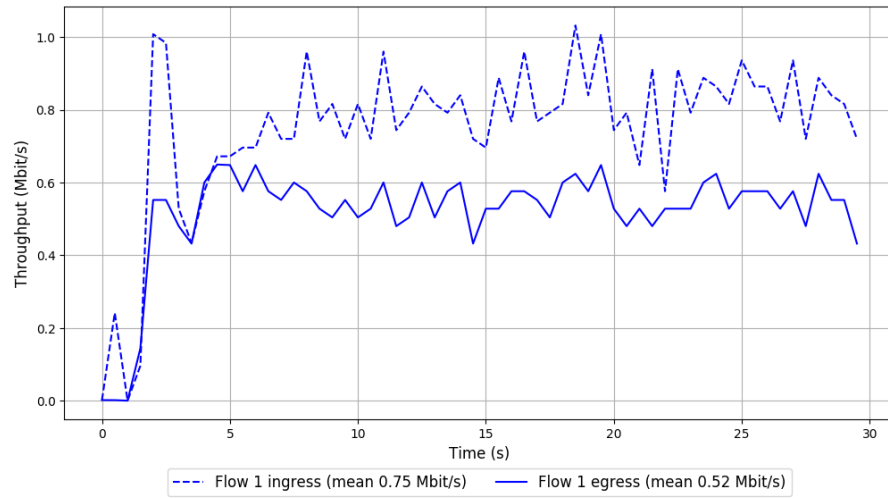
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 7982.280 ms

Loss rate: 31.07%

Run 1: Report of TCP Cubic — Data Link

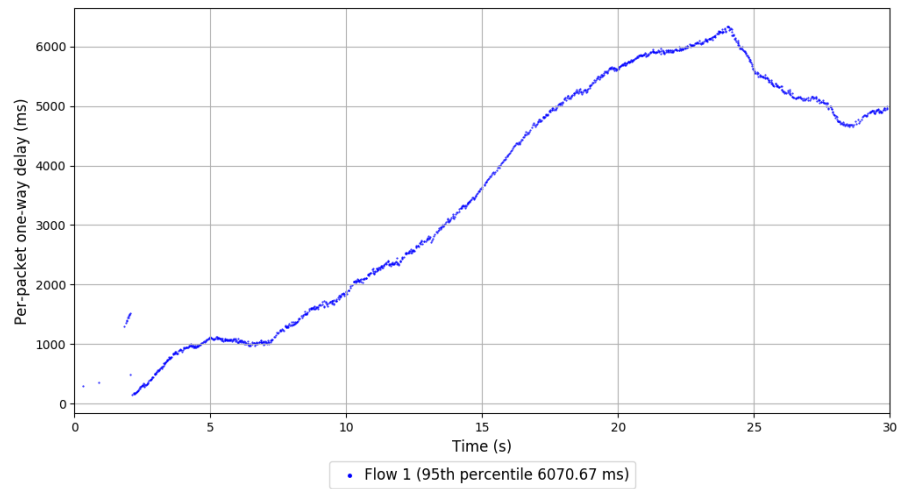
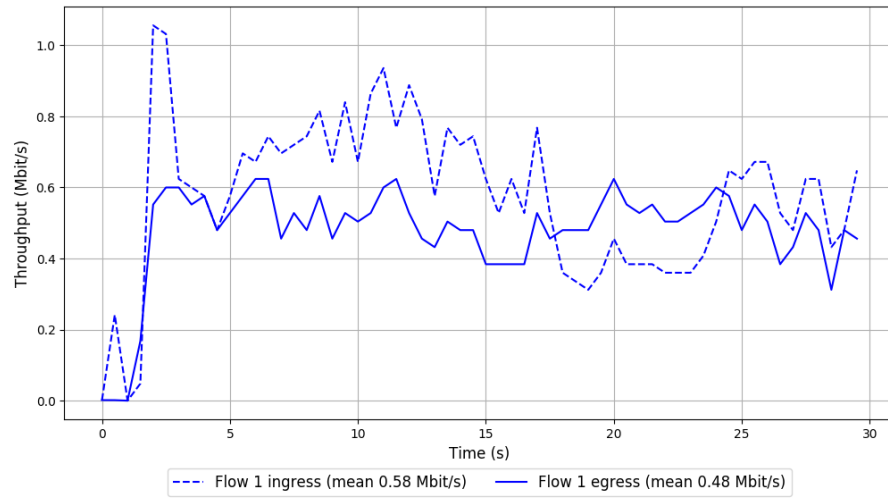


Run 2: Statistics of TCP Cubic

Start at: 2018-02-19 16:43:14
End at: 2018-02-19 16:43:44
Local clock offset: -14.209 ms
Remote clock offset: -3.709 ms

Below is generated by plot.py at 2018-02-19 18:20:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 6070.668 ms
Loss rate: 17.01%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 6070.668 ms
Loss rate: 17.01%

Run 2: Report of TCP Cubic — Data Link

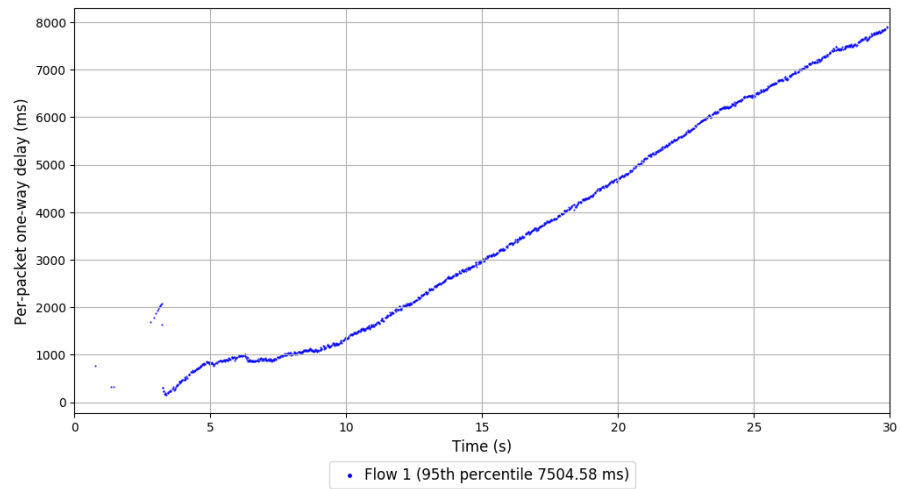
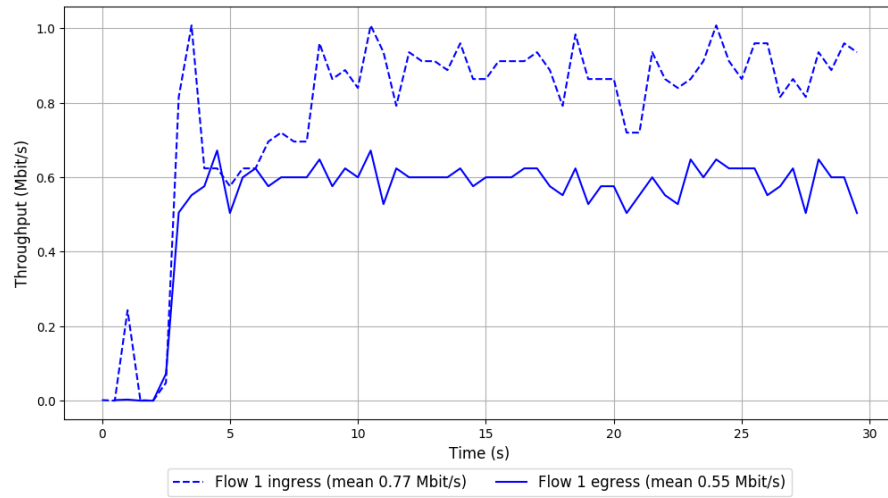


Run 3: Statistics of TCP Cubic

Start at: 2018-02-19 17:04:37
End at: 2018-02-19 17:05:07
Local clock offset: -14.457 ms
Remote clock offset: -3.439 ms

Below is generated by plot.py at 2018-02-19 18:20:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 7504.577 ms
Loss rate: 31.03%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 7504.577 ms
Loss rate: 31.03%

Run 3: Report of TCP Cubic — Data Link

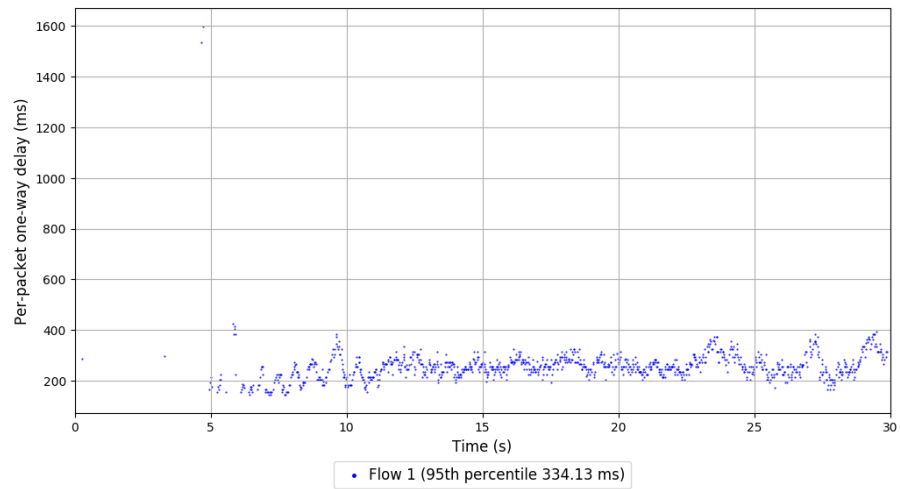
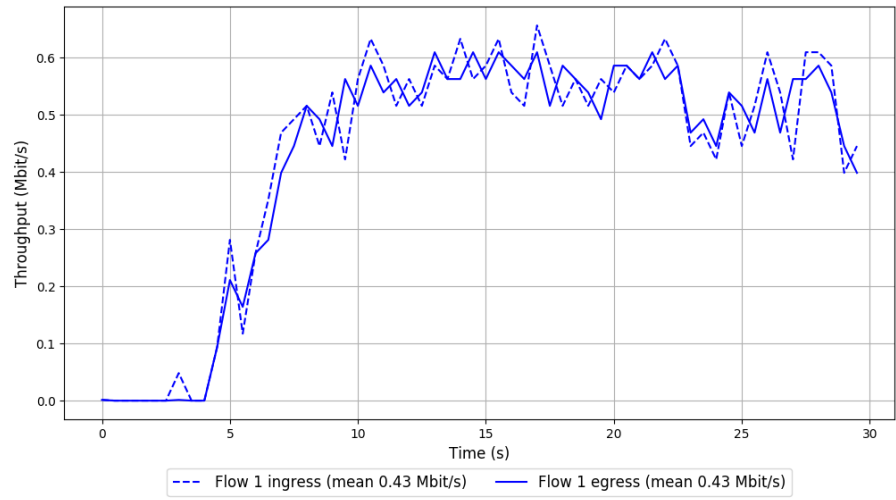


```
Run 1: Statistics of LEDBAT

Start at: 2018-02-19 16:13:16
End at: 2018-02-19 16:13:46
Local clock offset: -5.519 ms
Remote clock offset: -4.073 ms

# Below is generated by plot.py at 2018-02-19 18:20:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 334.127 ms
Loss rate: 1.26%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 334.127 ms
Loss rate: 1.26%
```


Run 1: Report of LEDBAT — Data Link

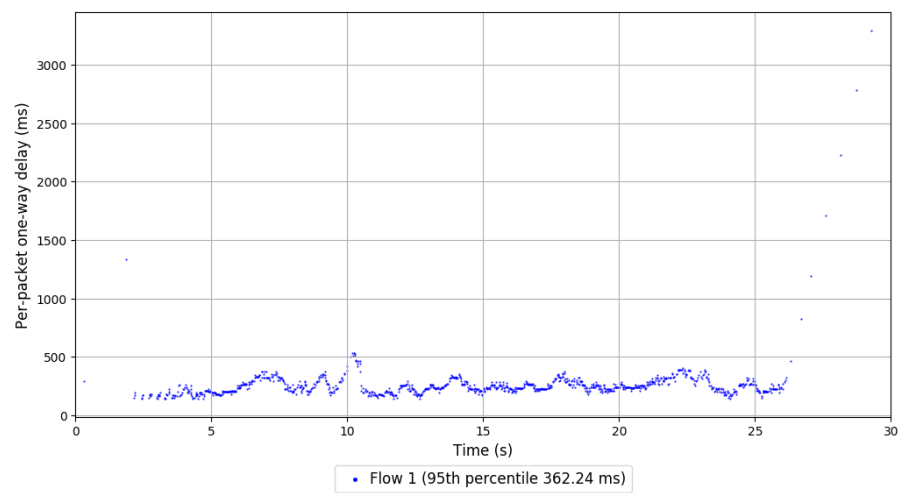
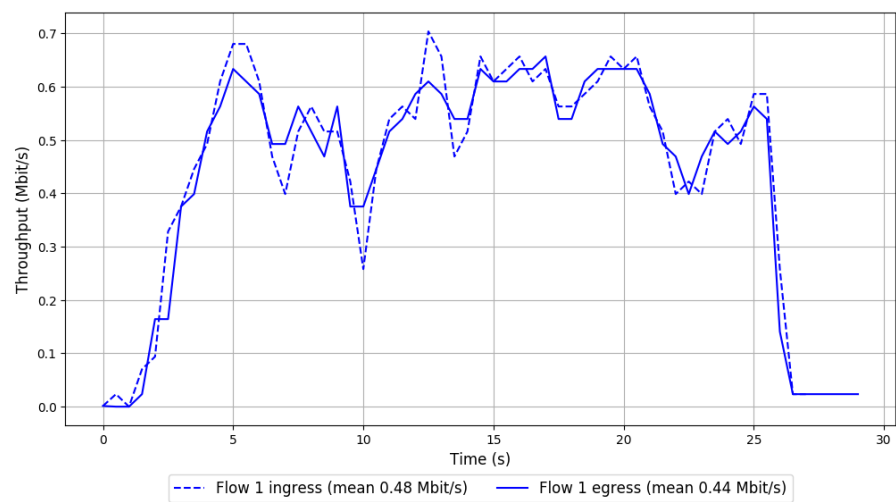


Run 2: Statistics of LEDBAT

Start at: 2018-02-19 16:34:31
End at: 2018-02-19 16:35:01
Local clock offset: -10.985 ms
Remote clock offset: 0.963 ms

Below is generated by plot.py at 2018-02-19 18:20:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 362.239 ms
Loss rate: 1.27%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 362.239 ms
Loss rate: 1.27%

Run 2: Report of LEDBAT — Data Link

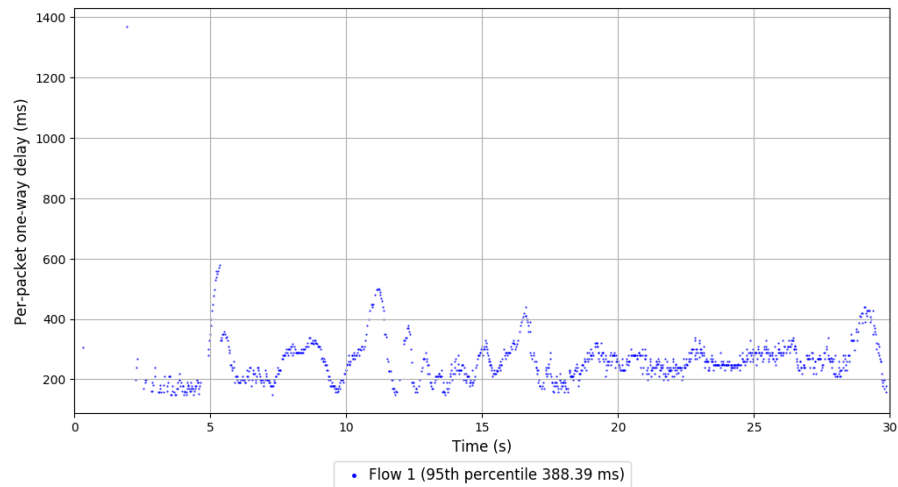
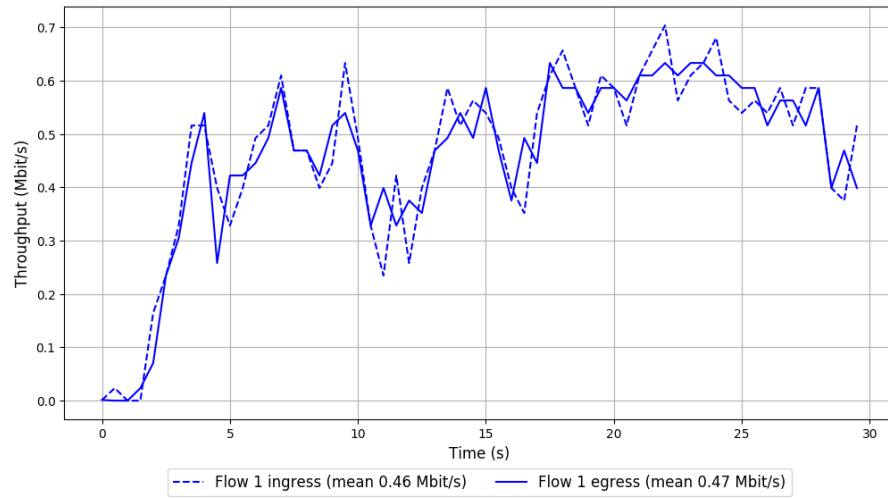


Run 3: Statistics of LEDBAT

Start at: 2018-02-19 16:56:18
End at: 2018-02-19 16:56:48
Local clock offset: -12.749 ms
Remote clock offset: -3.471 ms

Below is generated by plot.py at 2018-02-19 18:20:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 388.390 ms
Loss rate: 1.26%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 388.390 ms
Loss rate: 1.26%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC

Start at: 2018-02-19 16:15:36

End at: 2018-02-19 16:16:06

Local clock offset: -6.096 ms

Remote clock offset: 1.522 ms

Below is generated by plot.py at 2018-02-19 18:21:11

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 26042.187 ms

Loss rate: 98.31%

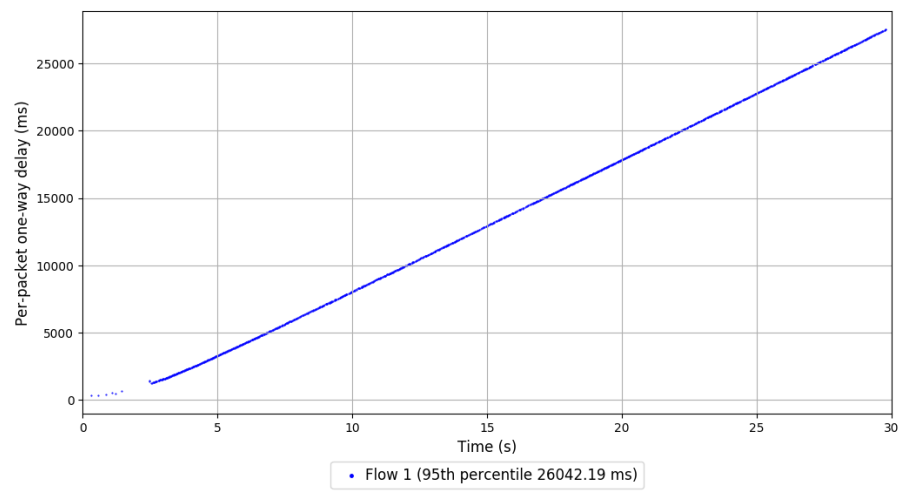
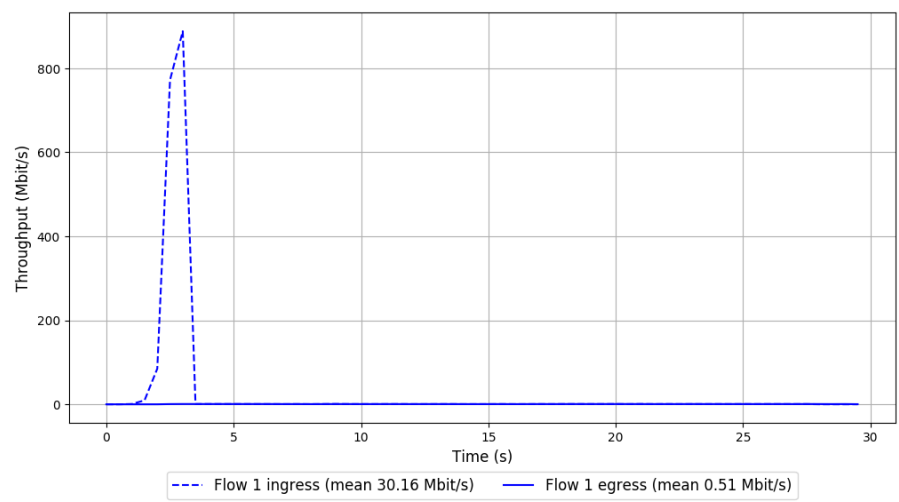
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 26042.187 ms

Loss rate: 98.31%

Run 1: Report of PCC — Data Link

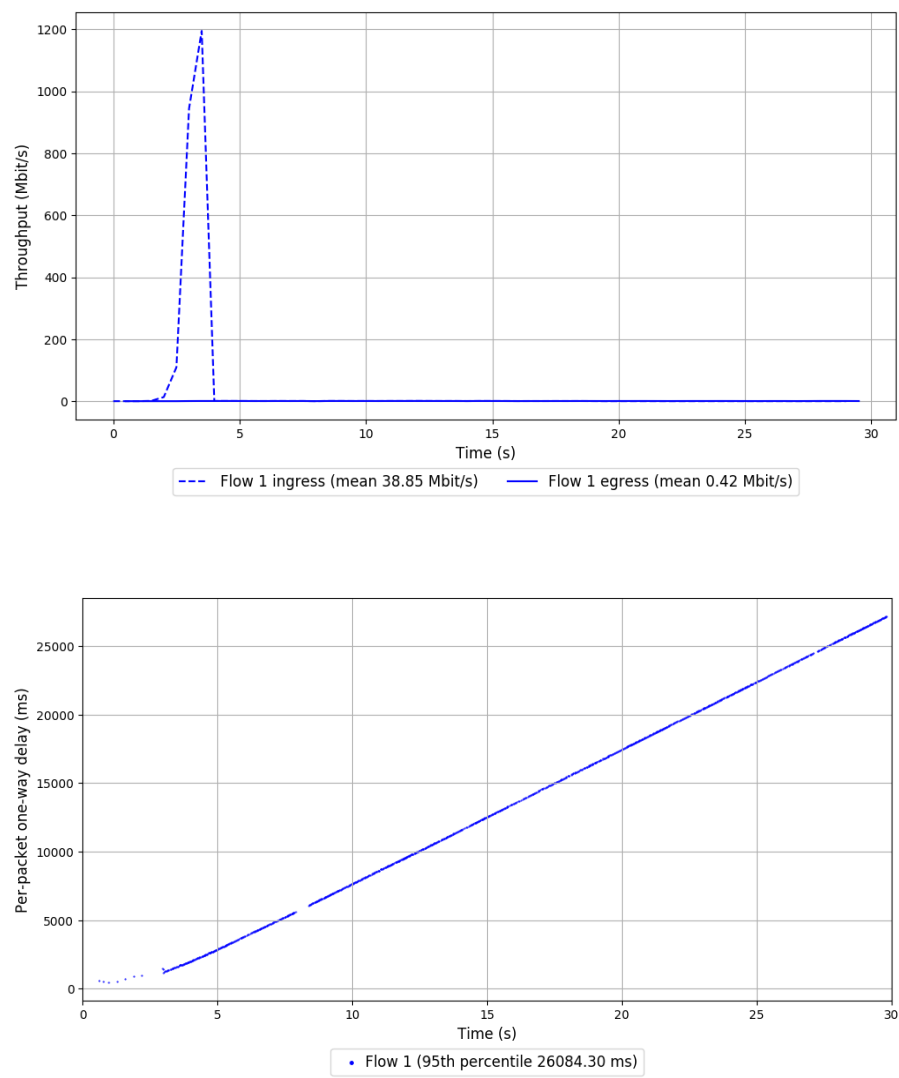


Run 2: Statistics of PCC

Start at: 2018-02-19 16:36:51
End at: 2018-02-19 16:37:21
Local clock offset: -11.665 ms
Remote clock offset: -4.743 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 26084.296 ms
Loss rate: 98.92%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 26084.296 ms
Loss rate: 98.92%

Run 2: Report of PCC — Data Link

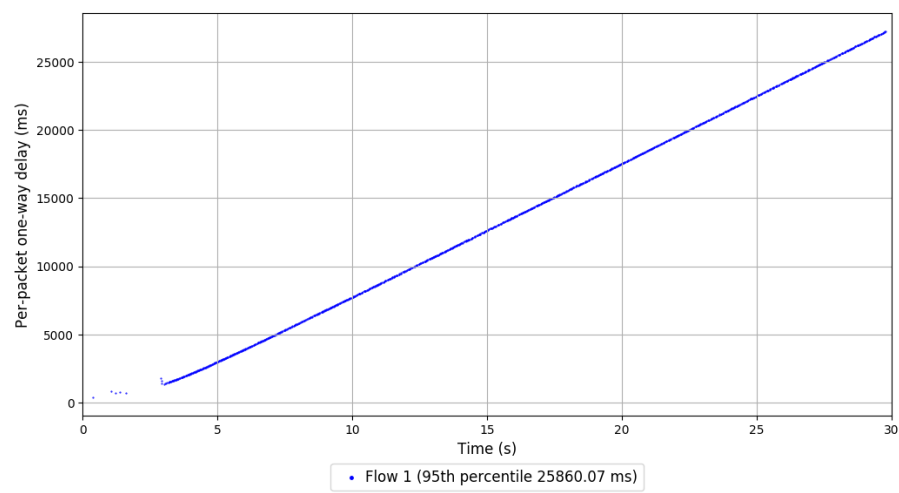
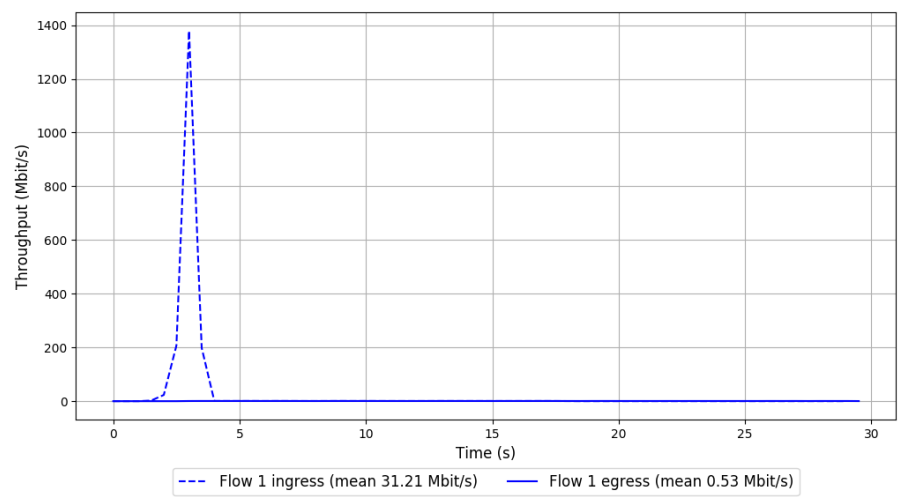


Run 3: Statistics of PCC

Start at: 2018-02-19 16:58:38
End at: 2018-02-19 16:59:08
Local clock offset: -13.106 ms
Remote clock offset: 1.247 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 25860.070 ms
Loss rate: 98.30%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 25860.070 ms
Loss rate: 98.30%

Run 3: Report of PCC — Data Link

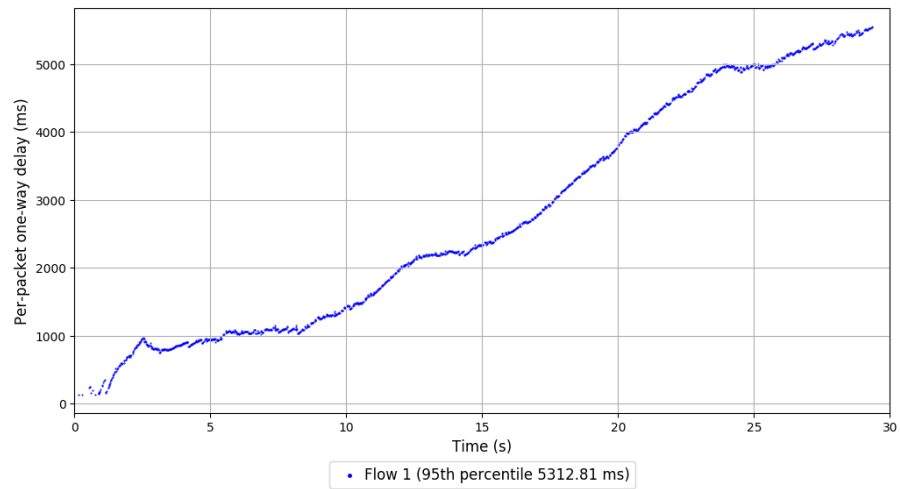
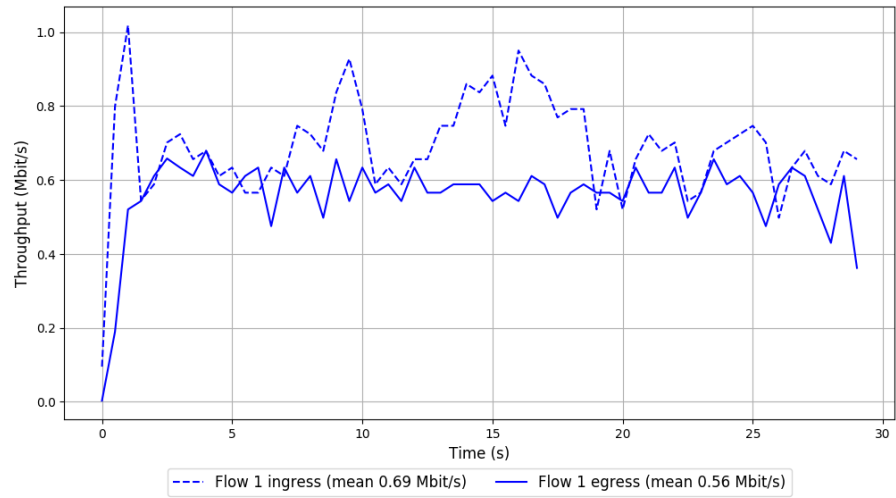


Run 1: Statistics of QUIC Cubic

Start at: 2018-02-19 16:18:02
End at: 2018-02-19 16:18:32
Local clock offset: -7.305 ms
Remote clock offset: -0.134 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 5312.813 ms
Loss rate: 18.78%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 5312.813 ms
Loss rate: 18.78%

Run 1: Report of QUIC Cubic — Data Link

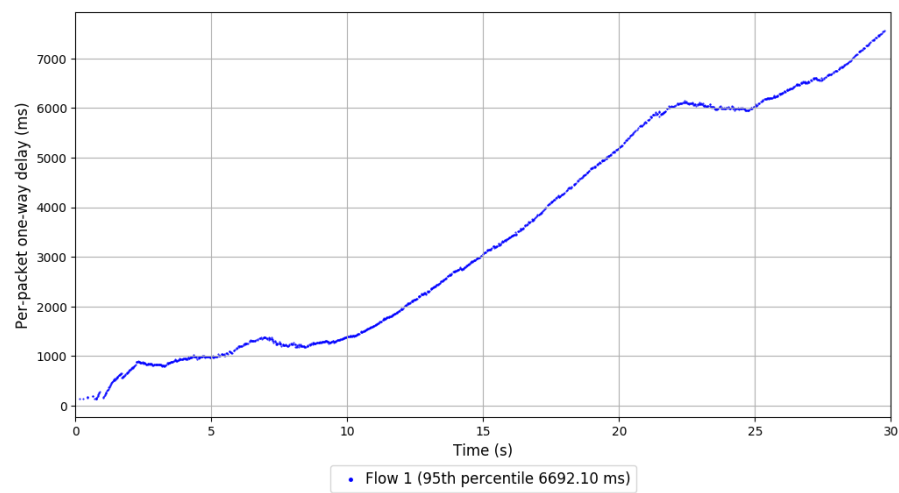
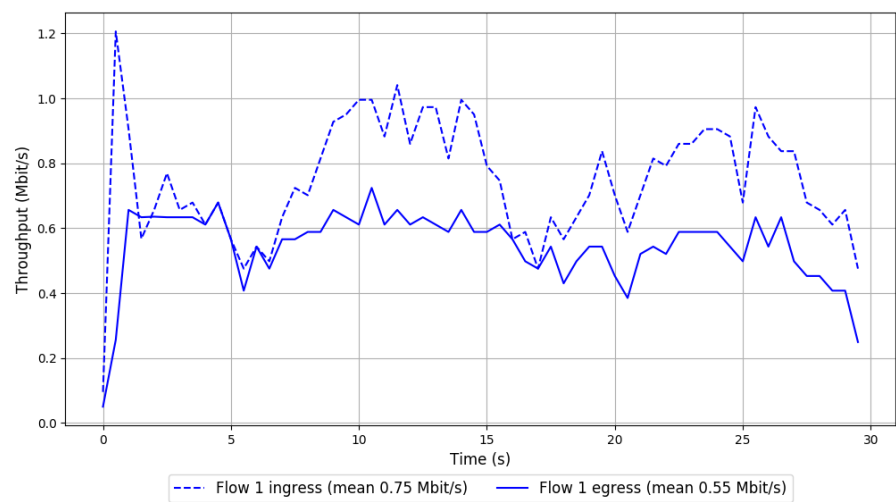


Run 2: Statistics of QUIC Cubic

Start at: 2018-02-19 16:39:30
End at: 2018-02-19 16:40:00
Local clock offset: -12.603 ms
Remote clock offset: -3.829 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 6692.096 ms
Loss rate: 27.32%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 6692.096 ms
Loss rate: 27.32%

Run 2: Report of QUIC Cubic — Data Link

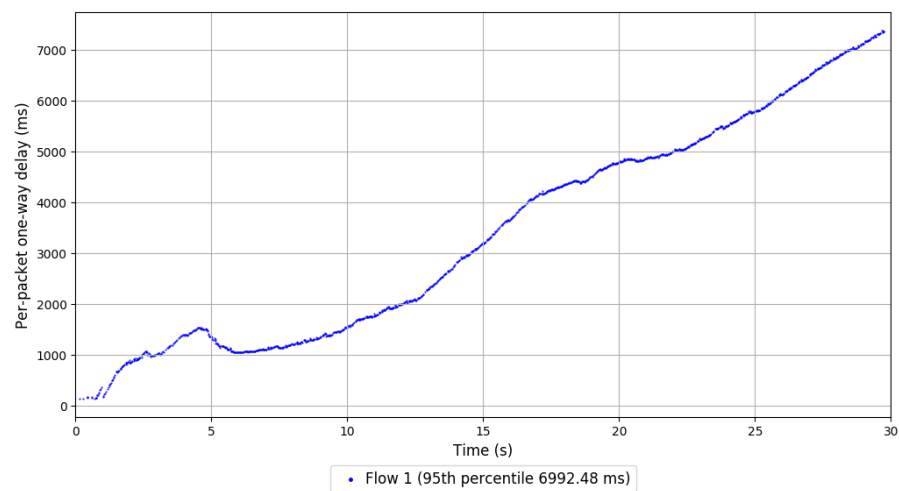
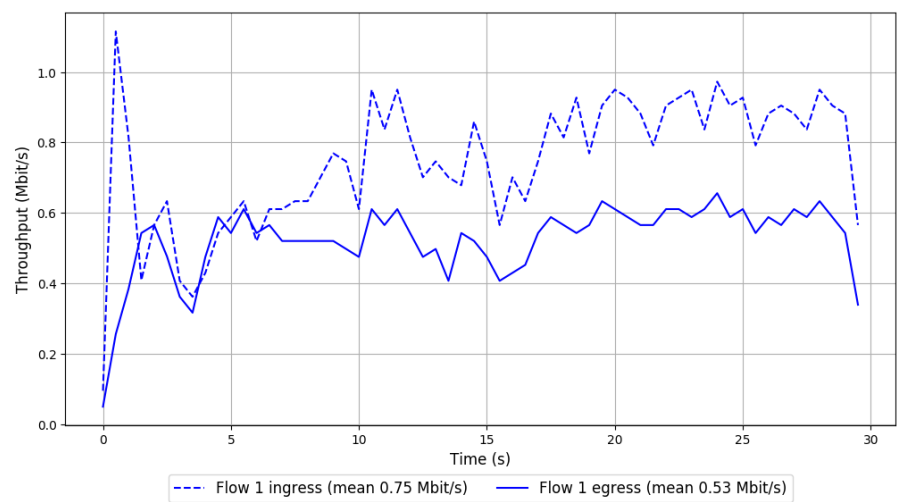


Run 3: Statistics of QUIC Cubic

Start at: 2018-02-19 17:01:05
End at: 2018-02-19 17:01:35
Local clock offset: -13.601 ms
Remote clock offset: -4.229 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 6992.485 ms
Loss rate: 30.05%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 6992.485 ms
Loss rate: 30.05%

Run 3: Report of QUIC Cubic — Data Link

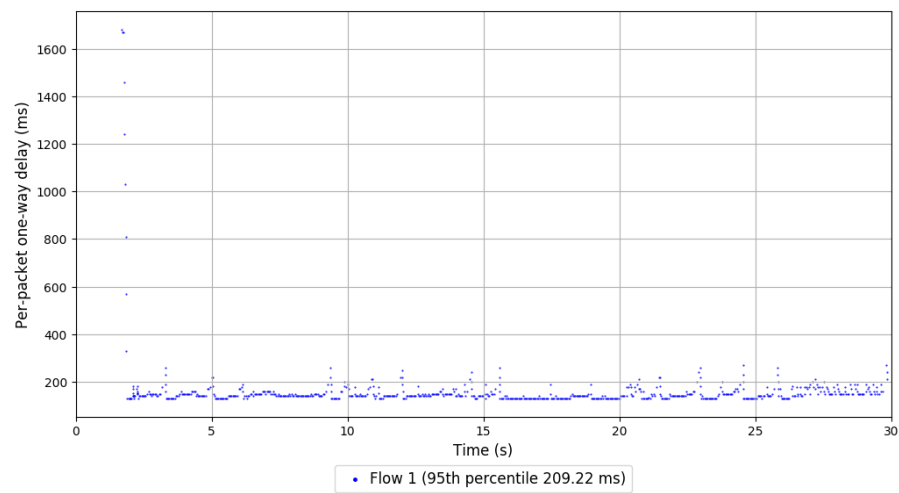
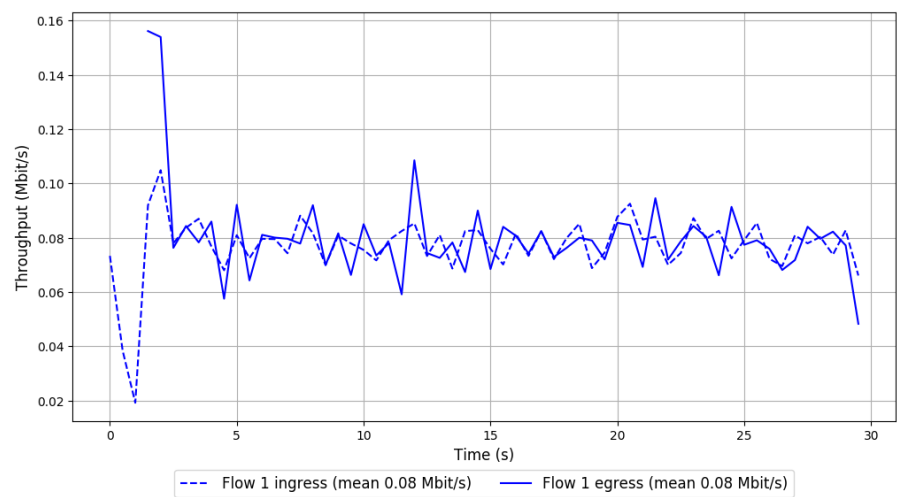


```
Run 1: Statistics of SCReAM

Start at: 2018-02-19 16:20:24
End at: 2018-02-19 16:20:54
Local clock offset: -8.202 ms
Remote clock offset: -0.127 ms

# Below is generated by plot.py at 2018-02-19 18:21:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 209.216 ms
Loss rate: 0.91%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 209.216 ms
Loss rate: 0.91%
```

Run 1: Report of SReAM — Data Link

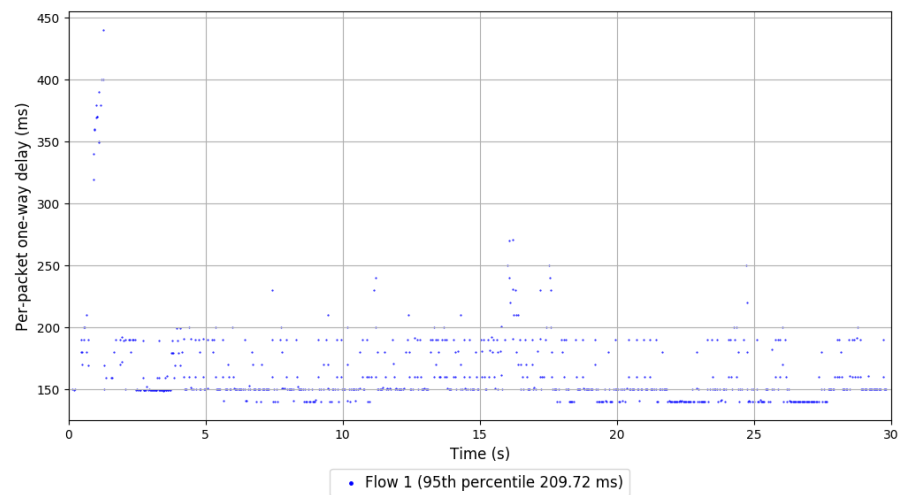
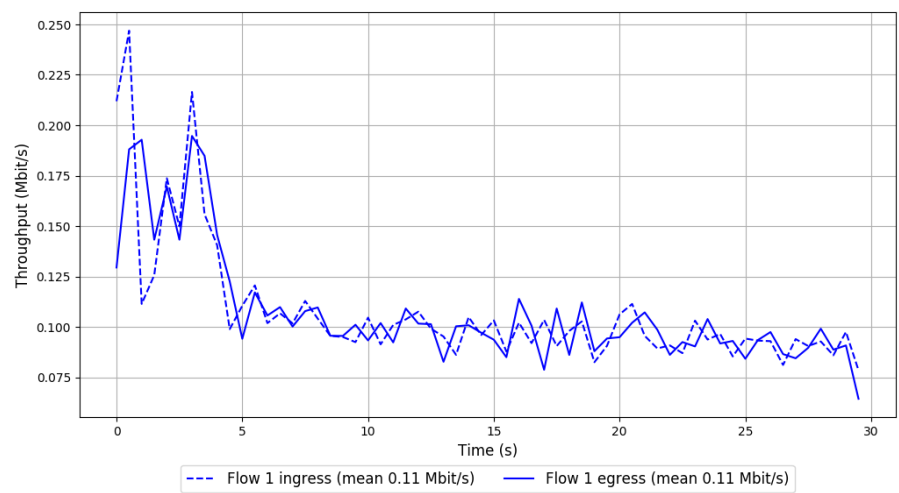


Run 2: Statistics of SCReAM

Start at: 2018-02-19 16:42:04
End at: 2018-02-19 16:42:34
Local clock offset: -13.682 ms
Remote clock offset: -4.616 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 209.723 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 209.723 ms
Loss rate: 0.66%

Run 2: Report of SReAM — Data Link

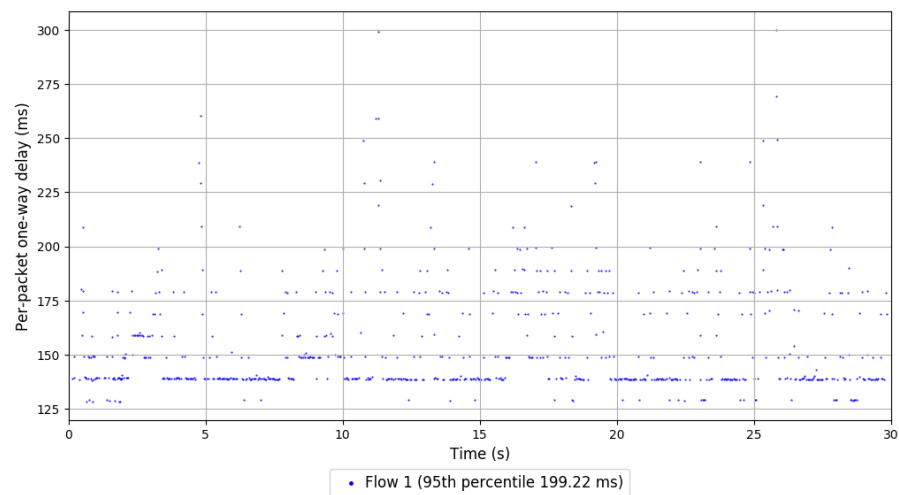
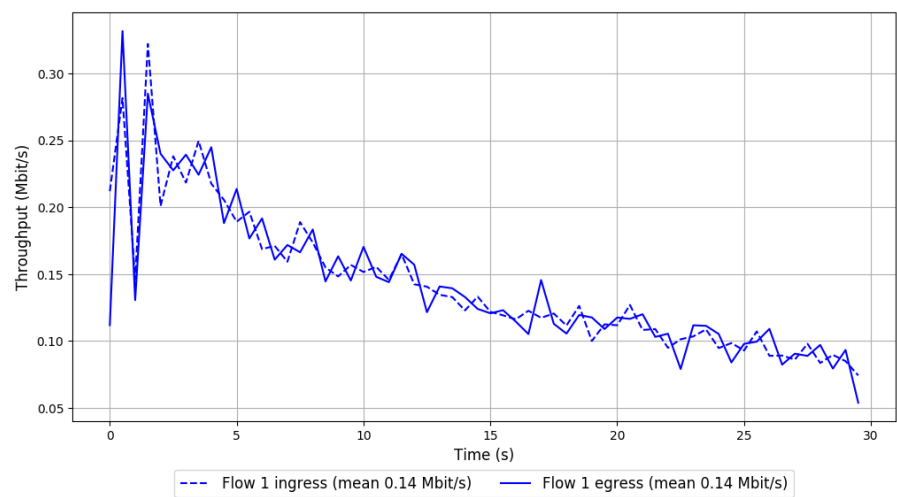


Run 3: Statistics of SCReAM

Start at: 2018-02-19 17:03:27
End at: 2018-02-19 17:03:57
Local clock offset: -14.167 ms
Remote clock offset: 2.278 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 199.223 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 199.223 ms
Loss rate: 0.47%

Run 3: Report of SReAM — Data Link

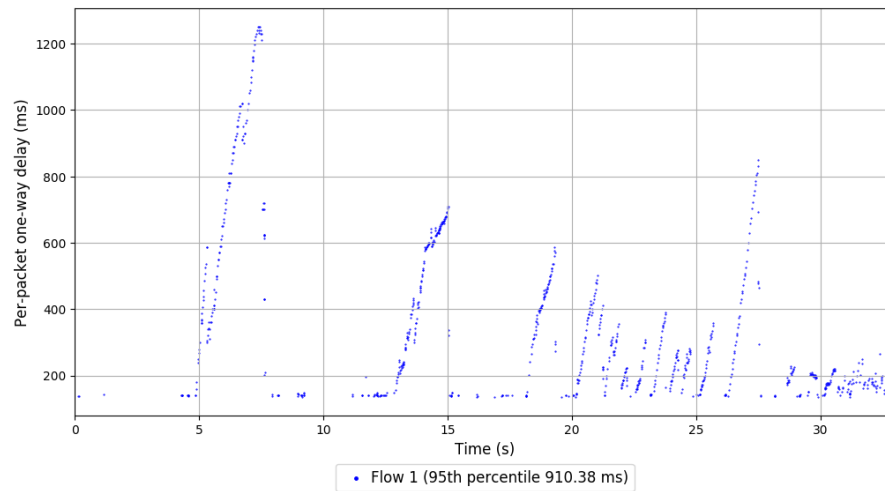
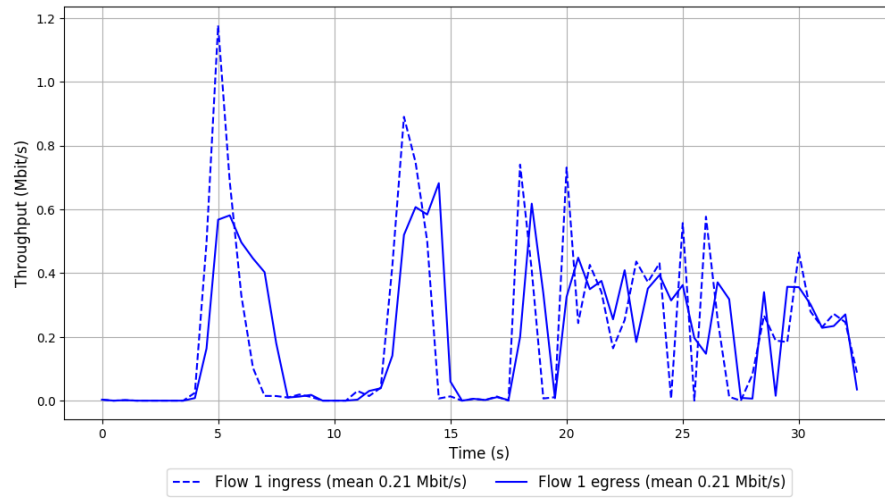


Run 1: Statistics of WebRTC media

Start at: 2018-02-19 16:33:20
End at: 2018-02-19 16:33:50
Local clock offset: -10.614 ms
Remote clock offset: -4.716 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 910.381 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 910.381 ms
Loss rate: 1.13%

Run 1: Report of WebRTC media — Data Link

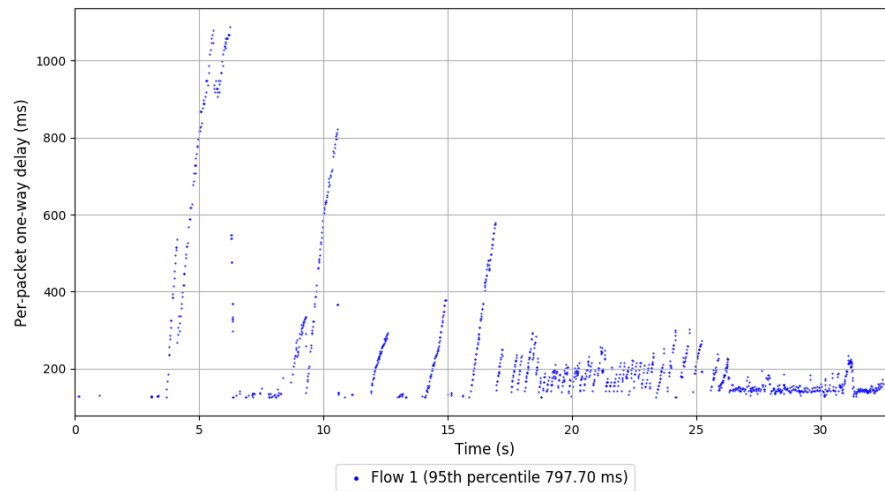
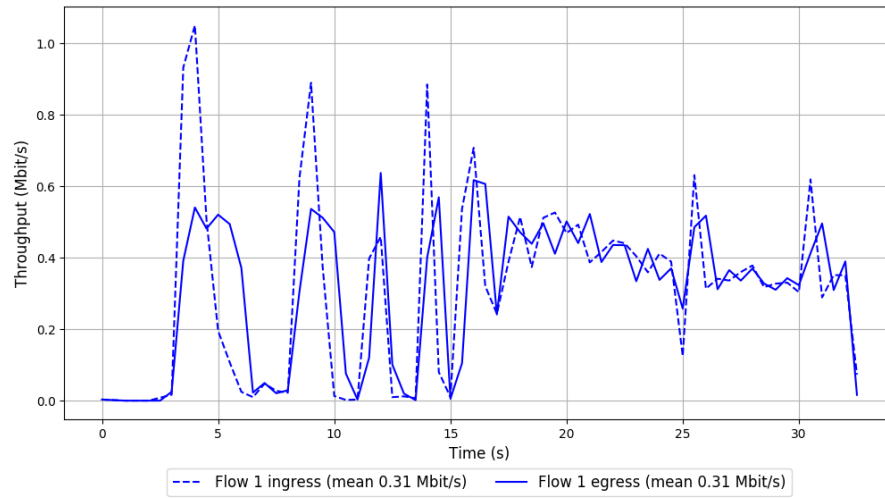


Run 2: Statistics of WebRTC media

Start at: 2018-02-19 16:55:07
End at: 2018-02-19 16:55:37
Local clock offset: -12.513 ms
Remote clock offset: 1.237 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 797.704 ms
Loss rate: 0.62%
-- Flow 1:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 797.704 ms
Loss rate: 0.62%

Run 2: Report of WebRTC media — Data Link

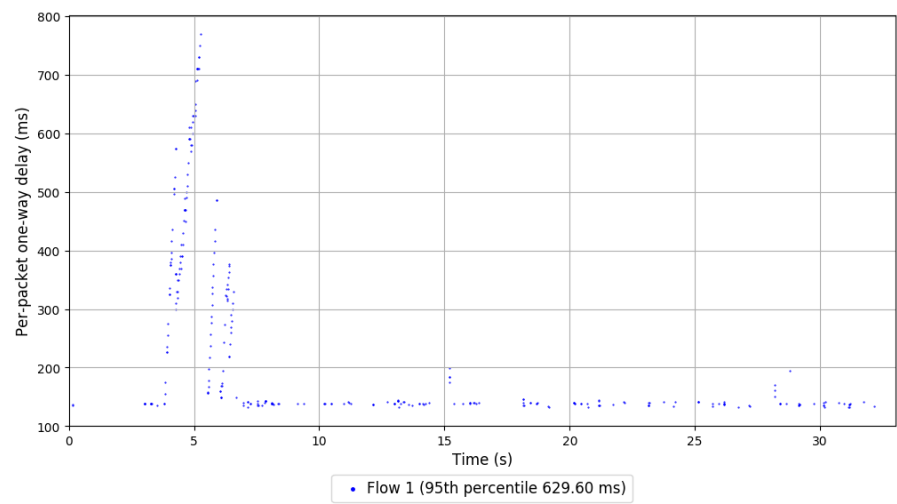
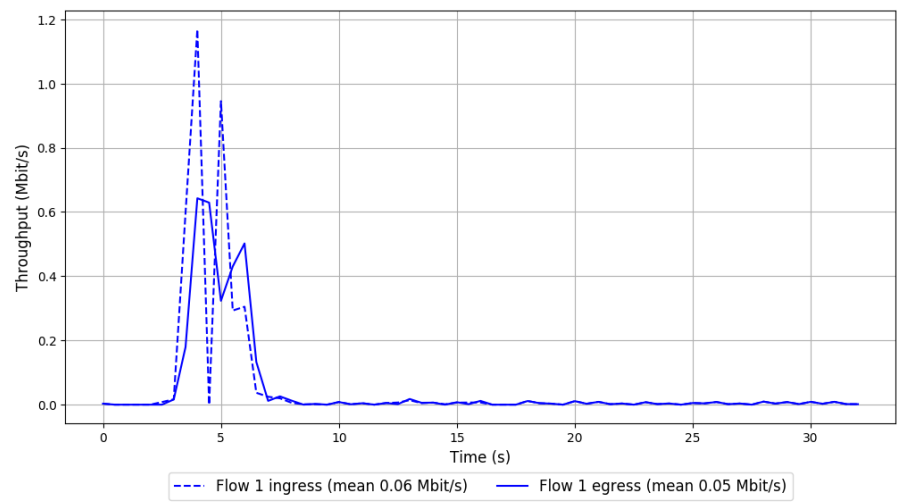


Run 3: Statistics of WebRTC media

Start at: 2018-02-19 17:16:31
End at: 2018-02-19 17:17:01
Local clock offset: -17.971 ms
Remote clock offset: -4.429 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 629.600 ms
Loss rate: 14.20%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 629.600 ms
Loss rate: 14.20%

Run 3: Report of WebRTC media — Data Link

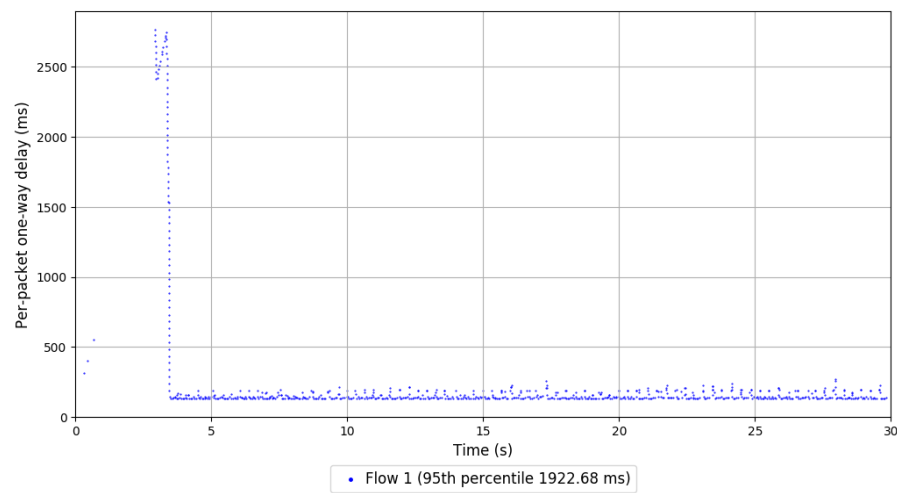
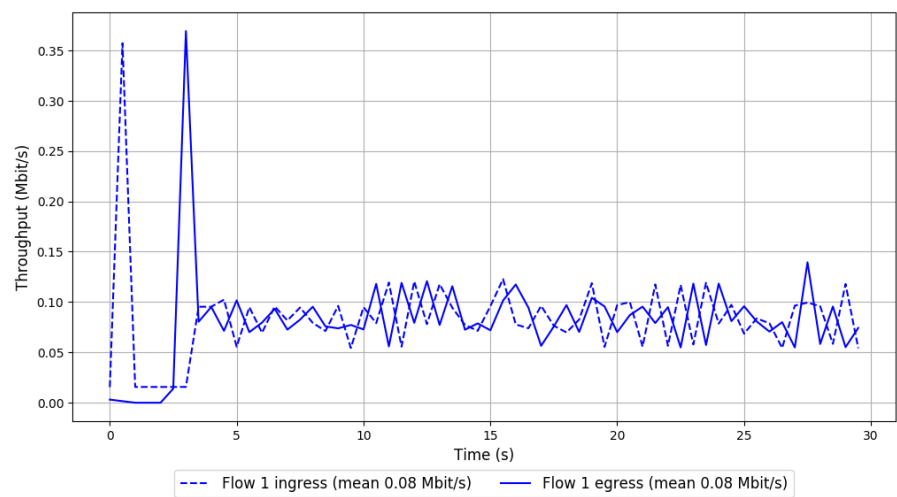


Run 1: Statistics of Sprout

Start at: 2018-02-19 16:28:40
End at: 2018-02-19 16:29:10
Local clock offset: -10.381 ms
Remote clock offset: -4.034 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 1922.683 ms
Loss rate: 2.12%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 1922.683 ms
Loss rate: 2.12%

Run 1: Report of Sprout — Data Link

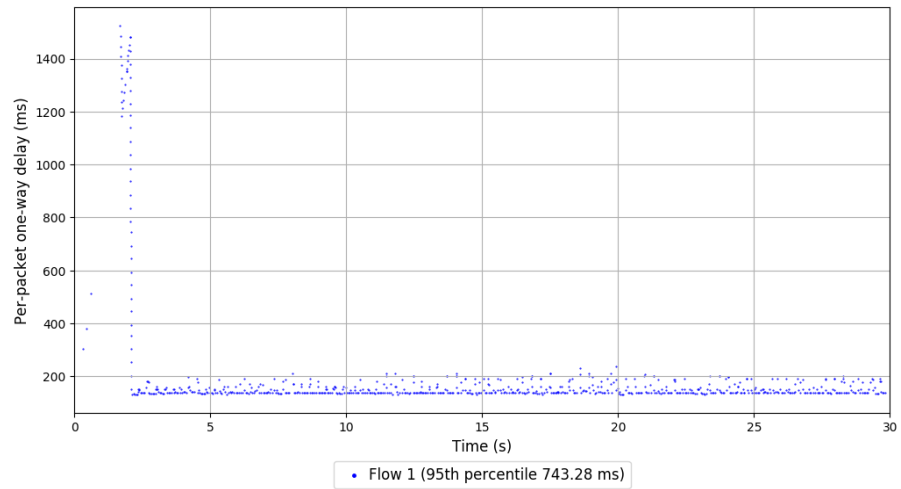
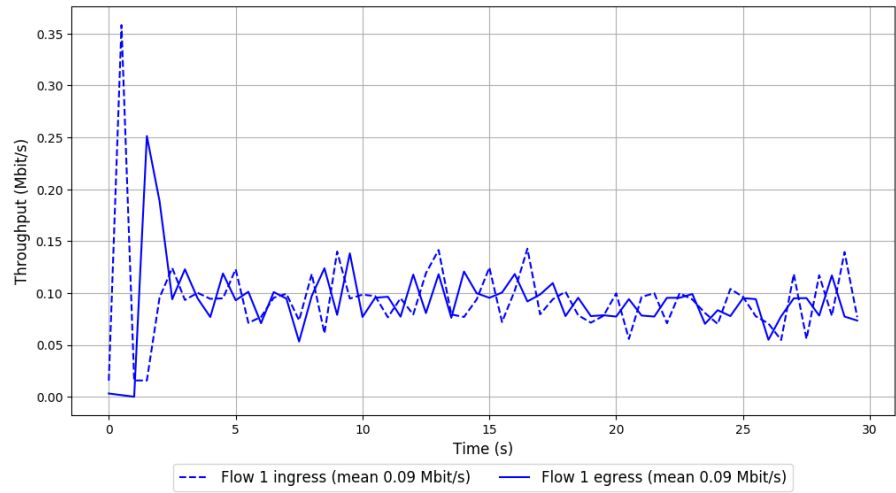


Run 2: Statistics of Sprout

Start at: 2018-02-19 16:50:23
End at: 2018-02-19 16:50:53
Local clock offset: -12.345 ms
Remote clock offset: -3.731 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 743.280 ms
Loss rate: 1.87%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 743.280 ms
Loss rate: 1.87%

Run 2: Report of Sprout — Data Link

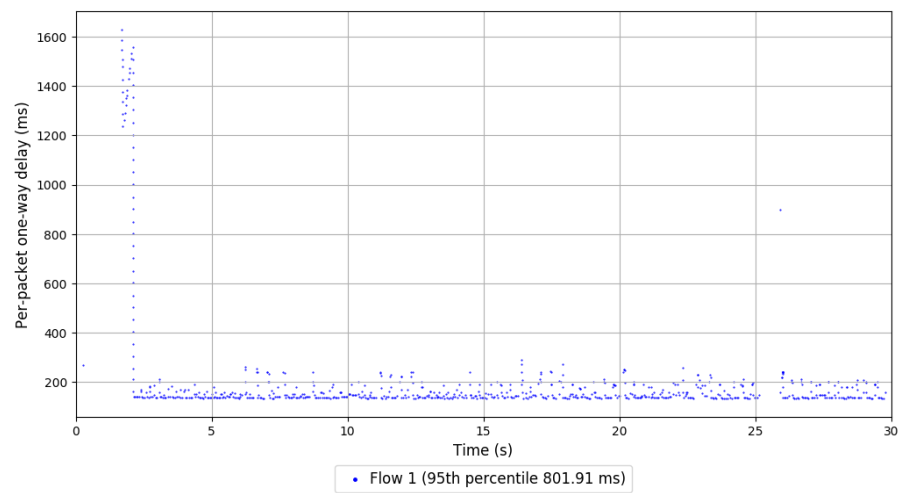
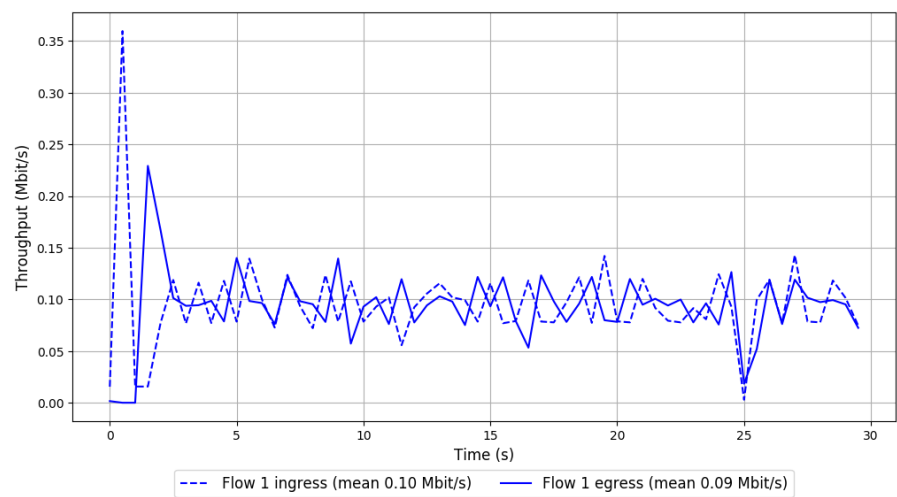


Run 3: Statistics of Sprout

Start at: 2018-02-19 17:11:50
End at: 2018-02-19 17:12:20
Local clock offset: -16.511 ms
Remote clock offset: -4.42 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 801.912 ms
Loss rate: 2.10%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 801.912 ms
Loss rate: 2.10%

Run 3: Report of Sprout — Data Link

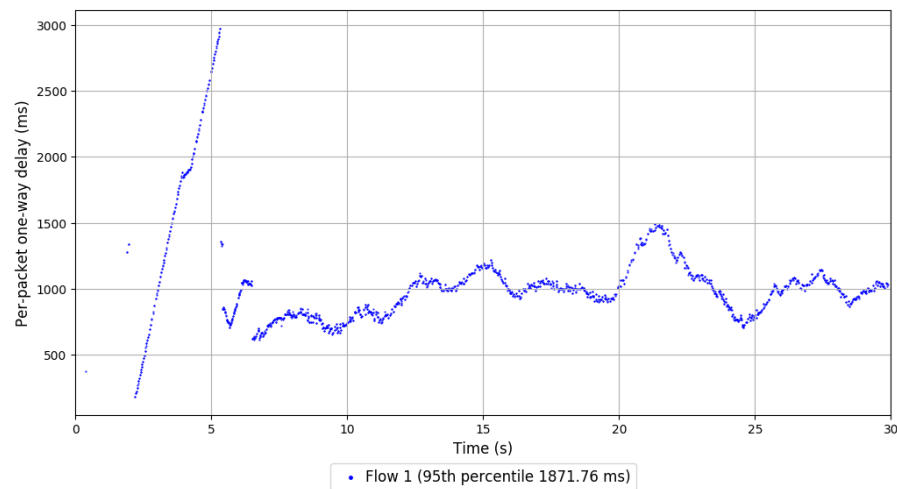
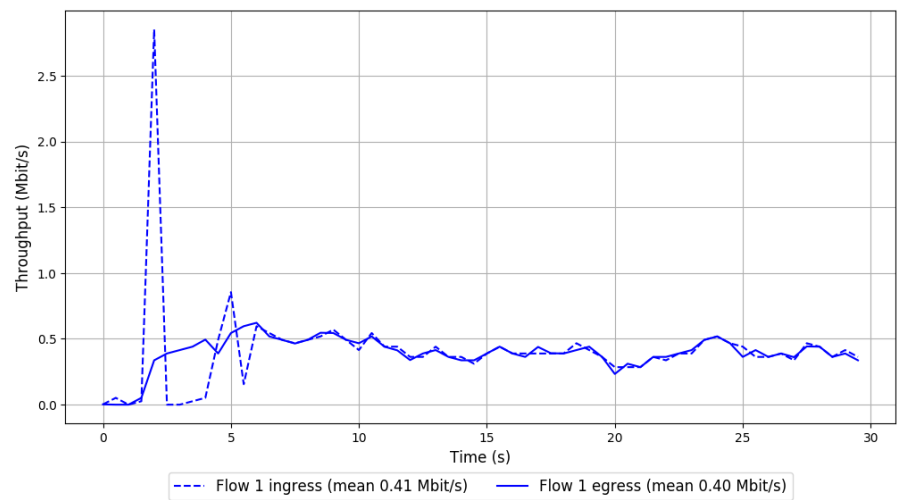


```
Run 1: Statistics of TaoVA-100x

Start at: 2018-02-19 16:31:00
End at: 2018-02-19 16:31:30
Local clock offset: -10.268 ms
Remote clock offset: 0.829 ms

# Below is generated by plot.py at 2018-02-19 18:21:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 1871.762 ms
Loss rate: 3.80%
-- Flow 1:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 1871.762 ms
Loss rate: 3.80%
```

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

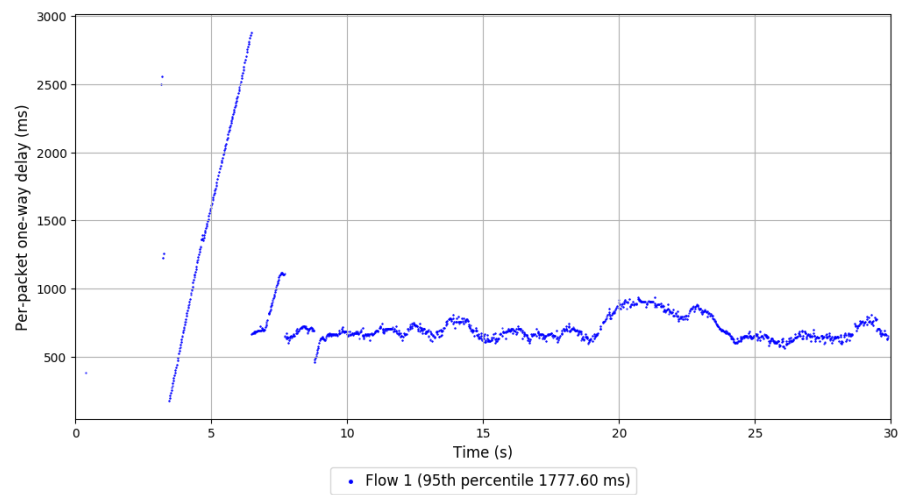
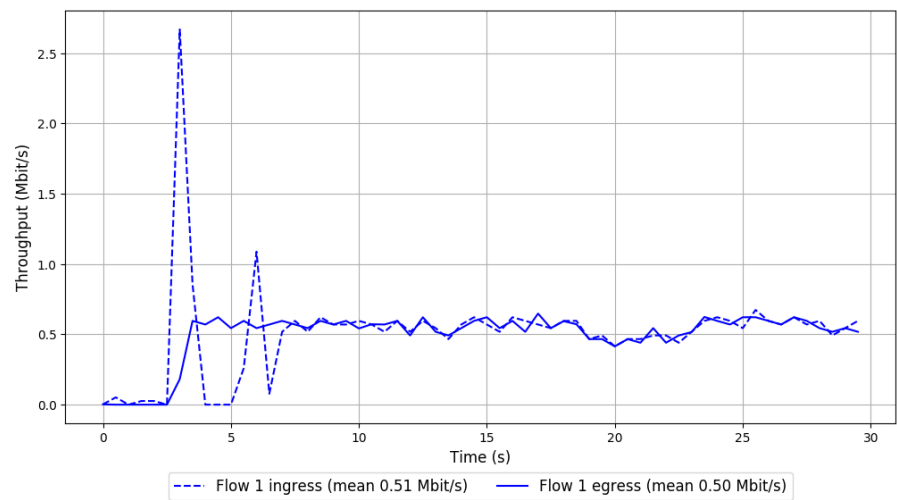


Run 2: Statistics of TaoVA-100x

Start at: 2018-02-19 16:52:43
End at: 2018-02-19 16:53:13
Local clock offset: -12.365 ms
Remote clock offset: -4.465 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 1777.604 ms
Loss rate: 2.80%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 1777.604 ms
Loss rate: 2.80%

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

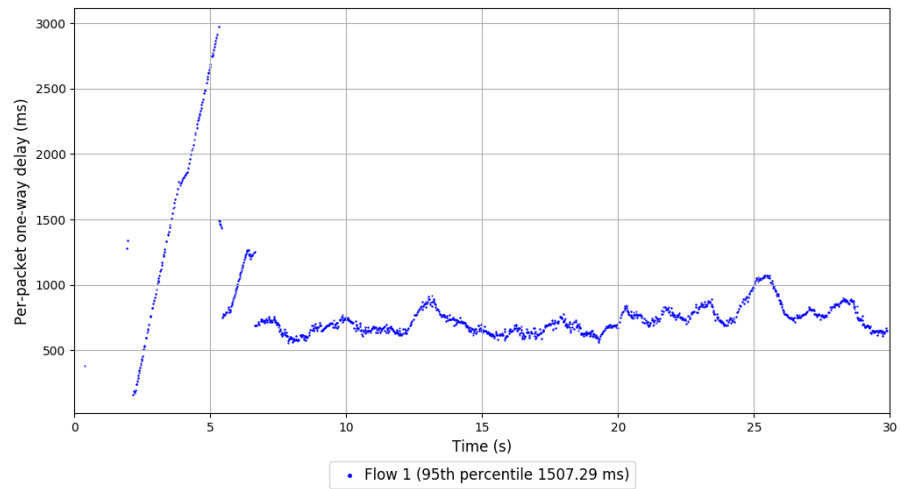
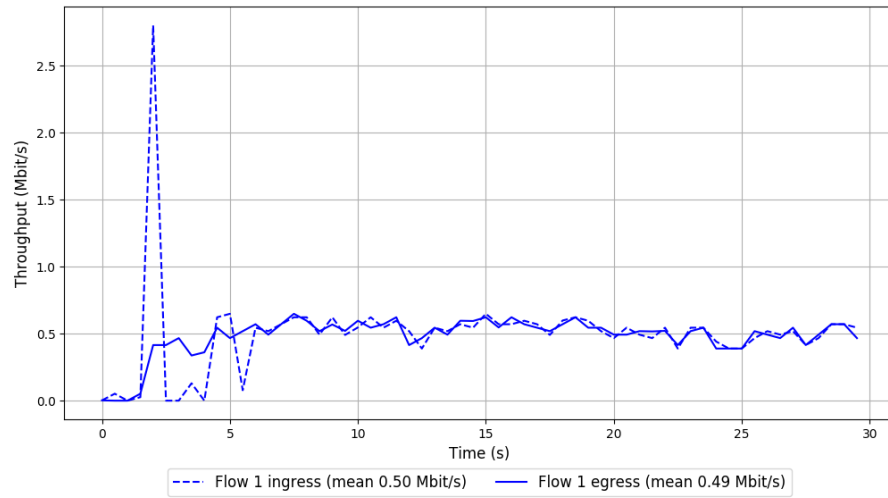


Run 3: Statistics of TaoVA-100x

Start at: 2018-02-19 17:14:11
End at: 2018-02-19 17:14:41
Local clock offset: -17.218 ms
Remote clock offset: 2.036 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 1507.287 ms
Loss rate: 2.88%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 1507.287 ms
Loss rate: 2.88%

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



Run 1: Statistics of TCP Vegas

Start at: 2018-02-19 16:22:46

End at: 2018-02-19 16:23:16

Local clock offset: -9.355 ms

Remote clock offset: 0.725 ms

Below is generated by plot.py at 2018-02-19 18:21:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 2532.947 ms

Loss rate: 1.55%

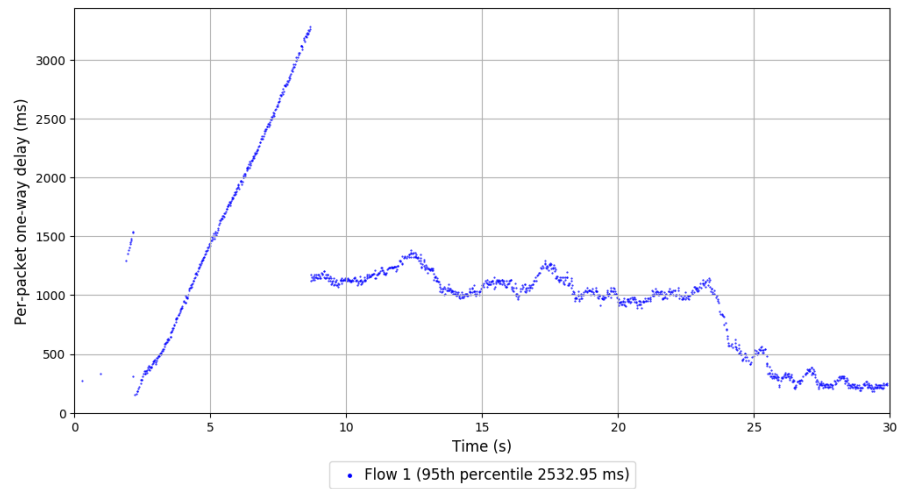
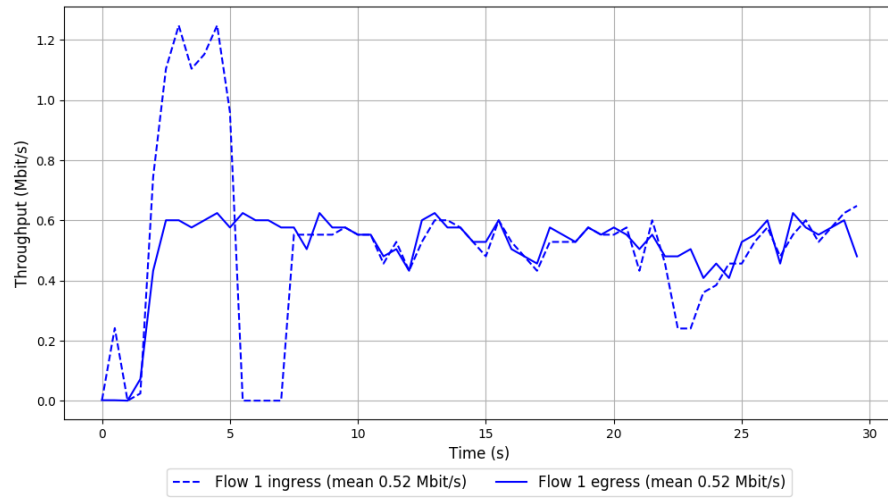
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 2532.947 ms

Loss rate: 1.55%

Run 1: Report of TCP Vegas — Data Link

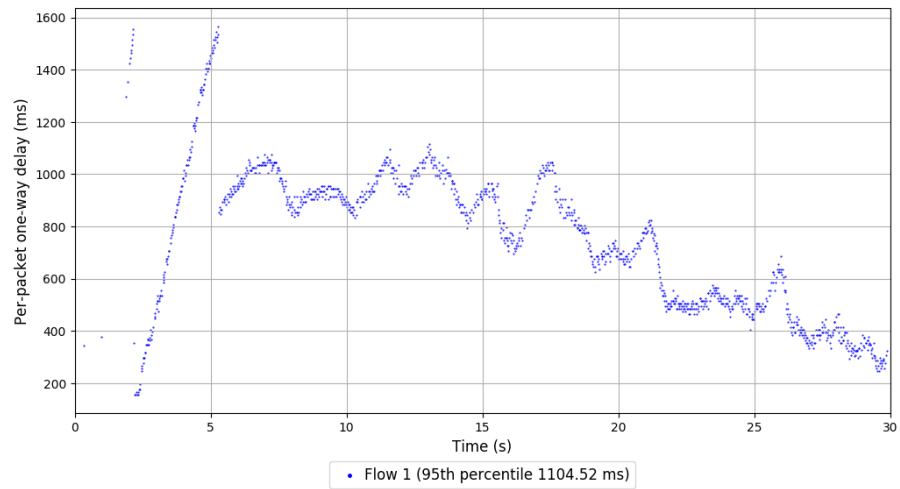
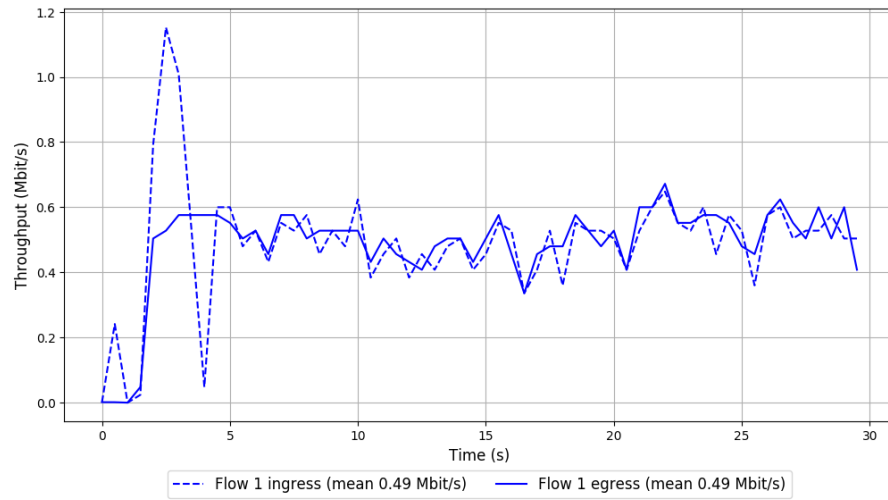


Run 2: Statistics of TCP Vegas

Start at: 2018-02-19 16:44:24
End at: 2018-02-19 16:44:54
Local clock offset: -13.656 ms
Remote clock offset: 1.959 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 1104.515 ms
Loss rate: 1.38%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 1104.515 ms
Loss rate: 1.38%

Run 2: Report of TCP Vegas — Data Link

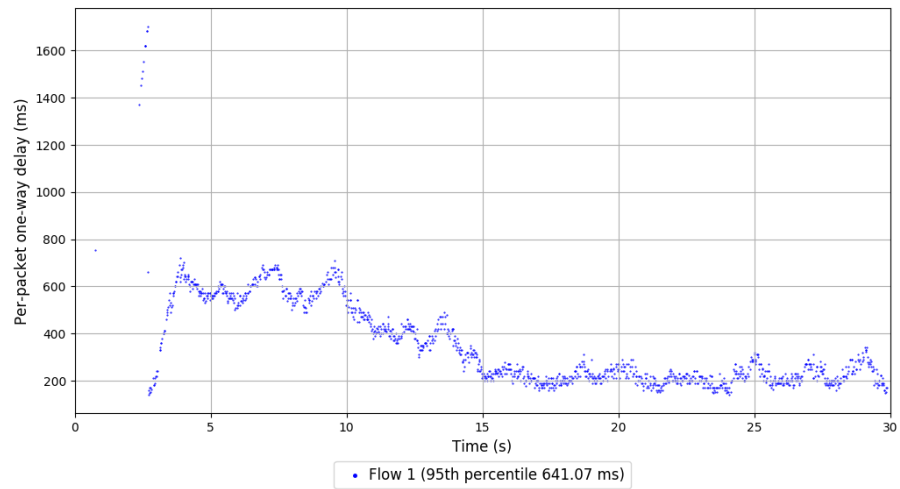
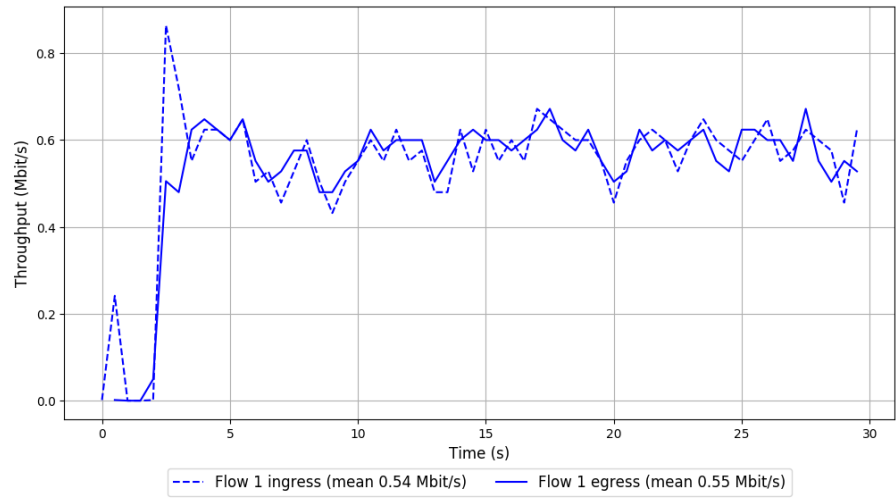


Run 3: Statistics of TCP Vegas

Start at: 2018-02-19 17:05:48
End at: 2018-02-19 17:06:18
Local clock offset: -14.765 ms
Remote clock offset: 2.272 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 641.066 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 641.066 ms
Loss rate: 1.05%

Run 3: Report of TCP Vegas — Data Link

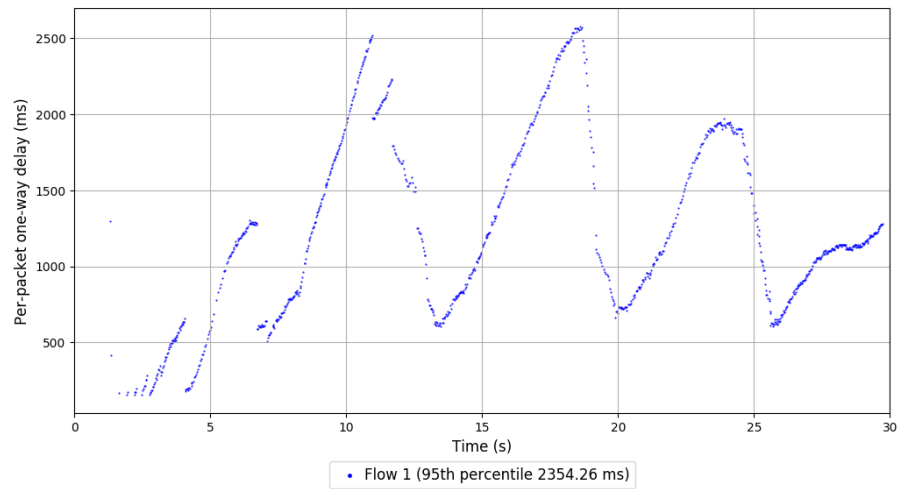
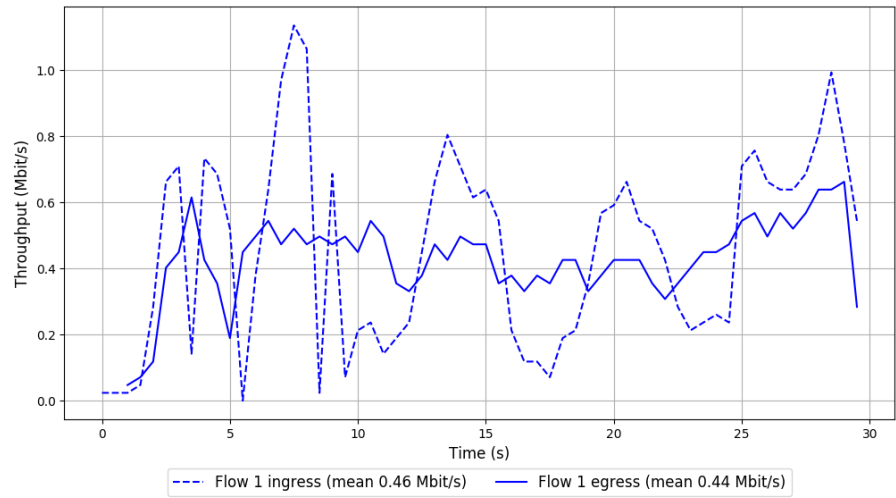


Run 1: Statistics of Verus

Start at: 2018-02-19 16:29:50
End at: 2018-02-19 16:30:20
Local clock offset: -10.322 ms
Remote clock offset: -4.148 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 2354.263 ms
Loss rate: 8.75%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 2354.263 ms
Loss rate: 8.75%

Run 1: Report of Verus — Data Link

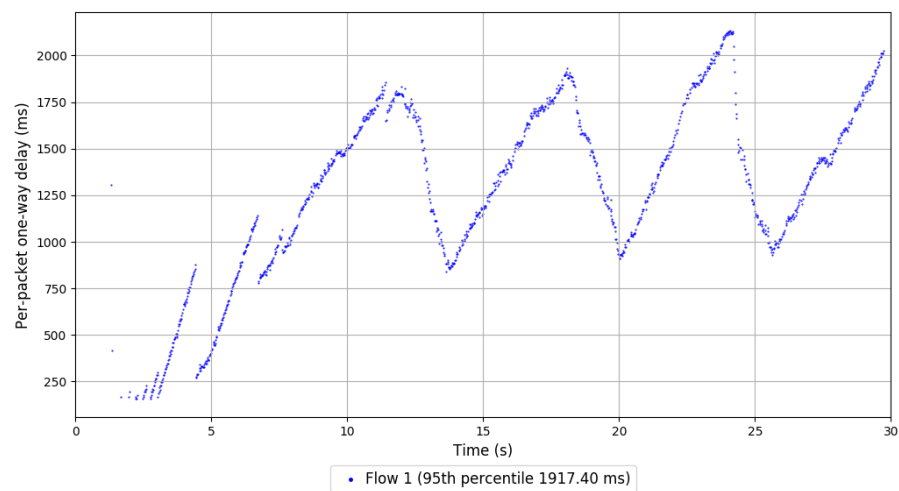
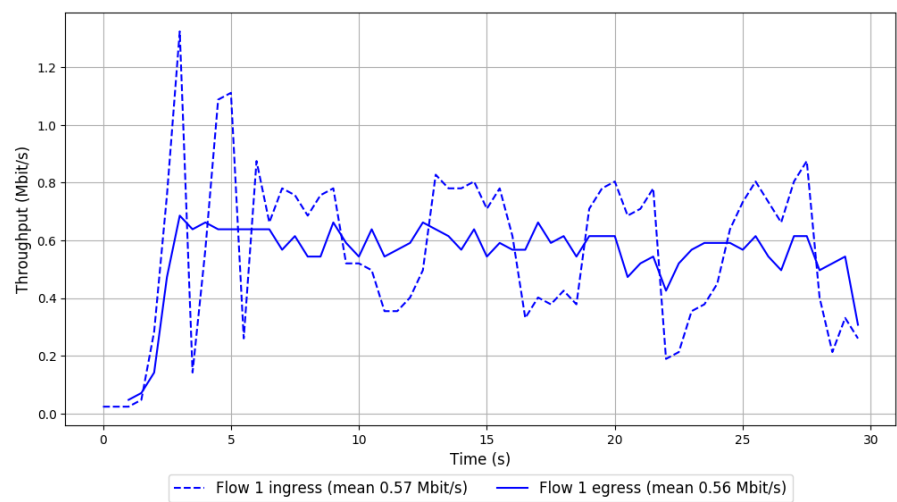


Run 2: Statistics of Verus

Start at: 2018-02-19 16:51:33
End at: 2018-02-19 16:52:03
Local clock offset: -12.318 ms
Remote clock offset: -4.498 ms

Below is generated by plot.py at 2018-02-19 18:21:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 1917.397 ms
Loss rate: 5.03%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 1917.397 ms
Loss rate: 5.03%

Run 2: Report of Verus — Data Link

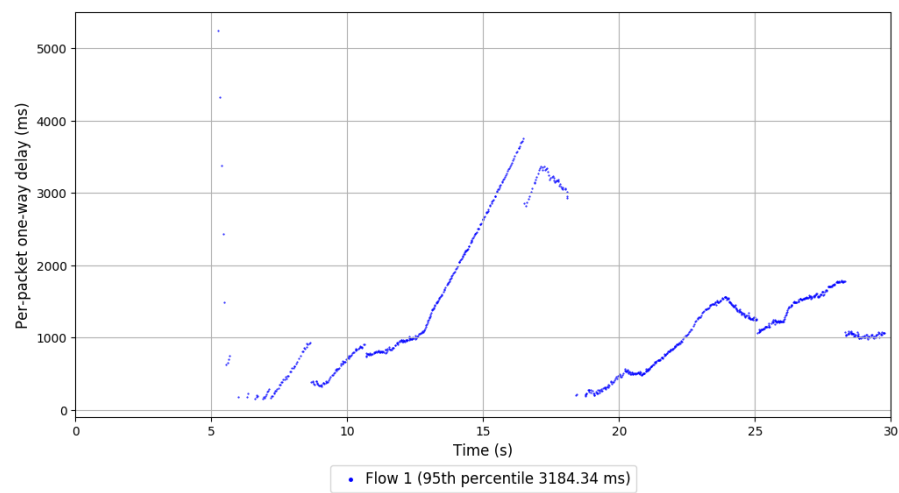
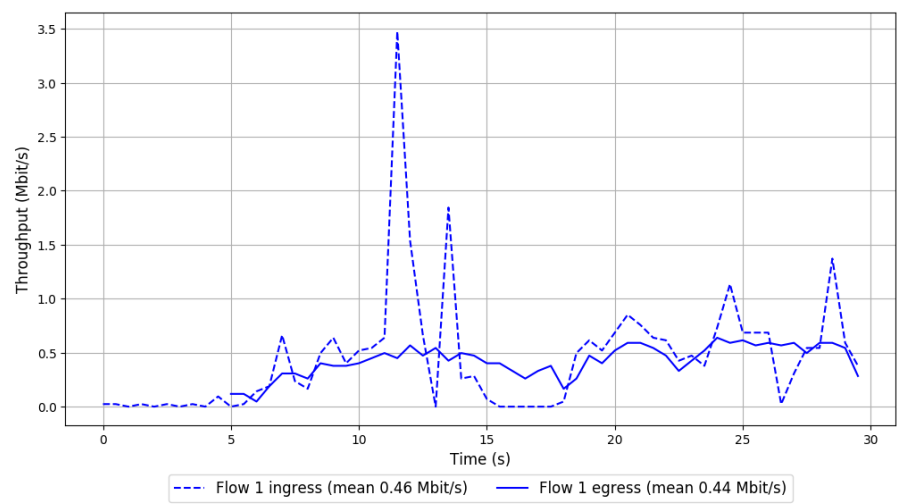


Run 3: Statistics of Verus

Start at: 2018-02-19 17:13:01
End at: 2018-02-19 17:13:31
Local clock offset: -16.834 ms
Remote clock offset: 2.06 ms

Below is generated by plot.py at 2018-02-19 18:21:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 3184.338 ms
Loss rate: 21.48%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 3184.338 ms
Loss rate: 21.48%

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

Start at: 2018-02-19 16:14:26

End at: 2018-02-19 16:14:56

Local clock offset: -5.638 ms

Remote clock offset: 0.664 ms

Below is generated by plot.py at 2018-02-19 18:21:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.46 Mbit/s

95th percentile per-packet one-way delay: 518.840 ms

Loss rate: 3.79%

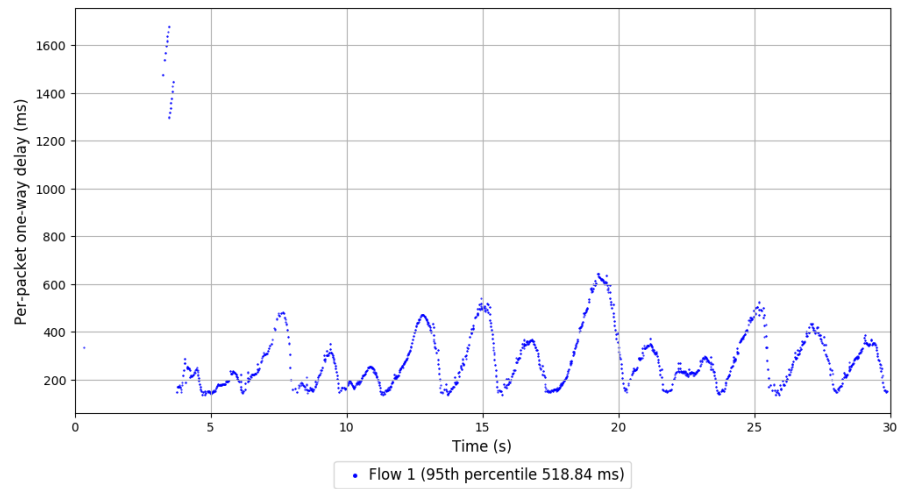
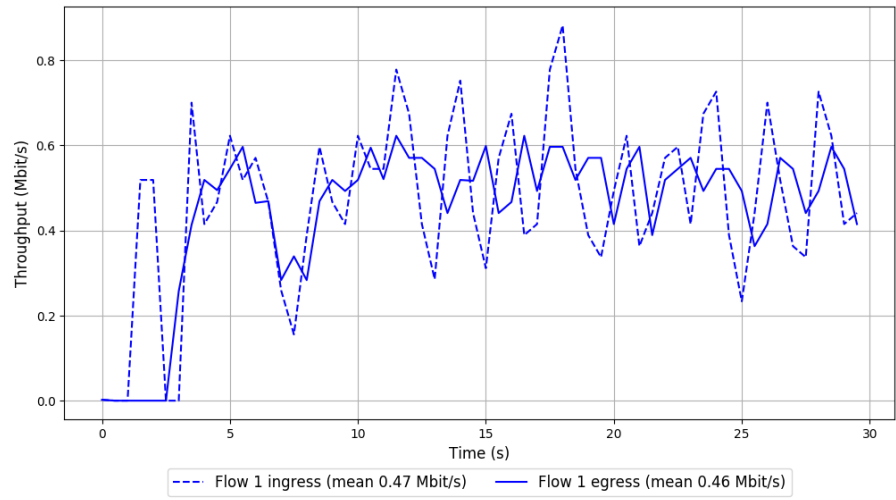
-- Flow 1:

Average throughput: 0.46 Mbit/s

95th percentile per-packet one-way delay: 518.840 ms

Loss rate: 3.79%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2018-02-19 16:35:41

End at: 2018-02-19 16:36:11

Local clock offset: -11.3 ms

Remote clock offset: 1.008 ms

Below is generated by plot.py at 2018-02-19 18:21:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 534.344 ms

Loss rate: 5.12%

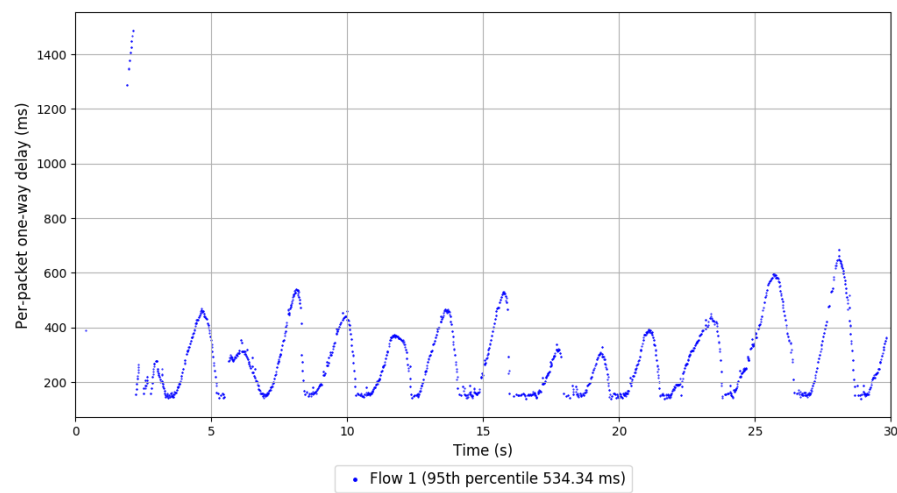
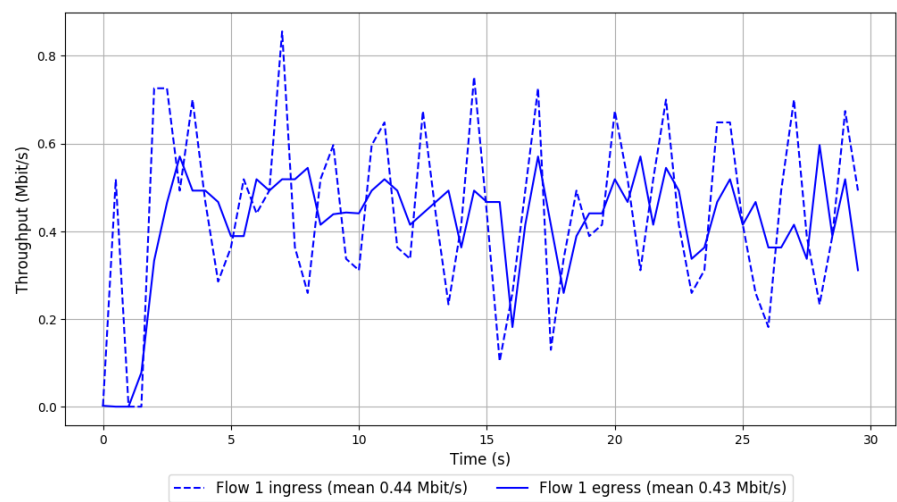
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 534.344 ms

Loss rate: 5.12%

Run 2: Report of Copa — Data Link

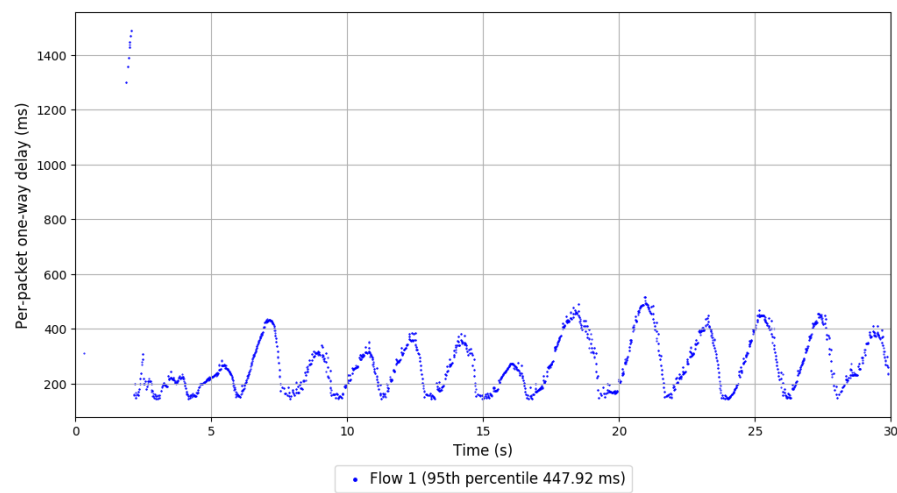
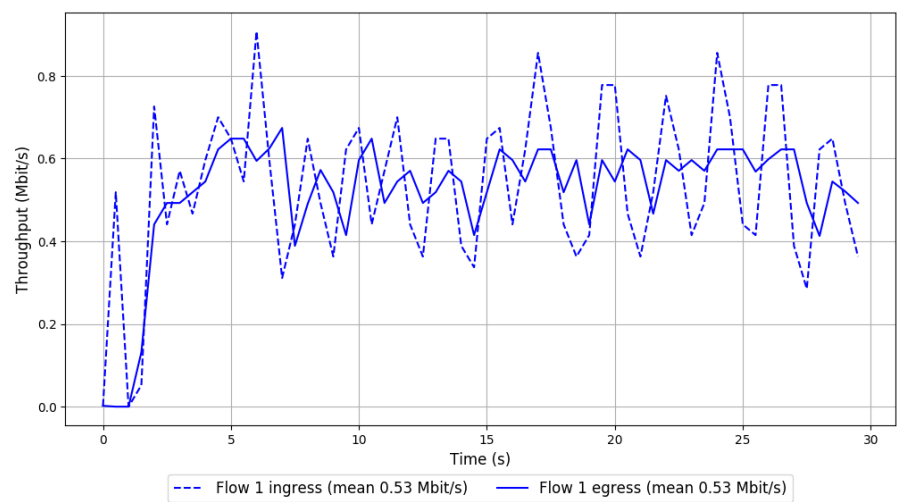


Run 3: Statistics of Copa

Start at: 2018-02-19 16:57:28
End at: 2018-02-19 16:57:58
Local clock offset: -12.826 ms
Remote clock offset: -4.323 ms

Below is generated by plot.py at 2018-02-19 18:21:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 447.919 ms
Loss rate: 2.35%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 447.919 ms
Loss rate: 2.35%

Run 3: Report of Copa — Data Link



Run 1: Statistics of FillP

Start at: 2018-02-19 16:19:12

End at: 2018-02-19 16:19:42

Local clock offset: -7.706 ms

Remote clock offset: 0.646 ms

Below is generated by plot.py at 2018-02-19 18:21:22

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 26739.391 ms

Loss rate: 99.03%

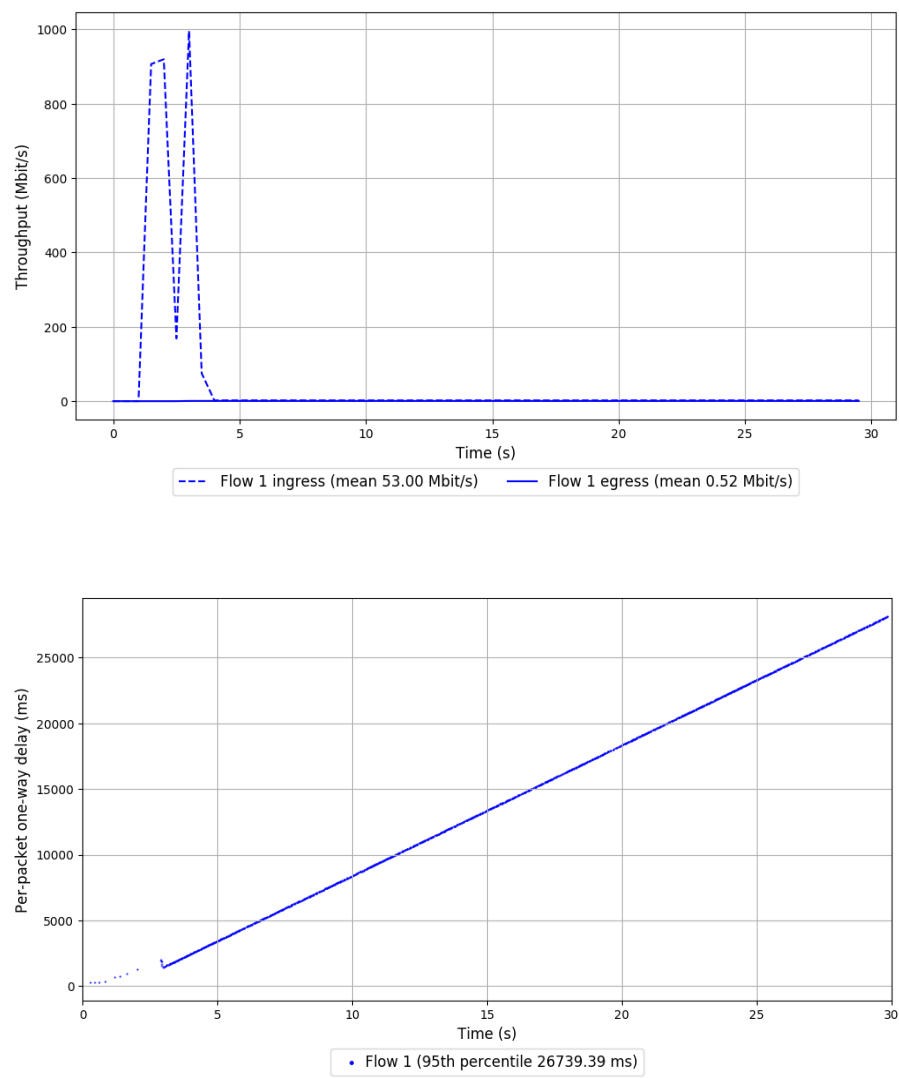
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 26739.391 ms

Loss rate: 99.03%

Run 1: Report of FillP — Data Link

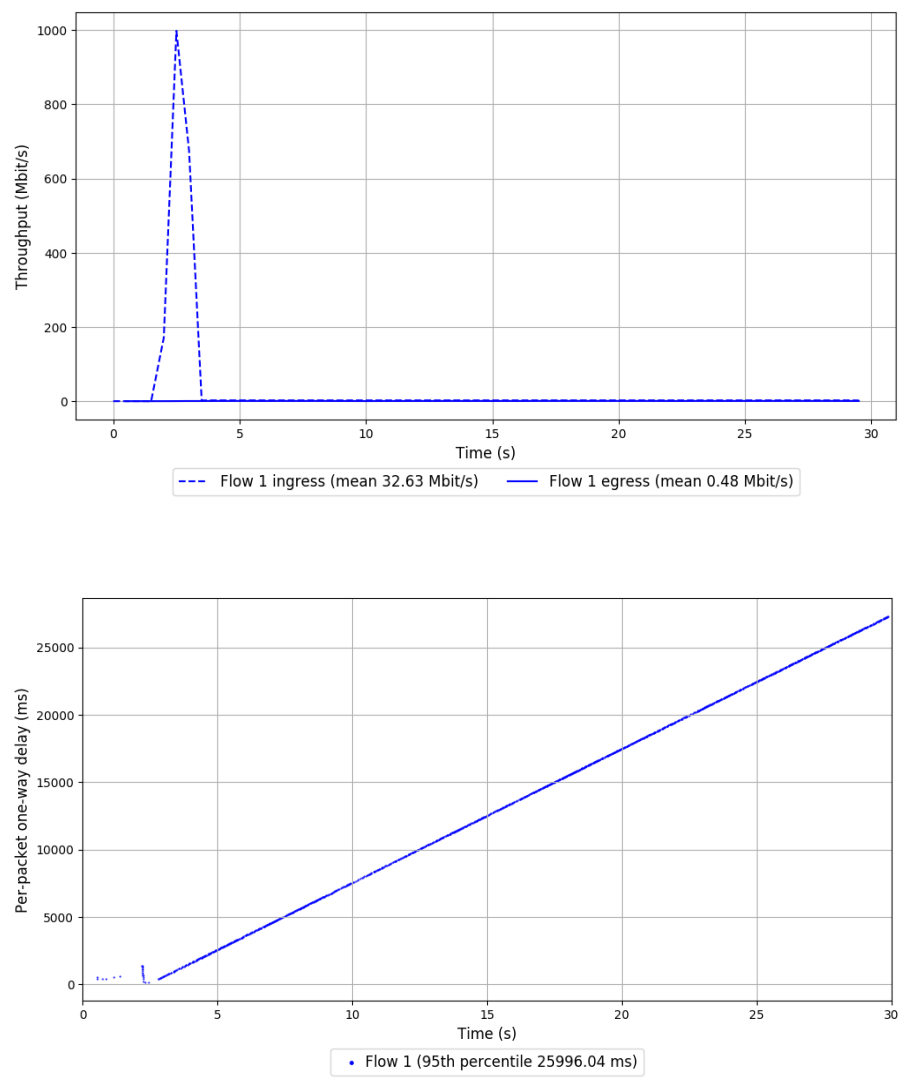


Run 2: Statistics of FillP

Start at: 2018-02-19 16:40:40
End at: 2018-02-19 16:41:10
Local clock offset: -13.089 ms
Remote clock offset: -4.515 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 25996.040 ms
Loss rate: 98.55%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 25996.040 ms
Loss rate: 98.55%

Run 2: Report of FillP — Data Link

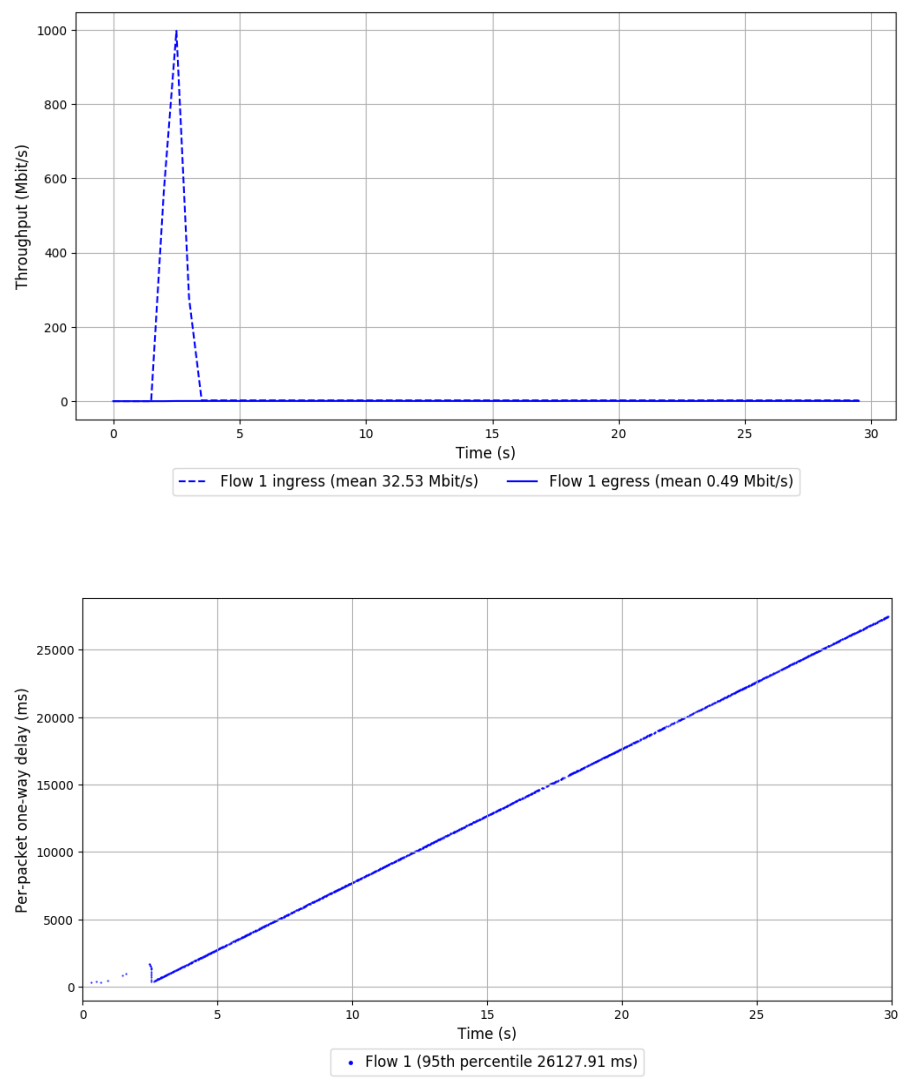


Run 3: Statistics of FillP

Start at: 2018-02-19 17:02:15
End at: 2018-02-19 17:02:45
Local clock offset: -13.888 ms
Remote clock offset: 0.479 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 26127.907 ms
Loss rate: 98.51%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 26127.907 ms
Loss rate: 98.51%

Run 3: Report of FillP — Data Link

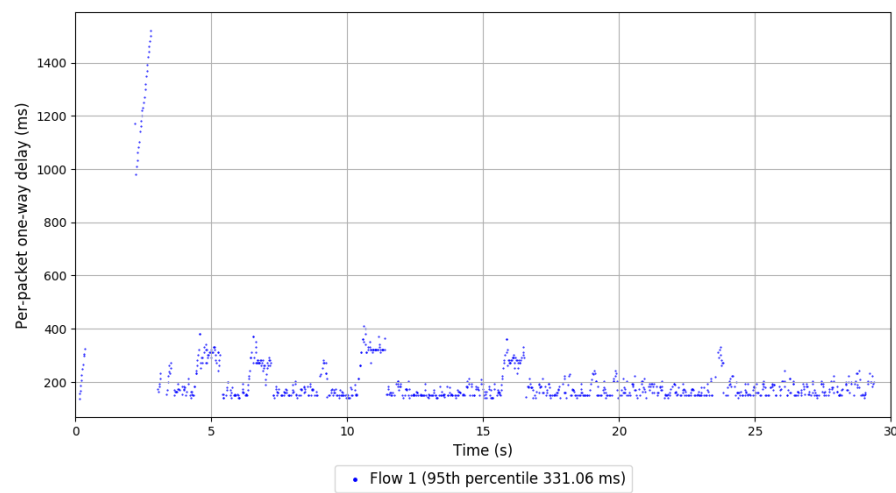
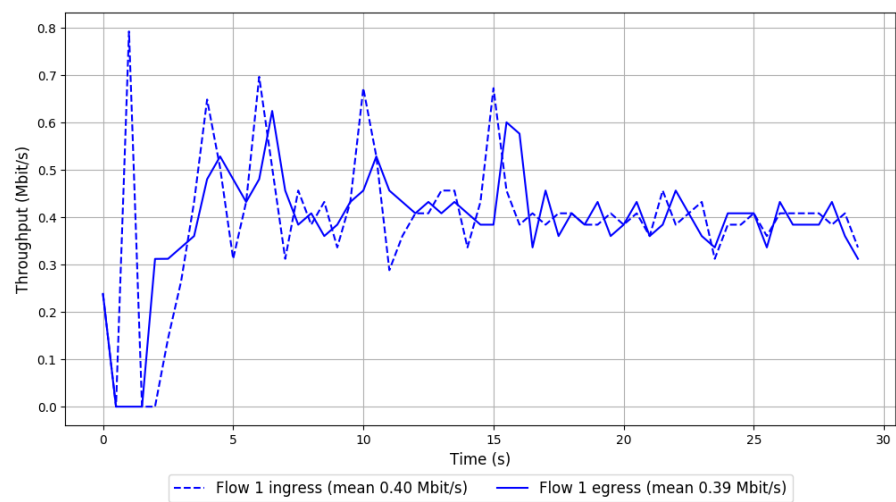


Run 1: Statistics of Indigo-1-32

Start at: 2018-02-19 16:26:17
End at: 2018-02-19 16:26:47
Local clock offset: -11.274 ms
Remote clock offset: -0.023 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 331.060 ms
Loss rate: 1.64%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 331.060 ms
Loss rate: 1.64%

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

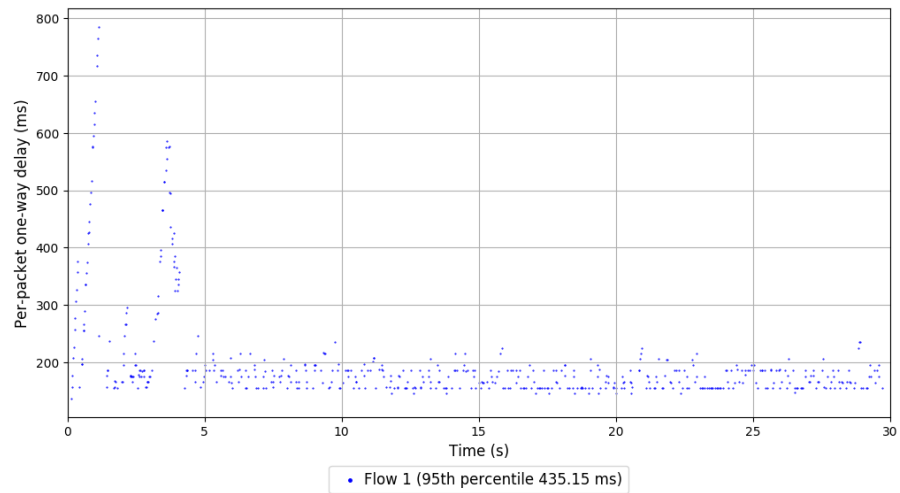
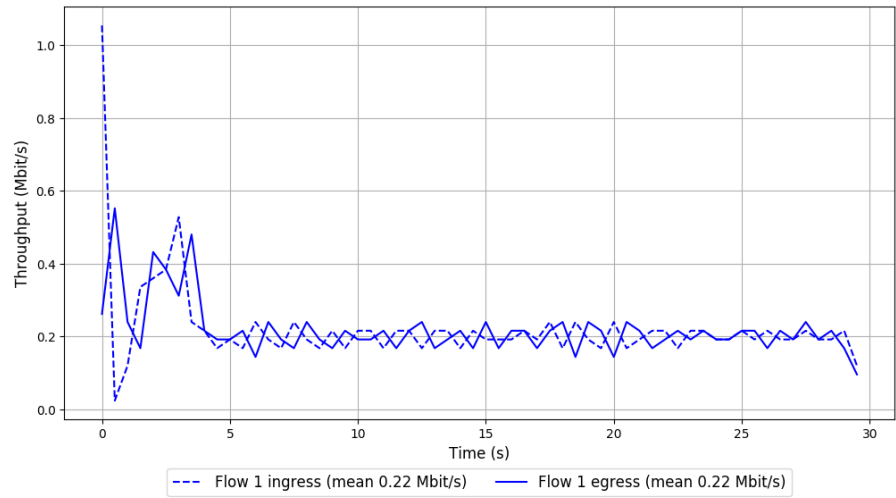


Run 2: Statistics of Indigo-1-32

Start at: 2018-02-19 16:48:03
End at: 2018-02-19 16:48:33
Local clock offset: -12.64 ms
Remote clock offset: -4.533 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 435.148 ms
Loss rate: 1.62%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 435.148 ms
Loss rate: 1.62%

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

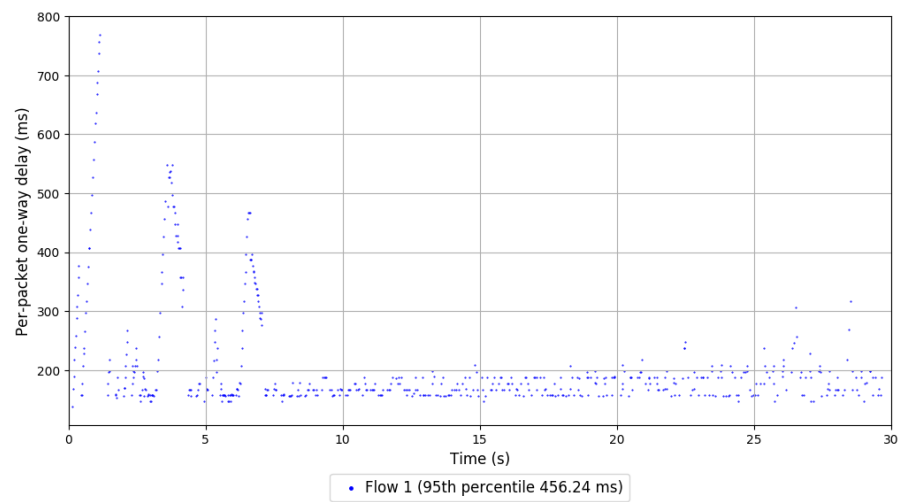
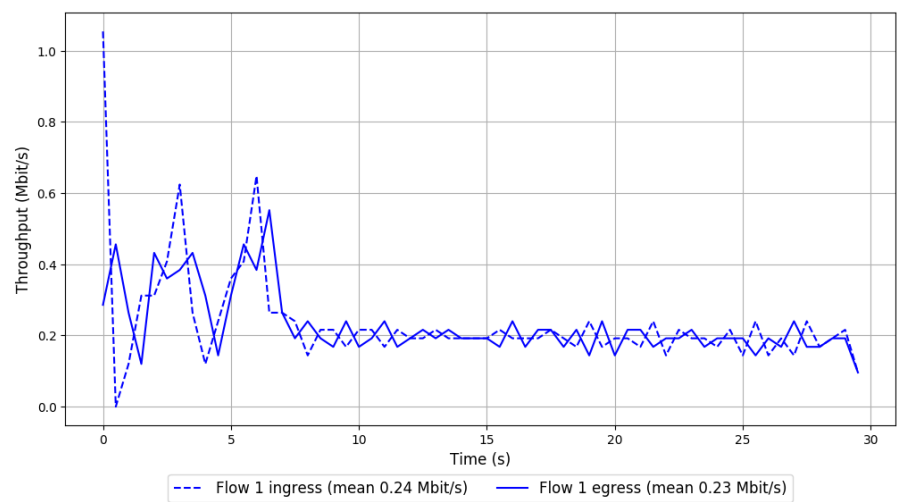


Run 3: Statistics of Indigo-1-32

Start at: 2018-02-19 17:09:28
End at: 2018-02-19 17:09:58
Local clock offset: -15.685 ms
Remote clock offset: -3.531 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 456.236 ms
Loss rate: 1.88%
-- Flow 1:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 456.236 ms
Loss rate: 1.88%

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



Run 1: Statistics of Vivace-latency

Start at: 2018-02-19 16:16:51

End at: 2018-02-19 16:17:21

Local clock offset: -6.63 ms

Remote clock offset: 0.735 ms

Below is generated by plot.py at 2018-02-19 18:21:22

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 22421.390 ms

Loss rate: 71.82%

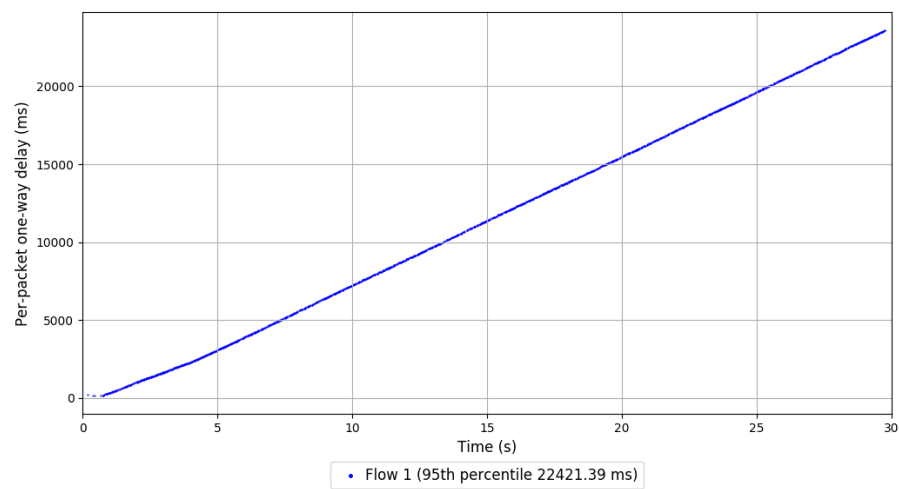
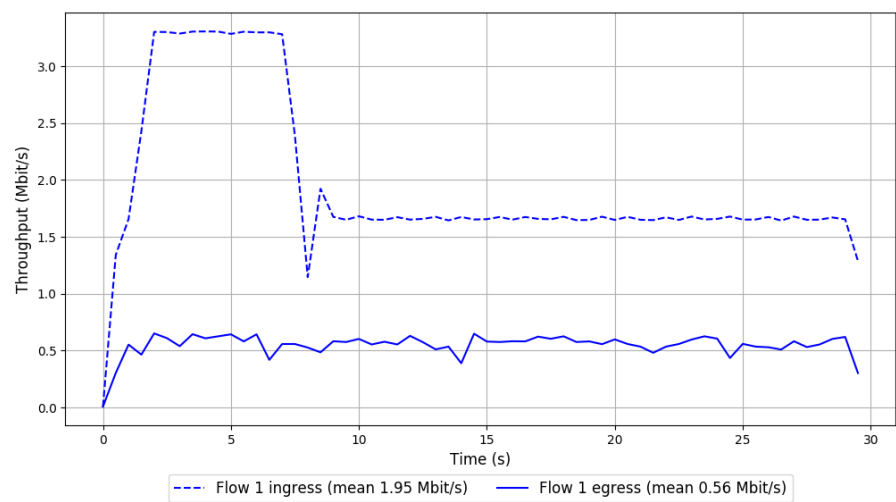
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 22421.390 ms

Loss rate: 71.82%

Run 1: Report of Vivace-latency — Data Link

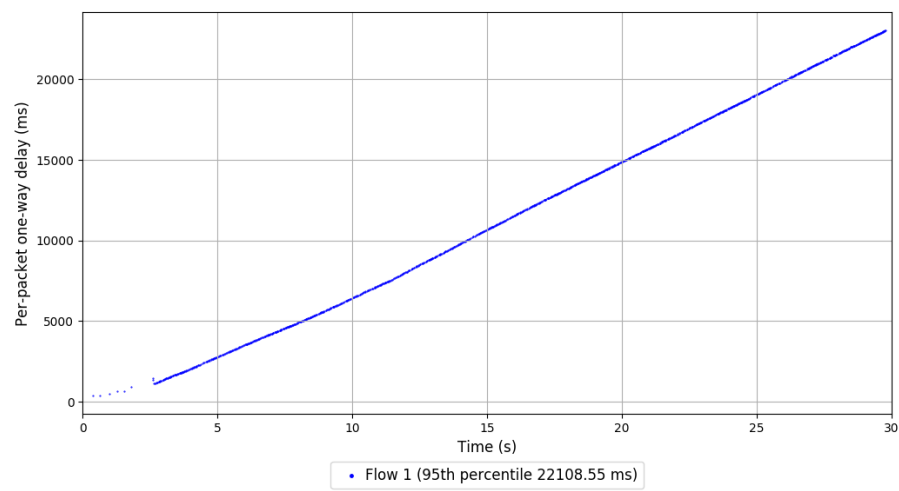
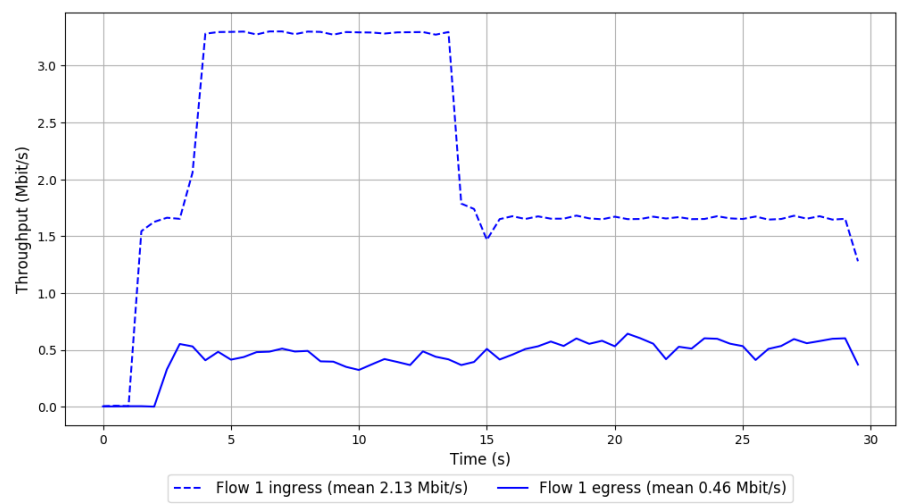


Run 2: Statistics of Vivace-latency

Start at: 2018-02-19 16:38:04
End at: 2018-02-19 16:38:34
Local clock offset: -12.132 ms
Remote clock offset: -4.651 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 22108.553 ms
Loss rate: 78.91%
-- Flow 1:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 22108.553 ms
Loss rate: 78.91%

Run 2: Report of Vivace-latency — Data Link

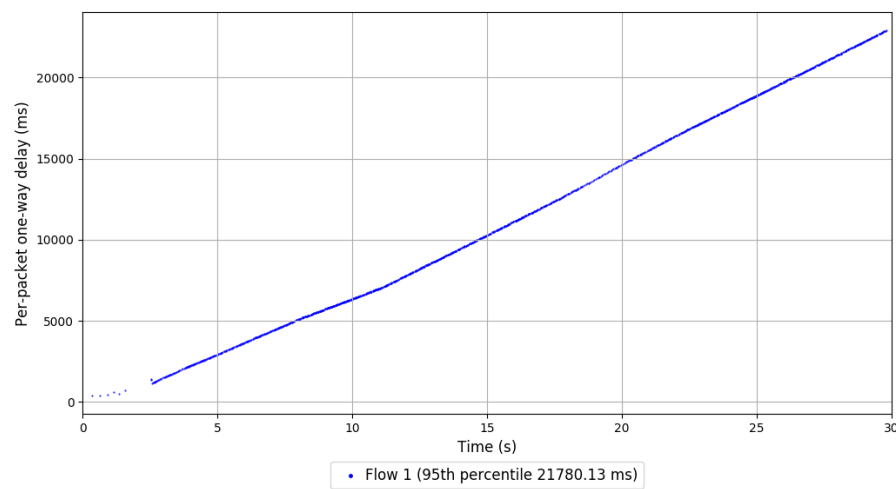
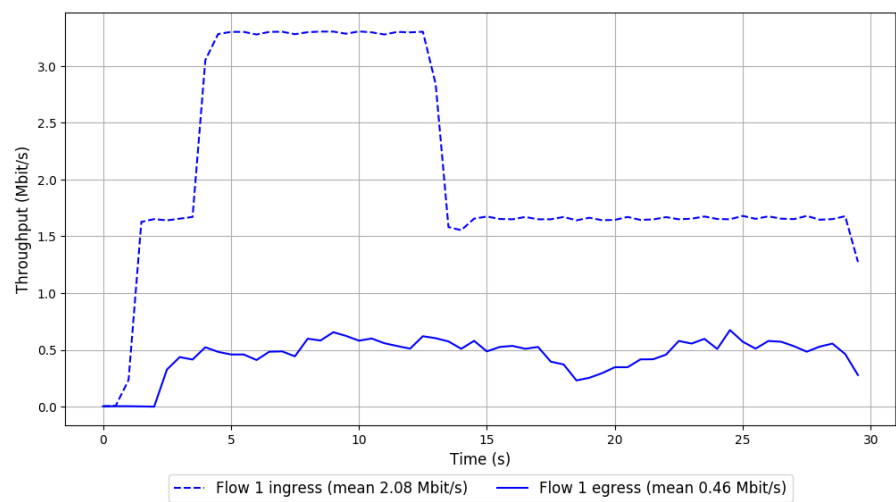


Run 3: Statistics of Vivace-latency

Start at: 2018-02-19 16:59:50
End at: 2018-02-19 17:00:20
Local clock offset: -13.365 ms
Remote clock offset: -4.318 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 21780.130 ms
Loss rate: 78.18%
-- Flow 1:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 21780.130 ms
Loss rate: 78.18%

Run 3: Report of Vivace-latency — Data Link

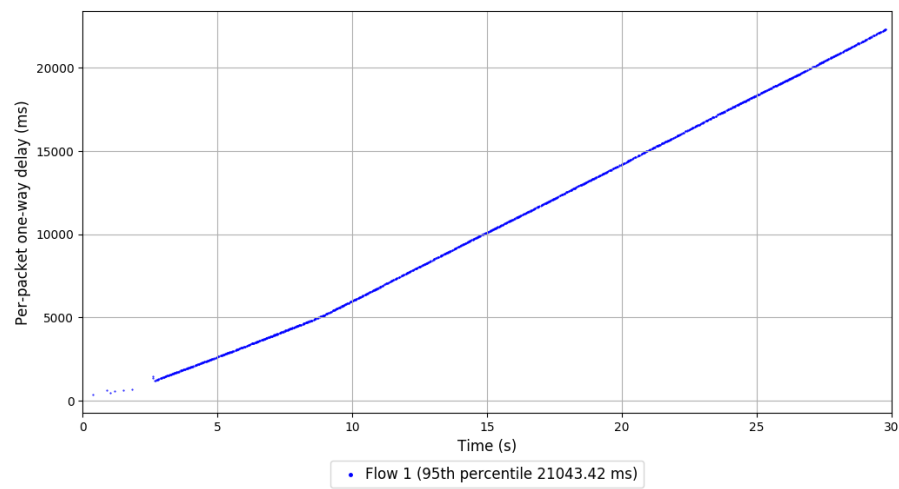
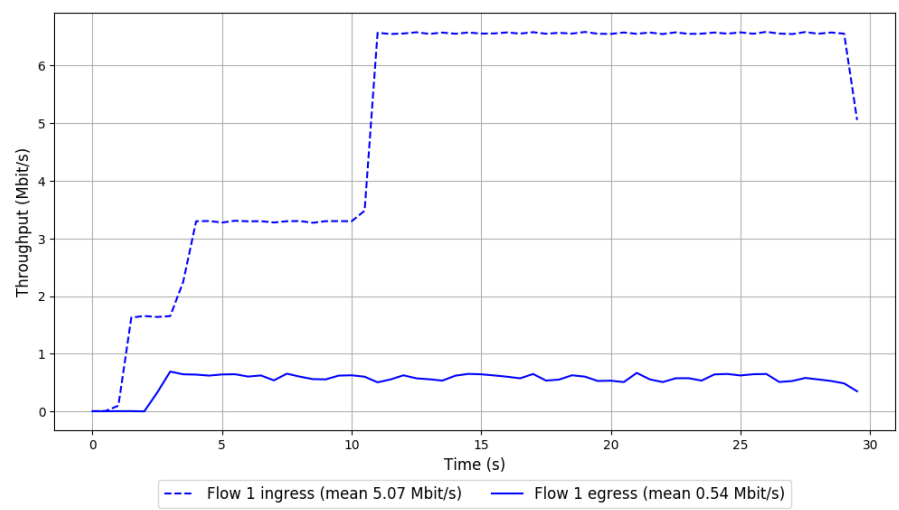


Run 1: Statistics of Vivace-loss

Start at: 2018-02-19 16:25:07
End at: 2018-02-19 16:25:37
Local clock offset: -10.807 ms
Remote clock offset: -4.873 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 21043.423 ms
Loss rate: 89.46%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 21043.423 ms
Loss rate: 89.46%

Run 1: Report of Vivace-loss — Data Link

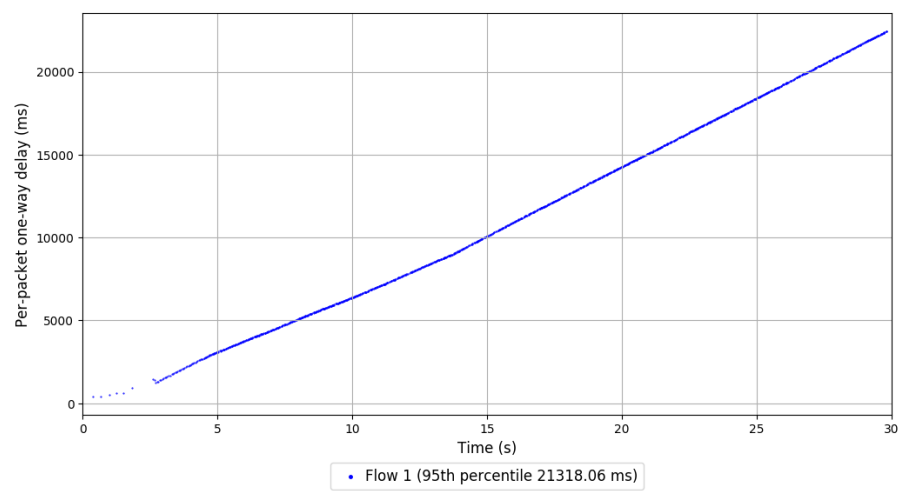
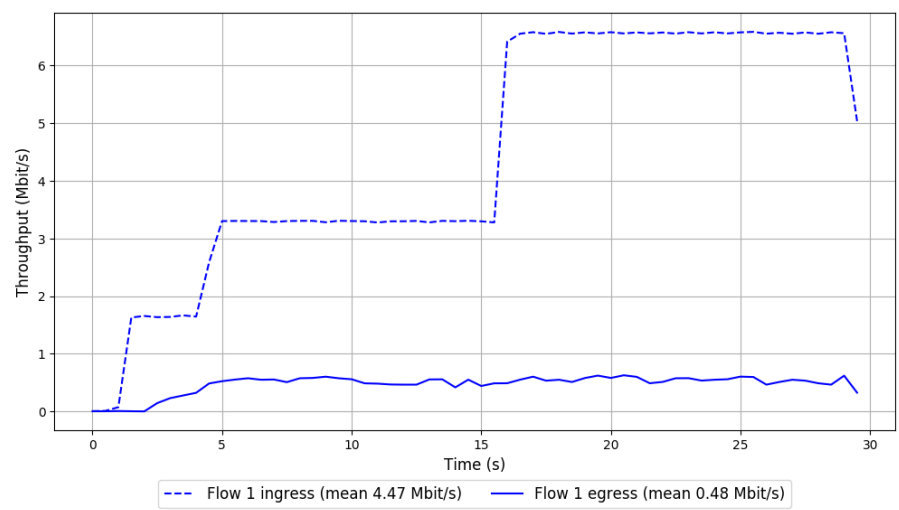


Run 2: Statistics of Vivace-loss

Start at: 2018-02-19 16:46:45
End at: 2018-02-19 16:47:15
Local clock offset: -12.905 ms
Remote clock offset: -3.646 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 21318.056 ms
Loss rate: 89.47%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 21318.056 ms
Loss rate: 89.47%

Run 2: Report of Vivace-loss — Data Link

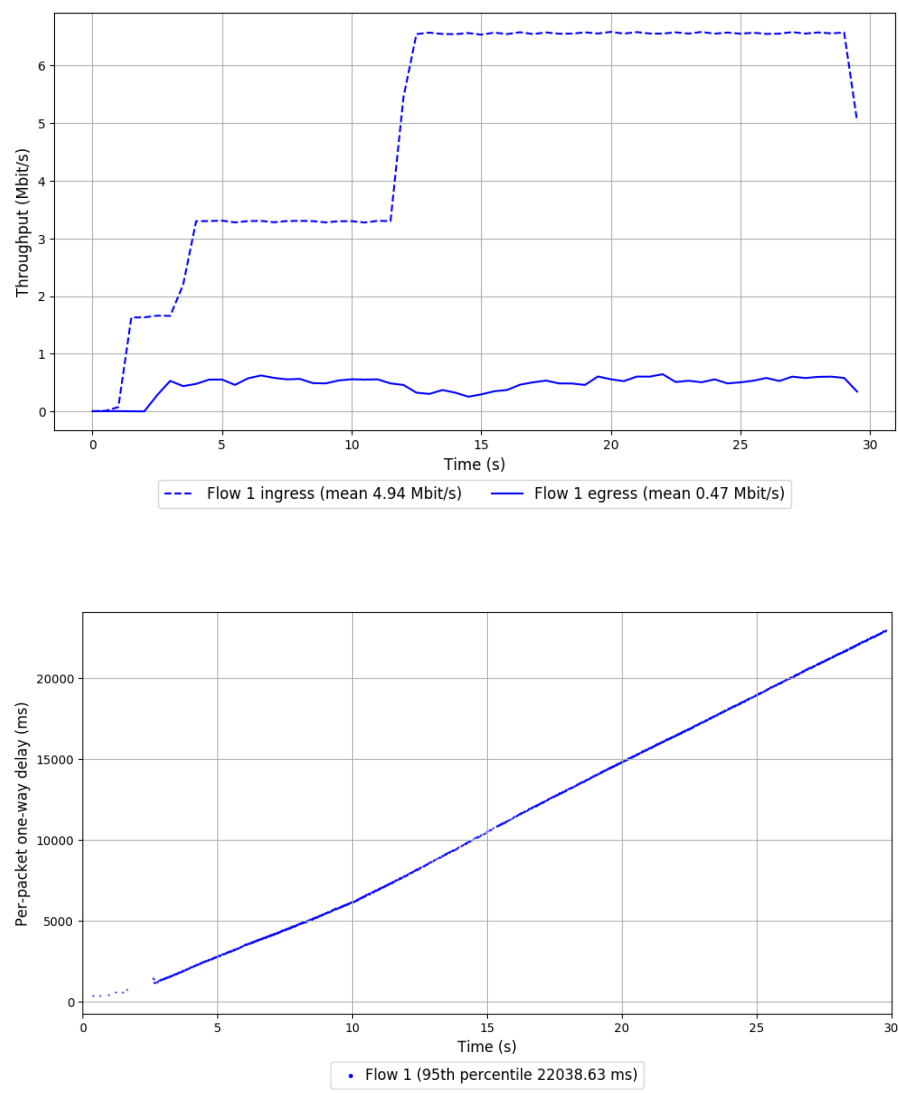


Run 3: Statistics of Vivace-loss

Start at: 2018-02-19 17:08:10
End at: 2018-02-19 17:08:40
Local clock offset: -15.354 ms
Remote clock offset: 2.285 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 22038.634 ms
Loss rate: 90.72%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 22038.634 ms
Loss rate: 90.72%

Run 3: Report of Vivace-loss — Data Link

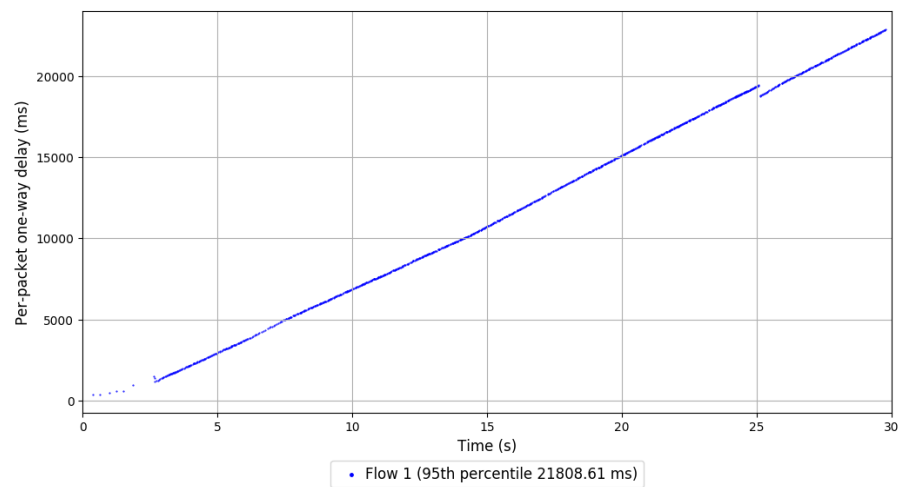
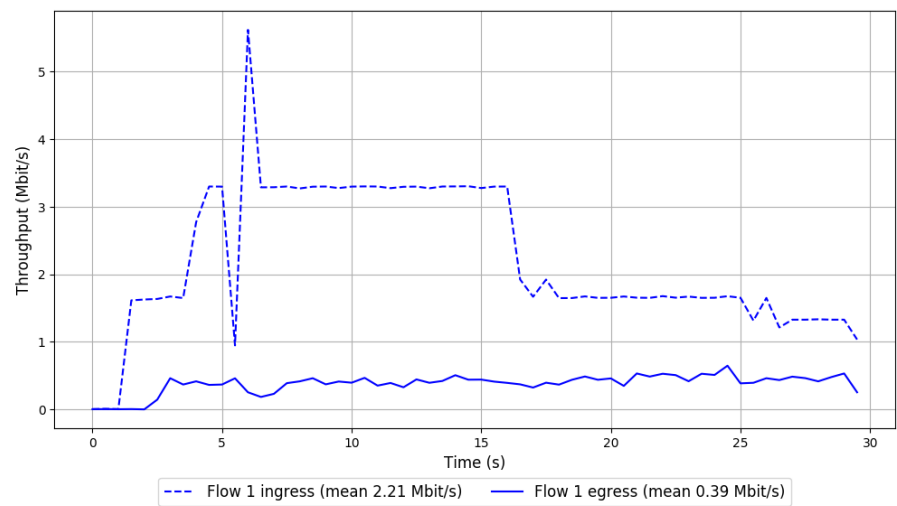


Run 1: Statistics of Vivace-LTE

Start at: 2018-02-19 16:32:10
End at: 2018-02-19 16:32:40
Local clock offset: -10.396 ms
Remote clock offset: 0.8 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 21808.613 ms
Loss rate: 82.79%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 21808.613 ms
Loss rate: 82.79%

Run 1: Report of Vivace-LTE — Data Link

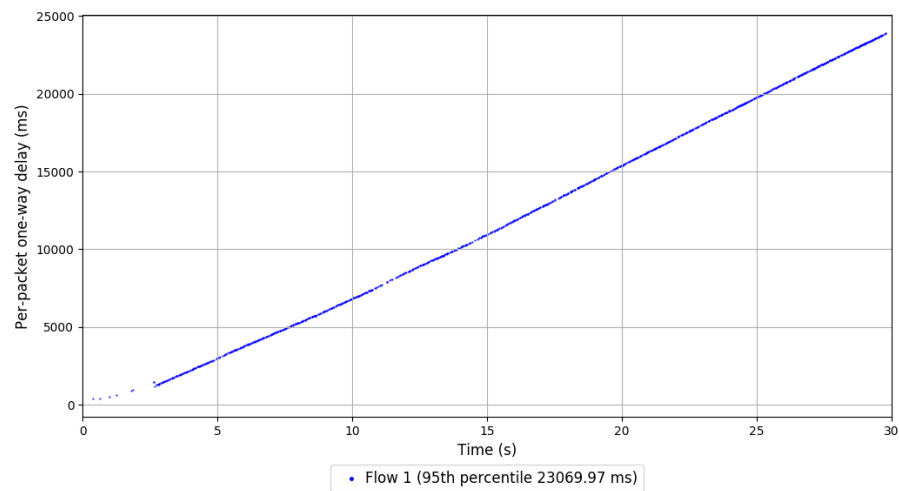
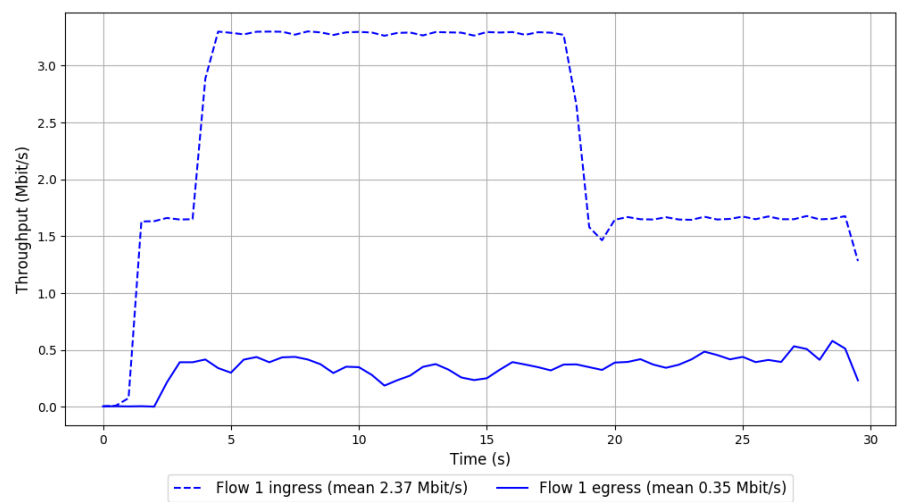


Run 2: Statistics of Vivace-LTE

Start at: 2018-02-19 16:53:54
End at: 2018-02-19 16:54:24
Local clock offset: -12.436 ms
Remote clock offset: -3.56 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 23069.973 ms
Loss rate: 85.64%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 23069.973 ms
Loss rate: 85.64%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-02-19 17:15:21
End at: 2018-02-19 17:15:51
Local clock offset: -17.547 ms
Remote clock offset: -3.585 ms

Below is generated by plot.py at 2018-02-19 18:21:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 21122.699 ms
Loss rate: 72.01%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 21122.699 ms
Loss rate: 72.01%

Run 3: Report of Vivace-LTE — Data Link

