

Pantheon Report

Generated at 2018-02-01 13:41:18 (UTC).

Data path: India ppp0 (*remote*) → AWS India 1 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).

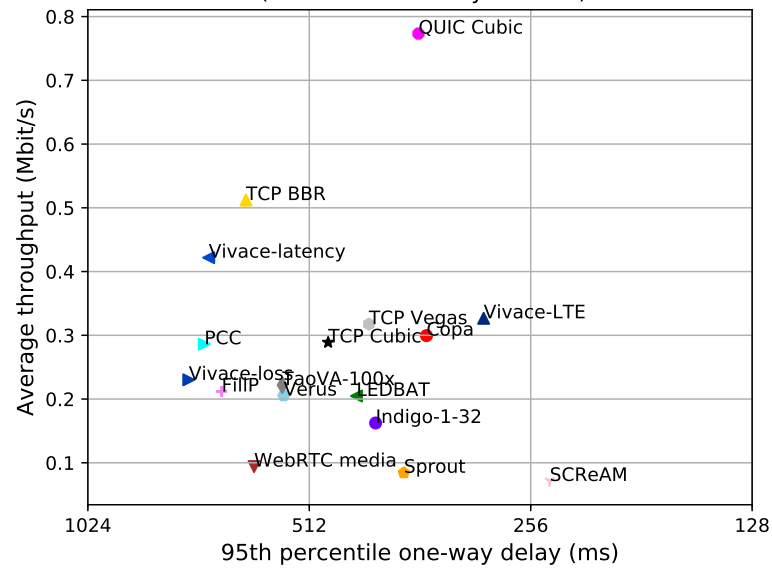
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

NTP offsets were measured against **nets.org.sg** and have been applied to correct the timestamps in logs.

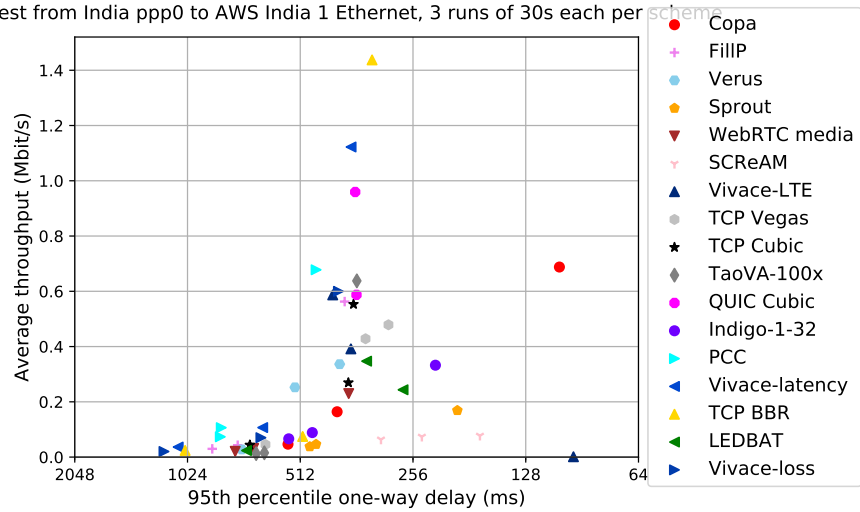
Git summary:

```
branch: master @ 70217998b3c9a7166a95460a70c0854d1326e100
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ fb9c9ab842e5614ad52911a76fb9bd1c1b0dca86
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
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-quick @ 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 India ppp0 to AWS India 1 Ethernet, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from India ppp0 to AWS India 1 Ethernet, 3 runs of 30s each per



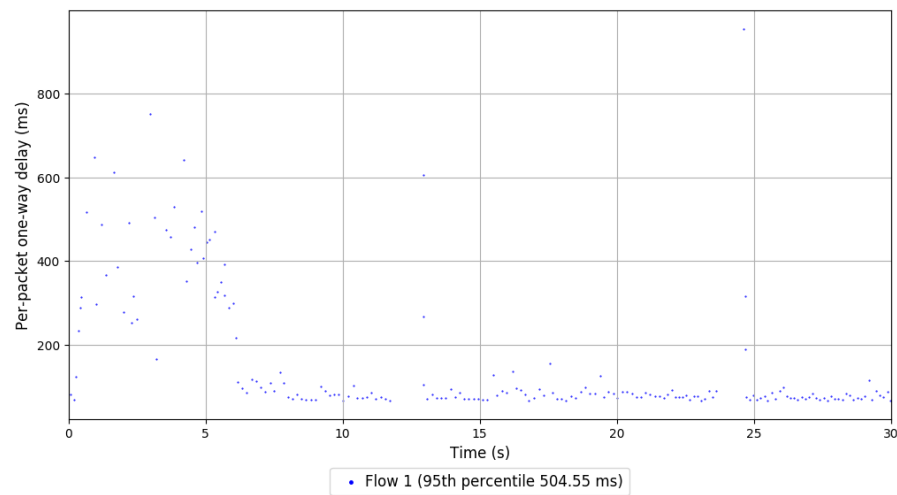
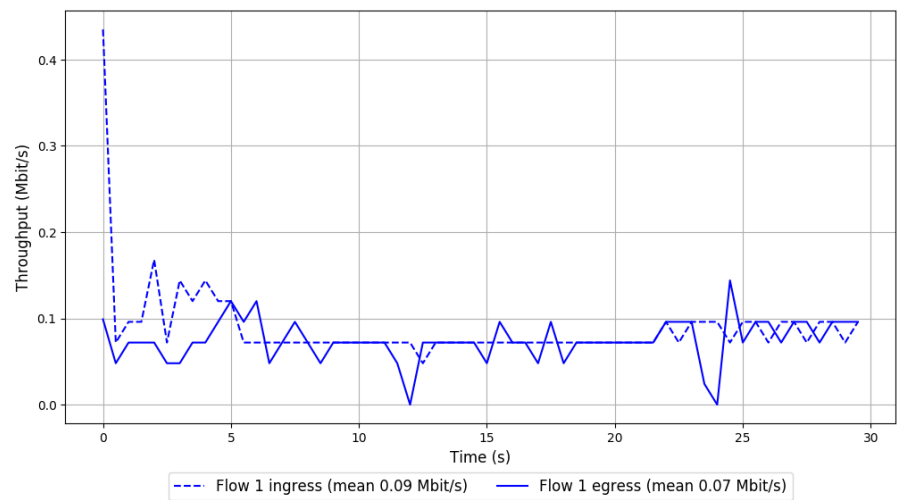
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	0.51	624.30	20.57
TCP Cubic	3	0.29	482.64	15.18
LEDBAT	3	0.20	441.75	12.23
PCC	3	0.29	711.07	92.00
QUIC Cubic	2	0.77	363.77	14.54
SCReAM	3	0.07	241.25	1.05
WebRTC media	3	0.09	608.60	40.68
Sprout	3	0.09	380.79	18.80
TaoVA-100x	3	0.22	557.12	75.18
TCP Vegas	3	0.32	424.83	9.61
Verus	3	0.21	554.75	41.64
Copa	3	0.30	354.77	40.44
FillP	3	0.21	673.73	77.93
Indigo-1-32	3	0.16	416.01	28.42
Vivace-latency	3	0.42	701.48	67.62
Vivace-loss	3	0.23	746.61	82.86
Vivace-LTE	3	0.33	296.63	42.90

Run 1: Statistics of TCP BBR

Start at: 2018-02-01 11:46:17
End at: 2018-02-01 11:46:47
Local clock offset: 2.338 ms
Remote clock offset: -4.454 ms

Below is generated by plot.py at 2018-02-01 13:40:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 504.554 ms
Loss rate: 16.58%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 504.554 ms
Loss rate: 16.58%

Run 1: Report of TCP BBR — Data Link

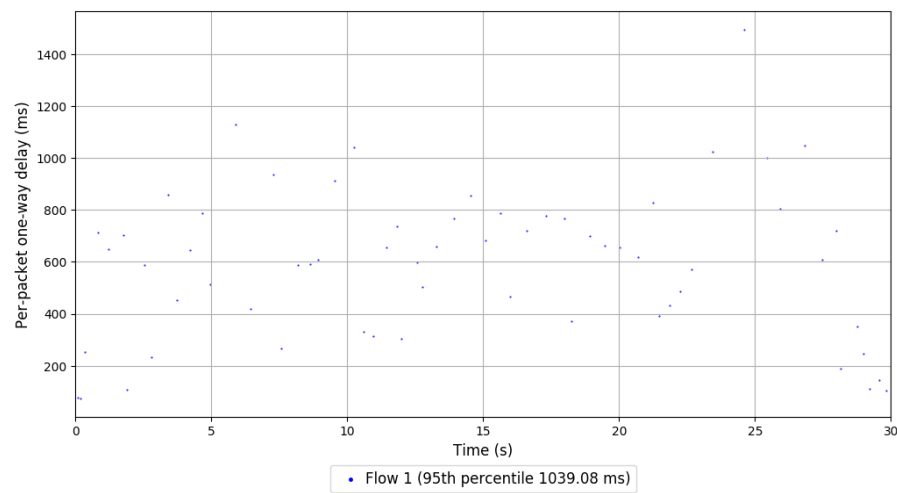
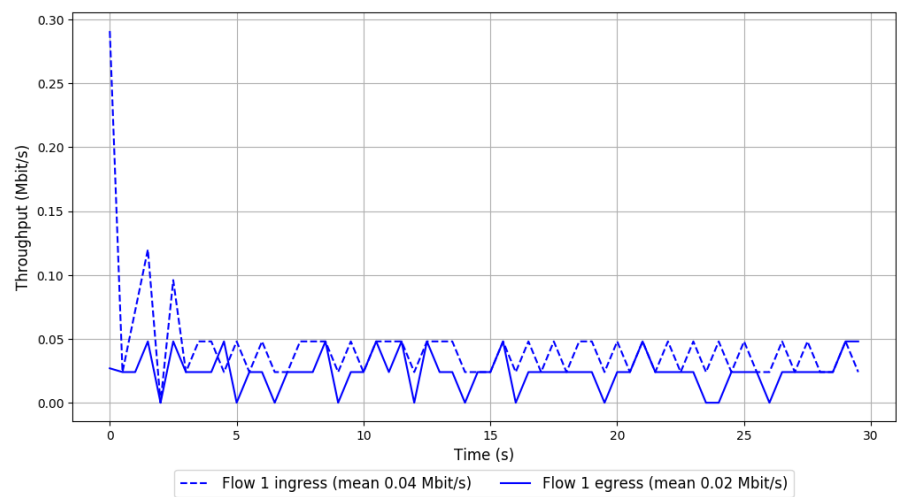


Run 2: Statistics of TCP BBR

Start at: 2018-02-01 12:07:09
End at: 2018-02-01 12:07:39
Local clock offset: 3.03 ms
Remote clock offset: -12.934 ms

Below is generated by plot.py at 2018-02-01 13:40:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1039.084 ms
Loss rate: 43.87%
-- Flow 1:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1039.084 ms
Loss rate: 43.87%

Run 2: Report of TCP BBR — Data Link

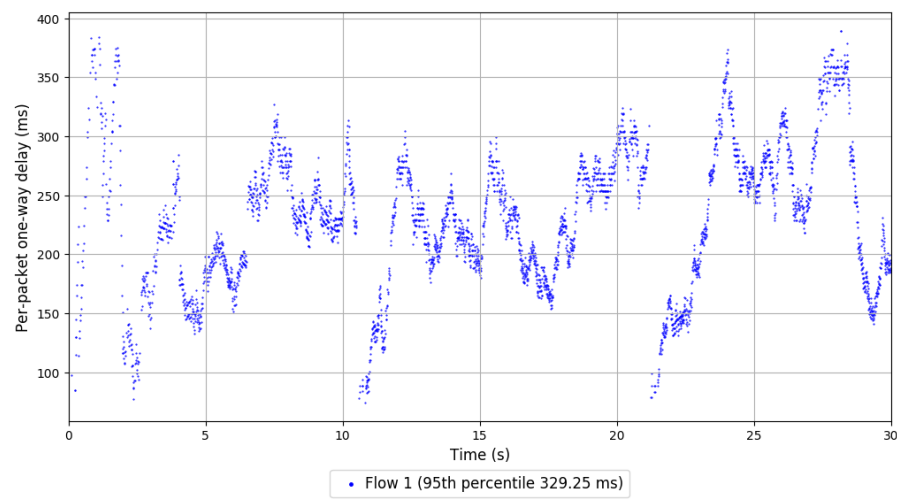
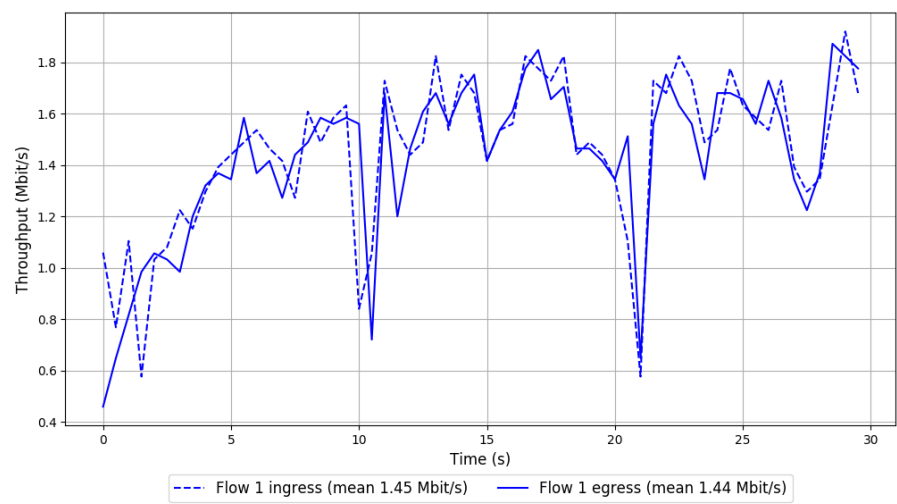


Run 3: Statistics of TCP BBR

Start at: 2018-02-01 12:28:18
End at: 2018-02-01 12:28:48
Local clock offset: 4.008 ms
Remote clock offset: -18.29 ms

Below is generated by plot.py at 2018-02-01 13:40:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 329.255 ms
Loss rate: 1.27%
-- Flow 1:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 329.255 ms
Loss rate: 1.27%

Run 3: Report of TCP BBR — Data Link

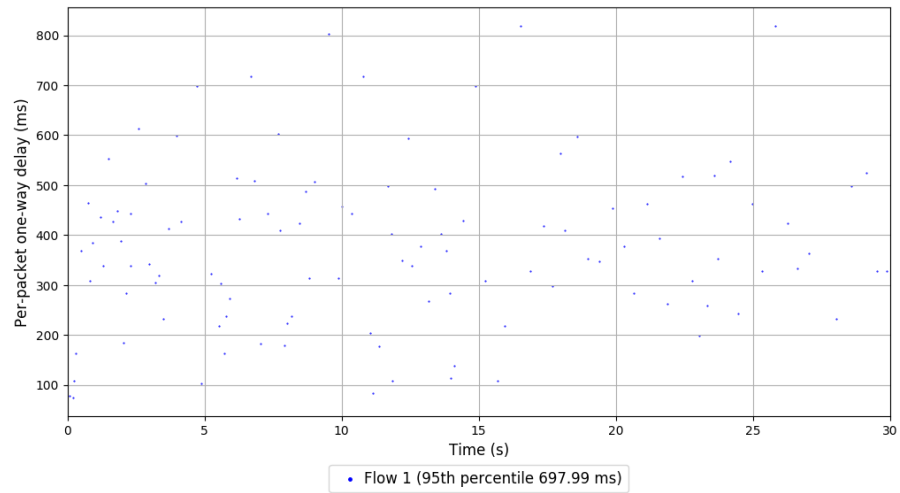
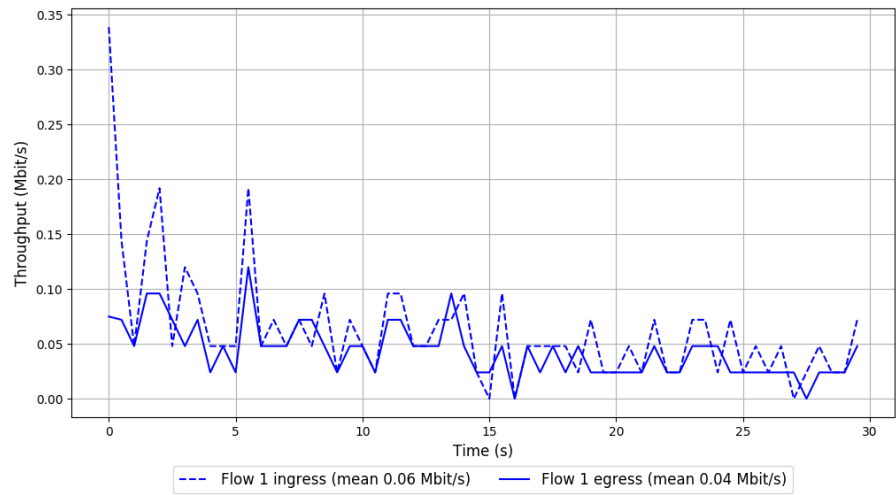


Run 1: Statistics of TCP Cubic

Start at: 2018-02-01 11:52:51
End at: 2018-02-01 11:53:21
Local clock offset: 1.221 ms
Remote clock offset: -2.392 ms

Below is generated by plot.py at 2018-02-01 13:40:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 697.994 ms
Loss rate: 30.55%
-- Flow 1:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 697.994 ms
Loss rate: 30.55%

Run 1: Report of TCP Cubic — Data Link

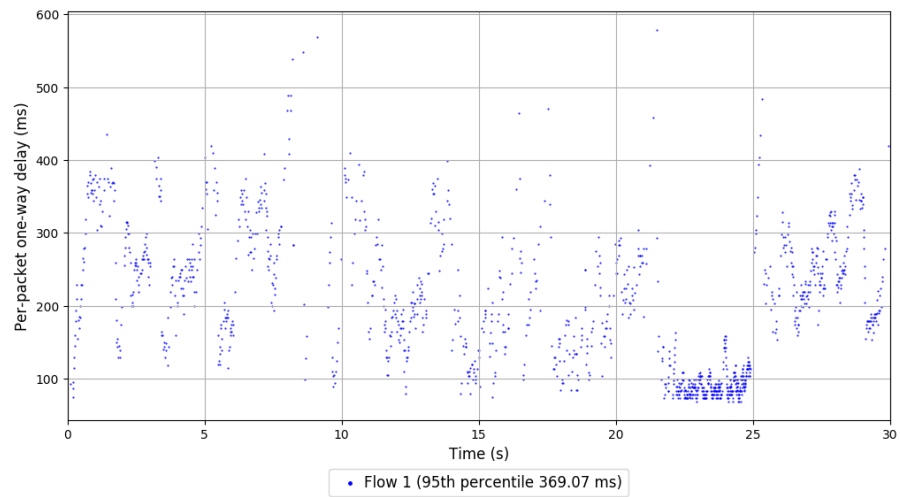
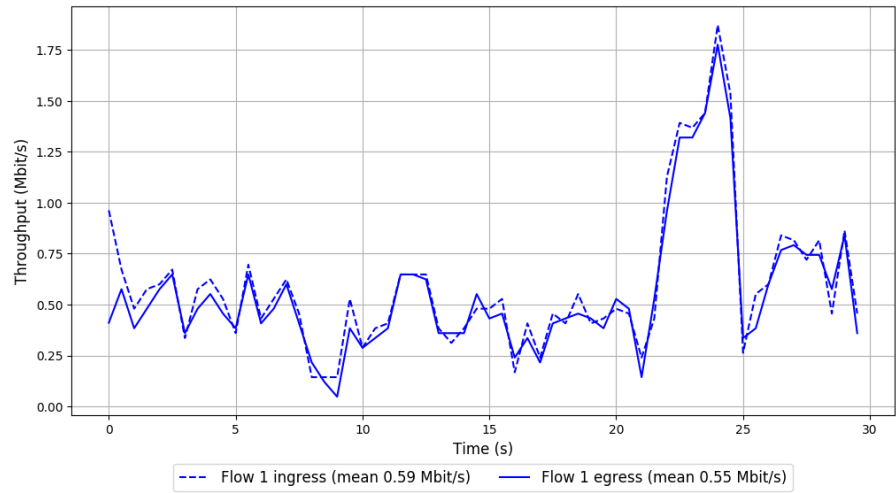


Run 2: Statistics of TCP Cubic

Start at: 2018-02-01 12:13:44
End at: 2018-02-01 12:14:14
Local clock offset: 2.054 ms
Remote clock offset: -16.85 ms

Below is generated by plot.py at 2018-02-01 13:40:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 369.067 ms
Loss rate: 6.90%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 369.067 ms
Loss rate: 6.90%

Run 2: Report of TCP Cubic — Data Link

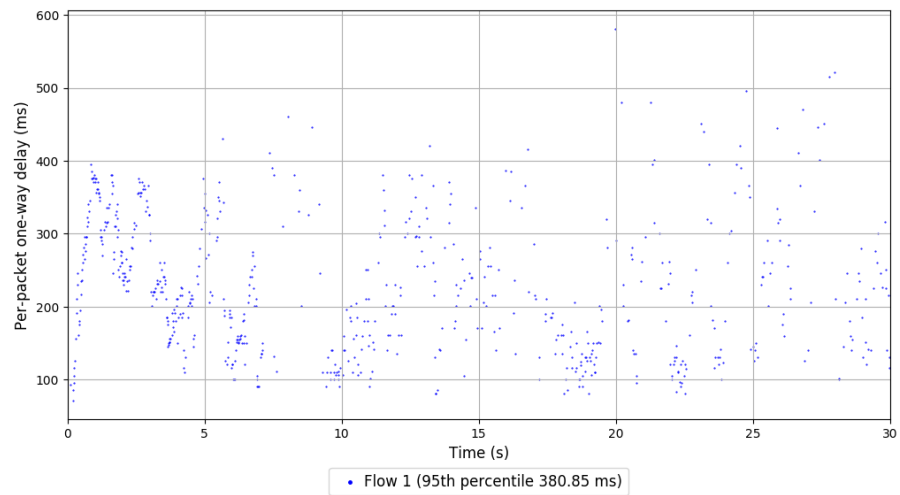
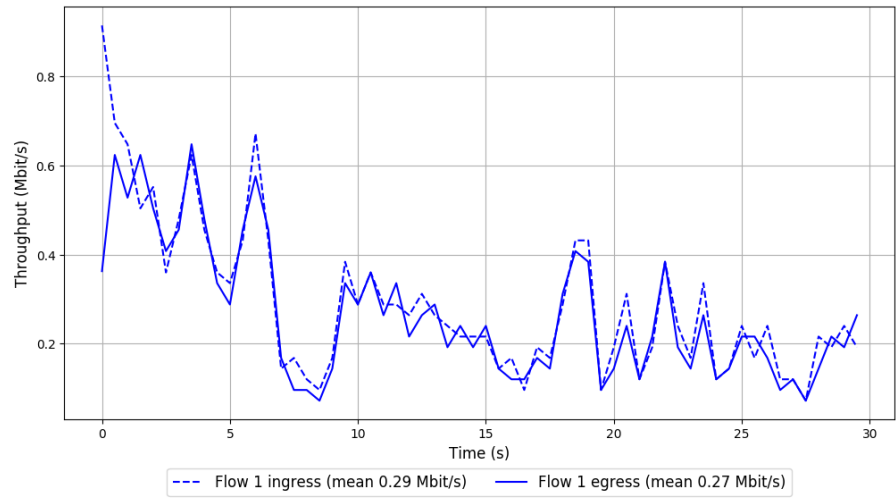


Run 3: Statistics of TCP Cubic

Start at: 2018-02-01 12:35:08
End at: 2018-02-01 12:35:38
Local clock offset: 1.944 ms
Remote clock offset: -18.755 ms

Below is generated by plot.py at 2018-02-01 13:40:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 380.852 ms
Loss rate: 8.08%
-- Flow 1:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 380.852 ms
Loss rate: 8.08%

Run 3: Report of TCP Cubic — Data Link

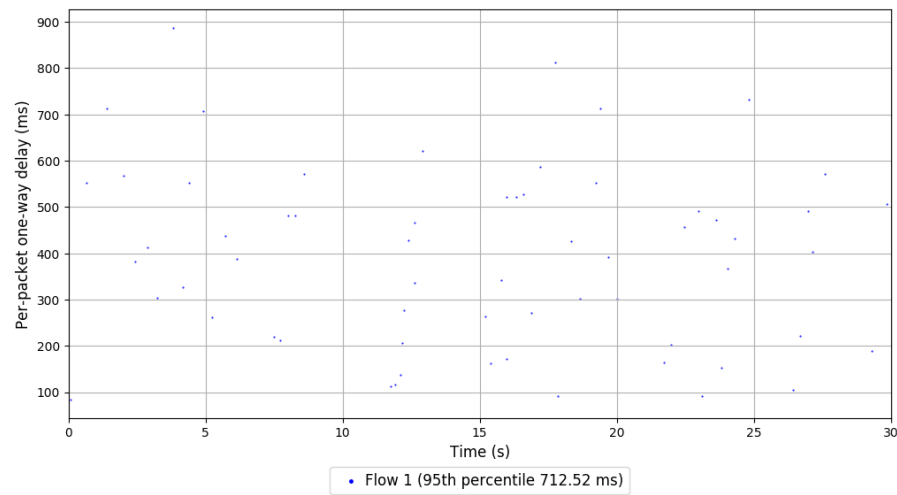
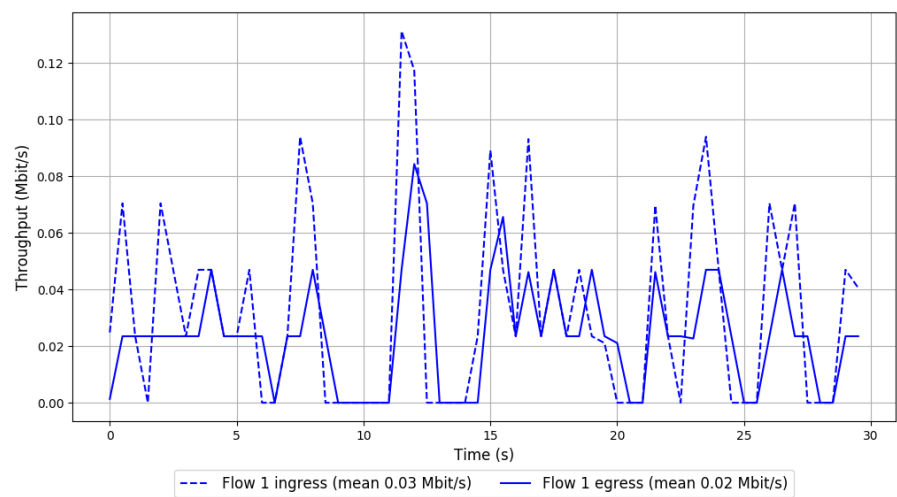


```
Run 1: Statistics of LEDBAT

Start at: 2018-02-01 11:42:55
End at: 2018-02-01 11:43:25
Local clock offset: 1.607 ms
Remote clock offset: -4.24 ms

# Below is generated by plot.py at 2018-02-01 13:40:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 712.520 ms
Loss rate: 26.51%
-- Flow 1:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 712.520 ms
Loss rate: 26.51%
```


Run 1: Report of LEDBAT — Data Link

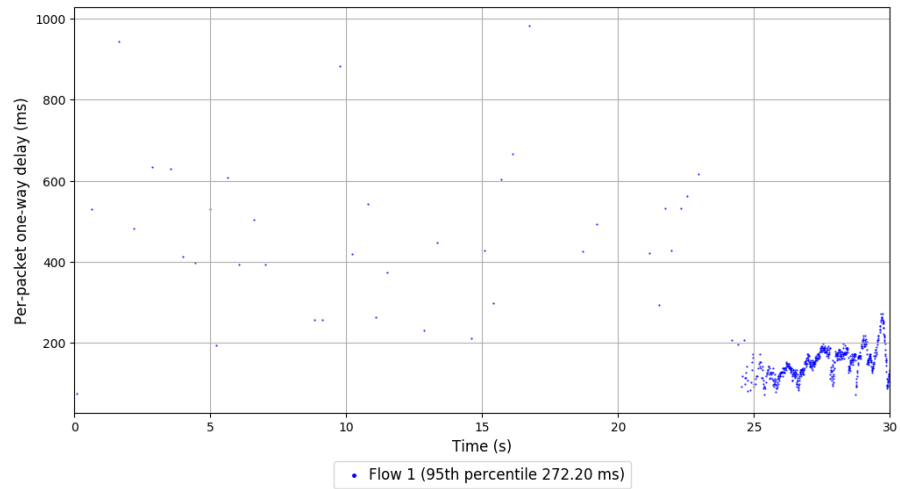
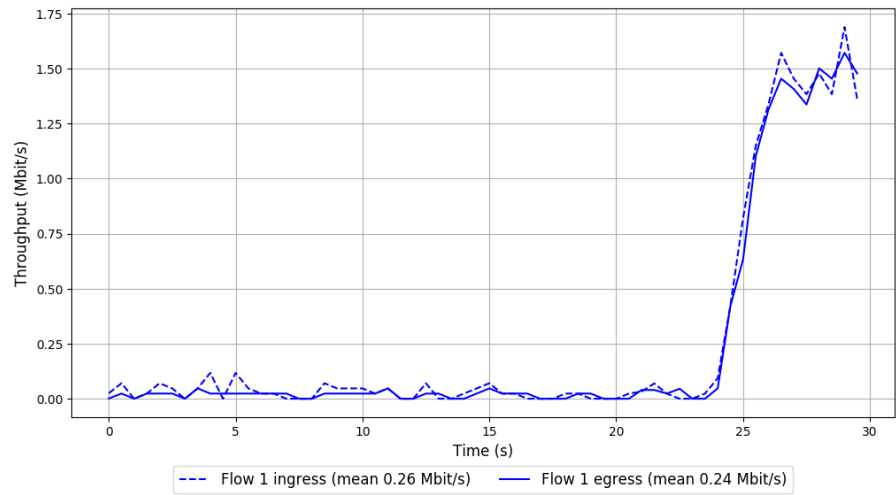


Run 2: Statistics of LEDBAT

Start at: 2018-02-01 12:03:51
End at: 2018-02-01 12:04:22
Local clock offset: 1.395 ms
Remote clock offset: -11.62 ms

Below is generated by plot.py at 2018-02-01 13:40:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 272.196 ms
Loss rate: 6.05%
-- Flow 1:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 272.196 ms
Loss rate: 6.05%

Run 2: Report of LEDBAT — Data Link

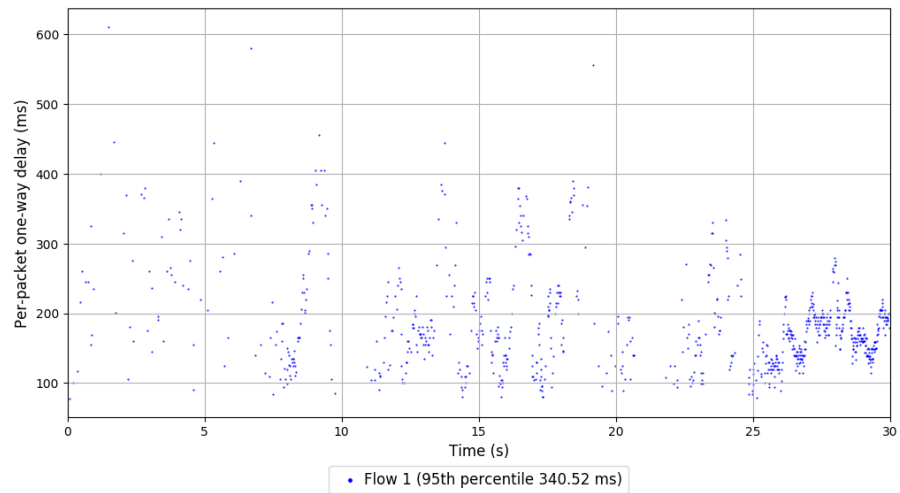
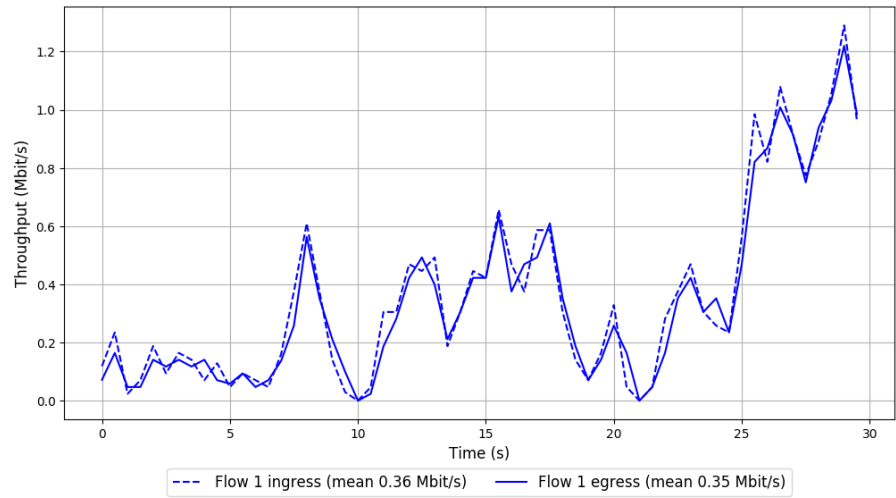


Run 3: Statistics of LEDBAT

Start at: 2018-02-01 12:25:01
End at: 2018-02-01 12:25:31
Local clock offset: 2.06 ms
Remote clock offset: -18.118 ms

Below is generated by plot.py at 2018-02-01 13:40:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 340.523 ms
Loss rate: 4.12%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 340.523 ms
Loss rate: 4.12%

Run 3: Report of LEDBAT — Data Link

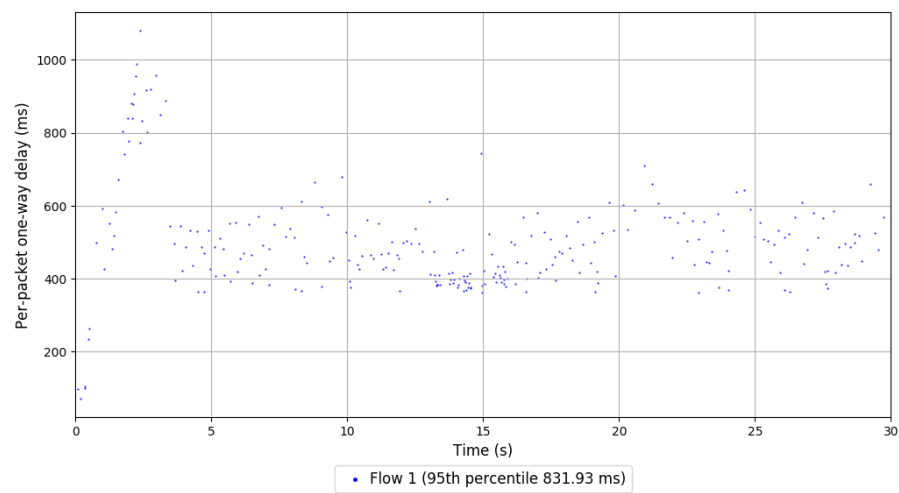
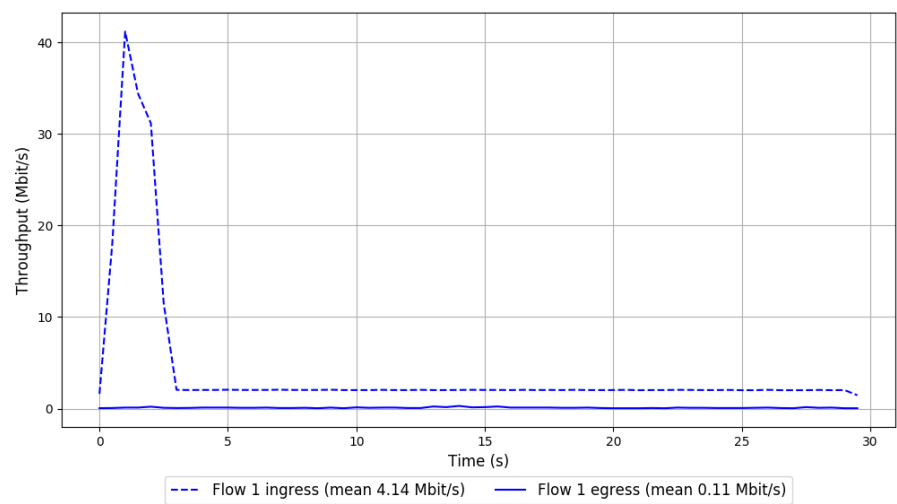


Run 1: Statistics of PCC

Start at: 2018-02-01 11:55:03
End at: 2018-02-01 11:55:33
Local clock offset: 1.635 ms
Remote clock offset: -2.945 ms

Below is generated by plot.py at 2018-02-01 13:40:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 831.927 ms
Loss rate: 97.44%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 831.927 ms
Loss rate: 97.44%

Run 1: Report of PCC — Data Link

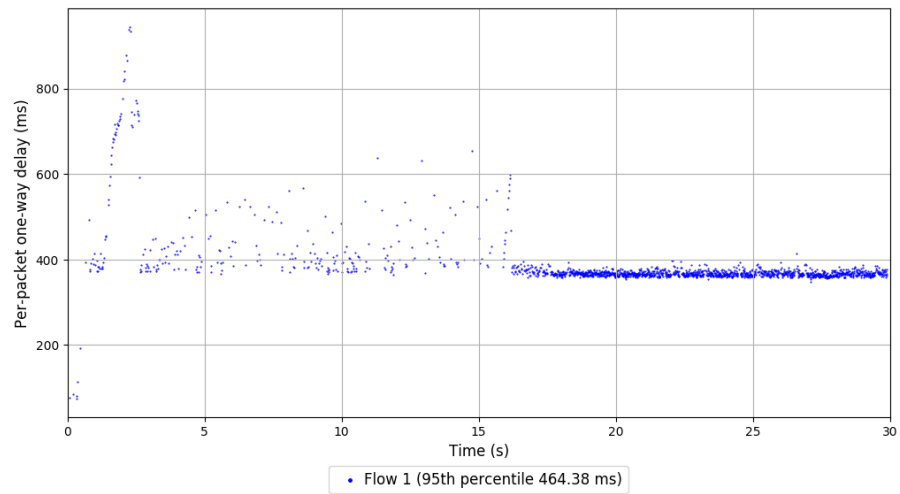
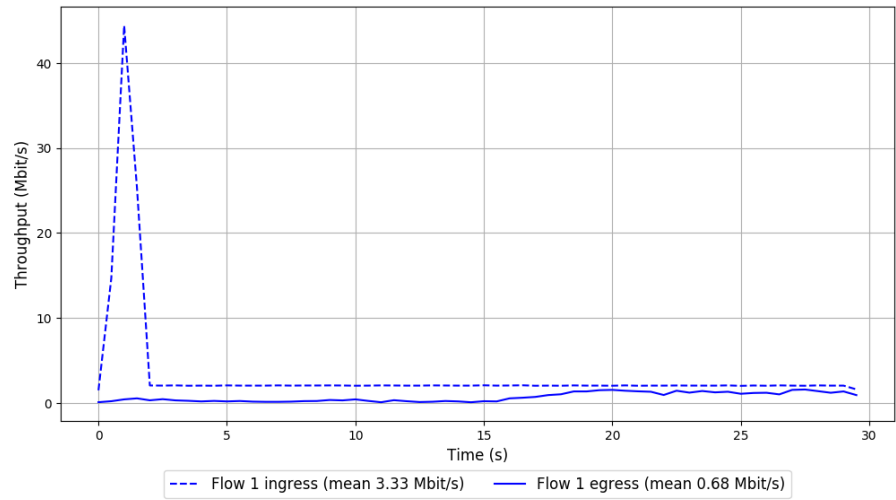


Run 2: Statistics of PCC

Start at: 2018-02-01 12:15:56
End at: 2018-02-01 12:16:26
Local clock offset: 4.054 ms
Remote clock offset: -16.499 ms

Below is generated by plot.py at 2018-02-01 13:40:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 464.385 ms
Loss rate: 79.71%
-- Flow 1:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 464.385 ms
Loss rate: 79.71%

Run 2: Report of PCC — Data Link

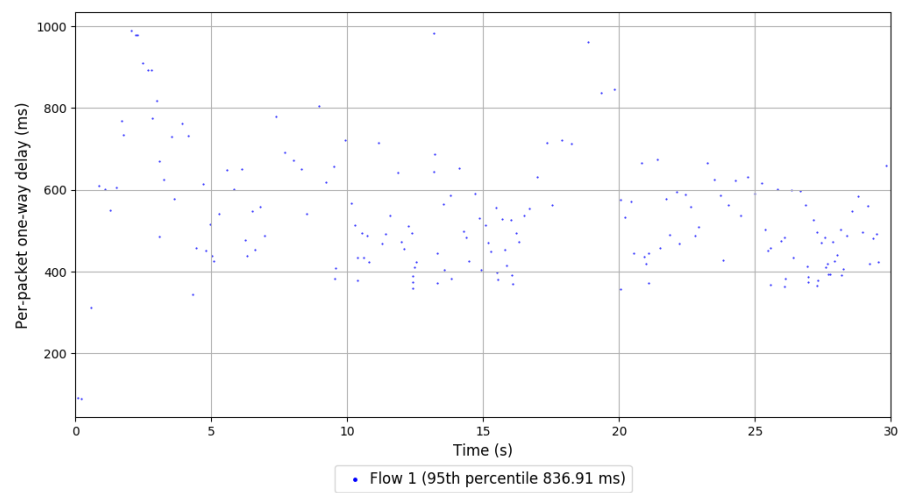
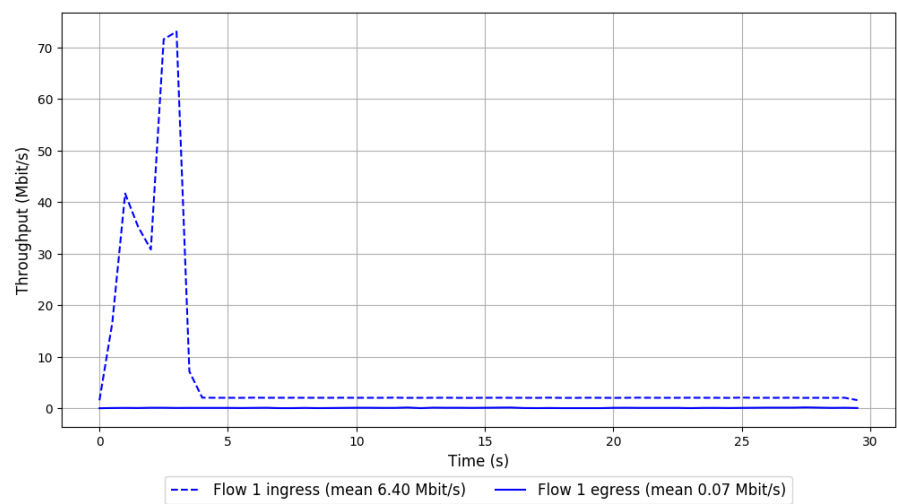


Run 3: Statistics of PCC

Start at: 2018-02-01 12:37:19
End at: 2018-02-01 12:37:49
Local clock offset: 2.288 ms
Remote clock offset: -16.895 ms

Below is generated by plot.py at 2018-02-01 13:40:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 836.913 ms
Loss rate: 98.86%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 836.913 ms
Loss rate: 98.86%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

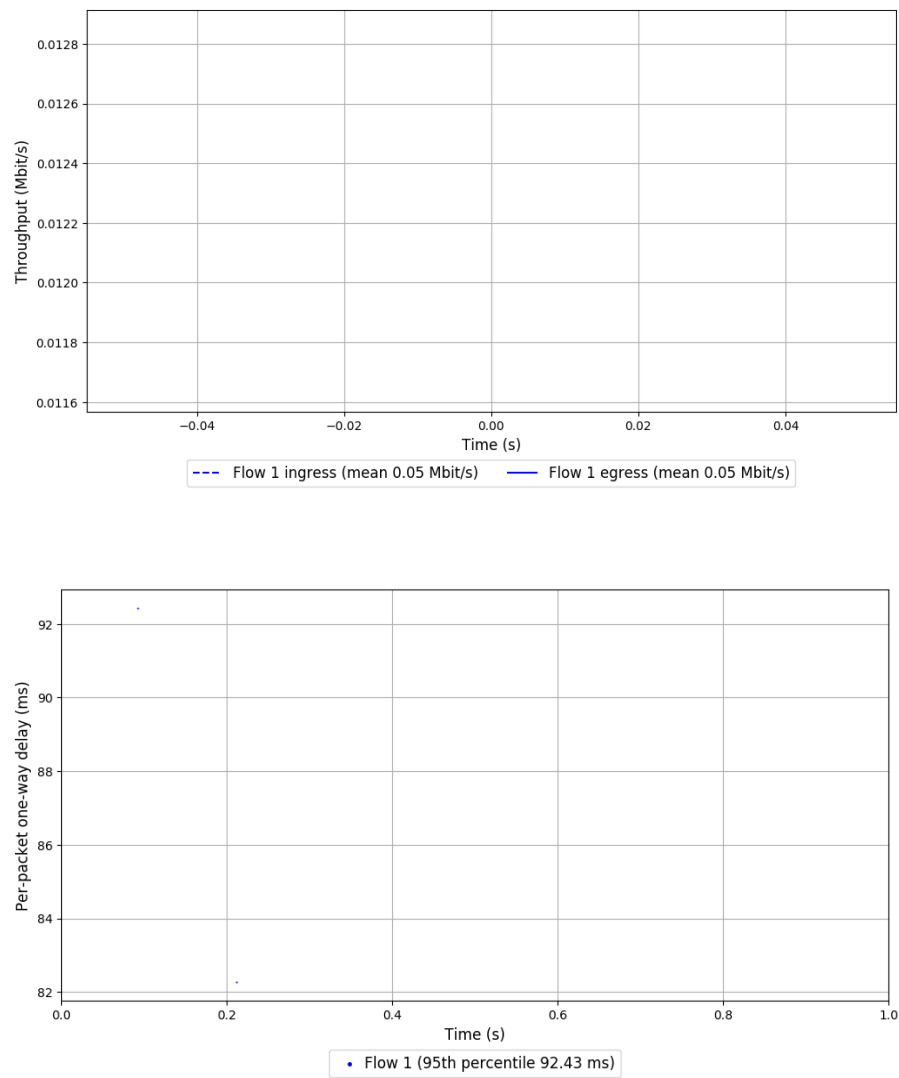
Start at: 2018-02-01 11:38:31

End at: 2018-02-01 11:39:01

Local clock offset: 2.512 ms

Remote clock offset: -5.426 ms

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-02-01 11:59:27

End at: 2018-02-01 11:59:57

Local clock offset: 2.269 ms

Remote clock offset: -6.903 ms

Below is generated by plot.py at 2018-02-01 13:40:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 362.338 ms

Loss rate: 19.17%

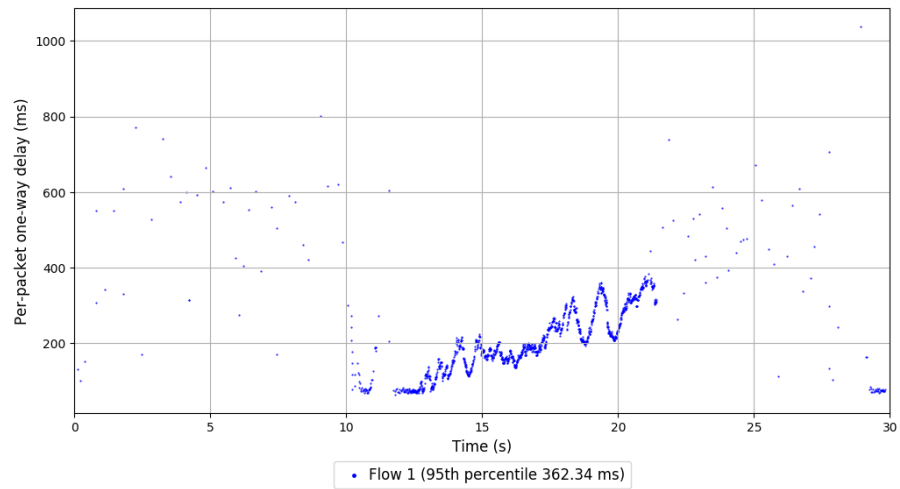
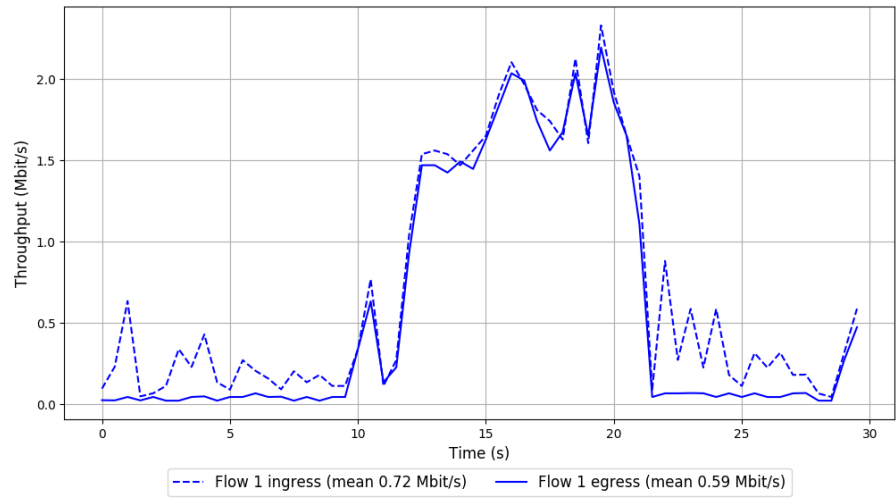
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 362.338 ms

Loss rate: 19.17%

Run 2: Report of QUIC Cubic — Data Link

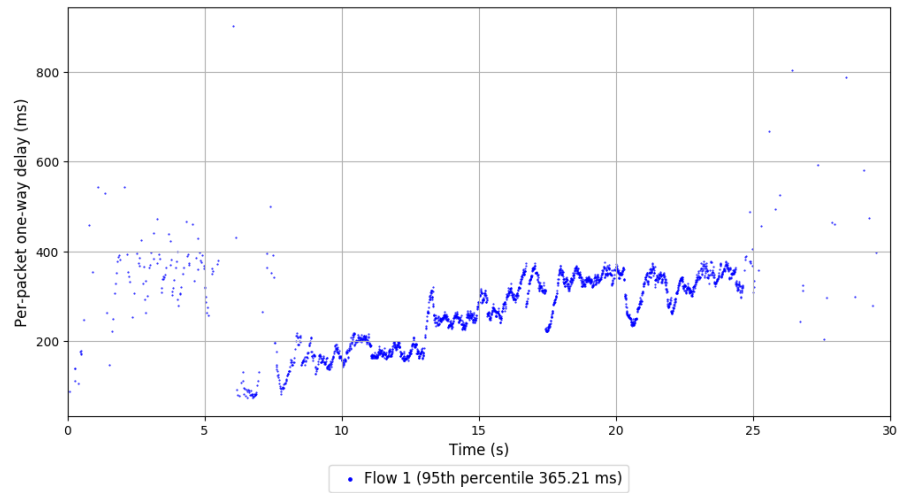
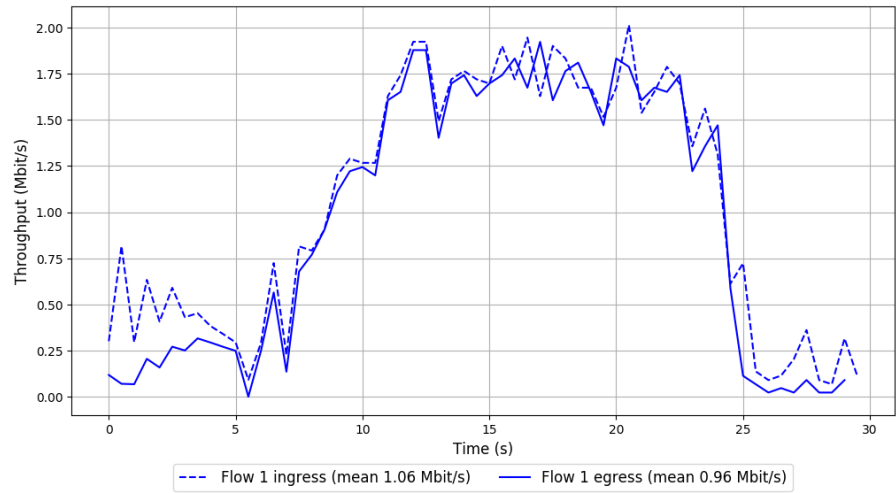


Run 3: Statistics of QUIC Cubic

Start at: 2018-02-01 12:20:20
End at: 2018-02-01 12:20:50
Local clock offset: 4.131 ms
Remote clock offset: -18.218 ms

Below is generated by plot.py at 2018-02-01 13:40:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 365.210 ms
Loss rate: 9.90%
-- Flow 1:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 365.210 ms
Loss rate: 9.90%

Run 3: Report of QUIC Cubic — Data Link

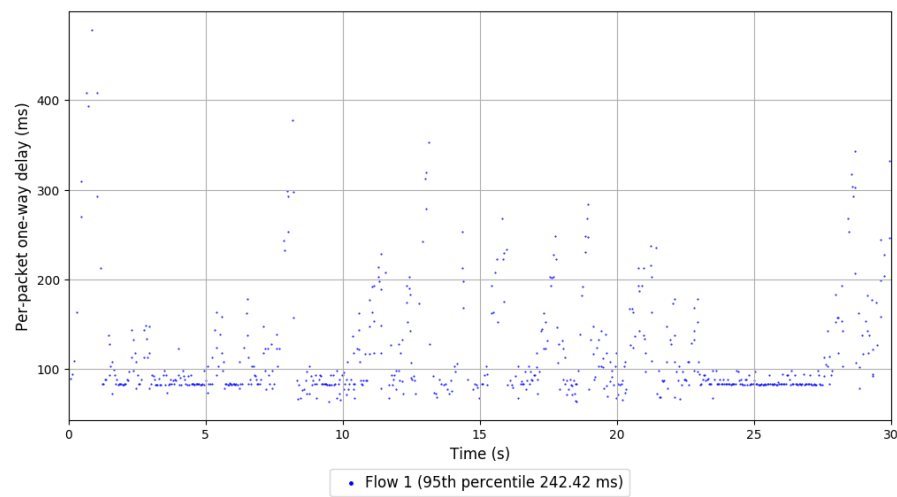
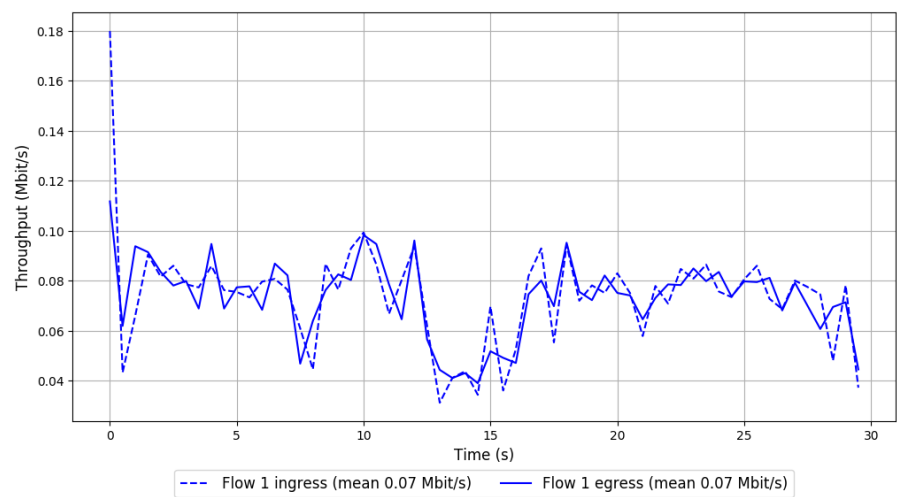


Run 1: Statistics of SCReAM

Start at: 2018-02-01 11:53:57
End at: 2018-02-01 11:54:27
Local clock offset: 1.09 ms
Remote clock offset: -2.427 ms

Below is generated by plot.py at 2018-02-01 13:40:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 242.417 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 242.417 ms
Loss rate: 0.70%

Run 1: Report of SReAM — Data Link

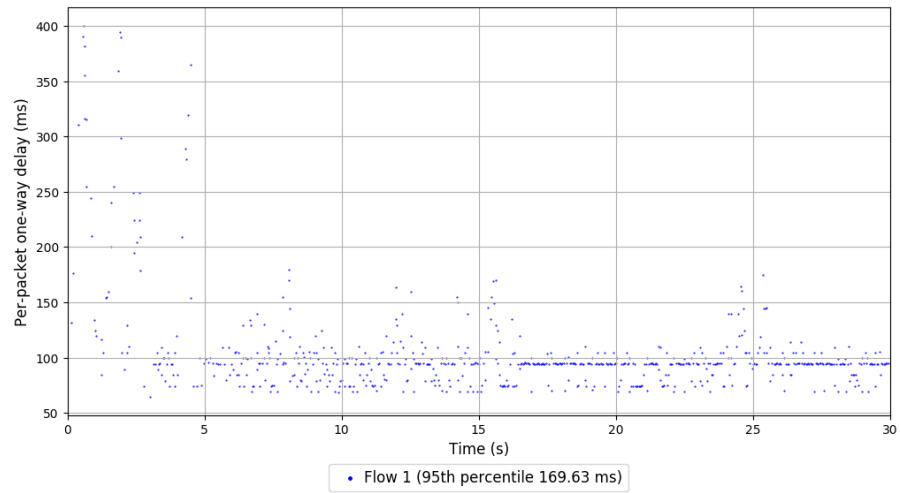
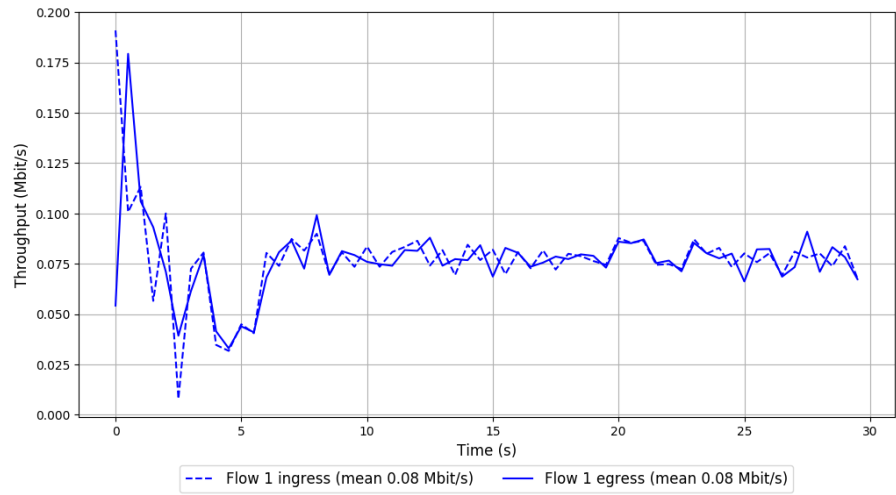


Run 2: Statistics of SCReAM

Start at: 2018-02-01 12:14:50
End at: 2018-02-01 12:15:20
Local clock offset: 1.795 ms
Remote clock offset: -17.039 ms

Below is generated by plot.py at 2018-02-01 13:40:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 169.626 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 169.626 ms
Loss rate: 0.94%

Run 2: Report of SReAM — Data Link

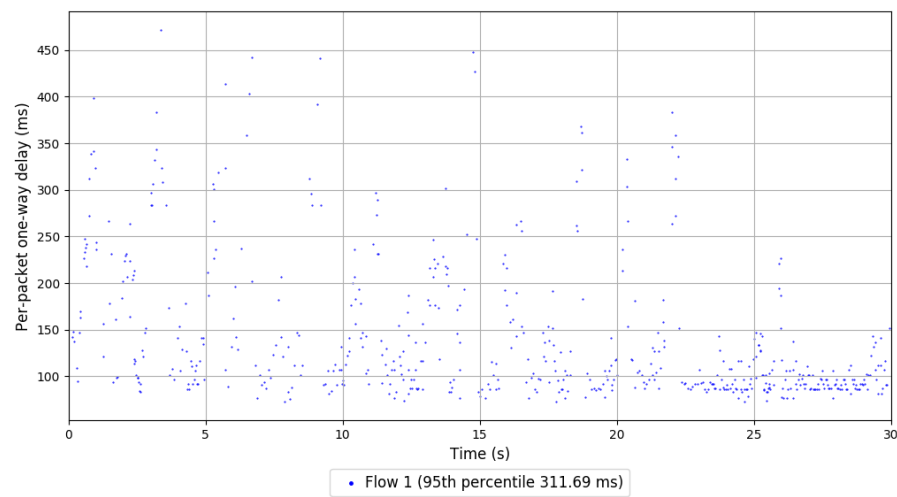
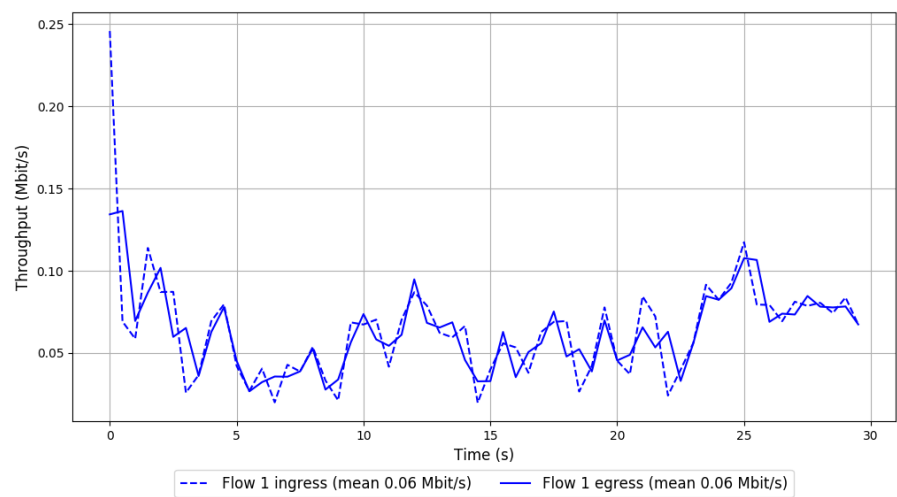


Run 3: Statistics of SCReAM

Start at: 2018-02-01 12:36:14
End at: 2018-02-01 12:36:44
Local clock offset: 4.382 ms
Remote clock offset: -18.412 ms

Below is generated by plot.py at 2018-02-01 13:40:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 311.694 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 311.694 ms
Loss rate: 1.51%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-02-01 11:44:01

End at: 2018-02-01 11:44:31

Local clock offset: 3.087 ms

Remote clock offset: -6.59 ms

Below is generated by plot.py at 2018-02-01 13:40:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.03 Mbit/s

95th percentile per-packet one-way delay: 682.068 ms

Loss rate: 40.84%

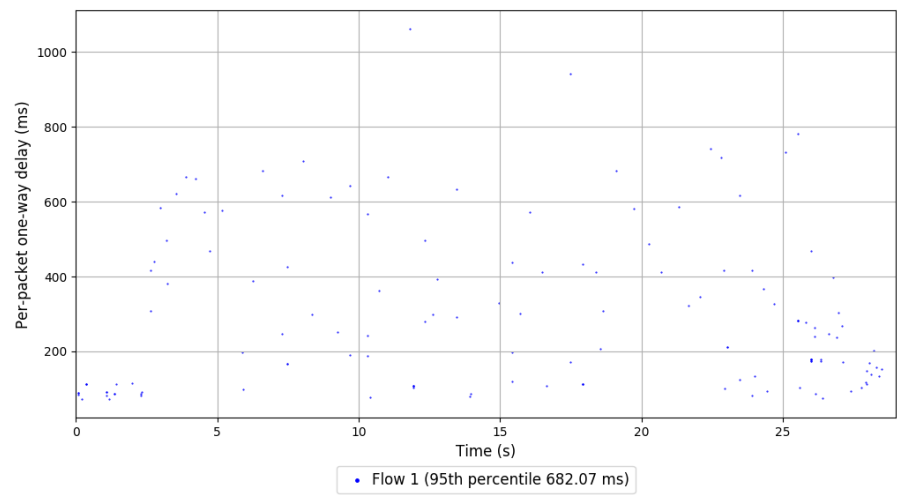
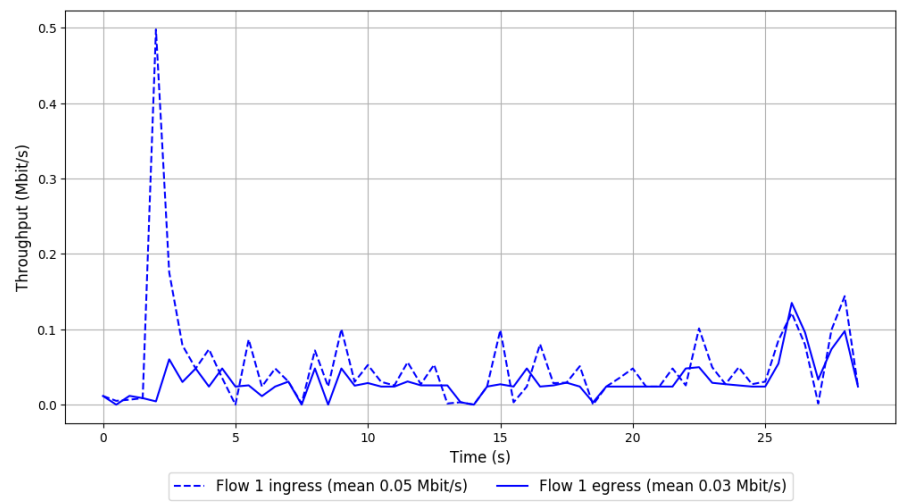
-- Flow 1:

Average throughput: 0.03 Mbit/s

95th percentile per-packet one-way delay: 682.068 ms

Loss rate: 40.84%

Run 1: Report of WebRTC media — Data Link

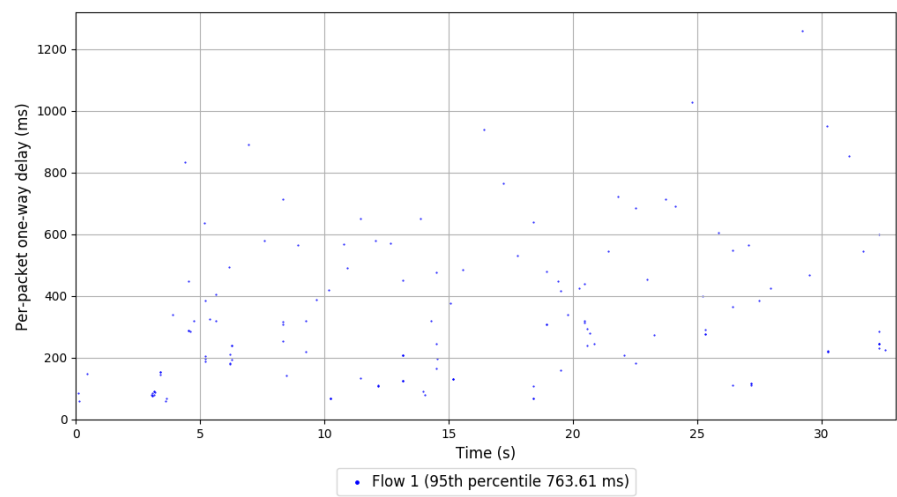
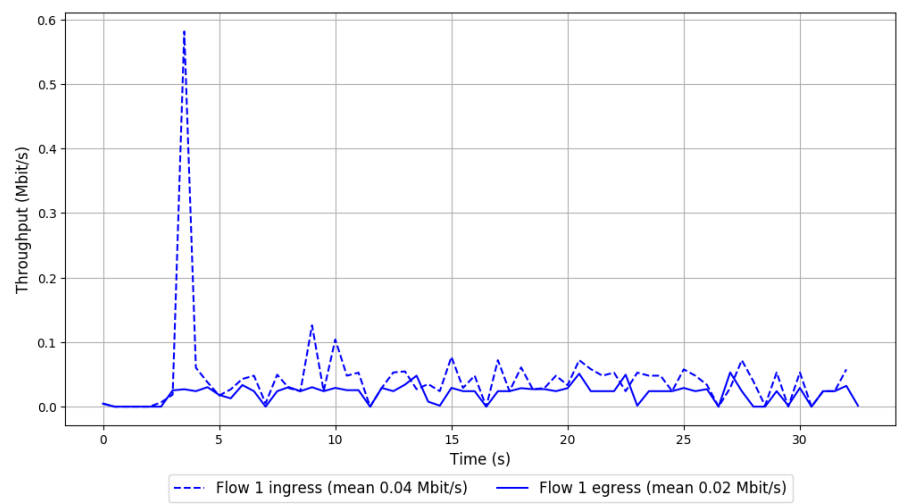


Run 2: Statistics of WebRTC media

Start at: 2018-02-01 12:04:57
End at: 2018-02-01 12:05:27
Local clock offset: 1.489 ms
Remote clock offset: -9.652 ms

Below is generated by plot.py at 2018-02-01 13:40:59
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 763.614 ms
Loss rate: 53.18%
-- Flow 1:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 763.614 ms
Loss rate: 53.18%

Run 2: Report of WebRTC media — Data Link

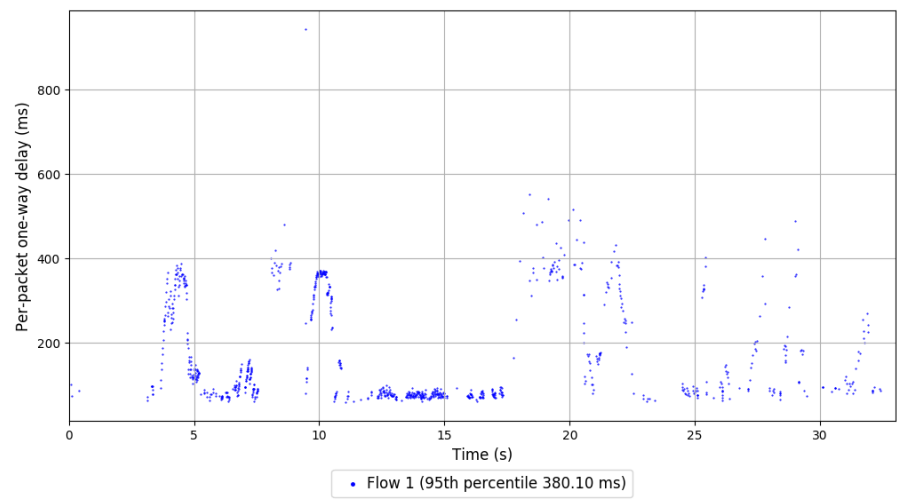
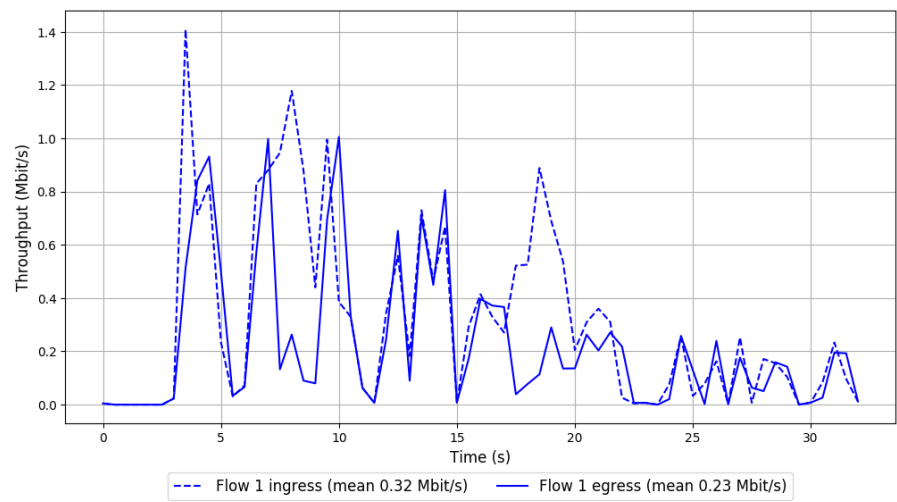


Run 3: Statistics of WebRTC media

Start at: 2018-02-01 12:26:06
End at: 2018-02-01 12:26:36
Local clock offset: 1.974 ms
Remote clock offset: -18.121 ms

Below is generated by plot.py at 2018-02-01 13:41:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 380.104 ms
Loss rate: 28.03%
-- Flow 1:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 380.104 ms
Loss rate: 28.03%

Run 3: Report of WebRTC media — Data Link

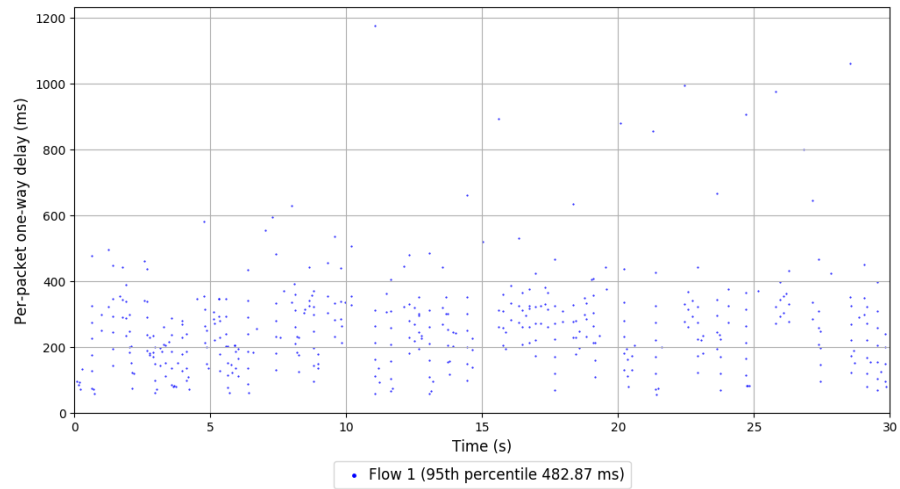
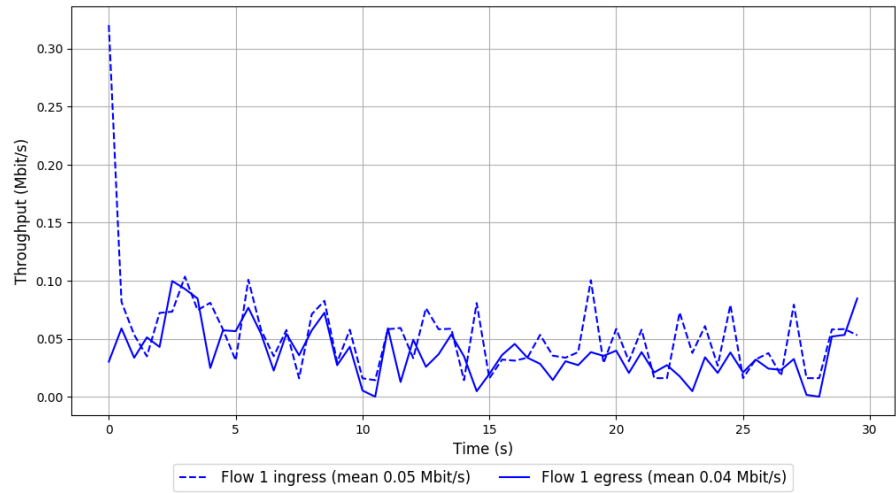


Run 1: Statistics of Sprout

Start at: 2018-02-01 11:49:34
End at: 2018-02-01 11:50:04
Local clock offset: 2.804 ms
Remote clock offset: -2.445 ms

Below is generated by plot.py at 2018-02-01 13:41:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 482.868 ms
Loss rate: 29.70%
-- Flow 1:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 482.868 ms
Loss rate: 29.70%

Run 1: Report of Sprout — Data Link

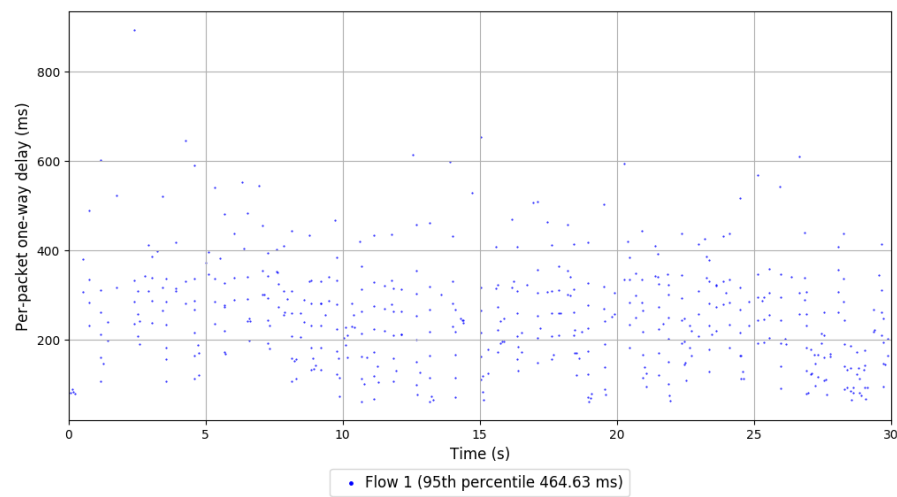
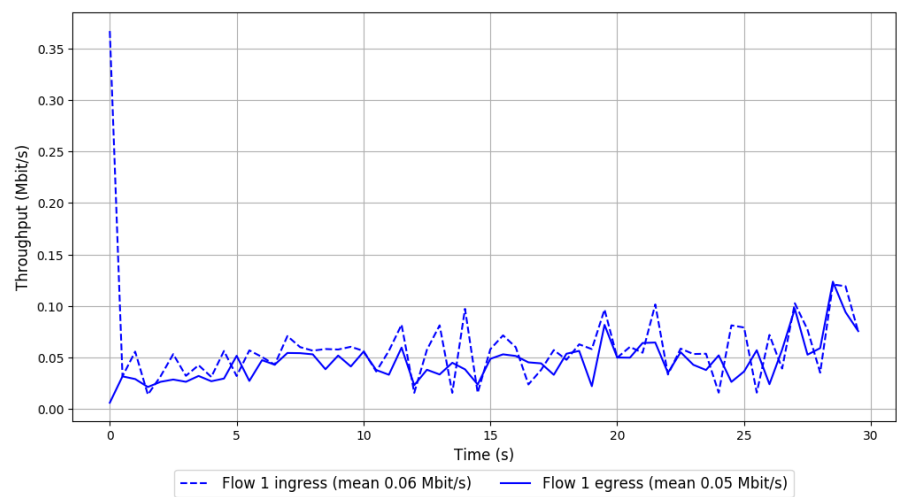


Run 2: Statistics of Sprout

Start at: 2018-02-01 12:10:27
End at: 2018-02-01 12:10:57
Local clock offset: 1.441 ms
Remote clock offset: -13.899 ms

Below is generated by plot.py at 2018-02-01 13:41:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 464.633 ms
Loss rate: 24.45%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 464.633 ms
Loss rate: 24.45%

Run 2: Report of Sprout — Data Link

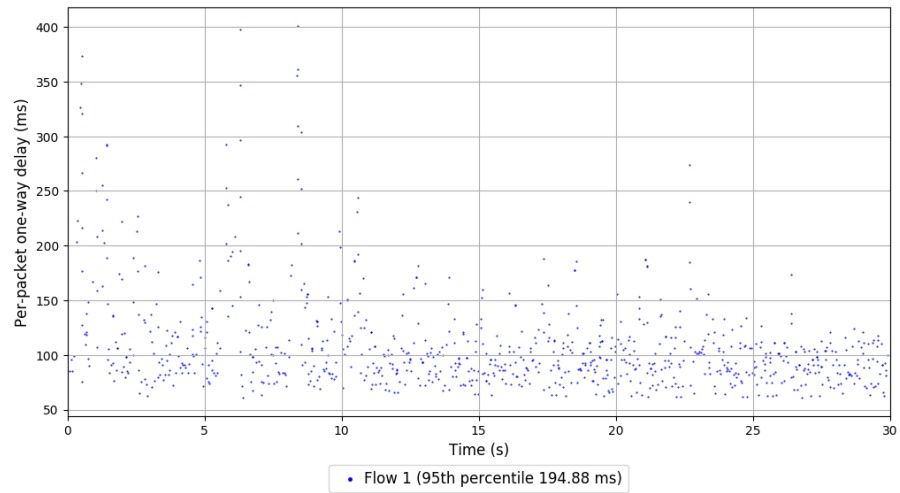
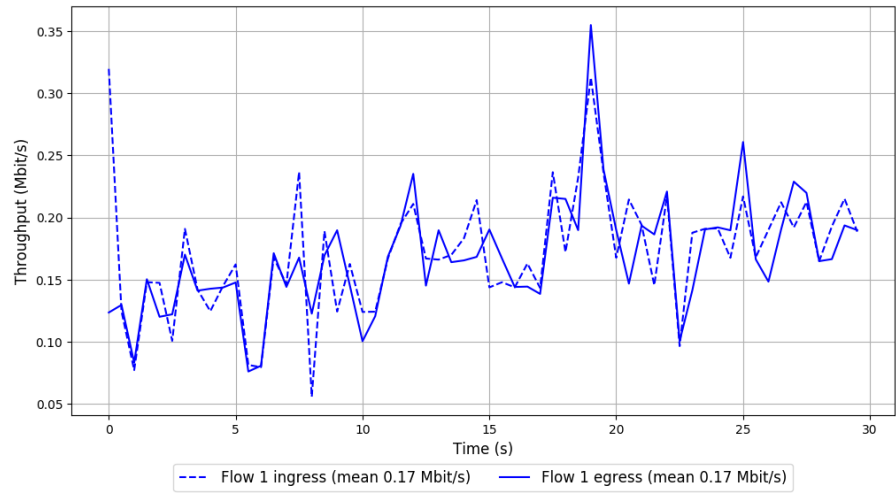


Run 3: Statistics of Sprout

Start at: 2018-02-01 12:31:36
End at: 2018-02-01 12:32:06
Local clock offset: 2.64 ms
Remote clock offset: -18.446 ms

Below is generated by plot.py at 2018-02-01 13:41:02
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 194.883 ms
Loss rate: 2.25%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 194.883 ms
Loss rate: 2.25%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-02-01 11:36:19

End at: 2018-02-01 11:36:49

Local clock offset: 3.246 ms

Remote clock offset: -7.174 ms

Below is generated by plot.py at 2018-02-01 13:41:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.01 Mbit/s

95th percentile per-packet one-way delay: 671.418 ms

Loss rate: 94.85%

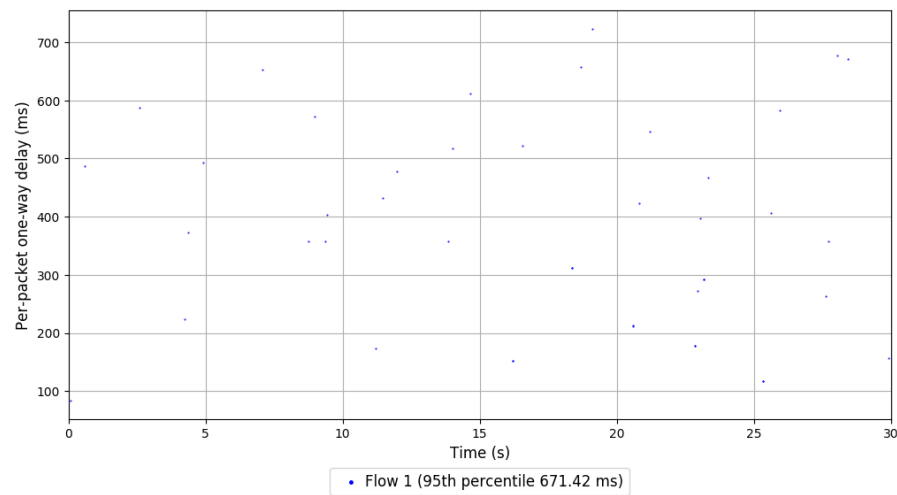
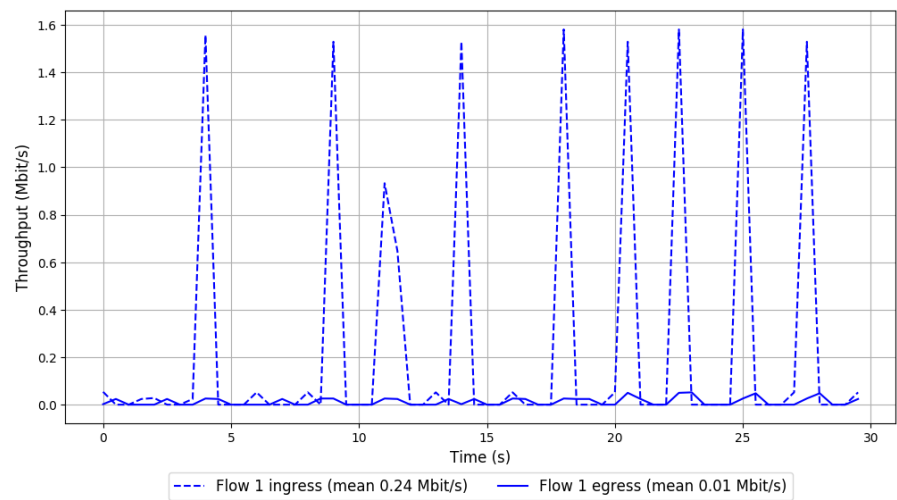
-- Flow 1:

Average throughput: 0.01 Mbit/s

95th percentile per-packet one-way delay: 671.418 ms

Loss rate: 94.85%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-02-01 11:57:15

End at: 2018-02-01 11:57:45

Local clock offset: 1.69 ms

Remote clock offset: -2.612 ms

Below is generated by plot.py at 2018-02-01 13:41:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.02 Mbit/s

95th percentile per-packet one-way delay: 638.372 ms

Loss rate: 95.53%

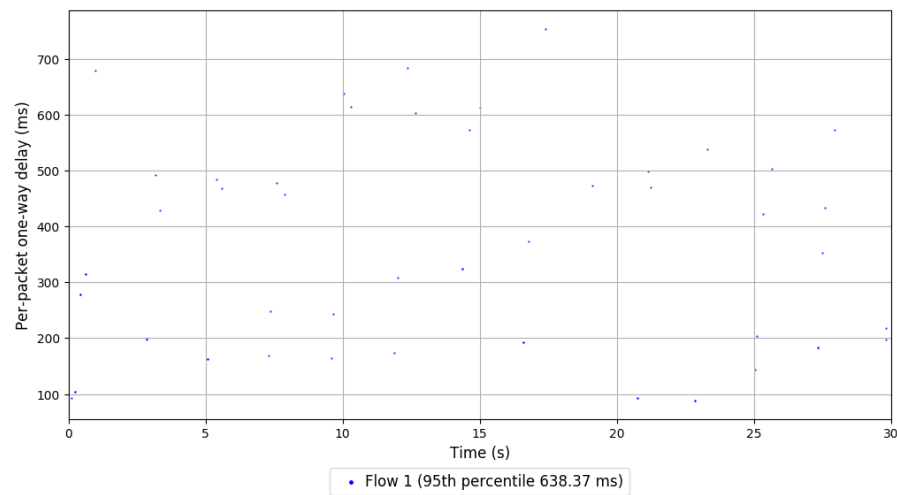
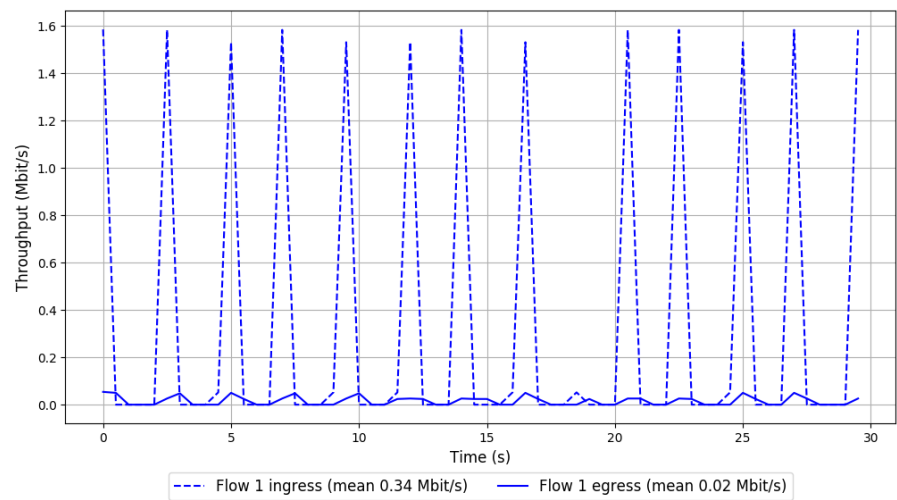
-- Flow 1:

Average throughput: 0.02 Mbit/s

95th percentile per-packet one-way delay: 638.372 ms

Loss rate: 95.53%

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

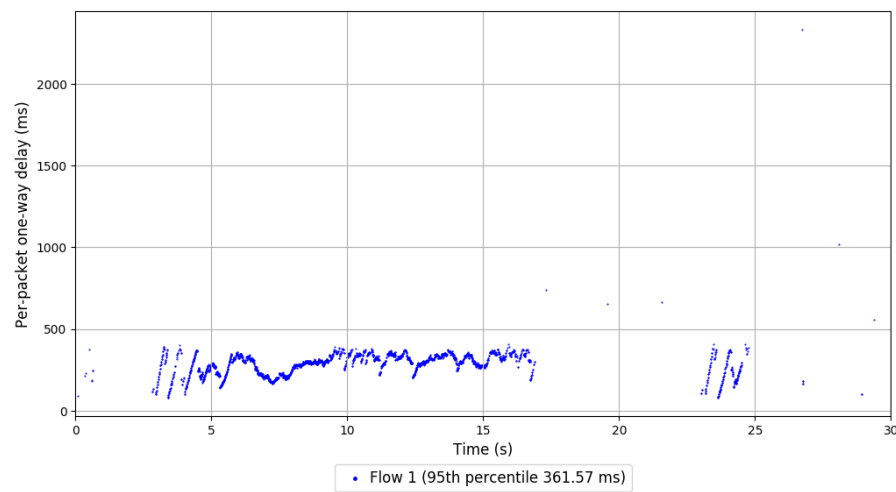
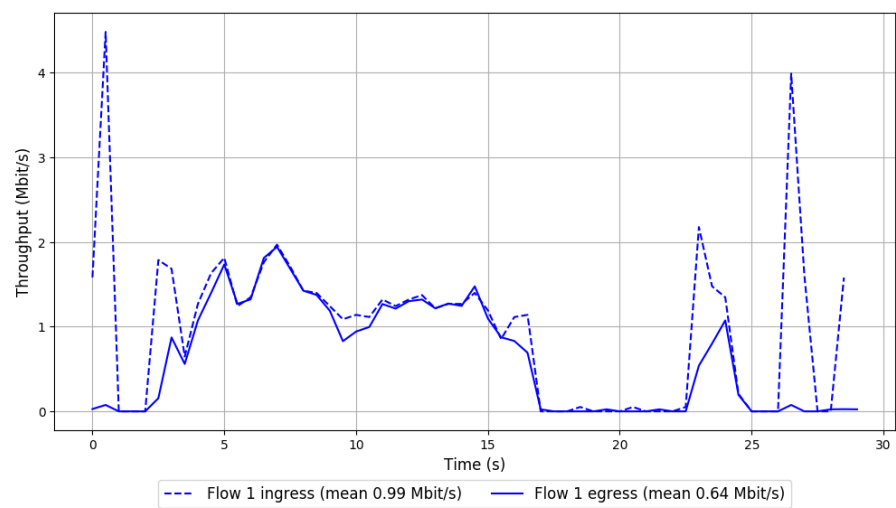


Run 3: Statistics of TaoVA-100x

Start at: 2018-02-01 12:18:08
End at: 2018-02-01 12:18:38
Local clock offset: 3.663 ms
Remote clock offset: -18.474 ms

Below is generated by plot.py at 2018-02-01 13:41:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 361.574 ms
Loss rate: 35.17%
-- Flow 1:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 361.574 ms
Loss rate: 35.17%

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

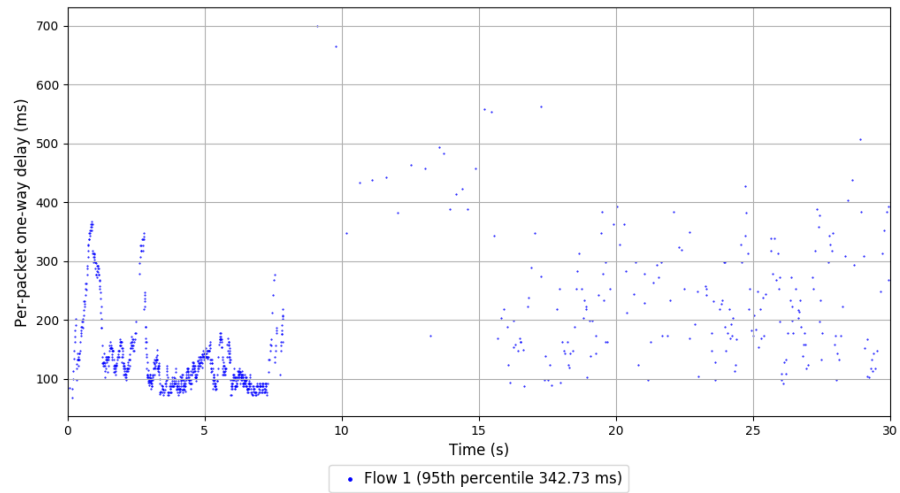
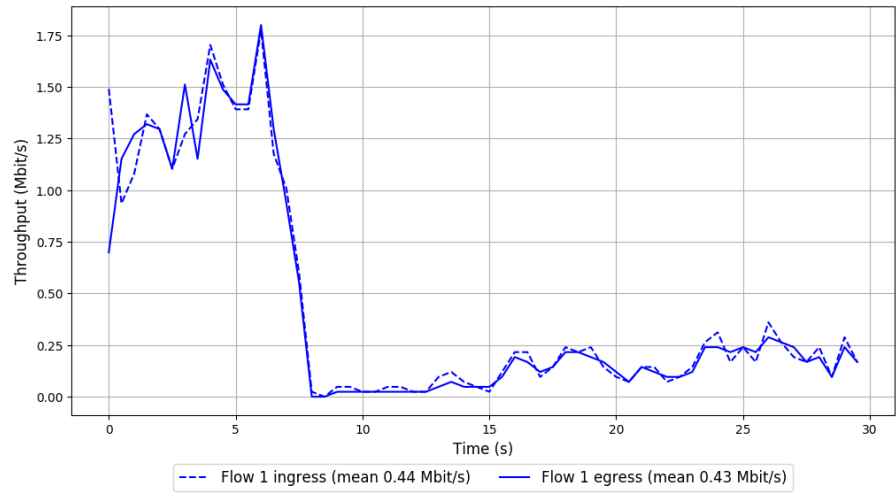


Run 1: Statistics of TCP Vegas

Start at: 2018-02-01 11:50:40
End at: 2018-02-01 11:51:10
Local clock offset: -2.658 ms
Remote clock offset: -10.713 ms

Below is generated by plot.py at 2018-02-01 13:41:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 342.726 ms
Loss rate: 3.27%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 342.726 ms
Loss rate: 3.27%

Run 1: Report of TCP Vegas — Data Link

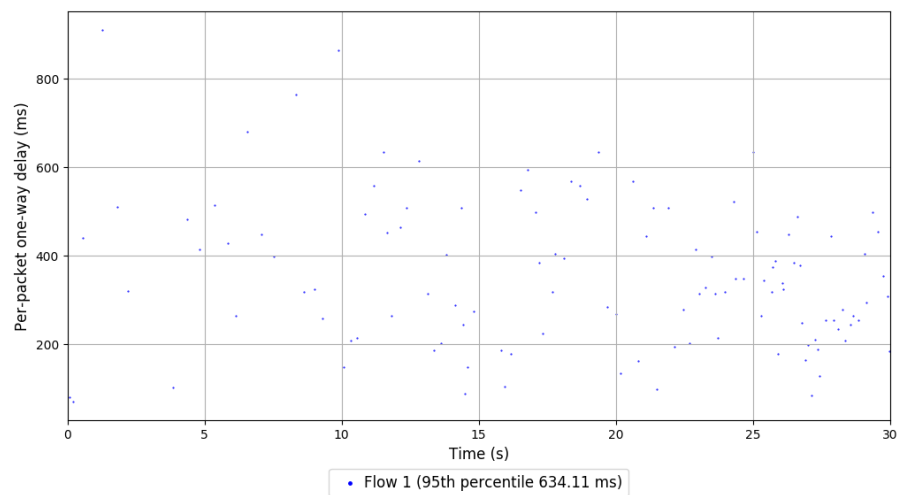
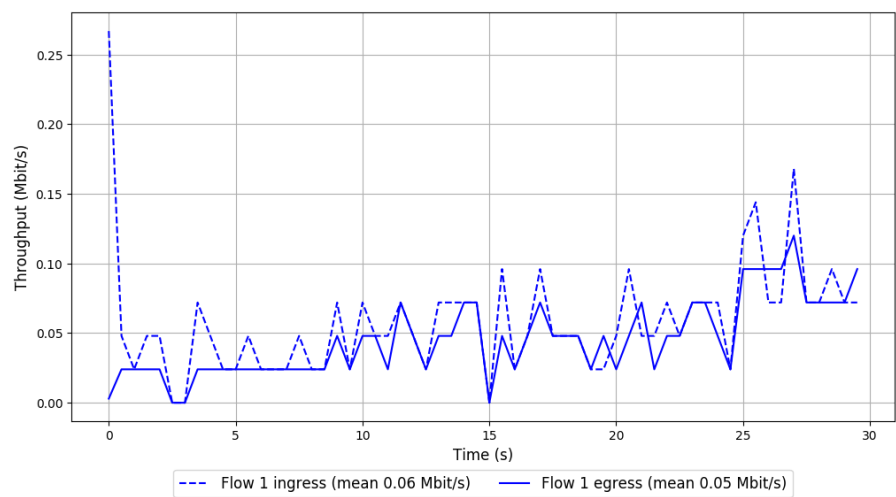


Run 2: Statistics of TCP Vegas

Start at: 2018-02-01 12:11:33
End at: 2018-02-01 12:12:03
Local clock offset: 1.196 ms
Remote clock offset: -15.776 ms

Below is generated by plot.py at 2018-02-01 13:41:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 634.105 ms
Loss rate: 23.11%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 634.105 ms
Loss rate: 23.11%

Run 2: Report of TCP Vegas — Data Link

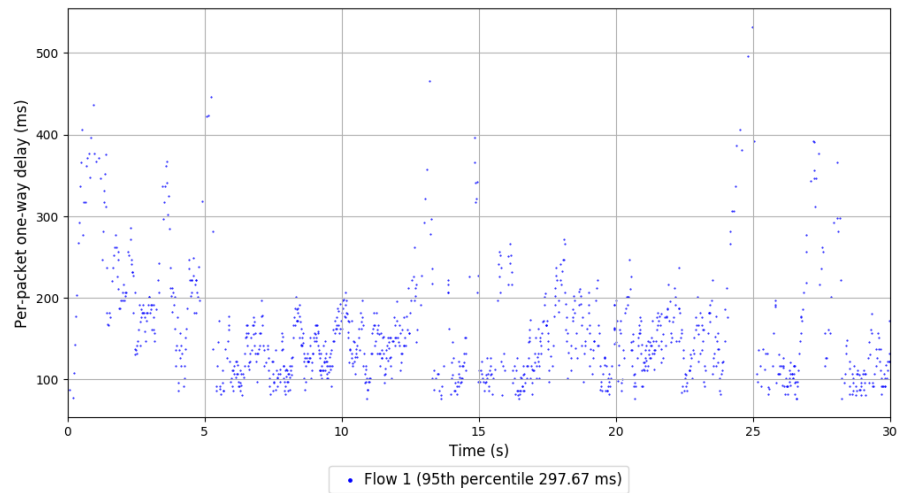
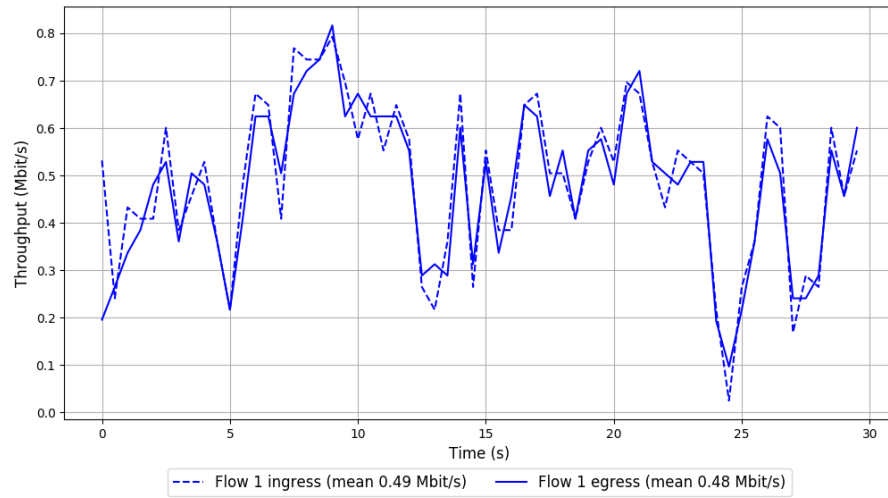


Run 3: Statistics of TCP Vegas

Start at: 2018-02-01 12:32:42
End at: 2018-02-01 12:33:12
Local clock offset: 2.152 ms
Remote clock offset: -19.012 ms

Below is generated by plot.py at 2018-02-01 13:41:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 297.667 ms
Loss rate: 2.45%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 297.667 ms
Loss rate: 2.45%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-02-01 11:47:22

End at: 2018-02-01 11:47:52

Local clock offset: 0.987 ms

Remote clock offset: -2.8 ms

Below is generated by plot.py at 2018-02-01 13:41:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.25 Mbit/s

95th percentile per-packet one-way delay: 528.993 ms

Loss rate: 74.77%

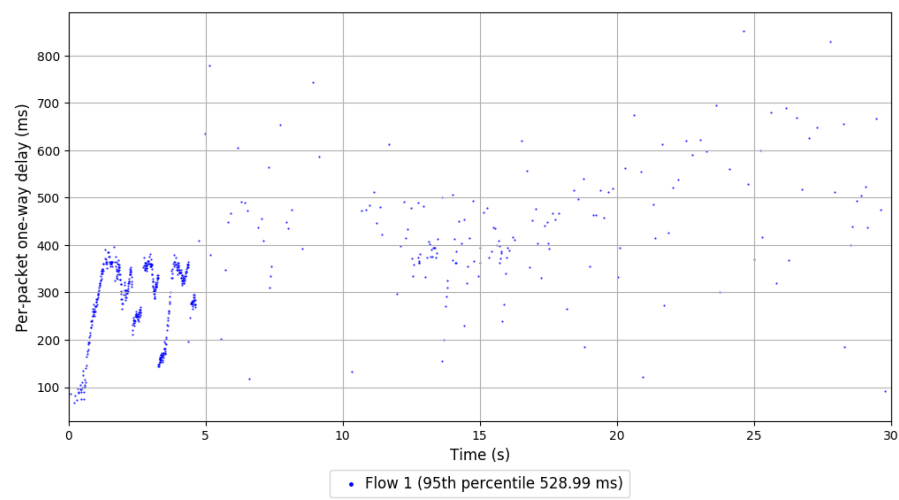
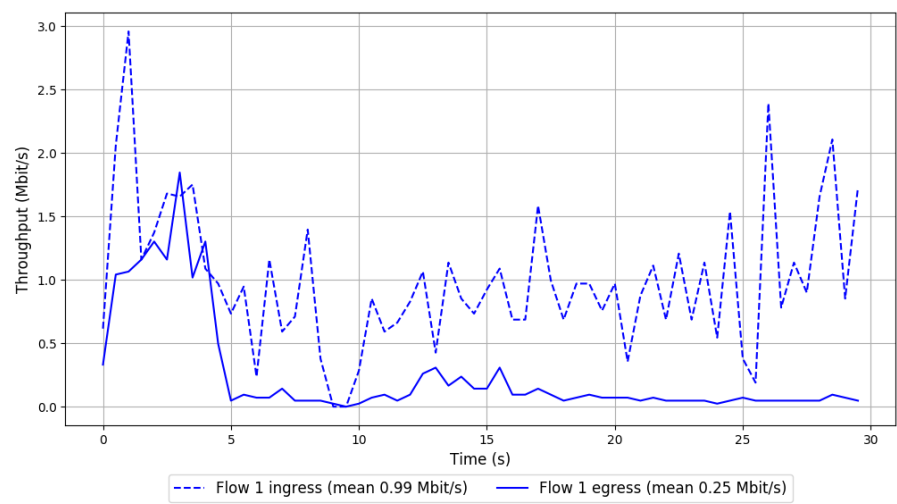
-- Flow 1:

Average throughput: 0.25 Mbit/s

95th percentile per-packet one-way delay: 528.993 ms

Loss rate: 74.77%

Run 1: Report of Verus — Data Link

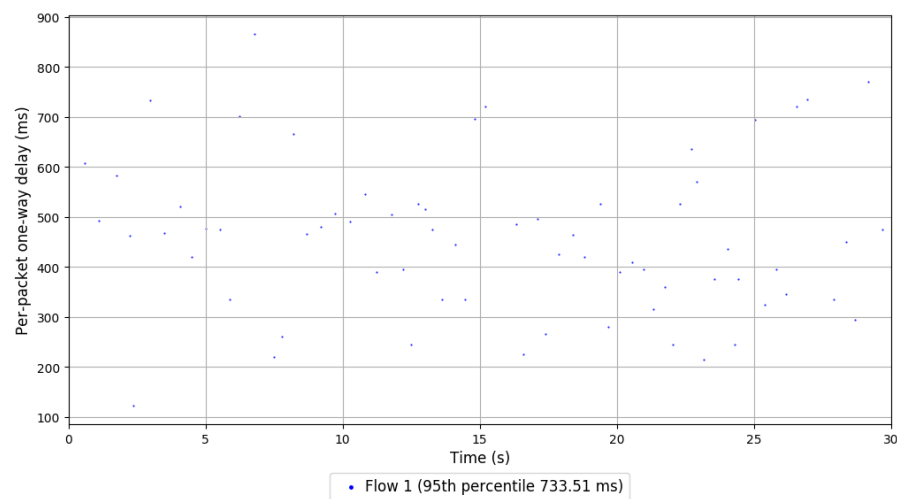
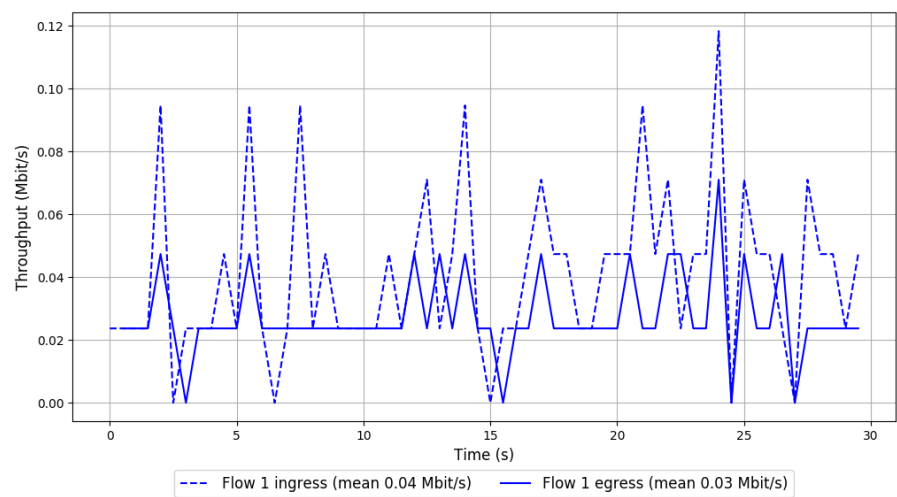


Run 2: Statistics of Verus

Start at: 2018-02-01 12:08:15
End at: 2018-02-01 12:08:45
Local clock offset: 3.112 ms
Remote clock offset: -12.534 ms

Below is generated by plot.py at 2018-02-01 13:41:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 733.510 ms
Loss rate: 33.98%
-- Flow 1:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 733.510 ms
Loss rate: 33.98%

Run 2: Report of Verus — Data Link

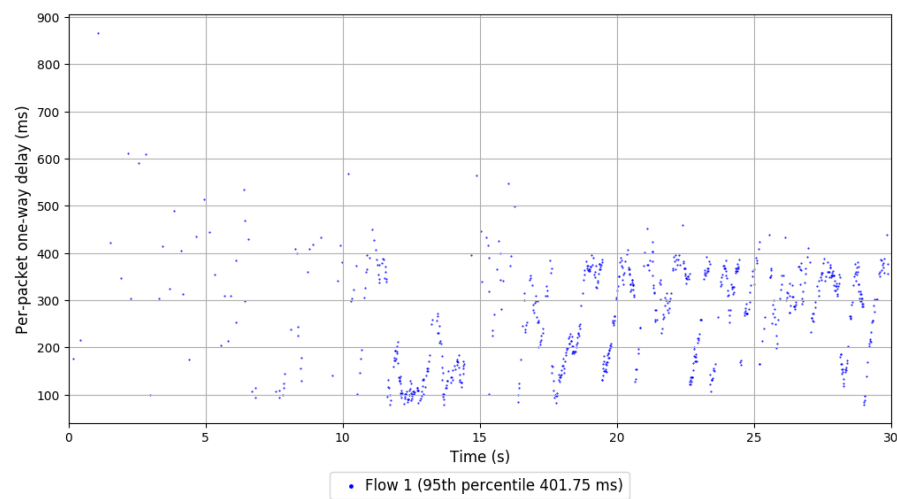
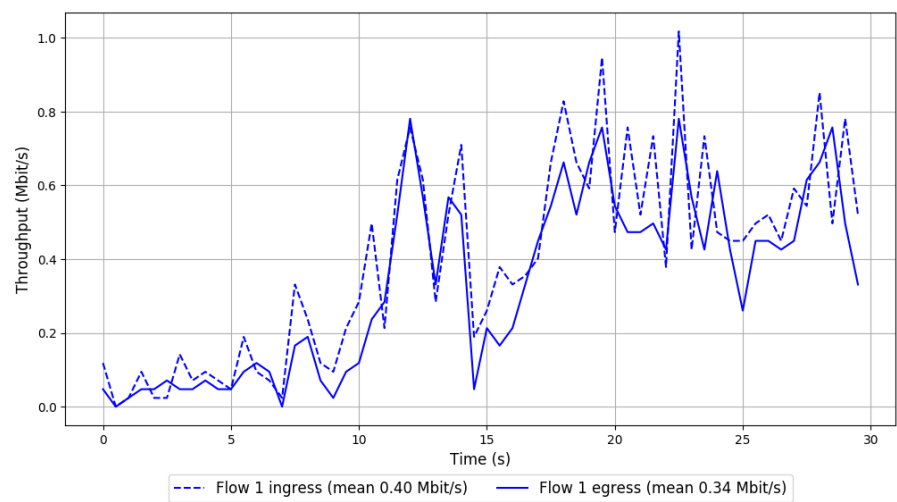


Run 3: Statistics of Verus

Start at: 2018-02-01 12:29:25
End at: 2018-02-01 12:29:55
Local clock offset: 1.745 ms
Remote clock offset: -18.861 ms

Below is generated by plot.py at 2018-02-01 13:41:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 401.749 ms
Loss rate: 16.17%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 401.749 ms
Loss rate: 16.17%

Run 3: Report of Verus — Data Link

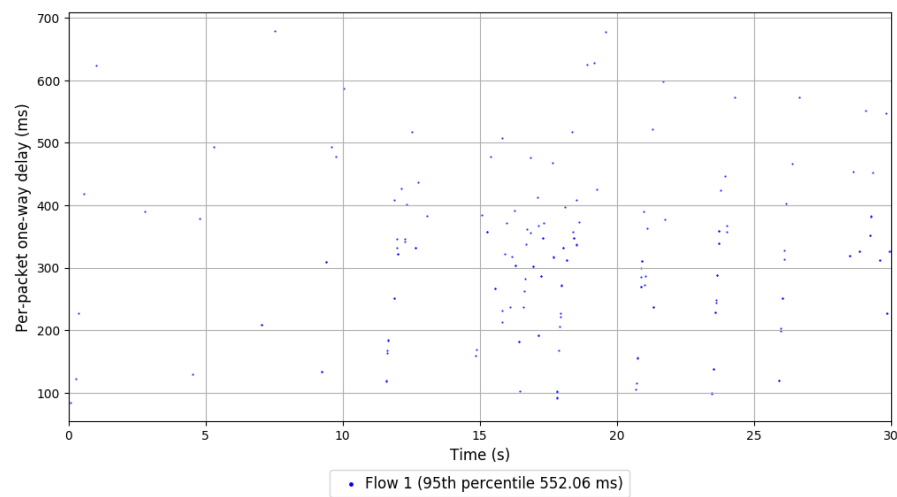
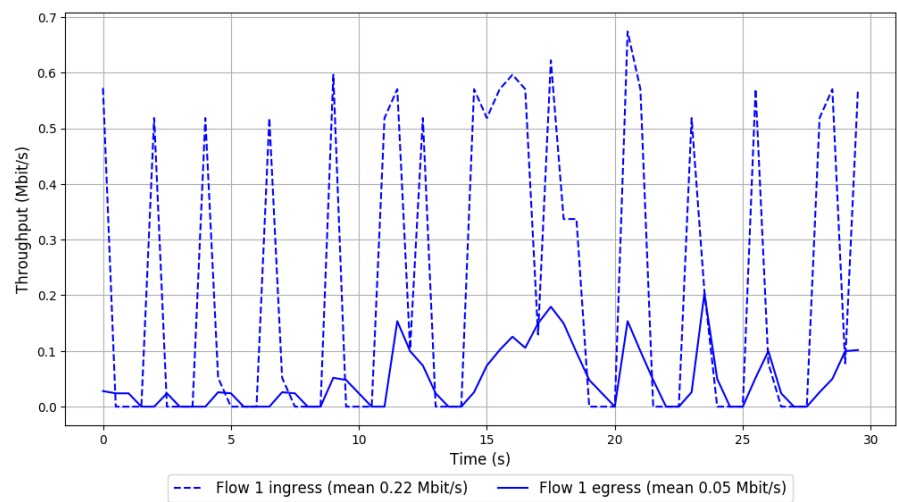


Run 1: Statistics of Copa

Start at: 2018-02-01 11:39:37
End at: 2018-02-01 11:40:08
Local clock offset: 0.852 ms
Remote clock offset: -3.447 ms

Below is generated by plot.py at 2018-02-01 13:41:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 552.064 ms
Loss rate: 78.79%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 552.064 ms
Loss rate: 78.79%

Run 1: Report of Copa — Data Link

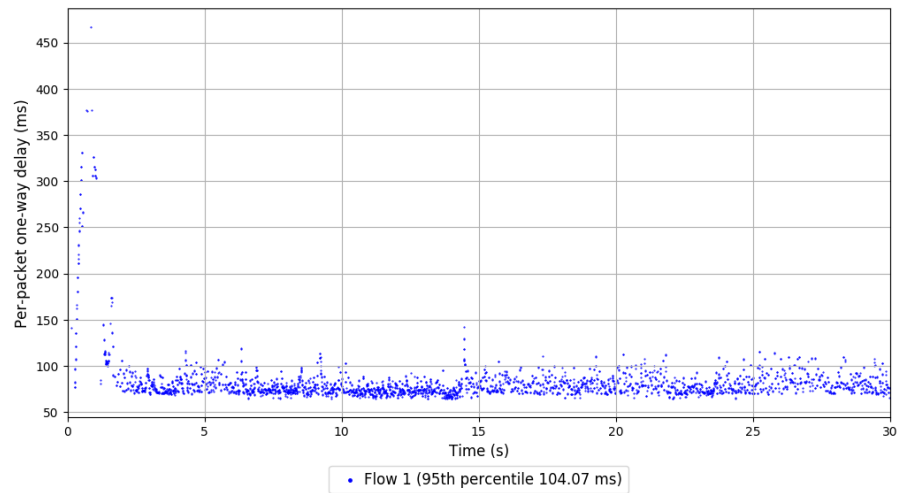
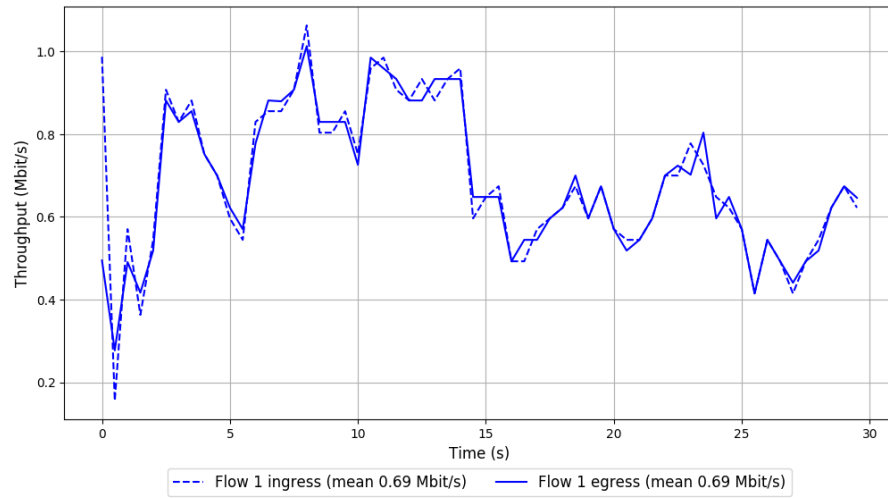


Run 2: Statistics of Copa

Start at: 2018-02-01 12:00:33
End at: 2018-02-01 12:01:03
Local clock offset: 1.821 ms
Remote clock offset: -6.673 ms

Below is generated by plot.py at 2018-02-01 13:41:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 104.070 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 104.070 ms
Loss rate: 0.96%

Run 2: Report of Copa — Data Link

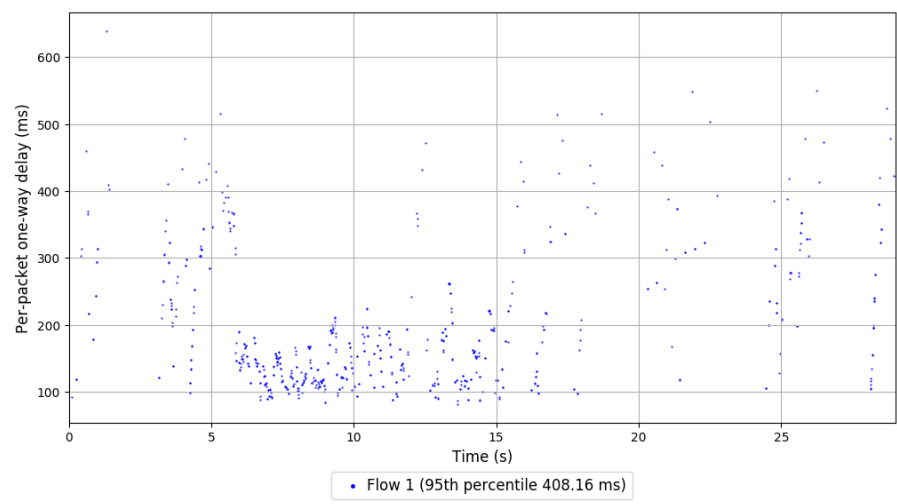
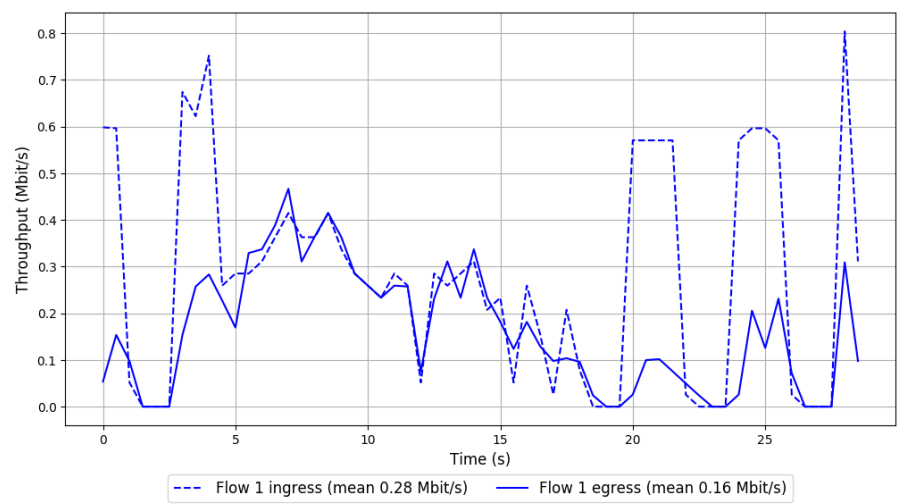


Run 3: Statistics of Copa

Start at: 2018-02-01 12:21:25
End at: 2018-02-01 12:21:55
Local clock offset: 3.364 ms
Remote clock offset: -18.052 ms

Below is generated by plot.py at 2018-02-01 13:41:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 408.164 ms
Loss rate: 41.57%
-- Flow 1:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 408.164 ms
Loss rate: 41.57%

Run 3: Report of Copa — Data Link

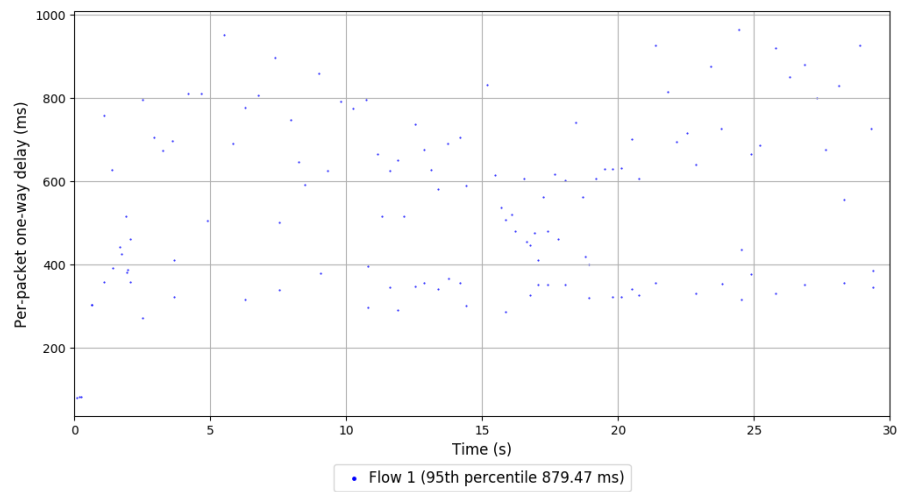
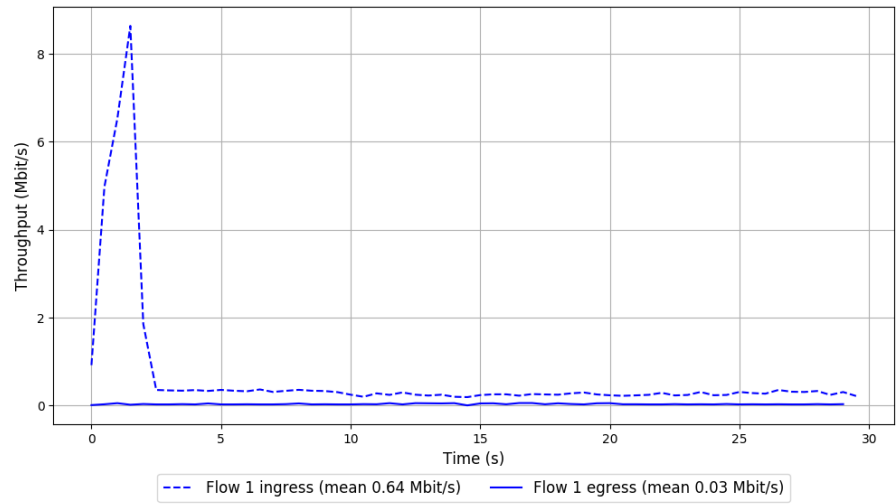


Run 1: Statistics of FillP

Start at: 2018-02-01 11:35:13
End at: 2018-02-01 11:35:43
Local clock offset: 0.682 ms
Remote clock offset: -7.956 ms

Below is generated by plot.py at 2018-02-01 13:41:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 879.466 ms
Loss rate: 95.42%
-- Flow 1:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 879.466 ms
Loss rate: 95.42%

Run 1: Report of FillP — Data Link

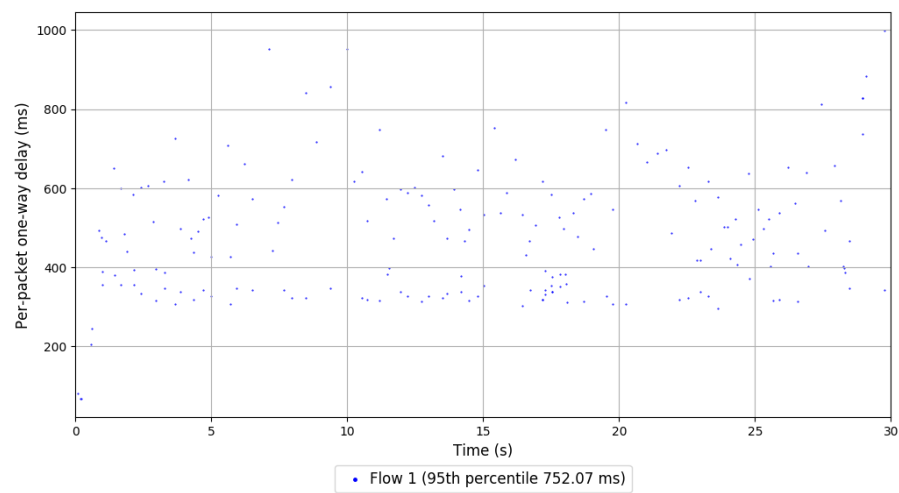
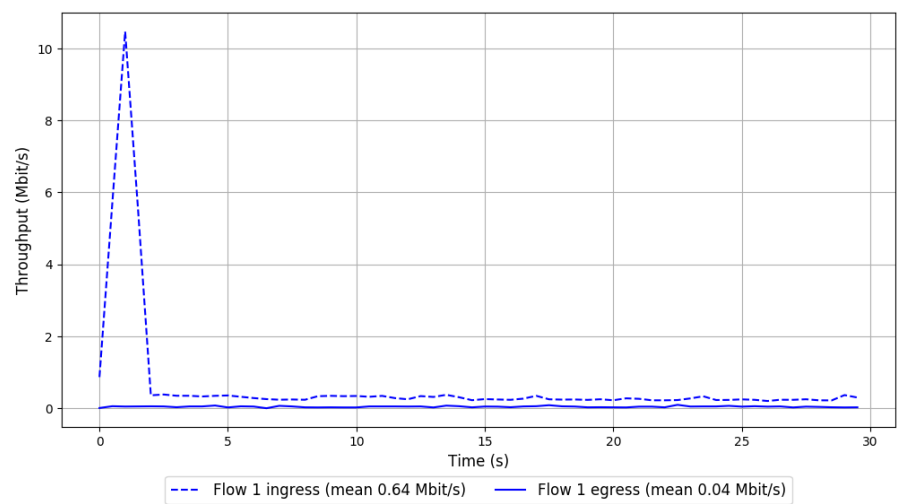


Run 2: Statistics of FillP

Start at: 2018-02-01 11:56:09
End at: 2018-02-01 11:56:39
Local clock offset: 1.416 ms
Remote clock offset: -2.466 ms

Below is generated by plot.py at 2018-02-01 13:41:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 752.074 ms
Loss rate: 93.33%
-- Flow 1:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 752.074 ms
Loss rate: 93.33%

Run 2: Report of FillP — Data Link

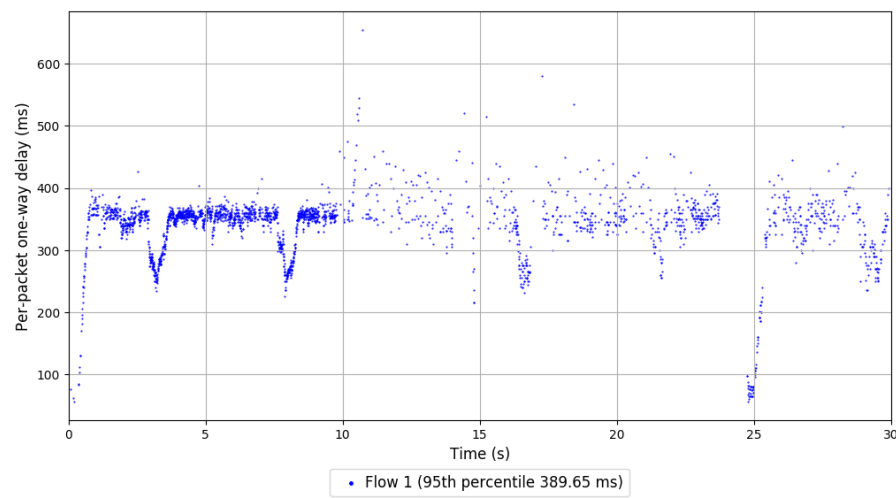
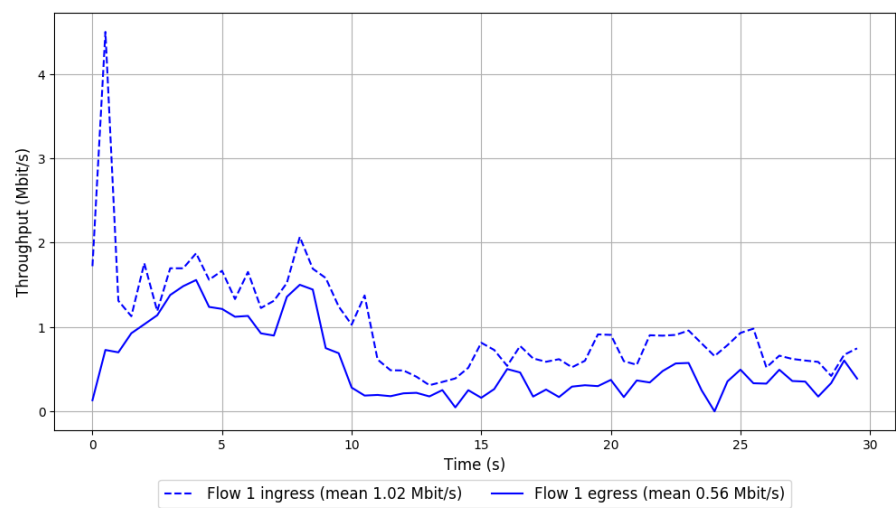


Run 3: Statistics of FillP

Start at: 2018-02-01 12:17:02
End at: 2018-02-01 12:17:32
Local clock offset: 2.498 ms
Remote clock offset: -15.082 ms

Below is generated by plot.py at 2018-02-01 13:41:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 389.655 ms
Loss rate: 45.04%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 389.655 ms
Loss rate: 45.04%

Run 3: Report of FillP — Data Link

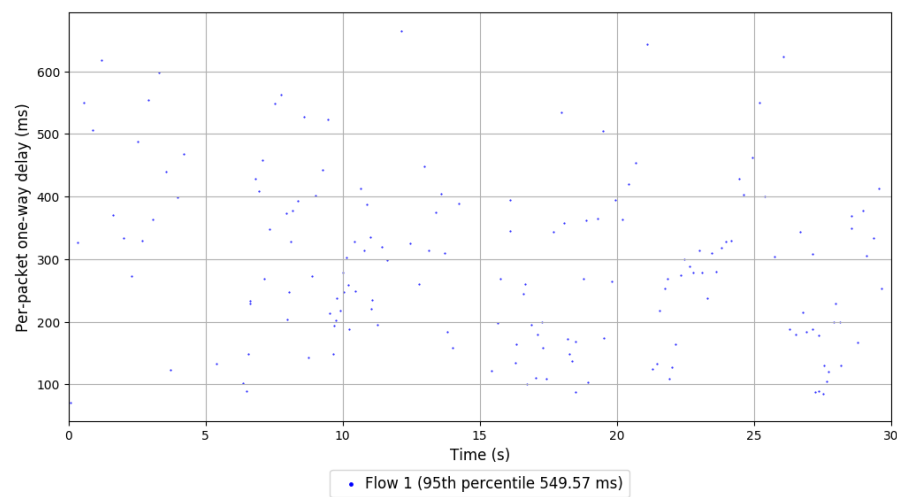
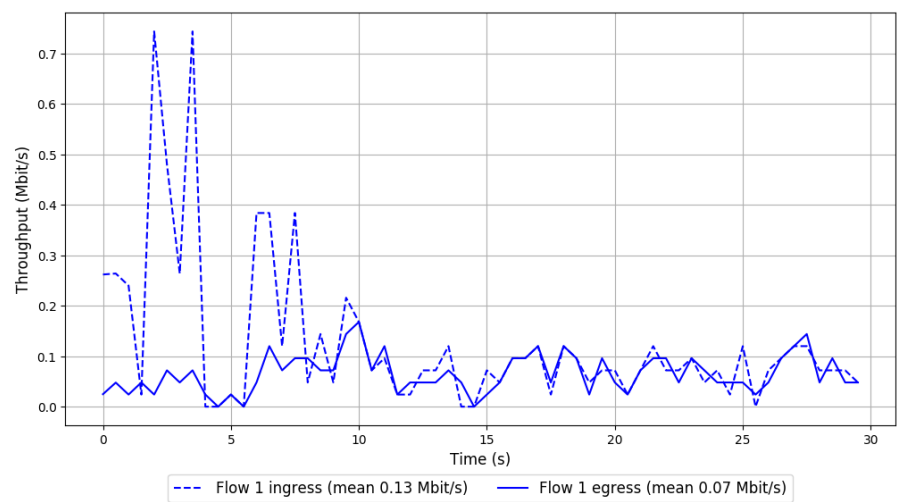


```
Run 1: Statistics of Indigo-1-32

Start at: 2018-02-01 11:51:46
End at: 2018-02-01 11:52:16
Local clock offset: 1.374 ms
Remote clock offset: -3.293 ms

# Below is generated by plot.py at 2018-02-01 13:41:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 549.569 ms
Loss rate: 49.04%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 549.569 ms
Loss rate: 49.04%
```

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

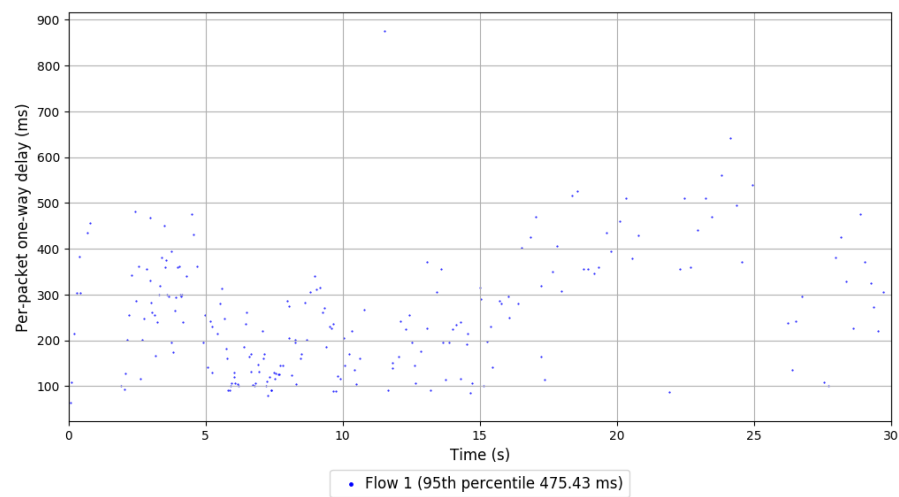
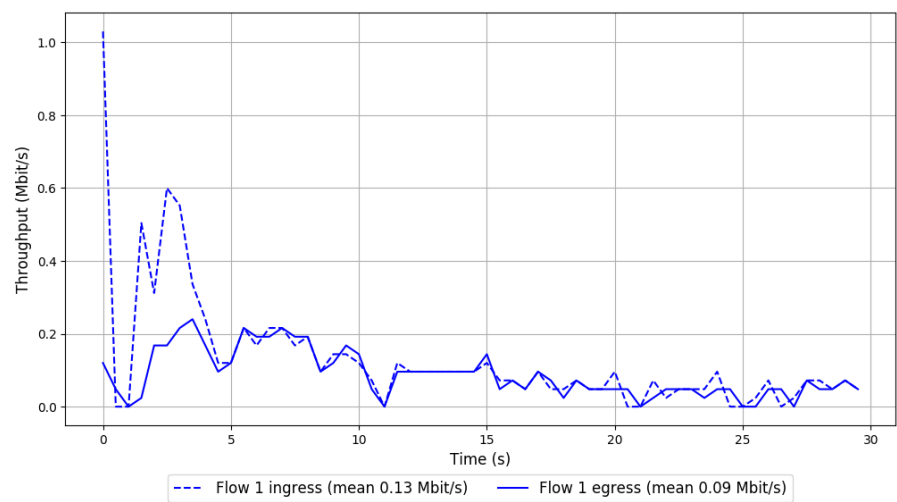


Run 2: Statistics of Indigo-1-32

Start at: 2018-02-01 12:12:39
End at: 2018-02-01 12:13:09
Local clock offset: 0.407 ms
Remote clock offset: -15.848 ms

Below is generated by plot.py at 2018-02-01 13:41:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 475.434 ms
Loss rate: 32.60%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 475.434 ms
Loss rate: 32.60%

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

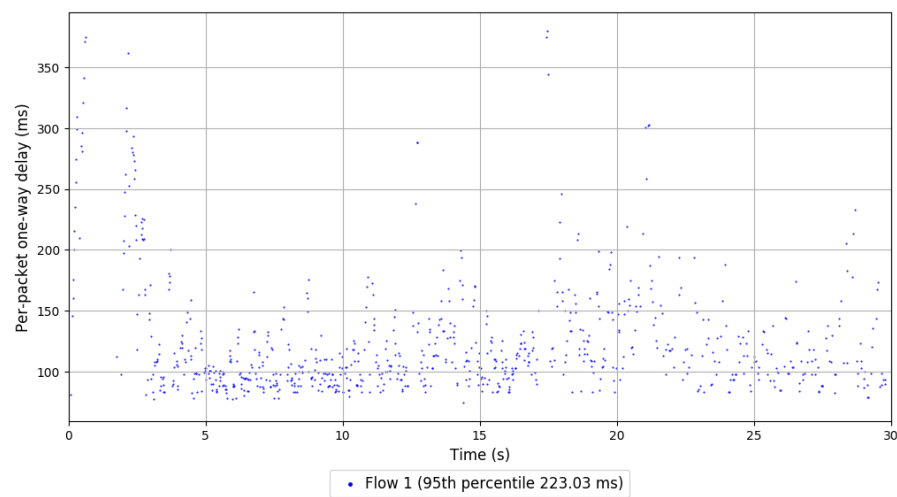
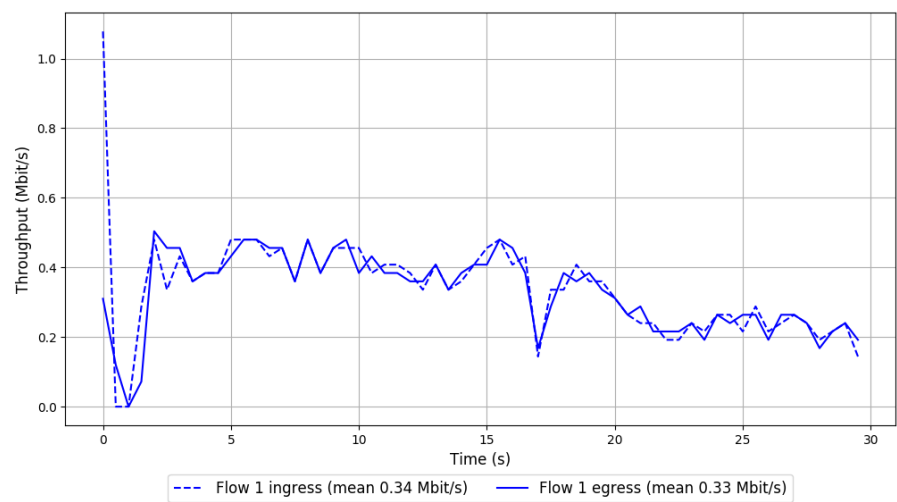


Run 3: Statistics of Indigo-1-32

Start at: 2018-02-01 12:33:48
End at: 2018-02-01 12:34:18
Local clock offset: 1.791 ms
Remote clock offset: -18.412 ms

Below is generated by plot.py at 2018-02-01 13:41:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 223.025 ms
Loss rate: 3.63%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 223.025 ms
Loss rate: 3.63%

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

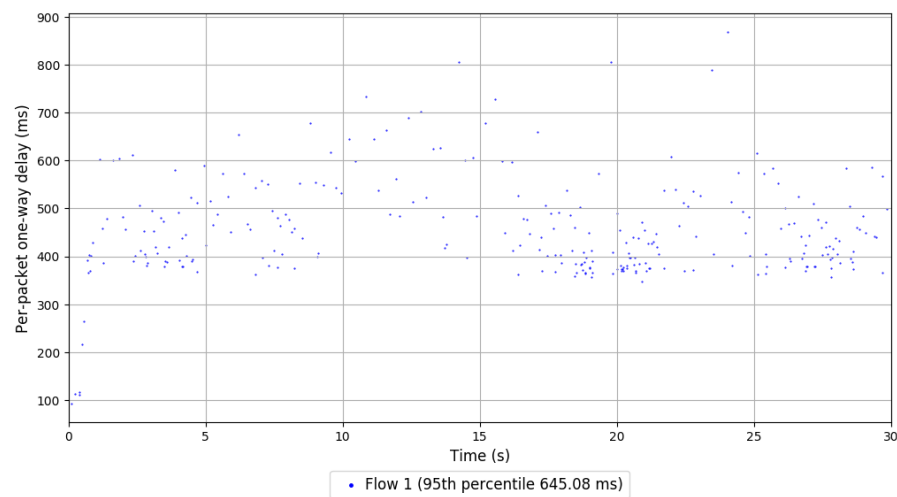
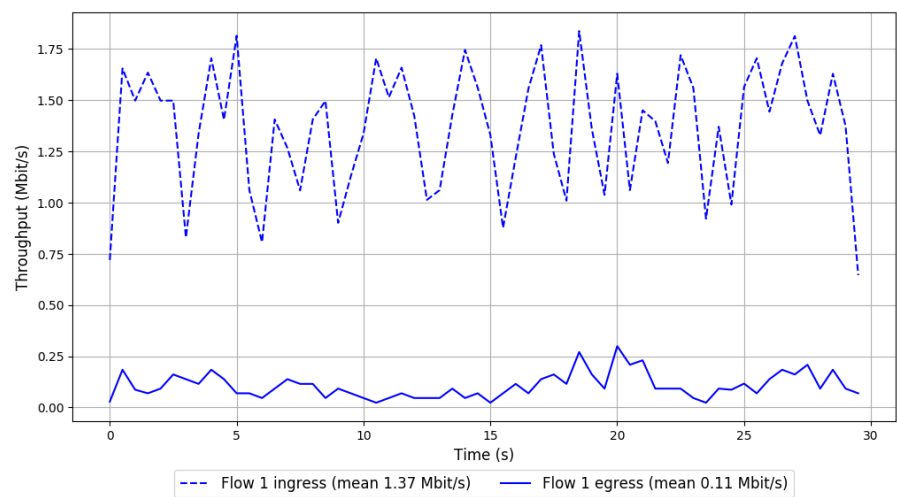


Run 1: Statistics of Vivace-latency

Start at: 2018-02-01 11:45:10
End at: 2018-02-01 11:45:40
Local clock offset: 1.142 ms
Remote clock offset: -5.157 ms

Below is generated by plot.py at 2018-02-01 13:41:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 645.084 ms
Loss rate: 92.22%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 645.084 ms
Loss rate: 92.22%

Run 1: Report of Vivace-latency — Data Link

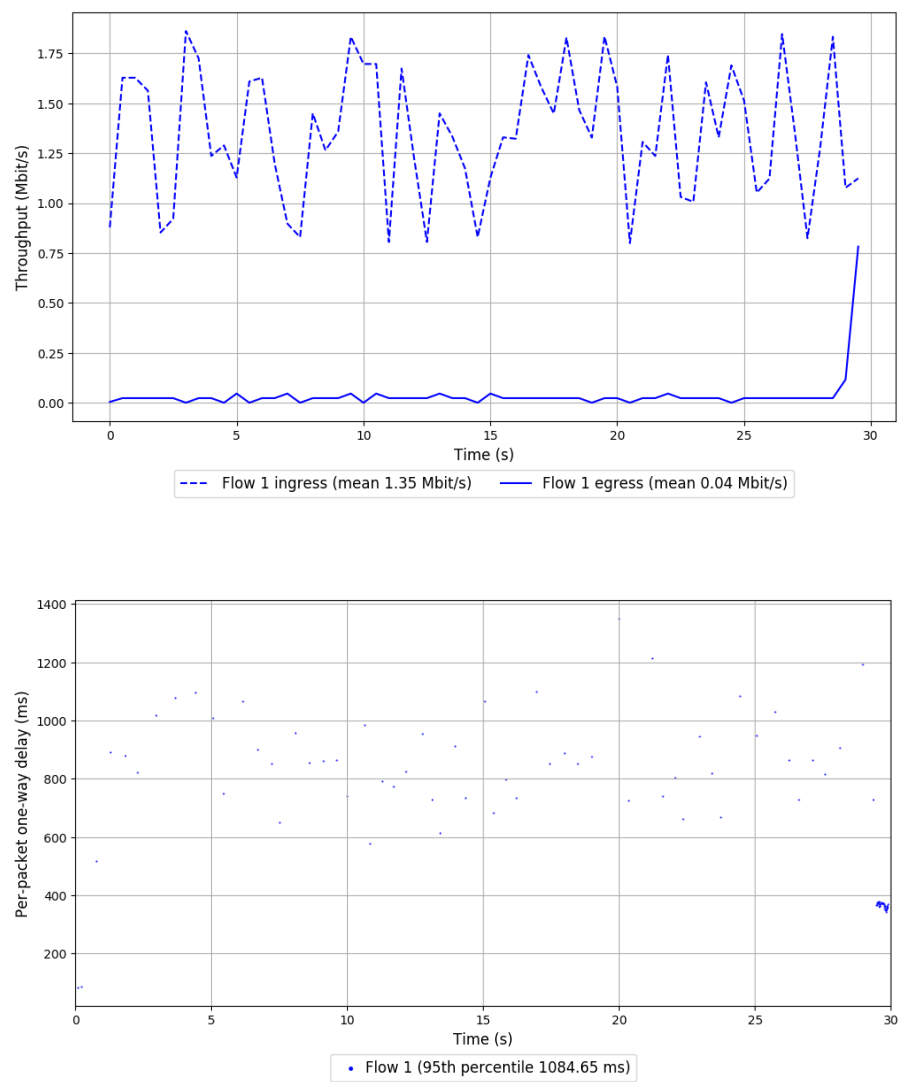


Run 2: Statistics of Vivace-latency

Start at: 2018-02-01 12:06:03
End at: 2018-02-01 12:06:33
Local clock offset: 3.034 ms
Remote clock offset: -10.867 ms

Below is generated by plot.py at 2018-02-01 13:41:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 1084.655 ms
Loss rate: 97.32%
-- Flow 1:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 1084.655 ms
Loss rate: 97.32%

Run 2: Report of Vivace-latency — Data Link

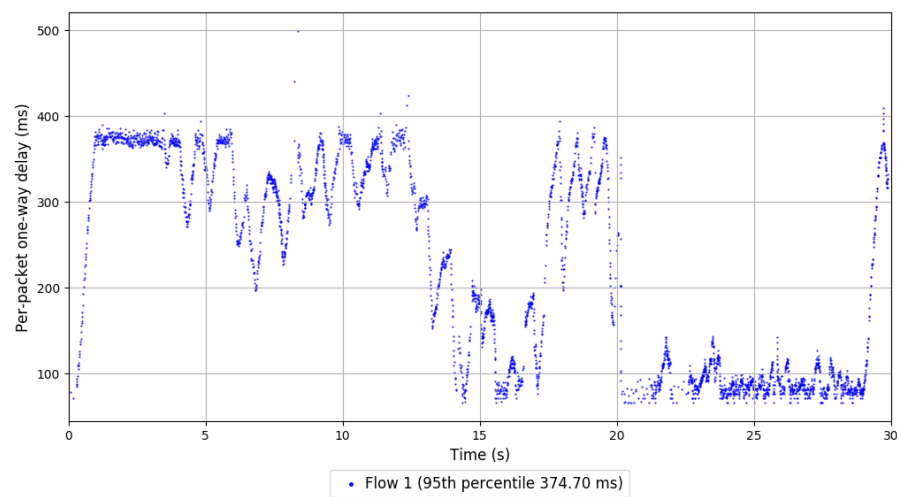
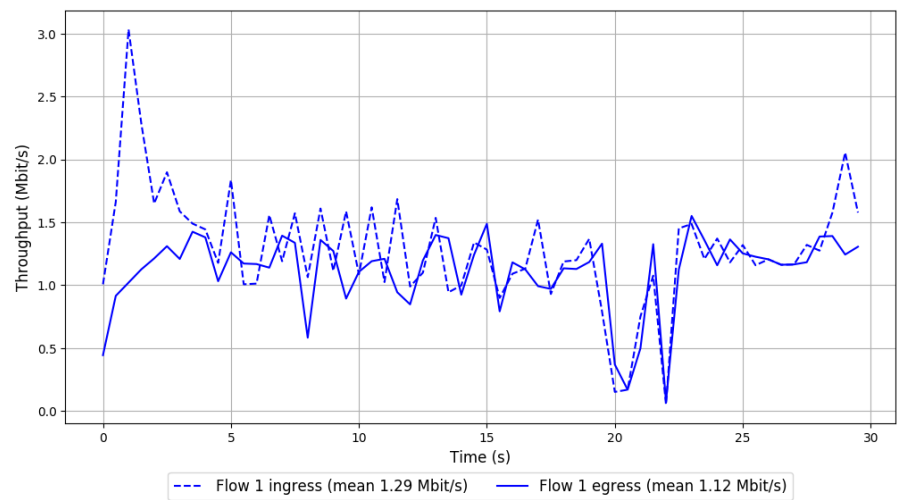


Run 3: Statistics of Vivace-latency

Start at: 2018-02-01 12:27:12
End at: 2018-02-01 12:27:42
Local clock offset: 5.081 ms
Remote clock offset: -18.015 ms

Below is generated by plot.py at 2018-02-01 13:41:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 374.699 ms
Loss rate: 13.32%
-- Flow 1:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 374.699 ms
Loss rate: 13.32%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-02-01 11:48:28

End at: 2018-02-01 11:48:58

Local clock offset: 2.786 ms

Remote clock offset: -3.068 ms

Below is generated by plot.py at 2018-02-01 13:41:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.07 Mbit/s

95th percentile per-packet one-way delay: 651.963 ms

Loss rate: 94.91%

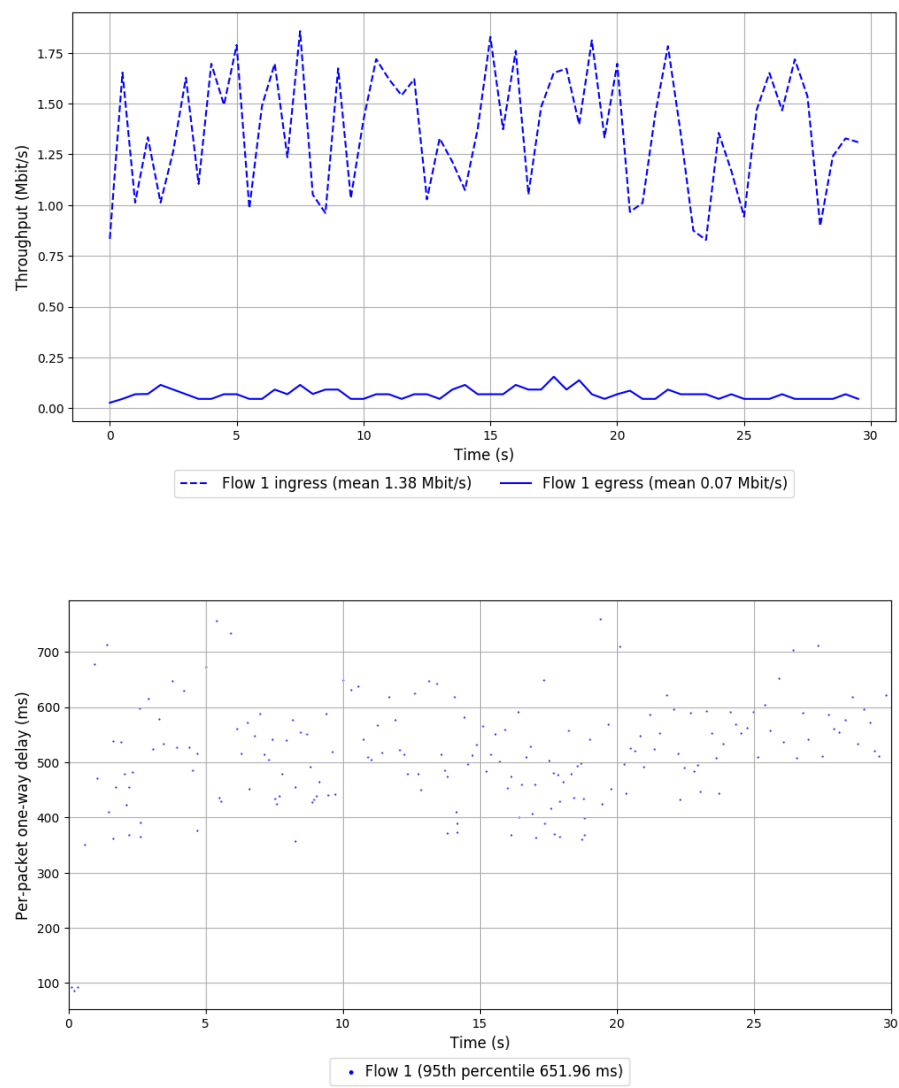
-- Flow 1:

Average throughput: 0.07 Mbit/s

95th percentile per-packet one-way delay: 651.963 ms

Loss rate: 94.91%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-02-01 12:09:21

End at: 2018-02-01 12:09:51

Local clock offset: 1.988 ms

Remote clock offset: -13.515 ms

Below is generated by plot.py at 2018-02-01 13:41:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.02 Mbit/s

95th percentile per-packet one-way delay: 1183.051 ms

Loss rate: 98.51%

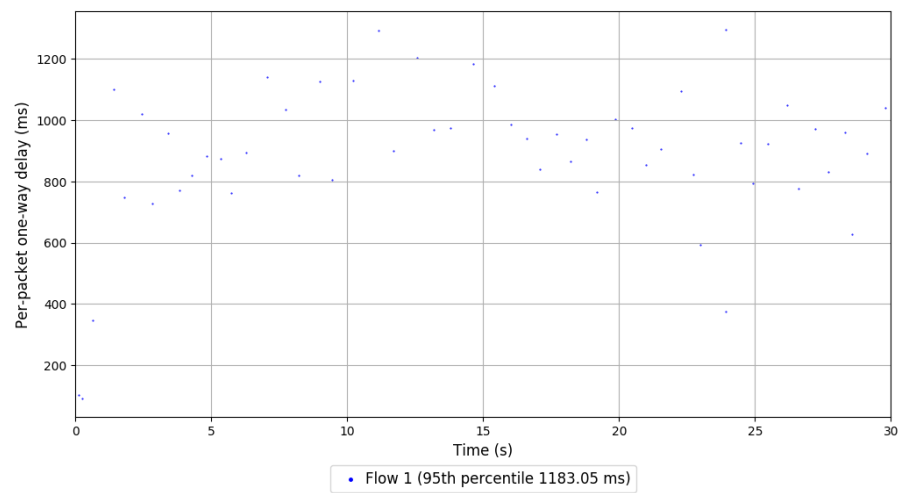
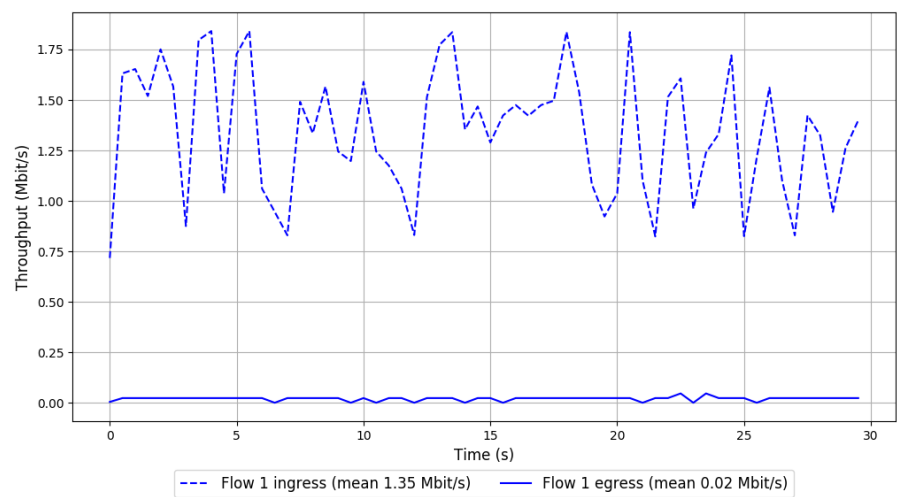
-- Flow 1:

Average throughput: 0.02 Mbit/s

95th percentile per-packet one-way delay: 1183.051 ms

Loss rate: 98.51%

Run 2: Report of Vivace-loss — Data Link

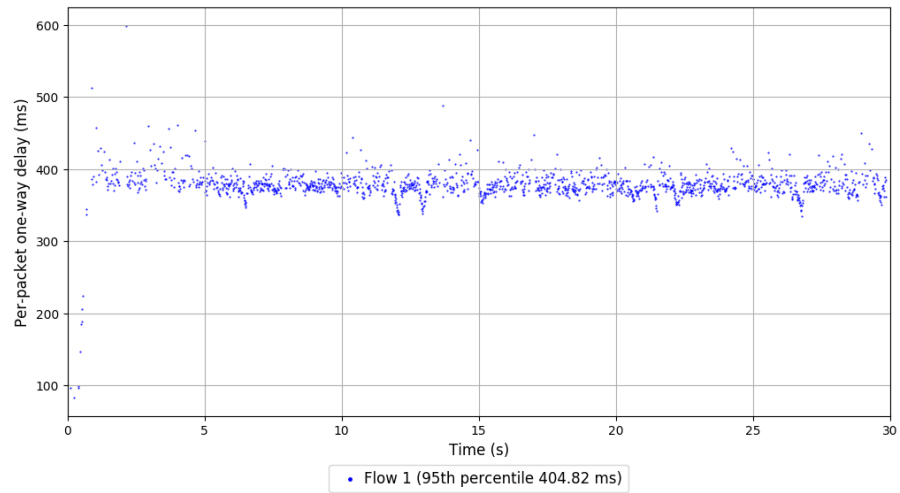
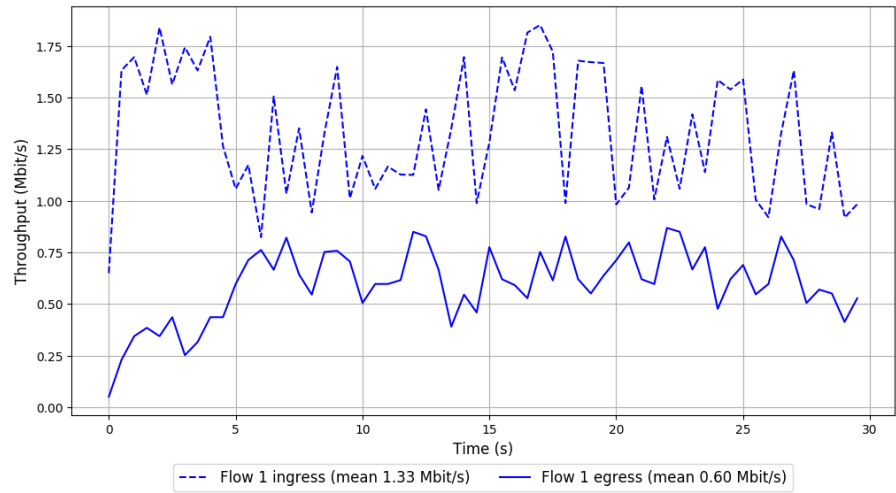


Run 3: Statistics of Vivace-loss

Start at: 2018-02-01 12:30:30
End at: 2018-02-01 12:31:00
Local clock offset: 3.801 ms
Remote clock offset: -20.227 ms

Below is generated by plot.py at 2018-02-01 13:41:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 404.820 ms
Loss rate: 55.17%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 404.820 ms
Loss rate: 55.17%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-02-01 11:40:43

End at: 2018-02-01 11:41:13

Local clock offset: 2.229 ms

Remote clock offset: -6.438 ms

Below is generated by plot.py at 2018-02-01 13:41:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 95.462 ms

Loss rate: 0.00%

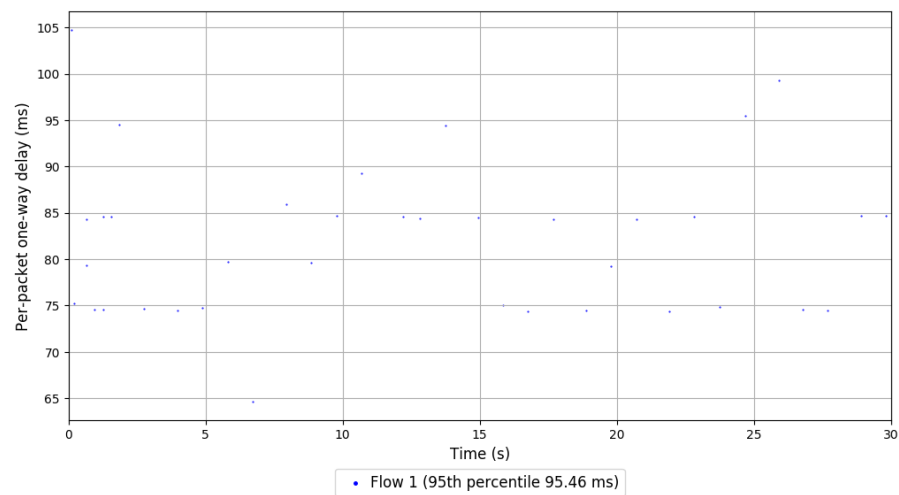
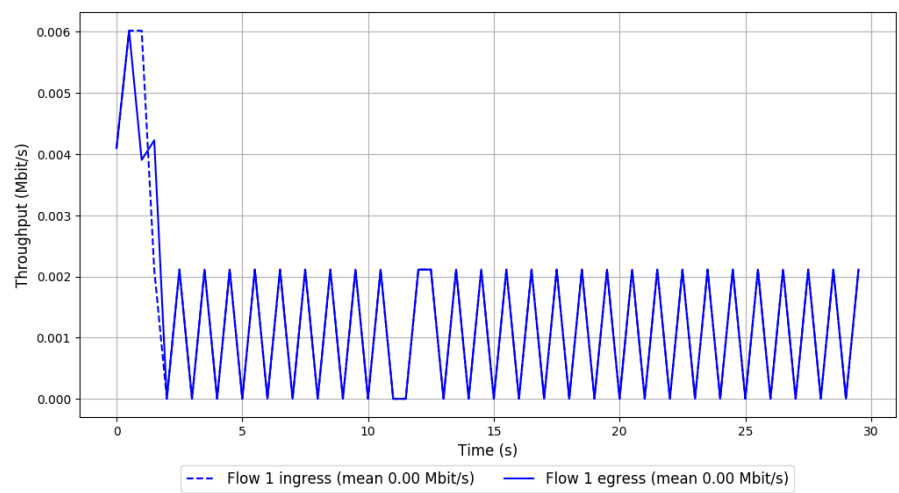
-- Flow 1:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 95.462 ms

Loss rate: 0.00%

Run 1: Report of Vivace-LTE — Data Link

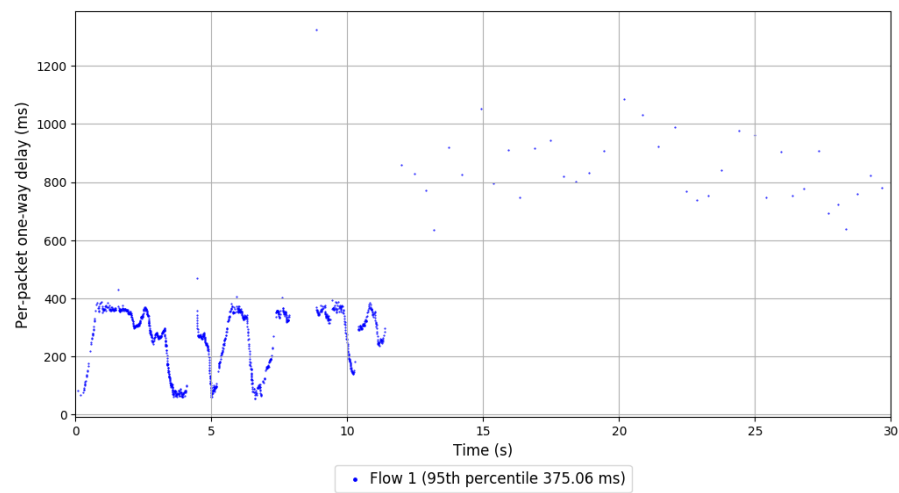
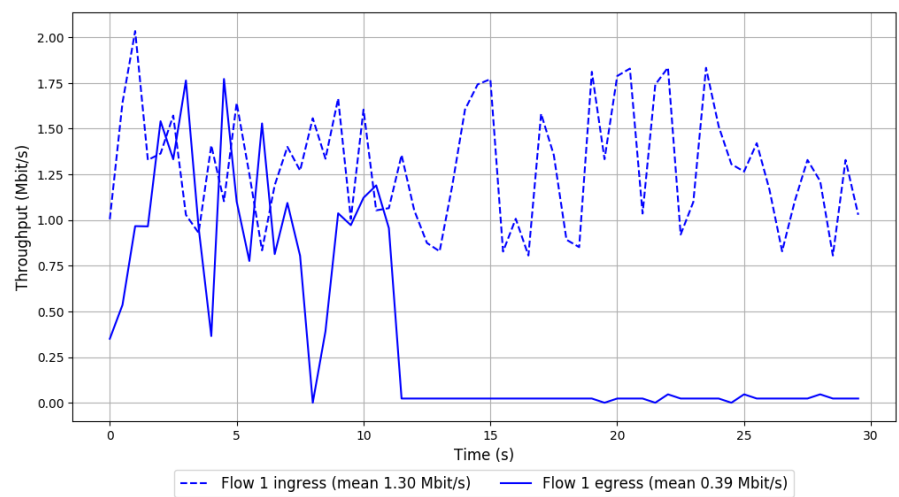


Run 2: Statistics of Vivace-LTE

Start at: 2018-02-01 12:01:40
End at: 2018-02-01 12:02:10
Local clock offset: 1.783 ms
Remote clock offset: -7.697 ms

Below is generated by plot.py at 2018-02-01 13:41:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 375.059 ms
Loss rate: 70.11%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 375.059 ms
Loss rate: 70.11%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-02-01 12:22:31
End at: 2018-02-01 12:23:01
Local clock offset: 2.234 ms
Remote clock offset: -17.581 ms

Below is generated by plot.py at 2018-02-01 13:41:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 419.375 ms
Loss rate: 58.59%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 419.375 ms
Loss rate: 58.59%

Run 3: Report of Vivace-LTE — Data Link

