

## Pantheon Report

Generated at 2018-04-03 01:58:56 (UTC).

Data path: Stanford ppp0 (*remote*) → AWS California 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).

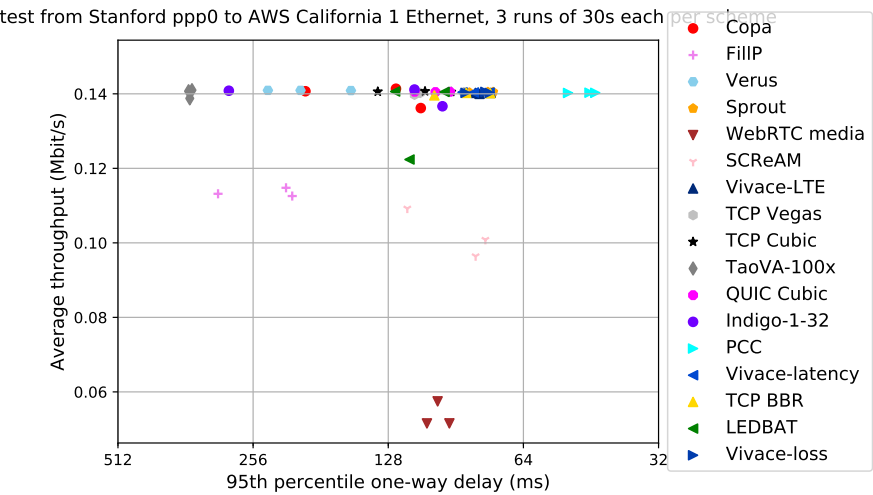
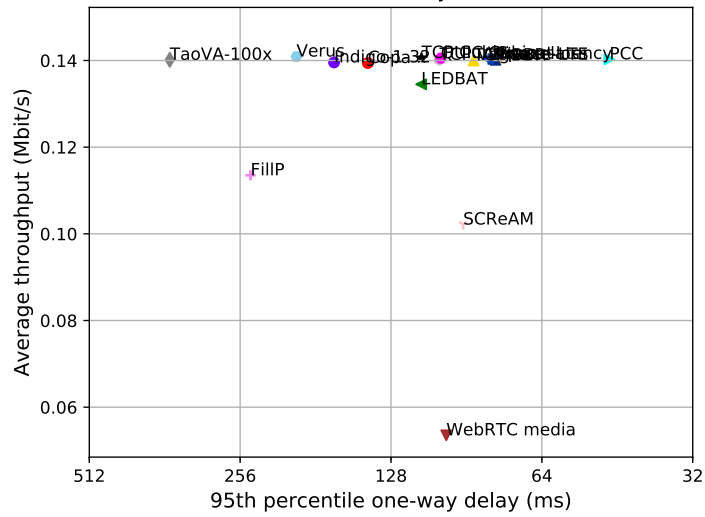
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo\_fast**).

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

Git summary:

```
branch: master @ eb420b5be9bafccd22cf68b99ff5a2000462fc59
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44
third_party/genericCC @ 9249eea3238475c4d8cca1443d28df70bff6c4a2
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eae30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webrtc @ f271183af822eee5d0031620f4bebf38aedc5581
```

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



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	0.14	87.57	18.91
TCP Cubic	3	0.14	111.27	33.22
LEDBAT	3	0.13	111.43	29.88
PCC	3	0.14	46.92	95.10
QUIC Cubic	3	0.14	101.84	64.13
SCReAM	3	0.10	91.89	1.37
WebRTC media	3	0.05	99.30	45.40
Sprout	3	0.14	78.67	44.78
TaoVA-100x	3	0.14	353.68	94.01
TCP Vegas	3	0.14	102.48	33.43
Verus	3	0.14	197.68	96.01
Copa	3	0.14	142.37	53.87
FillP	3	0.11	244.05	86.91
Indigo-1-32	3	0.14	166.26	79.73
Vivace-latency	3	0.14	82.04	88.21
Vivace-loss	3	0.14	79.99	88.39
Vivace-LTE	3	0.14	79.23	88.40

Run 1: Statistics of TCP BBR

Start at: 2018-04-02 23:49:59

End at: 2018-04-02 23:50:29

Local clock offset: -5.137 ms

Remote clock offset: -5.52 ms

# Below is generated by plot.py at 2018-04-03 01:58:27

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 85.791 ms

Loss rate: 20.31%

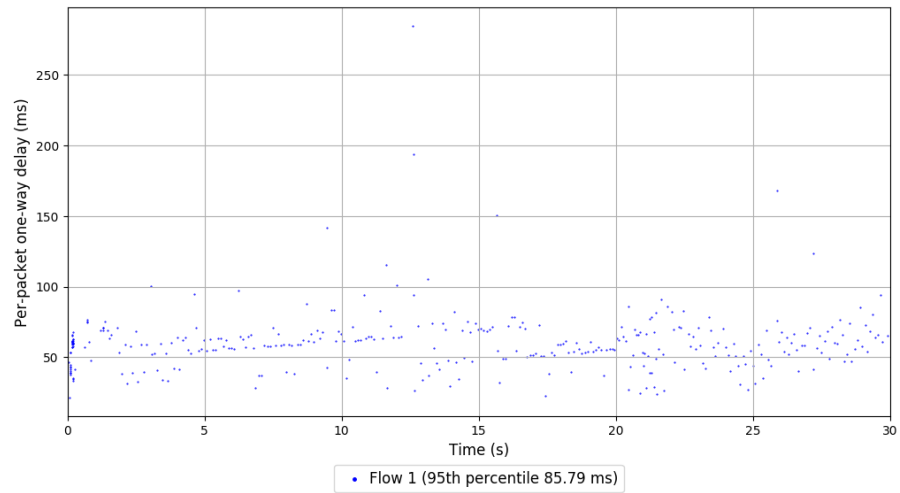
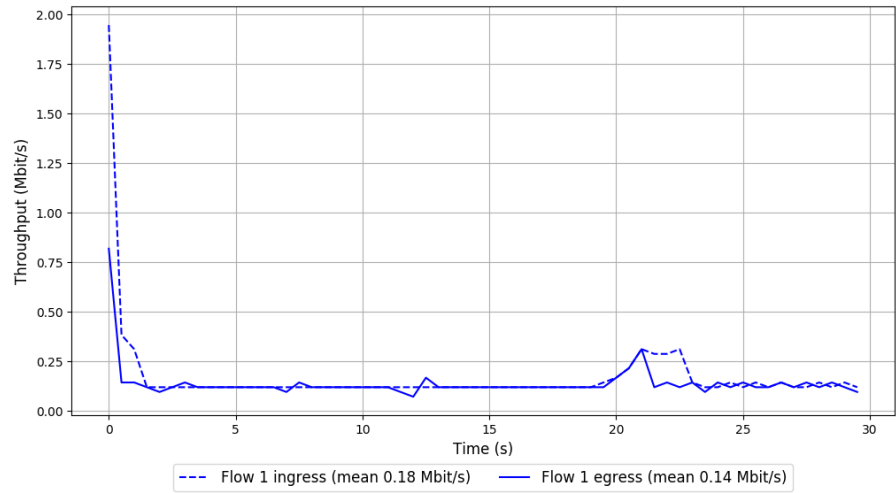
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 85.791 ms

Loss rate: 20.31%

# Run 1: Report of TCP BBR — Data Link

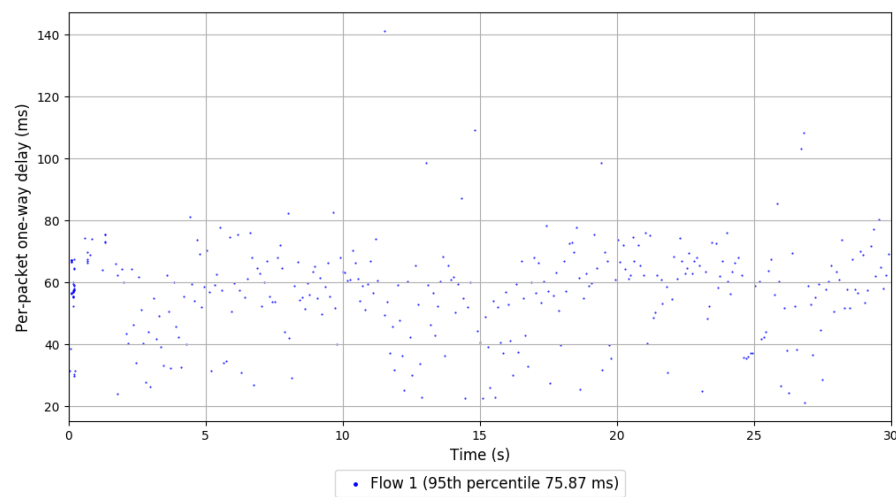
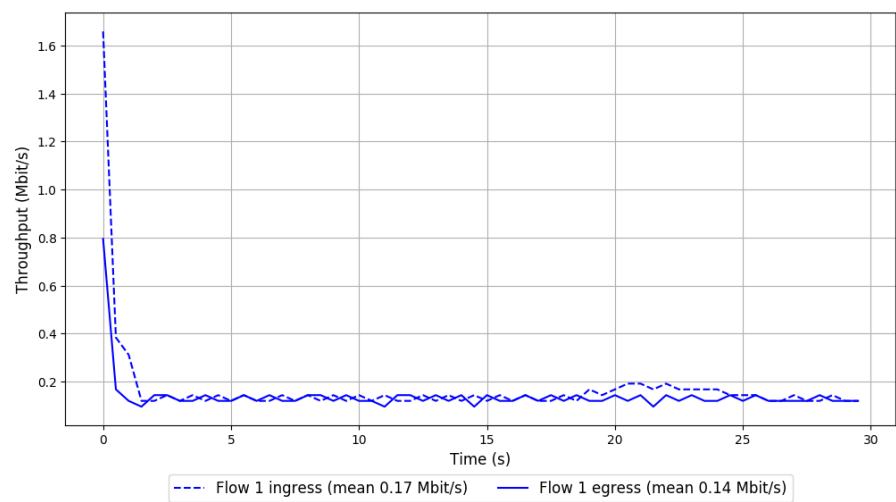


Run 2: Statistics of TCP BBR

Start at: 2018-04-03 00:13:29  
End at: 2018-04-03 00:13:59  
Local clock offset: -7.86 ms  
Remote clock offset: -4.914 ms

# Below is generated by plot.py at 2018-04-03 01:58:28  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 75.872 ms  
Loss rate: 18.26%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 75.872 ms  
Loss rate: 18.26%

Run 2: Report of TCP BBR — Data Link



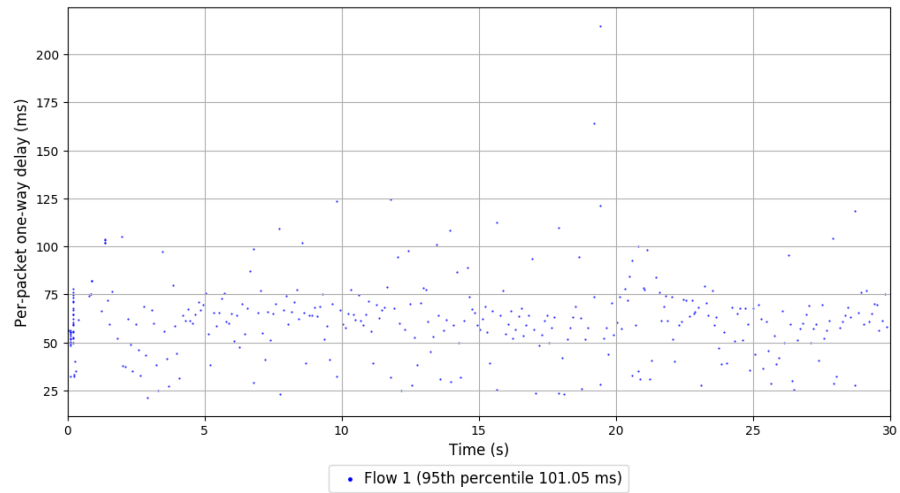
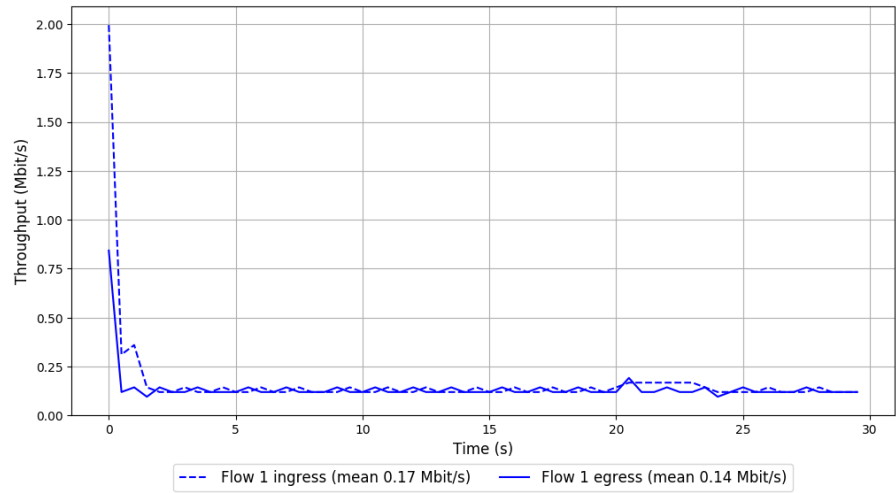
Run 3: Statistics of TCP BBR

Start at: 2018-04-03 00:36:58  
End at: 2018-04-03 00:37:28  
Local clock offset: -13.214 ms  
Remote clock offset: -4.959 ms

# Below is generated by plot.py at 2018-04-03 01:58:28  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 101.053 ms  
Loss rate: 18.16%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 101.053 ms  
Loss rate: 18.16%



### Run 3: Report of TCP BBR — Data Link

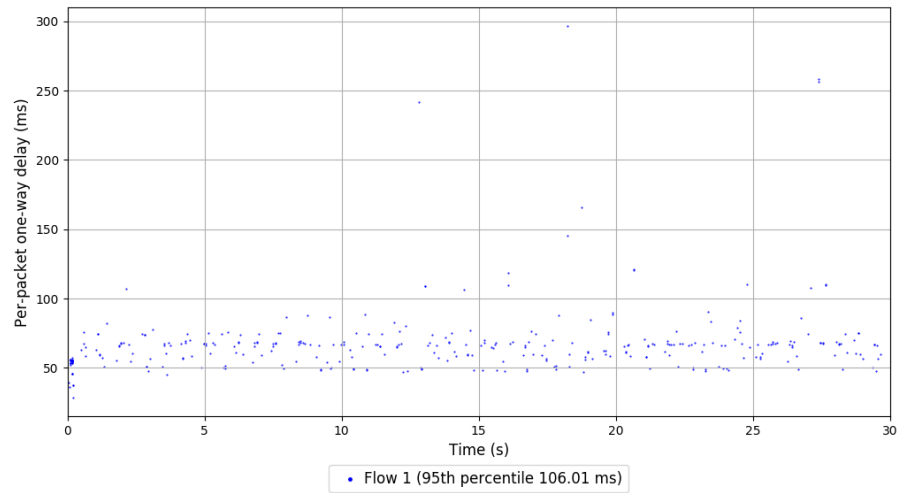
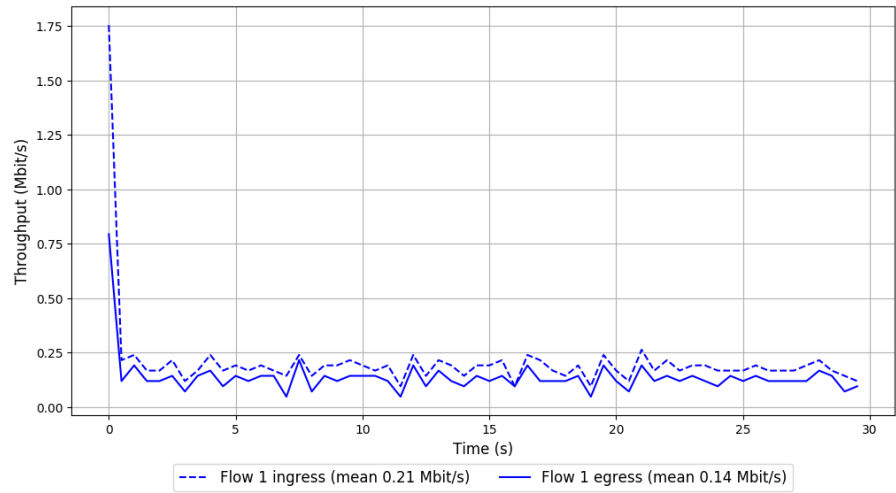


Run 1: Statistics of TCP Cubic

Start at: 2018-04-02 23:39:32  
End at: 2018-04-02 23:40:02  
Local clock offset: -1.397 ms  
Remote clock offset: -6.023 ms

# Below is generated by plot.py at 2018-04-03 01:58:28  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 106.009 ms  
Loss rate: 32.87%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 106.009 ms  
Loss rate: 32.87%

### Run 1: Report of TCP Cubic — Data Link

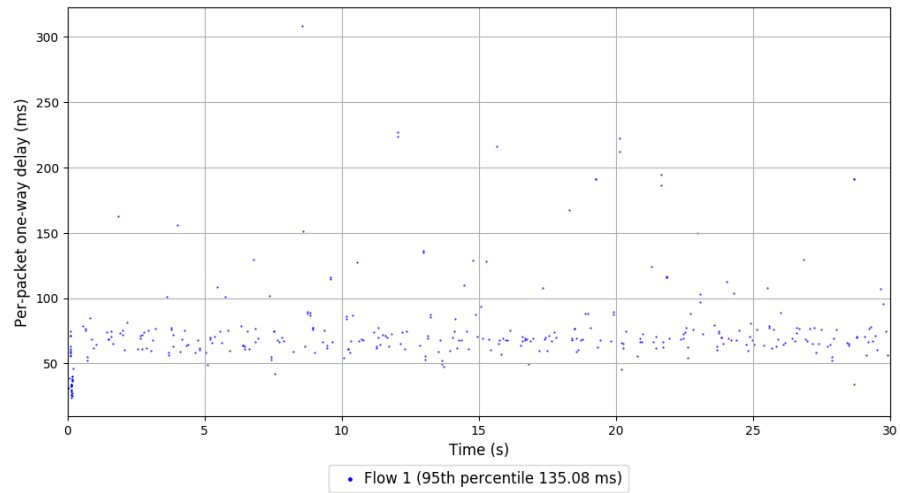
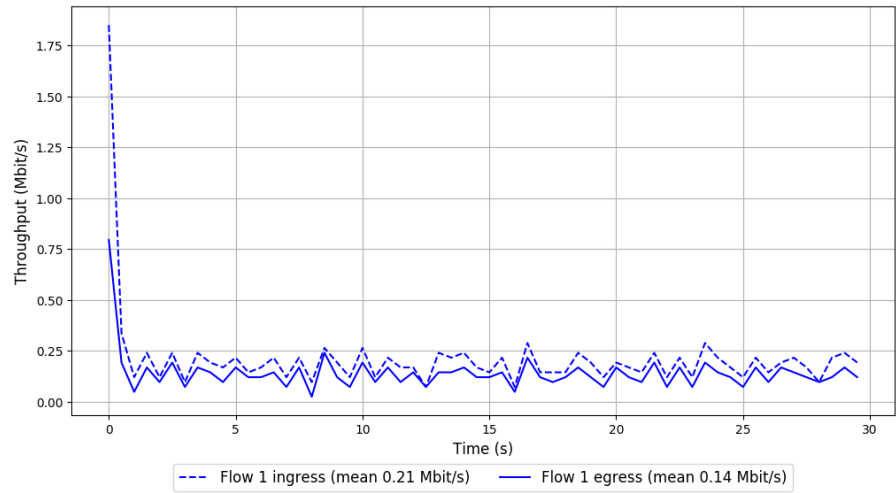


Run 2: Statistics of TCP Cubic

Start at: 2018-04-03 00:03:01  
End at: 2018-04-03 00:03:31  
Local clock offset: -6.806 ms  
Remote clock offset: -5.161 ms

# Below is generated by plot.py at 2018-04-03 01:58:28  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 135.079 ms  
Loss rate: 33.33%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 135.079 ms  
Loss rate: 33.33%

## Run 2: Report of TCP Cubic — Data Link

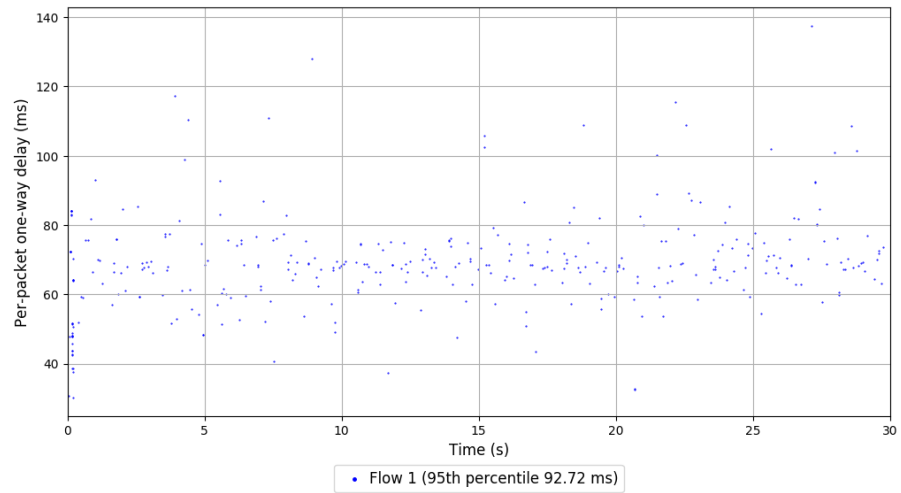
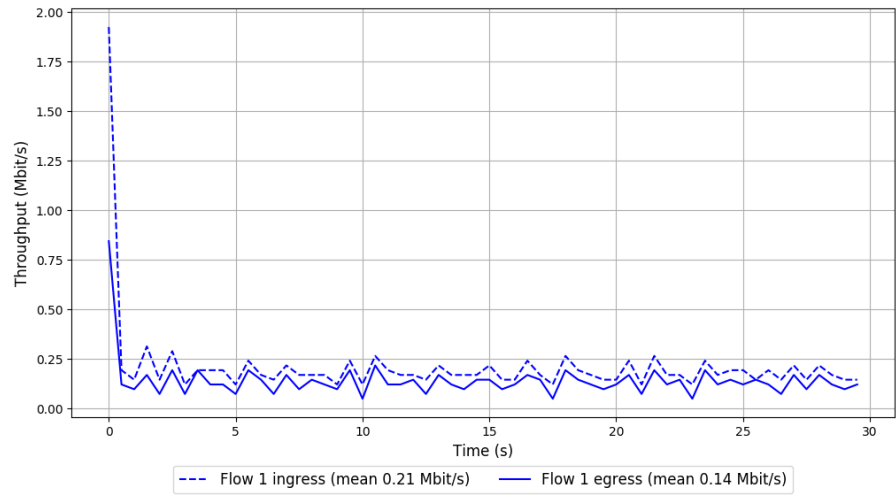


Run 3: Statistics of TCP Cubic

Start at: 2018-04-03 00:26:31  
End at: 2018-04-03 00:27:01  
Local clock offset: -9.121 ms  
Remote clock offset: -4.927 ms

# Below is generated by plot.py at 2018-04-03 01:58:28  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 92.716 ms  
Loss rate: 33.45%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 92.716 ms  
Loss rate: 33.45%

### Run 3: Report of TCP Cubic — Data Link



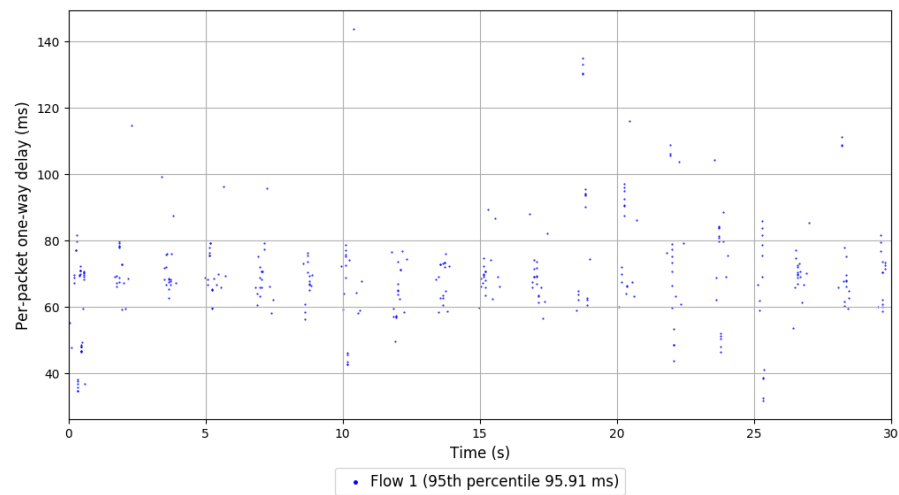
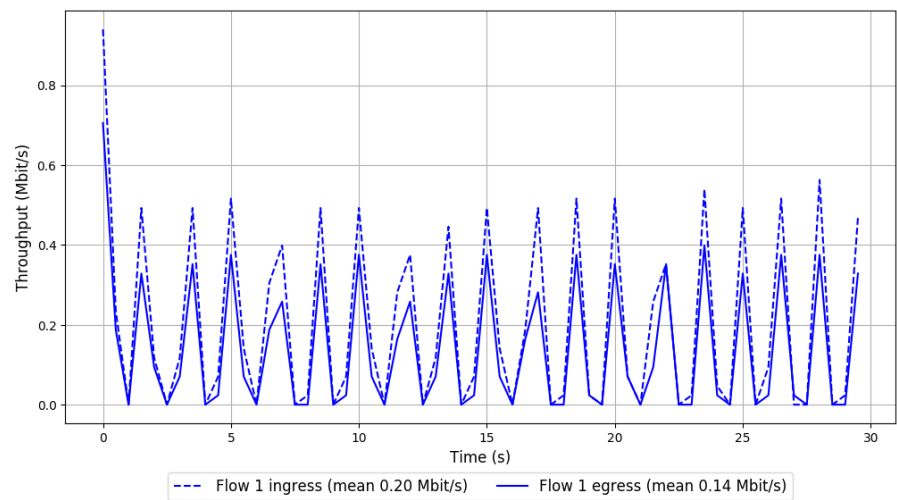
```
Run 1: Statistics of LEDBAT

Start at: 2018-04-02 23:56:30
End at: 2018-04-02 23:57:00
Local clock offset: -4.707 ms
Remote clock offset: -5.341 ms

# Below is generated by plot.py at 2018-04-03 01:58:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 95.911 ms
Loss rate: 31.40%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 95.911 ms
Loss rate: 31.40%
```



Run 1: Report of LEDBAT — Data Link

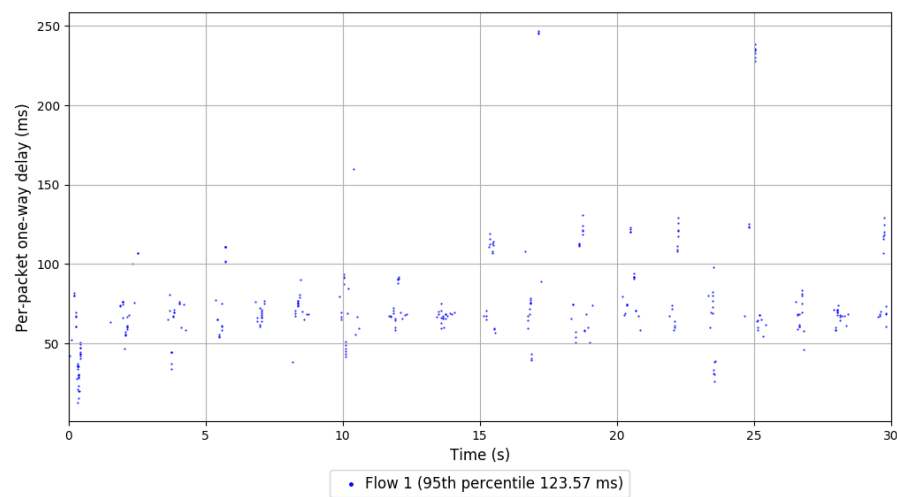
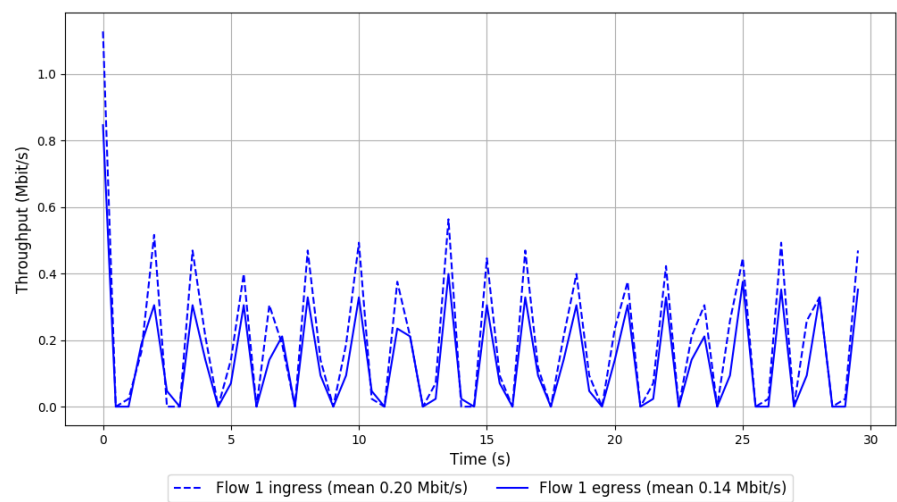


Run 2: Statistics of LEDBAT

Start at: 2018-04-03 00:20:00  
End at: 2018-04-03 00:20:30  
Local clock offset: -7.55 ms  
Remote clock offset: -4.907 ms

# Below is generated by plot.py at 2018-04-03 01:58:28  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 123.573 ms  
Loss rate: 29.16%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 123.573 ms  
Loss rate: 29.16%

Run 2: Report of LEDBAT — Data Link

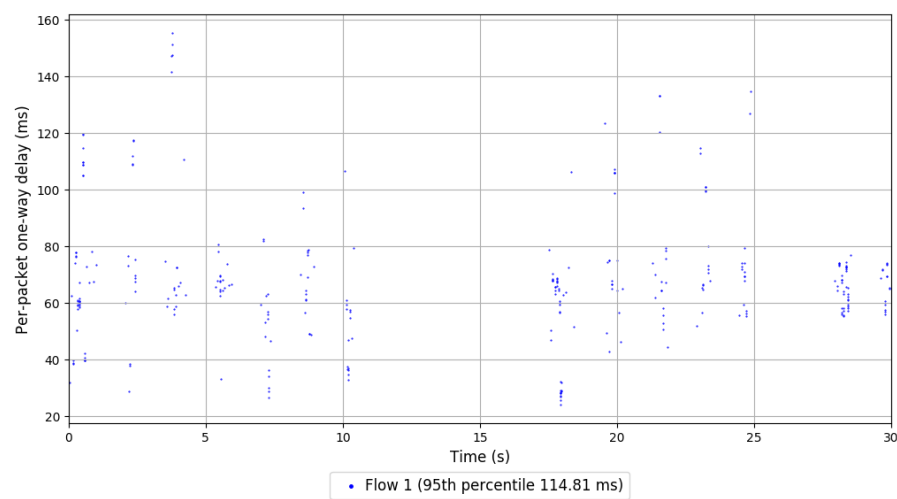
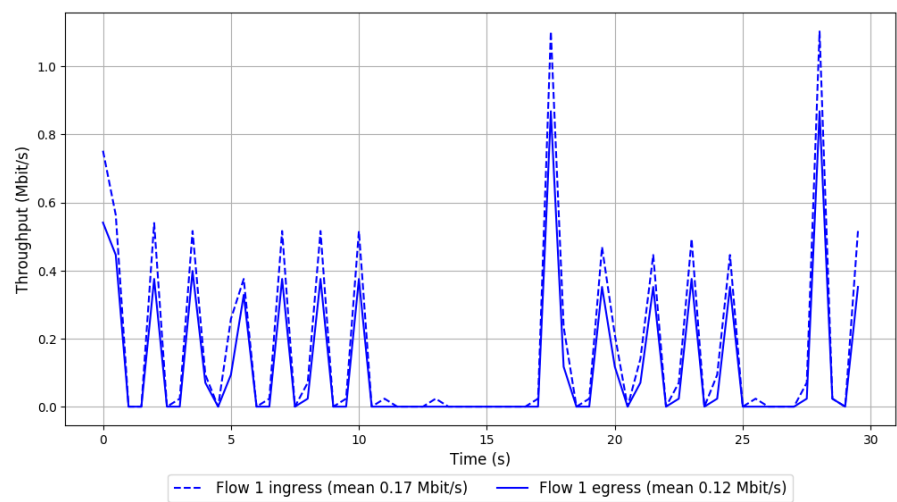


Run 3: Statistics of LEDBAT

Start at: 2018-04-03 00:43:29  
End at: 2018-04-03 00:43:59  
Local clock offset: -15.464 ms  
Remote clock offset: -4.839 ms

# Below is generated by plot.py at 2018-04-03 01:58:31  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.12 Mbit/s  
95th percentile per-packet one-way delay: 114.812 ms  
Loss rate: 29.09%  
-- Flow 1:  
Average throughput: 0.12 Mbit/s  
95th percentile per-packet one-way delay: 114.812 ms  
Loss rate: 29.09%

Run 3: Report of LEDBAT — Data Link

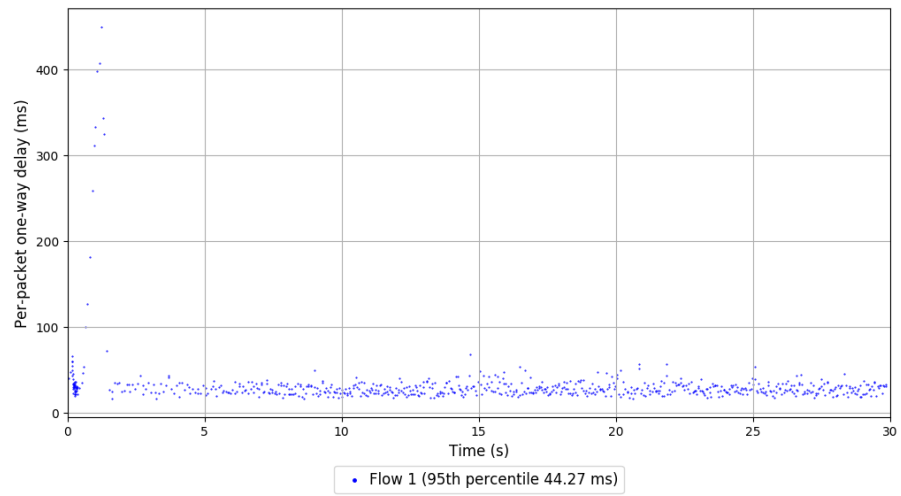
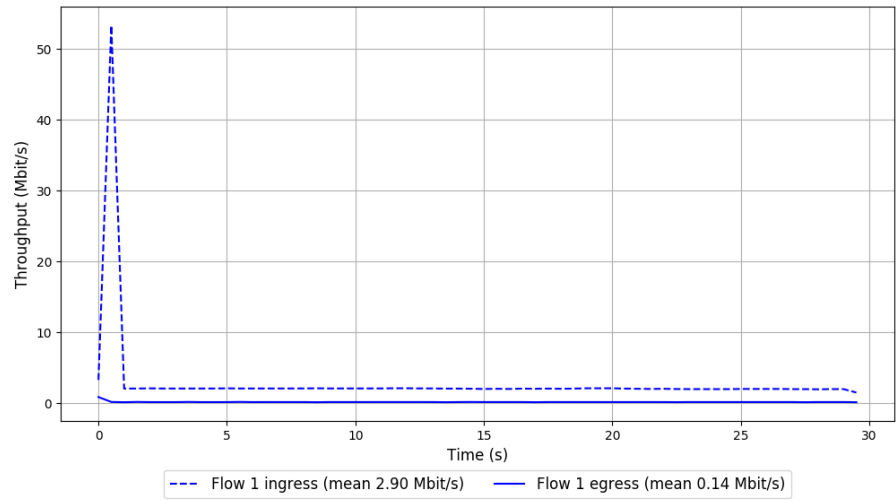


Run 1: Statistics of PCC

Start at: 2018-04-02 23:55:12  
End at: 2018-04-02 23:55:42  
Local clock offset: -4.678 ms  
Remote clock offset: -5.383 ms

# Below is generated by plot.py at 2018-04-03 01:58:34  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 44.267 ms  
Loss rate: 95.17%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 44.267 ms  
Loss rate: 95.17%

### Run 1: Report of PCC — Data Link



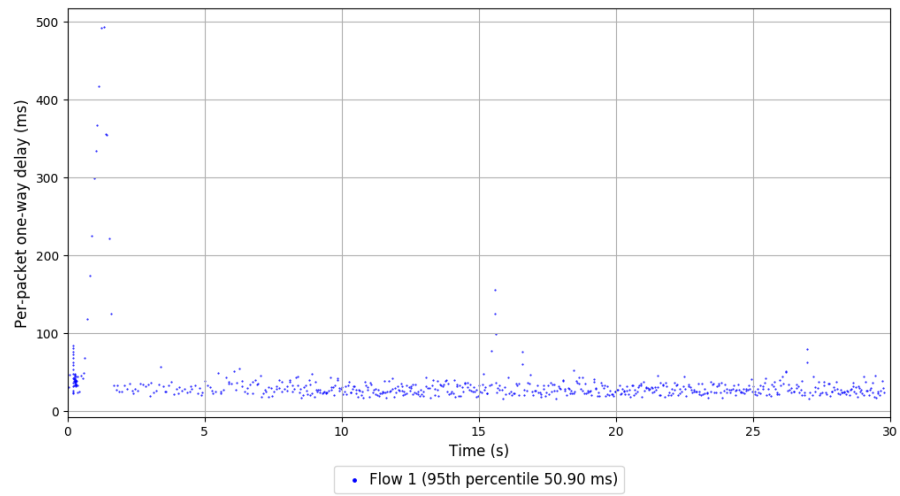
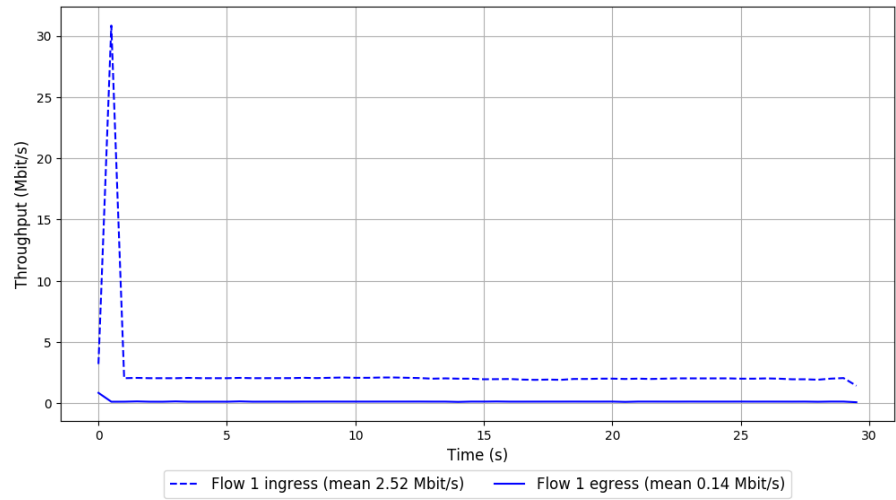
Run 2: Statistics of PCC

Start at: 2018-04-03 00:18:41  
End at: 2018-04-03 00:19:11  
Local clock offset: -7.535 ms  
Remote clock offset: -4.896 ms

# Below is generated by plot.py at 2018-04-03 01:58:34  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 50.899 ms  
Loss rate: 94.45%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 50.899 ms  
Loss rate: 94.45%



## Run 2: Report of PCC — Data Link

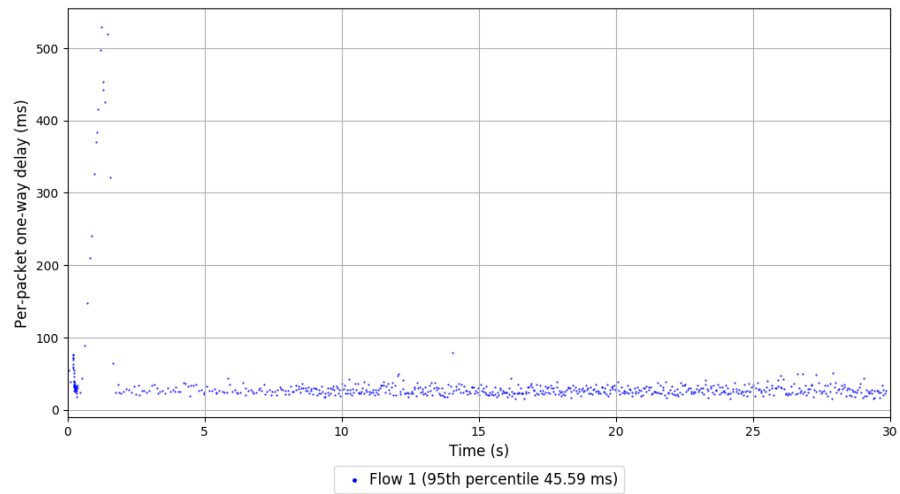
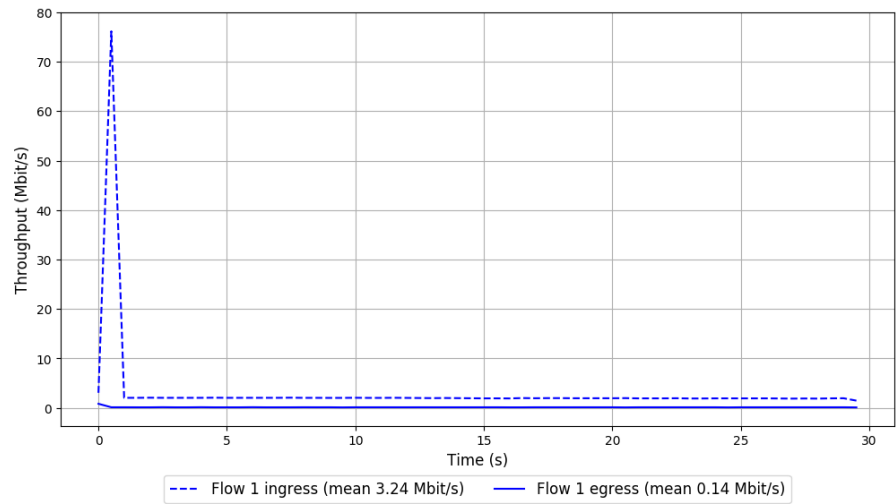


Run 3: Statistics of PCC

Start at: 2018-04-03 00:42:11  
End at: 2018-04-03 00:42:41  
Local clock offset: -15.727 ms  
Remote clock offset: -4.846 ms

# Below is generated by plot.py at 2018-04-03 01:58:34  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 45.593 ms  
Loss rate: 95.68%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 45.593 ms  
Loss rate: 95.68%

### Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-04-02 23:42:08

End at: 2018-04-02 23:42:38

Local clock offset: -2.222 ms

Remote clock offset: -6.099 ms

# Below is generated by plot.py at 2018-04-03 01:58:34

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 93.264 ms

Loss rate: 63.61%

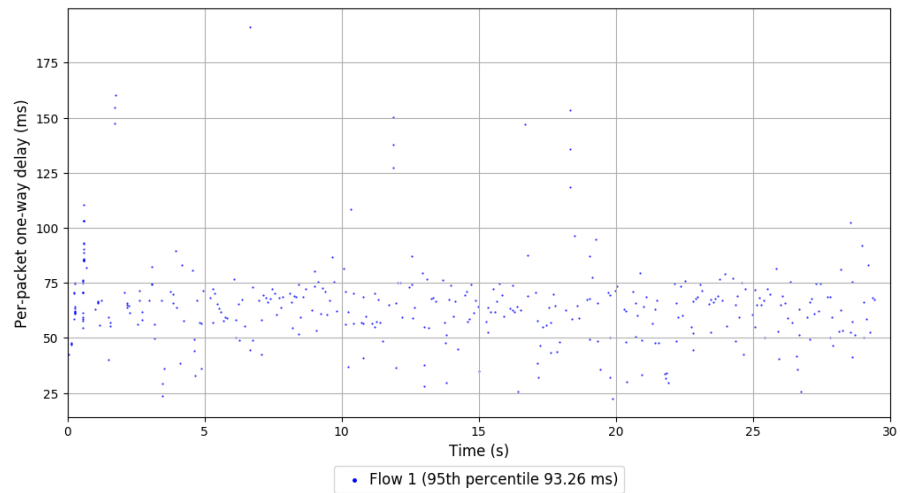
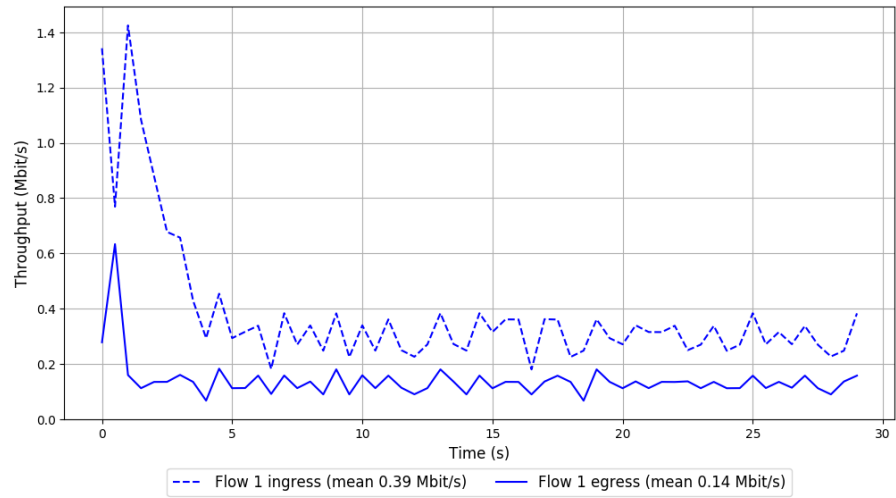
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 93.264 ms

Loss rate: 63.61%

## Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-04-03 00:05:38

End at: 2018-04-03 00:06:08

Local clock offset: -8.312 ms

Remote clock offset: -5.11 ms

# Below is generated by plot.py at 2018-04-03 01:58:34

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 100.486 ms

Loss rate: 64.91%

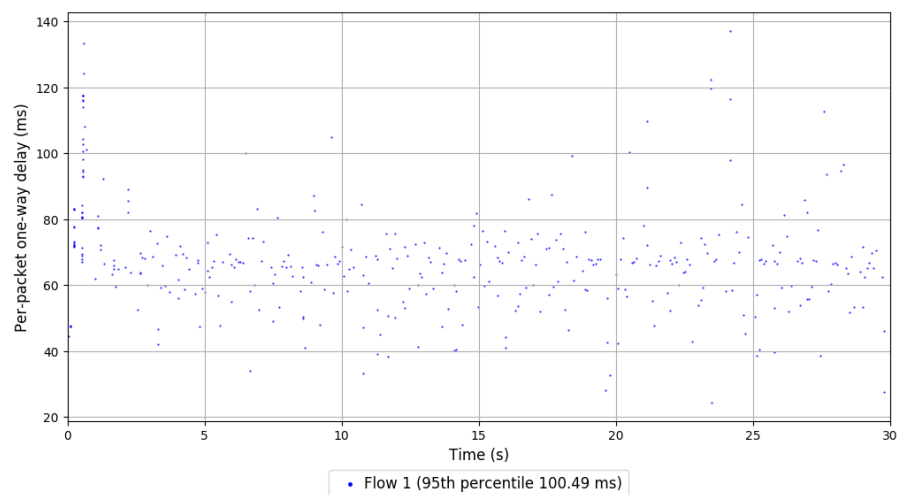
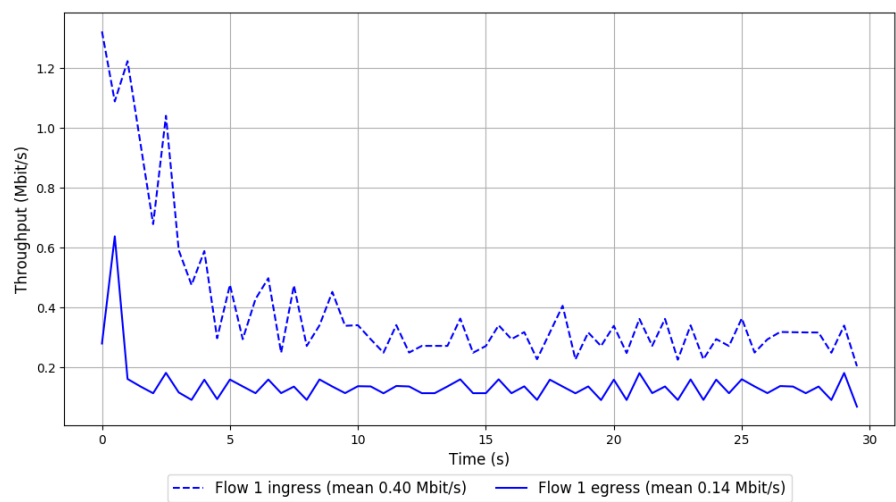
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 100.486 ms

Loss rate: 64.91%

## Run 2: Report of QUIC Cubic — Data Link



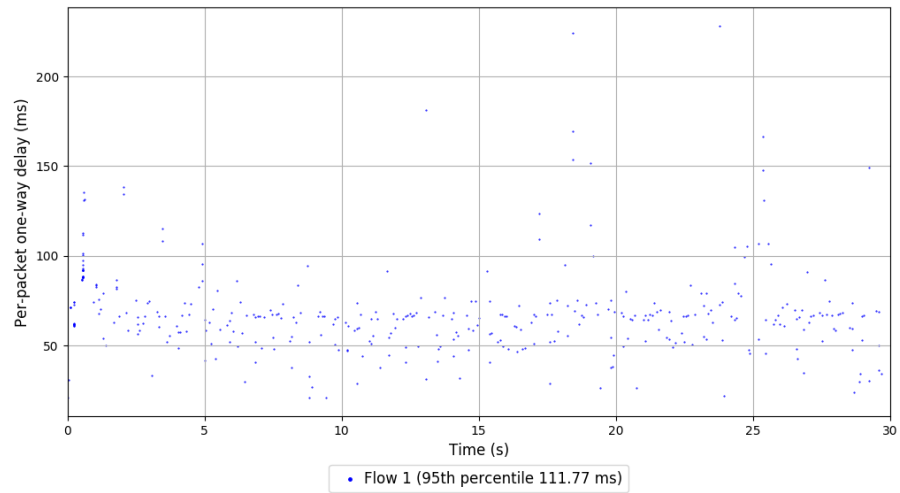
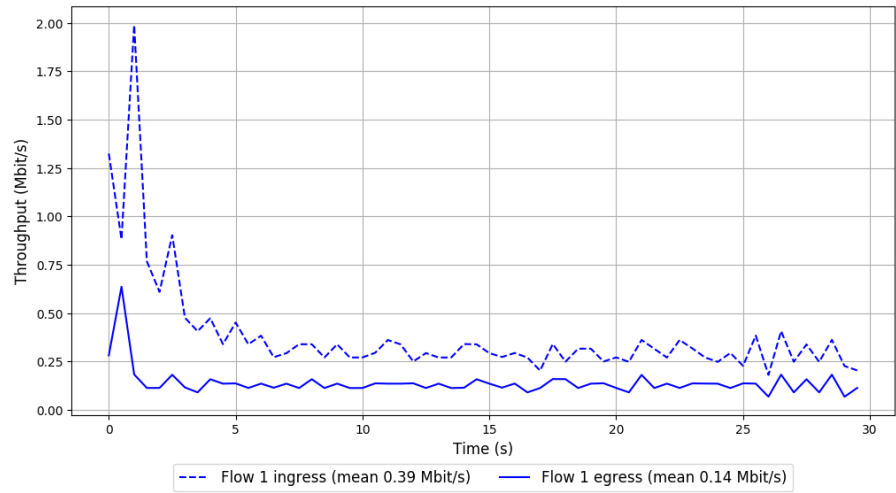
Run 3: Statistics of QUIC Cubic

Start at: 2018-04-03 00:29:08  
End at: 2018-04-03 00:29:38  
Local clock offset: -10.034 ms  
Remote clock offset: -4.951 ms

# Below is generated by plot.py at 2018-04-03 01:58:34  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 111.768 ms  
Loss rate: 63.88%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 111.768 ms  
Loss rate: 63.88%



### Run 3: Report of QUIC Cubic — Data Link

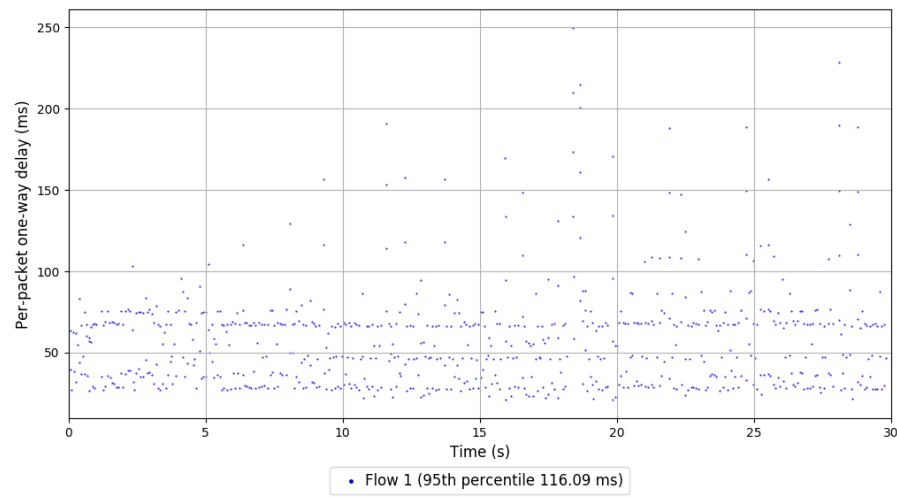
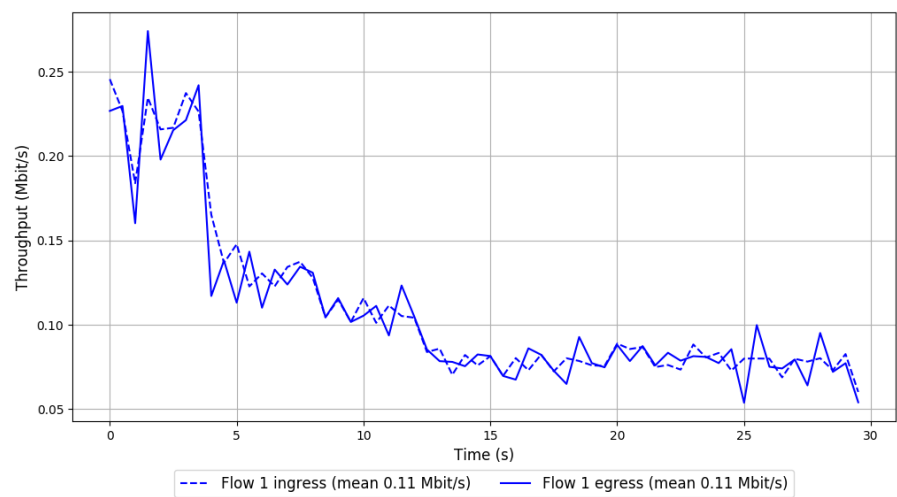


Run 1: Statistics of SCReAM

Start at: 2018-04-02 23:40:50  
End at: 2018-04-02 23:41:20  
Local clock offset: -1.294 ms  
Remote clock offset: -6.089 ms

# Below is generated by plot.py at 2018-04-03 01:58:34  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.11 Mbit/s  
95th percentile per-packet one-way delay: 116.089 ms  
Loss rate: 1.66%  
-- Flow 1:  
Average throughput: 0.11 Mbit/s  
95th percentile per-packet one-way delay: 116.089 ms  
Loss rate: 1.66%

Run 1: Report of SReAM — Data Link

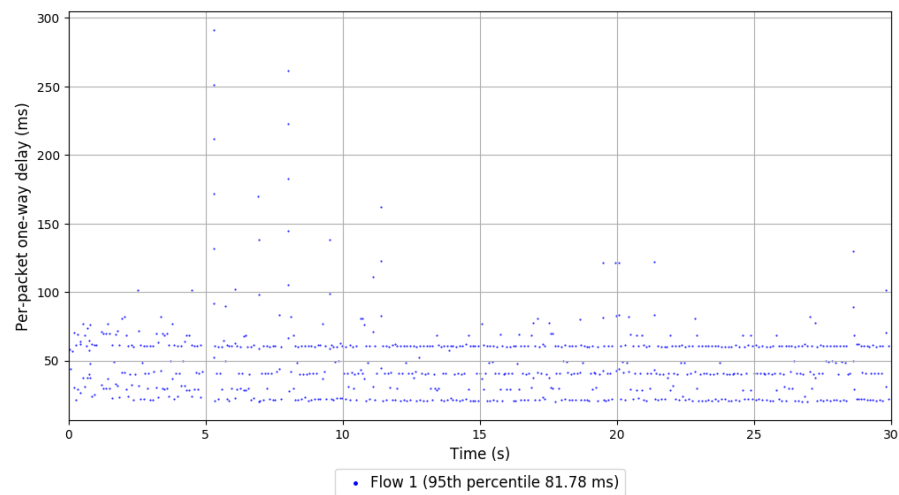
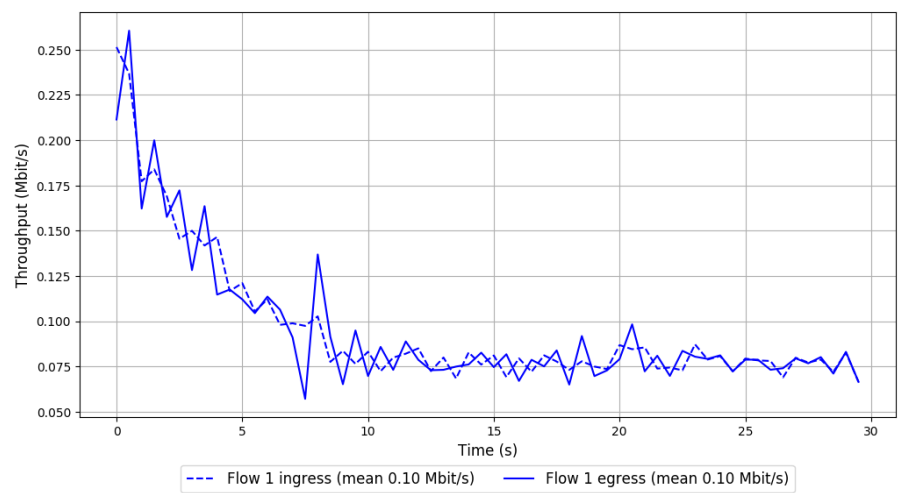


Run 2: Statistics of SCReAM

Start at: 2018-04-03 00:04:20  
End at: 2018-04-03 00:04:50  
Local clock offset: -7.675 ms  
Remote clock offset: -5.132 ms

# Below is generated by plot.py at 2018-04-03 01:58:35  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.10 Mbit/s  
95th percentile per-packet one-way delay: 81.779 ms  
Loss rate: 0.64%  
-- Flow 1:  
Average throughput: 0.10 Mbit/s  
95th percentile per-packet one-way delay: 81.779 ms  
Loss rate: 0.64%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-04-03 00:27:49

End at: 2018-04-03 00:28:19

Local clock offset: -9.617 ms

Remote clock offset: -4.98 ms

# Below is generated by plot.py at 2018-04-03 01:58:36

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 77.788 ms

Loss rate: 1.81%

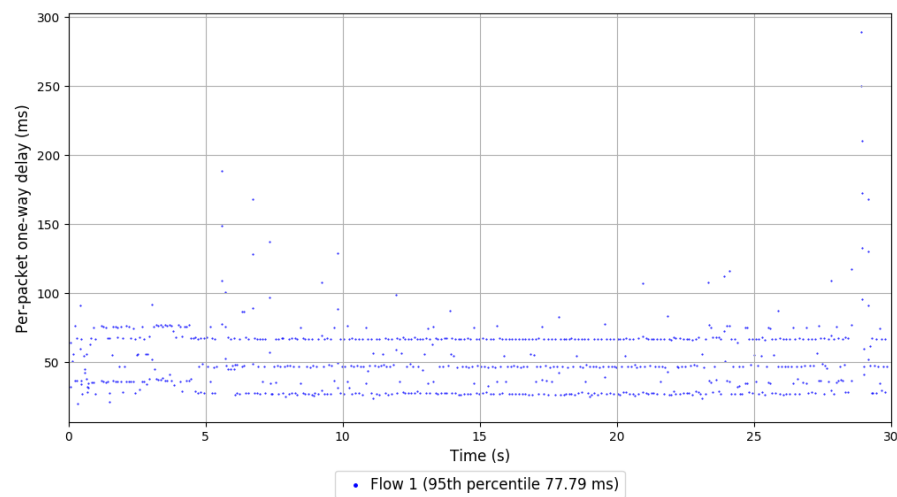
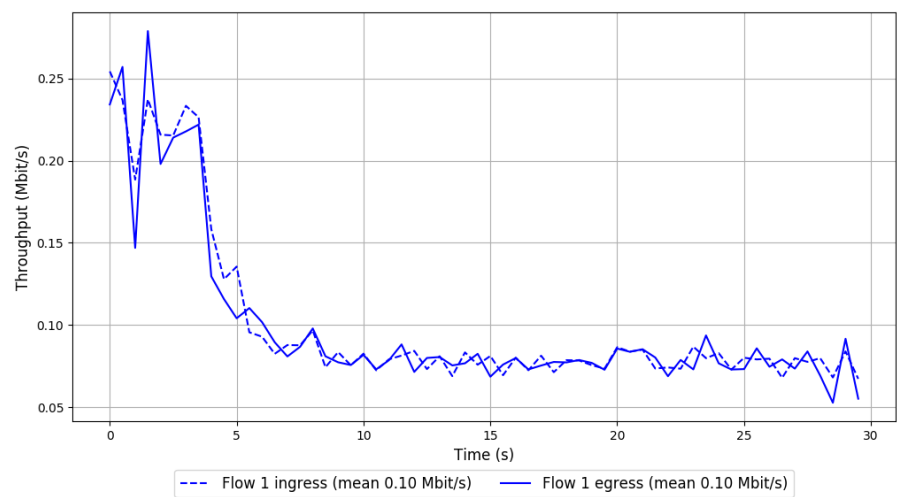
-- Flow 1:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 77.788 ms

Loss rate: 1.81%

Run 3: Report of SCSReAM — Data Link



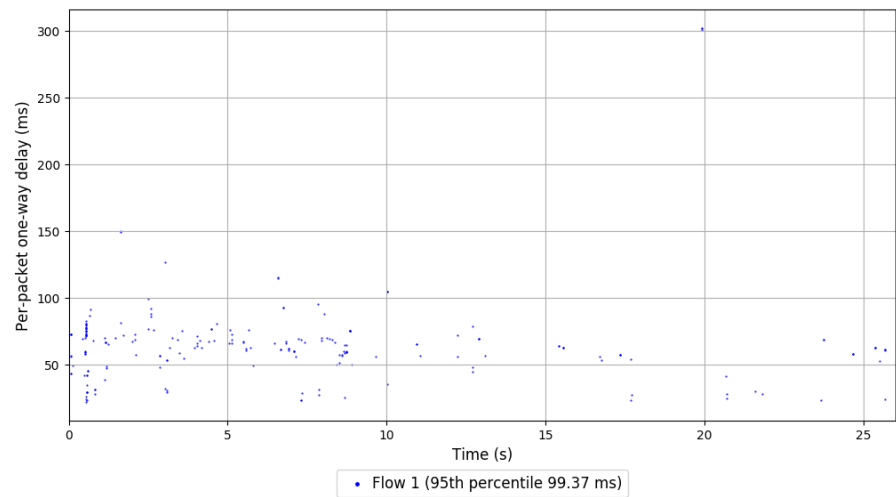
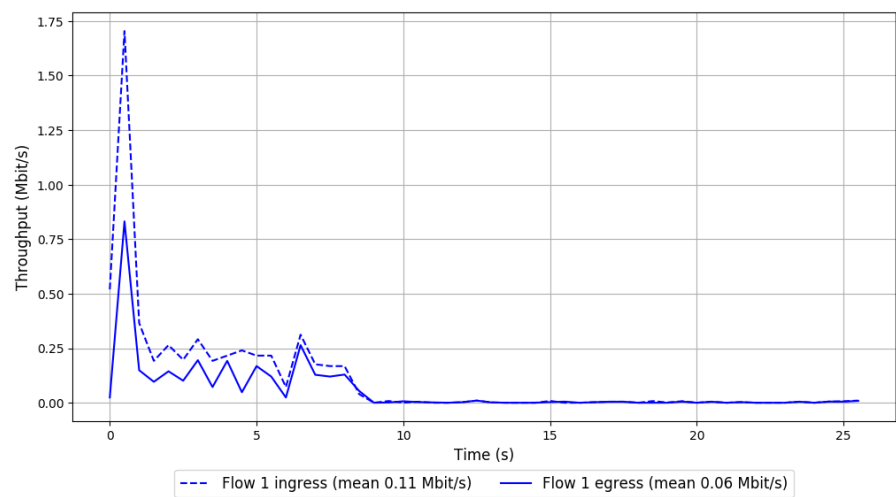
Run 1: Statistics of WebRTC media

Start at: 2018-04-02 23:51:17  
End at: 2018-04-02 23:51:47  
Local clock offset: -6.143 ms  
Remote clock offset: -5.546 ms

# Below is generated by plot.py at 2018-04-03 01:58:37  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.06 Mbit/s  
95th percentile per-packet one-way delay: 99.370 ms  
Loss rate: 47.87%  
-- Flow 1:  
Average throughput: 0.06 Mbit/s  
95th percentile per-packet one-way delay: 99.370 ms  
Loss rate: 47.87%



Run 1: Report of WebRTC media — Data Link

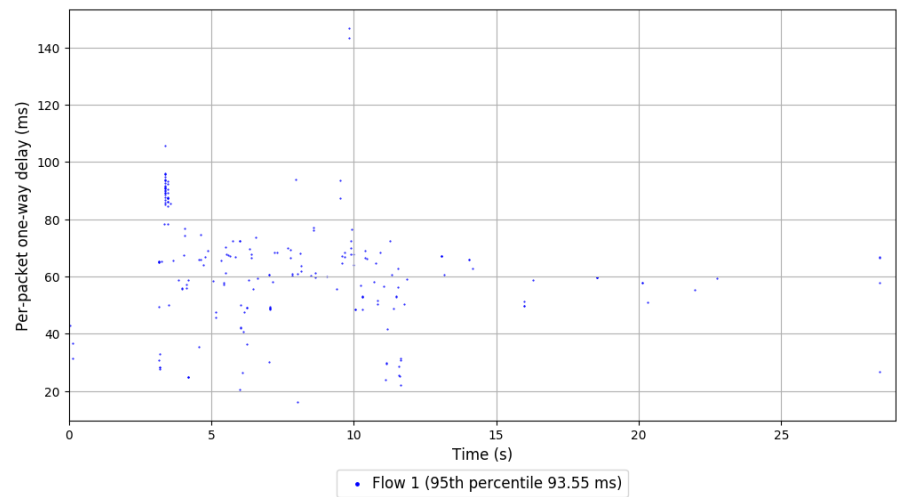
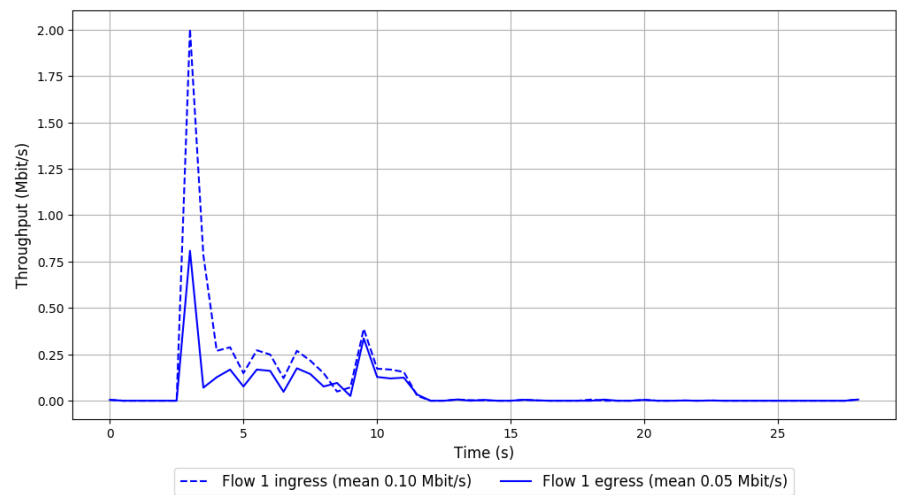


Run 2: Statistics of WebRTC media

Start at: 2018-04-03 00:14:47  
End at: 2018-04-03 00:15:17  
Local clock offset: -7.576 ms  
Remote clock offset: -4.889 ms

# Below is generated by plot.py at 2018-04-03 01:58:37  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.05 Mbit/s  
95th percentile per-packet one-way delay: 93.554 ms  
Loss rate: 49.89%  
-- Flow 1:  
Average throughput: 0.05 Mbit/s  
95th percentile per-packet one-way delay: 93.554 ms  
Loss rate: 49.89%

Run 2: Report of WebRTC media — Data Link

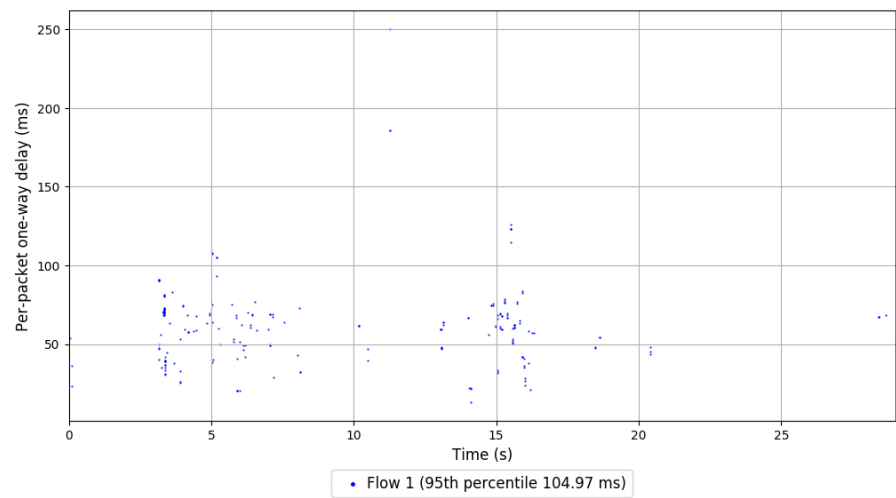
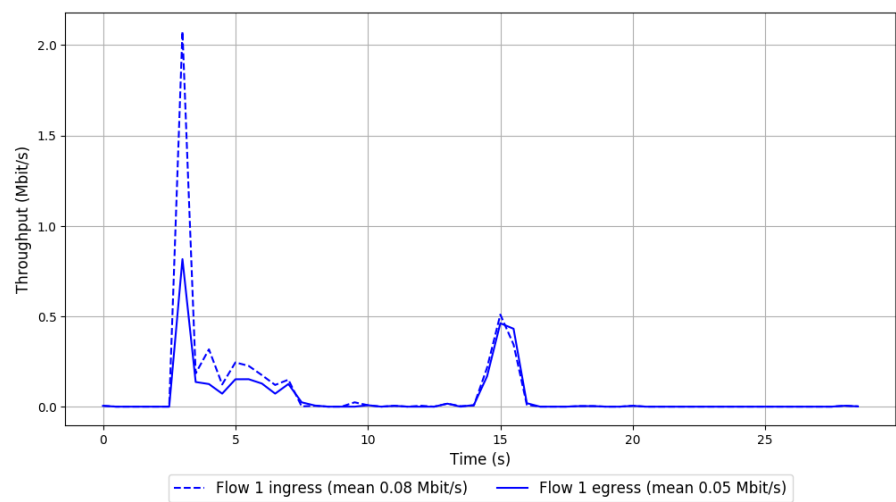


Run 3: Statistics of WebRTC media

Start at: 2018-04-03 00:38:16  
End at: 2018-04-03 00:38:46  
Local clock offset: -13.836 ms  
Remote clock offset: -4.874 ms

# Below is generated by plot.py at 2018-04-03 01:58:37  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.05 Mbit/s  
95th percentile per-packet one-way delay: 104.967 ms  
Loss rate: 38.43%  
-- Flow 1:  
Average throughput: 0.05 Mbit/s  
95th percentile per-packet one-way delay: 104.967 ms  
Loss rate: 38.43%

Run 3: Report of WebRTC media — Data Link



Run 1: Statistics of Sprout

Start at: 2018-04-02 23:53:54

End at: 2018-04-02 23:54:24

Local clock offset: -5.04 ms

Remote clock offset: -5.38 ms

# Below is generated by plot.py at 2018-04-03 01:58:38

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 76.806 ms

Loss rate: 43.48%

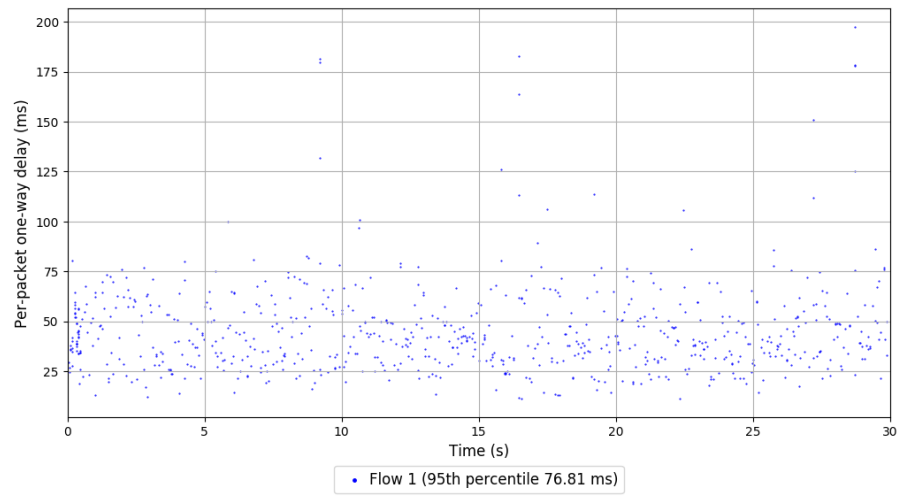
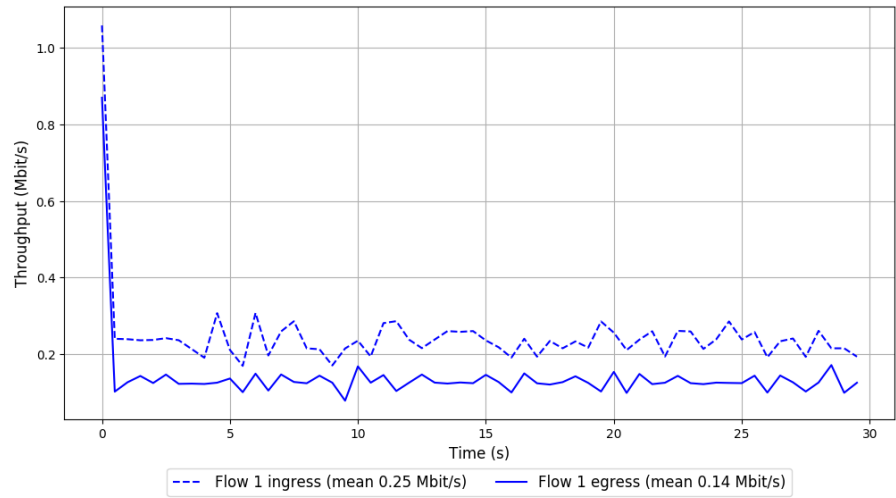
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 76.806 ms

Loss rate: 43.48%

# Run 1: Report of Sprout — Data Link



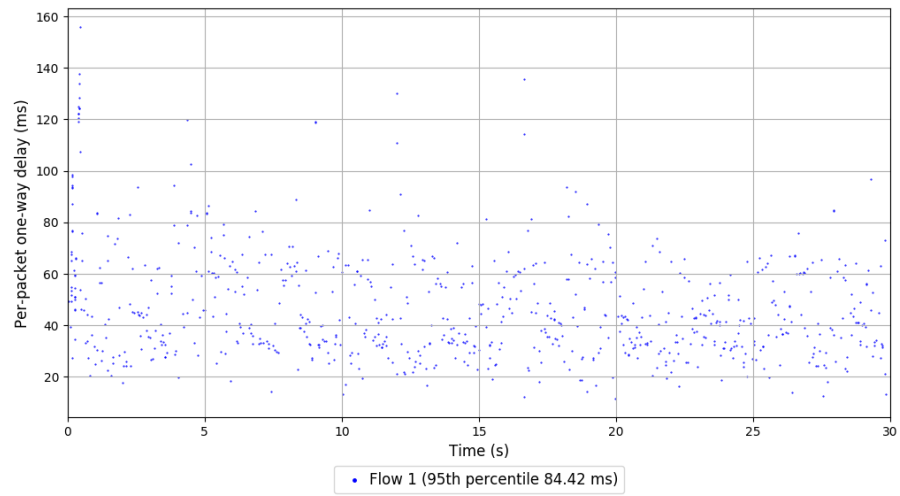
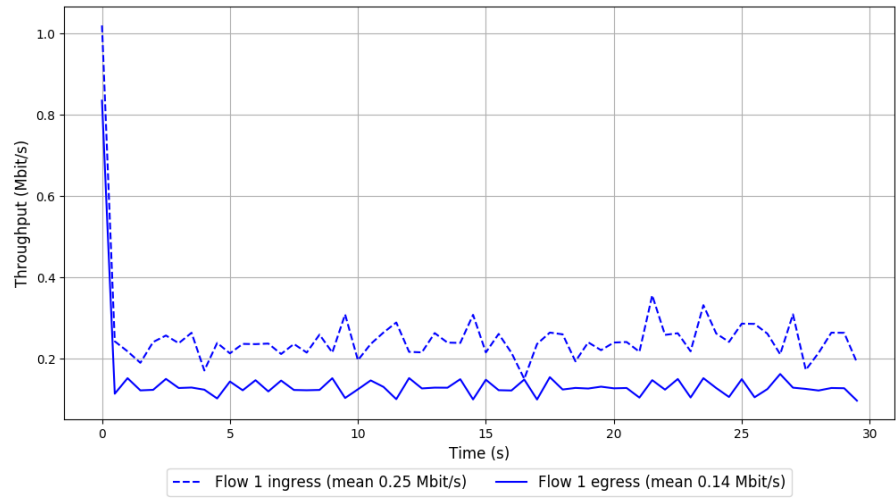
Run 2: Statistics of Sprout

Start at: 2018-04-03 00:17:23  
End at: 2018-04-03 00:17:53  
Local clock offset: -7.369 ms  
Remote clock offset: -4.842 ms

# Below is generated by plot.py at 2018-04-03 01:58:38  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 84.415 ms  
Loss rate: 45.03%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 84.415 ms  
Loss rate: 45.03%



## Run 2: Report of Sprout — Data Link

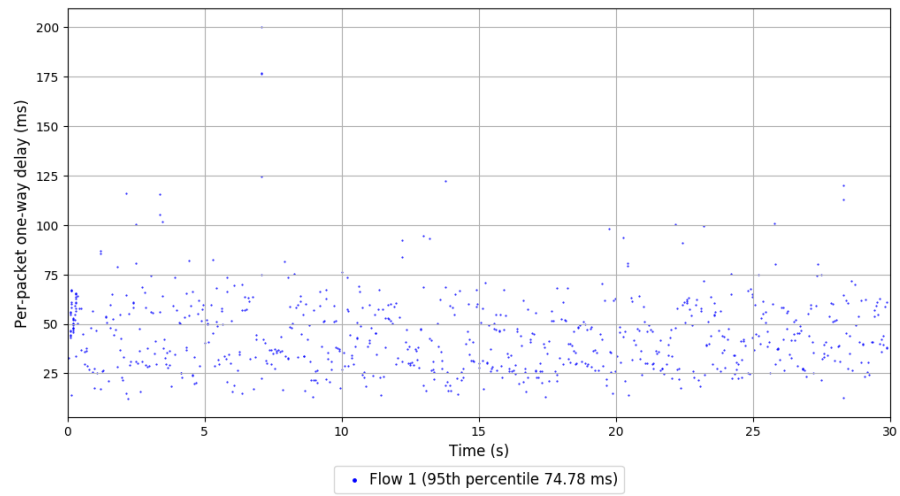
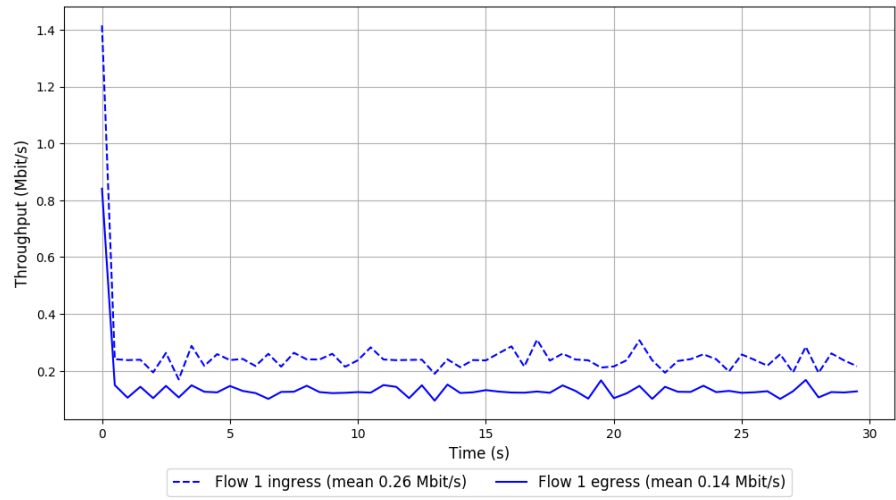


Run 3: Statistics of Sprout

Start at: 2018-04-03 00:40:53  
End at: 2018-04-03 00:41:23  
Local clock offset: -14.983 ms  
Remote clock offset: -4.857 ms

# Below is generated by plot.py at 2018-04-03 01:58:38  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 74.778 ms  
Loss rate: 45.84%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 74.778 ms  
Loss rate: 45.84%

### Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-04-02 23:46:03

End at: 2018-04-02 23:46:34

Local clock offset: -2.69 ms

Remote clock offset: -5.839 ms

# Below is generated by plot.py at 2018-04-03 01:58:42

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 356.488 ms

Loss rate: 94.16%

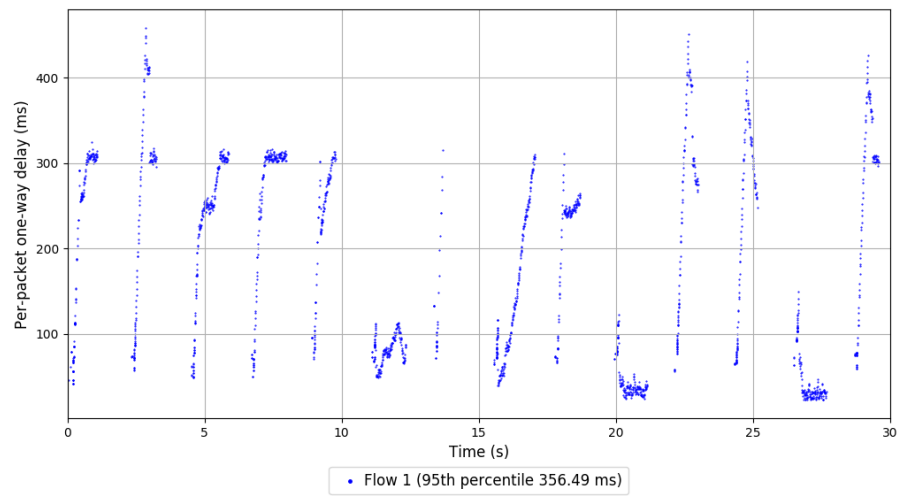
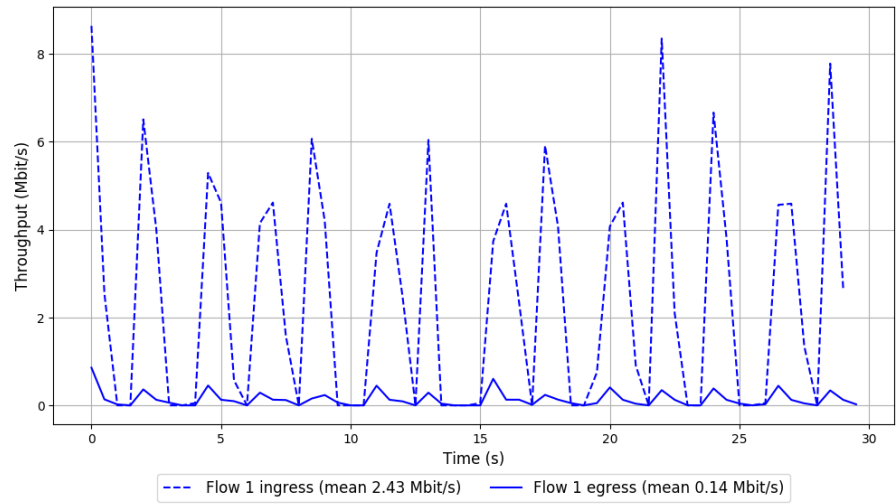
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 356.488 ms

Loss rate: 94.16%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-04-03 00:09:34

End at: 2018-04-03 00:10:04

Local clock offset: -9.861 ms

Remote clock offset: -4.941 ms

# Below is generated by plot.py at 2018-04-03 01:58:42

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 350.291 ms

Loss rate: 94.16%

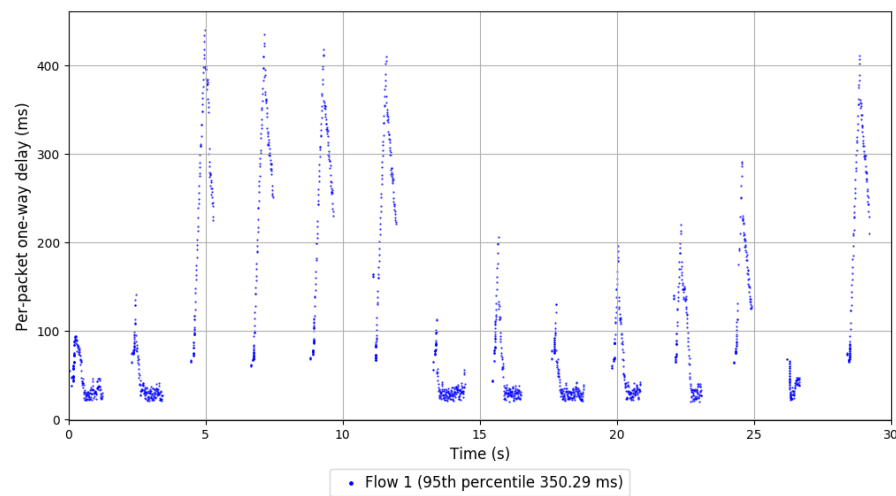
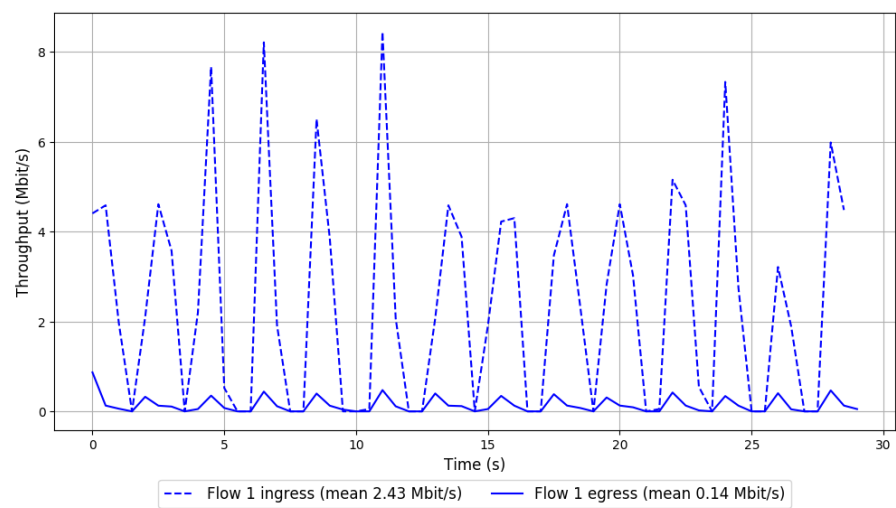
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 350.291 ms

Loss rate: 94.16%

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



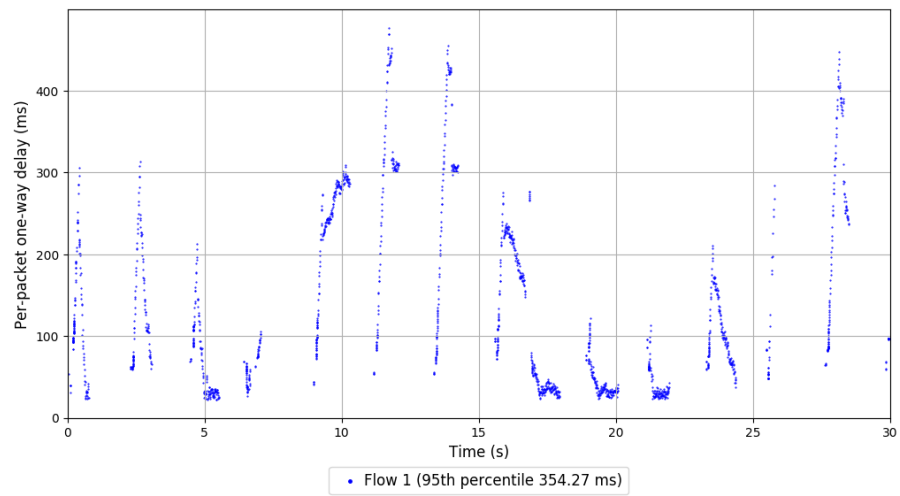
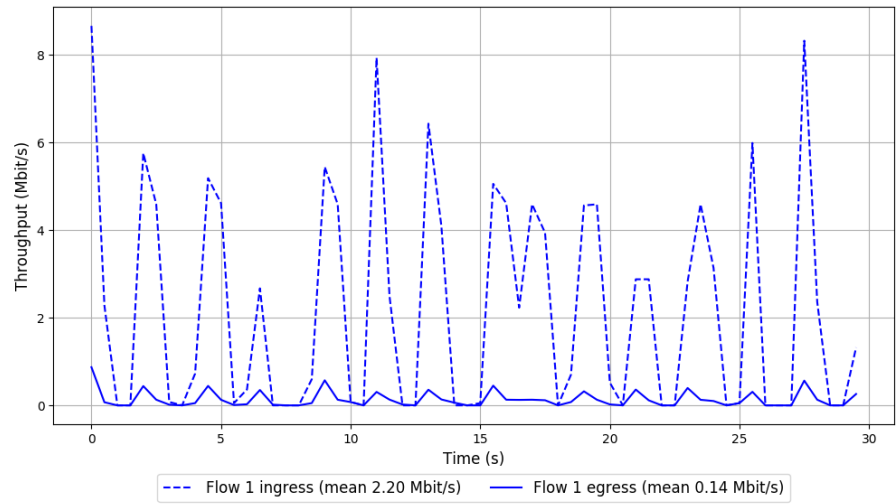
Run 3: Statistics of TaoVA-100x

Start at: 2018-04-03 00:33:03  
End at: 2018-04-03 00:33:33  
Local clock offset: -11.516 ms  
Remote clock offset: -4.92 ms

# Below is generated by plot.py at 2018-04-03 01:58:44  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 354.270 ms  
Loss rate: 93.70%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 354.270 ms  
Loss rate: 93.70%



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

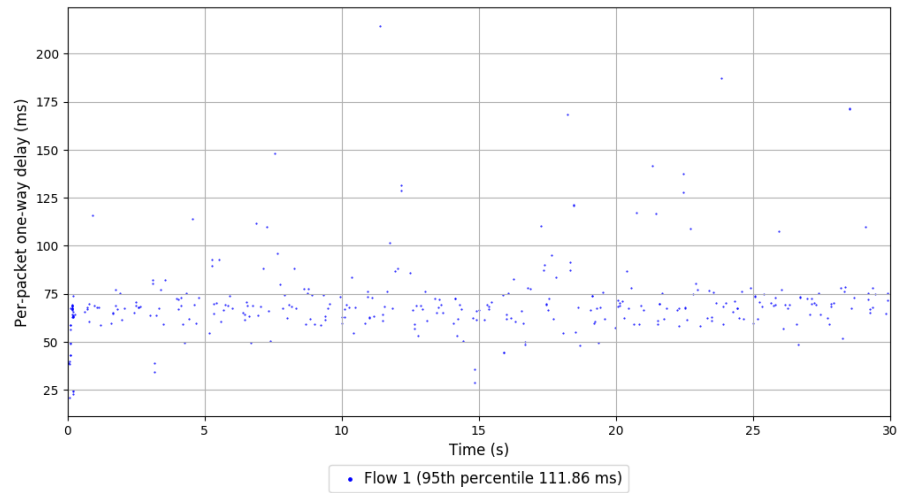
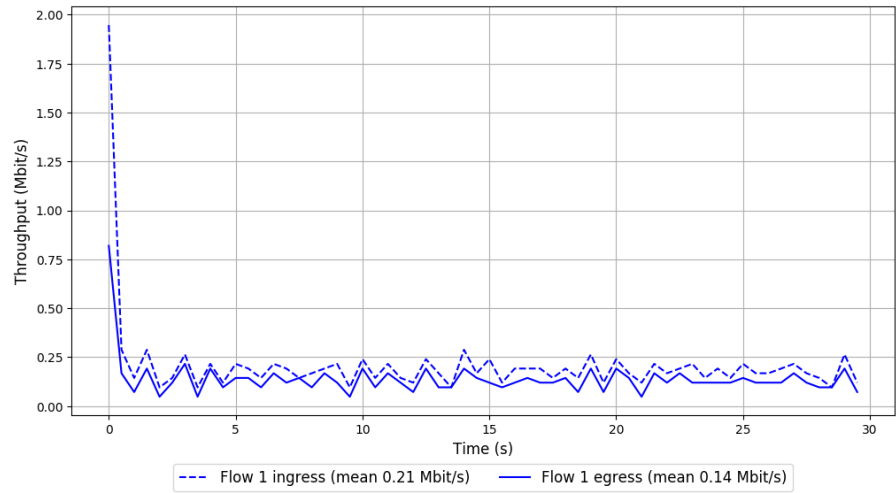


Run 1: Statistics of TCP Vegas

Start at: 2018-04-03 00:00:25  
End at: 2018-04-03 00:00:55  
Local clock offset: -5.688 ms  
Remote clock offset: -5.145 ms

# Below is generated by plot.py at 2018-04-03 01:58:44  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 111.865 ms  
Loss rate: 33.45%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 111.865 ms  
Loss rate: 33.45%

### Run 1: Report of TCP Vegas — Data Link

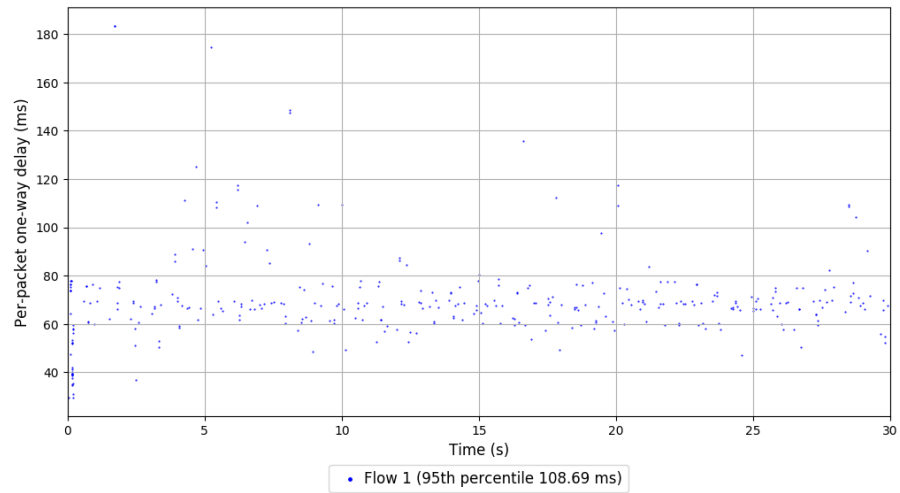
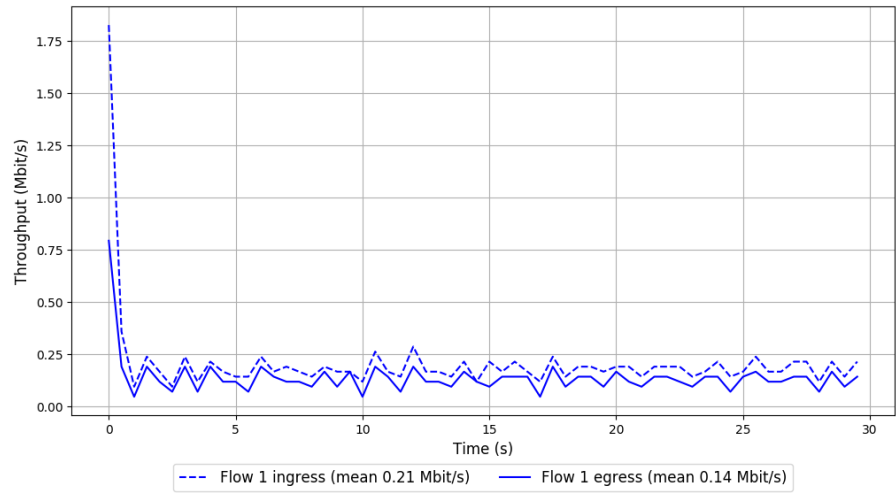


Run 2: Statistics of TCP Vegas

Start at: 2018-04-03 00:23:55  
End at: 2018-04-03 00:24:25  
Local clock offset: -8.367 ms  
Remote clock offset: -4.983 ms

# Below is generated by plot.py at 2018-04-03 01:58:44  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 108.688 ms  
Loss rate: 33.13%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 108.688 ms  
Loss rate: 33.13%

## Run 2: Report of TCP Vegas — Data Link

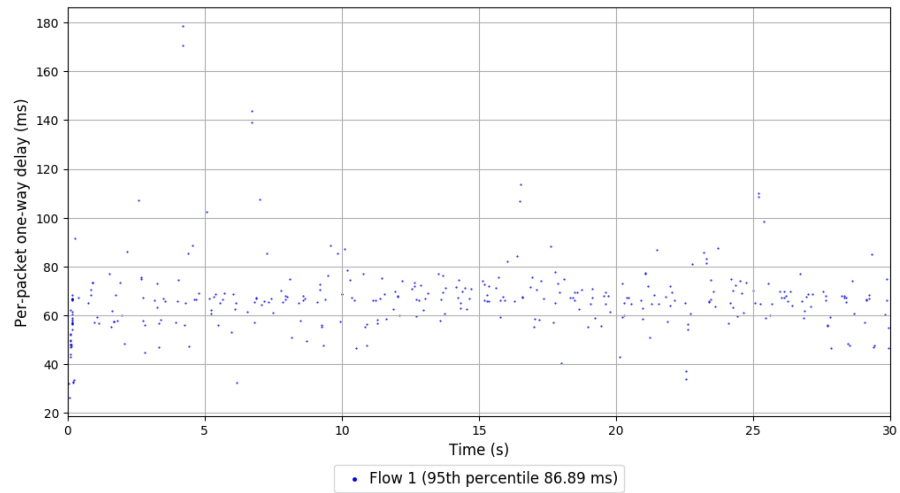
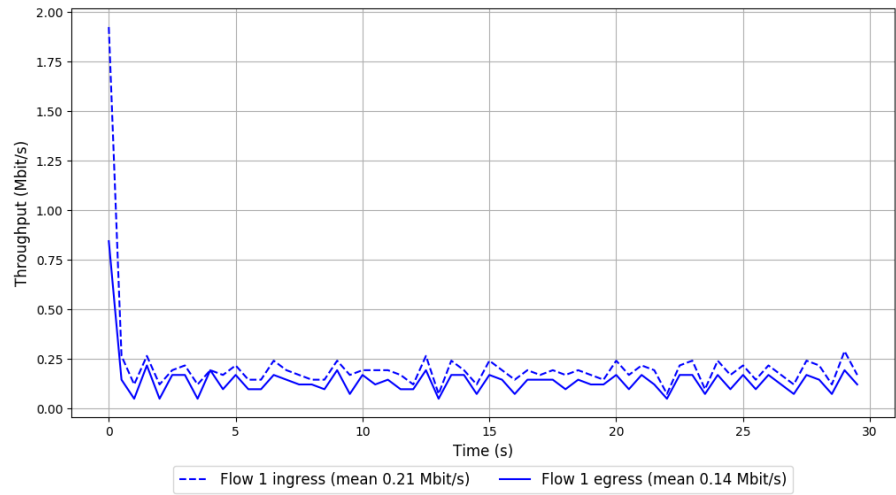


Run 3: Statistics of TCP Vegas

Start at: 2018-04-03 00:47:24  
End at: 2018-04-03 00:47:54  
Local clock offset: -9.966 ms  
Remote clock offset: -4.881 ms

# Below is generated by plot.py at 2018-04-03 01:58:44  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 86.888 ms  
Loss rate: 33.70%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 86.888 ms  
Loss rate: 33.70%

### Run 3: Report of TCP Vegas — Data Link



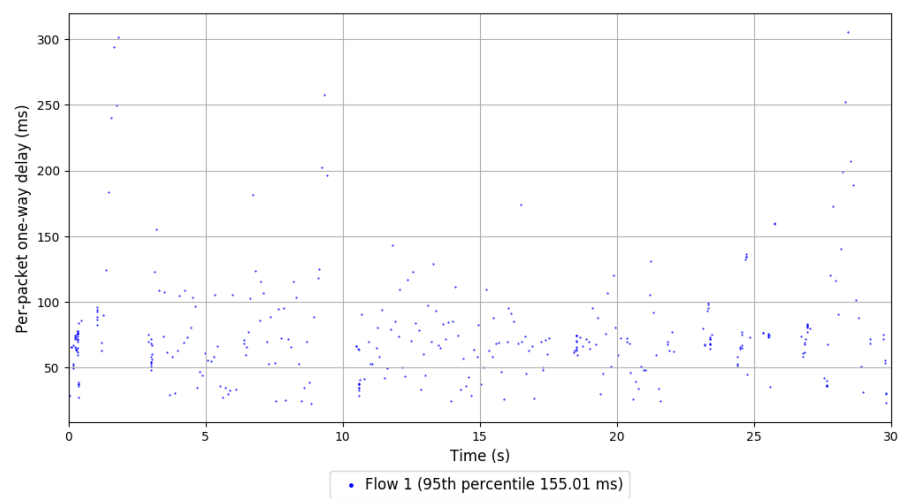
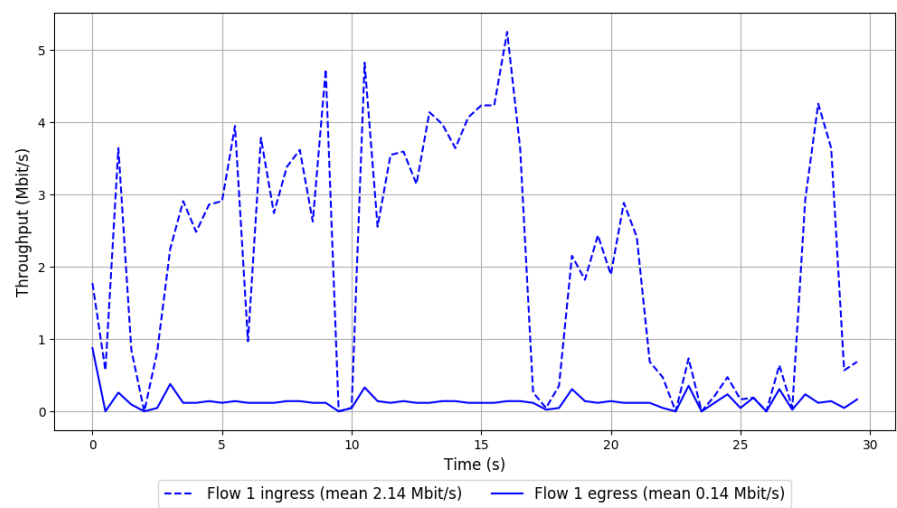
Run 1: Statistics of Verus

Start at: 2018-04-02 23:48:40  
End at: 2018-04-02 23:49:10  
Local clock offset: -4.044 ms  
Remote clock offset: -5.671 ms

# Below is generated by plot.py at 2018-04-03 01:58:44  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 155.012 ms  
Loss rate: 93.43%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 155.012 ms  
Loss rate: 93.43%



Run 1: Report of Verus — Data Link

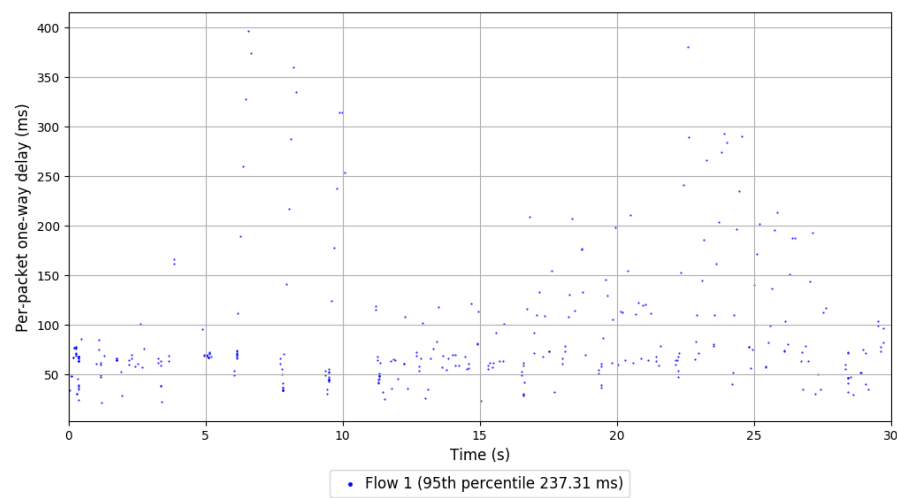
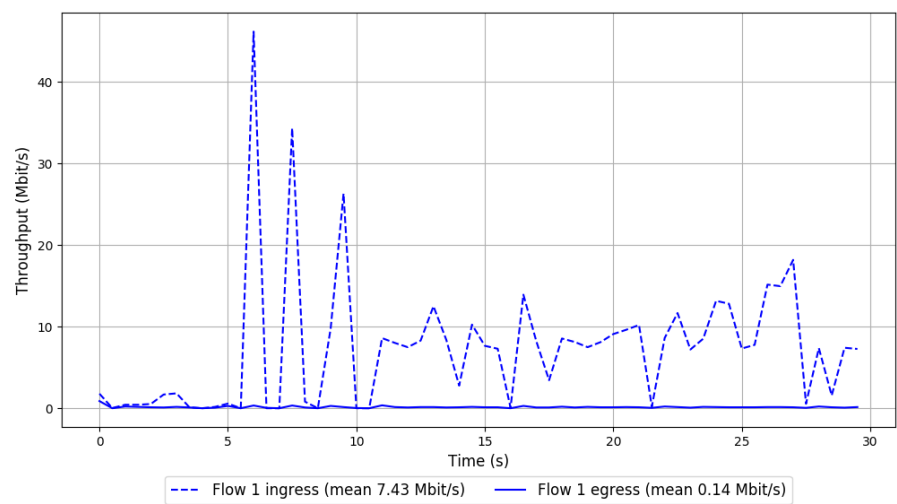


Run 2: Statistics of Verus

Start at: 2018-04-03 00:12:11  
End at: 2018-04-03 00:12:41  
Local clock offset: -8.36 ms  
Remote clock offset: -4.944 ms

# Below is generated by plot.py at 2018-04-03 01:58:47  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 237.308 ms  
Loss rate: 98.11%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 237.308 ms  
Loss rate: 98.11%

Run 2: Report of Verus — Data Link

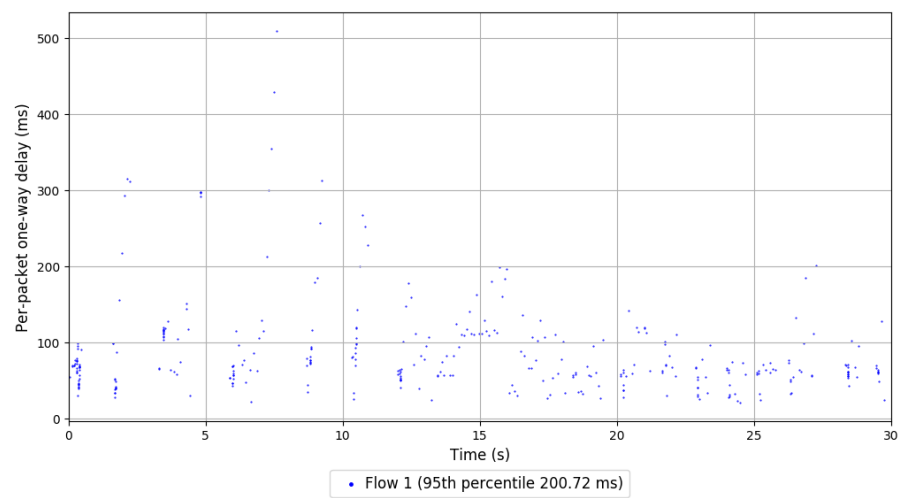
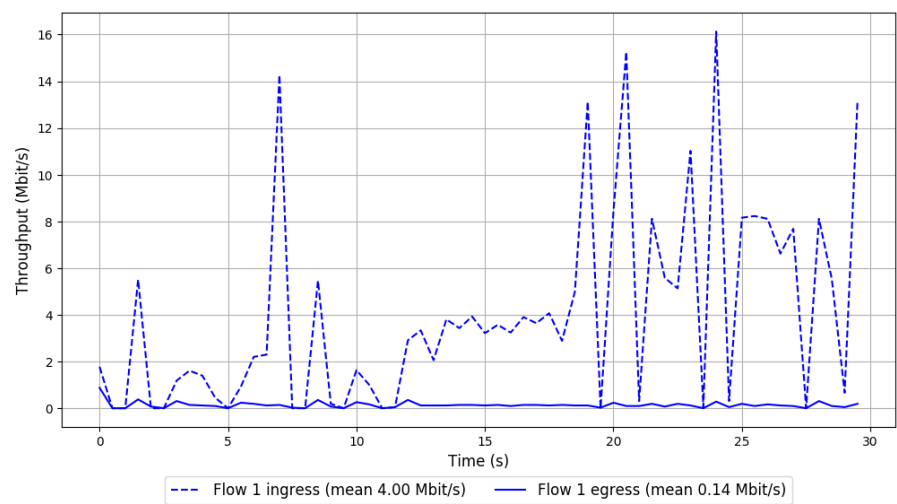


Run 3: Statistics of Verus

Start at: 2018-04-03 00:35:40  
End at: 2018-04-03 00:36:10  
Local clock offset: -12.714 ms  
Remote clock offset: -4.972 ms

# Below is generated by plot.py at 2018-04-03 01:58:47  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 200.724 ms  
Loss rate: 96.49%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 200.724 ms  
Loss rate: 96.49%

Run 3: Report of Verus — Data Link

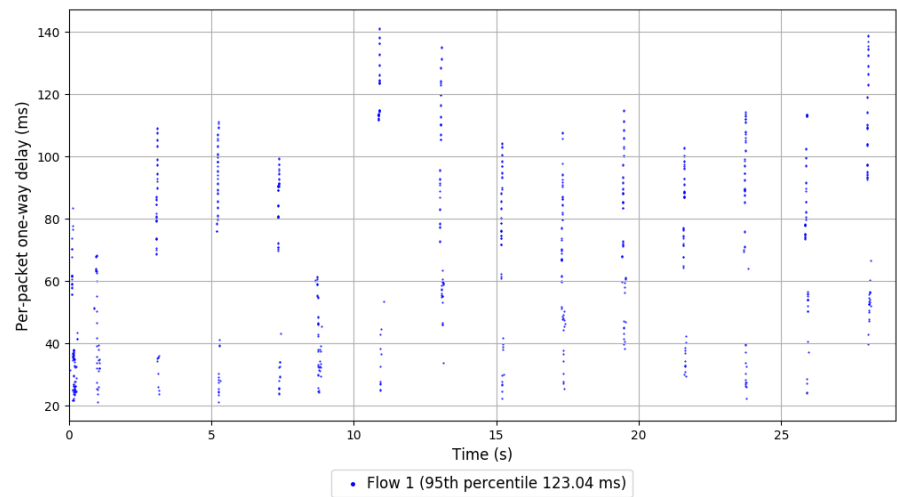
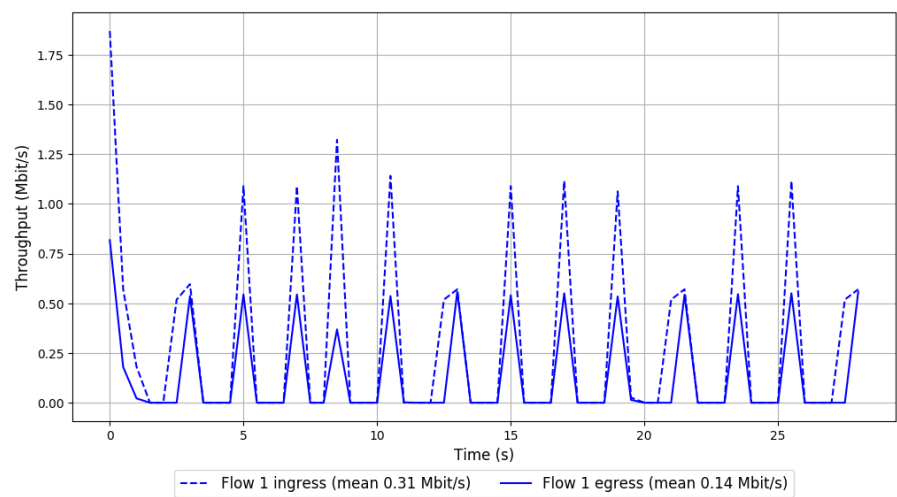


Run 1: Statistics of Copa

Start at: 2018-04-02 23:47:22  
End at: 2018-04-02 23:47:52  
Local clock offset: -3.371 ms  
Remote clock offset: -5.749 ms

# Below is generated by plot.py at 2018-04-03 01:58:47  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 123.038 ms  
Loss rate: 53.64%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 123.038 ms  
Loss rate: 53.64%

Run 1: Report of Copa — Data Link



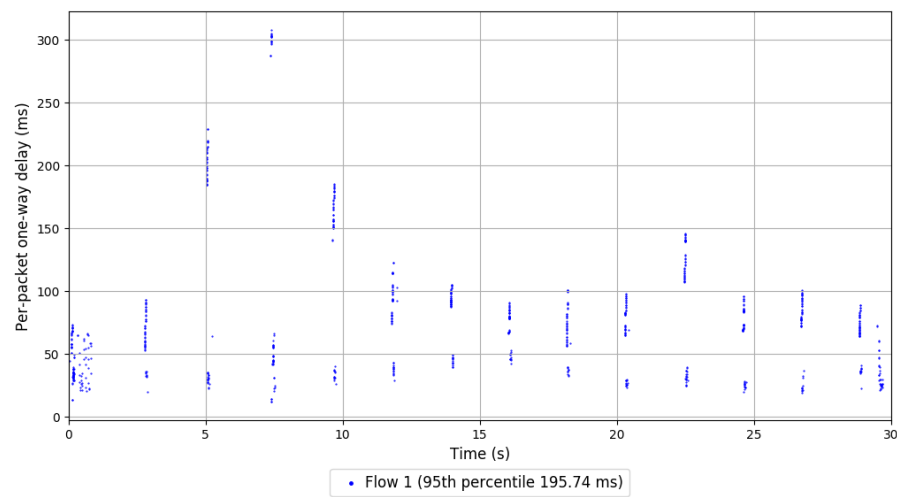
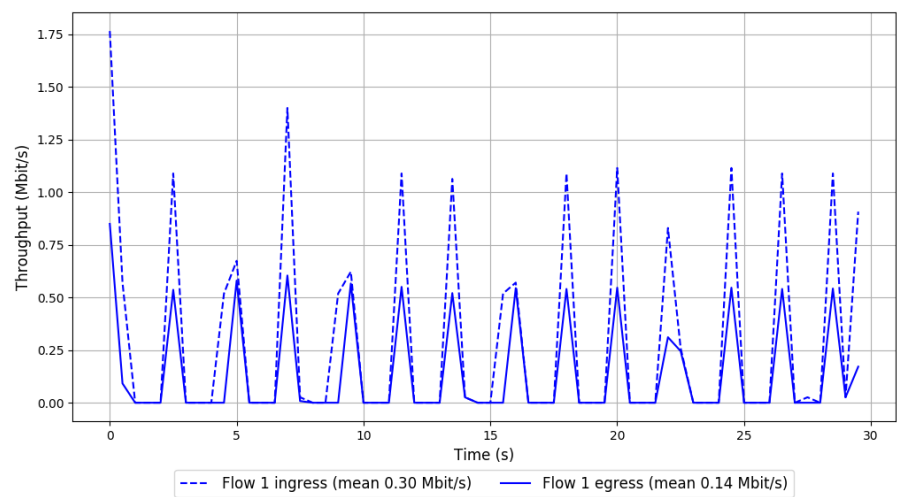
Run 2: Statistics of Copa

Start at: 2018-04-03 00:10:52  
End at: 2018-04-03 00:11:22  
Local clock offset: -9.008 ms  
Remote clock offset: -4.928 ms

# Below is generated by plot.py at 2018-04-03 01:58:47  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 195.740 ms  
Loss rate: 53.62%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 195.740 ms  
Loss rate: 53.62%



Run 2: Report of Copa — Data Link

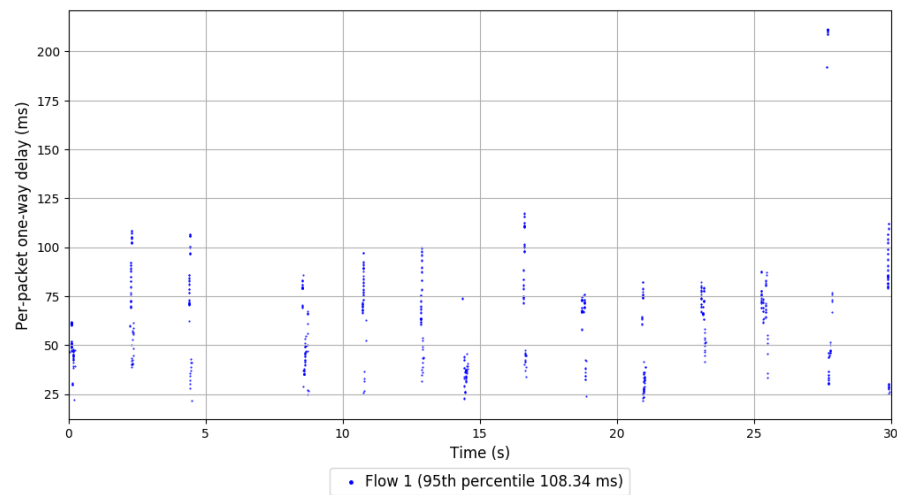
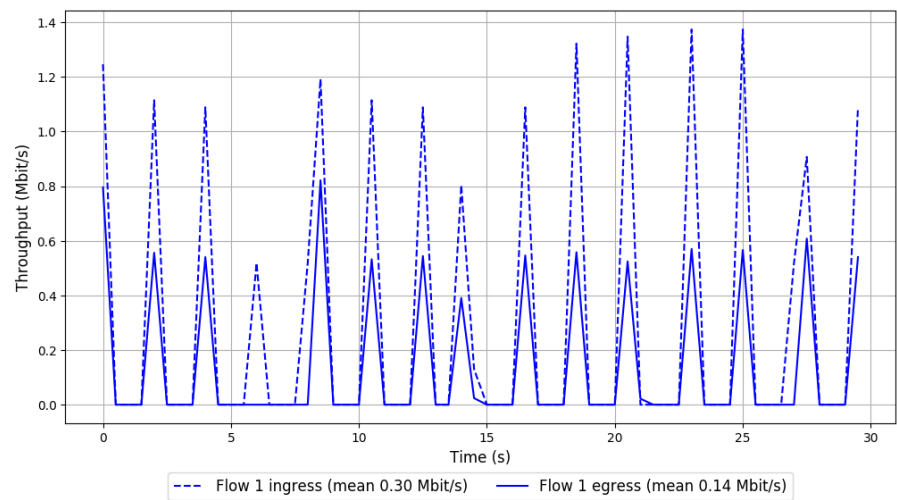


Run 3: Statistics of Copa

Start at: 2018-04-03 00:34:22  
End at: 2018-04-03 00:34:52  
Local clock offset: -12.17 ms  
Remote clock offset: -4.996 ms

# Below is generated by plot.py at 2018-04-03 01:58:47  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 108.339 ms  
Loss rate: 54.36%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 108.339 ms  
Loss rate: 54.36%

Run 3: Report of Copa — Data Link



Run 1: Statistics of FillP

Start at: 2018-04-02 23:43:27

End at: 2018-04-02 23:43:57

Local clock offset: -3.366 ms

Remote clock offset: -5.96 ms

# Below is generated by plot.py at 2018-04-03 01:58:47

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.11 Mbit/s

95th percentile per-packet one-way delay: 216.238 ms

Loss rate: 86.89%

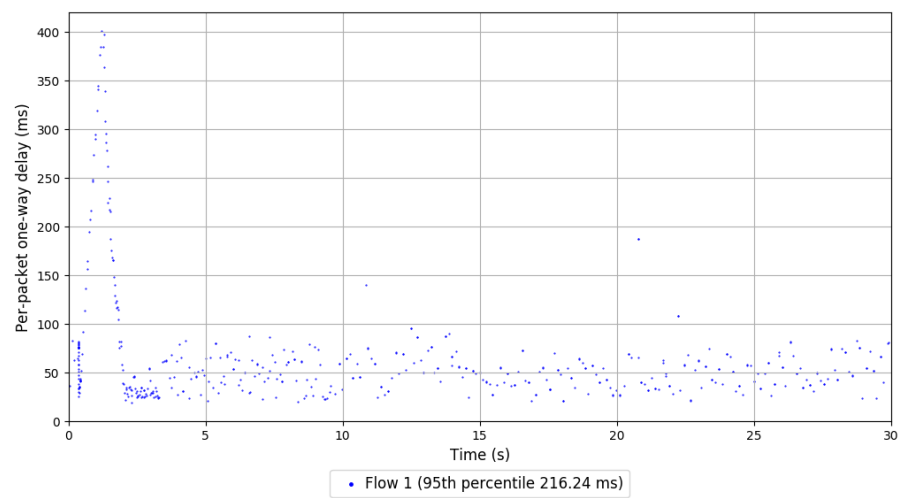
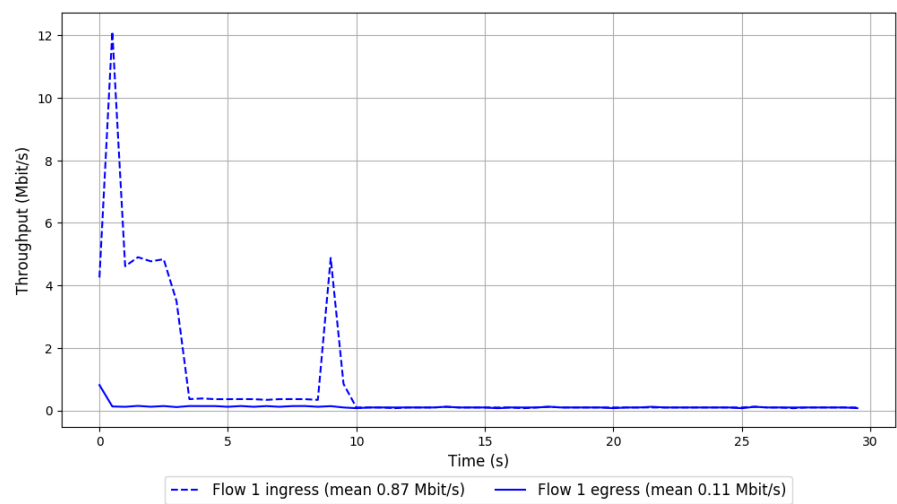
-- Flow 1:

Average throughput: 0.11 Mbit/s

95th percentile per-packet one-way delay: 216.238 ms

Loss rate: 86.89%

Run 1: Report of FillP — Data Link

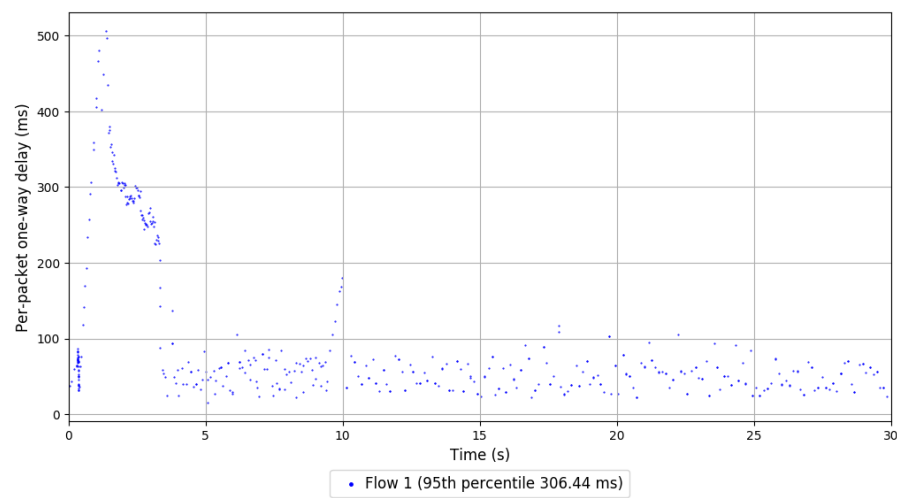
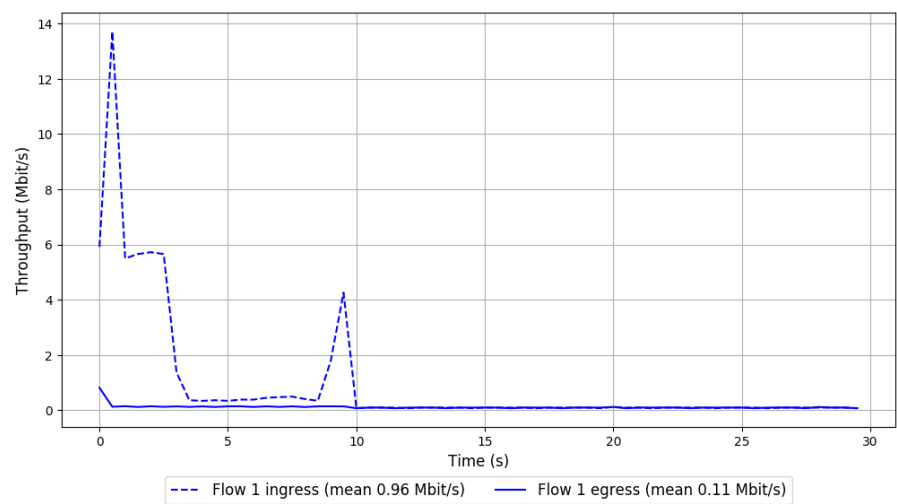


Run 2: Statistics of FillP

Start at: 2018-04-03 00:06:57  
End at: 2018-04-03 00:07:27  
Local clock offset: -9.054 ms  
Remote clock offset: -5.083 ms

# Below is generated by plot.py at 2018-04-03 01:58:47  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.11 Mbit/s  
95th percentile per-packet one-way delay: 306.441 ms  
Loss rate: 88.23%  
-- Flow 1:  
Average throughput: 0.11 Mbit/s  
95th percentile per-packet one-way delay: 306.441 ms  
Loss rate: 88.23%

Run 2: Report of FillP — Data Link



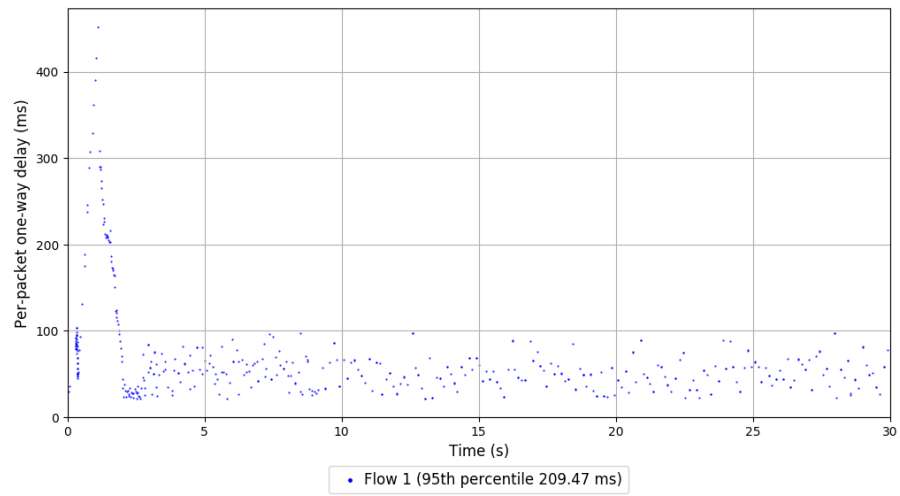
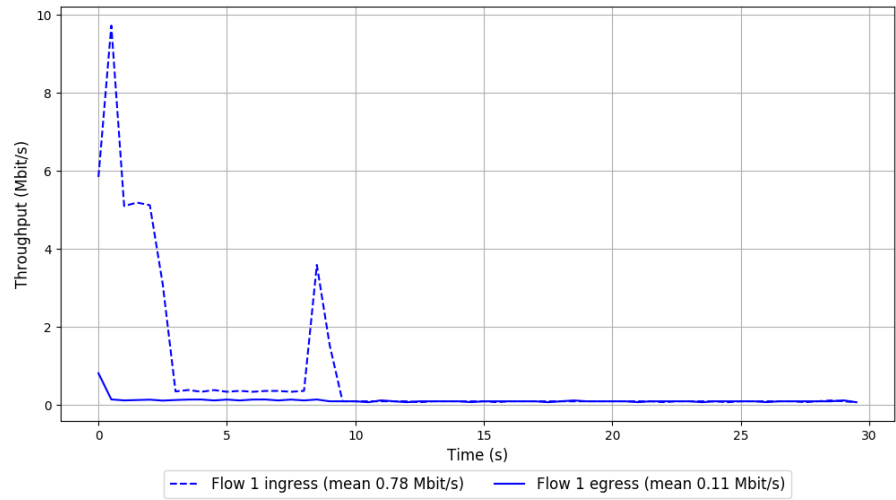
Run 3: Statistics of FillP

Start at: 2018-04-03 00:30:26  
End at: 2018-04-03 00:30:56  
Local clock offset: -10.546 ms  
Remote clock offset: -4.984 ms

# Below is generated by plot.py at 2018-04-03 01:58:49  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.11 Mbit/s  
95th percentile per-packet one-way delay: 209.469 ms  
Loss rate: 85.60%  
-- Flow 1:  
Average throughput: 0.11 Mbit/s  
95th percentile per-packet one-way delay: 209.469 ms  
Loss rate: 85.60%



### Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo-1-32

Start at: 2018-04-02 23:38:14

End at: 2018-04-02 23:38:44

Local clock offset: -1.272 ms

Remote clock offset: -6.043 ms

# Below is generated by plot.py at 2018-04-03 01:58:50

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 96.943 ms

Loss rate: 84.45%

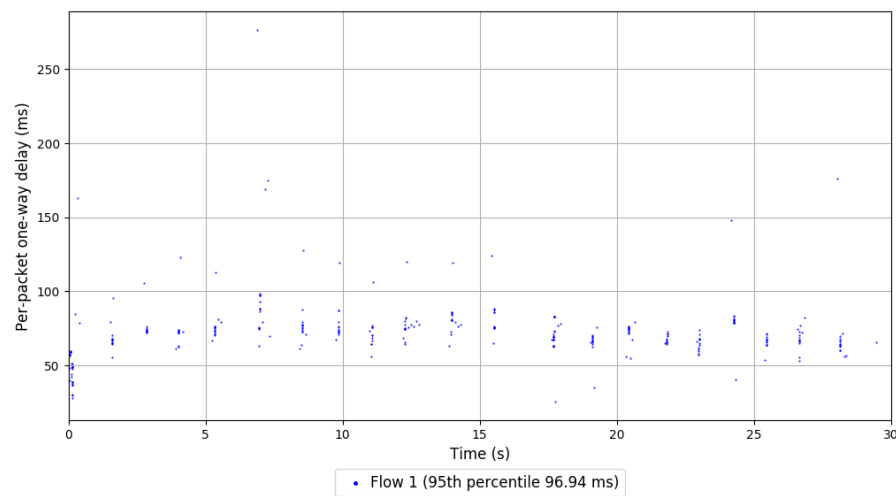
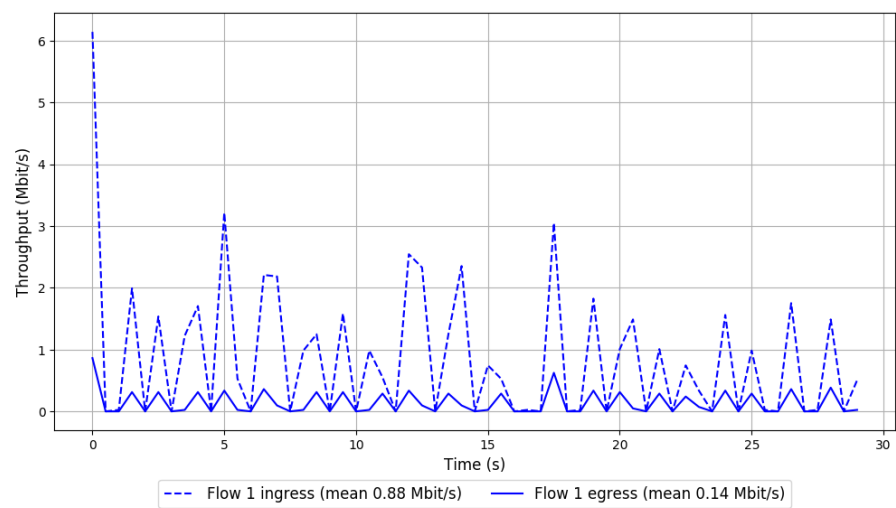
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 96.943 ms

Loss rate: 84.45%

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

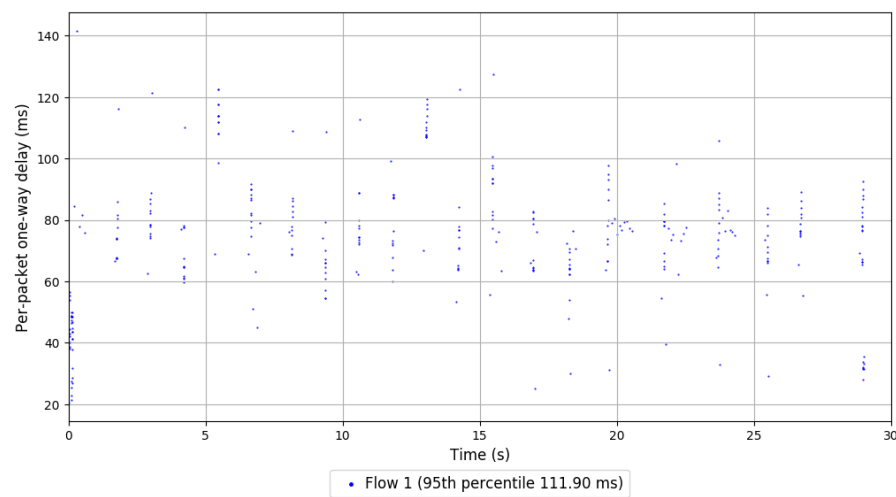
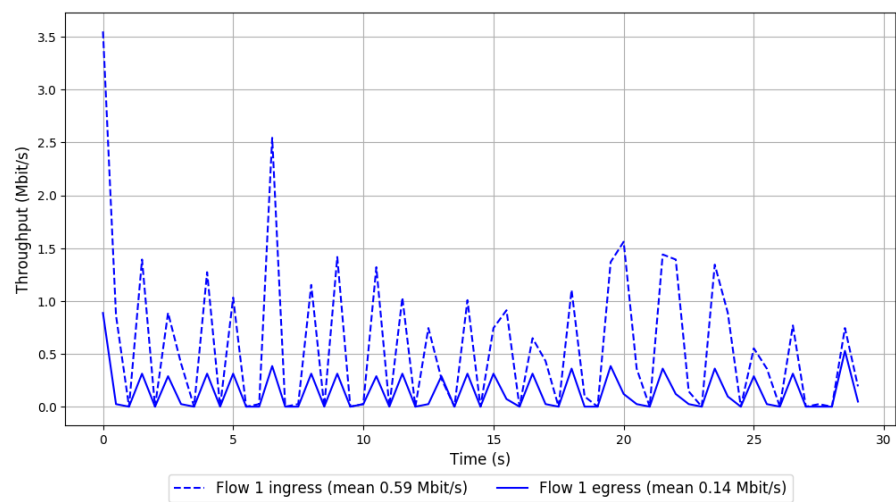


Run 2: Statistics of Indigo-1-32

Start at: 2018-04-03 00:01:43  
End at: 2018-04-03 00:02:13  
Local clock offset: -6.336 ms  
Remote clock offset: -5.133 ms

# Below is generated by plot.py at 2018-04-03 01:58:51  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 111.898 ms  
Loss rate: 75.96%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 111.898 ms  
Loss rate: 75.96%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-04-03 00:25:13

End at: 2018-04-03 00:25:43

Local clock offset: -8.694 ms

Remote clock offset: -4.94 ms

# Below is generated by plot.py at 2018-04-03 01:58:51

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 289.946 ms

Loss rate: 78.79%

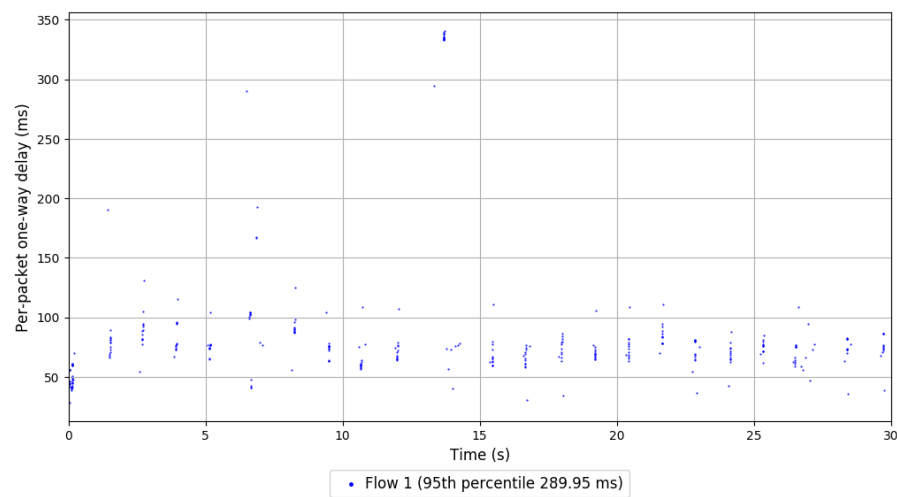
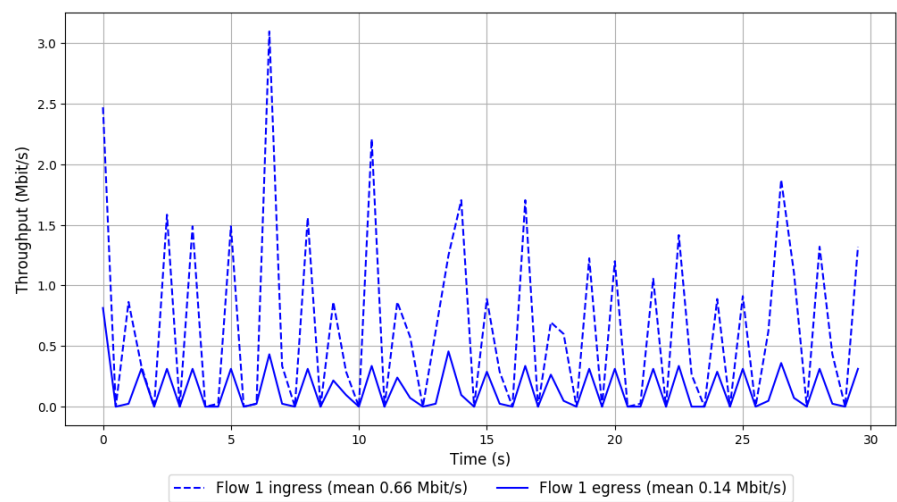
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 289.946 ms

Loss rate: 78.79%

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



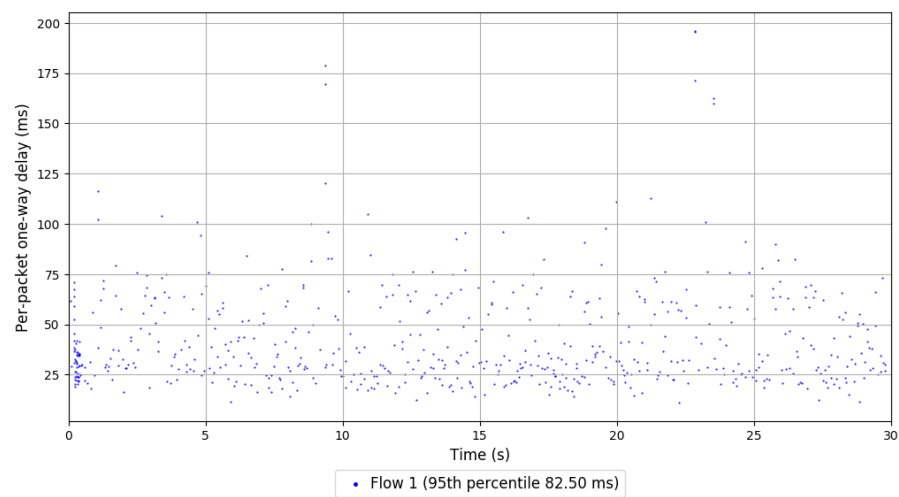
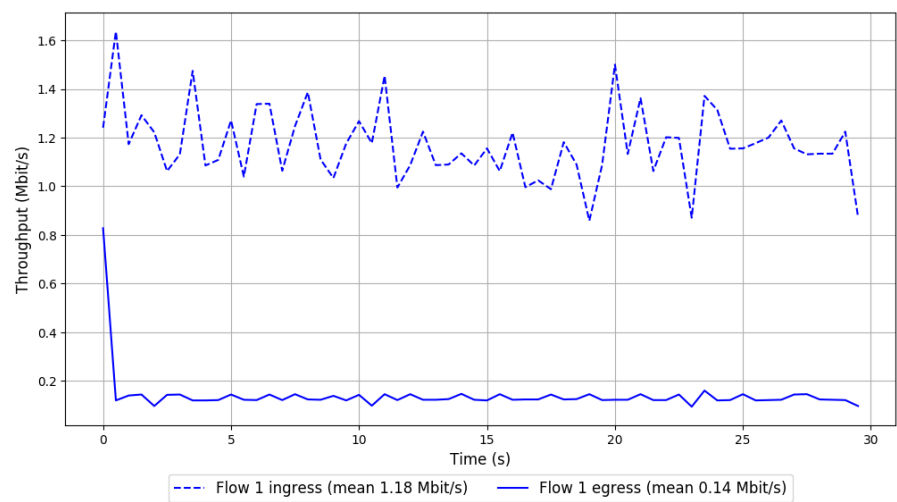
Run 1: Statistics of Vivace-latency

Start at: 2018-04-02 23:52:35  
End at: 2018-04-02 23:53:05  
Local clock offset: -5.904 ms  
Remote clock offset: -5.473 ms

# Below is generated by plot.py at 2018-04-03 01:58:52  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 82.505 ms  
Loss rate: 88.13%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 82.505 ms  
Loss rate: 88.13%



Run 1: Report of Vivace-latency — Data Link

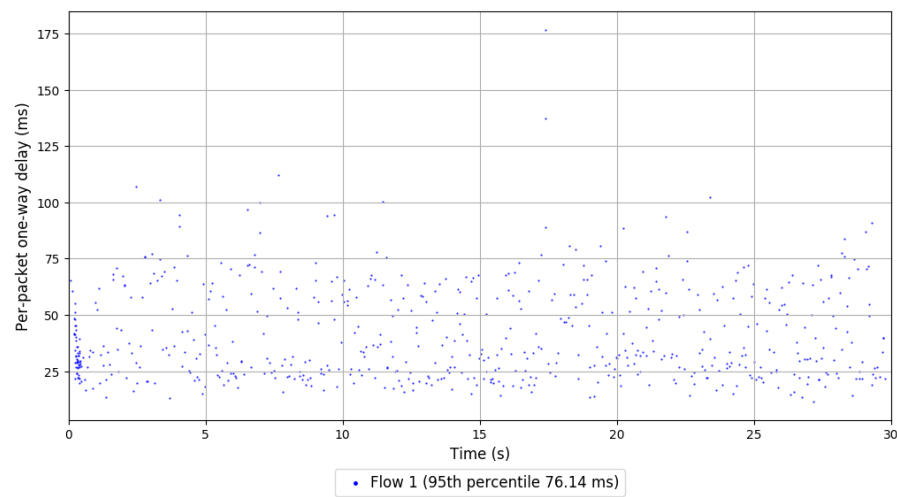
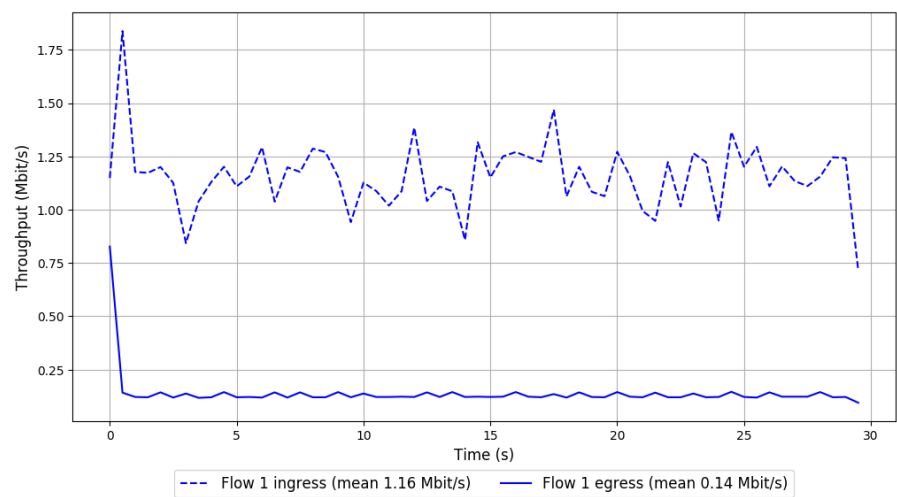


Run 2: Statistics of Vivace-latency

Start at: 2018-04-03 00:16:05  
End at: 2018-04-03 00:16:35  
Local clock offset: -7.424 ms  
Remote clock offset: -4.907 ms

# Below is generated by plot.py at 2018-04-03 01:58:52  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 76.135 ms  
Loss rate: 87.99%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 76.135 ms  
Loss rate: 87.99%

Run 2: Report of Vivace-latency — Data Link

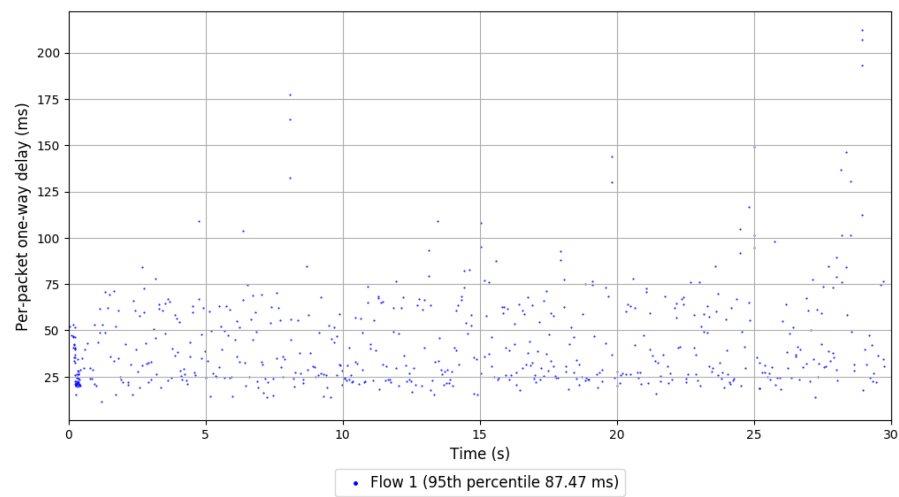
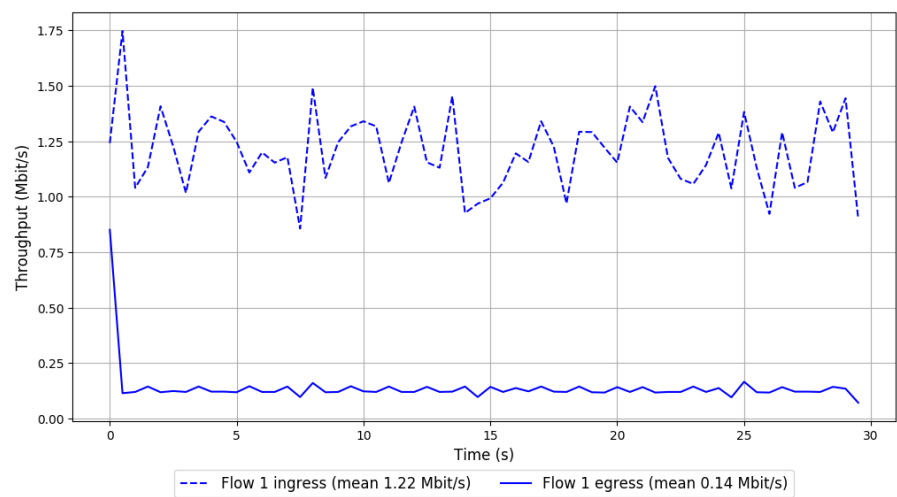


Run 3: Statistics of Vivace-latency

Start at: 2018-04-03 00:39:34  
End at: 2018-04-03 00:40:04  
Local clock offset: -14.475 ms  
Remote clock offset: -4.893 ms

# Below is generated by plot.py at 2018-04-03 01:58:52  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 87.475 ms  
Loss rate: 88.50%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 87.475 ms  
Loss rate: 88.50%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-04-02 23:44:45

End at: 2018-04-02 23:45:15

Local clock offset: -2.6 ms

Remote clock offset: -5.865 ms

# Below is generated by plot.py at 2018-04-03 01:58:52

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 76.093 ms

Loss rate: 88.37%

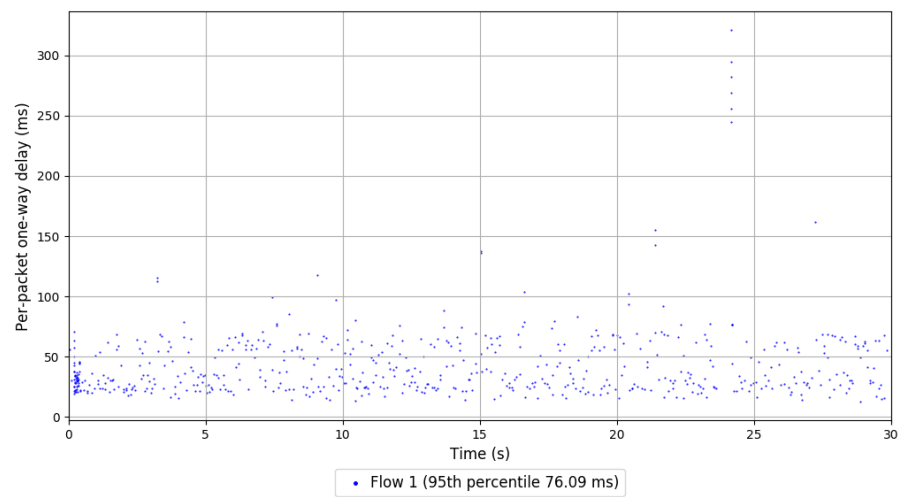
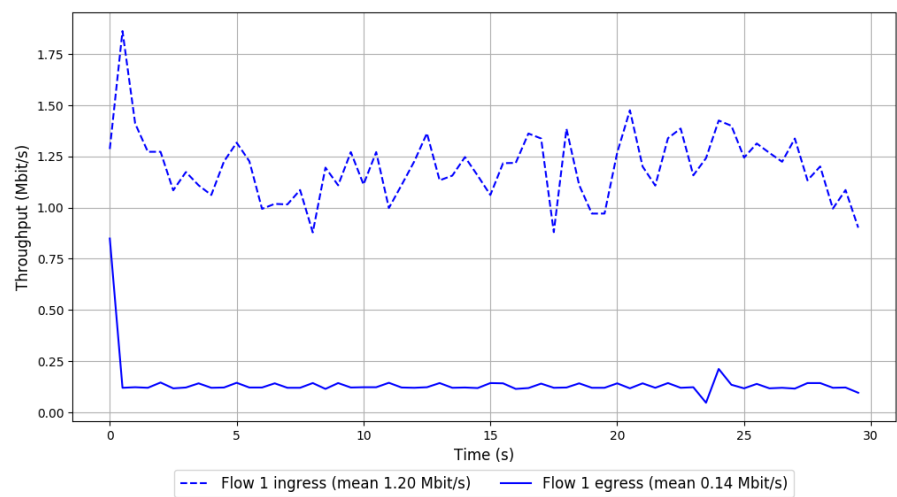
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 76.093 ms

Loss rate: 88.37%

Run 1: Report of Vivace-loss — Data Link



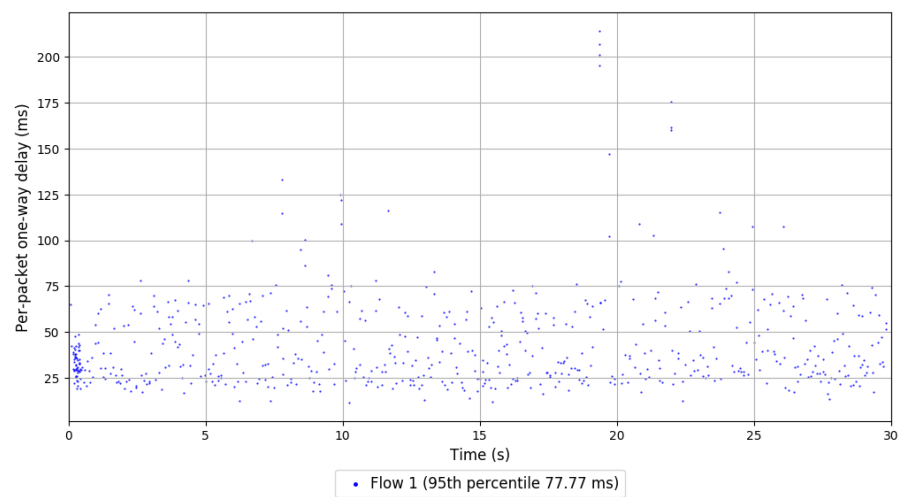
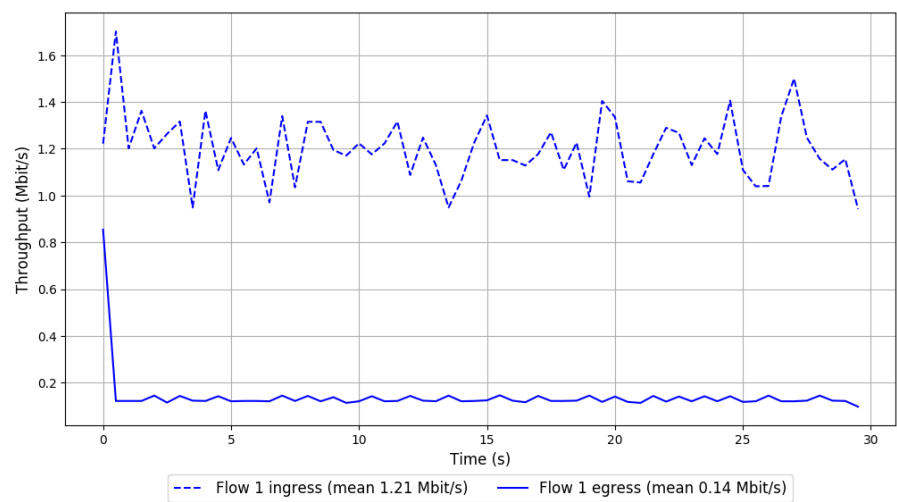
Run 2: Statistics of Vivace-loss

Start at: 2018-04-03 00:08:15  
End at: 2018-04-03 00:08:45  
Local clock offset: -9.969 ms  
Remote clock offset: -5.052 ms

# Below is generated by plot.py at 2018-04-03 01:58:53  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 77.766 ms  
Loss rate: 88.39%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 77.766 ms  
Loss rate: 88.39%



Run 2: Report of Vivace-loss — Data Link

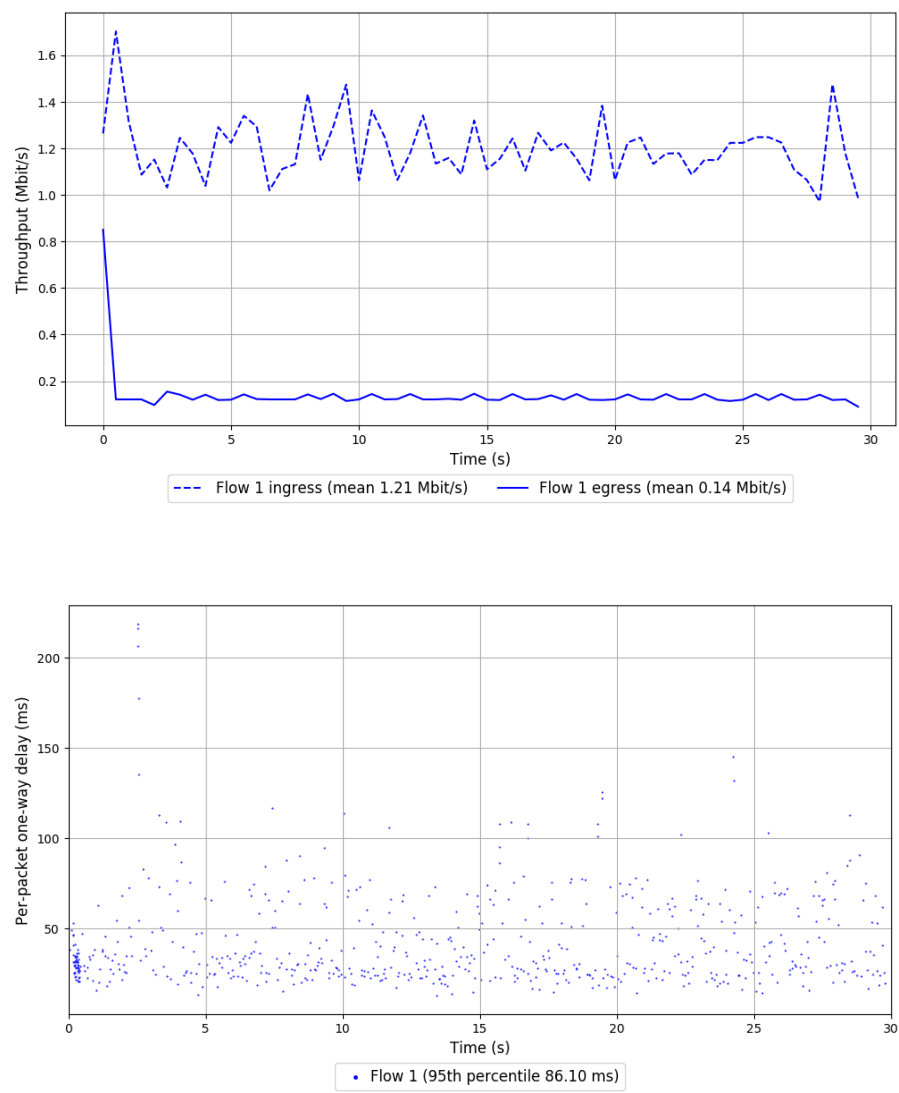


Run 3: Statistics of Vivace-loss

Start at: 2018-04-03 00:31:45  
End at: 2018-04-03 00:32:15  
Local clock offset: -11.033 ms  
Remote clock offset: -4.951 ms

# Below is generated by plot.py at 2018-04-03 01:58:54  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 86.103 ms  
Loss rate: 88.40%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 86.103 ms  
Loss rate: 88.40%

Run 3: Report of Vivace-loss — Data Link

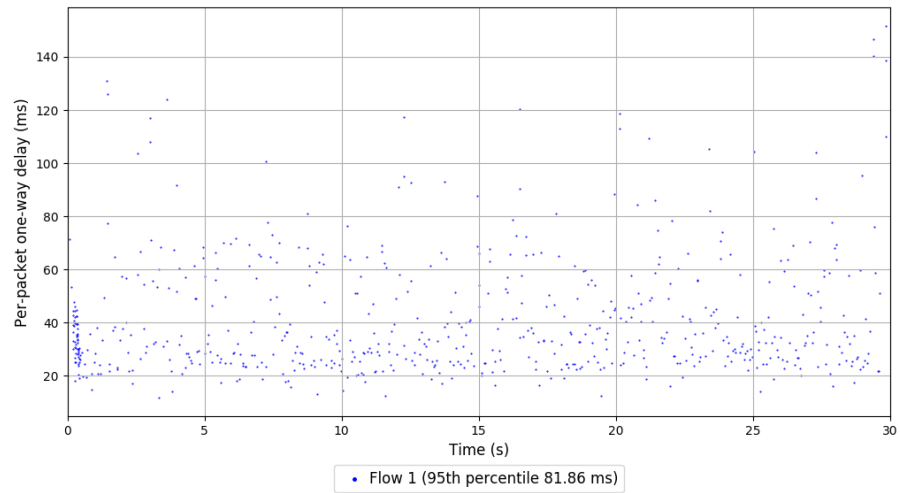
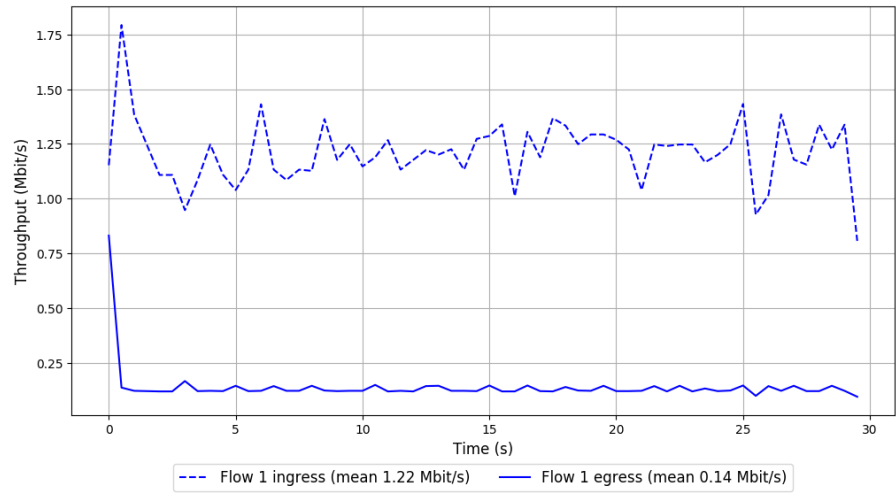


Run 1: Statistics of Vivace-LTE

Start at: 2018-04-02 23:59:07  
End at: 2018-04-02 23:59:37  
Local clock offset: -5.263 ms  
Remote clock offset: -5.186 ms

# Below is generated by plot.py at 2018-04-03 01:58:54  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 81.855 ms  
Loss rate: 88.50%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 81.855 ms  
Loss rate: 88.50%

### Run 1: Report of Vivace-LTE — Data Link

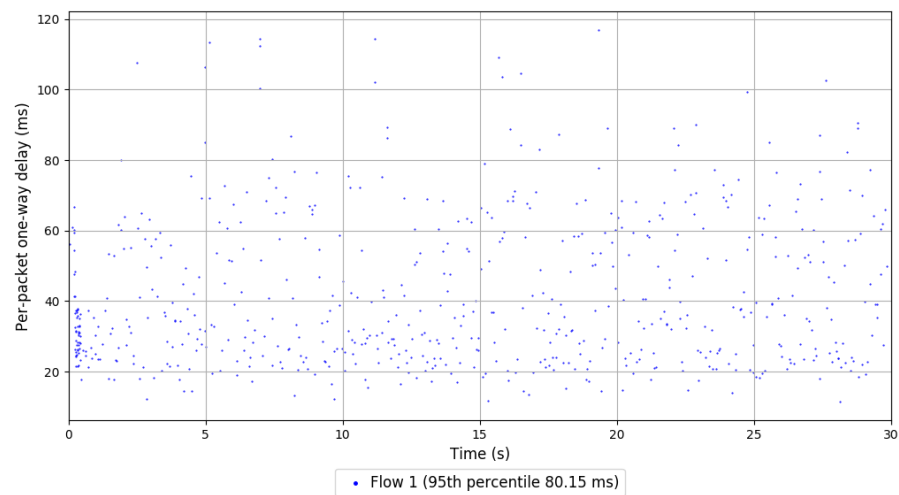
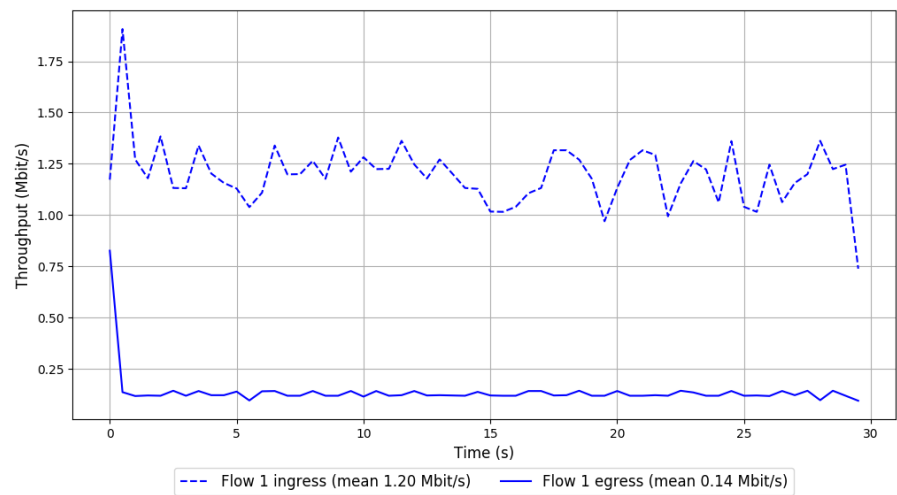


Run 2: Statistics of Vivace-LTE

Start at: 2018-04-03 00:22:36  
End at: 2018-04-03 00:23:06  
Local clock offset: -8.053 ms  
Remote clock offset: -4.998 ms

# Below is generated by plot.py at 2018-04-03 01:58:54  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 80.148 ms  
Loss rate: 88.40%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 80.148 ms  
Loss rate: 88.40%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-04-03 00:46:05  
End at: 2018-04-03 00:46:35  
Local clock offset: -11.664 ms  
Remote clock offset: -4.898 ms

# Below is generated by plot.py at 2018-04-03 01:58:54  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 75.684 ms  
Loss rate: 88.30%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 75.684 ms  
Loss rate: 88.30%



### Run 3: Report of Vivace-LTE — Data Link

