

Pantheon Report

Generated at 2018-02-17 02:51:03 (UTC).

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

Repeated the test of 17 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

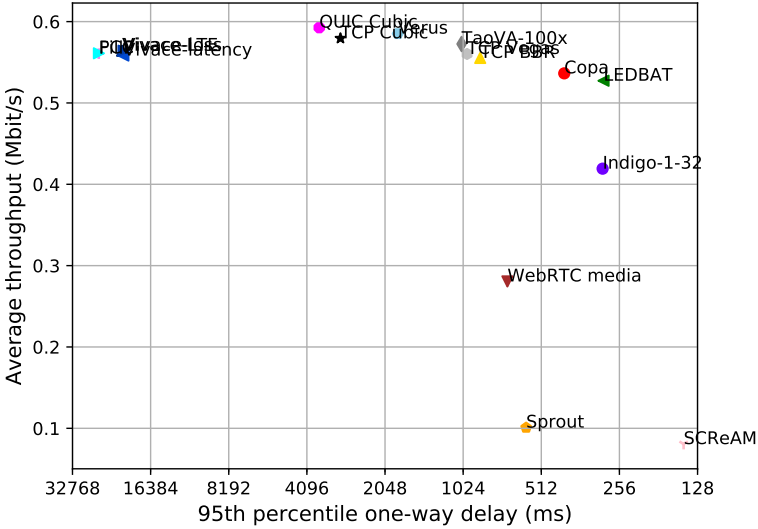
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

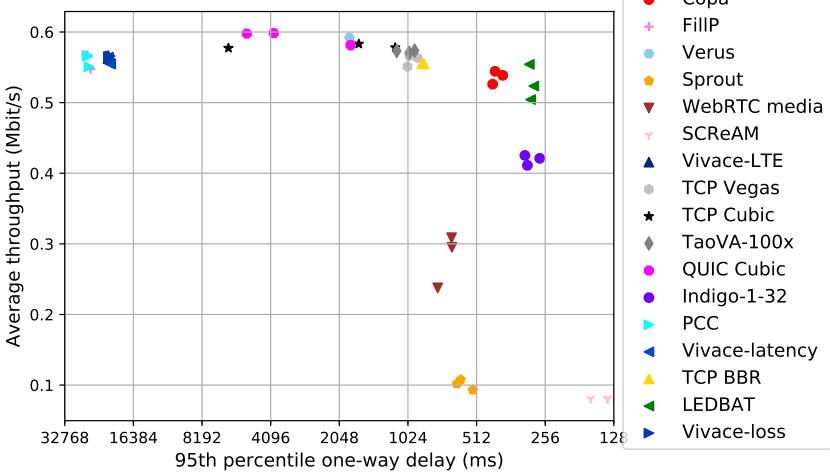
Git summary:

```
branch: master @ cccb2d77344969a7bac1df6edf6c0cfb6c77a6f8
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 828bbf95fd4941149b5cec90f281d1c69ae1a5c6
third_party/genericCC @ 8400b8926887fc4cf8c795a1d7ce2c8ac041ec72
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeab30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

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



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



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	0.56	880.24	2.30
TCP Cubic	3	0.58	3041.04	13.39
LEDBAT	3	0.52	294.85	1.54
PCC	3	0.56	25914.63	98.30
QUIC Cubic	3	0.59	3670.22	16.07
SCReAM	3	0.08	144.83	0.89
WebRTC media	3	0.28	691.52	0.82
Sprout	3	0.10	585.74	2.13
TaoVA-100x	3	0.57	1038.35	2.72
TCP Vegas	3	0.56	989.12	0.96
Verus	3	0.58	1828.65	2.85
Copa	3	0.54	417.66	3.98
FillP	3	0.56	25954.65	98.25
Indigo-1-32	3	0.42	297.14	1.48
Vivace-latency	3	0.56	20870.92	71.57
Vivace-loss	3	0.57	20829.77	89.13
Vivace-LTE	3	0.56	21110.19	71.22

Run 1: Statistics of TCP BBR

Start at: 2018-02-17 00:52:06

End at: 2018-02-17 00:52:36

Local clock offset: -3.826 ms

Remote clock offset: -3.574 ms

Below is generated by plot.py at 2018-02-17 02:50:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 888.670 ms

Loss rate: 2.40%

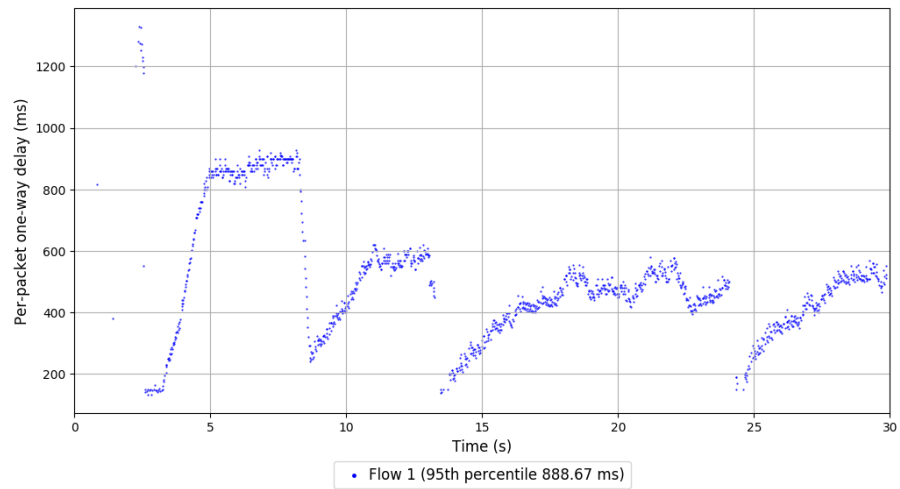
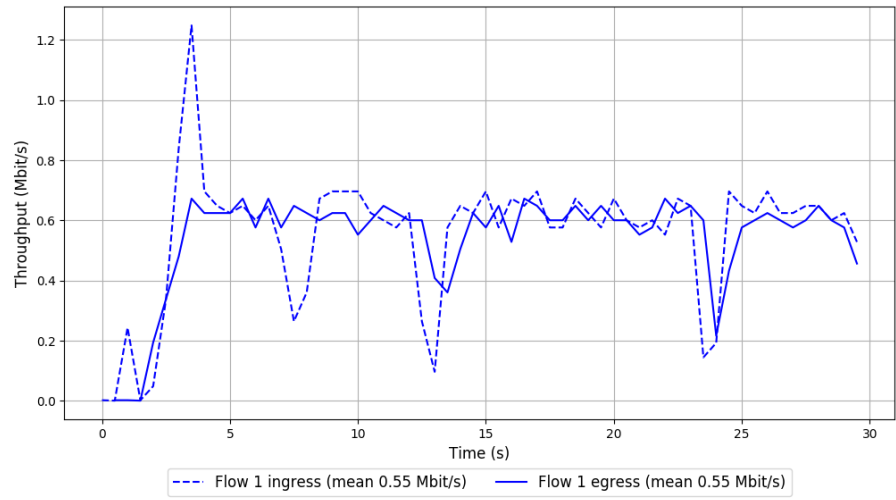
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 888.670 ms

Loss rate: 2.40%

Run 1: Report of TCP BBR — Data Link

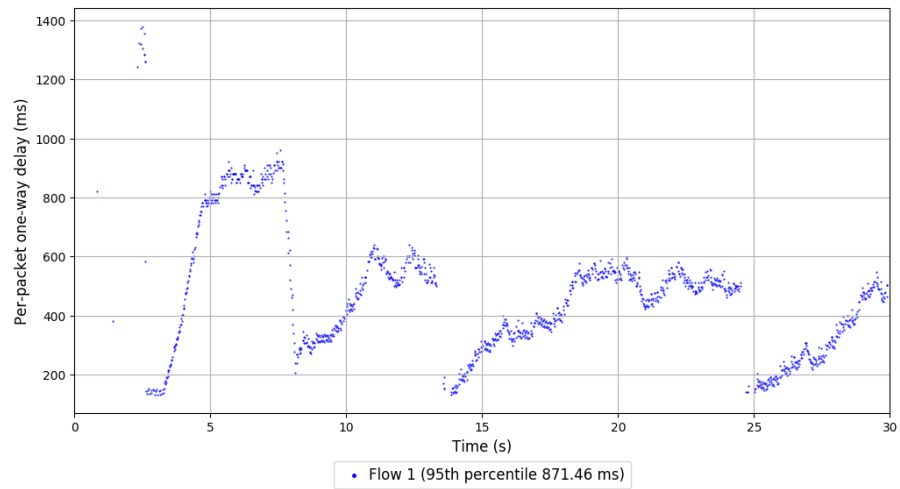
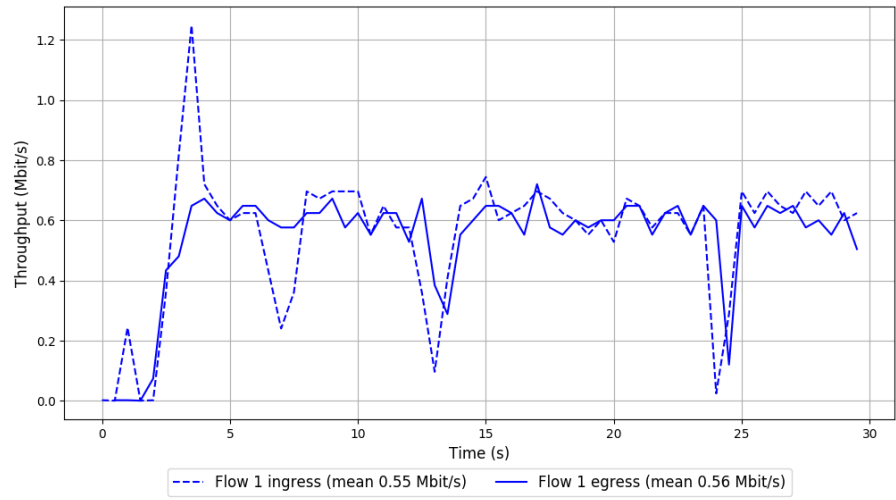


Run 2: Statistics of TCP BBR

Start at: 2018-02-17 01:13:15
End at: 2018-02-17 01:13:45
Local clock offset: -2.899 ms
Remote clock offset: -3.432 ms

Below is generated by plot.py at 2018-02-17 02:50:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 871.460 ms
Loss rate: 2.25%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 871.460 ms
Loss rate: 2.25%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-02-17 01:34:23

End at: 2018-02-17 01:34:53

Local clock offset: -2.102 ms

Remote clock offset: 3.109 ms

Below is generated by plot.py at 2018-02-17 02:50:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 880.602 ms

Loss rate: 2.25%

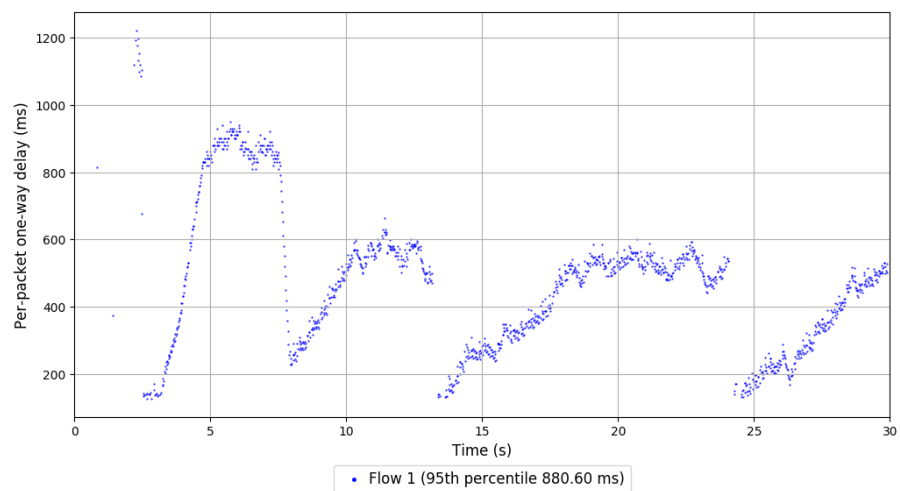
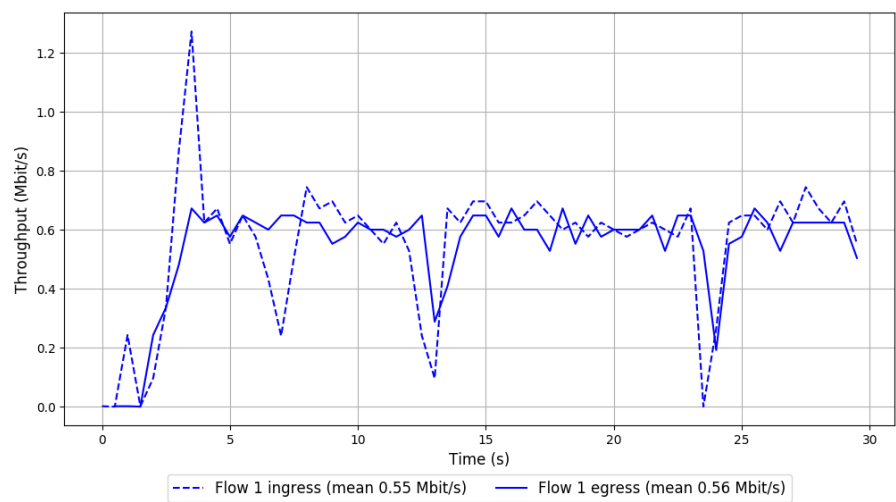
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 880.602 ms

Loss rate: 2.25%

Run 3: Report of TCP BBR — Data Link

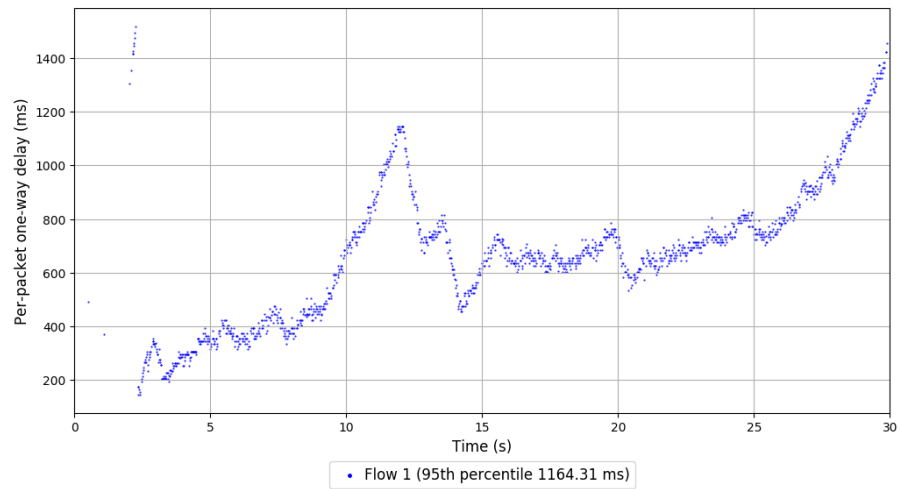
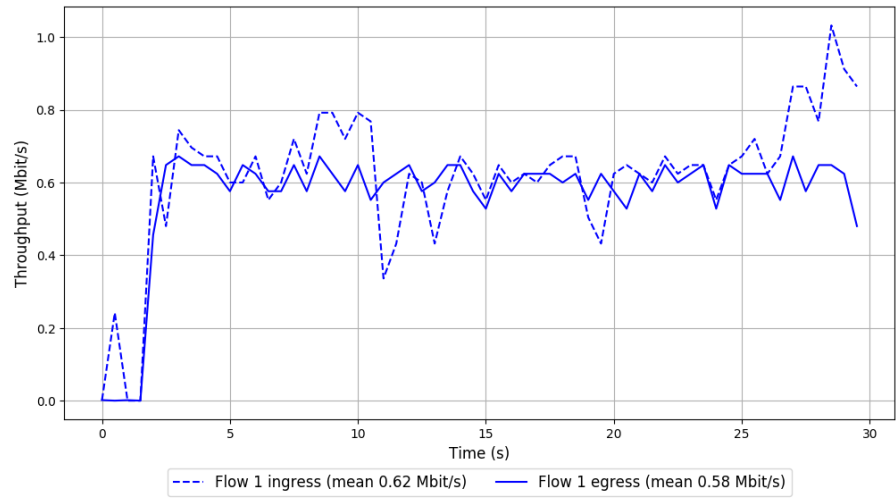


Run 1: Statistics of TCP Cubic

Start at: 2018-02-17 00:48:35
End at: 2018-02-17 00:49:05
Local clock offset: -4.034 ms
Remote clock offset: -4.444 ms

Below is generated by plot.py at 2018-02-17 02:50:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1164.305 ms
Loss rate: 7.99%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1164.305 ms
Loss rate: 7.99%

Run 1: Report of TCP Cubic — Data Link

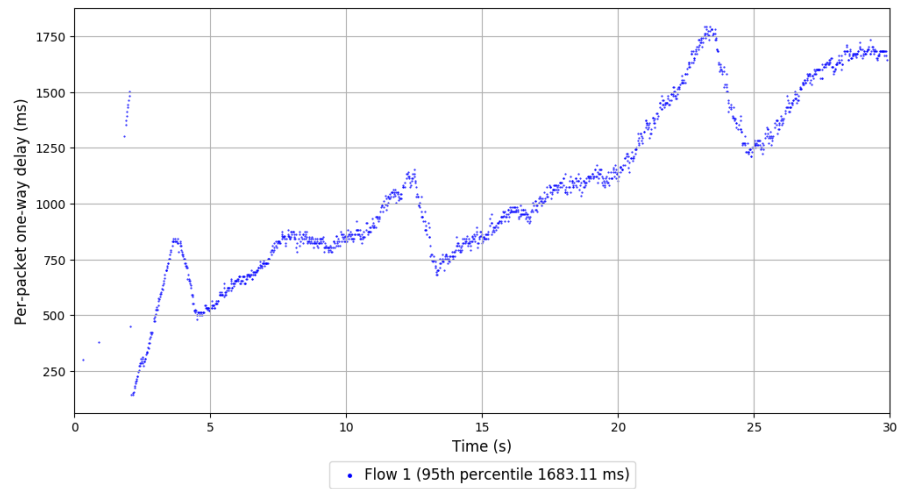
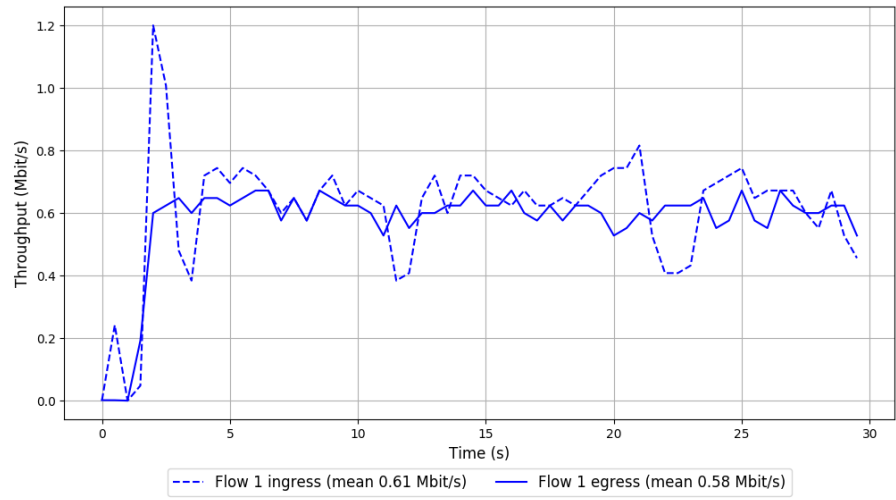


Run 2: Statistics of TCP Cubic

Start at: 2018-02-17 01:09:44
End at: 2018-02-17 01:10:14
Local clock offset: -3.015 ms
Remote clock offset: -4.284 ms

Below is generated by plot.py at 2018-02-17 02:50:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1683.114 ms
Loss rate: 5.65%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1683.114 ms
Loss rate: 5.65%

Run 2: Report of TCP Cubic — Data Link

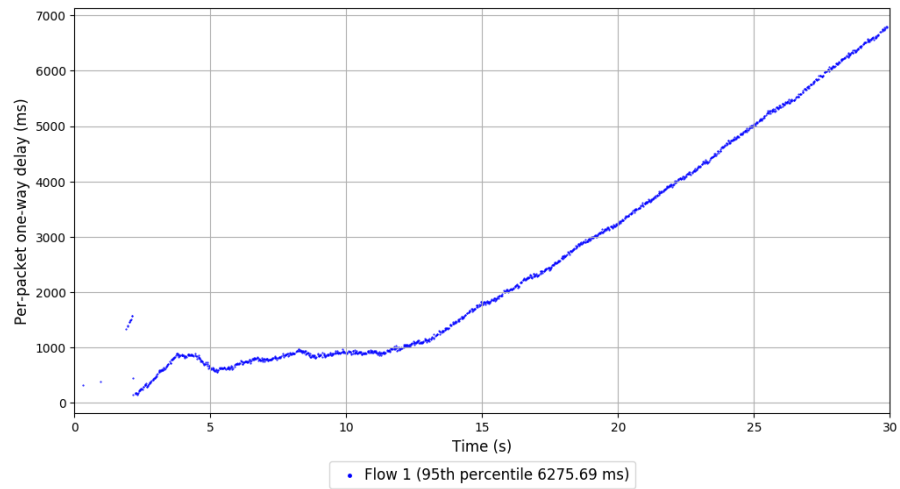
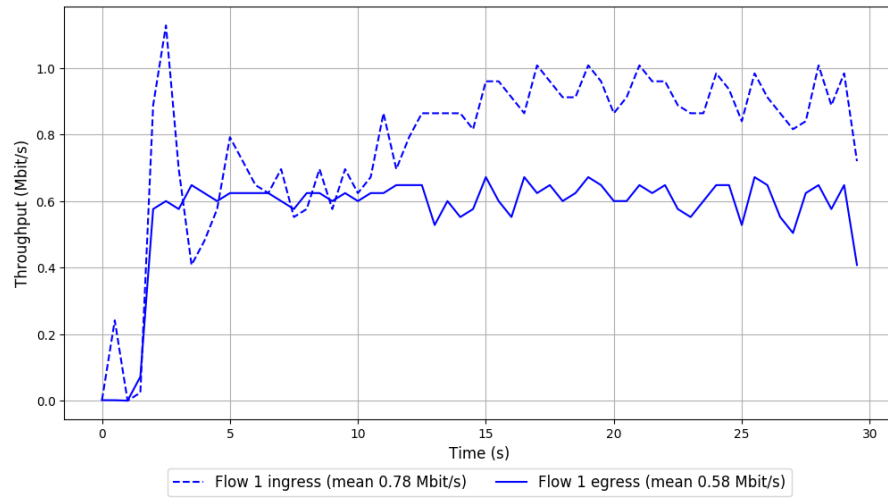


Run 3: Statistics of TCP Cubic

Start at: 2018-02-17 01:30:52
End at: 2018-02-17 01:31:22
Local clock offset: -2.311 ms
Remote clock offset: -1.996 ms

Below is generated by plot.py at 2018-02-17 02:50:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 6275.694 ms
Loss rate: 26.53%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 6275.694 ms
Loss rate: 26.53%

Run 3: Report of TCP Cubic — Data Link

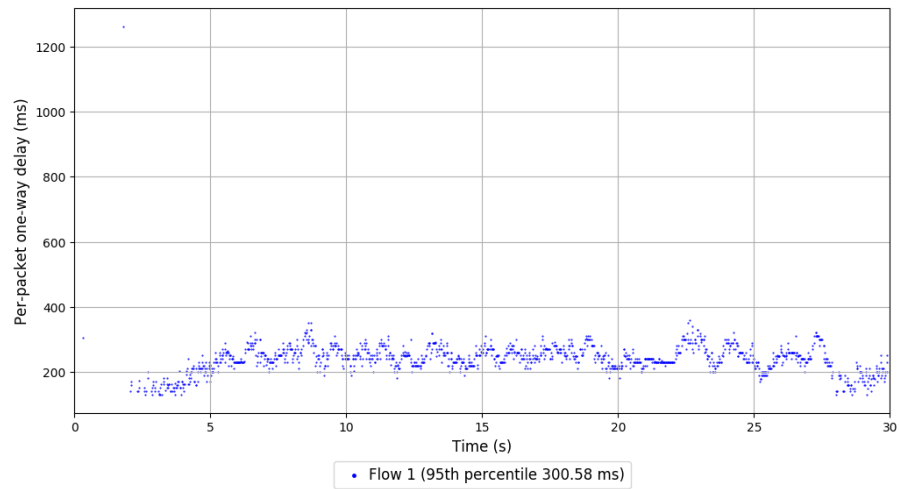
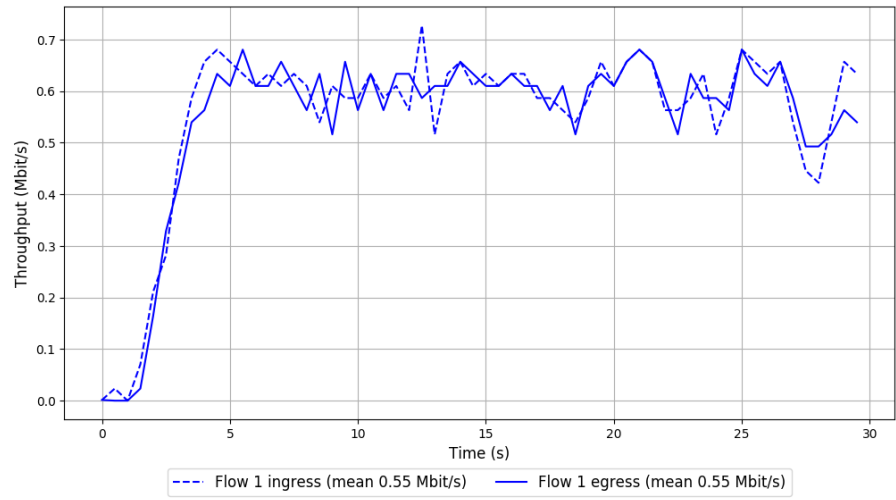


```
Run 1: Statistics of LEDBAT

Start at: 2018-02-17 00:58:00
End at: 2018-02-17 00:58:30
Local clock offset: -3.575 ms
Remote clock offset: -3.603 ms

# Below is generated by plot.py at 2018-02-17 02:50:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 300.584 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 300.584 ms
Loss rate: 1.13%
```


Run 1: Report of LEDBAT — Data Link

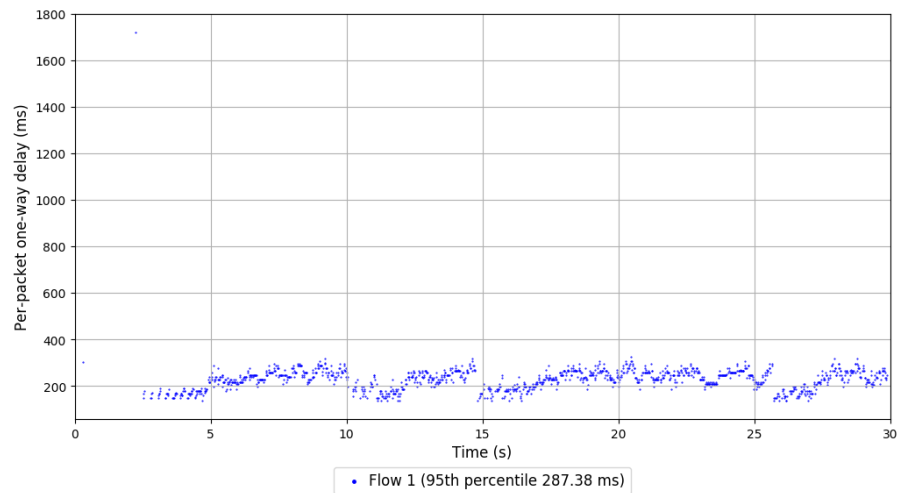
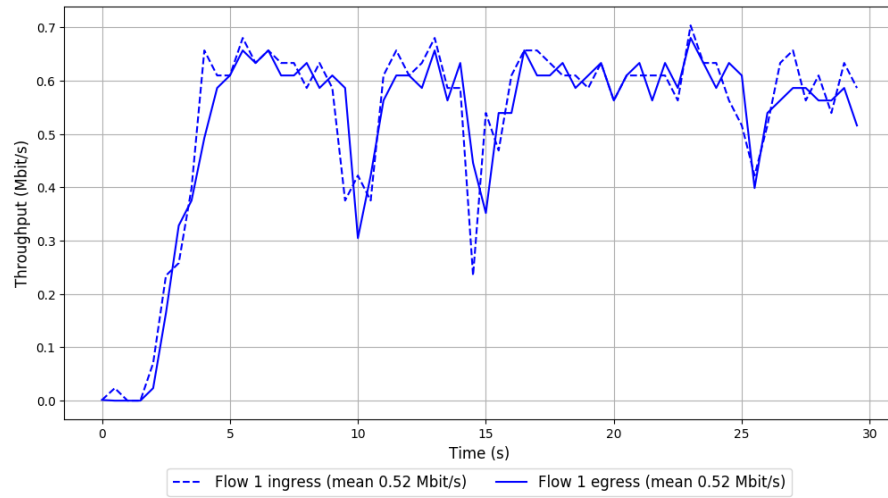


Run 2: Statistics of LEDBAT

Start at: 2018-02-17 01:19:08
End at: 2018-02-17 01:19:38
Local clock offset: -2.678 ms
Remote clock offset: -3.408 ms

Below is generated by plot.py at 2018-02-17 02:50:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 287.375 ms
Loss rate: 1.57%
-- Flow 1:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 287.375 ms
Loss rate: 1.57%

Run 2: Report of LEDBAT — Data Link

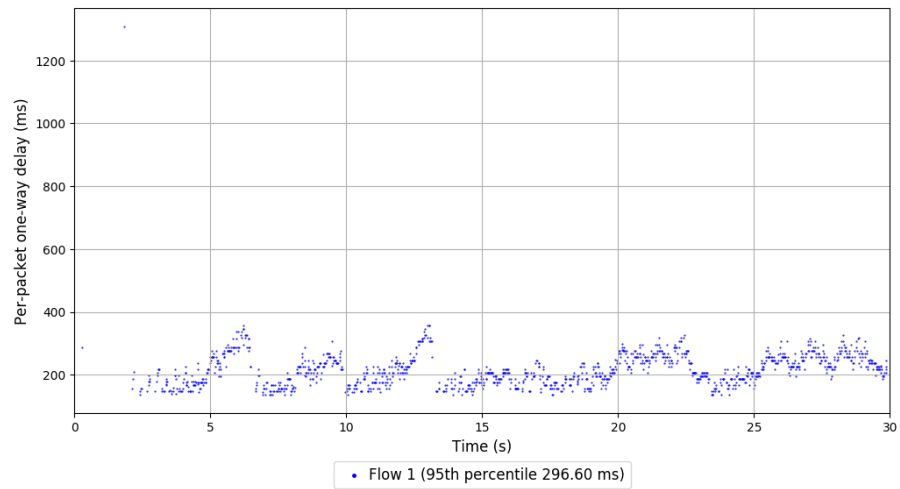
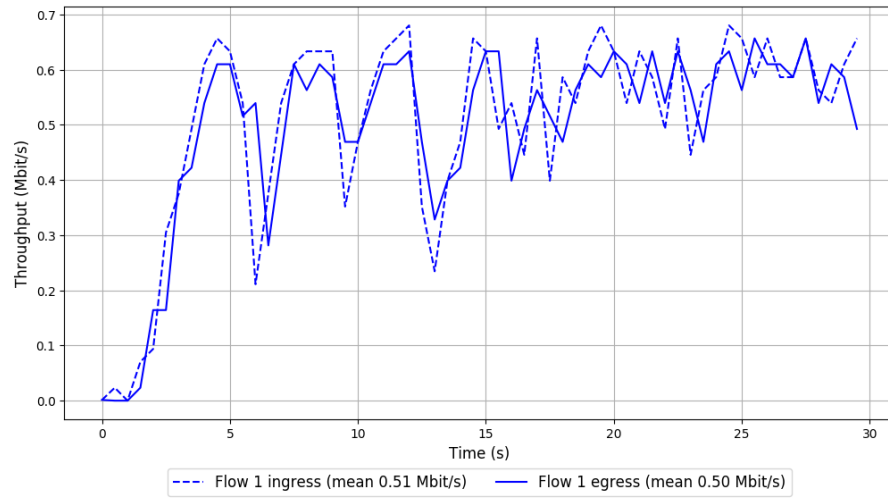


Run 3: Statistics of LEDBAT

Start at: 2018-02-17 01:40:16
End at: 2018-02-17 01:40:46
Local clock offset: -2.883 ms
Remote clock offset: -1.996 ms

Below is generated by plot.py at 2018-02-17 02:50:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 296.598 ms
Loss rate: 1.93%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 296.598 ms
Loss rate: 1.93%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC

Start at: 2018-02-17 00:59:10

End at: 2018-02-17 00:59:40

Local clock offset: -3.467 ms

Remote clock offset: 2.096 ms

Below is generated by plot.py at 2018-02-17 02:50:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26069.312 ms

Loss rate: 98.18%

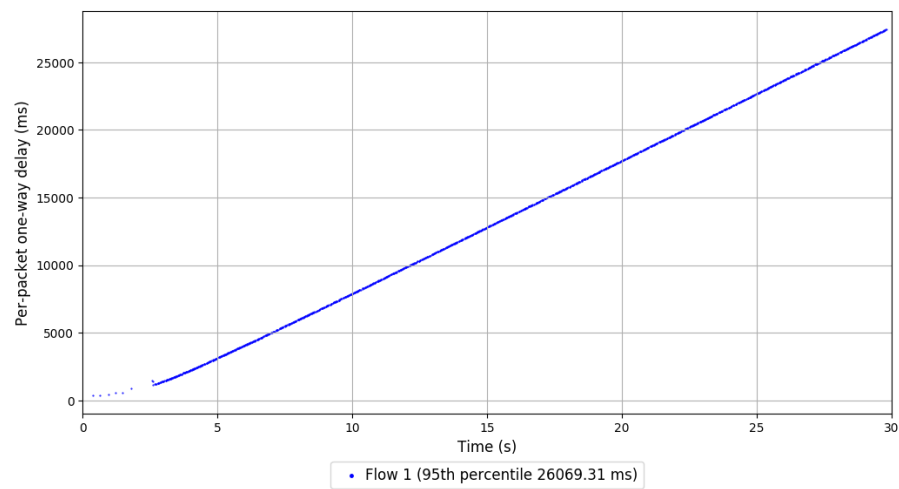
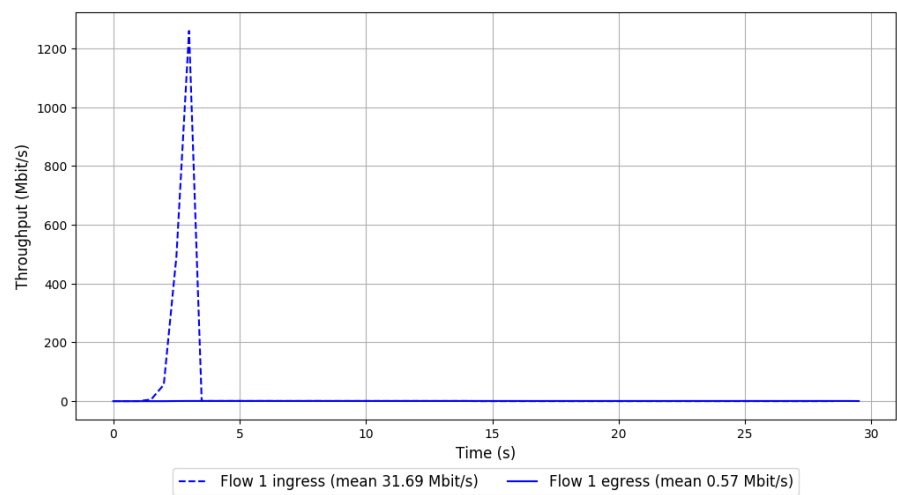
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26069.312 ms

Loss rate: 98.18%

Run 1: Report of PCC — Data Link



Run 2: Statistics of PCC

Start at: 2018-02-17 01:20:18

End at: 2018-02-17 01:20:48

Local clock offset: -2.638 ms

Remote clock offset: 2.306 ms

Below is generated by plot.py at 2018-02-17 02:50:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 25657.175 ms

Loss rate: 98.22%

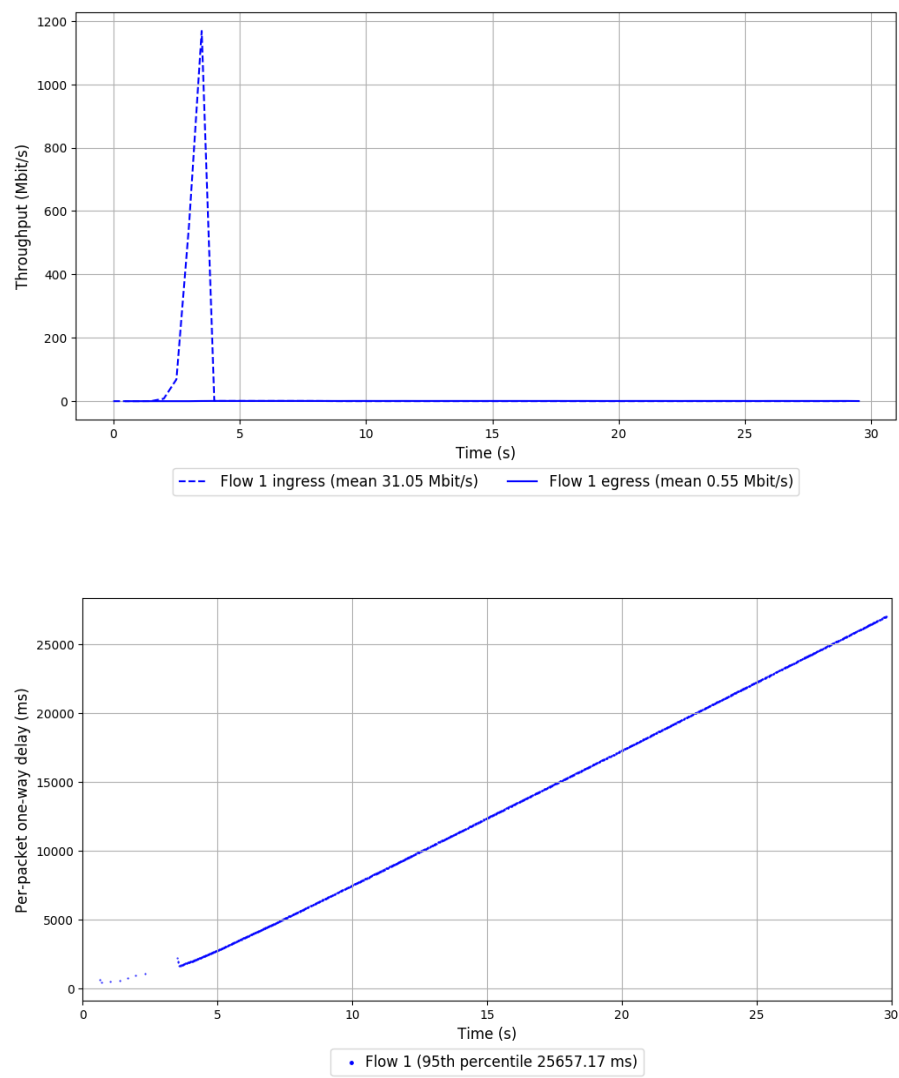
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 25657.175 ms

Loss rate: 98.22%

Run 2: Report of PCC — Data Link

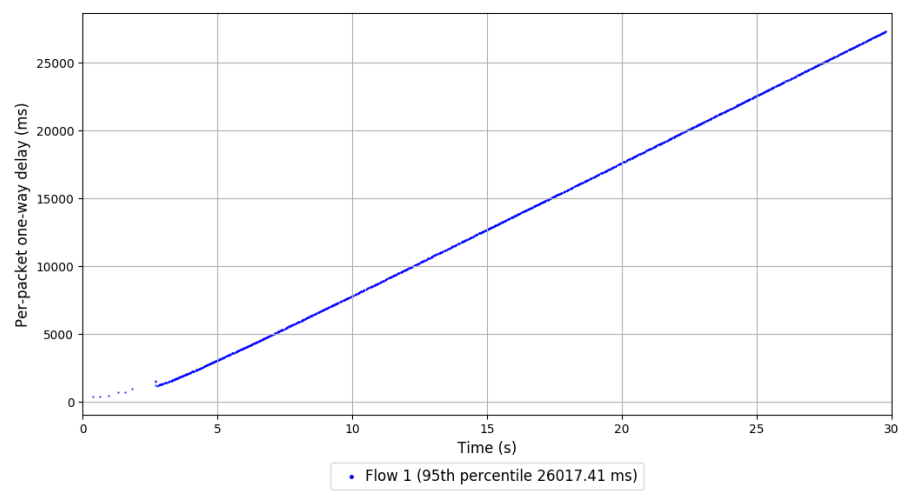
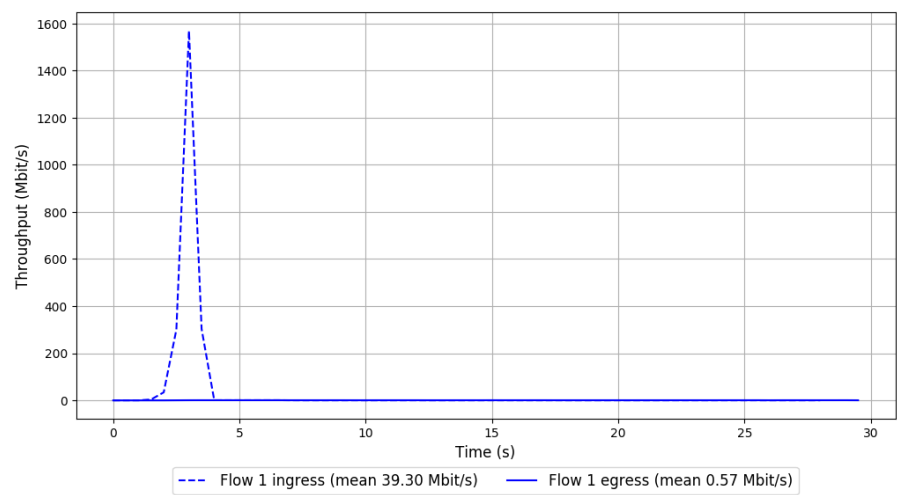


Run 3: Statistics of PCC

Start at: 2018-02-17 01:41:26
End at: 2018-02-17 01:41:57
Local clock offset: -3.503 ms
Remote clock offset: -1.104 ms

Below is generated by plot.py at 2018-02-17 02:50:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26017.406 ms
Loss rate: 98.50%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26017.406 ms
Loss rate: 98.50%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-02-17 00:46:15

End at: 2018-02-17 00:46:45

Local clock offset: -4.205 ms

Remote clock offset: 1.278 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1828.672 ms

Loss rate: 5.59%

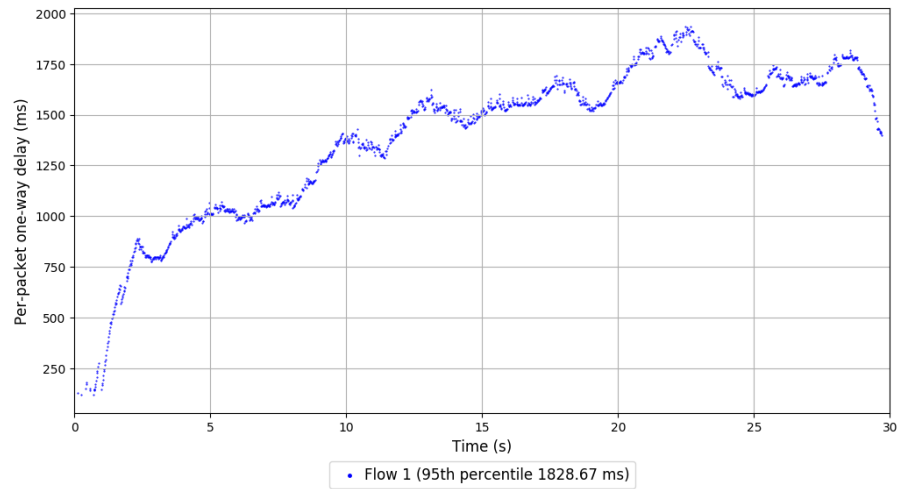
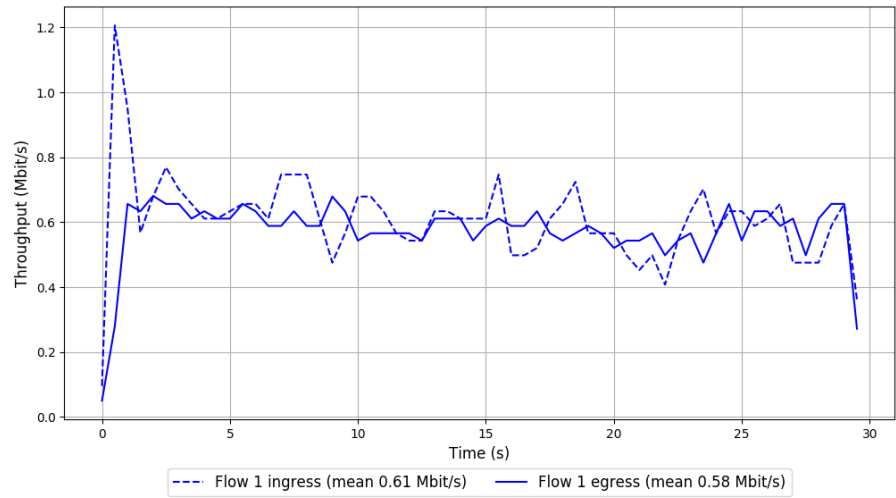
-- Flow 1:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1828.672 ms

Loss rate: 5.59%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-02-17 01:07:24

End at: 2018-02-17 01:07:54

Local clock offset: -3.12 ms

Remote clock offset: -3.482 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 5213.172 ms

Loss rate: 22.30%

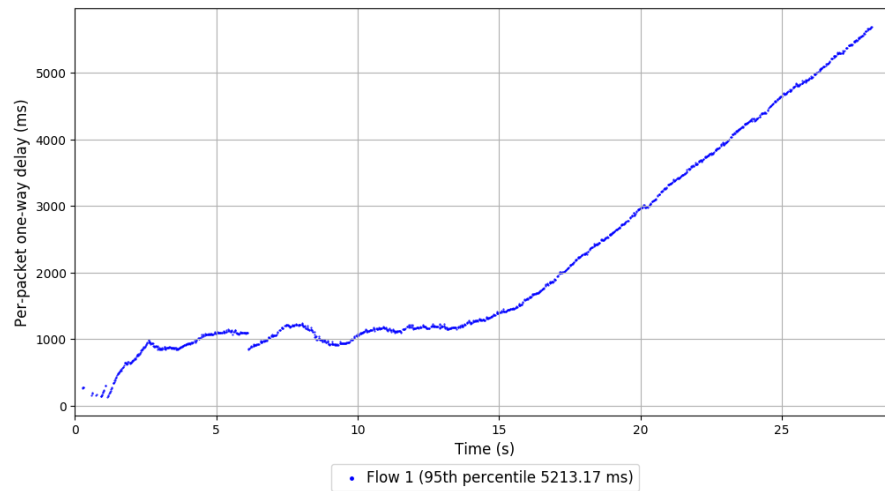
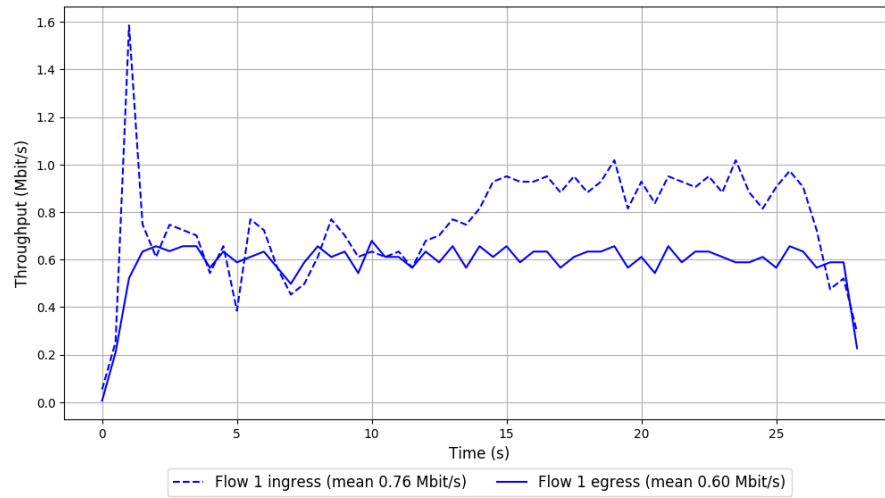
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 5213.172 ms

Loss rate: 22.30%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-02-17 01:28:32

End at: 2018-02-17 01:29:02

Local clock offset: -2.384 ms

Remote clock offset: -2.264 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 3968.803 ms

Loss rate: 20.33%

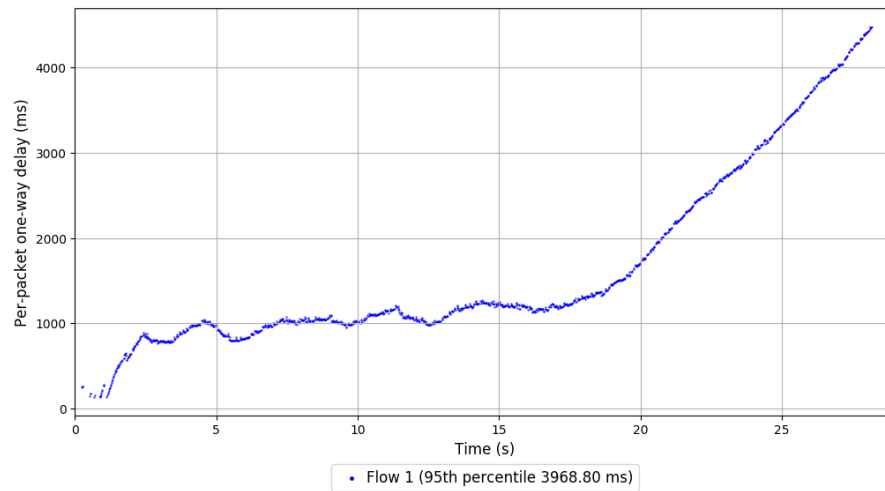
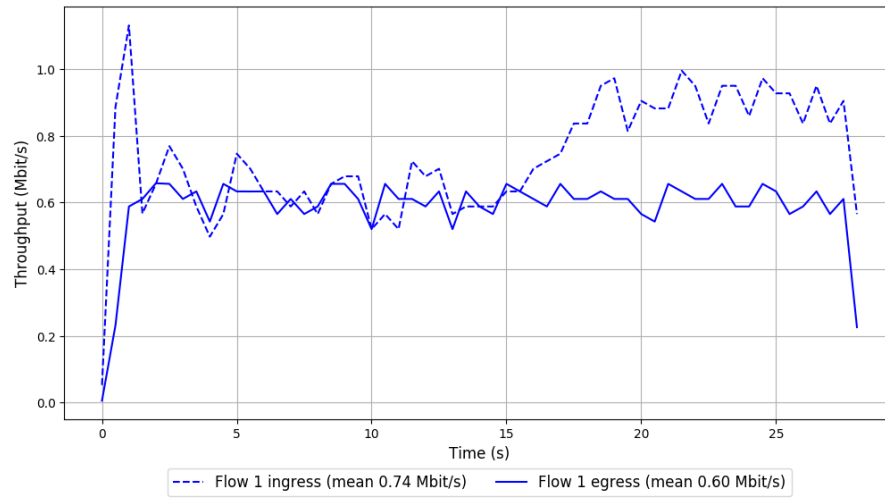
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 3968.803 ms

Loss rate: 20.33%

Run 3: Report of QUIC Cubic — Data Link

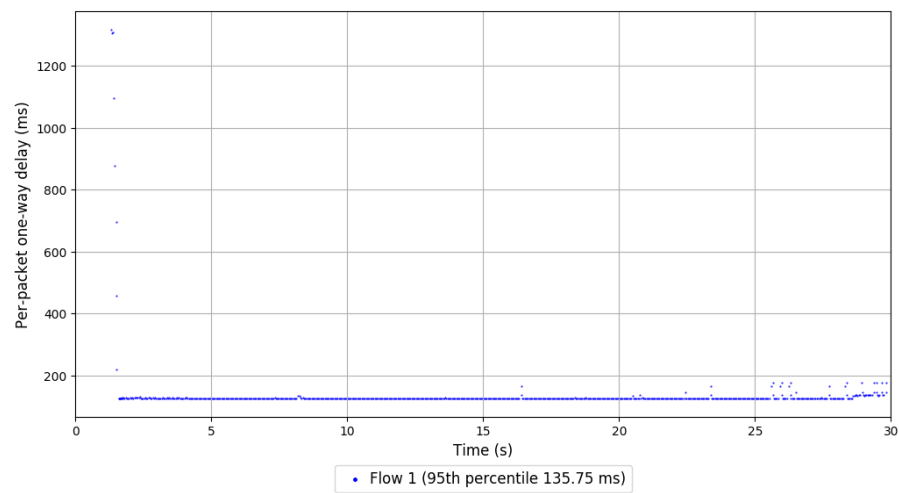
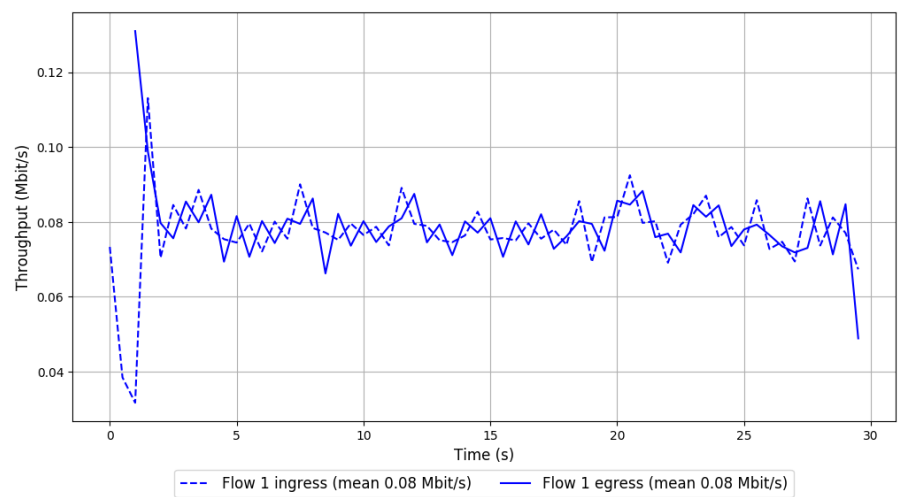


Run 1: Statistics of SCReAM

Start at: 2018-02-17 01:03:53
End at: 2018-02-17 01:04:23
Local clock offset: -3.254 ms
Remote clock offset: -3.547 ms

Below is generated by plot.py at 2018-02-17 02:50:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 135.748 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 135.748 ms
Loss rate: 1.09%

Run 1: Report of SReAM — Data Link

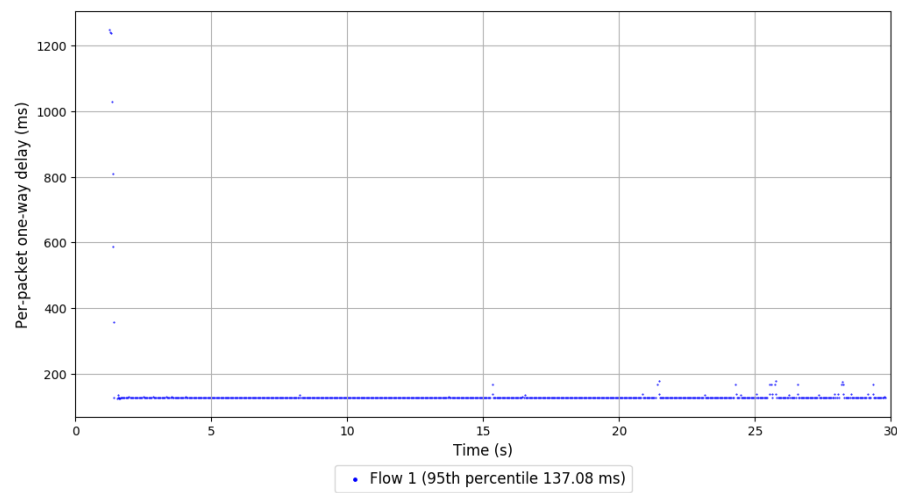
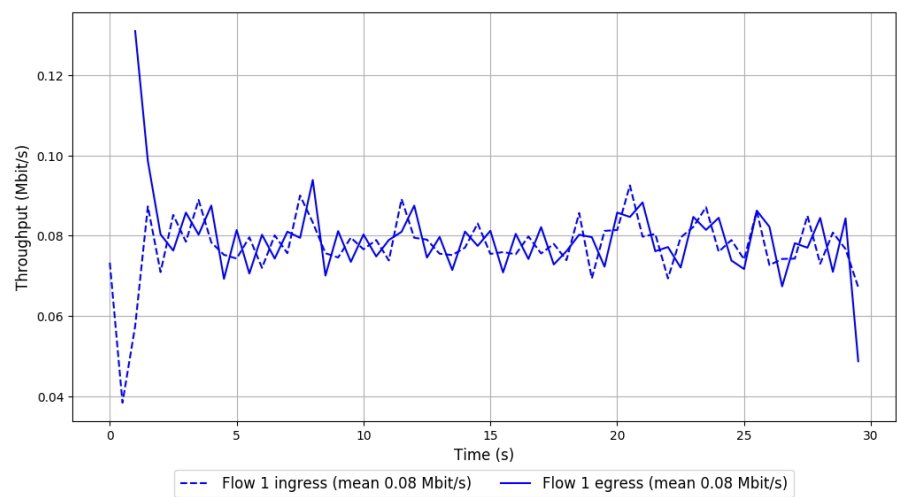


Run 2: Statistics of SCReAM

Start at: 2018-02-17 01:25:01
End at: 2018-02-17 01:25:31
Local clock offset: -2.439 ms
Remote clock offset: -2.661 ms

Below is generated by plot.py at 2018-02-17 02:50:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 137.081 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 137.081 ms
Loss rate: 0.79%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-02-17 01:46:10

End at: 2018-02-17 01:46:40

Local clock offset: -4.888 ms

Remote clock offset: 4.793 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 161.663 ms

Loss rate: 0.80%

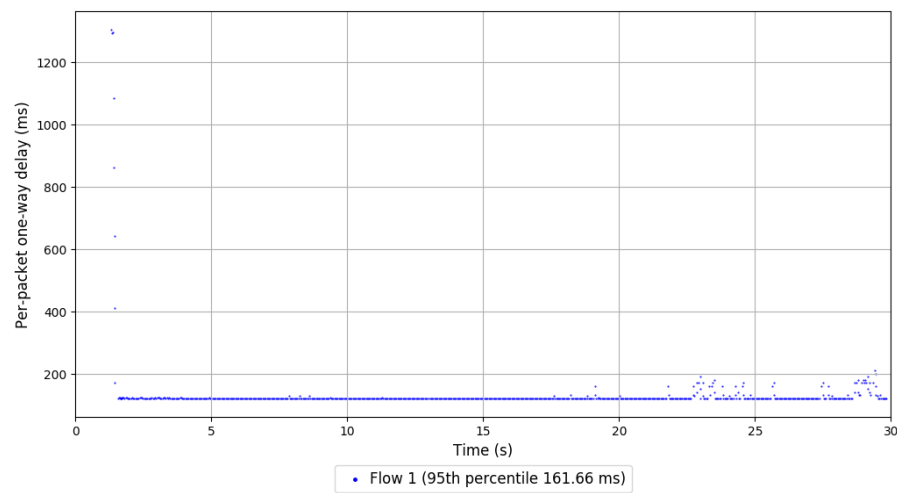
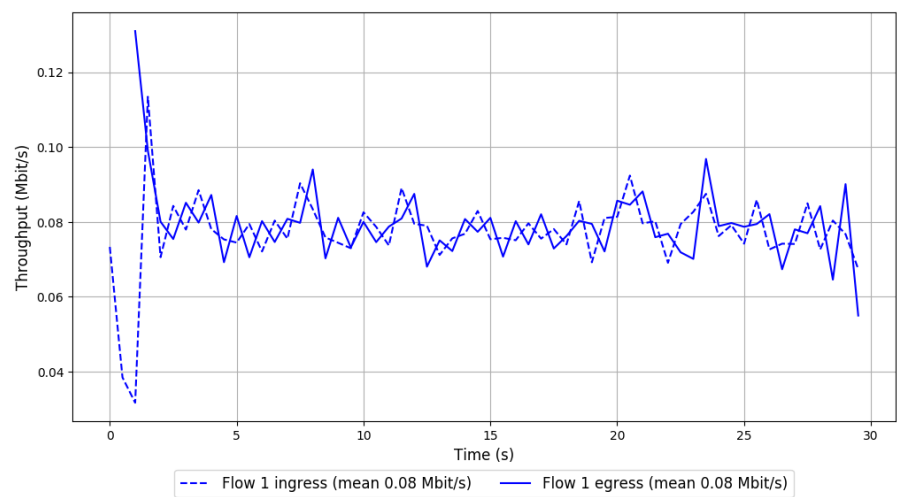
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 161.663 ms

Loss rate: 0.80%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-02-17 00:54:27

End at: 2018-02-17 00:54:57

Local clock offset: -3.676 ms

Remote clock offset: 1.255 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.30 Mbit/s

95th percentile per-packet one-way delay: 657.154 ms

Loss rate: 0.19%

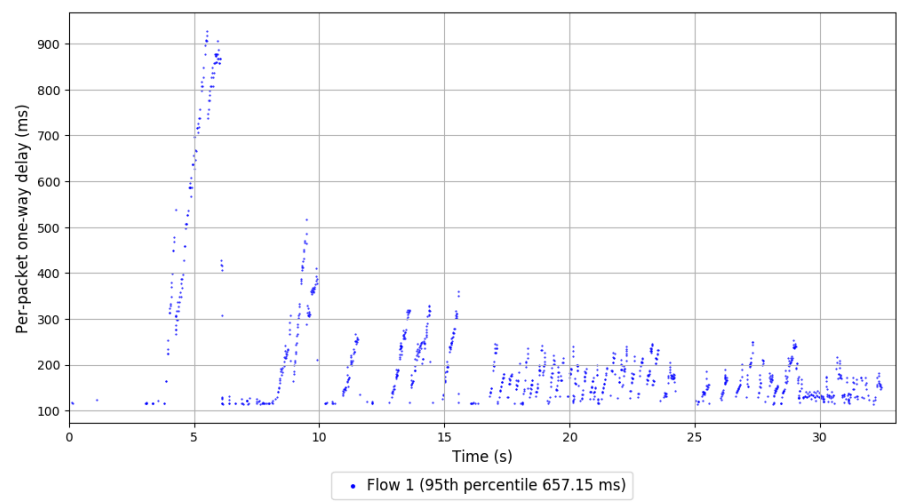
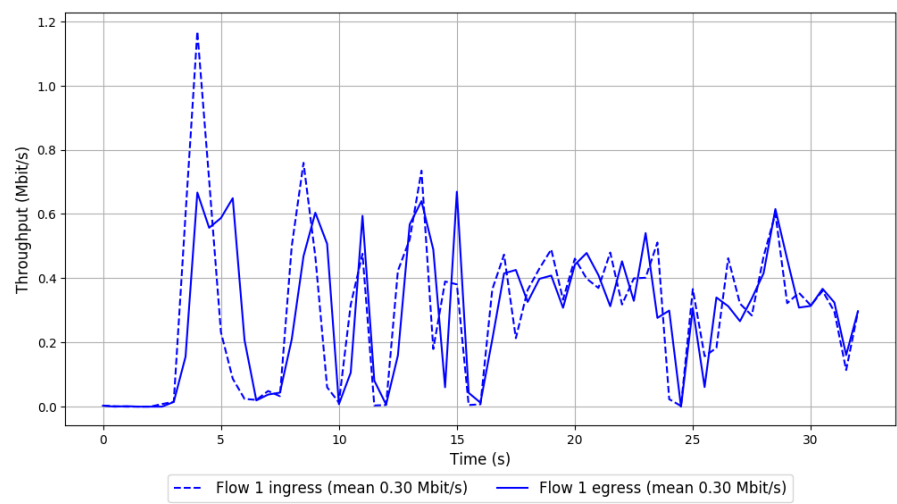
-- Flow 1:

Average throughput: 0.30 Mbit/s

95th percentile per-packet one-way delay: 657.154 ms

Loss rate: 0.19%

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2018-02-17 01:15:35

End at: 2018-02-17 01:16:05

Local clock offset: -2.791 ms

Remote clock offset: 0.533 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.31 Mbit/s

95th percentile per-packet one-way delay: 659.260 ms

Loss rate: 1.06%

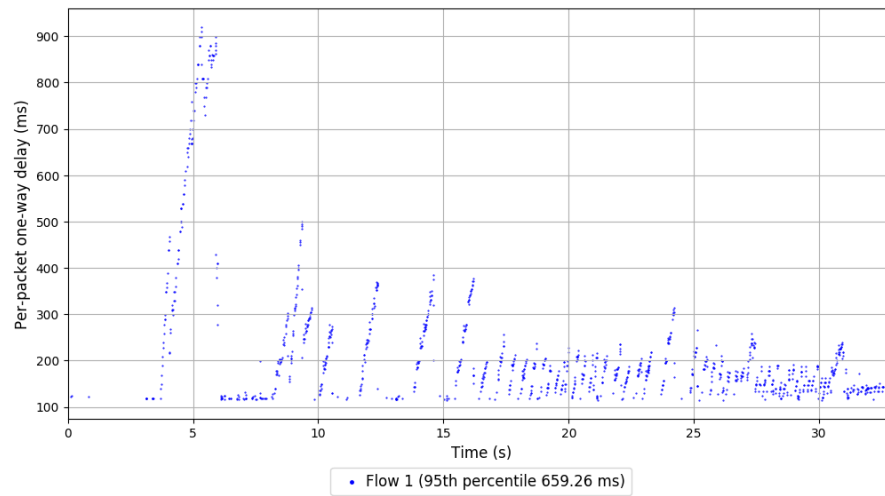
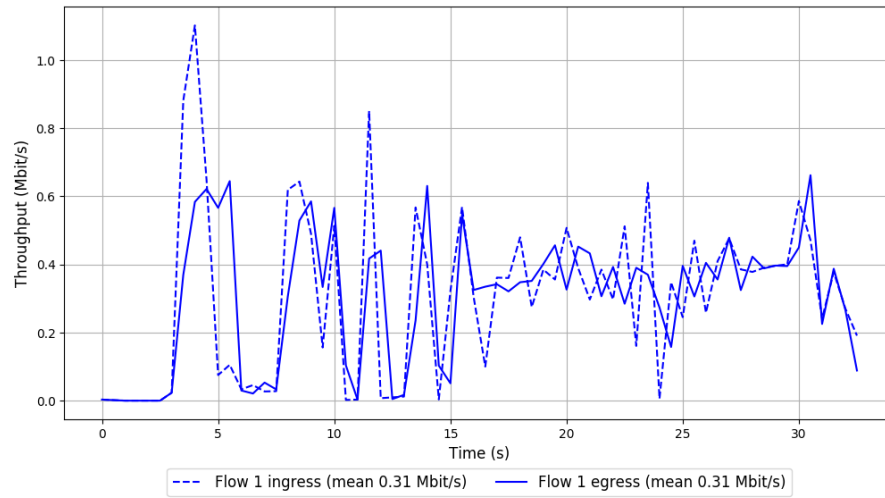
-- Flow 1:

Average throughput: 0.31 Mbit/s

95th percentile per-packet one-way delay: 659.260 ms

Loss rate: 1.06%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-02-17 01:36:44

End at: 2018-02-17 01:37:14

Local clock offset: -2.032 ms

Remote clock offset: 4.231 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.24 Mbit/s

95th percentile per-packet one-way delay: 758.158 ms

Loss rate: 1.21%

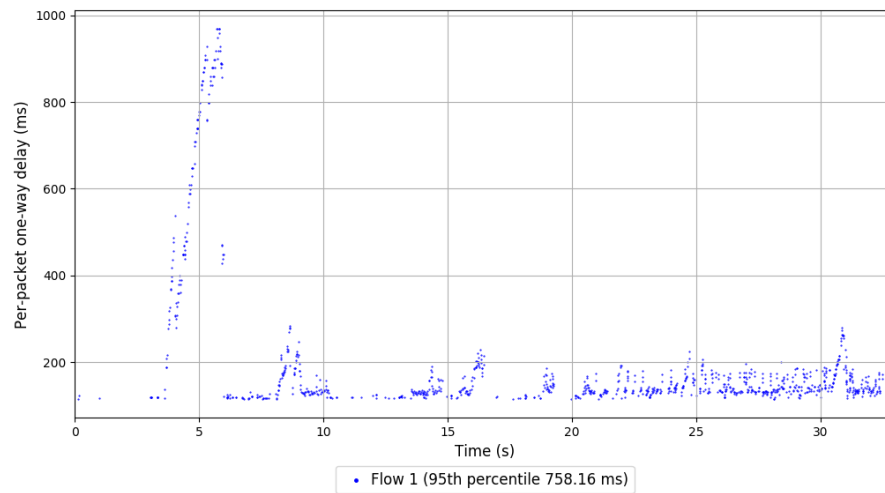
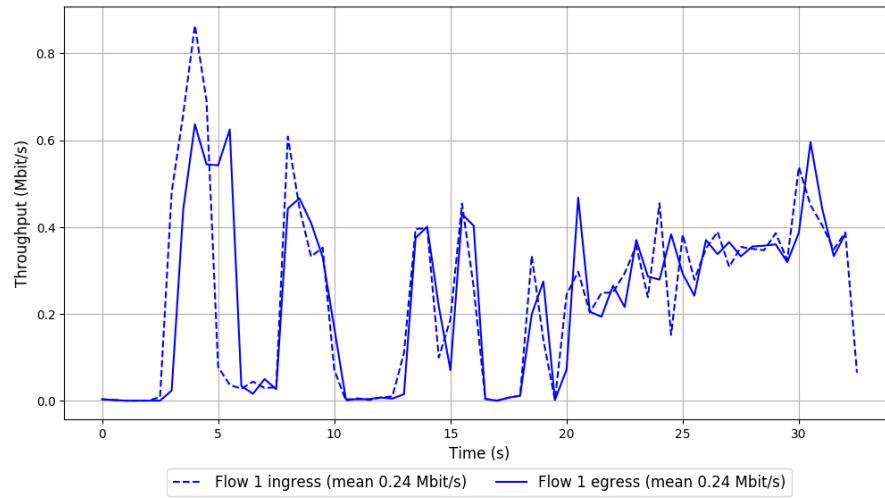
-- Flow 1:

Average throughput: 0.24 Mbit/s

95th percentile per-packet one-way delay: 758.158 ms

Loss rate: 1.21%

Run 3: Report of WebRTC media — Data Link



Run 1: Statistics of Sprout

Start at: 2018-02-17 01:01:32

End at: 2018-02-17 01:02:02

Local clock offset: -3.384 ms

Remote clock offset: -4.4 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.09 Mbit/s

95th percentile per-packet one-way delay: 531.866 ms

Loss rate: 2.30%

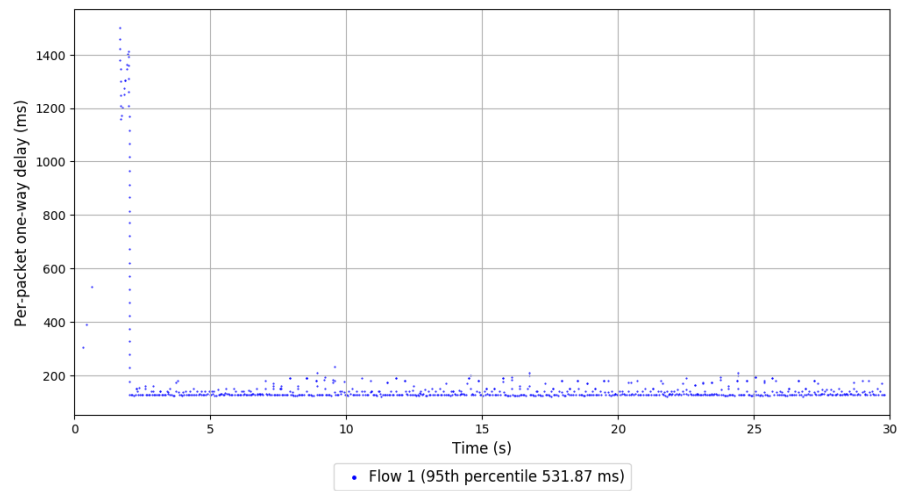
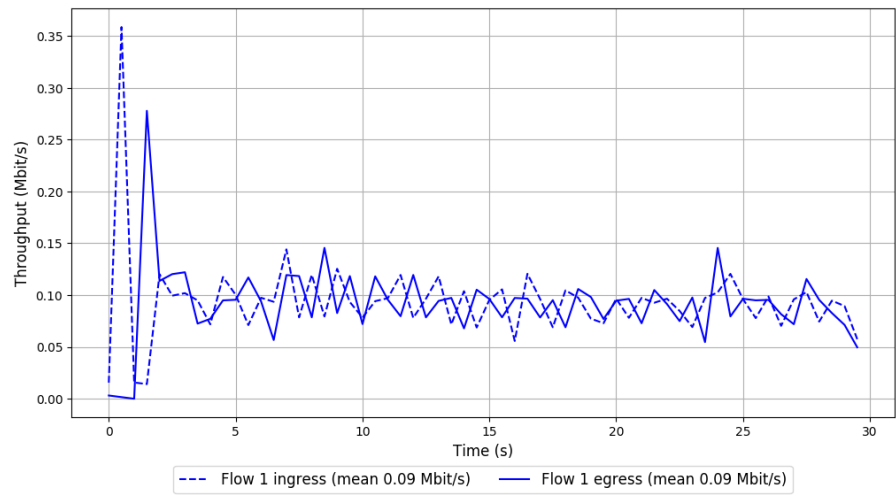
-- Flow 1:

Average throughput: 0.09 Mbit/s

95th percentile per-packet one-way delay: 531.866 ms

Loss rate: 2.30%

Run 1: Report of Sprout — Data Link

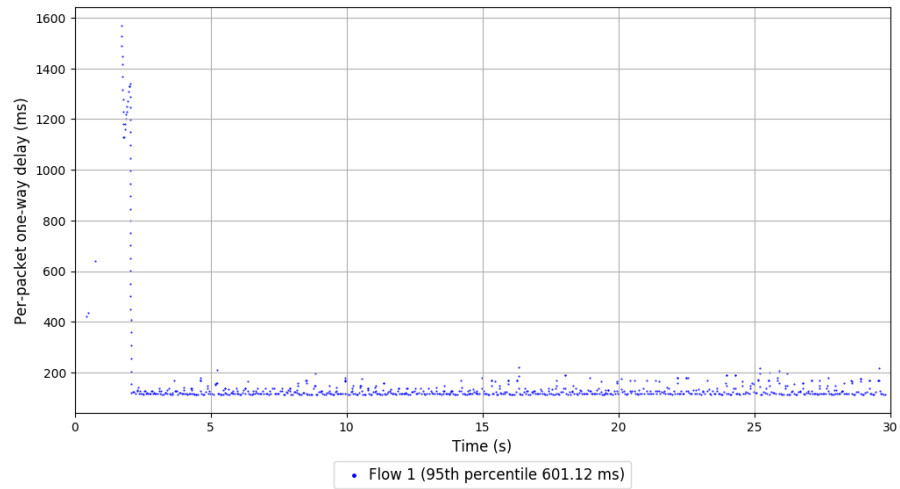
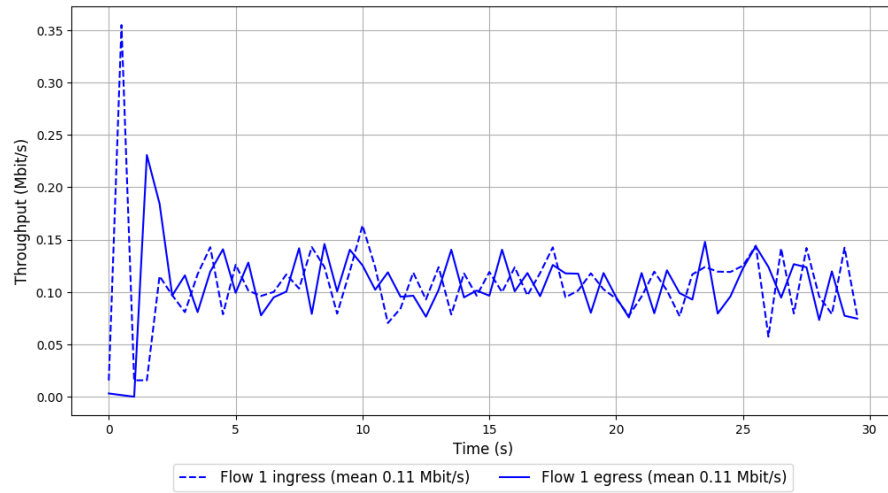


Run 2: Statistics of Sprout

Start at: 2018-02-17 01:22:40
End at: 2018-02-17 01:23:10
Local clock offset: -2.541 ms
Remote clock offset: 2.553 ms

Below is generated by plot.py at 2018-02-17 02:50:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 601.125 ms
Loss rate: 1.97%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 601.125 ms
Loss rate: 1.97%

Run 2: Report of Sprout — Data Link

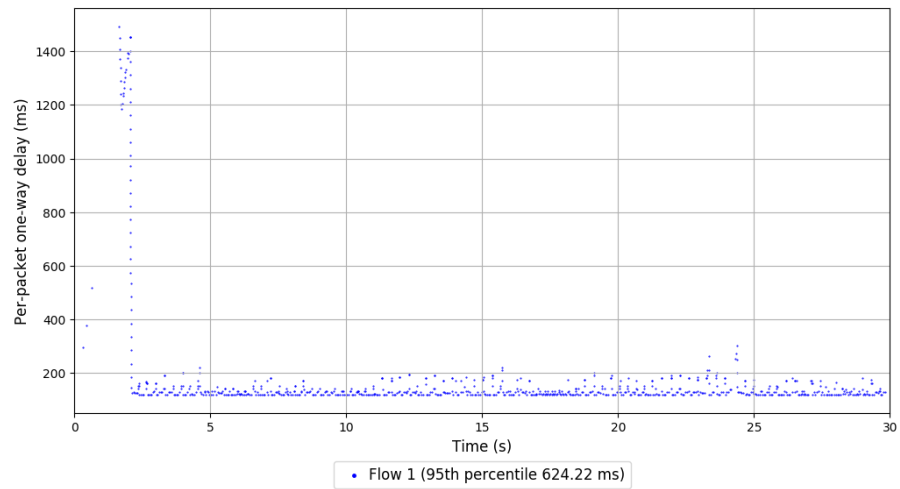
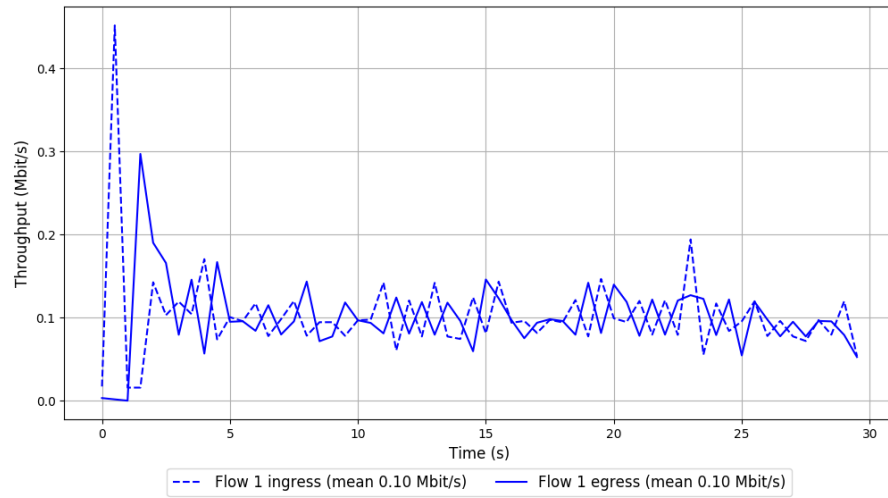


Run 3: Statistics of Sprout

Start at: 2018-02-17 01:43:48
End at: 2018-02-17 01:44:19
Local clock offset: -4.222 ms
Remote clock offset: -1.052 ms

Below is generated by plot.py at 2018-02-17 02:50:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 624.218 ms
Loss rate: 2.13%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 624.218 ms
Loss rate: 2.13%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-02-17 01:02:42

End at: 2018-02-17 01:03:12

Local clock offset: -3.402 ms

Remote clock offset: -4.349 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 1146.337 ms

Loss rate: 2.81%

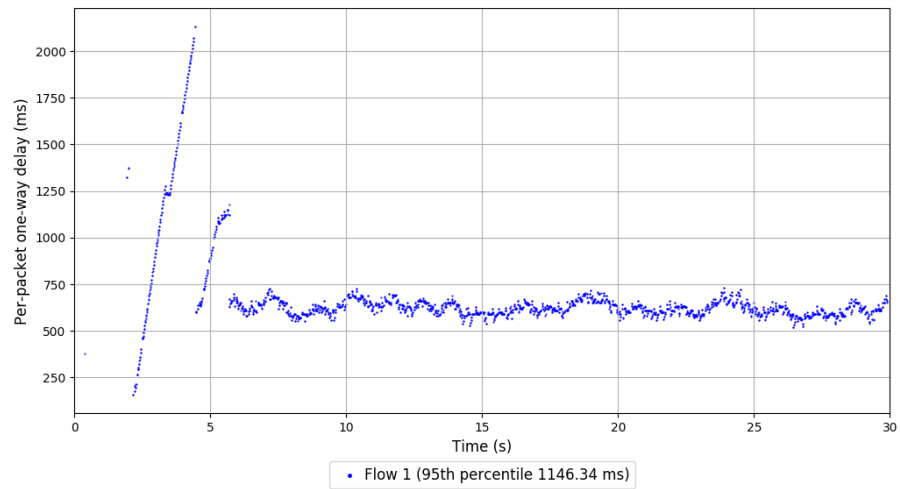
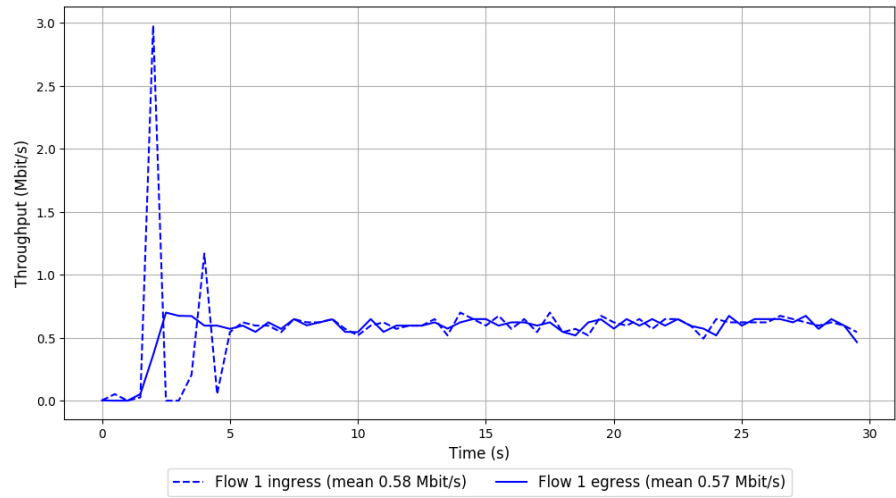
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 1146.337 ms

Loss rate: 2.81%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-02-17 01:23:50

End at: 2018-02-17 01:24:20

Local clock offset: -2.489 ms

Remote clock offset: -2.971 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 957.260 ms

Loss rate: 2.67%

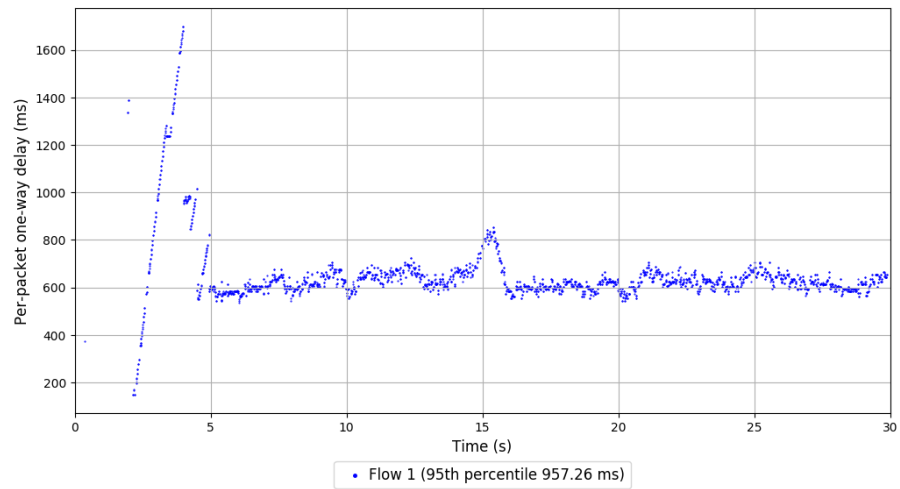
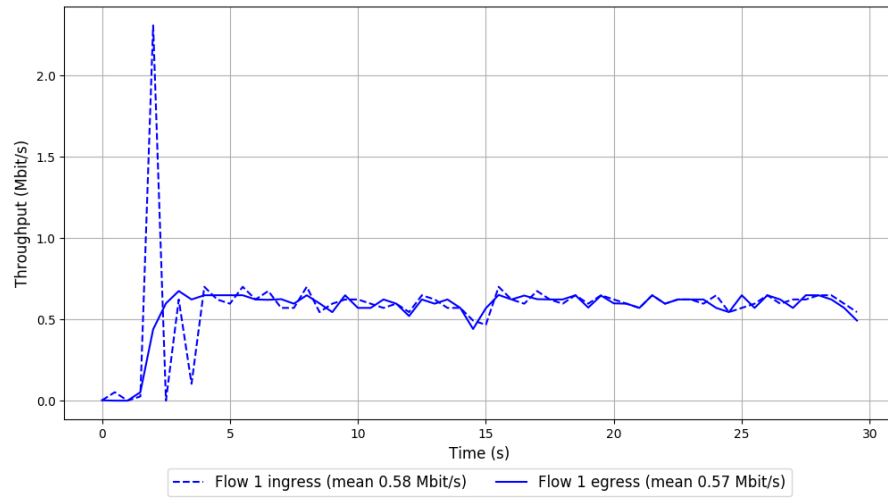
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 957.260 ms

Loss rate: 2.67%

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

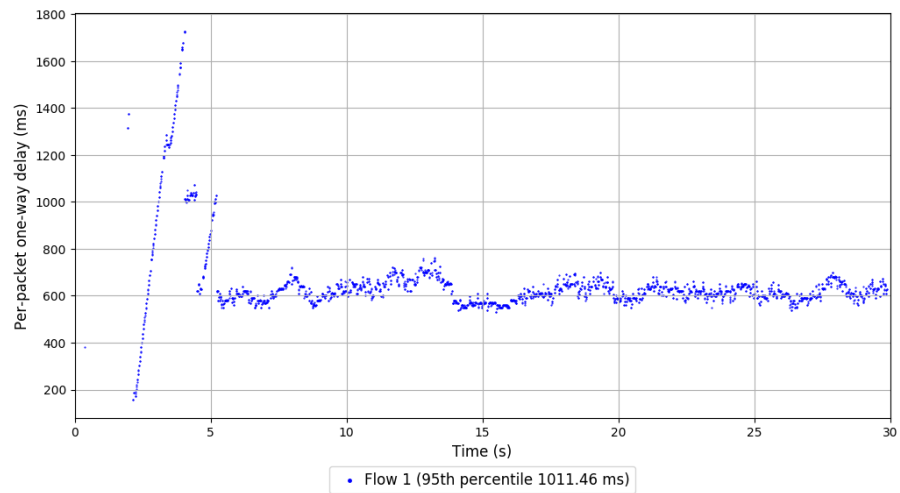
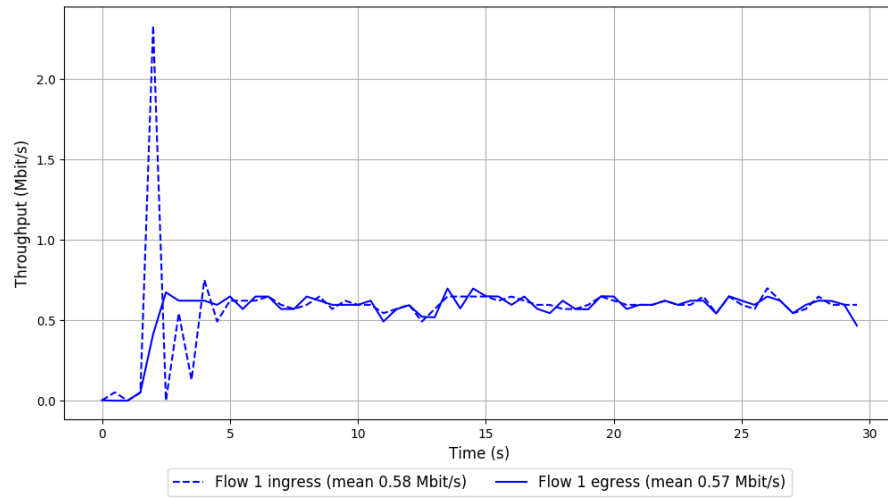


Run 3: Statistics of TaoVA-100x

Start at: 2018-02-17 01:44:59
End at: 2018-02-17 01:45:29
Local clock offset: -4.595 ms
Remote clock offset: -1.706 ms

Below is generated by plot.py at 2018-02-17 02:50:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 1011.464 ms
Loss rate: 2.69%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 1011.464 ms
Loss rate: 2.69%

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



Run 1: Statistics of TCP Vegas

Start at: 2018-02-17 01:00:22

End at: 2018-02-17 01:00:52

Local clock offset: -3.489 ms

Remote clock offset: 0.43 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 1029.650 ms

Loss rate: 1.24%

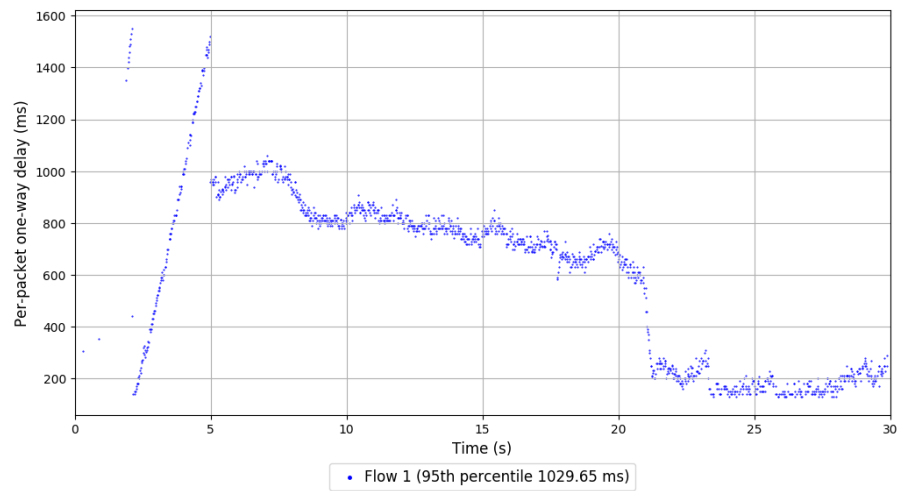
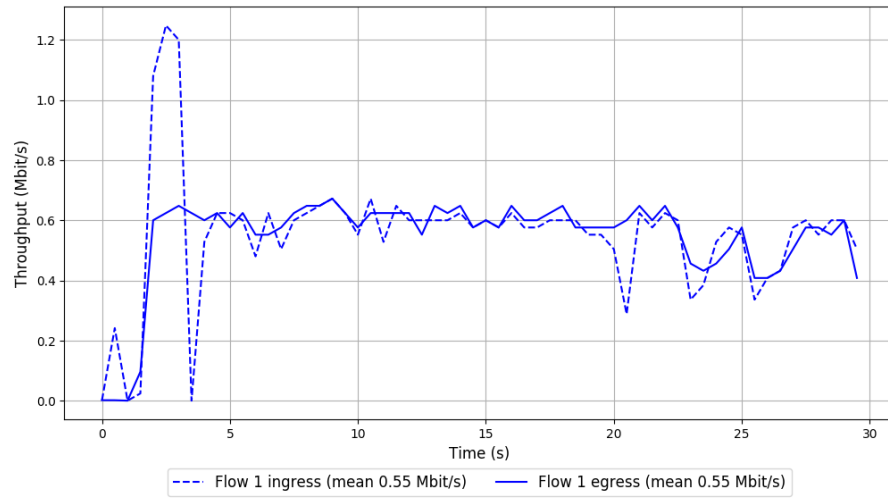
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 1029.650 ms

Loss rate: 1.24%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2018-02-17 01:21:29

End at: 2018-02-17 01:21:59

Local clock offset: -2.648 ms

Remote clock offset: 0.563 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 1009.428 ms

Loss rate: 0.85%

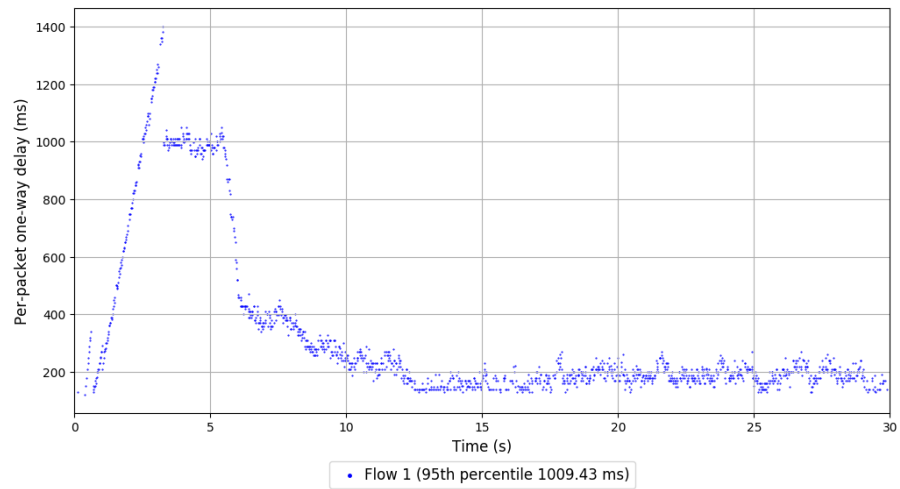
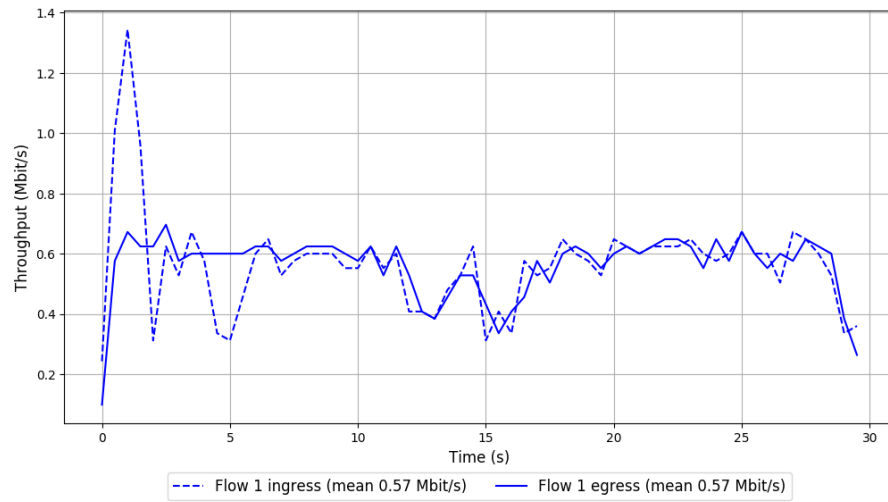
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 1009.428 ms

Loss rate: 0.85%

Run 2: Report of TCP Vegas — Data Link

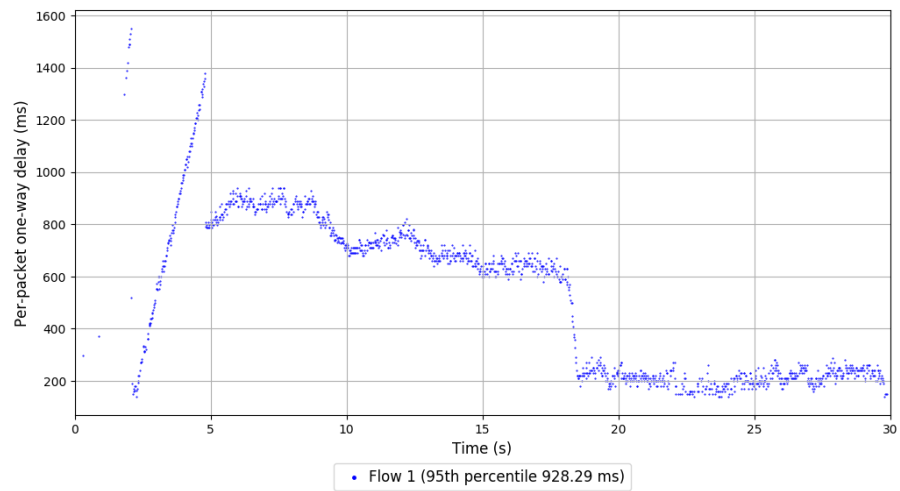
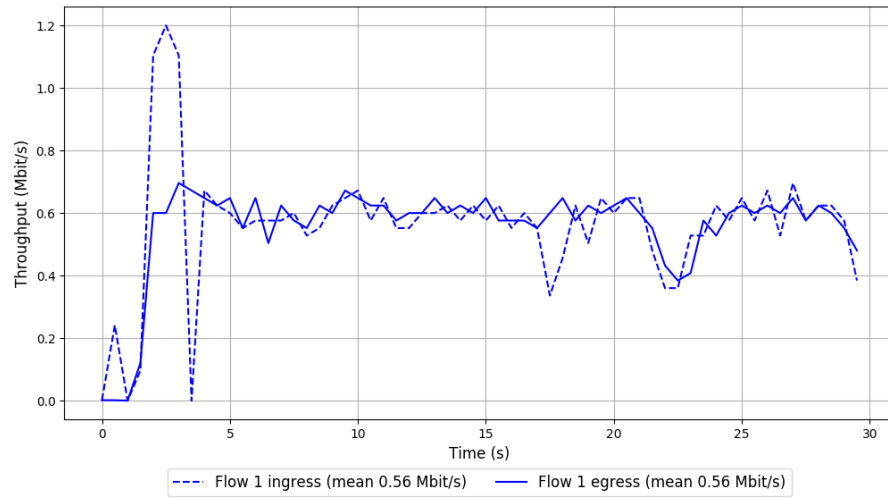


Run 3: Statistics of TCP Vegas

Start at: 2018-02-17 01:42:38
End at: 2018-02-17 01:43:08
Local clock offset: -3.88 ms
Remote clock offset: -0.992 ms

Below is generated by plot.py at 2018-02-17 02:50:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 928.289 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 928.289 ms
Loss rate: 0.79%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-02-17 00:47:25

End at: 2018-02-17 00:47:55

Local clock offset: -4.121 ms

Remote clock offset: 1.283 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1820.463 ms

Loss rate: 3.12%

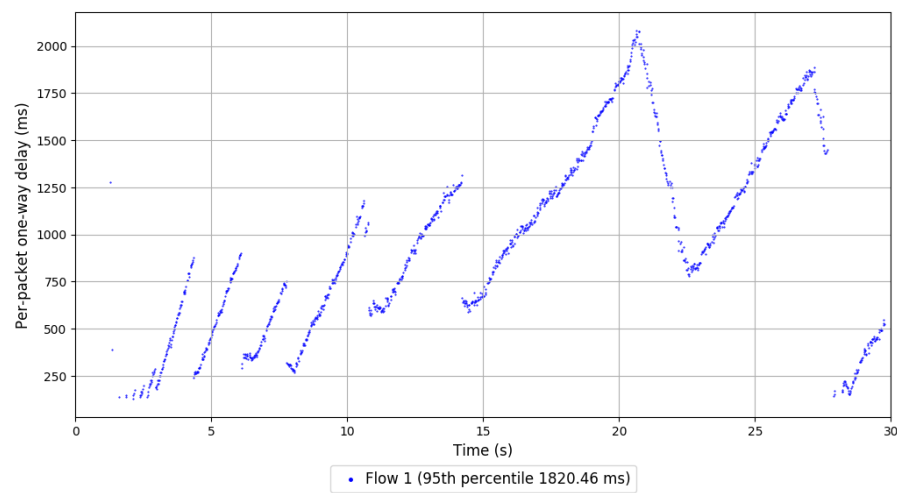
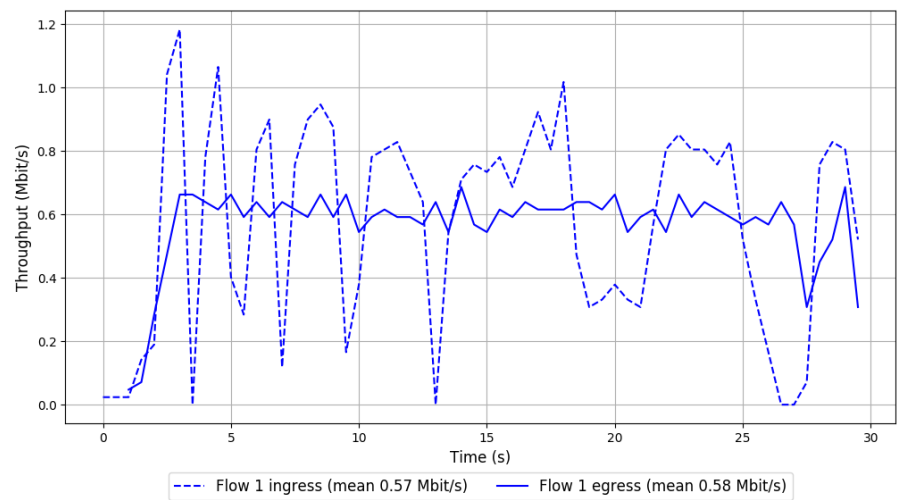
-- Flow 1:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1820.463 ms

Loss rate: 3.12%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2018-02-17 01:08:34

End at: 2018-02-17 01:09:04

Local clock offset: -3.127 ms

Remote clock offset: 2.173 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 1849.370 ms

Loss rate: 2.46%

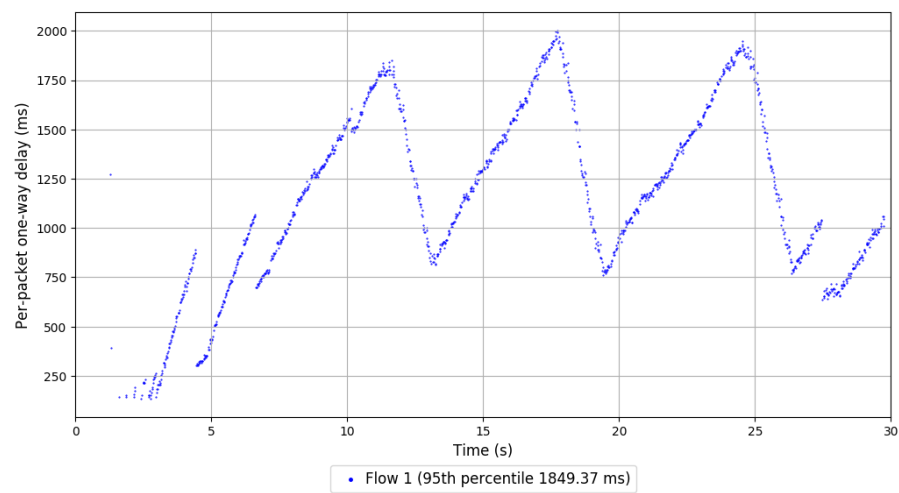
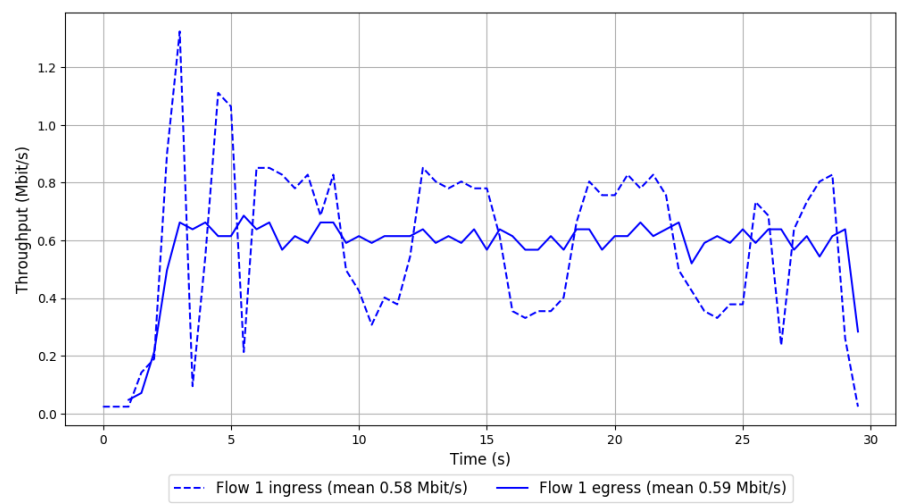
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 1849.370 ms

Loss rate: 2.46%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2018-02-17 01:29:42

End at: 2018-02-17 01:30:12

Local clock offset: -2.344 ms

Remote clock offset: 2.81 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1816.109 ms

Loss rate: 2.97%

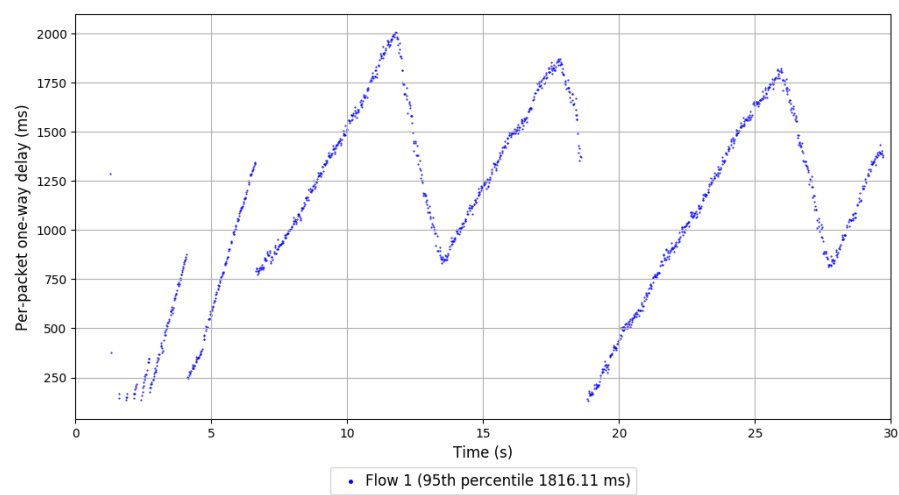
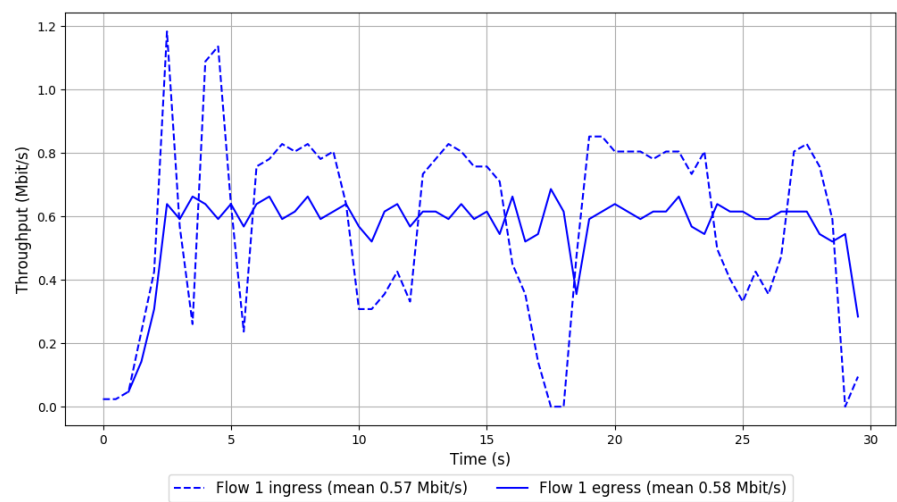
-- Flow 1:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1816.109 ms

Loss rate: 2.97%

Run 3: Report of Verus — Data Link

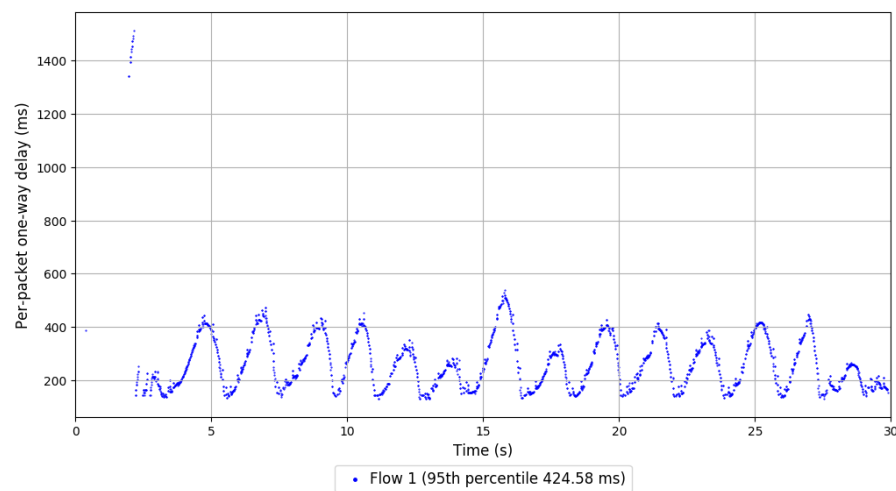
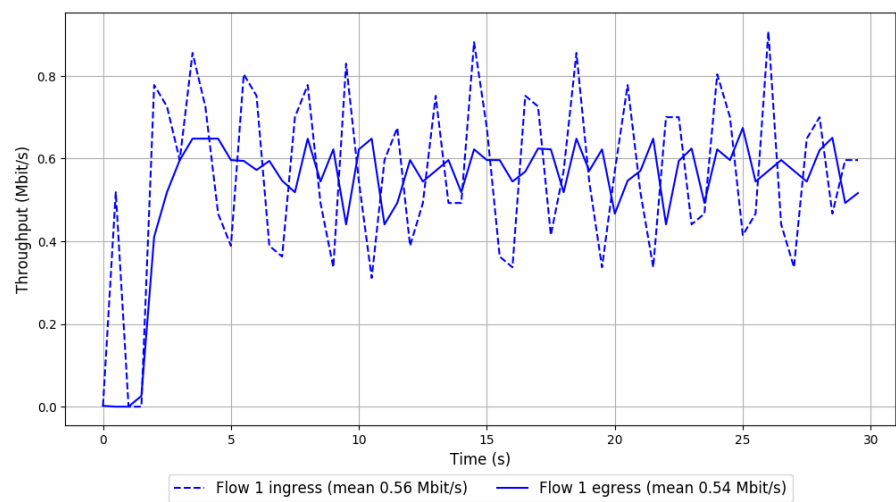


Run 1: Statistics of Copa

Start at: 2018-02-17 00:43:49
End at: 2018-02-17 00:44:19
Local clock offset: -4.366 ms
Remote clock offset: -3.596 ms

Below is generated by plot.py at 2018-02-17 02:50:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 424.584 ms
Loss rate: 3.52%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 424.584 ms
Loss rate: 3.52%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2018-02-17 01:05:03

End at: 2018-02-17 01:05:33

Local clock offset: -3.224 ms

Remote clock offset: 1.275 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 393.090 ms

Loss rate: 4.73%

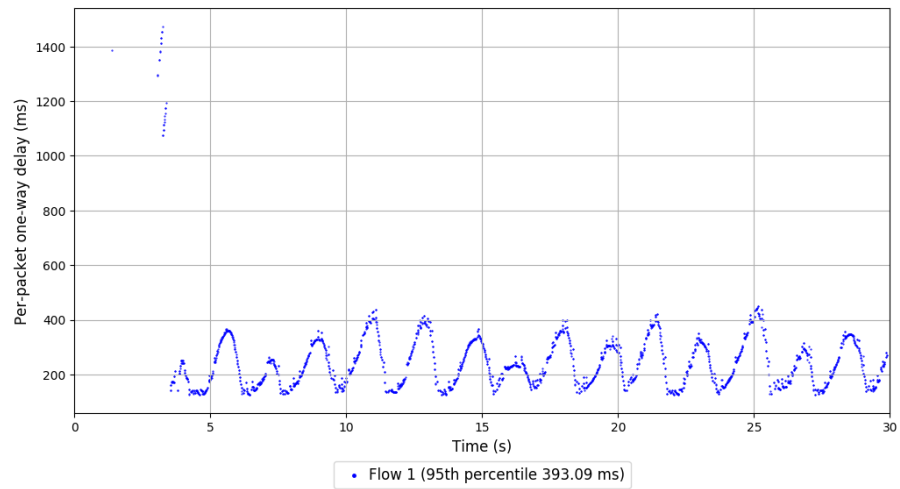
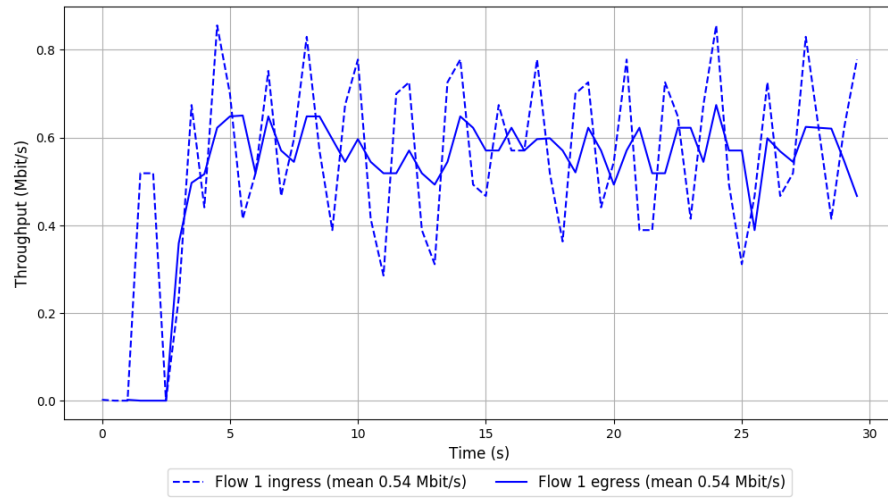
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 393.090 ms

Loss rate: 4.73%

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2018-02-17 01:26:11

End at: 2018-02-17 01:26:41

Local clock offset: -2.443 ms

Remote clock offset: 3.099 ms

Below is generated by plot.py at 2018-02-17 02:50:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 435.293 ms

Loss rate: 3.70%

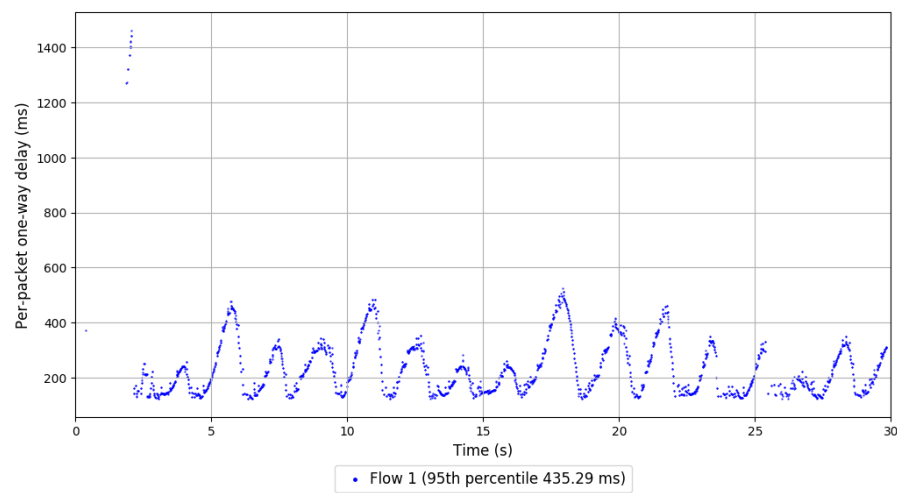
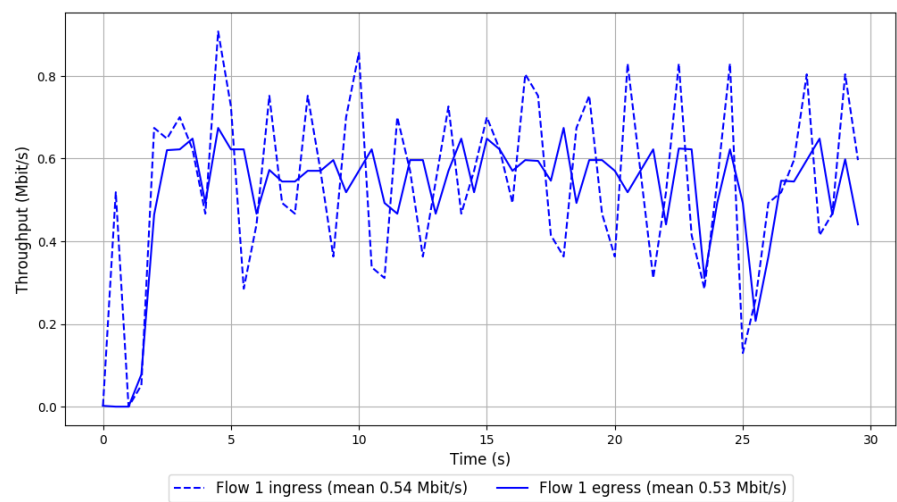
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 435.293 ms

Loss rate: 3.70%

Run 3: Report of Copa — Data Link

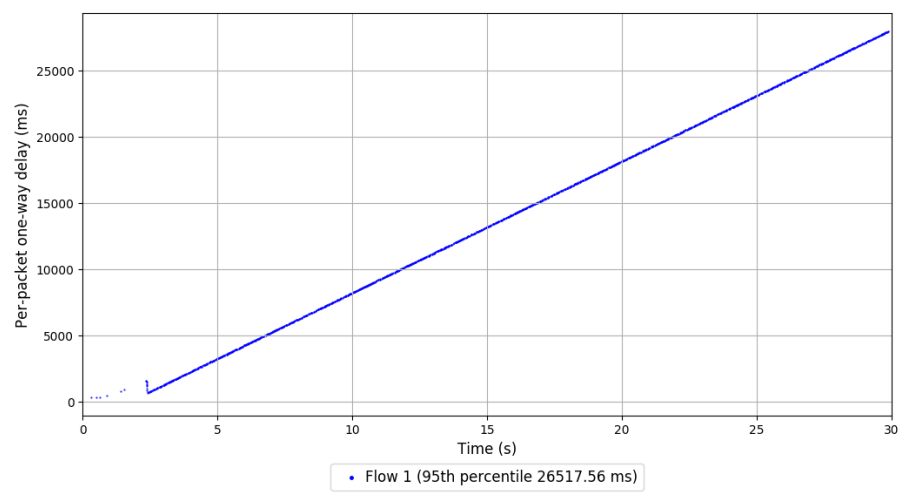
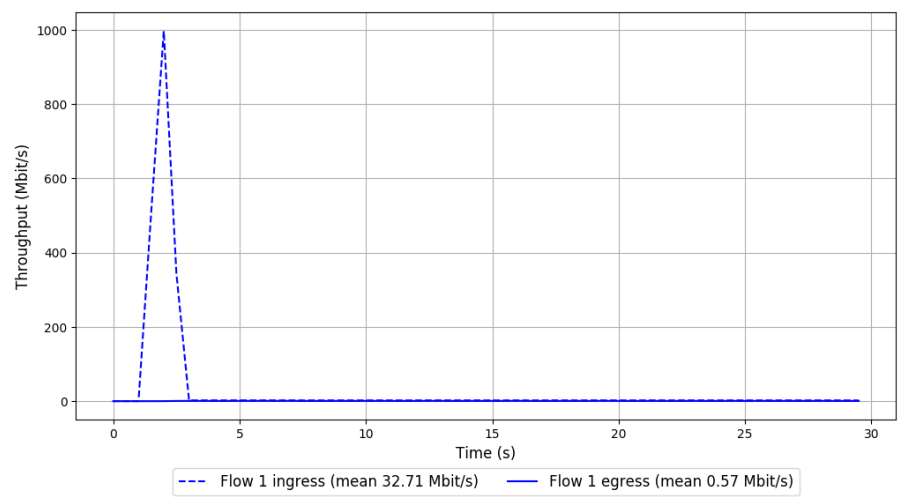


Run 1: Statistics of FillP

Start at: 2018-02-17 00:56:48
End at: 2018-02-17 00:57:18
Local clock offset: -3.589 ms
Remote clock offset: -4.386 ms

Below is generated by plot.py at 2018-02-17 02:51:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26517.561 ms
Loss rate: 98.29%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26517.561 ms
Loss rate: 98.29%

Run 1: Report of FillP — Data Link

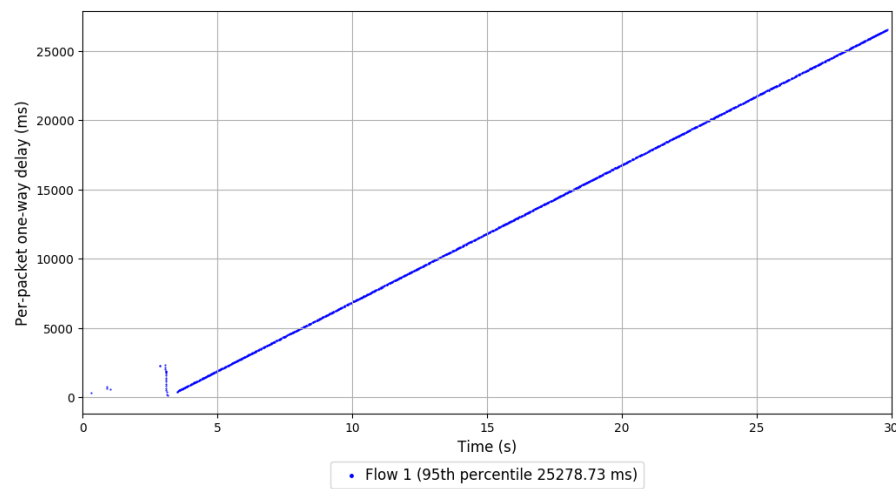
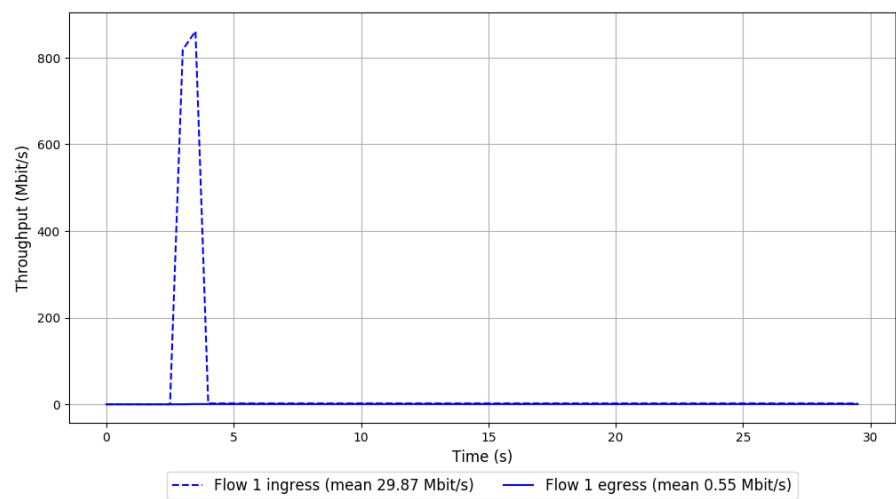


Run 2: Statistics of FillP

Start at: 2018-02-17 01:17:56
End at: 2018-02-17 01:18:26
Local clock offset: -2.753 ms
Remote clock offset: -3.492 ms

Below is generated by plot.py at 2018-02-17 02:51:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 25278.734 ms
Loss rate: 98.19%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 25278.734 ms
Loss rate: 98.19%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-02-17 01:39:04

End at: 2018-02-17 01:39:34

Local clock offset: -2.355 ms

Remote clock offset: 3.605 ms

Below is generated by plot.py at 2018-02-17 02:51:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26067.645 ms

Loss rate: 98.26%

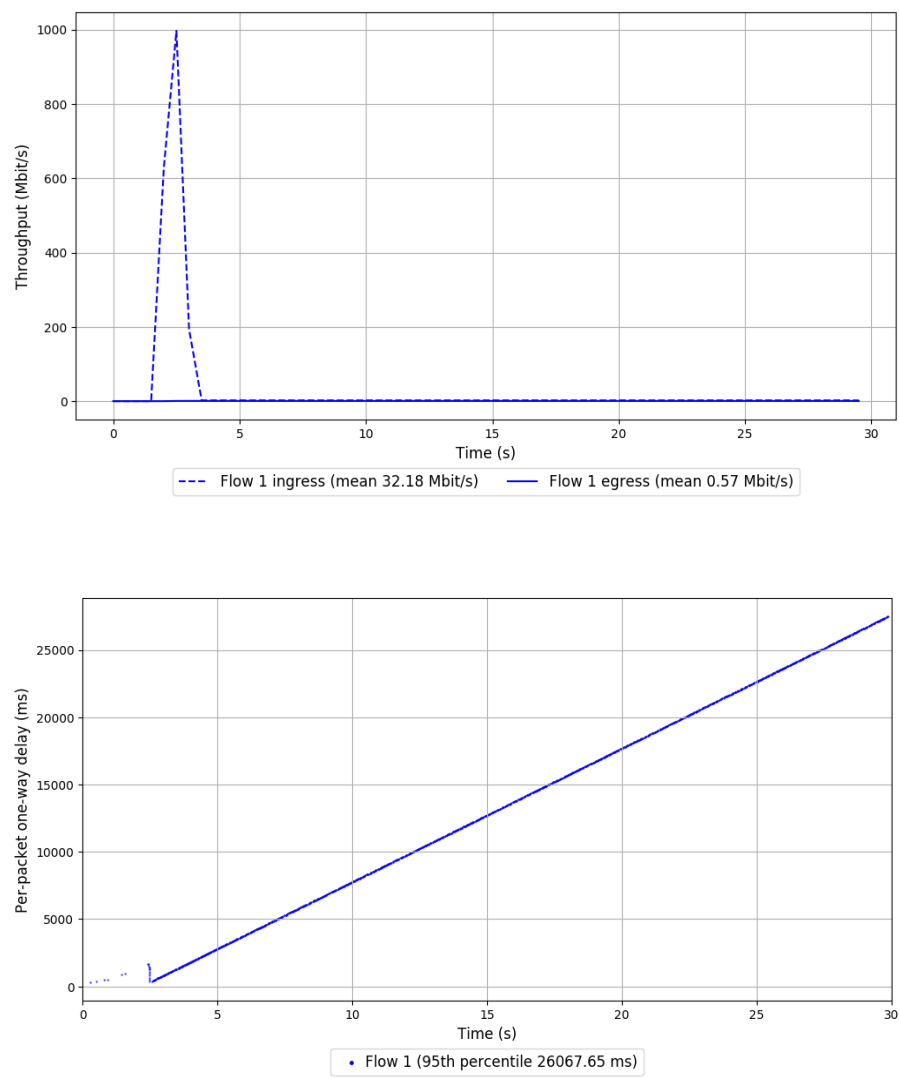
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26067.645 ms

Loss rate: 98.26%

Run 3: Report of FillP — Data Link

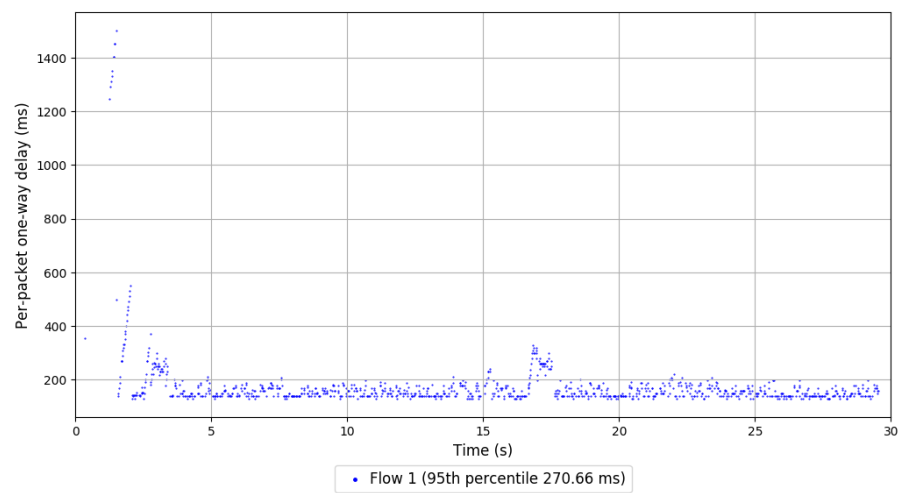
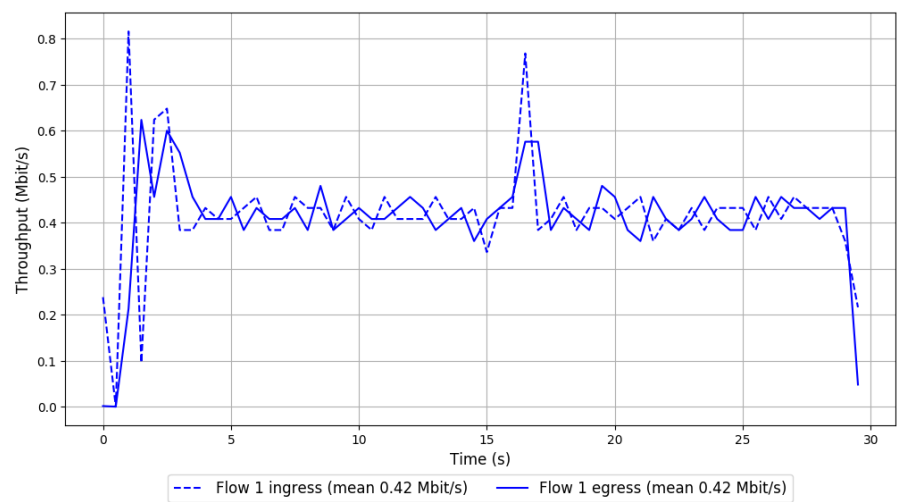


```
Run 1: Statistics of Indigo-1-32

Start at: 2018-02-17 00:55:37
End at: 2018-02-17 00:56:07
Local clock offset: -3.641 ms
Remote clock offset: 1.241 ms

# Below is generated by plot.py at 2018-02-17 02:51:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 270.660 ms
Loss rate: 1.82%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 270.660 ms
Loss rate: 1.82%
```

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



Run 2: Statistics of Indigo-1-32

Start at: 2018-02-17 01:16:46

End at: 2018-02-17 01:17:16

Local clock offset: -2.822 ms

Remote clock offset: 1.345 ms

Below is generated by plot.py at 2018-02-17 02:51:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.41 Mbit/s

95th percentile per-packet one-way delay: 306.472 ms

Loss rate: 1.38%

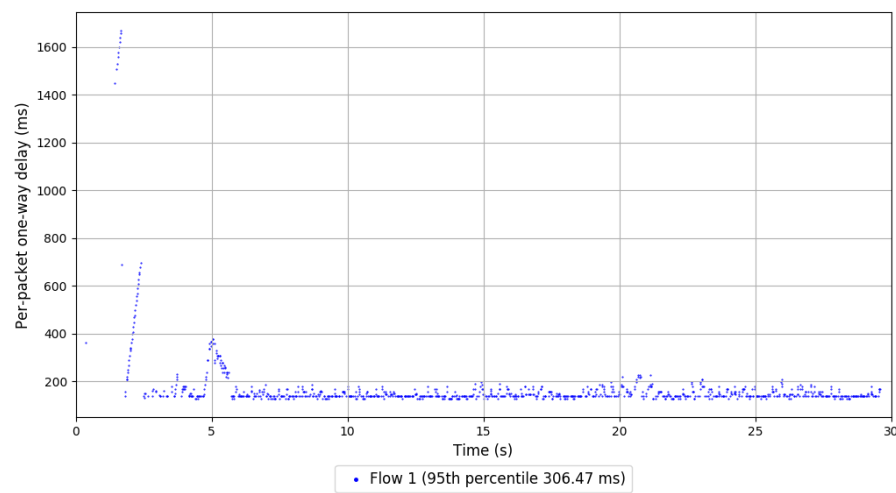
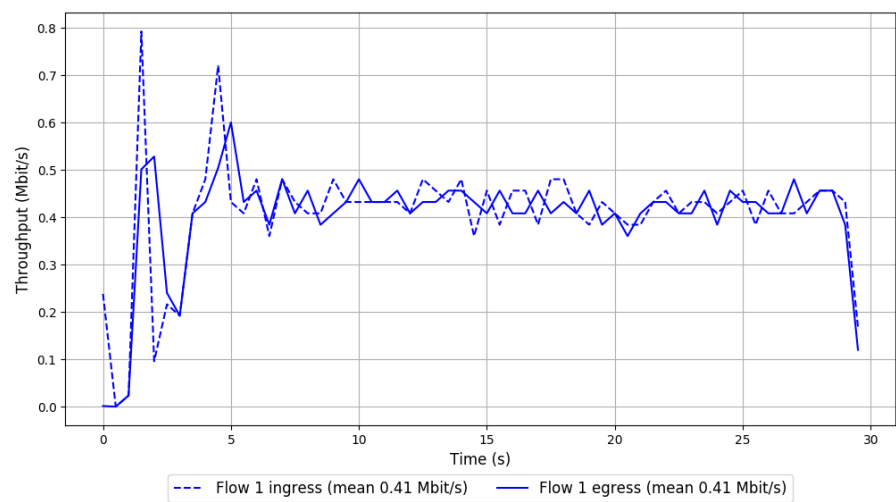
-- Flow 1:

Average throughput: 0.41 Mbit/s

95th percentile per-packet one-way delay: 306.472 ms

Loss rate: 1.38%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-02-17 01:37:54

End at: 2018-02-17 01:38:24

Local clock offset: -2.059 ms

Remote clock offset: -1.312 ms

Below is generated by plot.py at 2018-02-17 02:51:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 314.279 ms

Loss rate: 1.24%

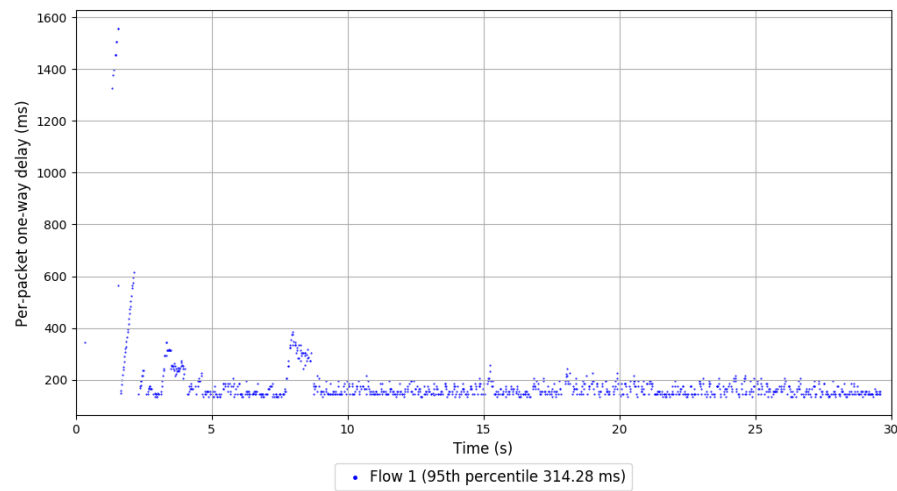
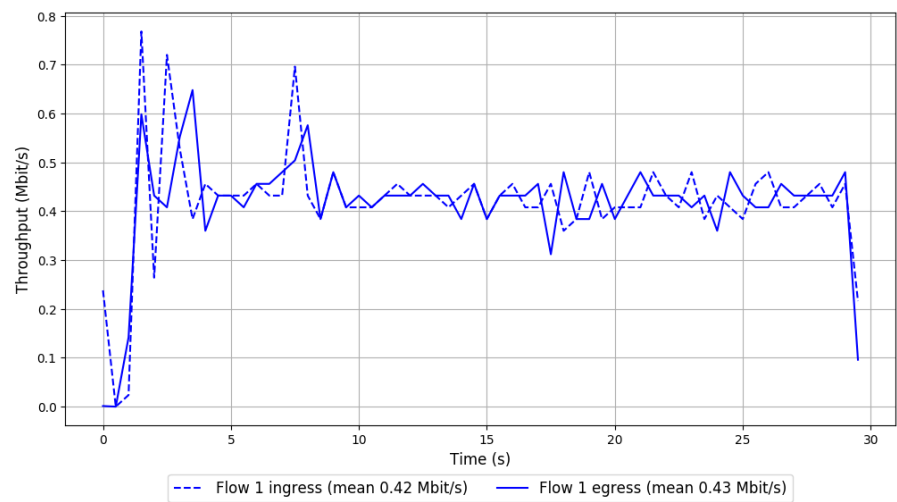
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 314.279 ms

Loss rate: 1.24%

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



Run 1: Statistics of Vivace-latency

Start at: 2018-02-17 00:44:59

End at: 2018-02-17 00:45:29

Local clock offset: -4.293 ms

Remote clock offset: 1.264 ms

Below is generated by plot.py at 2018-02-17 02:51:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 20597.713 ms

Loss rate: 71.46%

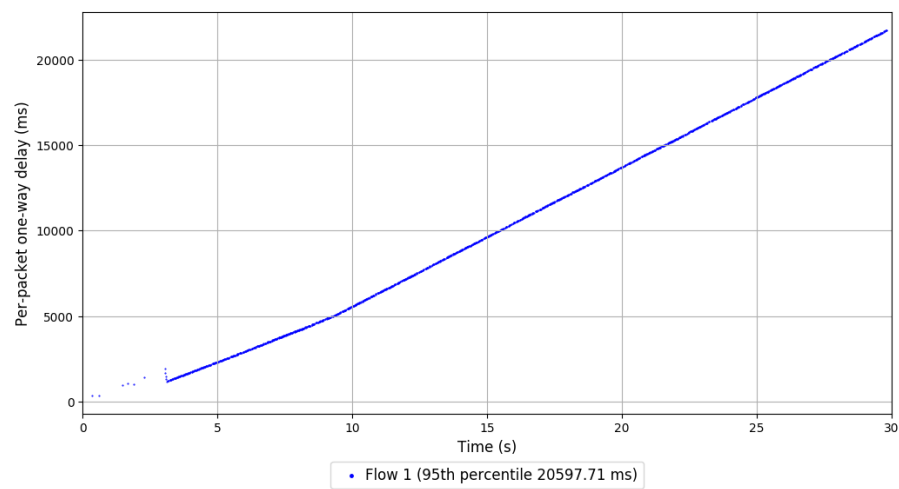
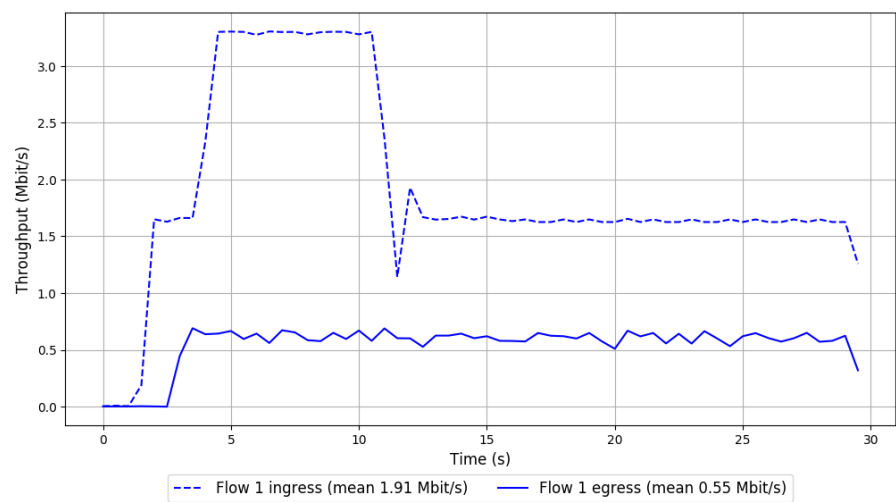
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 20597.713 ms

Loss rate: 71.46%

Run 1: Report of Vivace-latency — Data Link

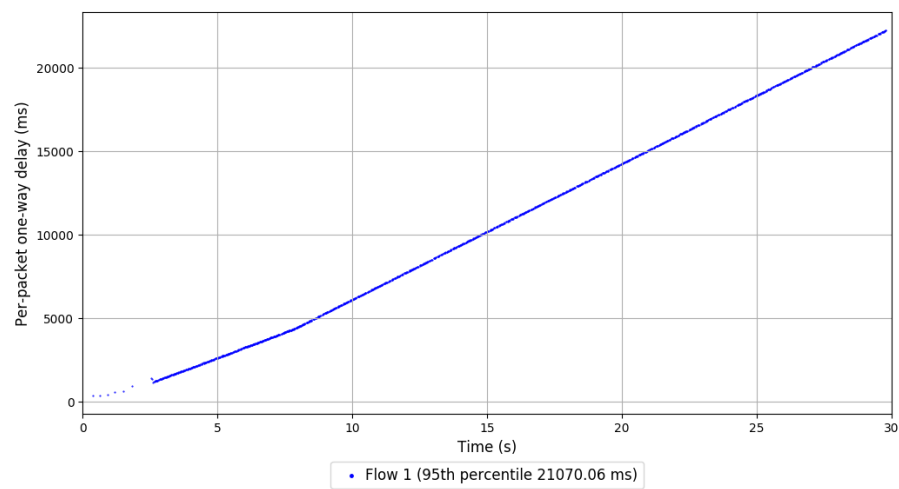
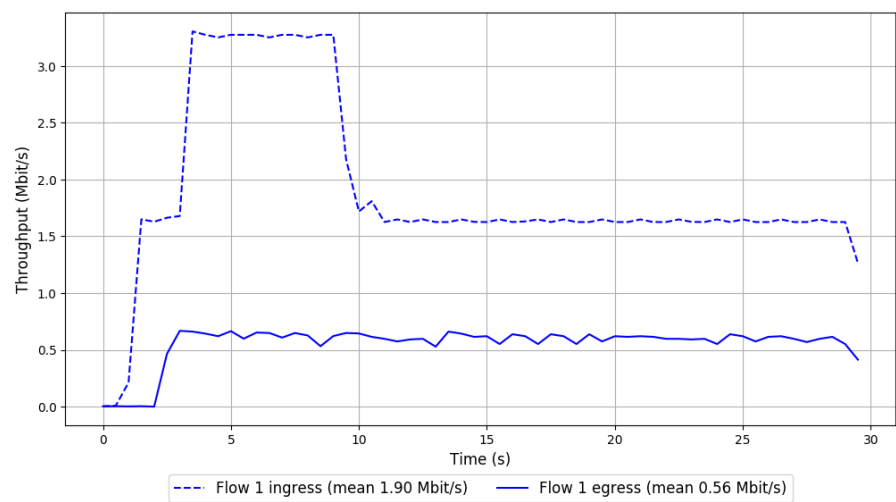


Run 2: Statistics of Vivace-latency

Start at: 2018-02-17 01:06:14
End at: 2018-02-17 01:06:44
Local clock offset: -3.181 ms
Remote clock offset: -3.464 ms

Below is generated by plot.py at 2018-02-17 02:51:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 21070.060 ms
Loss rate: 70.75%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 21070.060 ms
Loss rate: 70.75%

Run 2: Report of Vivace-latency — Data Link

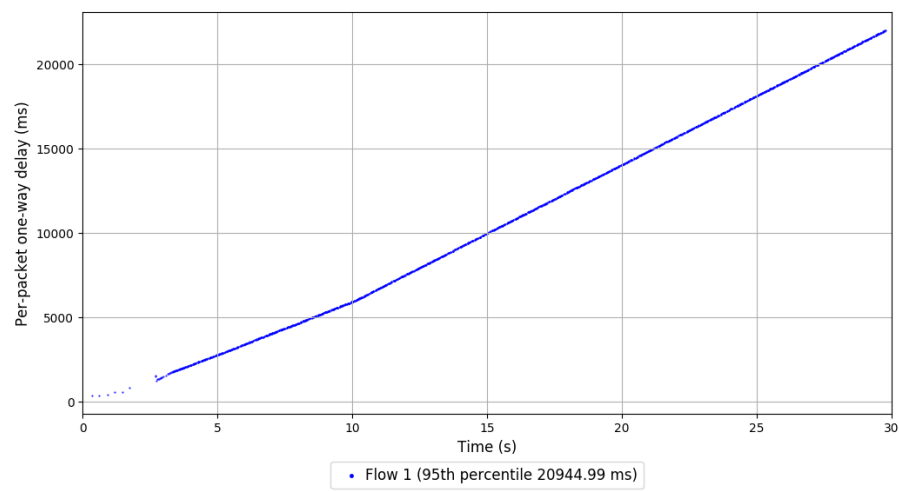
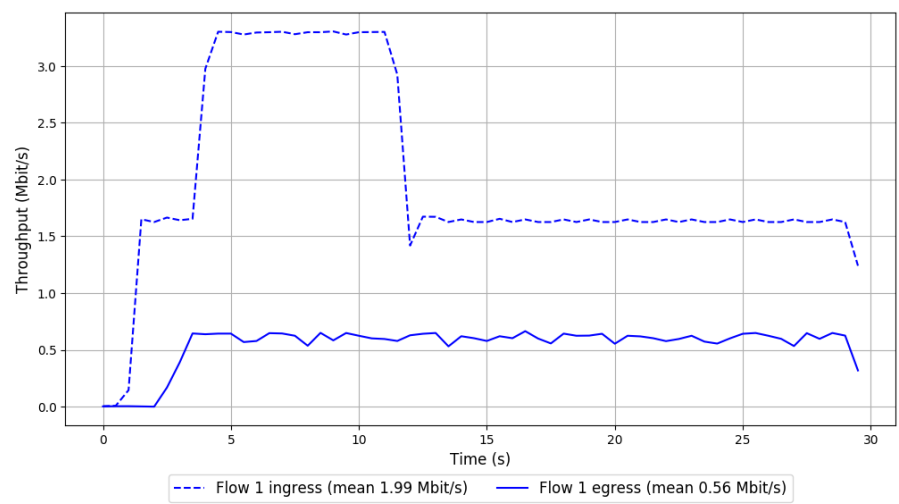


Run 3: Statistics of Vivace-latency

Start at: 2018-02-17 01:27:22
End at: 2018-02-17 01:27:52
Local clock offset: -2.381 ms
Remote clock offset: -3.235 ms

Below is generated by plot.py at 2018-02-17 02:51:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20944.989 ms
Loss rate: 72.49%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20944.989 ms
Loss rate: 72.49%

Run 3: Report of Vivace-latency — Data Link

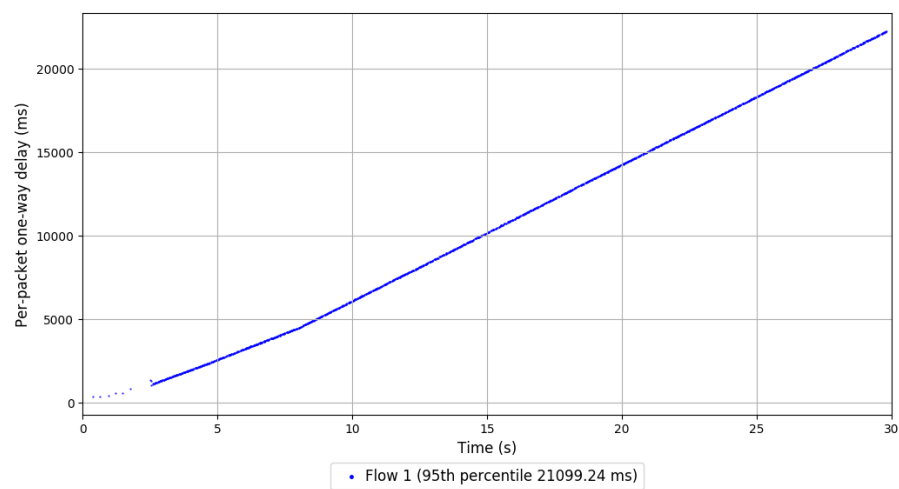
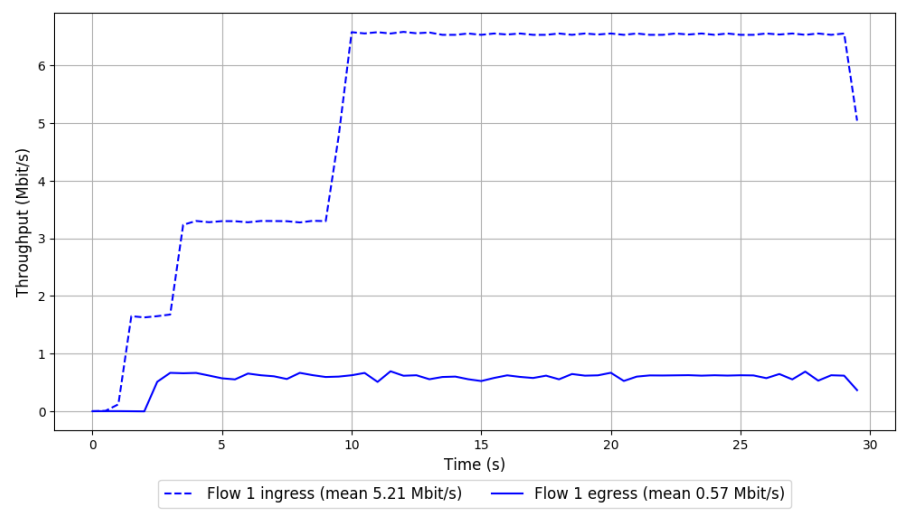


Run 1: Statistics of Vivace-loss

Start at: 2018-02-17 00:50:56
End at: 2018-02-17 00:51:26
Local clock offset: -3.888 ms
Remote clock offset: -4.386 ms

Below is generated by plot.py at 2018-02-17 02:51:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21099.243 ms
Loss rate: 89.31%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21099.243 ms
Loss rate: 89.31%

Run 1: Report of Vivace-loss — Data Link

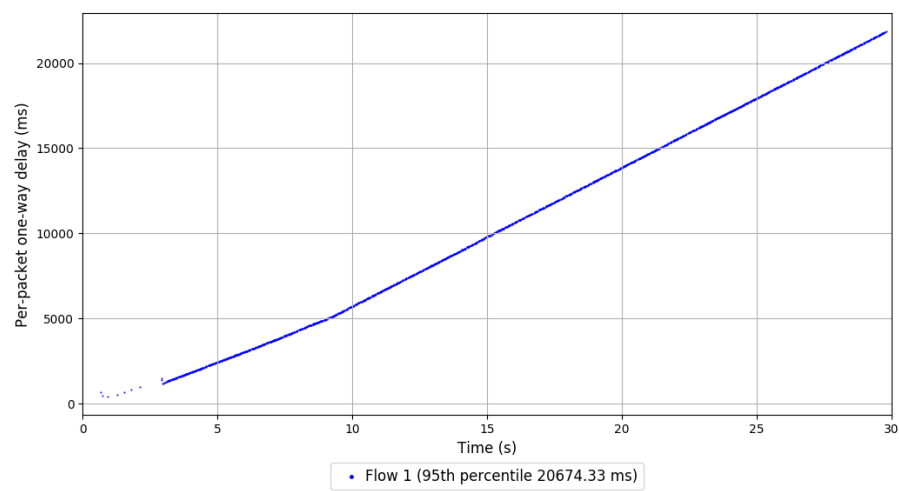
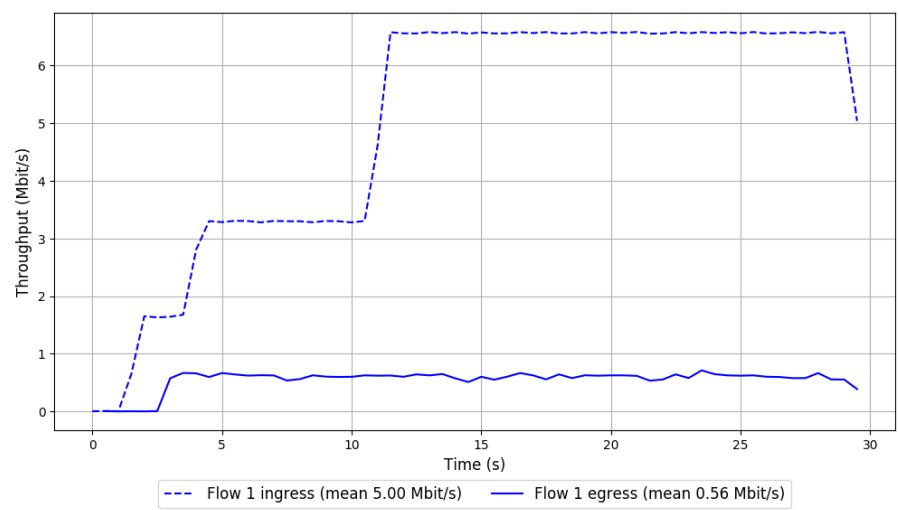


Run 2: Statistics of Vivace-loss

Start at: 2018-02-17 01:12:05
End at: 2018-02-17 01:12:35
Local clock offset: -2.969 ms
Remote clock offset: -4.351 ms

Below is generated by plot.py at 2018-02-17 02:51:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20674.327 ms
Loss rate: 89.05%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20674.327 ms
Loss rate: 89.05%

Run 2: Report of Vivace-loss — Data Link

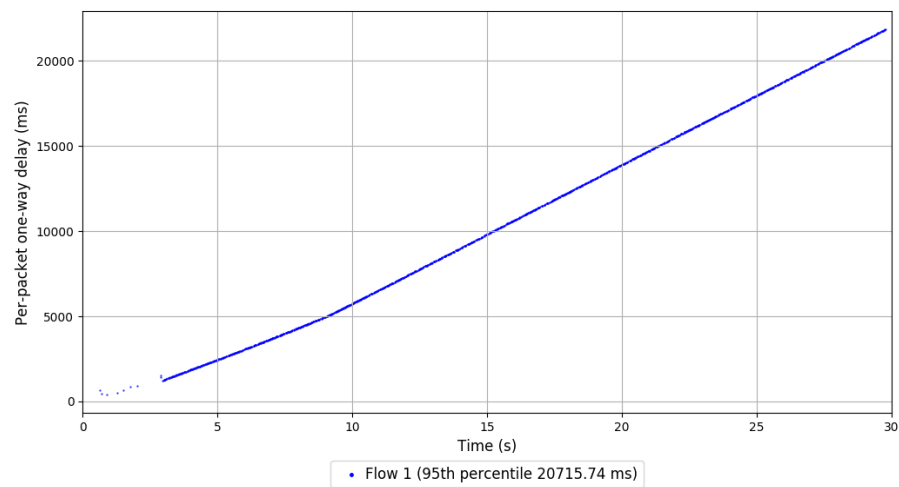
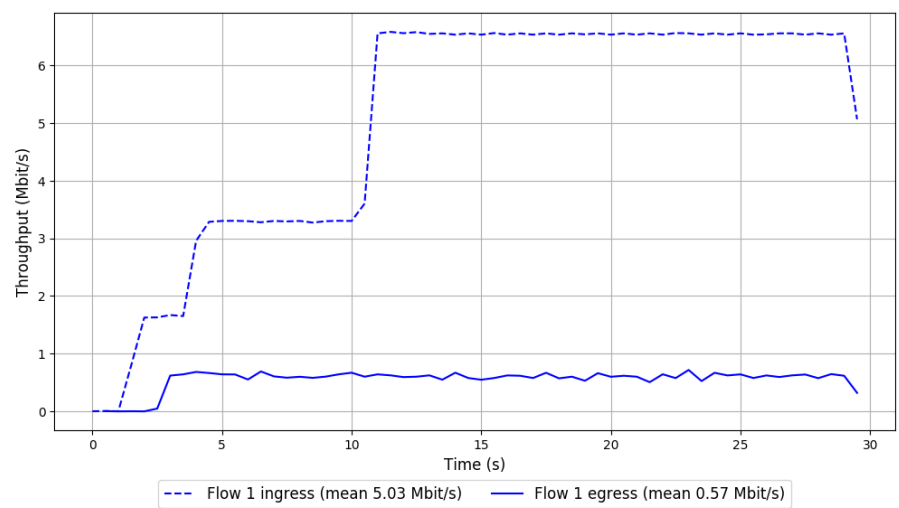


Run 3: Statistics of Vivace-loss

Start at: 2018-02-17 01:33:13
End at: 2018-02-17 01:33:43
Local clock offset: -2.156 ms
Remote clock offset: -2.478 ms

Below is generated by plot.py at 2018-02-17 02:51:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 20715.738 ms
Loss rate: 89.03%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 20715.738 ms
Loss rate: 89.03%

Run 3: Report of Vivace-loss — Data Link

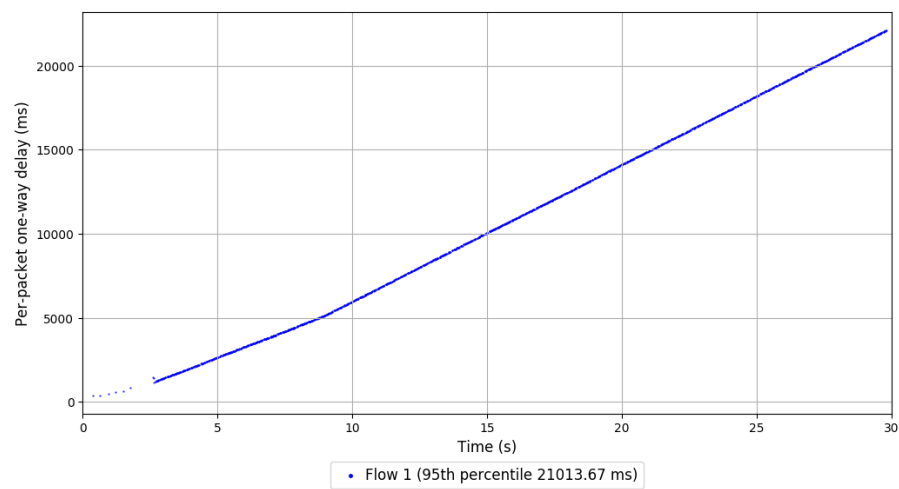
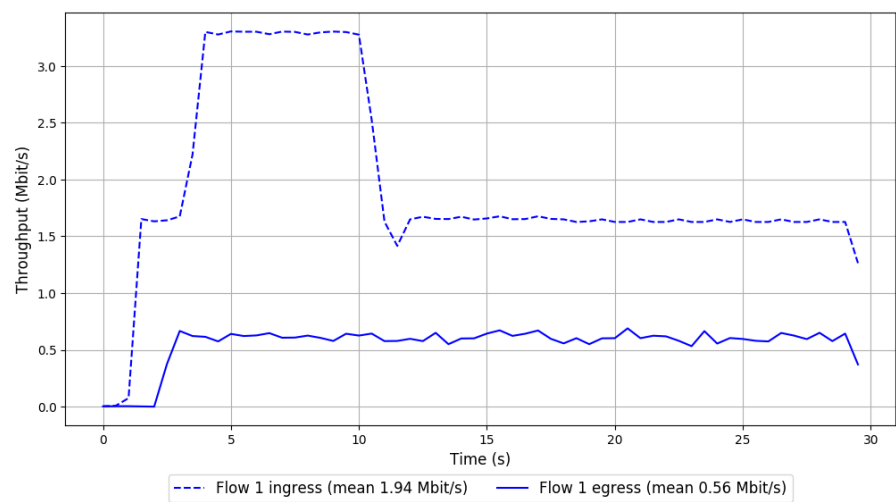


Run 1: Statistics of Vivace-LTE

Start at: 2018-02-17 00:53:17
End at: 2018-02-17 00:53:47
Local clock offset: -3.753 ms
Remote clock offset: -3.476 ms

Below is generated by plot.py at 2018-02-17 02:51:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 21013.668 ms
Loss rate: 71.42%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 21013.668 ms
Loss rate: 71.42%

Run 1: Report of Vivace-LTE — Data Link



Run 2: Statistics of Vivace-LTE

Start at: 2018-02-17 01:14:25

End at: 2018-02-17 01:14:55

Local clock offset: -2.85 ms

Remote clock offset: 2.187 ms

Below is generated by plot.py at 2018-02-17 02:51:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21134.329 ms

Loss rate: 70.95%

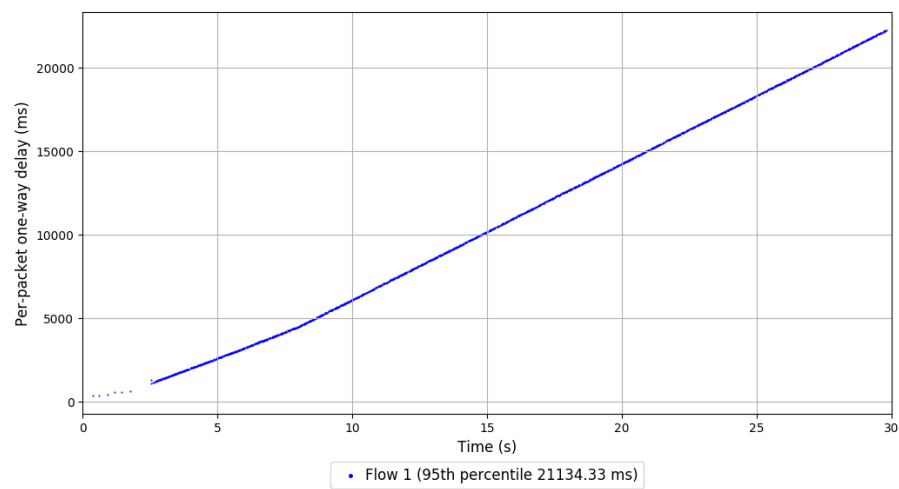
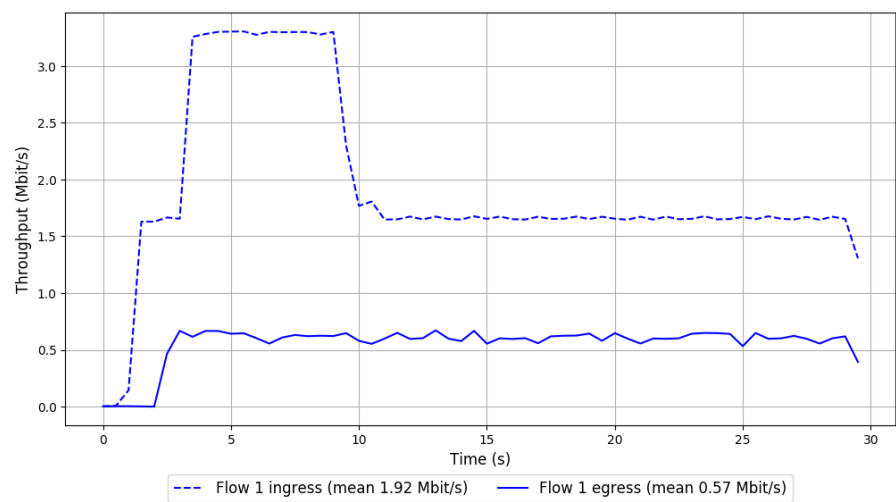
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21134.329 ms

Loss rate: 70.95%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-02-17 01:35:34

End at: 2018-02-17 01:36:04

Local clock offset: -2.069 ms

Remote clock offset: 2.431 ms

Below is generated by plot.py at 2018-02-17 02:51:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 21182.559 ms

Loss rate: 71.30%

-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 21182.559 ms

Loss rate: 71.30%

Run 3: Report of Vivace-LTE — Data Link

