

Pantheon Report

Generated at 2018-08-22 10:29:49 (UTC).

Data path: Colombia ppp0 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.

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

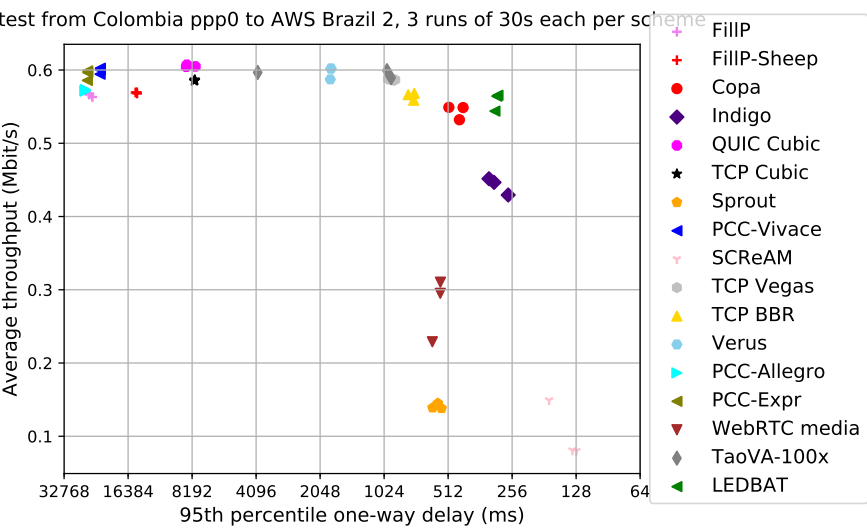
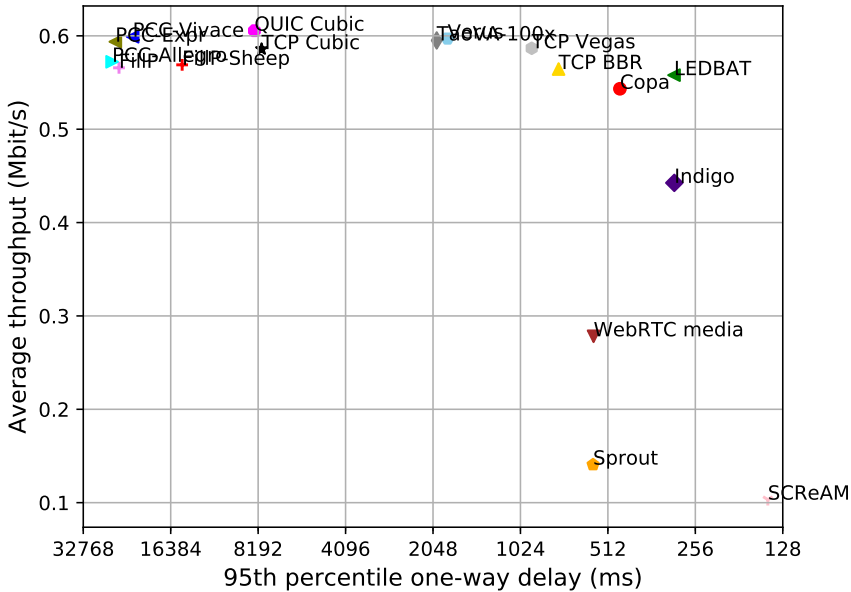
System info:

```
Linux 4.15.0-1017-aws
net.core.default_qdisc = fq_codel
net.core.rmem_default = 16777216
net.core.rmem_max = 33554432
net.core.wmem_default = 212992
net.core.wmem_max = 212992
net.ipv4.tcp_rmem = 4096 87380 6291456
net.ipv4.tcp_wmem = 4096 16384 4194304
```

Git summary:

```
branch: master @ 7719b900495aa706f8452ab7d4a94dd562e9296e
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfef58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ 6f038ed31259d366f9840f65b82cbe8f464b1b39
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/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from Colombia ppp0 to AWS Brazil 2, 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	0.57	756.86	1.97
Copa	3	0.54	465.44	1.19
TCP Cubic	3	0.59	7972.39	30.91
FillP	3	0.57	24683.38	64.00
FillP-Sheep	3	0.57	14962.47	38.84
Indigo	3	0.44	302.44	0.83
LEDBAT	3	0.56	303.17	1.19
PCC-Allegro	3	0.57	26068.20	58.63
PCC-Expr	3	0.60	25416.58	89.60
QUIC Cubic	3	0.60	8438.57	31.90
SCReAM	3	0.10	144.10	0.61
Sprout	3	0.14	575.89	0.91
TaoVA-100x	3	0.60	1988.92	2.38
TCP Vegas	3	0.59	936.57	1.27
Verus	3	0.60	1824.98	4.35
PCC-Vivace	3	0.60	22153.44	69.14
WebRTC media	3	0.28	573.64	0.53

Run 1: Statistics of TCP BBR

Start at: 2018-08-22 09:44:49

End at: 2018-08-22 09:45:19

Local clock offset: -6.865 ms

Remote clock offset: 8.383 ms

Below is generated by plot.py at 2018-08-22 10:29:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 743.511 ms

Loss rate: 1.99%

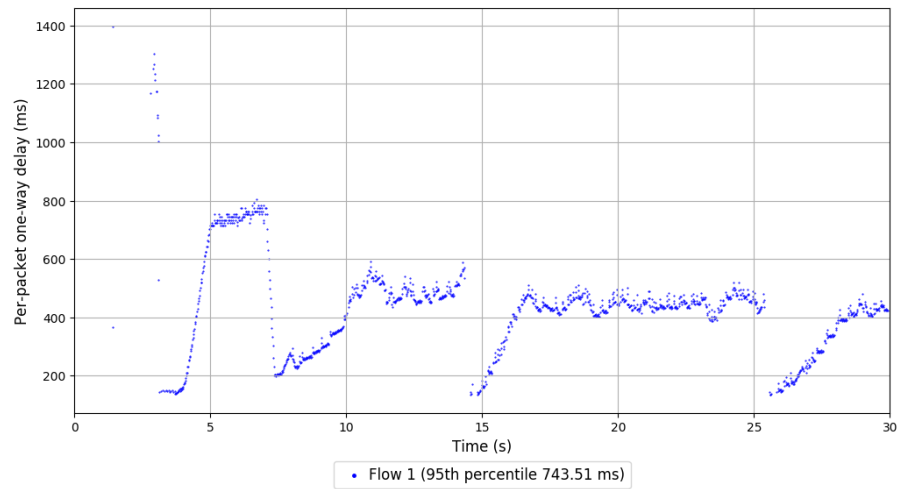
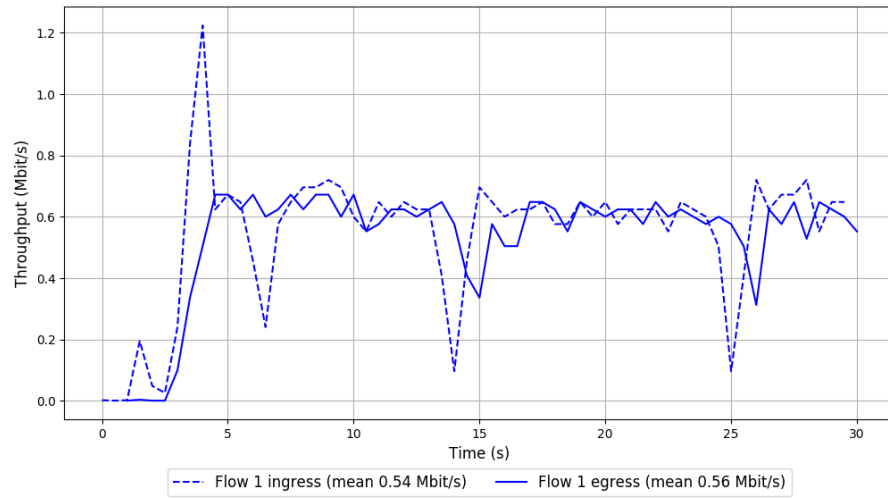
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 743.511 ms

Loss rate: 1.99%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-22 10:03:55

End at: 2018-08-22 10:04:25

Local clock offset: -7.998 ms

Remote clock offset: 5.583 ms

Below is generated by plot.py at 2018-08-22 10:29:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 788.588 ms

Loss rate: 1.96%

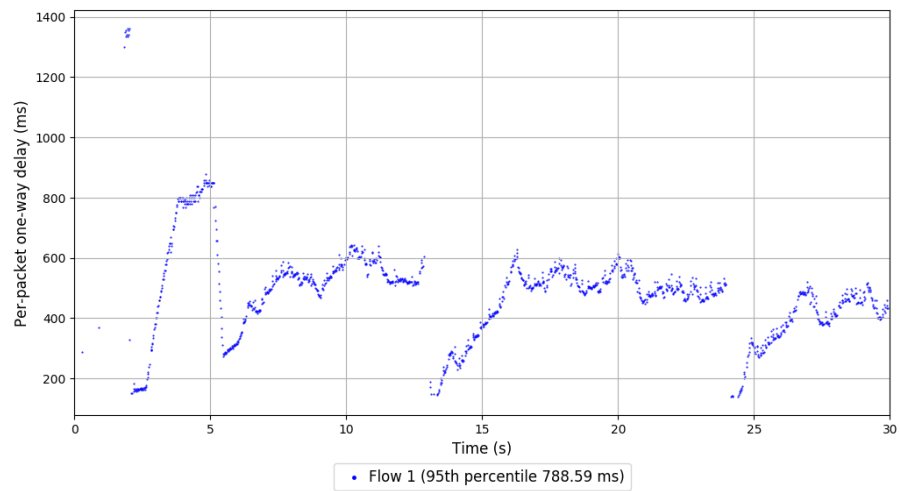
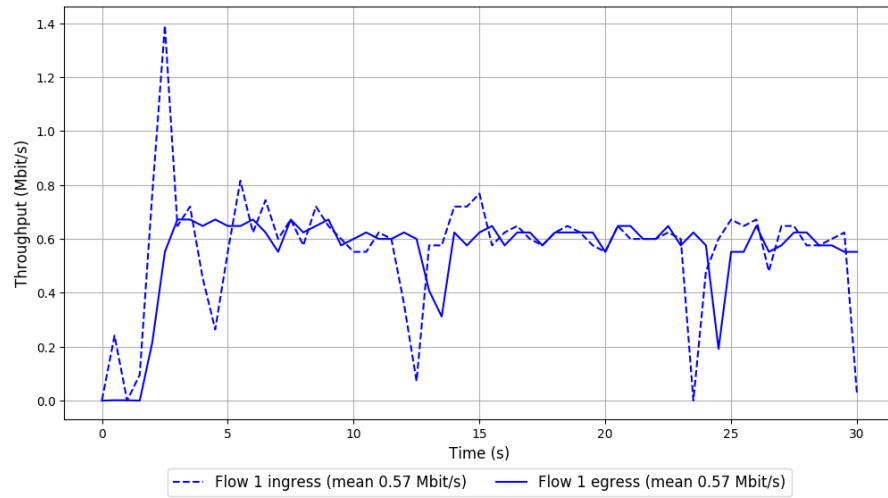
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 788.588 ms

Loss rate: 1.96%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-08-22 10:23:01

End at: 2018-08-22 10:23:31

Local clock offset: -5.63 ms

Remote clock offset: 5.813 ms

Below is generated by plot.py at 2018-08-22 10:29:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 738.473 ms

Loss rate: 1.96%

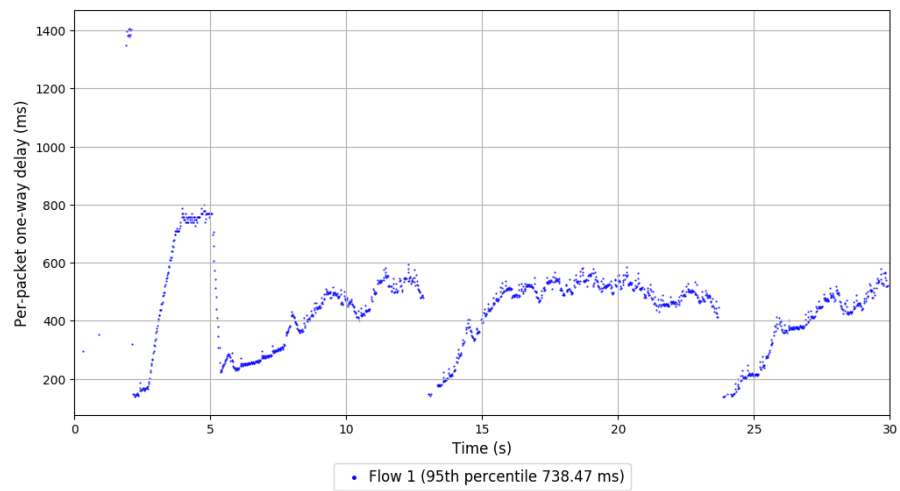
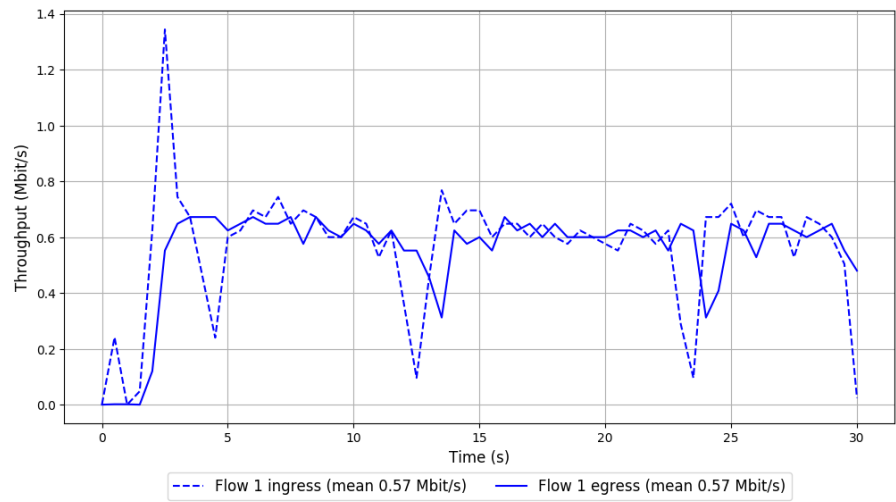
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 738.473 ms

Loss rate: 1.96%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

Start at: 2018-08-22 09:35:51

End at: 2018-08-22 09:36:21

Local clock offset: -4.595 ms

Remote clock offset: 4.22 ms

Below is generated by plot.py at 2018-08-22 10:29:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 435.352 ms

Loss rate: 1.57%

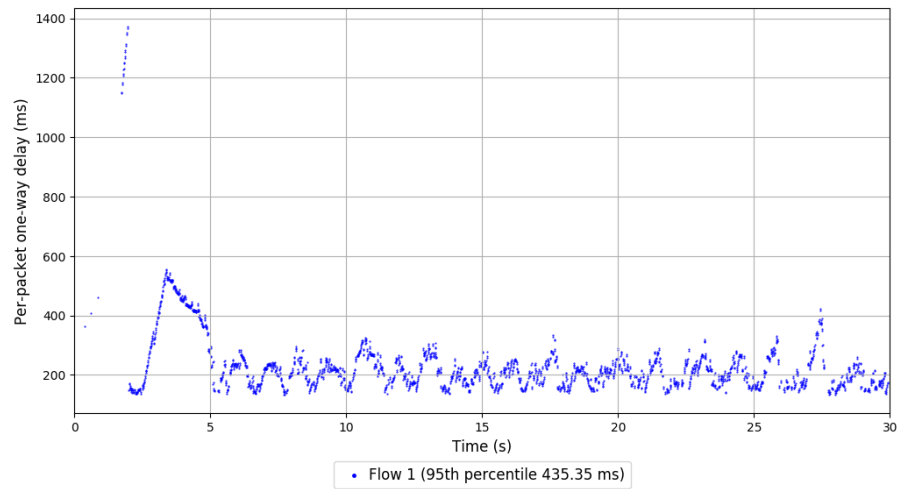
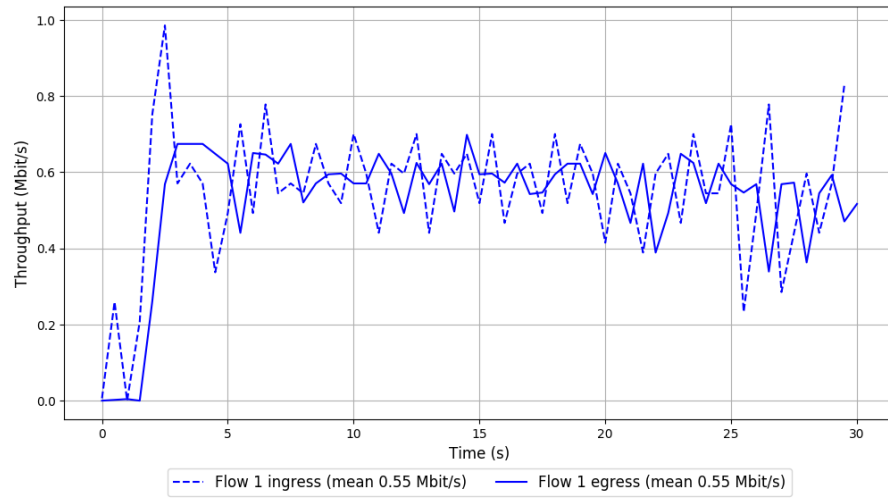
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 435.352 ms

Loss rate: 1.57%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2018-08-22 09:54:57

End at: 2018-08-22 09:55:27

Local clock offset: -7.598 ms

Remote clock offset: 4.631 ms

Below is generated by plot.py at 2018-08-22 10:29:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 507.983 ms

Loss rate: 1.03%

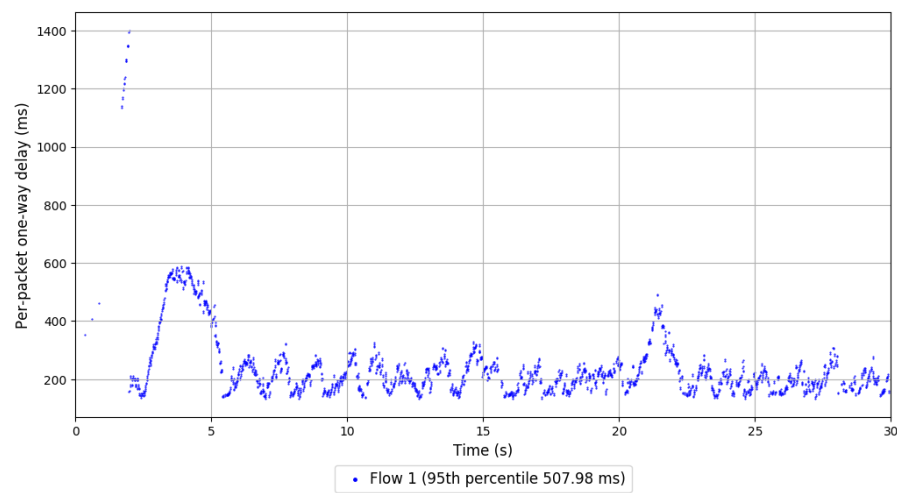
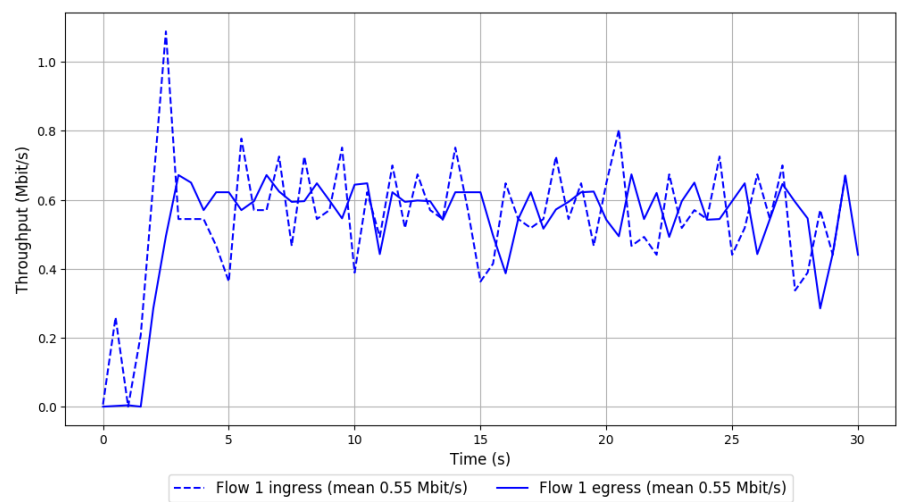
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 507.983 ms

Loss rate: 1.03%

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2018-08-22 10:14:03

End at: 2018-08-22 10:14:33

Local clock offset: -6.588 ms

Remote clock offset: 9.545 ms

Below is generated by plot.py at 2018-08-22 10:29:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 452.999 ms

Loss rate: 0.98%

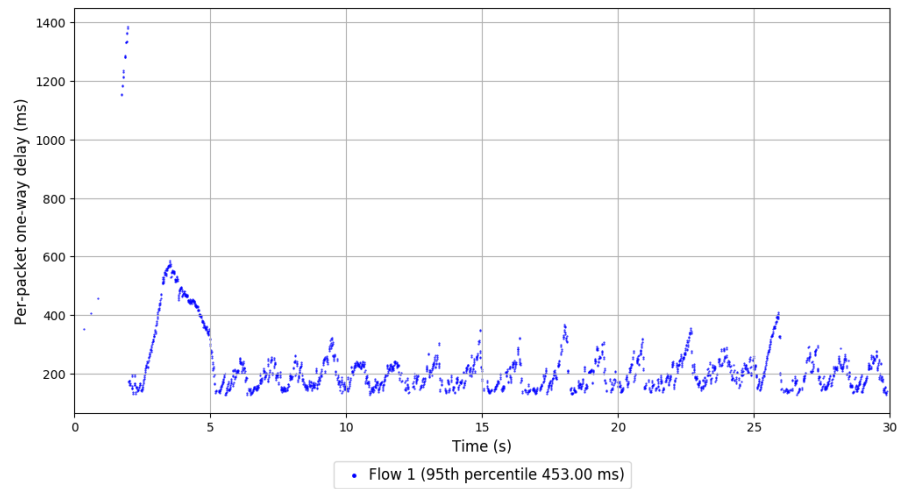
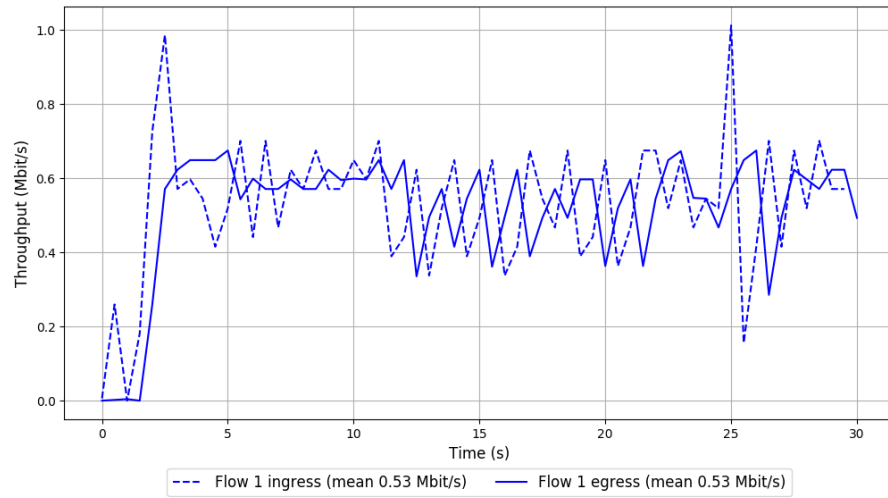
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 452.999 ms

Loss rate: 0.98%

Run 3: Report of Copa — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-22 09:40:20

End at: 2018-08-22 09:40:50

Local clock offset: -6.089 ms

Remote clock offset: 8.128 ms

Below is generated by plot.py at 2018-08-22 10:29:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 7955.013 ms

Loss rate: 30.83%

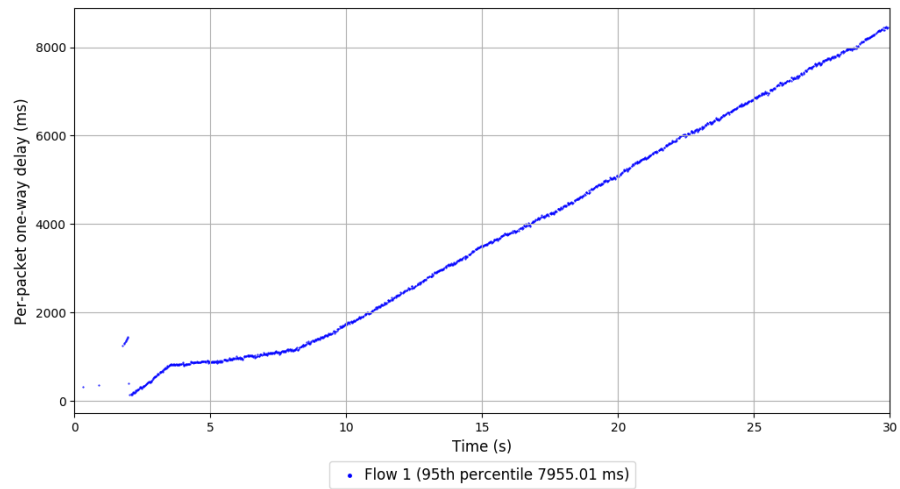
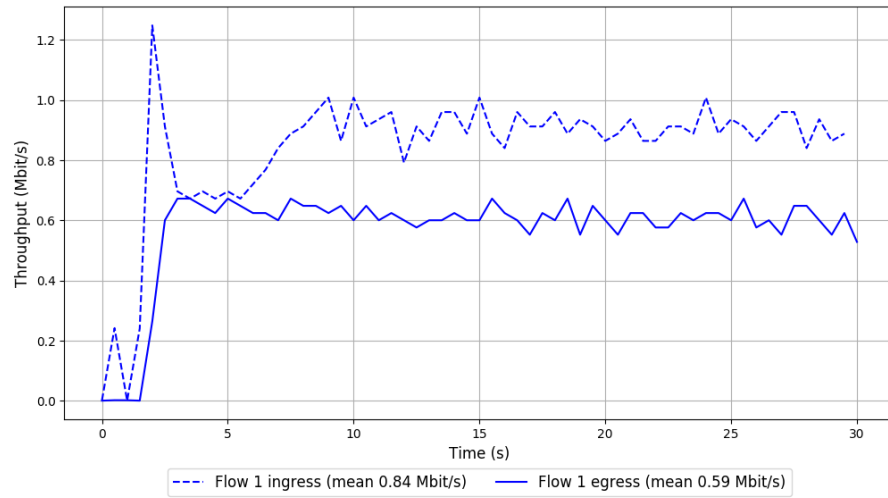
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 7955.013 ms

Loss rate: 30.83%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-08-22 09:59:26

End at: 2018-08-22 09:59:56

Local clock offset: -7.015 ms

Remote clock offset: 9.48 ms

Below is generated by plot.py at 2018-08-22 10:29:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 7958.491 ms

Loss rate: 30.93%

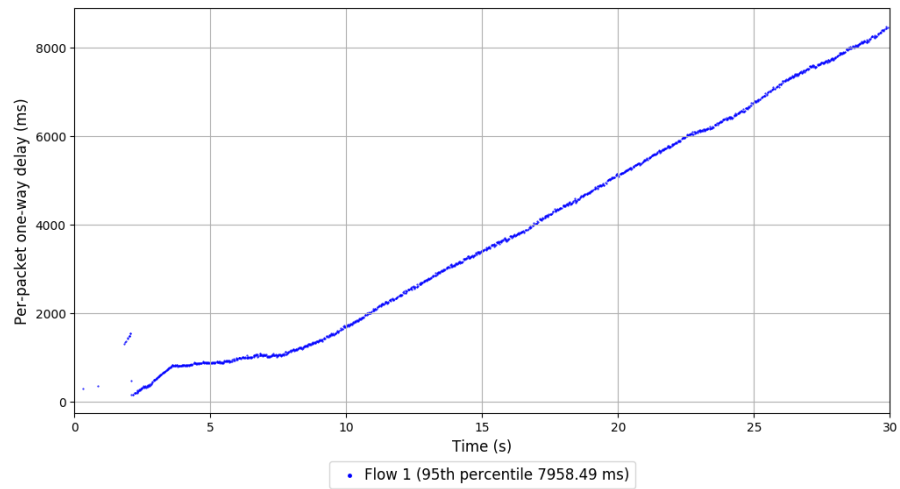
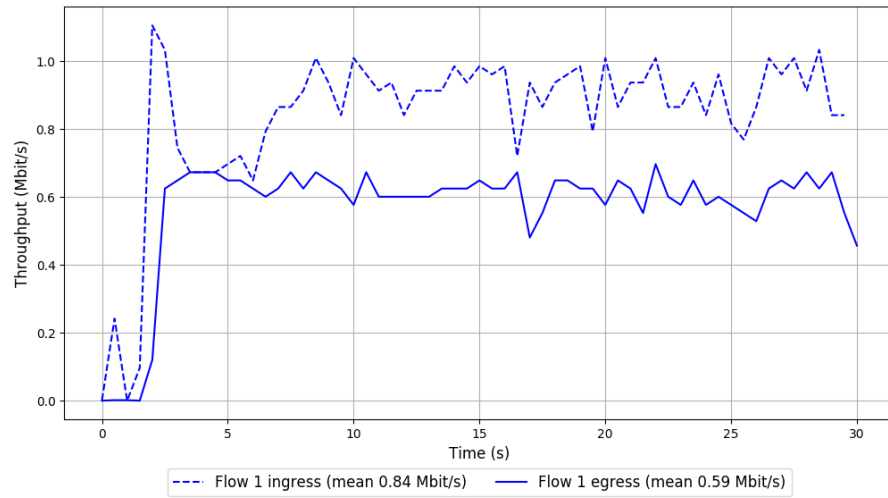
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 7958.491 ms

Loss rate: 30.93%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-08-22 10:18:32

End at: 2018-08-22 10:19:02

Local clock offset: -5.281 ms

Remote clock offset: 8.459 ms

Below is generated by plot.py at 2018-08-22 10:29:24

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 8003.677 ms

Loss rate: 30.97%

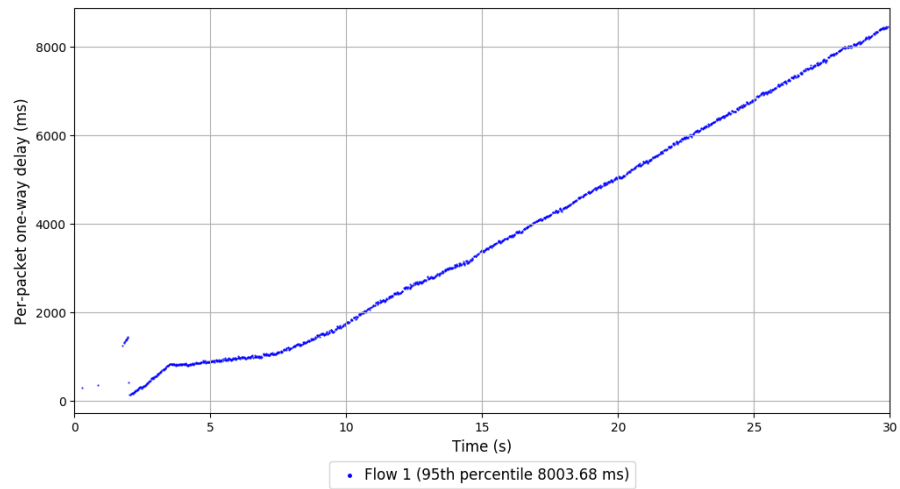
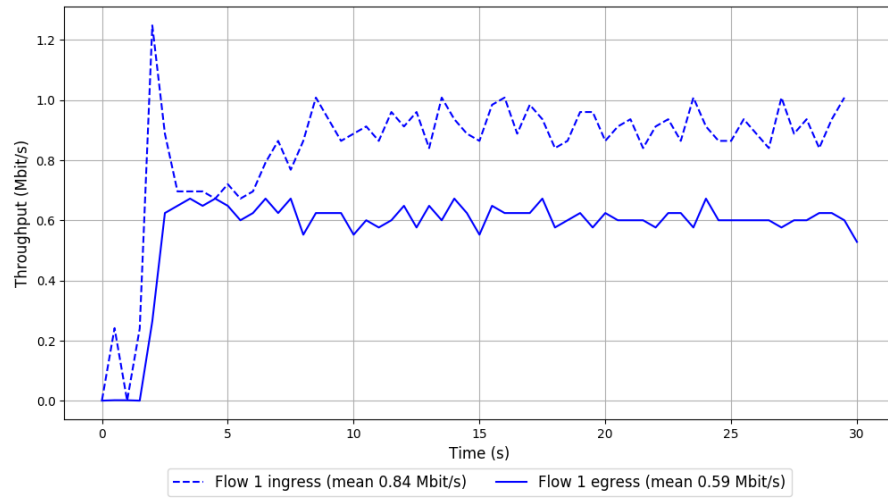
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 8003.677 ms

Loss rate: 30.97%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2018-08-22 09:45:56

End at: 2018-08-22 09:46:27

Local clock offset: -6.163 ms

Remote clock offset: 9.421 ms

Below is generated by plot.py at 2018-08-22 10:29:24

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 24138.227 ms

Loss rate: 64.05%

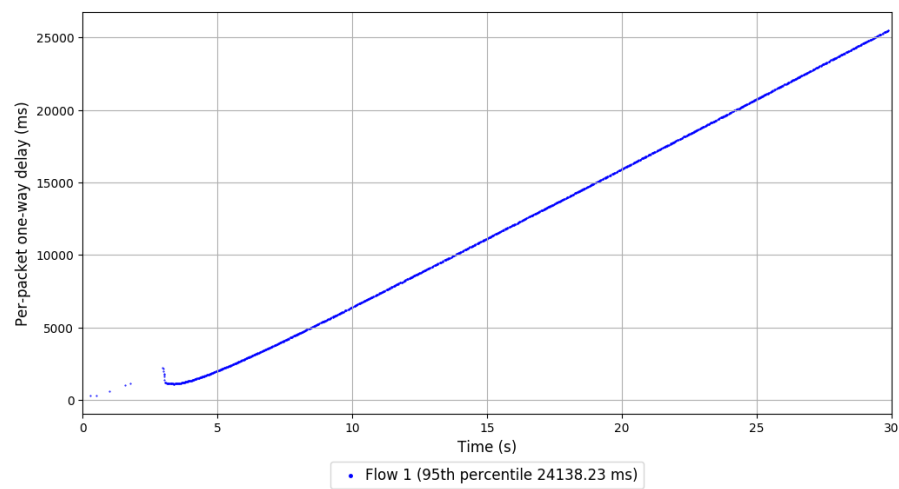
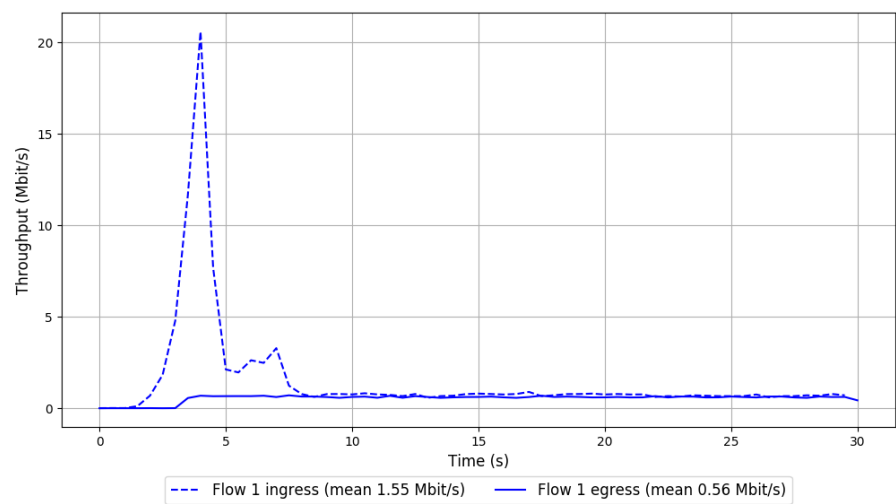
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 24138.227 ms

Loss rate: 64.05%

Run 1: Report of FillP — Data Link

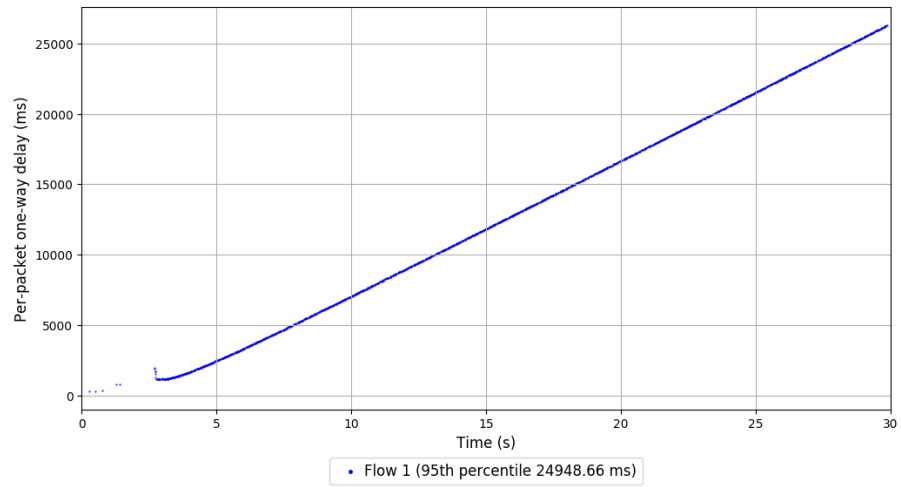
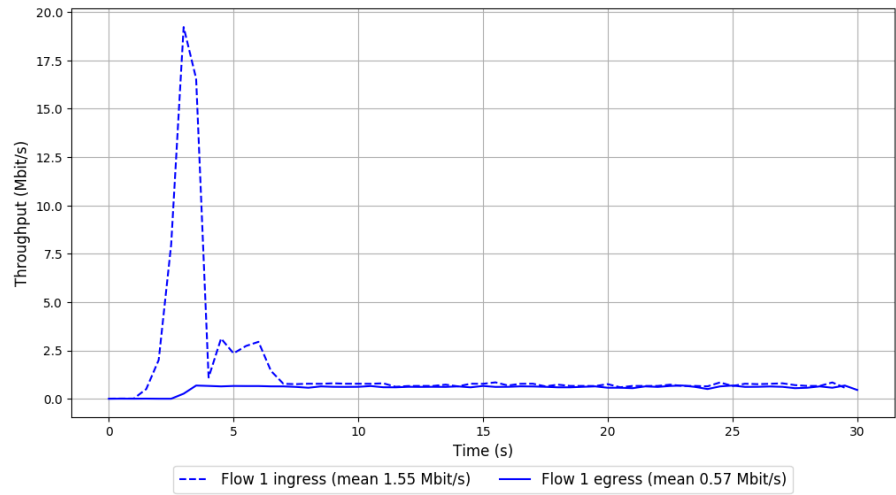


Run 2: Statistics of FillP

Start at: 2018-08-22 10:05:02
End at: 2018-08-22 10:05:32
Local clock offset: -7.215 ms
Remote clock offset: 10.576 ms

Below is generated by plot.py at 2018-08-22 10:29:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 24948.660 ms
Loss rate: 63.91%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 24948.660 ms
Loss rate: 63.91%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-08-22 10:24:08

End at: 2018-08-22 10:24:38

Local clock offset: -5.56 ms

Remote clock offset: 5.856 ms

Below is generated by plot.py at 2018-08-22 10:29:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 24963.260 ms

Loss rate: 64.05%

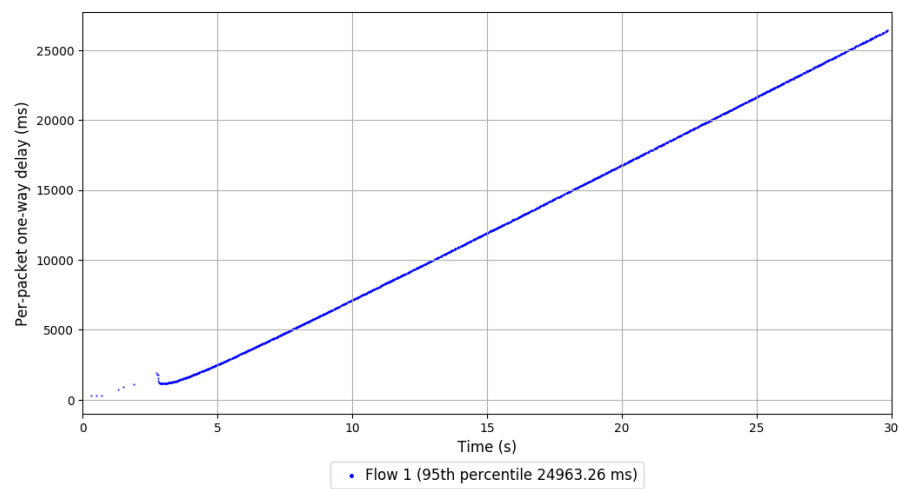
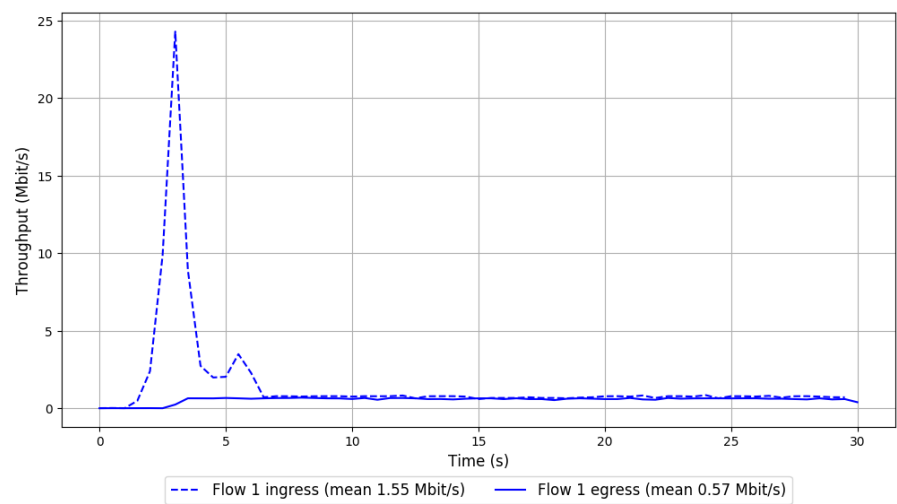
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 24963.260 ms

Loss rate: 64.05%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2018-08-22 09:39:13

End at: 2018-08-22 09:39:43

Local clock offset: -5.117 ms

Remote clock offset: 4.353 ms

Below is generated by plot.py at 2018-08-22 10:29:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 15110.491 ms

Loss rate: 38.72%

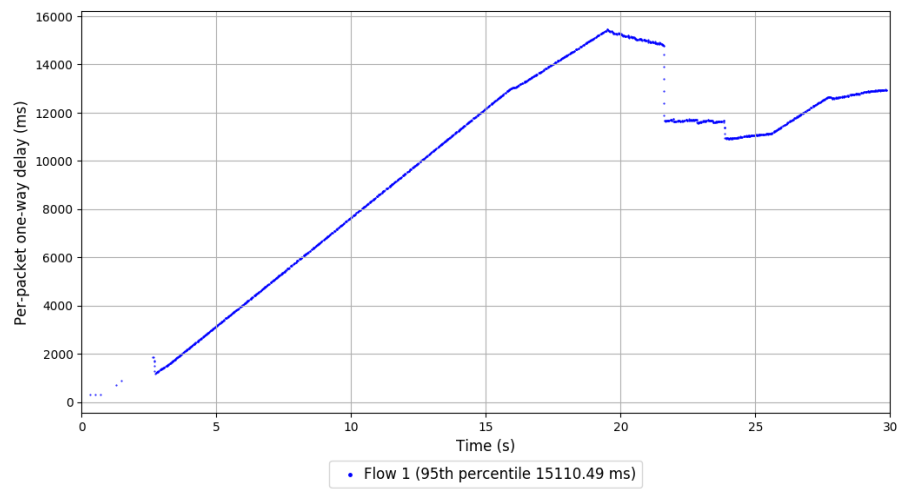
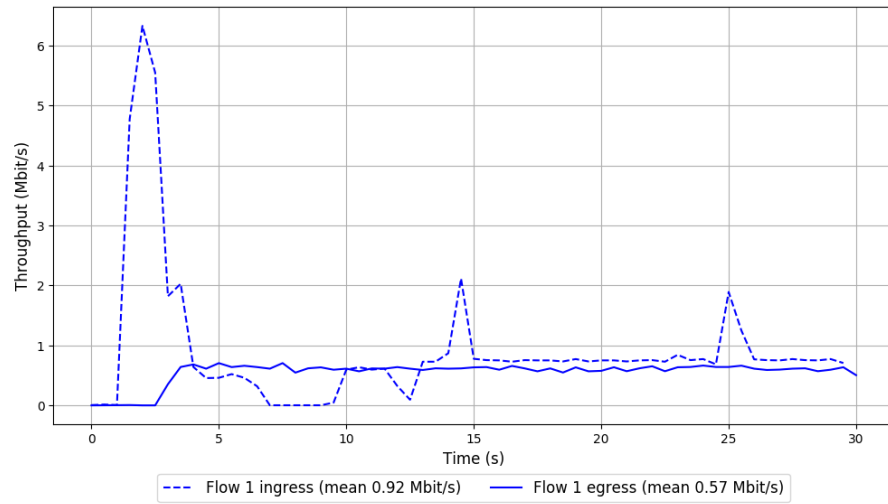
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 15110.491 ms

Loss rate: 38.72%

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2018-08-22 09:58:19

End at: 2018-08-22 09:58:49

Local clock offset: -6.97 ms

Remote clock offset: 4.588 ms

Below is generated by plot.py at 2018-08-22 10:29:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 14912.618 ms

Loss rate: 38.04%

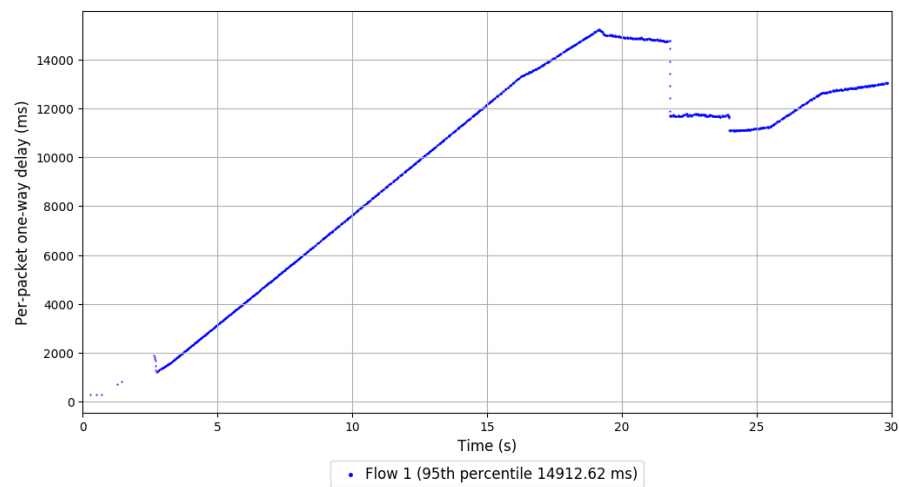
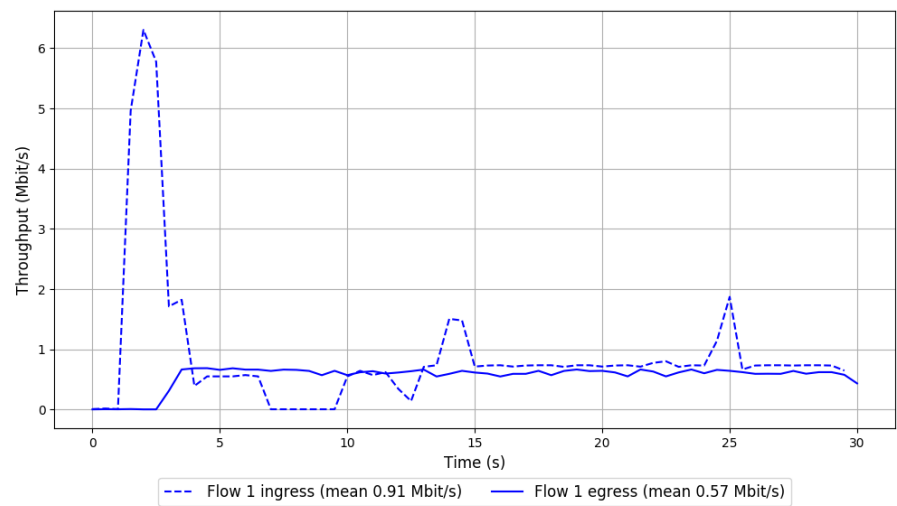
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 14912.618 ms

Loss rate: 38.04%

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2018-08-22 10:17:25

End at: 2018-08-22 10:17:55

Local clock offset: -6.168 ms

Remote clock offset: 4.696 ms

Below is generated by plot.py at 2018-08-22 10:29:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 14864.287 ms

Loss rate: 39.77%

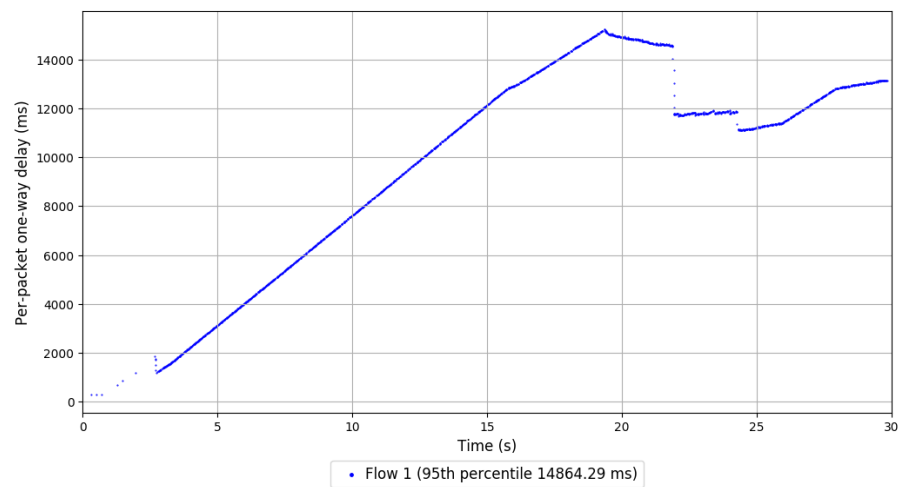
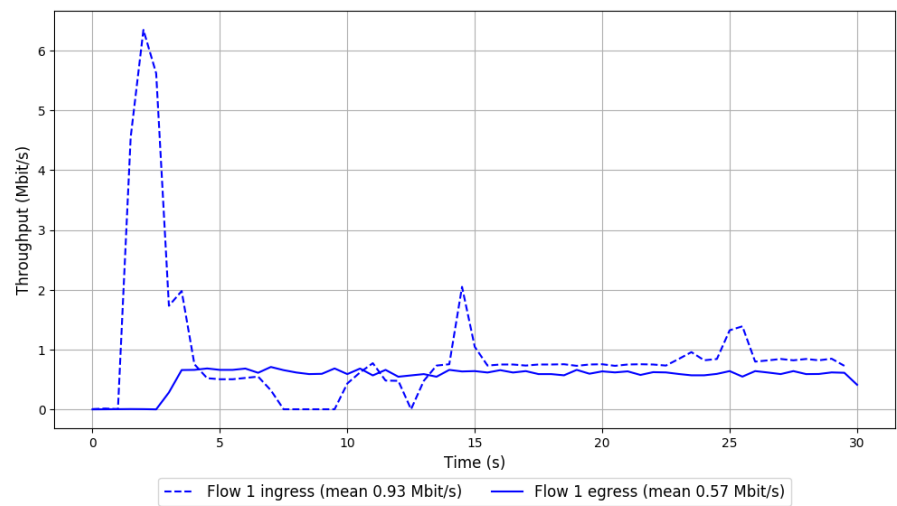
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 14864.287 ms

Loss rate: 39.77%

Run 3: Report of FillP-Sheep — Data Link

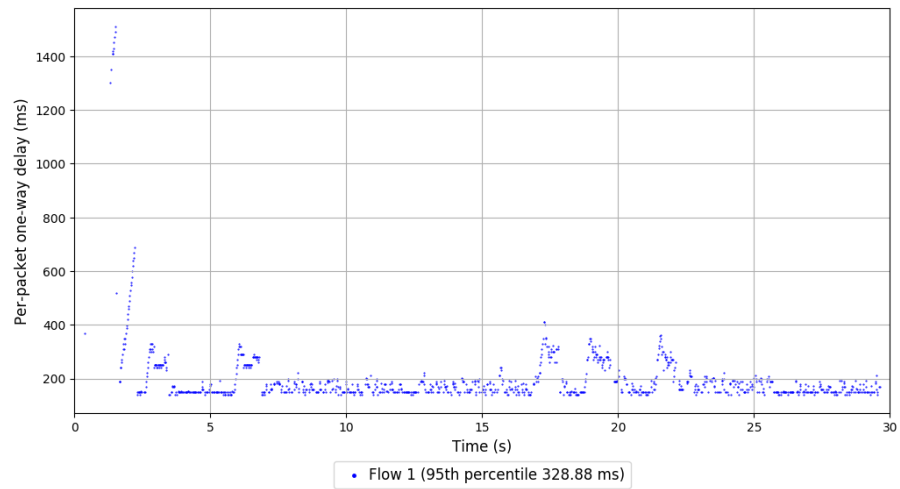
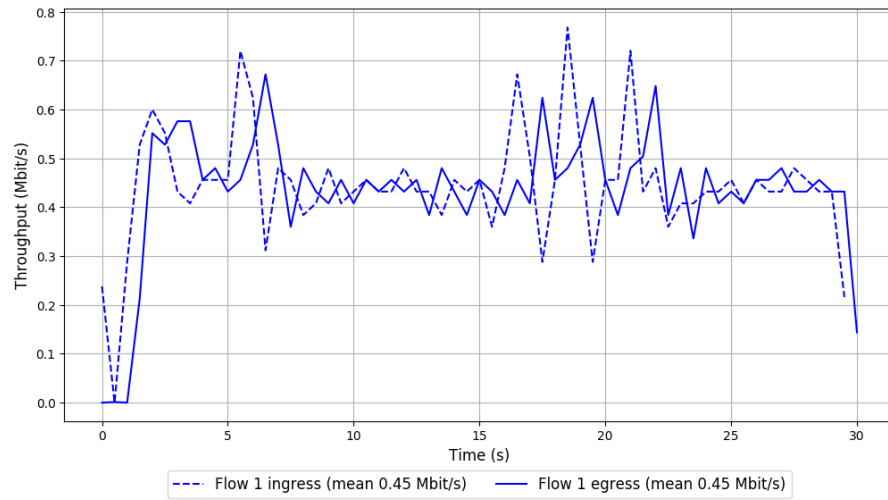


```
Run 1: Statistics of Indigo

Start at: 2018-08-22 09:41:28
End at: 2018-08-22 09:41:58
Local clock offset: -4.725 ms
Remote clock offset: 9.387 ms

# Below is generated by plot.py at 2018-08-22 10:29:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 328.880 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 328.880 ms
Loss rate: 0.81%
```

Run 1: Report of Indigo — Data Link

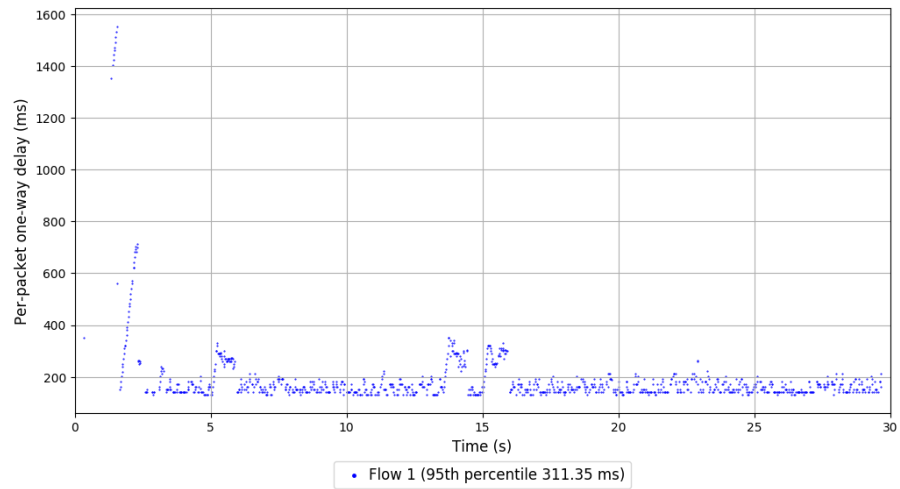
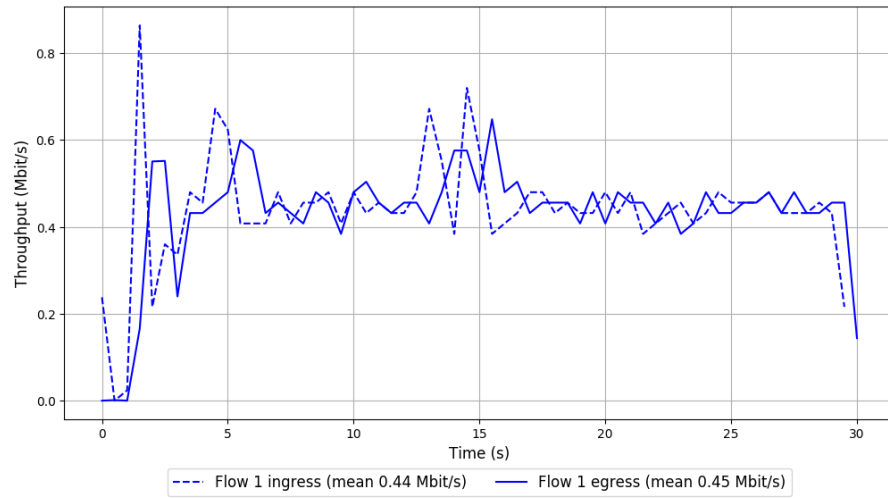


Run 2: Statistics of Indigo

Start at: 2018-08-22 10:00:33
End at: 2018-08-22 10:01:03
Local clock offset: -7.825 ms
Remote clock offset: 10.468 ms

Below is generated by plot.py at 2018-08-22 10:29:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 311.351 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 311.351 ms
Loss rate: 0.73%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-08-22 10:19:39

End at: 2018-08-22 10:20:09

Local clock offset: -4.34 ms

Remote clock offset: 4.681 ms

Below is generated by plot.py at 2018-08-22 10:29:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 267.091 ms

Loss rate: 0.95%

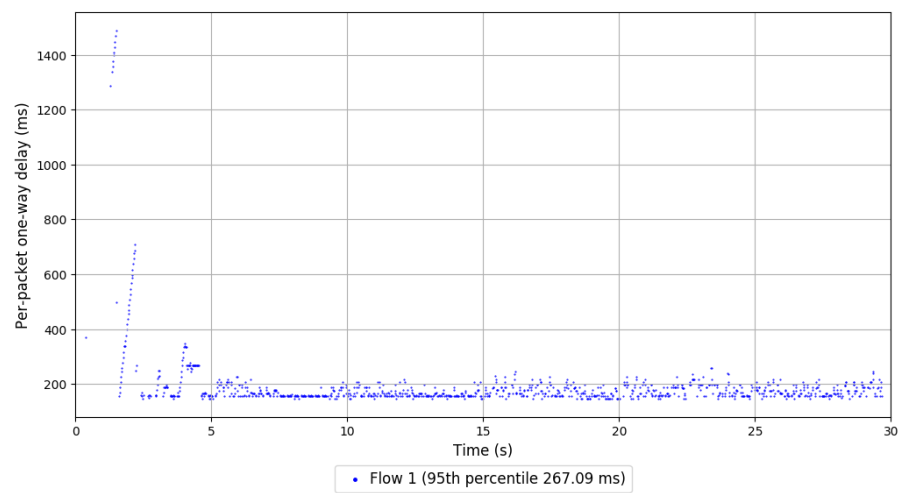
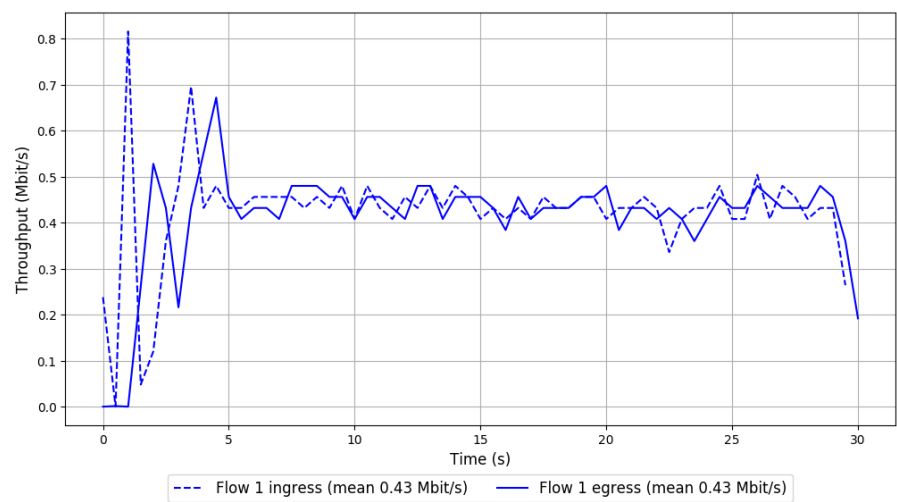
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 267.091 ms

Loss rate: 0.95%

Run 3: Report of Indigo — Data Link

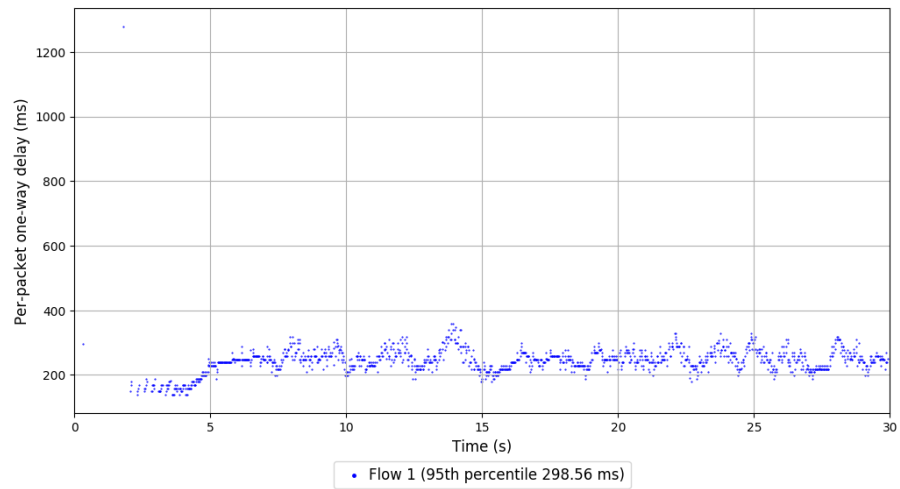
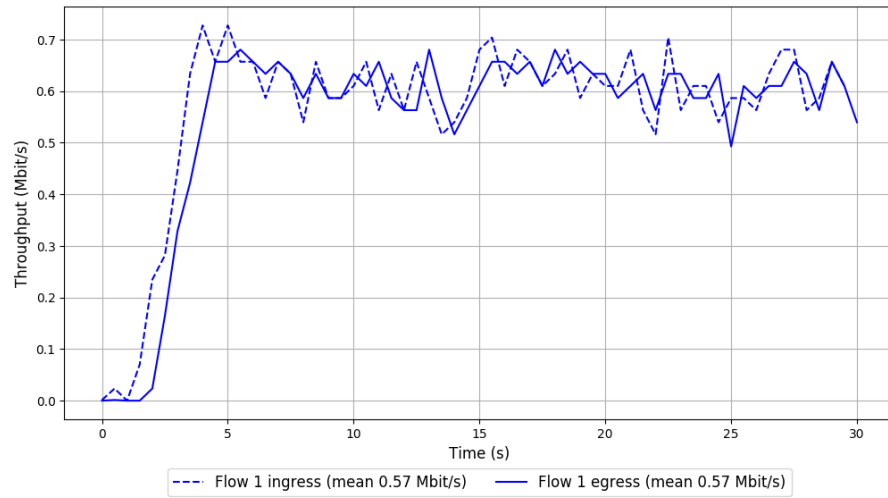


```
Run 1: Statistics of LEDBAT

Start at: 2018-08-22 09:50:28
End at: 2018-08-22 09:50:58
Local clock offset: -6.556 ms
Remote clock offset: 10.66 ms

# Below is generated by plot.py at 2018-08-22 10:29:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 298.556 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 298.556 ms
Loss rate: 1.18%
```

Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2018-08-22 10:09:34

End at: 2018-08-22 10:10:04

Local clock offset: -7.387 ms

Remote clock offset: 5.661 ms

Below is generated by plot.py at 2018-08-22 10:29:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 302.479 ms

Loss rate: 1.25%

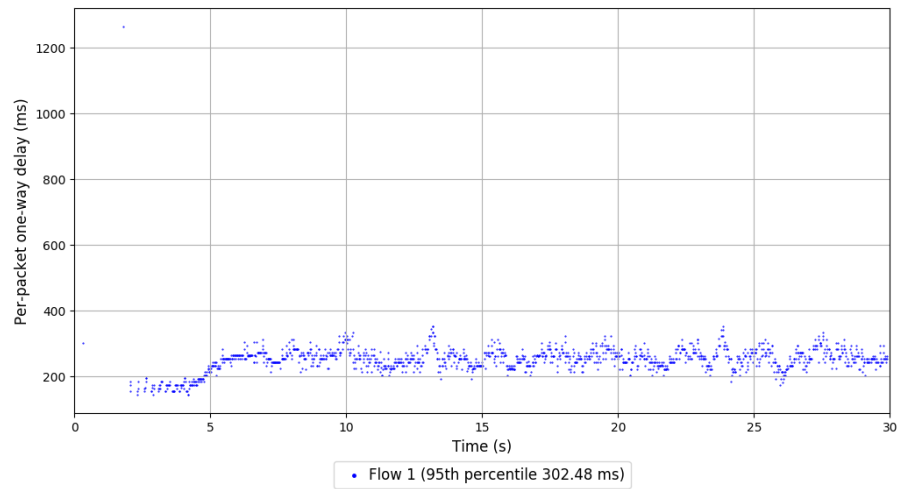
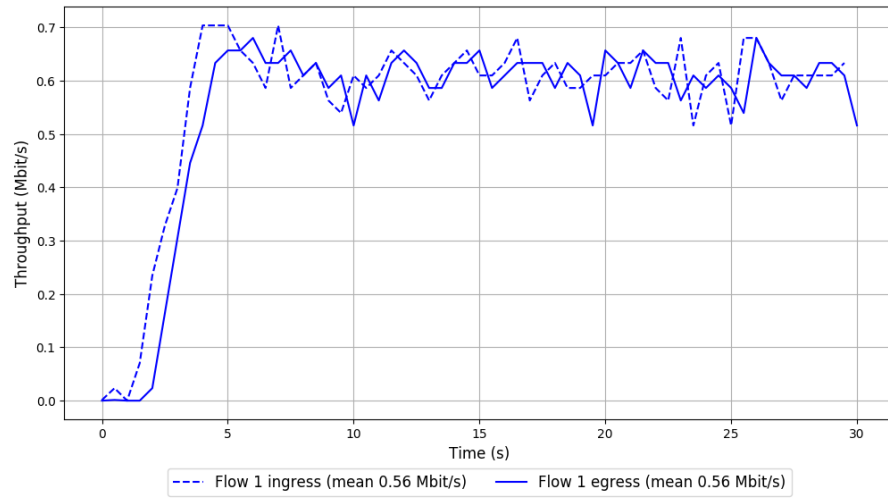
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 302.479 ms

Loss rate: 1.25%

Run 2: Report of LEDBAT — Data Link

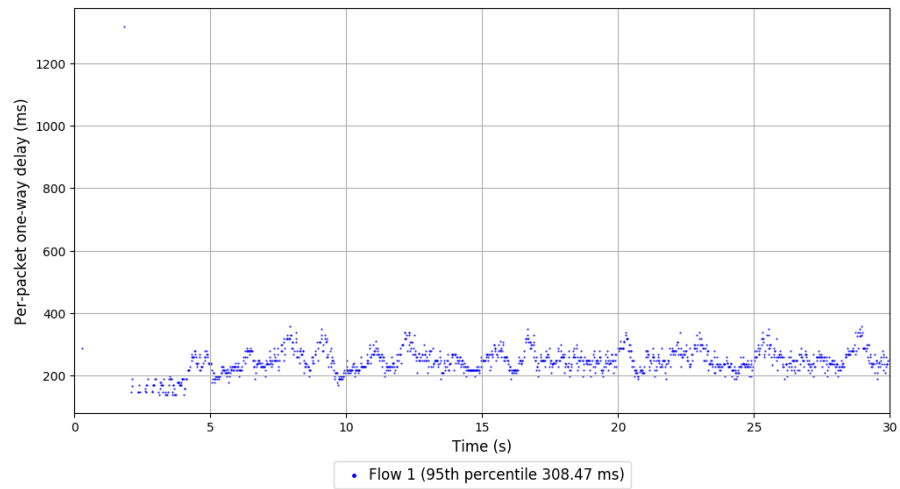
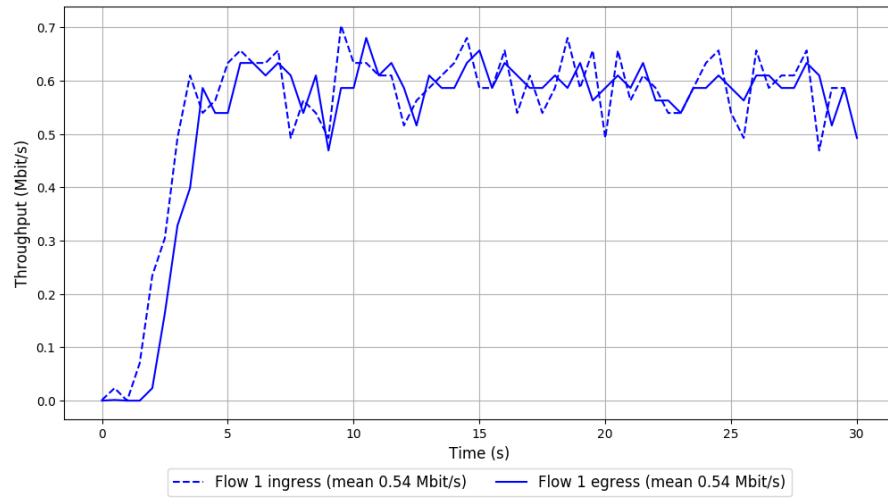


Run 3: Statistics of LEDBAT

Start at: 2018-08-22 10:28:42
End at: 2018-08-22 10:29:12
Local clock offset: -4.567 ms
Remote clock offset: 10.733 ms

Below is generated by plot.py at 2018-08-22 10:29:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 308.474 ms
Loss rate: 1.15%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 308.474 ms
Loss rate: 1.15%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2018-08-22 09:33:36

End at: 2018-08-22 09:34:06

Local clock offset: -5.41 ms

Remote clock offset: 5.369 ms

Below is generated by plot.py at 2018-08-22 10:29:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26029.948 ms

Loss rate: 58.20%

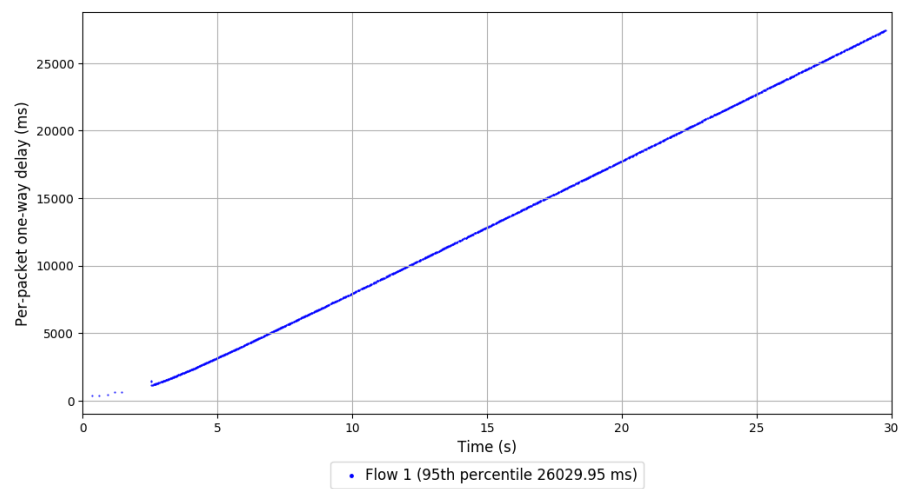
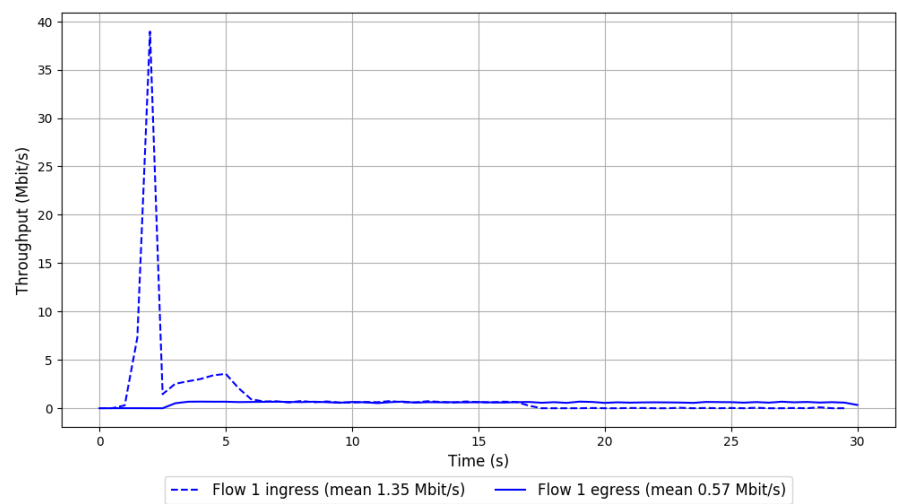
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26029.948 ms

Loss rate: 58.20%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2018-08-22 09:52:42

End at: 2018-08-22 09:53:12

Local clock offset: -6.698 ms

Remote clock offset: 4.823 ms

Below is generated by plot.py at 2018-08-22 10:29:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26049.212 ms

Loss rate: 58.05%

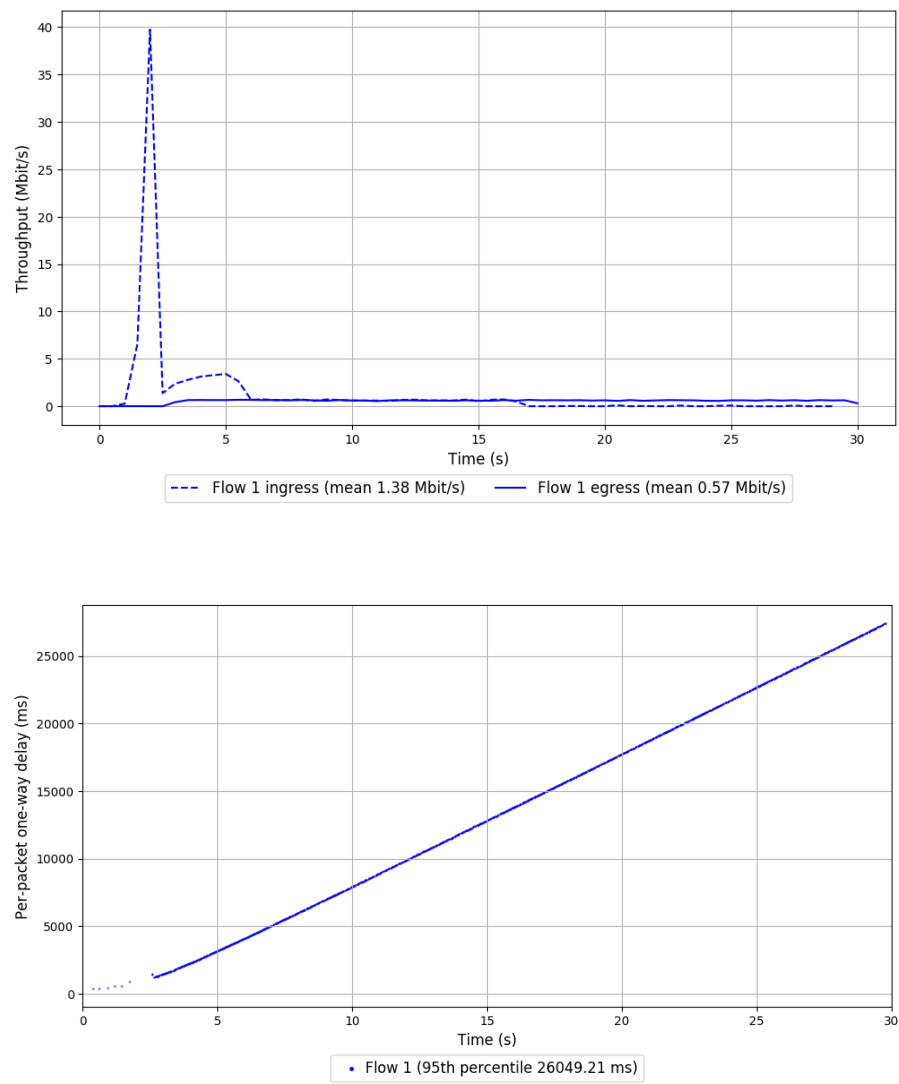
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26049.212 ms

Loss rate: 58.05%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2018-08-22 10:11:48

End at: 2018-08-22 10:12:18

Local clock offset: -6.908 ms

Remote clock offset: 10.58 ms

Below is generated by plot.py at 2018-08-22 10:29:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26125.440 ms

Loss rate: 59.65%

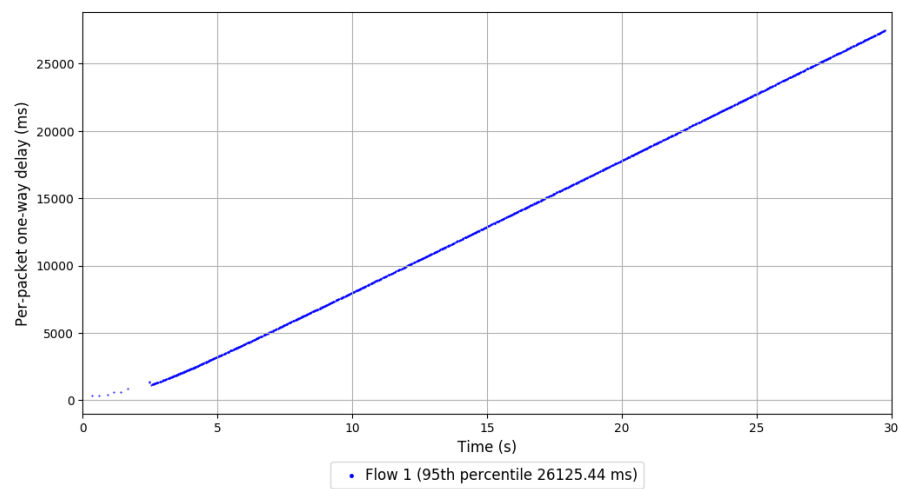
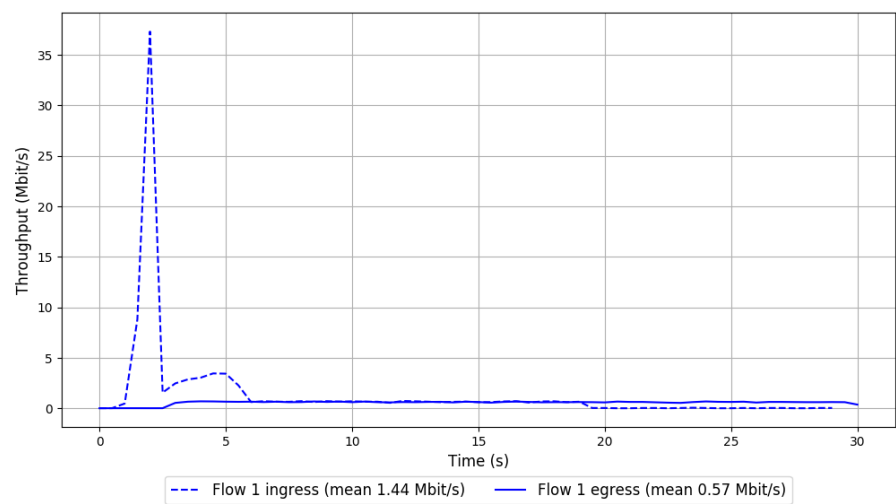
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26125.440 ms

Loss rate: 59.65%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

Start at: 2018-08-22 09:48:13

End at: 2018-08-22 09:48:43

Local clock offset: -7.131 ms

Remote clock offset: 9.512 ms

Below is generated by plot.py at 2018-08-22 10:29:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 25362.501 ms

Loss rate: 89.85%

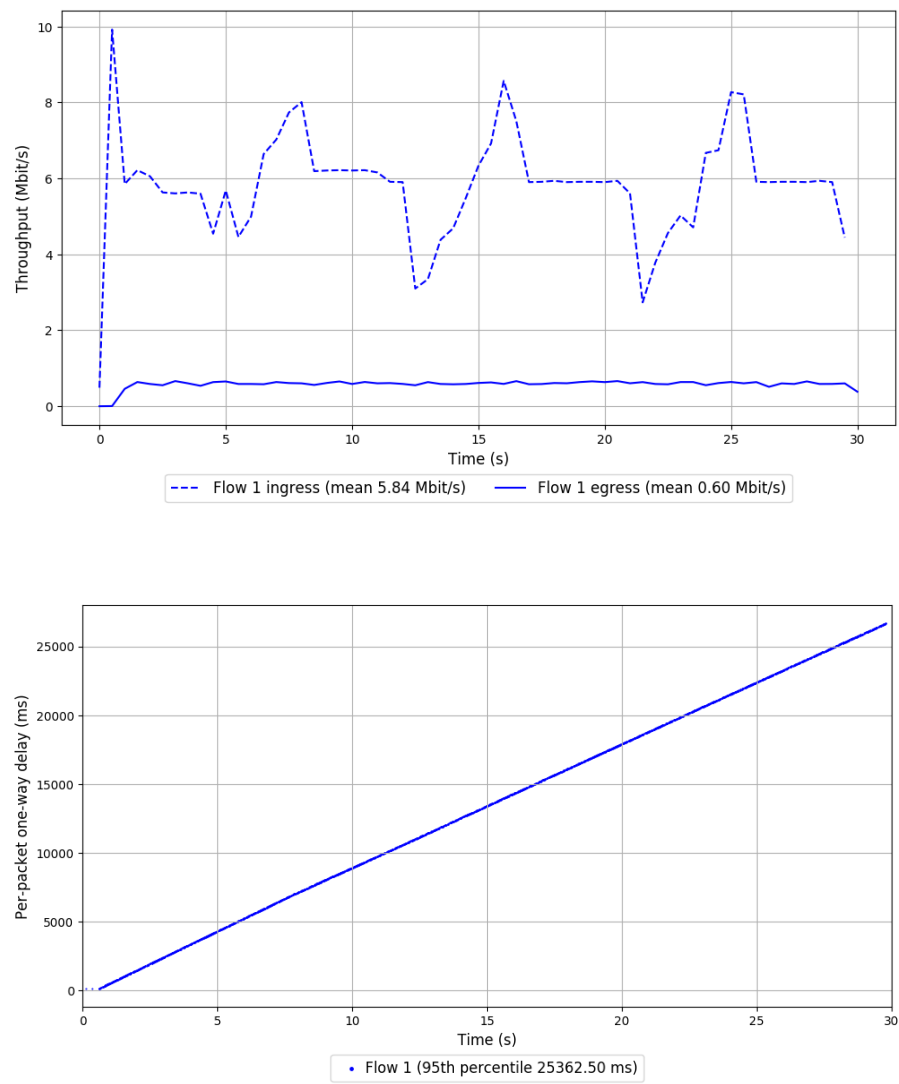
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 25362.501 ms

Loss rate: 89.85%

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

Start at: 2018-08-22 10:07:19

End at: 2018-08-22 10:07:49

Local clock offset: -7.298 ms

Remote clock offset: 5.633 ms

Below is generated by plot.py at 2018-08-22 10:29:39

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 25399.913 ms

Loss rate: 89.63%

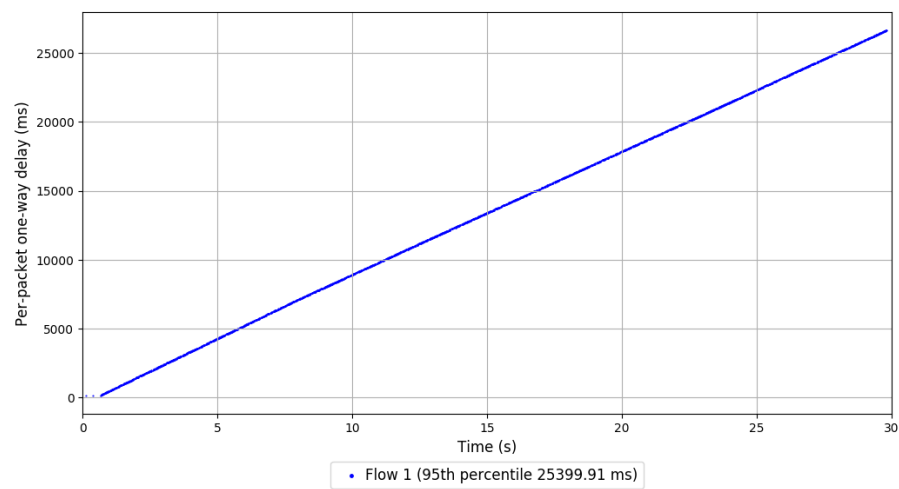
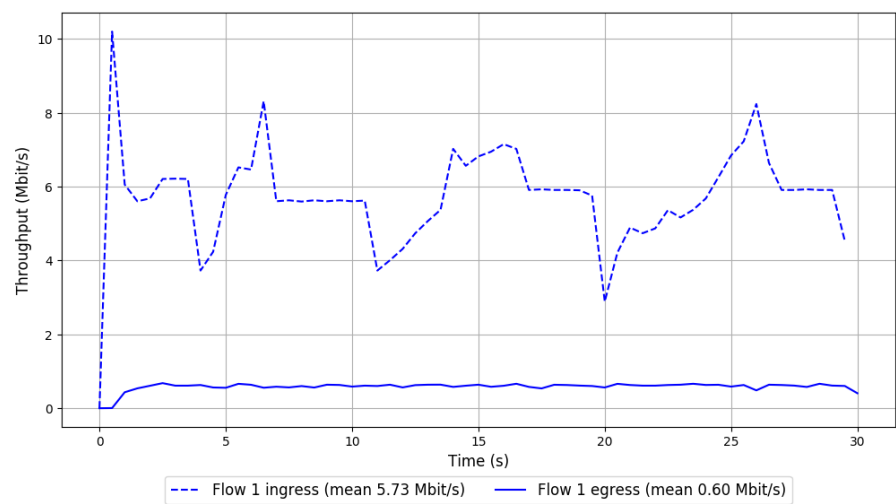
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 25399.913 ms

Loss rate: 89.63%

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

Start at: 2018-08-22 10:26:24

End at: 2018-08-22 10:26:54

Local clock offset: -3.899 ms

Remote clock offset: 4.752 ms

Below is generated by plot.py at 2018-08-22 10:29:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 25487.325 ms

Loss rate: 89.31%

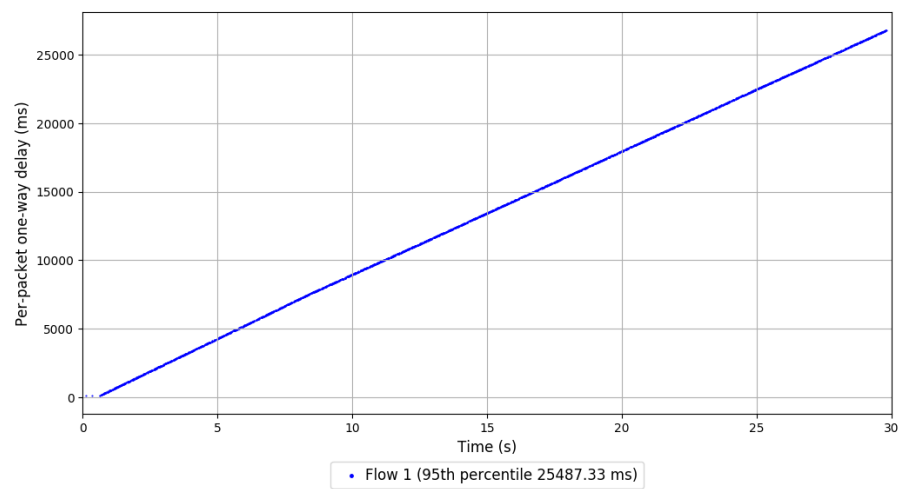
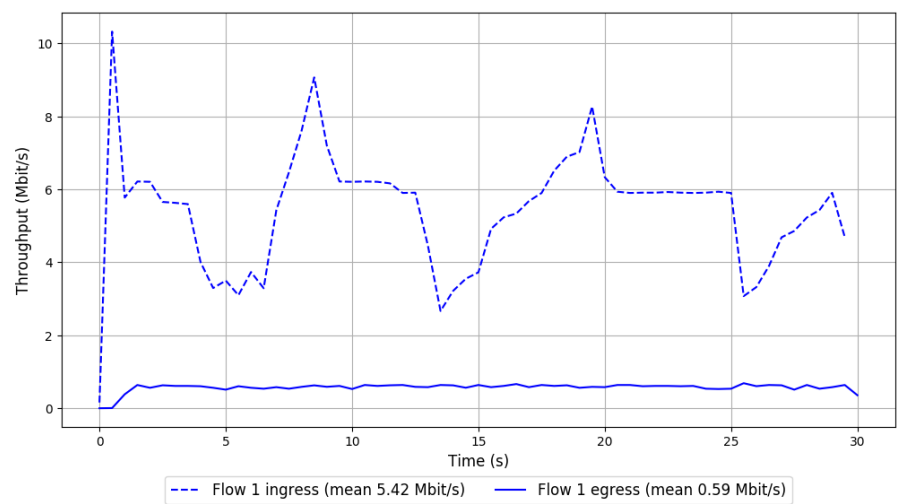
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 25487.325 ms

Loss rate: 89.31%

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-08-22 09:34:44

End at: 2018-08-22 09:35:14

Local clock offset: -3.845 ms

Remote clock offset: 9.031 ms

Below is generated by plot.py at 2018-08-22 10:29:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 7900.385 ms

Loss rate: 30.30%

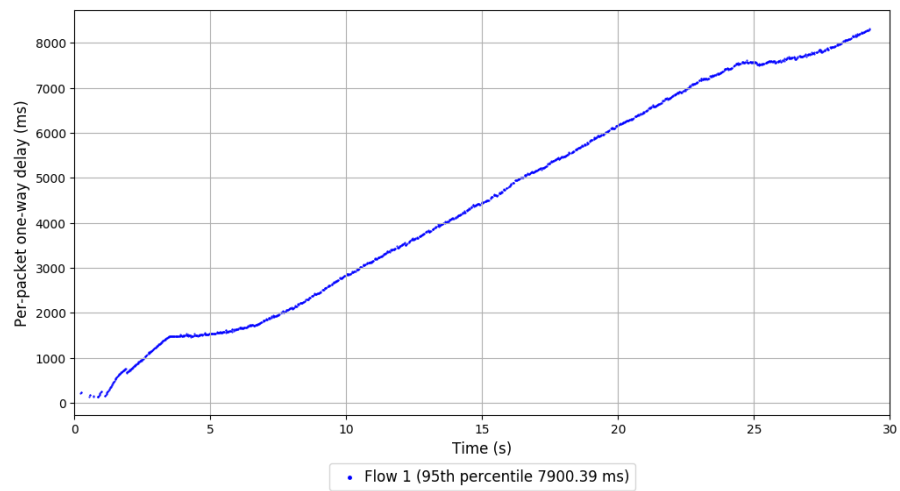
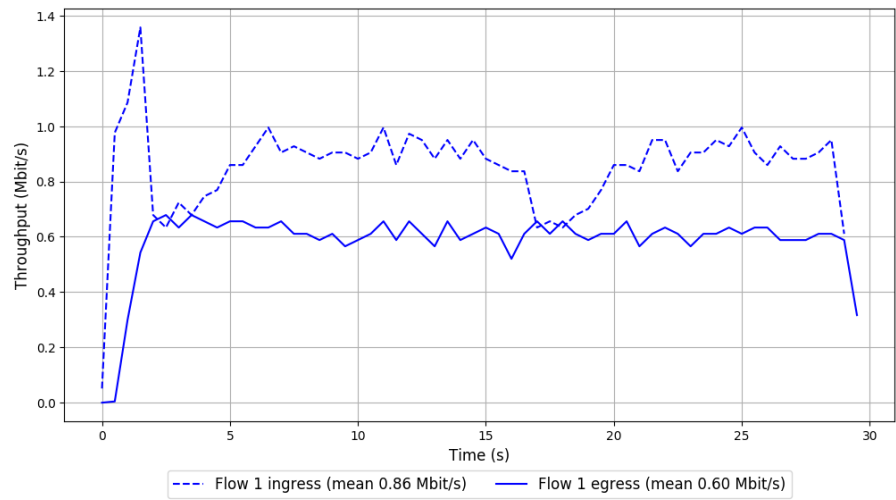
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 7900.385 ms

Loss rate: 30.30%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-08-22 09:53:50

End at: 2018-08-22 09:54:20

Local clock offset: -6.014 ms

Remote clock offset: 8.541 ms

Below is generated by plot.py at 2018-08-22 10:29:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 8741.424 ms

Loss rate: 32.67%

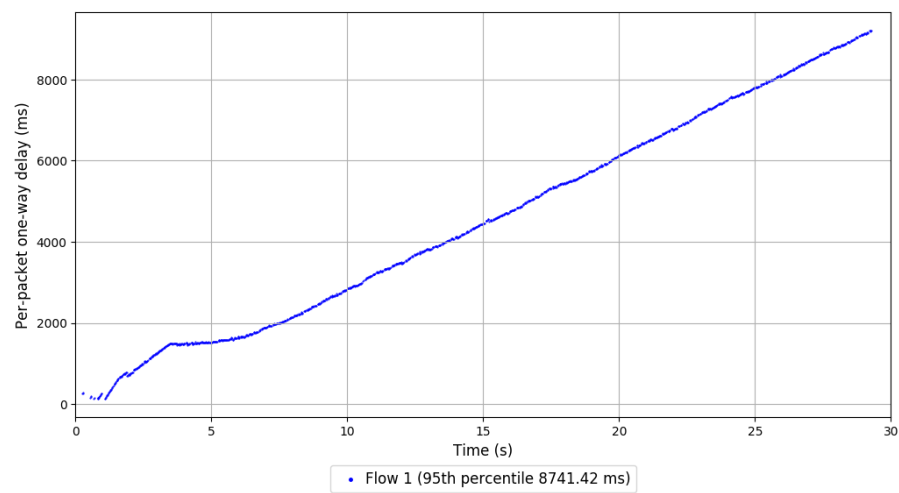
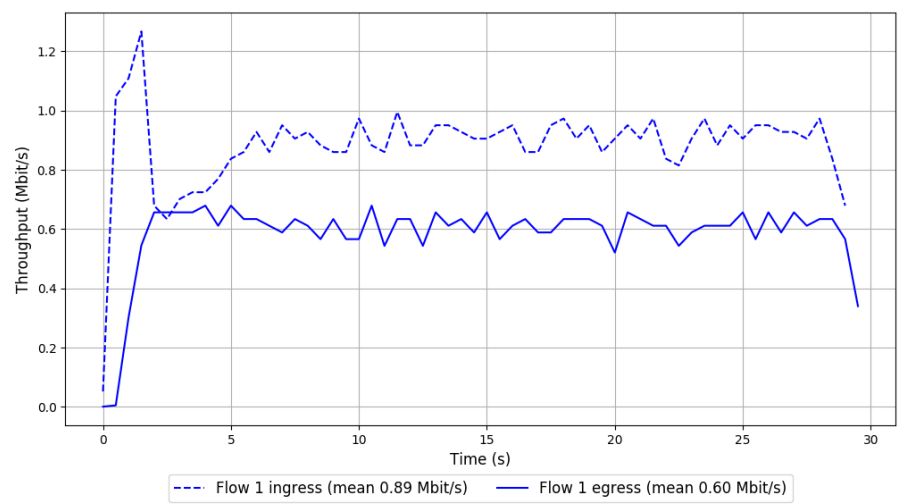
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 8741.424 ms

Loss rate: 32.67%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-08-22 10:12:56

End at: 2018-08-22 10:13:26

Local clock offset: -6.686 ms

Remote clock offset: 9.468 ms

Below is generated by plot.py at 2018-08-22 10:29:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 8673.915 ms

Loss rate: 32.72%

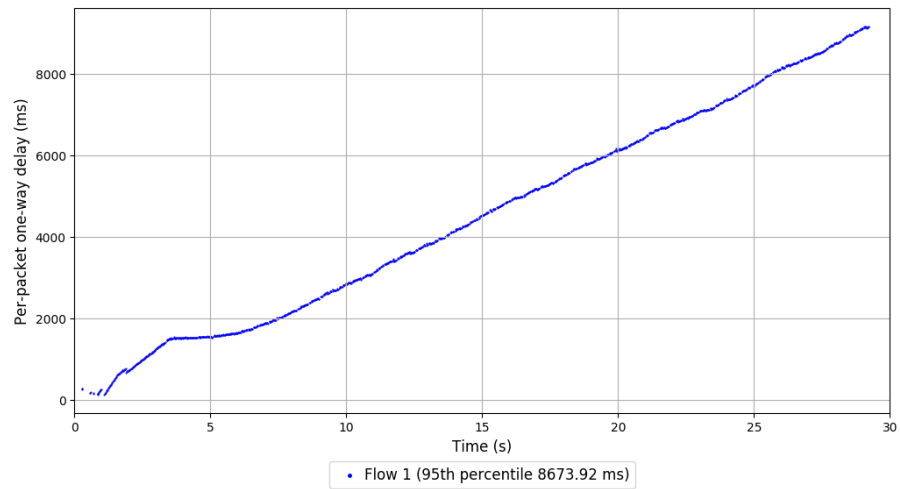
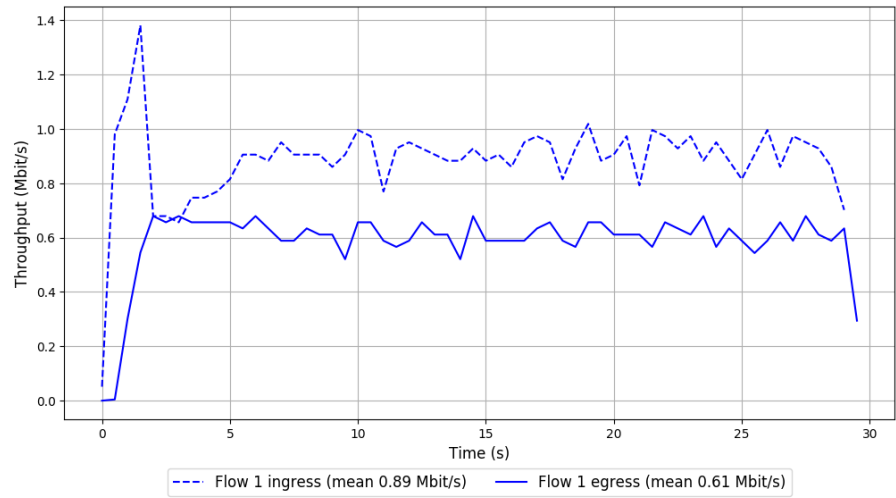
-- Flow 1:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 8673.915 ms

Loss rate: 32.72%

Run 3: Report of QUIC Cubic — Data Link



Run 1: Statistics of SCReAM

Start at: 2018-08-22 09:32:29

End at: 2018-08-22 09:32:59

Local clock offset: -4.738 ms

Remote clock offset: 9.148 ms

Below is generated by plot.py at 2018-08-22 10:29:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 171.517 ms

Loss rate: 0.41%

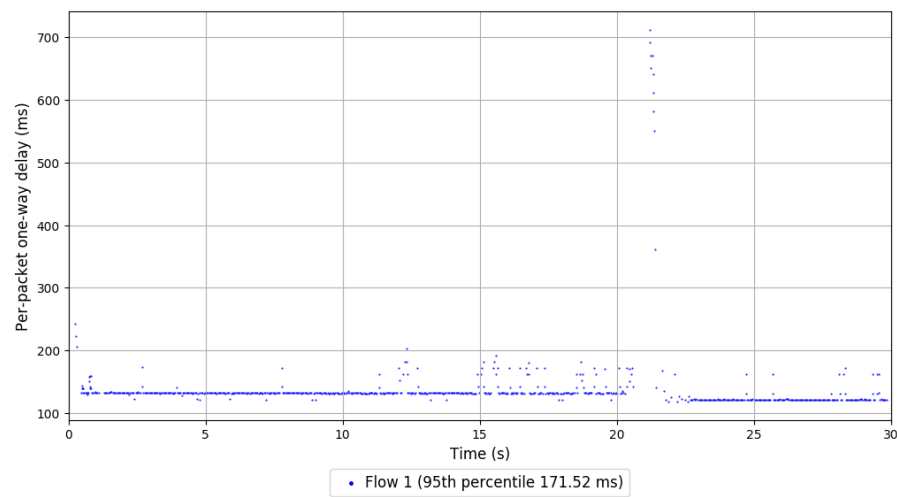
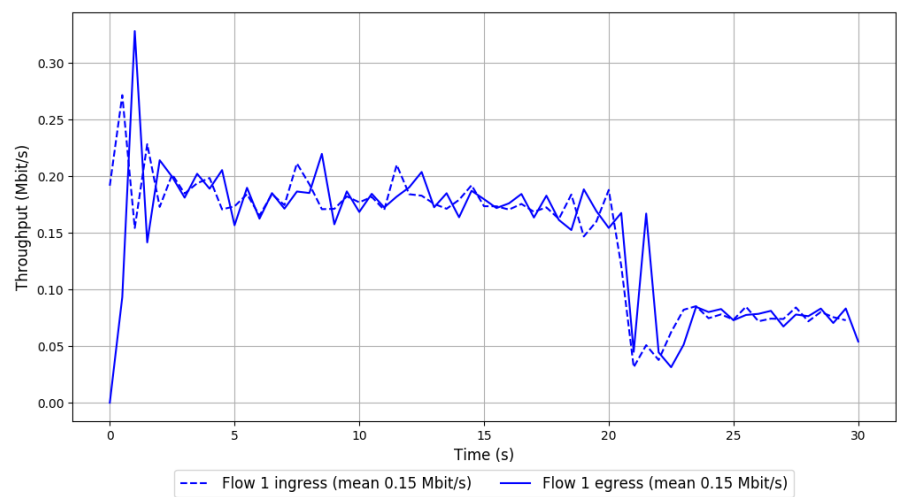
-- Flow 1:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 171.517 ms

Loss rate: 0.41%

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2018-08-22 09:51:35

End at: 2018-08-22 09:52:05

Local clock offset: -5.863 ms

Remote clock offset: 5.874 ms

Below is generated by plot.py at 2018-08-22 10:29:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 127.601 ms

Loss rate: 0.65%

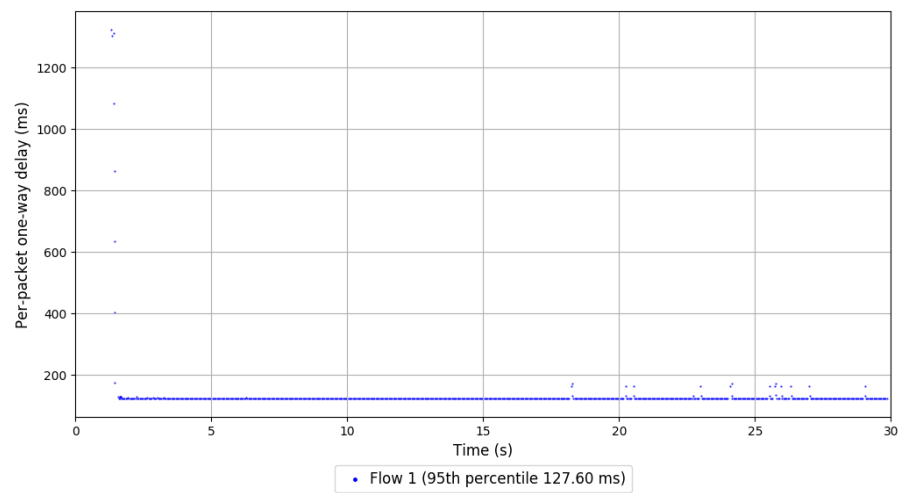
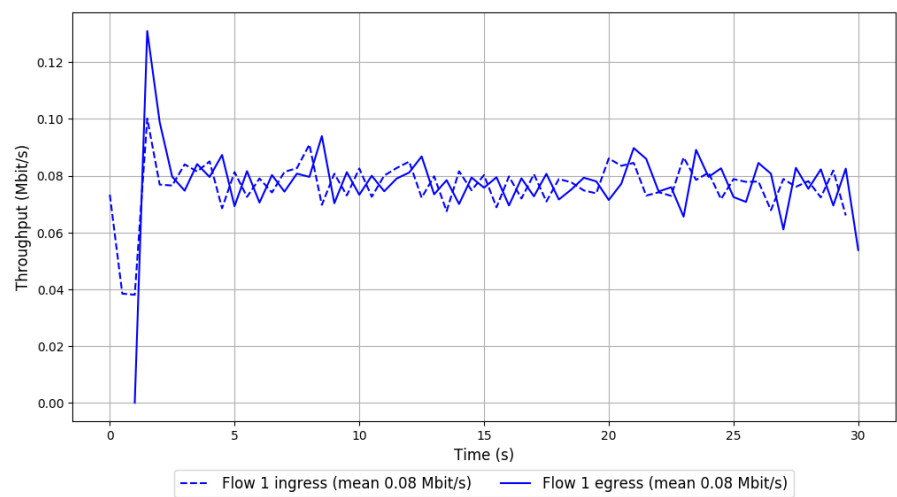
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 127.601 ms

Loss rate: 0.65%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-08-22 10:10:41

End at: 2018-08-22 10:11:11

Local clock offset: -7.085 ms

Remote clock offset: 9.377 ms

Below is generated by plot.py at 2018-08-22 10:29:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 133.187 ms

Loss rate: 0.78%

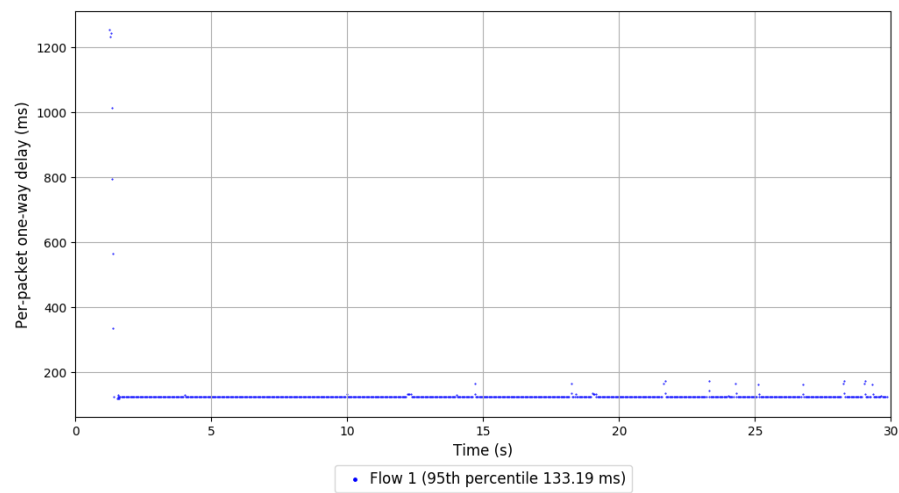
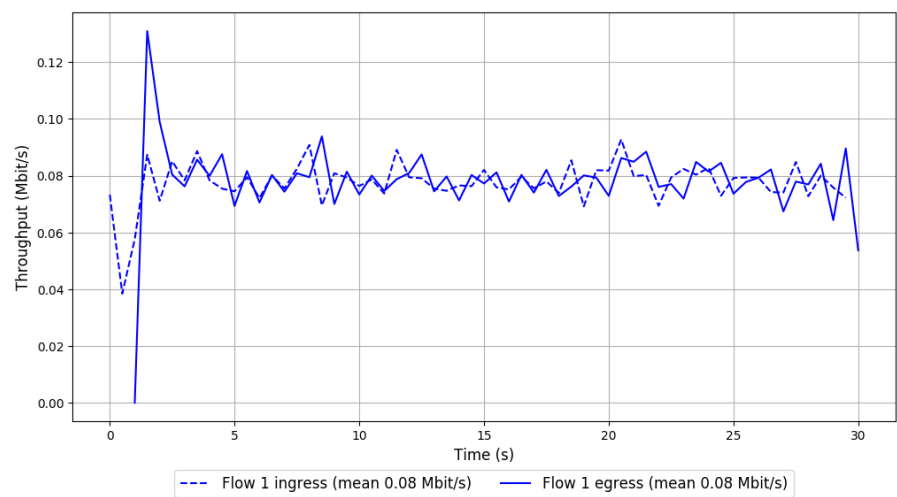
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 133.187 ms

Loss rate: 0.78%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of Sprout

Start at: 2018-08-22 09:36:58

End at: 2018-08-22 09:37:28

Local clock offset: -5.337 ms

Remote clock offset: 4.24 ms

Below is generated by plot.py at 2018-08-22 10:29:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 605.731 ms

Loss rate: 1.02%

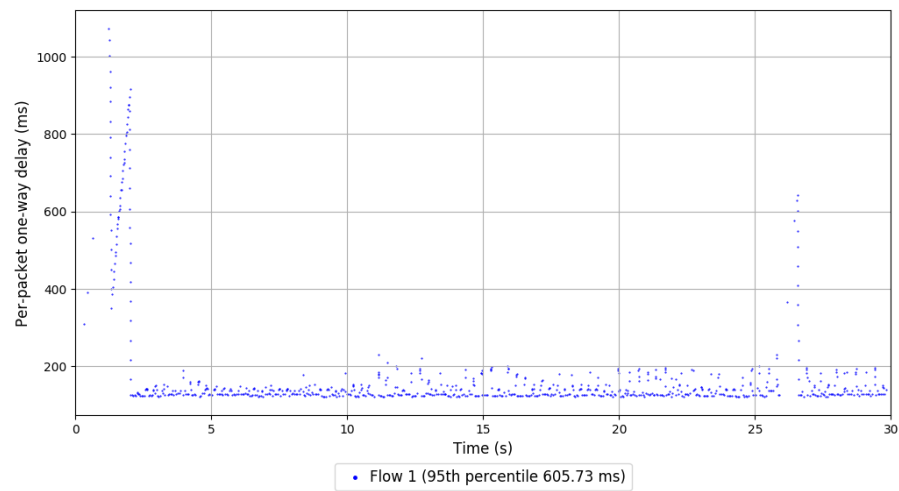
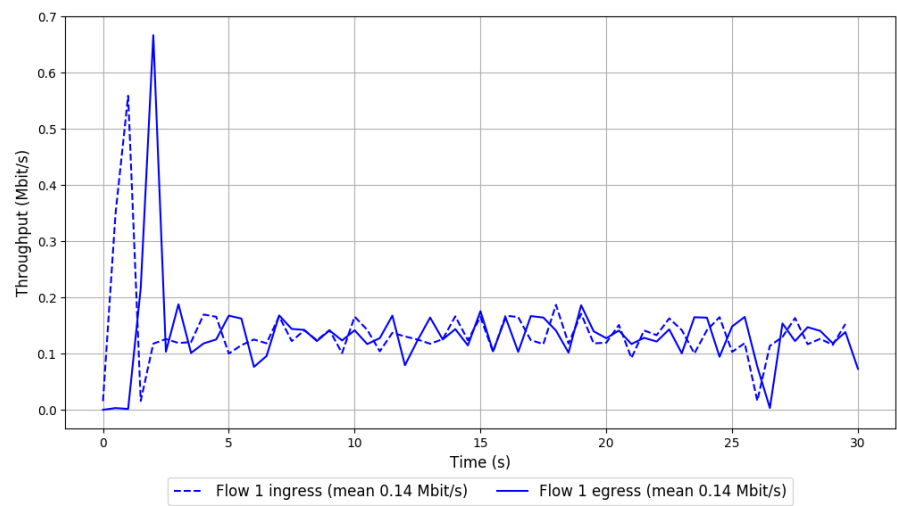
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 605.731 ms

Loss rate: 1.02%

Run 1: Report of Sprout — Data Link

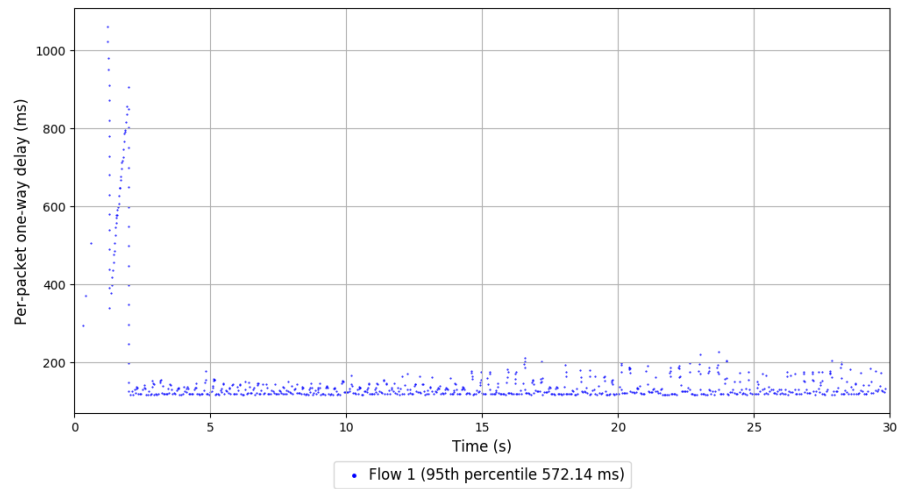
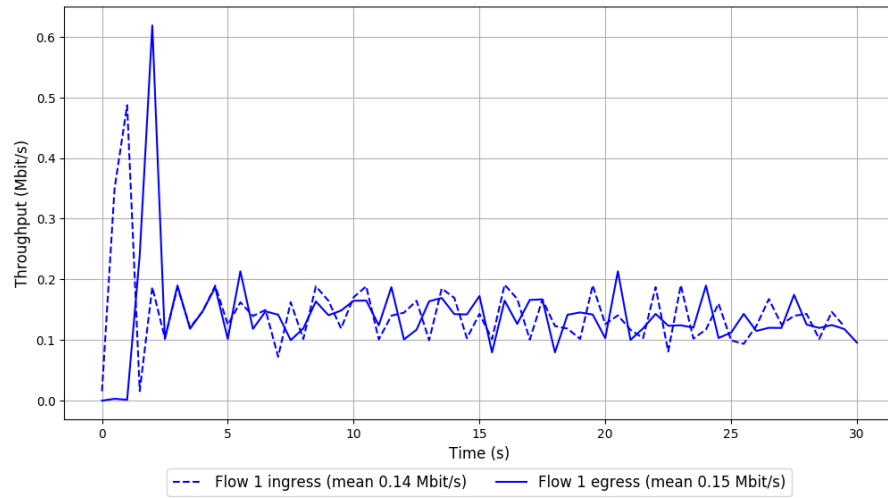


Run 2: Statistics of Sprout

Start at: 2018-08-22 09:56:04
End at: 2018-08-22 09:56:34
Local clock offset: -6.951 ms
Remote clock offset: 9.456 ms

Below is generated by plot.py at 2018-08-22 10:29:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 572.140 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 572.140 ms
Loss rate: 0.86%

Run 2: Report of Sprout — Data Link

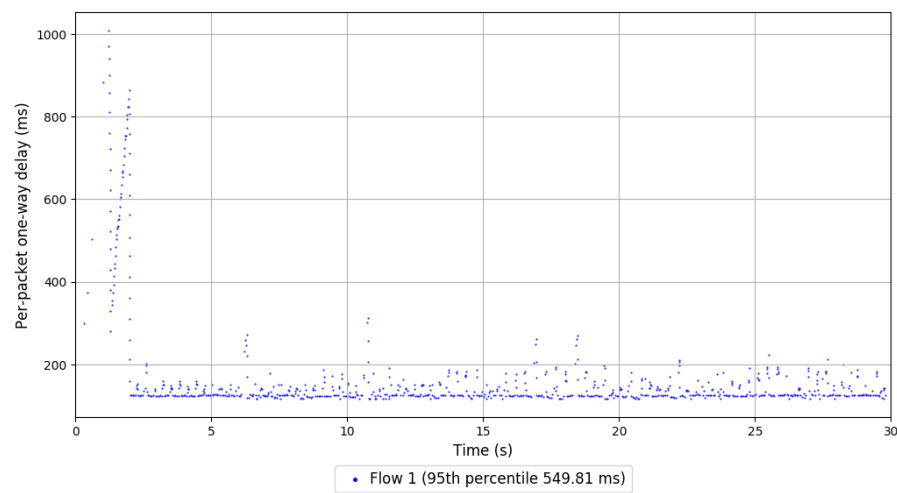
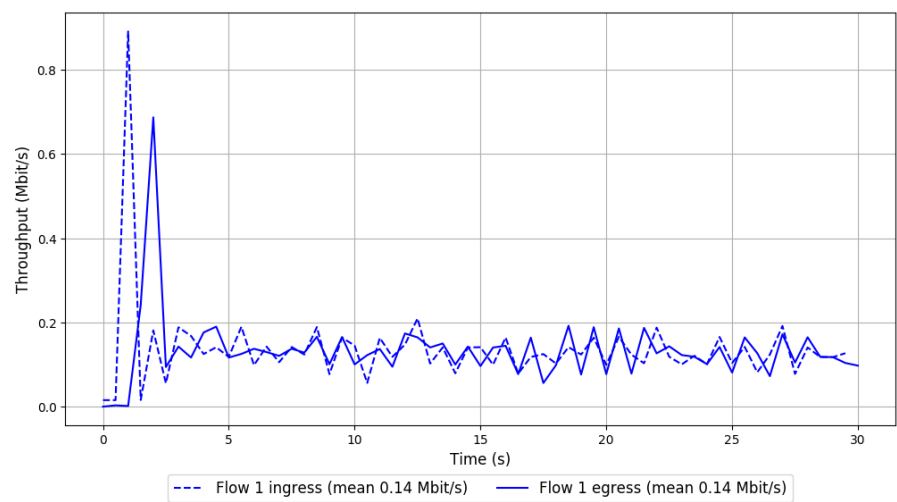


Run 3: Statistics of Sprout

Start at: 2018-08-22 10:15:10
End at: 2018-08-22 10:15:40
Local clock offset: -6.364 ms
Remote clock offset: 9.504 ms

Below is generated by plot.py at 2018-08-22 10:29:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 549.808 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 549.808 ms
Loss rate: 0.86%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-08-22 09:49:20

End at: 2018-08-22 09:49:51

Local clock offset: -6.469 ms

Remote clock offset: 4.572 ms

Below is generated by plot.py at 2018-08-22 10:29:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 4025.029 ms

Loss rate: 2.35%

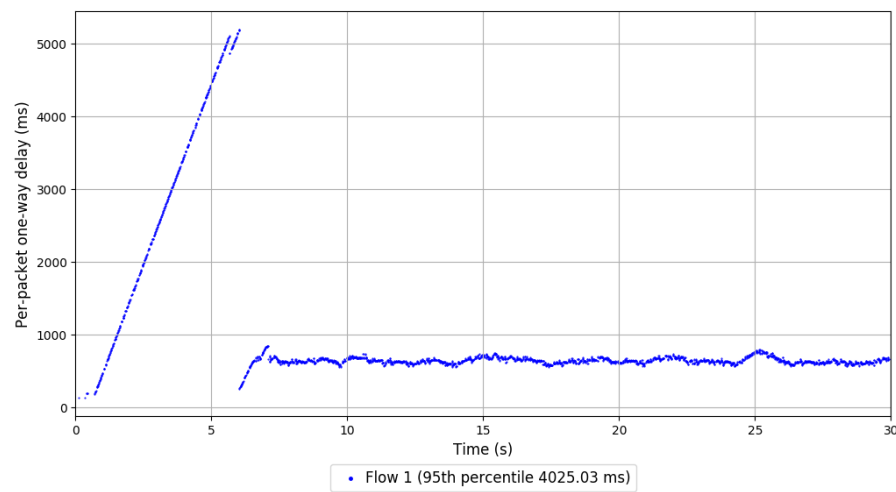
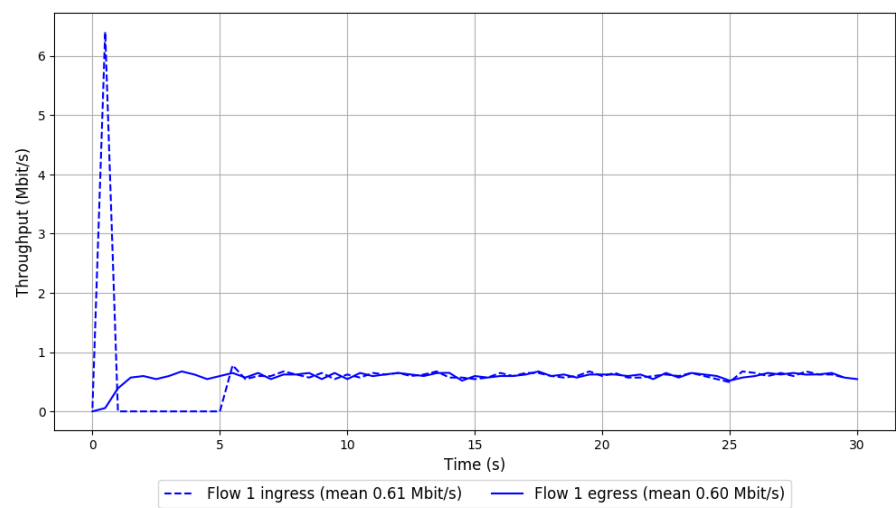
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 4025.029 ms

Loss rate: 2.35%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-08-22 10:08:26

End at: 2018-08-22 10:08:56

Local clock offset: -6.11 ms

Remote clock offset: 5.604 ms

Below is generated by plot.py at 2018-08-22 10:29:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 992.368 ms

Loss rate: 2.40%

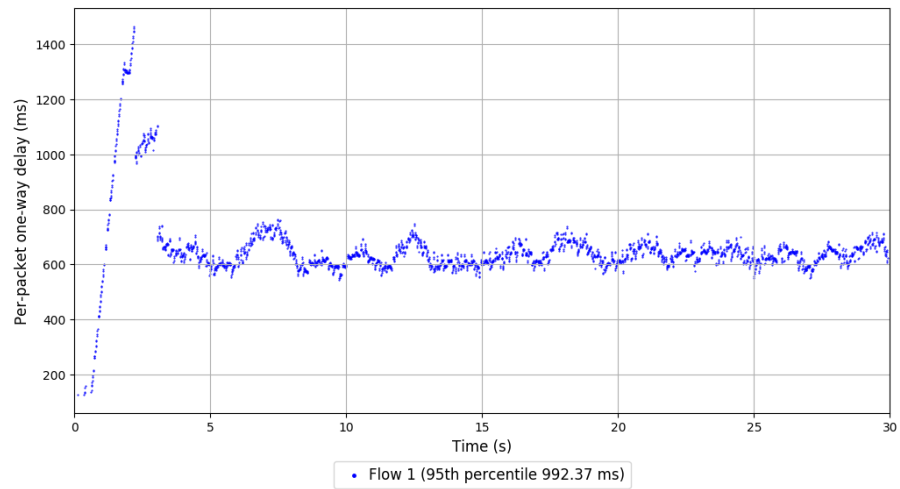
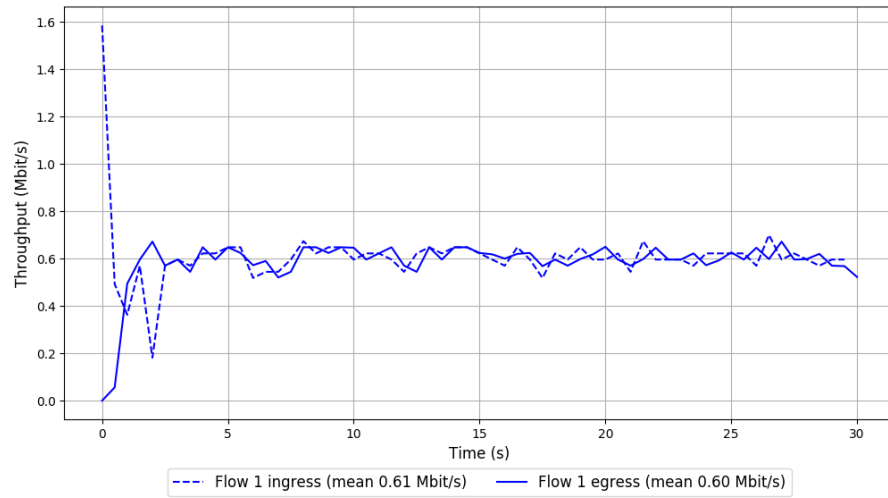
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 992.368 ms

Loss rate: 2.40%

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



Run 3: Statistics of TaoVA-100x

Start at: 2018-08-22 10:27:35

End at: 2018-08-22 10:28:05

Local clock offset: -5.396 ms

Remote clock offset: 9.669 ms

Below is generated by plot.py at 2018-08-22 10:29:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 949.365 ms

Loss rate: 2.38%

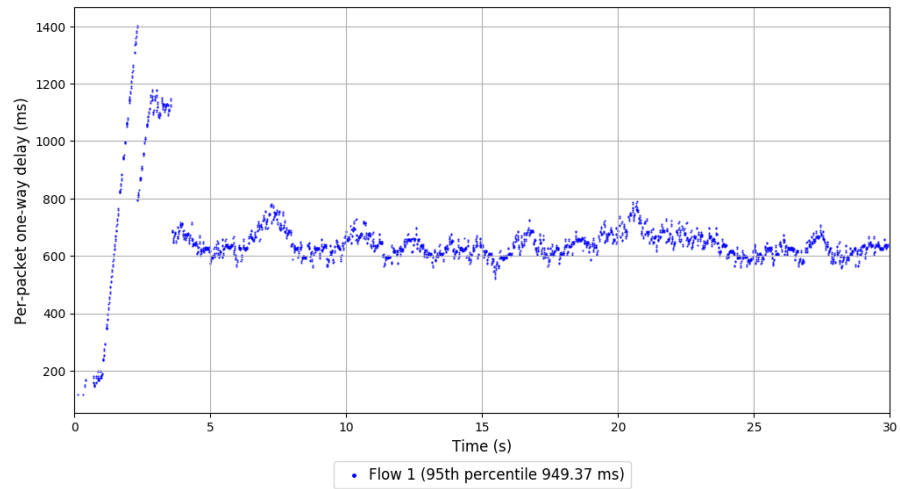
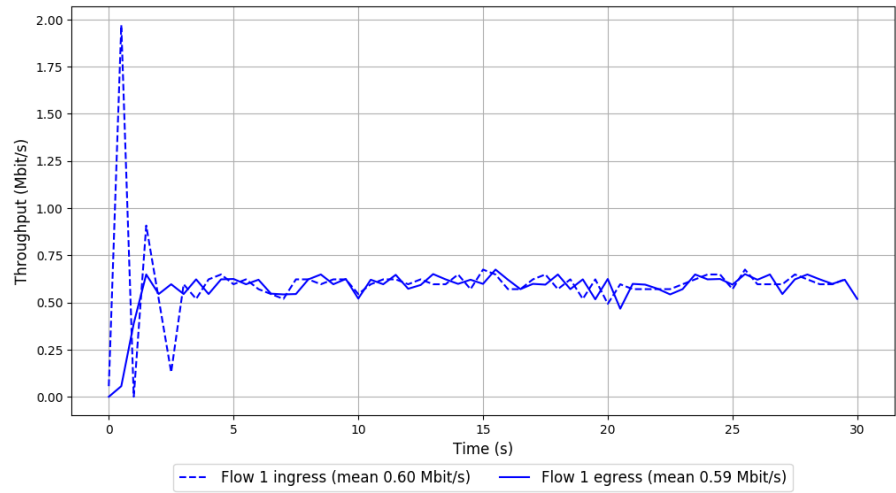
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 949.365 ms

Loss rate: 2.38%

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



Run 1: Statistics of TCP Vegas

Start at: 2018-08-22 09:43:42

End at: 2018-08-22 09:44:12

Local clock offset: -6.669 ms

Remote clock offset: 4.493 ms

Below is generated by plot.py at 2018-08-22 10:29:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 908.025 ms

Loss rate: 1.16%

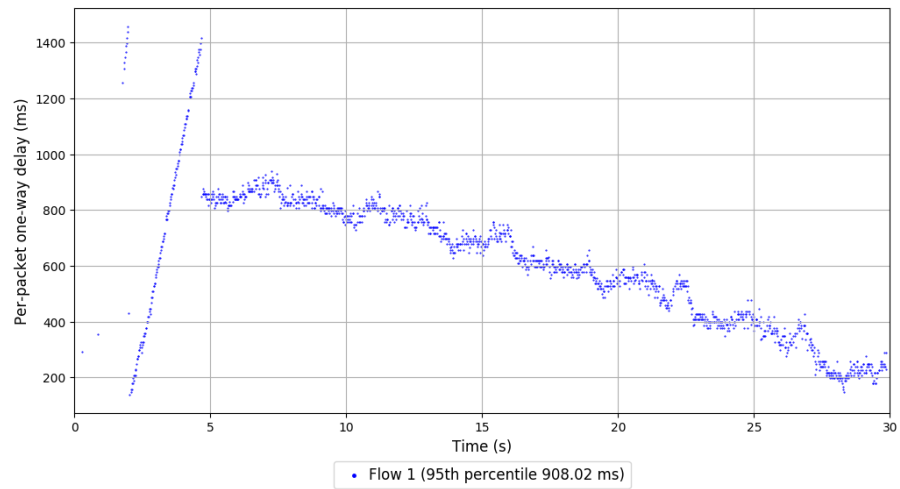
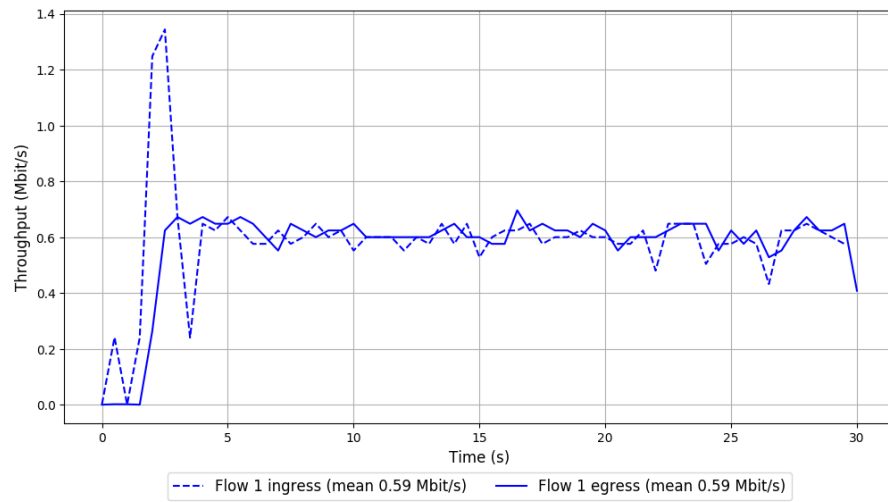
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 908.025 ms

Loss rate: 1.16%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2018-08-22 10:02:48

End at: 2018-08-22 10:03:18

Local clock offset: -7.972 ms

Remote clock offset: 4.603 ms

Below is generated by plot.py at 2018-08-22 10:29:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 921.432 ms

Loss rate: 1.03%

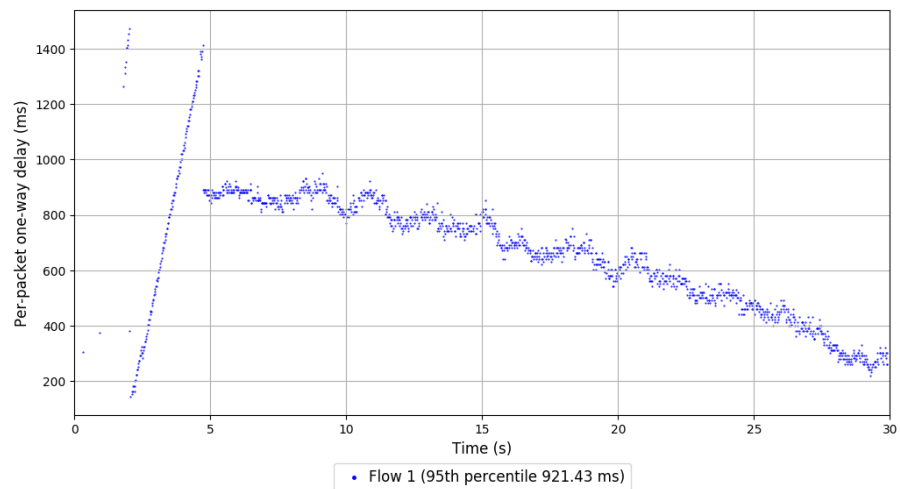
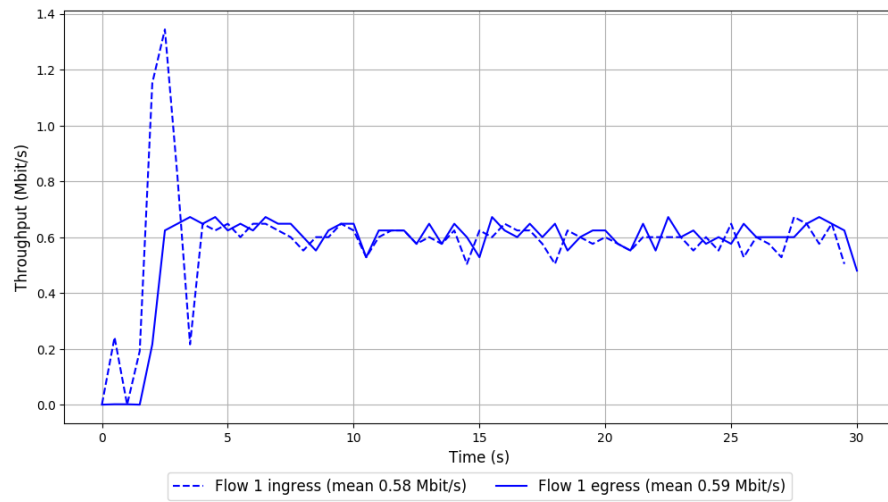
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 921.432 ms

Loss rate: 1.03%

Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

Start at: 2018-08-22 10:21:54

End at: 2018-08-22 10:22:24

Local clock offset: -4.932 ms

Remote clock offset: 10.74 ms

Below is generated by plot.py at 2018-08-22 10:29:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 980.244 ms

Loss rate: 1.63%

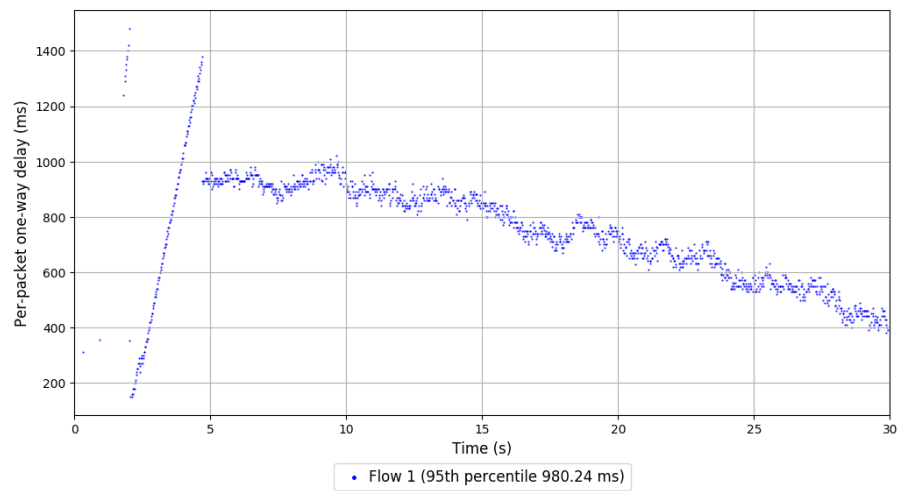
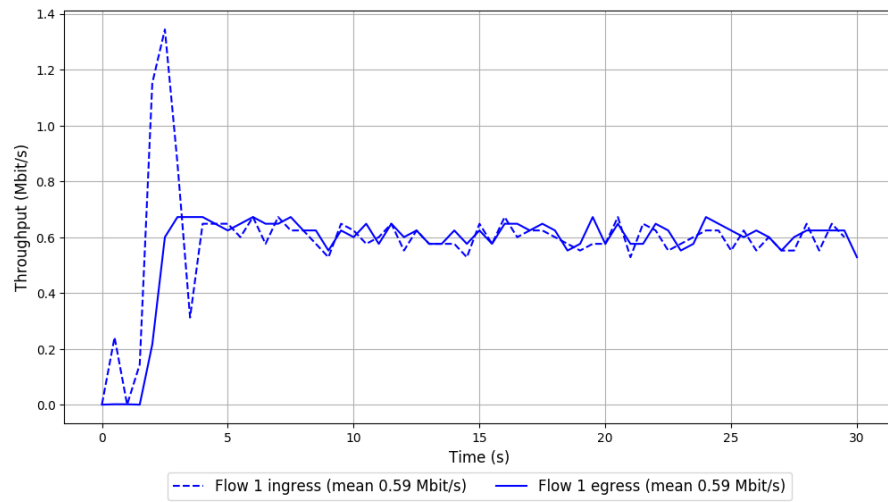
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 980.244 ms

Loss rate: 1.63%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-08-22 09:38:05

End at: 2018-08-22 09:38:36

Local clock offset: -5.57 ms

Remote clock offset: 5.501 ms

Below is generated by plot.py at 2018-08-22 10:29:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 1819.677 ms

Loss rate: 4.73%

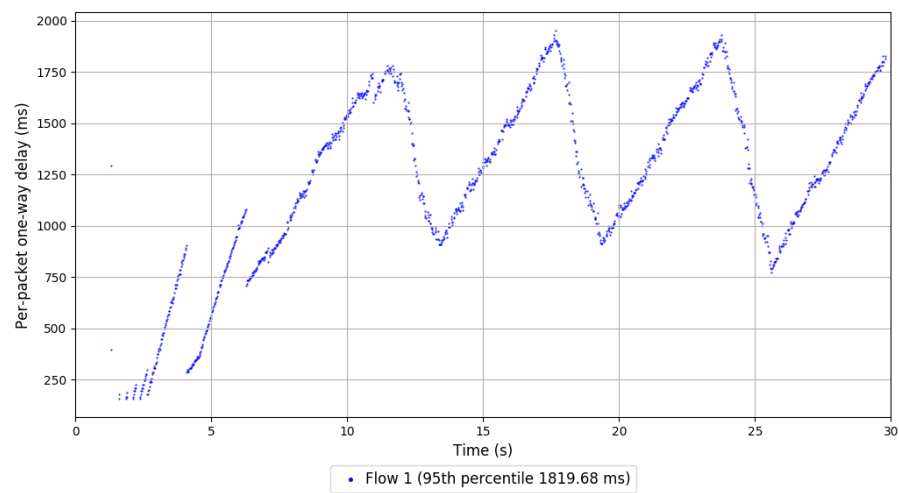
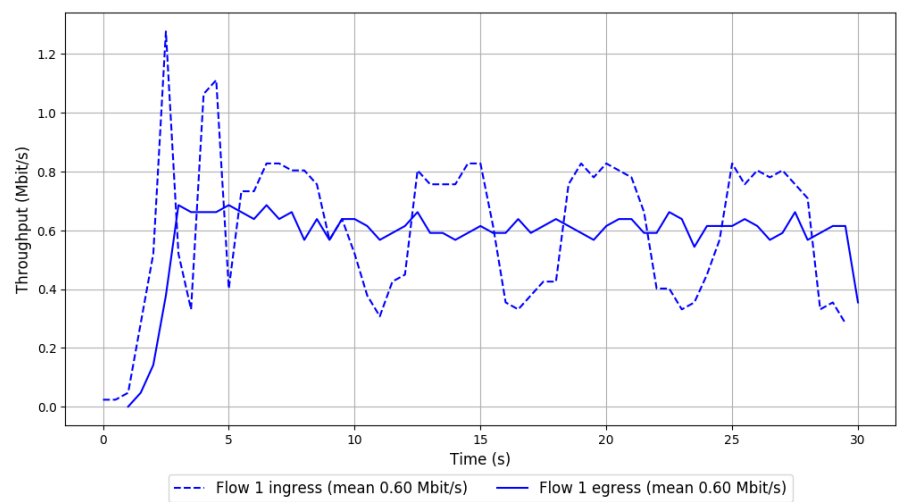
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 1819.677 ms

Loss rate: 4.73%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2018-08-22 09:57:12

End at: 2018-08-22 09:57:42

Local clock offset: -6.938 ms

Remote clock offset: 4.583 ms

Below is generated by plot.py at 2018-08-22 10:29:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 1820.861 ms

Loss rate: 3.92%

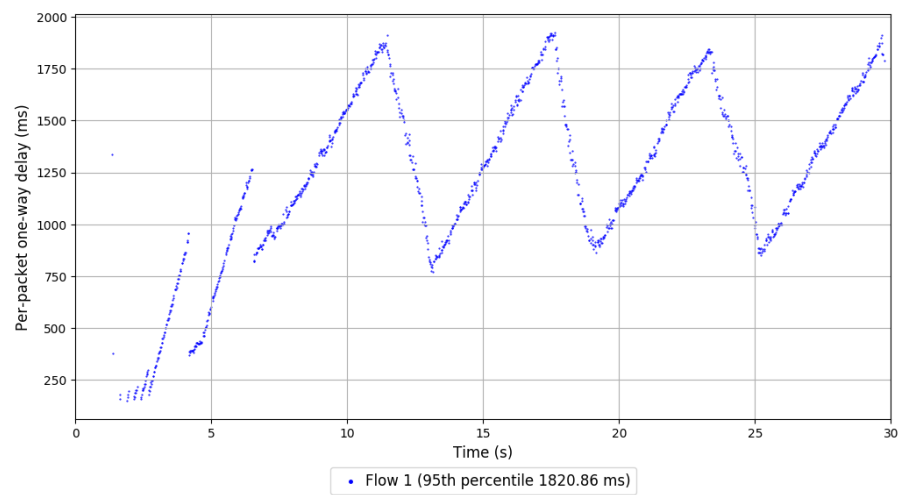
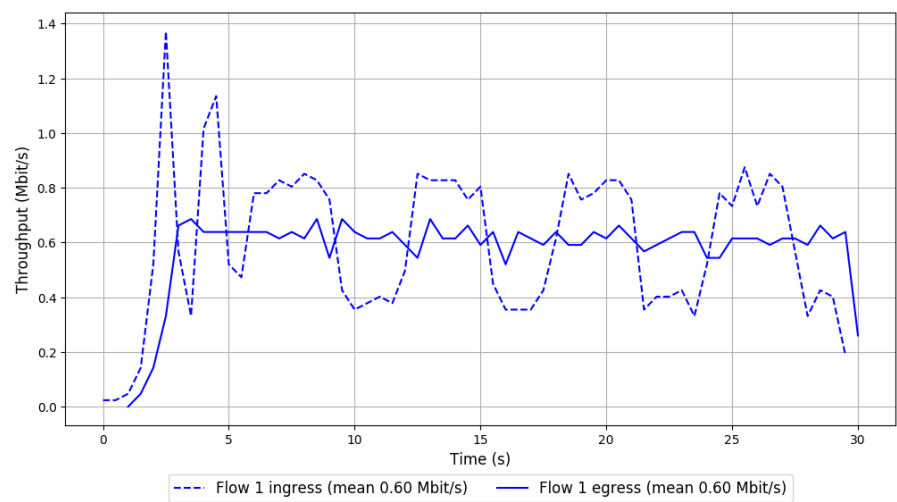
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 1820.861 ms

Loss rate: 3.92%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2018-08-22 10:16:17

End at: 2018-08-22 10:16:47

Local clock offset: -5.459 ms

Remote clock offset: 9.462 ms

Below is generated by plot.py at 2018-08-22 10:29:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 1834.404 ms

Loss rate: 4.39%

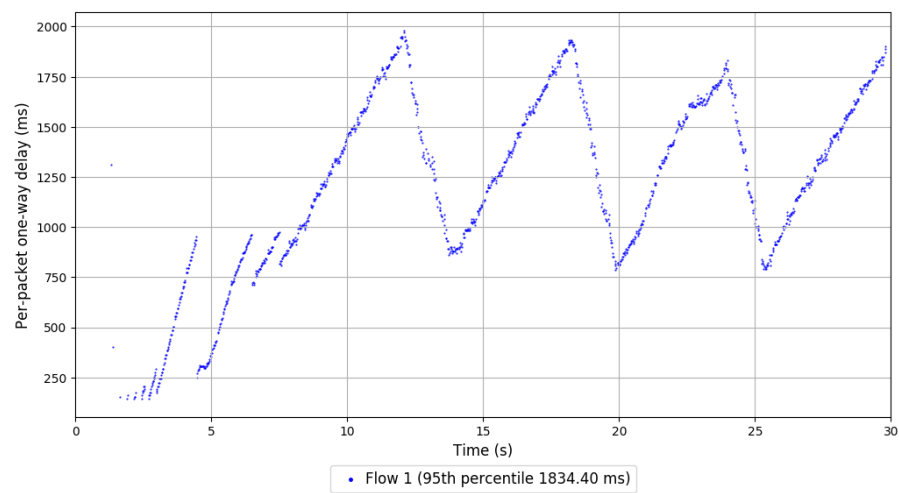
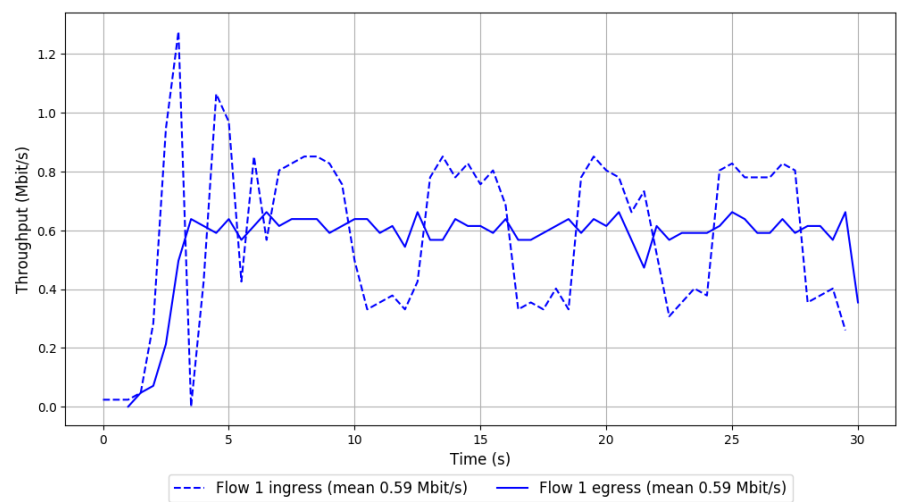
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 1834.404 ms

Loss rate: 4.39%

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2018-08-22 09:47:04

End at: 2018-08-22 09:47:34

Local clock offset: -7.106 ms

Remote clock offset: 8.362 ms

Below is generated by plot.py at 2018-08-22 10:29:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 22144.416 ms

Loss rate: 68.59%

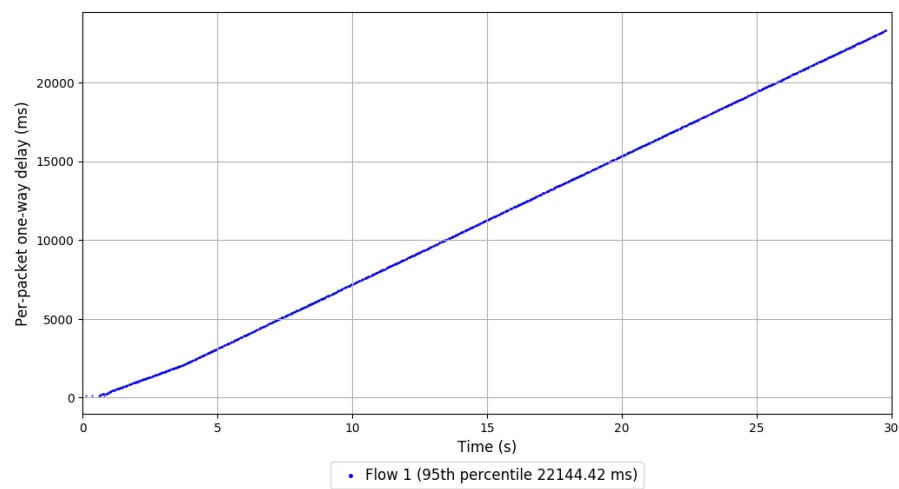
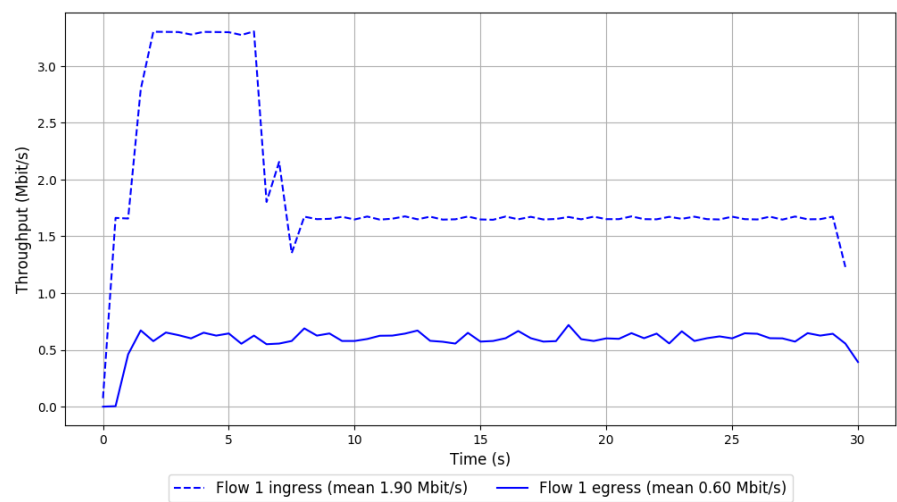
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 22144.416 ms

Loss rate: 68.59%

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2018-08-22 10:06:10

End at: 2018-08-22 10:06:40

Local clock offset: -7.237 ms

Remote clock offset: 5.611 ms

Below is generated by plot.py at 2018-08-22 10:29:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 22123.935 ms

Loss rate: 68.93%

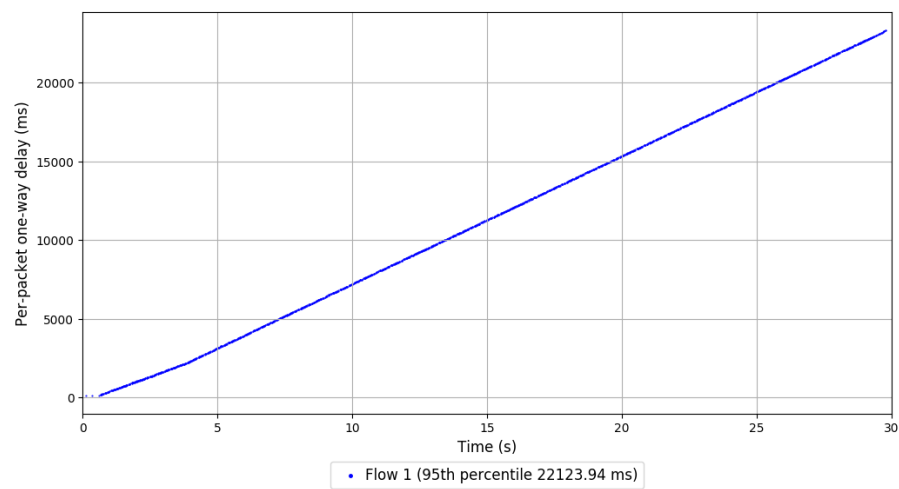
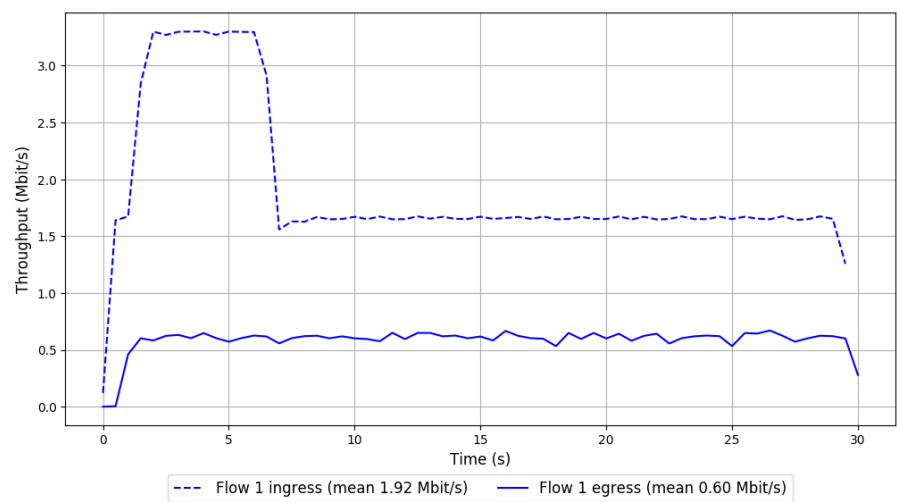
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 22123.935 ms

Loss rate: 68.93%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2018-08-22 10:25:16

End at: 2018-08-22 10:25:46

Local clock offset: -5.565 ms

Remote clock offset: 8.521 ms

Below is generated by plot.py at 2018-08-22 10:29:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 22191.980 ms

Loss rate: 69.91%

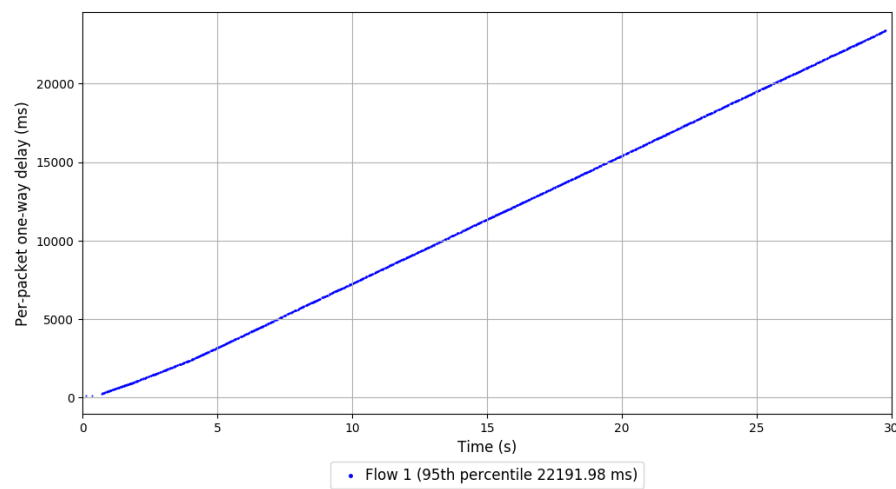
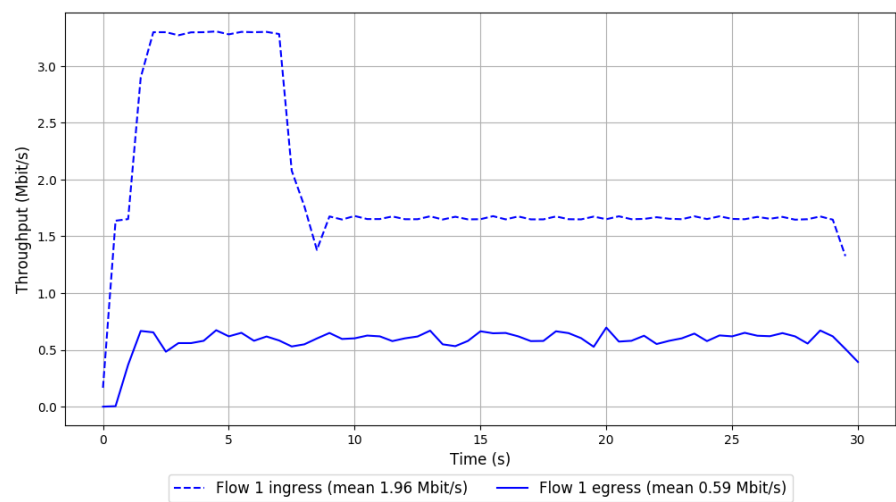
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 22191.980 ms

Loss rate: 69.91%

Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-08-22 09:42:35

End at: 2018-08-22 09:43:05

Local clock offset: -6.466 ms

Remote clock offset: 5.631 ms

Below is generated by plot.py at 2018-08-22 10:29:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.31 Mbit/s

95th percentile per-packet one-way delay: 556.422 ms

Loss rate: 0.50%

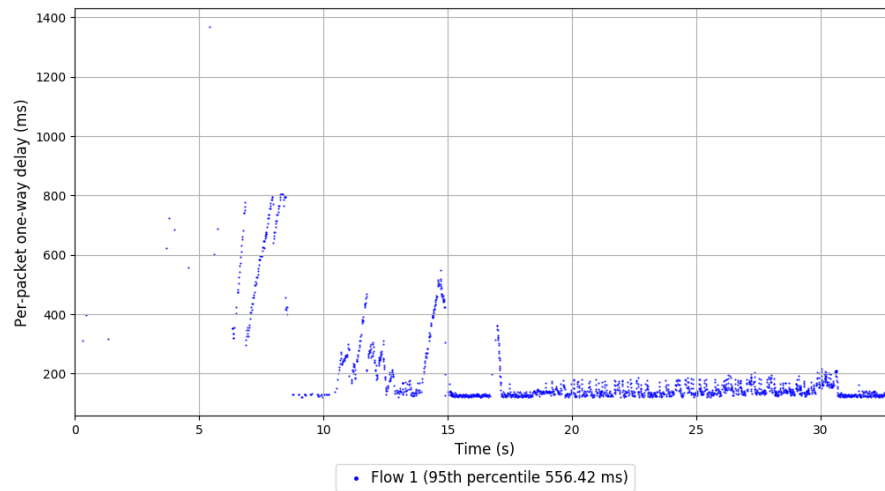
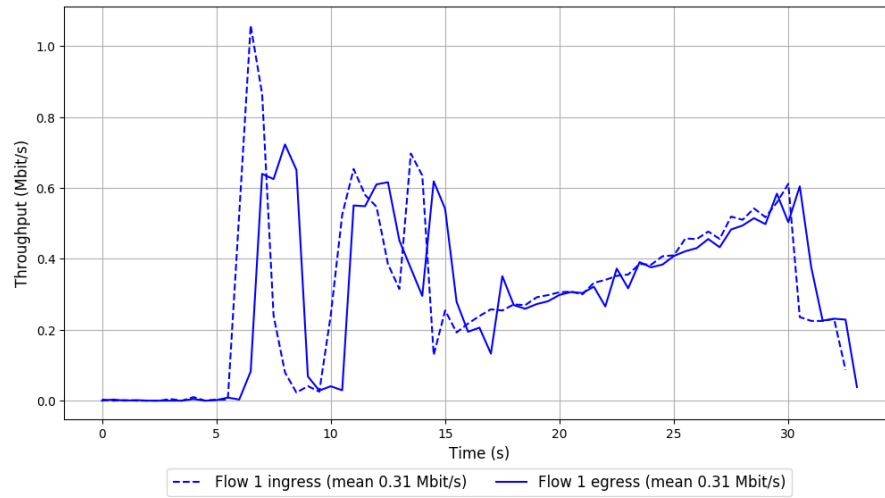
-- Flow 1:

Average throughput: 0.31 Mbit/s

95th percentile per-packet one-way delay: 556.422 ms

Loss rate: 0.50%

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2018-08-22 10:01:41

End at: 2018-08-22 10:02:11

Local clock offset: -7.871 ms

Remote clock offset: 5.629 ms

Below is generated by plot.py at 2018-08-22 10:29:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.23 Mbit/s

95th percentile per-packet one-way delay: 607.184 ms

Loss rate: 0.55%

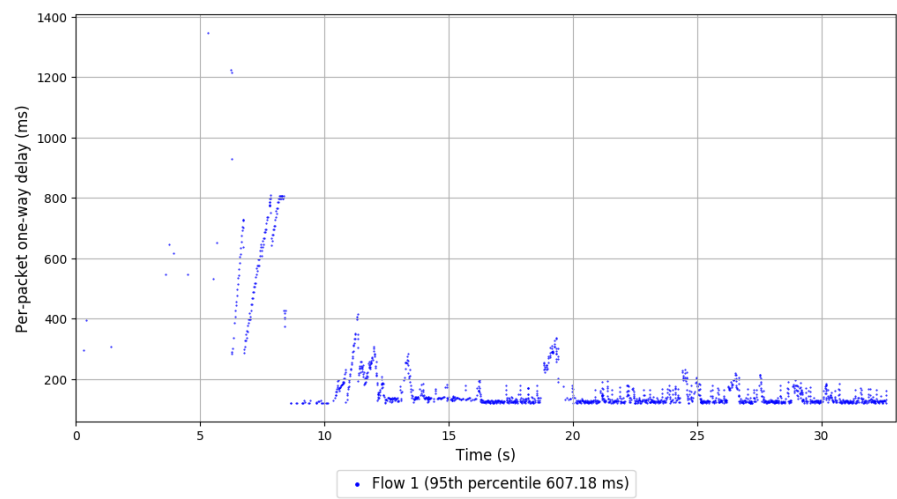
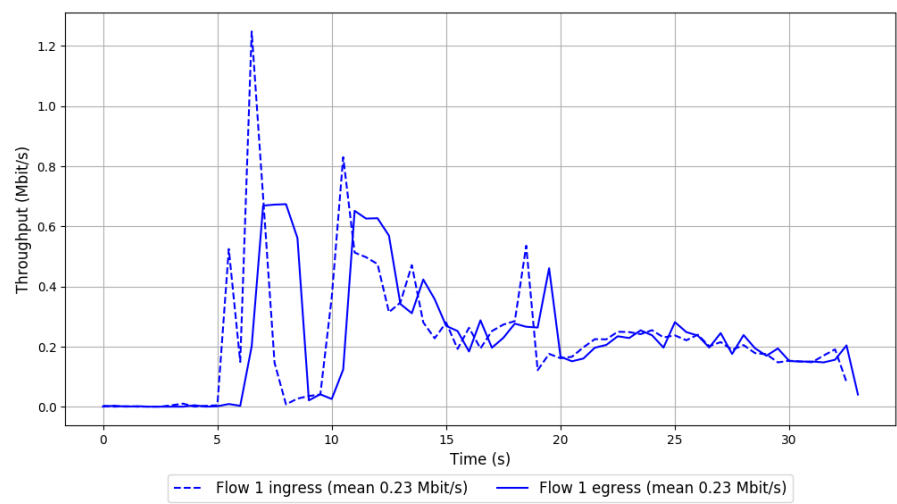
-- Flow 1:

Average throughput: 0.23 Mbit/s

95th percentile per-packet one-way delay: 607.184 ms

Loss rate: 0.55%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-08-22 10:20:47

End at: 2018-08-22 10:21:17

Local clock offset: -5.861 ms

Remote clock offset: 9.605 ms

Below is generated by plot.py at 2018-08-22 10:29:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.30 Mbit/s

95th percentile per-packet one-way delay: 557.317 ms

Loss rate: 0.53%

-- Flow 1:

Average throughput: 0.30 Mbit/s

95th percentile per-packet one-way delay: 557.317 ms

Loss rate: 0.53%

Run 3: Report of WebRTC media — Data Link

