

Pantheon Report

Generated at 2018-09-06 13:40:05 (UTC).

Data path: Colombia cellular on ppp0 (*remote*) → AWS Brazil 2 on ens5 (*local*).

Repeated the test of 18 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.

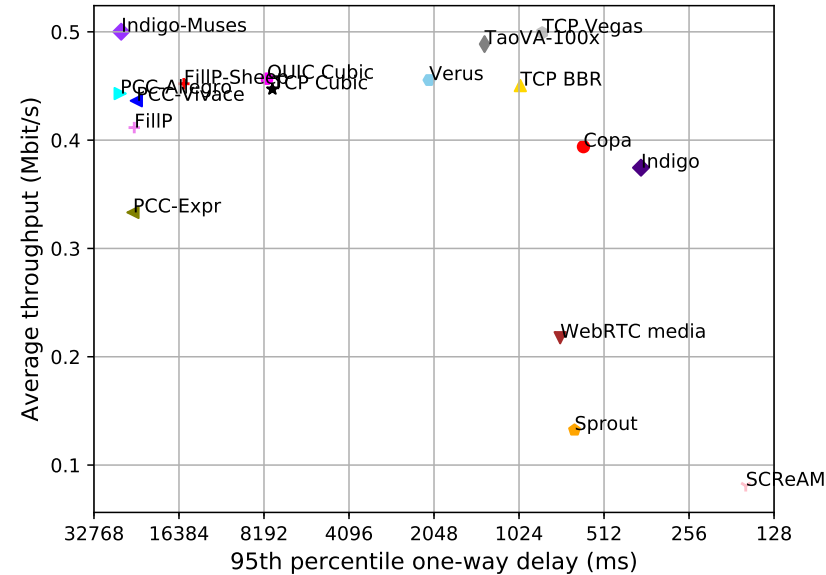
System info:

```
Linux 4.15.0-1020-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
net.ipv4.tcp_mem = 536870912 536870912 536870912
```

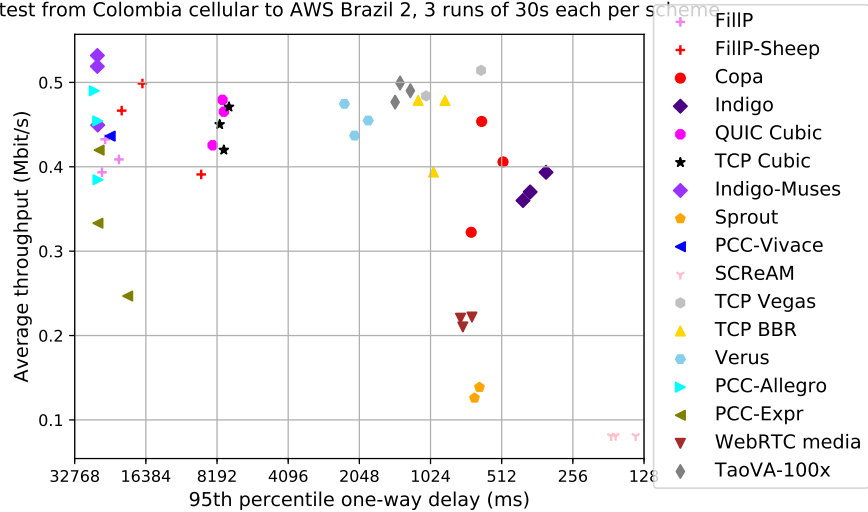
Git summary:

```
branch: muses @ f392ce15d580343f4432c3d7e068b3290f03eb4a
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ a28d20fb82a95a965a3da65fd1eb71b8994e9b84
third_party/pantheon-tunnel @ cbfce6db5ff5740dafa1771f813cd646339e1952
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 cellular to AWS Brazil 2, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from Colombia cellular to AWS Brazil 2, 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	0.45	1013.11	2.45
Copa	3	0.39	605.54	1.24
TCP Cubic	3	0.45	7648.45	31.61
FillP	3	0.41	23591.66	82.58
FillP-Sheep	3	0.45	15745.81	38.70
Indigo	3	0.37	378.81	1.23
LEDBAT	0	N/A	N/A	N/A
Indigo-Muses	3	0.50	26247.22	94.65
PCC-Allegro	3	0.44	26462.66	98.74
PCC-Expr	3	0.33	23846.65	94.85
QUIC Cubic	3	0.46	7994.29	29.20
SCReAM	3	0.08	161.25	0.74
Sprout	2	0.14	651.45	1.08
TaoVA-100x	3	0.49	1356.41	2.88
TCP Vegas	2	0.49	847.76	1.04
Verus	3	0.45	2131.46	4.55
PCC-Vivace	1	0.44	23202.80	79.36
WebRTC media	3	0.22	732.08	0.54

Run 1: Statistics of TCP BBR

Start at: 2018-09-06 12:47:27

End at: 2018-09-06 12:47:57

Local clock offset: 3.882 ms

Remote clock offset: 0.298 ms

Below is generated by plot.py at 2018-09-06 13:39:35

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 994.509 ms

Loss rate: 2.63%

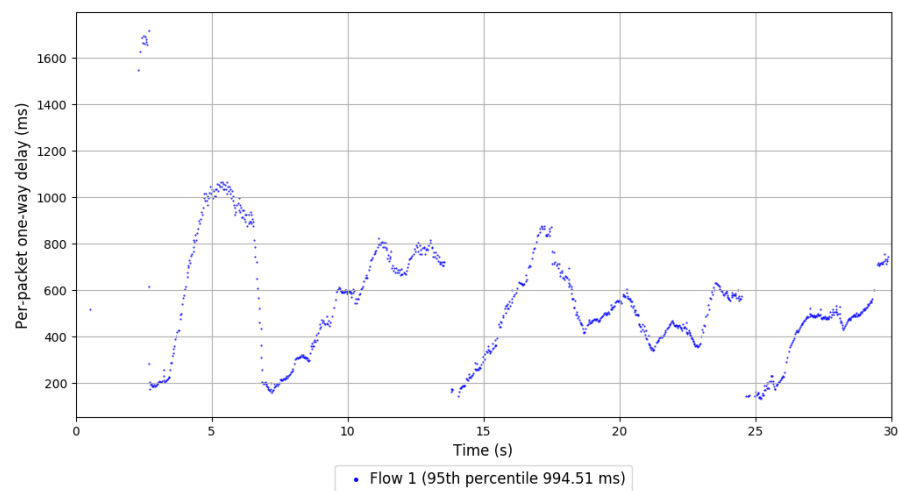
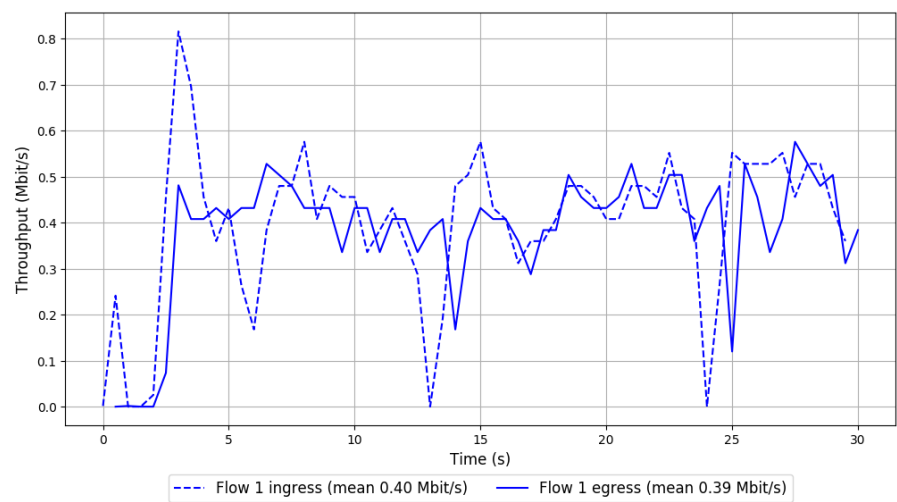
-- Flow 1:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 994.509 ms

Loss rate: 2.63%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-06 13:08:44

End at: 2018-09-06 13:09:14

Local clock offset: 4.547 ms

Remote clock offset: -0.574 ms

Below is generated by plot.py at 2018-09-06 13:39:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 889.625 ms

Loss rate: 2.24%

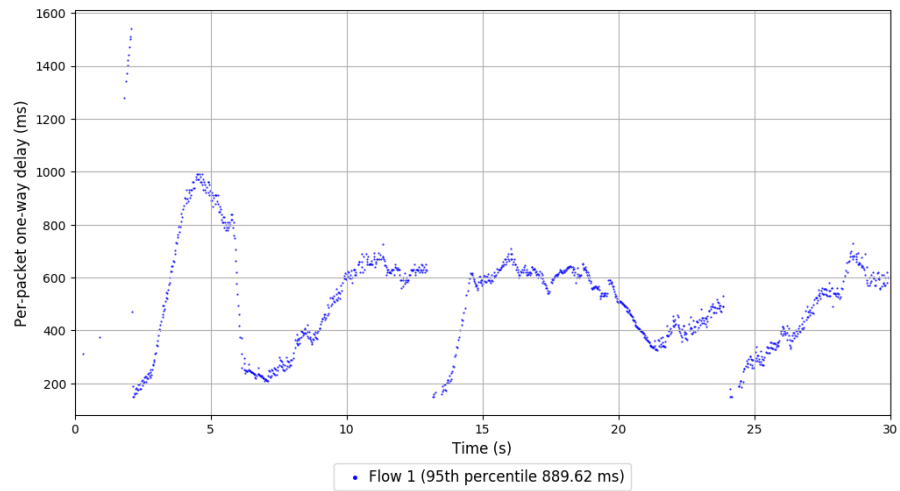
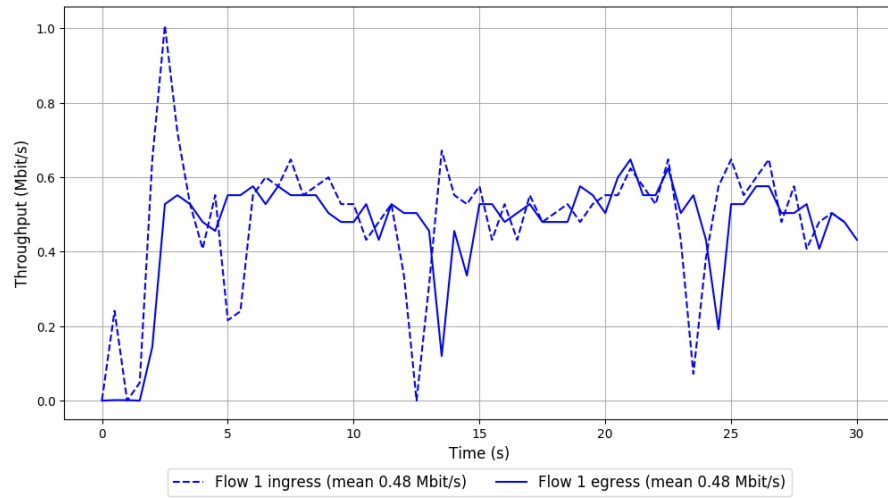
-- Flow 1:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 889.625 ms

Loss rate: 2.24%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-09-06 13:30:35

End at: 2018-09-06 13:31:05

Local clock offset: 4.587 ms

Remote clock offset: -0.766 ms

Below is generated by plot.py at 2018-09-06 13:39:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 1155.197 ms

Loss rate: 2.49%

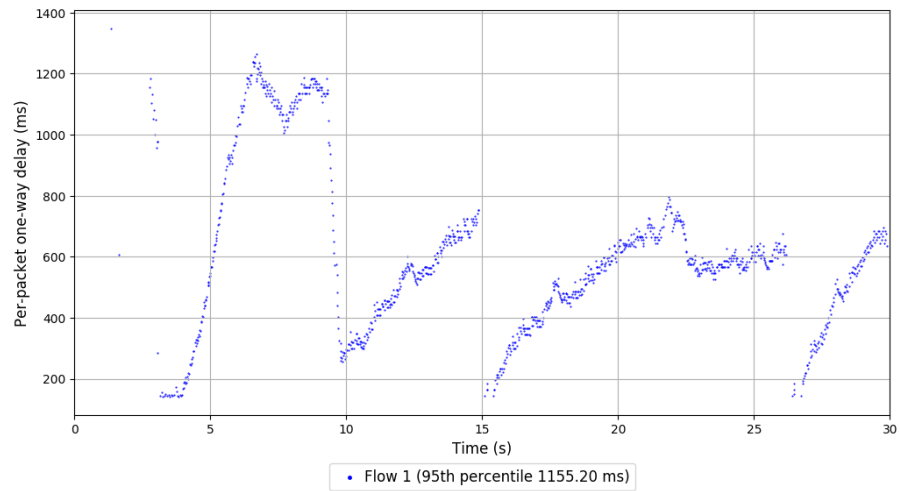
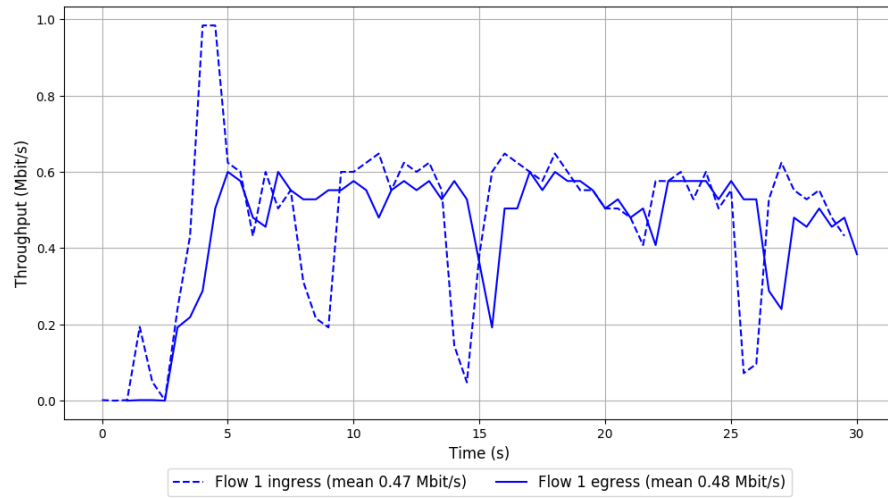
-- Flow 1:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 1155.197 ms

Loss rate: 2.49%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

Start at: 2018-09-06 12:37:55

End at: 2018-09-06 12:38:25

Local clock offset: 4.626 ms

Remote clock offset: 0.523 ms

Below is generated by plot.py at 2018-09-06 13:39:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.32 Mbit/s

95th percentile per-packet one-way delay: 688.943 ms

Loss rate: 1.87%

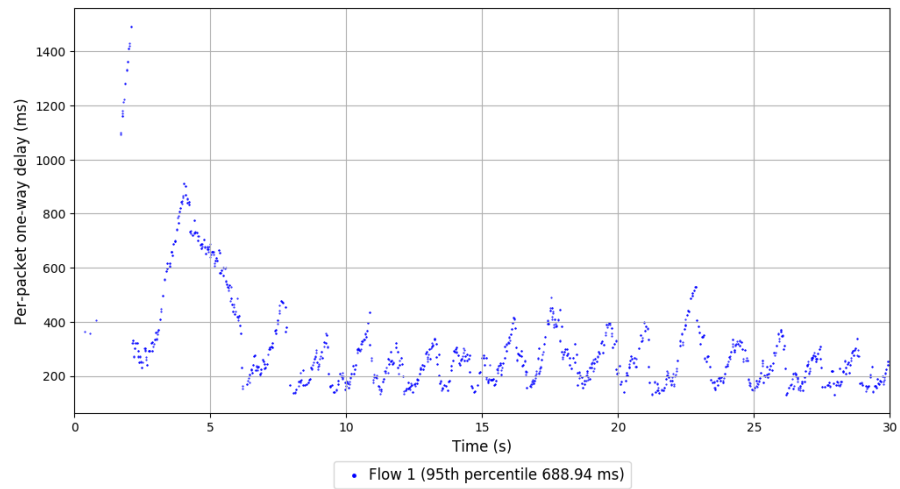
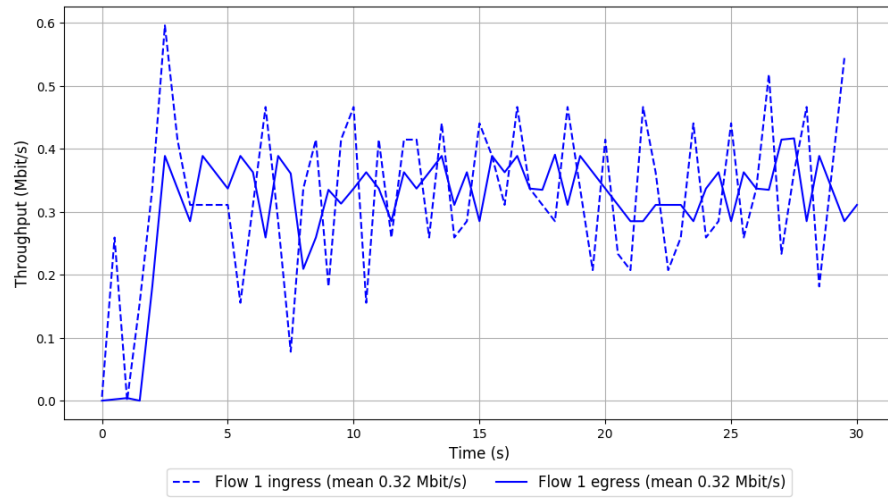
-- Flow 1:

Average throughput: 0.32 Mbit/s

95th percentile per-packet one-way delay: 688.943 ms

Loss rate: 1.87%

Run 1: Report of Copa — Data Link

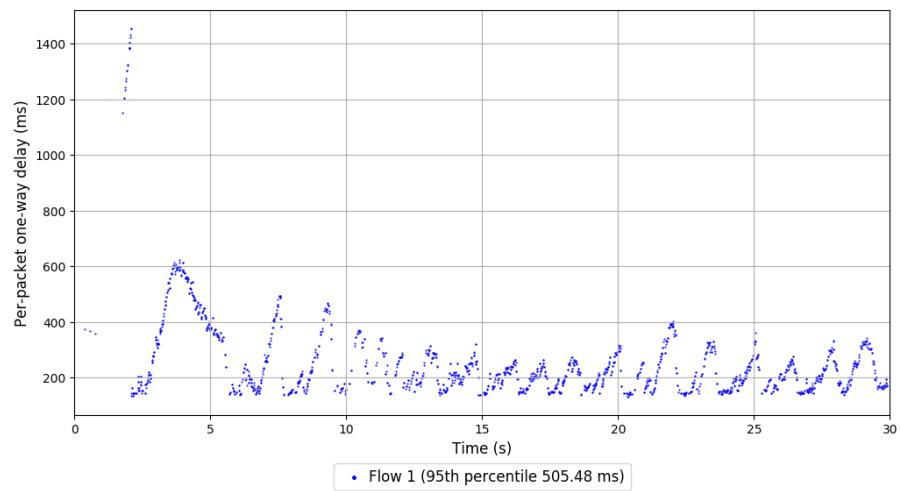
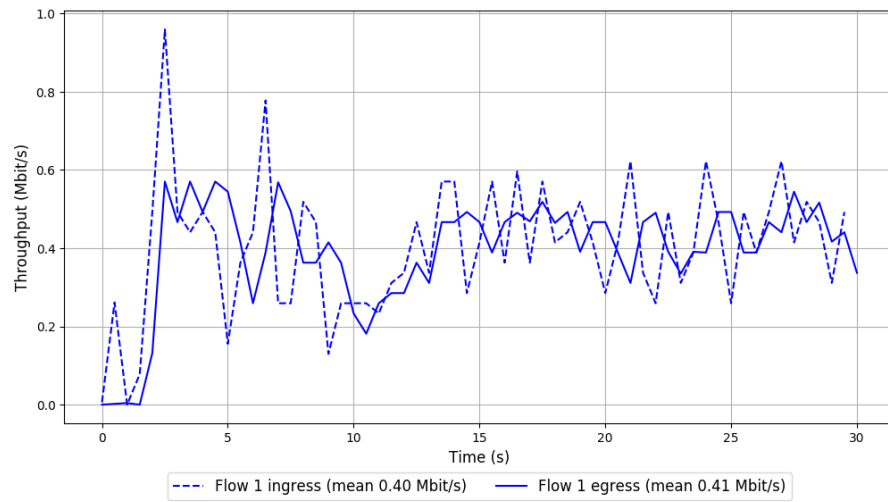


Run 2: Statistics of Copa

Start at: 2018-09-06 12:59:13
End at: 2018-09-06 12:59:43
Local clock offset: 3.842 ms
Remote clock offset: -0.786 ms

Below is generated by plot.py at 2018-09-06 13:39:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 505.484 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 505.484 ms
Loss rate: 1.18%

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2018-09-06 13:20:34

End at: 2018-09-06 13:21:04

Local clock offset: 3.84 ms

Remote clock offset: 0.423 ms

Below is generated by plot.py at 2018-09-06 13:39:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 622.199 ms

Loss rate: 0.67%

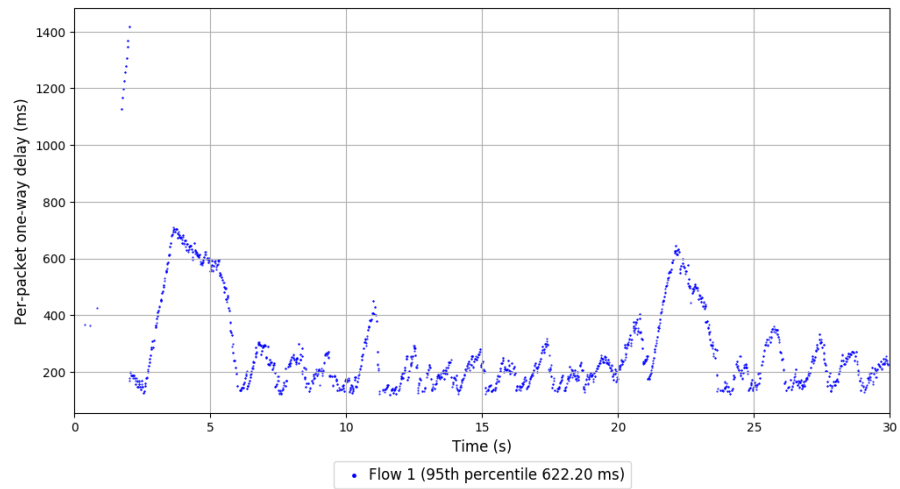
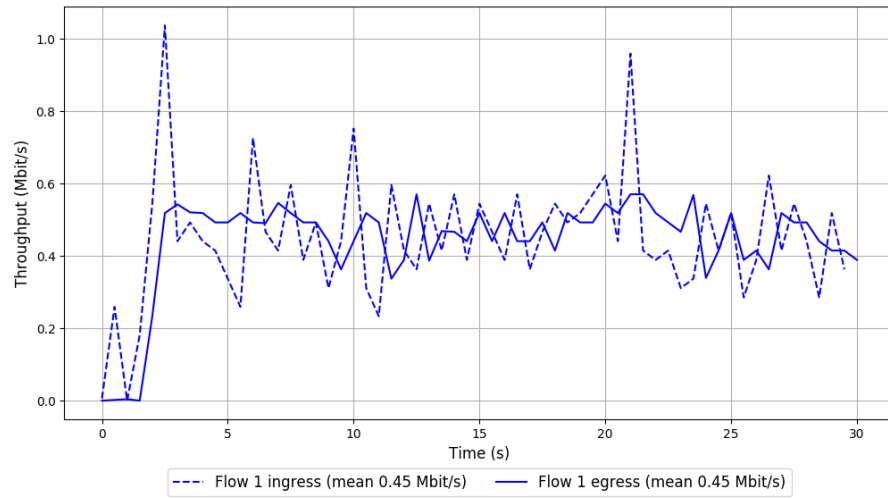
-- Flow 1:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 622.199 ms

Loss rate: 0.67%

Run 3: Report of Copa — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-06 12:46:20

End at: 2018-09-06 12:46:50

Local clock offset: 4.603 ms

Remote clock offset: 0.275 ms

Below is generated by plot.py at 2018-09-06 13:39:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 7985.959 ms

Loss rate: 31.27%

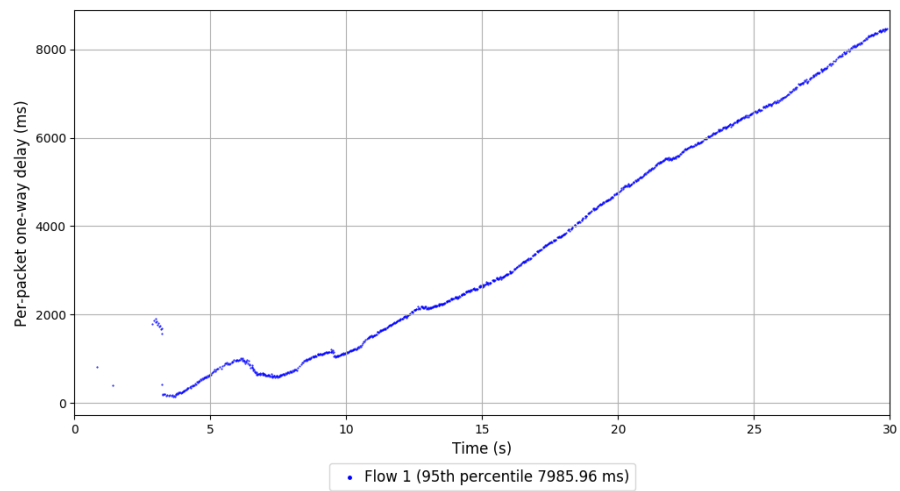
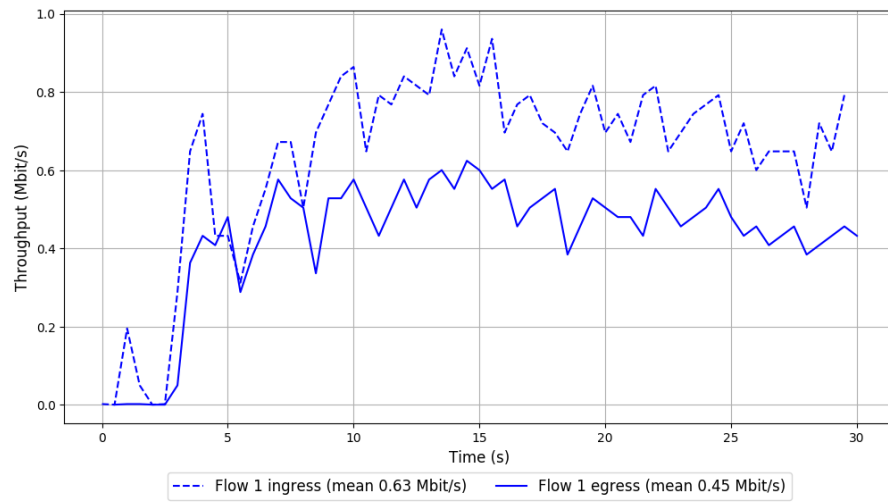
-- Flow 1:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 7985.959 ms

Loss rate: 31.27%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-06 13:07:34

End at: 2018-09-06 13:08:04

Local clock offset: 3.84 ms

Remote clock offset: 0.342 ms

Below is generated by plot.py at 2018-09-06 13:39:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 7292.142 ms

Loss rate: 31.68%

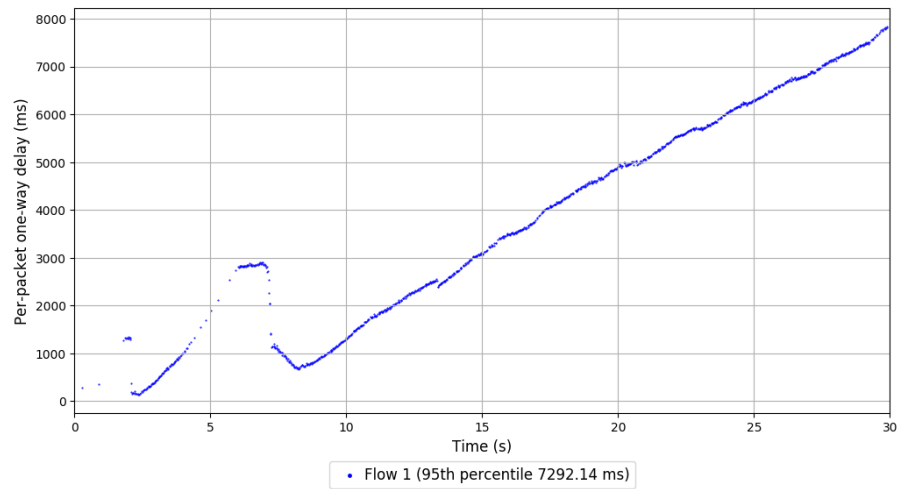
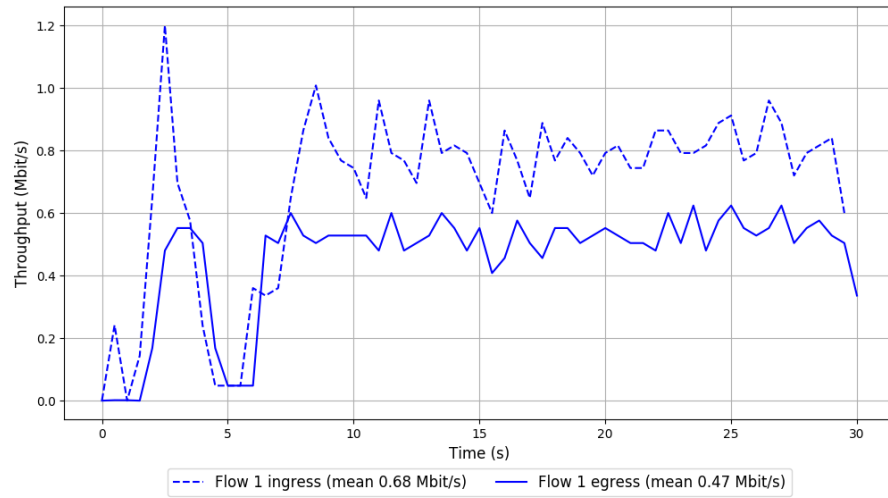
-- Flow 1:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 7292.142 ms

Loss rate: 31.68%

Run 2: Report of TCP Cubic — Data Link

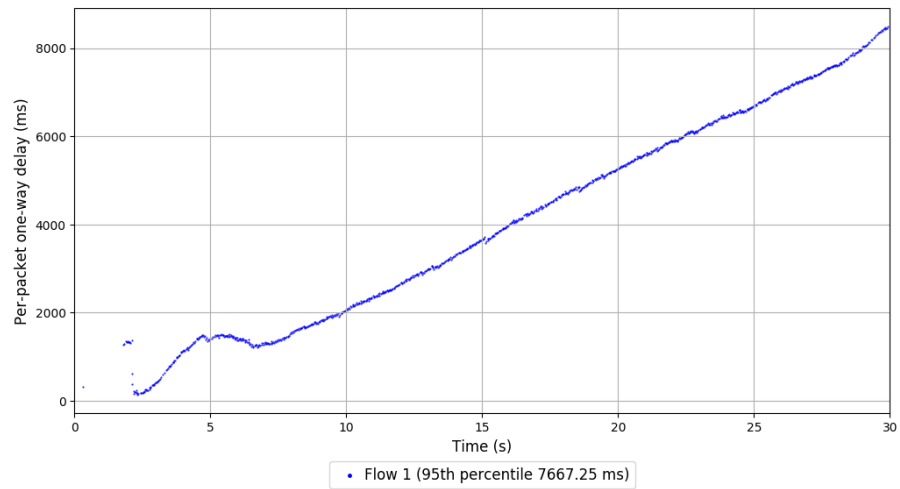
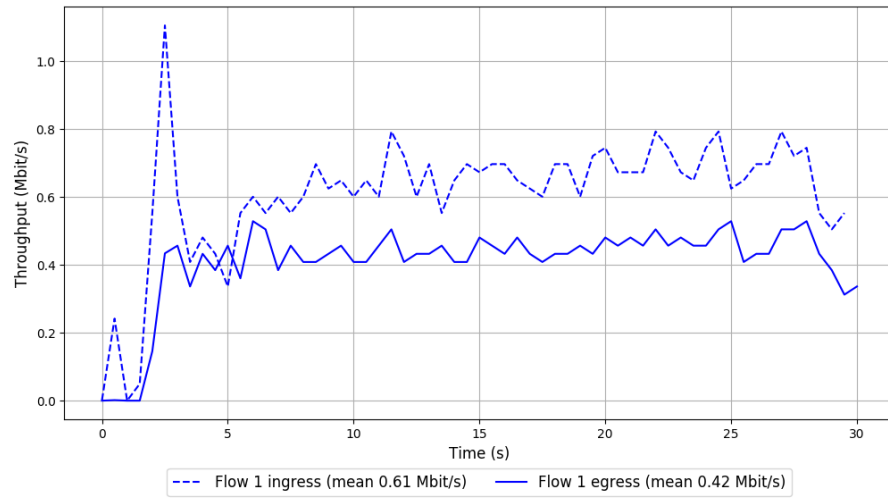


Run 3: Statistics of TCP Cubic

Start at: 2018-09-06 13:29:27
End at: 2018-09-06 13:29:57
Local clock offset: 4.597 ms
Remote clock offset: -0.685 ms

Below is generated by plot.py at 2018-09-06 13:39:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 7667.251 ms
Loss rate: 31.88%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 7667.251 ms
Loss rate: 31.88%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2018-09-06 12:49:43

End at: 2018-09-06 12:50:13

Local clock offset: 4.64 ms

Remote clock offset: 0.223 ms

Below is generated by plot.py at 2018-09-06 13:39:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 24358.066 ms

Loss rate: 77.32%

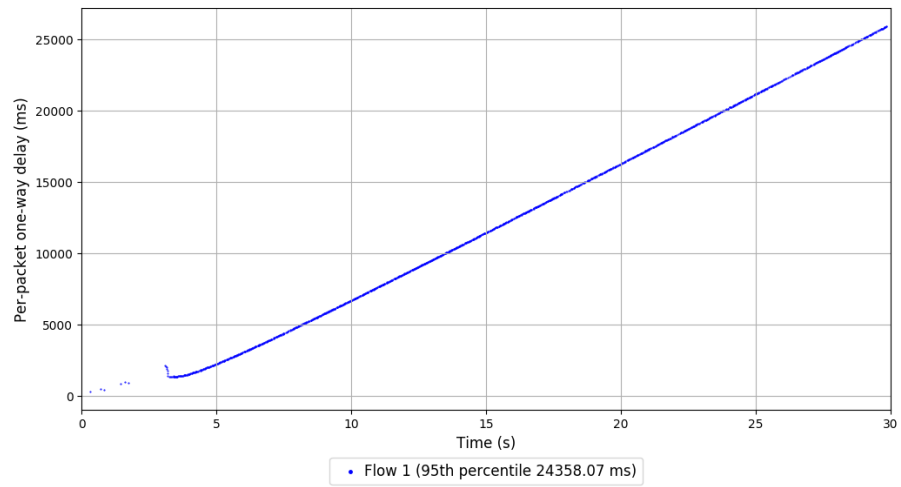
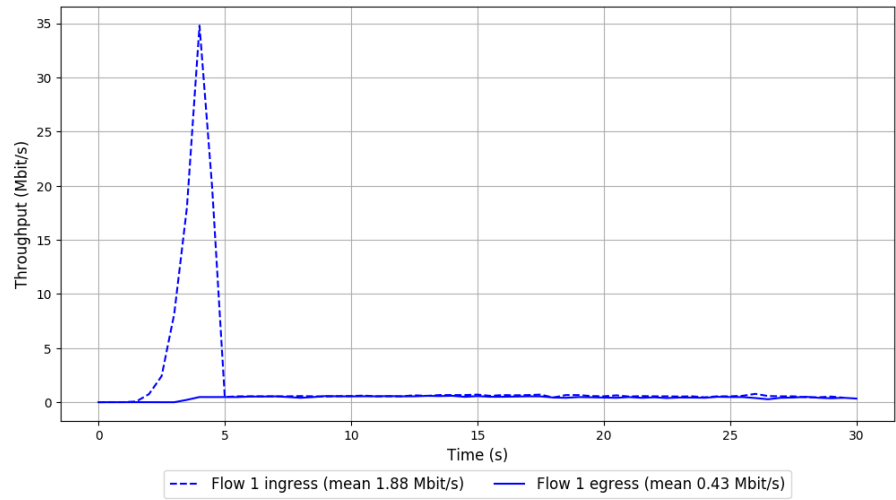
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 24358.066 ms

Loss rate: 77.32%

Run 1: Report of FillP — Data Link

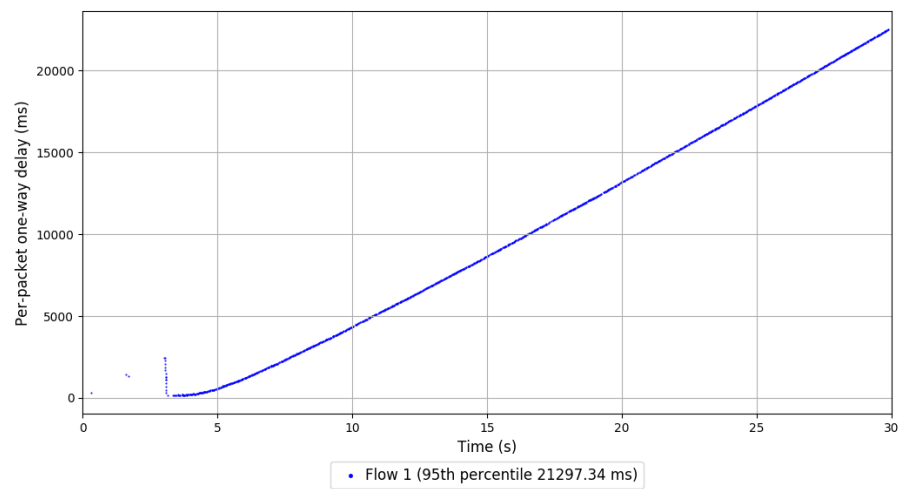
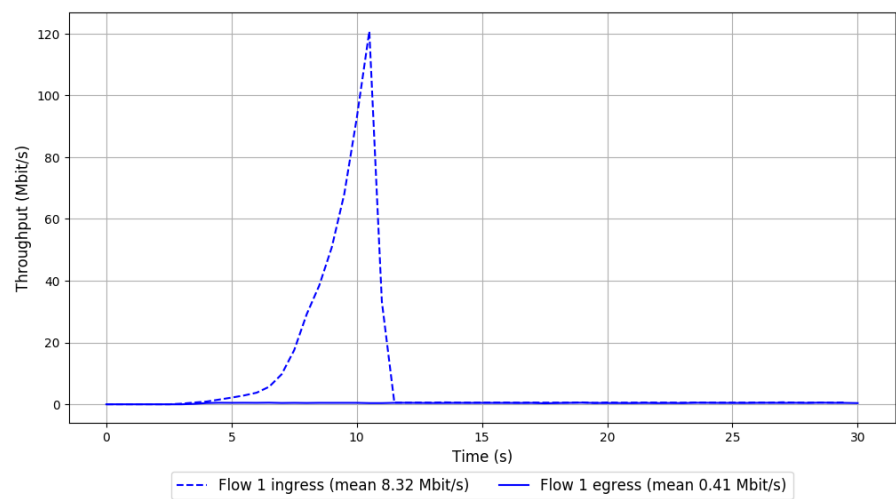


Run 2: Statistics of FillP

Start at: 2018-09-06 13:11:00
End at: 2018-09-06 13:11:30
Local clock offset: 4.623 ms
Remote clock offset: -0.825 ms

Below is generated by plot.py at 2018-09-06 13:39:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 21297.336 ms
Loss rate: 95.15%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 21297.336 ms
Loss rate: 95.15%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-09-06 13:32:51

End at: 2018-09-06 13:33:21

Local clock offset: 4.597 ms

Remote clock offset: 1.565 ms

Below is generated by plot.py at 2018-09-06 13:39:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 25119.571 ms

Loss rate: 75.28%

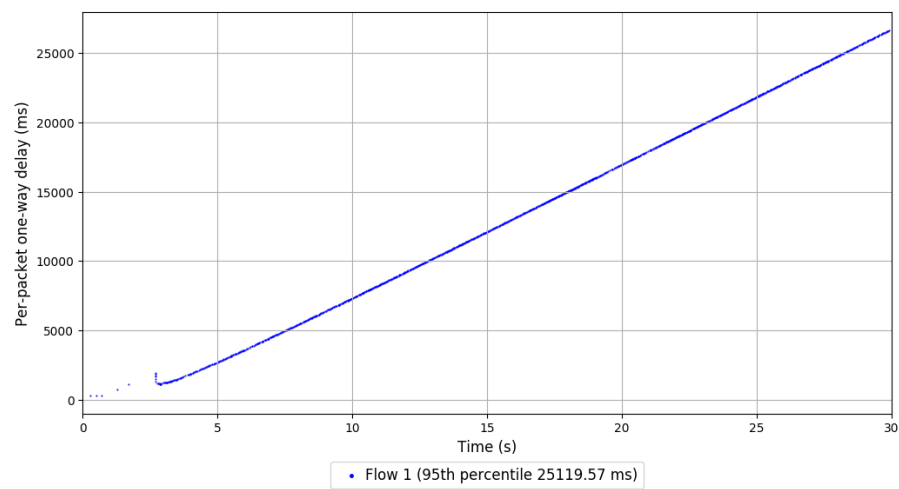
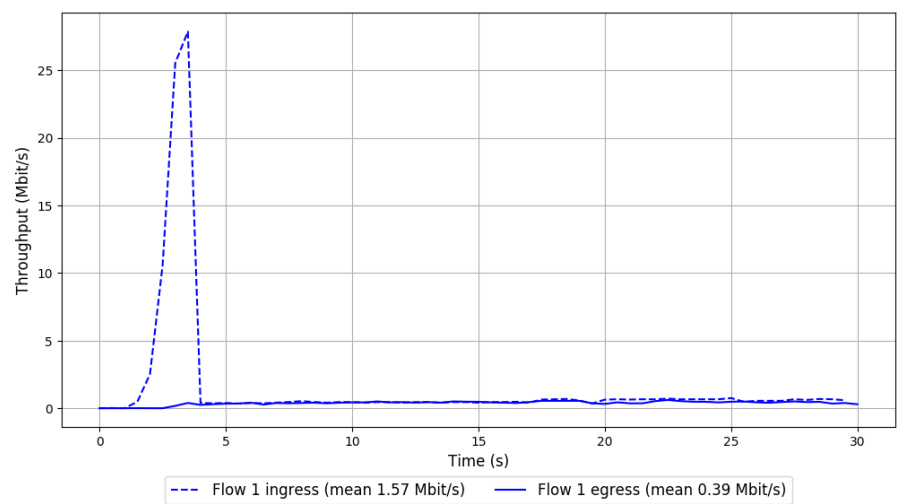
-- Flow 1:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 25119.571 ms

Loss rate: 75.28%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2018-09-06 12:36:47

End at: 2018-09-06 12:37:17

Local clock offset: 4.629 ms

Remote clock offset: -0.737 ms

Below is generated by plot.py at 2018-09-06 13:39:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 9558.800 ms

Loss rate: 27.35%

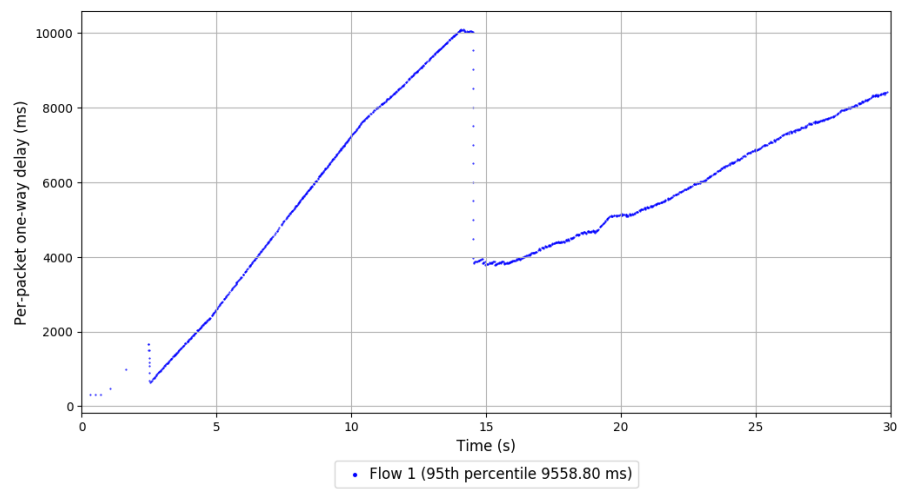
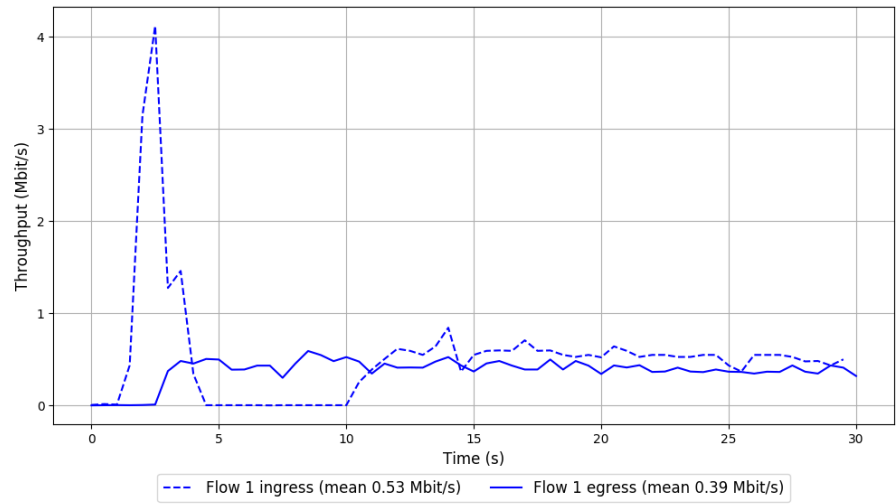
-- Flow 1:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 9558.800 ms

Loss rate: 27.35%

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2018-09-06 12:58:05

End at: 2018-09-06 12:58:35

Local clock offset: 4.56 ms

Remote clock offset: 0.387 ms

Below is generated by plot.py at 2018-09-06 13:39:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 16944.329 ms

Loss rate: 41.53%

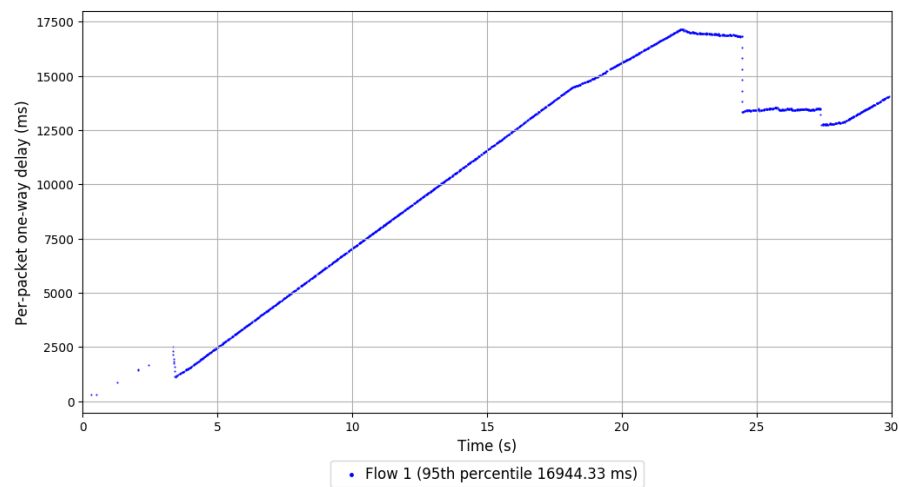
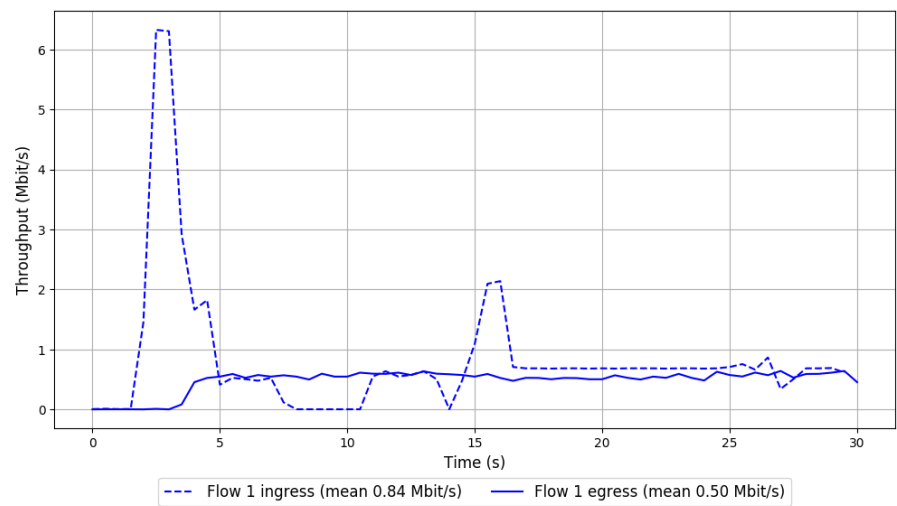
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 16944.329 ms

Loss rate: 41.53%

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2018-09-06 13:19:26

End at: 2018-09-06 13:19:56

Local clock offset: 4.536 ms

Remote clock offset: 0.456 ms

Below is generated by plot.py at 2018-09-06 13:39:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 20734.300 ms

Loss rate: 47.22%

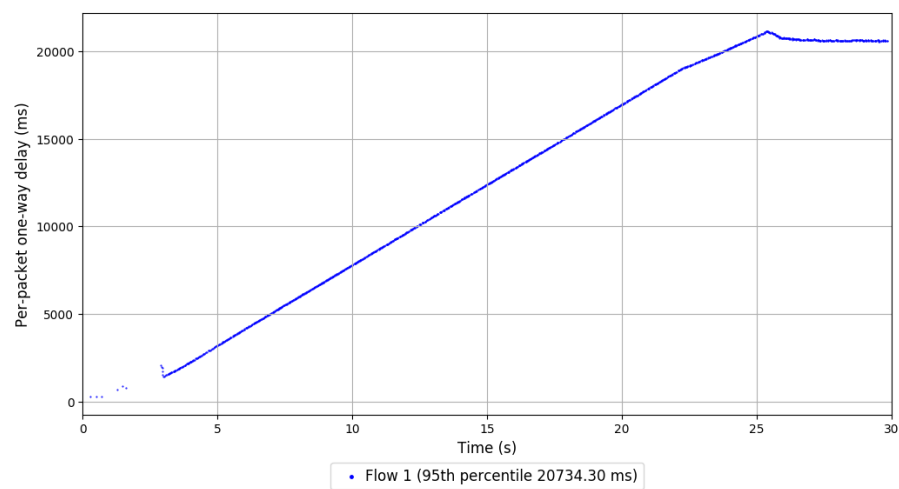
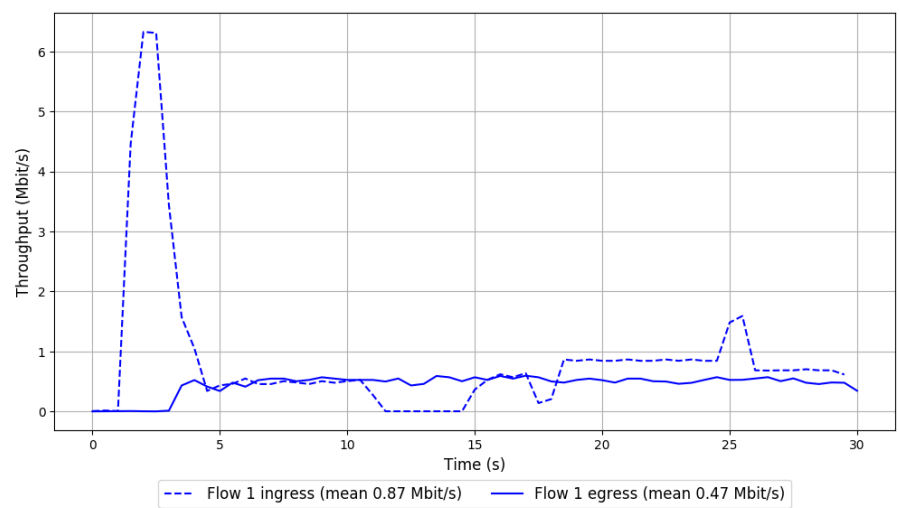
-- Flow 1:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 20734.300 ms

Loss rate: 47.22%

Run 3: Report of FillP-Sheep — Data Link

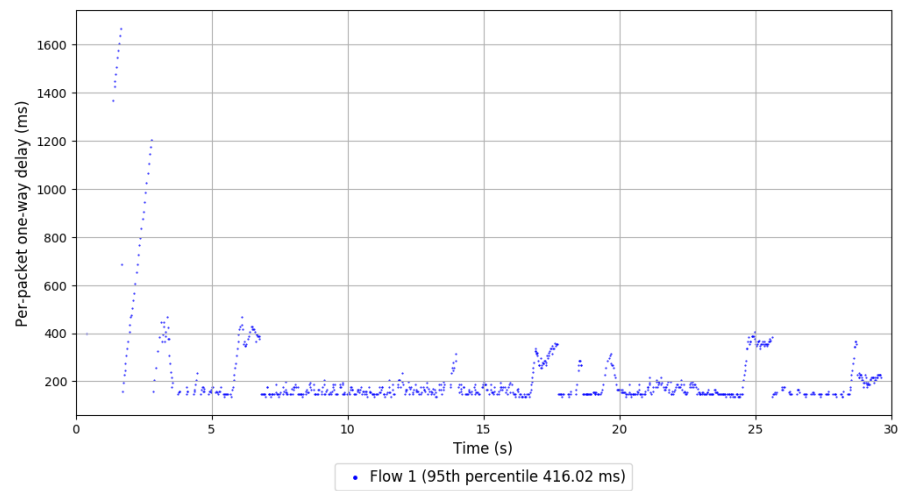
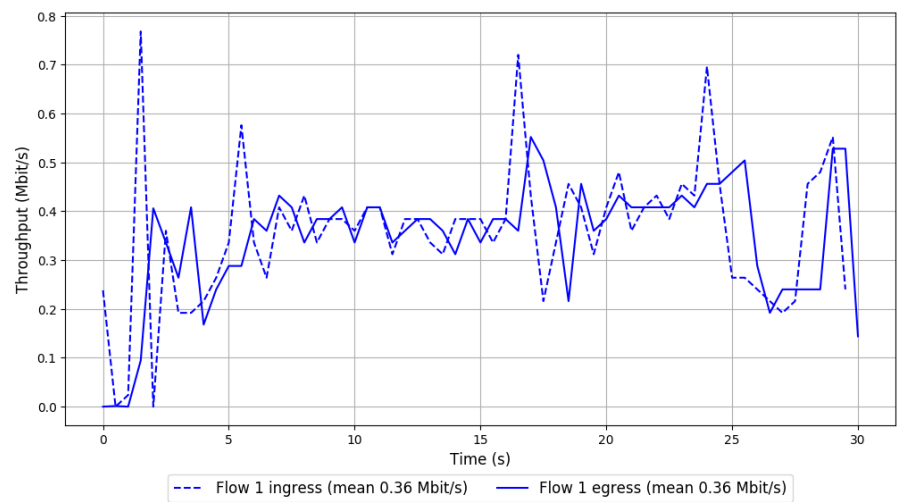


```
Run 1: Statistics of Indigo

Start at: 2018-09-06 12:52:22
End at: 2018-09-06 12:52:52
Local clock offset: 3.862 ms
Remote clock offset: 0.316 ms

# Below is generated by plot.py at 2018-09-06 13:39:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 416.020 ms
Loss rate: 1.46%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 416.020 ms
Loss rate: 1.46%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-06 13:13:43

End at: 2018-09-06 13:14:13

Local clock offset: 3.782 ms

Remote clock offset: 1.442 ms

Below is generated by plot.py at 2018-09-06 13:39:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 387.966 ms

Loss rate: 0.88%

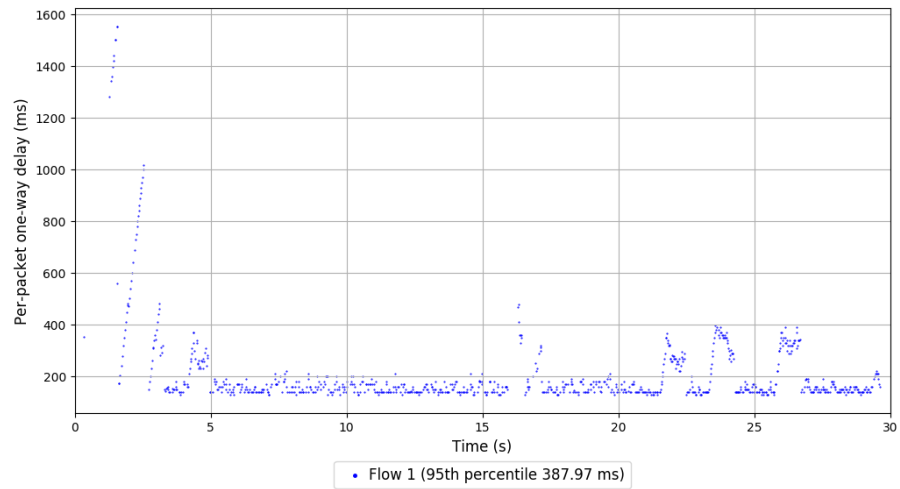
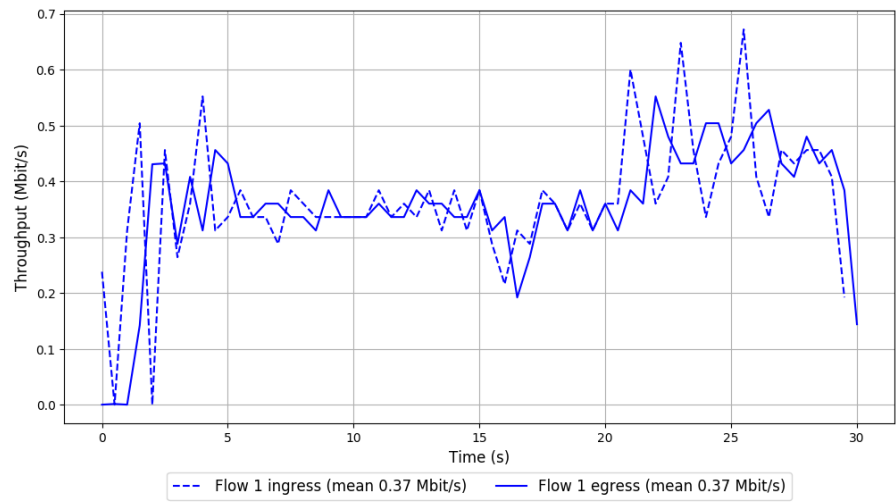
-- Flow 1:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 387.966 ms

Loss rate: 0.88%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-09-06 13:35:33

End at: 2018-09-06 13:36:03

Local clock offset: 4.53 ms

Remote clock offset: 0.605 ms

Below is generated by plot.py at 2018-09-06 13:39:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 332.451 ms

Loss rate: 1.34%

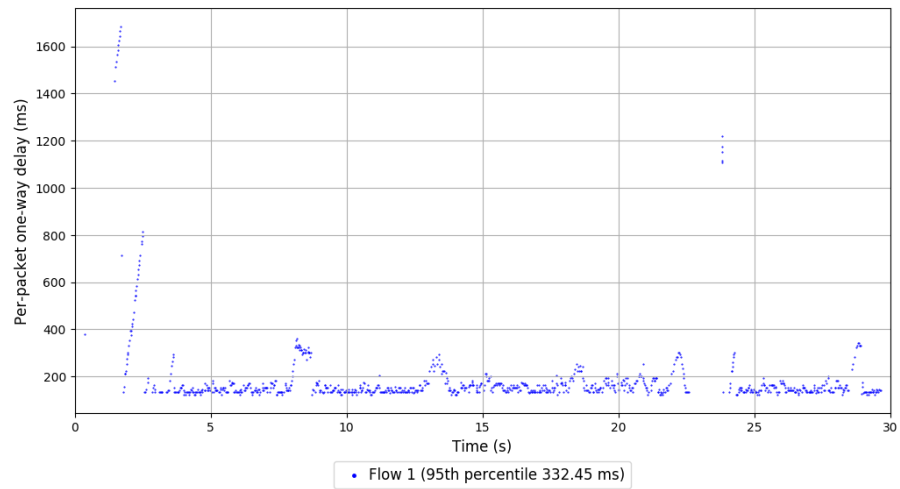
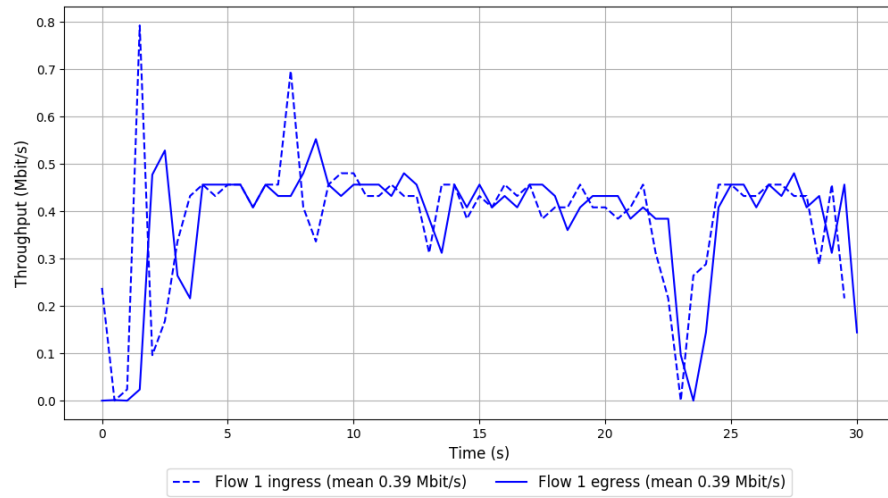
-- Flow 1:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 332.451 ms

Loss rate: 1.34%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2018-09-06T12-35-Colombia-cellular-to-AWS-Brazil-2-3-runs/ledbat.

Run 1: Report of LEDBAT — Data Link

Figure is missing

Figure is missing

Run 2: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2018-09-06T12-35-Colombia-cellular-to-AWS-Brazil-2-3-runs/ledbat.

Run 2: Report of LEDBAT — Data Link

Figure is missing

Figure is missing

Run 3: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2018-09-06T12-35-Colombia-cellular-to-AWS-Brazil-2-3-runs/ledbat.

Run 3: Report of LEDBAT — Data Link

Figure is missing

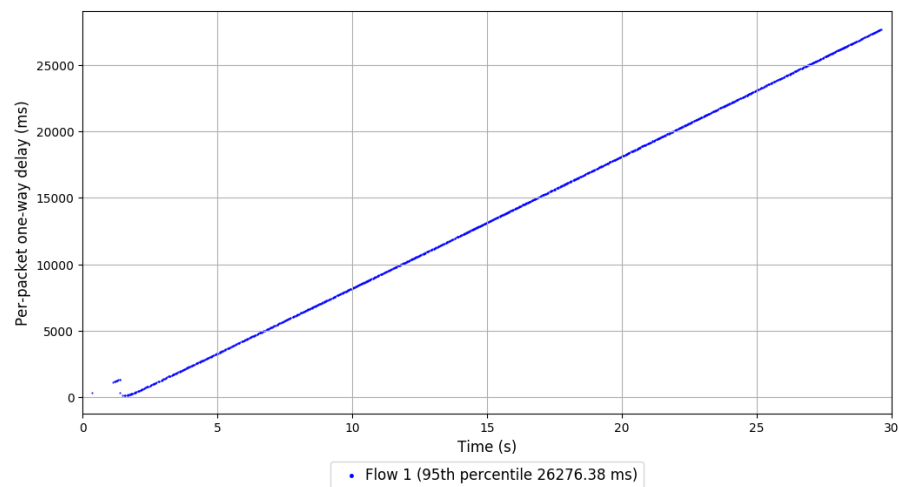
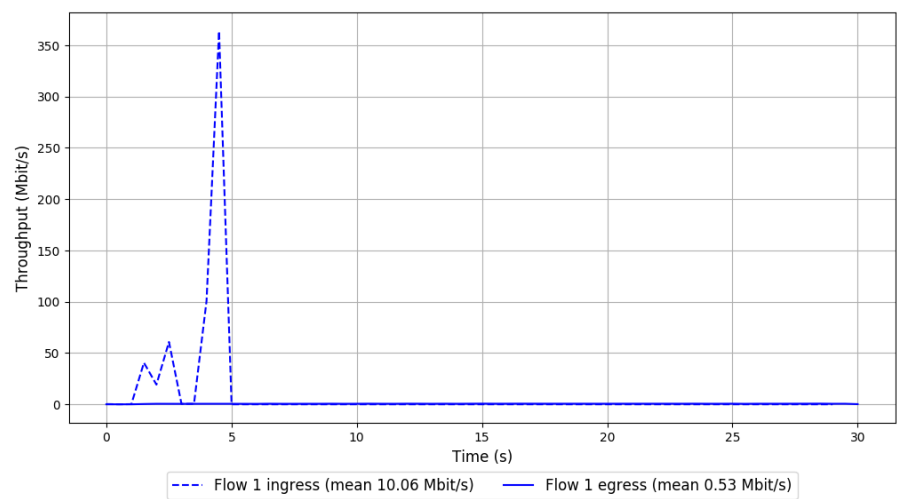
Figure is missing

```
Run 1: Statistics of Indigo-Muses

Start at: 2018-09-06 12:53:31
End at: 2018-09-06 12:54:01
Local clock offset: 3.857 ms
Remote clock offset: 0.294 ms

# Below is generated by plot.py at 2018-09-06 13:39:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 26276.382 ms
Loss rate: 94.69%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 26276.382 ms
Loss rate: 94.69%
```

Run 1: Report of Indigo-Muses — Data Link



Run 2: Statistics of Indigo-Muses

Start at: 2018-09-06 13:14:51

End at: 2018-09-06 13:15:21

Local clock offset: 3.841 ms

Remote clock offset: 0.498 ms

Below is generated by plot.py at 2018-09-06 13:39:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 26285.579 ms

Loss rate: 93.75%

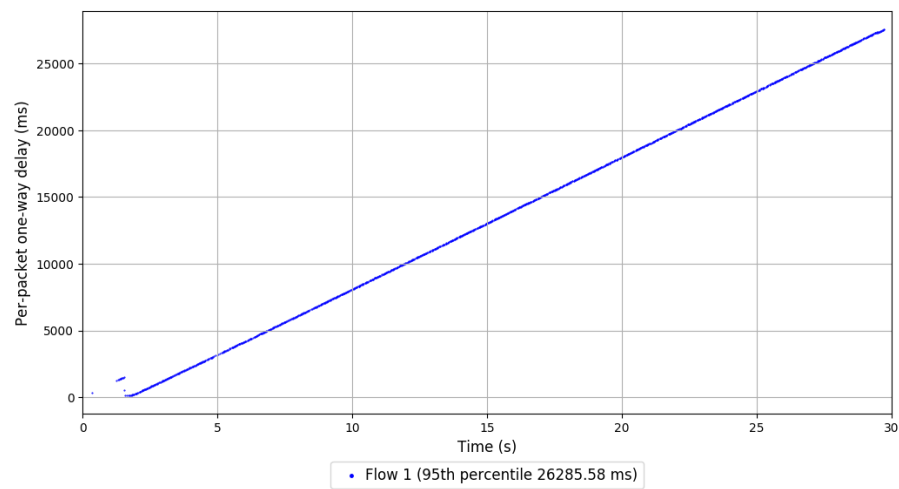
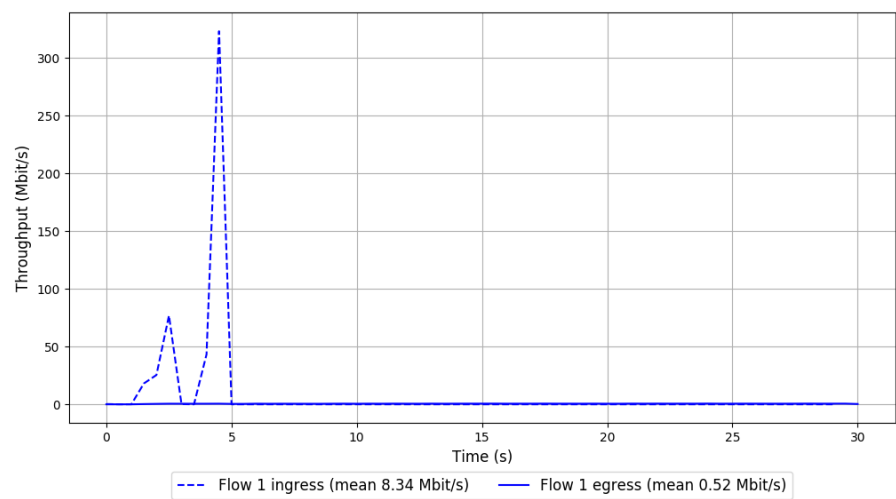
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 26285.579 ms

Loss rate: 93.75%

Run 2: Report of Indigo-Muses — Data Link



Run 3: Statistics of Indigo-Muses

Start at: 2018-09-06 13:36:41

End at: 2018-09-06 13:37:11

Local clock offset: 4.589 ms

Remote clock offset: 1.629 ms

Below is generated by plot.py at 2018-09-06 13:39:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 26179.697 ms

Loss rate: 95.50%

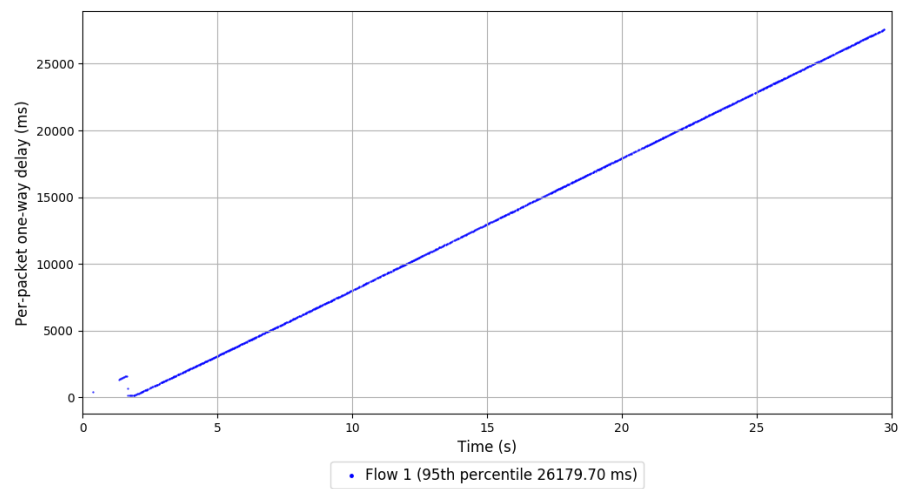
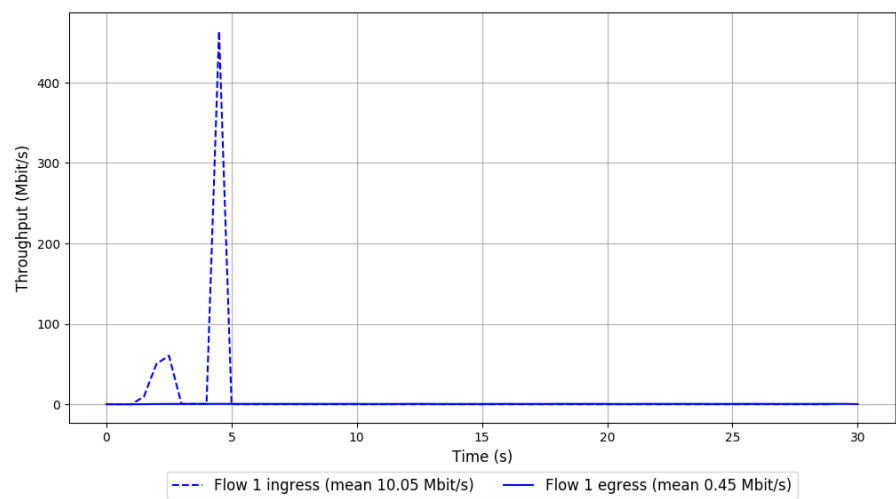
-- Flow 1:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 26179.697 ms

Loss rate: 95.50%

Run 3: Report of Indigo-Muses — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2018-09-06 12:43:59

End at: 2018-09-06 12:44:29

Local clock offset: 4.605 ms

Remote clock offset: 1.396 ms

Below is generated by plot.py at 2018-09-06 13:40:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 27090.663 ms

Loss rate: 98.46%

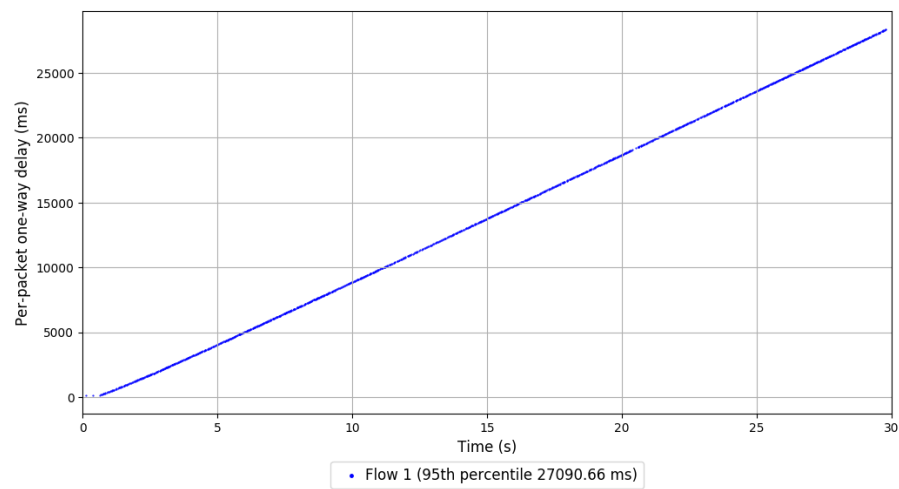
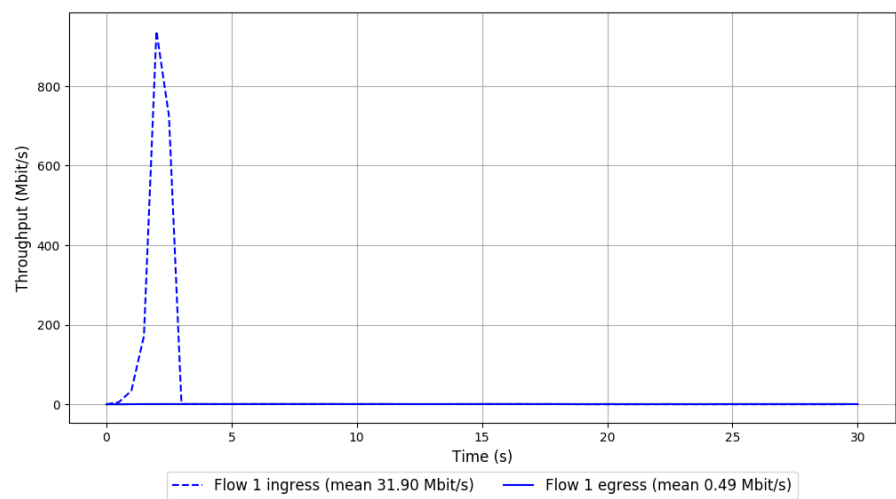
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 27090.663 ms

Loss rate: 98.46%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2018-09-06 13:05:16

End at: 2018-09-06 13:05:46

Local clock offset: 4.545 ms

Remote clock offset: 0.288 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 26180.530 ms

Loss rate: 98.76%

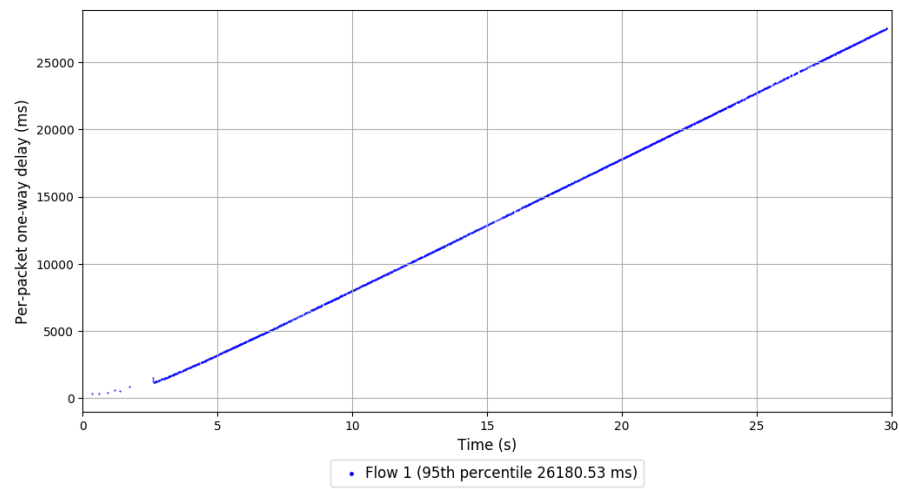
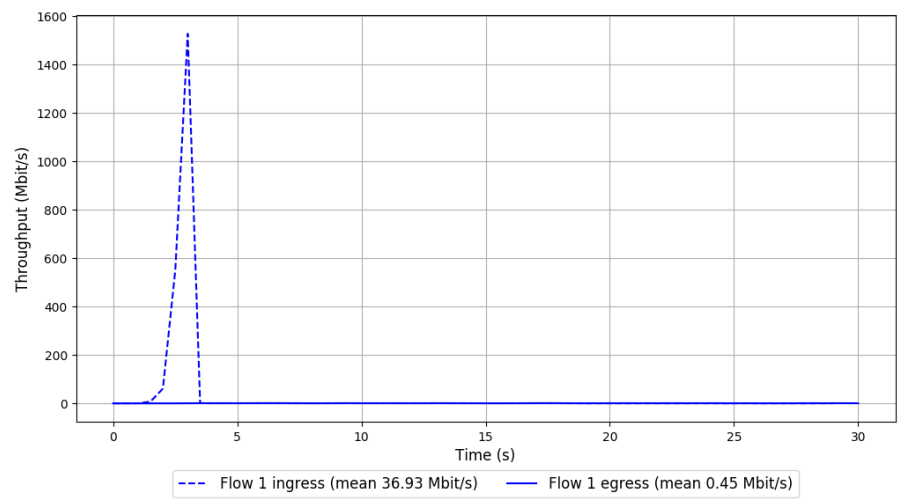
-- Flow 1:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 26180.530 ms

Loss rate: 98.76%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2018-09-06 13:26:45

End at: 2018-09-06 13:27:15

Local clock offset: 4.607 ms

Remote clock offset: 1.572 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.38 Mbit/s

95th percentile per-packet one-way delay: 26116.784 ms

Loss rate: 99.00%

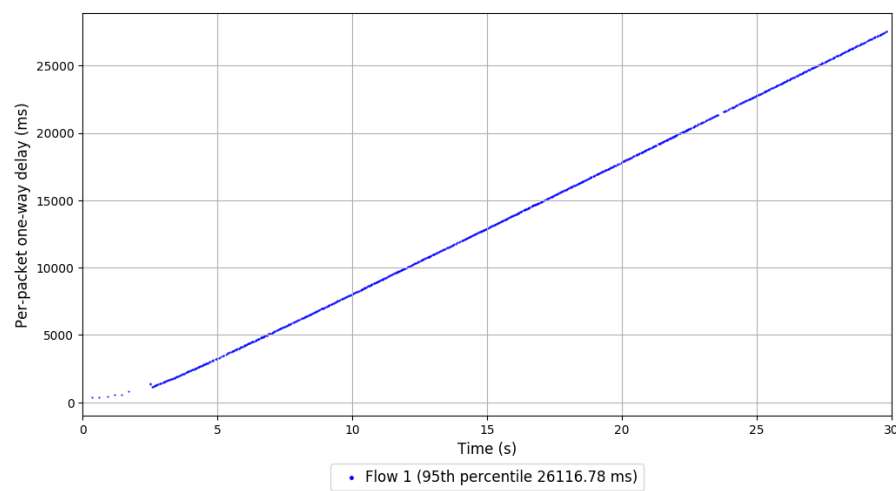
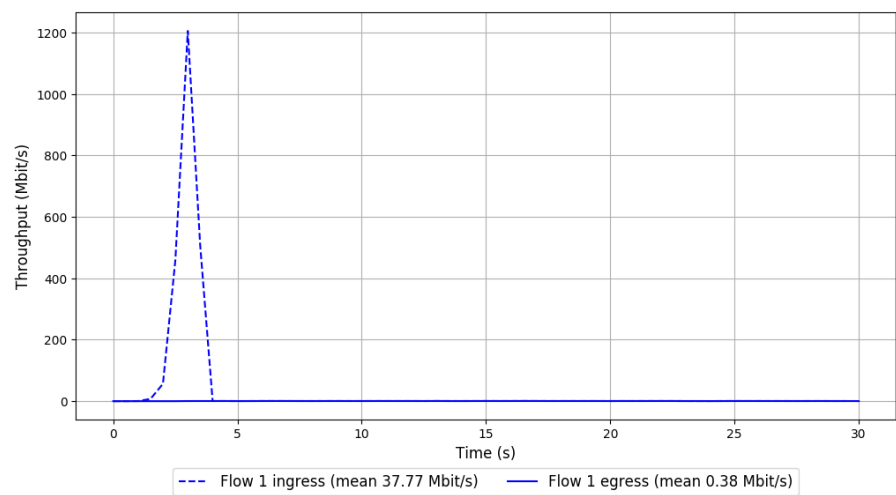
-- Flow 1:

Average throughput: 0.38 Mbit/s

95th percentile per-packet one-way delay: 26116.784 ms

Loss rate: 99.00%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

Start at: 2018-09-06 12:39:03

End at: 2018-09-06 12:39:33

Local clock offset: 3.88 ms

Remote clock offset: 0.513 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.42 Mbit/s

95th percentile per-packet one-way delay: 25838.545 ms

Loss rate: 93.11%

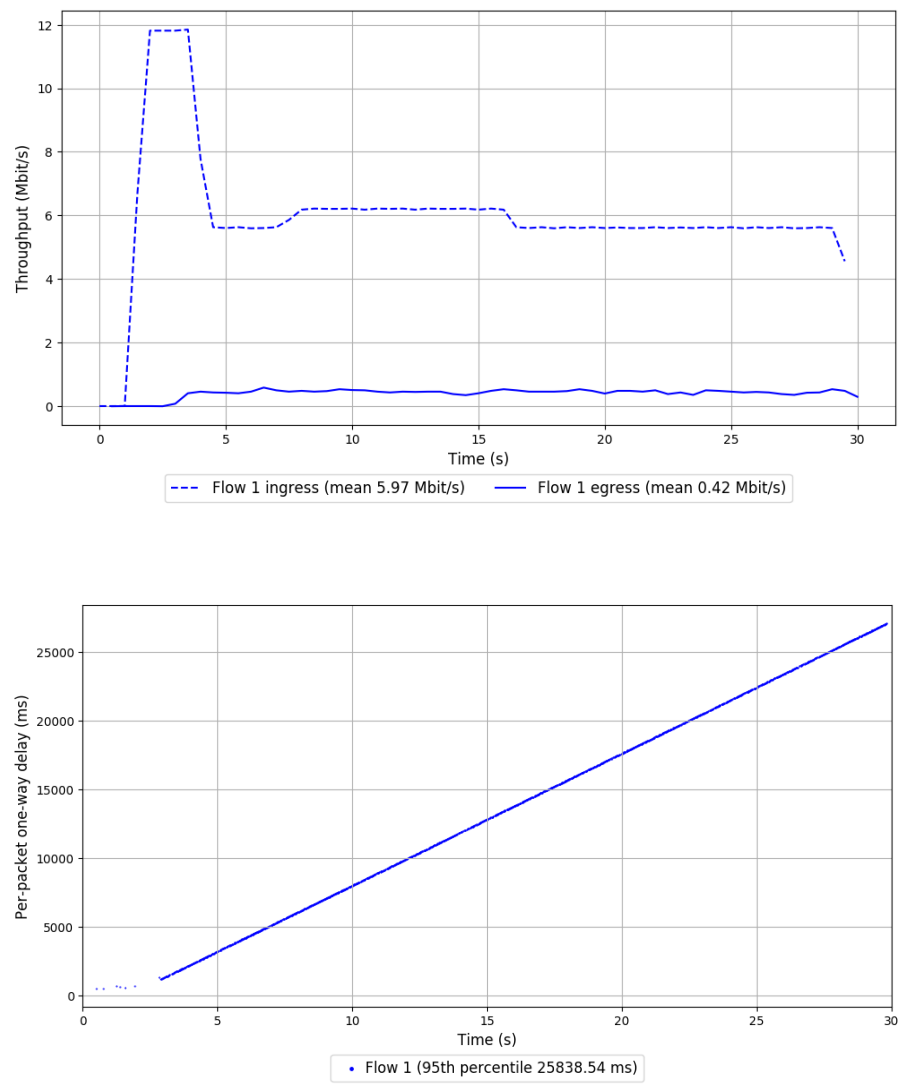
-- Flow 1:

Average throughput: 0.42 Mbit/s

95th percentile per-packet one-way delay: 25838.545 ms

Loss rate: 93.11%

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

Start at: 2018-09-06 13:00:21

End at: 2018-09-06 13:00:51

Local clock offset: 3.85 ms

Remote clock offset: 0.546 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.25 Mbit/s

95th percentile per-packet one-way delay: 19560.783 ms

Loss rate: 96.91%

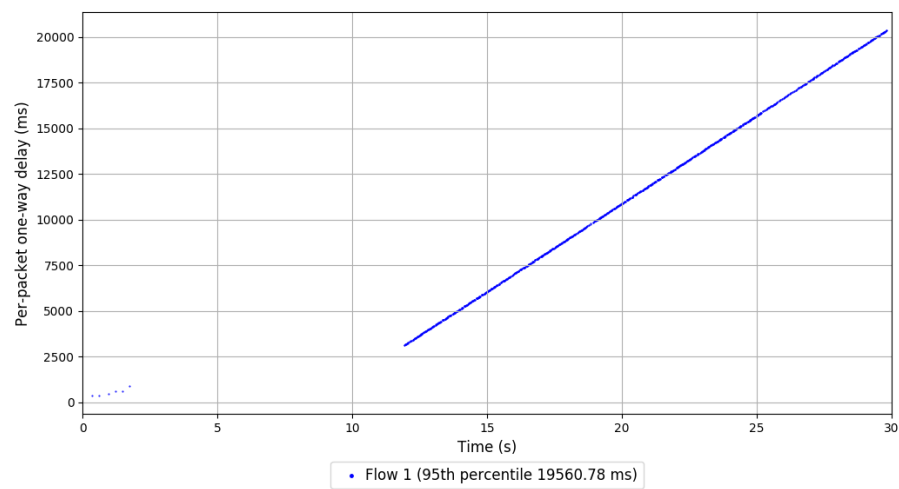
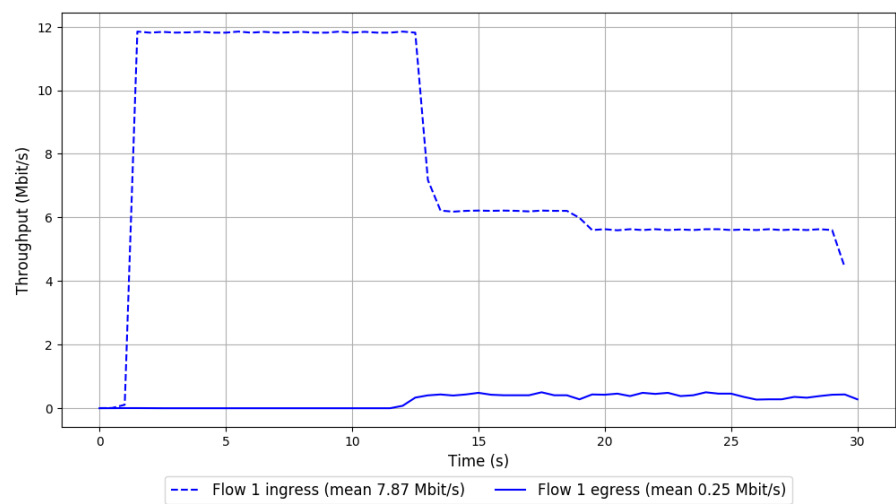
-- Flow 1:

Average throughput: 0.25 Mbit/s

95th percentile per-packet one-way delay: 19560.783 ms

Loss rate: 96.91%

Run 2: Report of PCC-Expr — Data Link

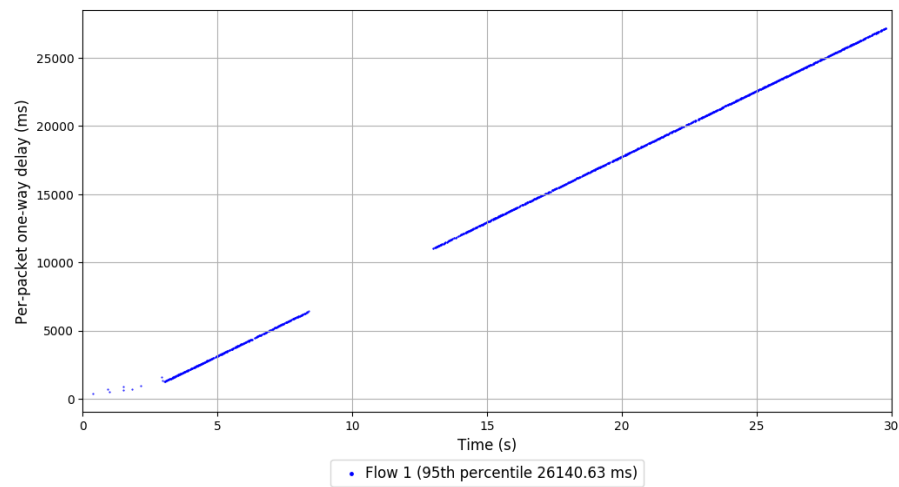
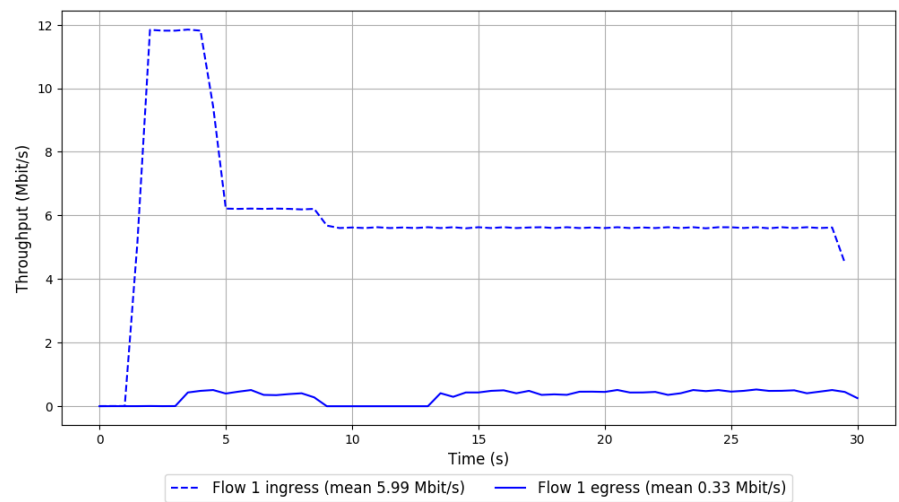


Run 3: Statistics of PCC-Expr

Start at: 2018-09-06 13:21:42
End at: 2018-09-06 13:22:12
Local clock offset: 3.827 ms
Remote clock offset: -0.633 ms

Below is generated by plot.py at 2018-09-06 13:40:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 26140.634 ms
Loss rate: 94.53%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 26140.634 ms
Loss rate: 94.53%

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-09-06 12:48:35

End at: 2018-09-06 12:49:05

Local clock offset: 4.639 ms

Remote clock offset: -0.766 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 7771.421 ms

Loss rate: 28.72%

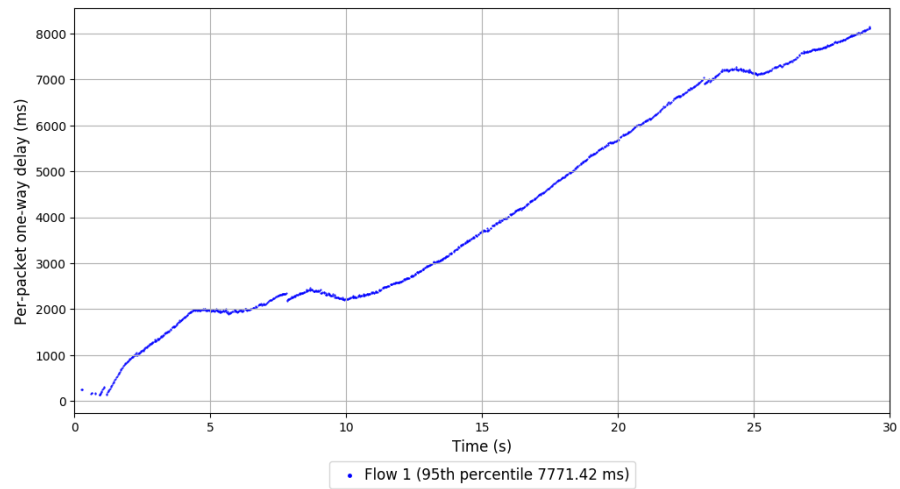
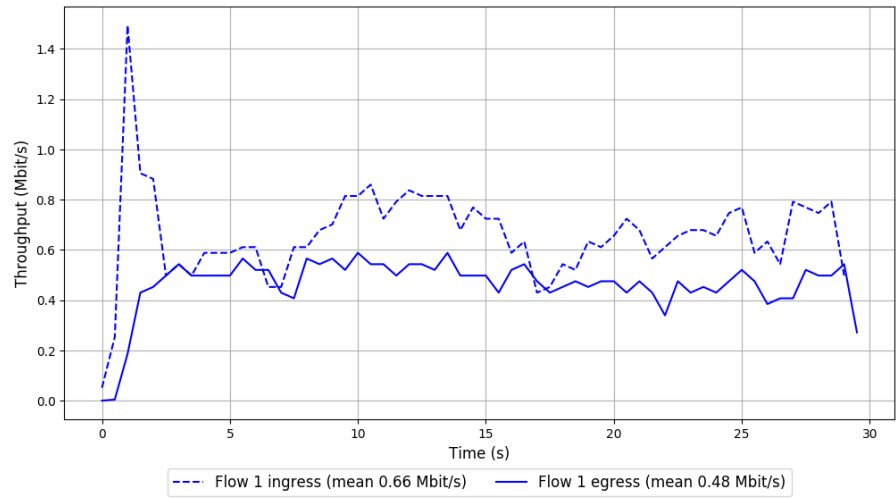
-- Flow 1:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 7771.421 ms

Loss rate: 28.72%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-09-06 13:09:52

End at: 2018-09-06 13:10:22

Local clock offset: 3.852 ms

Remote clock offset: 0.671 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 7664.518 ms

Loss rate: 31.88%

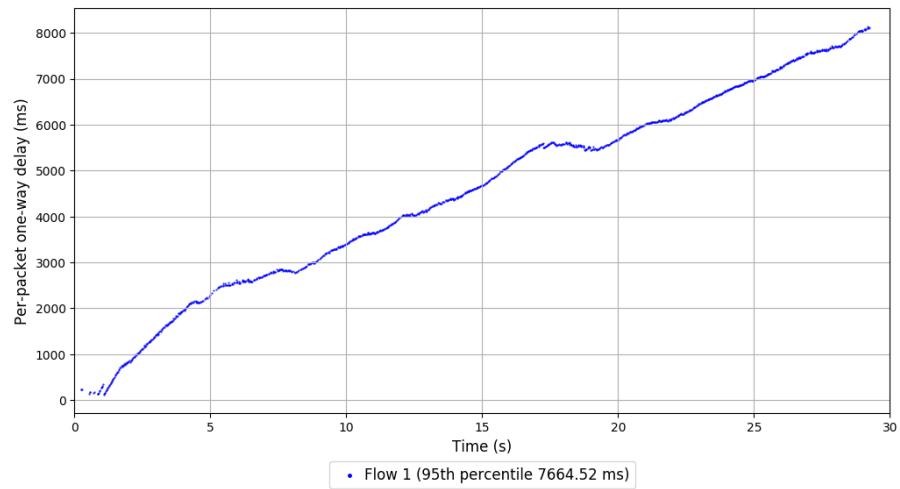
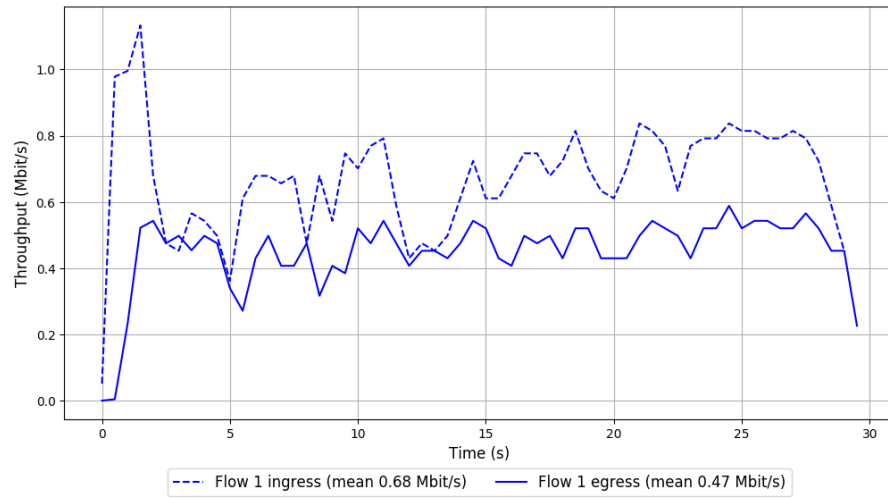
-- Flow 1:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 7664.518 ms

Loss rate: 31.88%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-09-06 13:31:43

End at: 2018-09-06 13:32:13

Local clock offset: 3.824 ms

Remote clock offset: 0.522 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 8546.940 ms

Loss rate: 27.00%

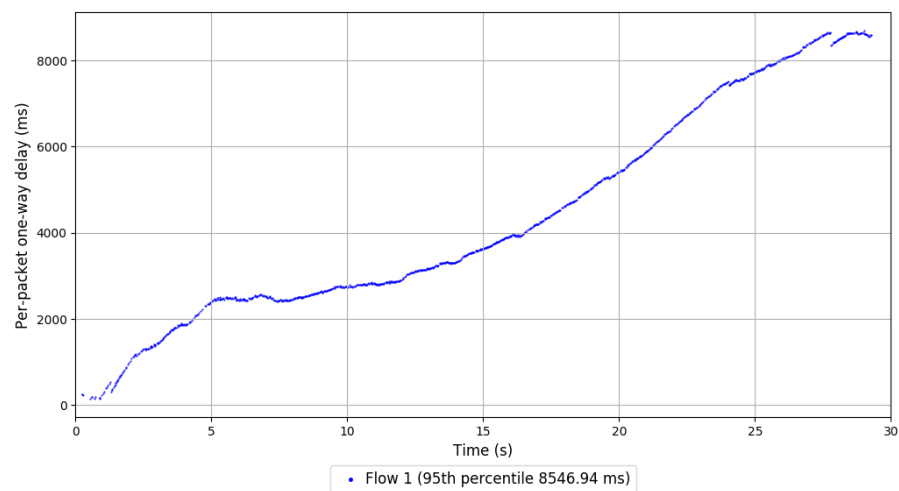
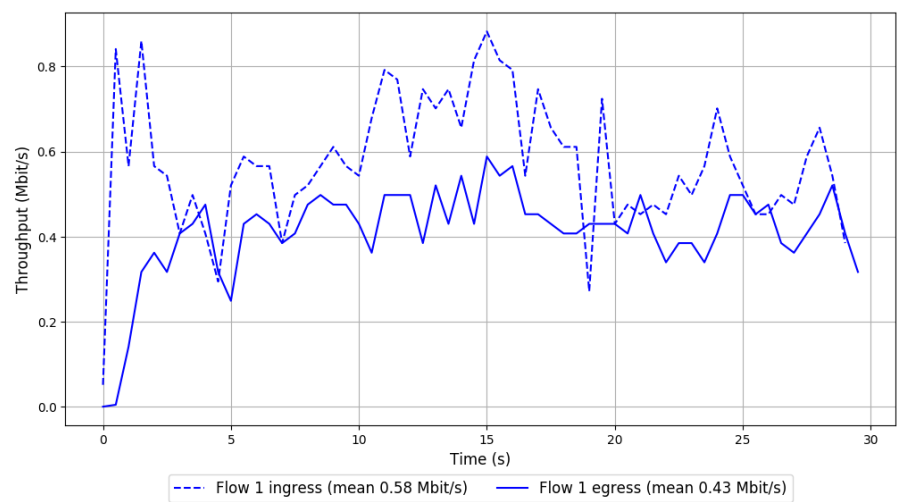
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 8546.940 ms

Loss rate: 27.00%

Run 3: Report of QUIC Cubic — Data Link

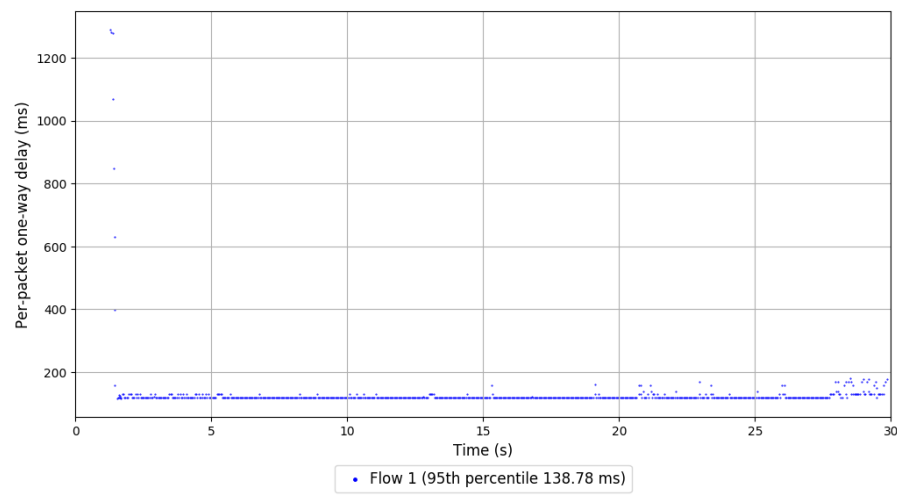
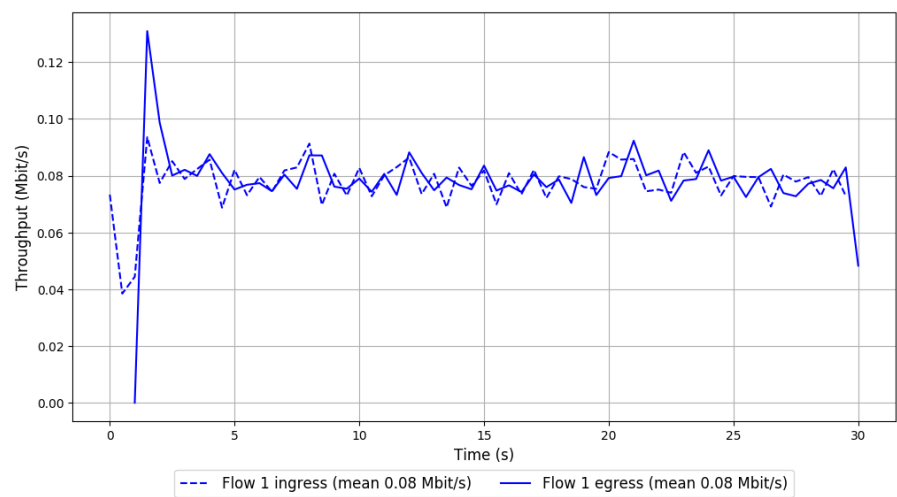


Run 1: Statistics of SCReAM

Start at: 2018-09-06 12:42:51
End at: 2018-09-06 12:43:21
Local clock offset: 3.894 ms
Remote clock offset: -0.807 ms

Below is generated by plot.py at 2018-09-06 13:40:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 138.783 ms
Loss rate: 0.91%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 138.783 ms
Loss rate: 0.91%

Run 1: Report of SReAM — Data Link

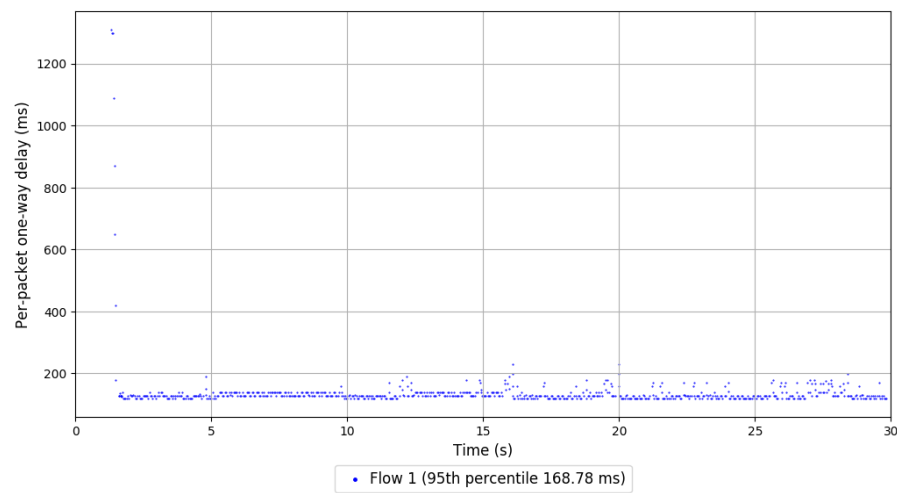
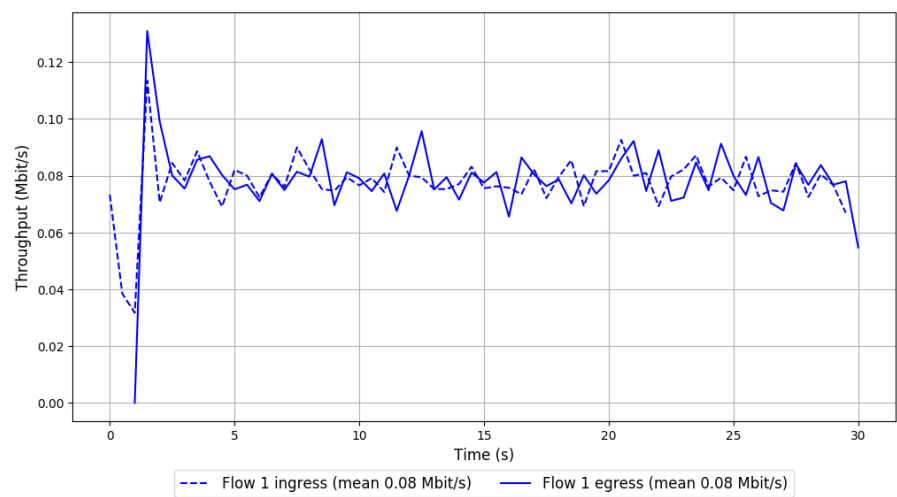


Run 2: Statistics of SCReAM

Start at: 2018-09-06 13:04:08
End at: 2018-09-06 13:04:38
Local clock offset: 3.847 ms
Remote clock offset: -0.708 ms

Below is generated by plot.py at 2018-09-06 13:40:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 168.785 ms
Loss rate: 0.65%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 168.785 ms
Loss rate: 0.65%

Run 2: Report of SReAM — Data Link

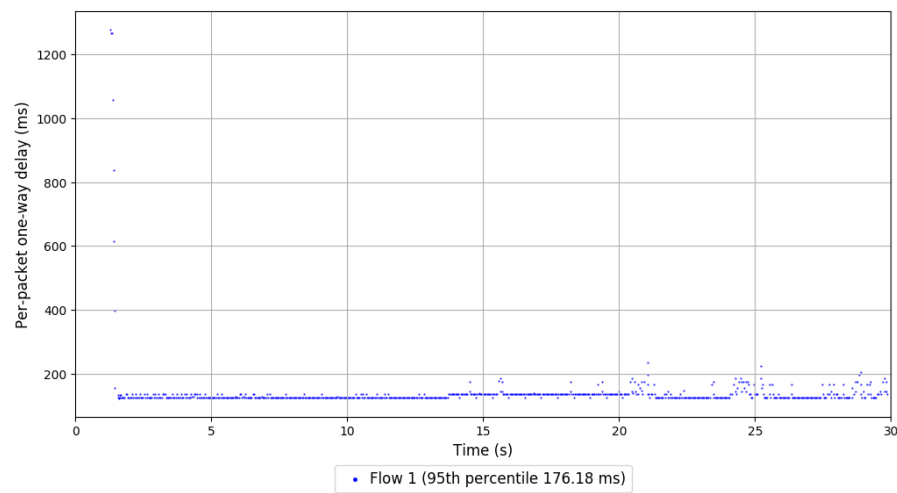
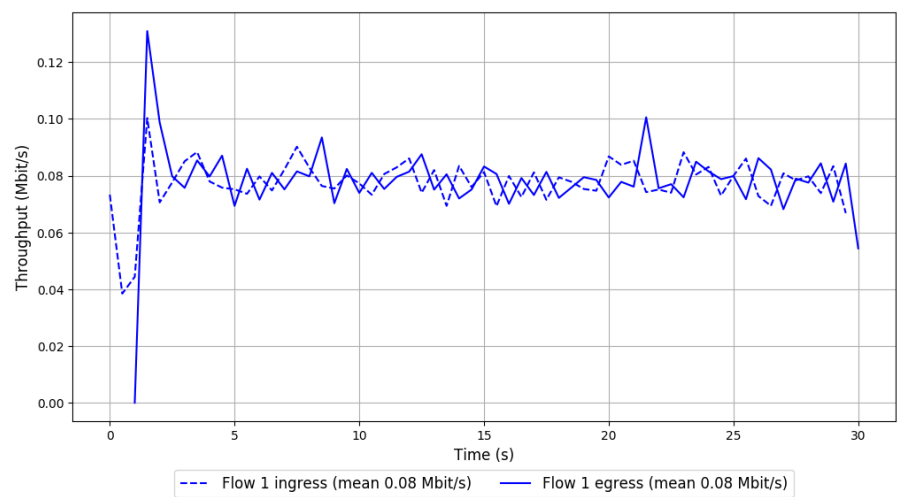


Run 3: Statistics of SCReAM

Start at: 2018-09-06 13:25:38
End at: 2018-09-06 13:26:08
Local clock offset: 3.822 ms
Remote clock offset: -0.715 ms

Below is generated by plot.py at 2018-09-06 13:40:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 176.184 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 176.184 ms
Loss rate: 0.66%

Run 3: Report of SReAM — Data Link

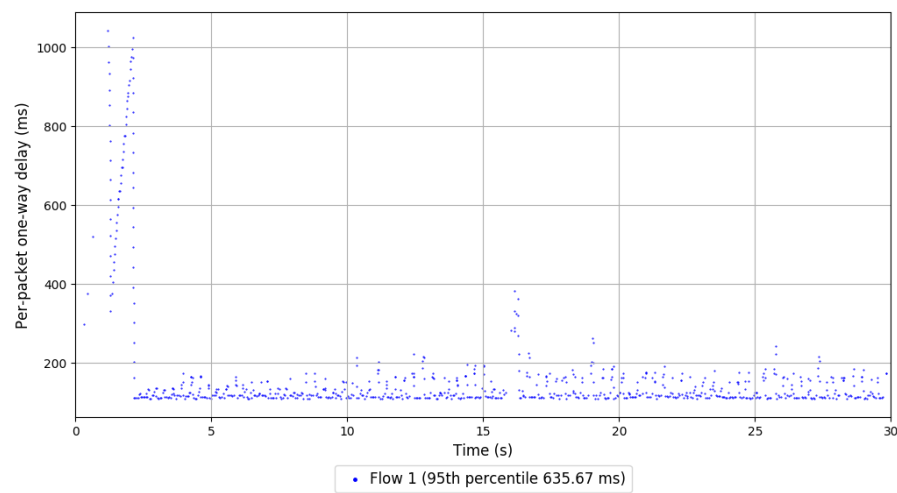
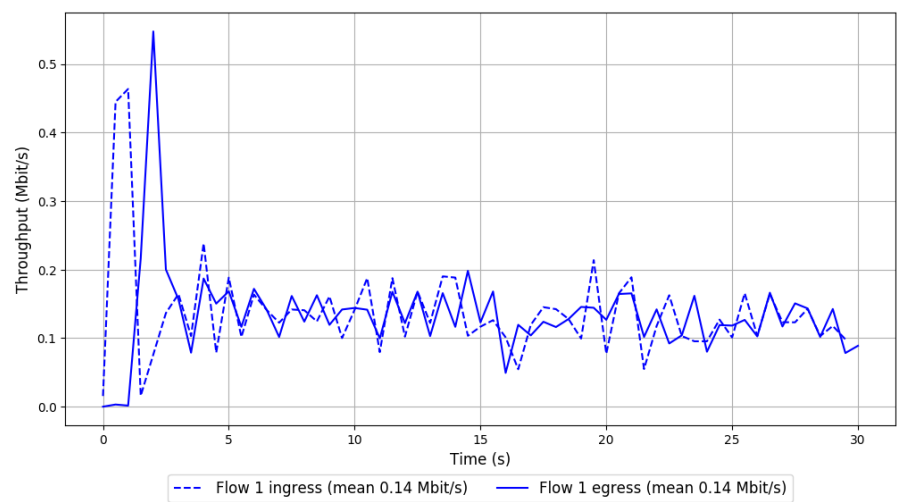


```
Run 1: Statistics of Sprout

Start at: 2018-09-06 12:41:43
End at: 2018-09-06 12:42:13
Local clock offset: 3.831 ms
Remote clock offset: 0.26 ms

# Below is generated by plot.py at 2018-09-06 13:40:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 635.666 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 635.666 ms
Loss rate: 0.94%
```

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2018-09-06 13:03:01

End at: 2018-09-06 13:03:31

Local clock offset: 3.773 ms

Remote clock offset: 0.291 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.13 Mbit/s

95th percentile per-packet one-way delay: 667.228 ms

Loss rate: 1.23%

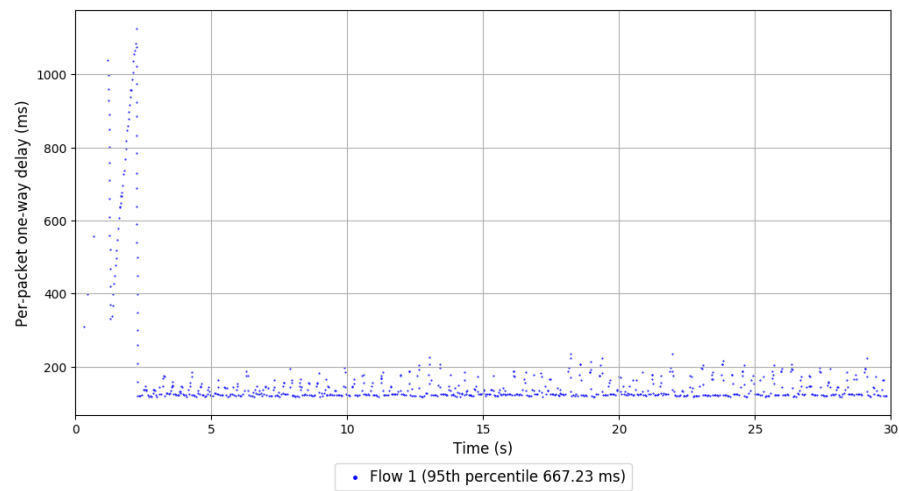
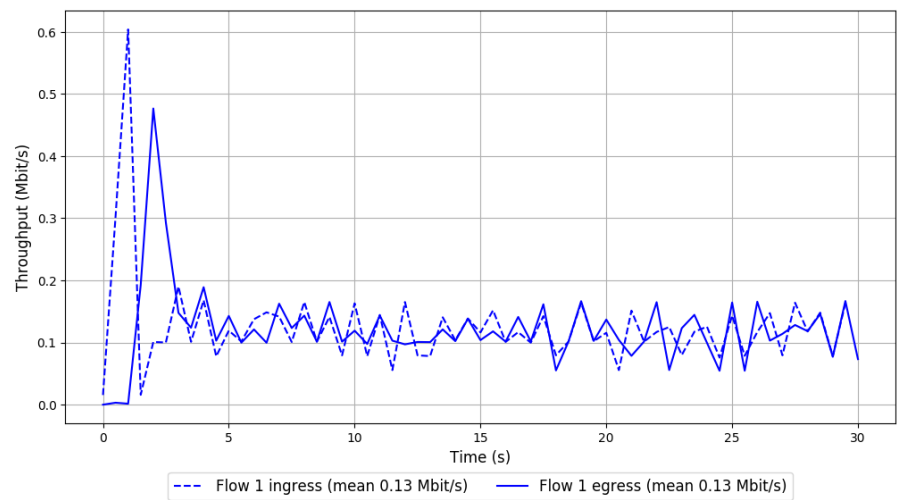
-- Flow 1:

Average throughput: 0.13 Mbit/s

95th percentile per-packet one-way delay: 667.228 ms

Loss rate: 1.23%

Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

/home/ubuntu/pantheon/data/2018-09-06T12-35-Colombia-cellular-to-AWS-Brazil-2-3-runs/sprout.

Run 3: Report of Sprout — Data Link

Figure is missing

Figure is missing

Run 1: Statistics of TaoVA-100x

Start at: 2018-09-06 12:35:39

End at: 2018-09-06 12:36:09

Local clock offset: 4.627 ms

Remote clock offset: 1.505 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 1245.831 ms

Loss rate: 2.95%

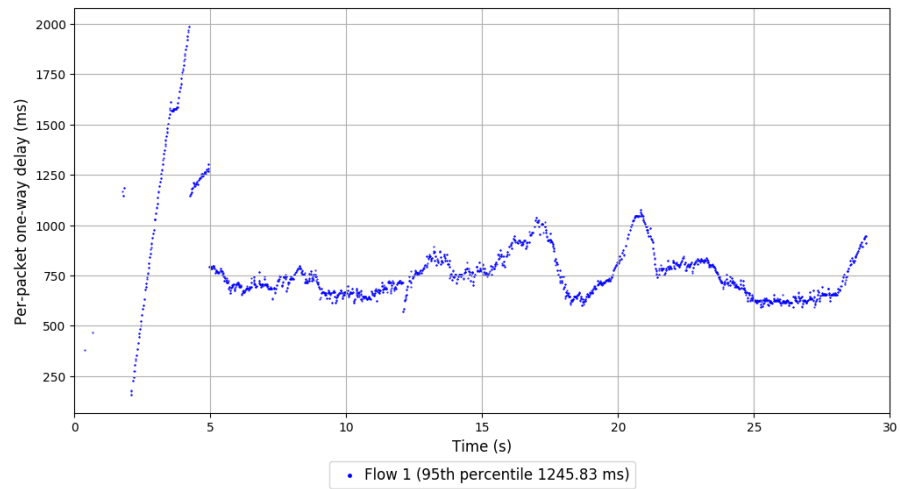
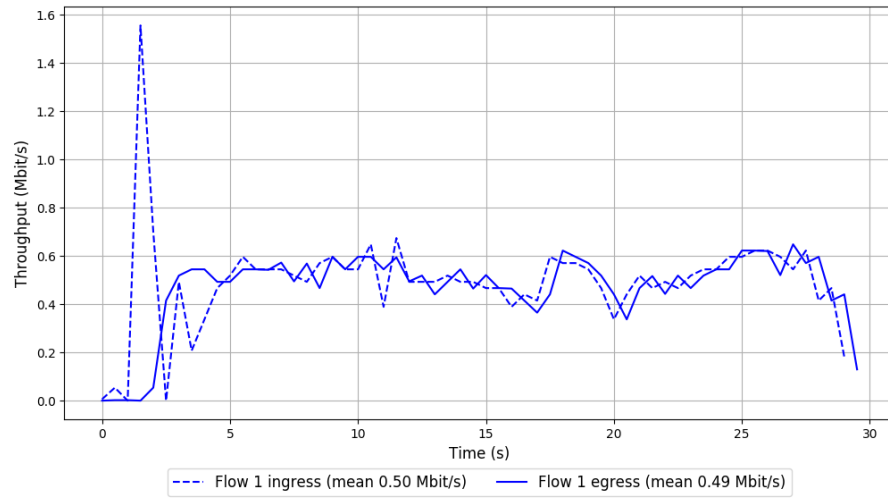
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 1245.831 ms

Loss rate: 2.95%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-09-06 12:56:55

End at: 2018-09-06 12:57:25

Local clock offset: 3.849 ms

Remote clock offset: -0.628 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 1377.700 ms

Loss rate: 2.73%

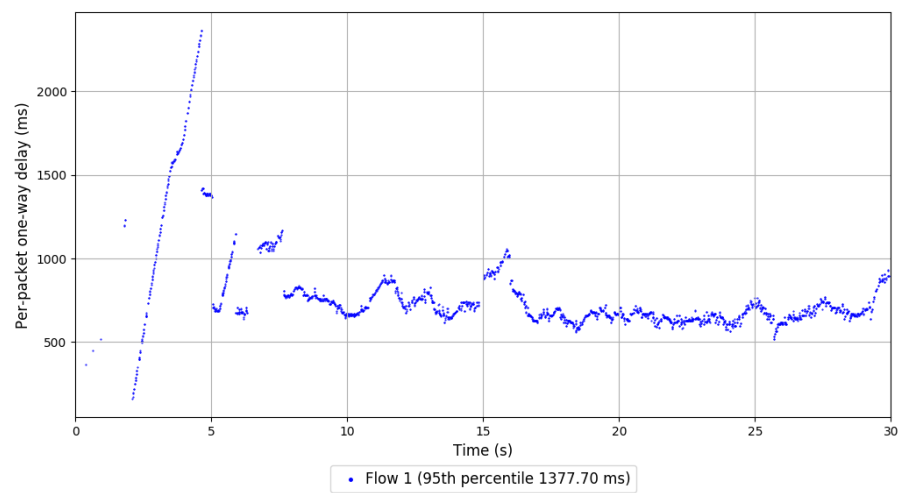
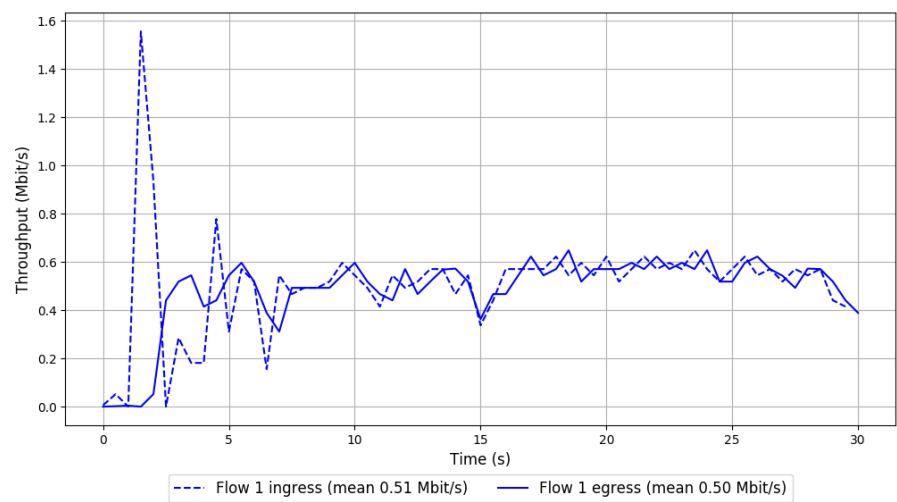
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 1377.700 ms

Loss rate: 2.73%

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



Run 3: Statistics of TaoVA-100x

Start at: 2018-09-06 13:18:18

End at: 2018-09-06 13:18:48

Local clock offset: 4.616 ms

Remote clock offset: -0.785 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 1445.691 ms

Loss rate: 2.95%

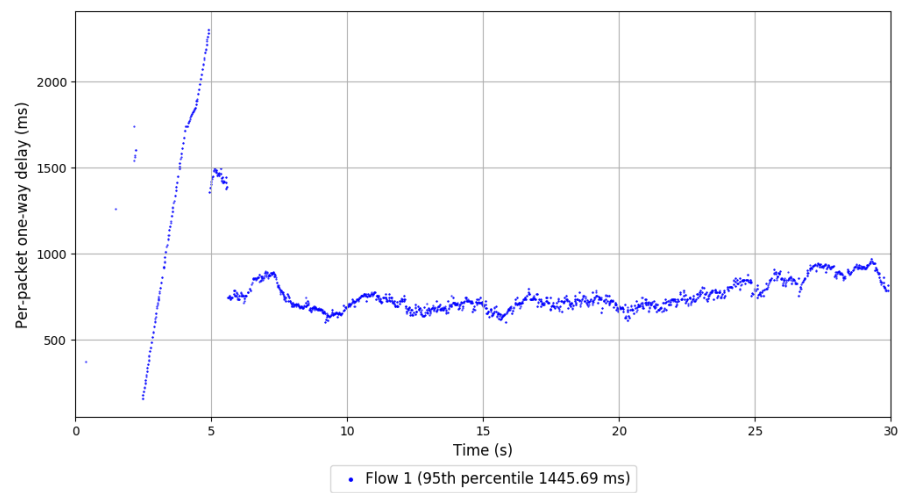
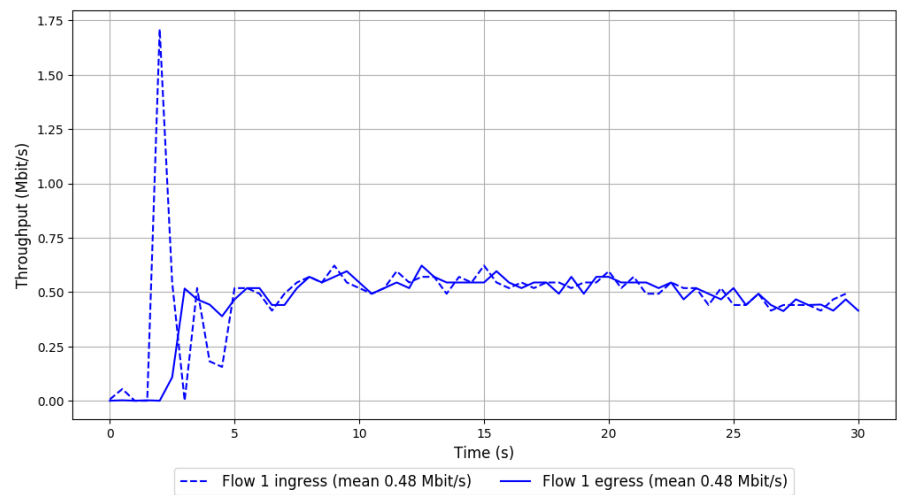
-- Flow 1:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 1445.691 ms

Loss rate: 2.95%

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

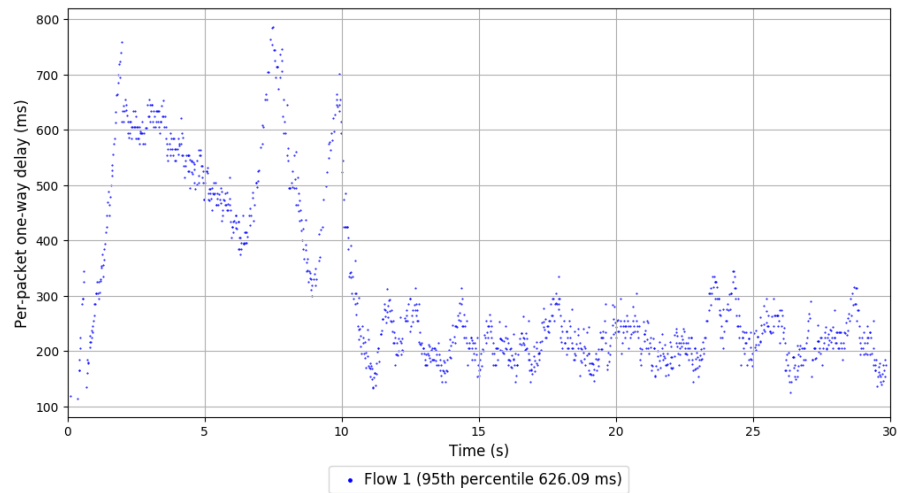
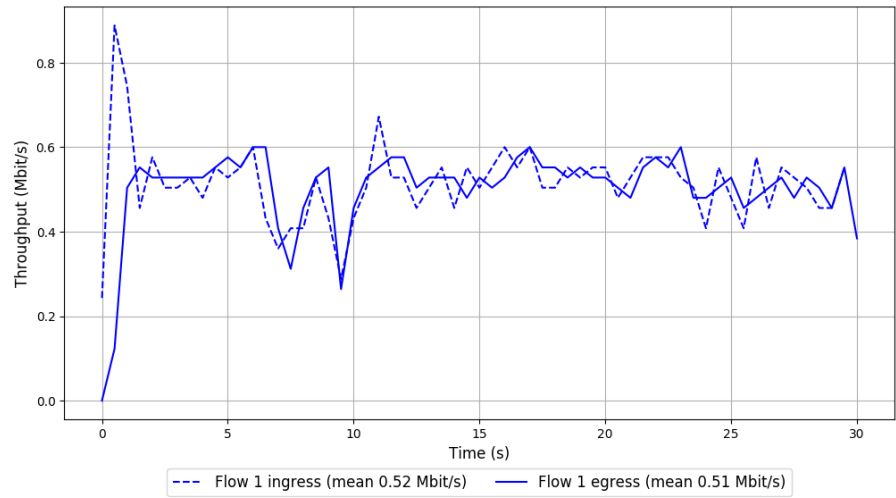


Run 1: Statistics of TCP Vegas

Start at: 2018-09-06 12:45:12
End at: 2018-09-06 12:45:42
Local clock offset: 4.621 ms
Remote clock offset: -0.825 ms

Below is generated by plot.py at 2018-09-06 13:40:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 626.085 ms
Loss rate: 1.01%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 626.085 ms
Loss rate: 1.01%

Run 1: Report of TCP Vegas — Data Link

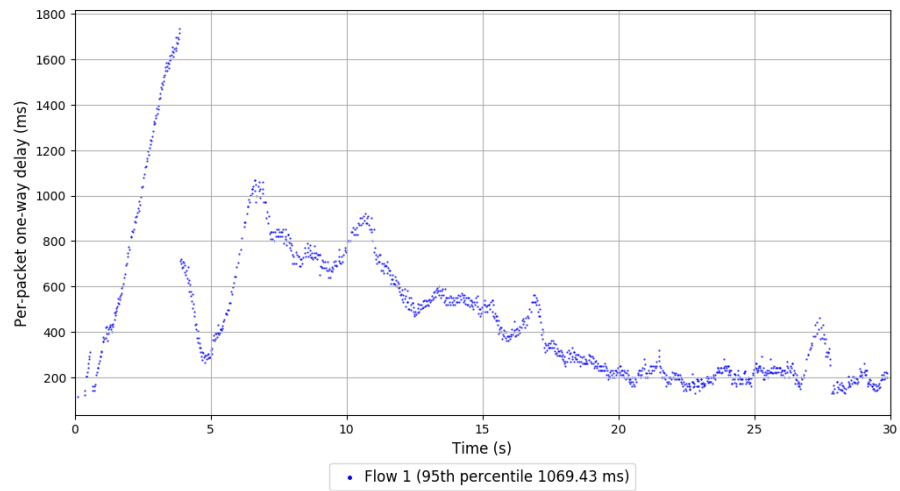
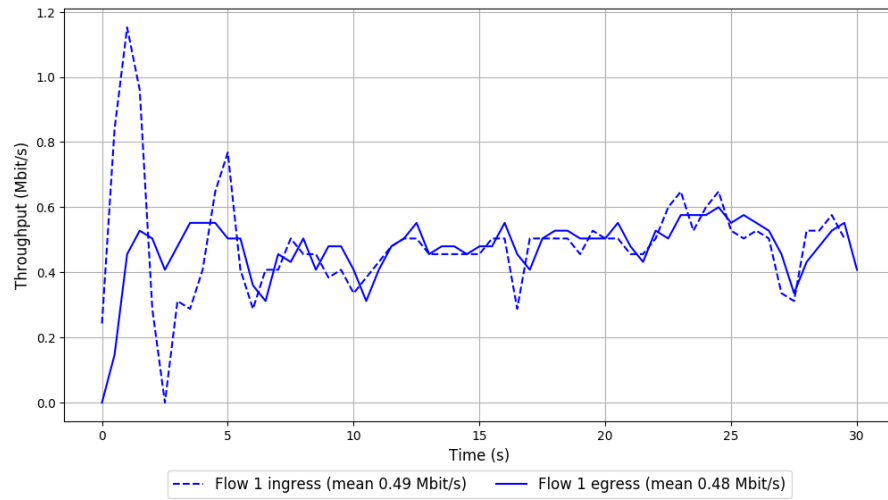


Run 2: Statistics of TCP Vegas

Start at: 2018-09-06 13:06:26
End at: 2018-09-06 13:06:56
Local clock offset: 4.52 ms
Remote clock offset: -0.711 ms

Below is generated by plot.py at 2018-09-06 13:40:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 1069.431 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 1069.431 ms
Loss rate: 1.07%

Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

/home/ubuntu/pantheon/data/2018-09-06T12-35-Colombia-cellular-to-AWS-Brazil-2-3-runs/vegas_s

Run 3: Report of TCP Vegas — Data Link

Figure is missing

Figure is missing

Run 1: Statistics of Verus

Start at: 2018-09-06 12:55:47

End at: 2018-09-06 12:56:17

Local clock offset: 3.853 ms

Remote clock offset: 0.193 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 1878.714 ms

Loss rate: 3.27%

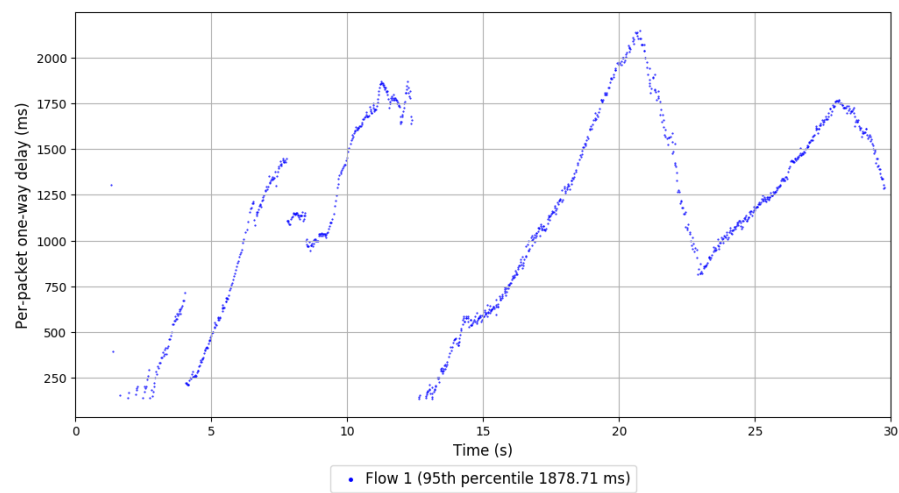
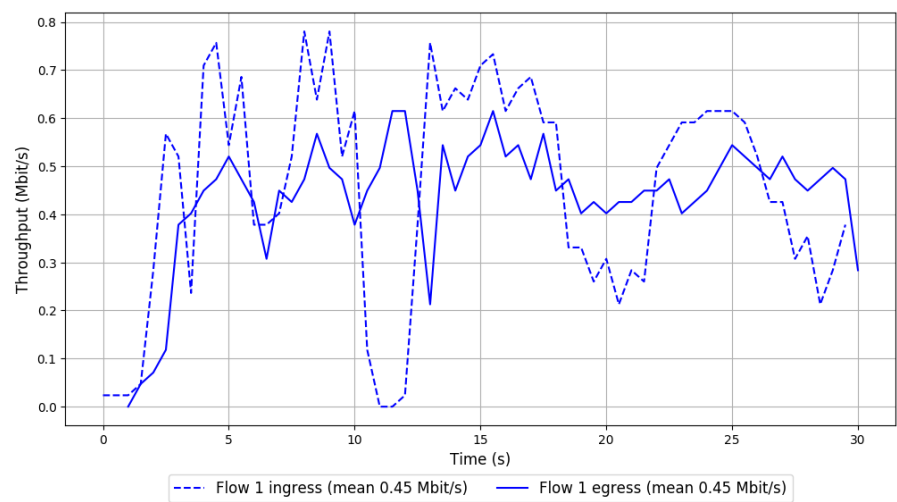
-- Flow 1:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 1878.714 ms

Loss rate: 3.27%

Run 1: Report of Verus — Data Link

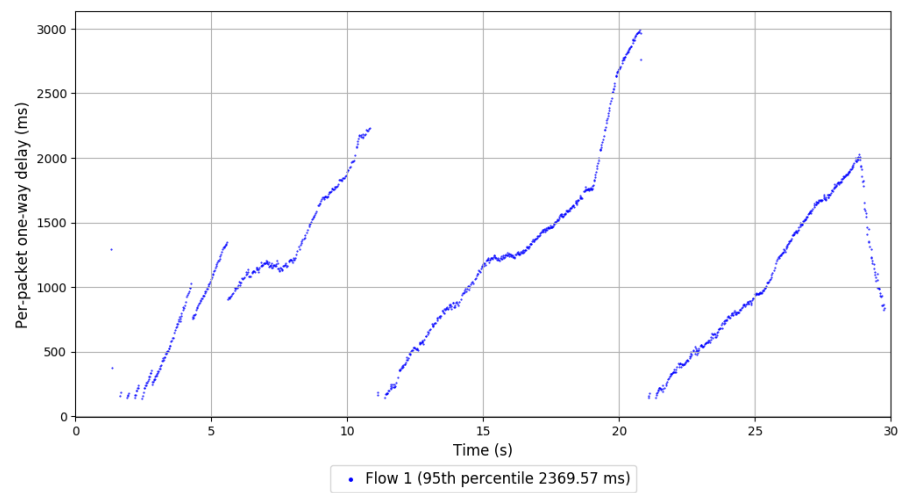
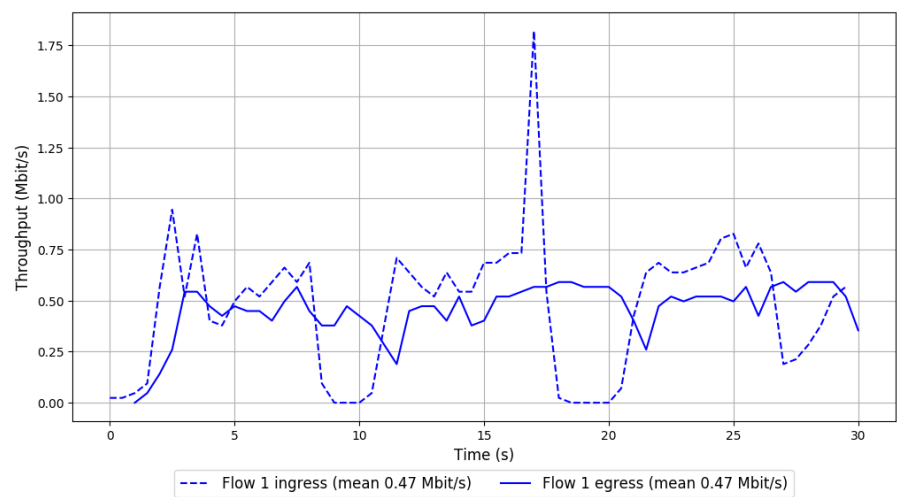


Run 2: Statistics of Verus

Start at: 2018-09-06 13:17:09
End at: 2018-09-06 13:17:39
Local clock offset: 3.85 ms
Remote clock offset: -0.757 ms

Below is generated by plot.py at 2018-09-06 13:40:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 2369.571 ms
Loss rate: 4.11%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 2369.571 ms
Loss rate: 4.11%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2018-09-06 13:38:57

End at: 2018-09-06 13:39:27

Local clock offset: 3.826 ms

Remote clock offset: 0.608 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 2146.082 ms

Loss rate: 6.26%

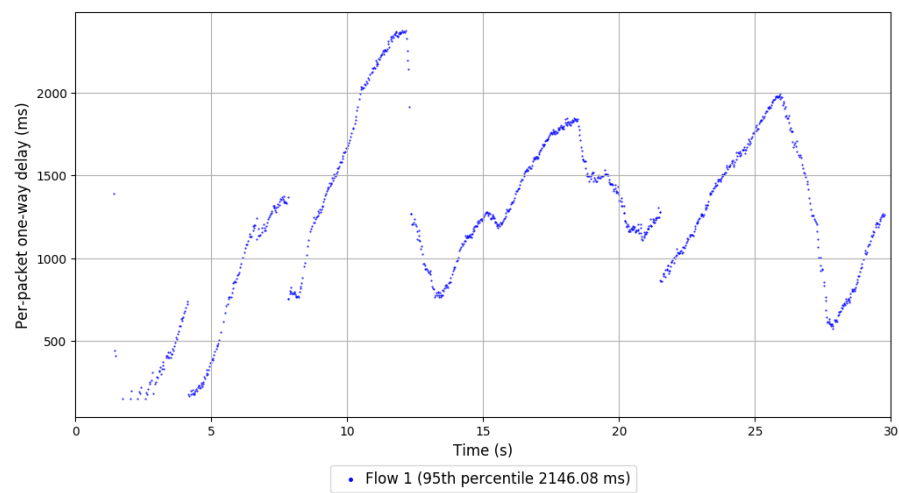
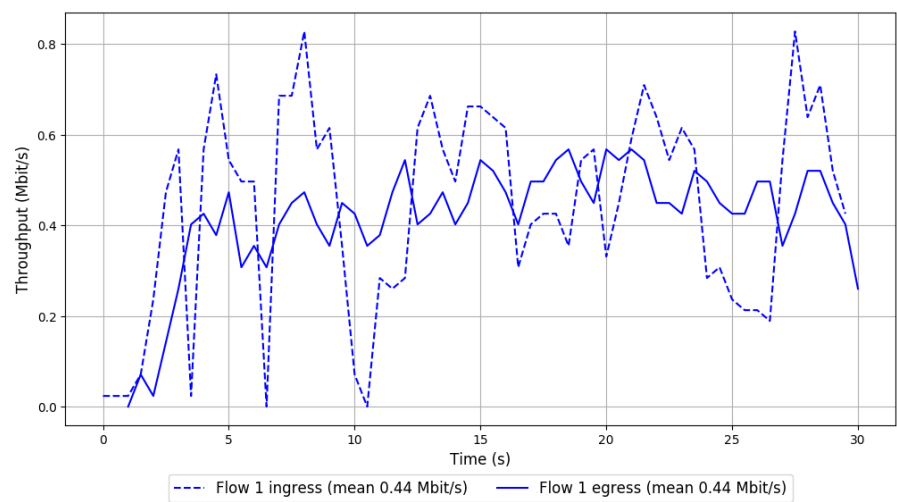
-- Flow 1:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 2146.082 ms

Loss rate: 6.26%

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2018-09-06T12-35-Colombia-cellular-to-AWS-Brazil-2-3-runs/vivace.

Run 1: Report of PCC-Vivace — Data Link

Figure is missing

Figure is missing

Run 2: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2018-09-06T12-35-Colombia-cellular-to-AWS-Brazil-2-3-runs/vivace.

Run 2: Report of PCC-Vivace — Data Link

Figure is missing

Figure is missing

Run 3: Statistics of PCC-Vivace

Start at: 2018-09-06 13:22:58

End at: 2018-09-06 13:23:28

Local clock offset: 3.827 ms

Remote clock offset: 0.411 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 23202.804 ms

Loss rate: 79.36%

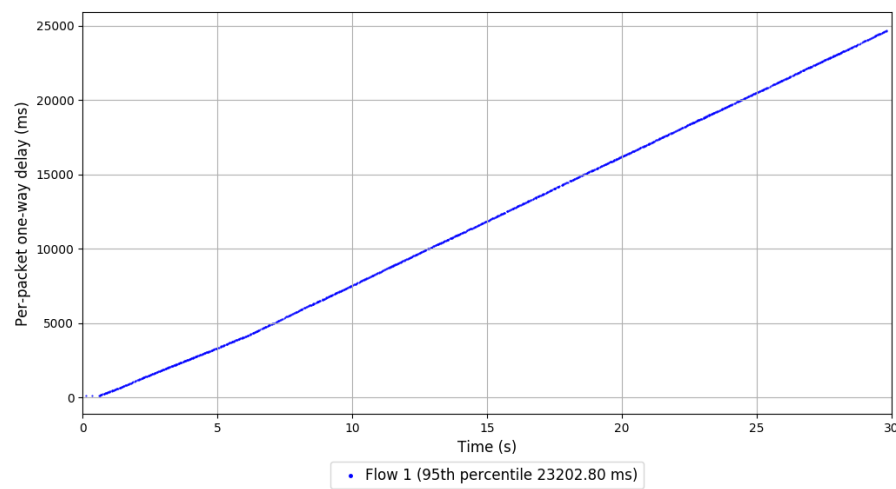
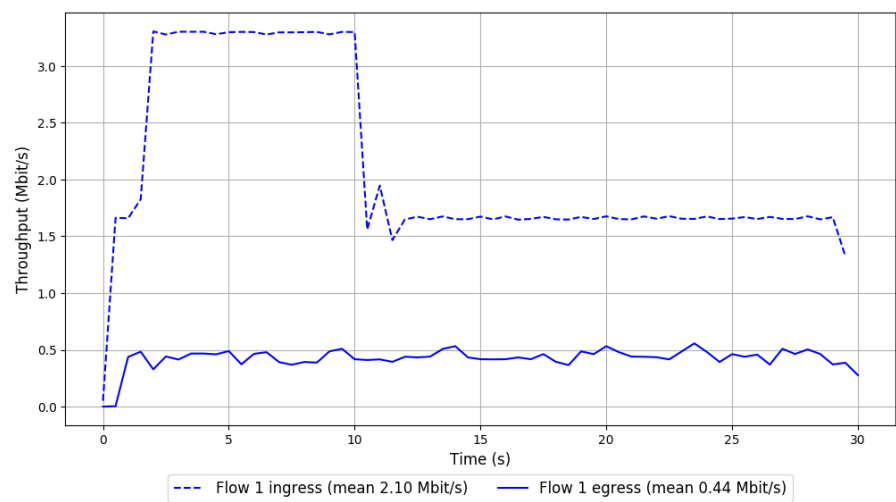
-- Flow 1:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 23202.804 ms

Loss rate: 79.36%

Run 3: Report of PCC-Vivace — Data Link

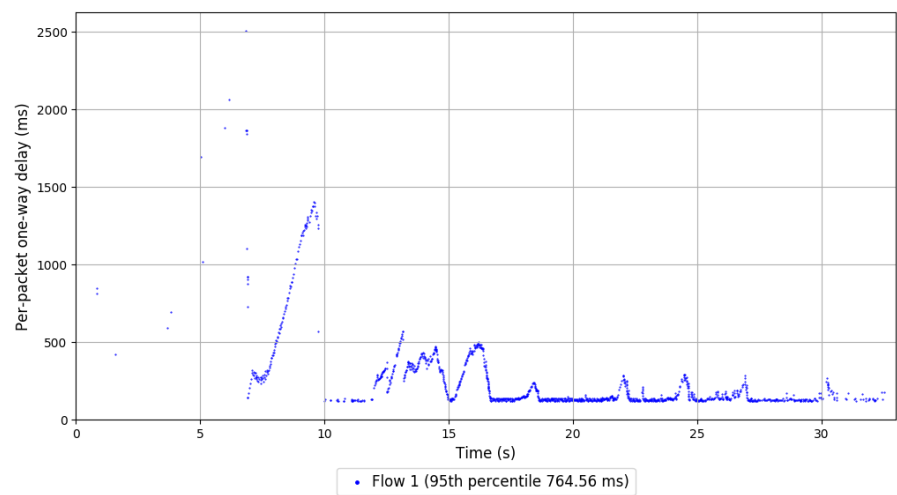
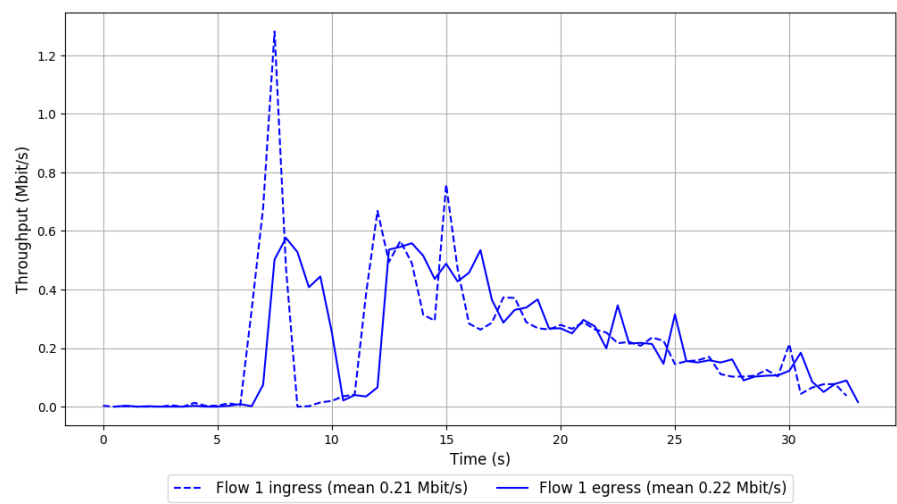


```
Run 1: Statistics of WebRTC media

Start at: 2018-09-06 12:54:40
End at: 2018-09-06 12:55:10
Local clock offset: 4.622 ms
Remote clock offset: 1.476 ms

# Below is generated by plot.py at 2018-09-06 13:40:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 764.562 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 764.562 ms
Loss rate: 0.27%
```

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2018-09-06 13:16:01

End at: 2018-09-06 13:16:31

Local clock offset: 4.617 ms

Remote clock offset: 1.45 ms

Below is generated by plot.py at 2018-09-06 13:40:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.21 Mbit/s

95th percentile per-packet one-way delay: 747.665 ms

Loss rate: 0.81%

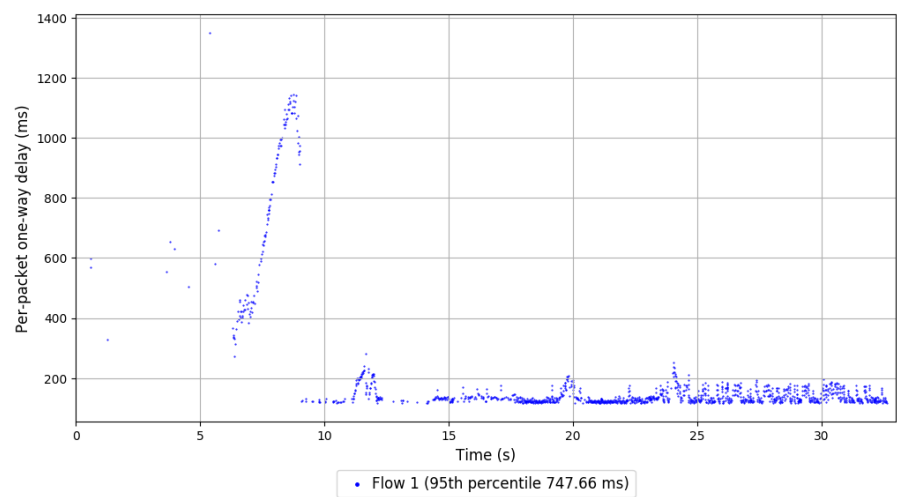
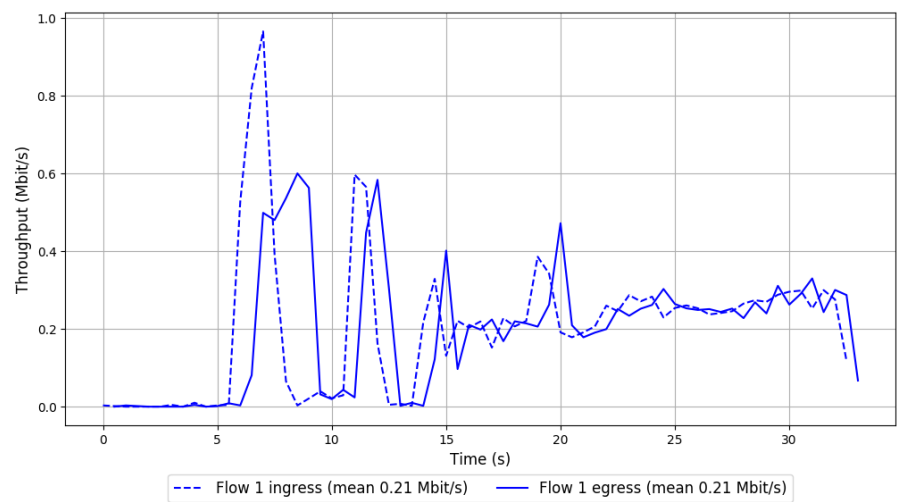
-- Flow 1:

Average throughput: 0.21 Mbit/s

95th percentile per-packet one-way delay: 747.665 ms

Loss rate: 0.81%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-09-06 13:37:49
End at: 2018-09-06 13:38:19
Local clock offset: 4.597 ms
Remote clock offset: -0.486 ms

Below is generated by plot.py at 2018-09-06 13:40:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 684.006 ms
Loss rate: 0.54%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 684.006 ms
Loss rate: 0.54%

Run 3: Report of WebRTC media — Data Link

