

Pantheon Report

Generated at 2019-02-20 05:03:08 (UTC).

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

Repeated the test of 21 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:

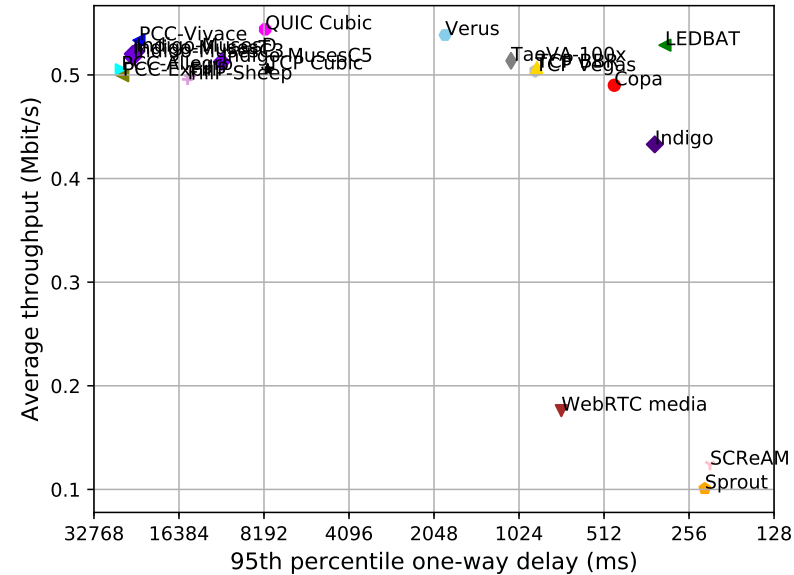
```
Linux 4.15.0-1031-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

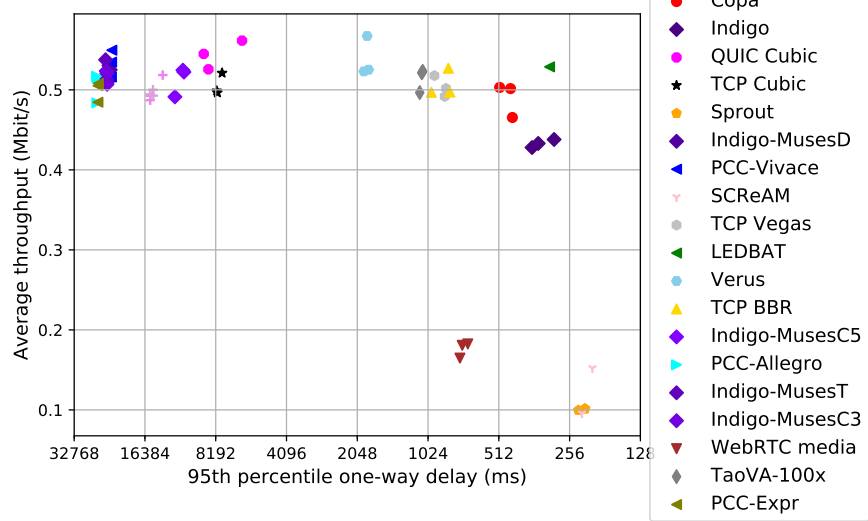
```
branch: muses @ 7a686f7c2ed0a333082c0bab1fa5c921ab47e6ee
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 5ce721187ad823da20955337730c746486ca4966
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
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-quick @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
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 @ 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	0.51	885.66	2.01
Copa	3	0.49	470.95	1.28
TCP Cubic	3	0.51	7957.17	31.15
FillP	3	0.50	14959.62	25.49
FillP-Sheep	3	0.49	15273.73	17.53
Indigo	3	0.43	338.62	0.69
Indigo-MusesC3	3	0.52	23825.56	93.88
Indigo-MusesC5	3	0.51	11564.72	43.77
Indigo-MusesD	3	0.52	23226.21	91.43
Indigo-MusesT	3	0.52	23888.83	86.99
LEDBAT	1	0.53	311.61	1.18
PCC-Allegro	3	0.50	26222.03	98.63
PCC-Expr	3	0.50	25919.13	92.18
QUIC Cubic	3	0.54	8113.79	29.57
SCReAM	2	0.12	215.83	0.64
Sprout	3	0.10	225.16	0.78
TaoVA-100x	3	0.51	1093.06	2.77
TCP Vegas	3	0.50	896.97	1.11
Verus	3	0.54	1871.01	5.50
PCC-Vivace	3	0.53	22713.63	73.30
WebRTC media	3	0.17	725.23	0.37

Run 1: Statistics of TCP BBR

Start at: 2019-02-20 03:51:20

End at: 2019-02-20 03:51:50

Local clock offset: -6.353 ms

Remote clock offset: 2.478 ms

Below is generated by plot.py at 2019-02-20 05:02:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 839.191 ms

Loss rate: 2.11%

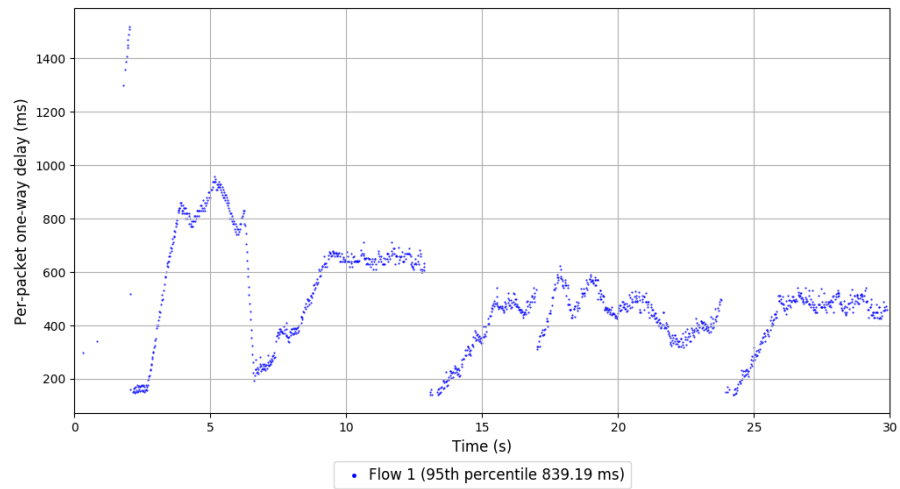
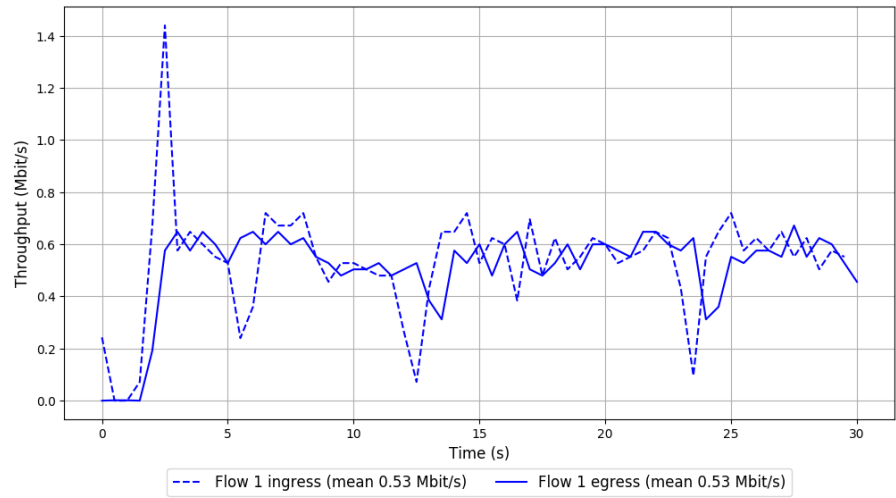
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 839.191 ms

Loss rate: 2.11%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2019-02-20 04:15:54

End at: 2019-02-20 04:16:24

Local clock offset: -6.396 ms

Remote clock offset: 3.773 ms

Below is generated by plot.py at 2019-02-20 05:02:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 991.302 ms

Loss rate: 1.84%

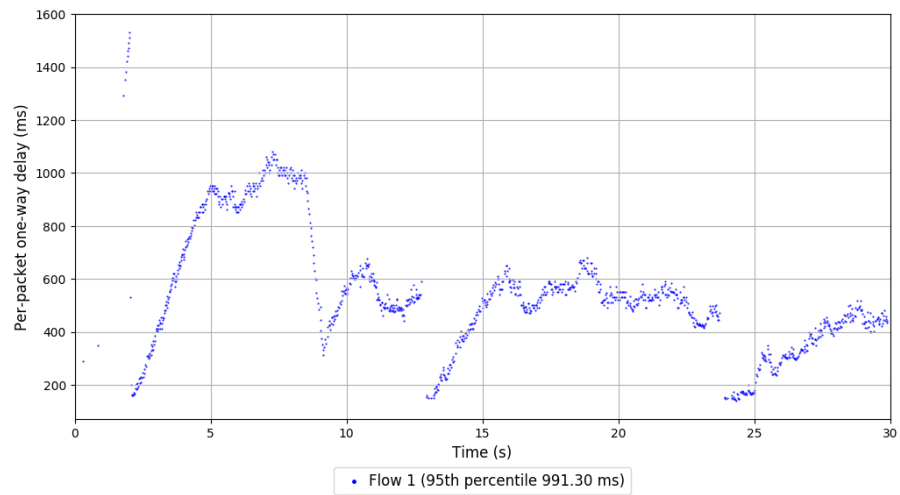
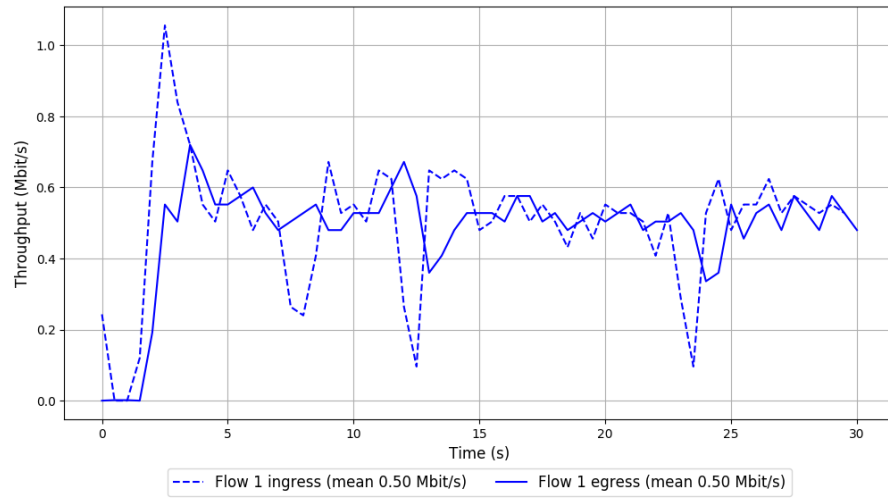
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 991.302 ms

Loss rate: 1.84%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2019-02-20 04:40:39

End at: 2019-02-20 04:41:09

Local clock offset: -6.24 ms

Remote clock offset: 2.301 ms

Below is generated by plot.py at 2019-02-20 05:02:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 826.473 ms

Loss rate: 2.07%

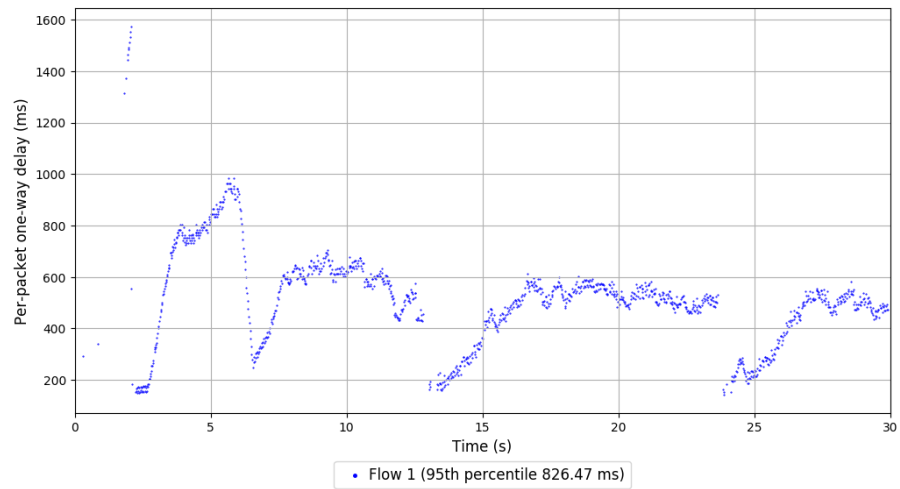
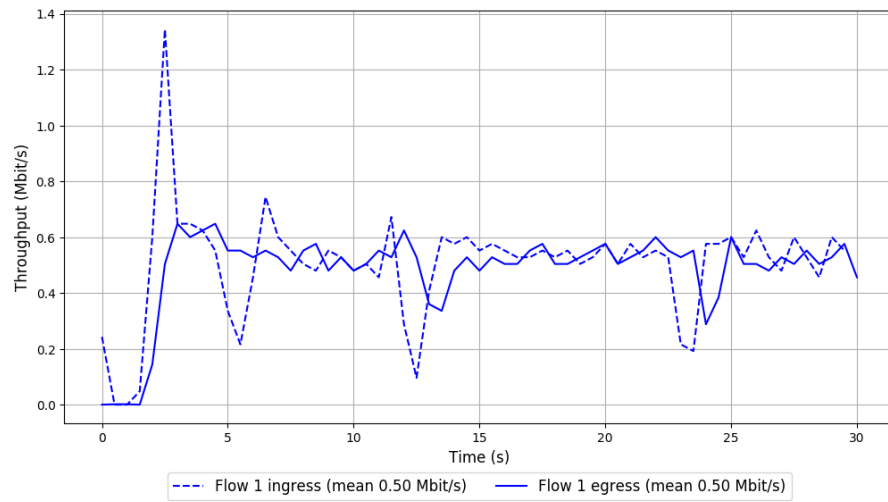
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 826.473 ms

Loss rate: 2.07%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

Start at: 2019-02-20 03:52:29

End at: 2019-02-20 03:52:59

Local clock offset: -6.371 ms

Remote clock offset: 7.284 ms

Below is generated by plot.py at 2019-02-20 05:02:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 507.929 ms

Loss rate: 1.08%

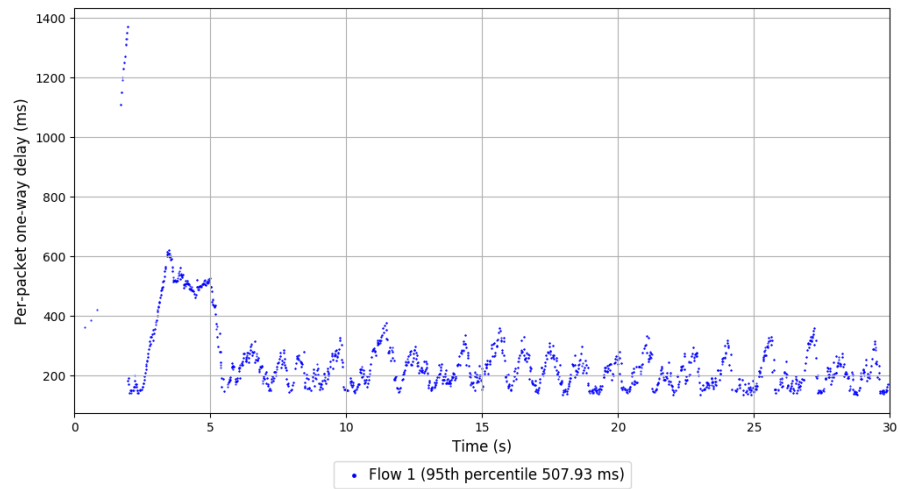
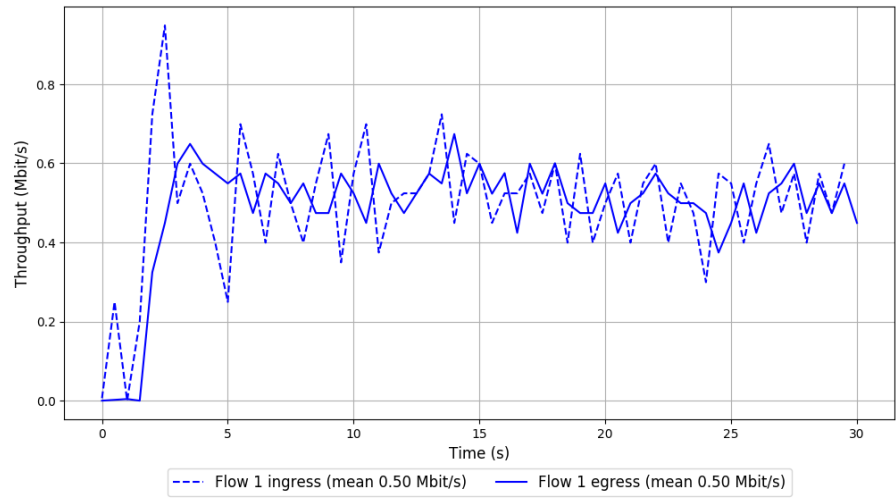
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 507.929 ms

Loss rate: 1.08%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2019-02-20 04:17:02

End at: 2019-02-20 04:17:32

Local clock offset: -6.33 ms

Remote clock offset: 6.477 ms

Below is generated by plot.py at 2019-02-20 05:02:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 456.613 ms

Loss rate: 1.16%

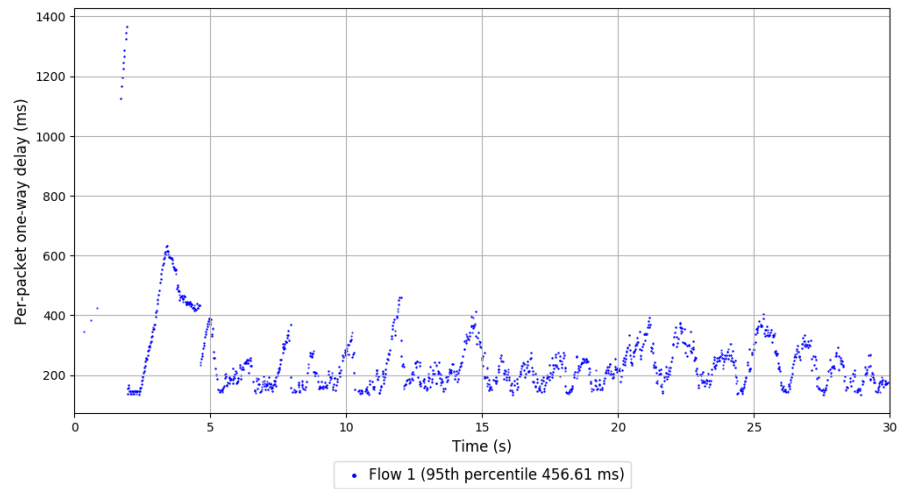
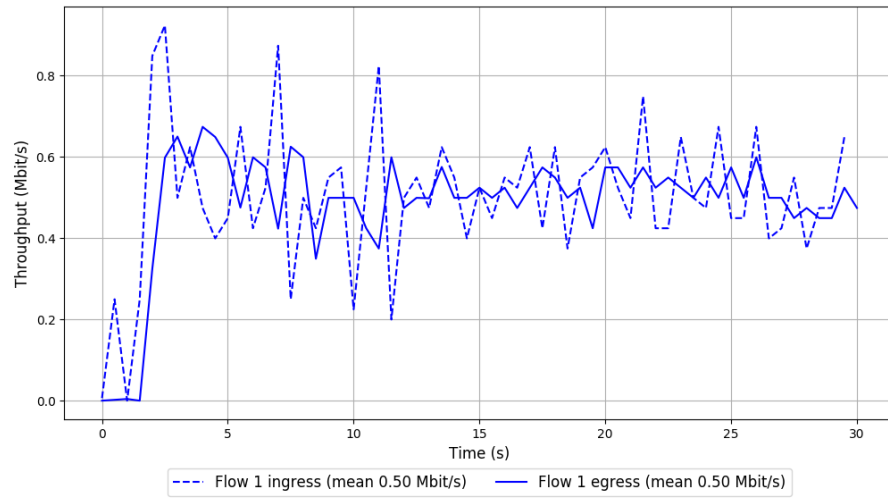
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 456.613 ms

Loss rate: 1.16%

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2019-02-20 04:41:47

End at: 2019-02-20 04:42:17

Local clock offset: -6.151 ms

Remote clock offset: 2.273 ms

Below is generated by plot.py at 2019-02-20 05:02:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 448.316 ms

Loss rate: 1.61%

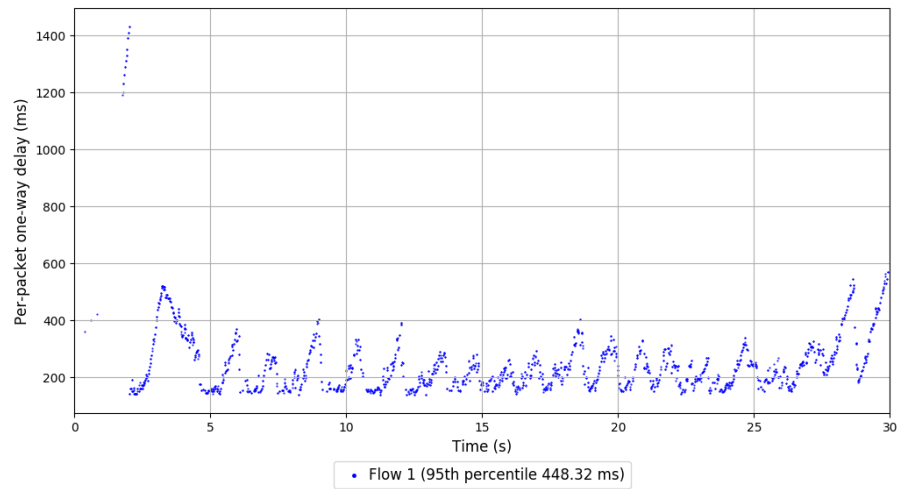
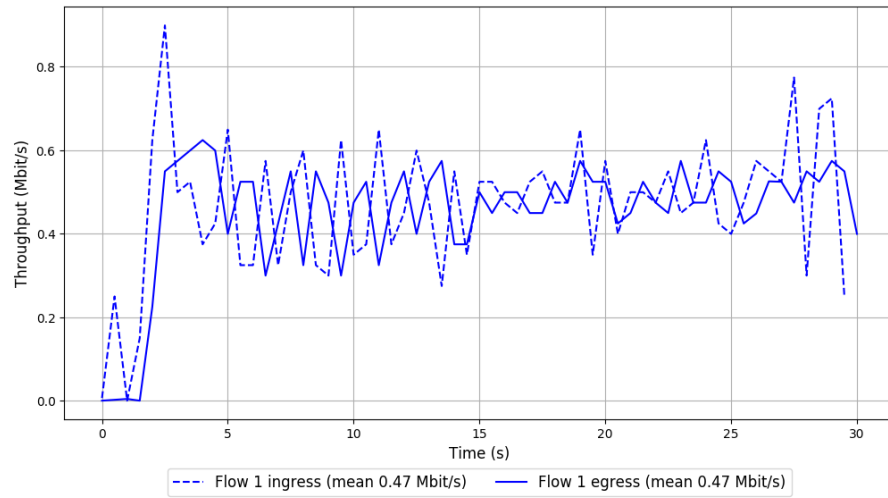
-- Flow 1:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 448.316 ms

Loss rate: 1.61%

Run 3: Report of Copa — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2019-02-20 04:05:13

End at: 2019-02-20 04:05:43

Local clock offset: -6.433 ms

Remote clock offset: 8.653 ms

Below is generated by plot.py at 2019-02-20 05:02:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 8113.458 ms

Loss rate: 31.24%

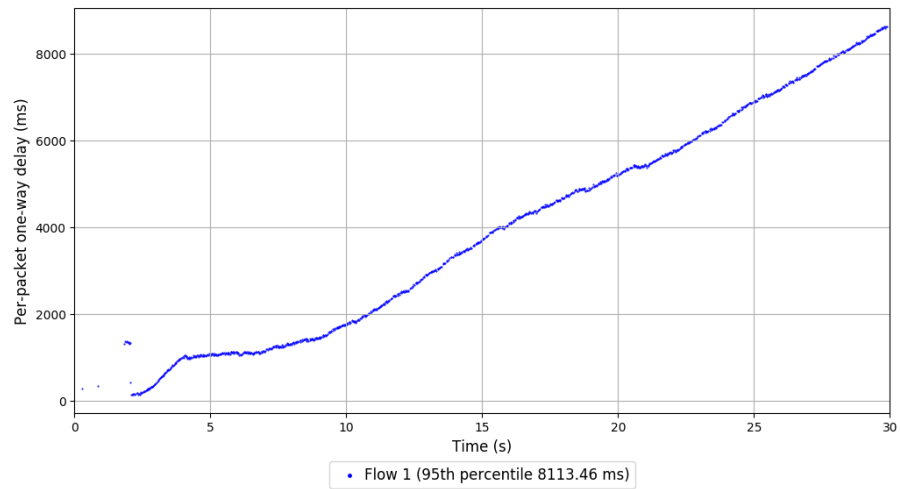
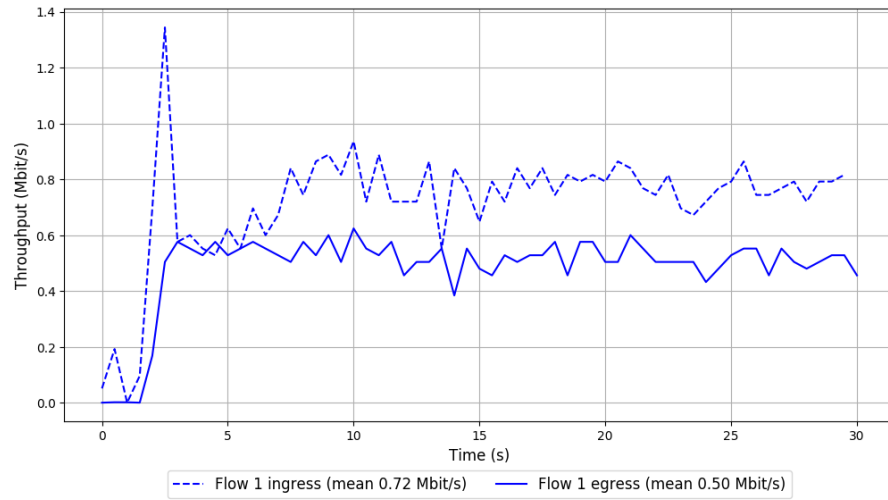
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 8113.458 ms

Loss rate: 31.24%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2019-02-20 04:30:02

End at: 2019-02-20 04:30:32

Local clock offset: -6.259 ms

Remote clock offset: 2.605 ms

Below is generated by plot.py at 2019-02-20 05:02:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 7696.521 ms

Loss rate: 31.08%

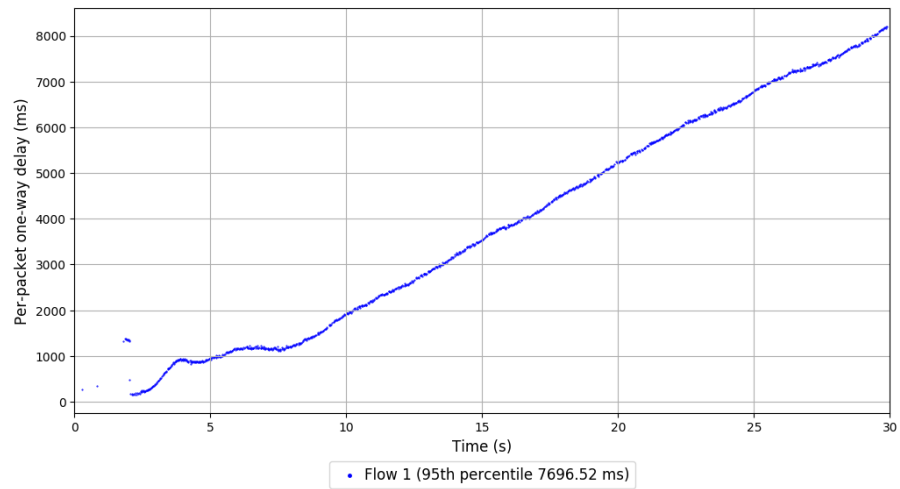
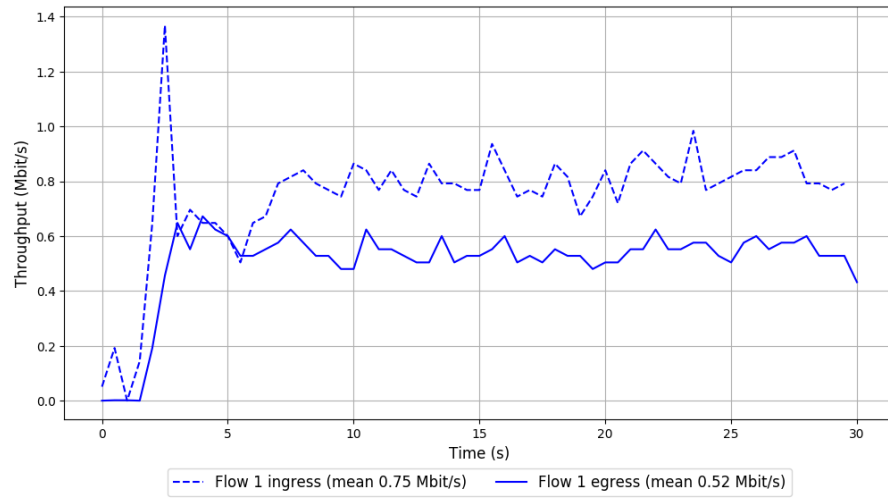
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 7696.521 ms

Loss rate: 31.08%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2019-02-20 04:54:33

End at: 2019-02-20 04:55:03

Local clock offset: -6.044 ms

Remote clock offset: 1.948 ms

Below is generated by plot.py at 2019-02-20 05:02:35

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 8061.533 ms

Loss rate: 31.12%

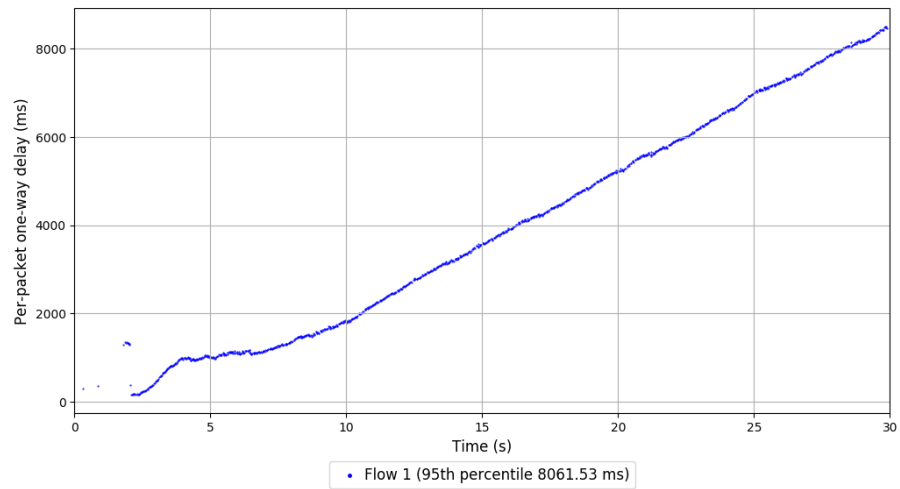
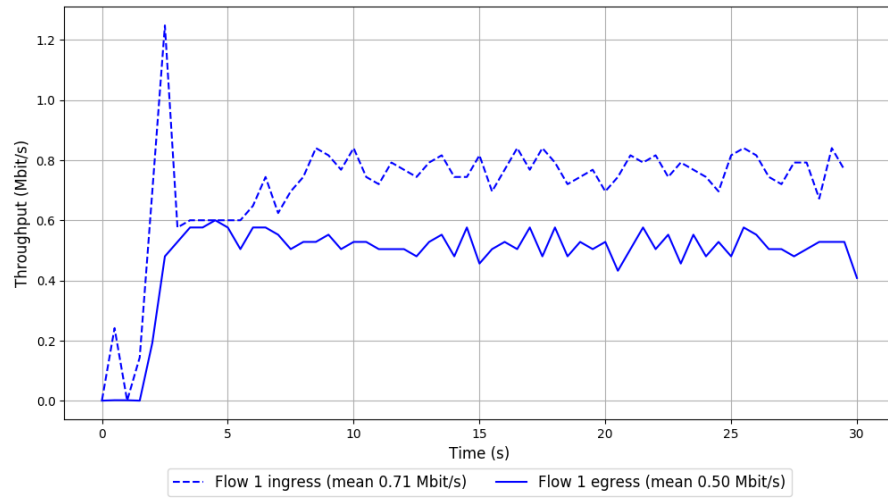
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 8061.533 ms

Loss rate: 31.12%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2019-02-20 03:58:15

End at: 2019-02-20 03:58:45

Local clock offset: -6.36 ms

Remote clock offset: 8.856 ms

Below is generated by plot.py at 2019-02-20 05:02:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 15547.875 ms

Loss rate: 26.08%

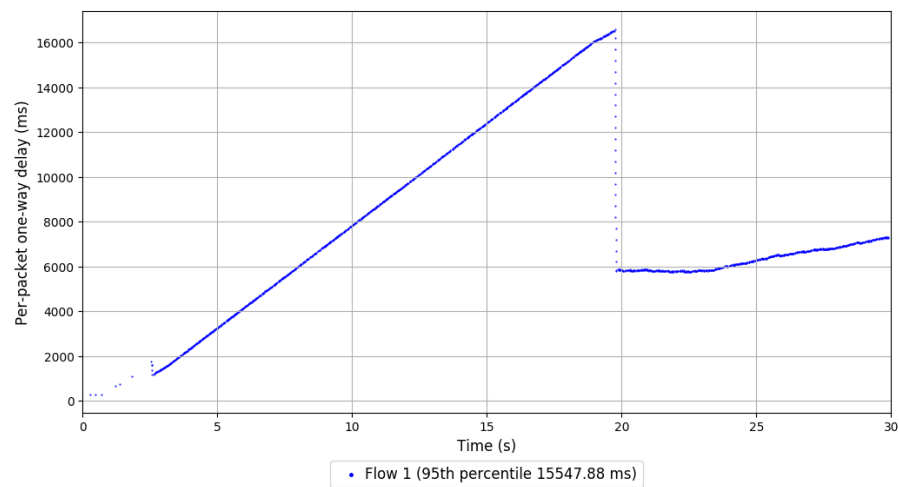
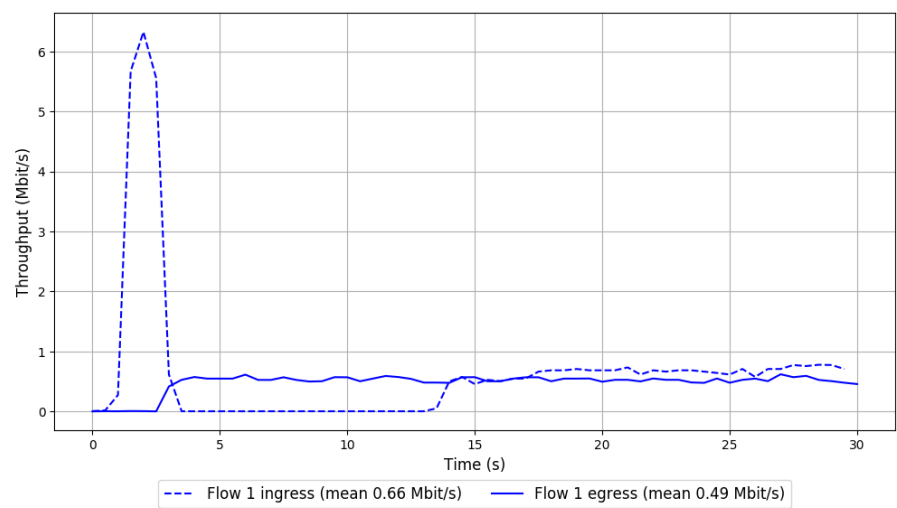
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 15547.875 ms

Loss rate: 26.08%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2019-02-20 04:22:46

End at: 2019-02-20 04:23:16

Local clock offset: -6.295 ms

Remote clock offset: 2.592 ms

Below is generated by plot.py at 2019-02-20 05:02:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 15568.279 ms

Loss rate: 27.25%

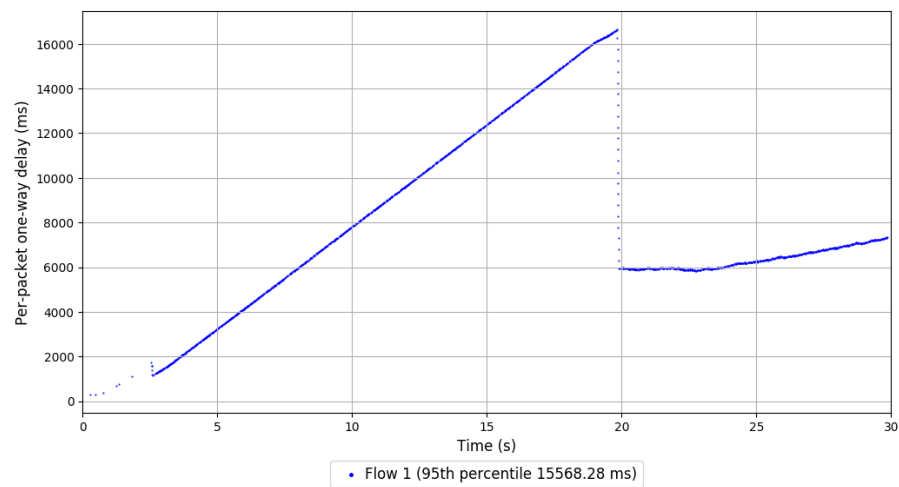
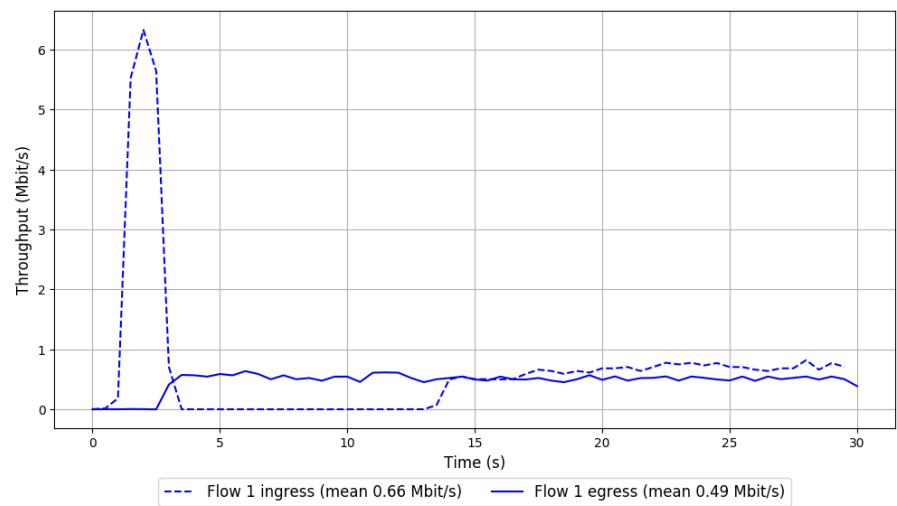
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 15568.279 ms

Loss rate: 27.25%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2019-02-20 04:47:35

End at: 2019-02-20 04:48:05

Local clock offset: -6.11 ms

Remote clock offset: 3.278 ms

Below is generated by plot.py at 2019-02-20 05:02:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 13762.699 ms

Loss rate: 23.14%

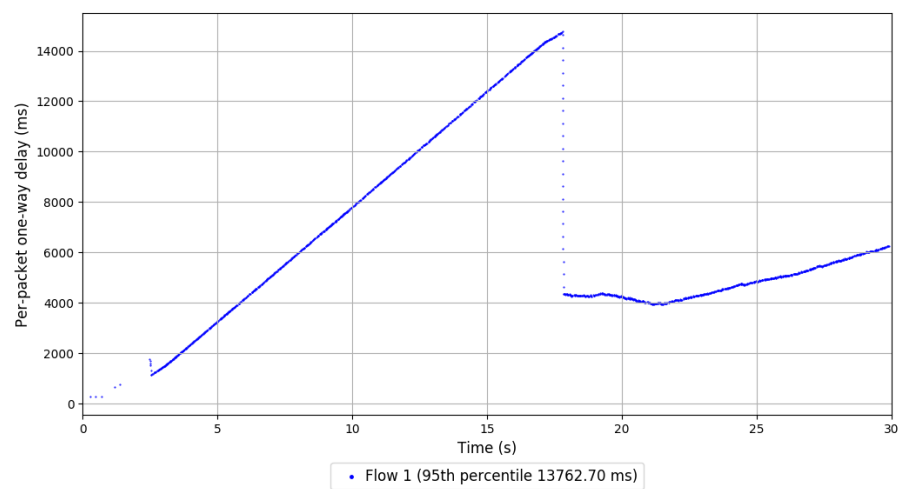
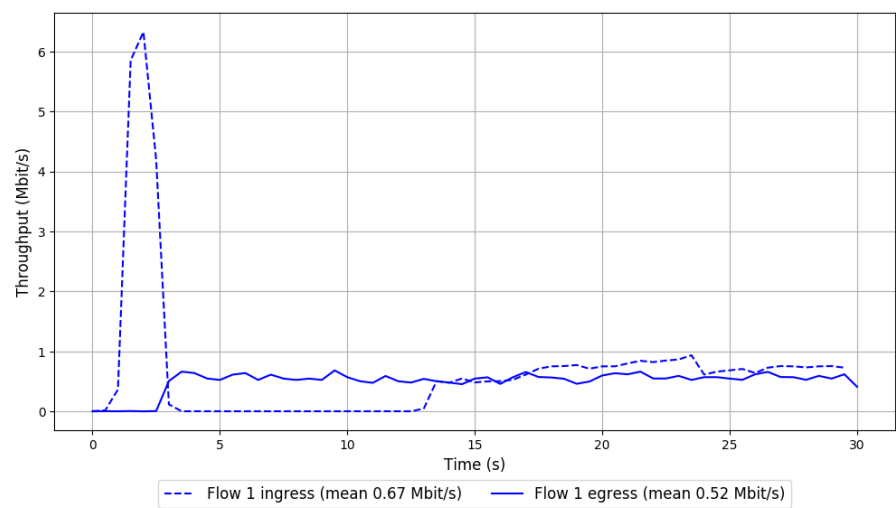
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 13762.699 ms

Loss rate: 23.14%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2019-02-20 03:53:37

End at: 2019-02-20 03:54:07

Local clock offset: -6.373 ms

Remote clock offset: 6.155 ms

Below is generated by plot.py at 2019-02-20 05:02:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 15573.223 ms

Loss rate: 19.62%

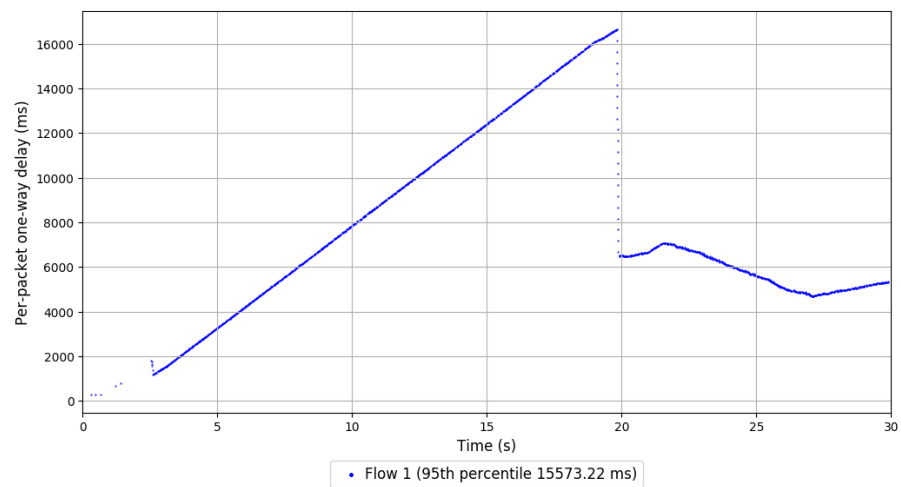
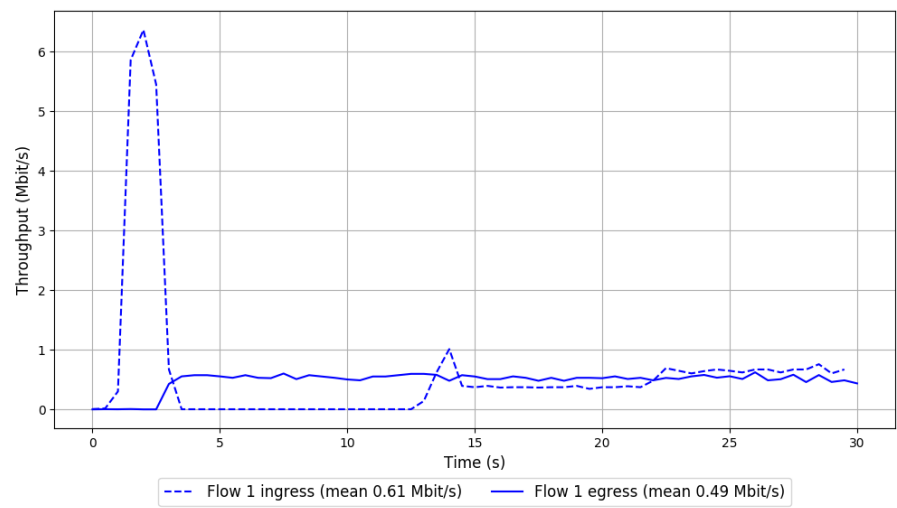
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 15573.223 ms

Loss rate: 19.62%

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2019-02-20 04:18:10

End at: 2019-02-20 04:18:40

Local clock offset: -6.318 ms

Remote clock offset: 2.295 ms

Below is generated by plot.py at 2019-02-20 05:02:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 15102.376 ms

Loss rate: 16.99%

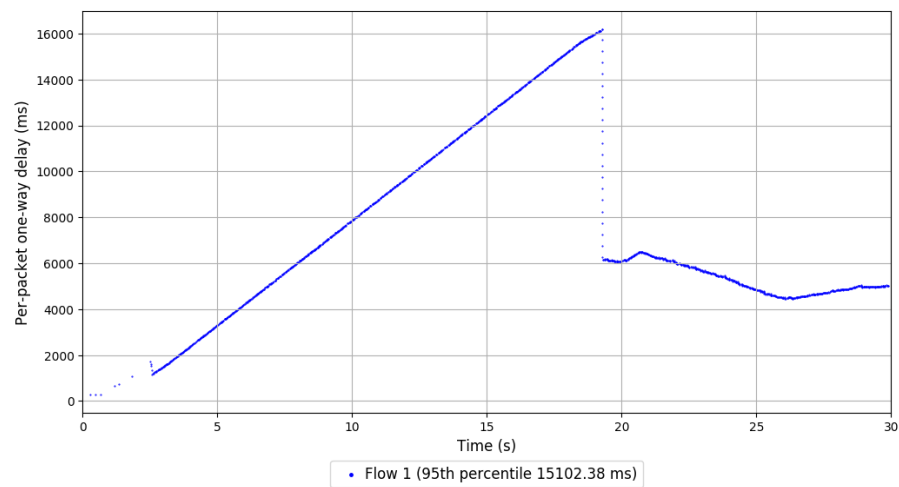
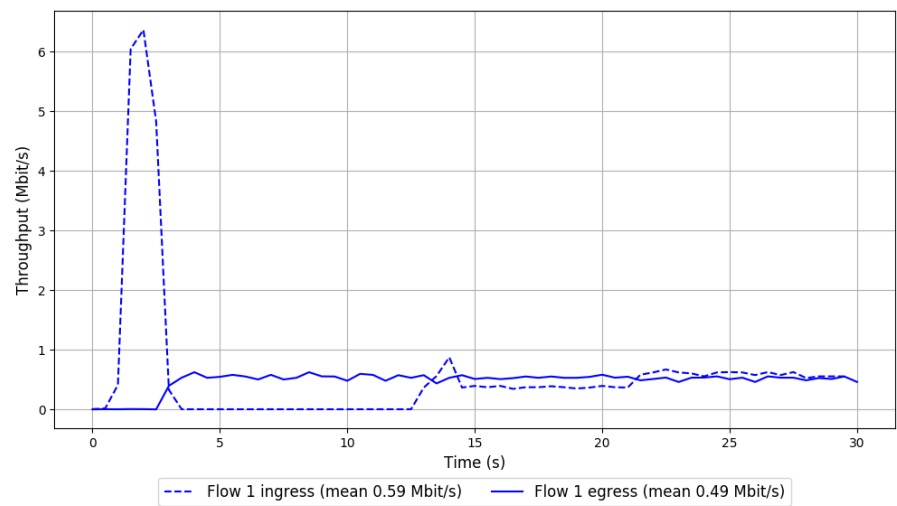
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 15102.376 ms

Loss rate: 16.99%

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2019-02-20 04:42:56

End at: 2019-02-20 04:43:26

Local clock offset: -6.195 ms

Remote clock offset: 2.295 ms

Below is generated by plot.py at 2019-02-20 05:02:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 15145.578 ms

Loss rate: 15.98%

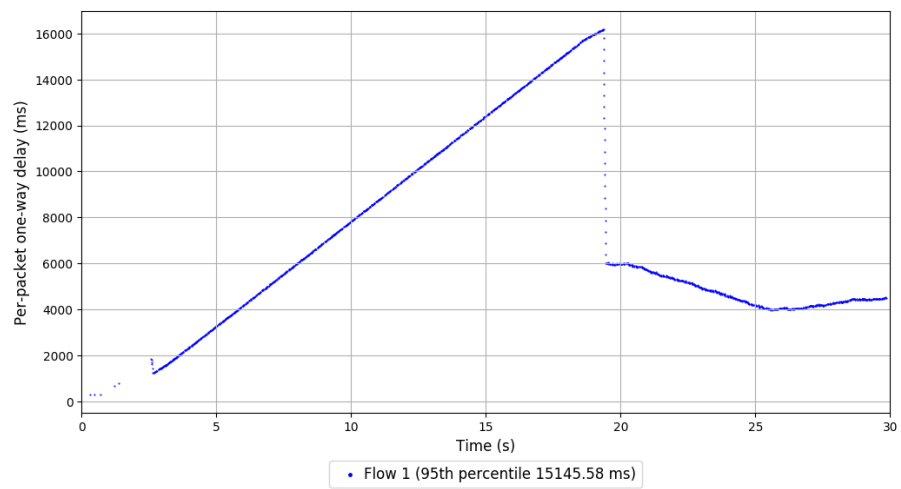
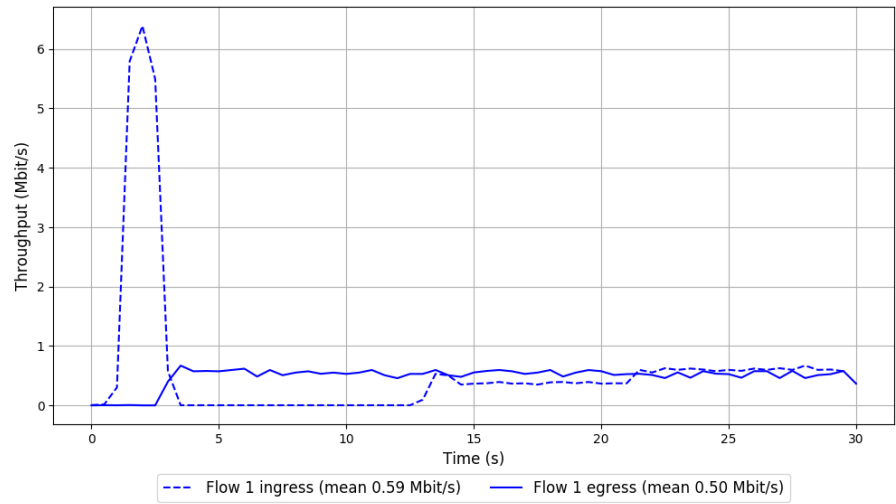
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 15145.578 ms

Loss rate: 15.98%

Run 3: Report of FillP-Sheep — Data Link



Run 1: Statistics of Indigo

Start at: 2019-02-20 04:10:12

End at: 2019-02-20 04:10:42

Local clock offset: -6.341 ms

Remote clock offset: 7.488 ms

Below is generated by plot.py at 2019-02-20 05:02:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 369.773 ms

Loss rate: 0.85%

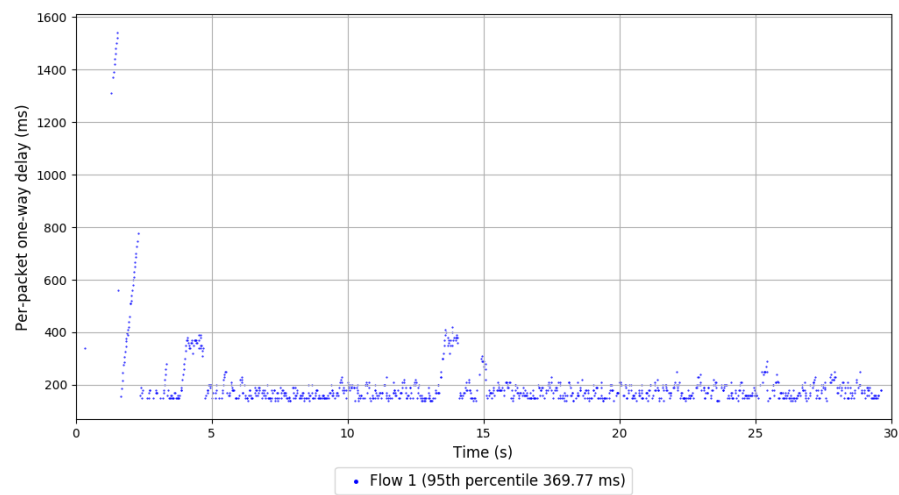
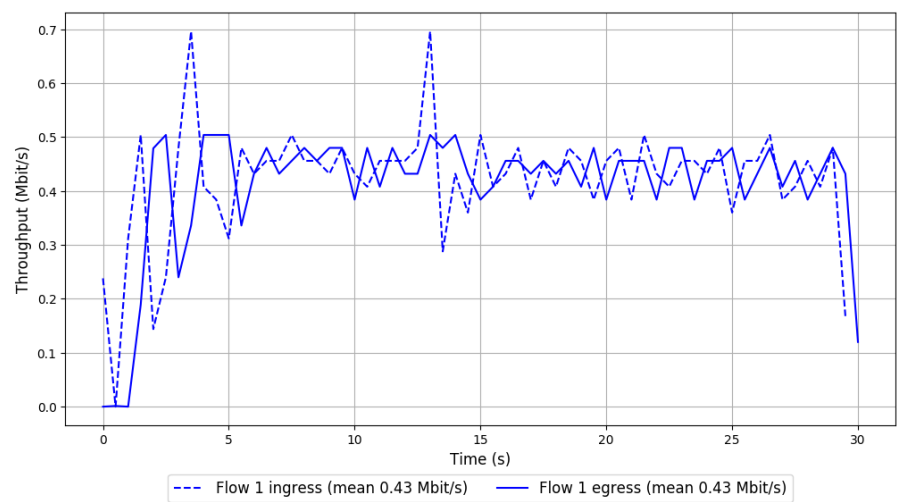
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 369.773 ms

Loss rate: 0.85%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2019-02-20 04:34:42

End at: 2019-02-20 04:35:12

Local clock offset: -6.208 ms

Remote clock offset: 7.838 ms

Below is generated by plot.py at 2019-02-20 05:02:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 297.996 ms

Loss rate: 0.83%

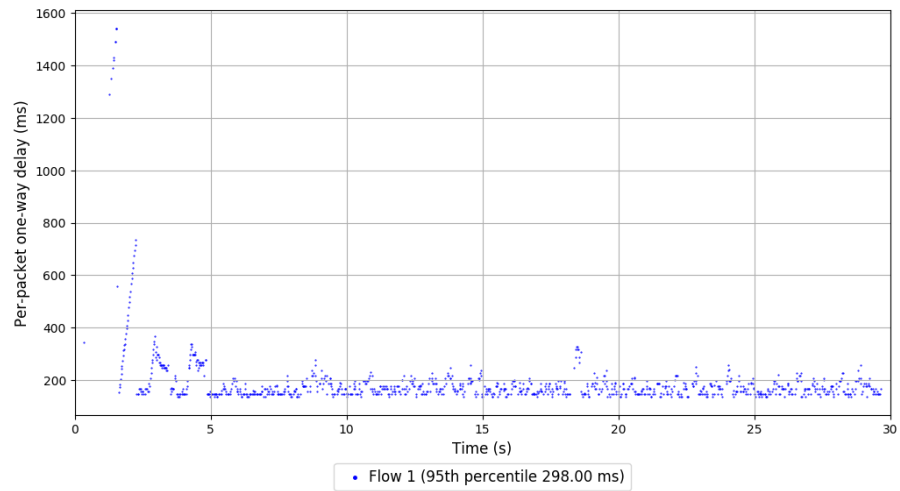
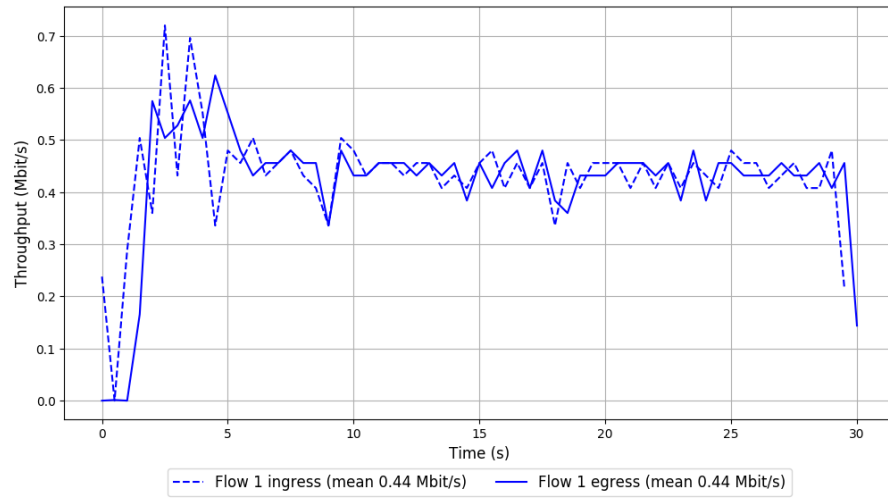
-- Flow 1:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 297.996 ms

Loss rate: 0.83%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2019-02-20 04:59:34

End at: 2019-02-20 05:00:04

Local clock offset: -6.113 ms

Remote clock offset: 3.31 ms

Below is generated by plot.py at 2019-02-20 05:02:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 348.094 ms

Loss rate: 0.38%

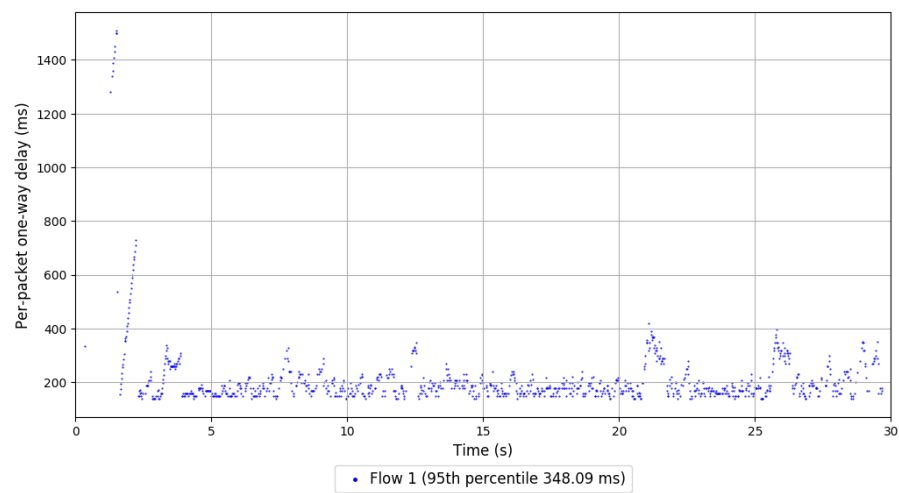
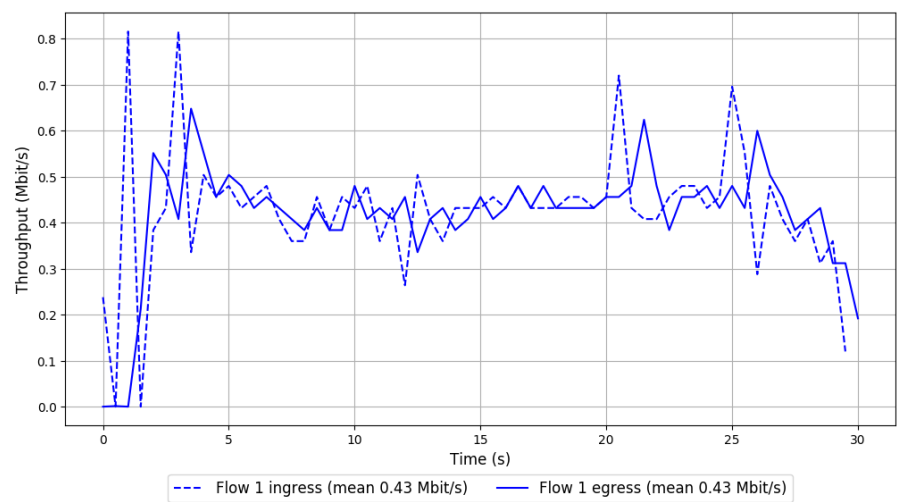
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 348.094 ms

Loss rate: 0.38%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Indigo-MusesC3

Start at: 2019-02-20 03:55:53

End at: 2019-02-20 03:56:23

Local clock offset: -6.365 ms

Remote clock offset: 2.747 ms

Below is generated by plot.py at 2019-02-20 05:02:41

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 23746.181 ms

Loss rate: 93.96%

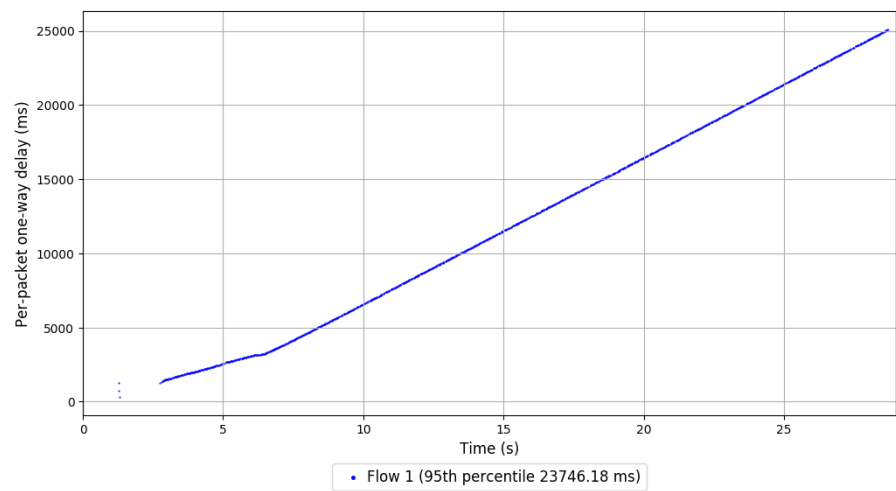
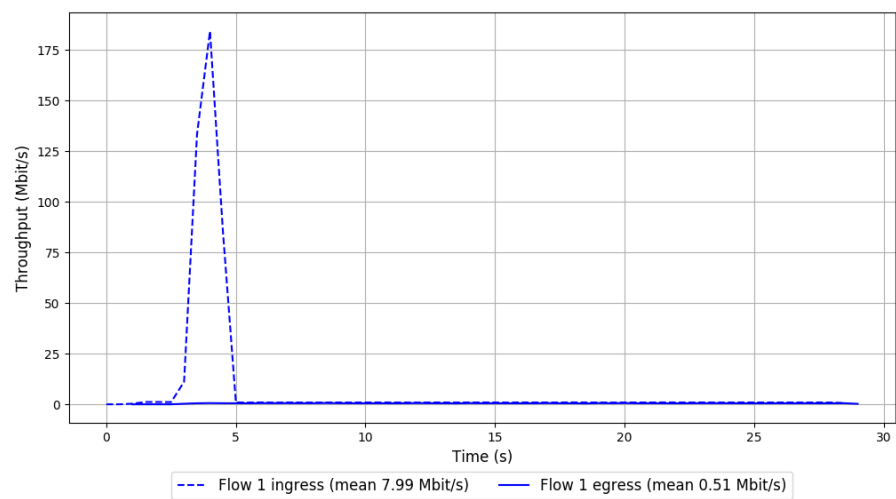
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 23746.181 ms

Loss rate: 93.96%

Run 1: Report of Indigo-MusesC3 — Data Link



Run 2: Statistics of Indigo-MusesC3

Start at: 2019-02-20 04:20:26

End at: 2019-02-20 04:20:56

Local clock offset: -6.371 ms

Remote clock offset: 6.094 ms

Below is generated by plot.py at 2019-02-20 05:02:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 23924.582 ms

Loss rate: 93.47%

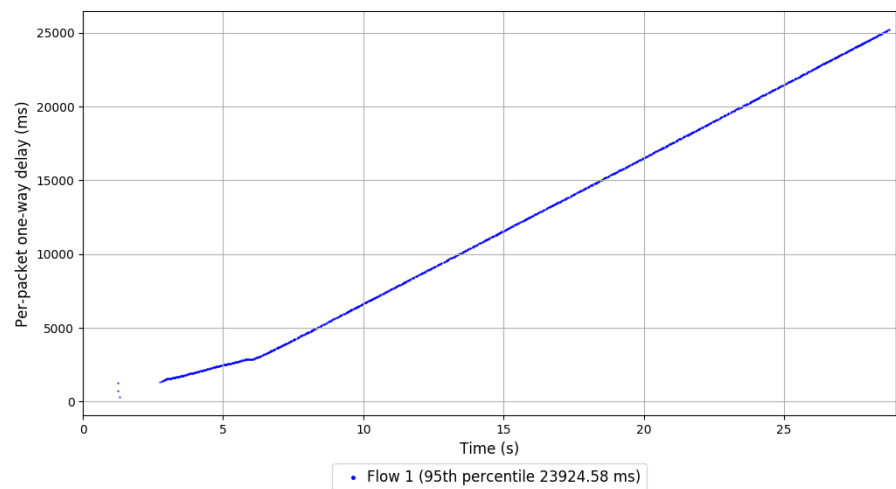
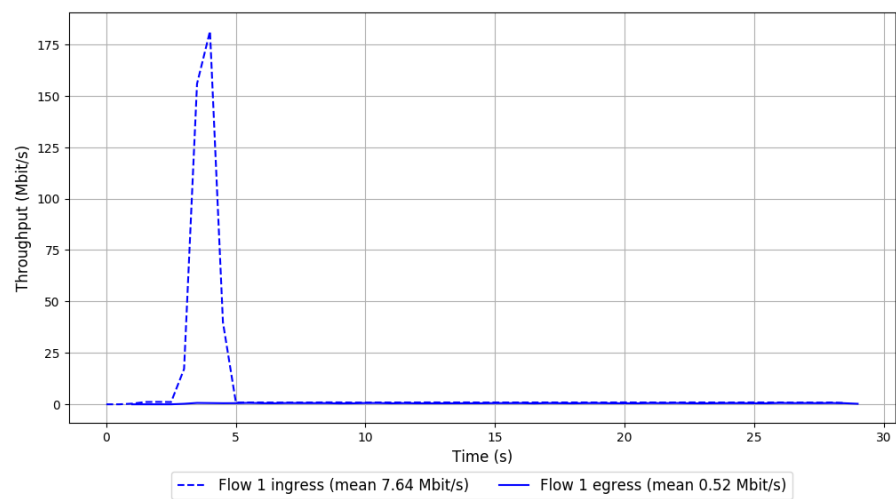
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 23924.582 ms

Loss rate: 93.47%

Run 2: Report of Indigo-MusesC3 — Data Link



Run 3: Statistics of Indigo-MusesC3

Start at: 2019-02-20 04:45:12

End at: 2019-02-20 04:45:42

Local clock offset: -6.132 ms

Remote clock offset: 6.796 ms

Below is generated by plot.py at 2019-02-20 05:02:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 23805.929 ms

Loss rate: 94.22%

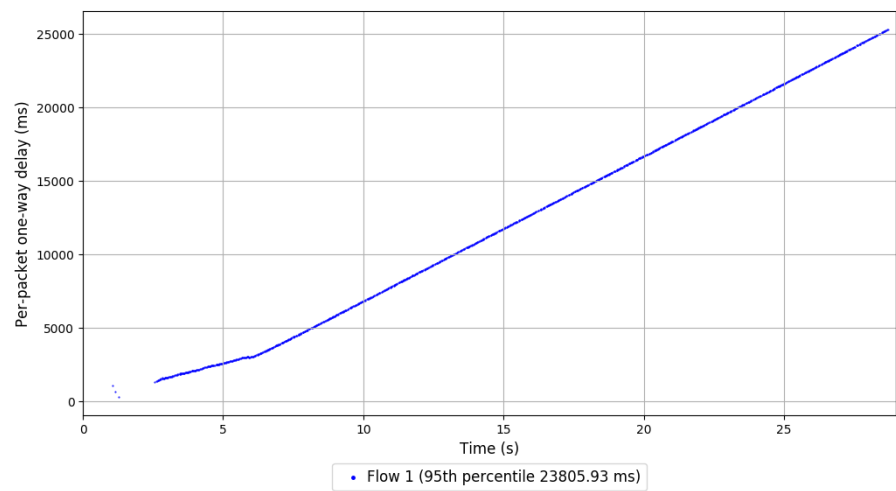
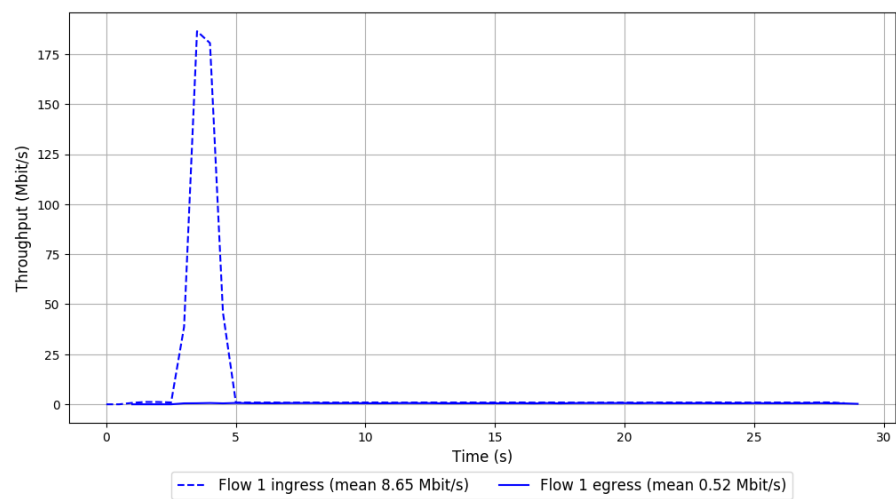
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 23805.929 ms

Loss rate: 94.22%

Run 3: Report of Indigo-MusesC3 — Data Link



Run 1: Statistics of Indigo-MusesC5

Start at: 2019-02-20 04:04:05

End at: 2019-02-20 04:04:35

Local clock offset: -6.365 ms

Remote clock offset: 6.588 ms

Below is generated by plot.py at 2019-02-20 05:02:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 11294.618 ms

Loss rate: 42.20%

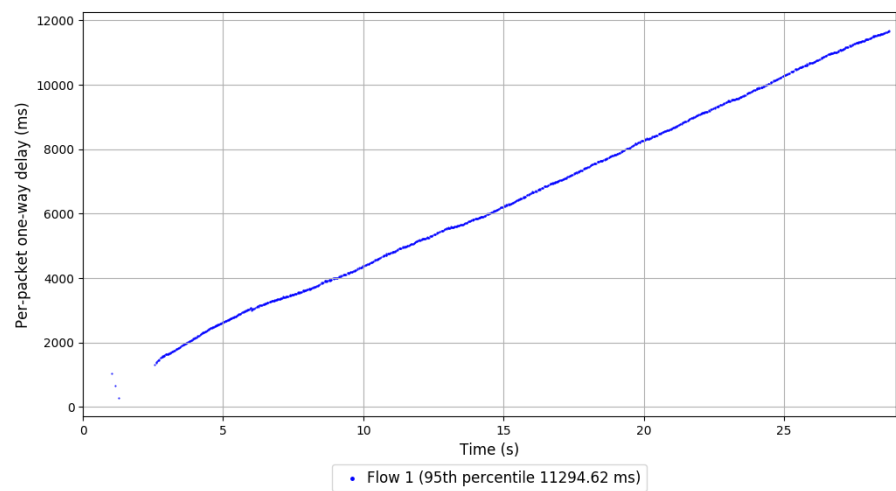
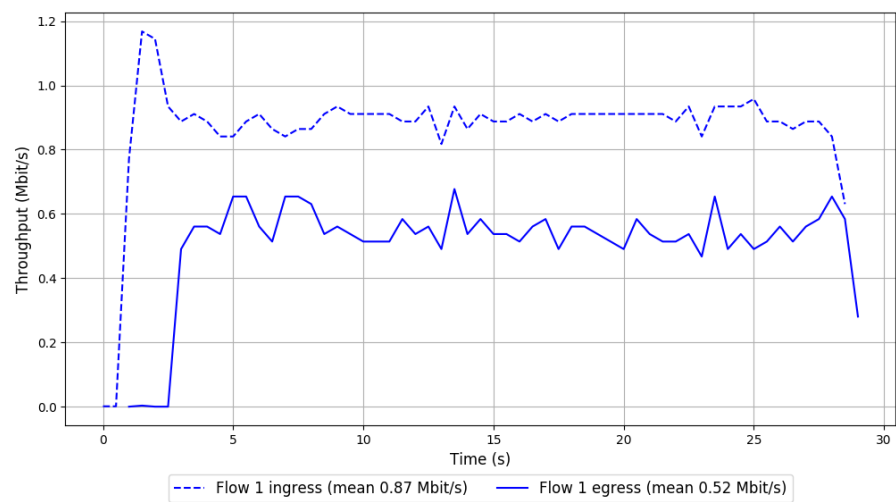
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 11294.618 ms

Loss rate: 42.20%

Run 1: Report of Indigo-MusesC5 — Data Link



Run 2: Statistics of Indigo-MusesC5

Start at: 2019-02-20 04:28:53

End at: 2019-02-20 04:29:23

Local clock offset: -6.321 ms

Remote clock offset: 7.709 ms

Below is generated by plot.py at 2019-02-20 05:02:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 11182.589 ms

Loss rate: 42.47%

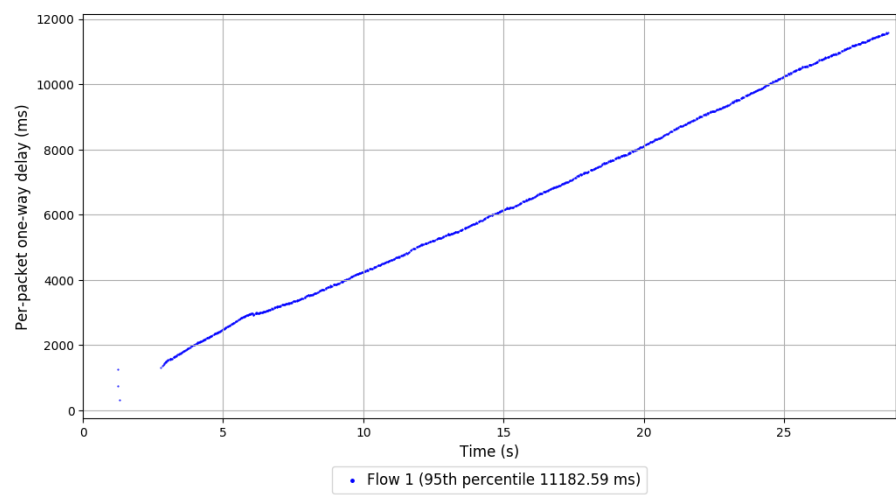
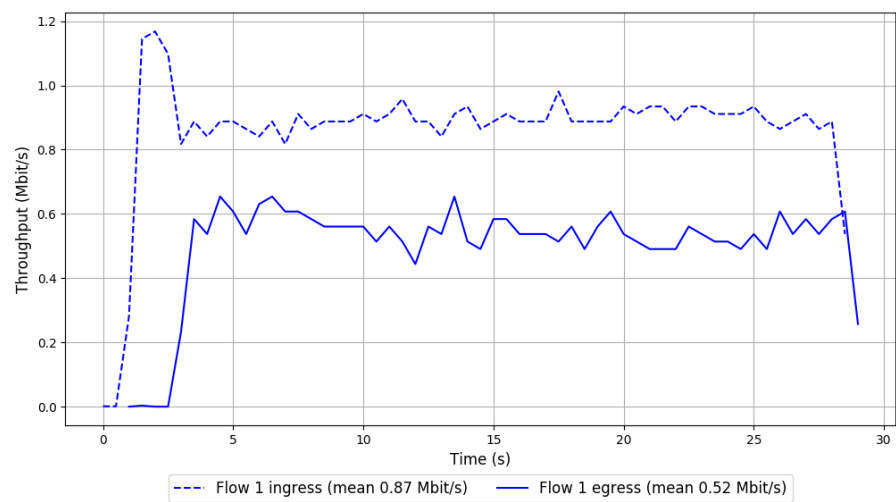
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 11182.589 ms

Loss rate: 42.47%

Run 2: Report of Indigo-MusesC5 — Data Link



Run 3: Statistics of Indigo-MusesC5

Start at: 2019-02-20 04:53:25

End at: 2019-02-20 04:53:55

Local clock offset: -6.065 ms

Remote clock offset: 1.953 ms

Below is generated by plot.py at 2019-02-20 05:02:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 12216.960 ms

Loss rate: 46.65%

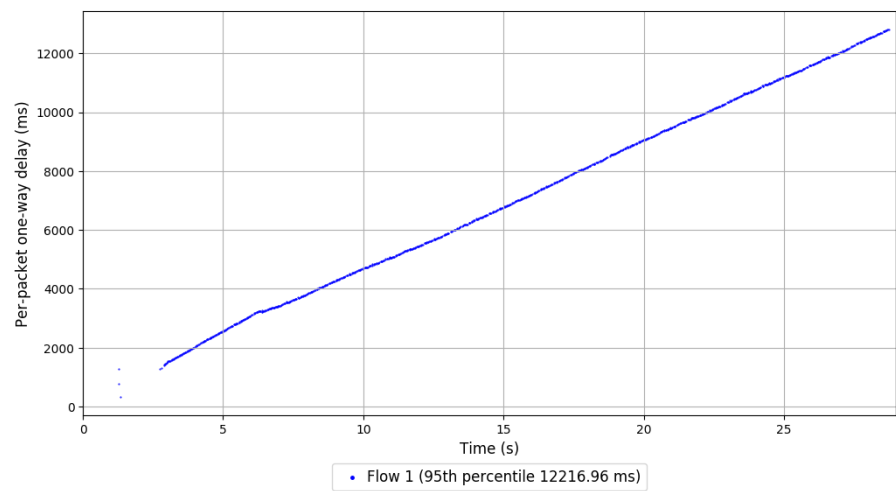
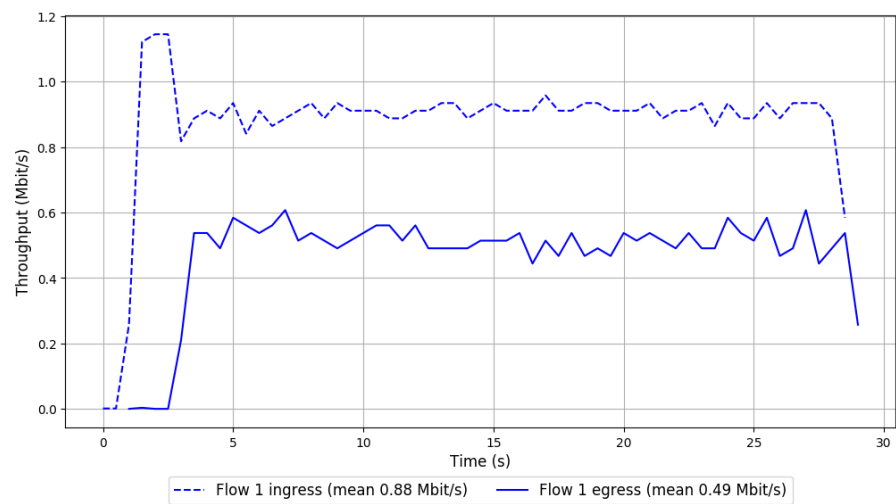
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 12216.960 ms

Loss rate: 46.65%

Run 3: Report of Indigo-MusesC5 — Data Link



Run 1: Statistics of Indigo-MusesD

Start at: 2019-02-20 03:59:23

End at: 2019-02-20 03:59:53

Local clock offset: -6.427 ms

Remote clock offset: 2.576 ms

Below is generated by plot.py at 2019-02-20 05:02:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 23022.045 ms

Loss rate: 92.17%

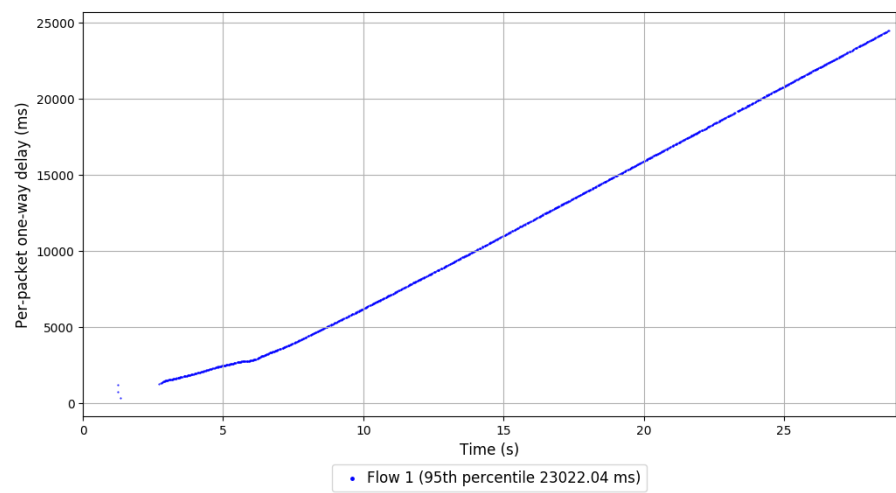
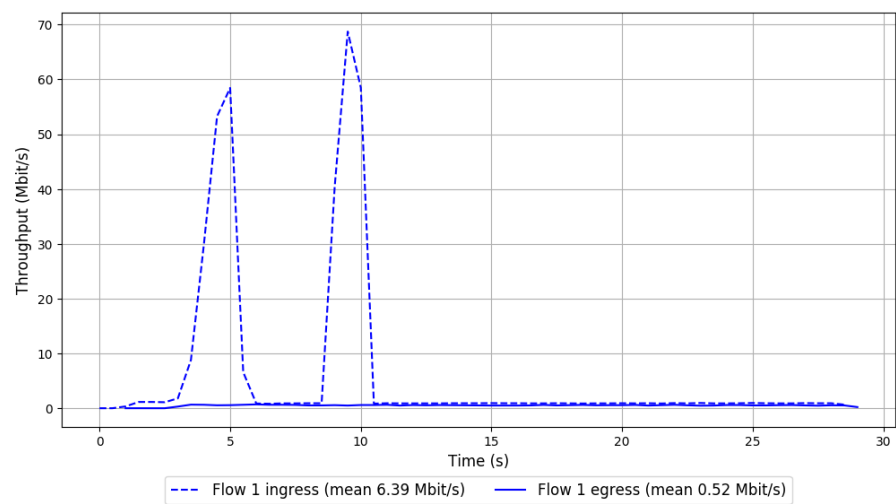
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 23022.045 ms

Loss rate: 92.17%

Run 1: Report of Indigo-MusesD — Data Link



Run 2: Statistics of Indigo-MusesD

Start at: 2019-02-20 04:23:54

End at: 2019-02-20 04:24:24

Local clock offset: -6.355 ms

Remote clock offset: 7.647 ms

Below is generated by plot.py at 2019-02-20 05:02:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 23299.791 ms

Loss rate: 92.39%

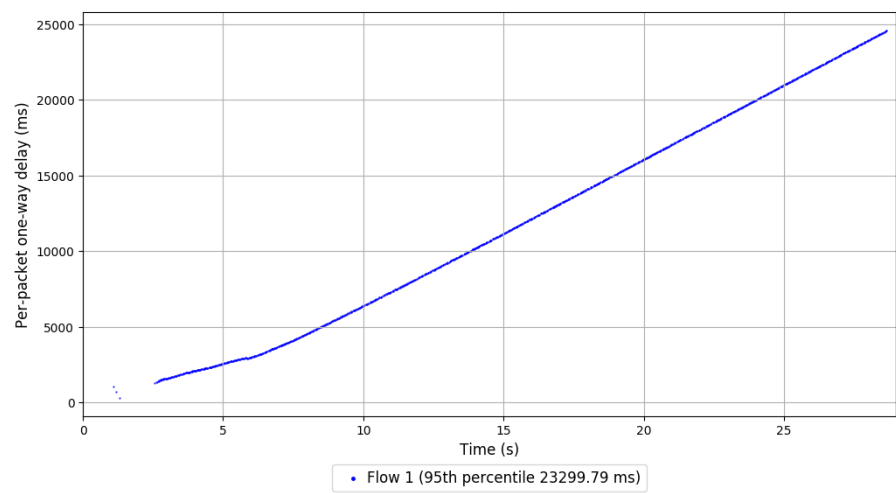
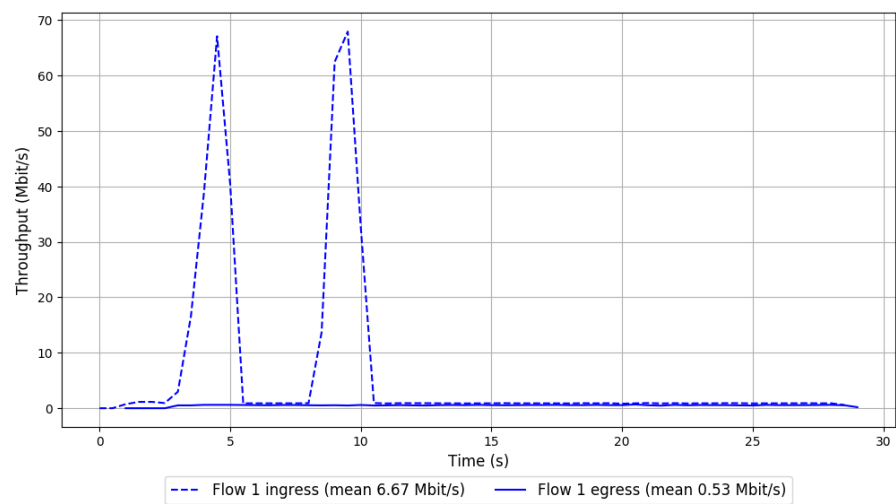
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 23299.791 ms

Loss rate: 92.39%

Run 2: Report of Indigo-MusesD — Data Link



Run 3: Statistics of Indigo-MusesD

Start at: 2019-02-20 04:48:44

End at: 2019-02-20 04:49:14

Local clock offset: -6.171 ms

Remote clock offset: 8.229 ms

Below is generated by plot.py at 2019-02-20 05:02:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 23356.795 ms

Loss rate: 89.74%

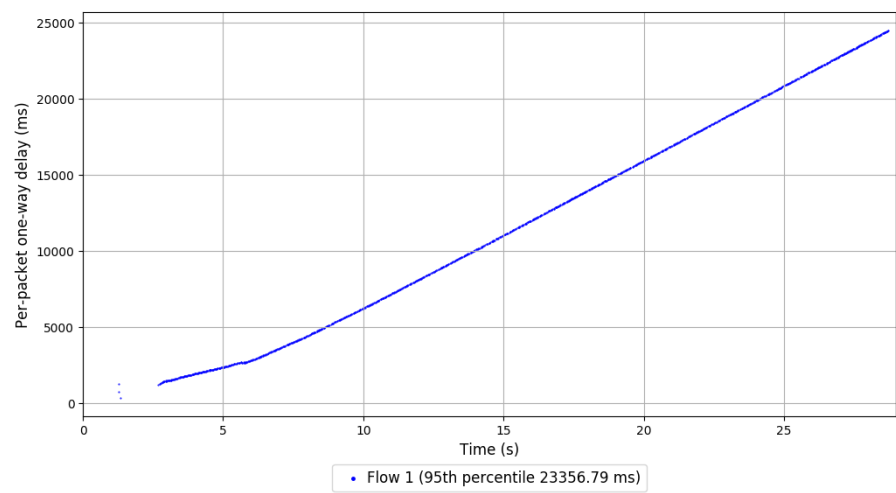
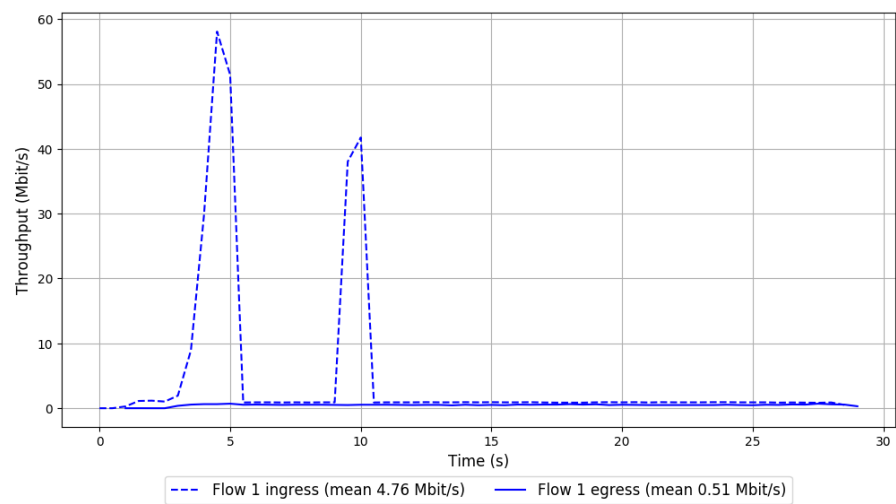
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 23356.795 ms

Loss rate: 89.74%

Run 3: Report of Indigo-MusesD — Data Link



Run 1: Statistics of Indigo-MusesT

Start at: 2019-02-20 04:00:35

End at: 2019-02-20 04:01:05

Local clock offset: -6.348 ms

Remote clock offset: 3.747 ms

Below is generated by plot.py at 2019-02-20 05:02:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 23781.671 ms

Loss rate: 88.59%

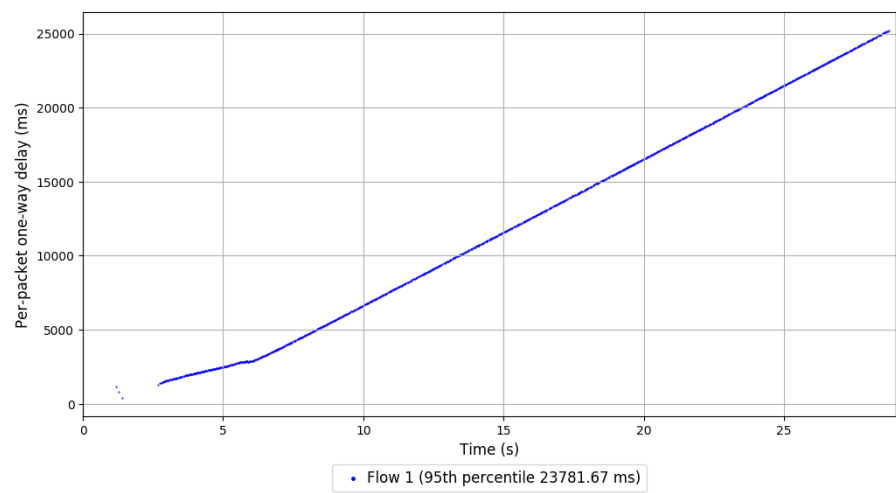
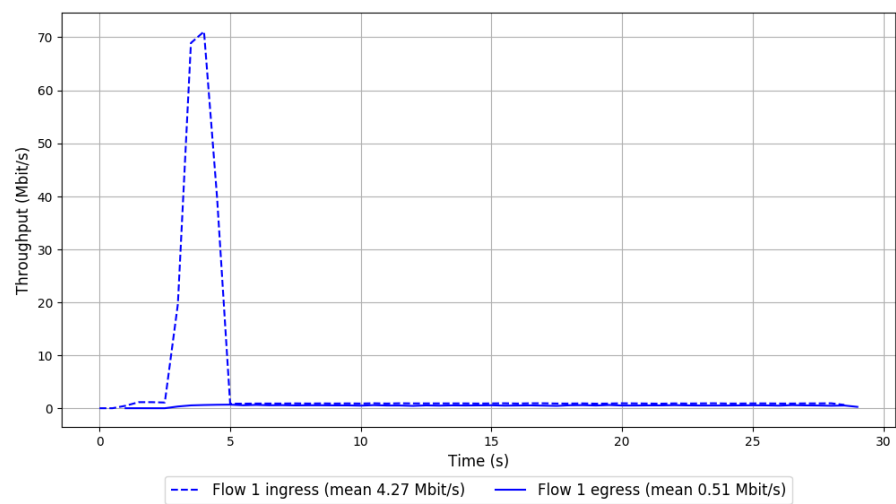
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 23781.671 ms

Loss rate: 88.59%

Run 1: Report of Indigo-MusesT — Data Link



Run 2: Statistics of Indigo-MusesT

Start at: 2019-02-20 04:25:06

End at: 2019-02-20 04:25:36

Local clock offset: -6.27 ms

Remote clock offset: 7.376 ms

Below is generated by plot.py at 2019-02-20 05:02:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 23794.441 ms

Loss rate: 84.99%

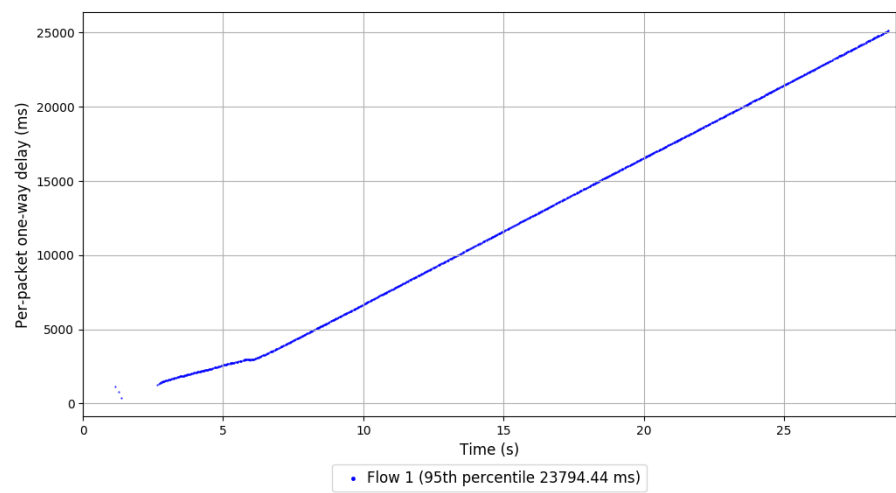
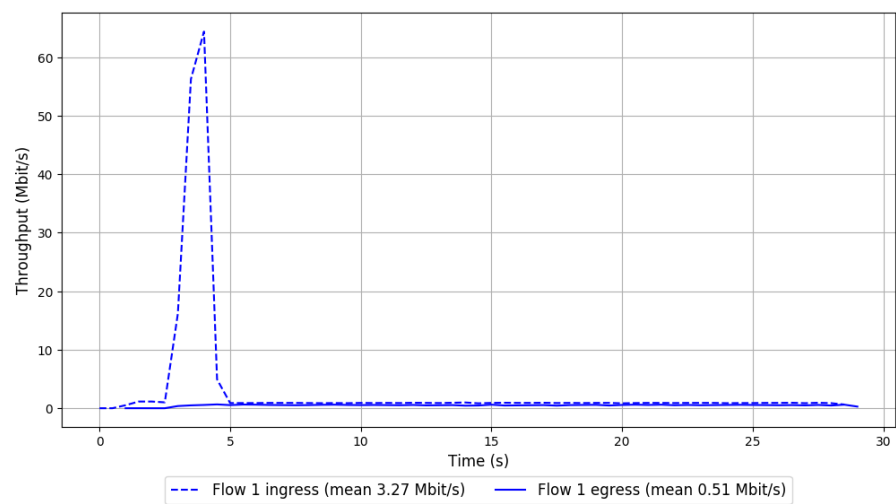
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 23794.441 ms

Loss rate: 84.99%

Run 2: Report of Indigo-MusesT — Data Link



Run 3: Statistics of Indigo-MusesT

Start at: 2019-02-20 04:49:57

End at: 2019-02-20 04:50:27

Local clock offset: -6.085 ms

Remote clock offset: 7.256 ms

Below is generated by plot.py at 2019-02-20 05:02:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 24090.372 ms

Loss rate: 87.38%

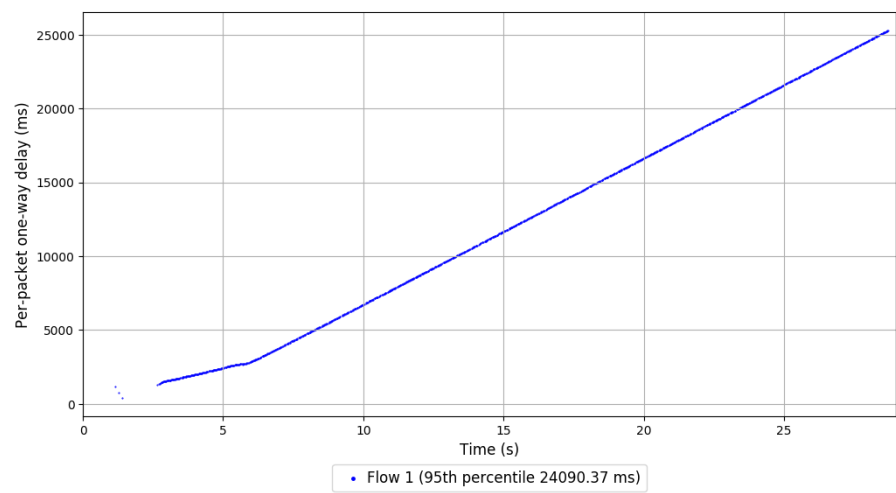
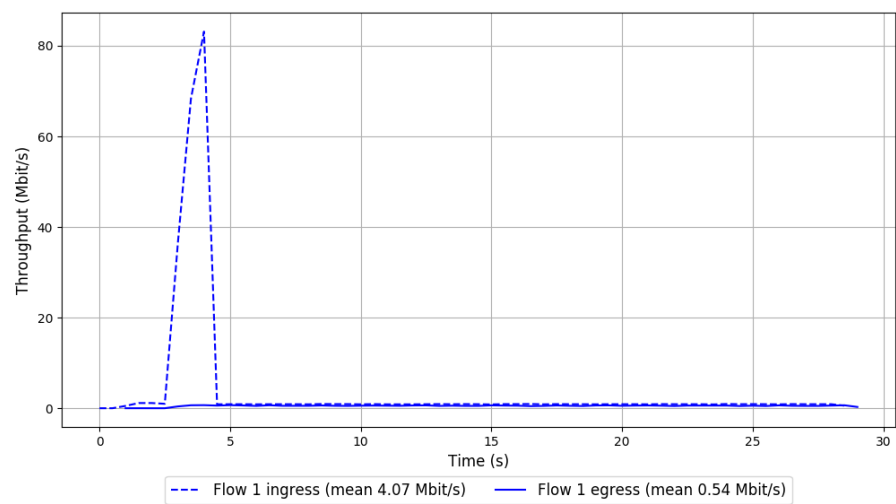
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 24090.372 ms

Loss rate: 87.38%

Run 3: Report of Indigo-MusesT — Data Link



Run 1: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-02-20T03-48-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

Start at: 2019-02-20 04:33:34

End at: 2019-02-20 04:34:04

Local clock offset: -6.217 ms

Remote clock offset: 2.652 ms

Below is generated by plot.py at 2019-02-20 05:02:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 311.614 ms

Loss rate: 1.18%

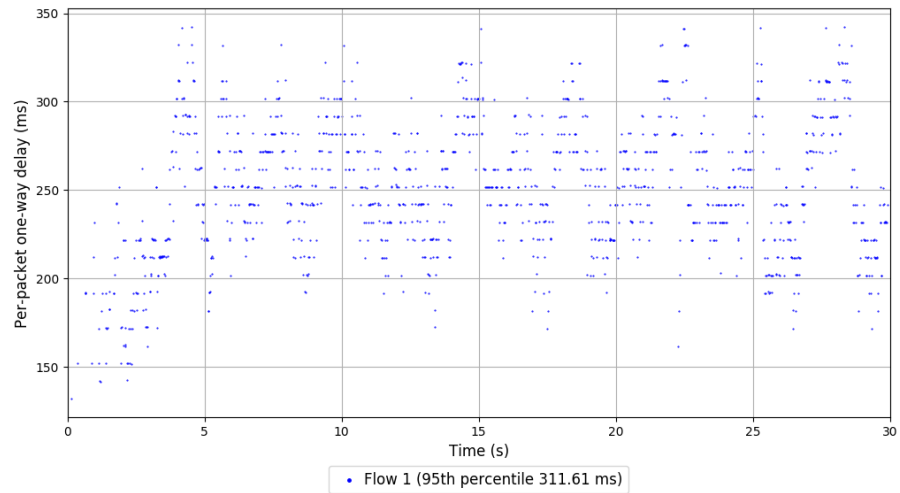
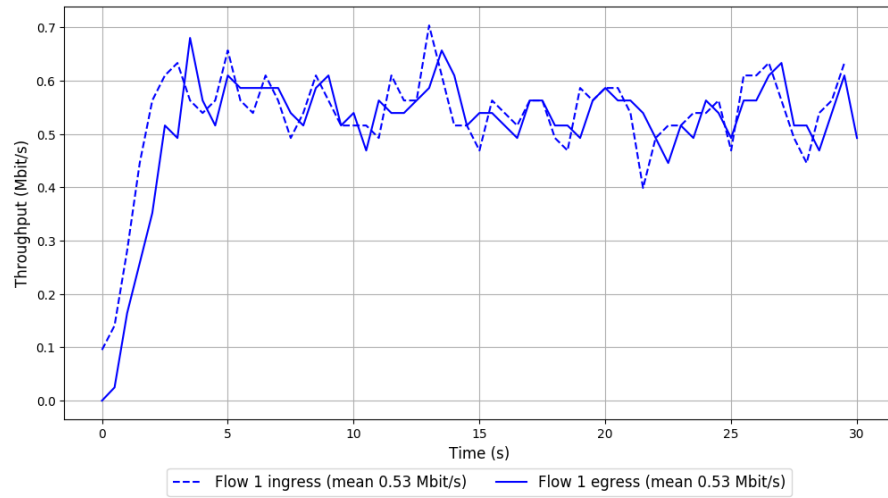
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 311.614 ms

Loss rate: 1.18%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-02-20T03-48-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 PCC-Allegro

Start at: 2019-02-20 04:11:20

End at: 2019-02-20 04:11:50

Local clock offset: -6.336 ms

Remote clock offset: 7.37 ms

Below is generated by plot.py at 2019-02-20 05:03:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 26148.671 ms

Loss rate: 98.58%

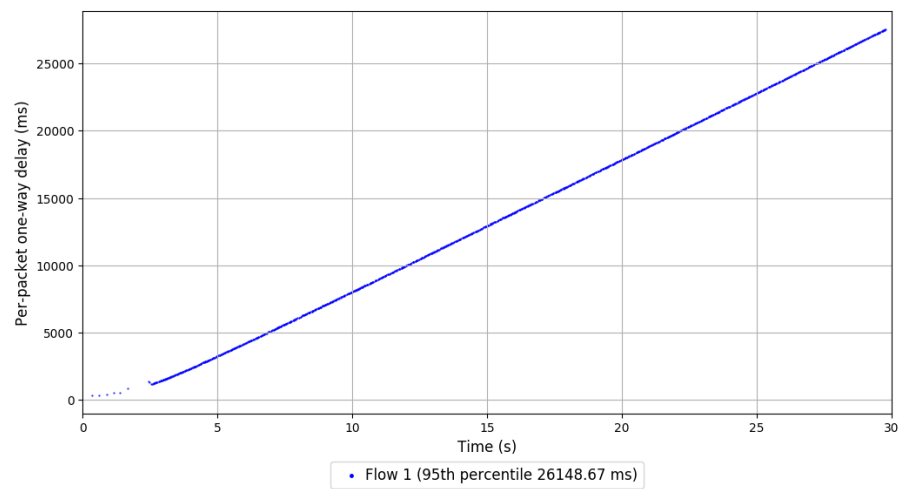
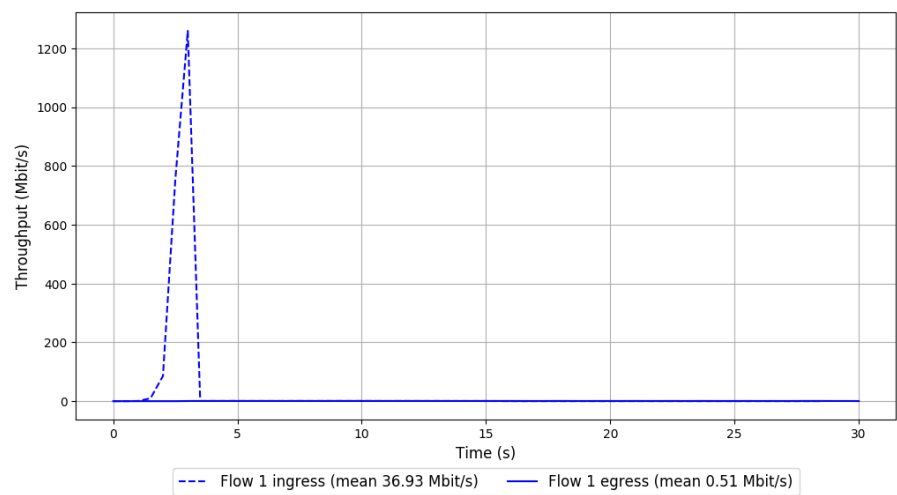
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 26148.671 ms

Loss rate: 98.58%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2019-02-20 04:35:50

End at: 2019-02-20 04:36:20

Local clock offset: -6.195 ms

Remote clock offset: 3.721 ms

Below is generated by plot.py at 2019-02-20 05:03:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 26227.876 ms

Loss rate: 98.66%

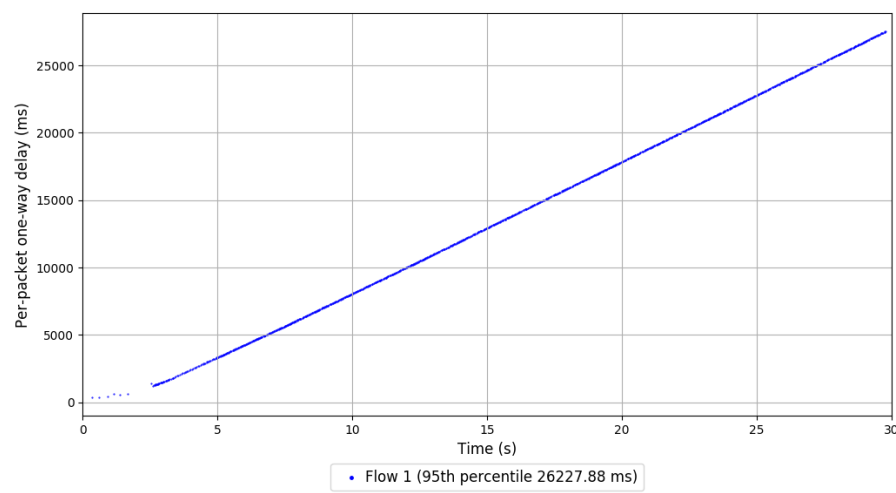
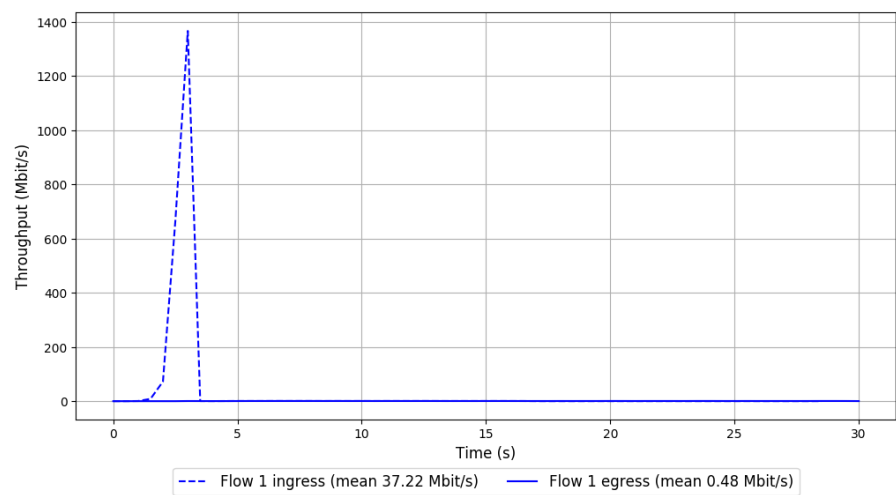
-- Flow 1:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 26227.876 ms

Loss rate: 98.66%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2019-02-20 05:00:42

End at: 2019-02-20 05:01:12

Local clock offset: -6.136 ms

Remote clock offset: 6.98 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 26289.540 ms

Loss rate: 98.64%

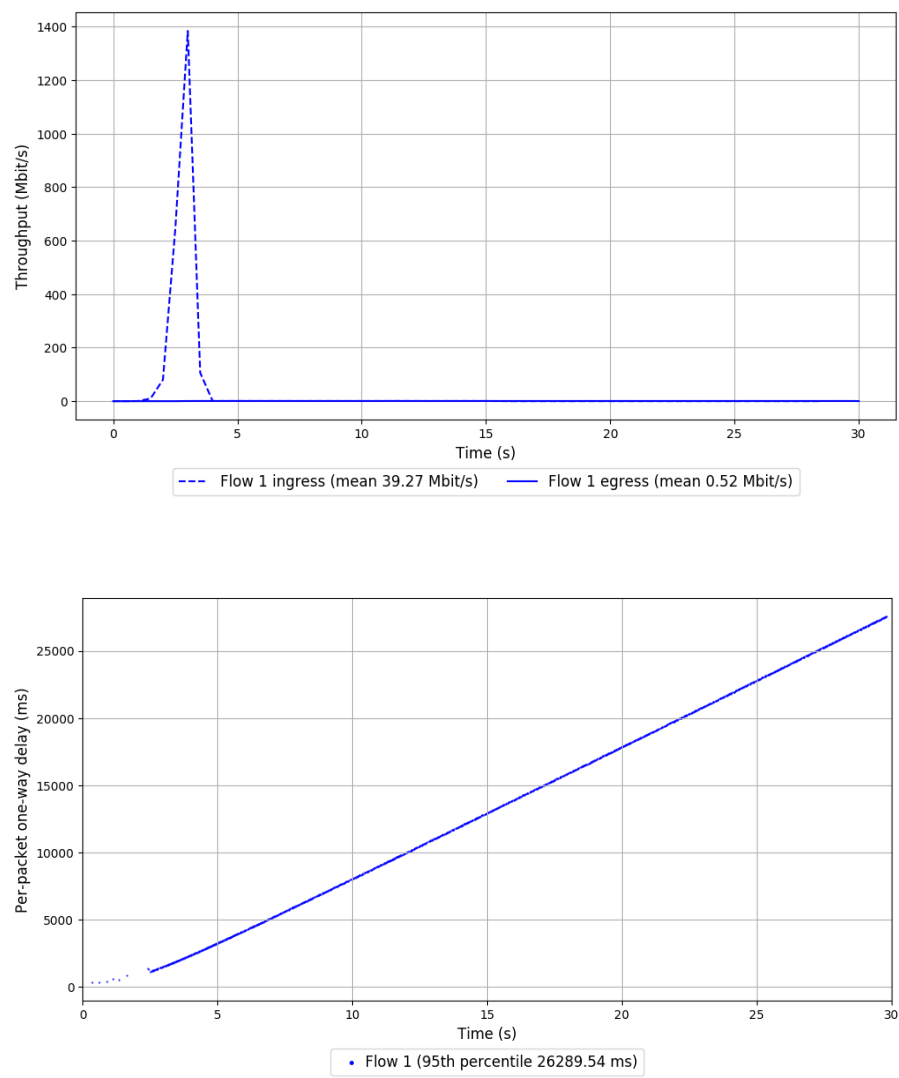
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 26289.540 ms

Loss rate: 98.64%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

Start at: 2019-02-20 04:06:21

End at: 2019-02-20 04:06:51

Local clock offset: -6.361 ms

Remote clock offset: 2.356 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 25834.024 ms

Loss rate: 91.57%

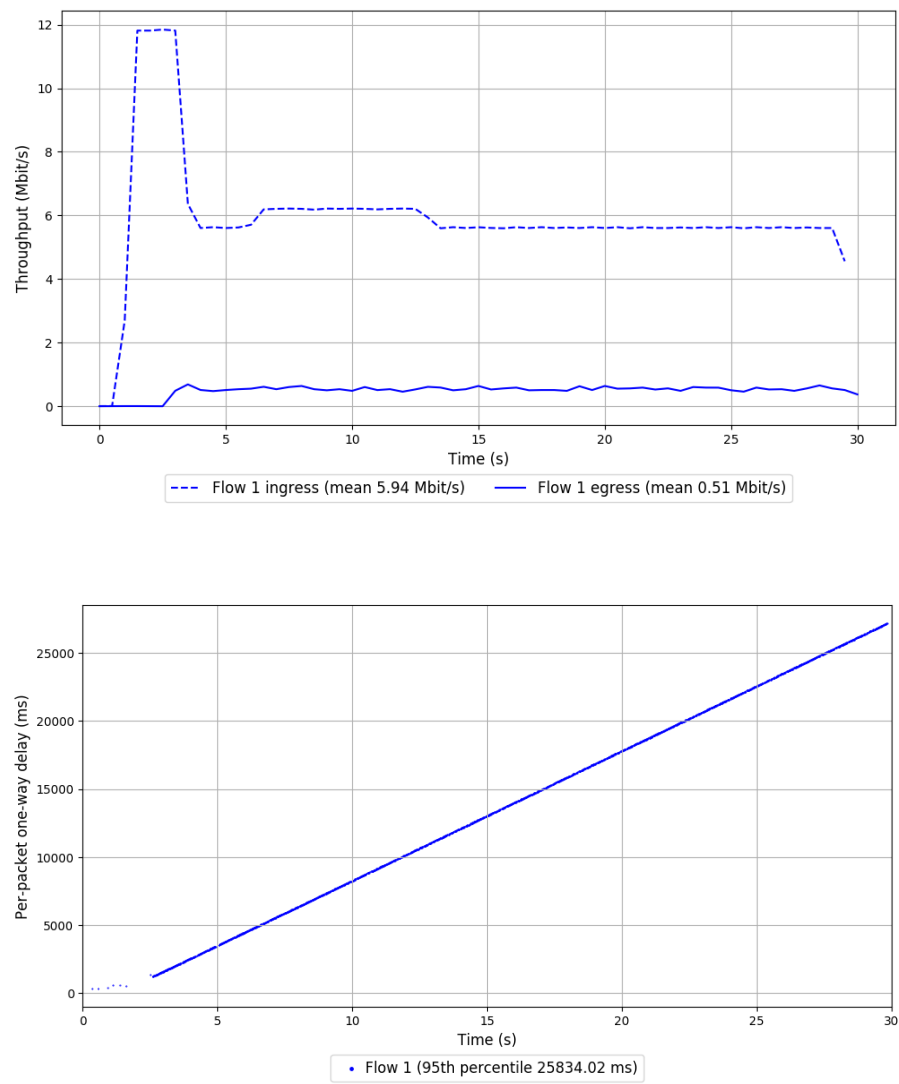
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 25834.024 ms

Loss rate: 91.57%

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

Start at: 2019-02-20 04:31:10

End at: 2019-02-20 04:31:40

Local clock offset: -6.252 ms

Remote clock offset: 3.966 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 25953.465 ms

Loss rate: 92.29%

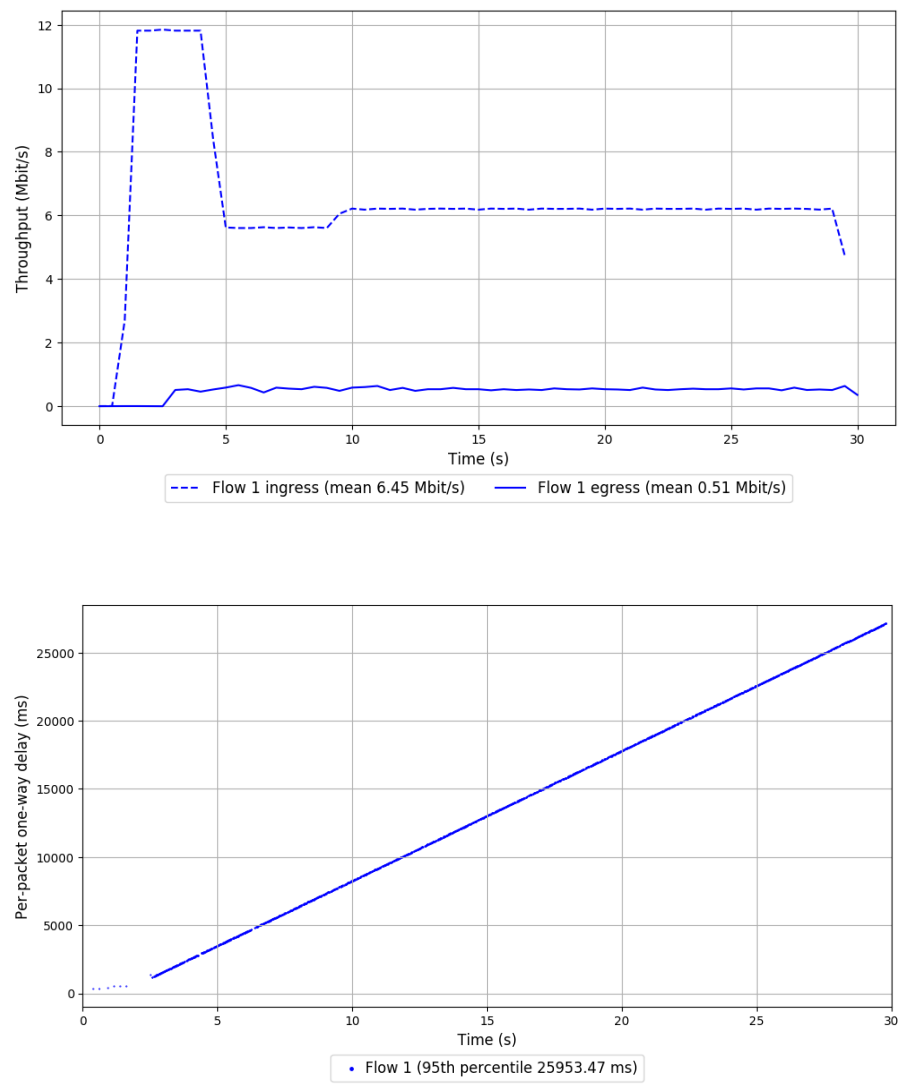
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 25953.465 ms

Loss rate: 92.29%

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

Start at: 2019-02-20 04:55:41

End at: 2019-02-20 04:56:11

Local clock offset: -6.055 ms

Remote clock offset: 3.232 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 25969.913 ms

Loss rate: 92.69%

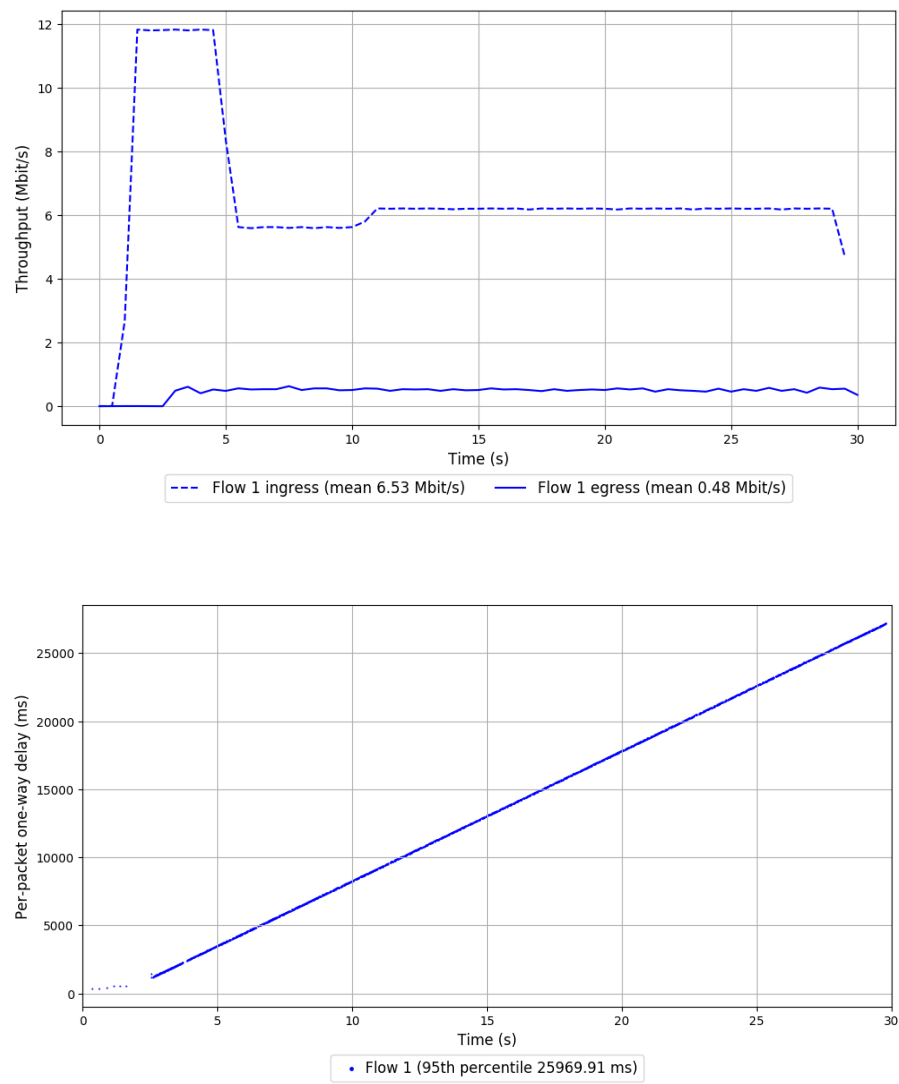
-- Flow 1:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 25969.913 ms

Loss rate: 92.69%

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2019-02-20 03:50:12

End at: 2019-02-20 03:50:42

Local clock offset: -6.451 ms

Remote clock offset: 7.377 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 9212.304 ms

Loss rate: 28.75%

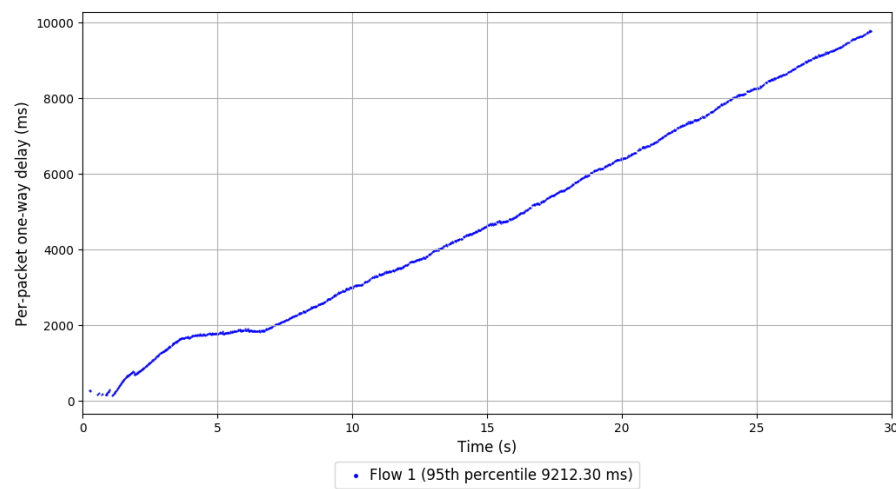
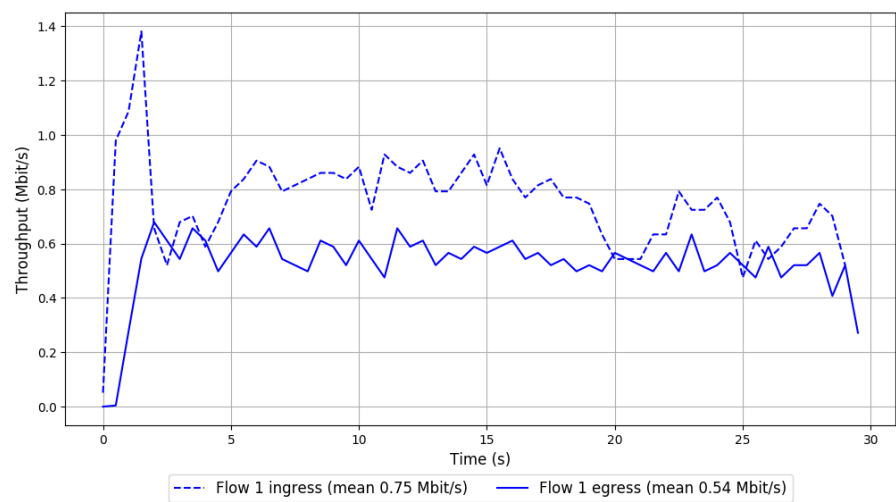
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 9212.304 ms

Loss rate: 28.75%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2019-02-20 04:14:45

End at: 2019-02-20 04:15:15

Local clock offset: -6.322 ms

Remote clock offset: 2.519 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 6330.638 ms

Loss rate: 26.81%

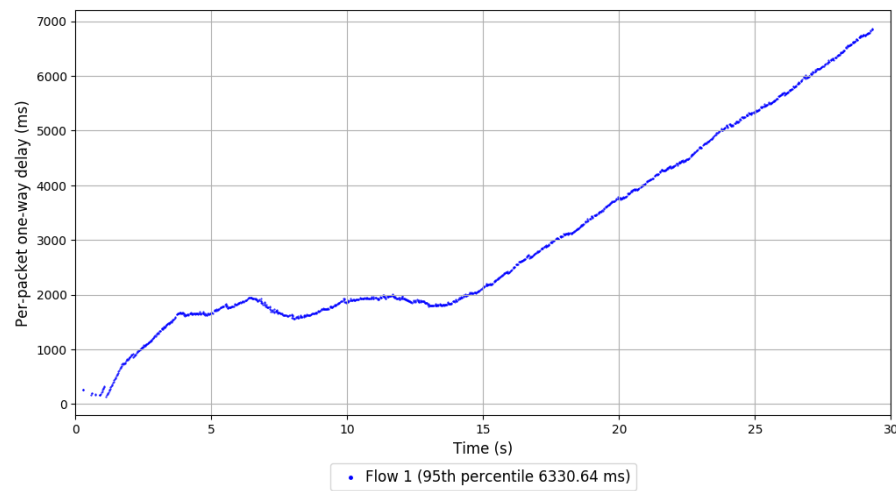
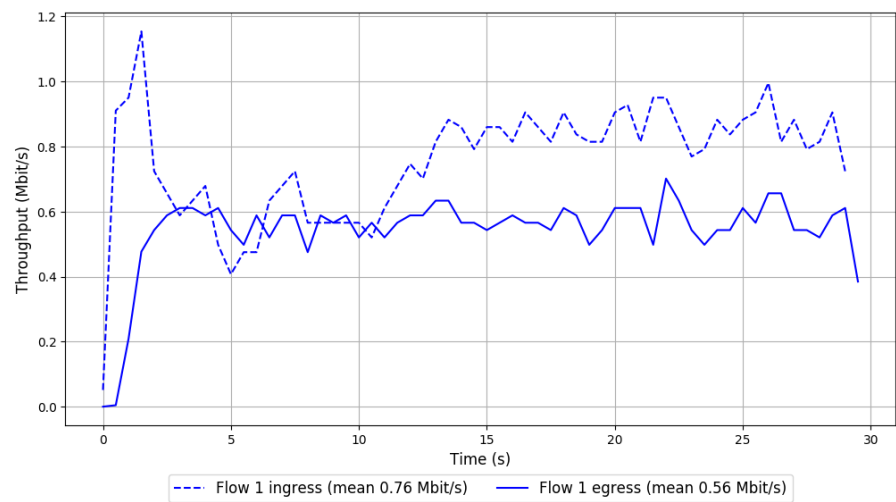
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 6330.638 ms

Loss rate: 26.81%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2019-02-20 04:39:31

End at: 2019-02-20 04:40:01

Local clock offset: -6.232 ms

Remote clock offset: 3.358 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 8798.442 ms

Loss rate: 33.16%

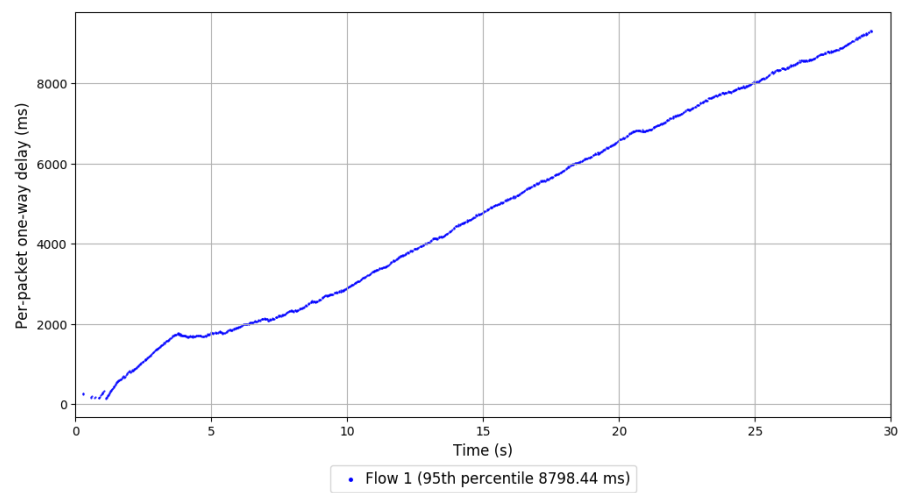
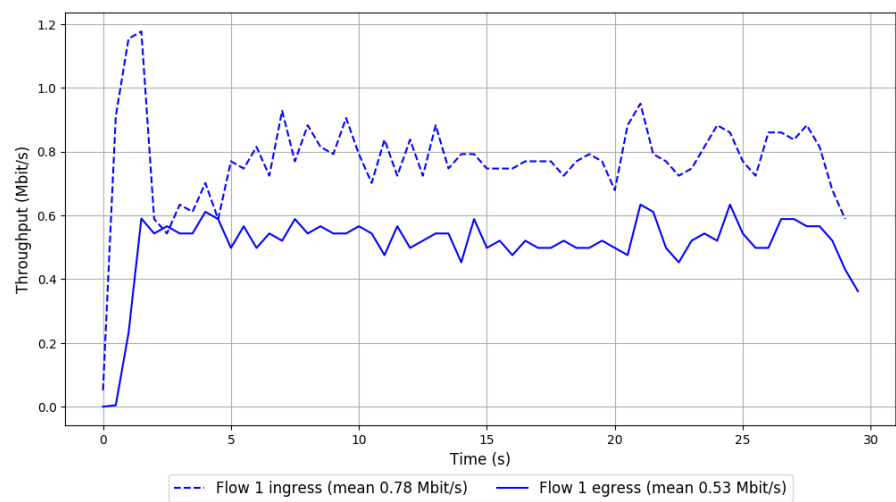
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 8798.442 ms

Loss rate: 33.16%

Run 3: Report of QUIC Cubic — Data Link



Run 1: Statistics of SCReAM

Start at: 2019-02-20 04:01:49

End at: 2019-02-20 04:02:19

Local clock offset: -6.368 ms

Remote clock offset: 7.604 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 226.834 ms

Loss rate: 0.75%

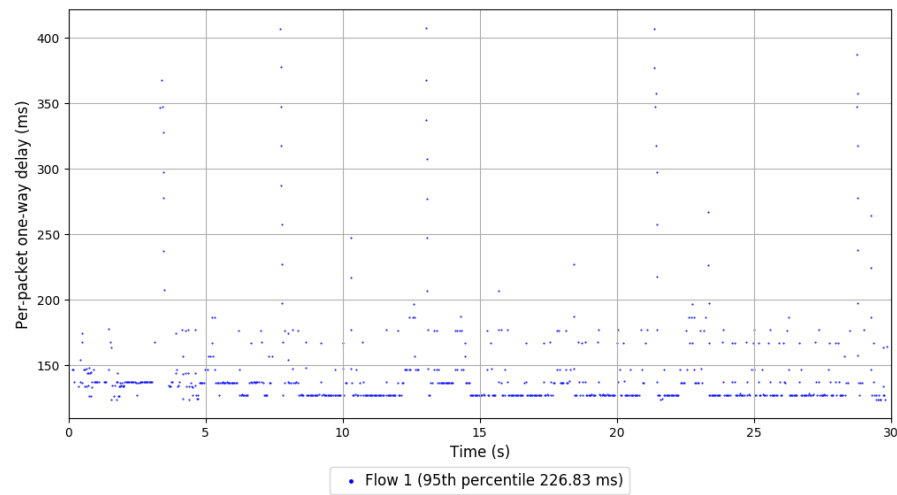
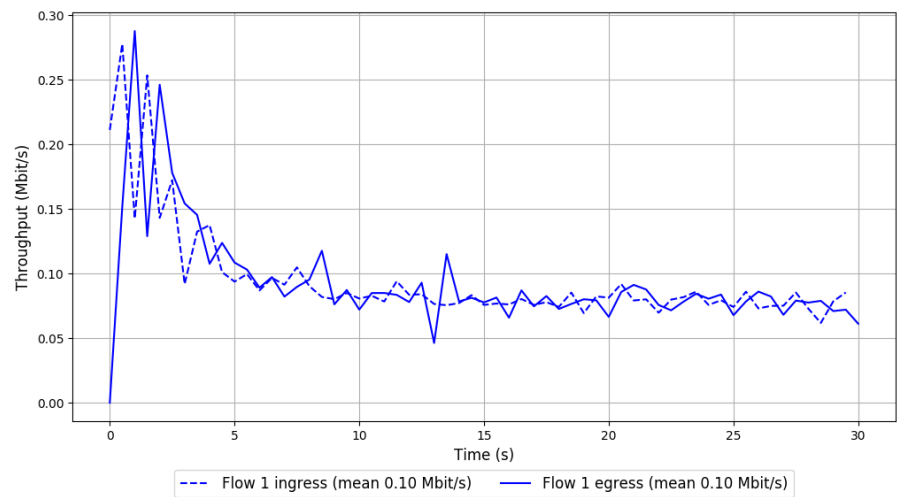
-- Flow 1:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 226.834 ms

Loss rate: 0.75%

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-02-20T03-48-Colombia-cellular-to-AWS-Brazil-2-3-runs/scream.

Run 2: Report of SReAM — Data Link

Figure is missing

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Run 3: Statistics of SCReAM

Start at: 2019-02-20 04:51:09

End at: 2019-02-20 04:51:39

Local clock offset: -6.139 ms

Remote clock offset: 3.214 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 204.825 ms

Loss rate: 0.53%

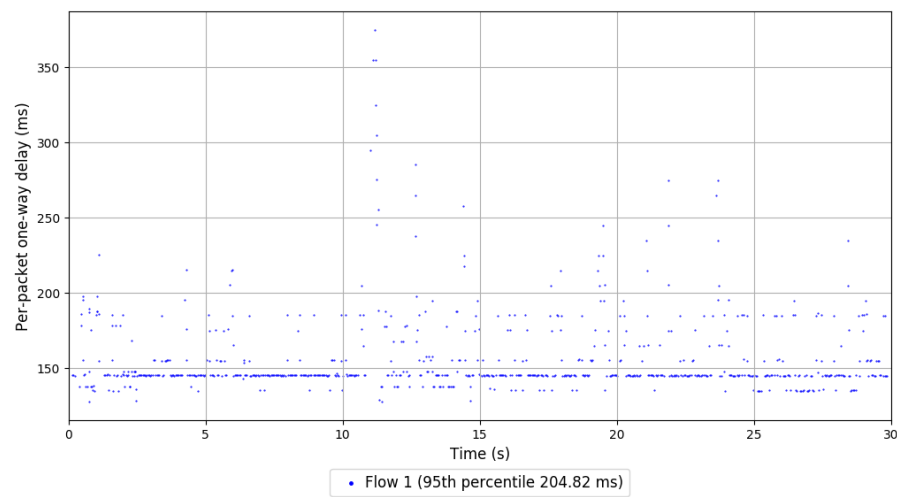
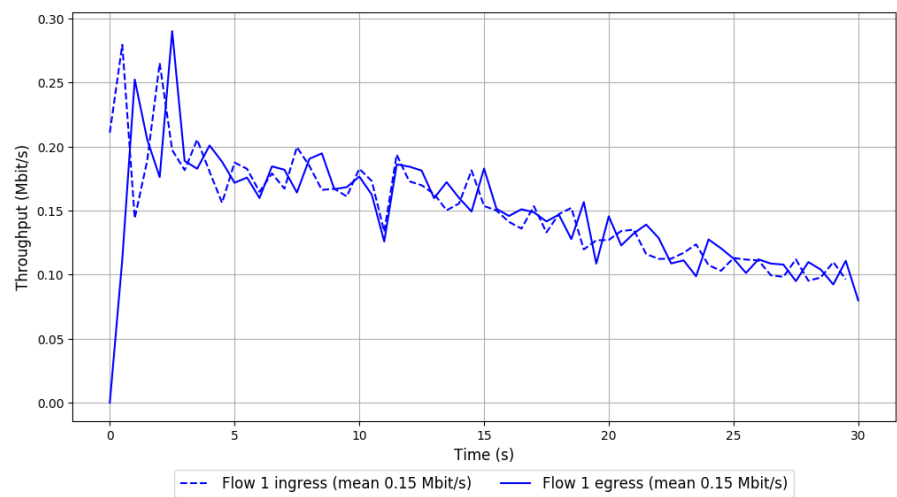
-- Flow 1:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 204.825 ms

Loss rate: 0.53%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of Sprout

Start at: 2019-02-20 03:57:06

End at: 2019-02-20 03:57:36

Local clock offset: -6.365 ms

Remote clock offset: 6.508 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 220.019 ms

Loss rate: 0.78%

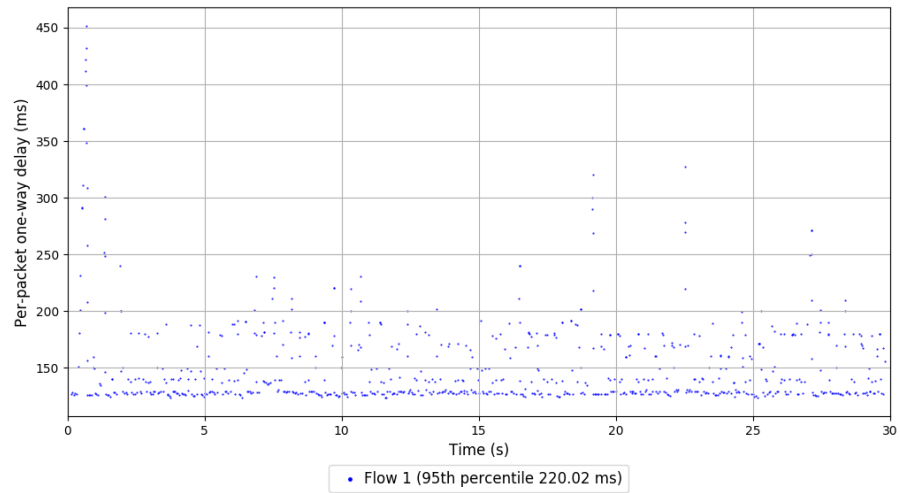
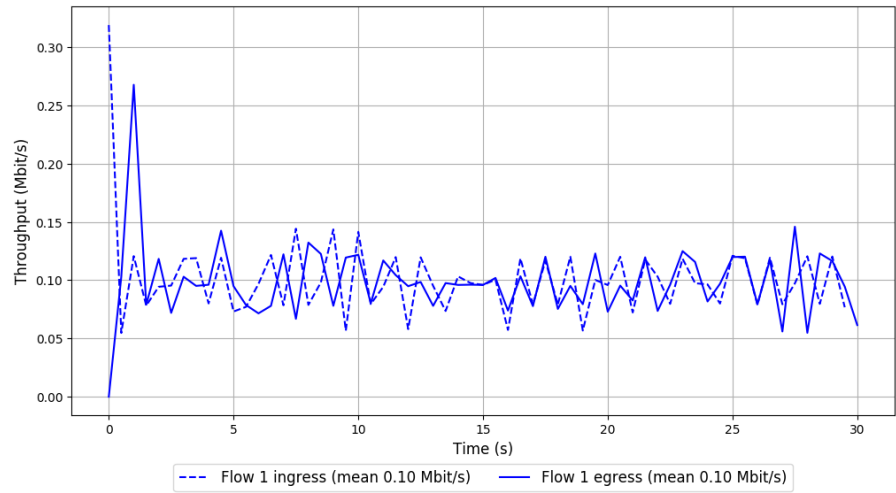
-- Flow 1:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 220.019 ms

Loss rate: 0.78%

Run 1: Report of Sprout — Data Link

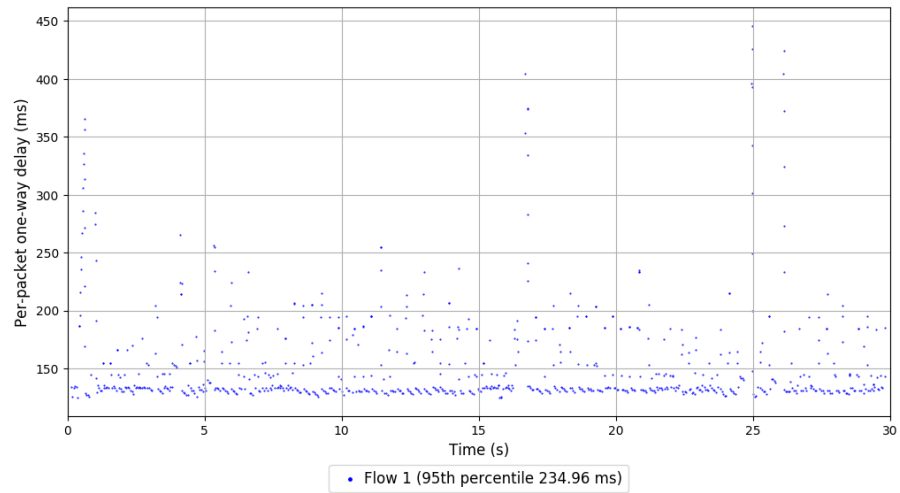
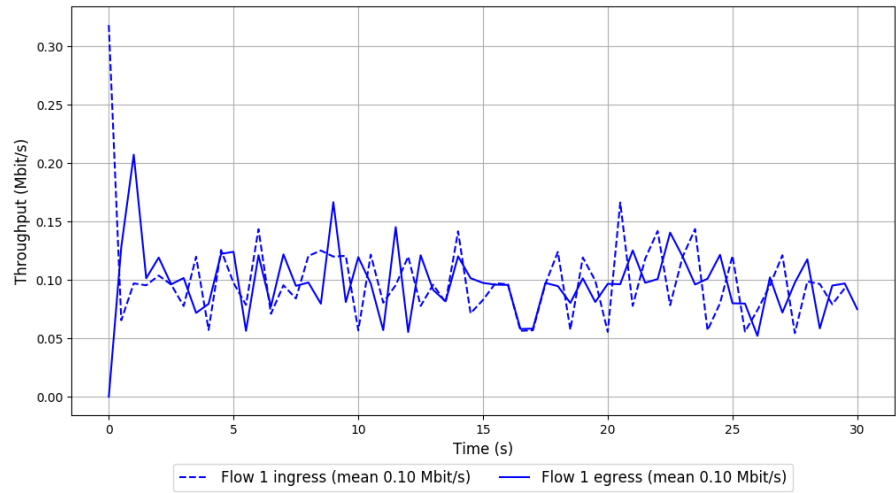


Run 2: Statistics of Sprout

Start at: 2019-02-20 04:21:38
End at: 2019-02-20 04:22:08
Local clock offset: -6.301 ms
Remote clock offset: 7.422 ms

Below is generated by plot.py at 2019-02-20 05:03:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 234.958 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 234.958 ms
Loss rate: 0.78%

Run 2: Report of Sprout — Data Link

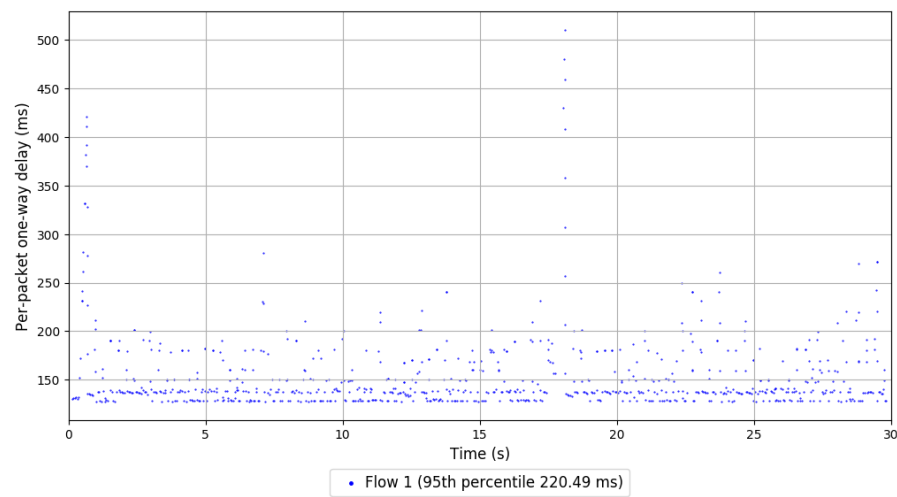
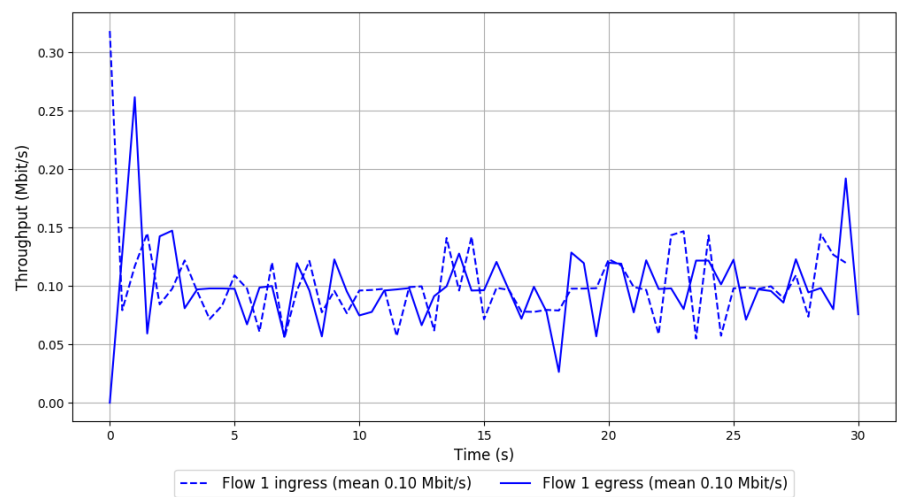


Run 3: Statistics of Sprout

Start at: 2019-02-20 04:46:25
End at: 2019-02-20 04:46:55
Local clock offset: -6.123 ms
Remote clock offset: 3.138 ms

Below is generated by plot.py at 2019-02-20 05:03:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 220.491 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 220.491 ms
Loss rate: 0.78%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2019-02-20 03:49:04

End at: 2019-02-20 03:49:34

Local clock offset: -6.375 ms

Remote clock offset: 7.427 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 1078.740 ms

Loss rate: 2.67%

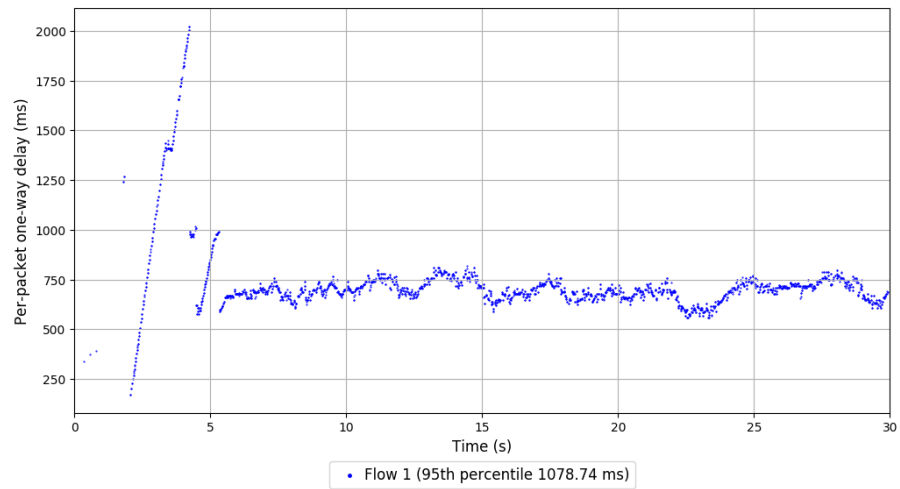
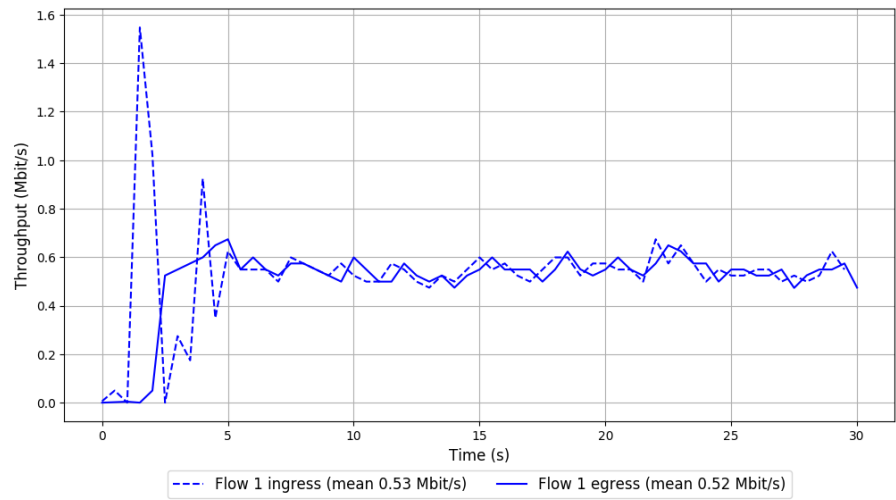
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 1078.740 ms

Loss rate: 2.67%

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



Run 2: Statistics of TaoVA-100x

Start at: 2019-02-20 04:13:37

End at: 2019-02-20 04:14:07

Local clock offset: -6.334 ms

Remote clock offset: 3.542 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 1110.968 ms

Loss rate: 2.89%

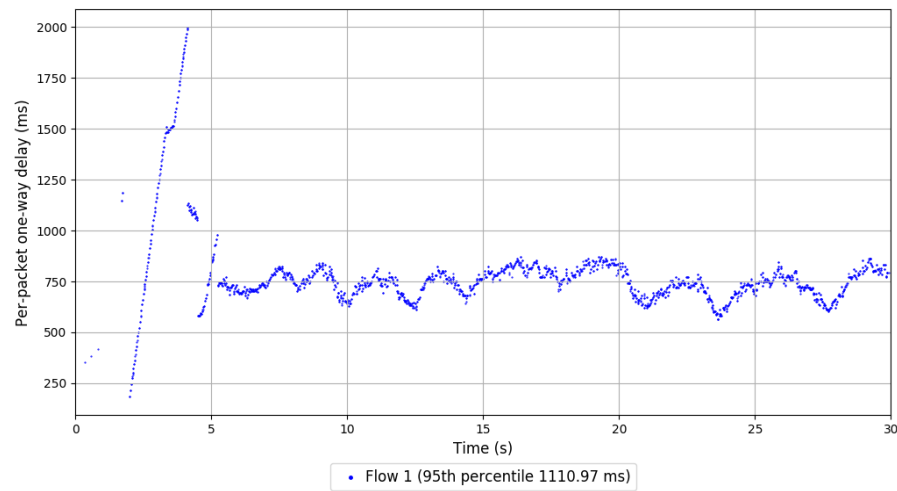
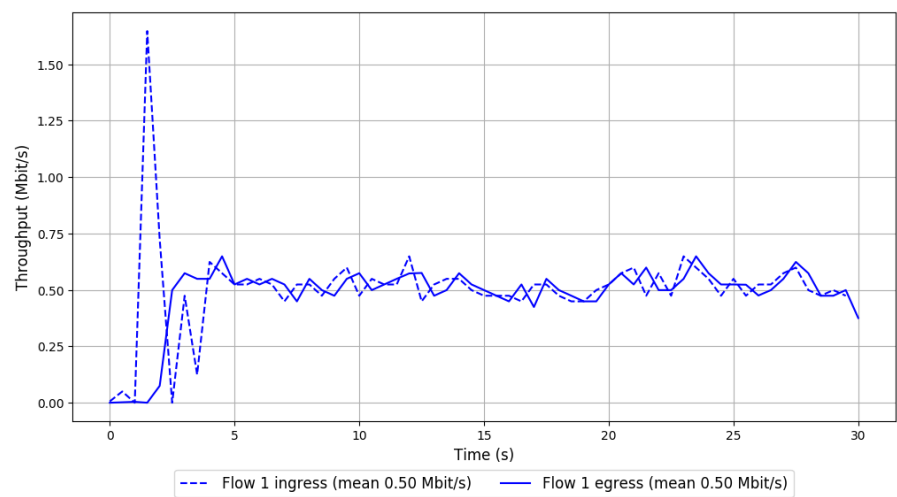
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 1110.968 ms

Loss rate: 2.89%

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



Run 3: Statistics of TaoVA-100x

Start at: 2019-02-20 04:38:07

End at: 2019-02-20 04:38:37

Local clock offset: -6.176 ms

Remote clock offset: 3.333 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 1089.461 ms

Loss rate: 2.76%

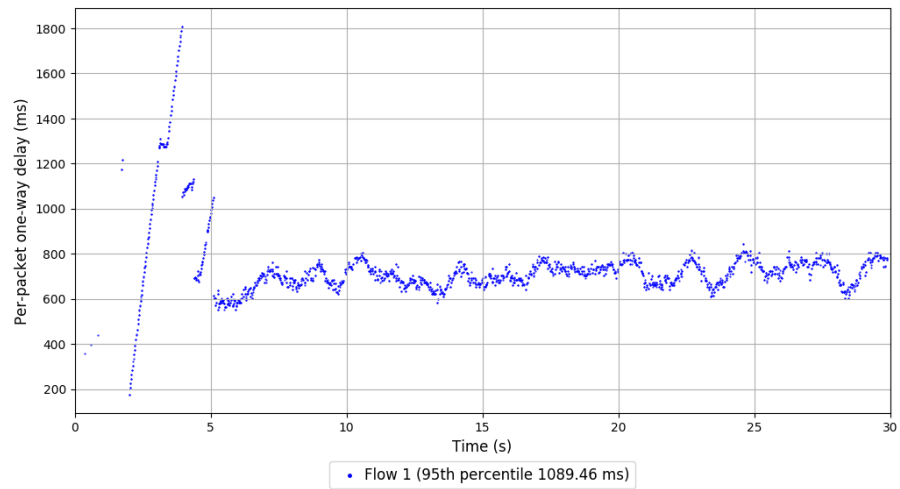
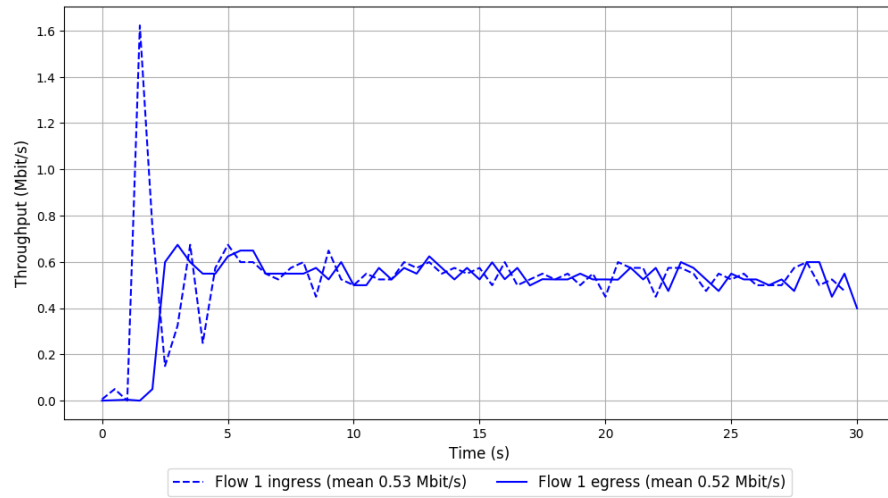
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 1089.461 ms

Loss rate: 2.76%

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



Run 1: Statistics of TCP Vegas

Start at: 2019-02-20 04:12:29

End at: 2019-02-20 04:12:59

Local clock offset: -6.349 ms

Remote clock offset: 2.337 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 962.159 ms

Loss rate: 1.16%

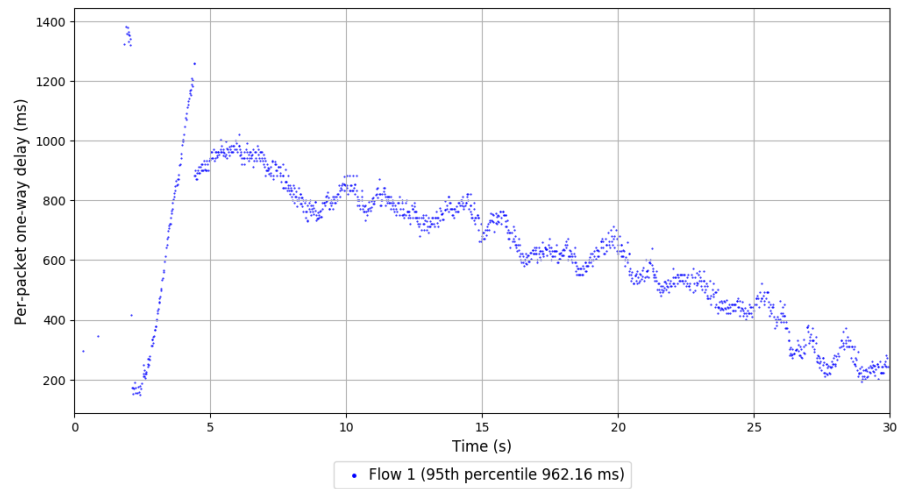
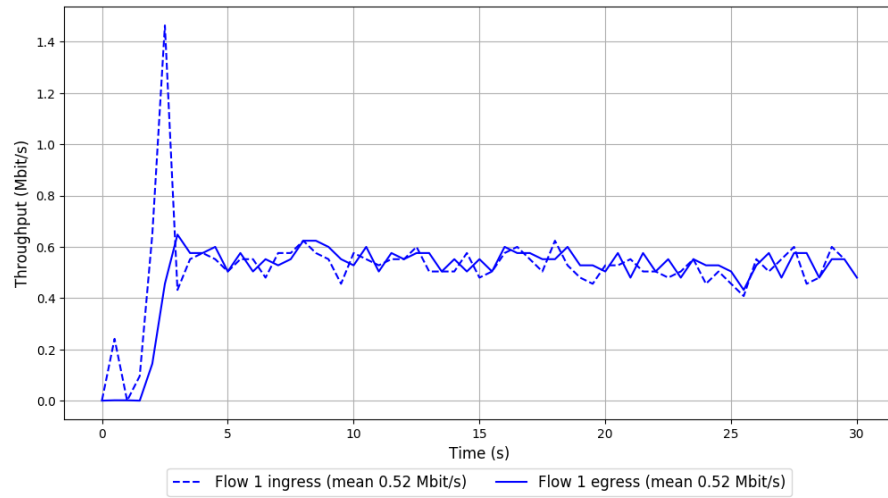
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 962.159 ms

Loss rate: 1.16%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2019-02-20 04:36:59

End at: 2019-02-20 04:37:29

Local clock offset: -6.275 ms

Remote clock offset: 8.491 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 858.939 ms

Loss rate: 1.12%

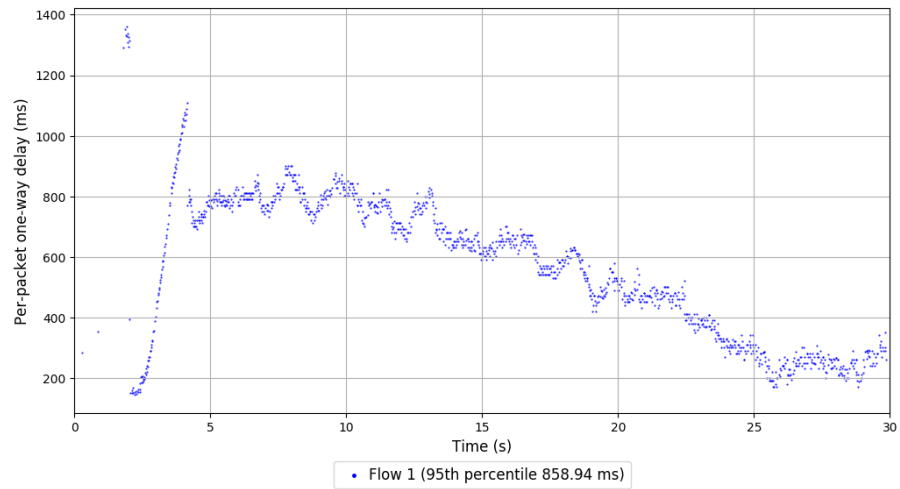
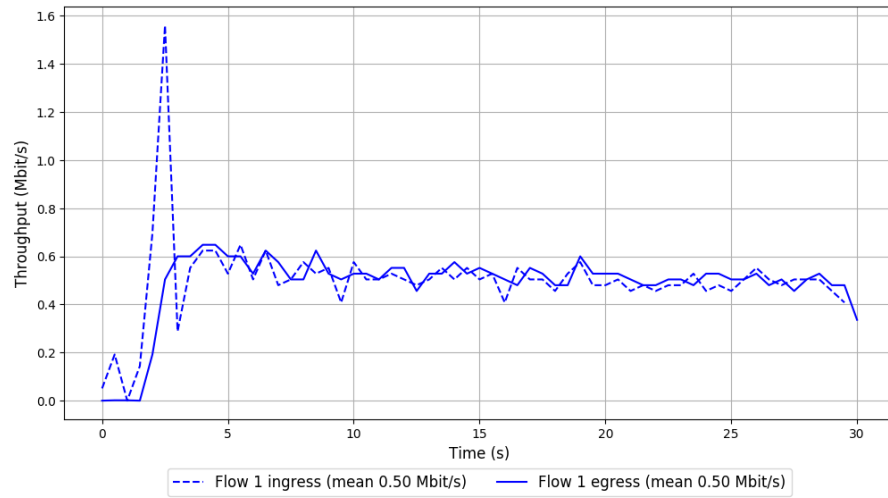
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 858.939 ms

Loss rate: 1.12%

Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

Start at: 2019-02-20 05:01:52

End at: 2019-02-20 05:02:22

Local clock offset: -6.091 ms

Remote clock offset: 7.075 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 869.808 ms

Loss rate: 1.06%

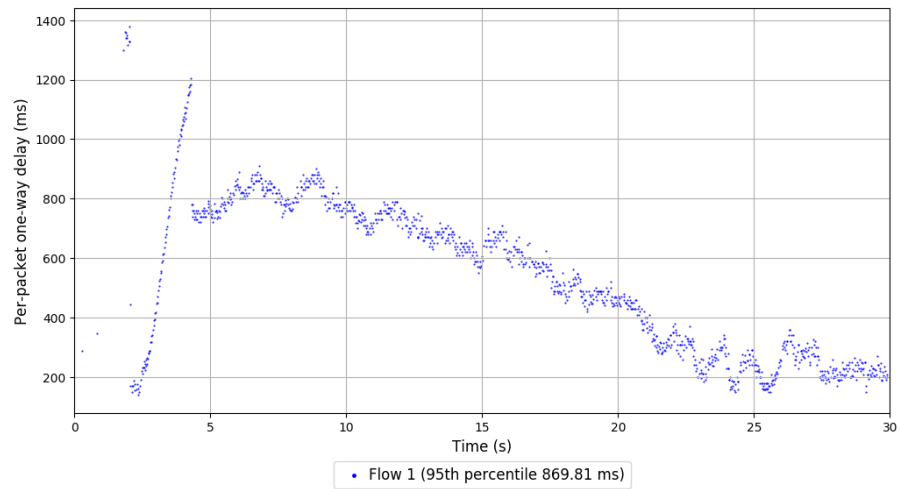
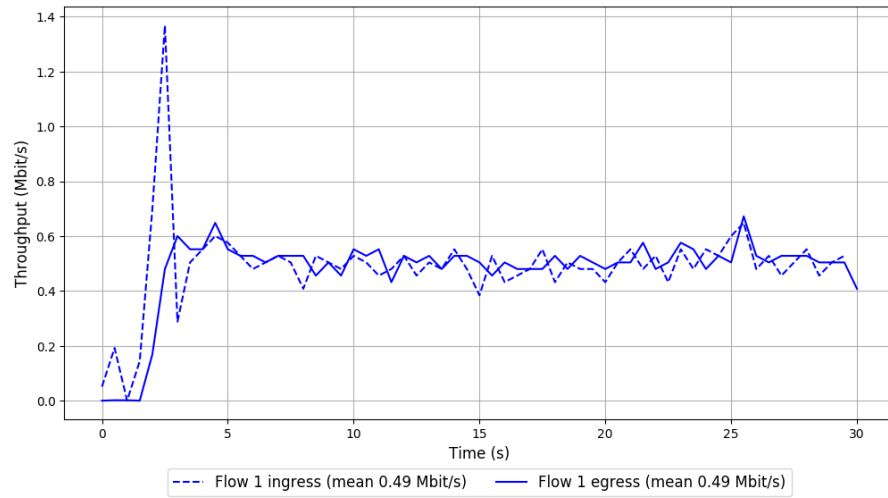
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 869.808 ms

Loss rate: 1.06%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2019-02-20 03:54:45

End at: 2019-02-20 03:55:15

Local clock offset: -6.354 ms

Remote clock offset: 3.73 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 1832.652 ms

Loss rate: 5.11%

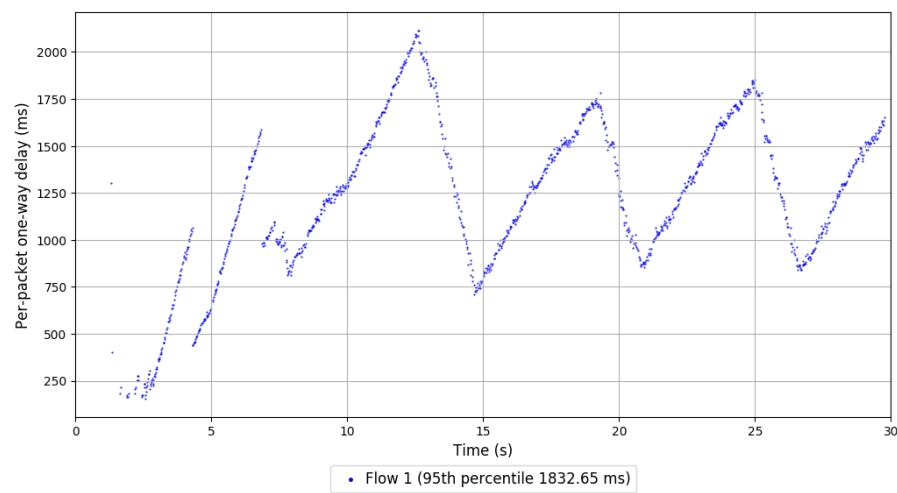
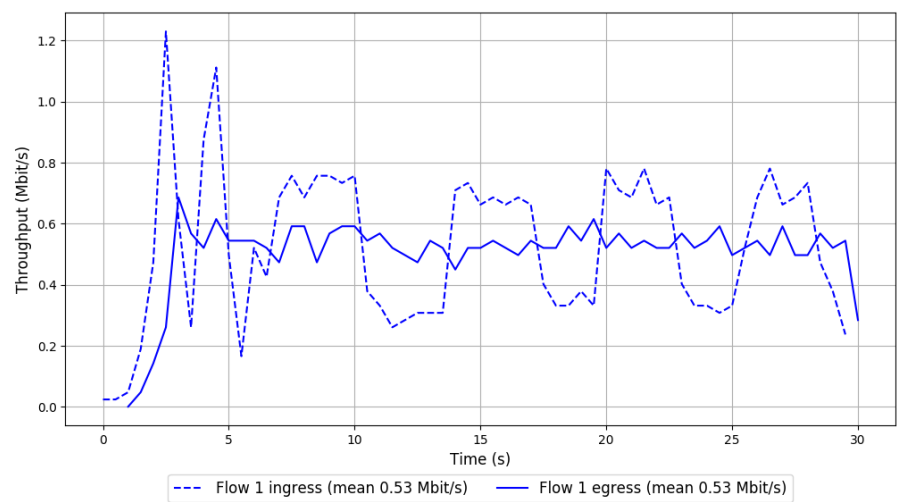
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 1832.652 ms

Loss rate: 5.11%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2019-02-20 04:19:18

End at: 2019-02-20 04:19:48

Local clock offset: -6.307 ms

Remote clock offset: 2.511 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 1859.238 ms

Loss rate: 4.94%

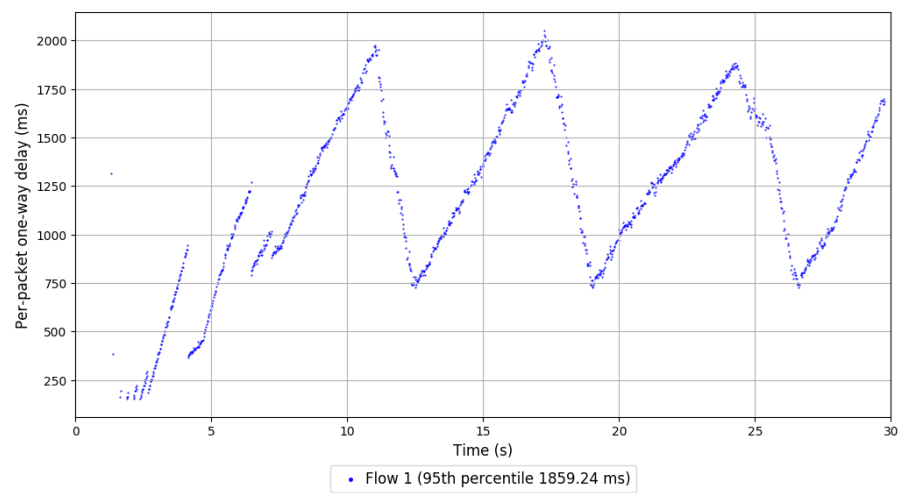
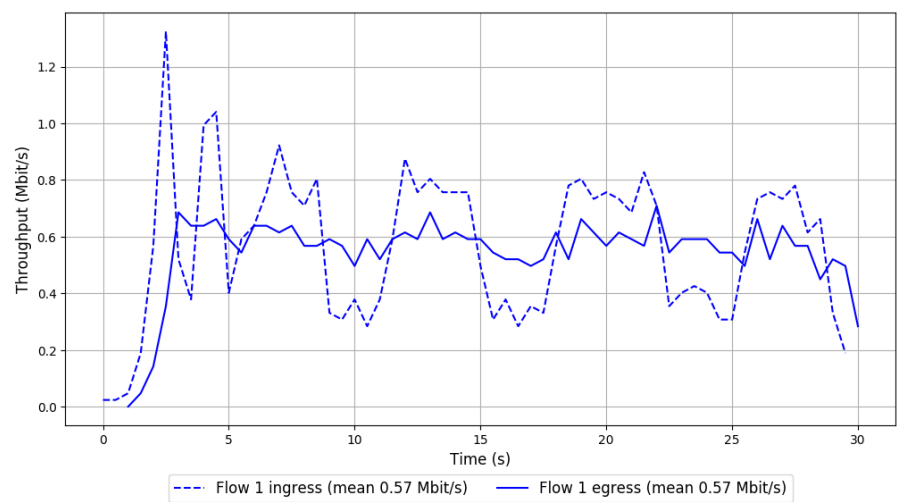
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 1859.238 ms

Loss rate: 4.94%

Run 2: Report of Verus — Data Link

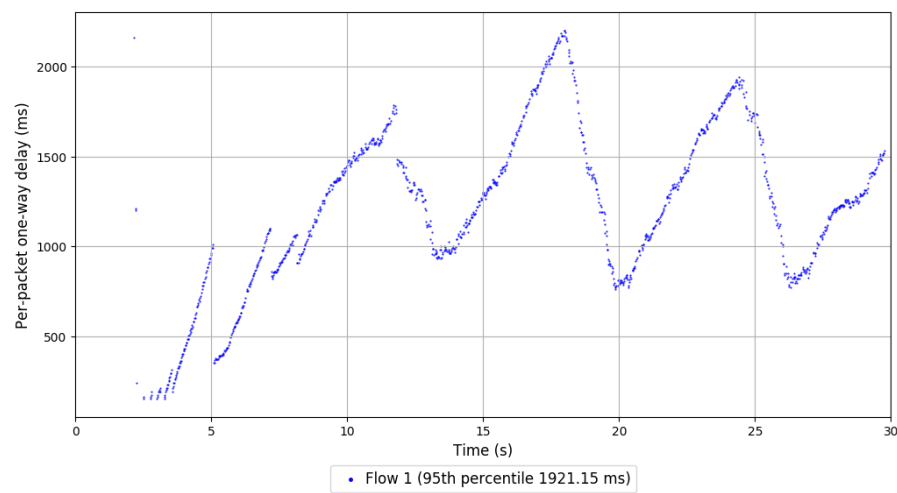
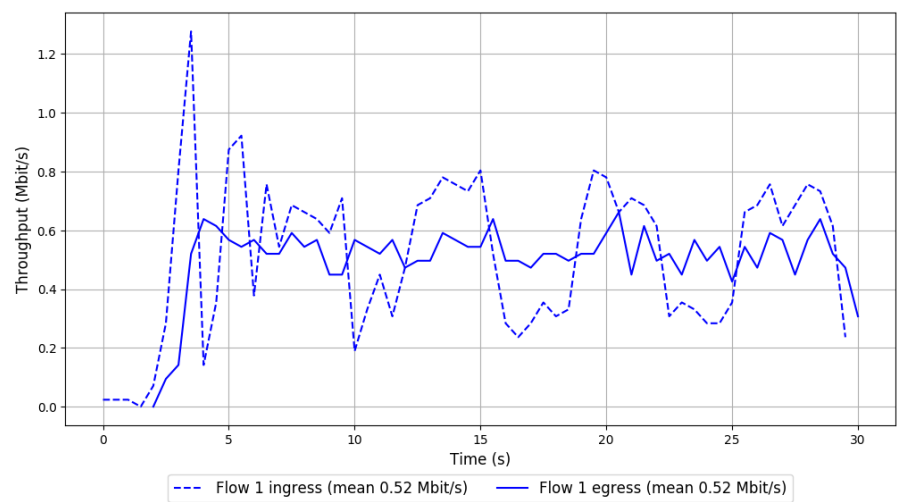


Run 3: Statistics of Verus

Start at: 2019-02-20 04:44:04
End at: 2019-02-20 04:44:34
Local clock offset: -6.199 ms
Remote clock offset: 3.266 ms

Below is generated by plot.py at 2019-02-20 05:03:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 1921.147 ms
Loss rate: 6.44%
-- Flow 1:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 1921.147 ms
Loss rate: 6.44%

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2019-02-20 04:07:32

End at: 2019-02-20 04:08:02

Local clock offset: -6.414 ms

Remote clock offset: 7.757 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 22714.261 ms

Loss rate: 72.87%

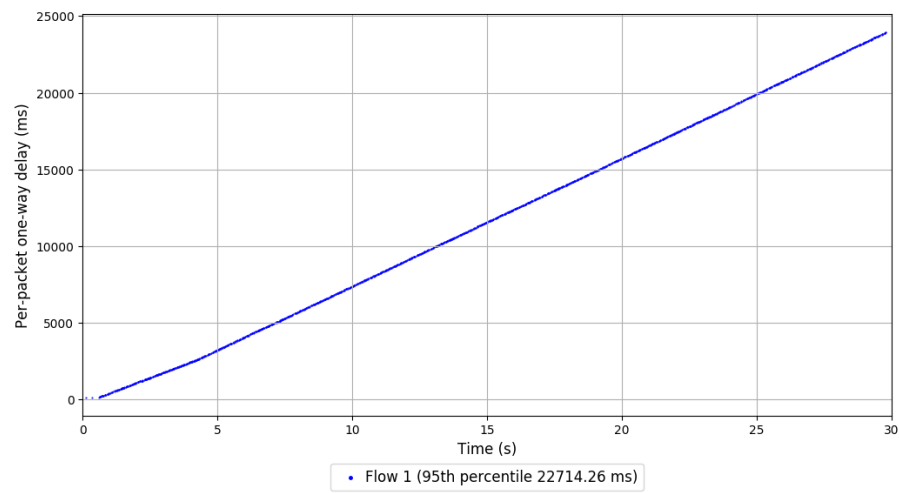
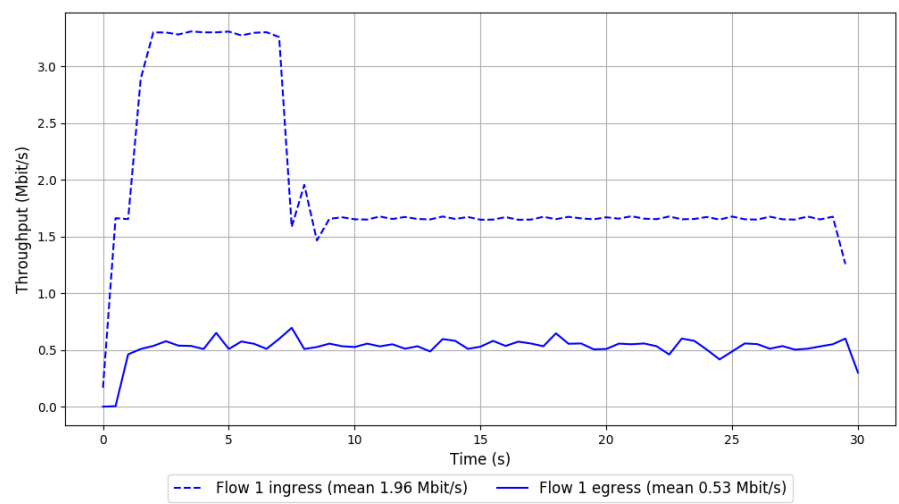
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 22714.261 ms

Loss rate: 72.87%

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2019-02-20 04:32:21

End at: 2019-02-20 04:32:51

Local clock offset: -6.249 ms

Remote clock offset: 3.943 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 22659.548 ms

Loss rate: 72.34%

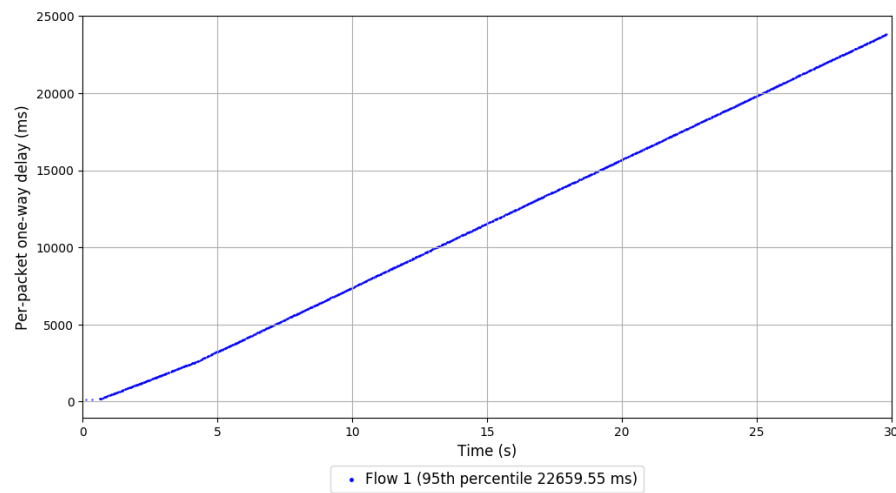
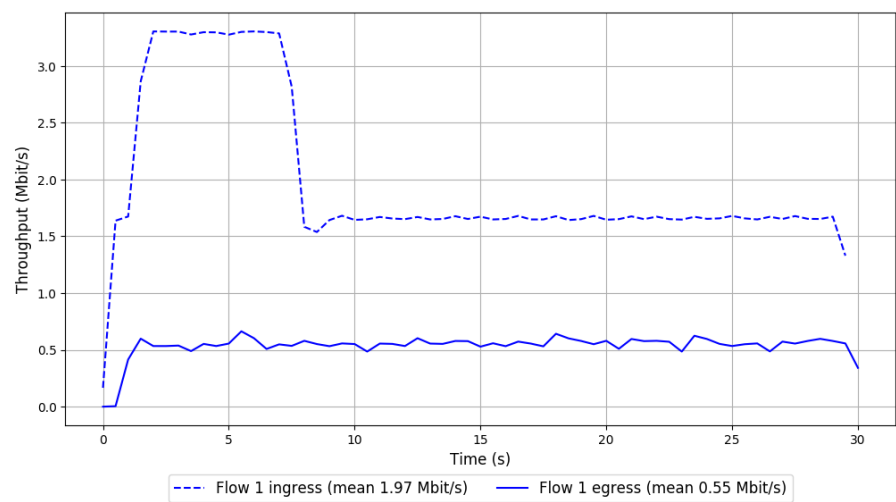
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 22659.548 ms

Loss rate: 72.34%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2019-02-20 04:56:54

End at: 2019-02-20 04:57:24

Local clock offset: -6.101 ms

Remote clock offset: 8.223 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 22767.091 ms

Loss rate: 74.69%

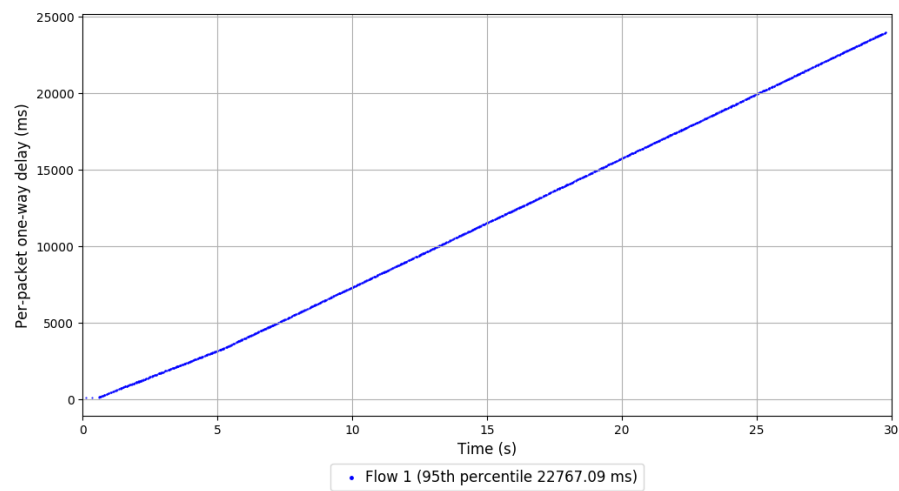
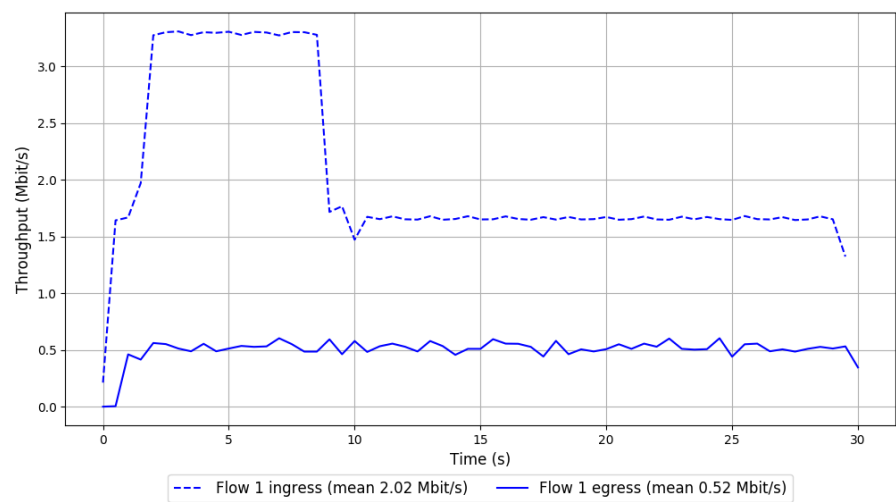
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 22767.091 ms

Loss rate: 74.69%

Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

Start at: 2019-02-20 04:02:57

End at: 2019-02-20 04:03:27

Local clock offset: -6.368 ms

Remote clock offset: 2.626 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.18 Mbit/s

95th percentile per-packet one-way delay: 732.487 ms

Loss rate: 0.19%

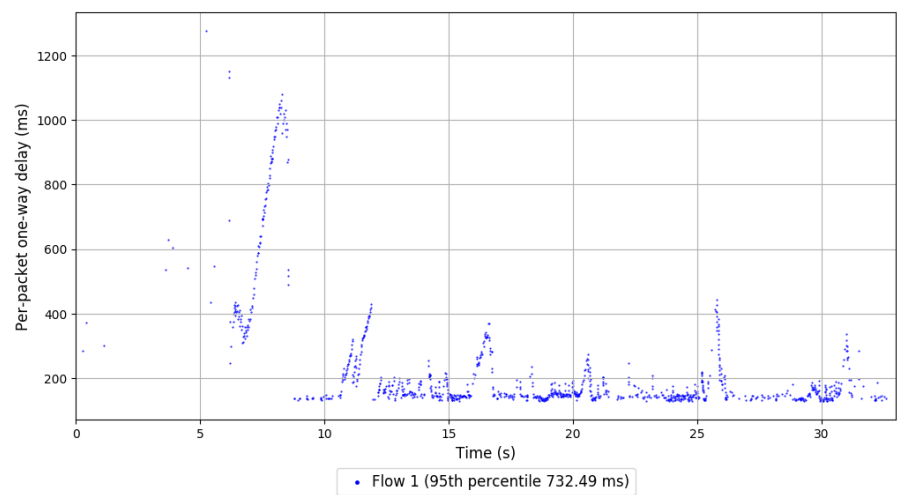
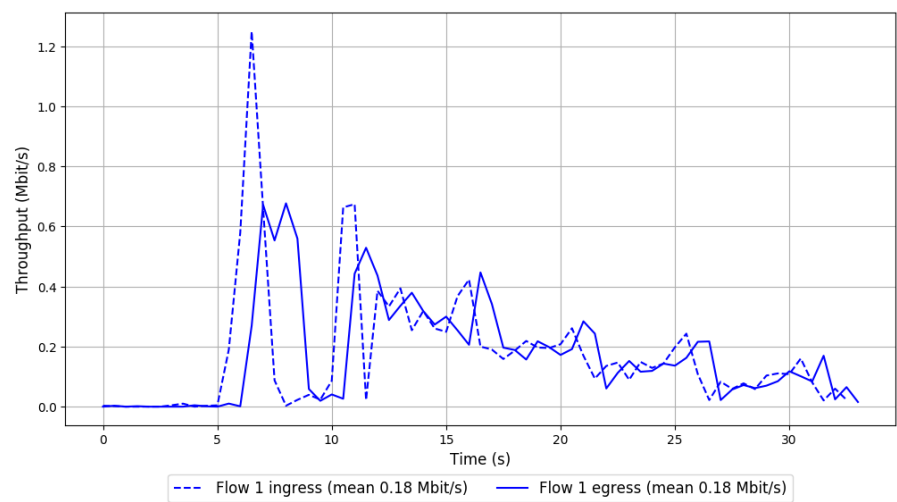
-- Flow 1:

Average throughput: 0.18 Mbit/s

95th percentile per-packet one-way delay: 732.487 ms

Loss rate: 0.19%

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2019-02-20 04:27:45

End at: 2019-02-20 04:28:15

Local clock offset: -6.279 ms

Remote clock offset: 3.736 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.18 Mbit/s

95th percentile per-packet one-way delay: 693.837 ms

Loss rate: 0.50%

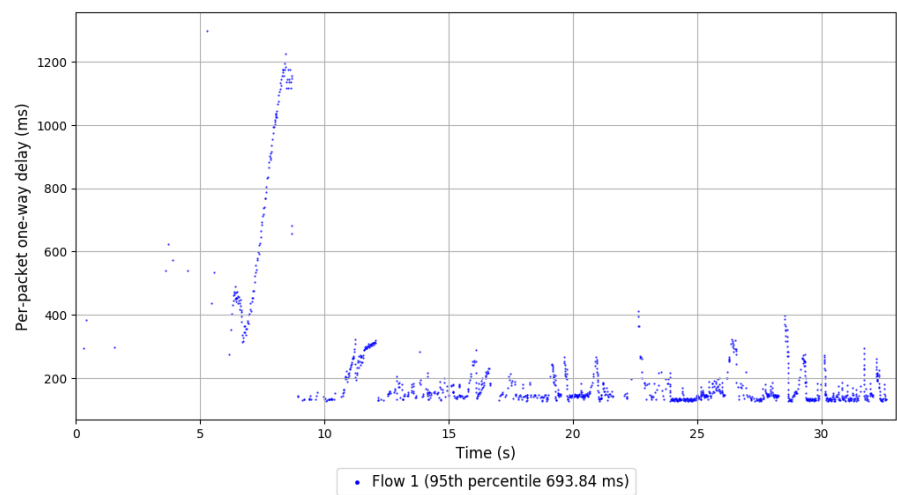
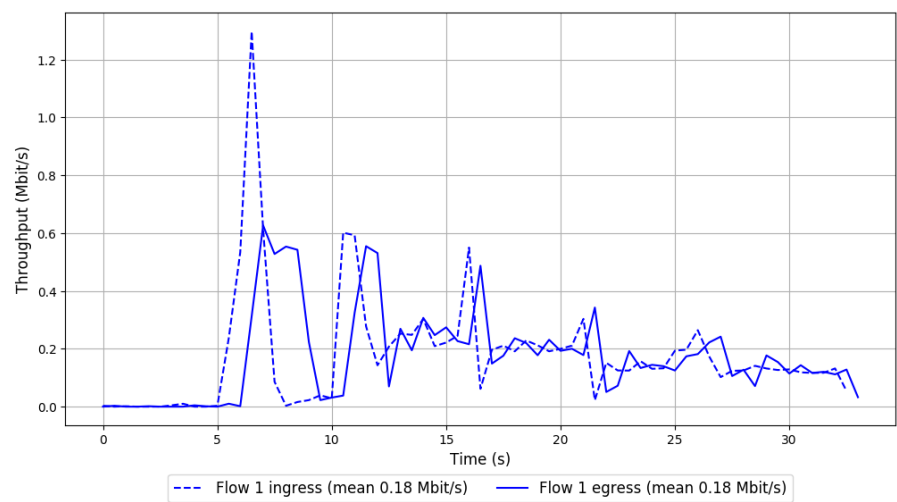
-- Flow 1:

Average throughput: 0.18 Mbit/s

95th percentile per-packet one-way delay: 693.837 ms

Loss rate: 0.50%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2019-02-20 04:52:17

End at: 2019-02-20 04:52:47

Local clock offset: -6.14 ms

Remote clock offset: 7.865 ms

Below is generated by plot.py at 2019-02-20 05:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.16 Mbit/s

95th percentile per-packet one-way delay: 749.367 ms

Loss rate: 0.42%

-- Flow 1:

Average throughput: 0.16 Mbit/s

95th percentile per-packet one-way delay: 749.367 ms

Loss rate: 0.42%

Run 3: Report of WebRTC media — Data Link

