

Pantheon Report

Generated at 2019-02-11 22:03:33 (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:

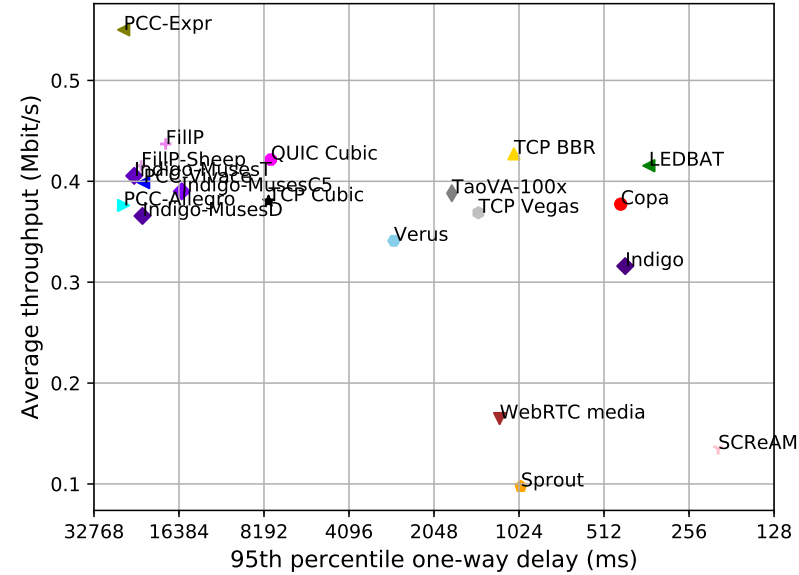
```
Linux 4.15.0-1031-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

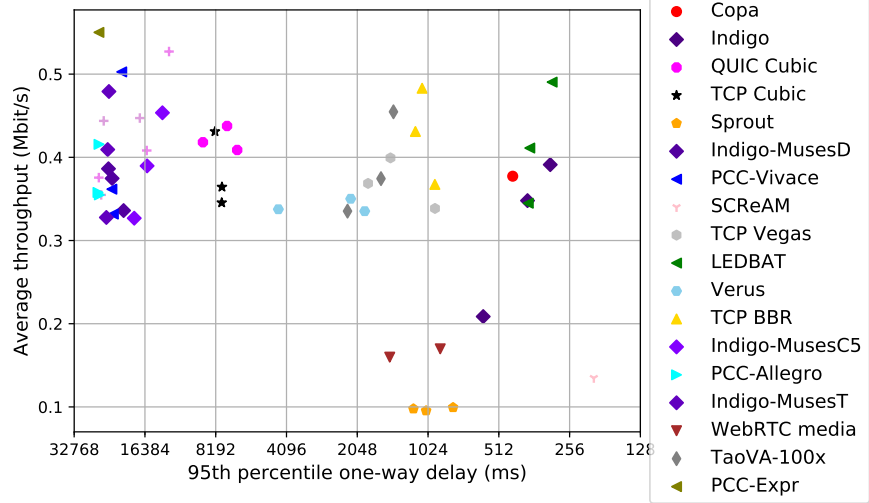
```
branch: muses @ 7a686f7c2ed0a333082c0bab1fa5c921ab47e6ee
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
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	0.43	1067.29	2.23
Copa	1	0.38	446.93	0.67
TCP Cubic	3	0.38	7895.54	29.70
FillP	3	0.44	18259.16	32.45
FillP-Sheep	3	0.41	22300.14	31.60
Indigo	3	0.32	430.85	0.55
Indigo-MusesC3	0	N/A	N/A	N/A
Indigo-MusesC5	3	0.39	16013.85	59.23
Indigo-MusesD	3	0.37	22069.07	94.28
Indigo-MusesT	3	0.41	23604.18	83.50
LEDBAT	3	0.41	355.26	1.08
PCC-Allegro	3	0.38	25744.43	98.82
PCC-Expr	1	0.55	25719.63	90.68
QUIC Cubic	3	0.42	7751.38	27.51
SCReAM	1	0.13	201.90	0.46
Sprout	3	0.10	1008.86	0.75
TaoVA-100x	3	0.39	1771.22	3.65
TCP Vegas	3	0.37	1426.30	1.62
Verus	3	0.34	2841.18	4.03
PCC-Vivace	3	0.40	21854.10	82.06
WebRTC media	2	0.17	1199.55	0.31

Run 1: Statistics of TCP BBR

Start at: 2019-02-11 21:07:30

End at: 2019-02-11 21:08:00

Local clock offset: -2.731 ms

Remote clock offset: 8.092 ms

Below is generated by plot.py at 2019-02-11 22:03:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 957.775 ms

Loss rate: 2.69%

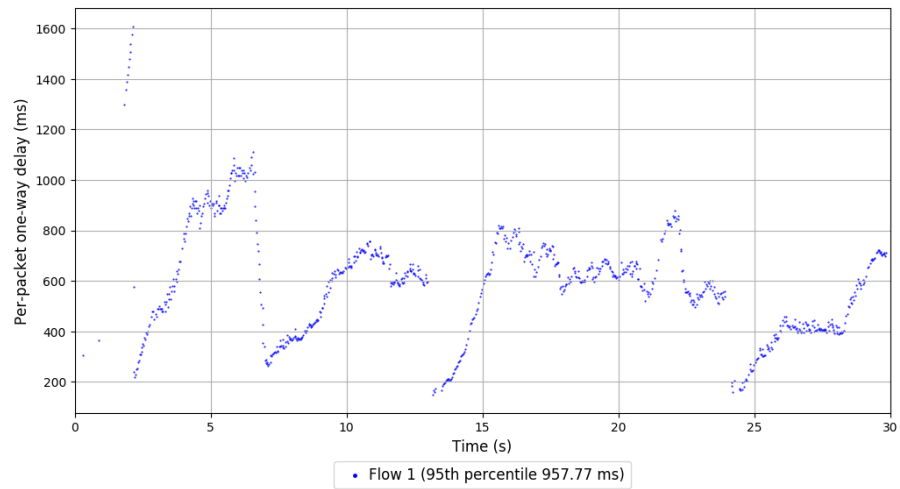
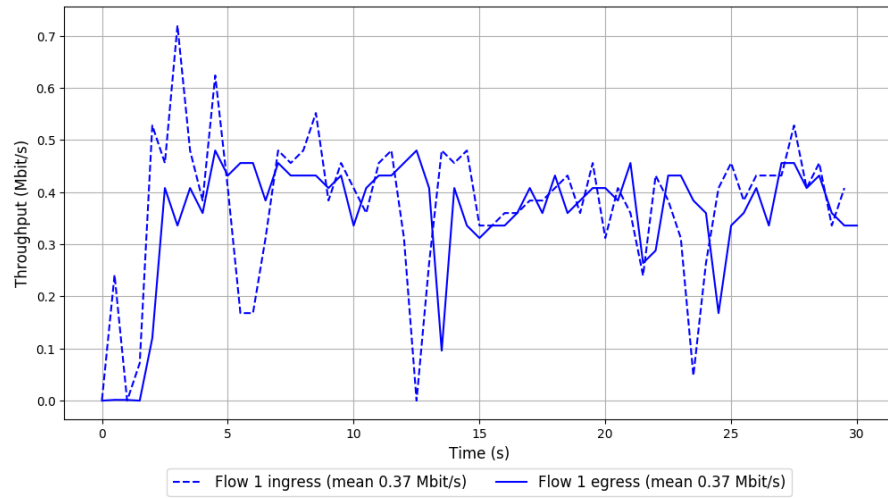
-- Flow 1:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 957.775 ms

Loss rate: 2.69%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2019-02-11 21:33:24

End at: 2019-02-11 21:33:54

Local clock offset: -6.462 ms

Remote clock offset: 4.039 ms

Below is generated by plot.py at 2019-02-11 22:03:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 1158.880 ms

Loss rate: 2.03%

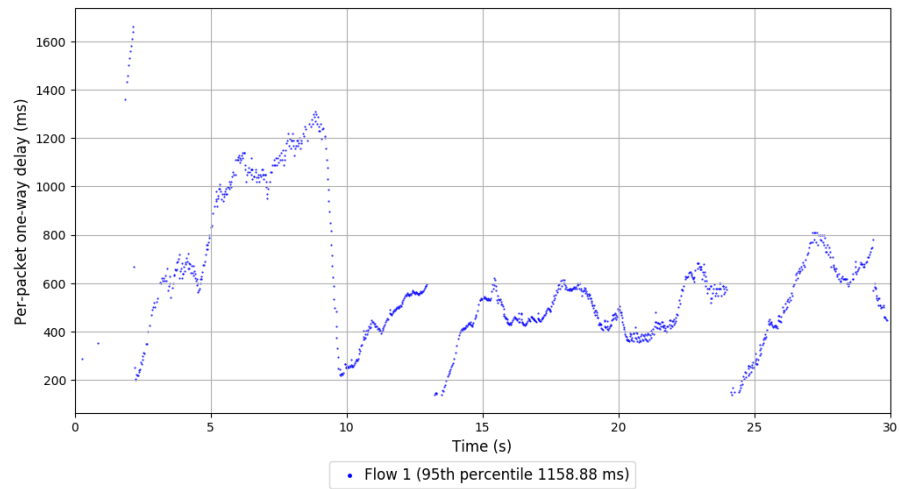
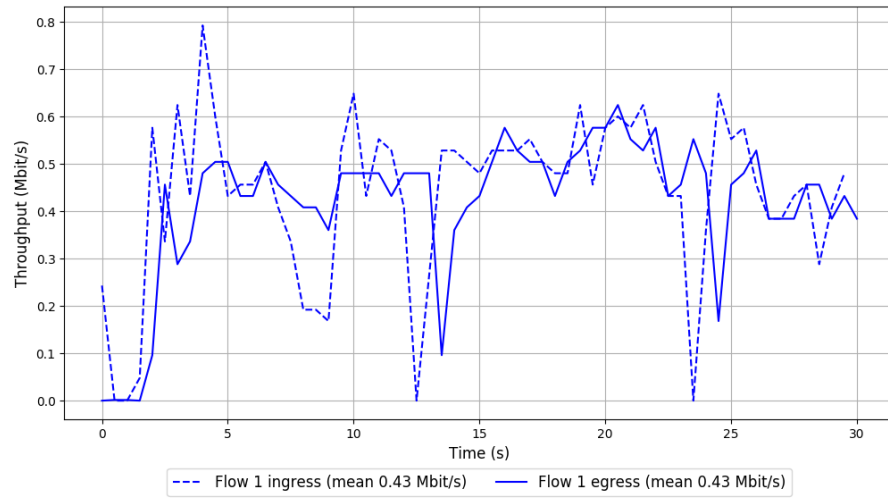
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 1158.880 ms

Loss rate: 2.03%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2019-02-11 21:58:33

End at: 2019-02-11 21:59:03

Local clock offset: -7.857 ms

Remote clock offset: 7.341 ms

Below is generated by plot.py at 2019-02-11 22:03:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 1085.218 ms

Loss rate: 1.97%

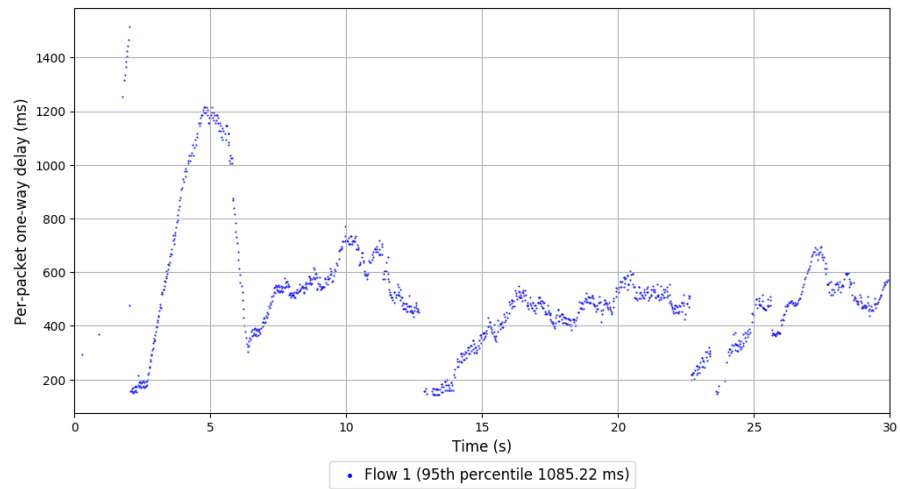
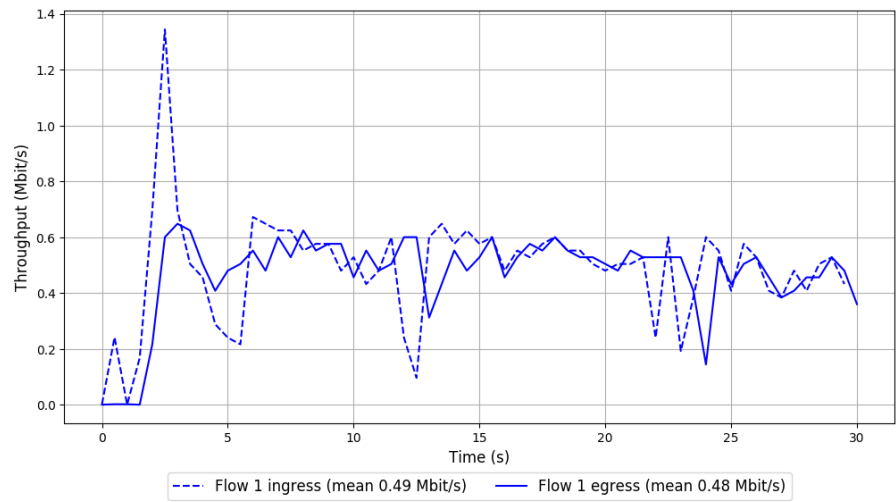
-- Flow 1:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 1085.218 ms

Loss rate: 1.97%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

Start at: 2019-02-11 21:11:16

End at: 2019-02-11 21:11:46

Local clock offset: -3.796 ms

Remote clock offset: 4.451 ms

Below is generated by plot.py at 2019-02-11 22:03:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.38 Mbit/s

95th percentile per-packet one-way delay: 446.929 ms

Loss rate: 0.67%

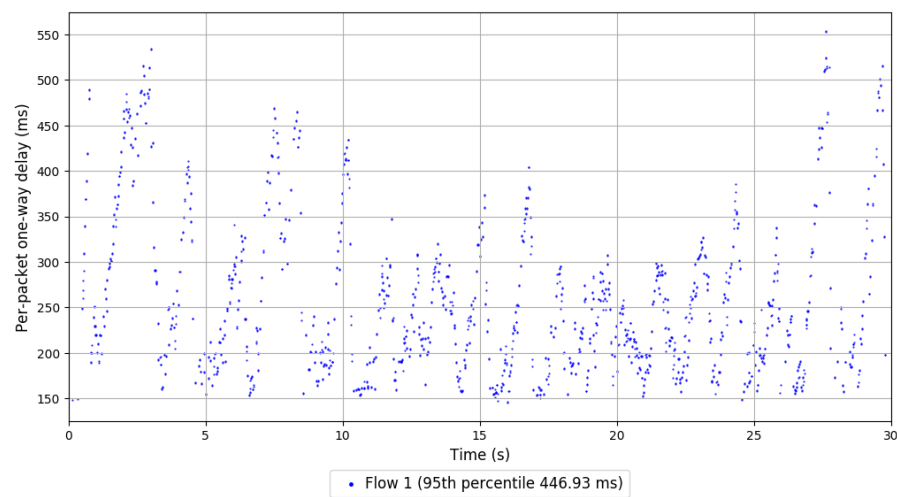
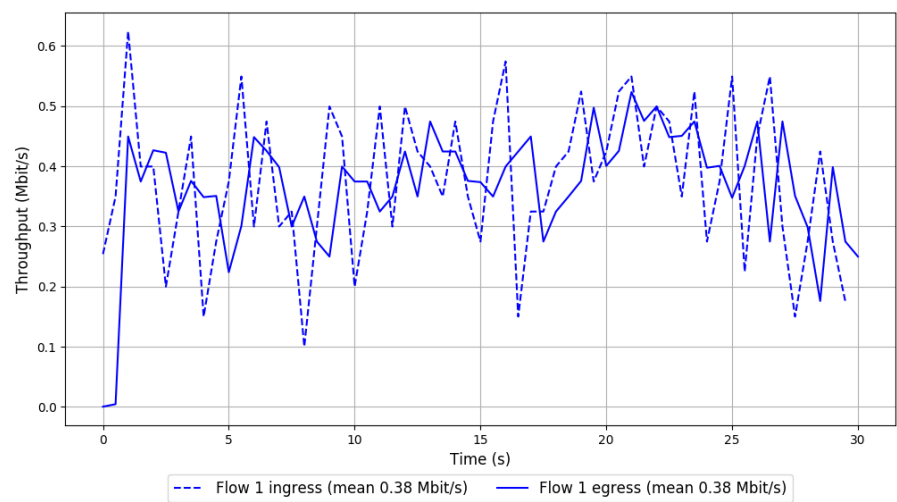
-- Flow 1:

Average throughput: 0.38 Mbit/s

95th percentile per-packet one-way delay: 446.929 ms

Loss rate: 0.67%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

/home/ubuntu/pantheon/data/2019-02-11T20-46-Colombia-cellular-to-AWS-Brazil-2-3-runs/copa_st

Run 2: Report of Copa — Data Link

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Run 3: Statistics of Copa

/home/ubuntu/pantheon/data/2019-02-11T20-46-Colombia-cellular-to-AWS-Brazil-2-3-runs/copa_st

Run 3: Report of Copa — Data Link

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Run 1: Statistics of TCP Cubic

Start at: 2019-02-11 21:05:13

End at: 2019-02-11 21:05:43

Local clock offset: -2.482 ms

Remote clock offset: 4.218 ms

Below is generated by plot.py at 2019-02-11 22:03:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 7725.538 ms

Loss rate: 30.16%

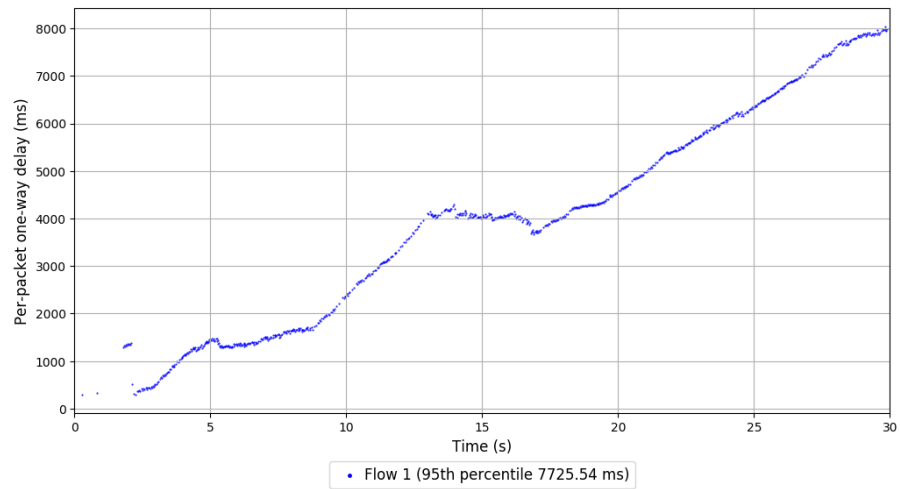
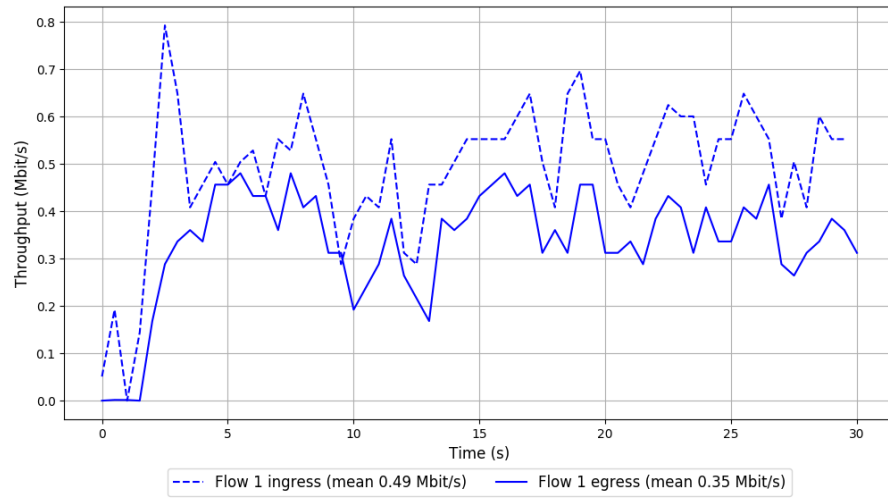
-- Flow 1:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 7725.538 ms

Loss rate: 30.16%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2019-02-11 21:31:08

End at: 2019-02-11 21:31:38

Local clock offset: -7.1 ms

Remote clock offset: 4.004 ms

Below is generated by plot.py at 2019-02-11 22:03:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.36 Mbit/s

95th percentile per-packet one-way delay: 7707.283 ms

Loss rate: 31.66%

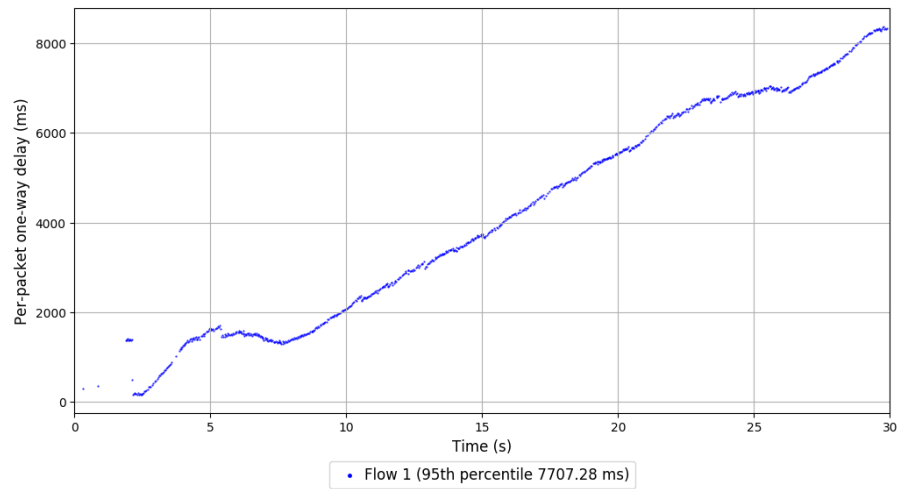
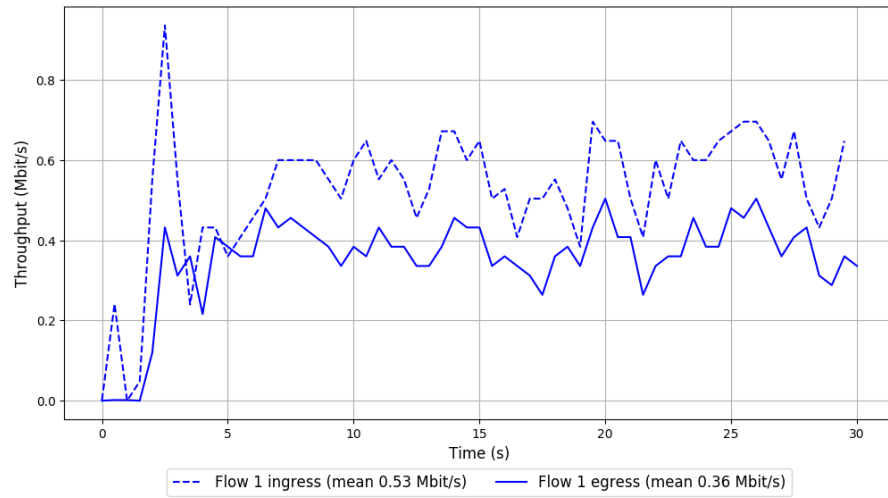
-- Flow 1:

Average throughput: 0.36 Mbit/s

95th percentile per-packet one-way delay: 7707.283 ms

Loss rate: 31.66%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2019-02-11 21:56:17

End at: 2019-02-11 21:56:47

Local clock offset: -7.803 ms

Remote clock offset: 3.004 ms

Below is generated by plot.py at 2019-02-11 22:03:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 8253.800 ms

Loss rate: 27.27%

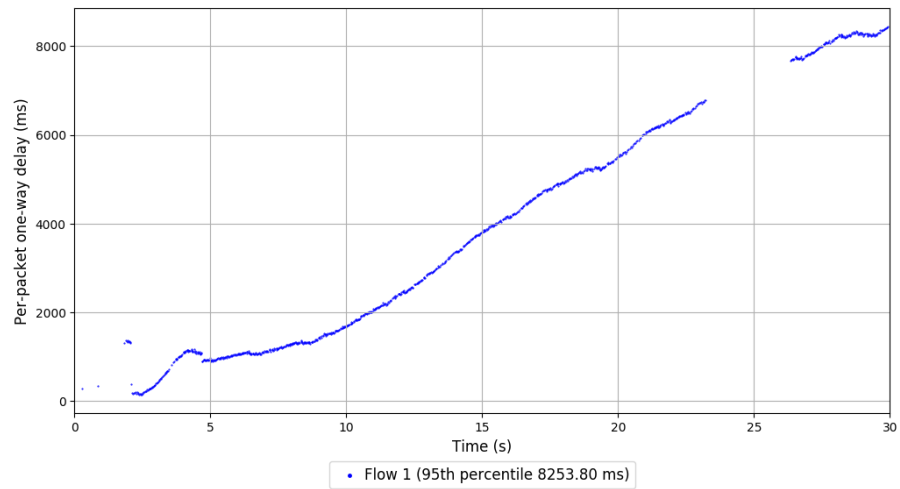
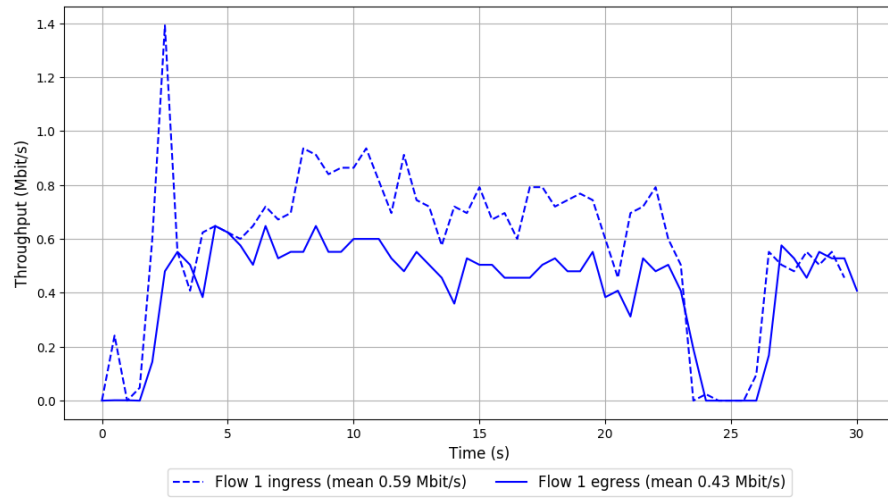
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 8253.800 ms

Loss rate: 27.27%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2019-02-11 21:04:05

End at: 2019-02-11 21:04:35

Local clock offset: -1.917 ms

Remote clock offset: 4.093 ms

Below is generated by plot.py at 2019-02-11 22:03:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.38 Mbit/s

95th percentile per-packet one-way delay: 25737.412 ms

Loss rate: 48.56%

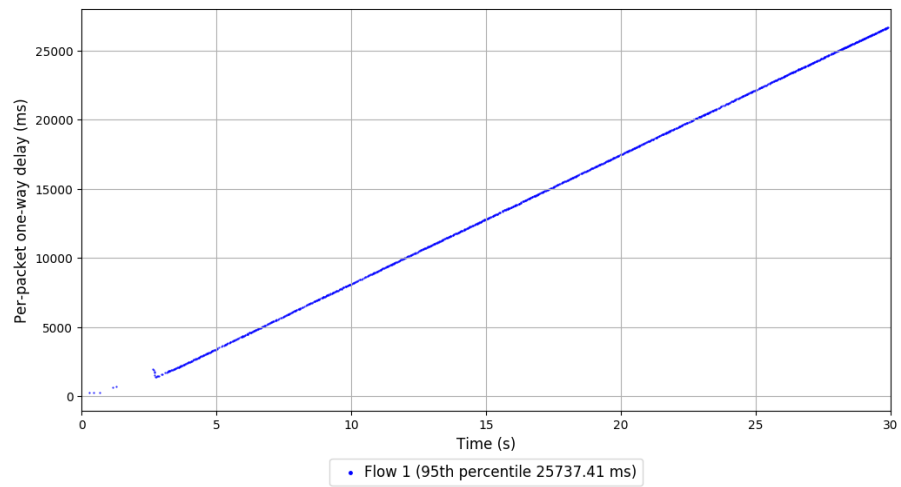
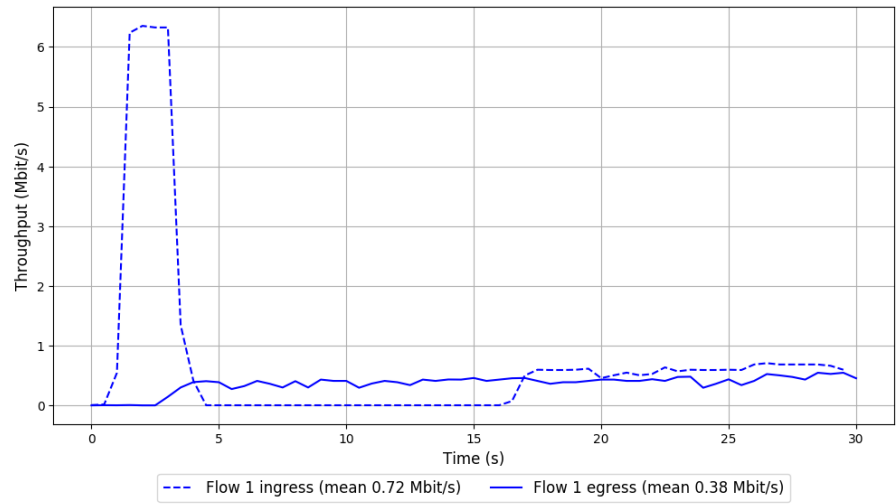
-- Flow 1:

Average throughput: 0.38 Mbit/s

95th percentile per-packet one-way delay: 25737.412 ms

Loss rate: 48.56%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2019-02-11 21:30:00

End at: 2019-02-11 21:30:30

Local clock offset: -6.264 ms

Remote clock offset: 9.077 ms

Below is generated by plot.py at 2019-02-11 22:03:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.41 Mbit/s

95th percentile per-packet one-way delay: 16099.001 ms

Loss rate: 29.78%

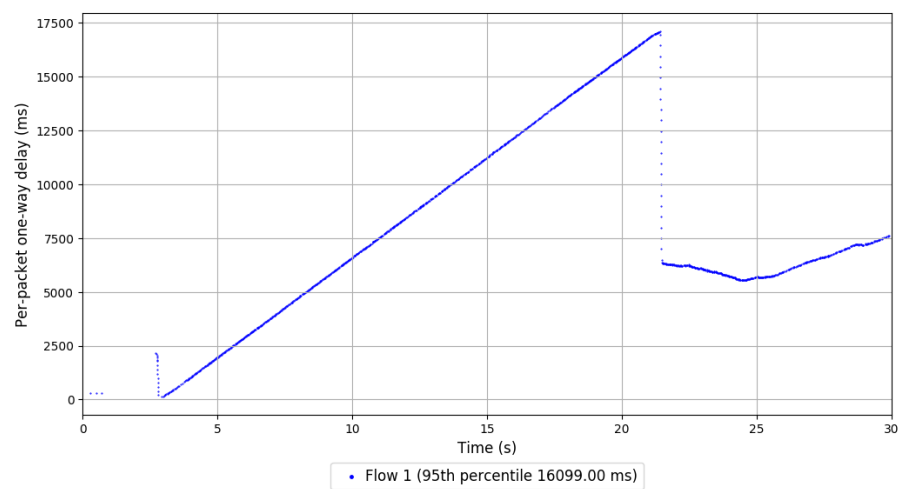
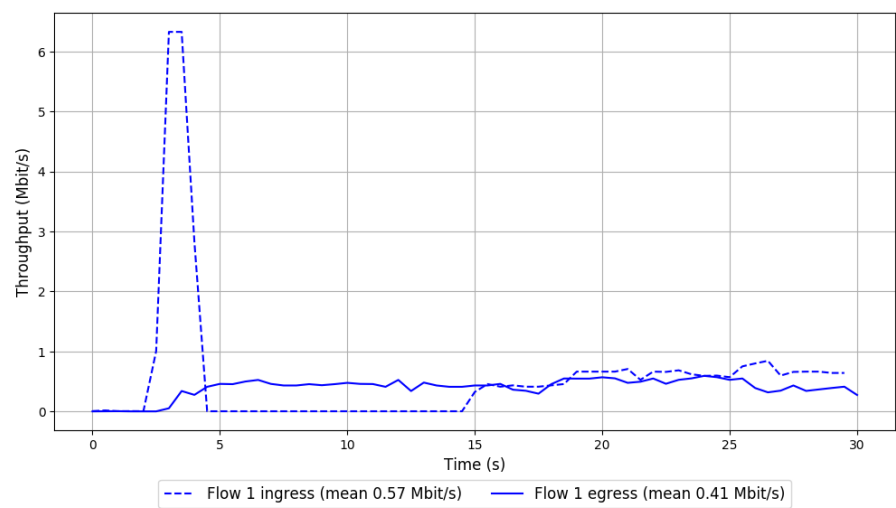
-- Flow 1:

Average throughput: 0.41 Mbit/s

95th percentile per-packet one-way delay: 16099.001 ms

Loss rate: 29.78%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2019-02-11 21:55:06

End at: 2019-02-11 21:55:36

Local clock offset: -7.002 ms

Remote clock offset: 3.04 ms

Below is generated by plot.py at 2019-02-11 22:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 12941.061 ms

Loss rate: 19.02%

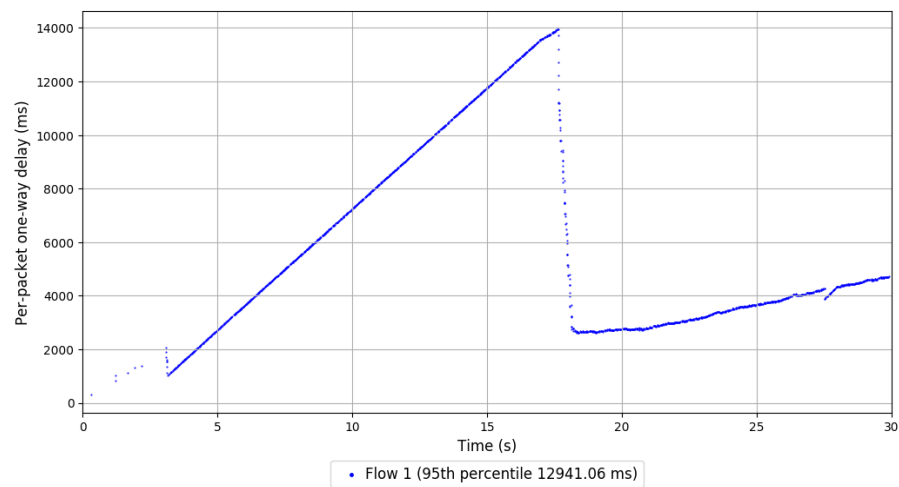
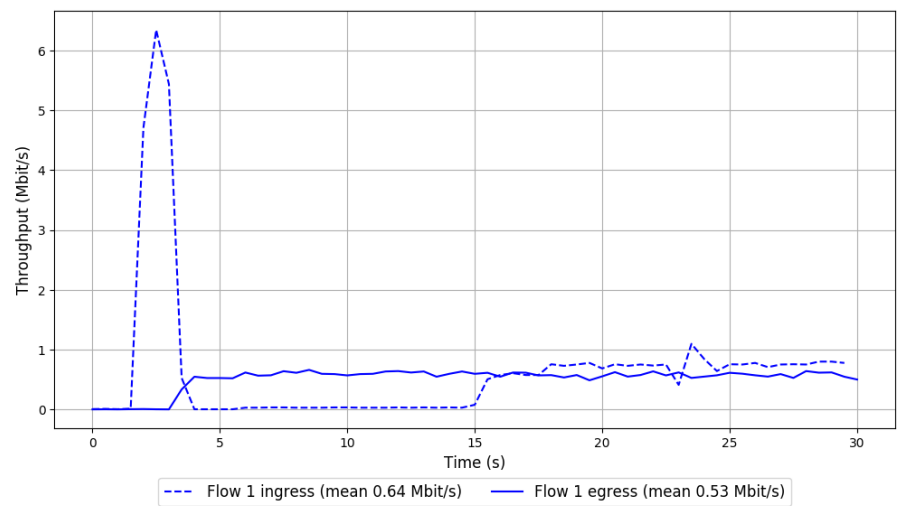
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 12941.061 ms

Loss rate: 19.02%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2019-02-11 20:59:05

End at: 2019-02-11 20:59:35

Local clock offset: -2.2 ms

Remote clock offset: 8.355 ms

Below is generated by plot.py at 2019-02-11 22:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 25142.161 ms

Loss rate: 45.89%

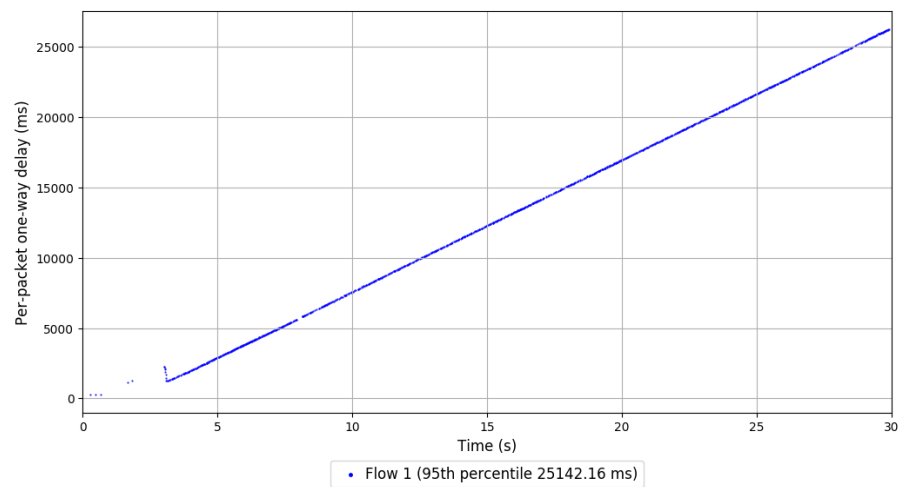
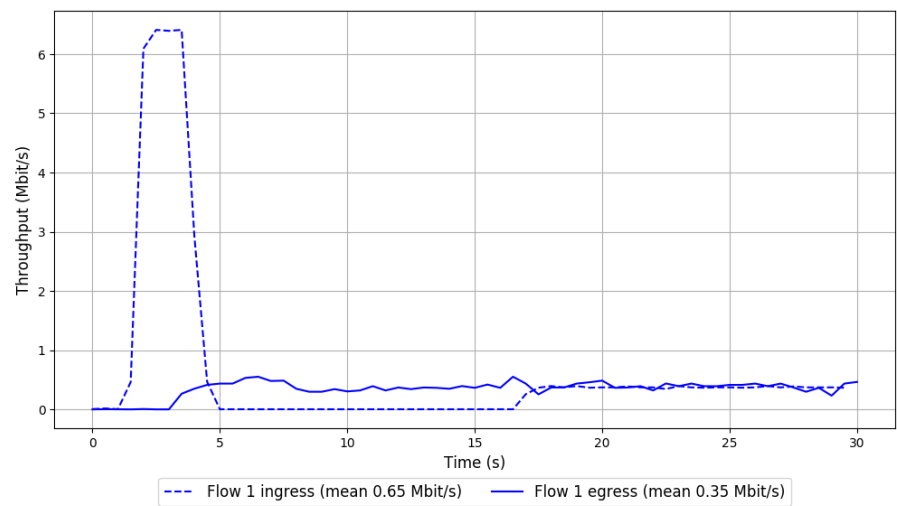
-- Flow 1:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 25142.161 ms

Loss rate: 45.89%

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2019-02-11 21:25:04

End at: 2019-02-11 21:25:34

Local clock offset: -6.767 ms

Remote clock offset: 6.814 ms

Below is generated by plot.py at 2019-02-11 22:03:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 24532.078 ms

Loss rate: 29.37%

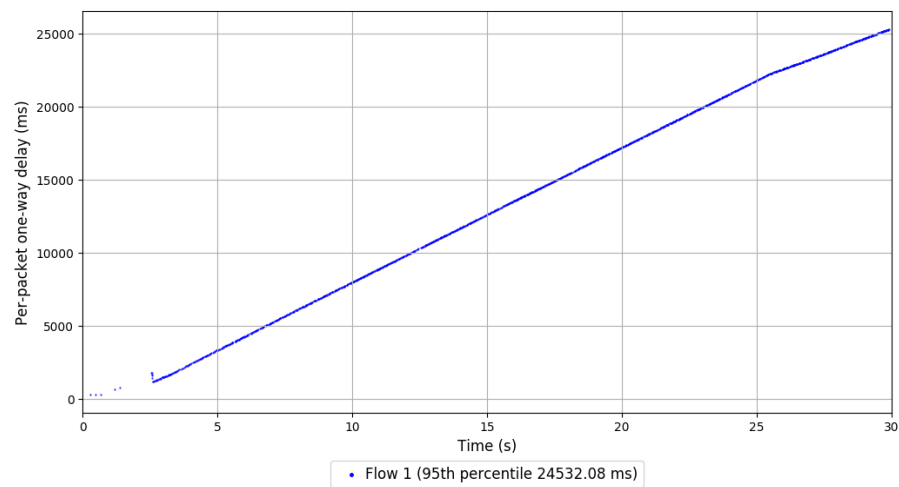
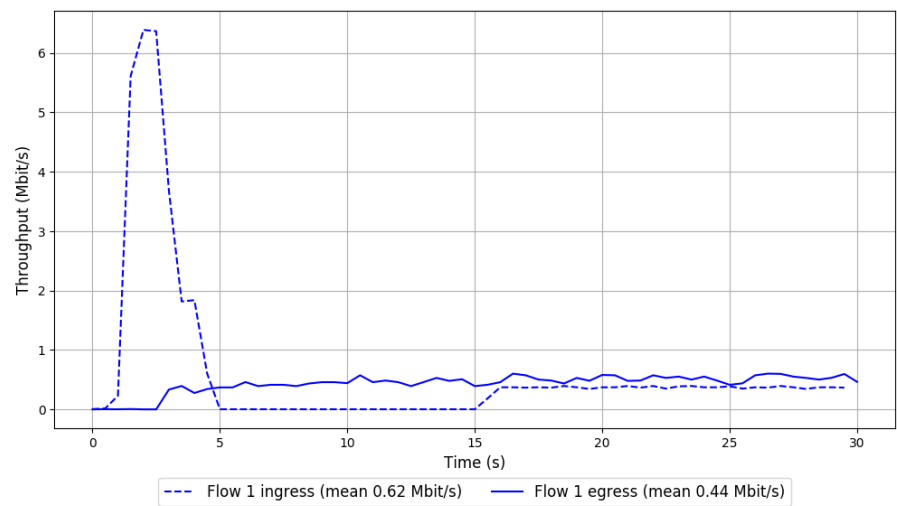
-- Flow 1:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 24532.078 ms

Loss rate: 29.37%

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2019-02-11 21:50:28

End at: 2019-02-11 21:50:58

Local clock offset: -6.878 ms

Remote clock offset: 8.022 ms

Below is generated by plot.py at 2019-02-11 22:03:08

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 17226.193 ms

Loss rate: 19.55%

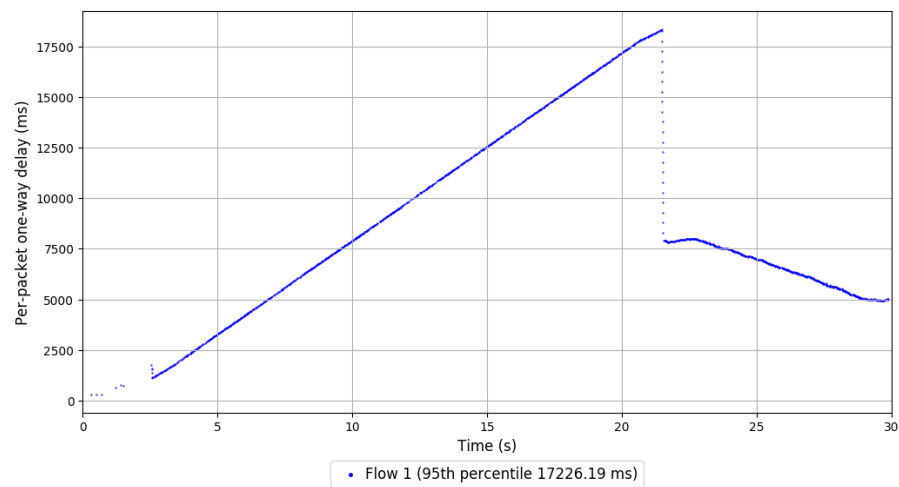
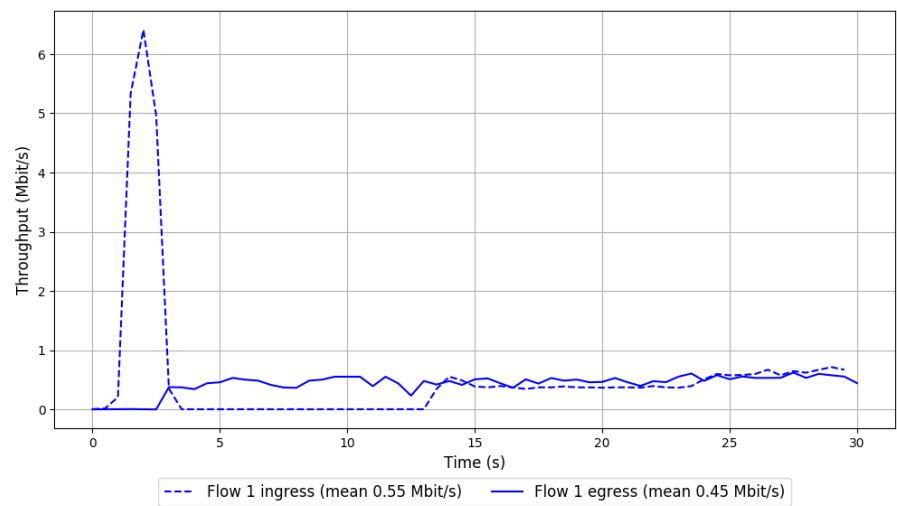
-- Flow 1:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 17226.193 ms

Loss rate: 19.55%

Run 3: Report of FillP-Sheep — Data Link

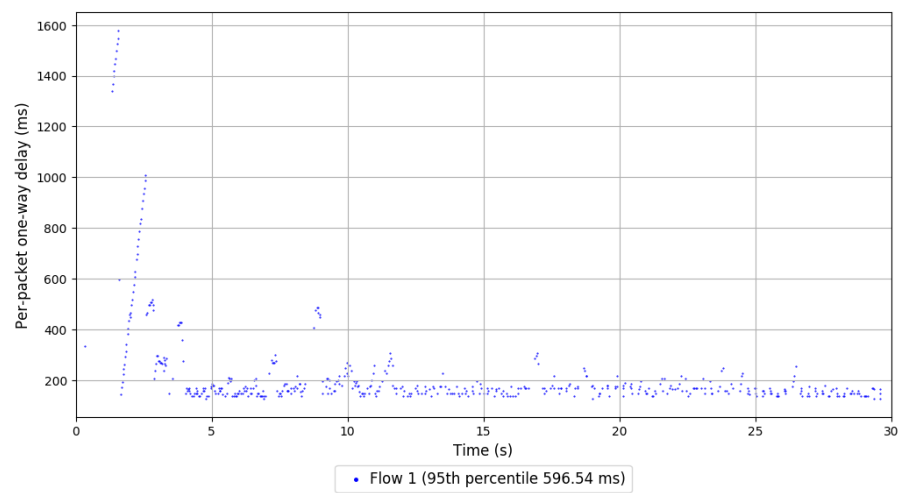
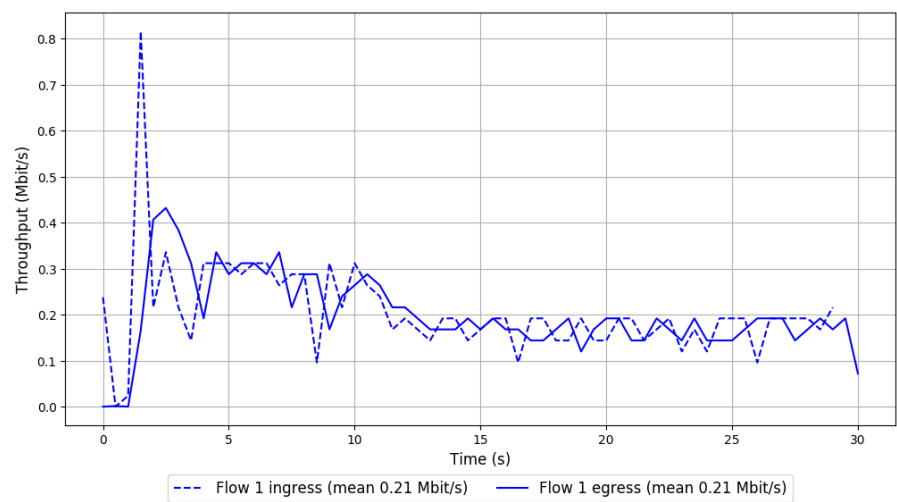


```
Run 1: Statistics of Indigo

Start at: 2019-02-11 21:02:57
End at: 2019-02-11 21:03:27
Local clock offset: -1.975 ms
Remote clock offset: 7.634 ms

# Below is generated by plot.py at 2019-02-11 22:03:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 596.538 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 596.538 ms
Loss rate: 0.20%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2019-02-11 21:28:52

End at: 2019-02-11 21:29:22

Local clock offset: -7.029 ms

Remote clock offset: 7.952 ms

Below is generated by plot.py at 2019-02-11 22:03:08

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 386.559 ms

Loss rate: 0.82%

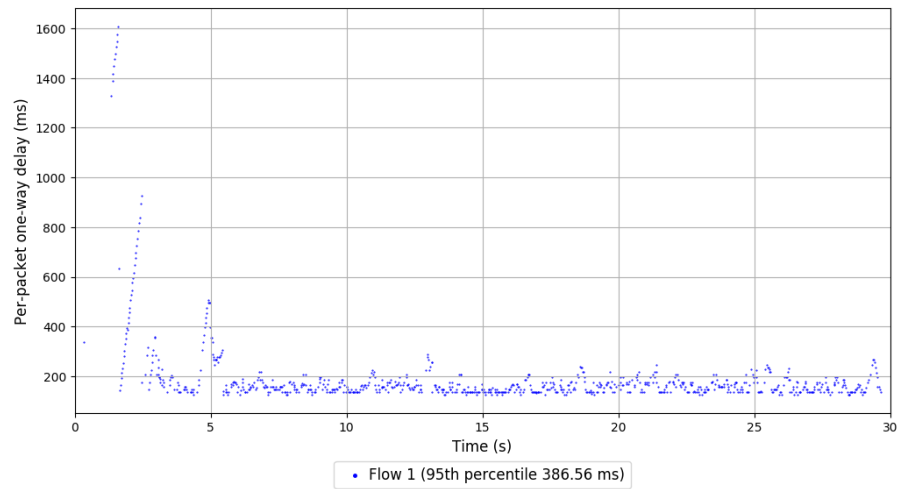
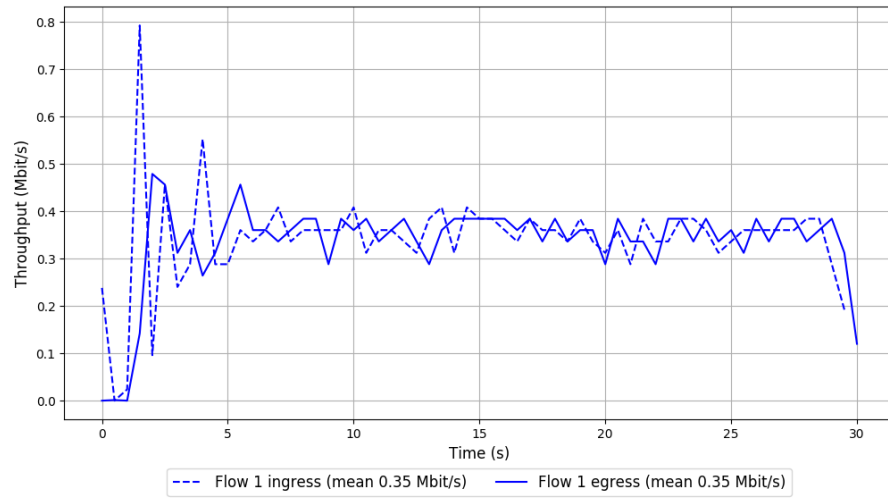
-- Flow 1:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 386.559 ms

Loss rate: 0.82%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2019-02-11 21:53:58

End at: 2019-02-11 21:54:28

Local clock offset: -7.74 ms

Remote clock offset: 3.99 ms

Below is generated by plot.py at 2019-02-11 22:03:08

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 309.439 ms

Loss rate: 0.62%

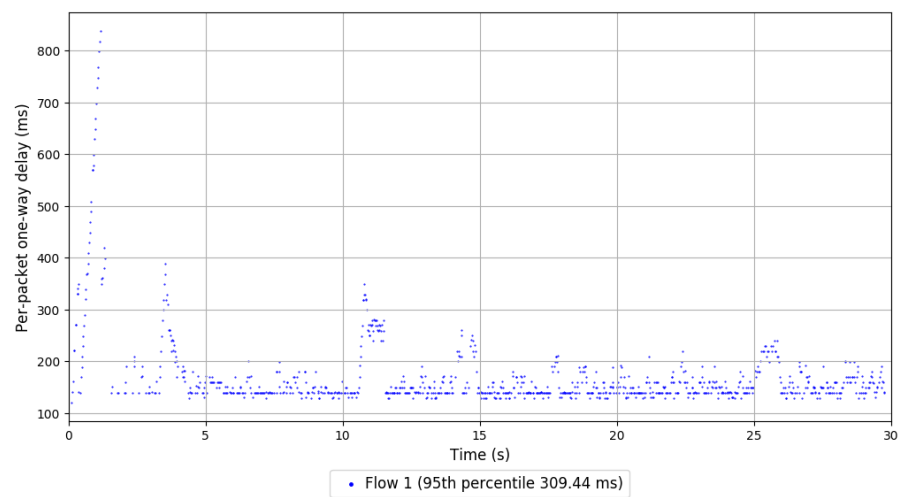
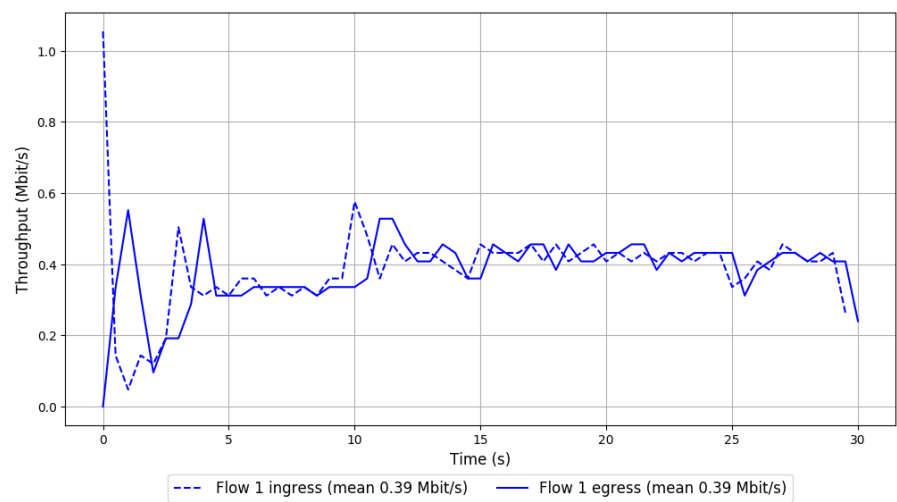
-- Flow 1:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 309.439 ms

Loss rate: 0.62%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-02-11T20-46-Colombia-cellular-to-AWS-Brazil-2-3-runs/indigo.

Run 1: Report of Indigo-MusesC3 — Data Link

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Run 2: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-02-11T20-46-Colombia-cellular-to-AWS-Brazil-2-3-runs/indigo.

Run 2: Report of Indigo-MusesC3 — Data Link

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Run 3: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-02-11T20-46-Colombia-cellular-to-AWS-Brazil-2-3-runs/indigo.

Run 3: Report of Indigo-MusesC3 — Data Link

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Run 1: Statistics of Indigo-MusesC5

Start at: 2019-02-11 20:52:54

End at: 2019-02-11 20:53:24

Local clock offset: -2.692 ms

Remote clock offset: 7.832 ms

Below is generated by plot.py at 2019-02-11 22:03:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 16041.723 ms

Loss rate: 59.86%

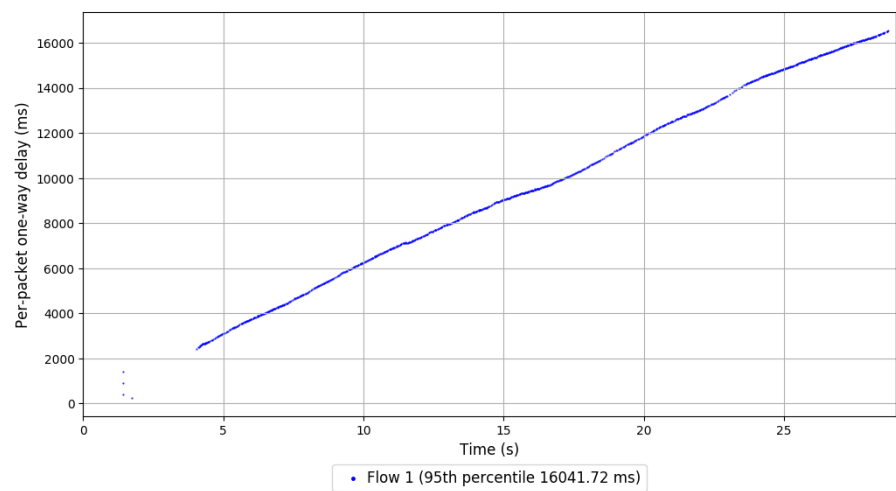
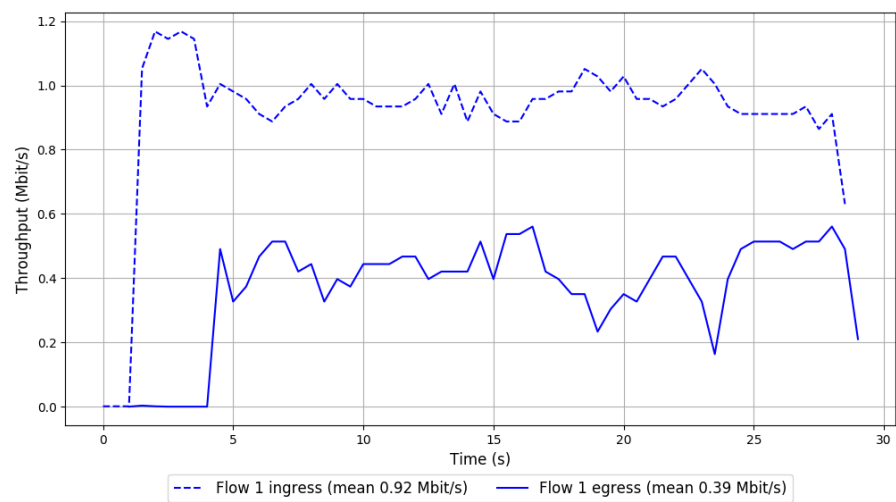
-- Flow 1:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 16041.723 ms

Loss rate: 59.86%

Run 1: Report of Indigo-MusesC5 — Data Link



Run 2: Statistics of Indigo-MusesC5

Start at: 2019-02-11 21:18:36

End at: 2019-02-11 21:19:06

Local clock offset: -6.06 ms

Remote clock offset: 8.032 ms

Below is generated by plot.py at 2019-02-11 22:03:10

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.33 Mbit/s

95th percentile per-packet one-way delay: 18194.547 ms

Loss rate: 67.43%

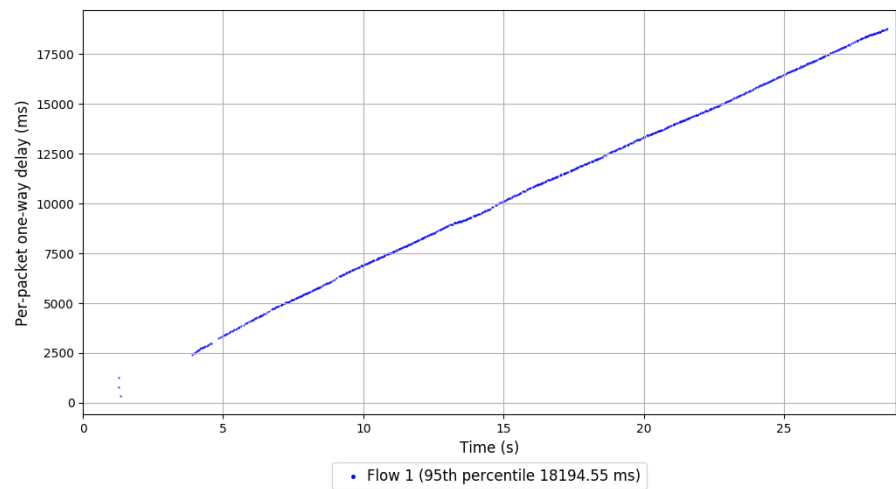
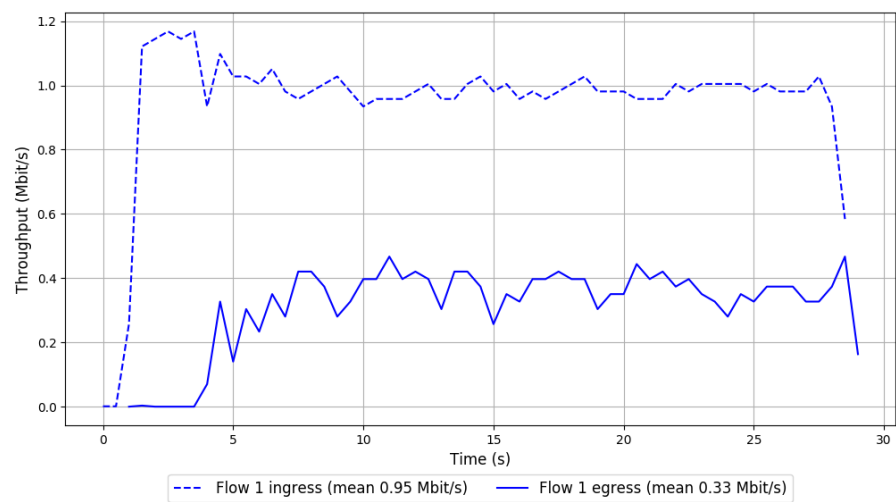
-- Flow 1:

Average throughput: 0.33 Mbit/s

95th percentile per-packet one-way delay: 18194.547 ms

Loss rate: 67.43%

Run 2: Report of Indigo-MusesC5 — Data Link



Run 3: Statistics of Indigo-MusesC5

Start at: 2019-02-11 21:44:27

End at: 2019-02-11 21:44:57

Local clock offset: -6.737 ms

Remote clock offset: 6.495 ms

Below is generated by plot.py at 2019-02-11 22:03:10

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 13805.271 ms

Loss rate: 50.40%

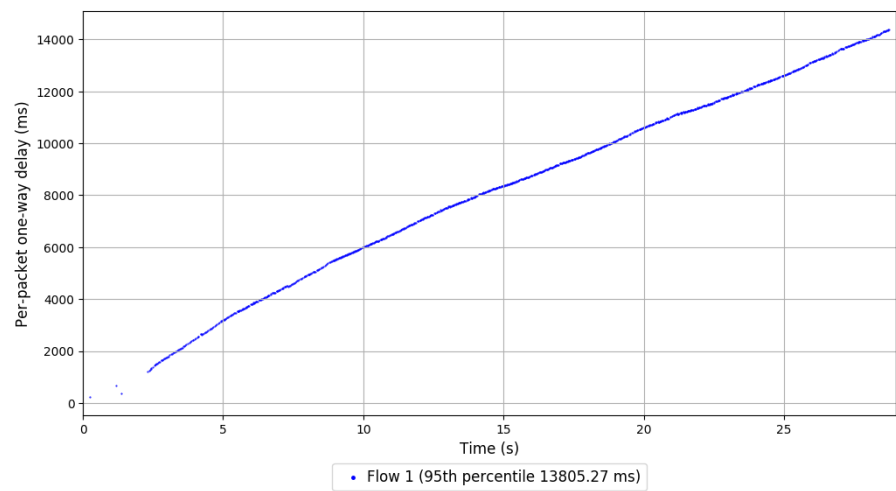
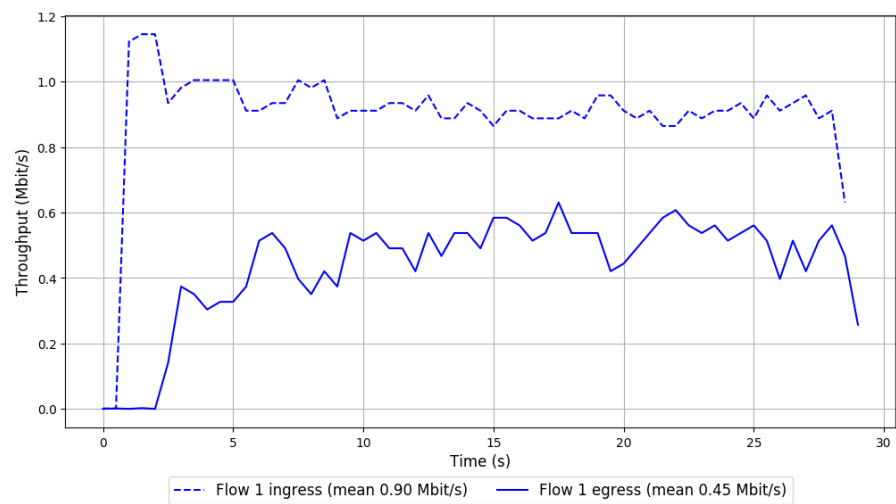
-- Flow 1:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 13805.271 ms

Loss rate: 50.40%

Run 3: Report of Indigo-MusesC5 — Data Link



Run 1: Statistics of Indigo-MusesD

Start at: 2019-02-11 20:56:25

End at: 2019-02-11 20:56:55

Local clock offset: -2.398 ms

Remote clock offset: 8.32 ms

Below is generated by plot.py at 2019-02-11 22:03:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 23418.425 ms

Loss rate: 92.87%

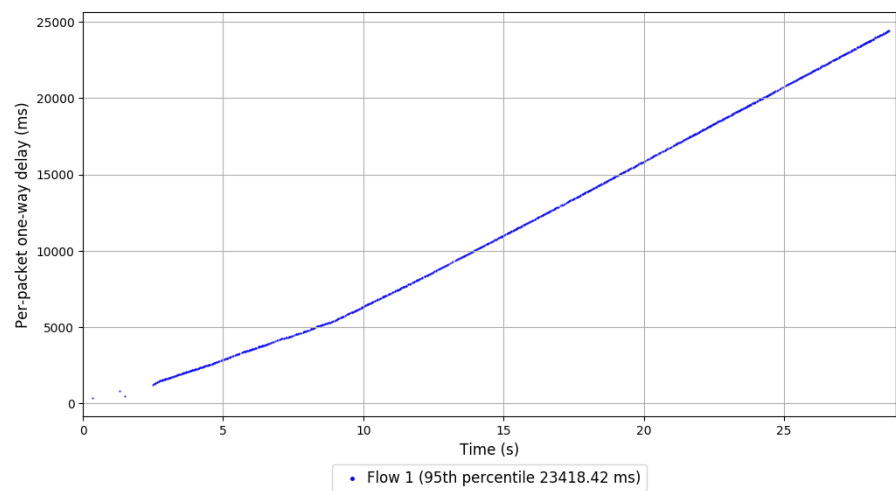
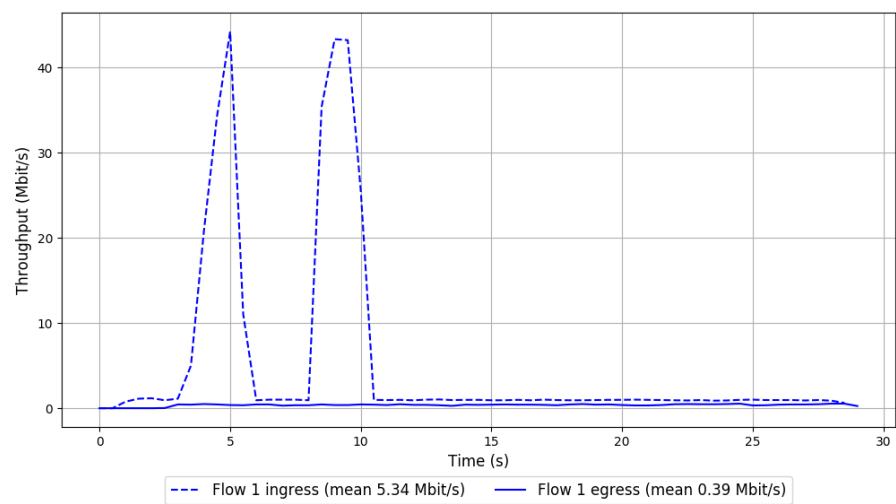
-- Flow 1:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 23418.425 ms

Loss rate: 92.87%

Run 1: Report of Indigo-MusesD — Data Link



Run 2: Statistics of Indigo-MusesD

Start at: 2019-02-11 21:22:23

End at: 2019-02-11 21:22:53

Local clock offset: -5.749 ms

Remote clock offset: 9.198 ms

Below is generated by plot.py at 2019-02-11 22:03:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 22595.554 ms

Loss rate: 95.24%

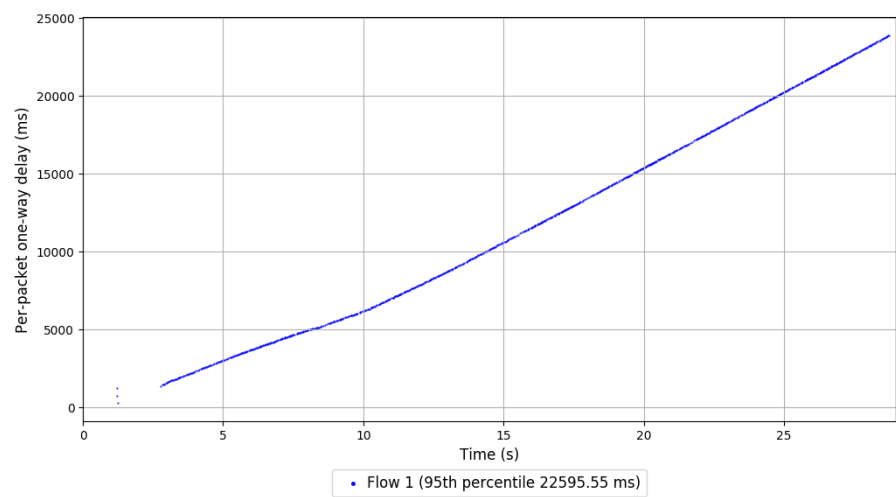
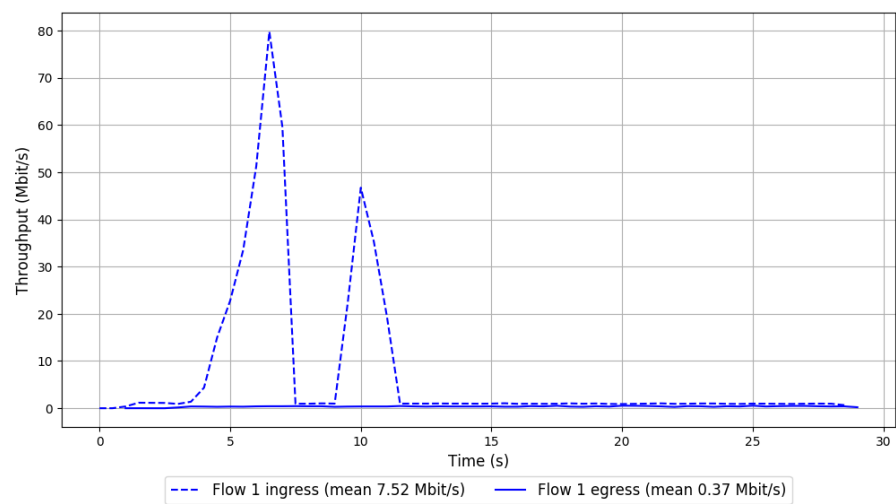
-- Flow 1:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 22595.554 ms

Loss rate: 95.24%

Run 2: Report of Indigo-MusesD — Data Link



Run 3: Statistics of Indigo-MusesD

Start at: 2019-02-11 21:47:51

End at: 2019-02-11 21:48:21

Local clock offset: -6.881 ms

Remote clock offset: 7.706 ms

Below is generated by plot.py at 2019-02-11 22:03:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.34 Mbit/s

95th percentile per-packet one-way delay: 20193.237 ms

Loss rate: 94.74%

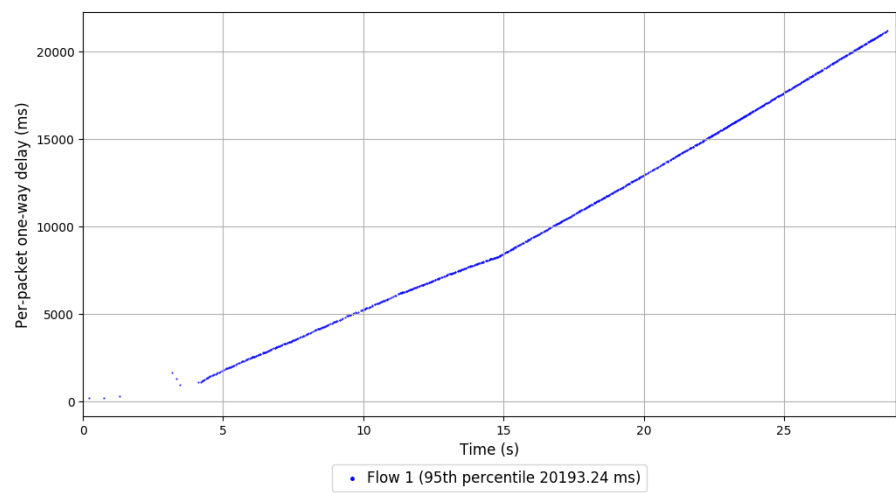
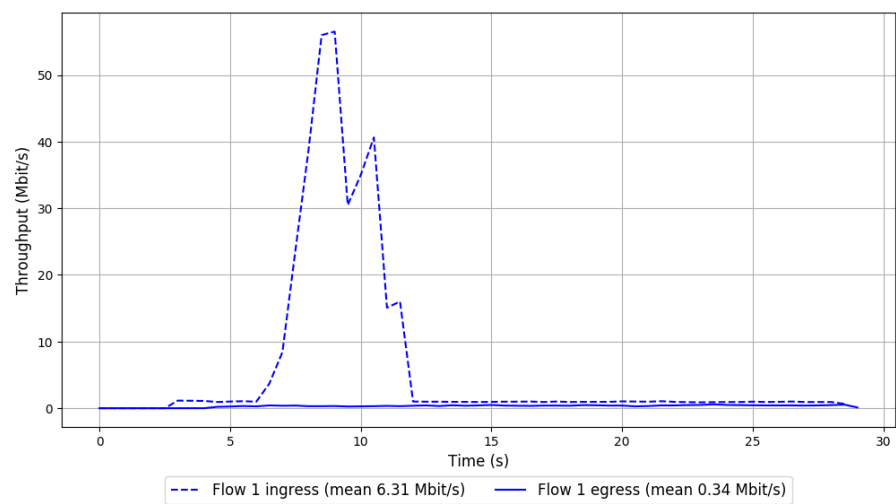
-- Flow 1:

Average throughput: 0.34 Mbit/s

95th percentile per-packet one-way delay: 20193.237 ms

Loss rate: 94.74%

Run 3: Report of Indigo-MusesD — Data Link



Run 1: Statistics of Indigo-MusesT

Start at: 2019-02-11 21:09:46

End at: 2019-02-11 21:10:16

Local clock offset: -3.576 ms

Remote clock offset: 4.168 ms

Below is generated by plot.py at 2019-02-11 22:03:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.33 Mbit/s

95th percentile per-packet one-way delay: 23906.763 ms

Loss rate: 83.44%

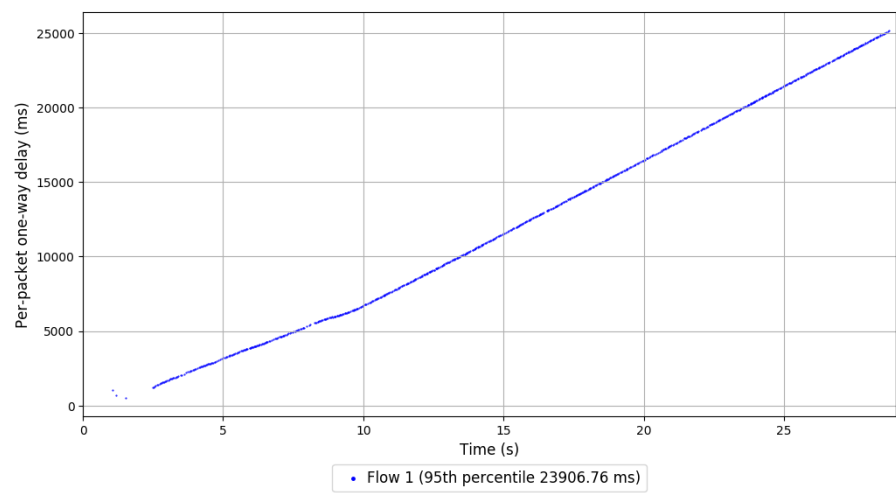
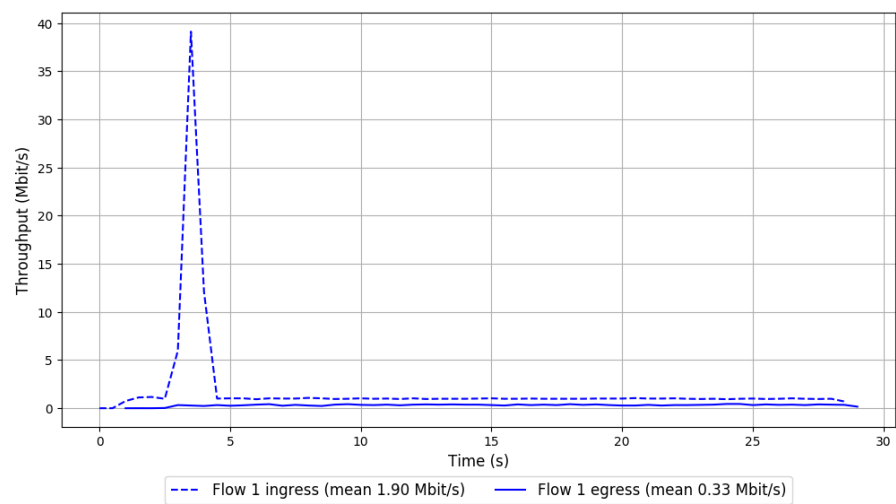
-- Flow 1:

Average throughput: 0.33 Mbit/s

95th percentile per-packet one-way delay: 23906.763 ms

Loss rate: 83.44%

Run 1: Report of Indigo-MusesT — Data Link



Run 2: Statistics of Indigo-MusesT

Start at: 2019-02-11 21:35:41

End at: 2019-02-11 21:36:11

Local clock offset: -7.344 ms

Remote clock offset: 8.117 ms

Below is generated by plot.py at 2019-02-11 22:03:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.41 Mbit/s

95th percentile per-packet one-way delay: 23593.994 ms

Loss rate: 77.22%

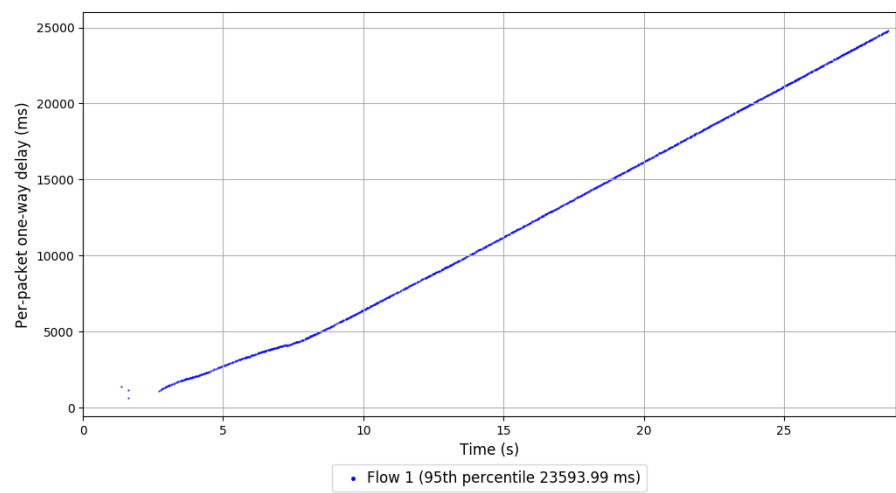
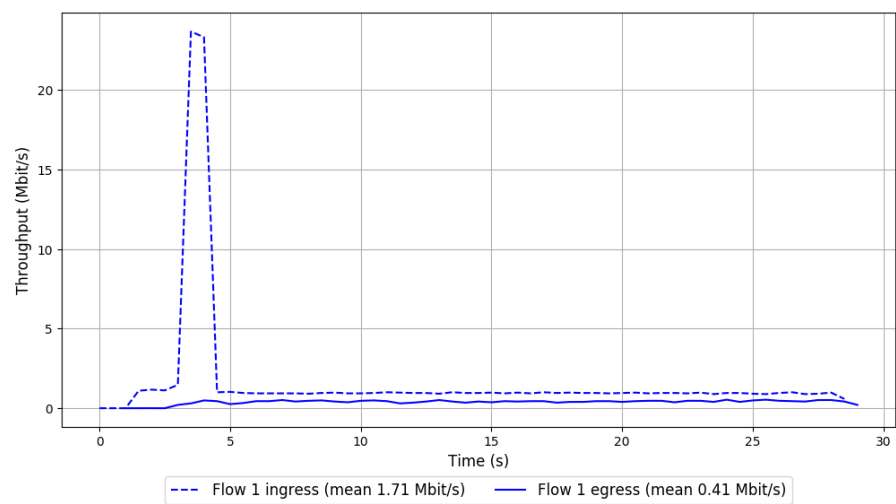
-- Flow 1:

Average throughput: 0.41 Mbit/s

95th percentile per-packet one-way delay: 23593.994 ms

Loss rate: 77.22%

Run 2: Report of Indigo-MusesT — Data Link



Run 3: Statistics of Indigo-MusesT

Start at: 2019-02-11 22:00:51

End at: 2019-02-11 22:01:21

Local clock offset: -7.915 ms

Remote clock offset: 3.447 ms

Below is generated by plot.py at 2019-02-11 22:03:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 23311.794 ms

Loss rate: 89.84%

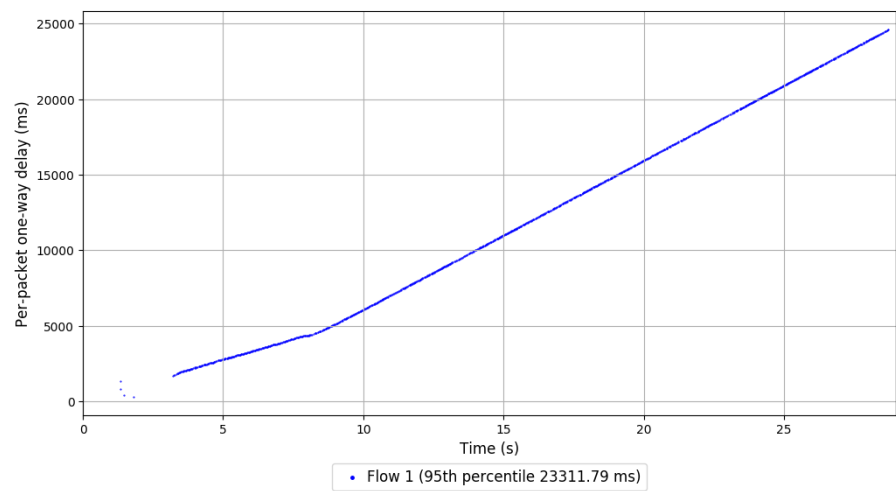
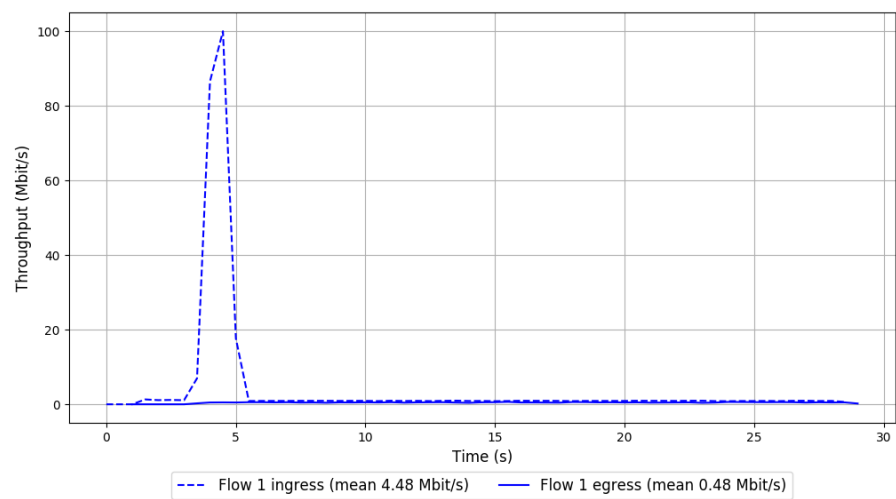
-- Flow 1:

Average throughput: 0.48 Mbit/s

95th percentile per-packet one-way delay: 23311.794 ms

Loss rate: 89.84%

Run 3: Report of Indigo-MusesT — Data Link

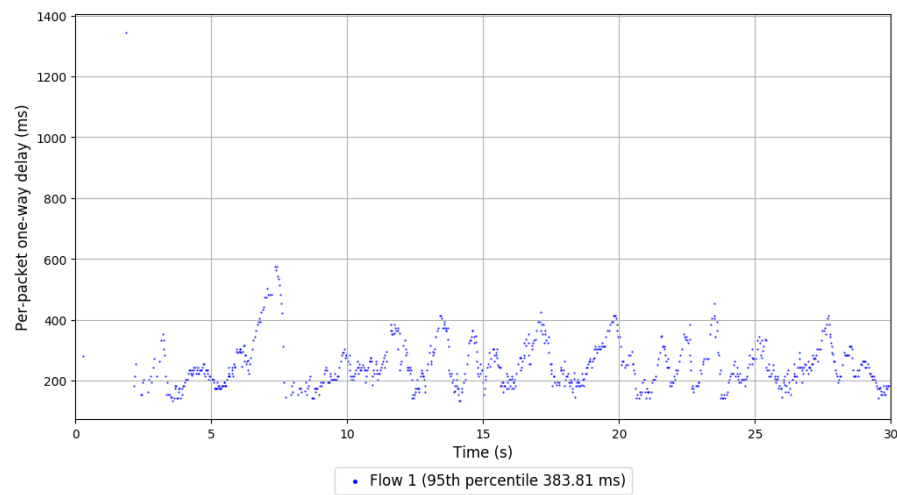
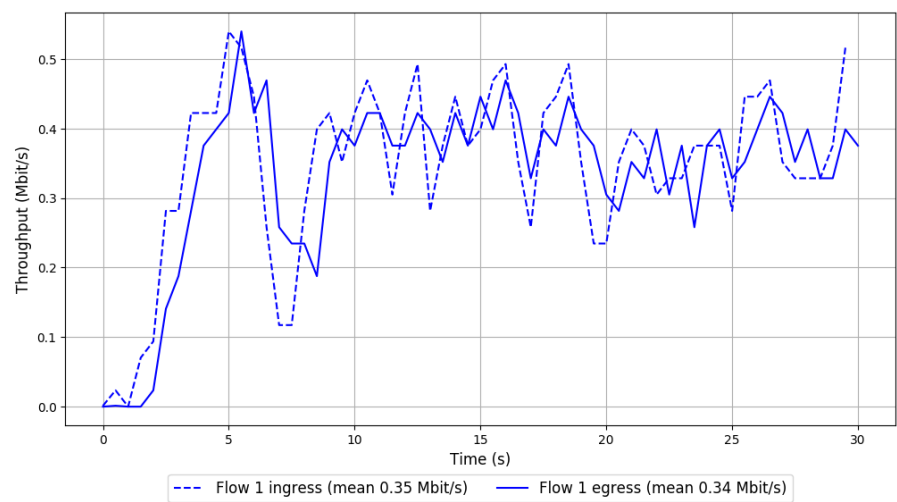


```
Run 1: Statistics of LEDBAT

Start at: 2019-02-11 21:06:21
End at: 2019-02-11 21:06:51
Local clock offset: -2.217 ms
Remote clock offset: 8.29 ms

# Below is generated by plot.py at 2019-02-11 22:03:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 383.805 ms
Loss rate: 1.36%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 383.805 ms
Loss rate: 1.36%
```

Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2019-02-11 21:32:16

End at: 2019-02-11 21:32:46

Local clock offset: -6.395 ms

Remote clock offset: 2.802 ms

Below is generated by plot.py at 2019-02-11 22:03:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.41 Mbit/s

95th percentile per-packet one-way delay: 378.128 ms

Loss rate: 0.77%

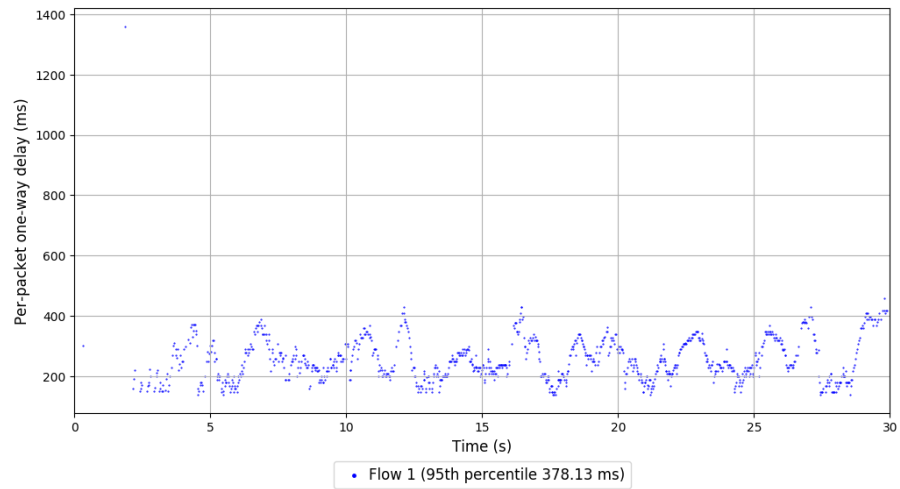
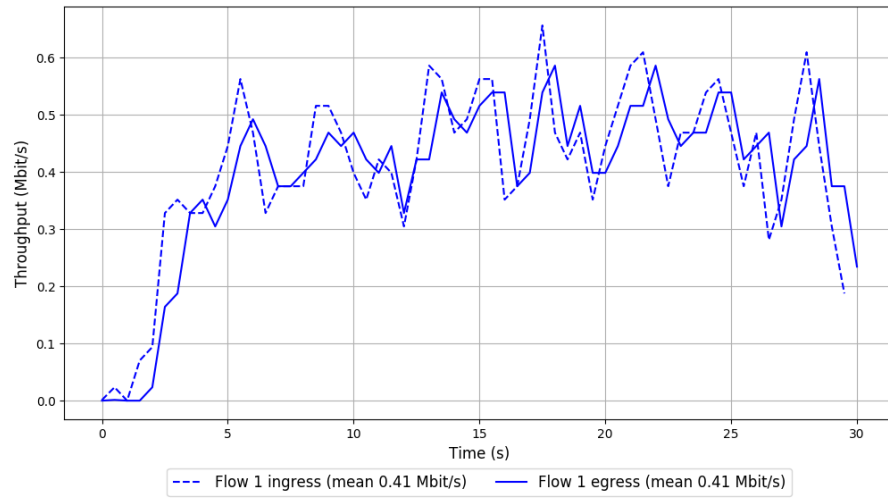
-- Flow 1:

Average throughput: 0.41 Mbit/s

95th percentile per-packet one-way delay: 378.128 ms

Loss rate: 0.77%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2019-02-11 21:57:25

End at: 2019-02-11 21:57:55

Local clock offset: -7.834 ms

Remote clock offset: 8.396 ms

Below is generated by plot.py at 2019-02-11 22:03:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 303.840 ms

Loss rate: 1.12%

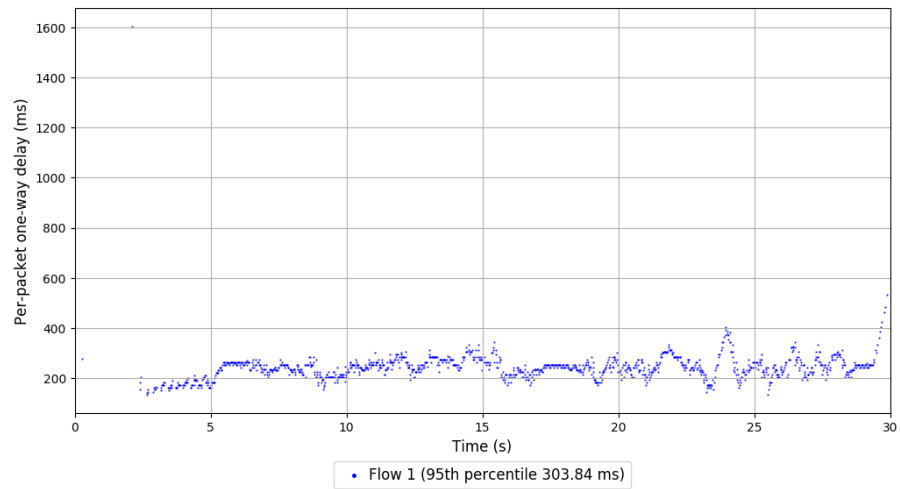
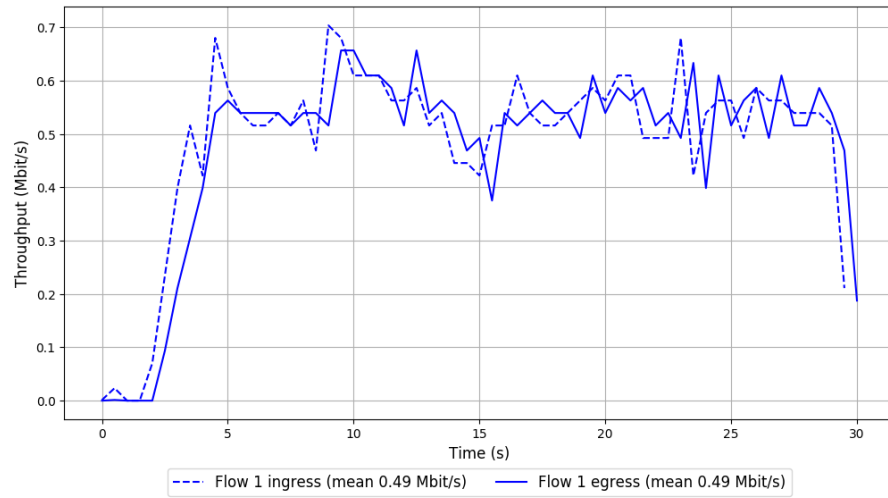
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 303.840 ms

Loss rate: 1.12%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2019-02-11 20:49:05

End at: 2019-02-11 20:49:35

Local clock offset: -3.088 ms

Remote clock offset: 7.5 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.36 Mbit/s

95th percentile per-packet one-way delay: 25940.994 ms

Loss rate: 99.05%

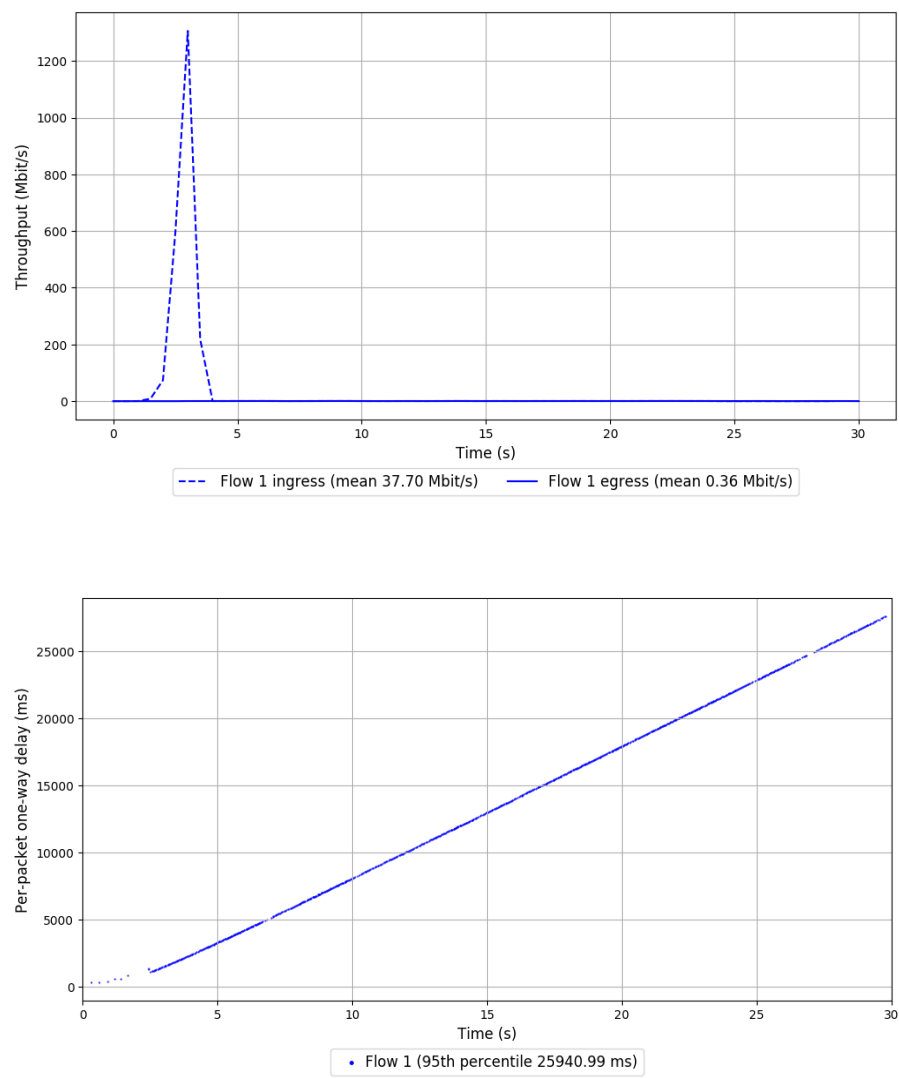
-- Flow 1:

Average throughput: 0.36 Mbit/s

95th percentile per-packet one-way delay: 25940.994 ms

Loss rate: 99.05%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2019-02-11 21:14:46

End at: 2019-02-11 21:15:16

Local clock offset: -4.738 ms

Remote clock offset: 7.147 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 25605.076 ms

Loss rate: 98.77%

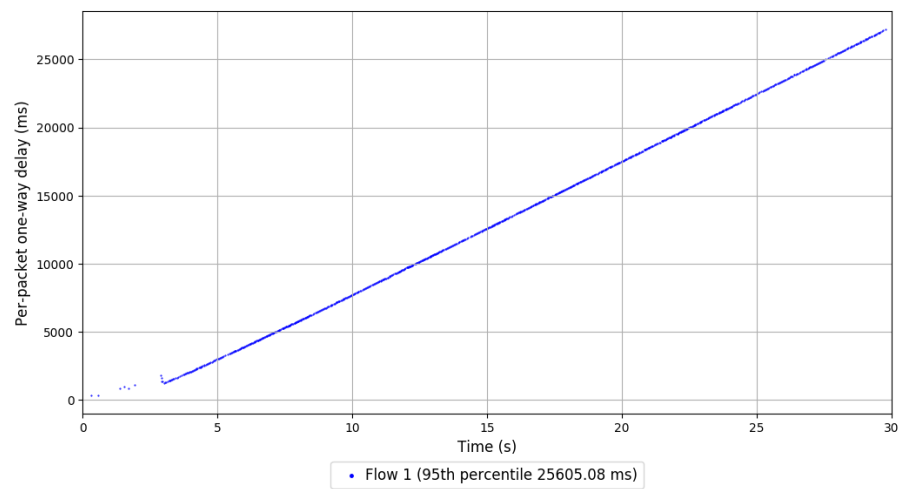
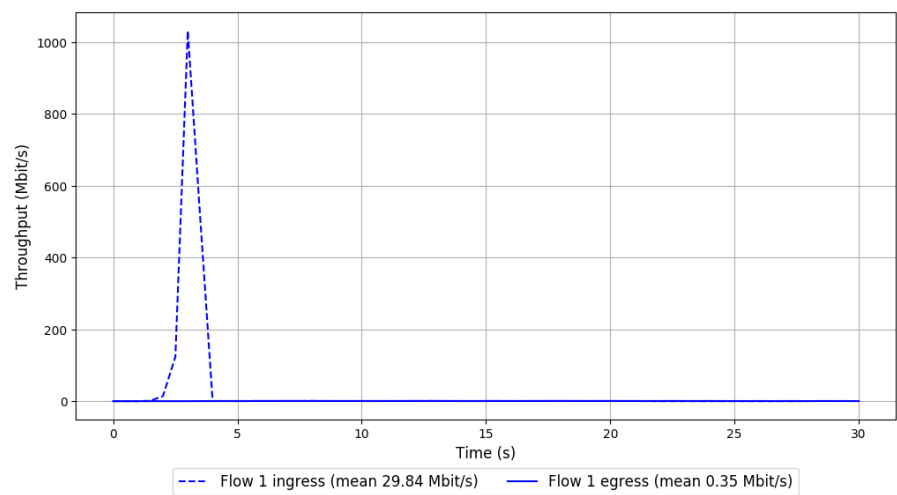
-- Flow 1:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 25605.076 ms

Loss rate: 98.77%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2019-02-11 21:40:37

End at: 2019-02-11 21:41:07

Local clock offset: -7.468 ms

Remote clock offset: 2.788 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.42 Mbit/s

95th percentile per-packet one-way delay: 25687.211 ms

Loss rate: 98.63%

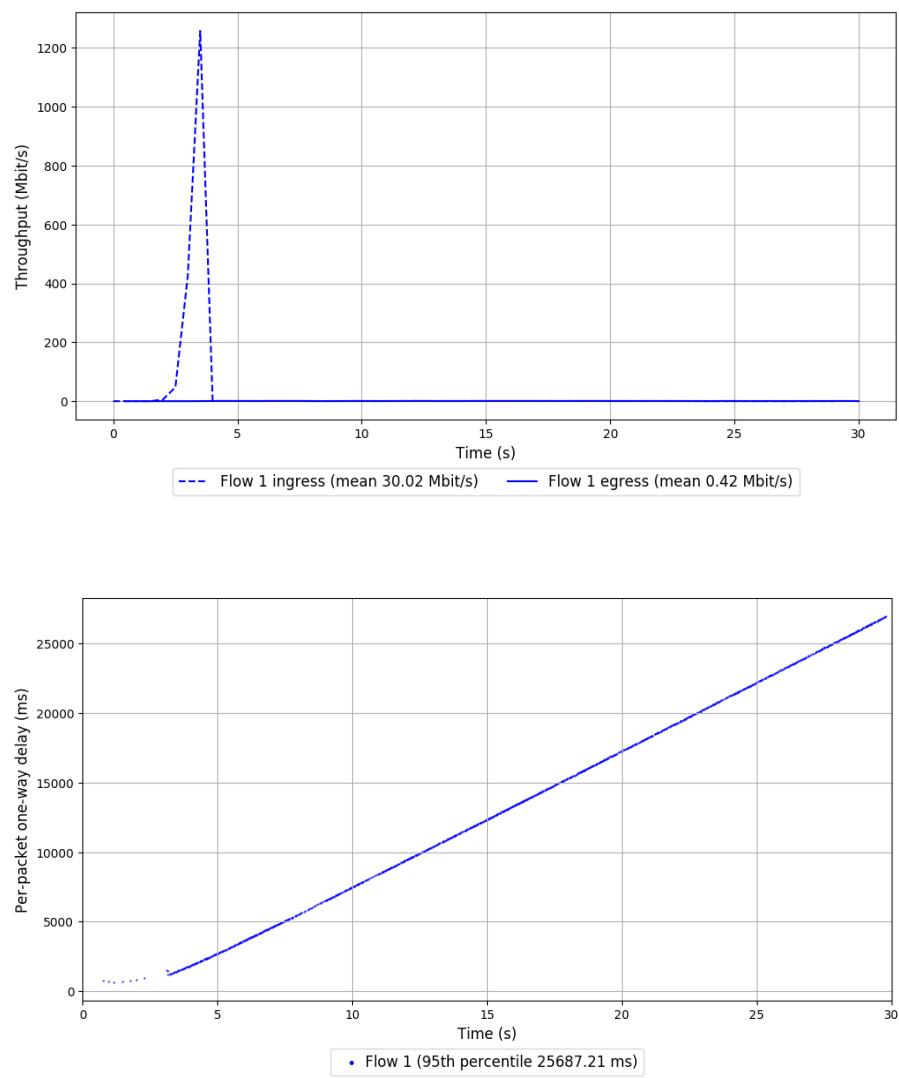
-- Flow 1:

Average throughput: 0.42 Mbit/s

95th percentile per-packet one-way delay: 25687.211 ms

Loss rate: 98.63%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

/home/ubuntu/pantheon/data/2019-02-11T20-46-Colombia-cellular-to-AWS-Brazil-2-3-runs/pcc_exp

Run 1: Report of PCC-Expr — Data Link

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Run 2: Statistics of PCC-Expr

/home/ubuntu/pantheon/data/2019-02-11T20-46-Colombia-cellular-to-AWS-Brazil-2-3-runs/pcc_exp

Run 2: Report of PCC-Expr — Data Link

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Run 3: Statistics of PCC-Expr

Start at: 2019-02-11 21:52:47

End at: 2019-02-11 21:53:17

Local clock offset: -7.754 ms

Remote clock offset: 2.678 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 25719.628 ms

Loss rate: 90.68%

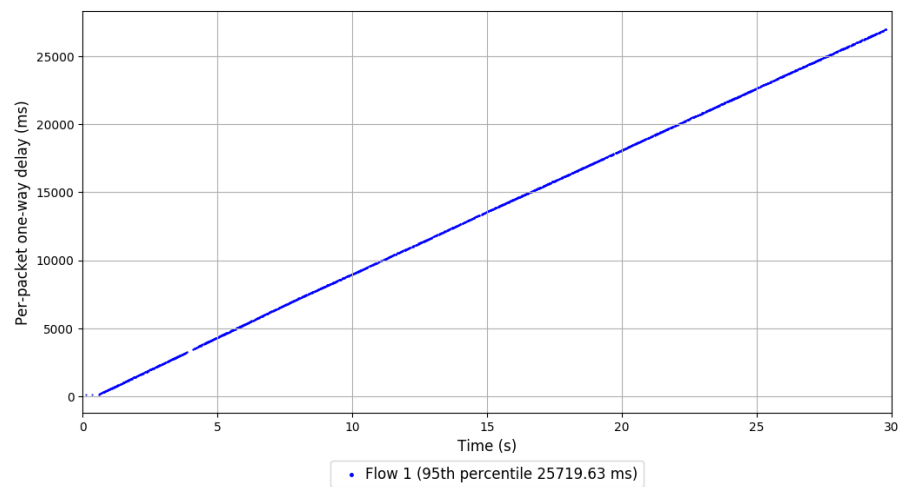
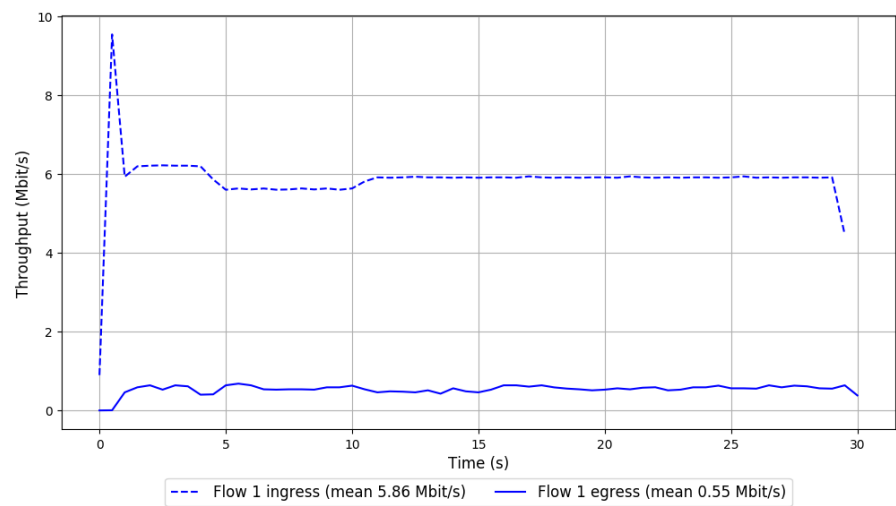
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 25719.628 ms

Loss rate: 90.68%

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2019-02-11 20:55:14

End at: 2019-02-11 20:55:44

Local clock offset: -1.788 ms

Remote clock offset: 4.024 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 7330.735 ms

Loss rate: 27.61%

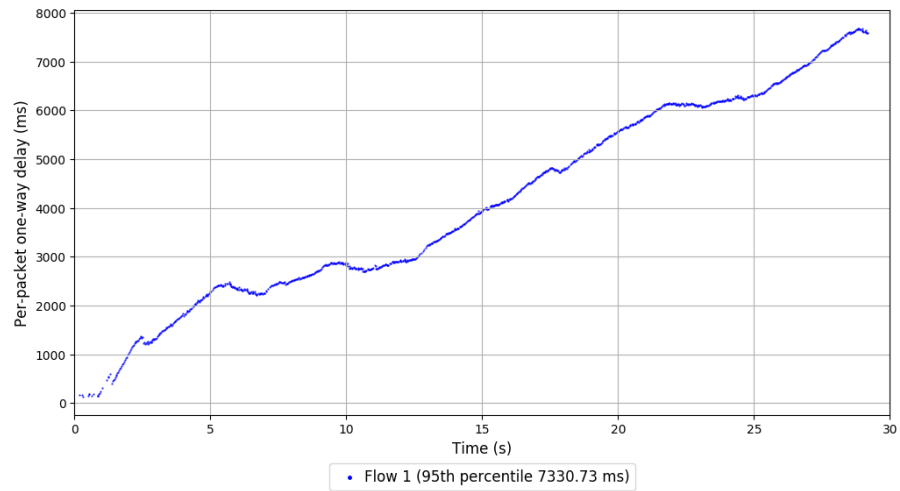
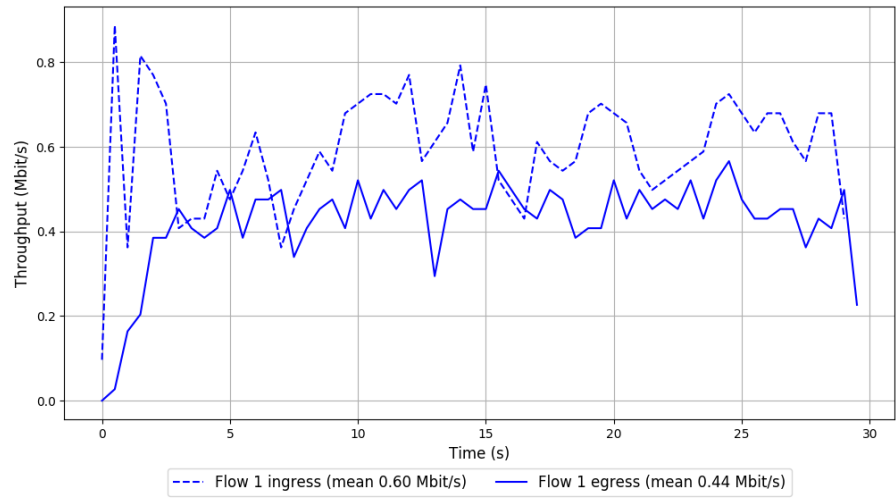
-- Flow 1:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 7330.735 ms

Loss rate: 27.61%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2019-02-11 21:21:15

End at: 2019-02-11 21:21:45

Local clock offset: -5.635 ms

Remote clock offset: 2.961 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.41 Mbit/s

95th percentile per-packet one-way delay: 6638.141 ms

Loss rate: 25.28%

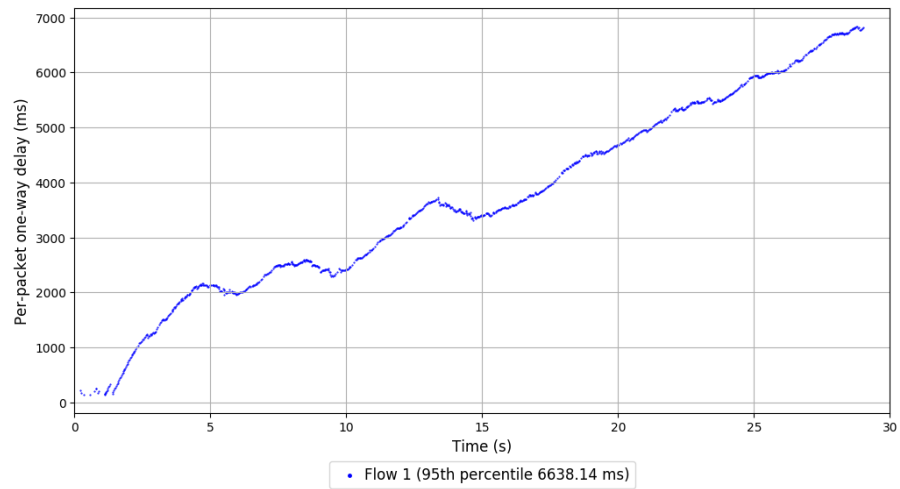
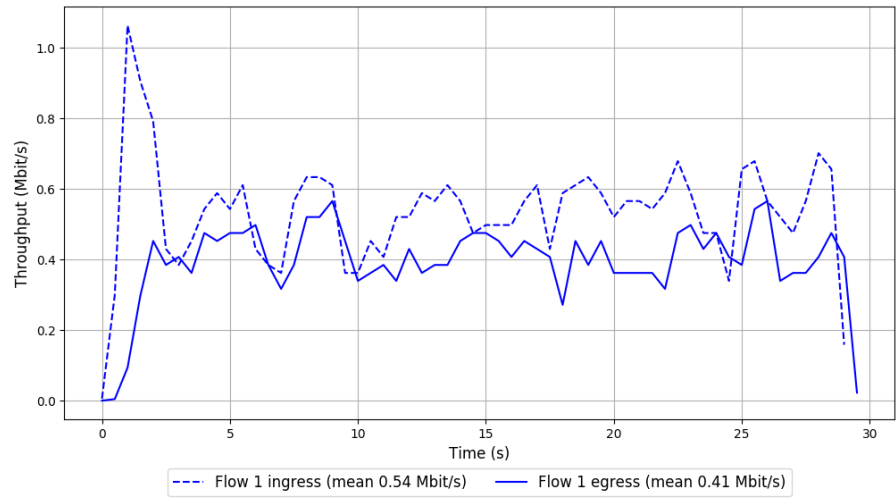
-- Flow 1:

Average throughput: 0.41 Mbit/s

95th percentile per-packet one-way delay: 6638.141 ms

Loss rate: 25.28%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2019-02-11 21:46:43

End at: 2019-02-11 21:47:13

Local clock offset: -6.836 ms

Remote clock offset: 7.67 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.42 Mbit/s

95th percentile per-packet one-way delay: 9285.269 ms

Loss rate: 29.64%

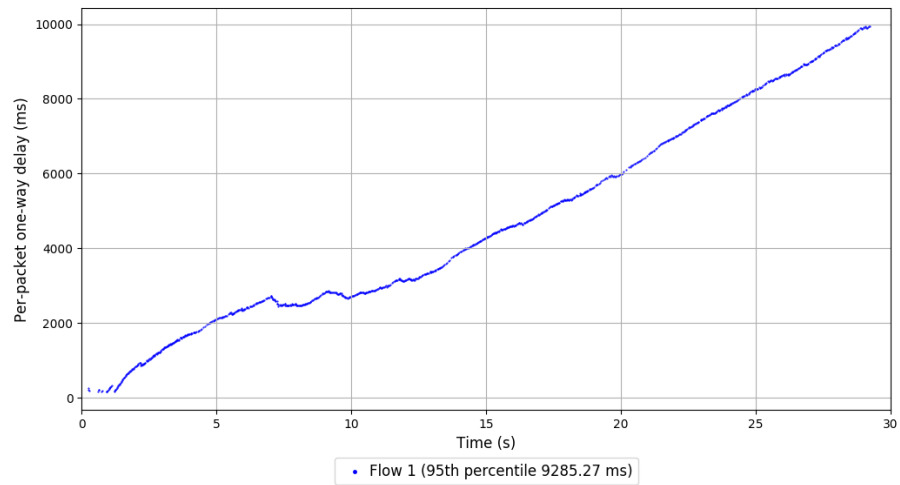
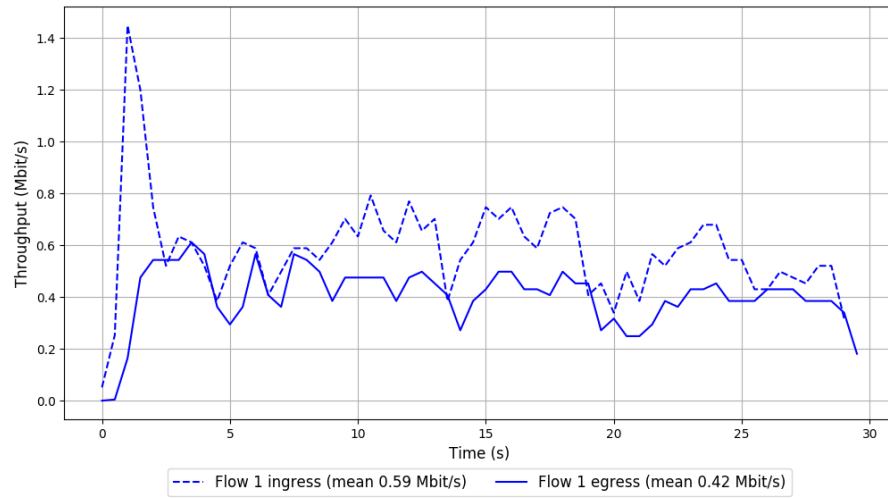
-- Flow 1:

Average throughput: 0.42 Mbit/s

95th percentile per-packet one-way delay: 9285.269 ms

Loss rate: 29.64%

Run 3: Report of QUIC Cubic — Data Link



Run 1: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-02-11T20-46-Colombia-cellular-to-AWS-Brazil-2-3-runs/scream.

Run 1: Report of SReAM — Data Link

Figure is missing

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Run 2: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-02-11T20-46-Colombia-cellular-to-AWS-Brazil-2-3-runs/scream.

Run 2: Report of SReAM — Data Link

Figure is missing

Figure is missing

Run 3: Statistics of SCReAM

Start at: 2019-02-11 21:49:20

End at: 2019-02-11 21:49:50

Local clock offset: -6.856 ms

Remote clock offset: 7.021 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.13 Mbit/s

95th percentile per-packet one-way delay: 201.900 ms

Loss rate: 0.46%

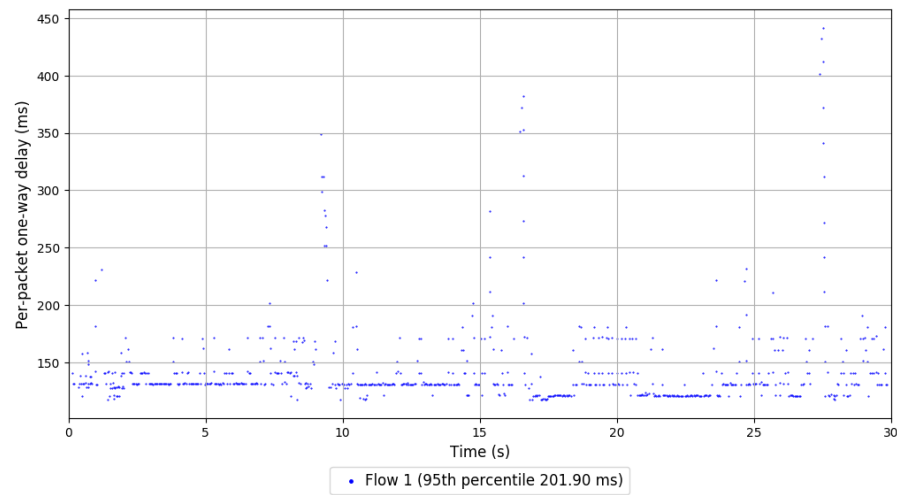
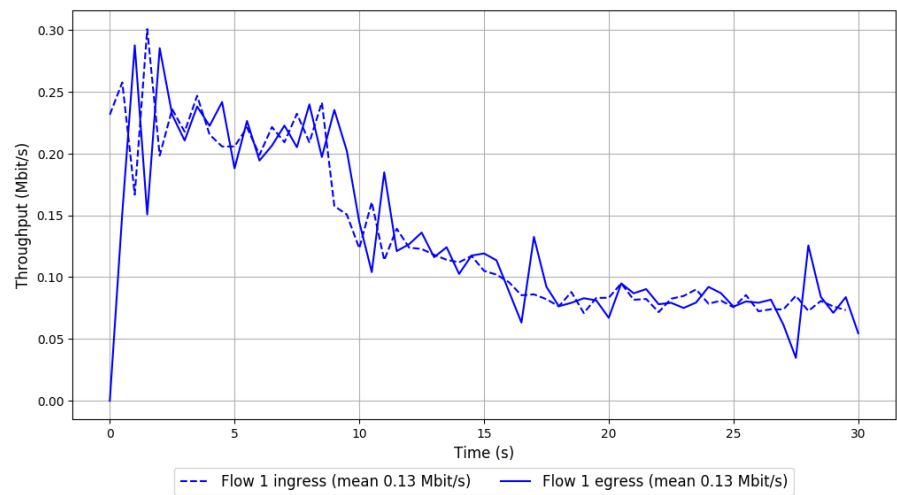
-- Flow 1:

Average throughput: 0.13 Mbit/s

95th percentile per-packet one-way delay: 201.900 ms

Loss rate: 0.46%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of Sprout

Start at: 2019-02-11 20:47:57

End at: 2019-02-11 20:48:27

Local clock offset: -2.501 ms

Remote clock offset: 3.598 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 1181.615 ms

Loss rate: 0.85%

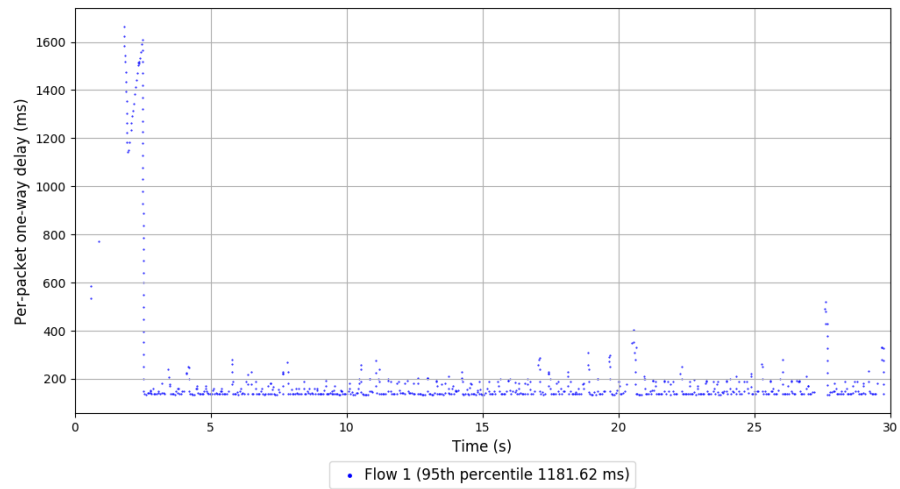
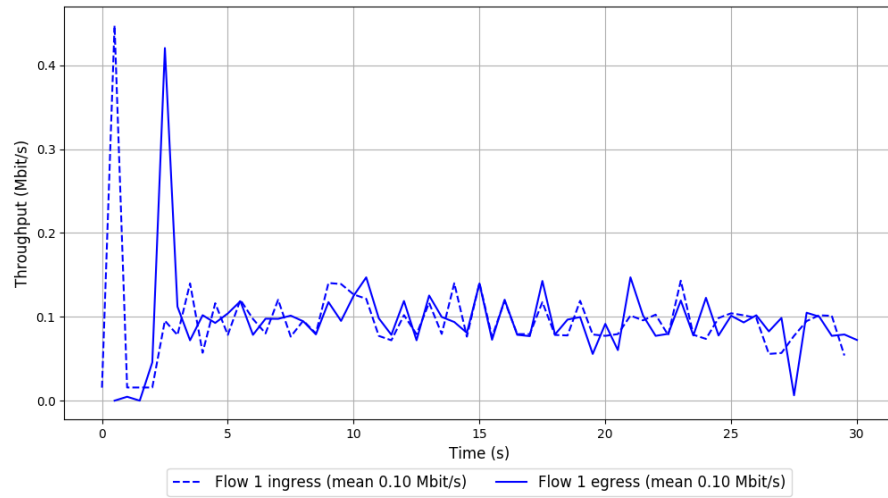
-- Flow 1:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 1181.615 ms

Loss rate: 0.85%

Run 1: Report of Sprout — Data Link

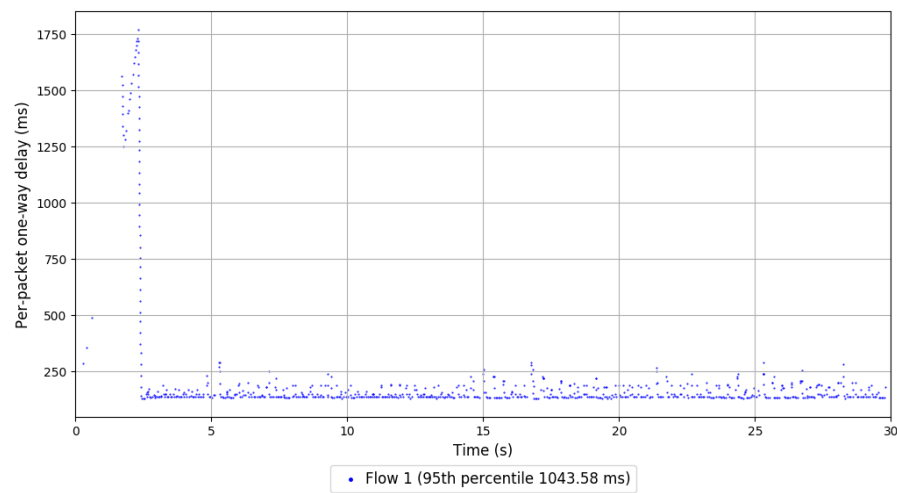
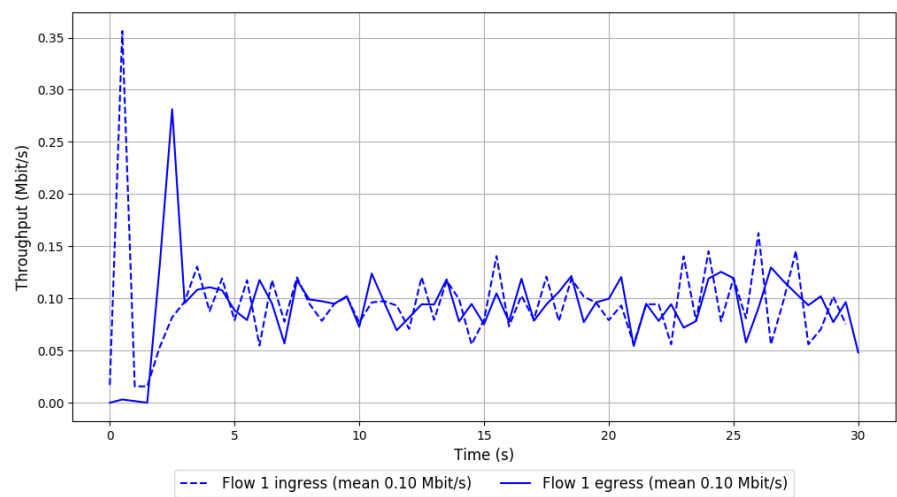


Run 2: Statistics of Sprout

Start at: 2019-02-11 21:13:37
End at: 2019-02-11 21:14:07
Local clock offset: -5.19 ms
Remote clock offset: 8.373 ms

Below is generated by plot.py at 2019-02-11 22:03:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 1043.581 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 1043.581 ms
Loss rate: 0.94%

Run 2: Report of Sprout — Data Link

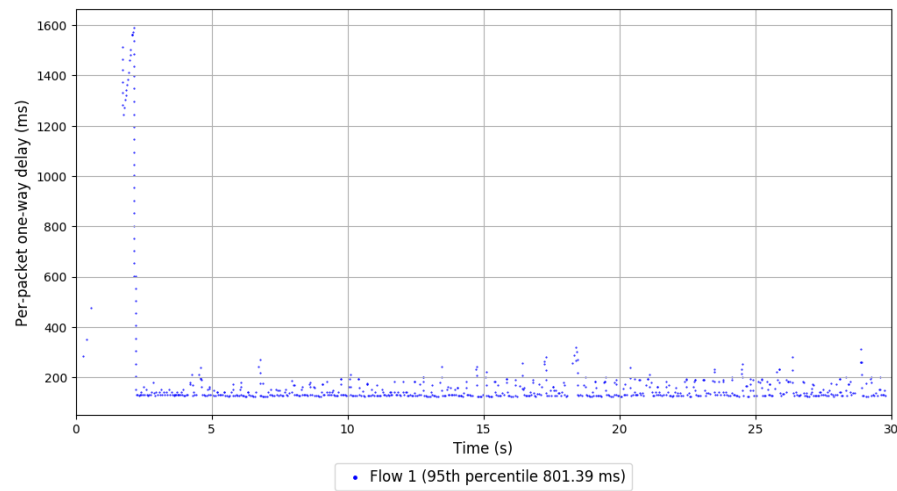
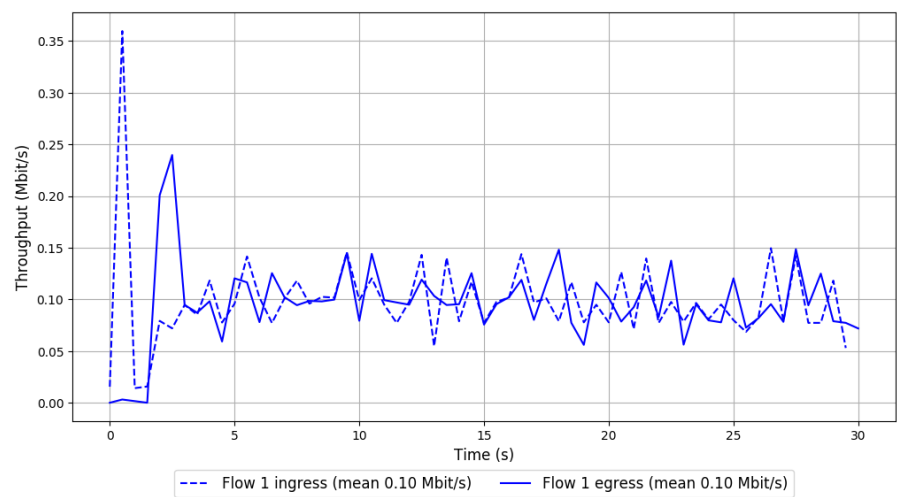


Run 3: Statistics of Sprout

Start at: 2019-02-11 21:39:29
End at: 2019-02-11 21:39:59
Local clock offset: -6.631 ms
Remote clock offset: 3.96 ms

Below is generated by plot.py at 2019-02-11 22:03:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 801.391 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 801.391 ms
Loss rate: 0.45%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2019-02-11 21:08:38

End at: 2019-02-11 21:09:08

Local clock offset: -3.797 ms

Remote clock offset: 3.854 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.34 Mbit/s

95th percentile per-packet one-way delay: 2253.328 ms

Loss rate: 4.11%

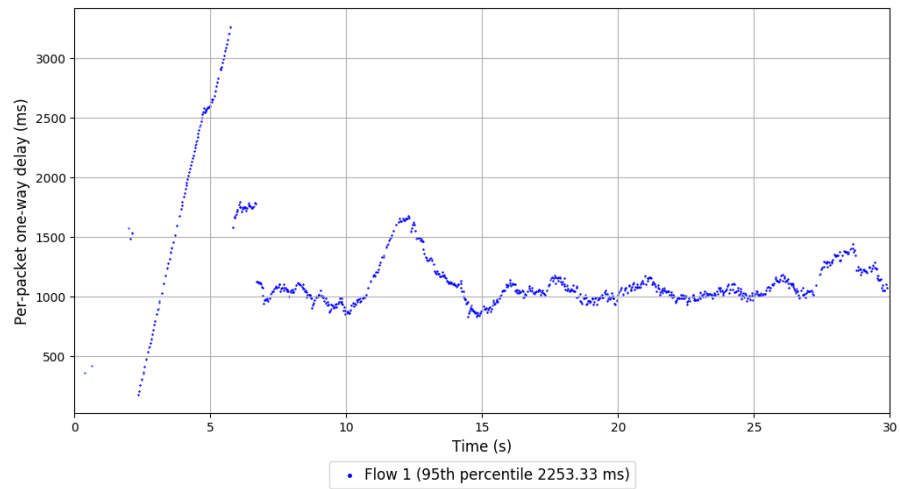
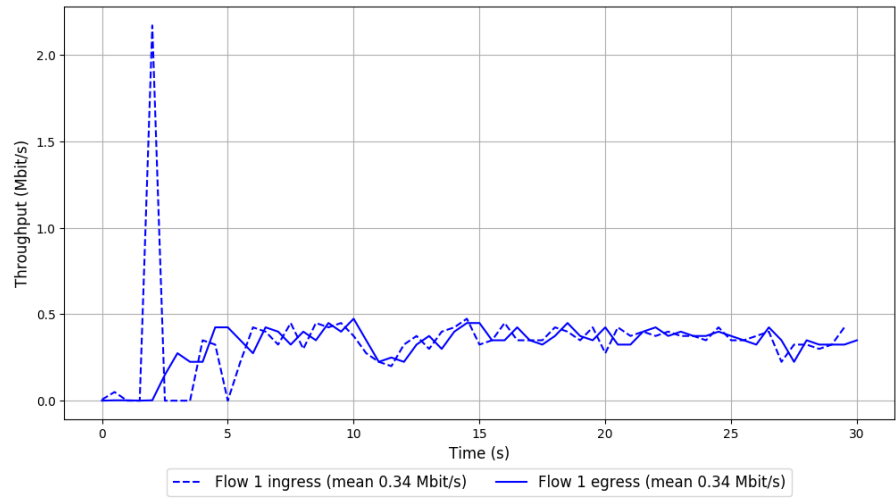
-- Flow 1:

Average throughput: 0.34 Mbit/s

95th percentile per-packet one-way delay: 2253.328 ms

Loss rate: 4.11%

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



Run 2: Statistics of TaoVA-100x

Start at: 2019-02-11 21:34:33

End at: 2019-02-11 21:35:03

Local clock offset: -7.266 ms

Remote clock offset: 7.976 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 1623.438 ms

Loss rate: 3.70%

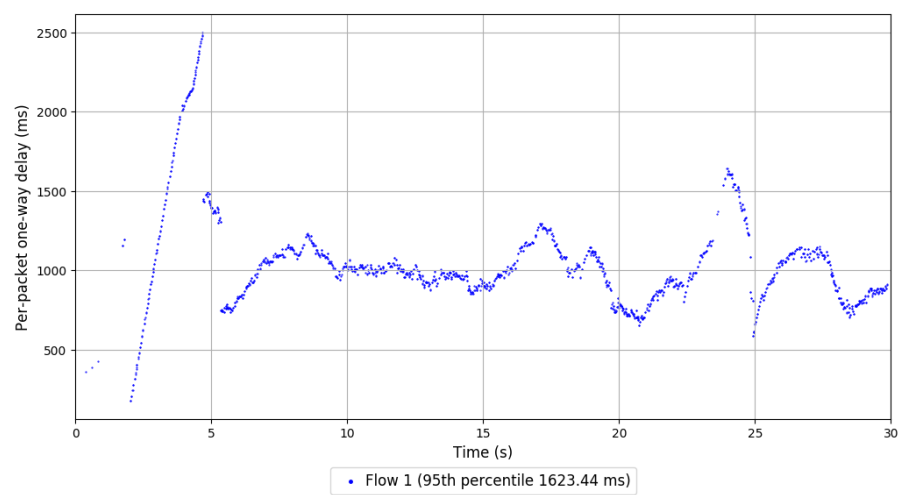
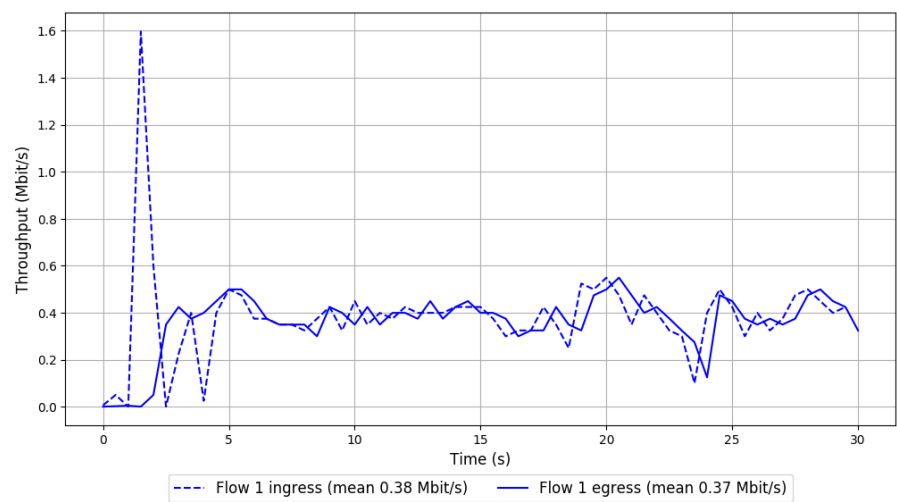
-- Flow 1:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 1623.438 ms

Loss rate: 3.70%

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



Run 3: Statistics of TaoVA-100x

Start at: 2019-02-11 21:59:43

End at: 2019-02-11 22:00:13

Local clock offset: -7.875 ms

Remote clock offset: 8.361 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 1436.883 ms

Loss rate: 3.15%

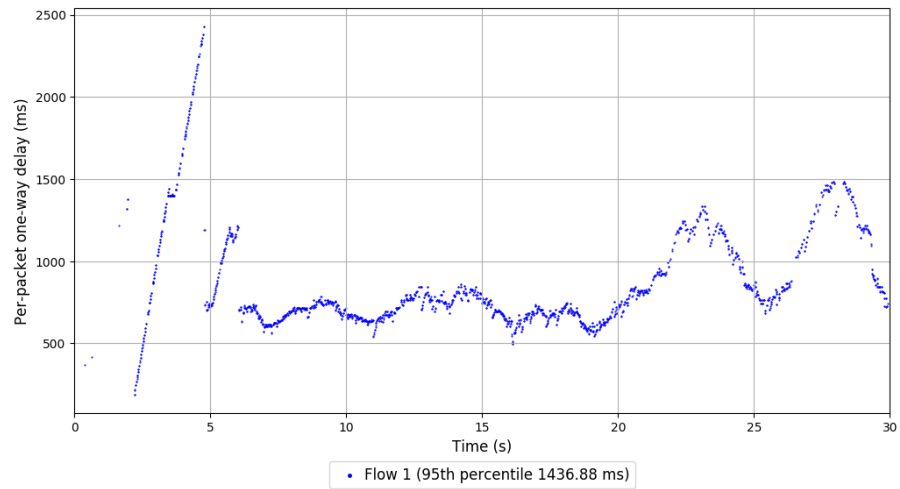
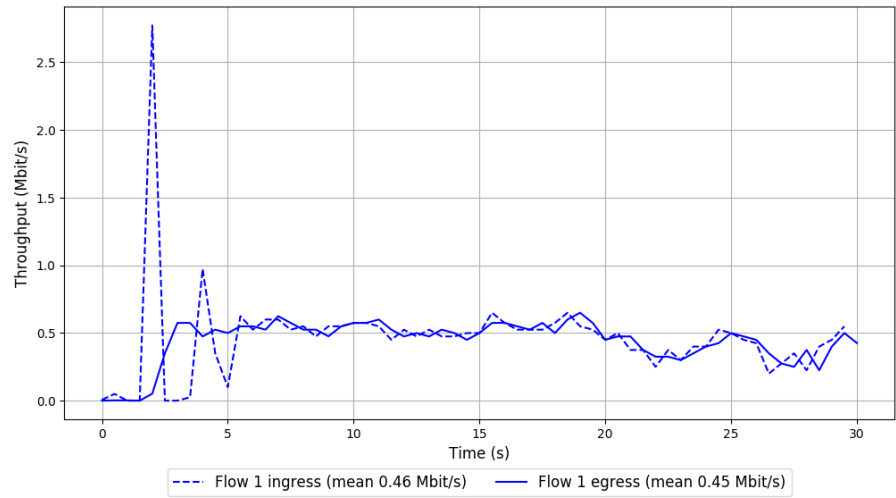
-- Flow 1:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 1436.883 ms

Loss rate: 3.15%

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



Run 1: Statistics of TCP Vegas

Start at: 2019-02-11 20:46:49

End at: 2019-02-11 20:47:19

Local clock offset: -2.645 ms

Remote clock offset: 7.361 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.40 Mbit/s

95th percentile per-packet one-way delay: 1479.547 ms

Loss rate: 2.38%

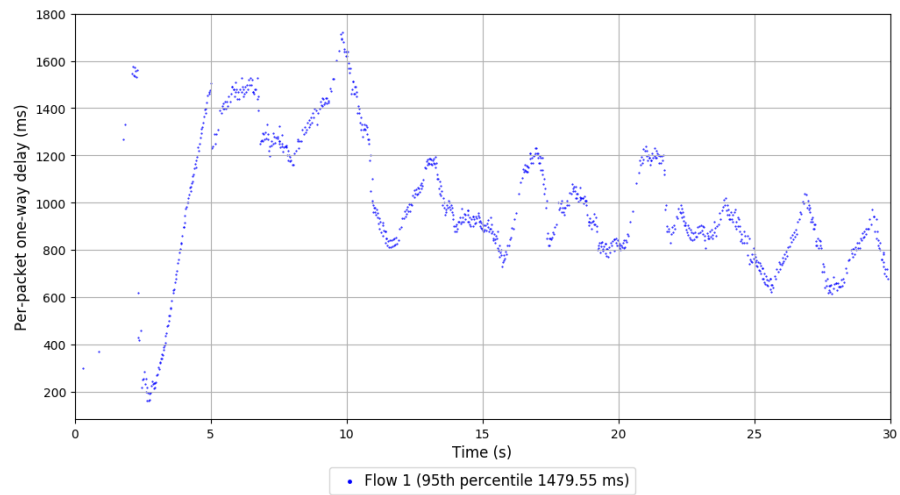
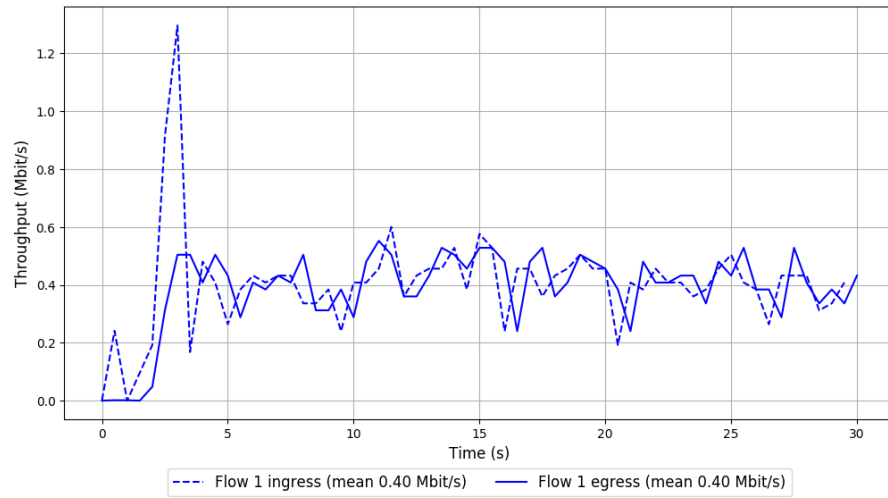
-- Flow 1:

Average throughput: 0.40 Mbit/s

95th percentile per-packet one-way delay: 1479.547 ms

Loss rate: 2.38%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2019-02-11 21:12:25

End at: 2019-02-11 21:12:55

Local clock offset: -5.043 ms

Remote clock offset: 4.193 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 1842.595 ms

Loss rate: 1.30%

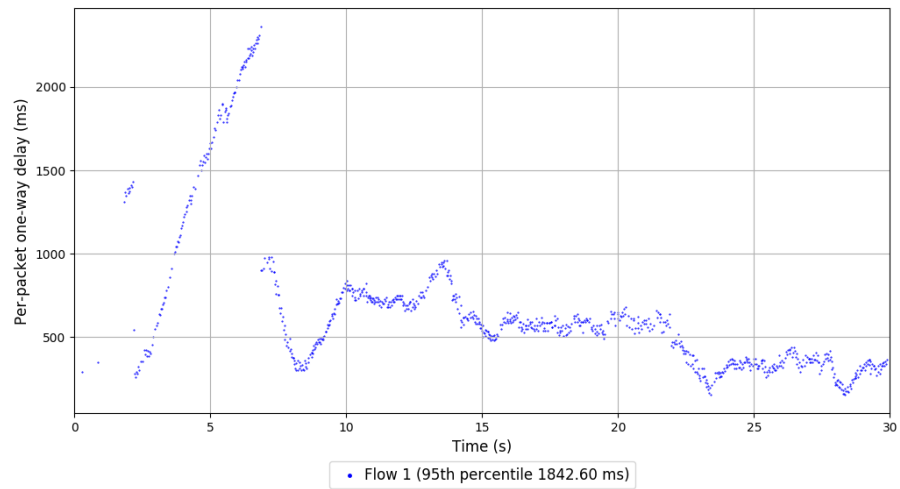
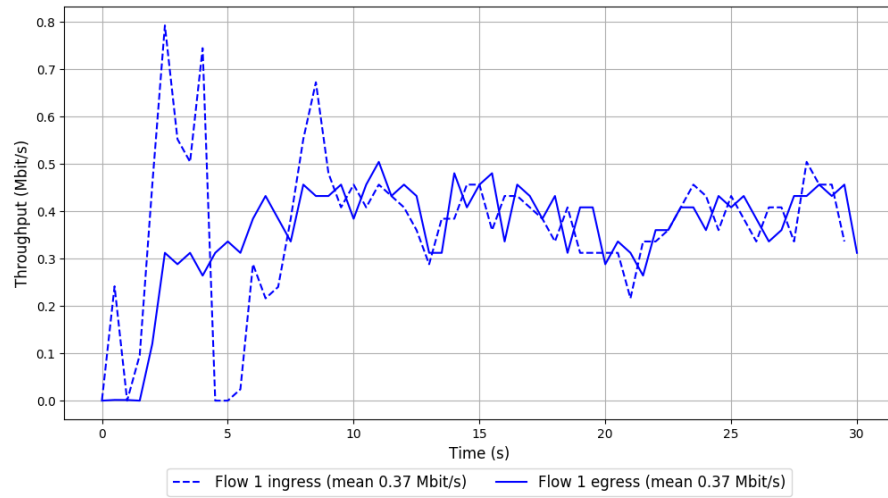
-- Flow 1:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 1842.595 ms

Loss rate: 1.30%

Run 2: Report of TCP Vegas — Data Link

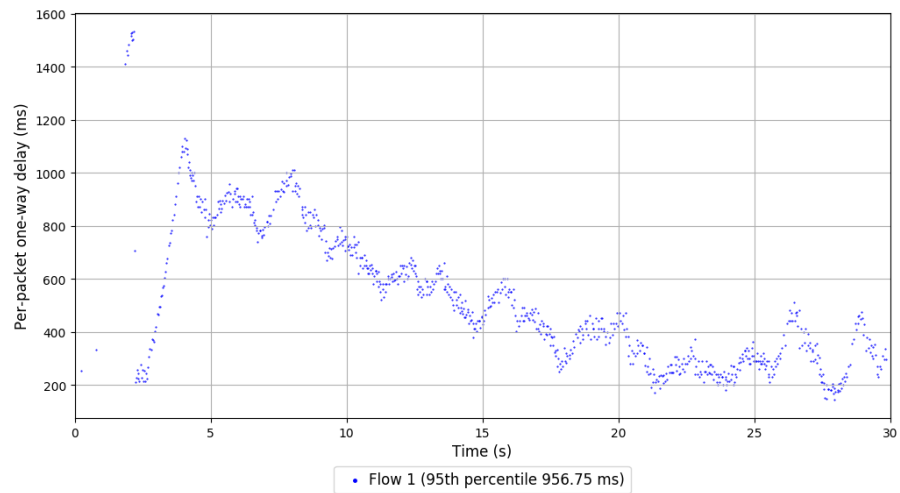
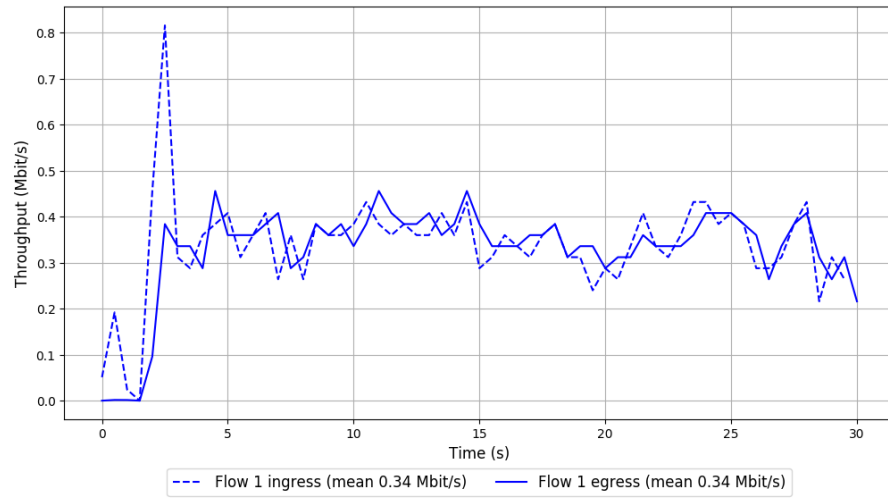


Run 3: Statistics of TCP Vegas

Start at: 2019-02-11 21:38:21
End at: 2019-02-11 21:38:51
Local clock offset: -7.408 ms
Remote clock offset: 3.868 ms

Below is generated by plot.py at 2019-02-11 22:03:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 956.755 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 956.755 ms
Loss rate: 1.18%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2019-02-11 20:51:46

End at: 2019-02-11 20:52:16

Local clock offset: -2.098 ms

Remote clock offset: 7.619 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.34 Mbit/s

95th percentile per-packet one-way delay: 1904.239 ms

Loss rate: 4.95%

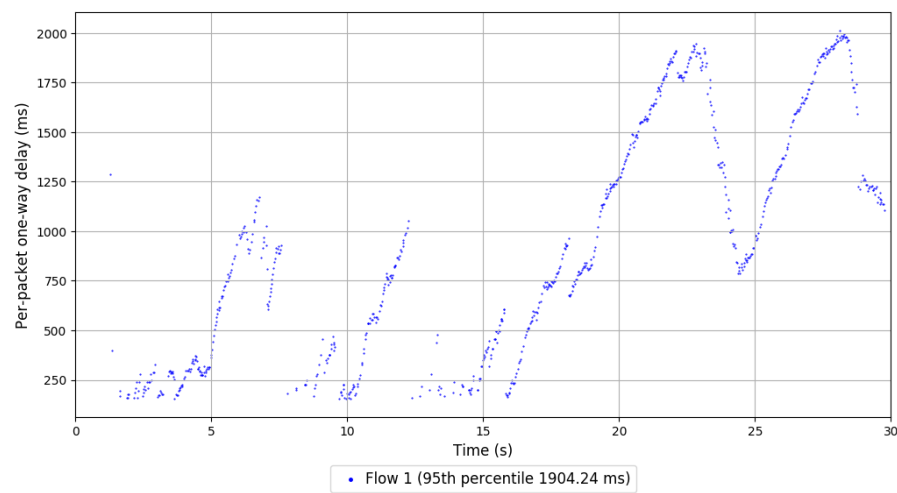
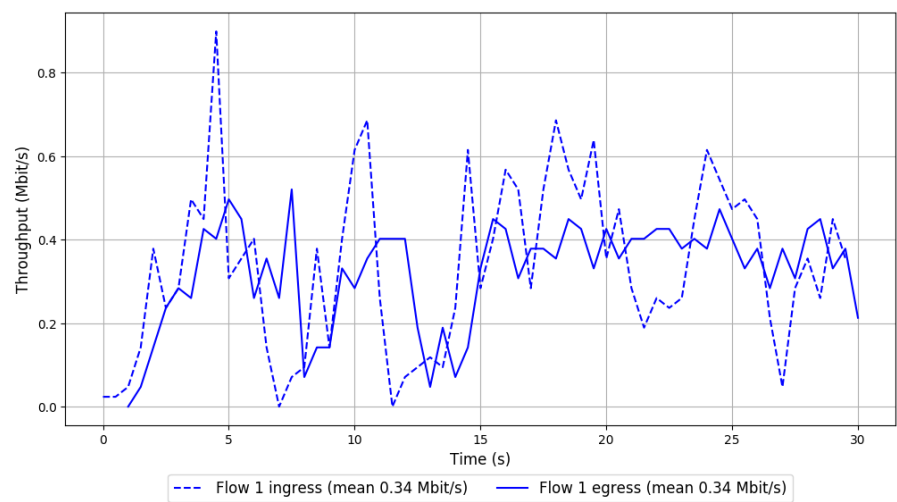
-- Flow 1:

Average throughput: 0.34 Mbit/s

95th percentile per-packet one-way delay: 1904.239 ms

Loss rate: 4.95%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2019-02-11 21:17:27

End at: 2019-02-11 21:17:57

Local clock offset: -5.964 ms

Remote clock offset: 4.038 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 2184.208 ms

Loss rate: 5.92%

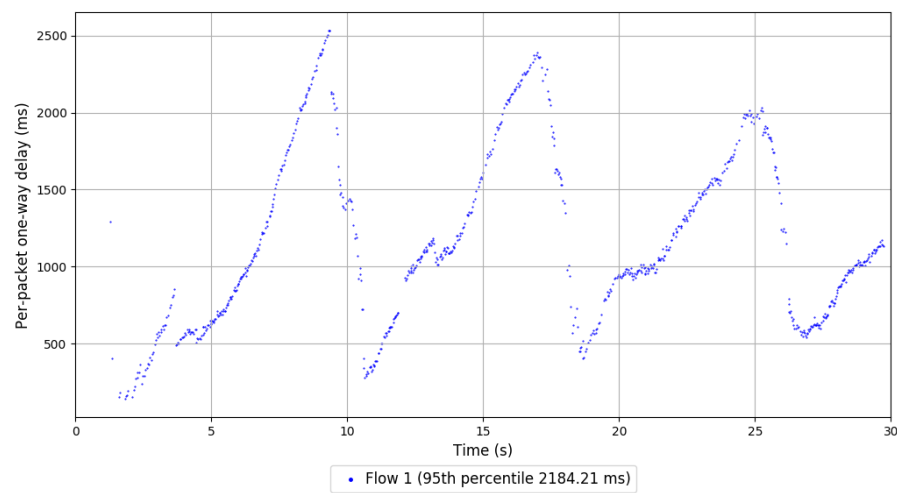
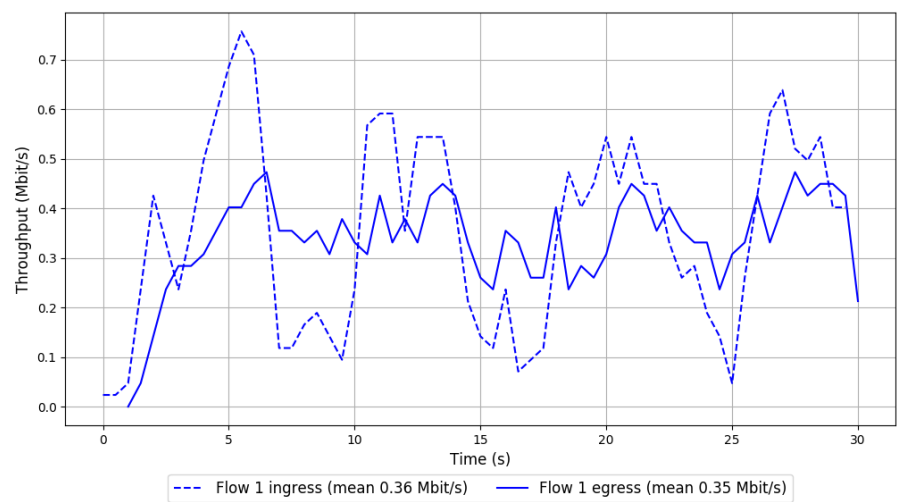
-- Flow 1:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 2184.208 ms

Loss rate: 5.92%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2019-02-11 21:43:18

End at: 2019-02-11 21:43:48

Local clock offset: -6.725 ms

Remote clock offset: 4.008 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.34 Mbit/s

95th percentile per-packet one-way delay: 4435.087 ms

Loss rate: 1.23%

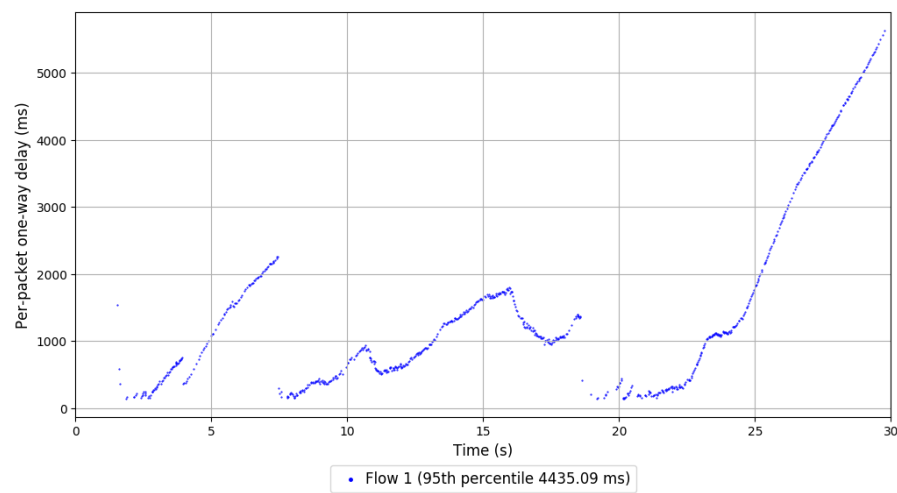
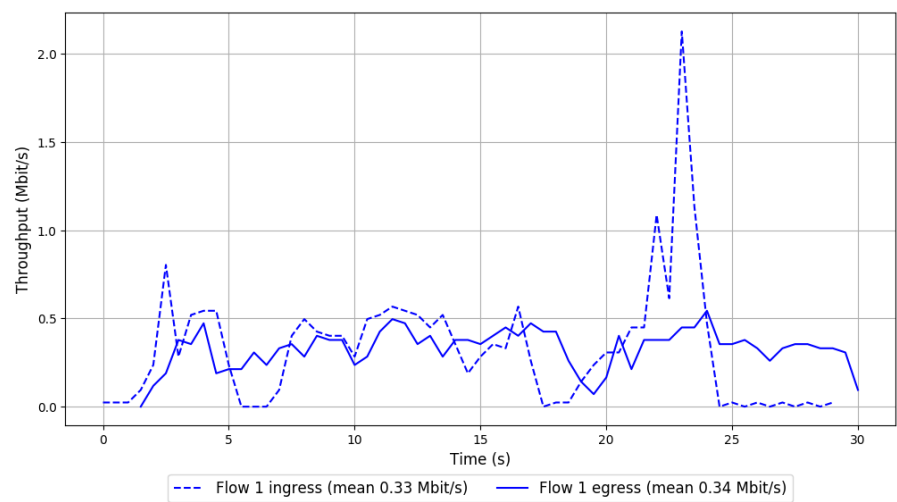
-- Flow 1:

Average throughput: 0.34 Mbit/s

95th percentile per-packet one-way delay: 4435.087 ms

Loss rate: 1.23%

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2019-02-11 21:00:14

End at: 2019-02-11 21:00:44

Local clock offset: -2.149 ms

Remote clock offset: 3.72 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.33 Mbit/s

95th percentile per-packet one-way delay: 22333.643 ms

Loss rate: 86.37%

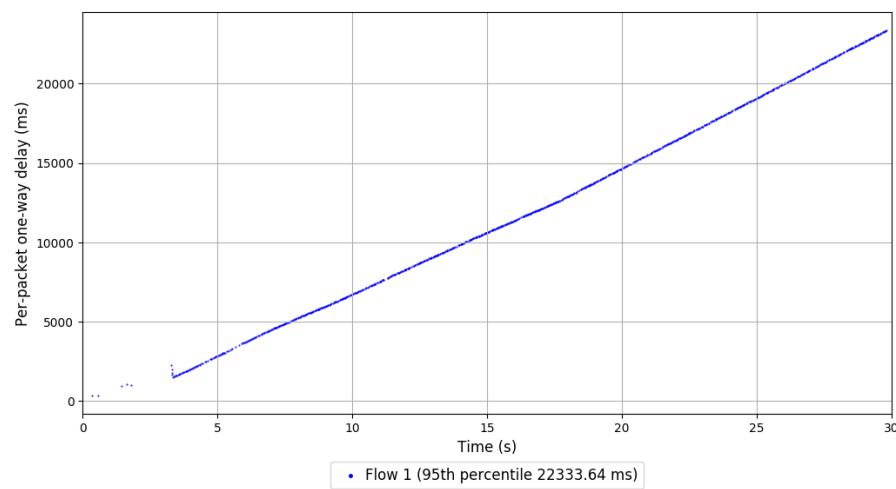
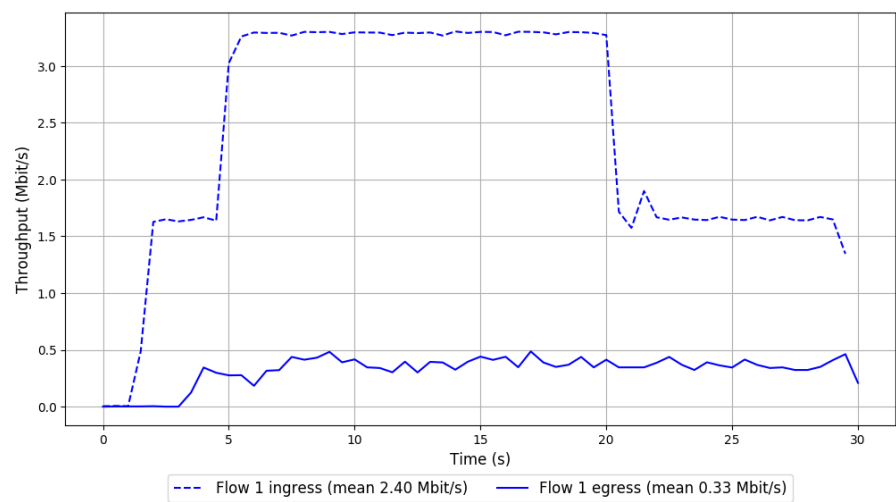
-- Flow 1:

Average throughput: 0.33 Mbit/s

95th percentile per-packet one-way delay: 22333.643 ms

Loss rate: 86.37%

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2019-02-11 21:26:12

End at: 2019-02-11 21:26:42

Local clock offset: -6.873 ms

Remote clock offset: 9.202 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.36 Mbit/s

95th percentile per-packet one-way delay: 22655.302 ms

Loss rate: 84.76%

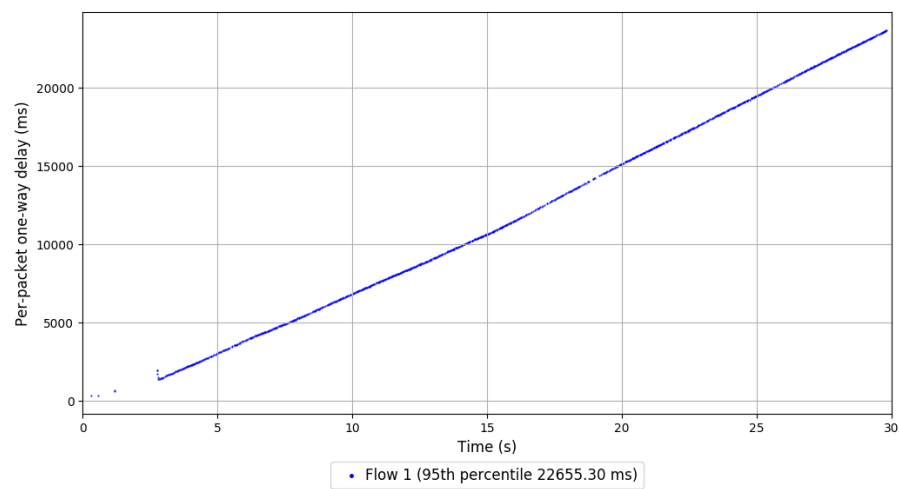
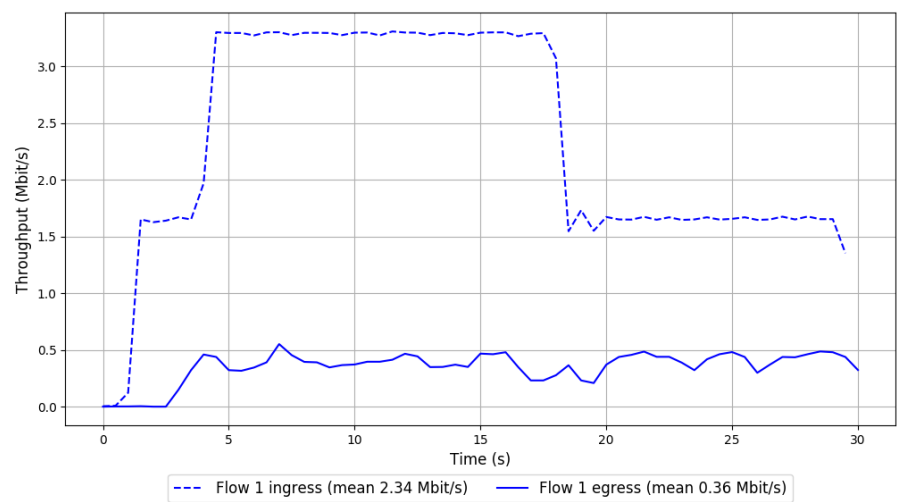
-- Flow 1:

Average throughput: 0.36 Mbit/s

95th percentile per-packet one-way delay: 22655.302 ms

Loss rate: 84.76%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2019-02-11 21:51:36

End at: 2019-02-11 21:52:06

Local clock offset: -7.736 ms

Remote clock offset: 3.955 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 20573.363 ms

Loss rate: 75.05%

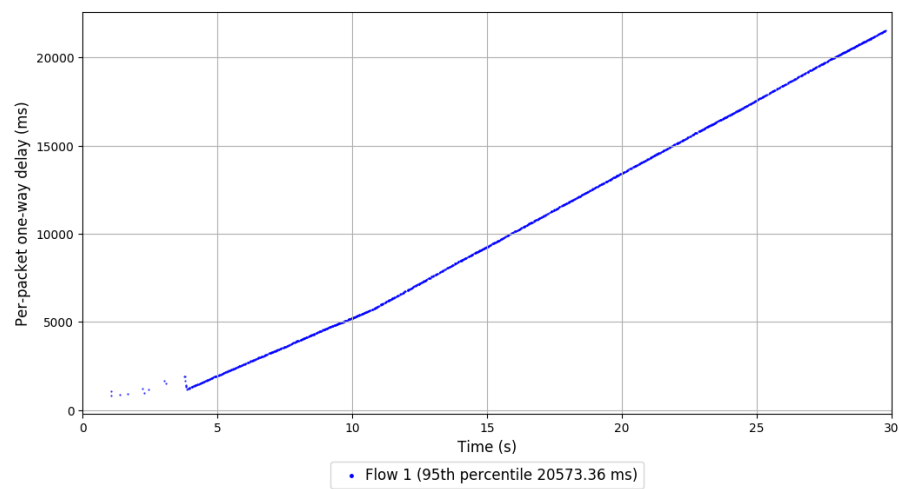
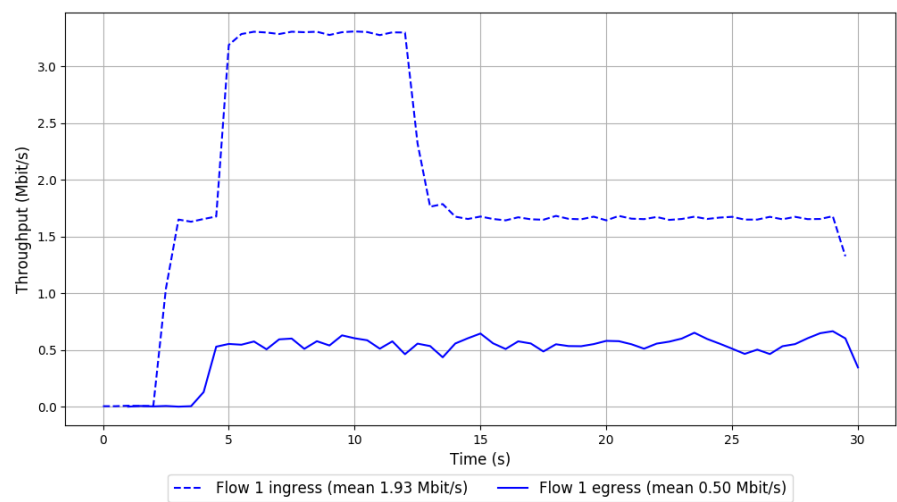
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 20573.363 ms

Loss rate: 75.05%

Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

Start at: 2019-02-11 20:54:06

End at: 2019-02-11 20:54:36

Local clock offset: -2.658 ms

Remote clock offset: 6.989 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.16 Mbit/s

95th percentile per-packet one-way delay: 1490.387 ms

Loss rate: 0.45%

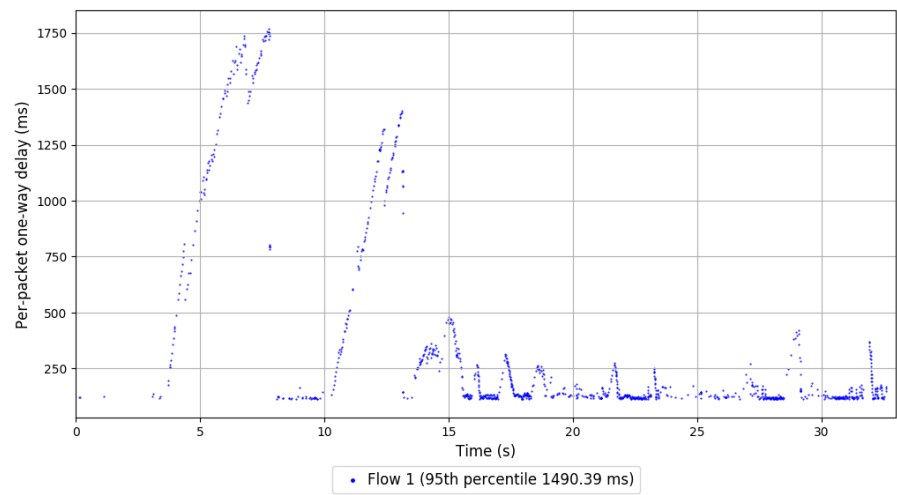
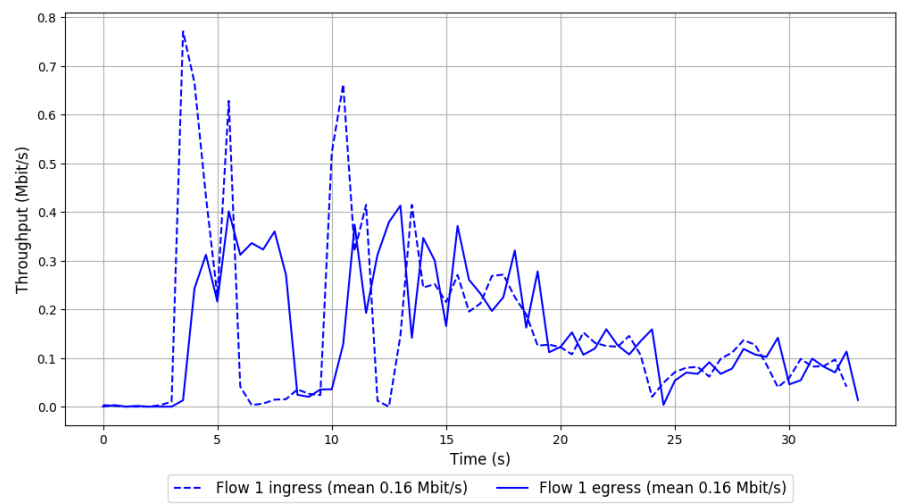
-- Flow 1:

Average throughput: 0.16 Mbit/s

95th percentile per-packet one-way delay: 1490.387 ms

Loss rate: 0.45%

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

/home/ubuntu/pantheon/data/2019-02-11T20-46-Colombia-cellular-to-AWS-Brazil-2-3-runs/webrtc.

Run 2: Report of WebRTC media — Data Link

Figure is missing

Figure is missing

Run 3: Statistics of WebRTC media

Start at: 2019-02-11 21:45:35

End at: 2019-02-11 21:46:05

Local clock offset: -7.506 ms

Remote clock offset: 4.016 ms

Below is generated by plot.py at 2019-02-11 22:03:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.17 Mbit/s

95th percentile per-packet one-way delay: 908.707 ms

Loss rate: 0.17%

-- Flow 1:

Average throughput: 0.17 Mbit/s

95th percentile per-packet one-way delay: 908.707 ms

Loss rate: 0.17%

Run 3: Report of WebRTC media — Data Link

