

Pantheon Report

Generated at 2019-01-25 10:11:01 (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:

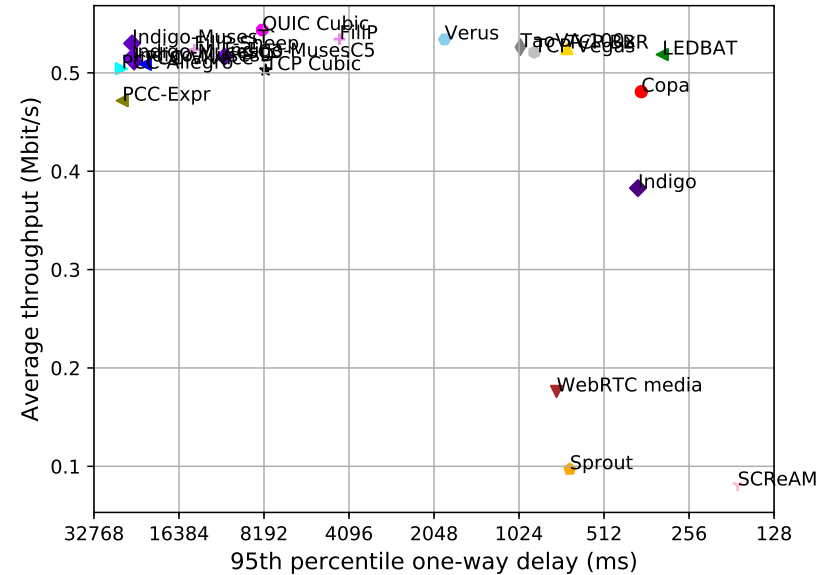
```
Linux 4.15.0-1031-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

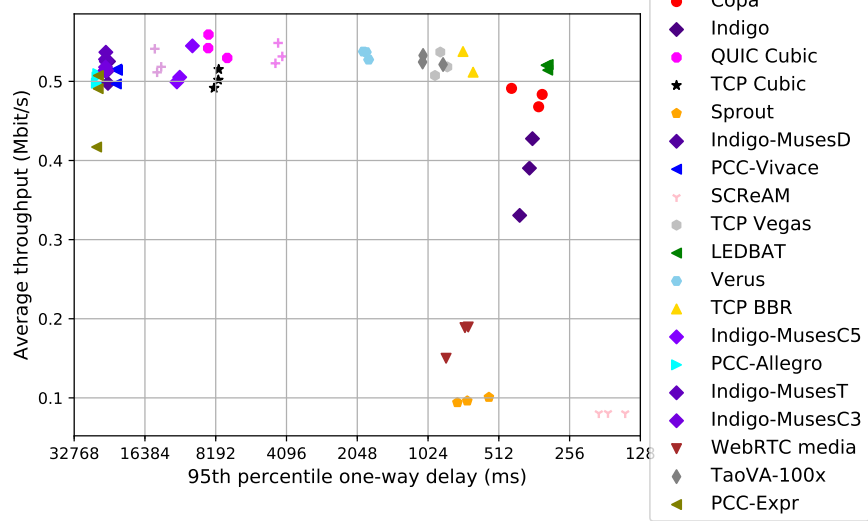
```
branch: muses @ 0b8e9a949603c3842368430acf469eec3b941f9f
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ d9c5ea33091330aca25ecd105ab2db6d34d5c40d
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	2	0.53	692.77	2.03
Copa	3	0.48	377.84	1.42
TCP Cubic	3	0.50	8088.03	31.33
FillP	3	0.53	4426.75	20.40
FillP-Sheep	3	0.52	14462.78	15.83
Indigo	3	0.38	388.36	0.88
Indigo-MusesC3	3	0.51	24042.56	93.29
Indigo-MusesC5	3	0.52	11310.98	43.23
Indigo-MusesD	3	0.51	23622.56	80.11
Indigo-MusesT	3	0.53	24013.71	85.98
LEDBAT	3	0.52	318.49	1.20
PCC-Allegro	3	0.51	26178.22	98.62
PCC-Expr	3	0.47	26022.39	92.58
QUIC Cubic	3	0.54	8311.23	30.41
SCReAM	3	0.08	172.21	0.83
Sprout	3	0.10	676.56	0.74
TaoVA-100x	3	0.52	1012.96	2.63
TCP Vegas	3	0.52	904.24	1.18
Verus	3	0.54	1879.12	5.14
PCC-Vivace	3	0.51	21566.59	74.90
WebRTC media	3	0.18	754.00	0.41

Run 1: Statistics of TCP BBR

/home/ubuntu/pantheon/data/2019-01-25T08-57-Colombia-cellular-to-AWS-Brazil-2-3-runs/bbr_sta

Run 1: Report of TCP BBR — Data Link

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Run 2: Statistics of TCP BBR

Start at: 2019-01-25 09:38:36

End at: 2019-01-25 09:39:06

Local clock offset: -6.169 ms

Remote clock offset: 3.604 ms

Below is generated by plot.py at 2019-01-25 10:10:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 658.463 ms

Loss rate: 2.08%

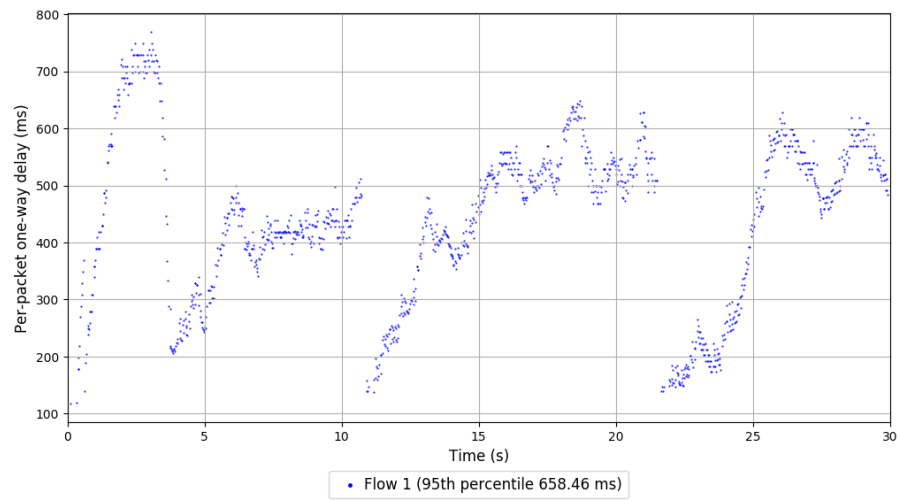
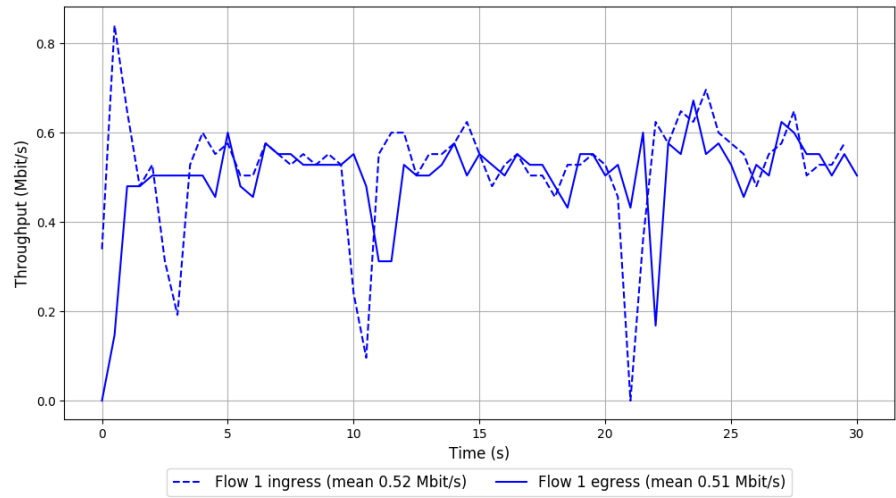
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 658.463 ms

Loss rate: 2.08%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2019-01-25 10:02:51

End at: 2019-01-25 10:03:21

Local clock offset: -8.535 ms

Remote clock offset: 3.789 ms

Below is generated by plot.py at 2019-01-25 10:10:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 727.086 ms

Loss rate: 1.98%

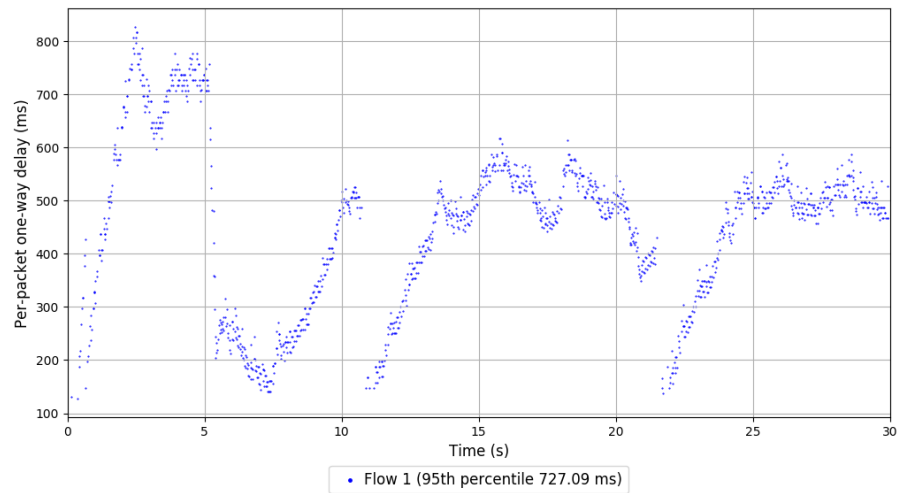
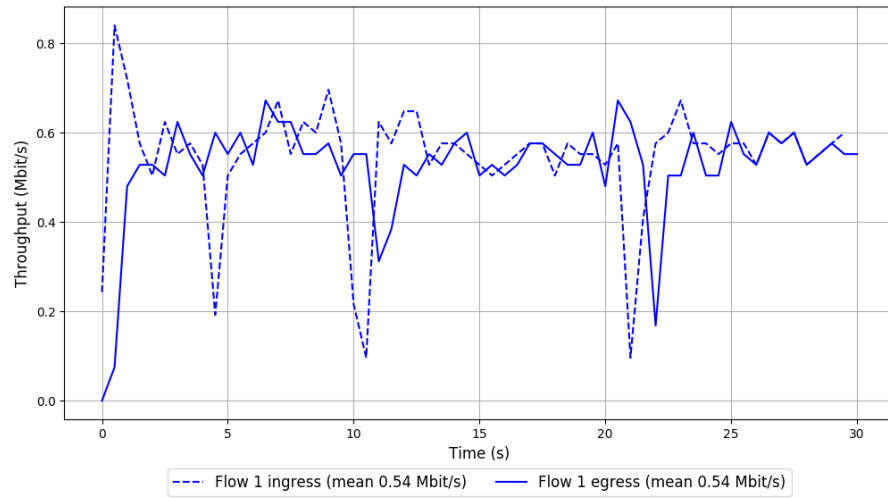
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 727.086 ms

Loss rate: 1.98%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

Start at: 2019-01-25 09:03:35

End at: 2019-01-25 09:04:05

Local clock offset: -6.304 ms

Remote clock offset: 5.991 ms

Below is generated by plot.py at 2019-01-25 10:10:24

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 346.663 ms

Loss rate: 1.33%

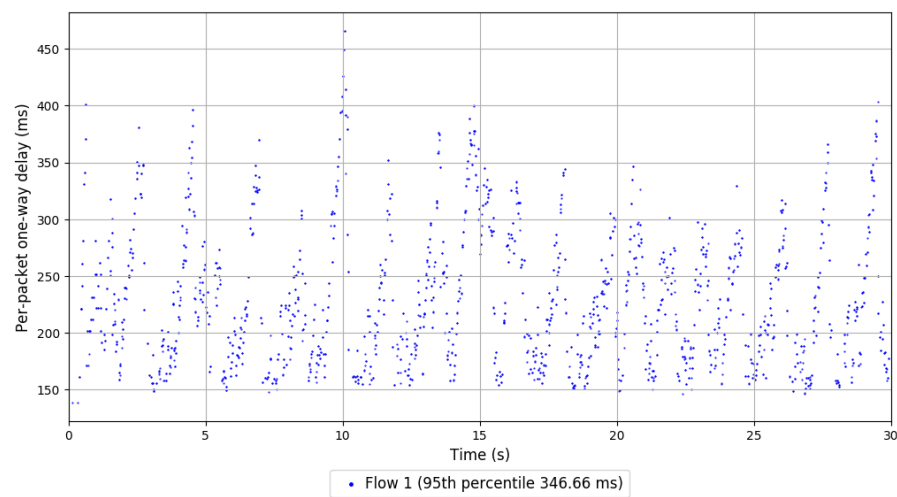
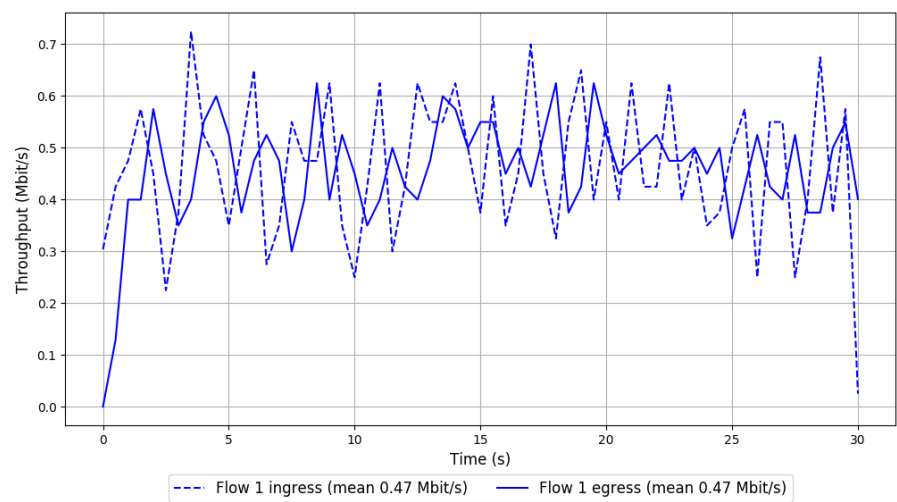
-- Flow 1:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 346.663 ms

Loss rate: 1.33%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2019-01-25 09:28:12

End at: 2019-01-25 09:28:42

Local clock offset: -2.329 ms

Remote clock offset: 8.453 ms

Below is generated by plot.py at 2019-01-25 10:10:24

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 452.019 ms

Loss rate: 1.57%

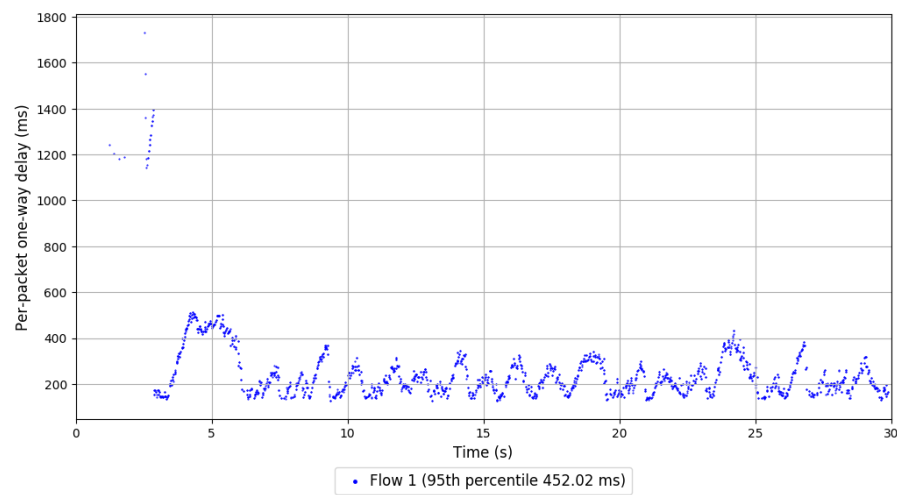
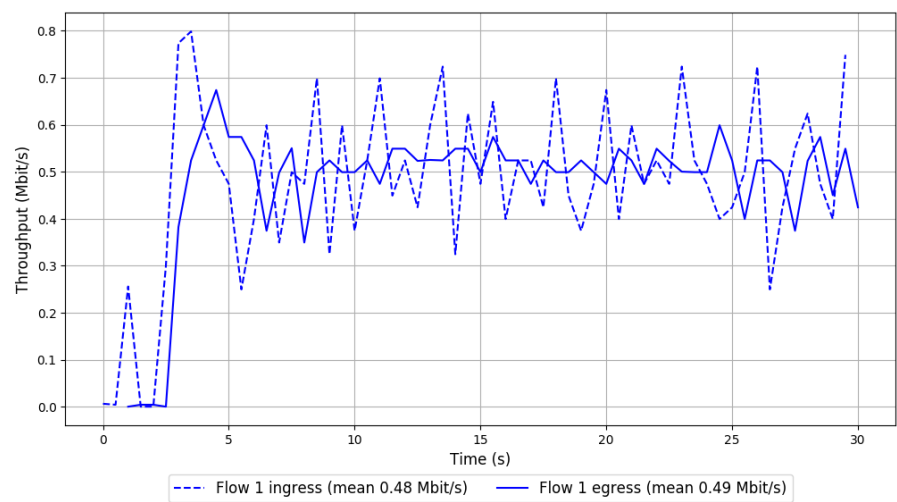
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 452.019 ms

Loss rate: 1.57%

Run 2: Report of Copa — Data Link

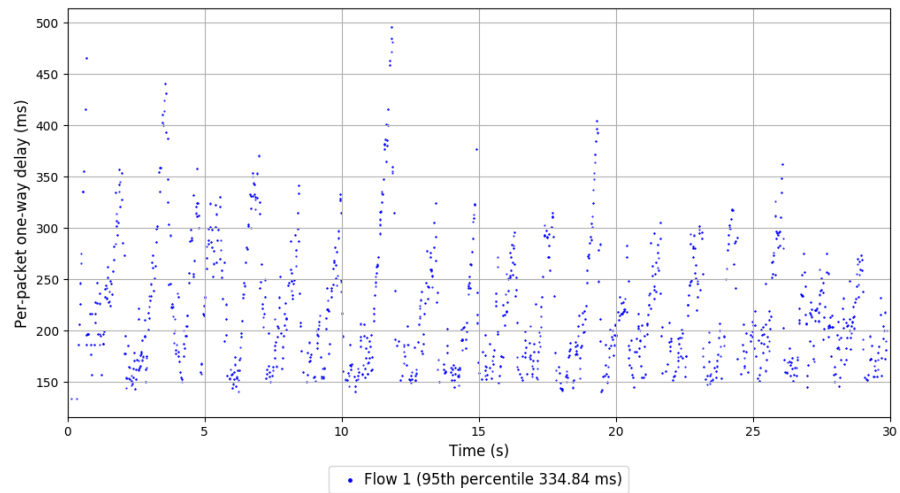
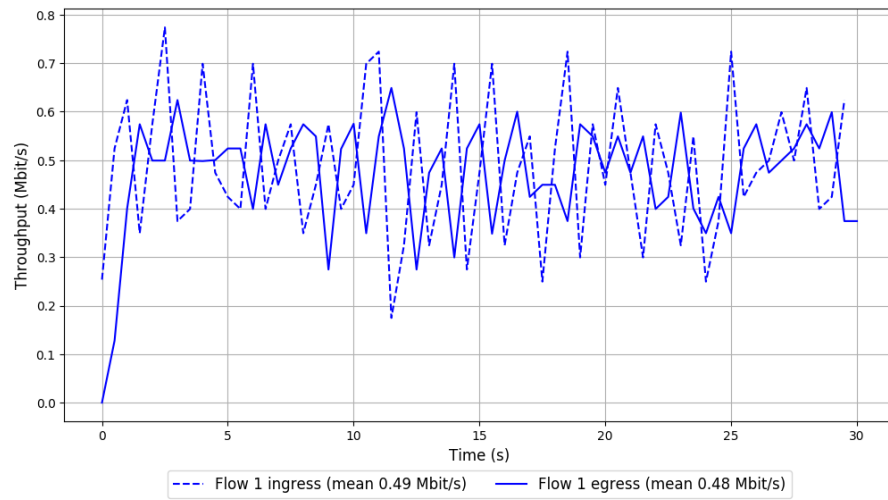


Run 3: Statistics of Copa

Start at: 2019-01-25 09:52:28
End at: 2019-01-25 09:52:58
Local clock offset: -8.371 ms
Remote clock offset: 6.421 ms

Below is generated by plot.py at 2019-01-25 10:10:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 334.843 ms
Loss rate: 1.37%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 334.843 ms
Loss rate: 1.37%

Run 3: Report of Copa — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2019-01-25 09:21:10

End at: 2019-01-25 09:21:40

Local clock offset: -2.843 ms

Remote clock offset: 3.275 ms

Below is generated by plot.py at 2019-01-25 10:10:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 7982.965 ms

Loss rate: 31.29%

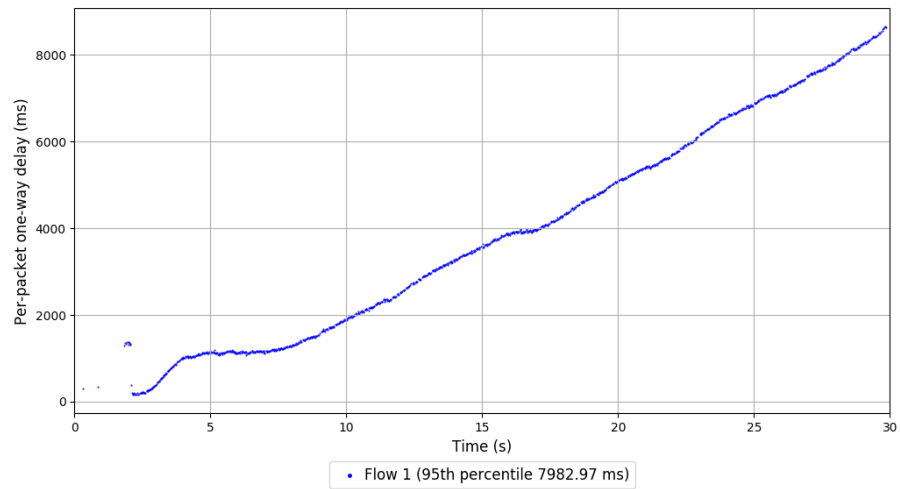
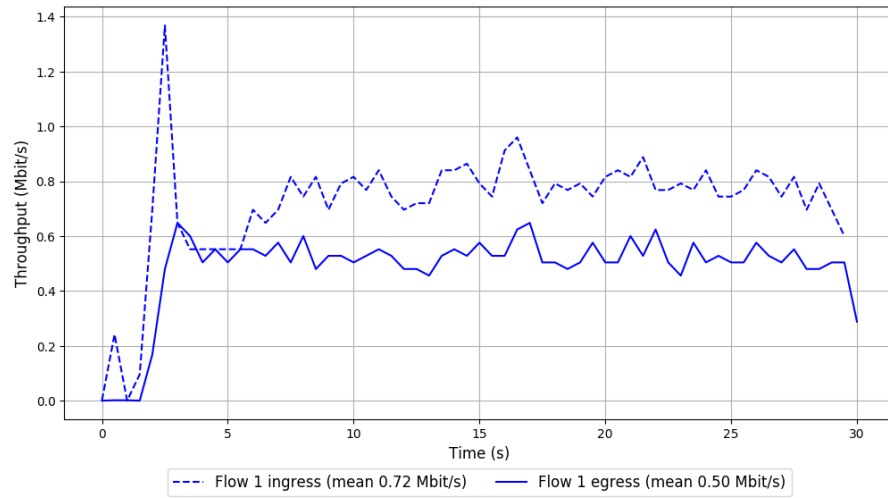
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 7982.965 ms

Loss rate: 31.29%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2019-01-25 09:45:30

End at: 2019-01-25 09:46:00

Local clock offset: -7.534 ms

Remote clock offset: 7.584 ms

Below is generated by plot.py at 2019-01-25 10:10:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 7959.578 ms

Loss rate: 31.30%

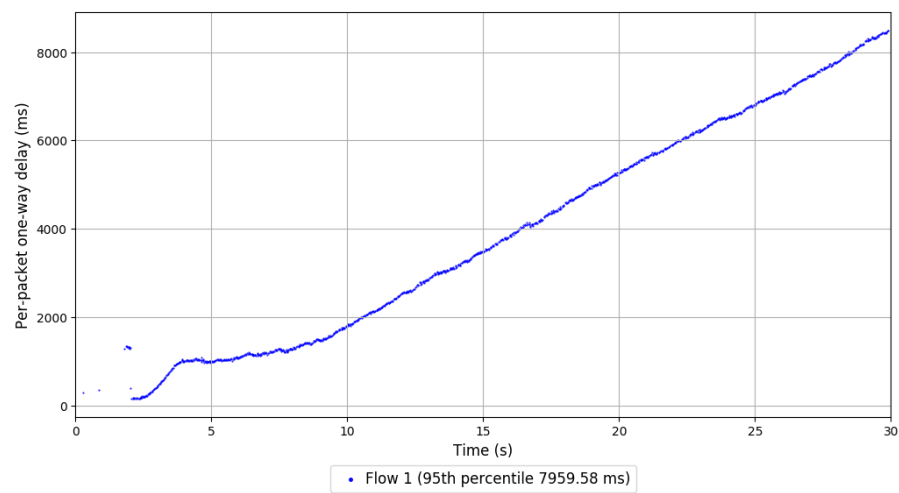
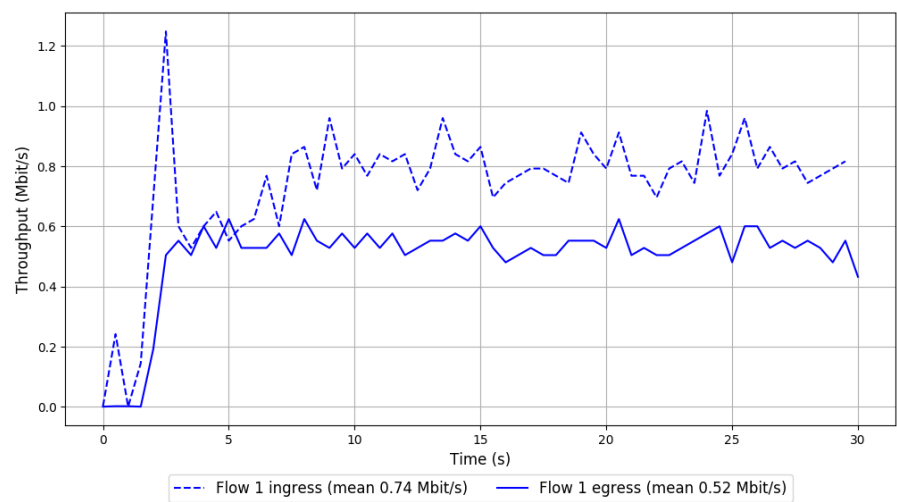
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 7959.578 ms

Loss rate: 31.30%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2019-01-25 10:09:44

End at: 2019-01-25 10:10:14

Local clock offset: -8.167 ms

Remote clock offset: 7.576 ms

Below is generated by plot.py at 2019-01-25 10:10:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 8321.534 ms

Loss rate: 31.39%

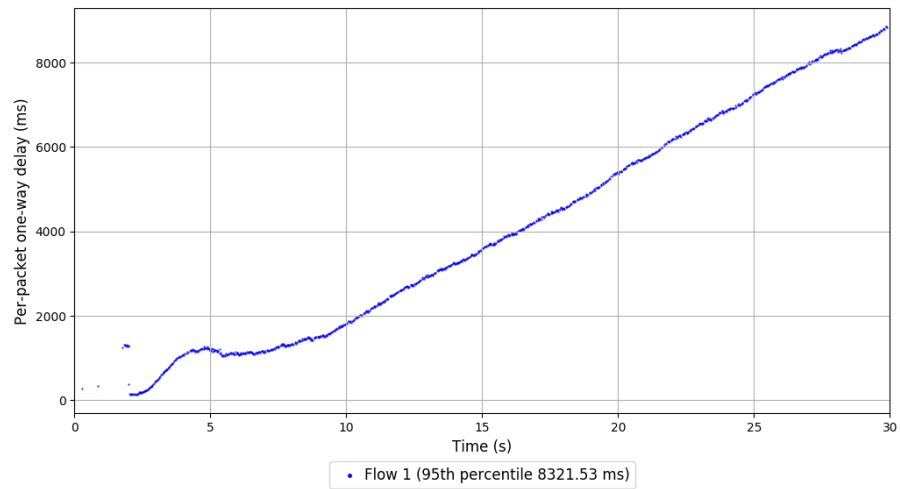
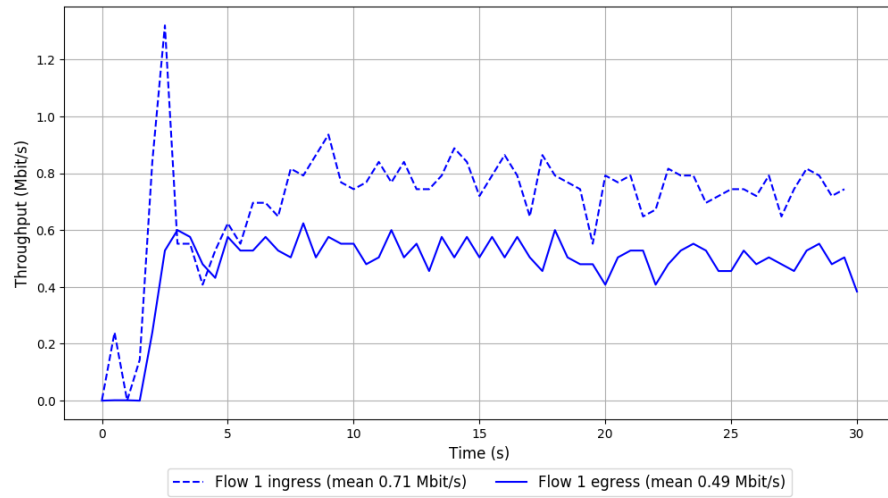
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 8321.534 ms

Loss rate: 31.39%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2019-01-25 09:00:06

End at: 2019-01-25 09:00:36

Local clock offset: -8.646 ms

Remote clock offset: 6.133 ms

Below is generated by plot.py at 2019-01-25 10:10:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 4565.057 ms

Loss rate: 19.89%

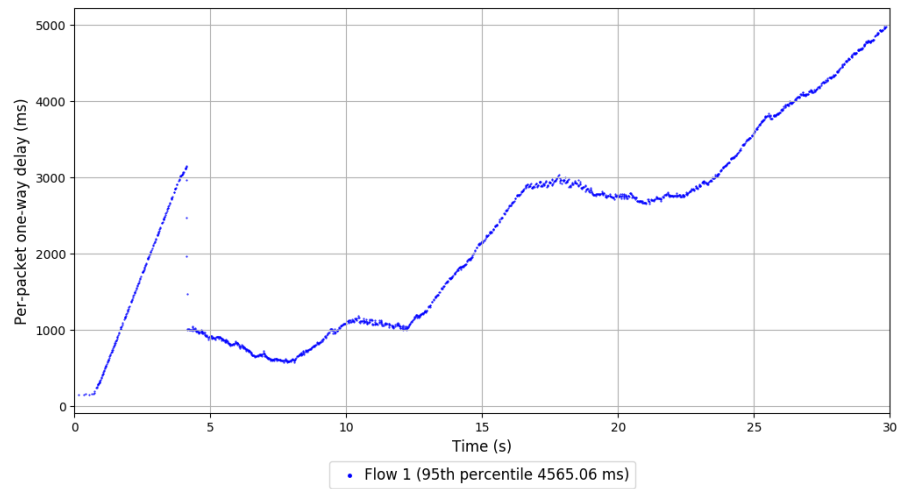
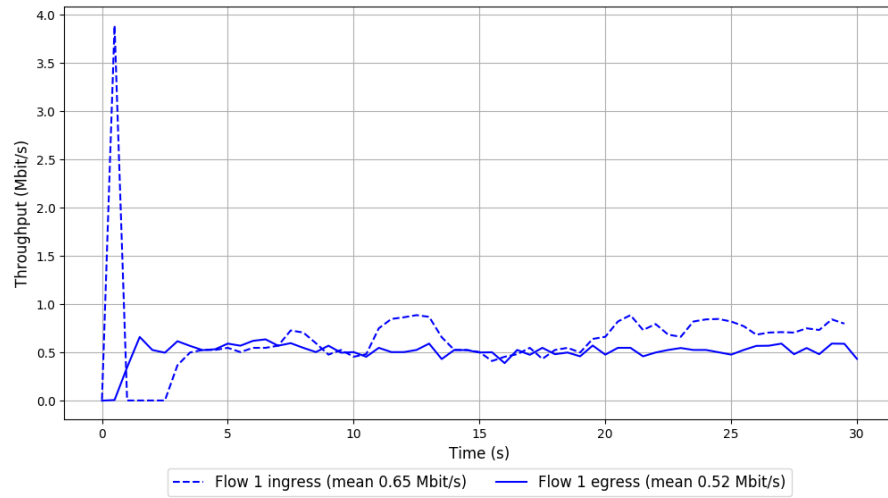
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 4565.057 ms

Loss rate: 19.89%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2019-01-25 09:24:42

End at: 2019-01-25 09:25:12

Local clock offset: -2.548 ms

Remote clock offset: 8.304 ms

Below is generated by plot.py at 2019-01-25 10:10:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 4268.455 ms

Loss rate: 20.82%

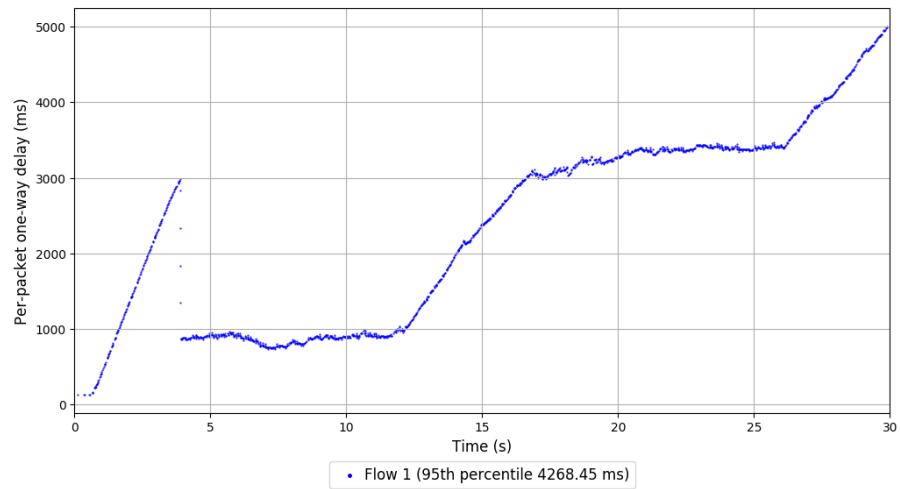
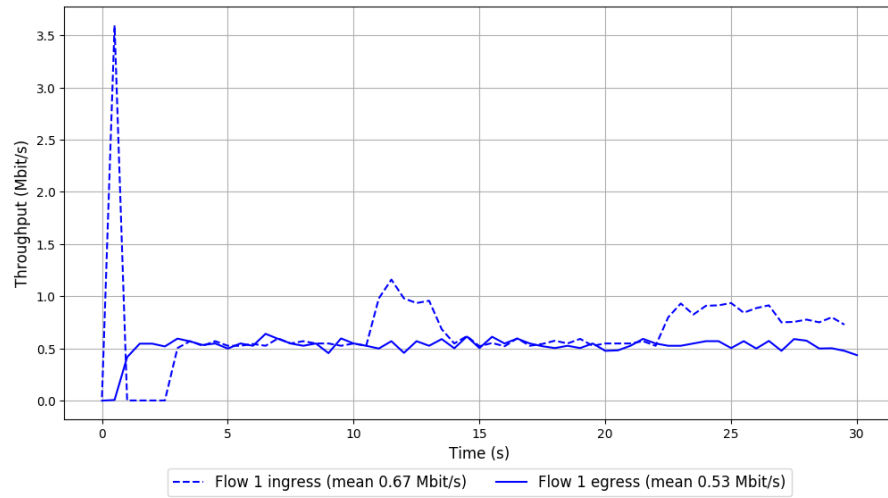
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 4268.455 ms

Loss rate: 20.82%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2019-01-25 09:49:00

End at: 2019-01-25 09:49:30

Local clock offset: -8.038 ms

Remote clock offset: 6.272 ms

Below is generated by plot.py at 2019-01-25 10:10:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 4446.749 ms

Loss rate: 20.50%

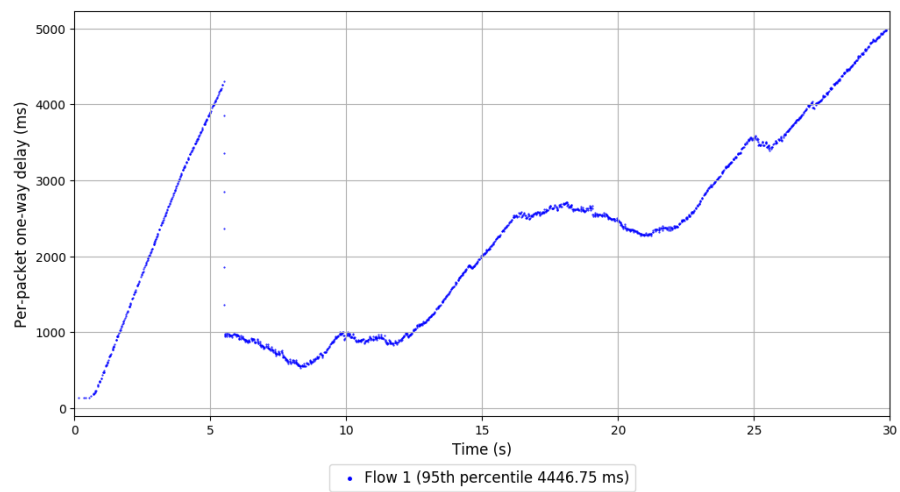
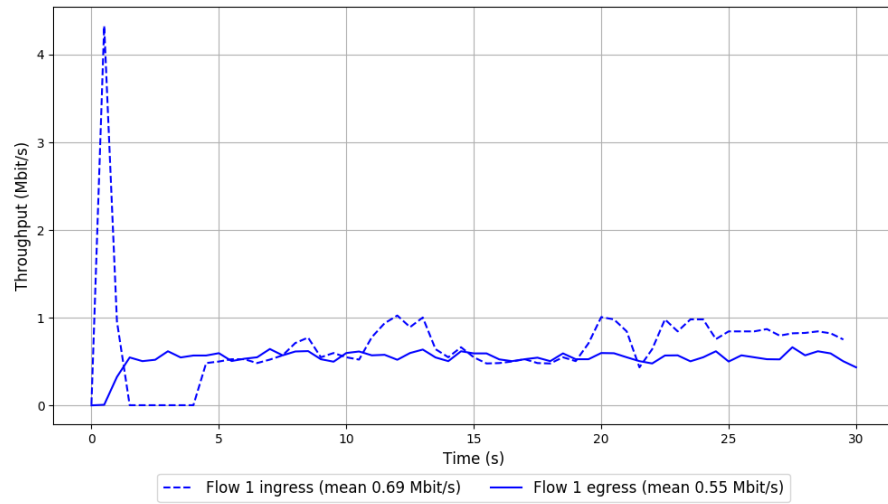
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 4446.749 ms

Loss rate: 20.50%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2019-01-25 09:20:02

End at: 2019-01-25 09:20:32

Local clock offset: -2.94 ms

Remote clock offset: 2.112 ms

Below is generated by plot.py at 2019-01-25 10:10:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 14873.555 ms

Loss rate: 15.90%

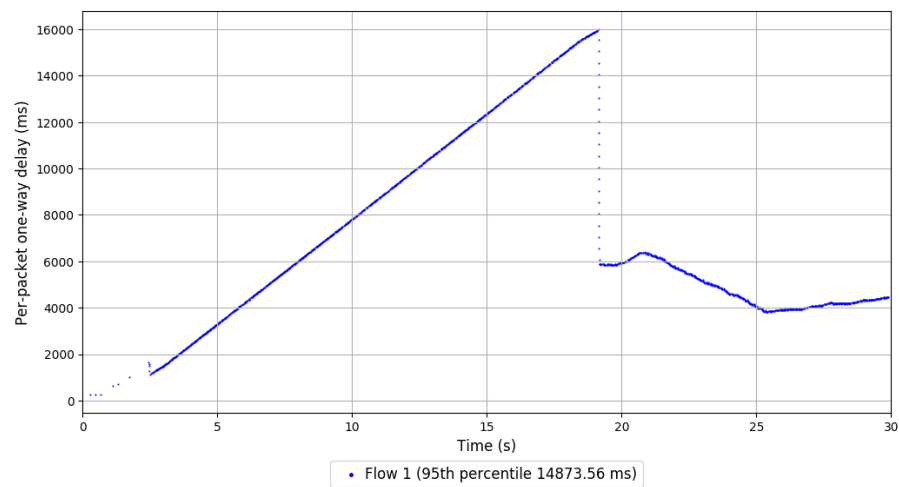
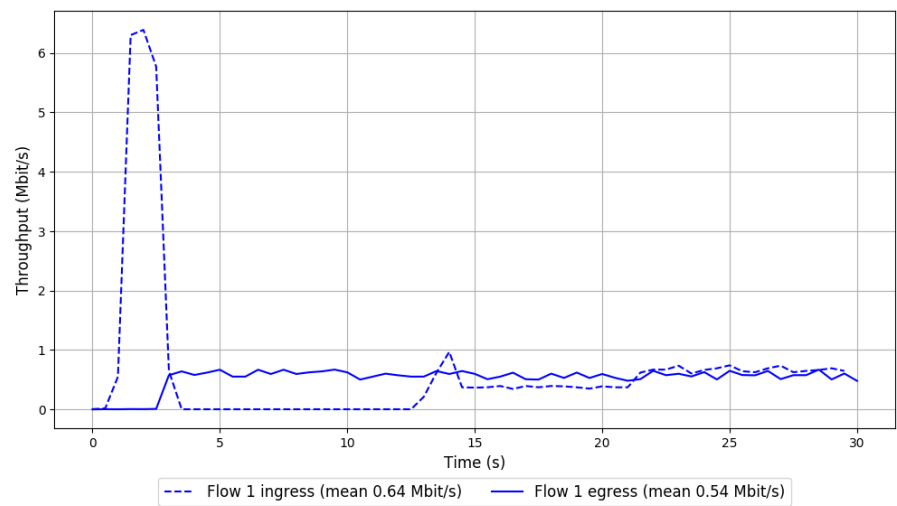
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 14873.555 ms

Loss rate: 15.90%

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2019-01-25 09:44:21

End at: 2019-01-25 09:44:51

Local clock offset: -7.404 ms

Remote clock offset: 3.822 ms

Below is generated by plot.py at 2019-01-25 10:10:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 13972.258 ms

Loss rate: 15.22%

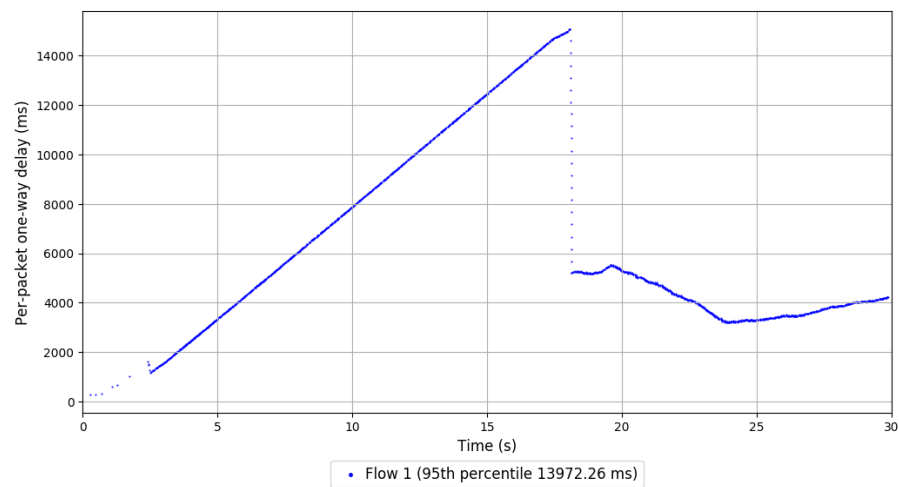
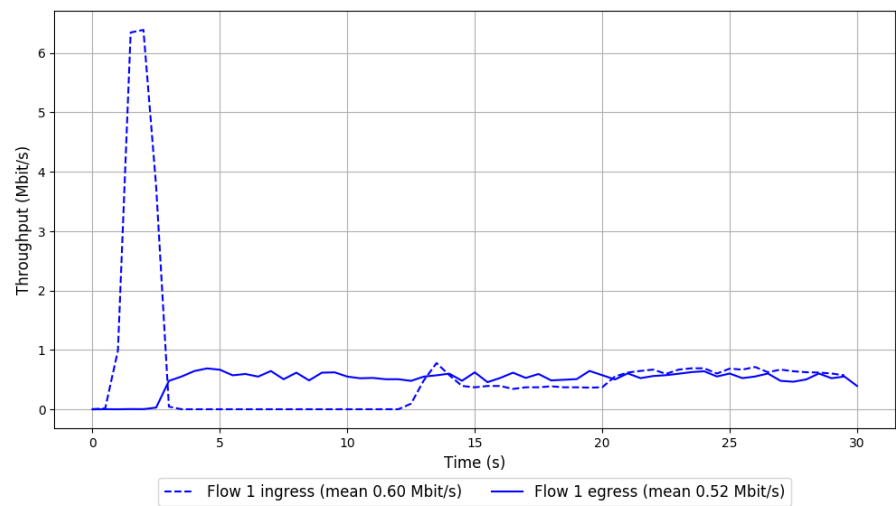
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 13972.258 ms

Loss rate: 15.22%

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2019-01-25 10:08:35

End at: 2019-01-25 10:09:05

Local clock offset: -8.276 ms

Remote clock offset: 2.593 ms

Below is generated by plot.py at 2019-01-25 10:10:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 14542.516 ms

Loss rate: 16.37%

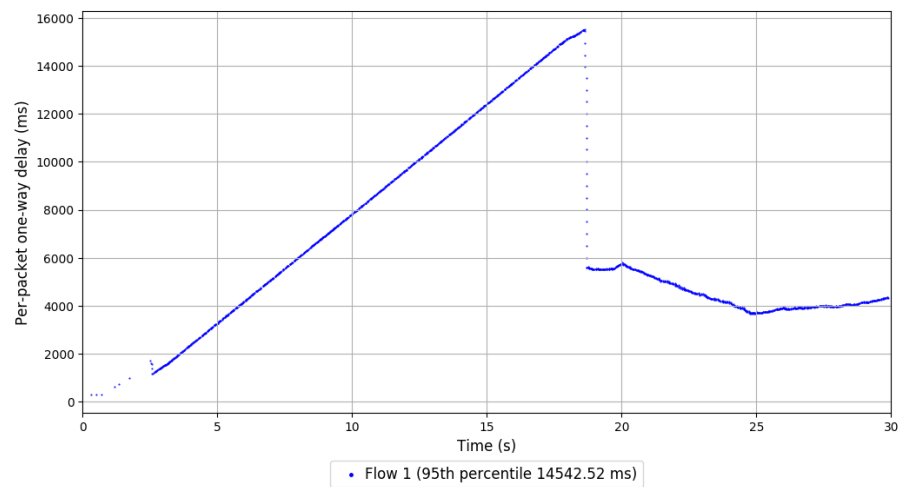
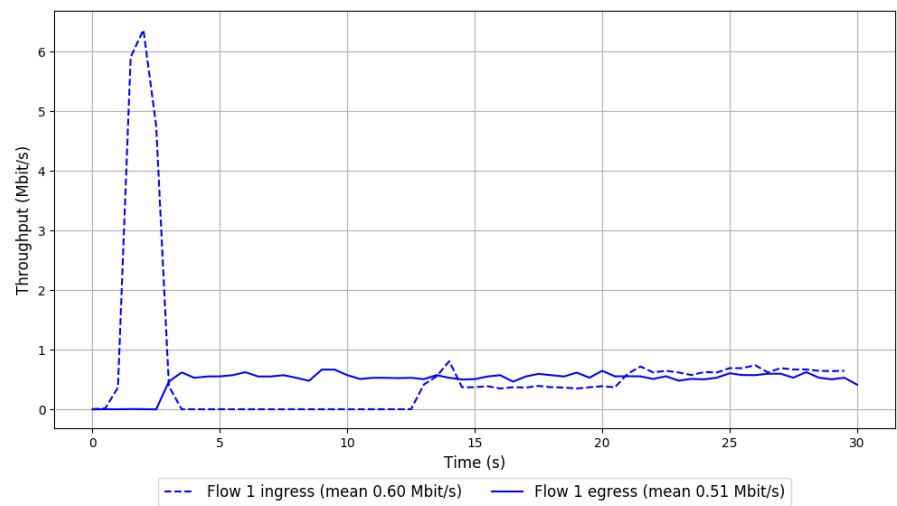
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 14542.516 ms

Loss rate: 16.37%

Run 3: Report of FillP-Sheep — Data Link

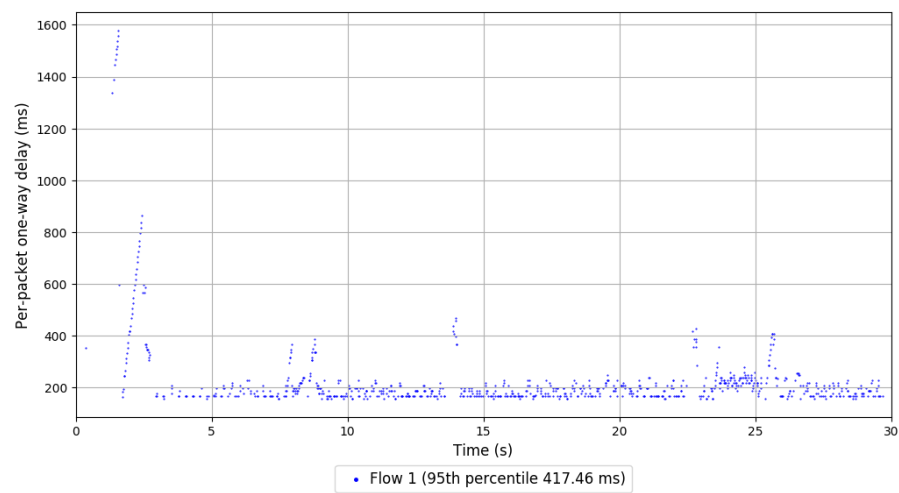
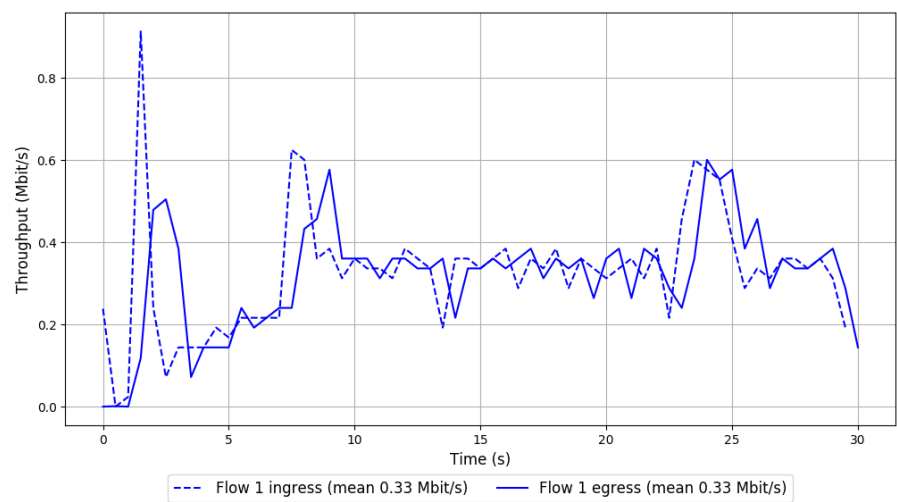


```
Run 1: Statistics of Indigo

Start at: 2019-01-25 09:11:37
End at: 2019-01-25 09:12:07
Local clock offset: -4.178 ms
Remote clock offset: 2.748 ms

# Below is generated by plot.py at 2019-01-25 10:10:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 417.460 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 417.460 ms
Loss rate: 0.86%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2019-01-25 09:36:15

End at: 2019-01-25 09:36:45

Local clock offset: -5.44 ms

Remote clock offset: 2.697 ms

Below is generated by plot.py at 2019-01-25 10:10:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 379.326 ms

Loss rate: 0.93%

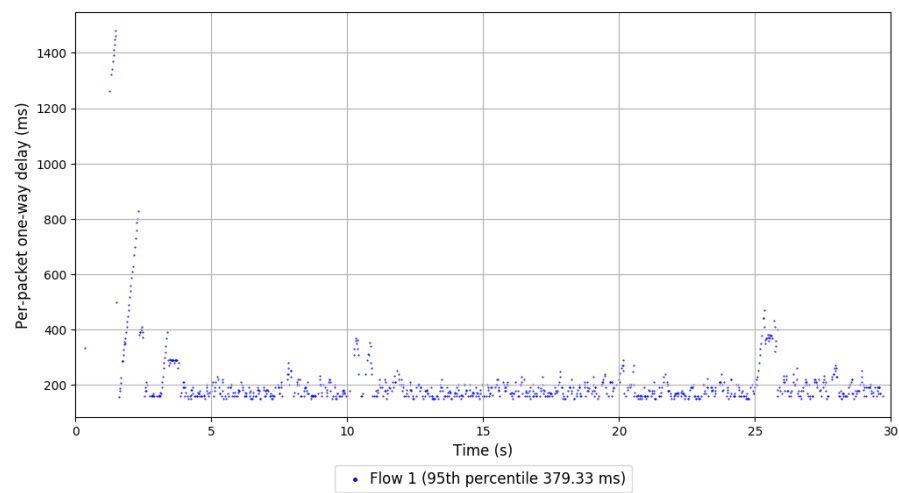
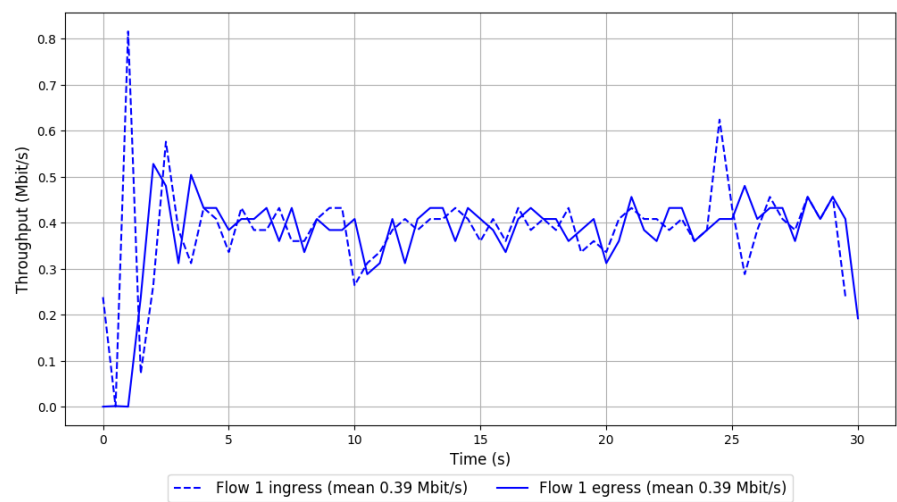
-- Flow 1:

Average throughput: 0.39 Mbit/s

95th percentile per-packet one-way delay: 379.326 ms

Loss rate: 0.93%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2019-01-25 10:00:30

End at: 2019-01-25 10:01:00

Local clock offset: -8.895 ms

Remote clock offset: 6.381 ms

Below is generated by plot.py at 2019-01-25 10:10:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 368.292 ms

Loss rate: 0.85%

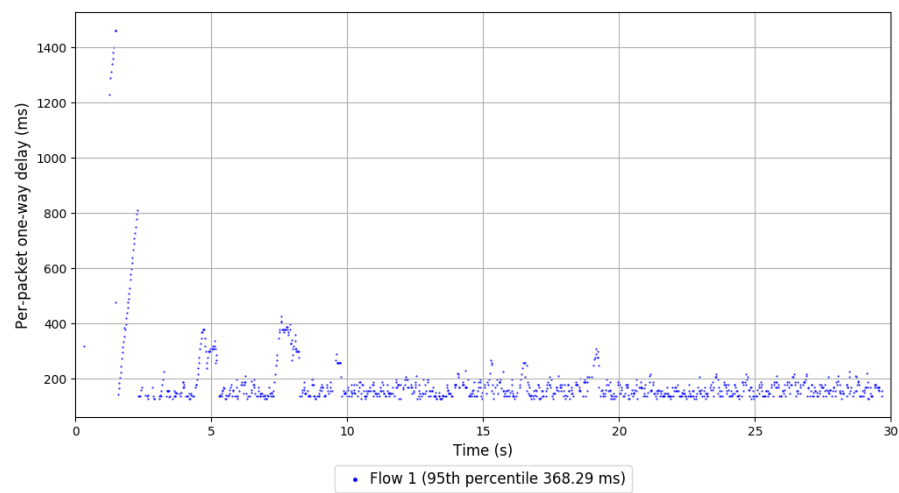
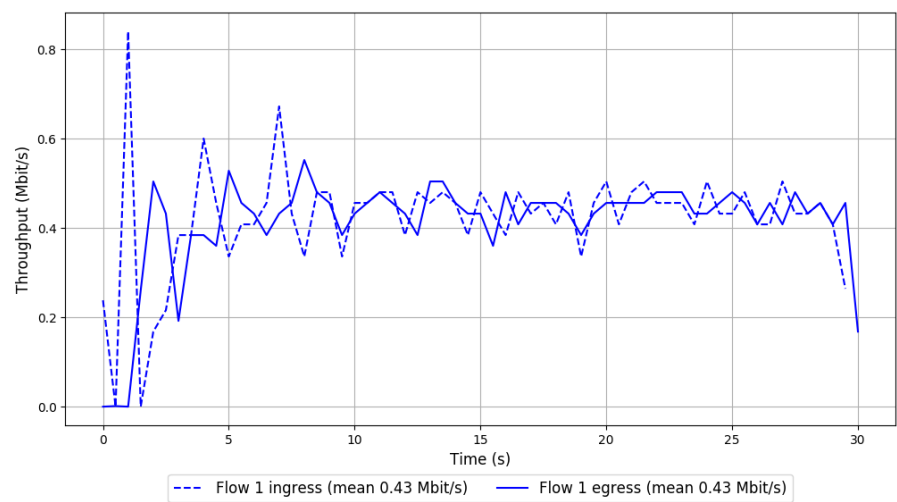
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 368.292 ms

Loss rate: 0.85%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Indigo-MusesC3

Start at: 2019-01-25 09:04:43

End at: 2019-01-25 09:05:13

Local clock offset: -5.695 ms

Remote clock offset: 4.943 ms

Below is generated by plot.py at 2019-01-25 10:10:34

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 23832.213 ms

Loss rate: 93.01%

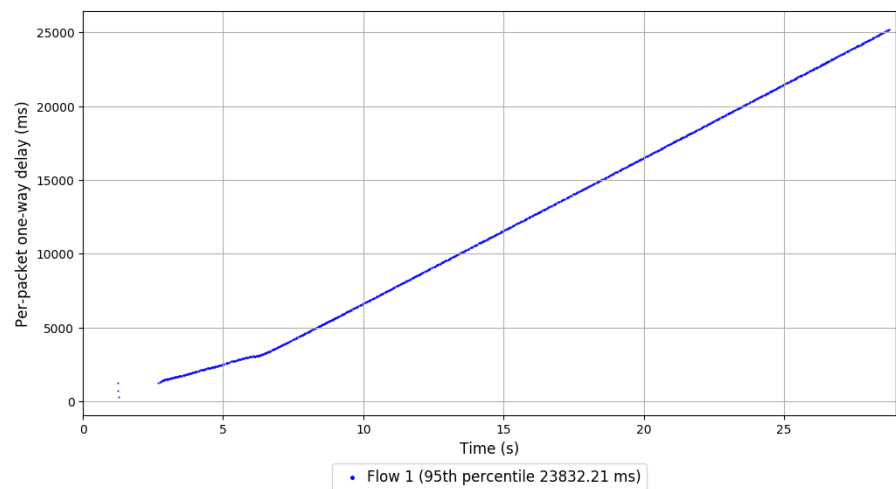
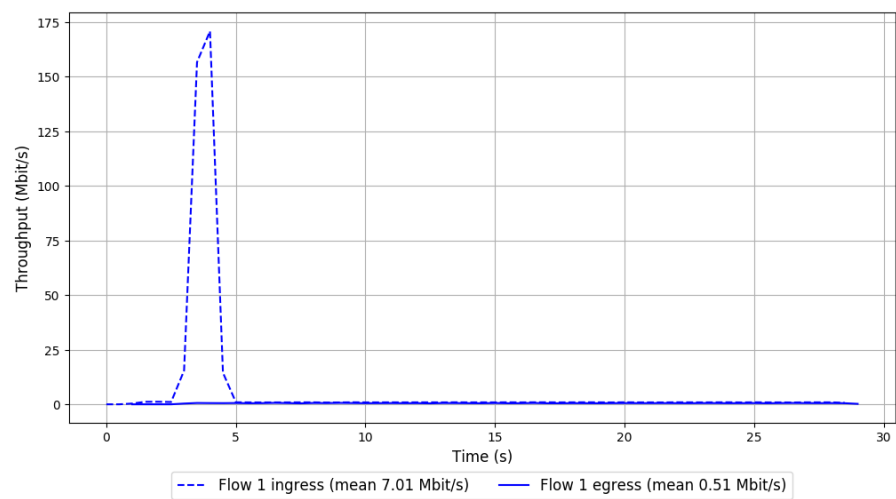
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 23832.213 ms

Loss rate: 93.01%

Run 1: Report of Indigo-MusesC3 — Data Link

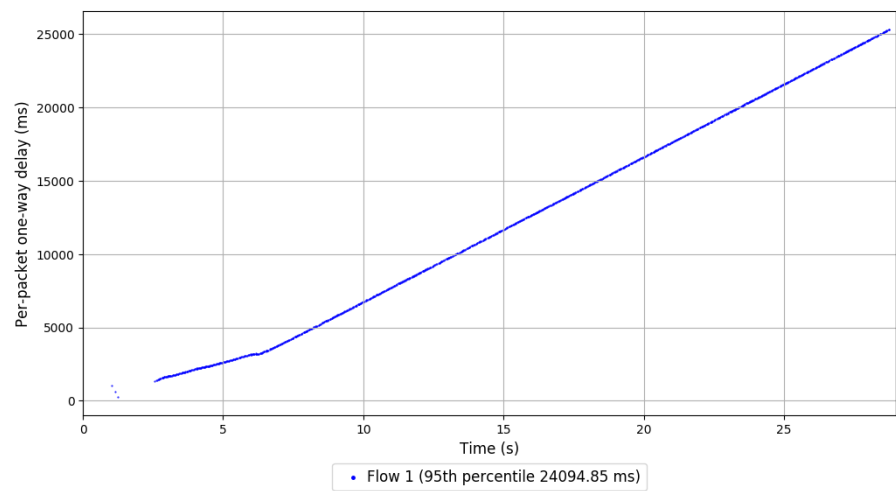
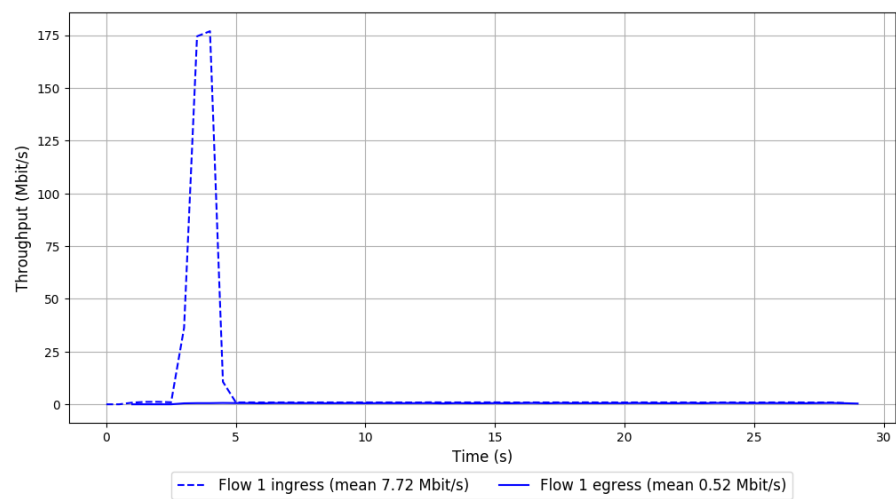


Run 2: Statistics of Indigo-MusesC3

Start at: 2019-01-25 09:29:20
End at: 2019-01-25 09:29:50
Local clock offset: -2.245 ms
Remote clock offset: 6.012 ms

Below is generated by plot.py at 2019-01-25 10:10:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 24094.848 ms
Loss rate: 93.55%
-- Flow 1:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 24094.848 ms
Loss rate: 93.55%

Run 2: Report of Indigo-MusesC3 — Data Link



Run 3: Statistics of Indigo-MusesC3

Start at: 2019-01-25 09:53:36

End at: 2019-01-25 09:54:06

Local clock offset: -7.772 ms

Remote clock offset: 2.551 ms

Below is generated by plot.py at 2019-01-25 10:10:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 24200.617 ms

Loss rate: 93.30%

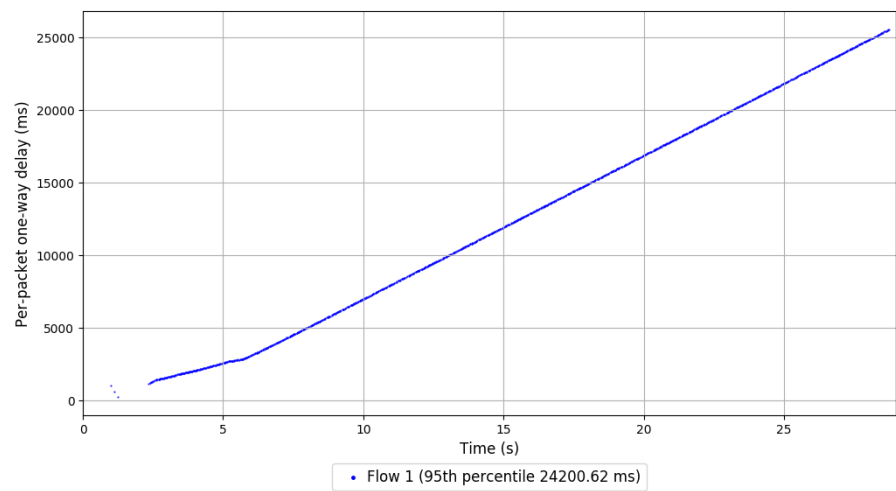
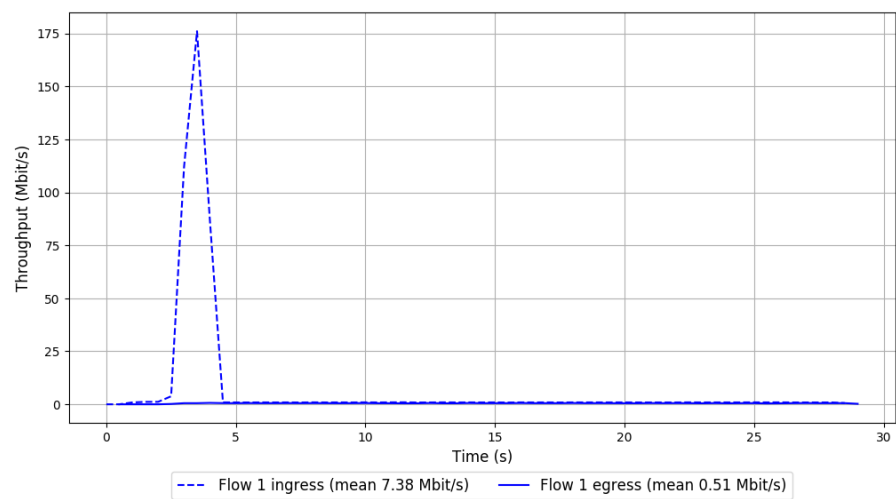
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 24200.617 ms

Loss rate: 93.30%

Run 3: Report of Indigo-MusesC3 — Data Link



Run 1: Statistics of Indigo-MusesC5

Start at: 2019-01-25 09:07:04

End at: 2019-01-25 09:07:34

Local clock offset: -5.522 ms

Remote clock offset: 6.052 ms

Below is generated by plot.py at 2019-01-25 10:10:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 11986.490 ms

Loss rate: 45.67%

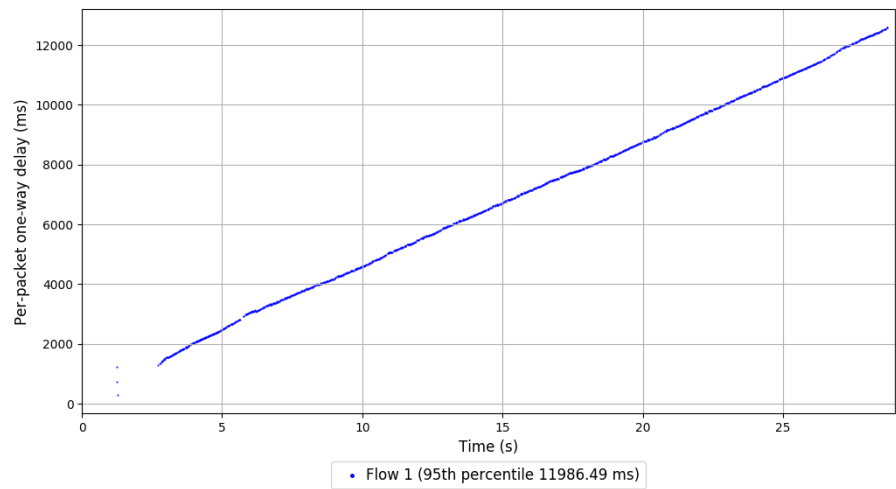
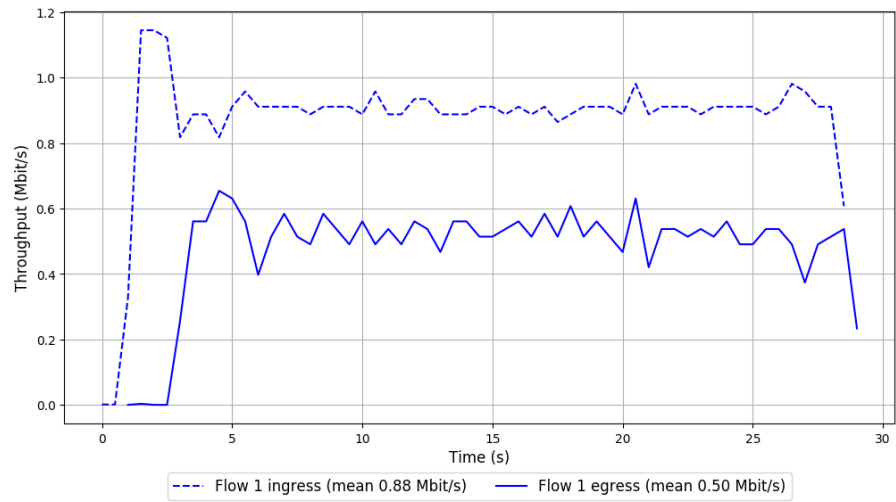
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 11986.490 ms

Loss rate: 45.67%

Run 1: Report of Indigo-MusesC5 — Data Link



Run 2: Statistics of Indigo-MusesC5

Start at: 2019-01-25 09:31:42

End at: 2019-01-25 09:32:12

Local clock offset: -3.502 ms

Remote clock offset: 7.744 ms

Below is generated by plot.py at 2019-01-25 10:10:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 10291.863 ms

Loss rate: 39.34%

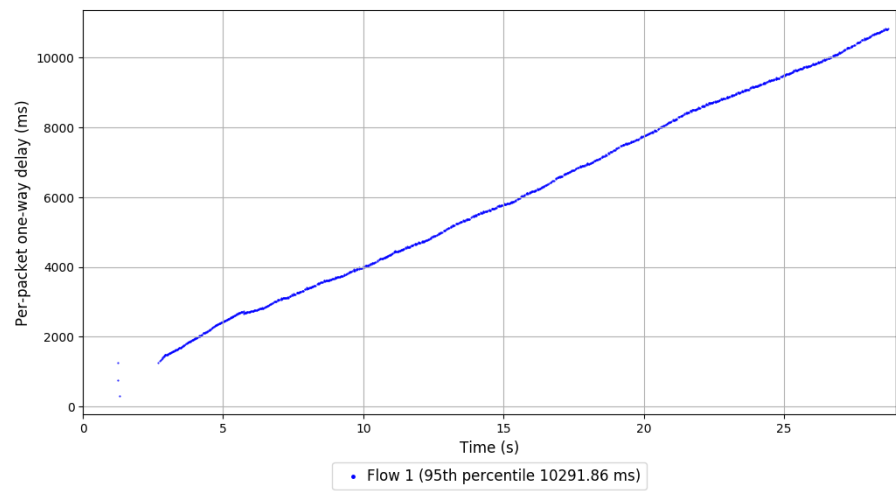
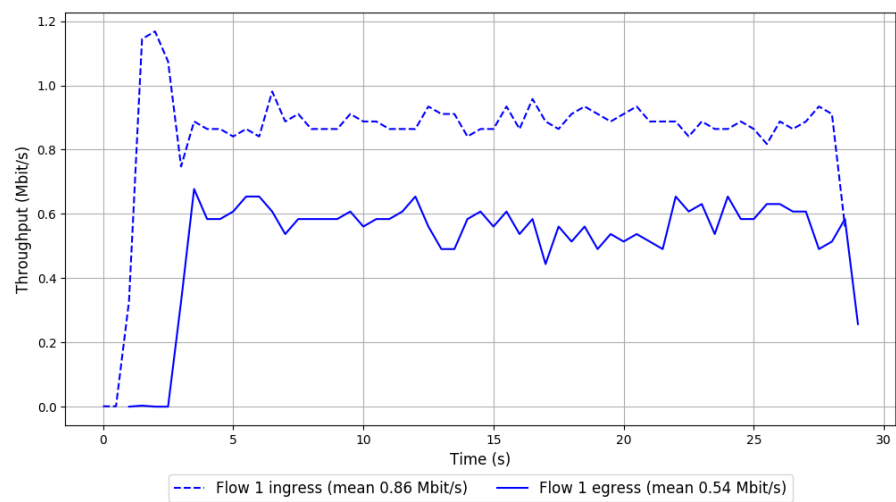
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 10291.863 ms

Loss rate: 39.34%

Run 2: Report of Indigo-MusesC5 — Data Link



Run 3: Statistics of Indigo-MusesC5

Start at: 2019-01-25 09:55:57

End at: 2019-01-25 09:56:27

Local clock offset: -7.898 ms

Remote clock offset: 3.769 ms

Below is generated by plot.py at 2019-01-25 10:10:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 11654.595 ms

Loss rate: 44.69%

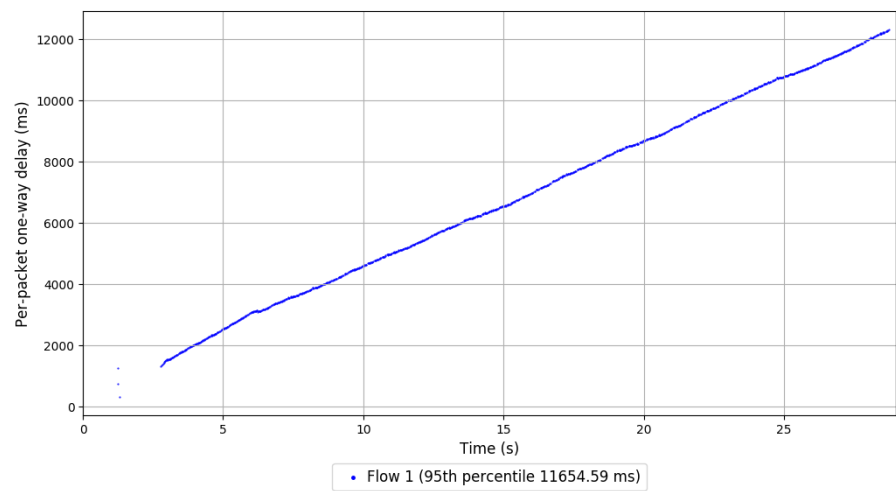
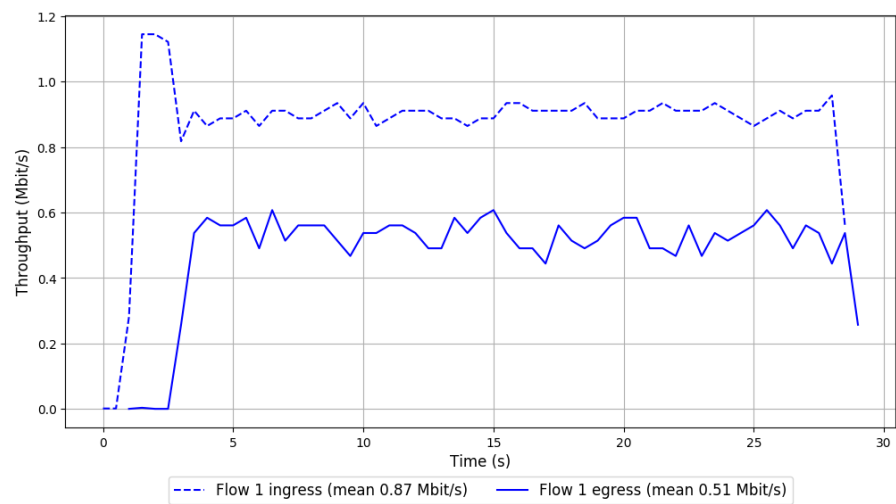
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 11654.595 ms

Loss rate: 44.69%

Run 3: Report of Indigo-MusesC5 — Data Link

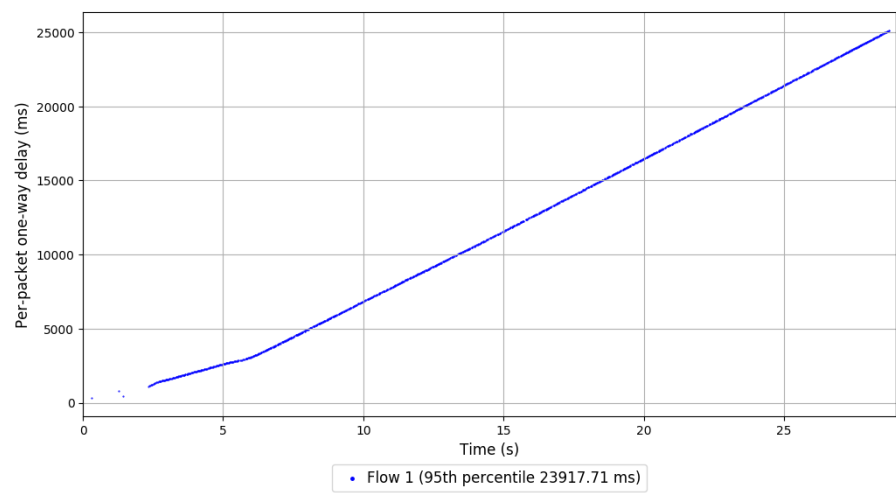
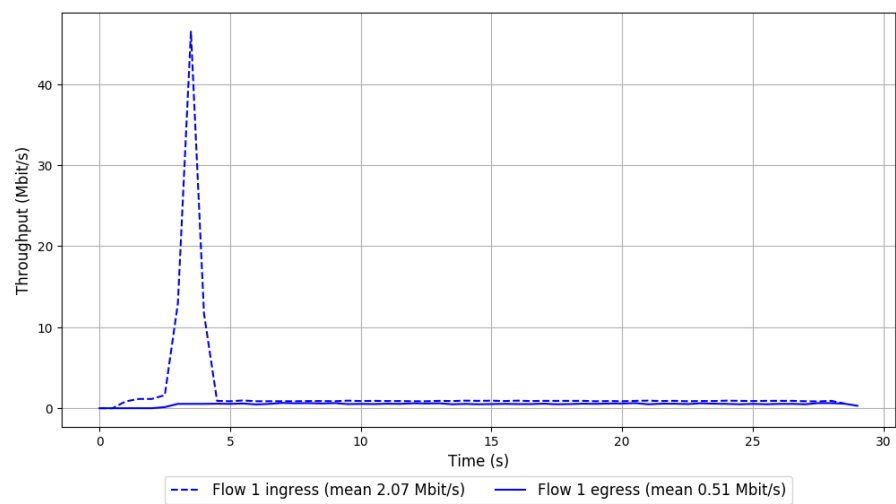


```
Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-25 08:58:52
End at: 2019-01-25 08:59:22
Local clock offset: -9.497 ms
Remote clock offset: 6.196 ms

# Below is generated by plot.py at 2019-01-25 10:10:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 23917.713 ms
Loss rate: 75.62%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 23917.713 ms
Loss rate: 75.62%
```

Run 1: Report of Indigo-MusesD — Data Link



Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-25 09:23:28

End at: 2019-01-25 09:23:58

Local clock offset: -2.616 ms

Remote clock offset: 3.366 ms

Below is generated by plot.py at 2019-01-25 10:10:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 23541.105 ms

Loss rate: 83.71%

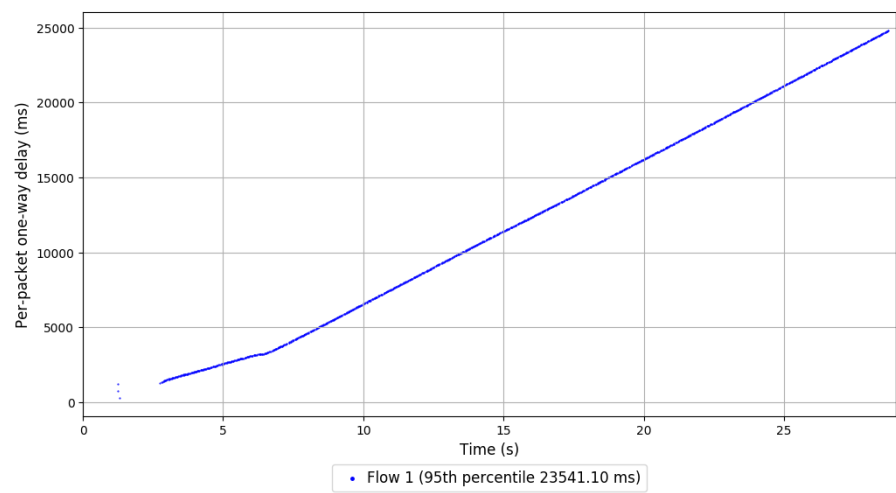
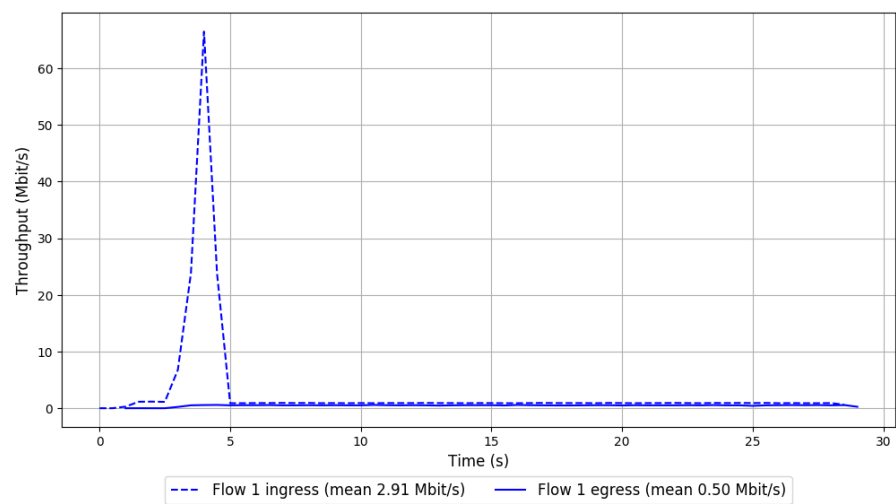
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 23541.105 ms

Loss rate: 83.71%

Run 2: Report of Indigo-MusesD — Data Link



Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-25 09:47:48

End at: 2019-01-25 09:48:18

Local clock offset: -7.923 ms

Remote clock offset: 7.511 ms

Below is generated by plot.py at 2019-01-25 10:10:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 23408.853 ms

Loss rate: 81.01%

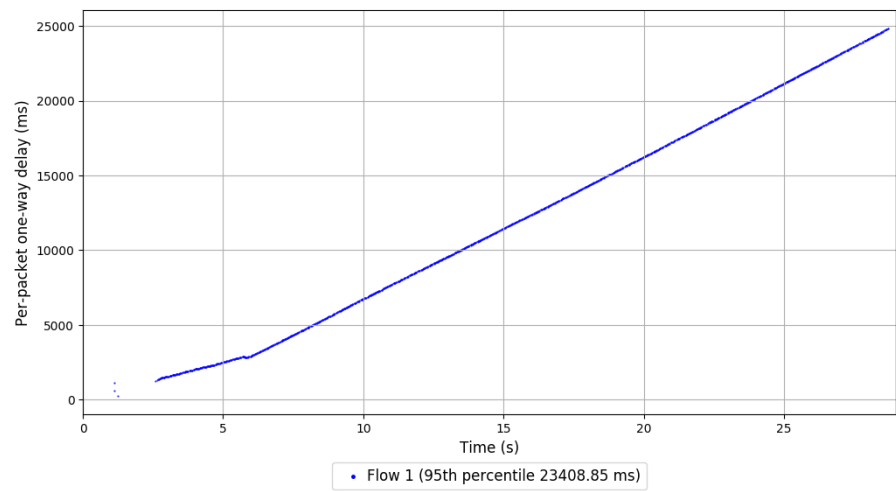
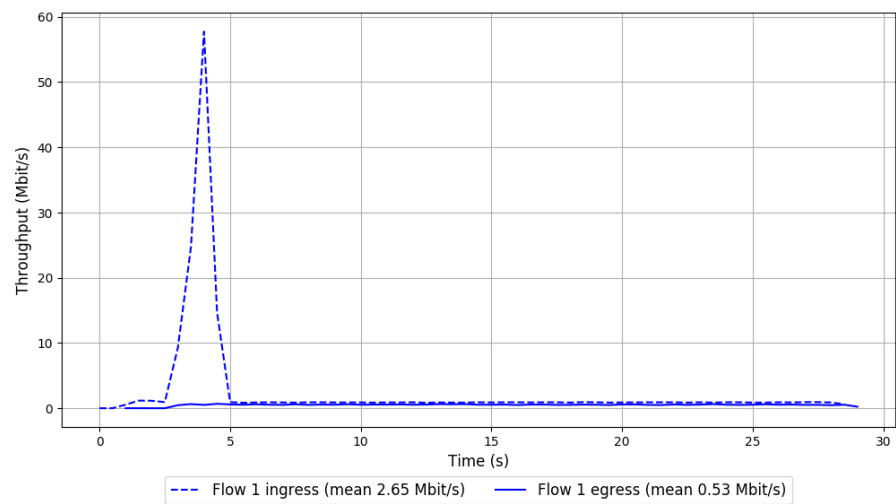
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 23408.853 ms

Loss rate: 81.01%

Run 3: Report of Indigo-MusesD — Data Link



Run 1: Statistics of Indigo-MusesT

Start at: 2019-01-25 09:15:25

End at: 2019-01-25 09:15:55

Local clock offset: -2.8 ms

Remote clock offset: 3.134 ms

Below is generated by plot.py at 2019-01-25 10:10:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 24110.122 ms

Loss rate: 83.34%

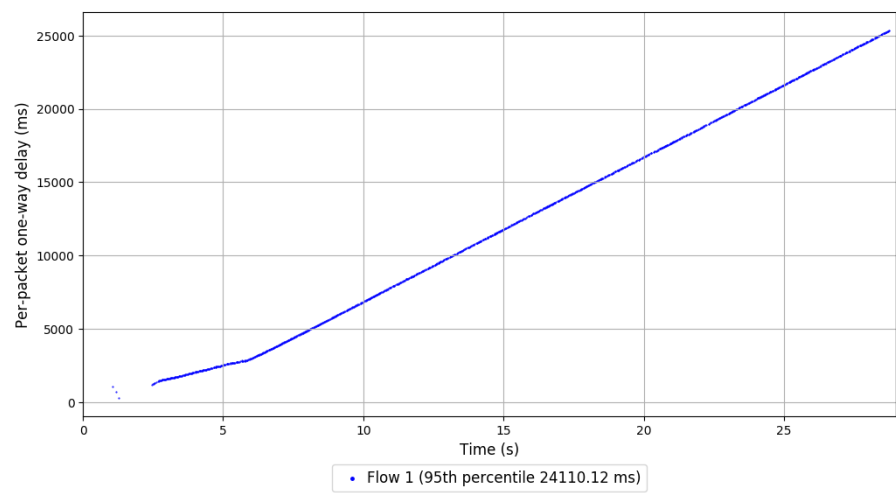
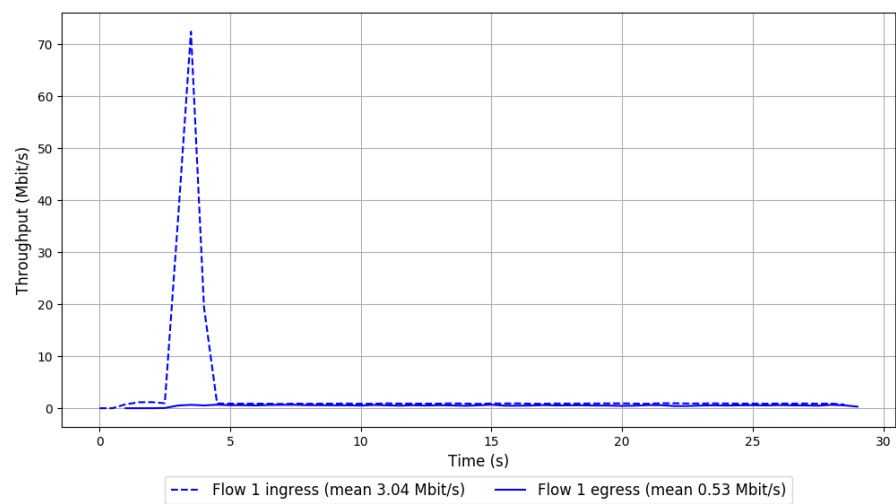
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 24110.122 ms

Loss rate: 83.34%

Run 1: Report of Indigo-MusesT — Data Link



Run 2: Statistics of Indigo-MusesT

Start at: 2019-01-25 09:39:44

End at: 2019-01-25 09:40:14

Local clock offset: -5.709 ms

Remote clock offset: 8.801 ms

Below is generated by plot.py at 2019-01-25 10:10:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 24022.818 ms

Loss rate: 87.71%

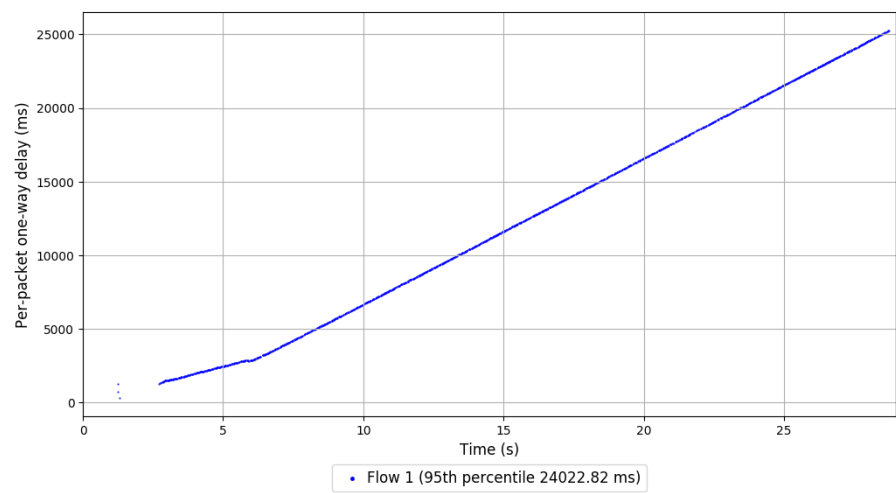
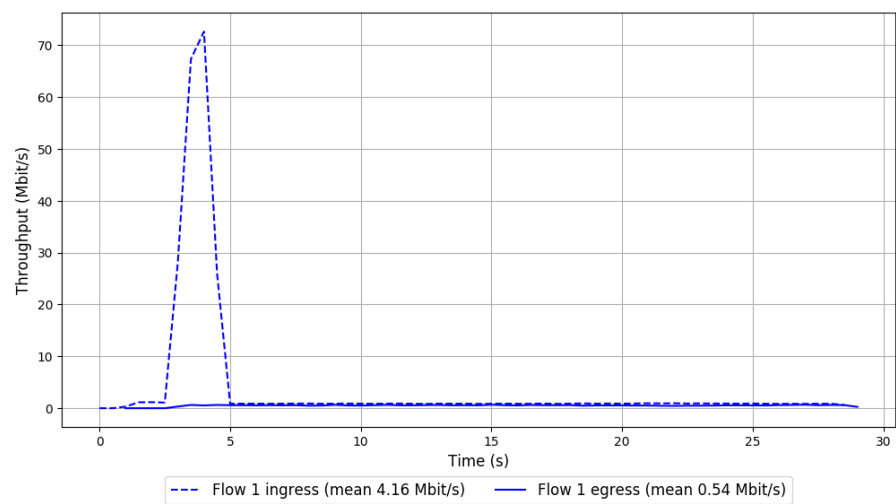
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 24022.818 ms

Loss rate: 87.71%

Run 2: Report of Indigo-MusesT — Data Link



Run 3: Statistics of Indigo-MusesT

Start at: 2019-01-25 10:03:59

End at: 2019-01-25 10:04:29

Local clock offset: -8.466 ms

Remote clock offset: 7.526 ms

Below is generated by plot.py at 2019-01-25 10:10:39

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 23908.199 ms

Loss rate: 86.89%

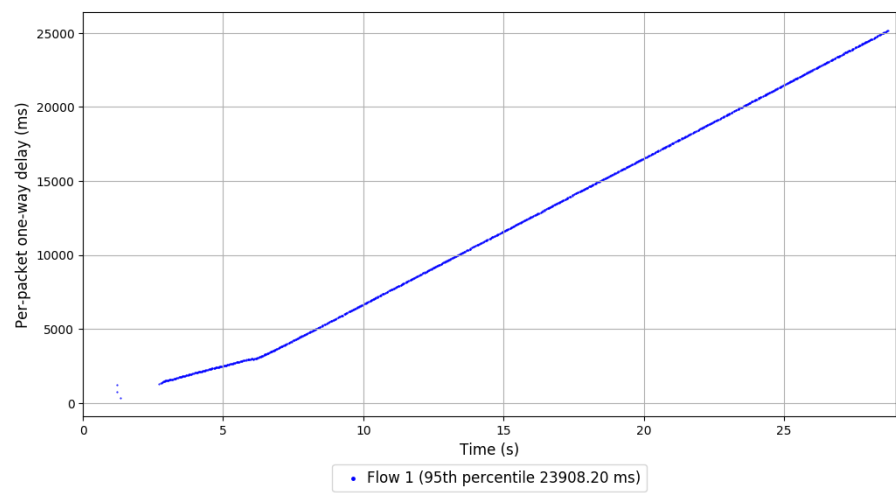
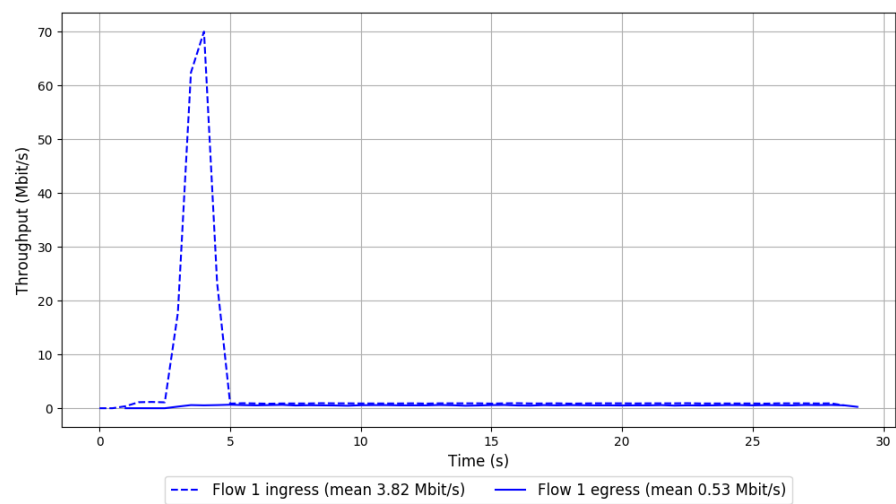
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 23908.199 ms

Loss rate: 86.89%

Run 3: Report of Indigo-MusesT — Data Link

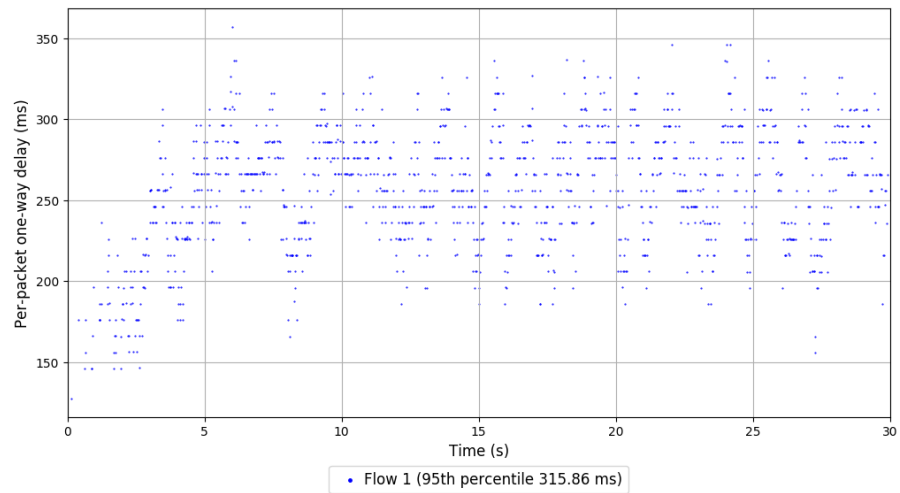
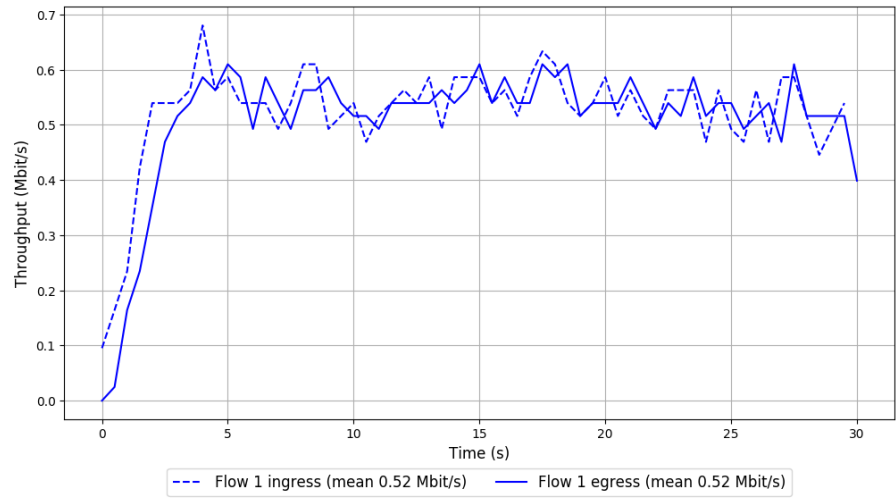


```
Run 1: Statistics of LEDBAT

Start at: 2019-01-25 09:05:56
End at: 2019-01-25 09:06:26
Local clock offset: -5.93 ms
Remote clock offset: 5.031 ms

# Below is generated by plot.py at 2019-01-25 10:10:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 315.862 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 315.862 ms
Loss rate: 1.12%
```

Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2019-01-25 09:30:33

End at: 2019-01-25 09:31:03

Local clock offset: -2.8 ms

Remote clock offset: 2.347 ms

Below is generated by plot.py at 2019-01-25 10:10:39

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 317.193 ms

Loss rate: 1.36%

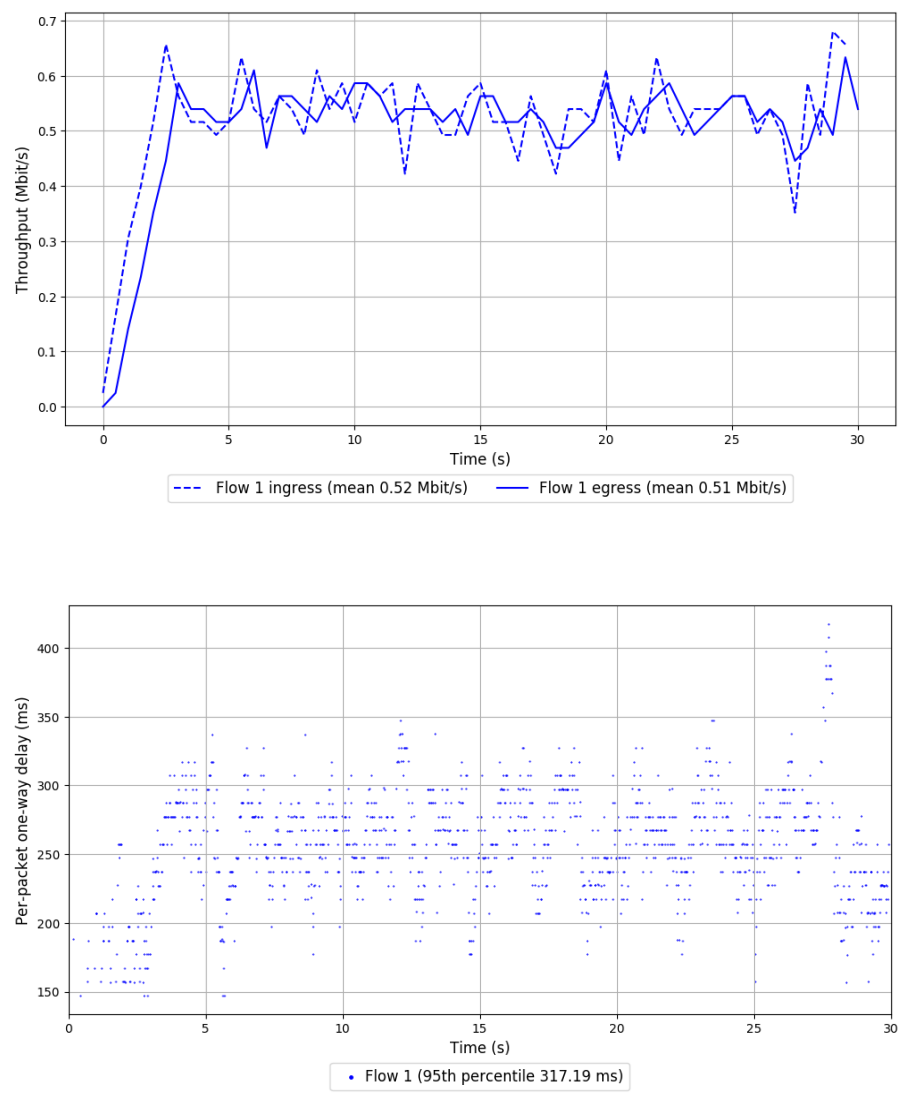
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 317.193 ms

Loss rate: 1.36%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2019-01-25 09:54:49

End at: 2019-01-25 09:55:19

Local clock offset: -8.647 ms

Remote clock offset: 7.524 ms

Below is generated by plot.py at 2019-01-25 10:10:39

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 322.422 ms

Loss rate: 1.12%

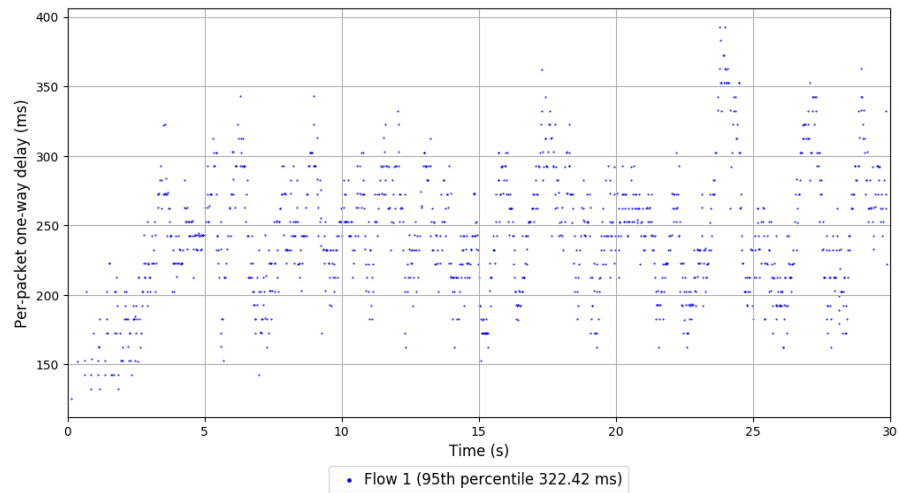
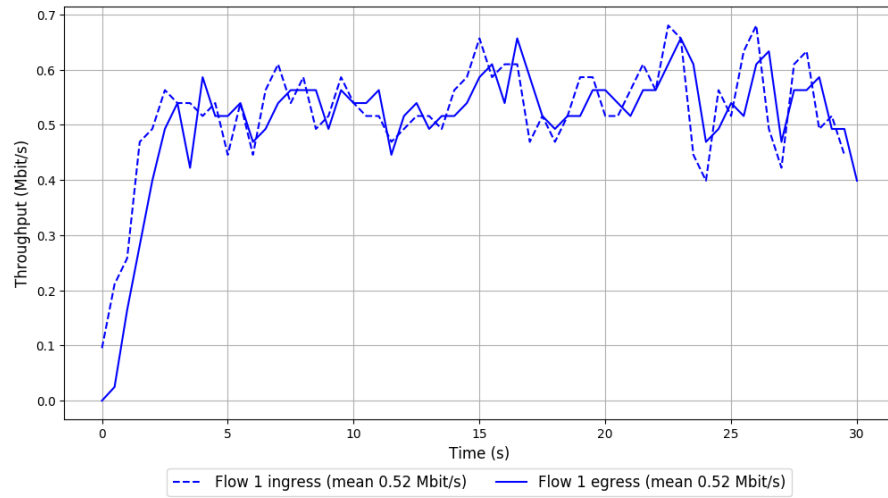
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 322.422 ms

Loss rate: 1.12%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2019-01-25 08:57:42

End at: 2019-01-25 08:58:12

Local clock offset: -9.409 ms

Remote clock offset: 2.257 ms

Below is generated by plot.py at 2019-01-25 10:10:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 25990.570 ms

Loss rate: 98.61%

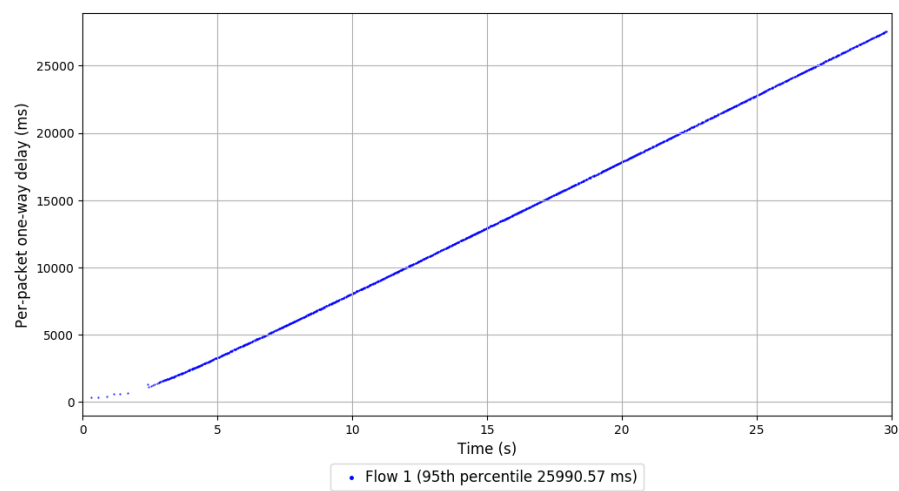
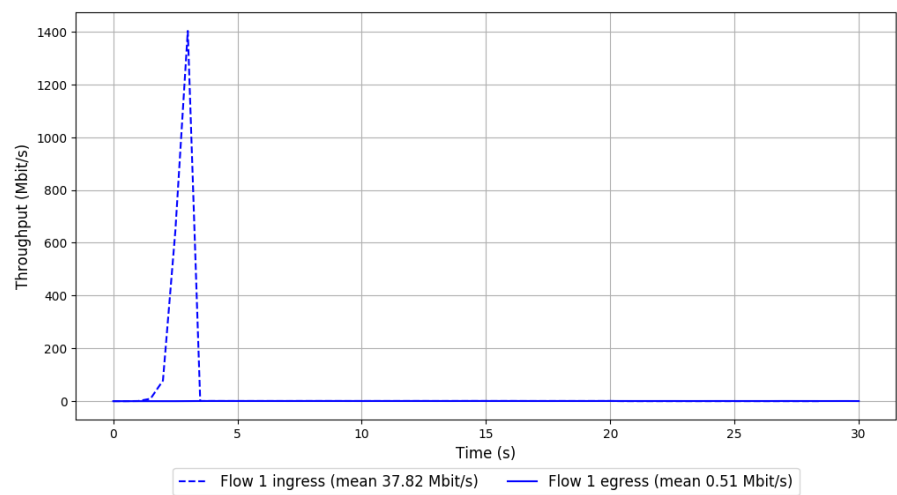
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 25990.570 ms

Loss rate: 98.61%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2019-01-25 09:22:18

End at: 2019-01-25 09:22:48

Local clock offset: -2.732 ms

Remote clock offset: 7.34 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 26189.666 ms

Loss rate: 98.63%

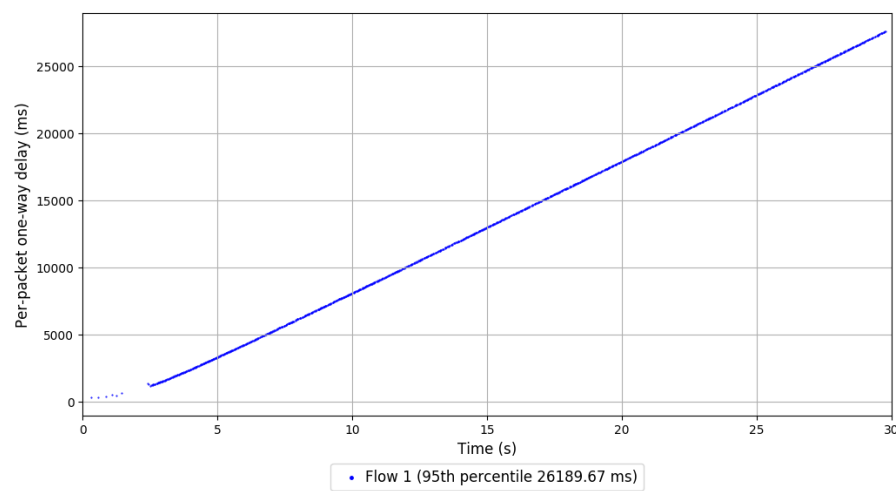
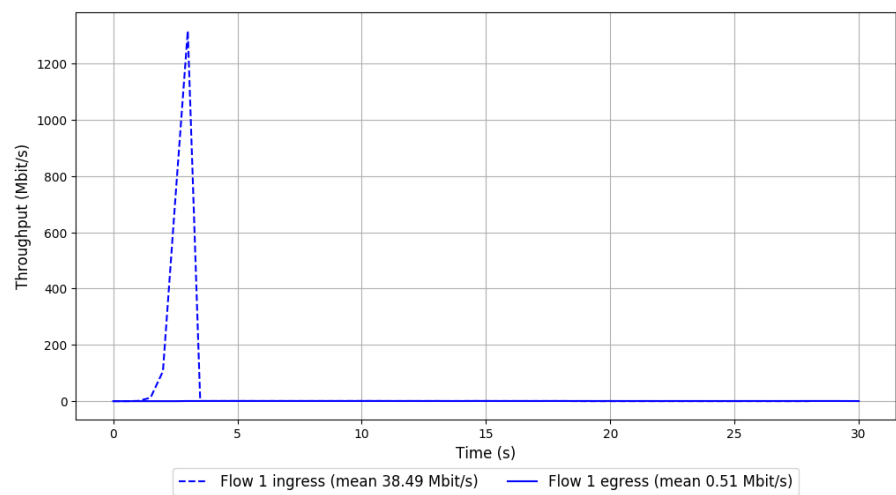
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 26189.666 ms

Loss rate: 98.63%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2019-01-25 09:46:38

End at: 2019-01-25 09:47:08

Local clock offset: -6.965 ms

Remote clock offset: 3.62 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 26354.419 ms

Loss rate: 98.63%

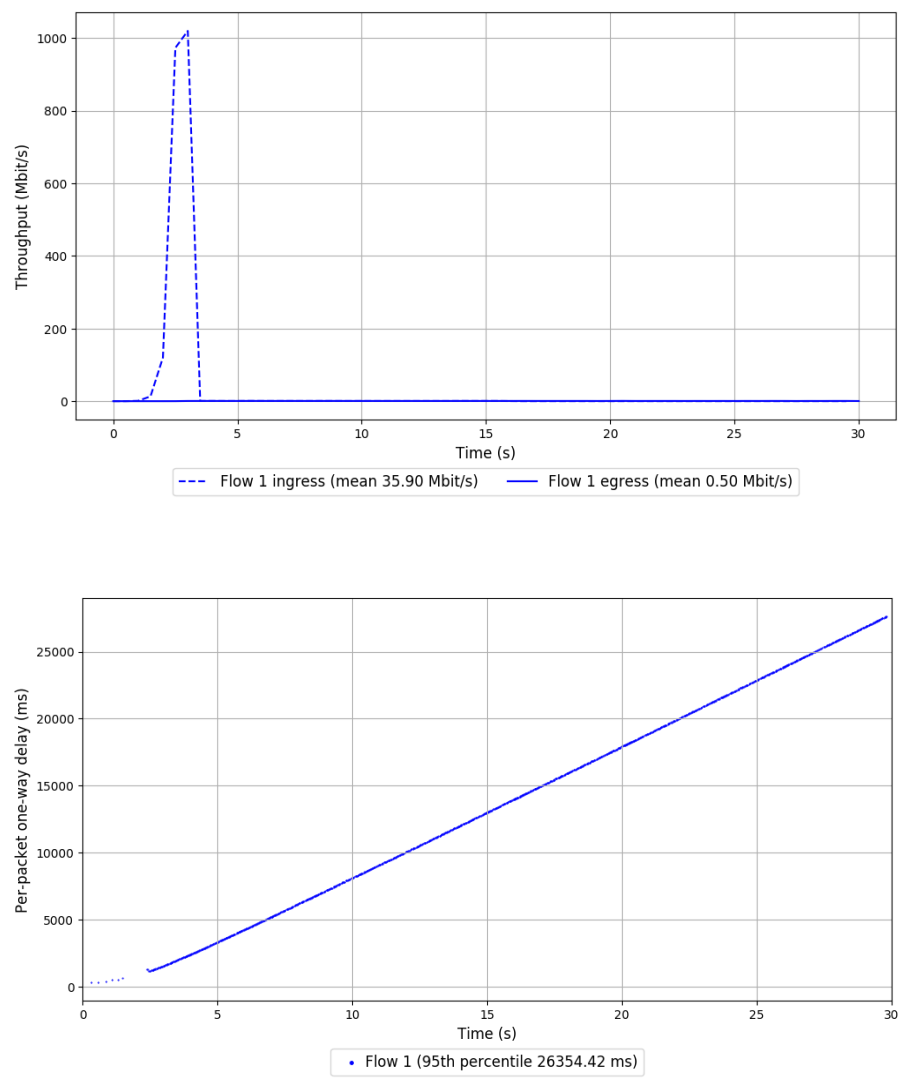
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 26354.419 ms

Loss rate: 98.63%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

Start at: 2019-01-25 09:02:23

End at: 2019-01-25 09:02:53

Local clock offset: -7.769 ms

Remote clock offset: 1.185 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.42 Mbit/s

95th percentile per-packet one-way delay: 26304.920 ms

Loss rate: 93.24%

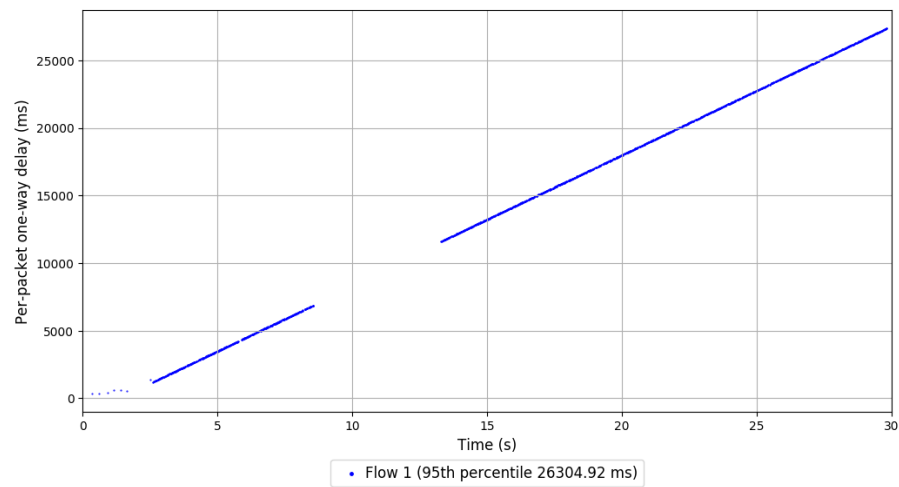
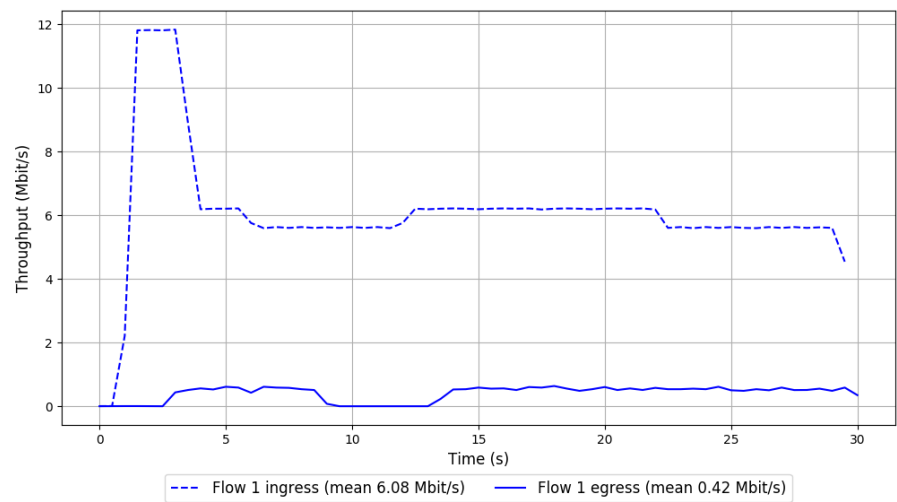
-- Flow 1:

Average throughput: 0.42 Mbit/s

95th percentile per-packet one-way delay: 26304.920 ms

Loss rate: 93.24%

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

Start at: 2019-01-25 09:26:59

End at: 2019-01-25 09:27:29

Local clock offset: -2.449 ms

Remote clock offset: 6.248 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 25908.710 ms

Loss rate: 92.38%

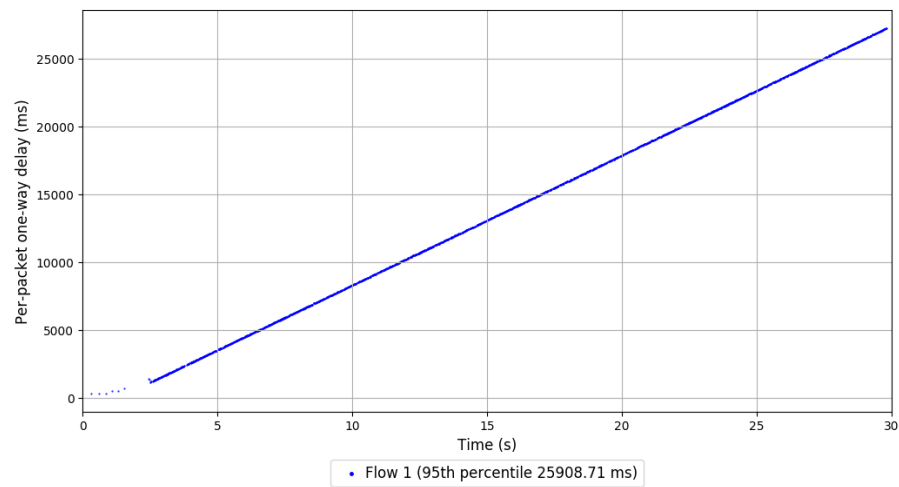
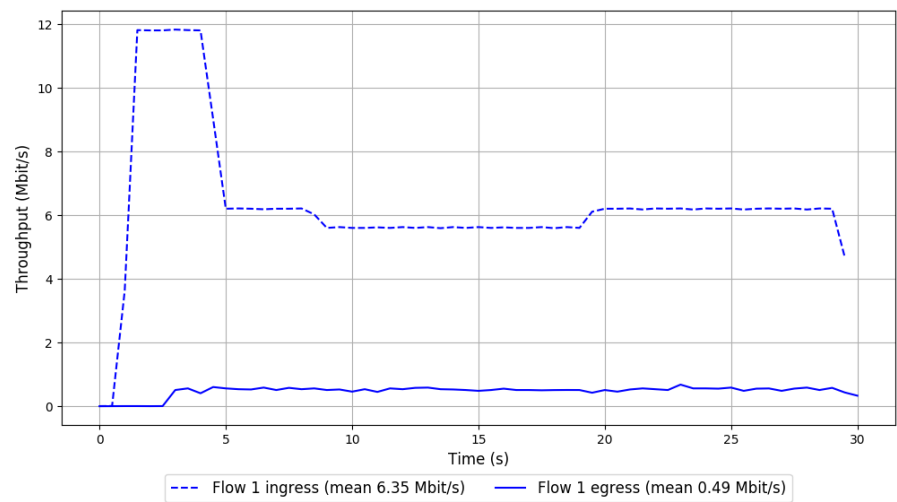
-- Flow 1:

Average throughput: 0.49 Mbit/s

95th percentile per-packet one-way delay: 25908.710 ms

Loss rate: 92.38%

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

Start at: 2019-01-25 09:51:17

End at: 2019-01-25 09:51:47

Local clock offset: -7.488 ms

Remote clock offset: 6.36 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 25853.549 ms

Loss rate: 92.11%

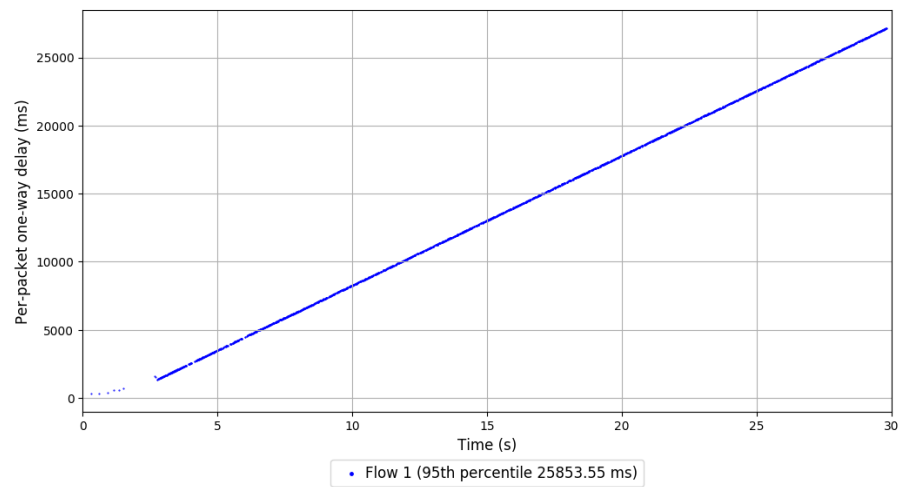
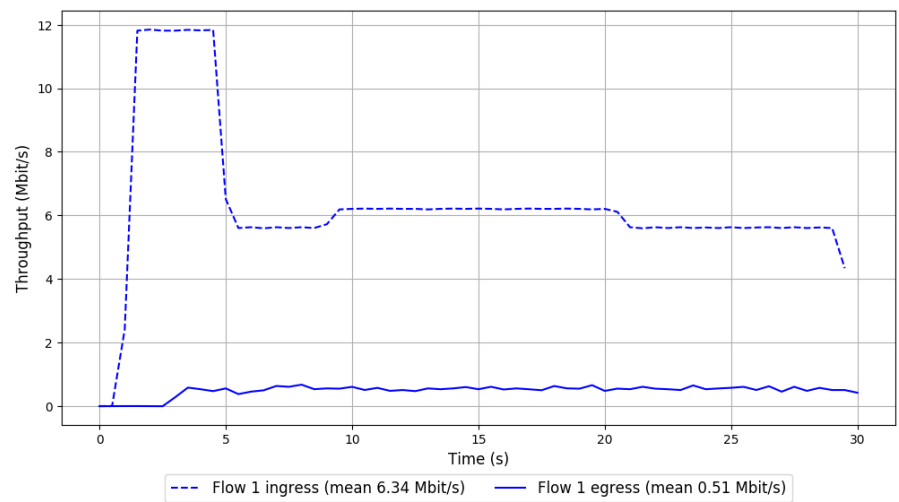
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 25853.549 ms

Loss rate: 92.11%

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2019-01-25 09:01:15

End at: 2019-01-25 09:01:45

Local clock offset: -8.525 ms

Remote clock offset: 1.042 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 7318.848 ms

Loss rate: 26.36%

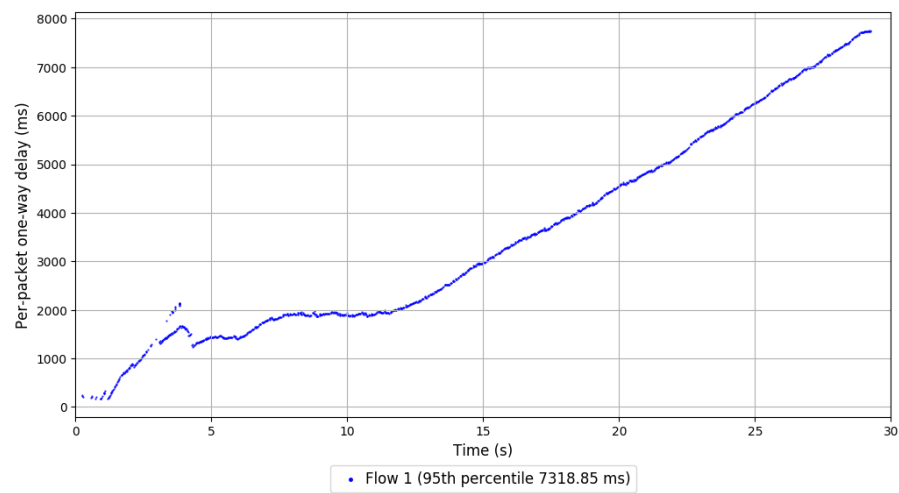
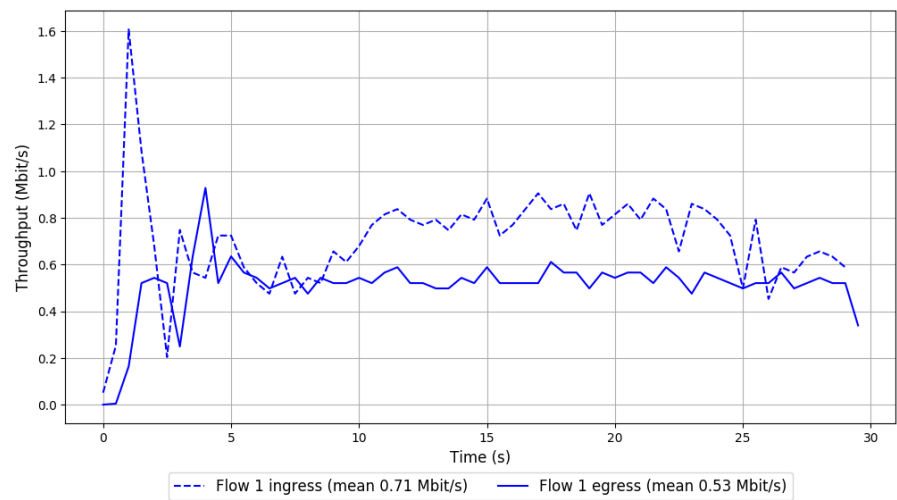
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 7318.848 ms

Loss rate: 26.36%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2019-01-25 09:25:50

End at: 2019-01-25 09:26:20

Local clock offset: -2.459 ms

Remote clock offset: 6.2 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 8793.368 ms

Loss rate: 33.17%

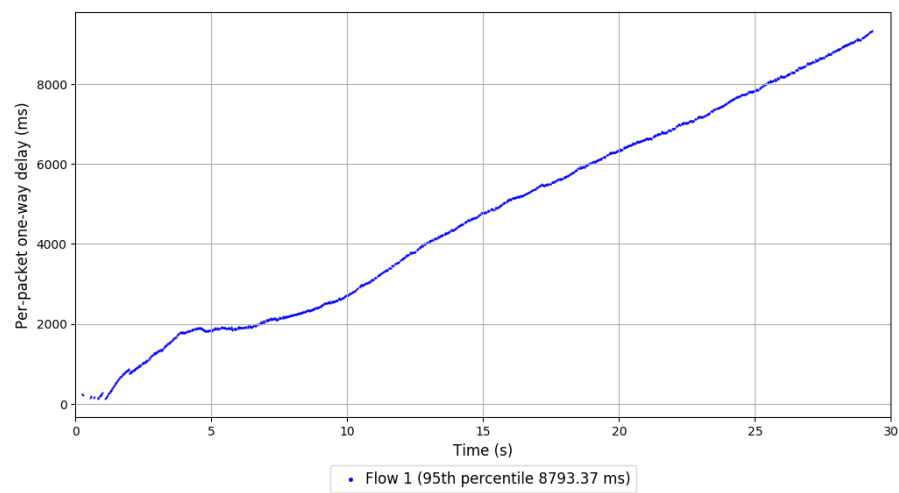
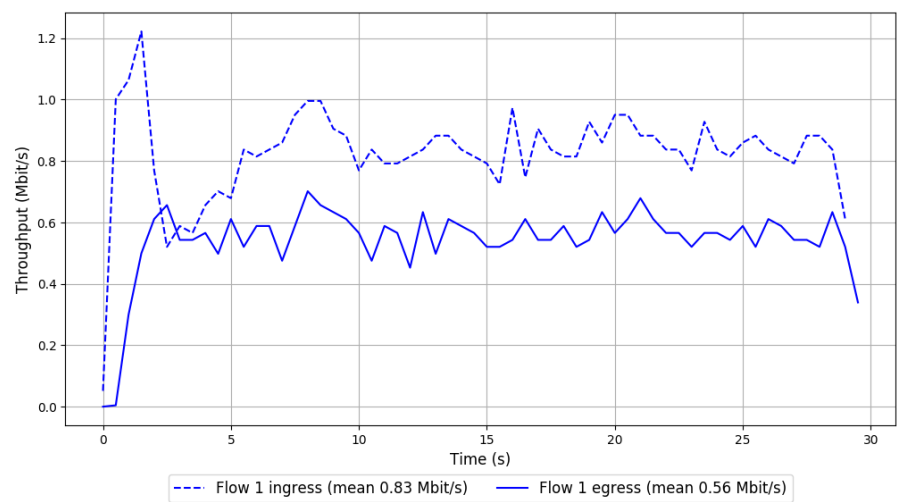
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 8793.368 ms

Loss rate: 33.17%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2019-01-25 09:50:08

End at: 2019-01-25 09:50:38

Local clock offset: -8.141 ms

Remote clock offset: 7.496 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 8821.474 ms

Loss rate: 31.71%

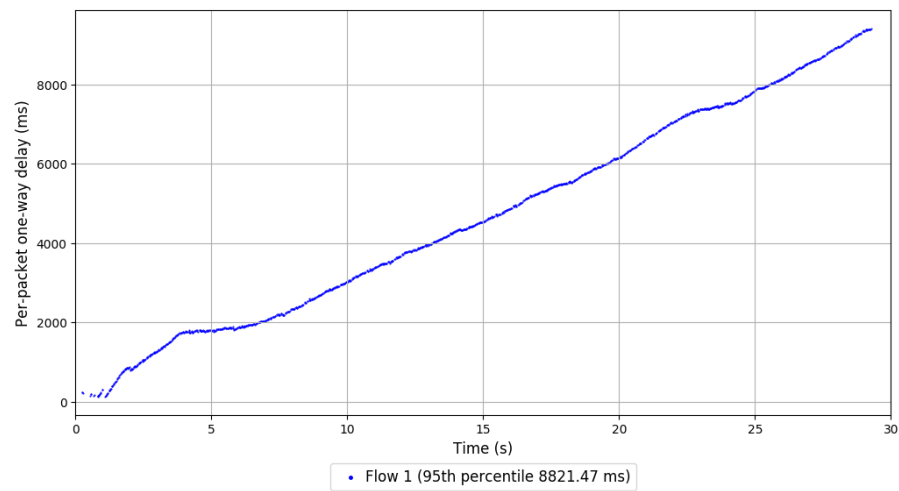
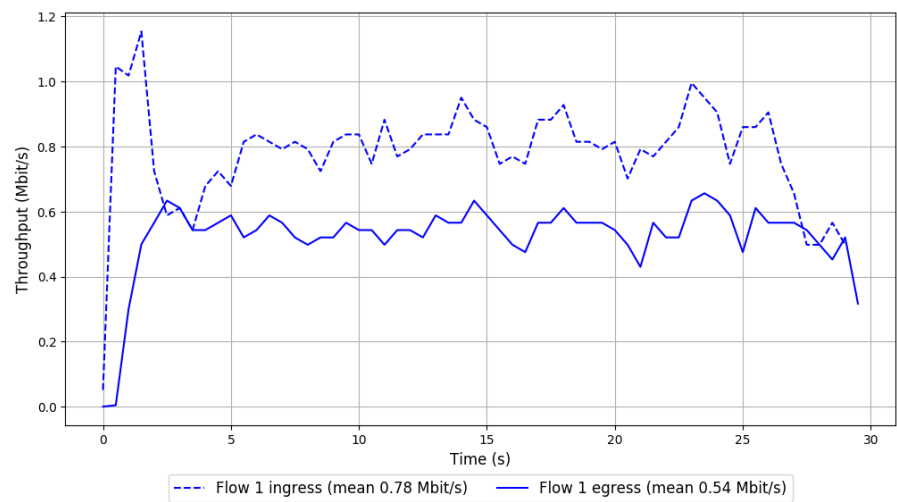
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 8821.474 ms

Loss rate: 31.71%

Run 3: Report of QUIC Cubic — Data Link



Run 1: Statistics of SCReAM

Start at: 2019-01-25 09:08:12

End at: 2019-01-25 09:08:42

Local clock offset: -4.402 ms

Remote clock offset: 6.302 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 192.310 ms

Loss rate: 0.92%

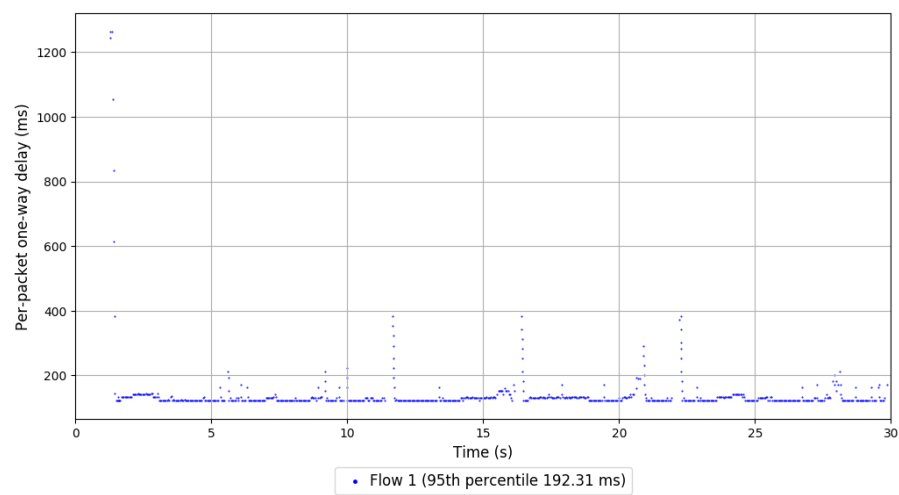
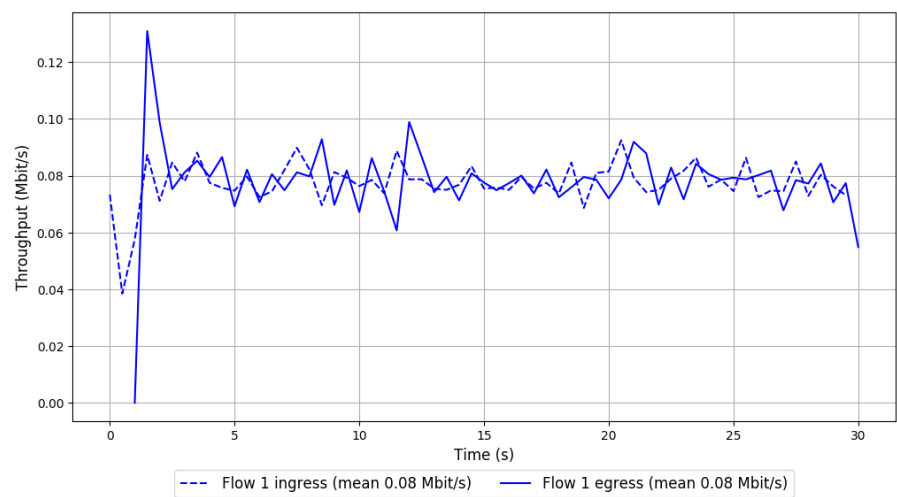
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 192.310 ms

Loss rate: 0.92%

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2019-01-25 09:32:50

End at: 2019-01-25 09:33:20

Local clock offset: -4.021 ms

Remote clock offset: 2.412 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 148.507 ms

Loss rate: 0.79%

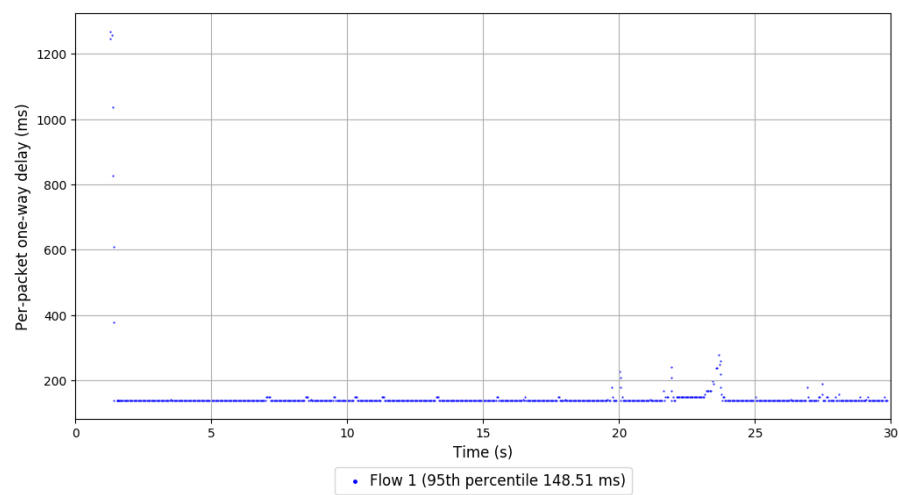
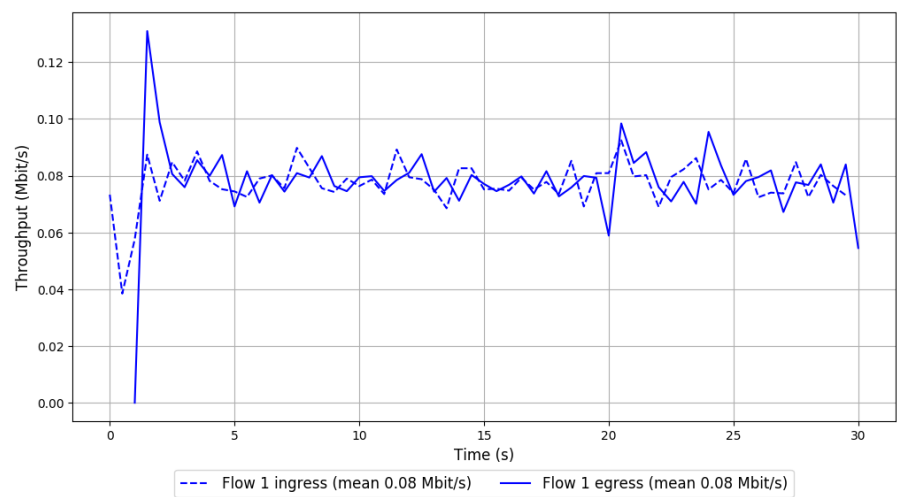
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 148.507 ms

Loss rate: 0.79%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2019-01-25 09:57:06

End at: 2019-01-25 09:57:36

Local clock offset: -7.997 ms

Remote clock offset: 3.727 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 175.798 ms

Loss rate: 0.78%

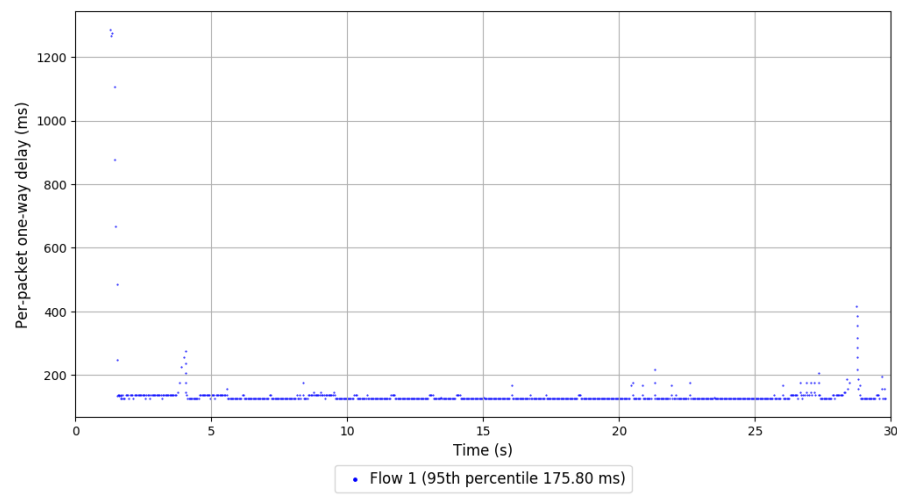
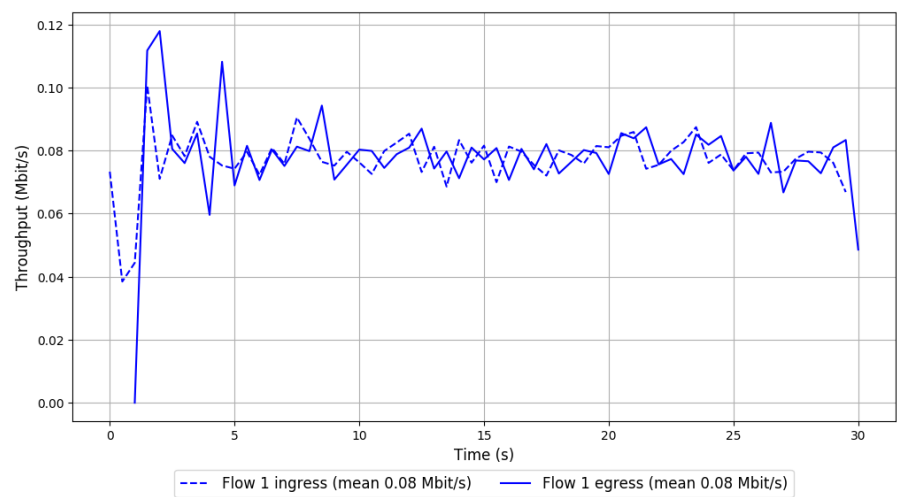
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 175.798 ms

Loss rate: 0.78%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of Sprout

Start at: 2019-01-25 09:18:54

End at: 2019-01-25 09:19:24

Local clock offset: -2.307 ms

Remote clock offset: 7.903 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.09 Mbit/s

95th percentile per-packet one-way delay: 768.150 ms

Loss rate: 0.48%

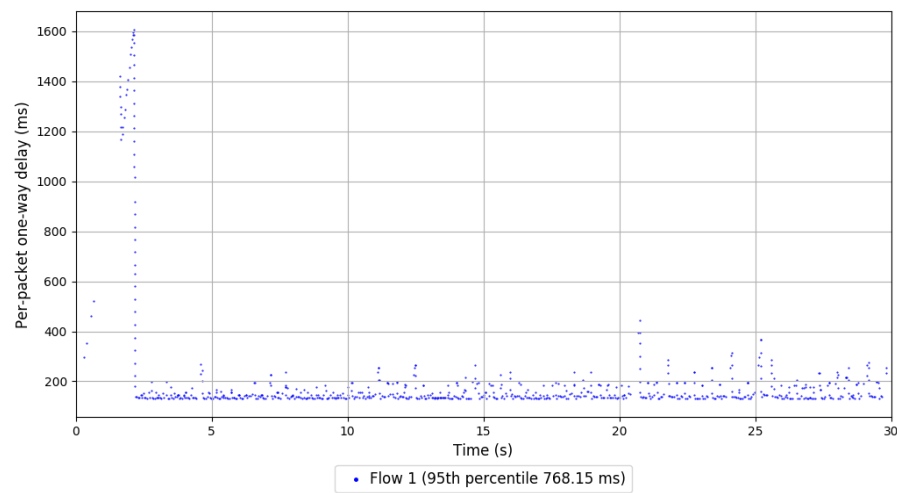
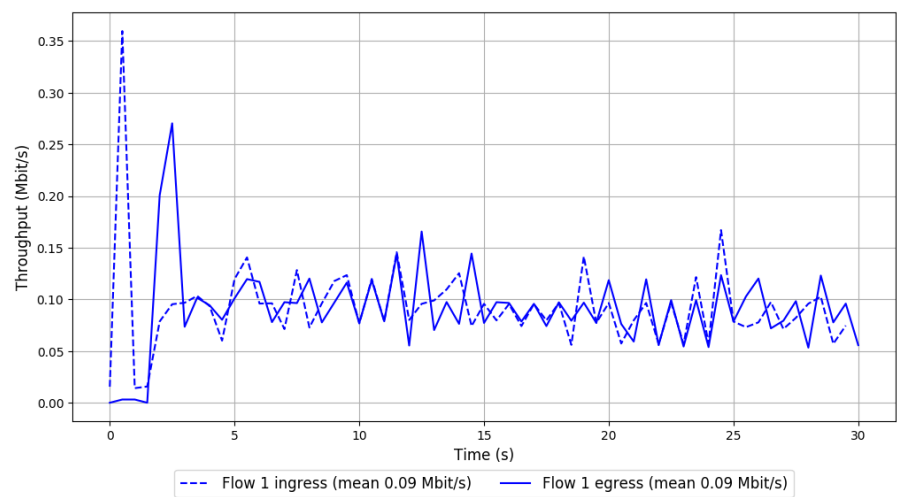
-- Flow 1:

Average throughput: 0.09 Mbit/s

95th percentile per-packet one-way delay: 768.150 ms

Loss rate: 0.48%

Run 1: Report of Sprout — Data Link

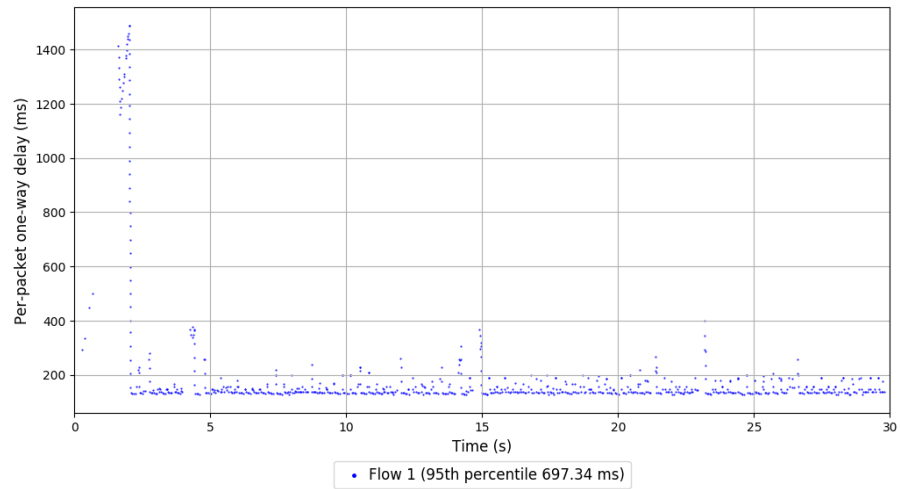
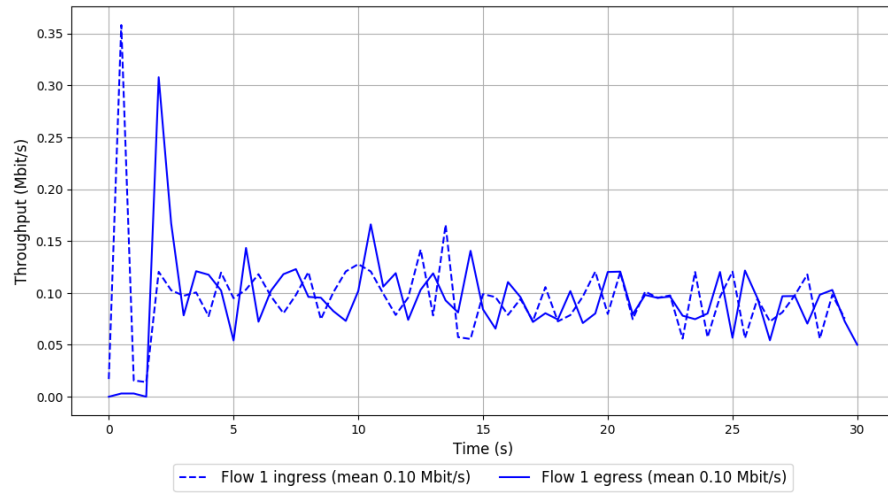


Run 2: Statistics of Sprout

Start at: 2019-01-25 09:43:13
End at: 2019-01-25 09:43:43
Local clock offset: -6.489 ms
Remote clock offset: 3.864 ms

Below is generated by plot.py at 2019-01-25 10:10:59
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 697.336 ms
Loss rate: 0.97%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 697.336 ms
Loss rate: 0.97%

Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2019-01-25 10:07:27

End at: 2019-01-25 10:07:57

Local clock offset: -7.481 ms

Remote clock offset: 6.485 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 564.200 ms

Loss rate: 0.78%

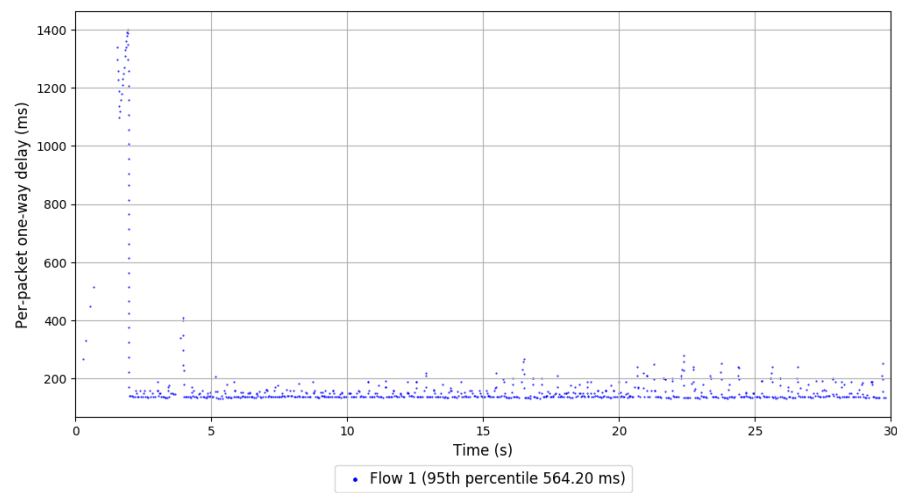
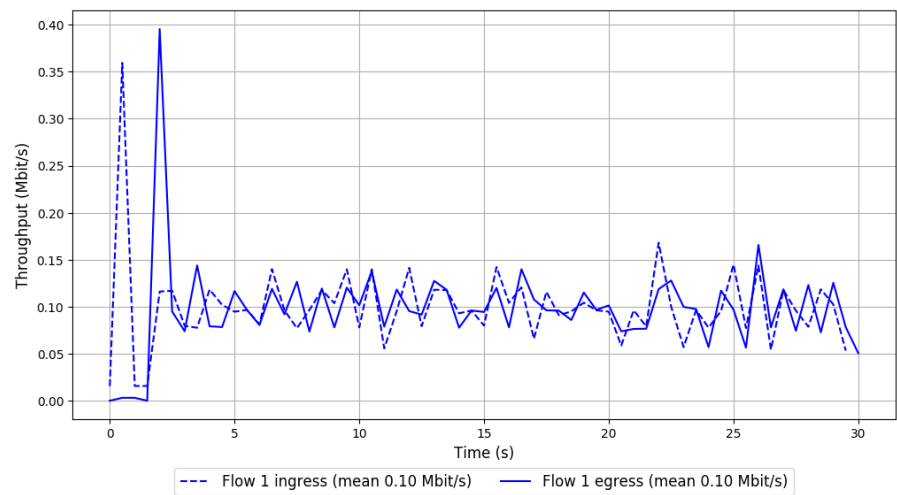
-- Flow 1:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 564.200 ms

Loss rate: 0.78%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2019-01-25 09:09:20

End at: 2019-01-25 09:09:50

Local clock offset: -4.013 ms

Remote clock offset: 7.442 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 883.817 ms

Loss rate: 2.60%

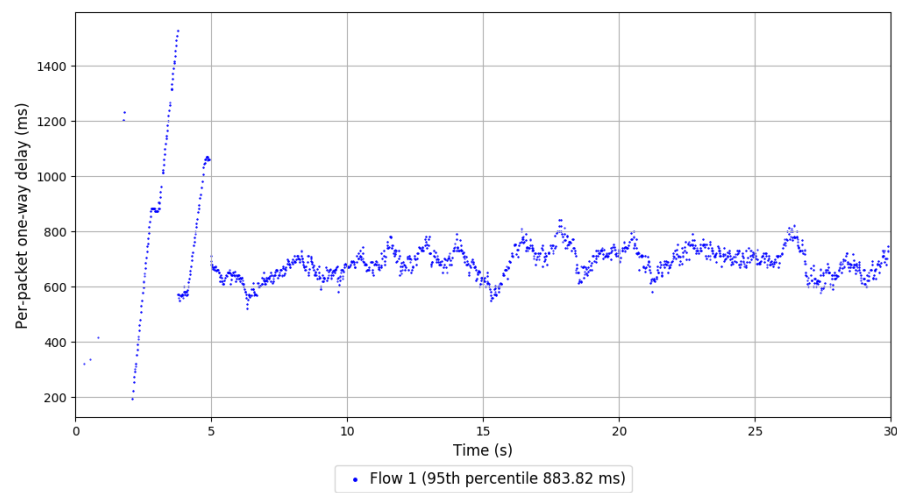
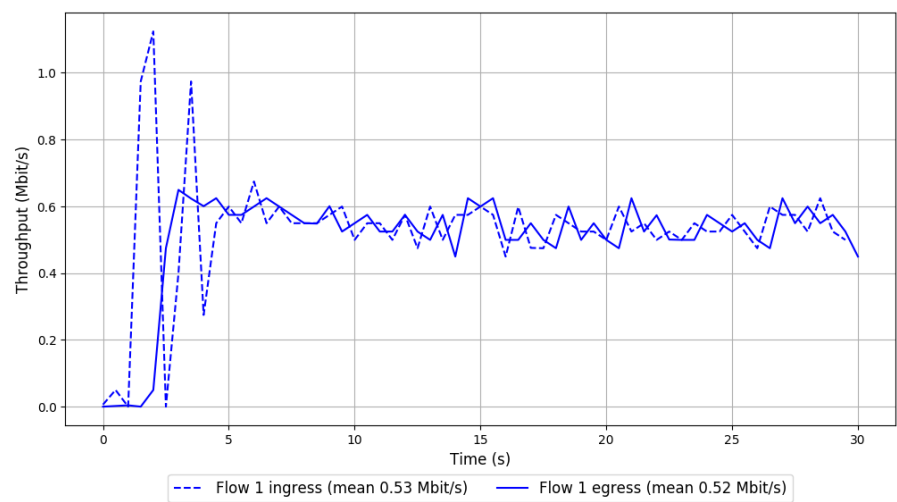
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 883.817 ms

Loss rate: 2.60%

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



Run 2: Statistics of TaoVA-100x

Start at: 2019-01-25 09:33:58

End at: 2019-01-25 09:34:28

Local clock offset: -4.64 ms

Remote clock offset: 2.59 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 1074.895 ms

Loss rate: 2.62%

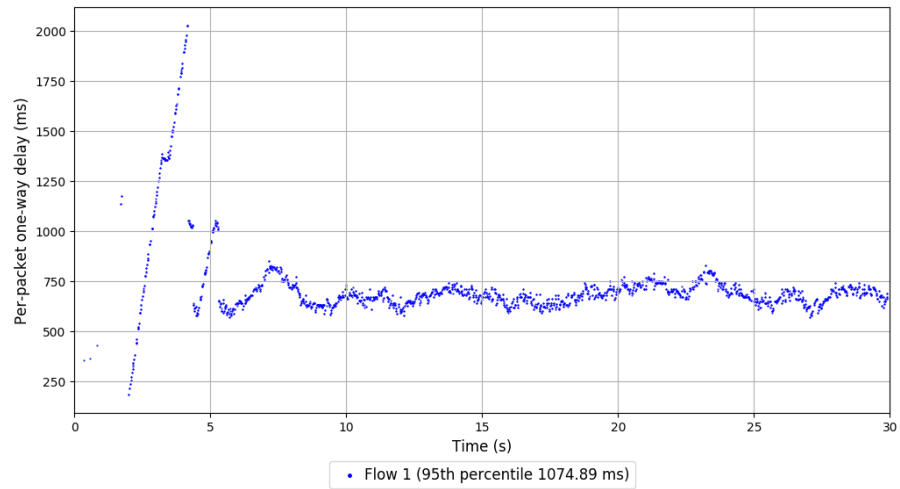
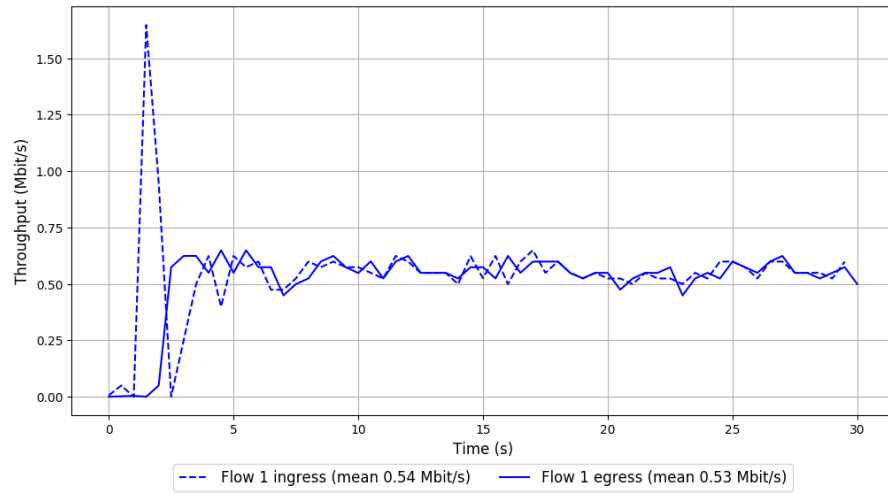
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 1074.895 ms

Loss rate: 2.62%

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



Run 3: Statistics of TaoVA-100x

Start at: 2019-01-25 09:58:14

End at: 2019-01-25 09:58:44

Local clock offset: -8.843 ms

Remote clock offset: 3.707 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 1080.156 ms

Loss rate: 2.66%

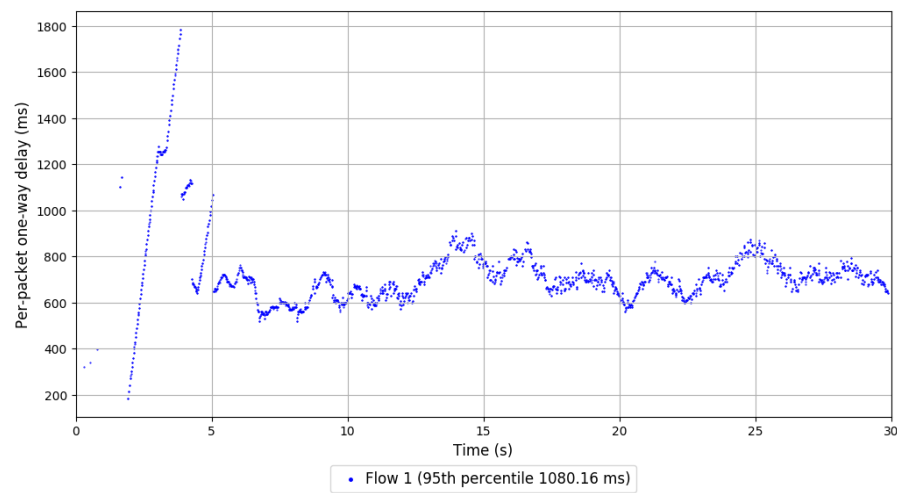
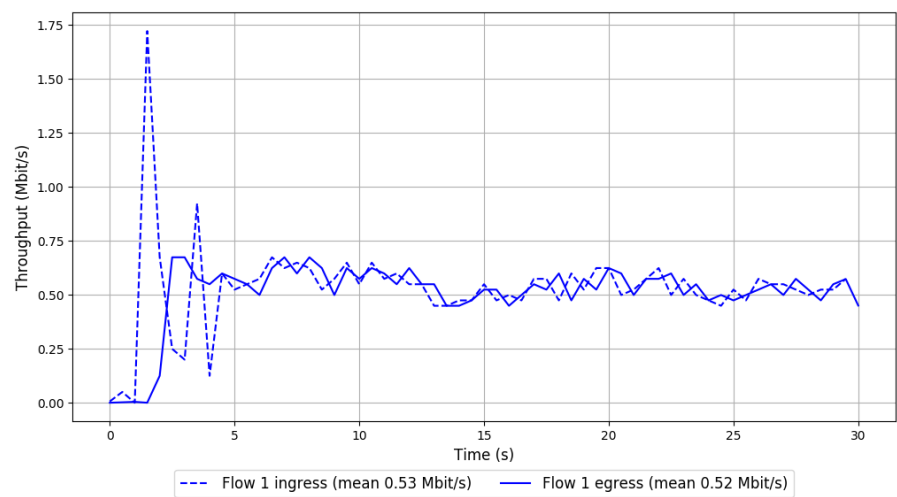
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 1080.156 ms

Loss rate: 2.66%

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



Run 1: Statistics of TCP Vegas

Start at: 2019-01-25 09:17:46

End at: 2019-01-25 09:18:16

Local clock offset: -2.497 ms

Remote clock offset: 3.058 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 956.603 ms

Loss rate: 1.10%

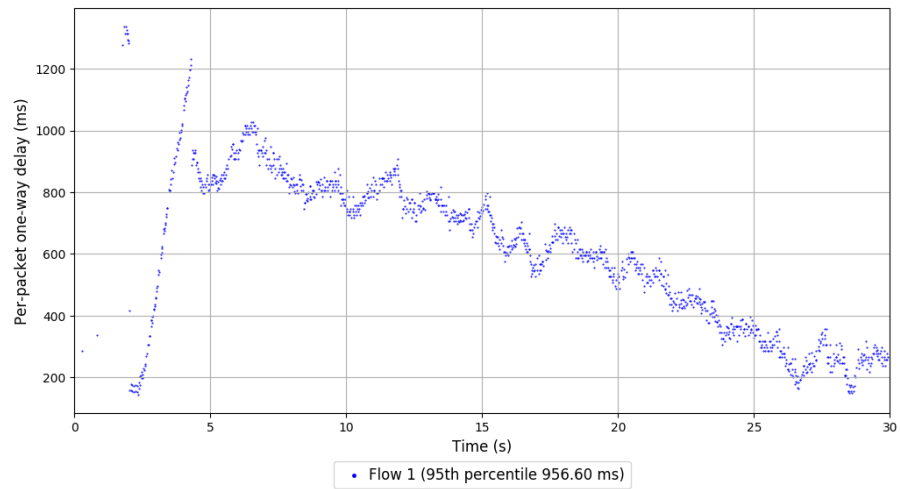
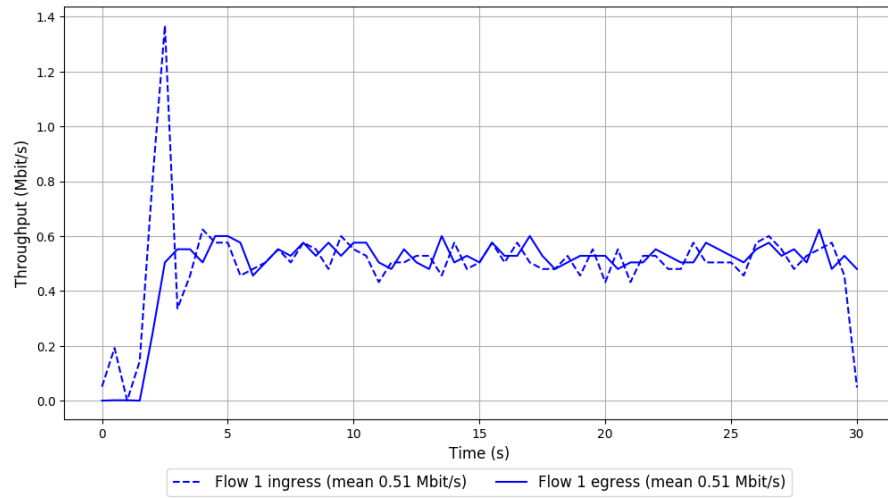
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 956.603 ms

Loss rate: 1.10%

Run 1: Report of TCP Vegas — Data Link

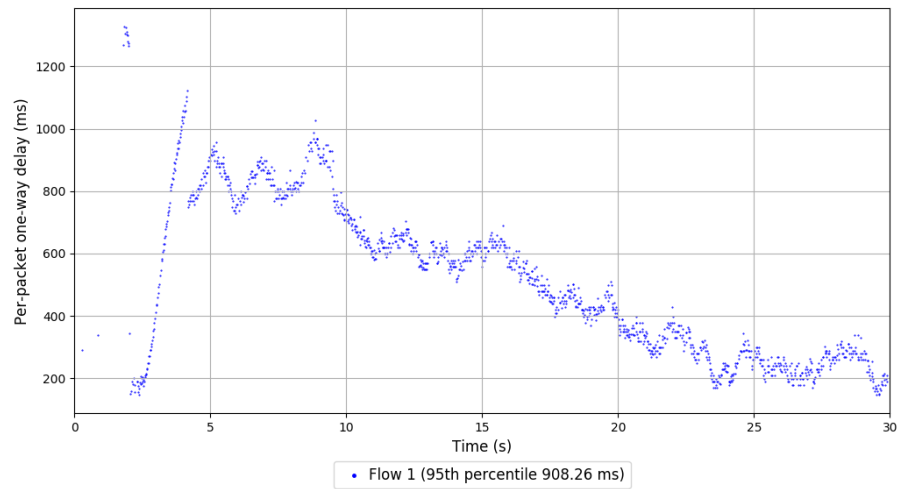
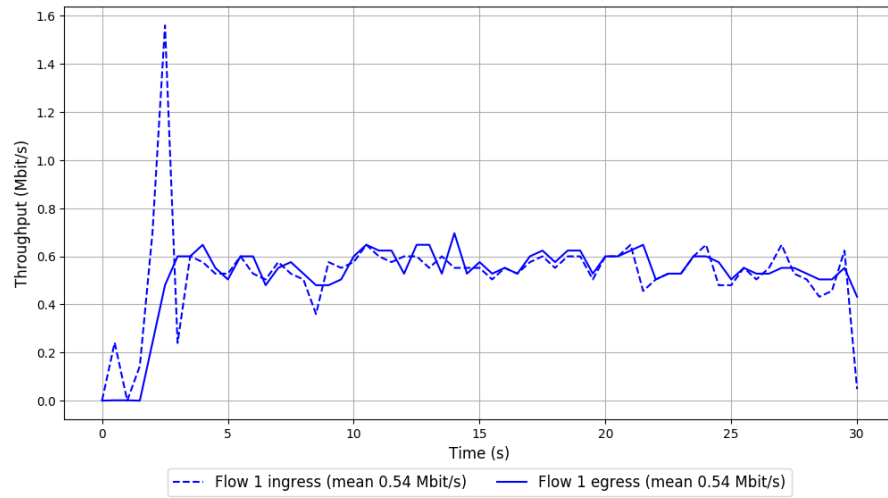


Run 2: Statistics of TCP Vegas

Start at: 2019-01-25 09:42:04
End at: 2019-01-25 09:42:34
Local clock offset: -7.041 ms
Remote clock offset: 8.856 ms

Below is generated by plot.py at 2019-01-25 10:10:59
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 908.260 ms
Loss rate: 1.19%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 908.260 ms
Loss rate: 1.19%

Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

Start at: 2019-01-25 10:06:19

End at: 2019-01-25 10:06:49

Local clock offset: -8.31 ms

Remote clock offset: 2.444 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 847.855 ms

Loss rate: 1.24%

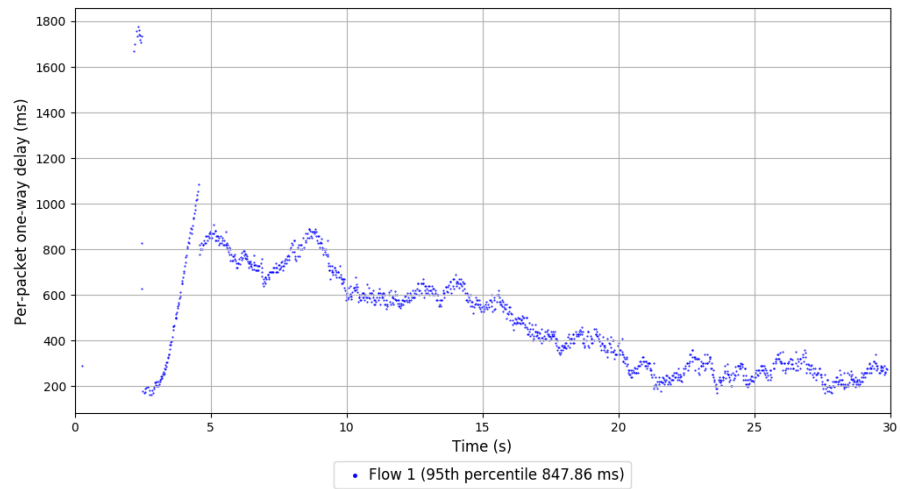
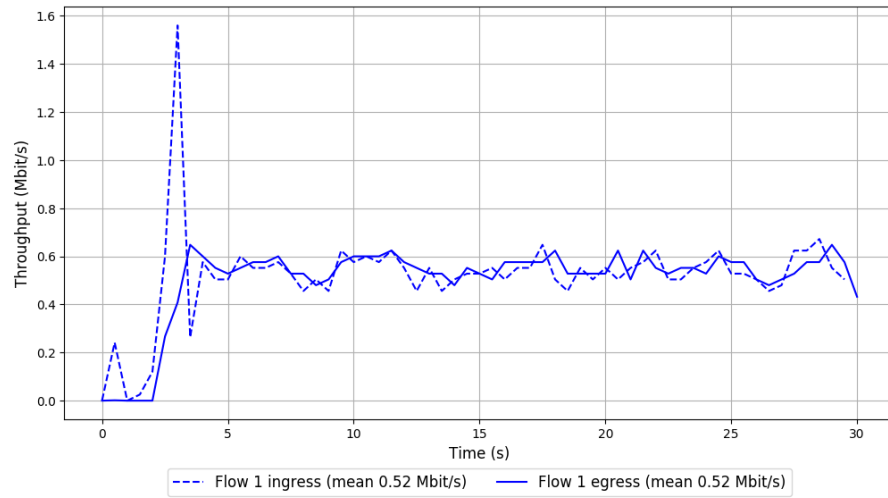
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 847.855 ms

Loss rate: 1.24%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2019-01-25 09:16:37

End at: 2019-01-25 09:17:07

Local clock offset: -2.57 ms

Remote clock offset: 6.904 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 1832.295 ms

Loss rate: 6.02%

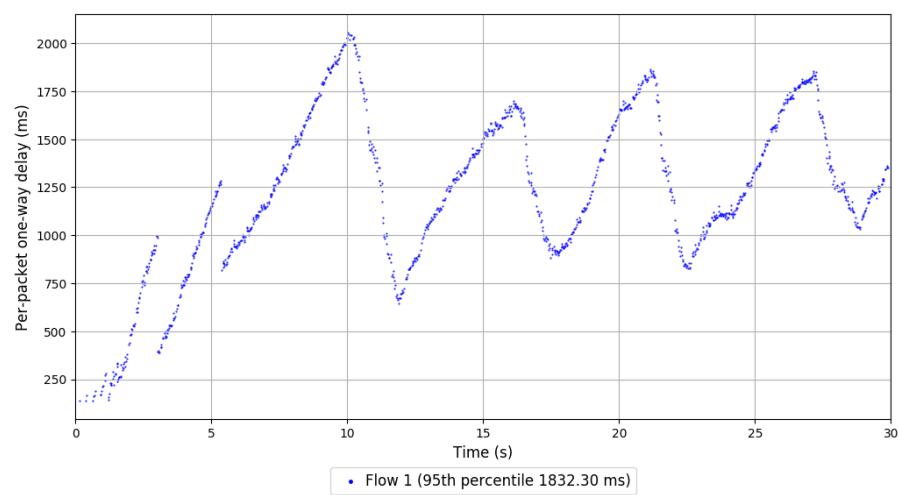
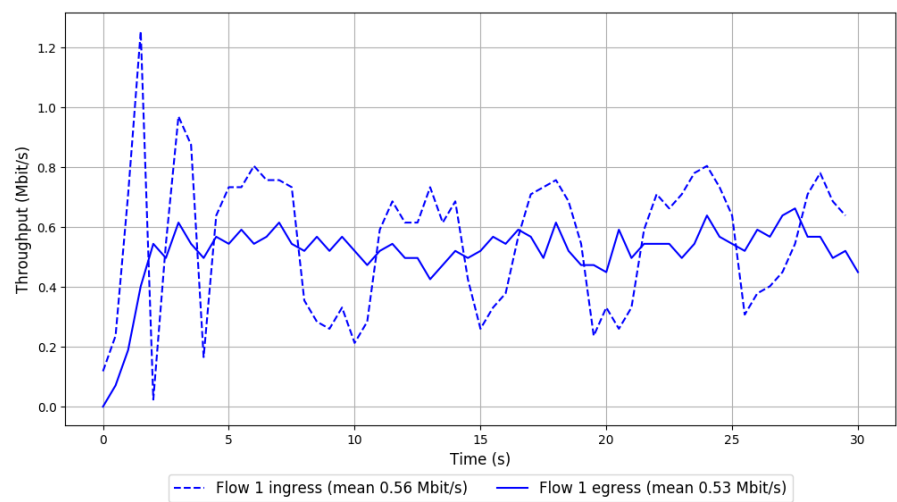
-- Flow 1:

Average throughput: 0.53 Mbit/s

95th percentile per-packet one-way delay: 1832.295 ms

Loss rate: 6.02%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2019-01-25 09:40:56

End at: 2019-01-25 09:41:26

Local clock offset: -5.935 ms

Remote clock offset: 2.761 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 1929.236 ms

Loss rate: 6.31%

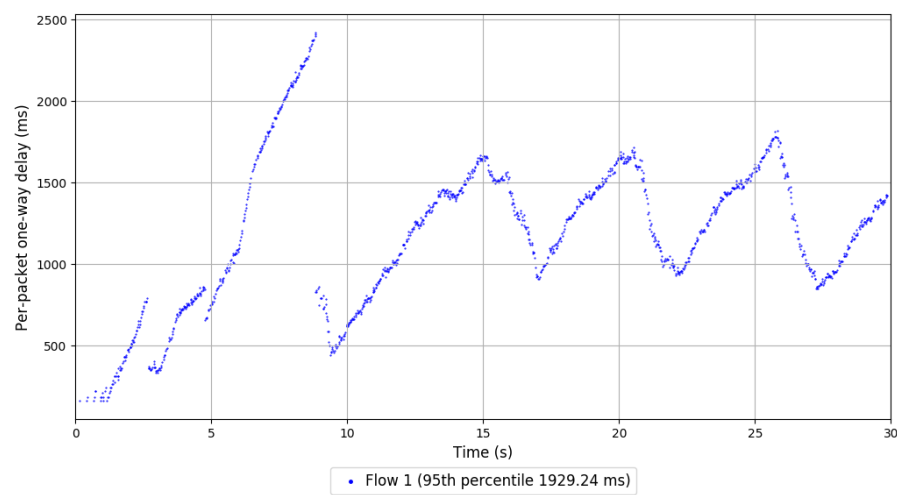
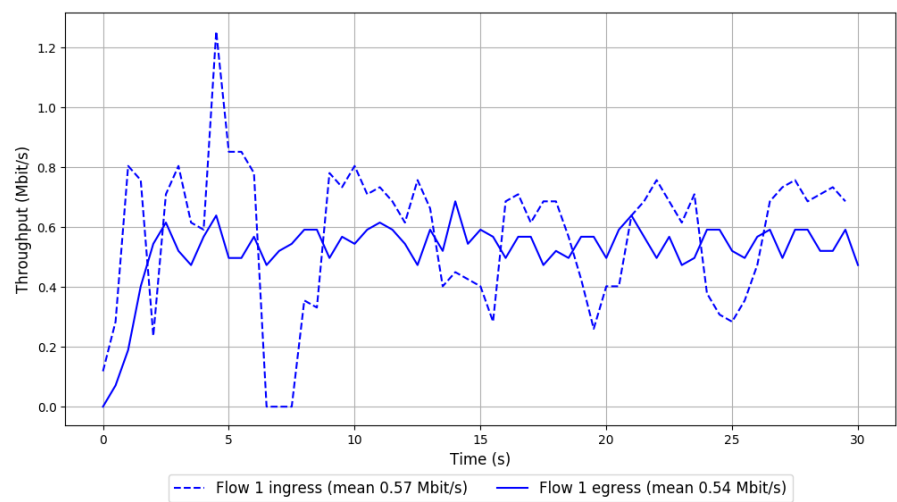
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 1929.236 ms

Loss rate: 6.31%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2019-01-25 10:05:11

End at: 2019-01-25 10:05:41

Local clock offset: -8.388 ms

Remote clock offset: 7.618 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 1875.839 ms

Loss rate: 3.09%

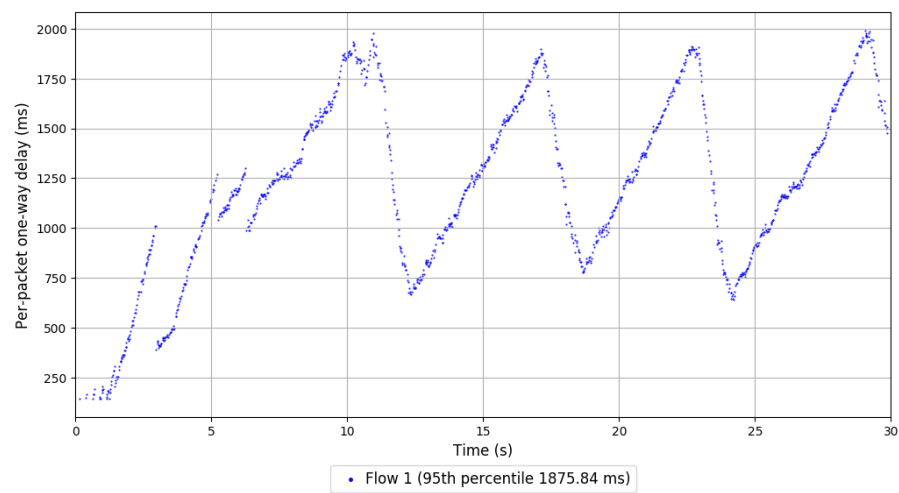
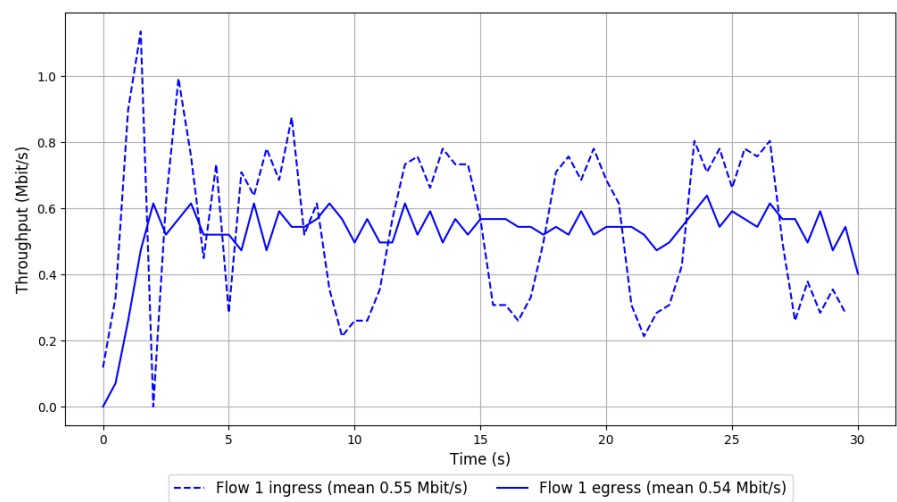
-- Flow 1:

Average throughput: 0.54 Mbit/s

95th percentile per-packet one-way delay: 1875.839 ms

Loss rate: 3.09%

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2019-01-25 09:12:45

End at: 2019-01-25 09:13:15

Local clock offset: -3.222 ms

Remote clock offset: 6.861 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 21685.242 ms

Loss rate: 75.62%

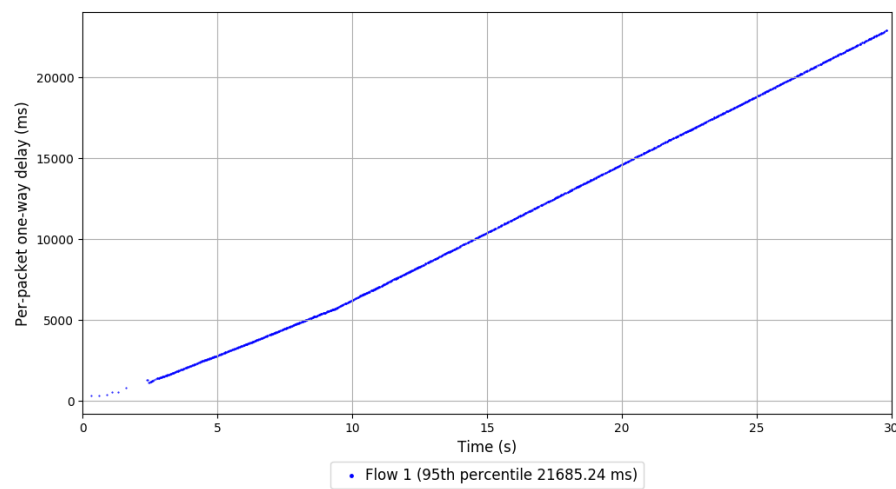
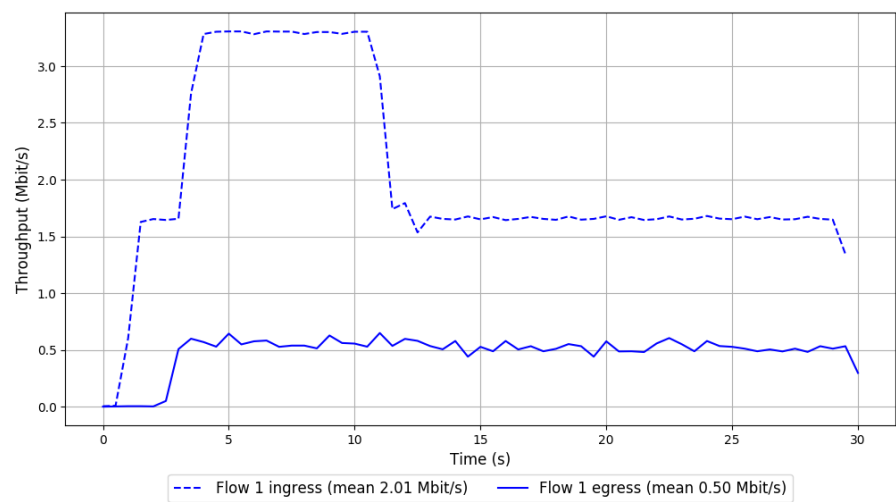
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 21685.242 ms

Loss rate: 75.62%

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2019-01-25 09:37:23

End at: 2019-01-25 09:37:53

Local clock offset: -5.042 ms

Remote clock offset: 8.65 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 21569.653 ms

Loss rate: 74.50%

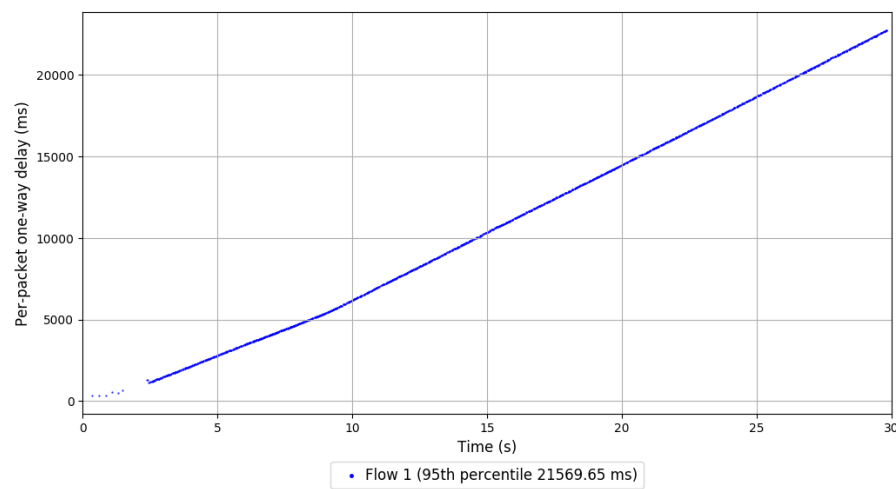
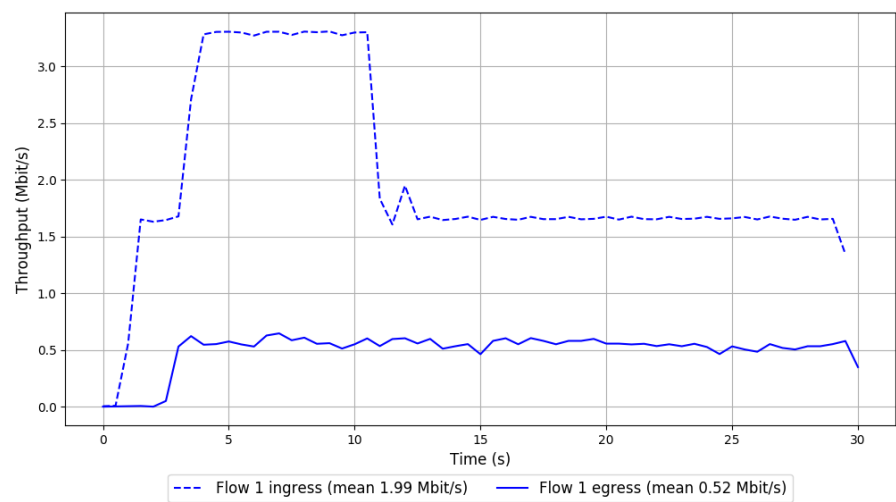
-- Flow 1:

Average throughput: 0.52 Mbit/s

95th percentile per-packet one-way delay: 21569.653 ms

Loss rate: 74.50%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2019-01-25 10:01:38

End at: 2019-01-25 10:02:08

Local clock offset: -8.751 ms

Remote clock offset: 7.738 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 21444.877 ms

Loss rate: 74.59%

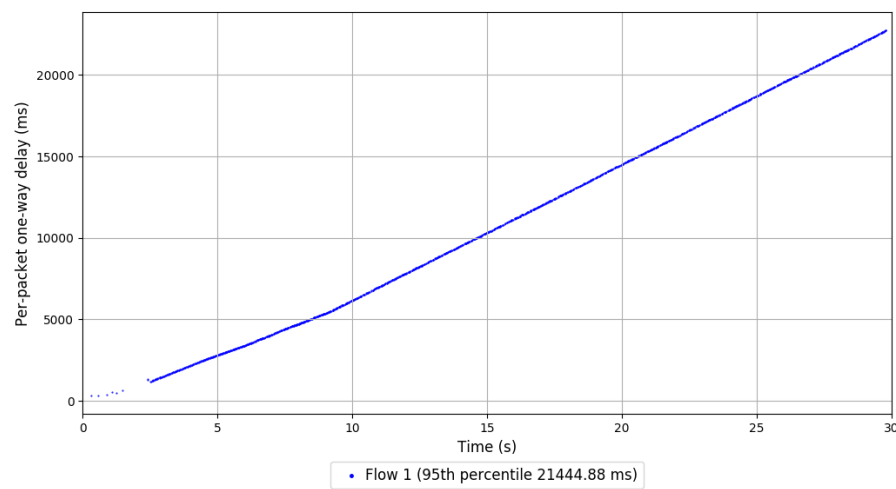
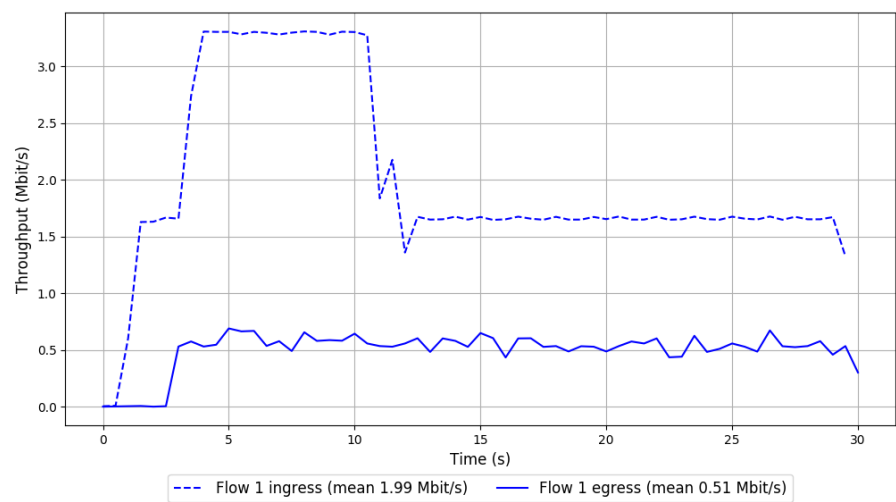
-- Flow 1:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 21444.877 ms

Loss rate: 74.59%

Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

Start at: 2019-01-25 09:10:29

End at: 2019-01-25 09:10:59

Local clock offset: -4.469 ms

Remote clock offset: 1.465 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.19 Mbit/s

95th percentile per-packet one-way delay: 713.202 ms

Loss rate: 0.37%

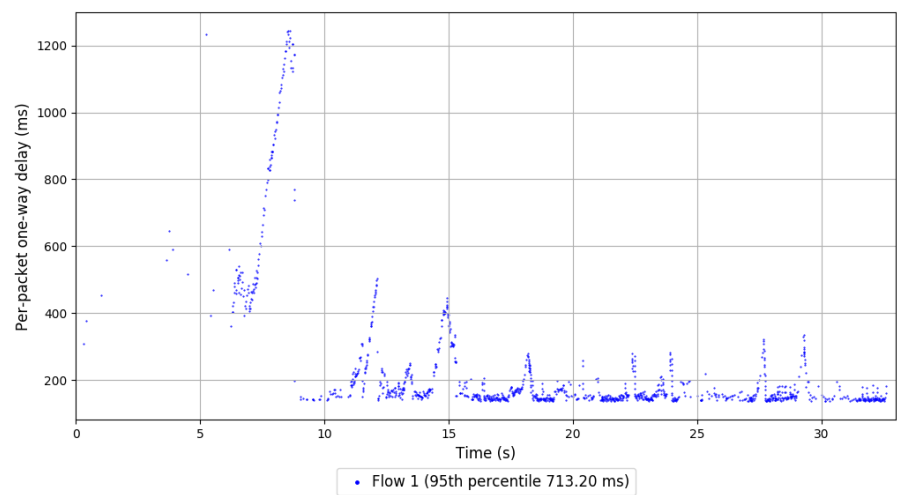
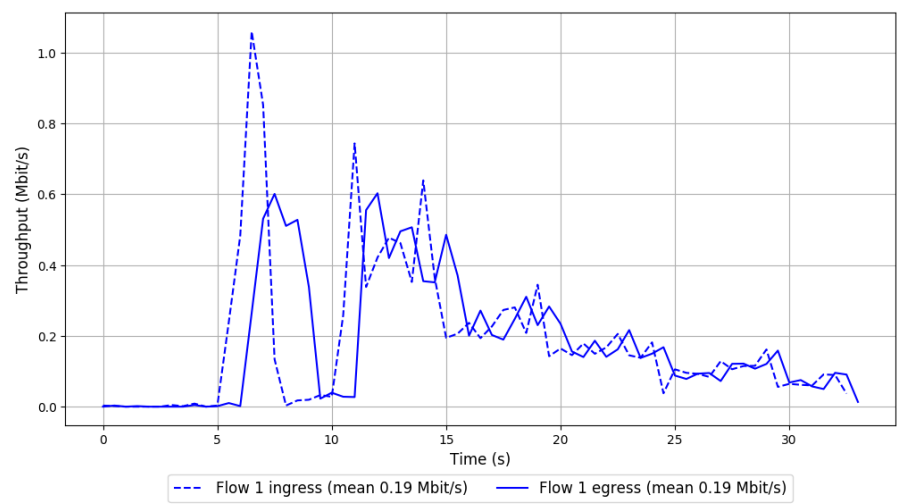
-- Flow 1:

Average throughput: 0.19 Mbit/s

95th percentile per-packet one-way delay: 713.202 ms

Loss rate: 0.37%

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2019-01-25 09:35:07

End at: 2019-01-25 09:35:37

Local clock offset: -4.246 ms

Remote clock offset: 7.324 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.19 Mbit/s

95th percentile per-packet one-way delay: 690.716 ms

Loss rate: 0.40%

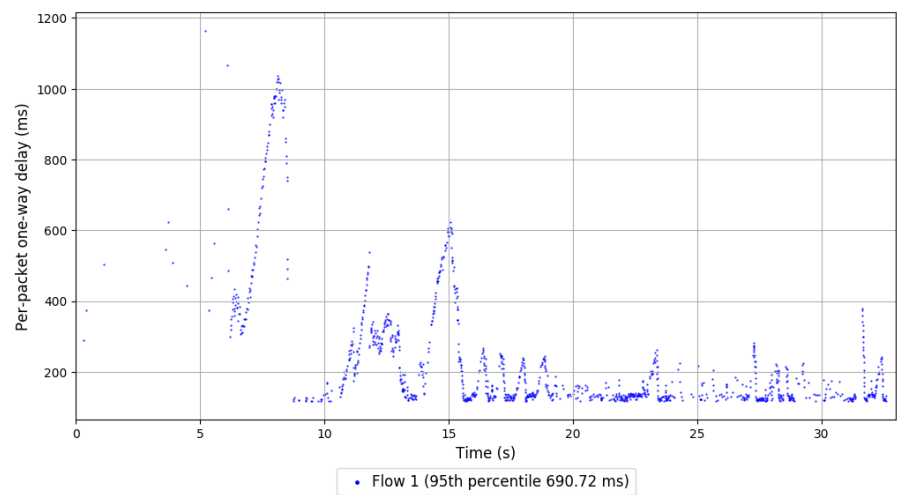
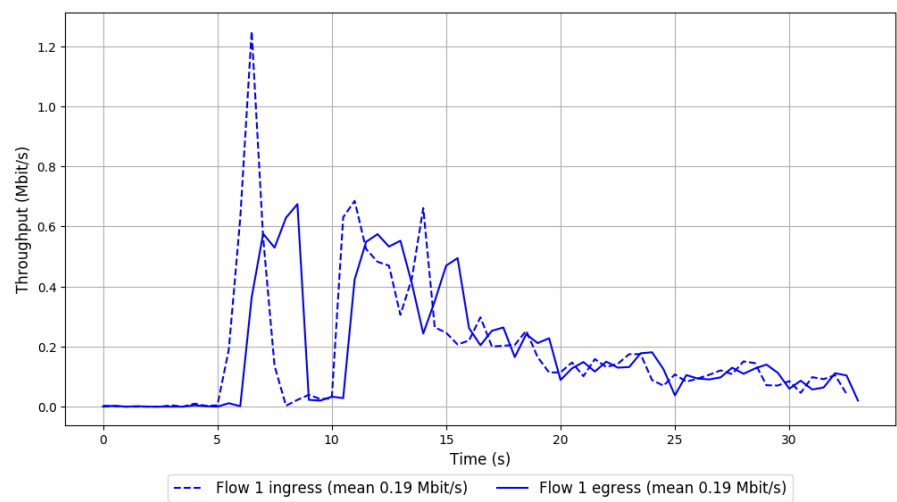
-- Flow 1:

Average throughput: 0.19 Mbit/s

95th percentile per-packet one-way delay: 690.716 ms

Loss rate: 0.40%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2019-01-25 09:59:22

End at: 2019-01-25 09:59:52

Local clock offset: -8.224 ms

Remote clock offset: 3.534 ms

Below is generated by plot.py at 2019-01-25 10:10:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 858.091 ms

Loss rate: 0.45%

-- Flow 1:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 858.091 ms

Loss rate: 0.45%

Run 3: Report of WebRTC media — Data Link

