

Pantheon Report

Generated at 2018-08-28 05:56:56 (UTC).

Data path: Mexico on **em1** (*remote*) → AWS California 2 on **ens5** (*local*).

Repeated the test of 4 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

NTP offsets were measured against **time.stanford.edu** and have been applied to correct the timestamps in logs.

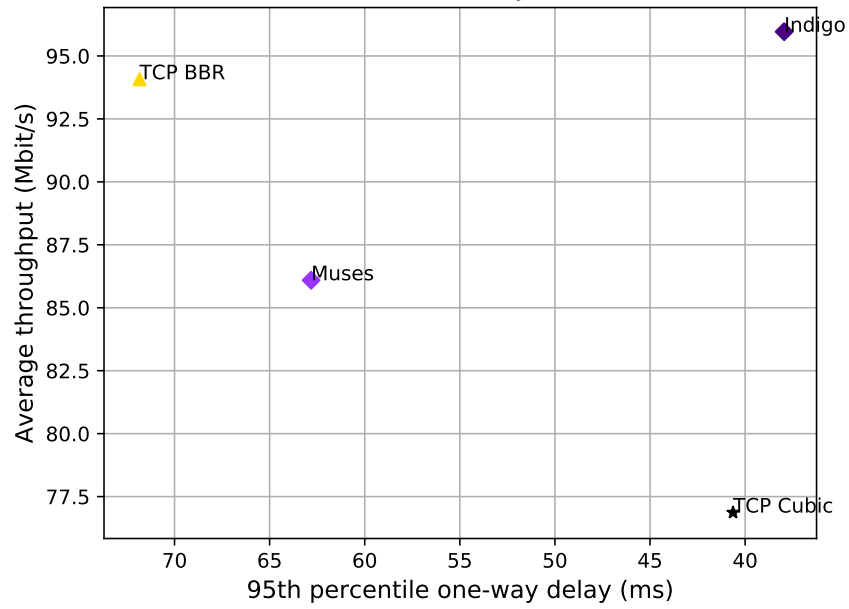
System info:

```
Linux 4.15.0-1019-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
```

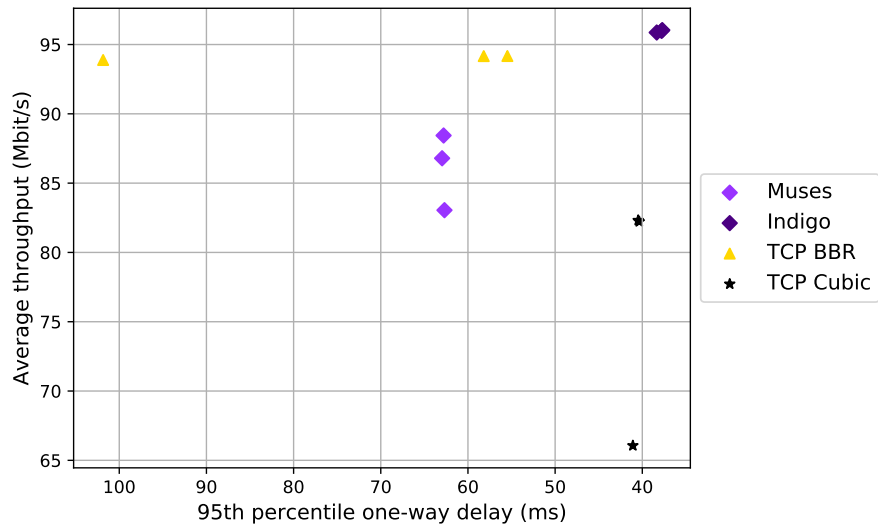
Git summary:

```
branch: muses @ 86ef433b09b2f4ecae1186d6940af93bcf0969cd
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b261c9e99c63be452bc16f94ce0caa99a4c9d39a
third_party/pantheon-tunnel @ cbfce6db5ff5740dfe1771f813cd646339e1952
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from Mexico to AWS California 2, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from Mexico to AWS California 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	94.07	71.84	0.57
TCP Cubic	3	76.87	40.63	0.27
Indigo	3	95.96	37.95	0.23
Muses	3	86.09	62.82	0.27

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 05:42:26

End at: 2018-08-28 05:42:56

Local clock offset: 0.311 ms

Remote clock offset: -0.328 ms

Below is generated by plot.py at 2018-08-28 05:56:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 58.190 ms

Loss rate: 0.59%

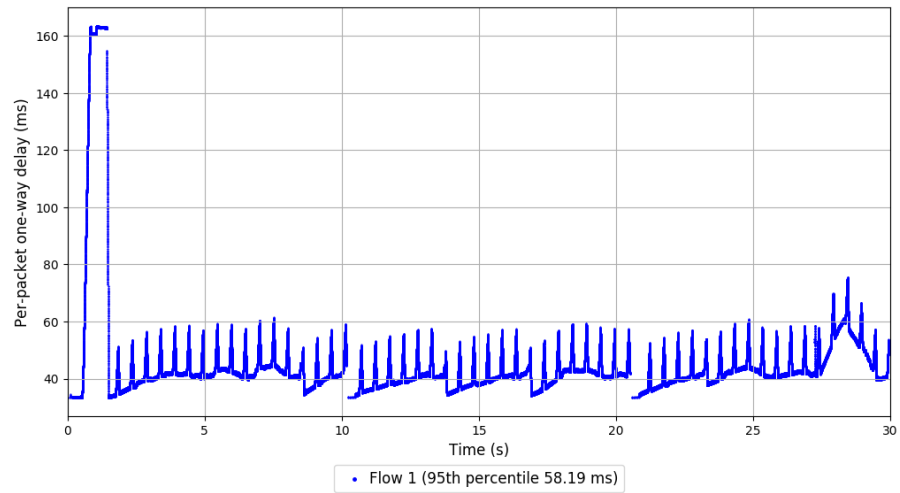
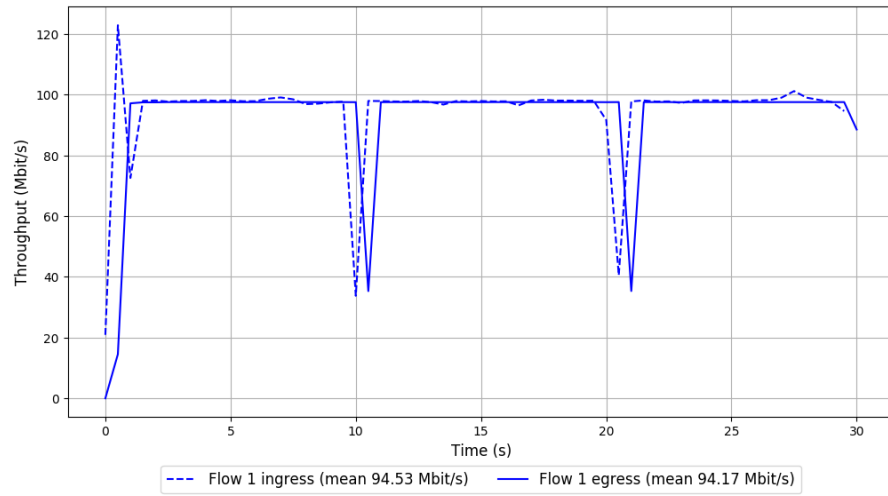
-- Flow 1:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 58.190 ms

Loss rate: 0.59%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-28 05:47:44

End at: 2018-08-28 05:48:14

Local clock offset: 0.289 ms

Remote clock offset: -0.146 ms

Below is generated by plot.py at 2018-08-28 05:56:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 93.88 Mbit/s

95th percentile per-packet one-way delay: 101.852 ms

Loss rate: 0.64%

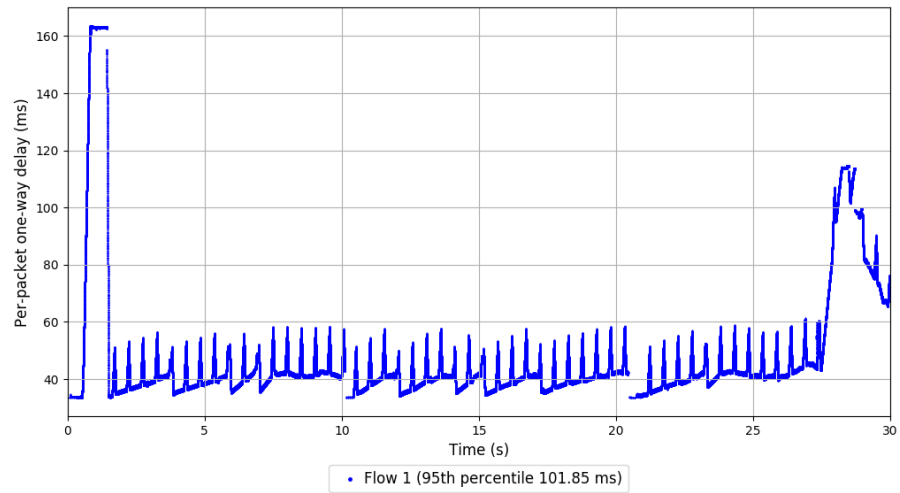
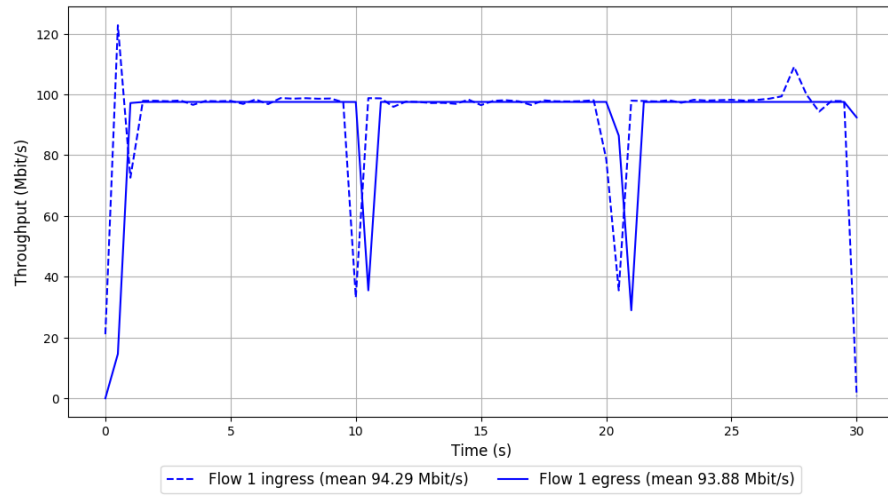
-- Flow 1:

Average throughput: 93.88 Mbit/s

95th percentile per-packet one-way delay: 101.852 ms

Loss rate: 0.64%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-08-28 05:53:01

End at: 2018-08-28 05:53:31

Local clock offset: 0.305 ms

Remote clock offset: 0.141 ms

Below is generated by plot.py at 2018-08-28 05:56:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 55.476 ms

Loss rate: 0.49%

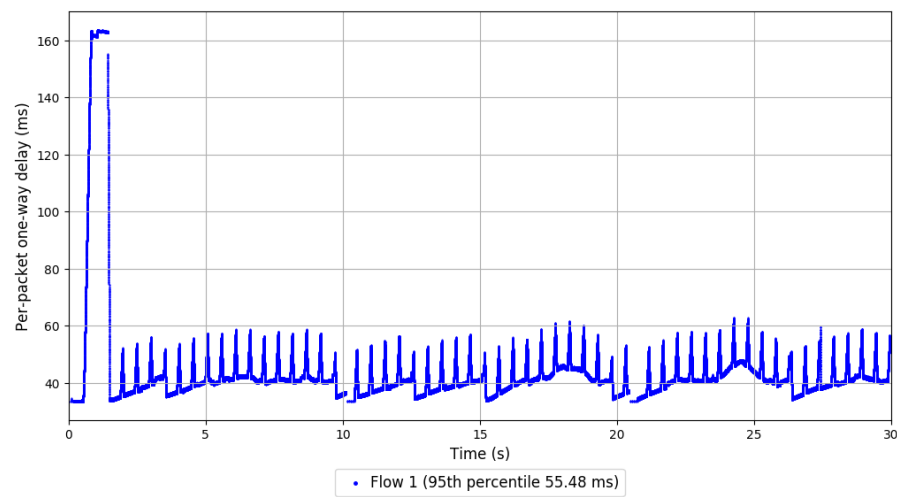
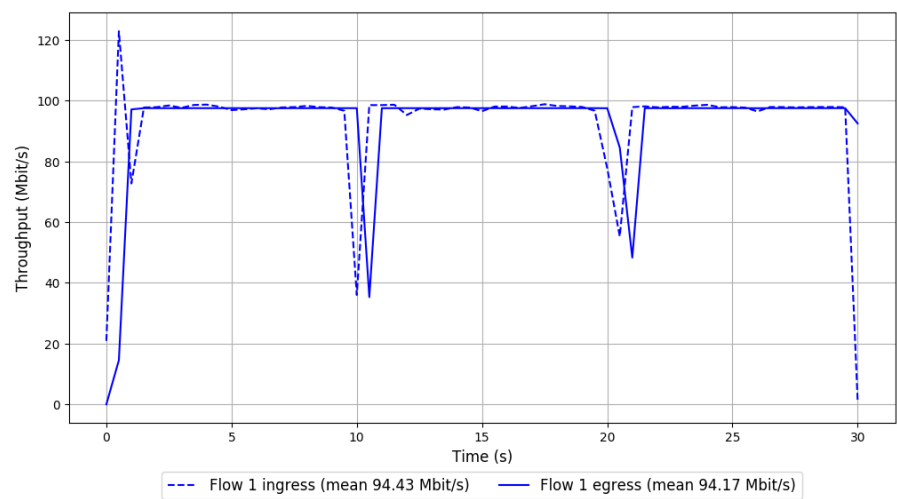
-- Flow 1:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 55.476 ms

Loss rate: 0.49%

Run 3: Report of TCP BBR — Data Link

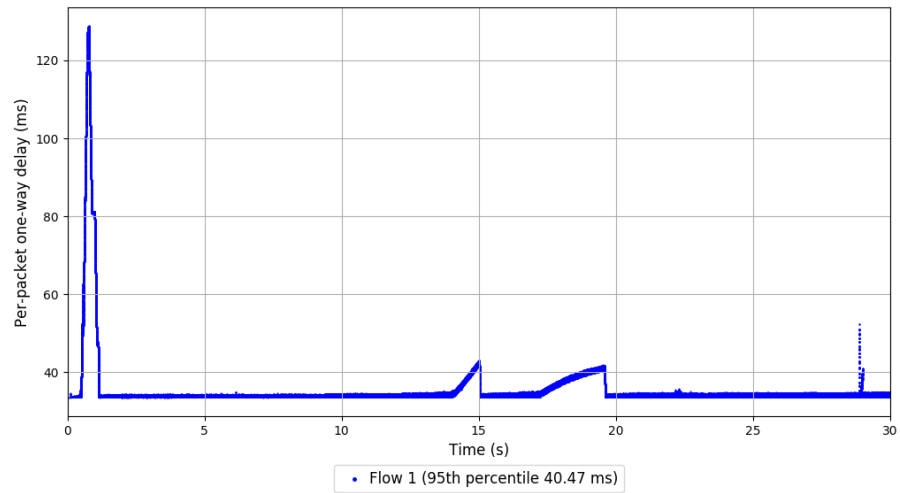
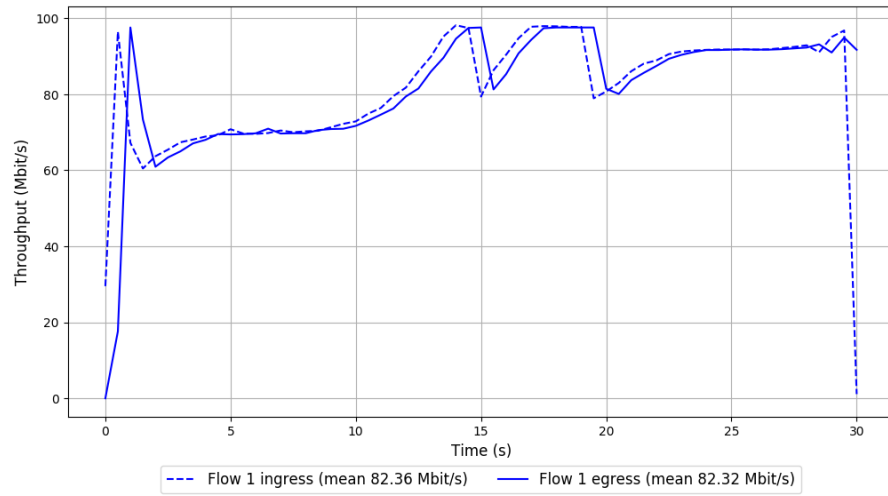


Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 05:41:07
End at: 2018-08-28 05:41:37
Local clock offset: 0.317 ms
Remote clock offset: -0.443 ms

Below is generated by plot.py at 2018-08-28 05:56:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 82.32 Mbit/s
95th percentile per-packet one-way delay: 40.469 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 82.32 Mbit/s
95th percentile per-packet one-way delay: 40.469 ms
Loss rate: 0.26%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 05:46:26

End at: 2018-08-28 05:46:56

Local clock offset: 0.223 ms

Remote clock offset: -0.37 ms

Below is generated by plot.py at 2018-08-28 05:56:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 66.06 Mbit/s

95th percentile per-packet one-way delay: 41.082 ms

Loss rate: 0.28%

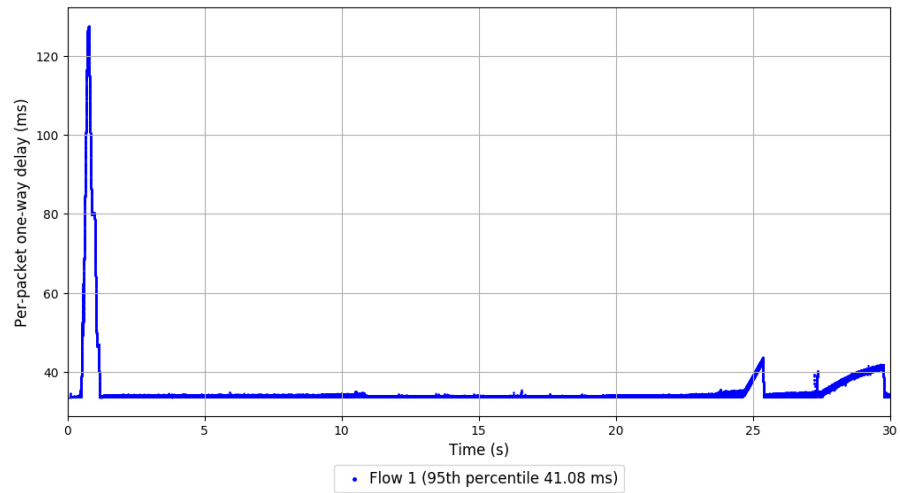
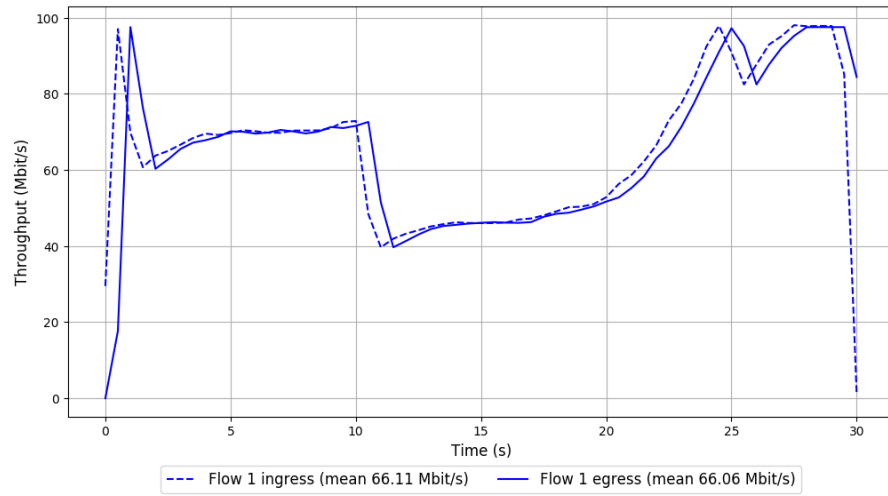
-- Flow 1:

Average throughput: 66.06 Mbit/s

95th percentile per-packet one-way delay: 41.082 ms

Loss rate: 0.28%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-08-28 05:51:42

End at: 2018-08-28 05:52:12

Local clock offset: 0.207 ms

Remote clock offset: 0.076 ms

Below is generated by plot.py at 2018-08-28 05:56:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 82.22 Mbit/s

95th percentile per-packet one-way delay: 40.347 ms

Loss rate: 0.26%

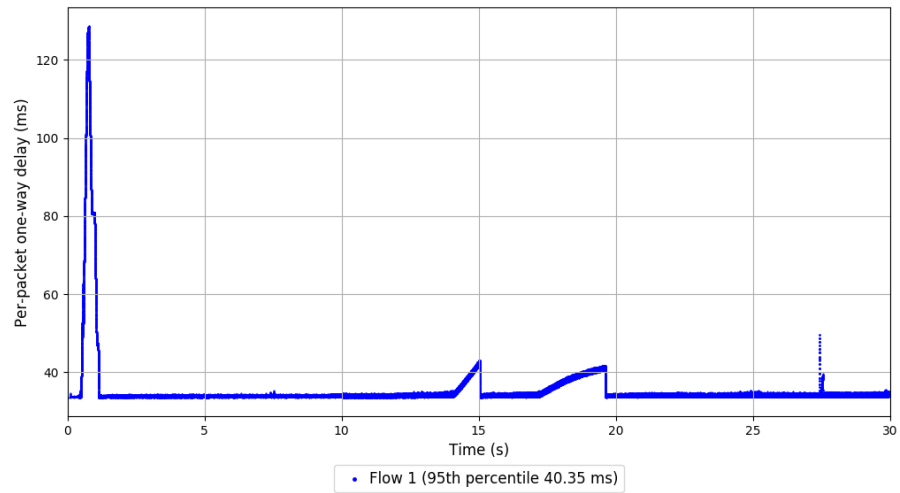
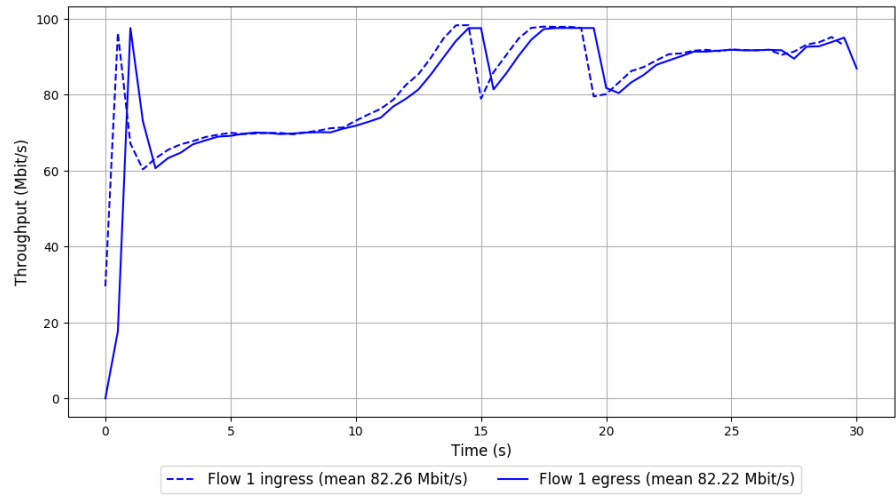
-- Flow 1:

Average throughput: 82.22 Mbit/s

95th percentile per-packet one-way delay: 40.347 ms

Loss rate: 0.26%

Run 3: Report of TCP Cubic — Data Link

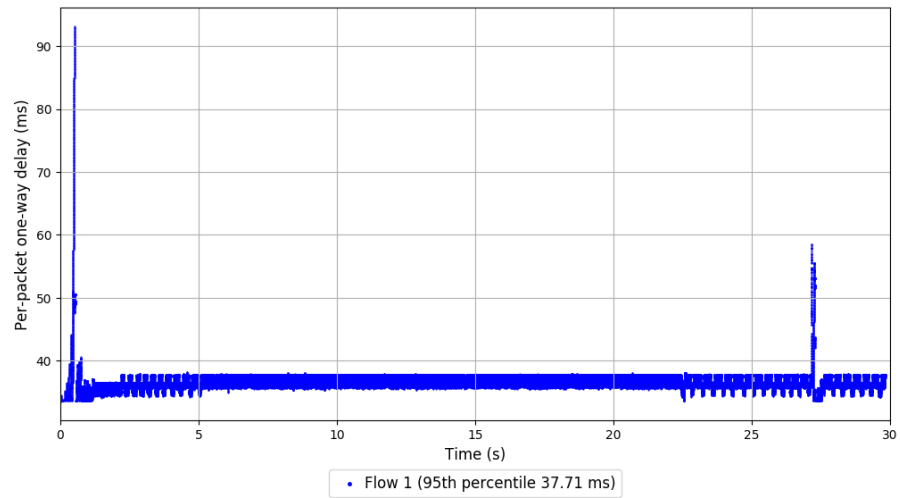
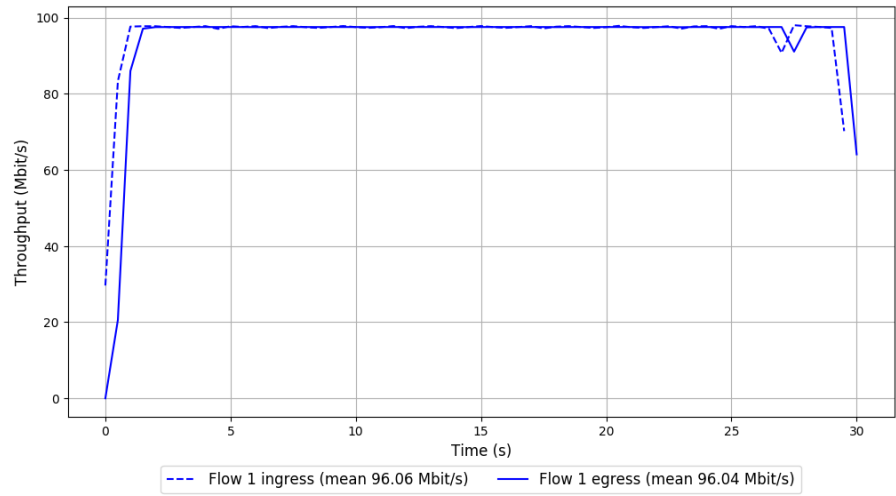


```
Run 1: Statistics of Indigo

Start at: 2018-08-28 05:43:46
End at: 2018-08-28 05:44:16
Local clock offset: 0.322 ms
Remote clock offset: -0.384 ms

# Below is generated by plot.py at 2018-08-28 05:56:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 96.04 Mbit/s
95th percentile per-packet one-way delay: 37.706 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 96.04 Mbit/s
95th percentile per-packet one-way delay: 37.706 ms
Loss rate: 0.23%
```

Run 1: Report of Indigo — Data Link

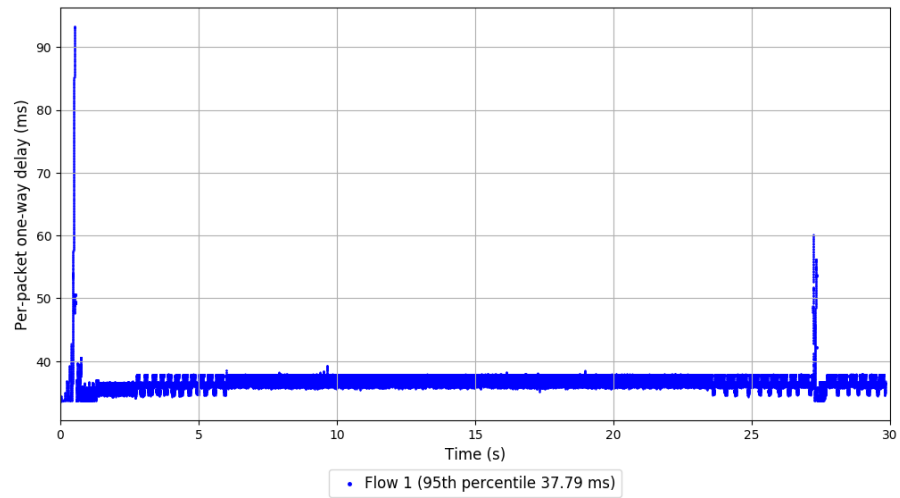
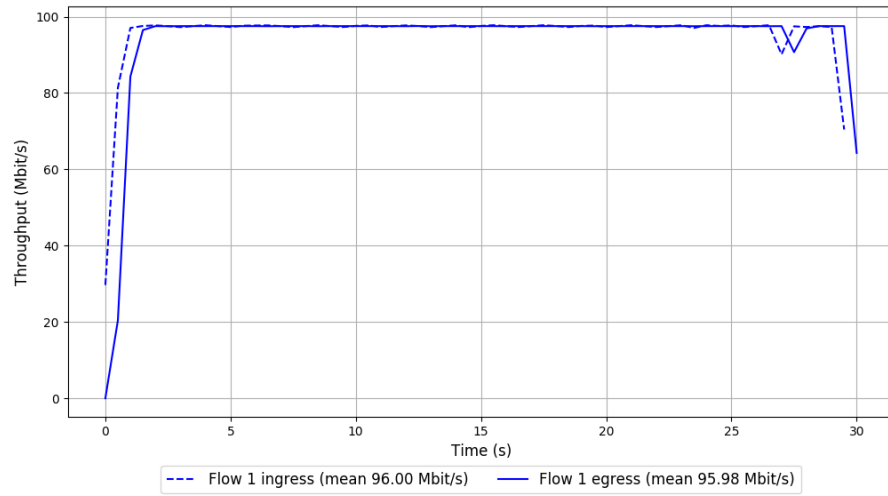


Run 2: Statistics of Indigo

Start at: 2018-08-28 05:49:03
End at: 2018-08-28 05:49:33
Local clock offset: 0.21 ms
Remote clock offset: -0.255 ms

Below is generated by plot.py at 2018-08-28 05:56:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 95.98 Mbit/s
95th percentile per-packet one-way delay: 37.790 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 95.98 Mbit/s
95th percentile per-packet one-way delay: 37.790 ms
Loss rate: 0.23%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-08-28 05:54:20

End at: 2018-08-28 05:54:51

Local clock offset: 0.307 ms

Remote clock offset: 0.117 ms

Below is generated by plot.py at 2018-08-28 05:56:39

Datalink statistics

-- Total of 1 flow:

Average throughput: 95.87 Mbit/s

95th percentile per-packet one-way delay: 38.346 ms

Loss rate: 0.23%

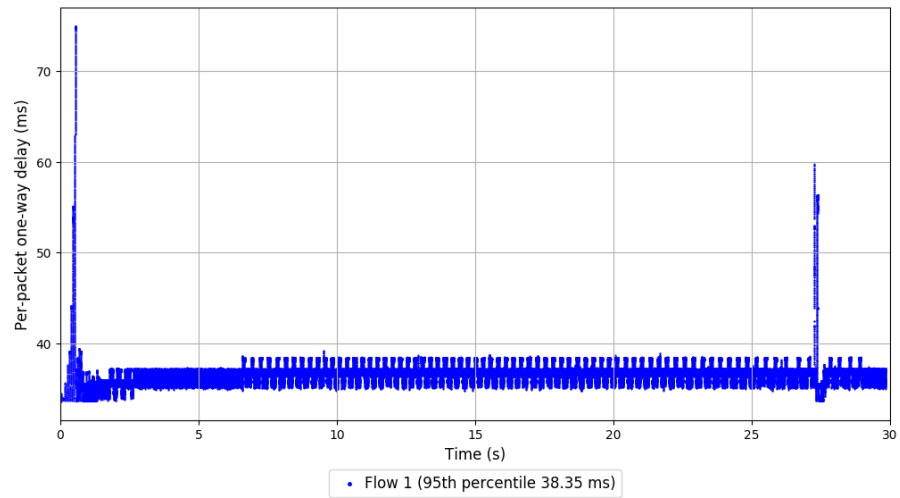
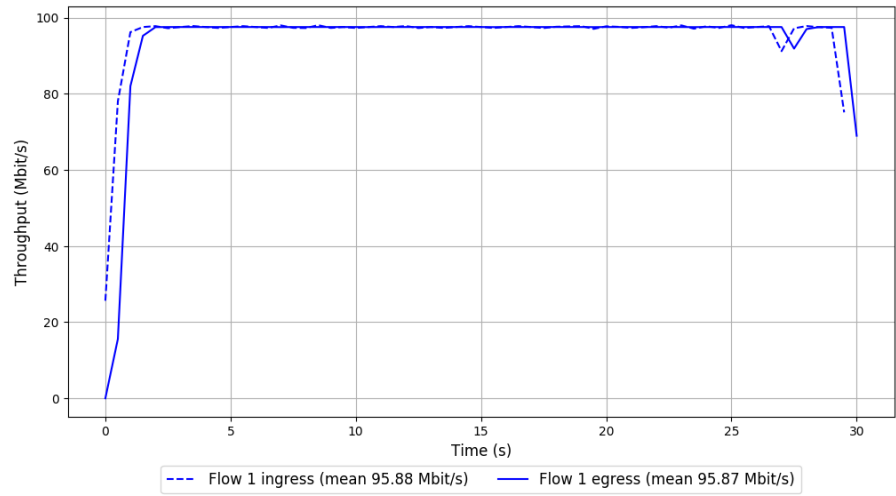
-- Flow 1:

Average throughput: 95.87 Mbit/s

95th percentile per-packet one-way delay: 38.346 ms

Loss rate: 0.23%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses

Start at: 2018-08-28 05:39:48

End at: 2018-08-28 05:40:18

Local clock offset: 0.3 ms

Remote clock offset: -0.714 ms

Below is generated by plot.py at 2018-08-28 05:56:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 86.79 Mbit/s

95th percentile per-packet one-way delay: 62.965 ms

Loss rate: 0.29%

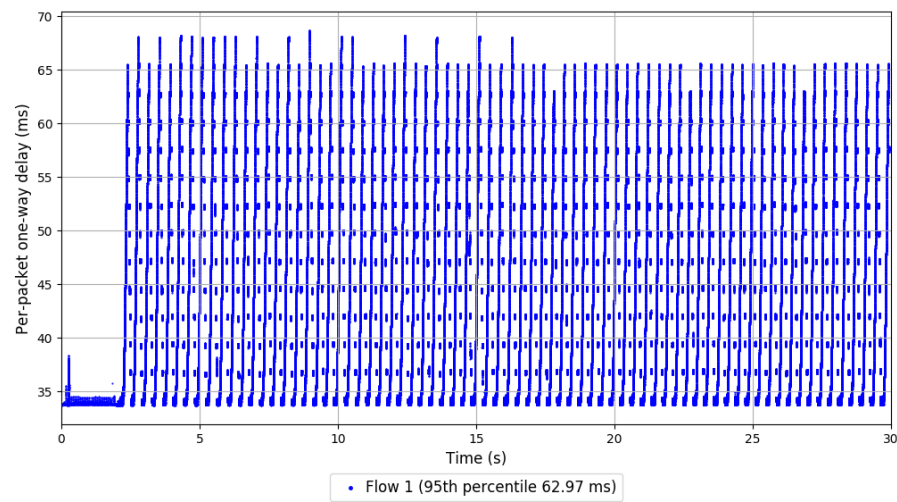
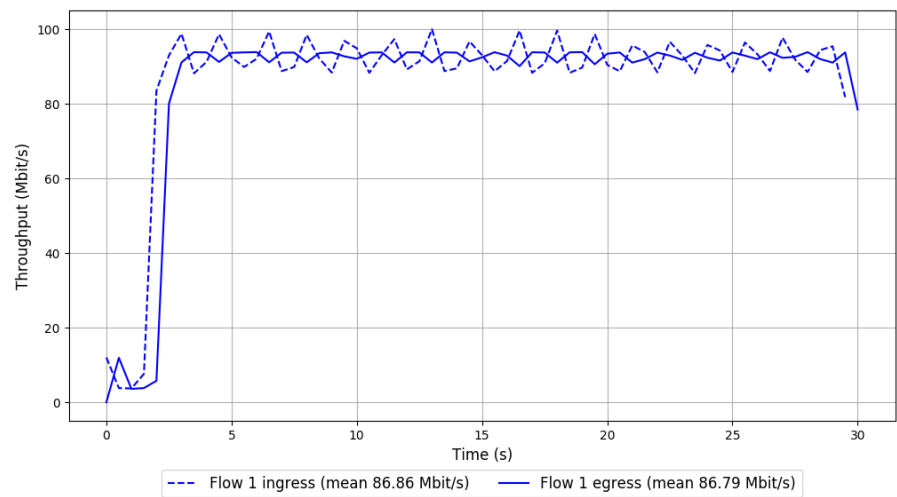
-- Flow 1:

Average throughput: 86.79 Mbit/s

95th percentile per-packet one-way delay: 62.965 ms

Loss rate: 0.29%

Run 1: Report of Muses — Data Link

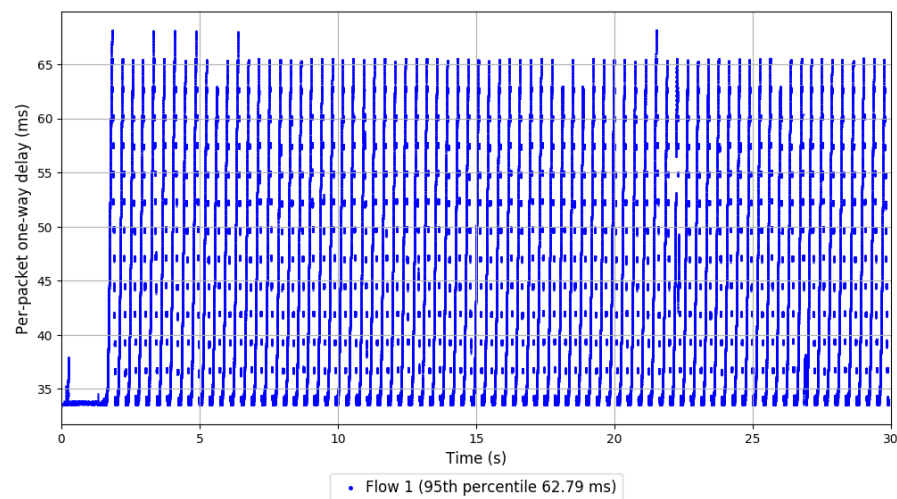
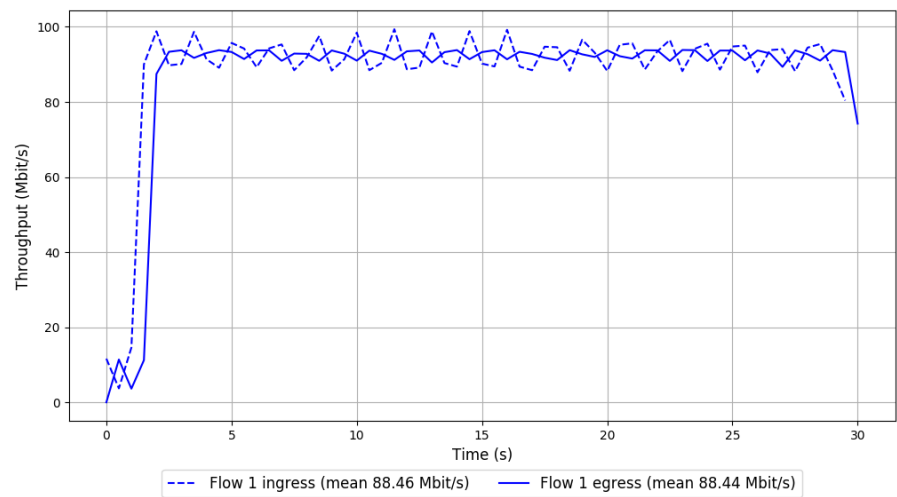


Run 2: Statistics of Muses

Start at: 2018-08-28 05:45:06
End at: 2018-08-28 05:45:36
Local clock offset: 0.312 ms
Remote clock offset: -0.323 ms

Below is generated by plot.py at 2018-08-28 05:56:55
Datalink statistics
-- Total of 1 flow:
Average throughput: 88.44 Mbit/s
95th percentile per-packet one-way delay: 62.794 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 88.44 Mbit/s
95th percentile per-packet one-way delay: 62.794 ms
Loss rate: 0.24%

Run 2: Report of Muses — Data Link



Run 3: Statistics of Muses

Start at: 2018-08-28 05:50:23
End at: 2018-08-28 05:50:53
Local clock offset: 0.22 ms
Remote clock offset: -0.128 ms

Below is generated by plot.py at 2018-08-28 05:56:55
Datalink statistics
-- Total of 1 flow:
Average throughput: 83.05 Mbit/s
95th percentile per-packet one-way delay: 62.693 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 83.05 Mbit/s
95th percentile per-packet one-way delay: 62.693 ms
Loss rate: 0.27%

Run 3: Report of Muses — Data Link

