

Pantheon Report

Generated at 2018-08-28 05:54:49 (UTC).

Data path: India on `em1` (*remote*) → AWS India 1 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 `nets.org.sg` and have been applied to correct the timestamps in logs.

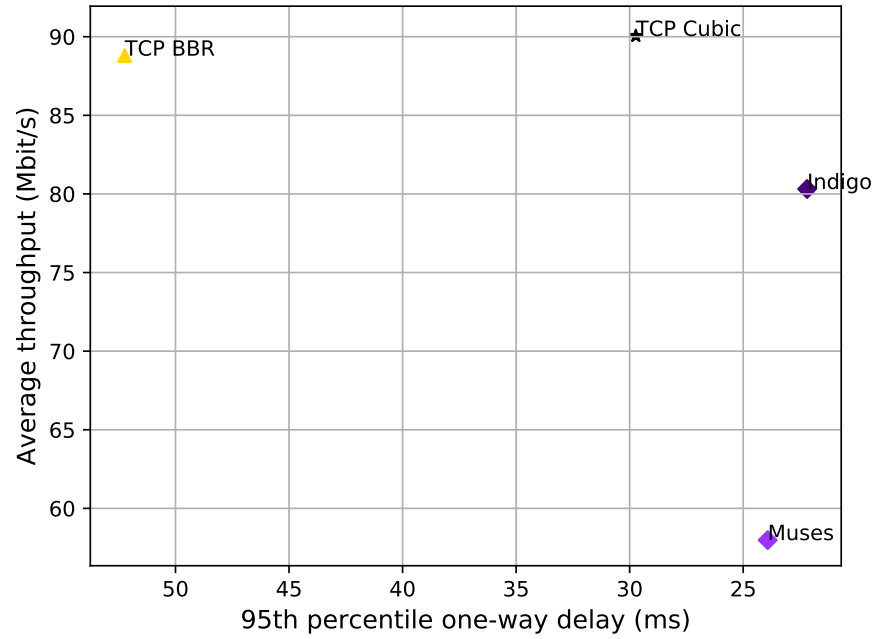
System info:

```
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
```

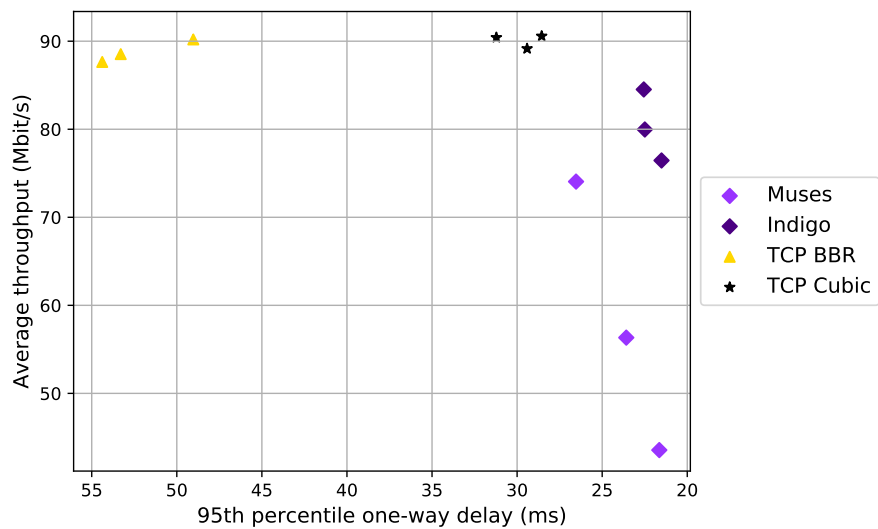
Git summary:

```
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 @ cbf6e6db5ff5740dfe1771f813cd646339e1952
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 India to AWS India 1, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from India to AWS India 1, 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	88.79	52.24	4.21
TCP Cubic	3	90.05	29.73	0.11
Indigo	3	80.31	22.19	0.08
Muses	3	57.98	23.92	0.09

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 05:39:38

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

Local clock offset: 0.485 ms

Remote clock offset: -3.532 ms

Below is generated by plot.py at 2018-08-28 05:54:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 87.64 Mbit/s

95th percentile per-packet one-way delay: 54.383 ms

Loss rate: 4.30%

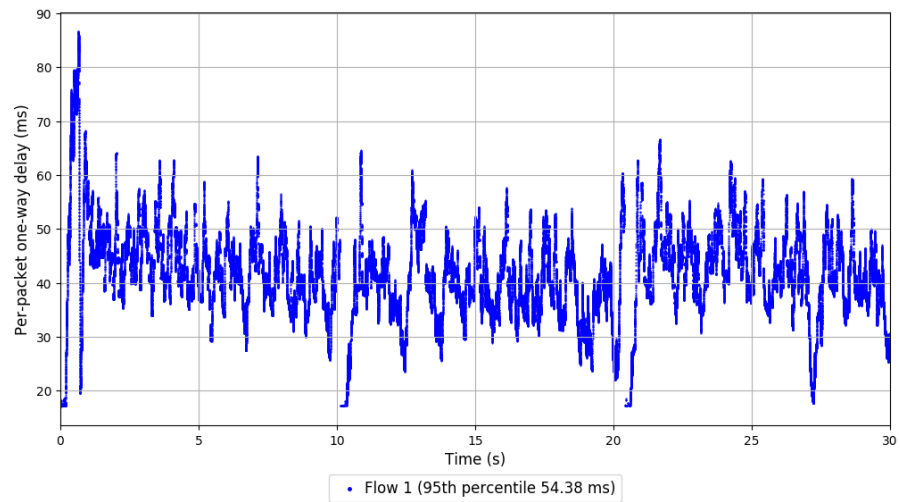
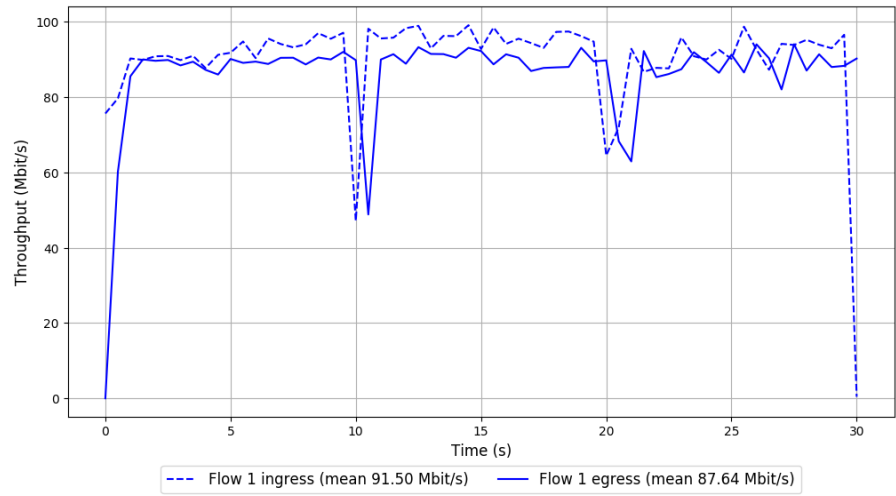
-- Flow 1:

Average throughput: 87.64 Mbit/s

95th percentile per-packet one-way delay: 54.383 ms

Loss rate: 4.30%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-28 05:44:20

End at: 2018-08-28 05:44:50

Local clock offset: -0.515 ms

Remote clock offset: -3.87 ms

Below is generated by plot.py at 2018-08-28 05:54:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 88.53 Mbit/s

95th percentile per-packet one-way delay: 53.295 ms

Loss rate: 4.37%

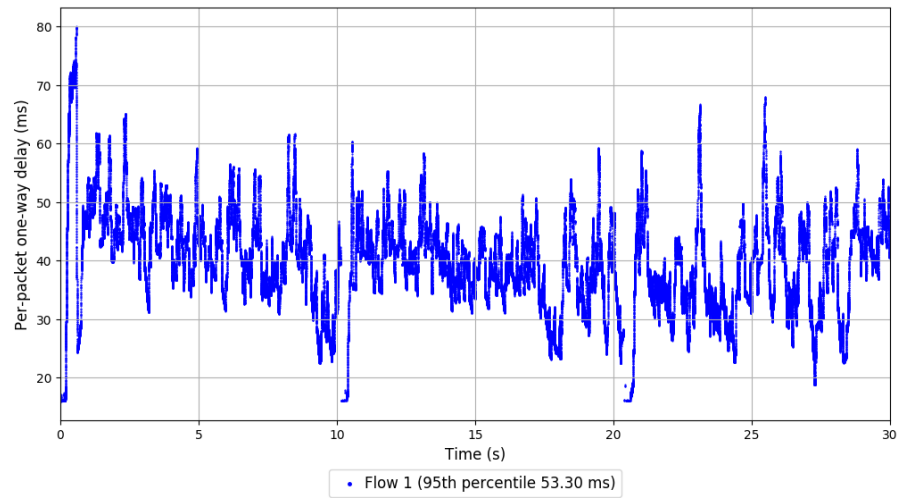
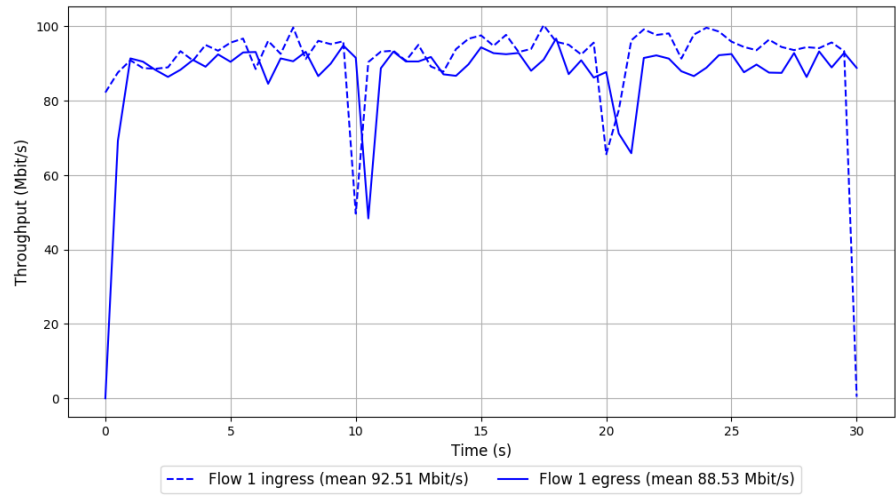
-- Flow 1:

Average throughput: 88.53 Mbit/s

95th percentile per-packet one-way delay: 53.295 ms

Loss rate: 4.37%

Run 2: Report of TCP BBR — Data Link

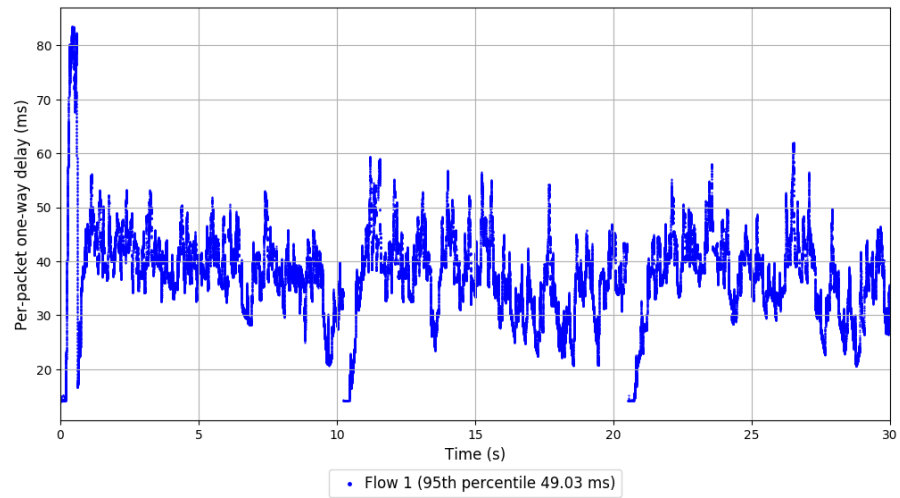
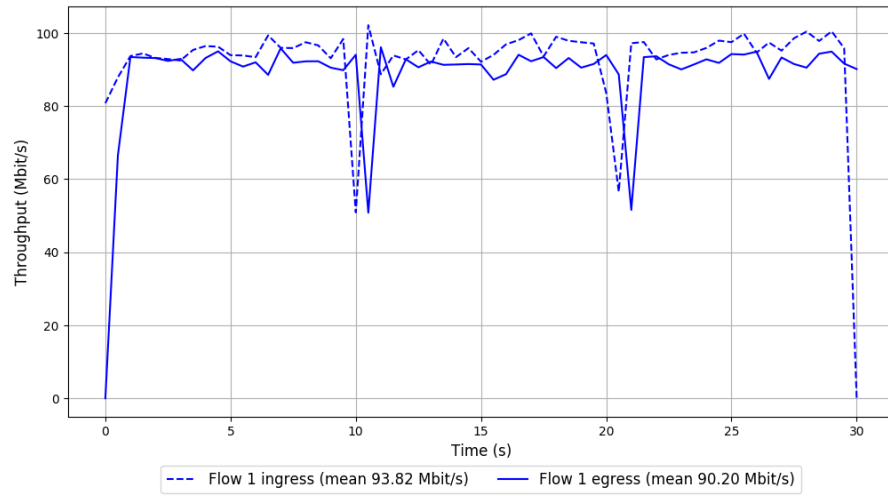


Run 3: Statistics of TCP BBR

Start at: 2018-08-28 05:49:01
End at: 2018-08-28 05:49:31
Local clock offset: -2.529 ms
Remote clock offset: -4.281 ms

Below is generated by plot.py at 2018-08-28 05:54:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 90.20 Mbit/s
95th percentile per-packet one-way delay: 49.031 ms
Loss rate: 3.95%
-- Flow 1:
Average throughput: 90.20 Mbit/s
95th percentile per-packet one-way delay: 49.031 ms
Loss rate: 3.95%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 05:42:04

End at: 2018-08-28 05:42:34

Local clock offset: 0.985 ms

Remote clock offset: -3.612 ms

Below is generated by plot.py at 2018-08-28 05:54:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 90.41 Mbit/s

95th percentile per-packet one-way delay: 31.218 ms

Loss rate: 0.11%

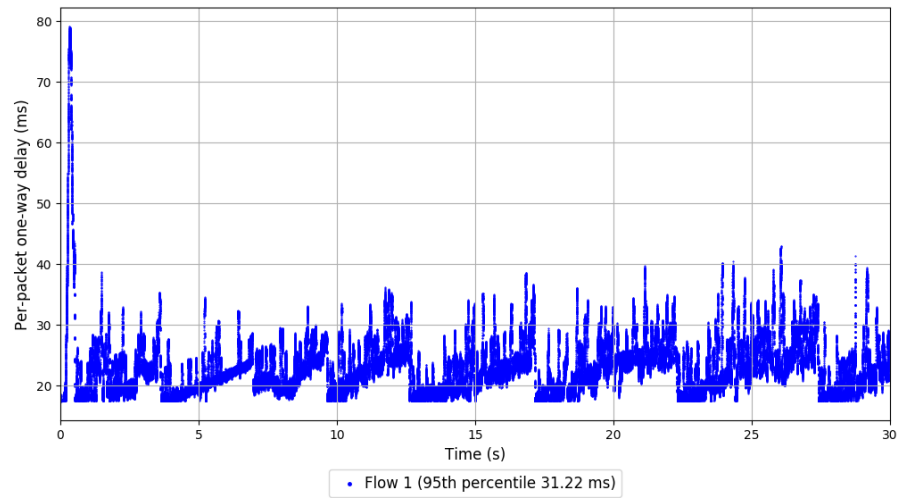
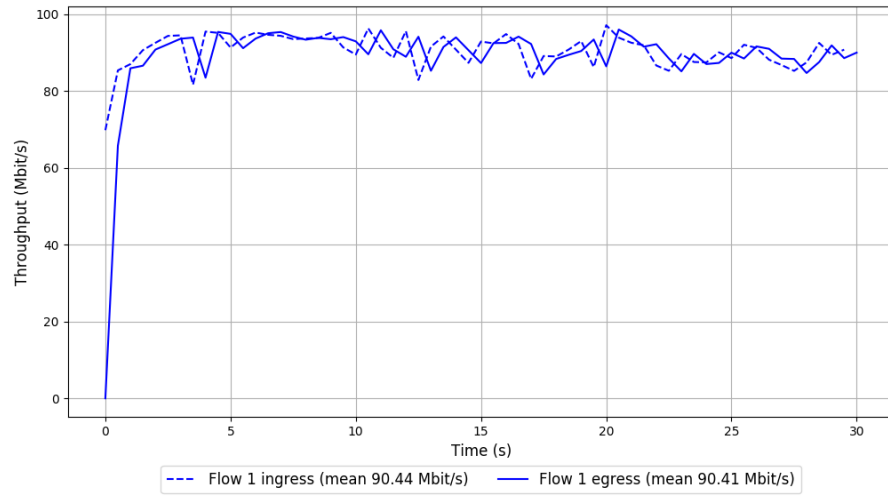
-- Flow 1:

Average throughput: 90.41 Mbit/s

95th percentile per-packet one-way delay: 31.218 ms

Loss rate: 0.11%

Run 1: Report of TCP Cubic — Data Link

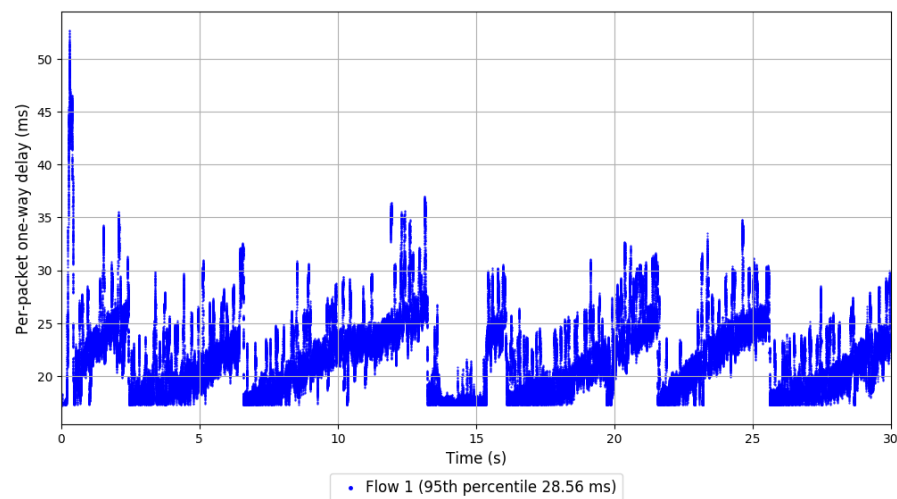
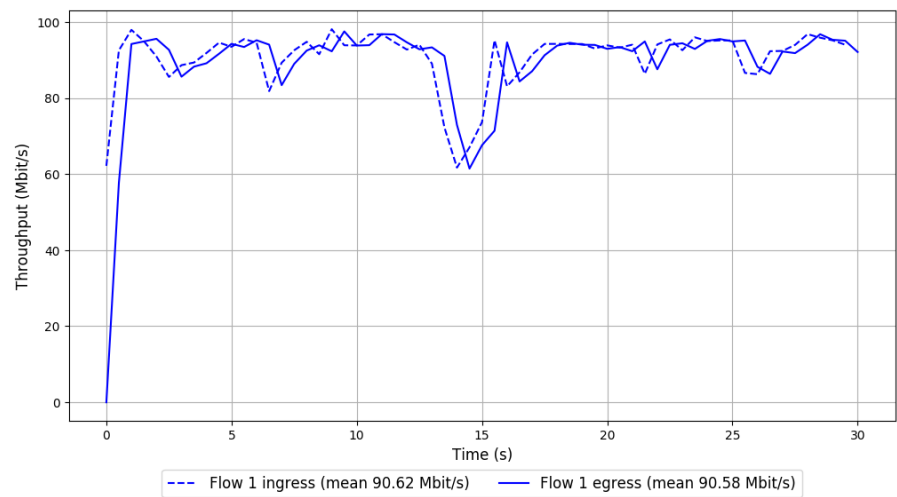


Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 05:46:44
End at: 2018-08-28 05:47:14
Local clock offset: 0.808 ms
Remote clock offset: -3.988 ms

Below is generated by plot.py at 2018-08-28 05:54:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 90.58 Mbit/s
95th percentile per-packet one-way delay: 28.557 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 90.58 Mbit/s
95th percentile per-packet one-way delay: 28.557 ms
Loss rate: 0.13%

Run 2: Report of TCP Cubic — Data Link

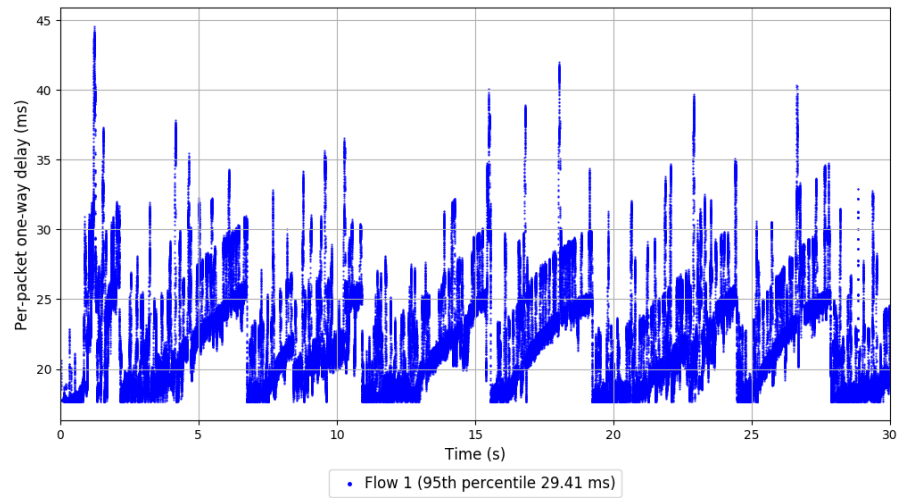
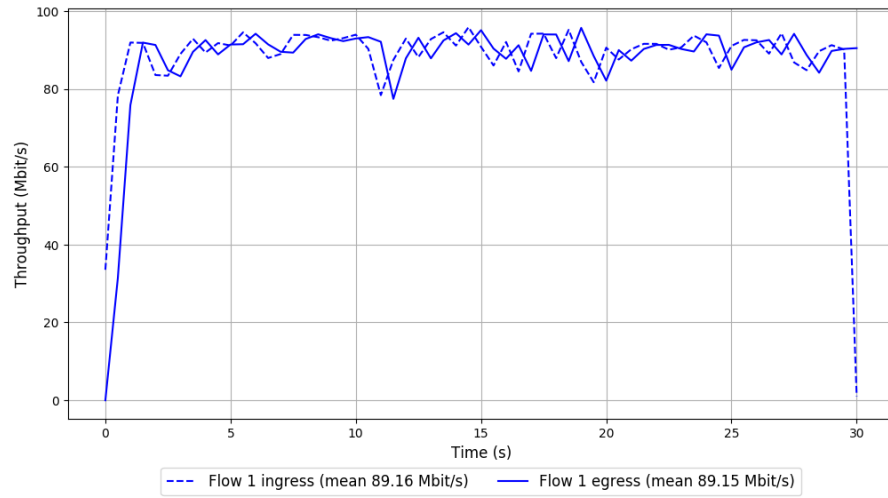


Run 3: Statistics of TCP Cubic

Start at: 2018-08-28 05:51:22
End at: 2018-08-28 05:51:52
Local clock offset: 1.559 ms
Remote clock offset: -3.894 ms

Below is generated by plot.py at 2018-08-28 05:54:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 89.15 Mbit/s
95th percentile per-packet one-way delay: 29.413 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 89.15 Mbit/s
95th percentile per-packet one-way delay: 29.413 ms
Loss rate: 0.10%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-08-28 05:40:53

End at: 2018-08-28 05:41:23

Local clock offset: -3.085 ms

Remote clock offset: -4.208 ms

Below is generated by plot.py at 2018-08-28 05:54:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 76.45 Mbit/s

95th percentile per-packet one-way delay: 21.512 ms

Loss rate: 0.10%

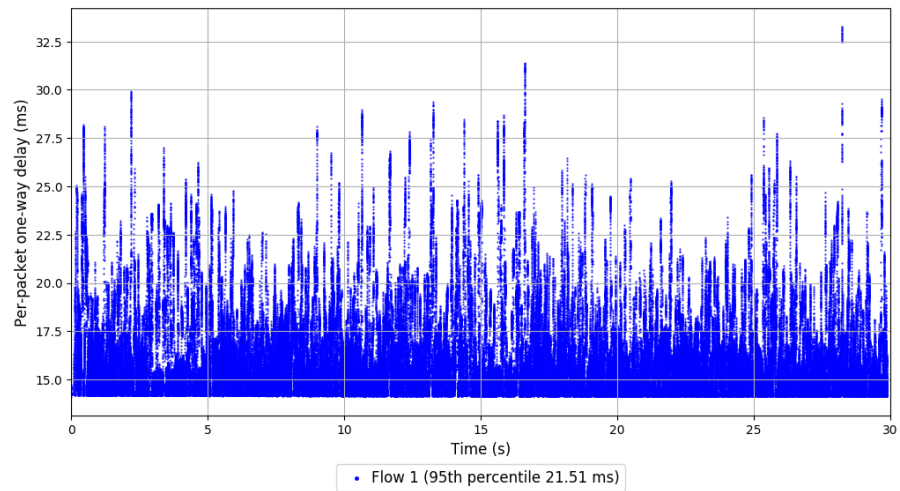
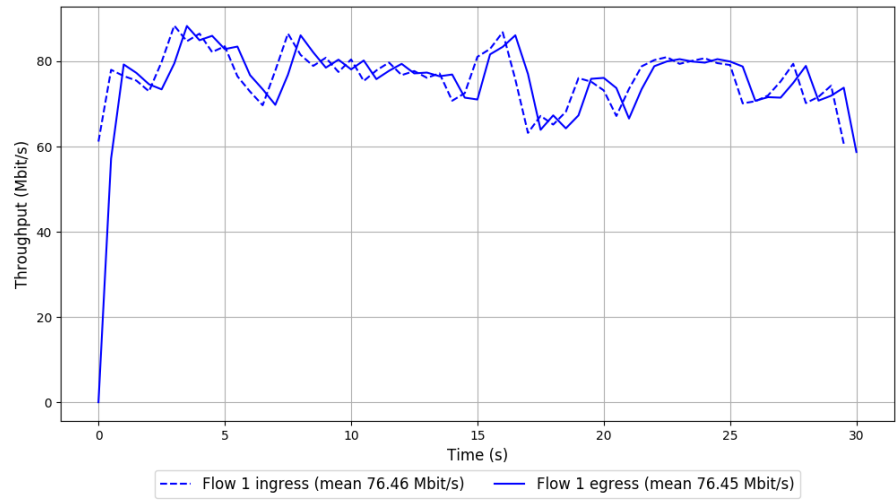
-- Flow 1:

Average throughput: 76.45 Mbit/s

95th percentile per-packet one-way delay: 21.512 ms

Loss rate: 0.10%

Run 1: Report of Indigo — Data Link

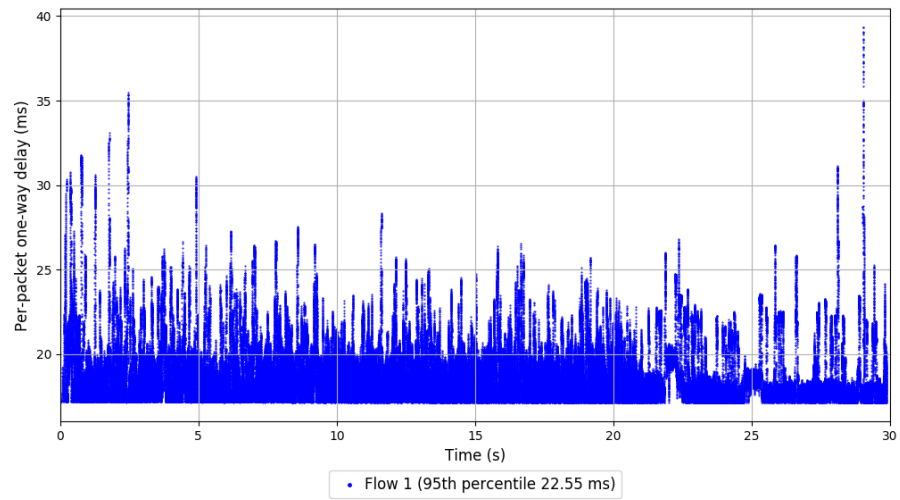
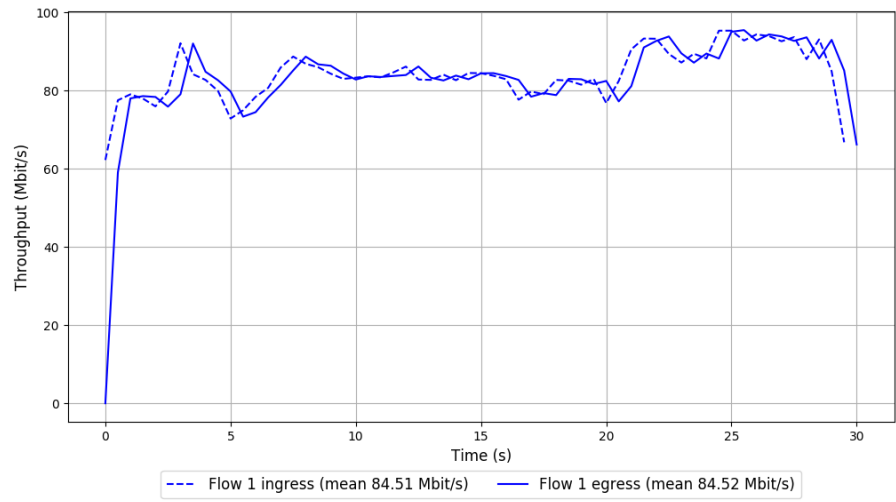


Run 2: Statistics of Indigo

Start at: 2018-08-28 05:45:34
End at: 2018-08-28 05:46:04
Local clock offset: 1.024 ms
Remote clock offset: -3.515 ms

Below is generated by plot.py at 2018-08-28 05:54:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 84.52 Mbit/s
95th percentile per-packet one-way delay: 22.555 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 84.52 Mbit/s
95th percentile per-packet one-way delay: 22.555 ms
Loss rate: 0.07%

Run 2: Report of Indigo — Data Link

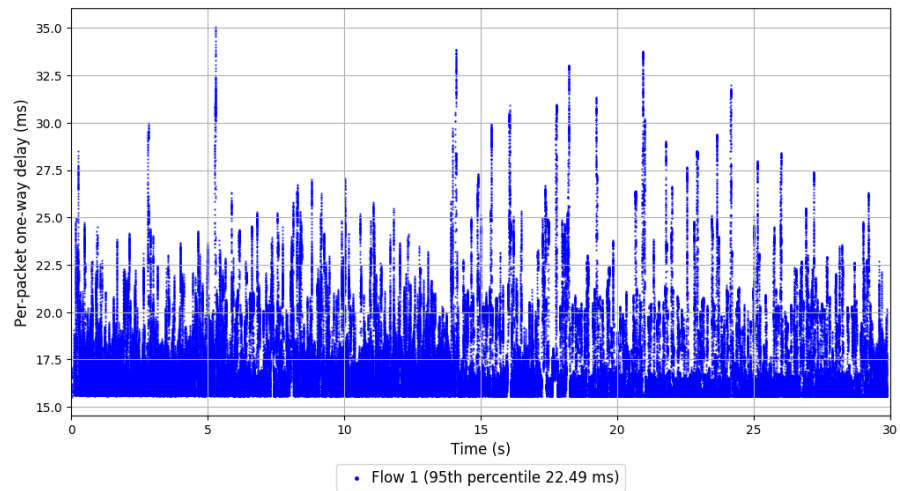
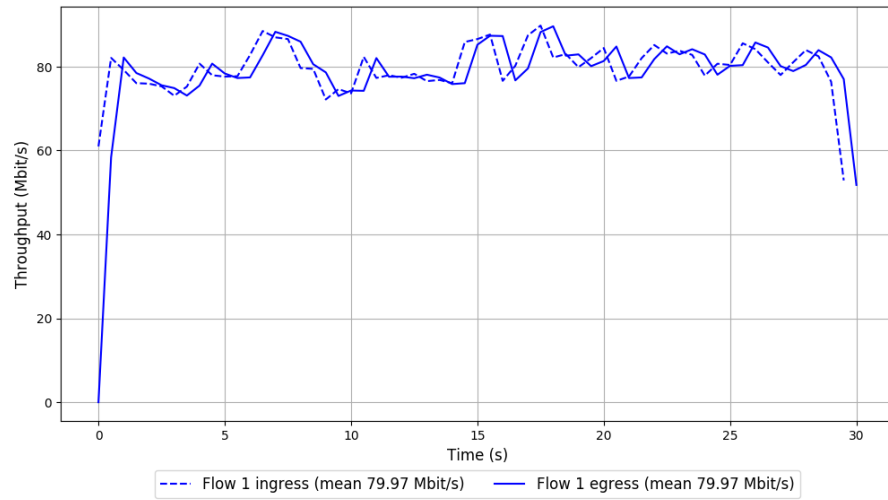


Run 3: Statistics of Indigo

Start at: 2018-08-28 05:50:12
End at: 2018-08-28 05:50:42
Local clock offset: -0.596 ms
Remote clock offset: -3.885 ms

Below is generated by plot.py at 2018-08-28 05:54:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 79.97 Mbit/s
95th percentile per-packet one-way delay: 22.494 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 79.97 Mbit/s
95th percentile per-packet one-way delay: 22.494 ms
Loss rate: 0.08%

Run 3: Report of Indigo — Data Link

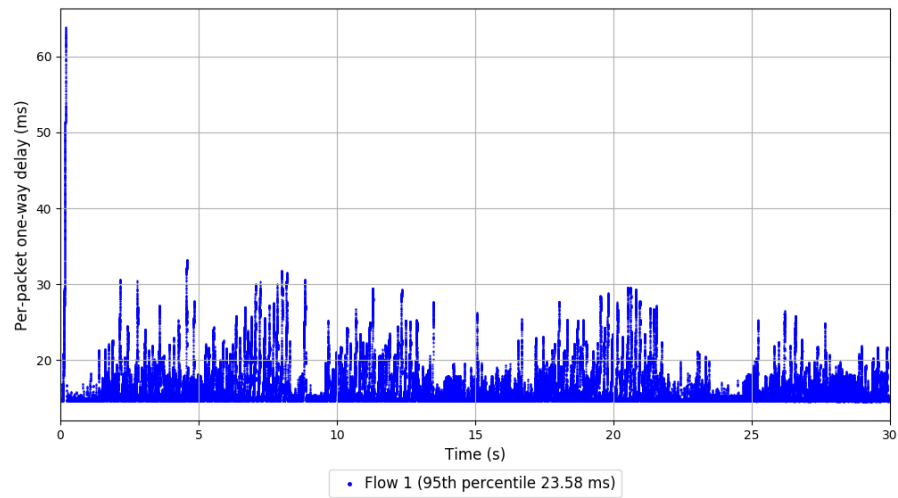
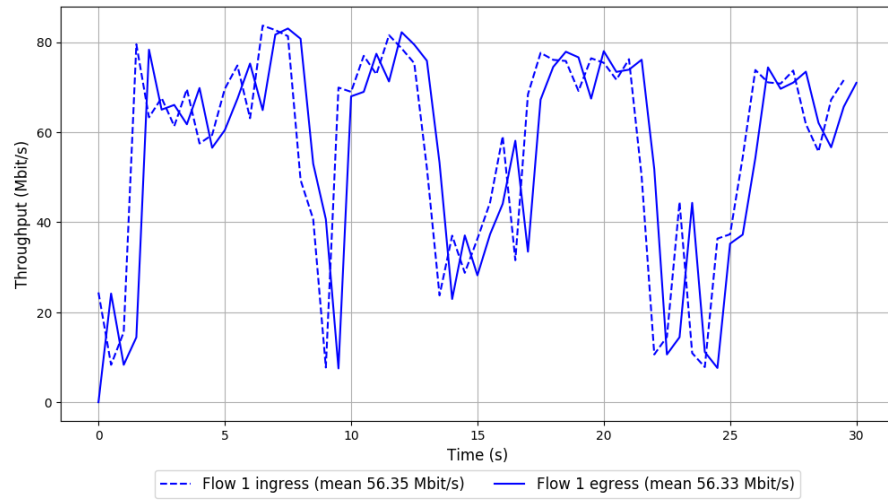


Run 1: Statistics of Muses

Start at: 2018-08-28 05:43:13
End at: 2018-08-28 05:43:43
Local clock offset: -1.343 ms
Remote clock offset: -3.073 ms

Below is generated by plot.py at 2018-08-28 05:54:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 56.33 Mbit/s
95th percentile per-packet one-way delay: 23.584 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 56.33 Mbit/s
95th percentile per-packet one-way delay: 23.584 ms
Loss rate: 0.11%

Run 1: Report of Muses — Data Link

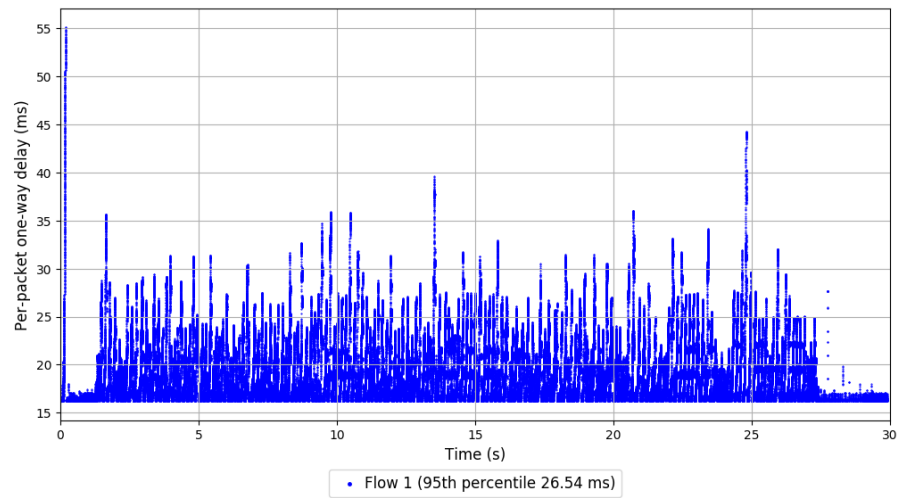
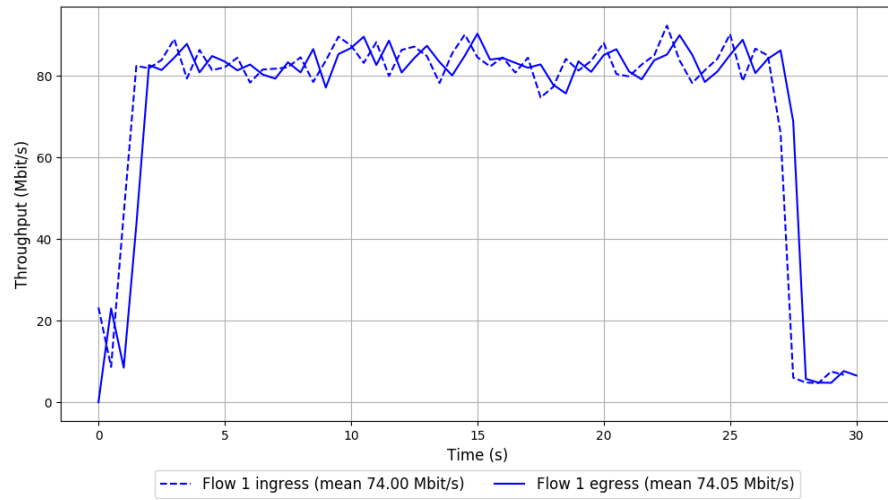


Run 2: Statistics of Muses

Start at: 2018-08-28 05:47:53
End at: 2018-08-28 05:48:23
Local clock offset: 0.401 ms
Remote clock offset: -3.379 ms

Below is generated by plot.py at 2018-08-28 05:54:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 74.05 Mbit/s
95th percentile per-packet one-way delay: 26.536 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 74.05 Mbit/s
95th percentile per-packet one-way delay: 26.536 ms
Loss rate: 0.01%

Run 2: Report of Muses — Data Link



Run 3: Statistics of Muses

Start at: 2018-08-28 05:52:30
End at: 2018-08-28 05:53:00
Local clock offset: -0.961 ms
Remote clock offset: -3.224 ms

Below is generated by plot.py at 2018-08-28 05:54:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 43.56 Mbit/s
95th percentile per-packet one-way delay: 21.643 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 43.56 Mbit/s
95th percentile per-packet one-way delay: 21.643 ms
Loss rate: 0.15%

Run 3: Report of Muses — Data Link

