

Pantheon Report

Generated at 2018-08-28 05:02:17 (UTC).

Data path: AWS India 1 on `ens5` (*local*) → India on `em1` (*remote*).

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.

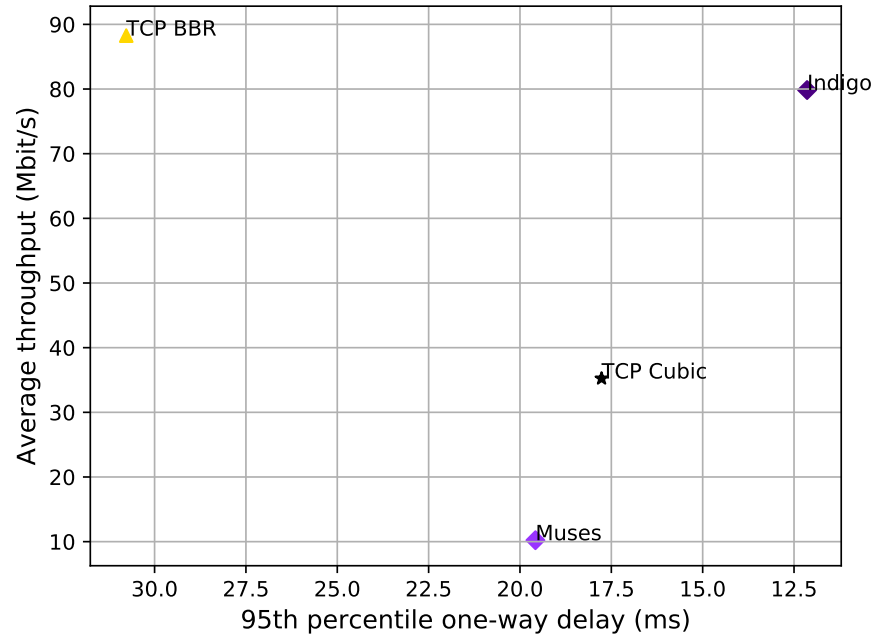
System info:

```
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
```

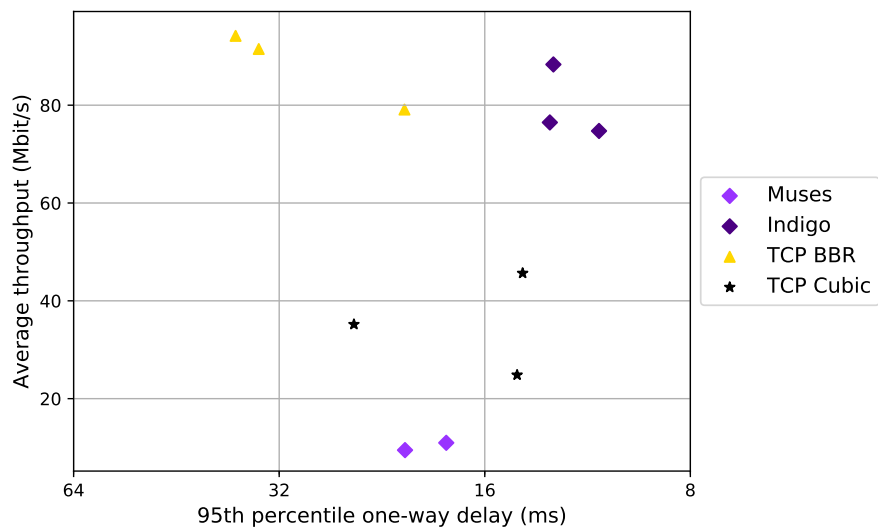
Git summary:

```
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 @ cbfce6db5ff5740dafa1771f813cd646339e1952
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 AWS India 1 to India, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS India 1 to India, 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	88.26	30.78	6.19
TCP Cubic	3	35.22	17.77	0.18
Indigo	3	79.84	12.14	3.83
Muses	2	10.23	19.58	21.11

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 04:48:12

End at: 2018-08-28 04:48:42

Local clock offset: 0.696 ms

Remote clock offset: -2.278 ms

Below is generated by plot.py at 2018-08-28 05:02:10

Datalink statistics

-- Total of 1 flow:

Average throughput: 79.11 Mbit/s

95th percentile per-packet one-way delay: 20.975 ms

Loss rate: 8.94%

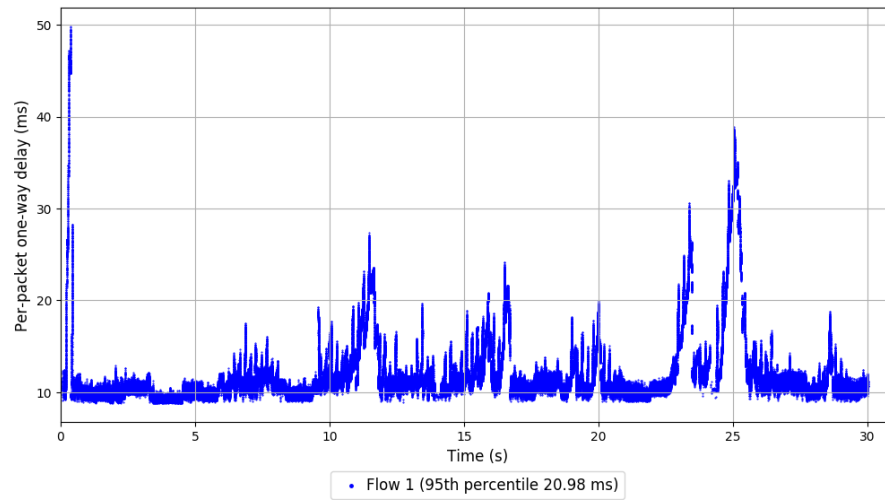
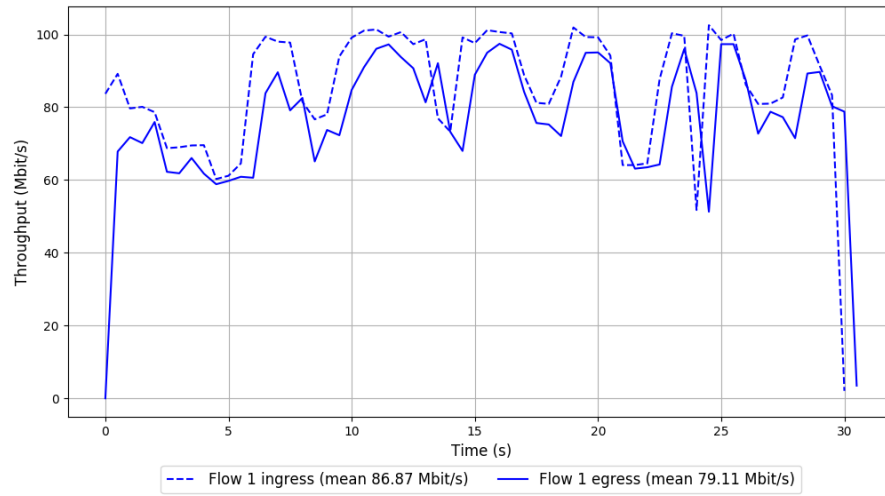
-- Flow 1:

Average throughput: 79.11 Mbit/s

95th percentile per-packet one-way delay: 20.975 ms

Loss rate: 8.94%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-28 04:52:38

End at: 2018-08-28 04:53:08

Local clock offset: 0.314 ms

Remote clock offset: -2.553 ms

Below is generated by plot.py at 2018-08-28 05:02:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 91.49 Mbit/s

95th percentile per-packet one-way delay: 34.284 ms

Loss rate: 5.36%

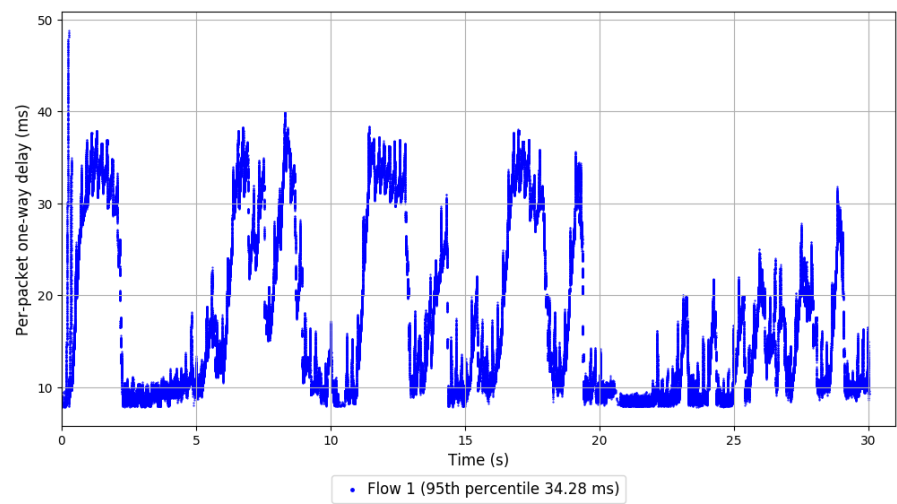
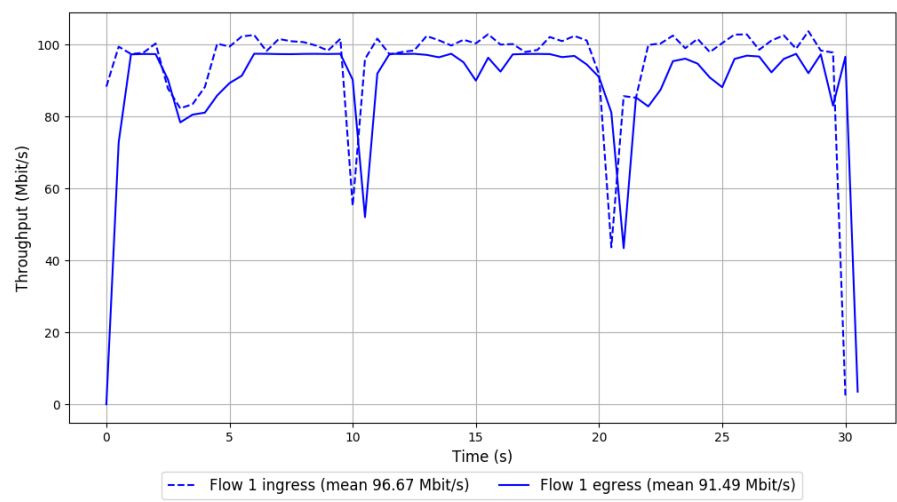
-- Flow 1:

Average throughput: 91.49 Mbit/s

95th percentile per-packet one-way delay: 34.284 ms

Loss rate: 5.36%

Run 2: Report of TCP BBR — Data Link

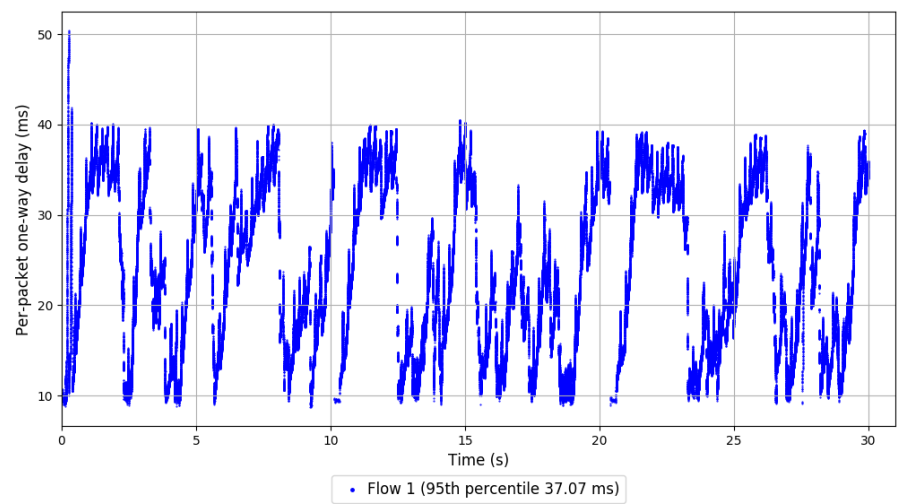
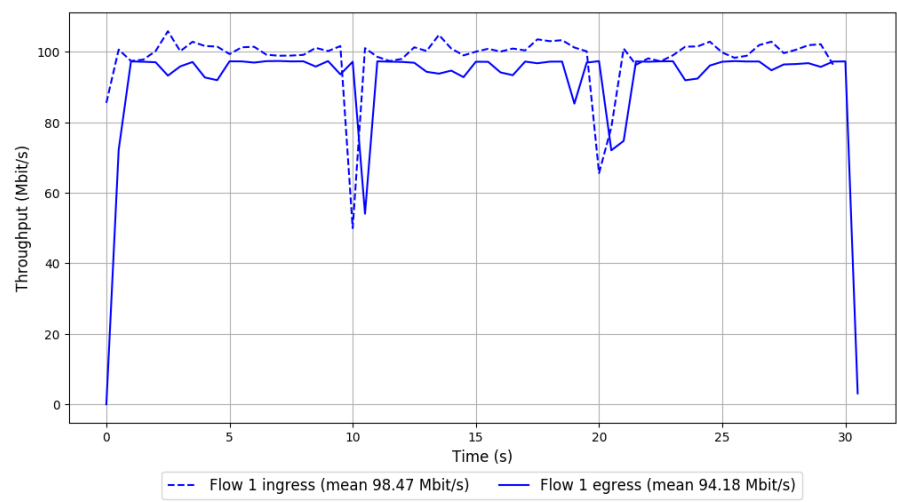


Run 3: Statistics of TCP BBR

Start at: 2018-08-28 04:57:09
End at: 2018-08-28 04:57:39
Local clock offset: -0.651 ms
Remote clock offset: -2.608 ms

Below is generated by plot.py at 2018-08-28 05:02:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 94.18 Mbit/s
95th percentile per-packet one-way delay: 37.067 ms
Loss rate: 4.28%
-- Flow 1:
Average throughput: 94.18 Mbit/s
95th percentile per-packet one-way delay: 37.067 ms
Loss rate: 4.28%

Run 3: Report of TCP BBR — Data Link

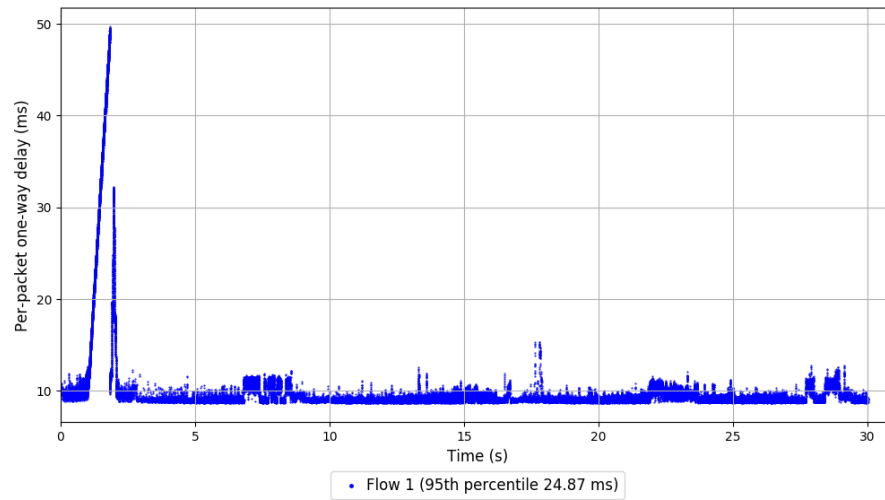
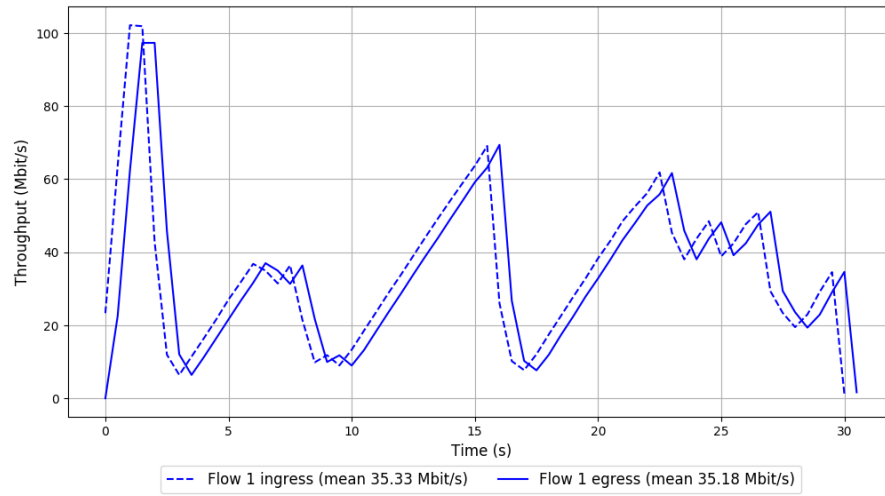


Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 04:51:32
End at: 2018-08-28 04:52:02
Local clock offset: -0.156 ms
Remote clock offset: -2.231 ms

Below is generated by plot.py at 2018-08-28 05:02:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 35.18 Mbit/s
95th percentile per-packet one-way delay: 24.872 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 35.18 Mbit/s
95th percentile per-packet one-way delay: 24.872 ms
Loss rate: 0.42%

Run 1: Report of TCP Cubic — Data Link

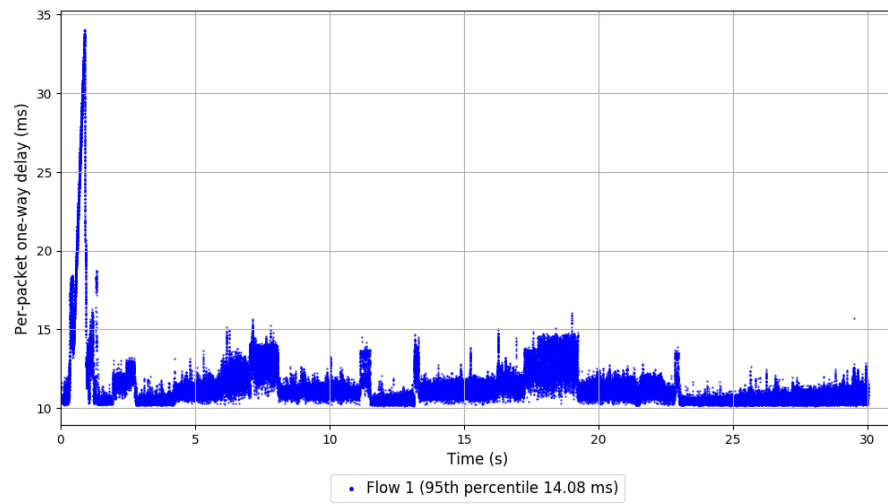
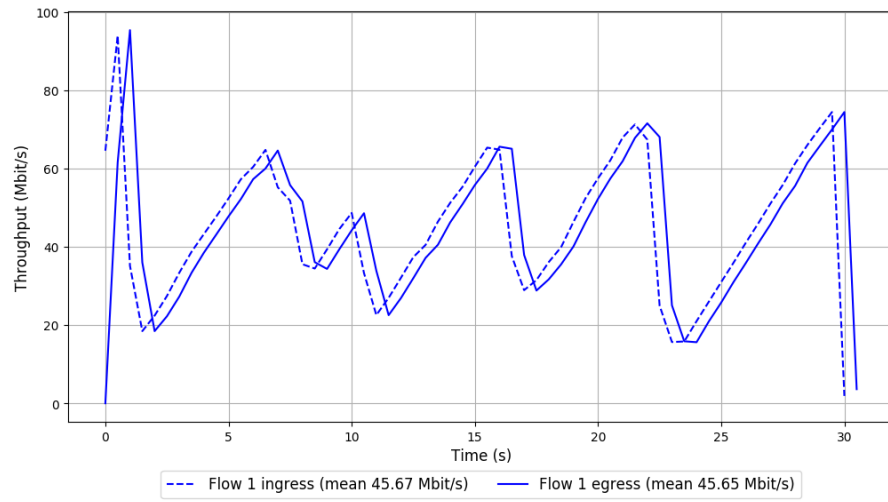


Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 04:56:00
End at: 2018-08-28 04:56:30
Local clock offset: -1.626 ms
Remote clock offset: -2.147 ms

Below is generated by plot.py at 2018-08-28 05:02:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 45.65 Mbit/s
95th percentile per-packet one-way delay: 14.083 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 45.65 Mbit/s
95th percentile per-packet one-way delay: 14.083 ms
Loss rate: 0.03%

Run 2: Report of TCP Cubic — Data Link

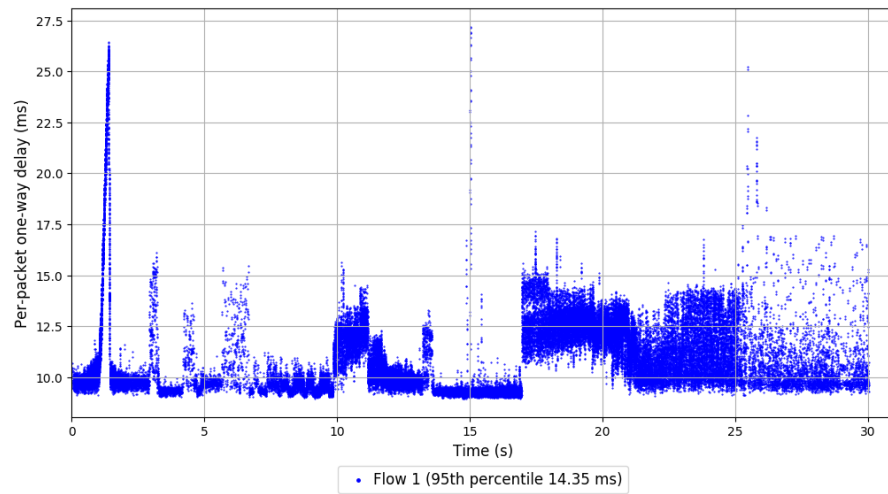
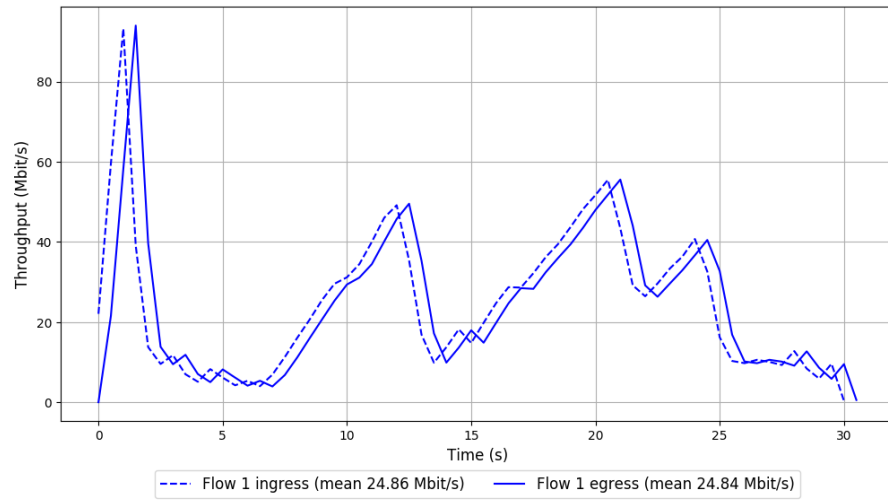


Run 3: Statistics of TCP Cubic

Start at: 2018-08-28 05:00:35
End at: 2018-08-28 05:01:05
Local clock offset: 0.281 ms
Remote clock offset: -2.279 ms

Below is generated by plot.py at 2018-08-28 05:02:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 24.84 Mbit/s
95th percentile per-packet one-way delay: 14.347 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 24.84 Mbit/s
95th percentile per-packet one-way delay: 14.347 ms
Loss rate: 0.08%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-08-28 04:49:20

End at: 2018-08-28 04:49:50

Local clock offset: 1.79 ms

Remote clock offset: -1.906 ms

Below is generated by plot.py at 2018-08-28 05:02:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 74.73 Mbit/s

95th percentile per-packet one-way delay: 10.885 ms

Loss rate: 5.67%

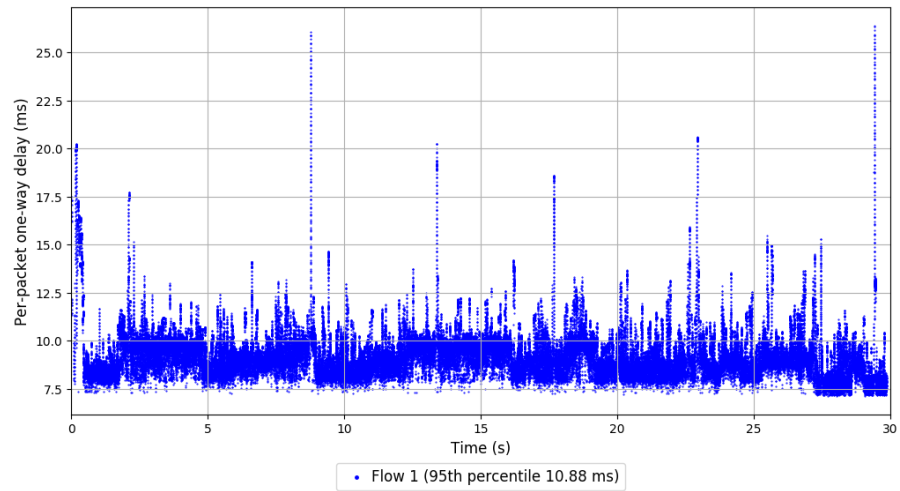
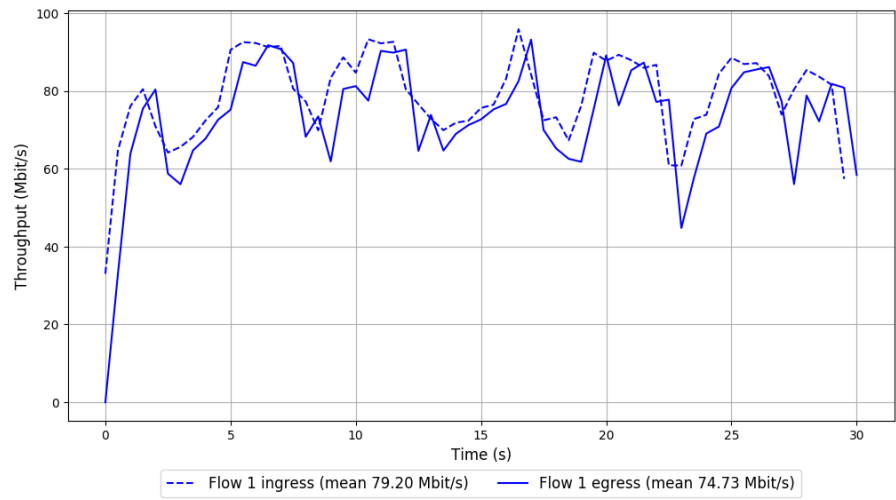
-- Flow 1:

Average throughput: 74.73 Mbit/s

95th percentile per-packet one-way delay: 10.885 ms

Loss rate: 5.67%

Run 1: Report of Indigo — Data Link

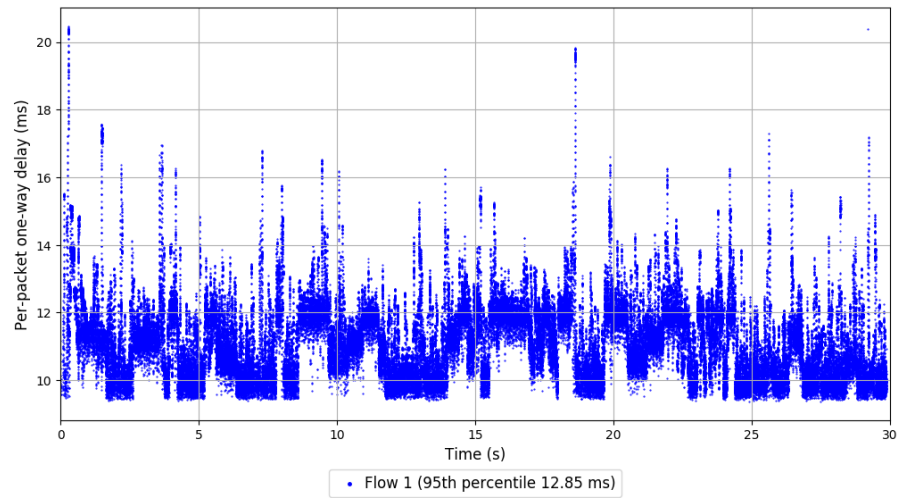
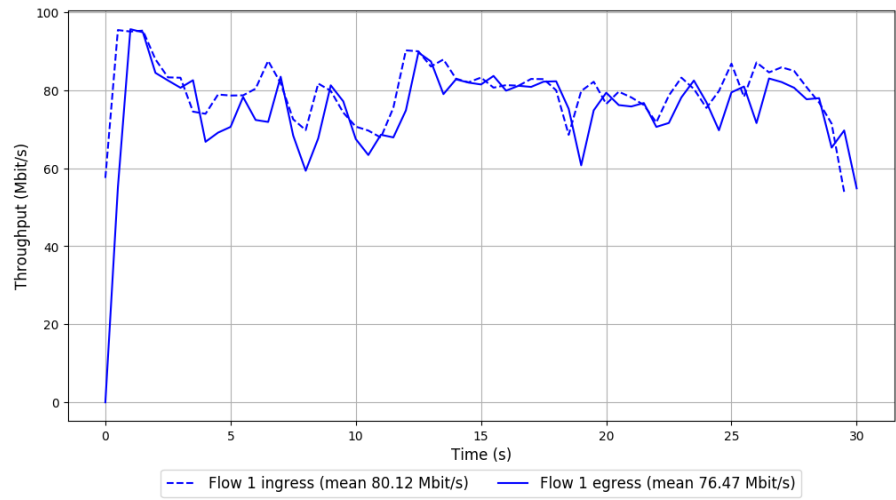


Run 2: Statistics of Indigo

Start at: 2018-08-28 04:53:47
End at: 2018-08-28 04:54:17
Local clock offset: -1.766 ms
Remote clock offset: -3.059 ms

Below is generated by plot.py at 2018-08-28 05:02:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 76.47 Mbit/s
95th percentile per-packet one-way delay: 12.848 ms
Loss rate: 4.55%
-- Flow 1:
Average throughput: 76.47 Mbit/s
95th percentile per-packet one-way delay: 12.848 ms
Loss rate: 4.55%

Run 2: Report of Indigo — Data Link

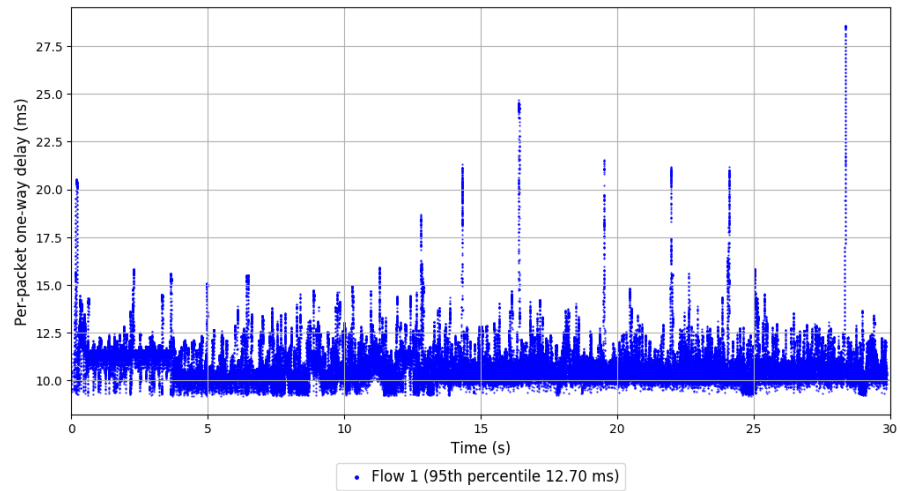
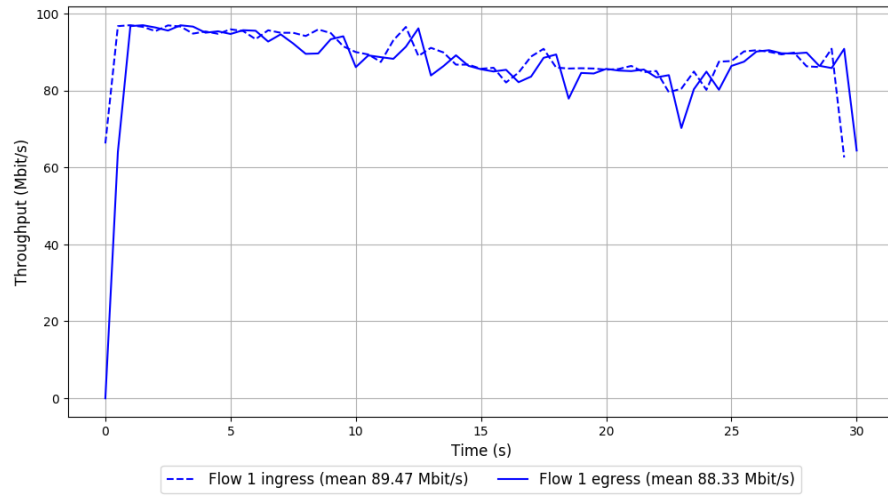


Run 3: Statistics of Indigo

Start at: 2018-08-28 04:58:19
End at: 2018-08-28 04:58:49
Local clock offset: 0.043 ms
Remote clock offset: -2.303 ms

Below is generated by plot.py at 2018-08-28 05:02:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 88.33 Mbit/s
95th percentile per-packet one-way delay: 12.695 ms
Loss rate: 1.28%
-- Flow 1:
Average throughput: 88.33 Mbit/s
95th percentile per-packet one-way delay: 12.695 ms
Loss rate: 1.28%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses

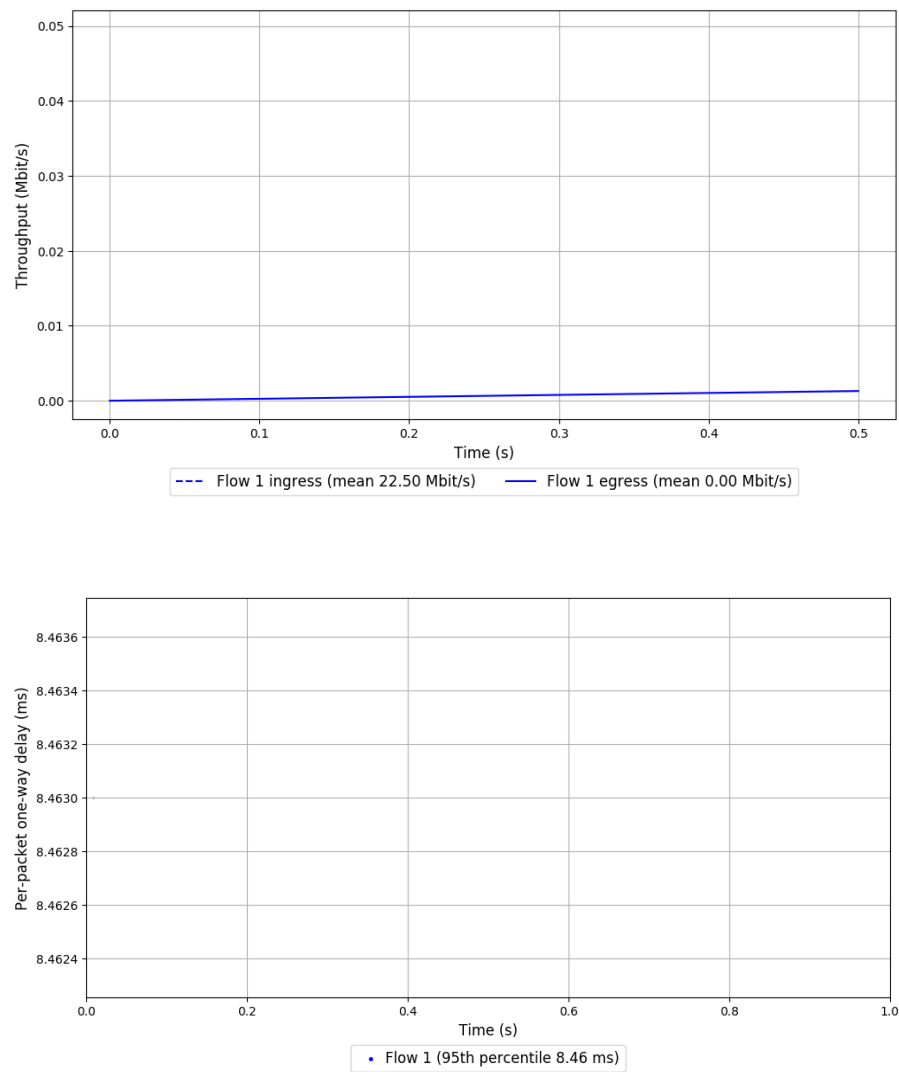
Start at: 2018-08-28 04:50:28

End at: 2018-08-28 04:50:58

Local clock offset: 0.831 ms

Remote clock offset: -2.829 ms

Run 1: Report of Muses — Data Link

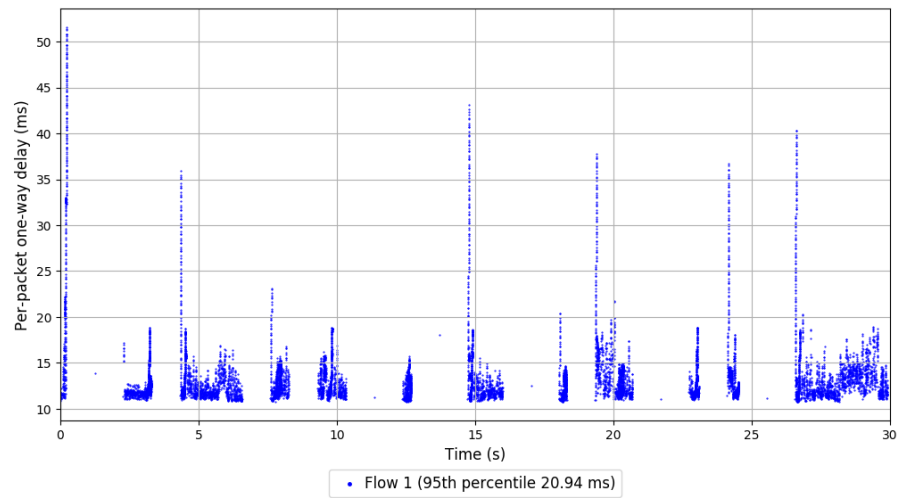
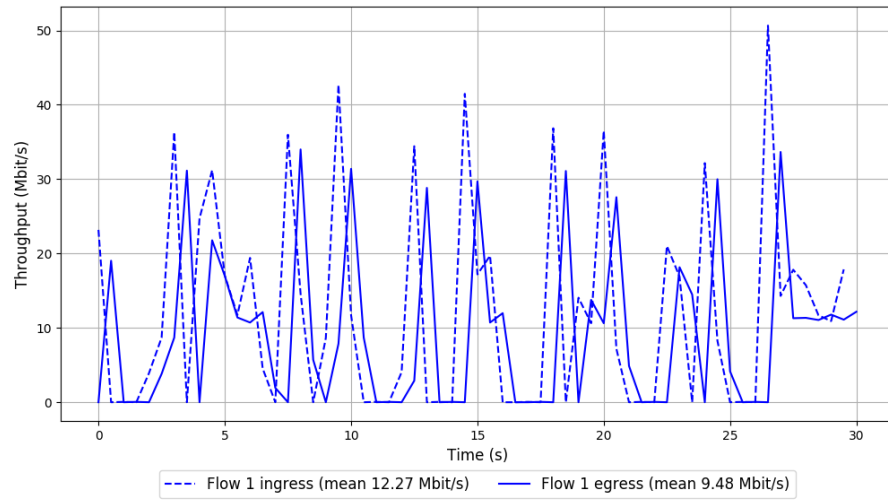


Run 2: Statistics of Muses

Start at: 2018-08-28 04:54:55
End at: 2018-08-28 04:55:25
Local clock offset: -1.096 ms
Remote clock offset: -2.167 ms

Below is generated by plot.py at 2018-08-28 05:02:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.48 Mbit/s
95th percentile per-packet one-way delay: 20.936 ms
Loss rate: 22.78%
-- Flow 1:
Average throughput: 9.48 Mbit/s
95th percentile per-packet one-way delay: 20.936 ms
Loss rate: 22.78%

Run 2: Report of Muses — Data Link



Run 3: Statistics of Muses

Start at: 2018-08-28 04:59:31
End at: 2018-08-28 05:00:01
Local clock offset: 0.58 ms
Remote clock offset: -2.359 ms

Below is generated by plot.py at 2018-08-28 05:02:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.97 Mbit/s
95th percentile per-packet one-way delay: 18.219 ms
Loss rate: 19.44%
-- Flow 1:
Average throughput: 10.97 Mbit/s
95th percentile per-packet one-way delay: 18.219 ms
Loss rate: 19.44%

Run 3: Report of Muses — Data Link

