

Pantheon Report

Generated at 2018-08-31 08:39:31 (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.

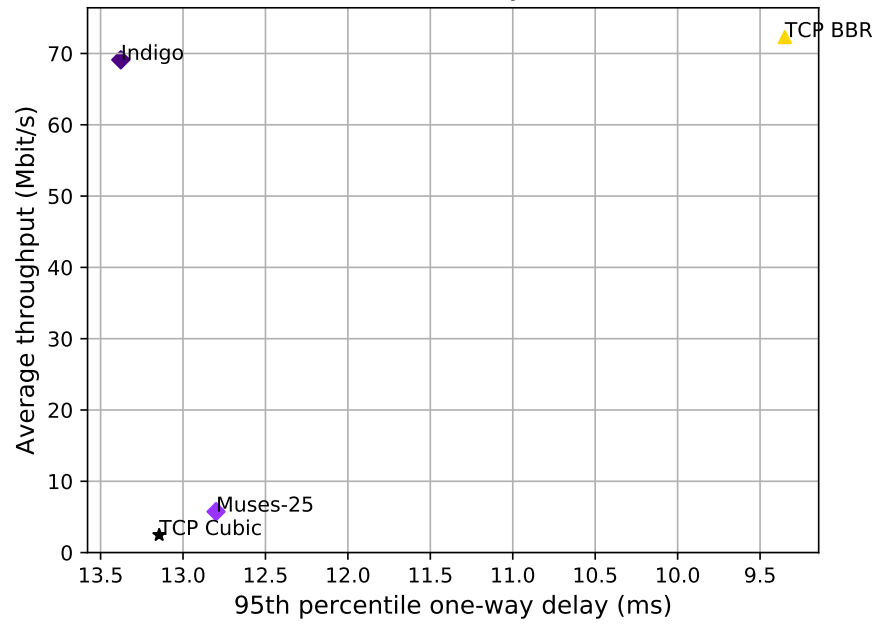
System info:

```
Linux 4.15.0-1020-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
net.ipv4.tcp_mem = 536870912 536870912 536870912
```

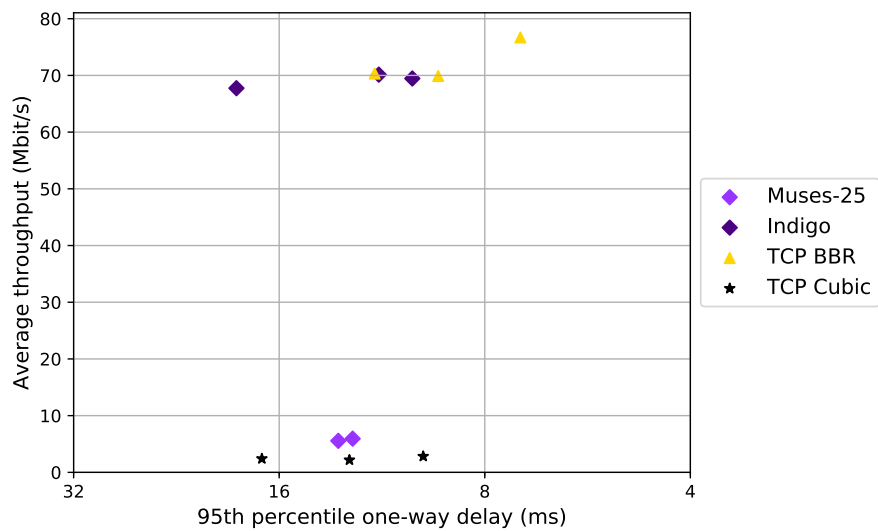
Git summary:

```
branch: muses @ e3c5aa19ca94c3066828fb83f16a8fb6b2731e7a
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b59e0d118c50af3579569c462d33045741c85981
third_party/pantheon-tunnel @ cbfce6db5ff5740d4afe1771f813cd646339e1952
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	72.30	9.35	12.09
TCP Cubic	3	2.47	13.14	5.53
Indigo	3	69.12	13.38	10.23
Muses-25	2	5.75	12.80	12.48

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 08:27:23

End at: 2018-08-31 08:27:53

Local clock offset: 1.853 ms

Remote clock offset: -5.897 ms

Below is generated by plot.py at 2018-08-31 08:39:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 76.69 Mbit/s

95th percentile per-packet one-way delay: 7.095 ms

Loss rate: 11.59%

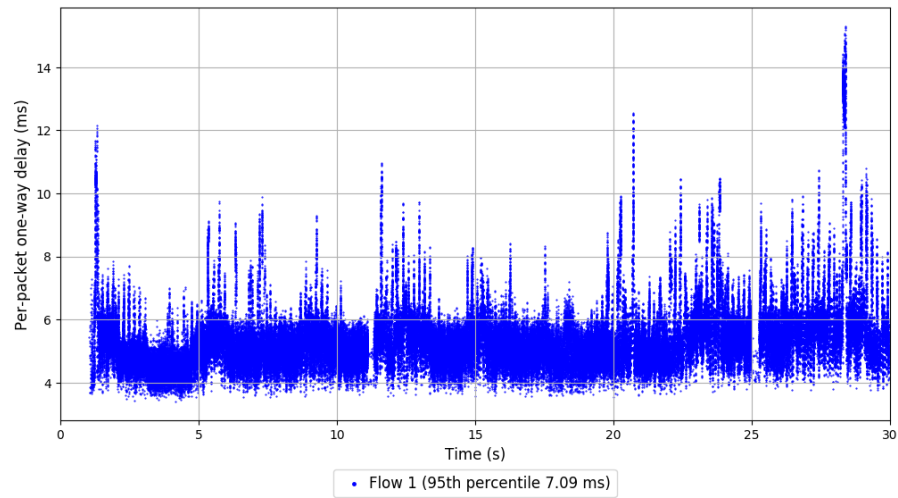
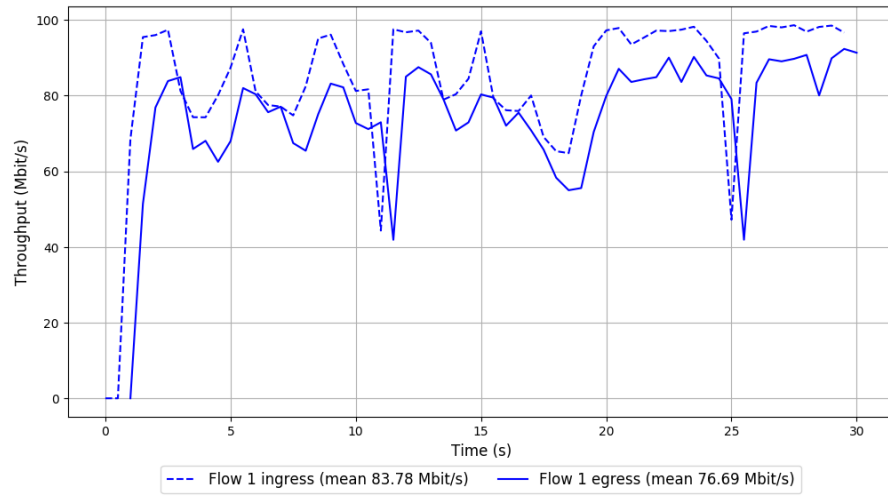
-- Flow 1:

Average throughput: 76.69 Mbit/s

95th percentile per-packet one-way delay: 7.095 ms

Loss rate: 11.59%

Run 1: Report of TCP BBR — Data Link

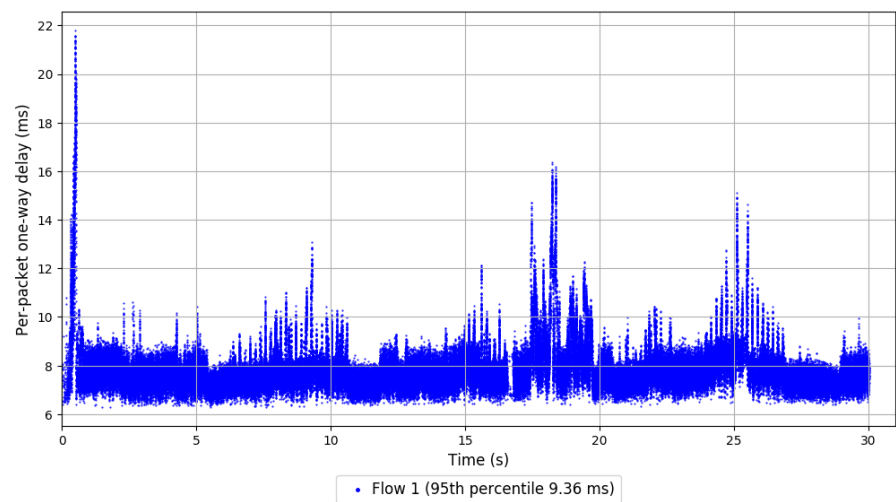
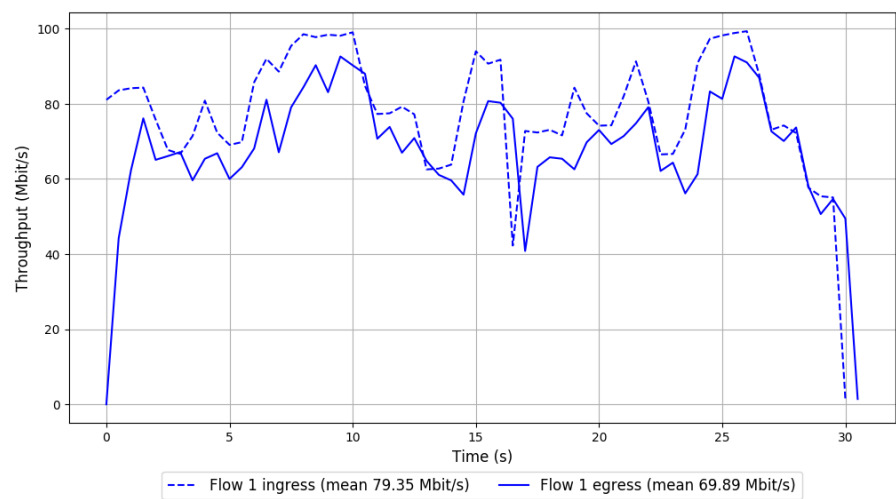


Run 2: Statistics of TCP BBR

Start at: 2018-08-31 08:32:09
End at: 2018-08-31 08:32:39
Local clock offset: 4.108 ms
Remote clock offset: -3.059 ms

Below is generated by plot.py at 2018-08-31 08:39:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 69.89 Mbit/s
95th percentile per-packet one-way delay: 9.360 ms
Loss rate: 11.93%
-- Flow 1:
Average throughput: 69.89 Mbit/s
95th percentile per-packet one-way delay: 9.360 ms
Loss rate: 11.93%

Run 2: Report of TCP BBR — Data Link

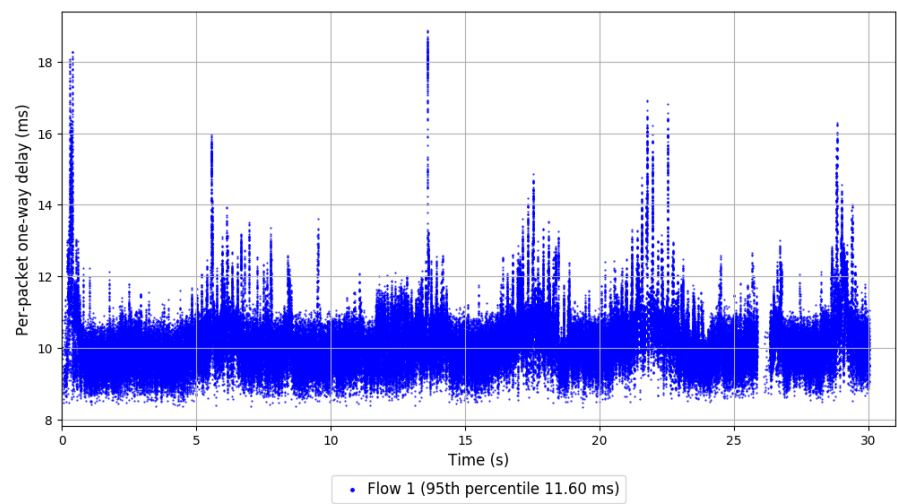
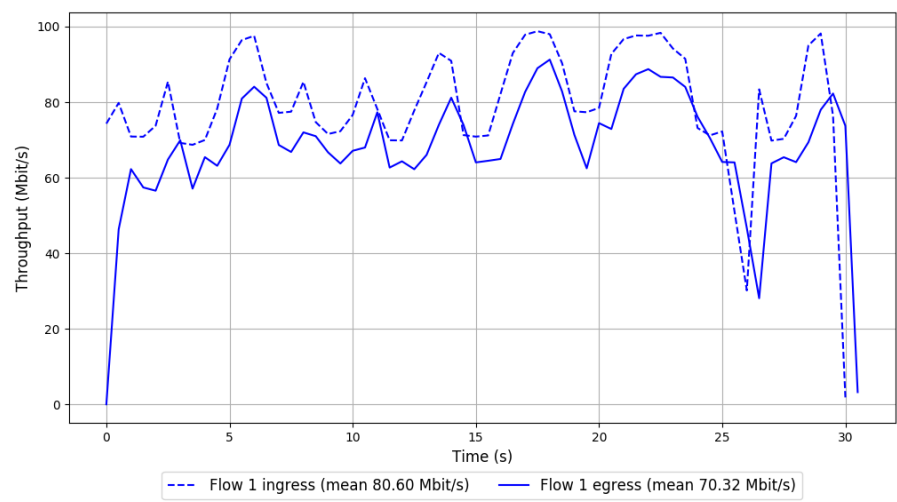


Run 3: Statistics of TCP BBR

Start at: 2018-08-31 08:36:57
End at: 2018-08-31 08:37:27
Local clock offset: 4.619 ms
Remote clock offset: -2.315 ms

Below is generated by plot.py at 2018-08-31 08:39:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 70.32 Mbit/s
95th percentile per-packet one-way delay: 11.595 ms
Loss rate: 12.76%
-- Flow 1:
Average throughput: 70.32 Mbit/s
95th percentile per-packet one-way delay: 11.595 ms
Loss rate: 12.76%

Run 3: Report of TCP BBR — Data Link

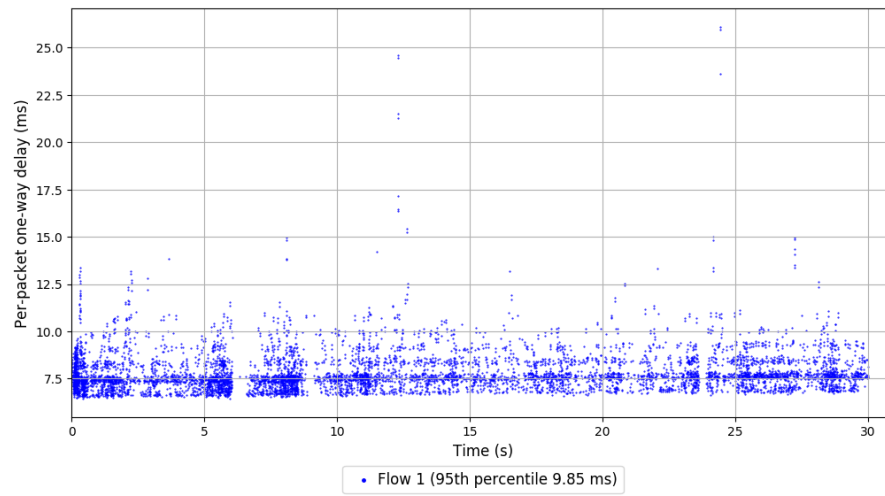
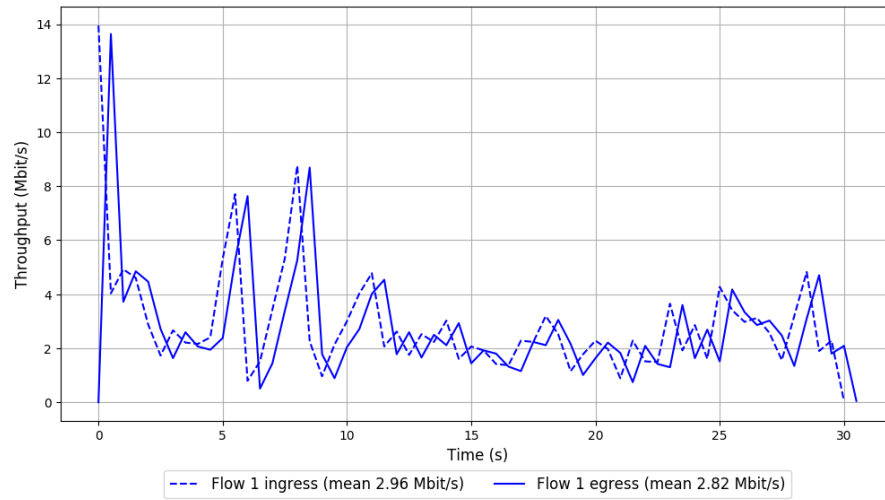


Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 08:26:18
End at: 2018-08-31 08:26:48
Local clock offset: -0.561 ms
Remote clock offset: -5.192 ms

Below is generated by plot.py at 2018-08-31 08:39:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.82 Mbit/s
95th percentile per-packet one-way delay: 9.845 ms
Loss rate: 4.74%
-- Flow 1:
Average throughput: 2.82 Mbit/s
95th percentile per-packet one-way delay: 9.845 ms
Loss rate: 4.74%

Run 1: Report of TCP Cubic — Data Link

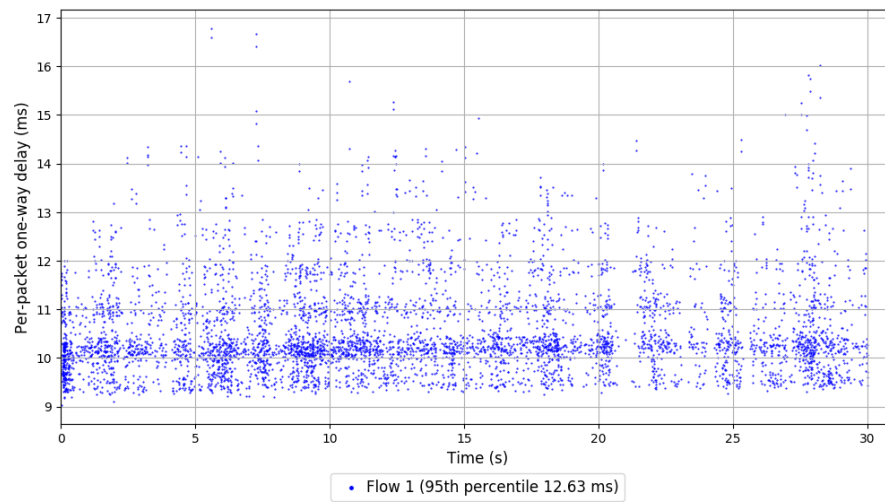
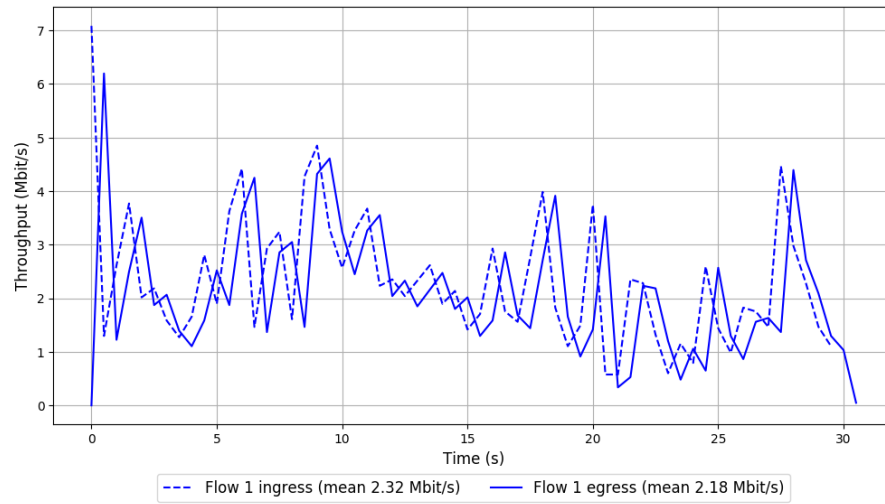


Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 08:31:05
End at: 2018-08-31 08:31:35
Local clock offset: 1.271 ms
Remote clock offset: -2.957 ms

Below is generated by plot.py at 2018-08-31 08:39:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 12.626 ms
Loss rate: 5.91%
-- Flow 1:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 12.626 ms
Loss rate: 5.91%

Run 2: Report of TCP Cubic — Data Link

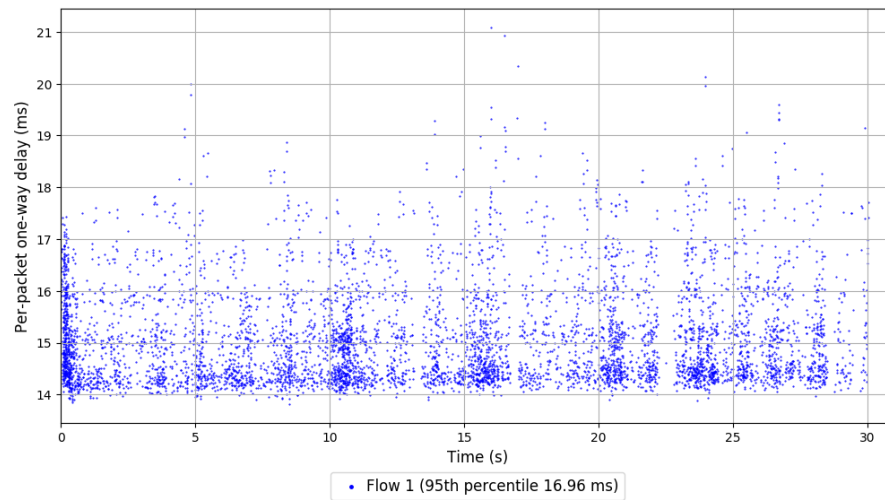
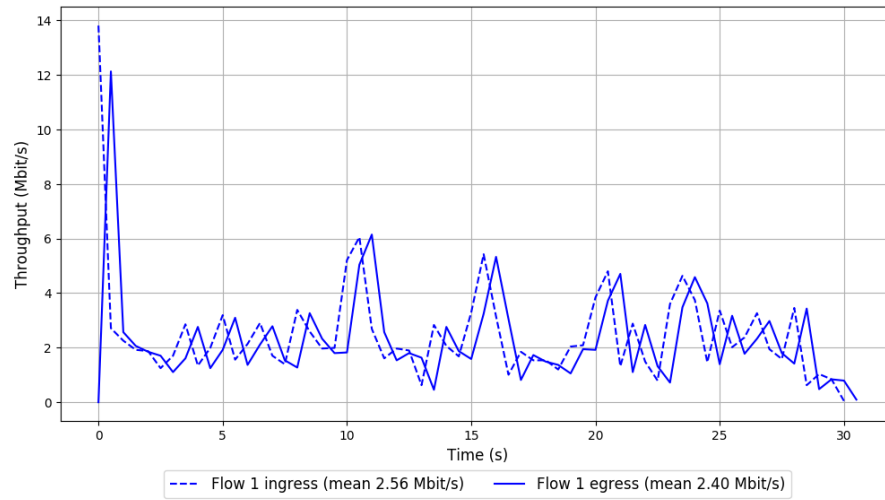


Run 3: Statistics of TCP Cubic

Start at: 2018-08-31 08:35:52
End at: 2018-08-31 08:36:22
Local clock offset: -3.195 ms
Remote clock offset: -4.111 ms

Below is generated by plot.py at 2018-08-31 08:39:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.40 Mbit/s
95th percentile per-packet one-way delay: 16.963 ms
Loss rate: 5.95%
-- Flow 1:
Average throughput: 2.40 Mbit/s
95th percentile per-packet one-way delay: 16.963 ms
Loss rate: 5.95%

Run 3: Report of TCP Cubic — Data Link

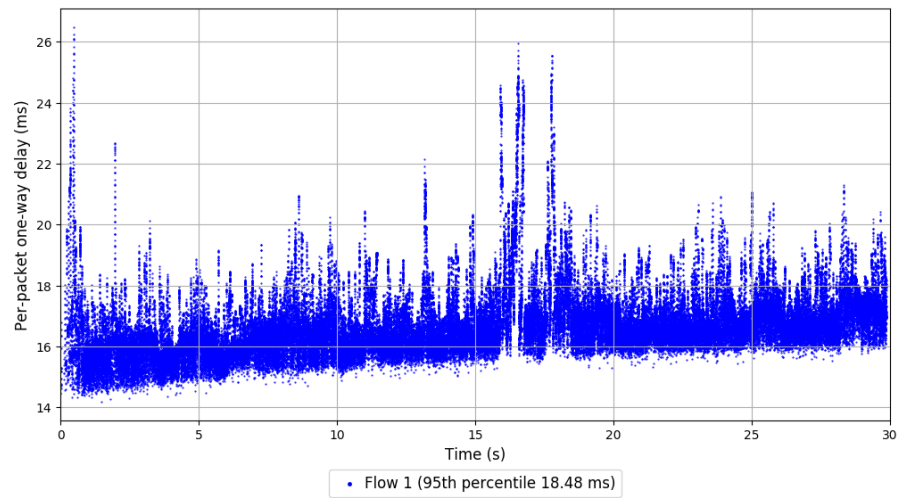
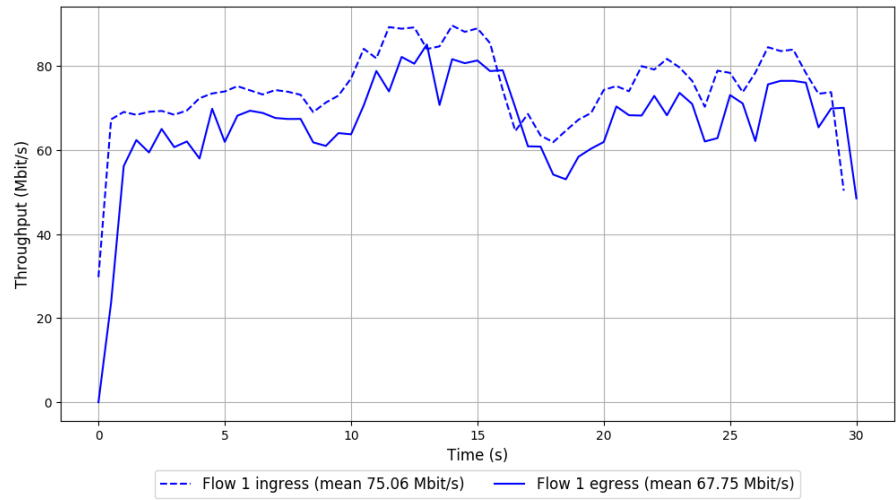


Run 1: Statistics of Indigo

Start at: 2018-08-31 08:25:05
End at: 2018-08-31 08:25:35
Local clock offset: -10.703 ms
Remote clock offset: -5.052 ms

Below is generated by plot.py at 2018-08-31 08:39:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 67.75 Mbit/s
95th percentile per-packet one-way delay: 18.482 ms
Loss rate: 9.74%
-- Flow 1:
Average throughput: 67.75 Mbit/s
95th percentile per-packet one-way delay: 18.482 ms
Loss rate: 9.74%

Run 1: Report of Indigo — Data Link

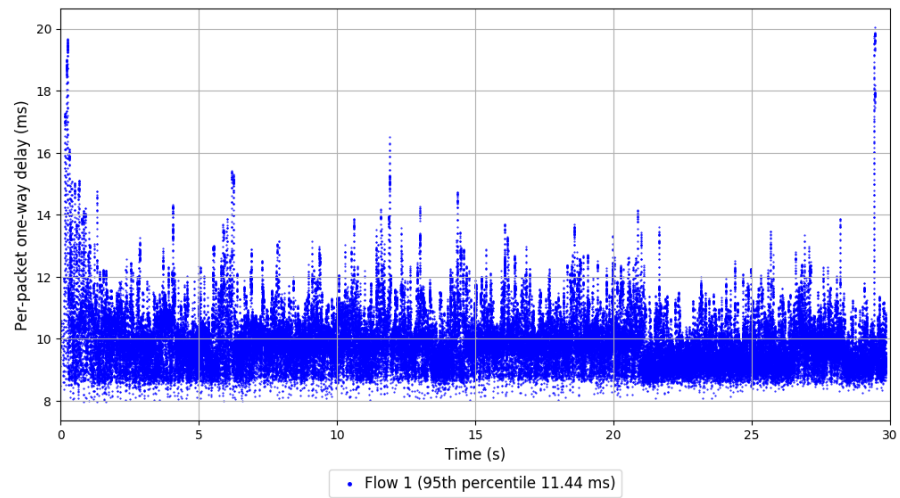
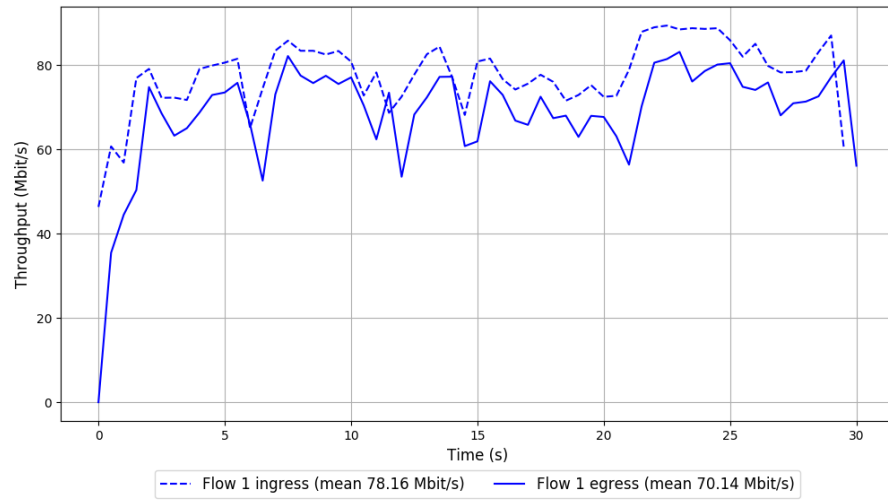


Run 2: Statistics of Indigo

Start at: 2018-08-31 08:29:42
End at: 2018-08-31 08:30:12
Local clock offset: -0.822 ms
Remote clock offset: -5.386 ms

Below is generated by plot.py at 2018-08-31 08:39:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 70.14 Mbit/s
95th percentile per-packet one-way delay: 11.436 ms
Loss rate: 10.27%
-- Flow 1:
Average throughput: 70.14 Mbit/s
95th percentile per-packet one-way delay: 11.436 ms
Loss rate: 10.27%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-08-31 08:34:23

End at: 2018-08-31 08:34:53

Local clock offset: 3.615 ms

Remote clock offset: -3.344 ms

Below is generated by plot.py at 2018-08-31 08:39:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 69.46 Mbit/s

95th percentile per-packet one-way delay: 10.214 ms

Loss rate: 10.67%

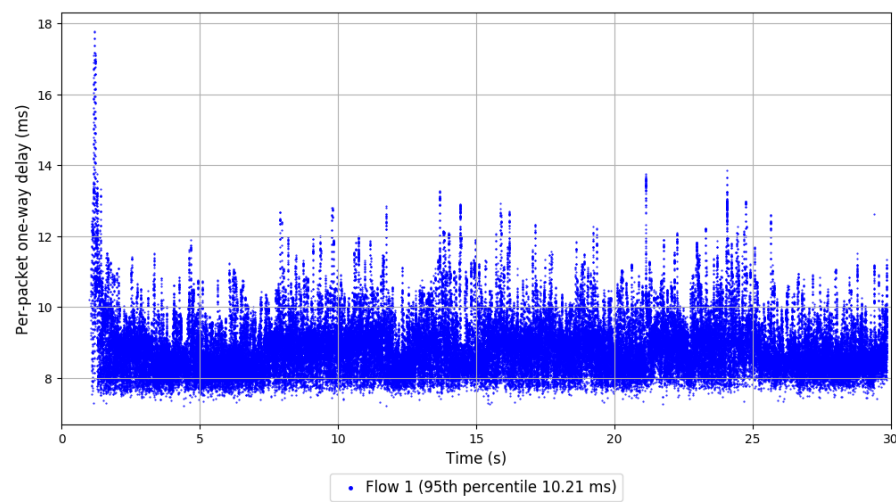
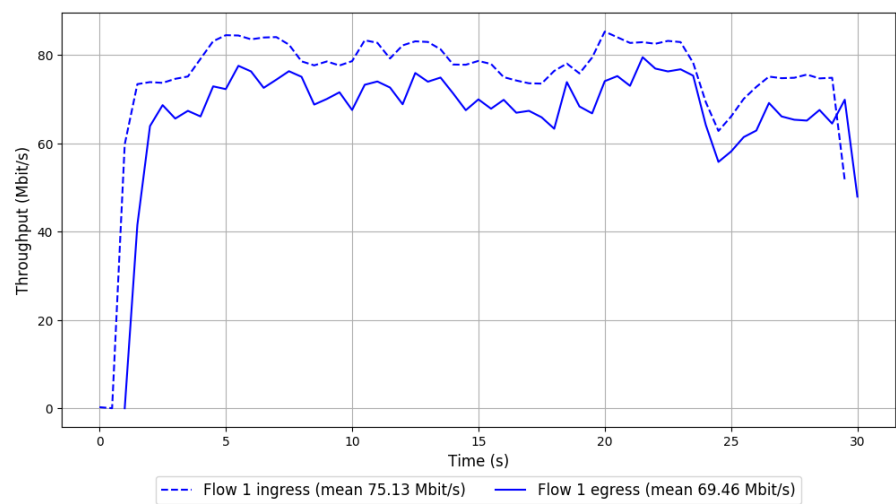
-- Flow 1:

Average throughput: 69.46 Mbit/s

95th percentile per-packet one-way delay: 10.214 ms

Loss rate: 10.67%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

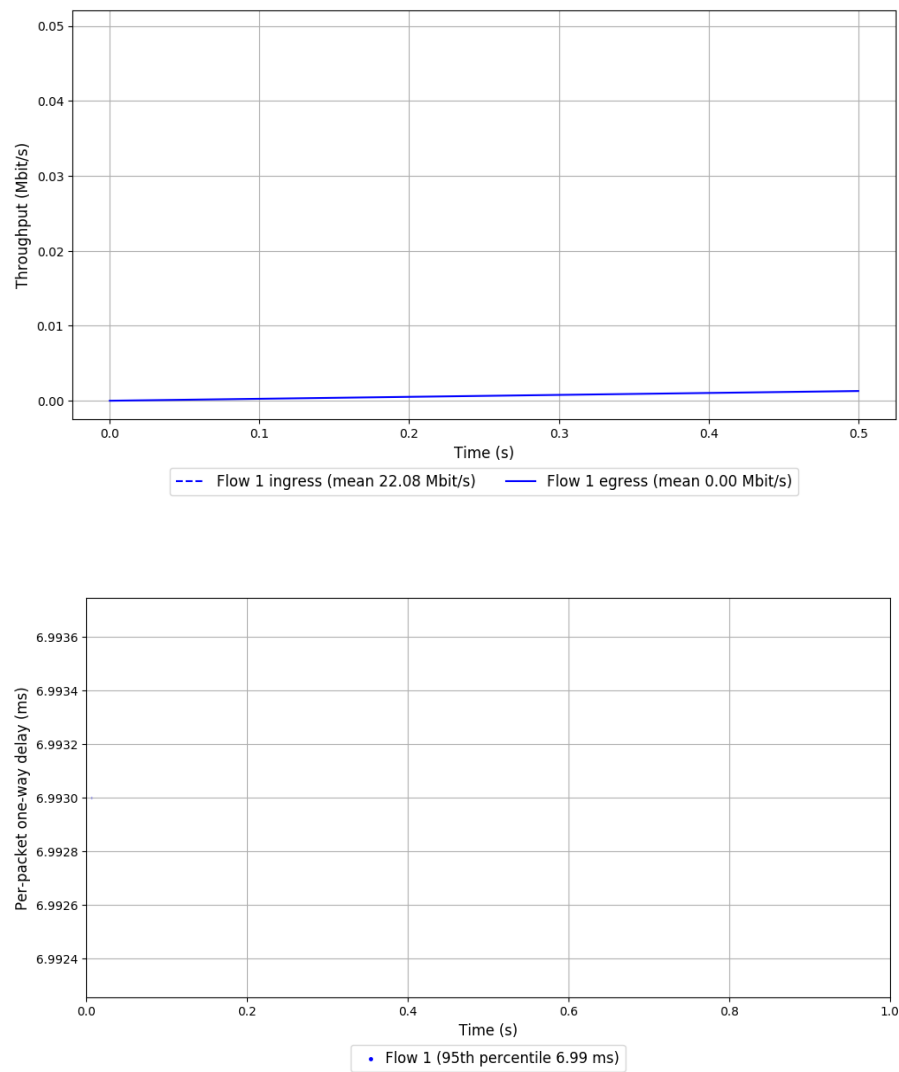
Start at: 2018-08-31 08:28:38

End at: 2018-08-31 08:29:08

Local clock offset: 2.303 ms

Remote clock offset: -4.323 ms

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-08-31 08:33:19

End at: 2018-08-31 08:33:49

Local clock offset: 2.823 ms

Remote clock offset: -3.07 ms

Below is generated by plot.py at 2018-08-31 08:39:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.94 Mbit/s

95th percentile per-packet one-way delay: 12.490 ms

Loss rate: 13.80%

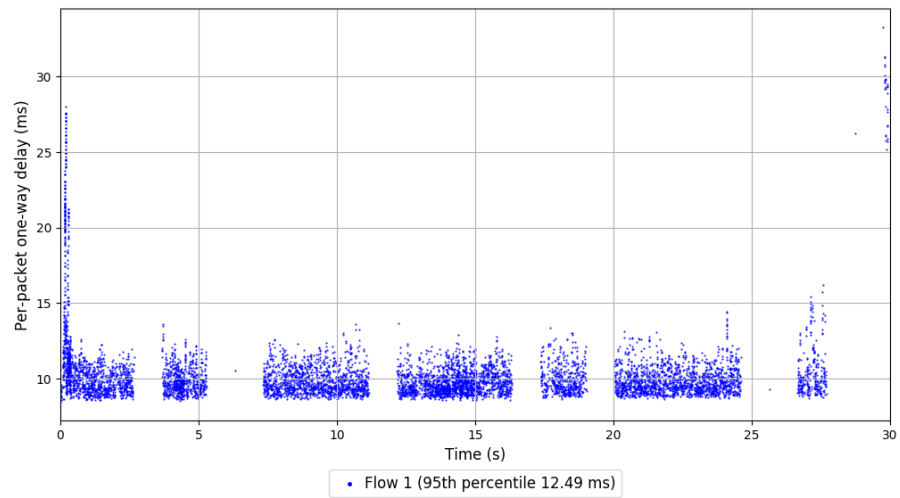
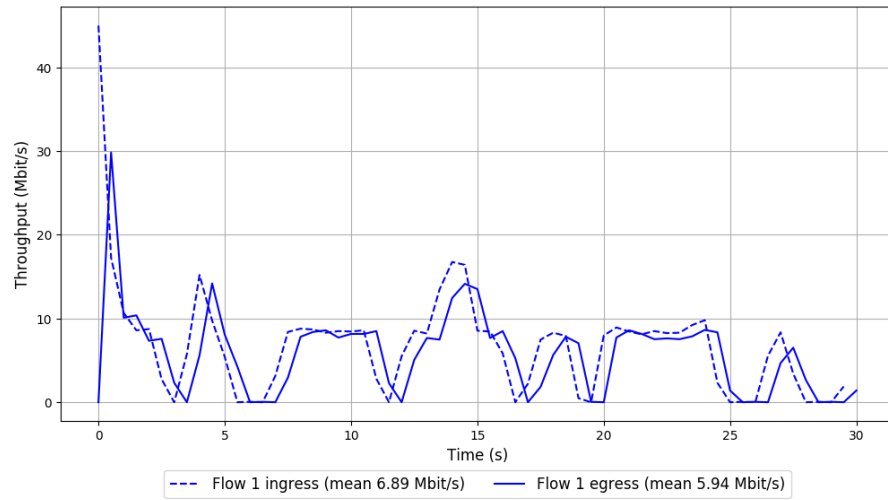
-- Flow 1:

Average throughput: 5.94 Mbit/s

95th percentile per-packet one-way delay: 12.490 ms

Loss rate: 13.80%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-08-31 08:38:08
End at: 2018-08-31 08:38:38
Local clock offset: 4.608 ms
Remote clock offset: -2.244 ms

Below is generated by plot.py at 2018-08-31 08:39:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.56 Mbit/s
95th percentile per-packet one-way delay: 13.109 ms
Loss rate: 11.16%
-- Flow 1:
Average throughput: 5.56 Mbit/s
95th percentile per-packet one-way delay: 13.109 ms
Loss rate: 11.16%

Run 3: Report of Muses-25 — Data Link

