

Pantheon Report

Generated at 2018-09-05 21:16:25 (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.

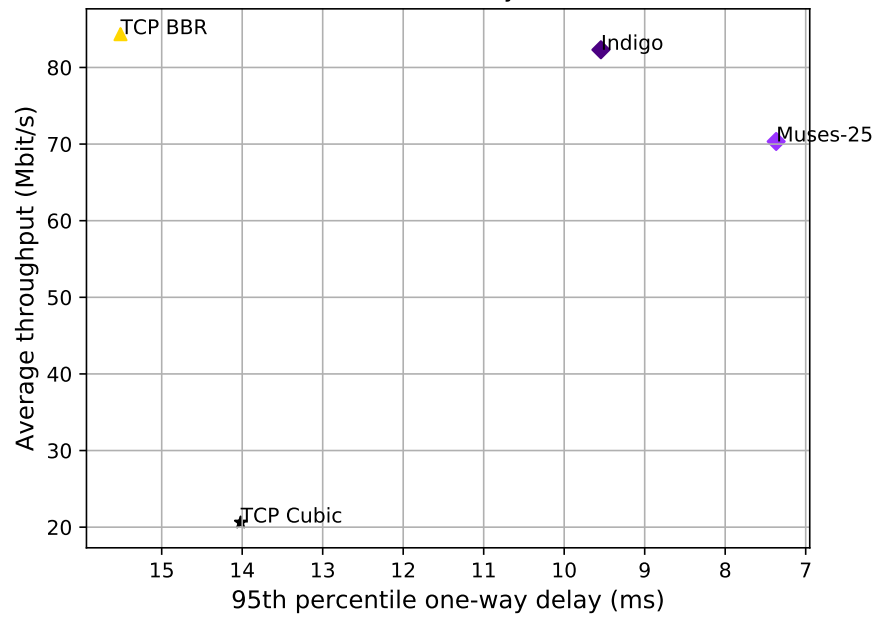
System info:

```
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
```

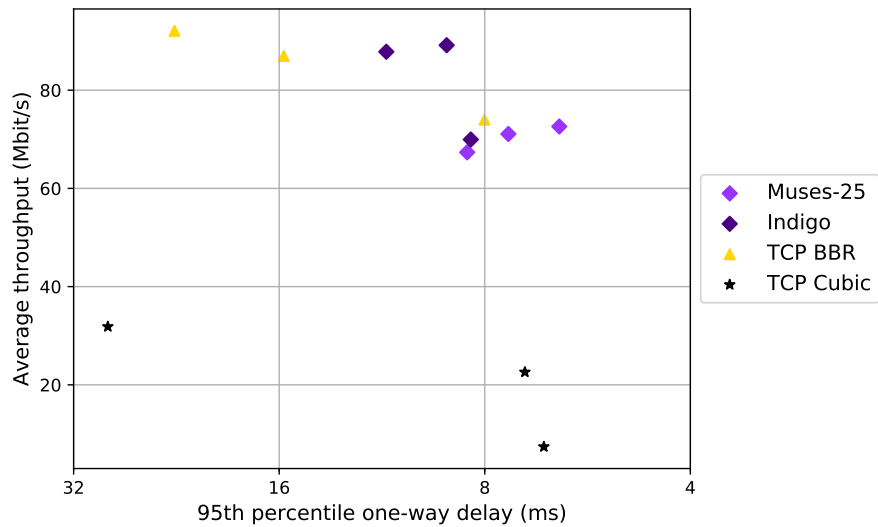
Git summary:

```
branch: muses @ 18b9165265c8ba2915c862e8713fd9ad82c1ac21
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ a28d20fb82a95a965a3da65fd1eb71b8994e9b84
third_party/pantheon-tunnel @ cbfce6db5ff5740d4fe1771f813cd646339e1952
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	84.35	15.51	7.74
TCP Cubic	3	20.61	14.02	0.47
Indigo	3	82.31	9.54	7.21
Muses-25	3	70.34	7.37	1.49

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 21:01:38

End at: 2018-09-05 21:02:08

Local clock offset: 0.305 ms

Remote clock offset: -2.964 ms

Below is generated by plot.py at 2018-09-05 21:16:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 86.97 Mbit/s

95th percentile per-packet one-way delay: 15.756 ms

Loss rate: 5.71%

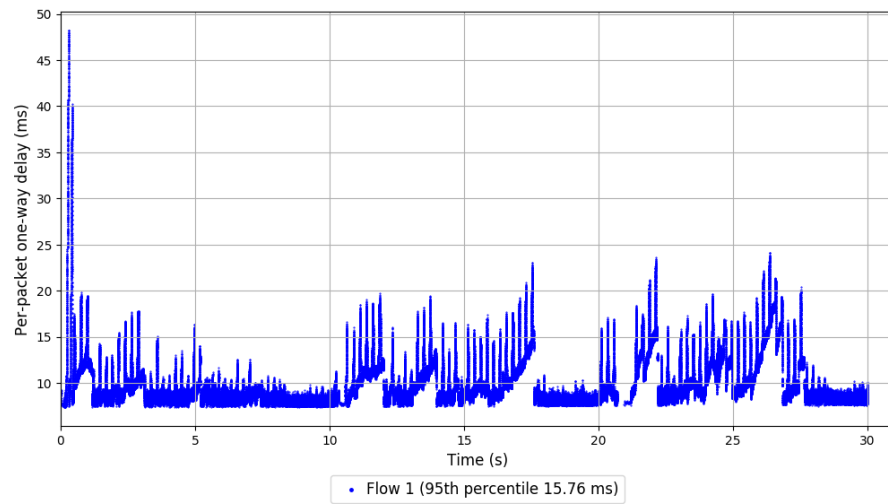
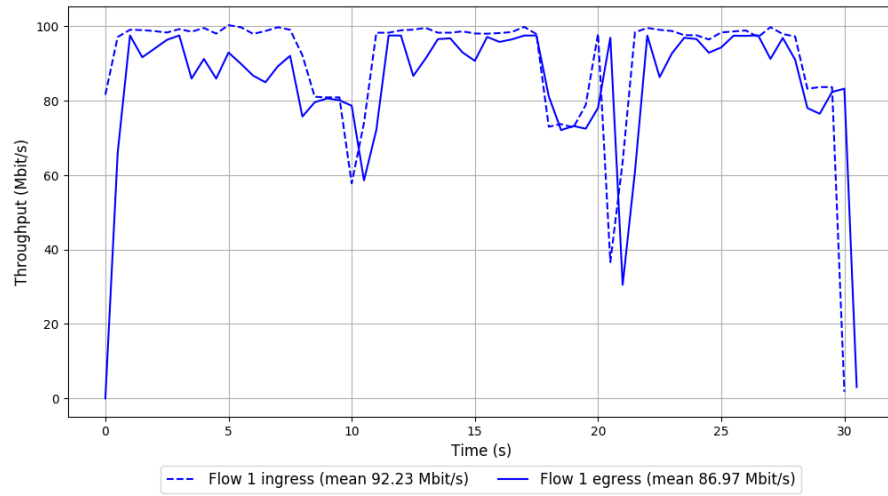
-- Flow 1:

Average throughput: 86.97 Mbit/s

95th percentile per-packet one-way delay: 15.756 ms

Loss rate: 5.71%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 21:06:13

End at: 2018-09-05 21:06:43

Local clock offset: 3.377 ms

Remote clock offset: -3.005 ms

Below is generated by plot.py at 2018-09-05 21:16:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 92.09 Mbit/s

95th percentile per-packet one-way delay: 22.770 ms

Loss rate: 4.64%

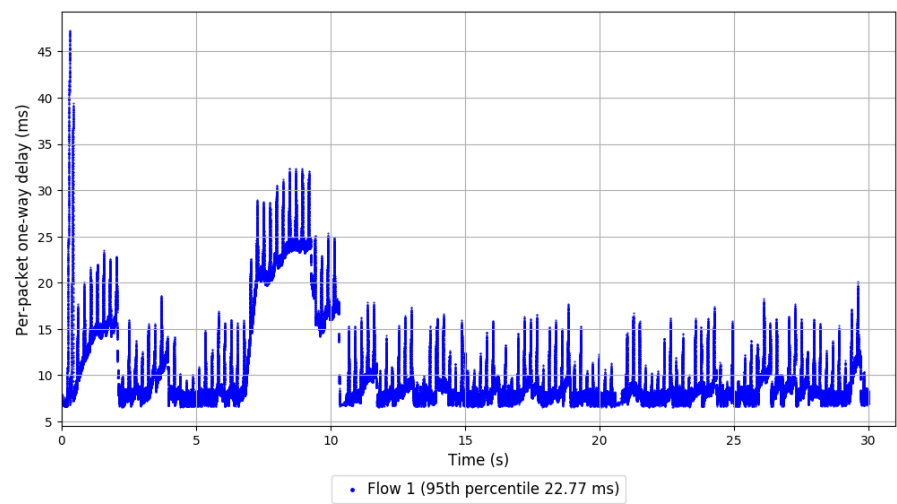
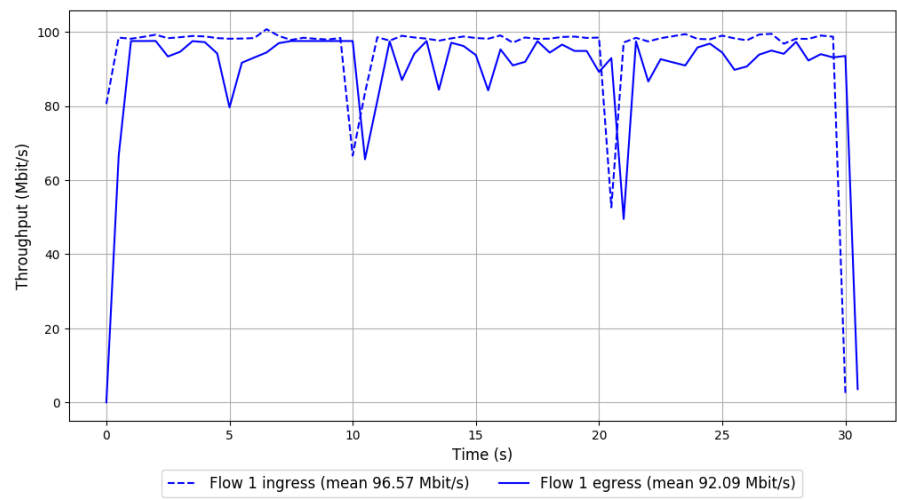
-- Flow 1:

Average throughput: 92.09 Mbit/s

95th percentile per-packet one-way delay: 22.770 ms

Loss rate: 4.64%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-09-05 21:10:57

End at: 2018-09-05 21:11:27

Local clock offset: 3.375 ms

Remote clock offset: -3.475 ms

Below is generated by plot.py at 2018-09-05 21:16:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 73.99 Mbit/s

95th percentile per-packet one-way delay: 8.009 ms

Loss rate: 12.87%

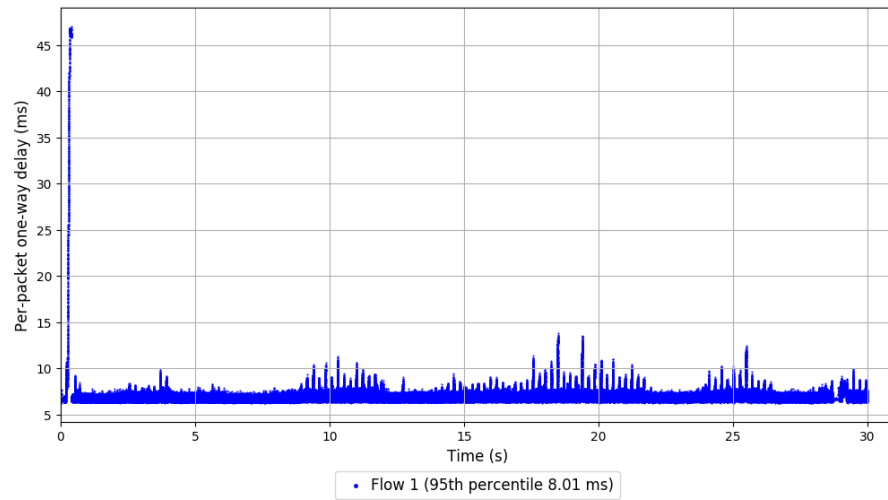
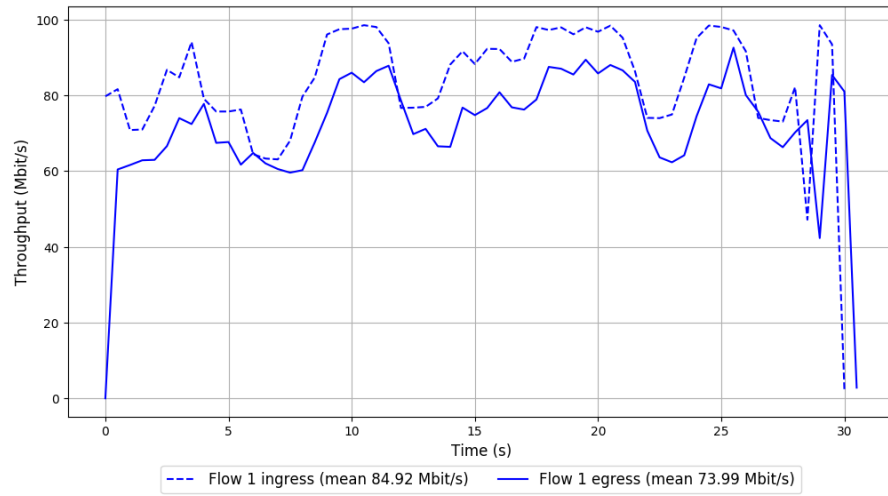
-- Flow 1:

Average throughput: 73.99 Mbit/s

95th percentile per-packet one-way delay: 8.009 ms

Loss rate: 12.87%

Run 3: Report of TCP BBR — Data Link

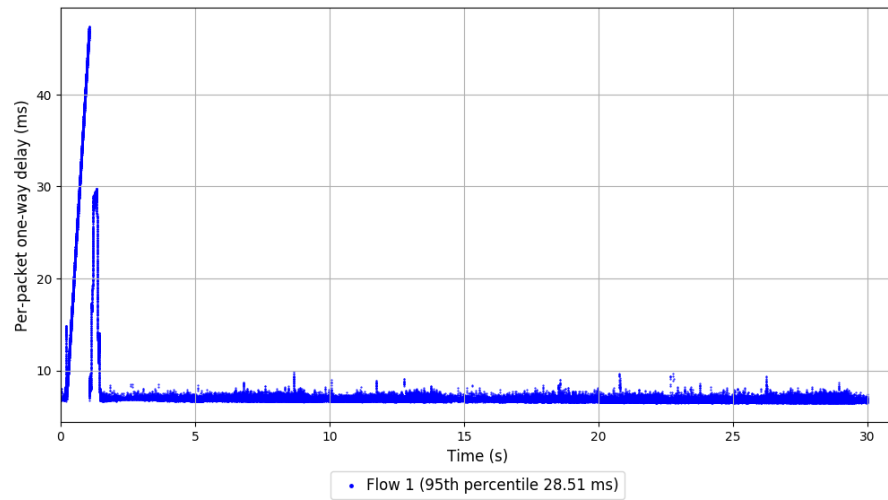
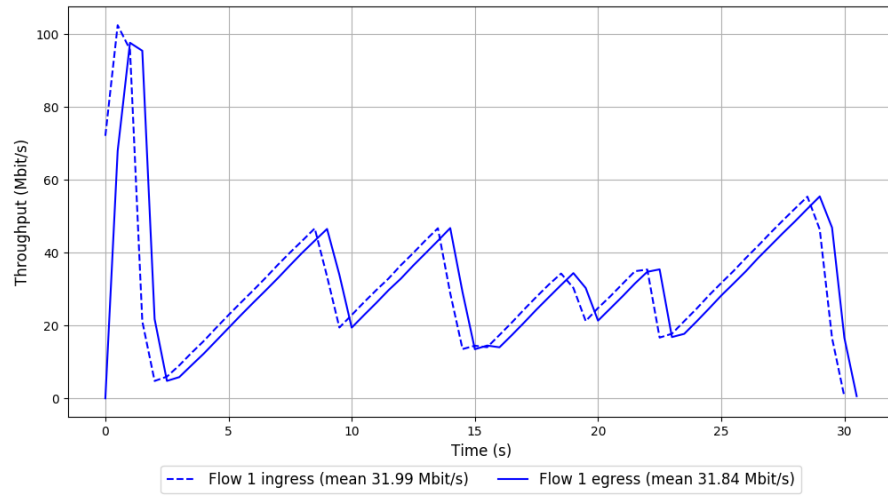


Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 21:05:06
End at: 2018-09-05 21:05:36
Local clock offset: 3.505 ms
Remote clock offset: -2.995 ms

Below is generated by plot.py at 2018-09-05 21:16:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 31.84 Mbit/s
95th percentile per-packet one-way delay: 28.514 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 31.84 Mbit/s
95th percentile per-packet one-way delay: 28.514 ms
Loss rate: 0.48%

Run 1: Report of TCP Cubic — Data Link

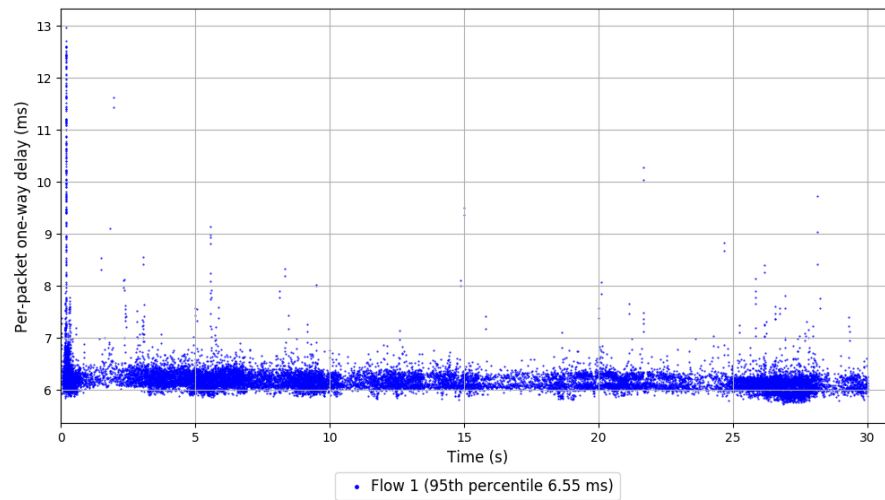
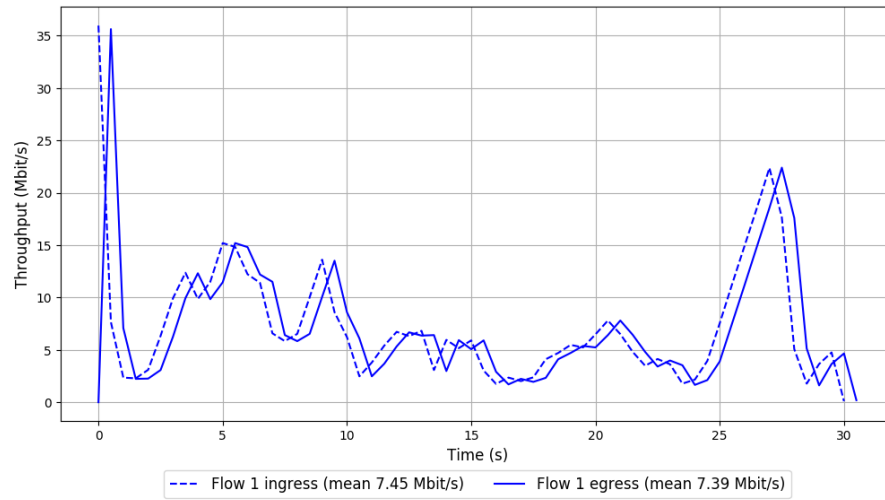


Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 21:09:51
End at: 2018-09-05 21:10:21
Local clock offset: 2.763 ms
Remote clock offset: -3.617 ms

Below is generated by plot.py at 2018-09-05 21:16:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.39 Mbit/s
95th percentile per-packet one-way delay: 6.555 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 7.39 Mbit/s
95th percentile per-packet one-way delay: 6.555 ms
Loss rate: 0.86%

Run 2: Report of TCP Cubic — Data Link

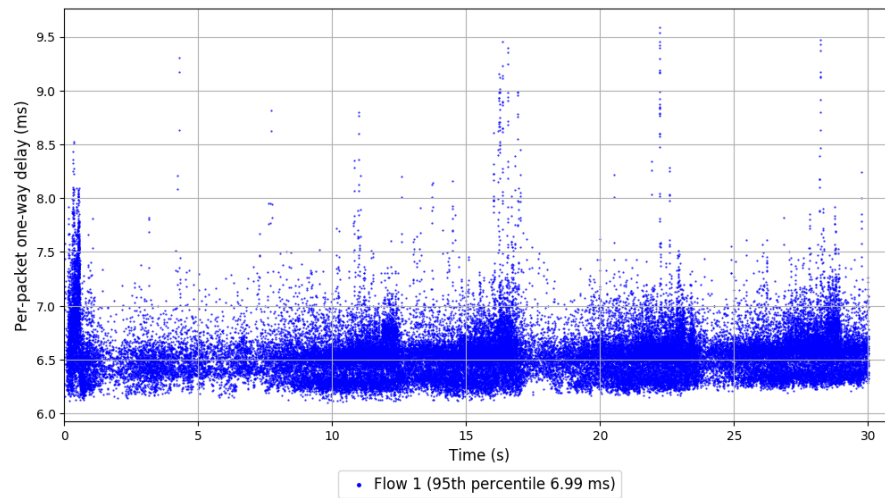
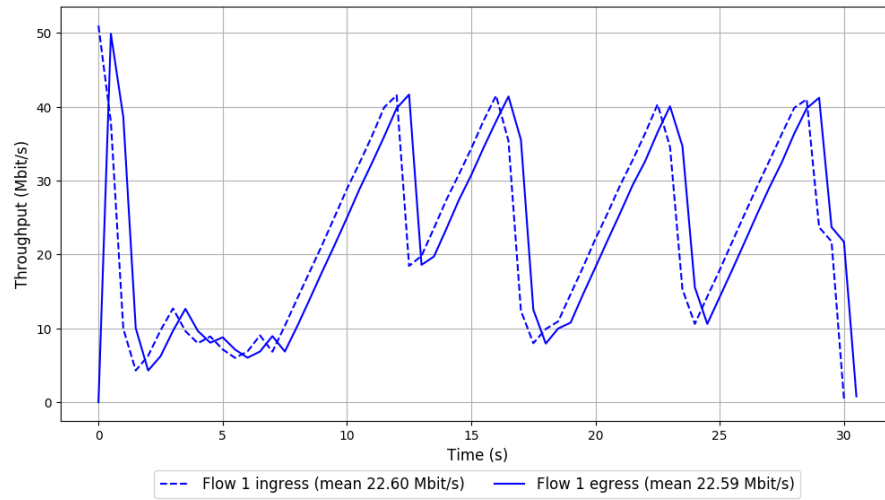


Run 3: Statistics of TCP Cubic

Start at: 2018-09-05 21:14:26
End at: 2018-09-05 21:14:56
Local clock offset: 3.855 ms
Remote clock offset: -2.593 ms

Below is generated by plot.py at 2018-09-05 21:16:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 22.59 Mbit/s
95th percentile per-packet one-way delay: 6.988 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 22.59 Mbit/s
95th percentile per-packet one-way delay: 6.988 ms
Loss rate: 0.08%

Run 3: Report of TCP Cubic — Data Link

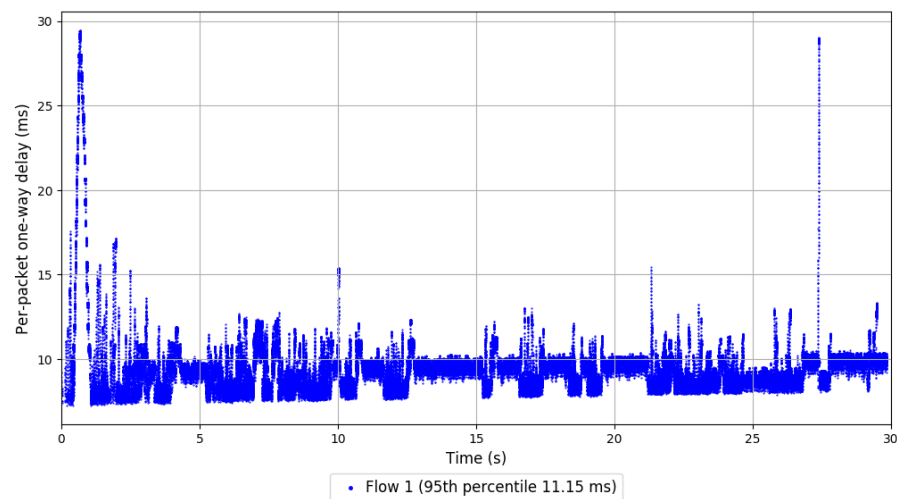
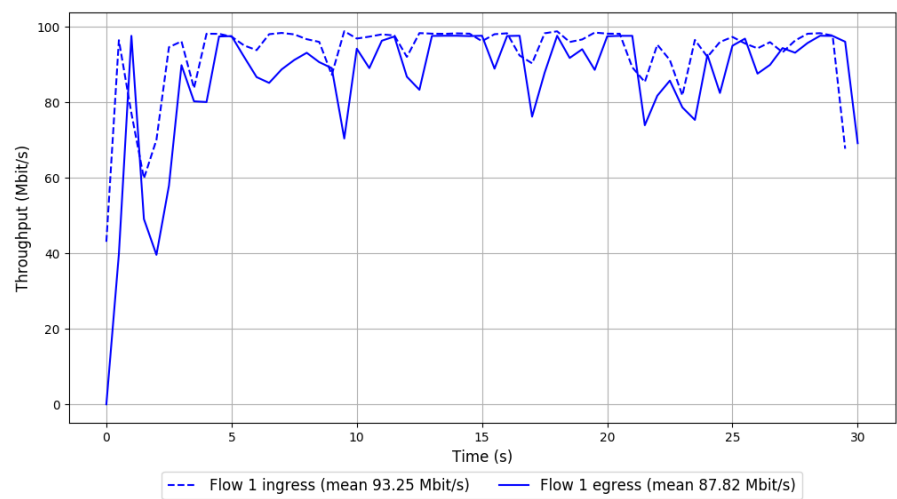


Run 1: Statistics of Indigo

Start at: 2018-09-05 21:02:48
End at: 2018-09-05 21:03:18
Local clock offset: 0.429 ms
Remote clock offset: -2.855 ms

Below is generated by plot.py at 2018-09-05 21:16:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 87.82 Mbit/s
95th percentile per-packet one-way delay: 11.150 ms
Loss rate: 5.82%
-- Flow 1:
Average throughput: 87.82 Mbit/s
95th percentile per-packet one-way delay: 11.150 ms
Loss rate: 5.82%

Run 1: Report of Indigo — Data Link

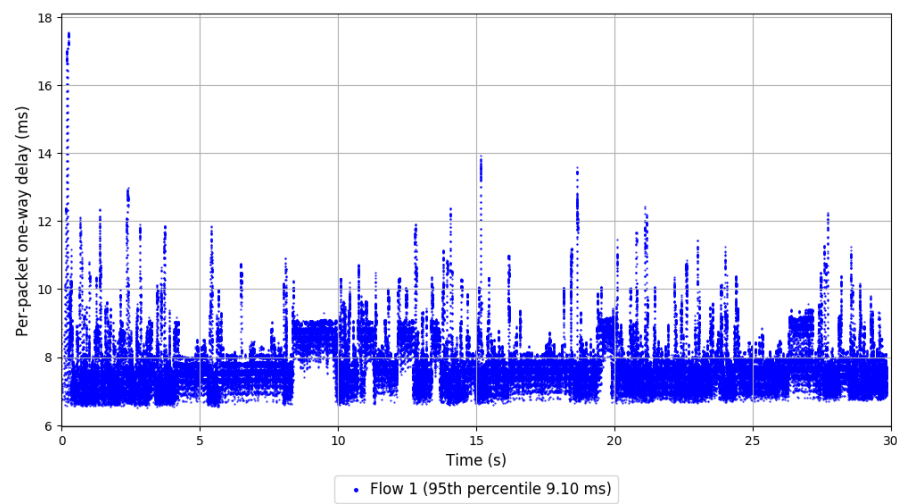
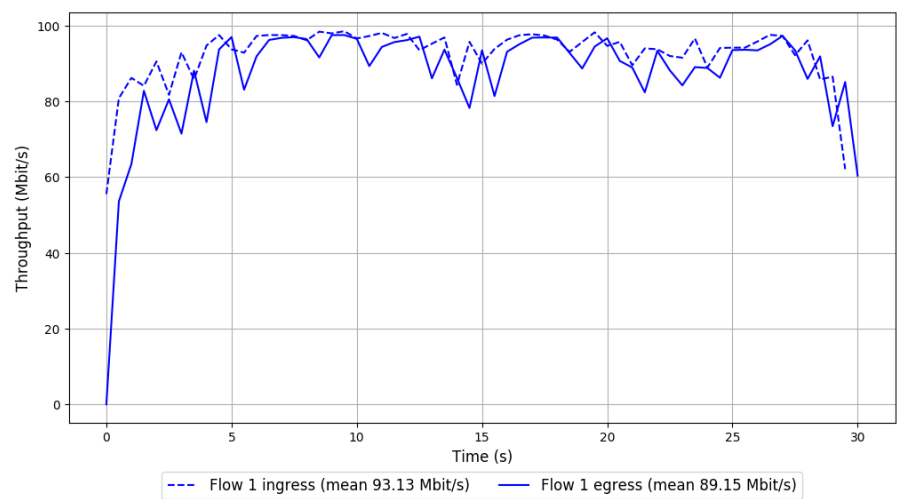


Run 2: Statistics of Indigo

Start at: 2018-09-05 21:07:27
End at: 2018-09-05 21:07:57
Local clock offset: 3.707 ms
Remote clock offset: -2.974 ms

Below is generated by plot.py at 2018-09-05 21:16:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 89.15 Mbit/s
95th percentile per-packet one-way delay: 9.096 ms
Loss rate: 4.28%
-- Flow 1:
Average throughput: 89.15 Mbit/s
95th percentile per-packet one-way delay: 9.096 ms
Loss rate: 4.28%

Run 2: Report of Indigo — Data Link

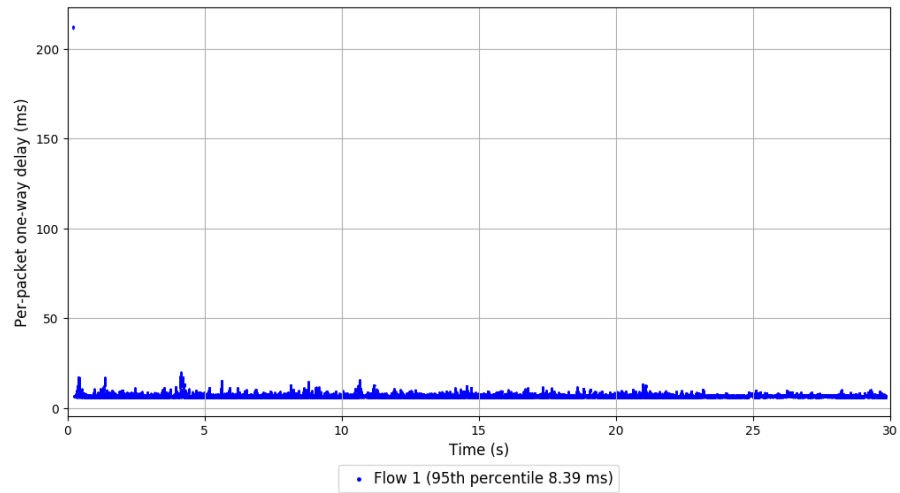
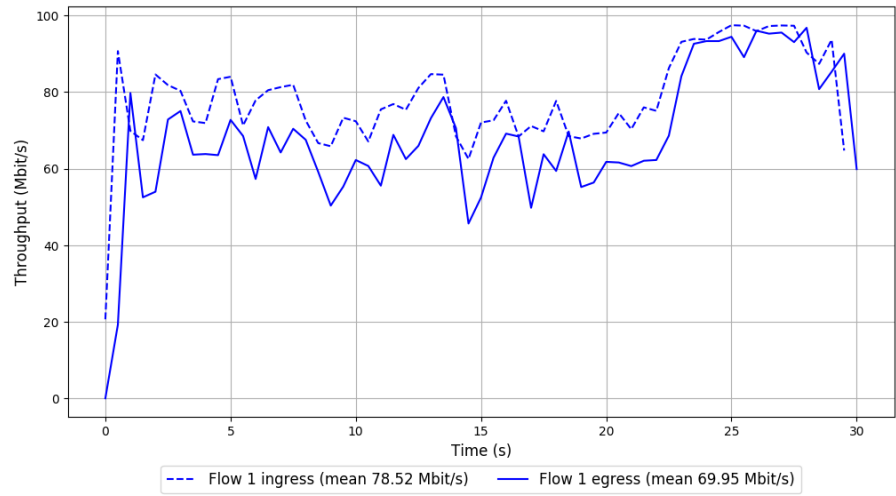


Run 3: Statistics of Indigo

Start at: 2018-09-05 21:12:07
End at: 2018-09-05 21:12:37
Local clock offset: 2.974 ms
Remote clock offset: -3.369 ms

Below is generated by plot.py at 2018-09-05 21:16:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 69.95 Mbit/s
95th percentile per-packet one-way delay: 8.386 ms
Loss rate: 11.52%
-- Flow 1:
Average throughput: 69.95 Mbit/s
95th percentile per-packet one-way delay: 8.386 ms
Loss rate: 11.52%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-05 21:03:58

End at: 2018-09-05 21:04:28

Local clock offset: 4.198 ms

Remote clock offset: -2.676 ms

Below is generated by plot.py at 2018-09-05 21:16:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 72.60 Mbit/s

95th percentile per-packet one-way delay: 6.223 ms

Loss rate: 1.84%

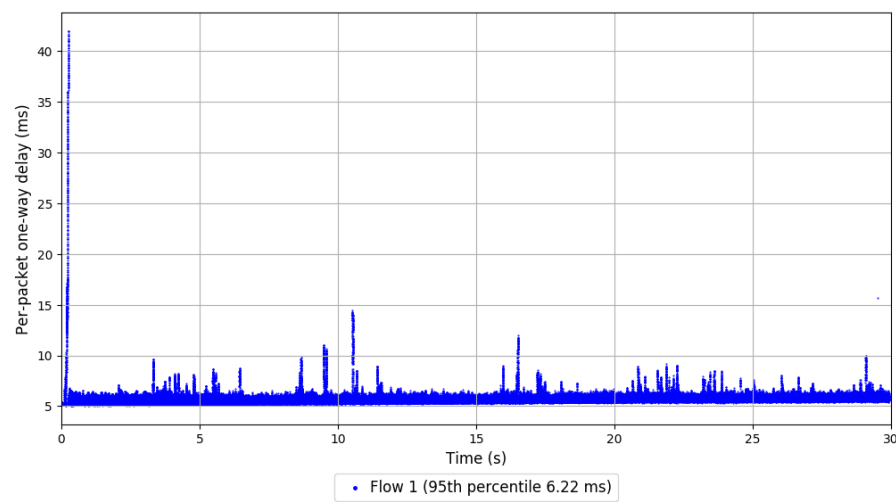
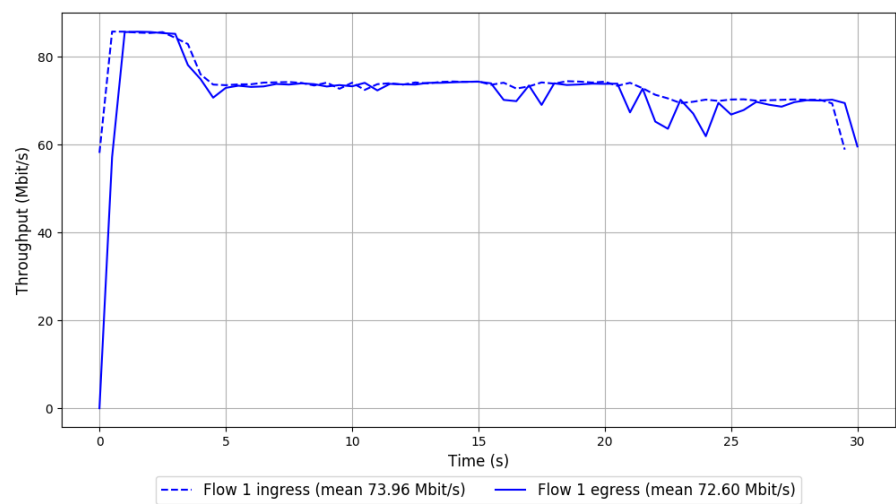
-- Flow 1:

Average throughput: 72.60 Mbit/s

95th percentile per-packet one-way delay: 6.223 ms

Loss rate: 1.84%

Run 1: Report of Muses-25 — Data Link

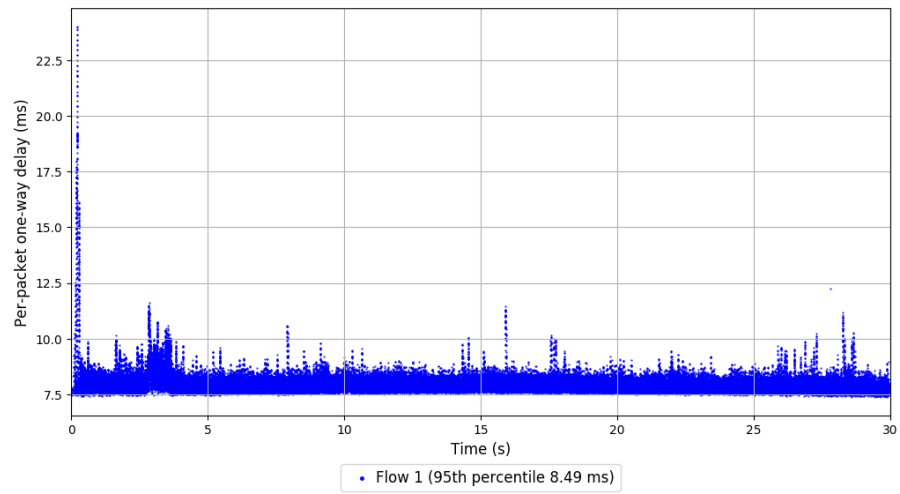
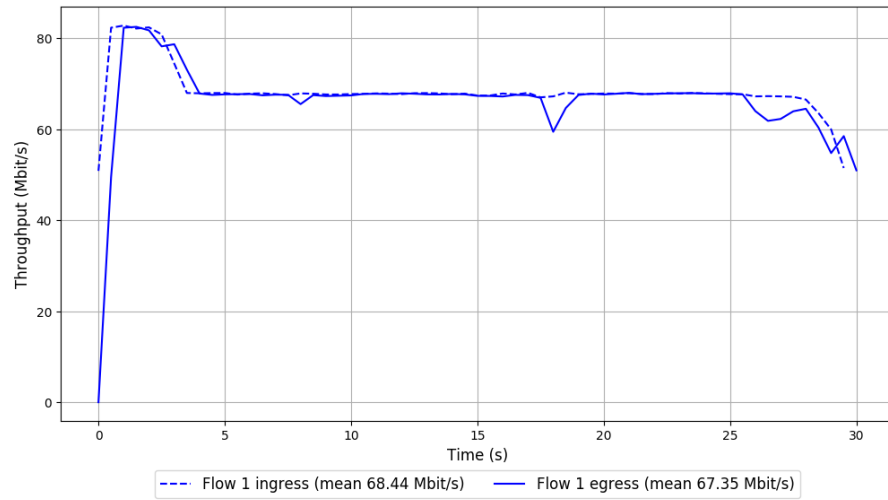


Run 2: Statistics of Muses-25

Start at: 2018-09-05 21:08:41
End at: 2018-09-05 21:09:11
Local clock offset: 3.086 ms
Remote clock offset: -3.169 ms

Below is generated by plot.py at 2018-09-05 21:16:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 67.35 Mbit/s
95th percentile per-packet one-way delay: 8.489 ms
Loss rate: 1.59%
-- Flow 1:
Average throughput: 67.35 Mbit/s
95th percentile per-packet one-way delay: 8.489 ms
Loss rate: 1.59%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-05 21:13:17
End at: 2018-09-05 21:13:47
Local clock offset: 3.585 ms
Remote clock offset: -3.205 ms

Below is generated by plot.py at 2018-09-05 21:16:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 71.08 Mbit/s
95th percentile per-packet one-way delay: 7.388 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 71.08 Mbit/s
95th percentile per-packet one-way delay: 7.388 ms
Loss rate: 1.03%

Run 3: Report of Muses-25 — Data Link

