

Pantheon Report

Generated at 2018-08-28 08:55:49 (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.

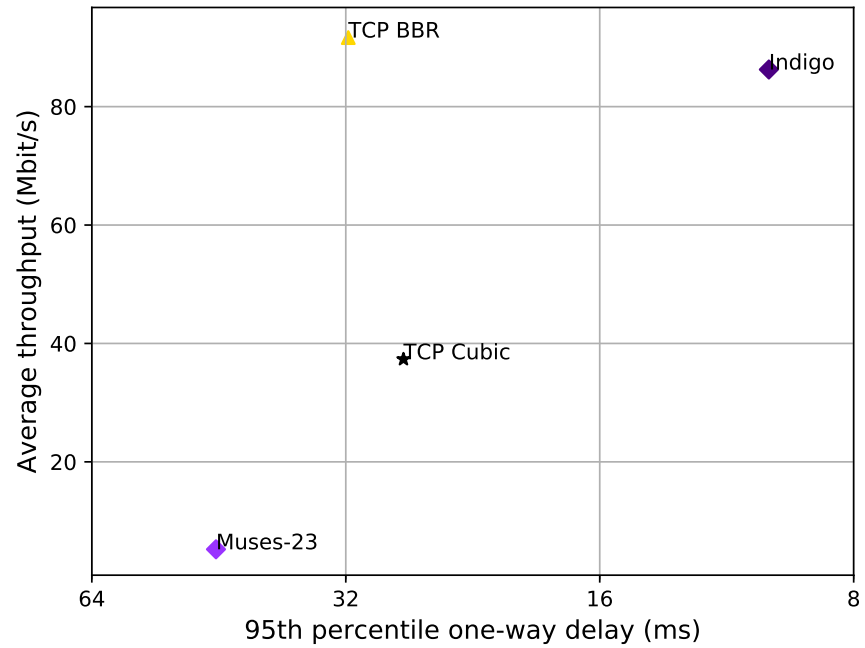
System info:

```
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
```

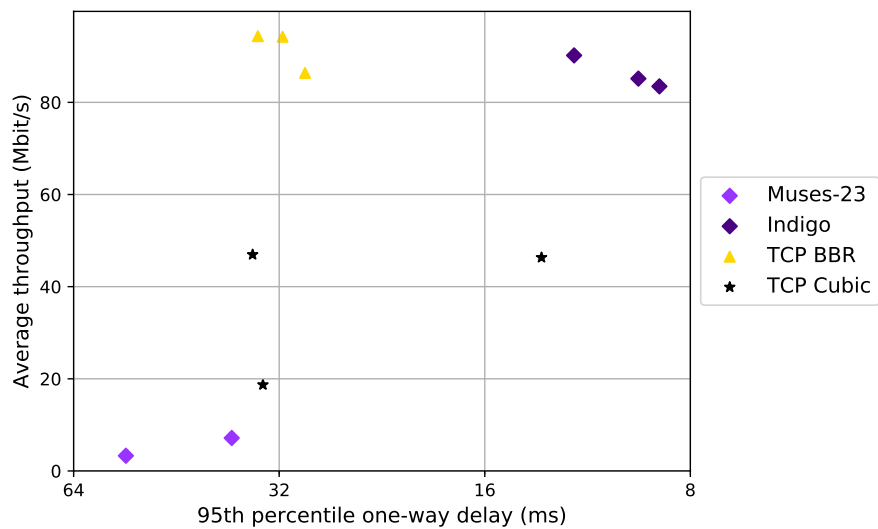
Git summary:

```
branch: muses-23 @ 88af05c5b0b7531637ca401951507a2fde628df6
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e562f4
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	91.66	31.78	4.10
TCP Cubic	3	37.33	27.34	0.33
Indigo	3	86.27	10.08	3.25
Muses-23	2	5.23	45.60	85.15

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 08:43:46

End at: 2018-08-28 08:44:16

Local clock offset: -0.908 ms

Remote clock offset: -6.804 ms

Below is generated by plot.py at 2018-08-28 08:55:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 86.39 Mbit/s

95th percentile per-packet one-way delay: 29.328 ms

Loss rate: 6.86%

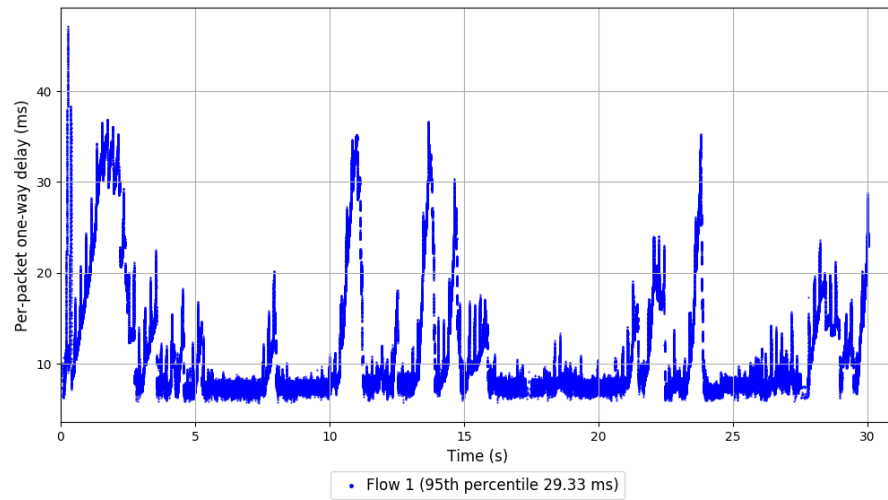
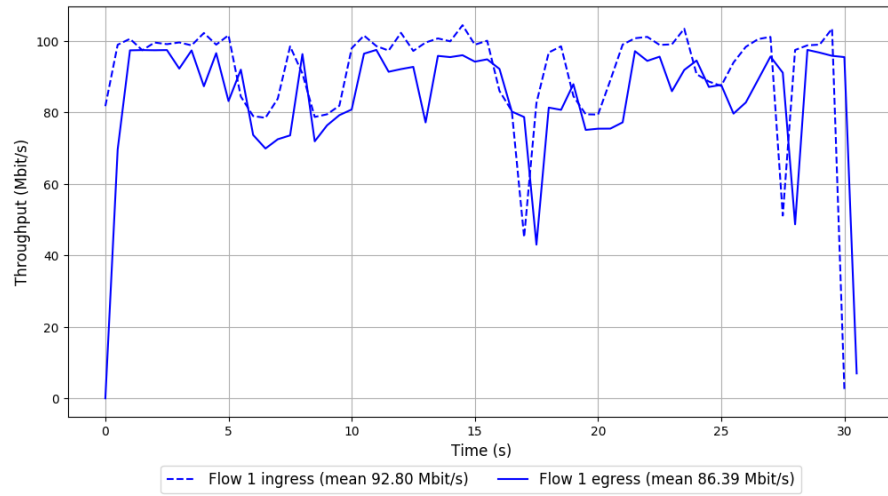
-- Flow 1:

Average throughput: 86.39 Mbit/s

95th percentile per-packet one-way delay: 29.328 ms

Loss rate: 6.86%

Run 1: Report of TCP BBR — Data Link

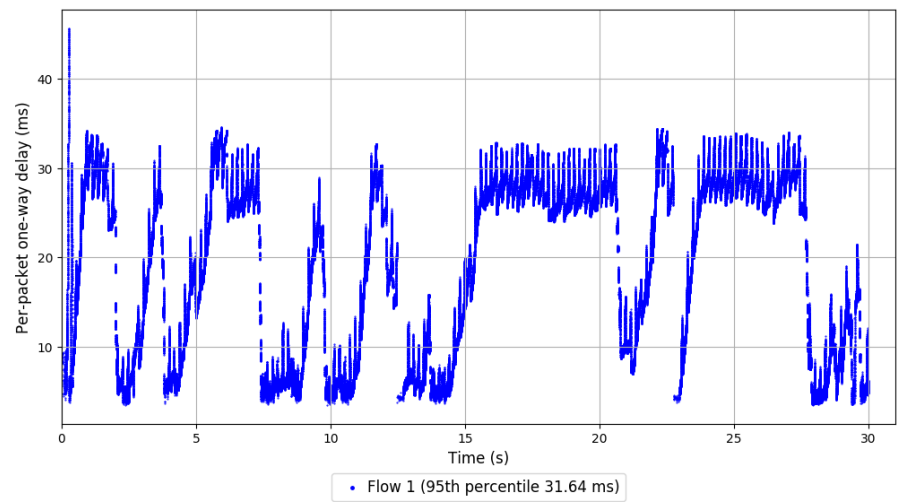
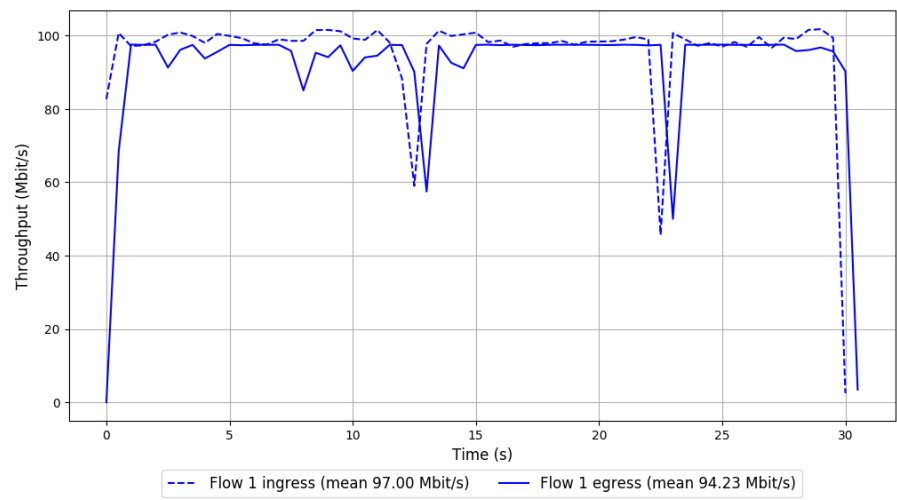


Run 2: Statistics of TCP BBR

Start at: 2018-08-28 08:48:16
End at: 2018-08-28 08:48:46
Local clock offset: -5.029 ms
Remote clock offset: -13.15 ms

Below is generated by plot.py at 2018-08-28 08:55:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 94.23 Mbit/s
95th percentile per-packet one-way delay: 31.637 ms
Loss rate: 2.87%
-- Flow 1:
Average throughput: 94.23 Mbit/s
95th percentile per-packet one-way delay: 31.637 ms
Loss rate: 2.87%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-08-28 08:52:45

End at: 2018-08-28 08:53:15

Local clock offset: 1.064 ms

Remote clock offset: -6.793 ms

Below is generated by plot.py at 2018-08-28 08:55:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 94.37 Mbit/s

95th percentile per-packet one-way delay: 34.384 ms

Loss rate: 2.58%

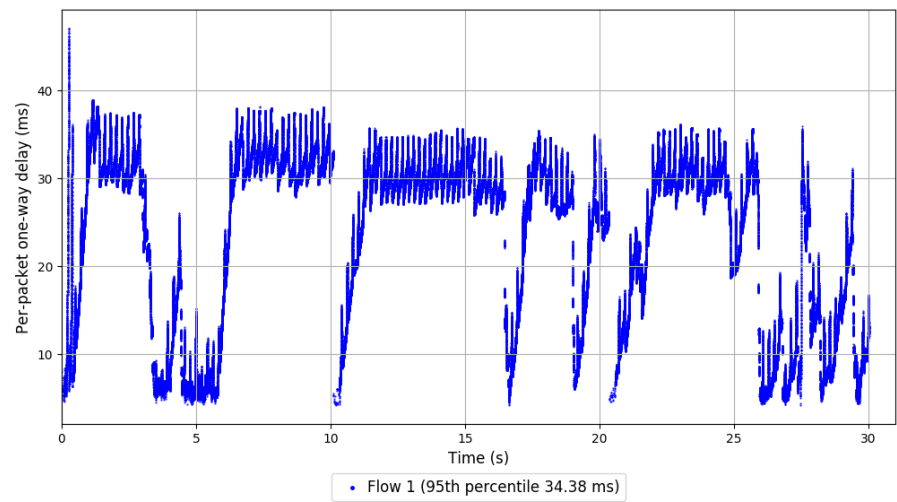
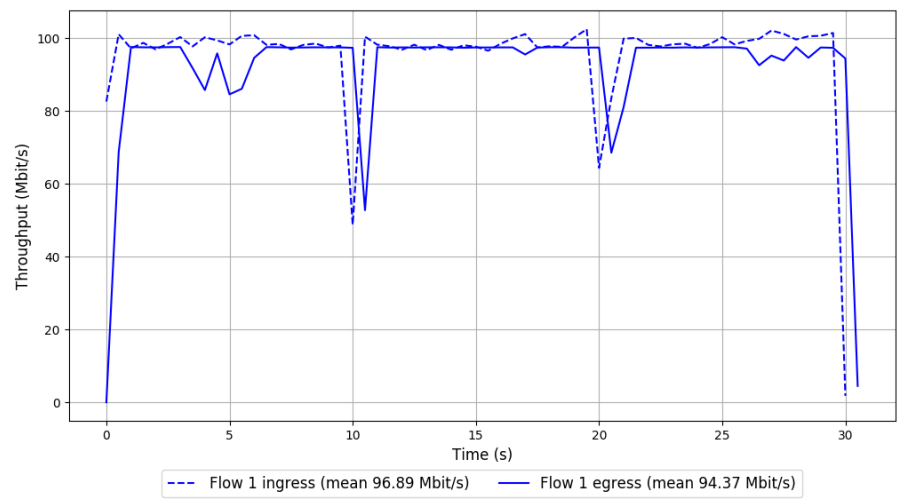
-- Flow 1:

Average throughput: 94.37 Mbit/s

95th percentile per-packet one-way delay: 34.384 ms

Loss rate: 2.58%

Run 3: Report of TCP BBR — Data Link

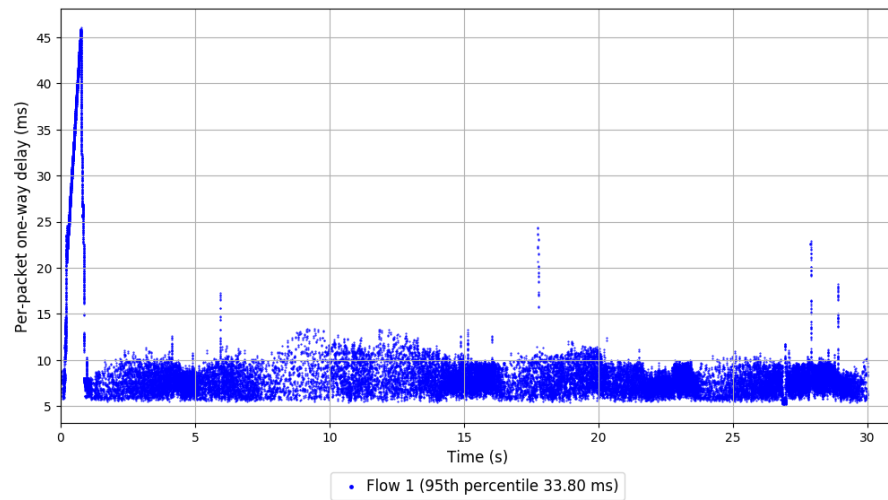
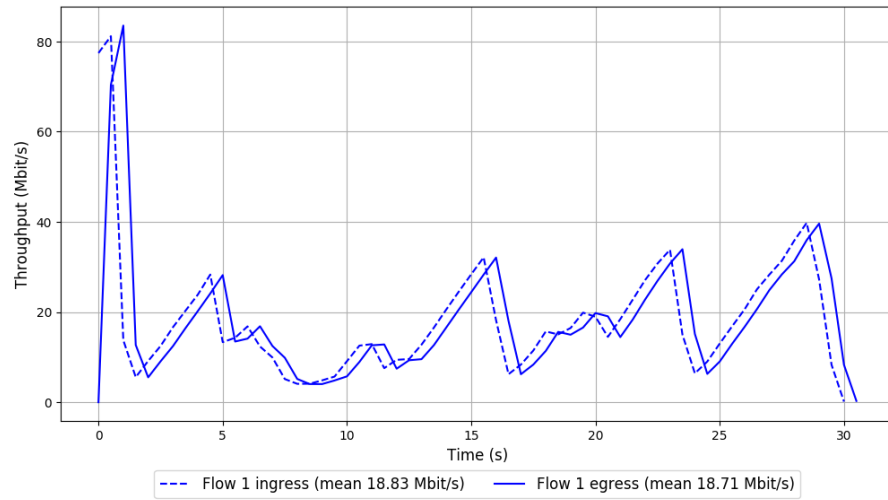


Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 08:44:55
End at: 2018-08-28 08:45:25
Local clock offset: 0.193 ms
Remote clock offset: -7.079 ms

Below is generated by plot.py at 2018-08-28 08:55:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 18.71 Mbit/s
95th percentile per-packet one-way delay: 33.804 ms
Loss rate: 0.65%
-- Flow 1:
Average throughput: 18.71 Mbit/s
95th percentile per-packet one-way delay: 33.804 ms
Loss rate: 0.65%

Run 1: Report of TCP Cubic — Data Link

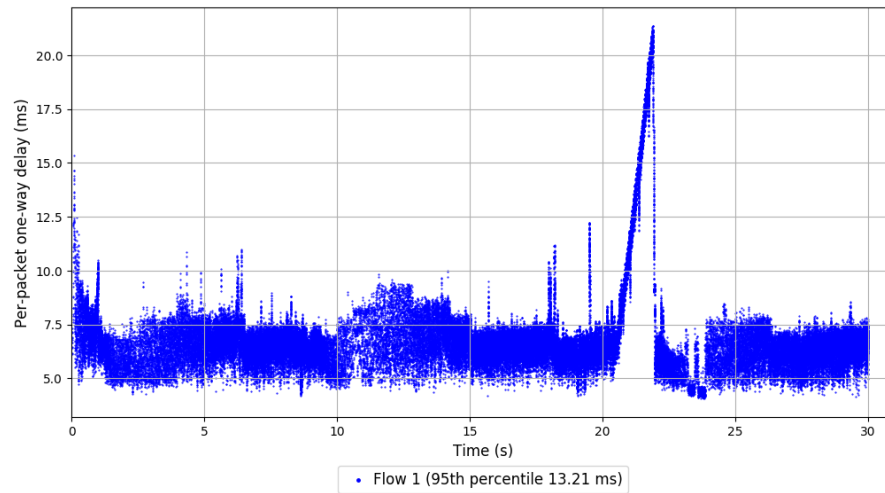
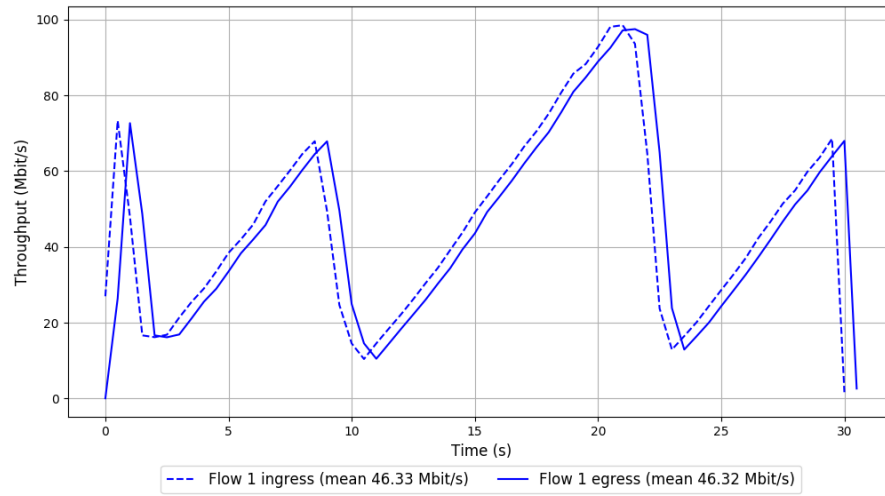


Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 08:49:26
End at: 2018-08-28 08:49:56
Local clock offset: 1.193 ms
Remote clock offset: -6.107 ms

Below is generated by plot.py at 2018-08-28 08:55:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 46.32 Mbit/s
95th percentile per-packet one-way delay: 13.214 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 46.32 Mbit/s
95th percentile per-packet one-way delay: 13.214 ms
Loss rate: 0.03%

Run 2: Report of TCP Cubic — Data Link

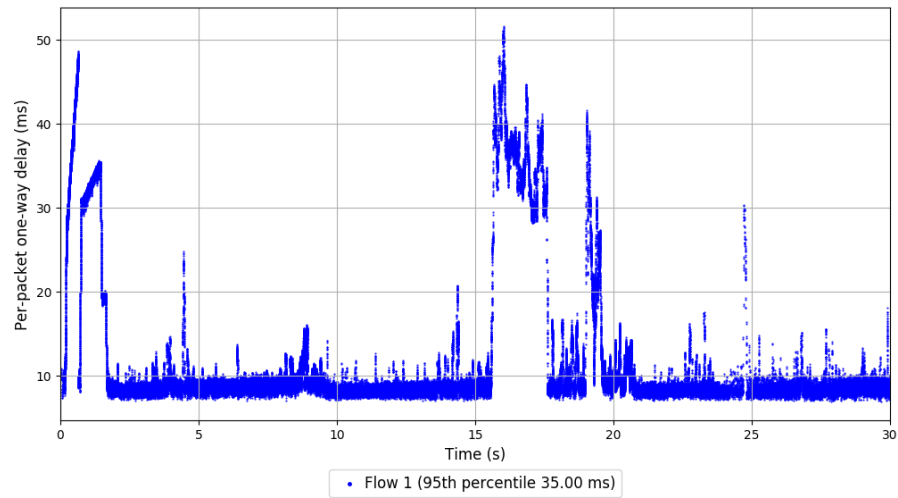
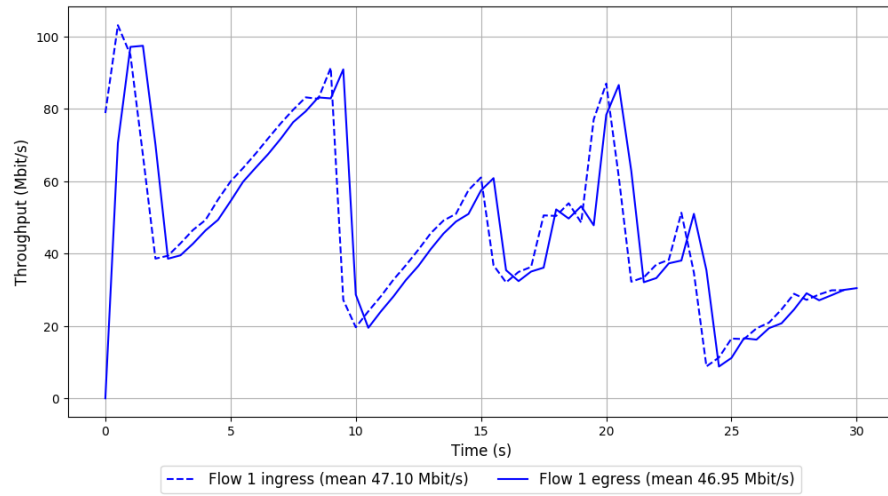


Run 3: Statistics of TCP Cubic

Start at: 2018-08-28 08:53:54
End at: 2018-08-28 08:54:24
Local clock offset: -1.074 ms
Remote clock offset: -5.959 ms

Below is generated by plot.py at 2018-08-28 08:55:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 46.95 Mbit/s
95th percentile per-packet one-way delay: 35.000 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 46.95 Mbit/s
95th percentile per-packet one-way delay: 35.000 ms
Loss rate: 0.31%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-08-28 08:42:37

End at: 2018-08-28 08:43:08

Local clock offset: 0.62 ms

Remote clock offset: -3.576 ms

Below is generated by plot.py at 2018-08-28 08:55:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 90.19 Mbit/s

95th percentile per-packet one-way delay: 11.839 ms

Loss rate: 3.24%

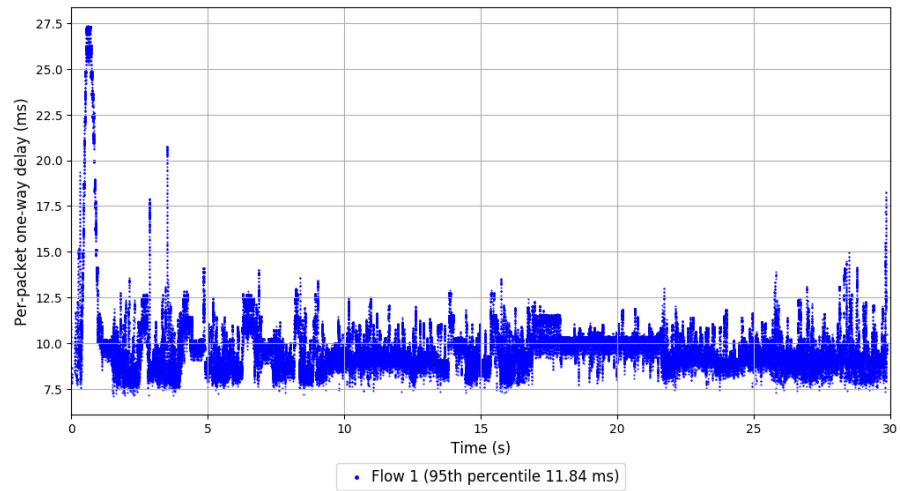
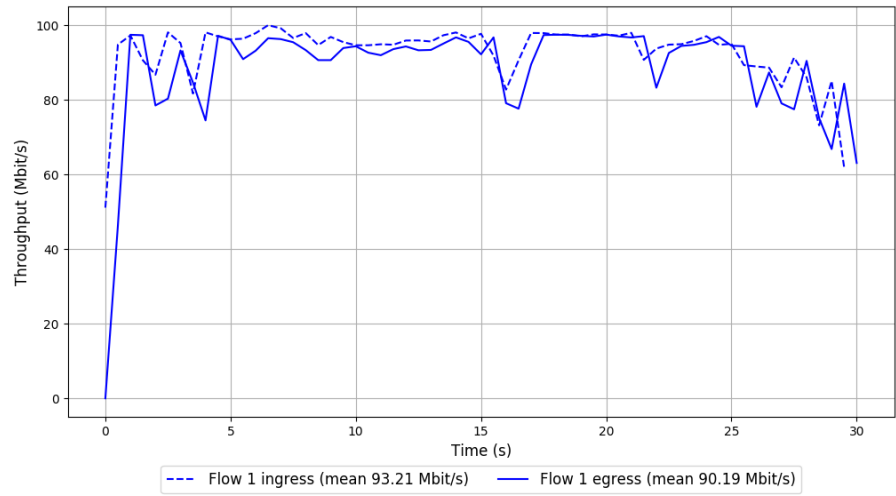
-- Flow 1:

Average throughput: 90.19 Mbit/s

95th percentile per-packet one-way delay: 11.839 ms

Loss rate: 3.24%

Run 1: Report of Indigo — Data Link

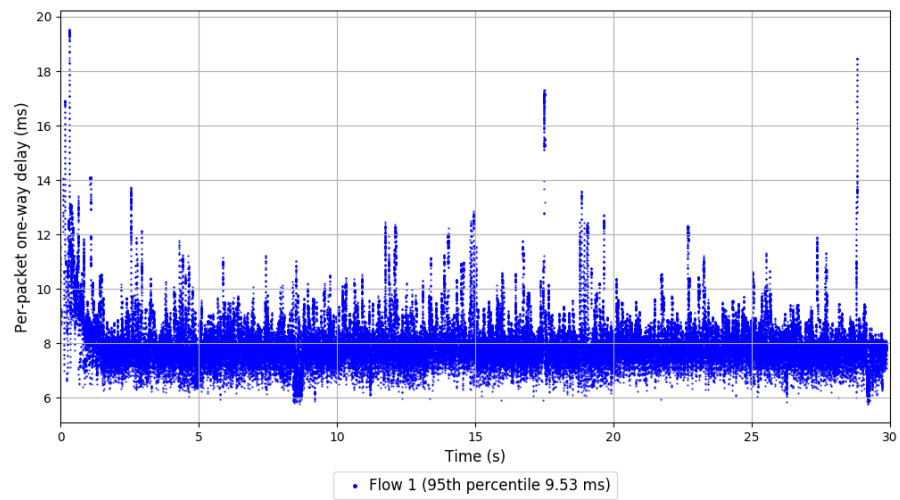
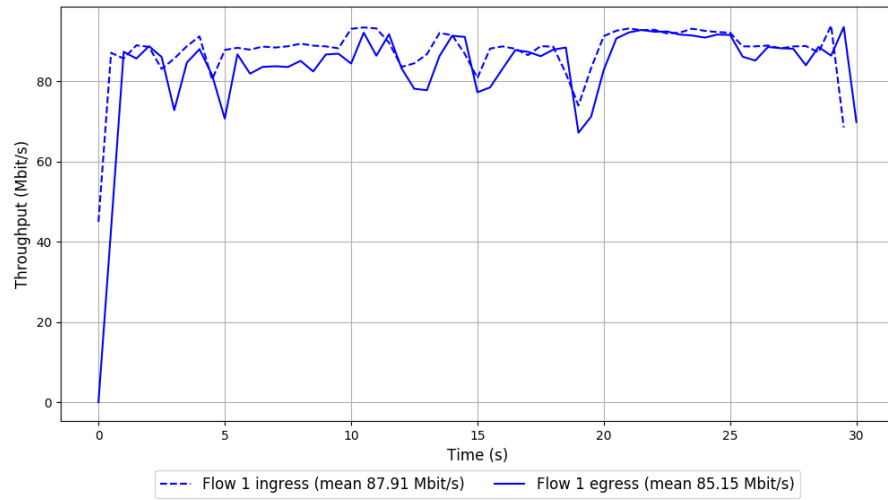


Run 2: Statistics of Indigo

Start at: 2018-08-28 08:47:05
End at: 2018-08-28 08:47:35
Local clock offset: 1.39 ms
Remote clock offset: -5.334 ms

Below is generated by plot.py at 2018-08-28 08:55:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 85.15 Mbit/s
95th percentile per-packet one-way delay: 9.532 ms
Loss rate: 3.15%
-- Flow 1:
Average throughput: 85.15 Mbit/s
95th percentile per-packet one-way delay: 9.532 ms
Loss rate: 3.15%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-08-28 08:51:36

End at: 2018-08-28 08:52:06

Local clock offset: -0.3 ms

Remote clock offset: -6.735 ms

Below is generated by plot.py at 2018-08-28 08:55:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 83.47 Mbit/s

95th percentile per-packet one-way delay: 8.880 ms

Loss rate: 3.37%

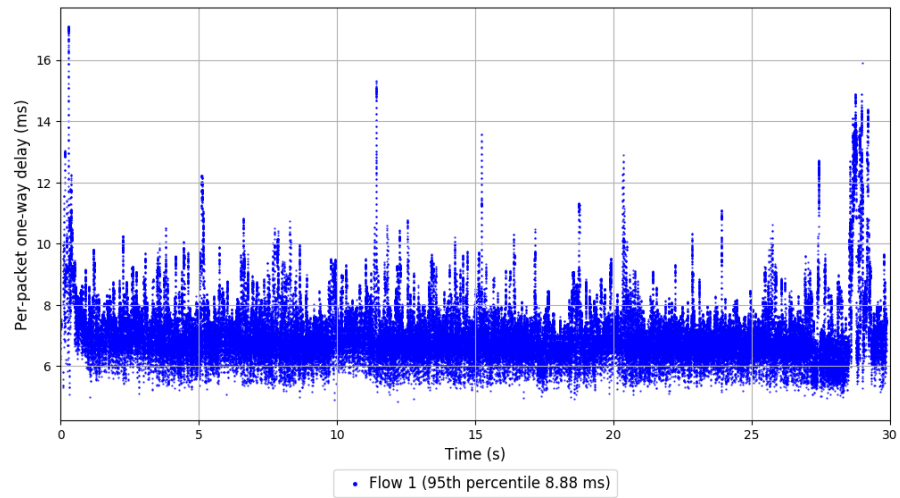
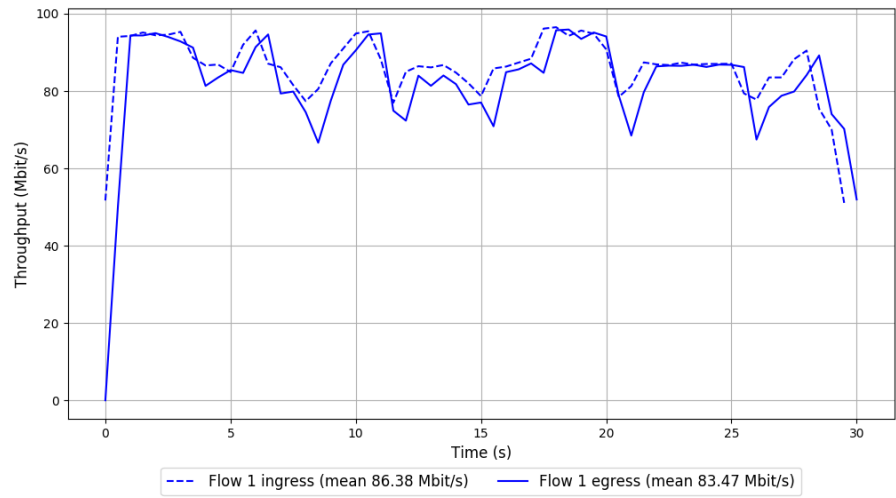
-- Flow 1:

Average throughput: 83.47 Mbit/s

95th percentile per-packet one-way delay: 8.880 ms

Loss rate: 3.37%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-23

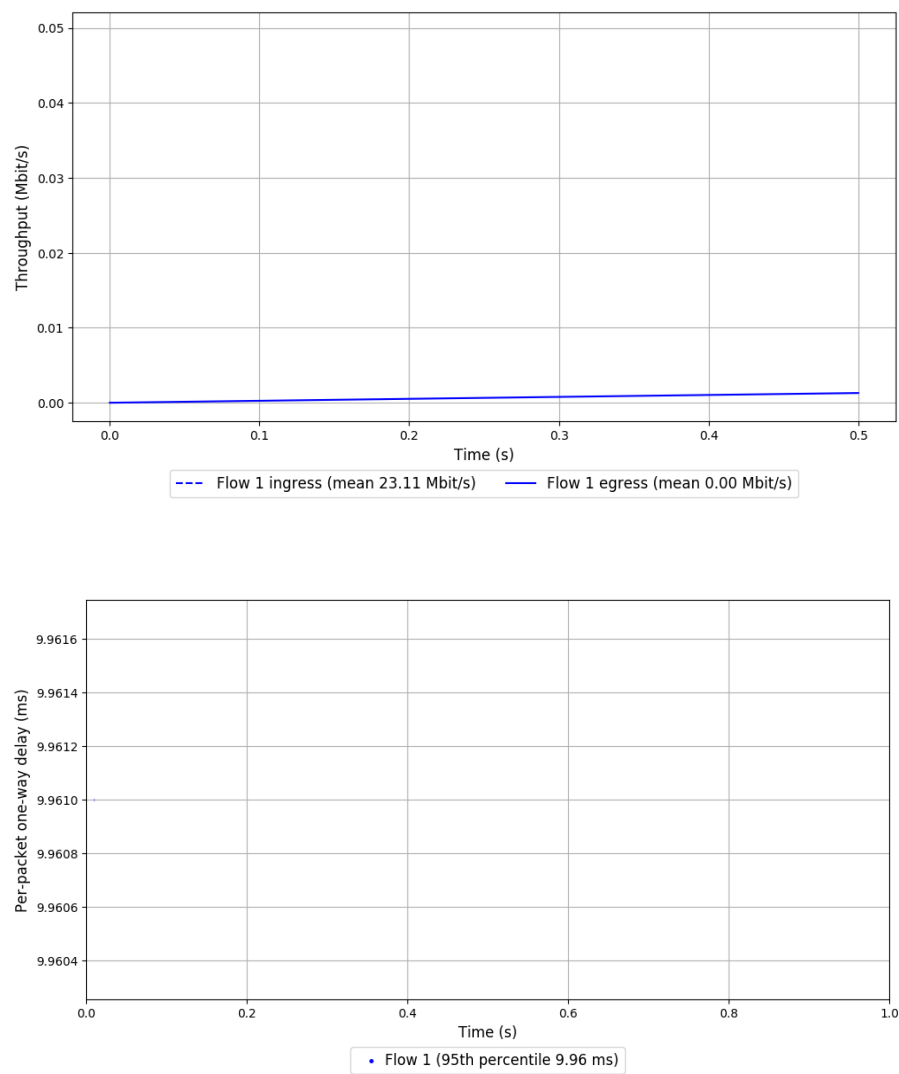
Start at: 2018-08-28 08:41:33

End at: 2018-08-28 08:42:03

Local clock offset: 0.181 ms

Remote clock offset: -3.792 ms

Run 1: Report of Muses-23 — Data Link

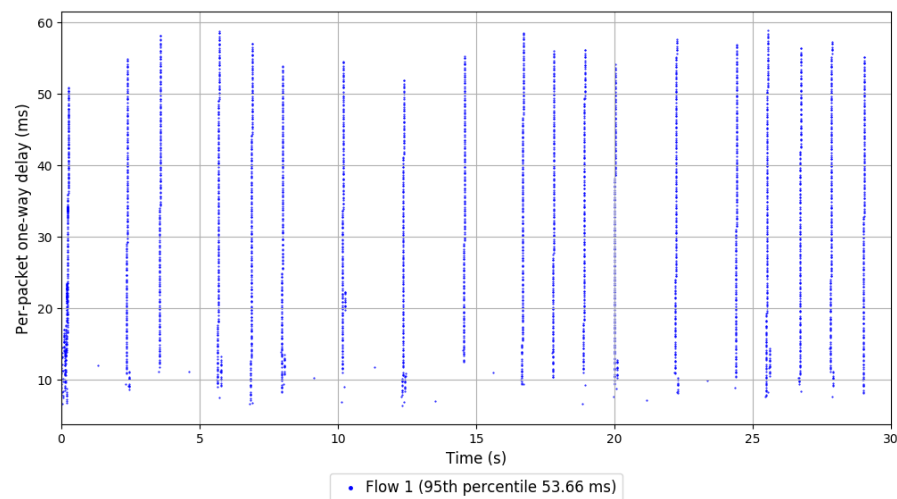
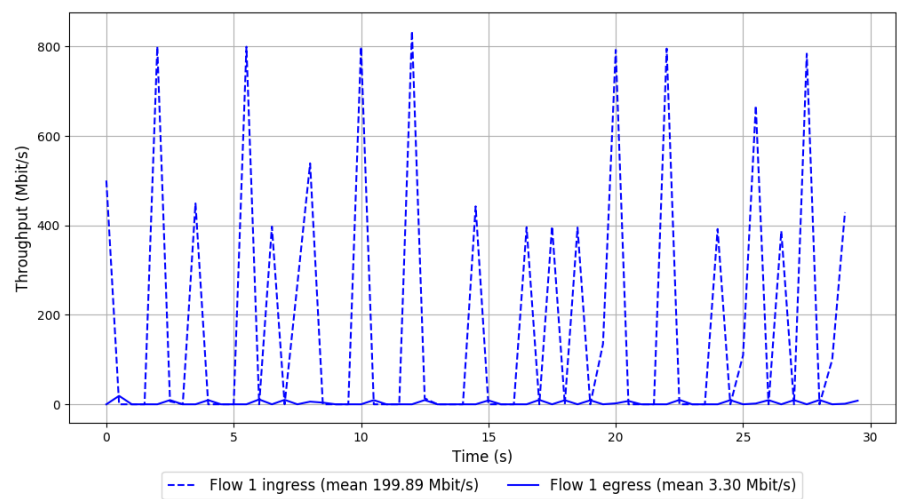


Run 2: Statistics of Muses-23

Start at: 2018-08-28 08:46:00
End at: 2018-08-28 08:46:30
Local clock offset: 0.417 ms
Remote clock offset: -6.173 ms

Below is generated by plot.py at 2018-08-28 08:55:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.30 Mbit/s
95th percentile per-packet one-way delay: 53.657 ms
Loss rate: 98.35%
-- Flow 1:
Average throughput: 3.30 Mbit/s
95th percentile per-packet one-way delay: 53.657 ms
Loss rate: 98.35%

Run 2: Report of Muses-23 — Data Link



Run 3: Statistics of Muses-23

Start at: 2018-08-28 08:50:32
End at: 2018-08-28 08:51:02
Local clock offset: 0.165 ms
Remote clock offset: -5.807 ms

Below is generated by plot.py at 2018-08-28 08:55:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.16 Mbit/s
95th percentile per-packet one-way delay: 37.553 ms
Loss rate: 71.95%
-- Flow 1:
Average throughput: 7.16 Mbit/s
95th percentile per-packet one-way delay: 37.553 ms
Loss rate: 71.95%

Run 3: Report of Muses-23 — Data Link

