

Pantheon Report

Generated at 2018-09-05 21:16:38 (UTC).

Data path: AWS Brazil 1 on `ens5` (*local*) → Brazil on `p4p1` (*remote*).

Repeated the test of 4 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

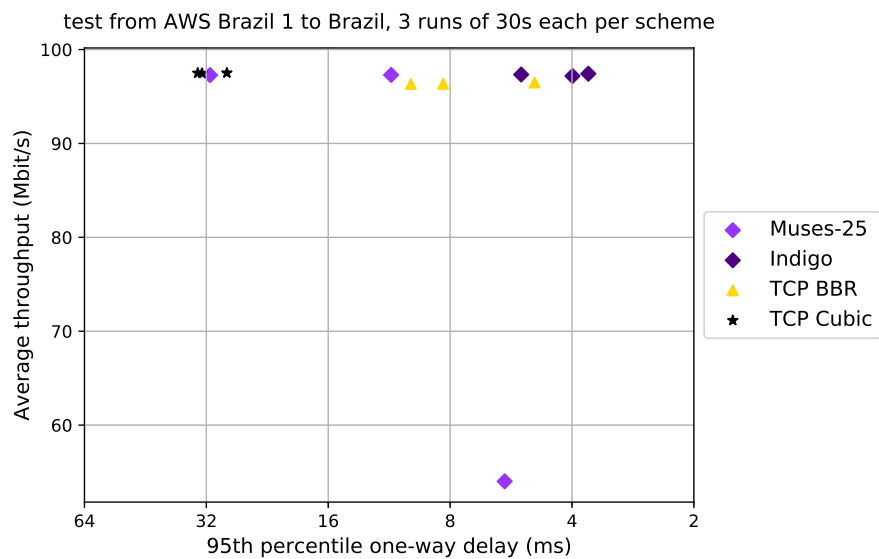
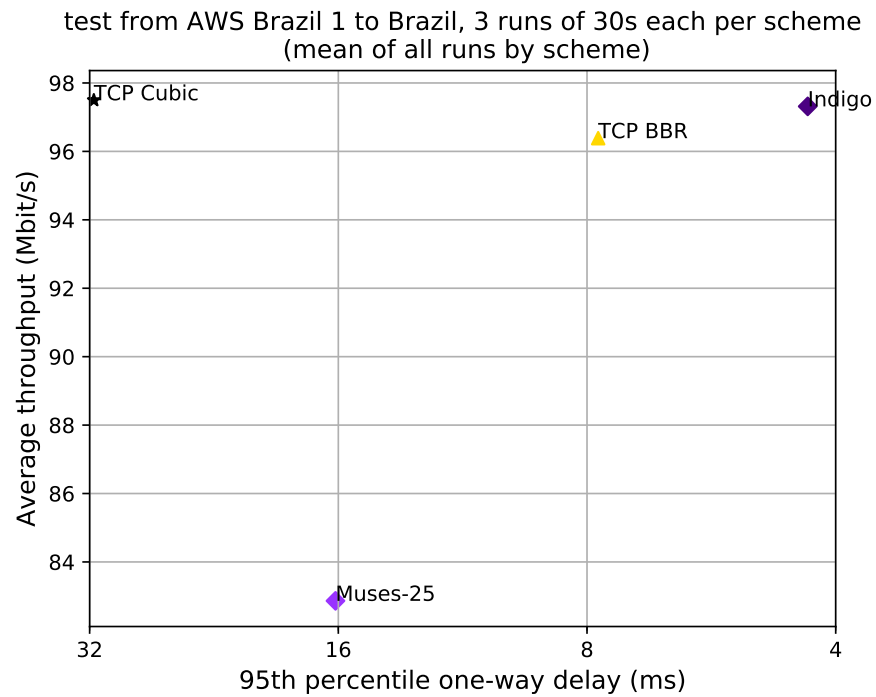
NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

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 @ d0153f8e594aa89e93b032143cedbdf58e562f4
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
```



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	96.39	7.75	0.00
TCP Cubic	3	97.49	31.63	0.01
Indigo	3	97.31	4.32	0.00
Muses-25	3	82.86	16.13	3.60

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 21:02:46

End at: 2018-09-05 21:03:16

Local clock offset: 3.605 ms

Remote clock offset: 0.099 ms

Below is generated by plot.py at 2018-09-05 21:16:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.32 Mbit/s

95th percentile per-packet one-way delay: 9.998 ms

Loss rate: 0.00%

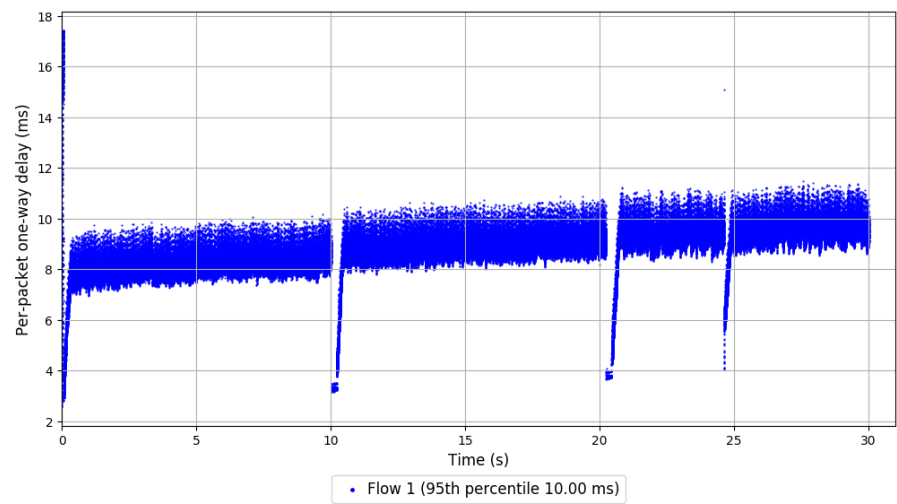
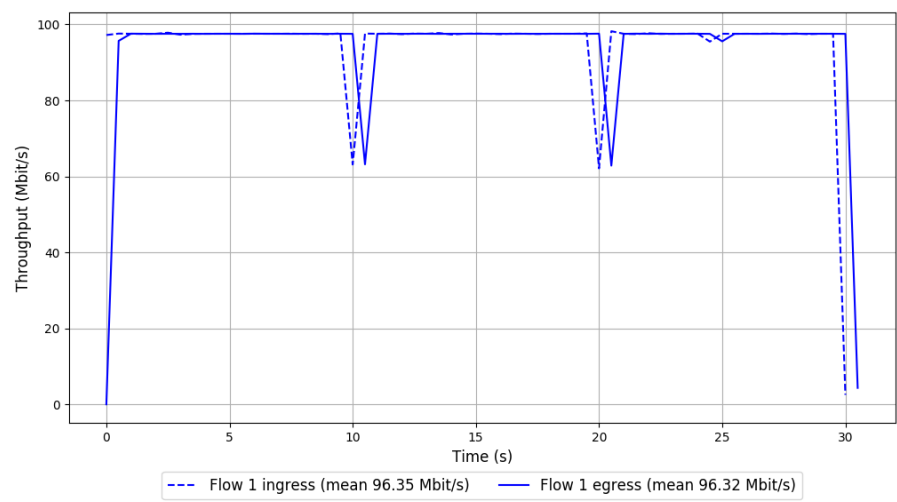
-- Flow 1:

Average throughput: 96.32 Mbit/s

95th percentile per-packet one-way delay: 9.998 ms

Loss rate: 0.00%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 21:07:18

End at: 2018-09-05 21:07:48

Local clock offset: 8.005 ms

Remote clock offset: 0.149 ms

Below is generated by plot.py at 2018-09-05 21:16:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.35 Mbit/s

95th percentile per-packet one-way delay: 8.318 ms

Loss rate: 0.00%

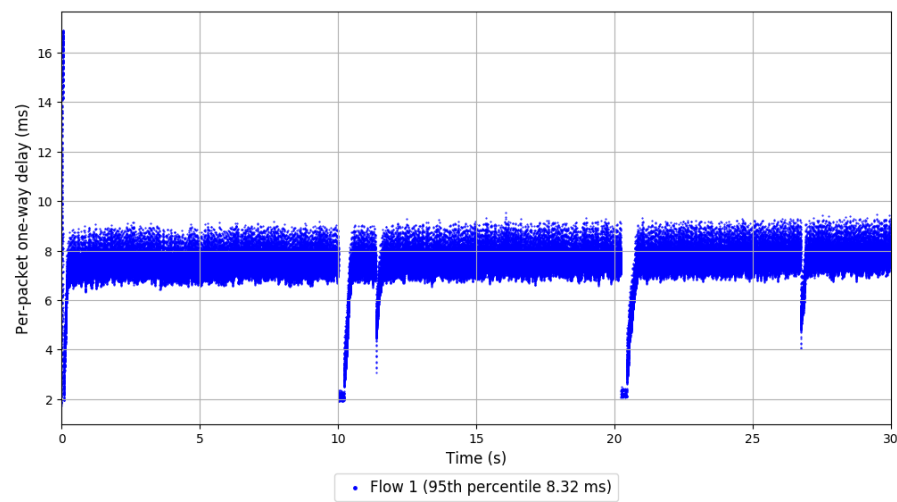
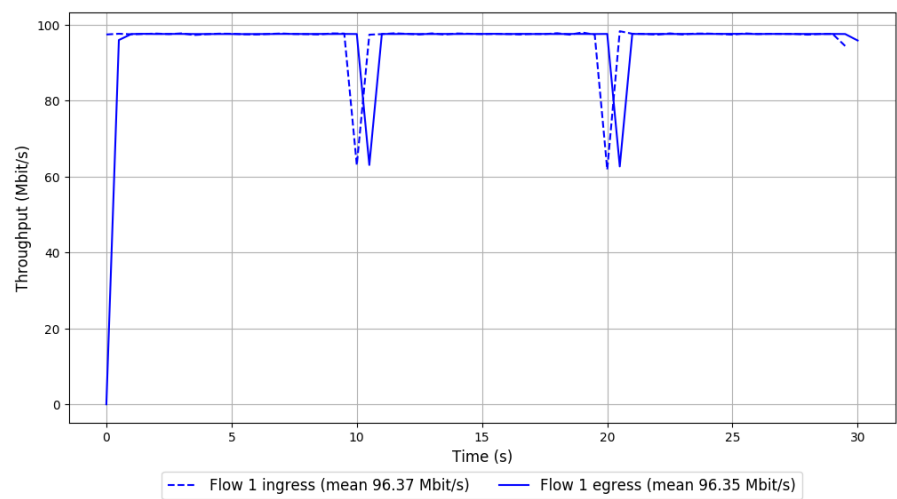
-- Flow 1:

Average throughput: 96.35 Mbit/s

95th percentile per-packet one-way delay: 8.318 ms

Loss rate: 0.00%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-09-05 21:11:51

End at: 2018-09-05 21:12:21

Local clock offset: 6.598 ms

Remote clock offset: 0.124 ms

Below is generated by plot.py at 2018-09-05 21:16:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.49 Mbit/s

95th percentile per-packet one-way delay: 4.948 ms

Loss rate: 0.00%

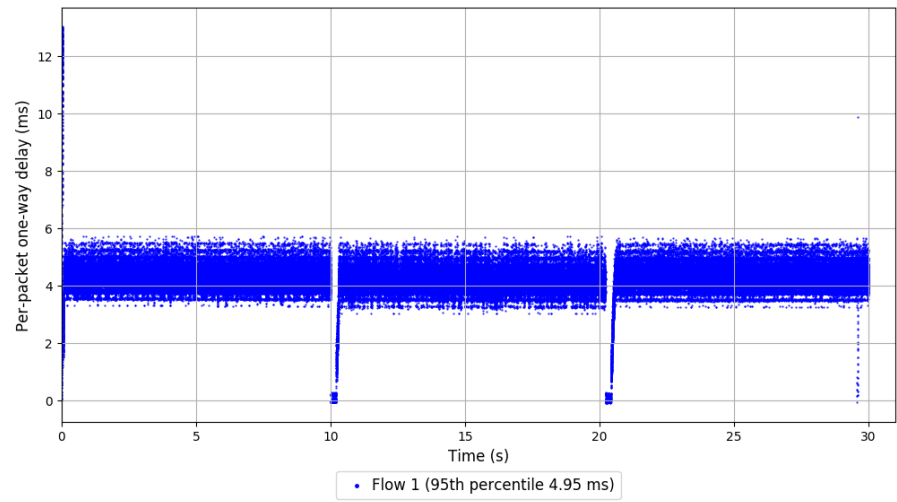
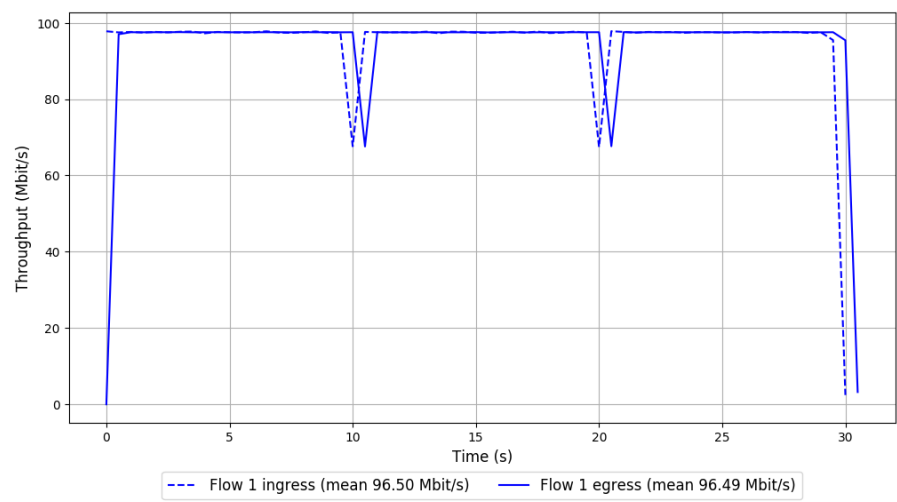
-- Flow 1:

Average throughput: 96.49 Mbit/s

95th percentile per-packet one-way delay: 4.948 ms

Loss rate: 0.00%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

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

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

Local clock offset: -0.133 ms

Remote clock offset: 0.193 ms

Below is generated by plot.py at 2018-09-05 21:16:08

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.50 Mbit/s

95th percentile per-packet one-way delay: 33.607 ms

Loss rate: 0.01%

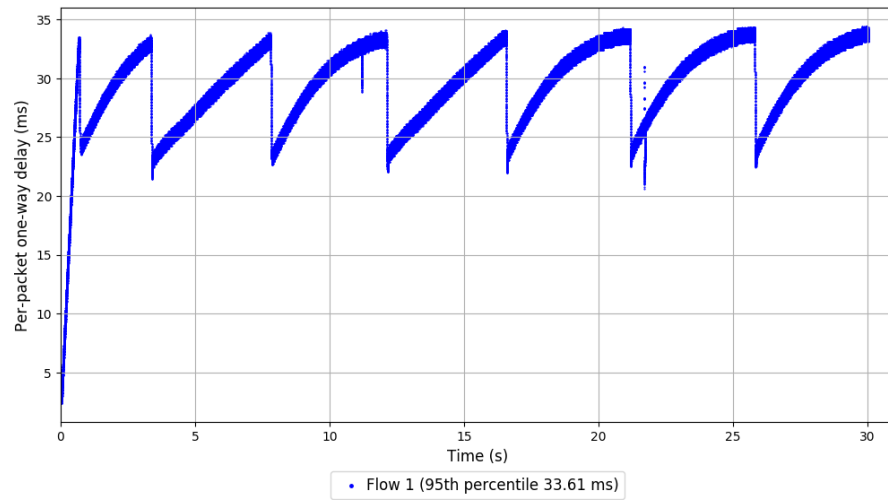
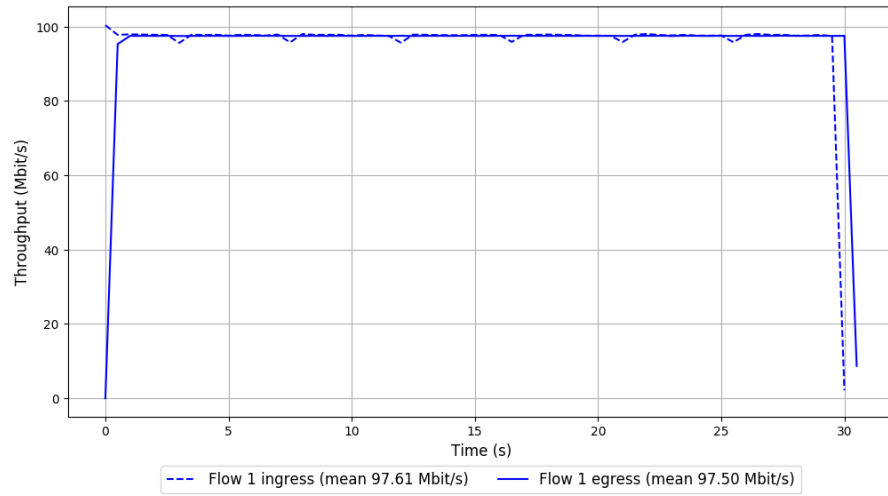
-- Flow 1:

Average throughput: 97.50 Mbit/s

95th percentile per-packet one-way delay: 33.607 ms

Loss rate: 0.01%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 21:06:10

End at: 2018-09-05 21:06:40

Local clock offset: 6.868 ms

Remote clock offset: 0.208 ms

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

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.47 Mbit/s

95th percentile per-packet one-way delay: 32.799 ms

Loss rate: 0.01%

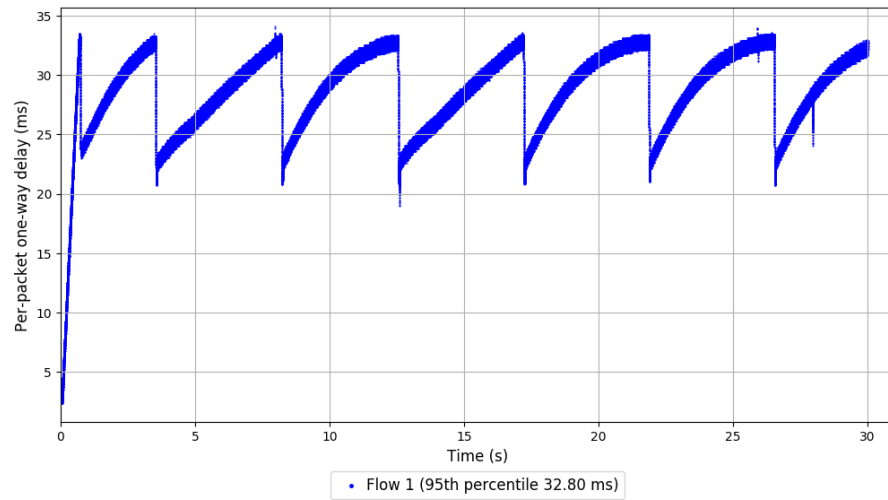
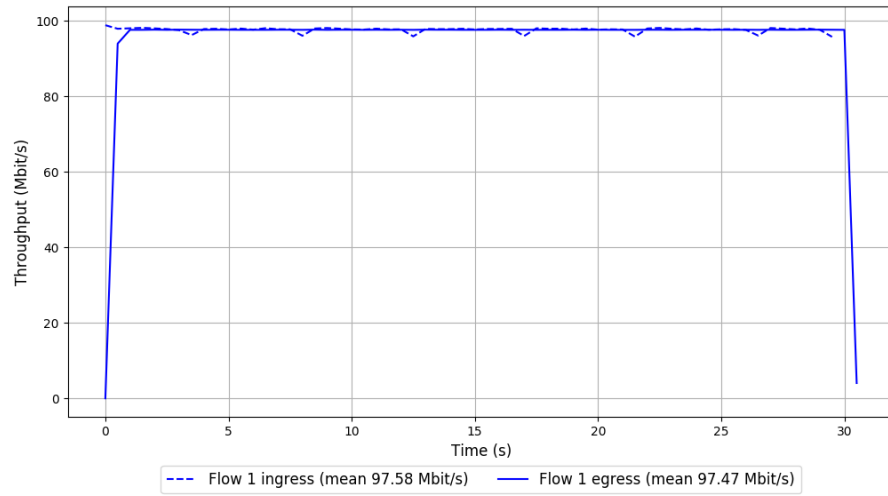
-- Flow 1:

Average throughput: 97.47 Mbit/s

95th percentile per-packet one-way delay: 32.799 ms

Loss rate: 0.01%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-09-05 21:10:43

End at: 2018-09-05 21:11:13

Local clock offset: 7.396 ms

Remote clock offset: 0.104 ms

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

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.51 Mbit/s

95th percentile per-packet one-way delay: 28.476 ms

Loss rate: 0.02%

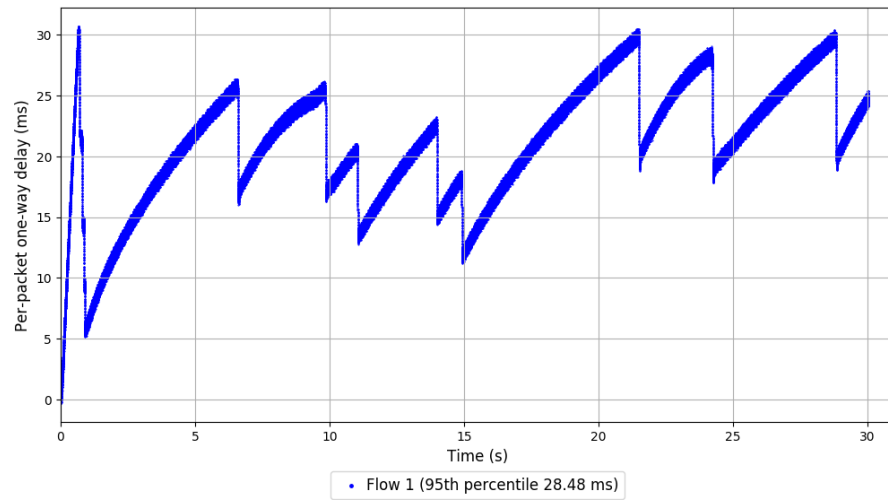
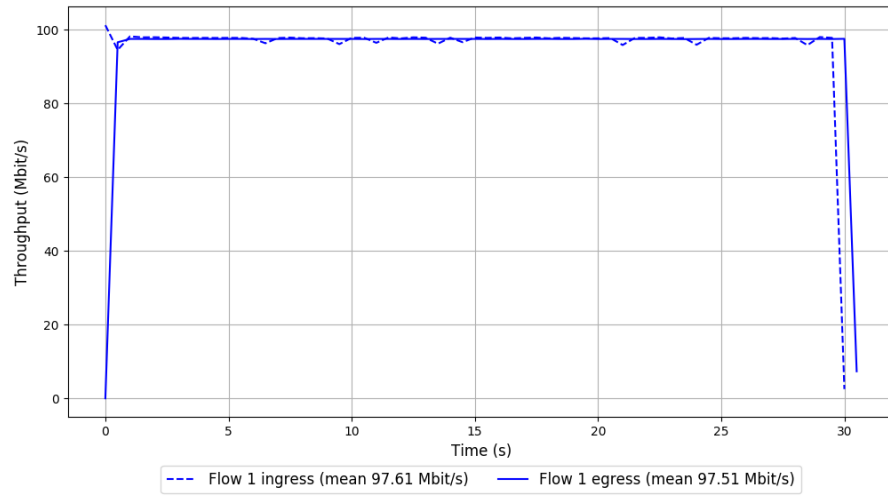
-- Flow 1:

Average throughput: 97.51 Mbit/s

95th percentile per-packet one-way delay: 28.476 ms

Loss rate: 0.02%

Run 3: Report of TCP Cubic — Data Link

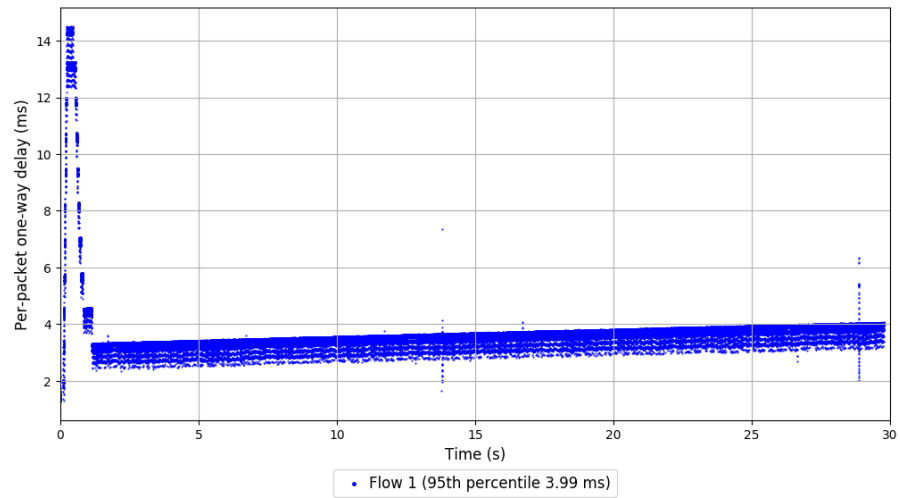
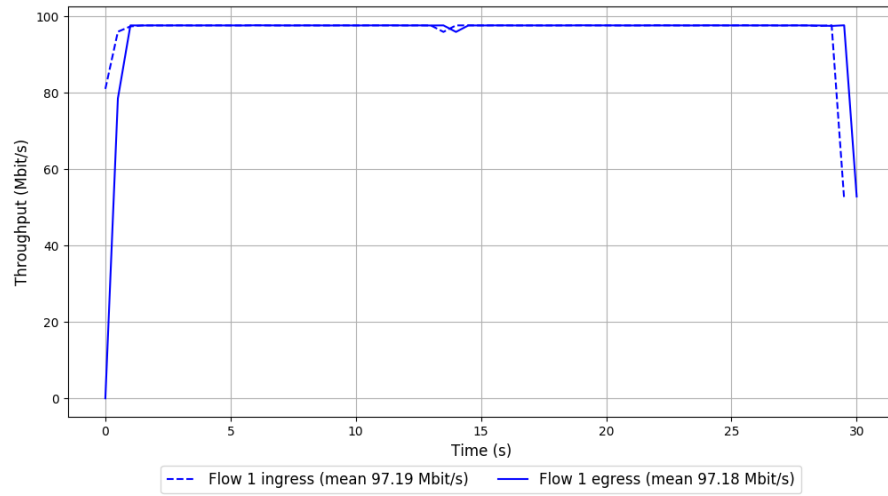


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 21:03:54
End at: 2018-09-05 21:04:24
Local clock offset: 6.071 ms
Remote clock offset: 0.044 ms

# Below is generated by plot.py at 2018-09-05 21:16:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 97.18 Mbit/s
95th percentile per-packet one-way delay: 3.989 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 97.18 Mbit/s
95th percentile per-packet one-way delay: 3.989 ms
Loss rate: 0.00%
```


Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-05 21:08:26

End at: 2018-09-05 21:08:56

Local clock offset: 8.131 ms

Remote clock offset: 0.216 ms

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

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.42 Mbit/s

95th percentile per-packet one-way delay: 3.645 ms

Loss rate: 0.00%

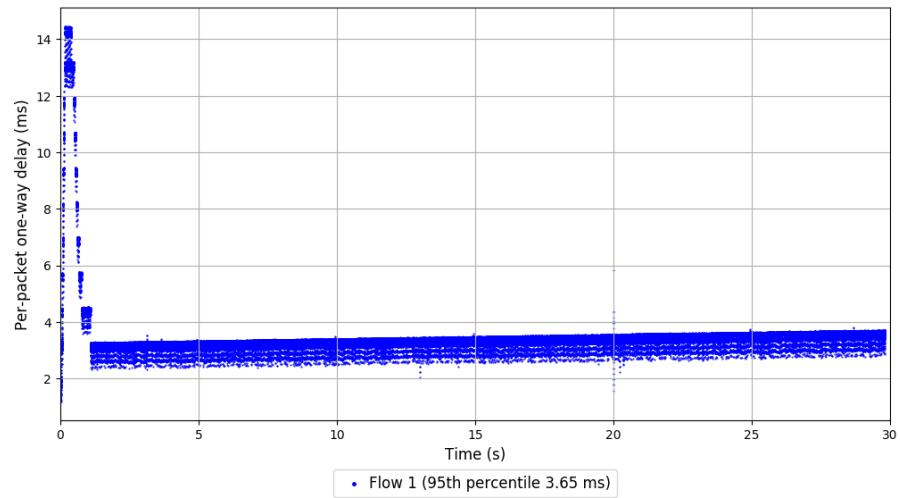
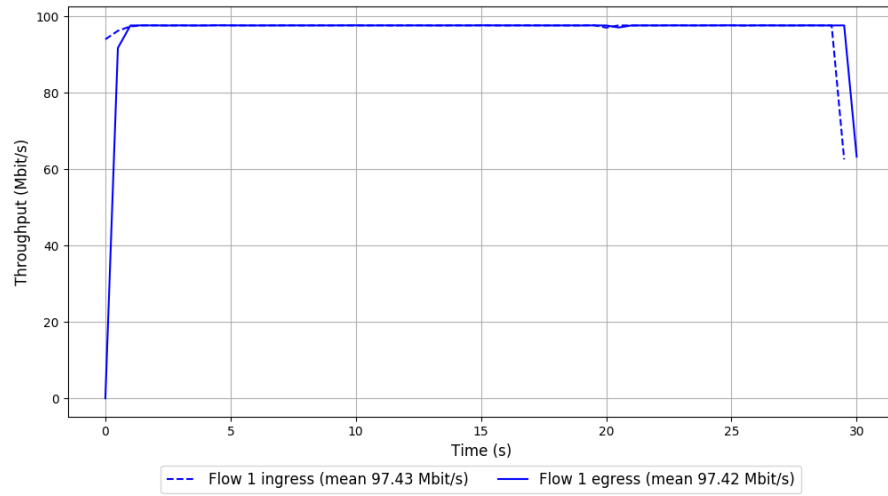
-- Flow 1:

Average throughput: 97.42 Mbit/s

95th percentile per-packet one-way delay: 3.645 ms

Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-09-05 21:12:59

End at: 2018-09-05 21:13:29

Local clock offset: 5.74 ms

Remote clock offset: 0.091 ms

Below is generated by plot.py at 2018-09-05 21:16:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.34 Mbit/s

95th percentile per-packet one-way delay: 5.340 ms

Loss rate: 0.00%

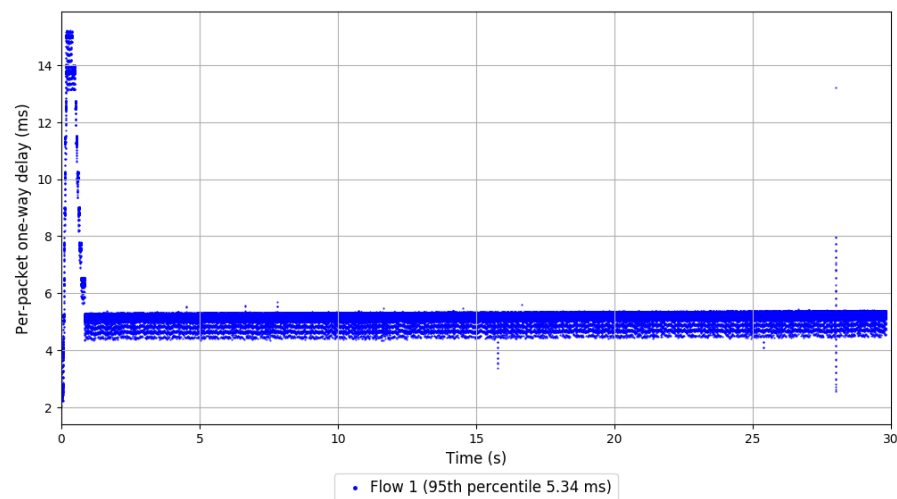
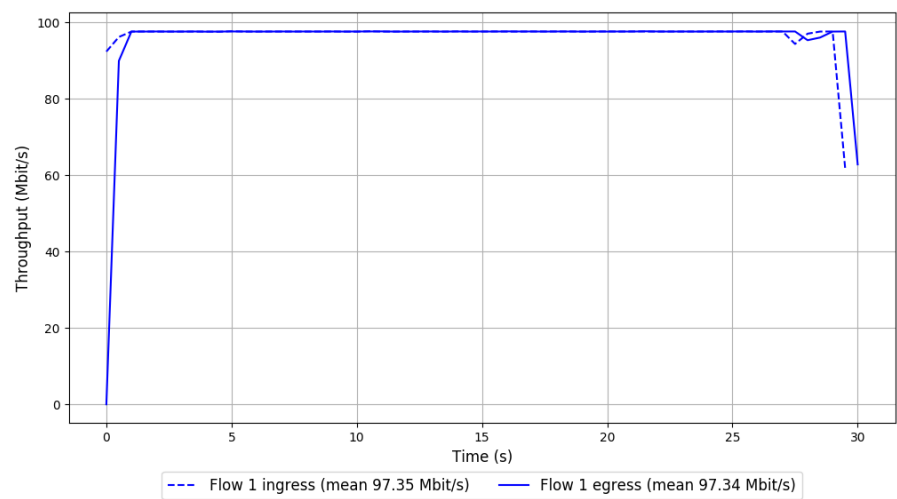
-- Flow 1:

Average throughput: 97.34 Mbit/s

95th percentile per-packet one-way delay: 5.340 ms

Loss rate: 0.00%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

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

End at: 2018-09-05 21:05:33

Local clock offset: 7.584 ms

Remote clock offset: 0.204 ms

Below is generated by plot.py at 2018-09-05 21:16:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 54.01 Mbit/s

95th percentile per-packet one-way delay: 5.865 ms

Loss rate: 0.05%

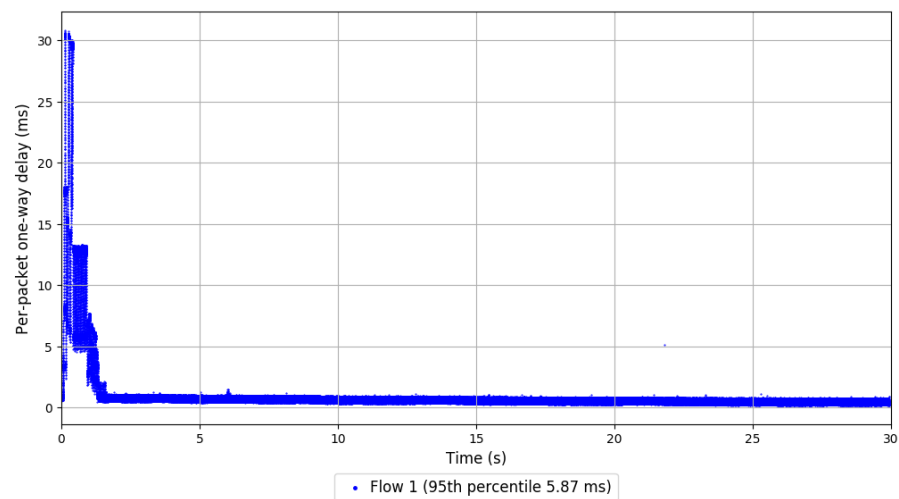
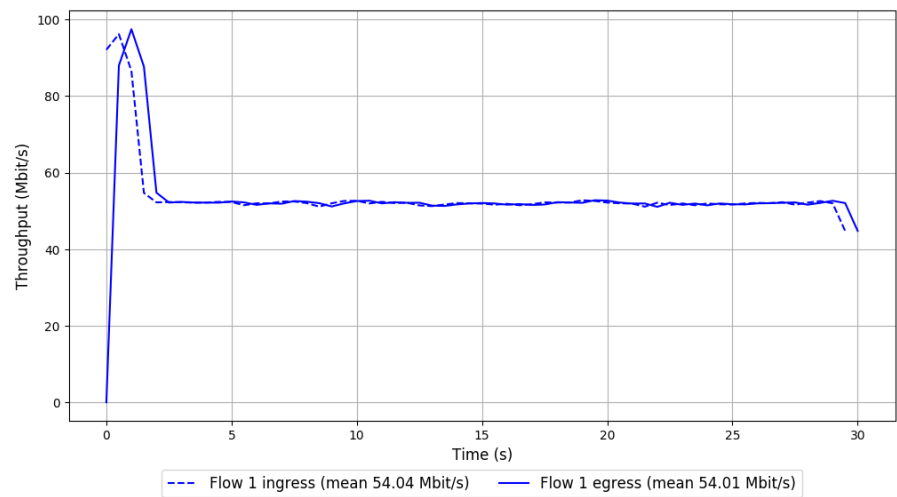
-- Flow 1:

Average throughput: 54.01 Mbit/s

95th percentile per-packet one-way delay: 5.865 ms

Loss rate: 0.05%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-05 21:09:35

End at: 2018-09-05 21:10:05

Local clock offset: 8.352 ms

Remote clock offset: 0.173 ms

Below is generated by plot.py at 2018-09-05 21:16:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.28 Mbit/s

95th percentile per-packet one-way delay: 31.330 ms

Loss rate: 10.74%

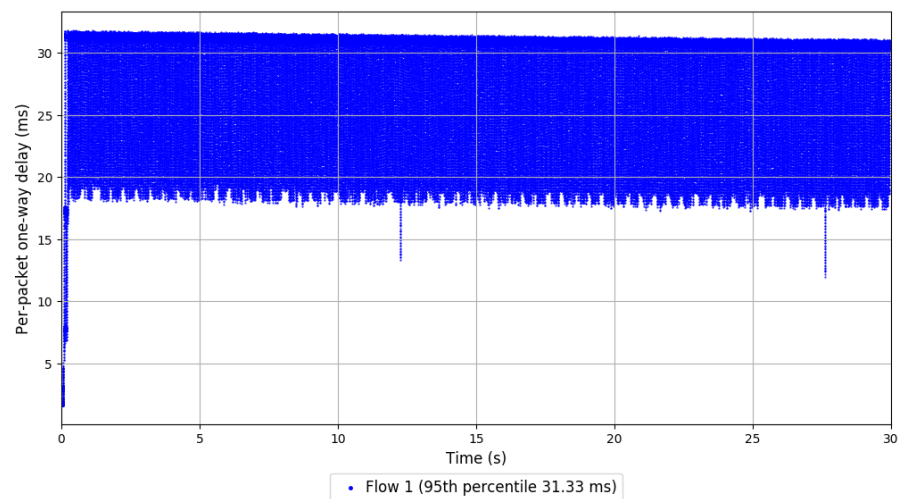
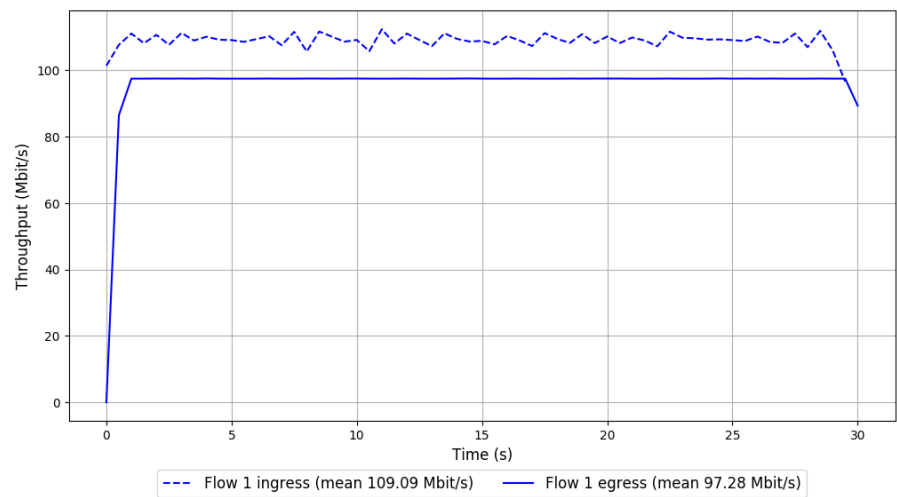
-- Flow 1:

Average throughput: 97.28 Mbit/s

95th percentile per-packet one-way delay: 31.330 ms

Loss rate: 10.74%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-05 21:14:08

End at: 2018-09-05 21:14:38

Local clock offset: 5.923 ms

Remote clock offset: 0.183 ms

Below is generated by plot.py at 2018-09-05 21:16:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.30 Mbit/s

95th percentile per-packet one-way delay: 11.187 ms

Loss rate: 0.02%

-- Flow 1:

Average throughput: 97.30 Mbit/s

95th percentile per-packet one-way delay: 11.187 ms

Loss rate: 0.02%

Run 3: Report of Muses-25 — Data Link

