

Pantheon Report

Generated at 2018-08-31 09:33:11 (UTC).

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

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.

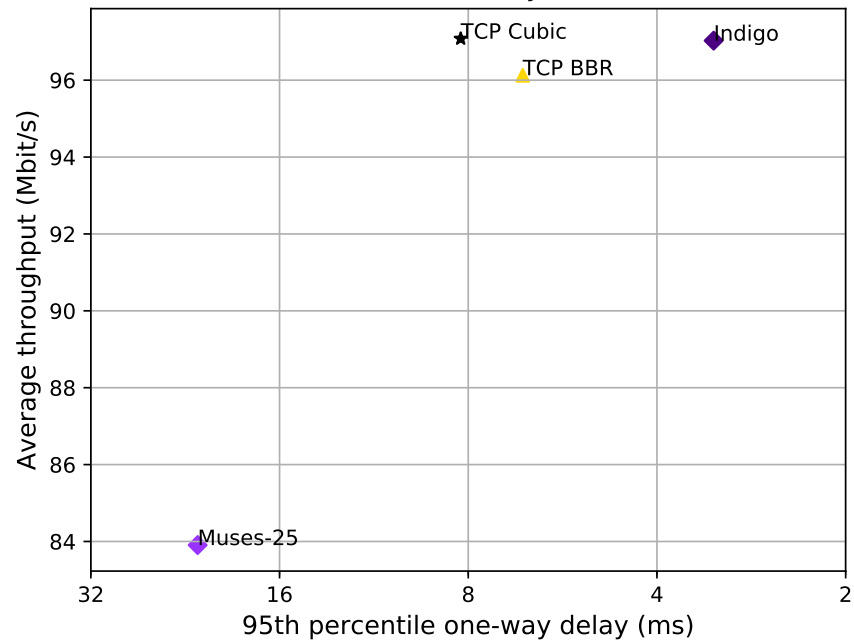
System info:

```
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
```

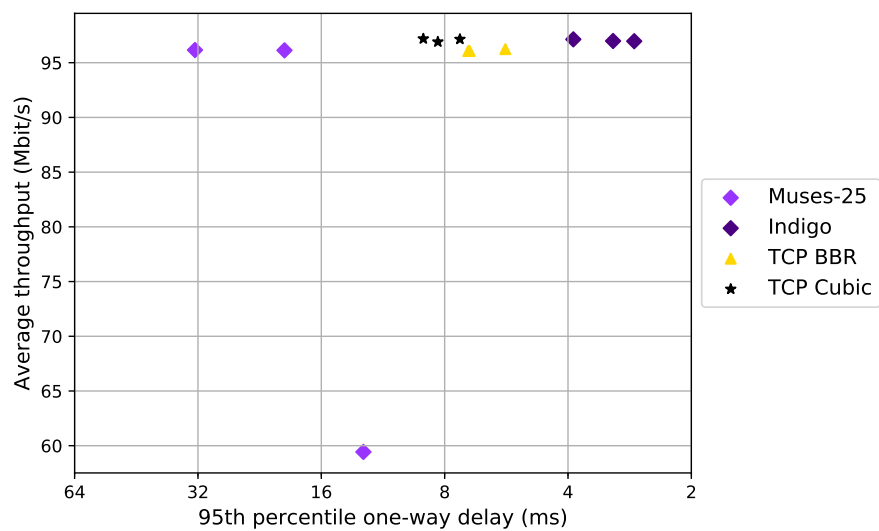
Git summary:

```
branch: muses @ e3c5aa19ca94c3066828fb83f16a8fb6b2731e7a
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd9c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b59e0d118c50af3579569c462d33045741c85981
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 Brazil to AWS Brazil 1, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from Brazil to AWS Brazil 1, 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	96.13	6.55	0.03
TCP Cubic	3	97.08	8.22	0.05
Indigo	3	97.02	3.25	0.02
Muses-25	3	83.91	21.62	1.56

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 09:19:20

End at: 2018-08-31 09:19:50

Local clock offset: -6.719 ms

Remote clock offset: 0.479 ms

Below is generated by plot.py at 2018-08-31 09:32:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.24 Mbit/s

95th percentile per-packet one-way delay: 5.690 ms

Loss rate: 0.02%

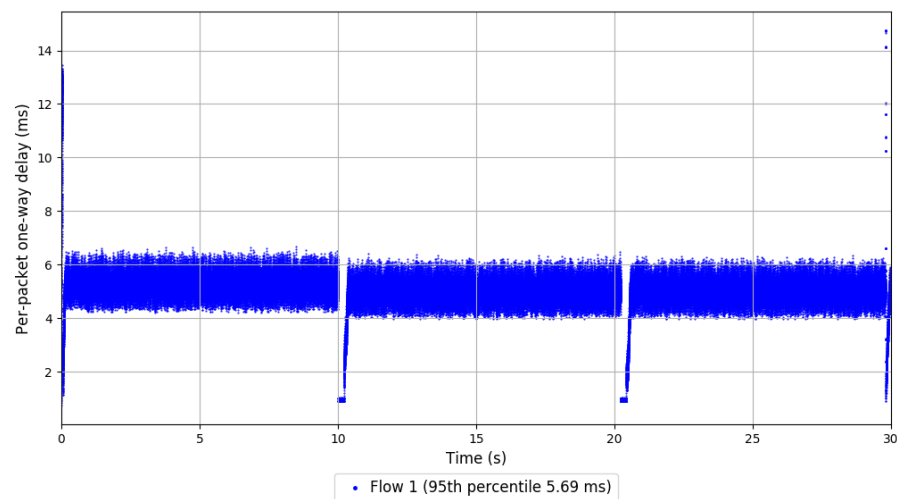
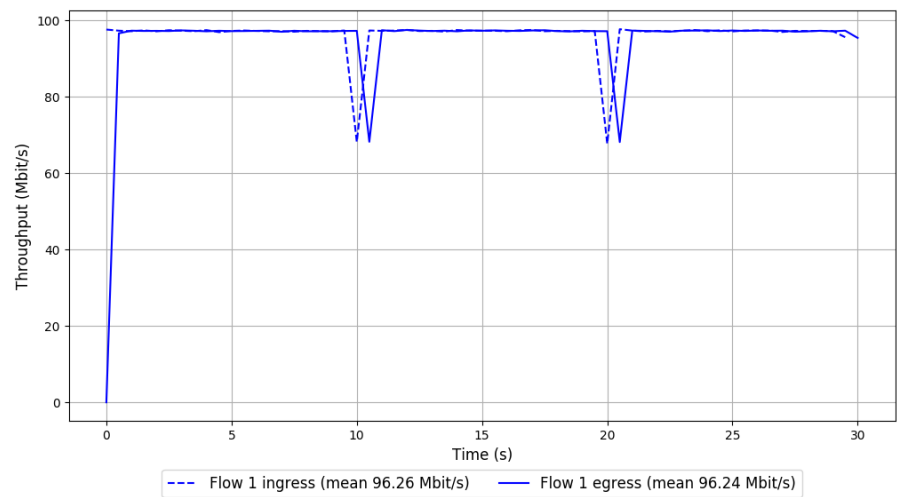
-- Flow 1:

Average throughput: 96.24 Mbit/s

95th percentile per-packet one-way delay: 5.690 ms

Loss rate: 0.02%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-31 09:23:51

End at: 2018-08-31 09:24:21

Local clock offset: -6.743 ms

Remote clock offset: 0.526 ms

Below is generated by plot.py at 2018-08-31 09:32:32

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.07 Mbit/s

95th percentile per-packet one-way delay: 7.006 ms

Loss rate: 0.03%

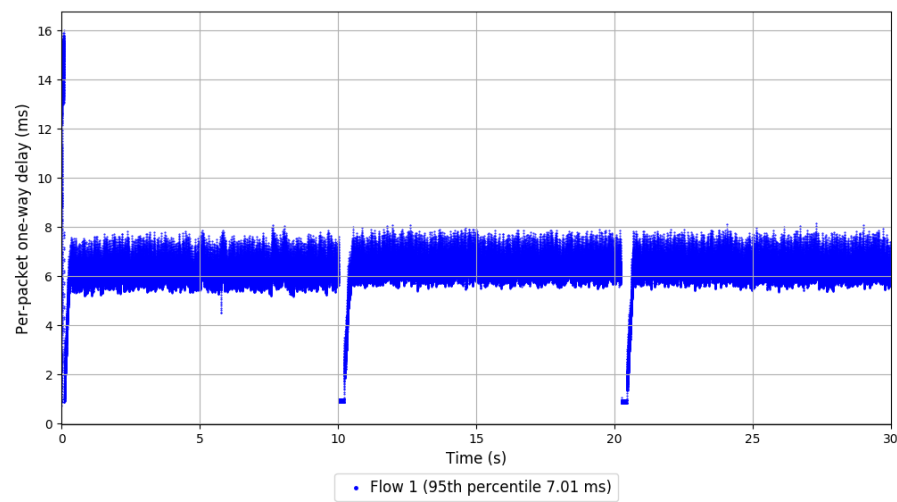
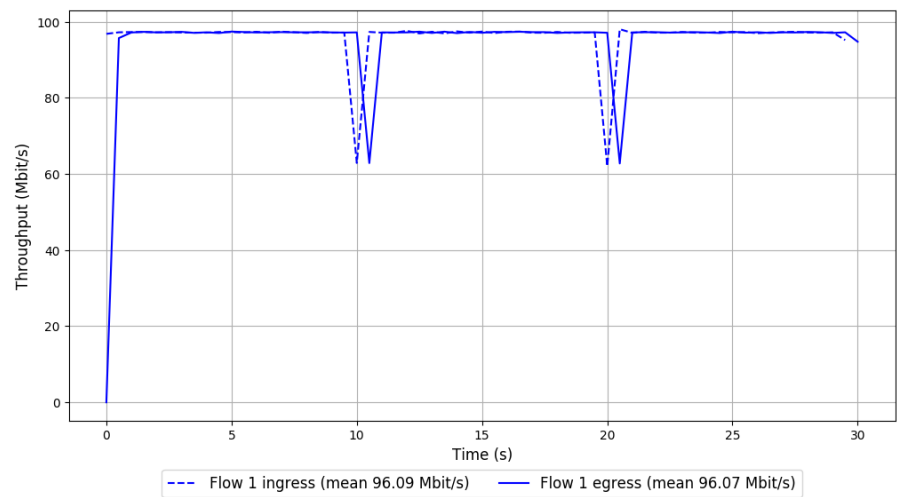
-- Flow 1:

Average throughput: 96.07 Mbit/s

95th percentile per-packet one-way delay: 7.006 ms

Loss rate: 0.03%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-08-31 09:28:21

End at: 2018-08-31 09:28:51

Local clock offset: -5.844 ms

Remote clock offset: 0.551 ms

Below is generated by plot.py at 2018-08-31 09:32:32

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.07 Mbit/s

95th percentile per-packet one-way delay: 6.952 ms

Loss rate: 0.03%

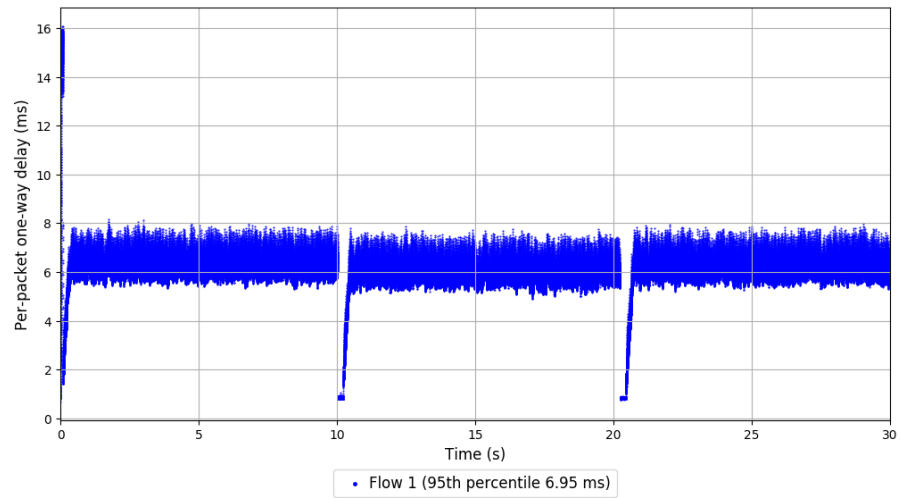
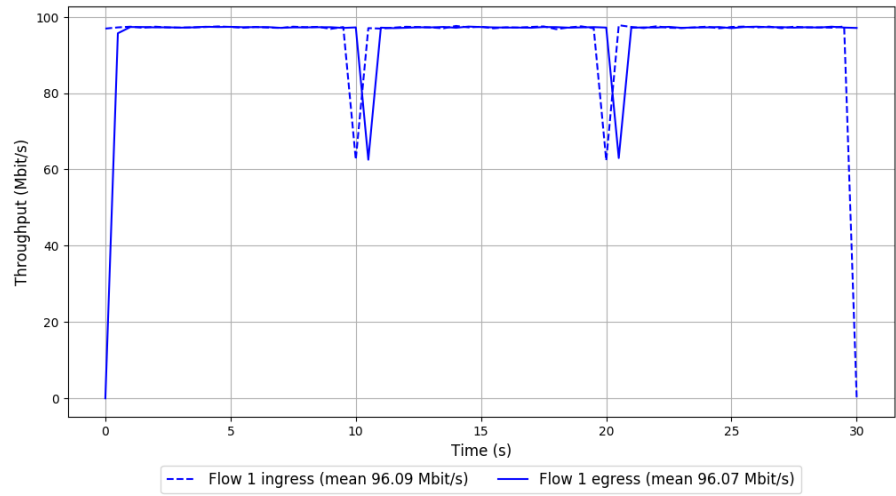
-- Flow 1:

Average throughput: 96.07 Mbit/s

95th percentile per-packet one-way delay: 6.952 ms

Loss rate: 0.03%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 09:21:35

End at: 2018-08-31 09:22:05

Local clock offset: -5.963 ms

Remote clock offset: 0.451 ms

Below is generated by plot.py at 2018-08-31 09:32:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.18 Mbit/s

95th percentile per-packet one-way delay: 9.019 ms

Loss rate: 0.05%

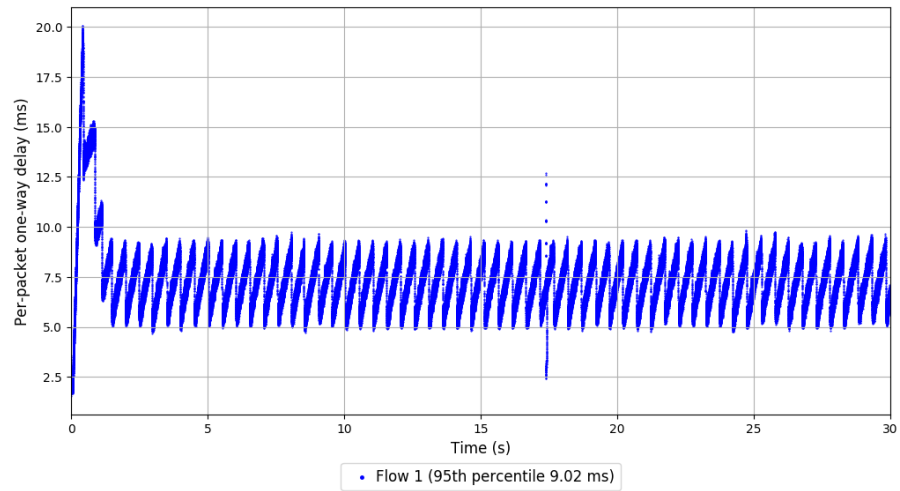
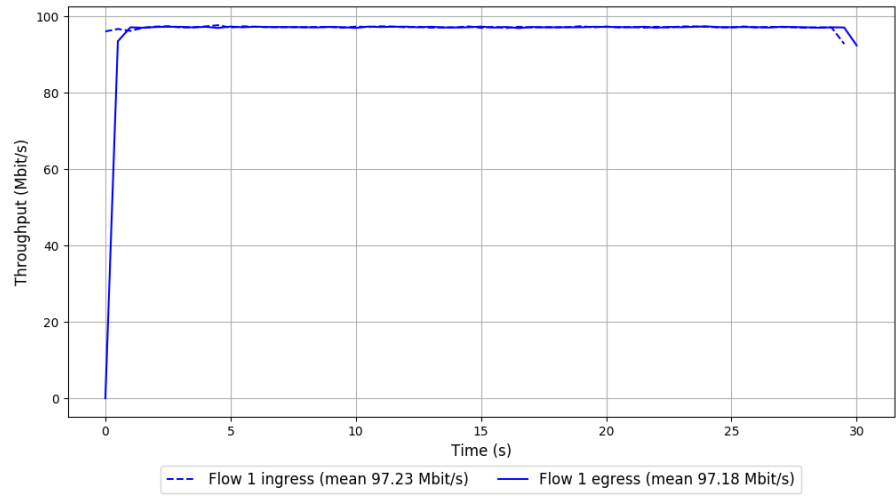
-- Flow 1:

Average throughput: 97.18 Mbit/s

95th percentile per-packet one-way delay: 9.019 ms

Loss rate: 0.05%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 09:26:05

End at: 2018-08-31 09:26:35

Local clock offset: -7.042 ms

Remote clock offset: 0.549 ms

Below is generated by plot.py at 2018-08-31 09:32:34

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.15 Mbit/s

95th percentile per-packet one-way delay: 7.343 ms

Loss rate: 0.06%

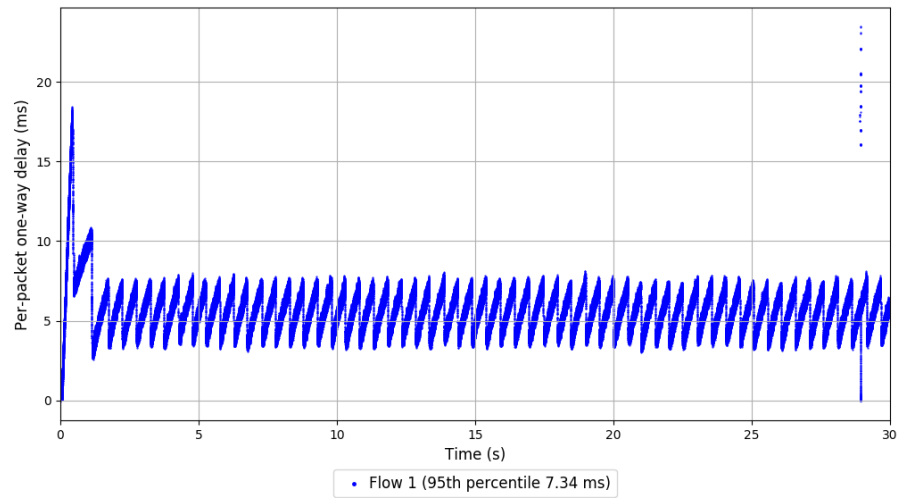
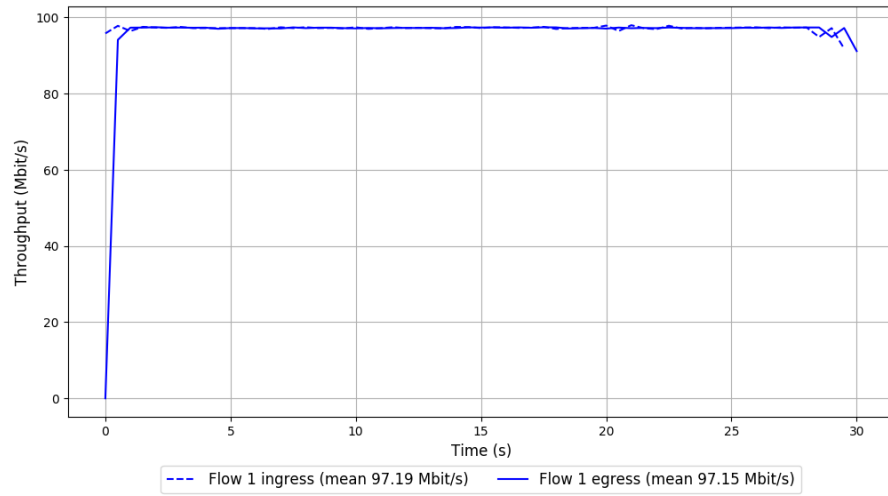
-- Flow 1:

Average throughput: 97.15 Mbit/s

95th percentile per-packet one-way delay: 7.343 ms

Loss rate: 0.06%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-08-31 09:30:34

End at: 2018-08-31 09:31:04

Local clock offset: -5.495 ms

Remote clock offset: 0.553 ms

Below is generated by plot.py at 2018-08-31 09:32:34

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.90 Mbit/s

95th percentile per-packet one-way delay: 8.312 ms

Loss rate: 0.05%

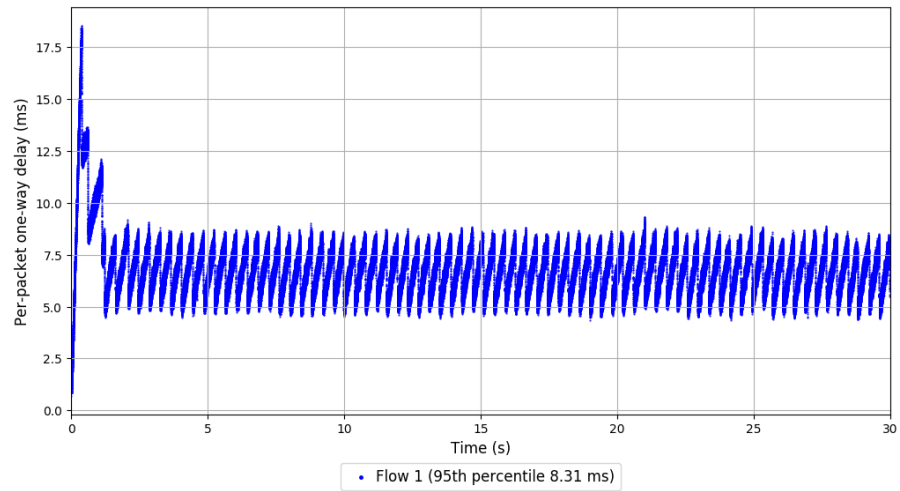
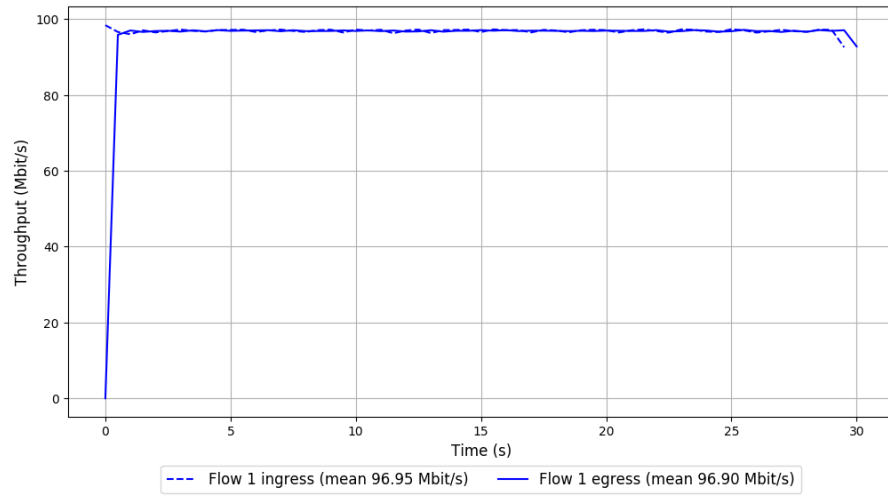
-- Flow 1:

Average throughput: 96.90 Mbit/s

95th percentile per-packet one-way delay: 8.312 ms

Loss rate: 0.05%

Run 3: Report of TCP Cubic — Data Link

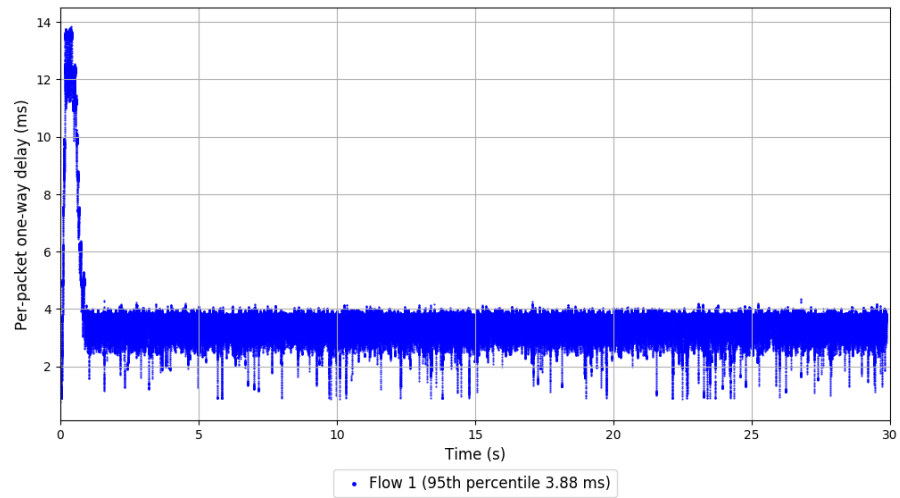
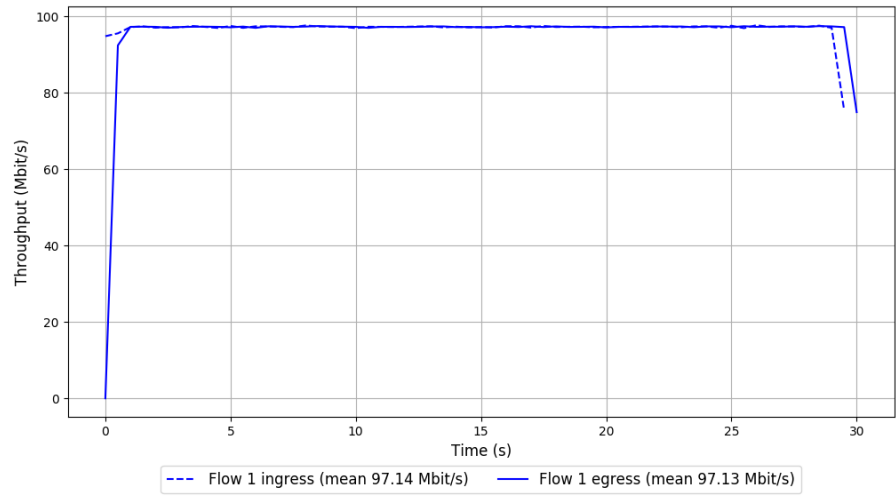


```
Run 1: Statistics of Indigo

Start at: 2018-08-31 09:18:12
End at: 2018-08-31 09:18:42
Local clock offset: -6.732 ms
Remote clock offset: 0.467 ms

# Below is generated by plot.py at 2018-08-31 09:32:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 97.13 Mbit/s
95th percentile per-packet one-way delay: 3.882 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 97.13 Mbit/s
95th percentile per-packet one-way delay: 3.882 ms
Loss rate: 0.02%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-31 09:22:42

End at: 2018-08-31 09:23:12

Local clock offset: -7.495 ms

Remote clock offset: 0.52 ms

Below is generated by plot.py at 2018-08-31 09:32:35

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.98 Mbit/s

95th percentile per-packet one-way delay: 3.105 ms

Loss rate: 0.02%

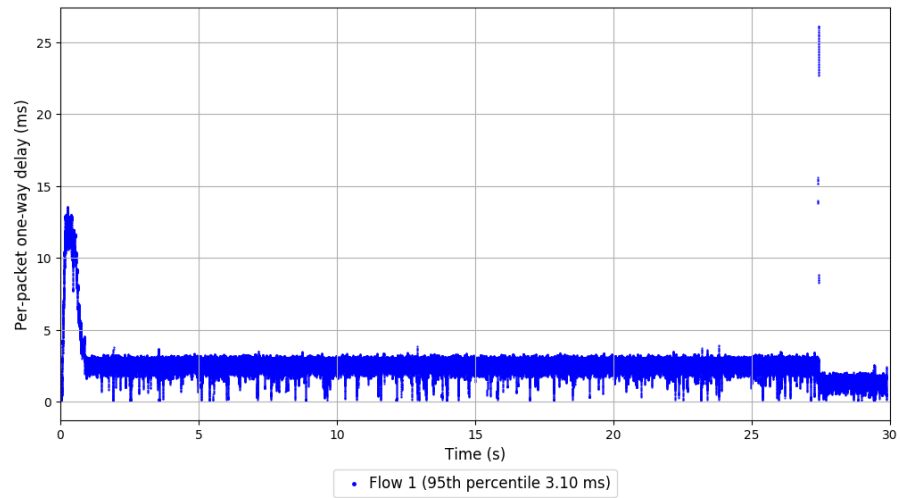
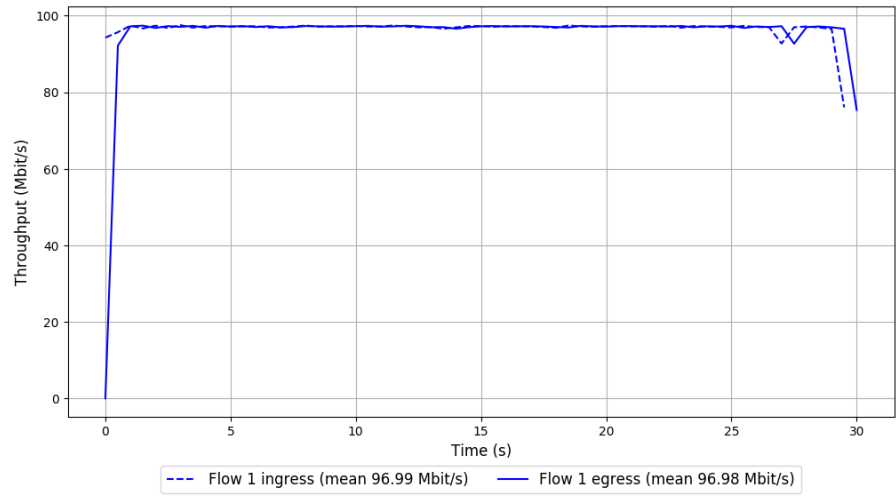
-- Flow 1:

Average throughput: 96.98 Mbit/s

95th percentile per-packet one-way delay: 3.105 ms

Loss rate: 0.02%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-08-31 09:27:13

End at: 2018-08-31 09:27:43

Local clock offset: -6.145 ms

Remote clock offset: 0.47 ms

Below is generated by plot.py at 2018-08-31 09:33:00

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.96 Mbit/s

95th percentile per-packet one-way delay: 2.757 ms

Loss rate: 0.01%

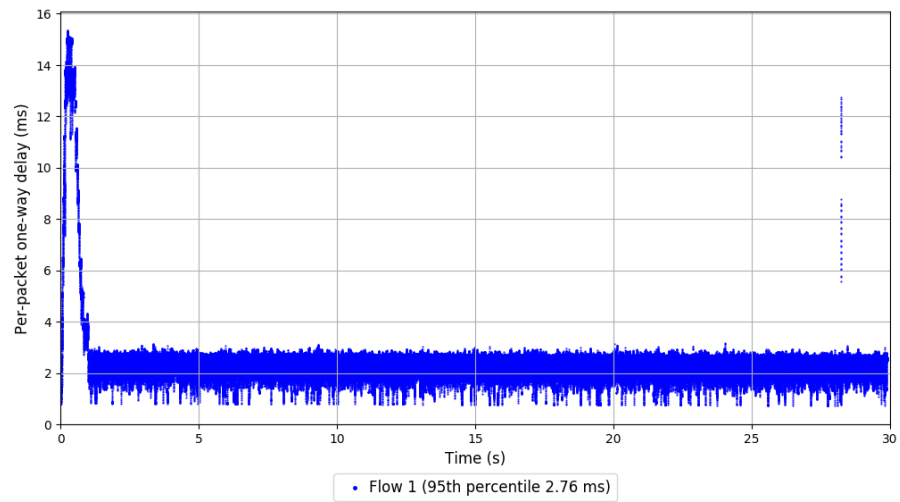
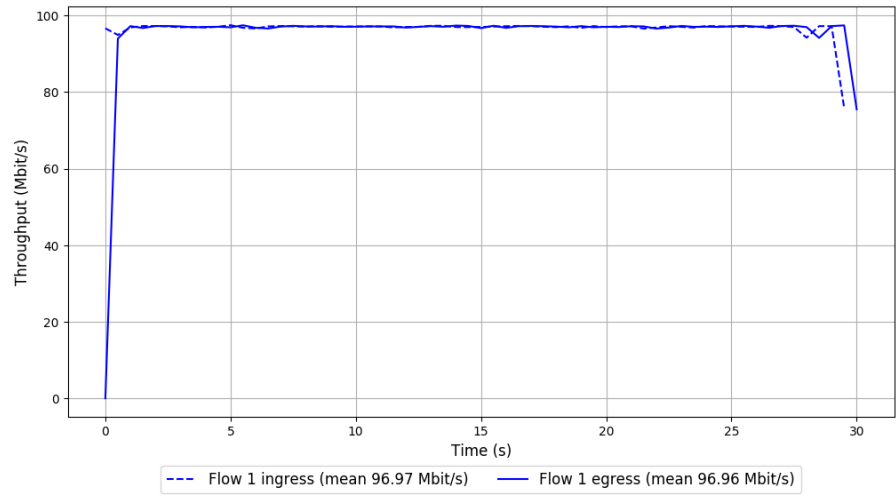
-- Flow 1:

Average throughput: 96.96 Mbit/s

95th percentile per-packet one-way delay: 2.757 ms

Loss rate: 0.01%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-08-31 09:20:27

End at: 2018-08-31 09:20:57

Local clock offset: -7.511 ms

Remote clock offset: 0.47 ms

Below is generated by plot.py at 2018-08-31 09:33:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.16 Mbit/s

95th percentile per-packet one-way delay: 32.541 ms

Loss rate: 4.62%

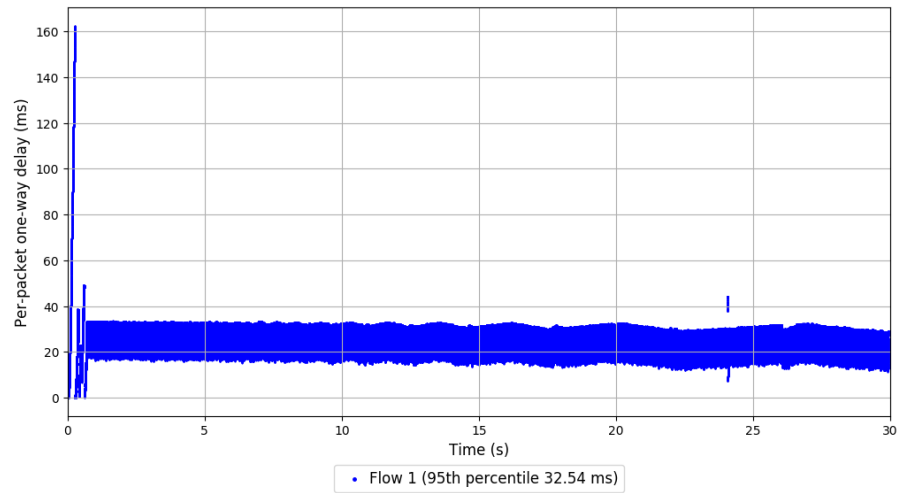
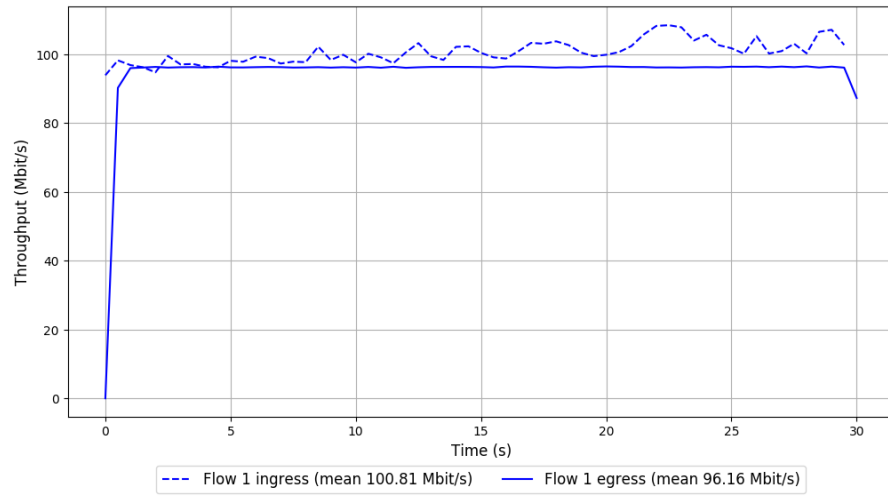
-- Flow 1:

Average throughput: 96.16 Mbit/s

95th percentile per-packet one-way delay: 32.541 ms

Loss rate: 4.62%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-08-31 09:24:58

End at: 2018-08-31 09:25:28

Local clock offset: -6.542 ms

Remote clock offset: 0.554 ms

Below is generated by plot.py at 2018-08-31 09:33:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.13 Mbit/s

95th percentile per-packet one-way delay: 19.679 ms

Loss rate: 0.06%

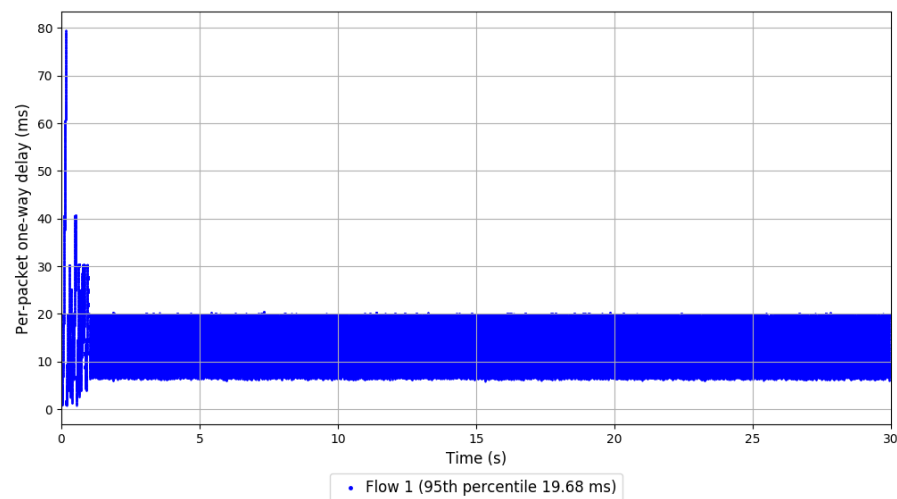
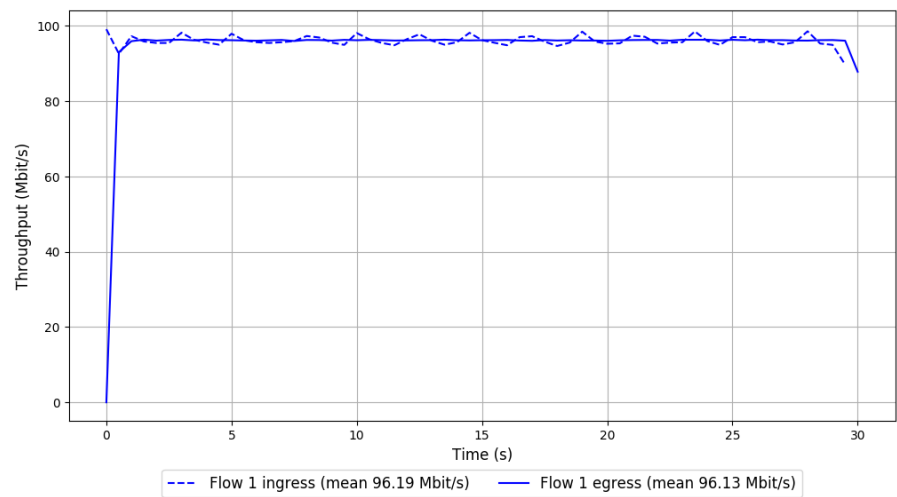
-- Flow 1:

Average throughput: 96.13 Mbit/s

95th percentile per-packet one-way delay: 19.679 ms

Loss rate: 0.06%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-08-31 09:29:28

End at: 2018-08-31 09:29:58

Local clock offset: -6.467 ms

Remote clock offset: 0.555 ms

Below is generated by plot.py at 2018-08-31 09:33:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 59.43 Mbit/s

95th percentile per-packet one-way delay: 12.629 ms

Loss rate: 0.01%

-- Flow 1:

Average throughput: 59.43 Mbit/s

95th percentile per-packet one-way delay: 12.629 ms

Loss rate: 0.01%

Run 3: Report of Muses-25 — Data Link

