

Pantheon Report

Generated at 2018-09-03 08:36:39 (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.

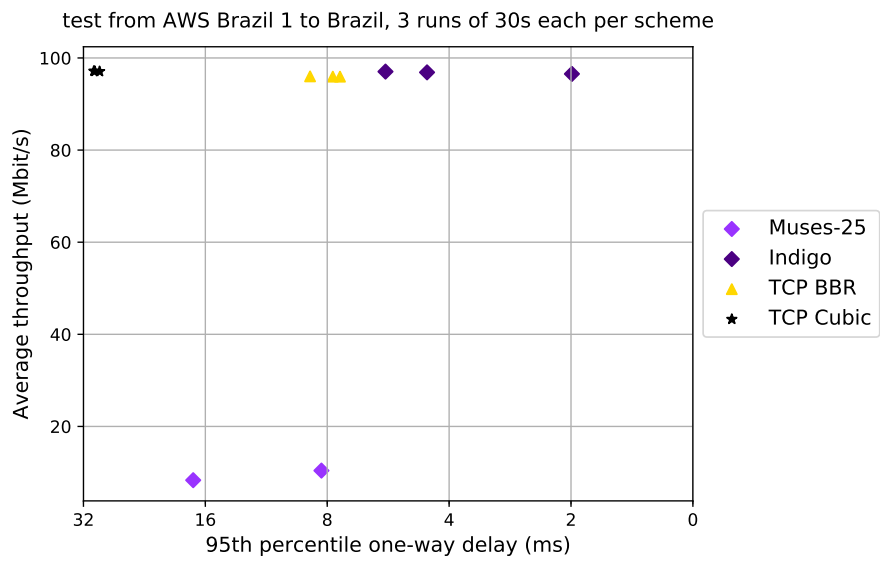
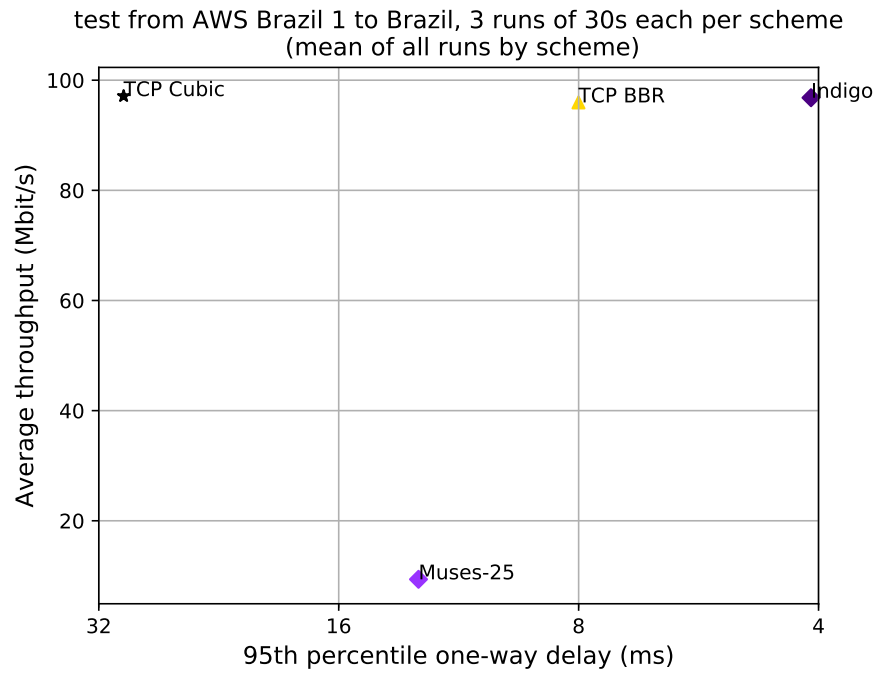
NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

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 @ f309f5459e2c5237279a184e52ece7a2b47ef1c9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b8d5019b83a3a678804d830fcfe1da7b3a63421b
third_party/pantheon-tunnel @ cbfce6db5ff5740dfe1771f813cd646339e1952
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	95.97	8.00	0.00
TCP Cubic	3	97.11	29.78	0.01
Indigo	3	96.82	4.09	0.00
Muses-25	2	9.37	12.71	10.54

Run 1: Statistics of TCP BBR

Start at: 2018-09-03 08:25:42

End at: 2018-09-03 08:26:12

Local clock offset: 3.262 ms

Remote clock offset: 0.089 ms

Below is generated by plot.py at 2018-09-03 08:36:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 95.95 Mbit/s

95th percentile per-packet one-way delay: 7.750 ms

Loss rate: 0.00%

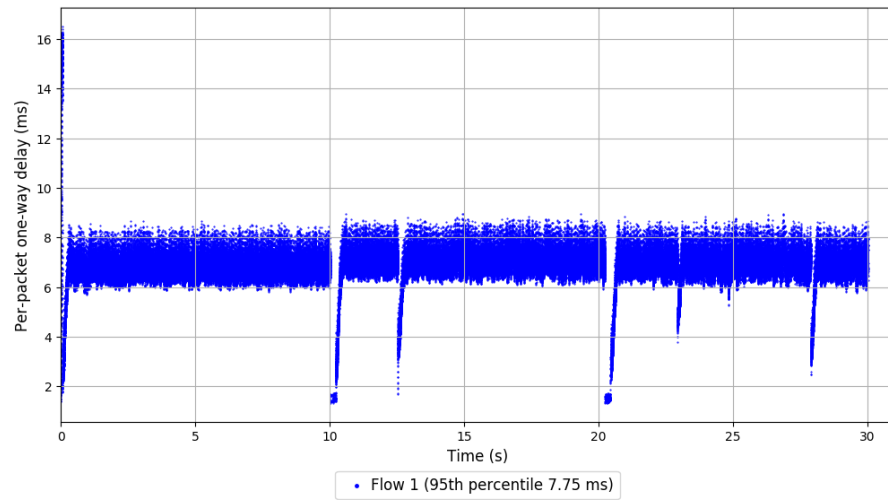
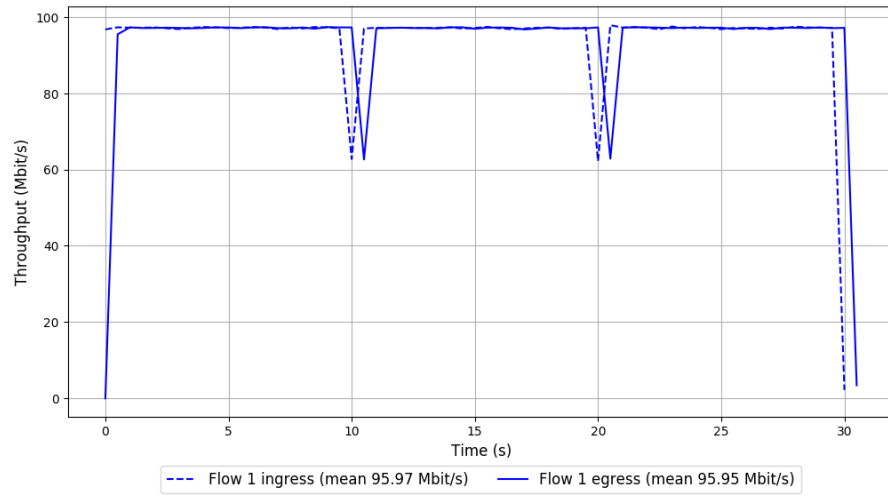
-- Flow 1:

Average throughput: 95.95 Mbit/s

95th percentile per-packet one-way delay: 7.750 ms

Loss rate: 0.00%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-03 08:30:08

End at: 2018-09-03 08:30:38

Local clock offset: 0.54 ms

Remote clock offset: 0.137 ms

Below is generated by plot.py at 2018-09-03 08:36:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 95.95 Mbit/s

95th percentile per-packet one-way delay: 7.440 ms

Loss rate: 0.00%

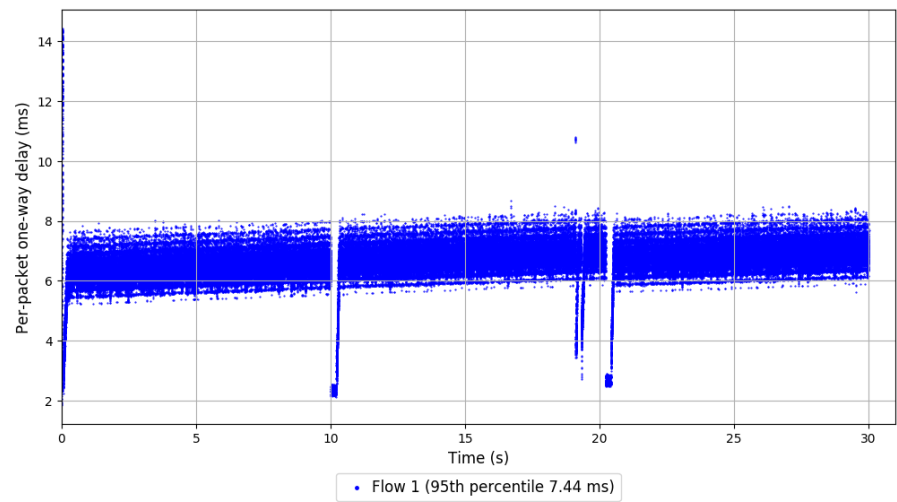
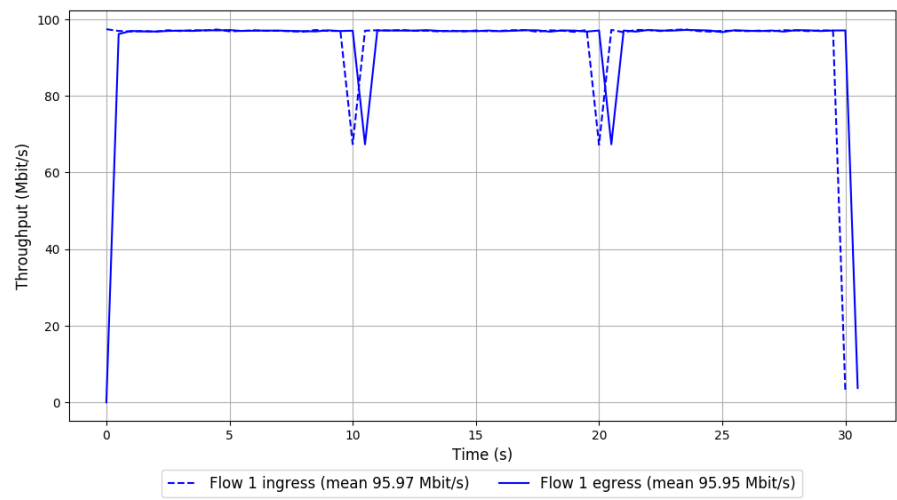
-- Flow 1:

Average throughput: 95.95 Mbit/s

95th percentile per-packet one-way delay: 7.440 ms

Loss rate: 0.00%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-09-03 08:34:34

End at: 2018-09-03 08:35:05

Local clock offset: 4.714 ms

Remote clock offset: 0.135 ms

Below is generated by plot.py at 2018-09-03 08:36:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.01 Mbit/s

95th percentile per-packet one-way delay: 8.820 ms

Loss rate: 0.00%

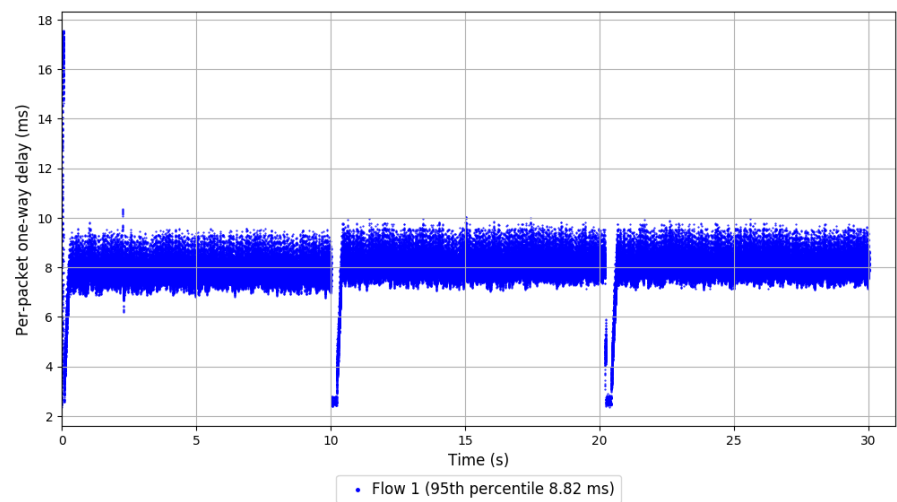
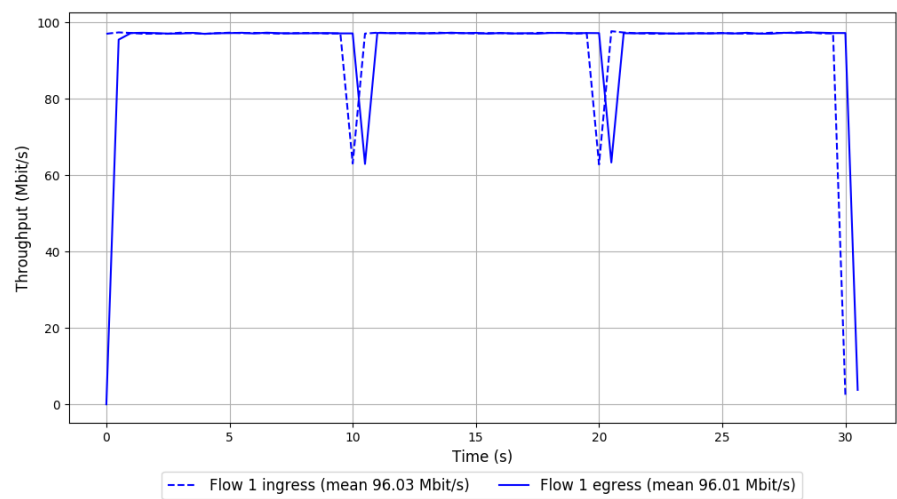
-- Flow 1:

Average throughput: 96.01 Mbit/s

95th percentile per-packet one-way delay: 8.820 ms

Loss rate: 0.00%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-03 08:23:26

End at: 2018-09-03 08:23:56

Local clock offset: 3.496 ms

Remote clock offset: 0.031 ms

Below is generated by plot.py at 2018-09-03 08:36:32

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.11 Mbit/s

95th percentile per-packet one-way delay: 29.997 ms

Loss rate: 0.01%

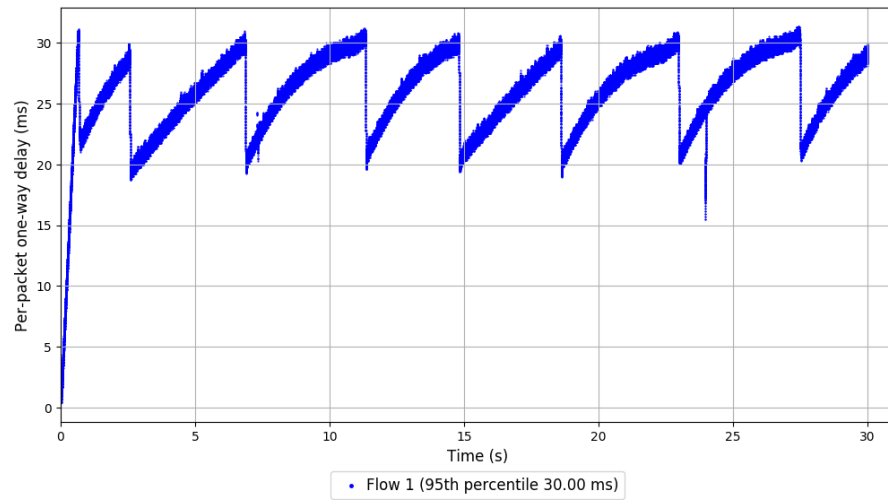
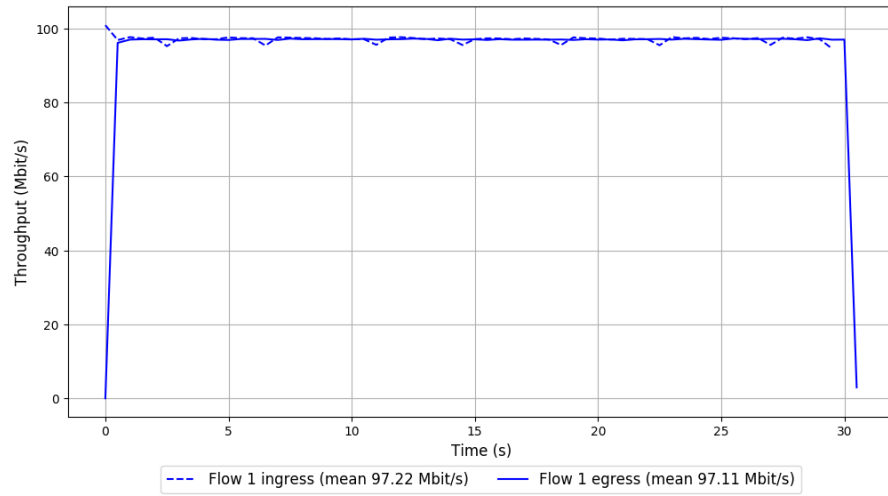
-- Flow 1:

Average throughput: 97.11 Mbit/s

95th percentile per-packet one-way delay: 29.997 ms

Loss rate: 0.01%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-03 08:27:53

End at: 2018-09-03 08:28:23

Local clock offset: 2.44 ms

Remote clock offset: 0.091 ms

Below is generated by plot.py at 2018-09-03 08:36:32

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.07 Mbit/s

95th percentile per-packet one-way delay: 29.198 ms

Loss rate: 0.02%

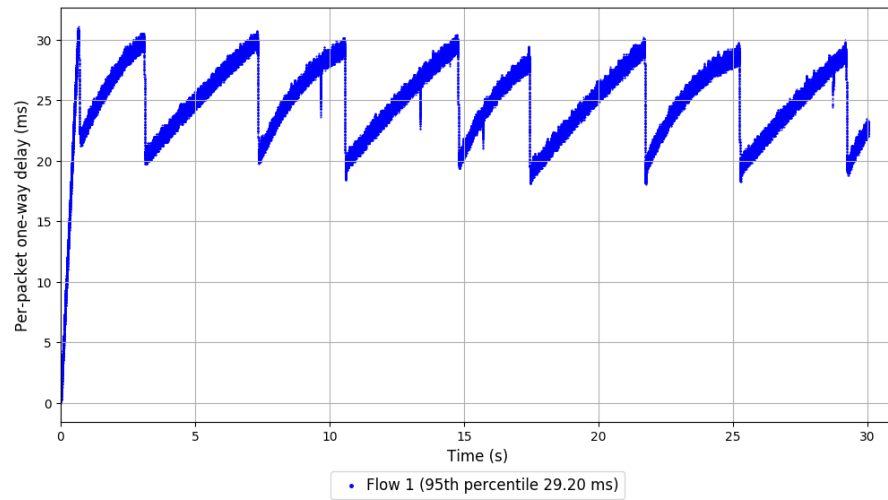
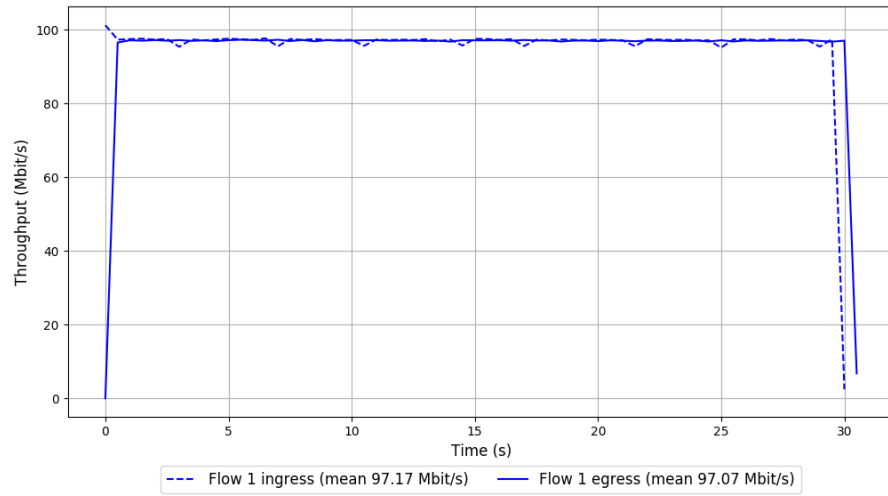
-- Flow 1:

Average throughput: 97.07 Mbit/s

95th percentile per-packet one-way delay: 29.198 ms

Loss rate: 0.02%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-09-03 08:32:19

End at: 2018-09-03 08:32:49

Local clock offset: 4.693 ms

Remote clock offset: 0.118 ms

Below is generated by plot.py at 2018-09-03 08:36:32

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.16 Mbit/s

95th percentile per-packet one-way delay: 30.159 ms

Loss rate: 0.01%

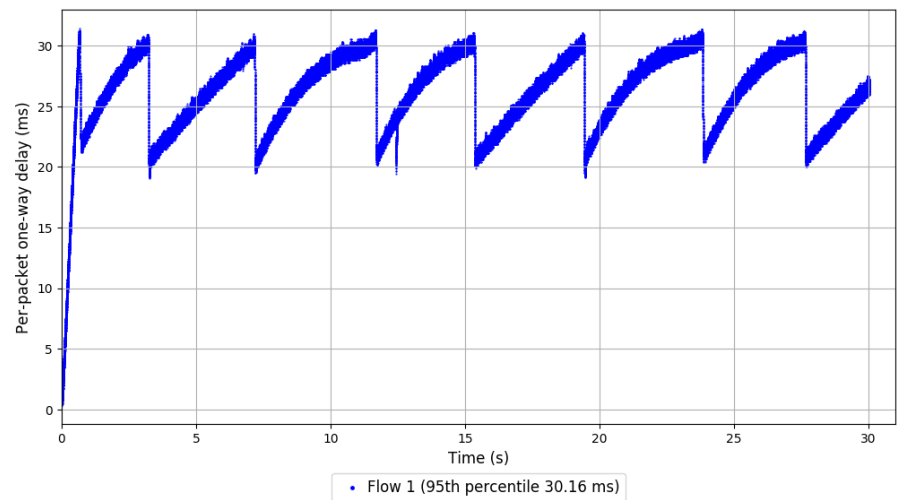
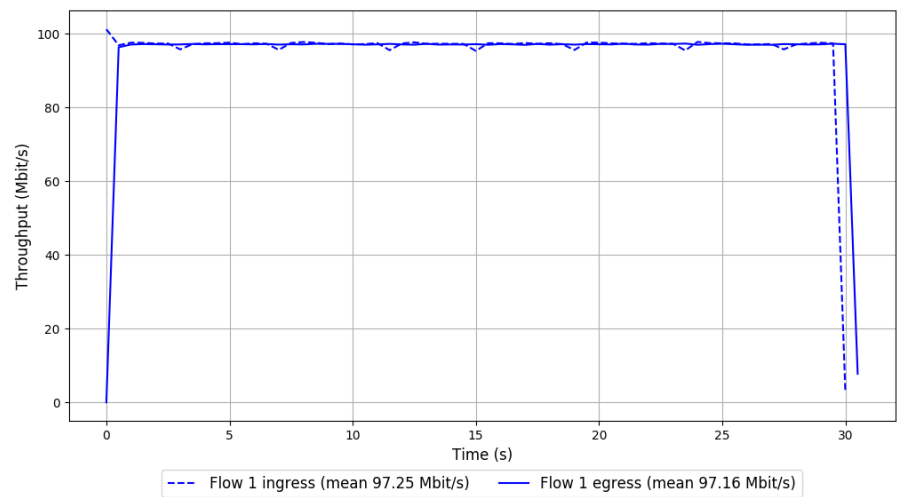
-- Flow 1:

Average throughput: 97.16 Mbit/s

95th percentile per-packet one-way delay: 30.159 ms

Loss rate: 0.01%

Run 3: Report of TCP Cubic — Data Link

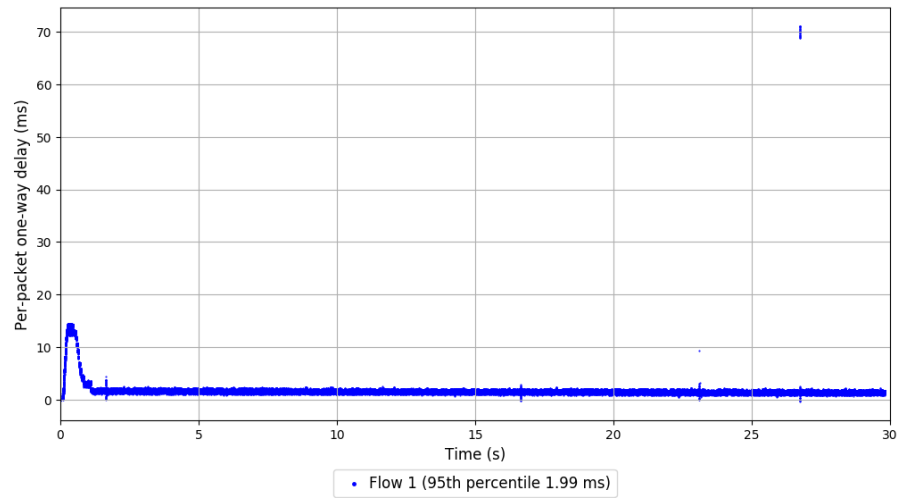
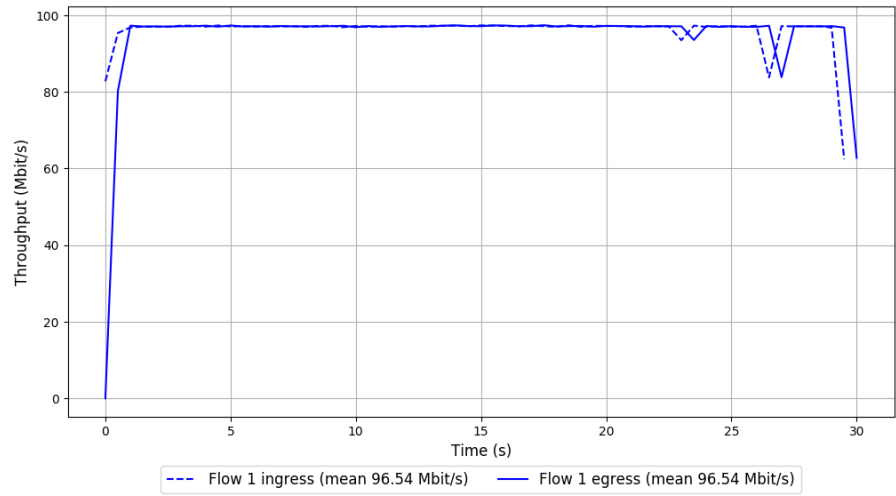


```
Run 1: Statistics of Indigo

Start at: 2018-09-03 08:24:33
End at: 2018-09-03 08:25:03
Local clock offset: 3.816 ms
Remote clock offset: 0.083 ms

# Below is generated by plot.py at 2018-09-03 08:36:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 96.54 Mbit/s
95th percentile per-packet one-way delay: 1.985 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 96.54 Mbit/s
95th percentile per-packet one-way delay: 1.985 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-03 08:29:00

End at: 2018-09-03 08:29:30

Local clock offset: 1.762 ms

Remote clock offset: 0.098 ms

Below is generated by plot.py at 2018-09-03 08:36:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.87 Mbit/s

95th percentile per-packet one-way delay: 4.535 ms

Loss rate: 0.00%

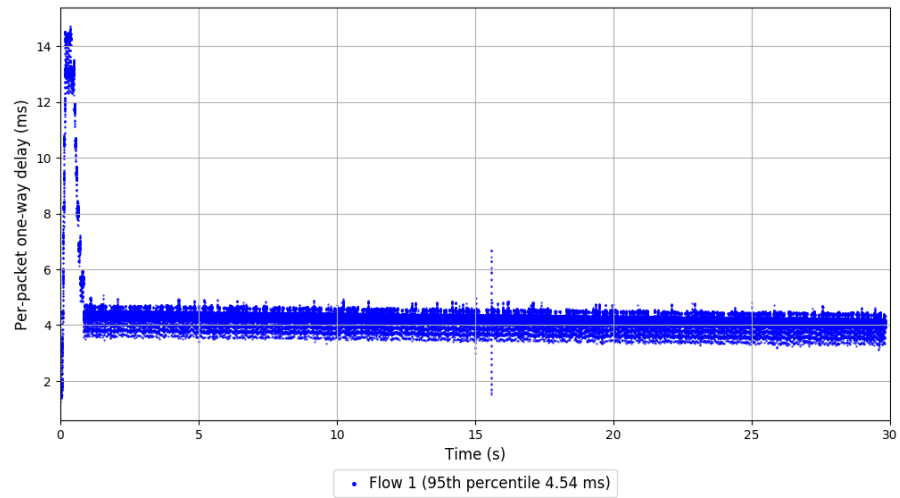
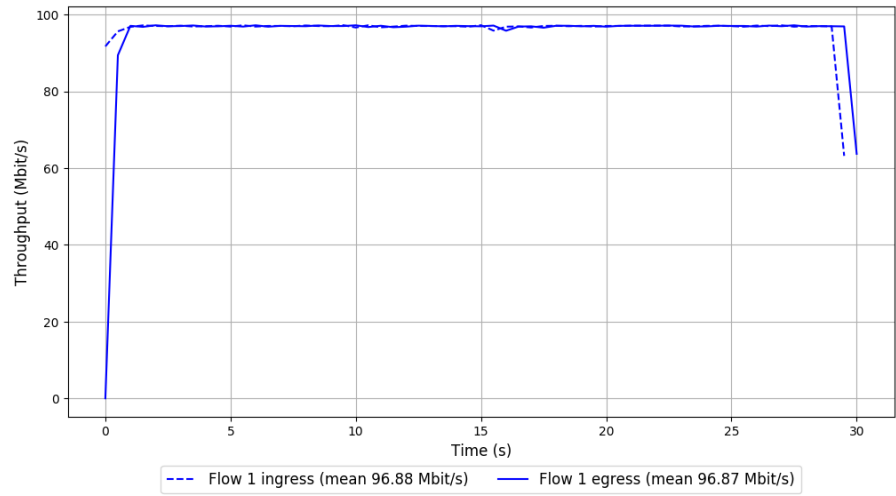
-- Flow 1:

Average throughput: 96.87 Mbit/s

95th percentile per-packet one-way delay: 4.535 ms

Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-09-03 08:33:26

End at: 2018-09-03 08:33:56

Local clock offset: 4.502 ms

Remote clock offset: 0.127 ms

Below is generated by plot.py at 2018-09-03 08:36:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.04 Mbit/s

95th percentile per-packet one-way delay: 5.744 ms

Loss rate: 0.00%

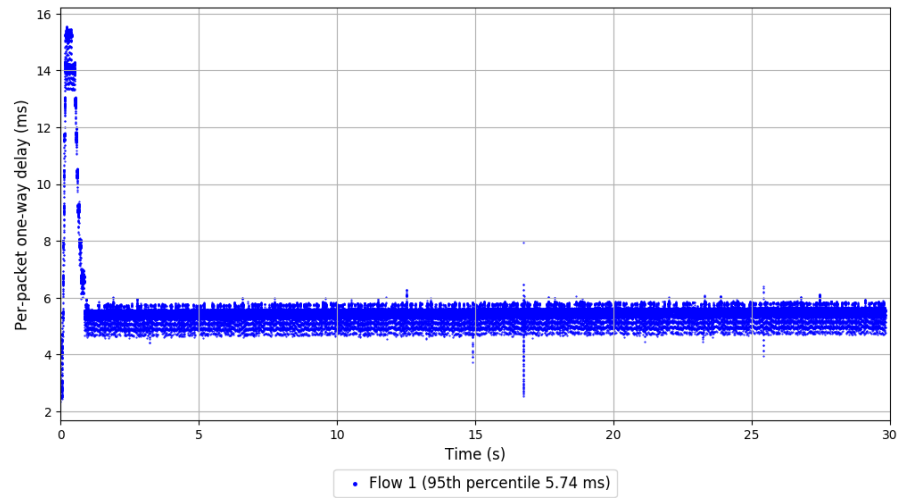
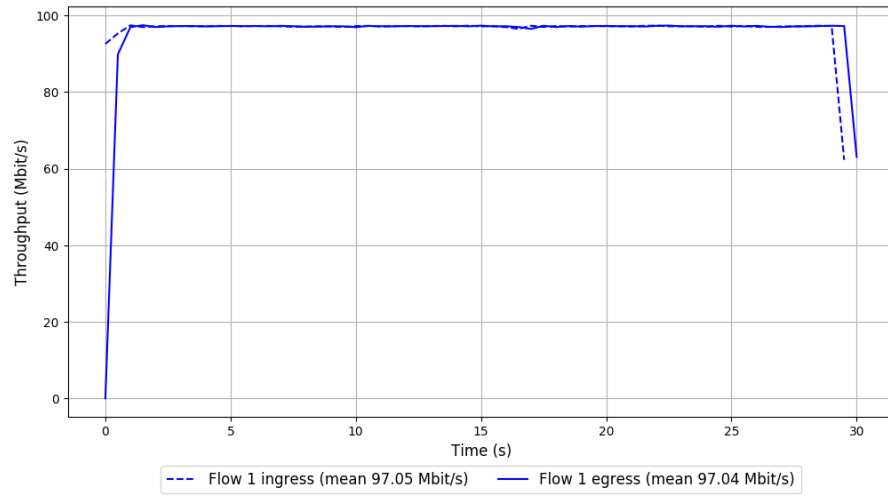
-- Flow 1:

Average throughput: 97.04 Mbit/s

95th percentile per-packet one-way delay: 5.744 ms

Loss rate: 0.00%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

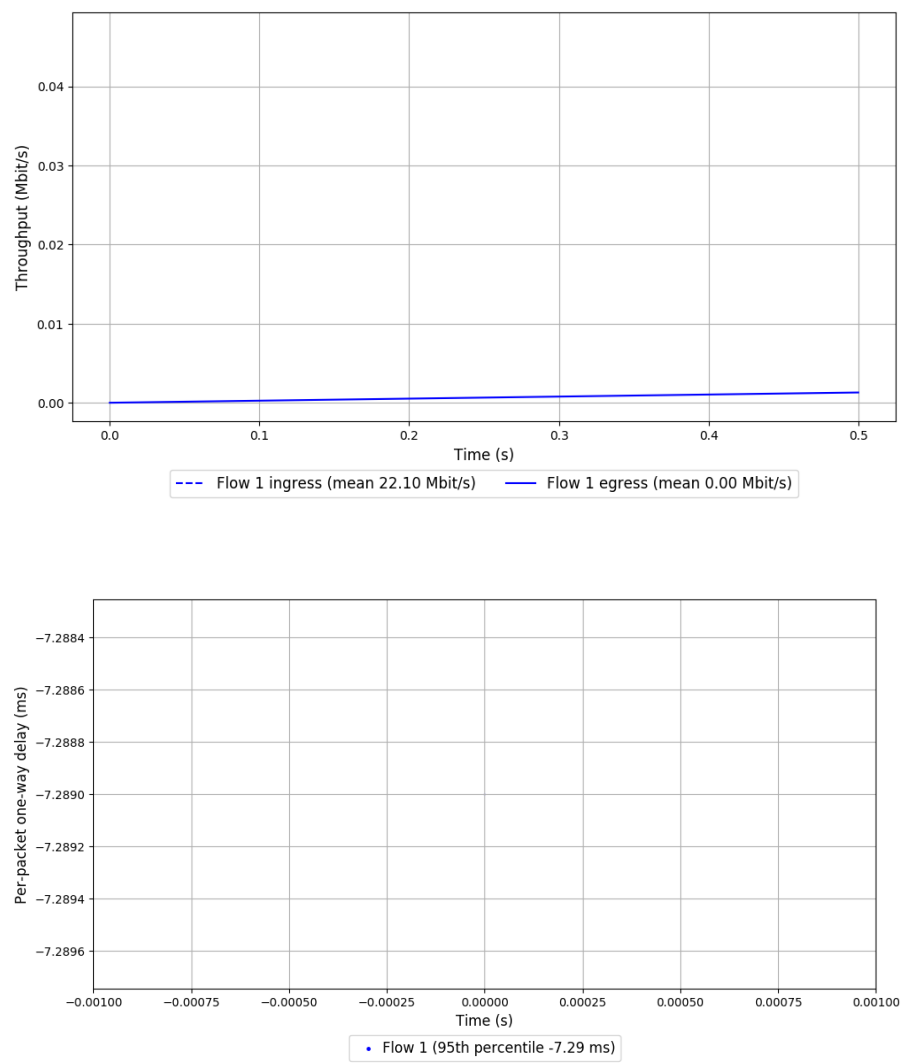
Start at: 2018-09-03 08:22:23

End at: 2018-09-03 08:22:53

Local clock offset: 15.011 ms

Remote clock offset: 0.049 ms

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-03 08:26:49

End at: 2018-09-03 08:27:19

Local clock offset: 2.198 ms

Remote clock offset: 0.113 ms

Below is generated by plot.py at 2018-09-03 08:36:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 10.41 Mbit/s

95th percentile per-packet one-way delay: 8.268 ms

Loss rate: 4.24%

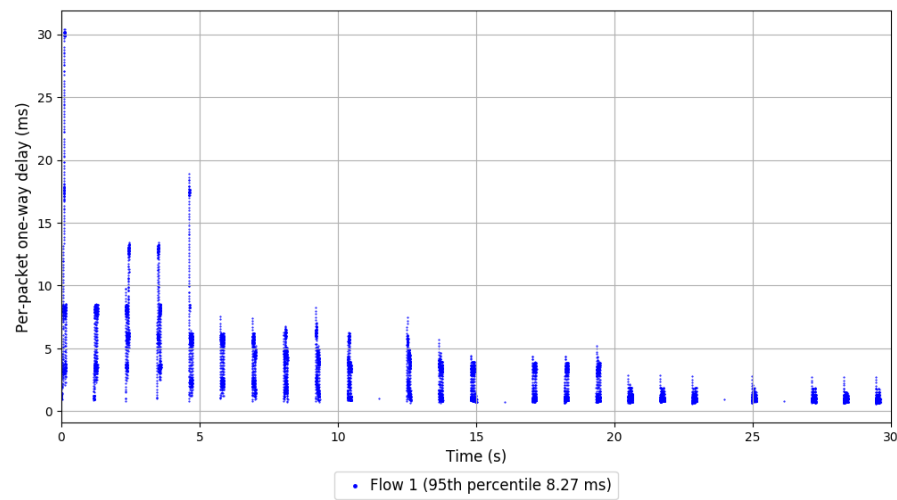
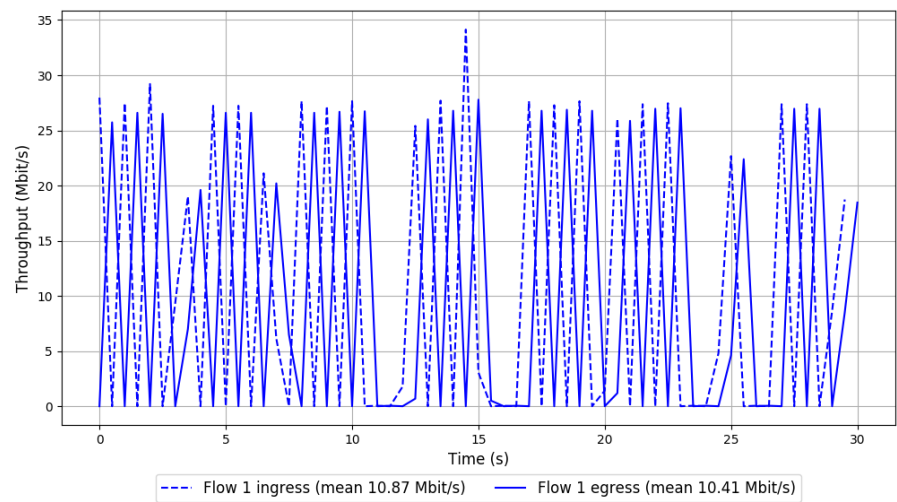
-- Flow 1:

Average throughput: 10.41 Mbit/s

95th percentile per-packet one-way delay: 8.268 ms

Loss rate: 4.24%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-03 08:31:15

End at: 2018-09-03 08:31:45

Local clock offset: 3.535 ms

Remote clock offset: 0.112 ms

Below is generated by plot.py at 2018-09-03 08:36:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 8.33 Mbit/s

95th percentile per-packet one-way delay: 17.144 ms

Loss rate: 16.83%

-- Flow 1:

Average throughput: 8.33 Mbit/s

95th percentile per-packet one-way delay: 17.144 ms

Loss rate: 16.83%

Run 3: Report of Muses-25 — Data Link

