

Pantheon Report

Generated at 2018-09-05 02:21:10 (UTC).

Data path: AWS Brazil 2 on `ens5` (*local*) → Colombia 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.

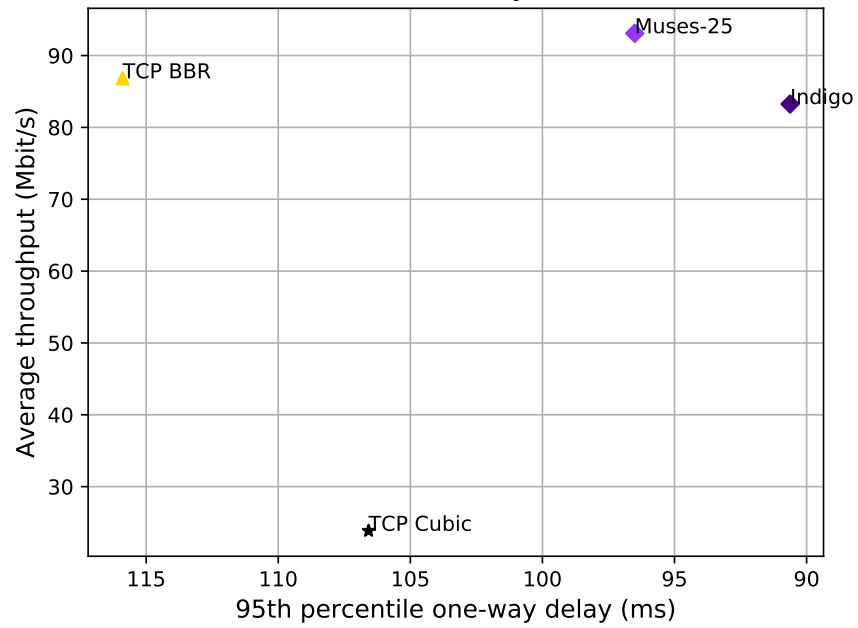
System info:

```
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
```

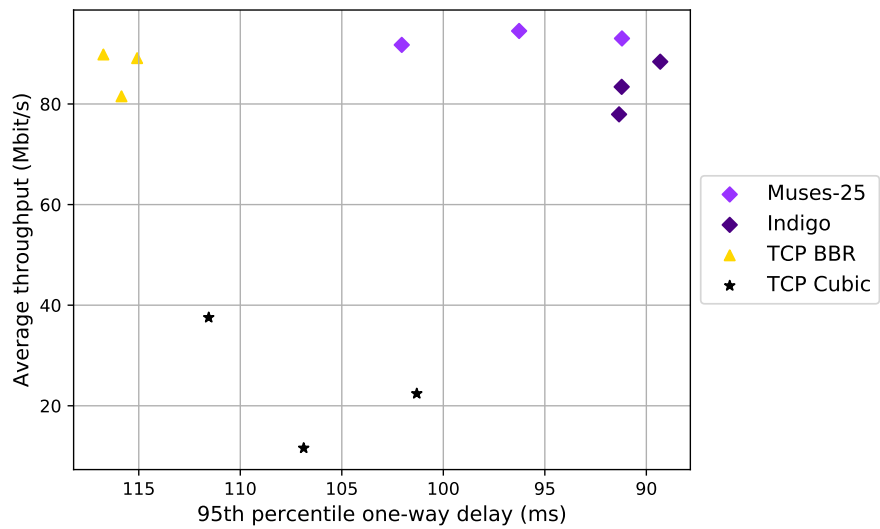
Git summary:

```
branch: muses @ 71e71e9a55b945431a7dea72180c1c9381097db9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 96fbc95fb38373d71fbc80c5a105e62e7636623b
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 Brazil 2 to Colombia, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS Brazil 2 to Colombia, 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	86.83	115.89	3.73
TCP Cubic	3	23.85	106.58	2.34
Indigo	3	83.25	90.62	1.74
Muses-25	3	93.10	96.50	1.62

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 02:06:57

End at: 2018-09-05 02:07:27

Local clock offset: 0.991 ms

Remote clock offset: 2.013 ms

Below is generated by plot.py at 2018-09-05 02:20:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 89.12 Mbit/s

95th percentile per-packet one-way delay: 115.082 ms

Loss rate: 3.14%

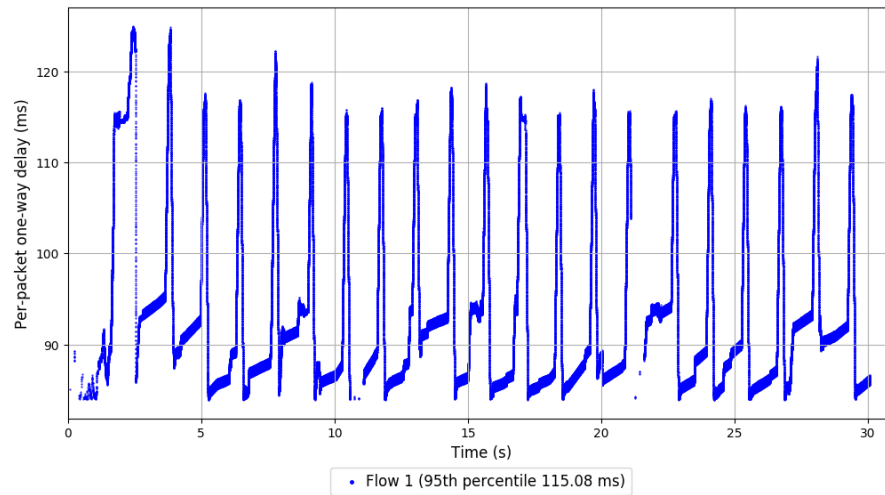
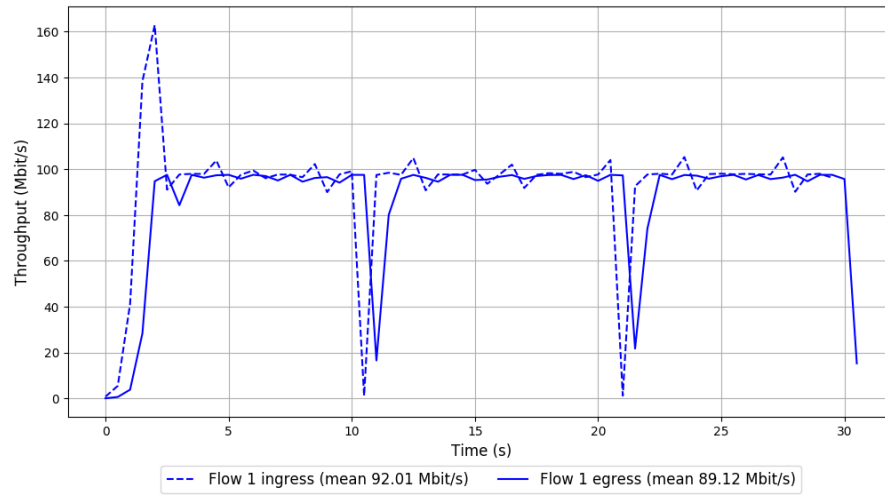
-- Flow 1:

Average throughput: 89.12 Mbit/s

95th percentile per-packet one-way delay: 115.082 ms

Loss rate: 3.14%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 02:11:45

End at: 2018-09-05 02:12:15

Local clock offset: 0.595 ms

Remote clock offset: 3.329 ms

Below is generated by plot.py at 2018-09-05 02:20:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 89.84 Mbit/s

95th percentile per-packet one-way delay: 116.743 ms

Loss rate: 3.13%

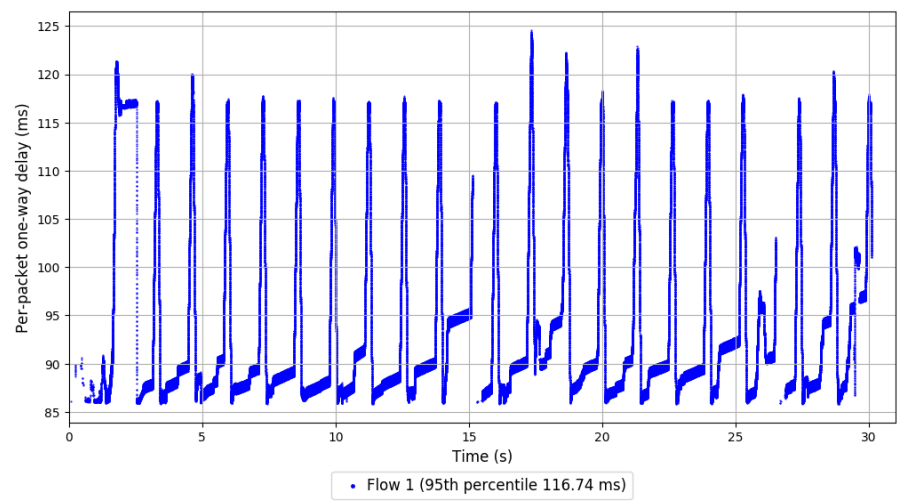
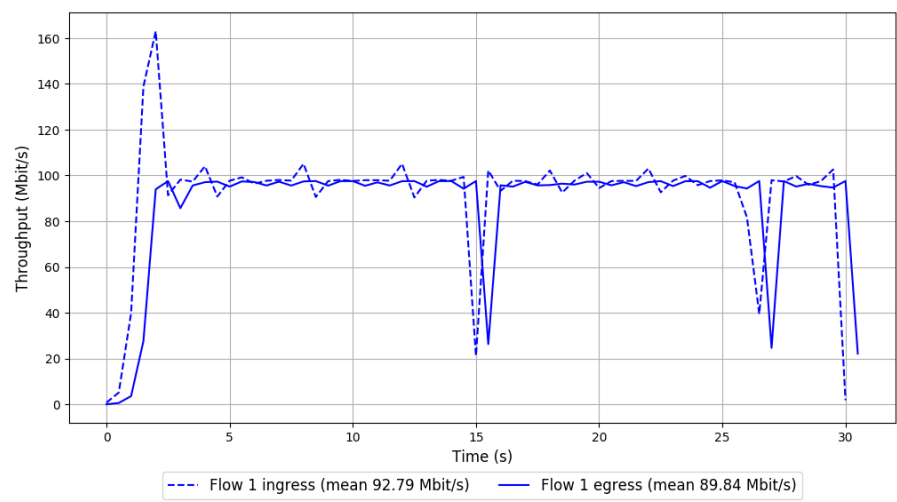
-- Flow 1:

Average throughput: 89.84 Mbit/s

95th percentile per-packet one-way delay: 116.743 ms

Loss rate: 3.13%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-09-05 02:16:37

End at: 2018-09-05 02:17:07

Local clock offset: 1.569 ms

Remote clock offset: -0.753 ms

Below is generated by plot.py at 2018-09-05 02:20:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 81.53 Mbit/s

95th percentile per-packet one-way delay: 115.851 ms

Loss rate: 4.92%

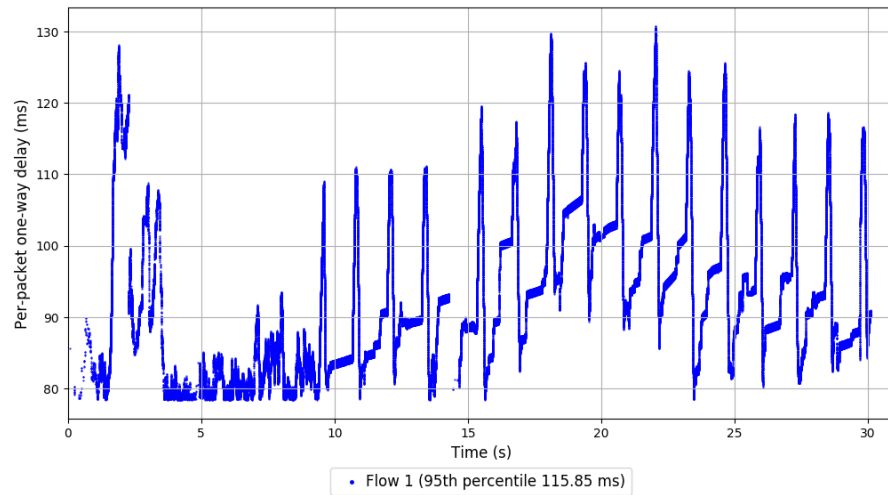
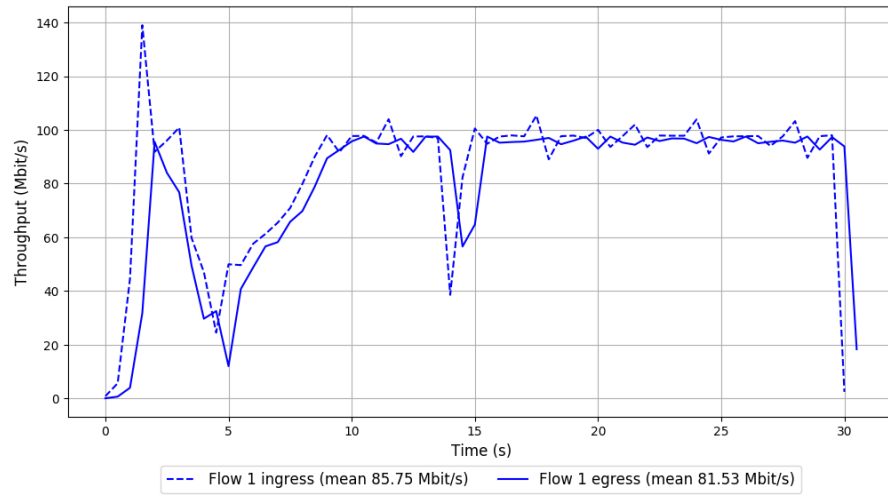
-- Flow 1:

Average throughput: 81.53 Mbit/s

95th percentile per-packet one-way delay: 115.851 ms

Loss rate: 4.92%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 02:05:48

End at: 2018-09-05 02:06:18

Local clock offset: 0.0 ms

Remote clock offset: 3.388 ms

Below is generated by plot.py at 2018-09-05 02:20:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 11.59 Mbit/s

95th percentile per-packet one-way delay: 106.878 ms

Loss rate: 0.11%

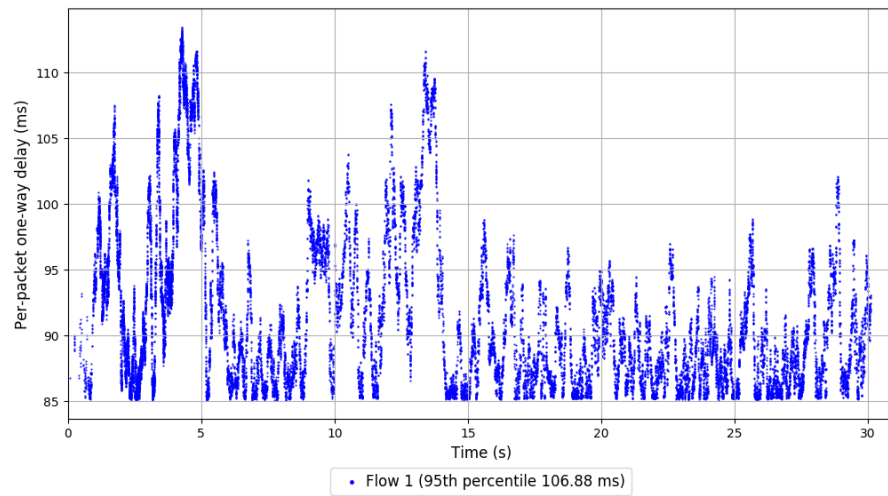
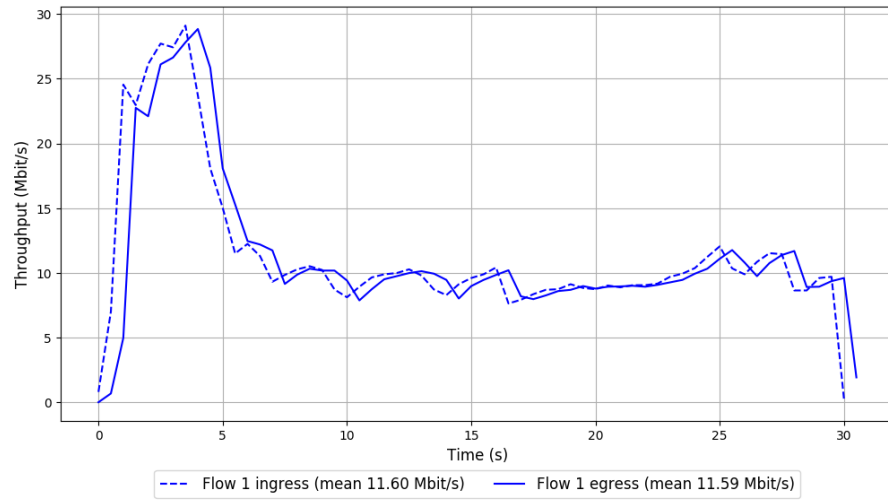
-- Flow 1:

Average throughput: 11.59 Mbit/s

95th percentile per-packet one-way delay: 106.878 ms

Loss rate: 0.11%

Run 1: Report of TCP Cubic — Data Link

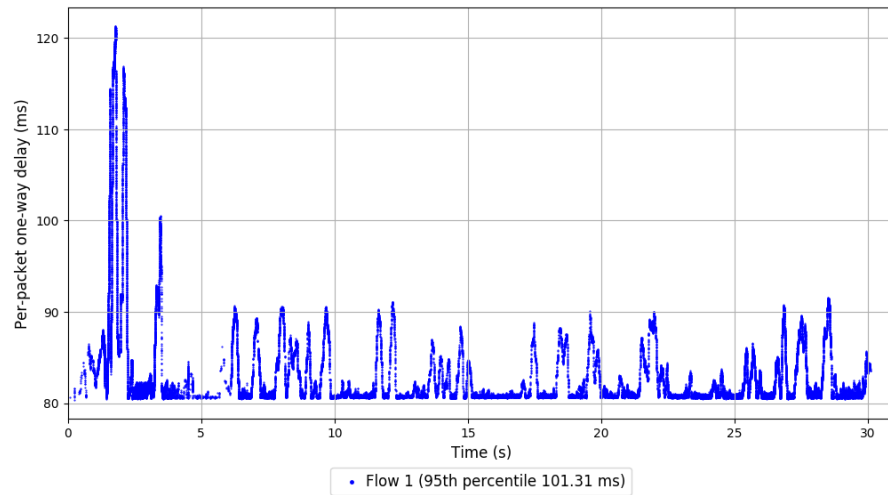
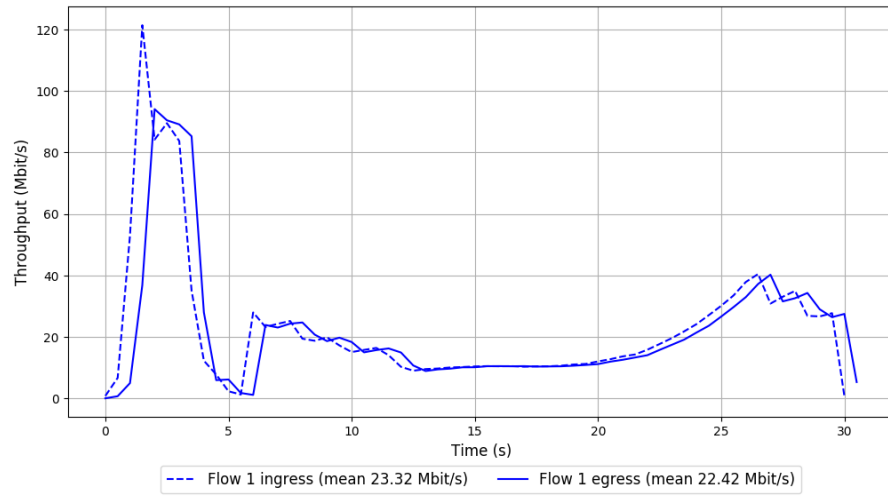


Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 02:10:36
End at: 2018-09-05 02:11:06
Local clock offset: 1.295 ms
Remote clock offset: -3.228 ms

Below is generated by plot.py at 2018-09-05 02:20:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 22.42 Mbit/s
95th percentile per-packet one-way delay: 101.308 ms
Loss rate: 3.90%
-- Flow 1:
Average throughput: 22.42 Mbit/s
95th percentile per-packet one-way delay: 101.308 ms
Loss rate: 3.90%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-09-05 02:15:26

End at: 2018-09-05 02:15:56

Local clock offset: 0.767 ms

Remote clock offset: 0.267 ms

Below is generated by plot.py at 2018-09-05 02:20:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 37.54 Mbit/s

95th percentile per-packet one-way delay: 111.555 ms

Loss rate: 3.02%

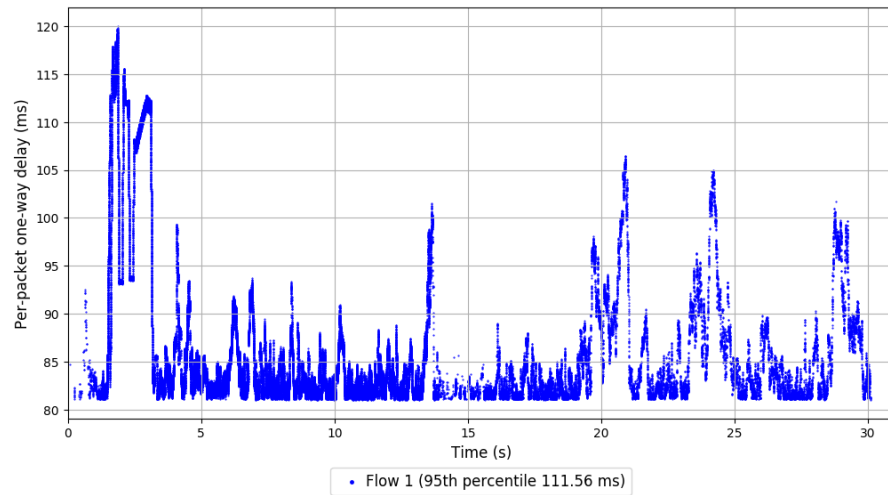
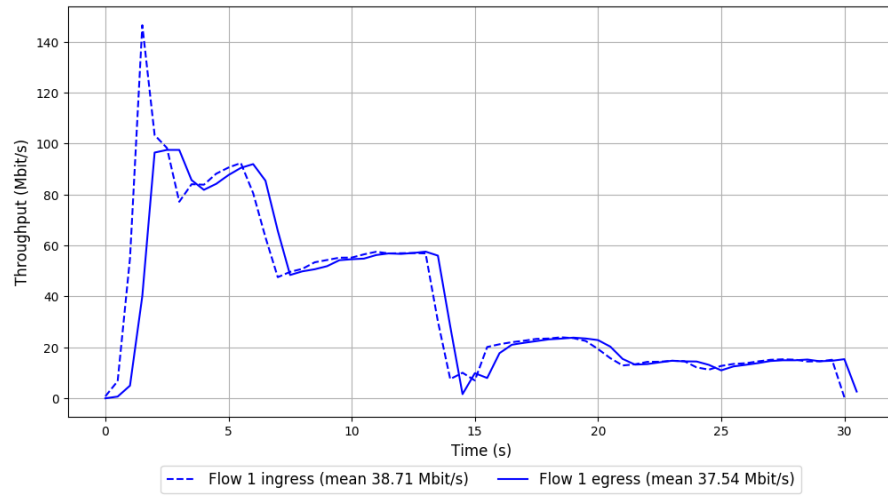
-- Flow 1:

Average throughput: 37.54 Mbit/s

95th percentile per-packet one-way delay: 111.555 ms

Loss rate: 3.02%

Run 3: Report of TCP Cubic — Data Link

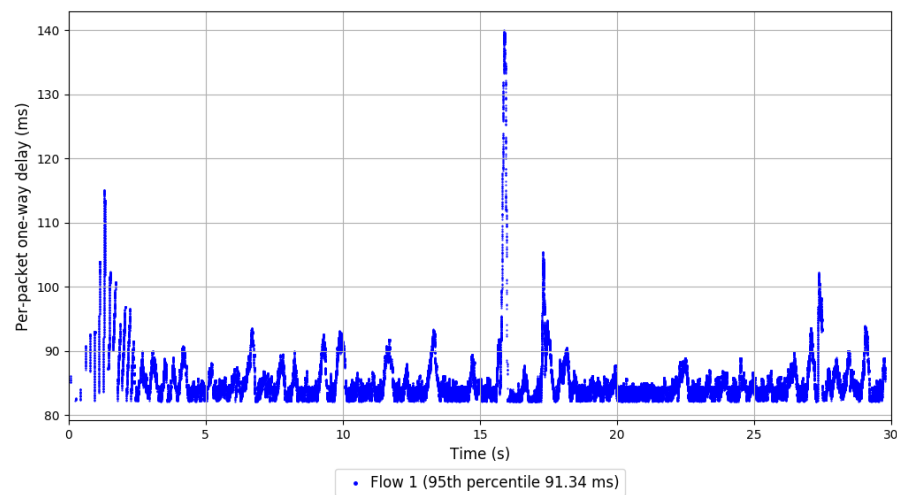
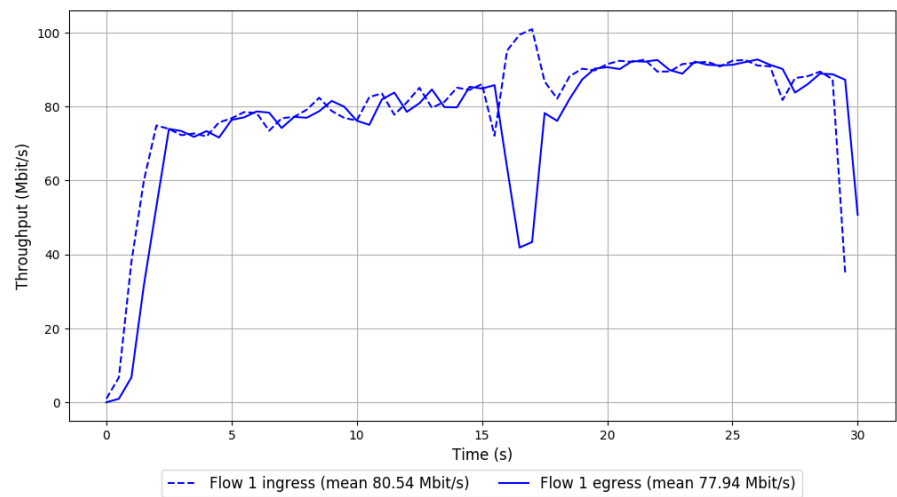


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 02:09:23
End at: 2018-09-05 02:09:53
Local clock offset: 0.449 ms
Remote clock offset: -0.45 ms

# Below is generated by plot.py at 2018-09-05 02:20:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 77.94 Mbit/s
95th percentile per-packet one-way delay: 91.344 ms
Loss rate: 3.22%
-- Flow 1:
Average throughput: 77.94 Mbit/s
95th percentile per-packet one-way delay: 91.344 ms
Loss rate: 3.22%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-05 02:14:09

End at: 2018-09-05 02:14:39

Local clock offset: 1.495 ms

Remote clock offset: 0.009 ms

Below is generated by plot.py at 2018-09-05 02:20:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 88.41 Mbit/s

95th percentile per-packet one-way delay: 89.316 ms

Loss rate: 0.75%

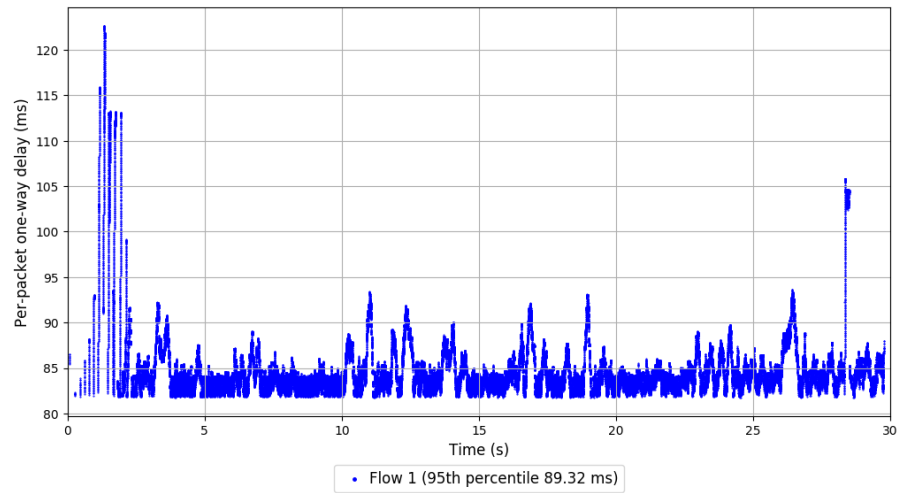
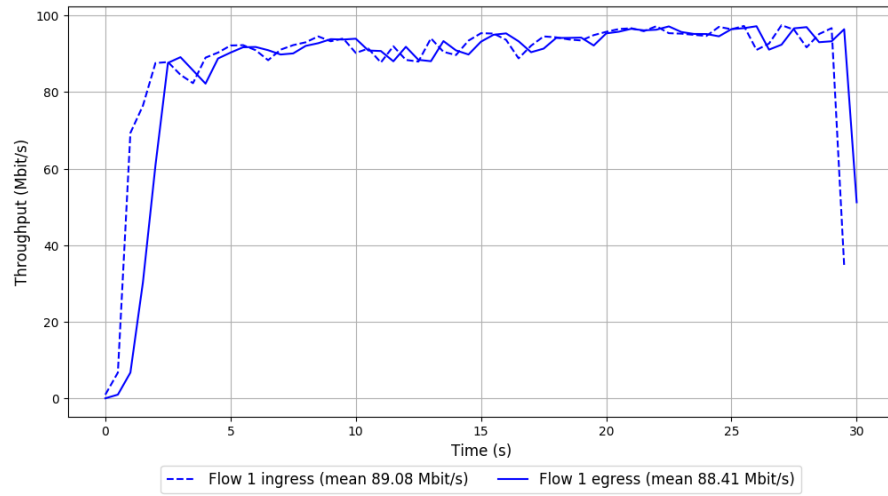
-- Flow 1:

Average throughput: 88.41 Mbit/s

95th percentile per-packet one-way delay: 89.316 ms

Loss rate: 0.75%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-09-05 02:19:03

End at: 2018-09-05 02:19:33

Local clock offset: 1.634 ms

Remote clock offset: 0.747 ms

Below is generated by plot.py at 2018-09-05 02:21:00

Datalink statistics

-- Total of 1 flow:

Average throughput: 83.41 Mbit/s

95th percentile per-packet one-way delay: 91.215 ms

Loss rate: 1.25%

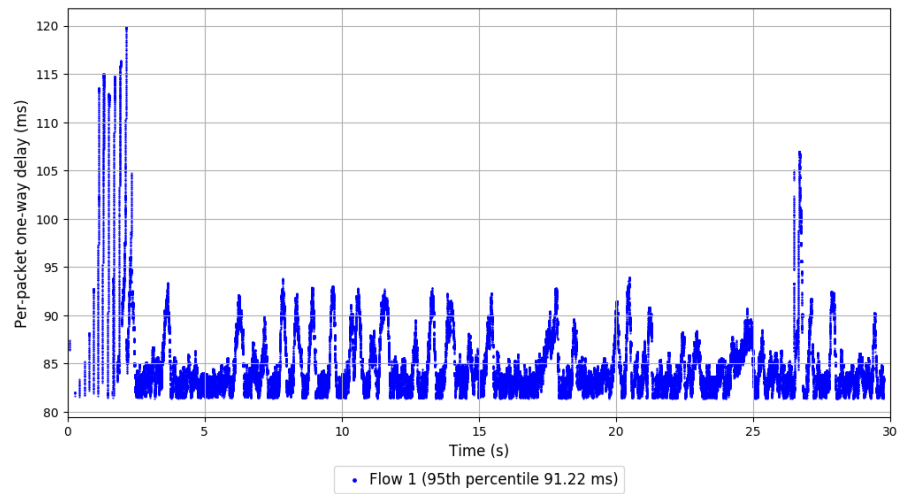
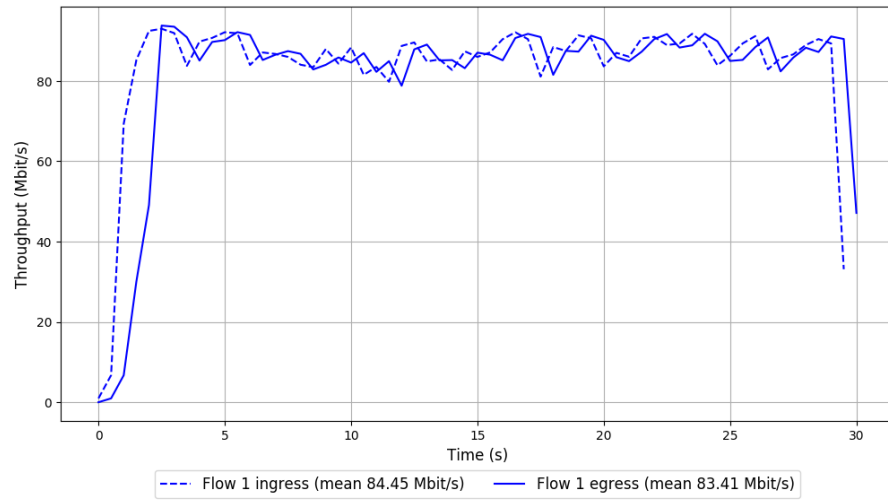
-- Flow 1:

Average throughput: 83.41 Mbit/s

95th percentile per-packet one-way delay: 91.215 ms

Loss rate: 1.25%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-05 02:08:10

End at: 2018-09-05 02:08:40

Local clock offset: 0.314 ms

Remote clock offset: 3.354 ms

Below is generated by plot.py at 2018-09-05 02:21:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 91.75 Mbit/s

95th percentile per-packet one-way delay: 102.047 ms

Loss rate: 2.18%

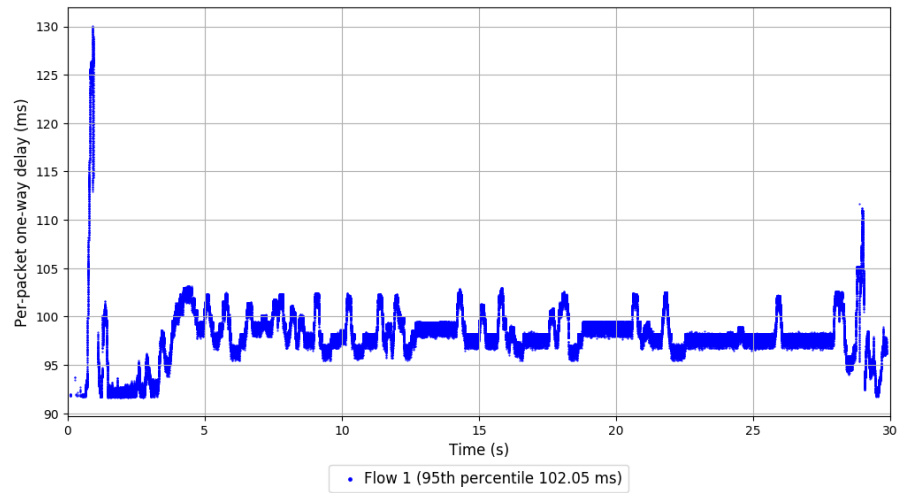
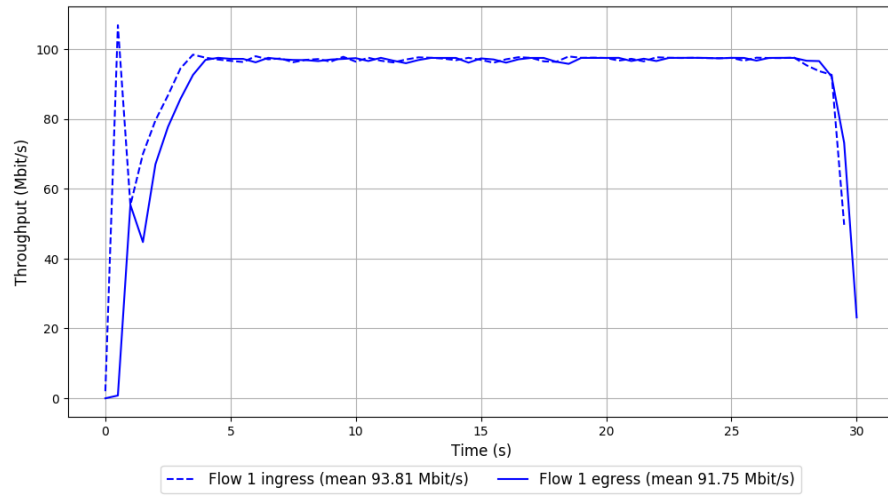
-- Flow 1:

Average throughput: 91.75 Mbit/s

95th percentile per-packet one-way delay: 102.047 ms

Loss rate: 2.18%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-05 02:12:57

End at: 2018-09-05 02:13:27

Local clock offset: 0.654 ms

Remote clock offset: 3.288 ms

Below is generated by plot.py at 2018-09-05 02:21:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 94.52 Mbit/s

95th percentile per-packet one-way delay: 96.267 ms

Loss rate: 1.39%

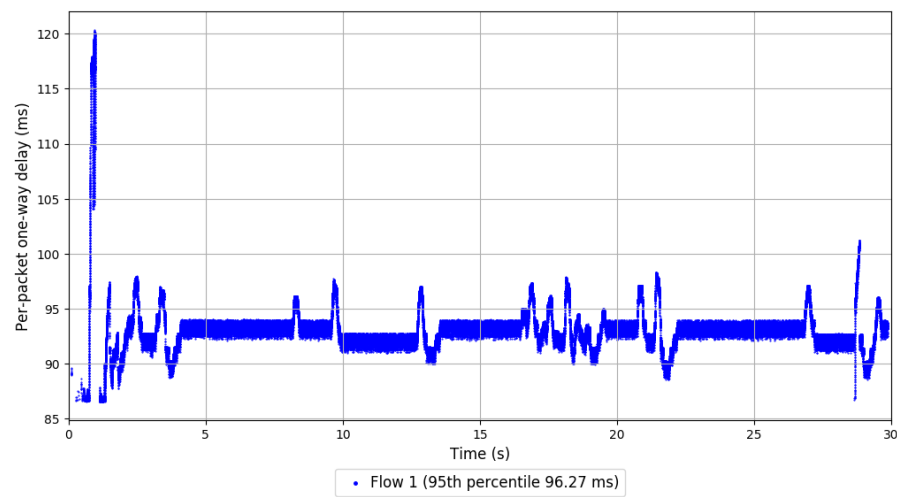
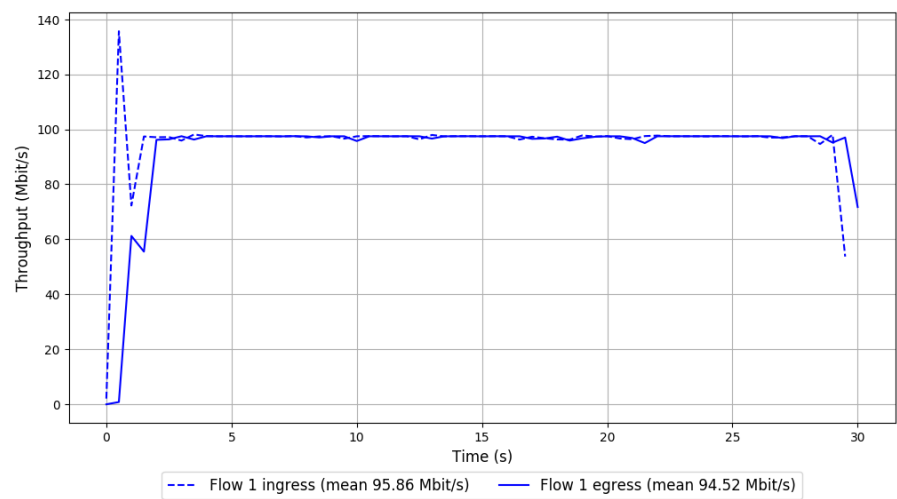
-- Flow 1:

Average throughput: 94.52 Mbit/s

95th percentile per-packet one-way delay: 96.267 ms

Loss rate: 1.39%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-05 02:17:51

End at: 2018-09-05 02:18:21

Local clock offset: 1.616 ms

Remote clock offset: 0.49 ms

Below is generated by plot.py at 2018-09-05 02:21:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 93.03 Mbit/s

95th percentile per-packet one-way delay: 91.201 ms

Loss rate: 1.28%

-- Flow 1:

Average throughput: 93.03 Mbit/s

95th percentile per-packet one-way delay: 91.201 ms

Loss rate: 1.28%

Run 3: Report of Muses-25 — Data Link

