

Pantheon Report

Generated at 2018-09-03 09:34:22 (UTC).

Data path: Colombia on **p4p1** (*remote*) → AWS Brazil 2 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.

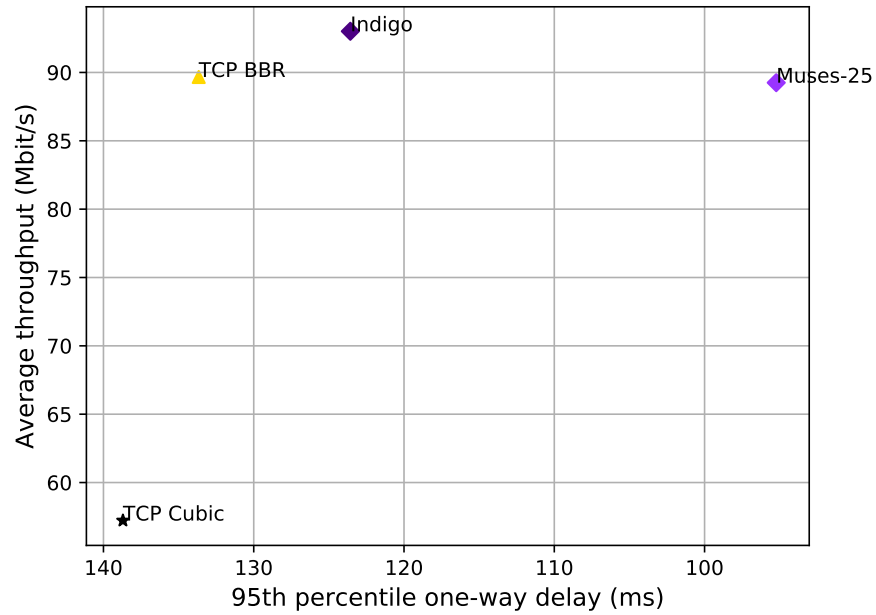
System info:

```
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
```

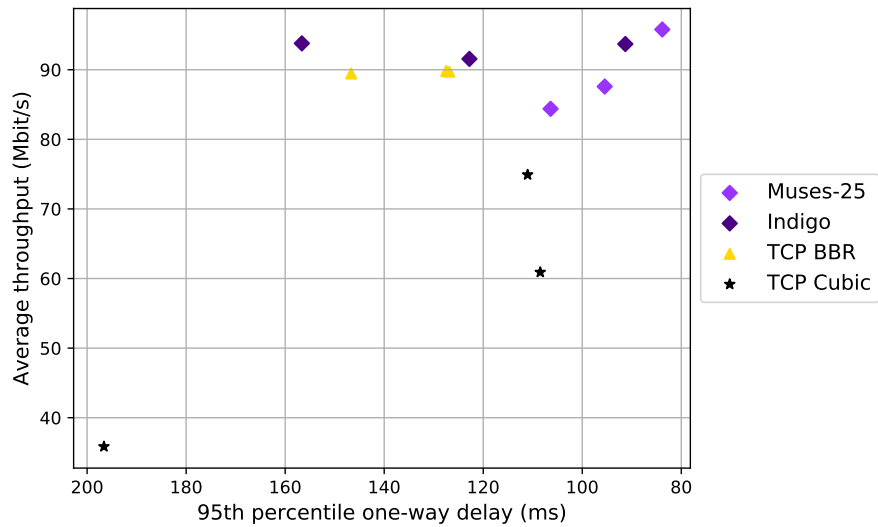
Git summary:

```
branch: muses @ 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
```

test from Colombia to AWS Brazil 2, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from Colombia to AWS Brazil 2, 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	89.67	133.66	0.85
TCP Cubic	3	57.22	138.70	1.22
Indigo	3	93.01	123.57	1.41
Muses-25	3	89.25	95.23	1.20

Run 1: Statistics of TCP BBR

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

End at: 2018-09-03 09:21:39

Local clock offset: -3.865 ms

Remote clock offset: 3.515 ms

Below is generated by plot.py at 2018-09-03 09:33:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 89.72 Mbit/s

95th percentile per-packet one-way delay: 126.830 ms

Loss rate: 0.81%

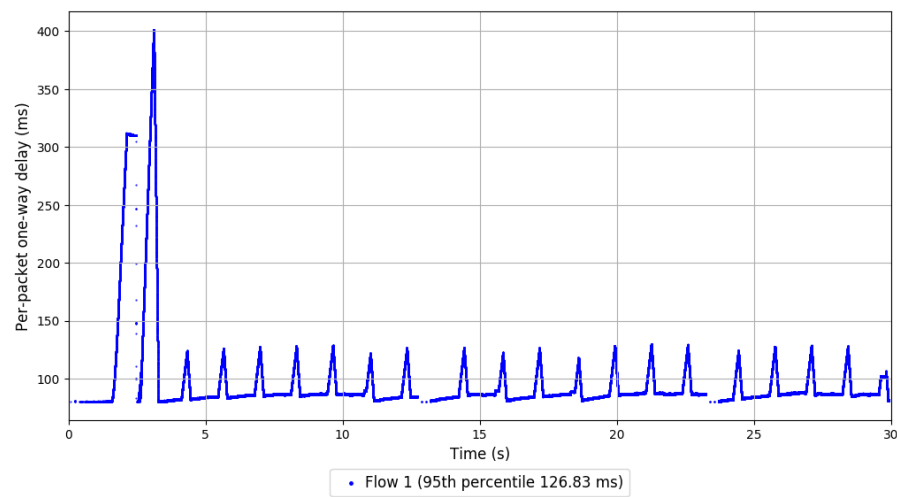
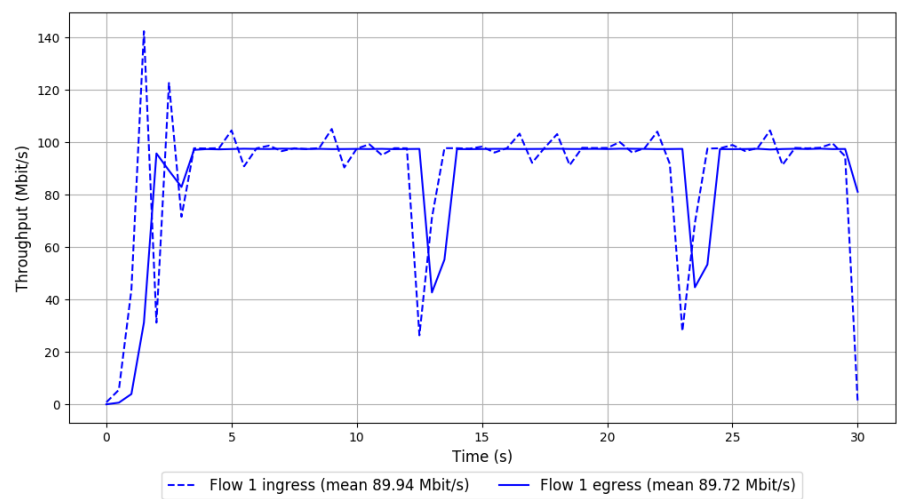
-- Flow 1:

Average throughput: 89.72 Mbit/s

95th percentile per-packet one-way delay: 126.830 ms

Loss rate: 0.81%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-03 09:26:04

End at: 2018-09-03 09:26:34

Local clock offset: -3.792 ms

Remote clock offset: 3.613 ms

Below is generated by plot.py at 2018-09-03 09:33:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 89.46 Mbit/s

95th percentile per-packet one-way delay: 146.673 ms

Loss rate: 0.86%

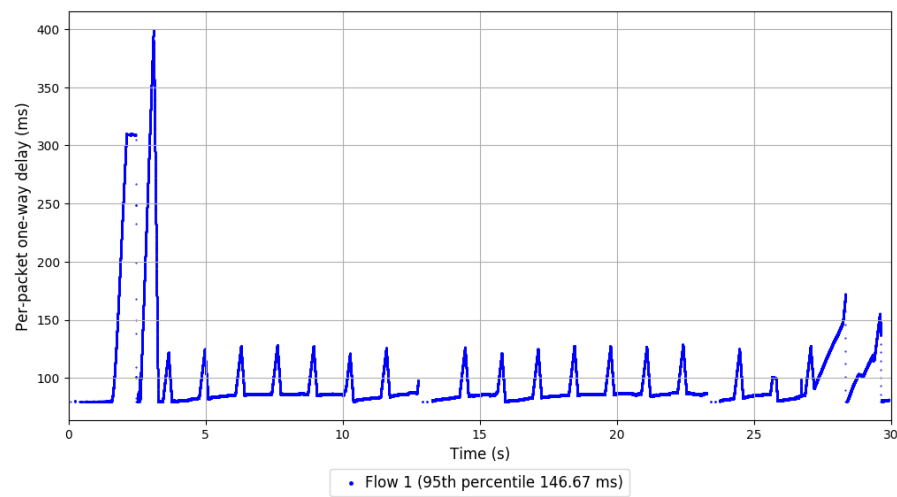
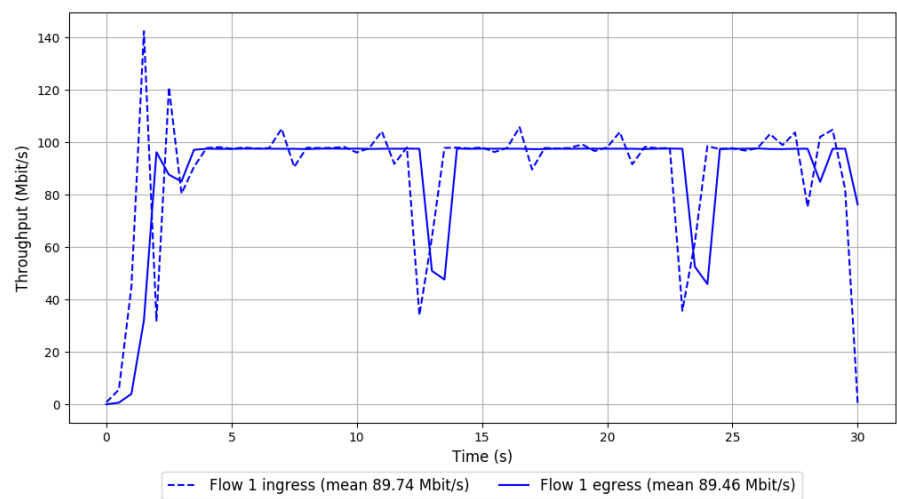
-- Flow 1:

Average throughput: 89.46 Mbit/s

95th percentile per-packet one-way delay: 146.673 ms

Loss rate: 0.86%

Run 2: Report of TCP BBR — Data Link

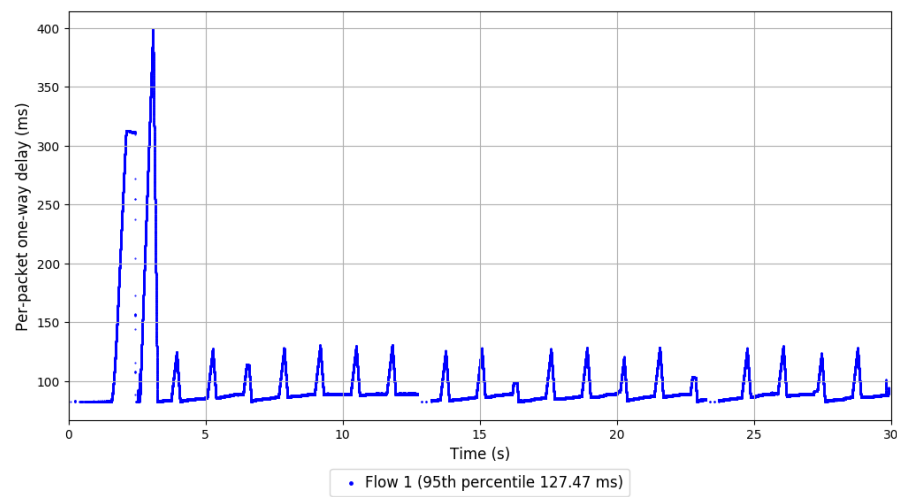
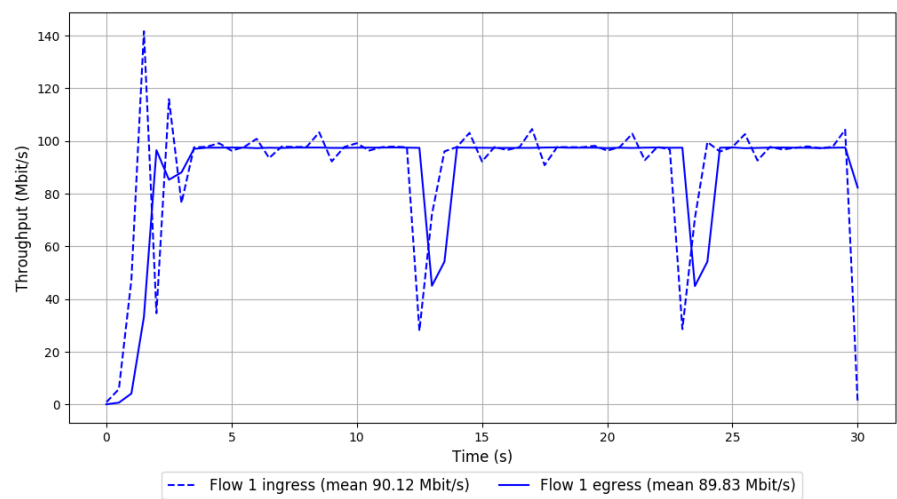


Run 3: Statistics of TCP BBR

Start at: 2018-09-03 09:30:48
End at: 2018-09-03 09:31:18
Local clock offset: -3.799 ms
Remote clock offset: -1.243 ms

Below is generated by plot.py at 2018-09-03 09:33:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 89.83 Mbit/s
95th percentile per-packet one-way delay: 127.475 ms
Loss rate: 0.87%
-- Flow 1:
Average throughput: 89.83 Mbit/s
95th percentile per-packet one-way delay: 127.475 ms
Loss rate: 0.87%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-03 09:22:32

End at: 2018-09-03 09:23:02

Local clock offset: -3.097 ms

Remote clock offset: -0.29 ms

Below is generated by plot.py at 2018-09-03 09:33:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 35.84 Mbit/s

95th percentile per-packet one-way delay: 196.601 ms

Loss rate: 2.18%

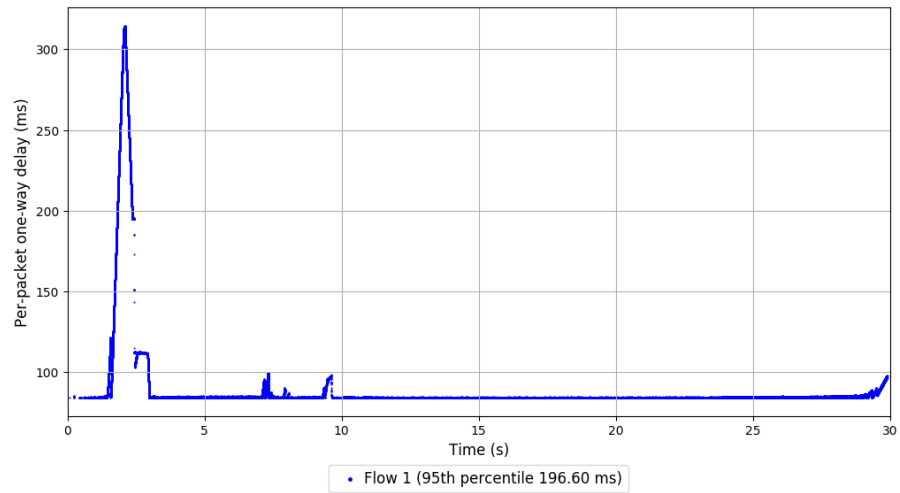
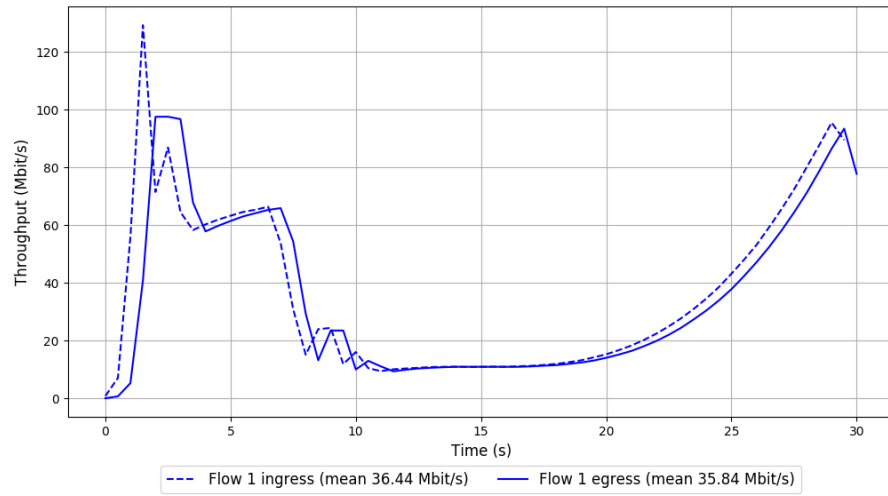
-- Flow 1:

Average throughput: 35.84 Mbit/s

95th percentile per-packet one-way delay: 196.601 ms

Loss rate: 2.18%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-03 09:27:16

End at: 2018-09-03 09:27:46

Local clock offset: -3.033 ms

Remote clock offset: 3.637 ms

Below is generated by plot.py at 2018-09-03 09:33:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 60.91 Mbit/s

95th percentile per-packet one-way delay: 108.479 ms

Loss rate: 0.86%

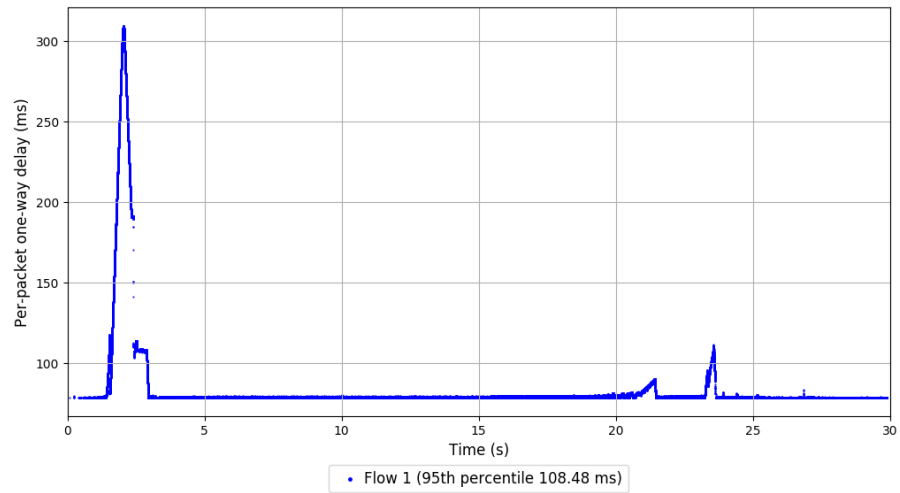
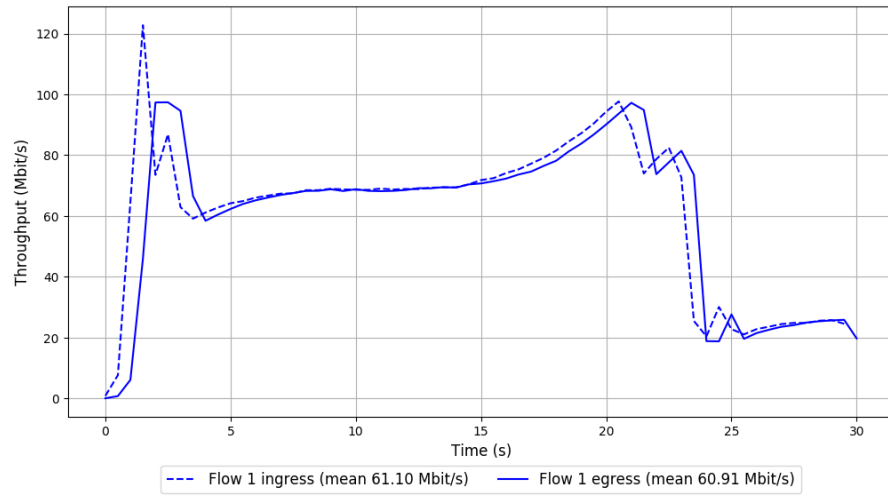
-- Flow 1:

Average throughput: 60.91 Mbit/s

95th percentile per-packet one-way delay: 108.479 ms

Loss rate: 0.86%

Run 2: Report of TCP Cubic — Data Link

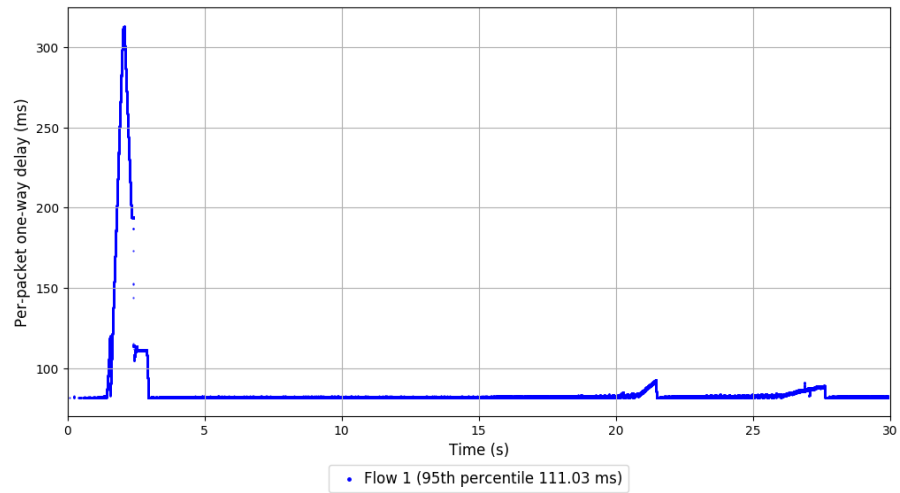
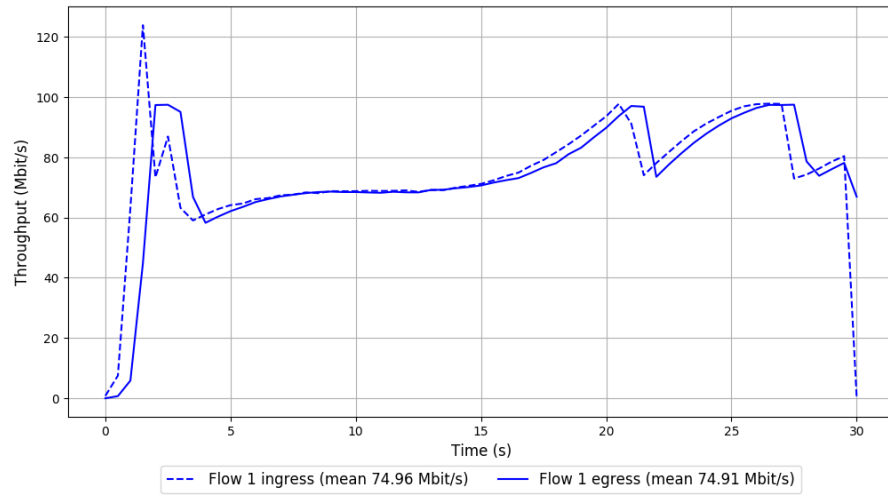


Run 3: Statistics of TCP Cubic

Start at: 2018-09-03 09:32:04
End at: 2018-09-03 09:32:34
Local clock offset: -3.876 ms
Remote clock offset: -0.125 ms

Below is generated by plot.py at 2018-09-03 09:33:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 74.91 Mbit/s
95th percentile per-packet one-way delay: 111.033 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 74.91 Mbit/s
95th percentile per-packet one-way delay: 111.033 ms
Loss rate: 0.61%

Run 3: Report of TCP Cubic — Data Link

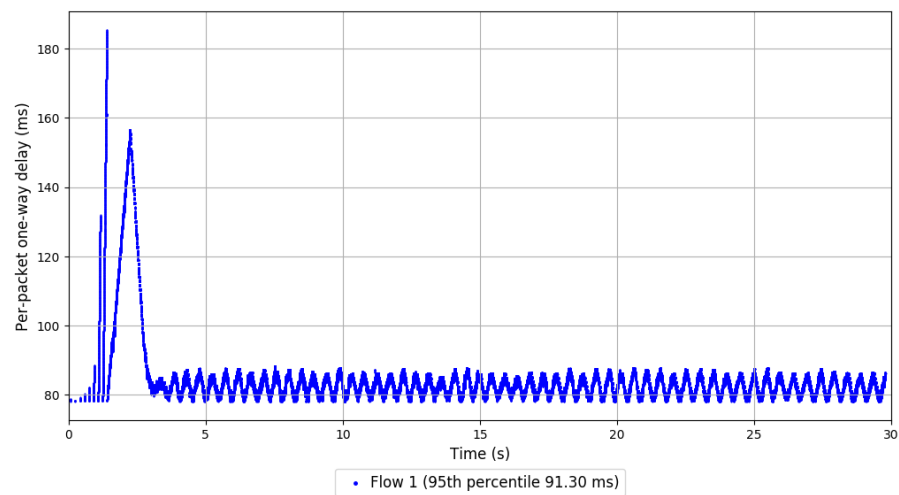
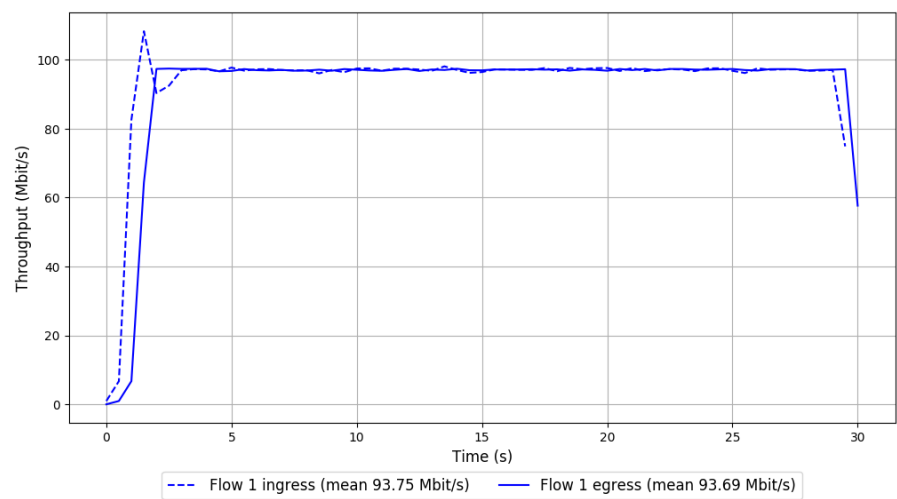


```
Run 1: Statistics of Indigo

Start at: 2018-09-03 09:19:56
End at: 2018-09-03 09:20:26
Local clock offset: -3.872 ms
Remote clock offset: 3.422 ms

# Below is generated by plot.py at 2018-09-03 09:33:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 93.69 Mbit/s
95th percentile per-packet one-way delay: 91.297 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 93.69 Mbit/s
95th percentile per-packet one-way delay: 91.297 ms
Loss rate: 0.61%
```

Run 1: Report of Indigo — Data Link

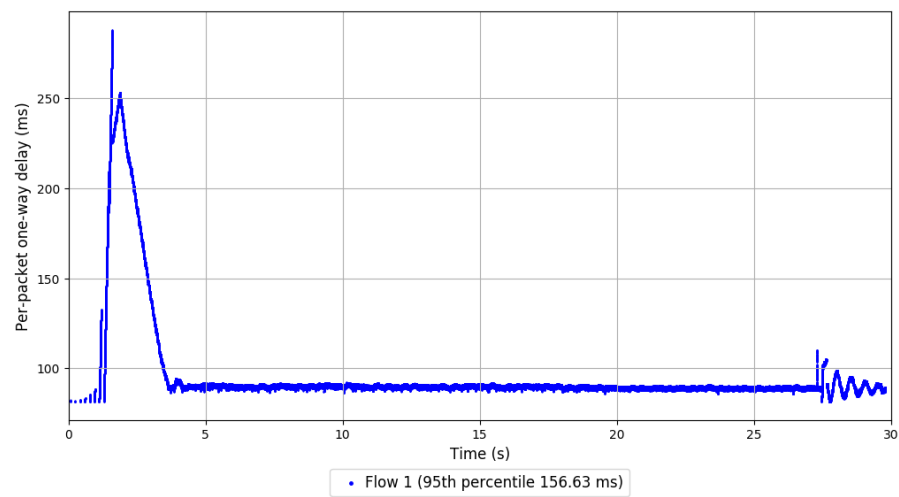
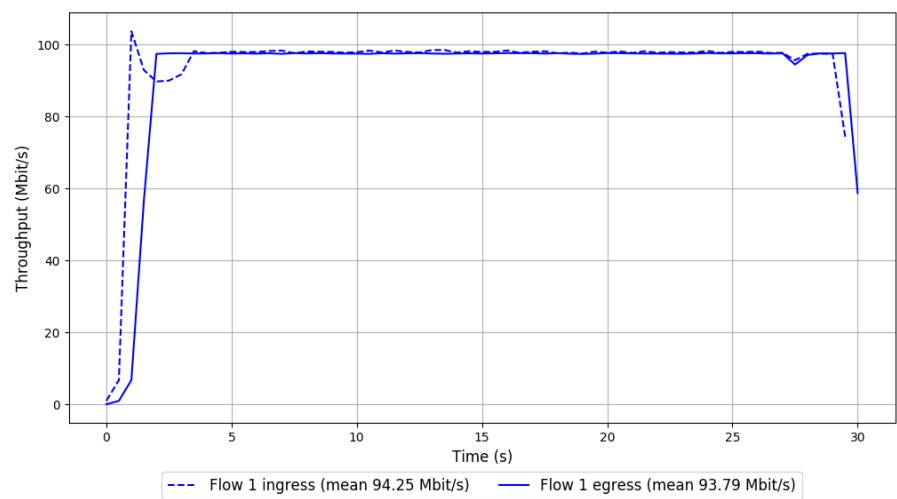


Run 2: Statistics of Indigo

Start at: 2018-09-03 09:24:52
End at: 2018-09-03 09:25:22
Local clock offset: -3.848 ms
Remote clock offset: -0.203 ms

Below is generated by plot.py at 2018-09-03 09:33:59
Datalink statistics
-- Total of 1 flow:
Average throughput: 93.79 Mbit/s
95th percentile per-packet one-way delay: 156.629 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 93.79 Mbit/s
95th percentile per-packet one-way delay: 156.629 ms
Loss rate: 1.03%

Run 2: Report of Indigo — Data Link

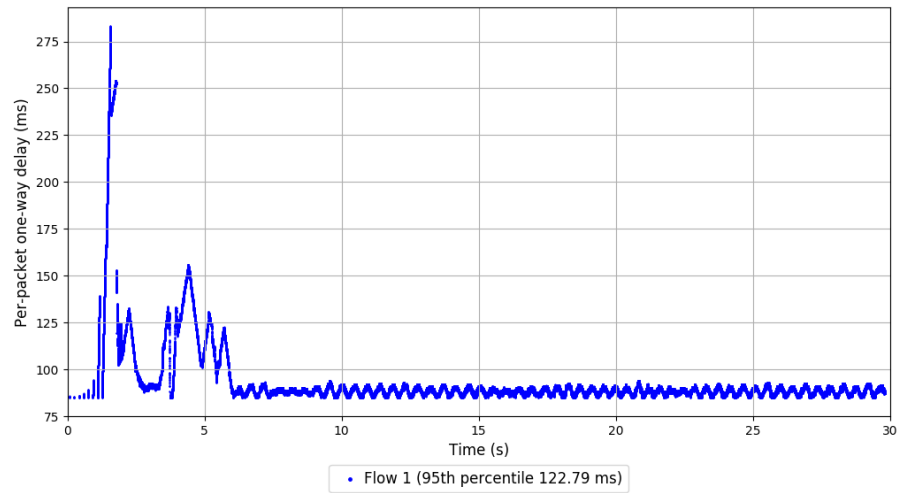
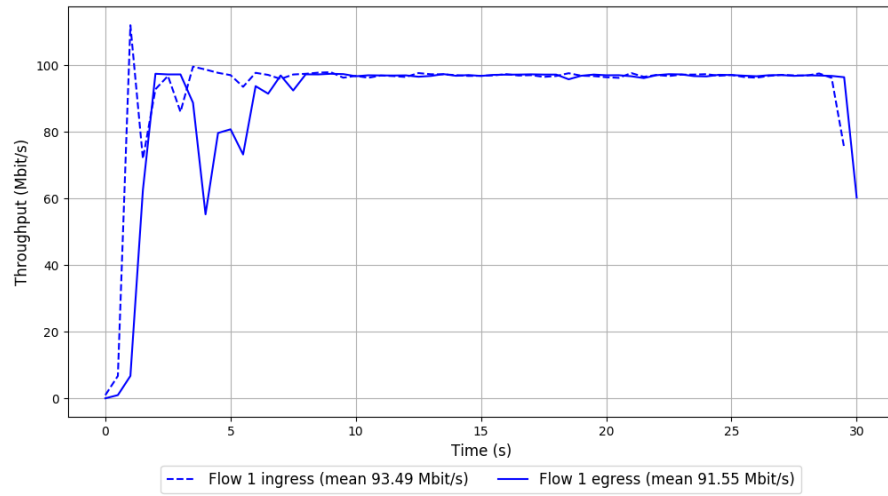


Run 3: Statistics of Indigo

Start at: 2018-09-03 09:29:36
End at: 2018-09-03 09:30:06
Local clock offset: -3.041 ms
Remote clock offset: -0.266 ms

Below is generated by plot.py at 2018-09-03 09:34:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 91.55 Mbit/s
95th percentile per-packet one-way delay: 122.789 ms
Loss rate: 2.60%
-- Flow 1:
Average throughput: 91.55 Mbit/s
95th percentile per-packet one-way delay: 122.789 ms
Loss rate: 2.60%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-03 09:18:45

End at: 2018-09-03 09:19:15

Local clock offset: -3.856 ms

Remote clock offset: 3.455 ms

Below is generated by plot.py at 2018-09-03 09:34:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 95.78 Mbit/s

95th percentile per-packet one-way delay: 83.837 ms

Loss rate: 0.62%

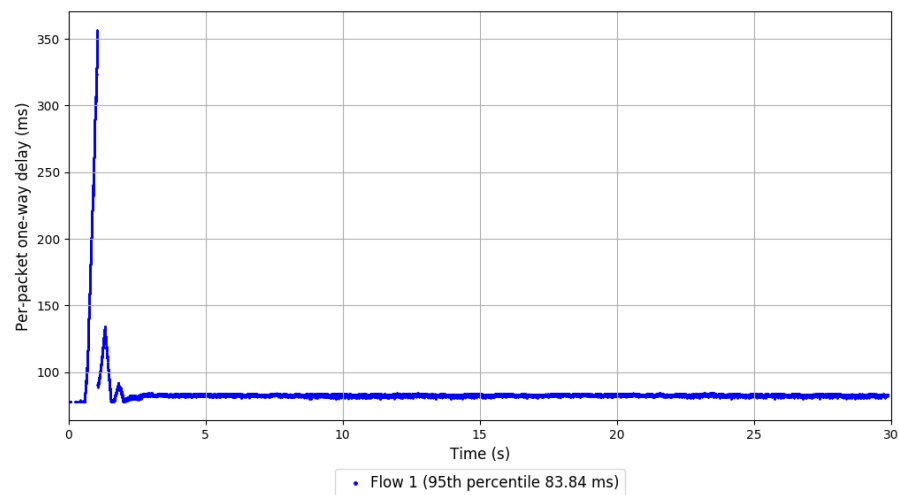
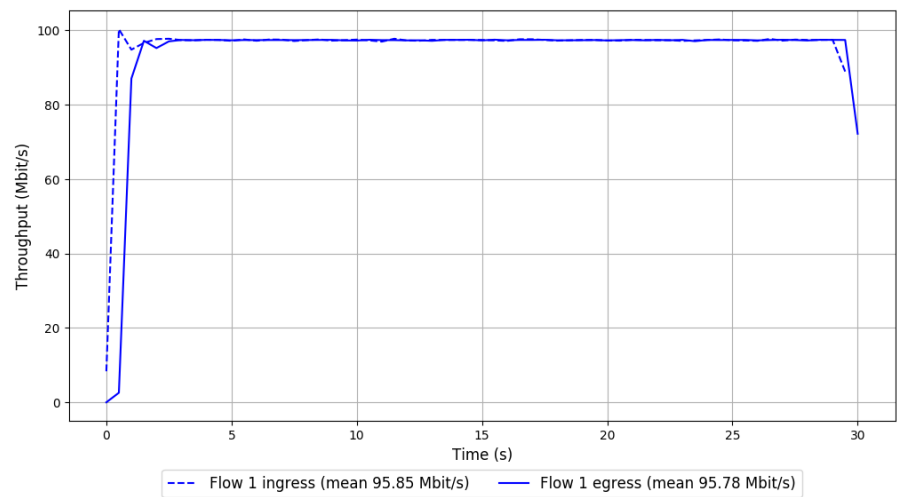
-- Flow 1:

Average throughput: 95.78 Mbit/s

95th percentile per-packet one-way delay: 83.837 ms

Loss rate: 0.62%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-03 09:23:41

End at: 2018-09-03 09:24:11

Local clock offset: -3.022 ms

Remote clock offset: 3.622 ms

Below is generated by plot.py at 2018-09-03 09:34:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 87.59 Mbit/s

95th percentile per-packet one-way delay: 95.463 ms

Loss rate: 1.46%

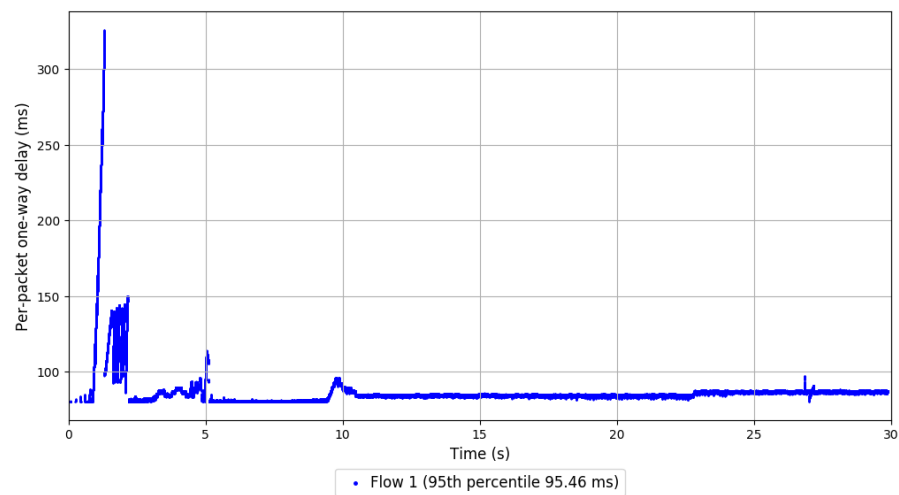
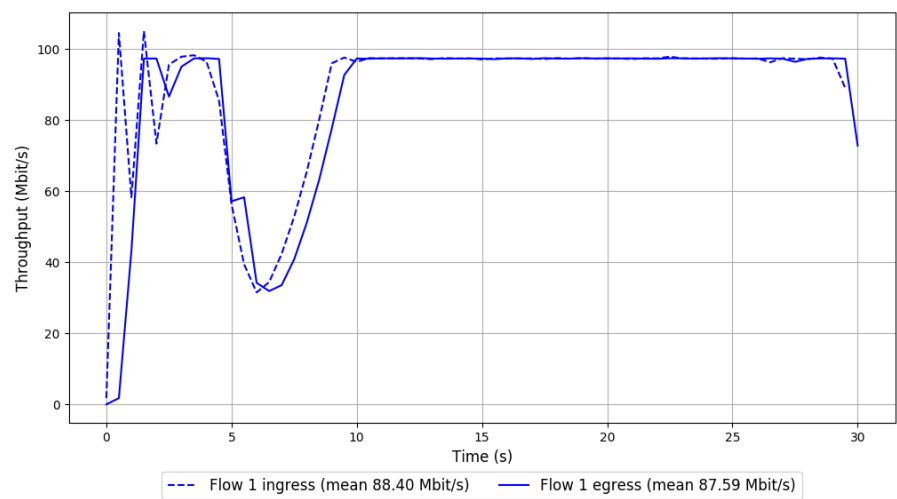
-- Flow 1:

Average throughput: 87.59 Mbit/s

95th percentile per-packet one-way delay: 95.463 ms

Loss rate: 1.46%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-03 09:28:26

End at: 2018-09-03 09:28:56

Local clock offset: -3.031 ms

Remote clock offset: 3.517 ms

Below is generated by plot.py at 2018-09-03 09:34:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 84.38 Mbit/s

95th percentile per-packet one-way delay: 106.392 ms

Loss rate: 1.51%

-- Flow 1:

Average throughput: 84.38 Mbit/s

95th percentile per-packet one-way delay: 106.392 ms

Loss rate: 1.51%

Run 3: Report of Muses-25 — Data Link

