

Pantheon Report

Generated at 2018-09-05 03:19:11 (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.

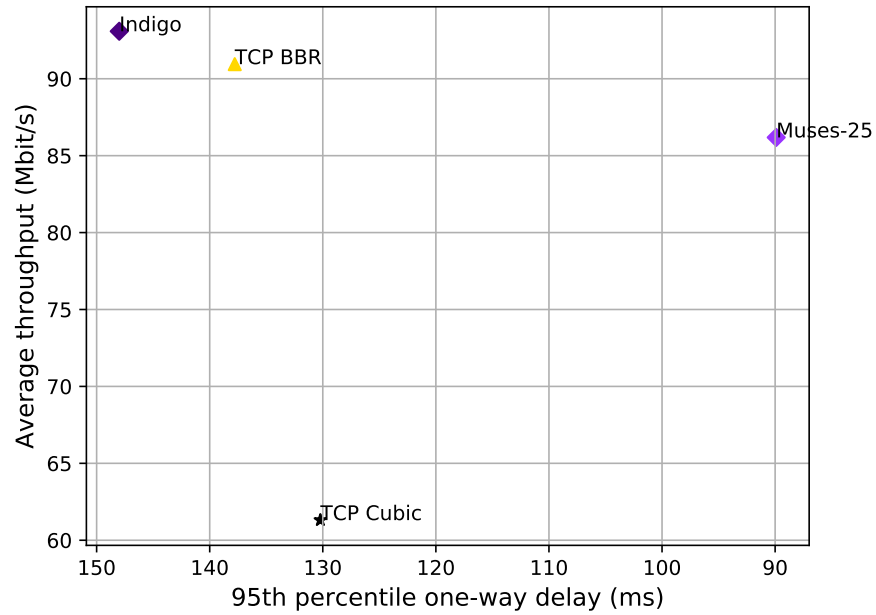
System info:

```
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
```

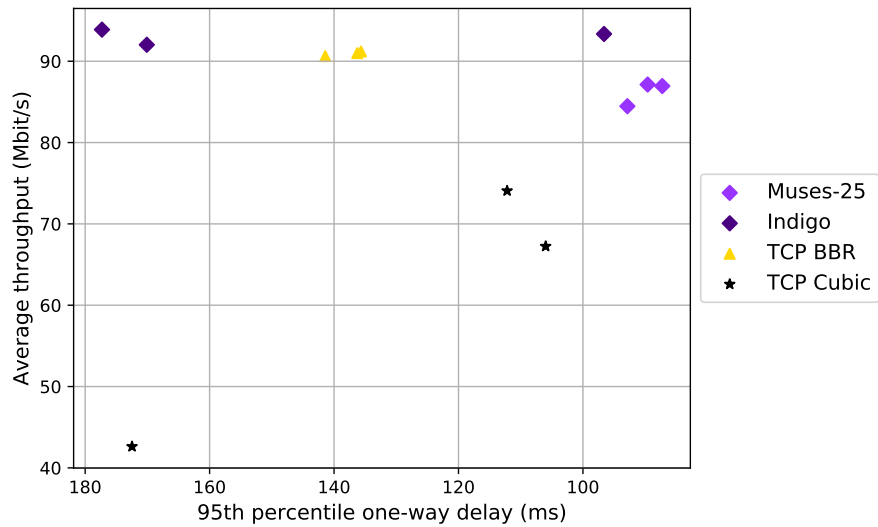
Git summary:

```
branch: muses @ 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 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	90.95	137.78	1.52
TCP Cubic	3	61.31	130.22	0.88
Indigo	3	93.09	148.00	1.69
Muses-25	3	86.19	89.90	1.60

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 03:07:00

End at: 2018-09-05 03:07:30

Local clock offset: 2.608 ms

Remote clock offset: 1.779 ms

Below is generated by plot.py at 2018-09-05 03:18:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 91.00 Mbit/s

95th percentile per-packet one-way delay: 136.275 ms

Loss rate: 1.31%

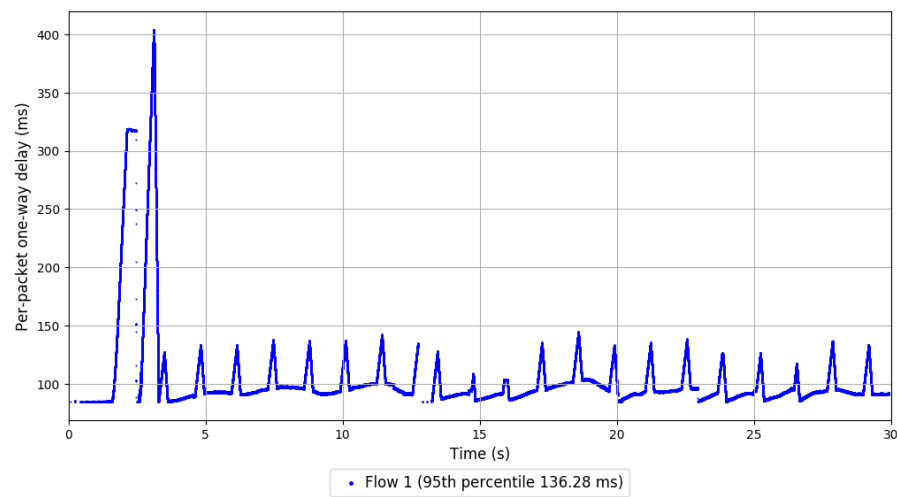
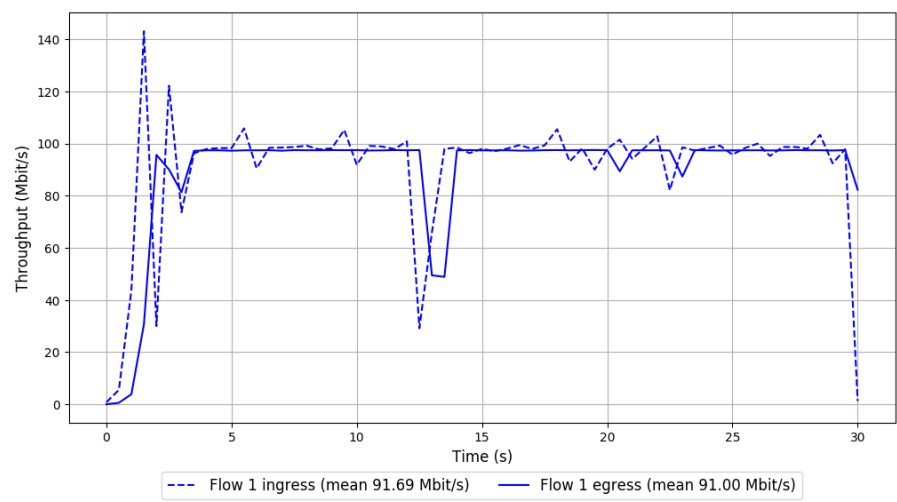
-- Flow 1:

Average throughput: 91.00 Mbit/s

95th percentile per-packet one-way delay: 136.275 ms

Loss rate: 1.31%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 03:12:00

End at: 2018-09-05 03:12:30

Local clock offset: 2.461 ms

Remote clock offset: 6.58 ms

Below is generated by plot.py at 2018-09-05 03:18:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 91.21 Mbit/s

95th percentile per-packet one-way delay: 135.667 ms

Loss rate: 1.77%

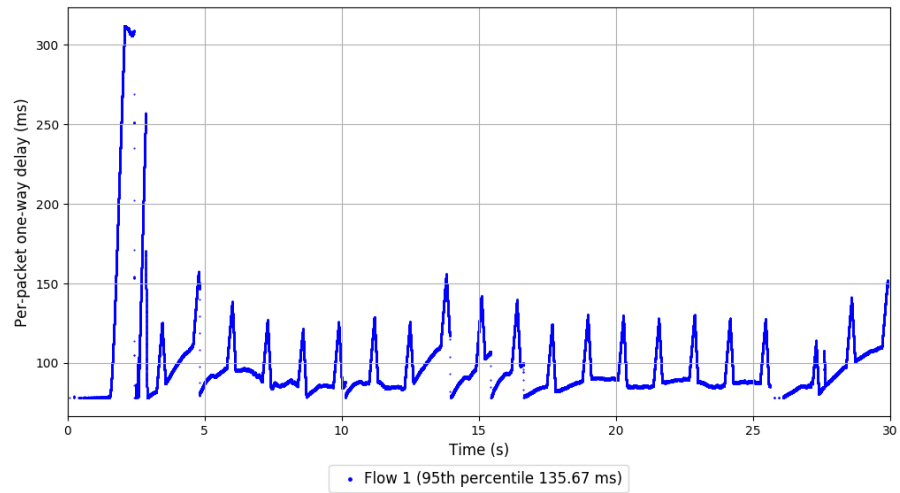
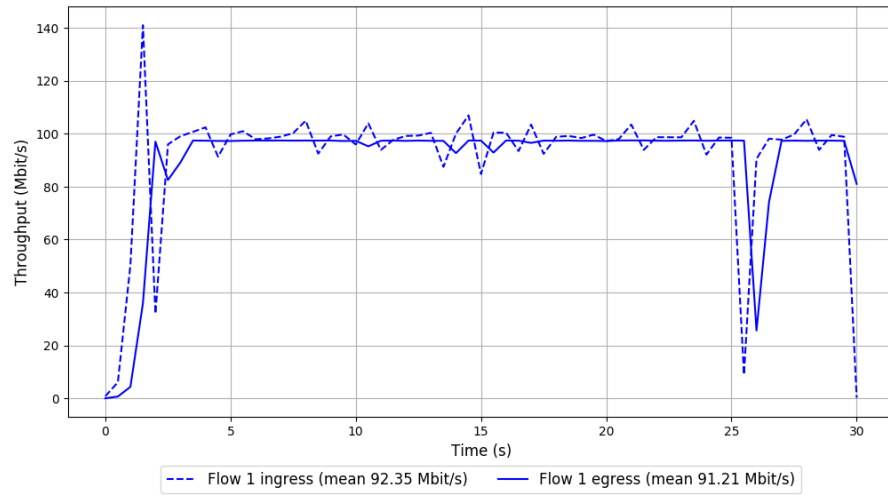
-- Flow 1:

Average throughput: 91.21 Mbit/s

95th percentile per-packet one-way delay: 135.667 ms

Loss rate: 1.77%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-09-05 03:16:49

End at: 2018-09-05 03:17:19

Local clock offset: 2.392 ms

Remote clock offset: 6.333 ms

Below is generated by plot.py at 2018-09-05 03:18:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 90.63 Mbit/s

95th percentile per-packet one-way delay: 141.412 ms

Loss rate: 1.48%

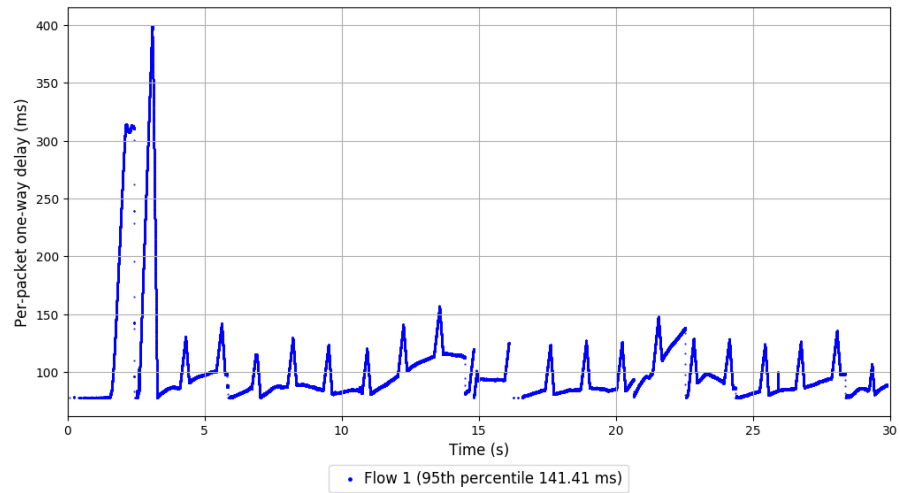
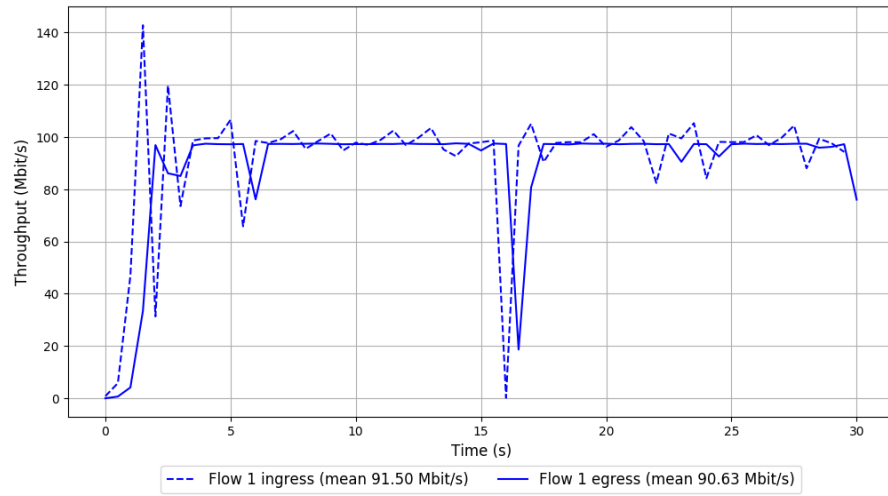
-- Flow 1:

Average throughput: 90.63 Mbit/s

95th percentile per-packet one-way delay: 141.412 ms

Loss rate: 1.48%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 03:03:25

End at: 2018-09-05 03:03:55

Local clock offset: 2.786 ms

Remote clock offset: 5.729 ms

Below is generated by plot.py at 2018-09-05 03:18:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 42.62 Mbit/s

95th percentile per-packet one-way delay: 172.467 ms

Loss rate: 1.22%

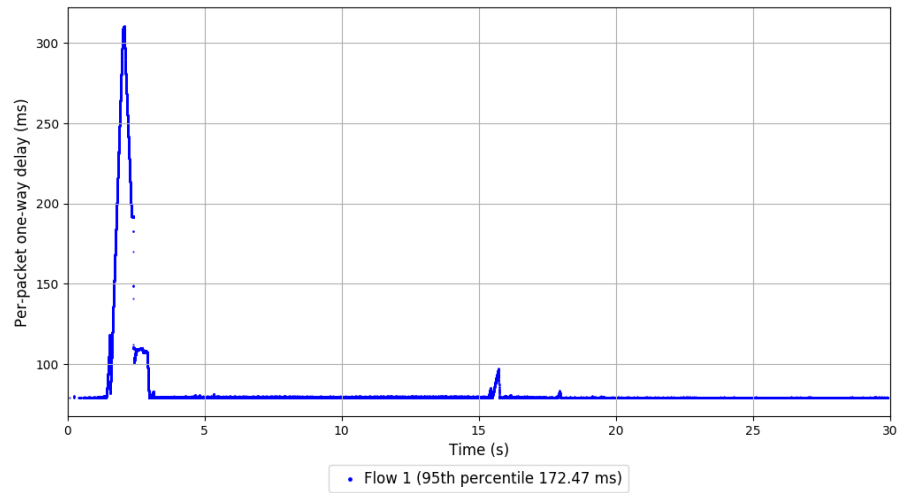
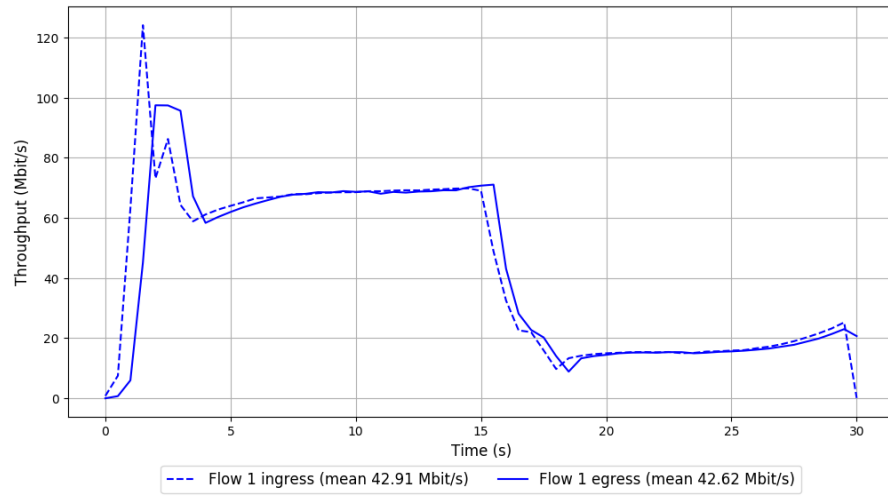
-- Flow 1:

Average throughput: 42.62 Mbit/s

95th percentile per-packet one-way delay: 172.467 ms

Loss rate: 1.22%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 03:08:12

End at: 2018-09-05 03:08:42

Local clock offset: 3.33 ms

Remote clock offset: 2.876 ms

Below is generated by plot.py at 2018-09-05 03:18:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 74.07 Mbit/s

95th percentile per-packet one-way delay: 112.187 ms

Loss rate: 0.40%

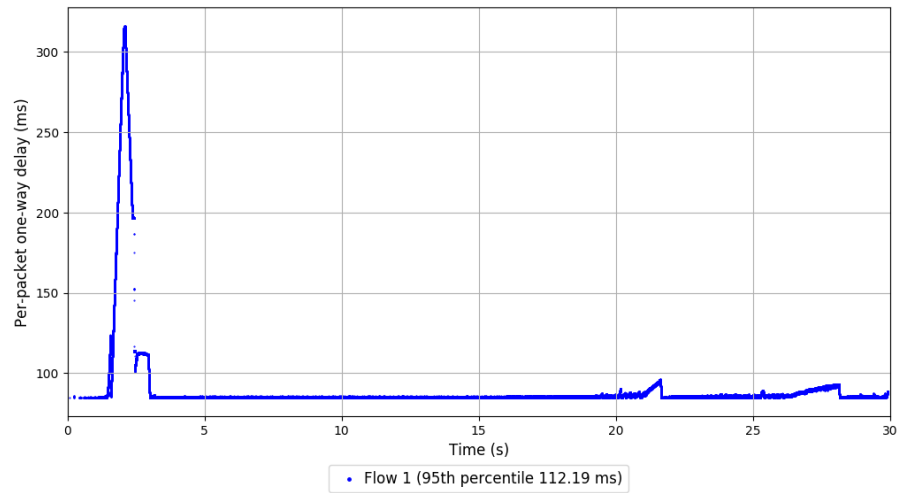
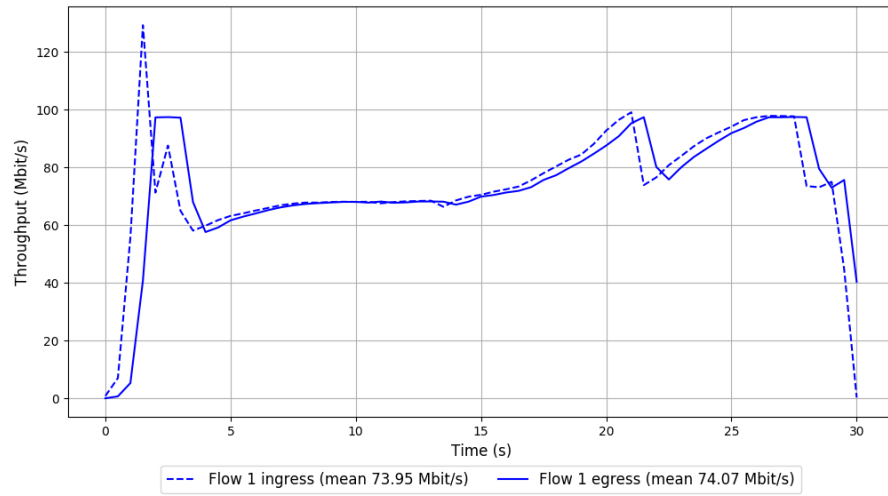
-- Flow 1:

Average throughput: 74.07 Mbit/s

95th percentile per-packet one-way delay: 112.187 ms

Loss rate: 0.40%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-09-05 03:13:13

End at: 2018-09-05 03:13:43

Local clock offset: 3.138 ms

Remote clock offset: 7.564 ms

Below is generated by plot.py at 2018-09-05 03:18:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 67.24 Mbit/s

95th percentile per-packet one-way delay: 105.992 ms

Loss rate: 1.01%

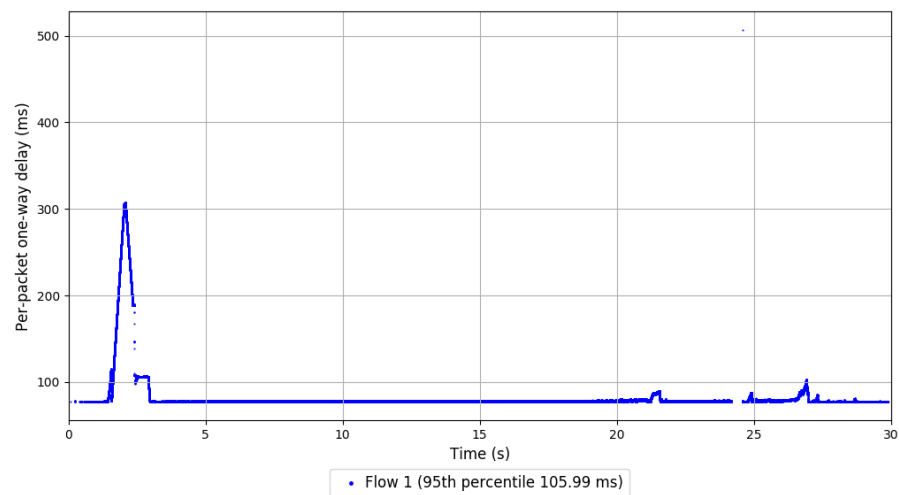
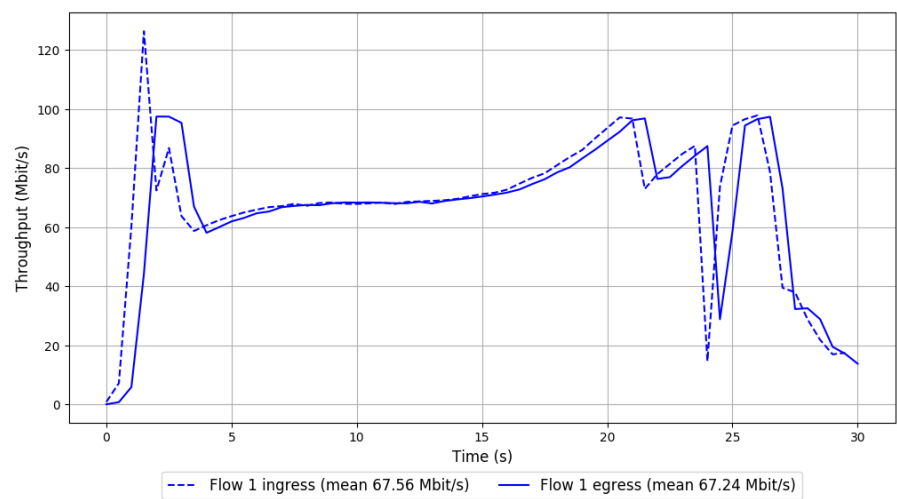
-- Flow 1:

Average throughput: 67.24 Mbit/s

95th percentile per-packet one-way delay: 105.992 ms

Loss rate: 1.01%

Run 3: Report of TCP Cubic — Data Link

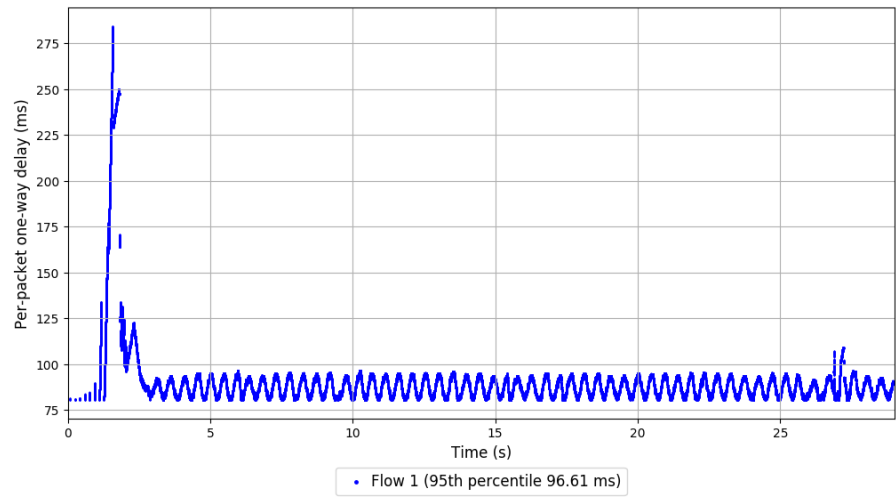
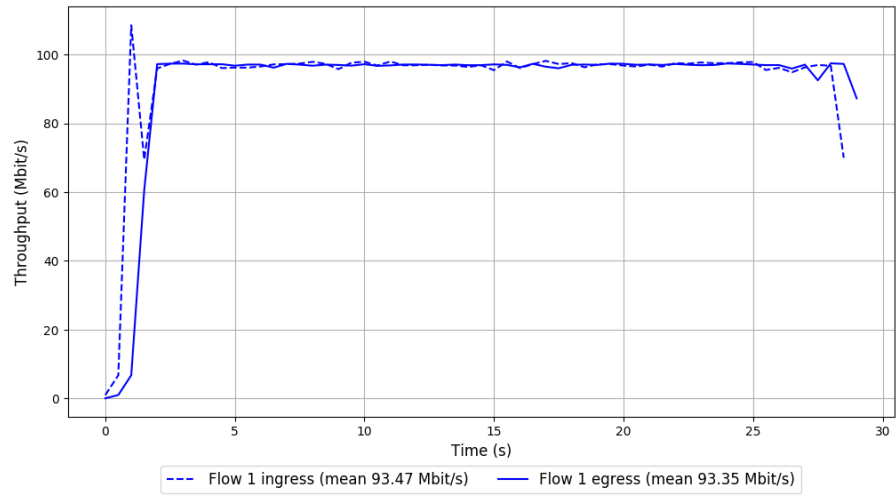


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 03:05:47
End at: 2018-09-05 03:06:17
Local clock offset: 3.418 ms
Remote clock offset: 6.735 ms

# Below is generated by plot.py at 2018-09-05 03:18:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 93.35 Mbit/s
95th percentile per-packet one-way delay: 96.610 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 93.35 Mbit/s
95th percentile per-packet one-way delay: 96.610 ms
Loss rate: 0.10%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-05 03:10:47

End at: 2018-09-05 03:11:17

Local clock offset: 3.259 ms

Remote clock offset: 1.737 ms

Below is generated by plot.py at 2018-09-05 03:18:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 93.89 Mbit/s

95th percentile per-packet one-way delay: 177.296 ms

Loss rate: 2.60%

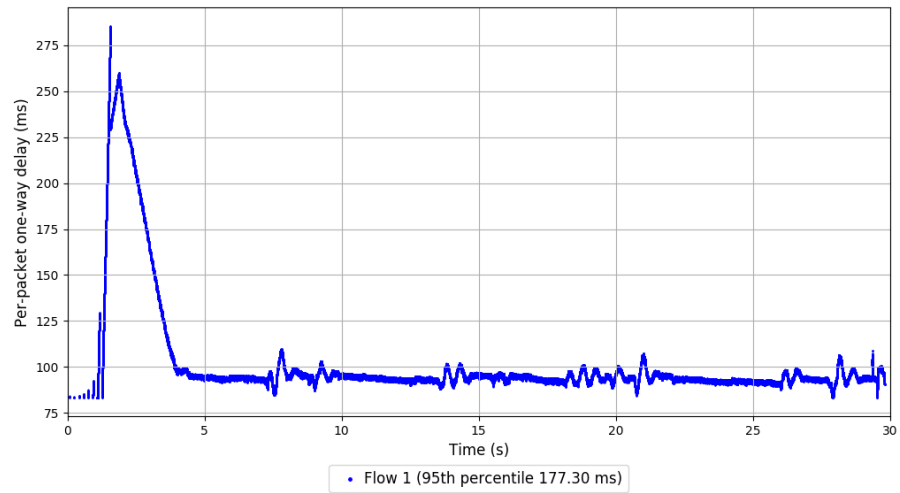
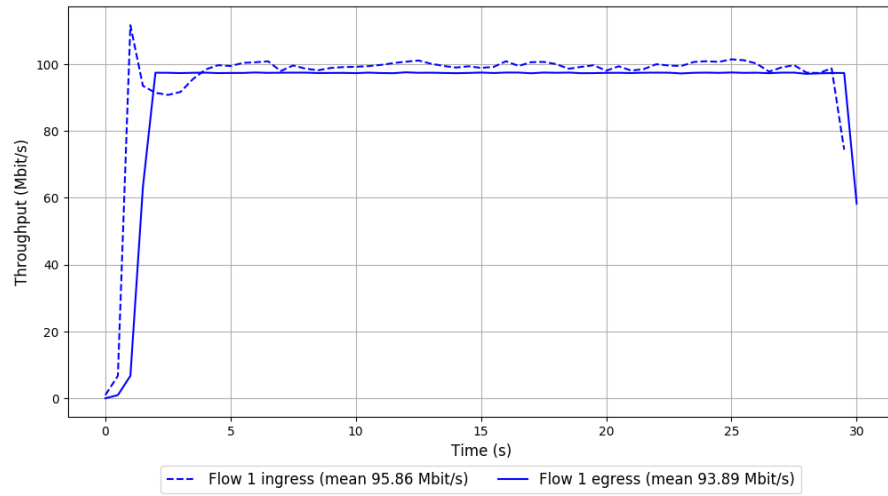
-- Flow 1:

Average throughput: 93.89 Mbit/s

95th percentile per-packet one-way delay: 177.296 ms

Loss rate: 2.60%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-09-05 03:15:36

End at: 2018-09-05 03:16:06

Local clock offset: 3.1 ms

Remote clock offset: 6.452 ms

Below is generated by plot.py at 2018-09-05 03:19:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 92.02 Mbit/s

95th percentile per-packet one-way delay: 170.093 ms

Loss rate: 2.38%

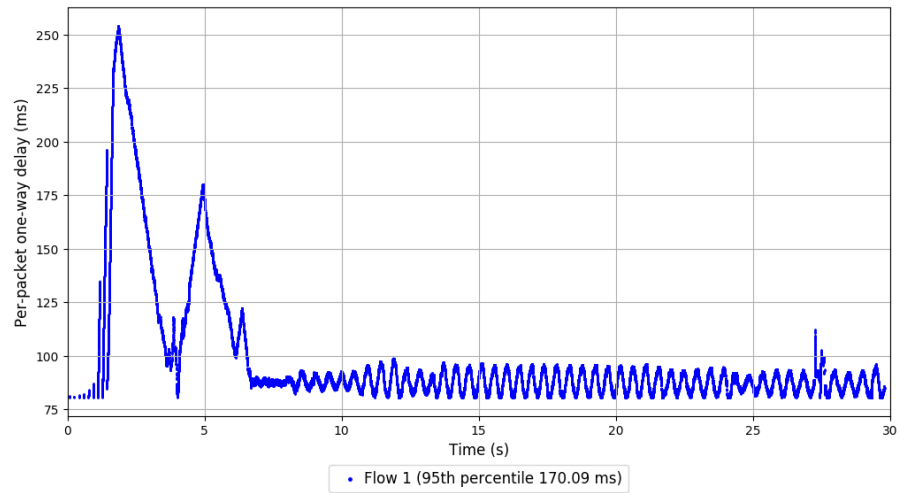
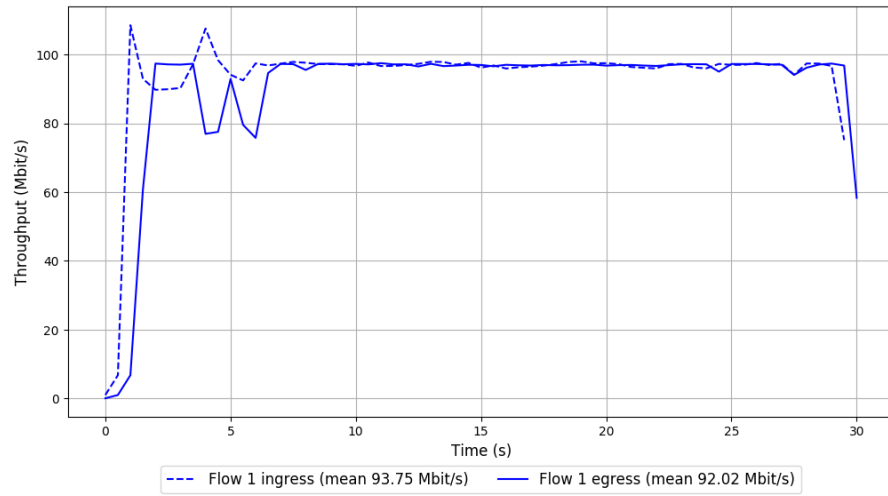
-- Flow 1:

Average throughput: 92.02 Mbit/s

95th percentile per-packet one-way delay: 170.093 ms

Loss rate: 2.38%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-05 03:04:35

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

Local clock offset: 2.647 ms

Remote clock offset: 7.844 ms

Below is generated by plot.py at 2018-09-05 03:19:10

Datalink statistics

-- Total of 1 flow:

Average throughput: 86.95 Mbit/s

95th percentile per-packet one-way delay: 87.252 ms

Loss rate: 1.63%

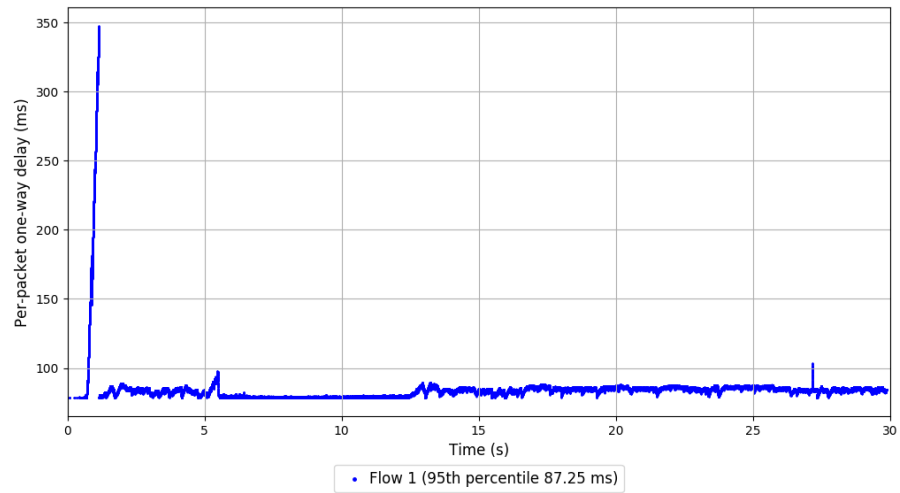
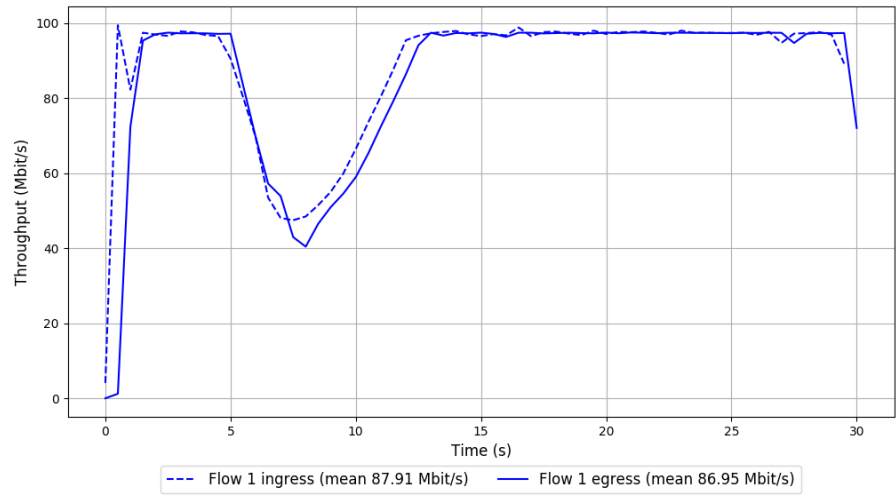
-- Flow 1:

Average throughput: 86.95 Mbit/s

95th percentile per-packet one-way delay: 87.252 ms

Loss rate: 1.63%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-05 03:09:34

End at: 2018-09-05 03:10:04

Local clock offset: 3.283 ms

Remote clock offset: 1.706 ms

Below is generated by plot.py at 2018-09-05 03:19:10

Datalink statistics

-- Total of 1 flow:

Average throughput: 84.47 Mbit/s

95th percentile per-packet one-way delay: 92.858 ms

Loss rate: 1.62%

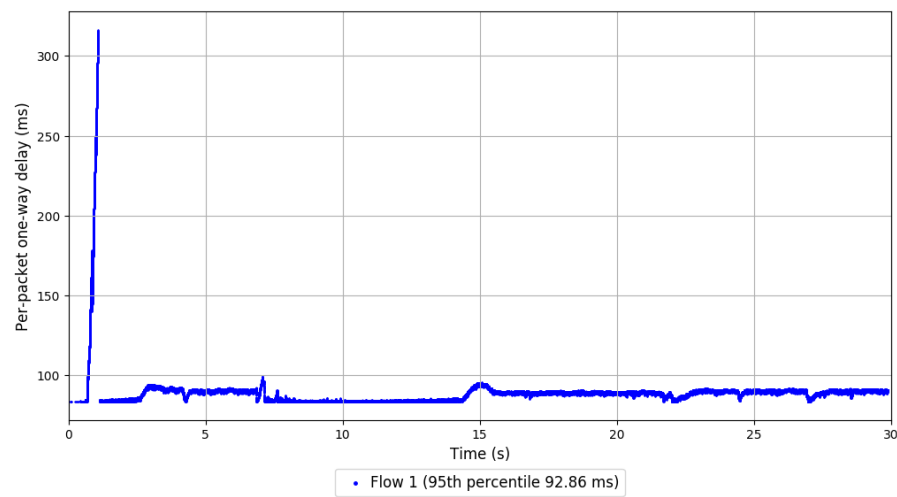
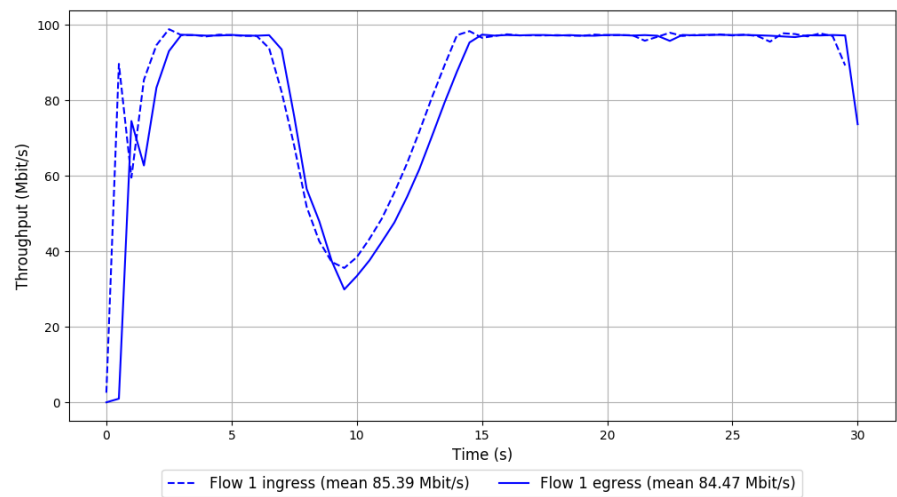
-- Flow 1:

Average throughput: 84.47 Mbit/s

95th percentile per-packet one-way delay: 92.858 ms

Loss rate: 1.62%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-05 03:14:24

End at: 2018-09-05 03:14:54

Local clock offset: 3.187 ms

Remote clock offset: 6.457 ms

Below is generated by plot.py at 2018-09-05 03:19:10

Datalink statistics

-- Total of 1 flow:

Average throughput: 87.14 Mbit/s

95th percentile per-packet one-way delay: 89.601 ms

Loss rate: 1.56%

-- Flow 1:

Average throughput: 87.14 Mbit/s

95th percentile per-packet one-way delay: 89.601 ms

Loss rate: 1.56%

Run 3: Report of Muses-25 — Data Link

