

Pantheon Report

Generated at 2018-09-06 02:14:09 (UTC).

Data path: GCE Iowa on `ens4` (*remote*) → GCE London on `ens4` (*local*).

Repeated the test of 4 congestion control schemes twice.

Each test lasted for 30 seconds running 1 flow.

NTP offsets were measured against `time.google.com` and have been applied to correct the timestamps in logs.

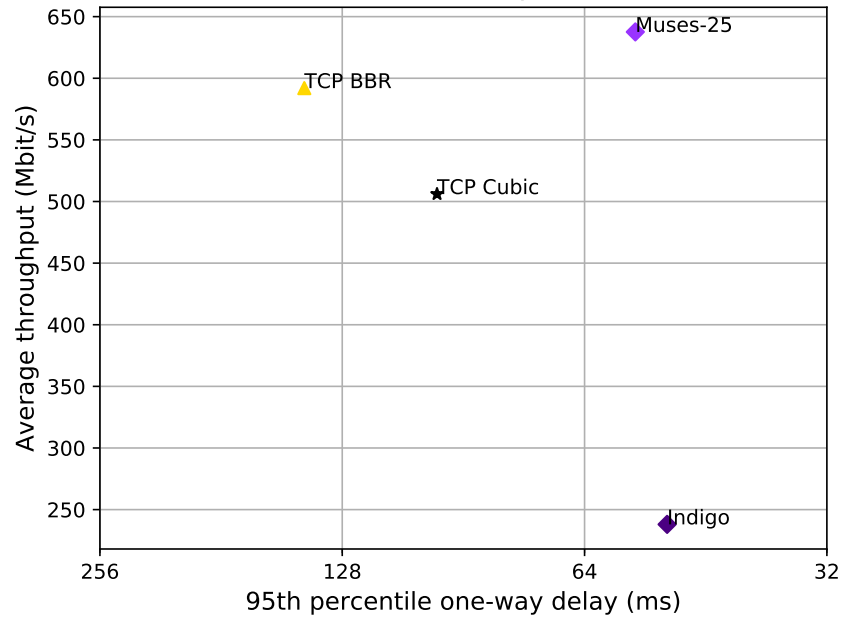
System info:

```
Linux 4.15.0-1018-gcp
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
```

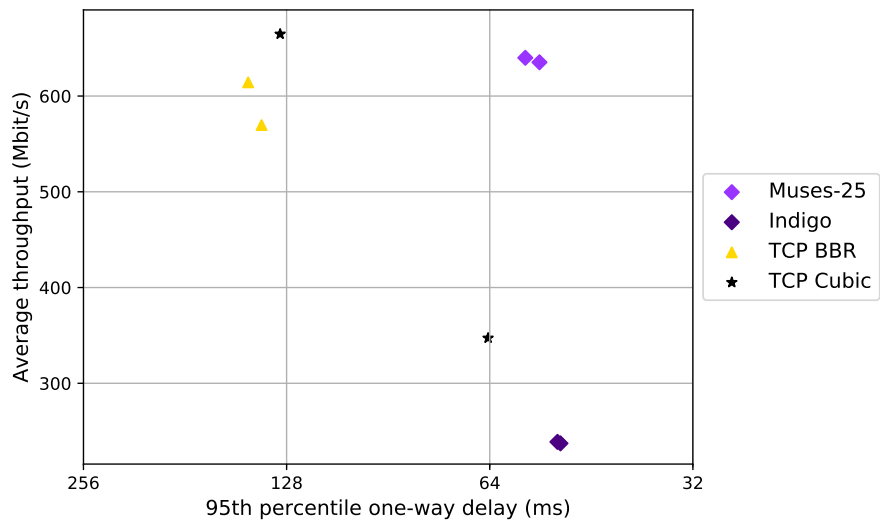
Git summary:

```
branch: muses @ 18b9165265c8ba2915c862e8713fd9ad82c1ac21
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ a28d20fb82a95a965a3da65fd1eb71b8994e9b84
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 GCE Iowa to GCE London, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Iowa to GCE London, 2 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	2	592.01	142.67	1.01
TCP Cubic	2	506.02	97.60	0.27
Indigo	2	238.03	50.54	0.34
Muses-25	2	637.60	55.35	0.34

Run 1: Statistics of TCP BBR

Start at: 2018-09-06 01:54:16

End at: 2018-09-06 01:54:46

Local clock offset: 0.045 ms

Remote clock offset: -0.143 ms

Below is generated by plot.py at 2018-09-06 02:13:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 569.70 Mbit/s

95th percentile per-packet one-way delay: 139.413 ms

Loss rate: 0.68%

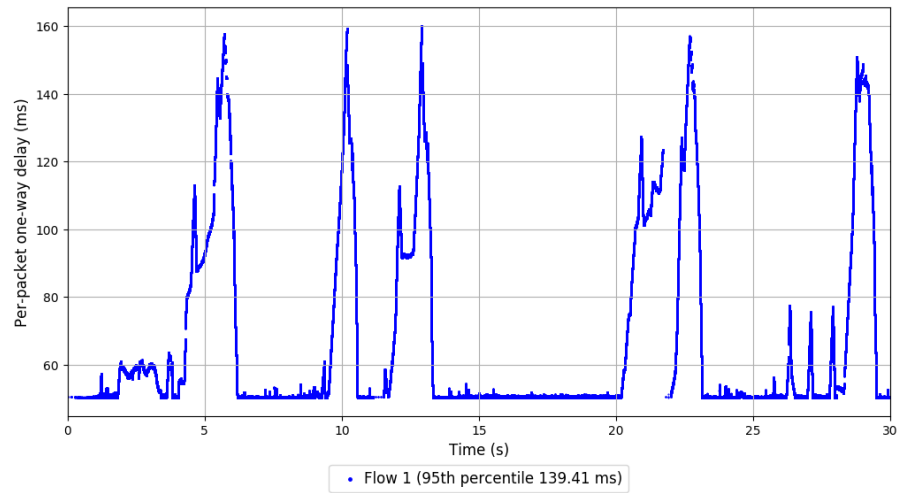
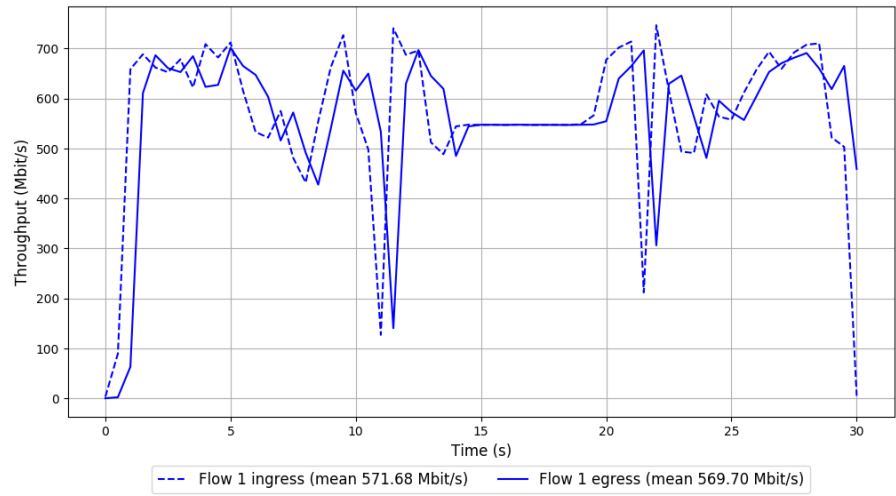
-- Flow 1:

Average throughput: 569.70 Mbit/s

95th percentile per-packet one-way delay: 139.413 ms

Loss rate: 0.68%

Run 1: Report of TCP BBR — Data Link

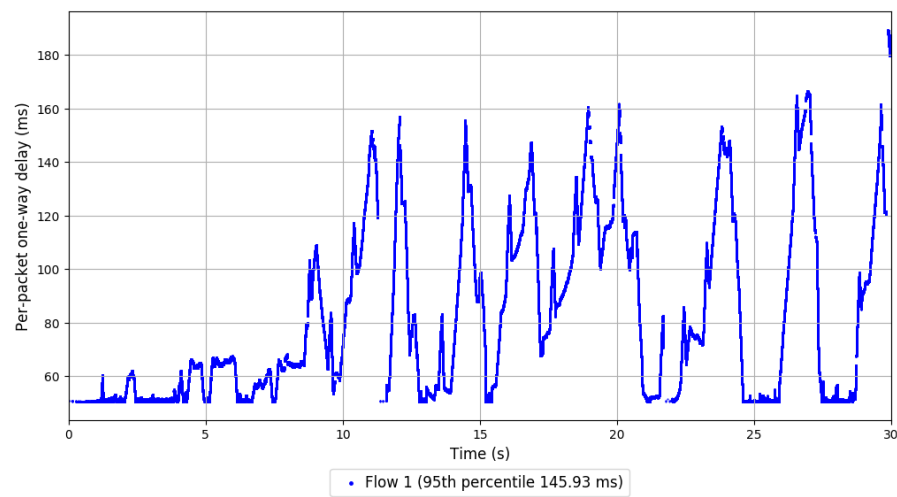
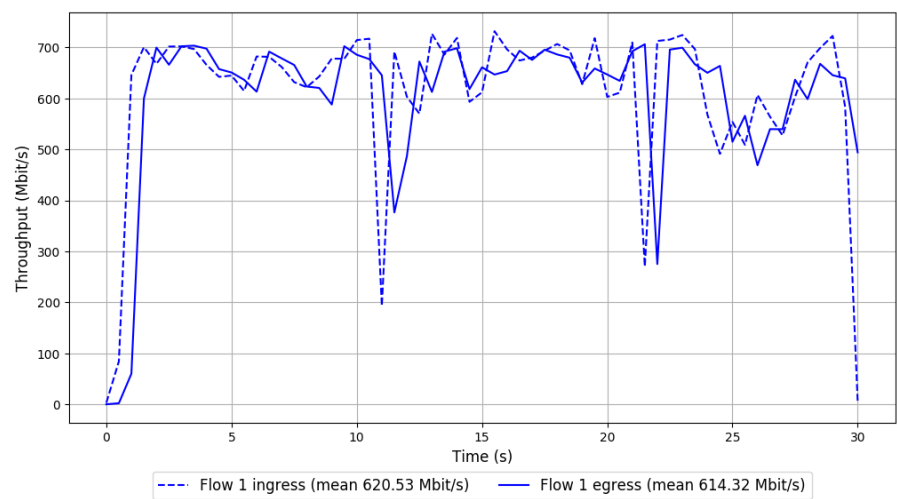


Run 2: Statistics of TCP BBR

Start at: 2018-09-06 02:00:32
End at: 2018-09-06 02:01:02
Local clock offset: 0.087 ms
Remote clock offset: -0.104 ms

Below is generated by plot.py at 2018-09-06 02:13:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 614.32 Mbit/s
95th percentile per-packet one-way delay: 145.928 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 614.32 Mbit/s
95th percentile per-packet one-way delay: 145.928 ms
Loss rate: 1.34%

Run 2: Report of TCP BBR — Data Link

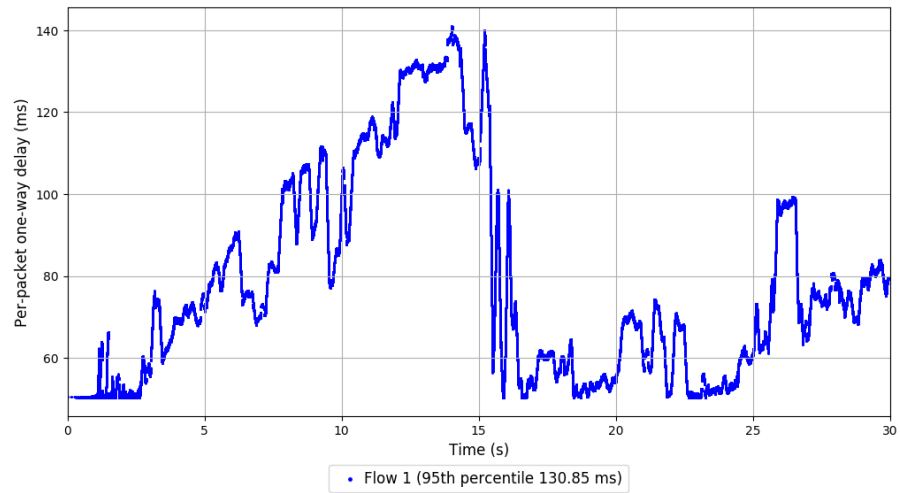
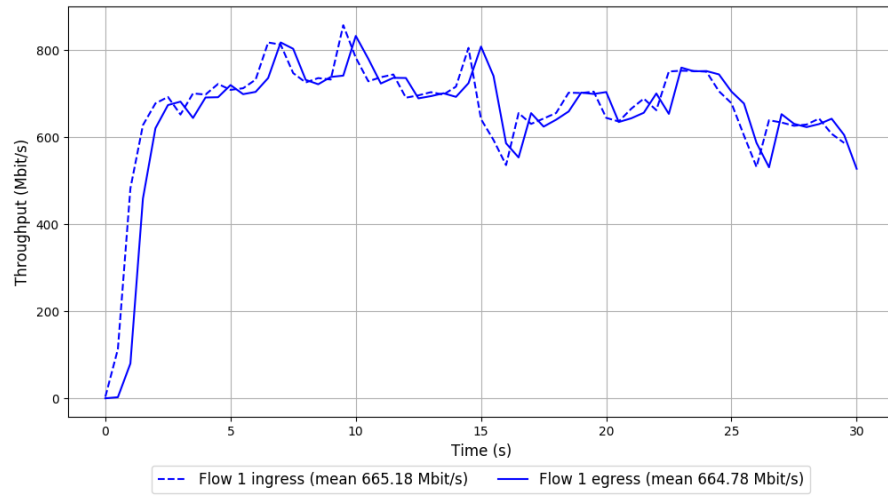


Run 1: Statistics of TCP Cubic

Start at: 2018-09-06 01:57:18
End at: 2018-09-06 01:57:48
Local clock offset: 0.071 ms
Remote clock offset: -0.081 ms

Below is generated by plot.py at 2018-09-06 02:14:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 664.78 Mbit/s
95th percentile per-packet one-way delay: 130.849 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 664.78 Mbit/s
95th percentile per-packet one-way delay: 130.849 ms
Loss rate: 0.40%

Run 1: Report of TCP Cubic — Data Link

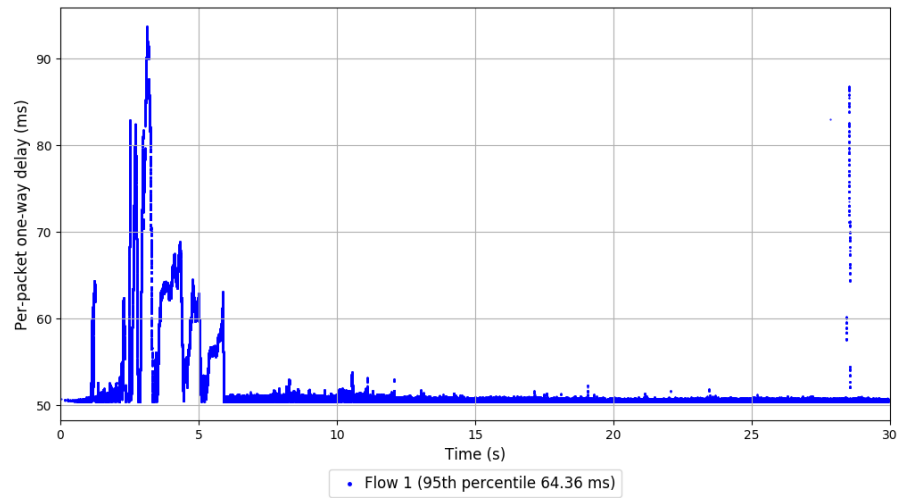
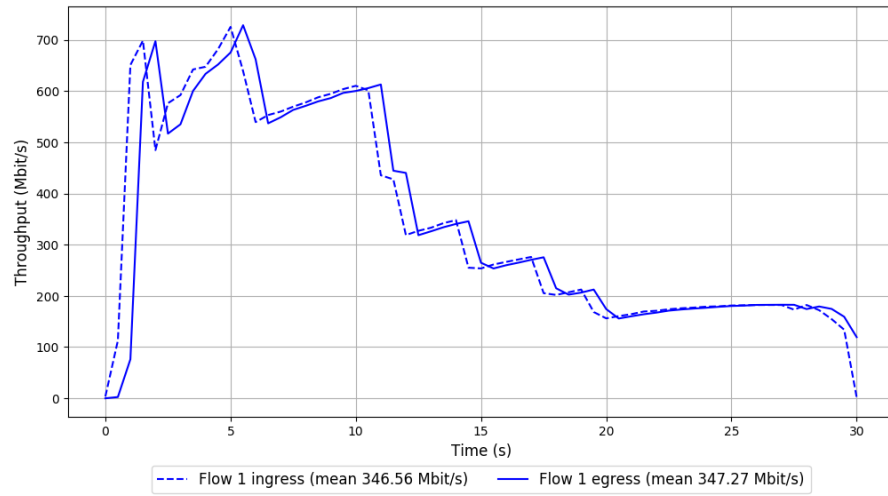


Run 2: Statistics of TCP Cubic

Start at: 2018-09-06 02:03:36
End at: 2018-09-06 02:04:06
Local clock offset: 0.076 ms
Remote clock offset: -0.091 ms

Below is generated by plot.py at 2018-09-06 02:14:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 347.27 Mbit/s
95th percentile per-packet one-way delay: 64.360 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 347.27 Mbit/s
95th percentile per-packet one-way delay: 64.360 ms
Loss rate: 0.13%

Run 2: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-09-06 01:55:51

End at: 2018-09-06 01:56:21

Local clock offset: 0.444 ms

Remote clock offset: -0.085 ms

Below is generated by plot.py at 2018-09-06 02:14:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 237.25 Mbit/s

95th percentile per-packet one-way delay: 50.281 ms

Loss rate: 0.33%

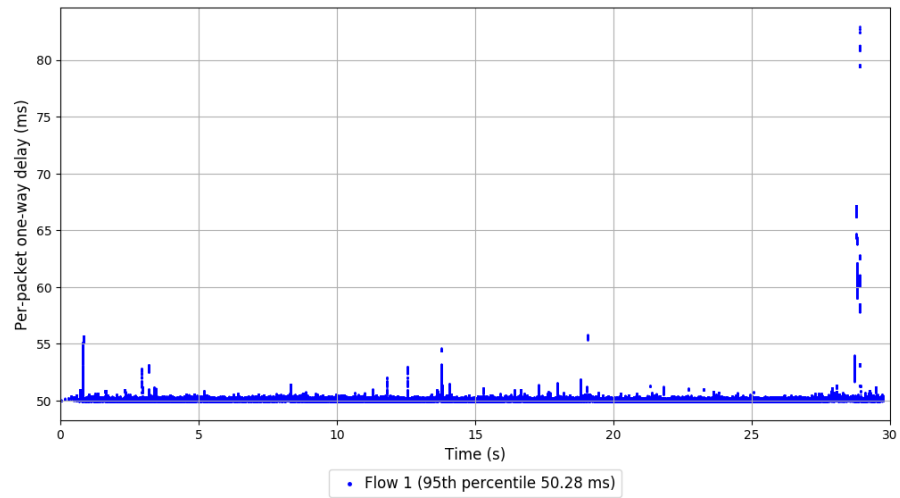
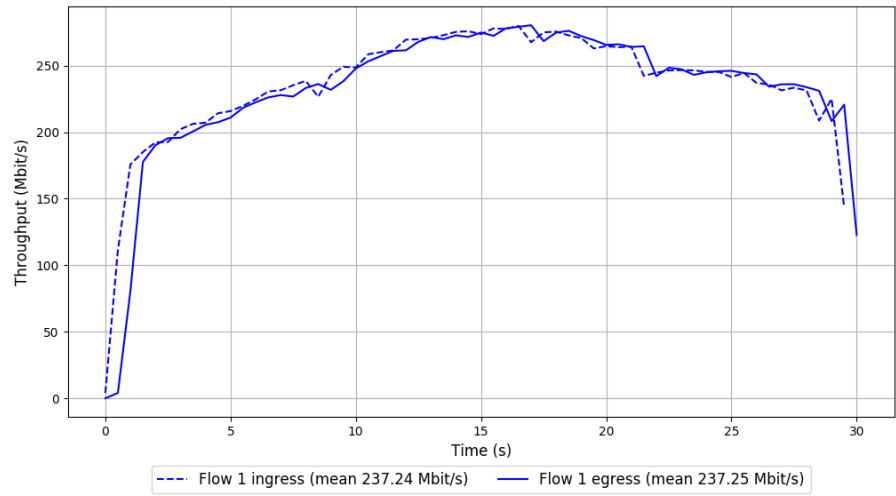
-- Flow 1:

Average throughput: 237.25 Mbit/s

95th percentile per-packet one-way delay: 50.281 ms

Loss rate: 0.33%

Run 1: Report of Indigo — Data Link

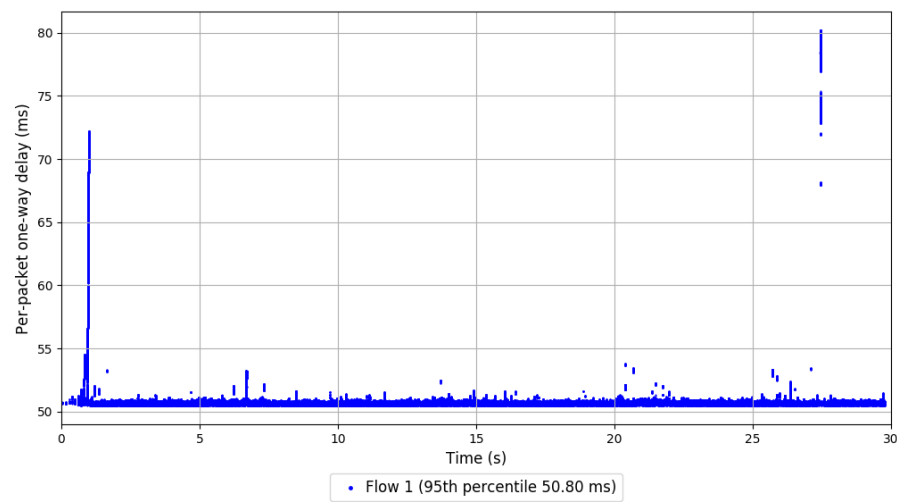
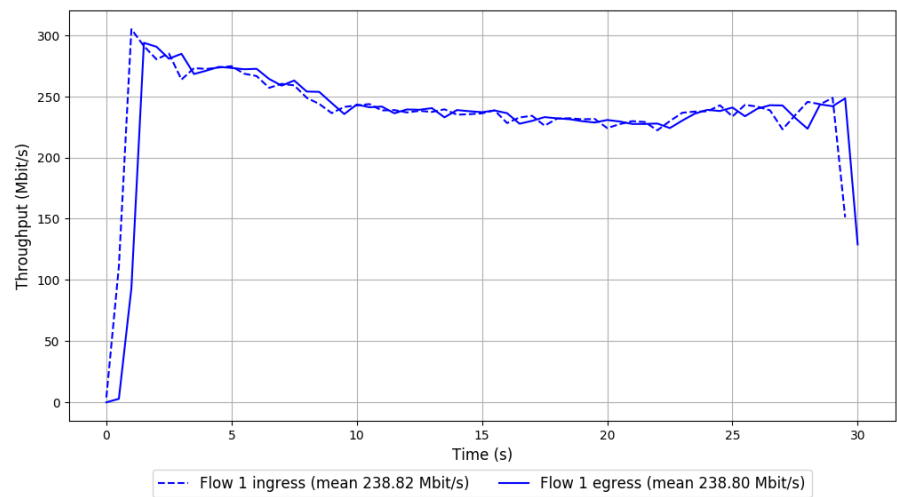


Run 2: Statistics of Indigo

Start at: 2018-09-06 02:02:09
End at: 2018-09-06 02:02:39
Local clock offset: 0.031 ms
Remote clock offset: -0.052 ms

Below is generated by plot.py at 2018-09-06 02:14:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 238.80 Mbit/s
95th percentile per-packet one-way delay: 50.799 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 238.80 Mbit/s
95th percentile per-packet one-way delay: 50.799 ms
Loss rate: 0.35%

Run 2: Report of Indigo — Data Link

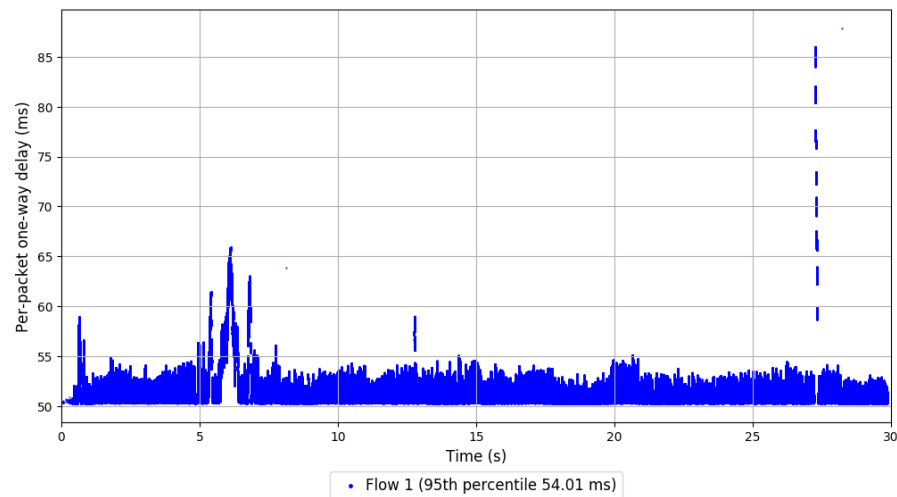
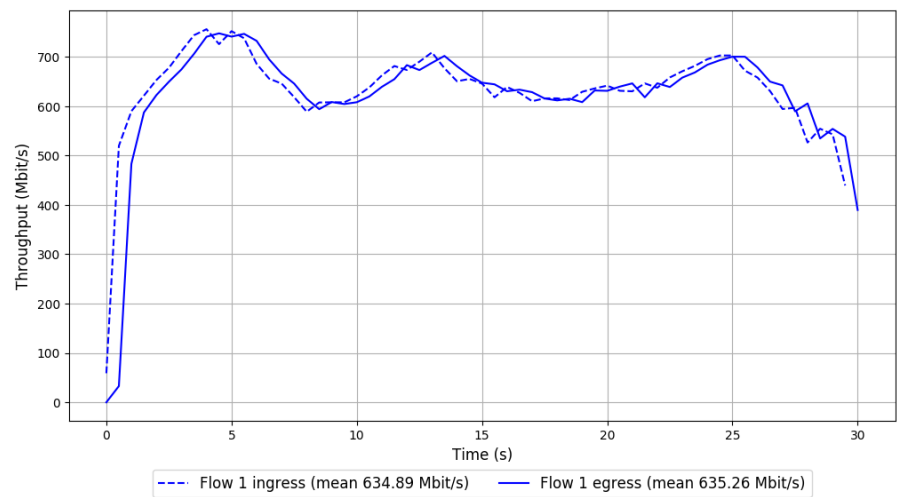


Run 1: Statistics of Muses-25

Start at: 2018-09-06 01:52:40
End at: 2018-09-06 01:53:10
Local clock offset: 0.083 ms
Remote clock offset: -0.118 ms

Below is generated by plot.py at 2018-09-06 02:14:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 635.26 Mbit/s
95th percentile per-packet one-way delay: 54.012 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 635.26 Mbit/s
95th percentile per-packet one-way delay: 54.012 ms
Loss rate: 0.28%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-06 01:58:56
End at: 2018-09-06 01:59:27
Local clock offset: -0.335 ms
Remote clock offset: -0.111 ms

Below is generated by plot.py at 2018-09-06 02:14:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 639.94 Mbit/s
95th percentile per-packet one-way delay: 56.689 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 639.94 Mbit/s
95th percentile per-packet one-way delay: 56.689 ms
Loss rate: 0.40%

Run 2: Report of Muses-25 — Data Link

