

Pantheon Report

Generated at 2018-08-28 16:20:59 (UTC).

Data path: GCE Sydney on **ens4** (*local*) → GCE Tokyo on **ens4** (*remote*).

Repeated the test of 4 congestion control schemes twice.

Each test lasted for 30 seconds running 1 flow.

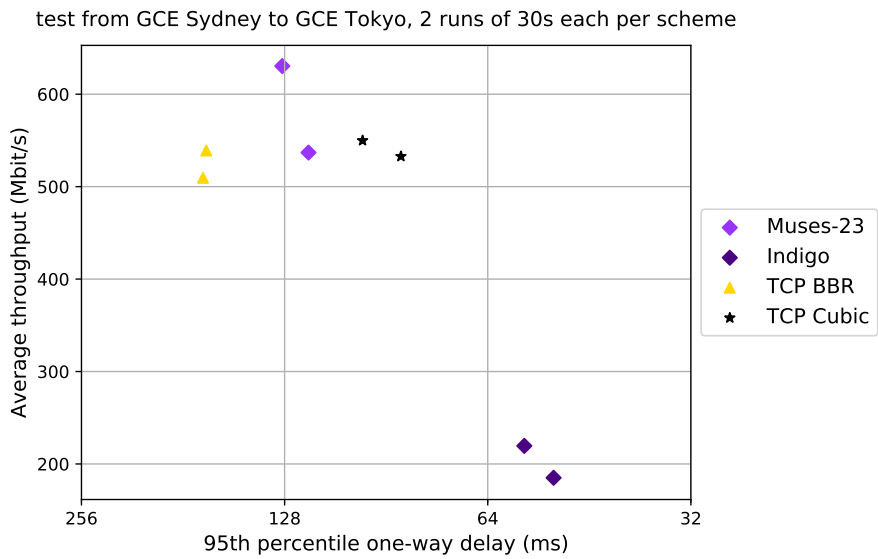
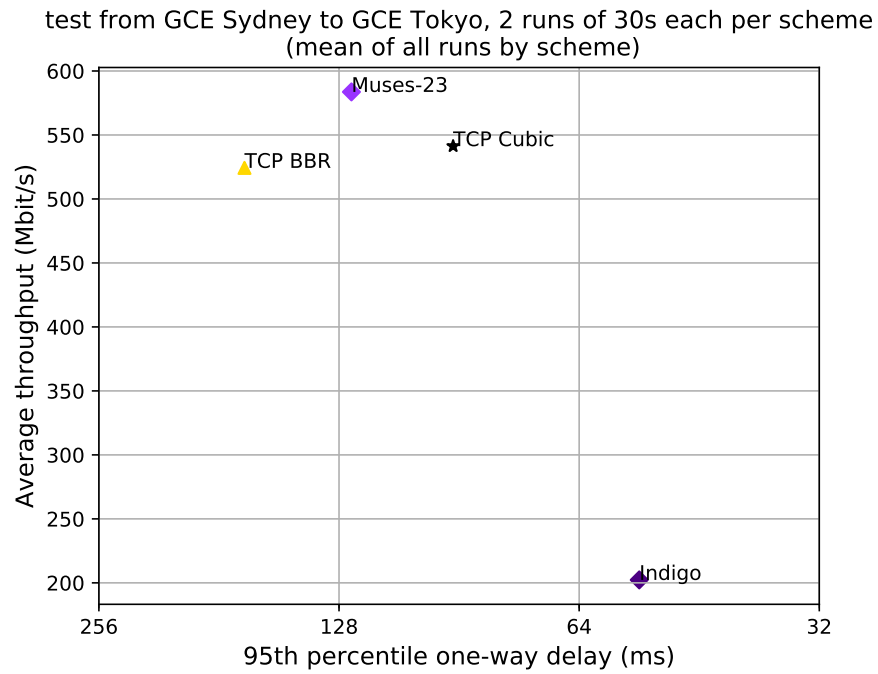
NTP offsets were measured against `time.google.com` and have been applied to correct the timestamps in logs.

System info:

```
Linux 4.15.0-1015-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
```

Git summary:

```
branch: muses-23 @ 88af05c5b0b7531637ca401951507a2fde628df6
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b261c9e99c63be452bc16f94ce0caa99a4c9d39a
third_party/pantheon-tunnel @ cbfce6db5ff5740dafe1771f813cd646339e1952
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	2	524.29	168.16	0.72
TCP Cubic	2	541.28	92.08	0.03
Indigo	2	202.31	53.81	0.01
Muses-23	2	583.66	123.49	1.09

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 16:03:41

End at: 2018-08-28 16:04:11

Local clock offset: -0.359 ms

Remote clock offset: 2.784 ms

Below is generated by plot.py at 2018-08-28 16:19:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 509.54 Mbit/s

95th percentile per-packet one-way delay: 169.065 ms

Loss rate: 0.73%

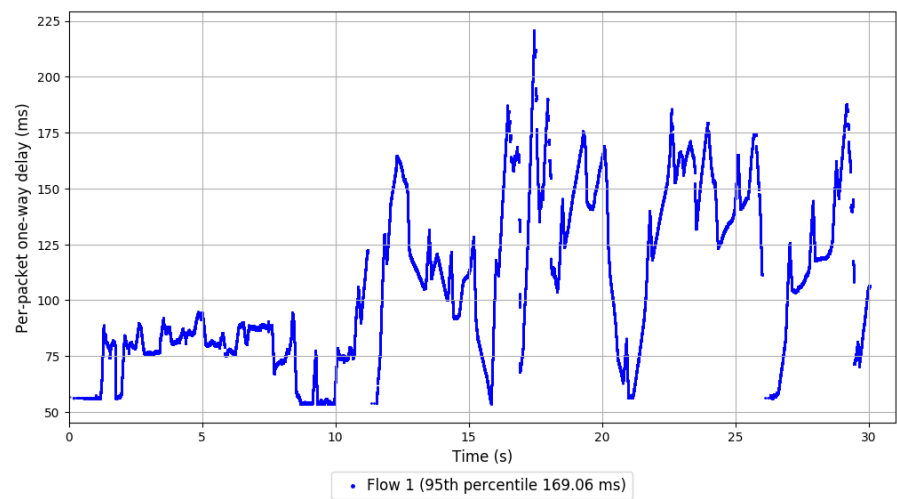
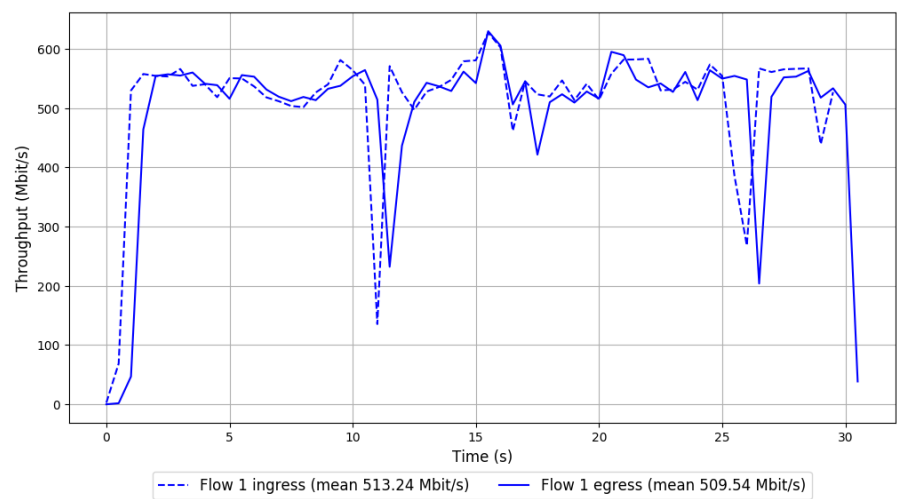
-- Flow 1:

Average throughput: 509.54 Mbit/s

95th percentile per-packet one-way delay: 169.065 ms

Loss rate: 0.73%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-28 16:09:36

End at: 2018-08-28 16:10:06

Local clock offset: -0.404 ms

Remote clock offset: 2.833 ms

Below is generated by plot.py at 2018-08-28 16:19:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 539.05 Mbit/s

95th percentile per-packet one-way delay: 167.246 ms

Loss rate: 0.72%

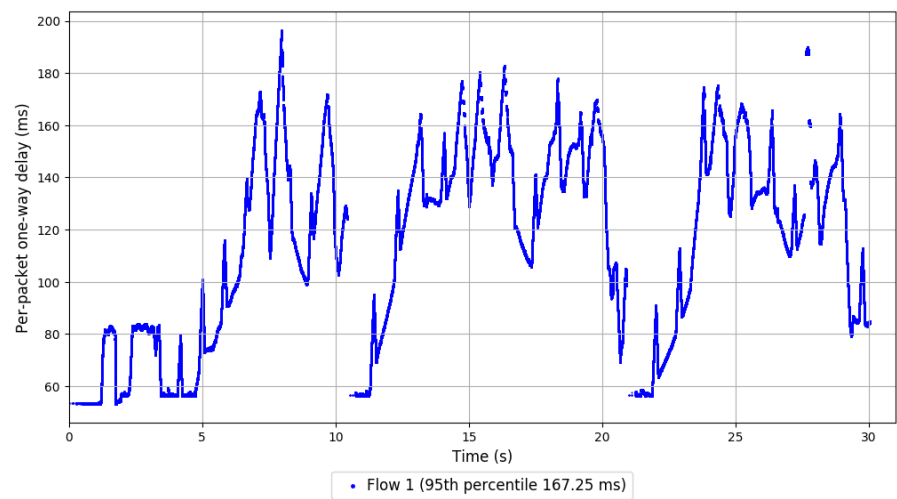
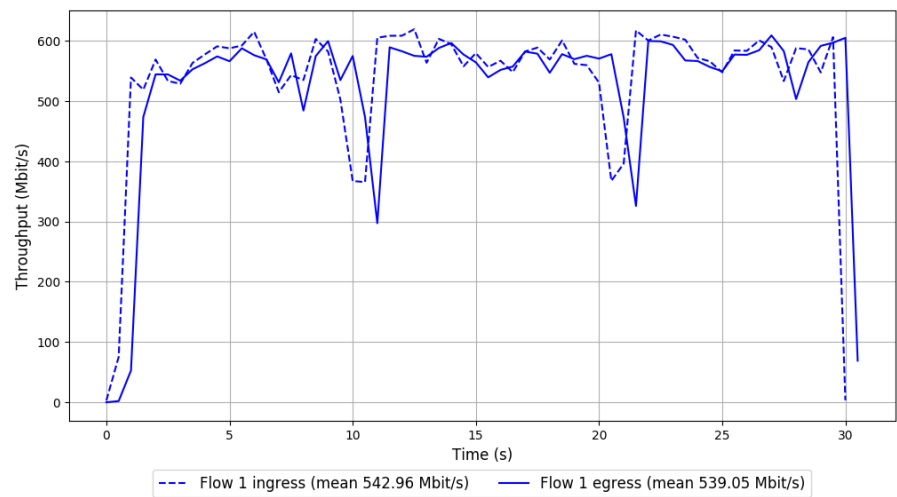
-- Flow 1:

Average throughput: 539.05 Mbit/s

95th percentile per-packet one-way delay: 167.246 ms

Loss rate: 0.72%

Run 2: Report of TCP BBR — Data Link

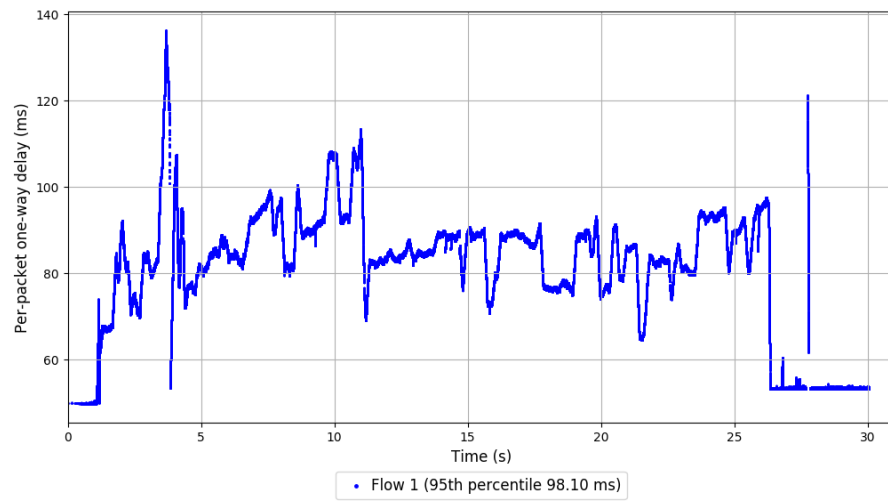
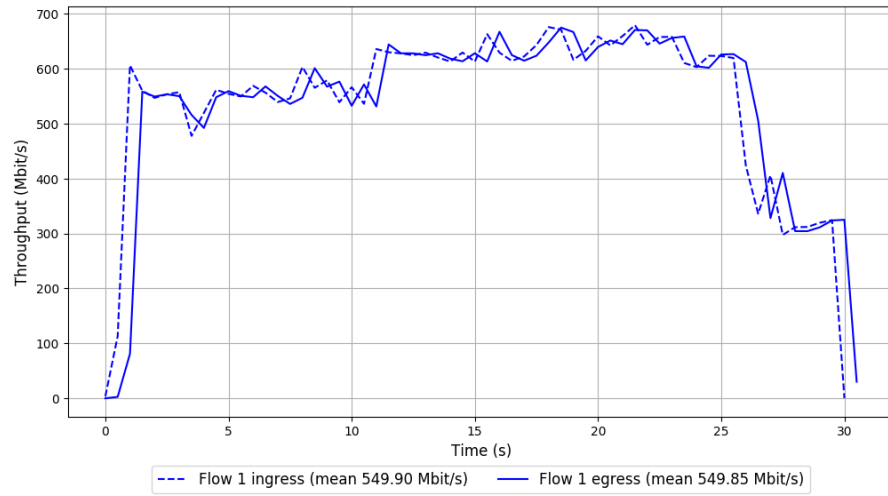


Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 15:59:06
End at: 2018-08-28 15:59:36
Local clock offset: -0.067 ms
Remote clock offset: -0.089 ms

Below is generated by plot.py at 2018-08-28 16:19:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 549.85 Mbit/s
95th percentile per-packet one-way delay: 98.099 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 549.85 Mbit/s
95th percentile per-packet one-way delay: 98.099 ms
Loss rate: 0.01%

Run 1: Report of TCP Cubic — Data Link

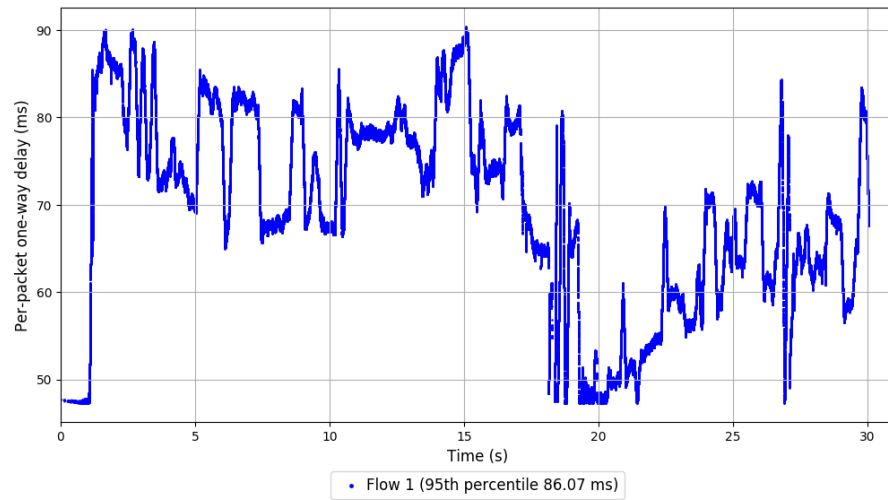
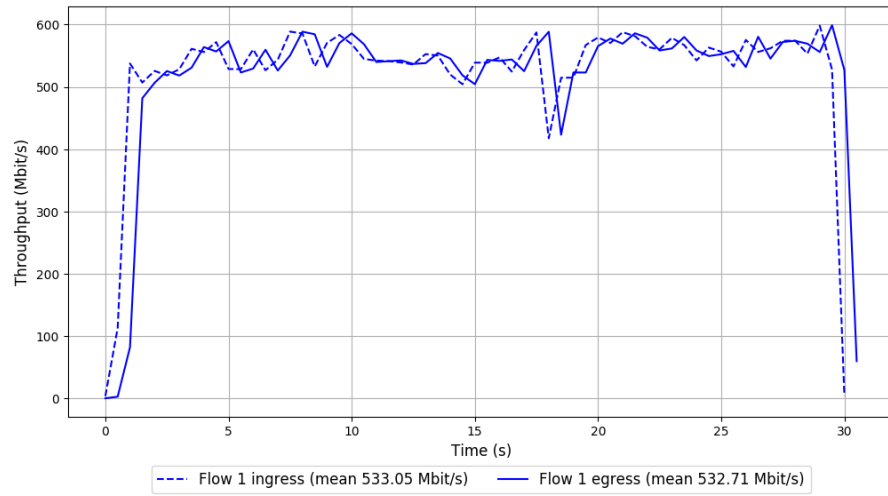


Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 16:05:11
End at: 2018-08-28 16:05:41
Local clock offset: -0.273 ms
Remote clock offset: -2.848 ms

Below is generated by plot.py at 2018-08-28 16:19:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 532.71 Mbit/s
95th percentile per-packet one-way delay: 86.066 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 532.71 Mbit/s
95th percentile per-packet one-way delay: 86.066 ms
Loss rate: 0.06%

Run 2: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-08-28 16:00:37

End at: 2018-08-28 16:01:07

Local clock offset: -0.037 ms

Remote clock offset: 2.747 ms

Below is generated by plot.py at 2018-08-28 16:19:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 219.57 Mbit/s

95th percentile per-packet one-way delay: 56.494 ms

Loss rate: 0.00%

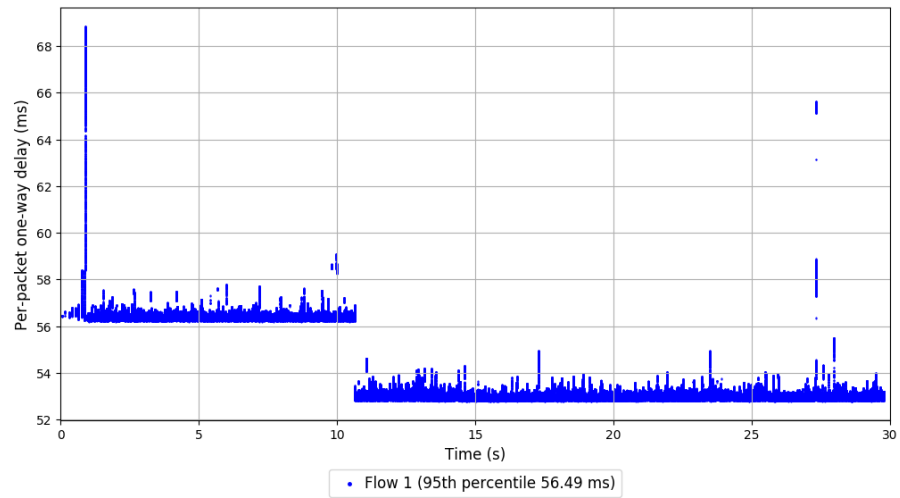
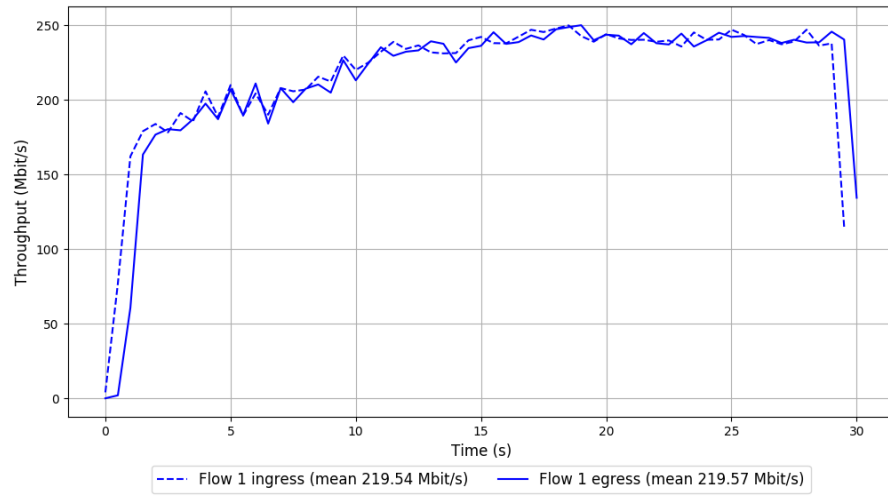
-- Flow 1:

Average throughput: 219.57 Mbit/s

95th percentile per-packet one-way delay: 56.494 ms

Loss rate: 0.00%

Run 1: Report of Indigo — Data Link

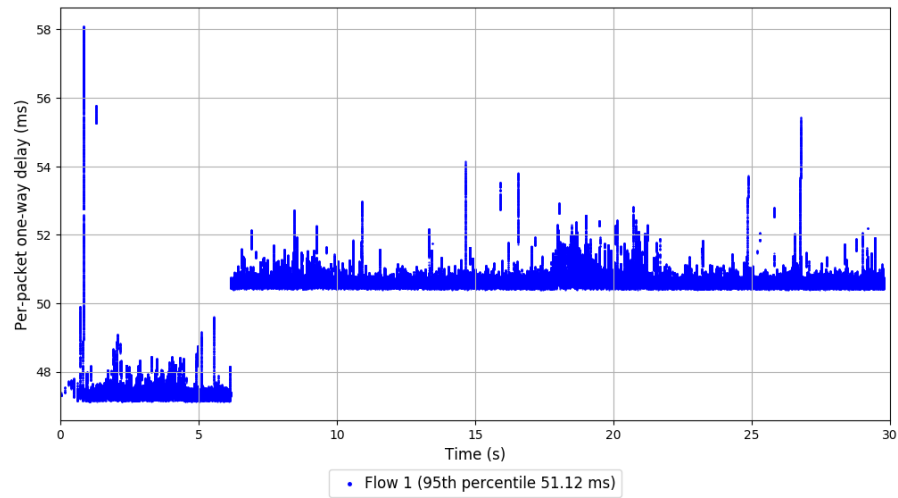
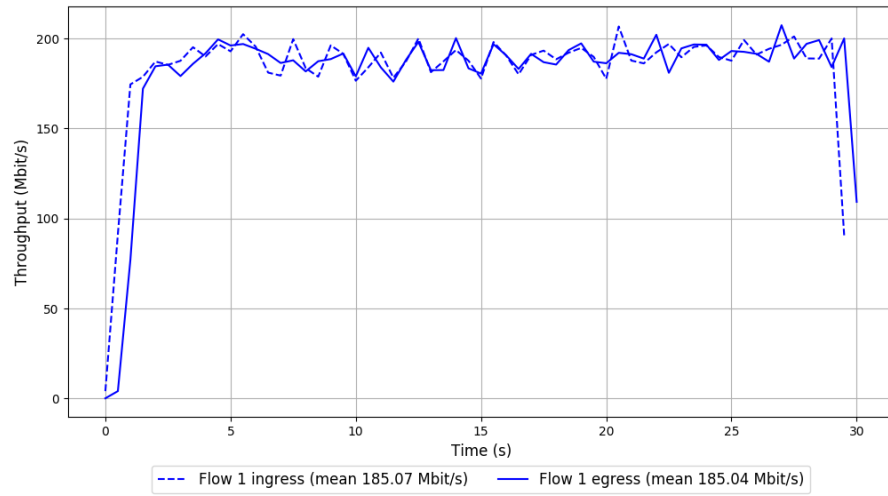


Run 2: Statistics of Indigo

Start at: 2018-08-28 16:06:42
End at: 2018-08-28 16:07:12
Local clock offset: -0.449 ms
Remote clock offset: -2.954 ms

Below is generated by plot.py at 2018-08-28 16:19:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 185.04 Mbit/s
95th percentile per-packet one-way delay: 51.120 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 185.04 Mbit/s
95th percentile per-packet one-way delay: 51.120 ms
Loss rate: 0.01%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-23

Start at: 2018-08-28 16:02:02

End at: 2018-08-28 16:02:32

Local clock offset: -0.254 ms

Remote clock offset: 2.856 ms

Below is generated by plot.py at 2018-08-28 16:20:57

Datalink statistics

-- Total of 1 flow:

Average throughput: 630.46 Mbit/s

95th percentile per-packet one-way delay: 129.016 ms

Loss rate: 1.71%

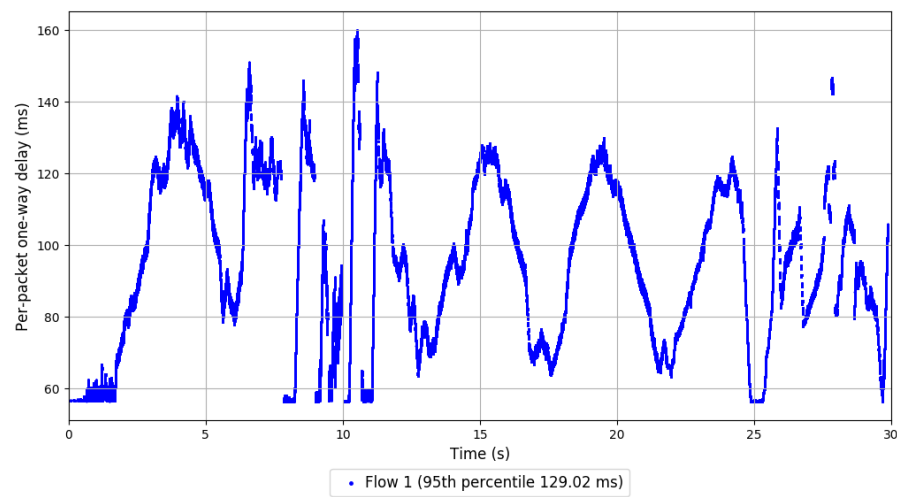
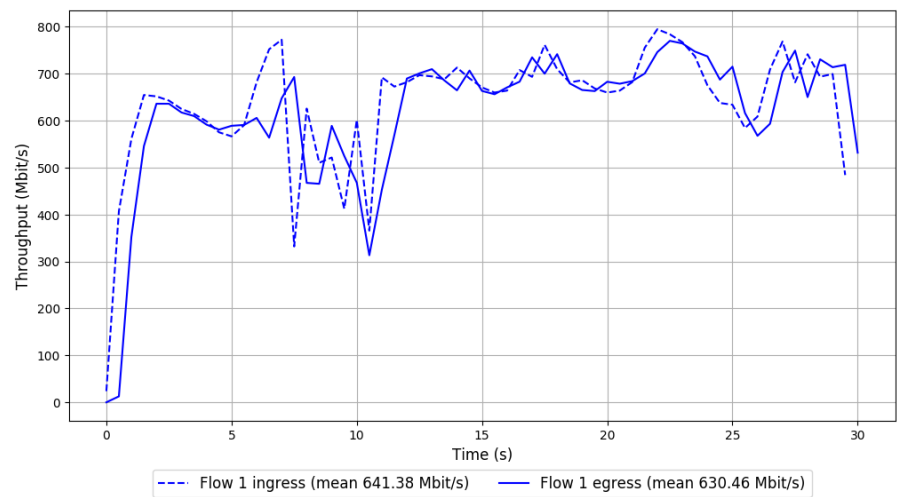
-- Flow 1:

Average throughput: 630.46 Mbit/s

95th percentile per-packet one-way delay: 129.016 ms

Loss rate: 1.71%

Run 1: Report of Muses-23 — Data Link



Run 2: Statistics of Muses-23

Start at: 2018-08-28 16:08:03

End at: 2018-08-28 16:08:33

Local clock offset: -0.029 ms

Remote clock offset: -0.08 ms

Below is generated by plot.py at 2018-08-28 16:20:57

Datalink statistics

-- Total of 1 flow:

Average throughput: 536.86 Mbit/s

95th percentile per-packet one-way delay: 117.973 ms

Loss rate: 0.47%

-- Flow 1:

Average throughput: 536.86 Mbit/s

95th percentile per-packet one-way delay: 117.973 ms

Loss rate: 0.47%

Run 2: Report of Muses-23 — Data Link

