

Pantheon Report

Generated at 2018-09-05 07:12:00 (UTC).

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

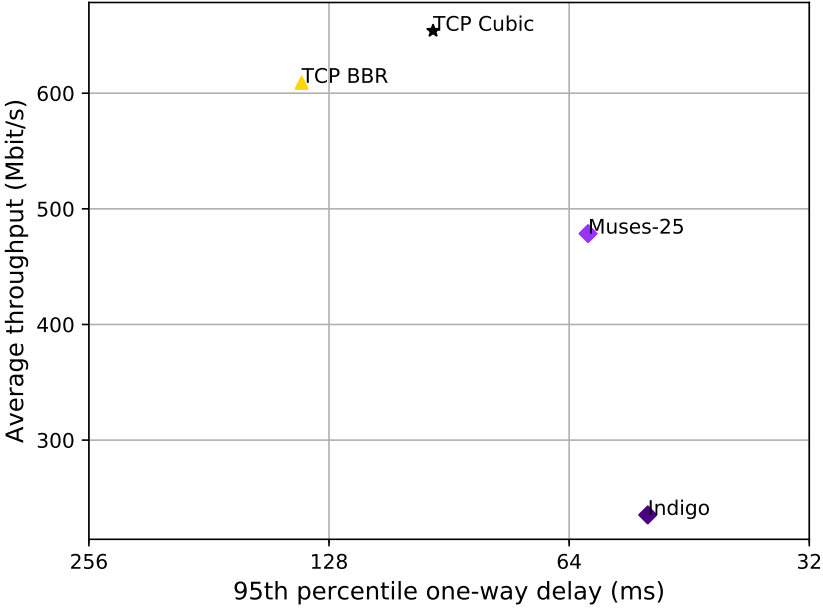
System info:

```
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
```

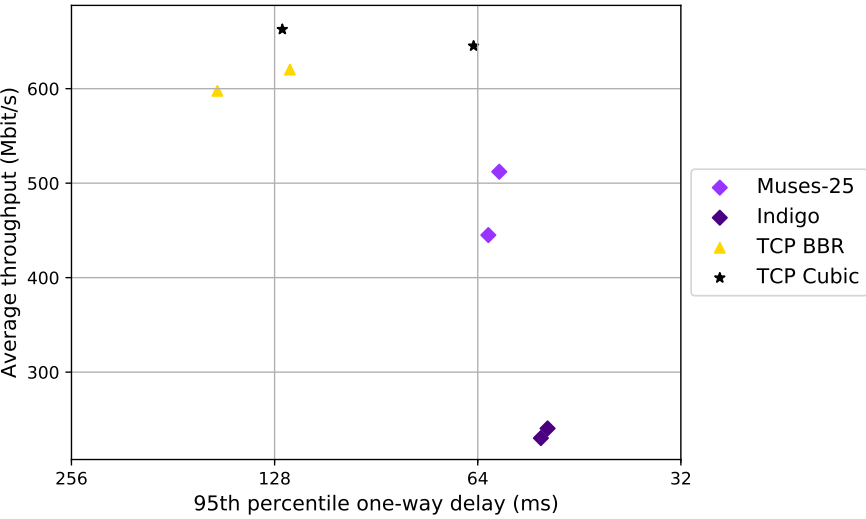
Git summary:

```
branch: muses @ 71e71e9a55b945431a7dea72180c1c9381097db9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
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 GCE Tokyo to GCE Sydney, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Tokyo to GCE Sydney, 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	608.95	138.54	0.79
TCP Cubic	2	653.99	94.79	0.46
Indigo	2	235.31	51.01	0.33
Muses-25	2	478.57	60.60	0.29

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 06:51:17

End at: 2018-09-05 06:51:48

Local clock offset: 0.124 ms

Remote clock offset: 0.042 ms

Below is generated by plot.py at 2018-09-05 07:11:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 597.72 Mbit/s

95th percentile per-packet one-way delay: 155.587 ms

Loss rate: 1.31%

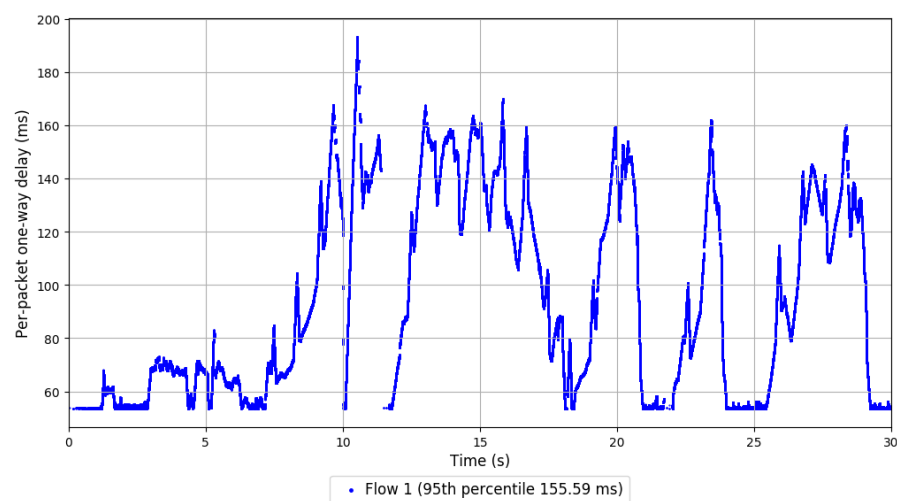
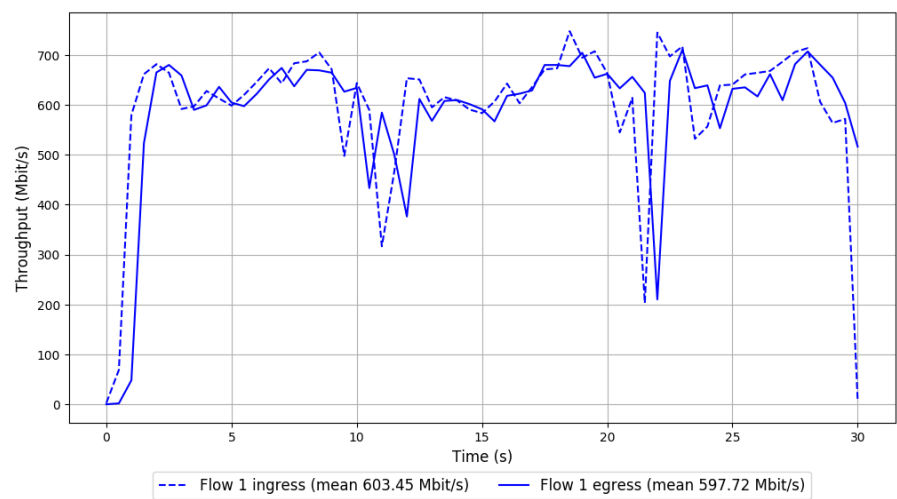
-- Flow 1:

Average throughput: 597.72 Mbit/s

95th percentile per-packet one-way delay: 155.587 ms

Loss rate: 1.31%

Run 1: Report of TCP BBR — Data Link

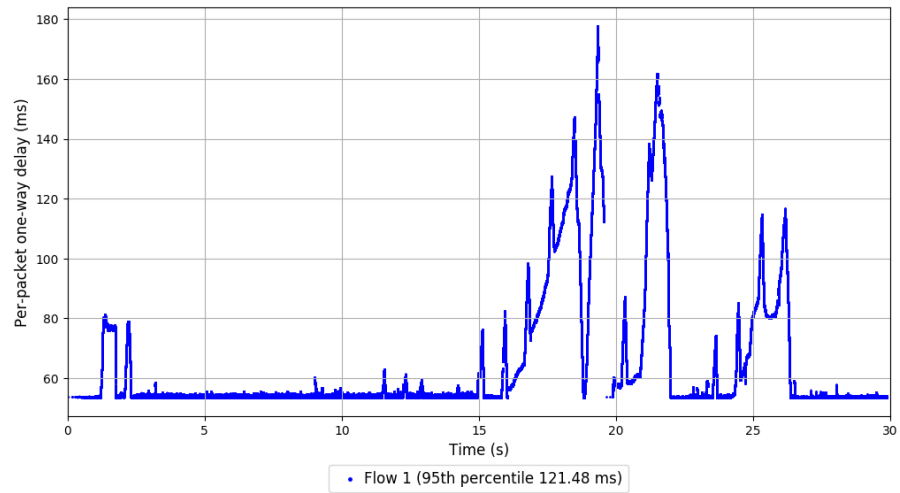
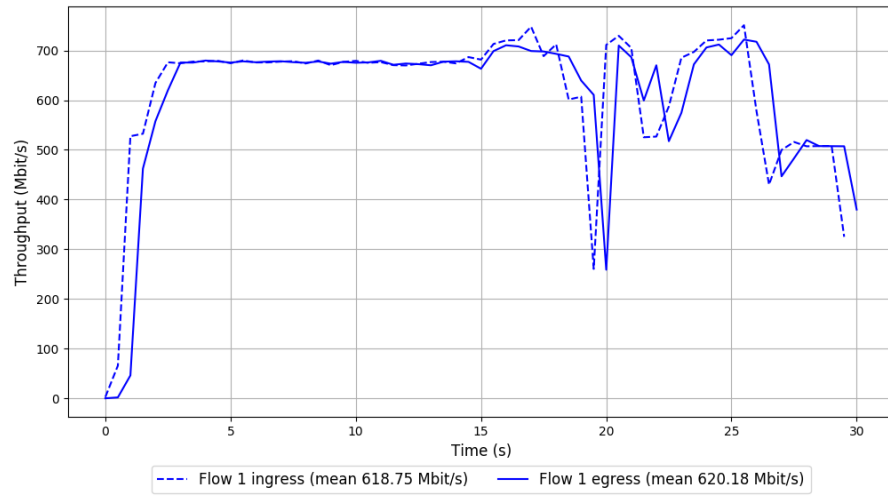


Run 2: Statistics of TCP BBR

Start at: 2018-09-05 06:57:31
End at: 2018-09-05 06:58:01
Local clock offset: -0.321 ms
Remote clock offset: -0.159 ms

Below is generated by plot.py at 2018-09-05 07:11:53
Datalink statistics
-- Total of 1 flow:
Average throughput: 620.18 Mbit/s
95th percentile per-packet one-way delay: 121.485 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 620.18 Mbit/s
95th percentile per-packet one-way delay: 121.485 ms
Loss rate: 0.26%

Run 2: Report of TCP BBR — Data Link

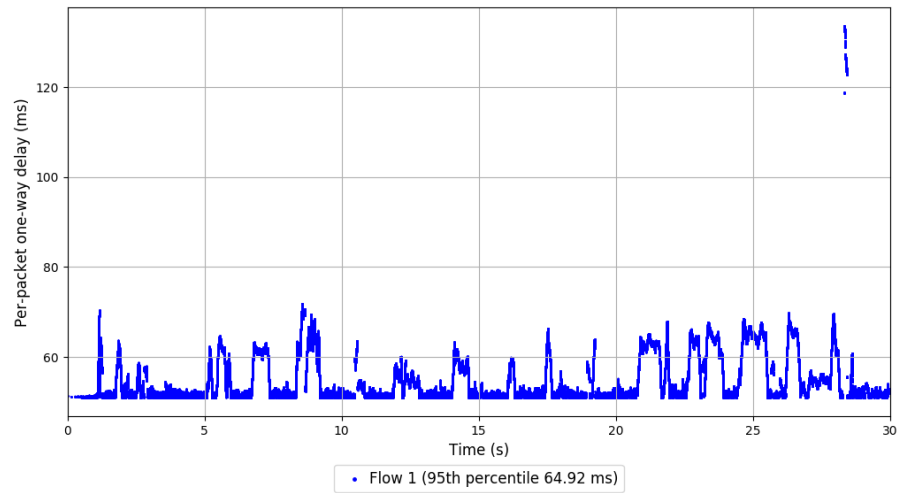
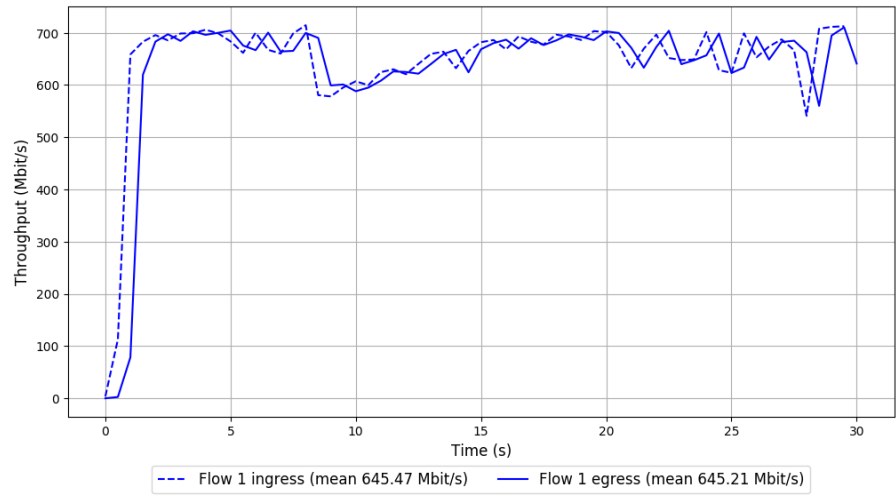


Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 06:54:22
End at: 2018-09-05 06:54:52
Local clock offset: 0.075 ms
Remote clock offset: -0.319 ms

Below is generated by plot.py at 2018-09-05 07:11:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 645.21 Mbit/s
95th percentile per-packet one-way delay: 64.917 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 645.21 Mbit/s
95th percentile per-packet one-way delay: 64.917 ms
Loss rate: 0.38%

Run 1: Report of TCP Cubic — Data Link

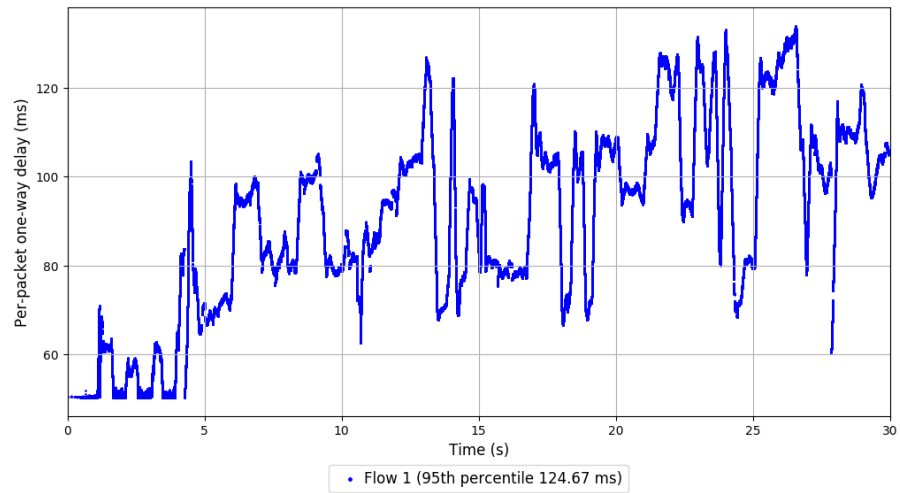
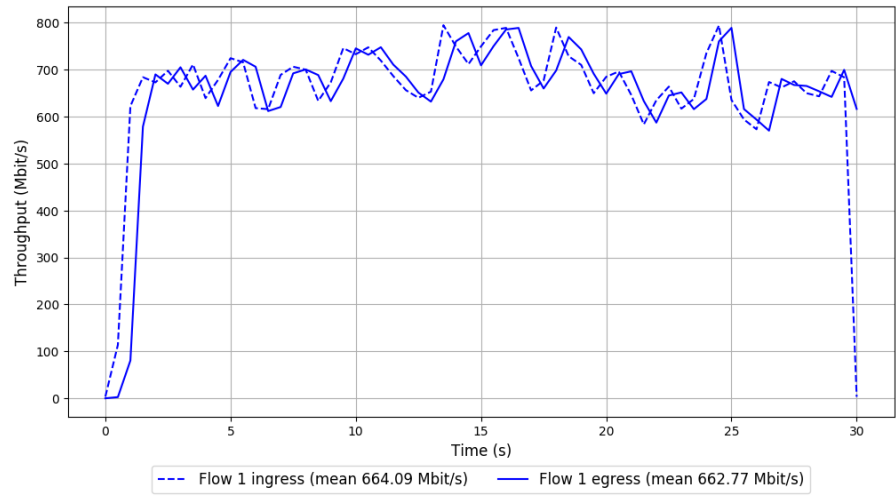


Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 07:00:36
End at: 2018-09-05 07:01:06
Local clock offset: 0.072 ms
Remote clock offset: -0.115 ms

Below is generated by plot.py at 2018-09-05 07:11:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 662.77 Mbit/s
95th percentile per-packet one-way delay: 124.668 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 662.77 Mbit/s
95th percentile per-packet one-way delay: 124.668 ms
Loss rate: 0.53%

Run 2: Report of TCP Cubic — Data Link

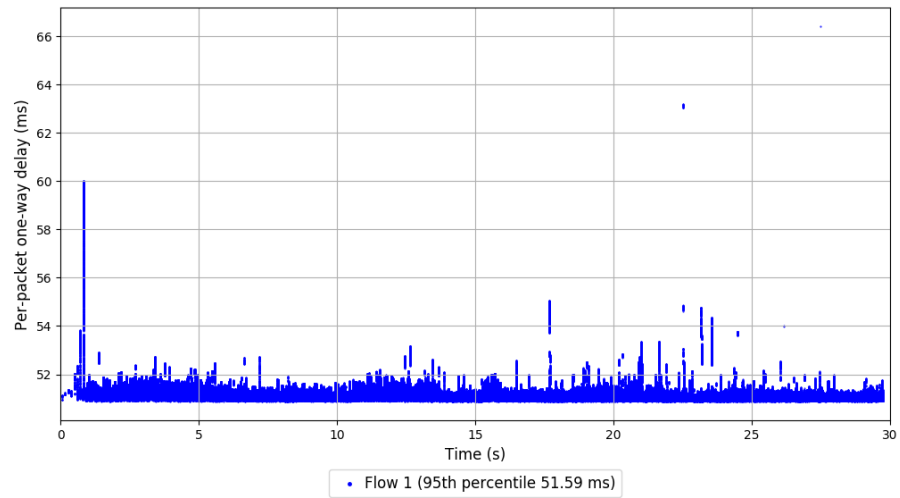
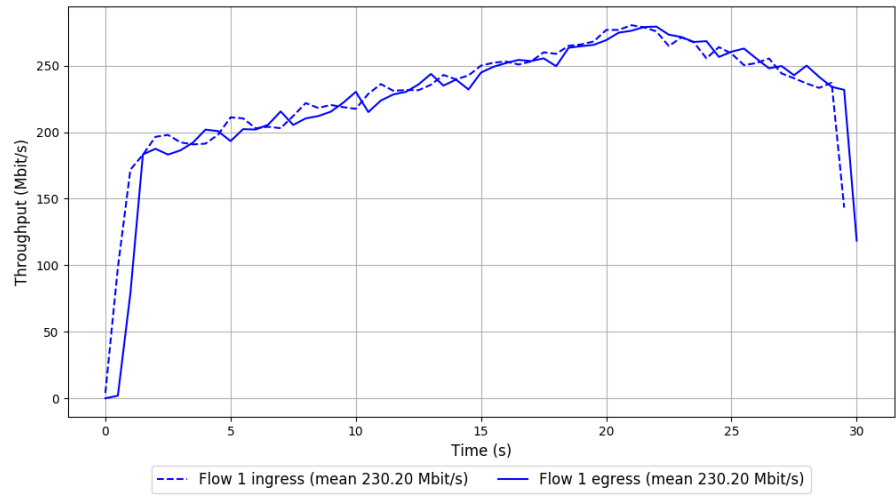


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 06:52:55
End at: 2018-09-05 06:53:25
Local clock offset: 0.123 ms
Remote clock offset: -0.204 ms

# Below is generated by plot.py at 2018-09-05 07:11:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 230.20 Mbit/s
95th percentile per-packet one-way delay: 51.595 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 230.20 Mbit/s
95th percentile per-packet one-way delay: 51.595 ms
Loss rate: 0.35%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-05 06:59:07

End at: 2018-09-05 06:59:38

Local clock offset: -0.184 ms

Remote clock offset: -0.08 ms

Below is generated by plot.py at 2018-09-05 07:11:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 240.42 Mbit/s

95th percentile per-packet one-way delay: 50.429 ms

Loss rate: 0.32%

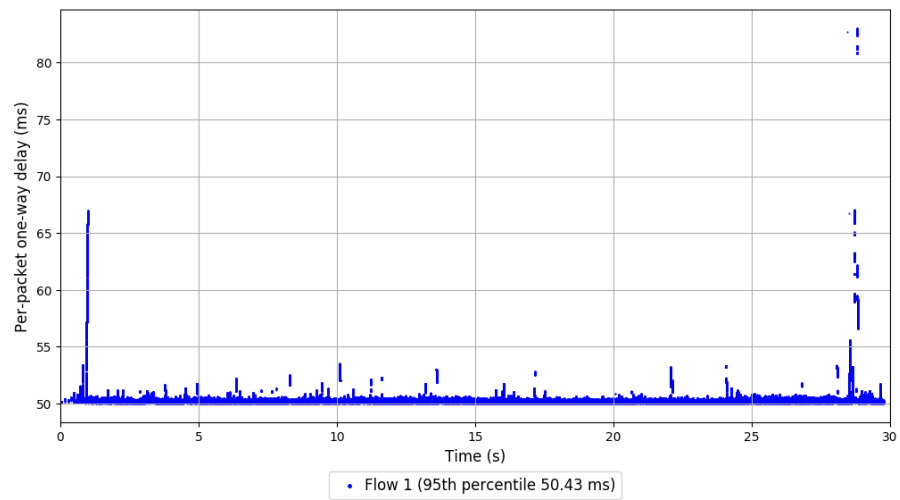
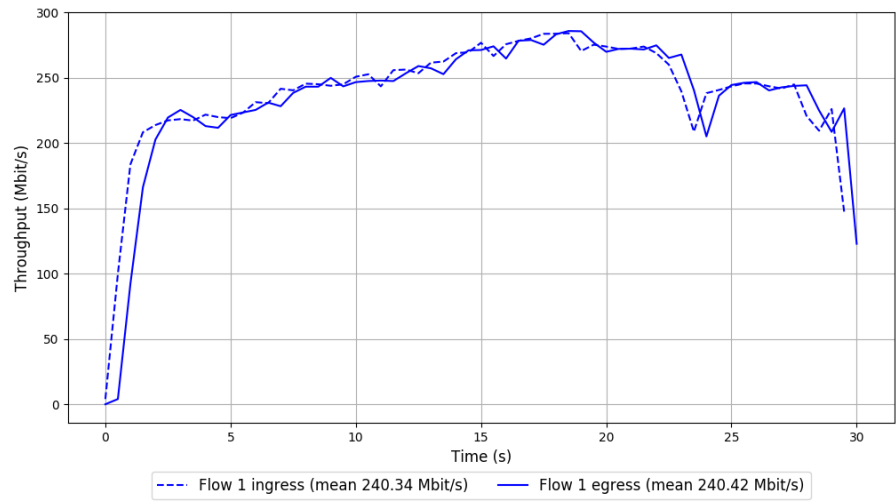
-- Flow 1:

Average throughput: 240.42 Mbit/s

95th percentile per-packet one-way delay: 50.429 ms

Loss rate: 0.32%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-05 06:49:50

End at: 2018-09-05 06:50:20

Local clock offset: 0.071 ms

Remote clock offset: -0.35 ms

Below is generated by plot.py at 2018-09-05 07:11:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 445.05 Mbit/s

95th percentile per-packet one-way delay: 61.730 ms

Loss rate: 0.17%

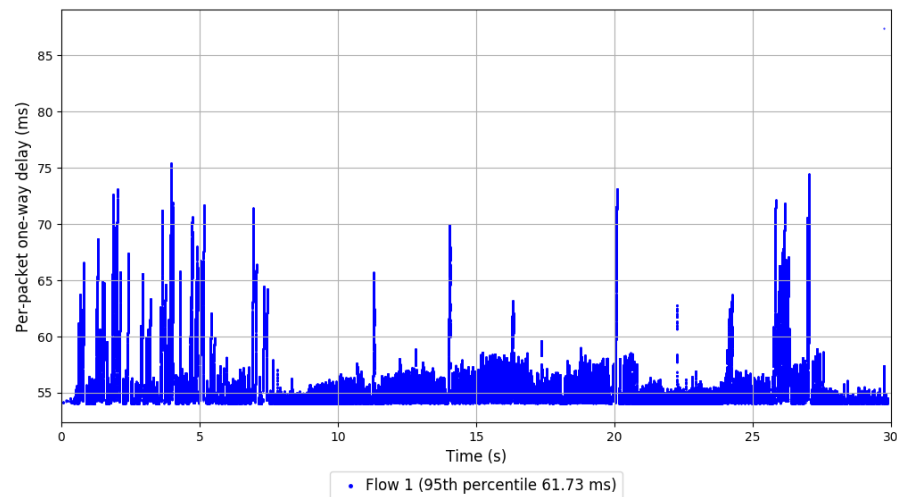
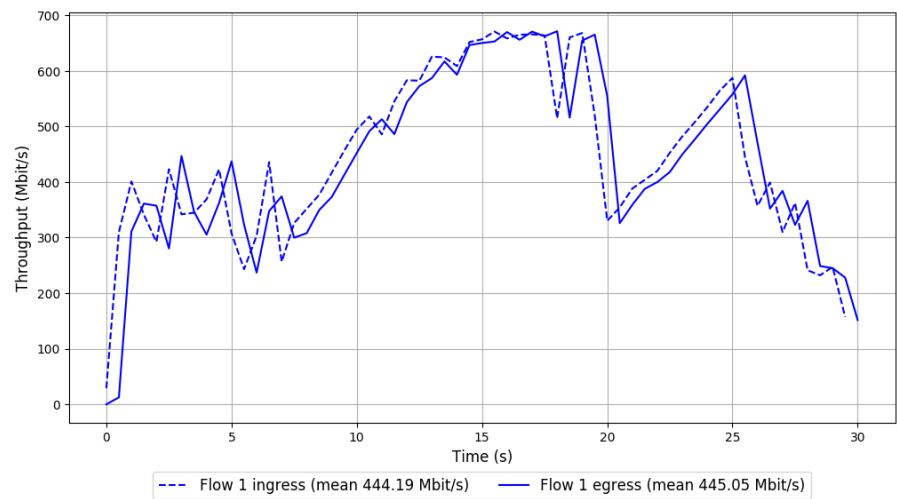
-- Flow 1:

Average throughput: 445.05 Mbit/s

95th percentile per-packet one-way delay: 61.730 ms

Loss rate: 0.17%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-05 06:55:59
End at: 2018-09-05 06:56:29
Local clock offset: -0.121 ms
Remote clock offset: -0.257 ms

Below is generated by plot.py at 2018-09-05 07:11:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 512.09 Mbit/s
95th percentile per-packet one-way delay: 59.470 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 512.09 Mbit/s
95th percentile per-packet one-way delay: 59.470 ms
Loss rate: 0.40%

Run 2: Report of Muses-25 — Data Link

