

Pantheon Report

Generated at 2018-09-06 00:16:59 (UTC).

Data path: GCE London 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.

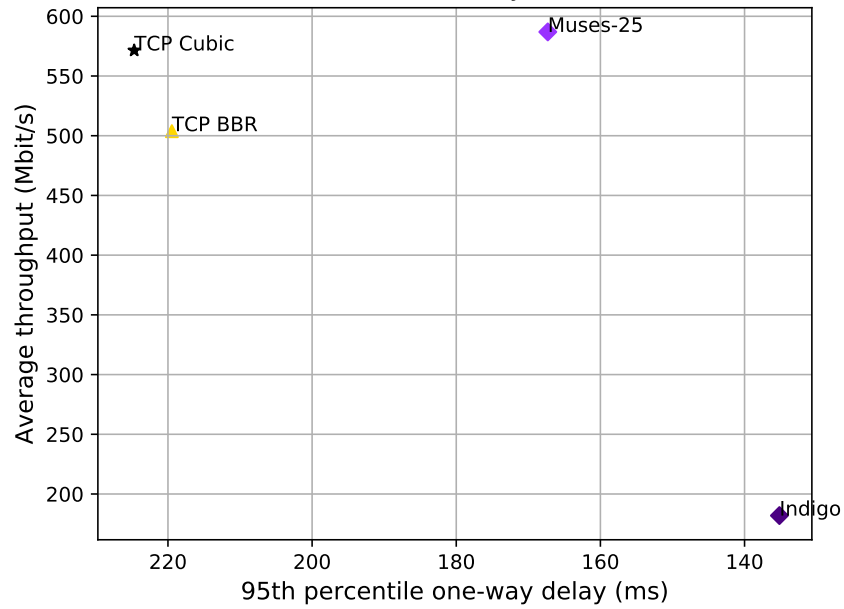
System info:

```
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
```

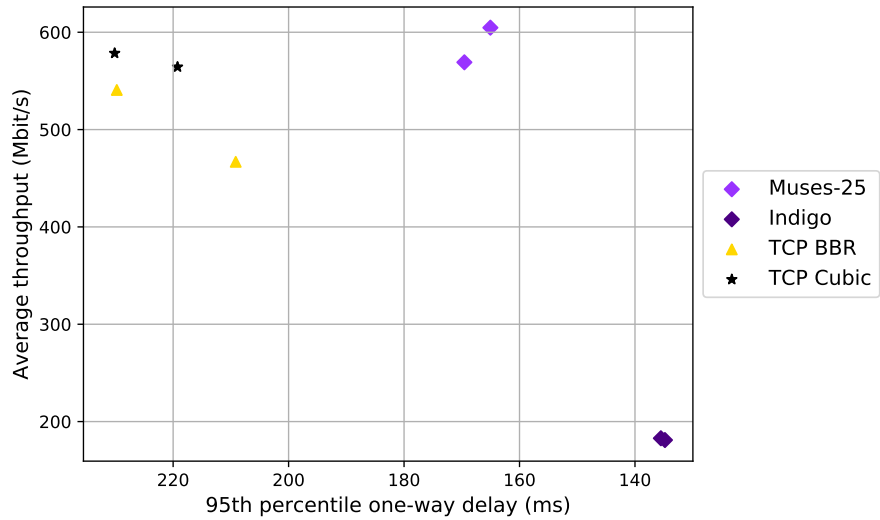
Git summary:

```
branch: muses @ 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 London to GCE Sydney, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE London 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	503.81	219.46	2.29
TCP Cubic	2	571.40	224.69	1.25
Indigo	2	181.94	135.16	0.89
Muses-25	2	586.91	167.30	0.67

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 23:54:51

End at: 2018-09-05 23:55:21

Local clock offset: 2.87 ms

Remote clock offset: 0.49 ms

Below is generated by plot.py at 2018-09-06 00:16:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 540.73 Mbit/s

95th percentile per-packet one-way delay: 229.757 ms

Loss rate: 2.66%

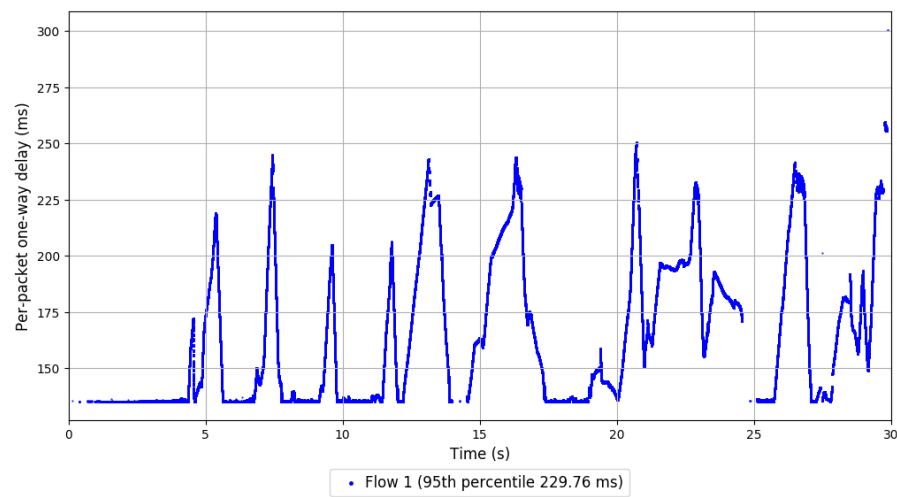
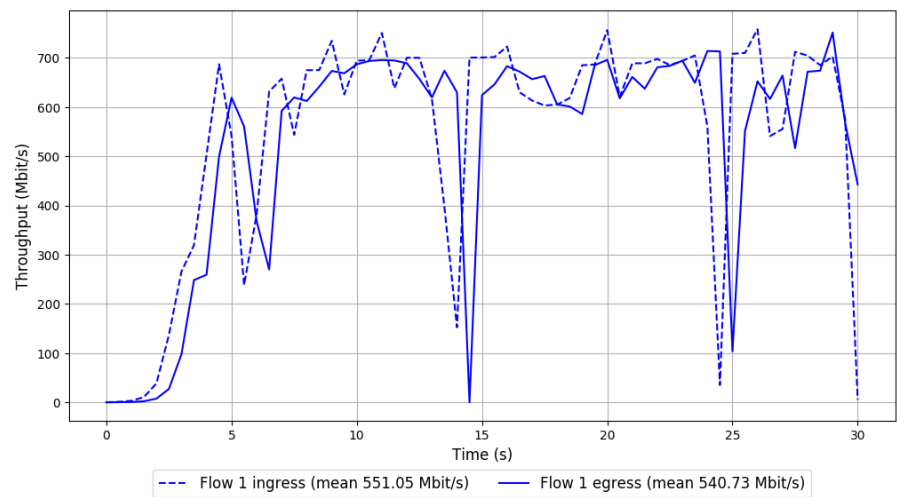
-- Flow 1:

Average throughput: 540.73 Mbit/s

95th percentile per-packet one-way delay: 229.757 ms

Loss rate: 2.66%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-06 00:01:27

End at: 2018-09-06 00:01:57

Local clock offset: 1.538 ms

Remote clock offset: 0.147 ms

Below is generated by plot.py at 2018-09-06 00:16:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 466.89 Mbit/s

95th percentile per-packet one-way delay: 209.157 ms

Loss rate: 1.92%

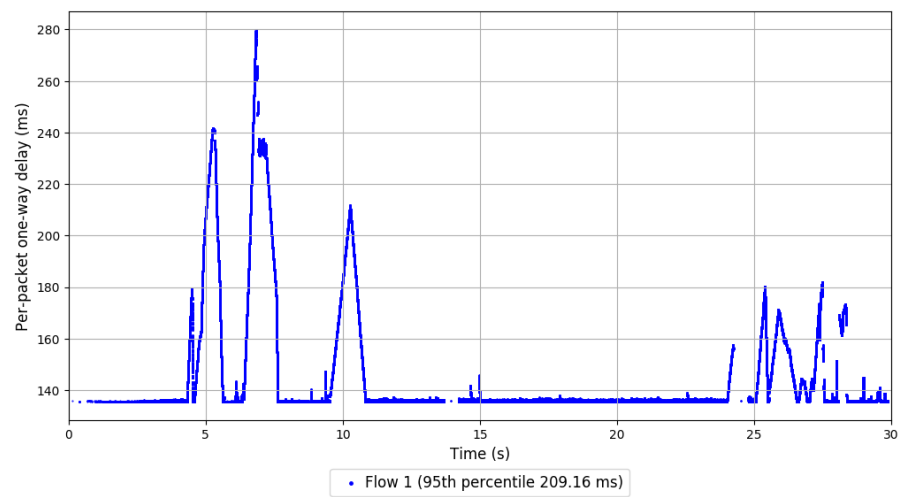
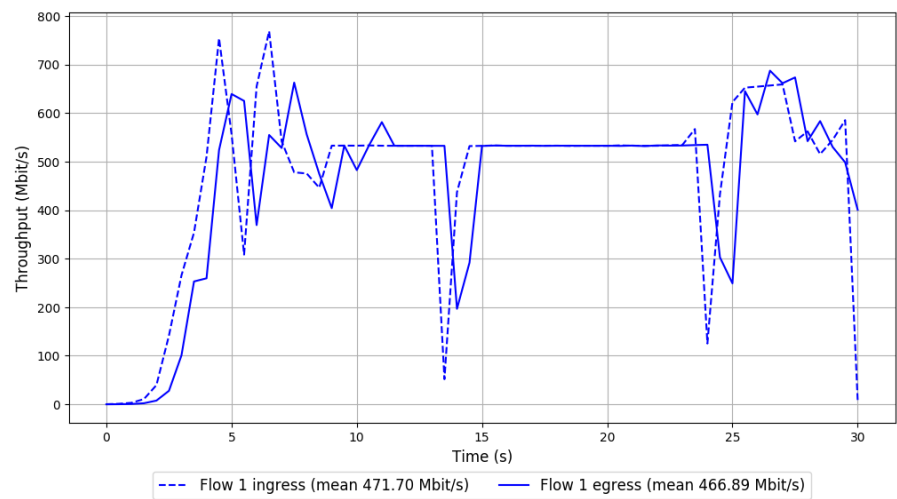
-- Flow 1:

Average throughput: 466.89 Mbit/s

95th percentile per-packet one-way delay: 209.157 ms

Loss rate: 1.92%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 23:59:44

End at: 2018-09-06 00:00:14

Local clock offset: 1.879 ms

Remote clock offset: 0.115 ms

Below is generated by plot.py at 2018-09-06 00:16:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 578.45 Mbit/s

95th percentile per-packet one-way delay: 230.132 ms

Loss rate: 1.24%

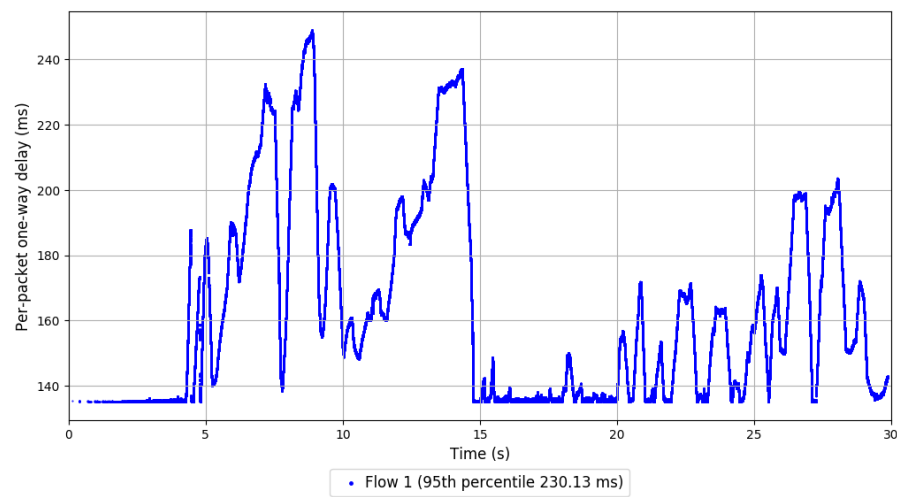
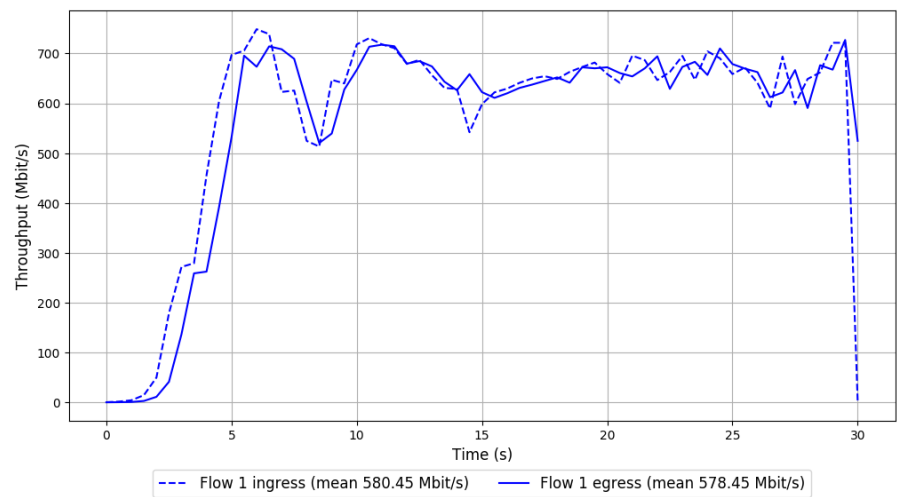
-- Flow 1:

Average throughput: 578.45 Mbit/s

95th percentile per-packet one-way delay: 230.132 ms

Loss rate: 1.24%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-06 00:06:16

End at: 2018-09-06 00:06:46

Local clock offset: 1.196 ms

Remote clock offset: 0.143 ms

Below is generated by plot.py at 2018-09-06 00:16:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 564.35 Mbit/s

95th percentile per-packet one-way delay: 219.239 ms

Loss rate: 1.27%

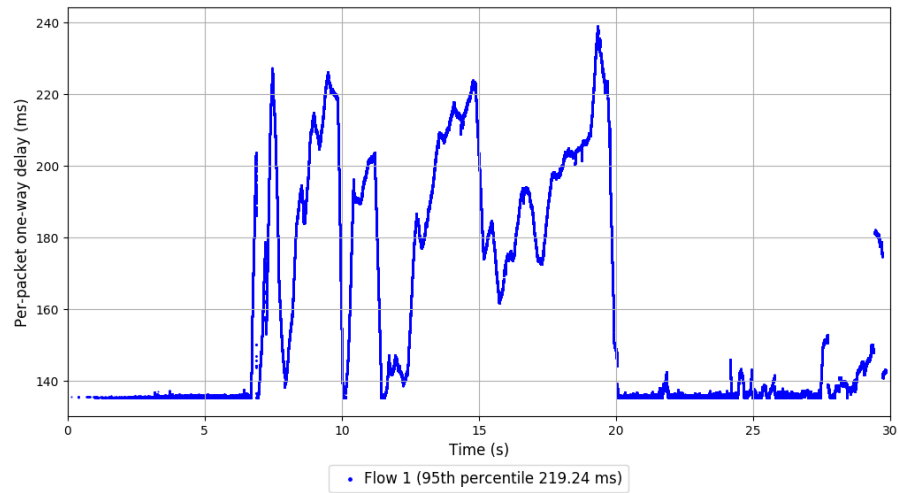
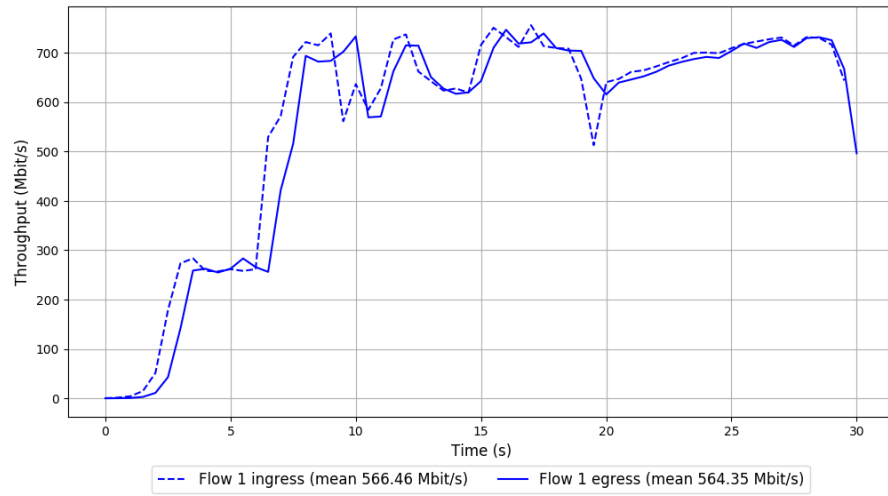
-- Flow 1:

Average throughput: 564.35 Mbit/s

95th percentile per-packet one-way delay: 219.239 ms

Loss rate: 1.27%

Run 2: Report of TCP Cubic — Data Link

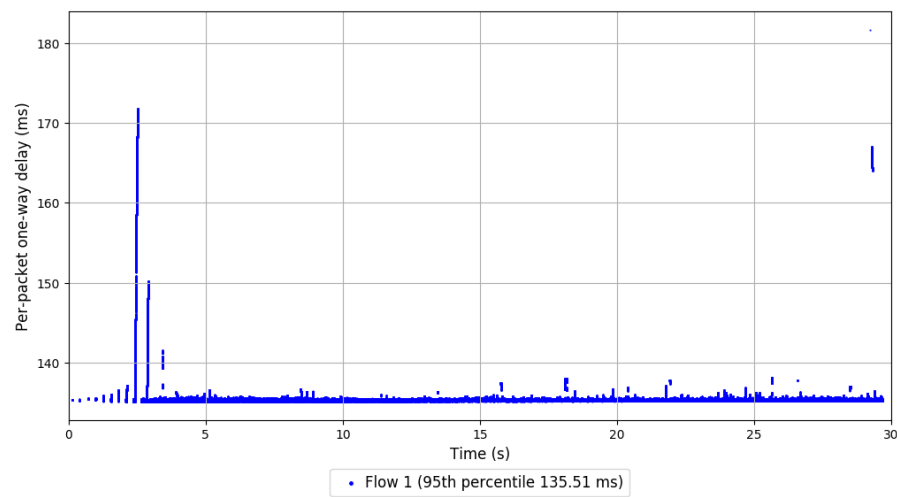
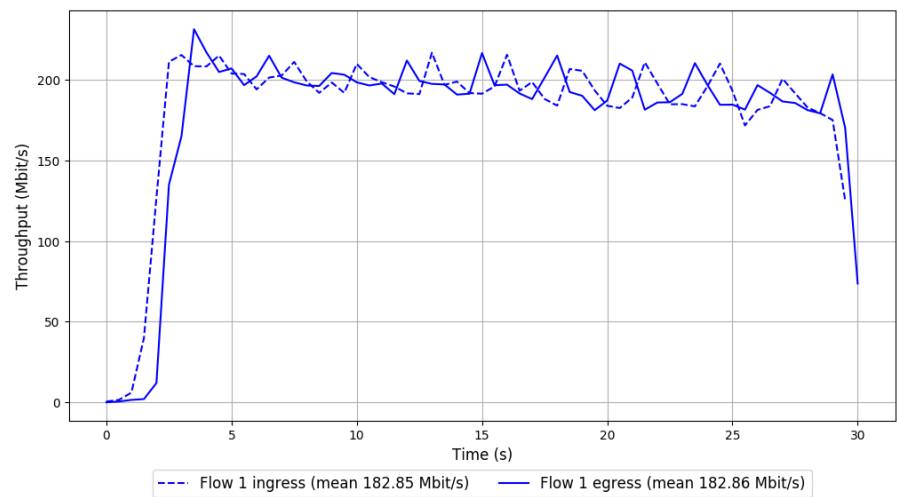


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 23:56:35
End at: 2018-09-05 23:57:05
Local clock offset: 2.386 ms
Remote clock offset: 0.5 ms

# Below is generated by plot.py at 2018-09-06 00:16:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 182.86 Mbit/s
95th percentile per-packet one-way delay: 135.514 ms
Loss rate: 0.91%
-- Flow 1:
Average throughput: 182.86 Mbit/s
95th percentile per-packet one-way delay: 135.514 ms
Loss rate: 0.91%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-06 00:03:05

End at: 2018-09-06 00:03:35

Local clock offset: 1.444 ms

Remote clock offset: 0.083 ms

Below is generated by plot.py at 2018-09-06 00:16:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 181.01 Mbit/s

95th percentile per-packet one-way delay: 134.810 ms

Loss rate: 0.86%

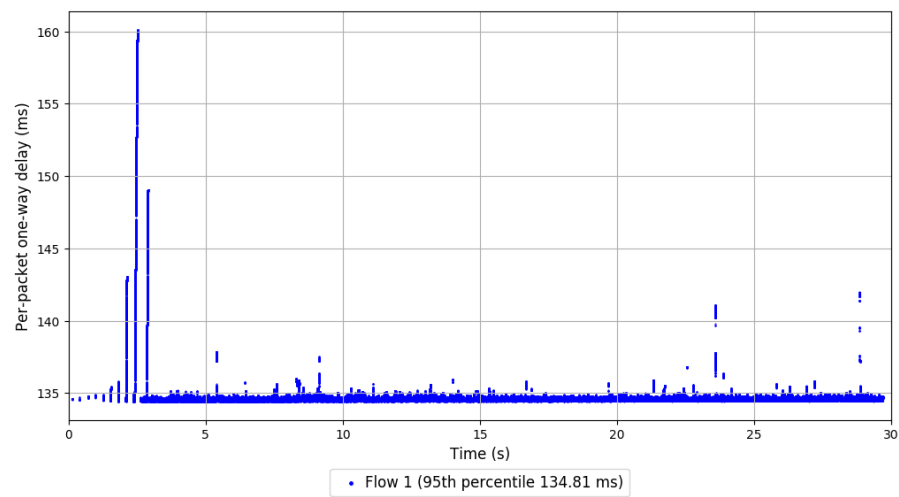
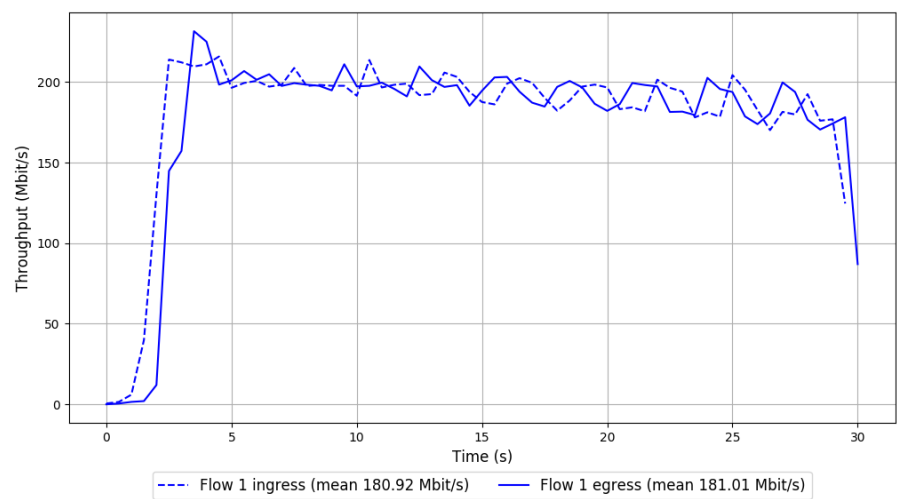
-- Flow 1:

Average throughput: 181.01 Mbit/s

95th percentile per-packet one-way delay: 134.810 ms

Loss rate: 0.86%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-05 23:58:03

End at: 2018-09-05 23:58:33

Local clock offset: 2.425 ms

Remote clock offset: 0.13 ms

Below is generated by plot.py at 2018-09-06 00:16:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 569.12 Mbit/s

95th percentile per-packet one-way delay: 169.551 ms

Loss rate: 0.51%

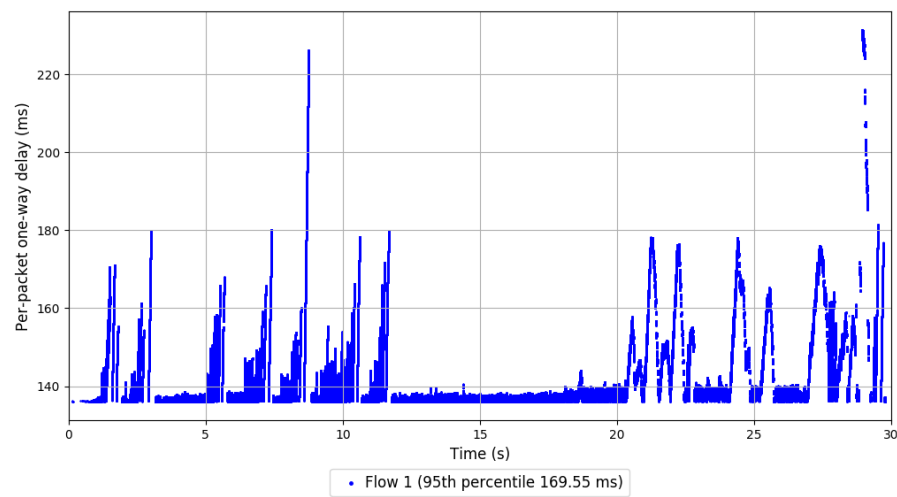
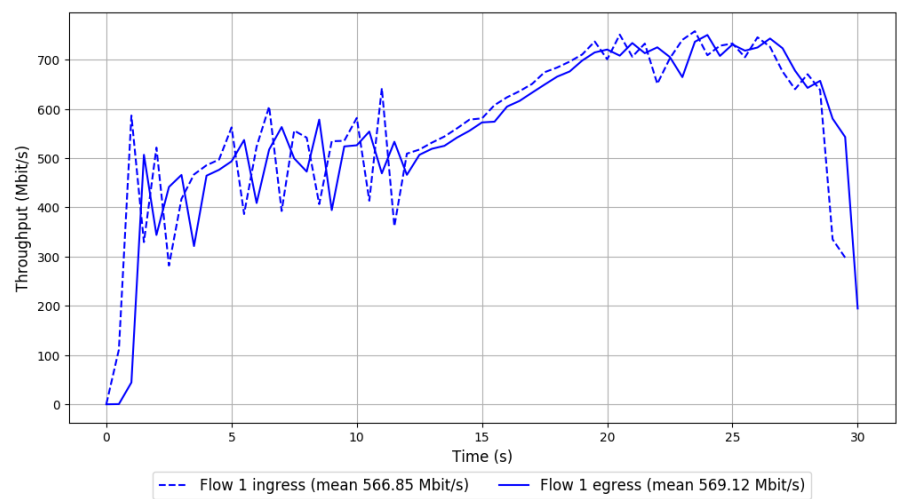
-- Flow 1:

Average throughput: 569.12 Mbit/s

95th percentile per-packet one-way delay: 169.551 ms

Loss rate: 0.51%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-06 00:04:33
End at: 2018-09-06 00:05:03
Local clock offset: 1.281 ms
Remote clock offset: -0.224 ms

Below is generated by plot.py at 2018-09-06 00:16:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 604.71 Mbit/s
95th percentile per-packet one-way delay: 165.046 ms
Loss rate: 0.82%
-- Flow 1:
Average throughput: 604.71 Mbit/s
95th percentile per-packet one-way delay: 165.046 ms
Loss rate: 0.82%

Run 2: Report of Muses-25 — Data Link

