

Pantheon Report

Generated at 2018-09-05 03:24:40 (UTC).

Data path: GCE Iowa 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.

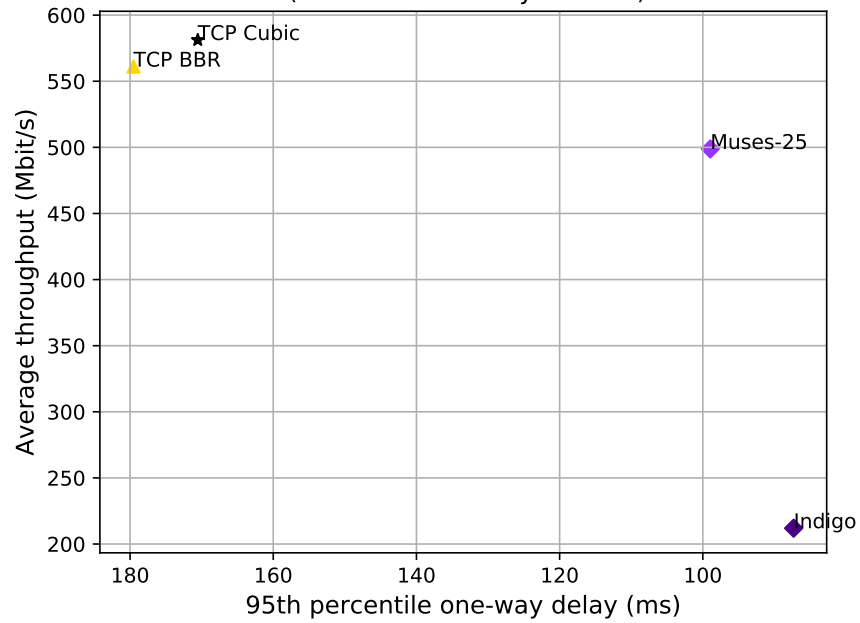
System info:

```
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
```

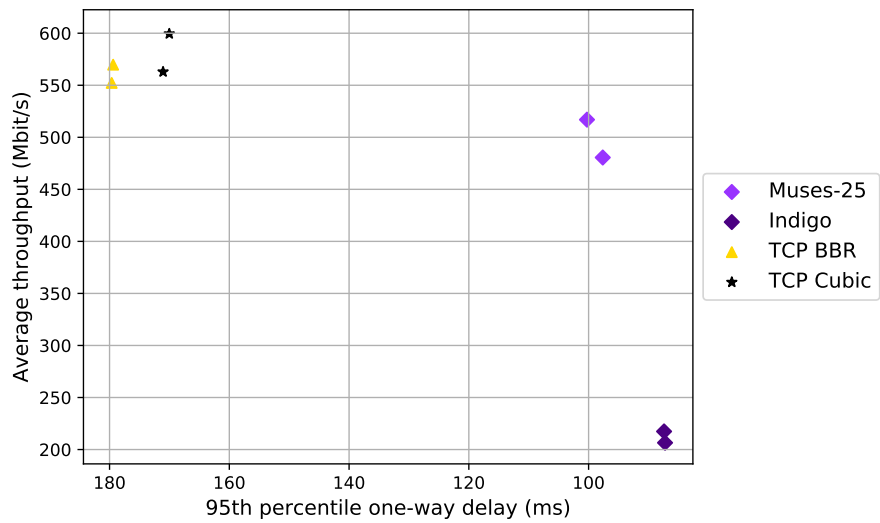
Git summary:

```
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 Iowa to GCE Sydney, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Iowa 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	561.02	179.52	1.85
TCP Cubic	2	581.16	170.54	0.58
Indigo	2	211.96	87.31	0.63
Muses-25	2	498.75	98.95	0.58

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 03:05:51

End at: 2018-09-05 03:06:21

Local clock offset: 7.185 ms

Remote clock offset: 1.54 ms

Below is generated by plot.py at 2018-09-05 03:24:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 569.78 Mbit/s

95th percentile per-packet one-way delay: 179.400 ms

Loss rate: 1.69%

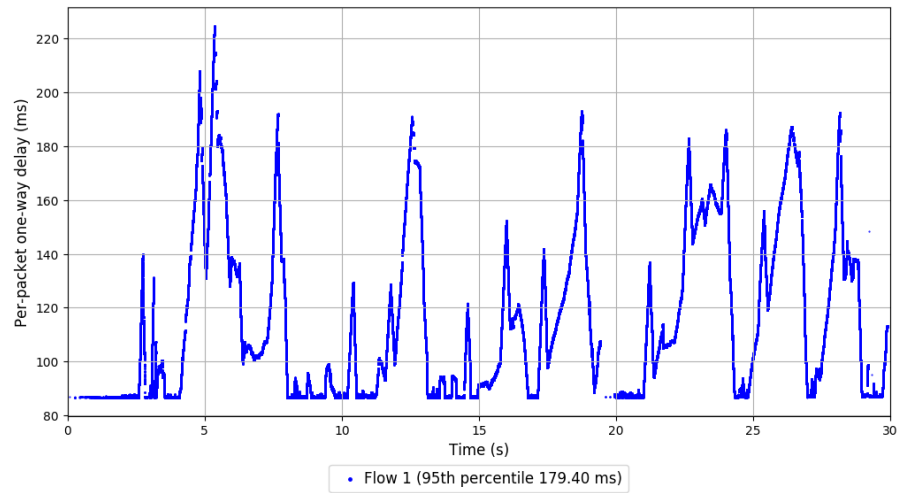
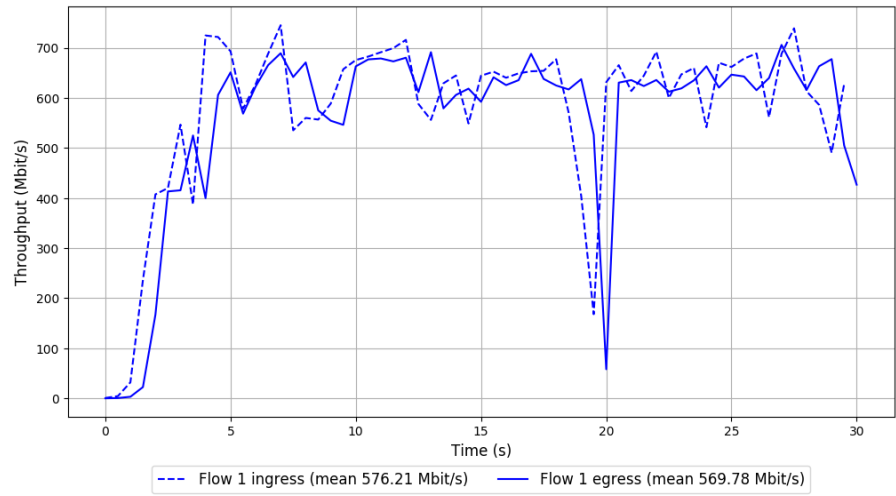
-- Flow 1:

Average throughput: 569.78 Mbit/s

95th percentile per-packet one-way delay: 179.400 ms

Loss rate: 1.69%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 03:12:10

End at: 2018-09-05 03:12:40

Local clock offset: 4.758 ms

Remote clock offset: 1.459 ms

Below is generated by plot.py at 2018-09-05 03:24:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 552.27 Mbit/s

95th percentile per-packet one-way delay: 179.645 ms

Loss rate: 2.02%

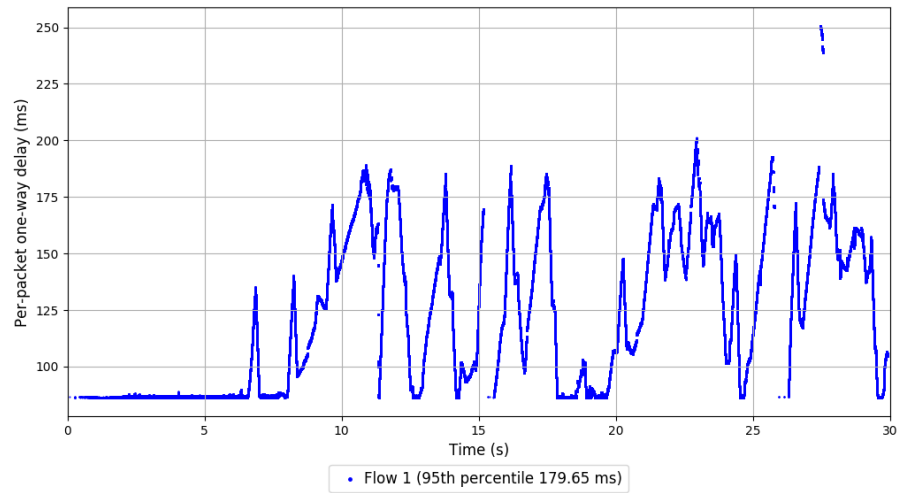
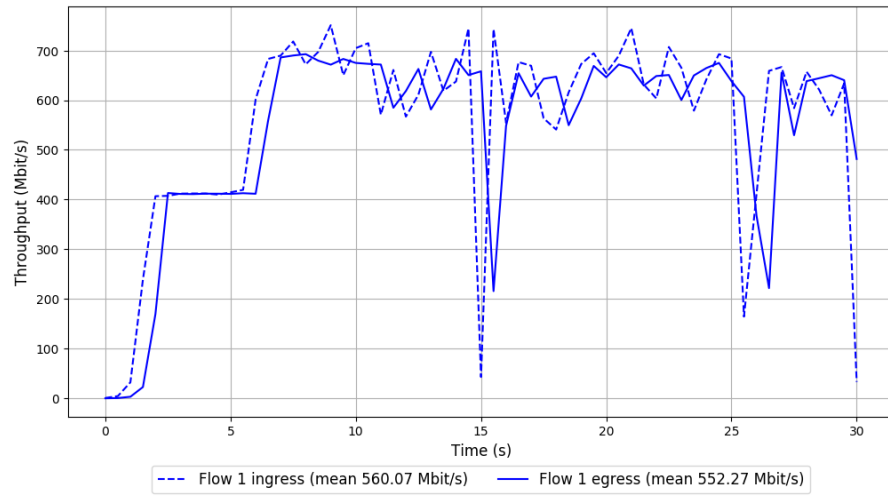
-- Flow 1:

Average throughput: 552.27 Mbit/s

95th percentile per-packet one-way delay: 179.645 ms

Loss rate: 2.02%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 03:07:31

End at: 2018-09-05 03:08:01

Local clock offset: 6.137 ms

Remote clock offset: 1.453 ms

Below is generated by plot.py at 2018-09-05 03:24:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 562.89 Mbit/s

95th percentile per-packet one-way delay: 171.061 ms

Loss rate: 0.71%

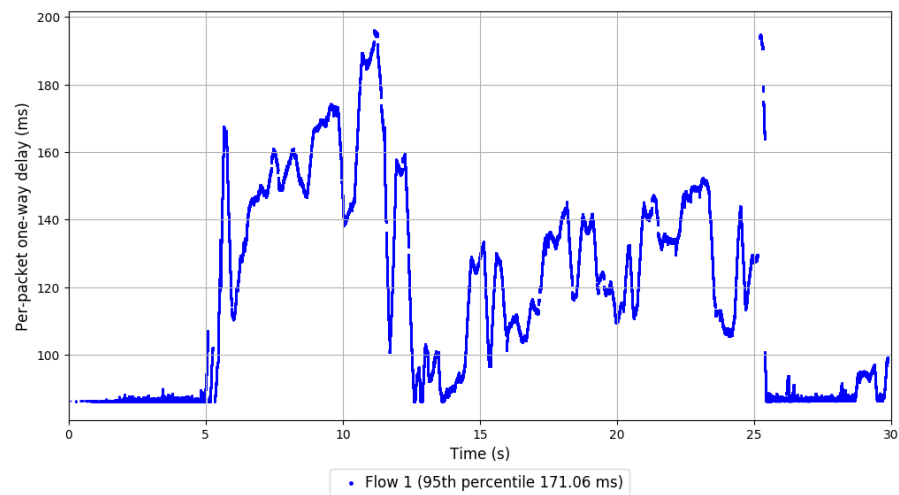
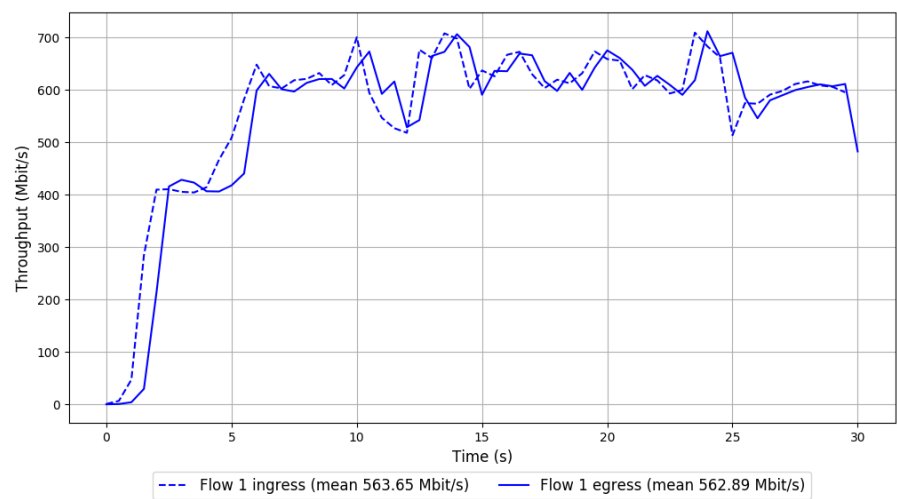
-- Flow 1:

Average throughput: 562.89 Mbit/s

95th percentile per-packet one-way delay: 171.061 ms

Loss rate: 0.71%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 03:13:49

End at: 2018-09-05 03:14:19

Local clock offset: 4.505 ms

Remote clock offset: 1.477 ms

Below is generated by plot.py at 2018-09-05 03:24:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 599.44 Mbit/s

95th percentile per-packet one-way delay: 170.024 ms

Loss rate: 0.45%

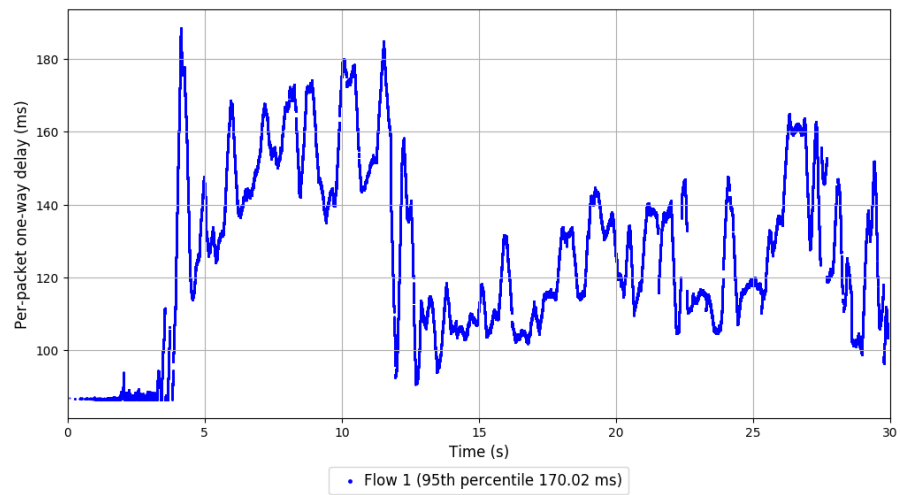
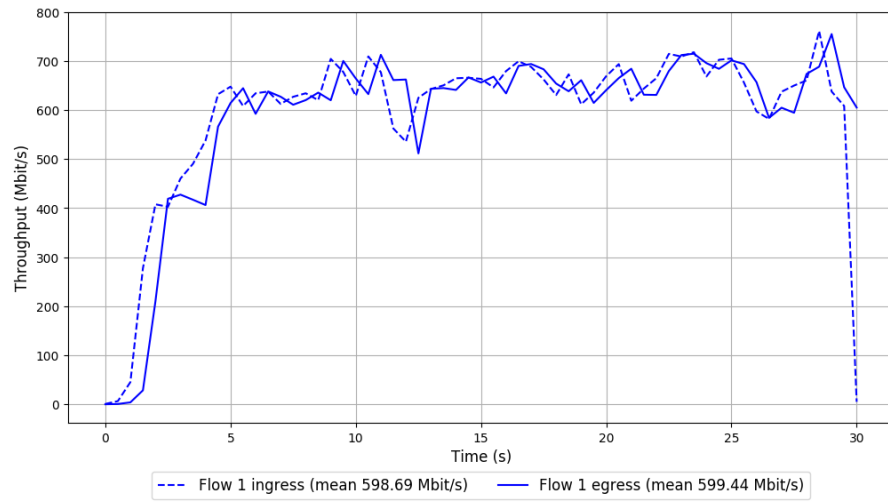
-- Flow 1:

Average throughput: 599.44 Mbit/s

95th percentile per-packet one-way delay: 170.024 ms

Loss rate: 0.45%

Run 2: Report of TCP Cubic — Data Link

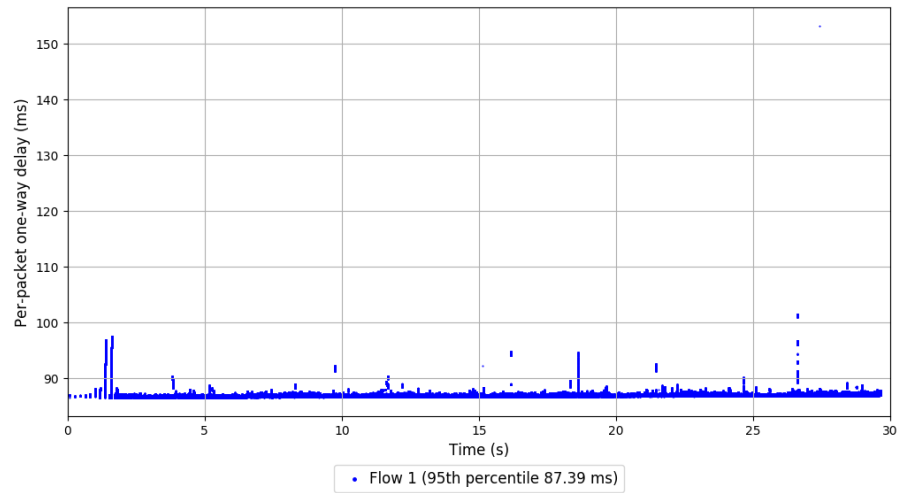
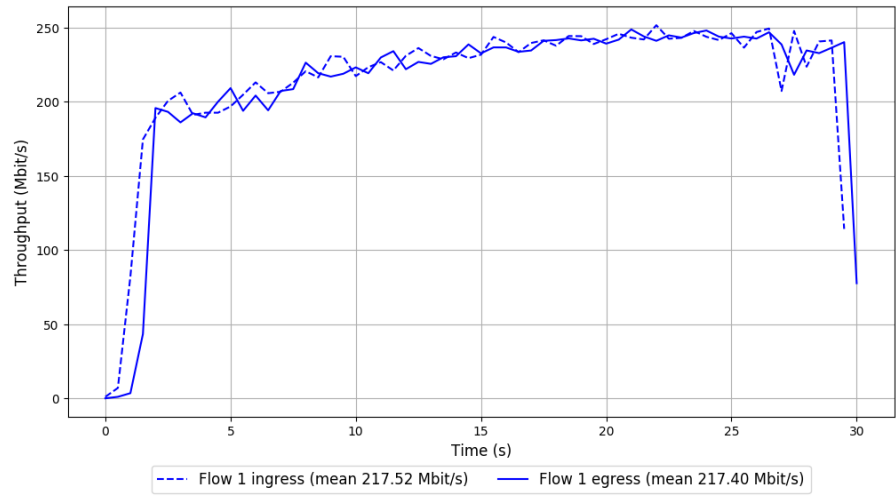


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 03:02:50
End at: 2018-09-05 03:03:20
Local clock offset: 9.054 ms
Remote clock offset: 1.664 ms

# Below is generated by plot.py at 2018-09-05 03:24:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 217.40 Mbit/s
95th percentile per-packet one-way delay: 87.395 ms
Loss rate: 0.64%
-- Flow 1:
Average throughput: 217.40 Mbit/s
95th percentile per-packet one-way delay: 87.395 ms
Loss rate: 0.64%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

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

End at: 2018-09-05 03:09:39

Local clock offset: 5.587 ms

Remote clock offset: 1.469 ms

Below is generated by plot.py at 2018-09-05 03:24:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 206.52 Mbit/s

95th percentile per-packet one-way delay: 87.234 ms

Loss rate: 0.62%

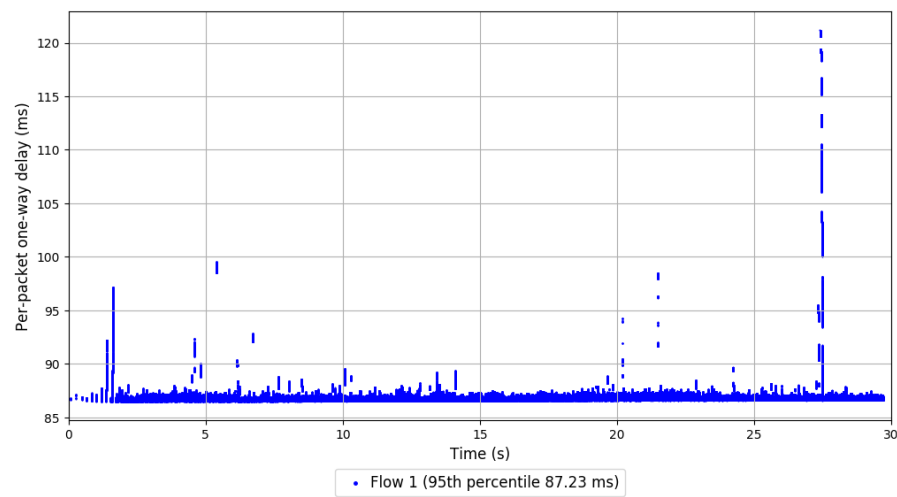
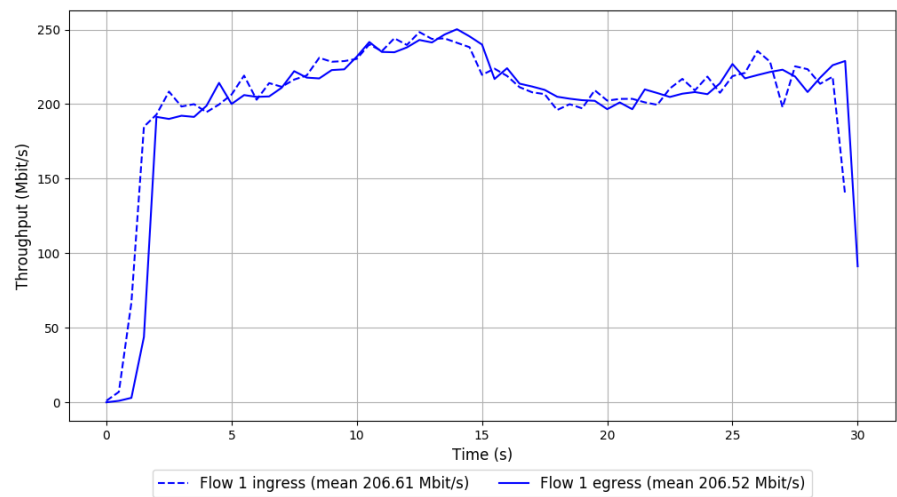
-- Flow 1:

Average throughput: 206.52 Mbit/s

95th percentile per-packet one-way delay: 87.234 ms

Loss rate: 0.62%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-05 03:04:19

End at: 2018-09-05 03:04:49

Local clock offset: 7.835 ms

Remote clock offset: 1.591 ms

Below is generated by plot.py at 2018-09-05 03:24:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 480.57 Mbit/s

95th percentile per-packet one-way delay: 97.635 ms

Loss rate: 0.76%

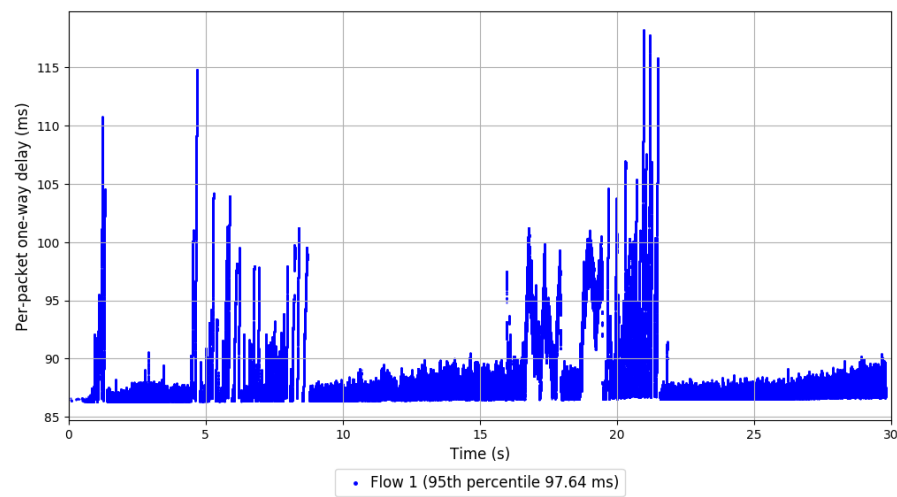
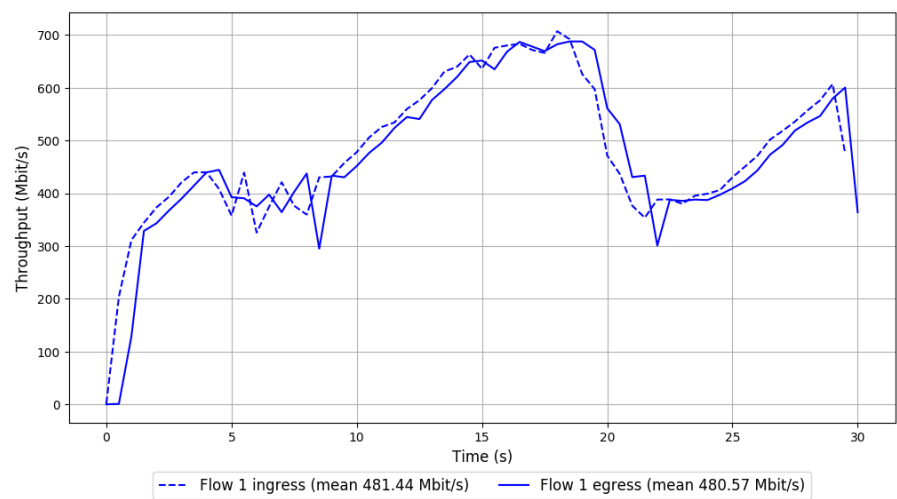
-- Flow 1:

Average throughput: 480.57 Mbit/s

95th percentile per-packet one-way delay: 97.635 ms

Loss rate: 0.76%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-05 03:10:36

End at: 2018-09-05 03:11:06

Local clock offset: 5.077 ms

Remote clock offset: 1.423 ms

Below is generated by plot.py at 2018-09-05 03:24:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 516.94 Mbit/s

95th percentile per-packet one-way delay: 100.270 ms

Loss rate: 0.40%

-- Flow 1:

Average throughput: 516.94 Mbit/s

95th percentile per-packet one-way delay: 100.270 ms

Loss rate: 0.40%

Run 2: Report of Muses-25 — Data Link

