

Pantheon Report

Generated at 2018-09-05 02:28:08 (UTC).

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

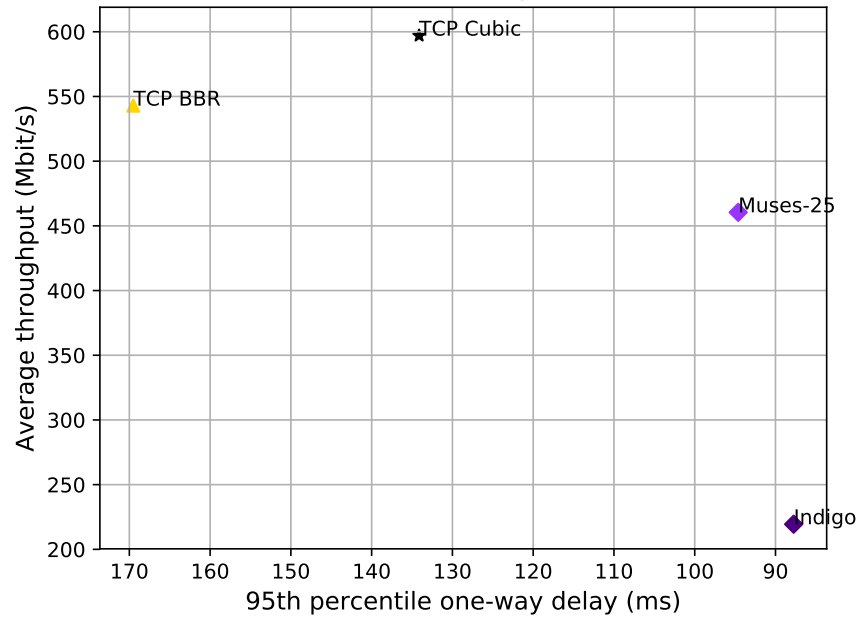
System info:

```
Linux 4.15.0-1018-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
```

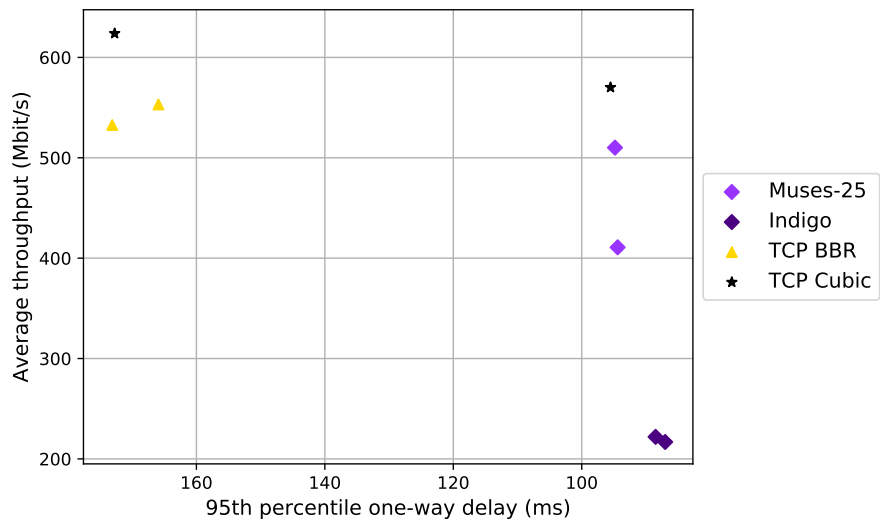
Git summary:

```
branch: muses @ 71e71e9a55b945431a7dea72180c1c9381097db9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
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 Sydney to GCE Iowa, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Sydney to GCE Iowa, 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	542.92	169.51	0.63
TCP Cubic	2	597.01	134.12	0.06
Indigo	2	219.42	87.75	0.00
Muses-25	2	460.46	94.62	0.00

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 02:08:19

End at: 2018-09-05 02:08:49

Local clock offset: 23.554 ms

Remote clock offset: 16.141 ms

Below is generated by plot.py at 2018-09-05 02:28:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 553.17 Mbit/s

95th percentile per-packet one-way delay: 165.913 ms

Loss rate: 0.57%

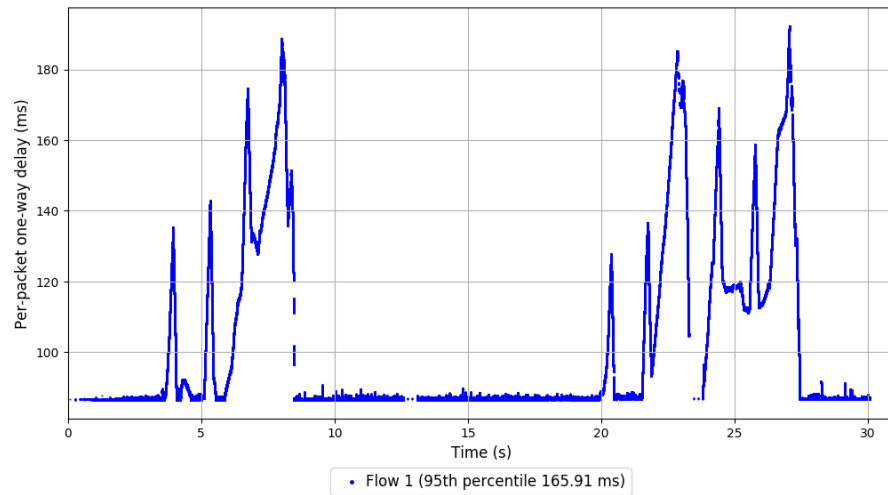
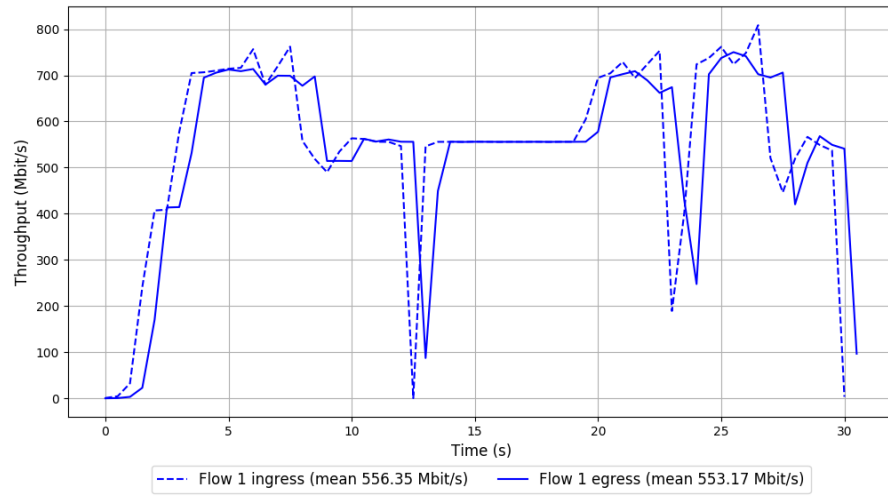
-- Flow 1:

Average throughput: 553.17 Mbit/s

95th percentile per-packet one-way delay: 165.913 ms

Loss rate: 0.57%

Run 1: Report of TCP BBR — Data Link

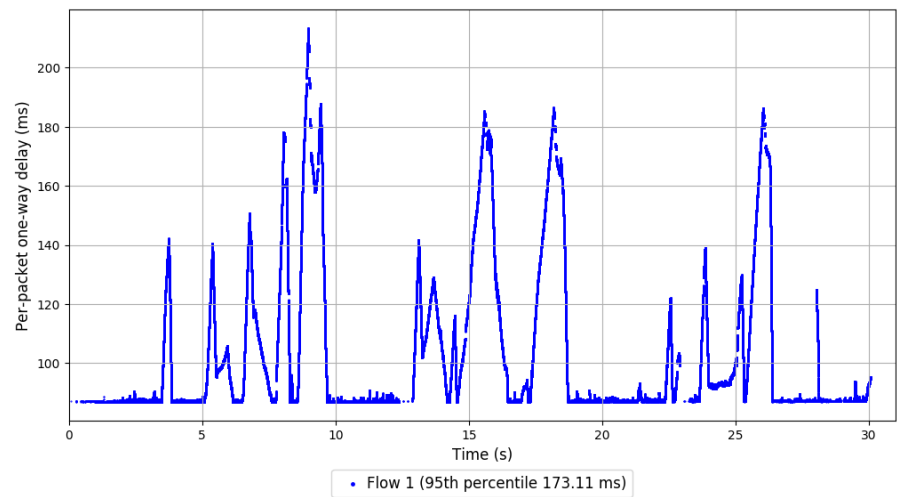
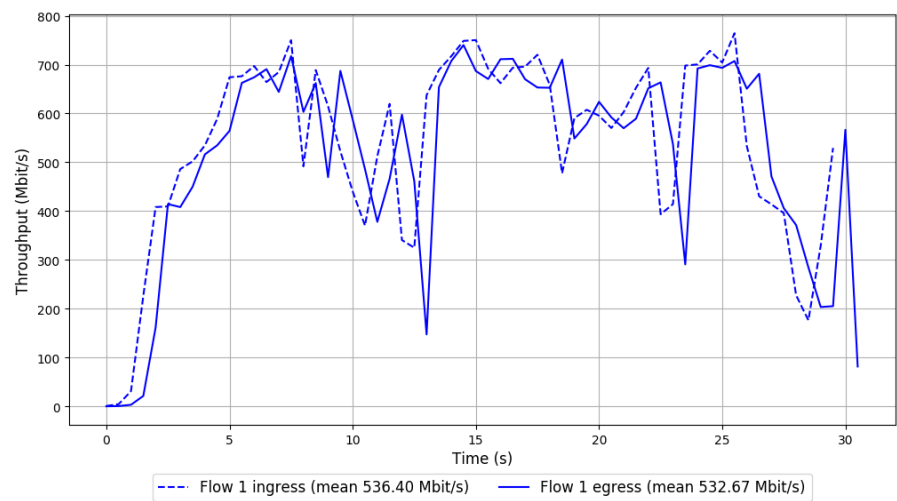


Run 2: Statistics of TCP BBR

Start at: 2018-09-05 02:14:35
End at: 2018-09-05 02:15:05
Local clock offset: 28.619 ms
Remote clock offset: 18.613 ms

Below is generated by plot.py at 2018-09-05 02:28:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 532.67 Mbit/s
95th percentile per-packet one-way delay: 173.108 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 532.67 Mbit/s
95th percentile per-packet one-way delay: 173.108 ms
Loss rate: 0.69%

Run 2: Report of TCP BBR — Data Link

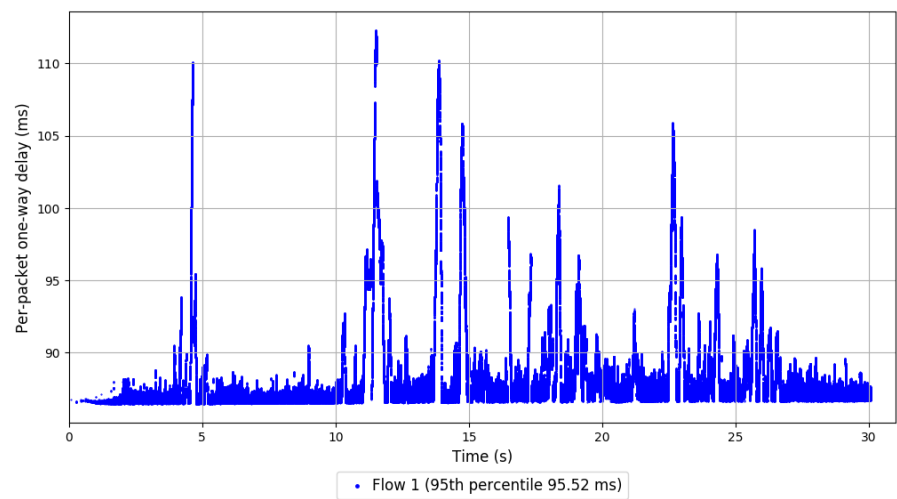
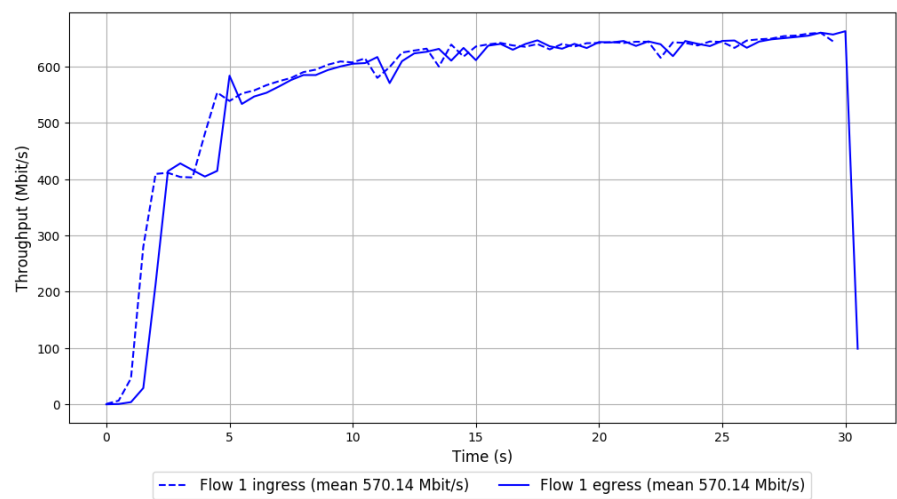


Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 02:06:41
End at: 2018-09-05 02:07:11
Local clock offset: 22.348 ms
Remote clock offset: 15.668 ms

Below is generated by plot.py at 2018-09-05 02:28:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 570.14 Mbit/s
95th percentile per-packet one-way delay: 95.518 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 570.14 Mbit/s
95th percentile per-packet one-way delay: 95.518 ms
Loss rate: 0.00%

Run 1: Report of TCP Cubic — Data Link

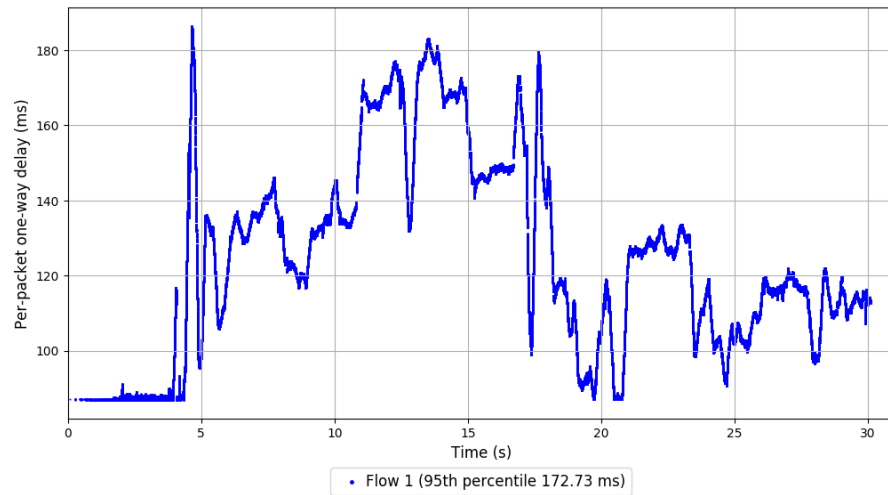
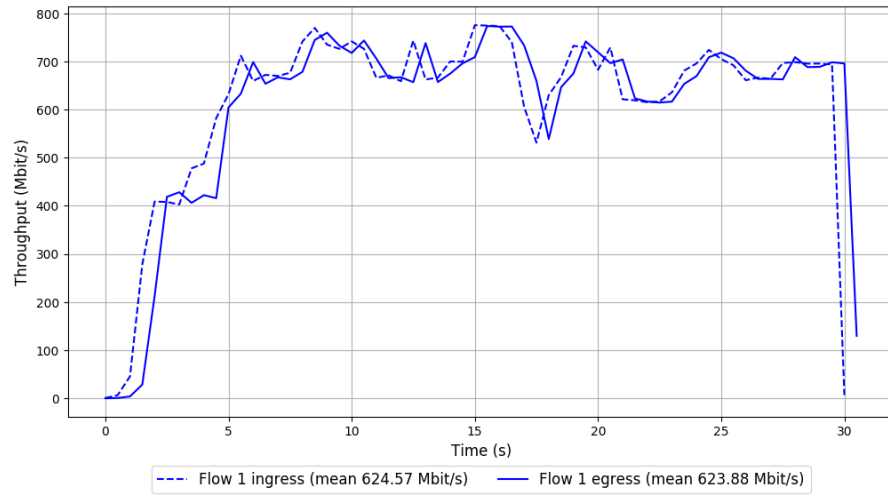


Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 02:12:55
End at: 2018-09-05 02:13:25
Local clock offset: 27.12 ms
Remote clock offset: 17.902 ms

Below is generated by plot.py at 2018-09-05 02:28:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 623.88 Mbit/s
95th percentile per-packet one-way delay: 172.730 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 623.88 Mbit/s
95th percentile per-packet one-way delay: 172.730 ms
Loss rate: 0.11%

Run 2: Report of TCP Cubic — Data Link

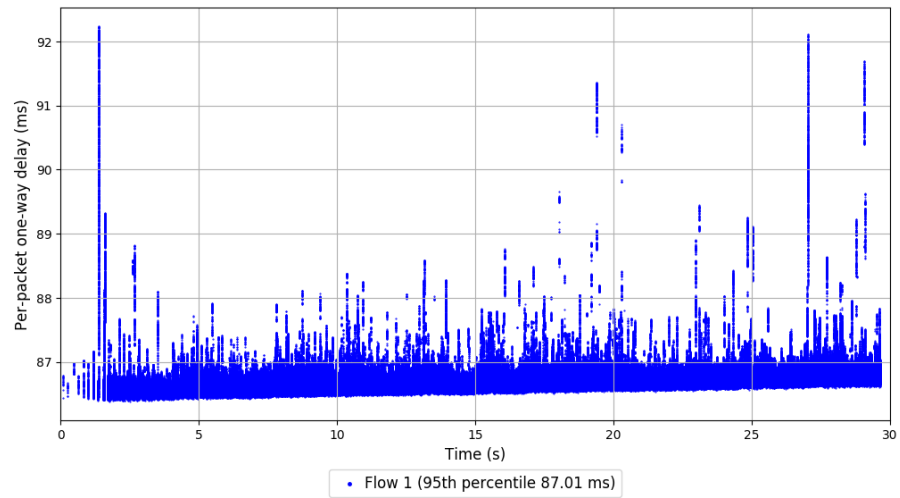
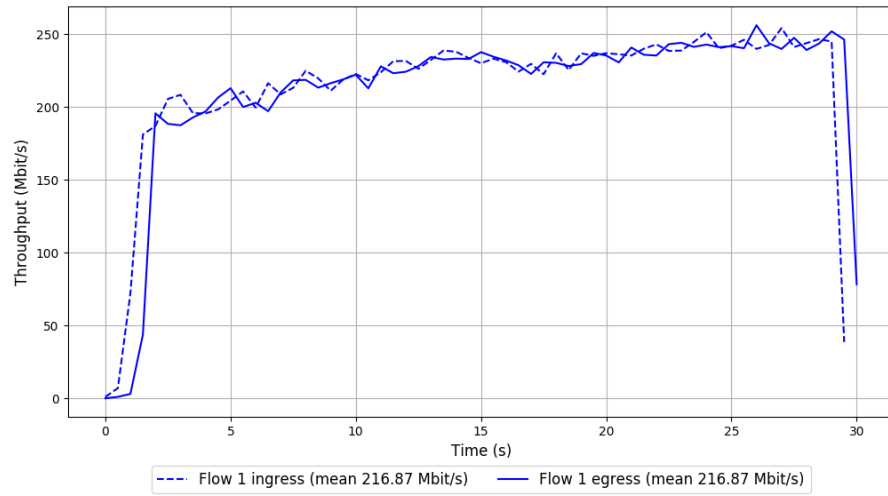


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 02:11:26
End at: 2018-09-05 02:11:56
Local clock offset: 26.177 ms
Remote clock offset: 17.24 ms

# Below is generated by plot.py at 2018-09-05 02:28:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 216.87 Mbit/s
95th percentile per-packet one-way delay: 87.008 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 216.87 Mbit/s
95th percentile per-packet one-way delay: 87.008 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link

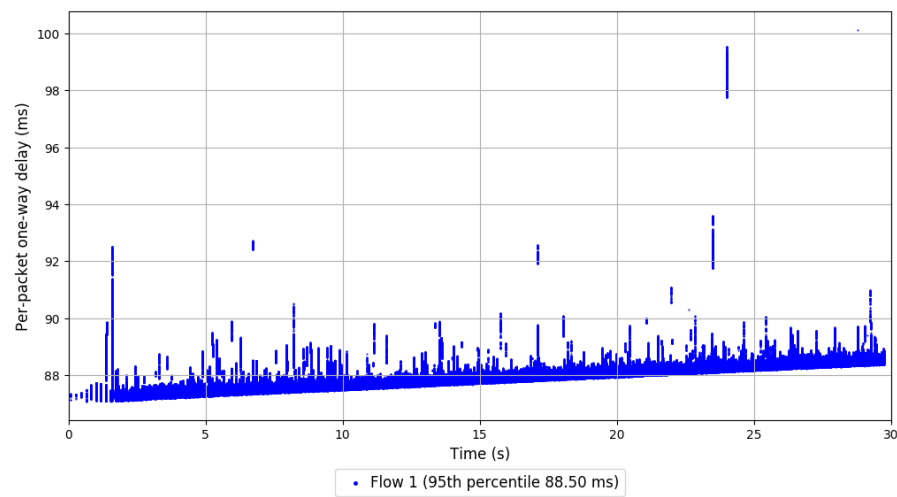
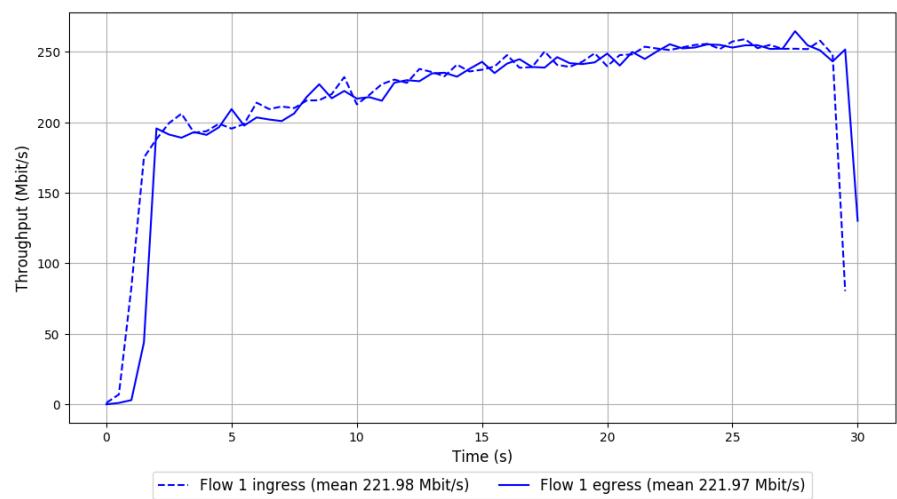


Run 2: Statistics of Indigo

Start at: 2018-09-05 02:17:47
End at: 2018-09-05 02:18:17
Local clock offset: 31.956 ms
Remote clock offset: 17.161 ms

Below is generated by plot.py at 2018-09-05 02:28:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 221.97 Mbit/s
95th percentile per-packet one-way delay: 88.501 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 221.97 Mbit/s
95th percentile per-packet one-way delay: 88.501 ms
Loss rate: 0.00%

Run 2: Report of Indigo — Data Link

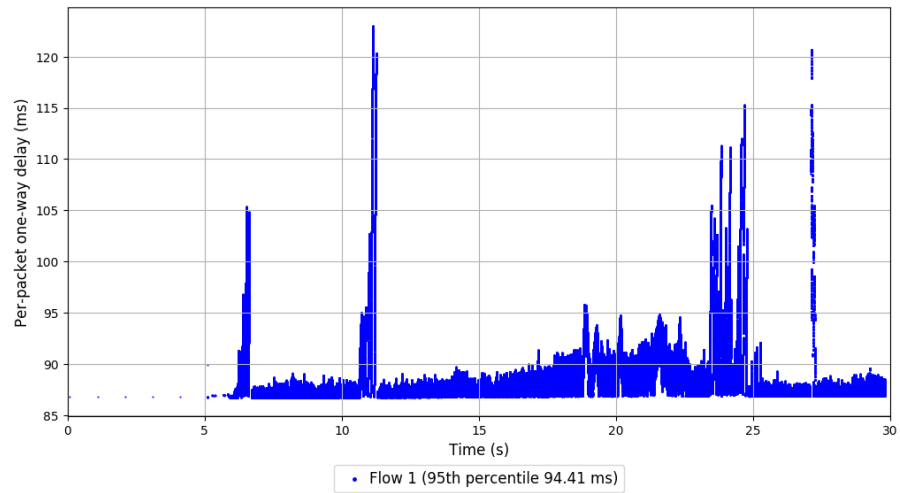
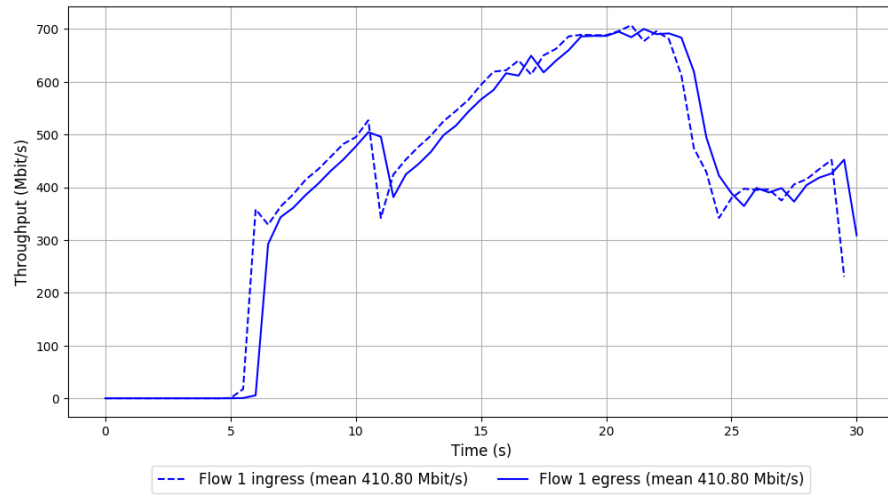


Run 1: Statistics of Muses-25

Start at: 2018-09-05 02:09:58
End at: 2018-09-05 02:10:28
Local clock offset: 24.702 ms
Remote clock offset: 16.719 ms

Below is generated by plot.py at 2018-09-05 02:28:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 410.80 Mbit/s
95th percentile per-packet one-way delay: 94.406 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 410.80 Mbit/s
95th percentile per-packet one-way delay: 94.406 ms
Loss rate: 0.00%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-05 02:16:13

End at: 2018-09-05 02:16:43

Local clock offset: 30.34 ms

Remote clock offset: 19.43 ms

Below is generated by plot.py at 2018-09-05 02:28:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 510.12 Mbit/s

95th percentile per-packet one-way delay: 94.824 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 510.12 Mbit/s

95th percentile per-packet one-way delay: 94.824 ms

Loss rate: 0.00%

Run 2: Report of Muses-25 — Data Link

