

Pantheon Report

Generated at 2018-08-28 05:20:31 (UTC).

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

Repeated the test of 4 congestion control schemes 3 times.

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.

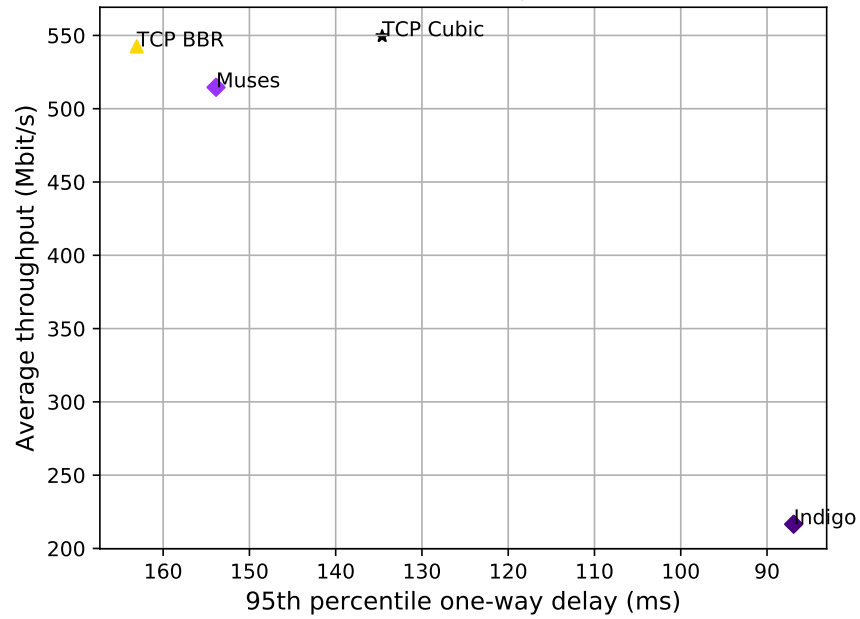
System info:

```
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
```

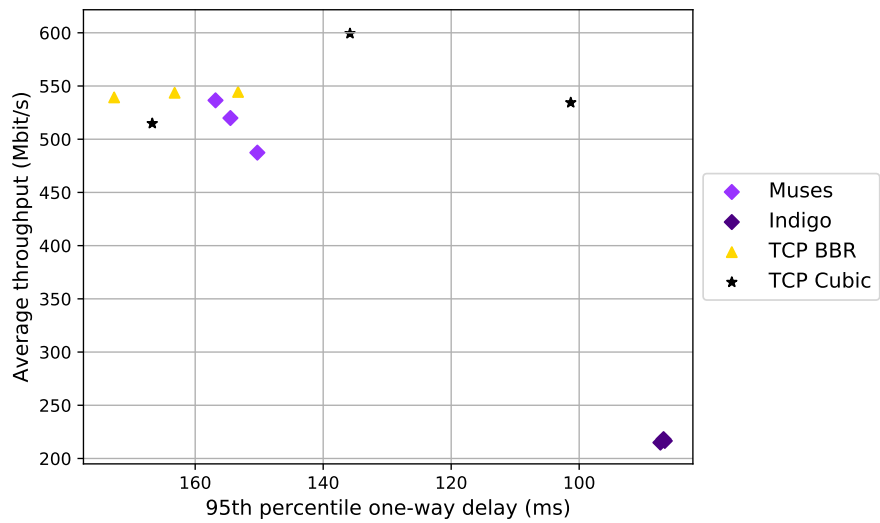
Git summary:

```
branch: muses @ 86ef433b09b2f4ecae1186d6940af93bcf0969cd
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 @ 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, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Sydney to GCE Iowa, 3 runs of 30s each per scheme



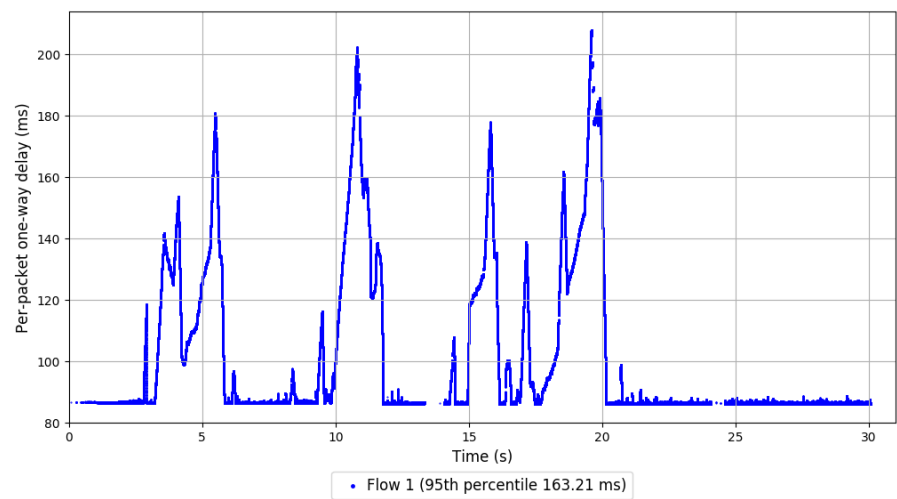
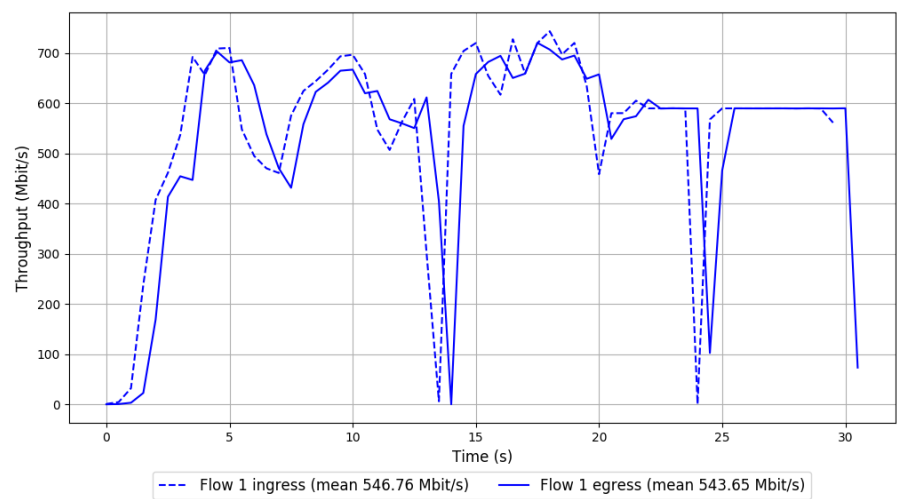
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	542.47	163.06	0.45
TCP Cubic	3	549.48	134.61	0.12
Indigo	3	216.54	86.91	0.00
Muses	3	514.60	153.87	1.26

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 04:50:18
End at: 2018-08-28 04:50:48
Local clock offset: -0.692 ms
Remote clock offset: -0.075 ms

Below is generated by plot.py at 2018-08-28 05:16:18
Datalink statistics
-- Total of 1 flow:
Average throughput: 543.65 Mbit/s
95th percentile per-packet one-way delay: 163.212 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 543.65 Mbit/s
95th percentile per-packet one-way delay: 163.212 ms
Loss rate: 0.57%

Run 1: Report of TCP BBR — Data Link

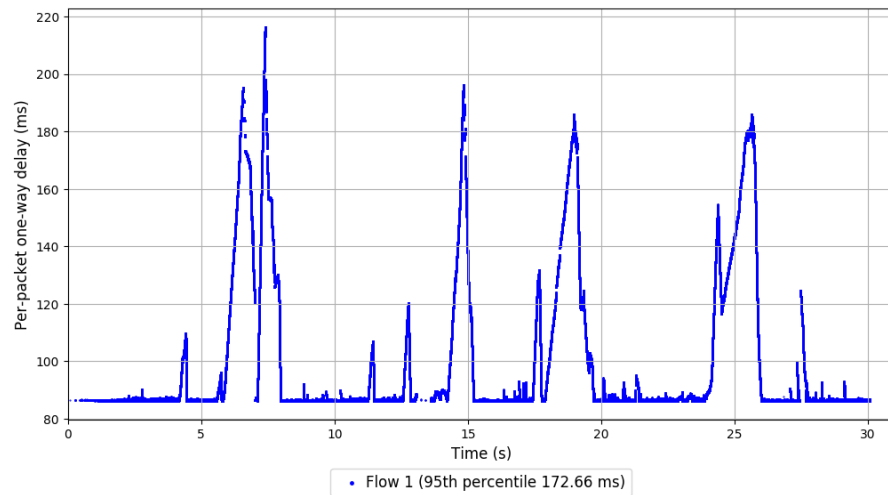
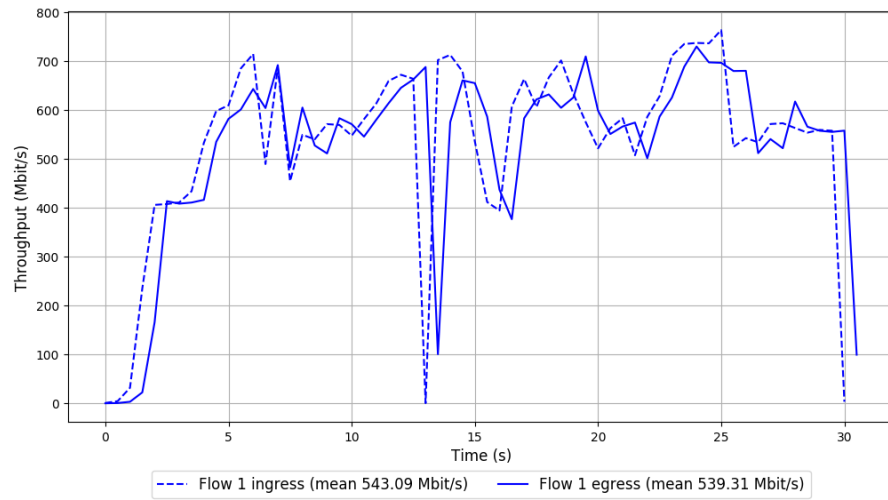


Run 2: Statistics of TCP BBR

Start at: 2018-08-28 04:56:28
End at: 2018-08-28 04:56:58
Local clock offset: -0.531 ms
Remote clock offset: -0.124 ms

Below is generated by plot.py at 2018-08-28 05:16:18
Datalink statistics
-- Total of 1 flow:
Average throughput: 539.31 Mbit/s
95th percentile per-packet one-way delay: 172.663 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 539.31 Mbit/s
95th percentile per-packet one-way delay: 172.663 ms
Loss rate: 0.70%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-08-28 05:02:46

End at: 2018-08-28 05:03:16

Local clock offset: -0.763 ms

Remote clock offset: -0.084 ms

Below is generated by plot.py at 2018-08-28 05:16:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 544.46 Mbit/s

95th percentile per-packet one-way delay: 153.300 ms

Loss rate: 0.08%

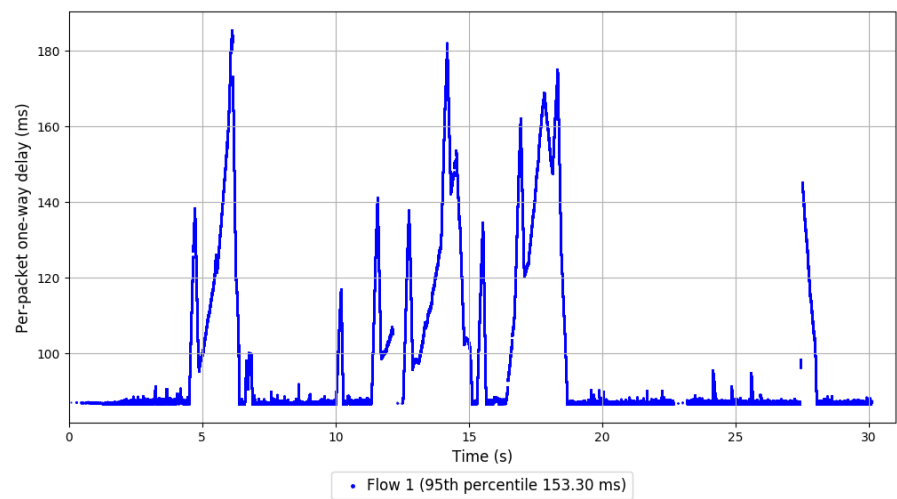
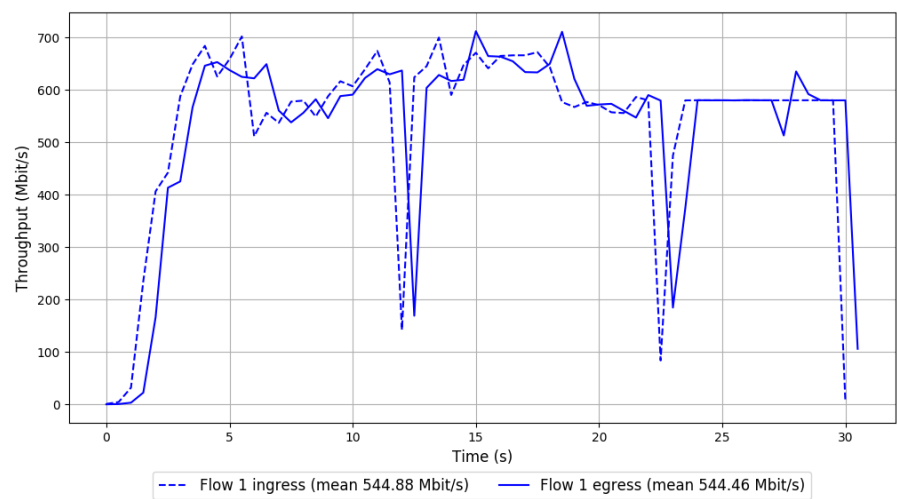
-- Flow 1:

Average throughput: 544.46 Mbit/s

95th percentile per-packet one-way delay: 153.300 ms

Loss rate: 0.08%

Run 3: Report of TCP BBR — Data Link

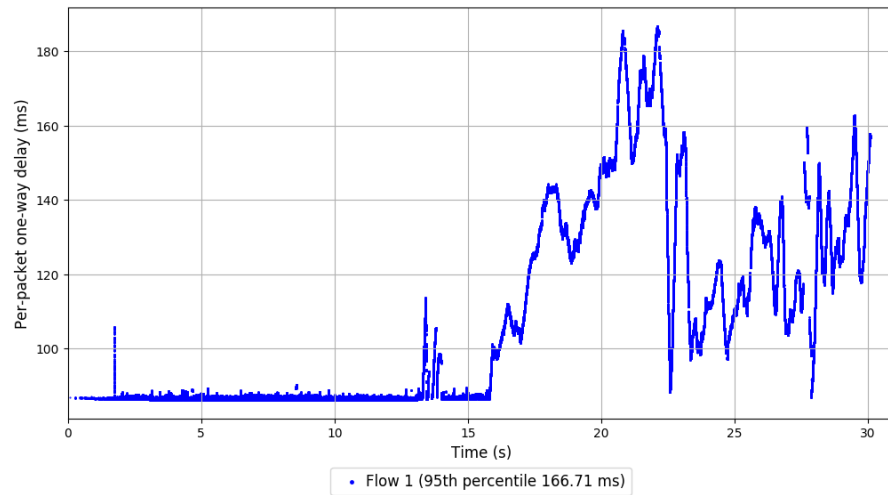
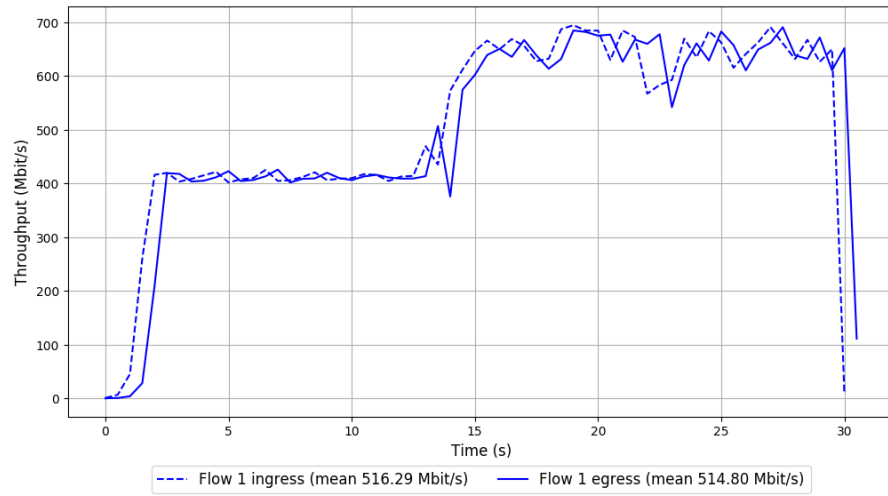


Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 04:51:55
End at: 2018-08-28 04:52:25
Local clock offset: -0.852 ms
Remote clock offset: -0.122 ms

Below is generated by plot.py at 2018-08-28 05:16:18
Datalink statistics
-- Total of 1 flow:
Average throughput: 514.80 Mbit/s
95th percentile per-packet one-way delay: 166.705 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 514.80 Mbit/s
95th percentile per-packet one-way delay: 166.705 ms
Loss rate: 0.29%

Run 1: Report of TCP Cubic — Data Link

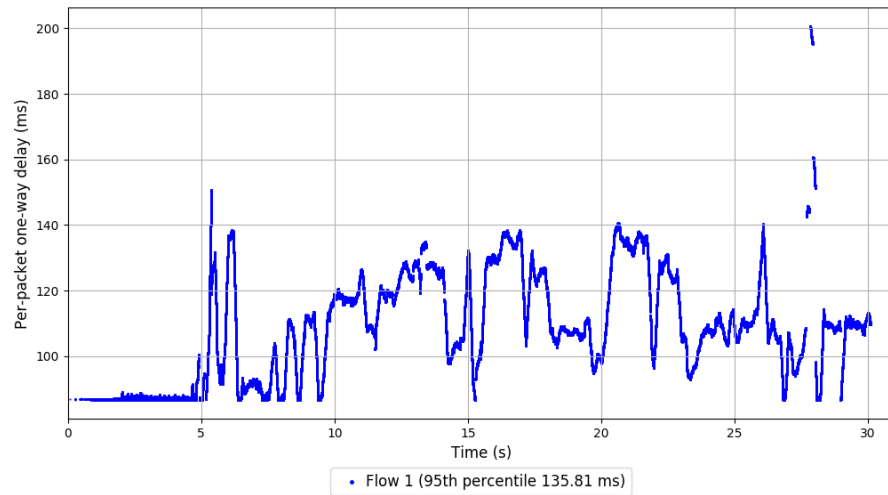
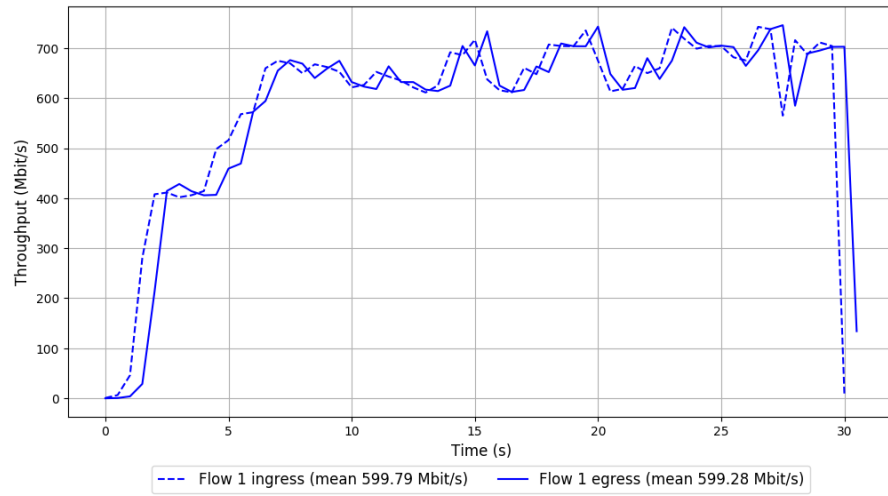


Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 04:58:05
End at: 2018-08-28 04:58:35
Local clock offset: -0.916 ms
Remote clock offset: -0.086 ms

Below is generated by plot.py at 2018-08-28 05:16:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 599.28 Mbit/s
95th percentile per-packet one-way delay: 135.812 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 599.28 Mbit/s
95th percentile per-packet one-way delay: 135.812 ms
Loss rate: 0.08%

Run 2: Report of TCP Cubic — Data Link

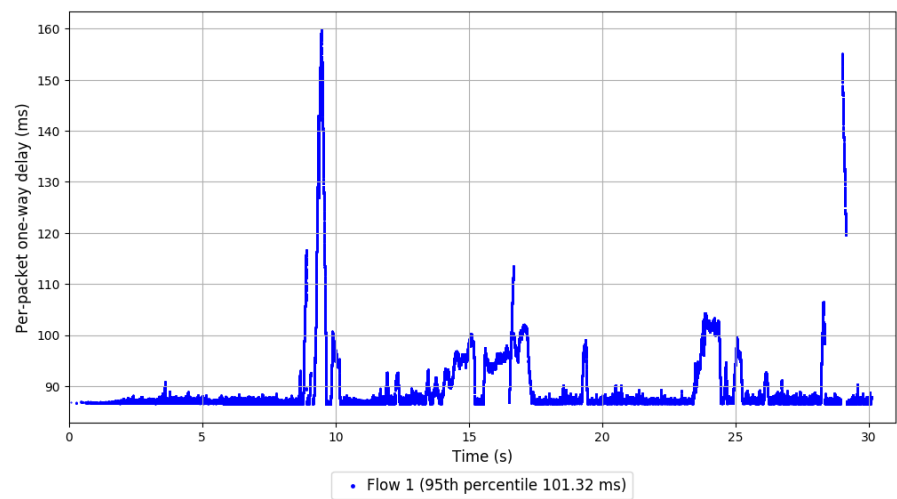
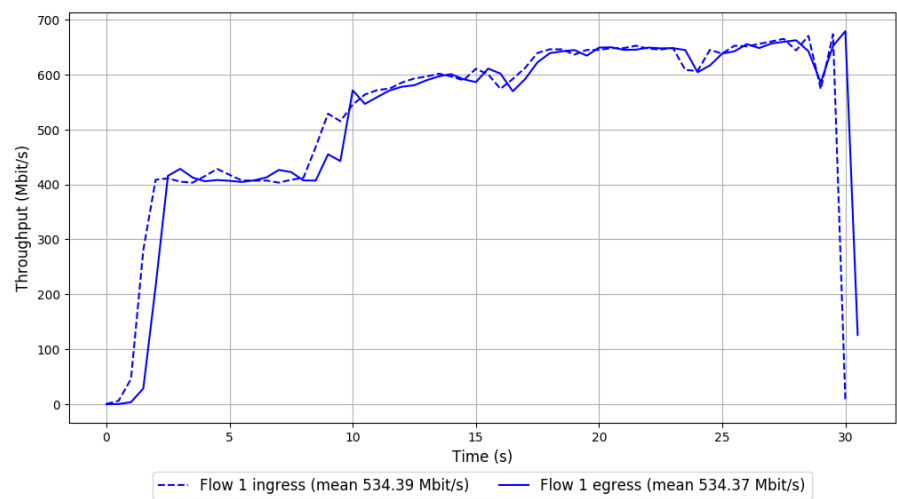


Run 3: Statistics of TCP Cubic

Start at: 2018-08-28 05:04:22
End at: 2018-08-28 05:04:52
Local clock offset: -0.982 ms
Remote clock offset: -0.099 ms

Below is generated by plot.py at 2018-08-28 05:16:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 534.37 Mbit/s
95th percentile per-packet one-way delay: 101.316 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 534.37 Mbit/s
95th percentile per-packet one-way delay: 101.316 ms
Loss rate: 0.00%

Run 3: Report of TCP Cubic — Data Link

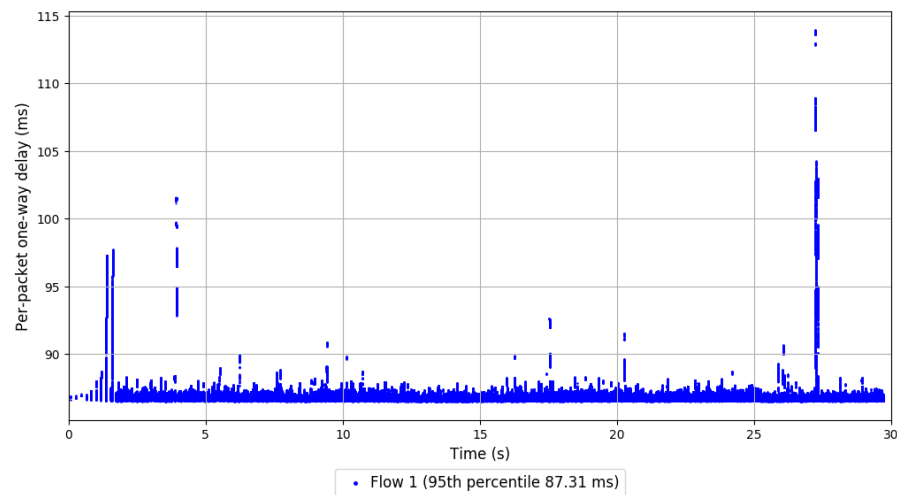
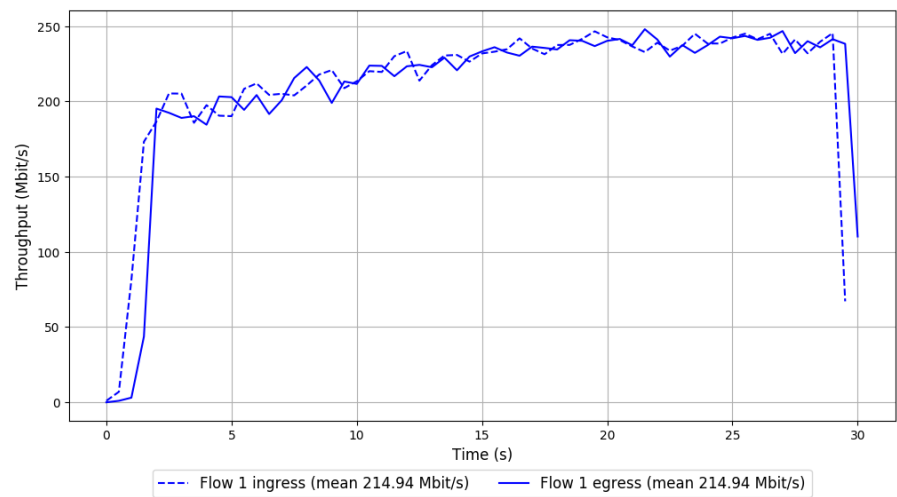


Run 1: Statistics of Indigo

Start at: 2018-08-28 04:48:51
End at: 2018-08-28 04:49:21
Local clock offset: -0.738 ms
Remote clock offset: -0.105 ms

Below is generated by plot.py at 2018-08-28 05:16:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 214.94 Mbit/s
95th percentile per-packet one-way delay: 87.307 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 214.94 Mbit/s
95th percentile per-packet one-way delay: 87.307 ms
Loss rate: 0.00%

Run 1: Report of Indigo — Data Link

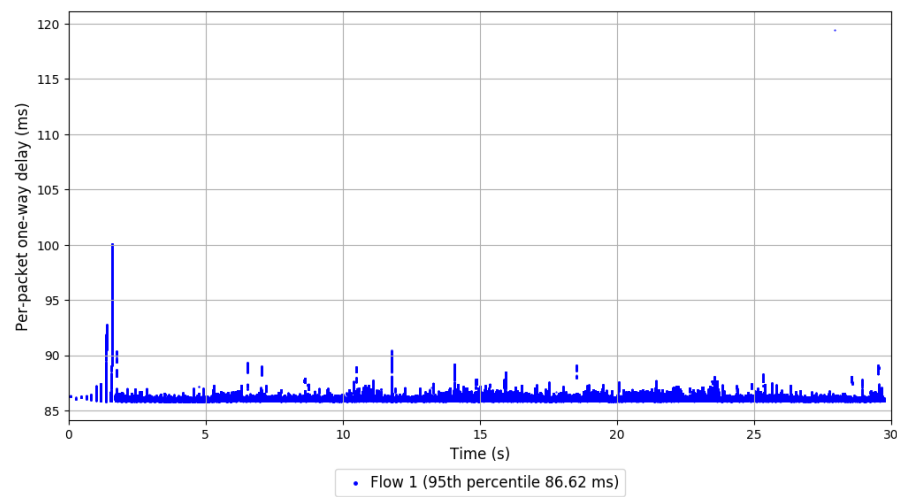
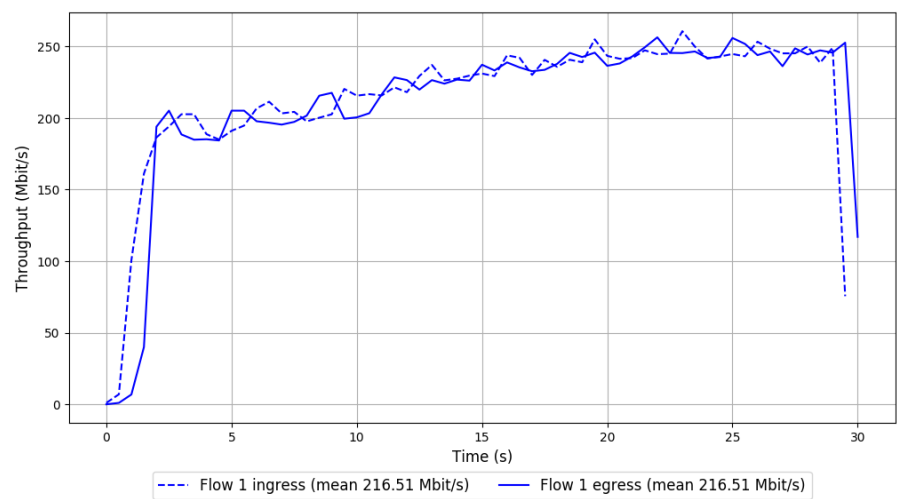


Run 2: Statistics of Indigo

Start at: 2018-08-28 04:55:01
End at: 2018-08-28 04:55:31
Local clock offset: -0.572 ms
Remote clock offset: -0.139 ms

Below is generated by plot.py at 2018-08-28 05:16:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 216.51 Mbit/s
95th percentile per-packet one-way delay: 86.621 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 216.51 Mbit/s
95th percentile per-packet one-way delay: 86.621 ms
Loss rate: 0.00%

Run 2: Report of Indigo — Data Link

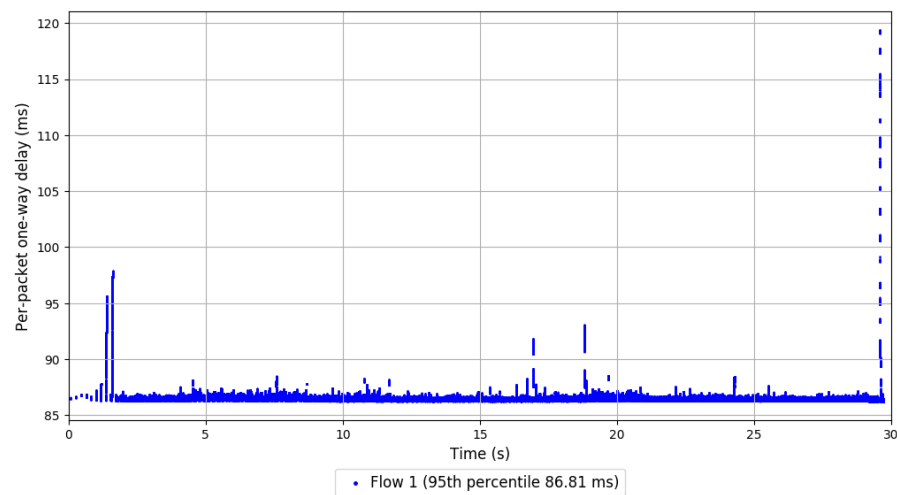
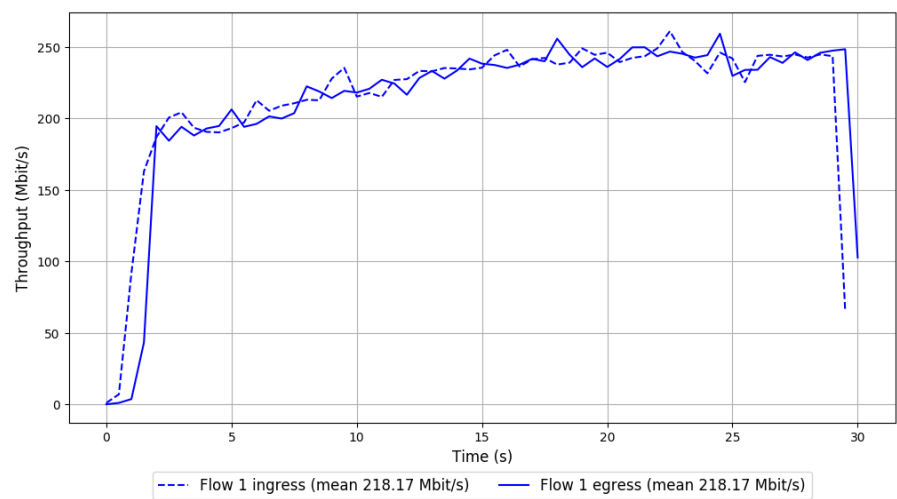


Run 3: Statistics of Indigo

Start at: 2018-08-28 05:01:18
End at: 2018-08-28 05:01:48
Local clock offset: -0.724 ms
Remote clock offset: -0.141 ms

Below is generated by plot.py at 2018-08-28 05:18:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 218.17 Mbit/s
95th percentile per-packet one-way delay: 86.815 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 218.17 Mbit/s
95th percentile per-packet one-way delay: 86.815 ms
Loss rate: 0.00%

Run 3: Report of Indigo — Data Link

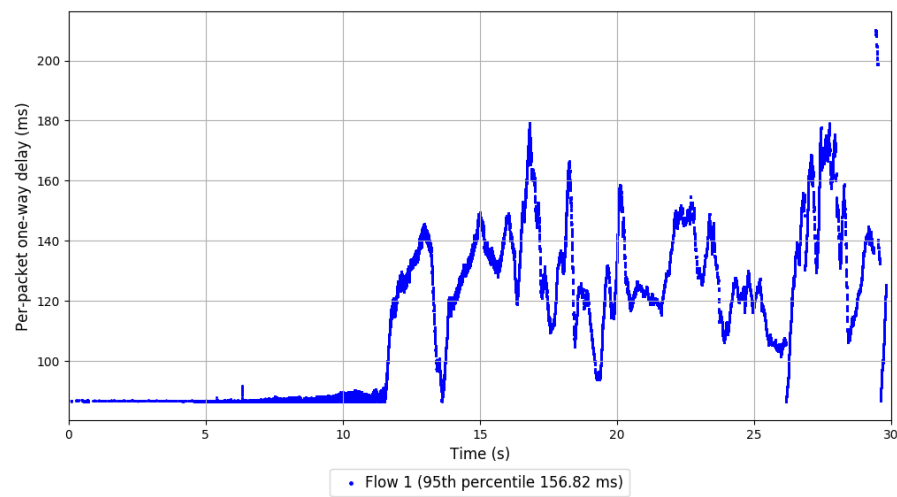
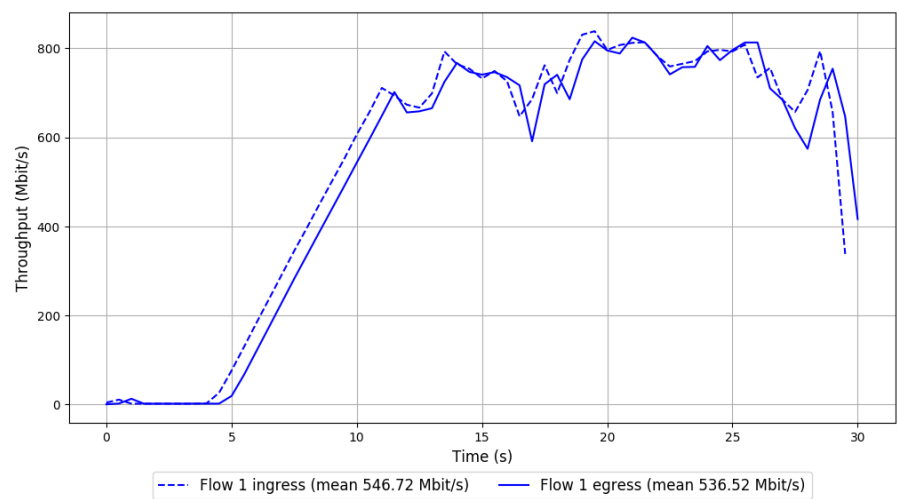


Run 1: Statistics of Muses

Start at: 2018-08-28 04:47:15
End at: 2018-08-28 04:47:45
Local clock offset: -0.897 ms
Remote clock offset: -0.116 ms

Below is generated by plot.py at 2018-08-28 05:20:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 536.52 Mbit/s
95th percentile per-packet one-way delay: 156.823 ms
Loss rate: 1.86%
-- Flow 1:
Average throughput: 536.52 Mbit/s
95th percentile per-packet one-way delay: 156.823 ms
Loss rate: 1.86%

Run 1: Report of Muses — Data Link

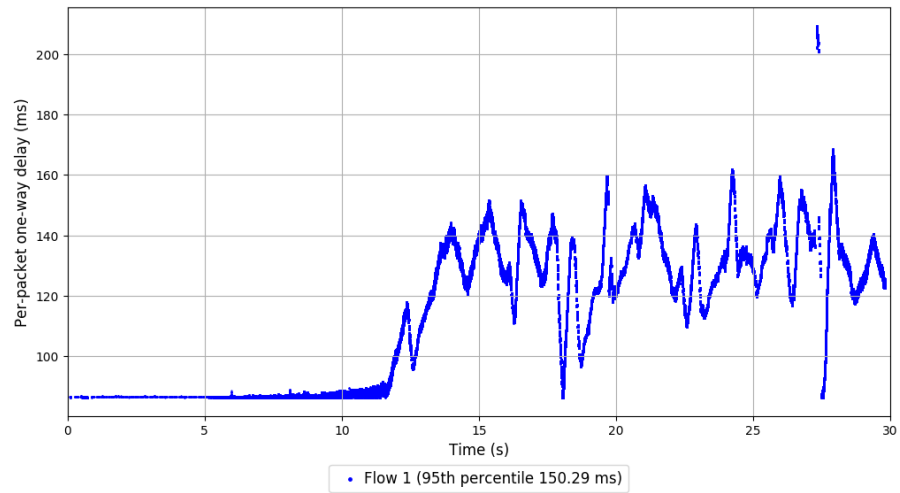
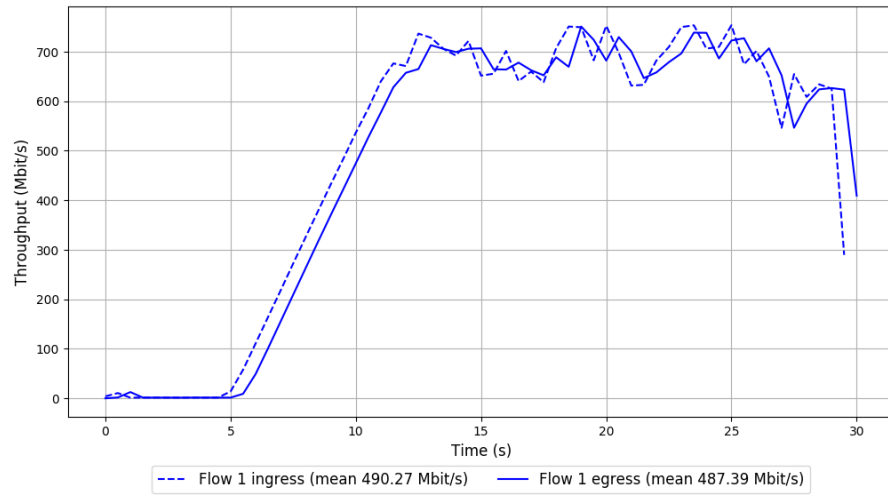


Run 2: Statistics of Muses

Start at: 2018-08-28 04:53:28
End at: 2018-08-28 04:53:58
Local clock offset: -0.694 ms
Remote clock offset: -0.098 ms

Below is generated by plot.py at 2018-08-28 05:20:26
Datalink statistics
-- Total of 1 flow:
Average throughput: 487.39 Mbit/s
95th percentile per-packet one-way delay: 150.286 ms
Loss rate: 0.59%
-- Flow 1:
Average throughput: 487.39 Mbit/s
95th percentile per-packet one-way delay: 150.286 ms
Loss rate: 0.59%

Run 2: Report of Muses — Data Link



Run 3: Statistics of Muses

Start at: 2018-08-28 04:59:43
End at: 2018-08-28 05:00:13
Local clock offset: -0.946 ms
Remote clock offset: -0.156 ms

Below is generated by plot.py at 2018-08-28 05:20:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 519.90 Mbit/s
95th percentile per-packet one-way delay: 154.495 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 519.90 Mbit/s
95th percentile per-packet one-way delay: 154.495 ms
Loss rate: 1.33%

Run 3: Report of Muses — Data Link

