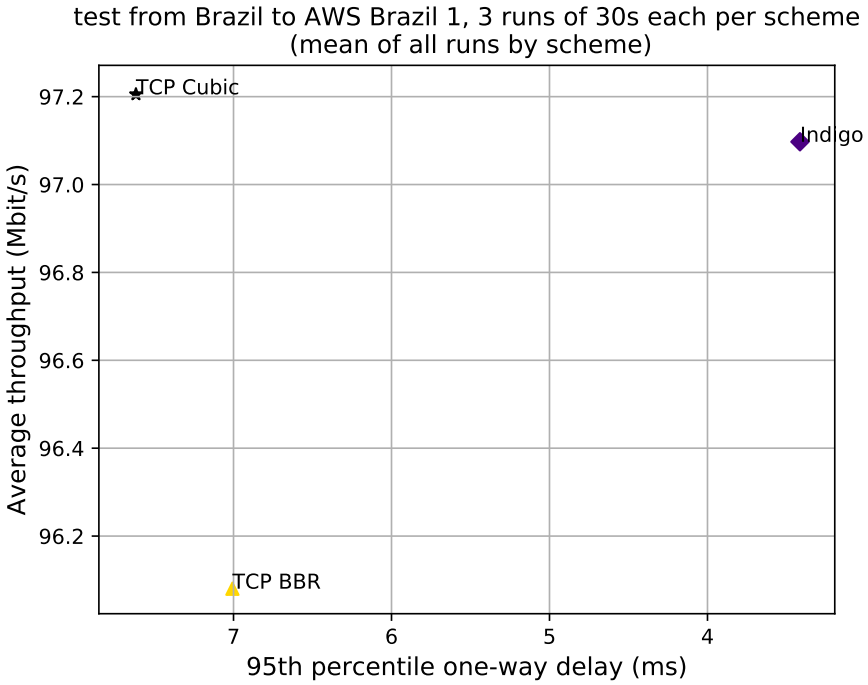
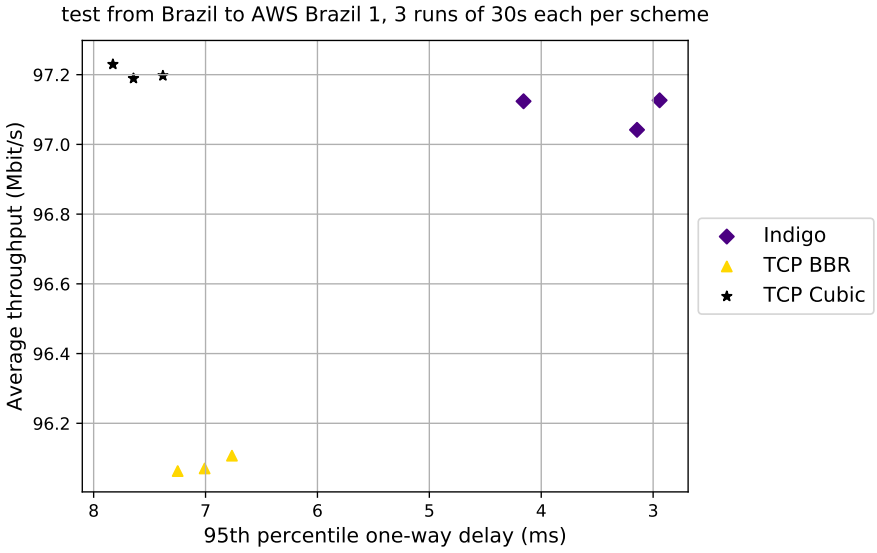
Pantheon Report

Generated at 2018-08-31 05:24:00 (UTC).
Data path: Brazil on `p4p1` (*remote*) →AWS Brazil 1 on `ens5` (*local*).
Repeated the test of 4 congestion control schemes 3 times.
Each test lasted for 30 seconds running 1 flow.
NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

```
System info:
Linux 4.15.0-1020-aws
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 @ 2de97ca91a065473c29a25fffe63fb137c97a67c
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b59e0d118c50af3579569c462d33045741c85981
third_party/pantheon-tunnel @ cbfce6db5ff5740dafe1771f813cd646339e1952
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 Brazil to AWS Brazil 1, 3 runs of 30s each per scheme
(mean of all runs by scheme)
TCP Cubic
Indigo
TCP BBR
Average throughput (Mbit/s)
97.2
97.0
96.8
96.6
96.4
96.2
7
6
5
4
95th percentile one-way delay (ms)


test from Brazil to AWS Brazil 1, 3 runs of 30s each per scheme
Average throughput (Mbit/s)
97.2
97.0
96.8
96.6
96.4
96.2
8
7
6
5
4
3
95th percentile one-way delay (ms)
Indigo
TCP BBR
TCP Cubic

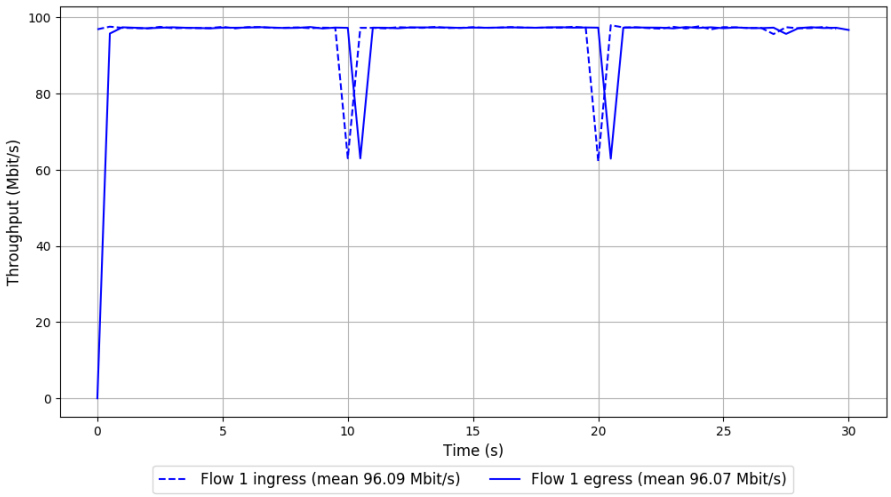
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	96.08	7.01	0.03
TCP Cubic	3	97.21	7.62	0.06
Indigo	3	97.10	3.41	0.02
Muses-25	0	N/A	N/A	N/A

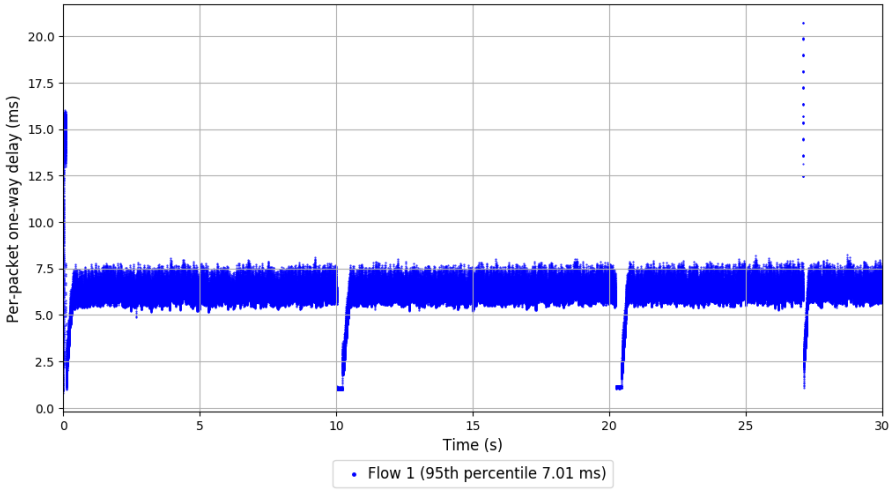
```
Run 1: Statistics of TCP BBR

Start at: 2018-08-31 05:09:46
End at: 2018-08-31 05:10:16
Local clock offset: -18.665 ms
Remote clock offset: 0.227 ms

# Below is generated by plot.py at 2018-08-31 05:23:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 96.07 Mbit/s
95th percentile per-packet one-way delay: 7.008 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 96.07 Mbit/s
95th percentile per-packet one-way delay: 7.008 ms
Loss rate: 0.03%
```

Run 1: Report of TCP BBR — Data Link



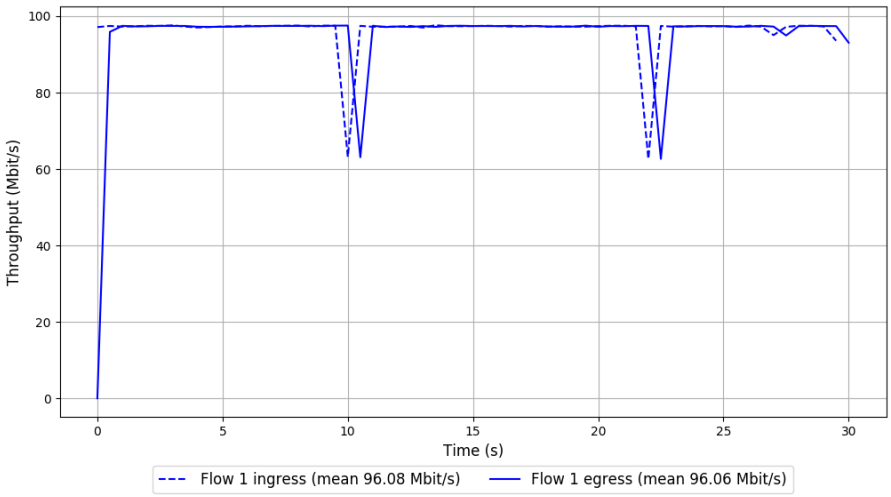


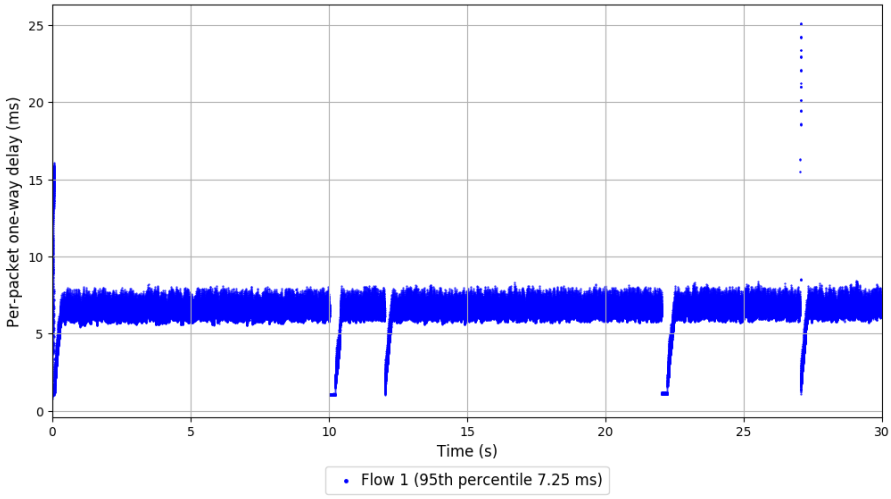
```
Run 2: Statistics of TCP BBR

Start at: 2018-08-31 05:14:12
End at: 2018-08-31 05:14:42
Local clock offset: -20.109 ms
Remote clock offset: 0.228 ms

# Below is generated by plot.py at 2018-08-31 05:23:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 96.06 Mbit/s
95th percentile per-packet one-way delay: 7.249 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 96.06 Mbit/s
95th percentile per-packet one-way delay: 7.249 ms
Loss rate: 0.03%
```

Run 2: Report of TCP BBR — Data Link



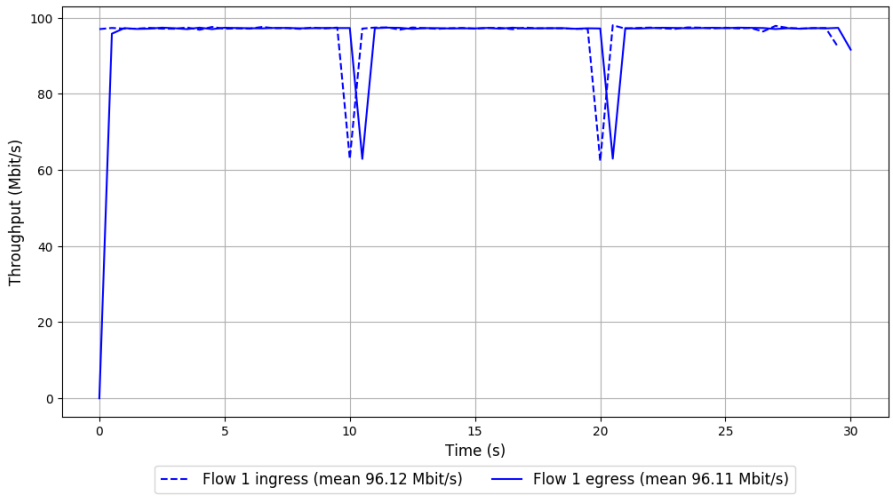


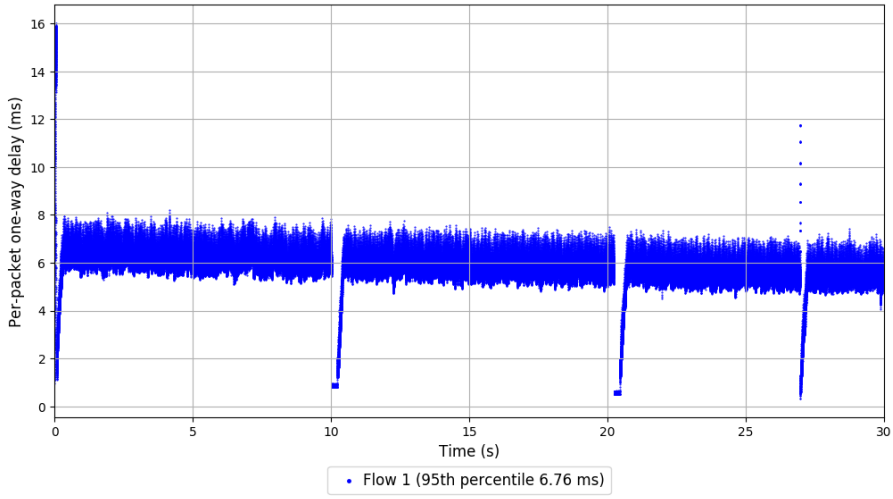
```
Run 3: Statistics of TCP BBR

Start at: 2018-08-31 05:18:39
End at: 2018-08-31 05:19:09
Local clock offset: -15.288 ms
Remote clock offset: 0.227 ms

# Below is generated by plot.py at 2018-08-31 05:23:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 96.11 Mbit/s
95th percentile per-packet one-way delay: 6.764 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 96.11 Mbit/s
95th percentile per-packet one-way delay: 6.764 ms
Loss rate: 0.03%
```

Run 3: Report of TCP BBR — Data Link



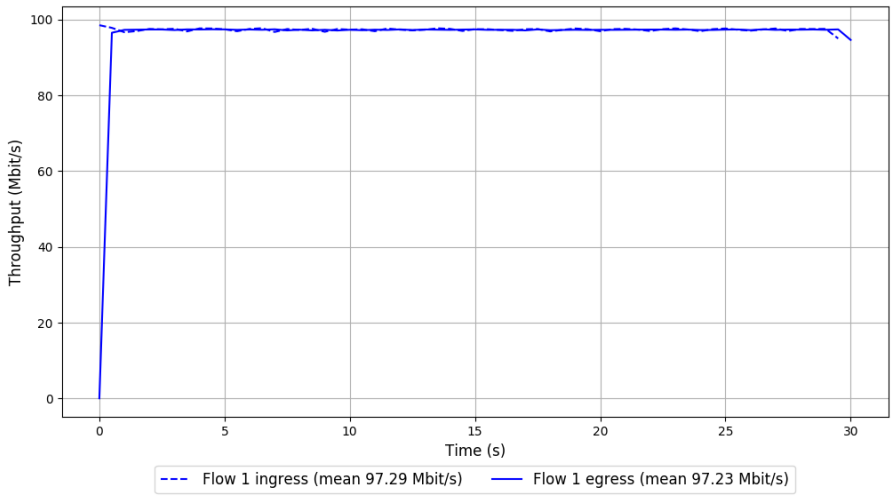


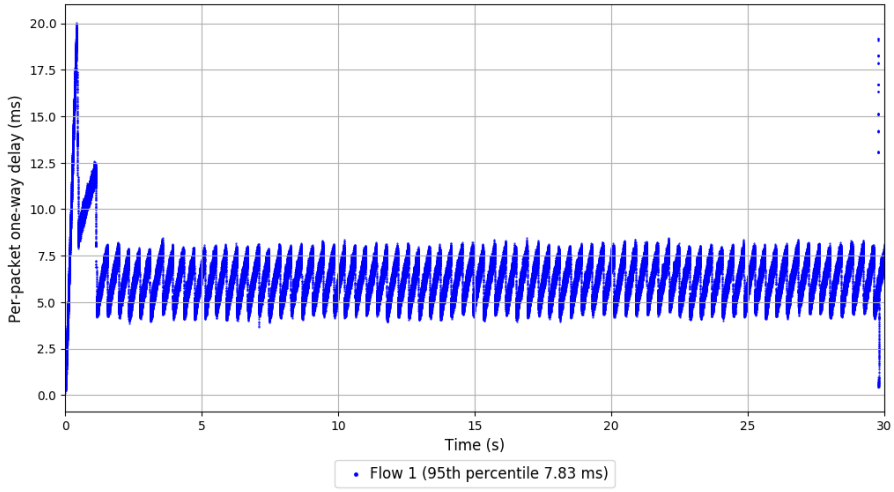
```
Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 05:12:02
End at: 2018-08-31 05:12:32
Local clock offset: -20.067 ms
Remote clock offset: 0.232 ms

# Below is generated by plot.py at 2018-08-31 05:23:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 97.23 Mbit/s
95th percentile per-packet one-way delay: 7.828 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 97.23 Mbit/s
95th percentile per-packet one-way delay: 7.828 ms
Loss rate: 0.07%
```

Run 1: Report of TCP Cubic — Data Link



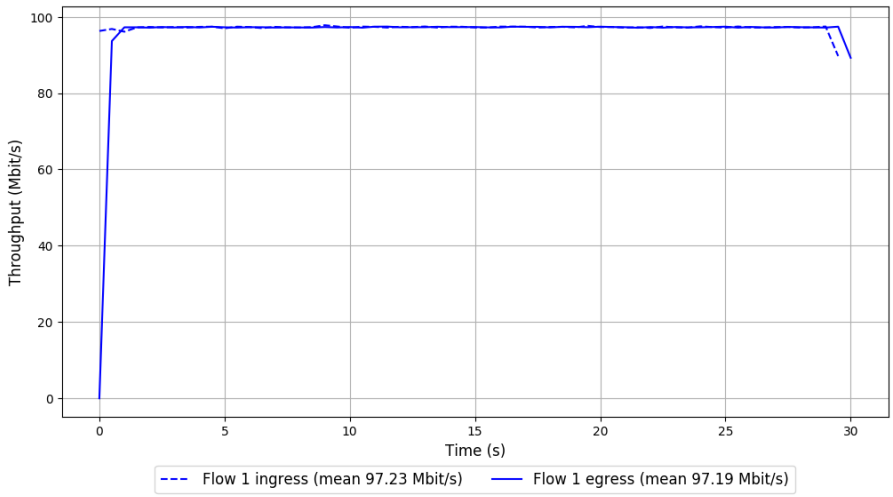


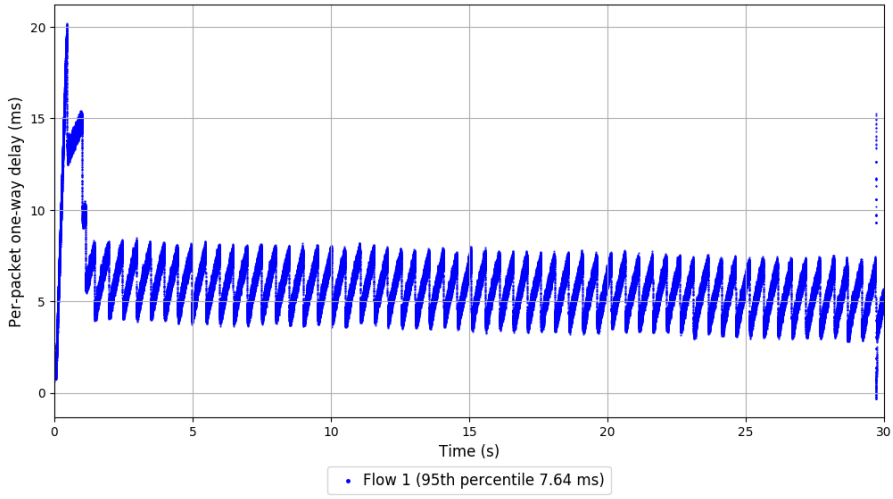
```
Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 05:16:28
End at: 2018-08-31 05:16:58
Local clock offset: -20.005 ms
Remote clock offset: 0.236 ms

# Below is generated by plot.py at 2018-08-31 05:23:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 97.19 Mbit/s
95th percentile per-packet one-way delay: 7.644 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 97.19 Mbit/s
95th percentile per-packet one-way delay: 7.644 ms
Loss rate: 0.05%
```

Run 2: Report of TCP Cubic — Data Link



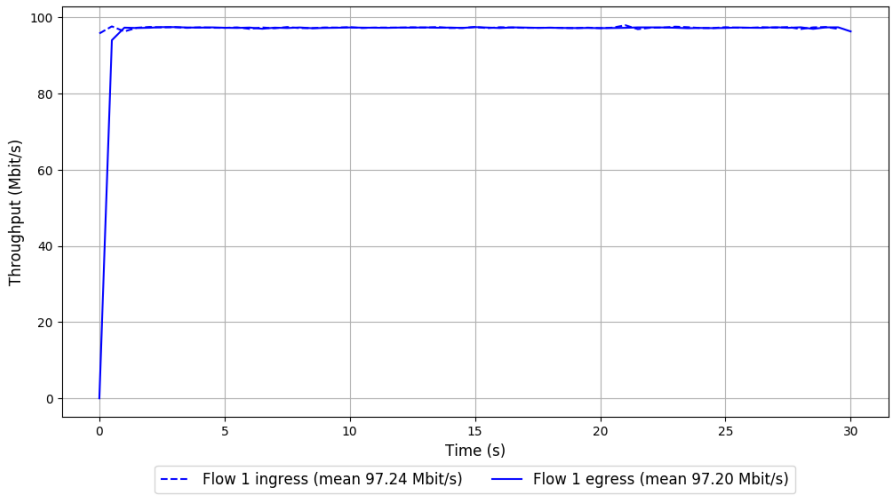


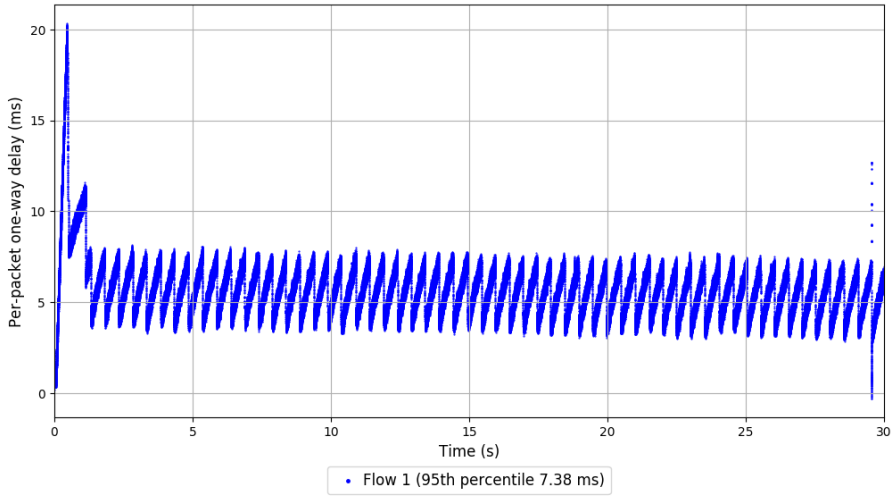
```
Run 3: Statistics of TCP Cubic

Start at: 2018-08-31 05:20:54
End at: 2018-08-31 05:21:24
Local clock offset: -12.488 ms
Remote clock offset: 0.204 ms

# Below is generated by plot.py at 2018-08-31 05:23:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 97.20 Mbit/s
95th percentile per-packet one-way delay: 7.381 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 97.20 Mbit/s
95th percentile per-packet one-way delay: 7.381 ms
Loss rate: 0.06%
```

Run 3: Report of TCP Cubic — Data Link



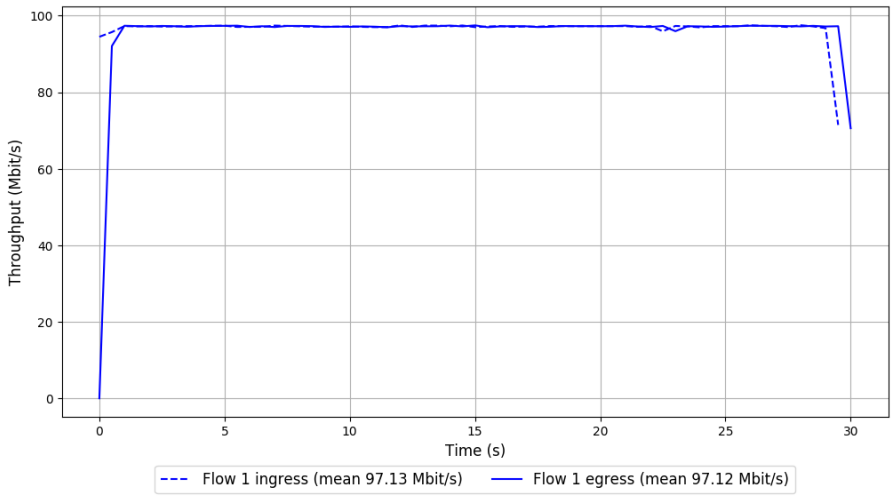


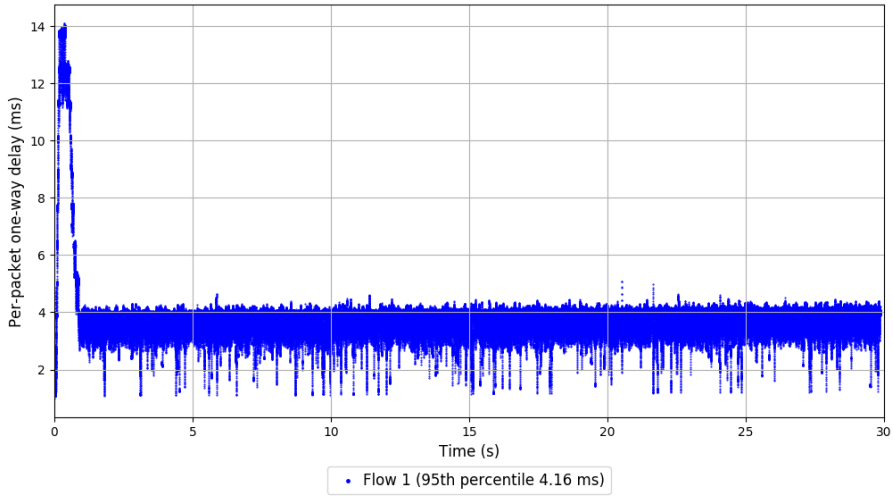
```
Run 1: Statistics of Indigo

Start at: 2018-08-31 05:10:53
End at: 2018-08-31 05:11:23
Local clock offset: -18.956 ms
Remote clock offset: 0.155 ms

# Below is generated by plot.py at 2018-08-31 05:23:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 97.12 Mbit/s
95th percentile per-packet one-way delay: 4.158 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 97.12 Mbit/s
95th percentile per-packet one-way delay: 4.158 ms
Loss rate: 0.02%
```

Run 1: Report of Indigo — Data Link



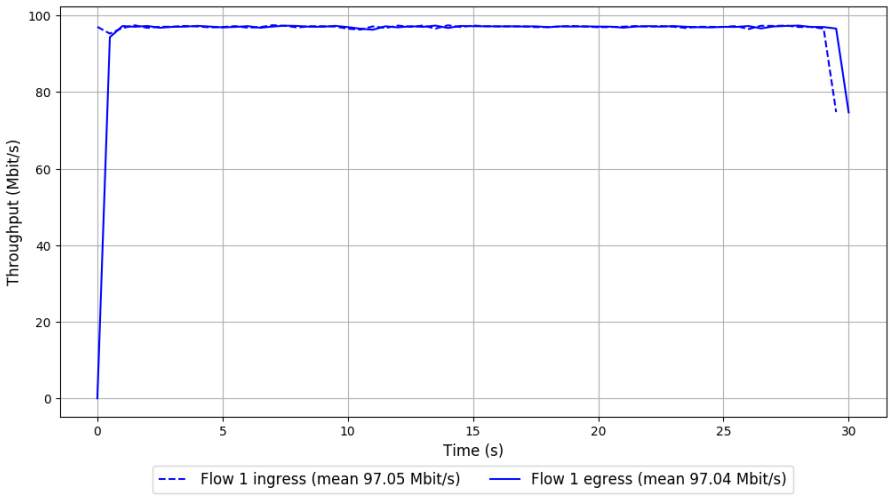


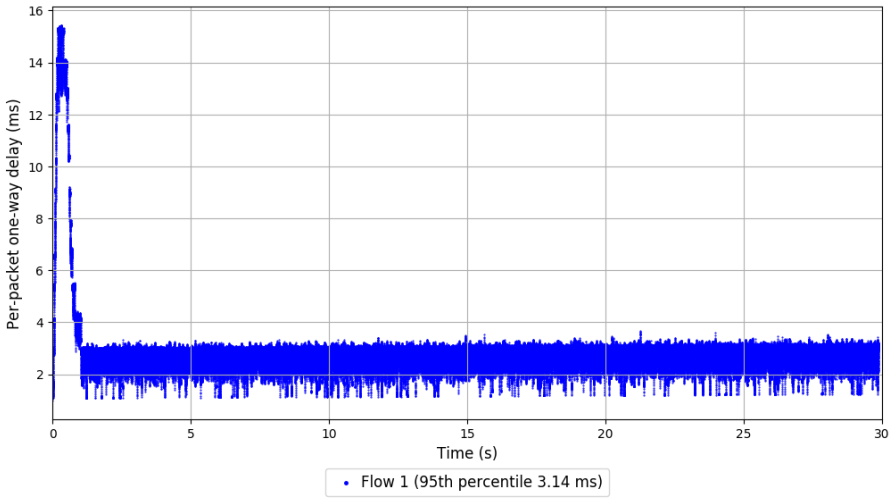
```
Run 2: Statistics of Indigo

Start at: 2018-08-31 05:15:20
End at: 2018-08-31 05:15:50
Local clock offset: -20.427 ms
Remote clock offset: 0.153 ms

# Below is generated by plot.py at 2018-08-31 05:23:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 97.04 Mbit/s
95th percentile per-packet one-way delay: 3.144 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 97.04 Mbit/s
95th percentile per-packet one-way delay: 3.144 ms
Loss rate: 0.01%
```

Run 2: Report of Indigo — Data Link



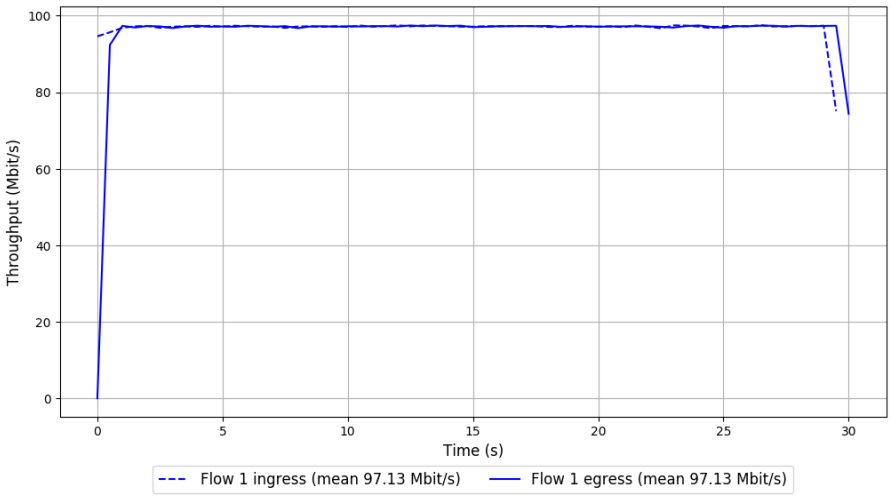


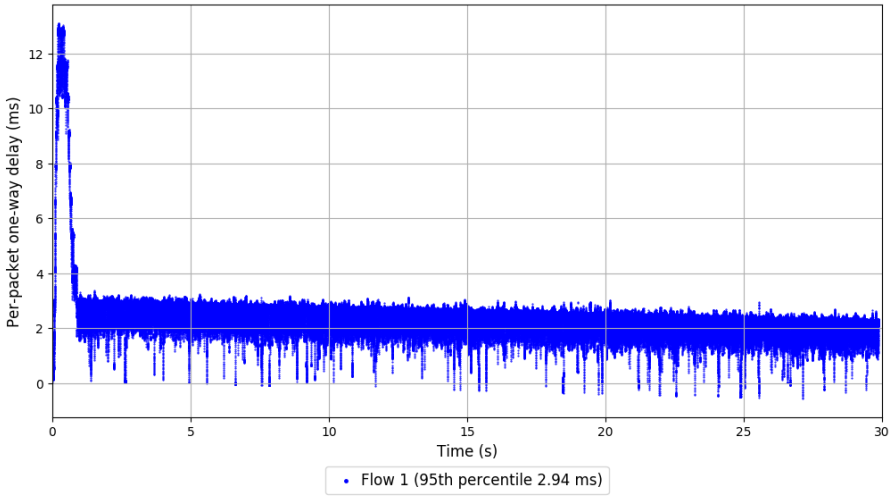
```
Run 3: Statistics of Indigo

Start at: 2018-08-31 05:19:46
End at: 2018-08-31 05:20:16
Local clock offset: -14.375 ms
Remote clock offset: 0.219 ms

# Below is generated by plot.py at 2018-08-31 05:24:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 97.13 Mbit/s
95th percentile per-packet one-way delay: 2.942 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 97.13 Mbit/s
95th percentile per-packet one-way delay: 2.942 ms
Loss rate: 0.02%
```

Run 3: Report of Indigo — Data Link

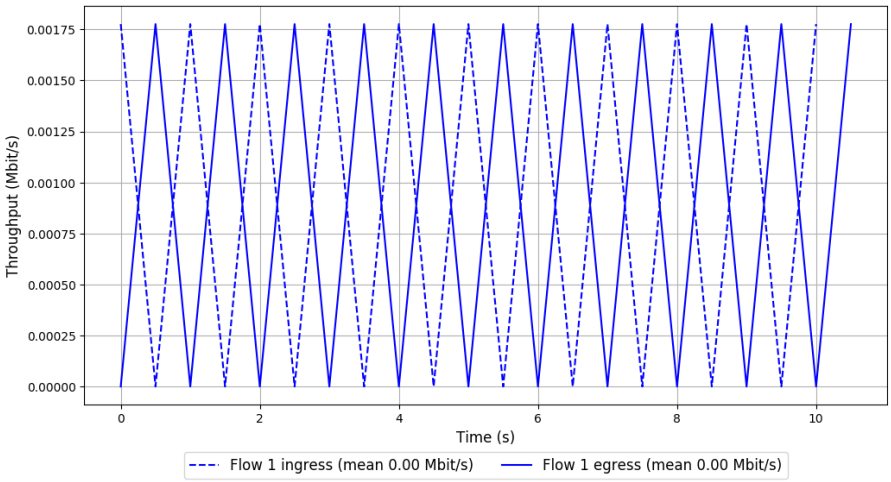


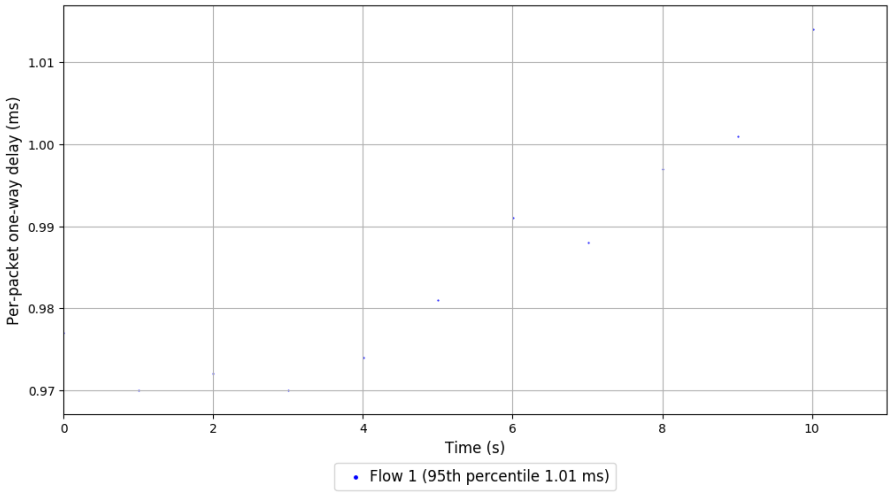


```
Run 1: Statistics of Muses-25

Start at: 2018-08-31 05:13:09
End at: 2018-08-31 05:13:39
Local clock offset: -19.7 ms
Remote clock offset: 0.145 ms
```

Run 1: Report of Muses-25 — Data Link

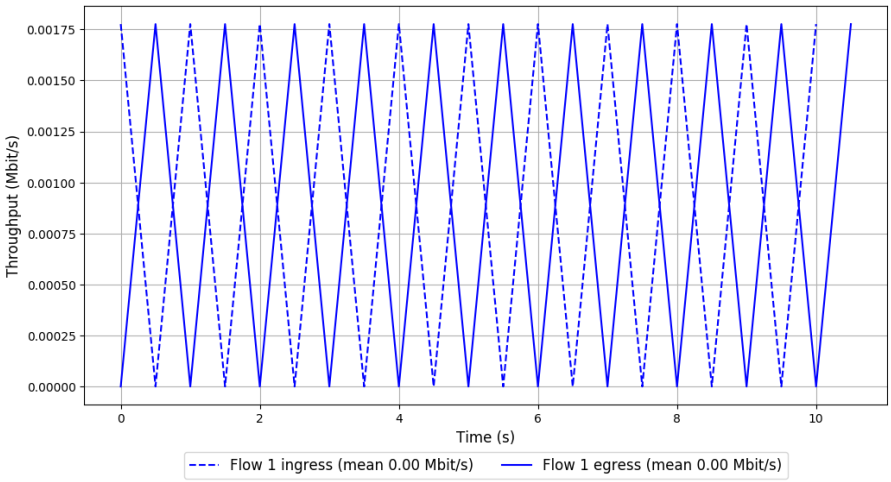


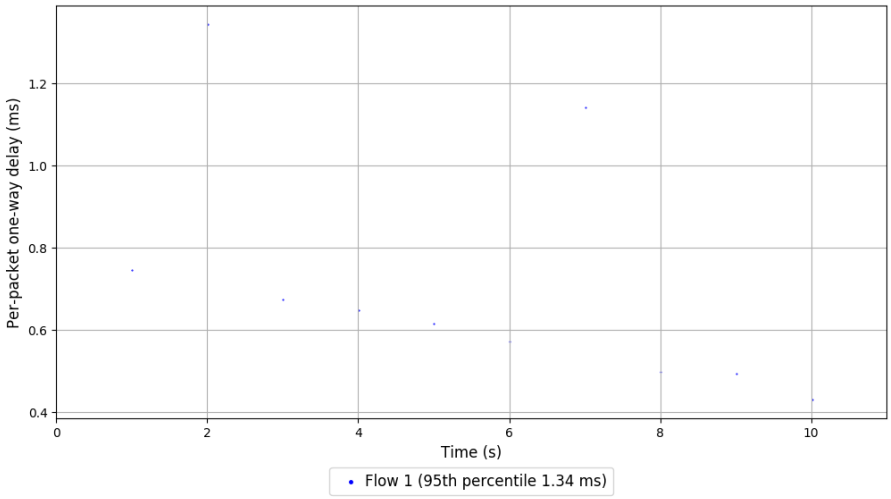


```
Run 2: Statistics of Muses-25

Start at: 2018-08-31 05:17:35
End at: 2018-08-31 05:18:05
Local clock offset: -17.548 ms
Remote clock offset: 0.166 ms
```

Run 2: Report of Muses-25 — Data Link





```
Run 3: Statistics of Muses-25

Start at: 2018-08-31 05:22:02
End at: 2018-08-31 05:22:32
Local clock offset: -11.838 ms
Remote clock offset: 0.209 ms
```

Run 3: Report of Muses-25 — Data Link