Pantheon Report

Generated at 2017-08-10 19:21:55 (UTC).

Data path: AWS Brazil 2 Ethernet (*local*) →Colombia ppp0 (*remote*).

Repeated the test of 15 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

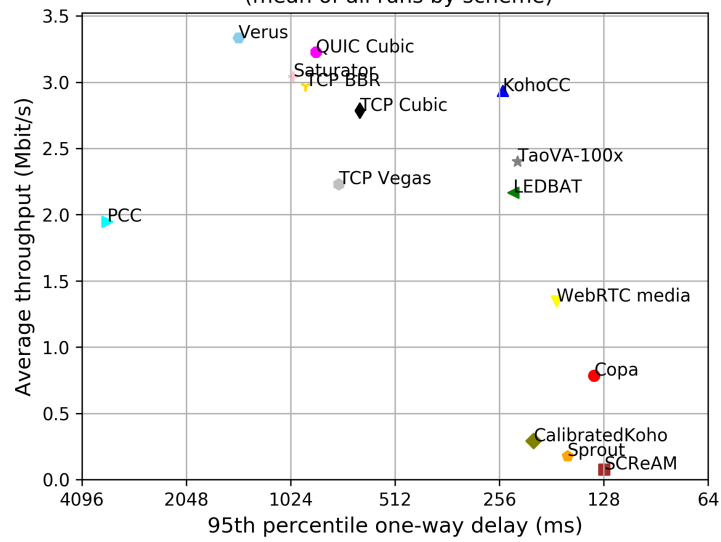Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

Tested BBR with qdisc of Fair Queuing (`fq`), and other schemes with the default Linux qdisc (`pfifo_fast`).

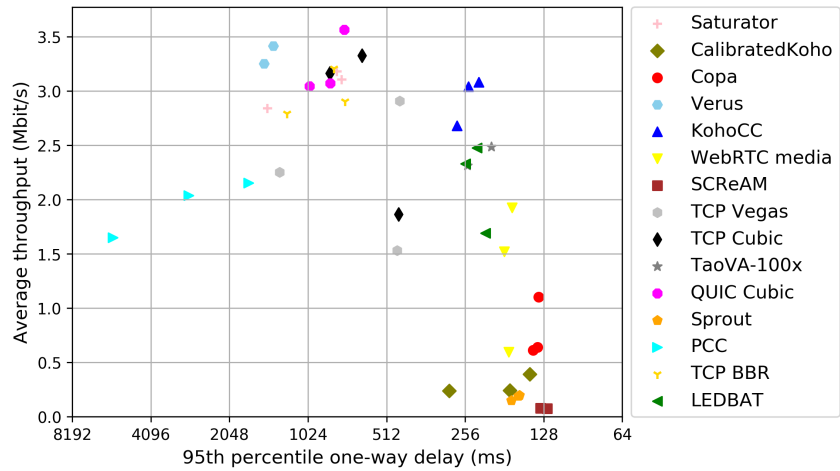NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

```
Git summary:
branch: master @ e43be7582298d552838afcf6382342bf187fbbd6
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
 M datagrump/sender.cc
third_party/genericCC @ dae96123232f1bcb37725348fa2378691ce26725
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
 M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-stimuli @ fc73a85ca16c34366d1888dc8a0d0d88d4ebf2a7
third_party/pantheon-tunnel @ baf443516dea3eeddeccaf9b916cc313273ca4f4
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/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeeb30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
 M src/examples/cellsim.cc
 M src/examples/sproutbt2.cc
 M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
 M src/verus.hpp
 M tools/plot.py
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)

test from AWS Brazil 2 Ethernet to Colombia ppp0, 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	2.97	928.91	2.31
CalibratedKoho	3	0.29	204.15	0.06
Copa	3	0.78	136.54	0.19
TCP Cubic	3	2.79	647.66	2.29
KohoCC	3	2.93	250.39	0.44
LEDBAT	3	2.17	233.48	0.34
PCC	3	1.95	3463.66	44.61
QUIC Cubic	3	3.23	865.96	3.01
Saturator	3	3.04	1007.92	1.64
SCReAM	2	0.08	127.83	0.28
Sprout	3	0.18	163.06	0.08
TaoVA-100x	2	2.40	227.05	0.15
TCP Vegas	3	2.23	745.76	0.31
Verus	2	3.33	1451.15	3.63
WebRTC media	3	1.35	175.01	0.44

```
Run 1: Statistics of TCP BBR

Start at: 2017-08-10 18:42:06
End at: 2017-08-10 18:42:36
Local clock offset: 0.901 ms
Remote clock offset: 2.934 ms


# Below is generated by plot.py at 2017-08-10 19:21:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.79 Mbit/s
95th percentile per-packet one-way delay: 1232.740 ms
Loss rate: 3.86%
-- Flow 1:
Average throughput: 2.79 Mbit/s
95th percentile per-packet one-way delay: 1232.740 ms
Loss rate: 3.86%
```
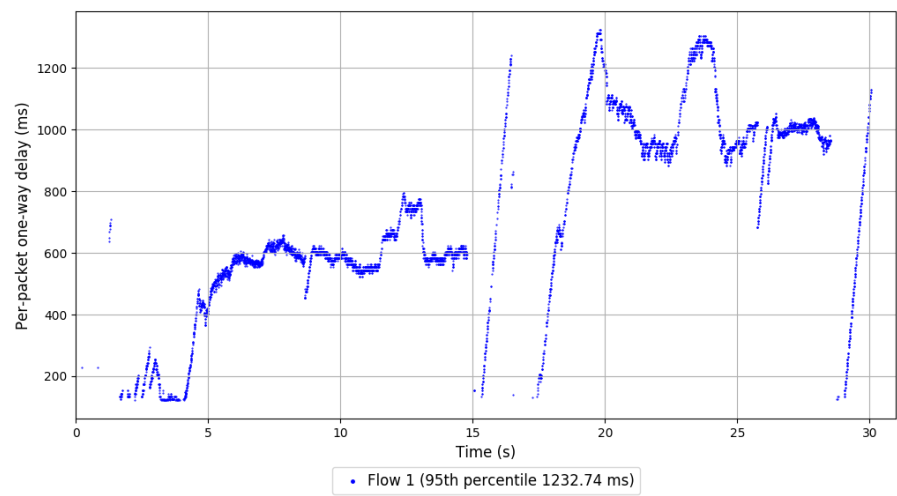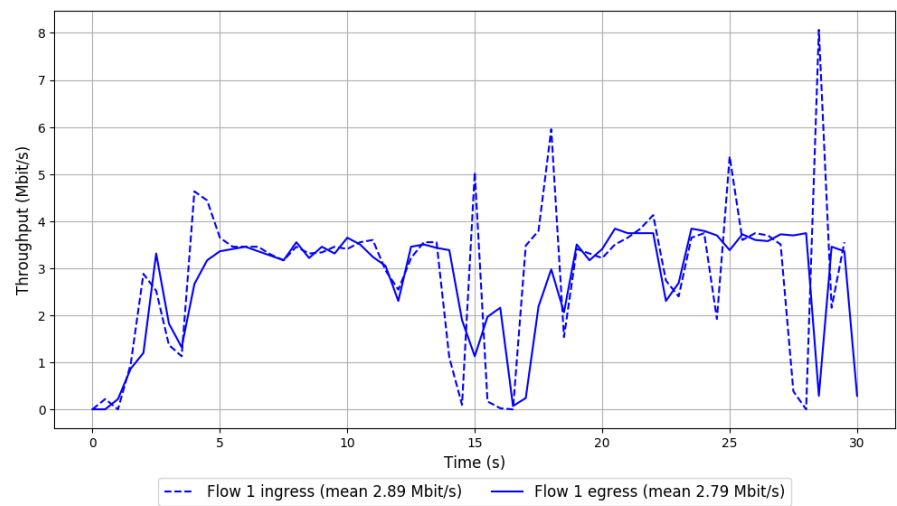
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2017-08-10 18:59:44
End at: 2017-08-10 19:00:14
Local clock offset: 0.838 ms
Remote clock offset: -1.921 ms


# Below is generated by plot.py at 2017-08-10 19:21:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 738.187 ms
Loss rate: 1.80%
-- Flow 1:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 738.187 ms
Loss rate: 1.80%
```
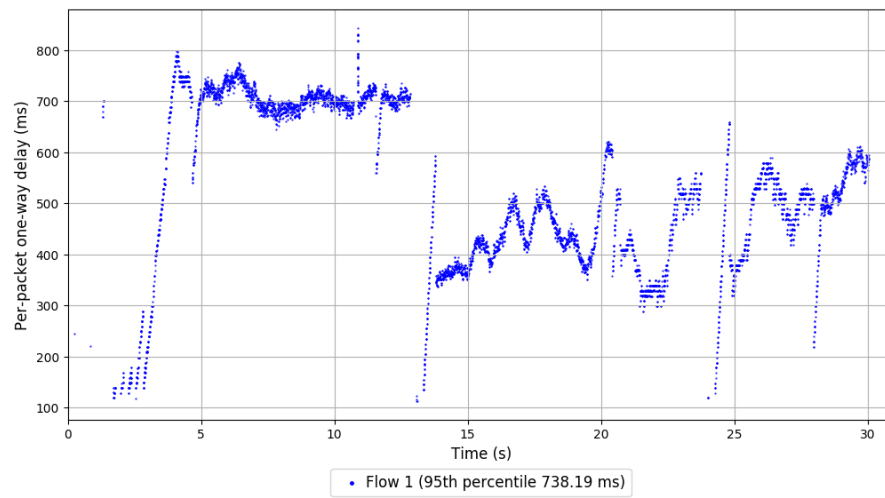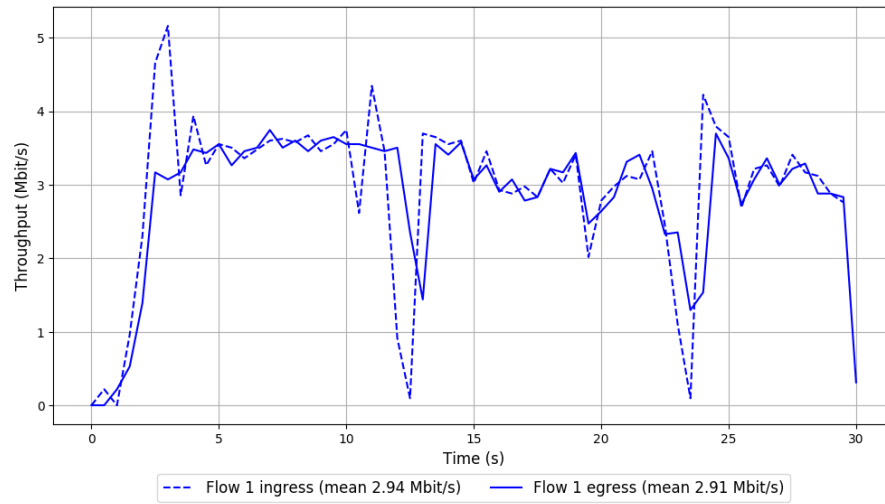
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2017-08-10 19:17:24
End at: 2017-08-10 19:17:54
Local clock offset: 0.699 ms
Remote clock offset: 3.122 ms


# Below is generated by plot.py at 2017-08-10 19:21:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.21 Mbit/s
95th percentile per-packet one-way delay: 815.810 ms
Loss rate: 1.26%
-- Flow 1:
Average throughput: 3.21 Mbit/s
95th percentile per-packet one-way delay: 815.810 ms
Loss rate: 1.26%
```
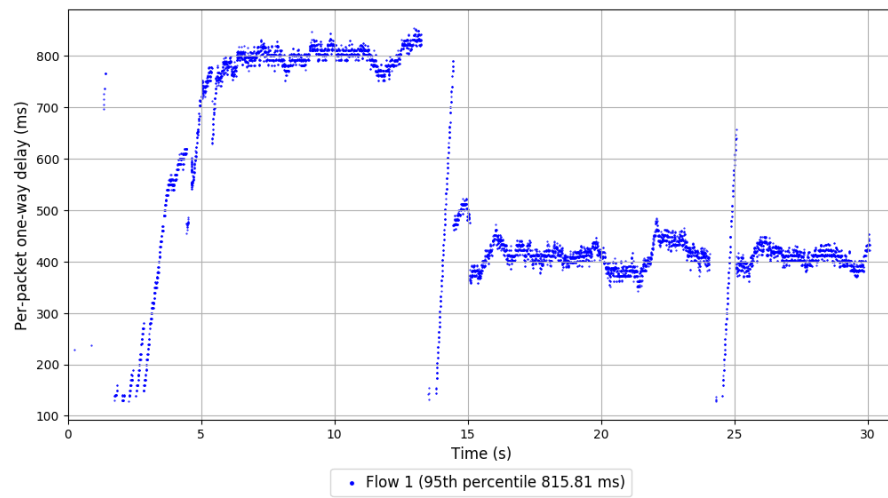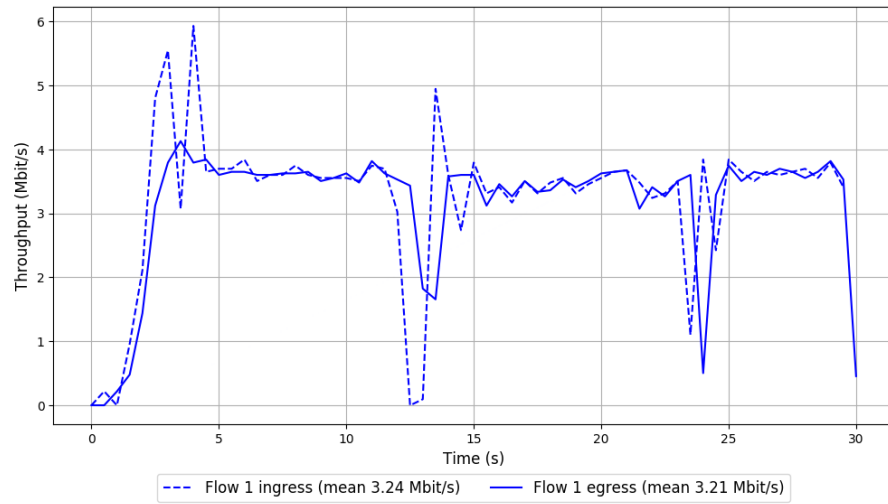
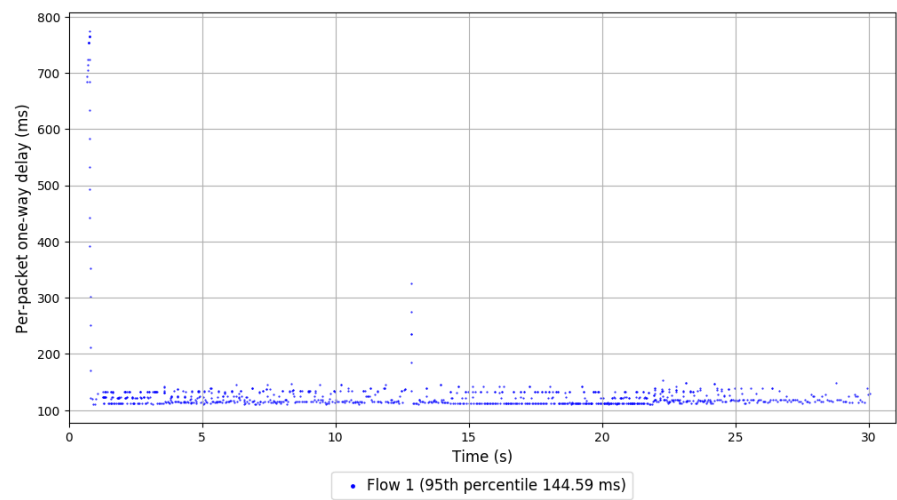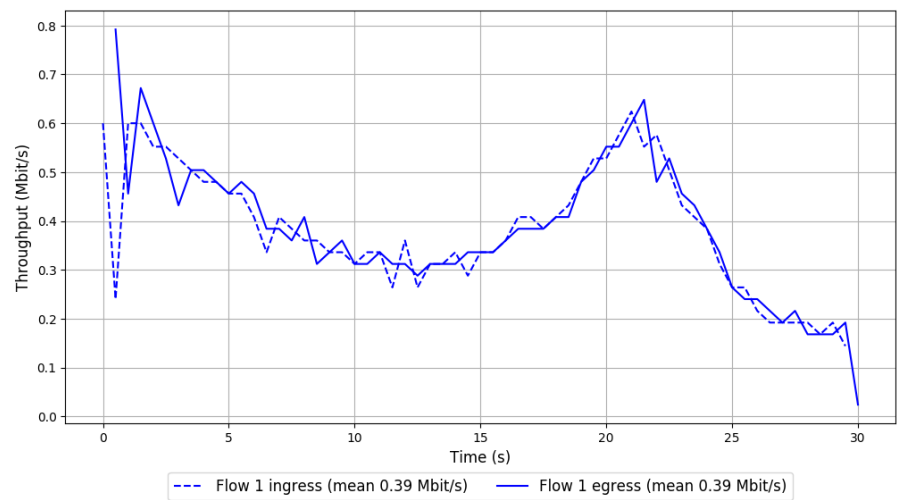Run 3: Report of TCP BBR — Data Link

```
Run 1: Statistics of CalibratedKoho

Start at: 2017-08-10 18:27:58
End at: 2017-08-10 18:28:28
Local clock offset: 0.862 ms
Remote clock offset: -2.046 ms


# Below is generated by plot.py at 2017-08-10 19:21:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 144.591 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 144.591 ms
Loss rate: 0.00%
```

Run 1: Report of CalibratedKoho — Data Link

```
Run 2: Statistics of CalibratedKoho

Start at: 2017-08-10 18:45:38
End at: 2017-08-10 18:46:08
Local clock offset: 0.896 ms
Remote clock offset: 3.142 ms


# Below is generated by plot.py at 2017-08-10 19:21:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 295.075 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 295.075 ms
Loss rate: 0.17%
```
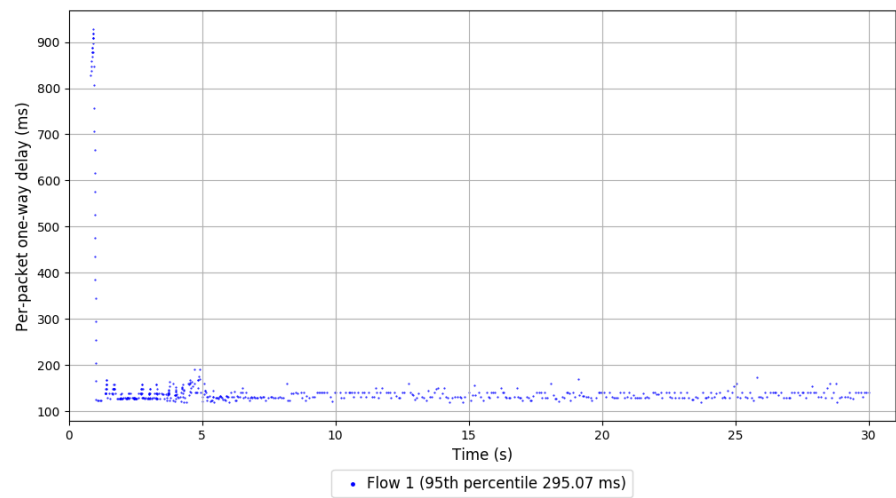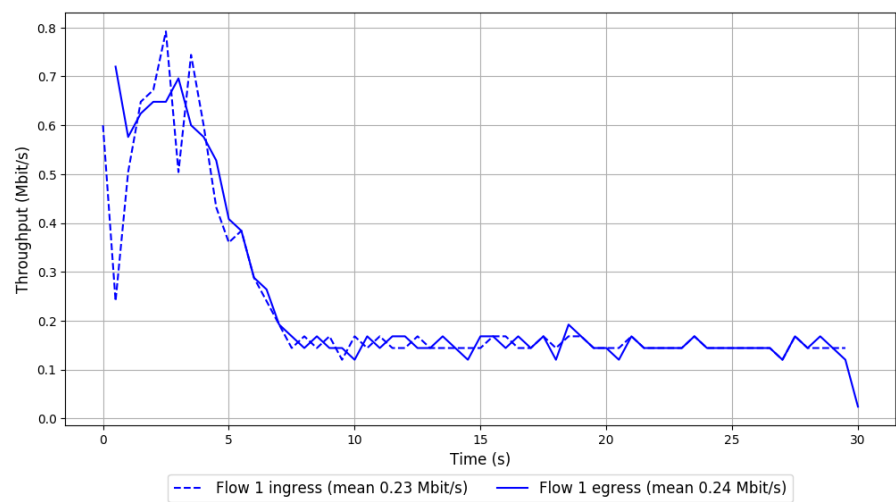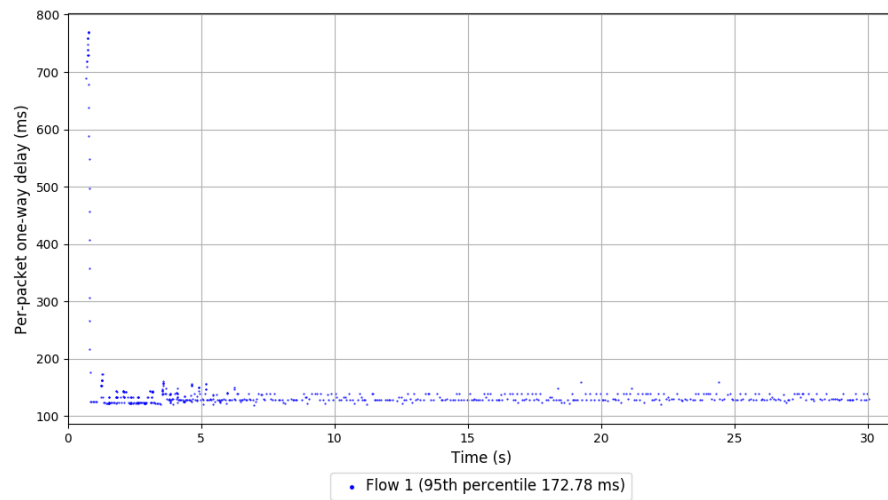
Run 2: Report of CalibratedKoho — Data Link

Flow 1 ingress (mean 0.23 Mbit/s) --- Flow 1 egress (mean 0.24 Mbit/s)

Flow 1 (95th percentile 295.07 ms)

13

```
Run 3: Statistics of CalibratedKoho

Start at: 2017-08-10 19:03:16
End at: 2017-08-10 19:03:46
Local clock offset: 0.763 ms
Remote clock offset: 2.942 ms

# Below is generated by plot.py at 2017-08-10 19:21:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 172.776 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 172.776 ms
Loss rate: 0.00%
```
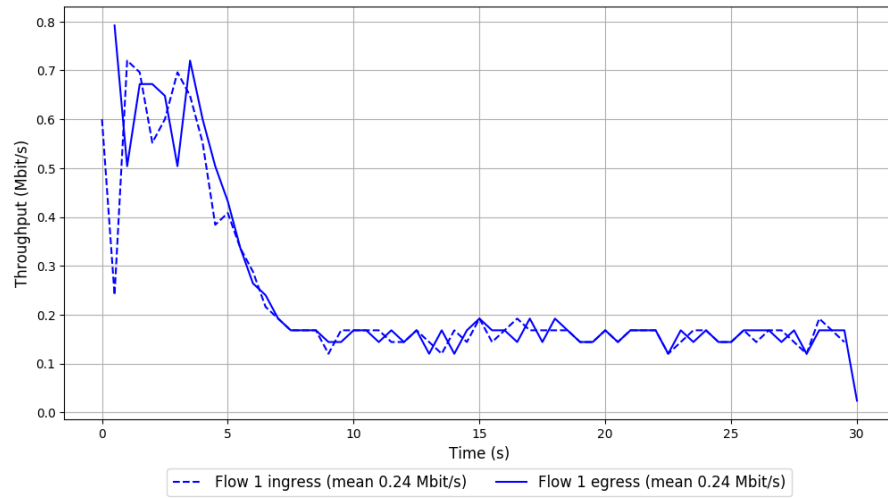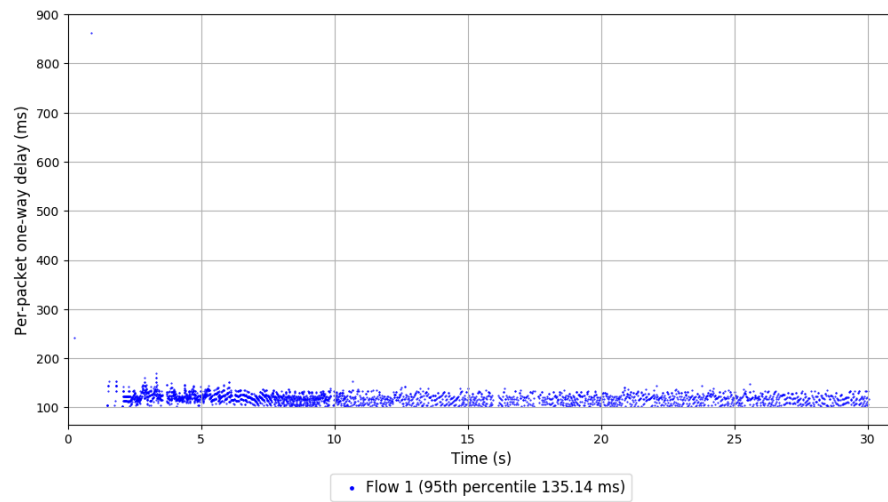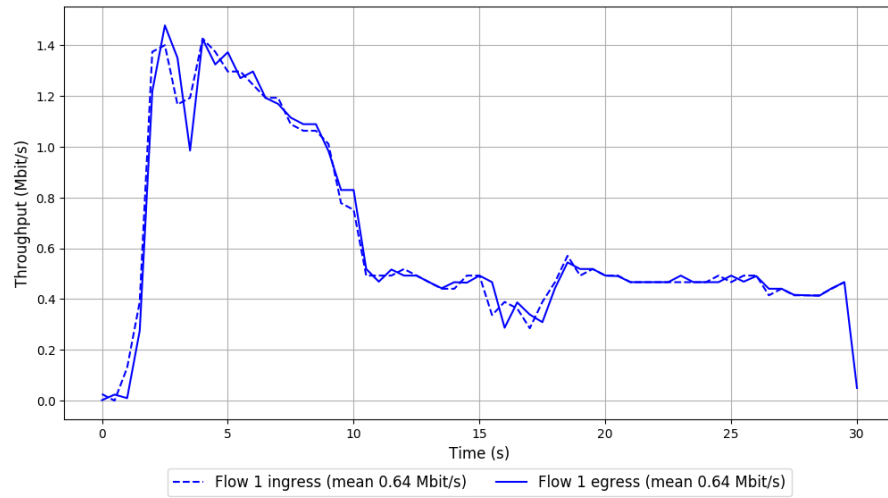
Run 3: Report of CalibratedKoho — Data Link

```
Run 1: Statistics of Copa

Start at: 2017-08-10 18:43:16
End at: 2017-08-10 18:43:46
Local clock offset: 0.922 ms
Remote clock offset: -1.823 ms


# Below is generated by plot.py at 2017-08-10 19:21:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 135.138 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 135.138 ms
Loss rate: 0.14%
```
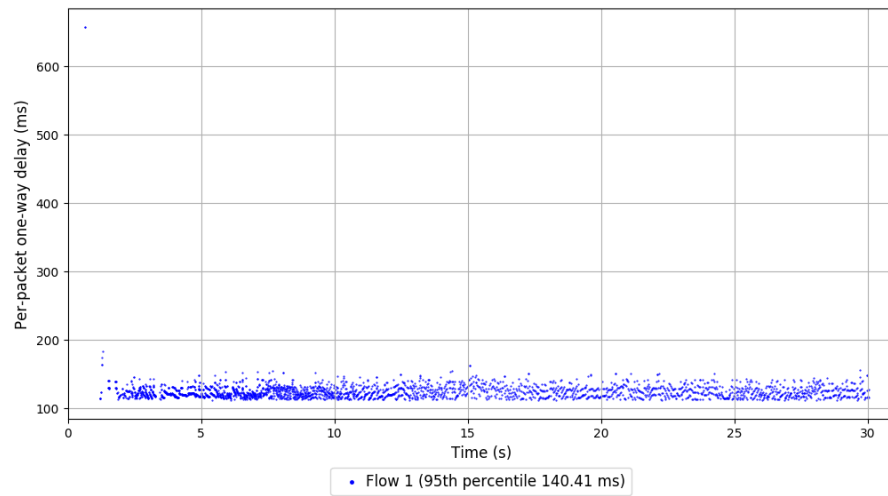
Run 1: Report of Copa — Data Link

Flow 1 ingress (mean 0.64 Mbit/s)   Flow 1 egress (mean 0.64 Mbit/s)

Flow 1 (95th percentile 135.14 ms)

```
Run 2: Statistics of Copa

Start at: 2017-08-10 19:00:55
End at: 2017-08-10 19:01:25
Local clock offset: 0.839 ms
Remote clock offset: 3.121 ms


# Below is generated by plot.py at 2017-08-10 19:21:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 140.415 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 140.415 ms
Loss rate: 0.28%
```
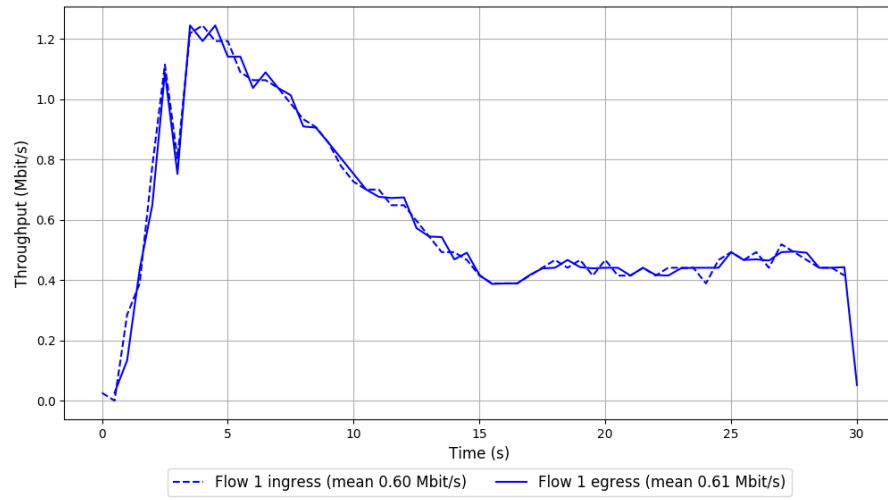
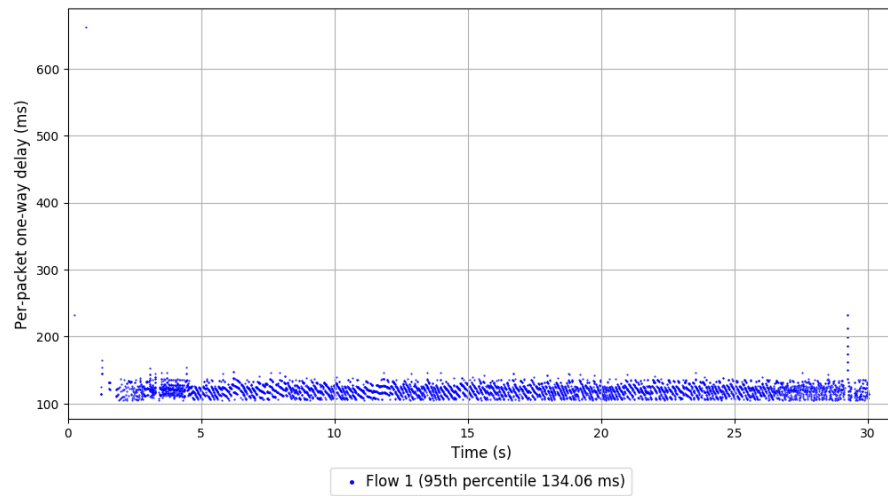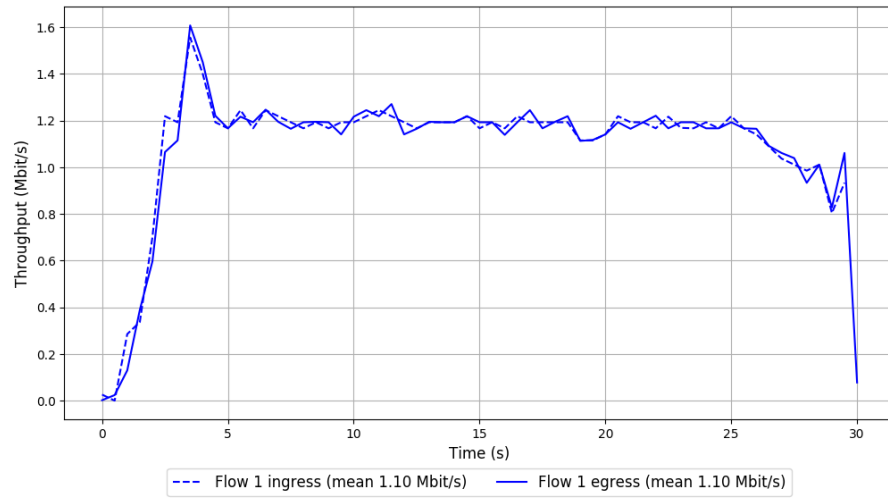Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2017-08-10 19:18:35
End at: 2017-08-10 19:19:05
Local clock offset: 0.746 ms
Remote clock offset: -2.056 ms


# Below is generated by plot.py at 2017-08-10 19:21:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 134.063 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 134.063 ms
Loss rate: 0.16%
```

Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 1.10 Mbit/s) --- Flow 1 egress (mean 1.10 Mbit/s)

• Flow 1 (95th percentile 134.06 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2017-08-10 18:36:12
End at: 2017-08-10 18:36:42
Local clock offset: 0.917 ms
Remote clock offset: 3.013 ms

# Below is generated by plot.py at 2017-08-10 19:21:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.17 Mbit/s
95th percentile per-packet one-way delay: 844.750 ms
Loss rate: 2.19%
-- Flow 1:
Average throughput: 3.17 Mbit/s
95th percentile per-packet one-way delay: 844.750 ms
Loss rate: 2.19%
```
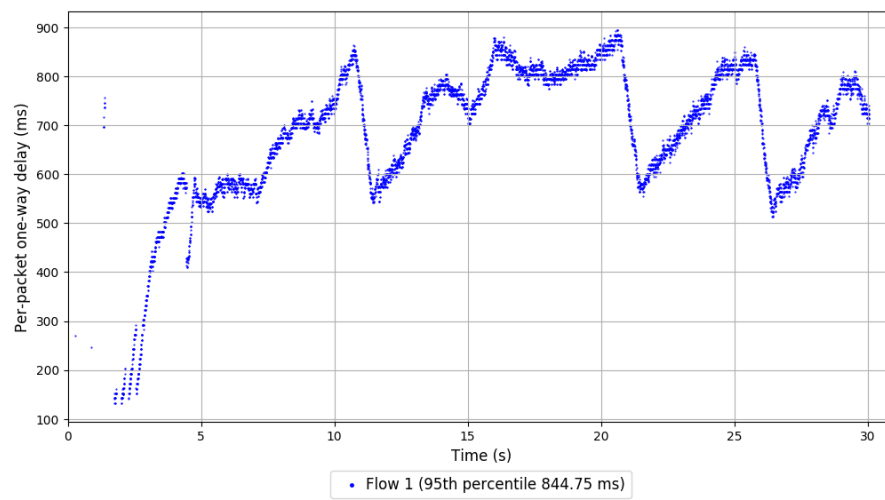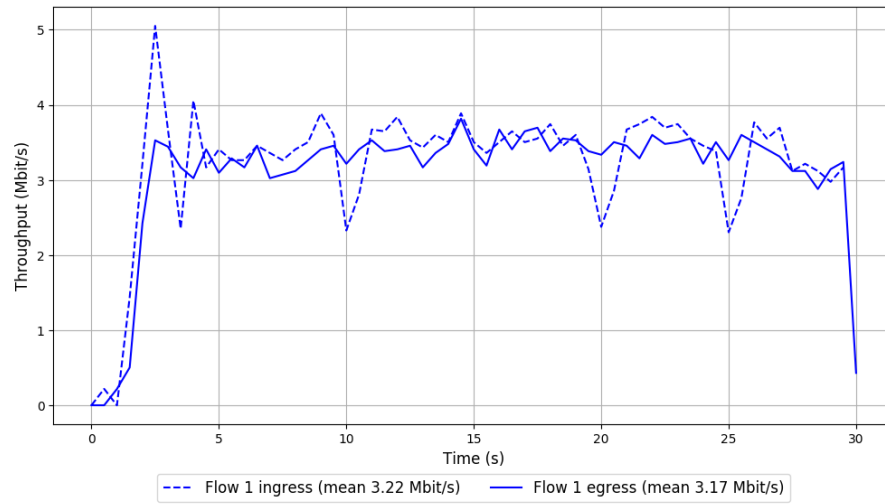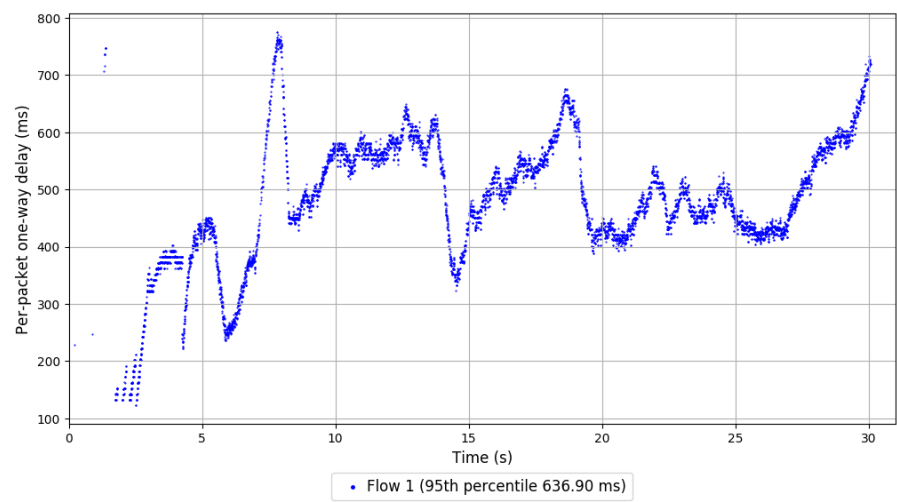
Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 3.22 Mbit/s)   Flow 1 egress (mean 3.17 Mbit/s)

• Flow 1 (95th percentile 844.75 ms)

```
Run 2: Statistics of TCP Cubic

Start at: 2017-08-10 18:53:52
End at: 2017-08-10 18:54:22
Local clock offset: 0.84 ms
Remote clock offset: 3.065 ms


# Below is generated by plot.py at 2017-08-10 19:21:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.33 Mbit/s
95th percentile per-packet one-way delay: 636.898 ms
Loss rate: 2.46%
-- Flow 1:
Average throughput: 3.33 Mbit/s
95th percentile per-packet one-way delay: 636.898 ms
Loss rate: 2.46%
```
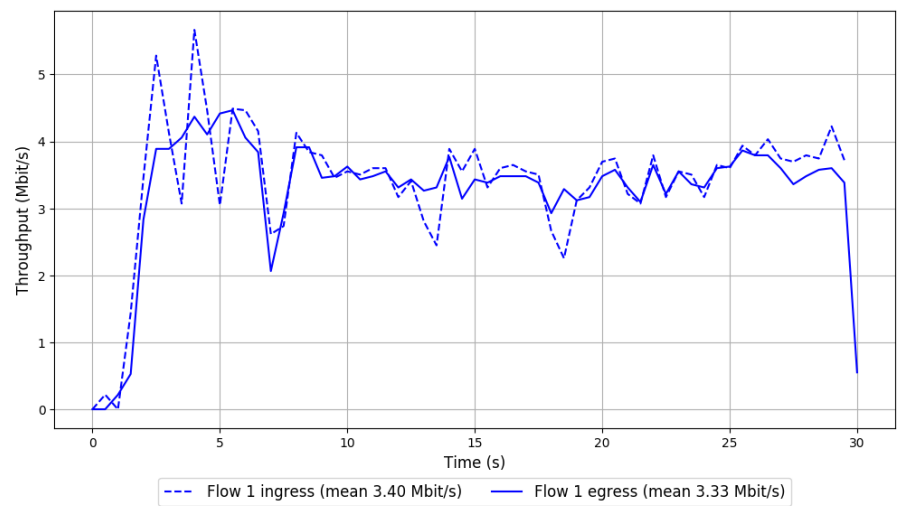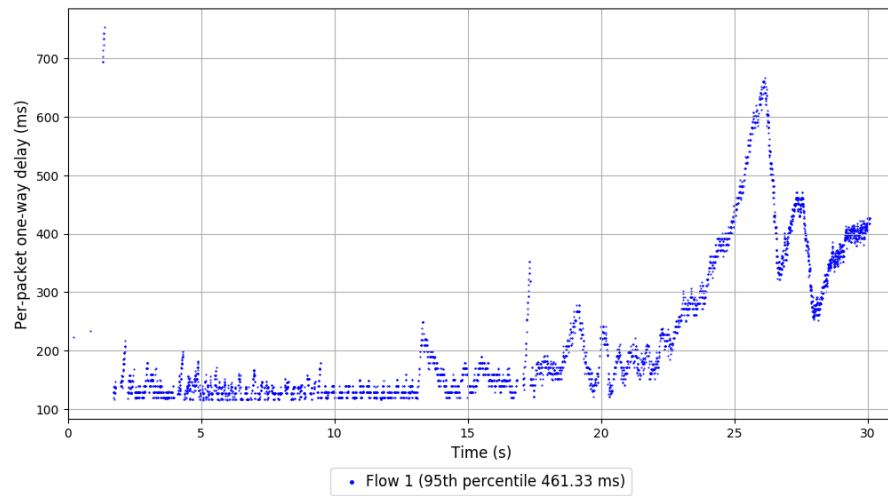
Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 3.40 Mbit/s) — Flow 1 egress (mean 3.33 Mbit/s)

• Flow 1 (95th percentile 636.90 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2017-08-10 19:11:32
End at: 2017-08-10 19:12:02
Local clock offset: 0.822 ms
Remote clock offset: -1.9 ms


# Below is generated by plot.py at 2017-08-10 19:21:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 461.327 ms
Loss rate: 2.21%
-- Flow 1:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 461.327 ms
Loss rate: 2.21%
```
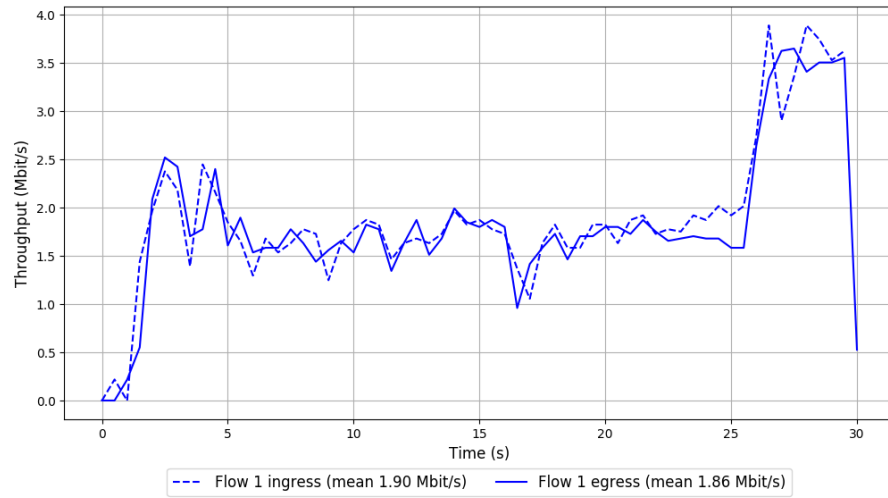
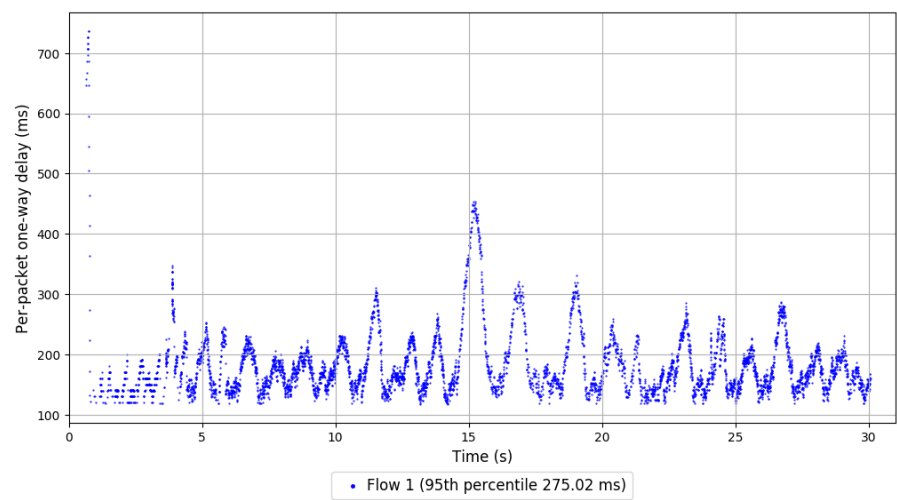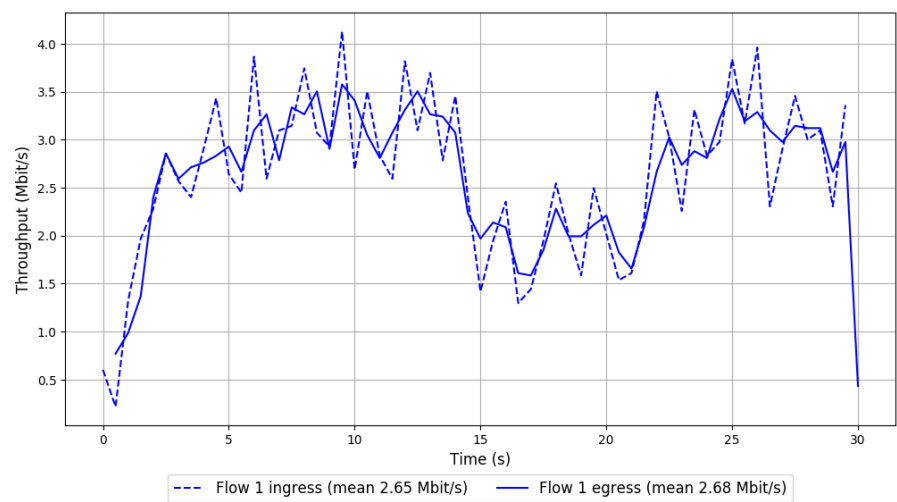Run 3: Report of TCP Cubic — Data Link

```
Run 1: Statistics of KohoCC

Start at: 2017-08-10 18:31:29
End at: 2017-08-10 18:31:59
Local clock offset: 0.947 ms
Remote clock offset: -1.814 ms


# Below is generated by plot.py at 2017-08-10 19:21:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.68 Mbit/s
95th percentile per-packet one-way delay: 275.017 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 2.68 Mbit/s
95th percentile per-packet one-way delay: 275.017 ms
Loss rate: 0.57%
```

Run 1: Report of KohoCC — Data Link

```
Run 2: Statistics of KohoCC

Start at: 2017-08-10 18:49:09
End at: 2017-08-10 18:49:39
Local clock offset: 0.88 ms
Remote clock offset: 2.969 ms


# Below is generated by plot.py at 2017-08-10 19:21:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.04 Mbit/s
95th percentile per-packet one-way delay: 249.093 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 3.04 Mbit/s
95th percentile per-packet one-way delay: 249.093 ms
Loss rate: 0.37%
```
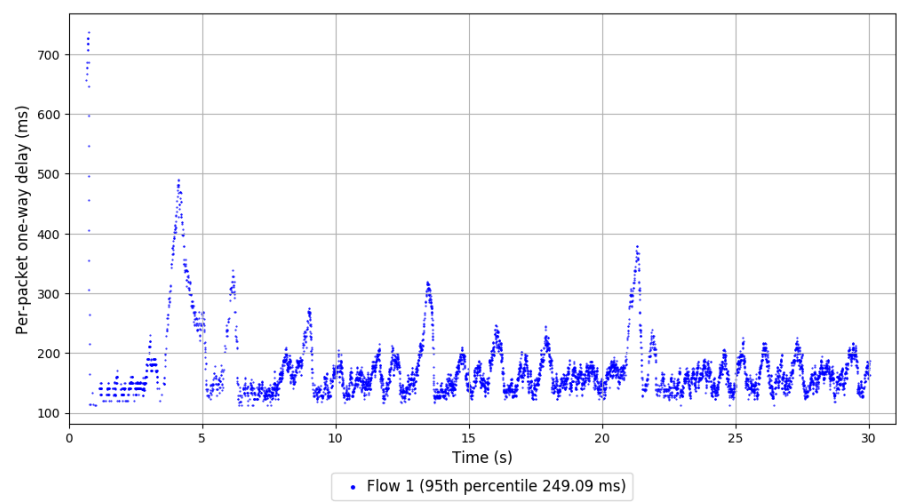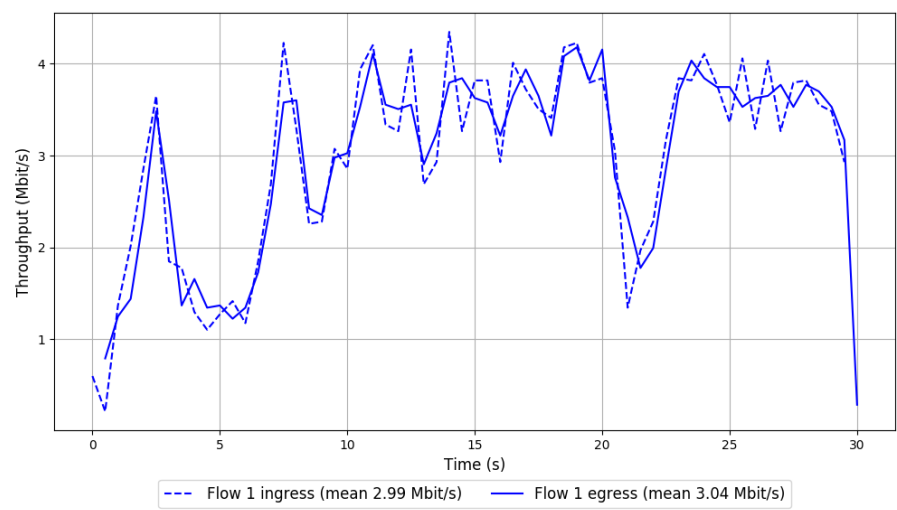
Run 2: Report of KohoCC — Data Link

```
Run 3: Statistics of KohoCC

Start at: 2017-08-10 19:06:50
End at: 2017-08-10 19:07:20
Local clock offset: 0.749 ms
Remote clock offset: -2.02 ms


# Below is generated by plot.py at 2017-08-10 19:21:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.08 Mbit/s
95th percentile per-packet one-way delay: 227.061 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 3.08 Mbit/s
95th percentile per-packet one-way delay: 227.061 ms
Loss rate: 0.38%
```
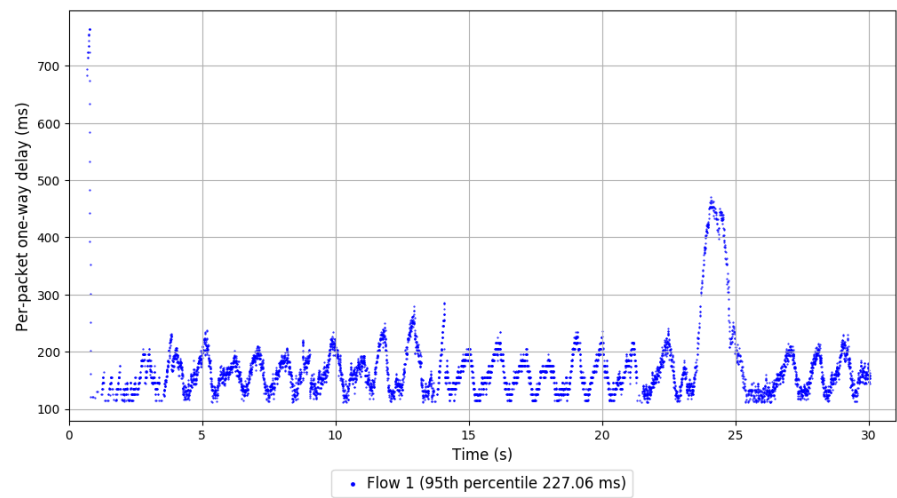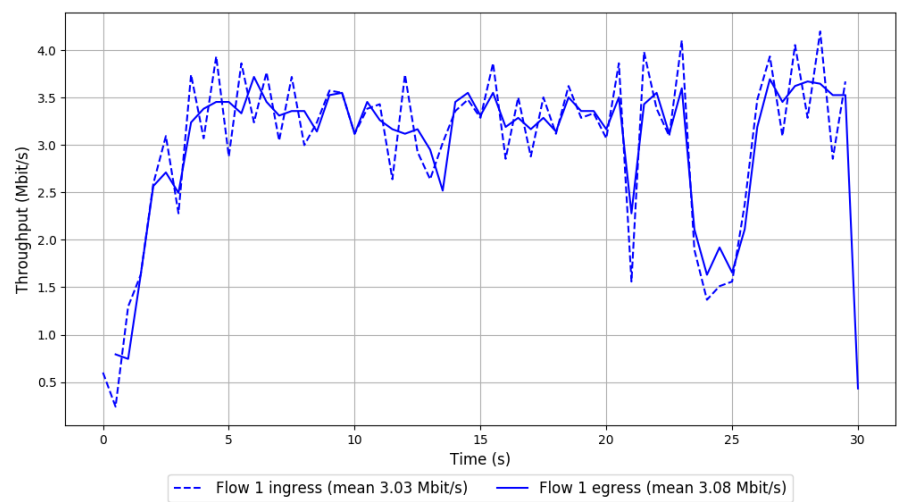
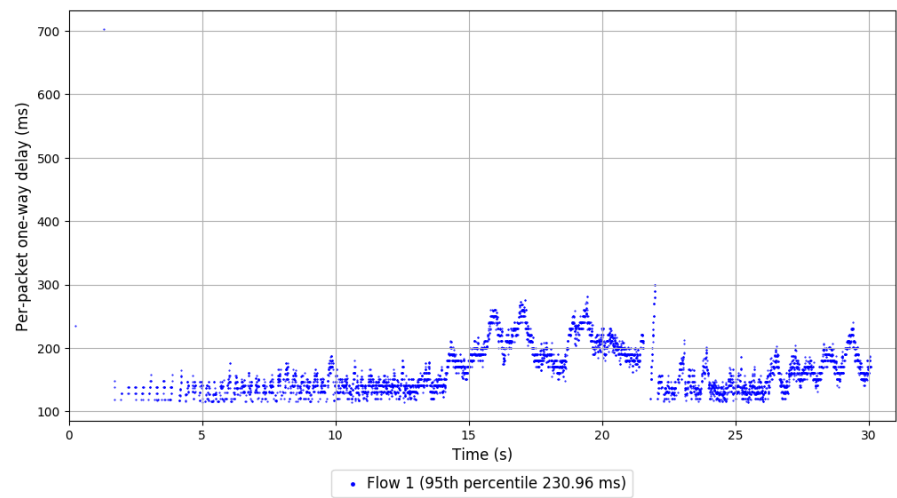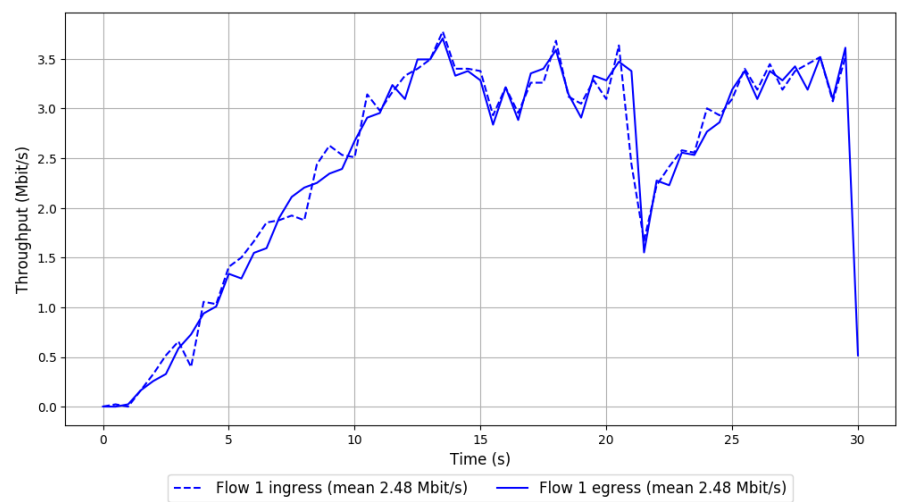Run 3: Report of KohoCC — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2017-08-10 18:39:45
End at: 2017-08-10 18:40:15
Local clock offset: 0.905 ms
Remote clock offset: -1.907 ms


# Below is generated by plot.py at 2017-08-10 19:21:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.48 Mbit/s
95th percentile per-packet one-way delay: 230.956 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 2.48 Mbit/s
95th percentile per-packet one-way delay: 230.956 ms
Loss rate: 0.41%
```

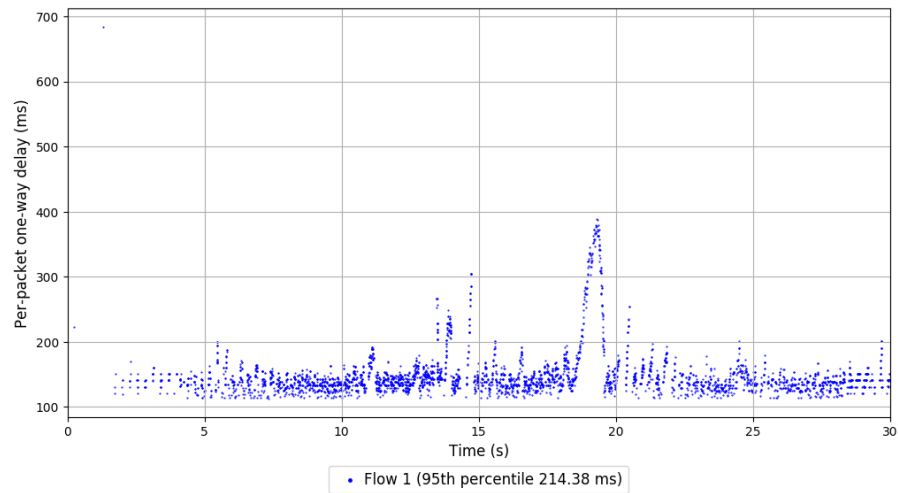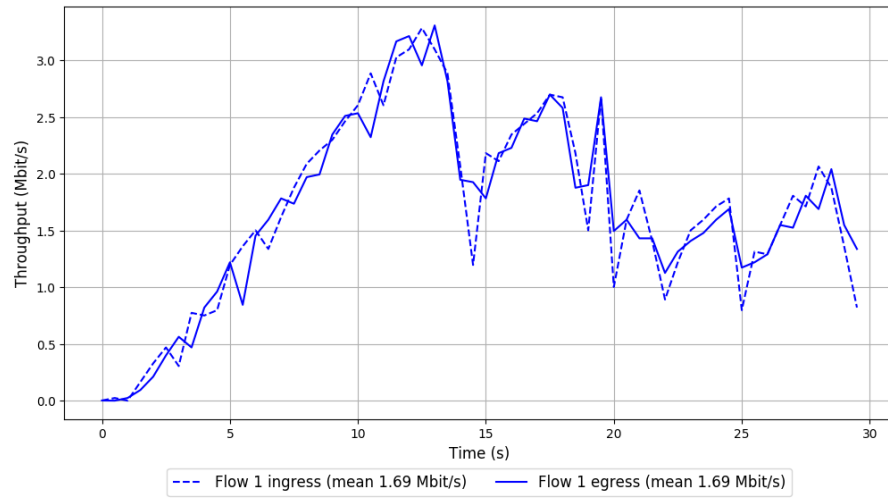Run 1: Report of LEDBAT — Data Link

Flow 1 ingress (mean 2.48 Mbit/s) --- Flow 1 egress (mean 2.48 Mbit/s)

Flow 1 (95th percentile 230.96 ms)

```
Run 2: Statistics of LEDBAT

Start at: 2017-08-10 18:57:23
End at: 2017-08-10 18:57:53
Local clock offset: 0.866 ms
Remote clock offset: -2.038 ms

# Below is generated by plot.py at 2017-08-10 19:21:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 214.382 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 214.382 ms
Loss rate: 0.19%
```

Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 1.69 Mbit/s)   Flow 1 egress (mean 1.69 Mbit/s)

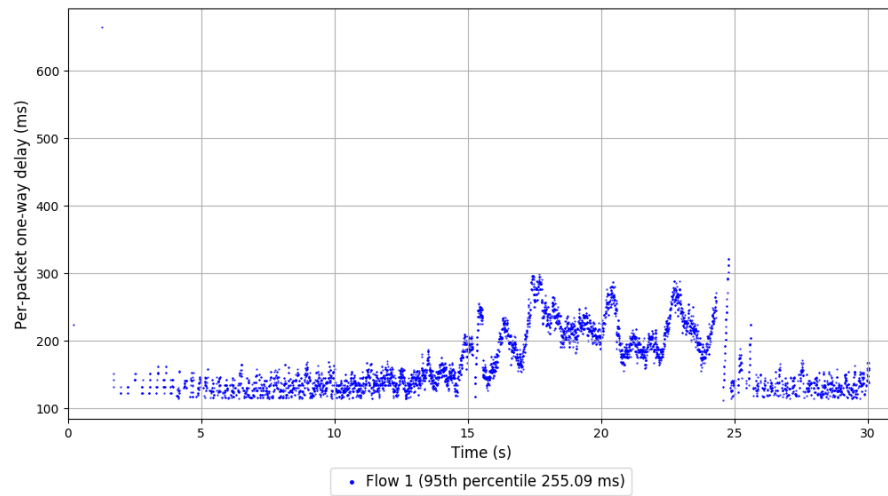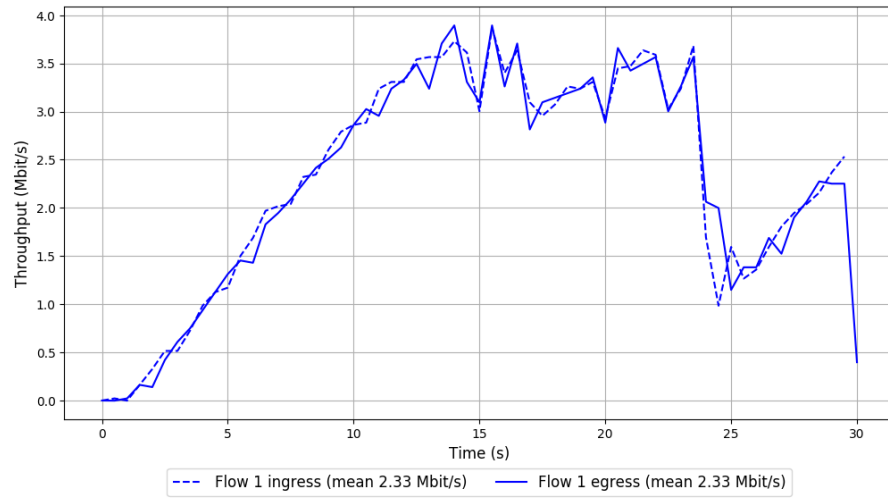Flow 1 (95th percentile 214.38 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2017-08-10 19:15:04
End at: 2017-08-10 19:15:34
Local clock offset: 0.79 ms
Remote clock offset: -2.039 ms


# Below is generated by plot.py at 2017-08-10 19:21:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 255.091 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 255.091 ms
Loss rate: 0.42%
```

Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 2.33 Mbit/s) — — — Flow 1 egress (mean 2.33 Mbit/s)

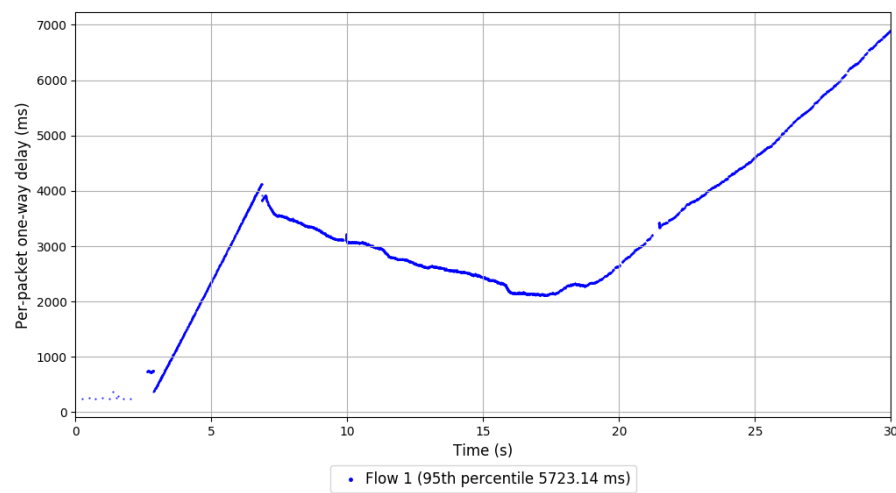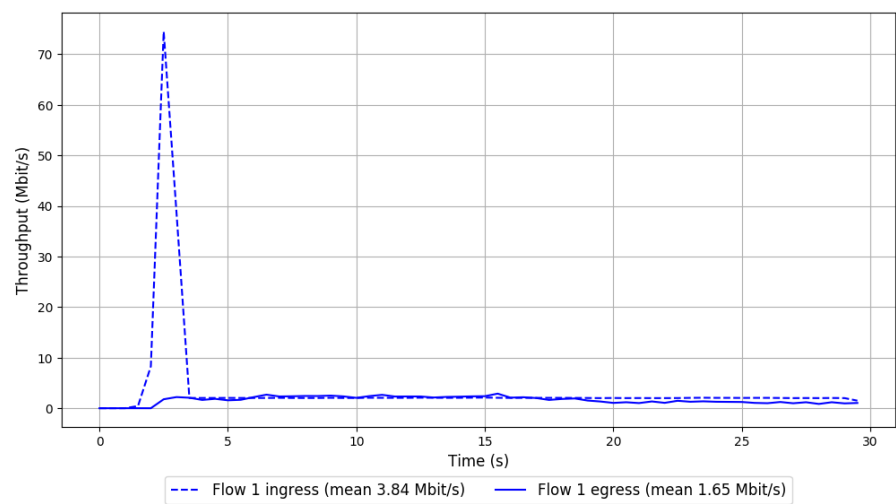• Flow 1 (95th percentile 255.09 ms)

39

```
Run 1: Statistics of PCC

Start at: 2017-08-10 18:32:40
End at: 2017-08-10 18:33:10
Local clock offset: 0.93 ms
Remote clock offset: -1.905 ms


# Below is generated by plot.py at 2017-08-10 19:21:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 5723.142 ms
Loss rate: 57.27%
-- Flow 1:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 5723.142 ms
Loss rate: 57.27%
```

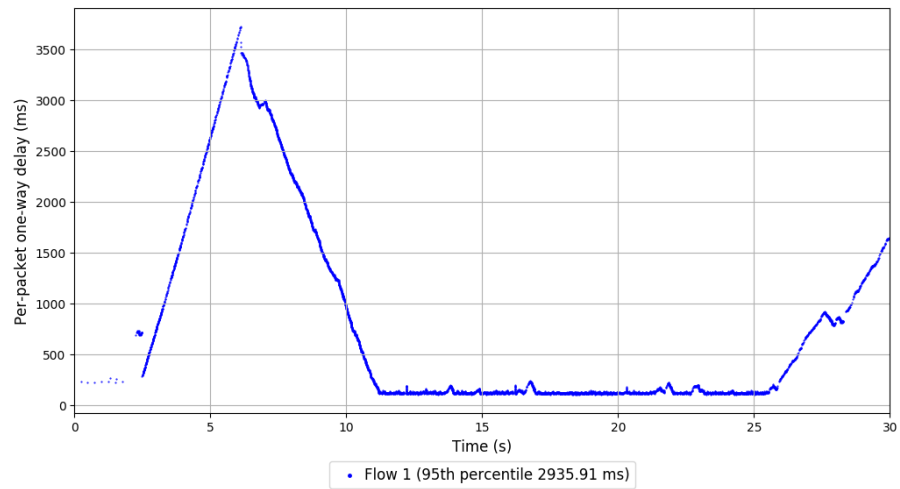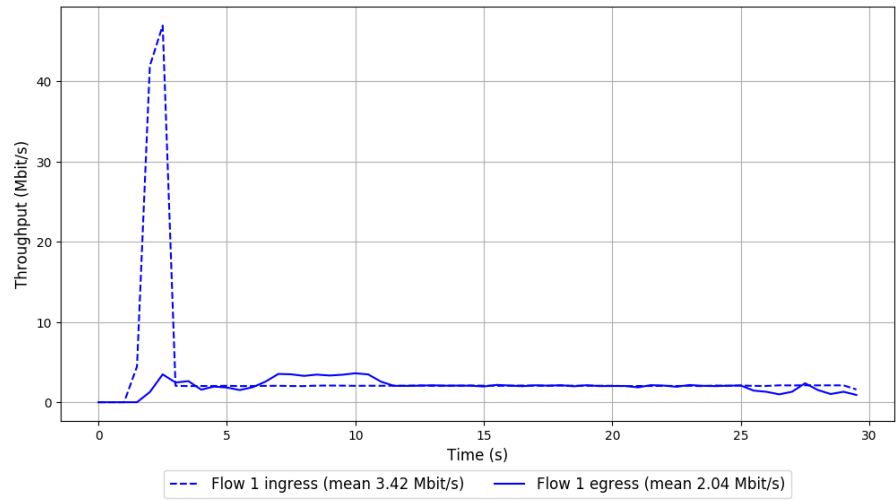Run 1: Report of PCC — Data Link

Flow 1 ingress (mean 3.84 Mbit/s)   Flow 1 egress (mean 1.65 Mbit/s)

• Flow 1 (95th percentile 5723.14 ms)

```
Run 2: Statistics of PCC

Start at: 2017-08-10 18:50:20
End at: 2017-08-10 18:50:50
Local clock offset: 0.815 ms
Remote clock offset: -1.915 ms


# Below is generated by plot.py at 2017-08-10 19:21:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 2935.910 ms
Loss rate: 40.66%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 2935.910 ms
Loss rate: 40.66%
```

Run 2: Report of PCC — Data Link

Flow 1 ingress (mean 3.42 Mbit/s) --- Flow 1 egress (mean 2.04 Mbit/s)

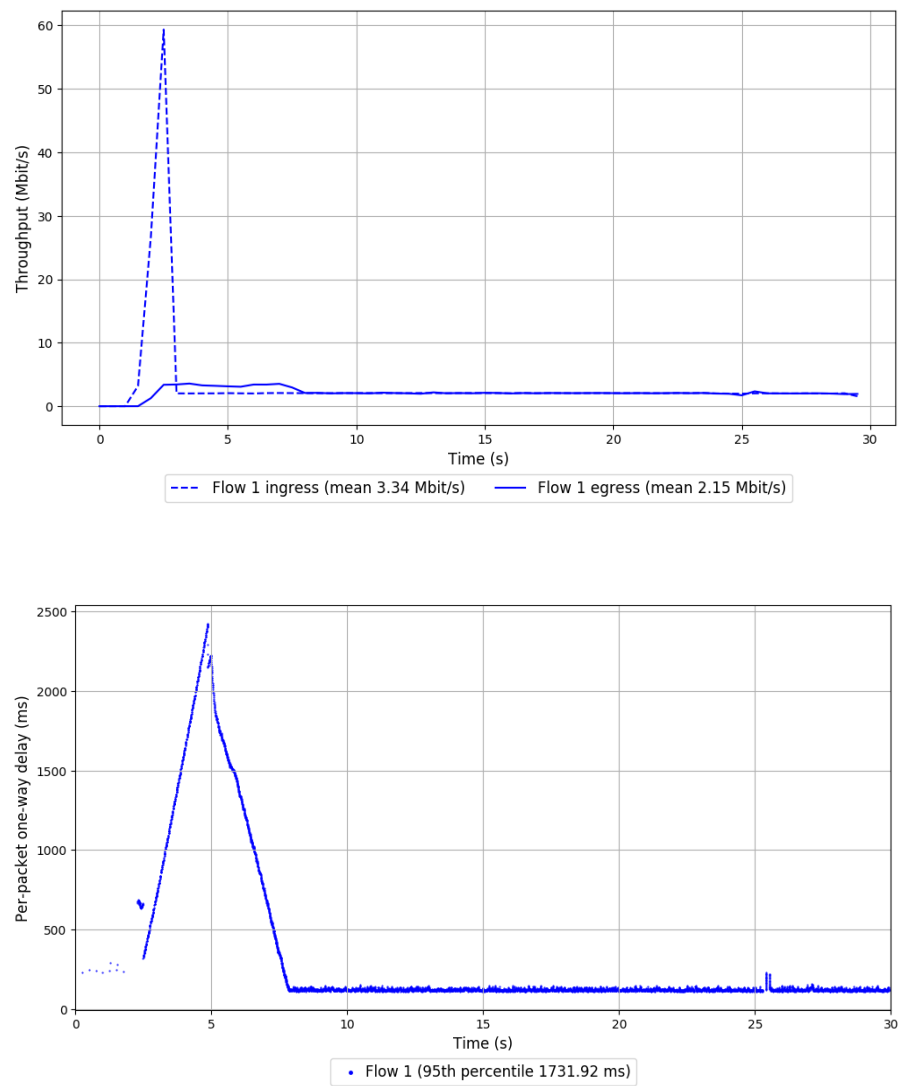Flow 1 (95th percentile 2935.91 ms)

```
Run 3: Statistics of PCC

Start at: 2017-08-10 19:08:00
End at: 2017-08-10 19:08:30
Local clock offset: 0.877 ms
Remote clock offset: -1.906 ms


# Below is generated by plot.py at 2017-08-10 19:21:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 1731.917 ms
Loss rate: 35.89%
-- Flow 1:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 1731.917 ms
Loss rate: 35.89%
```
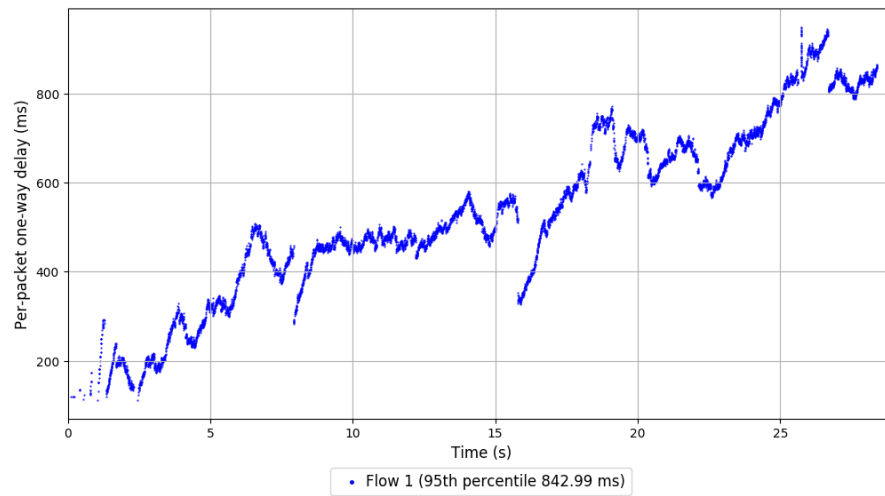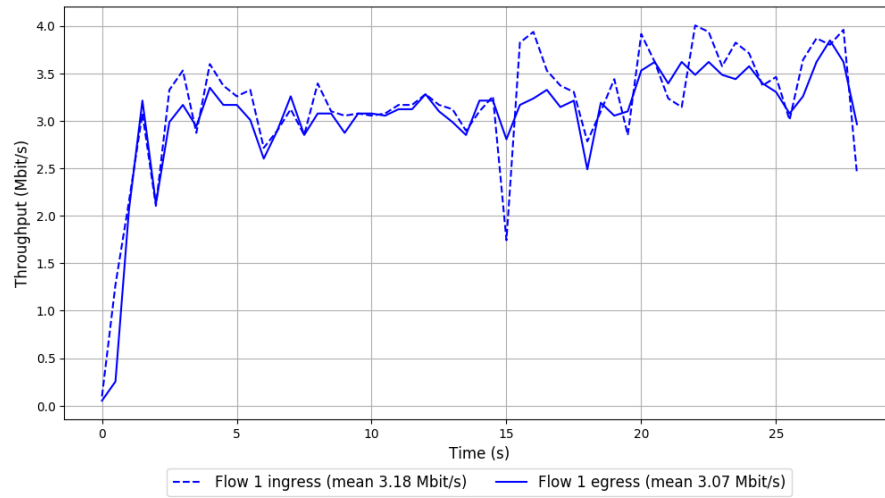
Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 3.34 Mbit/s) — — —   Flow 1 egress (mean 2.15 Mbit/s) ———

• Flow 1 (95th percentile 1731.92 ms)

45

```
Run 1: Statistics of QUIC Cubic

Start at: 2017-08-10 18:37:22
End at: 2017-08-10 18:37:52
Local clock offset: 0.917 ms
Remote clock offset: -1.727 ms

# Below is generated by plot.py at 2017-08-10 19:21:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.07 Mbit/s
95th percentile per-packet one-way delay: 842.987 ms
Loss rate: 3.38%
-- Flow 1:
Average throughput: 3.07 Mbit/s
95th percentile per-packet one-way delay: 842.987 ms
Loss rate: 3.38%
```

Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2017-08-10 18:55:02
End at: 2017-08-10 18:55:32
Local clock offset: 0.863 ms
Remote clock offset: -1.86 ms


# Below is generated by plot.py at 2017-08-10 19:21:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.04 Mbit/s
95th percentile per-packet one-way delay: 1010.893 ms
Loss rate: 3.24%
-- Flow 1:
Average throughput: 3.04 Mbit/s
95th percentile per-packet one-way delay: 1010.893 ms
Loss rate: 3.24%
```
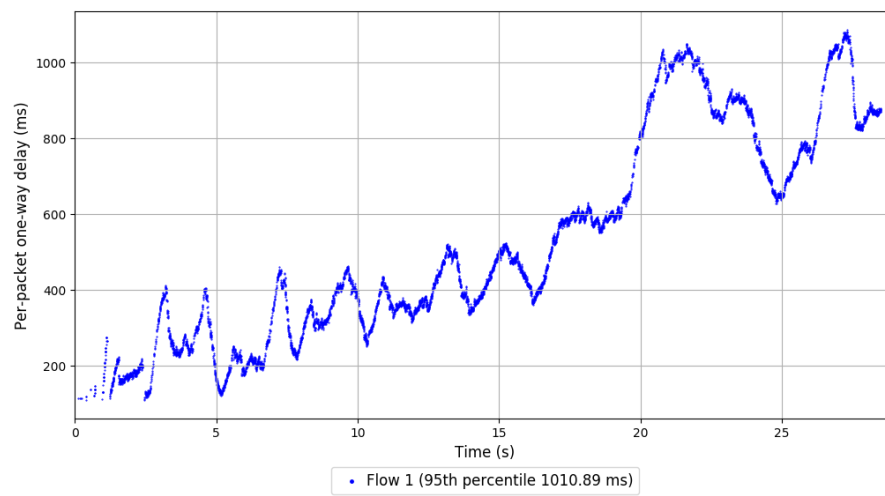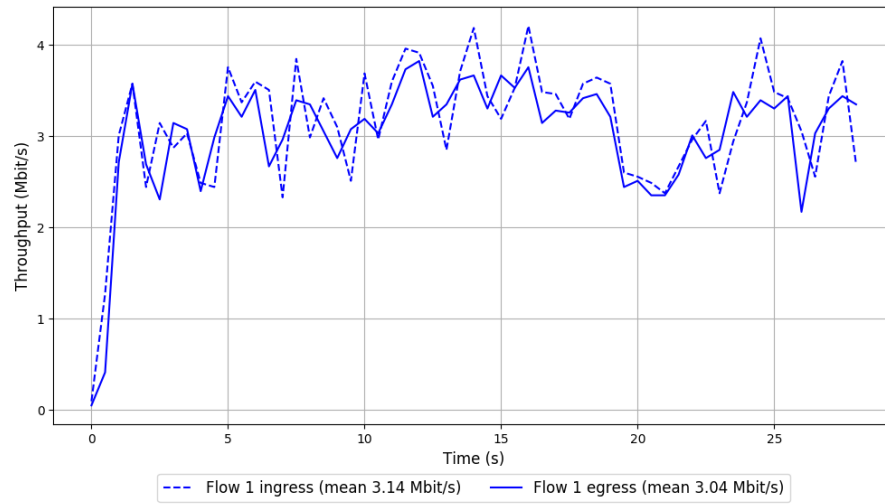
Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-08-10 19:12:42
End at: 2017-08-10 19:13:12
Local clock offset: 0.801 ms
Remote clock offset: -1.928 ms


# Below is generated by plot.py at 2017-08-10 19:21:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.57 Mbit/s
95th percentile per-packet one-way delay: 744.004 ms
Loss rate: 2.42%
-- Flow 1:
Average throughput: 3.57 Mbit/s
95th percentile per-packet one-way delay: 744.004 ms
Loss rate: 2.42%
```
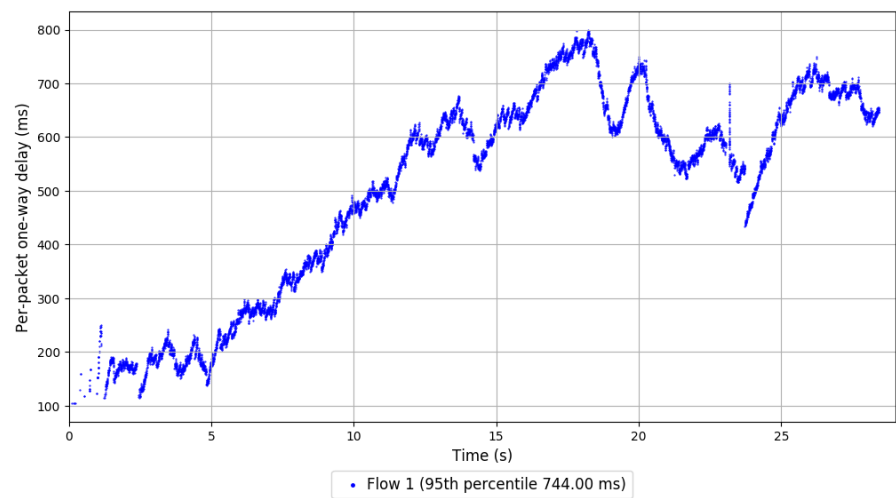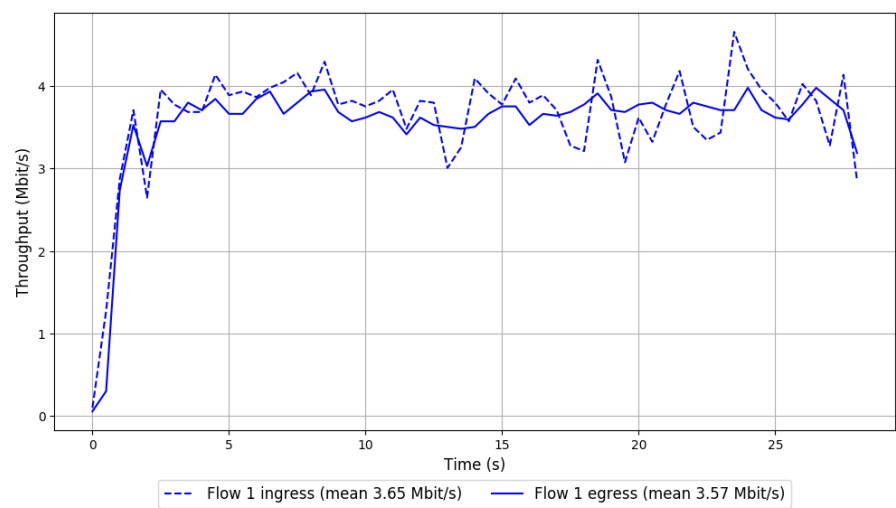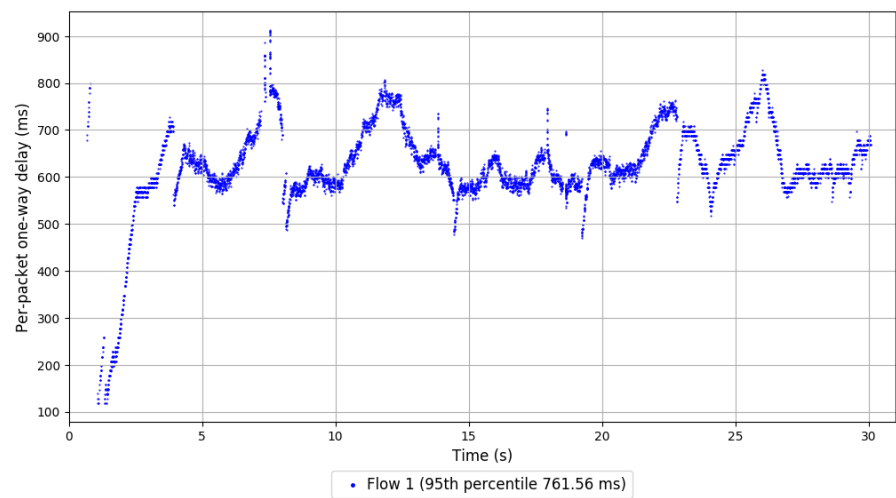
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 3.65 Mbit/s) — — —   Flow 1 egress (mean 3.57 Mbit/s) ———

• Flow 1 (95th percentile 744.00 ms)

51

```
Run 1: Statistics of Saturator

Start at: 2017-08-10 18:35:01
End at: 2017-08-10 18:35:31
Local clock offset: 0.927 ms
Remote clock offset: 2.832 ms


# Below is generated by plot.py at 2017-08-10 19:21:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.11 Mbit/s
95th percentile per-packet one-way delay: 761.556 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 3.11 Mbit/s
95th percentile per-packet one-way delay: 761.556 ms
Loss rate: 1.14%
```
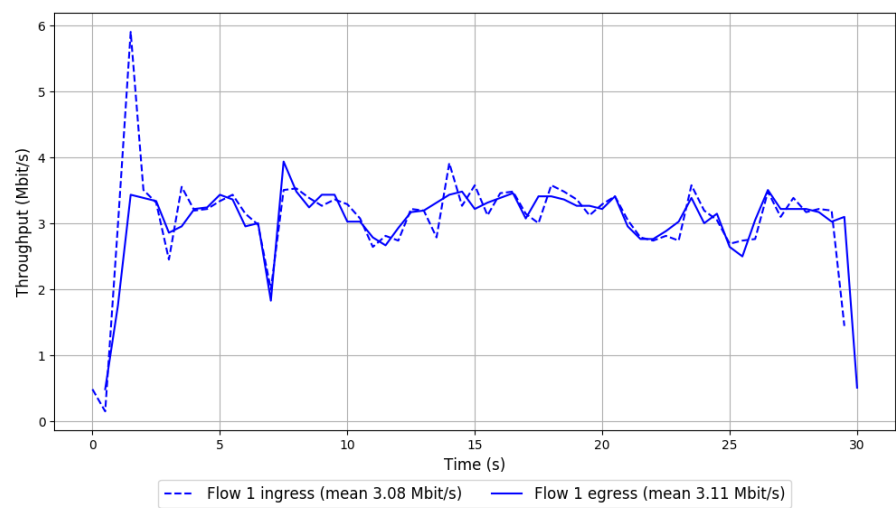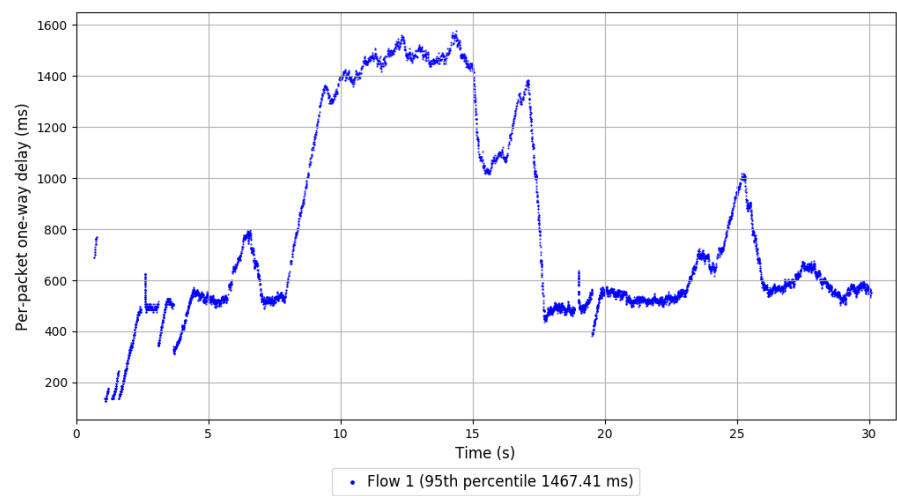
Run 1: Report of Saturator — Data Link

Flow 1 ingress (mean 3.08 Mbit/s)   Flow 1 egress (mean 3.11 Mbit/s)

Flow 1 (95th percentile 761.56 ms)

```
Run 2: Statistics of Saturator

Start at: 2017-08-10 18:52:41
End at: 2017-08-10 18:53:11
Local clock offset: 0.797 ms
Remote clock offset: 2.955 ms


# Below is generated by plot.py at 2017-08-10 19:21:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.84 Mbit/s
95th percentile per-packet one-way delay: 1467.410 ms
Loss rate: 2.04%
-- Flow 1:
Average throughput: 2.84 Mbit/s
95th percentile per-packet one-way delay: 1467.410 ms
Loss rate: 2.04%
```
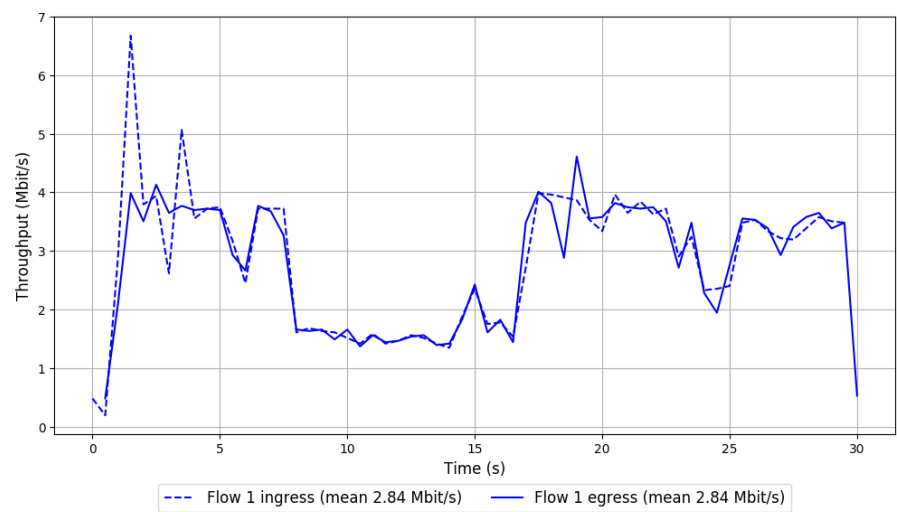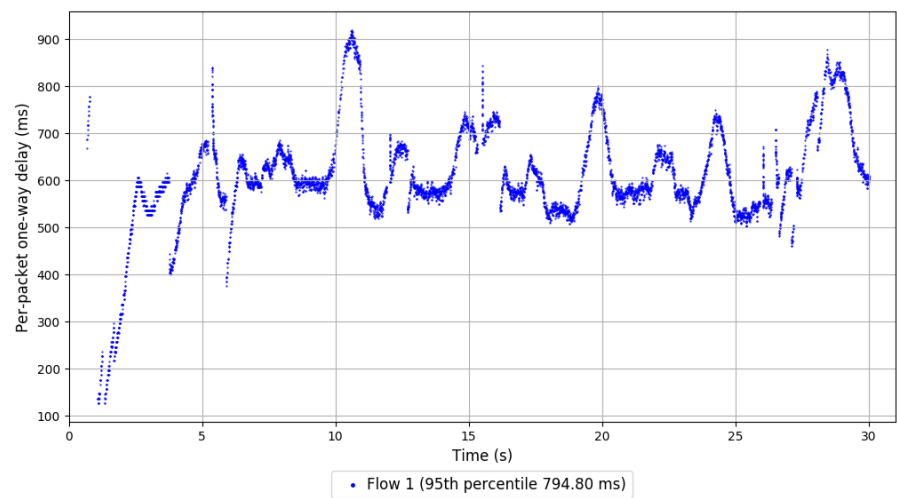
Run 2: Report of Saturator — Data Link

Flow 1 ingress (mean 2.84 Mbit/s) --- Flow 1 egress (mean 2.84 Mbit/s)

Flow 1 (95th percentile 1467.41 ms)

```
Run 3: Statistics of Saturator

Start at: 2017-08-10 19:10:21
End at: 2017-08-10 19:10:51
Local clock offset: 0.853 ms
Remote clock offset: 2.813 ms


# Below is generated by plot.py at 2017-08-10 19:21:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.18 Mbit/s
95th percentile per-packet one-way delay: 794.803 ms
Loss rate: 1.75%
-- Flow 1:
Average throughput: 3.18 Mbit/s
95th percentile per-packet one-way delay: 794.803 ms
Loss rate: 1.75%
```
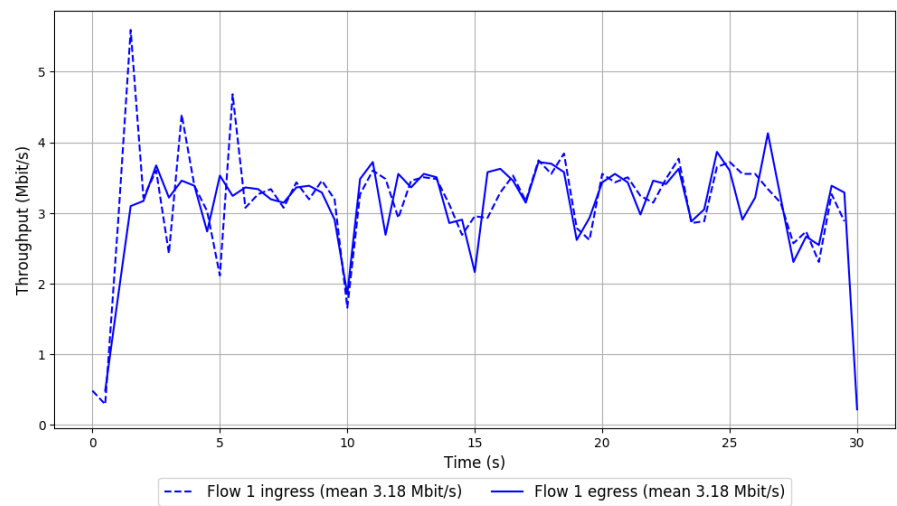
Run 3: Report of Saturator — Data Link

Flow 1 ingress (mean 3.18 Mbit/s) Flow 1 egress (mean 3.18 Mbit/s)

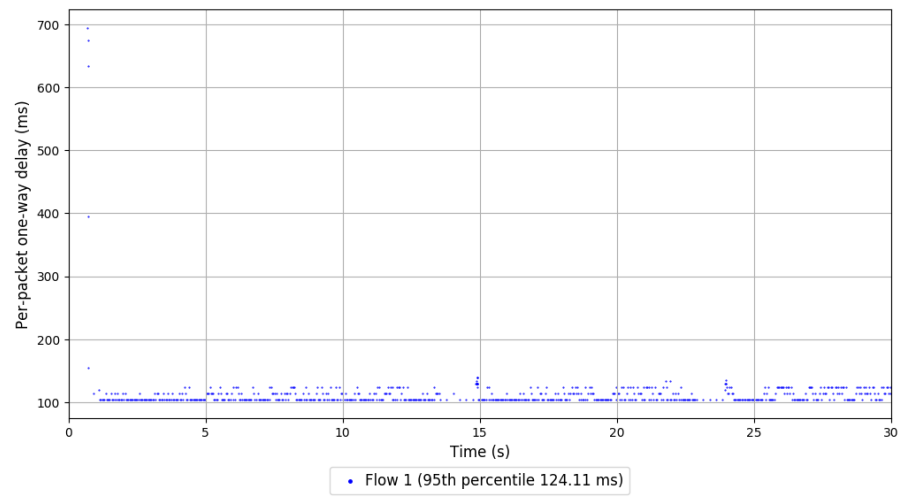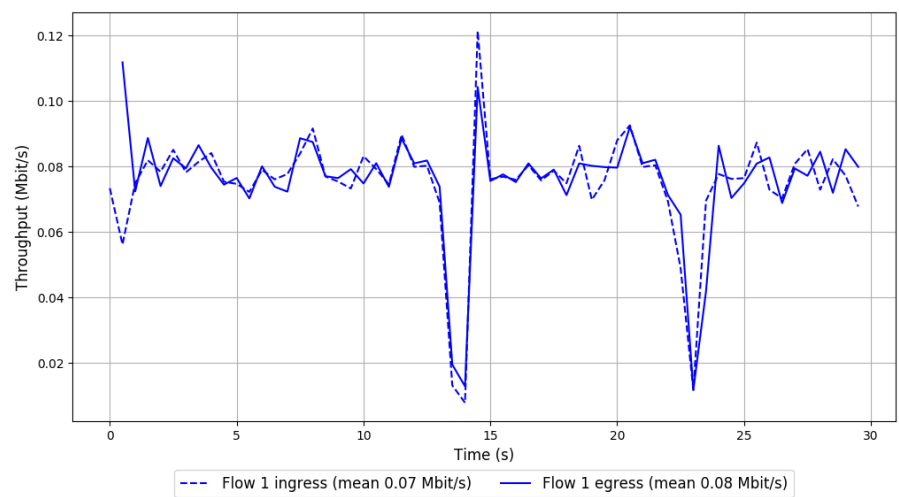Flow 1 (95th percentile 794.80 ms)

```
Run 1: Statistics of SCReAM

Start at: 2017-08-10 18:40:55
End at: 2017-08-10 18:41:25
Local clock offset: 0.896 ms
Remote clock offset: -2.006 ms


# Below is generated by plot.py at 2017-08-10 19:21:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 124.111 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 124.111 ms
Loss rate: 0.43%
```

Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2017-08-10 18:58:34
End at: 2017-08-10 18:59:04
Local clock offset: 0.836 ms
Remote clock offset: 3.142 ms
```
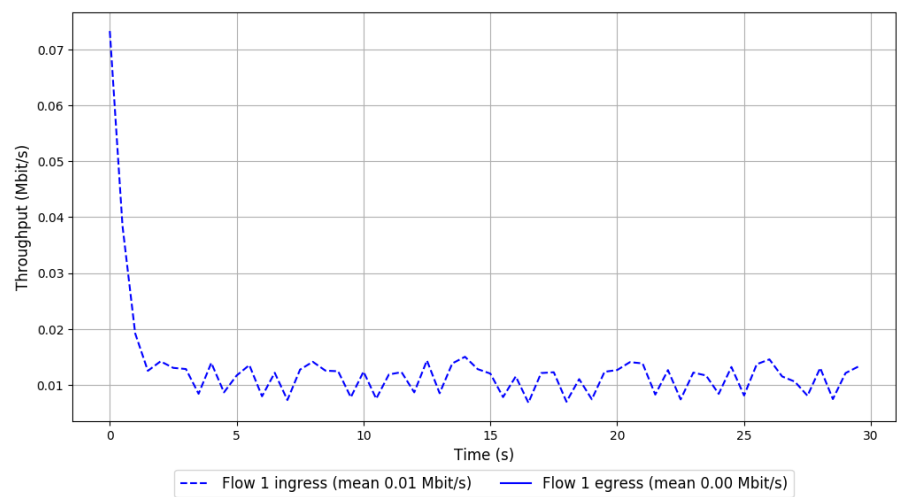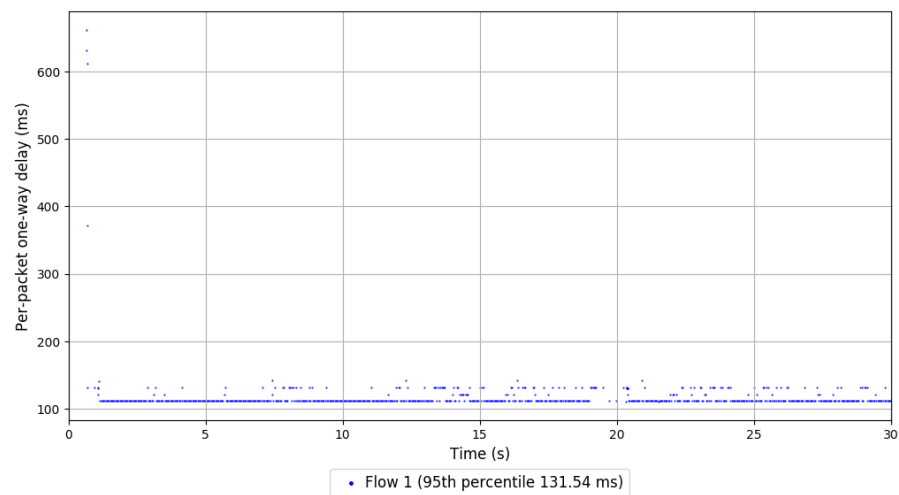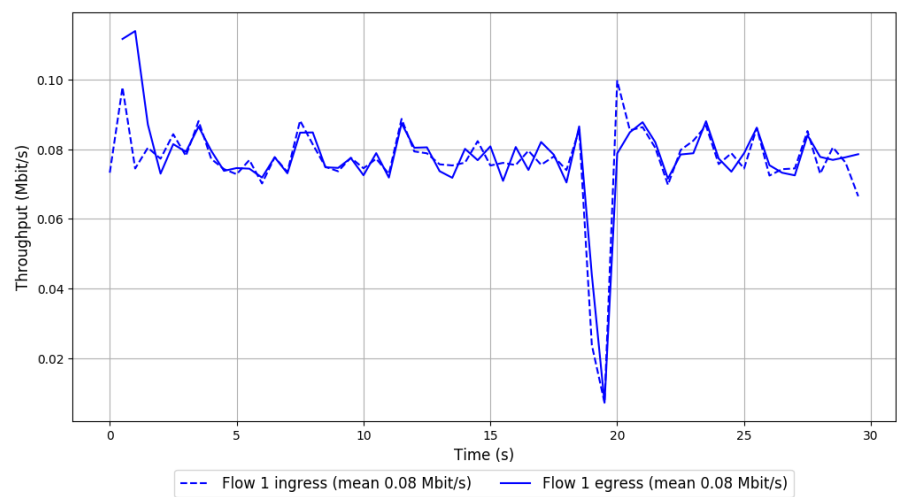
Run 2: Report of SCReAM — Data Link

Figure is missing

```
Run 3: Statistics of SCReAM

Start at: 2017-08-10 19:16:14
End at: 2017-08-10 19:16:44
Local clock offset: 0.7 ms
Remote clock offset: -1.929 ms


# Below is generated by plot.py at 2017-08-10 19:21:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 131.542 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 131.542 ms
Loss rate: 0.13%
```

Run 3: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.08 Mbit/s)   Flow 1 egress (mean 0.08 Mbit/s)

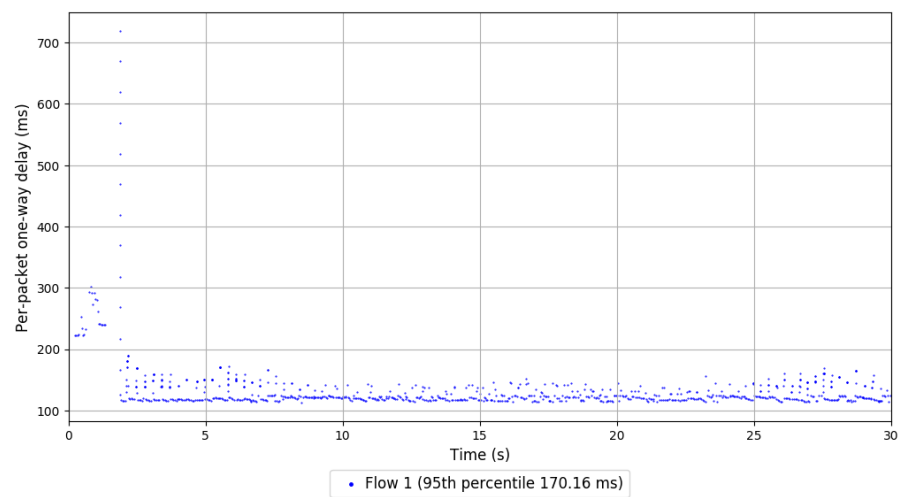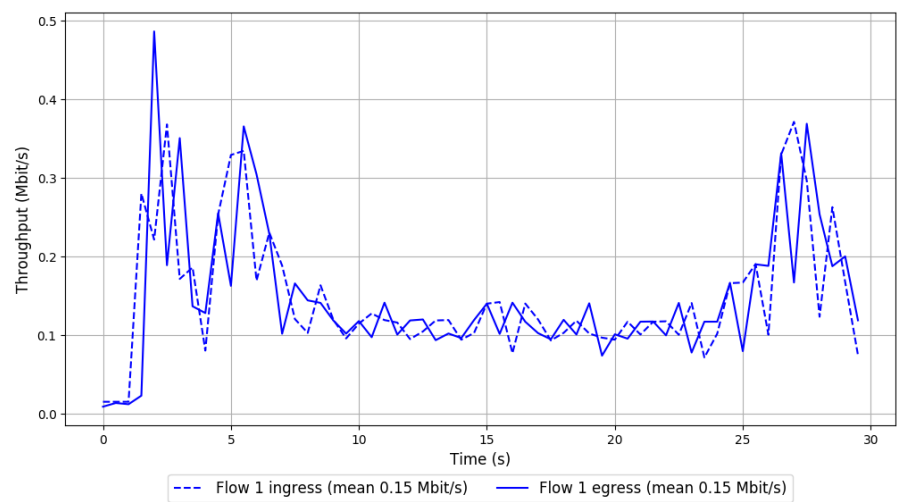Flow 1 (95th percentile 131.54 ms)

```
Run 1: Statistics of Sprout

Start at: 2017-08-10 18:29:08
End at: 2017-08-10 18:29:39
Local clock offset: 0.833 ms
Remote clock offset: -1.916 ms


# Below is generated by plot.py at 2017-08-10 19:21:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 170.158 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 170.158 ms
Loss rate: 0.04%
```

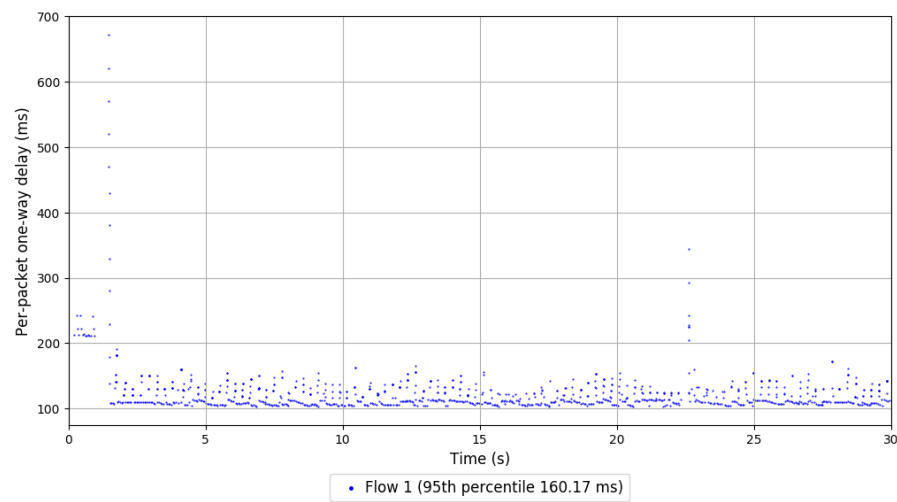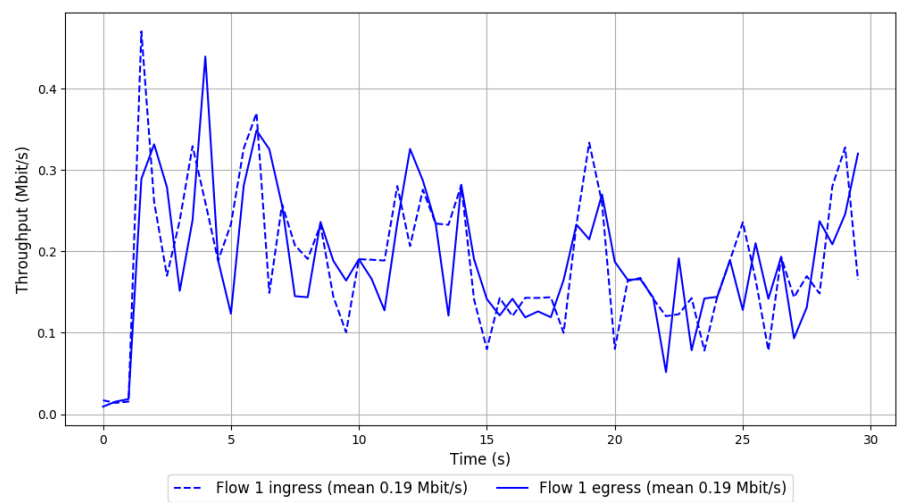Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2017-08-10 18:46:48
End at: 2017-08-10 18:47:18
Local clock offset: 0.816 ms
Remote clock offset: -1.814 ms


# Below is generated by plot.py at 2017-08-10 19:21:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 160.173 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 160.173 ms
Loss rate: 0.01%
```

Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2017-08-10 19:04:26
End at: 2017-08-10 19:04:56
Local clock offset: 0.865 ms
Remote clock offset: 3.121 ms


# Below is generated by plot.py at 2017-08-10 19:21:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 158.843 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 158.843 ms
Loss rate: 0.20%
```
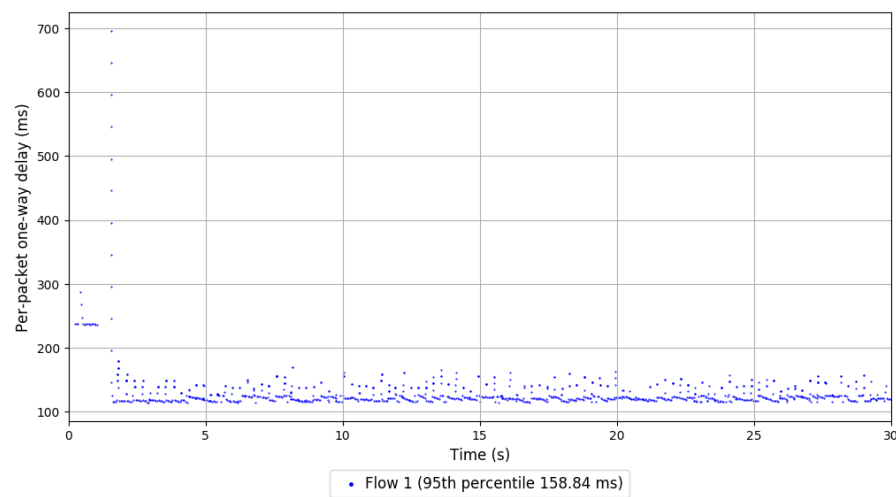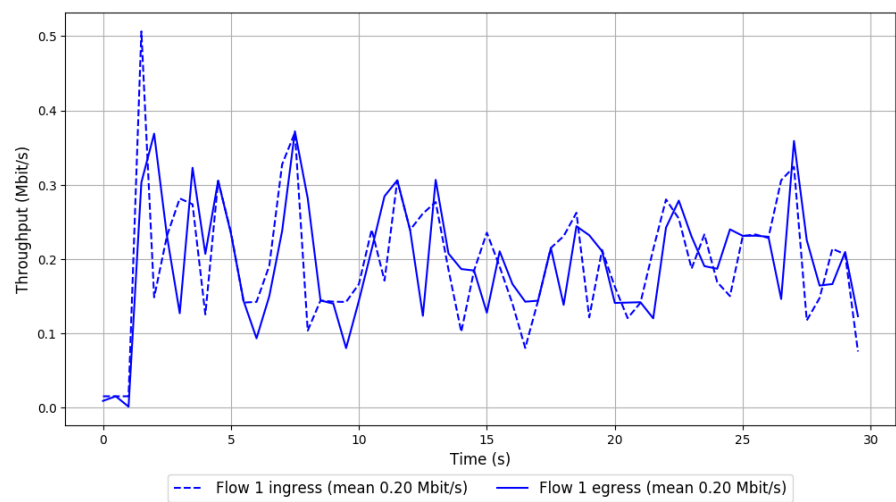
Run 3: Report of Sprout — Data Link
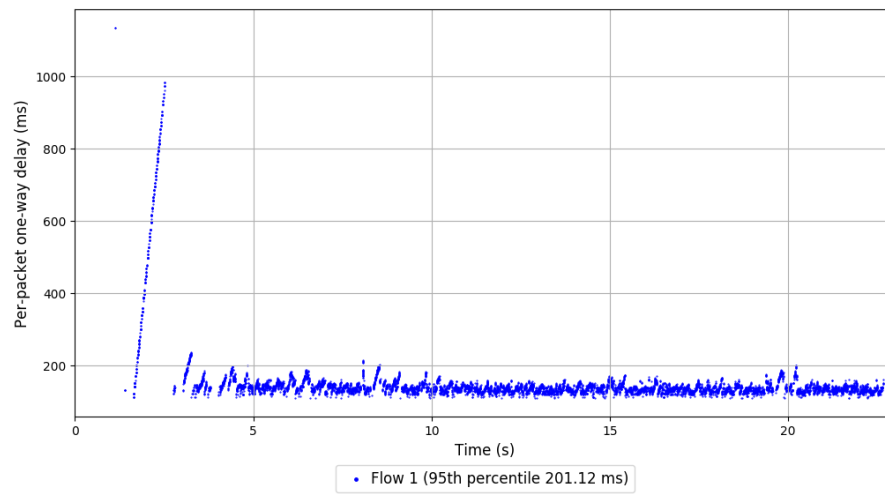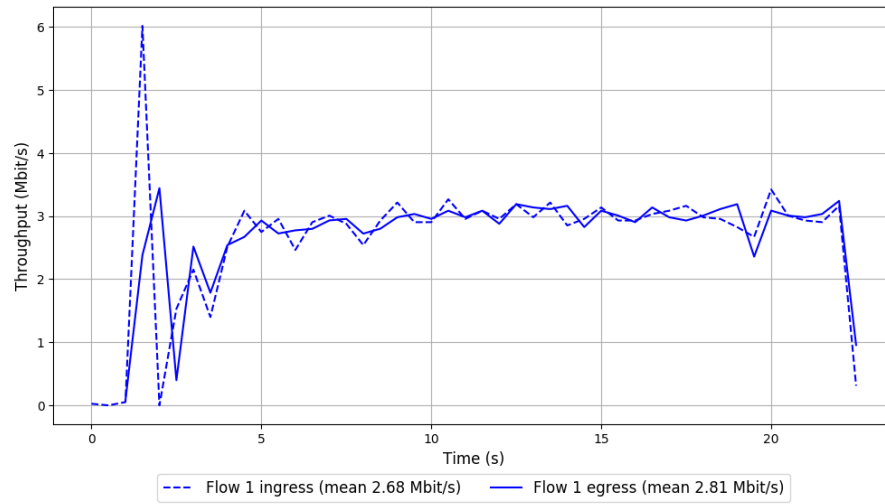
```
Run 1: Statistics of TaoVA-100x

Start at: 2017-08-10 18:44:27
End at: 2017-08-10 18:44:57
Local clock offset: 0.802 ms
Remote clock offset: 3.017 ms
```

Run 1: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 2.68 Mbit/s)   Flow 1 egress (mean 2.81 Mbit/s)

Flow 1 (95th percentile 201.12 ms)

```
Run 2: Statistics of TaoVA-100x

Start at: 2017-08-10 19:02:05
End at: 2017-08-10 19:02:35
Local clock offset: 0.828 ms
Remote clock offset: 3.106 ms


# Below is generated by plot.py at 2017-08-10 19:21:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 250.928 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 250.928 ms
Loss rate: 0.24%
```
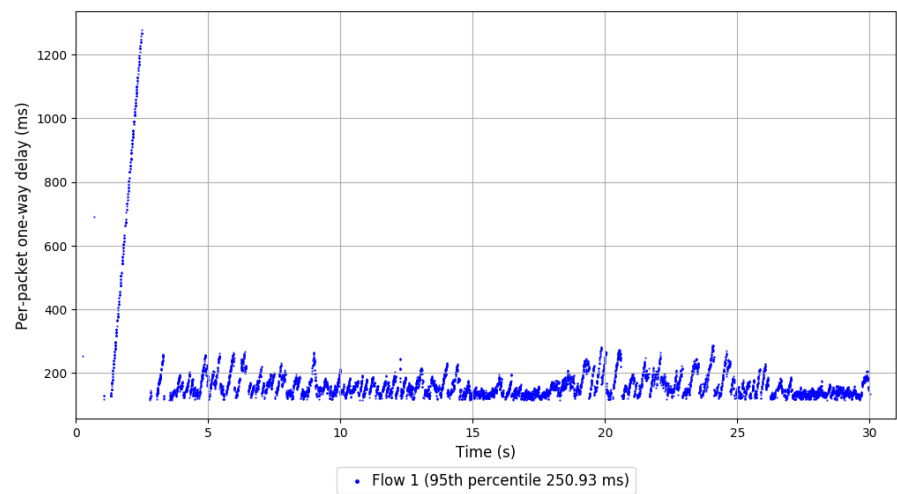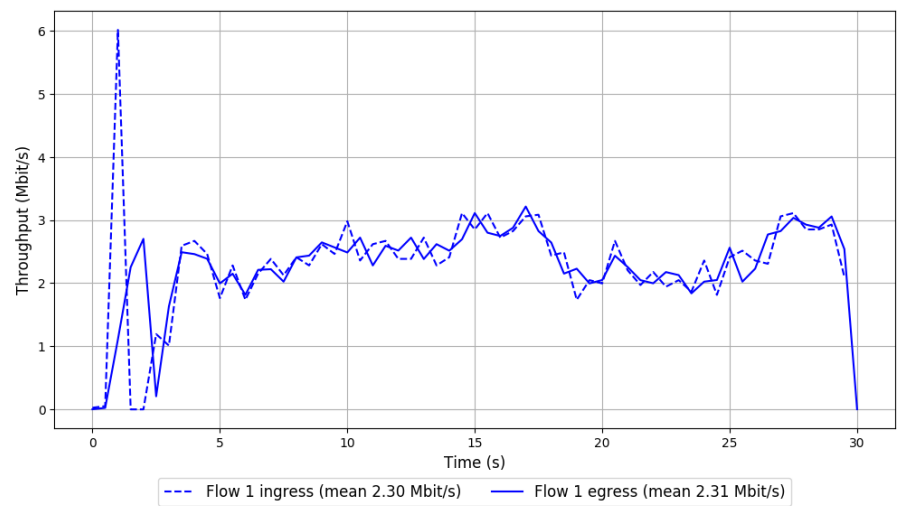
Run 2: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 2.30 Mbit/s) --- Flow 1 egress (mean 2.31 Mbit/s)

Flow 1 (95th percentile 250.93 ms)

```
Run 3: Statistics of TaoVA-100x

Start at: 2017-08-10 19:19:45
End at: 2017-08-10 19:20:15
Local clock offset: 0.748 ms
Remote clock offset: -2.075 ms


# Below is generated by plot.py at 2017-08-10 19:21:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 203.167 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 203.167 ms
Loss rate: 0.06%
```
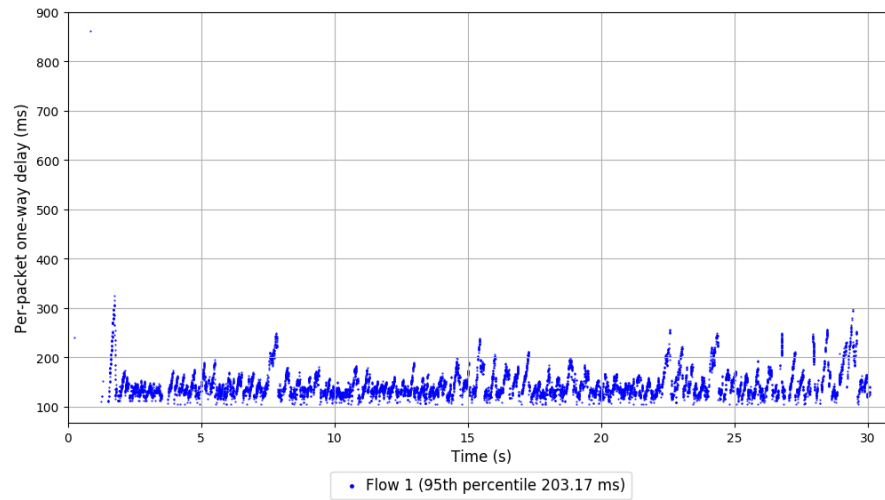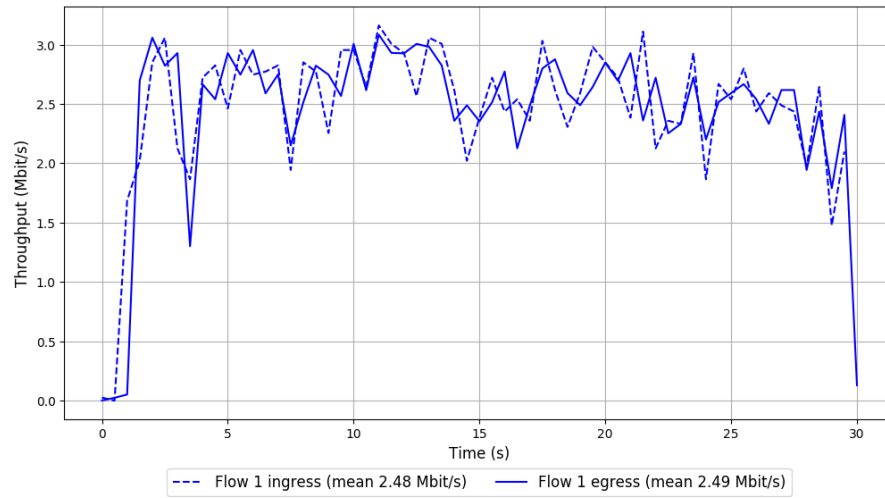
Run 3: Report of TaoVA-100x — Data Link

```
Run 1: Statistics of TCP Vegas

Start at: 2017-08-10 18:33:51
End at: 2017-08-10 18:34:21
Local clock offset: 0.939 ms
Remote clock offset: 2.981 ms


# Below is generated by plot.py at 2017-08-10 19:21:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 455.662 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 455.662 ms
Loss rate: 0.50%
```
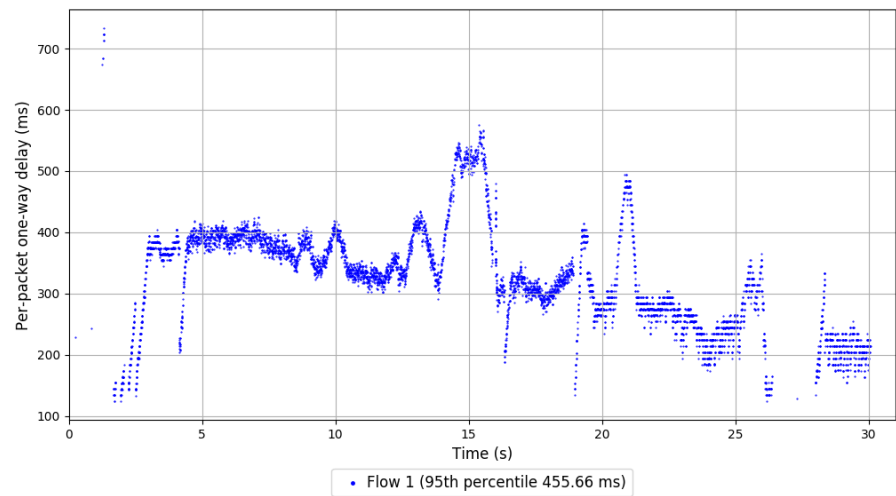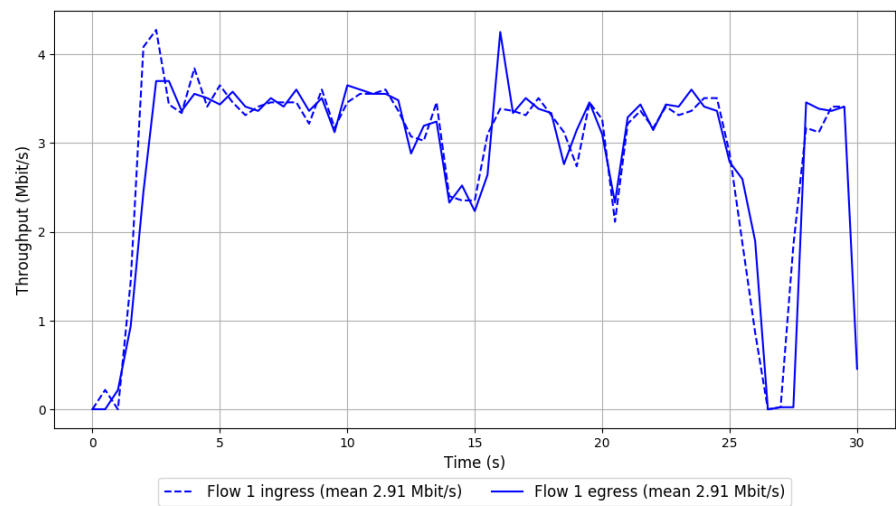
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2017-08-10 18:51:31
End at: 2017-08-10 18:52:01
Local clock offset: 0.775 ms
Remote clock offset: 2.861 ms


# Below is generated by plot.py at 2017-08-10 19:21:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 467.130 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 467.130 ms
Loss rate: 0.24%
```
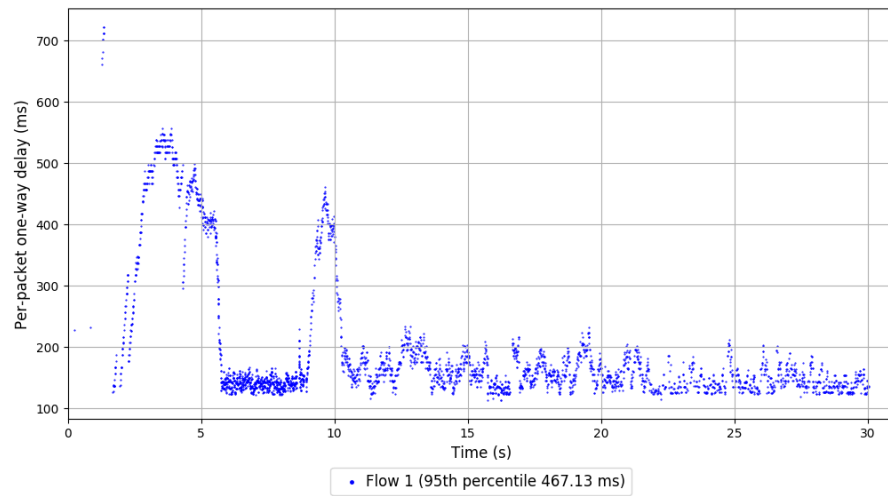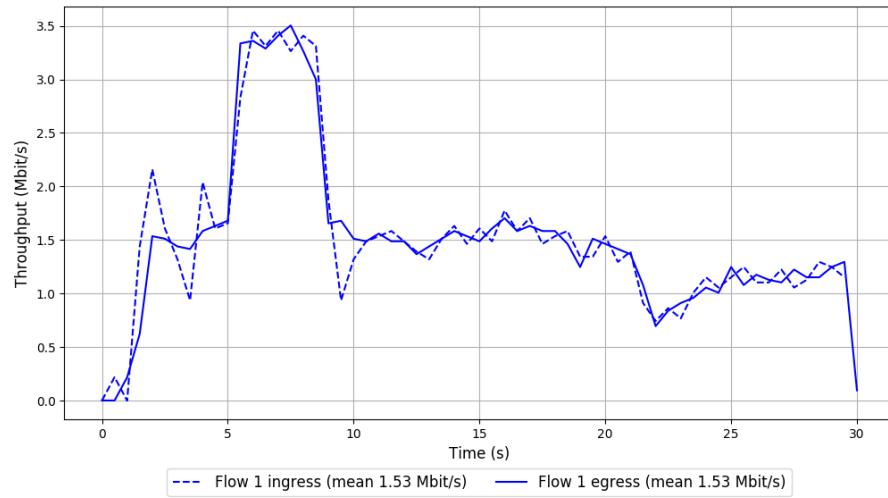
Run 2: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 1.53 Mbit/s) --- Flow 1 egress (mean 1.53 Mbit/s)
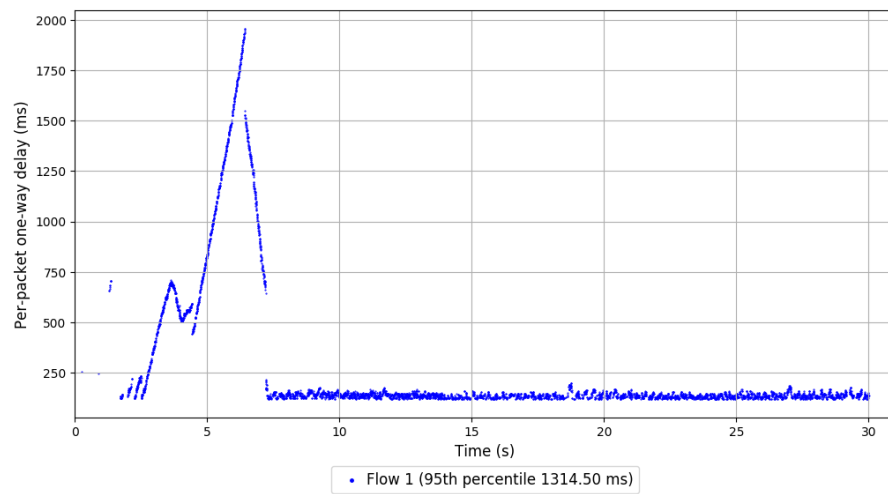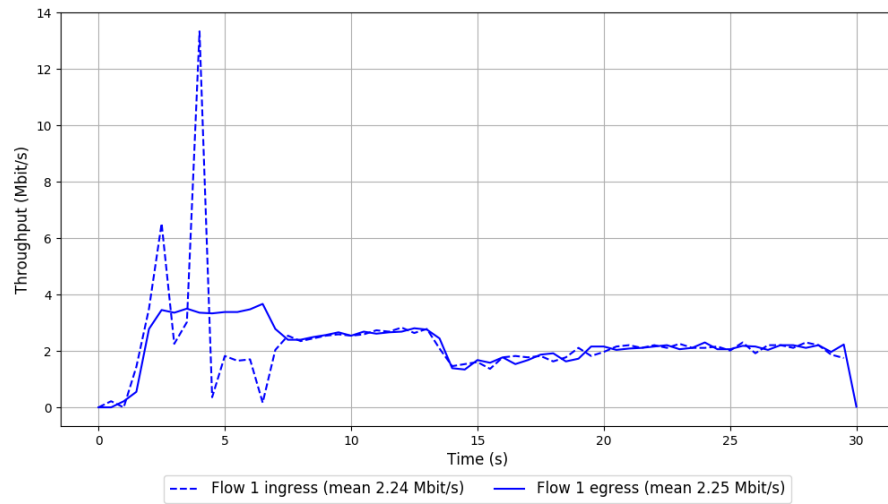

Flow 1 (95th percentile 467.13 ms)

```
Run 3: Statistics of TCP Vegas

Start at: 2017-08-10 19:09:11
End at: 2017-08-10 19:09:41
Local clock offset: 0.79 ms
Remote clock offset: -1.912 ms


# Below is generated by plot.py at 2017-08-10 19:21:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 1314.502 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 1314.502 ms
Loss rate: 0.18%
```

Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 2.24 Mbit/s)   Flow 1 egress (mean 2.25 Mbit/s)

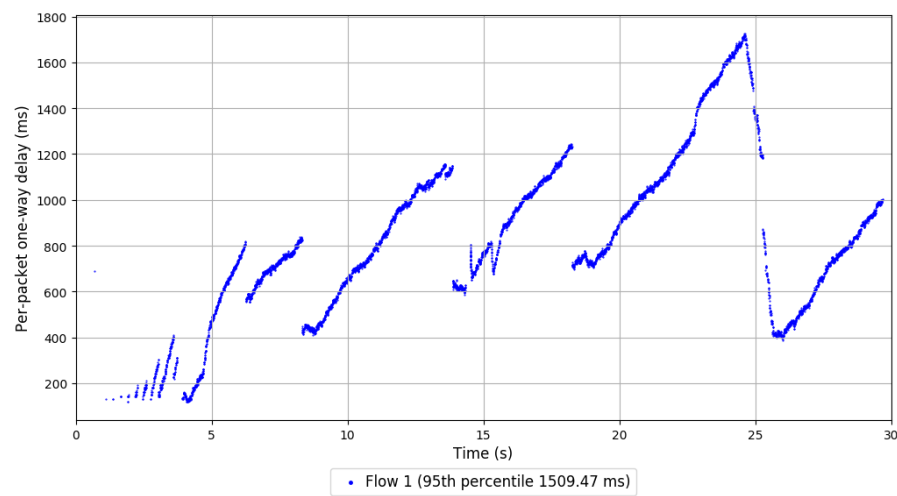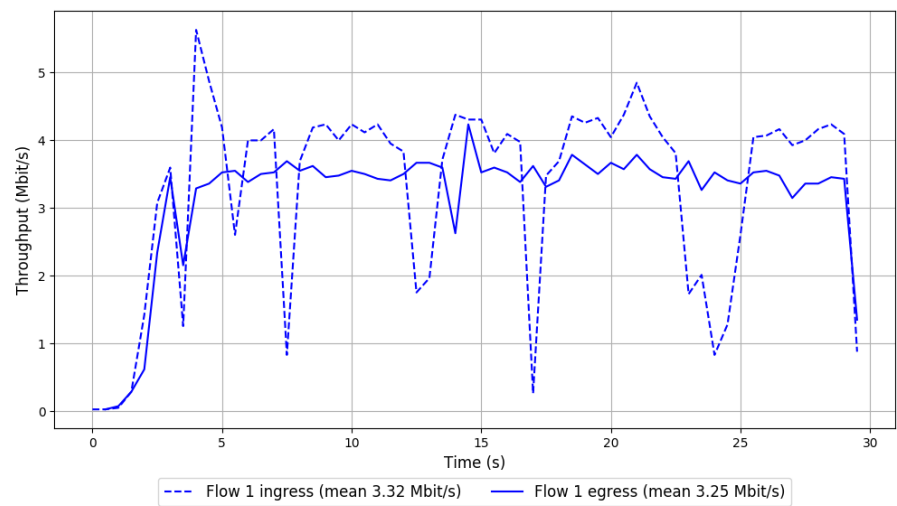Flow 1 (95th percentile 1314.50 ms)

```
Run 1: Statistics of Verus

Start at: 2017-08-10 18:38:33
End at: 2017-08-10 18:39:03
Local clock offset: 0.895 ms
Remote clock offset: -1.864 ms

# Below is generated by plot.py at 2017-08-10 19:21:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.25 Mbit/s
95th percentile per-packet one-way delay: 1509.472 ms
Loss rate: 4.03%
-- Flow 1:
Average throughput: 3.25 Mbit/s
95th percentile per-packet one-way delay: 1509.472 ms
Loss rate: 4.03%
```

Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2017-08-10 18:56:13
End at: 2017-08-10 18:56:43
Local clock offset: 0.859 ms
Remote clock offset: 3.0 ms


# Below is generated by plot.py at 2017-08-10 19:21:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.42 Mbit/s
95th percentile per-packet one-way delay: 1392.838 ms
Loss rate: 3.23%
-- Flow 1:
Average throughput: 3.42 Mbit/s
95th percentile per-packet one-way delay: 1392.838 ms
Loss rate: 3.23%
```
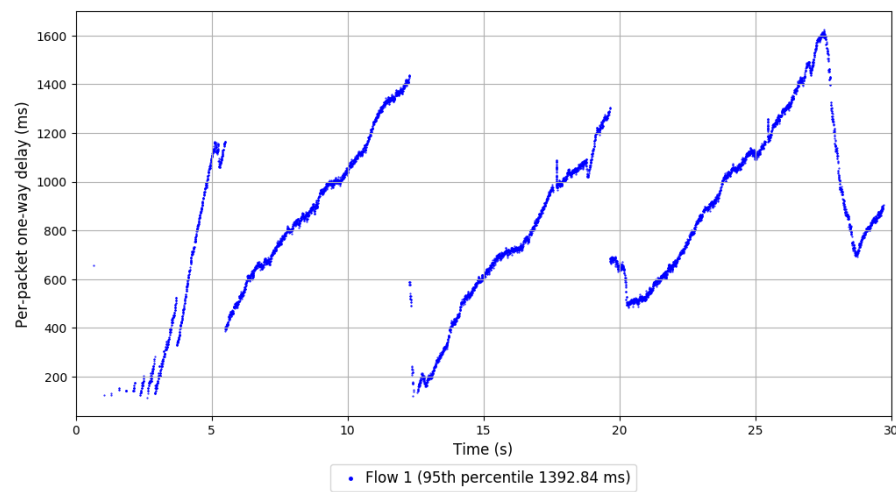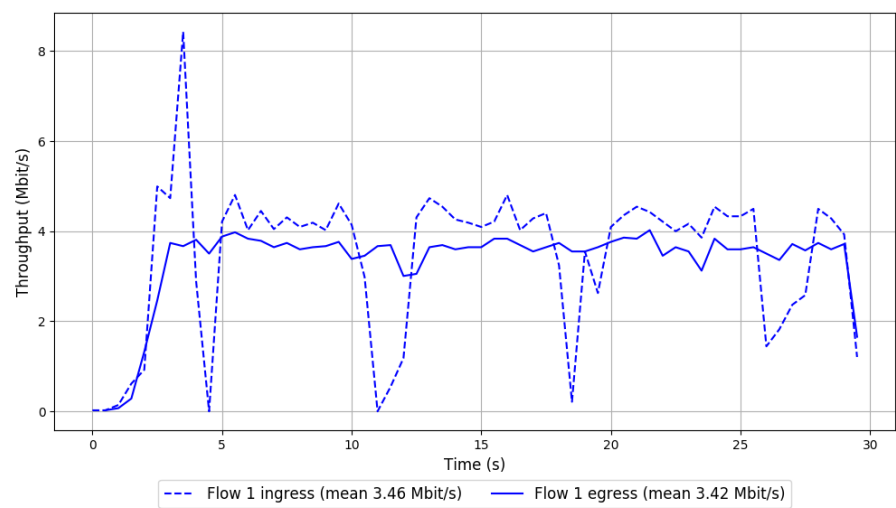
Run 2: Report of Verus — Data Link
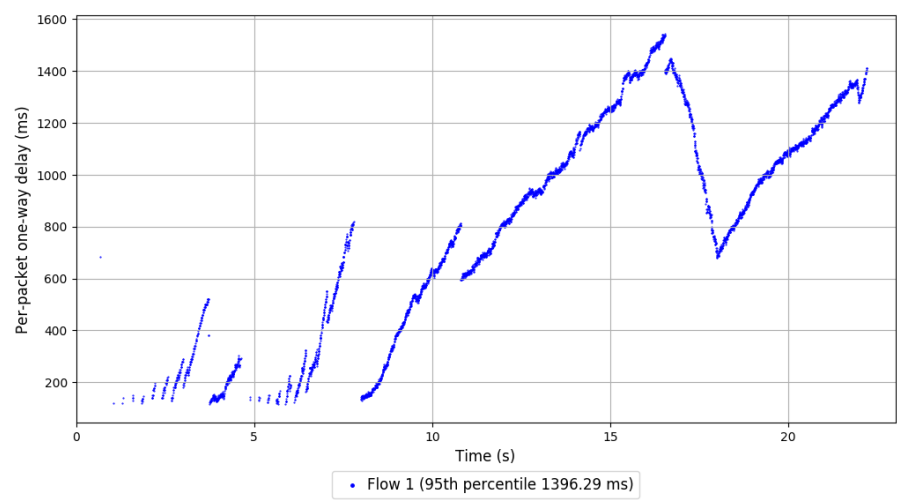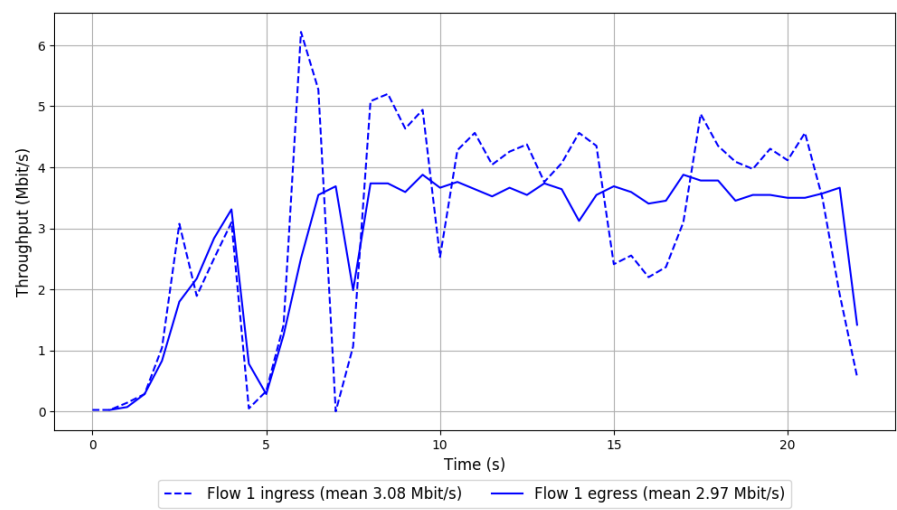
```
Run 3: Statistics of Verus

Start at: 2017-08-10 19:13:53
End at: 2017-08-10 19:14:23
Local clock offset: 0.786 ms
Remote clock offset: -1.955 ms
```

Run 3: Report of Verus — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2017-08-10 18:30:19
End at: 2017-08-10 18:30:49
Local clock offset: 0.912 ms
Remote clock offset: 2.954 ms


# Below is generated by plot.py at 2017-08-10 19:21:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 181.474 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 181.474 ms
Loss rate: 0.78%
```
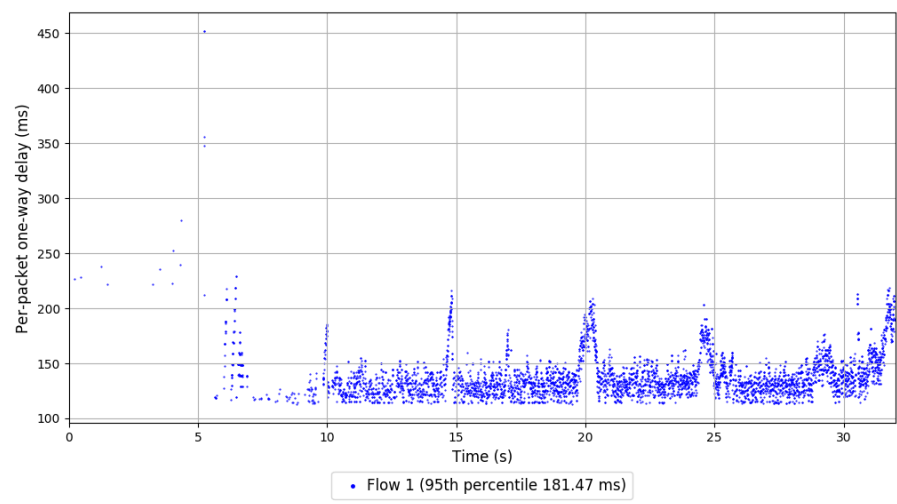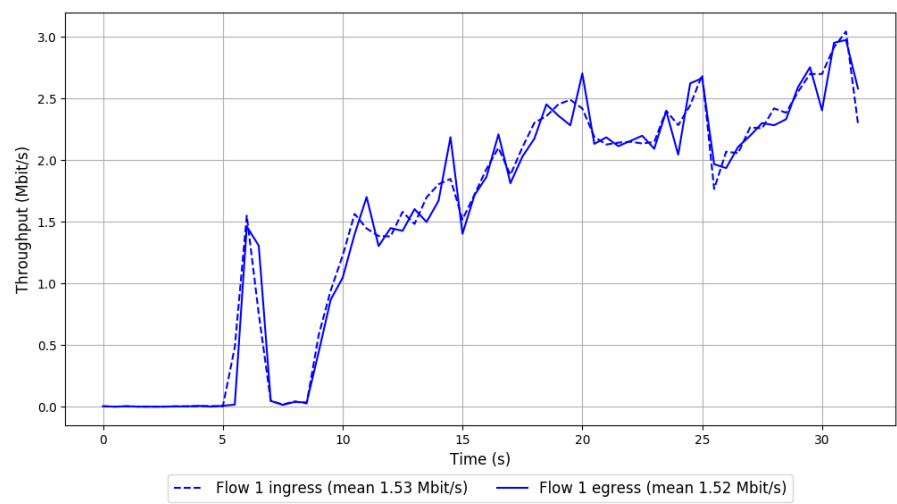
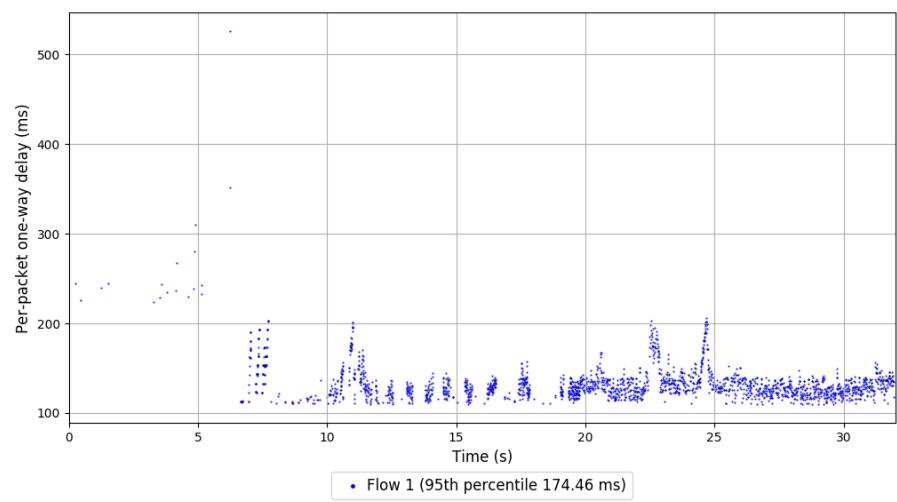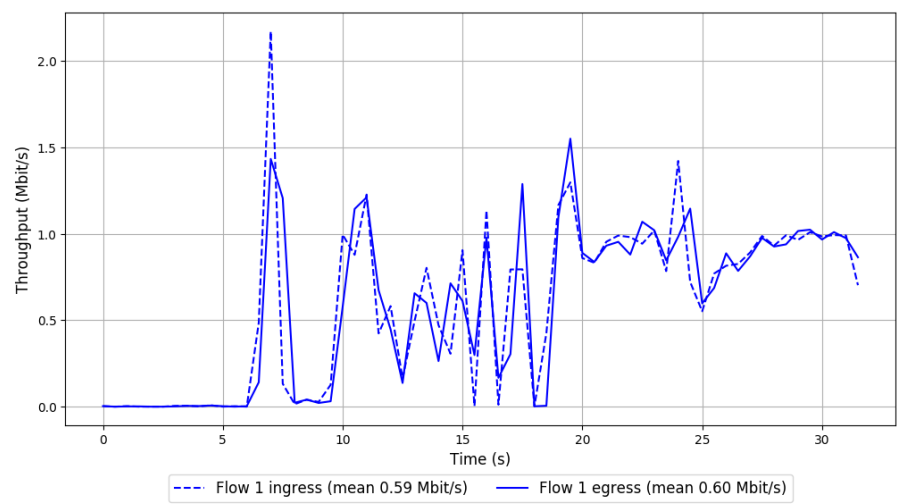Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2017-08-10 18:47:59
End at: 2017-08-10 18:48:29
Local clock offset: 0.81 ms
Remote clock offset: -2.007 ms


# Below is generated by plot.py at 2017-08-10 19:21:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 174.455 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 174.455 ms
Loss rate: 0.25%
```

Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2017-08-10 19:05:38
End at: 2017-08-10 19:06:08
Local clock offset: 0.826 ms
Remote clock offset: -1.907 ms


# Below is generated by plot.py at 2017-08-10 19:21:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 169.092 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 169.092 ms
Loss rate: 0.29%
```

Run 3: Report of WebRTC media — Data Link

Flow 1 ingress (mean 1.91 Mbit/s)   Flow 1 egress (mean 1.93 Mbit/s)

Flow 1 (95th percentile 169.09 ms)