Pantheon Report

Generated at 2017-08-21 06:16:03 (UTC).

Data path: Stanford ppp0 (*remote*) →AWS California 1 Ethernet (*local*).

Repeated the test of 15 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

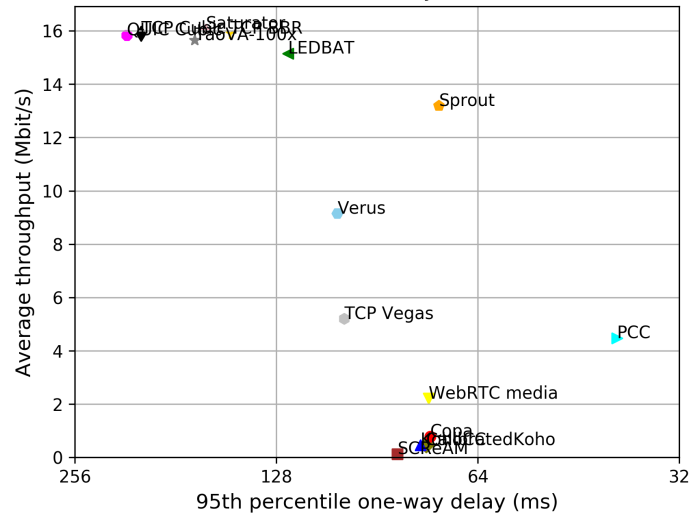Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

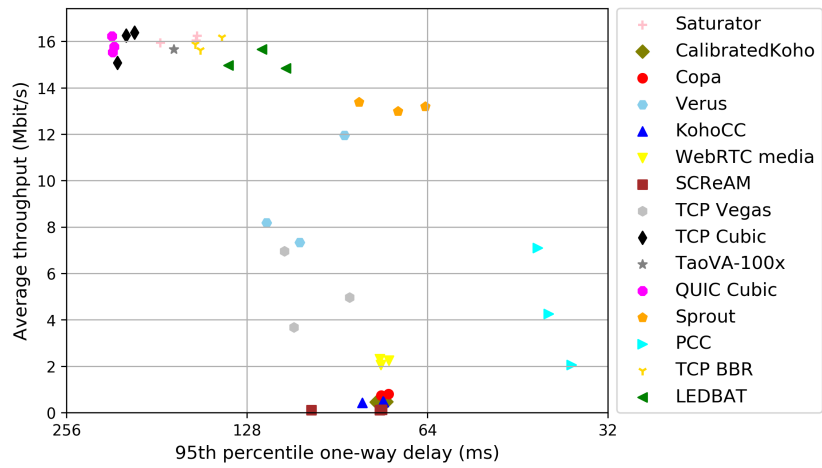NTP offsets were measured against `time.stanford.edu` and have been applied to correct the timestamps in logs.

```
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
 M scripts/merge-tunnel-logs
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 Stanford ppp0 to AWS California 1 Ethernet, 3 runs of 30s each per scheme
(mean of all runs by scheme)

test from Stanford ppp0 to AWS California 1 Ethernet, 3 runs of 30s each per scheme

2

scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	15.89	150.07	0.42
CalibratedKoho	2	0.47	76.45	0.69
Copa	2	0.78	75.42	0.14
TCP Cubic	3	15.90	203.84	0.73
KohoCC	3	0.46	77.97	0.66
LEDBAT	3	15.16	122.92	0.42
PCC	3	4.47	39.64	0.16
QUIC Cubic	3	15.84	214.30	1.17
Saturator	3	16.08	163.17	0.52
SCReAM	3	0.12	84.40	0.41
Sprout	3	13.19	73.18	0.93
TaoVA-100x	1	15.65	169.56	0.57
TCP Vegas	3	5.20	101.42	0.04
Verus	3	9.16	103.79	28.16
WebRTC media	3	2.21	75.87	0.36

```
Run 1: Statistics of TCP BBR

Start at: 2017-08-21 04:39:05
End at: 2017-08-21 04:39:35
Local clock offset: 0.202 ms
Remote clock offset: -1.4 ms

# Below is generated by plot.py at 2017-08-21 06:15:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.62 Mbit/s
95th percentile per-packet one-way delay: 153.159 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 15.62 Mbit/s
95th percentile per-packet one-way delay: 153.159 ms
Loss rate: 0.52%
```
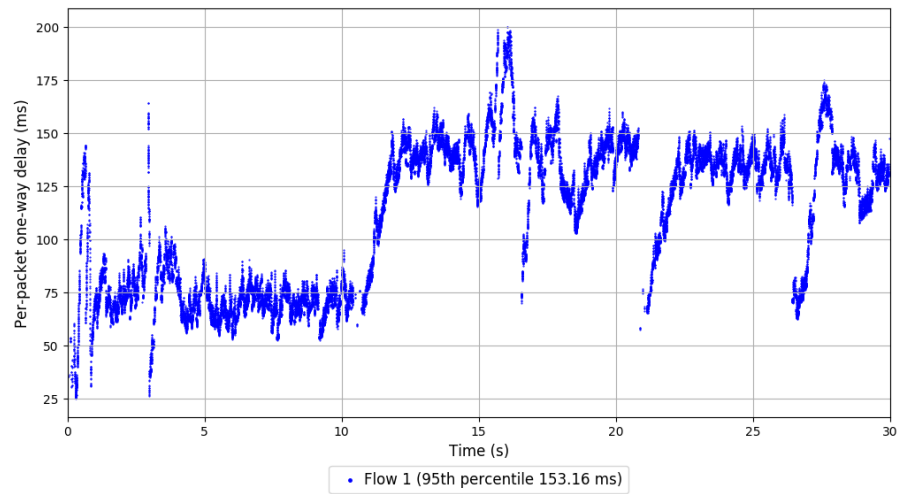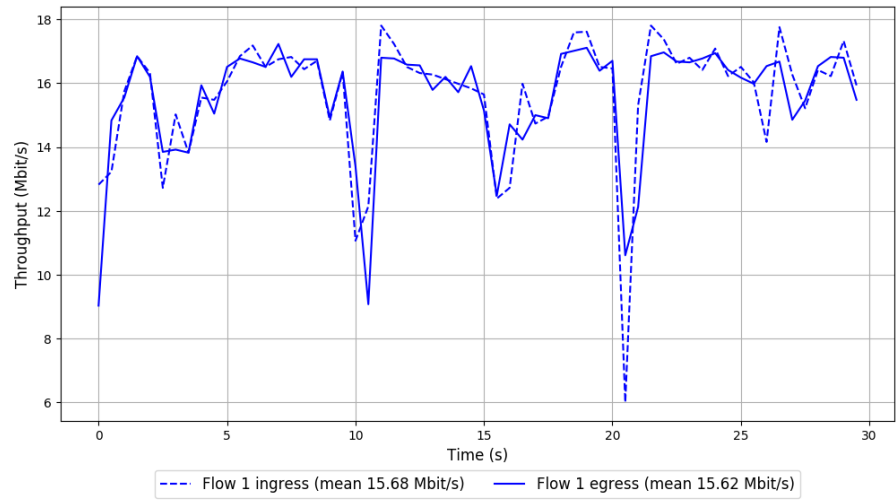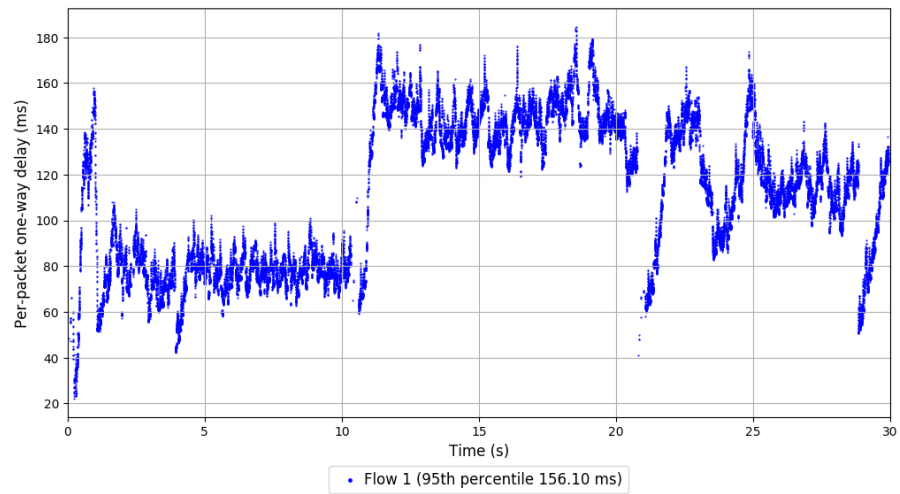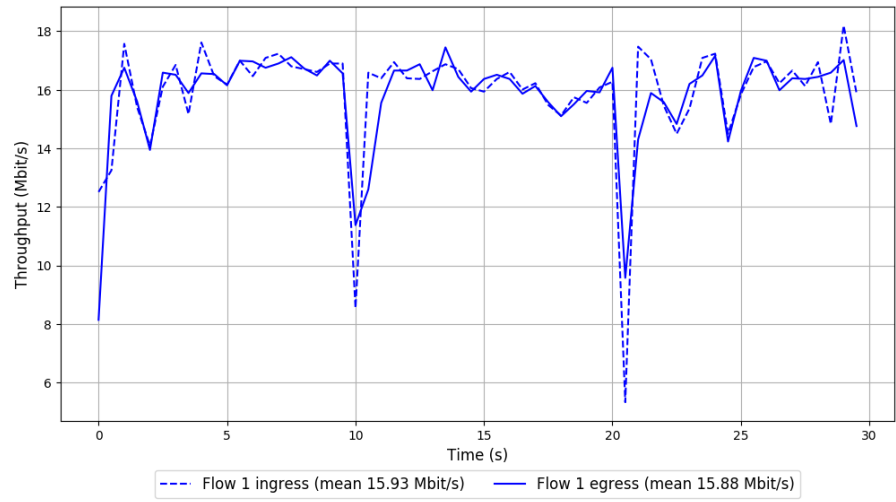
Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 15.68 Mbit/s)   Flow 1 egress (mean 15.62 Mbit/s)

Flow 1 (95th percentile 153.16 ms)

```
Run 2: Statistics of TCP BBR

Start at: 2017-08-21 04:56:46
End at: 2017-08-21 04:57:16
Local clock offset: 0.095 ms
Remote clock offset: -1.282 ms


# Below is generated by plot.py at 2017-08-21 06:15:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.88 Mbit/s
95th percentile per-packet one-way delay: 156.099 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 15.88 Mbit/s
95th percentile per-packet one-way delay: 156.099 ms
Loss rate: 0.51%
```

Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2017-08-21 05:14:27
End at: 2017-08-21 05:14:57
Local clock offset: 0.226 ms
Remote clock offset: -1.235 ms


# Below is generated by plot.py at 2017-08-21 06:15:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.18 Mbit/s
95th percentile per-packet one-way delay: 140.942 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 16.18 Mbit/s
95th percentile per-packet one-way delay: 140.942 ms
Loss rate: 0.24%
```
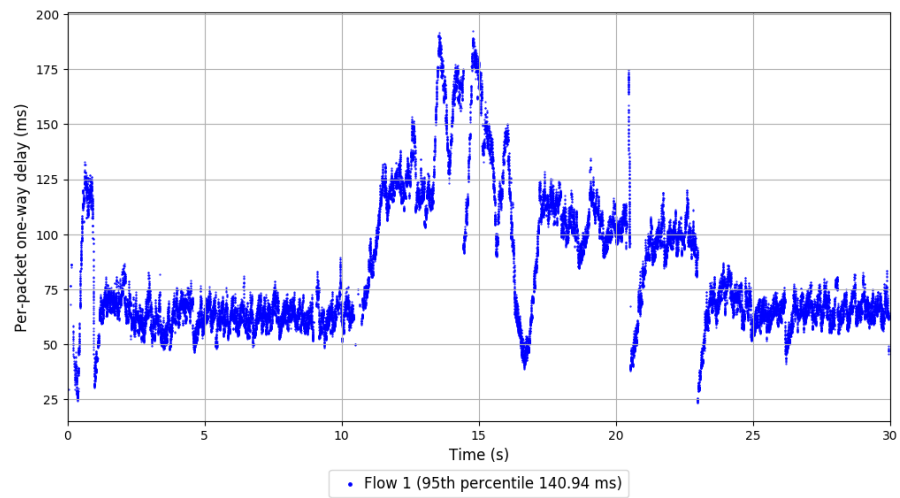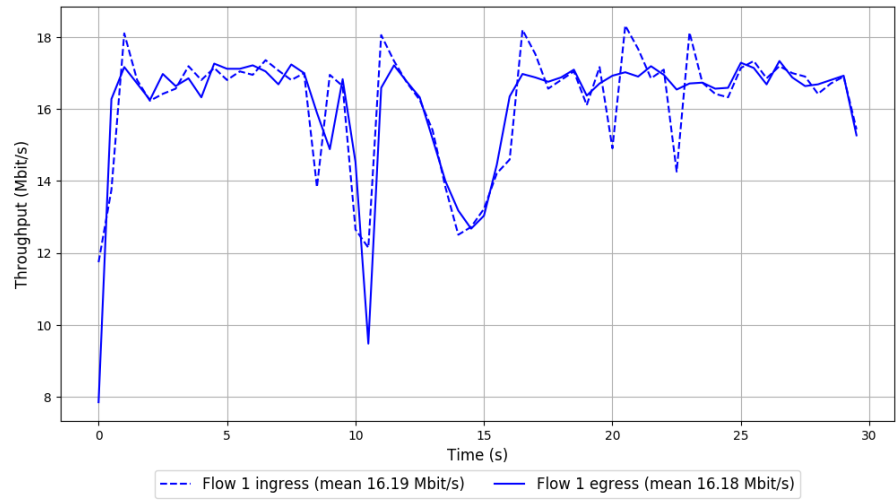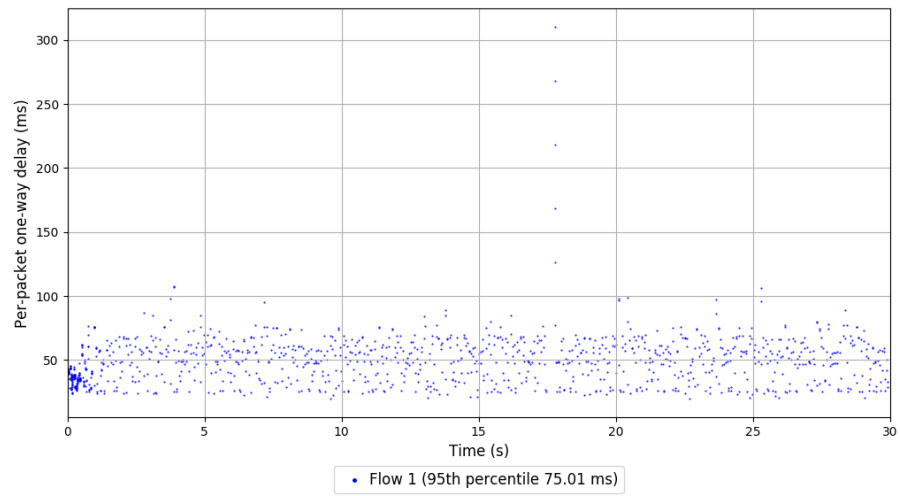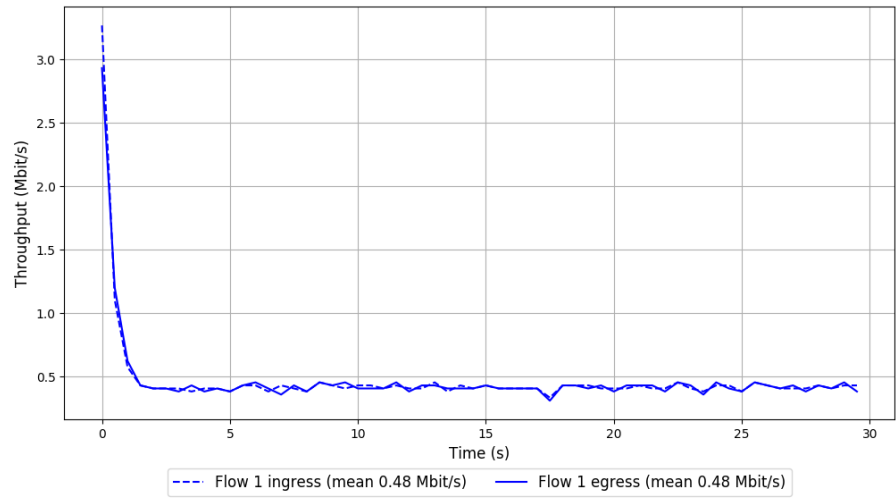
Run 3: Report of TCP BBR — Data Link
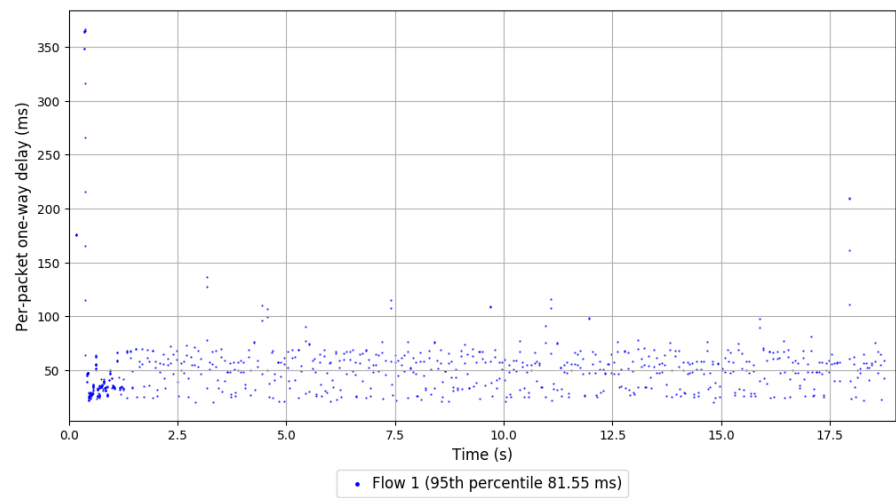
```
Run 1: Statistics of CalibratedKoho

Start at: 2017-08-21 04:37:54
End at: 2017-08-21 04:38:24
Local clock offset: 0.177 ms
Remote clock offset: -1.446 ms


# Below is generated by plot.py at 2017-08-21 06:15:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 75.013 ms
Loss rate: 0.84%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 75.013 ms
Loss rate: 0.84%
```

Run 1: Report of CalibratedKoho — Data Link
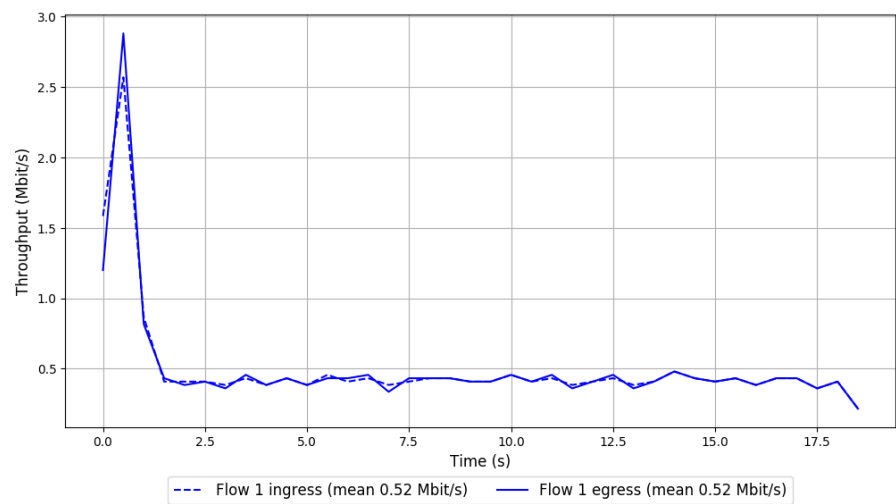
Run 2: Statistics of CalibratedKoho

Start at: 2017-08-21 04:55:36
End at: 2017-08-21 04:56:06
Local clock offset: 0.174 ms
Remote clock offset: -1.305 ms

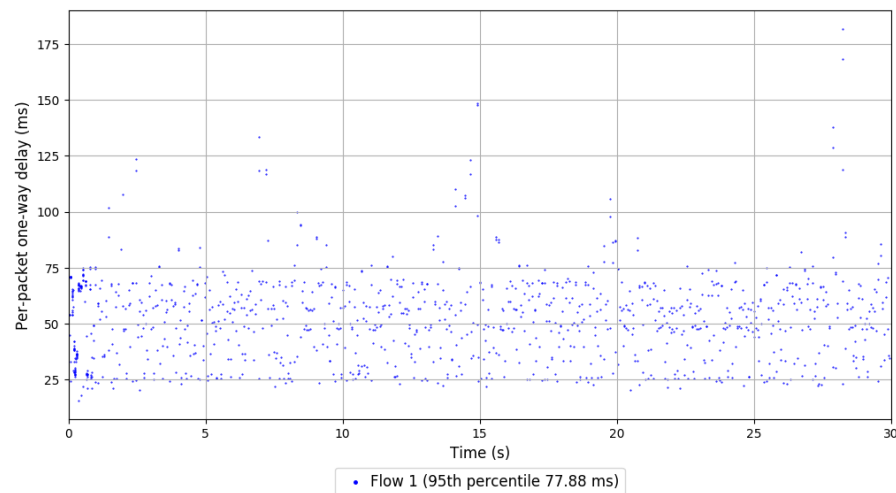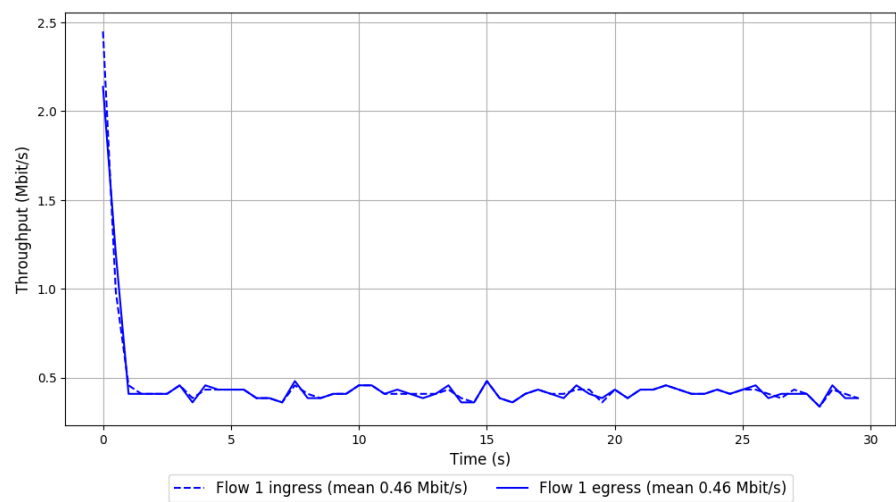# Run 2: Report of CalibratedKoho — Data Link

```
Run 3: Statistics of CalibratedKoho

Start at: 2017-08-21 05:13:16
End at: 2017-08-21 05:13:46
Local clock offset: 0.296 ms
Remote clock offset: -1.321 ms


# Below is generated by plot.py at 2017-08-21 06:15:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 77.883 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 77.883 ms
Loss rate: 0.53%
```

Run 3: Report of CalibratedKoho — Data Link

Flow 1 ingress (mean 0.46 Mbit/s)   Flow 1 egress (mean 0.46 Mbit/s)
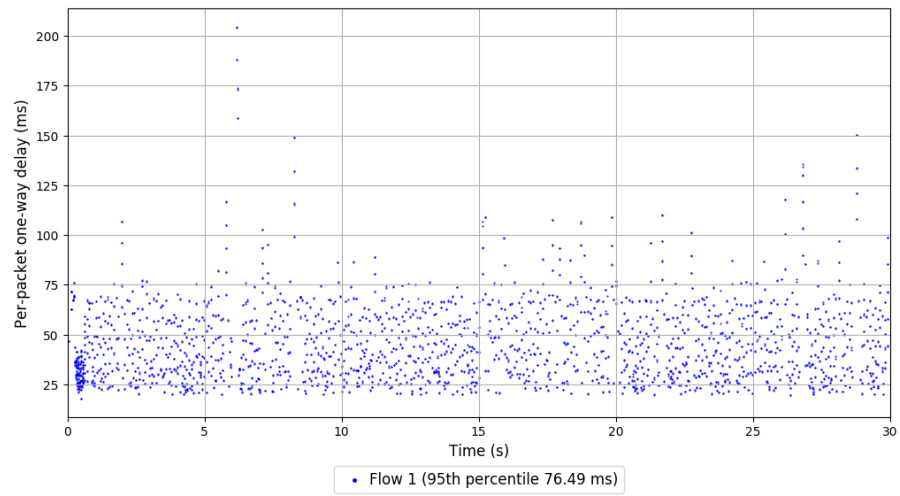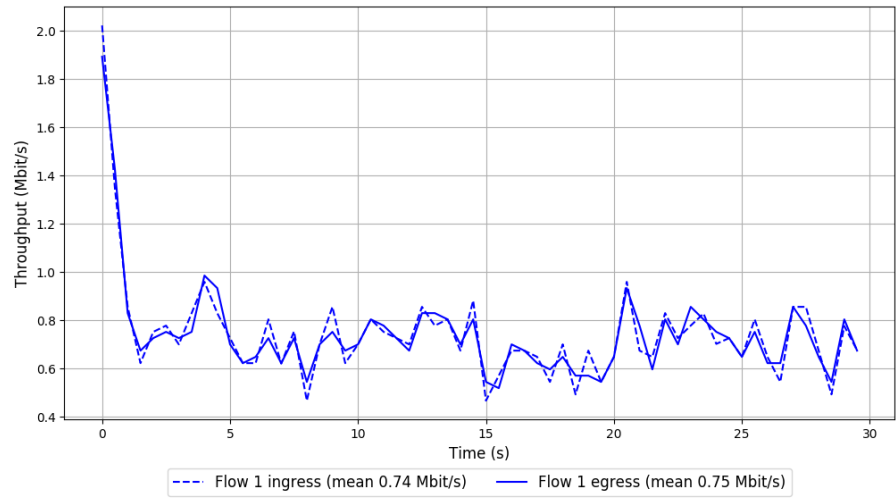

Flow 1 (95th percentile 77.88 ms)

```
Run 1: Statistics of Copa

Start at: 2017-08-21 04:33:12
End at: 2017-08-21 04:33:42
Local clock offset: 0.197 ms
Remote clock offset: -1.578 ms


# Below is generated by plot.py at 2017-08-21 06:15:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 76.491 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 76.491 ms
Loss rate: 0.12%
```

Run 1: Report of Copa — Data Link

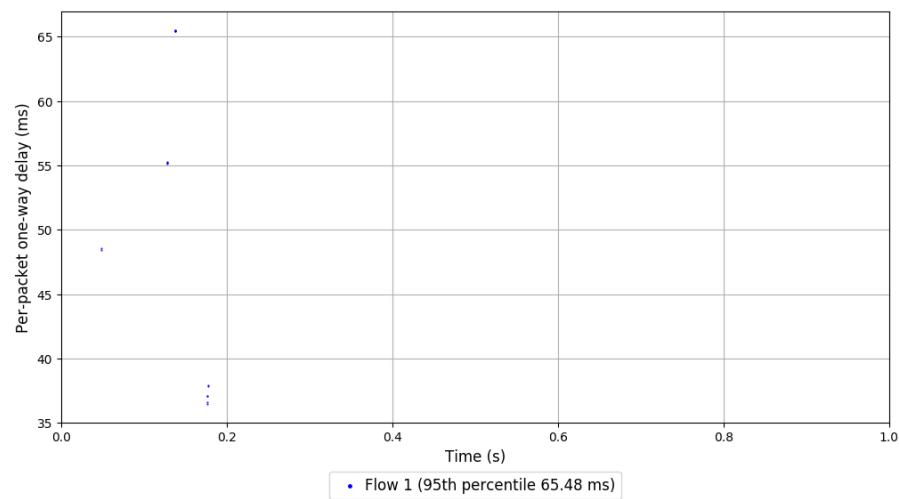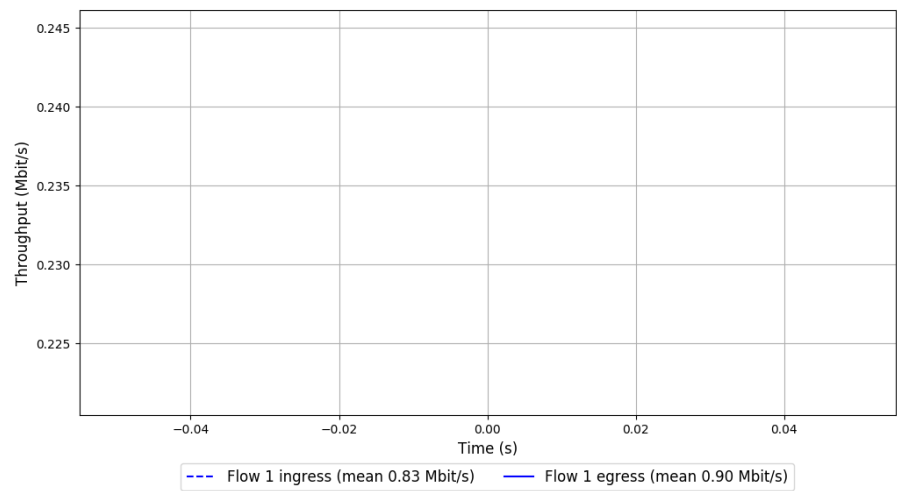```
Run 2: Statistics of Copa

Start at: 2017-08-21 04:50:53
End at: 2017-08-21 04:51:23
Local clock offset: 0.162 ms
Remote clock offset: -1.343 ms
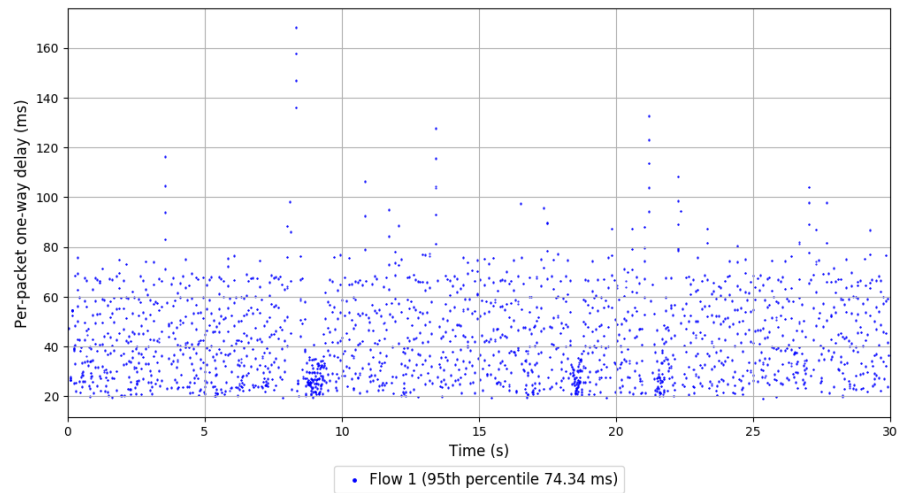```

Run 2: Report of Copa — Data Link

Flow 1 ingress (mean 0.83 Mbit/s)   Flow 1 egress (mean 0.90 Mbit/s)
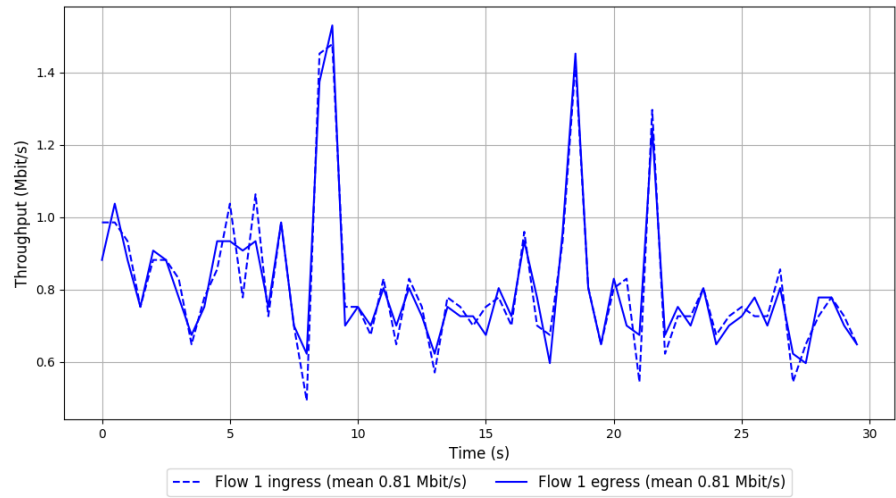

Flow 1 (95th percentile 65.48 ms)

```
Run 3: Statistics of Copa

Start at: 2017-08-21 05:08:34
End at: 2017-08-21 05:09:04
Local clock offset: 0.173 ms
Remote clock offset: -1.303 ms


# Below is generated by plot.py at 2017-08-21 06:15:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 74.340 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 74.340 ms
Loss rate: 0.16%
```

Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 0.81 Mbit/s) --- Flow 1 egress (mean 0.81 Mbit/s)

Flow 1 (95th percentile 74.34 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2017-08-21 04:34:22
End at: 2017-08-21 04:34:53
Local clock offset: 0.217 ms
Remote clock offset: -1.592 ms

# Below is generated by plot.py at 2017-08-21 06:15:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.07 Mbit/s
95th percentile per-packet one-way delay: 210.614 ms
Loss rate: 0.77%
-- Flow 1:
Average throughput: 15.07 Mbit/s
95th percentile per-packet one-way delay: 210.614 ms
Loss rate: 0.77%
```
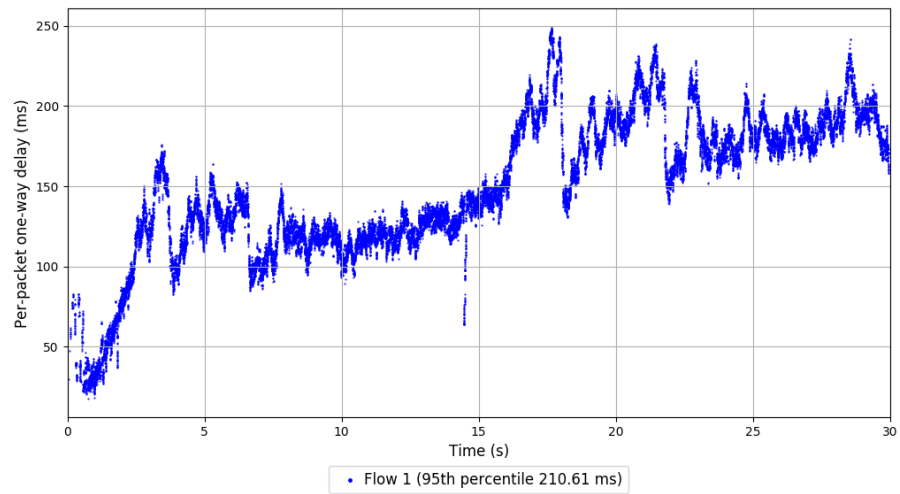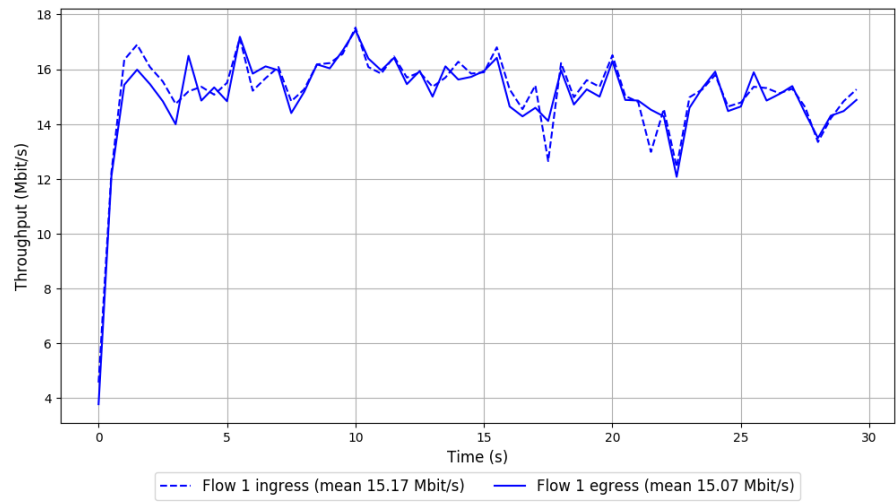
Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 15.17 Mbit/s)   Flow 1 egress (mean 15.07 Mbit/s)

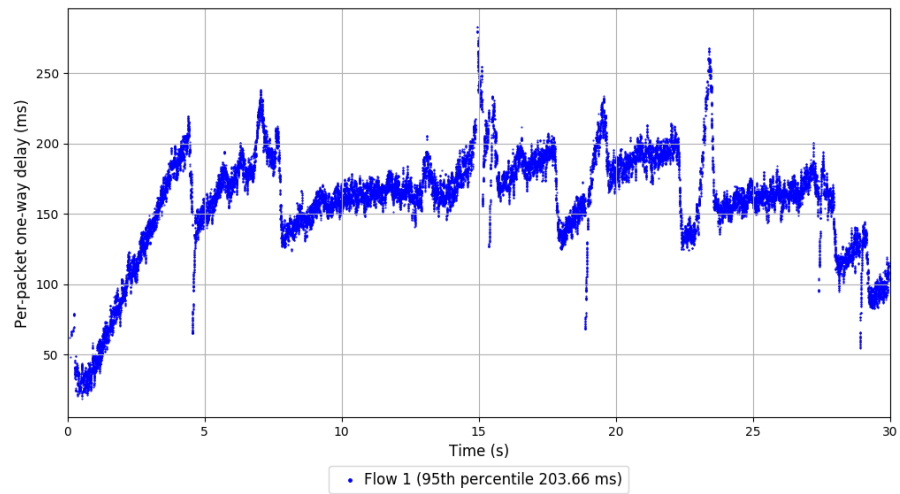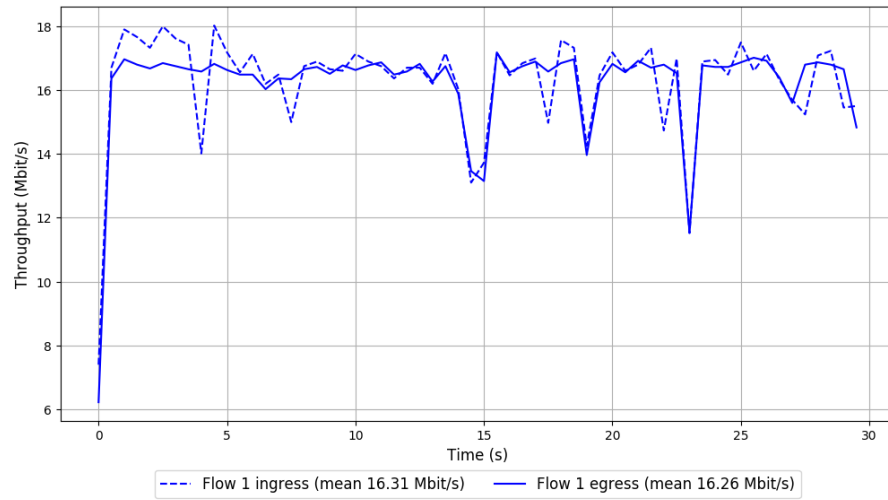Flow 1 (95th percentile 210.61 ms)

```
Run 2: Statistics of TCP Cubic

Start at: 2017-08-21 04:52:03
End at: 2017-08-21 04:52:33
Local clock offset: 0.181 ms
Remote clock offset: -1.421 ms


# Below is generated by plot.py at 2017-08-21 06:15:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.26 Mbit/s
95th percentile per-packet one-way delay: 203.659 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 16.26 Mbit/s
95th percentile per-packet one-way delay: 203.659 ms
Loss rate: 0.55%
```

Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 16.31 Mbit/s)   Flow 1 egress (mean 16.26 Mbit/s)
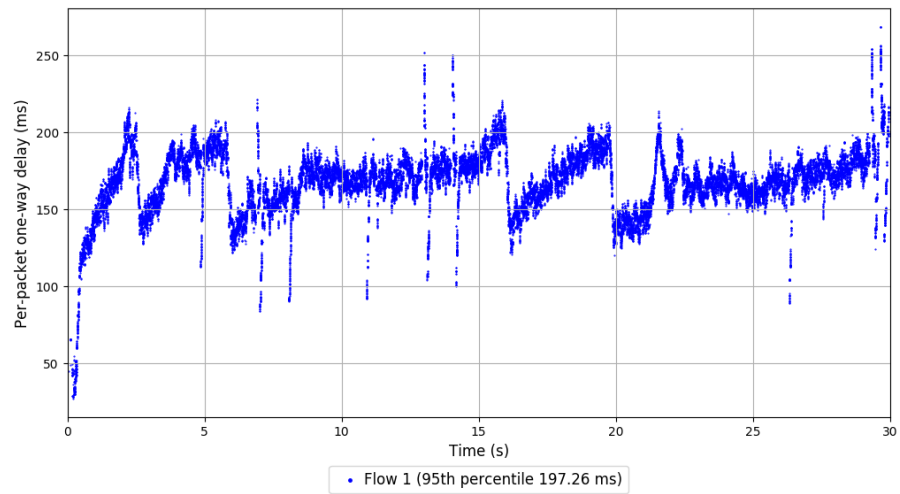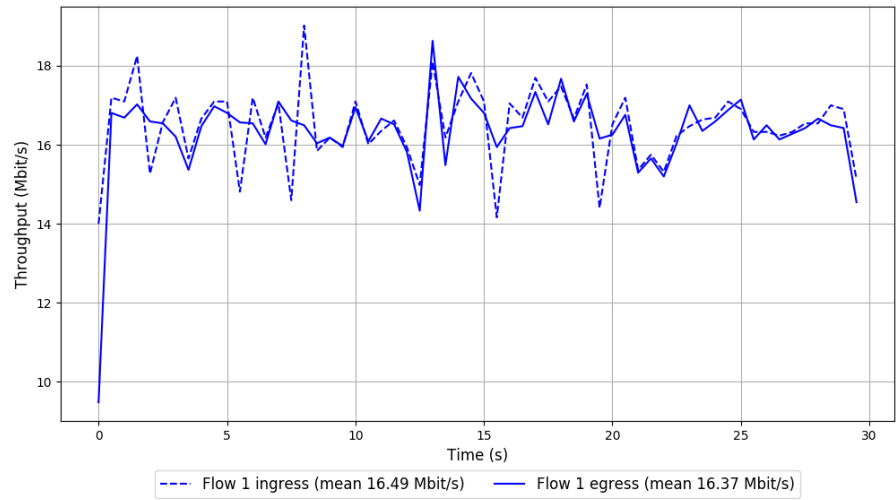

Flow 1 (95th percentile 203.66 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2017-08-21 05:09:44
End at: 2017-08-21 05:10:14
Local clock offset: 0.272 ms
Remote clock offset: -1.262 ms


# Below is generated by plot.py at 2017-08-21 06:15:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.37 Mbit/s
95th percentile per-packet one-way delay: 197.261 ms
Loss rate: 0.87%
-- Flow 1:
Average throughput: 16.37 Mbit/s
95th percentile per-packet one-way delay: 197.261 ms
Loss rate: 0.87%
```

Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 16.49 Mbit/s)   ——— Flow 1 egress (mean 16.37 Mbit/s)
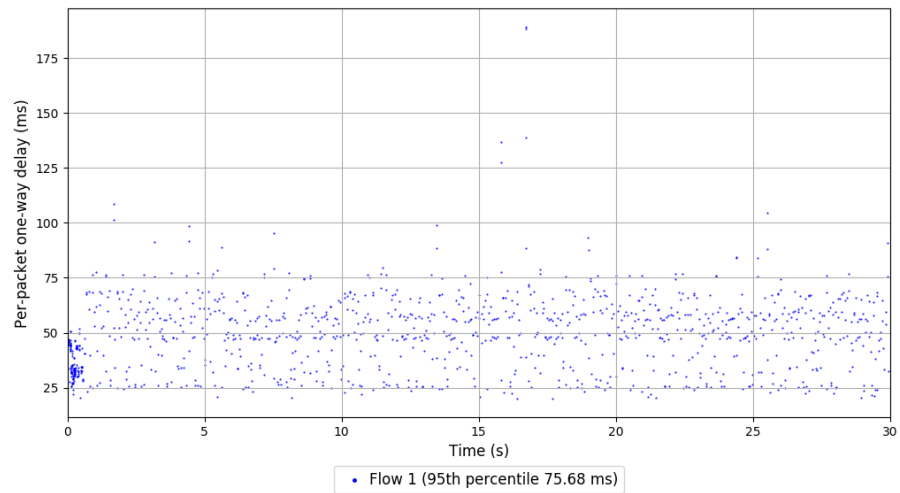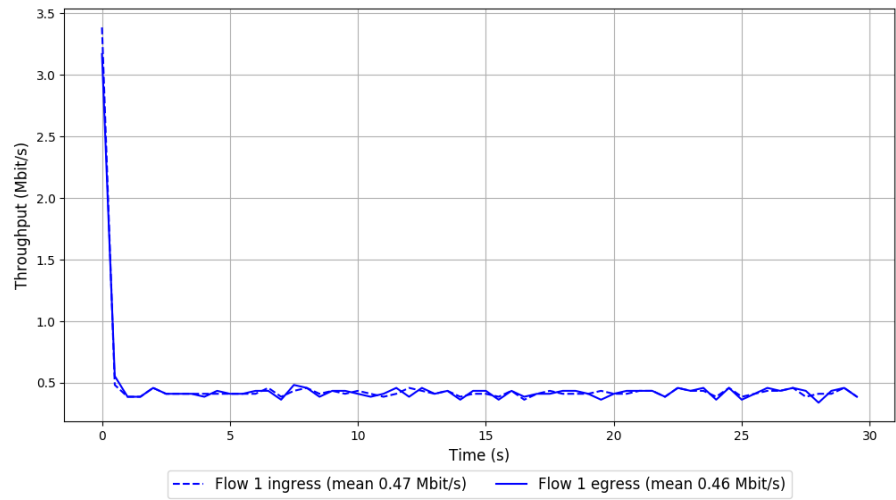

• Flow 1 (95th percentile 197.26 ms)

```
Run 1: Statistics of KohoCC

Start at: 2017-08-21 04:40:16
End at: 2017-08-21 04:40:46
Local clock offset: 0.099 ms
Remote clock offset: -1.349 ms

# Below is generated by plot.py at 2017-08-21 06:15:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 75.677 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 75.677 ms
Loss rate: 0.52%
```
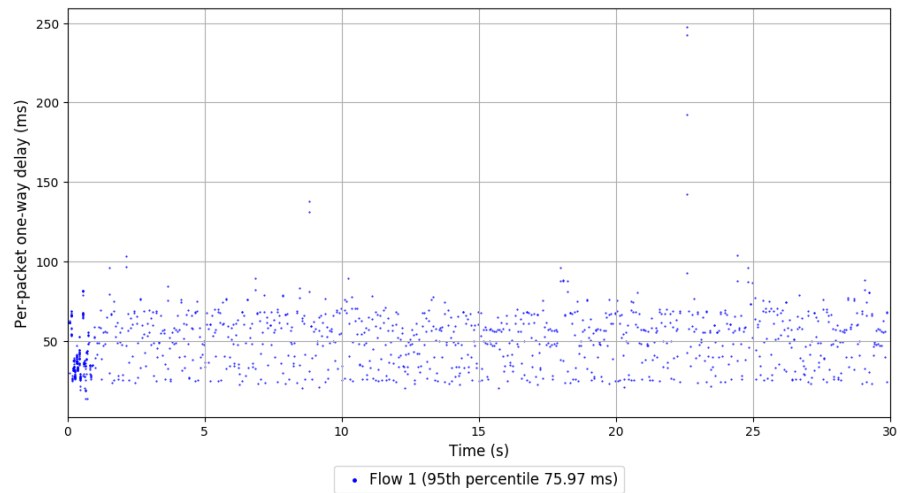
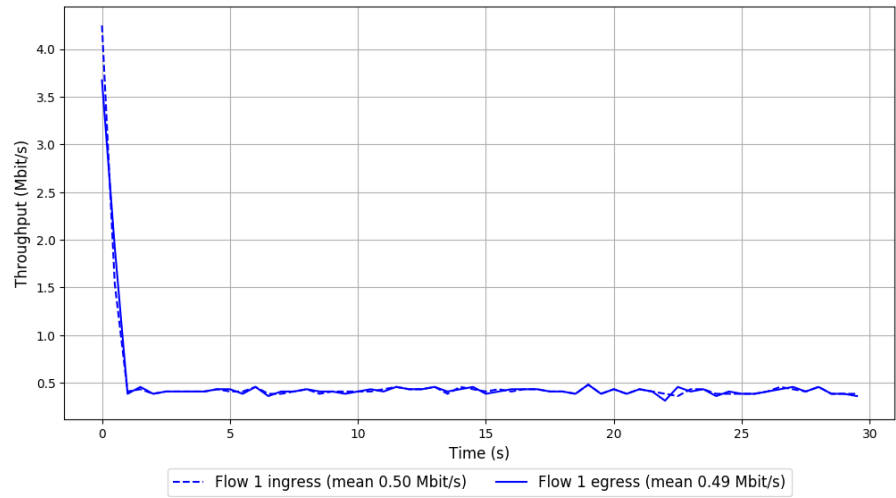Run 1: Report of KohoCC — Data Link

```
Run 2: Statistics of KohoCC

Start at: 2017-08-21 04:57:57
End at: 2017-08-21 04:58:27
Local clock offset: 0.207 ms
Remote clock offset: -1.262 ms


# Below is generated by plot.py at 2017-08-21 06:15:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 75.965 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 75.965 ms
Loss rate: 0.73%
```

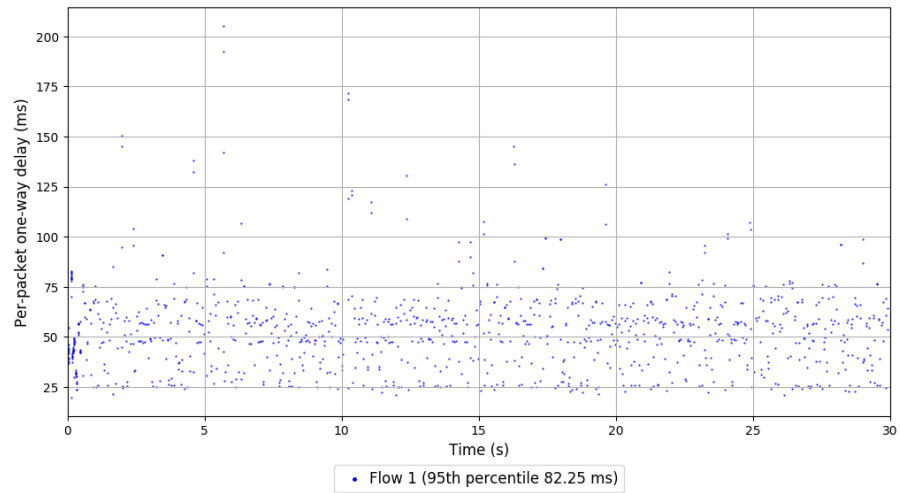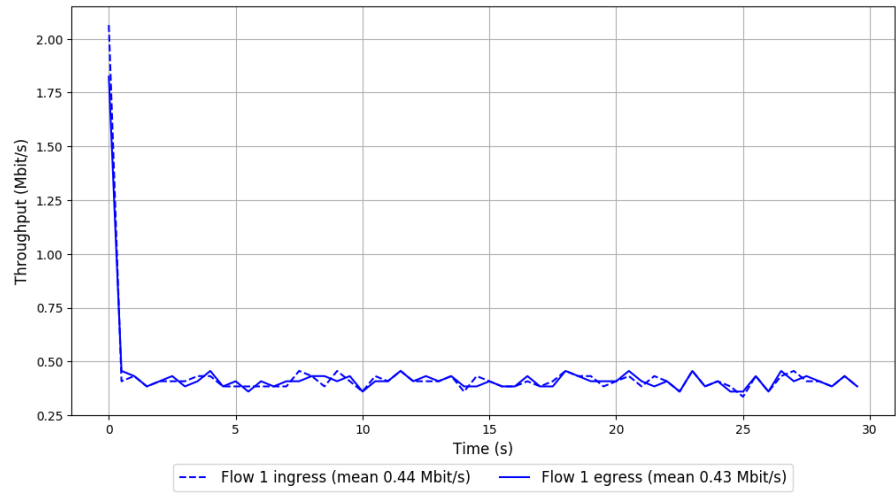Run 2: Report of KohoCC — Data Link

```
Run 3: Statistics of KohoCC

Start at: 2017-08-21 05:15:38
End at: 2017-08-21 05:16:08
Local clock offset: 0.208 ms
Remote clock offset: -1.316 ms


# Below is generated by plot.py at 2017-08-21 06:15:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 82.254 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 82.254 ms
Loss rate: 0.74%
```

Run 3: Report of KohoCC — Data Link

Flow 1 ingress (mean 0.44 Mbit/s)   Flow 1 egress (mean 0.43 Mbit/s)

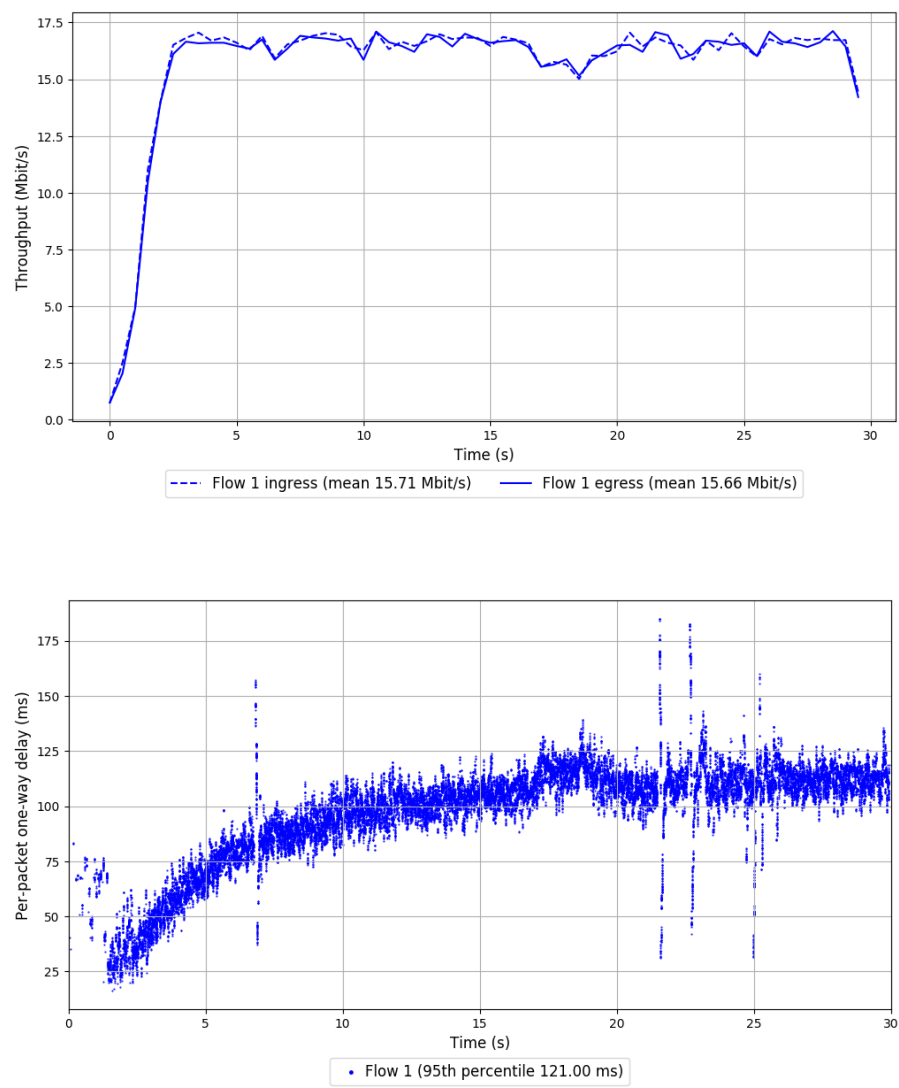Flow 1 (95th percentile 82.25 ms)

```
Run 1: Statistics of LEDBAT

Start at: 2017-08-21 04:29:39
End at: 2017-08-21 04:30:09
Local clock offset: 0.141 ms
Remote clock offset: -1.678 ms

# Below is generated by plot.py at 2017-08-21 06:15:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.66 Mbit/s
95th percentile per-packet one-way delay: 121.001 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 15.66 Mbit/s
95th percentile per-packet one-way delay: 121.001 ms
Loss rate: 0.44%
```

Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2017-08-21 04:47:21
End at: 2017-08-21 04:47:51
Local clock offset: 0.165 ms
Remote clock offset: -1.38 ms

# Below is generated by plot.py at 2017-08-21 06:15:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 14.97 Mbit/s
95th percentile per-packet one-way delay: 137.495 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 14.97 Mbit/s
95th percentile per-packet one-way delay: 137.495 ms
Loss rate: 0.45%
```
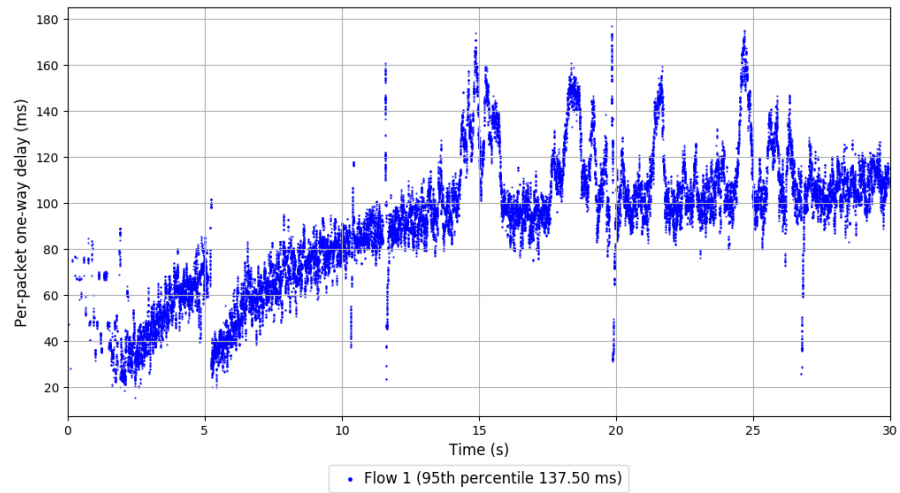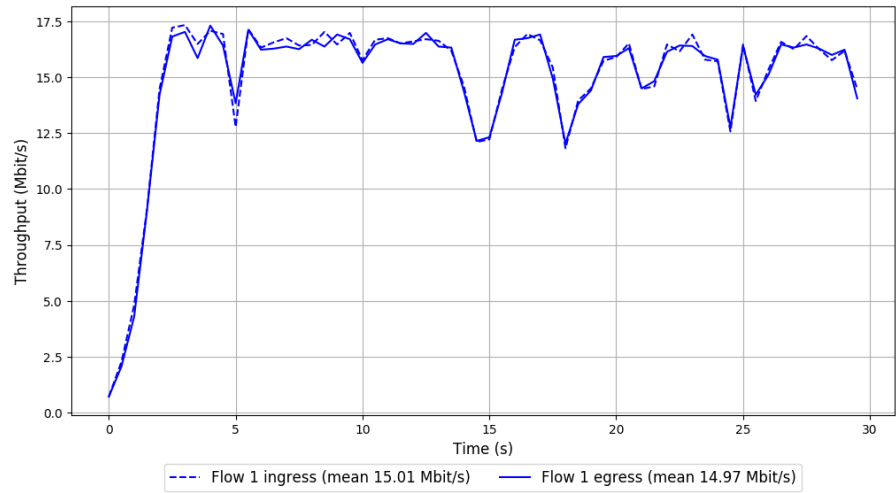
Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 15.01 Mbit/s) --- Flow 1 egress (mean 14.97 Mbit/s)

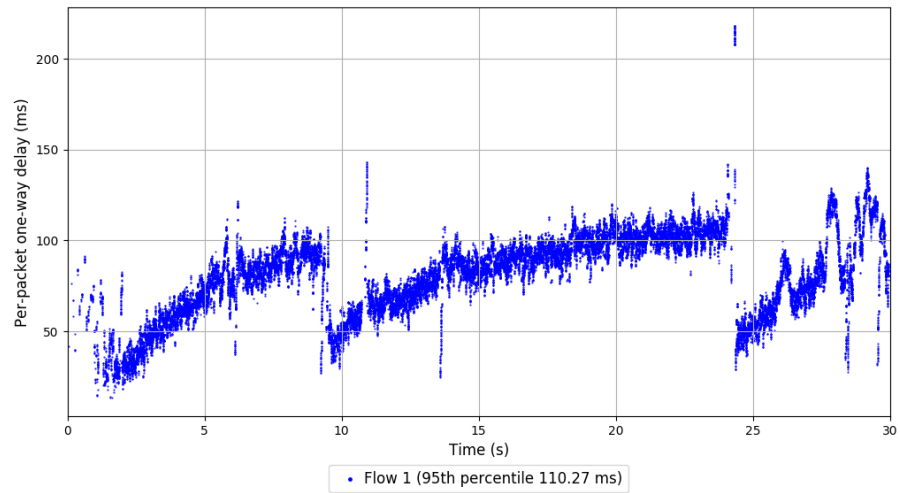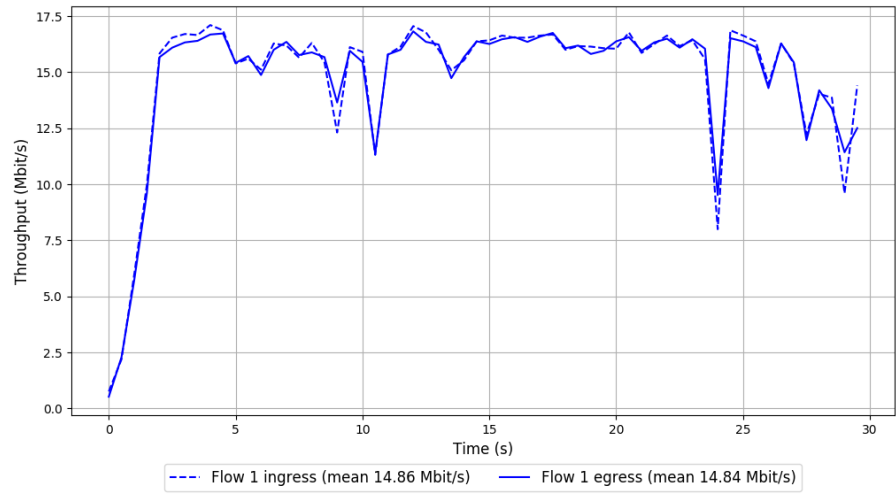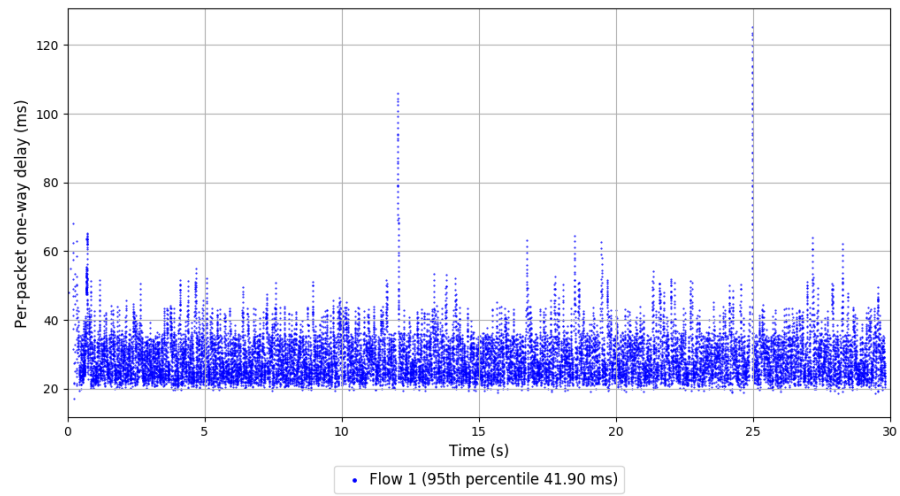Flow 1 (95th percentile 137.50 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2017-08-21 05:05:01
End at: 2017-08-21 05:05:31
Local clock offset: 0.125 ms
Remote clock offset: -1.252 ms


# Below is generated by plot.py at 2017-08-21 06:15:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 14.84 Mbit/s
95th percentile per-packet one-way delay: 110.267 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 14.84 Mbit/s
95th percentile per-packet one-way delay: 110.267 ms
Loss rate: 0.36%
```
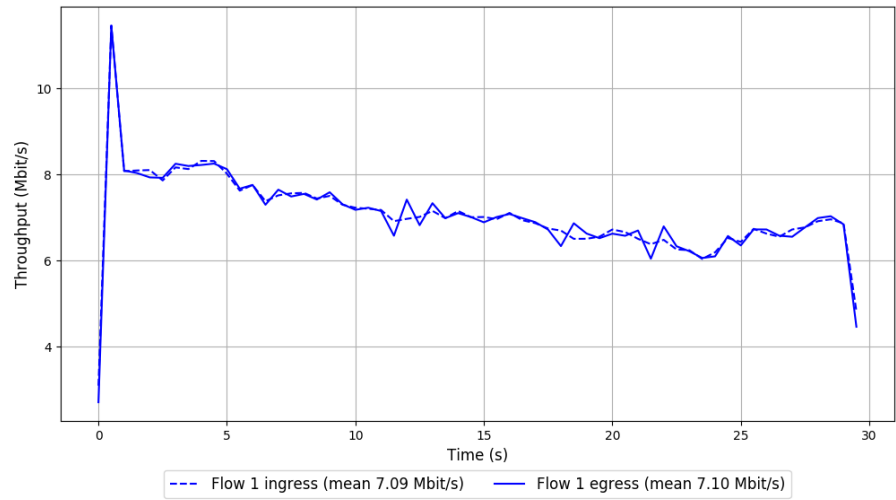
Run 3: Report of LEDBAT — Data Link

```
Run 1: Statistics of PCC

Start at: 2017-08-21 04:32:01
End at: 2017-08-21 04:32:31
Local clock offset: 0.226 ms
Remote clock offset: -1.59 ms

# Below is generated by plot.py at 2017-08-21 06:15:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.10 Mbit/s
95th percentile per-packet one-way delay: 41.896 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 7.10 Mbit/s
95th percentile per-packet one-way delay: 41.896 ms
Loss rate: 0.17%
```
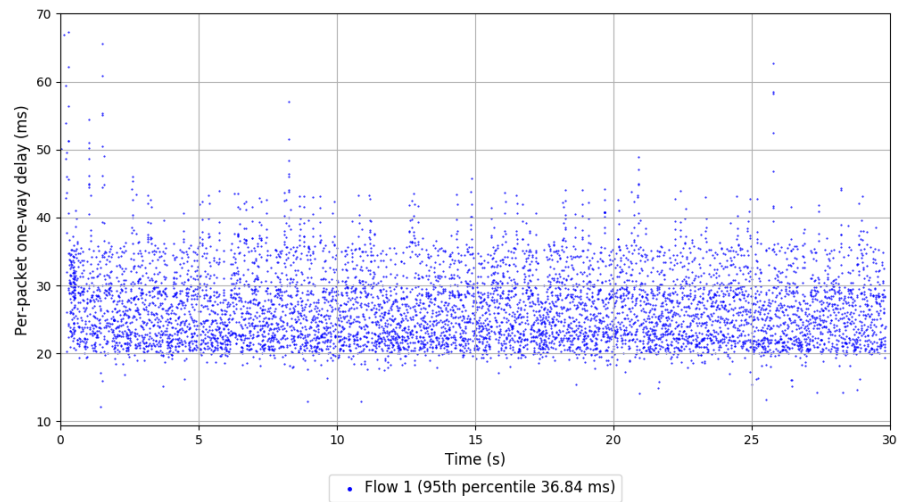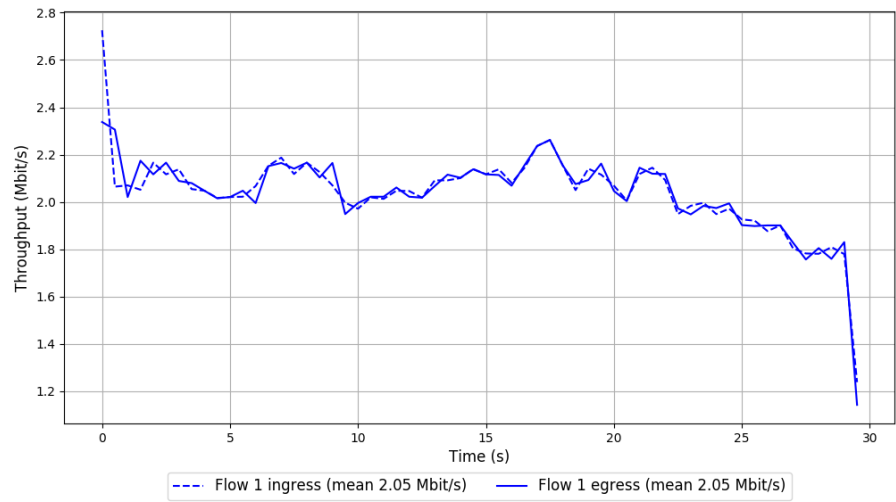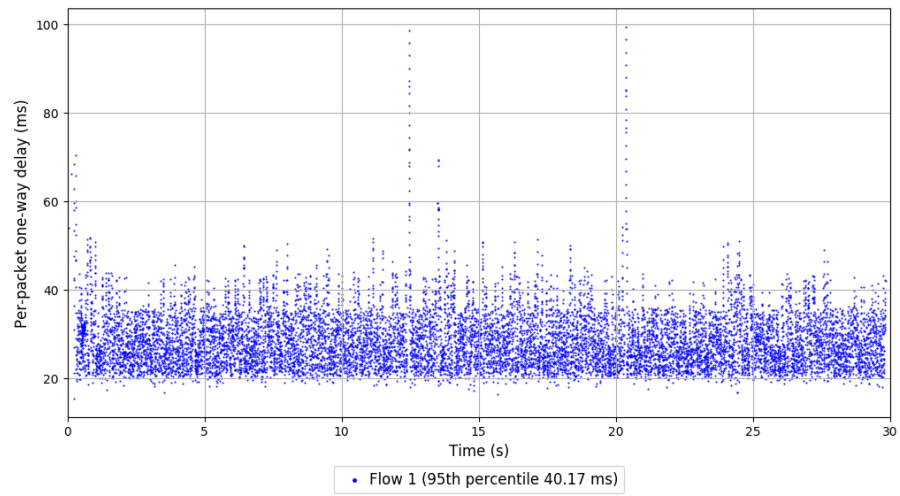
Run 1: Report of PCC — Data Link

Flow 1 ingress (mean 7.09 Mbit/s)   Flow 1 egress (mean 7.10 Mbit/s)

Flow 1 (95th percentile 41.90 ms)

```
Run 2: Statistics of PCC

Start at: 2017-08-21 04:49:43
End at: 2017-08-21 04:50:13
Local clock offset: 0.14 ms
Remote clock offset: -1.402 ms


# Below is generated by plot.py at 2017-08-21 06:15:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 36.836 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 36.836 ms
Loss rate: 0.14%
```

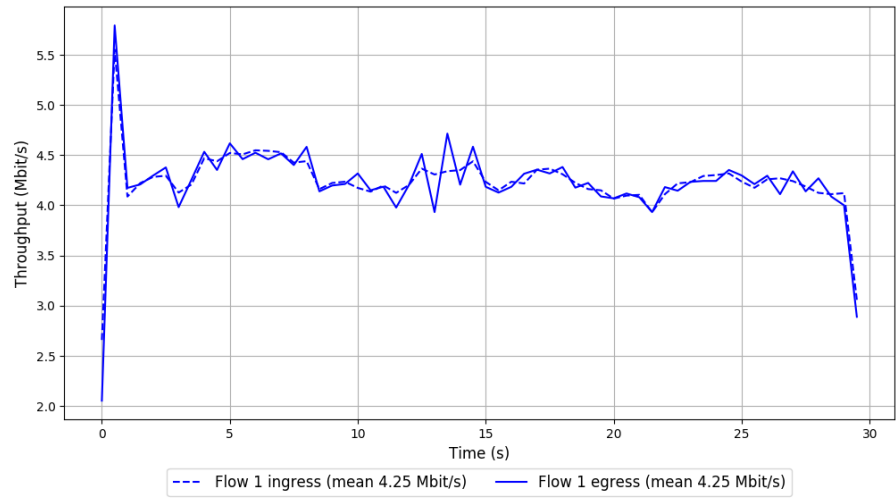Run 2: Report of PCC — Data Link

```
Run 3: Statistics of PCC

Start at: 2017-08-21 05:07:24
End at: 2017-08-21 05:07:54
Local clock offset: 0.168 ms
Remote clock offset: -1.237 ms


# Below is generated by plot.py at 2017-08-21 06:15:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.25 Mbit/s
95th percentile per-packet one-way delay: 40.175 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 4.25 Mbit/s
95th percentile per-packet one-way delay: 40.175 ms
Loss rate: 0.18%
```

Run 3: Report of PCC — Data Link

```
Run 1: Statistics of QUIC Cubic

Start at: 2017-08-21 04:41:26
End at: 2017-08-21 04:41:56
Local clock offset: 0.095 ms
Remote clock offset: -1.328 ms


# Below is generated by plot.py at 2017-08-21 06:15:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.54 Mbit/s
95th percentile per-packet one-way delay: 214.530 ms
Loss rate: 1.15%
-- Flow 1:
Average throughput: 15.54 Mbit/s
95th percentile per-packet one-way delay: 214.530 ms
Loss rate: 1.15%
```
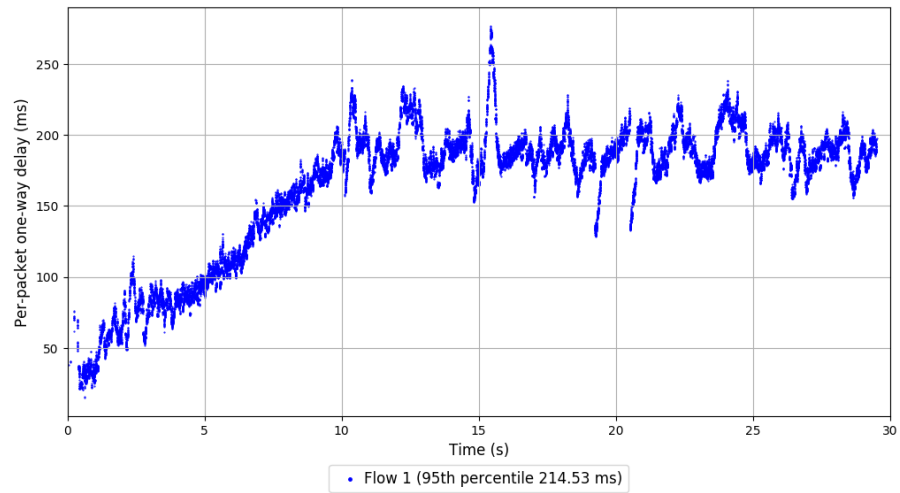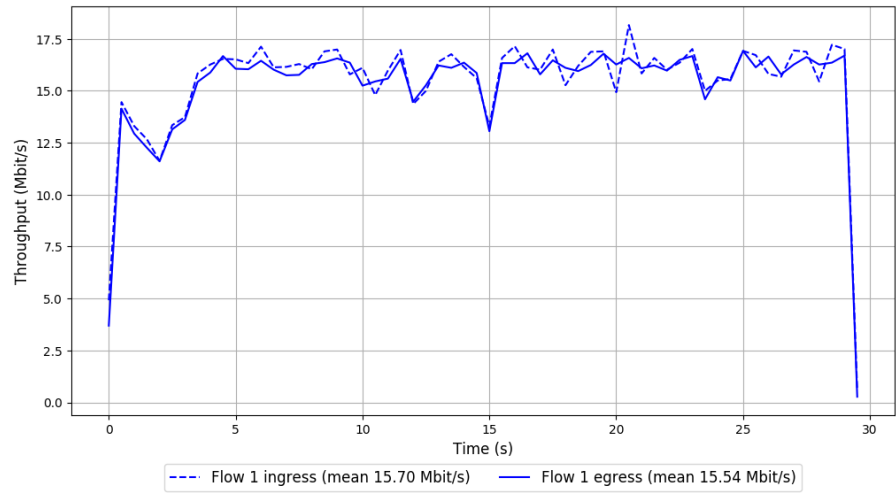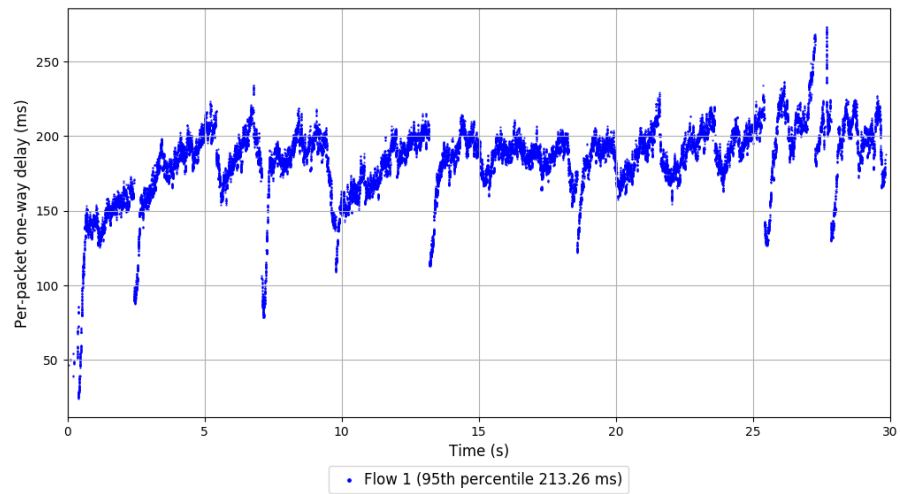
Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2017-08-21 04:59:08
End at: 2017-08-21 04:59:38
Local clock offset: 0.206 ms
Remote clock offset: -1.226 ms


# Below is generated by plot.py at 2017-08-21 06:15:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.77 Mbit/s
95th percentile per-packet one-way delay: 213.258 ms
Loss rate: 1.17%
-- Flow 1:
Average throughput: 15.77 Mbit/s
95th percentile per-packet one-way delay: 213.258 ms
Loss rate: 1.17%
```
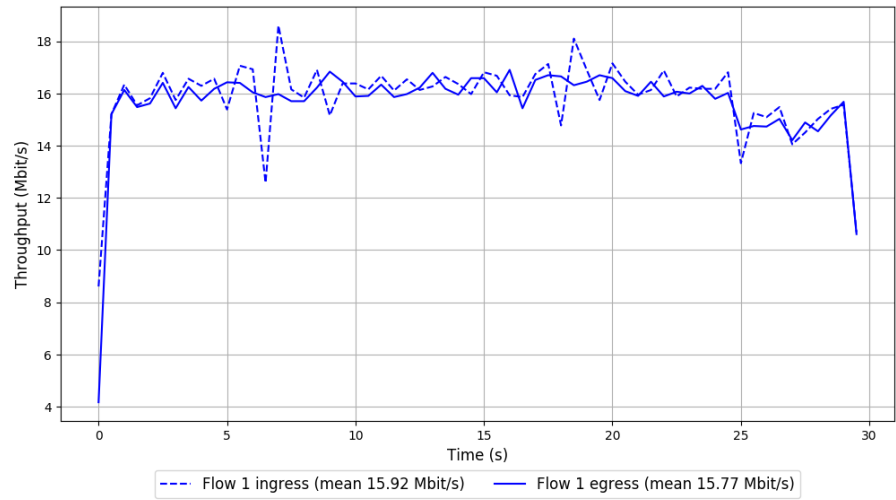
Run 2: Report of QUIC Cubic — Data Link

49

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-08-21 05:16:48
End at: 2017-08-21 05:17:18
Local clock offset: 0.217 ms
Remote clock offset: -1.268 ms


# Below is generated by plot.py at 2017-08-21 06:15:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.22 Mbit/s
95th percentile per-packet one-way delay: 215.115 ms
Loss rate: 1.20%
-- Flow 1:
Average throughput: 16.22 Mbit/s
95th percentile per-packet one-way delay: 215.115 ms
Loss rate: 1.20%
```
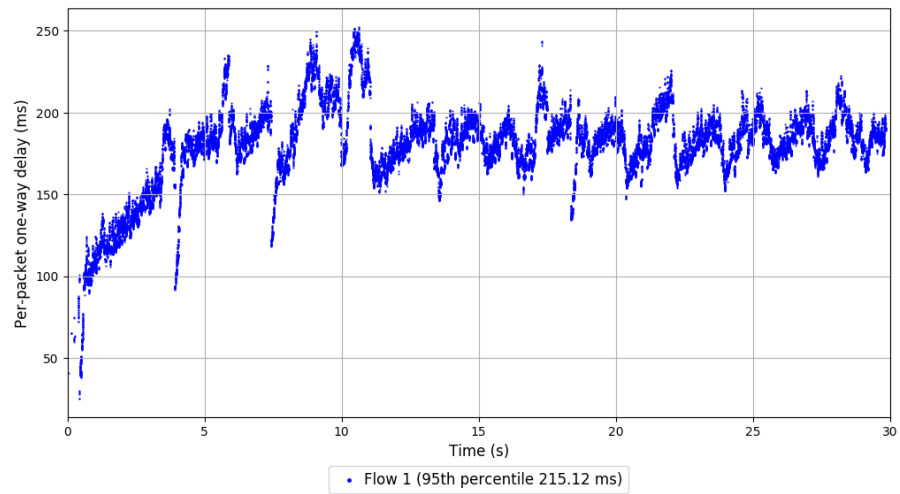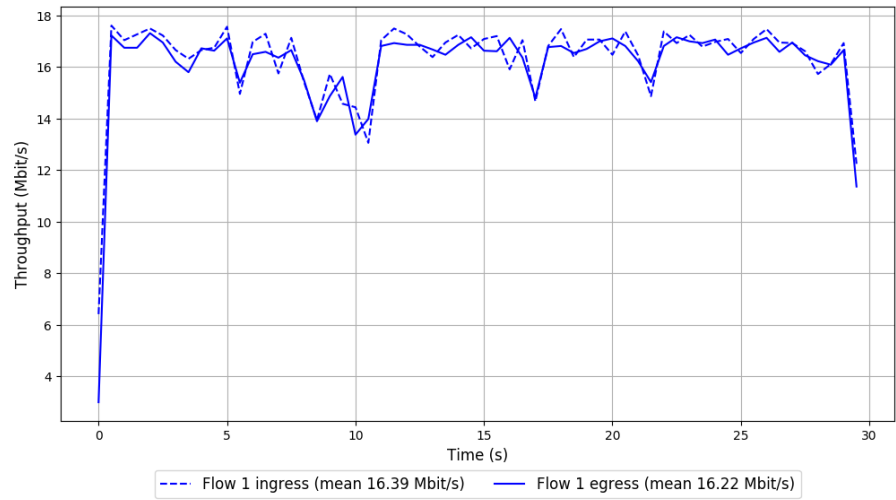
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 16.39 Mbit/s) — Flow 1 egress (mean 16.22 Mbit/s)

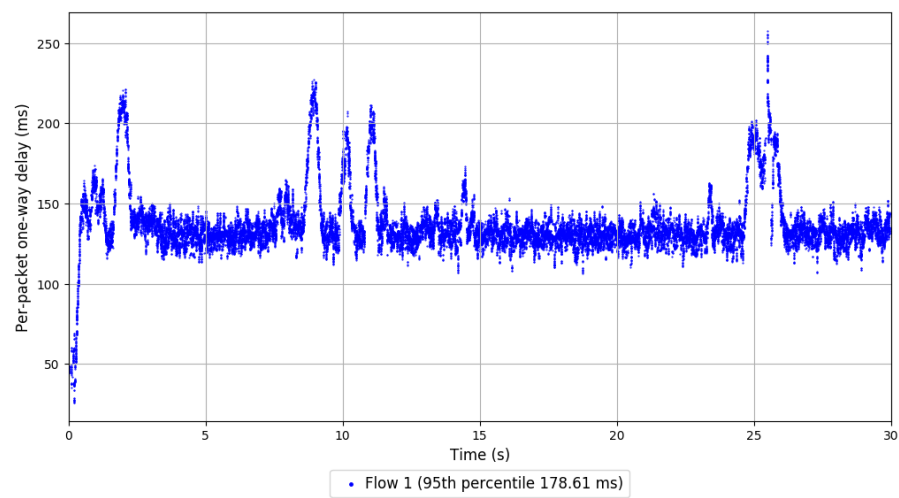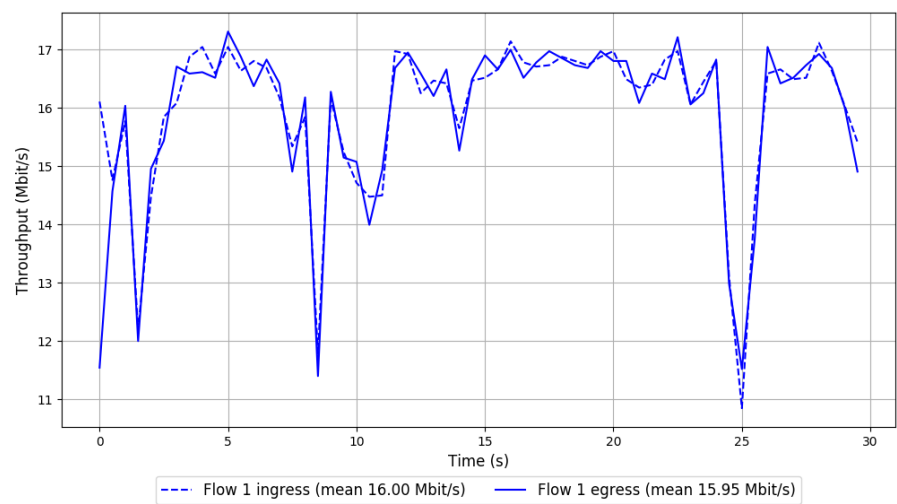

• Flow 1 (95th percentile 215.12 ms)

```
Run 1: Statistics of Saturator

Start at: 2017-08-21 04:42:37
End at: 2017-08-21 04:43:07
Local clock offset: 0.113 ms
Remote clock offset: -1.325 ms


# Below is generated by plot.py at 2017-08-21 06:15:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.95 Mbit/s
95th percentile per-packet one-way delay: 178.612 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 15.95 Mbit/s
95th percentile per-packet one-way delay: 178.612 ms
Loss rate: 0.52%
```

Run 1: Report of Saturator — Data Link

```
Run 2: Statistics of Saturator

Start at: 2017-08-21 05:00:19
End at: 2017-08-21 05:00:49
Local clock offset: 0.109 ms
Remote clock offset: -1.22 ms


# Below is generated by plot.py at 2017-08-21 06:15:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.04 Mbit/s
95th percentile per-packet one-way delay: 155.811 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 16.04 Mbit/s
95th percentile per-packet one-way delay: 155.811 ms
Loss rate: 0.52%
```
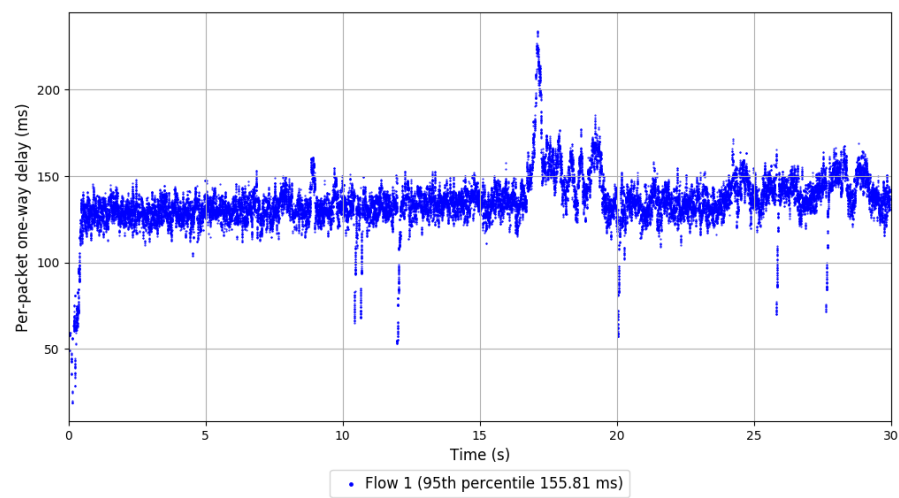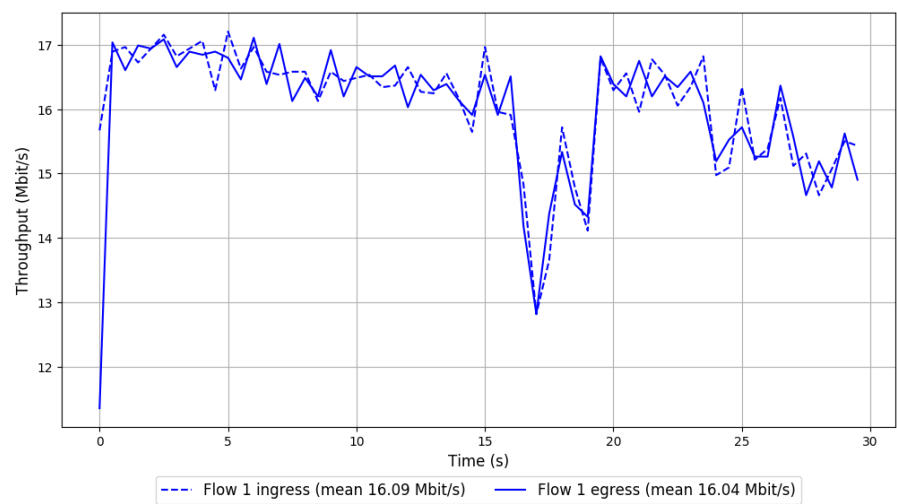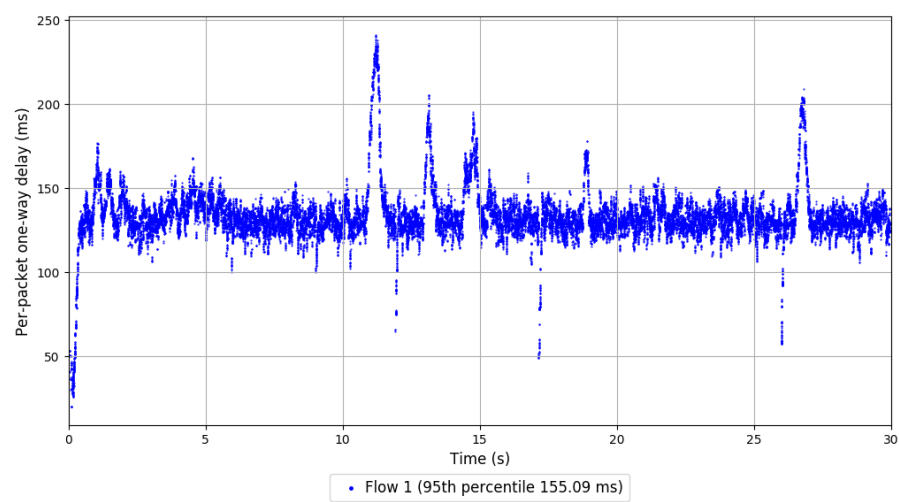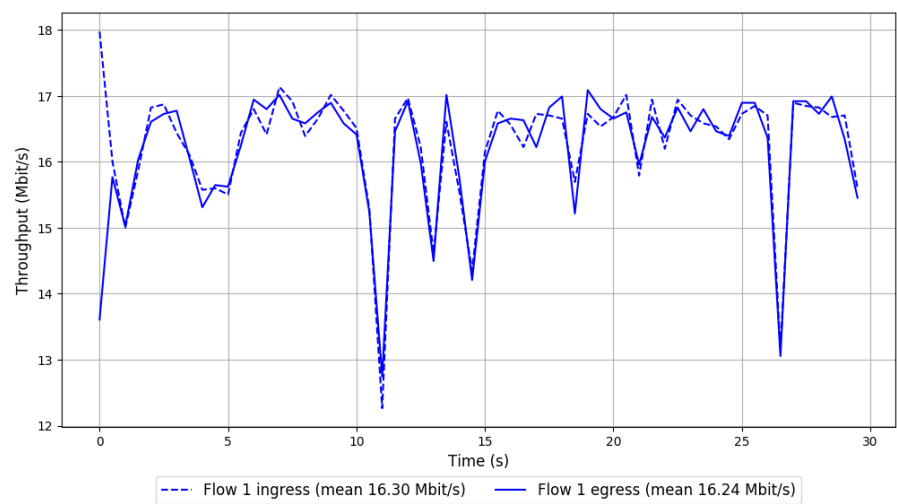
Run 2: Report of Saturator — Data Link

```
Run 3: Statistics of Saturator

Start at: 2017-08-21 05:17:59
End at: 2017-08-21 05:18:29
Local clock offset: 0.327 ms
Remote clock offset: -1.262 ms


# Below is generated by plot.py at 2017-08-21 06:15:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.24 Mbit/s
95th percentile per-packet one-way delay: 155.091 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 16.24 Mbit/s
95th percentile per-packet one-way delay: 155.091 ms
Loss rate: 0.51%
```

Run 3: Report of Saturator — Data Link

Flow 1 ingress (mean 16.30 Mbit/s)   Flow 1 egress (mean 16.24 Mbit/s)

Flow 1 (95th percentile 155.09 ms)

```
Run 1: Statistics of SCReAM

Start at: 2017-08-21 04:35:34
End at: 2017-08-21 04:36:04
Local clock offset: 0.09 ms
Remote clock offset: -1.5 ms


# Below is generated by plot.py at 2017-08-21 06:15:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 76.884 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 76.884 ms
Loss rate: 0.47%
```
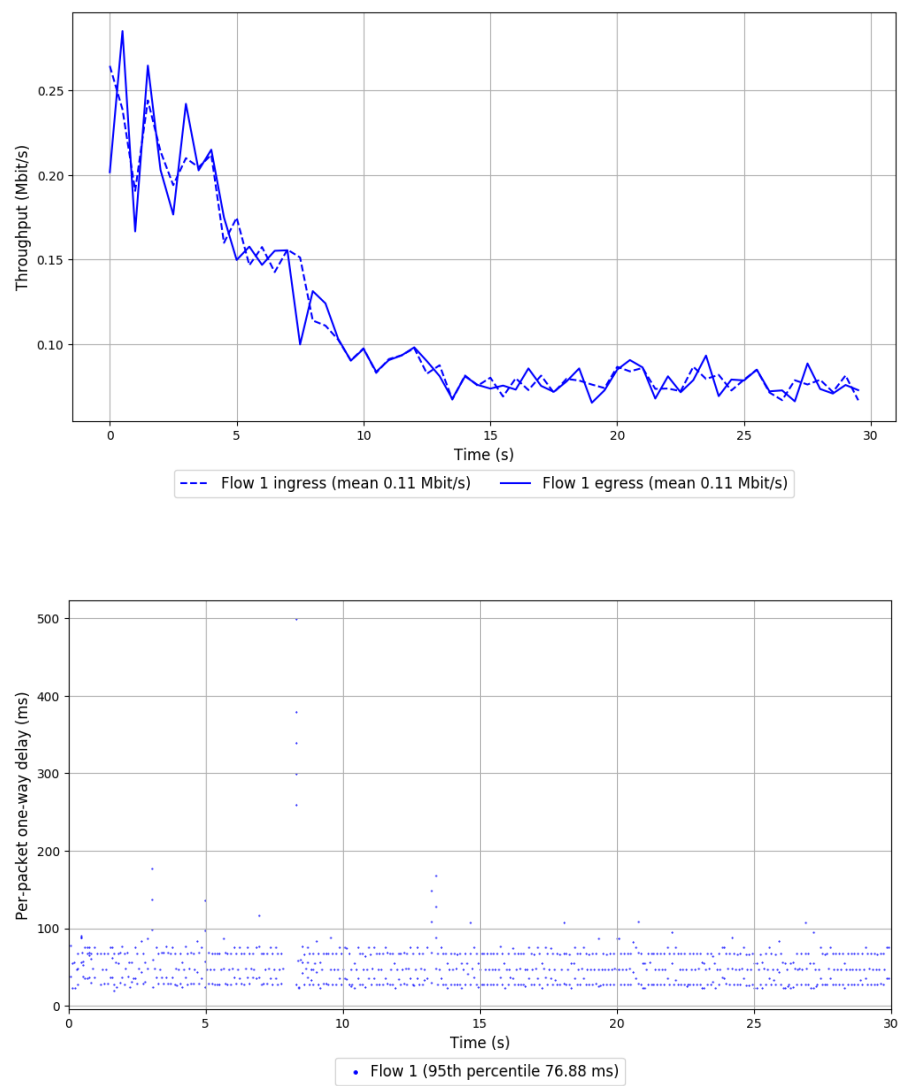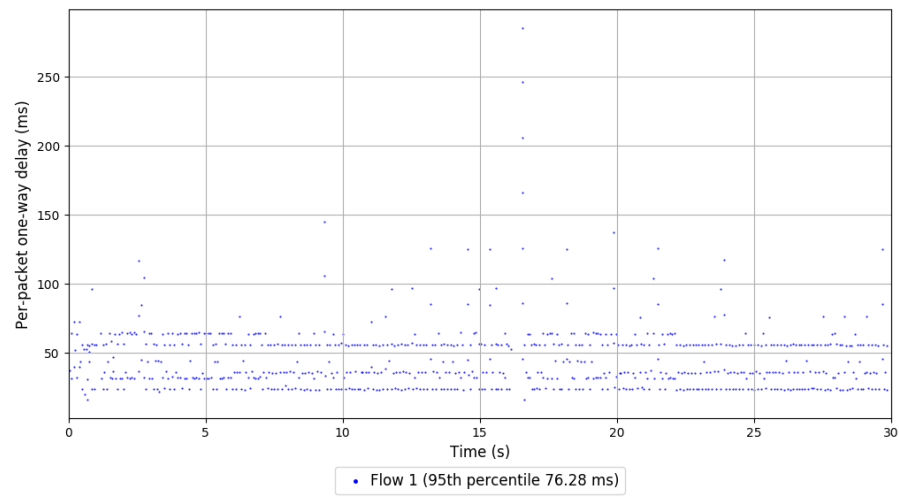
Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2017-08-21 04:53:15
End at: 2017-08-21 04:53:45
Local clock offset: 0.093 ms
Remote clock offset: -1.37 ms


# Below is generated by plot.py at 2017-08-21 06:15:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 76.282 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 76.282 ms
Loss rate: 0.69%
```
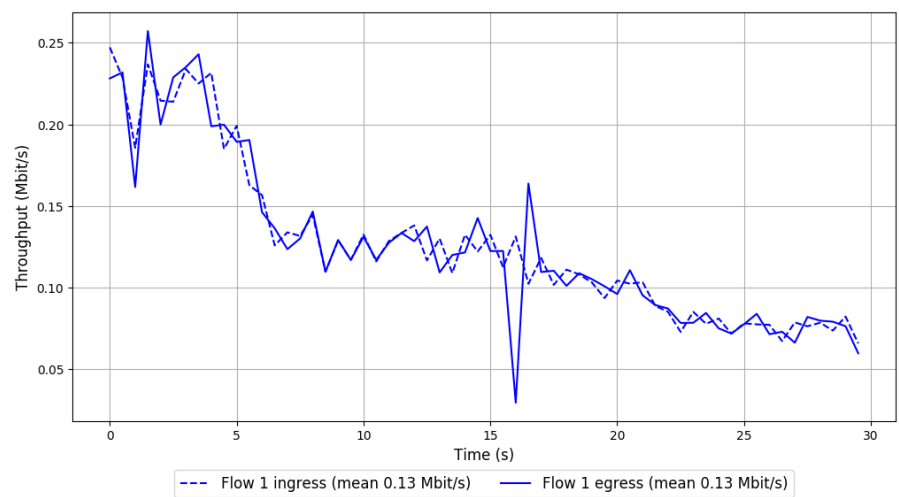
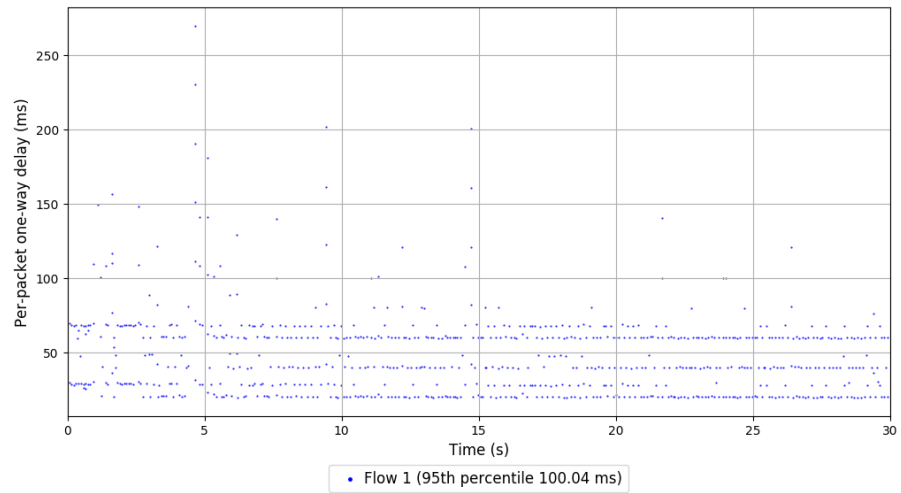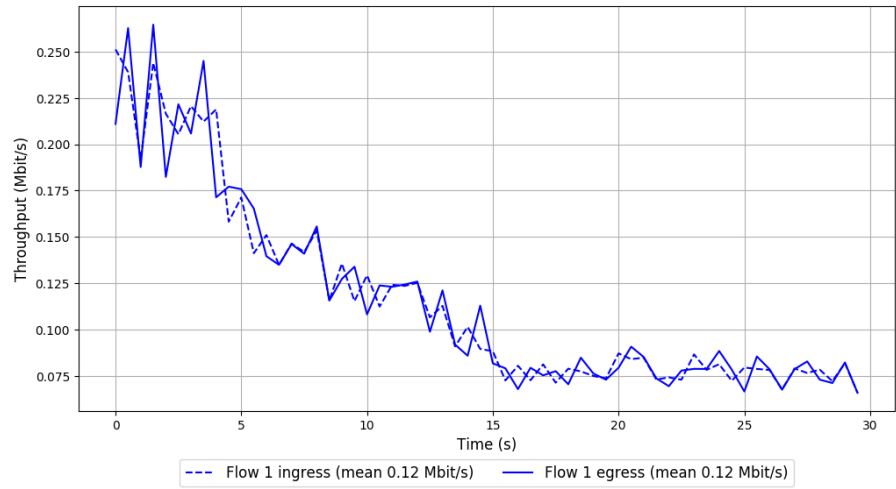Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2017-08-21 05:10:55
End at: 2017-08-21 05:11:25
Local clock offset: 0.262 ms
Remote clock offset: -1.201 ms


# Below is generated by plot.py at 2017-08-21 06:15:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 100.039 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 100.039 ms
Loss rate: 0.08%
```

Run 3: Report of SCReAM — Data Link

```
Run 1: Statistics of Sprout

Start at: 2017-08-21 04:36:44
End at: 2017-08-21 04:37:14
Local clock offset: 0.222 ms
Remote clock offset: -1.515 ms


# Below is generated by plot.py at 2017-08-21 06:15:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.20 Mbit/s
95th percentile per-packet one-way delay: 64.526 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 13.20 Mbit/s
95th percentile per-packet one-way delay: 64.526 ms
Loss rate: 0.93%
```
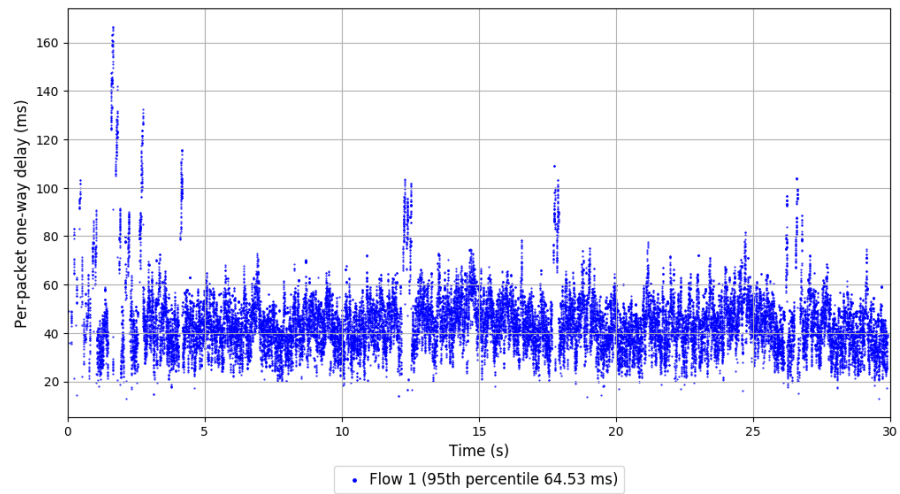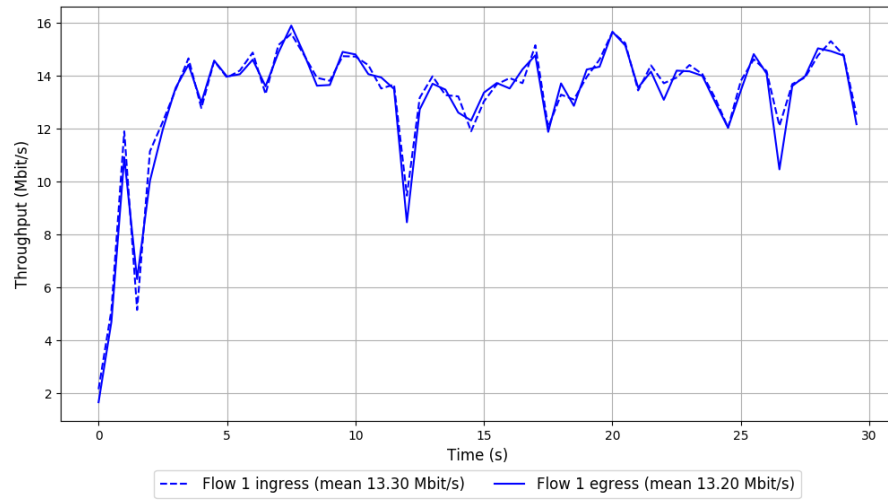
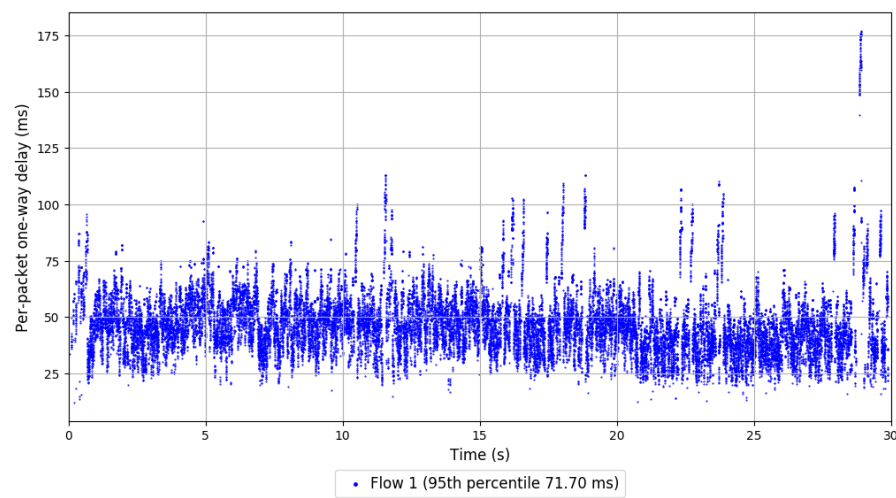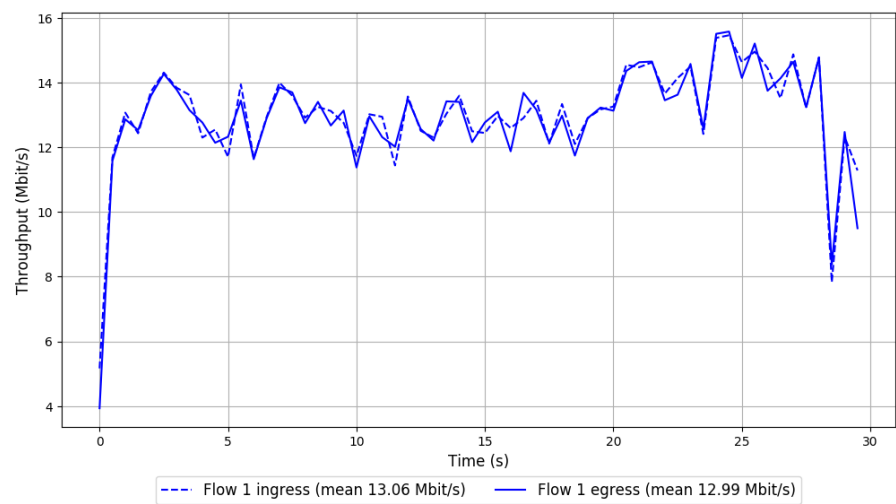Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2017-08-21 04:54:25
End at: 2017-08-21 04:54:55
Local clock offset: 0.161 ms
Remote clock offset: -1.296 ms


# Below is generated by plot.py at 2017-08-21 06:15:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.99 Mbit/s
95th percentile per-packet one-way delay: 71.701 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 12.99 Mbit/s
95th percentile per-packet one-way delay: 71.701 ms
Loss rate: 0.67%
```

Run 2: Report of Sprout — Data Link

Flow 1 ingress (mean 13.06 Mbit/s) ----   Flow 1 egress (mean 12.99 Mbit/s) ——

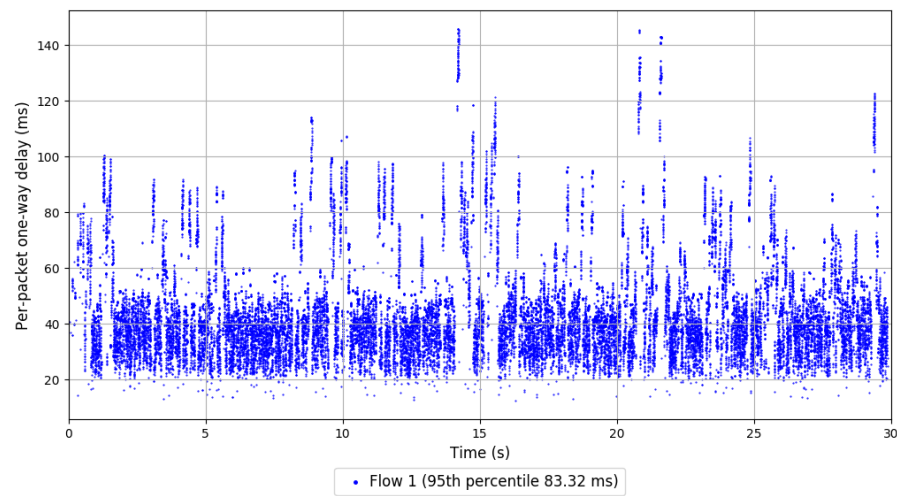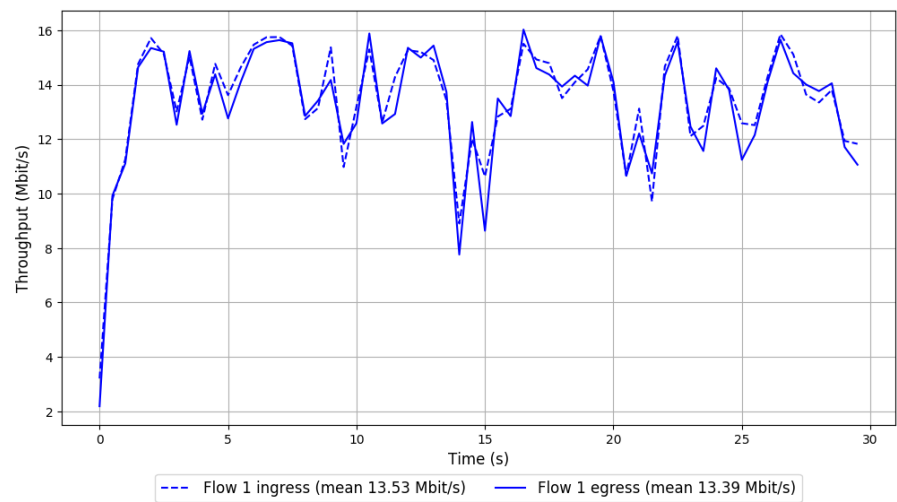
Flow 1 (95th percentile 71.70 ms)

```
Run 3: Statistics of Sprout

Start at: 2017-08-21 05:12:06
End at: 2017-08-21 05:12:36
Local clock offset: 0.282 ms
Remote clock offset: -1.298 ms


# Below is generated by plot.py at 2017-08-21 06:15:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.39 Mbit/s
95th percentile per-packet one-way delay: 83.316 ms
Loss rate: 1.20%
-- Flow 1:
Average throughput: 13.39 Mbit/s
95th percentile per-packet one-way delay: 83.316 ms
Loss rate: 1.20%
```

Run 3: Report of Sprout — Data Link
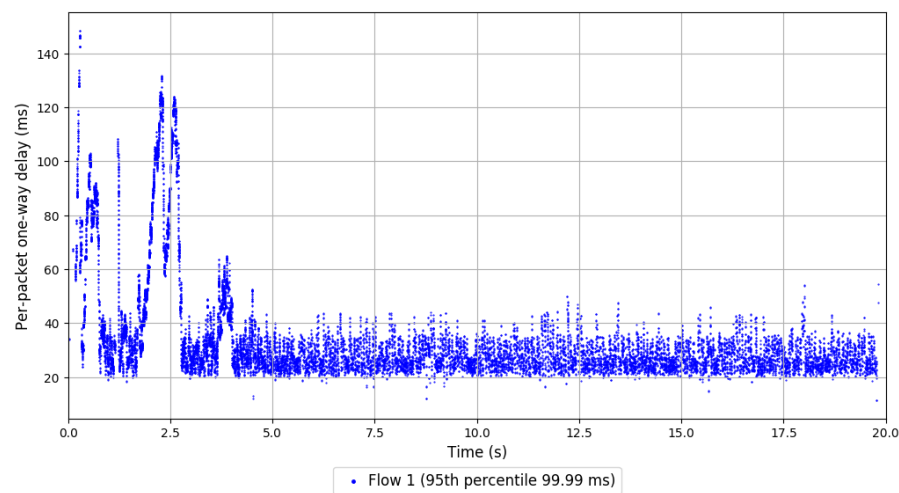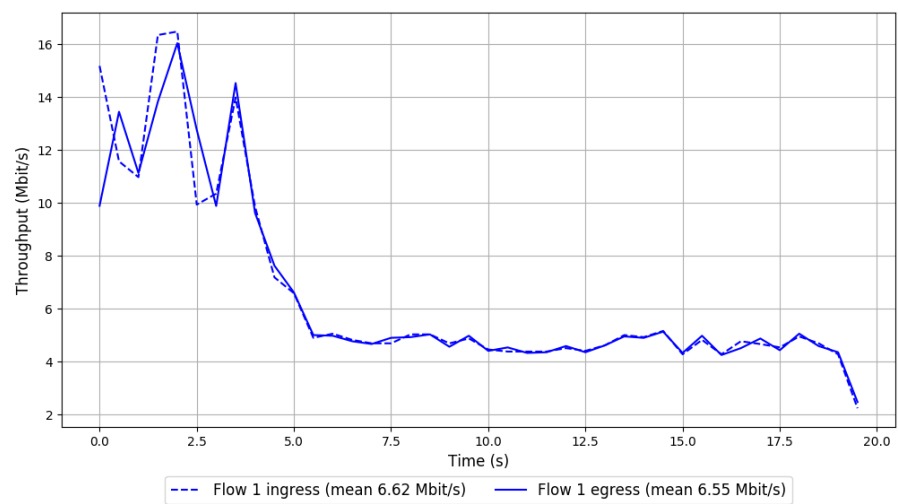
Run 1: Statistics of TaoVA-100x

Start at: 2017-08-21 04:27:17
End at: 2017-08-21 04:27:47
Local clock offset: 0.134 ms
Remote clock offset: -1.781 ms

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

Flow 1 ingress (mean 6.62 Mbit/s) --- Flow 1 egress (mean 6.55 Mbit/s)

Flow 1 (95th percentile 99.99 ms)

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

Start at: 2017-08-21 04:44:59
End at: 2017-08-21 04:45:29
Local clock offset: 0.11 ms
Remote clock offset: -1.343 ms

# Below is generated by plot.py at 2017-08-21 06:15:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.65 Mbit/s
95th percentile per-packet one-way delay: 169.564 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 15.65 Mbit/s
95th percentile per-packet one-way delay: 169.564 ms
Loss rate: 0.57%
```
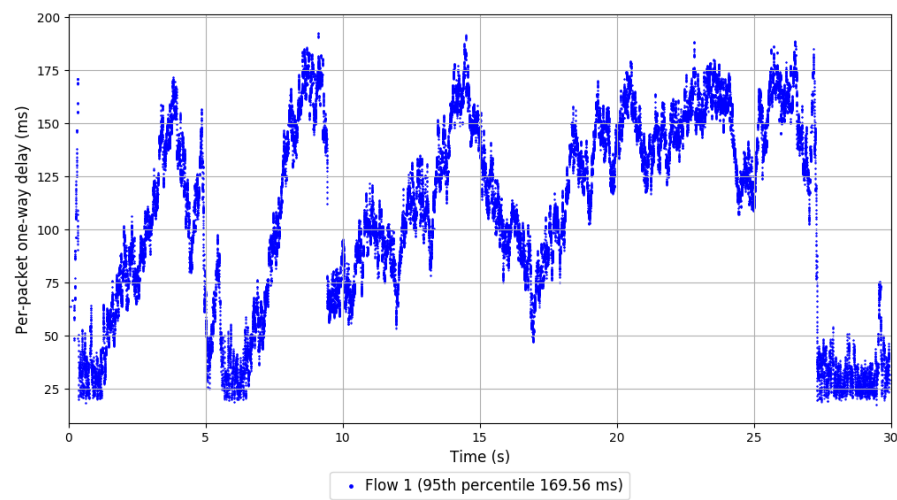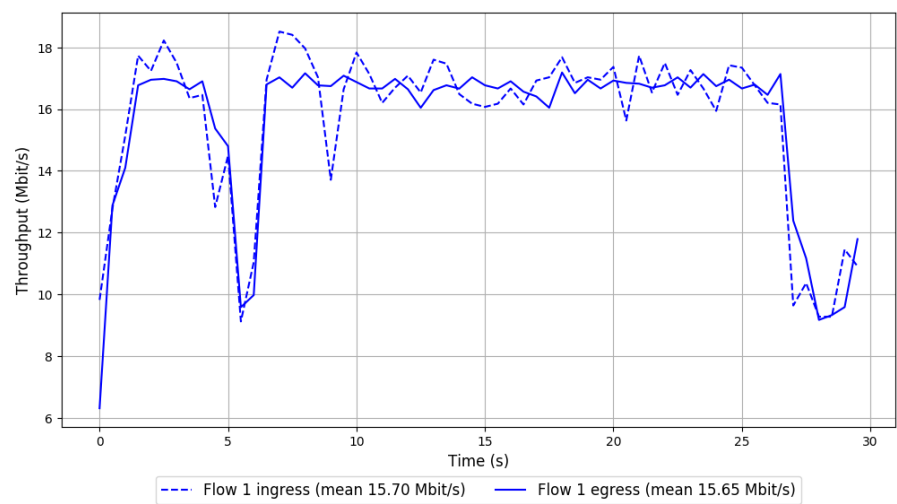
Run 2: Report of TaoVA-100x — Data Link
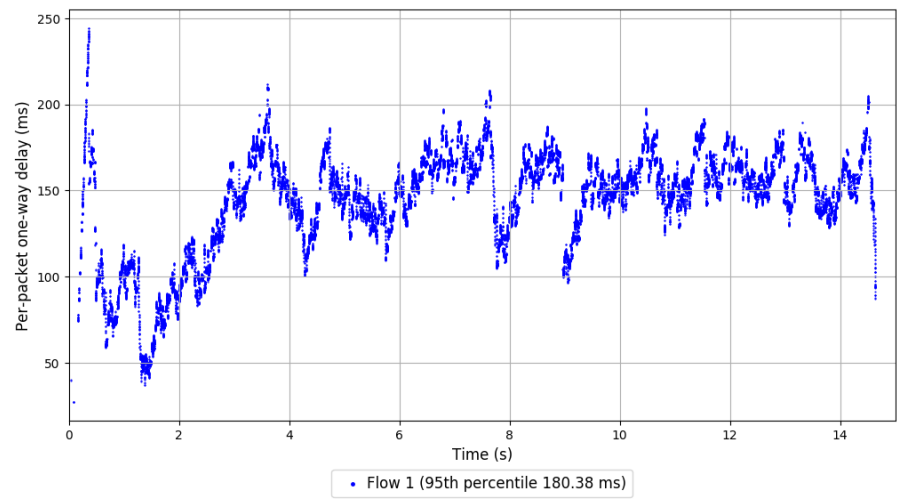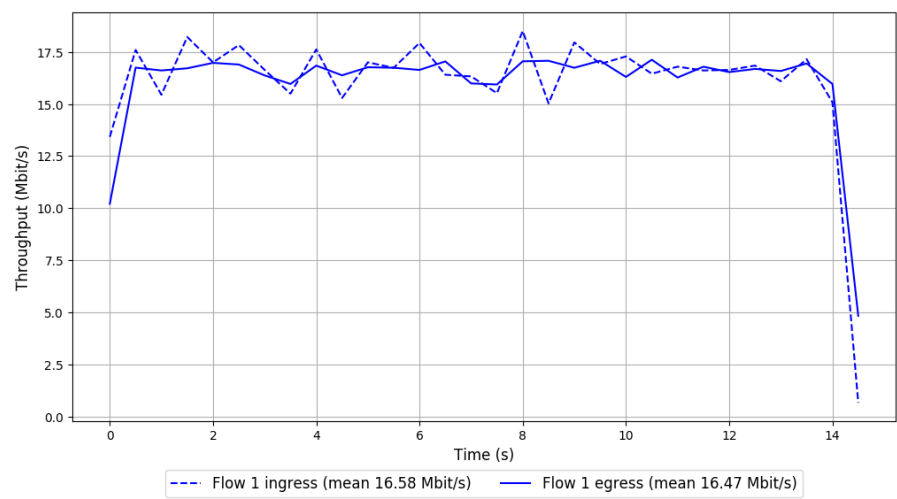
```
Run 3: Statistics of TaoVA-100x

Start at: 2017-08-21 05:02:40
End at: 2017-08-21 05:03:10
Local clock offset: 0.126 ms
Remote clock offset: -1.119 ms
```

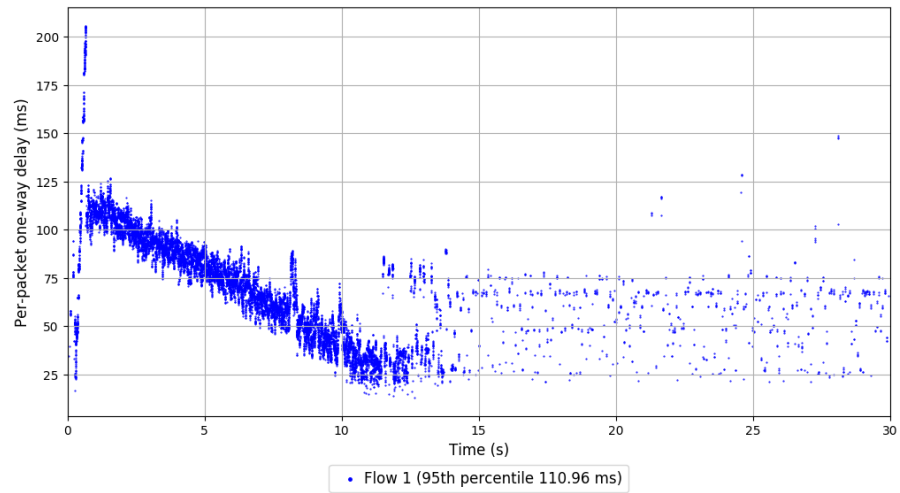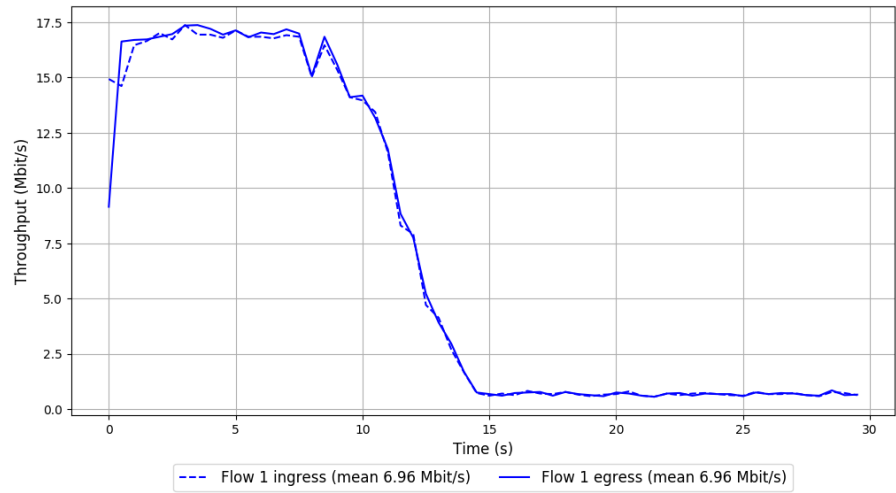# Run 3: Report of TaoVA-100x — Data Link

```
Run 1: Statistics of TCP Vegas

Start at: 2017-08-21 04:43:48
End at: 2017-08-21 04:44:18
Local clock offset: 0.097 ms
Remote clock offset: -1.375 ms


# Below is generated by plot.py at 2017-08-21 06:15:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.96 Mbit/s
95th percentile per-packet one-way delay: 110.956 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 6.96 Mbit/s
95th percentile per-packet one-way delay: 110.956 ms
Loss rate: 0.02%
```

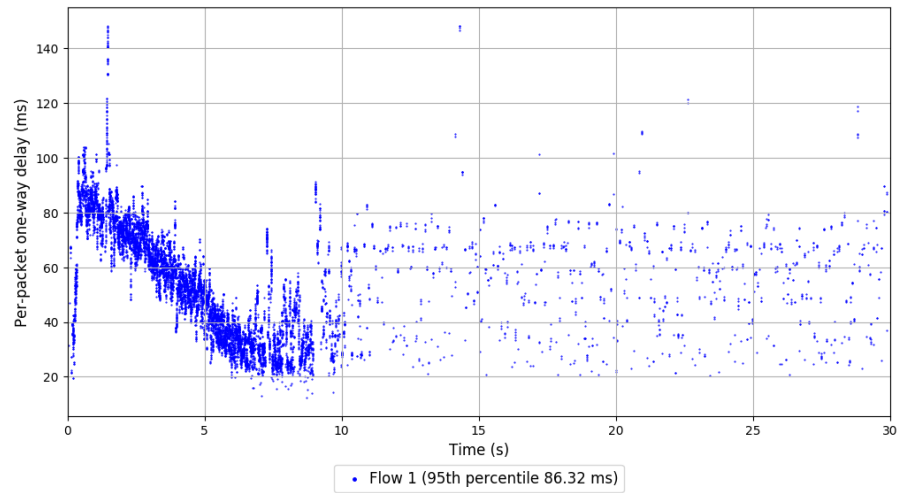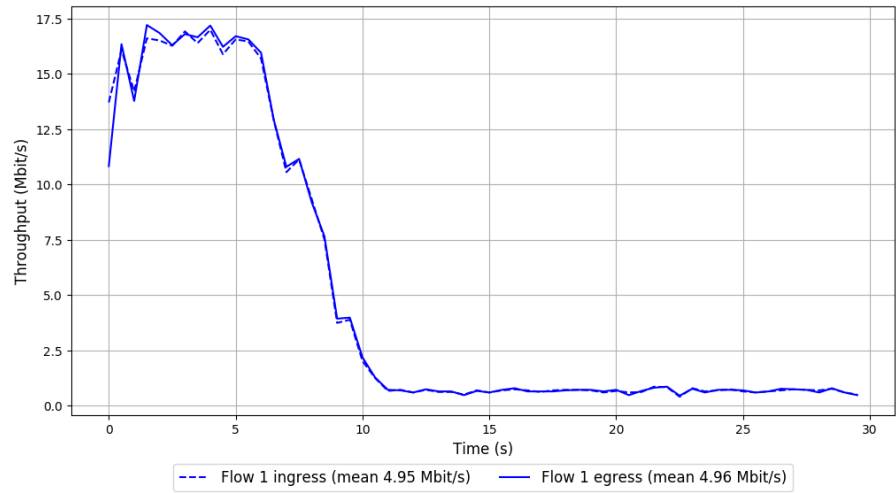Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2017-08-21 05:01:30
End at: 2017-08-21 05:02:00
Local clock offset: 0.128 ms
Remote clock offset: -1.121 ms


# Below is generated by plot.py at 2017-08-21 06:15:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.96 Mbit/s
95th percentile per-packet one-way delay: 86.321 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 4.96 Mbit/s
95th percentile per-packet one-way delay: 86.321 ms
Loss rate: 0.03%
```

Run 2: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 4.95 Mbit/s)   Flow 1 egress (mean 4.96 Mbit/s)
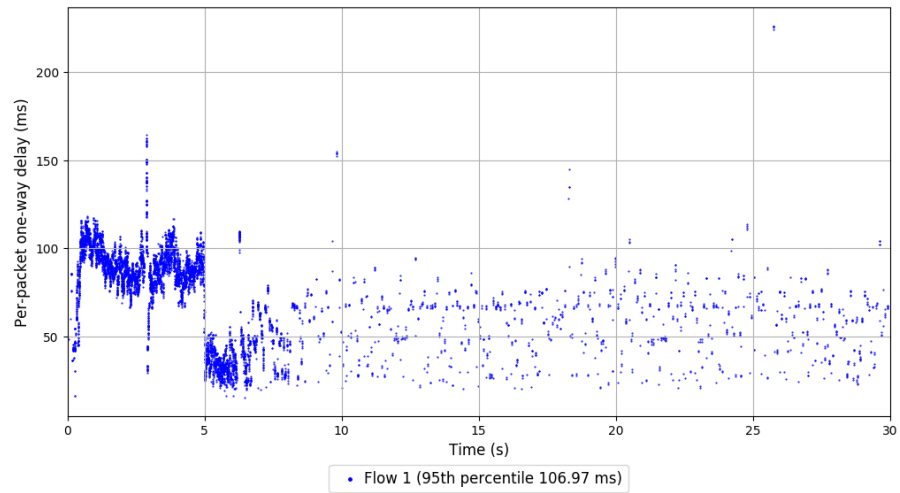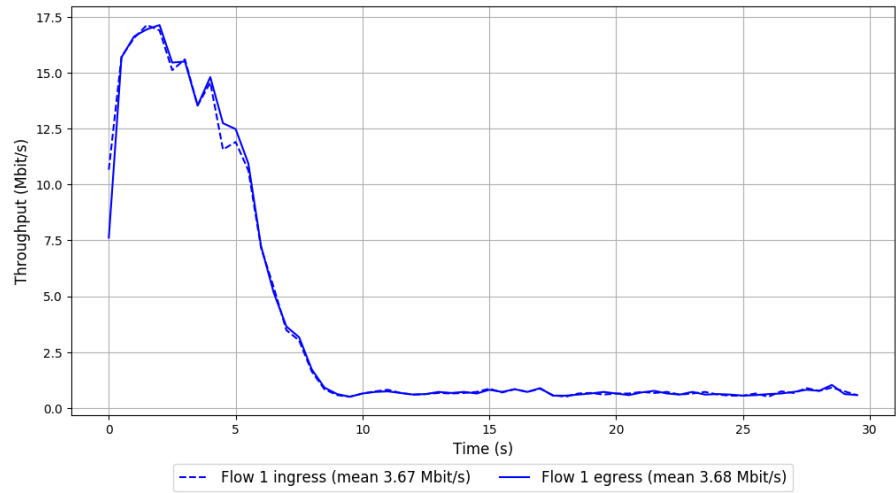

Flow 1 (95th percentile 86.32 ms)

```
Run 3: Statistics of TCP Vegas

Start at: 2017-08-21 05:19:10
End at: 2017-08-21 05:19:40
Local clock offset: 0.332 ms
Remote clock offset: -1.207 ms


# Below is generated by plot.py at 2017-08-21 06:15:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.68 Mbit/s
95th percentile per-packet one-way delay: 106.972 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 3.68 Mbit/s
95th percentile per-packet one-way delay: 106.972 ms
Loss rate: 0.07%
```

Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 3.67 Mbit/s)   Flow 1 egress (mean 3.68 Mbit/s)
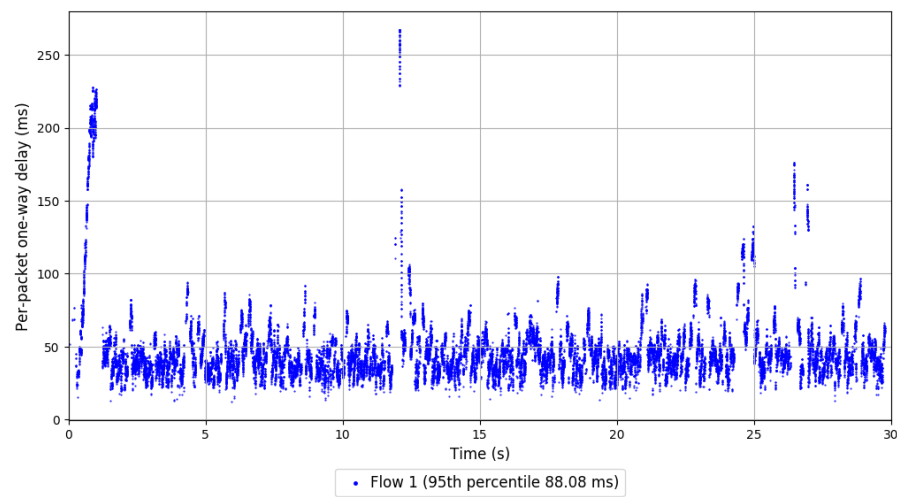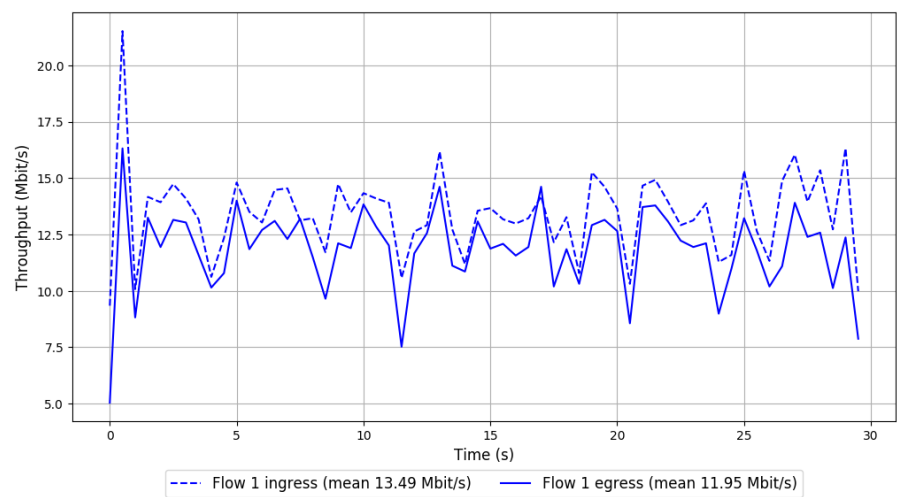

Flow 1 (95th percentile 106.97 ms)

```
Run 1: Statistics of Verus

Start at: 2017-08-21 04:30:50
End at: 2017-08-21 04:31:20
Local clock offset: 0.195 ms
Remote clock offset: -1.577 ms

# Below is generated by plot.py at 2017-08-21 06:15:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.95 Mbit/s
95th percentile per-packet one-way delay: 88.082 ms
Loss rate: 11.72%
-- Flow 1:
Average throughput: 11.95 Mbit/s
95th percentile per-packet one-way delay: 88.082 ms
Loss rate: 11.72%
```
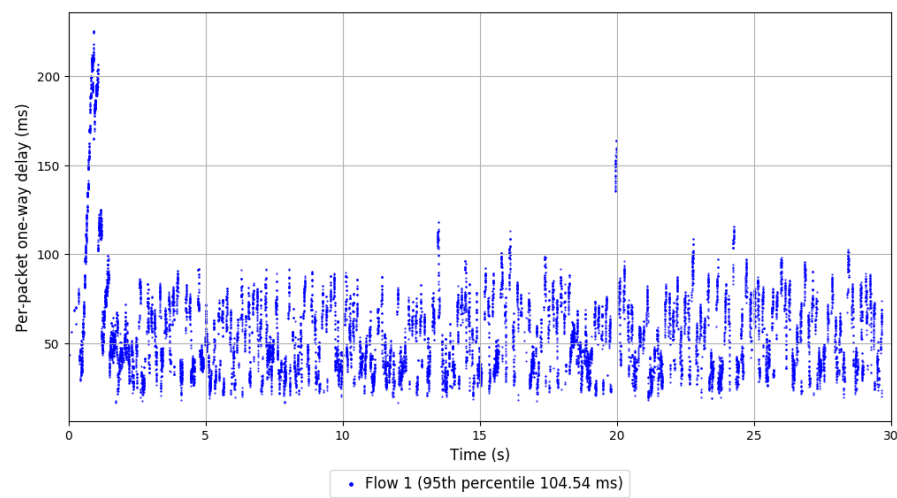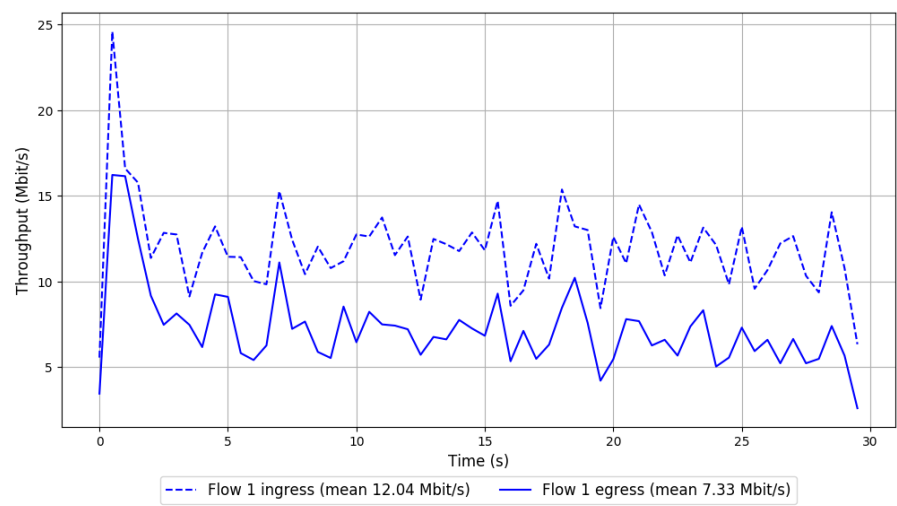
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2017-08-21 04:48:32
End at: 2017-08-21 04:49:02
Local clock offset: 0.171 ms
Remote clock offset: -1.369 ms


# Below is generated by plot.py at 2017-08-21 06:15:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.33 Mbit/s
95th percentile per-packet one-way delay: 104.540 ms
Loss rate: 39.39%
-- Flow 1:
Average throughput: 7.33 Mbit/s
95th percentile per-packet one-way delay: 104.540 ms
Loss rate: 39.39%
```
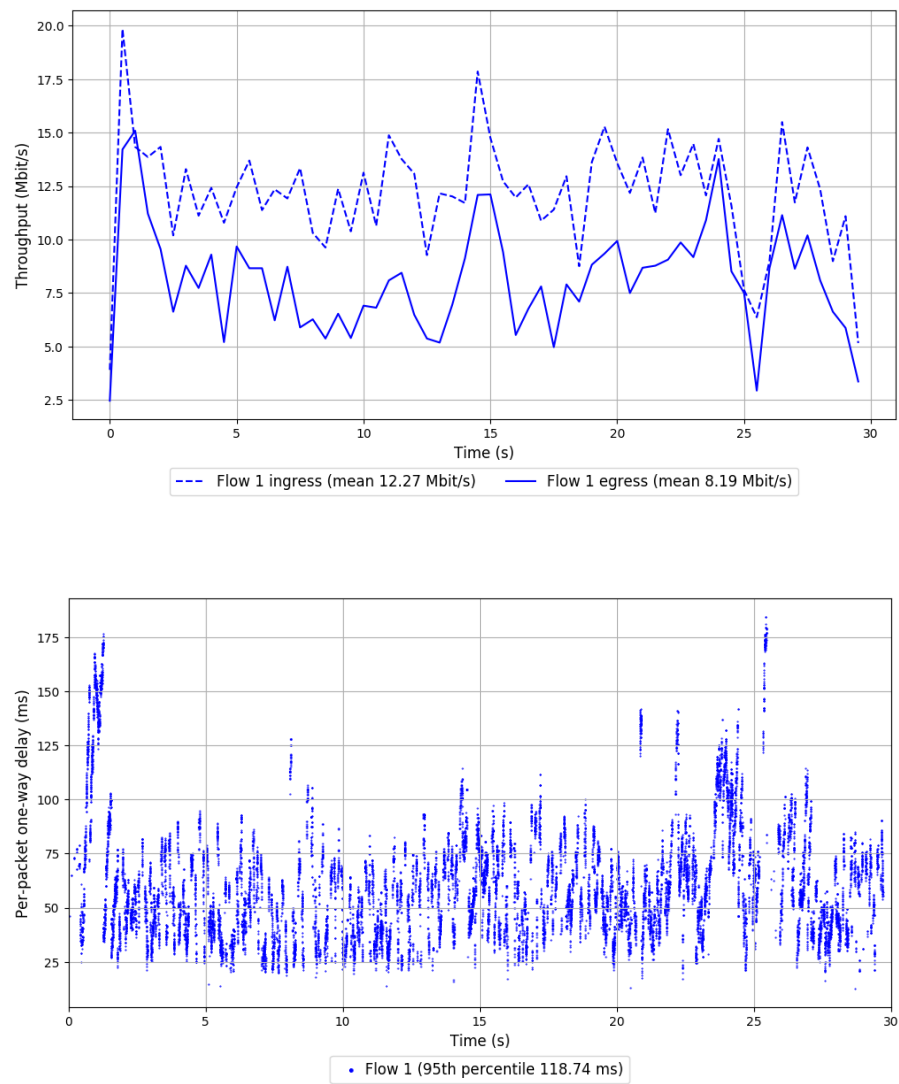
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2017-08-21 05:06:13
End at: 2017-08-21 05:06:43
Local clock offset: 0.238 ms
Remote clock offset: -1.206 ms


# Below is generated by plot.py at 2017-08-21 06:16:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.19 Mbit/s
95th percentile per-packet one-way delay: 118.743 ms
Loss rate: 33.37%
-- Flow 1:
Average throughput: 8.19 Mbit/s
95th percentile per-packet one-way delay: 118.743 ms
Loss rate: 33.37%
```
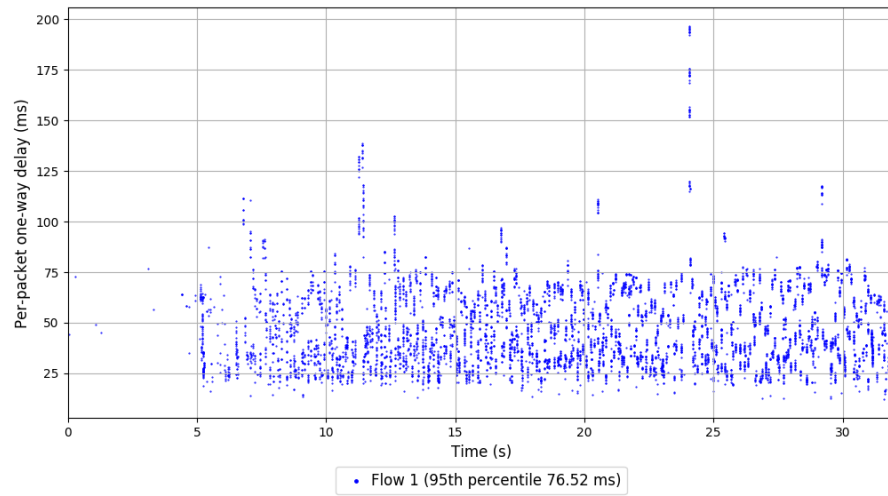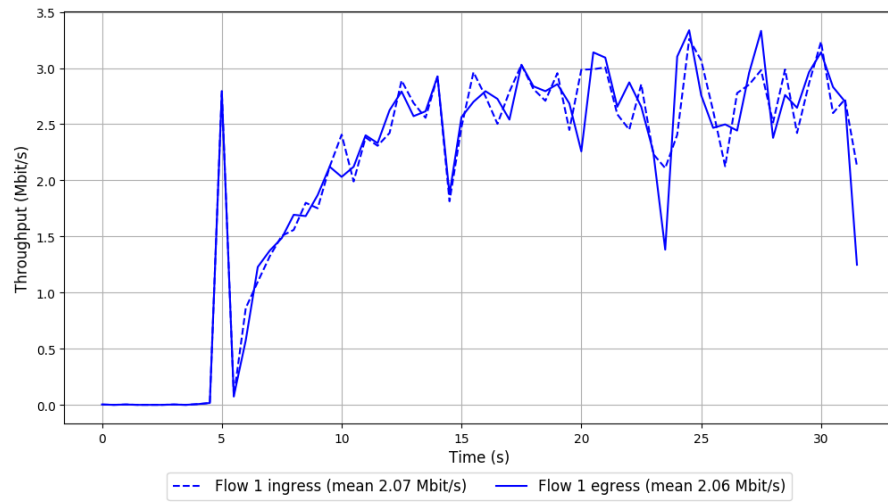
Run 3: Report of Verus — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2017-08-21 04:28:28
End at: 2017-08-21 04:28:58
Local clock offset: 0.23 ms
Remote clock offset: -1.771 ms


# Below is generated by plot.py at 2017-08-21 06:16:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 76.523 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 76.523 ms
Loss rate: 0.68%
```

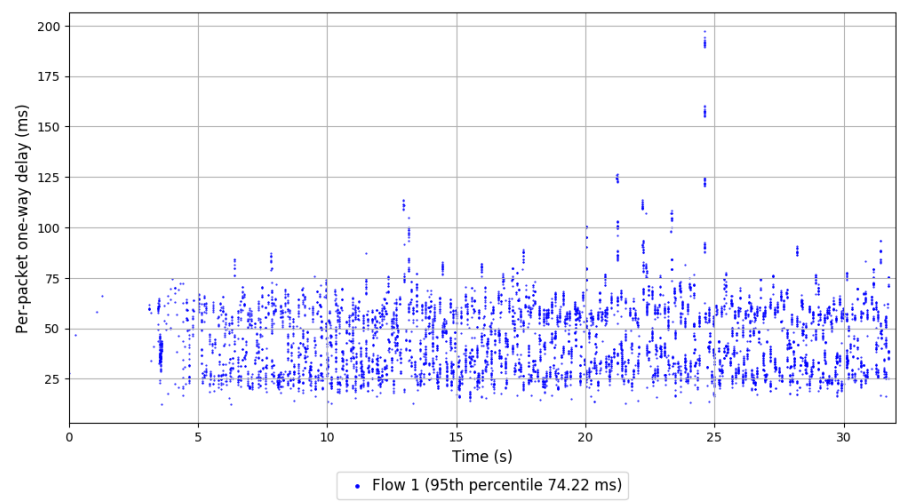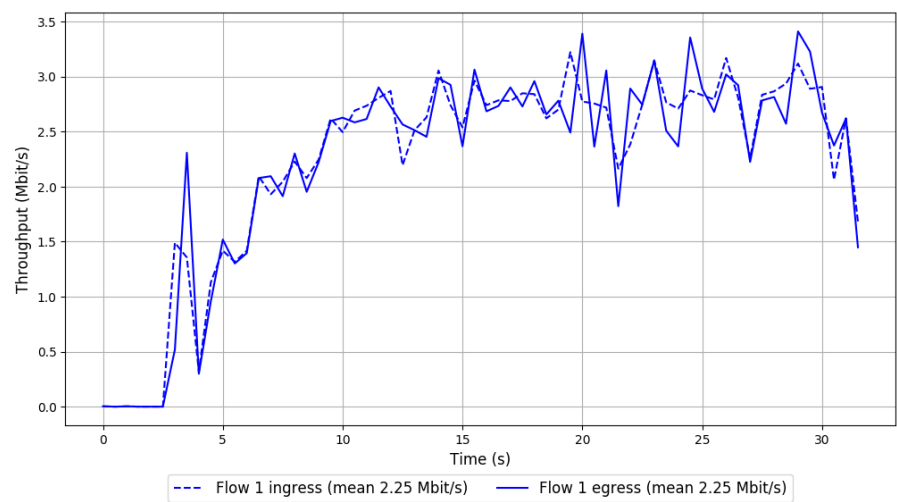Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2017-08-21 04:46:10
End at: 2017-08-21 04:46:40
Local clock offset: 0.179 ms
Remote clock offset: -1.307 ms


# Below is generated by plot.py at 2017-08-21 06:16:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 74.217 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 74.217 ms
Loss rate: 0.16%
```

Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2017-08-21 05:03:51
End at: 2017-08-21 05:04:21
Local clock offset: 0.248 ms
Remote clock offset: -1.244 ms


# Below is generated by plot.py at 2017-08-21 06:16:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 76.875 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 76.875 ms
Loss rate: 0.25%
```

Run 3: Report of WebRTC media — Data Link

Flow 1 ingress (mean 2.32 Mbit/s)   Flow 1 egress (mean 2.32 Mbit/s)

Flow 1 (95th percentile 76.88 ms)