Pantheon Report

Generated at 2017-12-05 07:57:08 (UTC).

Data path: AWS Korea Ethernet (*local*) →China ppp0 (*remote*).

Repeated the test of 14 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

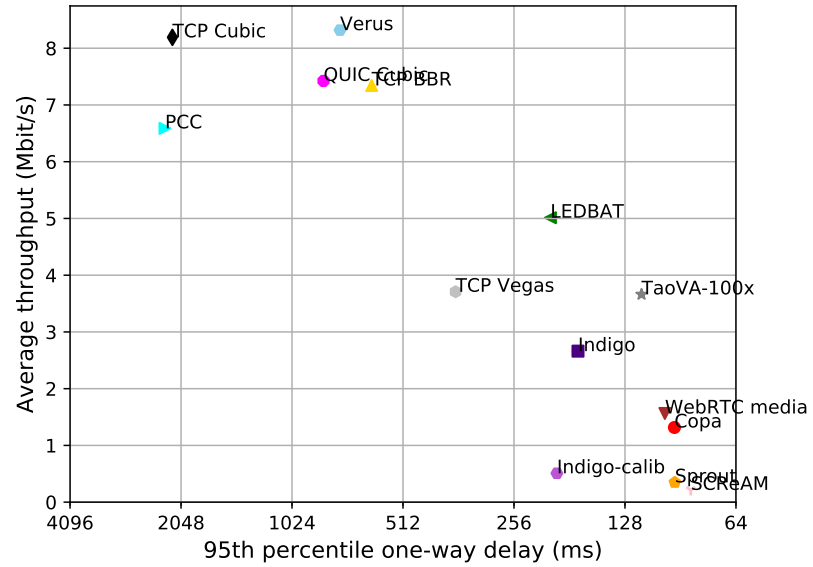Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

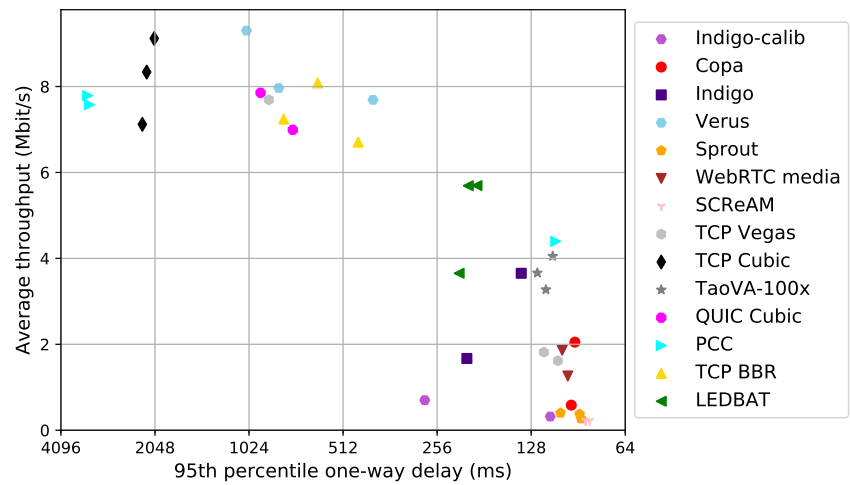NTP offsets were measured against `ntp.nict.jp` and have been applied to correct the timestamps in logs.

```
Git summary:
branch: indigos @ e3a57ad5ac5cfcaca0e3f983c8dd4cc3509e0262
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
 M datagrump/sender.cc
third_party/genericCC @ b5b7c38e8391001927dc41c6cfa2627d03dde737
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
third_party/indigo-cellular @ aee99e8eb842cb053f8c9a80e28cd256a930bbc2
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/indigo-no-cwnd @ 3e58442c04028a11d7b02456e137604633ba2d6c
third_party/indigo-no-delivery-rate @ 57caa40858b964906edff4876d5a7e5bfff666c5
third_party/indigo-no-queuing-delay @ 03455460fd1a8ffbdad86fabb936fdca204b80db
third_party/indigo-no-send-rate @ b39dfa6b2c5f19cb7cd89626cb4f5bb81f9fecda
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
 M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
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 Korea Ethernet to China ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)

test from AWS Korea Ethernet to China ppp0, 3 runs of 30s each per scheme
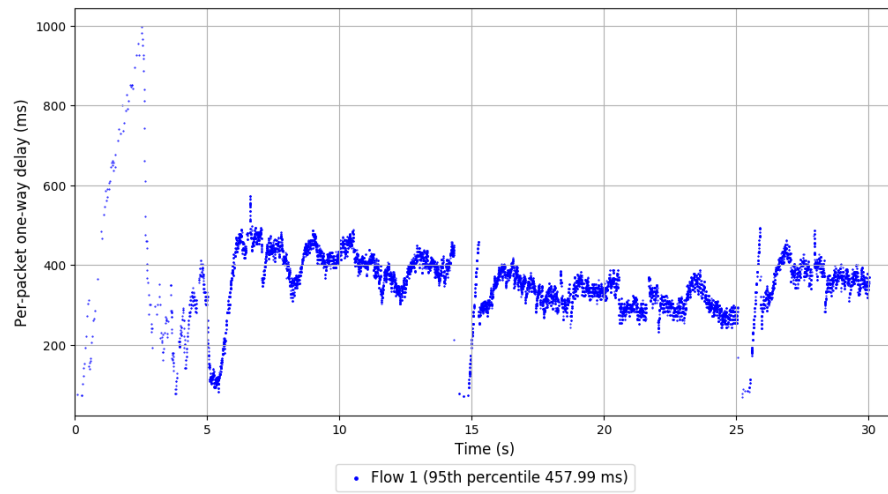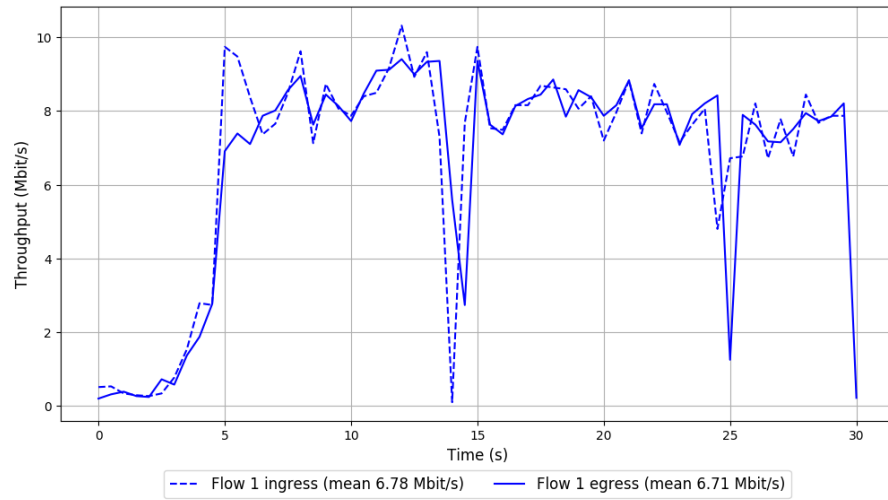
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	7.34	622.73	1.15
TCP Cubic	3	8.19	2161.50	6.25
LEDBAT	3	5.01	203.99	0.43
PCC	3	6.59	2263.59	7.31
QUIC Cubic	2	7.43	841.12	2.49
SCReAM	3	0.22	84.85	0.08
WebRTC media	2	1.56	99.76	0.21
Sprout	3	0.35	93.76	0.11
TaoVA-100x	3	3.66	115.44	0.40
TCP Vegas	3	3.71	368.70	0.85
Verus	3	8.32	758.82	1.20
Copa	2	1.31	94.00	0.12
Indigo	2	2.66	171.66	0.12
Indigo-calib	2	0.51	195.81	0.00

```
Run 1: Statistics of TCP BBR

Start at: 2017-12-05 07:19:31
End at: 2017-12-05 07:20:01
Local clock offset: -8.209 ms
Remote clock offset: -1.702 ms


# Below is generated by plot.py at 2017-12-05 07:56:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.71 Mbit/s
95th percentile per-packet one-way delay: 457.991 ms
Loss rate: 1.28%
-- Flow 1:
Average throughput: 6.71 Mbit/s
95th percentile per-packet one-way delay: 457.991 ms
Loss rate: 1.28%
```

Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2017-12-05 07:35:32
End at: 2017-12-05 07:36:02
Local clock offset: -6.051 ms
Remote clock offset: 5.027 ms


# Below is generated by plot.py at 2017-12-05 07:56:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.08 Mbit/s
95th percentile per-packet one-way delay: 617.132 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 8.08 Mbit/s
95th percentile per-packet one-way delay: 617.132 ms
Loss rate: 0.80%
```
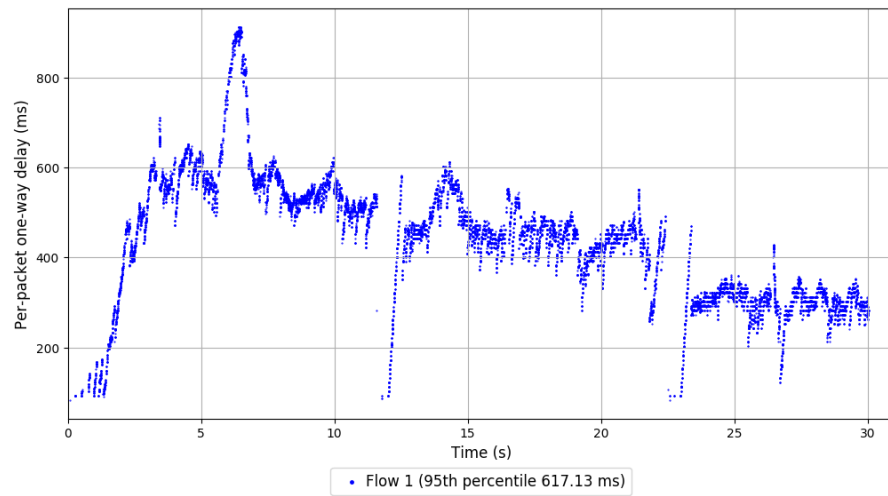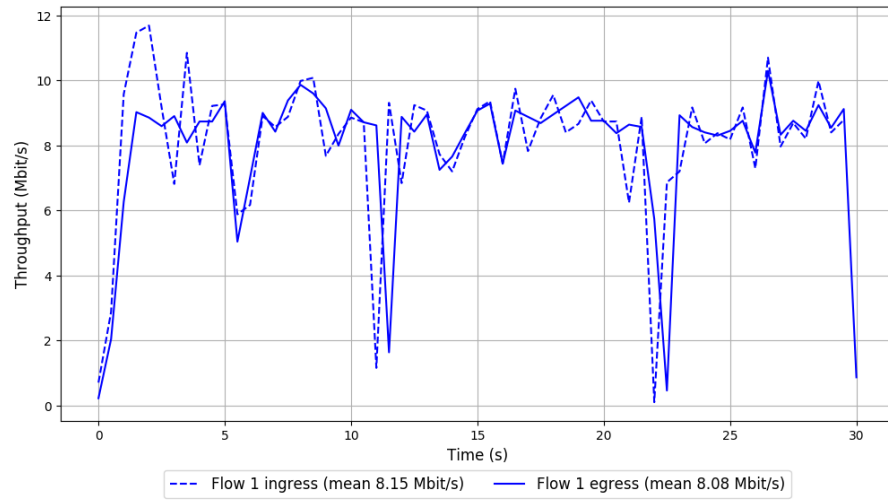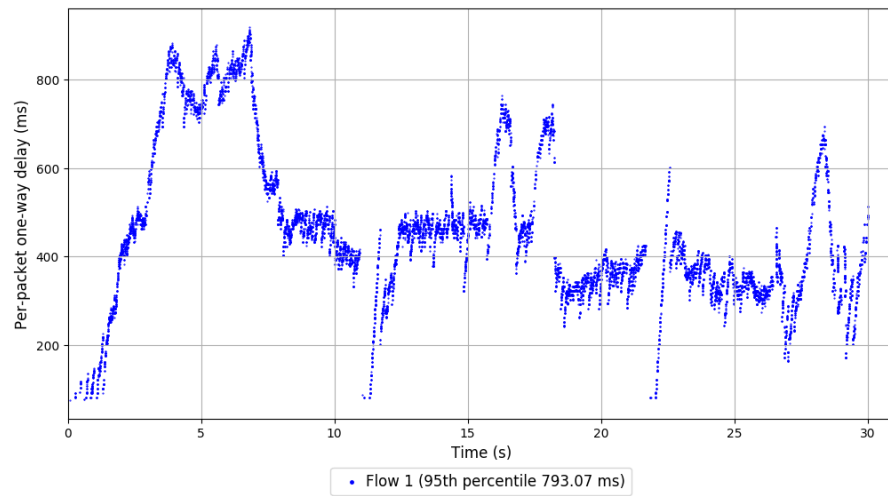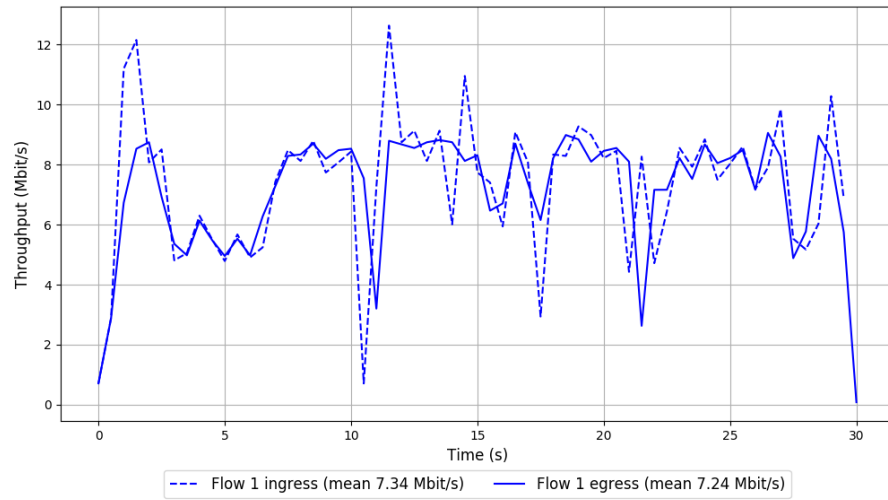
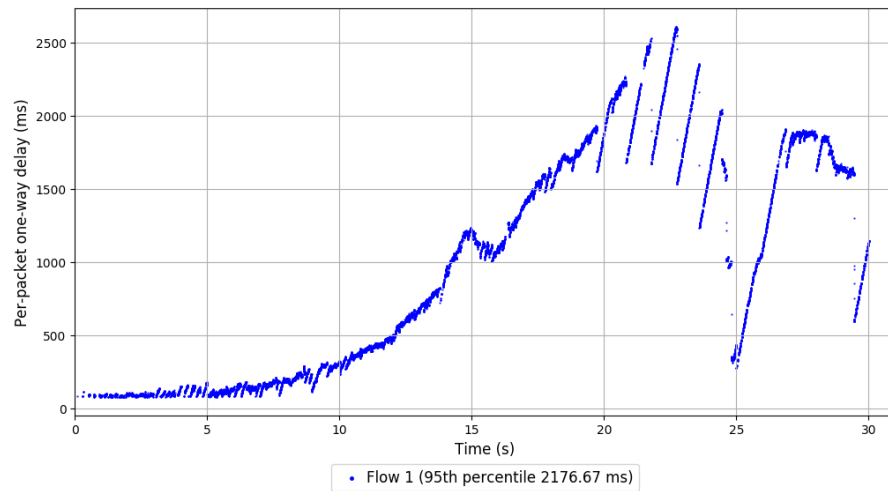Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2017-12-05 07:51:37
End at: 2017-12-05 07:52:08
Local clock offset: -8.074 ms
Remote clock offset: -2.121 ms


# Below is generated by plot.py at 2017-12-05 07:56:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.24 Mbit/s
95th percentile per-packet one-way delay: 793.073 ms
Loss rate: 1.36%
-- Flow 1:
Average throughput: 7.24 Mbit/s
95th percentile per-packet one-way delay: 793.073 ms
Loss rate: 1.36%
```

Run 3: Report of TCP BBR — Data Link

Flow 1 ingress (mean 7.34 Mbit/s)   Flow 1 egress (mean 7.24 Mbit/s)

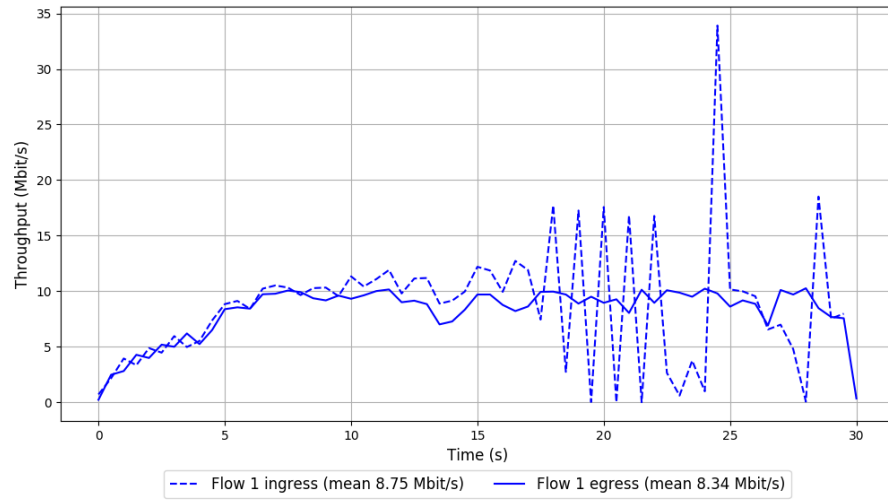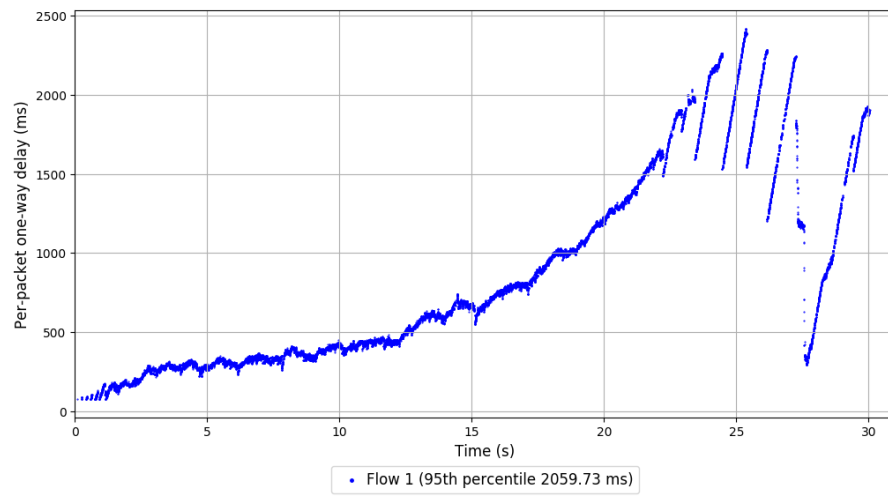Flow 1 (95th percentile 793.07 ms)

9

```
Run 1: Statistics of TCP Cubic

Start at: 2017-12-05 07:14:33
End at: 2017-12-05 07:15:03
Local clock offset: -7.863 ms
Remote clock offset: -2.049 ms


# Below is generated by plot.py at 2017-12-05 07:56:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.34 Mbit/s
95th percentile per-packet one-way delay: 2176.668 ms
Loss rate: 4.83%
-- Flow 1:
Average throughput: 8.34 Mbit/s
95th percentile per-packet one-way delay: 2176.668 ms
Loss rate: 4.83%
```
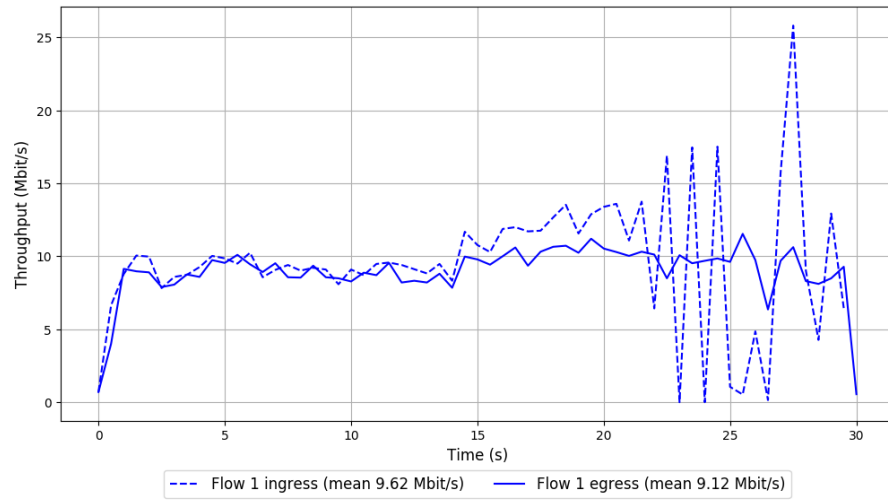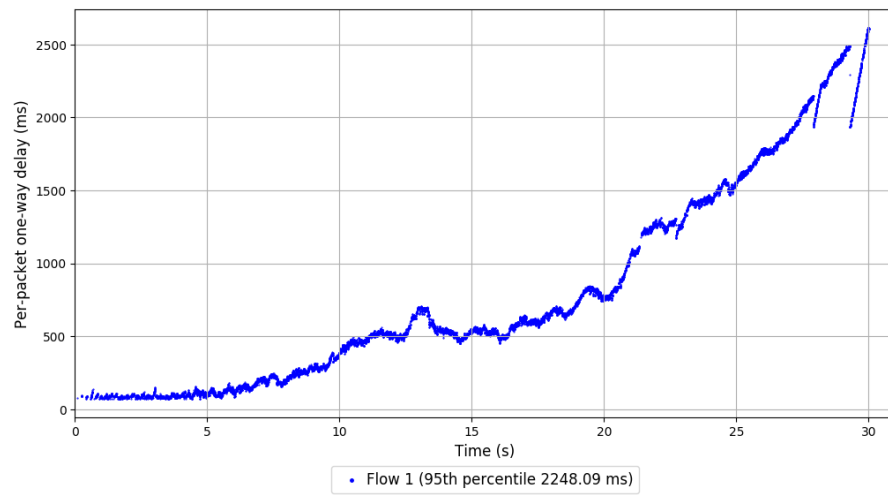
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2017-12-05 07:30:58
End at: 2017-12-05 07:31:28
Local clock offset: -7.007 ms
Remote clock offset: -1.577 ms


# Below is generated by plot.py at 2017-12-05 07:56:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.12 Mbit/s
95th percentile per-packet one-way delay: 2059.731 ms
Loss rate: 5.23%
-- Flow 1:
Average throughput: 9.12 Mbit/s
95th percentile per-packet one-way delay: 2059.731 ms
Loss rate: 5.23%
```

Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 9.62 Mbit/s) —— Flow 1 egress (mean 9.12 Mbit/s)
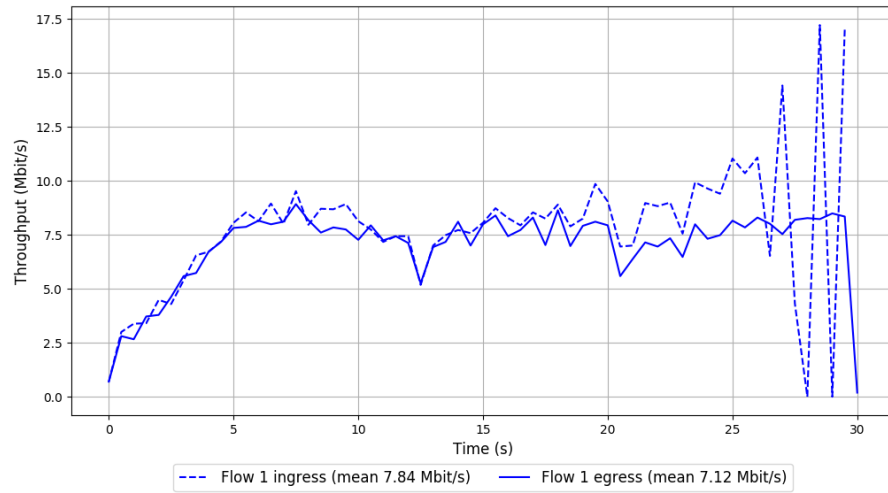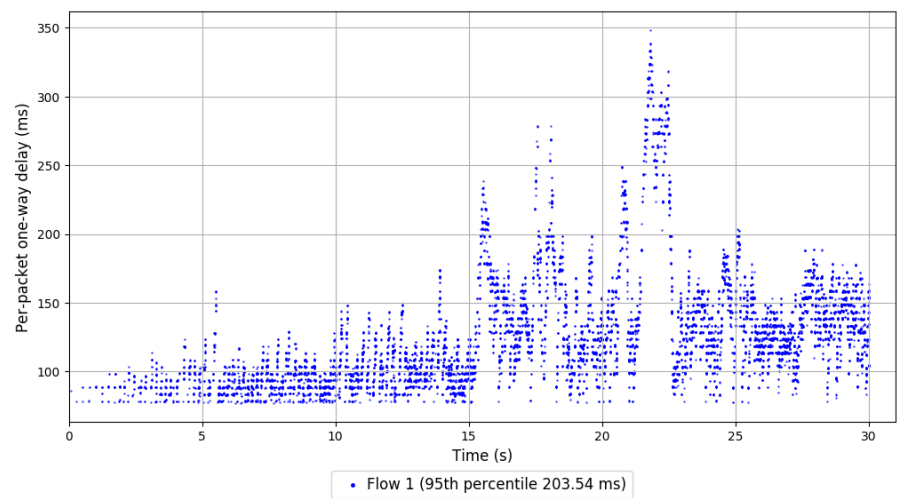

Flow 1 (95th percentile 2059.73 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2017-12-05 07:47:01
End at: 2017-12-05 07:47:31
Local clock offset: -7.189 ms
Remote clock offset: -2.491 ms


# Below is generated by plot.py at 2017-12-05 07:56:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.12 Mbit/s
95th percentile per-packet one-way delay: 2248.088 ms
Loss rate: 8.70%
-- Flow 1:
Average throughput: 7.12 Mbit/s
95th percentile per-packet one-way delay: 2248.088 ms
Loss rate: 8.70%
```

Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 7.84 Mbit/s) --- Flow 1 egress (mean 7.12 Mbit/s)

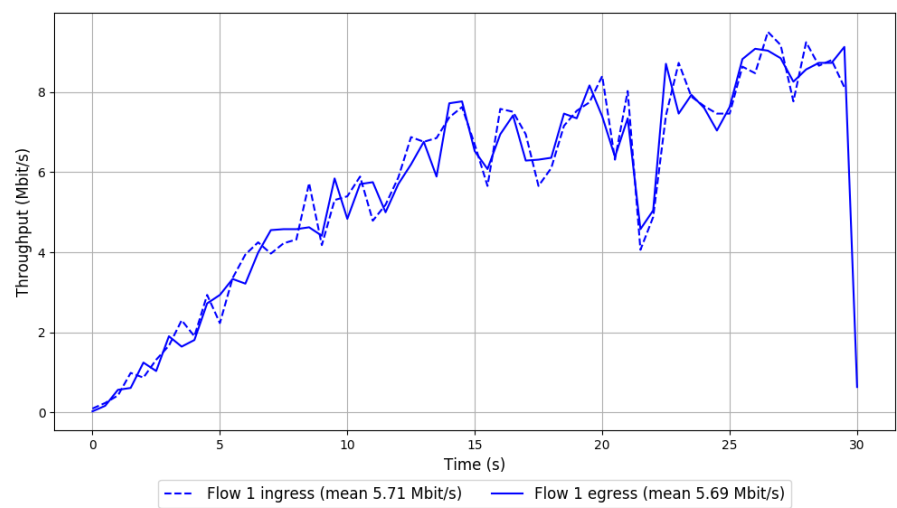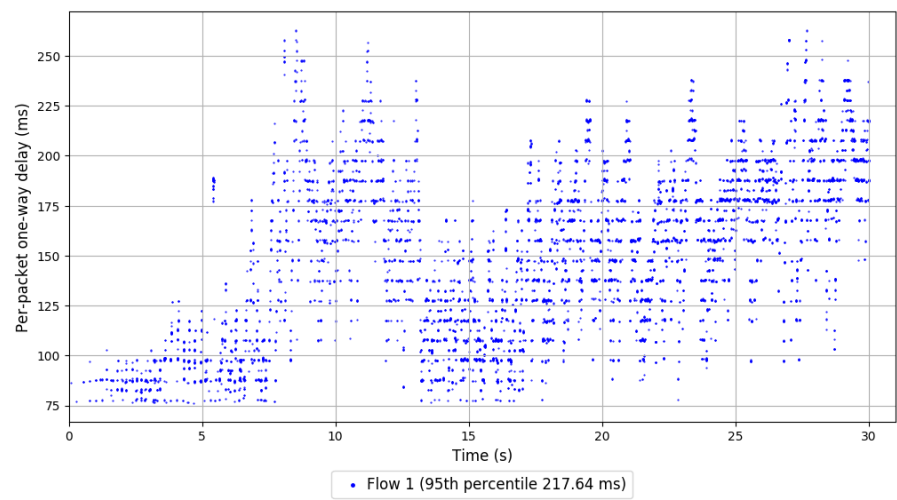
Flow 1 (95th percentile 2248.09 ms)

15

```
Run 1: Statistics of LEDBAT

Start at: 2017-12-05 07:09:42
End at: 2017-12-05 07:10:12
Local clock offset: -7.216 ms
Remote clock offset: -1.797 ms


# Below is generated by plot.py at 2017-12-05 07:56:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.69 Mbit/s
95th percentile per-packet one-way delay: 203.540 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 5.69 Mbit/s
95th percentile per-packet one-way delay: 203.540 ms
Loss rate: 0.33%
```

Run 1: Report of LEDBAT — Data Link

Flow 1 ingress (mean 5.71 Mbit/s)   Flow 1 egress (mean 5.69 Mbit/s)

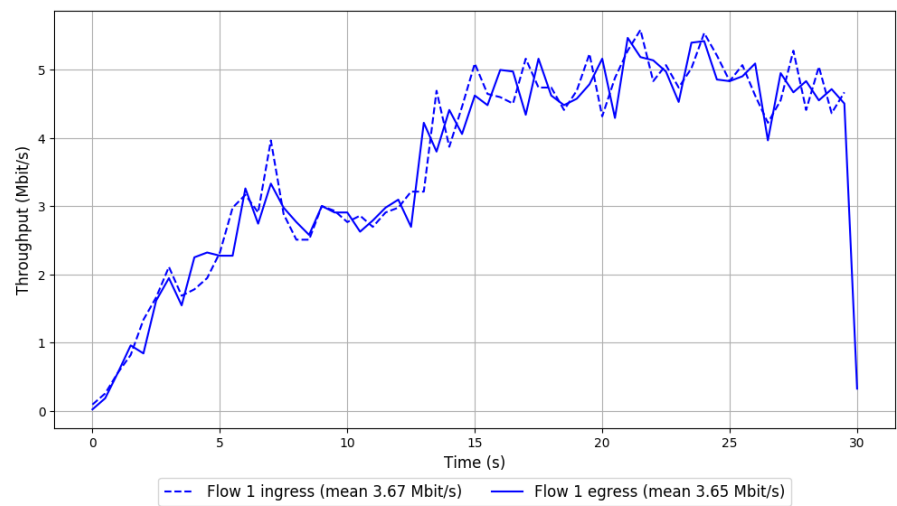· Flow 1 (95th percentile 203.54 ms)

```
Run 2: Statistics of LEDBAT

Start at: 2017-12-05 07:26:23
End at: 2017-12-05 07:26:53
Local clock offset: -7.379 ms
Remote clock offset: -1.444 ms

# Below is generated by plot.py at 2017-12-05 07:56:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.65 Mbit/s
95th percentile per-packet one-way delay: 217.640 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 3.65 Mbit/s
95th percentile per-packet one-way delay: 217.640 ms
Loss rate: 0.76%
```
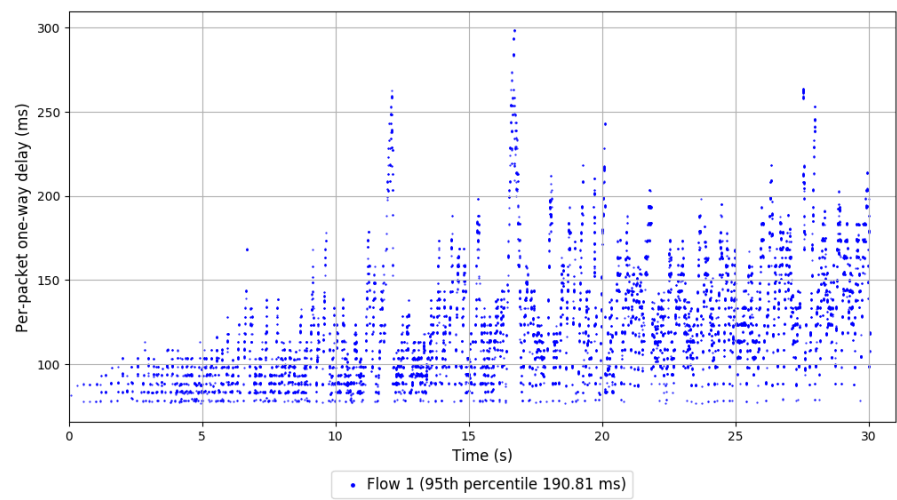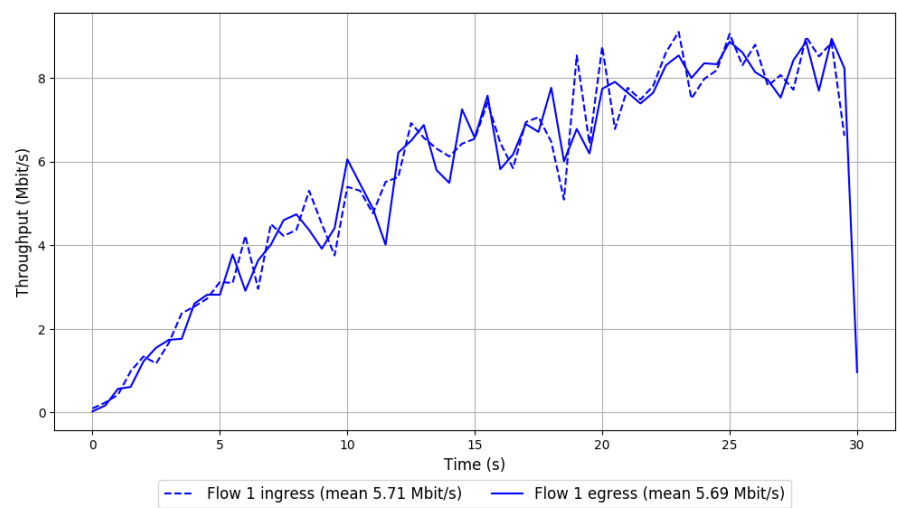
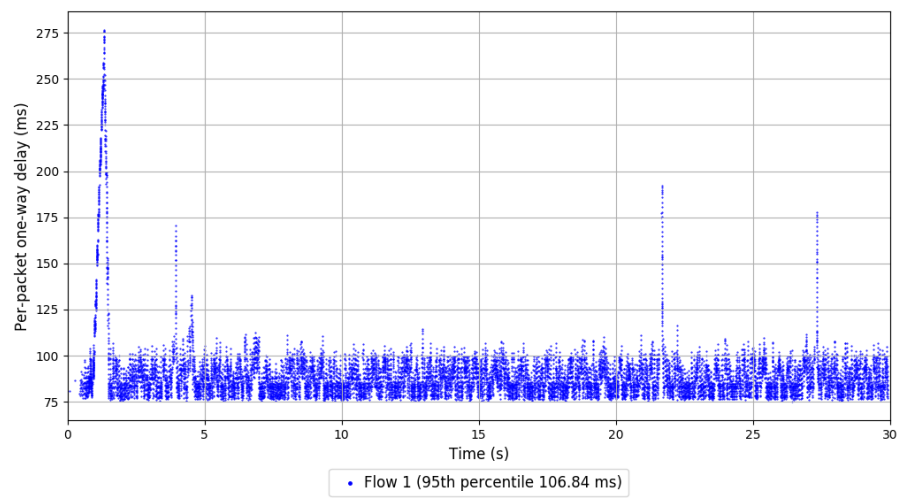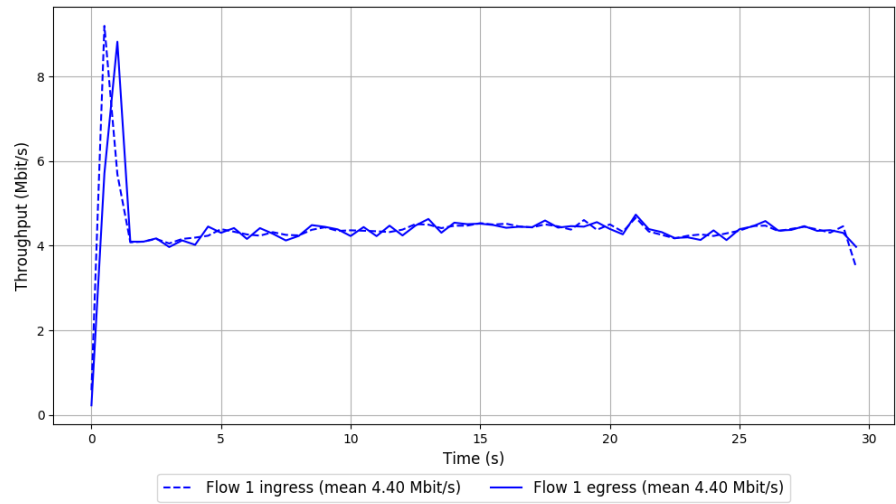Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 3.67 Mbit/s)   Flow 1 egress (mean 3.65 Mbit/s)

Flow 1 (95th percentile 217.64 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2017-12-05 07:42:24
End at: 2017-12-05 07:42:54
Local clock offset: -6.345 ms
Remote clock offset: 5.667 ms


# Below is generated by plot.py at 2017-12-05 07:56:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.69 Mbit/s
95th percentile per-packet one-way delay: 190.805 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 5.69 Mbit/s
95th percentile per-packet one-way delay: 190.805 ms
Loss rate: 0.21%
```
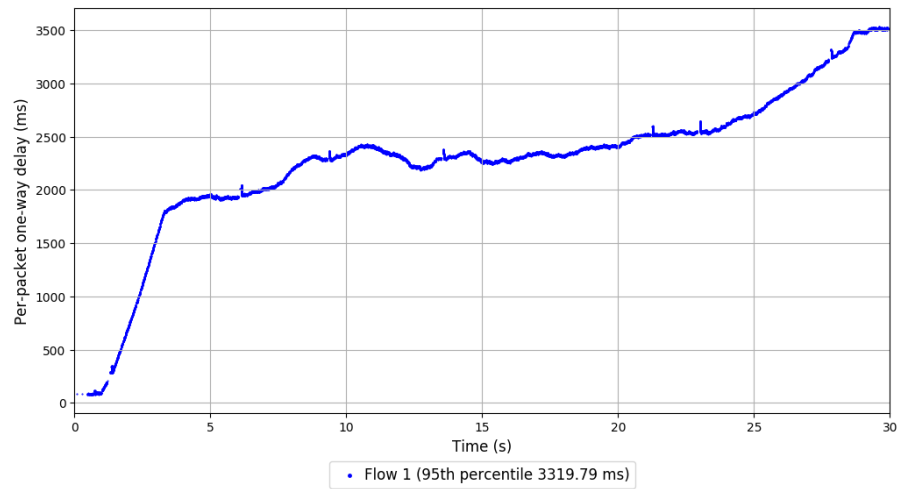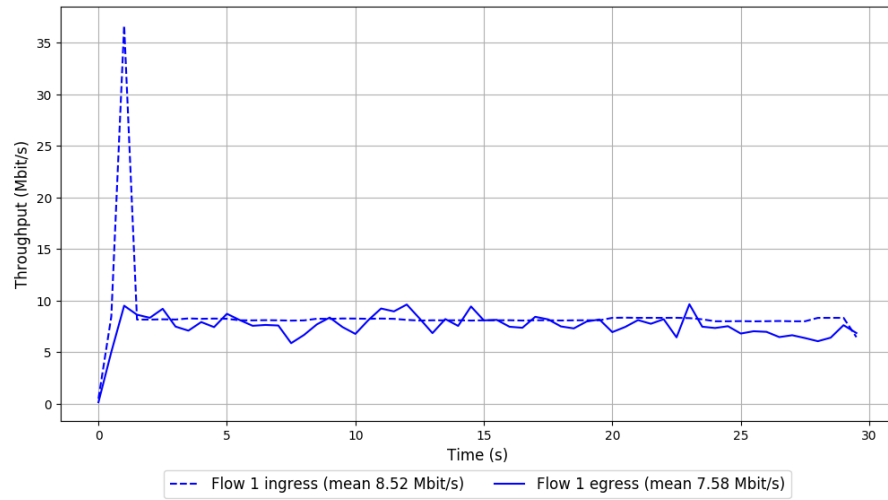
Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 5.71 Mbit/s) —— Flow 1 egress (mean 5.69 Mbit/s)

• Flow 1 (95th percentile 190.81 ms)

```
Run 1: Statistics of PCC

Start at: 2017-12-05 07:07:25
End at: 2017-12-05 07:07:55
Local clock offset: -6.394 ms
Remote clock offset: -1.958 ms


# Below is generated by plot.py at 2017-12-05 07:56:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.40 Mbit/s
95th percentile per-packet one-way delay: 106.836 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 4.40 Mbit/s
95th percentile per-packet one-way delay: 106.836 ms
Loss rate: 0.15%
```

Run 1: Report of PCC — Data Link

Flow 1 ingress (mean 4.40 Mbit/s) --- Flow 1 egress (mean 4.40 Mbit/s)

Flow 1 (95th percentile 106.84 ms)

```
Run 2: Statistics of PCC

Start at: 2017-12-05 07:24:06
End at: 2017-12-05 07:24:36
Local clock offset: -7.227 ms
Remote clock offset: -1.721 ms


# Below is generated by plot.py at 2017-12-05 07:56:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.58 Mbit/s
95th percentile per-packet one-way delay: 3319.791 ms
Loss rate: 11.15%
-- Flow 1:
Average throughput: 7.58 Mbit/s
95th percentile per-packet one-way delay: 3319.791 ms
Loss rate: 11.15%
```
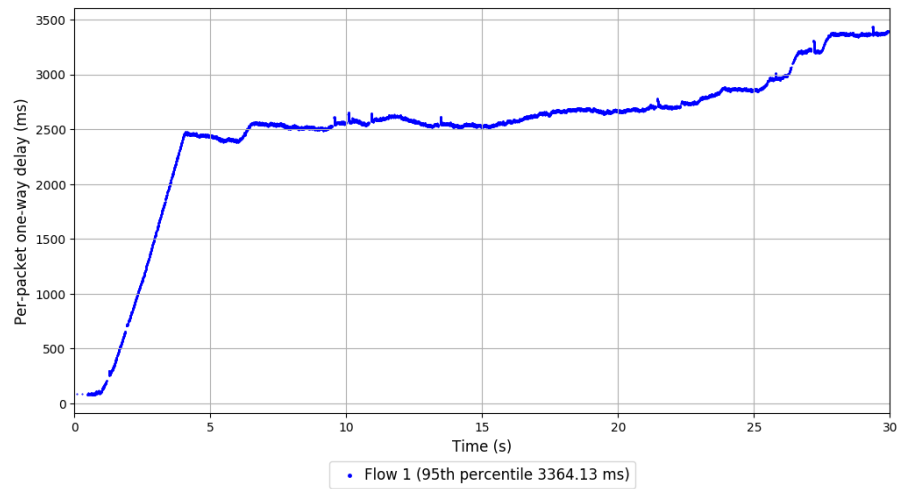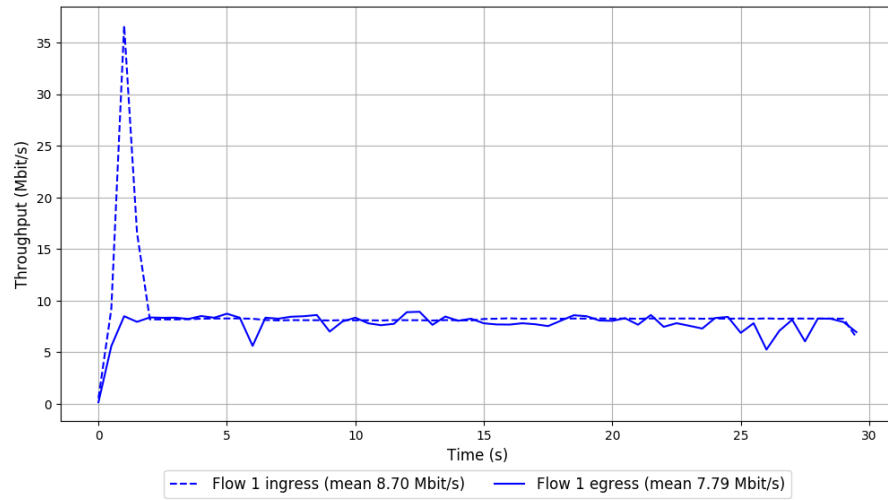
Run 2: Report of PCC — Data Link

Flow 1 ingress (mean 8.52 Mbit/s) --- Flow 1 egress (mean 7.58 Mbit/s)

Flow 1 (95th percentile 3319.79 ms)

```
Run 3: Statistics of PCC

Start at: 2017-12-05 07:40:06
End at: 2017-12-05 07:40:36
Local clock offset: -5.892 ms
Remote clock offset: 0.618 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.79 Mbit/s
95th percentile per-packet one-way delay: 3364.134 ms
Loss rate: 10.62%
-- Flow 1:
Average throughput: 7.79 Mbit/s
95th percentile per-packet one-way delay: 3364.134 ms
Loss rate: 10.62%
```
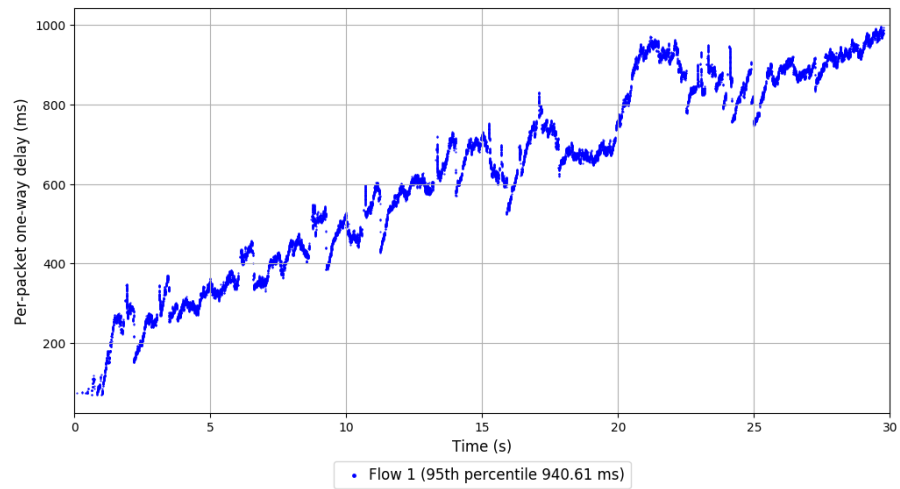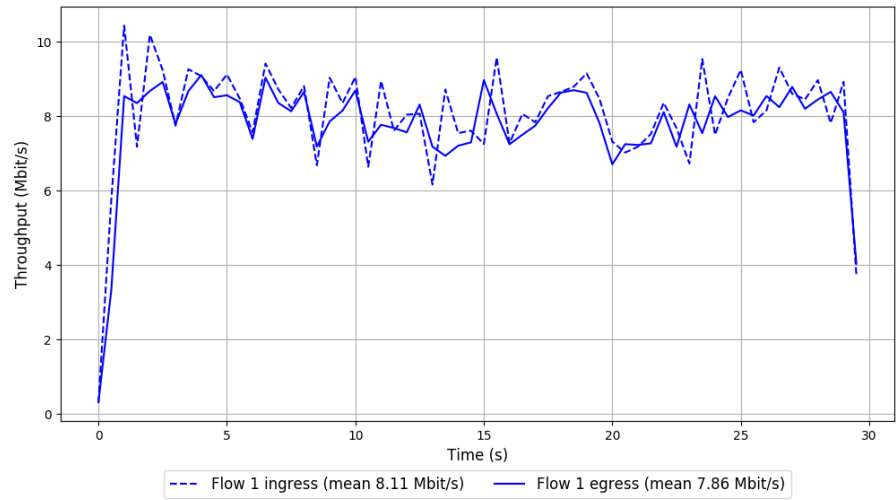
Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 8.70 Mbit/s)   —— Flow 1 egress (mean 7.79 Mbit/s)

• Flow 1 (95th percentile 3364.13 ms)

```
Run 1: Statistics of QUIC Cubic

Start at: 2017-12-05 07:10:51
End at: 2017-12-05 07:11:21
Local clock offset: -7.537 ms
Remote clock offset: -1.944 ms
```

Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 0.04 Mbit/s) --- Flow 1 egress (mean 0.04 Mbit/s)

Flow 1 (95th percentile 87.25 ms)

```
Run 2: Statistics of QUIC Cubic

Start at: 2017-12-05 07:27:31
End at: 2017-12-05 07:28:01
Local clock offset: -7.623 ms
Remote clock offset: -1.297 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.86 Mbit/s
95th percentile per-packet one-way delay: 940.611 ms
Loss rate: 3.31%
-- Flow 1:
Average throughput: 7.86 Mbit/s
95th percentile per-packet one-way delay: 940.611 ms
Loss rate: 3.31%
```
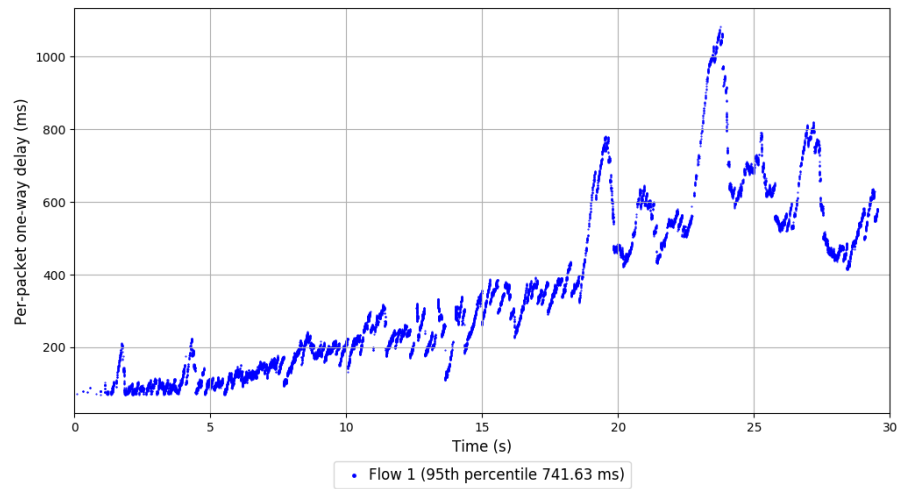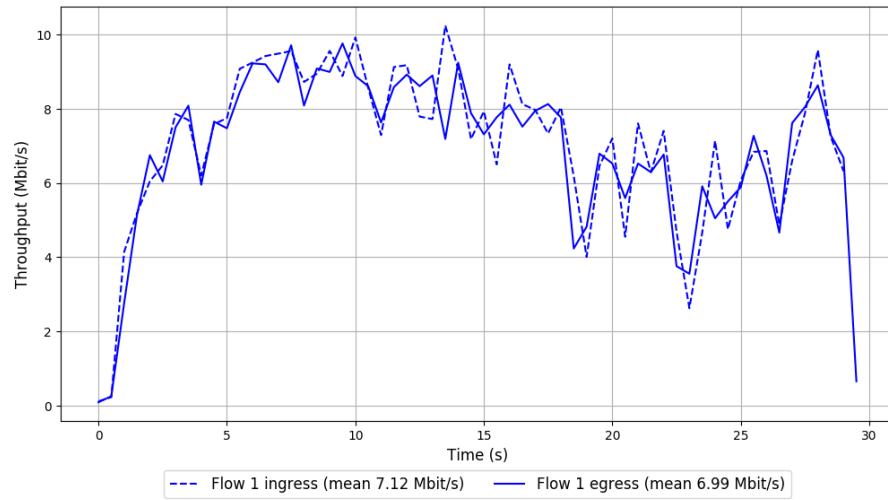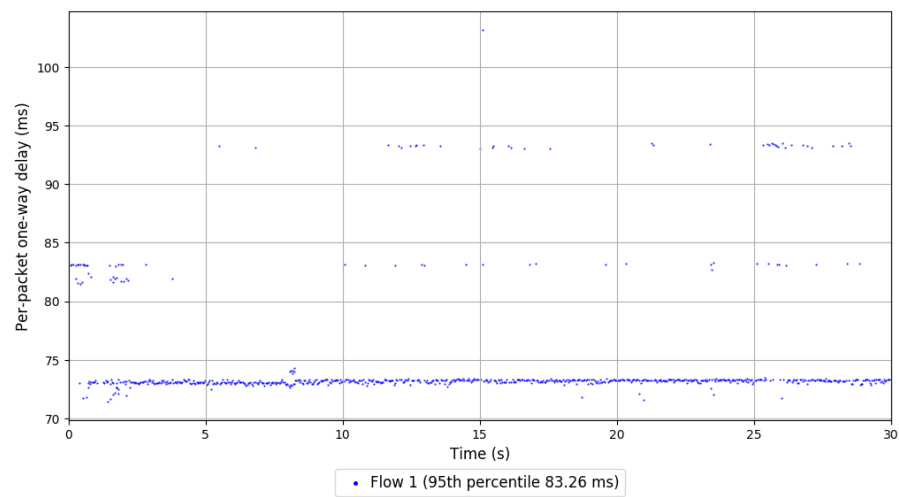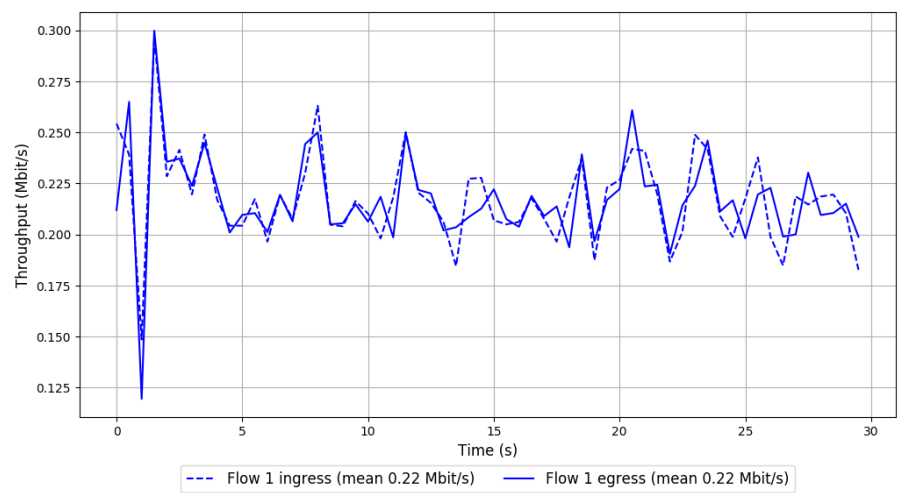
Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 8.11 Mbit/s) --- Flow 1 egress (mean 7.86 Mbit/s)

Flow 1 (95th percentile 940.61 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-12-05 07:43:34
End at: 2017-12-05 07:44:04
Local clock offset: -6.532 ms
Remote clock offset: -2.36 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.99 Mbit/s
95th percentile per-packet one-way delay: 741.633 ms
Loss rate: 1.67%
-- Flow 1:
Average throughput: 6.99 Mbit/s
95th percentile per-packet one-way delay: 741.633 ms
Loss rate: 1.67%
```
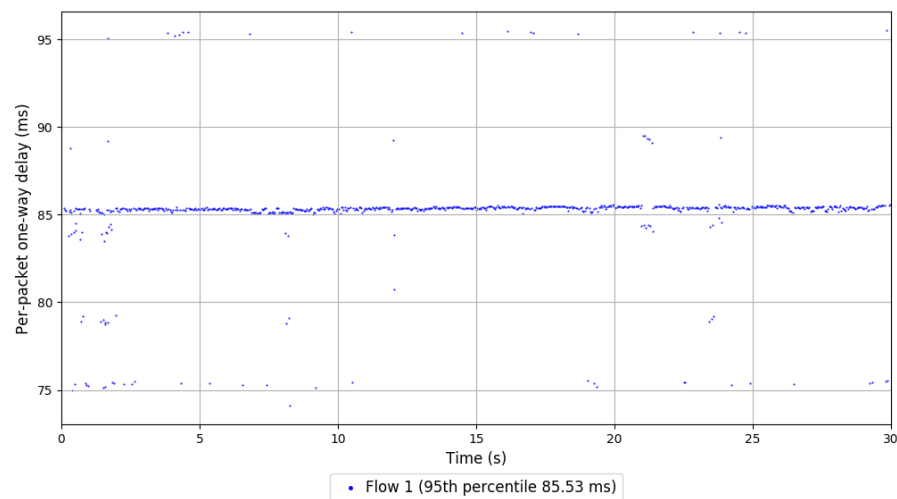
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 7.12 Mbit/s) --- Flow 1 egress (mean 6.99 Mbit/s)

Flow 1 (95th percentile 741.63 ms)

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```
Run 1: Statistics of SCReAM

Start at: 2017-12-05 07:20:40
End at: 2017-12-05 07:21:10
Local clock offset: -7.84 ms
Remote clock offset: -1.672 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 83.261 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 83.261 ms
Loss rate: 0.13%
```
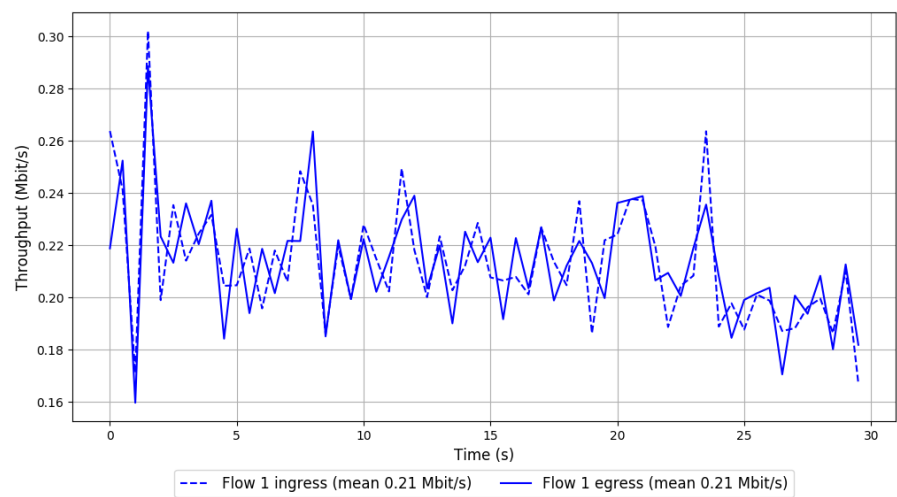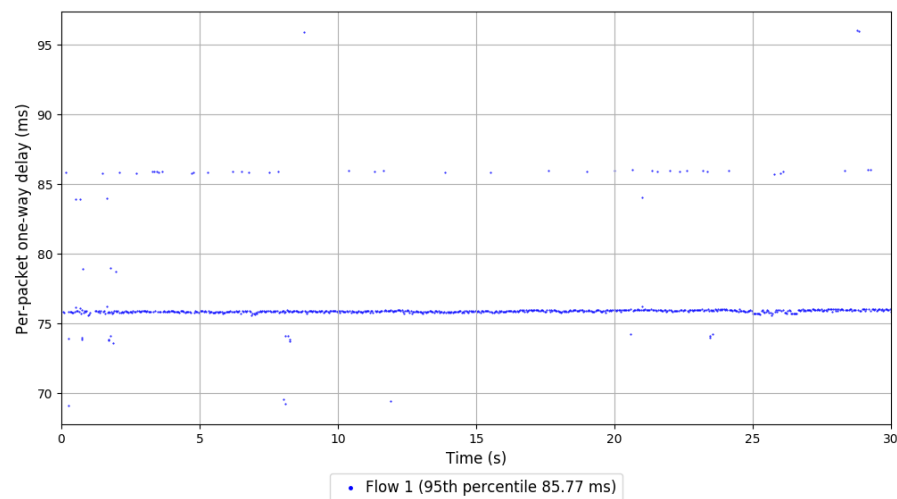
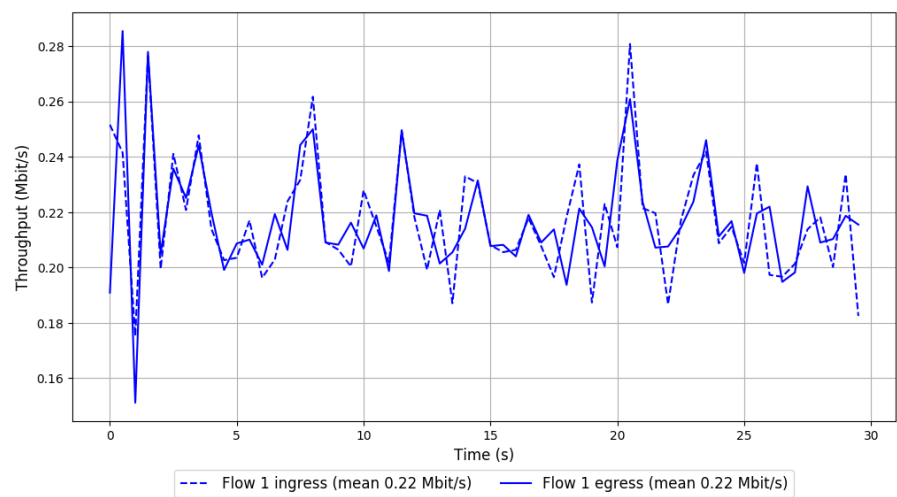Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2017-12-05 07:36:41
End at: 2017-12-05 07:37:11
Local clock offset: -5.881 ms
Remote clock offset: -1.81 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 85.530 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 85.530 ms
Loss rate: 0.12%
```
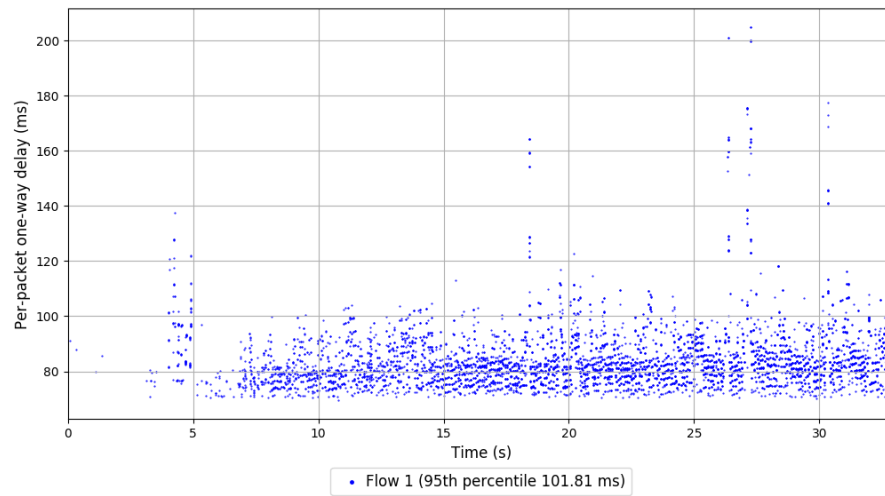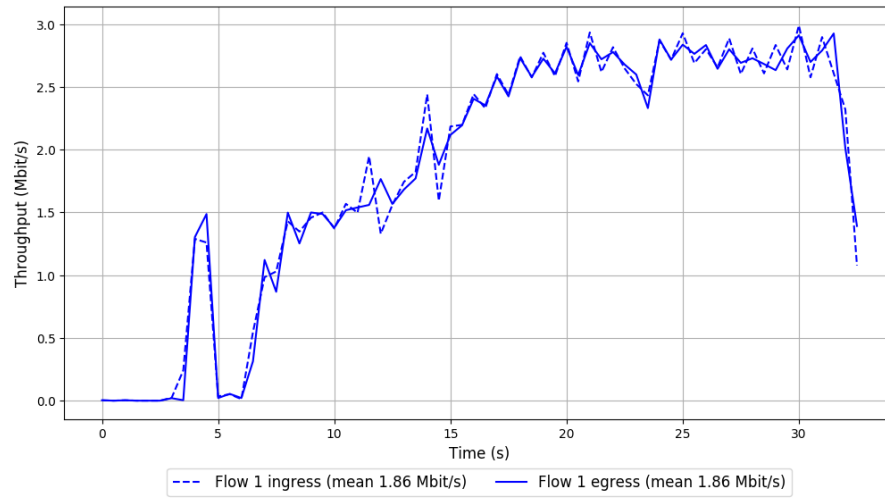
Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2017-12-05 07:52:47
End at: 2017-12-05 07:53:17
Local clock offset: -7.889 ms
Remote clock offset: -2.453 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 85.770 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 85.770 ms
Loss rate: 0.00%
```

Run 3: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.22 Mbit/s) ---- Flow 1 egress (mean 0.22 Mbit/s) ——

Flow 1 (95th percentile 85.77 ms)

```
Run 1: Statistics of WebRTC media

Start at: 2017-12-05 07:22:57
End at: 2017-12-05 07:23:27
Local clock offset: -7.447 ms
Remote clock offset: -1.631 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 101.815 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 101.815 ms
Loss rate: 0.17%
```

Run 1: Report of WebRTC media — Data Link

Flow 1 ingress (mean 1.86 Mbit/s)   Flow 1 egress (mean 1.86 Mbit/s)

Flow 1 (95th percentile 101.81 ms)

Run 2: Statistics of WebRTC media

Start at: 2017-12-05 07:38:58
End at: 2017-12-05 07:39:28
Local clock offset: -6.072 ms
Remote clock offset: -2.359 ms
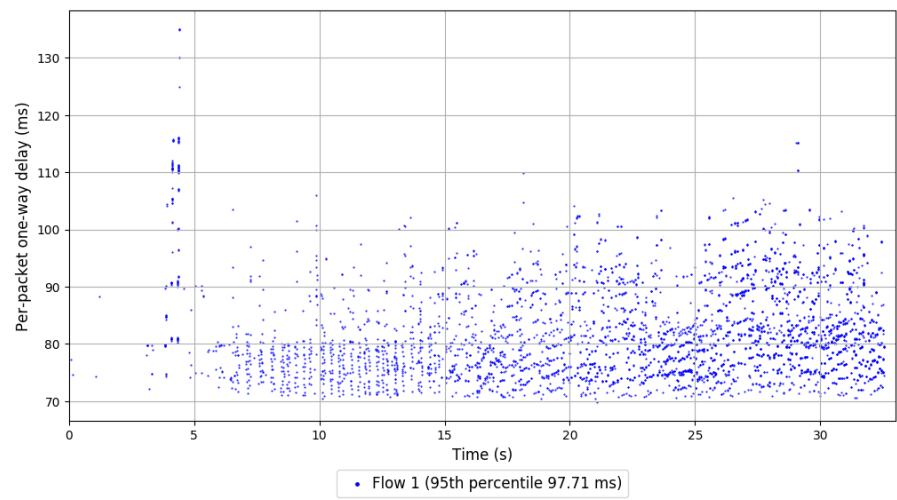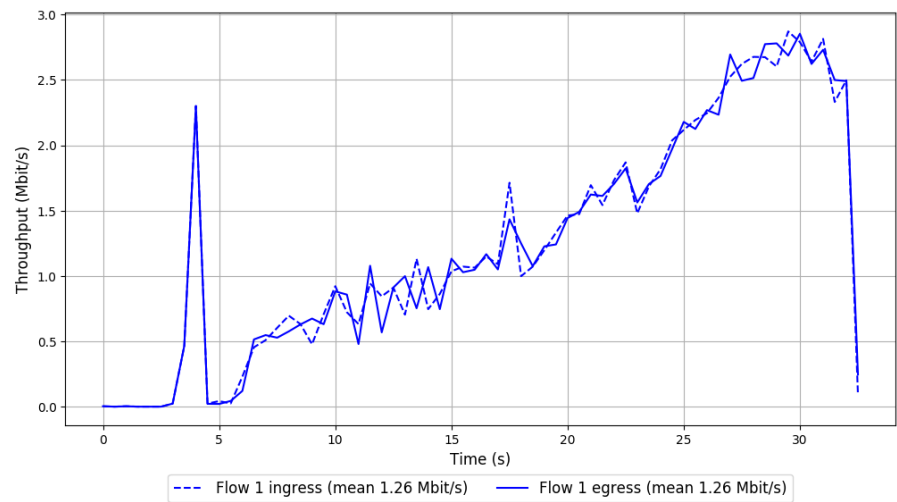
Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2017-12-05 07:55:04
End at: 2017-12-05 07:55:34
Local clock offset: -7.787 ms
Remote clock offset: -2.576 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 97.710 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 97.710 ms
Loss rate: 0.25%
```

Run 3: Report of WebRTC media — Data Link

```
Run 1: Statistics of Sprout

Start at: 2017-12-05 07:08:34
End at: 2017-12-05 07:09:04
Local clock offset: -6.74 ms
Remote clock offset: -2.082 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 89.611 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 89.611 ms
Loss rate: 0.01%
```
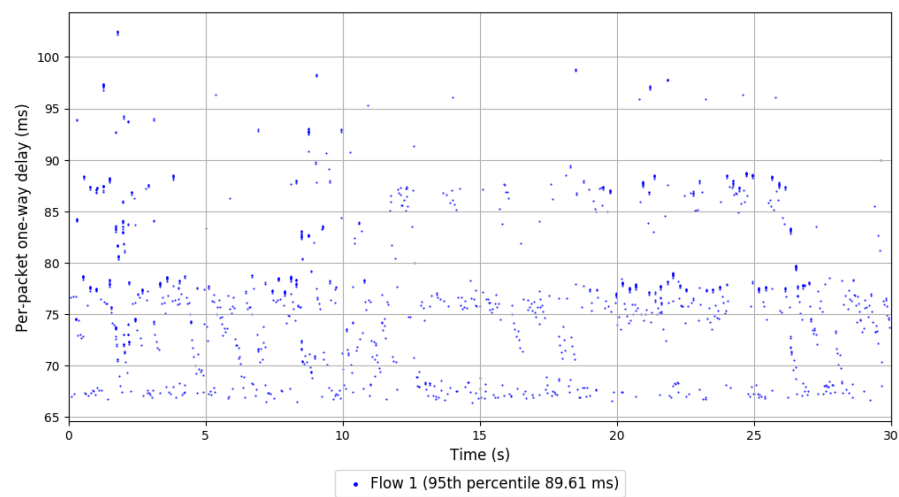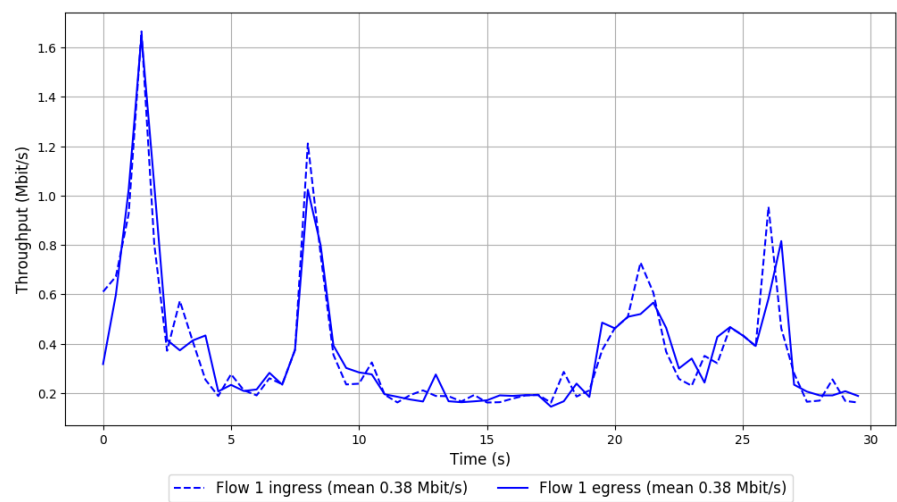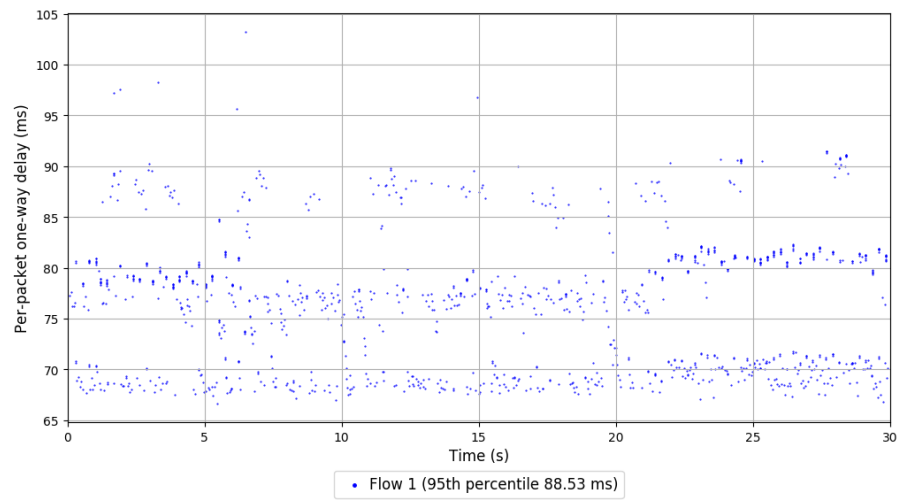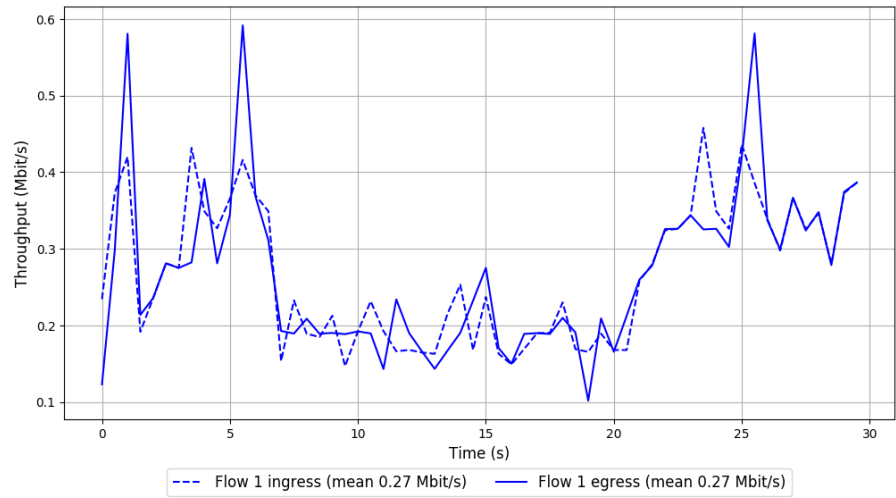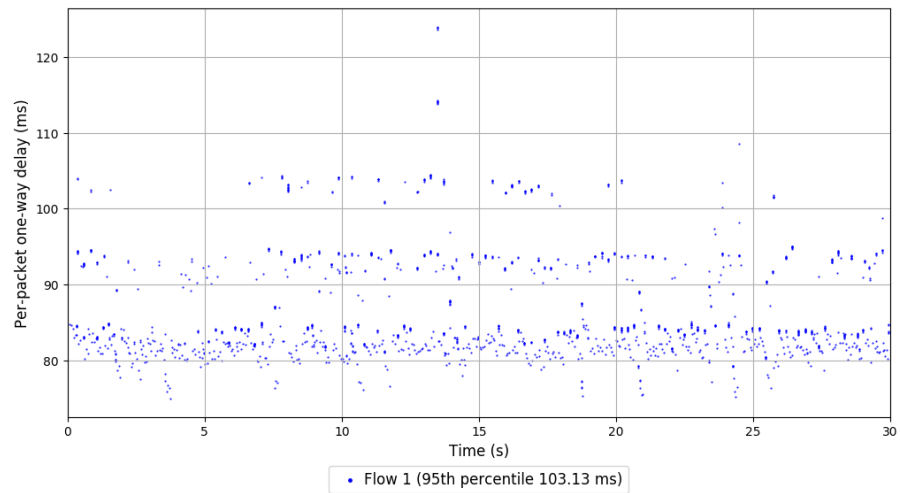
Run 1: Report of Sprout — Data Link

Flow 1 ingress (mean 0.38 Mbit/s) --- Flow 1 egress (mean 0.38 Mbit/s)

Flow 1 (95th percentile 89.61 ms)

```
Run 2: Statistics of Sprout

Start at: 2017-12-05 07:25:15
End at: 2017-12-05 07:25:45
Local clock offset: -7.466 ms
Remote clock offset: -1.18 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 88.535 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 88.535 ms
Loss rate: 0.01%
```

Run 2: Report of Sprout — Data Link

Flow 1 ingress (mean 0.27 Mbit/s)   Flow 1 egress (mean 0.27 Mbit/s)

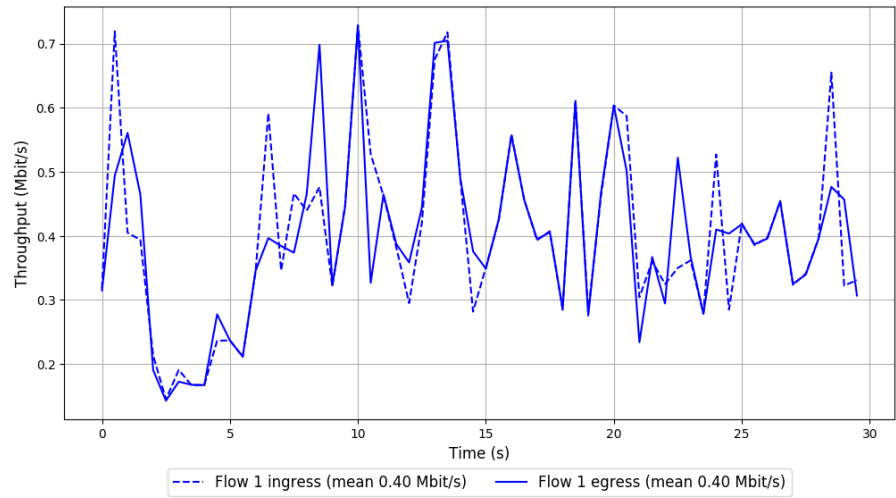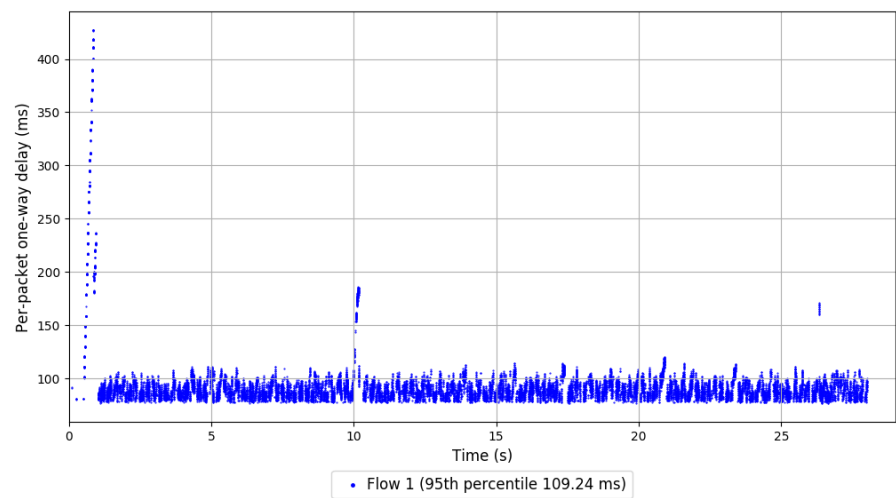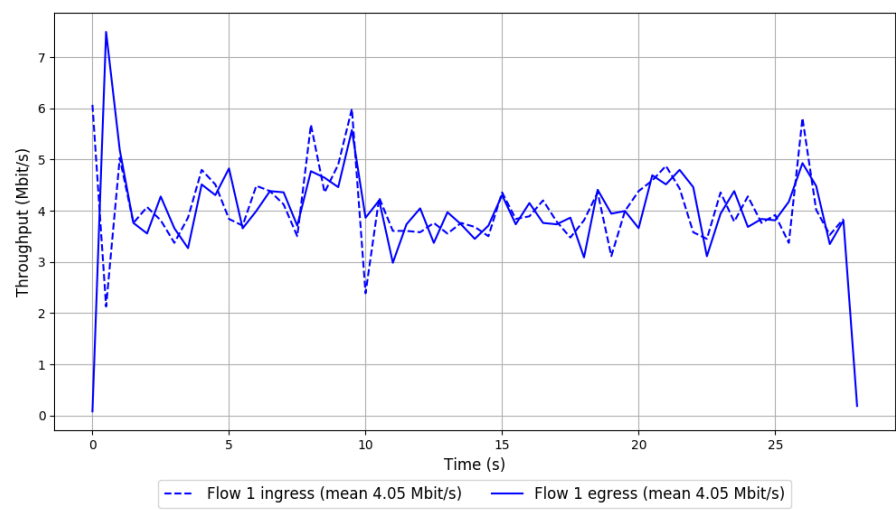Flow 1 (95th percentile 88.53 ms)

```
Run 3: Statistics of Sprout

Start at: 2017-12-05 07:41:15
End at: 2017-12-05 07:41:45
Local clock offset: -6.182 ms
Remote clock offset: -3.33 ms


# Below is generated by plot.py at 2017-12-05 07:56:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 103.126 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 103.126 ms
Loss rate: 0.30%
```

Run 3: Report of Sprout — Data Link

```
Run 1: Statistics of TaoVA-100x

Start at: 2017-12-05 07:16:54
End at: 2017-12-05 07:17:24
Local clock offset: -7.912 ms
Remote clock offset: -1.695 ms


# Below is generated by plot.py at 2017-12-05 07:56:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.05 Mbit/s
95th percentile per-packet one-way delay: 109.241 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 4.05 Mbit/s
95th percentile per-packet one-way delay: 109.241 ms
Loss rate: 0.24%
```

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

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

Start at: 2017-12-05 07:33:15
End at: 2017-12-05 07:33:45
Local clock offset: -6.218 ms
Remote clock offset: 2.487 ms


# Below is generated by plot.py at 2017-12-05 07:56:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.66 Mbit/s
95th percentile per-packet one-way delay: 122.295 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 3.66 Mbit/s
95th percentile per-packet one-way delay: 122.295 ms
Loss rate: 0.20%
```
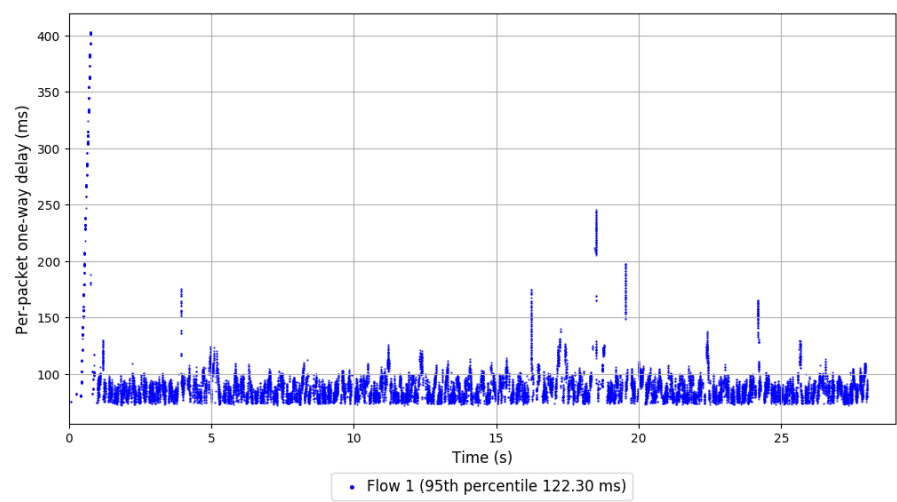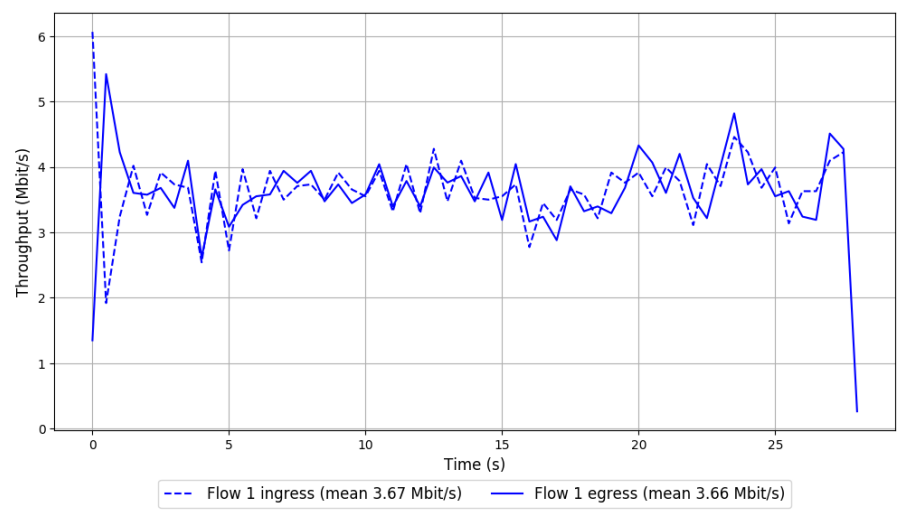
Run 2: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 3.67 Mbit/s) --- Flow 1 egress (mean 3.66 Mbit/s)

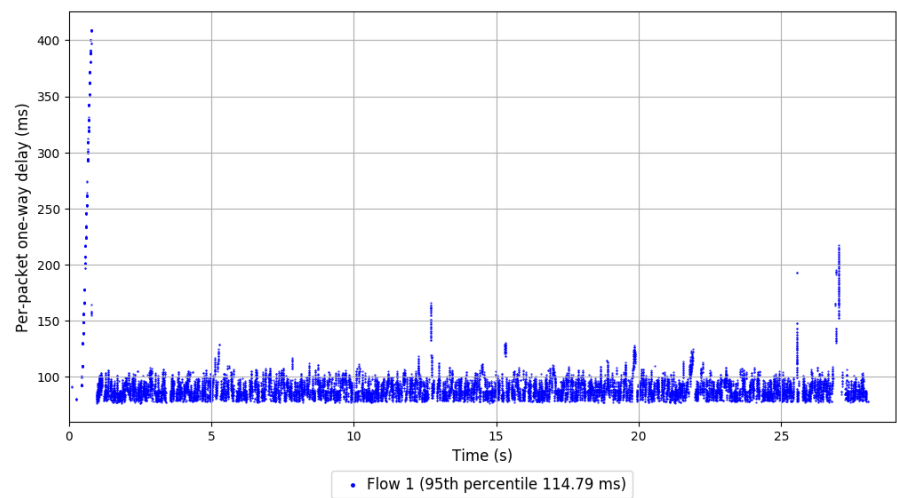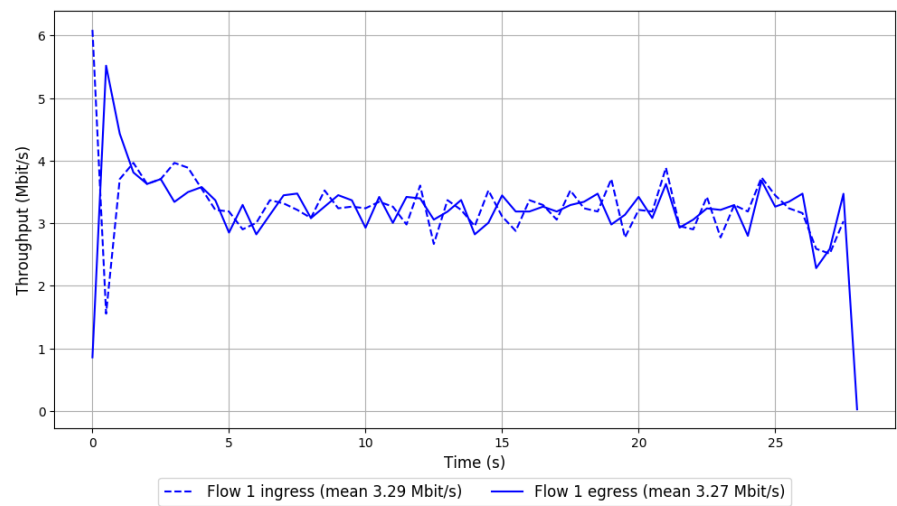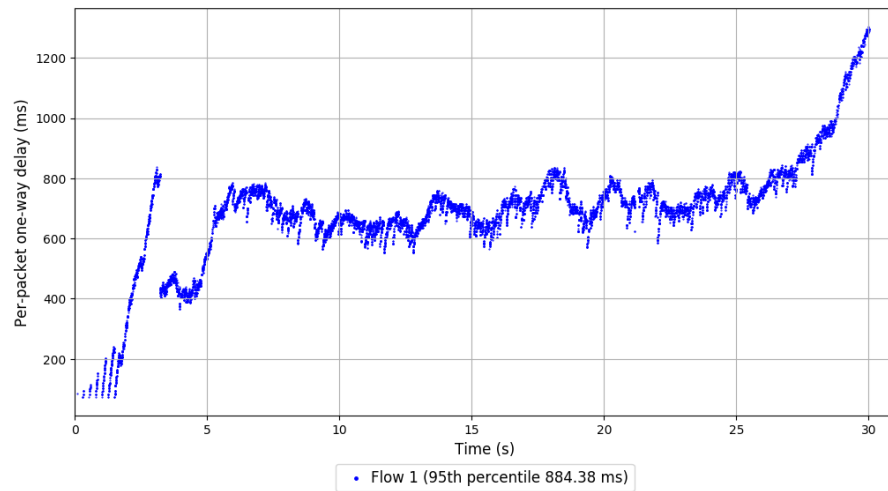• Flow 1 (95th percentile 122.30 ms)

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

Start at: 2017-12-05 07:49:19
End at: 2017-12-05 07:49:49
Local clock offset: -7.839 ms
Remote clock offset: -2.327 ms


# Below is generated by plot.py at 2017-12-05 07:56:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.27 Mbit/s
95th percentile per-packet one-way delay: 114.793 ms
Loss rate: 0.75%
-- Flow 1:
Average throughput: 3.27 Mbit/s
95th percentile per-packet one-way delay: 114.793 ms
Loss rate: 0.75%
```

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

Flow 1 ingress (mean 3.29 Mbit/s) —— Flow 1 egress (mean 3.27 Mbit/s)

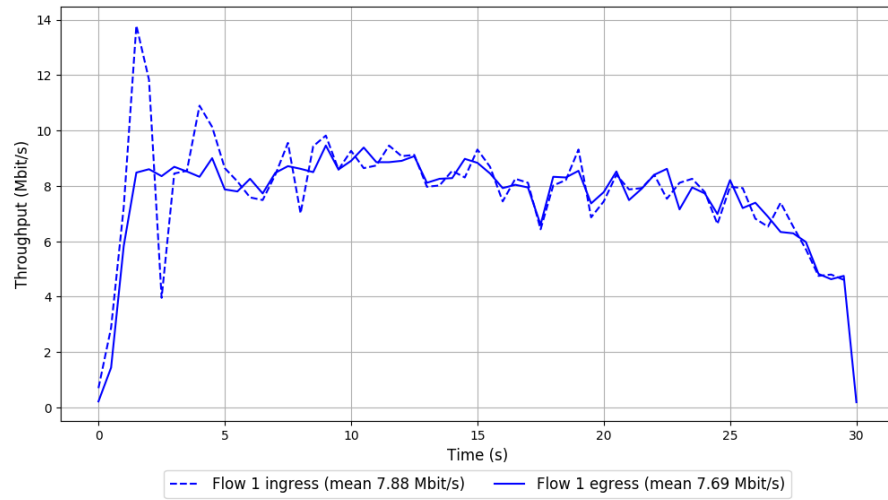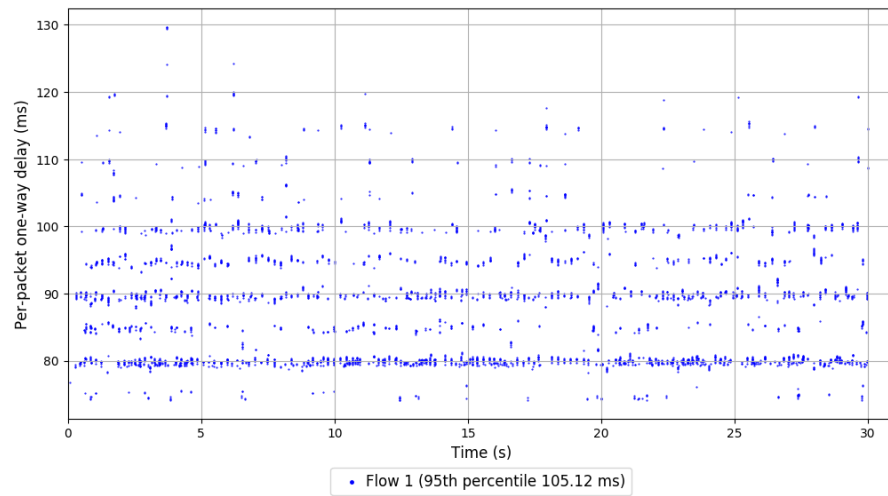• Flow 1 (95th percentile 114.79 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2017-12-05 07:15:44
End at: 2017-12-05 07:16:14
Local clock offset: -7.731 ms
Remote clock offset: -2.178 ms


# Below is generated by plot.py at 2017-12-05 07:57:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.69 Mbit/s
95th percentile per-packet one-way delay: 884.384 ms
Loss rate: 2.46%
-- Flow 1:
Average throughput: 7.69 Mbit/s
95th percentile per-packet one-way delay: 884.384 ms
Loss rate: 2.46%
```
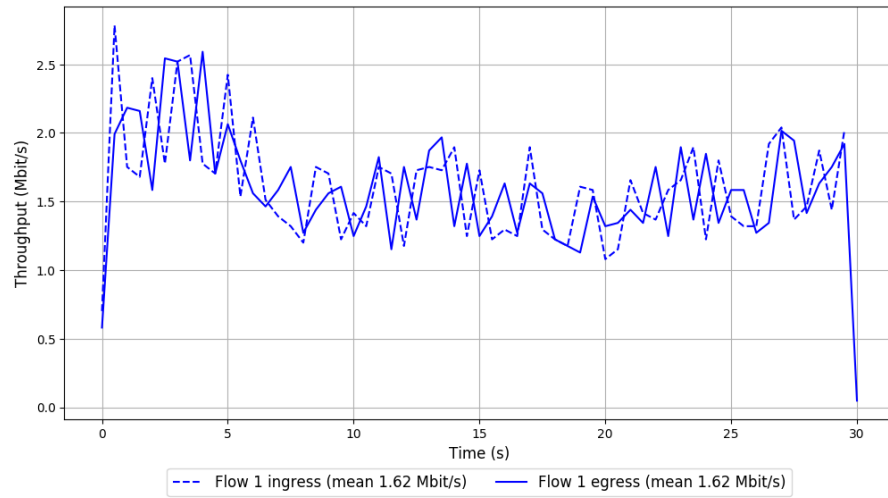
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2017-12-05 07:32:07
End at: 2017-12-05 07:32:37
Local clock offset: -6.672 ms
Remote clock offset: -1.288 ms


# Below is generated by plot.py at 2017-12-05 07:57:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 105.123 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 105.123 ms
Loss rate: 0.10%
```
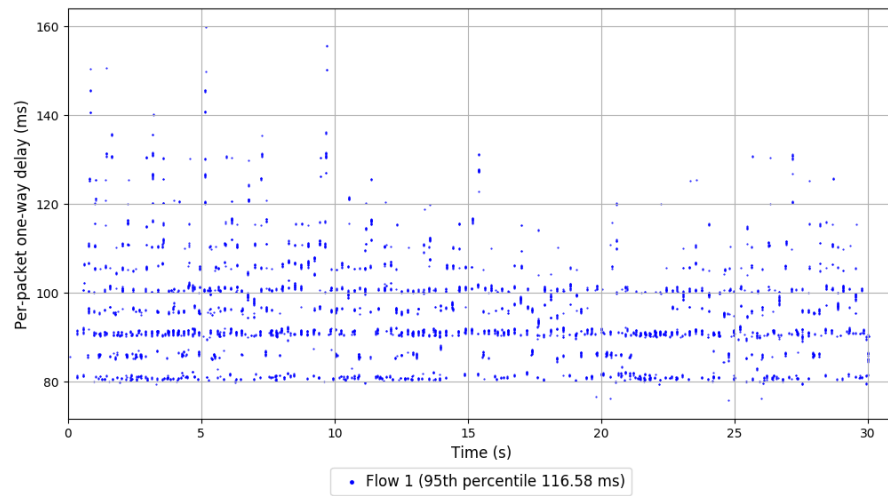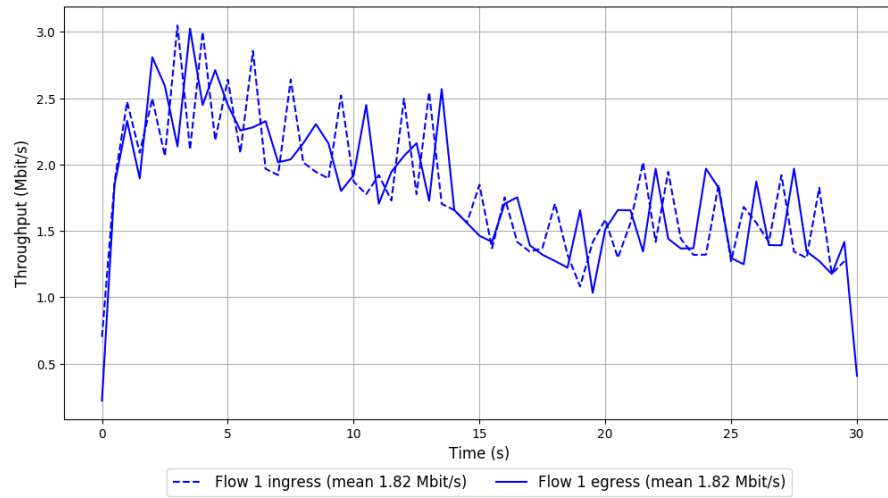
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2017-12-05 07:48:11
End at: 2017-12-05 07:48:41
Local clock offset: -7.671 ms
Remote clock offset: -2.206 ms


# Below is generated by plot.py at 2017-12-05 07:57:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 116.583 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 116.583 ms
Loss rate: 0.00%
```
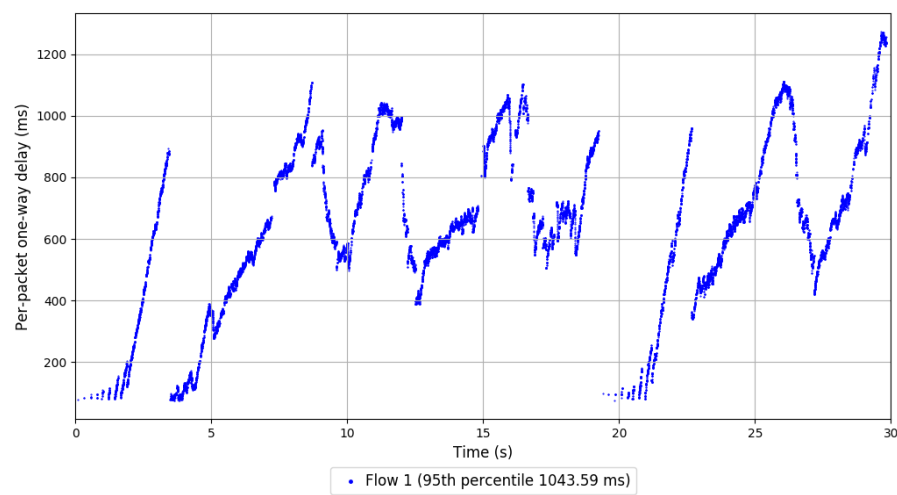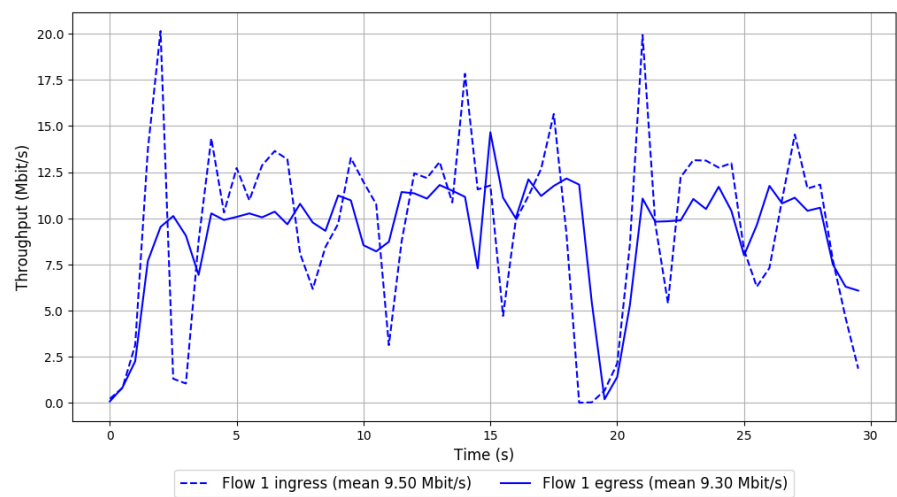
Run 3: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2017-12-05 07:11:59
End at: 2017-12-05 07:12:29
Local clock offset: -7.961 ms
Remote clock offset: -1.922 ms


# Below is generated by plot.py at 2017-12-05 07:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.30 Mbit/s
95th percentile per-packet one-way delay: 1043.585 ms
Loss rate: 2.19%
-- Flow 1:
Average throughput: 9.30 Mbit/s
95th percentile per-packet one-way delay: 1043.585 ms
Loss rate: 2.19%
```
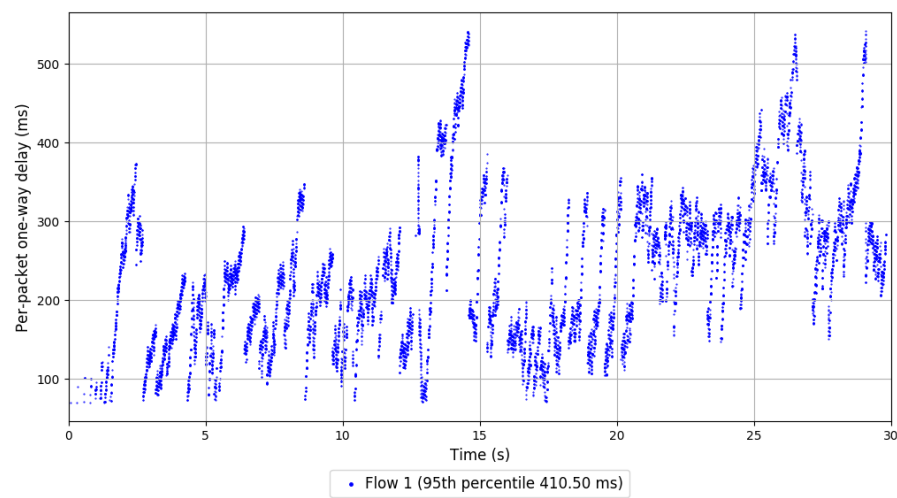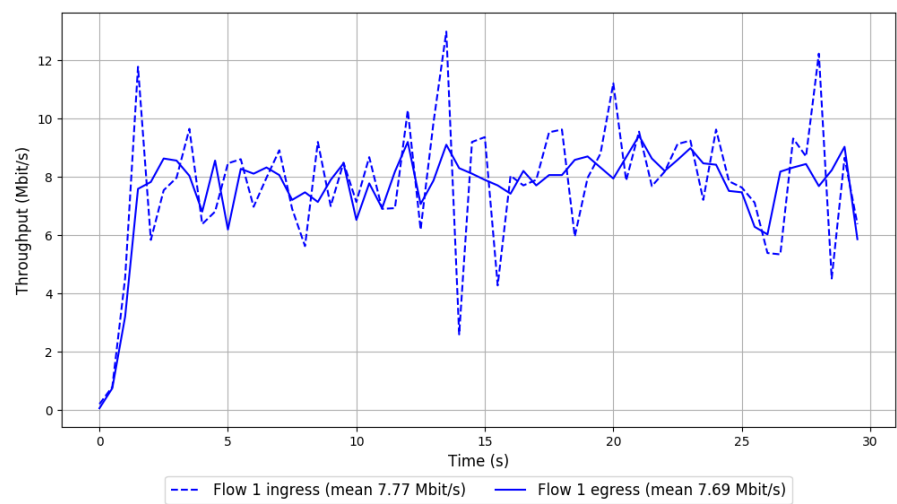
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2017-12-05 07:28:40
End at: 2017-12-05 07:29:10
Local clock offset: -7.772 ms
Remote clock offset: -1.601 ms


# Below is generated by plot.py at 2017-12-05 07:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.69 Mbit/s
95th percentile per-packet one-way delay: 410.498 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 7.69 Mbit/s
95th percentile per-packet one-way delay: 410.498 ms
Loss rate: 1.10%
```

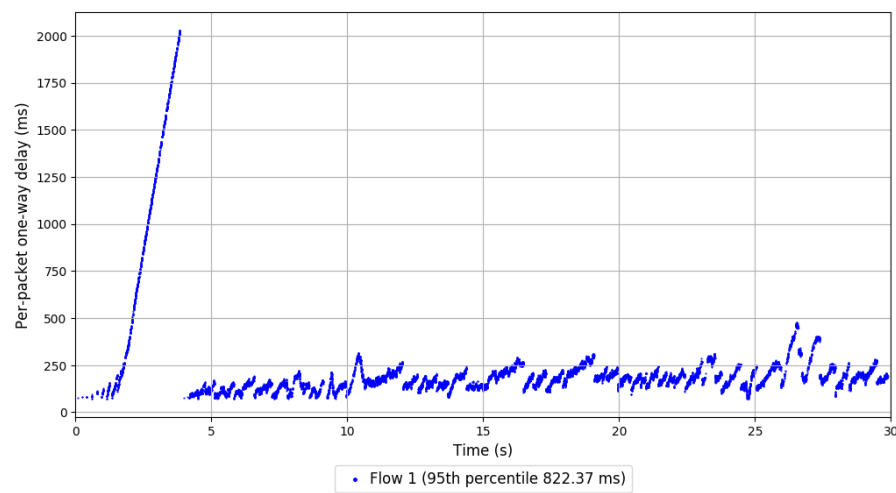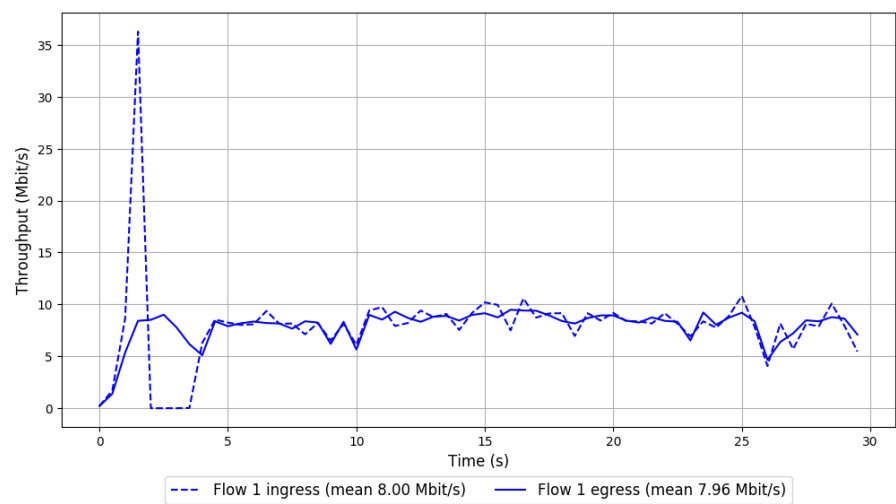Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2017-12-05 07:44:44
End at: 2017-12-05 07:45:14
Local clock offset: -6.773 ms
Remote clock offset: -1.781 ms


# Below is generated by plot.py at 2017-12-05 07:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.96 Mbit/s
95th percentile per-packet one-way delay: 822.373 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 7.96 Mbit/s
95th percentile per-packet one-way delay: 822.373 ms
Loss rate: 0.31%
```

Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 8.00 Mbit/s)   Flow 1 egress (mean 7.96 Mbit/s)

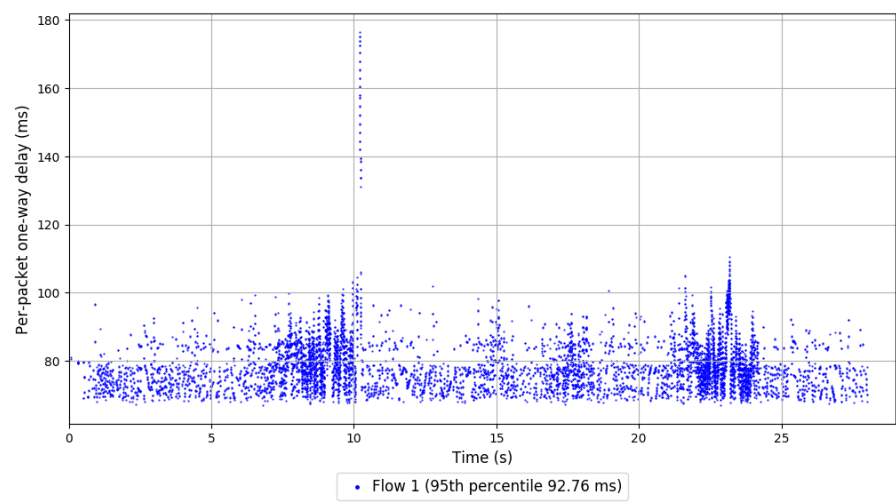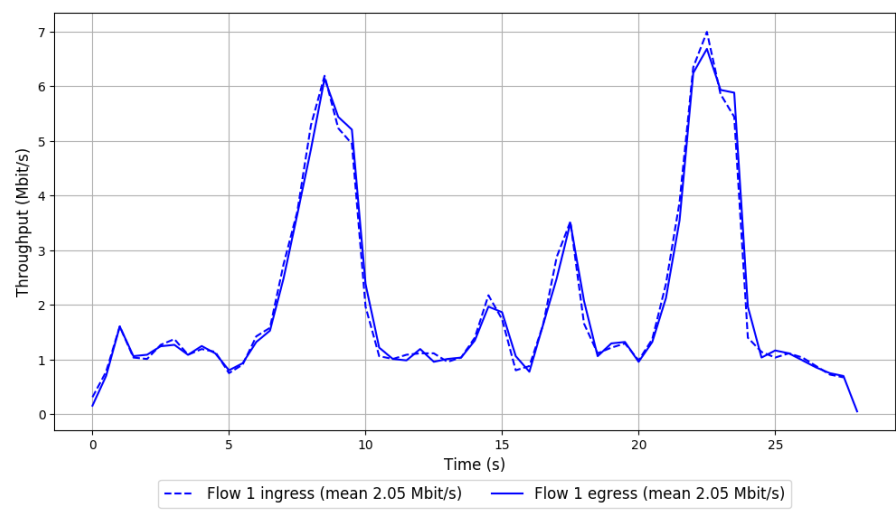Flow 1 (95th percentile 822.37 ms)

```
Run 1: Statistics of Copa

Start at: 2017-12-05 07:13:09
End at: 2017-12-05 07:13:39
Local clock offset: -7.892 ms
Remote clock offset: -1.844 ms


# Below is generated by plot.py at 2017-12-05 07:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 92.762 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 92.762 ms
Loss rate: 0.07%
```

Run 1: Report of Copa — Data Link

Run 2: Statistics of Copa

Start at: 2017-12-05 07:29:50
End at: 2017-12-05 07:30:20
Local clock offset: -7.246 ms
Remote clock offset: 7.712 ms

Run 2: Report of Copa — Data Link

Figure is missing

Figure is missing

```
Run 3: Statistics of Copa

Start at: 2017-12-05 07:45:53
End at: 2017-12-05 07:46:23
Local clock offset: -6.841 ms
Remote clock offset: -2.3 ms


# Below is generated by plot.py at 2017-12-05 07:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 95.234 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 95.234 ms
Loss rate: 0.16%
```
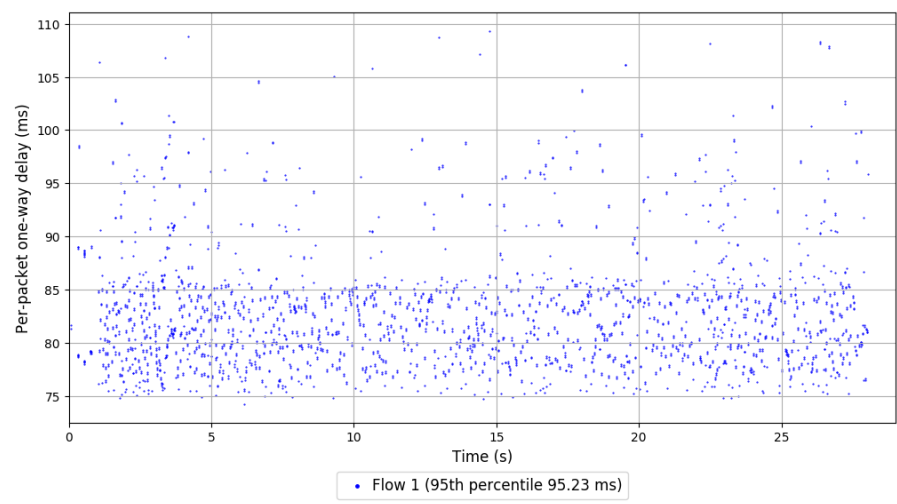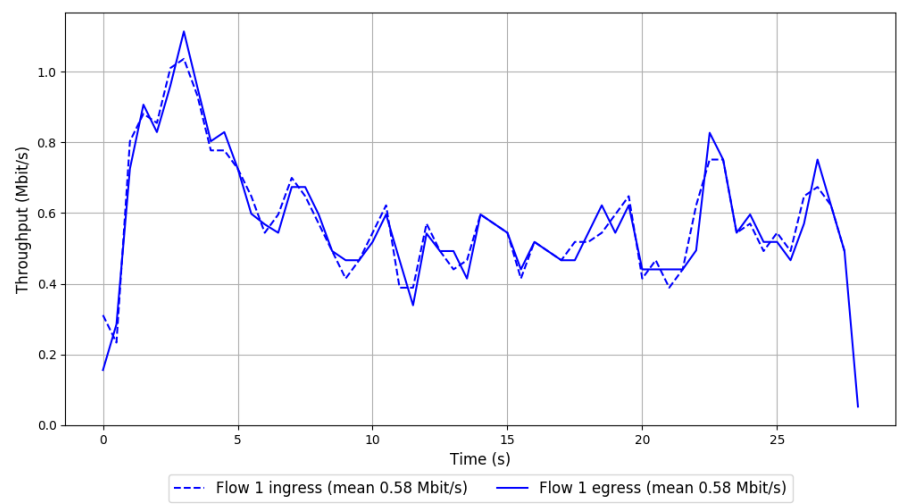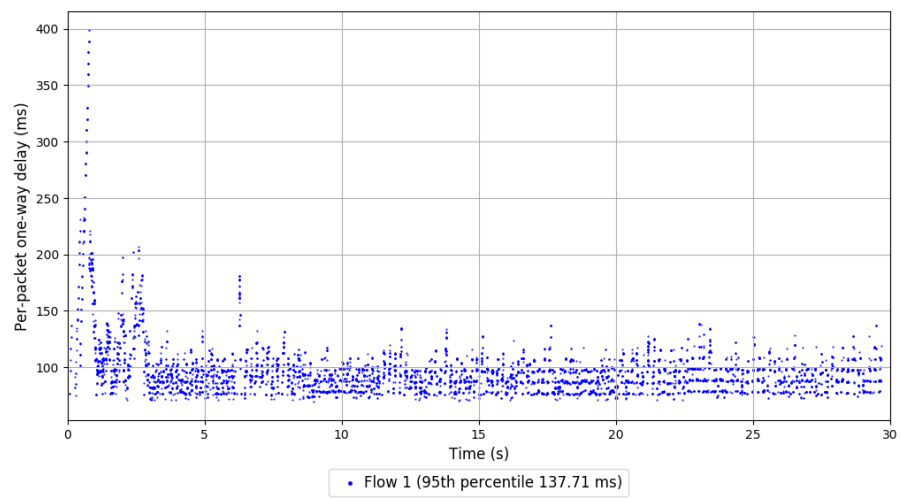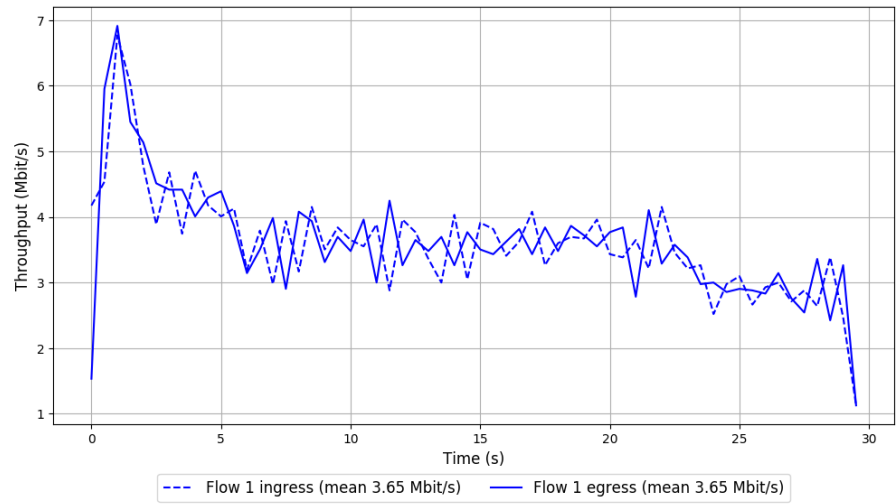
Run 3: Report of Copa — Data Link

Run 1: Statistics of Indigo

Start at: 2017-12-05 07:21:49
End at: 2017-12-05 07:22:19
Local clock offset: -7.624 ms
Remote clock offset: -1.957 ms

Below is generated by plot.py at 2017-12-05 07:57:06
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.65 Mbit/s
95th percentile per-packet one-way delay: 137.705 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 3.65 Mbit/s
95th percentile per-packet one-way delay: 137.705 ms
Loss rate: 0.08%

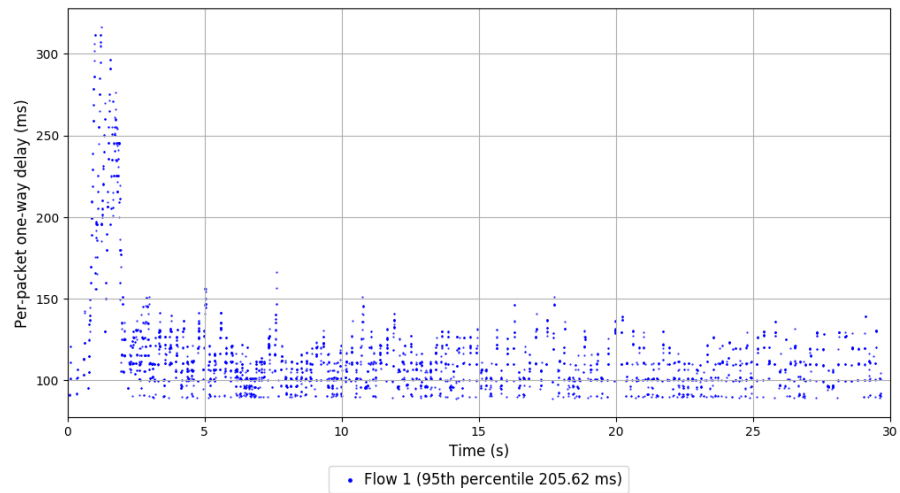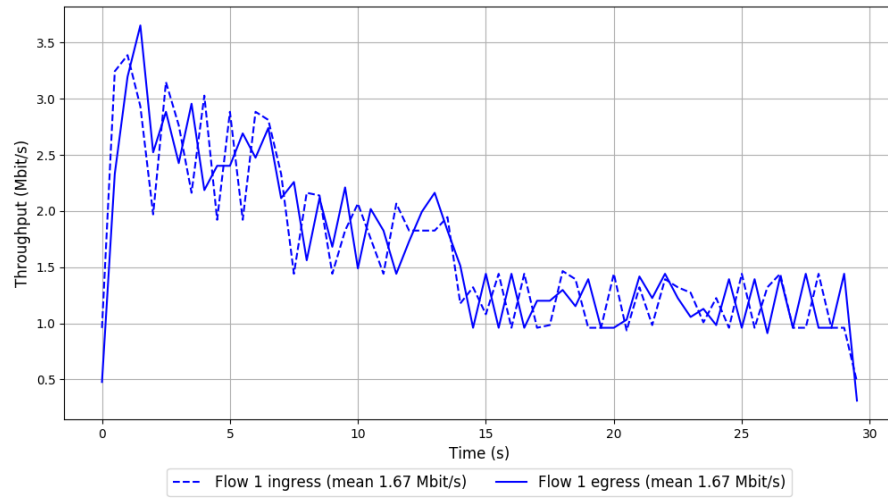Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2017-12-05 07:37:49
End at: 2017-12-05 07:38:19
Local clock offset: -5.73 ms
Remote clock offset: 17.837 ms


# Below is generated by plot.py at 2017-12-05 07:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 205.619 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 205.619 ms
Loss rate: 0.17%
```

Run 2: Report of Indigo — Data Link
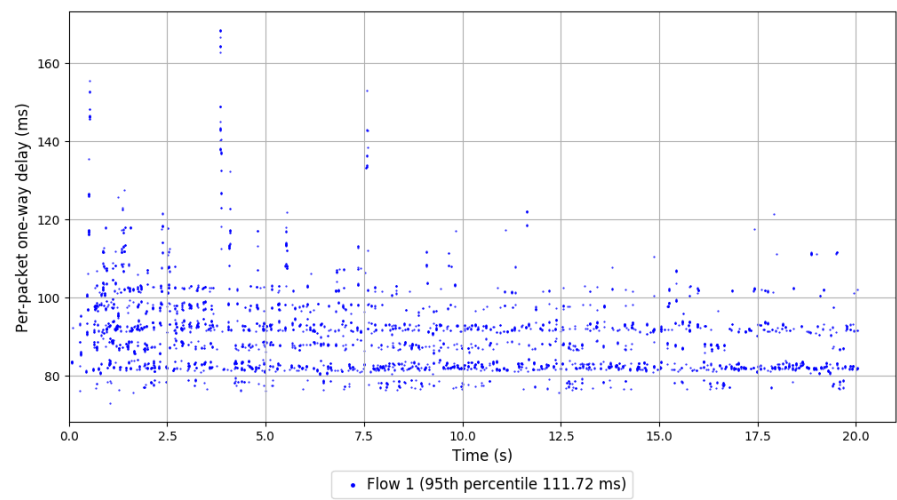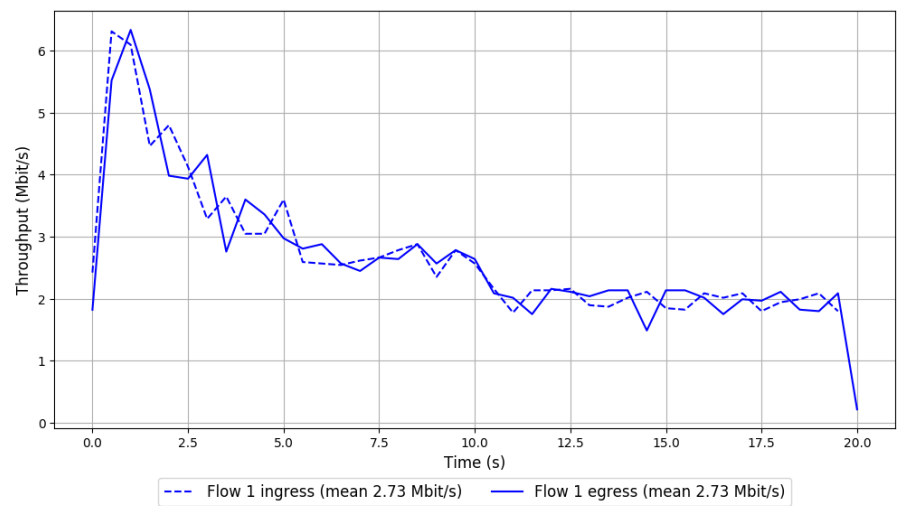
```
Run 3: Statistics of Indigo

Start at: 2017-12-05 07:53:56
End at: 2017-12-05 07:54:26
Local clock offset: -7.877 ms
Remote clock offset: 1.689 ms
```

Run 3: Report of Indigo — Data Link

Flow 1 ingress (mean 2.73 Mbit/s) — Flow 1 egress (mean 2.73 Mbit/s)

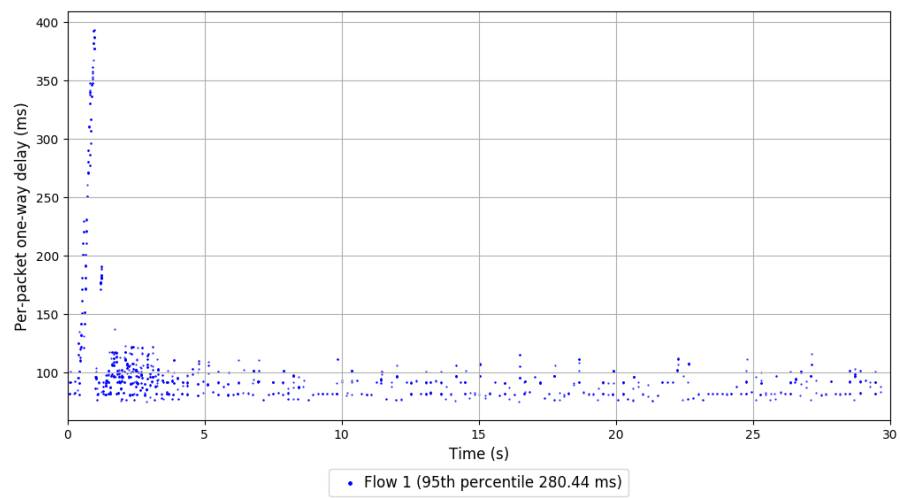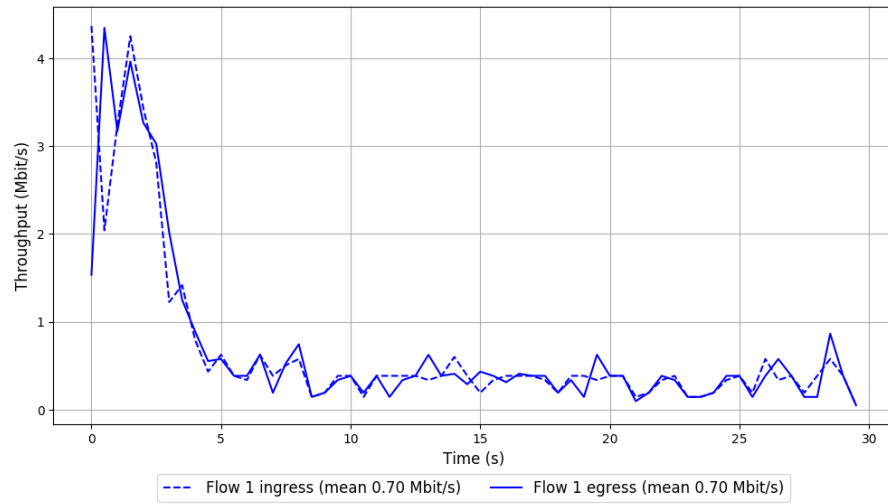
• Flow 1 (95th percentile 111.72 ms)

```
Run 1: Statistics of Indigo-calib

Start at: 2017-12-05 07:18:23
End at: 2017-12-05 07:18:53
Local clock offset: -7.999 ms
Remote clock offset: -1.725 ms


# Below is generated by plot.py at 2017-12-05 07:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 280.436 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 280.436 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo-calib — Data Link
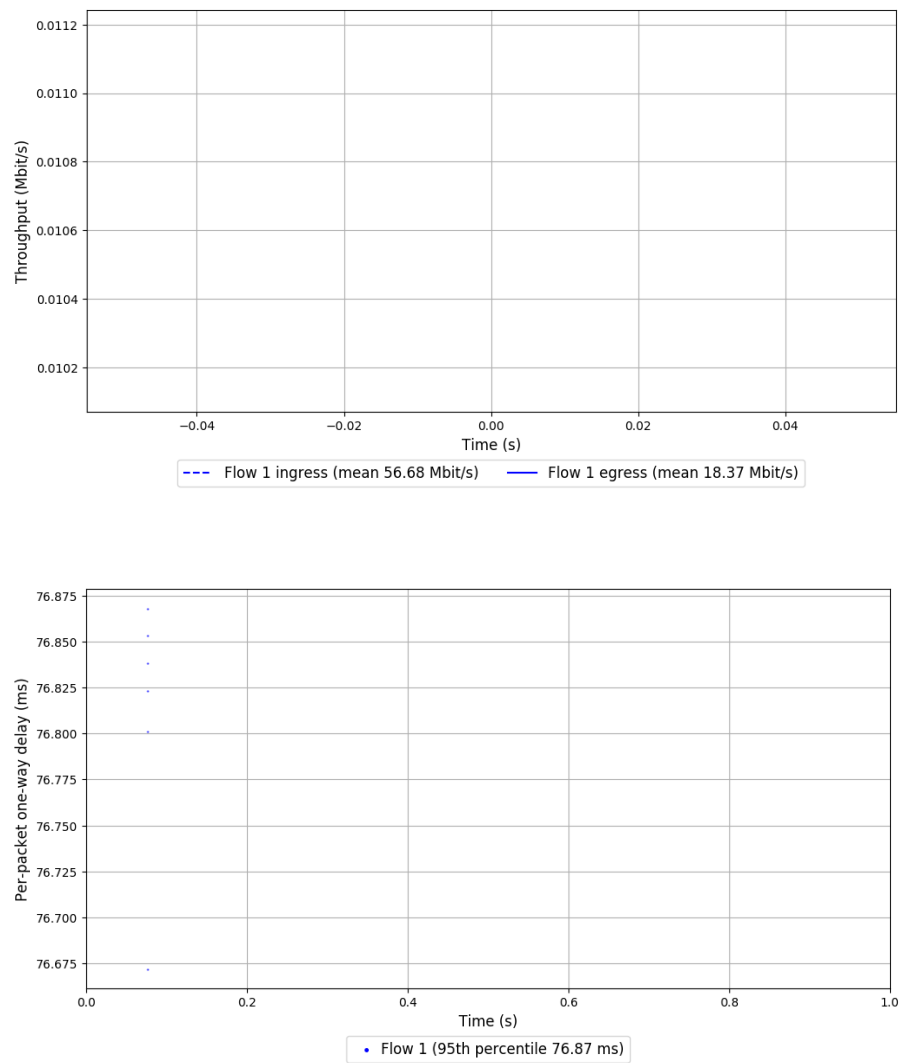
```
Run 2: Statistics of Indigo-calib

Start at: 2017-12-05 07:34:24
End at: 2017-12-05 07:34:54
Local clock offset: -6.028 ms
Remote clock offset: -2.666 ms
```

Run 2: Report of Indigo-calib — Data Link

```
Run 3: Statistics of Indigo-calib

Start at: 2017-12-05 07:50:29
End at: 2017-12-05 07:50:59
Local clock offset: -7.874 ms
Remote clock offset: -3.133 ms


# Below is generated by plot.py at 2017-12-05 07:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 111.193 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 111.193 ms
Loss rate: 0.00%
```

Run 3: Report of Indigo-calib — Data Link