Pantheon Report

Generated at 2017-09-22 11:15:10 (UTC).

Data path: AWS India 1 Ethernet (*local*) →India 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).
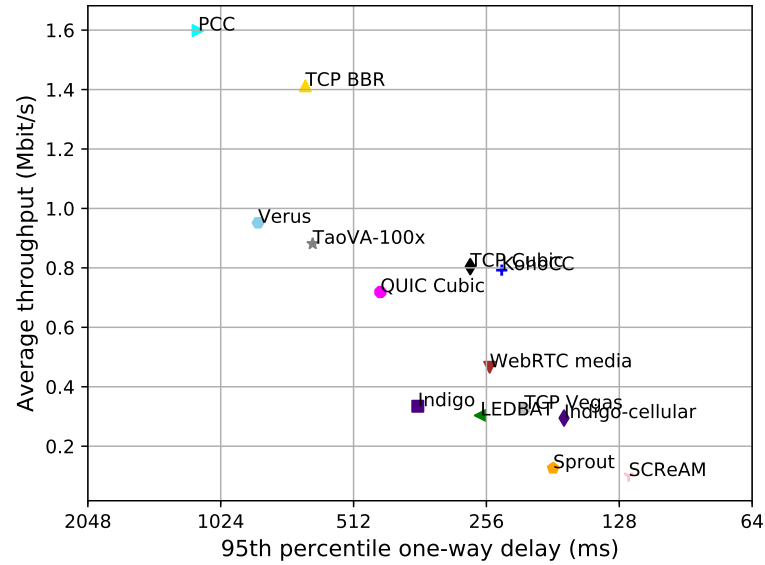
Tested BBR with qdisc of Fair Queuing (`fq`), and other schemes with the default Linux qdisc (`pfifo_fast`).

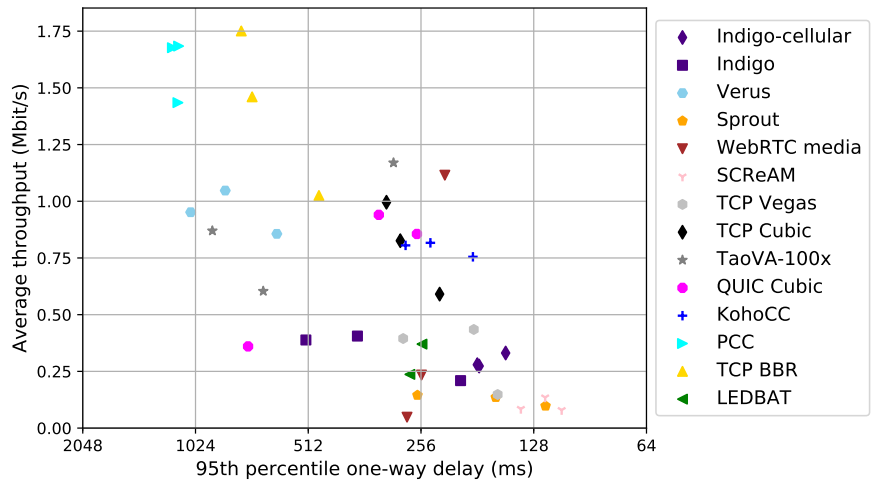NTP offsets were measured against `nets.org.sg` and have been applied to correct the timestamps in logs.

```
Git summary:
branch: indigos @ 46c7c812d4acb71eea4f5fb0b03b3657cea3062f
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
 M datagrump/sender.cc
third_party/genericCC @ f7ca42f251bf49b432bb71de6d13fa903515c366
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 India 1 Ethernet to India ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)

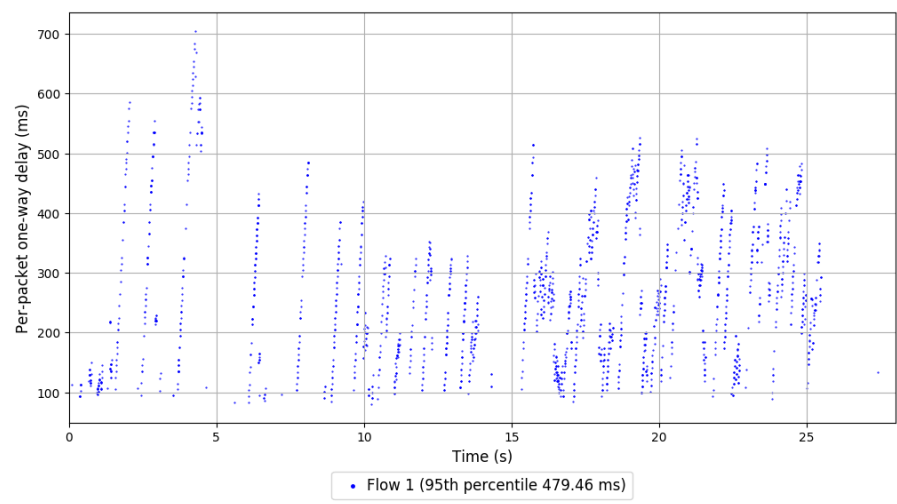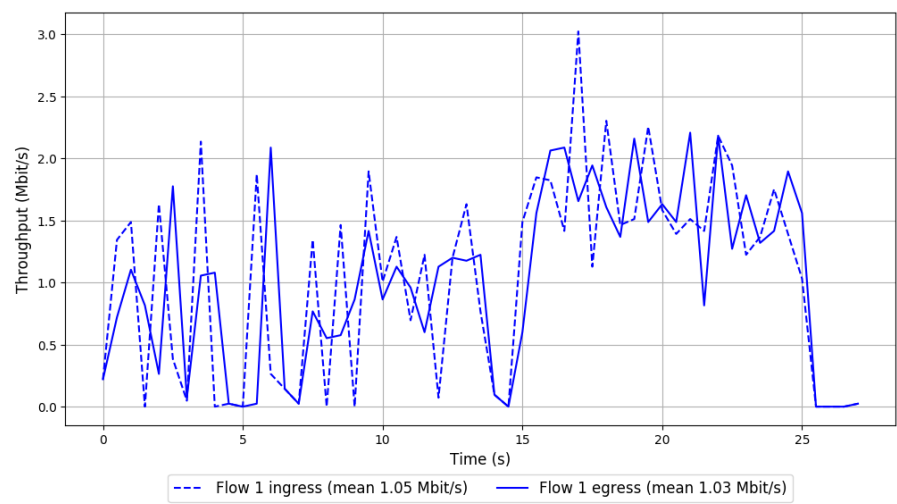test from AWS India 1 Ethernet to India ppp0, 3 runs of 30s each per scheme

2

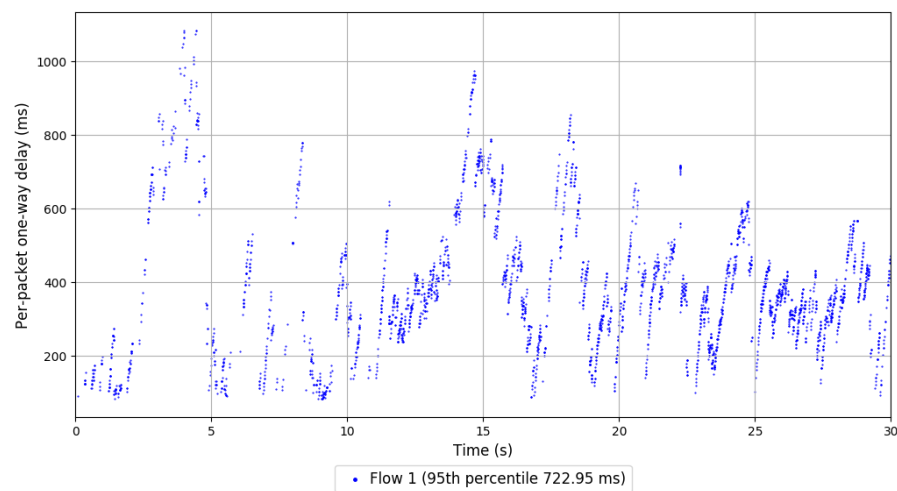| scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	1.41	658.40	5.21
TCP Cubic	3	0.81	278.54	1.77
LEDBAT	2	0.30	264.31	1.71
PCC	3	1.60	1152.32	45.02
QUIC Cubic	3	0.72	445.16	2.99
SCReAM	3	0.10	121.89	0.94
WebRTC media	3	0.46	251.75	2.15
Sprout	3	0.13	180.77	1.32
TaoVA-100x	3	0.88	633.83	4.92
TCP Vegas	3	0.32	210.16	1.77
Verus	3	0.95	842.96	15.07
Indigo	3	0.34	366.22	2.69
Indigo-cellular	3	0.29	170.75	1.25
KohoCC	3	0.80	236.37	1.57

```
Run 1: Statistics of TCP BBR

Start at: 2017-09-22 10:41:35
End at: 2017-09-22 10:42:05
Local clock offset: -0.586 ms
Remote clock offset: -3.702 ms


# Below is generated by plot.py at 2017-09-22 11:14:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 479.464 ms
Loss rate: 2.47%
-- Flow 1:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 479.464 ms
Loss rate: 2.47%
```
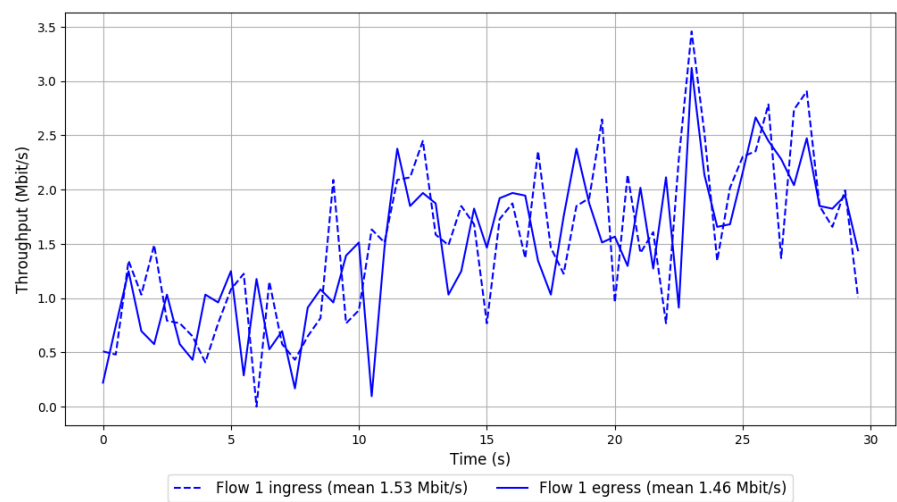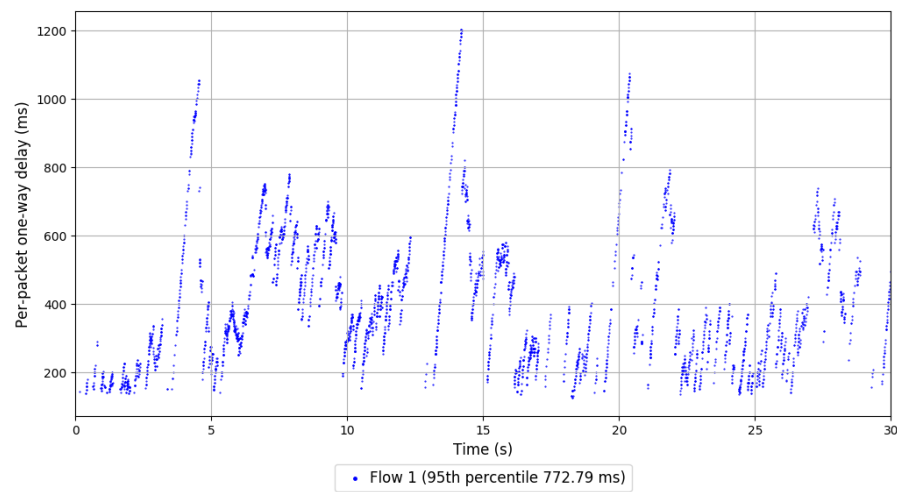
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2017-09-22 10:56:58
End at: 2017-09-22 10:57:28
Local clock offset: -0.898 ms
Remote clock offset: -3.459 ms


# Below is generated by plot.py at 2017-09-22 11:14:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 722.948 ms
Loss rate: 4.04%
-- Flow 1:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 722.948 ms
Loss rate: 4.04%
```
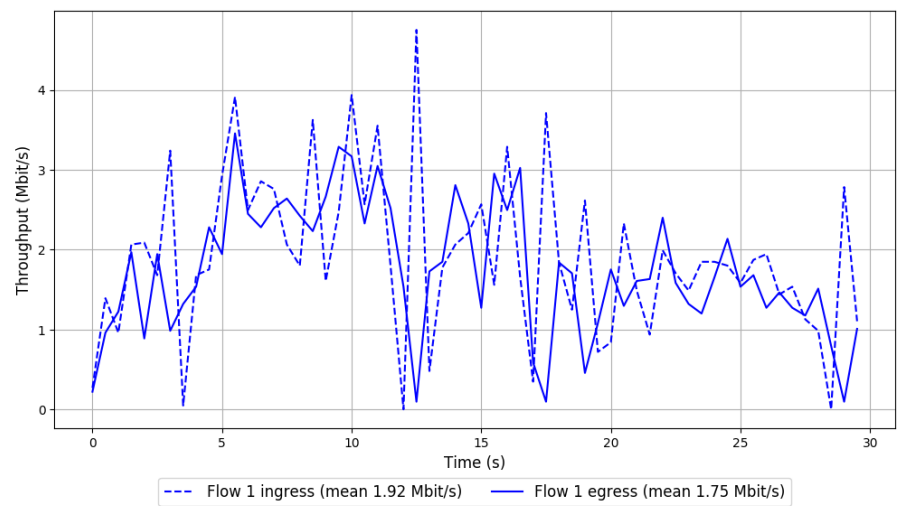
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2017-09-22 11:12:24
End at: 2017-09-22 11:12:54
Local clock offset: -1.783 ms
Remote clock offset: -2.666 ms


# Below is generated by plot.py at 2017-09-22 11:14:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 772.788 ms
Loss rate: 9.13%
-- Flow 1:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 772.788 ms
Loss rate: 9.13%
```

Run 3: Report of TCP BBR — Data Link

Flow 1 ingress (mean 1.92 Mbit/s)   Flow 1 egress (mean 1.75 Mbit/s)

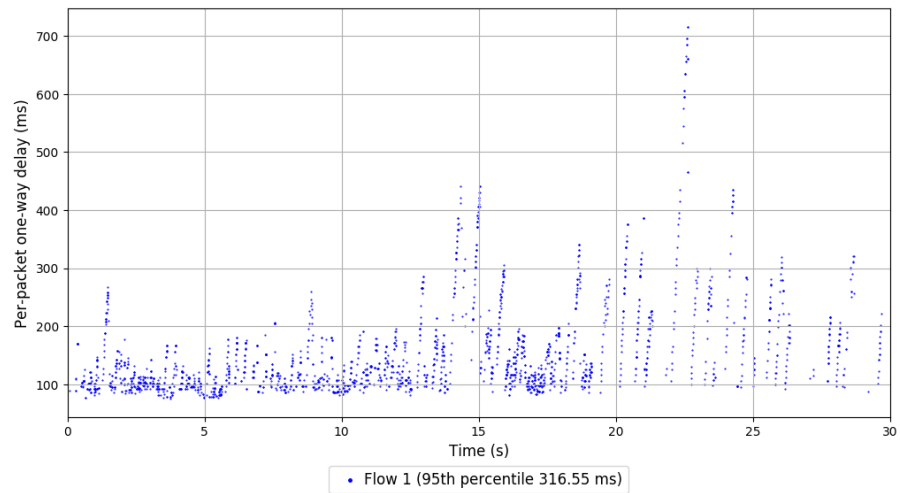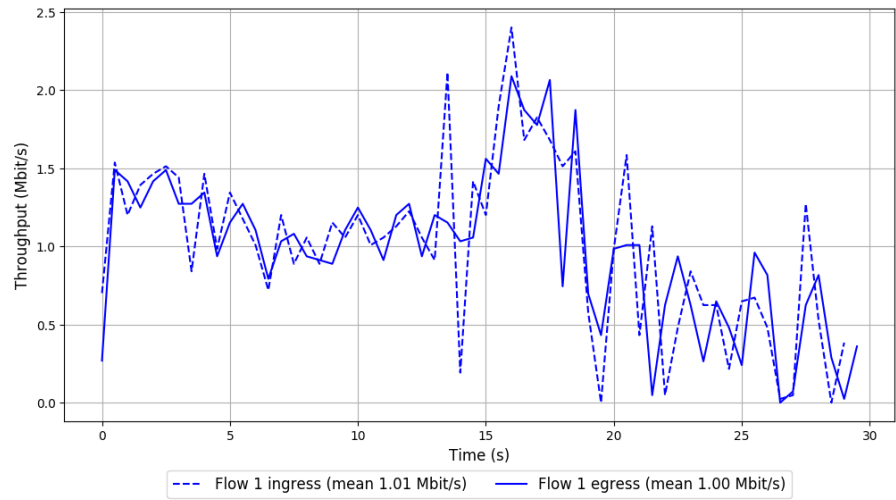Flow 1 (95th percentile 772.79 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2017-09-22 10:42:41
End at: 2017-09-22 10:43:11
Local clock offset: 2.194 ms
Remote clock offset: -4.029 ms


# Below is generated by plot.py at 2017-09-22 11:14:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 316.552 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 316.552 ms
Loss rate: 1.33%
```

Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 1.01 Mbit/s)   Flow 1 egress (mean 1.00 Mbit/s)

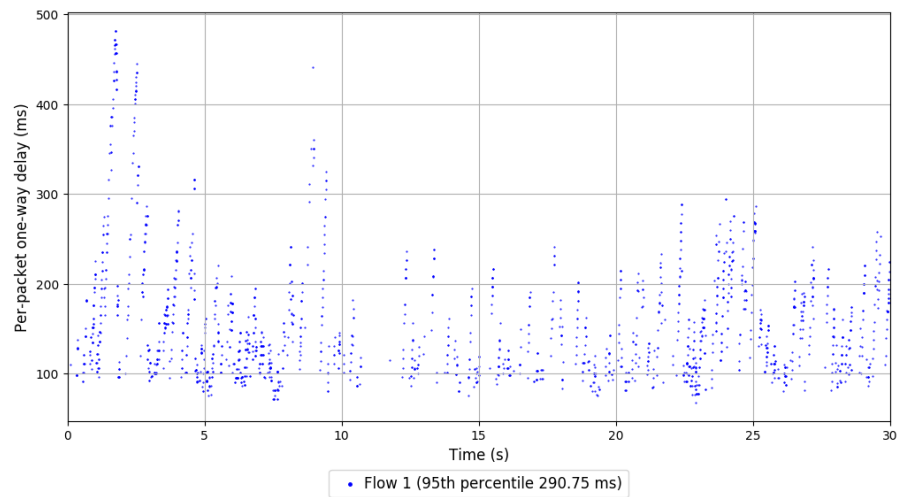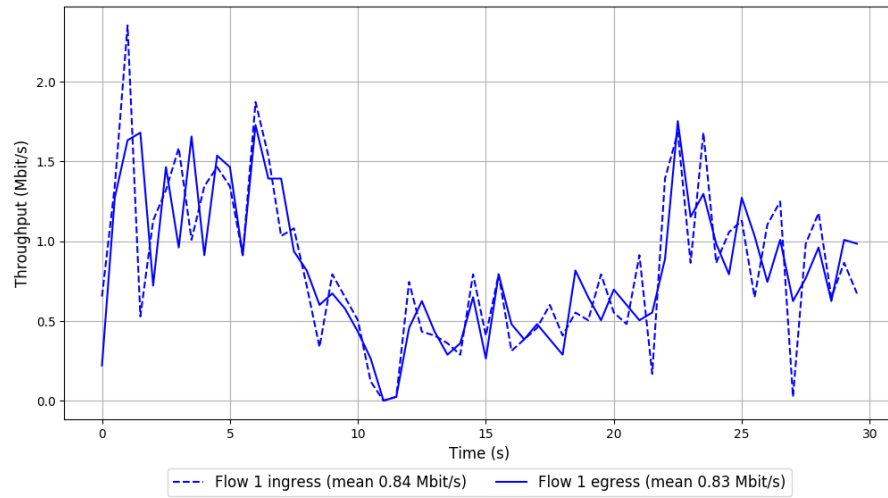Flow 1 (95th percentile 316.55 ms)

```
Run 2: Statistics of TCP Cubic

Start at: 2017-09-22 10:58:06
End at: 2017-09-22 10:58:36
Local clock offset: -3.922 ms
Remote clock offset: -9.673 ms


# Below is generated by plot.py at 2017-09-22 11:14:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 290.748 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 290.748 ms
Loss rate: 1.34%
```

Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 0.84 Mbit/s)   Flow 1 egress (mean 0.83 Mbit/s)

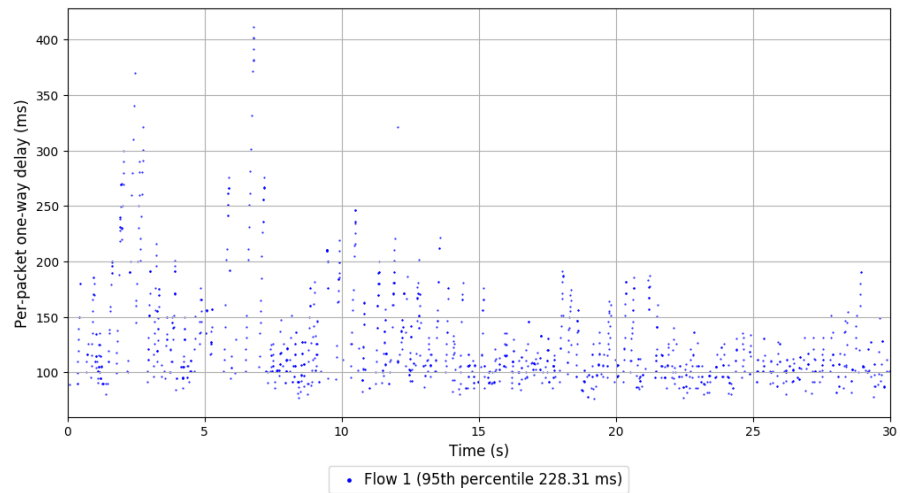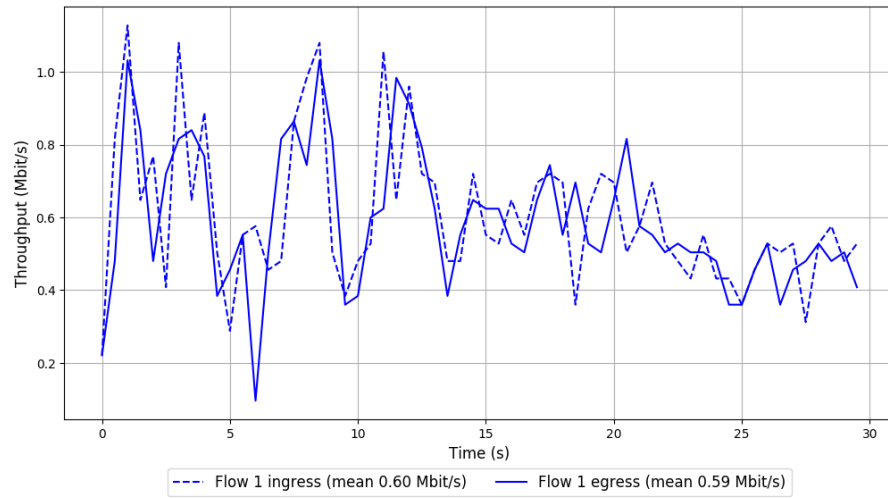Flow 1 (95th percentile 290.75 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2017-09-22 11:13:30
End at: 2017-09-22 11:14:00
Local clock offset: 1.104 ms
Remote clock offset: -3.429 ms


# Below is generated by plot.py at 2017-09-22 11:14:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 228.308 ms
Loss rate: 2.65%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 228.308 ms
Loss rate: 2.65%
```

Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 0.60 Mbit/s)　　　Flow 1 egress (mean 0.59 Mbit/s)

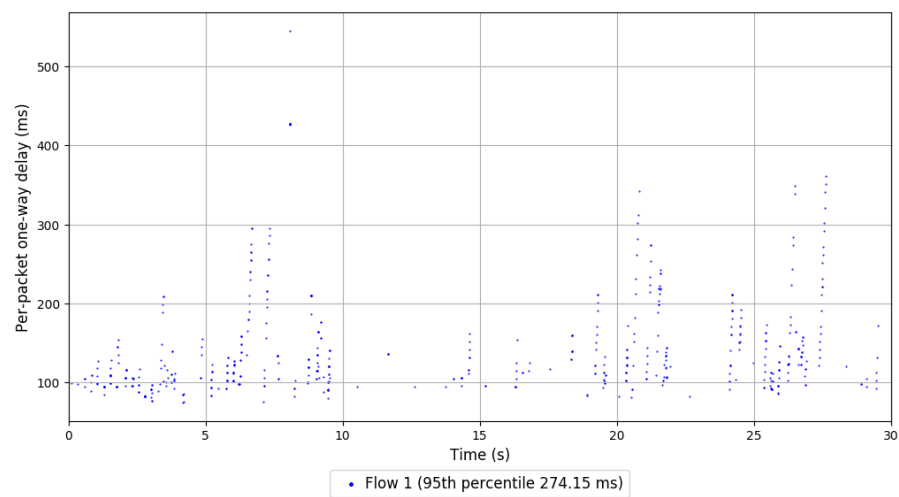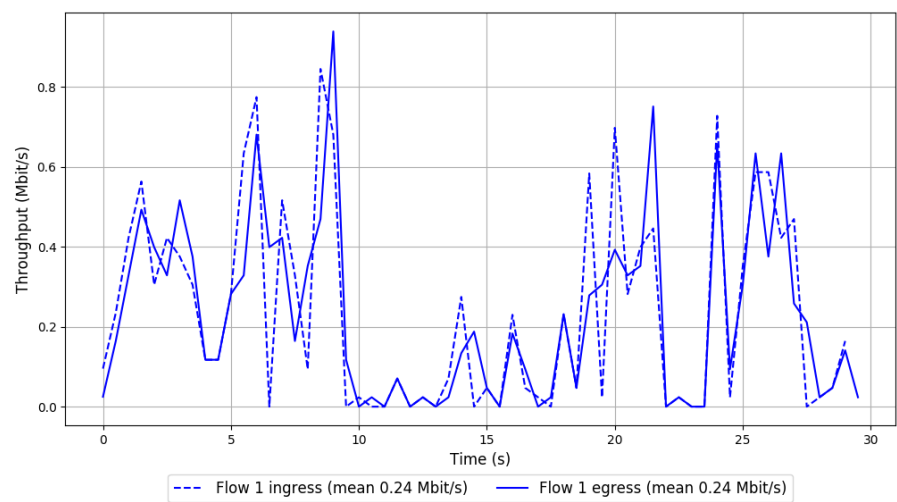Flow 1 (95th percentile 228.31 ms)

```
Run 1: Statistics of LEDBAT

Start at: 2017-09-22 10:32:48
End at: 2017-09-22 10:33:18
Local clock offset: -0.176 ms
Remote clock offset: -6.396 ms


# Below is generated by plot.py at 2017-09-22 11:14:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 274.155 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 274.155 ms
Loss rate: 0.83%
```

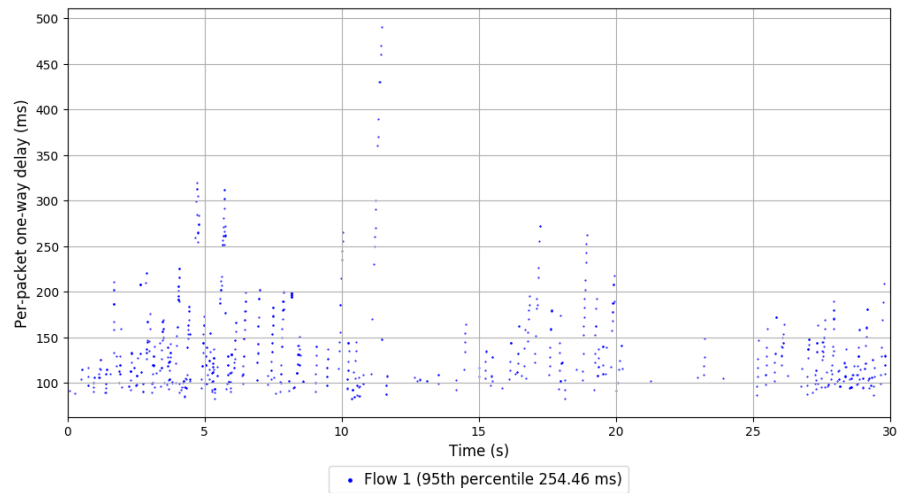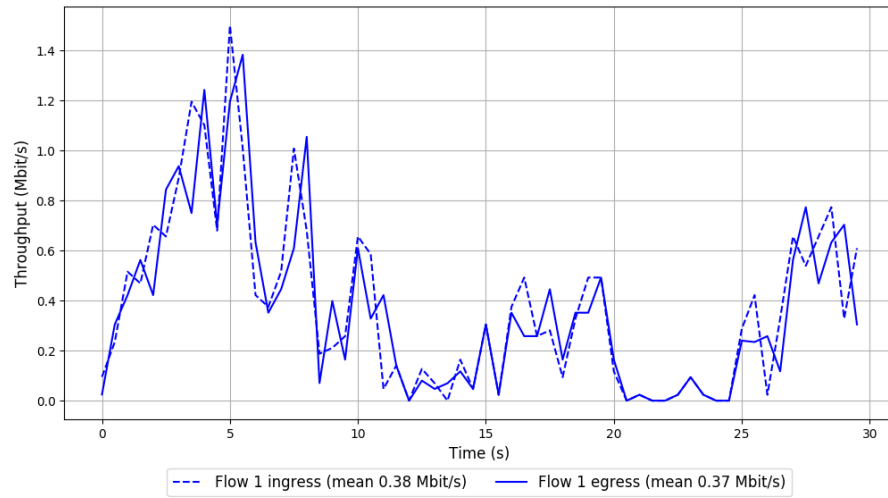Run 1: Report of LEDBAT — Data Link

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

Flow 1 (95th percentile 274.15 ms)

```
Run 2: Statistics of LEDBAT

Start at: 2017-09-22 10:48:11
End at: 2017-09-22 10:48:41
Local clock offset: -0.768 ms
Remote clock offset: -3.613 ms


# Below is generated by plot.py at 2017-09-22 11:14:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 254.460 ms
Loss rate: 2.59%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 254.460 ms
Loss rate: 2.59%
```

Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 0.38 Mbit/s)   Flow 1 egress (mean 0.37 Mbit/s)

Flow 1 (95th percentile 254.46 ms)
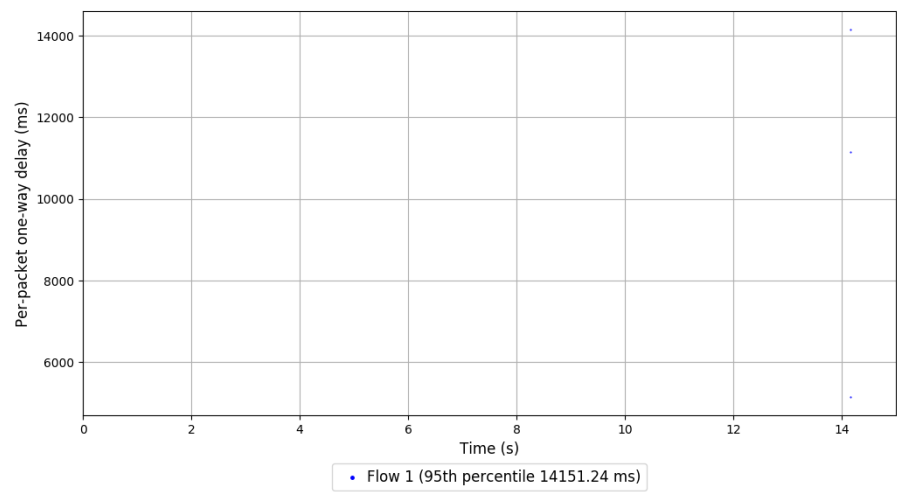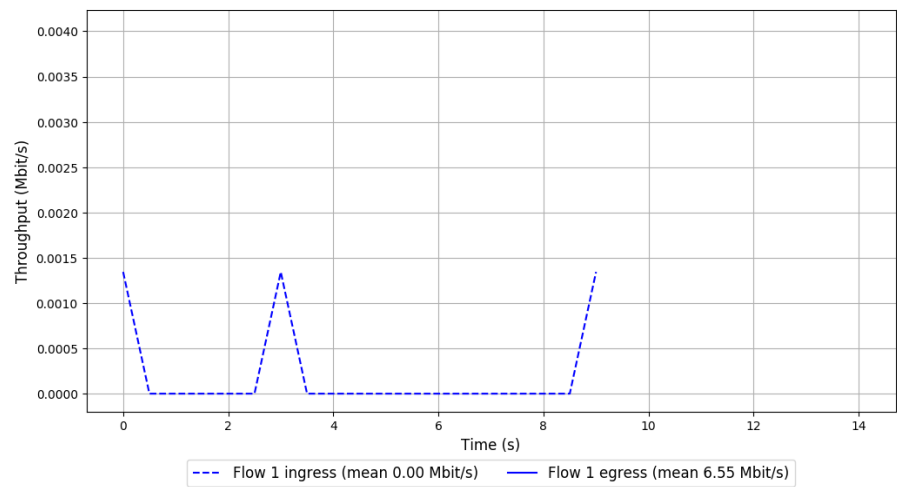
```
Run 3: Statistics of LEDBAT

Start at: 2017-09-22 11:03:35
End at: 2017-09-22 11:04:05
Local clock offset: 1.665 ms
Remote clock offset: -4.434 ms
```
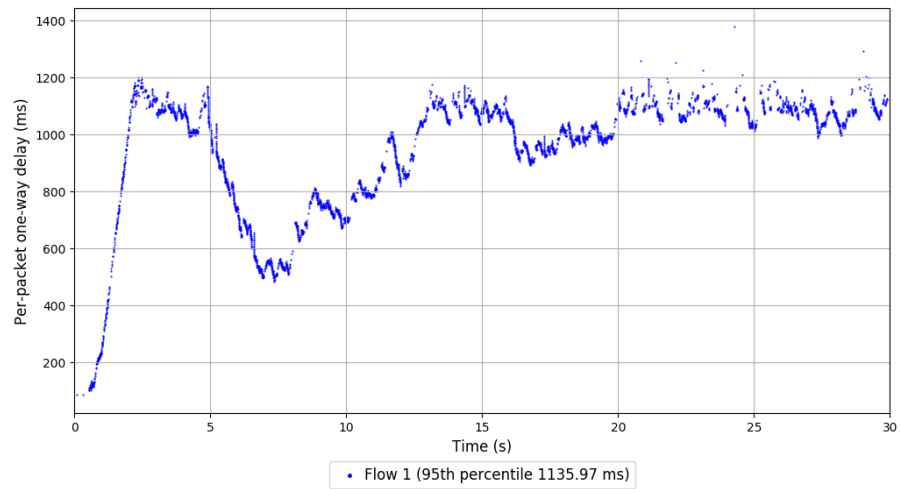
Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 0.00 Mbit/s) --- Flow 1 egress (mean 6.55 Mbit/s)
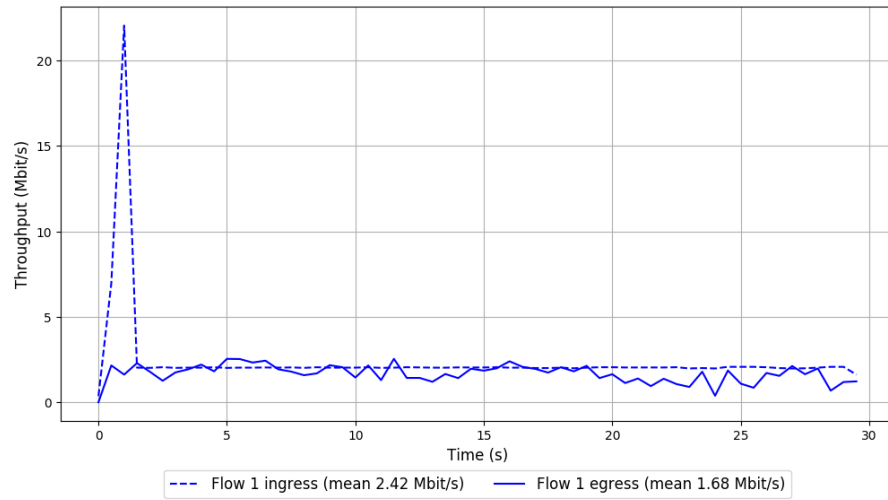

• Flow 1 (95th percentile 14151.24 ms)

```
Run 1: Statistics of PCC

Start at: 2017-09-22 10:34:59
End at: 2017-09-22 10:35:29
Local clock offset: 2.43 ms
Remote clock offset: -5.416 ms


# Below is generated by plot.py at 2017-09-22 11:14:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 1135.970 ms
Loss rate: 30.65%
-- Flow 1:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 1135.970 ms
Loss rate: 30.65%
```

Run 1: Report of PCC — Data Link

Flow 1 ingress (mean 2.42 Mbit/s)   Flow 1 egress (mean 1.68 Mbit/s)

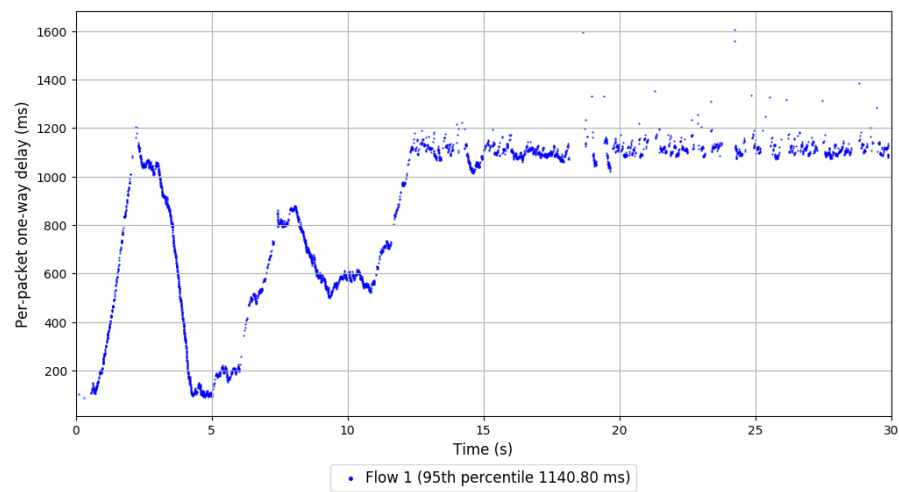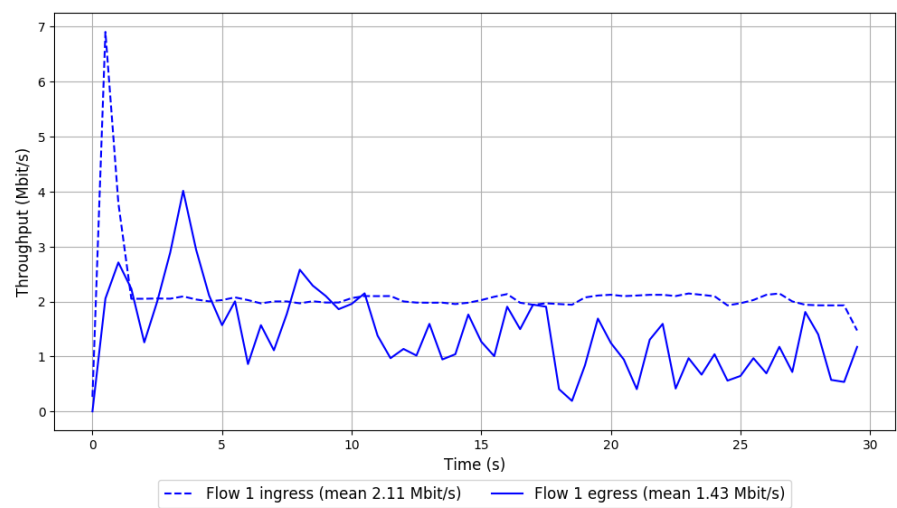Flow 1 (95th percentile 1135.97 ms)

```
Run 2: Statistics of PCC

Start at: 2017-09-22 10:50:22
End at: 2017-09-22 10:50:52
Local clock offset: -0.437 ms
Remote clock offset: -3.866 ms


# Below is generated by plot.py at 2017-09-22 11:14:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 1140.795 ms
Loss rate: 32.30%
-- Flow 1:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 1140.795 ms
Loss rate: 32.30%
```

Run 2: Report of PCC — Data Link

Flow 1 ingress (mean 2.11 Mbit/s) — — — Flow 1 egress (mean 1.43 Mbit/s)

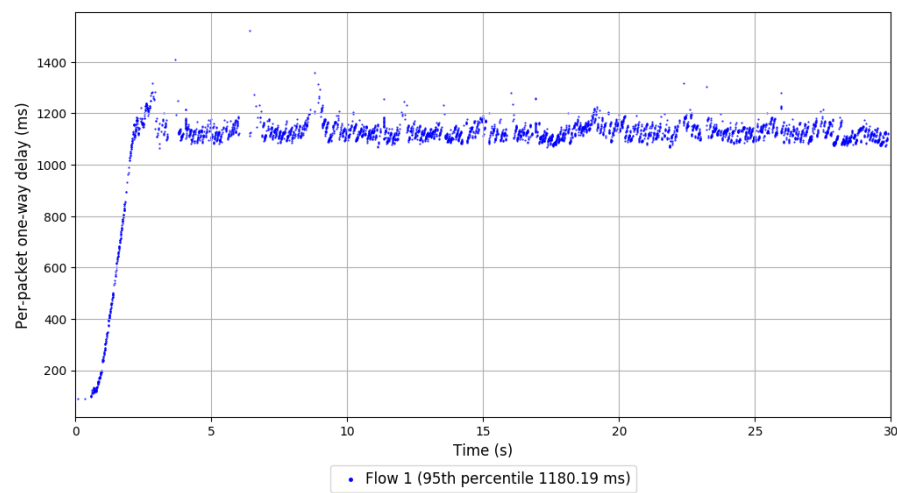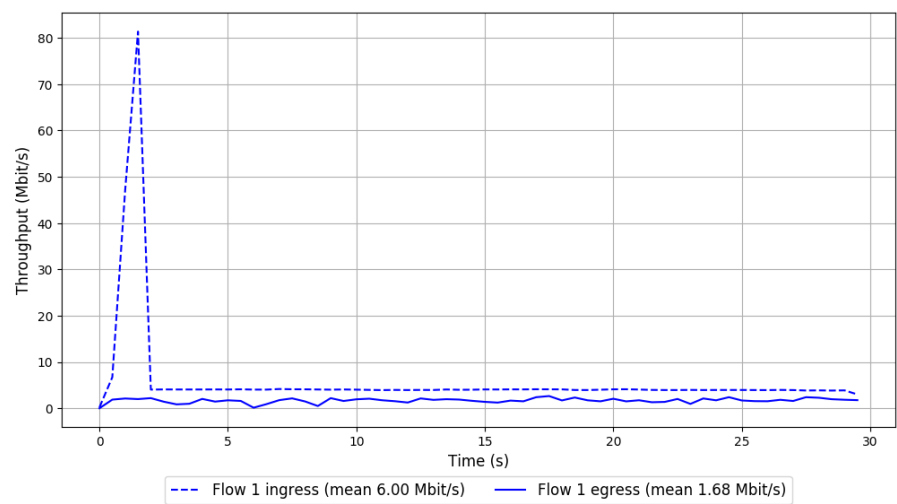• Flow 1 (95th percentile 1140.80 ms)

```
Run 3: Statistics of PCC

Start at: 2017-09-22 11:05:47
End at: 2017-09-22 11:06:17
Local clock offset: 1.015 ms
Remote clock offset: -3.315 ms


# Below is generated by plot.py at 2017-09-22 11:14:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 1180.195 ms
Loss rate: 72.11%
-- Flow 1:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 1180.195 ms
Loss rate: 72.11%
```

Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 6.00 Mbit/s) — — —   Flow 1 egress (mean 1.68 Mbit/s) ———

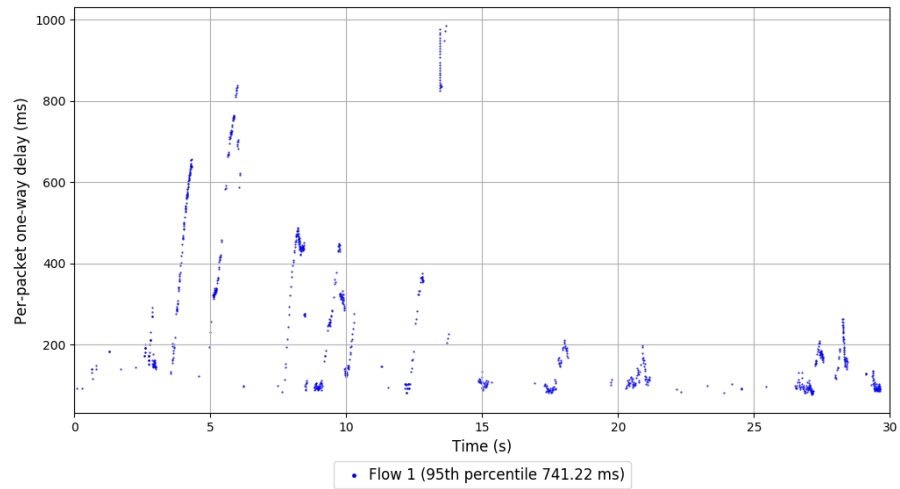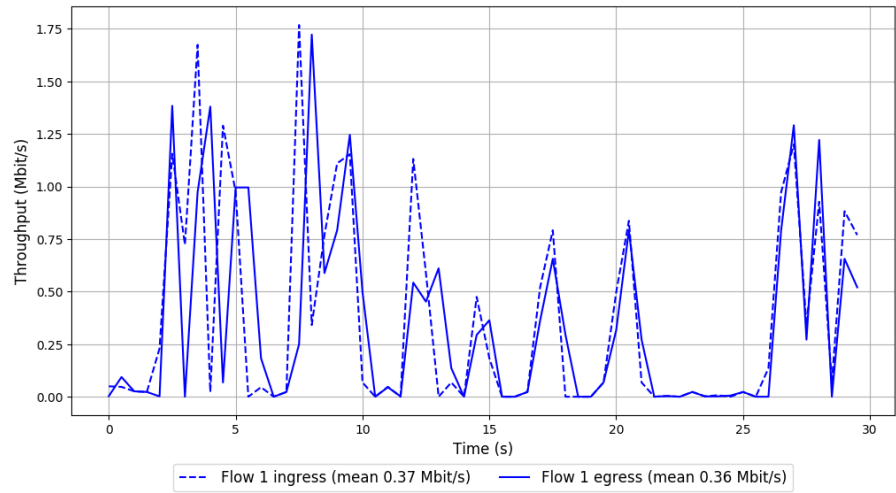
• Flow 1 (95th percentile 1180.19 ms)

```
Run 1: Statistics of QUIC Cubic

Start at: 2017-09-22 10:37:11
End at: 2017-09-22 10:37:41
Local clock offset: 0.643 ms
Remote clock offset: -3.886 ms


# Below is generated by plot.py at 2017-09-22 11:14:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 741.221 ms
Loss rate: 3.88%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 741.221 ms
Loss rate: 3.88%
```
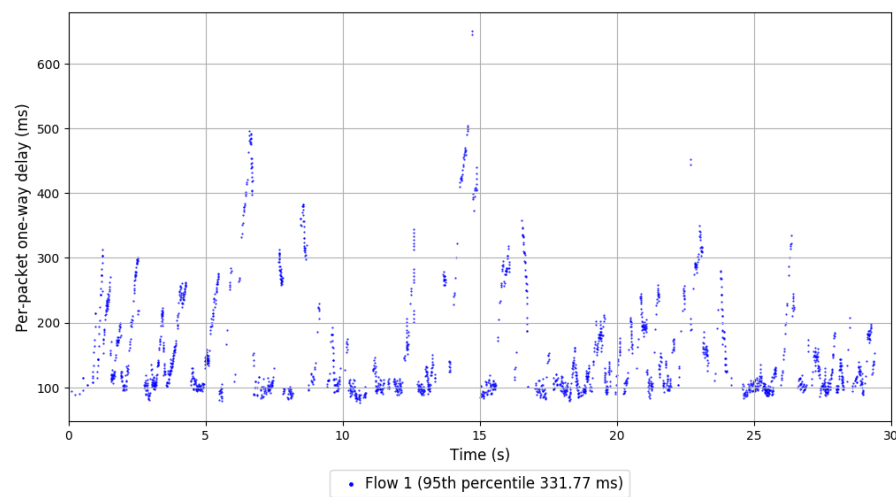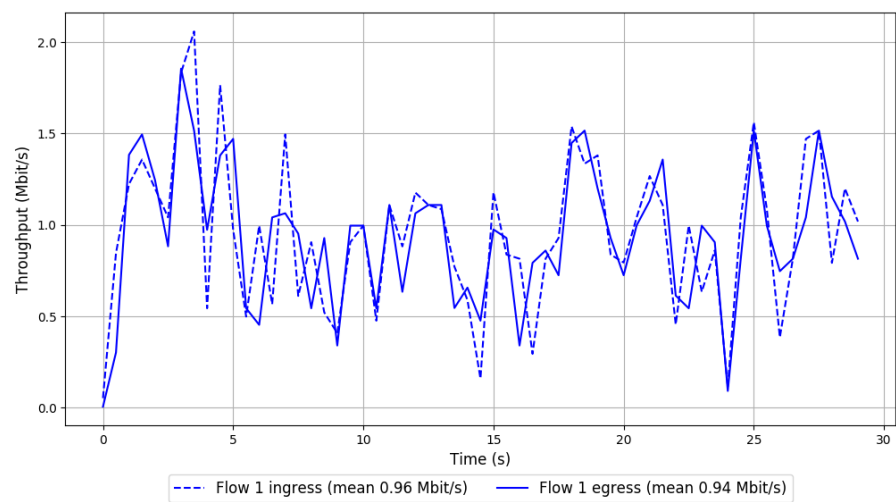
Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 0.37 Mbit/s) --- Flow 1 egress (mean 0.36 Mbit/s)

Flow 1 (95th percentile 741.22 ms)

```
Run 2: Statistics of QUIC Cubic

Start at: 2017-09-22 10:52:34
End at: 2017-09-22 10:53:04
Local clock offset: -0.553 ms
Remote clock offset: -3.089 ms


# Below is generated by plot.py at 2017-09-22 11:14:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 331.767 ms
Loss rate: 2.05%
-- Flow 1:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 331.767 ms
Loss rate: 2.05%
```
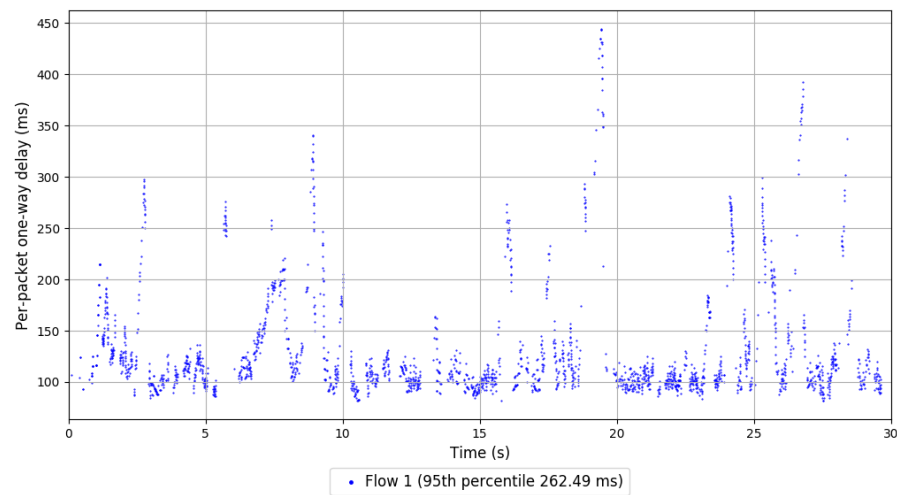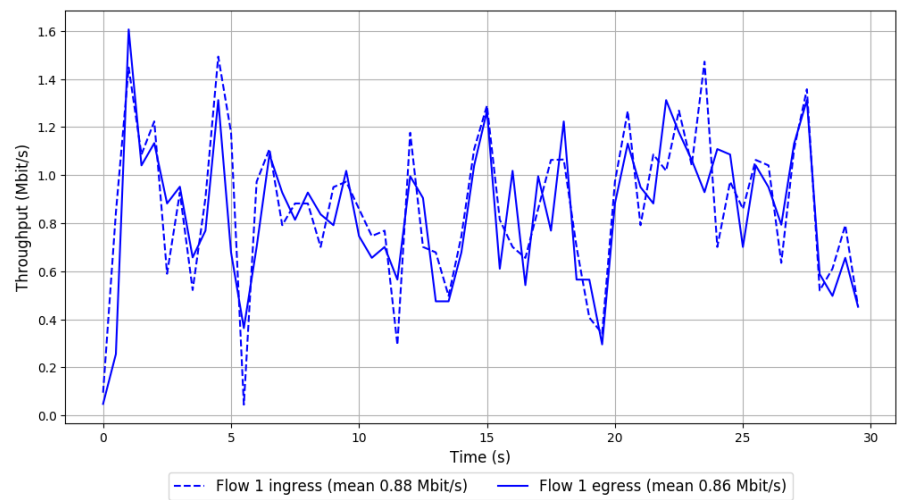
Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 0.96 Mbit/s) --- Flow 1 egress (mean 0.94 Mbit/s)

Flow 1 (95th percentile 331.77 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-09-22 11:08:00
End at: 2017-09-22 11:08:30
Local clock offset: 0.495 ms
Remote clock offset: -3.385 ms


# Below is generated by plot.py at 2017-09-22 11:14:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 262.491 ms
Loss rate: 3.04%
-- Flow 1:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 262.491 ms
Loss rate: 3.04%
```

Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 0.88 Mbit/s) ----   Flow 1 egress (mean 0.86 Mbit/s) ——
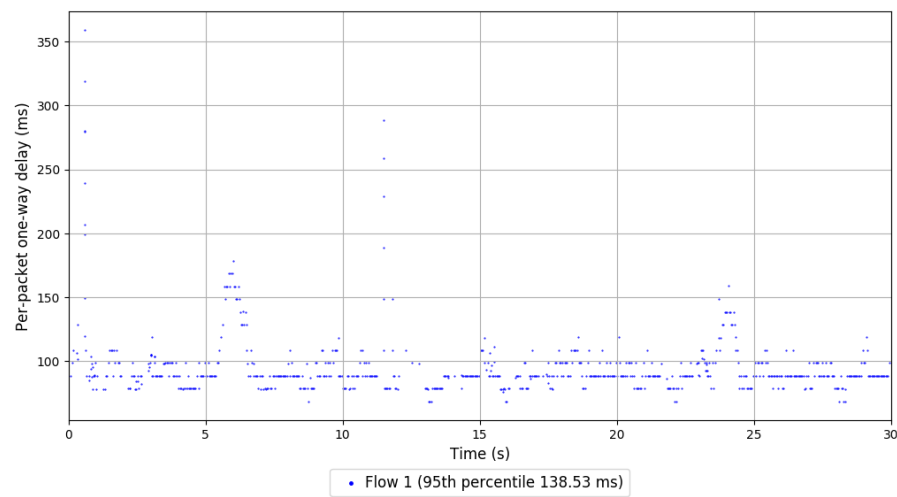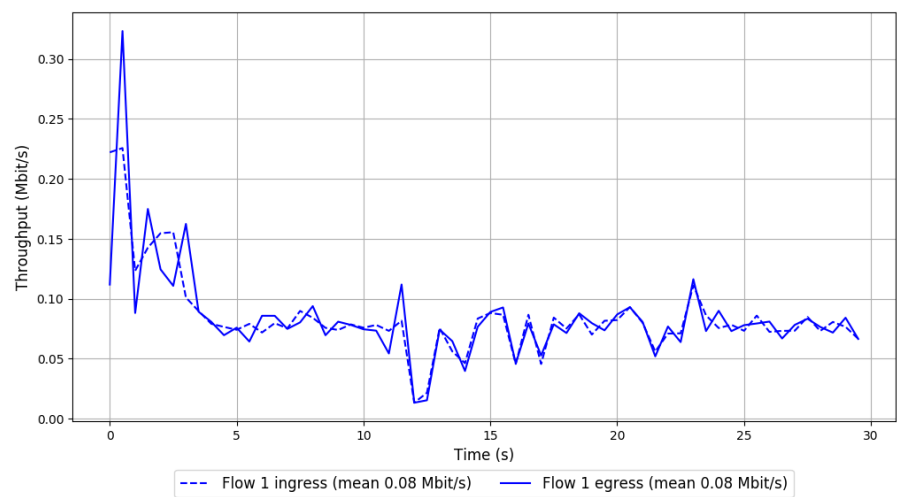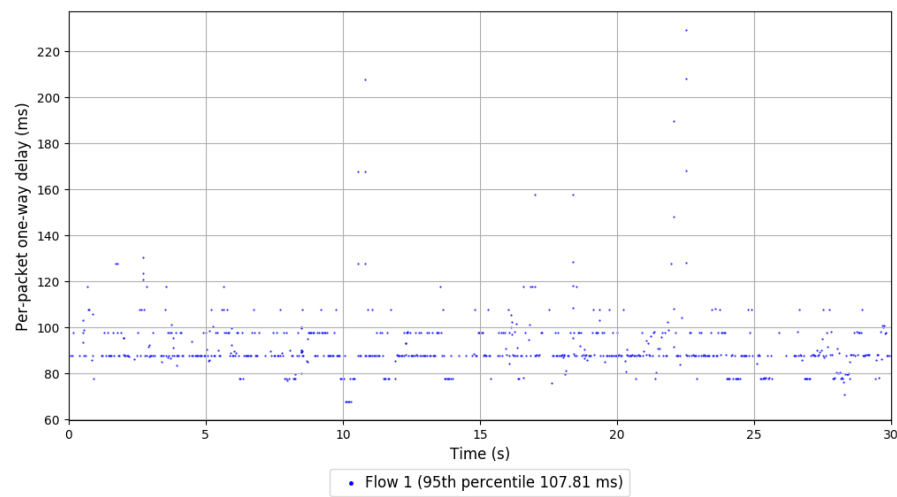

• Flow 1 (95th percentile 262.49 ms)

```
Run 1: Statistics of SCReAM

Start at: 2017-09-22 10:30:36
End at: 2017-09-22 10:31:06
Local clock offset: 1.036 ms
Remote clock offset: -5.408 ms

# Below is generated by plot.py at 2017-09-22 11:14:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 138.533 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 138.533 ms
Loss rate: 0.55%
```

Run 1: Report of SCReAM — Data Link

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

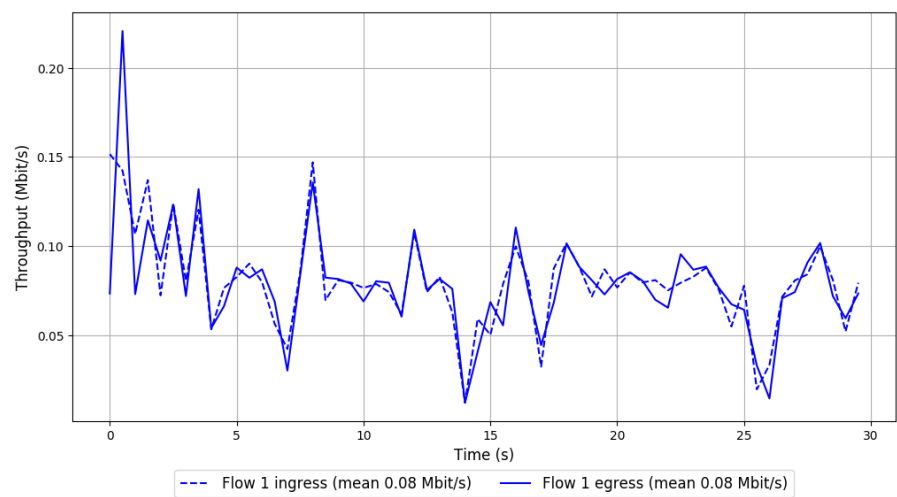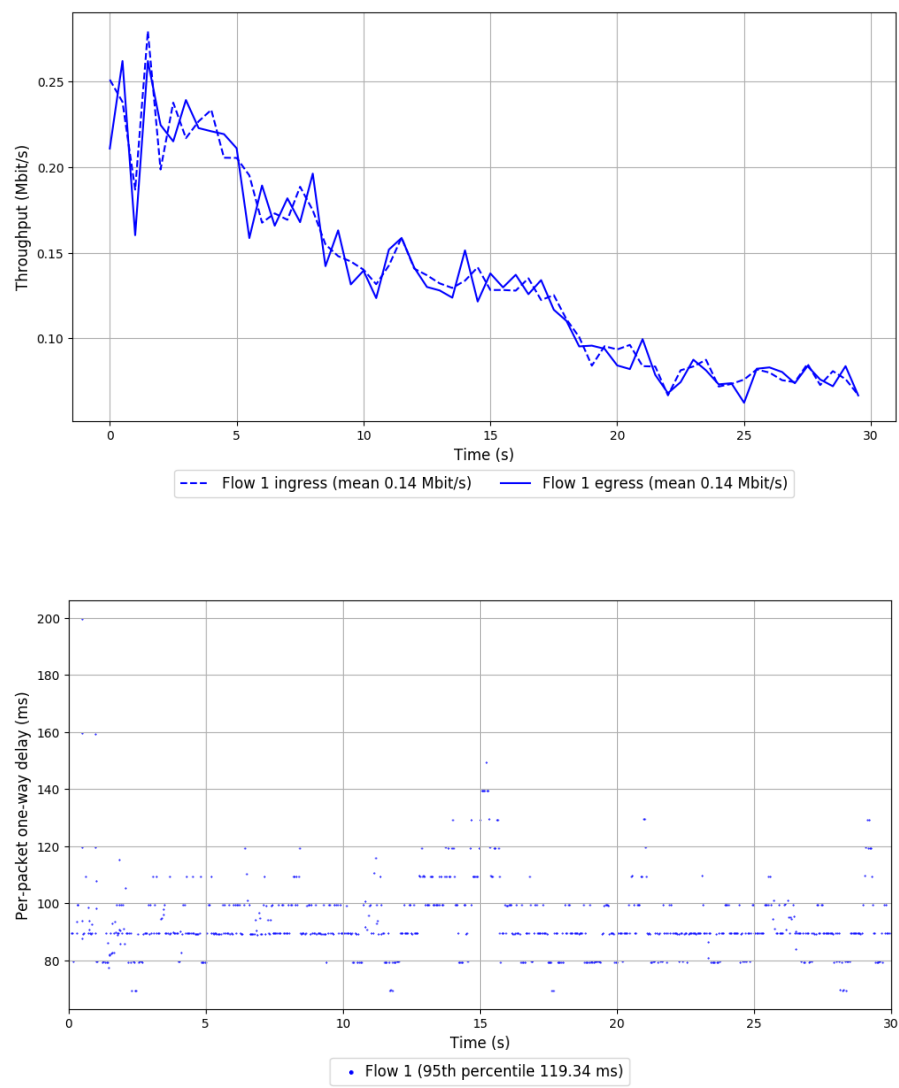Flow 1 (95th percentile 138.53 ms)

```
Run 2: Statistics of SCReAM

Start at: 2017-09-22 10:45:59
End at: 2017-09-22 10:46:29
Local clock offset: 2.515 ms
Remote clock offset: -3.854 ms


# Below is generated by plot.py at 2017-09-22 11:14:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 107.809 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 107.809 ms
Loss rate: 1.33%
```
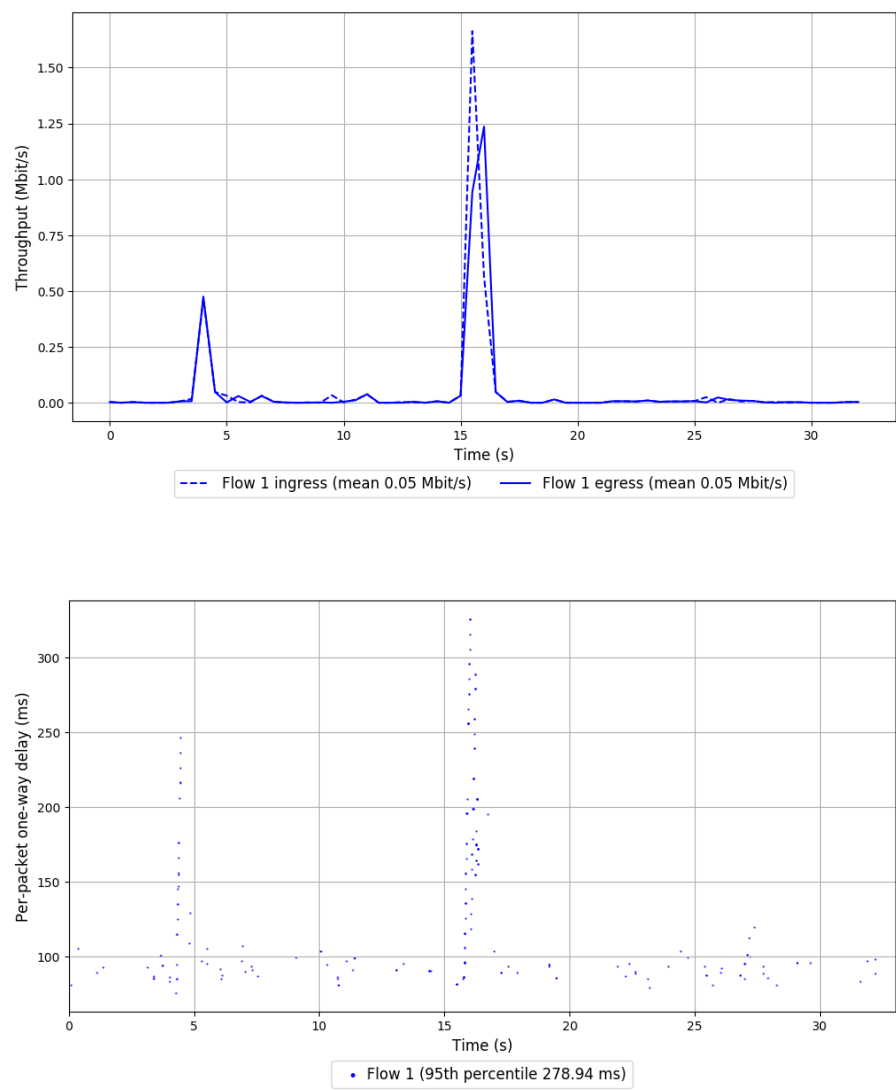
Run 2: Report of SCReAM — Data Link

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

• Flow 1 (95th percentile 107.81 ms)

```
Run 3: Statistics of SCReAM

Start at: 2017-09-22 11:01:24
End at: 2017-09-22 11:01:54
Local clock offset: -0.192 ms
Remote clock offset: -4.398 ms


# Below is generated by plot.py at 2017-09-22 11:14:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 119.336 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 119.336 ms
Loss rate: 0.93%
```
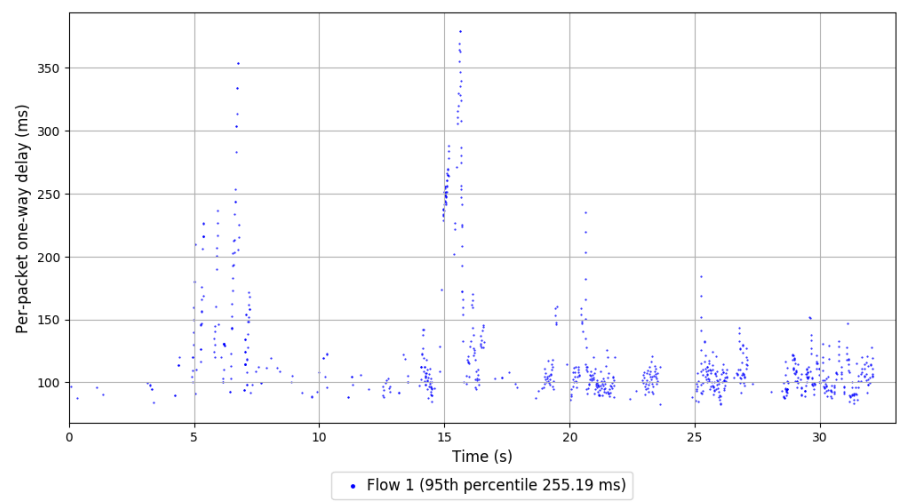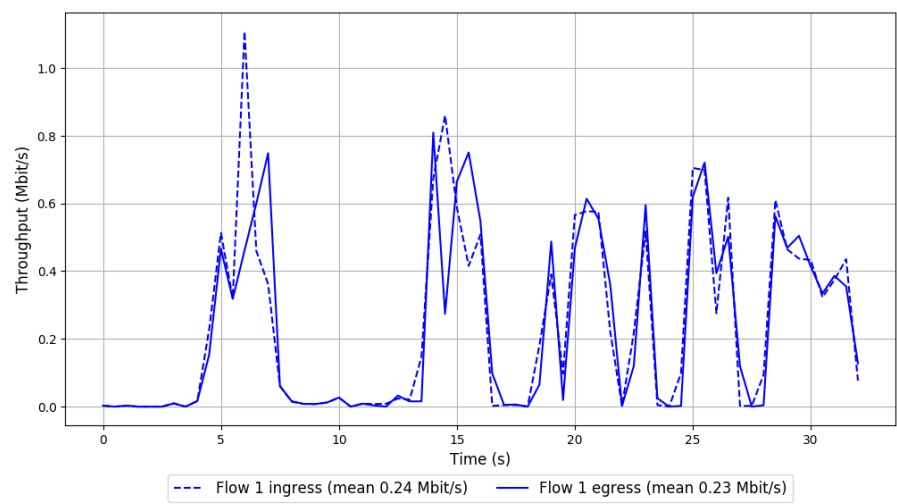
Run 3: Report of SCReAM — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2017-09-22 10:29:30
End at: 2017-09-22 10:30:00
Local clock offset: 0.916 ms
Remote clock offset: -6.127 ms


# Below is generated by plot.py at 2017-09-22 11:14:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 278.943 ms
Loss rate: 2.51%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 278.943 ms
Loss rate: 2.51%
```
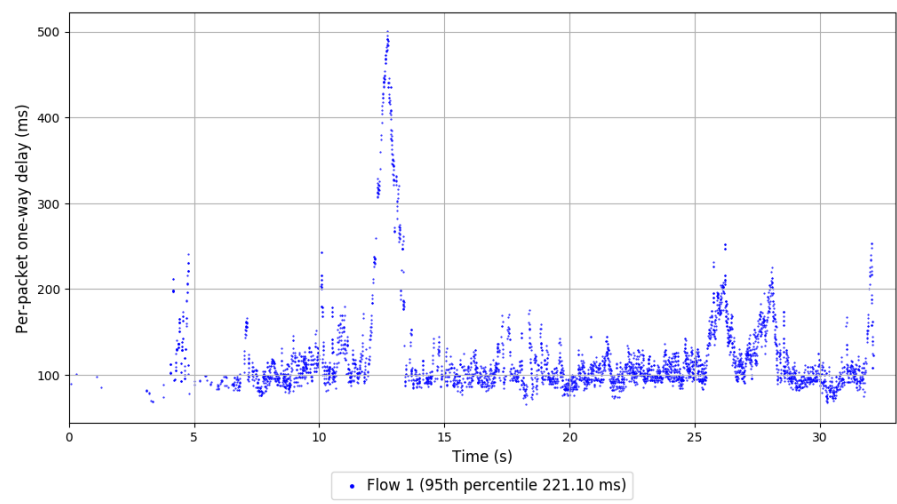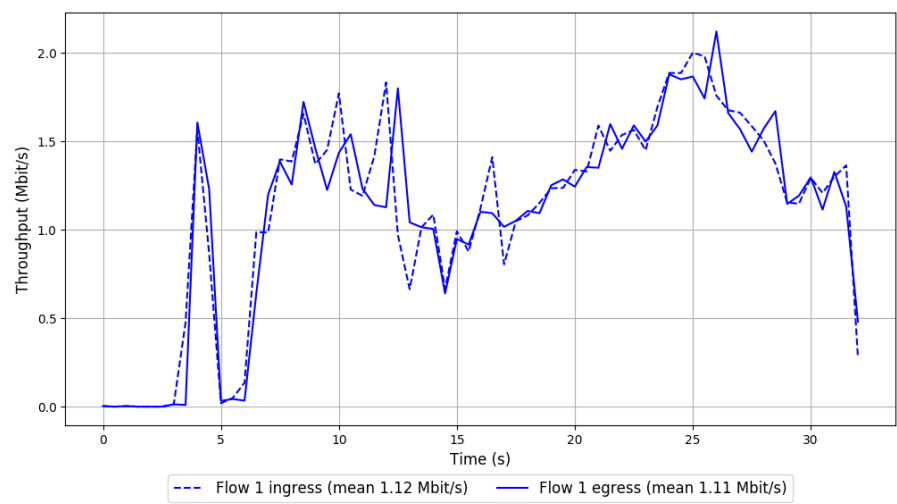
Run 1: Report of WebRTC media — Data Link

Flow 1 ingress (mean 0.05 Mbit/s)   Flow 1 egress (mean 0.05 Mbit/s)

Flow 1 (95th percentile 278.94 ms)

```
Run 2: Statistics of WebRTC media

Start at: 2017-09-22 10:44:53
End at: 2017-09-22 10:45:23
Local clock offset: -0.747 ms
Remote clock offset: -4.052 ms


# Below is generated by plot.py at 2017-09-22 11:14:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 255.195 ms
Loss rate: 2.95%
-- Flow 1:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 255.195 ms
Loss rate: 2.95%
```

Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2017-09-22 11:00:19
End at: 2017-09-22 11:00:49
Local clock offset: -0.363 ms
Remote clock offset: -4.563 ms


# Below is generated by plot.py at 2017-09-22 11:14:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 221.098 ms
Loss rate: 1.00%
-- Flow 1:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 221.098 ms
Loss rate: 1.00%
```
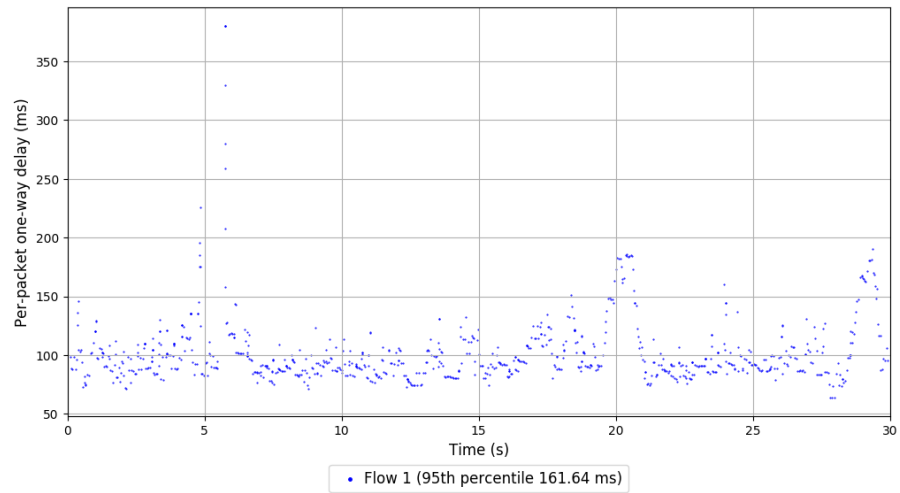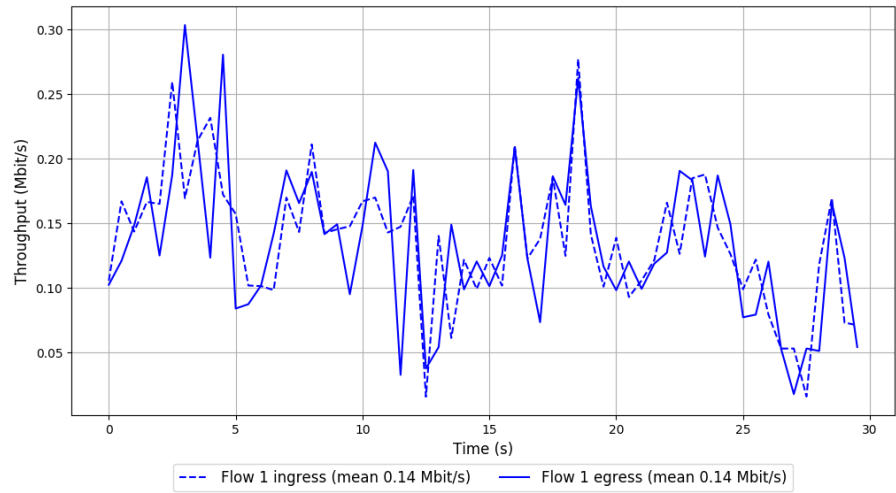
Run 3: Report of WebRTC media — Data Link

Flow 1 ingress (mean 1.12 Mbit/s) —— Flow 1 egress (mean 1.11 Mbit/s)
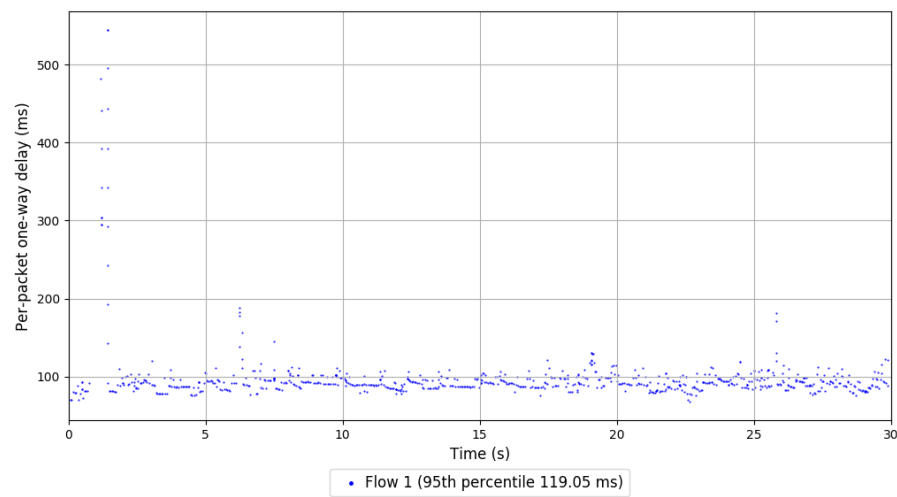

· Flow 1 (95th percentile 221.10 ms)

```
Run 1: Statistics of Sprout

Start at: 2017-09-22 10:28:24
End at: 2017-09-22 10:28:54
Local clock offset: 2.626 ms
Remote clock offset: -5.13 ms


# Below is generated by plot.py at 2017-09-22 11:14:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 161.643 ms
Loss rate: 1.65%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 161.643 ms
Loss rate: 1.65%
```

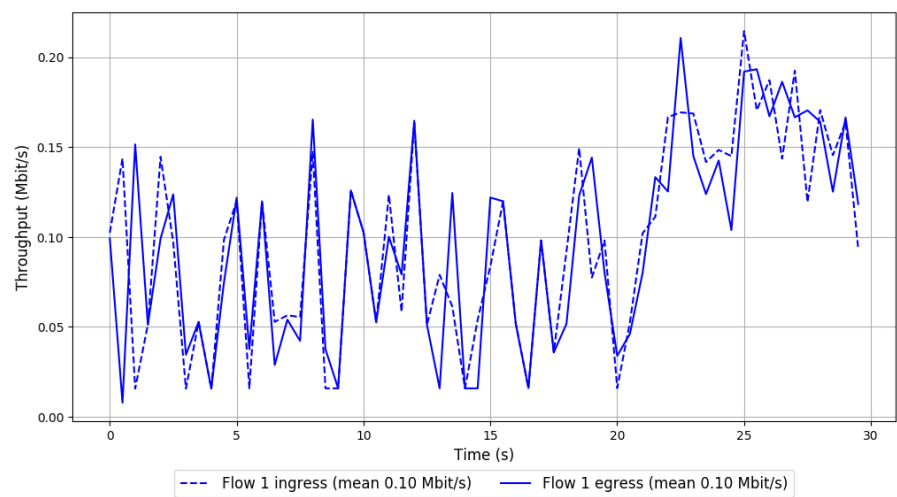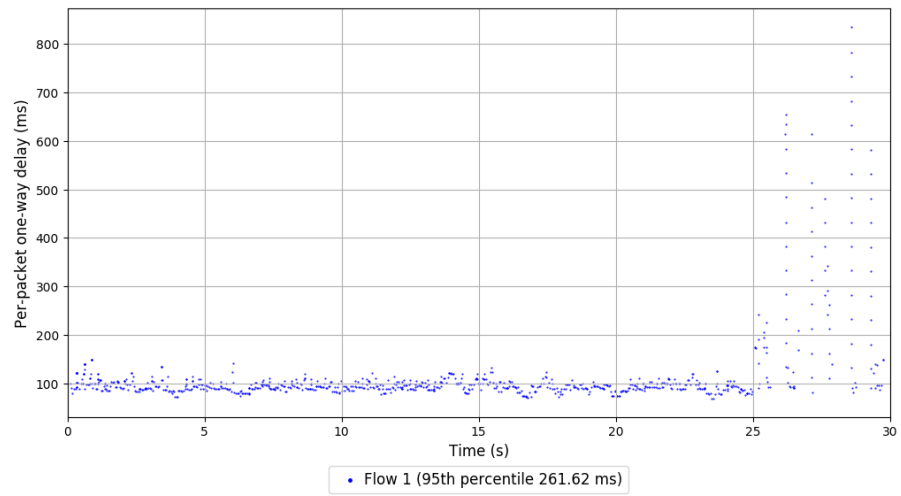Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2017-09-22 10:43:46
End at: 2017-09-22 10:44:16
Local clock offset: -0.015 ms
Remote clock offset: -4.518 ms


# Below is generated by plot.py at 2017-09-22 11:14:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 119.046 ms
Loss rate: 0.87%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 119.046 ms
Loss rate: 0.87%
```

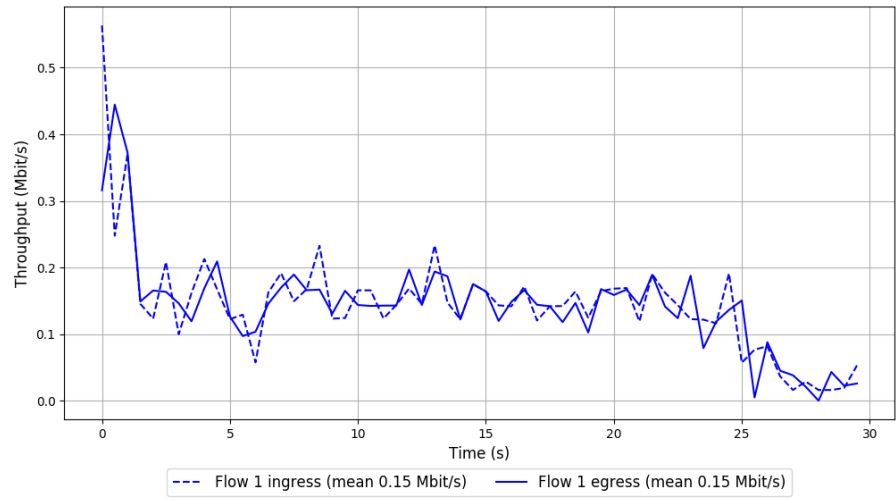Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2017-09-22 10:59:12
End at: 2017-09-22 10:59:42
Local clock offset: 1.792 ms
Remote clock offset: -3.585 ms


# Below is generated by plot.py at 2017-09-22 11:14:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 261.619 ms
Loss rate: 1.44%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 261.619 ms
Loss rate: 1.44%
```

Run 3: Report of Sprout — Data Link

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

Start at: 2017-09-22 10:39:23
End at: 2017-09-22 10:39:53
Local clock offset: 2.674 ms
Remote clock offset: -4.503 ms


# Below is generated by plot.py at 2017-09-22 11:15:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 675.150 ms
Loss rate: 5.84%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 675.150 ms
Loss rate: 5.84%
```
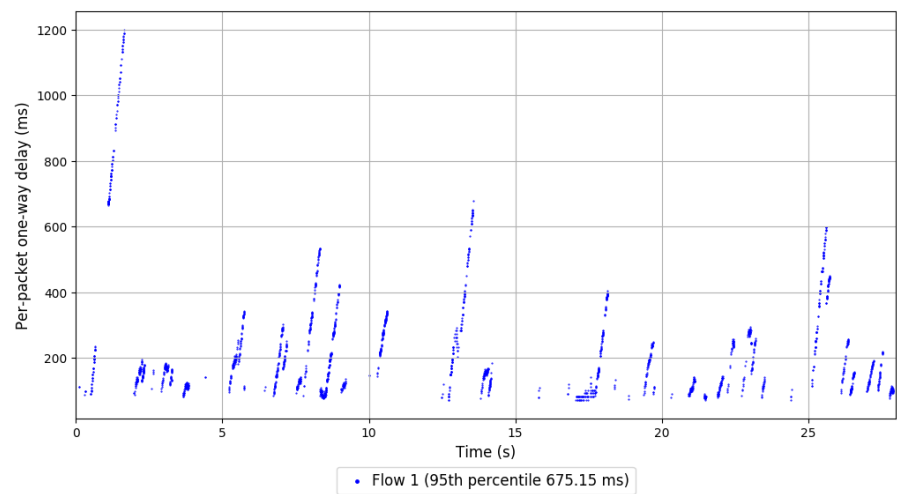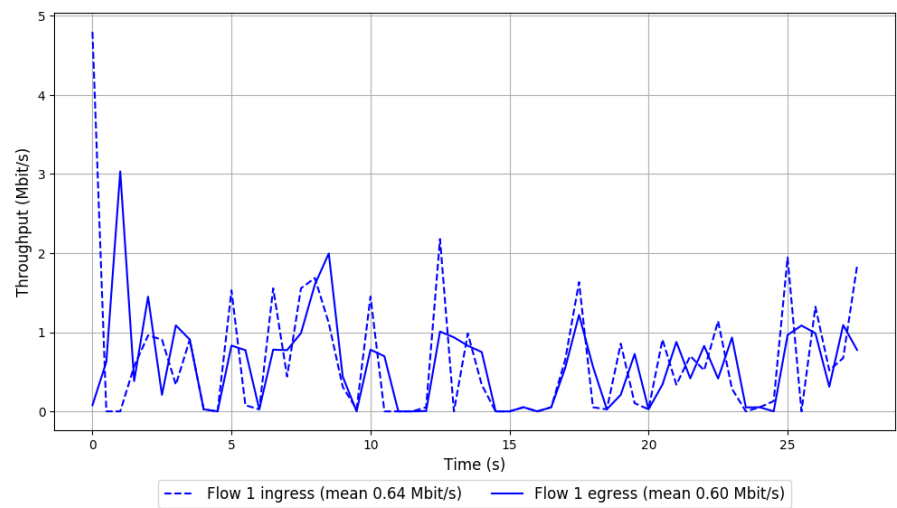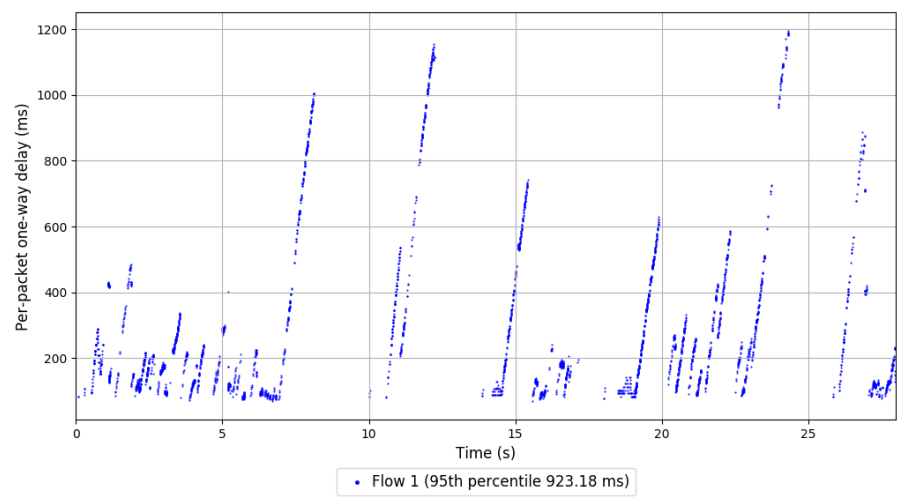
Run 1: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 0.64 Mbit/s)   Flow 1 egress (mean 0.60 Mbit/s)

Flow 1 (95th percentile 675.15 ms)

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

Start at: 2017-09-22 10:54:46
End at: 2017-09-22 10:55:16
Local clock offset: 2.056 ms
Remote clock offset: -4.287 ms


# Below is generated by plot.py at 2017-09-22 11:15:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 923.184 ms
Loss rate: 6.13%
-- Flow 1:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 923.184 ms
Loss rate: 6.13%
```
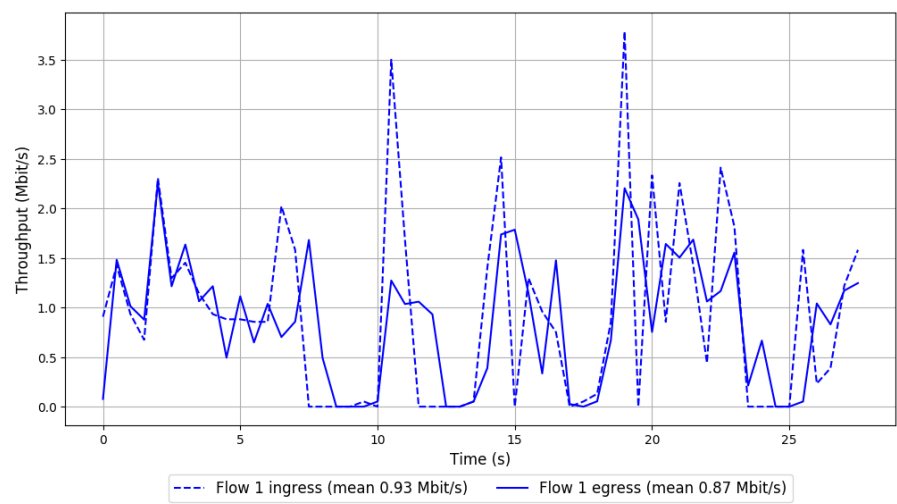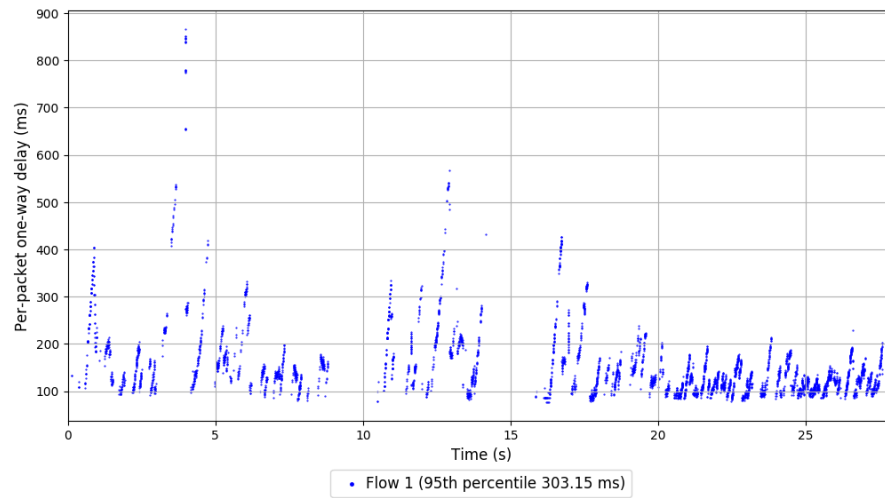
Run 2: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 0.93 Mbit/s) — — — Flow 1 egress (mean 0.87 Mbit/s) ——

Flow 1 (95th percentile 923.18 ms)

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

Start at: 2017-09-22 11:10:12
End at: 2017-09-22 11:10:42
Local clock offset: 1.394 ms
Remote clock offset: -3.604 ms


# Below is generated by plot.py at 2017-09-22 11:15:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 303.155 ms
Loss rate: 2.80%
-- Flow 1:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 303.155 ms
Loss rate: 2.80%
```
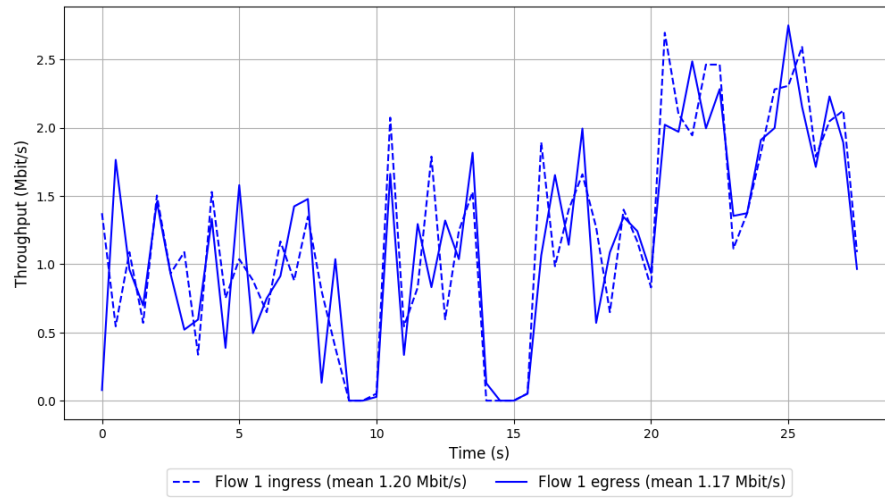
Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 1.20 Mbit/s) ---   Flow 1 egress (mean 1.17 Mbit/s) ——
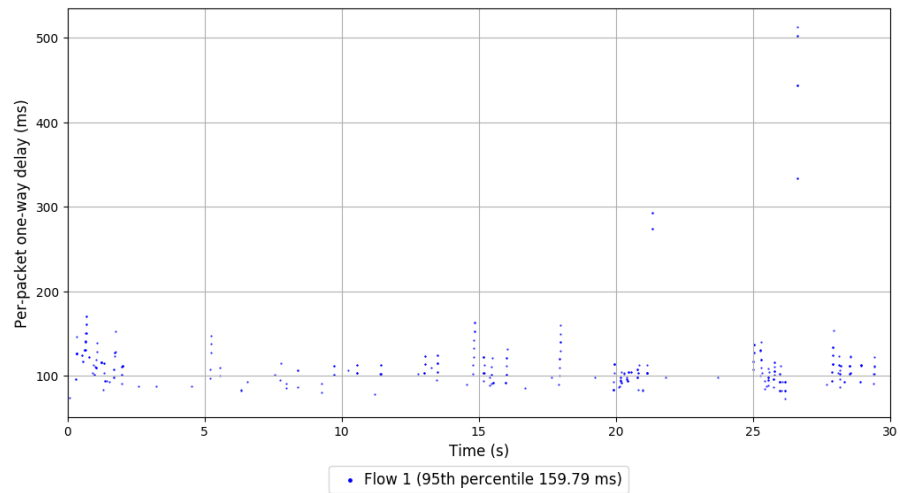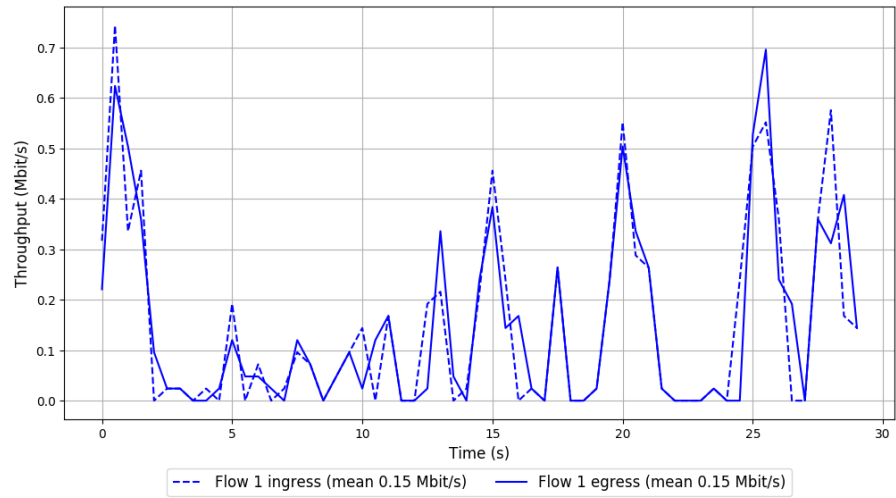

· Flow 1 (95th percentile 303.15 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2017-09-22 10:40:28
End at: 2017-09-22 10:40:58
Local clock offset: 1.863 ms
Remote clock offset: -3.996 ms


# Below is generated by plot.py at 2017-09-22 11:15:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 159.790 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 159.790 ms
Loss rate: 1.09%
```
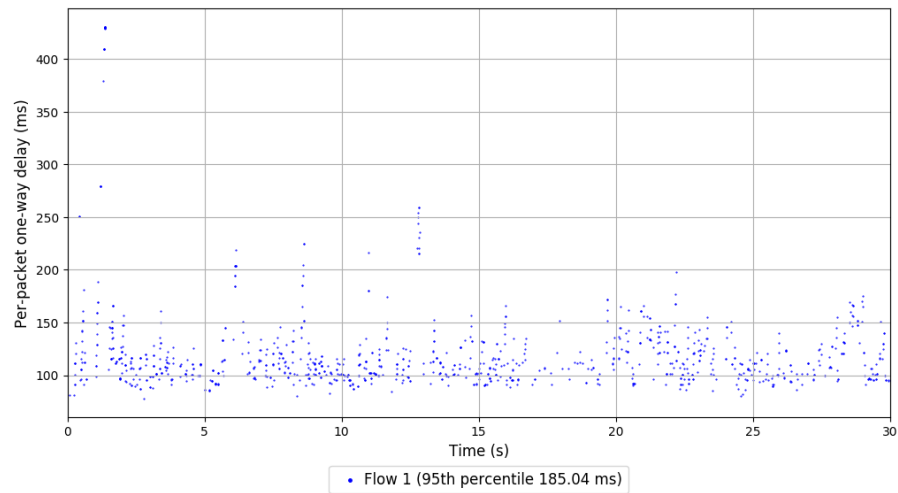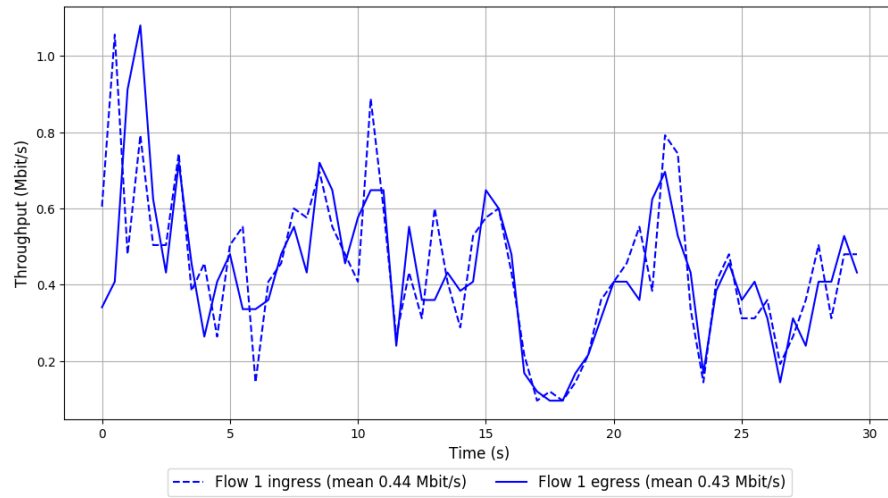
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2017-09-22 10:55:52
End at: 2017-09-22 10:56:22
Local clock offset: -0.84 ms
Remote clock offset: -3.778 ms


# Below is generated by plot.py at 2017-09-22 11:15:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 185.038 ms
Loss rate: 2.43%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 185.038 ms
Loss rate: 2.43%
```
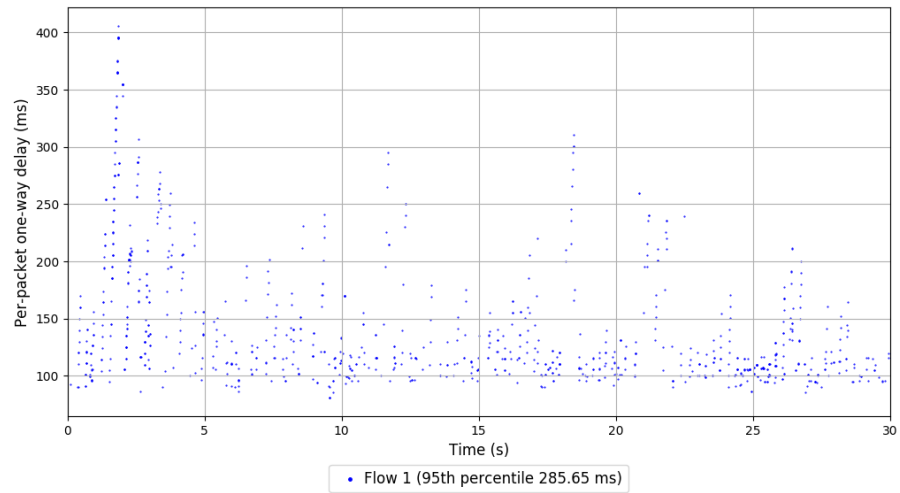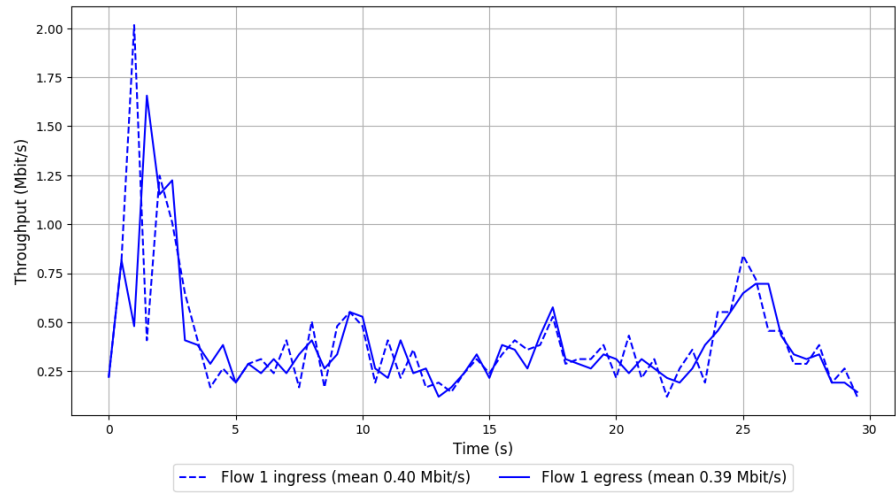
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2017-09-22 11:11:18
End at: 2017-09-22 11:11:48
Local clock offset: -1.629 ms
Remote clock offset: -3.369 ms


# Below is generated by plot.py at 2017-09-22 11:15:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 285.651 ms
Loss rate: 1.80%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 285.651 ms
Loss rate: 1.80%
```

Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 0.40 Mbit/s)   Flow 1 egress (mean 0.39 Mbit/s)

• Flow 1 (95th percentile 285.65 ms)

```
Run 1: Statistics of Verus

Start at: 2017-09-22 10:33:53
End at: 2017-09-22 10:34:23
Local clock offset: 0.19 ms
Remote clock offset: -6.4 ms


# Below is generated by plot.py at 2017-09-22 11:15:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 1054.941 ms
Loss rate: 38.41%
-- Flow 1:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 1054.941 ms
Loss rate: 38.41%
```
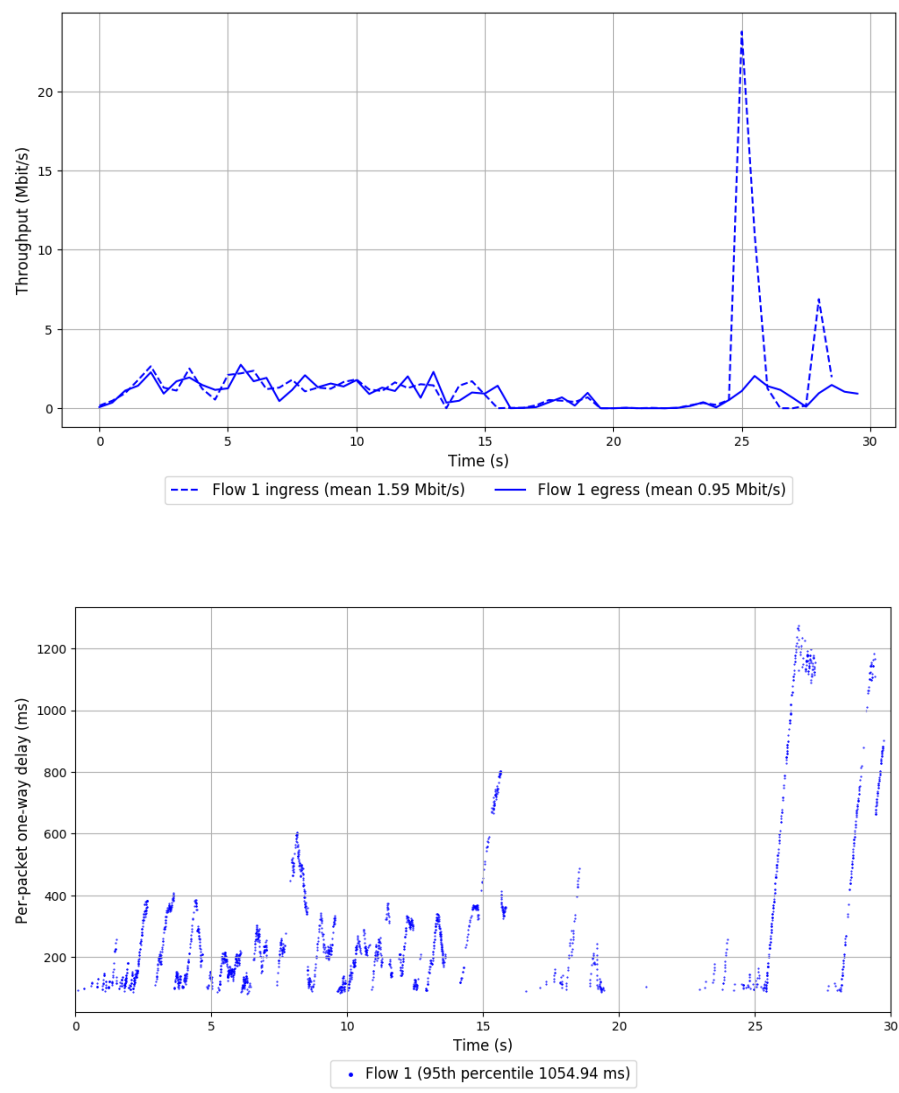
Run 1: Report of Verus — Data Link

Flow 1 ingress (mean 1.59 Mbit/s)   Flow 1 egress (mean 0.95 Mbit/s)

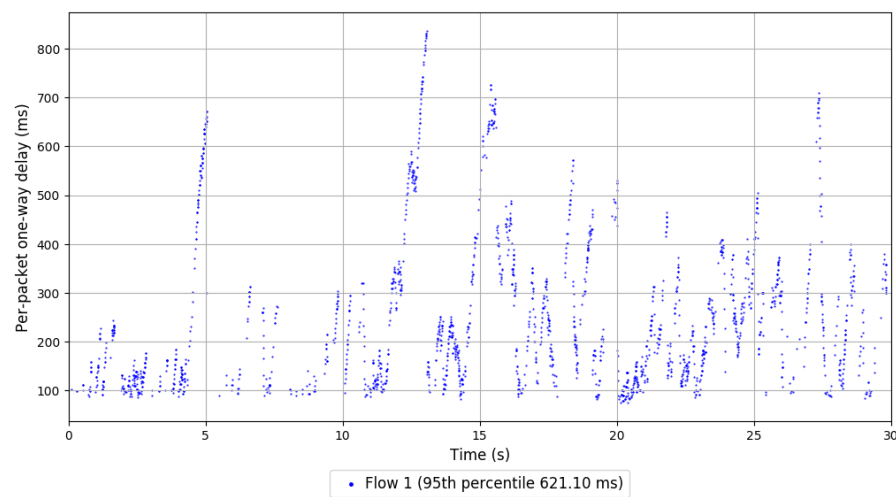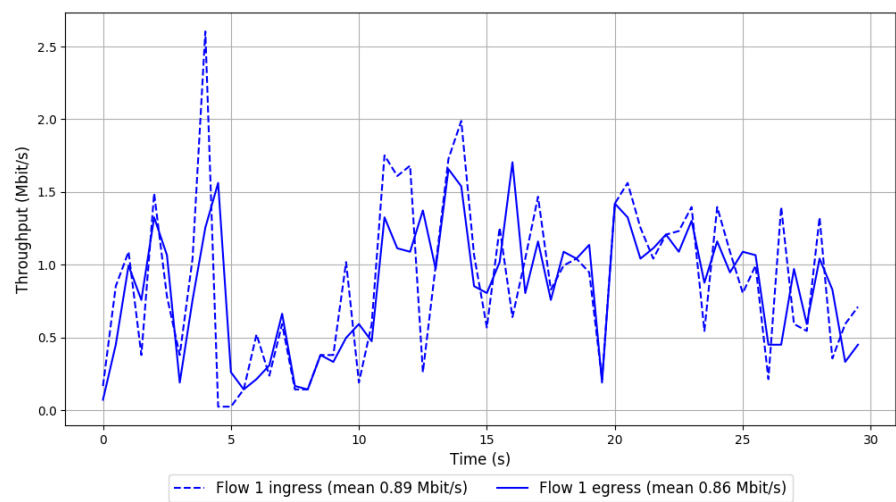• Flow 1 (95th percentile 1054.94 ms)

```
Run 2: Statistics of Verus

Start at: 2017-09-22 10:49:16
End at: 2017-09-22 10:49:46
Local clock offset: 2.548 ms
Remote clock offset: -3.861 ms

# Below is generated by plot.py at 2017-09-22 11:15:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 621.104 ms
Loss rate: 3.67%
-- Flow 1:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 621.104 ms
Loss rate: 3.67%
```

Run 2: Report of Verus — Data Link

Flow 1 ingress (mean 0.89 Mbit/s)   Flow 1 egress (mean 0.86 Mbit/s)

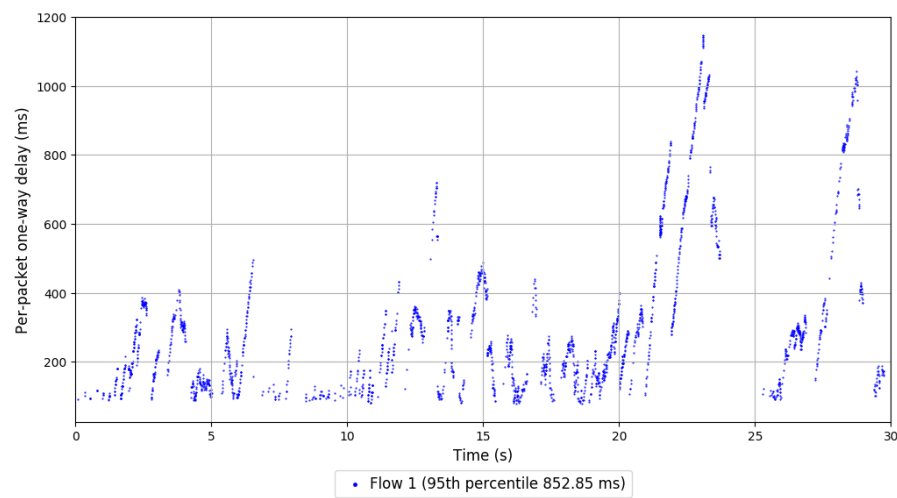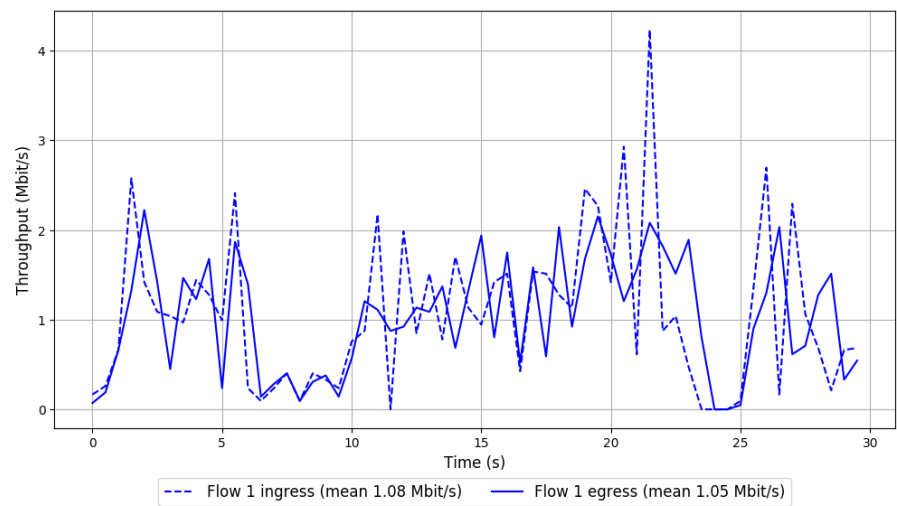Flow 1 (95th percentile 621.10 ms)

```
Run 3: Statistics of Verus

Start at: 2017-09-22 11:04:41
End at: 2017-09-22 11:05:11
Local clock offset: 1.482 ms
Remote clock offset: -3.472 ms


# Below is generated by plot.py at 2017-09-22 11:15:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 852.848 ms
Loss rate: 3.14%
-- Flow 1:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 852.848 ms
Loss rate: 3.14%
```

Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 1.08 Mbit/s)   Flow 1 egress (mean 1.05 Mbit/s)
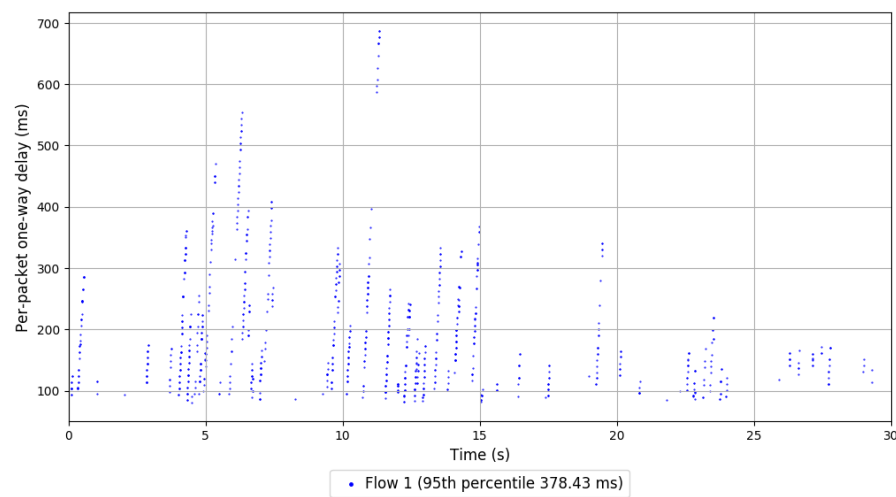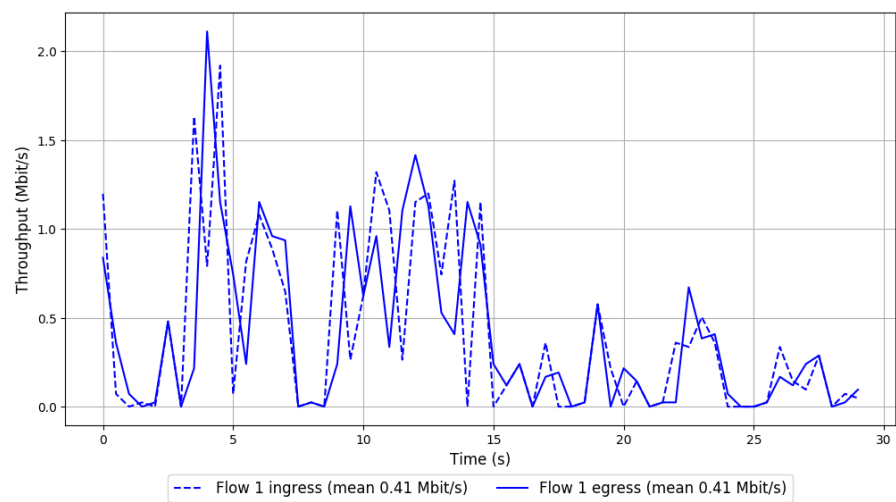

Flow 1 (95th percentile 852.85 ms)

```
Run 1: Statistics of Indigo

Start at: 2017-09-22 10:36:05
End at: 2017-09-22 10:36:35
Local clock offset: 0.211 ms
Remote clock offset: -4.251 ms


# Below is generated by plot.py at 2017-09-22 11:15:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 378.428 ms
Loss rate: 1.69%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 378.428 ms
Loss rate: 1.69%
```

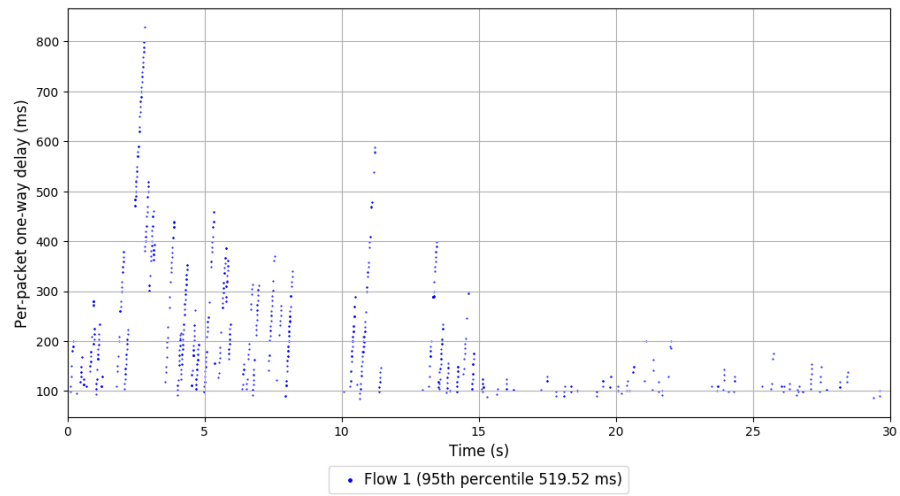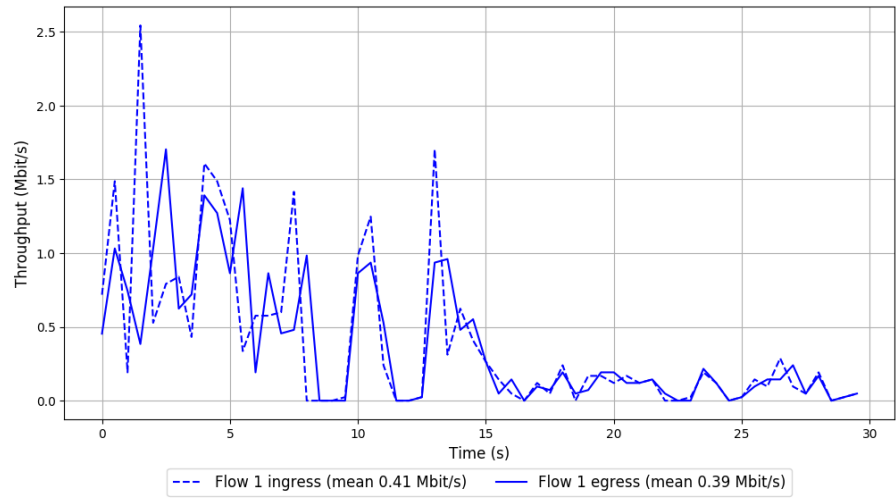Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2017-09-22 10:51:28
End at: 2017-09-22 10:51:58
Local clock offset: 1.715 ms
Remote clock offset: -4.687 ms


# Below is generated by plot.py at 2017-09-22 11:15:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 519.516 ms
Loss rate: 4.30%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 519.516 ms
Loss rate: 4.30%
```

Run 2: Report of Indigo — Data Link

Flow 1 ingress (mean 0.41 Mbit/s)   Flow 1 egress (mean 0.39 Mbit/s)

Flow 1 (95th percentile 519.52 ms)

```
Run 3: Statistics of Indigo

Start at: 2017-09-22 11:06:54
End at: 2017-09-22 11:07:24
Local clock offset: 1.41 ms
Remote clock offset: -2.948 ms


# Below is generated by plot.py at 2017-09-22 11:15:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 200.718 ms
Loss rate: 2.08%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 200.718 ms
Loss rate: 2.08%
```
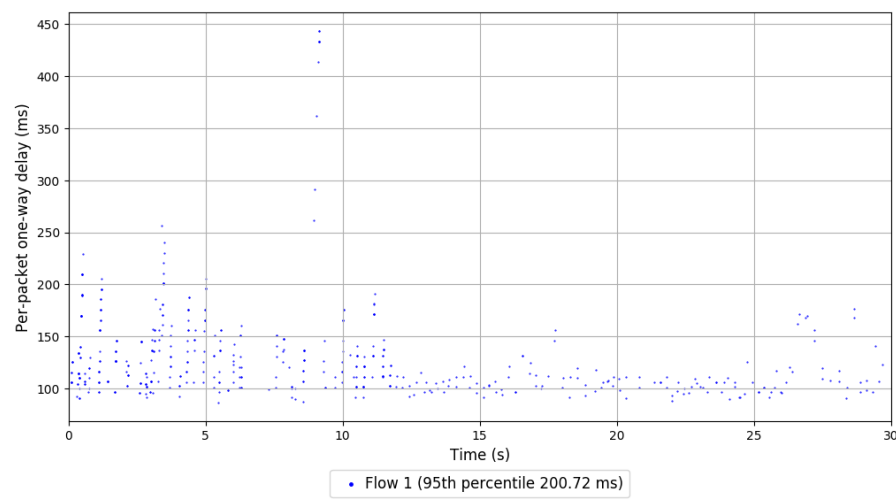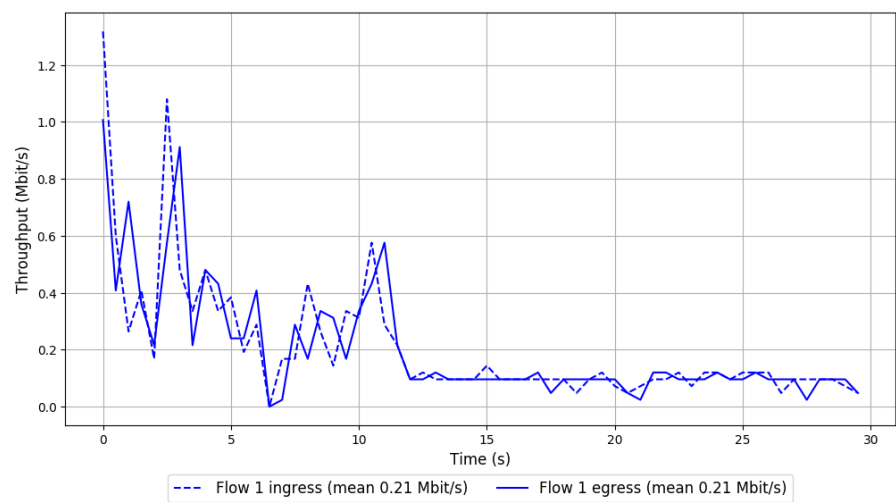
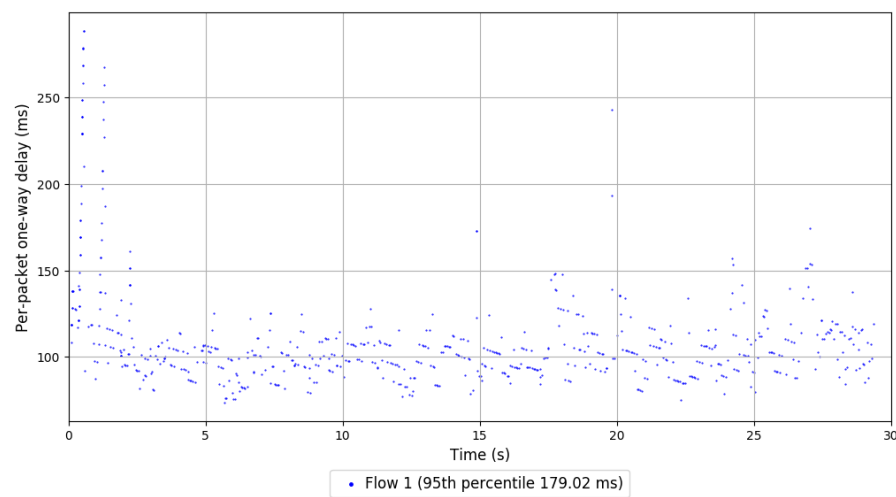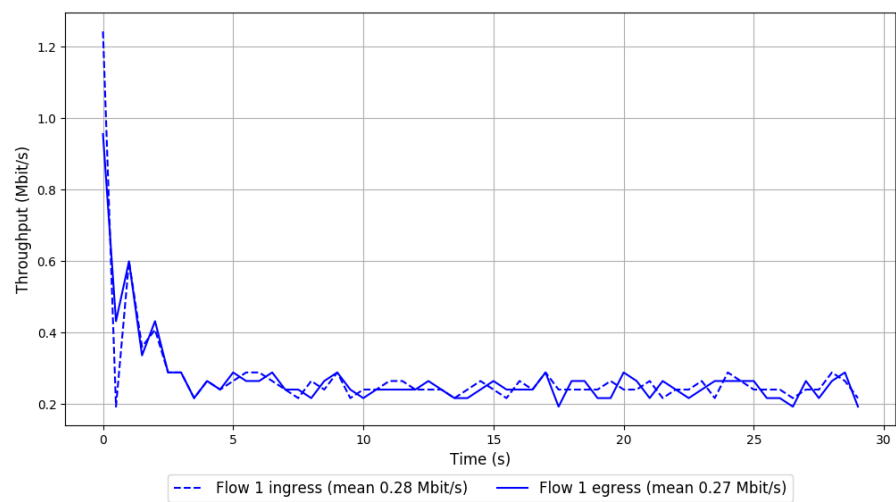Run 3: Report of Indigo — Data Link

```
Run 1: Statistics of Indigo-cellular

Start at: 2017-09-22 10:31:41
End at: 2017-09-22 10:32:11
Local clock offset: -0.557 ms
Remote clock offset: -5.405 ms


# Below is generated by plot.py at 2017-09-22 11:15:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 179.019 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 179.019 ms
Loss rate: 1.18%
```

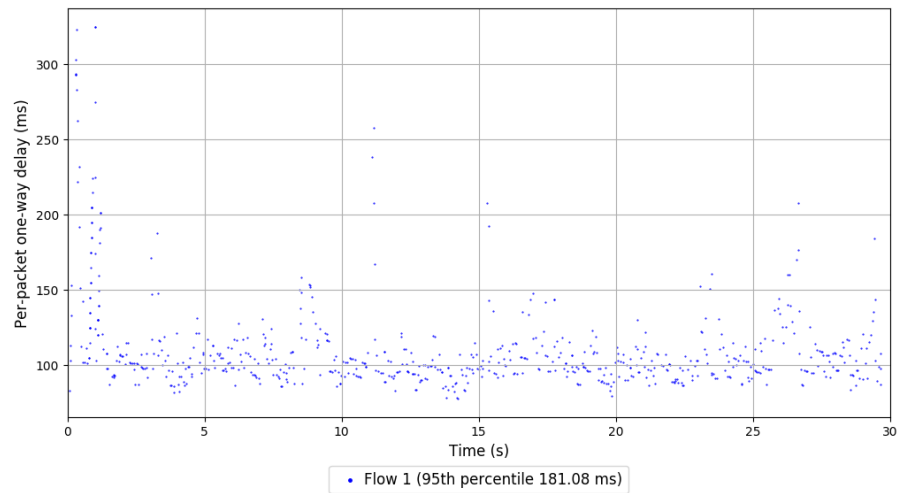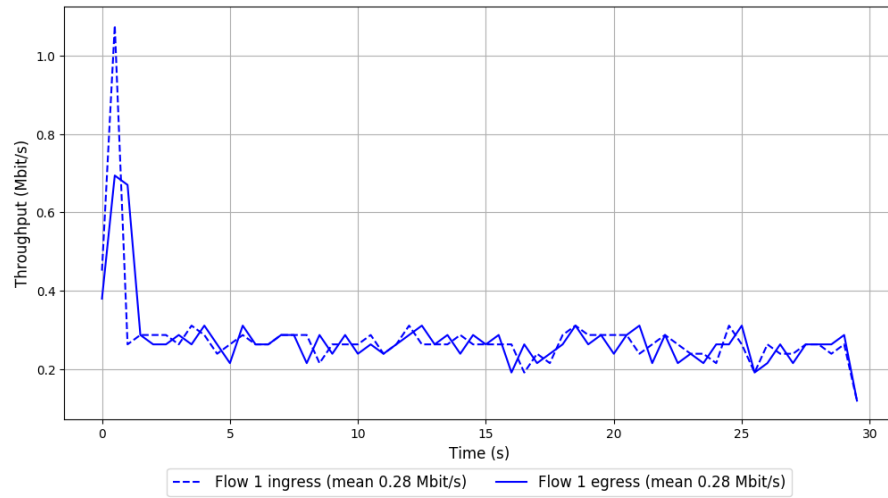Run 1: Report of Indigo-cellular — Data Link

```
Run 2: Statistics of Indigo-cellular

Start at: 2017-09-22 10:47:05
End at: 2017-09-22 10:47:35
Local clock offset: 1.64 ms
Remote clock offset: -4.249 ms


# Below is generated by plot.py at 2017-09-22 11:15:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 181.082 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 181.082 ms
Loss rate: 1.14%
```

Run 2: Report of Indigo-cellular — Data Link

Flow 1 ingress (mean 0.28 Mbit/s)   Flow 1 egress (mean 0.28 Mbit/s)
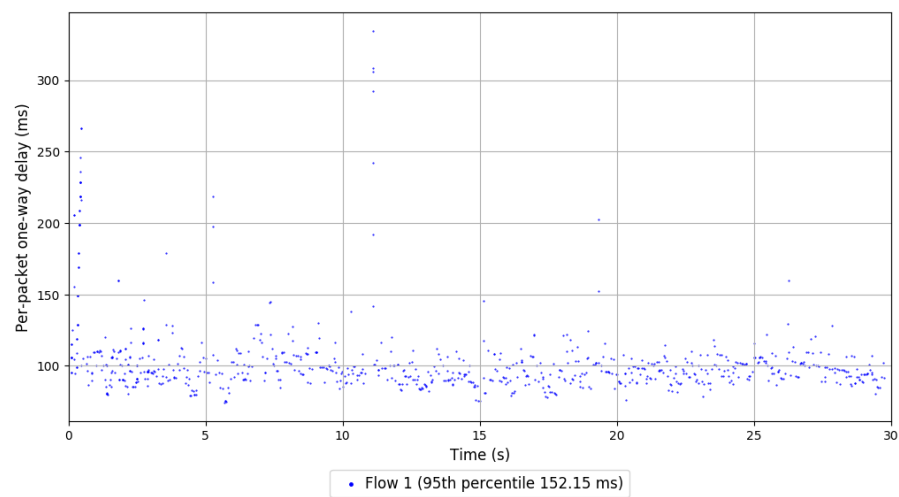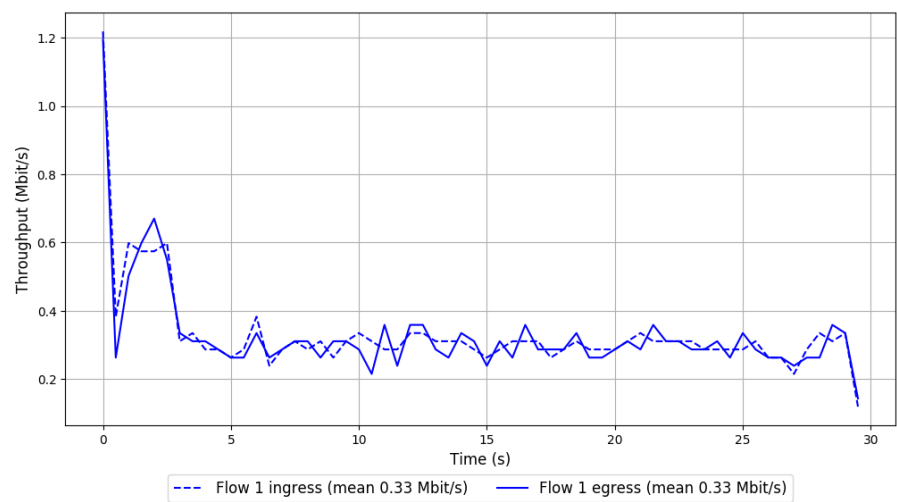

Flow 1 (95th percentile 181.08 ms)

```
Run 3: Statistics of Indigo-cellular

Start at: 2017-09-22 11:02:29
End at: 2017-09-22 11:02:59
Local clock offset: 1.902 ms
Remote clock offset: -3.432 ms


# Below is generated by plot.py at 2017-09-22 11:15:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 152.145 ms
Loss rate: 1.44%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 152.145 ms
Loss rate: 1.44%
```

Run 3: Report of Indigo-cellular — Data Link

```
Run 1: Statistics of KohoCC

Start at: 2017-09-22 10:38:17
End at: 2017-09-22 10:38:47
Local clock offset: -0.141 ms
Remote clock offset: -4.406 ms


# Below is generated by plot.py at 2017-09-22 11:15:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 241.620 ms
Loss rate: 1.60%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 241.620 ms
Loss rate: 1.60%
```
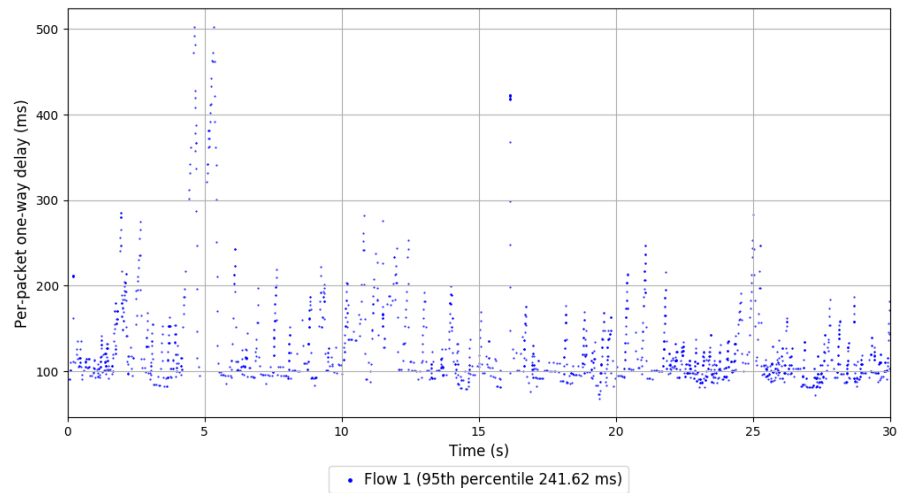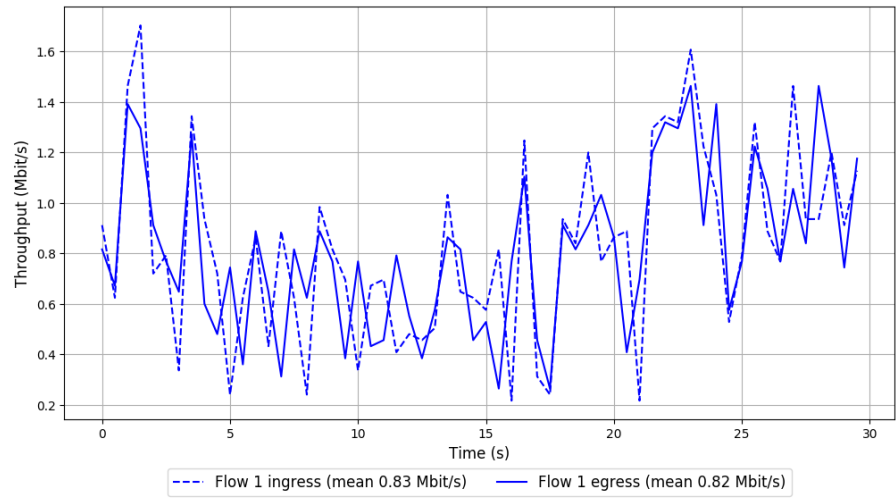
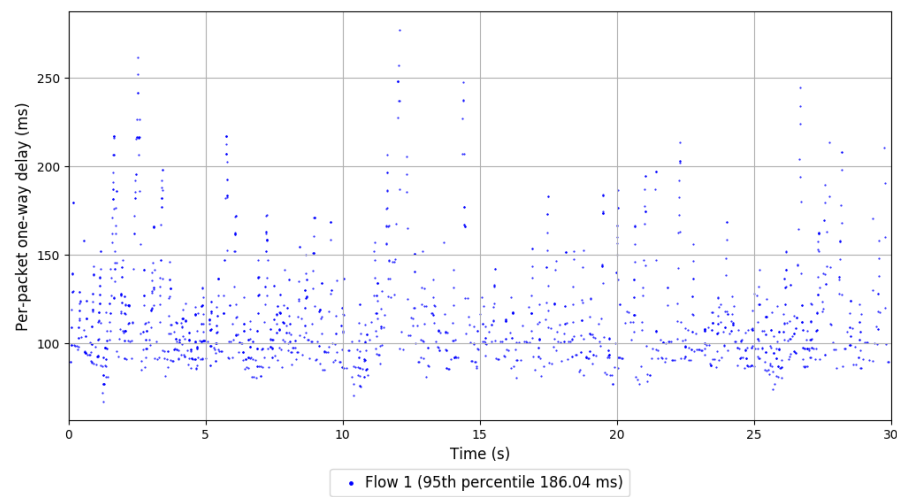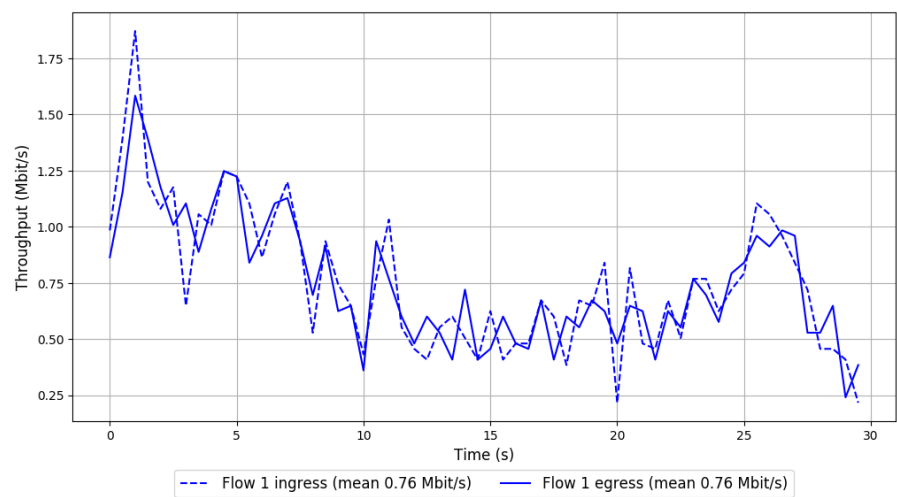# Run 1: Report of KohoCC — Data Link

```
Run 2: Statistics of KohoCC

Start at: 2017-09-22 10:53:40
End at: 2017-09-22 10:54:10
Local clock offset: 1.736 ms
Remote clock offset: -3.591 ms


# Below is generated by plot.py at 2017-09-22 11:15:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 186.037 ms
Loss rate: 0.90%
-- Flow 1:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 186.037 ms
Loss rate: 0.90%
```

Run 2: Report of KohoCC — Data Link

```
Run 3: Statistics of KohoCC

Start at: 2017-09-22 11:09:06
End at: 2017-09-22 11:09:36
Local clock offset: -1.587 ms
Remote clock offset: -4.252 ms


# Below is generated by plot.py at 2017-09-22 11:15:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 281.460 ms
Loss rate: 2.20%
-- Flow 1:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 281.460 ms
Loss rate: 2.20%
```

Run 3: Report of KohoCC — Data Link