Pantheon Report

Generated at 2017-09-22 13:27:31 (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.

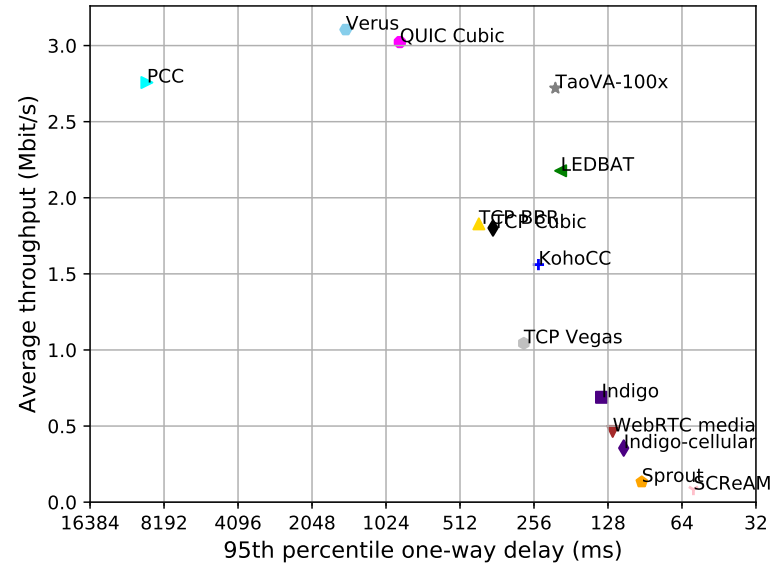Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

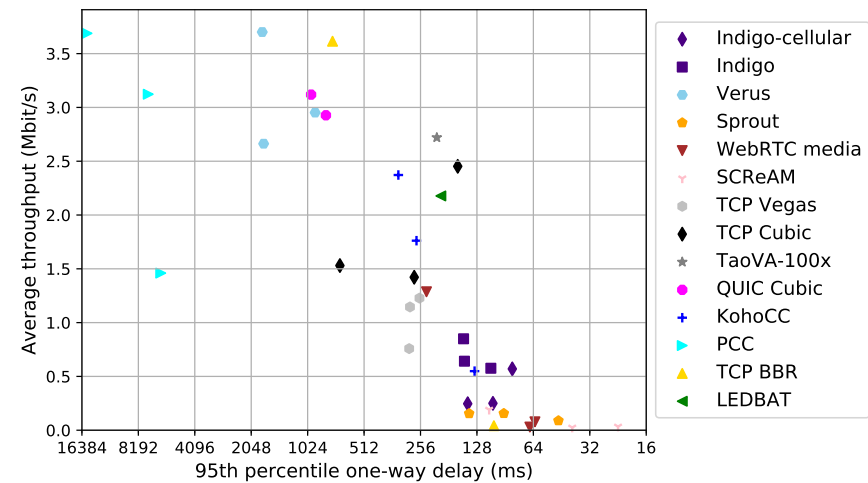NTP offsets were measured against `ntp.nict.jp` and have been applied to correct the timestamps in logs.

```
Git summary:
branch: indigos @ 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 Korea Ethernet to China ppp0, 3 runs of 30s each per scheme (mean of all runs by scheme)

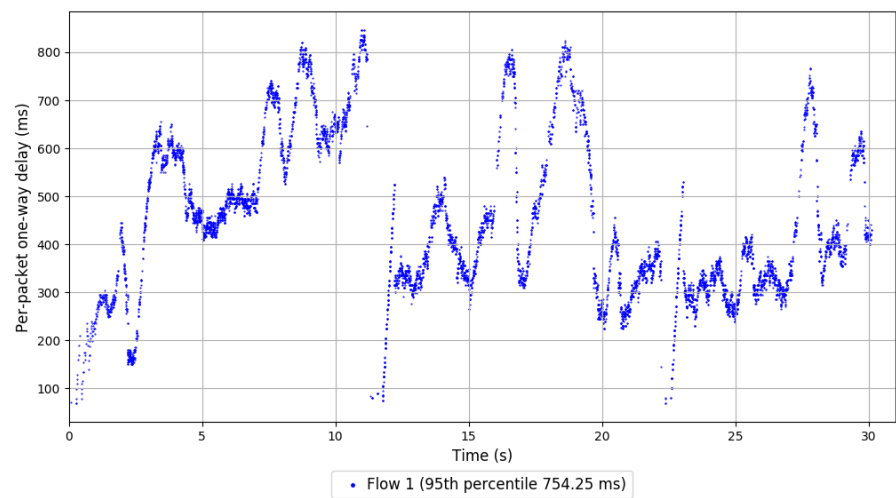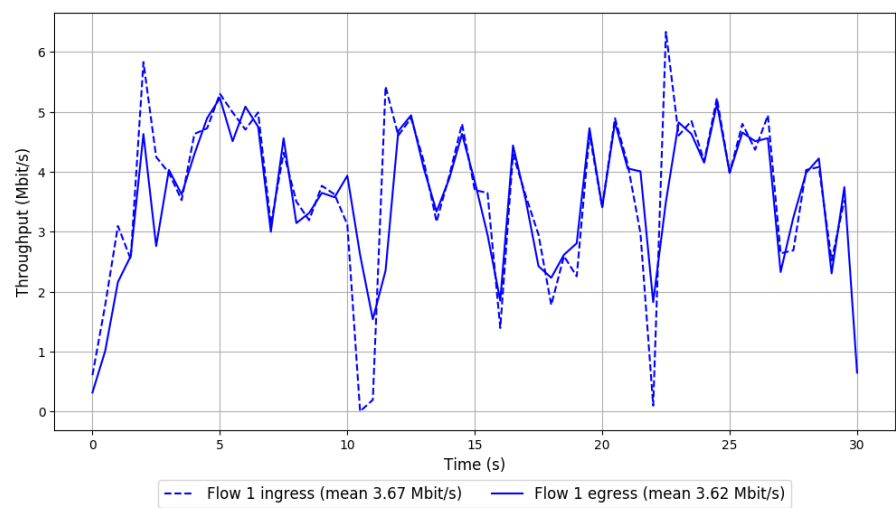## test from AWS Korea Ethernet to China ppp0, 3 runs of 30s each per scheme

scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	2	1.83	429.09	30.09
TCP Cubic	3	1.80	375.85	1.52
LEDBAT	1	2.18	199.44	0.13
PCC	3	2.76	9619.46	35.55
QUIC Cubic	2	3.03	899.81	2.29
SCReAM	3	0.08	57.50	27.14
WebRTC media	3	0.47	122.49	31.75
Sprout	3	0.13	93.30	13.24
TaoVA-100x	1	2.72	209.53	0.14
TCP Vegas	3	1.05	281.61	0.67
Verus	3	3.10	1493.34	1.06
Indigo	3	0.69	135.98	51.22
Indigo-cellular	3	0.36	110.48	59.19
KohoCC	3	1.56	245.58	28.05

```
Run 1: Statistics of TCP BBR

Start at: 2017-09-22 12:46:17
End at: 2017-09-22 12:46:48
Local clock offset: -2.646 ms
Remote clock offset: -15.35 ms

# Below is generated by plot.py at 2017-09-22 13:27:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.62 Mbit/s
95th percentile per-packet one-way delay: 754.250 ms
Loss rate: 1.30%
-- Flow 1:
Average throughput: 3.62 Mbit/s
95th percentile per-packet one-way delay: 754.250 ms
Loss rate: 1.30%
```
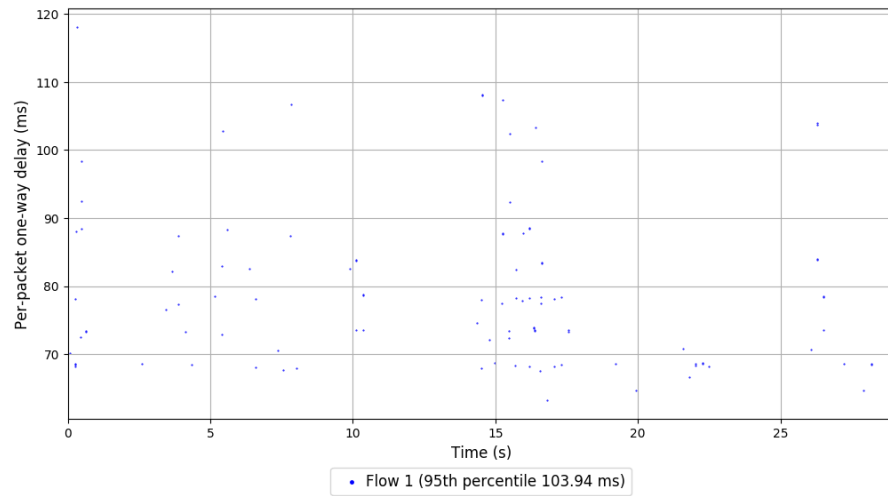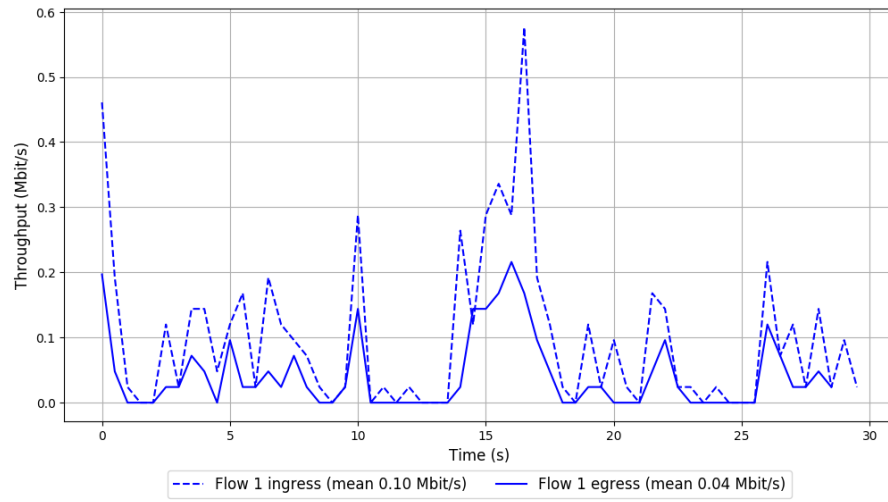
Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 3.67 Mbit/s)   Flow 1 egress (mean 3.62 Mbit/s)

• Flow 1 (95th percentile 754.25 ms)

5

```
Run 2: Statistics of TCP BBR

Start at: 2017-09-22 13:04:27
End at: 2017-09-22 13:04:57
Local clock offset: 14.405 ms
Remote clock offset: -2.029 ms


# Below is generated by plot.py at 2017-09-22 13:27:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 103.935 ms
Loss rate: 58.89%
-- Flow 1:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 103.935 ms
Loss rate: 58.89%
```

Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2017-09-22 13:22:05
End at: 2017-09-22 13:22:35
Local clock offset: -2.739 ms
Remote clock offset: -24.207 ms
```

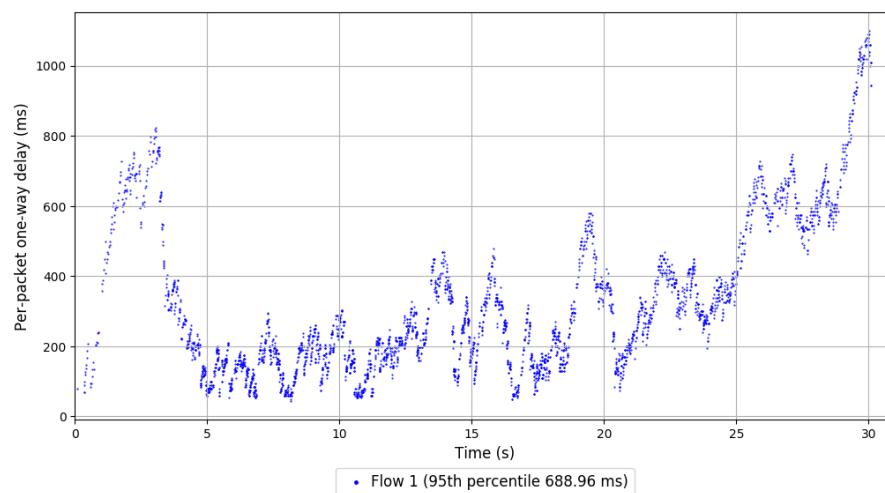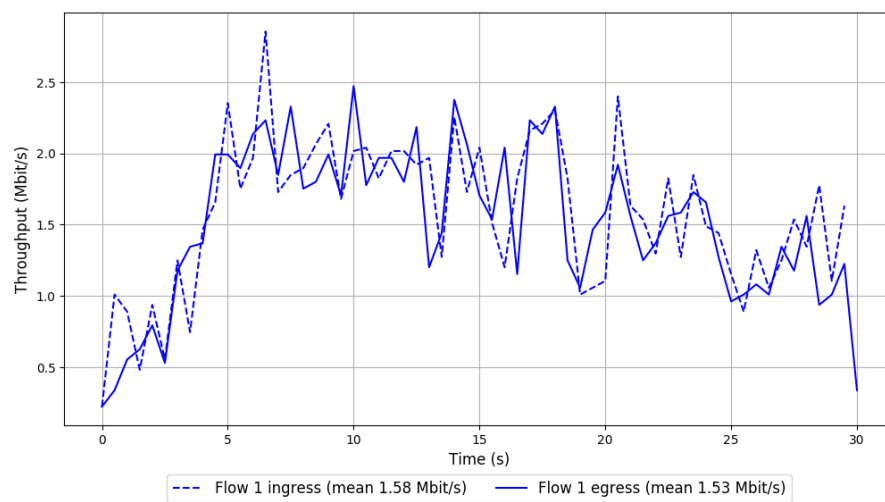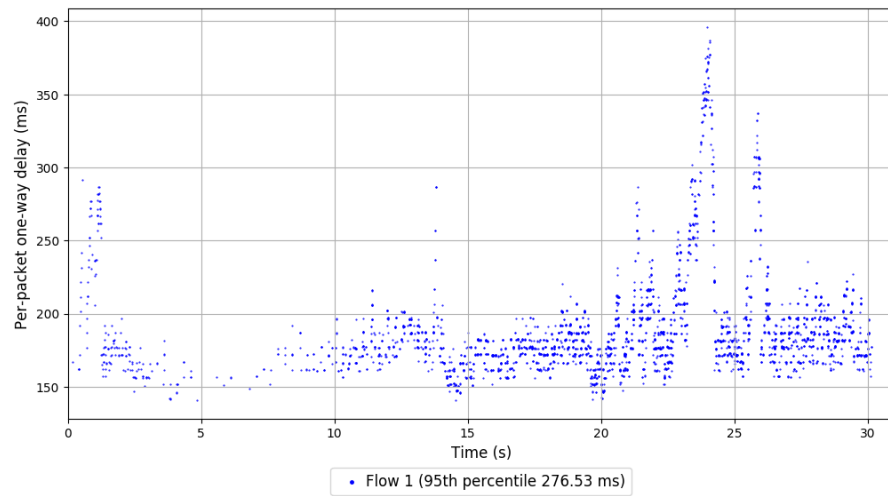Run 3: Report of TCP BBR — Data Link

```
Run 1: Statistics of TCP Cubic

Start at: 2017-09-22 12:45:04
End at: 2017-09-22 12:45:34
Local clock offset: -1.525 ms
Remote clock offset: -39.408 ms


# Below is generated by plot.py at 2017-09-22 13:27:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 688.957 ms
Loss rate: 2.92%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 688.957 ms
Loss rate: 2.92%
```

Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 1.58 Mbit/s)   Flow 1 egress (mean 1.53 Mbit/s)

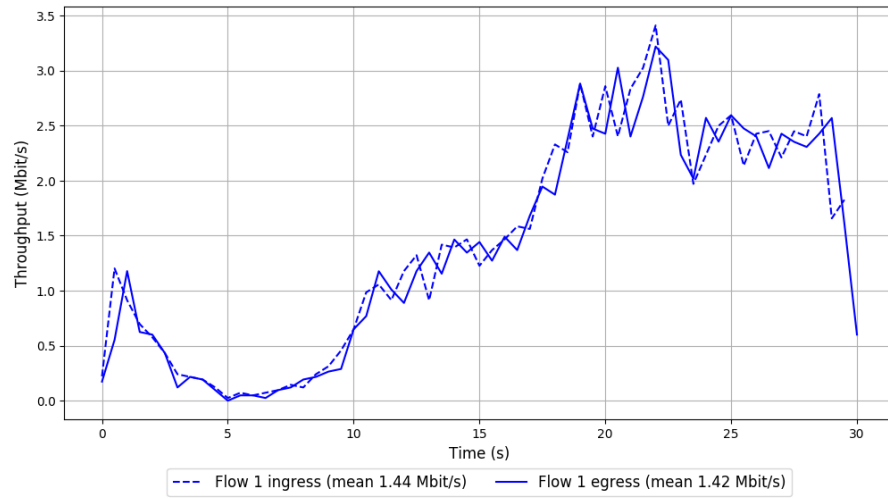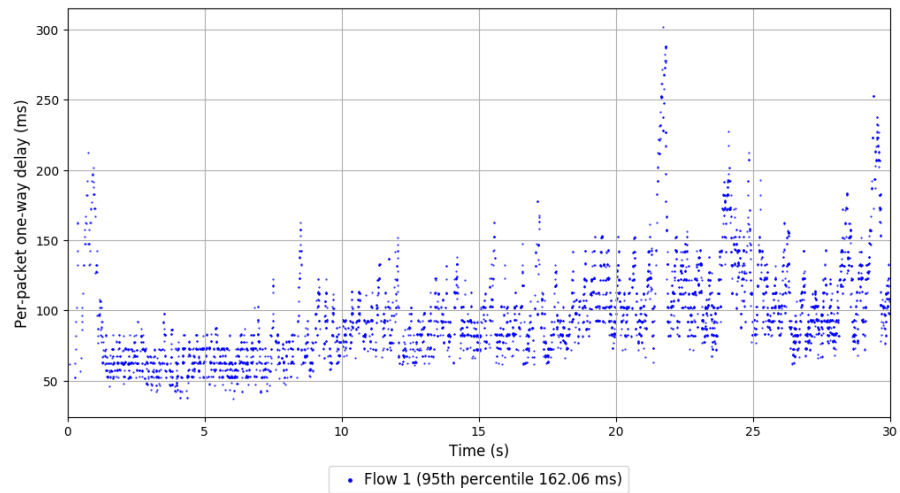Flow 1 (95th percentile 688.96 ms)

```
Run 2: Statistics of TCP Cubic

Start at: 2017-09-22 13:02:42
End at: 2017-09-22 13:03:12
Local clock offset: -2.729 ms
Remote clock offset: -2.449 ms


# Below is generated by plot.py at 2017-09-22 13:27:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 276.528 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 276.528 ms
Loss rate: 1.09%
```
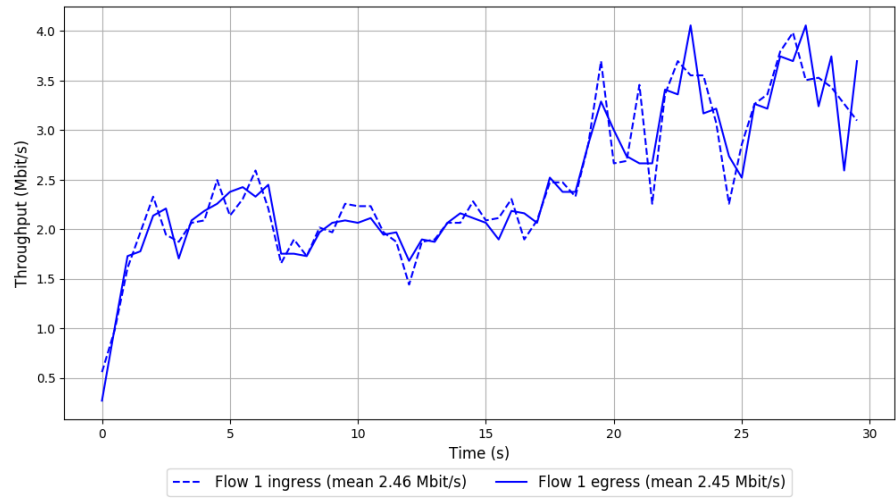
Run 2: Report of TCP Cubic — Data Link

```
Run 3: Statistics of TCP Cubic

Start at: 2017-09-22 13:20:40
End at: 2017-09-22 13:21:10
Local clock offset: 19.86 ms
Remote clock offset: -45.707 ms


# Below is generated by plot.py at 2017-09-22 13:27:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.45 Mbit/s
95th percentile per-packet one-way delay: 162.062 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 2.45 Mbit/s
95th percentile per-packet one-way delay: 162.062 ms
Loss rate: 0.55%
```

Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 2.46 Mbit/s)   Flow 1 egress (mean 2.45 Mbit/s)

Flow 1 (95th percentile 162.06 ms)
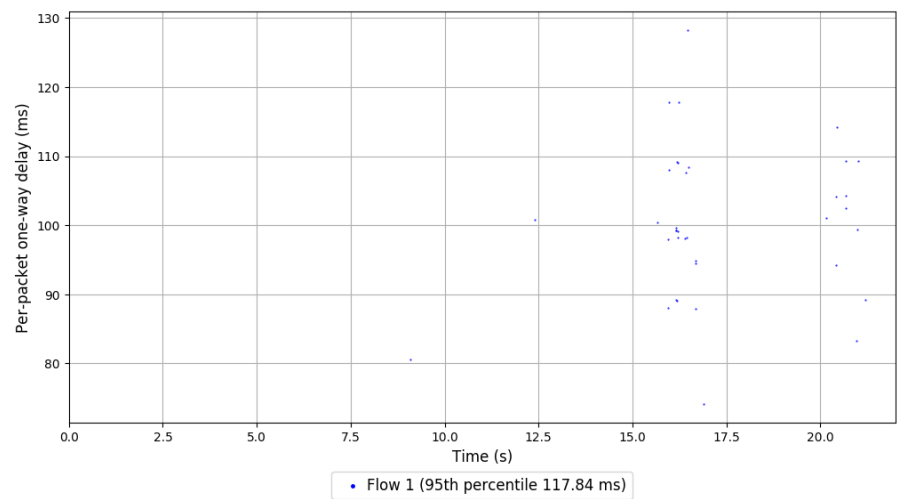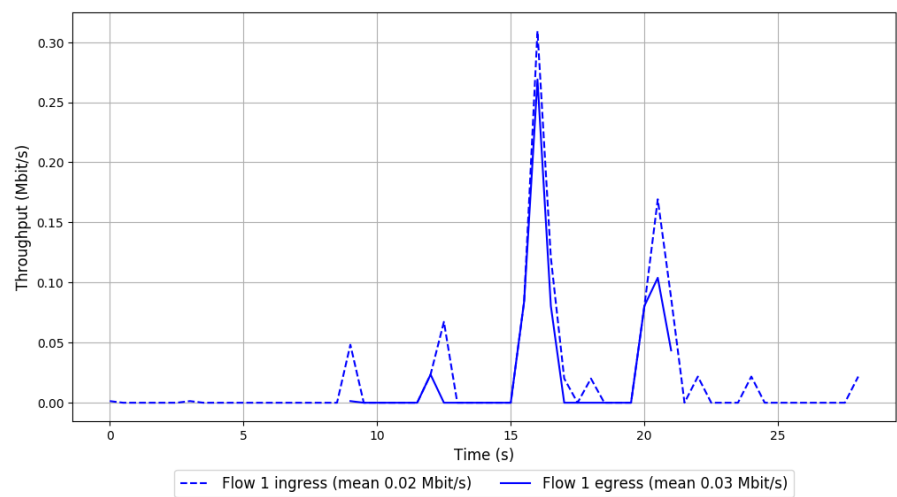
15

```
Run 1: Statistics of LEDBAT

Start at: 2017-09-22 12:42:38
End at: 2017-09-22 12:43:08
Local clock offset: -1.606 ms
Remote clock offset: -37.989 ms
```

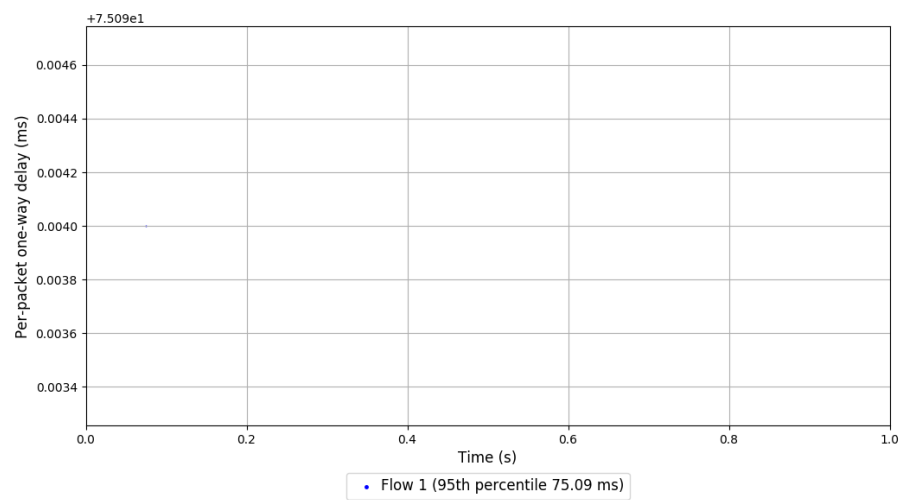# Run 1: Report of LEDBAT — Data Link
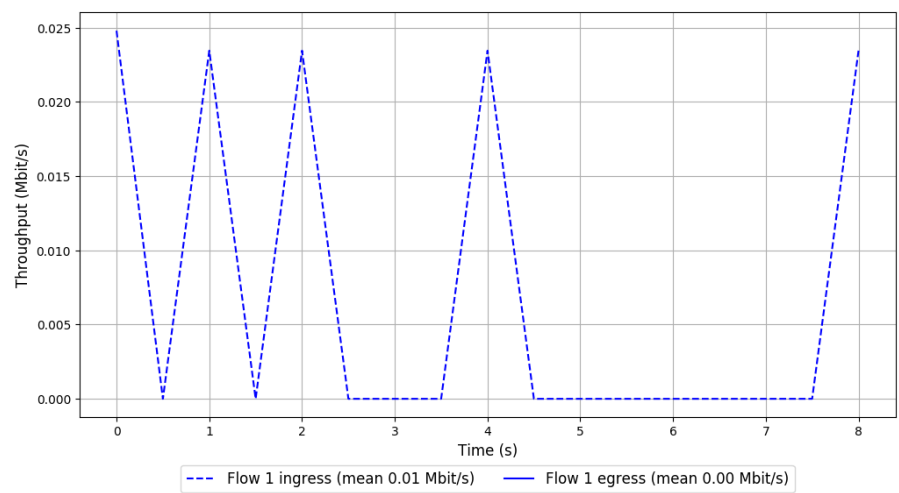
```
Run 2: Statistics of LEDBAT

Start at: 2017-09-22 13:00:15
End at: 2017-09-22 13:00:45
Local clock offset: -2.656 ms
Remote clock offset: -38.843 ms
```
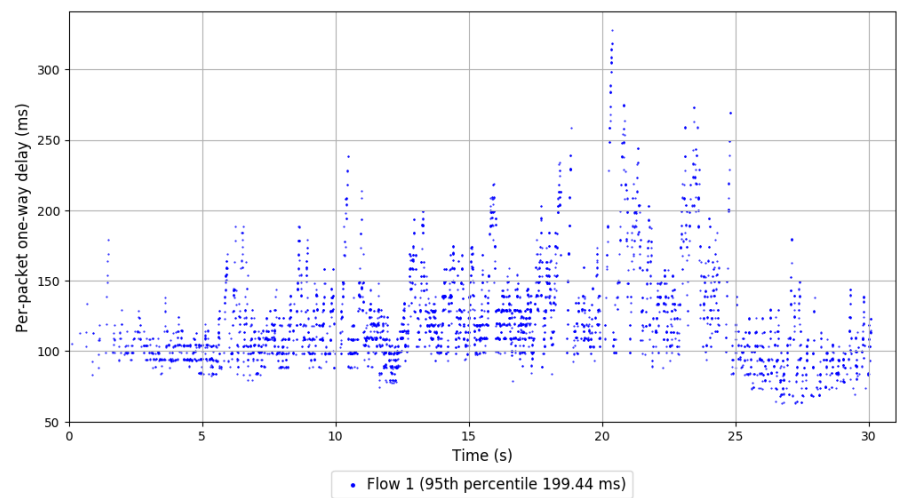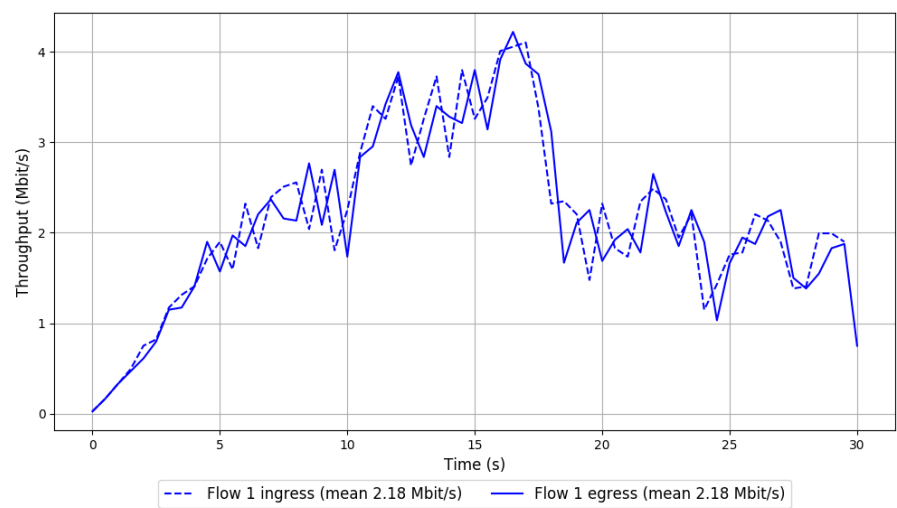
Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2017-09-22 13:18:12
End at: 2017-09-22 13:18:42
Local clock offset: -2.628 ms
Remote clock offset: -44.775 ms

# Below is generated by plot.py at 2017-09-22 13:27:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 199.441 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 199.441 ms
Loss rate: 0.13%
```

Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 2.18 Mbit/s) --- Flow 1 egress (mean 2.18 Mbit/s)

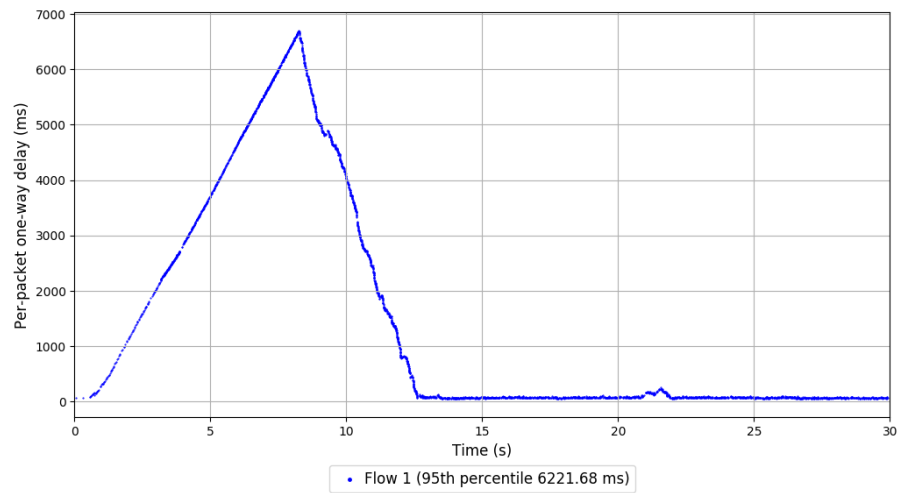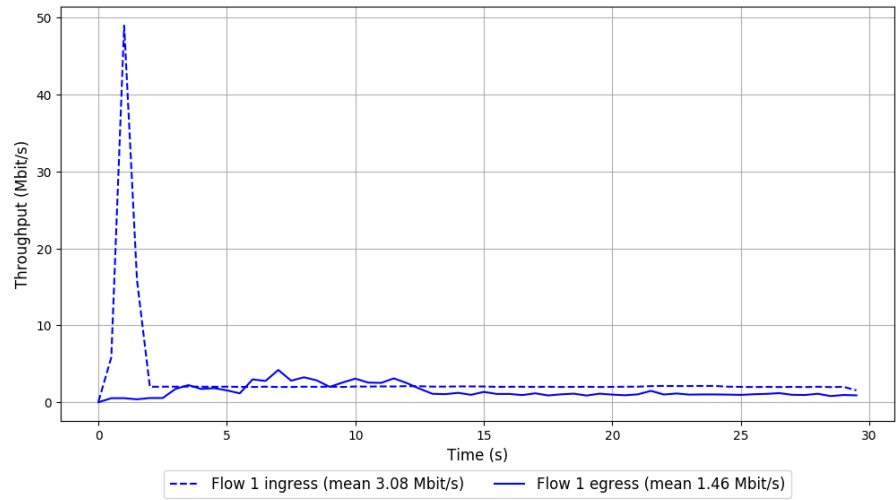• Flow 1 (95th percentile 199.44 ms)

```
Run 1: Statistics of PCC

Start at: 2017-09-22 12:50:00
End at: 2017-09-22 12:50:30
Local clock offset: 17.064 ms
Remote clock offset: -45.044 ms


# Below is generated by plot.py at 2017-09-22 13:27:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 6221.683 ms
Loss rate: 52.58%
-- Flow 1:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 6221.683 ms
Loss rate: 52.58%
```

Run 1: Report of PCC — Data Link

Flow 1 ingress (mean 3.08 Mbit/s)   Flow 1 egress (mean 1.46 Mbit/s)

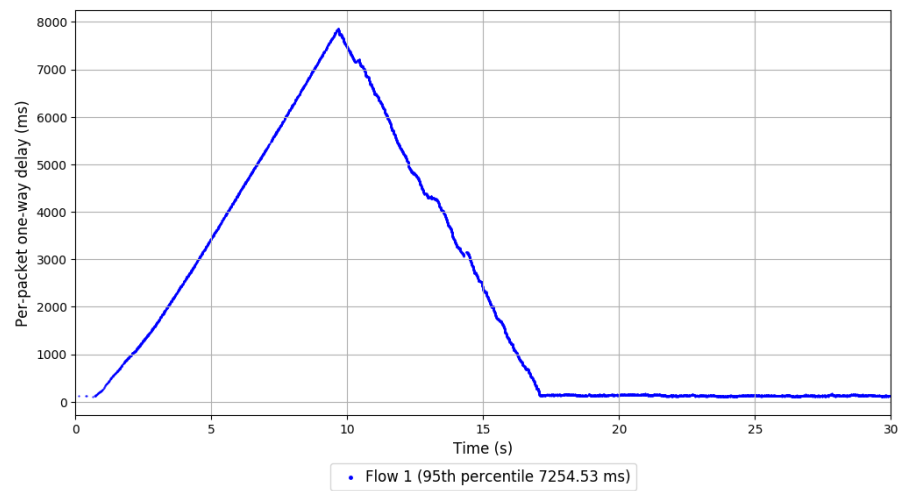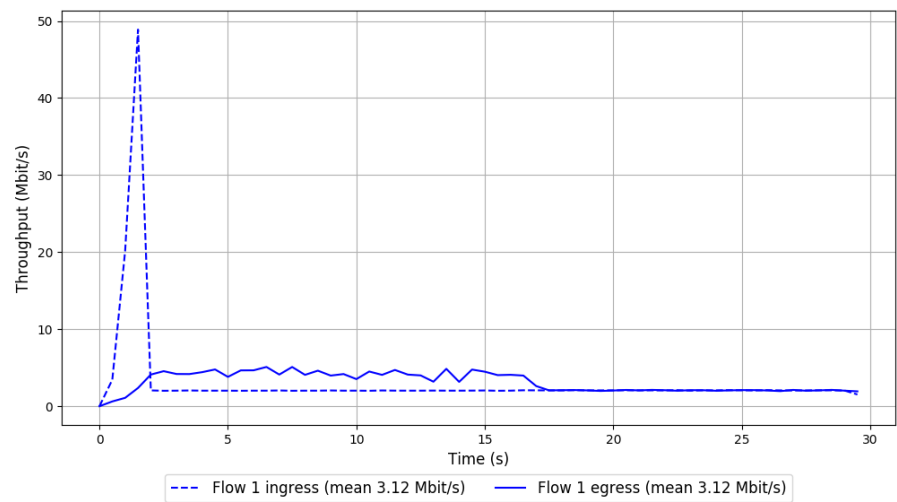Flow 1 (95th percentile 6221.68 ms)

```
Run 2: Statistics of PCC

Start at: 2017-09-22 13:08:22
End at: 2017-09-22 13:08:53
Local clock offset: -2.6 ms
Remote clock offset: -40.444 ms


# Below is generated by plot.py at 2017-09-22 13:27:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.12 Mbit/s
95th percentile per-packet one-way delay: 7254.526 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 3.12 Mbit/s
95th percentile per-packet one-way delay: 7254.526 ms
Loss rate: 0.19%
```

Run 2: Report of PCC — Data Link

Flow 1 ingress (mean 3.12 Mbit/s) --- Flow 1 egress (mean 3.12 Mbit/s)

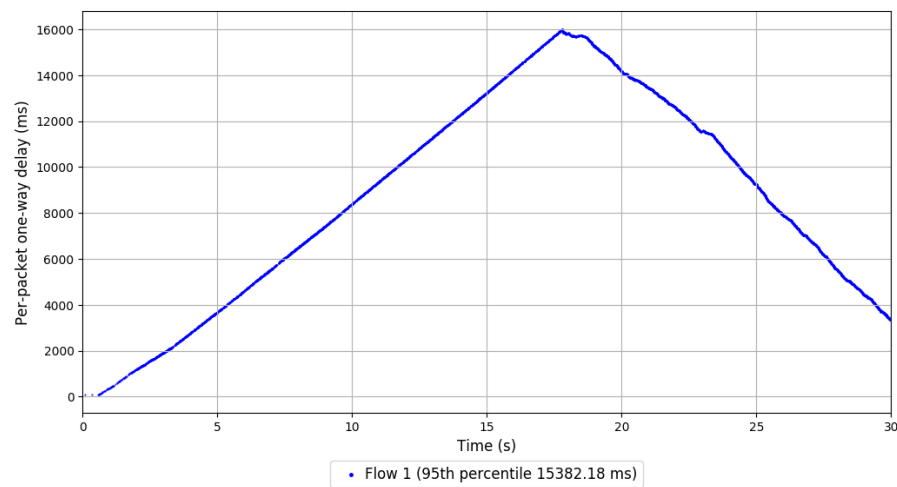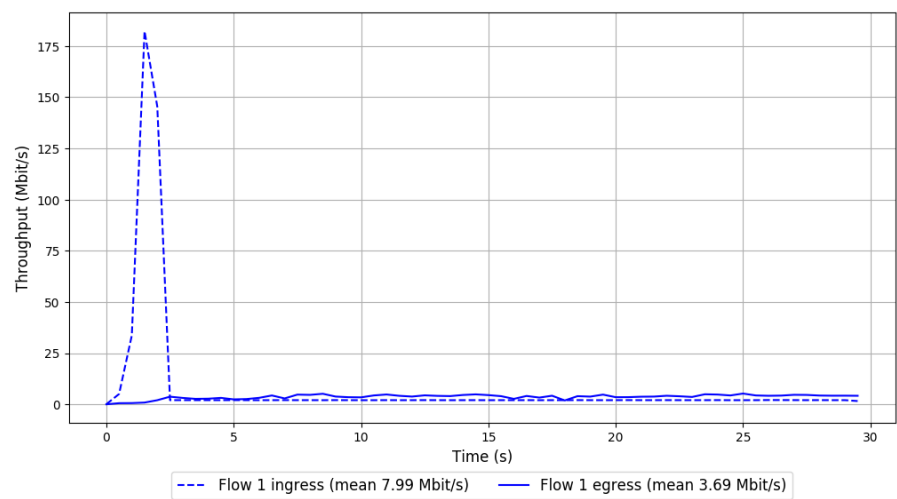• Flow 1 (95th percentile 7254.53 ms)

```
Run 3: Statistics of PCC

Start at: 2017-09-22 13:25:43
End at: 2017-09-22 13:26:13
Local clock offset: 15.986 ms
Remote clock offset: -33.254 ms


# Below is generated by plot.py at 2017-09-22 13:27:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.69 Mbit/s
95th percentile per-packet one-way delay: 15382.180 ms
Loss rate: 53.87%
-- Flow 1:
Average throughput: 3.69 Mbit/s
95th percentile per-packet one-way delay: 15382.180 ms
Loss rate: 53.87%
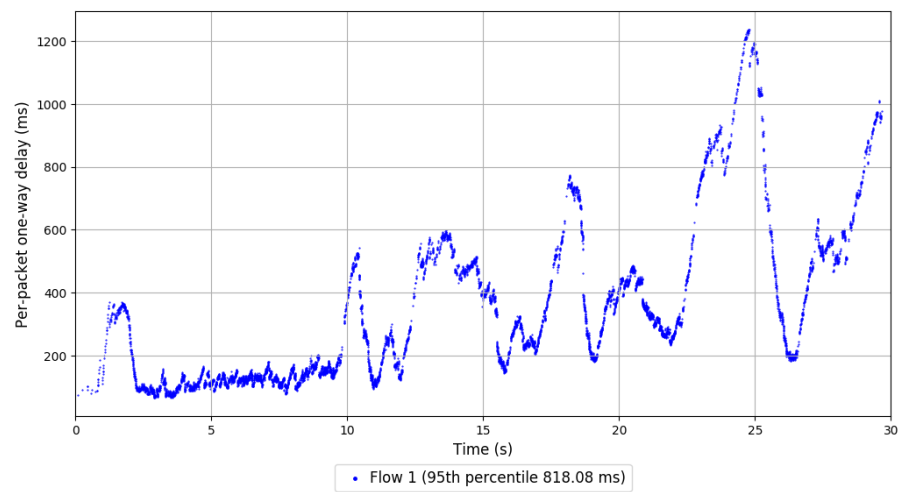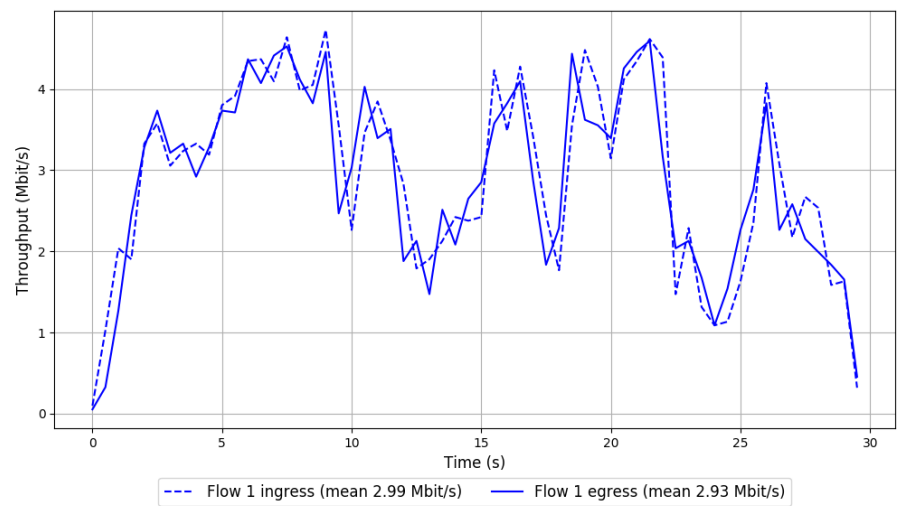```

## Run 3: Report of PCC — Data Link

```
Run 1: Statistics of QUIC Cubic

Start at: 2017-09-22 12:40:03
End at: 2017-09-22 12:40:33
Local clock offset: 16.871 ms
Remote clock offset: -41.041 ms

# Below is generated by plot.py at 2017-09-22 13:27:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.93 Mbit/s
95th percentile per-packet one-way delay: 818.077 ms
Loss rate: 1.93%
-- Flow 1:
Average throughput: 2.93 Mbit/s
95th percentile per-packet one-way delay: 818.077 ms
Loss rate: 1.93%
```

Run 1: Report of QUIC Cubic — Data Link
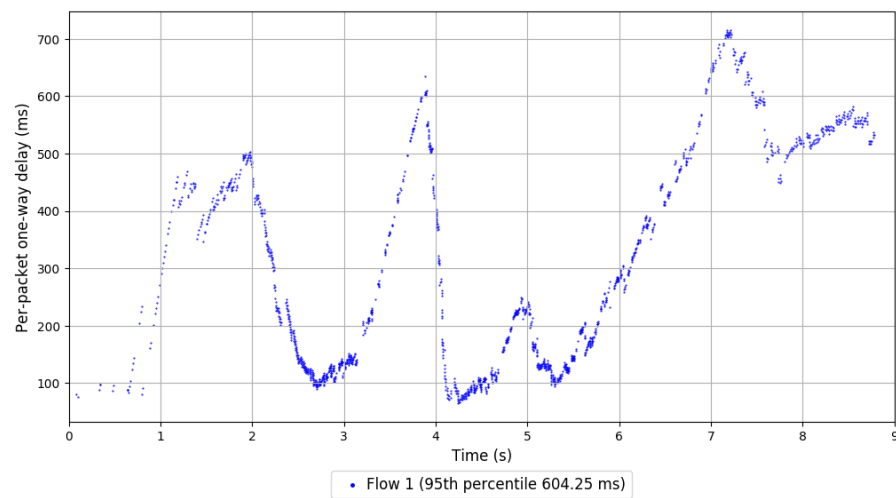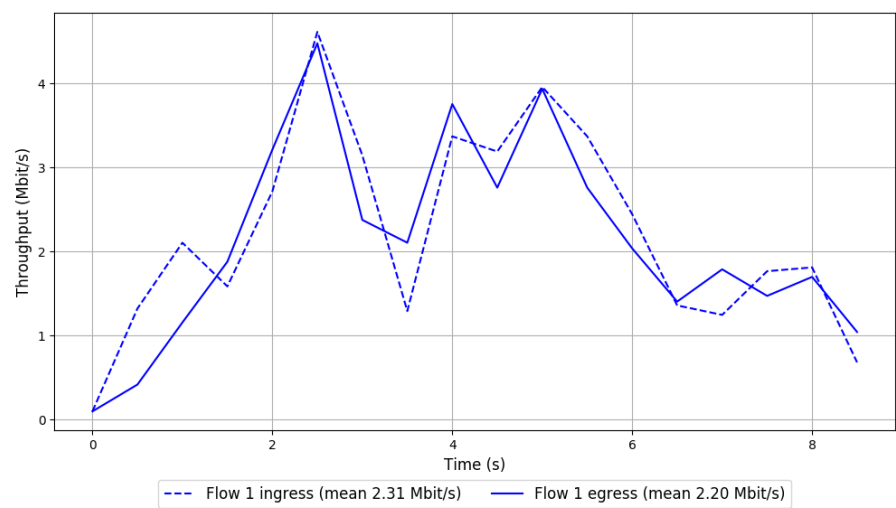
```
Run 2: Statistics of QUIC Cubic

Start at: 2017-09-22 12:57:49
End at: 2017-09-22 12:58:19
Local clock offset: -2.674 ms
Remote clock offset: -41.267 ms
```

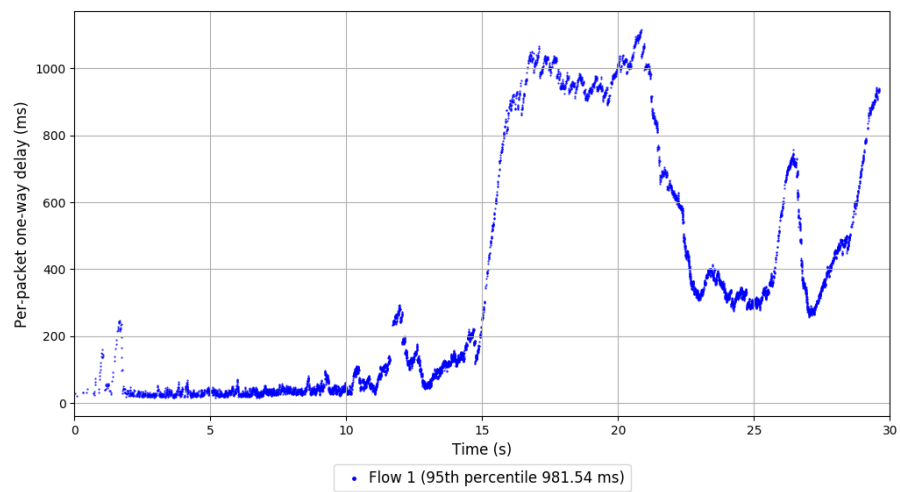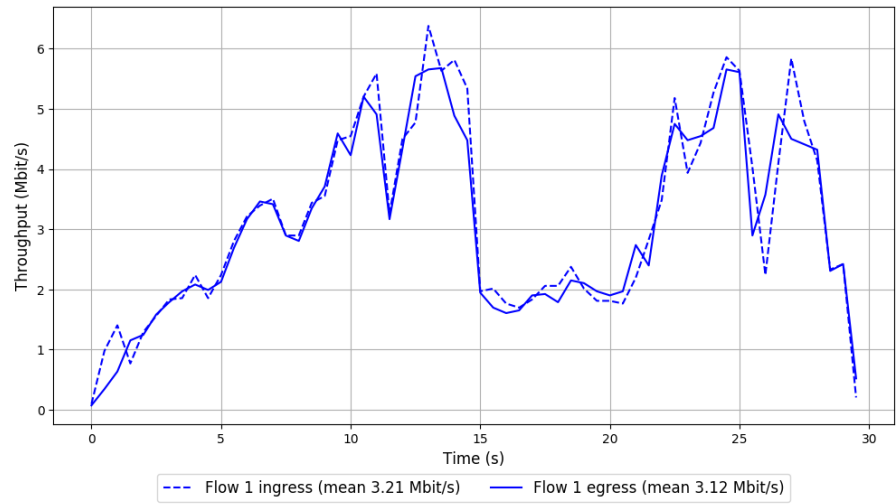Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-09-22 13:15:41
End at: 2017-09-22 13:16:11
Local clock offset: 18.67 ms
Remote clock offset: -45.987 ms


# Below is generated by plot.py at 2017-09-22 13:27:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.12 Mbit/s
95th percentile per-packet one-way delay: 981.540 ms
Loss rate: 2.65%
-- Flow 1:
Average throughput: 3.12 Mbit/s
95th percentile per-packet one-way delay: 981.540 ms
Loss rate: 2.65%
```

Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 3.21 Mbit/s) — — —   Flow 1 egress (mean 3.12 Mbit/s) ———
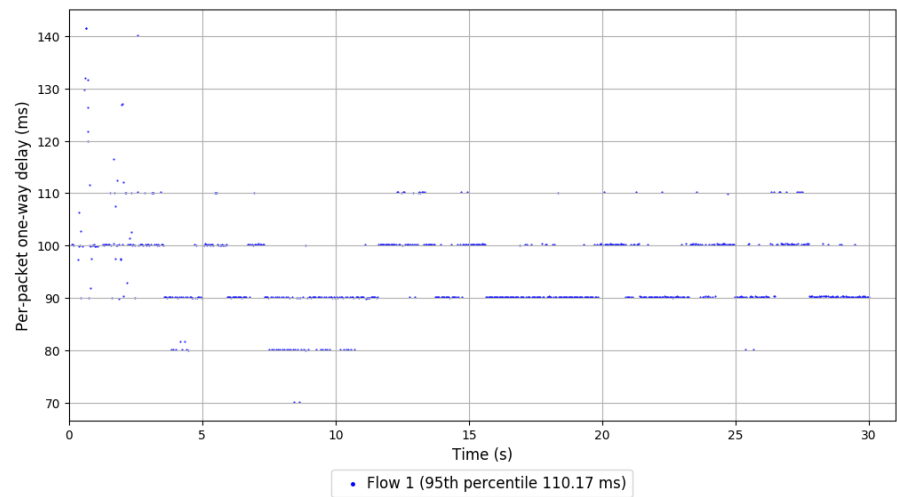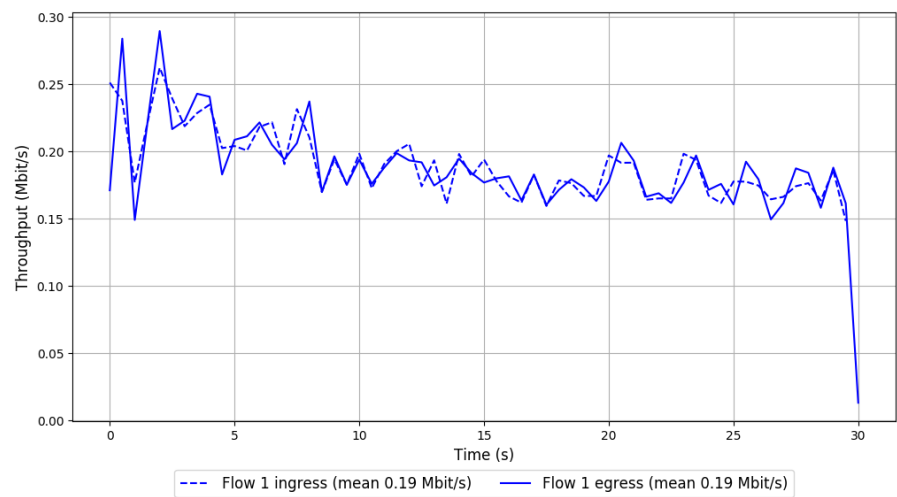

· Flow 1 (95th percentile 981.54 ms)

```
Run 1: Statistics of SCReAM

Start at: 2017-09-22 12:41:18
End at: 2017-09-22 12:41:48
Local clock offset: -2.491 ms
Remote clock offset: -37.565 ms


# Below is generated by plot.py at 2017-09-22 13:27:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 110.169 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 110.169 ms
Loss rate: 0.14%
```

Run 1: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.19 Mbit/s) — — — Flow 1 egress (mean 0.19 Mbit/s)
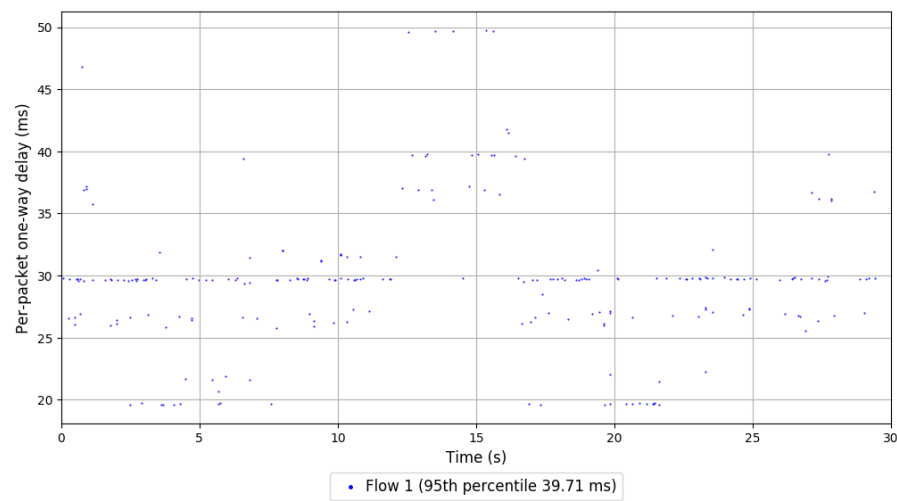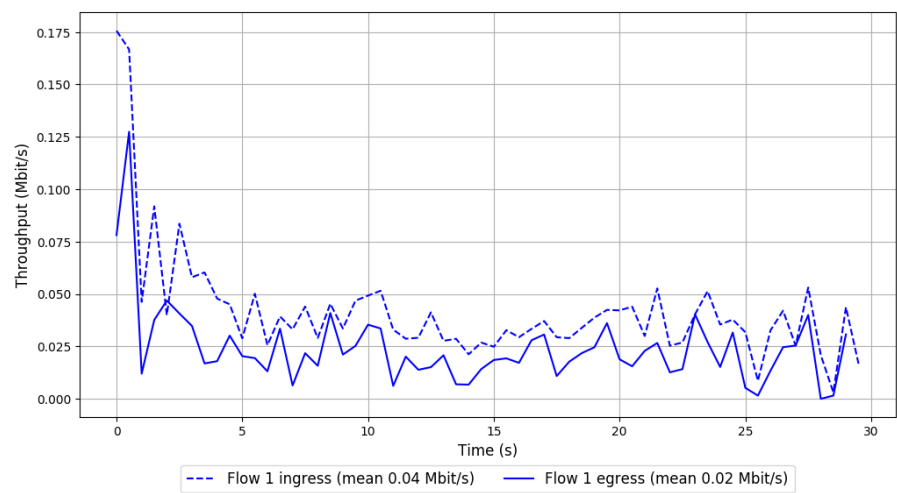

• Flow 1 (95th percentile 110.17 ms)

```
Run 2: Statistics of SCReAM

Start at: 2017-09-22 12:59:02
End at: 2017-09-22 12:59:32
Local clock offset: 14.712 ms
Remote clock offset: -39.765 ms

# Below is generated by plot.py at 2017-09-22 13:27:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 39.713 ms
Loss rate: 43.52%
-- Flow 1:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 39.713 ms
Loss rate: 43.52%
```
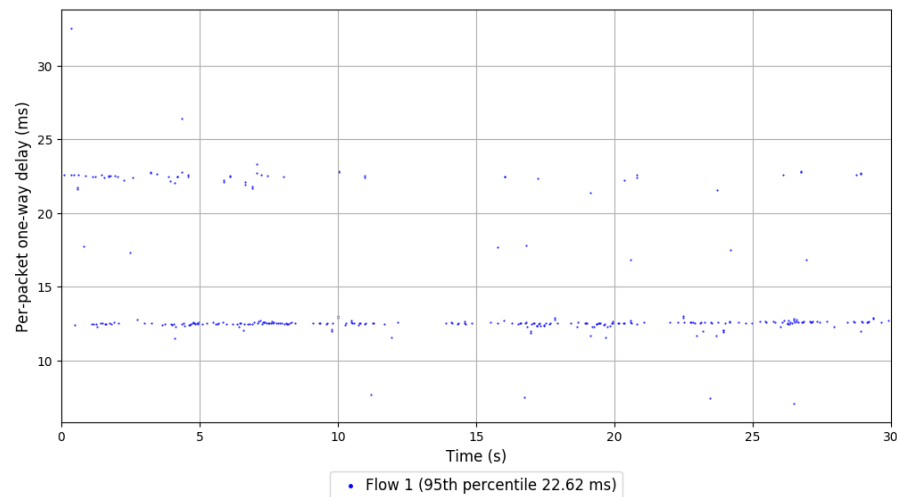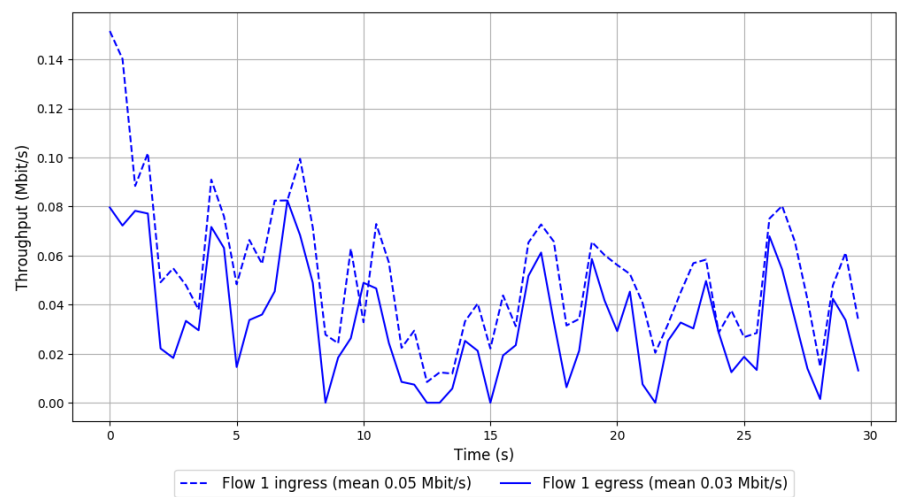
Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2017-09-22 13:16:57
End at: 2017-09-22 13:17:27
Local clock offset: 17.689 ms
Remote clock offset: -45.687 ms


# Below is generated by plot.py at 2017-09-22 13:27:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 22.620 ms
Loss rate: 37.76%
-- Flow 1:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 22.620 ms
Loss rate: 37.76%
```
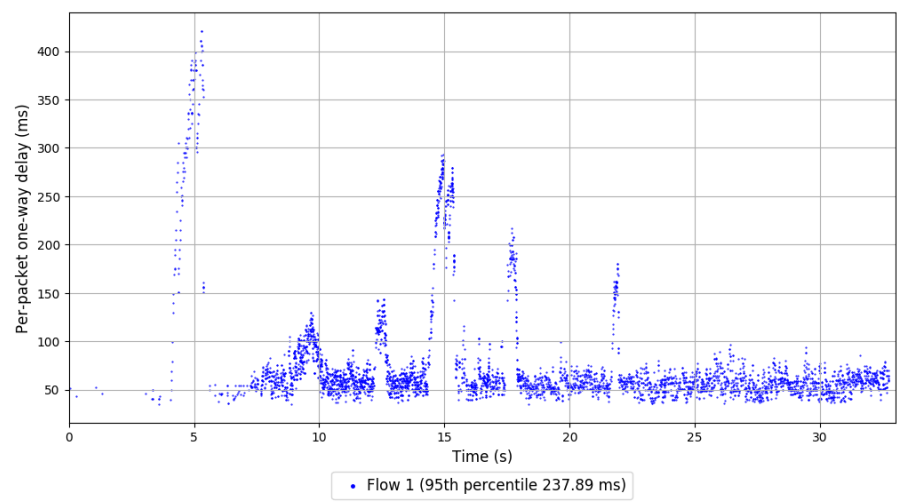
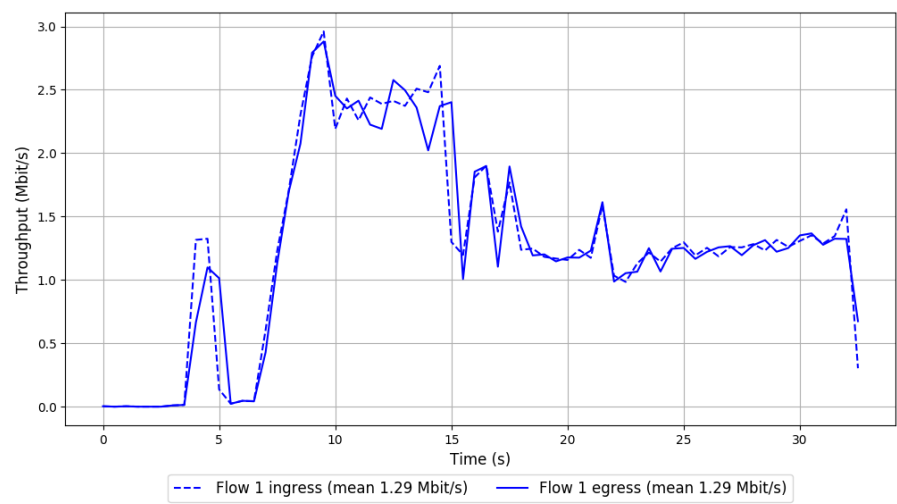# Run 3: Report of SCReAM — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2017-09-22 12:33:50
End at: 2017-09-22 12:34:20
Local clock offset: -2.675 ms
Remote clock offset: -45.488 ms


# Below is generated by plot.py at 2017-09-22 13:27:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 237.889 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 237.889 ms
Loss rate: 0.40%
```

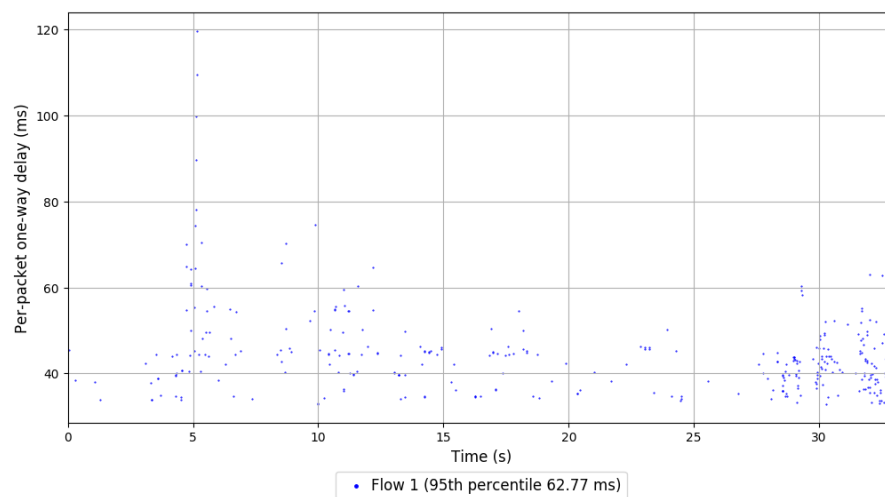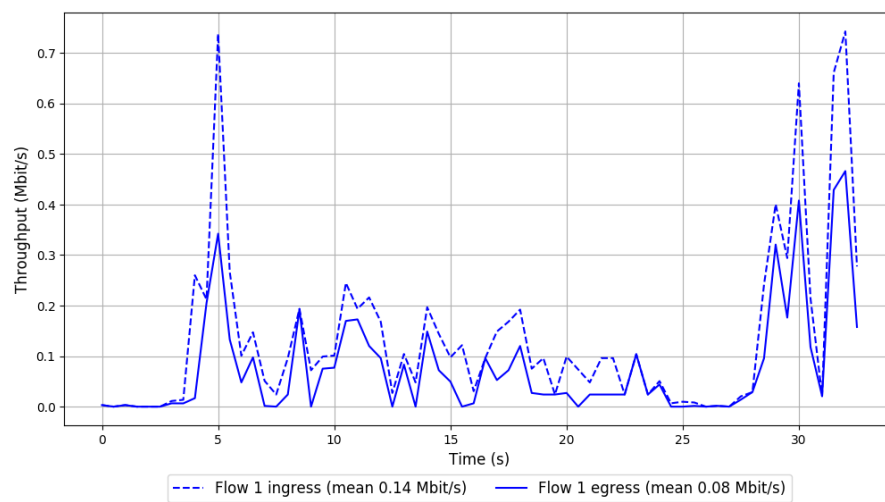Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2017-09-22 12:51:13
End at: 2017-09-22 12:51:43
Local clock offset: -2.533 ms
Remote clock offset: -41.112 ms


# Below is generated by plot.py at 2017-09-22 13:27:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 62.775 ms
Loss rate: 43.15%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 62.775 ms
Loss rate: 43.15%
```

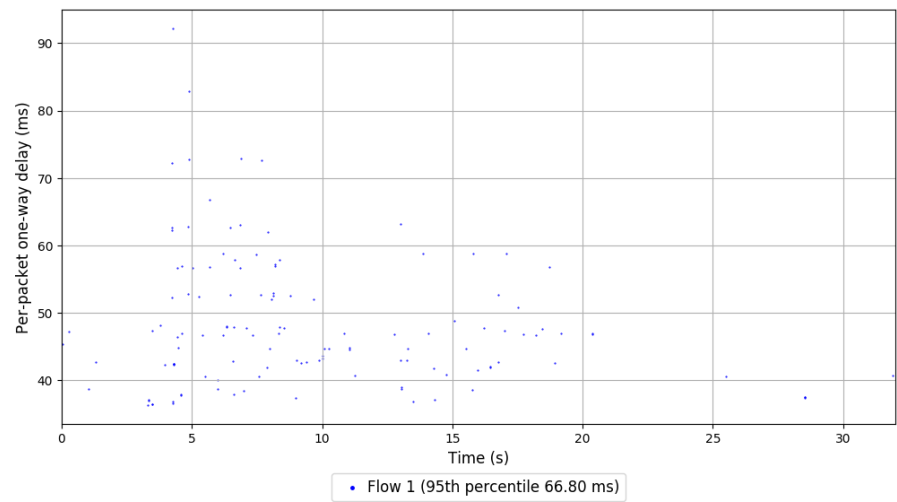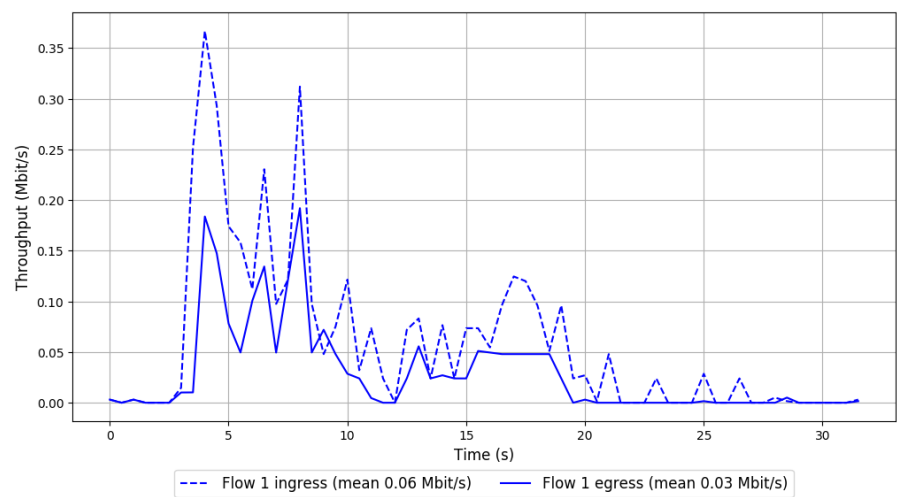Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2017-09-22 13:09:38
End at: 2017-09-22 13:10:08
Local clock offset: -2.766 ms
Remote clock offset: -44.682 ms


# Below is generated by plot.py at 2017-09-22 13:27:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 66.795 ms
Loss rate: 51.71%
-- Flow 1:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 66.795 ms
Loss rate: 51.71%
```

Run 3: Report of WebRTC media — Data Link

Flow 1 ingress (mean 0.06 Mbit/s)   Flow 1 egress (mean 0.03 Mbit/s)
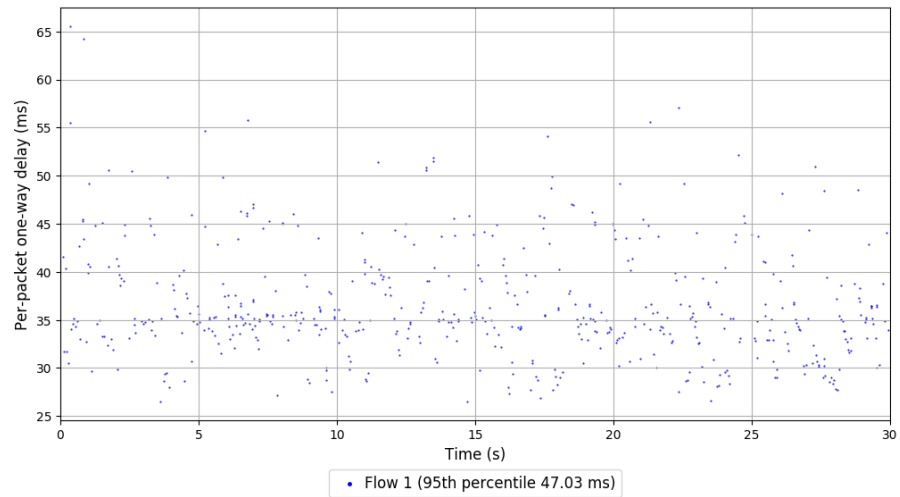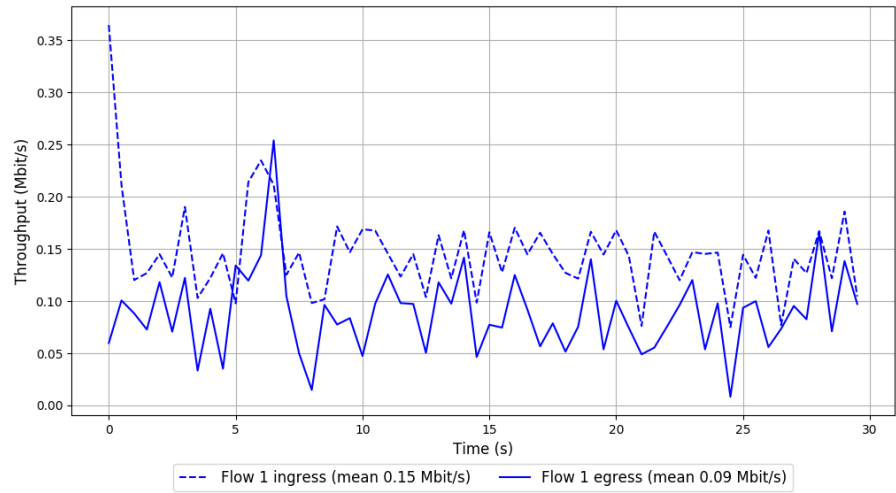

Flow 1 (95th percentile 66.80 ms)

45

```
Run 1: Statistics of Sprout

Start at: 2017-09-22 12:36:20
End at: 2017-09-22 12:36:50
Local clock offset: -2.563 ms
Remote clock offset: -48.548 ms

# Below is generated by plot.py at 2017-09-22 13:27:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 47.034 ms
Loss rate: 39.44%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 47.034 ms
Loss rate: 39.44%
```
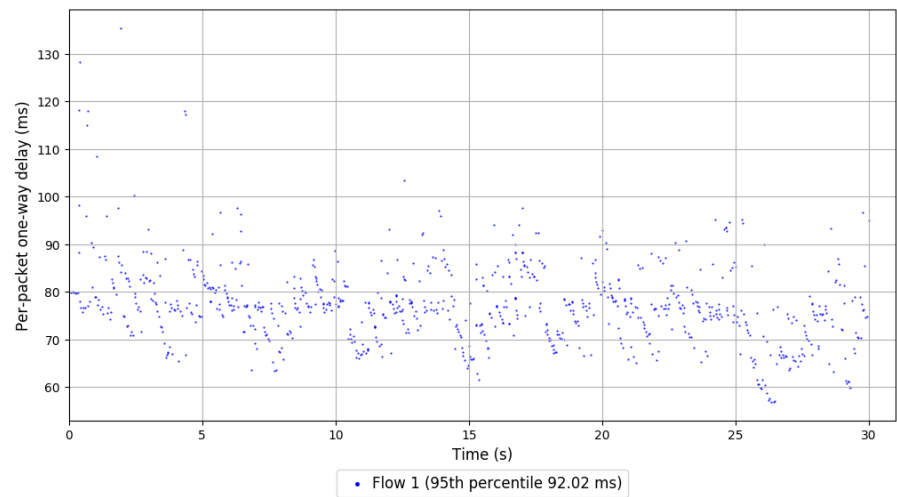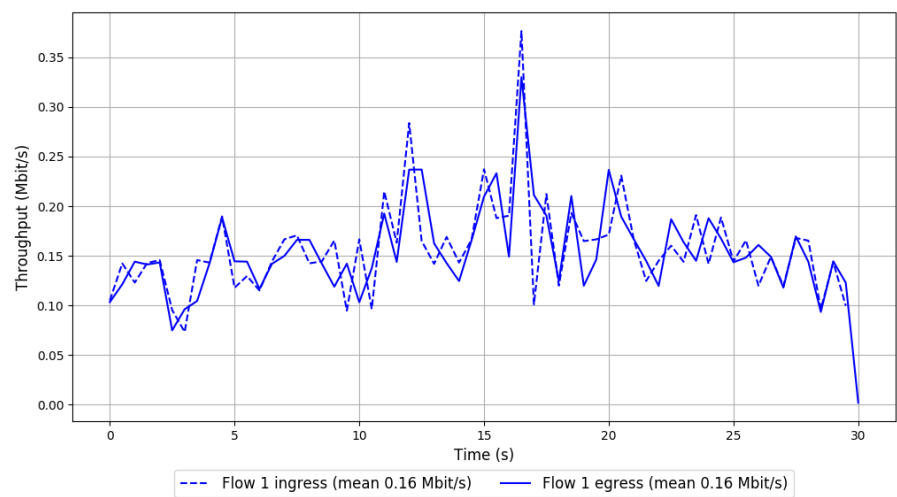
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2017-09-22 12:53:41
End at: 2017-09-22 12:54:11
Local clock offset: -2.766 ms
Remote clock offset: -48.253 ms


# Below is generated by plot.py at 2017-09-22 13:27:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 92.017 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 92.017 ms
Loss rate: 0.27%
```
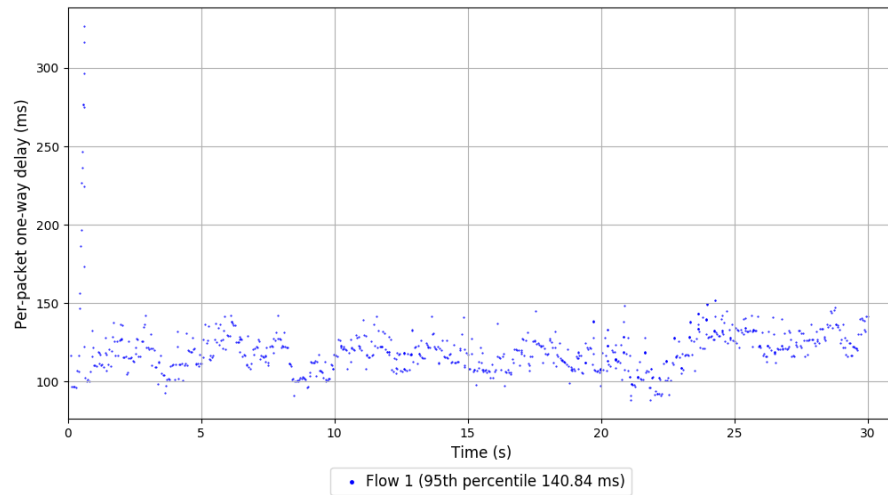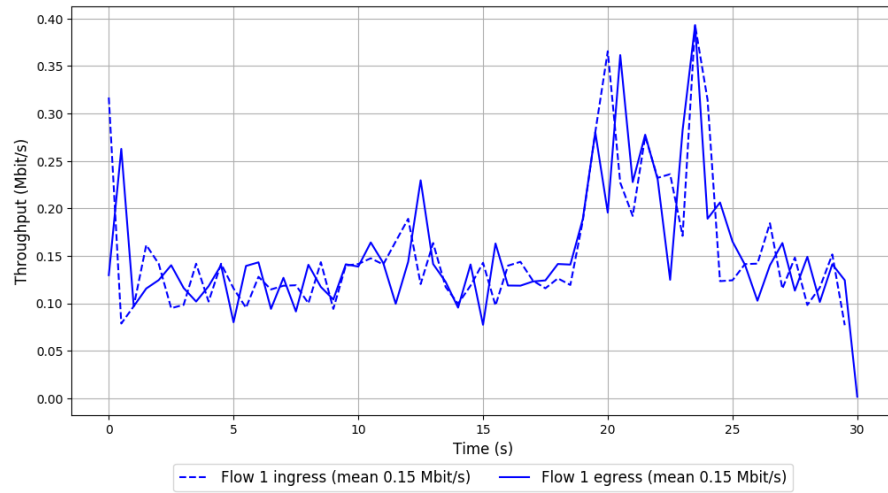
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2017-09-22 13:12:03
End at: 2017-09-22 13:12:33
Local clock offset: -1.557 ms
Remote clock offset: -43.528 ms


# Below is generated by plot.py at 2017-09-22 13:27:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 140.840 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 140.840 ms
Loss rate: 0.02%
```

Run 3: Report of Sprout — Data Link

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

Start at: 2017-09-22 12:38:50
End at: 2017-09-22 12:39:20
Local clock offset: -2.545 ms
Remote clock offset: -41.622 ms
```
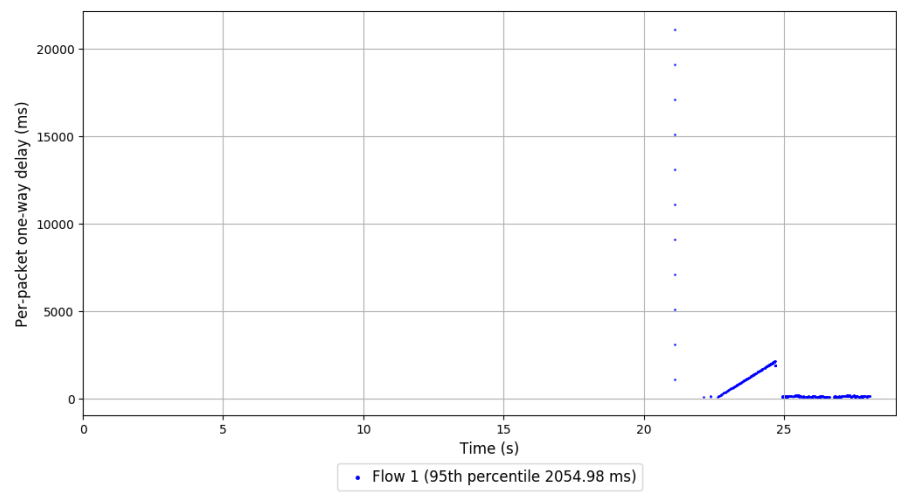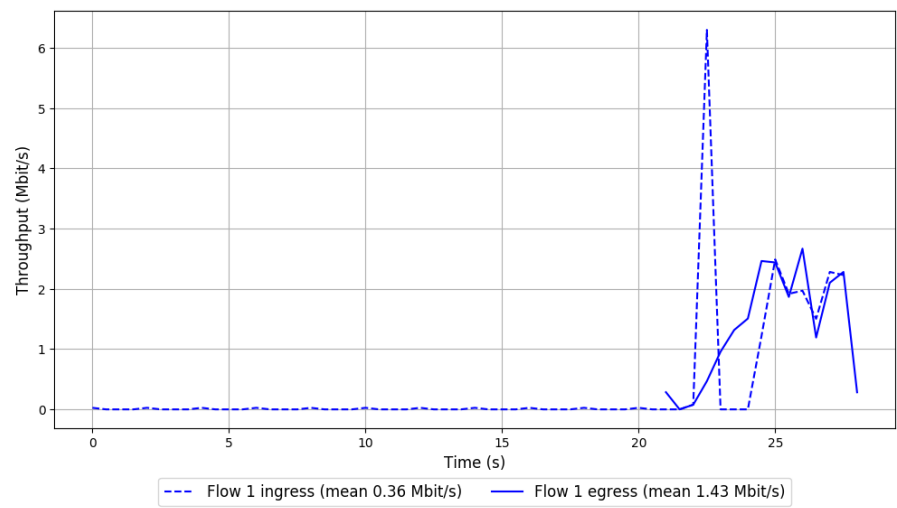
Run 1: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 0.36 Mbit/s) --- Flow 1 egress (mean 1.43 Mbit/s)

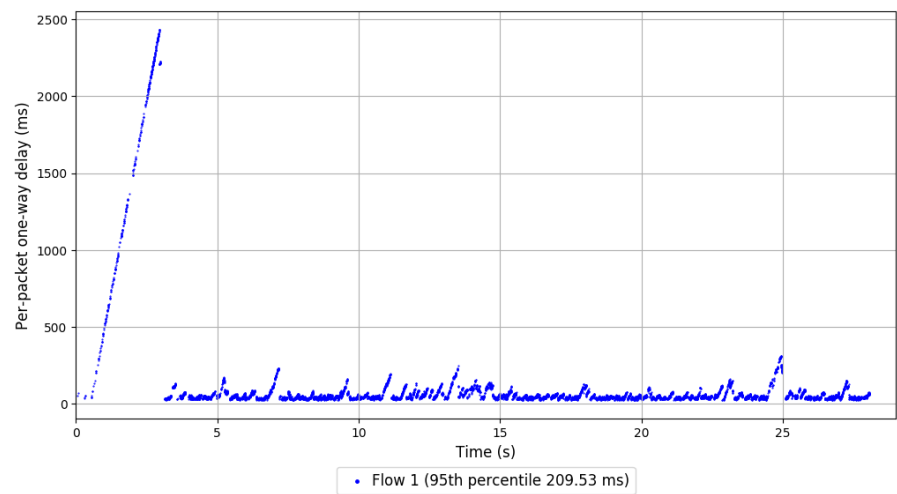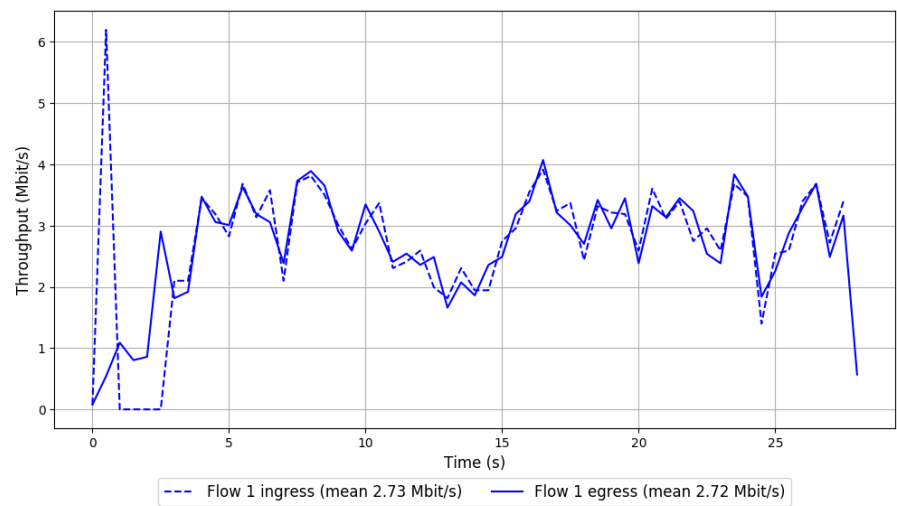

Flow 1 (95th percentile 2054.98 ms)

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

Start at: 2017-09-22 12:56:12
End at: 2017-09-22 12:56:42
Local clock offset: -1.517 ms
Remote clock offset: -54.807 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.72 Mbit/s
95th percentile per-packet one-way delay: 209.531 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 2.72 Mbit/s
95th percentile per-packet one-way delay: 209.531 ms
Loss rate: 0.14%
```

Run 2: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 2.73 Mbit/s)   Flow 1 egress (mean 2.72 Mbit/s)

Flow 1 (95th percentile 209.53 ms)

Run 3: Statistics of TaoVA-100x

Start at: 2017-09-22 13:14:28
End at: 2017-09-22 13:14:58
Local clock offset: -2.584 ms
Remote clock offset: -30.177 ms

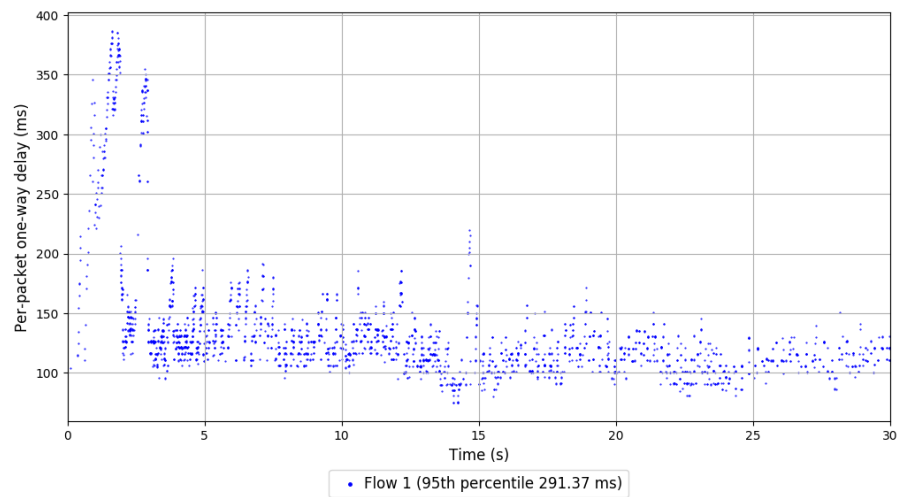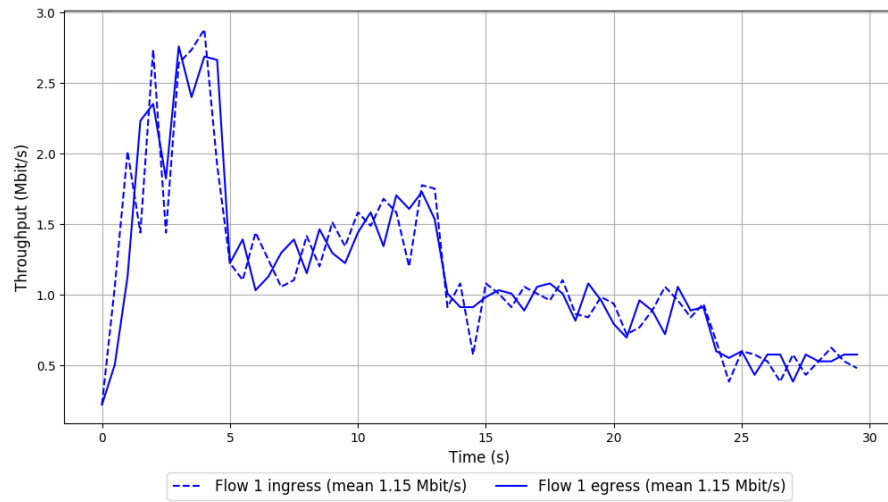Run 3: Report of TaoVA-100x — Data Link

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```
Run 1: Statistics of TCP Vegas

Start at: 2017-09-22 12:48:48
End at: 2017-09-22 12:49:18
Local clock offset: -2.571 ms
Remote clock offset: -45.686 ms

# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 291.366 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 291.366 ms
Loss rate: 0.17%
```

Run 1: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 1.15 Mbit/s) --- Flow 1 egress (mean 1.15 Mbit/s)
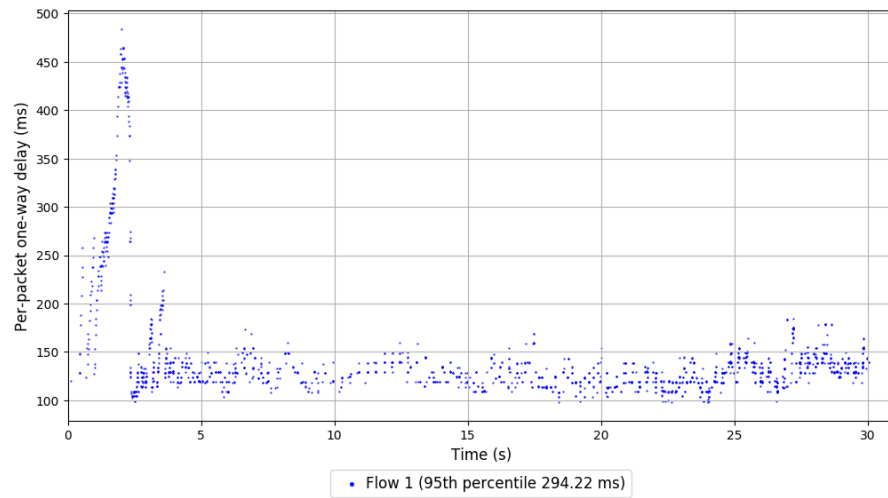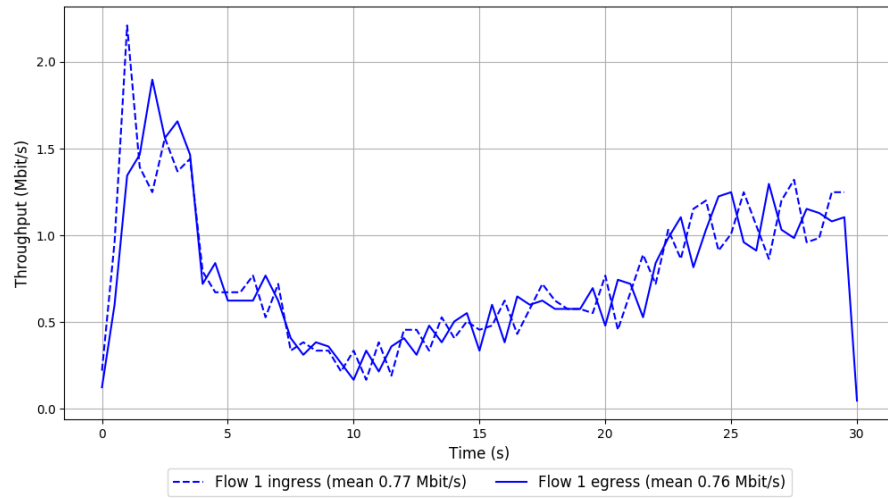

Flow 1 (95th percentile 291.37 ms)

```
Run 2: Statistics of TCP Vegas

Start at: 2017-09-22 13:07:05
End at: 2017-09-22 13:07:35
Local clock offset: 17.655 ms
Remote clock offset: -39.679 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 294.217 ms
Loss rate: 1.30%
-- Flow 1:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 294.217 ms
Loss rate: 1.30%
```

Run 2: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 0.77 Mbit/s) ----   Flow 1 egress (mean 0.76 Mbit/s) ——

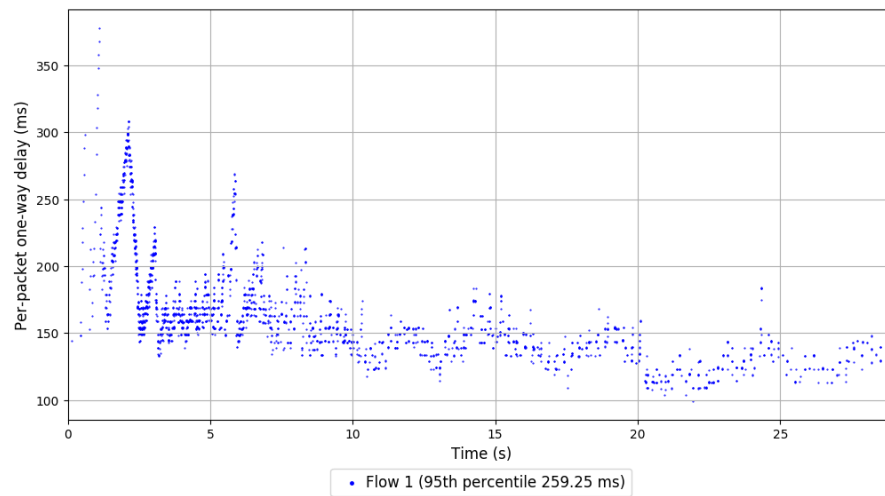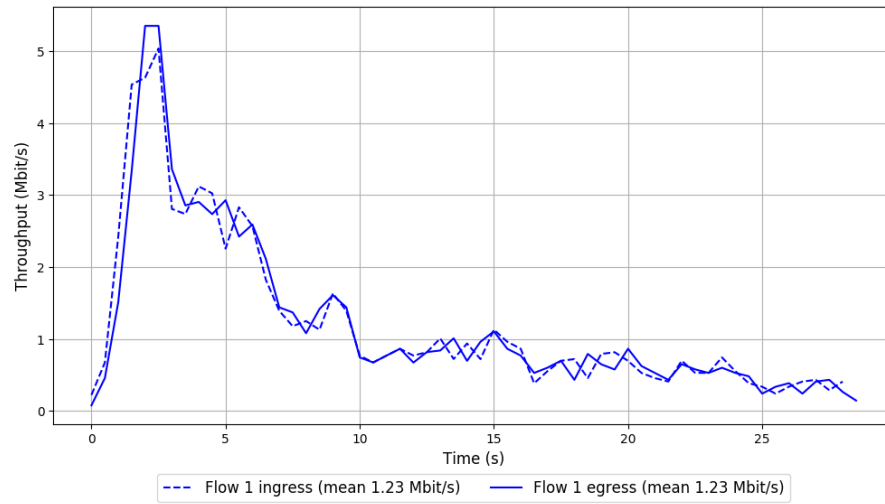
• Flow 1 (95th percentile 294.22 ms)

```
Run 3: Statistics of TCP Vegas

Start at: 2017-09-22 13:24:31
End at: 2017-09-22 13:25:01
Local clock offset: -2.649 ms
Remote clock offset: -43.858 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 259.254 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 259.254 ms
Loss rate: 0.55%
```

Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 1.23 Mbit/s) — — —   Flow 1 egress (mean 1.23 Mbit/s) ———

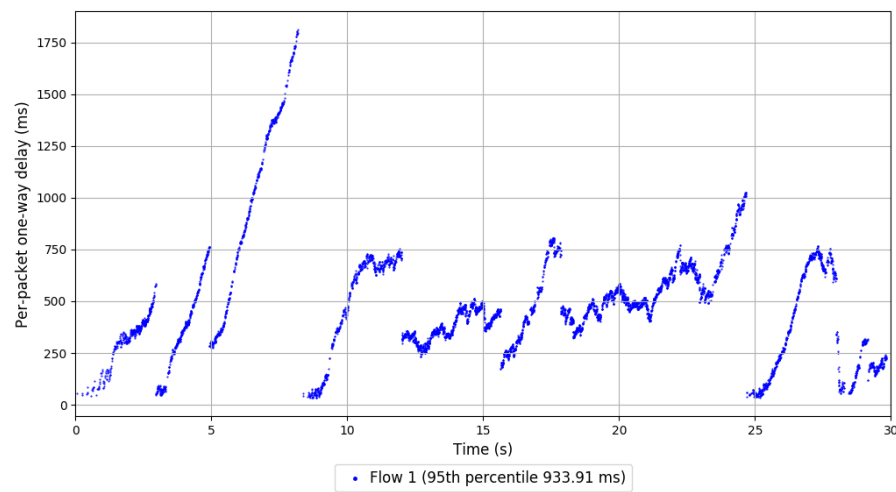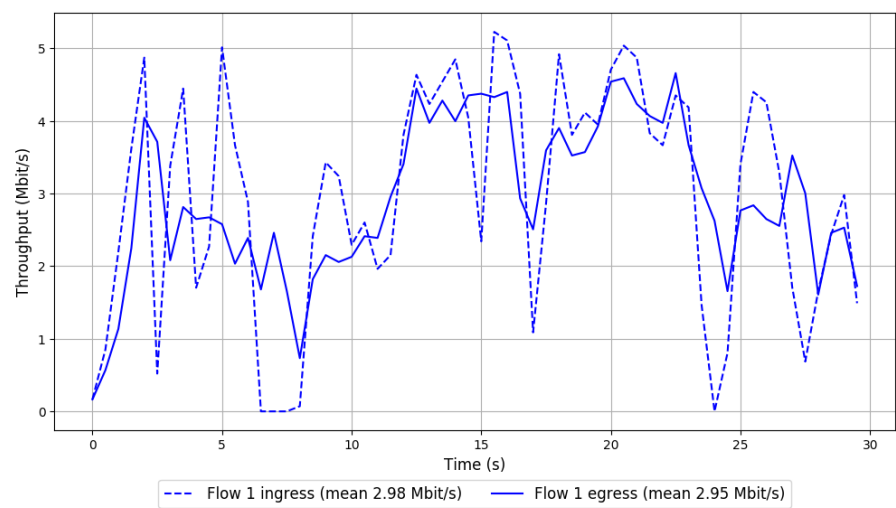
• Flow 1 (95th percentile 259.25 ms)

```
Run 1: Statistics of Verus

Start at: 2017-09-22 12:35:04
End at: 2017-09-22 12:35:34
Local clock offset: -2.571 ms
Remote clock offset: -42.295 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.95 Mbit/s
95th percentile per-packet one-way delay: 933.912 ms
Loss rate: 0.62%
-- Flow 1:
Average throughput: 2.95 Mbit/s
95th percentile per-packet one-way delay: 933.912 ms
Loss rate: 0.62%
```
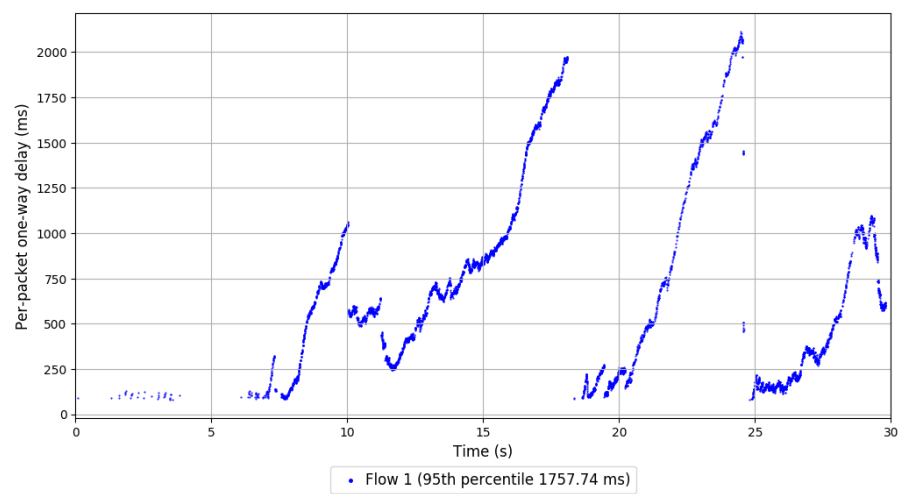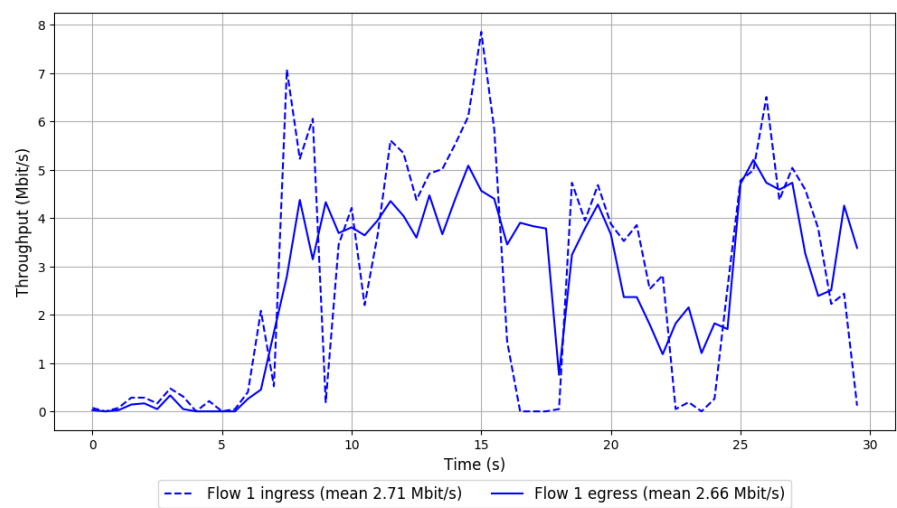
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2017-09-22 12:52:25
End at: 2017-09-22 12:52:55
Local clock offset: -2.566 ms
Remote clock offset: -41.568 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.66 Mbit/s
95th percentile per-packet one-way delay: 1757.738 ms
Loss rate: 1.62%
-- Flow 1:
Average throughput: 2.66 Mbit/s
95th percentile per-packet one-way delay: 1757.738 ms
Loss rate: 1.62%
```
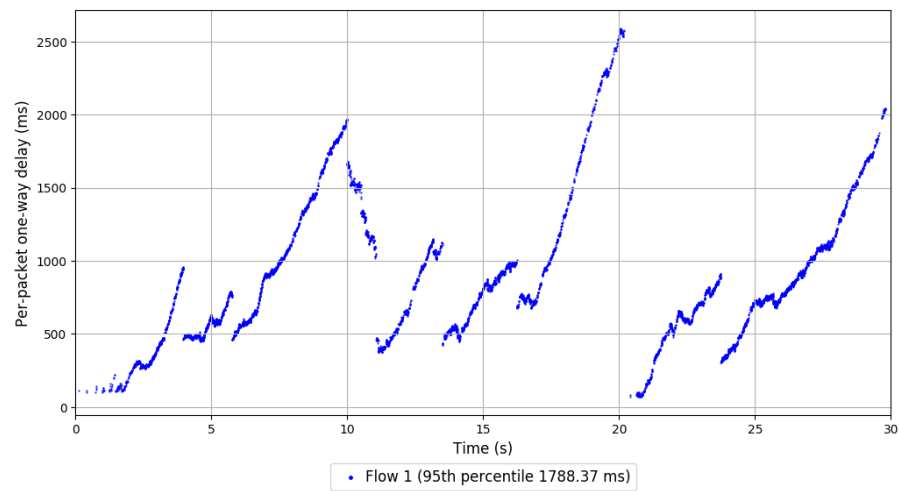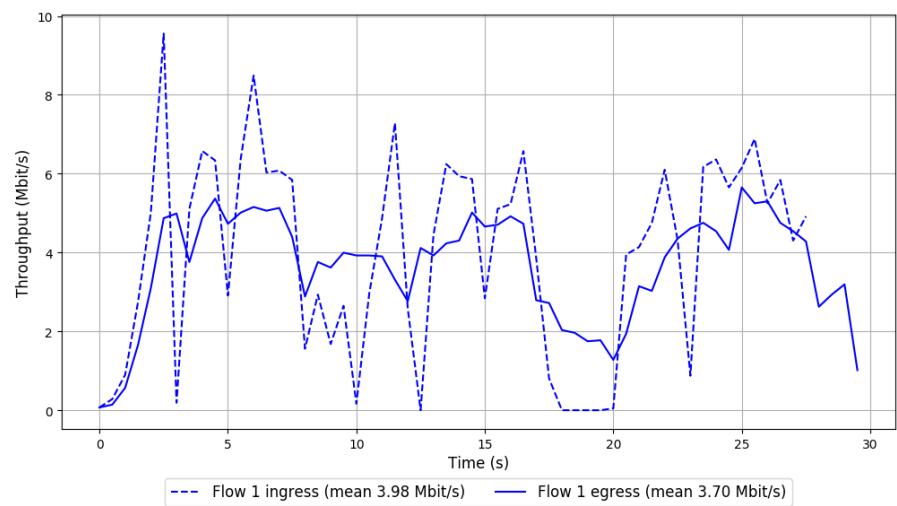
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2017-09-22 13:10:49
End at: 2017-09-22 13:11:19
Local clock offset: 17.926 ms
Remote clock offset: -40.955 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.70 Mbit/s
95th percentile per-packet one-way delay: 1788.365 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 3.70 Mbit/s
95th percentile per-packet one-way delay: 1788.365 ms
Loss rate: 0.93%
```

Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 3.98 Mbit/s)   Flow 1 egress (mean 3.70 Mbit/s)

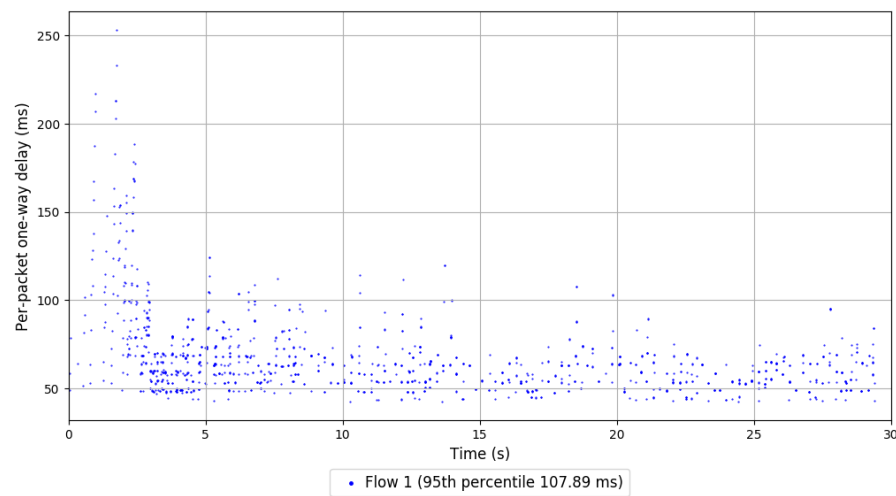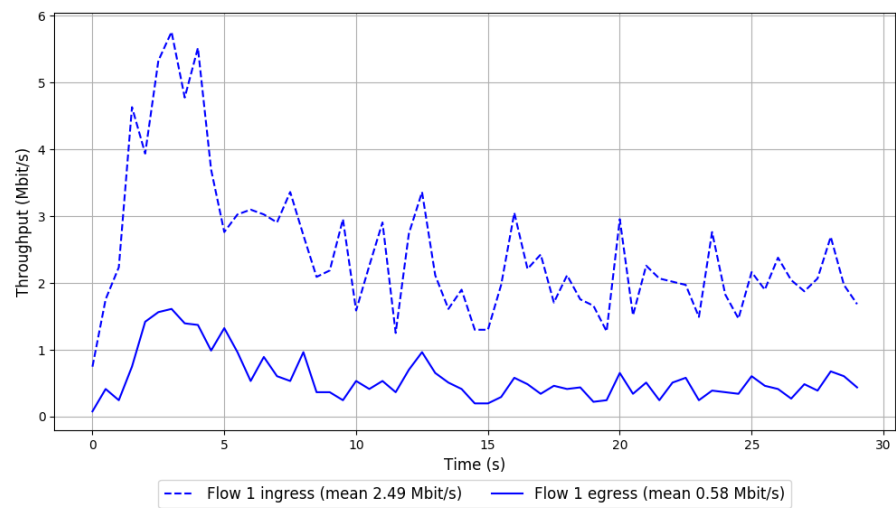• Flow 1 (95th percentile 1788.37 ms)

```
Run 1: Statistics of Indigo

Start at: 2017-09-22 12:43:51
End at: 2017-09-22 12:44:21
Local clock offset: -2.674 ms
Remote clock offset: -34.87 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 107.887 ms
Loss rate: 76.83%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 107.887 ms
Loss rate: 76.83%
```

Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2017-09-22 13:01:27
End at: 2017-09-22 13:01:57
Local clock offset: 13.625 ms
Remote clock offset: -43.806 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 149.217 ms
Loss rate: 76.39%
-- Flow 1:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 149.217 ms
Loss rate: 76.39%
```
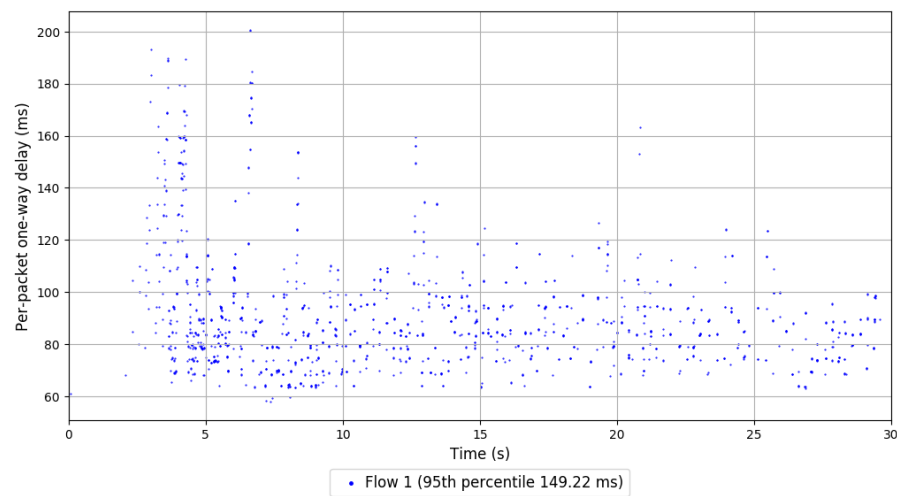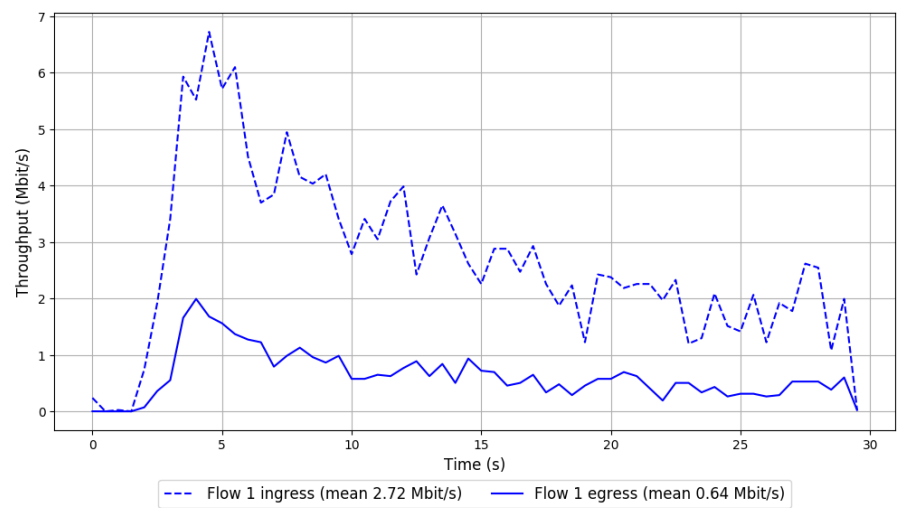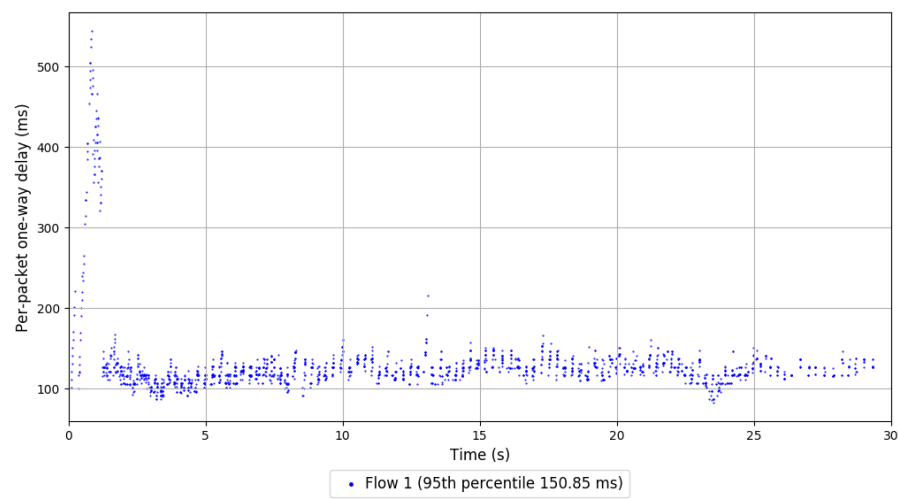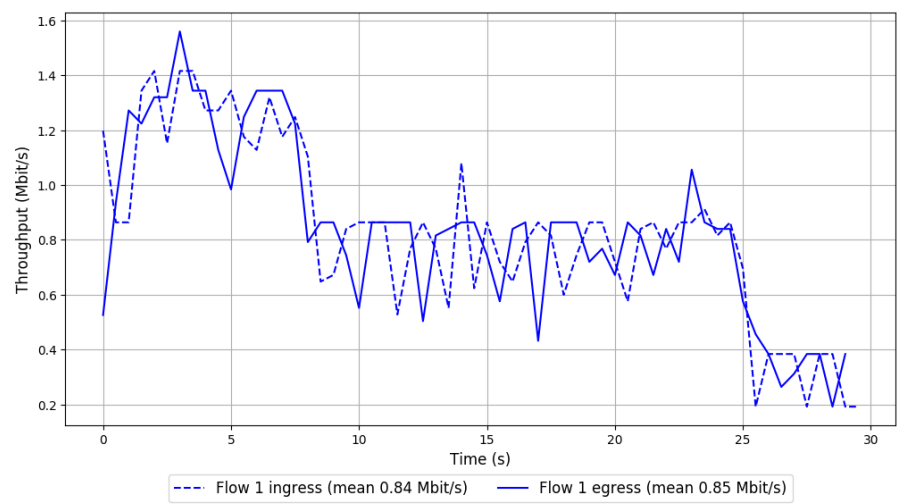
Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2017-09-22 13:19:27
End at: 2017-09-22 13:19:58
Local clock offset: -2.731 ms
Remote clock offset: -40.885 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 150.850 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 150.850 ms
Loss rate: 0.43%
```

Run 3: Report of Indigo — Data Link

Flow 1 ingress (mean 0.84 Mbit/s) — — — Flow 1 egress (mean 0.85 Mbit/s)

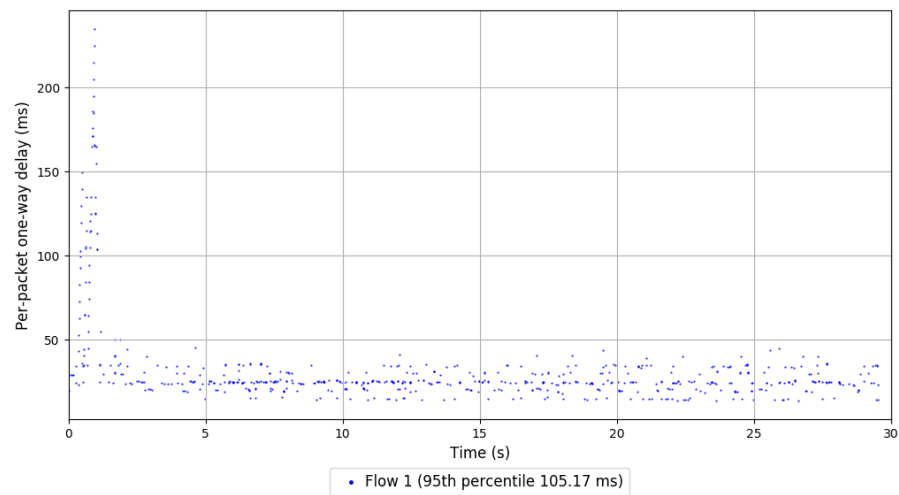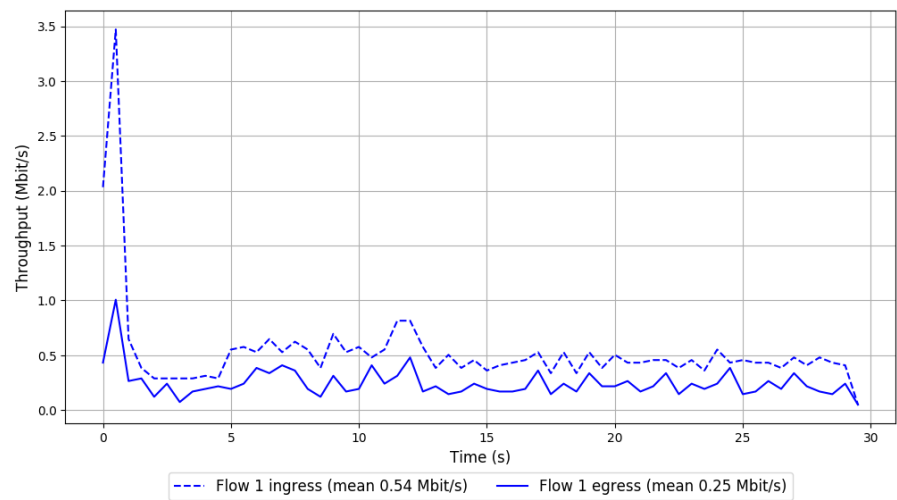
· Flow 1 (95th percentile 150.85 ms)

```
Run 1: Statistics of Indigo-cellular

Start at: 2017-09-22 12:37:38
End at: 2017-09-22 12:38:08
Local clock offset: 14.63 ms
Remote clock offset: -45.835 ms

# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 105.165 ms
Loss rate: 54.06%
-- Flow 1:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 105.165 ms
Loss rate: 54.06%
```

Run 1: Report of Indigo-cellular — Data Link

Flow 1 ingress (mean 0.54 Mbit/s) --- Flow 1 egress (mean 0.25 Mbit/s)

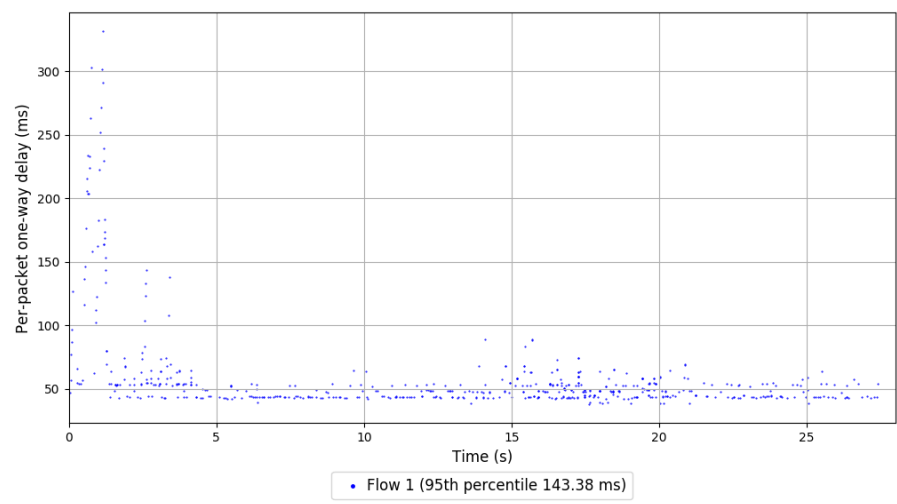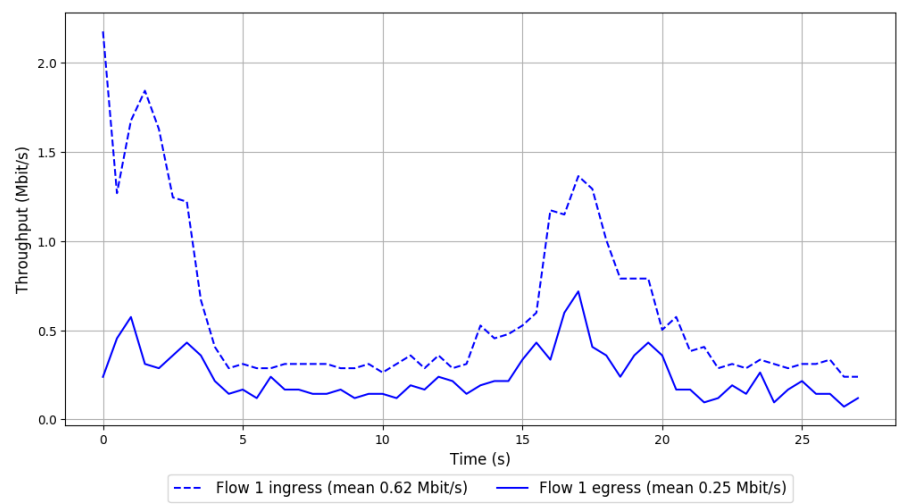
• Flow 1 (95th percentile 105.17 ms)

```
Run 2: Statistics of Indigo-cellular

Start at: 2017-09-22 12:54:55
End at: 2017-09-22 12:55:25
Local clock offset: -2.615 ms
Remote clock offset: -38.519 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 143.379 ms
Loss rate: 59.98%
-- Flow 1:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 143.379 ms
Loss rate: 59.98%
```

Run 2: Report of Indigo-cellular — Data Link

Flow 1 ingress (mean 0.62 Mbit/s)   Flow 1 egress (mean 0.25 Mbit/s)

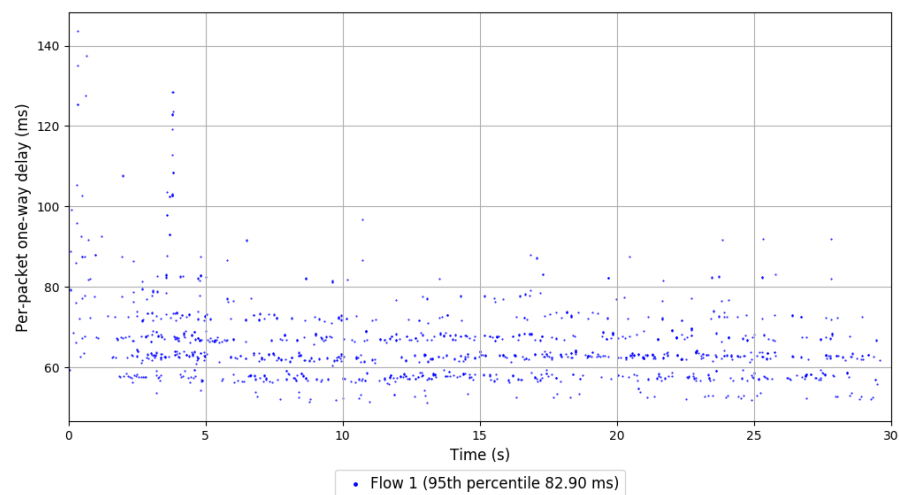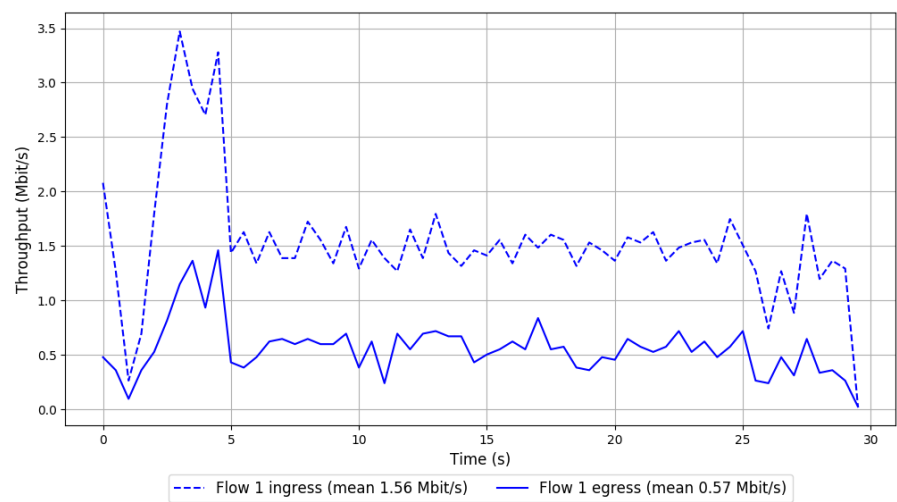
• Flow 1 (95th percentile 143.38 ms)

```
Run 3: Statistics of Indigo-cellular

Start at: 2017-09-22 13:13:15
End at: 2017-09-22 13:13:45
Local clock offset: -2.586 ms
Remote clock offset: -24.326 ms


# Below is generated by plot.py at 2017-09-22 13:27:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 82.897 ms
Loss rate: 63.54%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 82.897 ms
Loss rate: 63.54%
```

Run 3: Report of Indigo-cellular — Data Link

Flow 1 ingress (mean 1.56 Mbit/s)   Flow 1 egress (mean 0.57 Mbit/s)

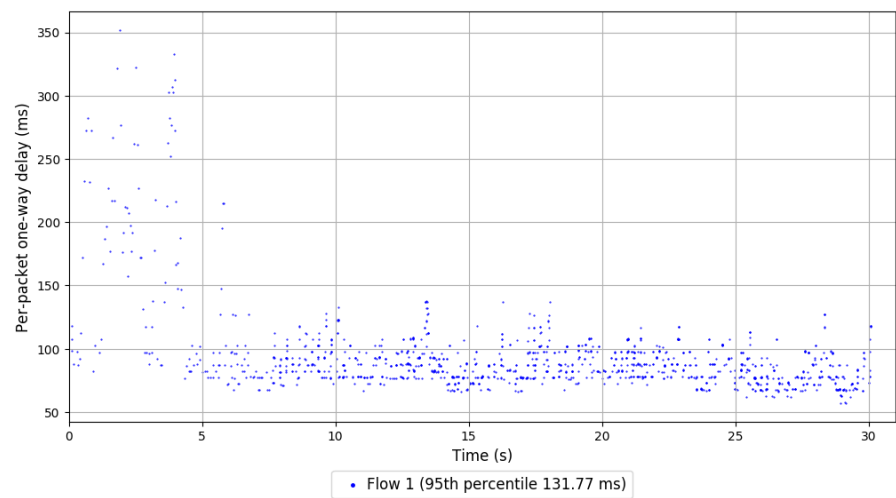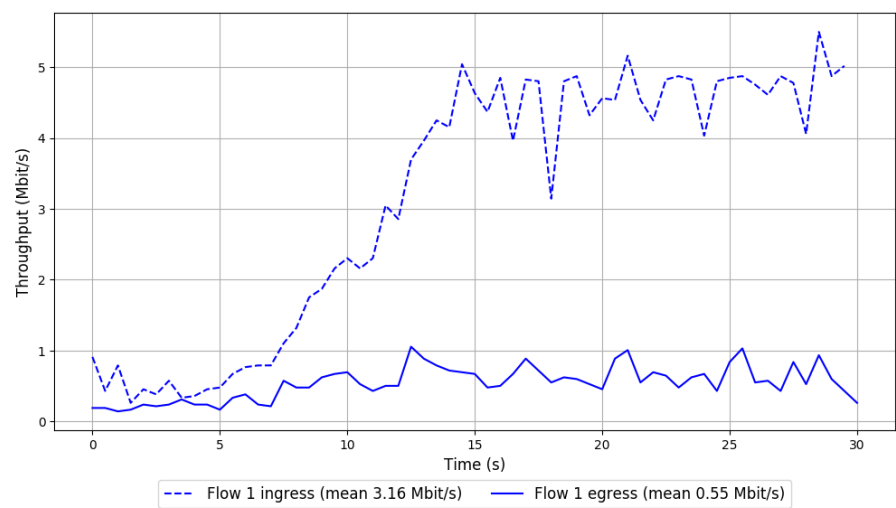

• Flow 1 (95th percentile 82.90 ms)

```
Run 1: Statistics of KohoCC

Start at: 2017-09-22 12:47:35
End at: 2017-09-22 12:48:05
Local clock offset: 11.599 ms
Remote clock offset: -35.404 ms

# Below is generated by plot.py at 2017-09-22 13:27:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 131.774 ms
Loss rate: 82.64%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 131.774 ms
Loss rate: 82.64%
```

Run 1: Report of KohoCC — Data Link

Flow 1 ingress (mean 3.16 Mbit/s)   Flow 1 egress (mean 0.55 Mbit/s)
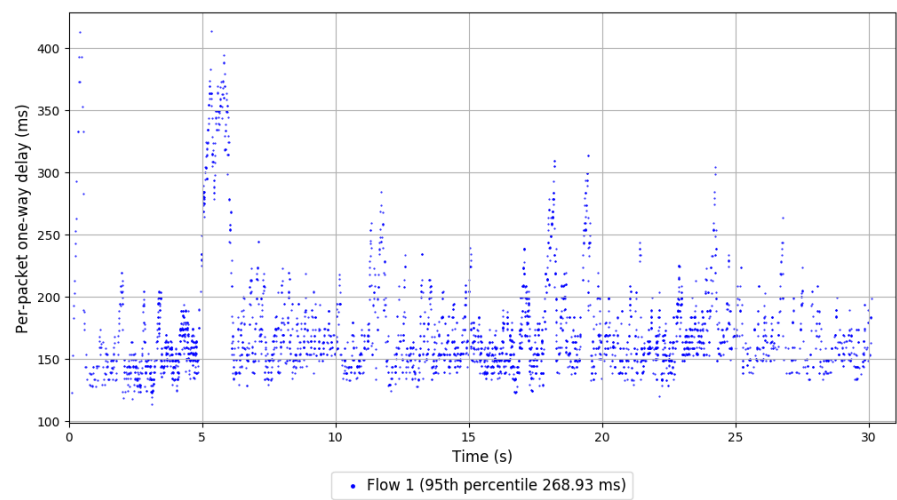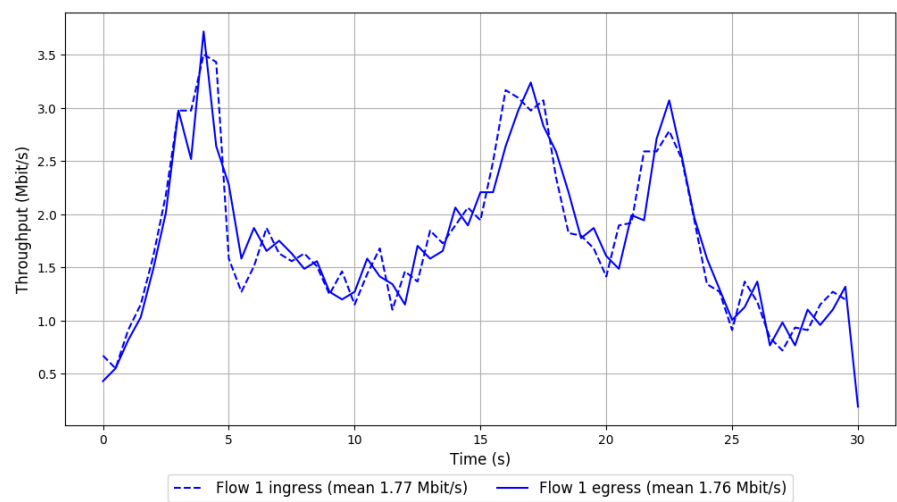

• Flow 1 (95th percentile 131.77 ms)

```
Run 2: Statistics of KohoCC

Start at: 2017-09-22 13:05:50
End at: 2017-09-22 13:06:20
Local clock offset: -2.818 ms
Remote clock offset: -26.932 ms


# Below is generated by plot.py at 2017-09-22 13:27:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 268.933 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 268.933 ms
Loss rate: 0.52%
```

Run 2: Report of KohoCC — Data Link

```
Run 3: Statistics of KohoCC

Start at: 2017-09-22 13:23:17
End at: 2017-09-22 13:23:47
Local clock offset: -2.647 ms
Remote clock offset: -44.896 ms


# Below is generated by plot.py at 2017-09-22 13:27:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 336.032 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 336.032 ms
Loss rate: 0.99%
```

Run 3: Report of KohoCC — Data Link