Pantheon Report

Generated at 2017-09-22 09:26:18 (UTC).

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

Repeated the test of 13 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

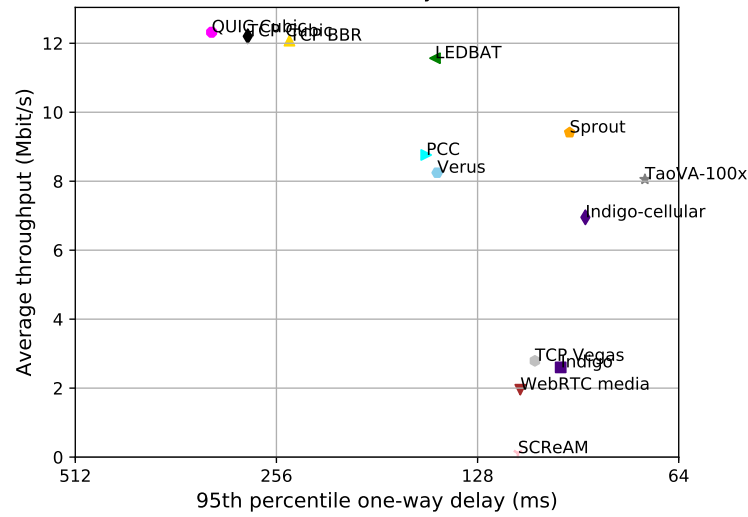Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

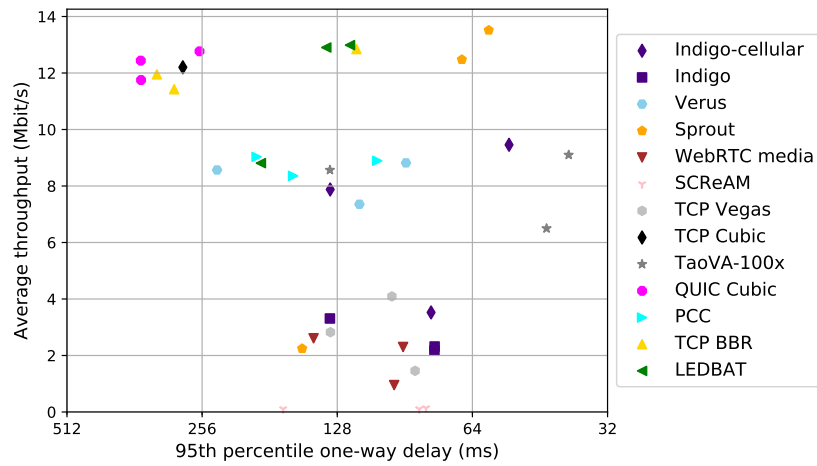NTP offsets were measured against `time.stanford.edu` and have been applied to correct the timestamps in logs.

```
Git summary:
branch: 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 Stanford ppp0 to AWS California 1 Ethernet, 3 runs of 30s each per scheme
(mean of all runs by scheme)

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

scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	12.08	244.76	0.76
TCP Cubic	1	12.20	282.60	1.13
LEDBAT	3	11.57	148.24	0.53
PCC	3	8.76	152.78	0.60
QUIC Cubic	3	12.32	320.06	1.94
SCReAM	3	0.11	111.40	0.62
WebRTC media	3	1.95	110.49	0.66
Sprout	3	9.41	93.23	1.44
TaoVA-100x	3	8.06	71.91	0.61
TCP Vegas	3	2.79	105.06	0.32
Verus	3	8.25	147.10	22.06
Indigo	3	2.60	96.13	0.22
Indigo-cellular	3	6.95	88.29	0.30

```
Run 1: Statistics of TCP BBR

Start at: 2017-09-22 07:54:58
End at: 2017-09-22 07:55:28
Local clock offset: -1.419 ms
Remote clock offset: -3.006 ms

# Below is generated by plot.py at 2017-09-22 09:25:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.95 Mbit/s
95th percentile per-packet one-way delay: 322.797 ms
Loss rate: 1.30%
-- Flow 1:
Average throughput: 11.95 Mbit/s
95th percentile per-packet one-way delay: 322.797 ms
Loss rate: 1.30%
```
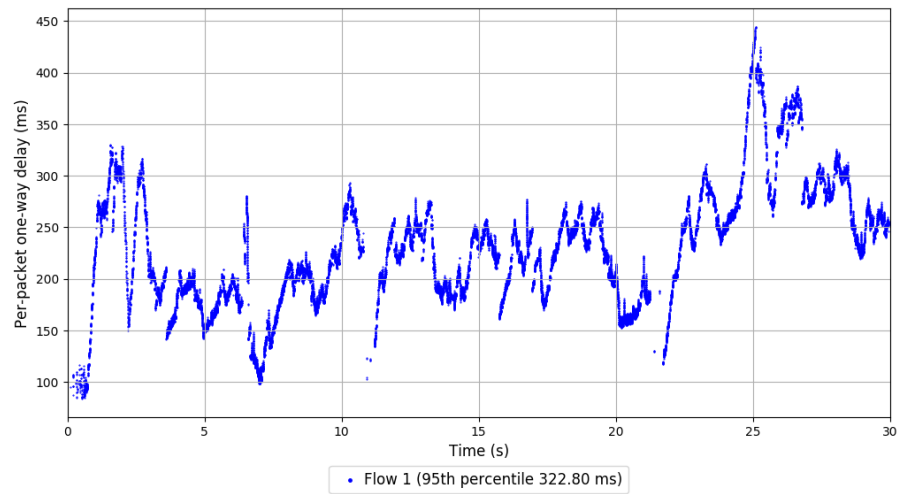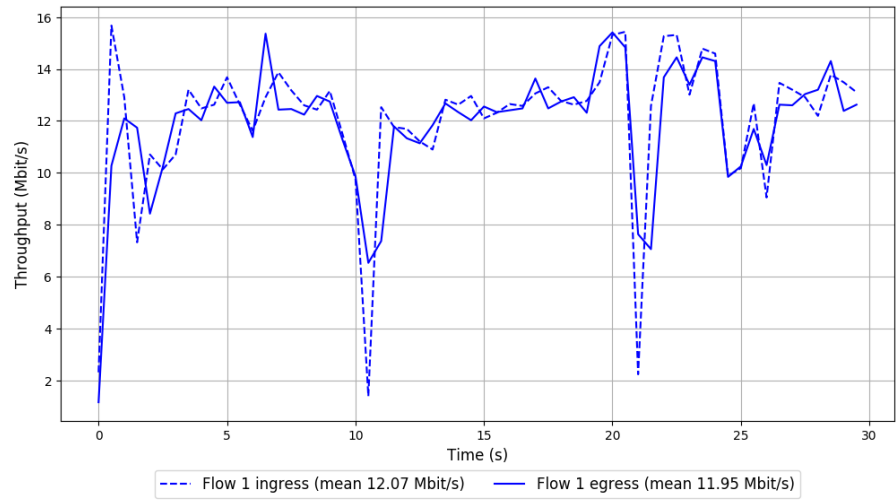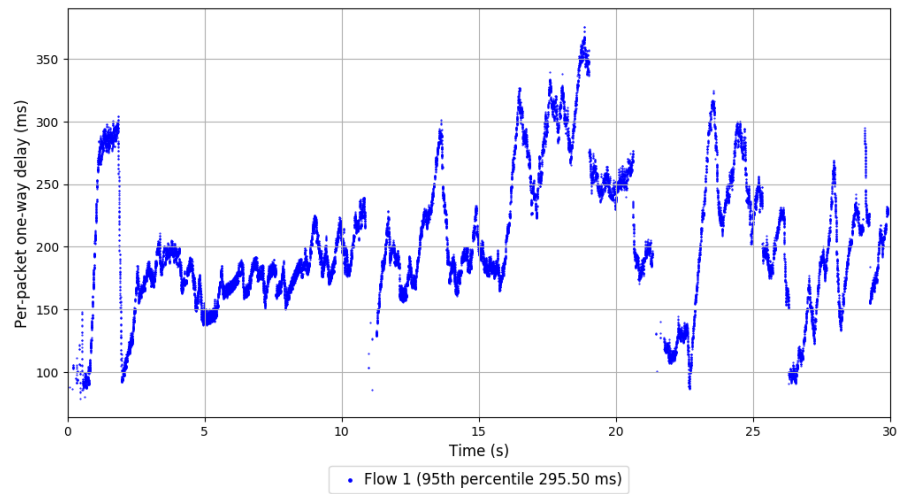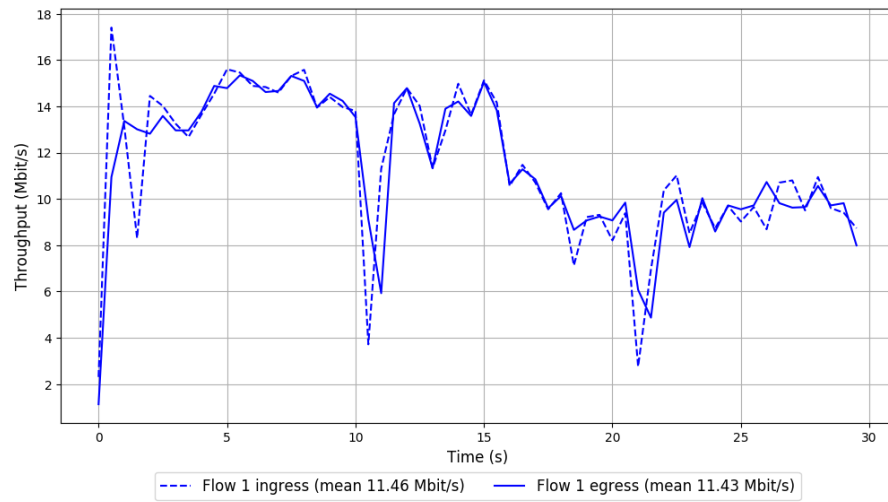
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2017-09-22 08:10:17
End at: 2017-09-22 08:10:47
Local clock offset: -1.507 ms
Remote clock offset: -2.776 ms


# Below is generated by plot.py at 2017-09-22 09:25:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.43 Mbit/s
95th percentile per-packet one-way delay: 295.496 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 11.43 Mbit/s
95th percentile per-packet one-way delay: 295.496 ms
Loss rate: 0.67%
```

Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2017-09-22 08:25:34
End at: 2017-09-22 08:26:04
Local clock offset: -1.463 ms
Remote clock offset: -2.605 ms

# Below is generated by plot.py at 2017-09-22 09:25:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.85 Mbit/s
95th percentile per-packet one-way delay: 115.998 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 12.85 Mbit/s
95th percentile per-packet one-way delay: 115.998 ms
Loss rate: 0.31%
```
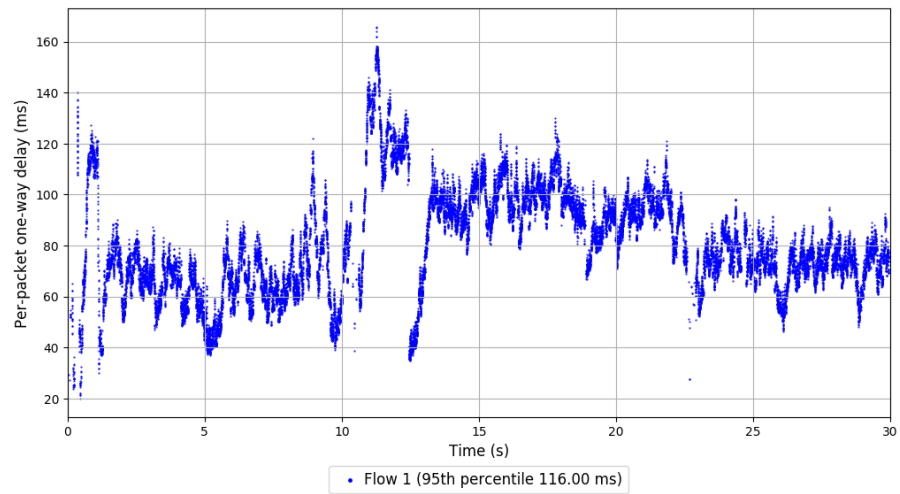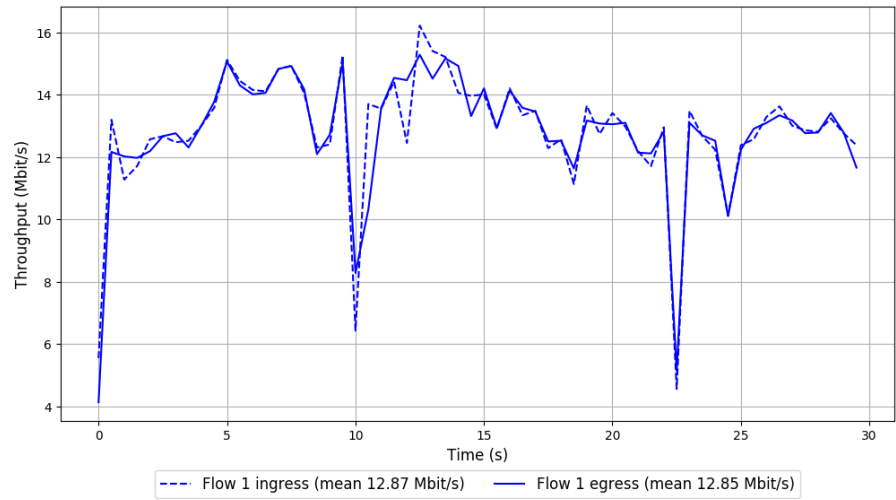
Run 3: Report of TCP BBR — Data Link

Flow 1 ingress (mean 12.87 Mbit/s) — — — — Flow 1 egress (mean 12.85 Mbit/s)

• Flow 1 (95th percentile 116.00 ms)
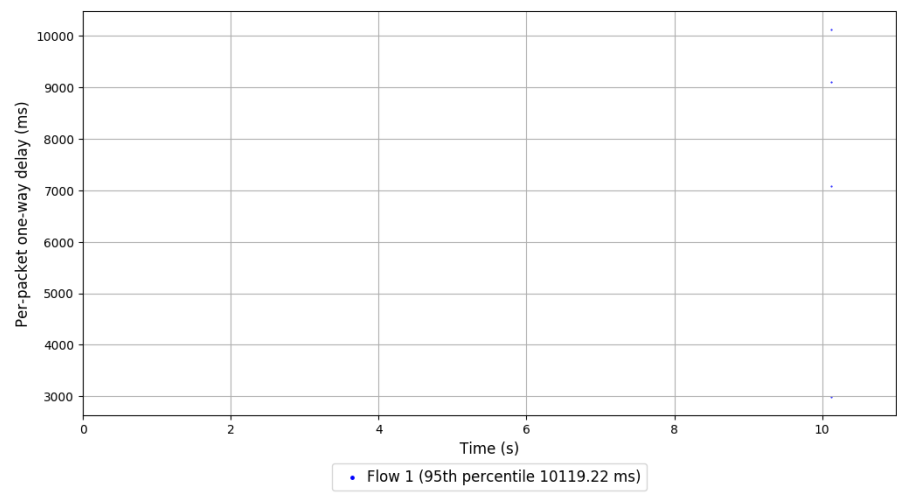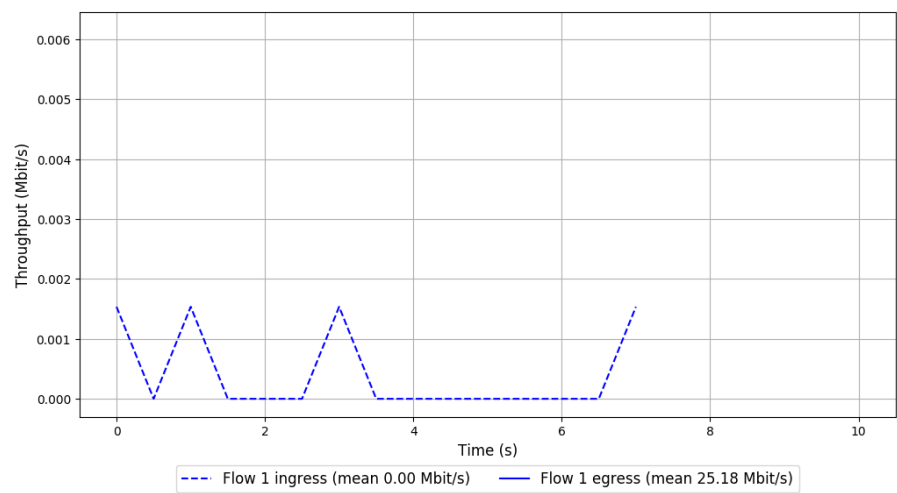
```
Run 1: Statistics of TCP Cubic

Start at: 2017-09-22 07:58:31
End at: 2017-09-22 07:59:01
Local clock offset: -1.455 ms
Remote clock offset: -2.97 ms
```
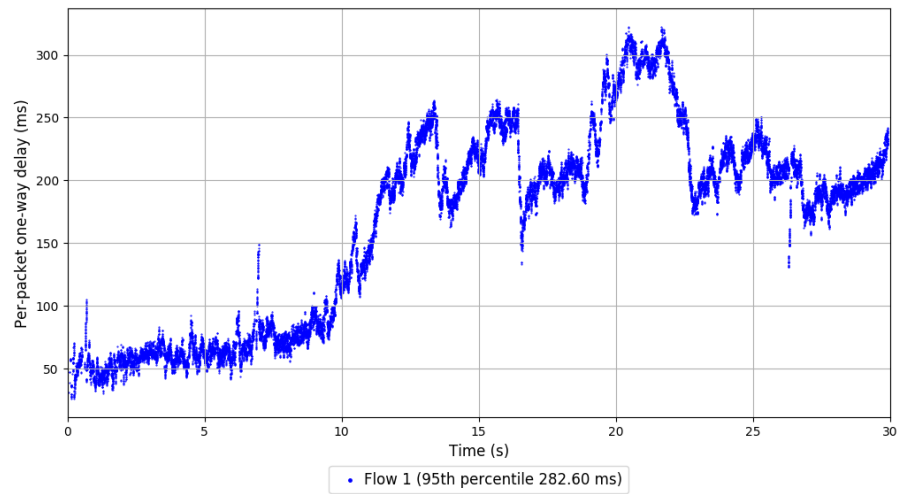
Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 0.00 Mbit/s)   Flow 1 egress (mean 25.18 Mbit/s)
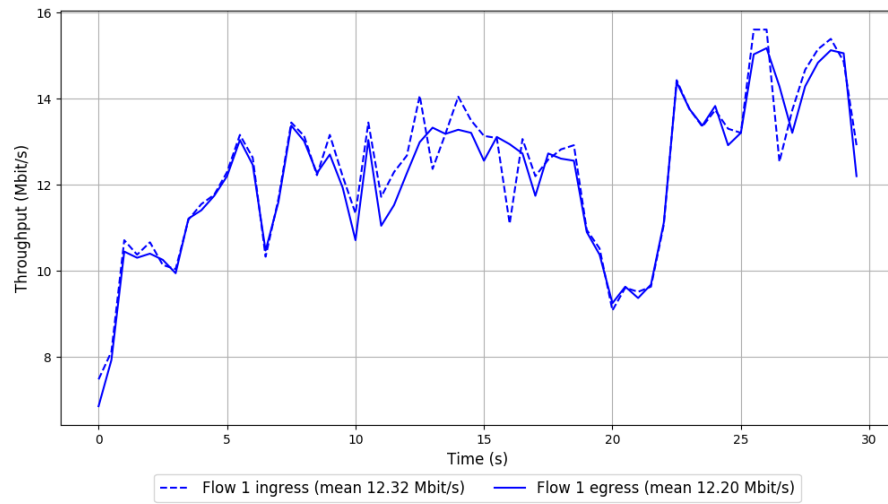

Flow 1 (95th percentile 10119.22 ms)

```
Run 2: Statistics of TCP Cubic

Start at: 2017-09-22 08:13:49
End at: 2017-09-22 08:14:19
Local clock offset: -1.398 ms
Remote clock offset: -2.718 ms


# Below is generated by plot.py at 2017-09-22 09:25:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.20 Mbit/s
95th percentile per-packet one-way delay: 282.596 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 12.20 Mbit/s
95th percentile per-packet one-way delay: 282.596 ms
Loss rate: 1.13%
```

Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 12.32 Mbit/s) --- Flow 1 egress (mean 12.20 Mbit/s)

• Flow 1 (95th percentile 282.60 ms)
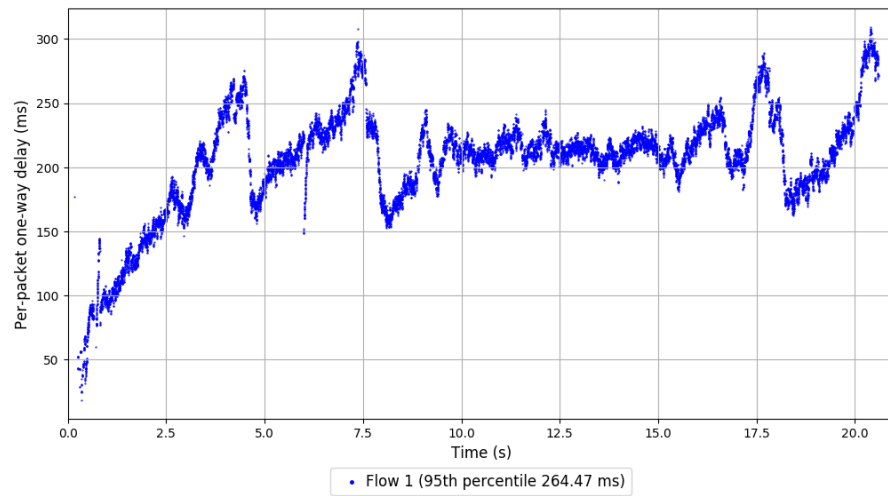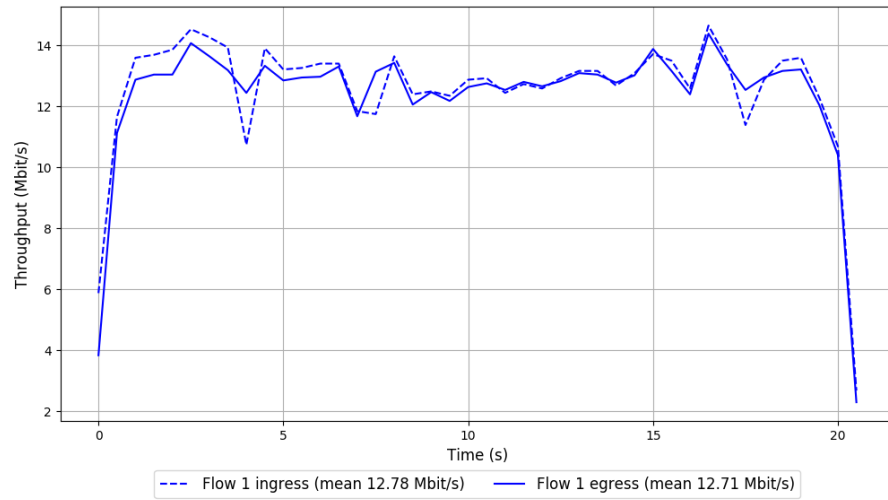
```
Run 3: Statistics of TCP Cubic

Start at: 2017-09-22 08:29:06
End at: 2017-09-22 08:29:36
Local clock offset: -1.473 ms
Remote clock offset: -2.6 ms
```
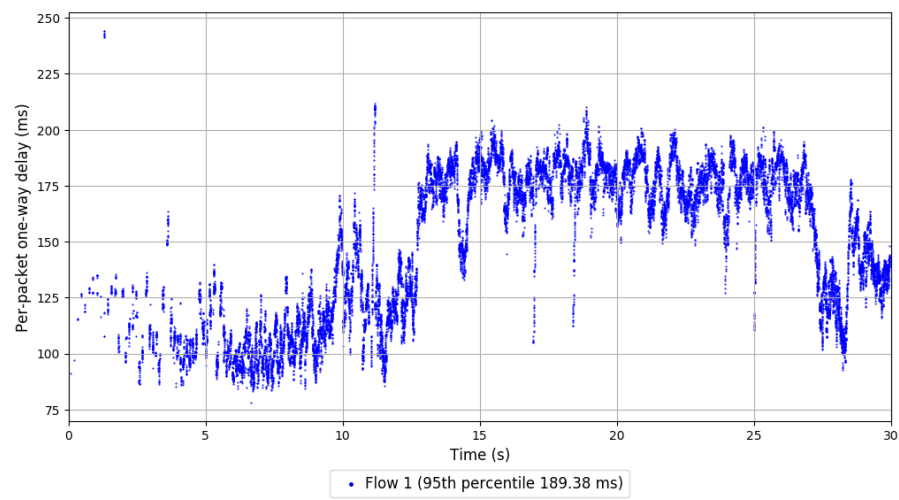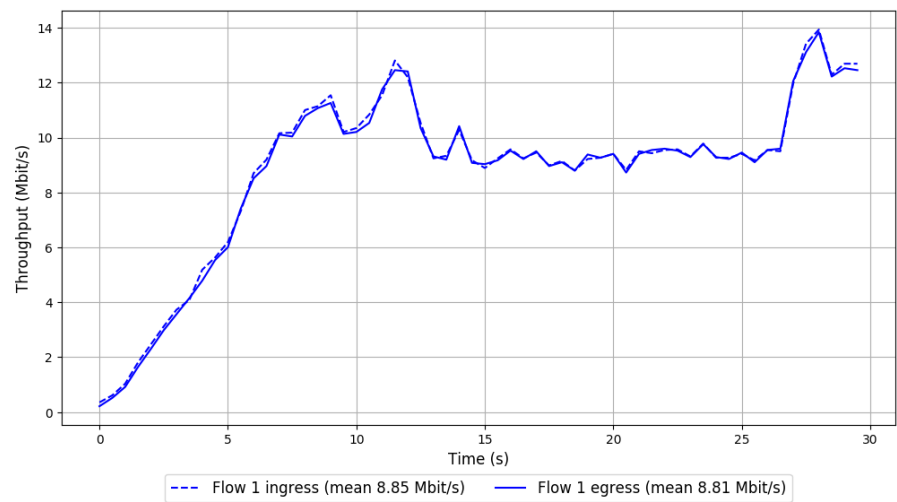
Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 12.78 Mbit/s) --- Flow 1 egress (mean 12.71 Mbit/s)

Flow 1 (95th percentile 264.47 ms)

```
Run 1: Statistics of LEDBAT

Start at: 2017-09-22 08:07:55
End at: 2017-09-22 08:08:25
Local clock offset: -1.488 ms
Remote clock offset: -2.851 ms

# Below is generated by plot.py at 2017-09-22 09:25:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.81 Mbit/s
95th percentile per-packet one-way delay: 189.382 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 8.81 Mbit/s
95th percentile per-packet one-way delay: 189.382 ms
Loss rate: 0.76%
```

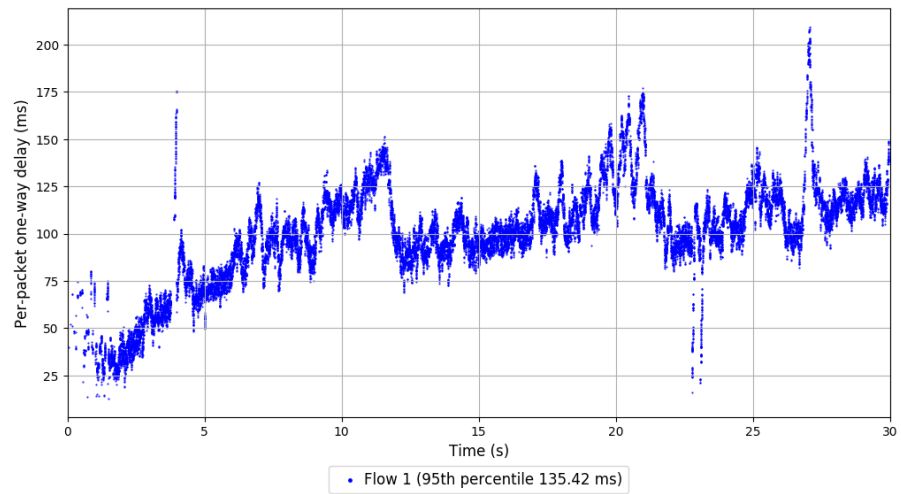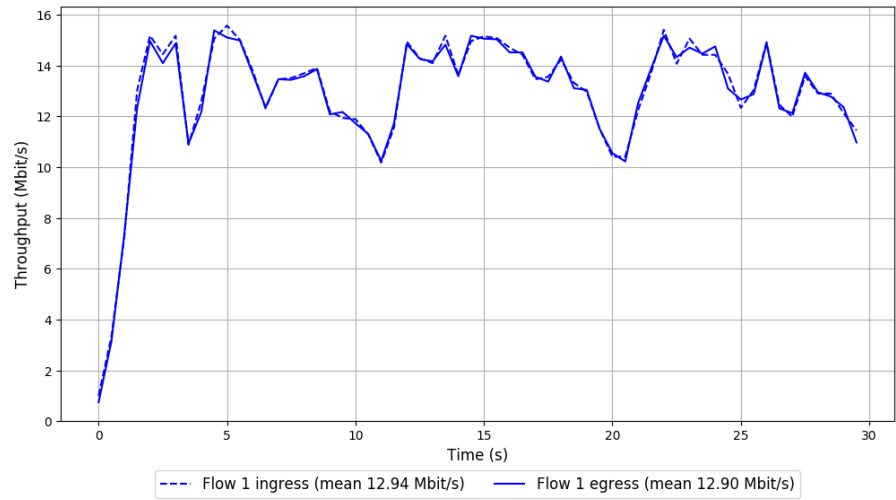Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2017-09-22 08:23:13
End at: 2017-09-22 08:23:43
Local clock offset: -1.536 ms
Remote clock offset: -2.612 ms


# Below is generated by plot.py at 2017-09-22 09:25:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.90 Mbit/s
95th percentile per-packet one-way delay: 135.421 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 12.90 Mbit/s
95th percentile per-packet one-way delay: 135.421 ms
Loss rate: 0.43%
```

Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 12.94 Mbit/s) --- Flow 1 egress (mean 12.90 Mbit/s)

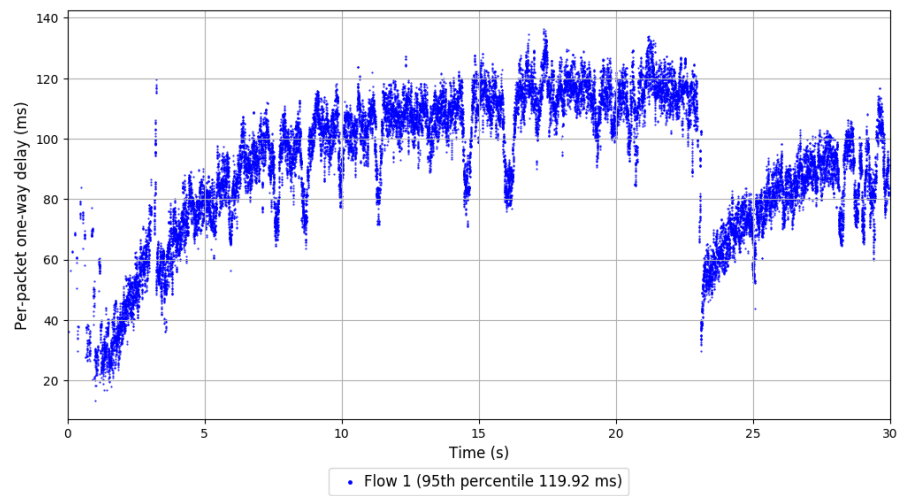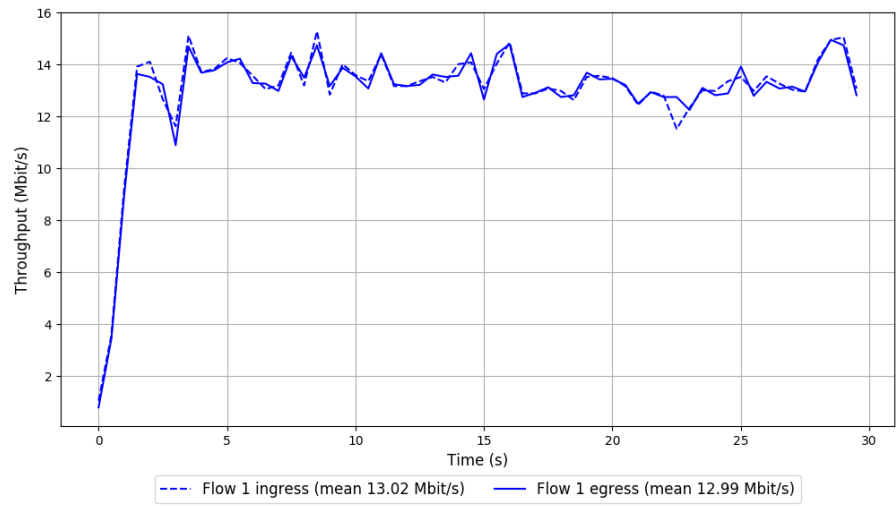· Flow 1 (95th percentile 135.42 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2017-09-22 08:38:30
End at: 2017-09-22 08:39:00
Local clock offset: -1.545 ms
Remote clock offset: -2.533 ms

# Below is generated by plot.py at 2017-09-22 09:25:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.99 Mbit/s
95th percentile per-packet one-way delay: 119.916 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 12.99 Mbit/s
95th percentile per-packet one-way delay: 119.916 ms
Loss rate: 0.40%
```
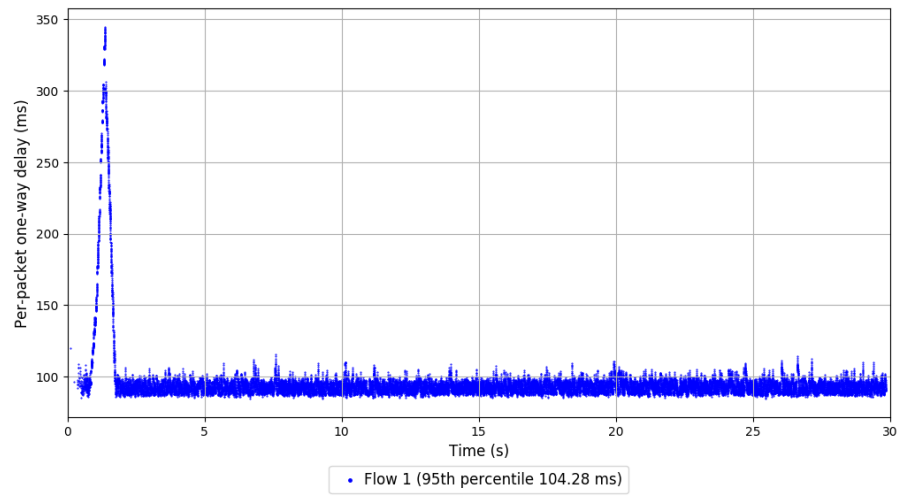
Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 13.02 Mbit/s)   Flow 1 egress (mean 12.99 Mbit/s)

Flow 1 (95th percentile 119.92 ms)

```
Run 1: Statistics of PCC

Start at: 2017-09-22 07:53:48
End at: 2017-09-22 07:54:18
Local clock offset: -1.343 ms
Remote clock offset: -3.1 ms


# Below is generated by plot.py at 2017-09-22 09:25:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.89 Mbit/s
95th percentile per-packet one-way delay: 104.275 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 8.89 Mbit/s
95th percentile per-packet one-way delay: 104.275 ms
Loss rate: 0.86%
```
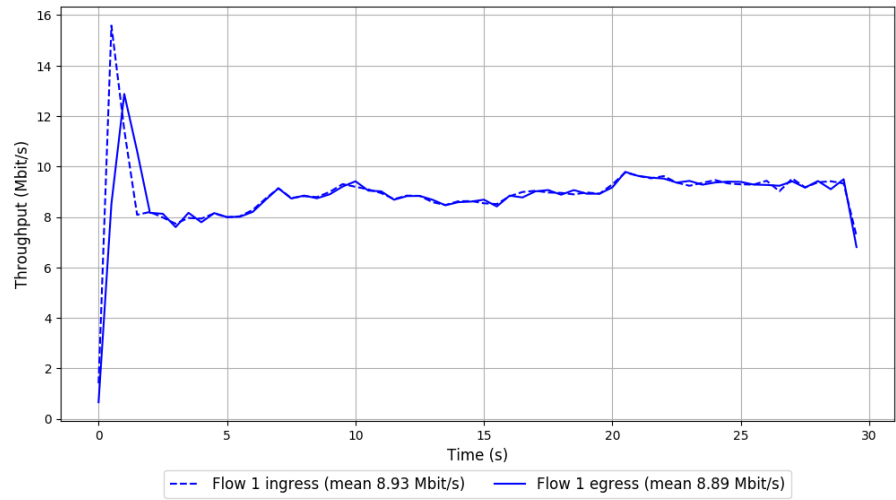
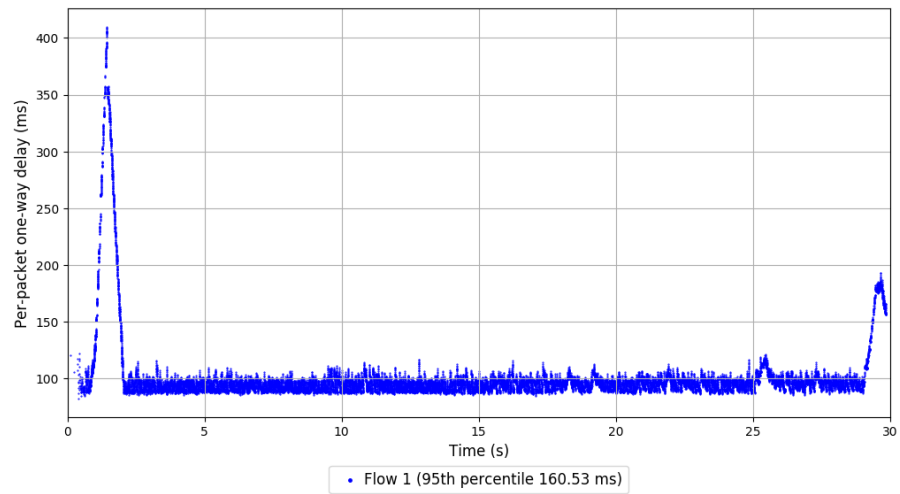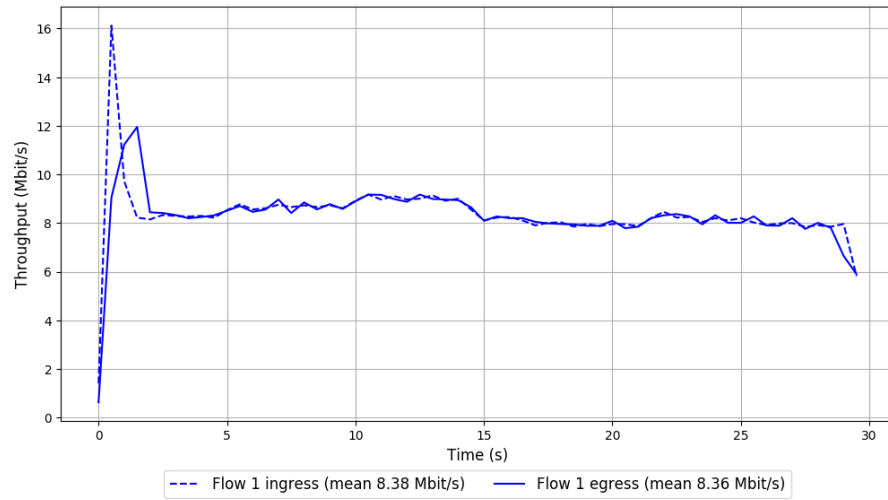Run 1: Report of PCC — Data Link

```
Run 2: Statistics of PCC

Start at: 2017-09-22 08:09:06
End at: 2017-09-22 08:09:36
Local clock offset: -1.393 ms
Remote clock offset: -2.817 ms


# Below is generated by plot.py at 2017-09-22 09:25:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.36 Mbit/s
95th percentile per-packet one-way delay: 160.530 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 8.36 Mbit/s
95th percentile per-packet one-way delay: 160.530 ms
Loss rate: 0.69%
```

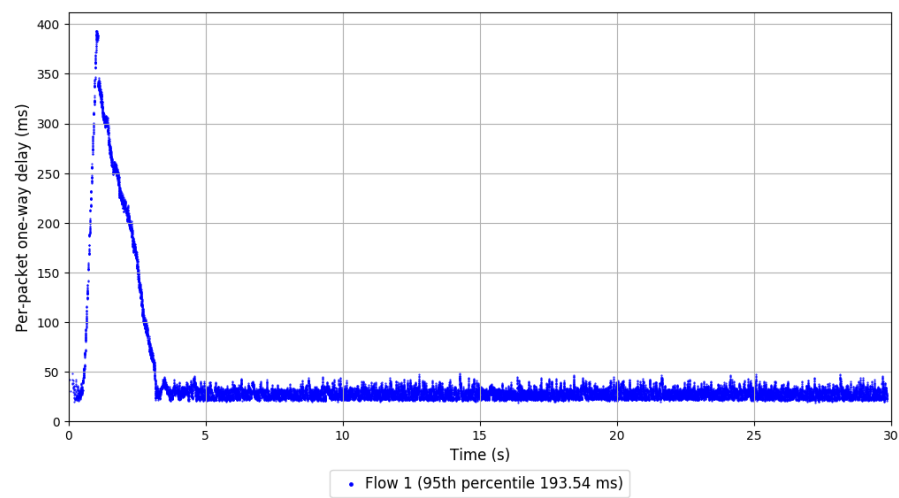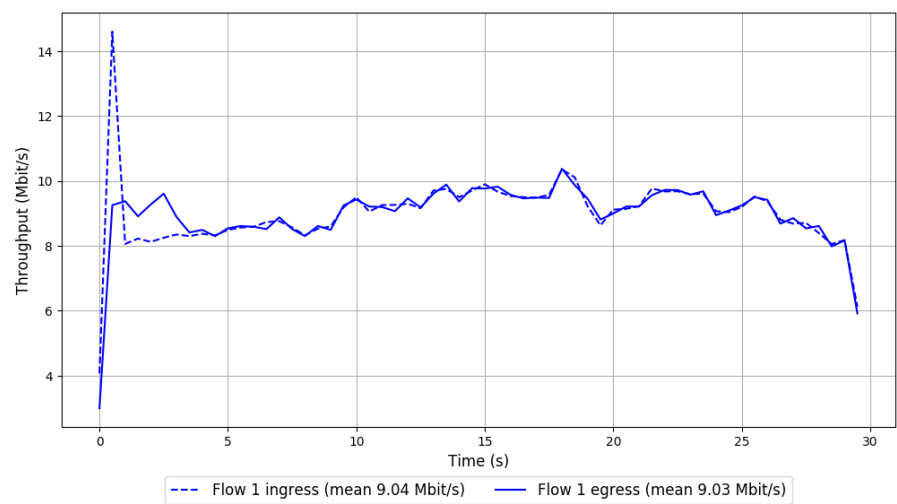Run 2: Report of PCC — Data Link

```
Run 3: Statistics of PCC

Start at: 2017-09-22 08:24:23
End at: 2017-09-22 08:24:53
Local clock offset: -1.453 ms
Remote clock offset: -2.557 ms


# Below is generated by plot.py at 2017-09-22 09:25:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.03 Mbit/s
95th percentile per-packet one-way delay: 193.542 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 9.03 Mbit/s
95th percentile per-packet one-way delay: 193.542 ms
Loss rate: 0.26%
```

Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 9.04 Mbit/s)   Flow 1 egress (mean 9.03 Mbit/s)
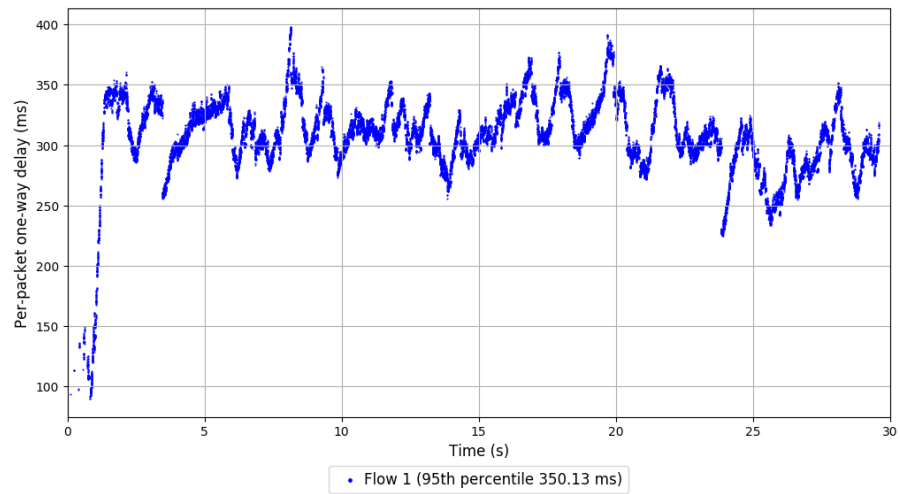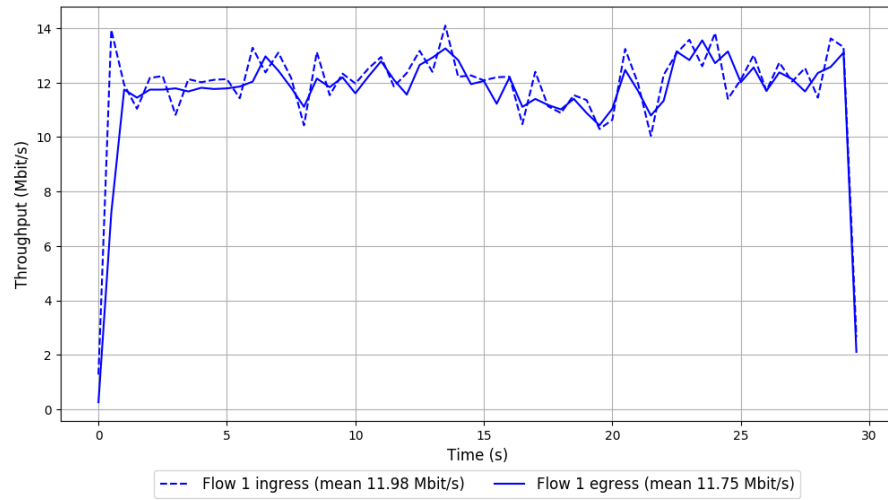

Flow 1 (95th percentile 193.54 ms)

```
Run 1: Statistics of QUIC Cubic

Start at: 2017-09-22 07:56:09
End at: 2017-09-22 07:56:39
Local clock offset: -1.342 ms
Remote clock offset: -3.024 ms


# Below is generated by plot.py at 2017-09-22 09:25:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.75 Mbit/s
95th percentile per-packet one-way delay: 350.133 ms
Loss rate: 2.29%
-- Flow 1:
Average throughput: 11.75 Mbit/s
95th percentile per-packet one-way delay: 350.133 ms
Loss rate: 2.29%
```

Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 11.98 Mbit/s)   Flow 1 egress (mean 11.75 Mbit/s)
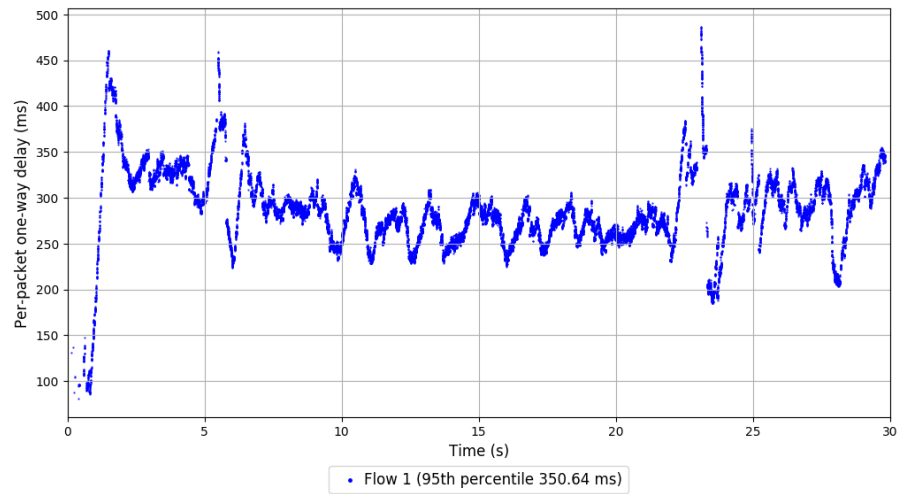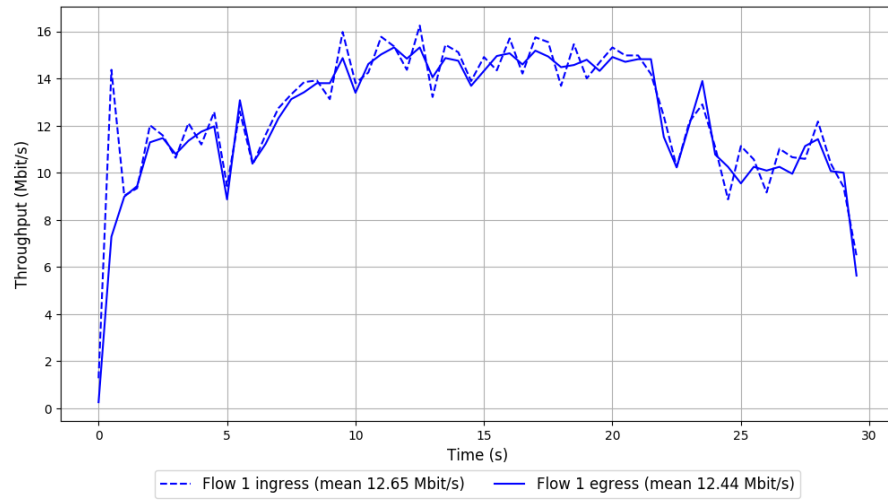

• Flow 1 (95th percentile 350.13 ms)

```
Run 2: Statistics of QUIC Cubic

Start at: 2017-09-22 08:11:28
End at: 2017-09-22 08:11:58
Local clock offset: -1.495 ms
Remote clock offset: -2.668 ms


# Below is generated by plot.py at 2017-09-22 09:25:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.44 Mbit/s
95th percentile per-packet one-way delay: 350.645 ms
Loss rate: 2.19%
-- Flow 1:
Average throughput: 12.44 Mbit/s
95th percentile per-packet one-way delay: 350.645 ms
Loss rate: 2.19%
```

Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 12.65 Mbit/s) --- Flow 1 egress (mean 12.44 Mbit/s)

· Flow 1 (95th percentile 350.64 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-09-22 08:26:45
End at: 2017-09-22 08:27:15
Local clock offset: -1.466 ms
Remote clock offset: -2.508 ms


# Below is generated by plot.py at 2017-09-22 09:25:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.77 Mbit/s
95th percentile per-packet one-way delay: 259.416 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 12.77 Mbit/s
95th percentile per-packet one-way delay: 259.416 ms
Loss rate: 1.34%
```
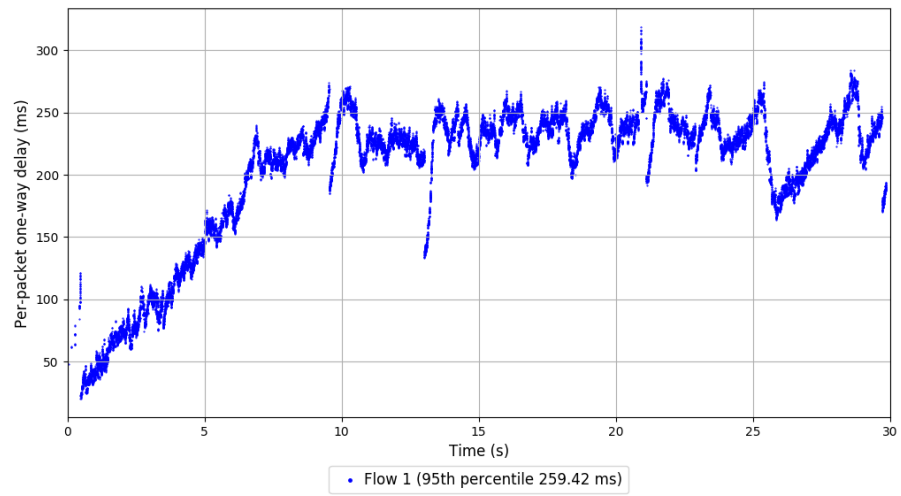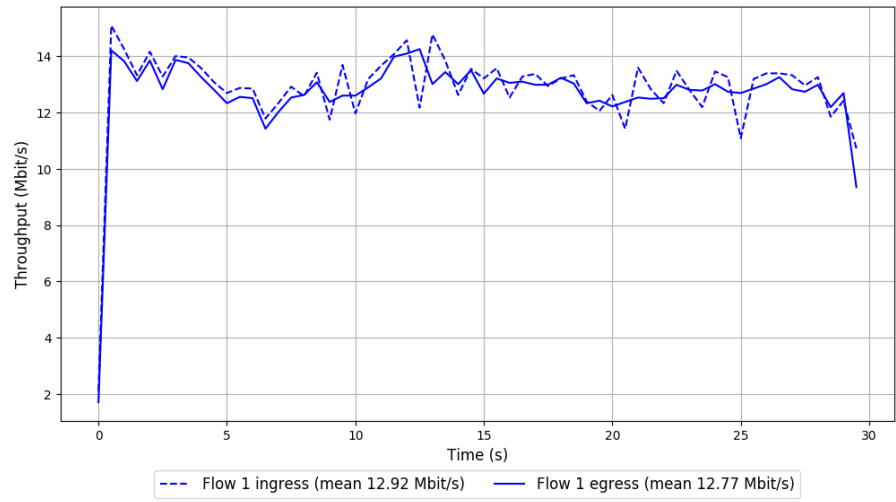
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 12.92 Mbit/s) --- Flow 1 egress (mean 12.77 Mbit/s)
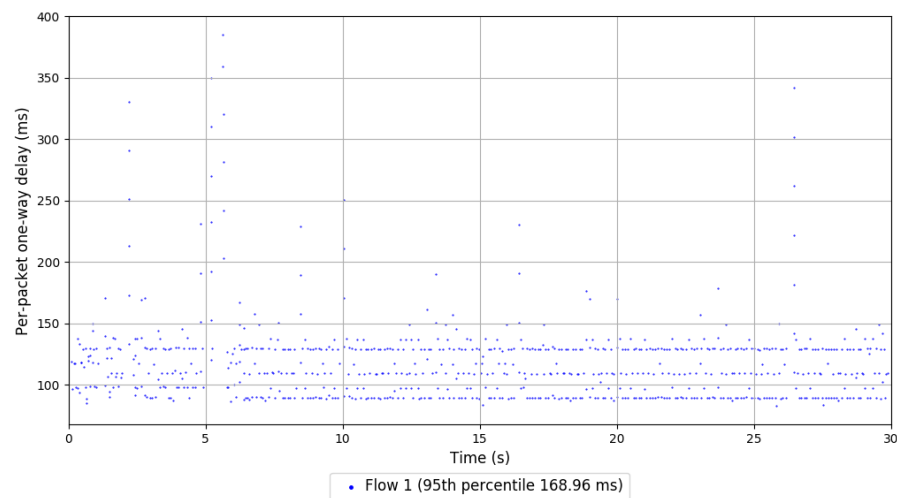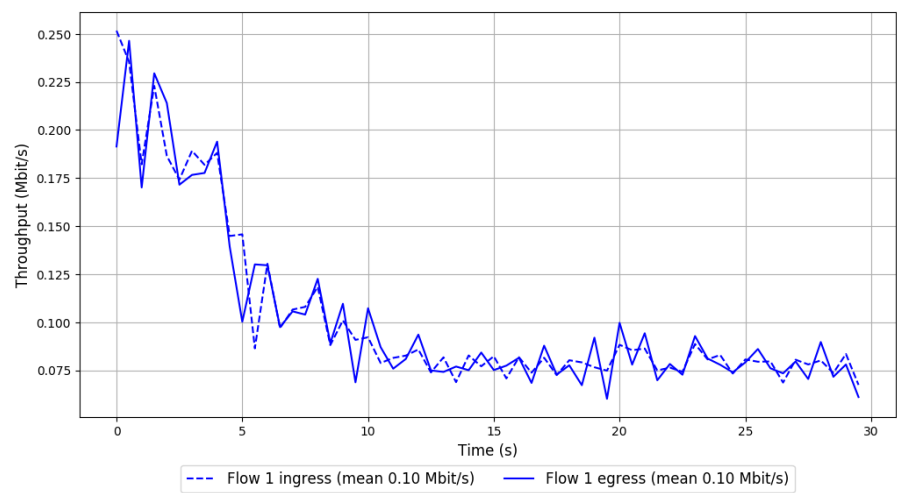

• Flow 1 (95th percentile 259.42 ms)

```
Run 1: Statistics of SCReAM

Start at: 2017-09-22 07:57:20
End at: 2017-09-22 07:57:50
Local clock offset: -1.331 ms
Remote clock offset: -3.042 ms


# Below is generated by plot.py at 2017-09-22 09:25:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 168.955 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 168.955 ms
Loss rate: 0.80%
```

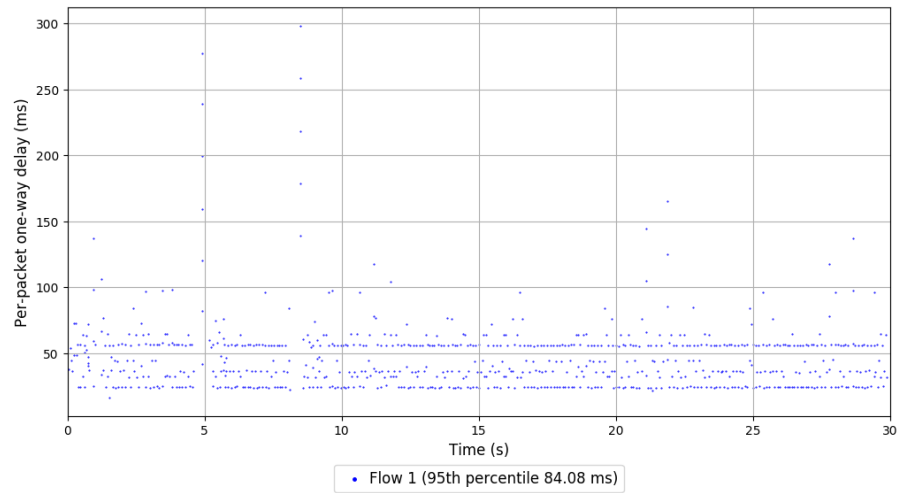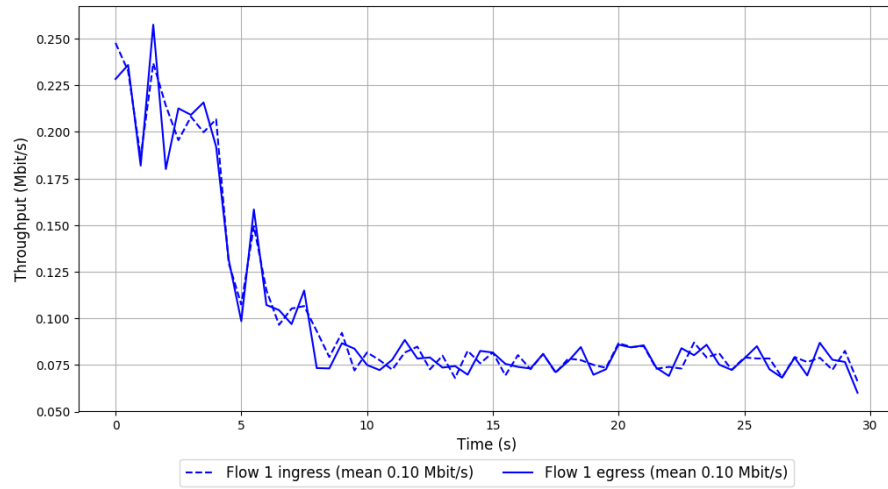Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2017-09-22 08:12:38
End at: 2017-09-22 08:13:08
Local clock offset: -1.418 ms
Remote clock offset: -2.666 ms


# Below is generated by plot.py at 2017-09-22 09:25:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 84.083 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 84.083 ms
Loss rate: 0.73%
```

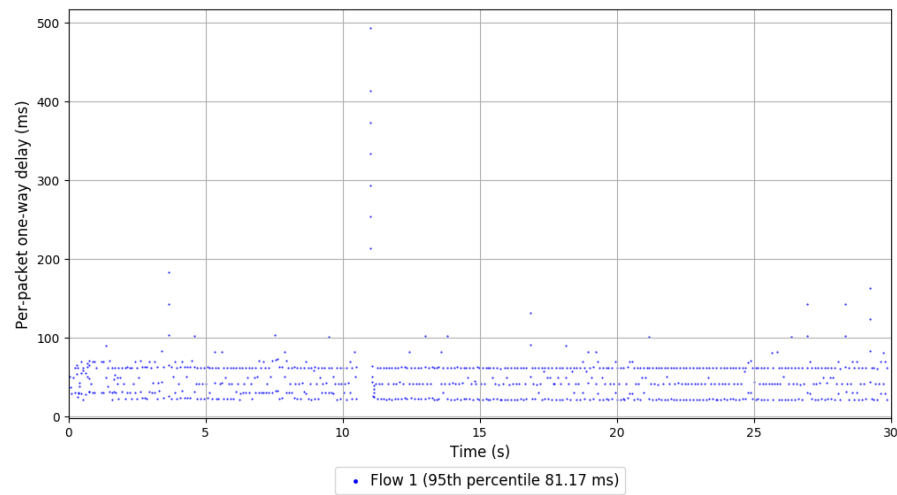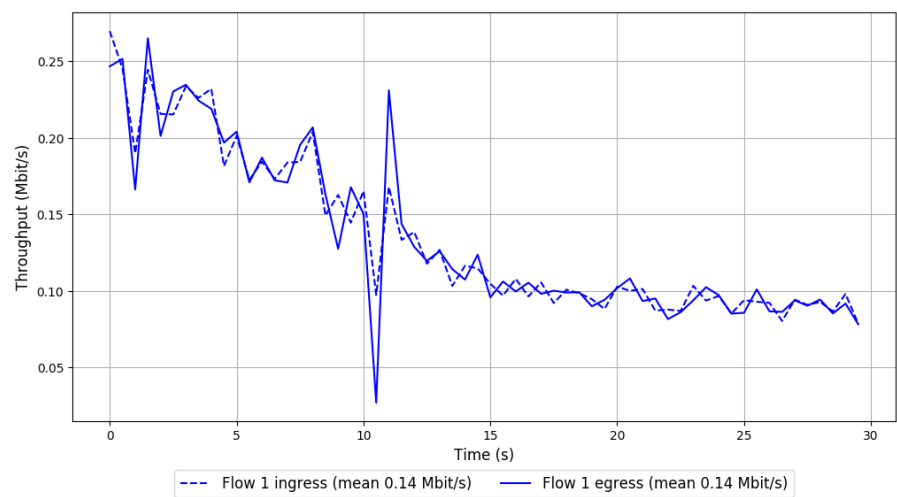Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2017-09-22 08:27:56
End at: 2017-09-22 08:28:26
Local clock offset: -1.556 ms
Remote clock offset: -2.576 ms


# Below is generated by plot.py at 2017-09-22 09:25:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 81.175 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 81.175 ms
Loss rate: 0.33%
```

Run 3: Report of SCReAM — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2017-09-22 08:03:12
End at: 2017-09-22 08:03:42
Local clock offset: -1.378 ms
Remote clock offset: -2.931 ms


# Below is generated by plot.py at 2017-09-22 09:25:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.61 Mbit/s
95th percentile per-packet one-way delay: 144.536 ms
Loss rate: 0.89%
-- Flow 1:
Average throughput: 2.61 Mbit/s
95th percentile per-packet one-way delay: 144.536 ms
Loss rate: 0.89%
```
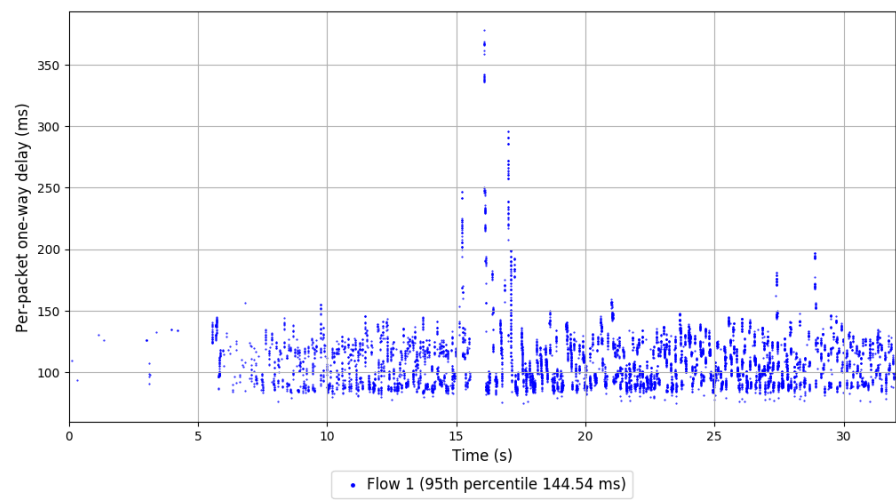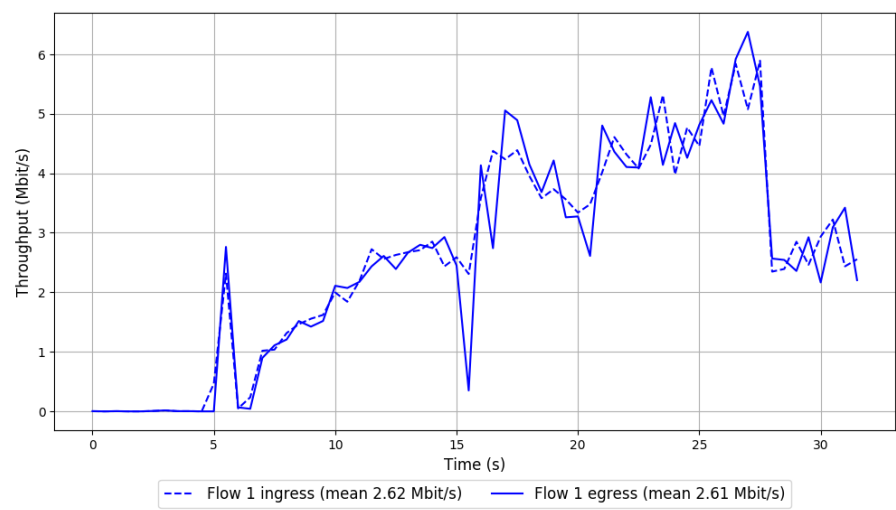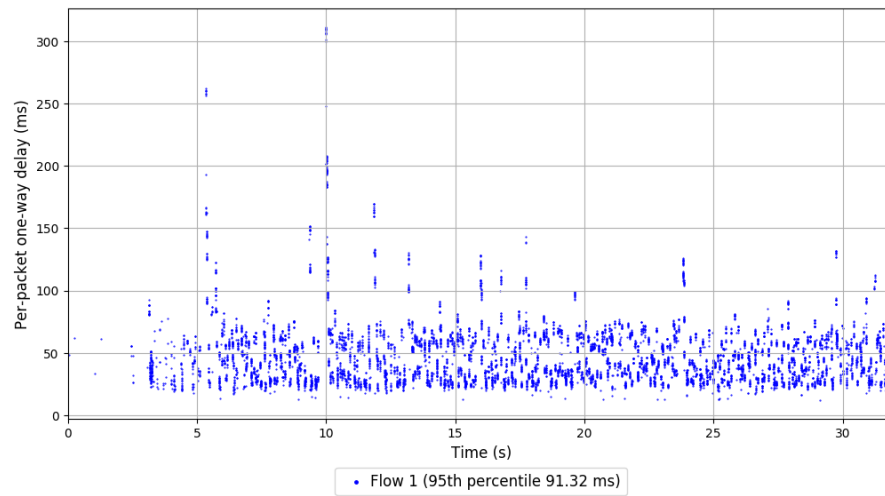
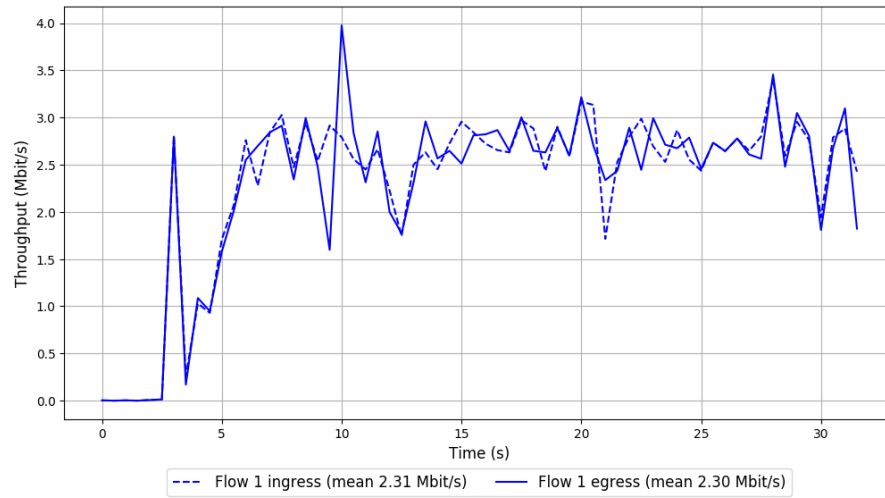Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2017-09-22 08:18:30
End at: 2017-09-22 08:19:00
Local clock offset: -1.42 ms
Remote clock offset: -2.618 ms


# Below is generated by plot.py at 2017-09-22 09:25:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 91.323 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 91.323 ms
Loss rate: 0.57%
```

Run 2: Report of WebRTC media — Data Link

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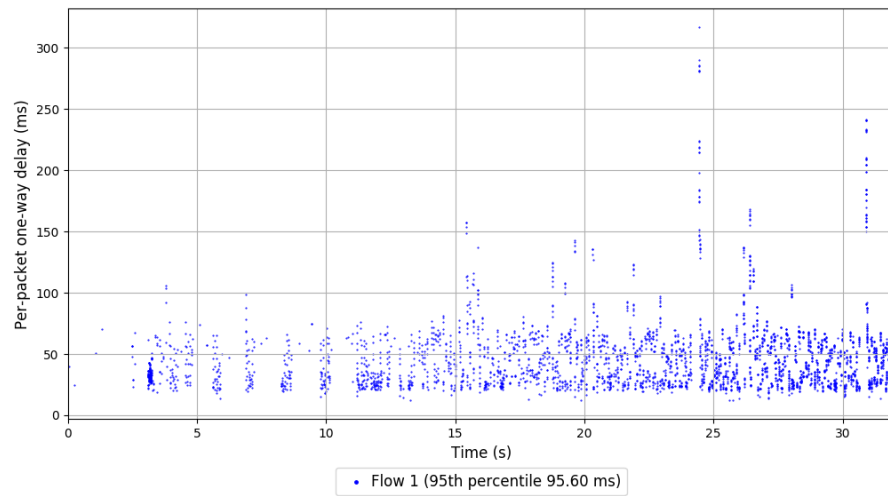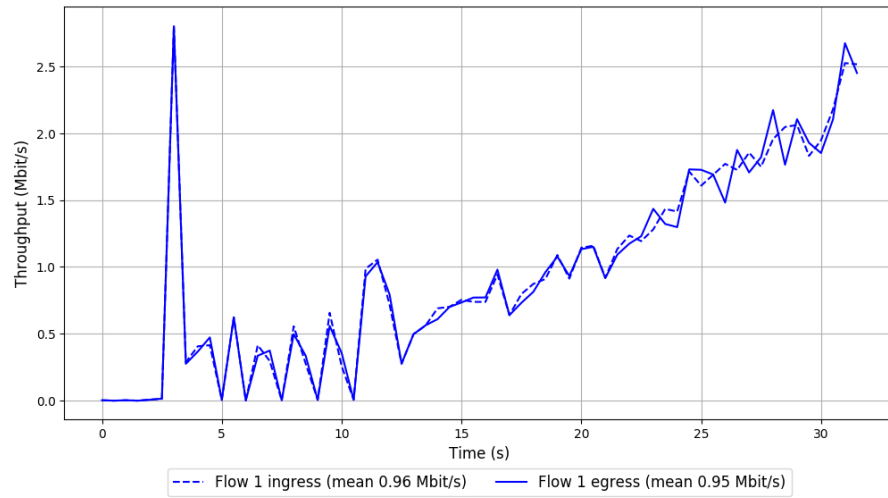

Flow 1 (95th percentile 91.32 ms)

```
Run 3: Statistics of WebRTC media

Start at: 2017-09-22 08:33:48
End at: 2017-09-22 08:34:18
Local clock offset: -1.539 ms
Remote clock offset: -2.542 ms


# Below is generated by plot.py at 2017-09-22 09:25:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 95.601 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 95.601 ms
Loss rate: 0.53%
```

Run 3: Report of WebRTC media — Data Link

```
Run 1: Statistics of Sprout

Start at: 2017-09-22 08:05:34
End at: 2017-09-22 08:06:04
Local clock offset: -1.373 ms
Remote clock offset: -2.786 ms


# Below is generated by plot.py at 2017-09-22 09:25:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 153.259 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 153.259 ms
Loss rate: 1.51%
```
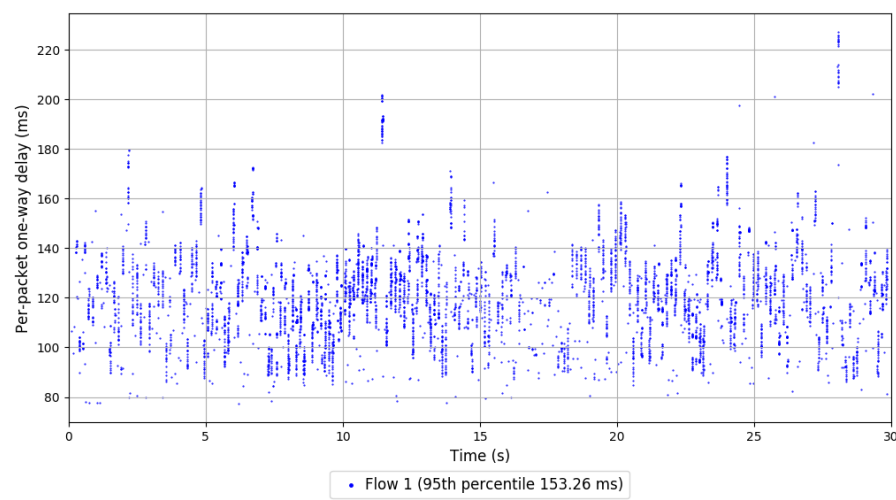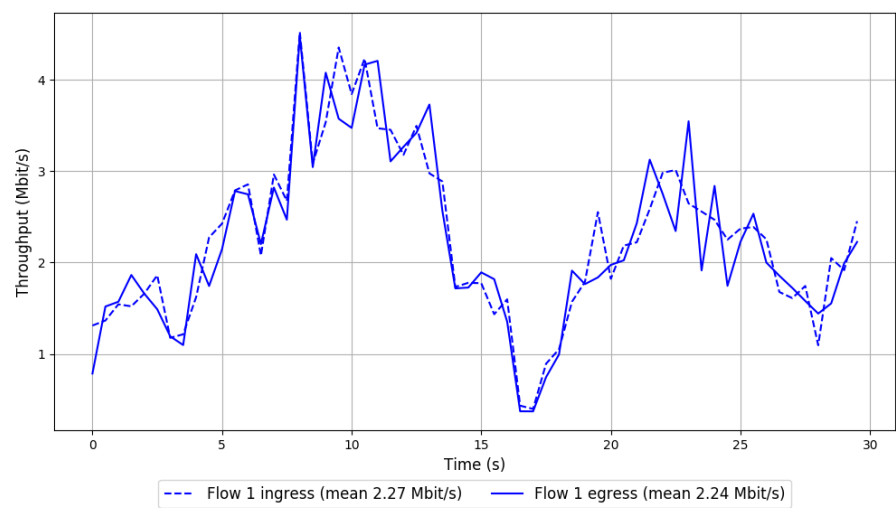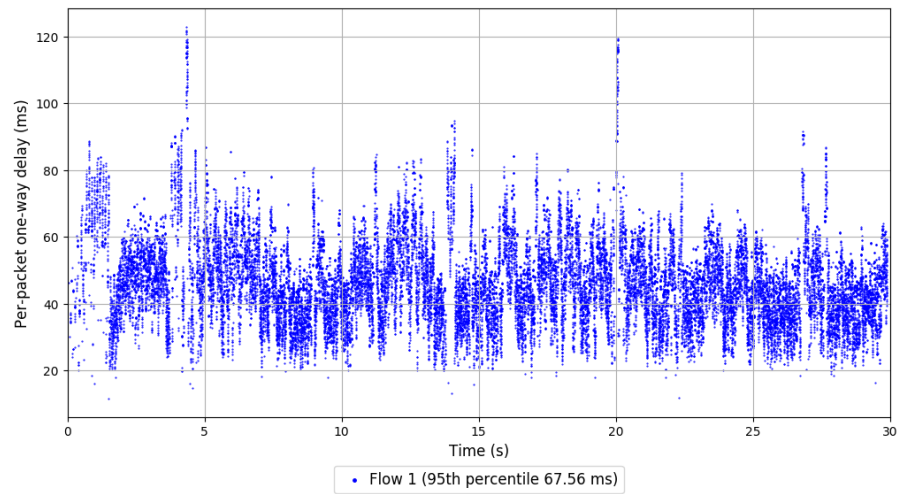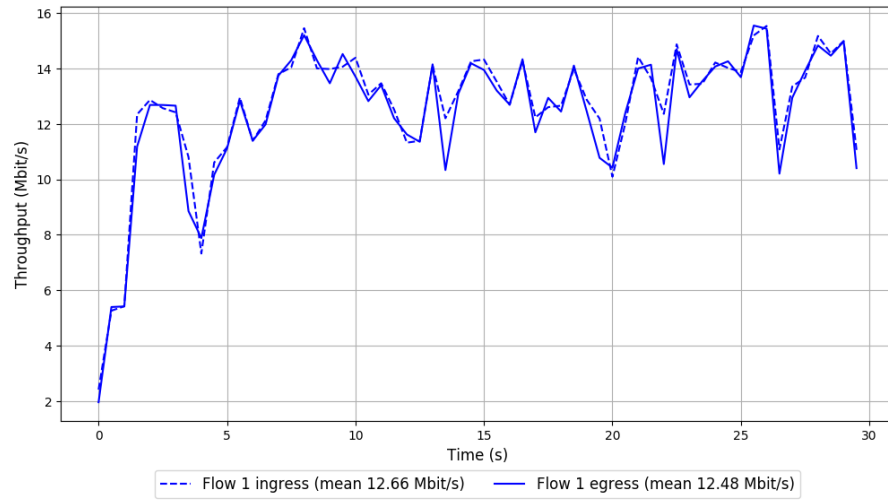
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2017-09-22 08:20:51
End at: 2017-09-22 08:21:21
Local clock offset: -1.532 ms
Remote clock offset: -2.515 ms


# Below is generated by plot.py at 2017-09-22 09:26:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.48 Mbit/s
95th percentile per-packet one-way delay: 67.557 ms
Loss rate: 1.67%
-- Flow 1:
Average throughput: 12.48 Mbit/s
95th percentile per-packet one-way delay: 67.557 ms
Loss rate: 1.67%
```
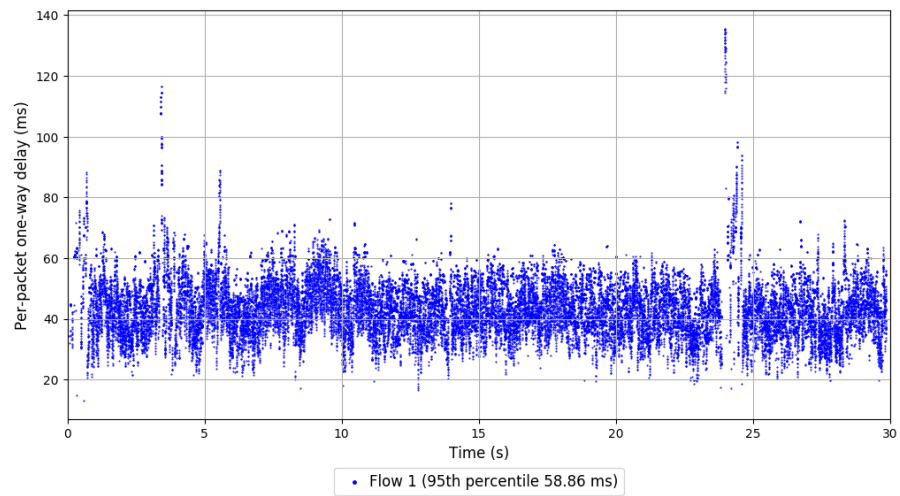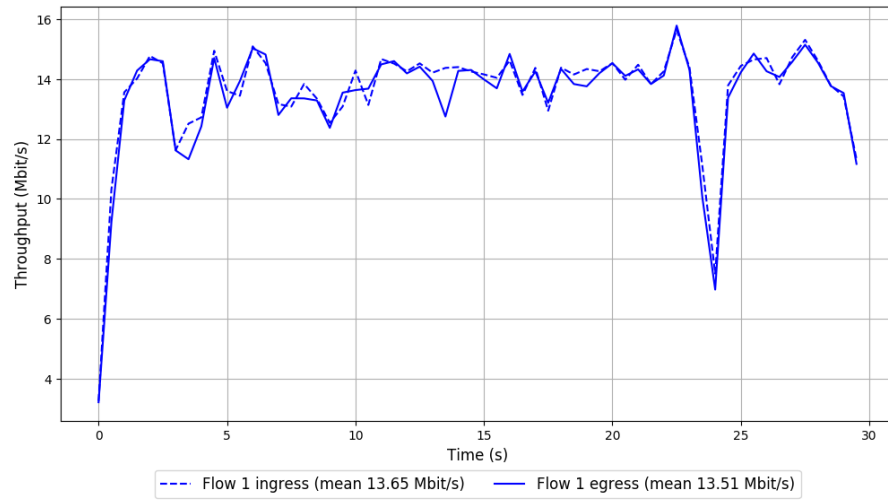
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2017-09-22 08:36:09
End at: 2017-09-22 08:36:39
Local clock offset: -1.552 ms
Remote clock offset: -2.611 ms


# Below is generated by plot.py at 2017-09-22 09:26:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.51 Mbit/s
95th percentile per-packet one-way delay: 58.861 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 13.51 Mbit/s
95th percentile per-packet one-way delay: 58.861 ms
Loss rate: 1.13%
```

Run 3: Report of Sprout — Data Link

Flow 1 ingress (mean 13.65 Mbit/s)   Flow 1 egress (mean 13.51 Mbit/s)

Flow 1 (95th percentile 58.86 ms)

51

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

Start at: 2017-09-22 08:04:23
End at: 2017-09-22 08:04:53
Local clock offset: -1.469 ms
Remote clock offset: -2.919 ms

# Below is generated by plot.py at 2017-09-22 09:26:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.57 Mbit/s
95th percentile per-packet one-way delay: 132.903 ms
Loss rate: 0.85%
-- Flow 1:
Average throughput: 8.57 Mbit/s
95th percentile per-packet one-way delay: 132.903 ms
Loss rate: 0.85%
```
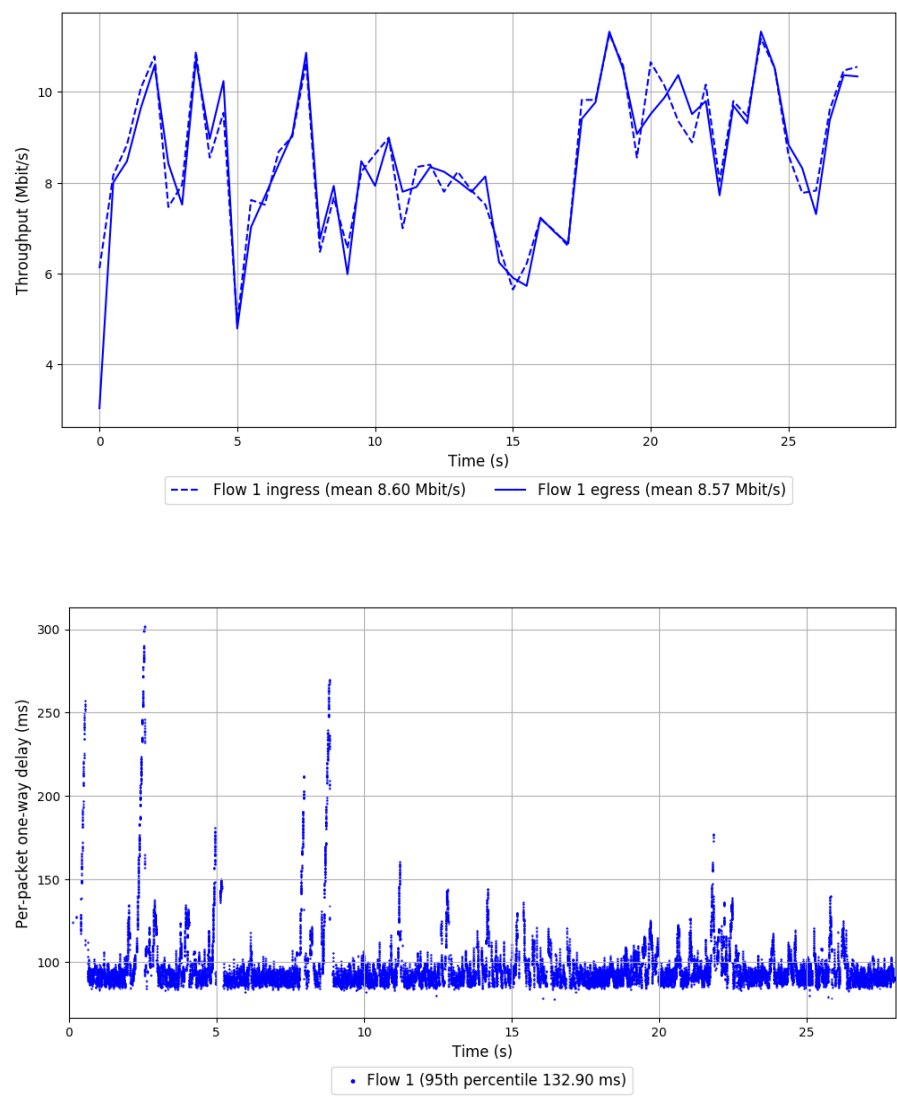
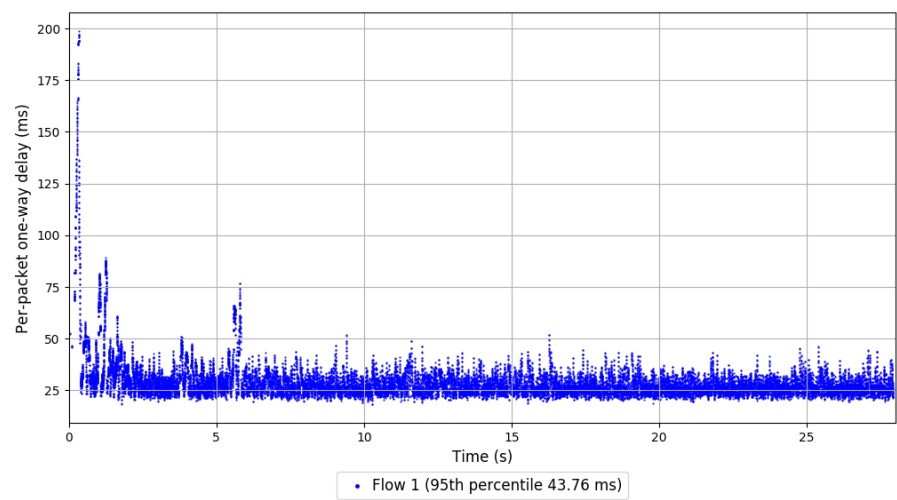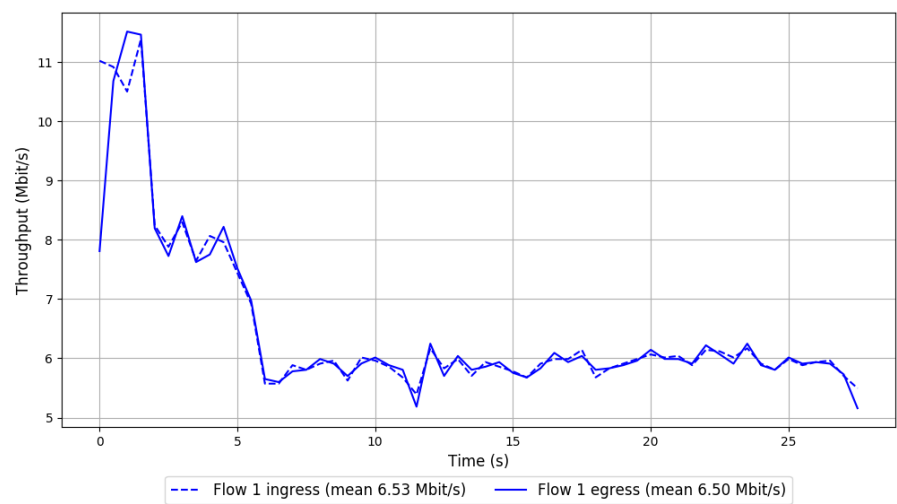Run 1: Report of TaoVA-100x — Data Link

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

Start at: 2017-09-22 08:19:40
End at: 2017-09-22 08:20:10
Local clock offset: -1.439 ms
Remote clock offset: -2.613 ms


# Below is generated by plot.py at 2017-09-22 09:26:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.50 Mbit/s
95th percentile per-packet one-way delay: 43.757 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 6.50 Mbit/s
95th percentile per-packet one-way delay: 43.757 ms
Loss rate: 0.74%
```

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

Flow 1 ingress (mean 6.53 Mbit/s) --- Flow 1 egress (mean 6.50 Mbit/s)

• Flow 1 (95th percentile 43.76 ms)

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

Start at: 2017-09-22 08:34:58
End at: 2017-09-22 08:35:28
Local clock offset: -1.552 ms
Remote clock offset: -2.626 ms


# Below is generated by plot.py at 2017-09-22 09:26:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.10 Mbit/s
95th percentile per-packet one-way delay: 39.063 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 9.10 Mbit/s
95th percentile per-packet one-way delay: 39.063 ms
Loss rate: 0.25%
```
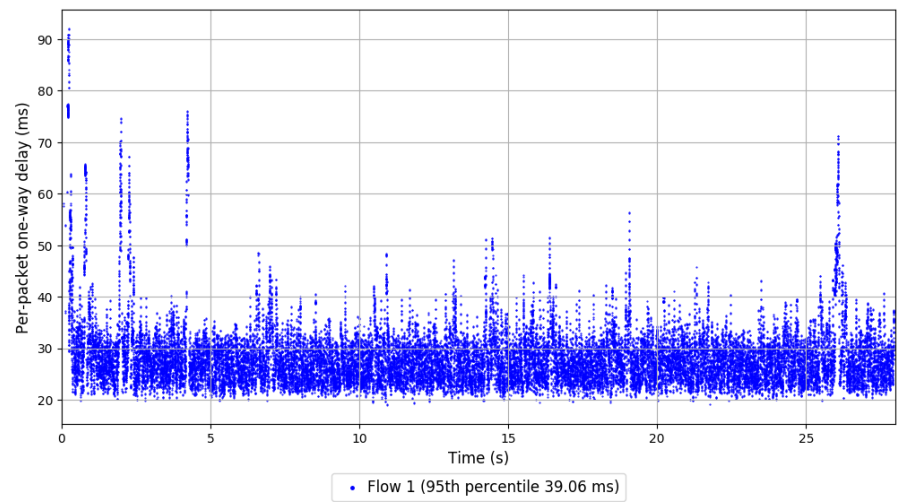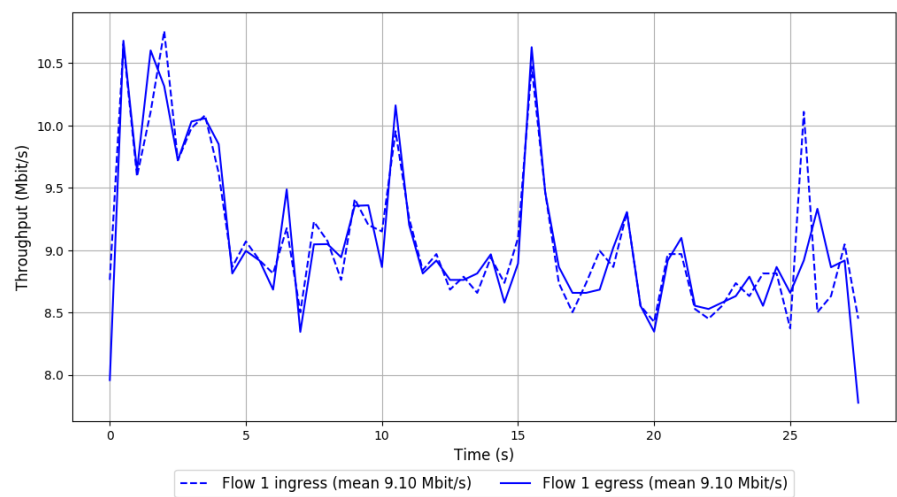
Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 9.10 Mbit/s) --- Flow 1 egress (mean 9.10 Mbit/s)
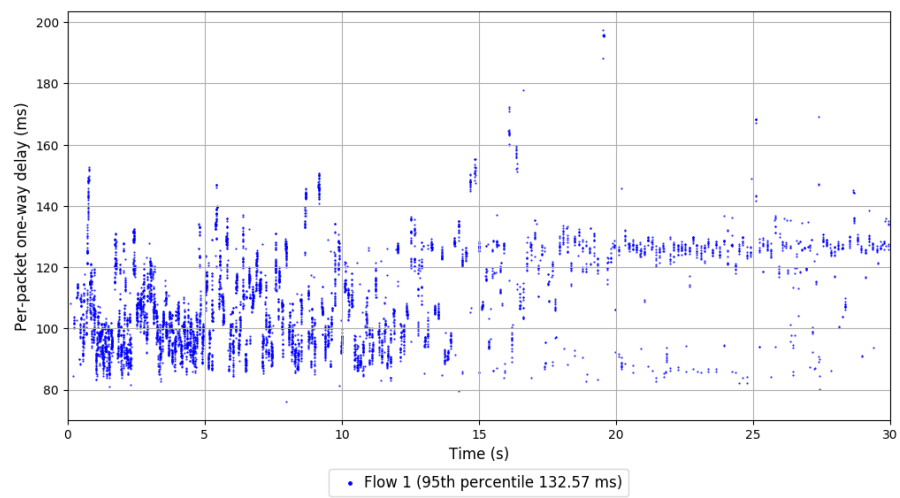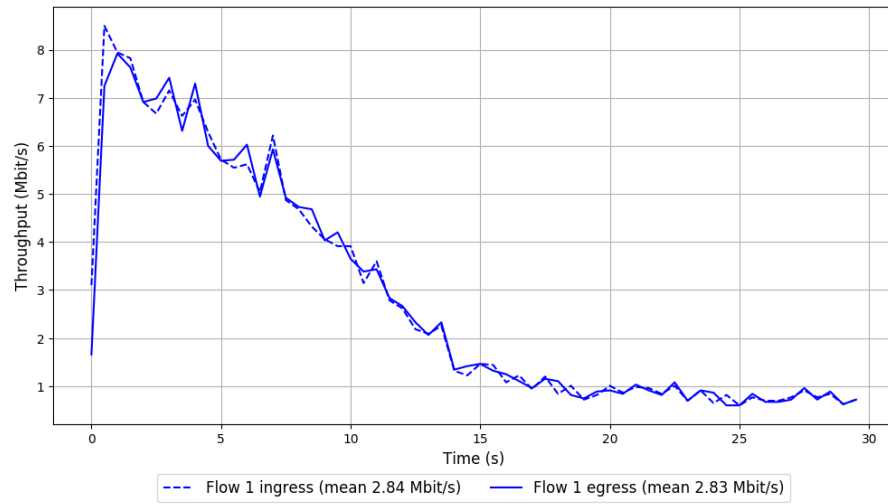

Flow 1 (95th percentile 39.06 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2017-09-22 08:02:02
End at: 2017-09-22 08:02:32
Local clock offset: -1.366 ms
Remote clock offset: -2.955 ms


# Below is generated by plot.py at 2017-09-22 09:26:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.83 Mbit/s
95th percentile per-packet one-way delay: 132.567 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 2.83 Mbit/s
95th percentile per-packet one-way delay: 132.567 ms
Loss rate: 0.81%
```

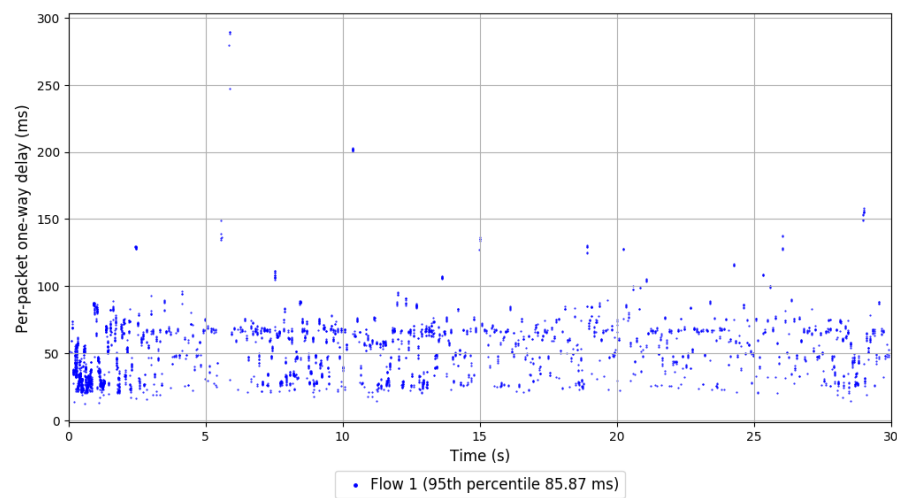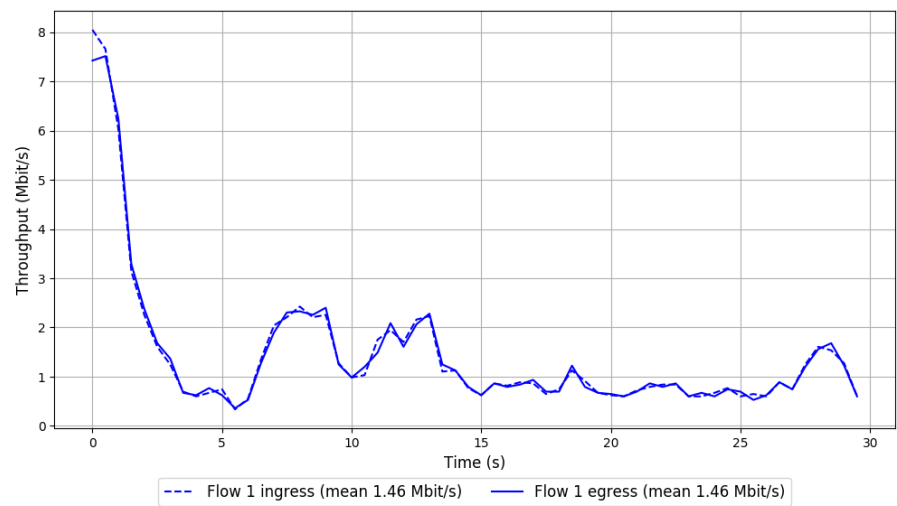Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2017-09-22 08:17:20
End at: 2017-09-22 08:17:50
Local clock offset: -1.525 ms
Remote clock offset: -2.582 ms


# Below is generated by plot.py at 2017-09-22 09:26:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 85.874 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 85.874 ms
Loss rate: 0.11%
```

Run 2: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 1.46 Mbit/s) ---- Flow 1 egress (mean 1.46 Mbit/s) ——
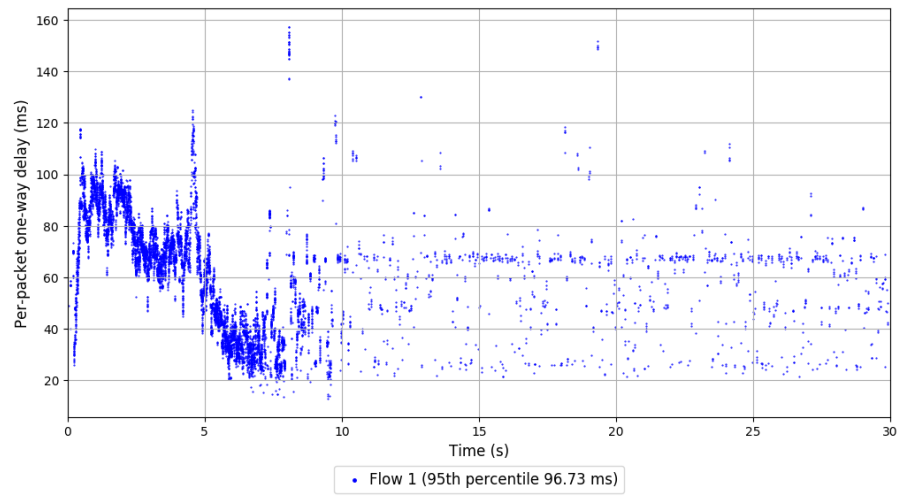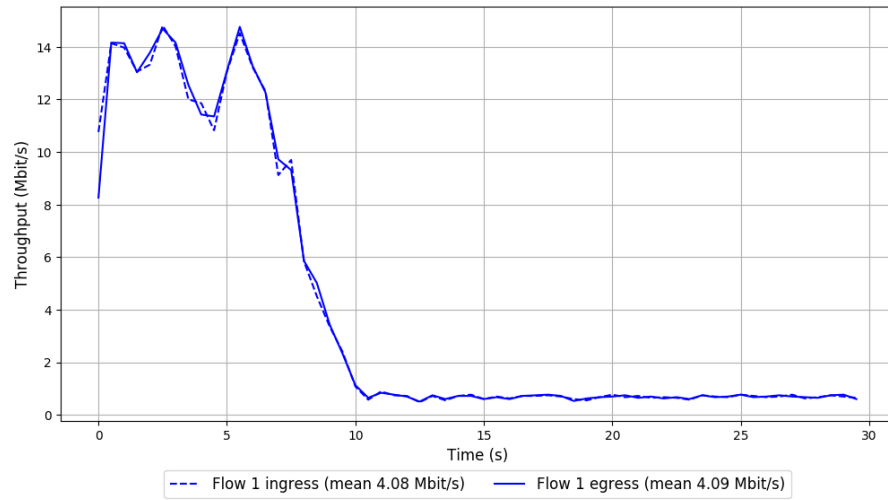

Flow 1 (95th percentile 85.87 ms)

```
Run 3: Statistics of TCP Vegas

Start at: 2017-09-22 08:32:37
End at: 2017-09-22 08:33:07
Local clock offset: -1.469 ms
Remote clock offset: -2.529 ms


# Below is generated by plot.py at 2017-09-22 09:26:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.09 Mbit/s
95th percentile per-packet one-way delay: 96.726 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 4.09 Mbit/s
95th percentile per-packet one-way delay: 96.726 ms
Loss rate: 0.03%
```

Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 4.08 Mbit/s) Flow 1 egress (mean 4.09 Mbit/s)
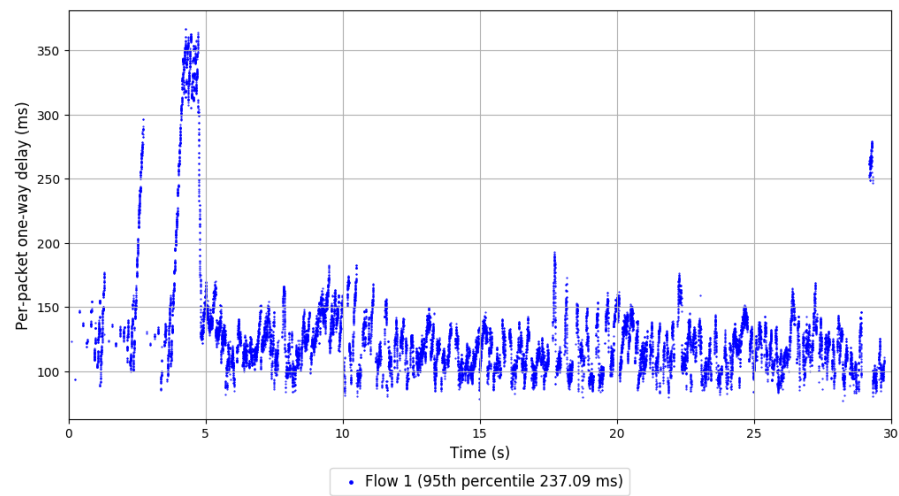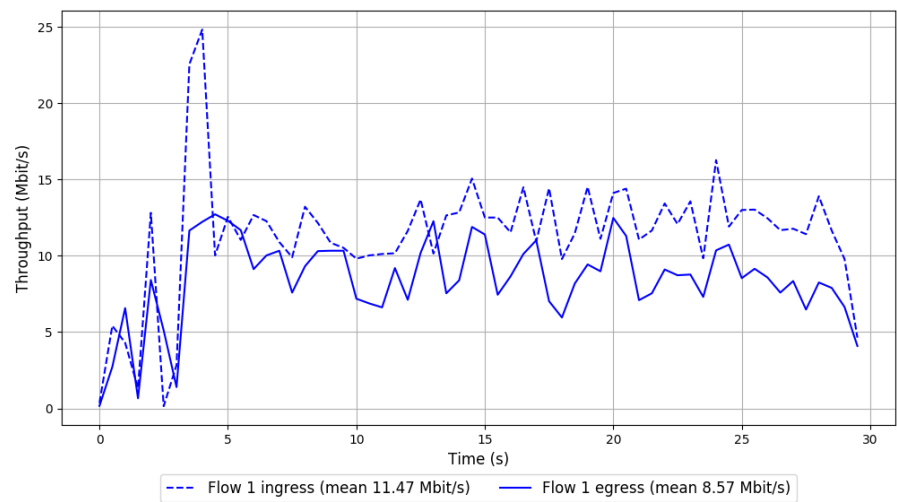

Flow 1 (95th percentile 96.73 ms)

```
Run 1: Statistics of Verus

Start at: 2017-09-22 08:06:44
End at: 2017-09-22 08:07:14
Local clock offset: -1.5 ms
Remote clock offset: -2.838 ms


# Below is generated by plot.py at 2017-09-22 09:26:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.57 Mbit/s
95th percentile per-packet one-way delay: 237.094 ms
Loss rate: 25.57%
-- Flow 1:
Average throughput: 8.57 Mbit/s
95th percentile per-packet one-way delay: 237.094 ms
Loss rate: 25.57%
```

Run 1: Report of Verus — Data Link

Flow 1 ingress (mean 11.47 Mbit/s) — — — Flow 1 egress (mean 8.57 Mbit/s)

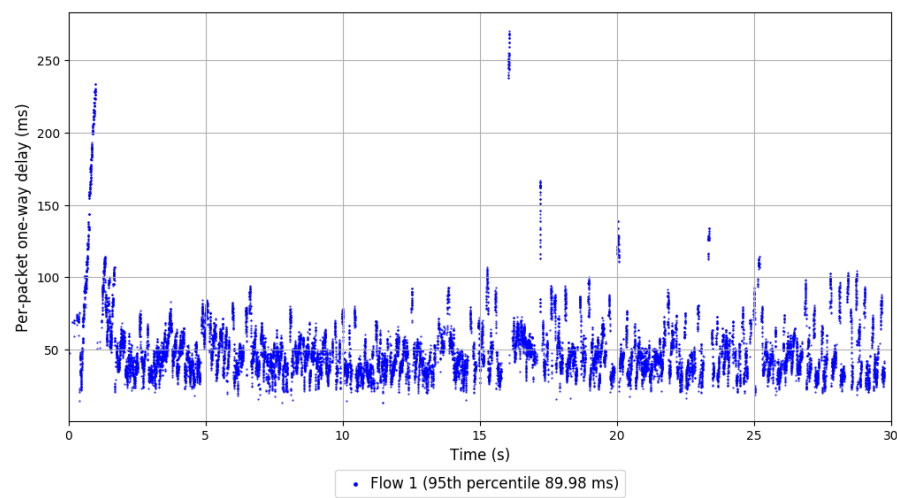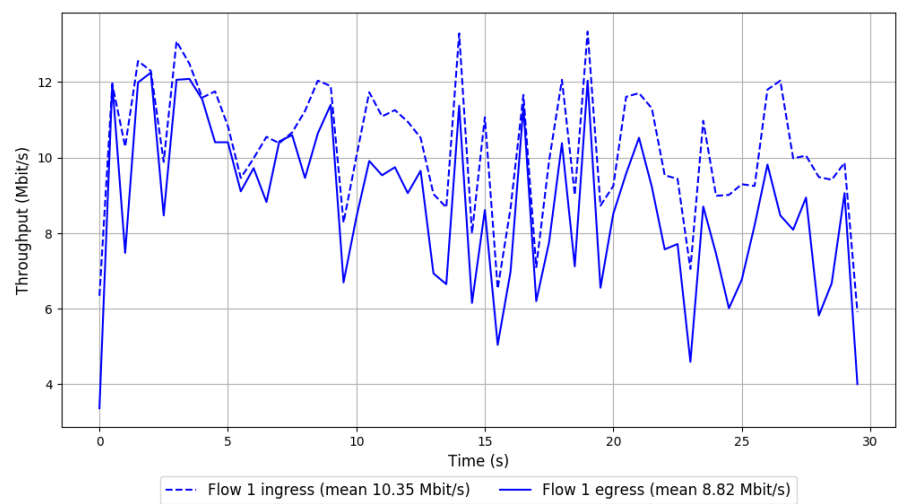
• Flow 1 (95th percentile 237.09 ms)

```
Run 2: Statistics of Verus

Start at: 2017-09-22 08:22:02
End at: 2017-09-22 08:22:32
Local clock offset: -1.436 ms
Remote clock offset: -2.556 ms


# Below is generated by plot.py at 2017-09-22 09:26:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.82 Mbit/s
95th percentile per-packet one-way delay: 89.976 ms
Loss rate: 14.95%
-- Flow 1:
Average throughput: 8.82 Mbit/s
95th percentile per-packet one-way delay: 89.976 ms
Loss rate: 14.95%
```
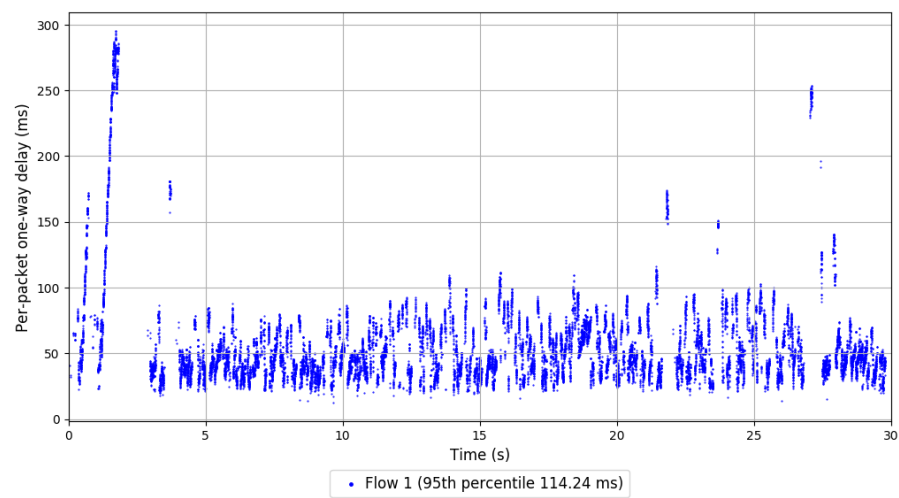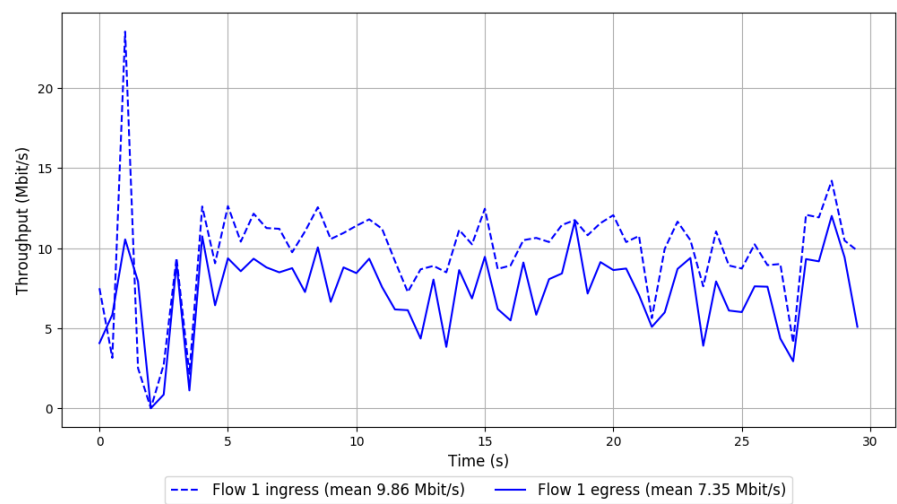
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2017-09-22 08:37:20
End at: 2017-09-22 08:37:50
Local clock offset: -1.464 ms
Remote clock offset: -2.613 ms


# Below is generated by plot.py at 2017-09-22 09:26:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.35 Mbit/s
95th percentile per-packet one-way delay: 114.243 ms
Loss rate: 25.67%
-- Flow 1:
Average throughput: 7.35 Mbit/s
95th percentile per-packet one-way delay: 114.243 ms
Loss rate: 25.67%
```

Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 9.86 Mbit/s) --- Flow 1 egress (mean 7.35 Mbit/s)

• Flow 1 (95th percentile 114.24 ms)

```
Run 1: Statistics of Indigo

Start at: 2017-09-22 08:00:52
End at: 2017-09-22 08:01:22
Local clock offset: -1.466 ms
Remote clock offset: -2.932 ms

# Below is generated by plot.py at 2017-09-22 09:26:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.31 Mbit/s
95th percentile per-packet one-way delay: 132.924 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 3.31 Mbit/s
95th percentile per-packet one-way delay: 132.924 ms
Loss rate: 0.28%
```
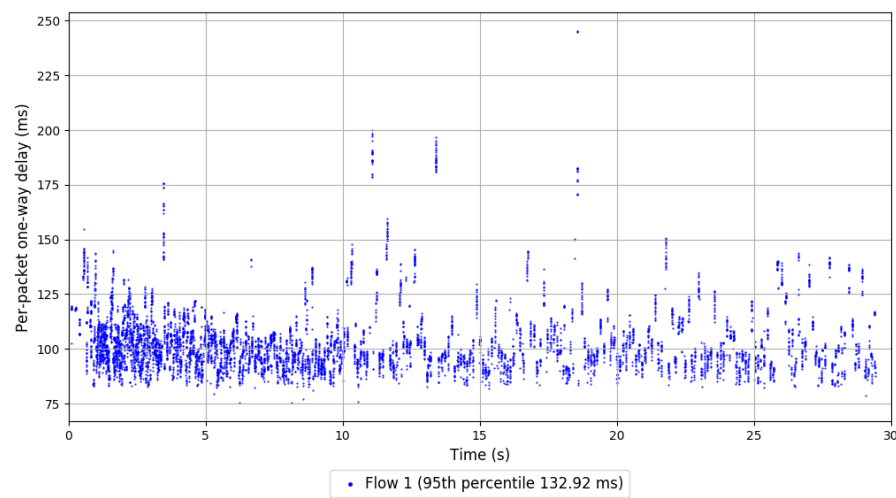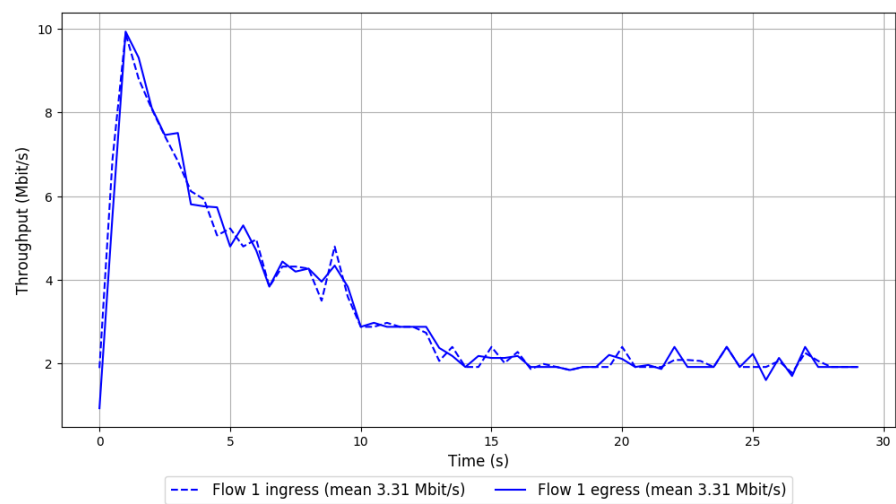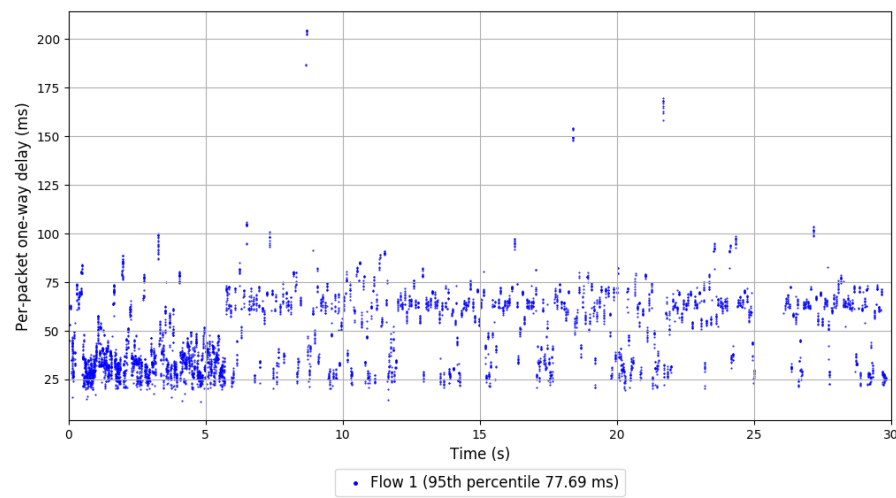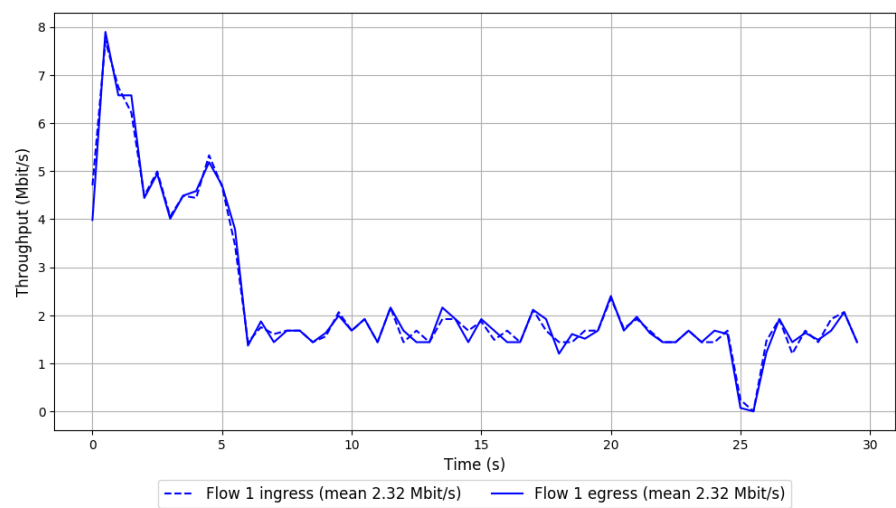
Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2017-09-22 08:16:10
End at: 2017-09-22 08:16:40
Local clock offset: -1.502 ms
Remote clock offset: -2.565 ms


# Below is generated by plot.py at 2017-09-22 09:26:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 77.693 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 77.693 ms
Loss rate: 0.35%
```
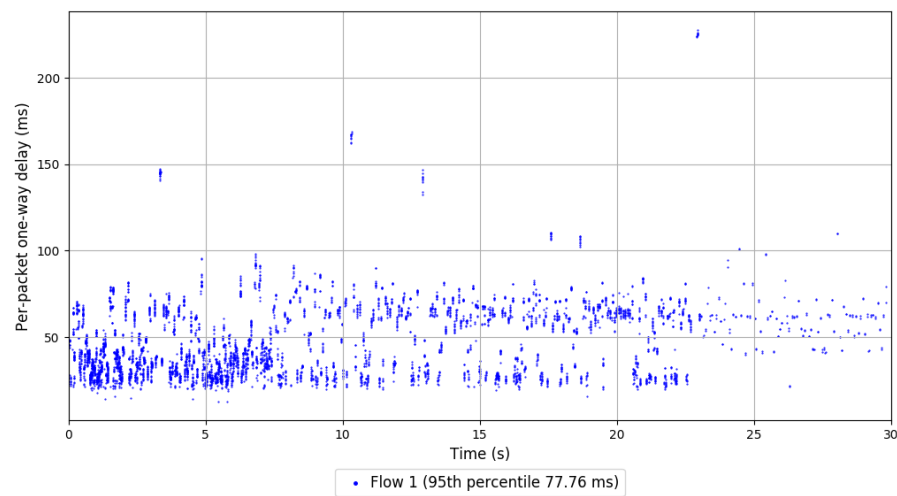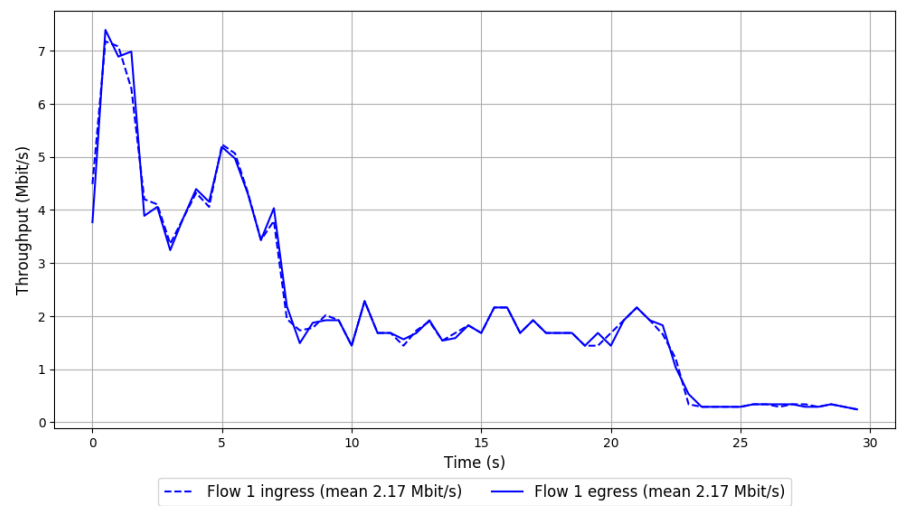
Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2017-09-22 08:31:27
End at: 2017-09-22 08:31:57
Local clock offset: -1.436 ms
Remote clock offset: -2.601 ms


# Below is generated by plot.py at 2017-09-22 09:26:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.17 Mbit/s
95th percentile per-packet one-way delay: 77.762 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 2.17 Mbit/s
95th percentile per-packet one-way delay: 77.762 ms
Loss rate: 0.04%
```

Run 3: Report of Indigo — Data Link

Flow 1 ingress (mean 2.17 Mbit/s)   ——— Flow 1 egress (mean 2.17 Mbit/s)

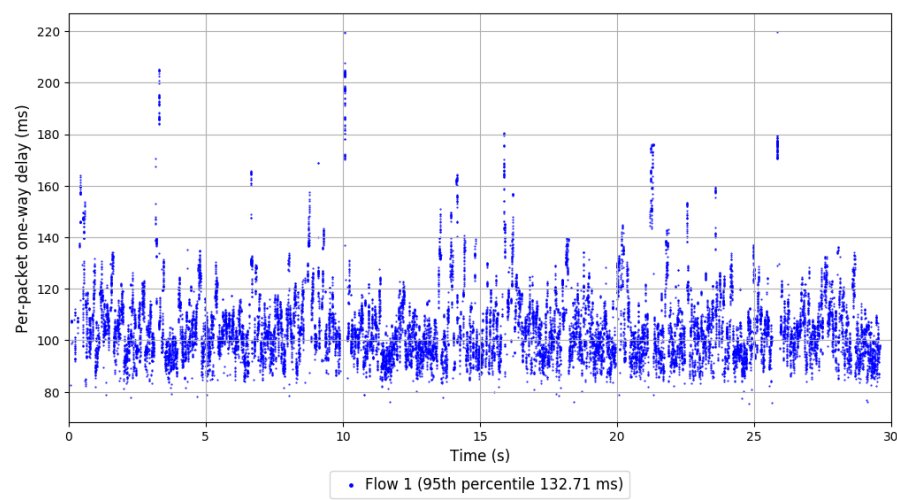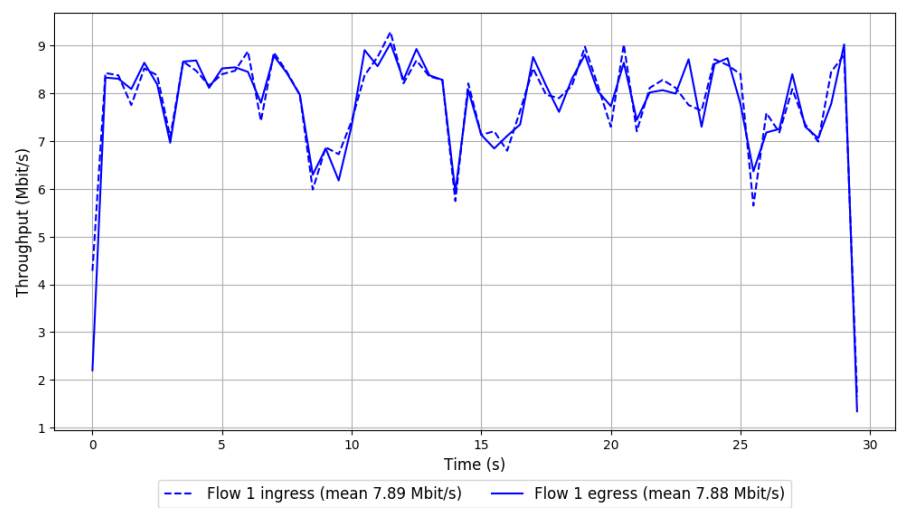

• Flow 1 (95th percentile 77.76 ms)

```
Run 1: Statistics of Indigo-cellular

Start at: 2017-09-22 07:59:41
End at: 2017-09-22 08:00:11
Local clock offset: -1.358 ms
Remote clock offset: -2.999 ms


# Below is generated by plot.py at 2017-09-22 09:26:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.88 Mbit/s
95th percentile per-packet one-way delay: 132.710 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 7.88 Mbit/s
95th percentile per-packet one-way delay: 132.710 ms
Loss rate: 0.48%
```

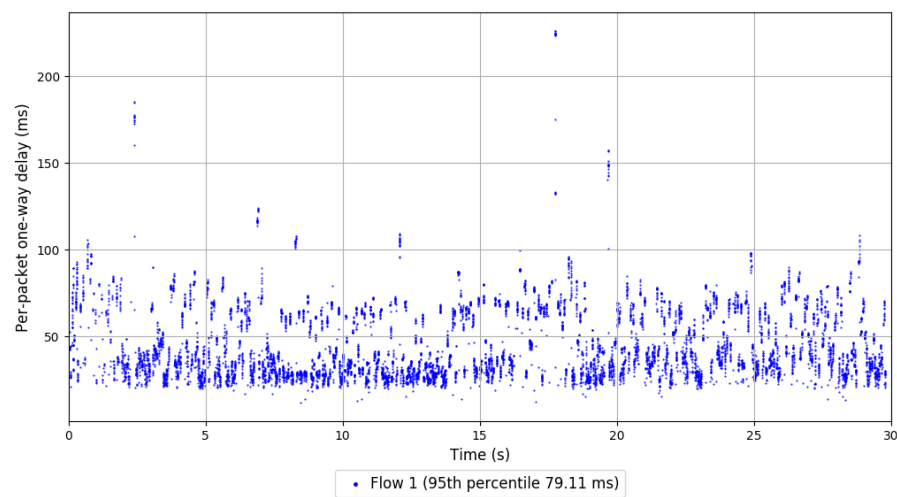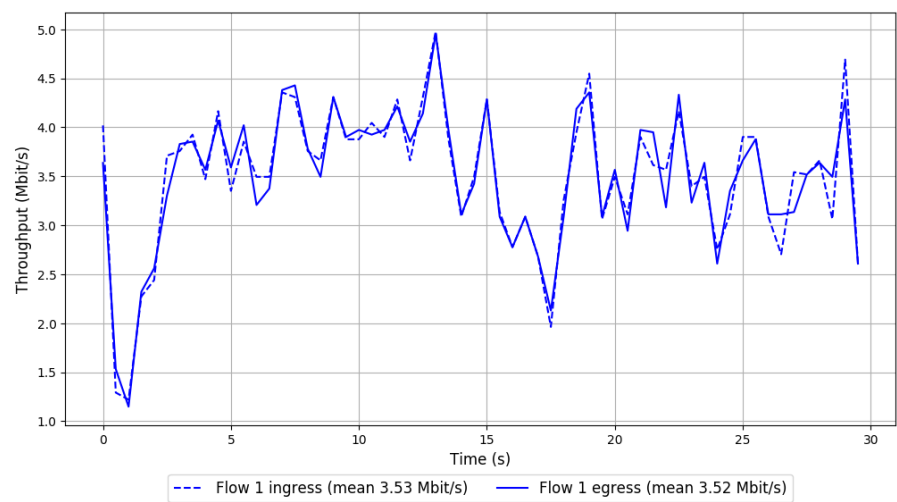Run 1: Report of Indigo-cellular — Data Link

```
Run 2: Statistics of Indigo-cellular

Start at: 2017-09-22 08:14:59
End at: 2017-09-22 08:15:29
Local clock offset: -1.499 ms
Remote clock offset: -2.573 ms


# Below is generated by plot.py at 2017-09-22 09:26:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.52 Mbit/s
95th percentile per-packet one-way delay: 79.111 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 3.52 Mbit/s
95th percentile per-packet one-way delay: 79.111 ms
Loss rate: 0.22%
```

Run 2: Report of Indigo-cellular — Data Link

Flow 1 ingress (mean 3.53 Mbit/s)   Flow 1 egress (mean 3.52 Mbit/s)

Flow 1 (95th percentile 79.11 ms)

```
Run 3: Statistics of Indigo-cellular

Start at: 2017-09-22 08:30:16
End at: 2017-09-22 08:30:46
Local clock offset: -1.469 ms
Remote clock offset: -2.509 ms


# Below is generated by plot.py at 2017-09-22 09:26:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.46 Mbit/s
95th percentile per-packet one-way delay: 53.039 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 9.46 Mbit/s
95th percentile per-packet one-way delay: 53.039 ms
Loss rate: 0.20%
```

Run 3: Report of Indigo-cellular — Data Link

Flow 1 ingress (mean 9.46 Mbit/s) --- Flow 1 egress (mean 9.46 Mbit/s)

Flow 1 (95th percentile 53.04 ms)