Pantheon Report

Generated at 2018-10-02 10:03:39 (UTC).

Data path: AWS California 1 on ens5 (*local*) →Stanford on eno1 (*remote*).

Repeated the test of 18 congestion control schemes 5 times.

Each test lasted for 30 seconds running 1 flow.

NTP offsets were measured against `time.stanford.edu` and have been applied to correct the timestamps in logs.
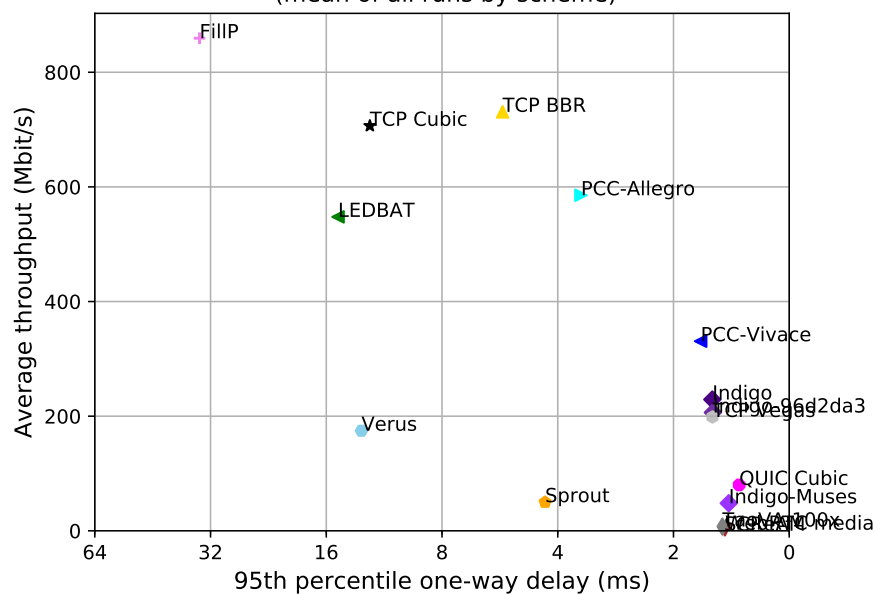
```
System info:
Linux 4.15.0-1021-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912

Git summary:
branch: muses @ 2e19c0464530faa92c63f8217c9971438a26a3be
third_party/fillp @ 5332fc9127c63565e13f4933b336c02d1aabdac6
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-96d2da3 @ 8413272d46f8aa0bcb967ed7048b6a8f994abb95
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
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/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
 M src/ScreamClient
 M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
 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/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
```
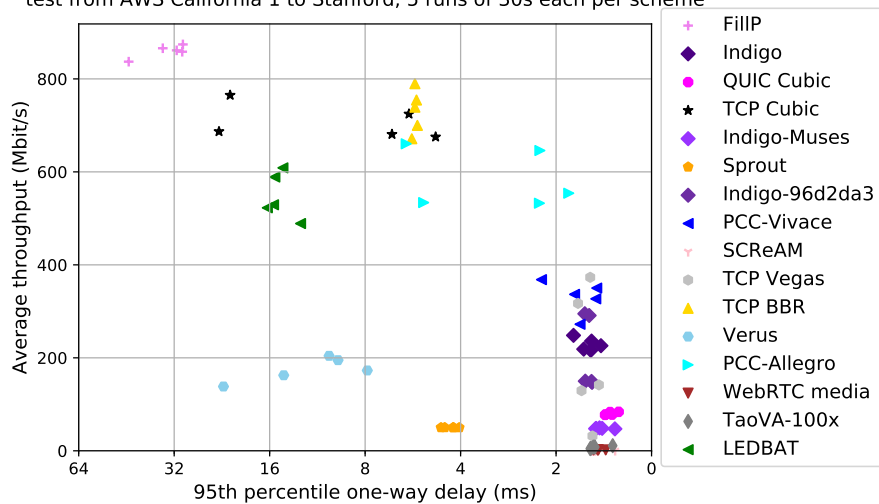
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851

test from AWS California 1 to Stanford, 5 runs of 30s each per scheme
(mean of all runs by scheme)

test from AWS California 1 to Stanford, 5 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	5	730.93	5.57	0.08
Copa	0	N/A	N/A	N/A
TCP Cubic	5	706.51	12.33	0.06
FillP	5	859.40	34.18	4.85
Indigo	5	229.05	1.33	0.02
Indigo-96d2da3	5	206.43	1.32	0.03
LEDBAT	5	547.66	14.91	0.06
Indigo-Muses	5	48.13	1.04	0.02
PCC-Allegro	5	585.39	3.48	0.11
PCC-Expr	0	N/A	N/A	N/A
QUIC Cubic	5	80.08	0.86	0.01
SCReAM	5	0.21	1.13	0.06
Sprout	5	50.01	4.32	0.08
TaoVA-100x	5	7.45	1.16	39.02
TCP Vegas	5	198.64	1.33	0.04
Verus	5	174.58	12.96	1.37
PCC-Vivace	5	330.77	1.53	0.04
WebRTC media	5	1.94	1.11	0.02

```
Run 1: Statistics of TCP BBR

Start at: 2018-10-02 07:28:49
End at: 2018-10-02 07:29:19
Local clock offset: 4.823 ms
Remote clock offset: -0.119 ms

# Below is generated by plot.py at 2018-10-02 09:34:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 671.27 Mbit/s
95th percentile per-packet one-way delay: 5.701 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 671.27 Mbit/s
95th percentile per-packet one-way delay: 5.701 ms
Loss rate: 0.10%
```
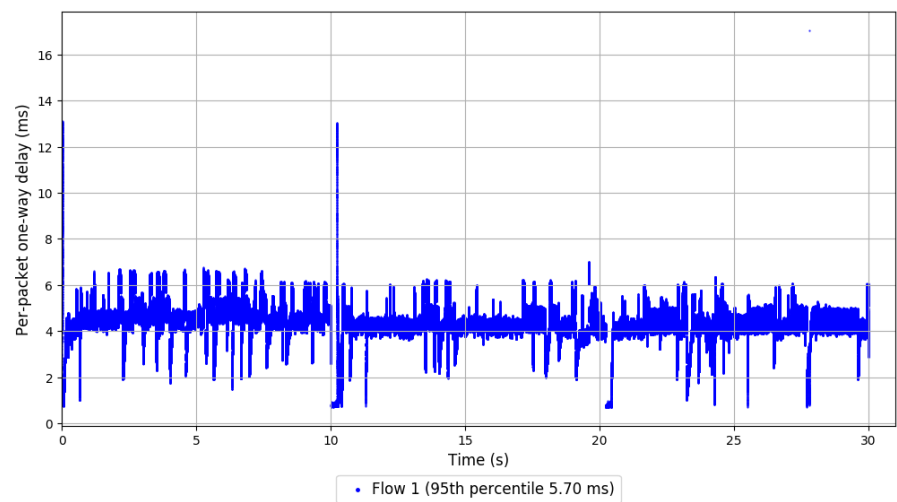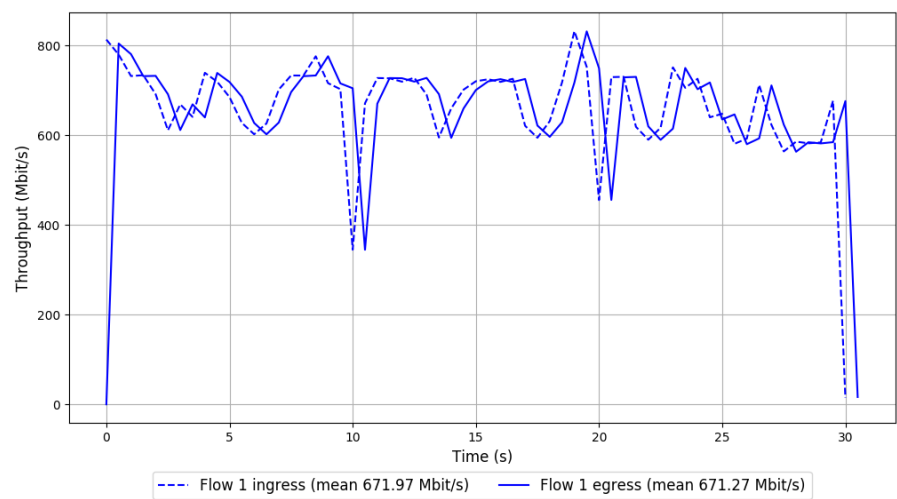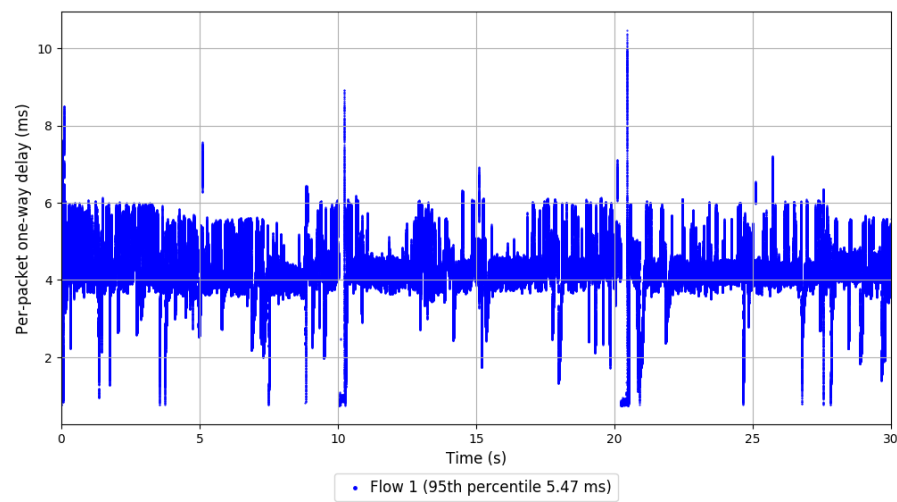
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2018-10-02 07:54:42
End at: 2018-10-02 07:55:12
Local clock offset: 3.708 ms
Remote clock offset: -0.597 ms


# Below is generated by plot.py at 2018-10-02 09:34:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 699.97 Mbit/s
95th percentile per-packet one-way delay: 5.474 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 699.97 Mbit/s
95th percentile per-packet one-way delay: 5.474 ms
Loss rate: 0.07%
```
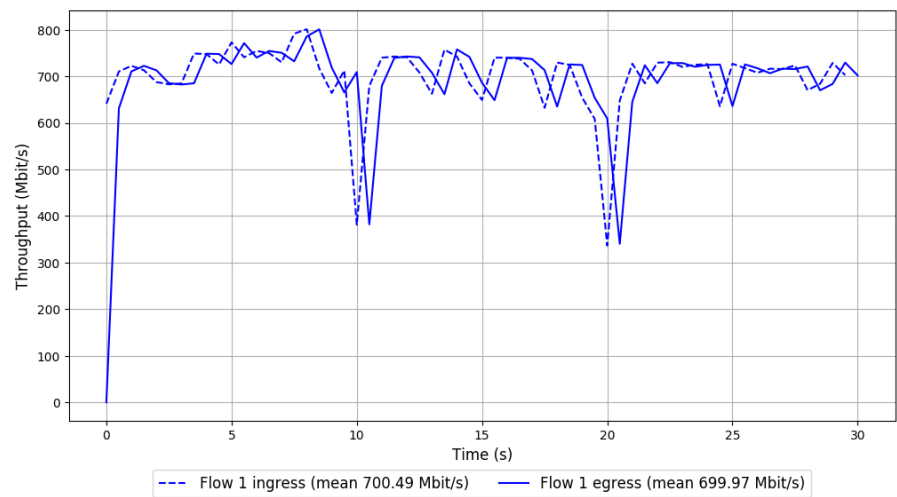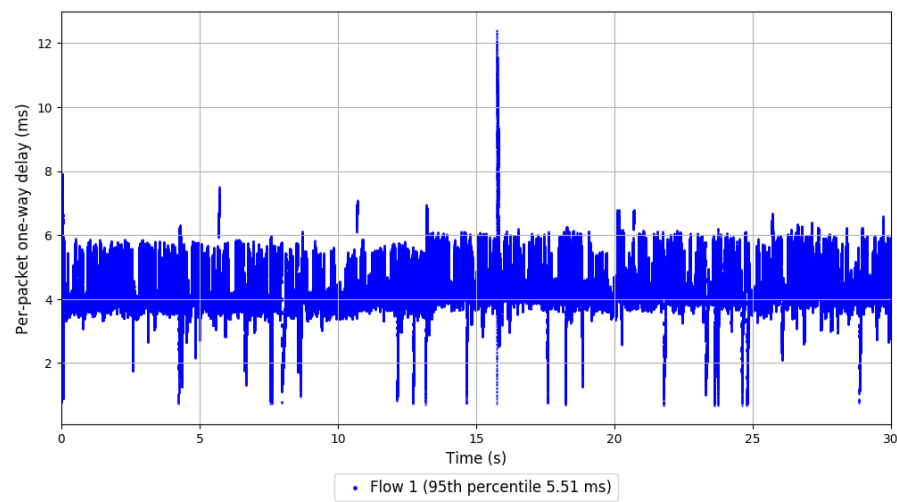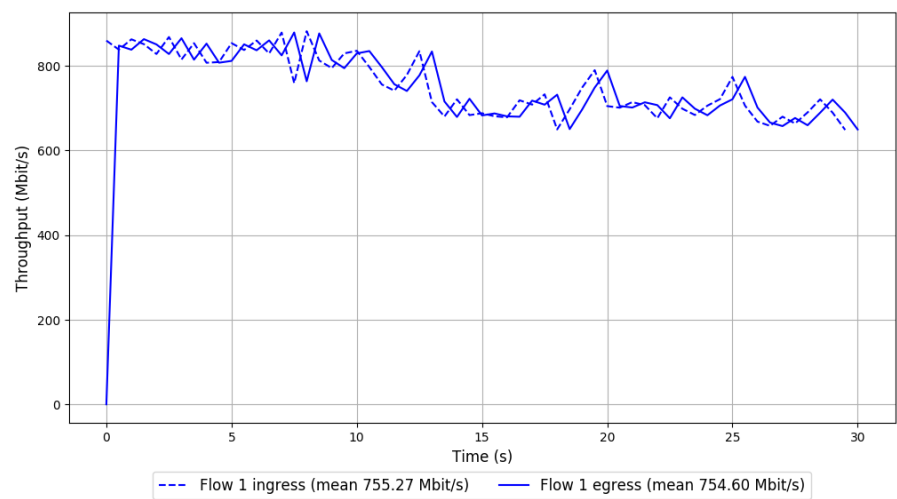
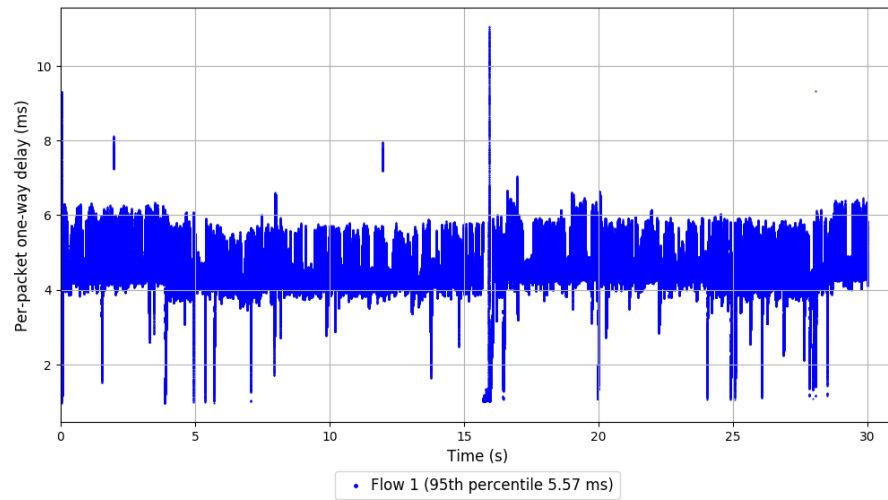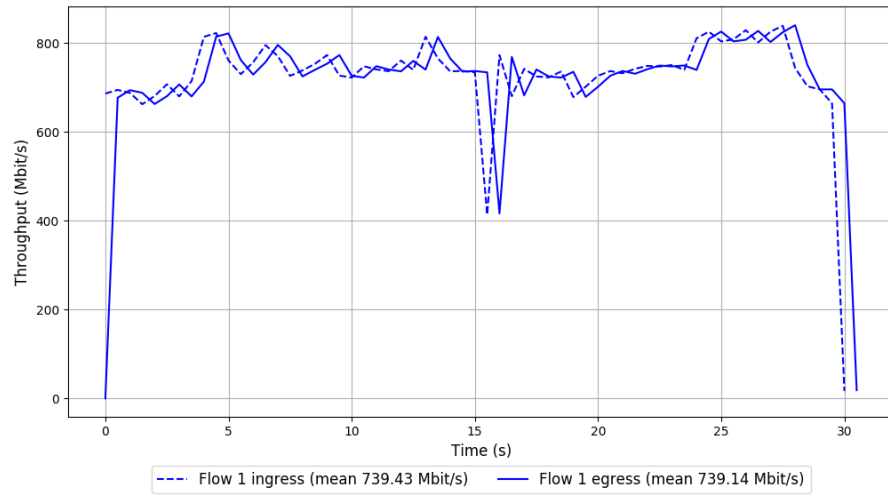Run 2: Report of TCP BBR — Data Link

Flow 1 ingress (mean 700.49 Mbit/s) ---- Flow 1 egress (mean 699.97 Mbit/s)

• Flow 1 (95th percentile 5.47 ms)

```
Run 3: Statistics of TCP BBR

Start at: 2018-10-02 08:20:35
End at: 2018-10-02 08:21:05
Local clock offset: 2.856 ms
Remote clock offset: -0.681 ms


# Below is generated by plot.py at 2018-10-02 09:34:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 754.60 Mbit/s
95th percentile per-packet one-way delay: 5.510 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 754.60 Mbit/s
95th percentile per-packet one-way delay: 5.510 ms
Loss rate: 0.09%
```

Run 3: Report of TCP BBR — Data Link

```
Run 4: Statistics of TCP BBR

Start at: 2018-10-02 08:46:31
End at: 2018-10-02 08:47:01
Local clock offset: 1.415 ms
Remote clock offset: -0.237 ms


# Below is generated by plot.py at 2018-10-02 09:34:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 739.14 Mbit/s
95th percentile per-packet one-way delay: 5.574 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 739.14 Mbit/s
95th percentile per-packet one-way delay: 5.574 ms
Loss rate: 0.04%
```
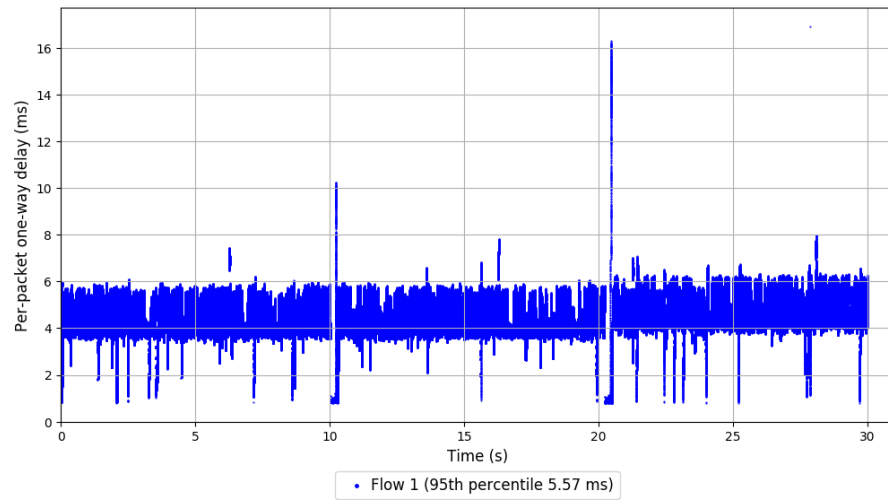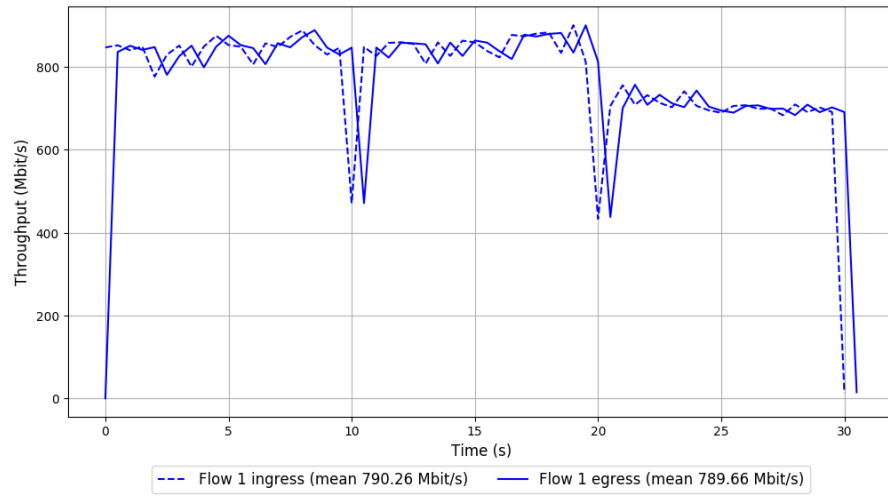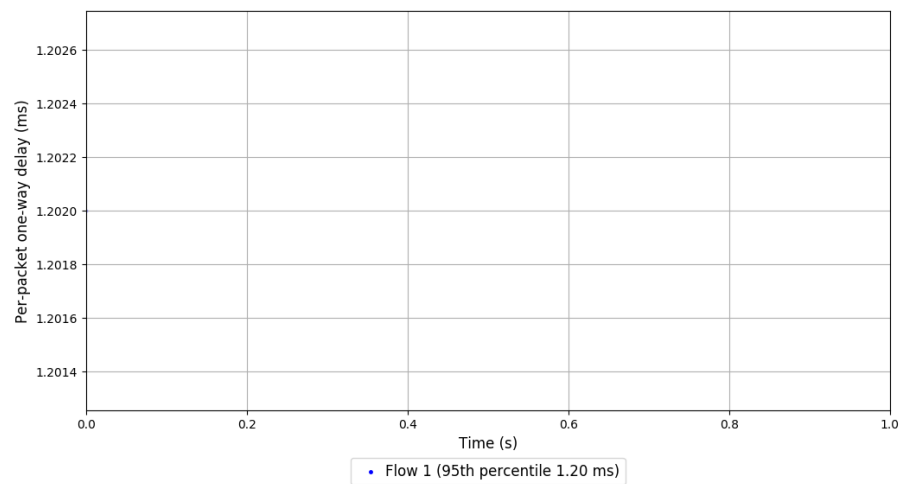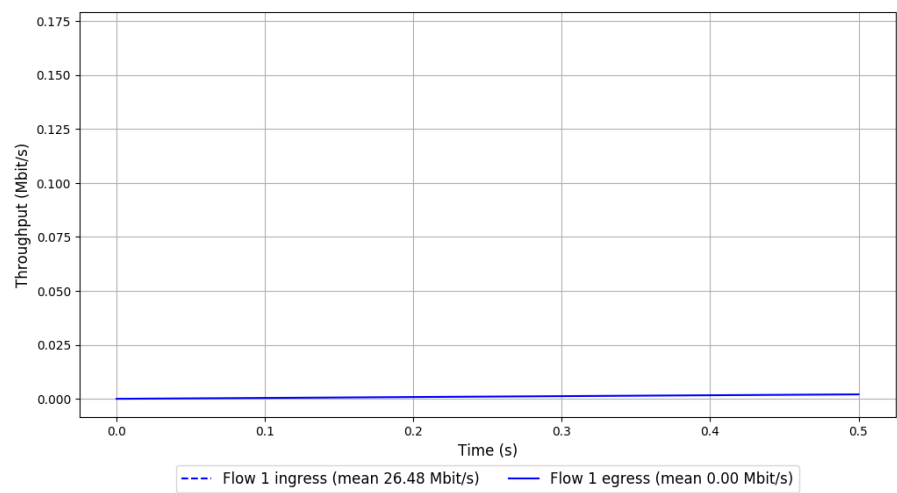
Run 4: Report of TCP BBR — Data Link

Flow 1 ingress (mean 739.43 Mbit/s)   Flow 1 egress (mean 739.14 Mbit/s)

Flow 1 (95th percentile 5.57 ms)

```
Run 5: Statistics of TCP BBR

Start at: 2018-10-02 09:12:46
End at: 2018-10-02 09:13:16
Local clock offset: 4.065 ms
Remote clock offset: 0.1 ms


# Below is generated by plot.py at 2018-10-02 09:35:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 789.66 Mbit/s
95th percentile per-packet one-way delay: 5.573 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 789.66 Mbit/s
95th percentile per-packet one-way delay: 5.573 ms
Loss rate: 0.08%
```

Run 5: Report of TCP BBR — Data Link

```
Run 1: Statistics of Copa

Start at: 2018-10-02 07:34:56
End at: 2018-10-02 07:35:26
Local clock offset: 4.147 ms
Remote clock offset: -0.435 ms
```

Run 1: Report of Copa — Data Link

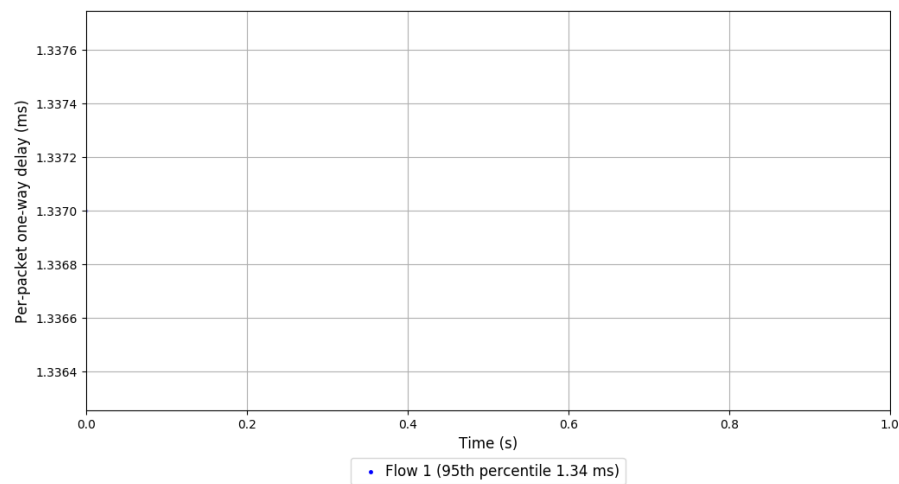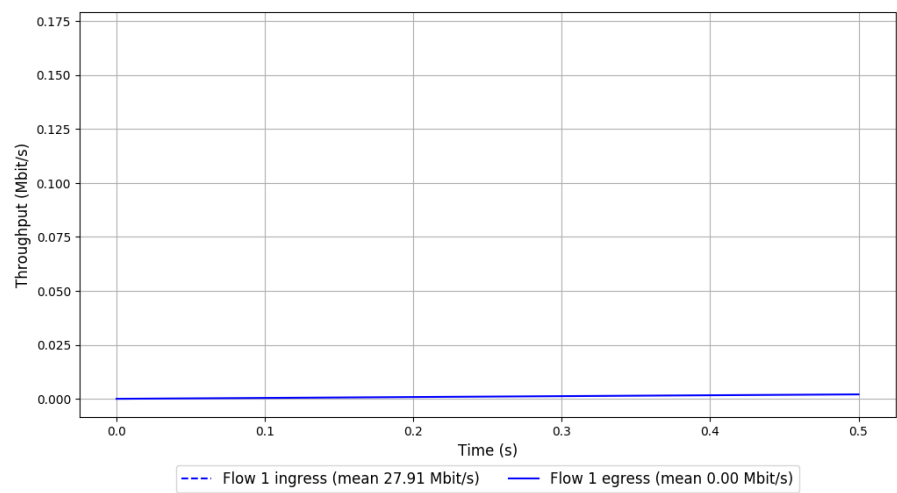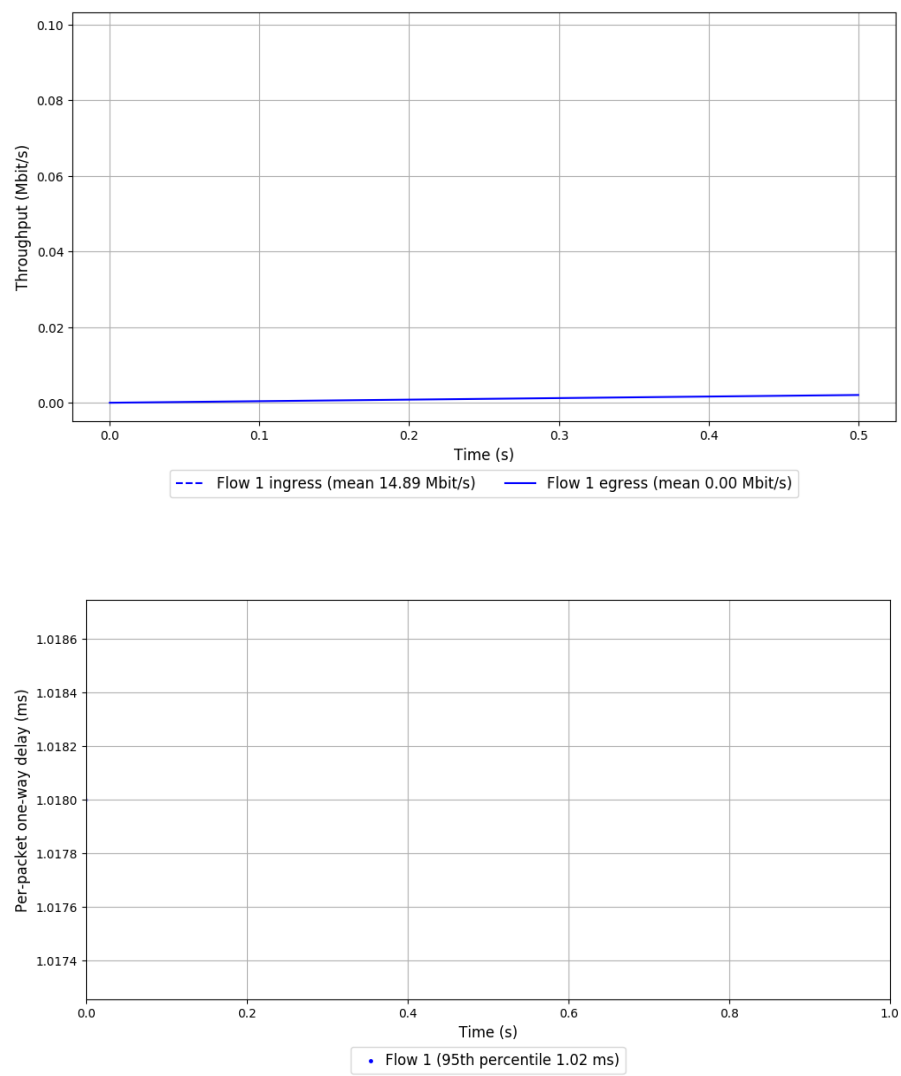Flow 1 ingress (mean 26.48 Mbit/s)   Flow 1 egress (mean 0.00 Mbit/s)

Flow 1 (95th percentile 1.20 ms)
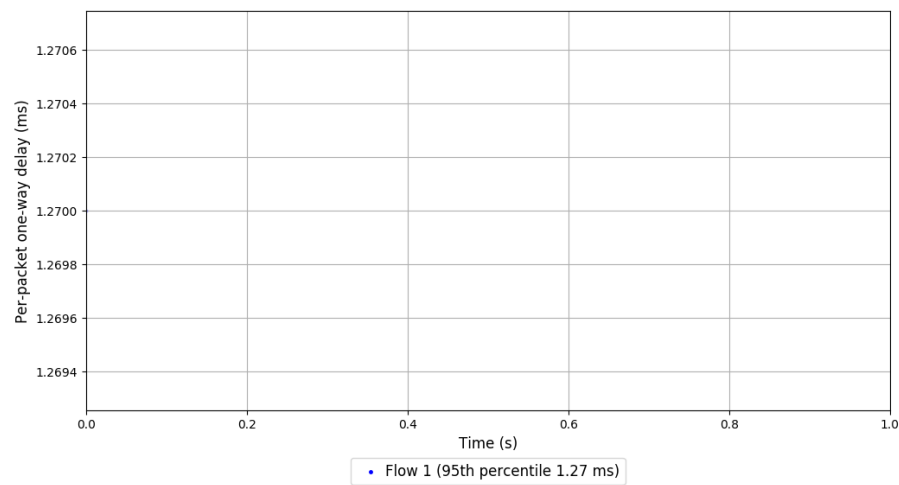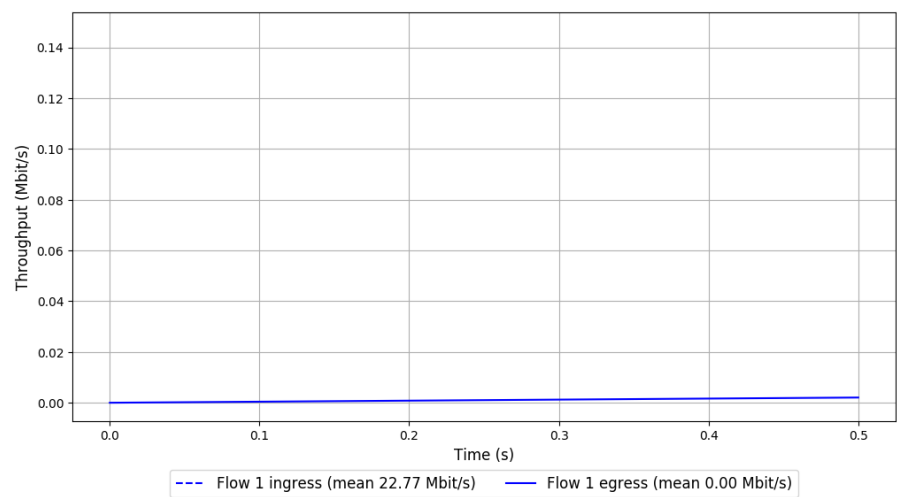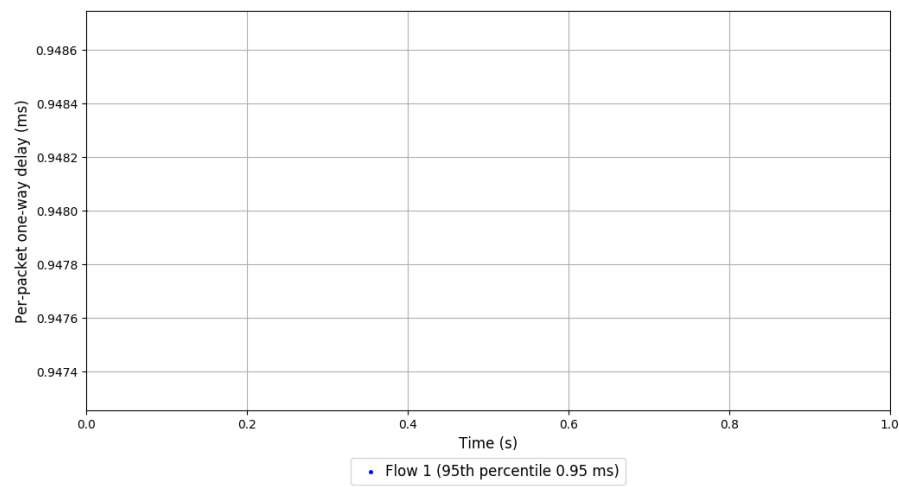
Run 2: Statistics of Copa

Start at: 2018-10-02 08:00:48
End at: 2018-10-02 08:01:18
Local clock offset: 3.708 ms
Remote clock offset: -0.544 ms

Run 2: Report of Copa — Data Link

Flow 1 ingress (mean 27.91 Mbit/s)   Flow 1 egress (mean 0.00 Mbit/s)

• Flow 1 (95th percentile 1.34 ms)

```
Run 3: Statistics of Copa

Start at: 2018-10-02 08:26:46
End at: 2018-10-02 08:27:16
Local clock offset: 2.232 ms
Remote clock offset: -0.407 ms
```

Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 14.89 Mbit/s) — — —   Flow 1 egress (mean 0.00 Mbit/s) ———

• Flow 1 (95th percentile 1.02 ms)

```
Run 4: Statistics of Copa

Start at: 2018-10-02 08:52:54
End at: 2018-10-02 08:53:24
Local clock offset: 2.805 ms
Remote clock offset: -0.23 ms
```
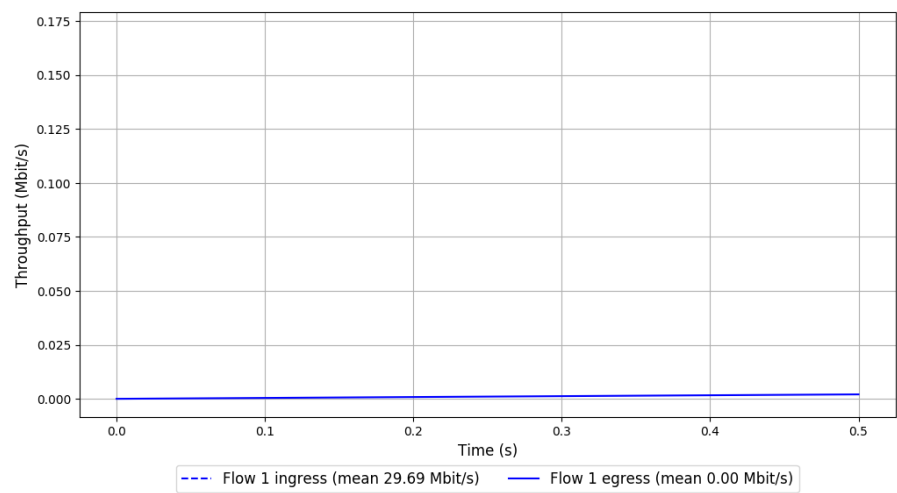
Run 4: Report of Copa — Data Link

Flow 1 ingress (mean 22.77 Mbit/s) — — —   Flow 1 egress (mean 0.00 Mbit/s) ———

Flow 1 (95th percentile 1.27 ms)

```
Run 5: Statistics of Copa

Start at: 2018-10-02 09:19:08
End at: 2018-10-02 09:19:38
Local clock offset: 4.141 ms
Remote clock offset: 0.082 ms
```

Run 5: Report of Copa — Data Link

```
Run 1: Statistics of TCP Cubic

Start at: 2018-10-02 07:13:41
End at: 2018-10-02 07:14:12
Local clock offset: 8.739 ms
Remote clock offset: 1.279 ms


# Below is generated by plot.py at 2018-10-02 09:35:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 675.28 Mbit/s
95th percentile per-packet one-way delay: 4.796 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 675.28 Mbit/s
95th percentile per-packet one-way delay: 4.796 ms
Loss rate: 0.06%
```
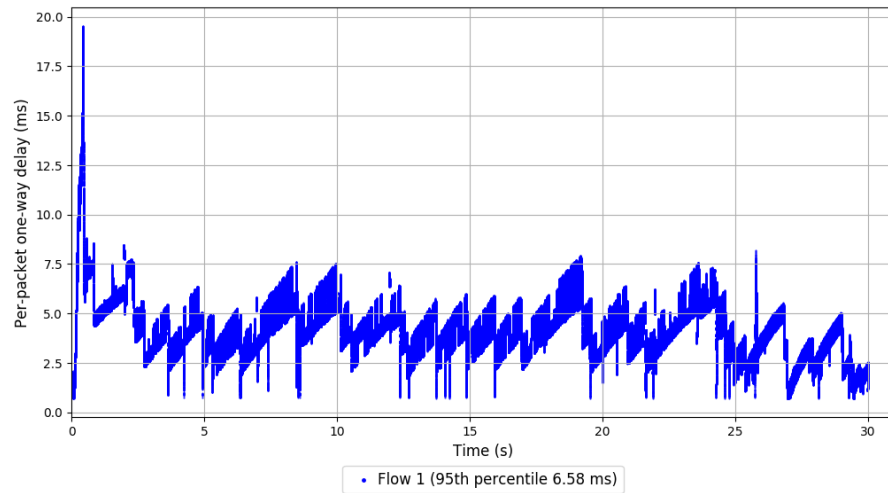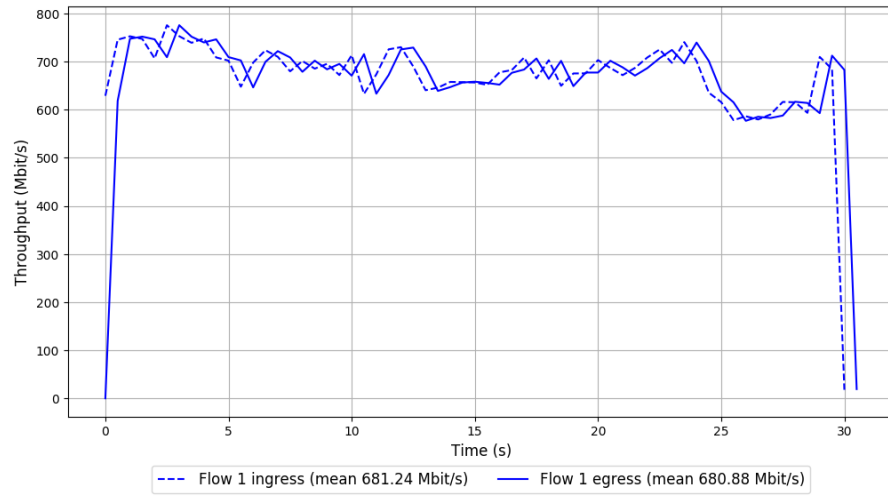
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-10-02 07:39:28
End at: 2018-10-02 07:39:58
Local clock offset: 3.839 ms
Remote clock offset: -0.585 ms


# Below is generated by plot.py at 2018-10-02 09:35:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 680.88 Mbit/s
95th percentile per-packet one-way delay: 6.584 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 680.88 Mbit/s
95th percentile per-packet one-way delay: 6.584 ms
Loss rate: 0.05%
```

Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 681.24 Mbit/s)   Flow 1 egress (mean 680.88 Mbit/s)

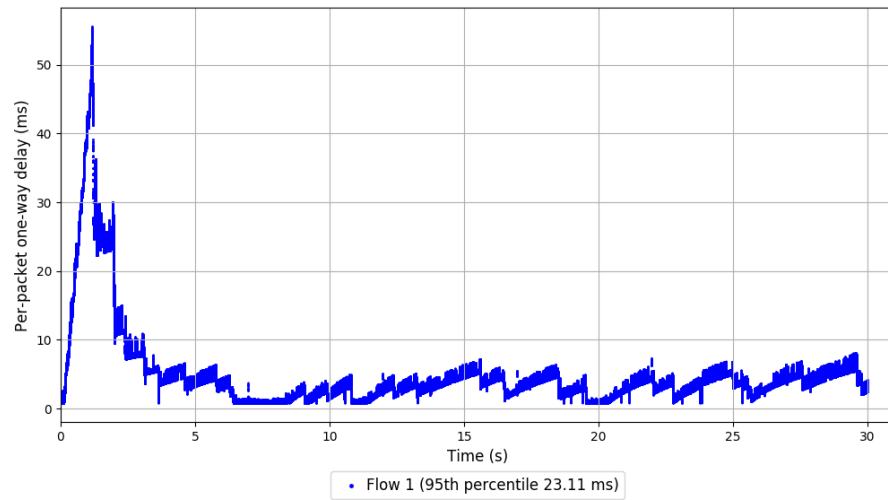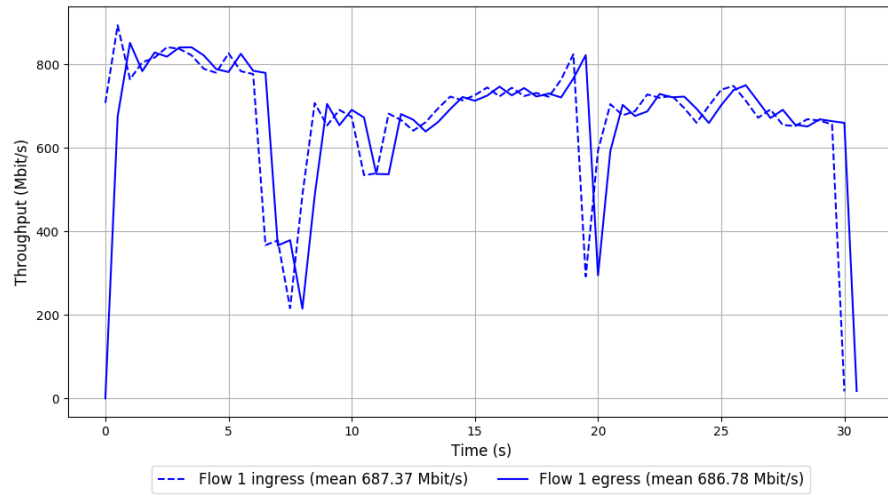
Flow 1 (95th percentile 6.58 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2018-10-02 08:05:20
End at: 2018-10-02 08:05:50
Local clock offset: 3.694 ms
Remote clock offset: -0.614 ms


# Below is generated by plot.py at 2018-10-02 09:35:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 686.78 Mbit/s
95th percentile per-packet one-way delay: 23.113 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 686.78 Mbit/s
95th percentile per-packet one-way delay: 23.113 ms
Loss rate: 0.08%
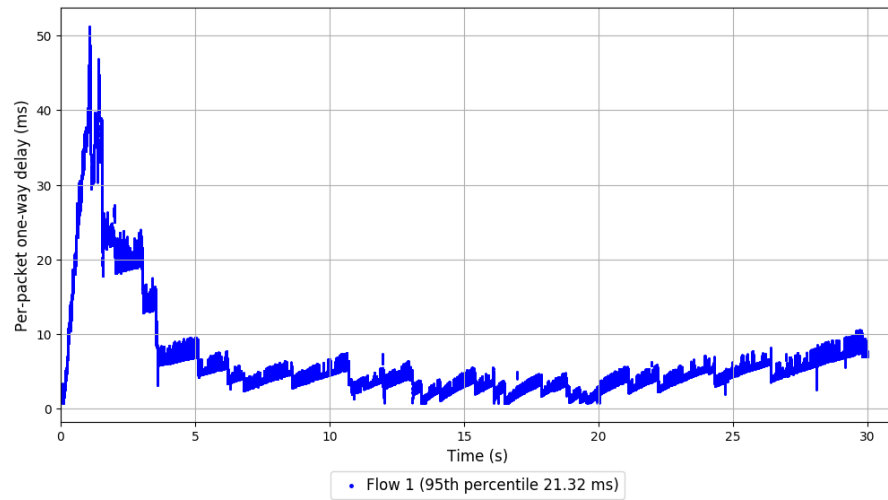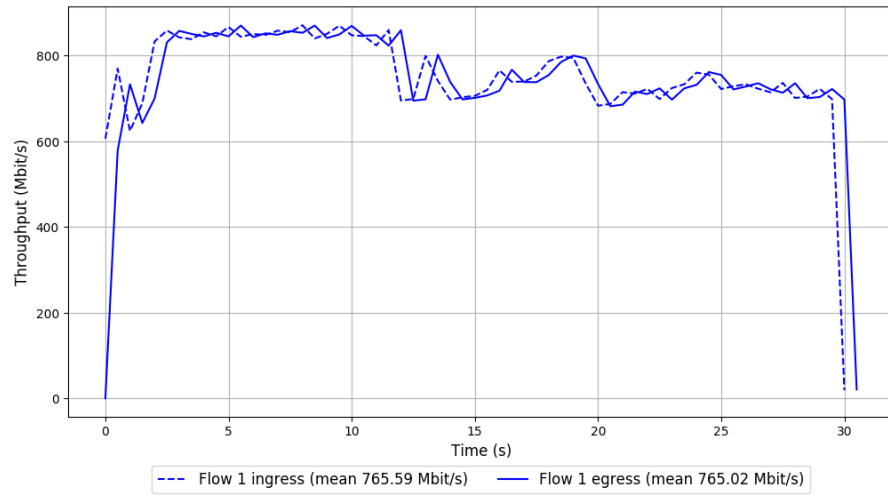```

Run 3: Report of TCP Cubic — Data Link

```
Run 4: Statistics of TCP Cubic

Start at: 2018-10-02 08:31:19
End at: 2018-10-02 08:31:49
Local clock offset: 1.935 ms
Remote clock offset: -0.193 ms

Below is generated by plot.py at 2018-10-02 09:42:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 765.02 Mbit/s
95th percentile per-packet one-way delay: 21.316 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 765.02 Mbit/s
95th percentile per-packet one-way delay: 21.316 ms
Loss rate: 0.07%
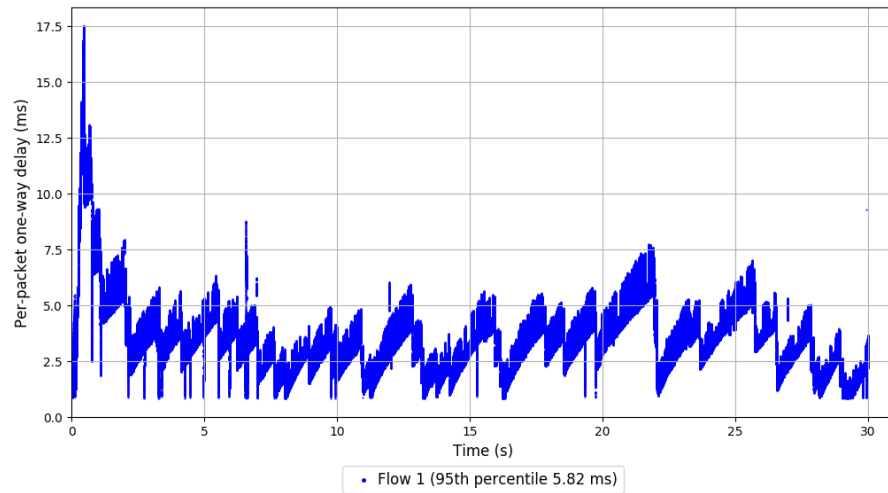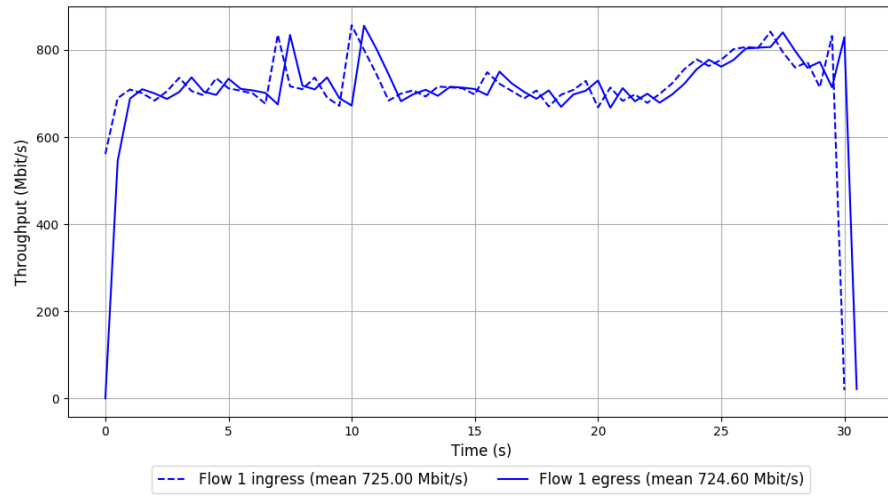```

Run 4: Report of TCP Cubic — Data Link

```
Run 5: Statistics of TCP Cubic

Start at: 2018-10-02 08:57:29
End at: 2018-10-02 08:57:59
Local clock offset: 3.328 ms
Remote clock offset: -0.049 ms


# Below is generated by plot.py at 2018-10-02 09:42:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 724.60 Mbit/s
95th percentile per-packet one-way delay: 5.819 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 724.60 Mbit/s
95th percentile per-packet one-way delay: 5.819 ms
Loss rate: 0.06%
```
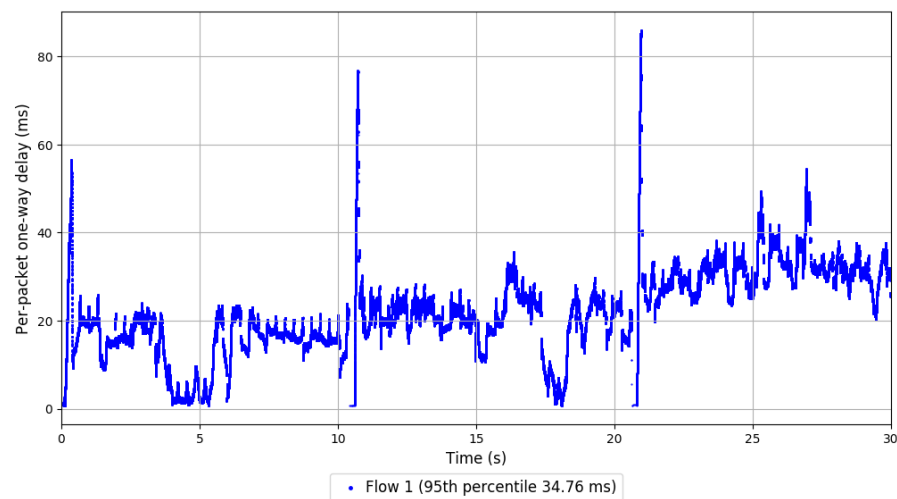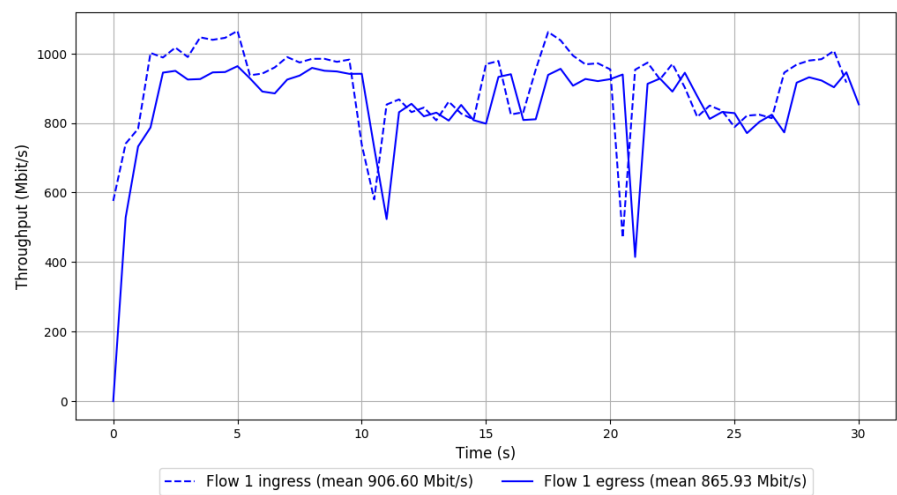
Run 5: Report of TCP Cubic — Data Link

```
Run 1: Statistics of FillP

Start at: 2018-10-02 07:36:14
End at: 2018-10-02 07:36:44
Local clock offset: 4.057 ms
Remote clock offset: -0.447 ms


# Below is generated by plot.py at 2018-10-02 09:46:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 865.93 Mbit/s
95th percentile per-packet one-way delay: 34.759 ms
Loss rate: 4.48%
-- Flow 1:
Average throughput: 865.93 Mbit/s
95th percentile per-packet one-way delay: 34.759 ms
Loss rate: 4.48%
```
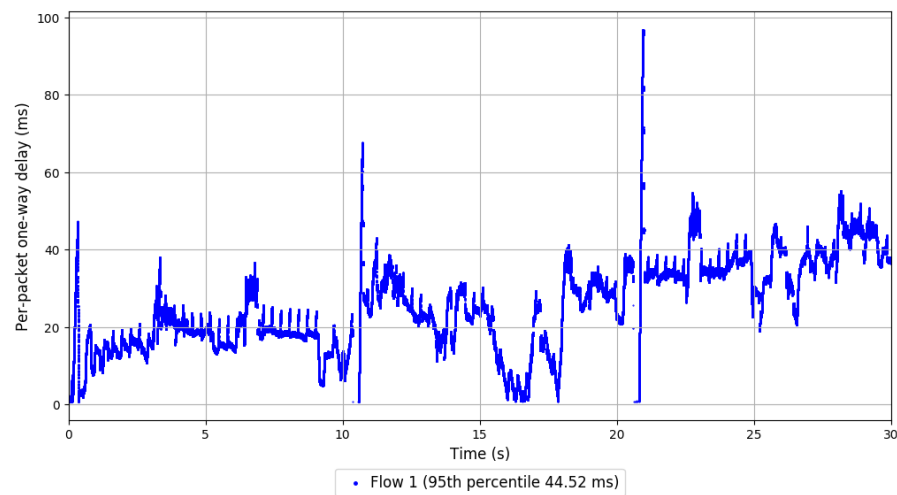
Run 1: Report of FillP — Data Link

Flow 1 ingress (mean 906.60 Mbit/s)   Flow 1 egress (mean 865.93 Mbit/s)

• Flow 1 (95th percentile 34.76 ms)

```
Run 2: Statistics of FillP

Start at: 2018-10-02 08:02:06
End at: 2018-10-02 08:02:36
Local clock offset: 3.723 ms
Remote clock offset: -0.64 ms

# Below is generated by plot.py at 2018-10-02 09:46:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 837.06 Mbit/s
95th percentile per-packet one-way delay: 44.518 ms
Loss rate: 4.37%
-- Flow 1:
Average throughput: 837.06 Mbit/s
95th percentile per-packet one-way delay: 44.518 ms
Loss rate: 4.37%
```
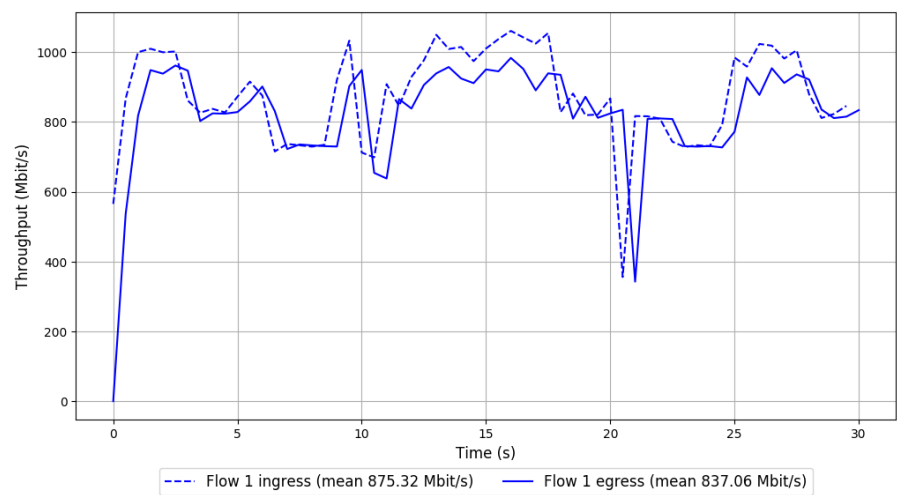
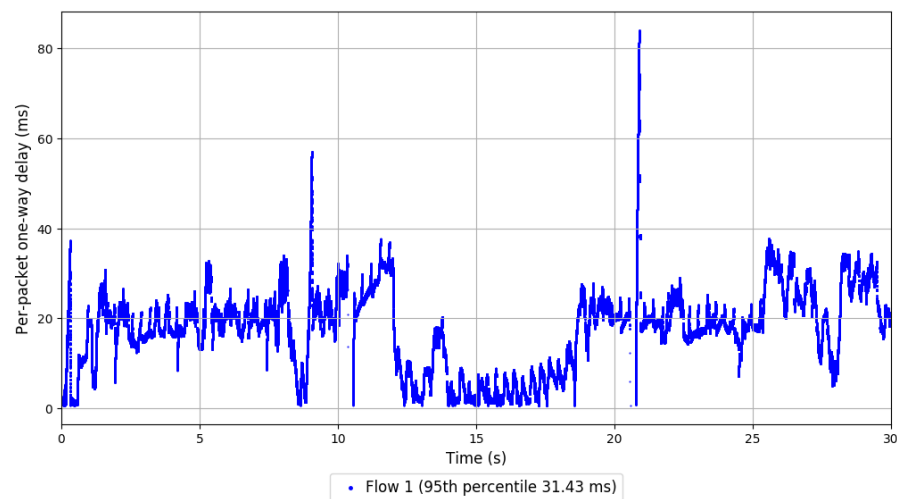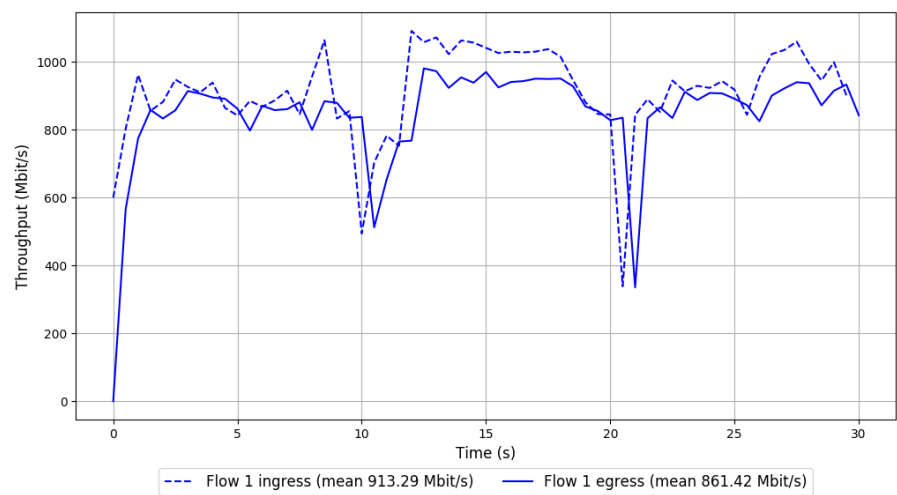## Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-10-02 08:28:04
End at: 2018-10-02 08:28:34
Local clock offset: 2.132 ms
Remote clock offset: -0.385 ms


# Below is generated by plot.py at 2018-10-02 09:46:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 861.42 Mbit/s
95th percentile per-packet one-way delay: 31.426 ms
Loss rate: 5.68%
-- Flow 1:
Average throughput: 861.42 Mbit/s
95th percentile per-packet one-way delay: 31.426 ms
Loss rate: 5.68%
```

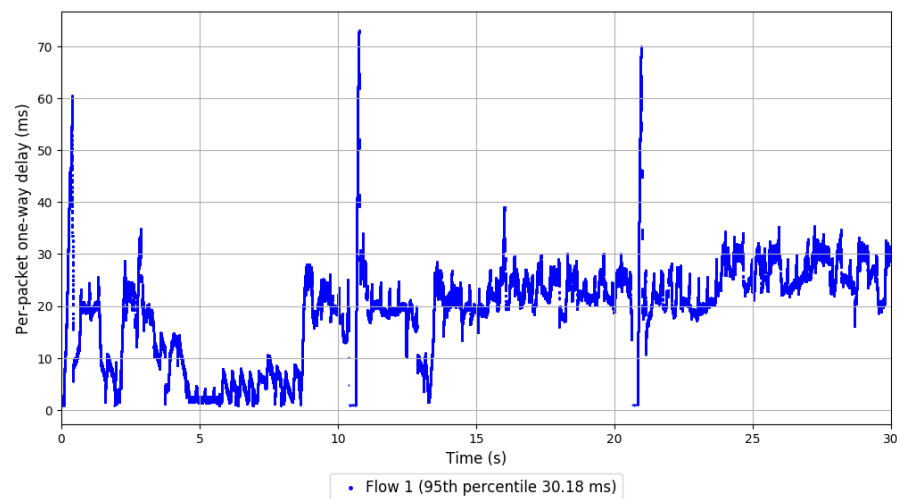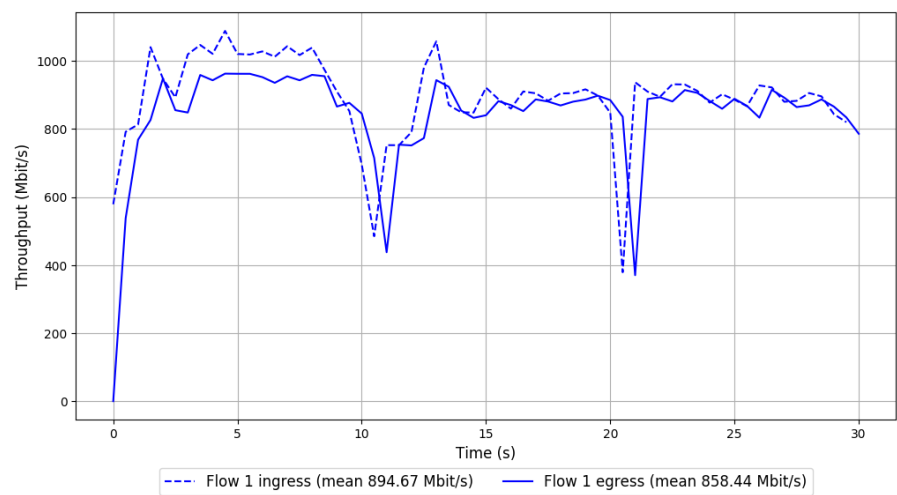Run 3: Report of FillP — Data Link

```
Run 4: Statistics of FillP

Start at: 2018-10-02 08:54:12
End at: 2018-10-02 08:54:42
Local clock offset: 2.961 ms
Remote clock offset: -0.185 ms


# Below is generated by plot.py at 2018-10-02 09:47:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 858.44 Mbit/s
95th percentile per-packet one-way delay: 30.181 ms
Loss rate: 4.05%
-- Flow 1:
Average throughput: 858.44 Mbit/s
95th percentile per-packet one-way delay: 30.181 ms
Loss rate: 4.05%
```

Run 4: Report of FillP — Data Link

Flow 1 ingress (mean 894.67 Mbit/s) ----- Flow 1 egress (mean 858.44 Mbit/s) ——

Flow 1 (95th percentile 30.18 ms)

```
Run 5: Statistics of FillP

Start at: 2018-10-02 09:20:25
End at: 2018-10-02 09:20:56
Local clock offset: 4.147 ms
Remote clock offset: 0.106 ms


# Below is generated by plot.py at 2018-10-02 09:47:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 874.13 Mbit/s
95th percentile per-packet one-way delay: 30.035 ms
Loss rate: 5.68%
-- Flow 1:
Average throughput: 874.13 Mbit/s
95th percentile per-packet one-way delay: 30.035 ms
Loss rate: 5.68%
```
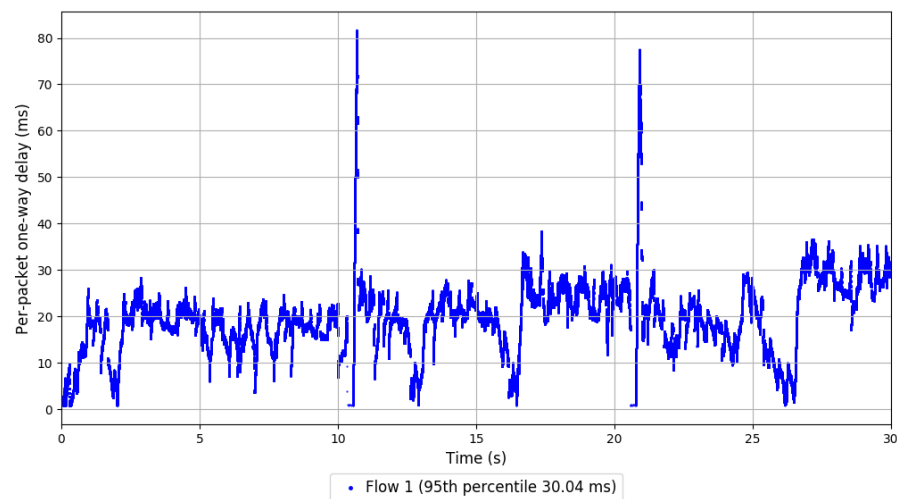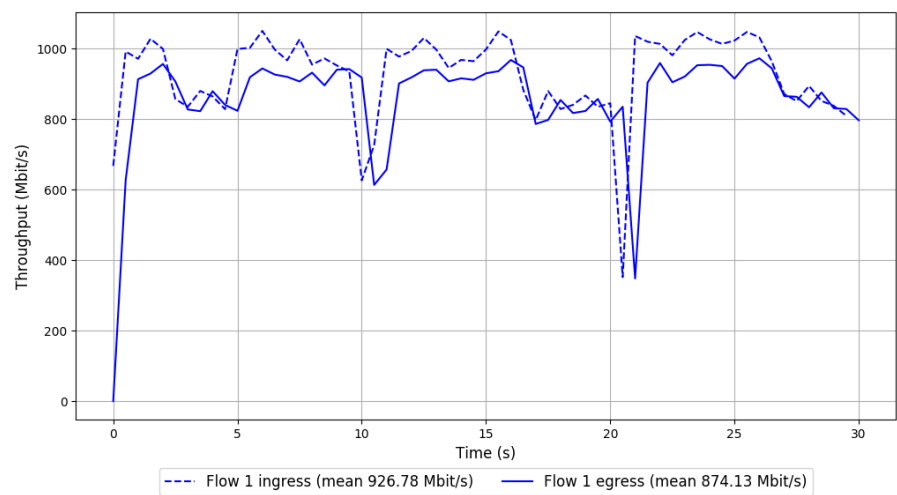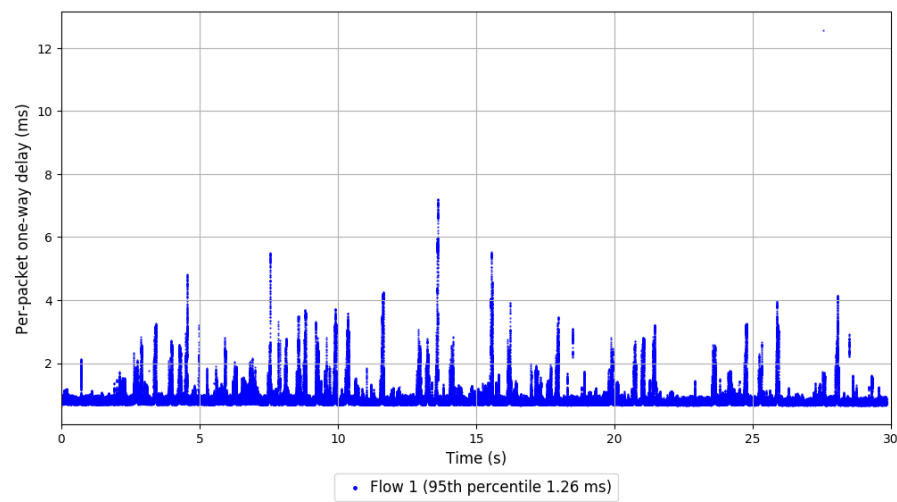
Run 5: Report of FillP — Data Link

Throughput (Mbit/s) vs Time (s)

- - - Flow 1 ingress (mean 926.78 Mbit/s) —— Flow 1 egress (mean 874.13 Mbit/s)

Per-packet one-way delay (ms) vs Time (s)

· Flow 1 (95th percentile 30.04 ms)

```
Run 1: Statistics of Indigo

Start at: 2018-10-02 07:31:50
End at: 2018-10-02 07:32:20
Local clock offset: 4.44 ms
Remote clock offset: -0.316 ms


# Below is generated by plot.py at 2018-10-02 09:47:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 236.06 Mbit/s
95th percentile per-packet one-way delay: 1.257 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 236.06 Mbit/s
95th percentile per-packet one-way delay: 1.257 ms
Loss rate: 0.02%
```
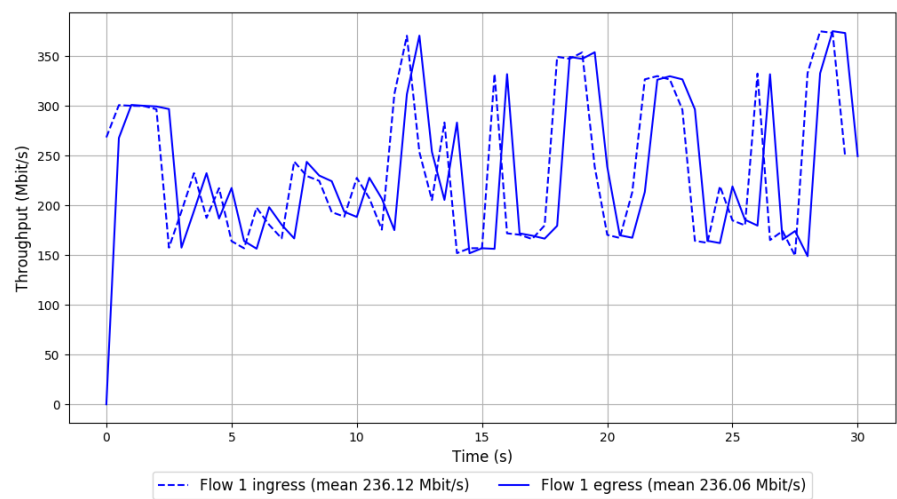
Run 1: Report of Indigo — Data Link

Flow 1 ingress (mean 236.12 Mbit/s)   Flow 1 egress (mean 236.06 Mbit/s)

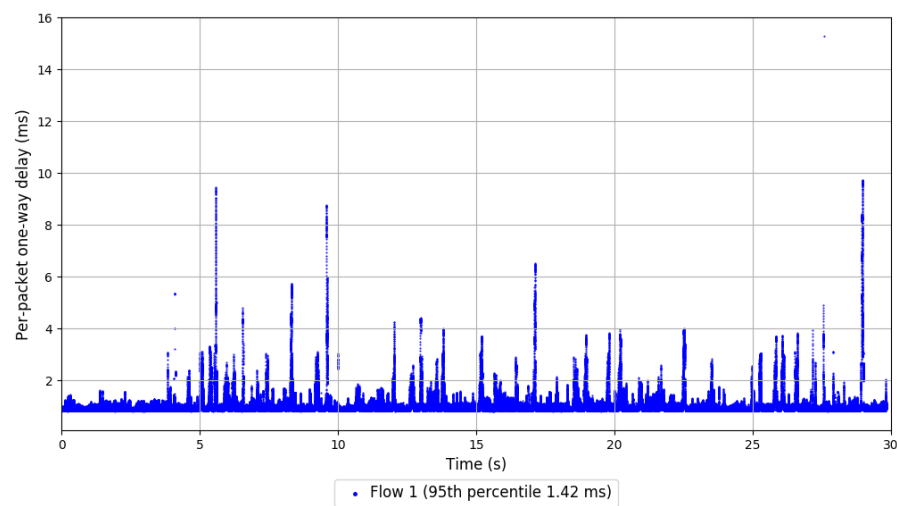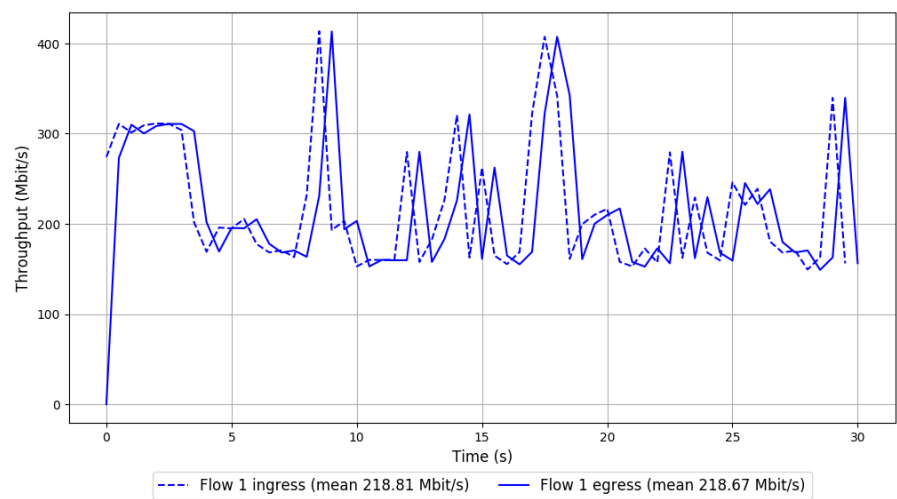Flow 1 (95th percentile 1.26 ms)

```
Run 2: Statistics of Indigo

Start at: 2018-10-02 07:57:40
End at: 2018-10-02 07:58:10
Local clock offset: 3.716 ms
Remote clock offset: -0.514 ms


# Below is generated by plot.py at 2018-10-02 09:47:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 218.67 Mbit/s
95th percentile per-packet one-way delay: 1.421 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 218.67 Mbit/s
95th percentile per-packet one-way delay: 1.421 ms
Loss rate: 0.07%
```

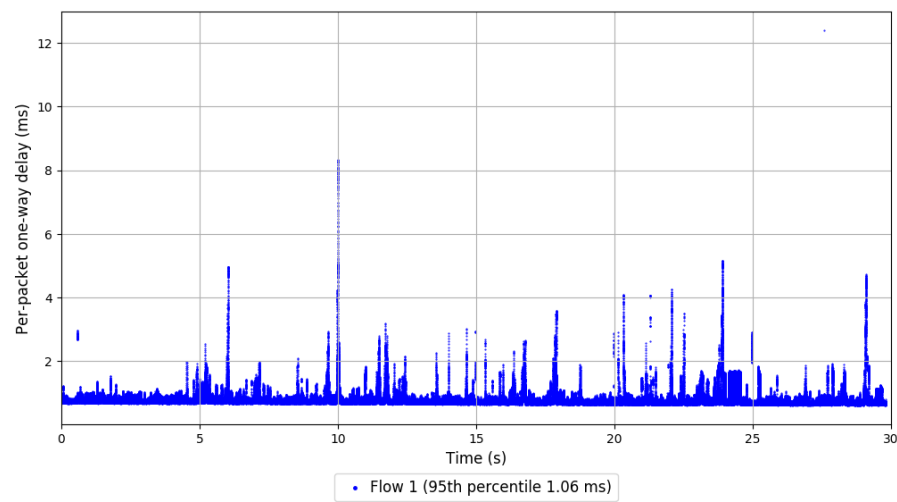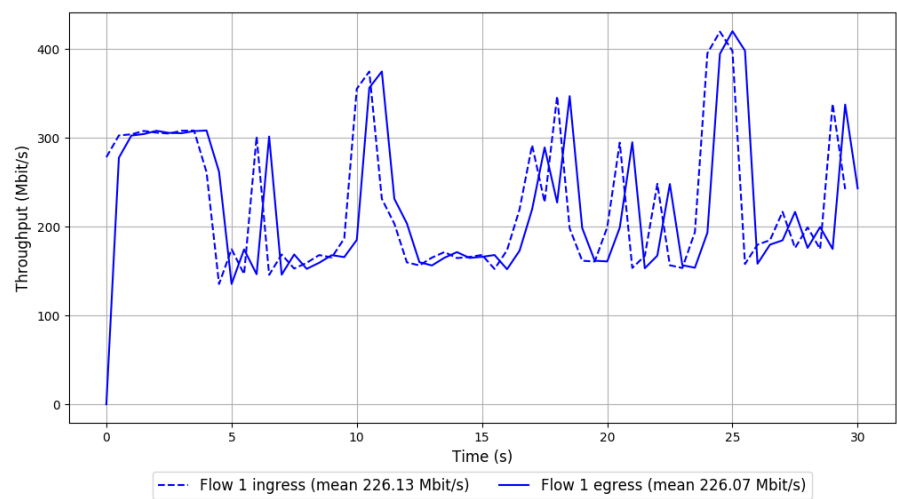Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2018-10-02 08:23:38
End at: 2018-10-02 08:24:08
Local clock offset: 2.526 ms
Remote clock offset: -0.524 ms


# Below is generated by plot.py at 2018-10-02 09:47:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 226.07 Mbit/s
95th percentile per-packet one-way delay: 1.060 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 226.07 Mbit/s
95th percentile per-packet one-way delay: 1.060 ms
Loss rate: 0.03%
```

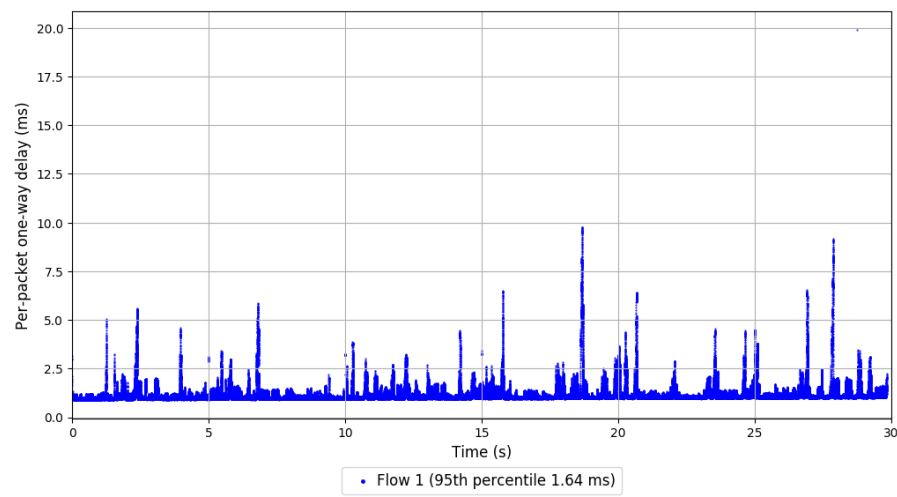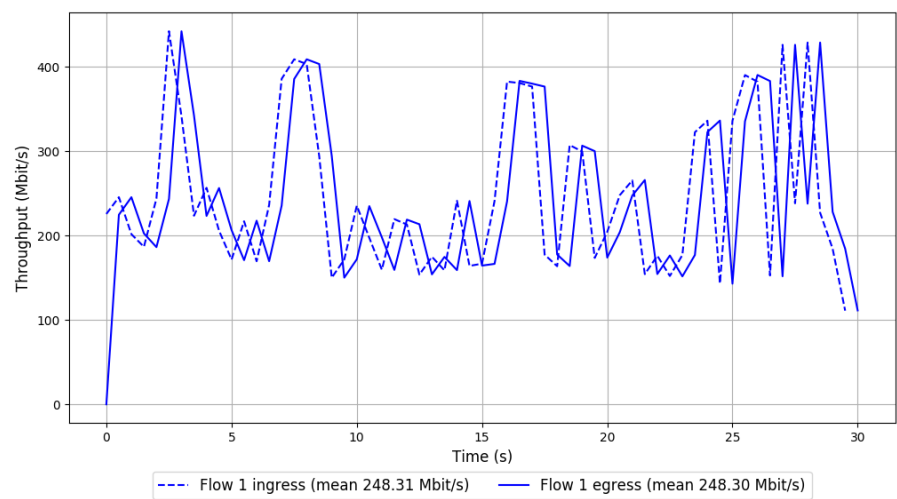Run 3: Report of Indigo — Data Link

```
Run 4: Statistics of Indigo

Start at: 2018-10-02 08:49:41
End at: 2018-10-02 08:50:11
Local clock offset: 2.21 ms
Remote clock offset: -0.237 ms


# Below is generated by plot.py at 2018-10-02 09:47:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 248.30 Mbit/s
95th percentile per-packet one-way delay: 1.635 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 248.30 Mbit/s
95th percentile per-packet one-way delay: 1.635 ms
Loss rate: 0.00%
```
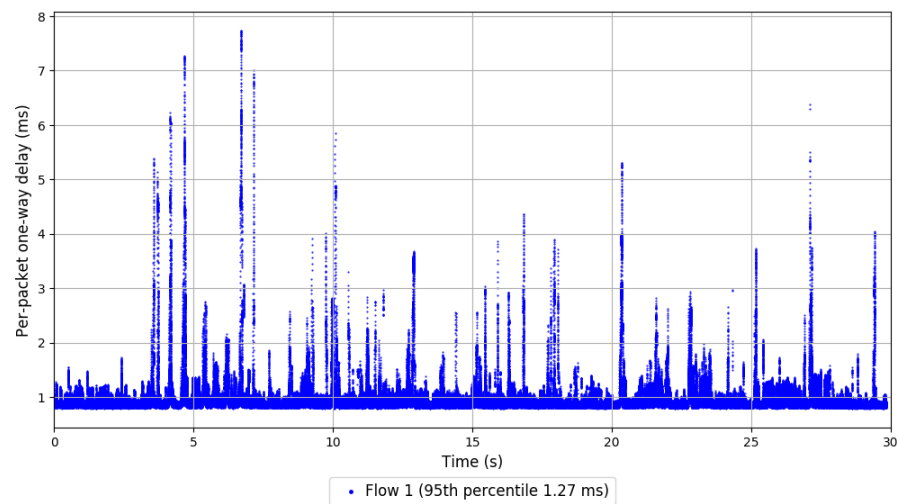
Run 4: Report of Indigo — Data Link

```
Run 5: Statistics of Indigo

Start at: 2018-10-02 09:15:58
End at: 2018-10-02 09:16:28
Local clock offset: 4.151 ms
Remote clock offset: 0.135 ms

# Below is generated by plot.py at 2018-10-02 09:47:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 216.13 Mbit/s
95th percentile per-packet one-way delay: 1.273 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 216.13 Mbit/s
95th percentile per-packet one-way delay: 1.273 ms
Loss rate: 0.00%
```
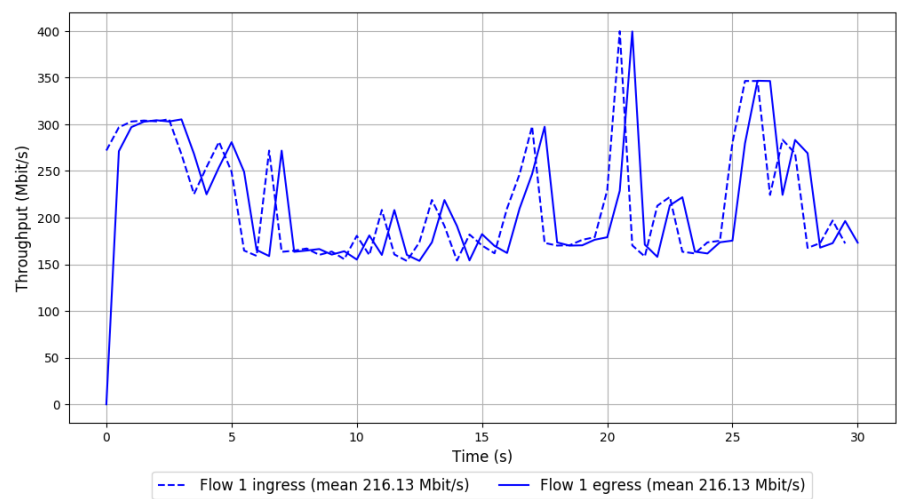
Run 5: Report of Indigo — Data Link

```
Run 1: Statistics of Indigo-96d2da3

Start at: 2018-10-02 07:24:50
End at: 2018-10-02 07:25:20
Local clock offset: 5.584 ms
Remote clock offset: 0.084 ms


# Below is generated by plot.py at 2018-10-02 09:47:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 147.19 Mbit/s
95th percentile per-packet one-way delay: 1.247 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 147.19 Mbit/s
95th percentile per-packet one-way delay: 1.247 ms
Loss rate: 0.06%
```
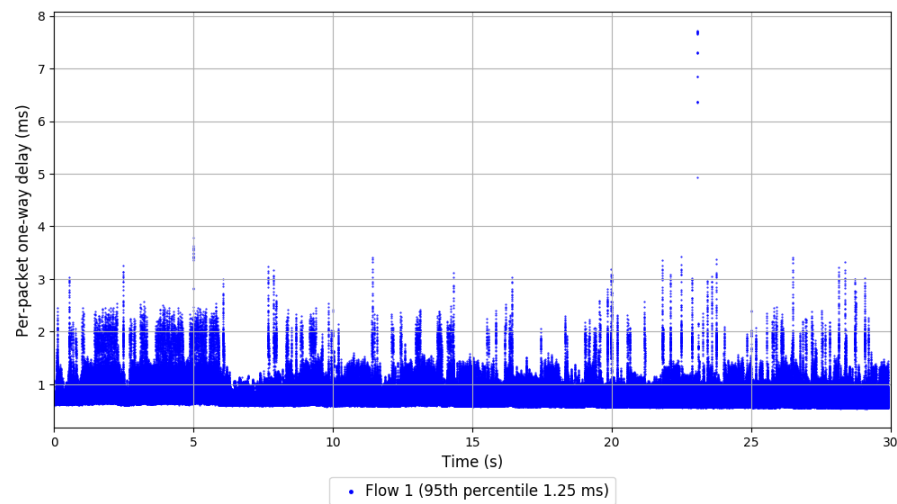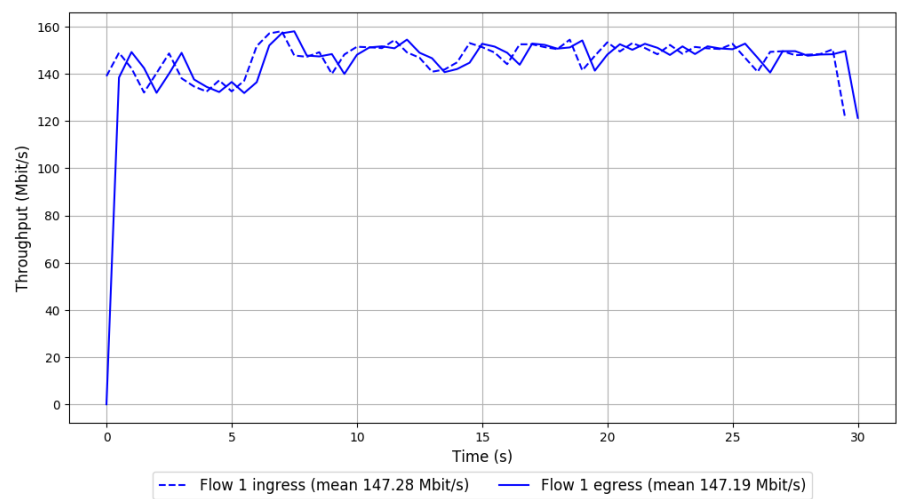
Run 1: Report of Indigo-96d2da3 — Data Link

Flow 1 ingress (mean 147.28 Mbit/s)   Flow 1 egress (mean 147.19 Mbit/s)
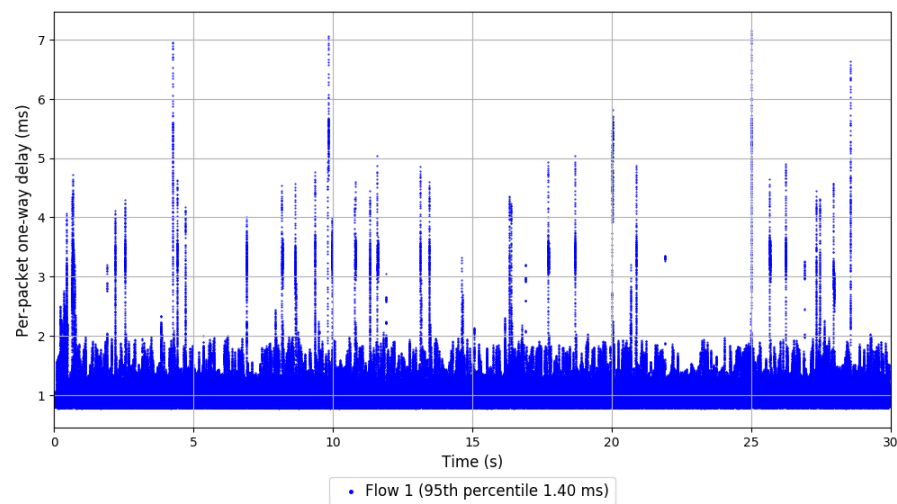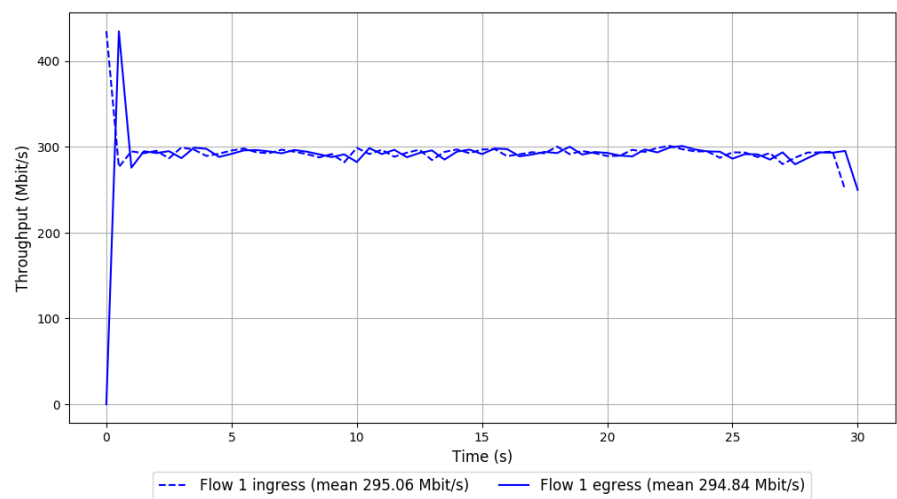

Flow 1 (95th percentile 1.25 ms)

```
Run 2: Statistics of Indigo-96d2da3

Start at: 2018-10-02 07:50:37
End at: 2018-10-02 07:51:07
Local clock offset: 3.662 ms
Remote clock offset: -0.593 ms


# Below is generated by plot.py at 2018-10-02 09:48:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 294.84 Mbit/s
95th percentile per-packet one-way delay: 1.398 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 294.84 Mbit/s
95th percentile per-packet one-way delay: 1.398 ms
Loss rate: 0.07%
```

Run 2: Report of Indigo-96d2da3 — Data Link

Flow 1 ingress (mean 295.06 Mbit/s)   Flow 1 egress (mean 294.84 Mbit/s)
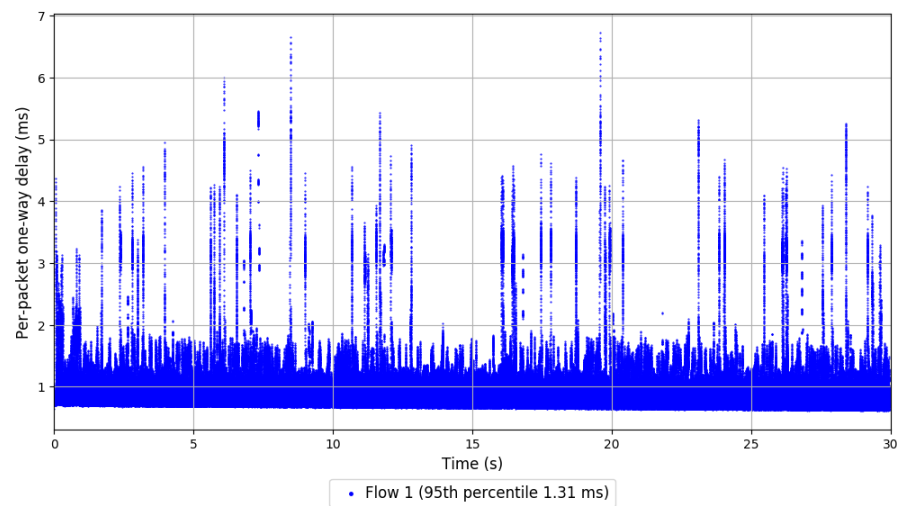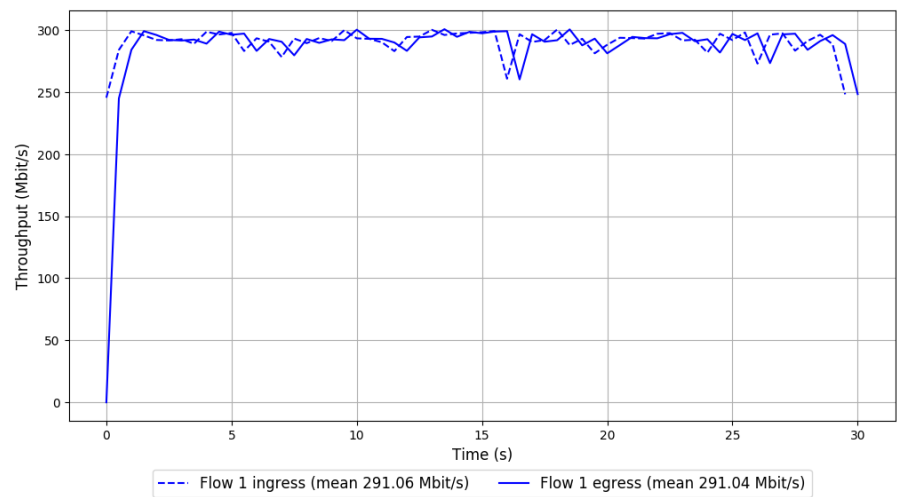

Flow 1 (95th percentile 1.40 ms)

```
Run 3: Statistics of Indigo-96d2da3

Start at: 2018-10-02 08:16:31
End at: 2018-10-02 08:17:01
Local clock offset: 3.523 ms
Remote clock offset: -0.778 ms


# Below is generated by plot.py at 2018-10-02 09:48:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 291.04 Mbit/s
95th percentile per-packet one-way delay: 1.307 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 291.04 Mbit/s
95th percentile per-packet one-way delay: 1.307 ms
Loss rate: 0.00%
```
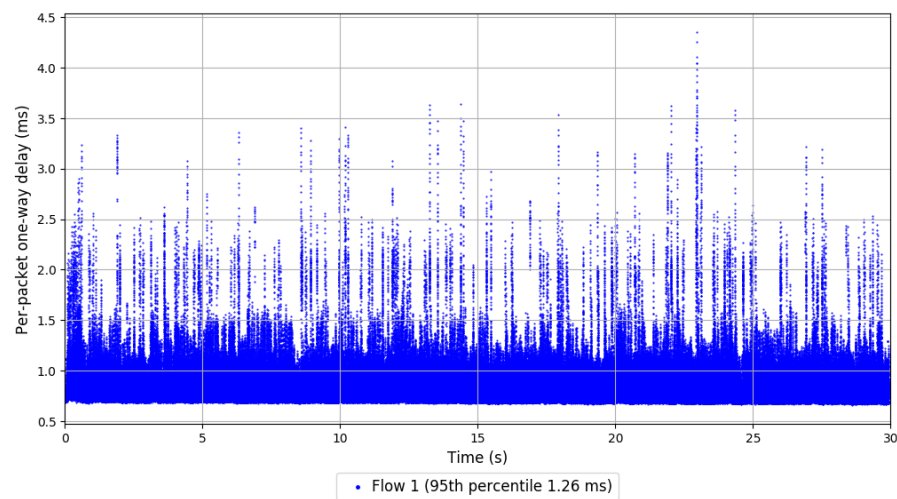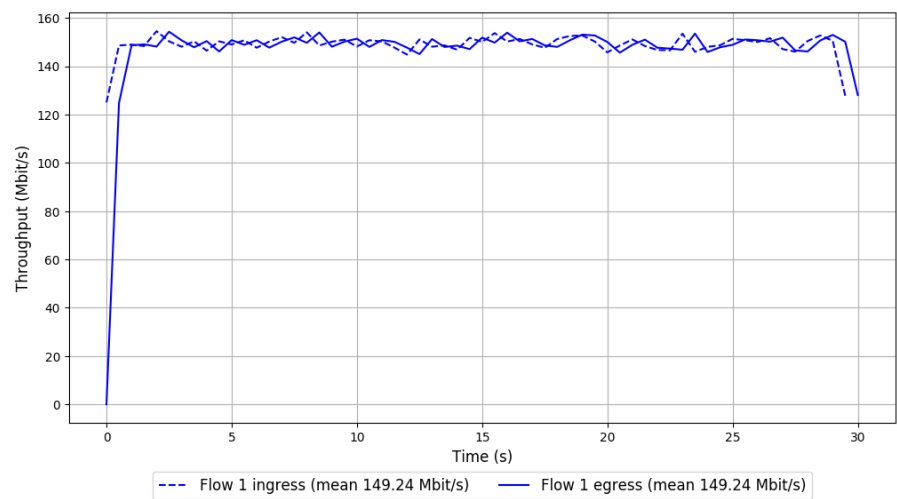
Run 3: Report of Indigo-96d2da3 — Data Link

```
Run 4: Statistics of Indigo-96d2da3

Start at: 2018-10-02 08:42:31
End at: 2018-10-02 08:43:01
Local clock offset: 1.405 ms
Remote clock offset: -0.259 ms


# Below is generated by plot.py at 2018-10-02 09:48:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 149.24 Mbit/s
95th percentile per-packet one-way delay: 1.258 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 149.24 Mbit/s
95th percentile per-packet one-way delay: 1.258 ms
Loss rate: 0.00%
```

Run 4: Report of Indigo-96d2da3 — Data Link

```
Run 5: Statistics of Indigo-96d2da3

Start at: 2018-10-02 09:08:45
End at: 2018-10-02 09:09:15
Local clock offset: 3.958 ms
Remote clock offset: 0.134 ms


# Below is generated by plot.py at 2018-10-02 09:48:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 149.84 Mbit/s
95th percentile per-packet one-way delay: 1.388 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 149.84 Mbit/s
95th percentile per-packet one-way delay: 1.388 ms
Loss rate: 0.00%
```
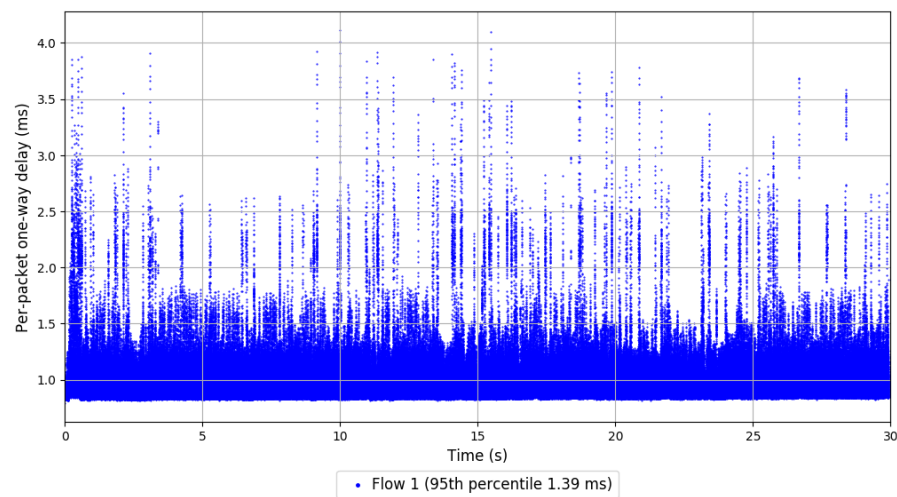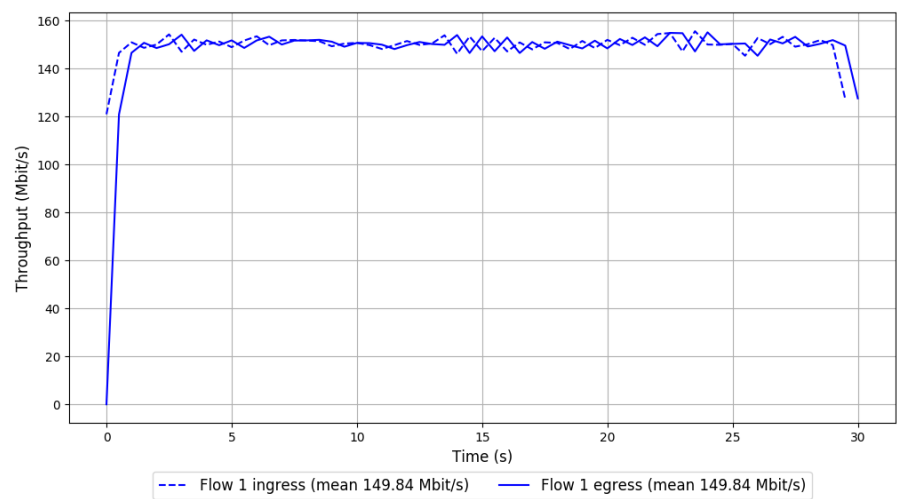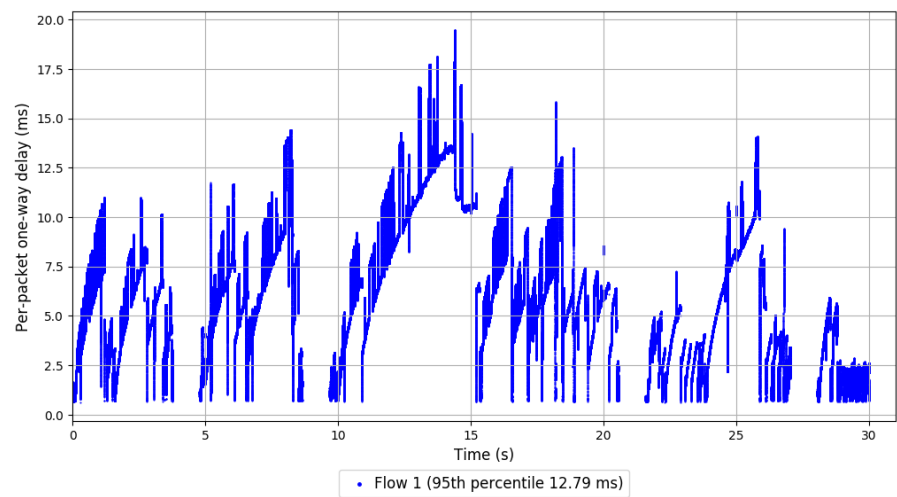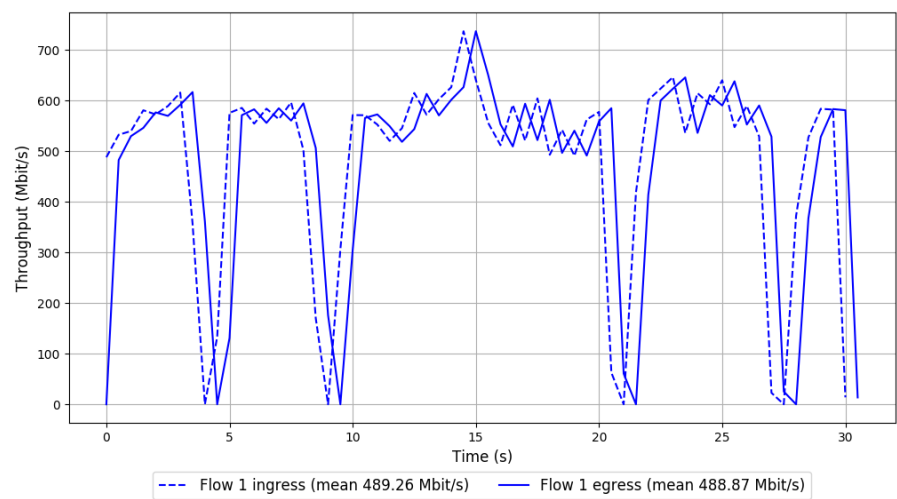
Run 5: Report of Indigo-96d2da3 — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2018-10-02 07:33:18
End at: 2018-10-02 07:33:48
Local clock offset: 4.307 ms
Remote clock offset: -0.385 ms


# Below is generated by plot.py at 2018-10-02 09:52:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 488.87 Mbit/s
95th percentile per-packet one-way delay: 12.787 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 488.87 Mbit/s
95th percentile per-packet one-way delay: 12.787 ms
Loss rate: 0.08%
```
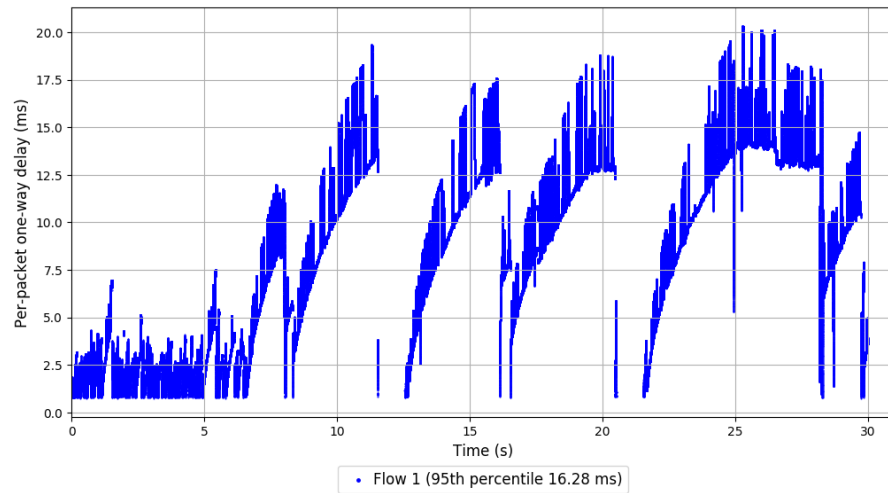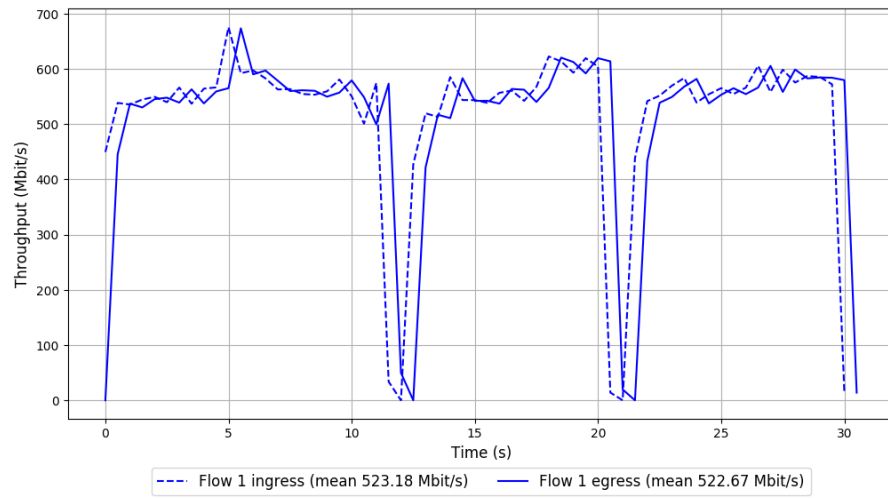
Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-10-02 07:59:07
End at: 2018-10-02 07:59:37
Local clock offset: 3.708 ms
Remote clock offset: -0.566 ms


# Below is generated by plot.py at 2018-10-02 09:53:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 522.67 Mbit/s
95th percentile per-packet one-way delay: 16.277 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 522.67 Mbit/s
95th percentile per-packet one-way delay: 16.277 ms
Loss rate: 0.10%
```

Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 523.18 Mbit/s)   Flow 1 egress (mean 522.67 Mbit/s)

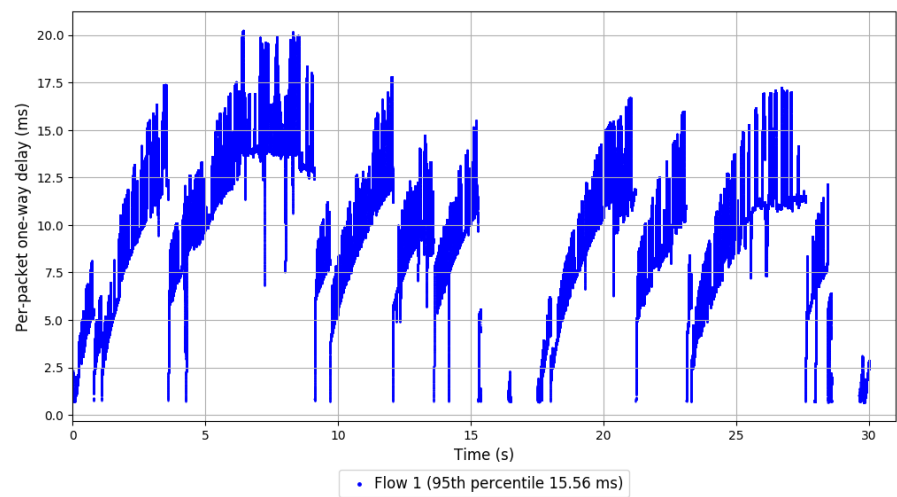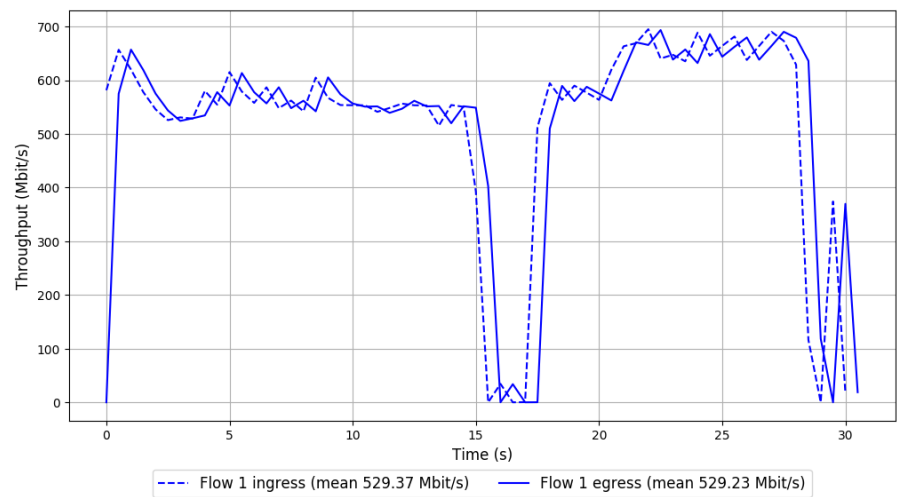Flow 1 (95th percentile 16.28 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2018-10-02 08:25:06
End at: 2018-10-02 08:25:36
Local clock offset: 2.372 ms
Remote clock offset: -0.458 ms


# Below is generated by plot.py at 2018-10-02 09:53:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 529.23 Mbit/s
95th percentile per-packet one-way delay: 15.558 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 529.23 Mbit/s
95th percentile per-packet one-way delay: 15.558 ms
Loss rate: 0.03%
```

Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 529.37 Mbit/s)   Flow 1 egress (mean 529.23 Mbit/s)

• Flow 1 (95th percentile 15.56 ms)

```
Run 4: Statistics of LEDBAT

Start at: 2018-10-02 08:51:10
End at: 2018-10-02 08:51:40
Local clock offset: 2.527 ms
Remote clock offset: -0.29 ms


# Below is generated by plot.py at 2018-10-02 09:54:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 608.63 Mbit/s
95th percentile per-packet one-way delay: 14.535 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 608.63 Mbit/s
95th percentile per-packet one-way delay: 14.535 ms
Loss rate: 0.05%
```
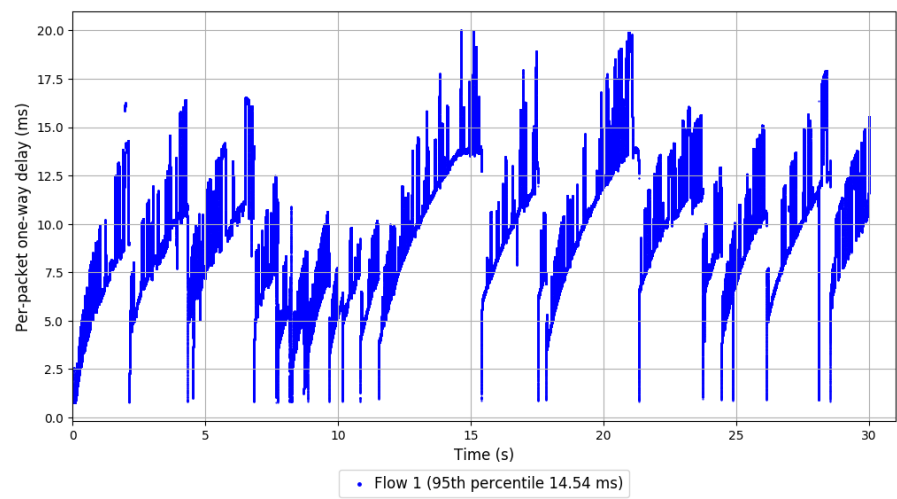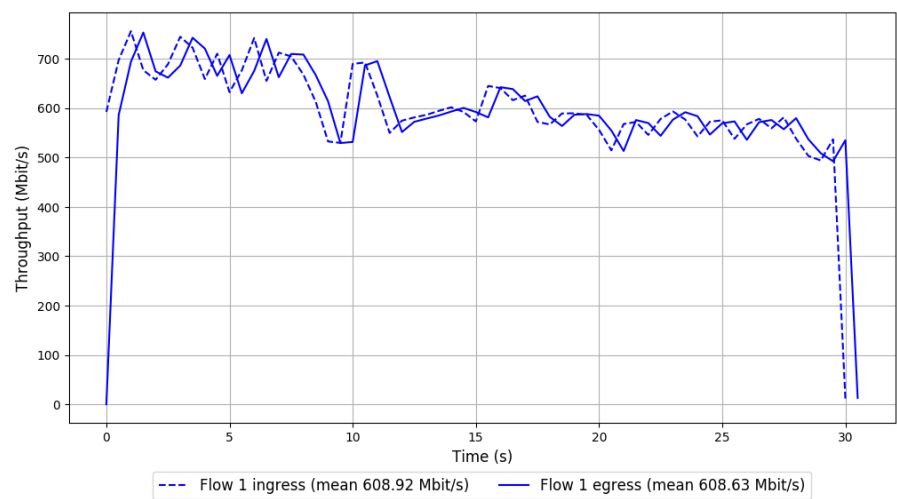
Run 4: Report of LEDBAT — Data Link

Flow 1 ingress (mean 608.92 Mbit/s) --- Flow 1 egress (mean 608.63 Mbit/s)

• Flow 1 (95th percentile 14.54 ms)

```
Run 5: Statistics of LEDBAT

Start at: 2018-10-02 09:17:25
End at: 2018-10-02 09:17:55
Local clock offset: 4.131 ms
Remote clock offset: 0.07 ms


# Below is generated by plot.py at 2018-10-02 09:55:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 588.90 Mbit/s
95th percentile per-packet one-way delay: 15.411 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 588.90 Mbit/s
95th percentile per-packet one-way delay: 15.411 ms
Loss rate: 0.05%
```
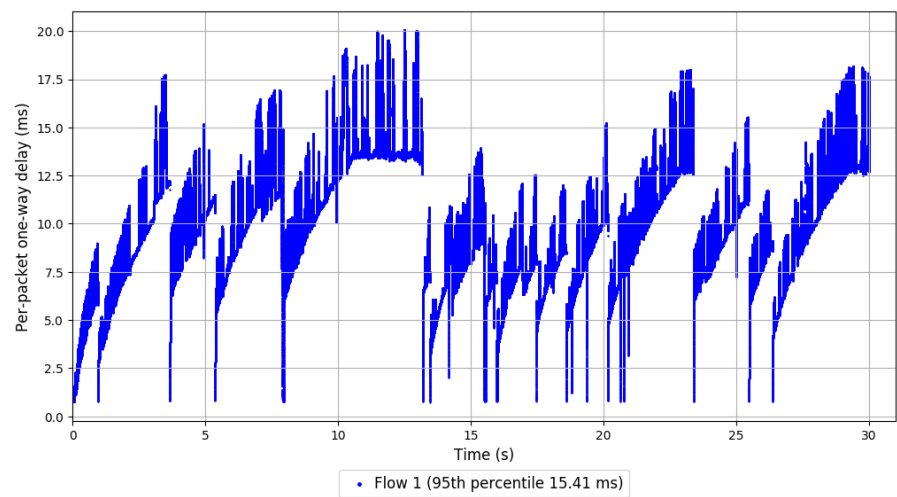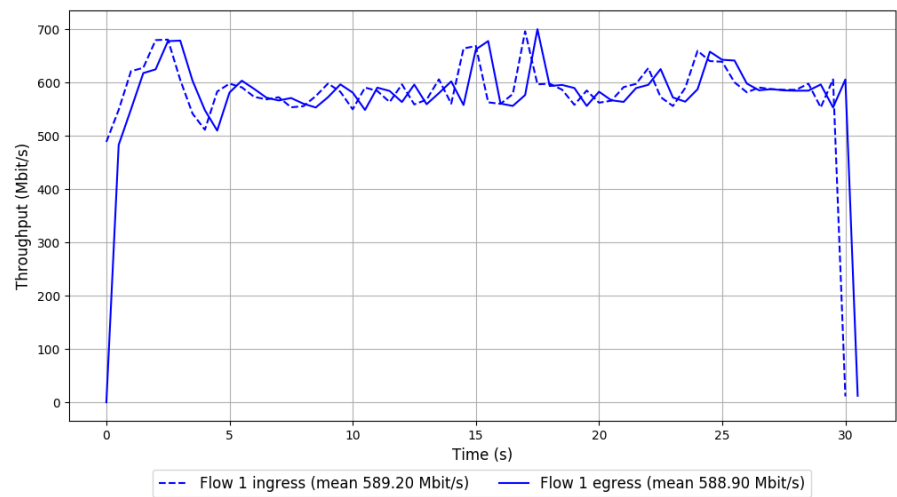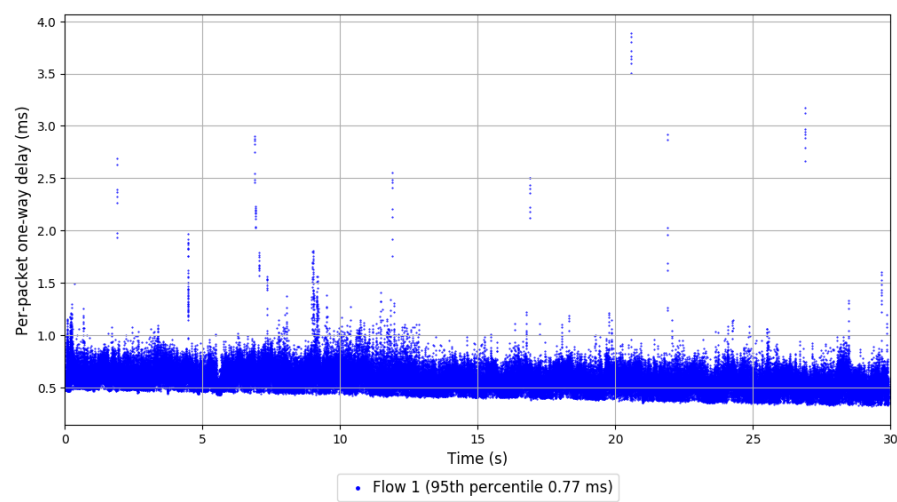
Run 5: Report of LEDBAT — Data Link

Flow 1 ingress (mean 589.20 Mbit/s)   Flow 1 egress (mean 588.90 Mbit/s)

• Flow 1 (95th percentile 15.41 ms)

```
Run 1: Statistics of Indigo-Muses

Start at: 2018-10-02 07:18:03
End at: 2018-10-02 07:18:34
Local clock offset: 7.894 ms
Remote clock offset: 0.697 ms


# Below is generated by plot.py at 2018-10-02 09:55:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 47.18 Mbit/s
95th percentile per-packet one-way delay: 0.768 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 47.18 Mbit/s
95th percentile per-packet one-way delay: 0.768 ms
Loss rate: 0.02%
```
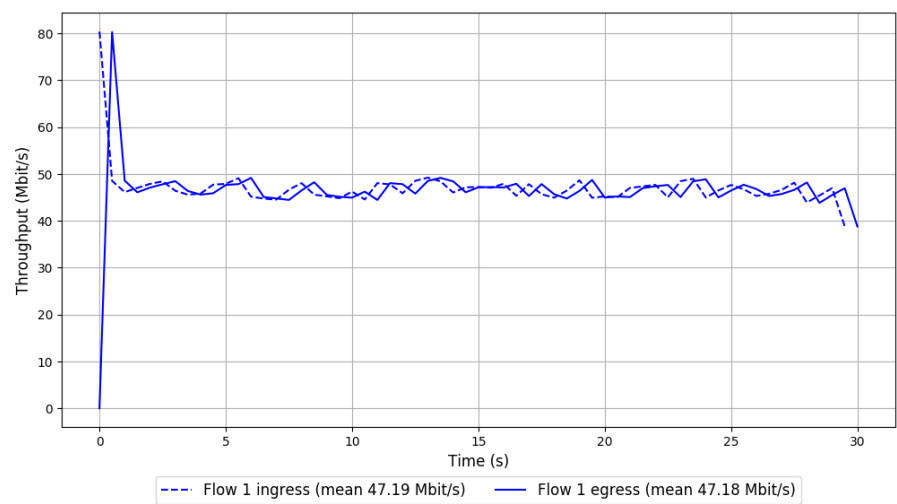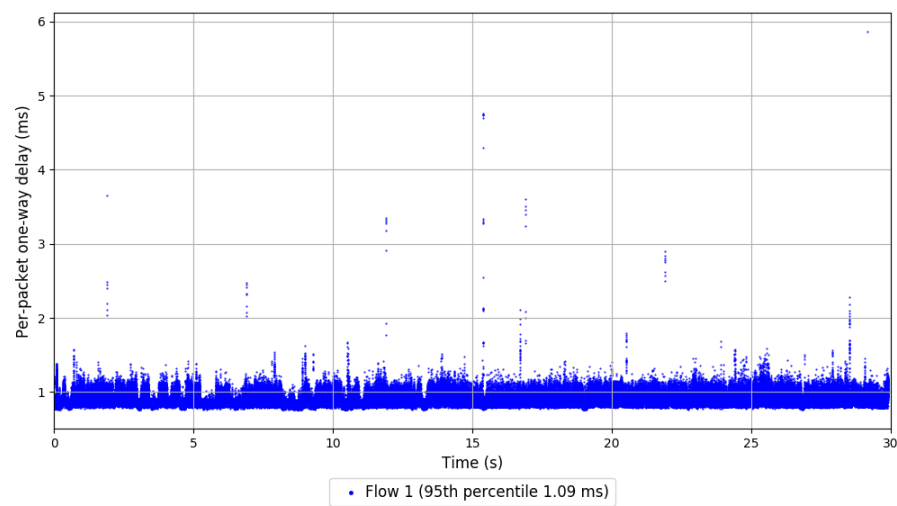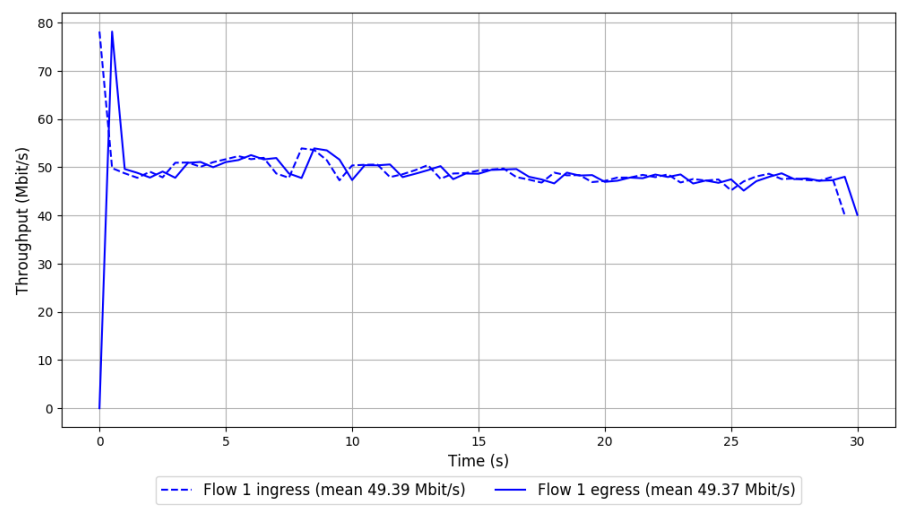
Run 1: Report of Indigo-Muses — Data Link

```
Run 2: Statistics of Indigo-Muses

Start at: 2018-10-02 07:43:50
End at: 2018-10-02 07:44:20
Local clock offset: 3.634 ms
Remote clock offset: -0.676 ms


# Below is generated by plot.py at 2018-10-02 09:55:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 49.37 Mbit/s
95th percentile per-packet one-way delay: 1.090 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 49.37 Mbit/s
95th percentile per-packet one-way delay: 1.090 ms
Loss rate: 0.05%
```

Run 2: Report of Indigo-Muses — Data Link

Flow 1 ingress (mean 49.39 Mbit/s) — Flow 1 egress (mean 49.37 Mbit/s)
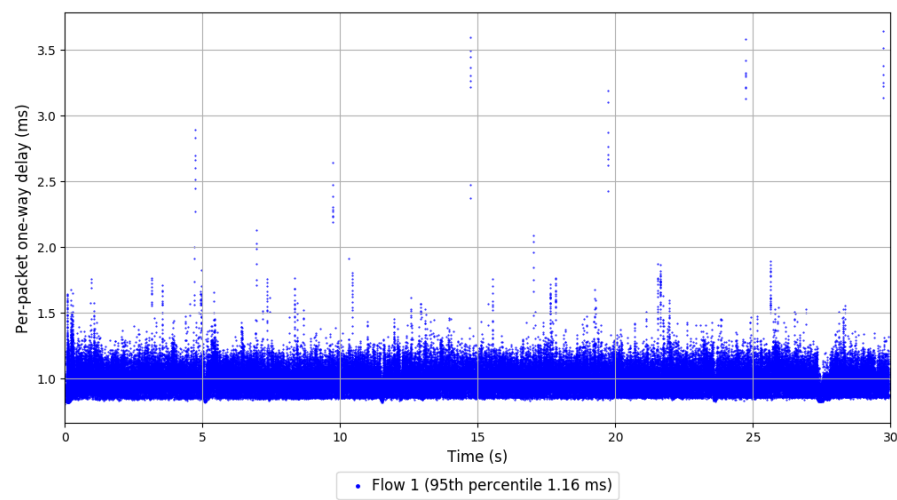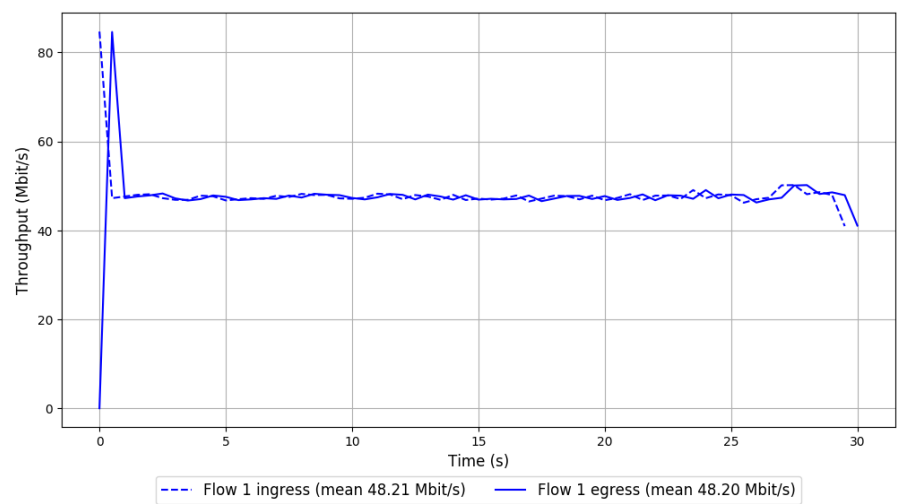

Flow 1 (95th percentile 1.09 ms)

```
Run 3: Statistics of Indigo-Muses

Start at: 2018-10-02 08:09:42
End at: 2018-10-02 08:10:12
Local clock offset: 3.656 ms
Remote clock offset: -0.648 ms

# Below is generated by plot.py at 2018-10-02 09:55:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 48.20 Mbit/s
95th percentile per-packet one-way delay: 1.160 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 48.20 Mbit/s
95th percentile per-packet one-way delay: 1.160 ms
Loss rate: 0.01%
```
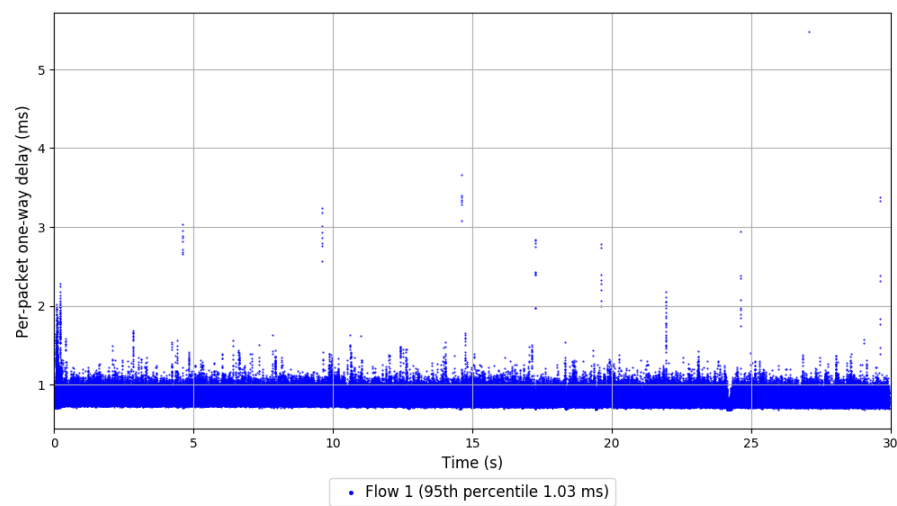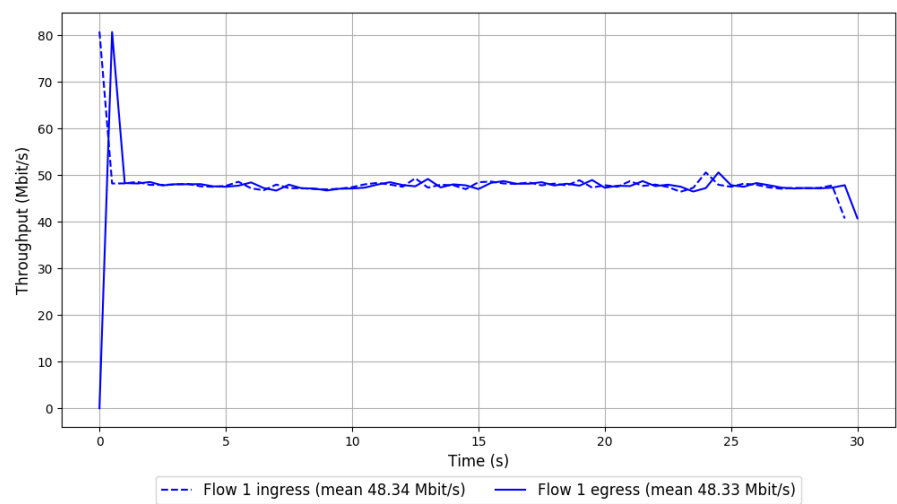
Run 3: Report of Indigo-Muses — Data Link

```
Run 4: Statistics of Indigo-Muses

Start at: 2018-10-02 08:35:45
End at: 2018-10-02 08:36:15
Local clock offset: 1.683 ms
Remote clock offset: -0.228 ms


# Below is generated by plot.py at 2018-10-02 09:55:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 48.33 Mbit/s
95th percentile per-packet one-way delay: 1.035 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 48.33 Mbit/s
95th percentile per-packet one-way delay: 1.035 ms
Loss rate: 0.01%
```

Run 4: Report of Indigo-Muses — Data Link

```
Run 5: Statistics of Indigo-Muses

Start at: 2018-10-02 09:01:55
End at: 2018-10-02 09:02:25
Local clock offset: 3.627 ms
Remote clock offset: 0.02 ms


# Below is generated by plot.py at 2018-10-02 09:55:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 47.57 Mbit/s
95th percentile per-packet one-way delay: 1.172 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 47.57 Mbit/s
95th percentile per-packet one-way delay: 1.172 ms
Loss rate: 0.00%
```
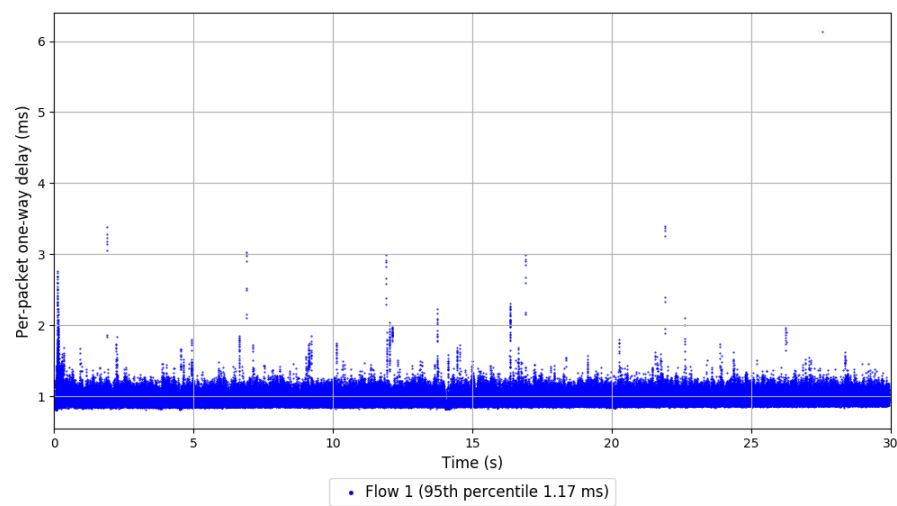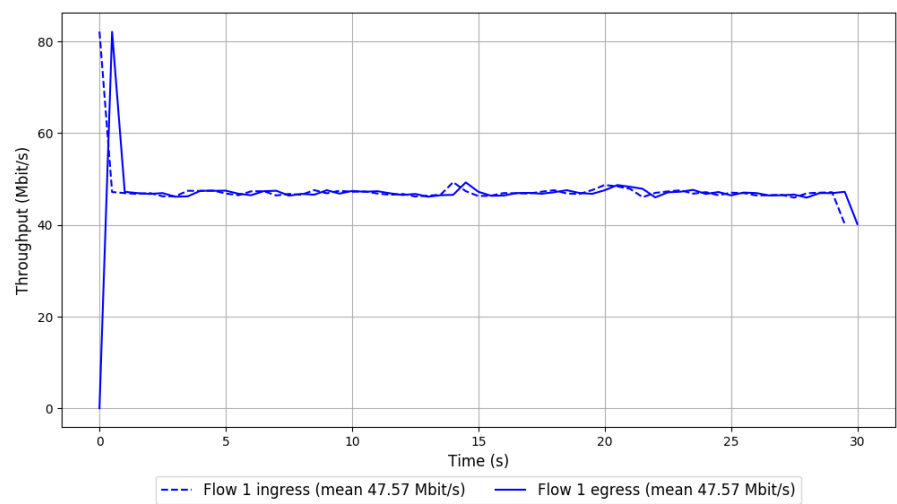
Run 5: Report of Indigo-Muses — Data Link

Flow 1 ingress (mean 47.57 Mbit/s) --- Flow 1 egress (mean 47.57 Mbit/s)

• Flow 1 (95th percentile 1.17 ms)

```
Run 1: Statistics of PCC-Allegro

Start at: 2018-10-02 07:23:19
End at: 2018-10-02 07:23:49
Local clock offset: 5.954 ms
Remote clock offset: 0.182 ms


# Below is generated by plot.py at 2018-10-02 09:56:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 533.95 Mbit/s
95th percentile per-packet one-way delay: 5.230 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 533.95 Mbit/s
95th percentile per-packet one-way delay: 5.230 ms
Loss rate: 0.06%
```
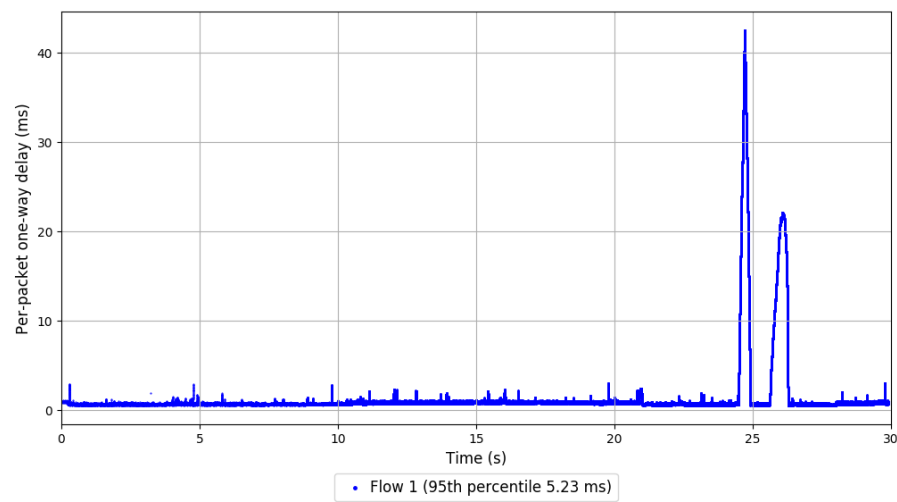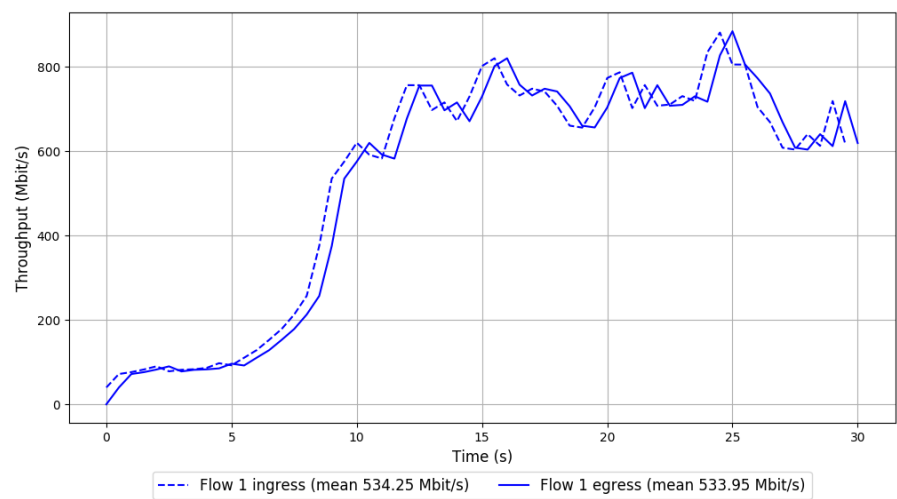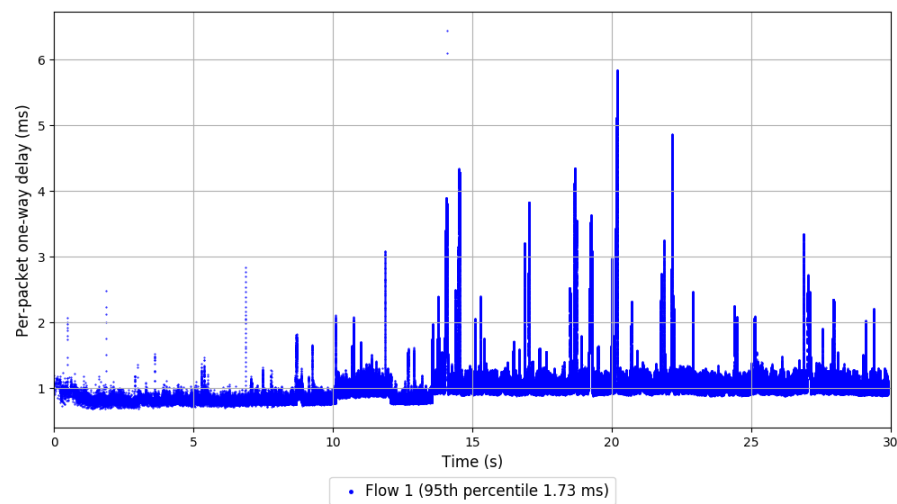
Run 1: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 534.25 Mbit/s)   Flow 1 egress (mean 533.95 Mbit/s)

Flow 1 (95th percentile 5.23 ms)

```
Run 2: Statistics of PCC-Allegro

Start at: 2018-10-02 07:49:06
End at: 2018-10-02 07:49:36
Local clock offset: 3.631 ms
Remote clock offset: -0.637 ms


# Below is generated by plot.py at 2018-10-02 09:56:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 554.06 Mbit/s
95th percentile per-packet one-way delay: 1.734 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 554.06 Mbit/s
95th percentile per-packet one-way delay: 1.734 ms
Loss rate: 0.40%
```
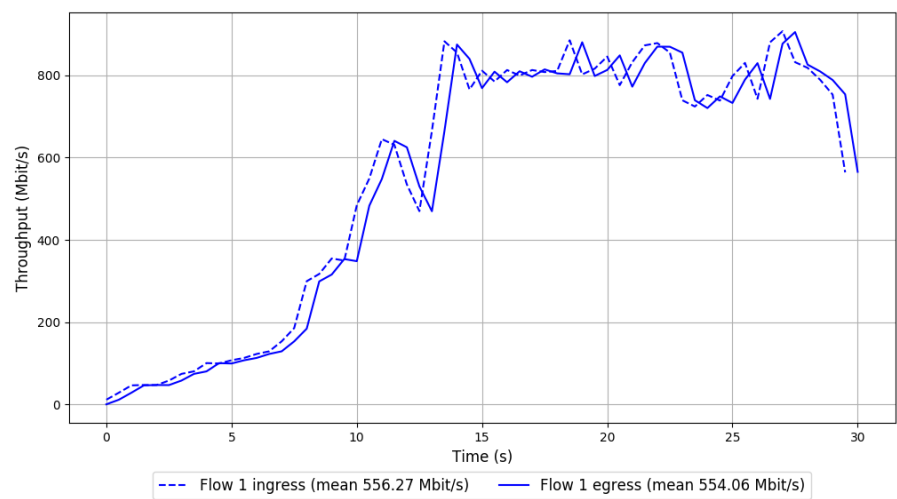
Run 2: Report of PCC-Allegro — Data Link

```
Run 3: Statistics of PCC-Allegro

Start at: 2018-10-02 08:14:58
End at: 2018-10-02 08:15:28
Local clock offset: 3.604 ms
Remote clock offset: -0.787 ms


# Below is generated by plot.py at 2018-10-02 09:58:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 660.42 Mbit/s
95th percentile per-packet one-way delay: 5.937 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 660.42 Mbit/s
95th percentile per-packet one-way delay: 5.937 ms
Loss rate: 0.04%
```
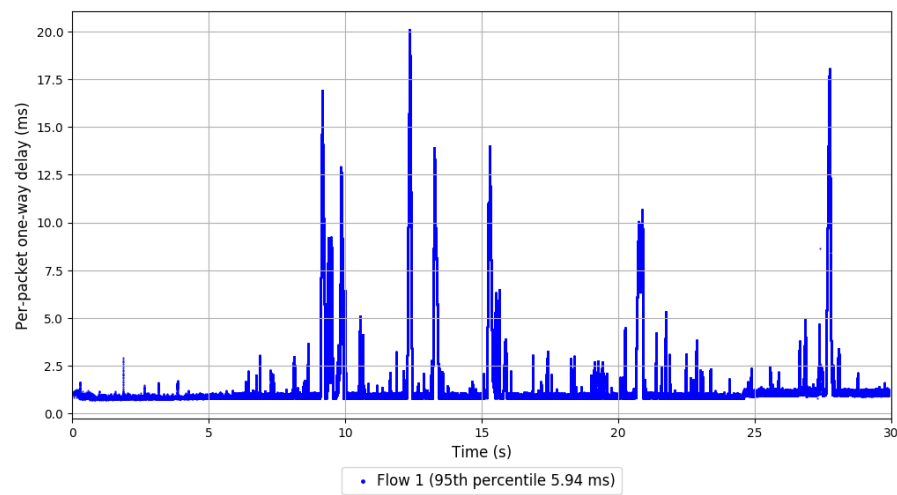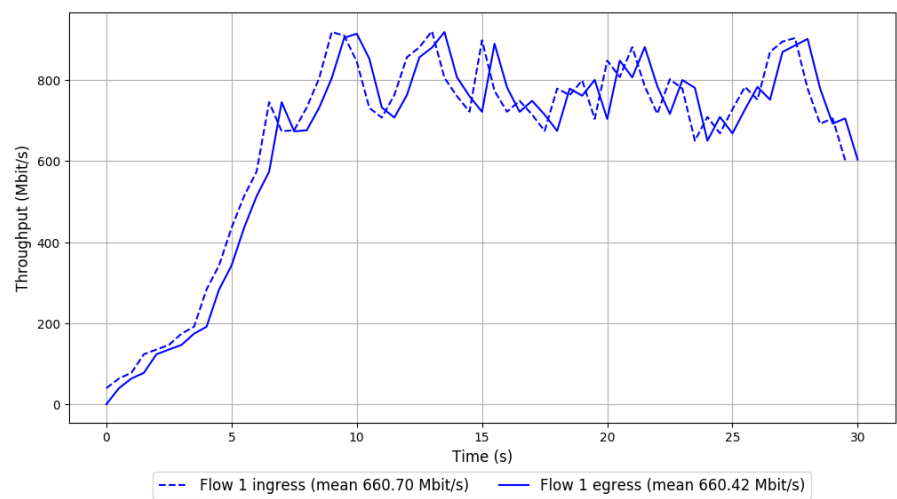
Run 3: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 660.70 Mbit/s)   Flow 1 egress (mean 660.42 Mbit/s)
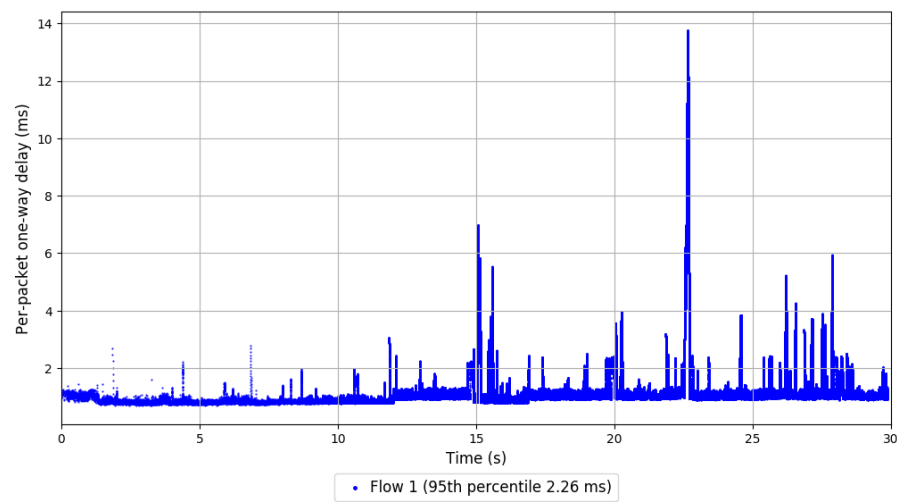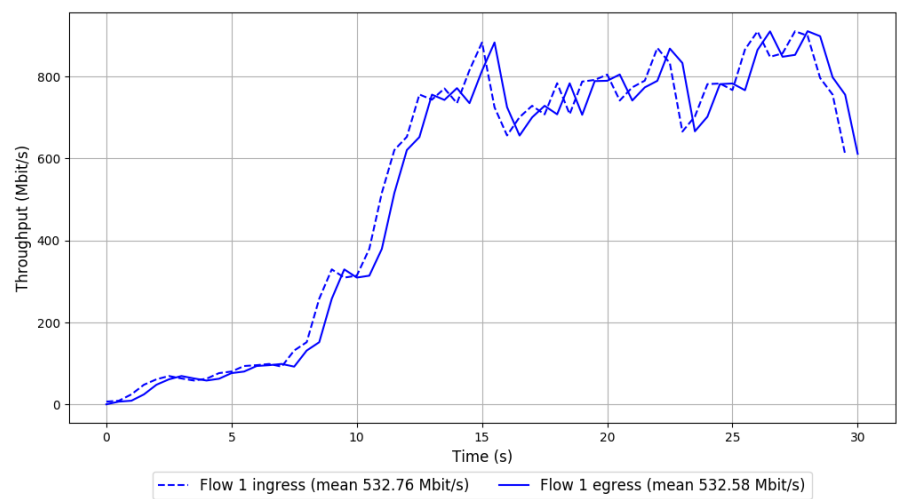

• Flow 1 (95th percentile 5.94 ms)

```
Run 4: Statistics of PCC-Allegro

Start at: 2018-10-02 08:41:00
End at: 2018-10-02 08:41:30
Local clock offset: 1.453 ms
Remote clock offset: -0.155 ms


# Below is generated by plot.py at 2018-10-02 09:59:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 532.58 Mbit/s
95th percentile per-packet one-way delay: 2.257 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 532.58 Mbit/s
95th percentile per-packet one-way delay: 2.257 ms
Loss rate: 0.03%
```

Run 4: Report of PCC-Allegro — Data Link

```
Run 5: Statistics of PCC-Allegro

Start at: 2018-10-02 09:07:12
End at: 2018-10-02 09:07:42
Local clock offset: 3.902 ms
Remote clock offset: 0.106 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 645.92 Mbit/s
95th percentile per-packet one-way delay: 2.249 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 645.92 Mbit/s
95th percentile per-packet one-way delay: 2.249 ms
Loss rate: 0.04%
```
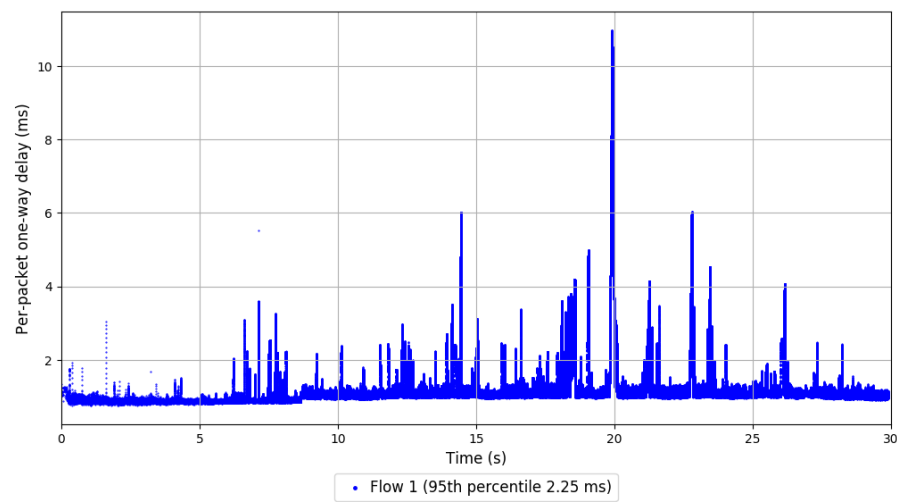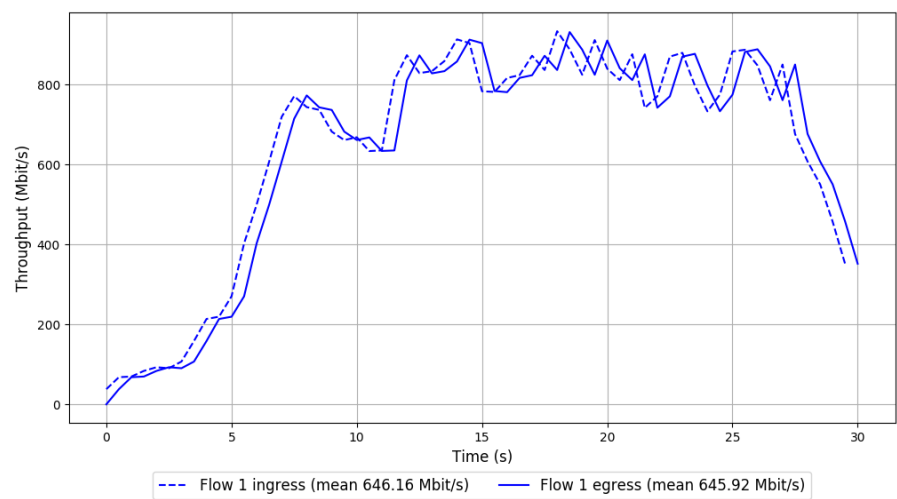
Run 5: Report of PCC-Allegro — Data Link
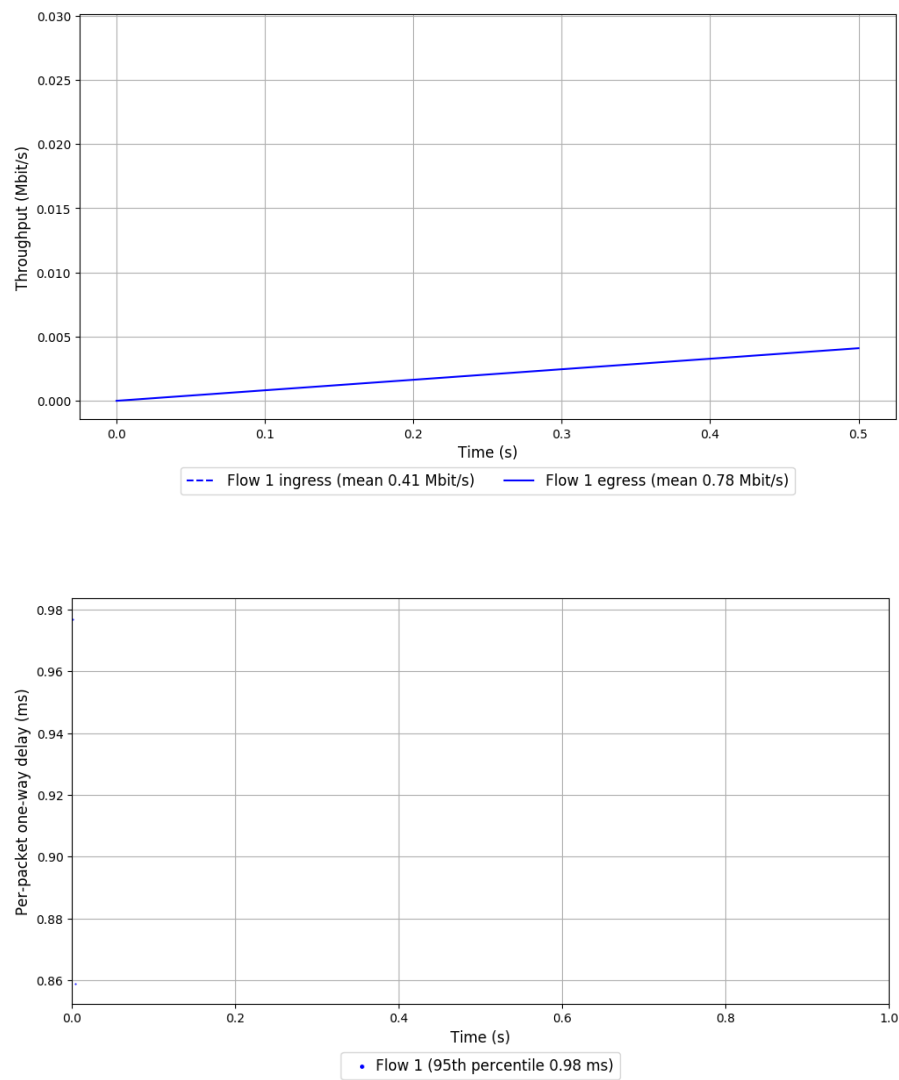

94

```
Run 1: Statistics of PCC-Expr

Start at: 2018-10-02 07:19:23
End at: 2018-10-02 07:19:53
Local clock offset: 7.248 ms
Remote clock offset: 0.595 ms
```

Run 1: Report of PCC-Expr — Data Link
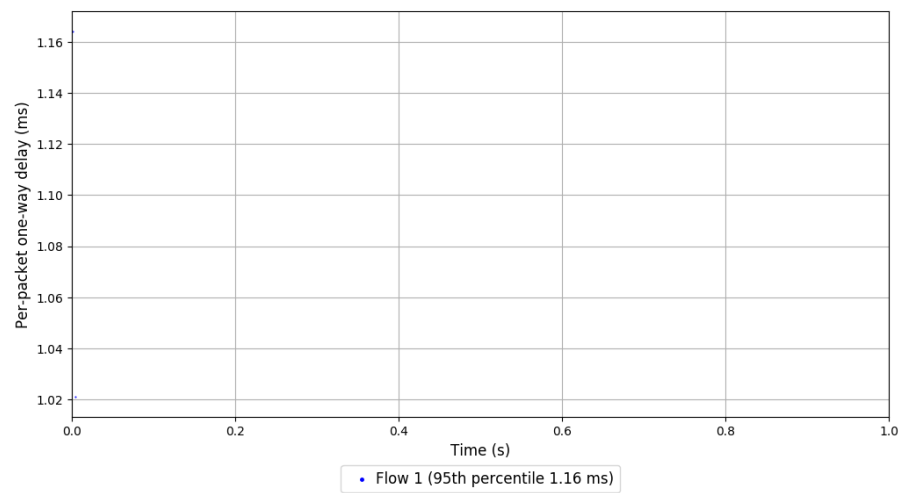
```
Run 2: Statistics of PCC-Expr

Start at: 2018-10-02 07:45:10
End at: 2018-10-02 07:45:40
Local clock offset: 3.577 ms
Remote clock offset: -0.7 ms
```
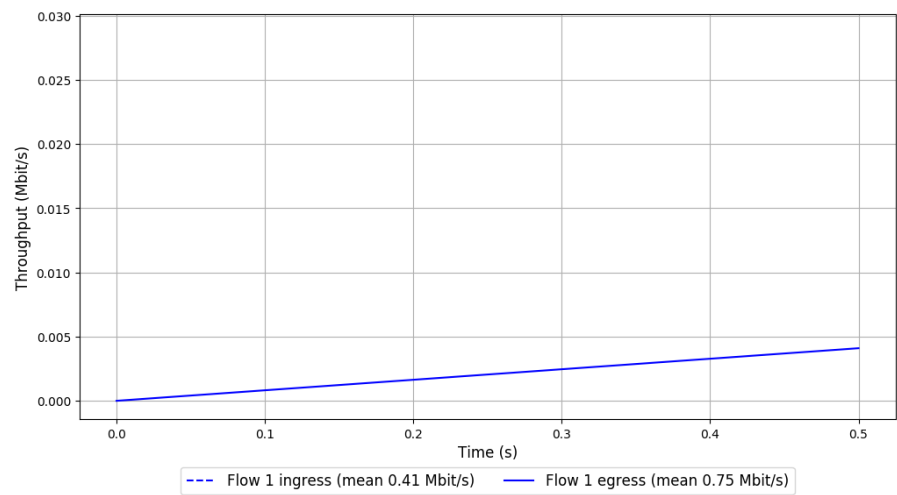
Run 2: Report of PCC-Expr — Data Link

```
Run 3: Statistics of PCC-Expr

Start at: 2018-10-02 08:11:01
End at: 2018-10-02 08:11:31
Local clock offset: 3.634 ms
Remote clock offset: -0.745 ms
```
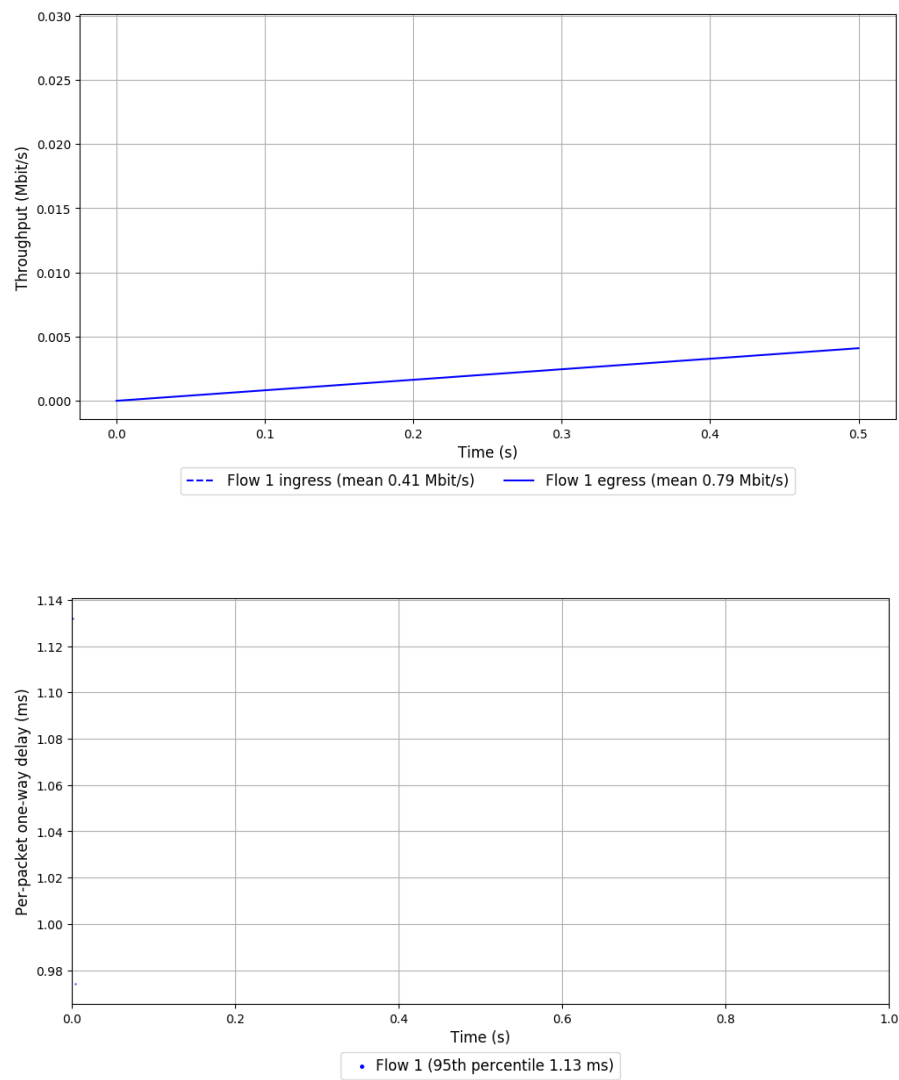
Run 3: Report of PCC-Expr — Data Link
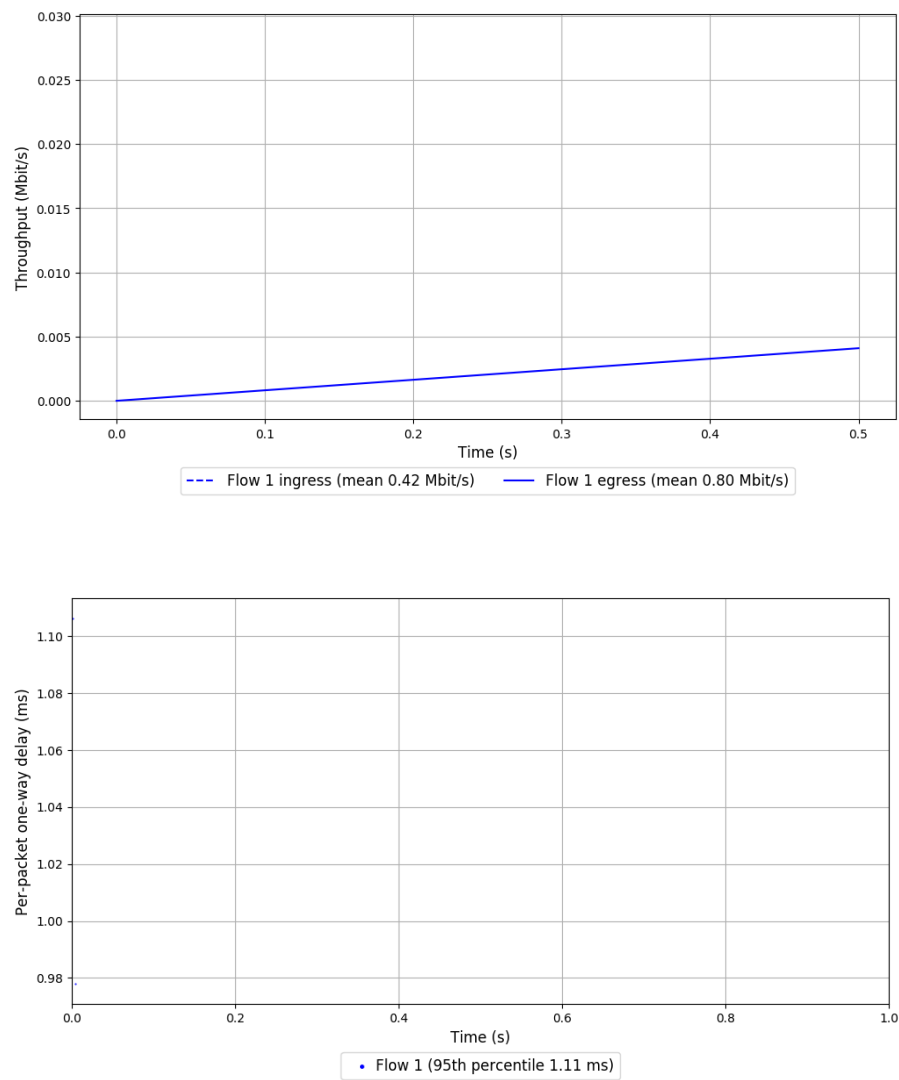
```
Run 4: Statistics of PCC-Expr

Start at: 2018-10-02 08:37:04
End at: 2018-10-02 08:37:34
Local clock offset: 1.621 ms
Remote clock offset: -0.222 ms
```

Run 4: Report of PCC-Expr — Data Link
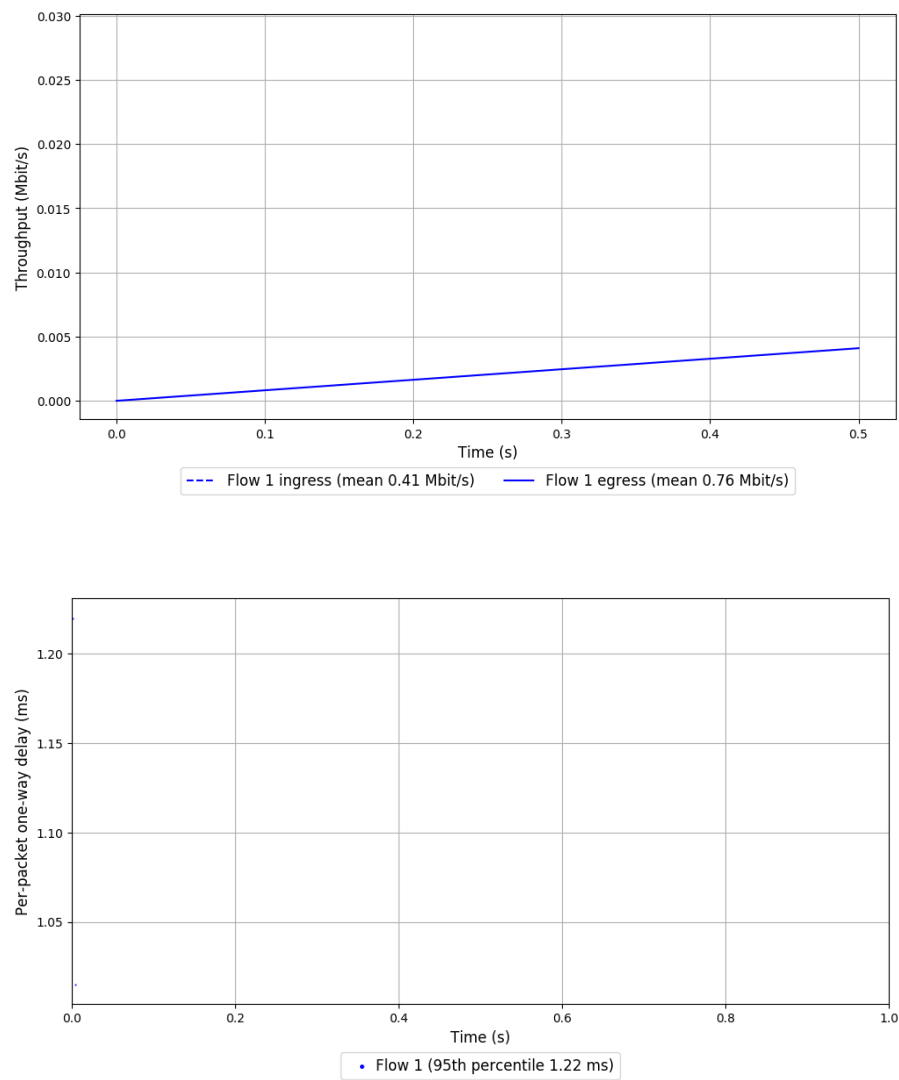
```
Run 5: Statistics of PCC-Expr

Start at: 2018-10-02 09:03:15
End at: 2018-10-02 09:03:45
Local clock offset: 3.71 ms
Remote clock offset: 0.047 ms
```

Run 5: Report of PCC-Expr — Data Link

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-10-02 07:20:40
End at: 2018-10-02 07:21:10
Local clock offset: 6.741 ms
Remote clock offset: 0.434 ms

# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 83.83 Mbit/s
95th percentile per-packet one-way delay: 0.689 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 83.83 Mbit/s
95th percentile per-packet one-way delay: 0.689 ms
Loss rate: 0.02%
```
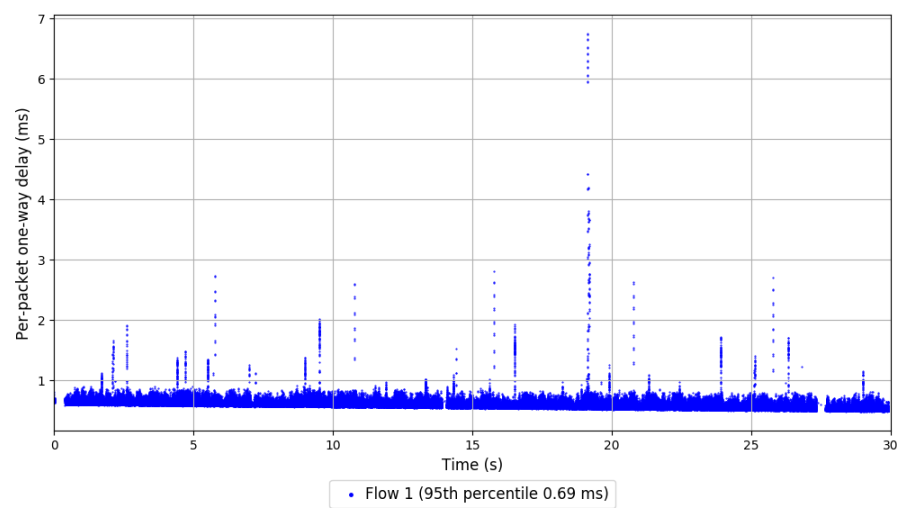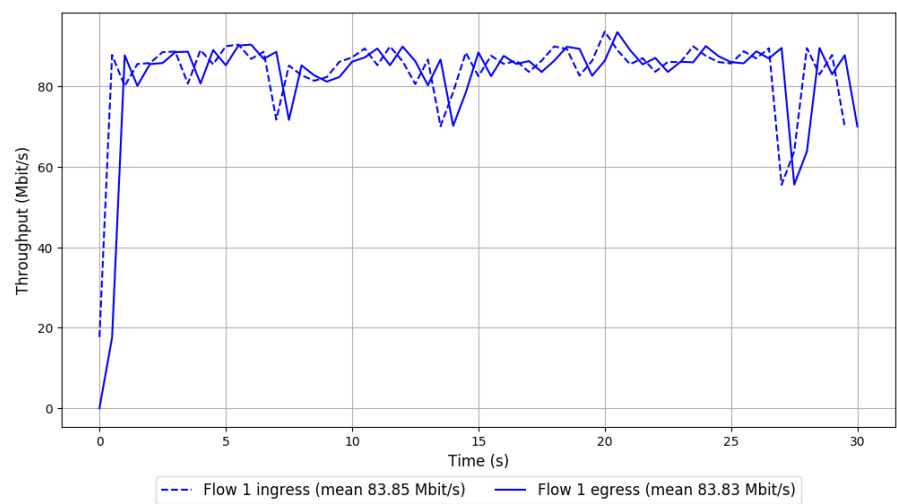
Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 83.85 Mbit/s)   Flow 1 egress (mean 83.83 Mbit/s)

Flow 1 (95th percentile 0.69 ms)

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-10-02 07:46:27
End at: 2018-10-02 07:46:57
Local clock offset: 3.577 ms
Remote clock offset: -0.568 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 77.28 Mbit/s
95th percentile per-packet one-way delay: 0.974 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 77.28 Mbit/s
95th percentile per-packet one-way delay: 0.974 ms
Loss rate: 0.02%
```
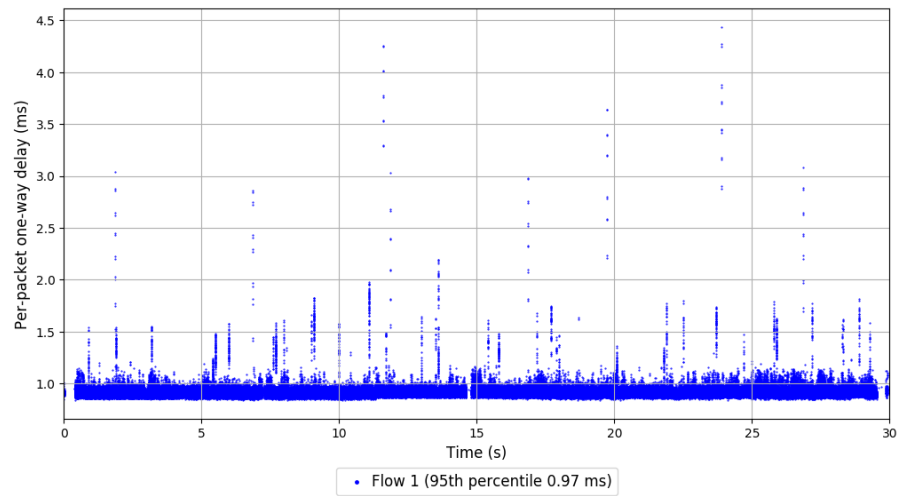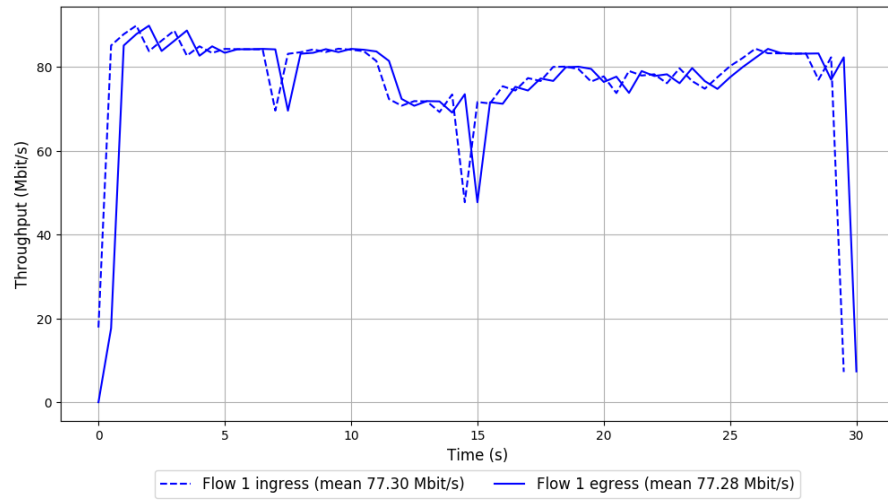
Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-10-02 08:12:19
End at: 2018-10-02 08:12:49
Local clock offset: 3.637 ms
Remote clock offset: -0.686 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 78.12 Mbit/s
95th percentile per-packet one-way delay: 0.965 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 78.12 Mbit/s
95th percentile per-packet one-way delay: 0.965 ms
Loss rate: 0.01%
```
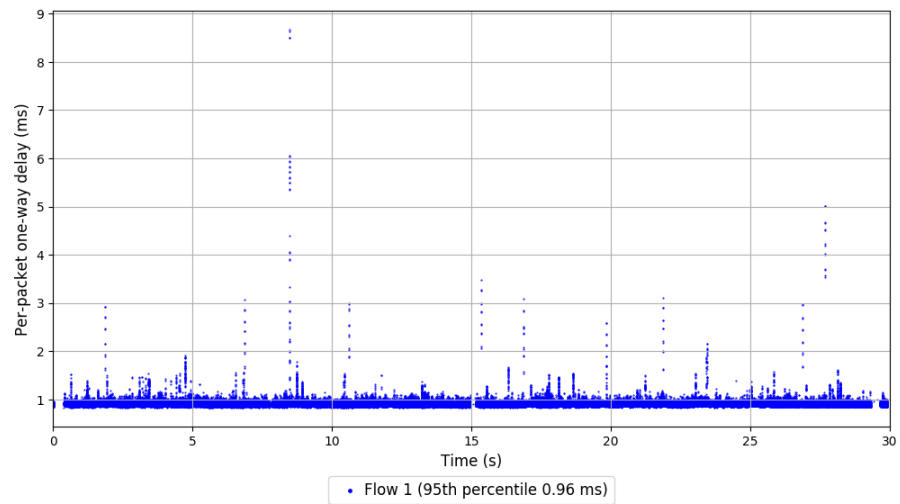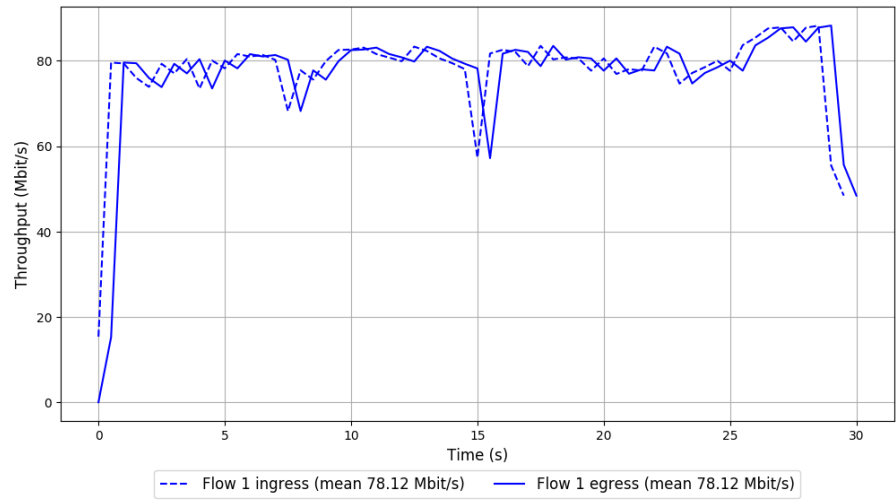
Run 3: Report of QUIC Cubic — Data Link

```
Run 4: Statistics of QUIC Cubic

Start at: 2018-10-02 08:38:22
End at: 2018-10-02 08:38:52
Local clock offset: 1.573 ms
Remote clock offset: -0.231 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 77.82 Mbit/s
95th percentile per-packet one-way delay: 0.826 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 77.82 Mbit/s
95th percentile per-packet one-way delay: 0.826 ms
Loss rate: 0.00%
```
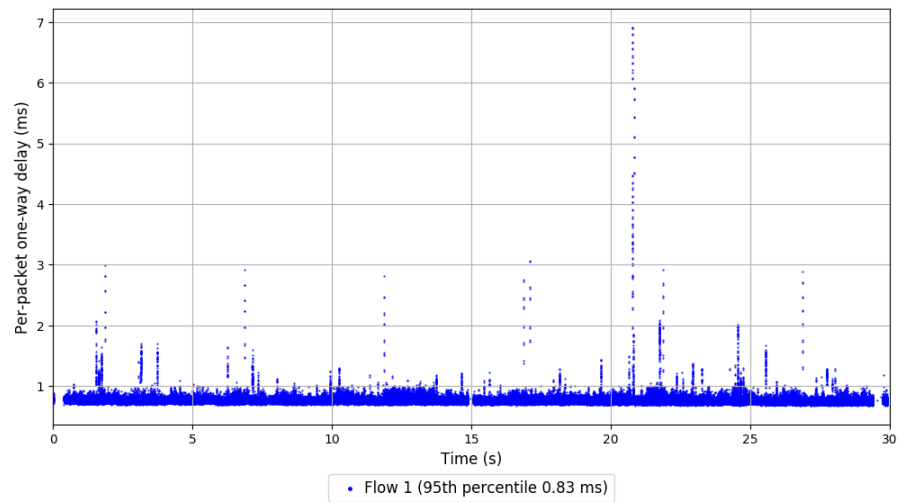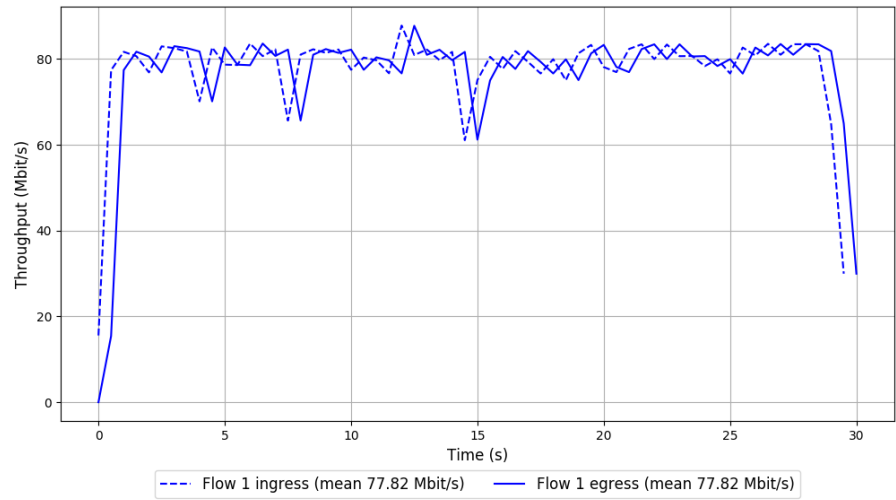
Run 4: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 77.82 Mbit/s) ——— Flow 1 egress (mean 77.82 Mbit/s)

• Flow 1 (95th percentile 0.83 ms)

```
Run 5: Statistics of QUIC Cubic

Start at: 2018-10-02 09:04:33
End at: 2018-10-02 09:05:03
Local clock offset: 3.771 ms
Remote clock offset: -0.002 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 83.33 Mbit/s
95th percentile per-packet one-way delay: 0.869 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 83.33 Mbit/s
95th percentile per-packet one-way delay: 0.869 ms
Loss rate: 0.01%
```
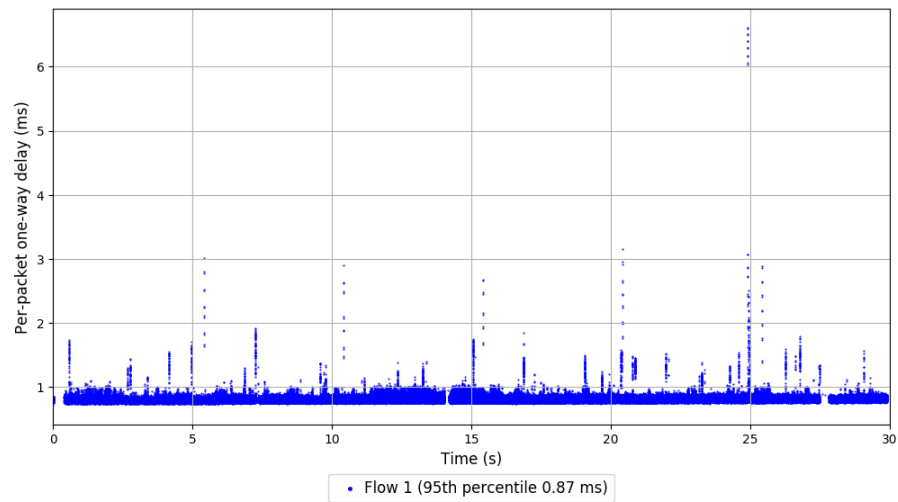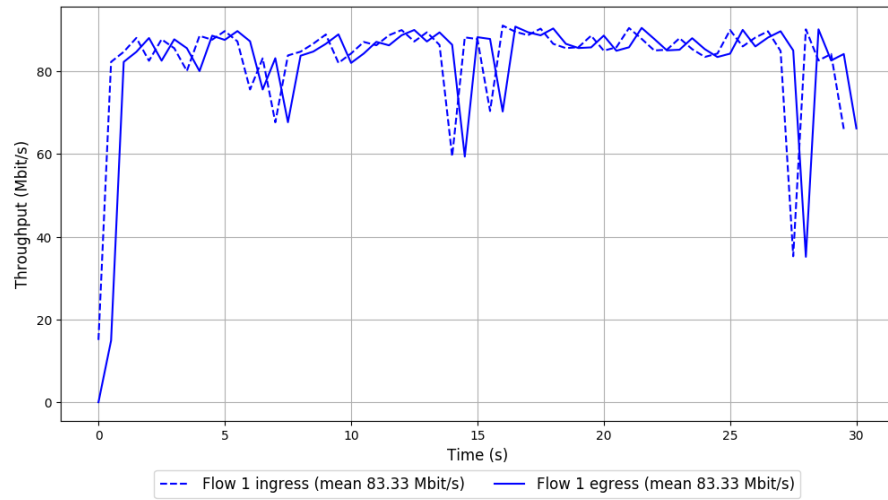
Run 5: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 83.33 Mbit/s)   Flow 1 egress (mean 83.33 Mbit/s)
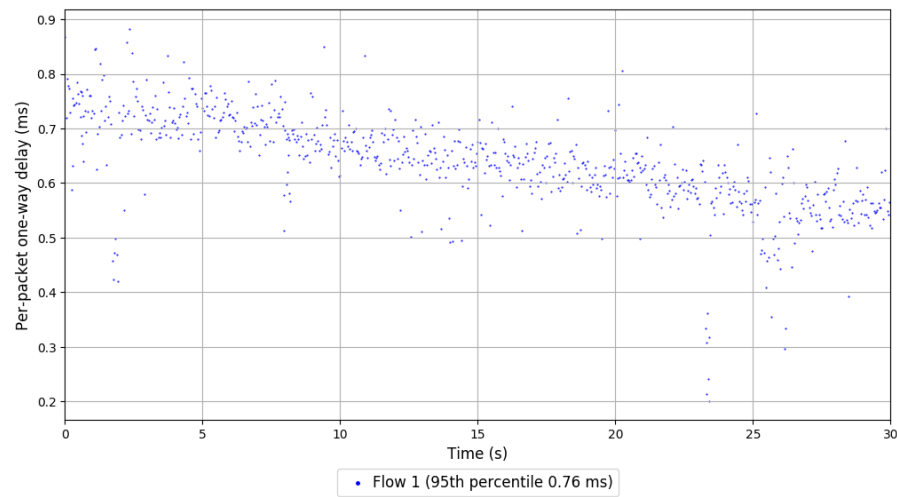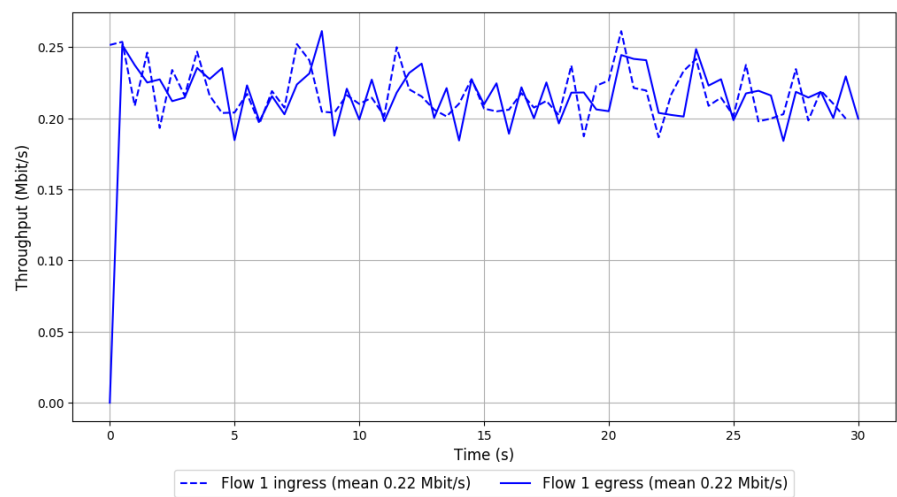

Flow 1 (95th percentile 0.87 ms)

```
Run 1: Statistics of SCReAM

Start at: 2018-10-02 07:16:46
End at: 2018-10-02 07:17:16
Local clock offset: 8.563 ms
Remote clock offset: 0.837 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 0.763 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 0.763 ms
Loss rate: 0.00%
```

Run 1: Report of SCReAM — Data Link

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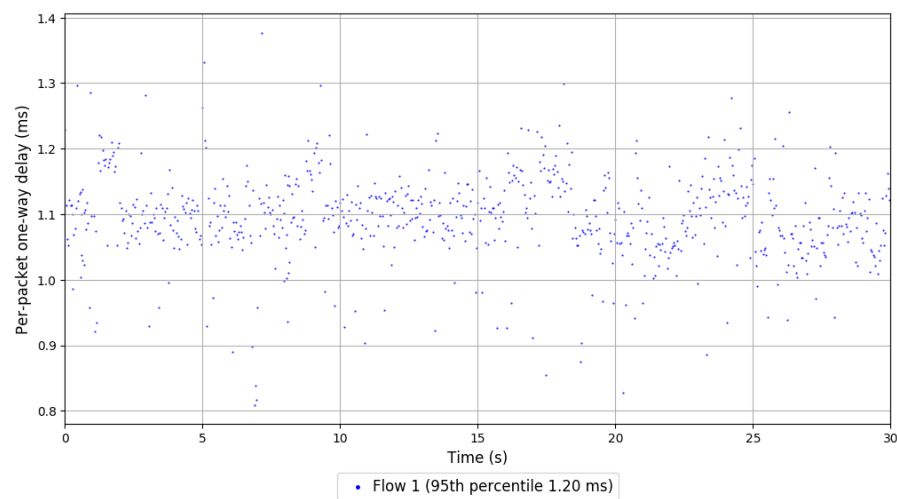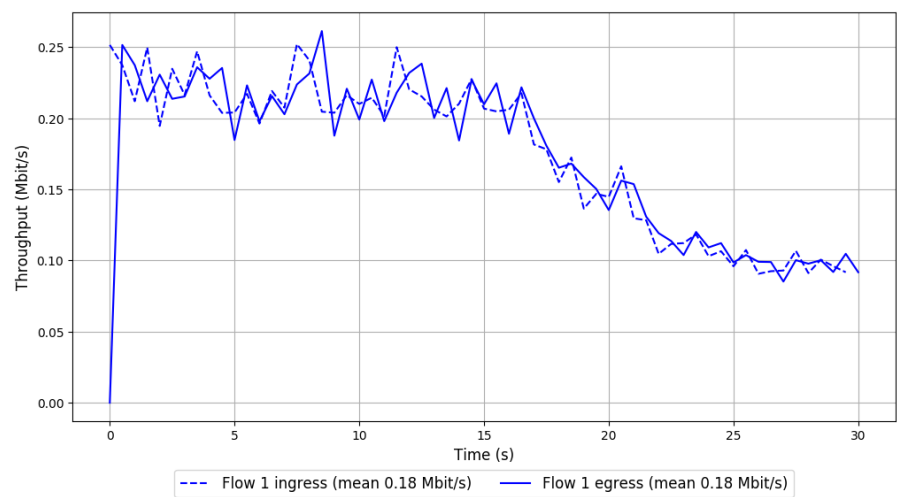

• Flow 1 (95th percentile 0.76 ms)

```
Run 2: Statistics of SCReAM

Start at: 2018-10-02 07:42:32
End at: 2018-10-02 07:43:02
Local clock offset: 3.683 ms
Remote clock offset: -0.644 ms

# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 1.201 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 1.201 ms
Loss rate: 0.28%
```

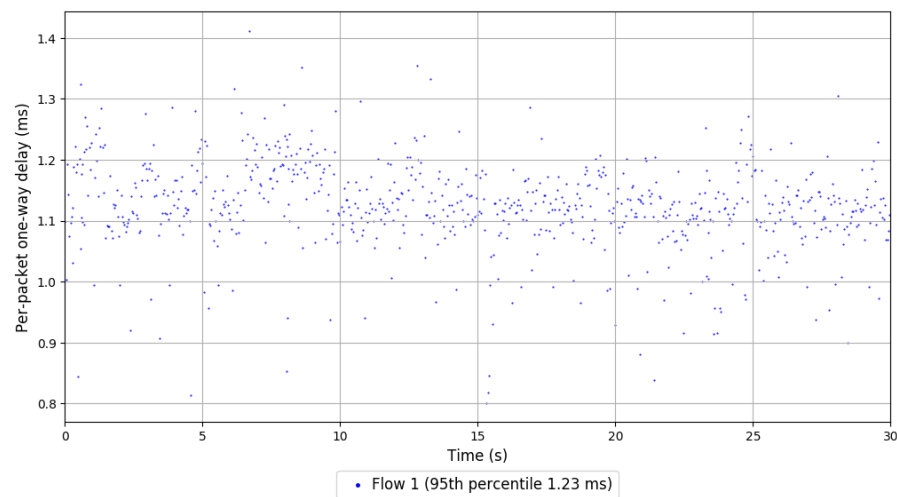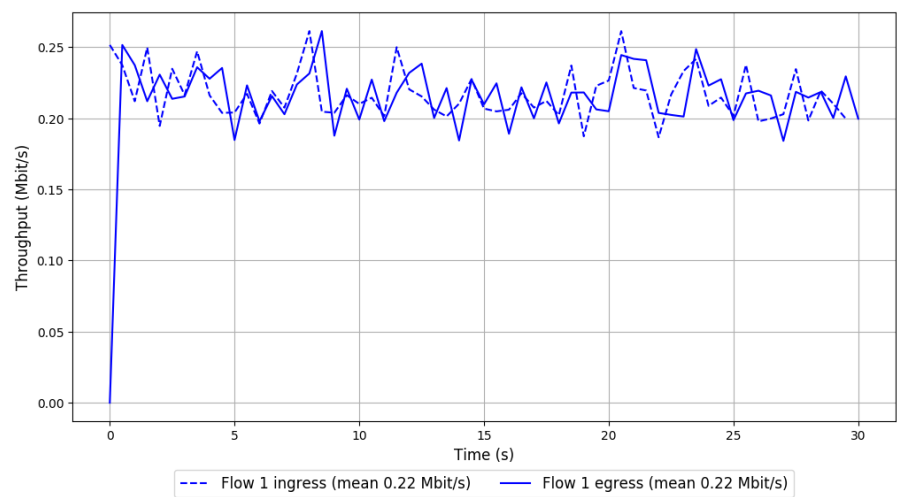## Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-10-02 08:08:24
End at: 2018-10-02 08:08:54
Local clock offset: 3.675 ms
Remote clock offset: -0.675 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.230 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.230 ms
Loss rate: 0.00%
```

Run 3: Report of SCReAM — Data Link

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

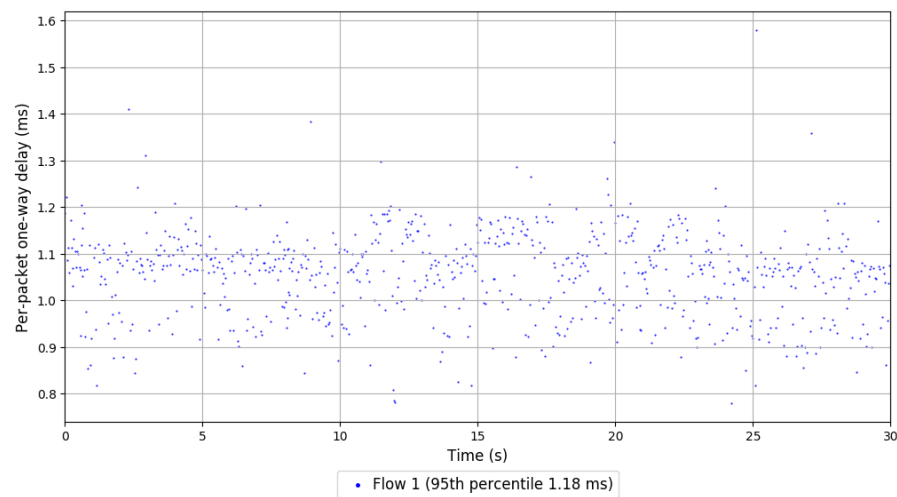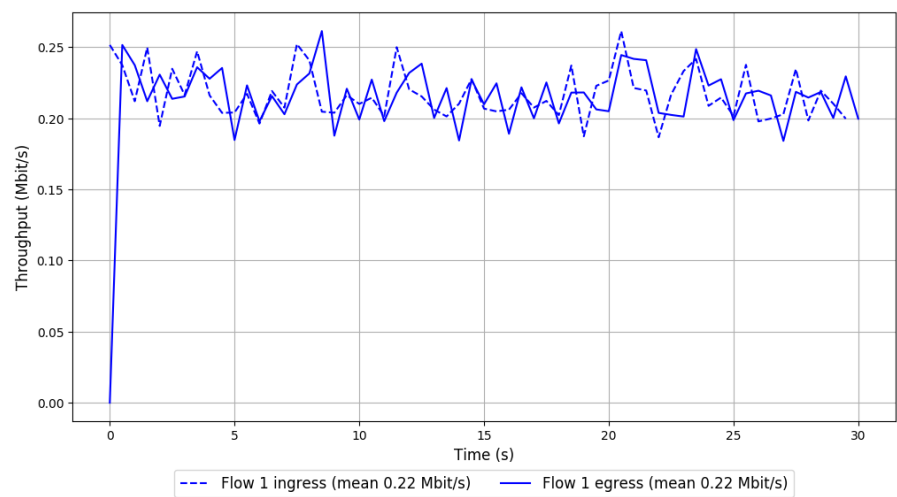

Flow 1 (95th percentile 1.23 ms)

```
Run 4: Statistics of SCReAM

Start at: 2018-10-02 08:34:27
End at: 2018-10-02 08:34:57
Local clock offset: 1.749 ms
Remote clock offset: -0.224 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.183 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.183 ms
Loss rate: 0.00%
```

Run 4: Report of SCReAM — Data Link

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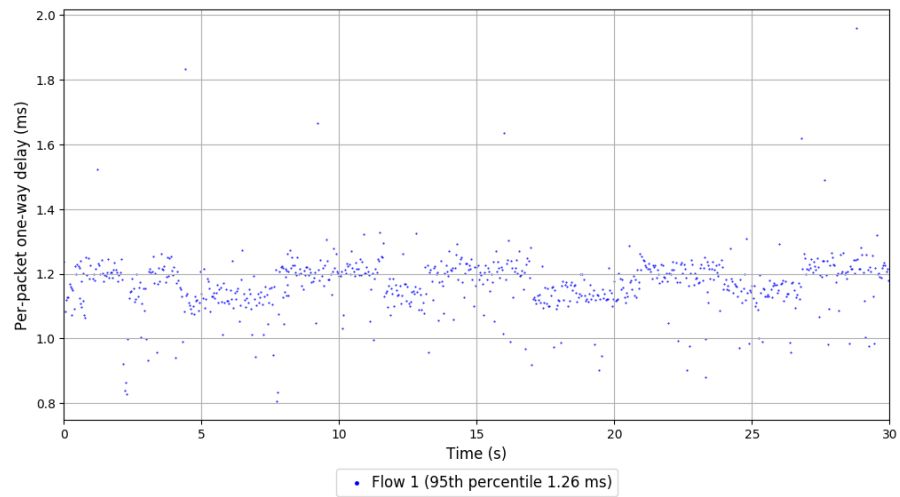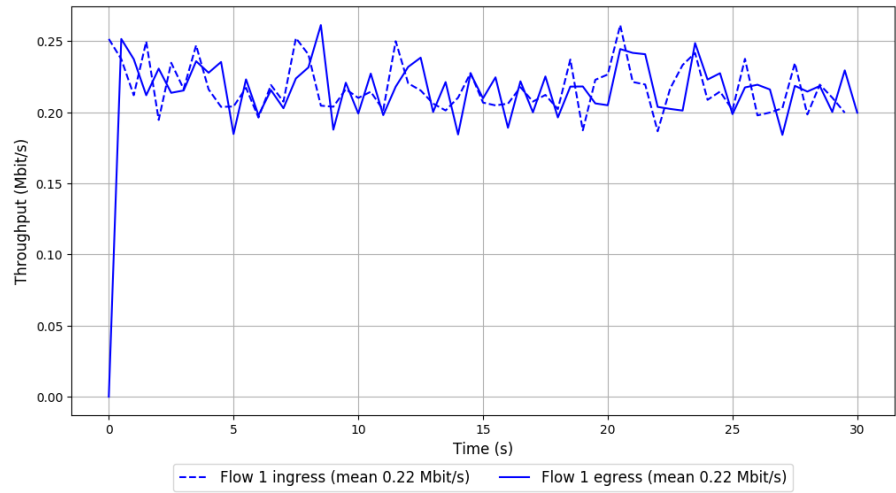

Flow 1 (95th percentile 1.18 ms)

```
Run 5: Statistics of SCReAM

Start at: 2018-10-02 09:00:37
End at: 2018-10-02 09:01:07
Local clock offset: 3.552 ms
Remote clock offset: -0.023 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.258 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.258 ms
Loss rate: 0.00%
```

Run 5: Report of SCReAM — Data Link

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

Flow 1 (95th percentile 1.26 ms)

```
Run 1: Statistics of Sprout

Start at: 2018-10-02 07:26:12
End at: 2018-10-02 07:26:42
Local clock offset: 5.297 ms
Remote clock offset: 0.004 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 49.94 Mbit/s
95th percentile per-packet one-way delay: 4.040 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 49.94 Mbit/s
95th percentile per-packet one-way delay: 4.040 ms
Loss rate: 0.21%
```
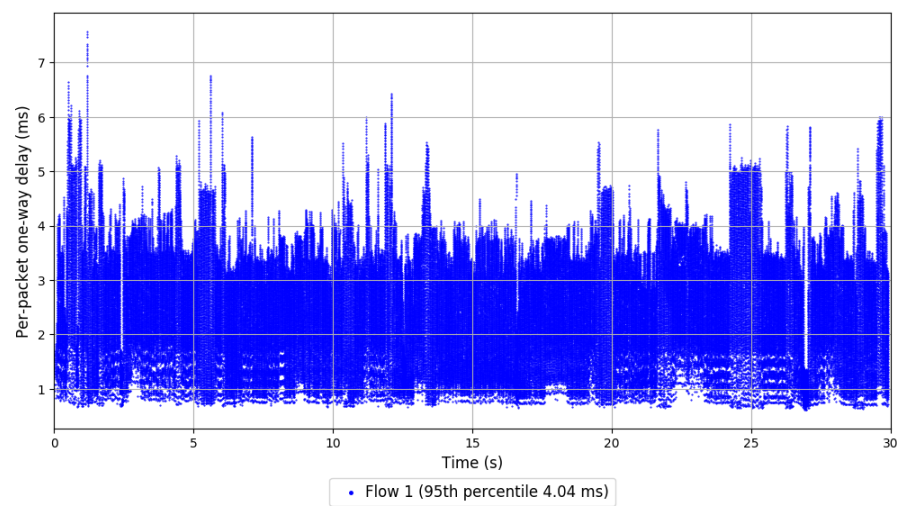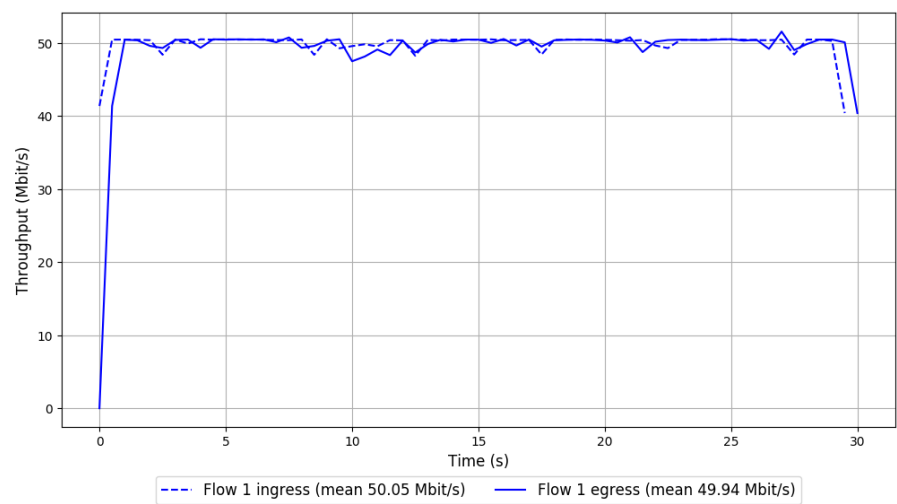
Run 1: Report of Sprout — Data Link

Flow 1 ingress (mean 50.05 Mbit/s) --- Flow 1 egress (mean 49.94 Mbit/s)

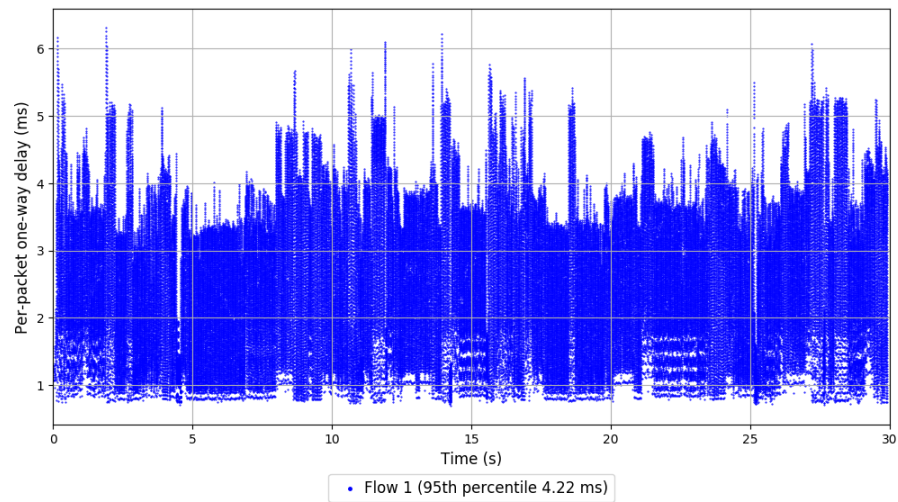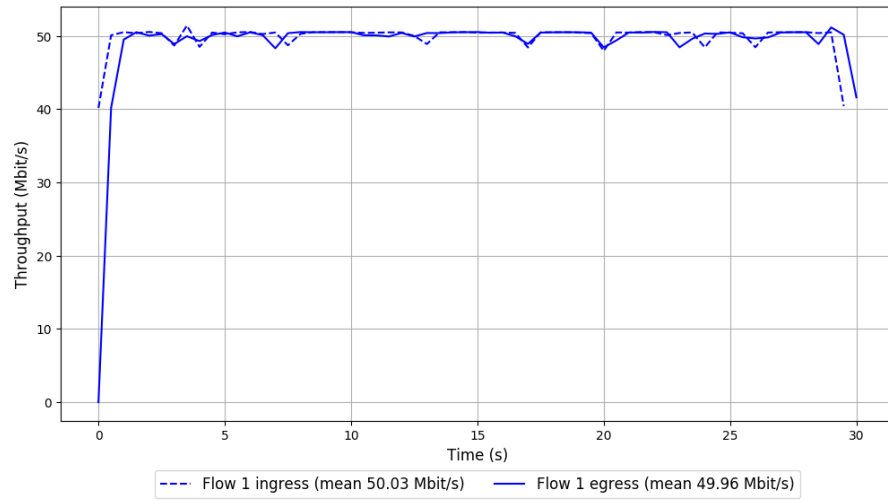• Flow 1 (95th percentile 4.04 ms)

```
Run 2: Statistics of Sprout

Start at: 2018-10-02 07:52:05
End at: 2018-10-02 07:52:35
Local clock offset: 3.694 ms
Remote clock offset: -0.657 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 49.96 Mbit/s
95th percentile per-packet one-way delay: 4.220 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 49.96 Mbit/s
95th percentile per-packet one-way delay: 4.220 ms
Loss rate: 0.13%
```

Run 2: Report of Sprout — Data Link

Flow 1 ingress (mean 50.03 Mbit/s)   Flow 1 egress (mean 49.96 Mbit/s)

Flow 1 (95th percentile 4.22 ms)

```
Run 3: Statistics of Sprout

Start at: 2018-10-02 08:17:58
End at: 2018-10-02 08:18:28
Local clock offset: 3.27 ms
Remote clock offset: -0.78 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 50.02 Mbit/s
95th percentile per-packet one-way delay: 4.217 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 50.02 Mbit/s
95th percentile per-packet one-way delay: 4.217 ms
Loss rate: 0.05%
```
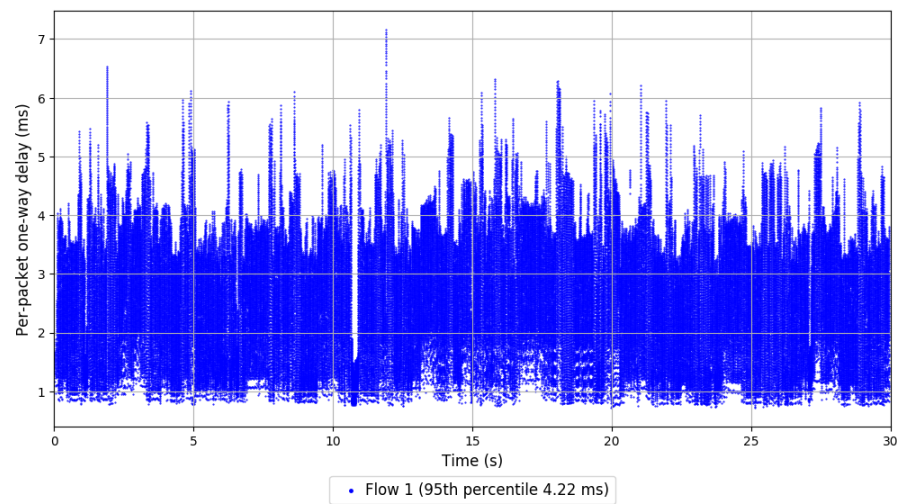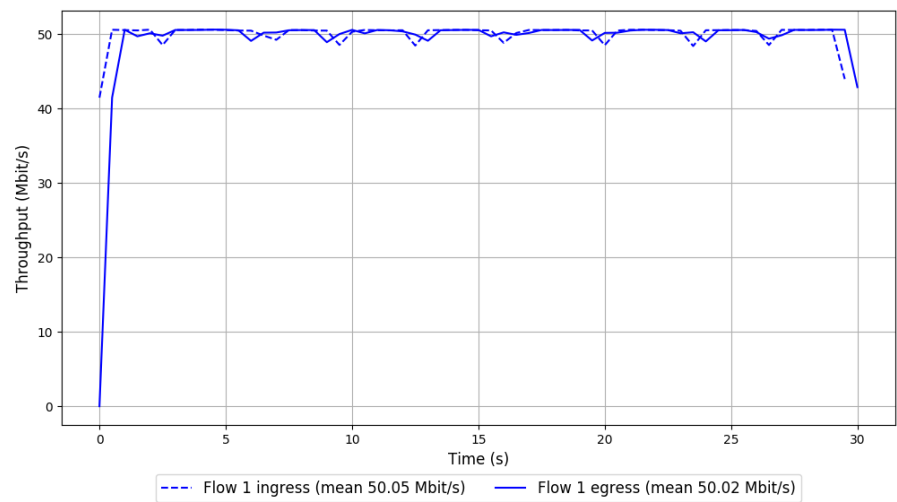
Run 3: Report of Sprout — Data Link

Flow 1 ingress (mean 50.05 Mbit/s) Flow 1 egress (mean 50.02 Mbit/s)

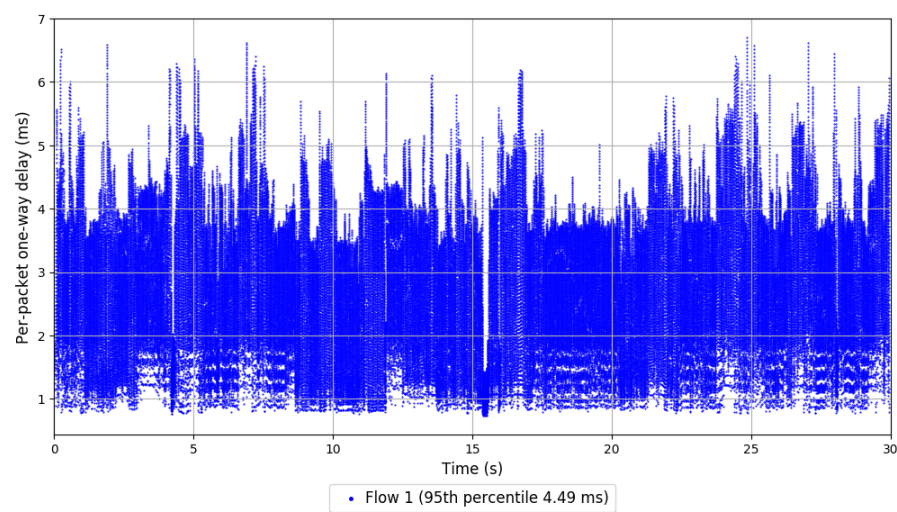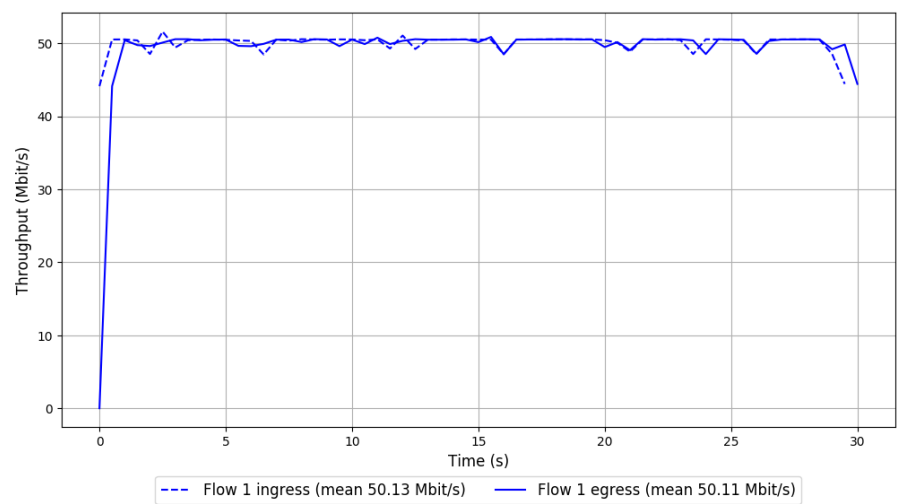• Flow 1 (95th percentile 4.22 ms)

```
Run 4: Statistics of Sprout

Start at: 2018-10-02 08:43:54
End at: 2018-10-02 08:44:24
Local clock offset: 1.354 ms
Remote clock offset: -0.215 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 50.11 Mbit/s
95th percentile per-packet one-way delay: 4.489 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 50.11 Mbit/s
95th percentile per-packet one-way delay: 4.489 ms
Loss rate: 0.03%
```

Run 4: Report of Sprout — Data Link

Flow 1 ingress (mean 50.13 Mbit/s)   —— Flow 1 egress (mean 50.11 Mbit/s)

• Flow 1 (95th percentile 4.49 ms)

```
Run 5: Statistics of Sprout

Start at: 2018-10-02 09:10:08
End at: 2018-10-02 09:10:38
Local clock offset: 3.996 ms
Remote clock offset: 0.031 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 50.02 Mbit/s
95th percentile per-packet one-way delay: 4.611 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 50.02 Mbit/s
95th percentile per-packet one-way delay: 4.611 ms
Loss rate: 0.00%
```
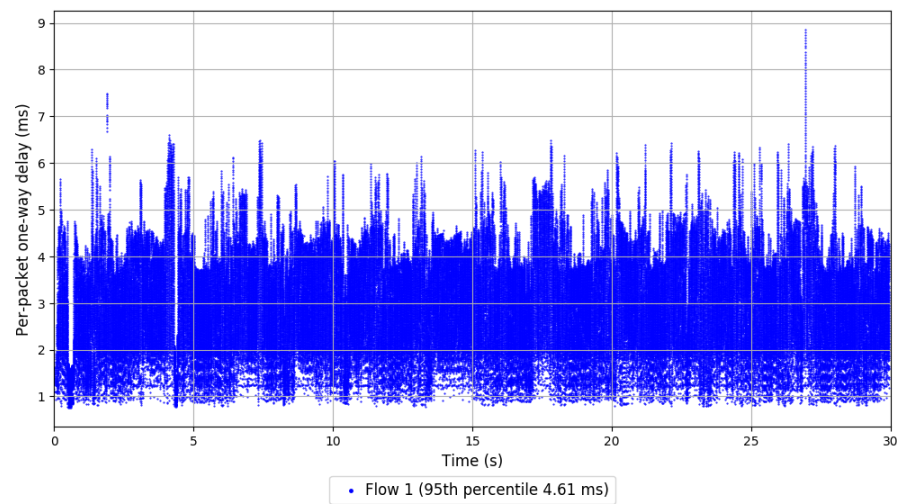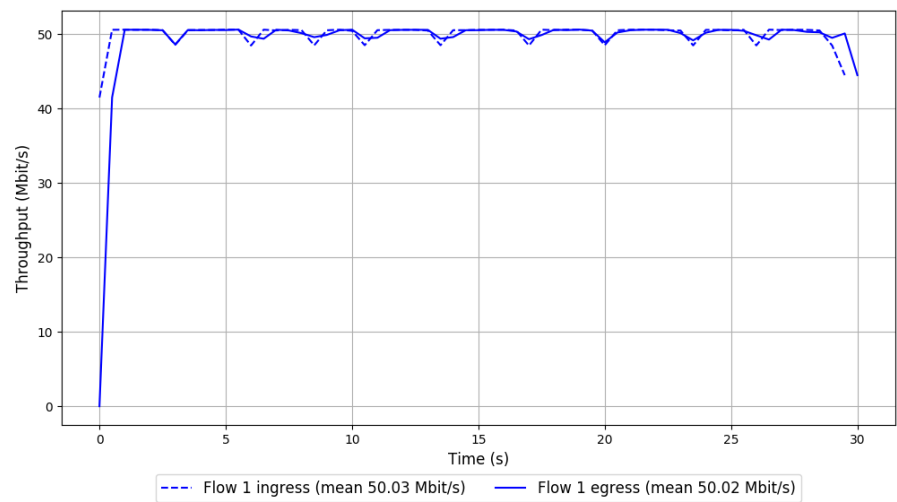
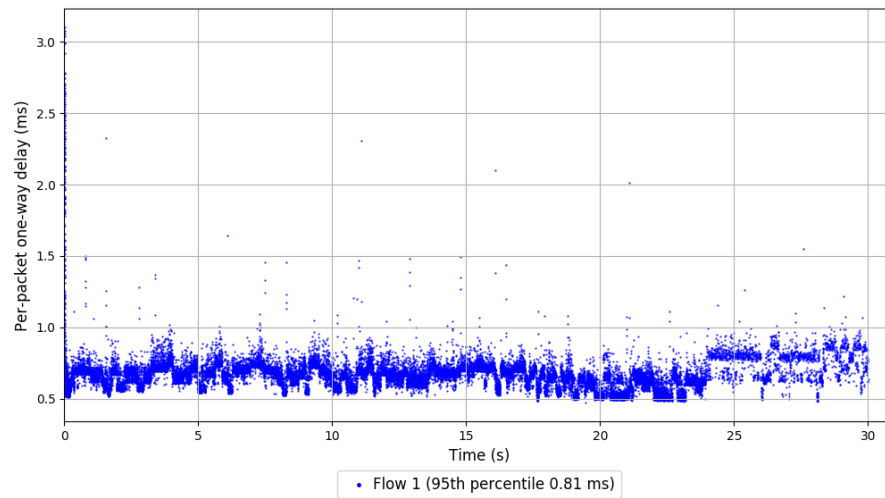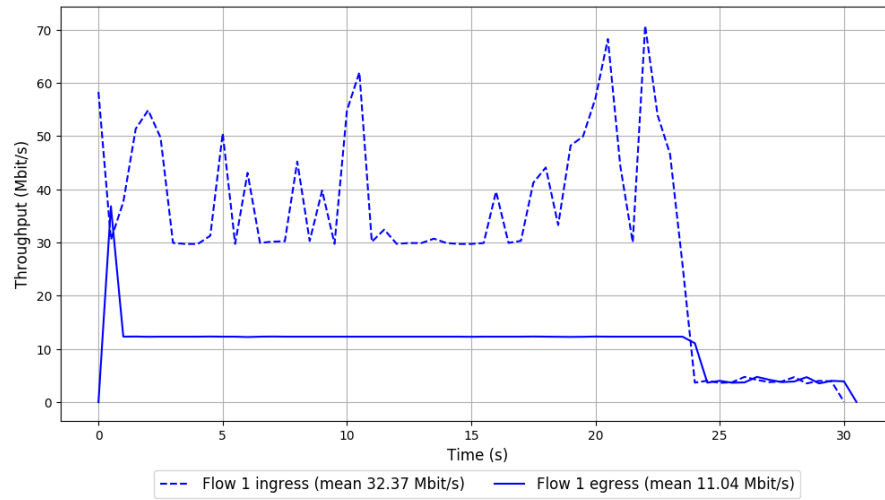Run 5: Report of Sprout — Data Link

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

Start at: 2018-10-02 07:22:01
End at: 2018-10-02 07:22:31
Local clock offset: 6.358 ms
Remote clock offset: 0.269 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.04 Mbit/s
95th percentile per-packet one-way delay: 0.814 ms
Loss rate: 65.90%
-- Flow 1:
Average throughput: 11.04 Mbit/s
95th percentile per-packet one-way delay: 0.814 ms
Loss rate: 65.90%
```

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

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

Start at: 2018-10-02 07:47:48
End at: 2018-10-02 07:48:18
Local clock offset: 3.609 ms
Remote clock offset: -0.603 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.43 Mbit/s
95th percentile per-packet one-way delay: 1.271 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 5.43 Mbit/s
95th percentile per-packet one-way delay: 1.271 ms
Loss rate: 0.00%
```
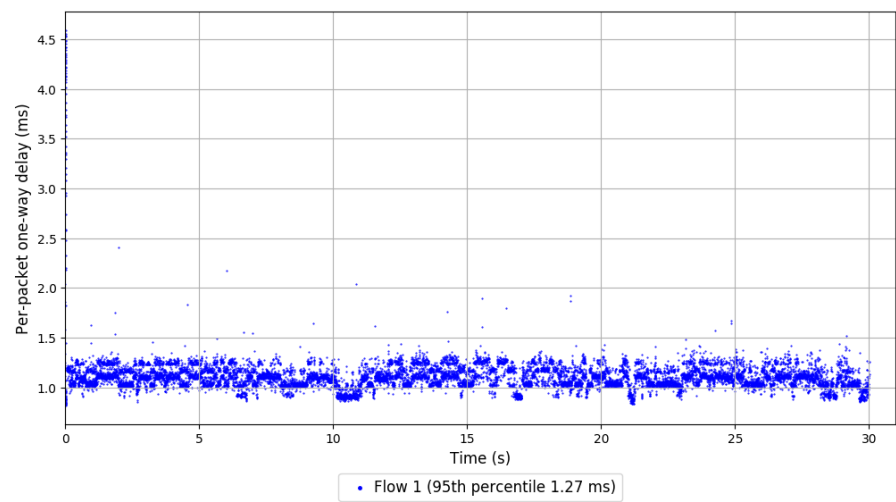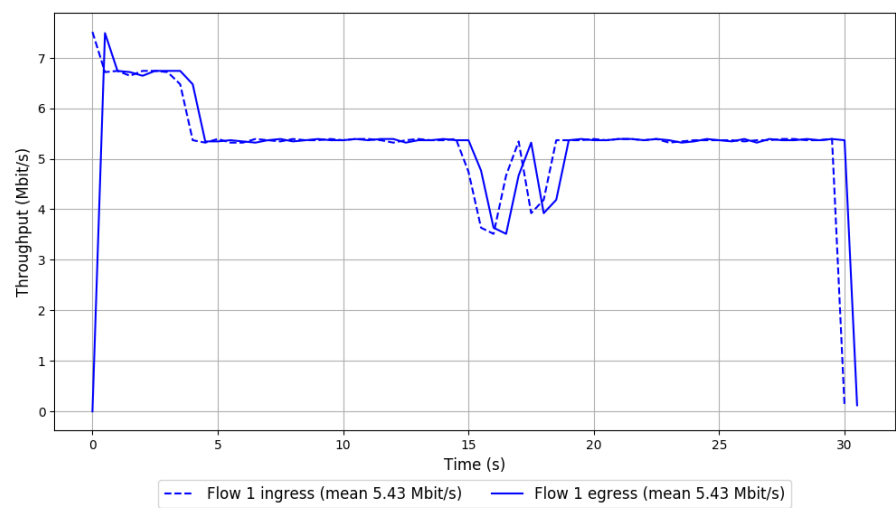
Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2018-10-02 08:13:40
End at: 2018-10-02 08:14:10
Local clock offset: 3.626 ms
Remote clock offset: -0.812 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.14 Mbit/s
95th percentile per-packet one-way delay: 1.188 ms
Loss rate: 72.38%
-- Flow 1:
Average throughput: 8.14 Mbit/s
95th percentile per-packet one-way delay: 1.188 ms
Loss rate: 72.38%
```
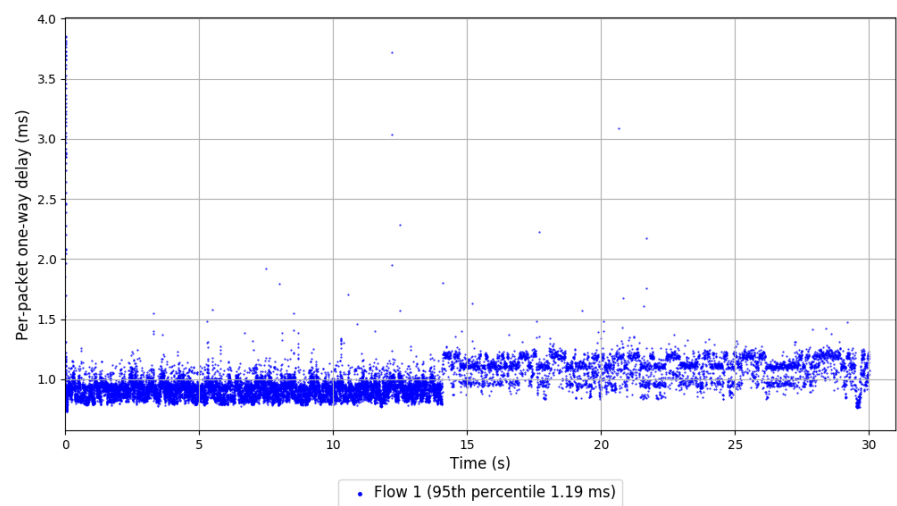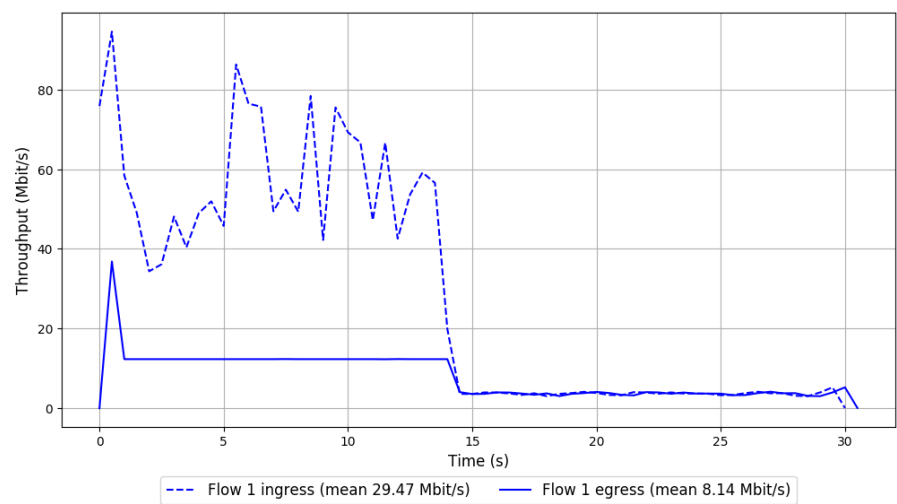
Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 29.47 Mbit/s) ----- Flow 1 egress (mean 8.14 Mbit/s) ——

Flow 1 (95th percentile 1.19 ms)

```
Run 4: Statistics of TaoVA-100x

Start at: 2018-10-02 08:39:42
End at: 2018-10-02 08:40:12
Local clock offset: 1.52 ms
Remote clock offset: -0.155 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.00 Mbit/s
95th percentile per-packet one-way delay: 1.220 ms
Loss rate: 56.83%
-- Flow 1:
Average throughput: 8.00 Mbit/s
95th percentile per-packet one-way delay: 1.220 ms
Loss rate: 56.83%
```
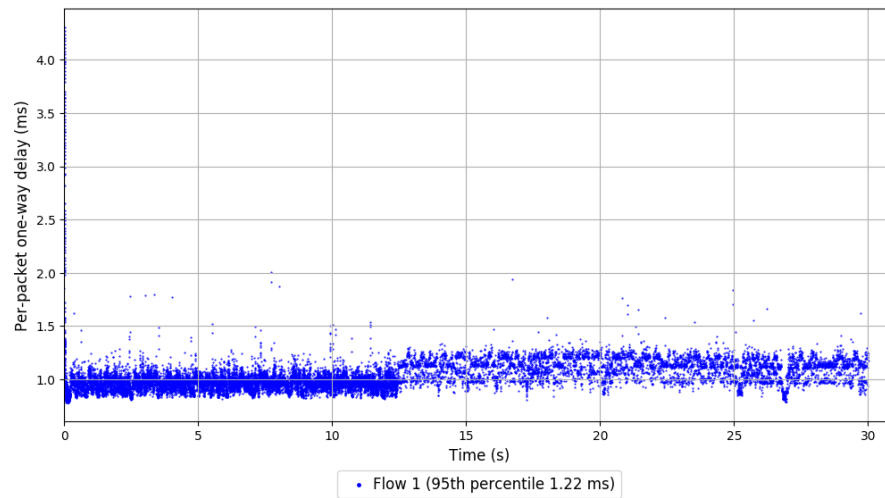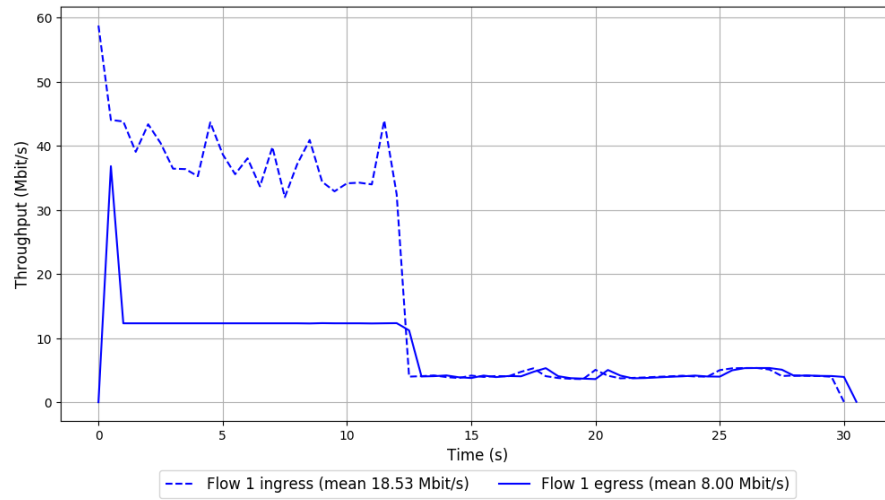
Run 4: Report of TaoVA-100x — Data Link

```
Run 5: Statistics of TaoVA-100x

Start at: 2018-10-02 09:05:54
End at: 2018-10-02 09:06:24
Local clock offset: 3.829 ms
Remote clock offset: 0.051 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 1.284 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 1.284 ms
Loss rate: 0.00%
```
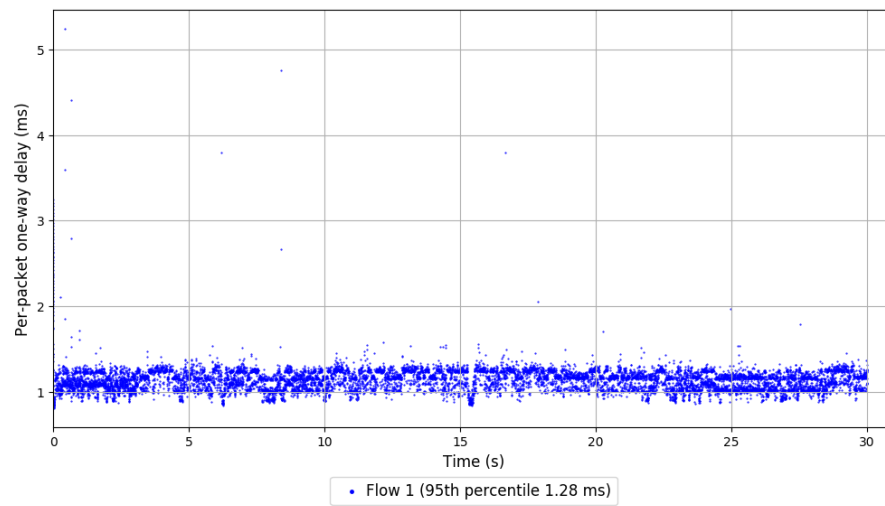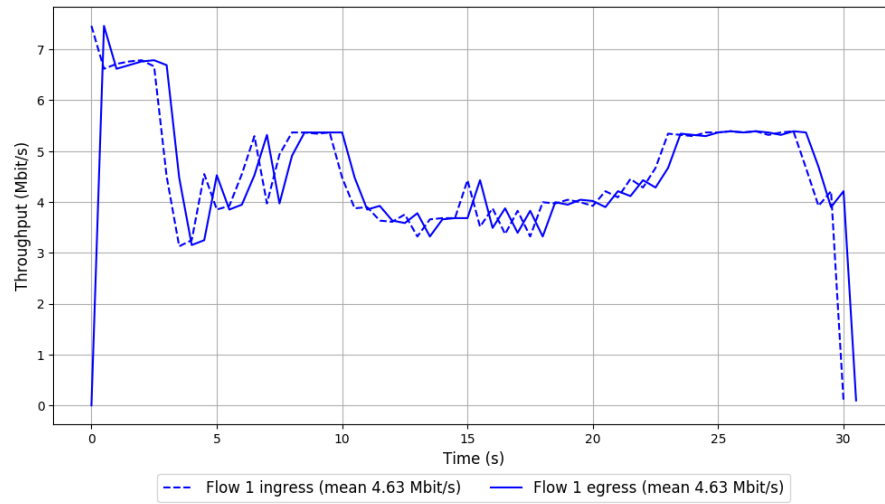
Run 5: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 4.63 Mbit/s)   ——— Flow 1 egress (mean 4.63 Mbit/s)

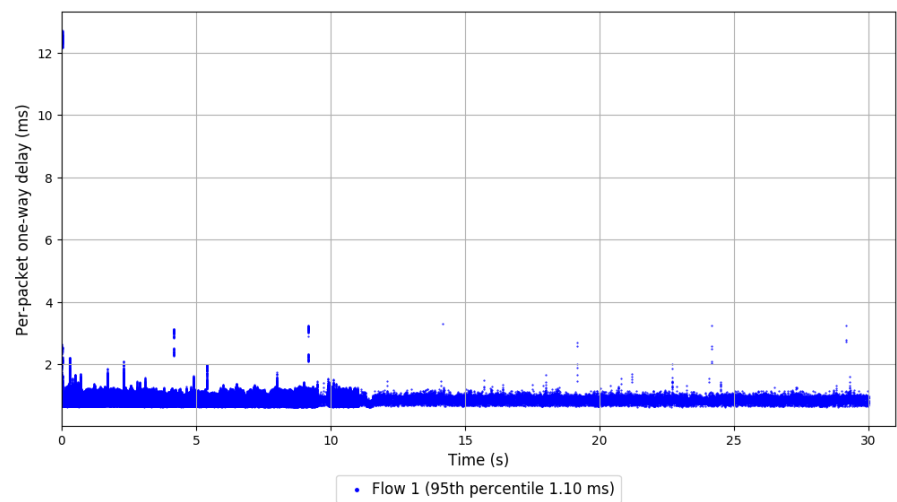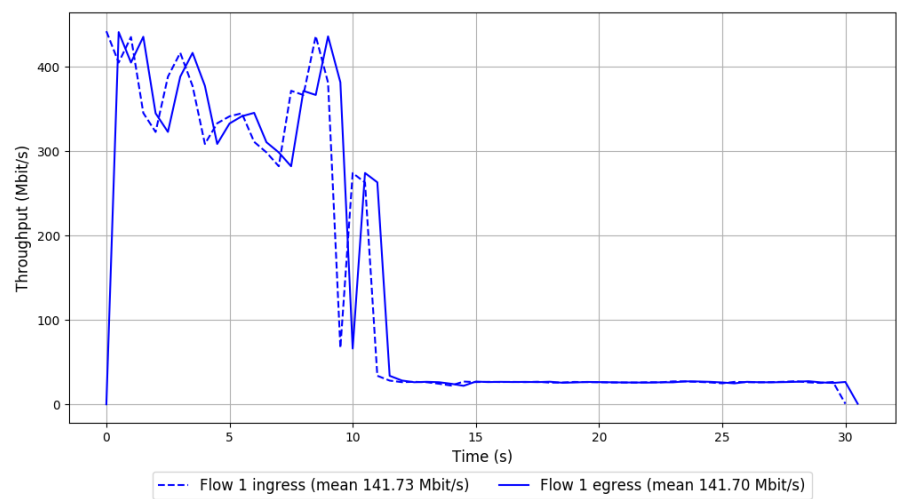· Flow 1 (95th percentile 1.28 ms)

144

```
Run 1: Statistics of TCP Vegas

Start at: 2018-10-02 07:30:28
End at: 2018-10-02 07:30:58
Local clock offset: 4.616 ms
Remote clock offset: -0.266 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 141.70 Mbit/s
95th percentile per-packet one-way delay: 1.103 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 141.70 Mbit/s
95th percentile per-packet one-way delay: 1.103 ms
Loss rate: 0.02%
```
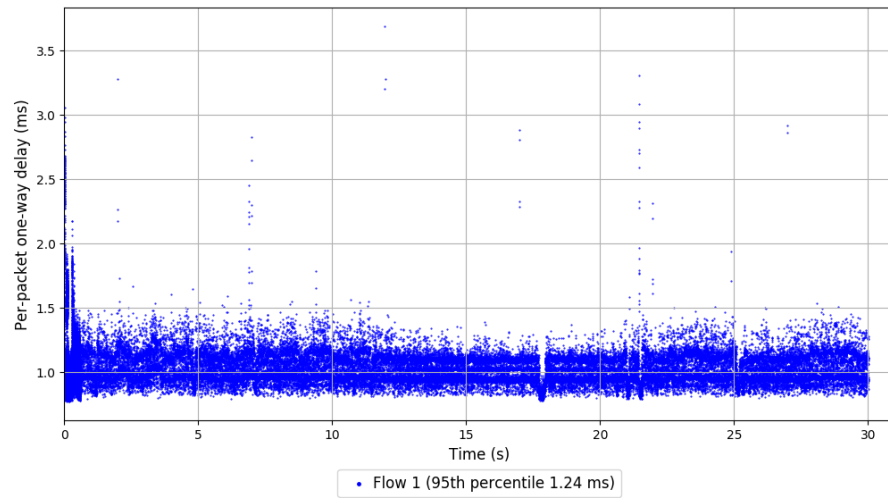
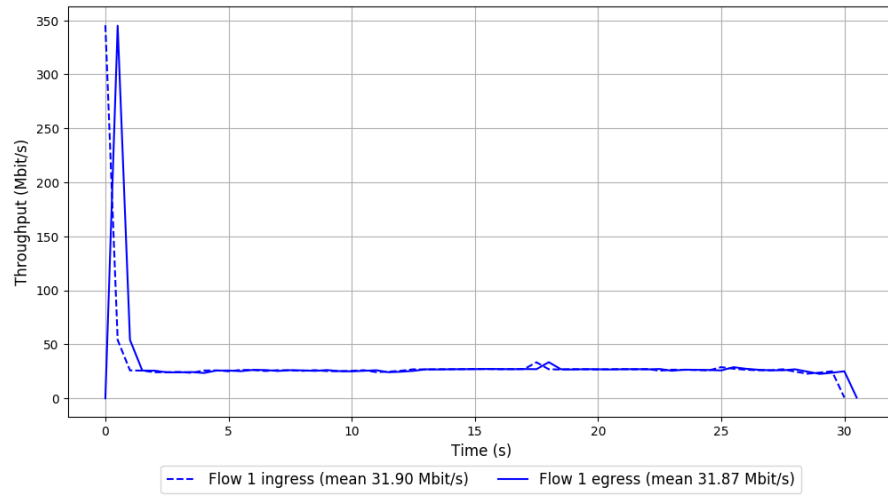Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-10-02 07:56:21
End at: 2018-10-02 07:56:51
Local clock offset: 3.694 ms
Remote clock offset: -0.572 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 31.87 Mbit/s
95th percentile per-packet one-way delay: 1.238 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 31.87 Mbit/s
95th percentile per-packet one-way delay: 1.238 ms
Loss rate: 0.11%
```
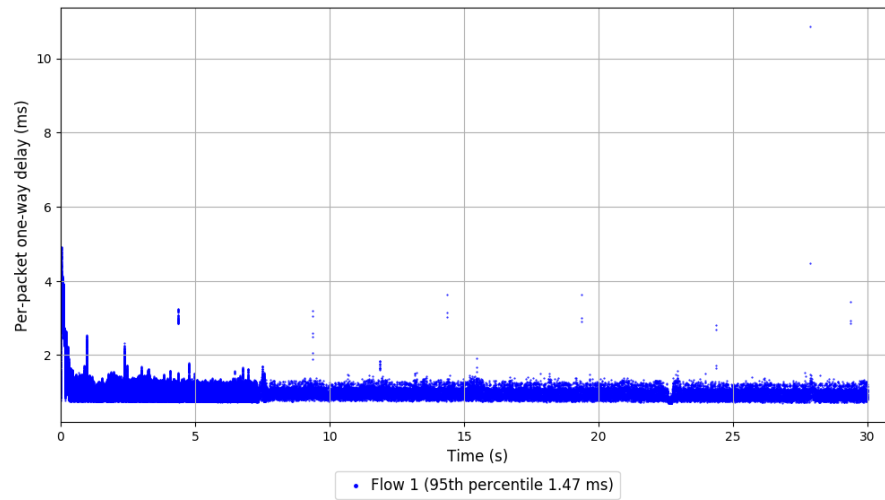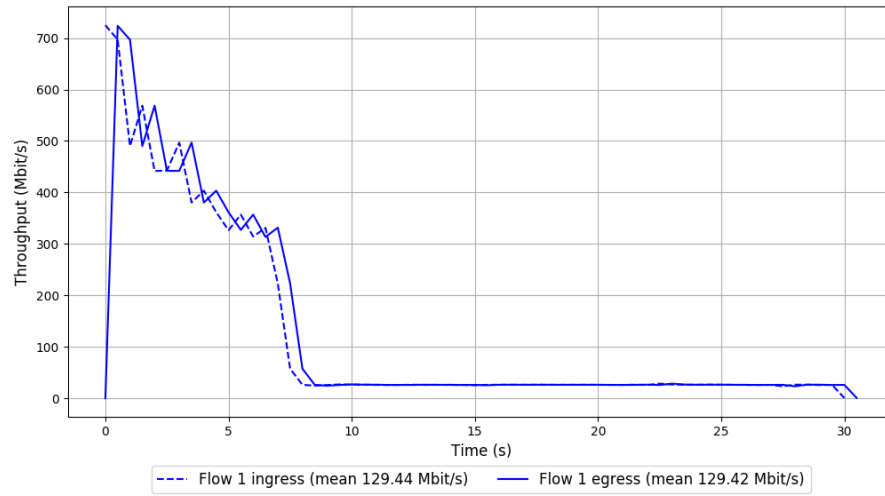
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-10-02 08:22:16
End at: 2018-10-02 08:22:47
Local clock offset: 2.63 ms
Remote clock offset: -0.577 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 129.42 Mbit/s
95th percentile per-packet one-way delay: 1.467 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 129.42 Mbit/s
95th percentile per-packet one-way delay: 1.467 ms
Loss rate: 0.02%
```

Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 129.44 Mbit/s)   Flow 1 egress (mean 129.42 Mbit/s)

Flow 1 (95th percentile 1.47 ms)

```
Run 4: Statistics of TCP Vegas

Start at: 2018-10-02 08:48:13
End at: 2018-10-02 08:48:43
Local clock offset: 1.89 ms
Remote clock offset: -0.2 ms


# Below is generated by plot.py at 2018-10-02 10:01:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 317.05 Mbit/s
95th percentile per-packet one-way delay: 1.540 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 317.05 Mbit/s
95th percentile per-packet one-way delay: 1.540 ms
Loss rate: 0.01%
```
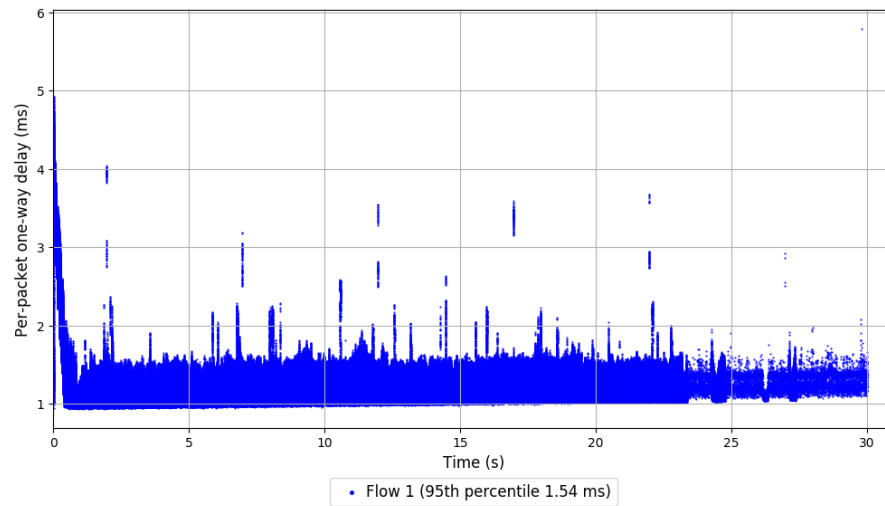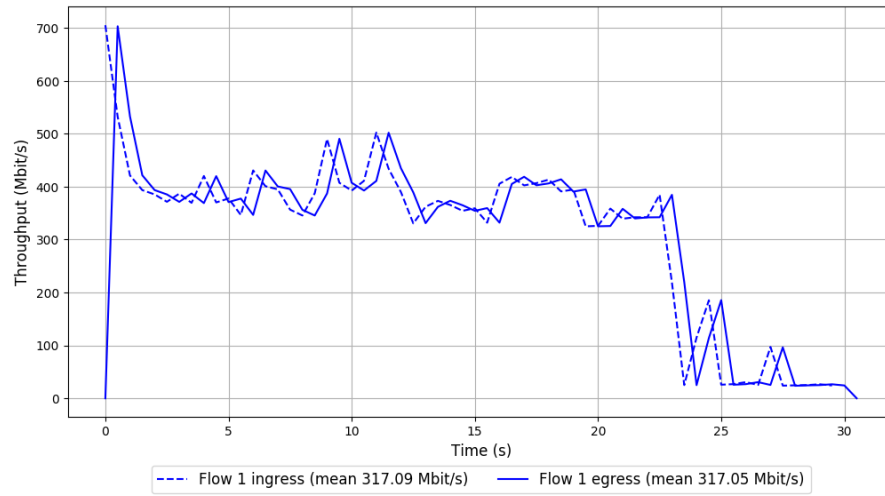
Run 4: Report of TCP Vegas — Data Link

```
Run 5: Statistics of TCP Vegas

Start at: 2018-10-02 09:14:29
End at: 2018-10-02 09:14:59
Local clock offset: 4.093 ms
Remote clock offset: 0.086 ms


# Below is generated by plot.py at 2018-10-02 10:01:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 373.18 Mbit/s
95th percentile per-packet one-way delay: 1.285 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 373.18 Mbit/s
95th percentile per-packet one-way delay: 1.285 ms
Loss rate: 0.02%
```
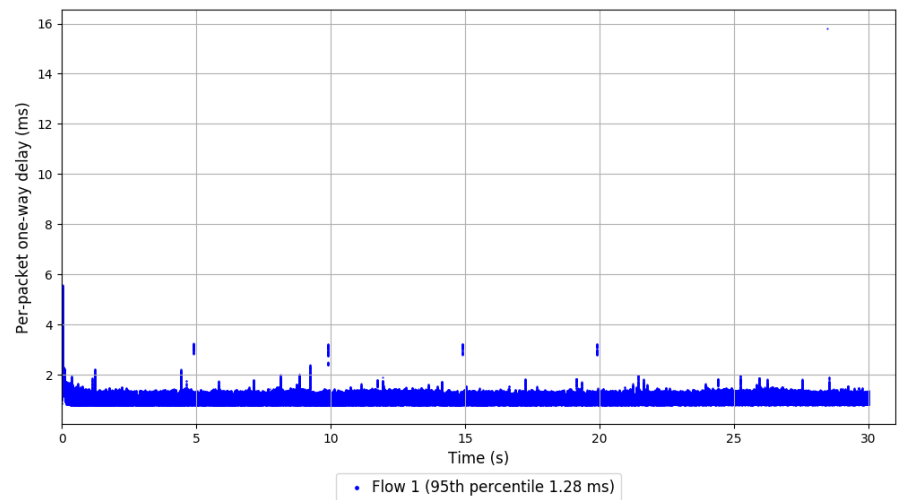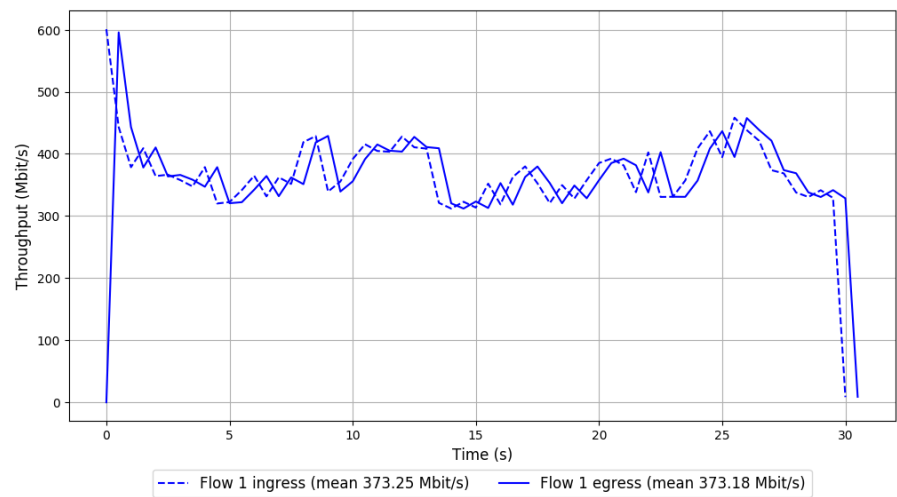
Run 5: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 373.25 Mbit/s)   Flow 1 egress (mean 373.18 Mbit/s)

Flow 1 (95th percentile 1.28 ms)

```
Run 1: Statistics of Verus

Start at: 2018-10-02 07:15:21
End at: 2018-10-02 07:15:51
Local clock offset: 8.861 ms
Remote clock offset: 1.04 ms


# Below is generated by plot.py at 2018-10-02 10:01:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 172.82 Mbit/s
95th percentile per-packet one-way delay: 7.875 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 172.82 Mbit/s
95th percentile per-packet one-way delay: 7.875 ms
Loss rate: 0.80%
```
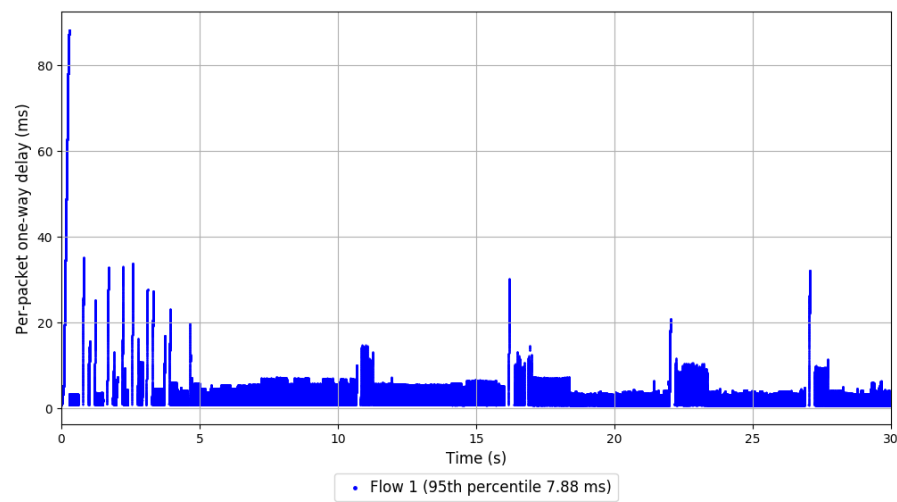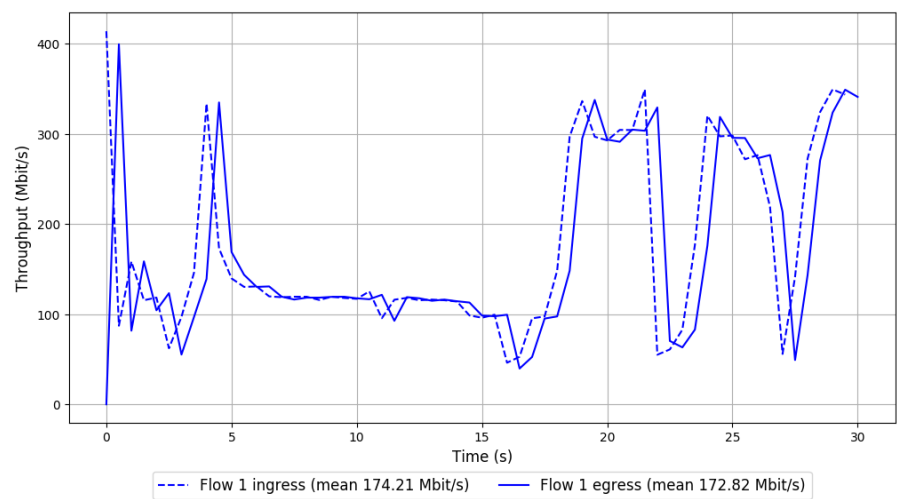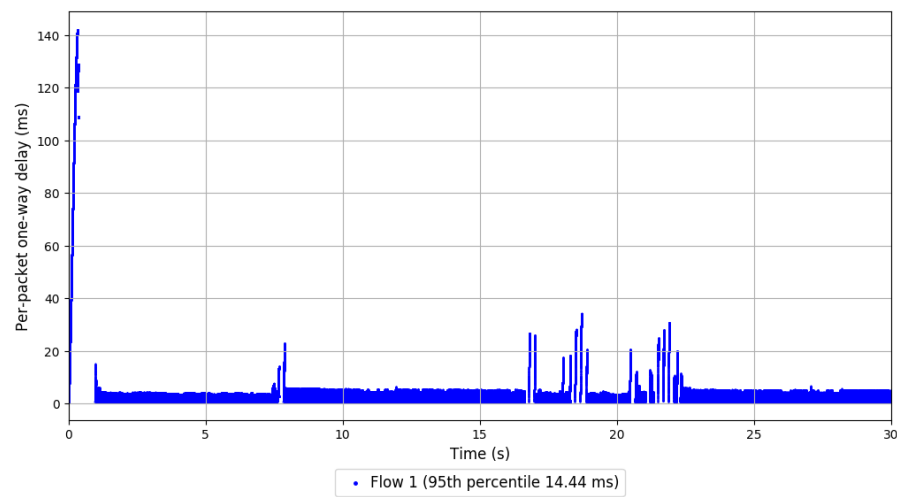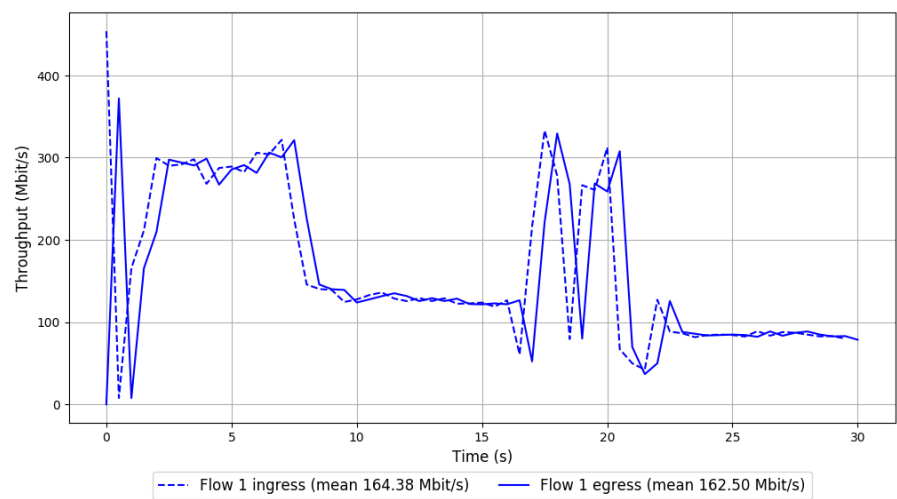
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2018-10-02 07:41:07
End at: 2018-10-02 07:41:37
Local clock offset: 3.752 ms
Remote clock offset: -0.566 ms


# Below is generated by plot.py at 2018-10-02 10:01:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 162.50 Mbit/s
95th percentile per-packet one-way delay: 14.444 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 162.50 Mbit/s
95th percentile per-packet one-way delay: 14.444 ms
Loss rate: 1.14%
```
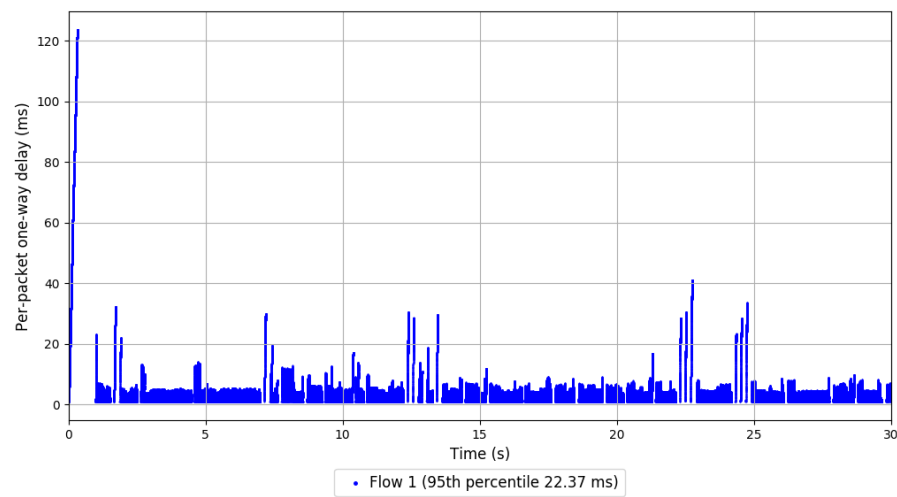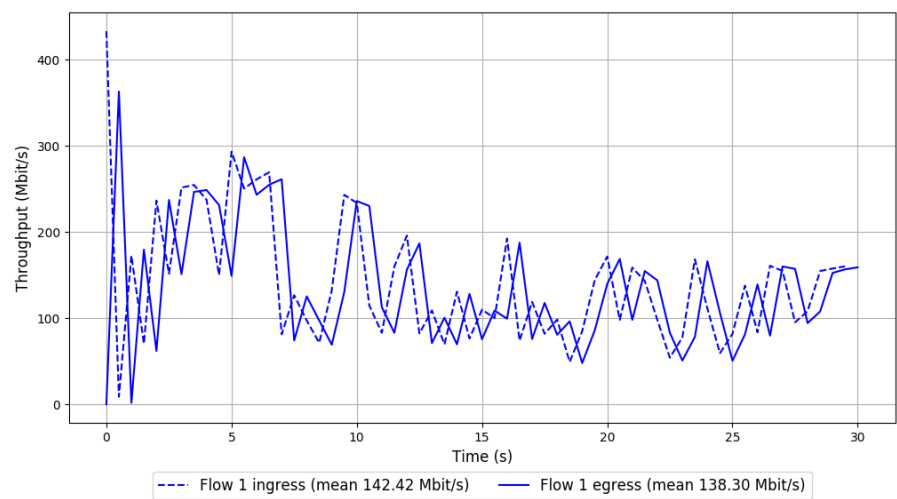
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-10-02 08:07:00
End at: 2018-10-02 08:07:30
Local clock offset: 3.68 ms
Remote clock offset: -0.562 ms


# Below is generated by plot.py at 2018-10-02 10:01:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 138.30 Mbit/s
95th percentile per-packet one-way delay: 22.372 ms
Loss rate: 2.87%
-- Flow 1:
Average throughput: 138.30 Mbit/s
95th percentile per-packet one-way delay: 22.372 ms
Loss rate: 2.87%
```

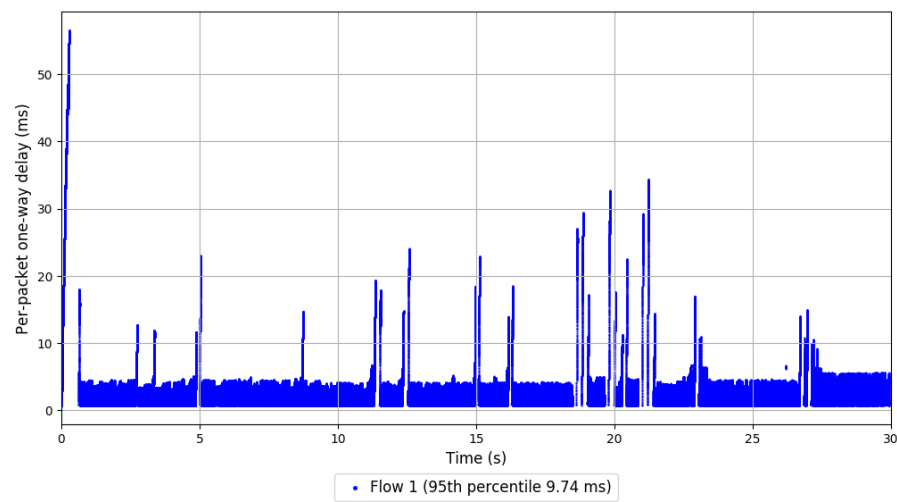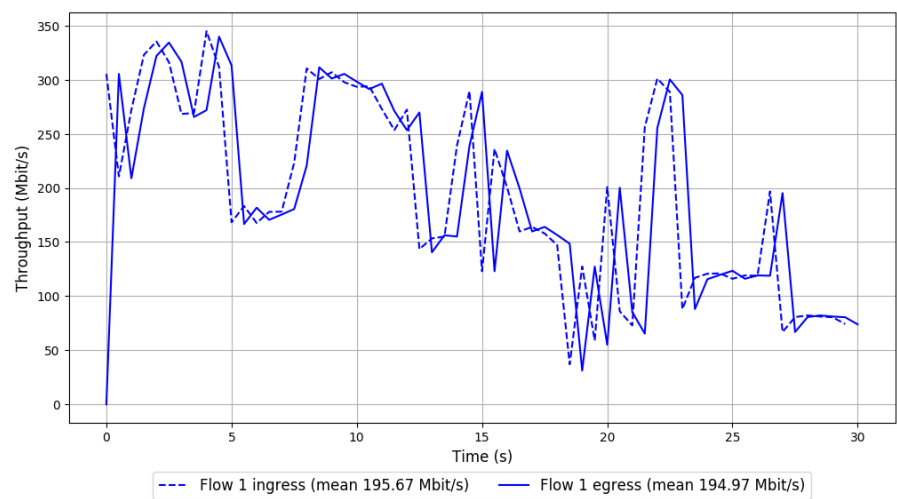## Run 3: Report of Verus — Data Link

```
Run 4: Statistics of Verus

Start at: 2018-10-02 08:33:01
End at: 2018-10-02 08:33:31
Local clock offset: 1.831 ms
Remote clock offset: -0.303 ms


# Below is generated by plot.py at 2018-10-02 10:01:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 194.97 Mbit/s
95th percentile per-packet one-way delay: 9.739 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 194.97 Mbit/s
95th percentile per-packet one-way delay: 9.739 ms
Loss rate: 0.35%
```
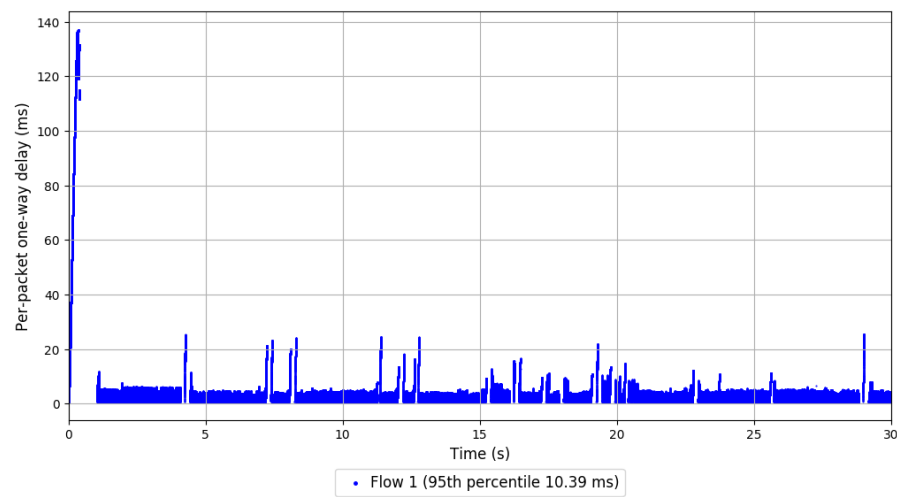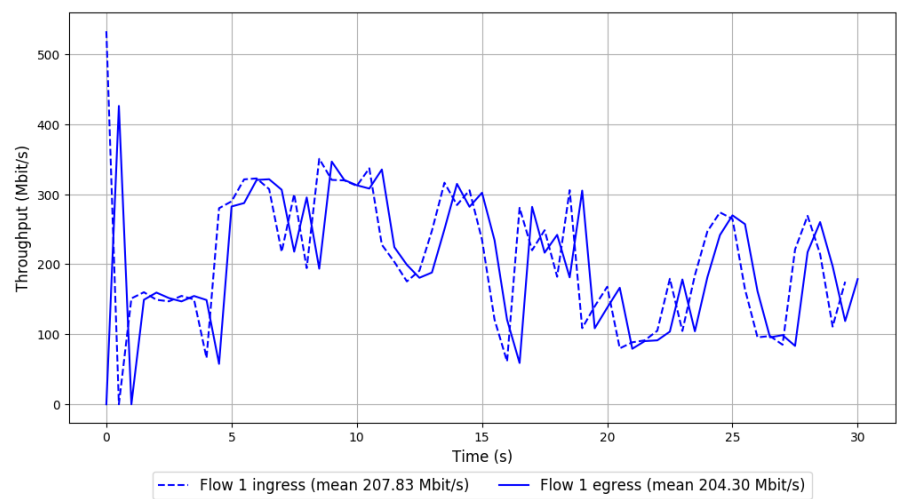
Run 4: Report of Verus — Data Link

```
Run 5: Statistics of Verus

Start at: 2018-10-02 08:59:10
End at: 2018-10-02 08:59:40
Local clock offset: 3.459 ms
Remote clock offset: -0.063 ms

# Below is generated by plot.py at 2018-10-02 10:01:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 204.30 Mbit/s
95th percentile per-packet one-way delay: 10.392 ms
Loss rate: 1.69%
-- Flow 1:
Average throughput: 204.30 Mbit/s
95th percentile per-packet one-way delay: 10.392 ms
Loss rate: 1.69%
```

Run 5: Report of Verus — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2018-10-02 07:12:12
End at: 2018-10-02 07:12:42
Local clock offset: 8.617 ms
Remote clock offset: 1.584 ms


# Below is generated by plot.py at 2018-10-02 10:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 272.16 Mbit/s
95th percentile per-packet one-way delay: 1.499 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 272.16 Mbit/s
95th percentile per-packet one-way delay: 1.499 ms
Loss rate: 0.05%
```
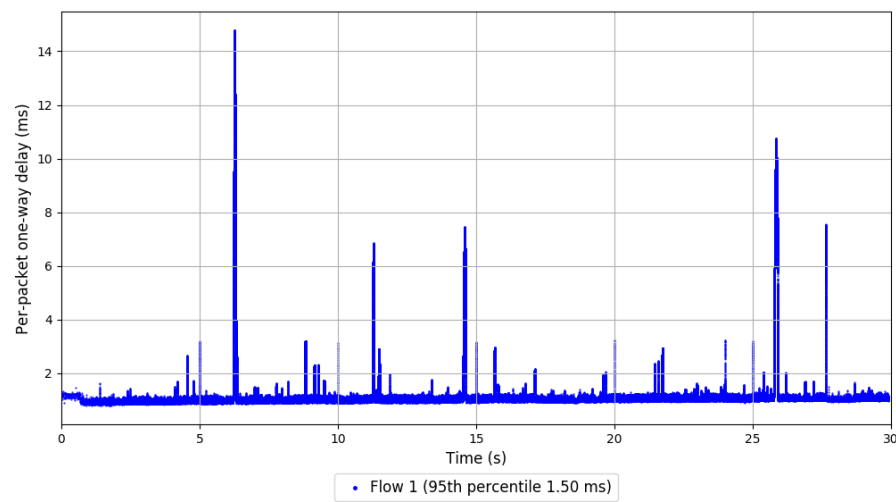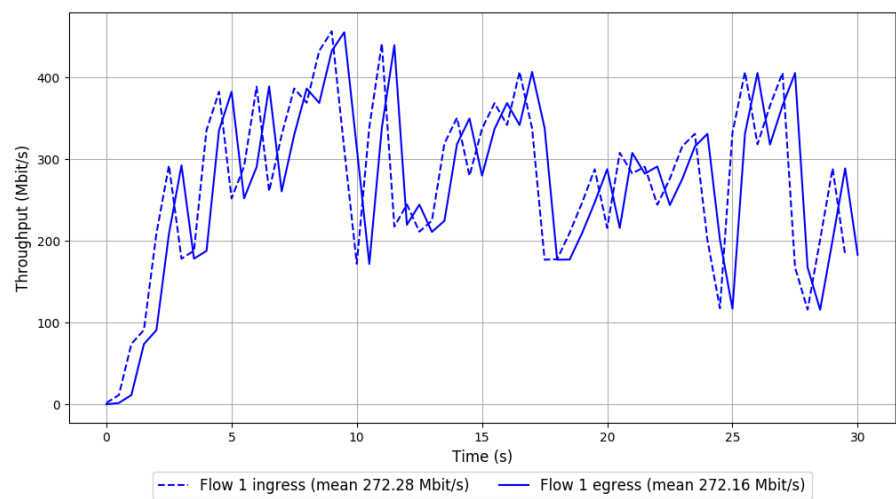
Run 1: Report of PCC-Vivace — Data Link

```
Run 2: Statistics of PCC-Vivace

Start at: 2018-10-02 07:37:56
End at: 2018-10-02 07:38:26
Local clock offset: 3.935 ms
Remote clock offset: -0.434 ms


# Below is generated by plot.py at 2018-10-02 10:03:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 326.91 Mbit/s
95th percentile per-packet one-way delay: 1.169 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 326.91 Mbit/s
95th percentile per-packet one-way delay: 1.169 ms
Loss rate: 0.04%
```
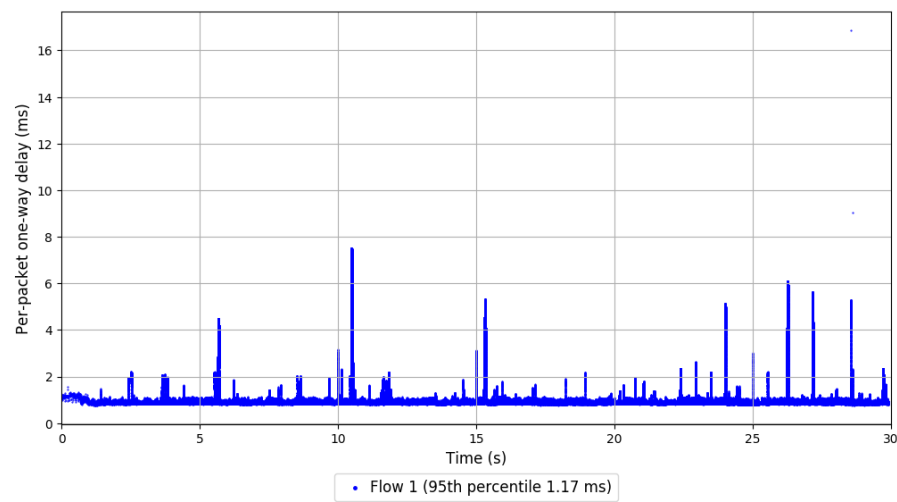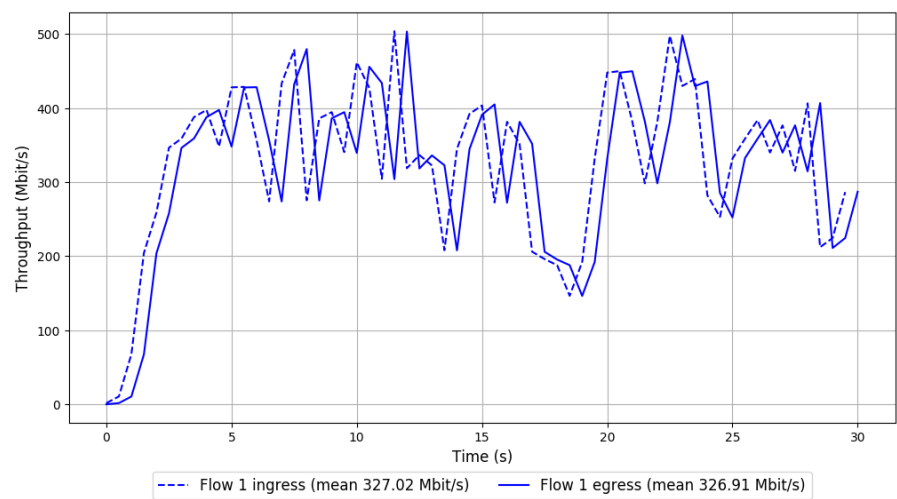
Run 2: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 327.02 Mbit/s) ——— Flow 1 egress (mean 326.91 Mbit/s)

• Flow 1 (95th percentile 1.17 ms)

168

```
Run 3: Statistics of PCC-Vivace

Start at: 2018-10-02 08:03:47
End at: 2018-10-02 08:04:17
Local clock offset: 3.695 ms
Remote clock offset: -0.65 ms

# Below is generated by plot.py at 2018-10-02 10:03:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 336.54 Mbit/s
95th percentile per-packet one-way delay: 1.613 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 336.54 Mbit/s
95th percentile per-packet one-way delay: 1.613 ms
Loss rate: 0.06%
```
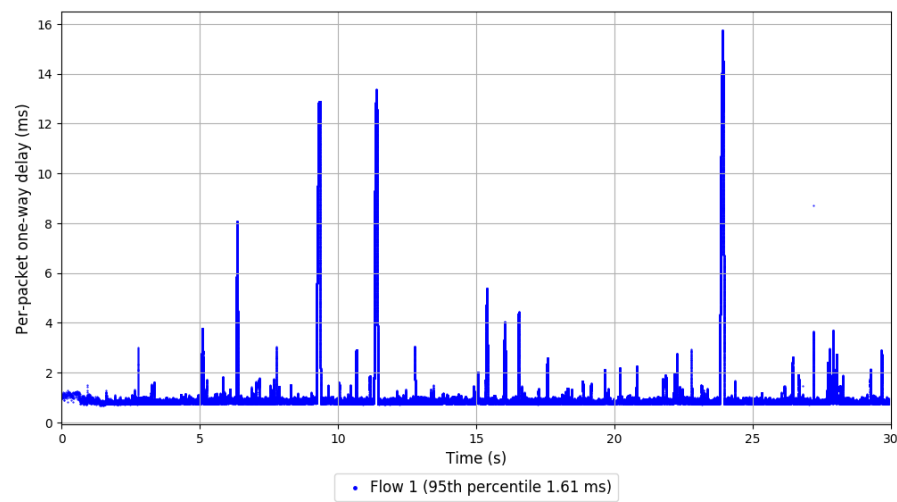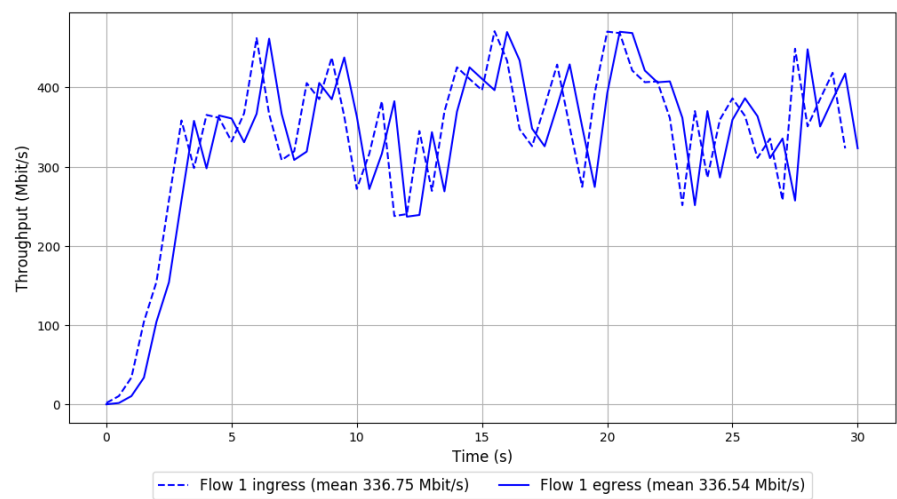
Run 3: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 336.75 Mbit/s) ----- Flow 1 egress (mean 336.54 Mbit/s)

· Flow 1 (95th percentile 1.61 ms)

```
Run 4: Statistics of PCC-Vivace

Start at: 2018-10-02 08:29:46
End at: 2018-10-02 08:30:16
Local clock offset: 2.035 ms
Remote clock offset: -0.283 ms


# Below is generated by plot.py at 2018-10-02 10:03:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 350.04 Mbit/s
95th percentile per-packet one-way delay: 1.149 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 350.04 Mbit/s
95th percentile per-packet one-way delay: 1.149 ms
Loss rate: 0.05%
```
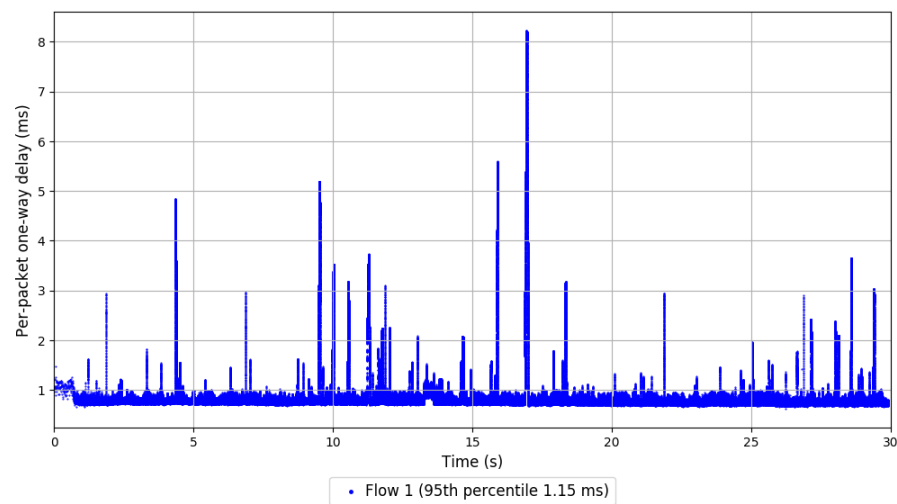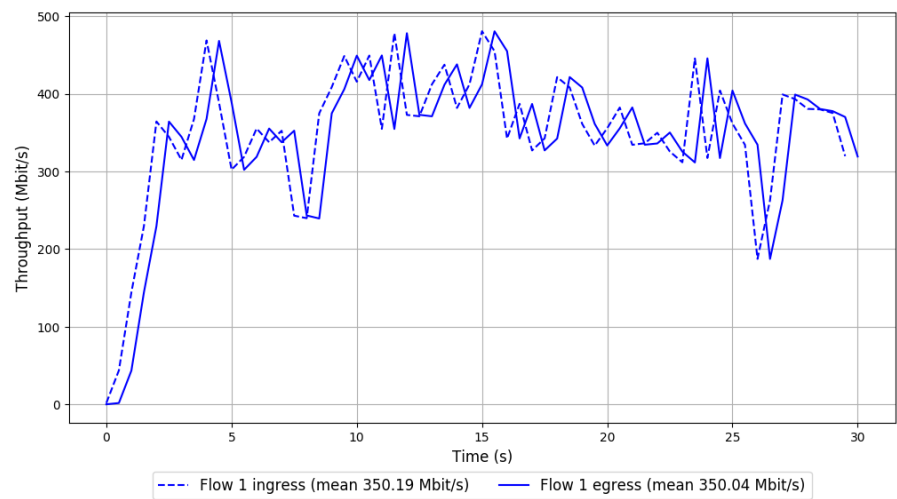
Run 4: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 350.19 Mbit/s)   Flow 1 egress (mean 350.04 Mbit/s)

Flow 1 (95th percentile 1.15 ms)

```
Run 5: Statistics of PCC-Vivace

Start at: 2018-10-02 08:55:54
End at: 2018-10-02 08:56:24
Local clock offset: 3.155 ms
Remote clock offset: -0.119 ms


# Below is generated by plot.py at 2018-10-02 10:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 368.20 Mbit/s
95th percentile per-packet one-way delay: 2.224 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 368.20 Mbit/s
95th percentile per-packet one-way delay: 2.224 ms
Loss rate: 0.02%
```
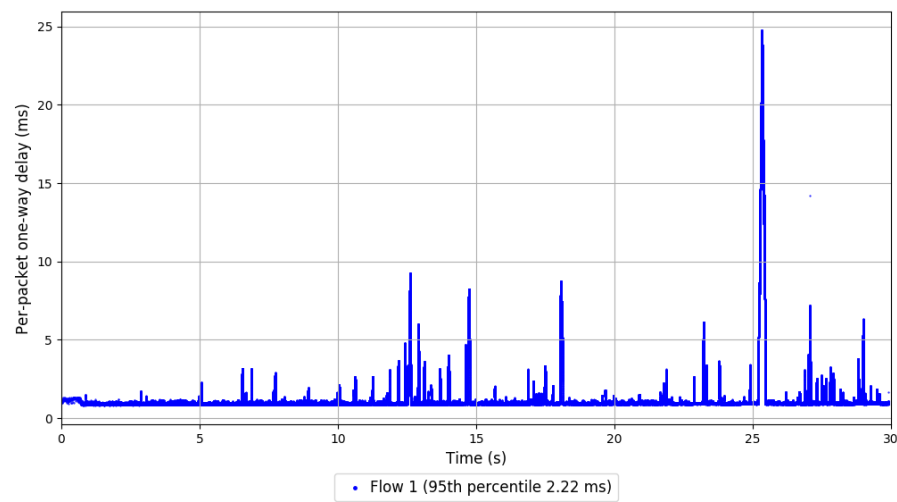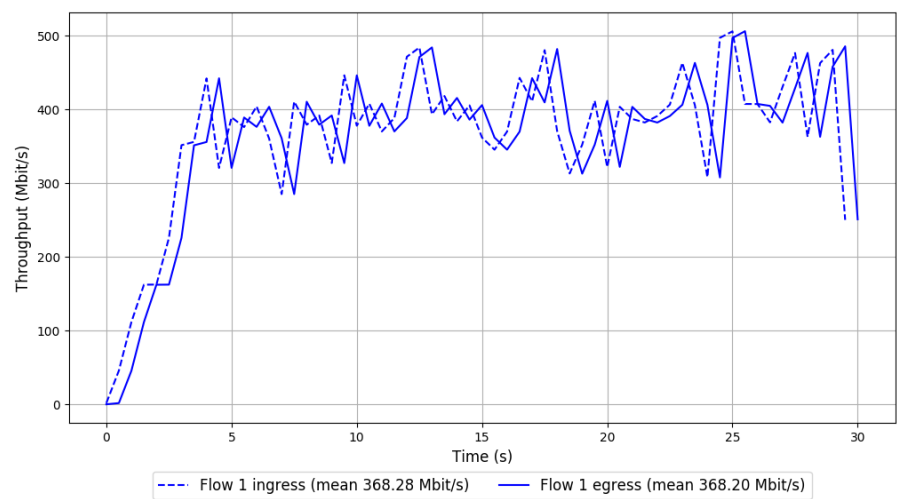
Run 5: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 368.28 Mbit/s)   Flow 1 egress (mean 368.20 Mbit/s)
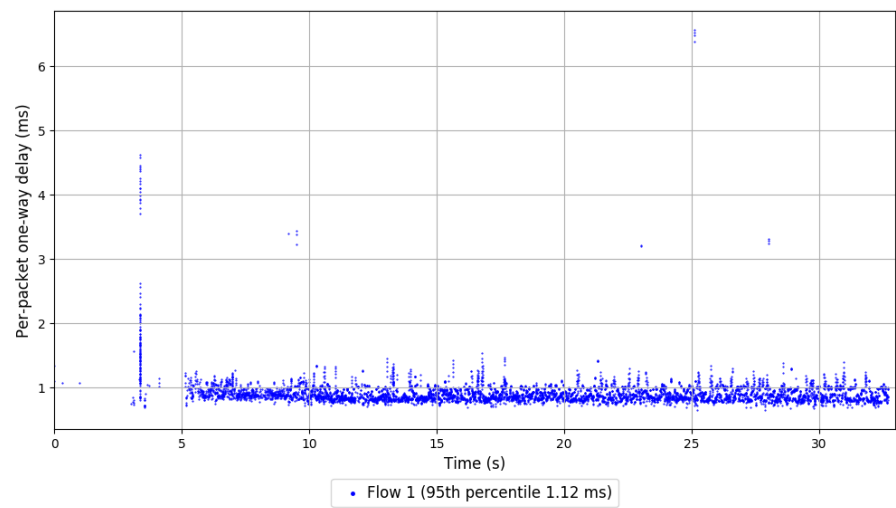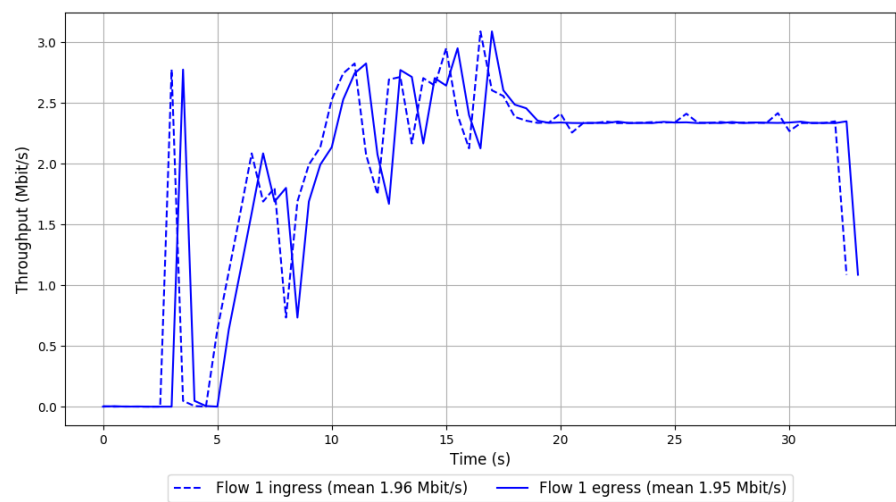

• Flow 1 (95th percentile 2.22 ms)

```
Run 1: Statistics of WebRTC media

Start at: 2018-10-02 07:27:31
End at: 2018-10-02 07:28:01
Local clock offset: 5.042 ms
Remote clock offset: -0.012 ms


# Below is generated by plot.py at 2018-10-02 10:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 1.124 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 1.124 ms
Loss rate: 0.06%
```

Run 1: Report of WebRTC media — Data Link

Flow 1 ingress (mean 1.96 Mbit/s)   Flow 1 egress (mean 1.95 Mbit/s)

Flow 1 (95th percentile 1.12 ms)

```
Run 2: Statistics of WebRTC media

Start at: 2018-10-02 07:53:24
End at: 2018-10-02 07:53:54
Local clock offset: 3.7 ms
Remote clock offset: -0.592 ms


# Below is generated by plot.py at 2018-10-02 10:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 1.115 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 1.115 ms
Loss rate: 0.00%
```
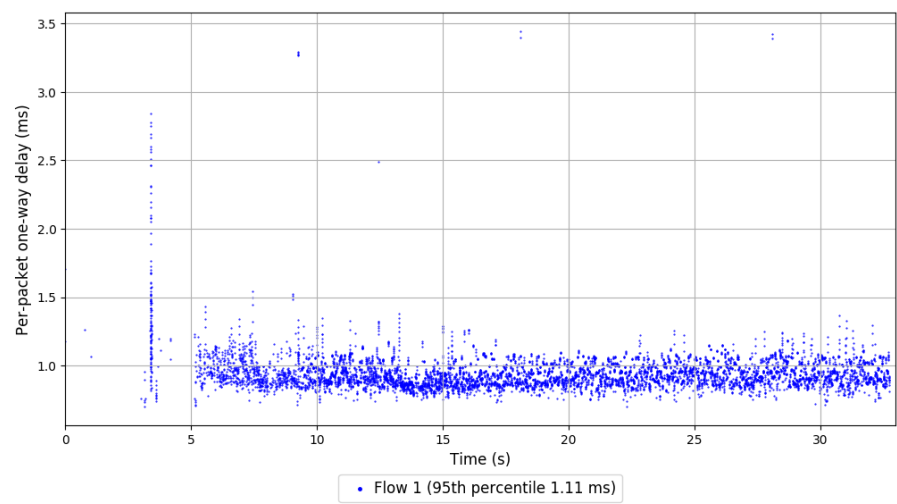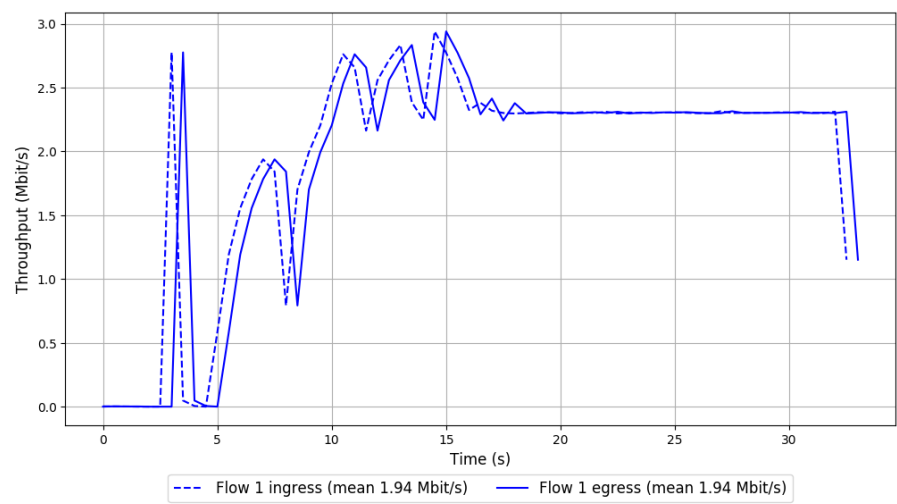
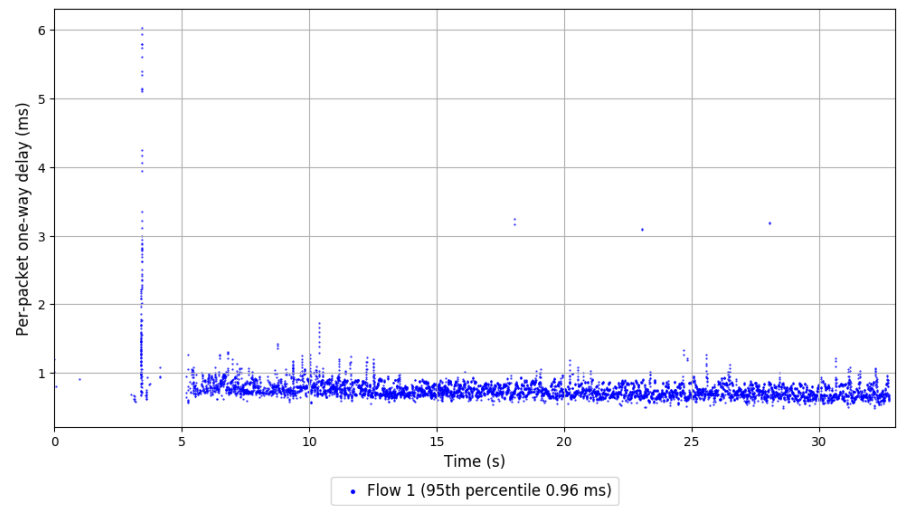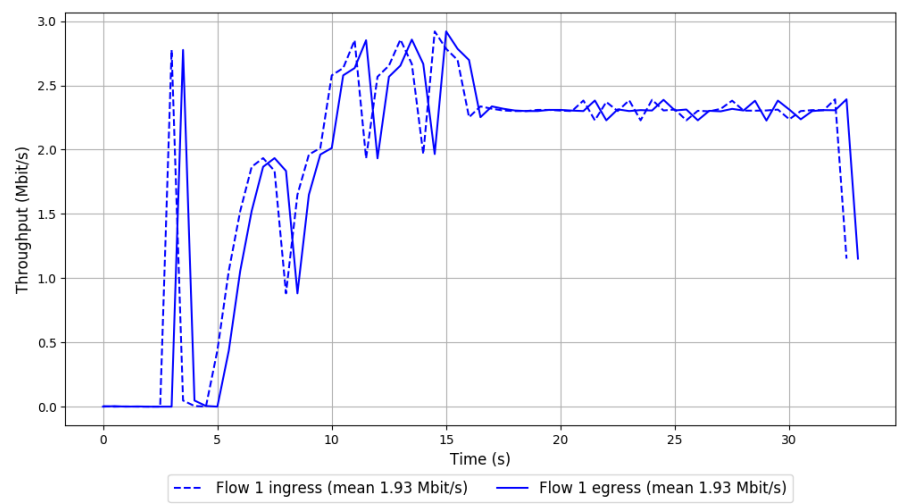Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-10-02 08:19:17
End at: 2018-10-02 08:19:47
Local clock offset: 3.052 ms
Remote clock offset: -0.857 ms


# Below is generated by plot.py at 2018-10-02 10:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 0.961 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 0.961 ms
Loss rate: 0.05%
```

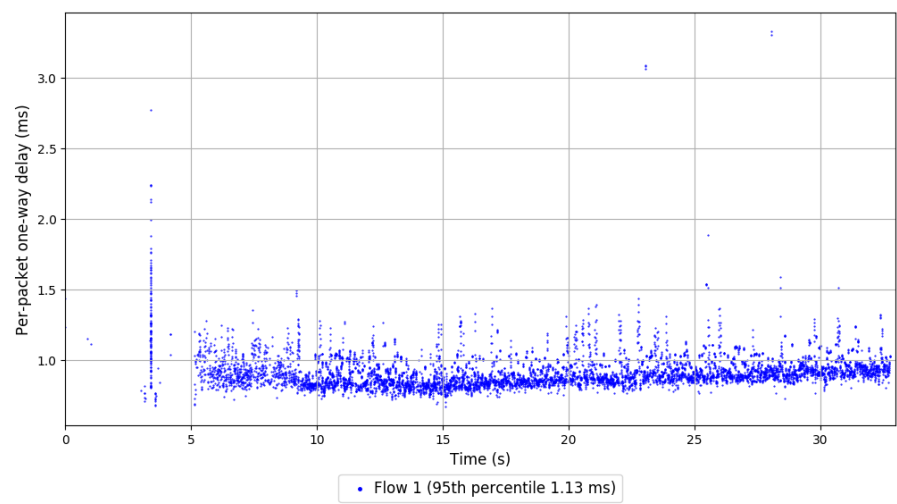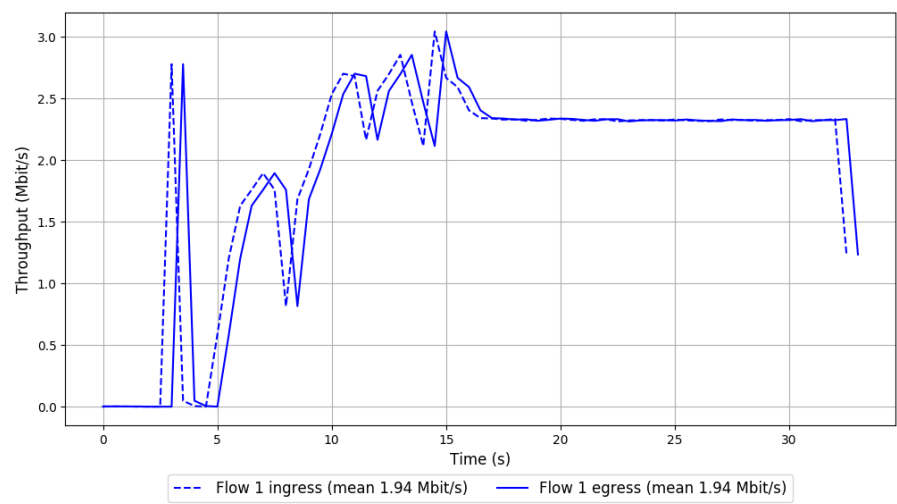## Run 3: Report of WebRTC media — Data Link

```
Run 4: Statistics of WebRTC media

Start at: 2018-10-02 08:45:13
End at: 2018-10-02 08:45:43
Local clock offset: 1.292 ms
Remote clock offset: -0.217 ms


# Below is generated by plot.py at 2018-10-02 10:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 1.131 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 1.131 ms
Loss rate: 0.00%
```

Run 4: Report of WebRTC media — Data Link

```
Run 5: Statistics of WebRTC media

Start at: 2018-10-02 09:11:28
End at: 2018-10-02 09:11:58
Local clock offset: 4.014 ms
Remote clock offset: 0.129 ms


# Below is generated by plot.py at 2018-10-02 10:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 1.216 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 1.216 ms
Loss rate: 0.00%
```

Run 5: Report of WebRTC media — Data Link