Pantheon Report

Generated at 2018-09-07 12:27:53 (UTC).

Data path: GCE London on `ens4` (*remote*) →GCE Tokyo on `ens4` (*local*).

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.google.com` and have been applied to correct the timestamps in logs.
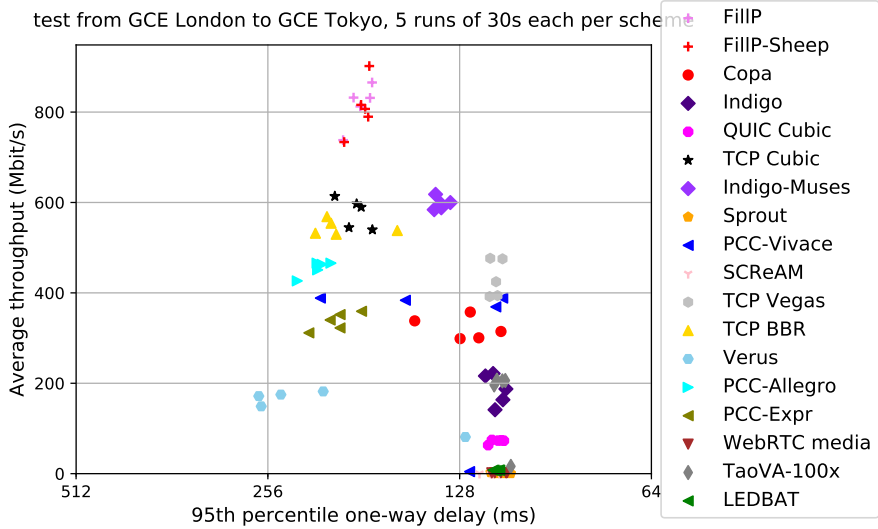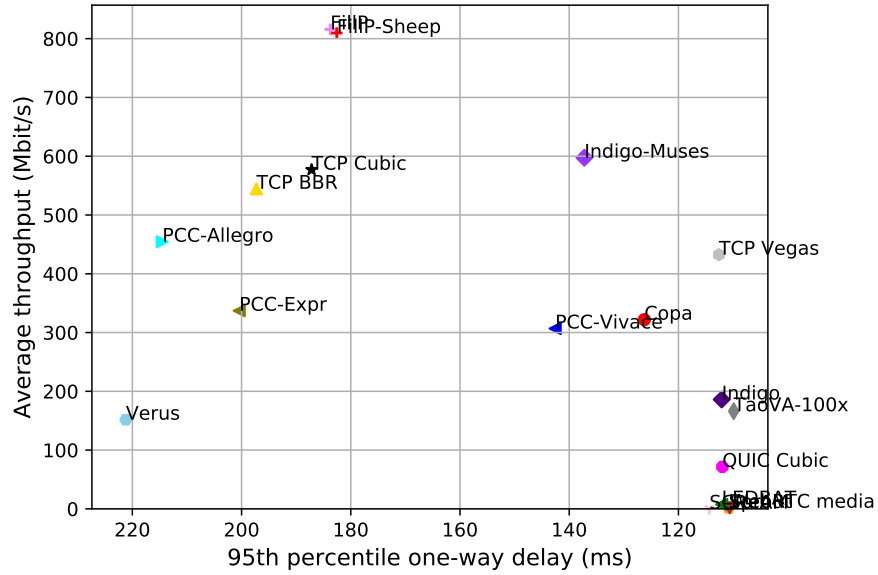
```
System info:
Linux 4.15.0-1018-gcp
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
net.ipv4.tcp_mem = 190986 254651 381972
```

```
Git summary:
branch: muses @ e0a9b05ad97d268013b7cc9a9c95637b593a1b4c
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 7631aea3923a3598767c87765ae5103aca0678d3
third_party/pantheon-tunnel @ cbfce6db5ff5740dafe1771f813cd646339e1952
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 GCE London to GCE Tokyo, 5 runs of 30s each per scheme
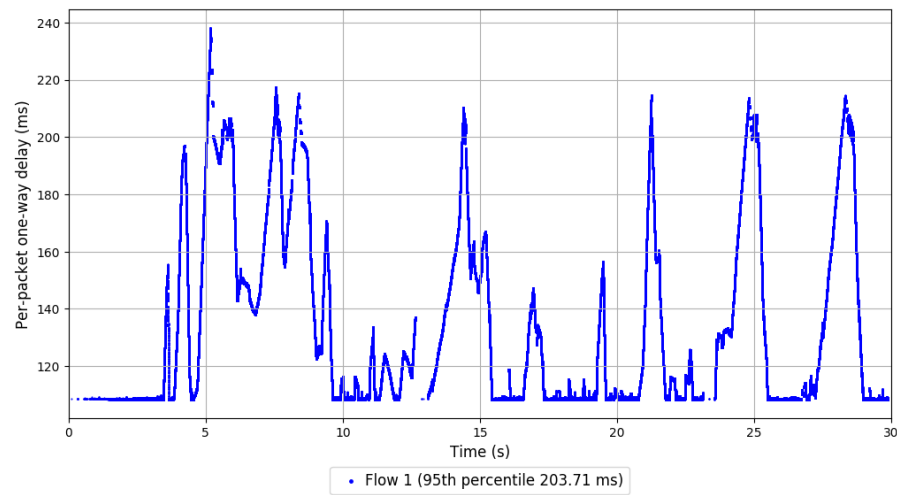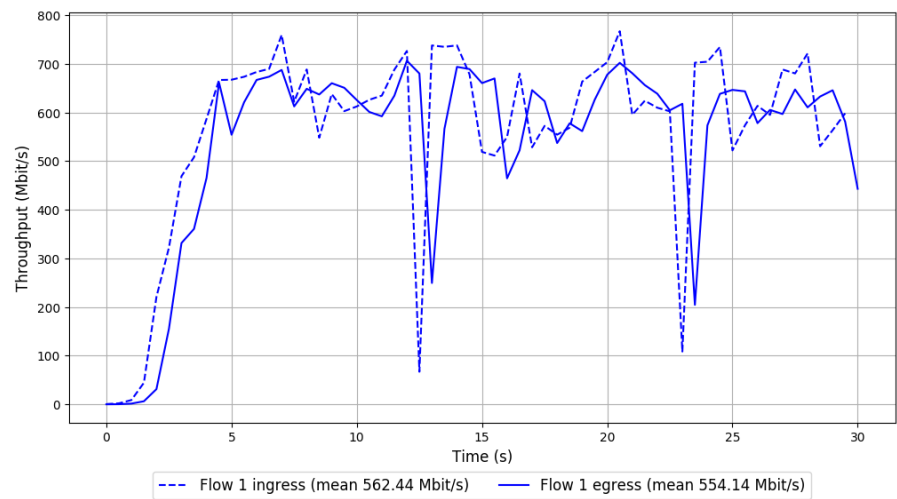(mean of all runs by scheme)

test from GCE London to GCE Tokyo, 5 runs of 30s each per scheme

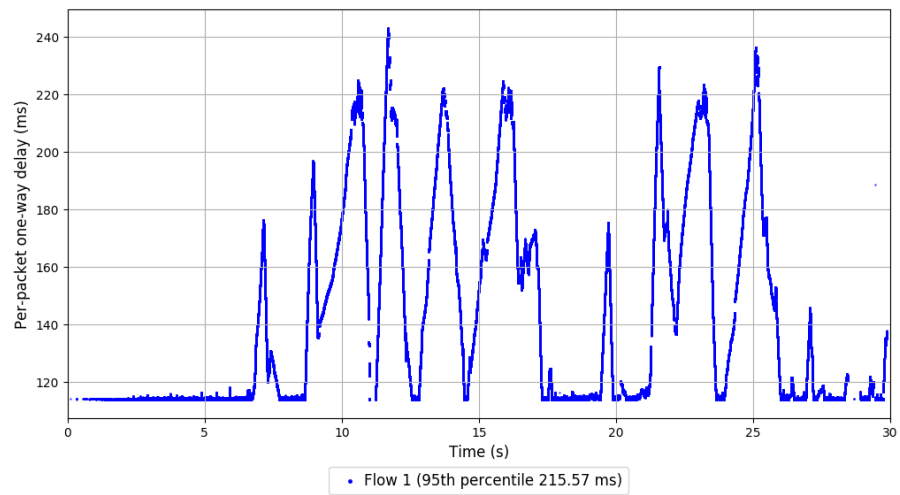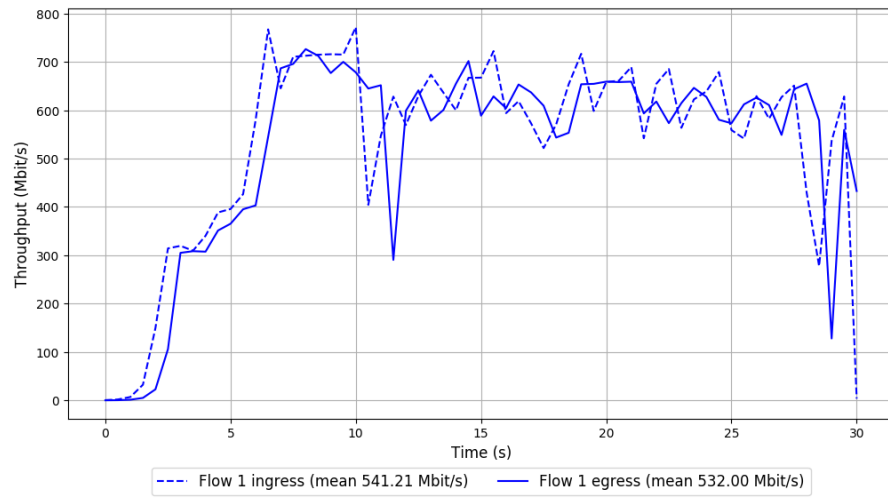| scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	5	544.52	197.27	1.84
Copa	5	321.89	126.24	0.74
TCP Cubic	5	576.93	187.18	1.04
FillP	5	815.86	183.75	5.43
FillP-Sheep	5	809.64	182.55	6.45
Indigo	5	186.02	112.09	0.85
LEDBAT	5	7.49	112.09	1.38
Indigo-Muses	5	597.43	137.23	0.91
PCC-Allegro	5	454.43	214.51	3.27
PCC-Expr	5	337.04	200.44	3.92
QUIC Cubic	5	71.50	111.96	1.06
SCReAM	5	0.20	114.34	0.71
Sprout	5	1.36	110.79	0.83
TaoVA-100x	5	166.13	109.88	0.75
TCP Vegas	5	432.44	112.58	0.81
Verus	5	151.71	221.20	7.38
PCC-Vivace	5	306.83	142.58	1.28
WebRTC media	5	1.91	110.62	0.83

```
Run 1: Statistics of TCP BBR

Start at: 2018-09-07 09:04:30
End at: 2018-09-07 09:05:00
Local clock offset: 24.359 ms
Remote clock offset: 25.335 ms

# Below is generated by plot.py at 2018-09-07 11:16:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 554.14 Mbit/s
95th percentile per-packet one-way delay: 203.710 ms
Loss rate: 2.19%
-- Flow 1:
Average throughput: 554.14 Mbit/s
95th percentile per-packet one-way delay: 203.710 ms
Loss rate: 2.19%
```
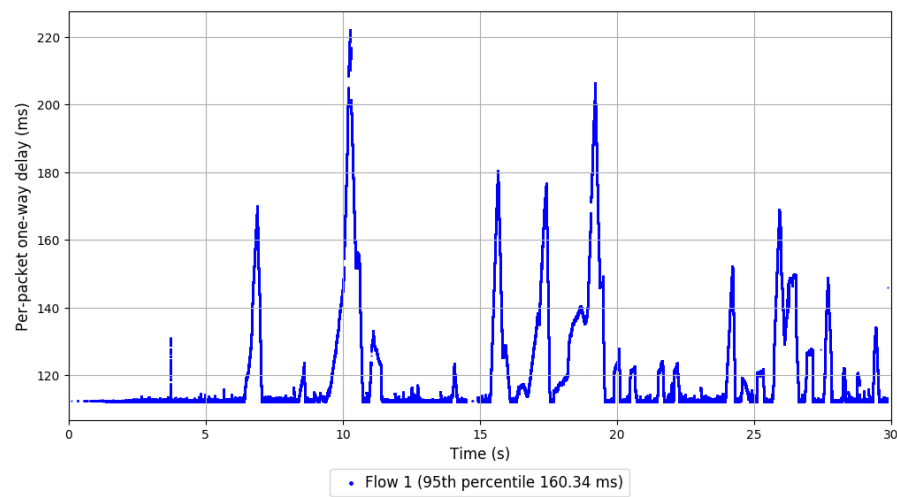
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2018-09-07 09:31:06
End at: 2018-09-07 09:31:36
Local clock offset: 17.075 ms
Remote clock offset: 17.854 ms


# Below is generated by plot.py at 2018-09-07 11:16:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 532.00 Mbit/s
95th percentile per-packet one-way delay: 215.571 ms
Loss rate: 2.43%
-- Flow 1:
Average throughput: 532.00 Mbit/s
95th percentile per-packet one-way delay: 215.571 ms
Loss rate: 2.43%
```
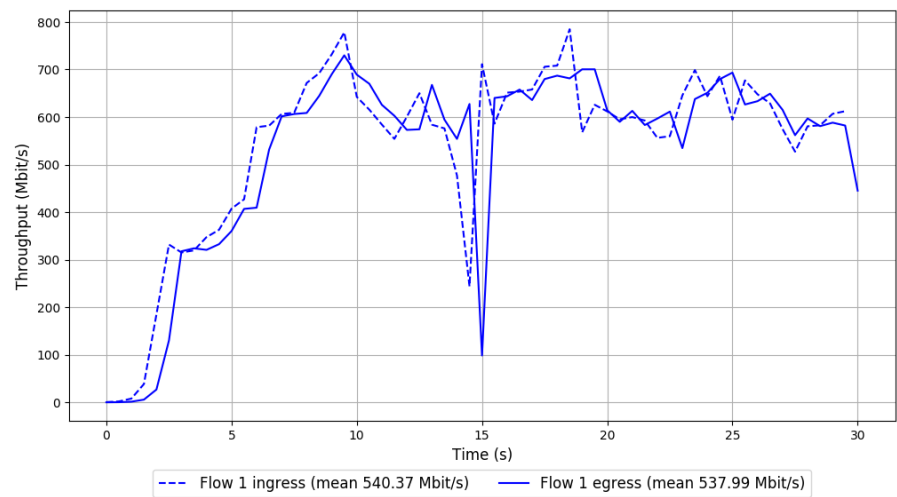
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2018-09-07 09:57:38
End at: 2018-09-07 09:58:08
Local clock offset: 7.203 ms
Remote clock offset: 7.858 ms


# Below is generated by plot.py at 2018-09-07 11:16:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 537.99 Mbit/s
95th percentile per-packet one-way delay: 160.344 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 537.99 Mbit/s
95th percentile per-packet one-way delay: 160.344 ms
Loss rate: 1.12%
```
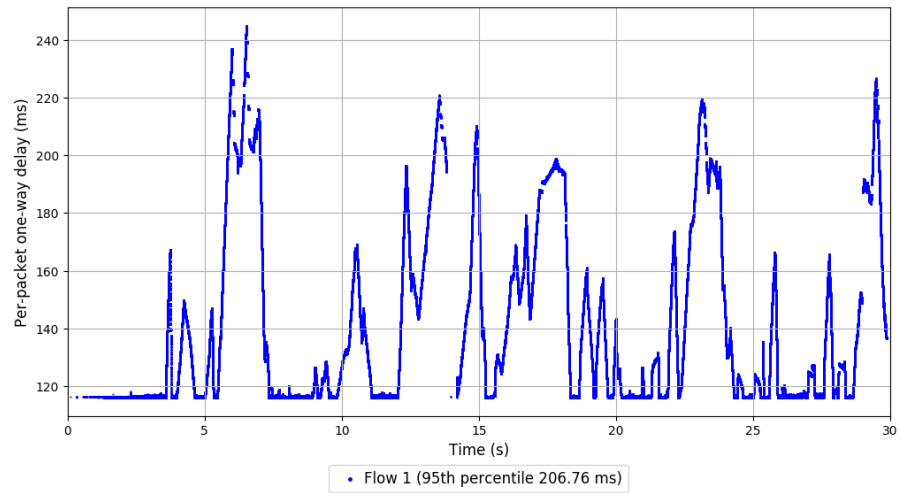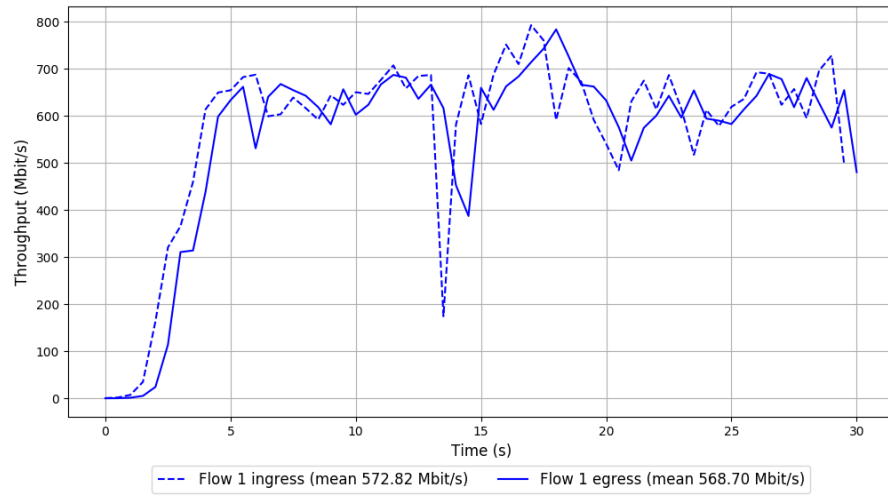
Run 3: Report of TCP BBR — Data Link

Flow 1 ingress (mean 540.37 Mbit/s)   Flow 1 egress (mean 537.99 Mbit/s)

Flow 1 (95th percentile 160.34 ms)

```
Run 4: Statistics of TCP BBR

Start at: 2018-09-07 10:24:35
End at: 2018-09-07 10:25:05
Local clock offset: 1.74 ms
Remote clock offset: 2.433 ms


# Below is generated by plot.py at 2018-09-07 11:16:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 568.70 Mbit/s
95th percentile per-packet one-way delay: 206.765 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 568.70 Mbit/s
95th percentile per-packet one-way delay: 206.765 ms
Loss rate: 1.47%
```
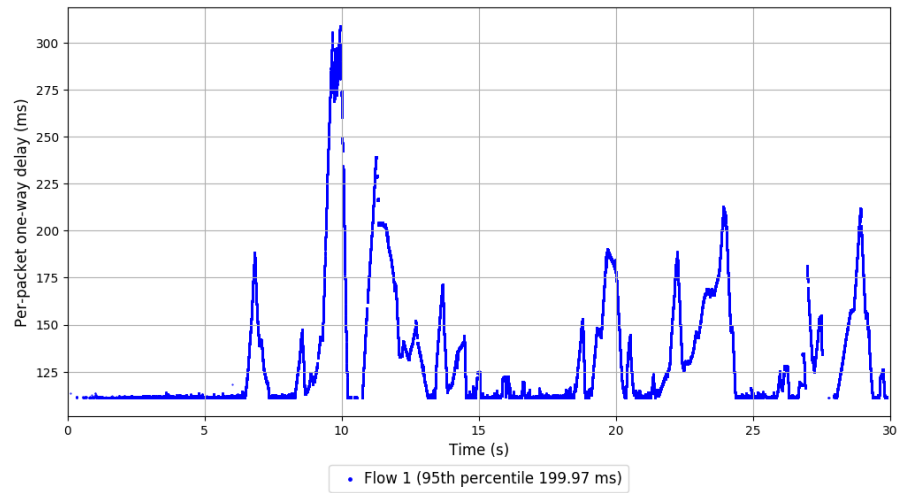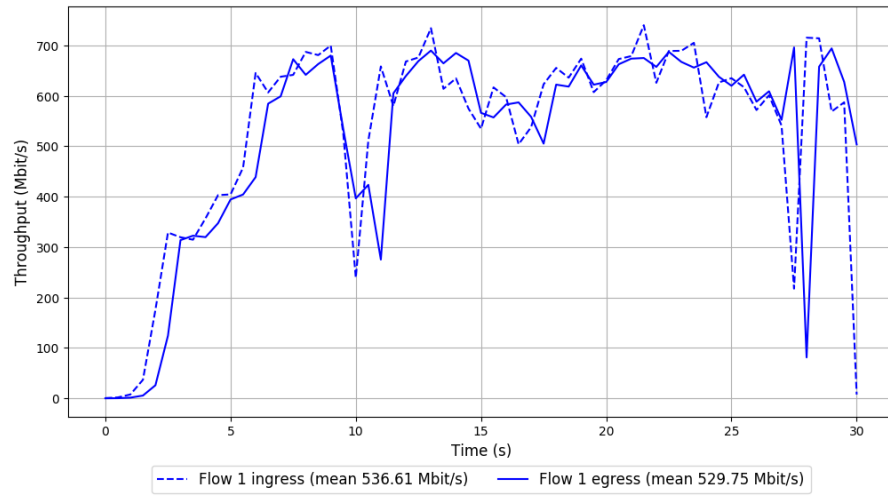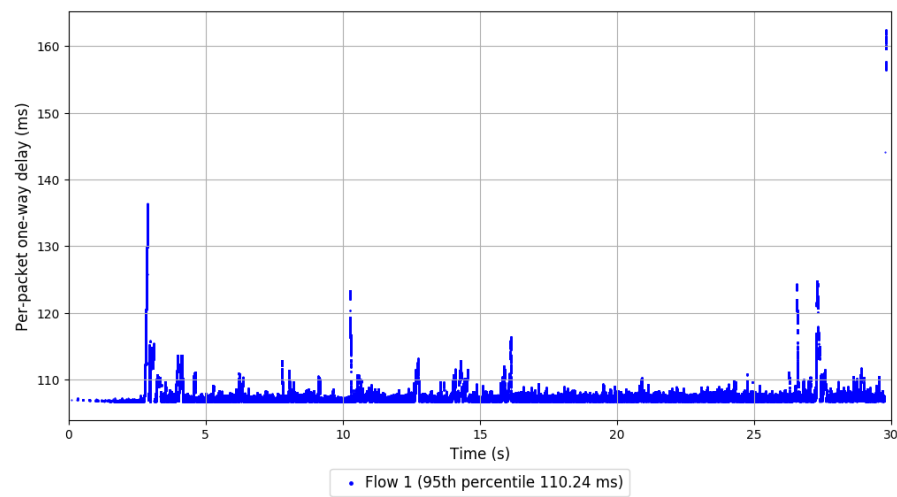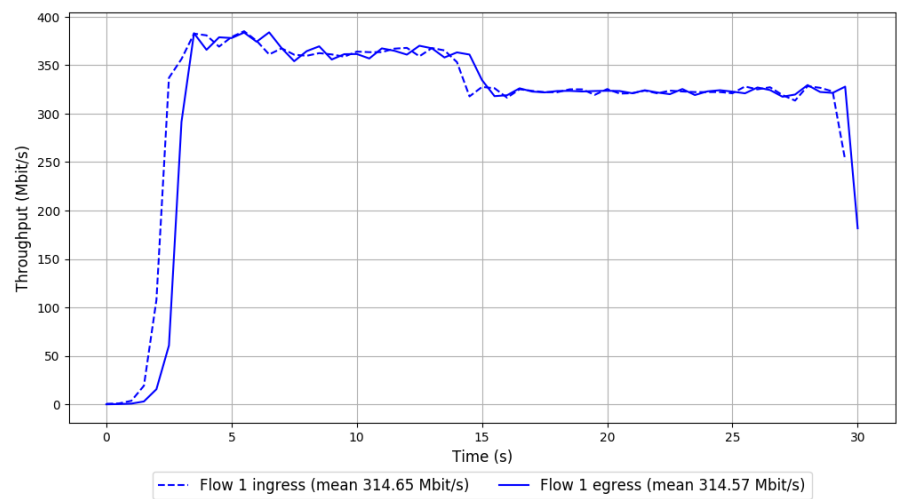
Run 4: Report of TCP BBR — Data Link

Flow 1 ingress (mean 572.82 Mbit/s)   Flow 1 egress (mean 568.70 Mbit/s)

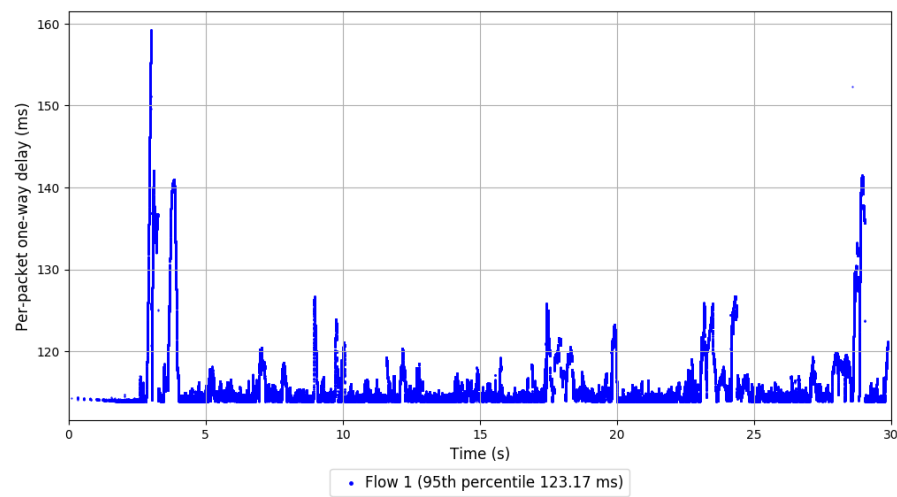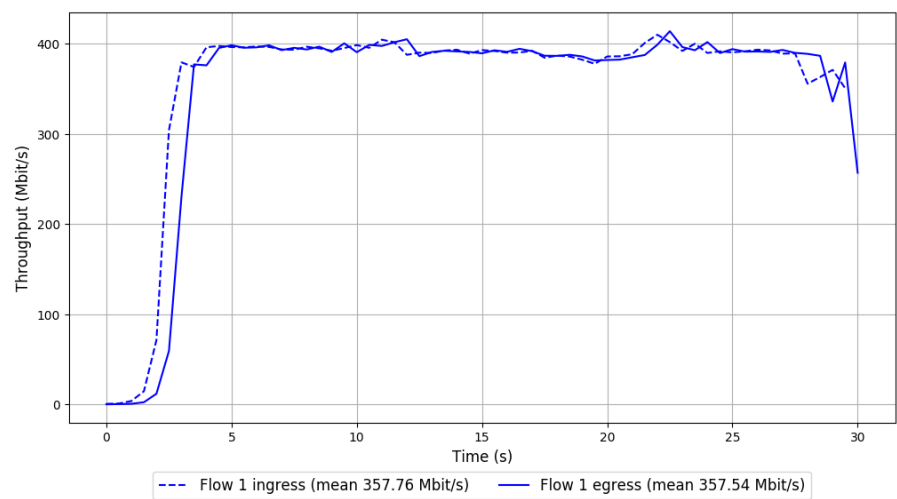
• Flow 1 (95th percentile 206.76 ms)

```
Run 5: Statistics of TCP BBR

Start at: 2018-09-07 10:51:25
End at: 2018-09-07 10:51:55
Local clock offset: 1.575 ms
Remote clock offset: 1.409 ms


# Below is generated by plot.py at 2018-09-07 11:16:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 529.75 Mbit/s
95th percentile per-packet one-way delay: 199.971 ms
Loss rate: 2.01%
-- Flow 1:
Average throughput: 529.75 Mbit/s
95th percentile per-packet one-way delay: 199.971 ms
Loss rate: 2.01%
```

Run 5: Report of TCP BBR — Data Link

Flow 1 ingress (mean 536.61 Mbit/s)   Flow 1 egress (mean 529.75 Mbit/s)

• Flow 1 (95th percentile 199.97 ms)

```
Run 1: Statistics of Copa

Start at: 2018-09-07 08:54:45
End at: 2018-09-07 08:55:15
Local clock offset: 31.318 ms
Remote clock offset: 33.708 ms

# Below is generated by plot.py at 2018-09-07 11:16:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 314.57 Mbit/s
95th percentile per-packet one-way delay: 110.240 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 314.57 Mbit/s
95th percentile per-packet one-way delay: 110.240 ms
Loss rate: 0.74%
```
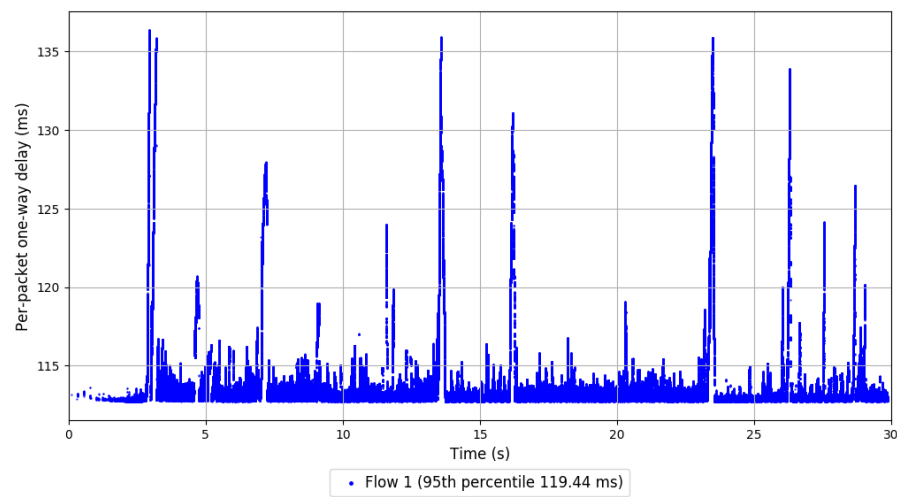
Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2018-09-07 09:21:21
End at: 2018-09-07 09:21:51
Local clock offset: 14.347 ms
Remote clock offset: 14.987 ms


# Below is generated by plot.py at 2018-09-07 11:18:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 357.54 Mbit/s
95th percentile per-packet one-way delay: 123.174 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 357.54 Mbit/s
95th percentile per-packet one-way delay: 123.174 ms
Loss rate: 0.80%
```
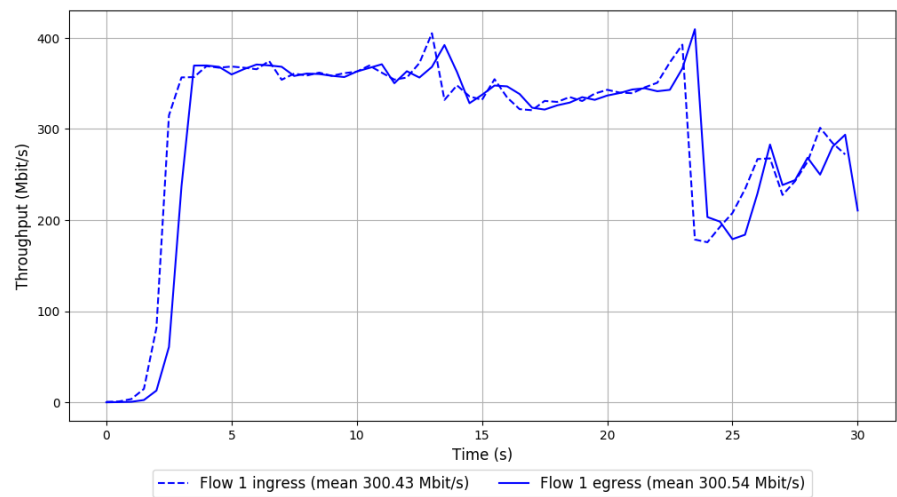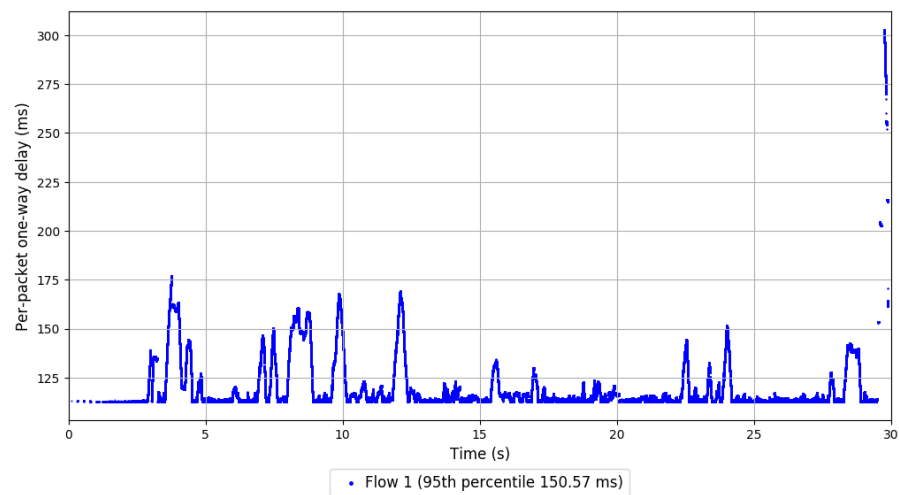
Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-09-07 09:48:11
End at: 2018-09-07 09:48:41
Local clock offset: 6.255 ms
Remote clock offset: 7.112 ms


# Below is generated by plot.py at 2018-09-07 11:18:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 300.54 Mbit/s
95th percentile per-packet one-way delay: 119.440 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 300.54 Mbit/s
95th percentile per-packet one-way delay: 119.440 ms
Loss rate: 0.70%
```
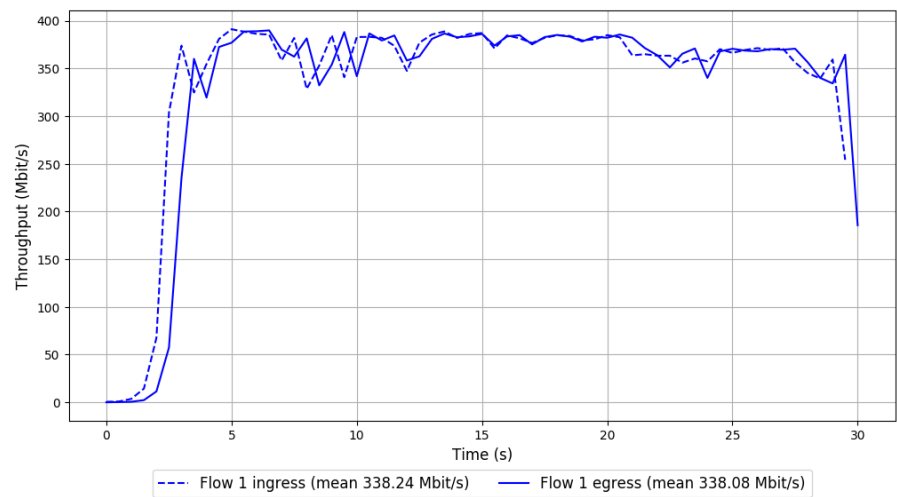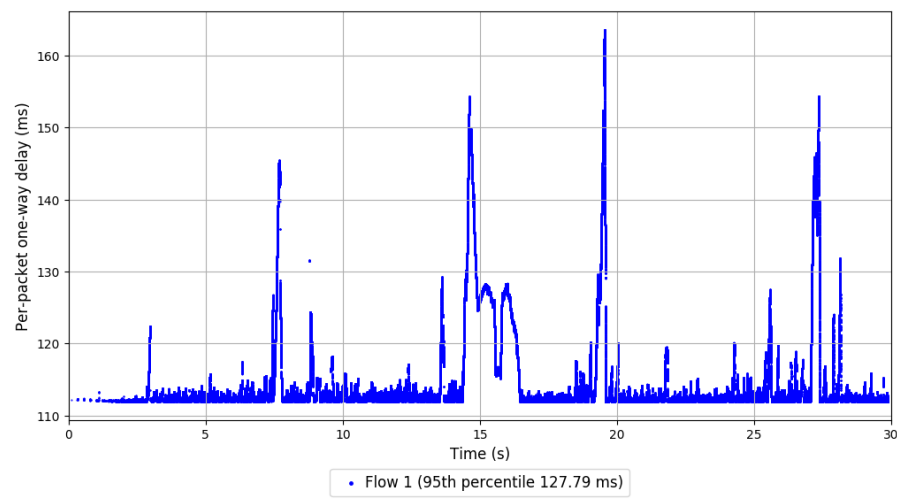
Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 300.43 Mbit/s) ---- Flow 1 egress (mean 300.54 Mbit/s) ——

Flow 1 (95th percentile 119.44 ms)

```
Run 4: Statistics of Copa

Start at: 2018-09-07 10:14:51
End at: 2018-09-07 10:15:21
Local clock offset: 4.663 ms
Remote clock offset: 4.77 ms


# Below is generated by plot.py at 2018-09-07 11:26:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 338.08 Mbit/s
95th percentile per-packet one-way delay: 150.568 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 338.08 Mbit/s
95th percentile per-packet one-way delay: 150.568 ms
Loss rate: 0.78%
```
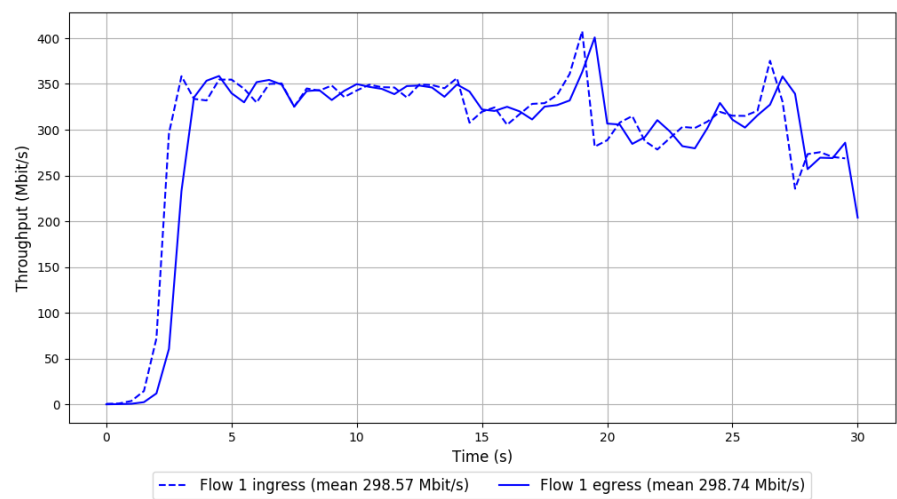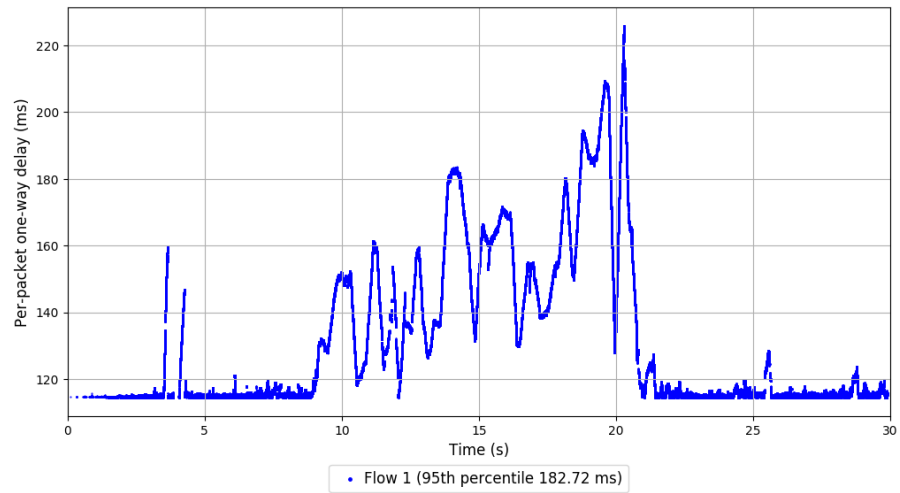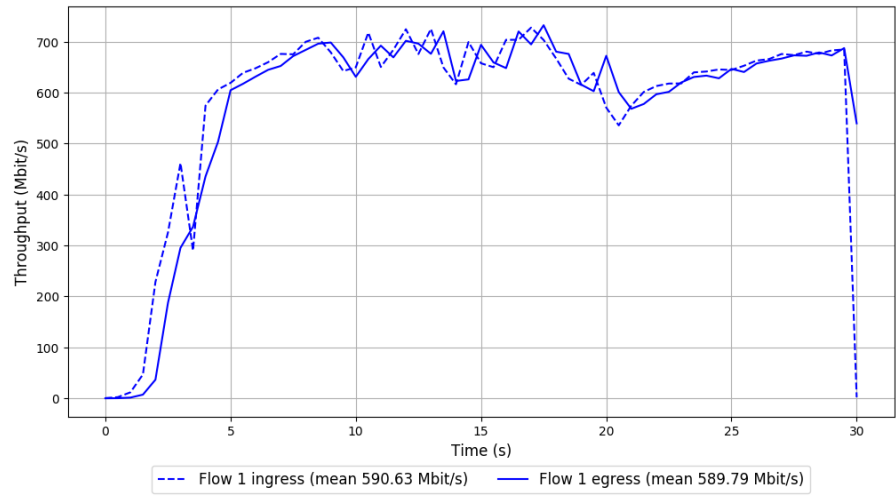
Run 4: Report of Copa — Data Link

```
Run 5: Statistics of Copa

Start at: 2018-09-07 10:41:40
End at: 2018-09-07 10:42:10
Local clock offset: 2.696 ms
Remote clock offset: 2.285 ms


# Below is generated by plot.py at 2018-09-07 11:26:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 298.74 Mbit/s
95th percentile per-packet one-way delay: 127.793 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 298.74 Mbit/s
95th percentile per-packet one-way delay: 127.793 ms
Loss rate: 0.68%
```

Run 5: Report of Copa — Data Link

Flow 1 ingress (mean 298.57 Mbit/s)   Flow 1 egress (mean 298.74 Mbit/s)
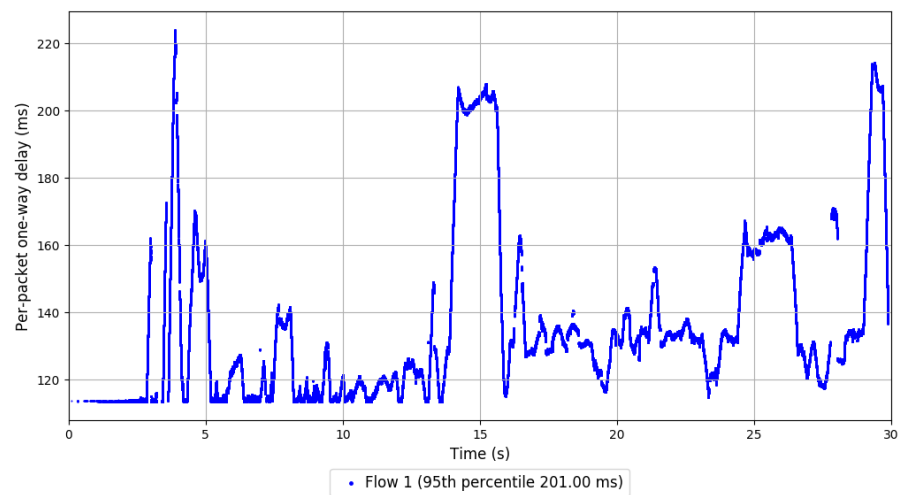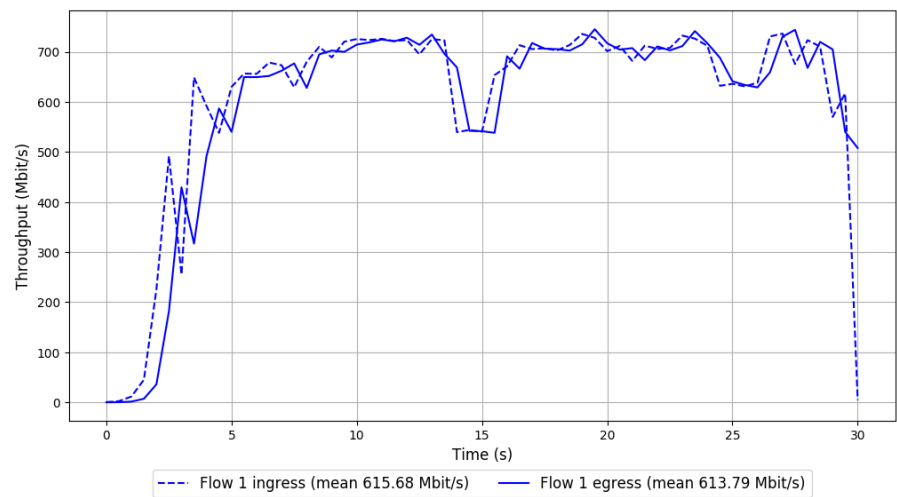

Flow 1 (95th percentile 127.79 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2018-09-07 09:02:50
End at: 2018-09-07 09:03:20
Local clock offset: 28.32 ms
Remote clock offset: 28.789 ms


# Below is generated by plot.py at 2018-09-07 11:26:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 589.79 Mbit/s
95th percentile per-packet one-way delay: 182.721 ms
Loss rate: 0.88%
-- Flow 1:
Average throughput: 589.79 Mbit/s
95th percentile per-packet one-way delay: 182.721 ms
Loss rate: 0.88%
```
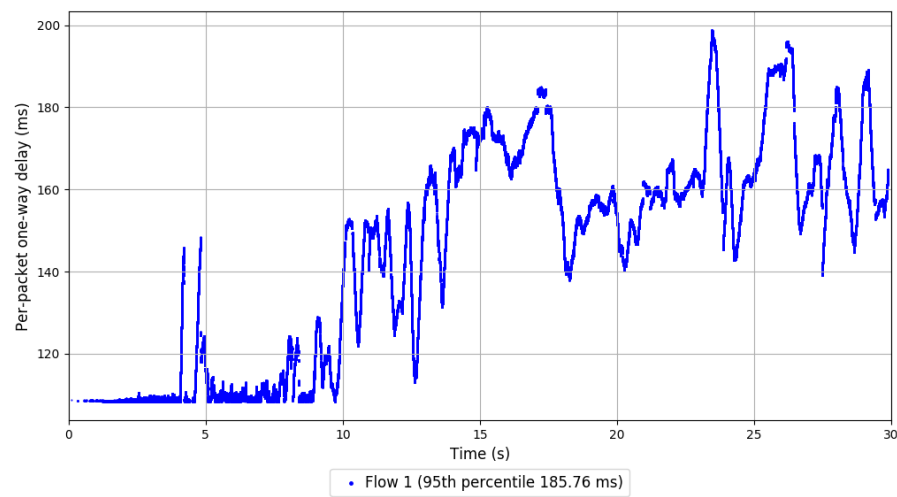
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-09-07 09:29:24
End at: 2018-09-07 09:29:54
Local clock offset: 16.267 ms
Remote clock offset: 17.793 ms


# Below is generated by plot.py at 2018-09-07 11:26:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 613.79 Mbit/s
95th percentile per-packet one-way delay: 200.999 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 613.79 Mbit/s
95th percentile per-packet one-way delay: 200.999 ms
Loss rate: 1.05%
```

Run 2: Report of TCP Cubic — Data Link

```
Run 3: Statistics of TCP Cubic

Start at: 2018-09-07 09:55:58
End at: 2018-09-07 09:56:28
Local clock offset: 6.644 ms
Remote clock offset: 6.951 ms


# Below is generated by plot.py at 2018-09-07 11:26:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 596.87 Mbit/s
95th percentile per-packet one-way delay: 185.765 ms
Loss rate: 1.04%
-- Flow 1:
Average throughput: 596.87 Mbit/s
95th percentile per-packet one-way delay: 185.765 ms
Loss rate: 1.04%
```
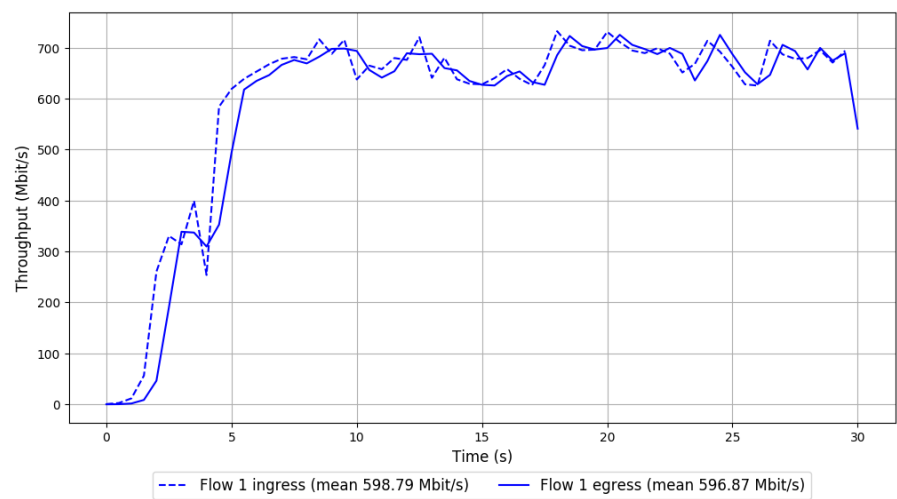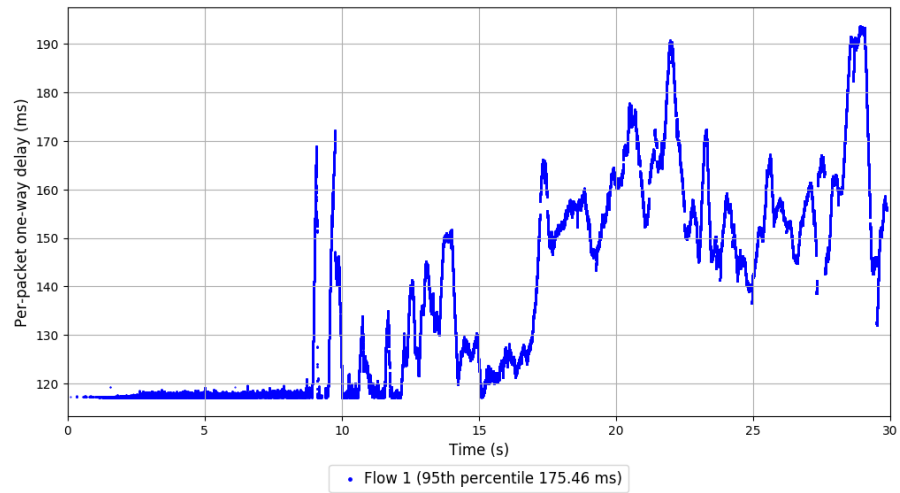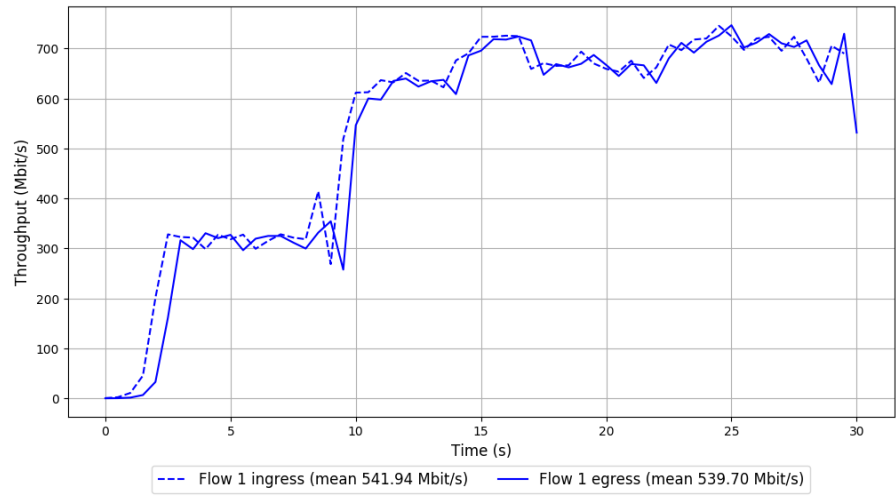
Run 3: Report of TCP Cubic — Data Link

```
Run 4: Statistics of TCP Cubic

Start at: 2018-09-07 10:22:58
End at: 2018-09-07 10:23:28
Local clock offset: 2.502 ms
Remote clock offset: 2.239 ms


# Below is generated by plot.py at 2018-09-07 11:26:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 539.70 Mbit/s
95th percentile per-packet one-way delay: 175.458 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 539.70 Mbit/s
95th percentile per-packet one-way delay: 175.458 ms
Loss rate: 1.16%
```
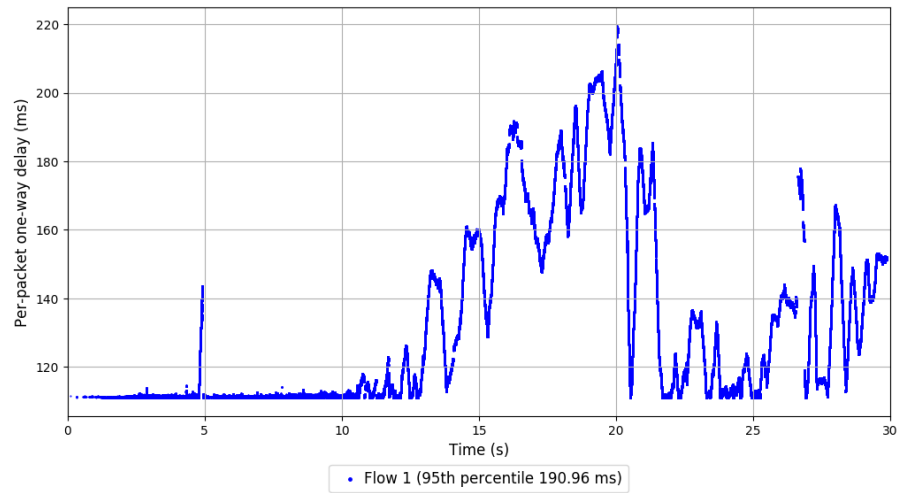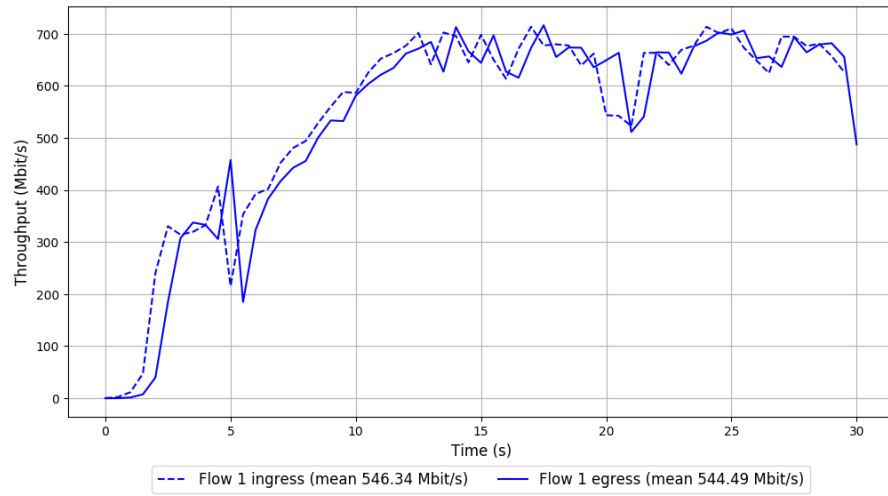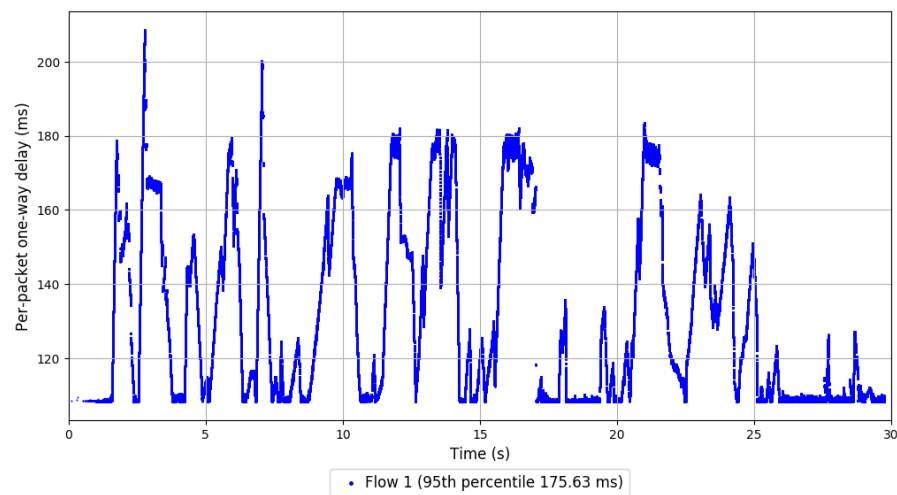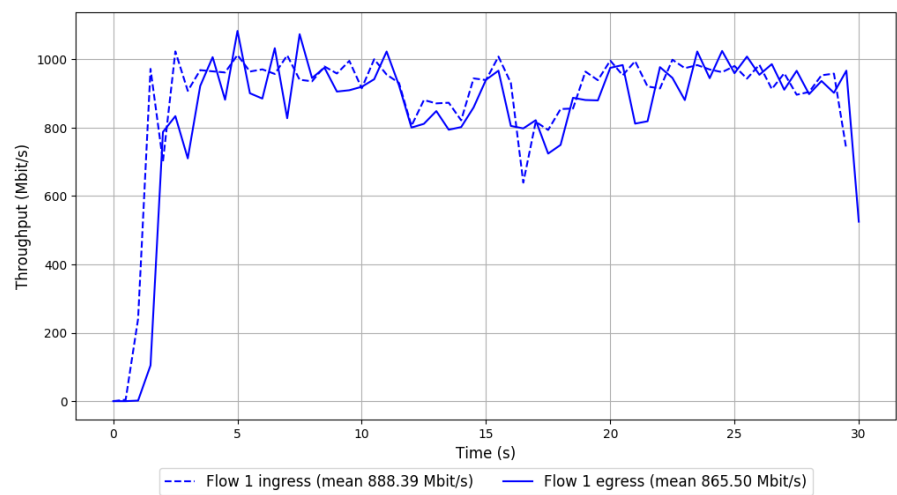
Run 4: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 541.94 Mbit/s) —— Flow 1 egress (mean 539.70 Mbit/s)

• Flow 1 (95th percentile 175.46 ms)

```
Run 5: Statistics of TCP Cubic

Start at: 2018-09-07 10:49:47
End at: 2018-09-07 10:50:17
Local clock offset: 2.25 ms
Remote clock offset: 1.542 ms


# Below is generated by plot.py at 2018-09-07 11:26:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 544.49 Mbit/s
95th percentile per-packet one-way delay: 190.961 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 544.49 Mbit/s
95th percentile per-packet one-way delay: 190.961 ms
Loss rate: 1.07%
```

Run 5: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 546.34 Mbit/s) —— Flow 1 egress (mean 544.49 Mbit/s)
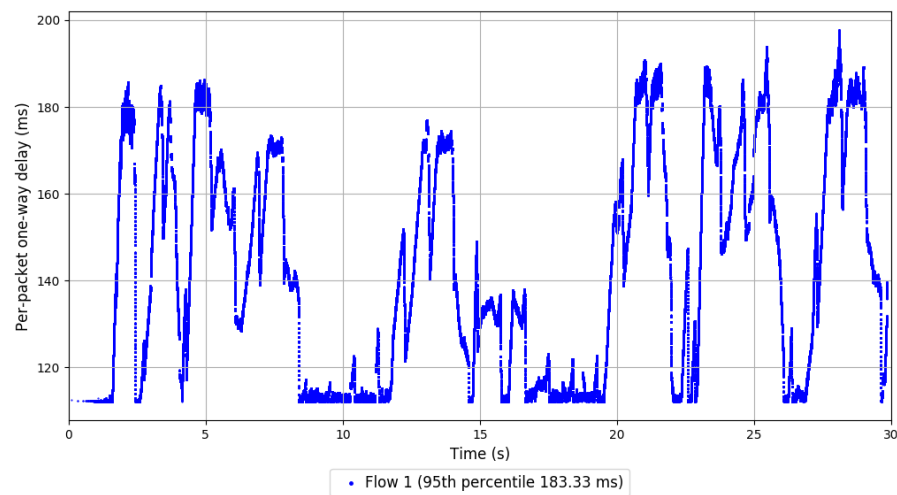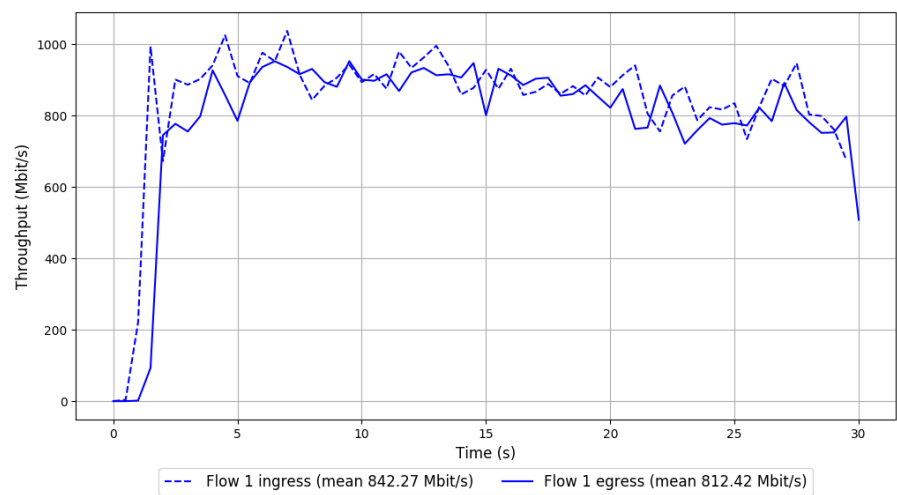

• Flow 1 (95th percentile 190.96 ms)

```
Run 1: Statistics of FillP

Start at: 2018-09-07 09:09:38
End at: 2018-09-07 09:10:08
Local clock offset: 16.917 ms
Remote clock offset: 17.521 ms


# Below is generated by plot.py at 2018-09-07 11:34:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 865.50 Mbit/s
95th percentile per-packet one-way delay: 175.635 ms
Loss rate: 3.28%
-- Flow 1:
Average throughput: 865.50 Mbit/s
95th percentile per-packet one-way delay: 175.635 ms
Loss rate: 3.28%
```

Run 1: Report of FillP — Data Link

```
Run 2: Statistics of FillP

Start at: 2018-09-07 09:36:10
End at: 2018-09-07 09:36:40
Local clock offset: 15.192 ms
Remote clock offset: 15.895 ms


# Below is generated by plot.py at 2018-09-07 11:42:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 812.42 Mbit/s
95th percentile per-packet one-way delay: 183.332 ms
Loss rate: 4.25%
-- Flow 1:
Average throughput: 812.42 Mbit/s
95th percentile per-packet one-way delay: 183.332 ms
Loss rate: 4.25%
```
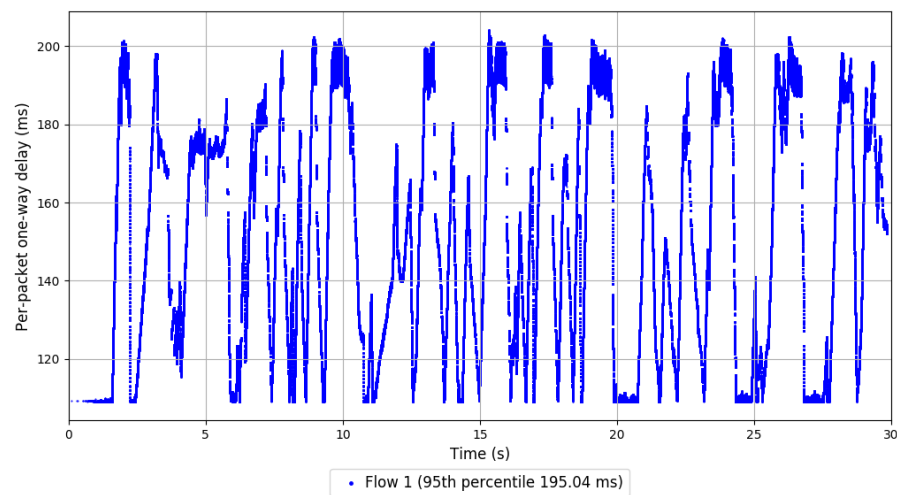
Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-09-07 10:02:46
End at: 2018-09-07 10:03:16
Local clock offset: 7.63 ms
Remote clock offset: 8.284 ms


# Below is generated by plot.py at 2018-09-07 11:42:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 737.93 Mbit/s
95th percentile per-packet one-way delay: 195.036 ms
Loss rate: 11.07%
-- Flow 1:
Average throughput: 737.93 Mbit/s
95th percentile per-packet one-way delay: 195.036 ms
Loss rate: 11.07%
```
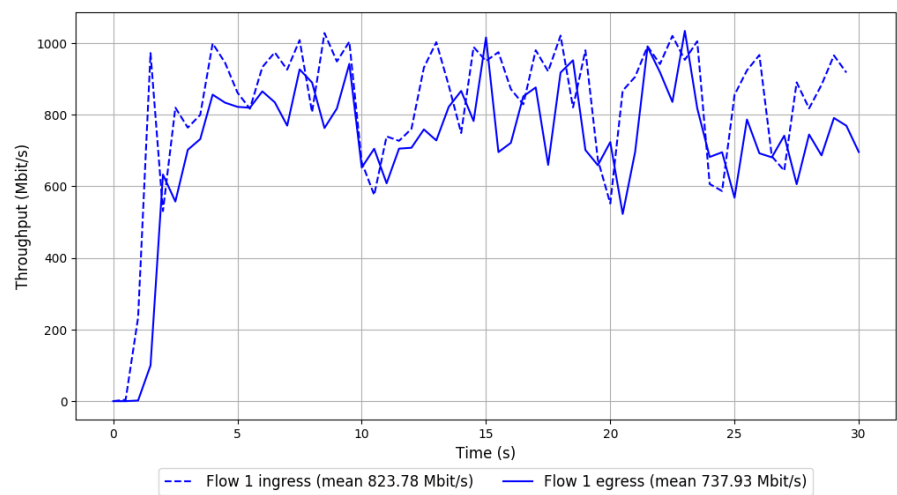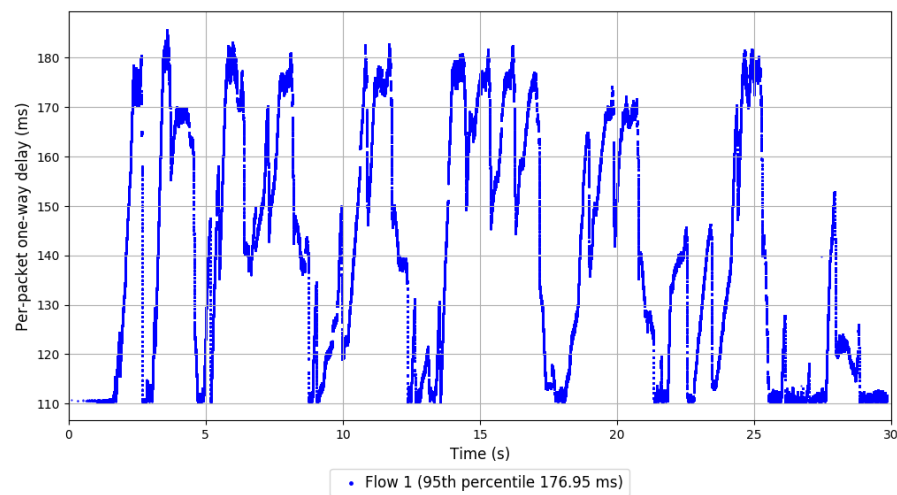
Run 3: Report of FillP — Data Link

```
Run 4: Statistics of FillP

Start at: 2018-09-07 10:29:41
End at: 2018-09-07 10:30:12
Local clock offset: 1.615 ms
Remote clock offset: 2.133 ms


# Below is generated by plot.py at 2018-09-07 11:42:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 831.40 Mbit/s
95th percentile per-packet one-way delay: 176.952 ms
Loss rate: 3.93%
-- Flow 1:
Average throughput: 831.40 Mbit/s
95th percentile per-packet one-way delay: 176.952 ms
Loss rate: 3.93%
```
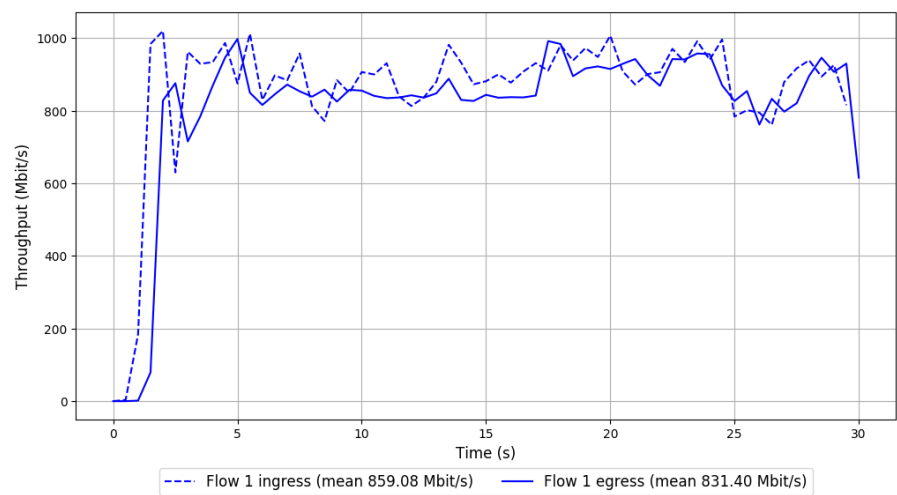
Run 4: Report of FillP — Data Link

```
Run 5: Statistics of FillP

Start at: 2018-09-07 10:56:31
End at: 2018-09-07 10:57:01
Local clock offset: 0.72 ms
Remote clock offset: 0.85 ms


# Below is generated by plot.py at 2018-09-07 11:42:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 832.03 Mbit/s
95th percentile per-packet one-way delay: 187.814 ms
Loss rate: 4.63%
-- Flow 1:
Average throughput: 832.03 Mbit/s
95th percentile per-packet one-way delay: 187.814 ms
Loss rate: 4.63%
```
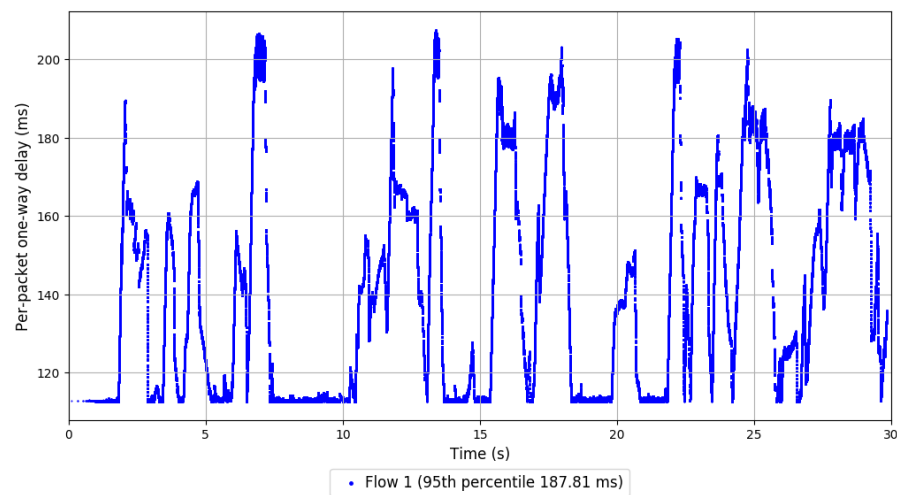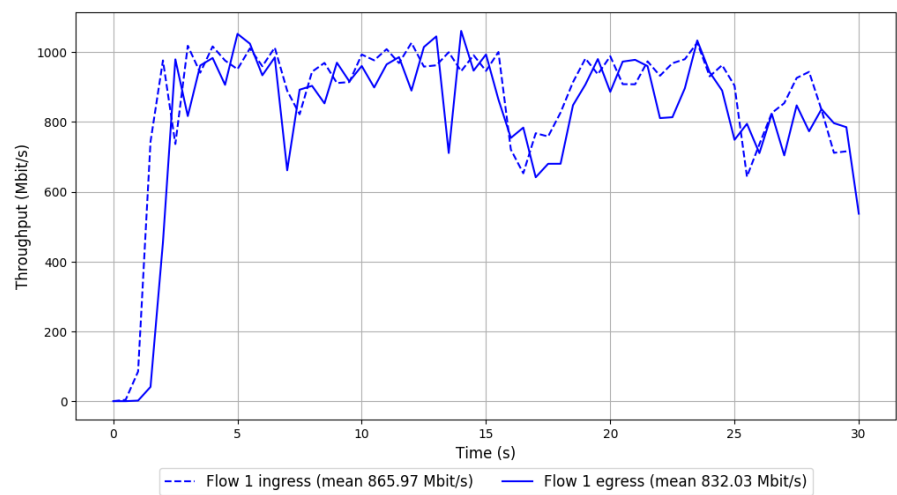
Run 5: Report of FillP — Data Link

```
Run 1: Statistics of FillP-Sheep

Start at: 2018-09-07 09:06:14
End at: 2018-09-07 09:06:44
Local clock offset: 19.805 ms
Remote clock offset: 21.926 ms


# Below is generated by plot.py at 2018-09-07 11:42:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 733.69 Mbit/s
95th percentile per-packet one-way delay: 194.303 ms
Loss rate: 13.40%
-- Flow 1:
Average throughput: 733.69 Mbit/s
95th percentile per-packet one-way delay: 194.303 ms
Loss rate: 13.40%
```
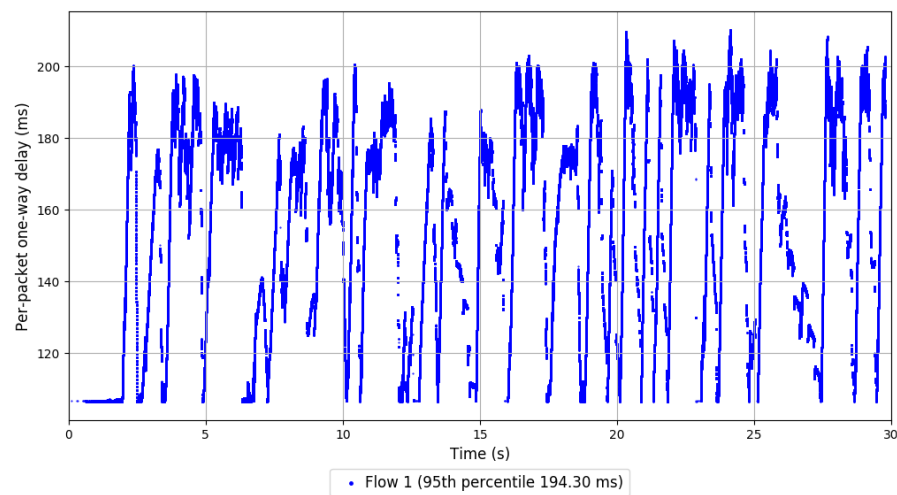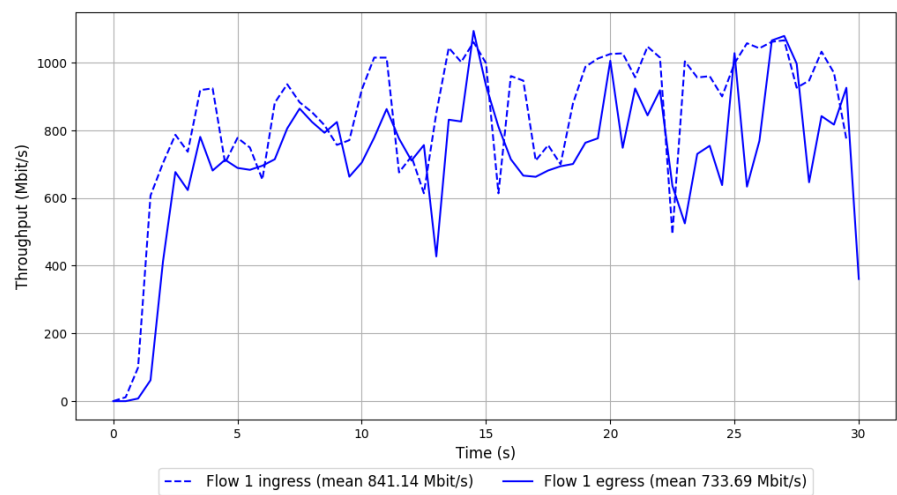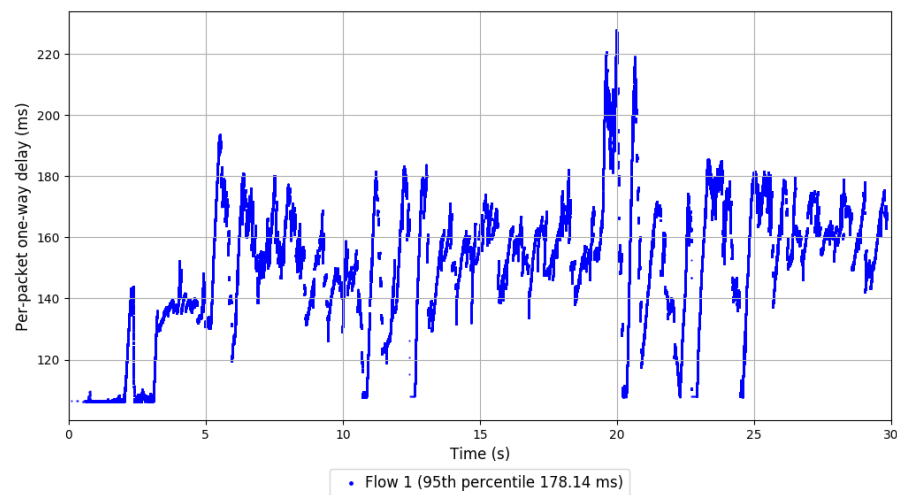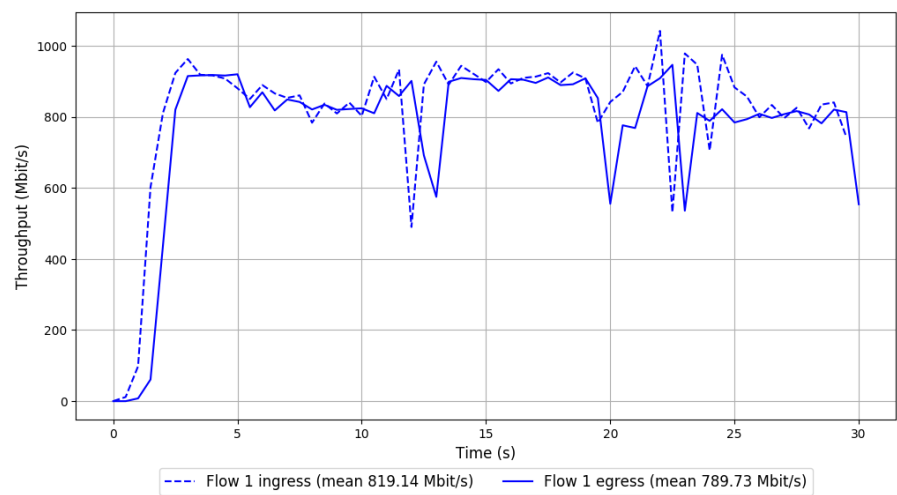
Run 1: Report of FillP-Sheep — Data Link

```
Run 2: Statistics of FillP-Sheep

Start at: 2018-09-07 09:32:46
End at: 2018-09-07 09:33:16
Local clock offset: 17.015 ms
Remote clock offset: 19.373 ms


# Below is generated by plot.py at 2018-09-07 11:42:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 789.73 Mbit/s
95th percentile per-packet one-way delay: 178.144 ms
Loss rate: 4.29%
-- Flow 1:
Average throughput: 789.73 Mbit/s
95th percentile per-packet one-way delay: 178.144 ms
Loss rate: 4.29%
```

Run 2: Report of FillP-Sheep — Data Link

```
Run 3: Statistics of FillP-Sheep

Start at: 2018-09-07 09:59:18
End at: 2018-09-07 09:59:48
Local clock offset: 7.576 ms
Remote clock offset: 7.716 ms


# Below is generated by plot.py at 2018-09-07 11:44:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 901.84 Mbit/s
95th percentile per-packet one-way delay: 177.425 ms
Loss rate: 4.99%
-- Flow 1:
Average throughput: 901.84 Mbit/s
95th percentile per-packet one-way delay: 177.425 ms
Loss rate: 4.99%
```
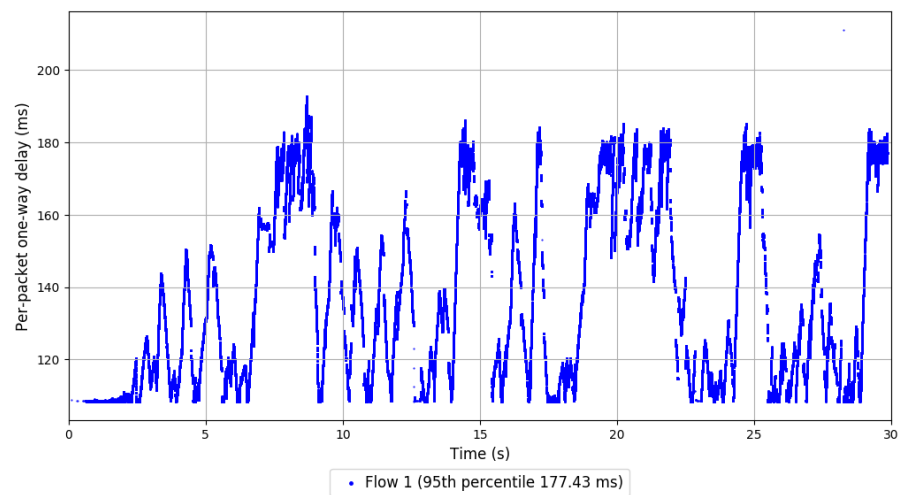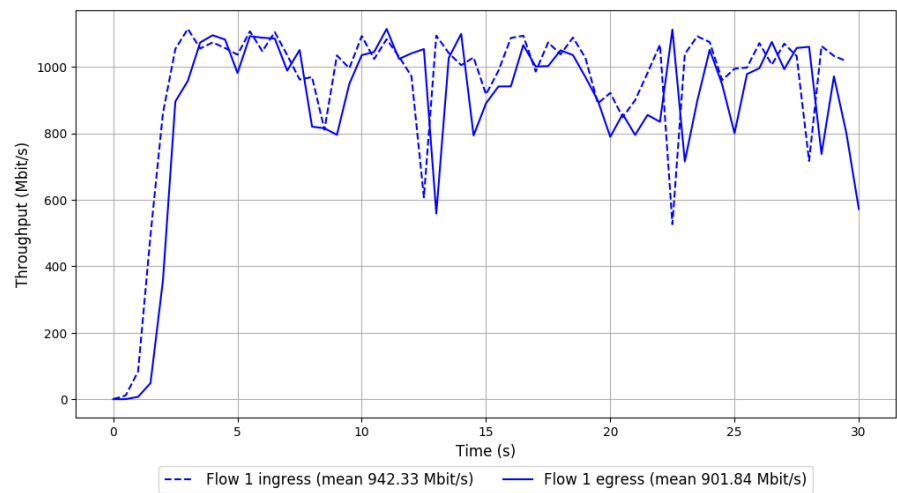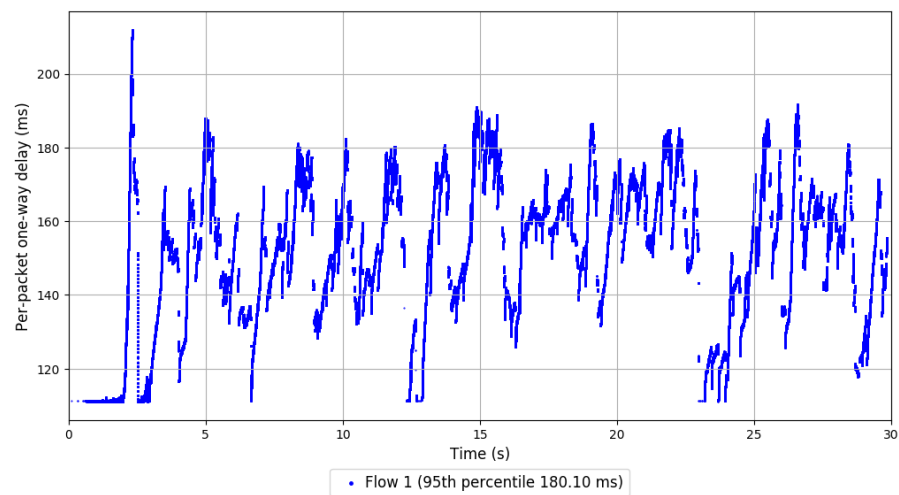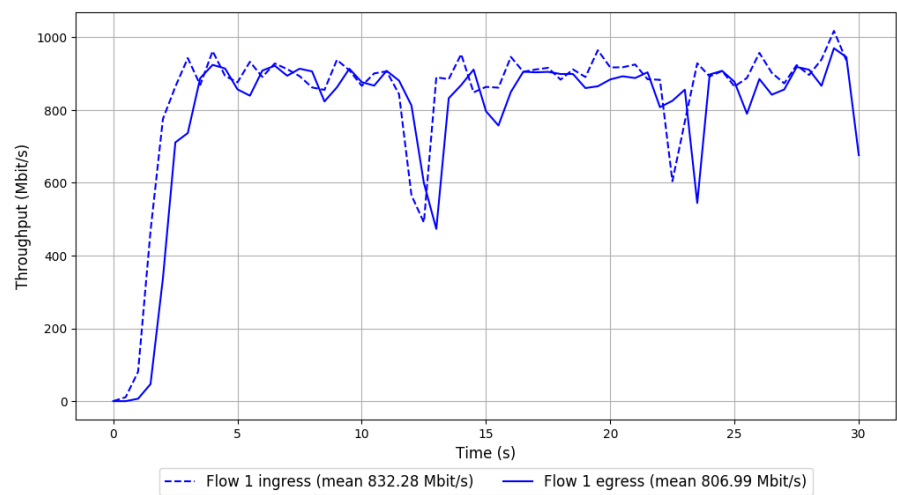
Run 3: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 942.33 Mbit/s)   Flow 1 egress (mean 901.84 Mbit/s)

Flow 1 (95th percentile 177.43 ms)

```
Run 4: Statistics of FillP-Sheep

Start at: 2018-09-07 10:26:17
End at: 2018-09-07 10:26:47
Local clock offset: 1.761 ms
Remote clock offset: 2.296 ms


# Below is generated by plot.py at 2018-09-07 11:54:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 806.99 Mbit/s
95th percentile per-packet one-way delay: 180.104 ms
Loss rate: 3.75%
-- Flow 1:
Average throughput: 806.99 Mbit/s
95th percentile per-packet one-way delay: 180.104 ms
Loss rate: 3.75%
```
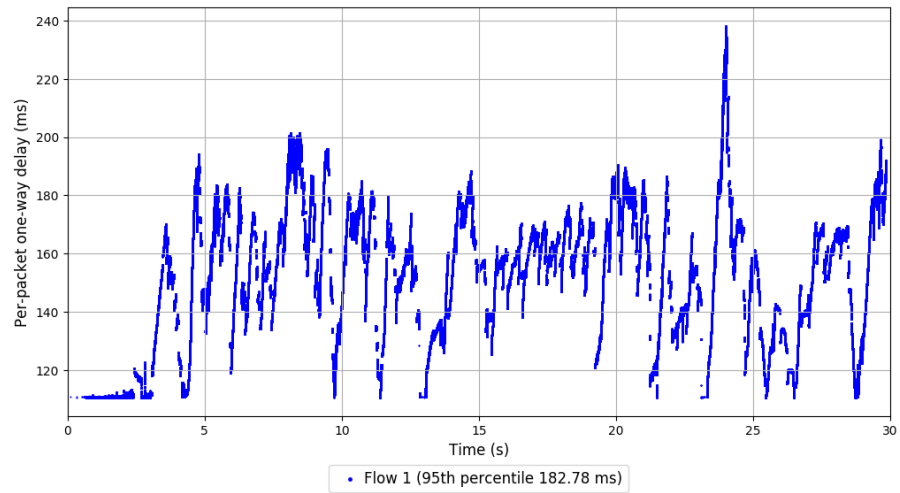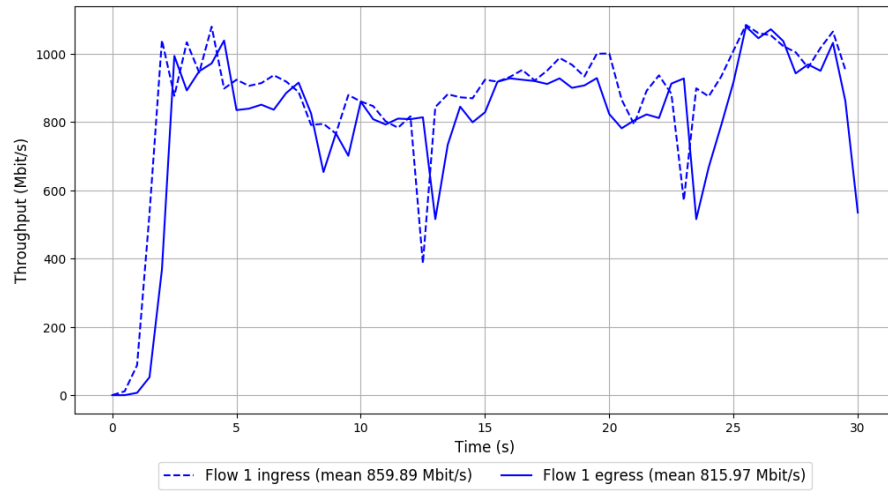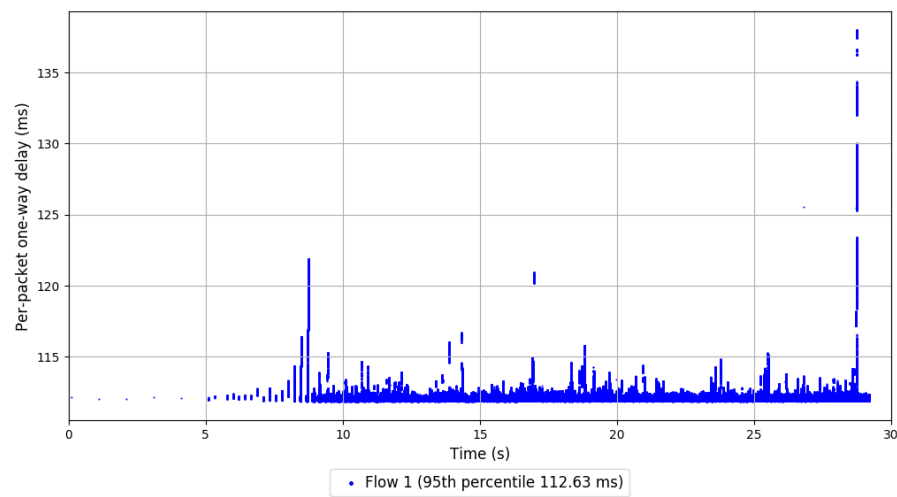
Run 4: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 832.28 Mbit/s)   Flow 1 egress (mean 806.99 Mbit/s)

Flow 1 (95th percentile 180.10 ms)

```
Run 5: Statistics of FillP-Sheep

Start at: 2018-09-07 10:53:06
End at: 2018-09-07 10:53:36
Local clock offset: 1.495 ms
Remote clock offset: 1.284 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 815.97 Mbit/s
95th percentile per-packet one-way delay: 182.783 ms
Loss rate: 5.80%
-- Flow 1:
Average throughput: 815.97 Mbit/s
95th percentile per-packet one-way delay: 182.783 ms
Loss rate: 5.80%
```

Run 5: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 859.89 Mbit/s)   Flow 1 egress (mean 815.97 Mbit/s)
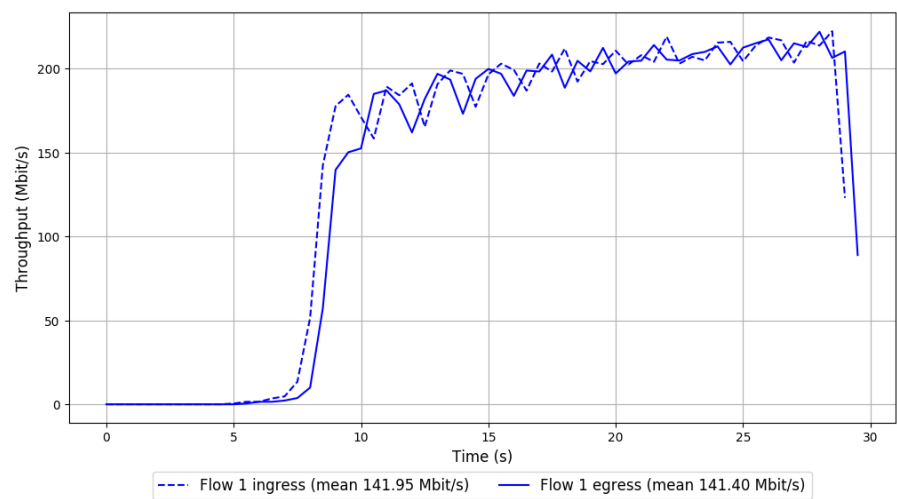

• Flow 1 (95th percentile 182.78 ms)

```
Run 1: Statistics of Indigo

Start at: 2018-09-07 08:46:14
End at: 2018-09-07 08:46:44
Local clock offset: 23.224 ms
Remote clock offset: 25.421 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 141.40 Mbit/s
95th percentile per-packet one-way delay: 112.630 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 141.40 Mbit/s
95th percentile per-packet one-way delay: 112.630 ms
Loss rate: 1.14%
```

Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2018-09-07 09:13:06
End at: 2018-09-07 09:13:36
Local clock offset: 14.832 ms
Remote clock offset: 15.54 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 221.58 Mbit/s
95th percentile per-packet one-way delay: 113.416 ms
Loss rate: 0.77%
-- Flow 1:
Average throughput: 221.58 Mbit/s
95th percentile per-packet one-way delay: 113.416 ms
Loss rate: 0.77%
```
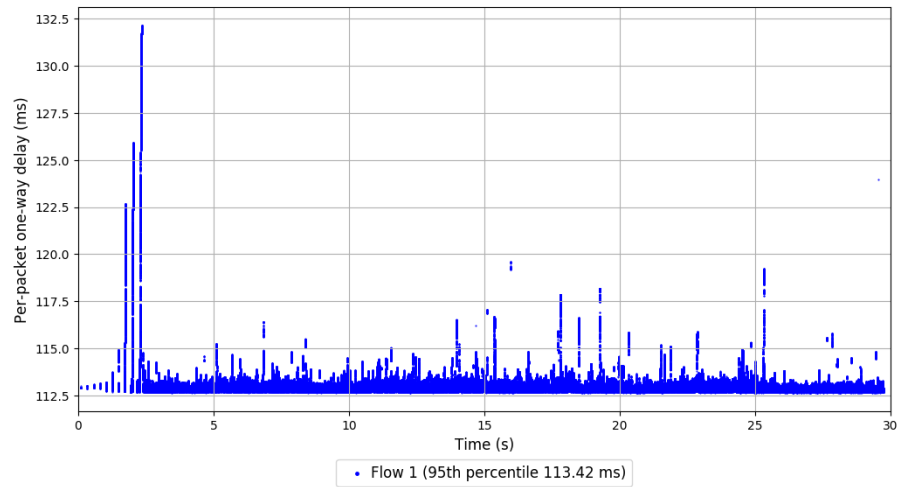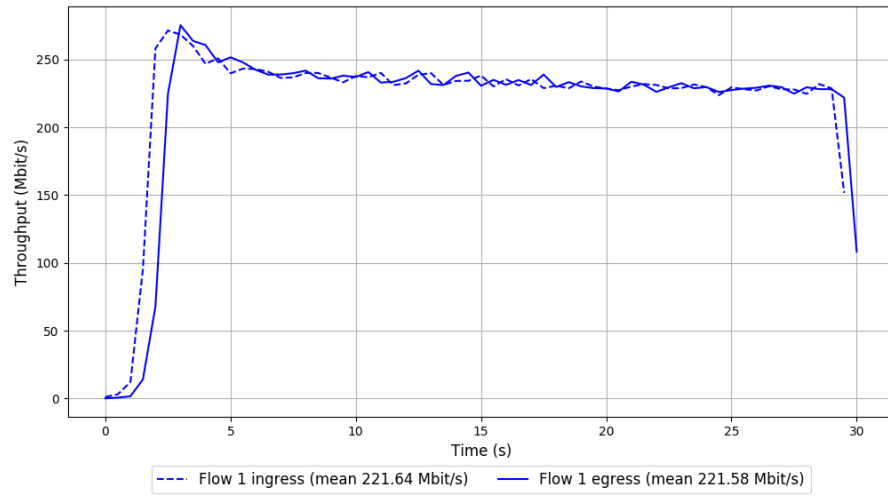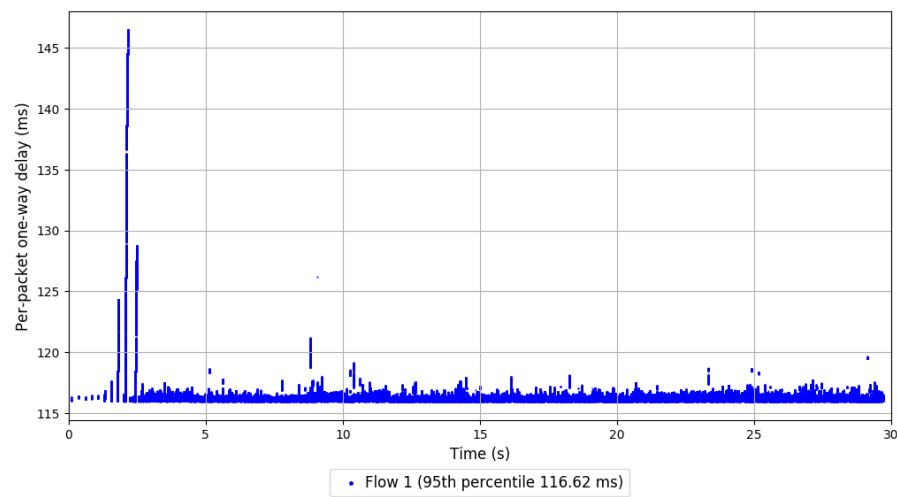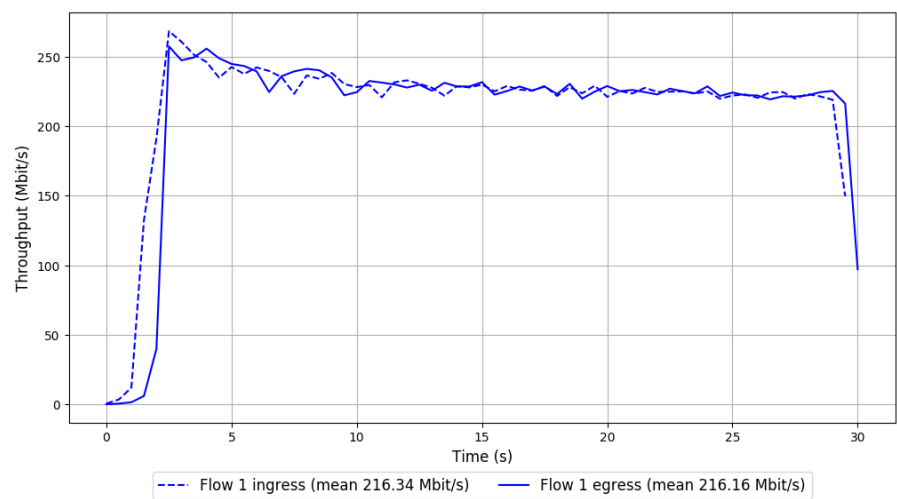
Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2018-09-07 09:39:34
End at: 2018-09-07 09:40:04
Local clock offset: 11.307 ms
Remote clock offset: 11.797 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 216.16 Mbit/s
95th percentile per-packet one-way delay: 116.620 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 216.16 Mbit/s
95th percentile per-packet one-way delay: 116.620 ms
Loss rate: 0.79%
```

Run 3: Report of Indigo — Data Link

```
Run 4: Statistics of Indigo

Start at: 2018-09-07 10:06:11
End at: 2018-09-07 10:06:41
Local clock offset: 9.596 ms
Remote clock offset: 9.015 ms

# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 163.54 Mbit/s
95th percentile per-packet one-way delay: 109.470 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 163.54 Mbit/s
95th percentile per-packet one-way delay: 109.470 ms
Loss rate: 0.76%
```
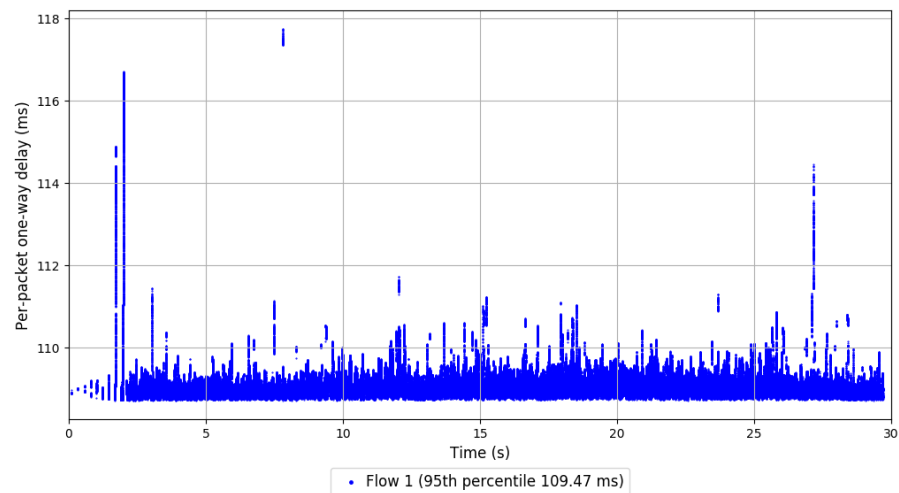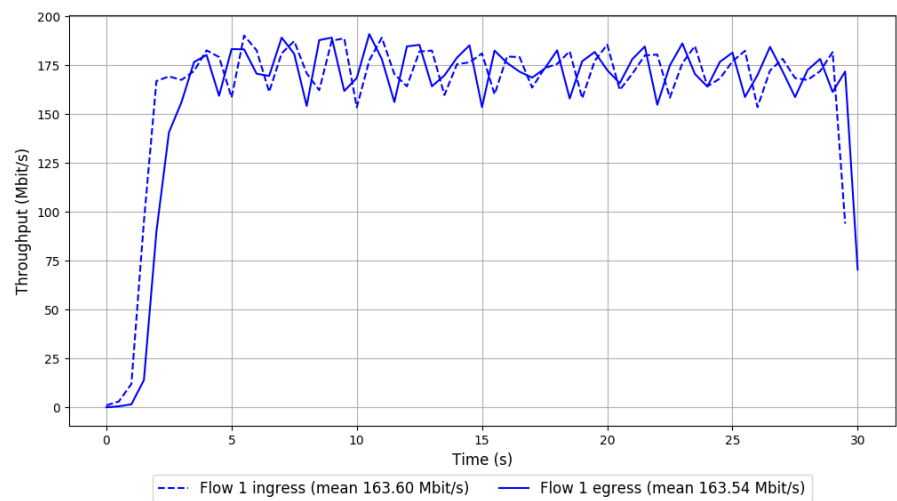
Run 4: Report of Indigo — Data Link

```
Run 5: Statistics of Indigo

Start at: 2018-09-07 10:33:08
End at: 2018-09-07 10:33:39
Local clock offset: 1.743 ms
Remote clock offset: 2.425 ms

# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 187.41 Mbit/s
95th percentile per-packet one-way delay: 108.293 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 187.41 Mbit/s
95th percentile per-packet one-way delay: 108.293 ms
Loss rate: 0.81%
```
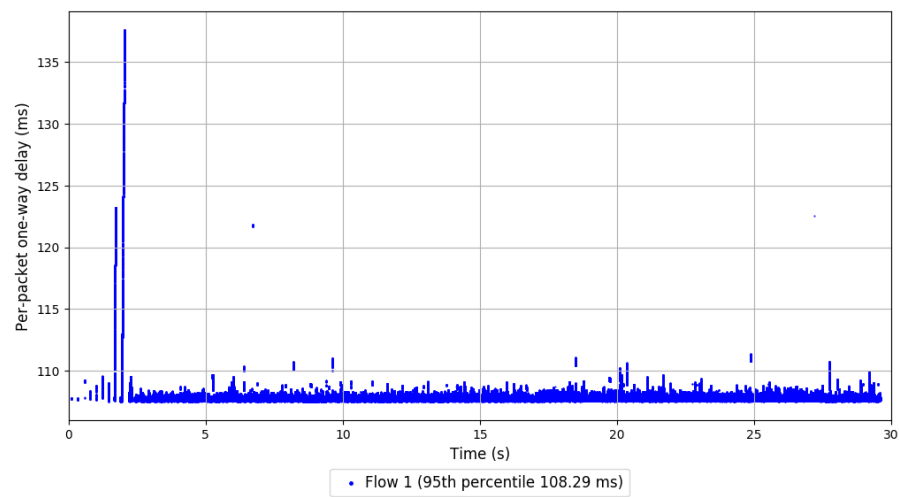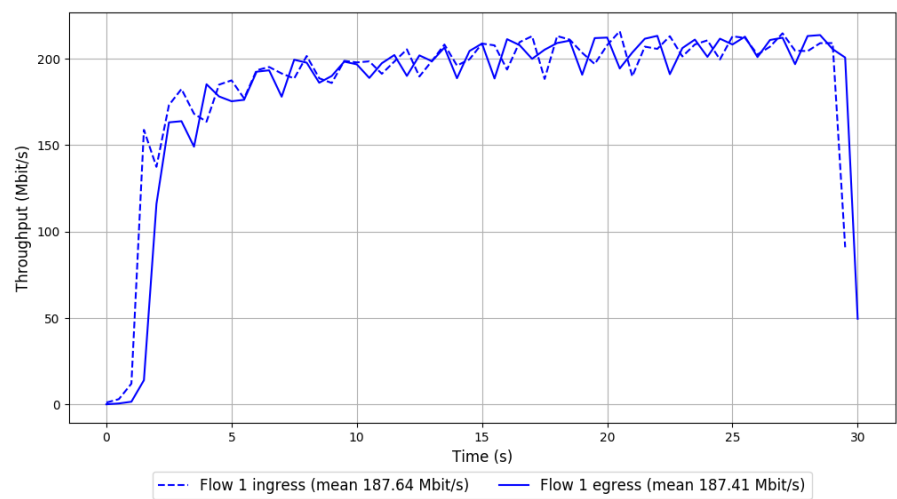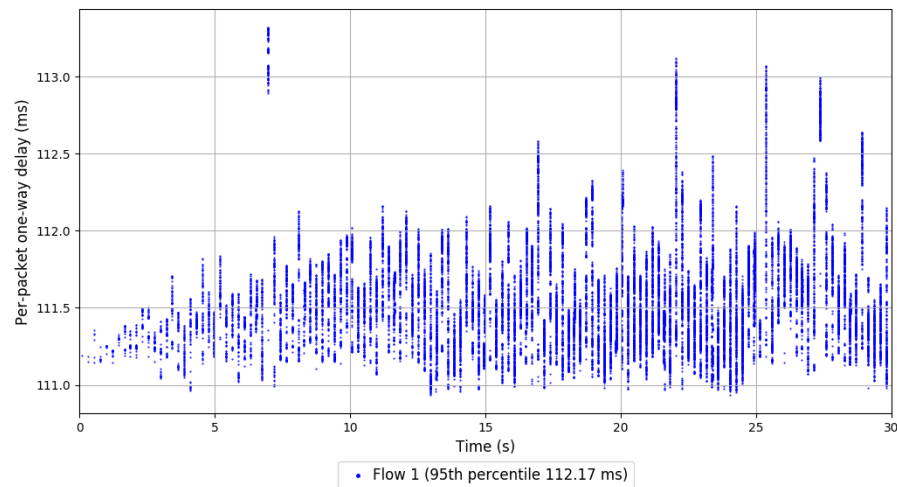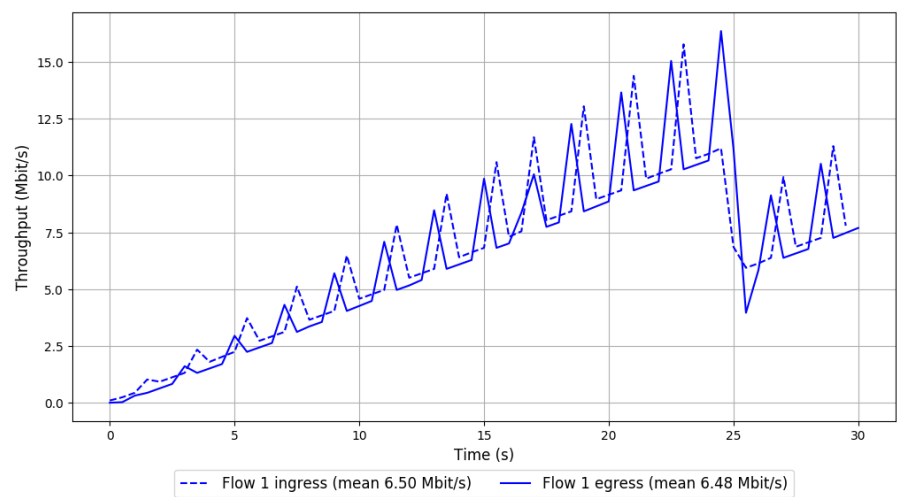
Run 5: Report of Indigo — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2018-09-07 08:50:45
End at: 2018-09-07 08:51:15
Local clock offset: 26.193 ms
Remote clock offset: 29.557 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.48 Mbit/s
95th percentile per-packet one-way delay: 112.172 ms
Loss rate: 1.01%
-- Flow 1:
Average throughput: 6.48 Mbit/s
95th percentile per-packet one-way delay: 112.172 ms
Loss rate: 1.01%
```

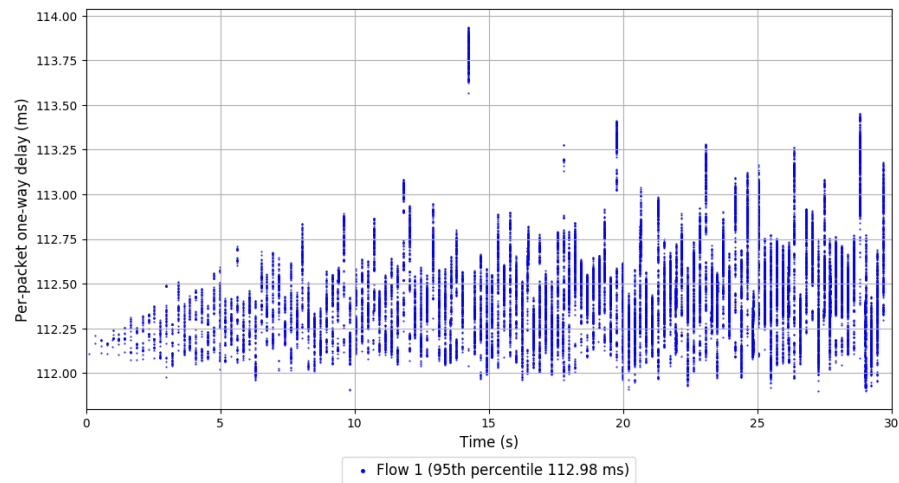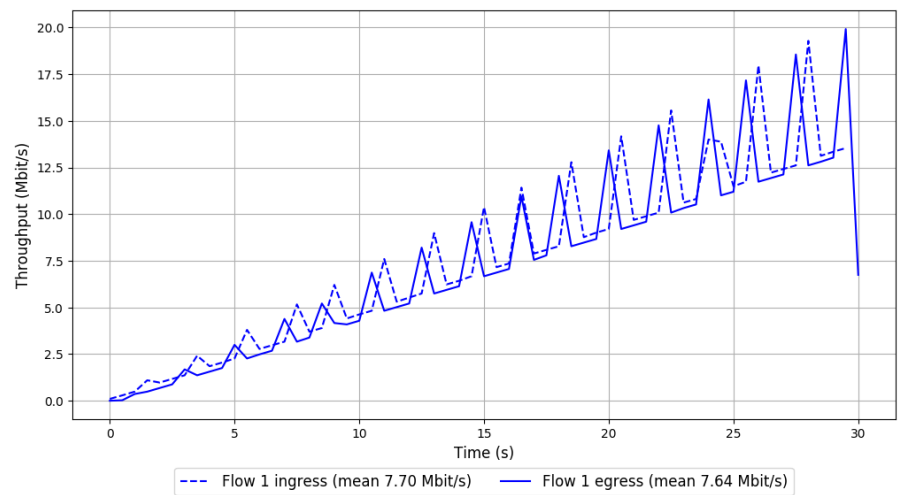# Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-09-07 09:17:20
End at: 2018-09-07 09:17:50
Local clock offset: 13.691 ms
Remote clock offset: 14.625 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.64 Mbit/s
95th percentile per-packet one-way delay: 112.981 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 7.64 Mbit/s
95th percentile per-packet one-way delay: 112.981 ms
Loss rate: 1.48%
```

Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2018-09-07 09:44:12
End at: 2018-09-07 09:44:42
Local clock offset: 8.185 ms
Remote clock offset: 8.28 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.64 Mbit/s
95th percentile per-packet one-way delay: 113.439 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 7.64 Mbit/s
95th percentile per-packet one-way delay: 113.439 ms
Loss rate: 1.48%
```
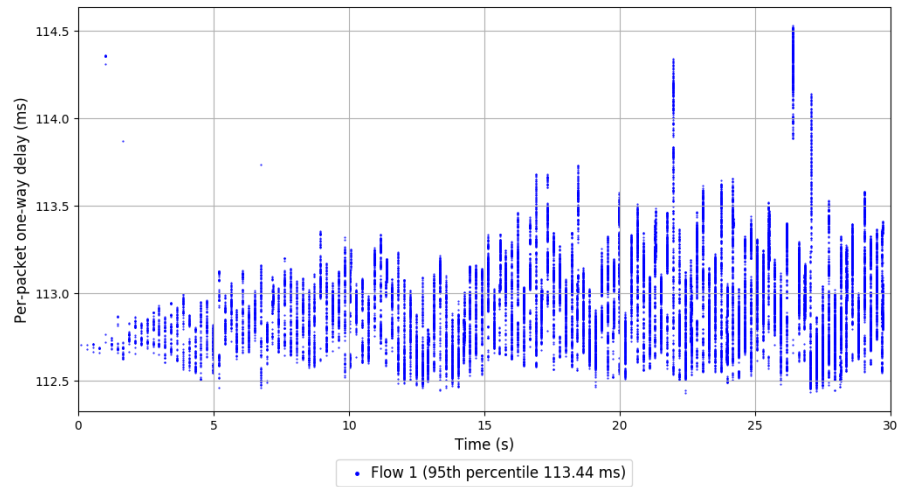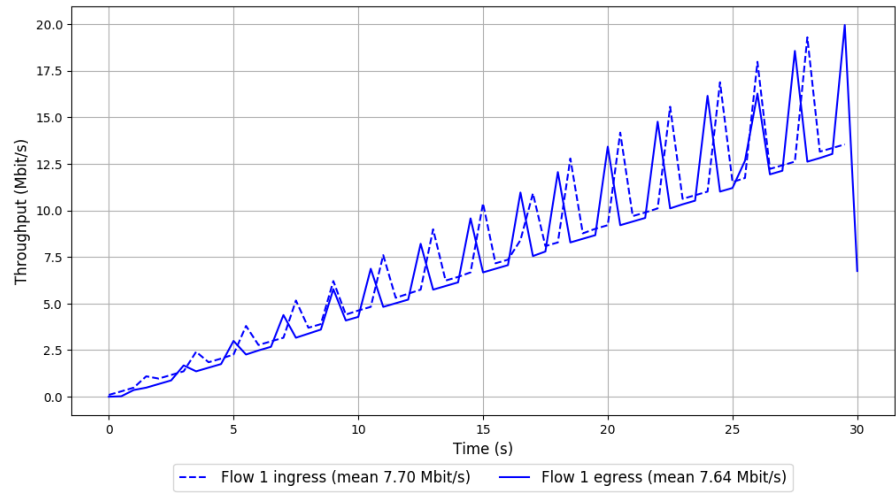
Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 7.70 Mbit/s)   Flow 1 egress (mean 7.64 Mbit/s)

• Flow 1 (95th percentile 113.44 ms)

```
Run 4: Statistics of LEDBAT

Start at: 2018-09-07 10:10:50
End at: 2018-09-07 10:11:20
Local clock offset: 8.06 ms
Remote clock offset: 7.154 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.94 Mbit/s
95th percentile per-packet one-way delay: 111.126 ms
Loss rate: 1.45%
-- Flow 1:
Average throughput: 7.94 Mbit/s
95th percentile per-packet one-way delay: 111.126 ms
Loss rate: 1.45%
```
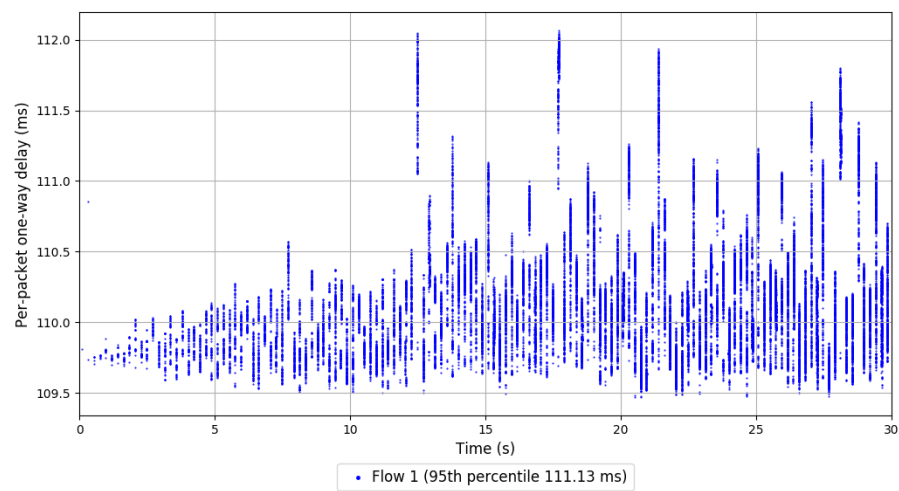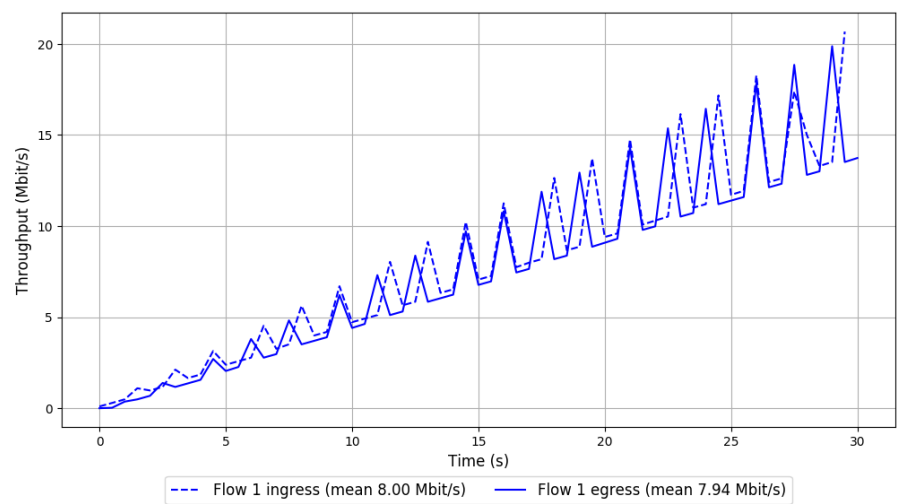
Run 4: Report of LEDBAT — Data Link

```
Run 5: Statistics of LEDBAT

Start at: 2018-09-07 10:37:42
End at: 2018-09-07 10:38:12
Local clock offset: 2.676 ms
Remote clock offset: 2.161 ms

# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.76 Mbit/s
95th percentile per-packet one-way delay: 110.722 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 7.76 Mbit/s
95th percentile per-packet one-way delay: 110.722 ms
Loss rate: 1.47%
```
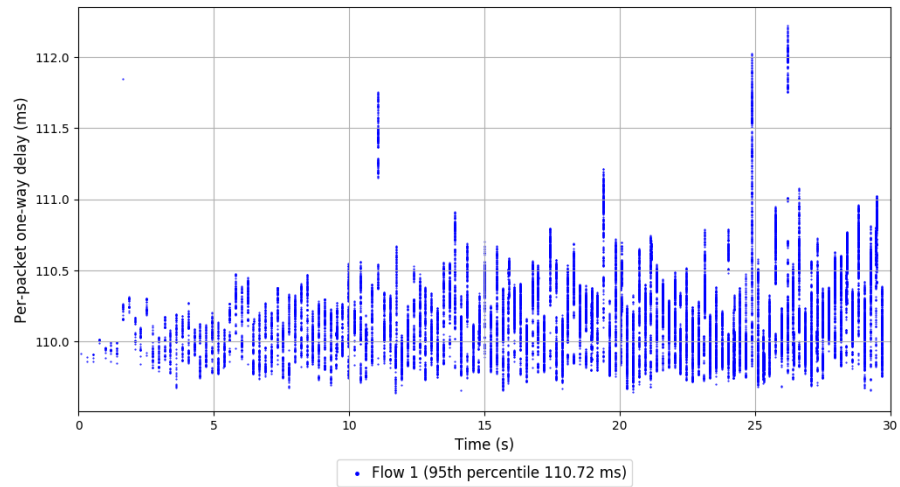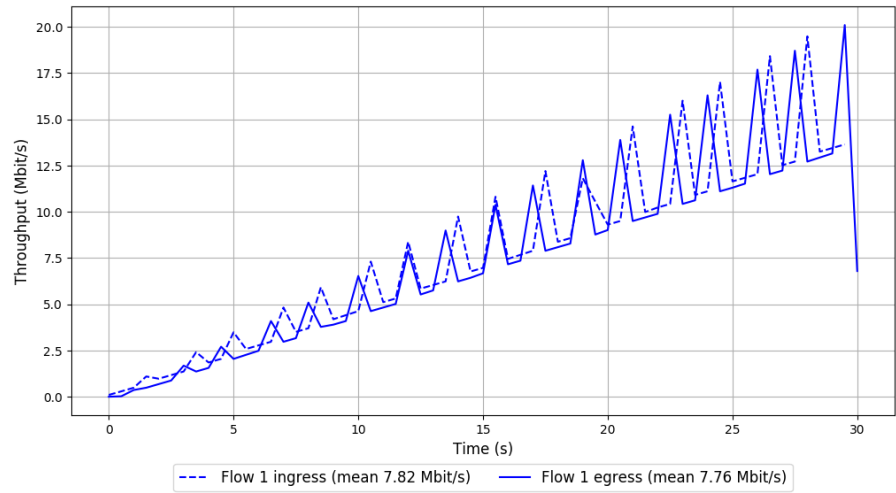
Run 5: Report of LEDBAT — Data Link

Flow 1 ingress (mean 7.82 Mbit/s)   Flow 1 egress (mean 7.76 Mbit/s)

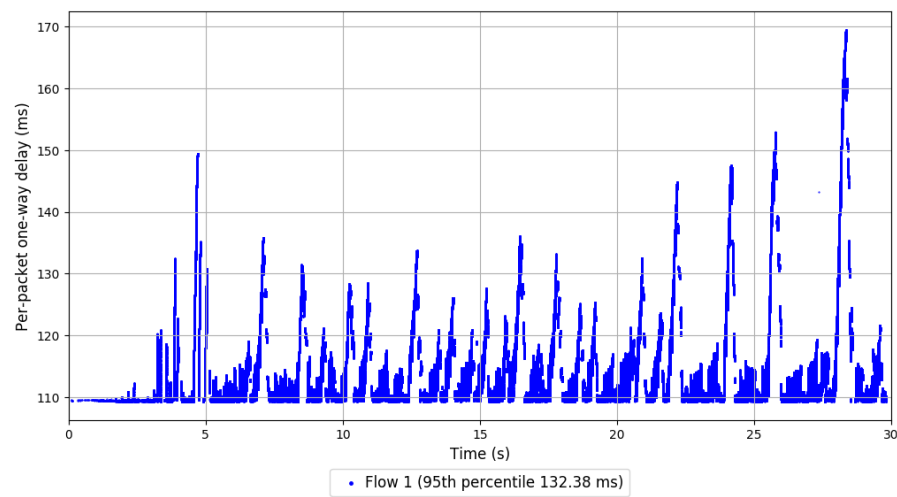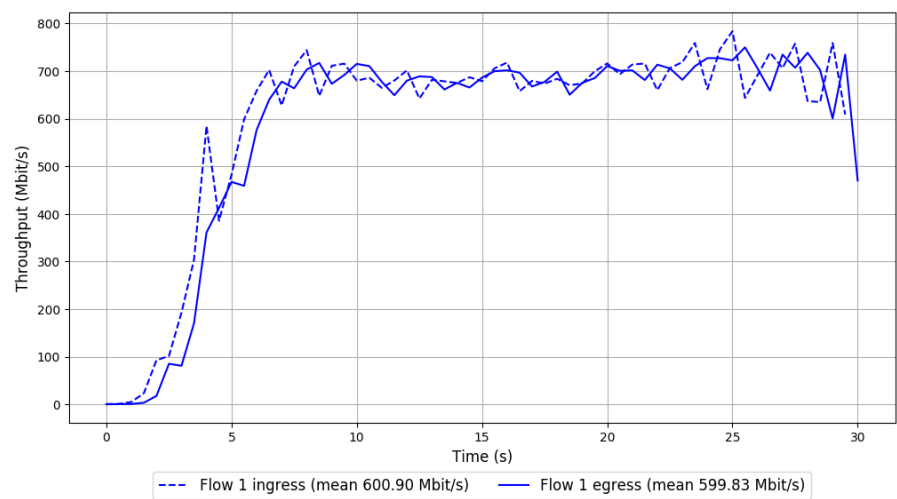• Flow 1 (95th percentile 110.72 ms)

```
Run 1: Statistics of Indigo-Muses

Start at: 2018-09-07 09:07:58
End at: 2018-09-07 09:08:28
Local clock offset: 20.244 ms
Remote clock offset: 19.226 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 599.83 Mbit/s
95th percentile per-packet one-way delay: 132.375 ms
Loss rate: 0.90%
-- Flow 1:
Average throughput: 599.83 Mbit/s
95th percentile per-packet one-way delay: 132.375 ms
Loss rate: 0.90%
```
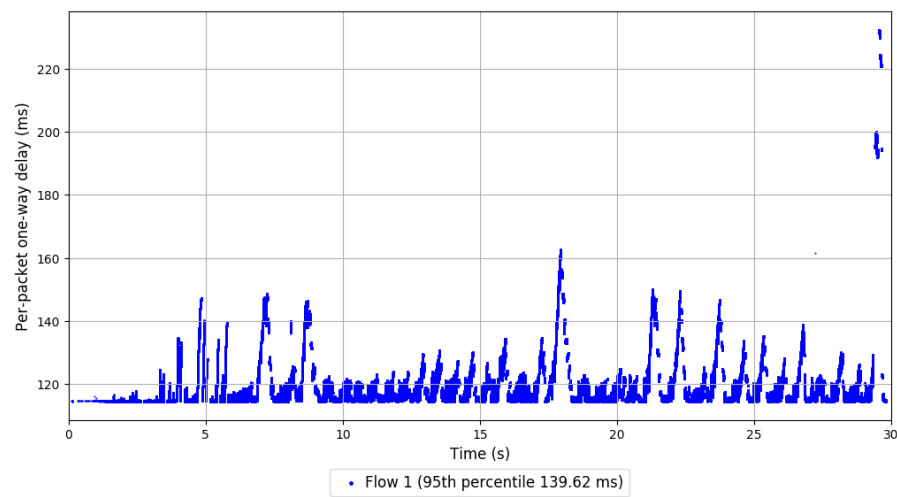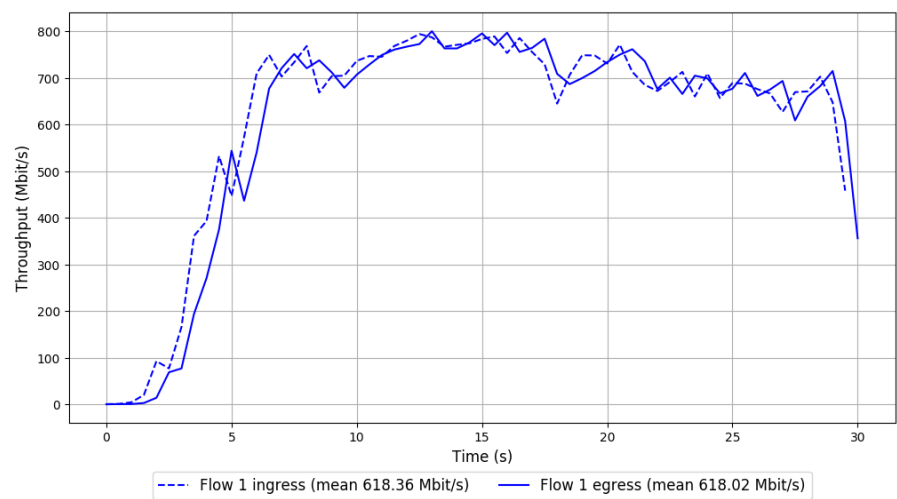
Run 1: Report of Indigo-Muses — Data Link

```
Run 2: Statistics of Indigo-Muses

Start at: 2018-09-07 09:34:29
End at: 2018-09-07 09:34:59
Local clock offset: 19.484 ms
Remote clock offset: 19.196 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 618.02 Mbit/s
95th percentile per-packet one-way delay: 139.624 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 618.02 Mbit/s
95th percentile per-packet one-way delay: 139.624 ms
Loss rate: 0.79%
```

Run 2: Report of Indigo-Muses — Data Link

```
Run 3: Statistics of Indigo-Muses

Start at: 2018-09-07 10:01:07
End at: 2018-09-07 10:01:37
Local clock offset: 7.54 ms
Remote clock offset: 7.662 ms


# Below is generated by plot.py at 2018-09-07 11:57:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 588.25 Mbit/s
95th percentile per-packet one-way delay: 136.774 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 588.25 Mbit/s
95th percentile per-packet one-way delay: 136.774 ms
Loss rate: 0.96%
```
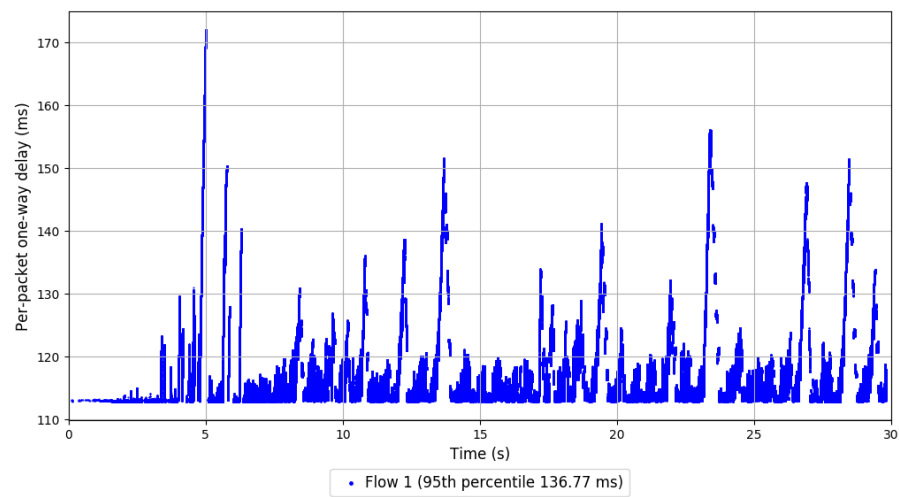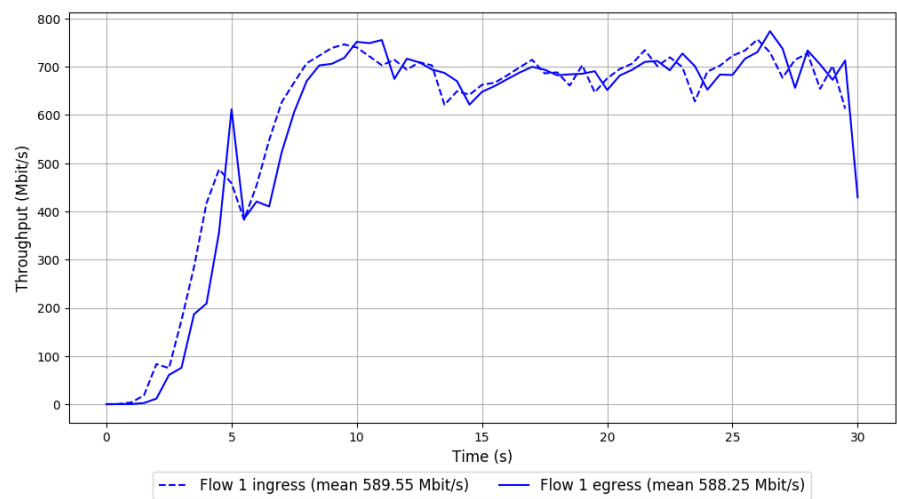
Run 3: Report of Indigo-Muses — Data Link

Flow 1 ingress (mean 589.55 Mbit/s)   Flow 1 egress (mean 588.25 Mbit/s)

• Flow 1 (95th percentile 136.77 ms)

```
Run 4: Statistics of Indigo-Muses

Start at: 2018-09-07 10:28:01
End at: 2018-09-07 10:28:31
Local clock offset: 3.218 ms
Remote clock offset: 2.181 ms


# Below is generated by plot.py at 2018-09-07 11:58:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 596.99 Mbit/s
95th percentile per-packet one-way delay: 137.042 ms
Loss rate: 0.95%
-- Flow 1:
Average throughput: 596.99 Mbit/s
95th percentile per-packet one-way delay: 137.042 ms
Loss rate: 0.95%
```
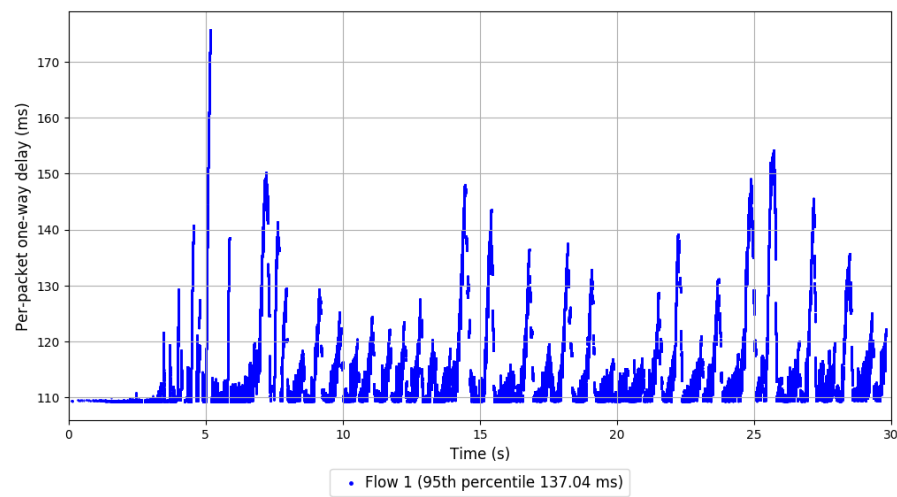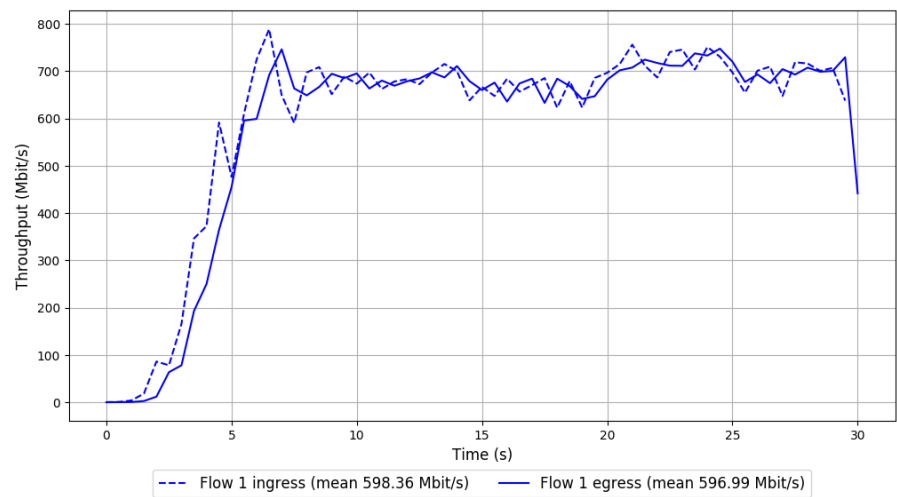
Run 4: Report of Indigo-Muses — Data Link

```
Run 5: Statistics of Indigo-Muses

Start at: 2018-09-07 10:54:51
End at: 2018-09-07 10:55:21
Local clock offset: 0.801 ms
Remote clock offset: 1.227 ms


# Below is generated by plot.py at 2018-09-07 11:58:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 584.05 Mbit/s
95th percentile per-packet one-way delay: 140.327 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 584.05 Mbit/s
95th percentile per-packet one-way delay: 140.327 ms
Loss rate: 0.94%
```
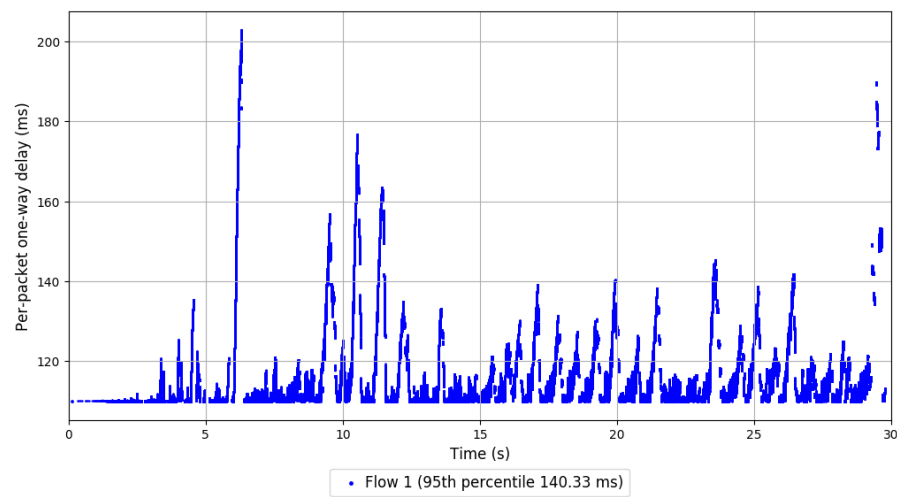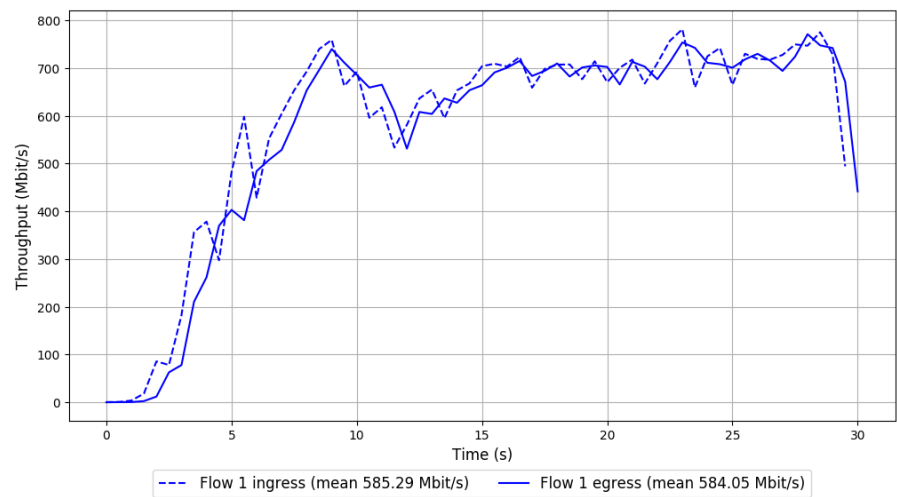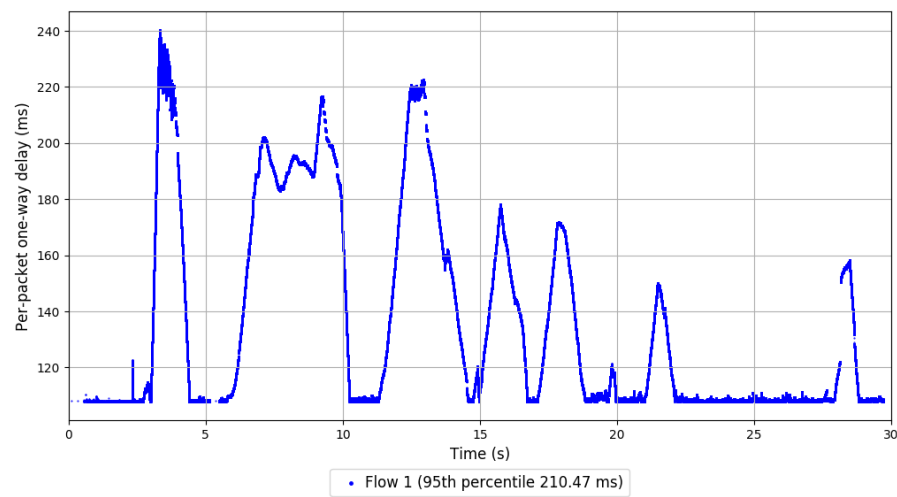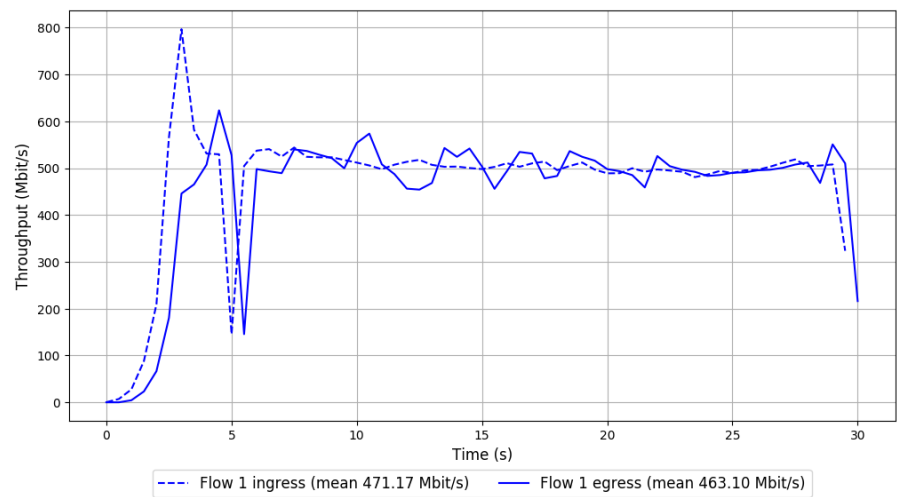
Run 5: Report of Indigo-Muses — Data Link

```
Run 1: Statistics of PCC-Allegro

Start at: 2018-09-07 08:44:31
End at: 2018-09-07 08:45:01
Local clock offset: 23.048 ms
Remote clock offset: 23.518 ms


# Below is generated by plot.py at 2018-09-07 12:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 463.10 Mbit/s
95th percentile per-packet one-way delay: 210.473 ms
Loss rate: 2.43%
-- Flow 1:
Average throughput: 463.10 Mbit/s
95th percentile per-packet one-way delay: 210.473 ms
Loss rate: 2.43%
```
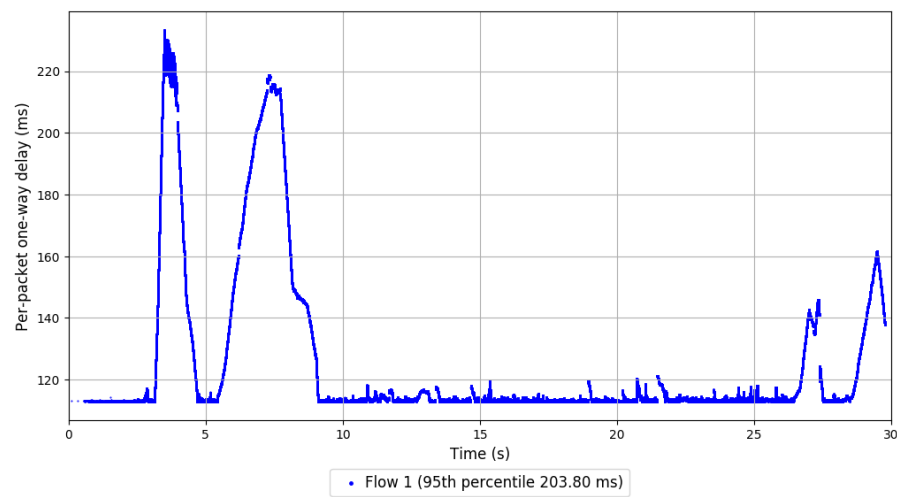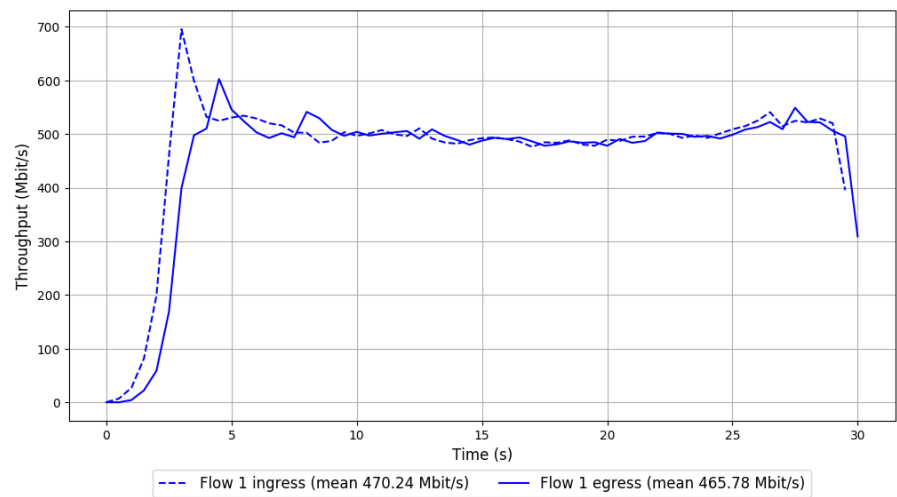
Run 1: Report of PCC-Allegro — Data Link

```
Run 2: Statistics of PCC-Allegro

Start at: 2018-09-07 09:11:25
End at: 2018-09-07 09:11:55
Local clock offset: 15.598 ms
Remote clock offset: 16.133 ms


# Below is generated by plot.py at 2018-09-07 12:09:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 465.78 Mbit/s
95th percentile per-packet one-way delay: 203.803 ms
Loss rate: 1.68%
-- Flow 1:
Average throughput: 465.78 Mbit/s
95th percentile per-packet one-way delay: 203.803 ms
Loss rate: 1.68%
```

Run 2: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 470.24 Mbit/s) — Flow 1 egress (mean 465.78 Mbit/s)

· Flow 1 (95th percentile 203.80 ms)

```
Run 3: Statistics of PCC-Allegro

Start at: 2018-09-07 09:37:55
End at: 2018-09-07 09:38:25
Local clock offset: 12.64 ms
Remote clock offset: 13.634 ms

# Below is generated by plot.py at 2018-09-07 12:10:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 426.53 Mbit/s
95th percentile per-packet one-way delay: 230.174 ms
Loss rate: 5.94%
-- Flow 1:
Average throughput: 426.53 Mbit/s
95th percentile per-packet one-way delay: 230.174 ms
Loss rate: 5.94%
```
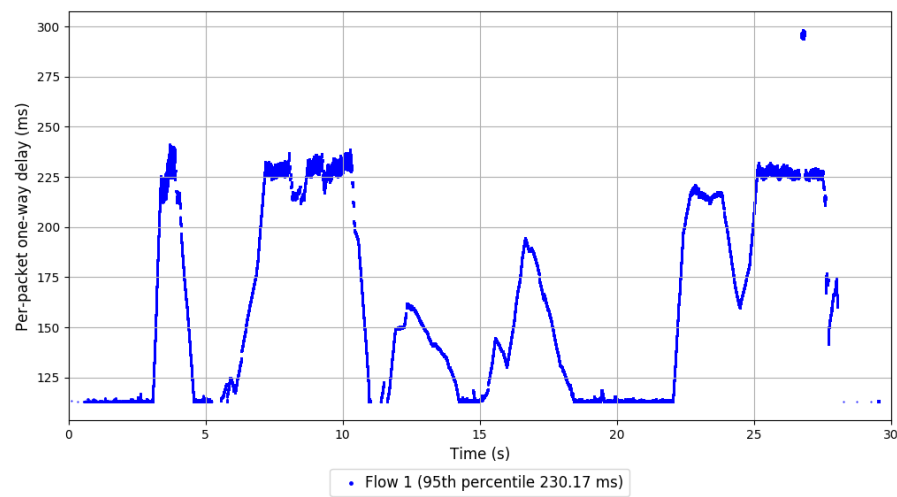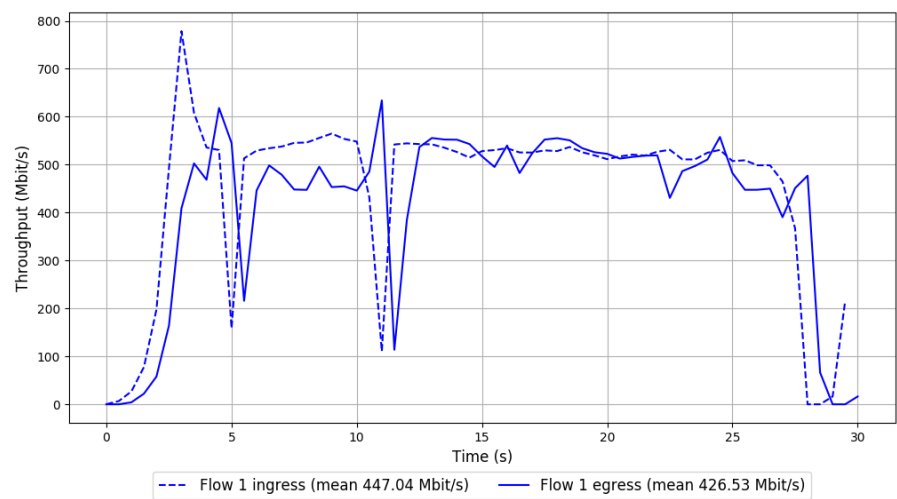
Run 3: Report of PCC-Allegro — Data Link

```
Run 4: Statistics of PCC-Allegro

Start at: 2018-09-07 10:04:29
End at: 2018-09-07 10:04:59
Local clock offset: 8.343 ms
Remote clock offset: 8.612 ms


# Below is generated by plot.py at 2018-09-07 12:12:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 465.80 Mbit/s
95th percentile per-packet one-way delay: 214.271 ms
Loss rate: 3.25%
-- Flow 1:
Average throughput: 465.80 Mbit/s
95th percentile per-packet one-way delay: 214.271 ms
Loss rate: 3.25%
```
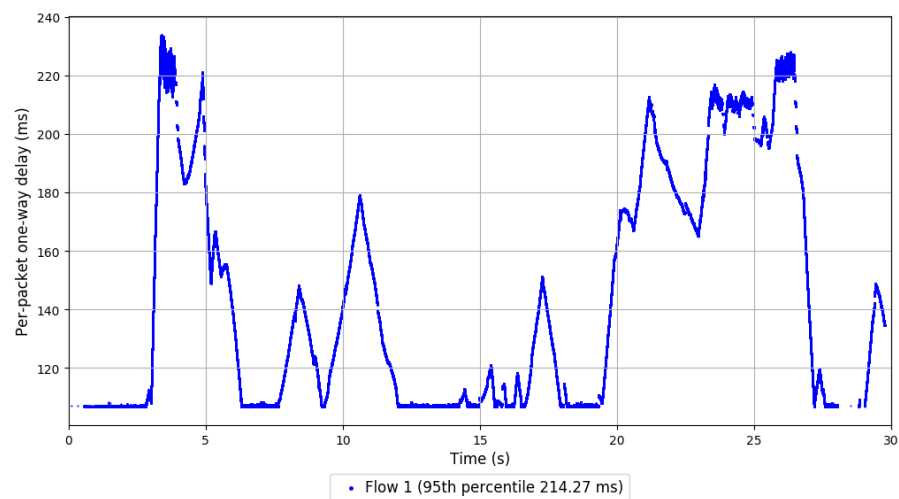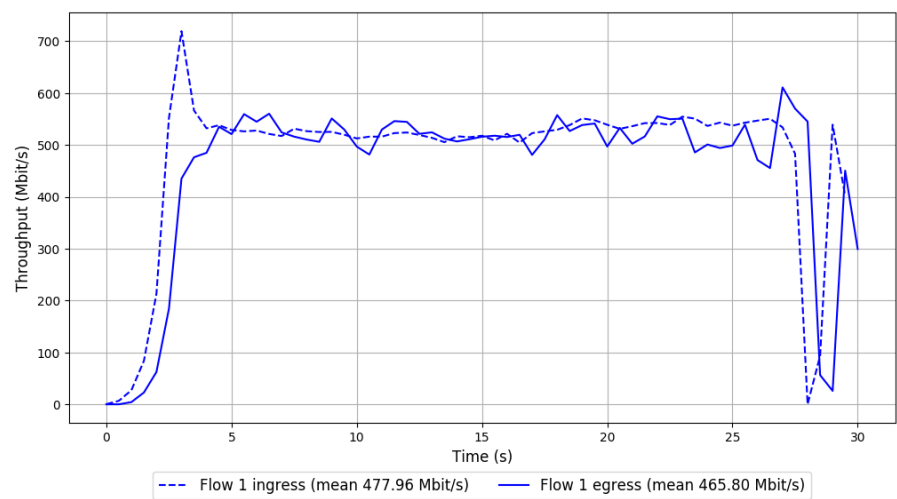
Run 4: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 477.96 Mbit/s) — — — Flow 1 egress (mean 465.80 Mbit/s)

• Flow 1 (95th percentile 214.27 ms)

```
Run 5: Statistics of PCC-Allegro

Start at: 2018-09-07 10:31:27
End at: 2018-09-07 10:31:57
Local clock offset: 2.553 ms
Remote clock offset: 2.441 ms


# Below is generated by plot.py at 2018-09-07 12:12:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 450.92 Mbit/s
95th percentile per-packet one-way delay: 213.824 ms
Loss rate: 3.03%
-- Flow 1:
Average throughput: 450.92 Mbit/s
95th percentile per-packet one-way delay: 213.824 ms
Loss rate: 3.03%
```
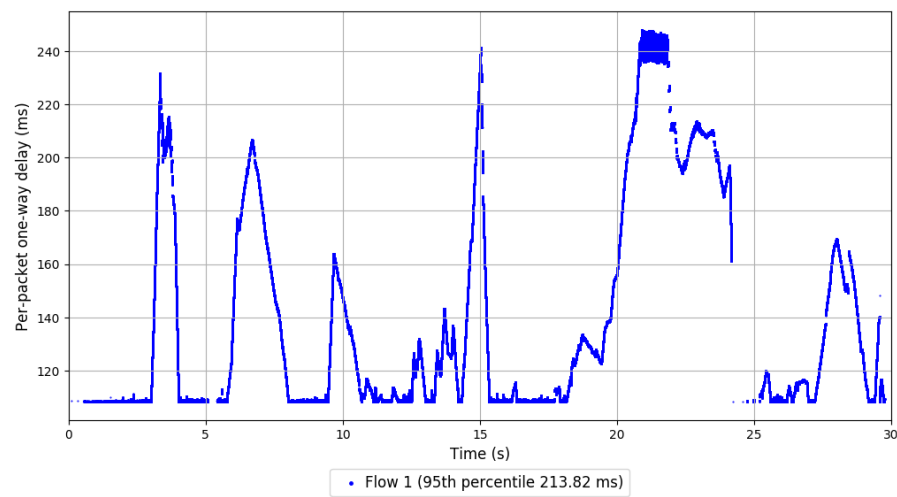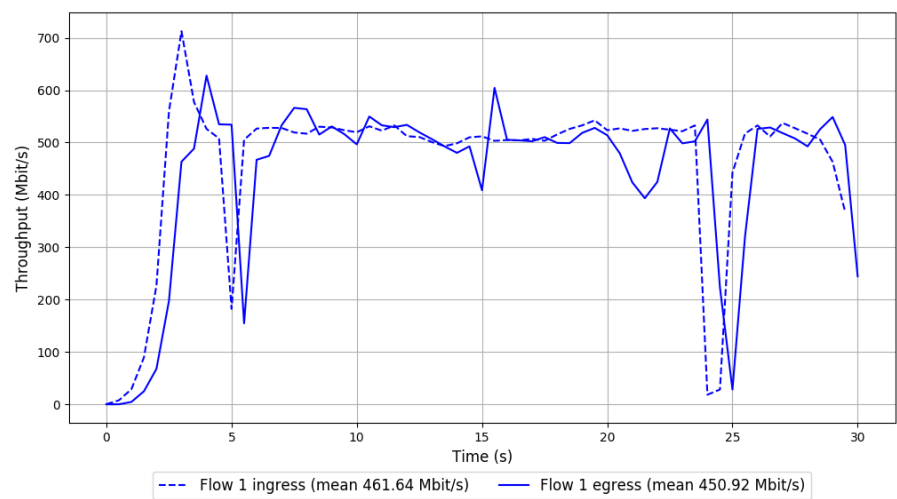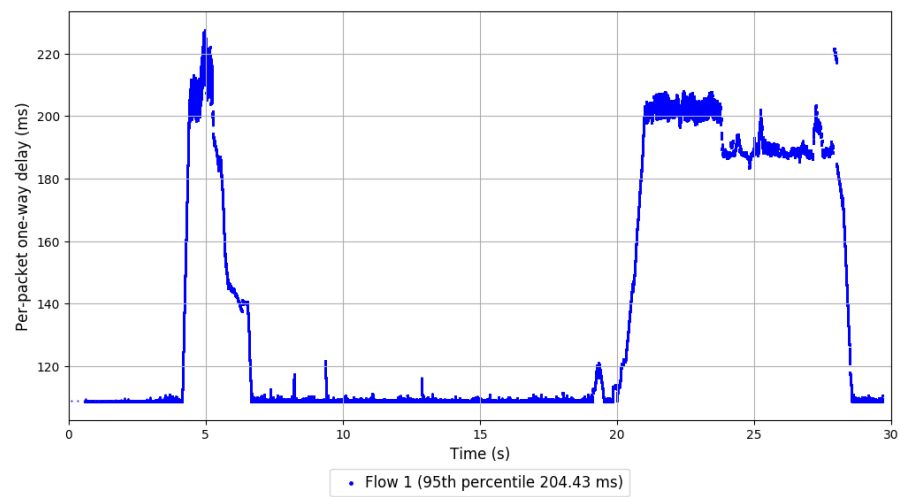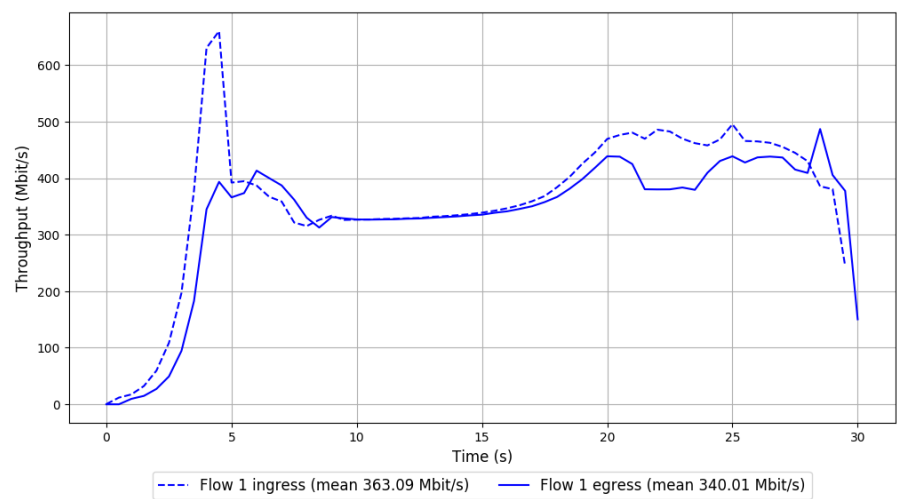
Run 5: Report of PCC-Allegro — Data Link

```
Run 1: Statistics of PCC-Expr

Start at: 2018-09-07 08:53:03
End at: 2018-09-07 08:53:33
Local clock offset: 29.154 ms
Remote clock offset: 31.386 ms


# Below is generated by plot.py at 2018-09-07 12:12:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 340.01 Mbit/s
95th percentile per-packet one-way delay: 204.433 ms
Loss rate: 7.04%
-- Flow 1:
Average throughput: 340.01 Mbit/s
95th percentile per-packet one-way delay: 204.433 ms
Loss rate: 7.04%
```

Run 1: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 363.09 Mbit/s)   Flow 1 egress (mean 340.01 Mbit/s)
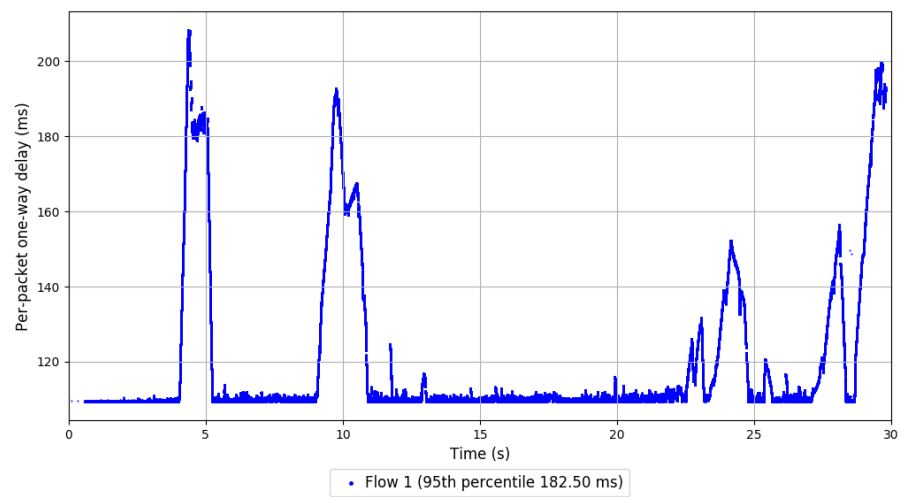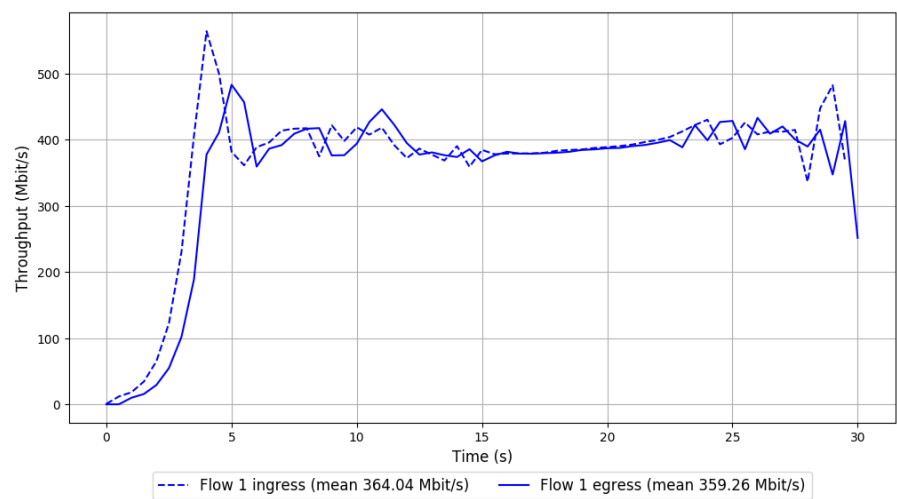

Flow 1 (95th percentile 204.43 ms)

```
Run 2: Statistics of PCC-Expr

Start at: 2018-09-07 09:19:38
End at: 2018-09-07 09:20:08
Local clock offset: 15.265 ms
Remote clock offset: 14.675 ms


# Below is generated by plot.py at 2018-09-07 12:12:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 359.26 Mbit/s
95th percentile per-packet one-way delay: 182.498 ms
Loss rate: 2.03%
-- Flow 1:
Average throughput: 359.26 Mbit/s
95th percentile per-packet one-way delay: 182.498 ms
Loss rate: 2.03%
```

Run 2: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 364.04 Mbit/s) ----   Flow 1 egress (mean 359.26 Mbit/s)

• Flow 1 (95th percentile 182.50 ms)

```
Run 3: Statistics of PCC-Expr

Start at: 2018-09-07 09:46:31
End at: 2018-09-07 09:47:01
Local clock offset: 7.091 ms
Remote clock offset: 8.209 ms

# Below is generated by plot.py at 2018-09-07 12:12:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 322.47 Mbit/s
95th percentile per-packet one-way delay: 197.262 ms
Loss rate: 3.54%
-- Flow 1:
Average throughput: 322.47 Mbit/s
95th percentile per-packet one-way delay: 197.262 ms
Loss rate: 3.54%
```
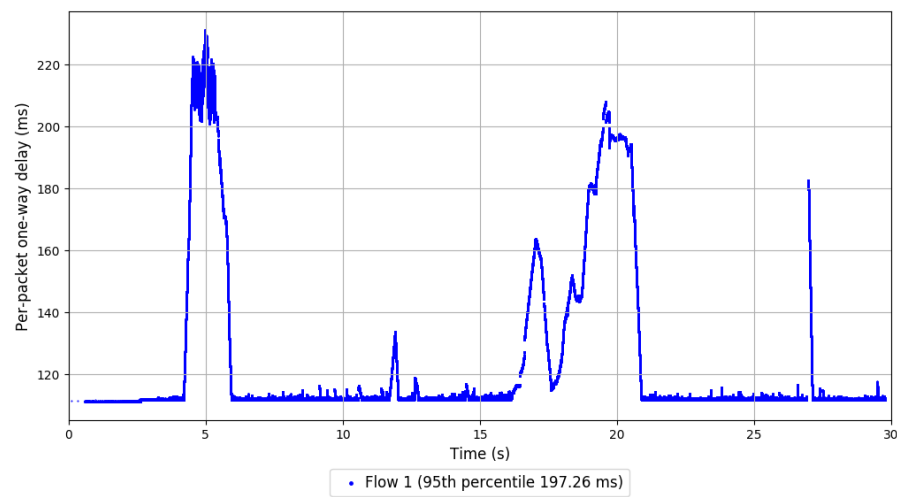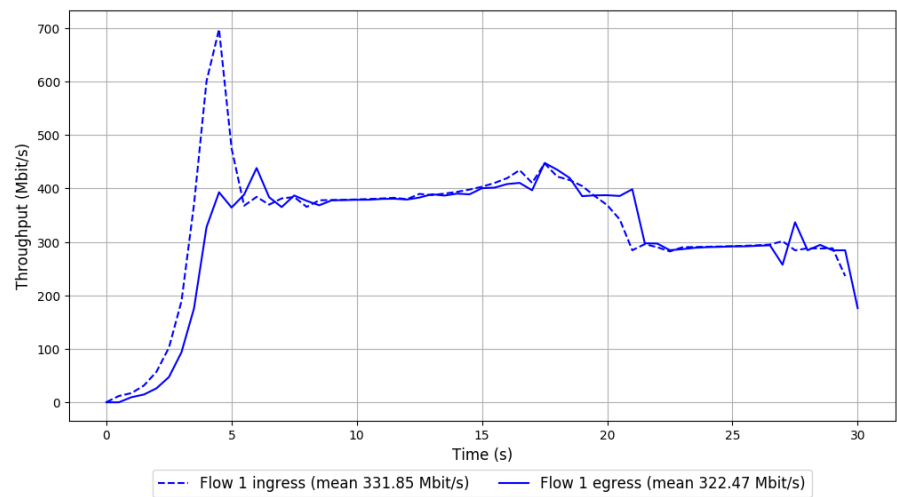
Run 3: Report of PCC-Expr — Data Link

```
Run 4: Statistics of PCC-Expr

Start at: 2018-09-07 10:13:08
End at: 2018-09-07 10:13:38
Local clock offset: 5.253 ms
Remote clock offset: 5.596 ms

# Below is generated by plot.py at 2018-09-07 12:16:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 351.95 Mbit/s
95th percentile per-packet one-way delay: 197.214 ms
Loss rate: 2.77%
-- Flow 1:
Average throughput: 351.95 Mbit/s
95th percentile per-packet one-way delay: 197.214 ms
Loss rate: 2.77%
```
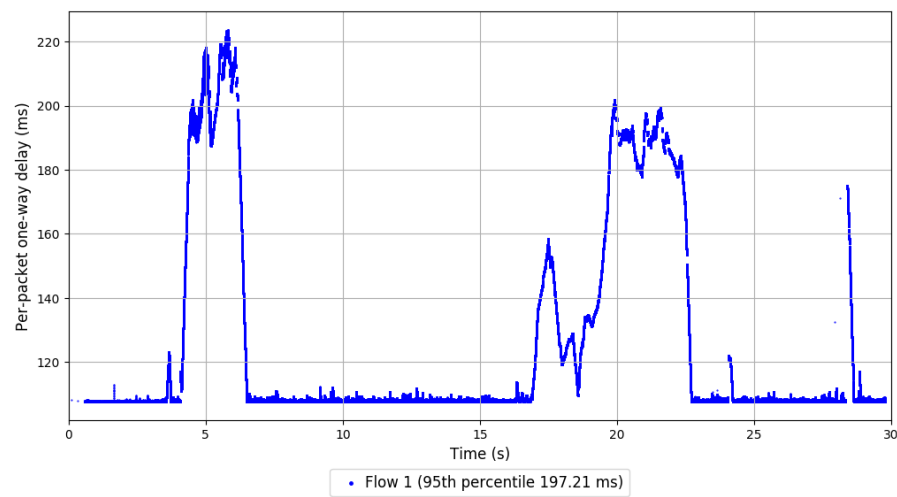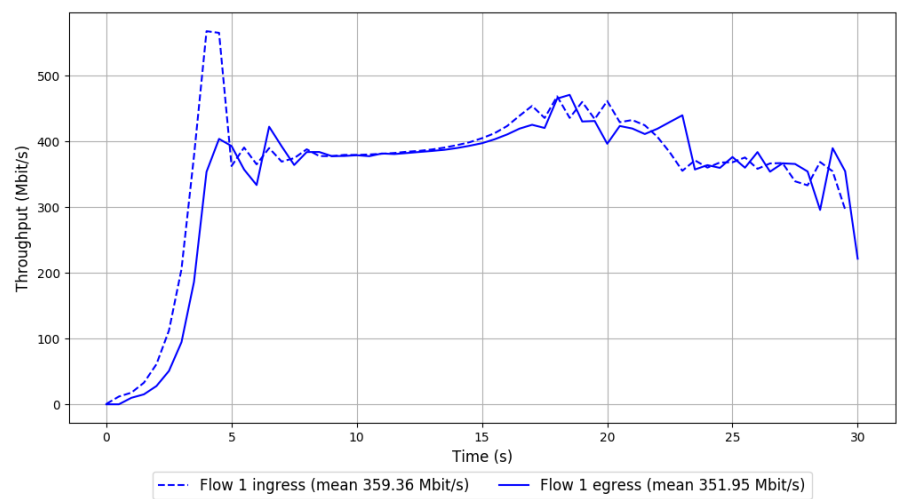
Run 4: Report of PCC-Expr — Data Link

```
Run 5: Statistics of PCC-Expr

Start at: 2018-09-07 10:40:00
End at: 2018-09-07 10:40:30
Local clock offset: 1.954 ms
Remote clock offset: 2.237 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 311.50 Mbit/s
95th percentile per-packet one-way delay: 220.773 ms
Loss rate: 4.20%
-- Flow 1:
Average throughput: 311.50 Mbit/s
95th percentile per-packet one-way delay: 220.773 ms
Loss rate: 4.20%
```
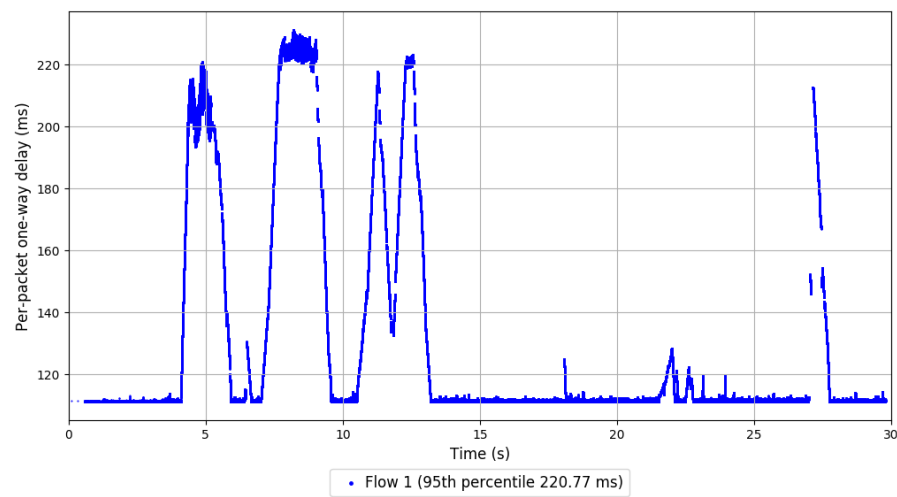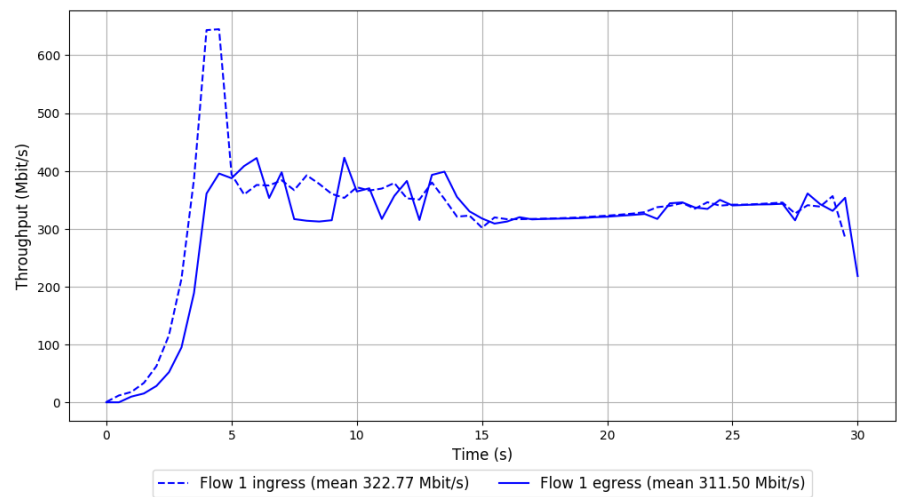
Run 5: Report of PCC-Expr — Data Link

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-09-07 09:01:37
End at: 2018-09-07 09:02:07
Local clock offset: 32.741 ms
Remote clock offset: 32.673 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 63.11 Mbit/s
95th percentile per-packet one-way delay: 115.466 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 63.11 Mbit/s
95th percentile per-packet one-way delay: 115.466 ms
Loss rate: 1.13%
```
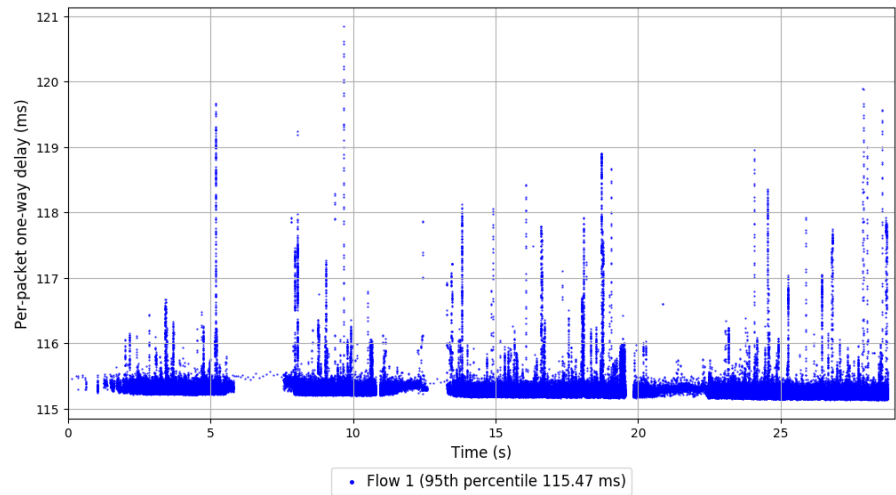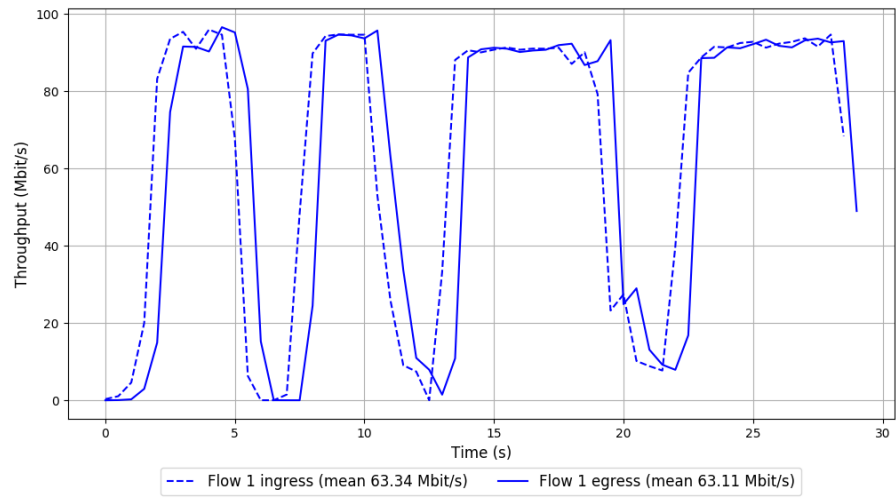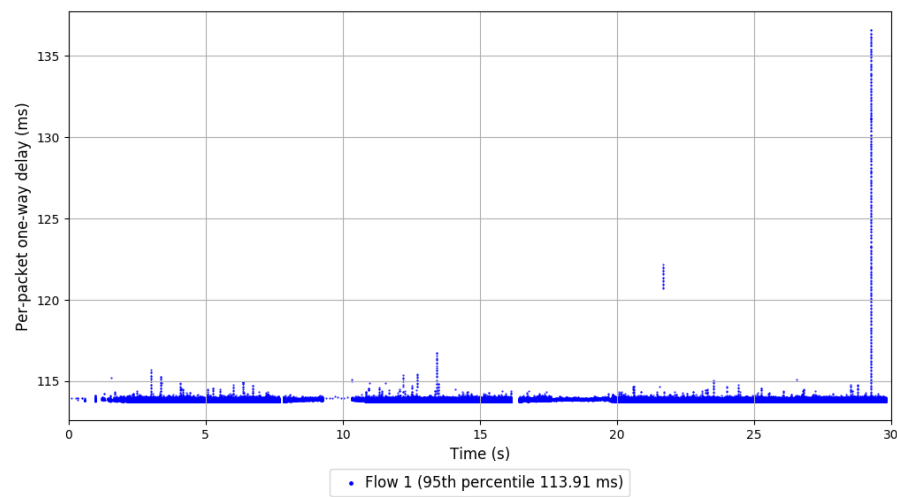
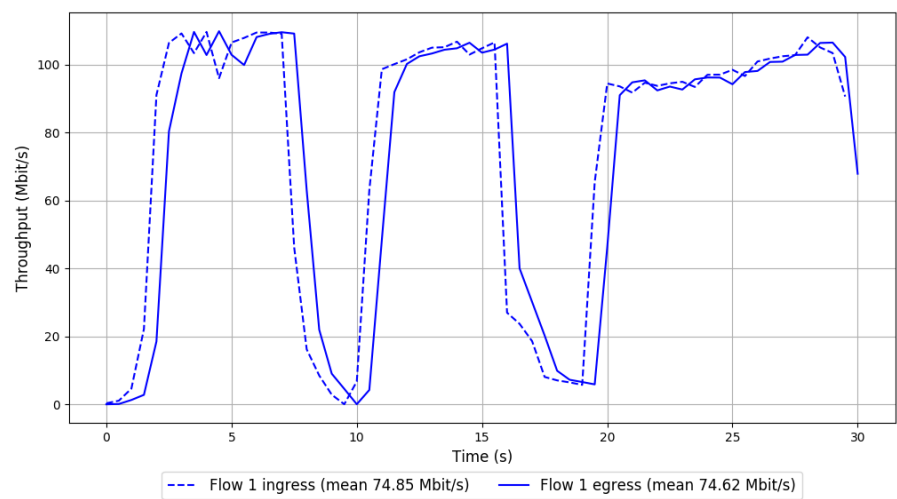Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-09-07 09:28:11
End at: 2018-09-07 09:28:41
Local clock offset: 16.08 ms
Remote clock offset: 16.987 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 74.62 Mbit/s
95th percentile per-packet one-way delay: 113.911 ms
Loss rate: 1.06%
-- Flow 1:
Average throughput: 74.62 Mbit/s
95th percentile per-packet one-way delay: 113.911 ms
Loss rate: 1.06%
```

Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-09-07 09:54:45
End at: 2018-09-07 09:55:15
Local clock offset: 7.699 ms
Remote clock offset: 7.223 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.86 Mbit/s
95th percentile per-packet one-way delay: 109.080 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 72.86 Mbit/s
95th percentile per-packet one-way delay: 109.080 ms
Loss rate: 1.05%
```
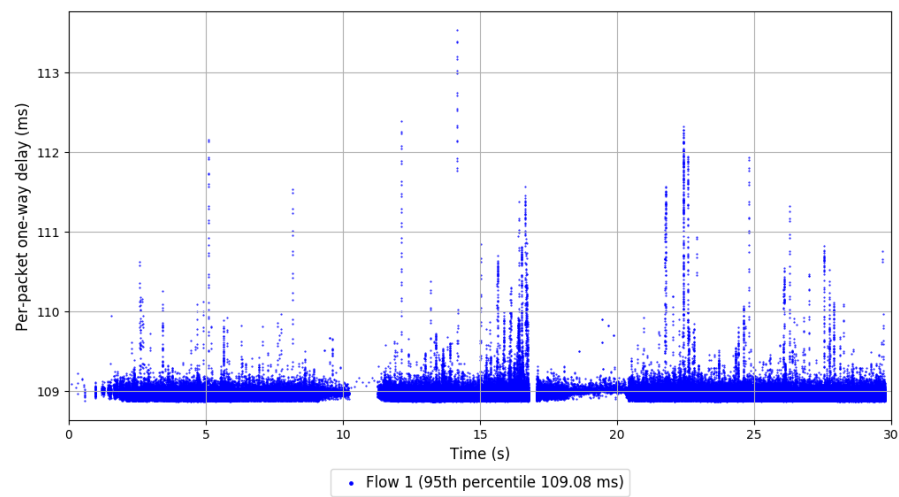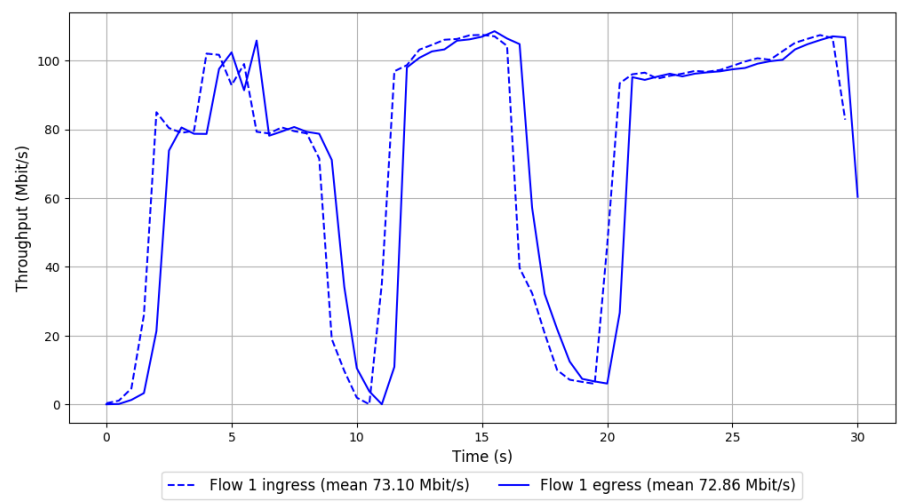
Run 3: Report of QUIC Cubic — Data Link

```
Run 4: Statistics of QUIC Cubic

Start at: 2018-09-07 10:21:45
End at: 2018-09-07 10:22:15
Local clock offset: 1.084 ms
Remote clock offset: 2.803 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 73.76 Mbit/s
95th percentile per-packet one-way delay: 109.983 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 73.76 Mbit/s
95th percentile per-packet one-way delay: 109.983 ms
Loss rate: 1.07%
```
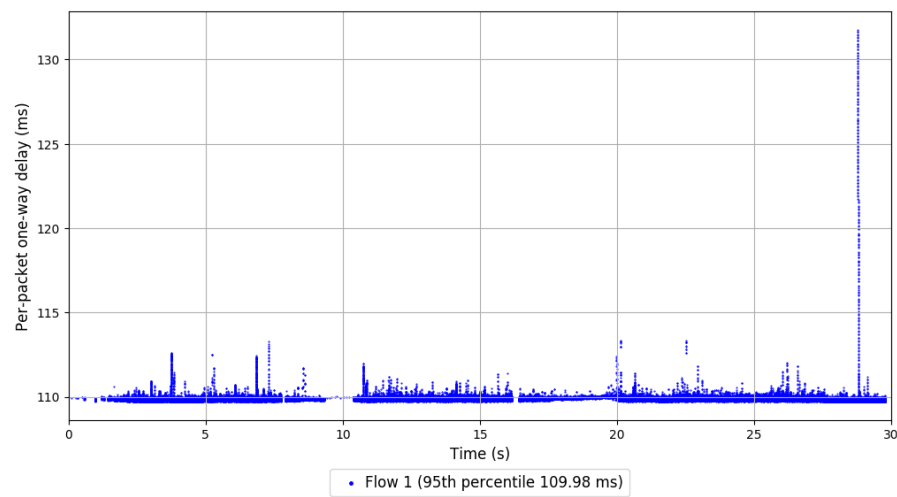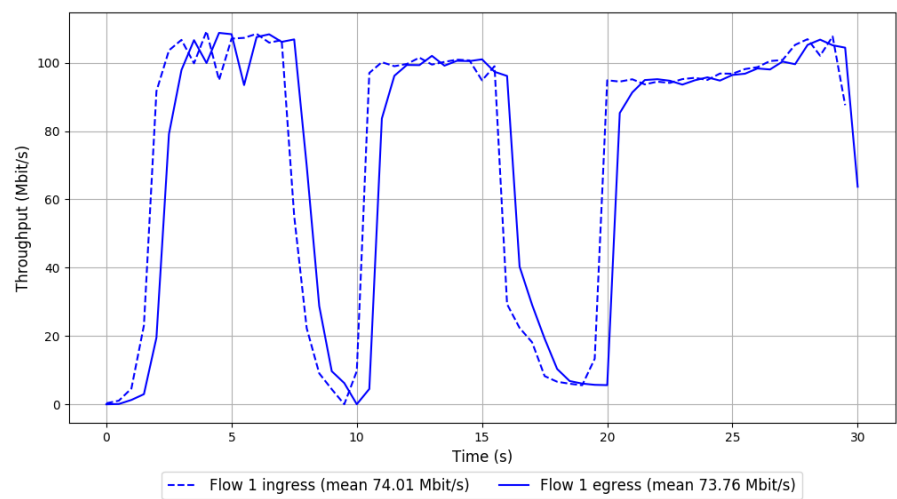
Run 4: Report of QUIC Cubic — Data Link

```
Run 5: Statistics of QUIC Cubic

Start at: 2018-09-07 10:48:33
End at: 2018-09-07 10:49:03
Local clock offset: 1.443 ms
Remote clock offset: 1.338 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 73.16 Mbit/s
95th percentile per-packet one-way delay: 111.373 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 73.16 Mbit/s
95th percentile per-packet one-way delay: 111.373 ms
Loss rate: 0.98%
```
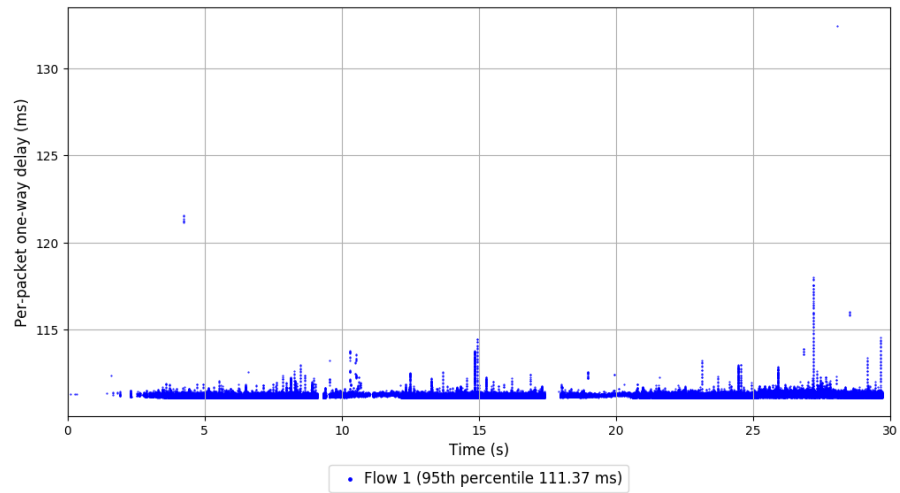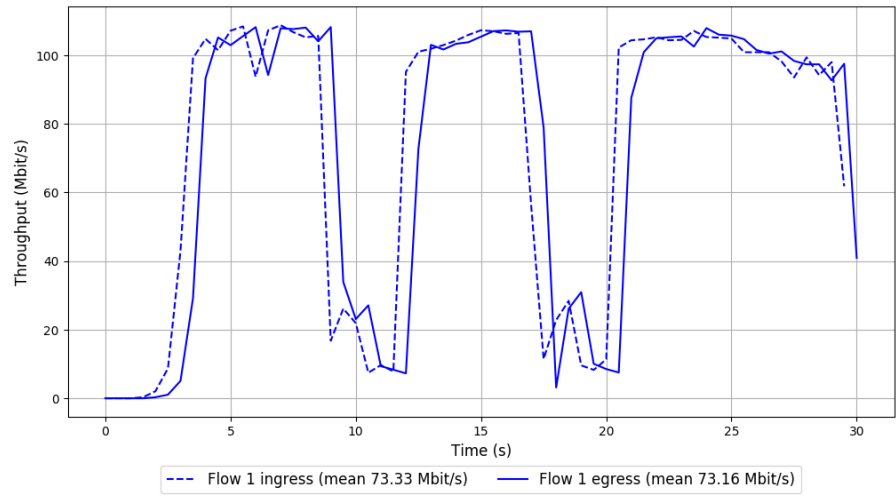
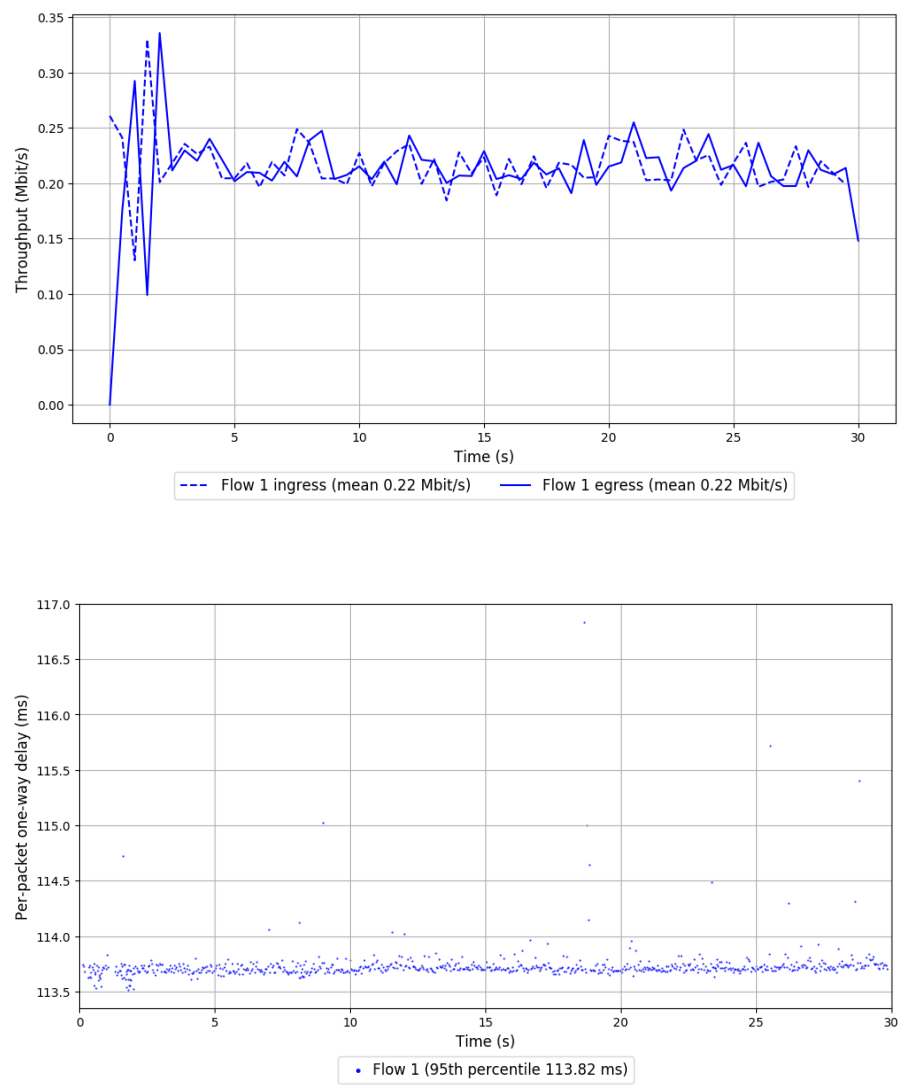Run 5: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2018-09-07 08:51:54
End at: 2018-09-07 08:52:24
Local clock offset: 29.772 ms
Remote clock offset: 30.677 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 113.821 ms
Loss rate: 0.77%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 113.821 ms
Loss rate: 0.77%
```
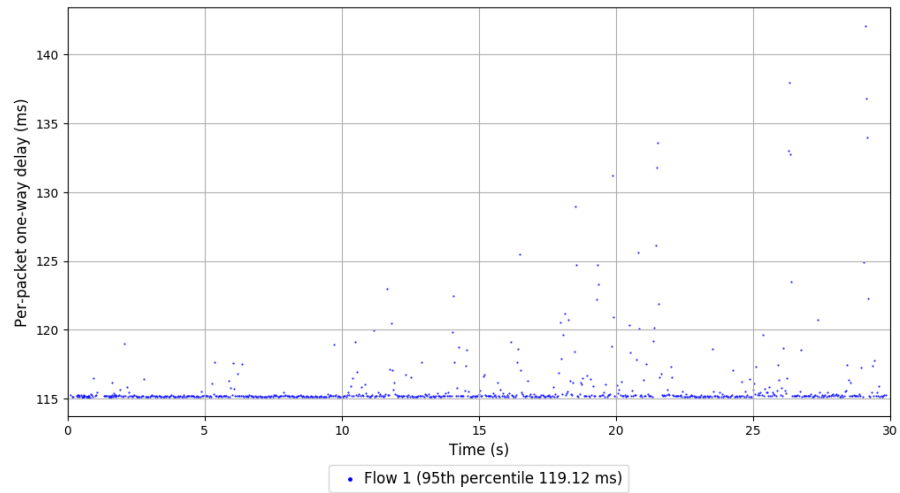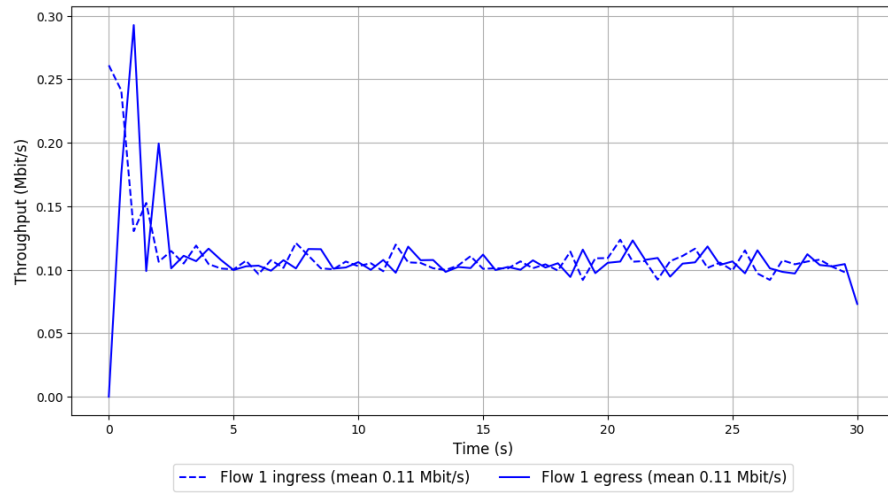
Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2018-09-07 09:18:30
End at: 2018-09-07 09:19:00
Local clock offset: 15.028 ms
Remote clock offset: 14.602 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 119.121 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 119.121 ms
Loss rate: 0.74%
```

Run 2: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.11 Mbit/s) --- Flow 1 egress (mean 0.11 Mbit/s)

Flow 1 (95th percentile 119.12 ms)

```
Run 3: Statistics of SCReAM

Start at: 2018-09-07 09:45:22
End at: 2018-09-07 09:45:52
Local clock offset: 8.126 ms
Remote clock offset: 8.558 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 113.629 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 113.629 ms
Loss rate: 0.76%
```
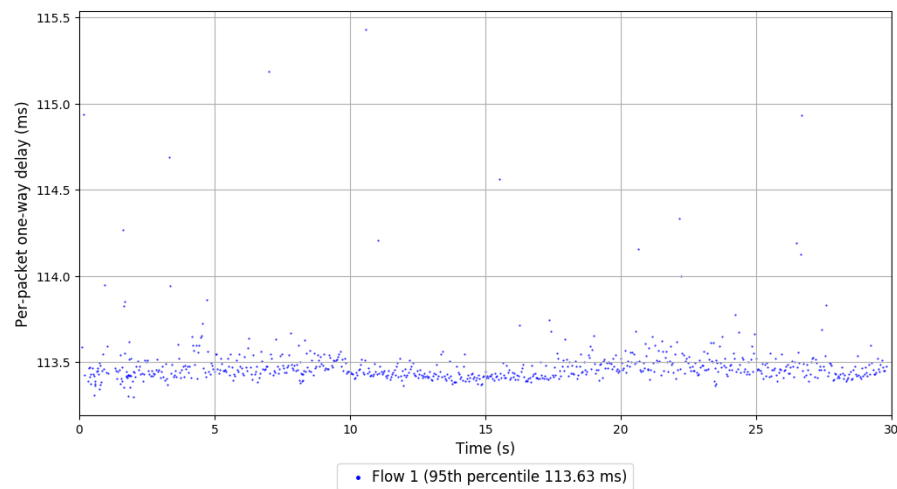
Run 3: Report of SCReAM — Data Link

```
Run 4: Statistics of SCReAM

Start at: 2018-09-07 10:12:00
End at: 2018-09-07 10:12:30
Local clock offset: 7.457 ms
Remote clock offset: 6.339 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 114.335 ms
Loss rate: 0.64%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 114.335 ms
Loss rate: 0.64%
```
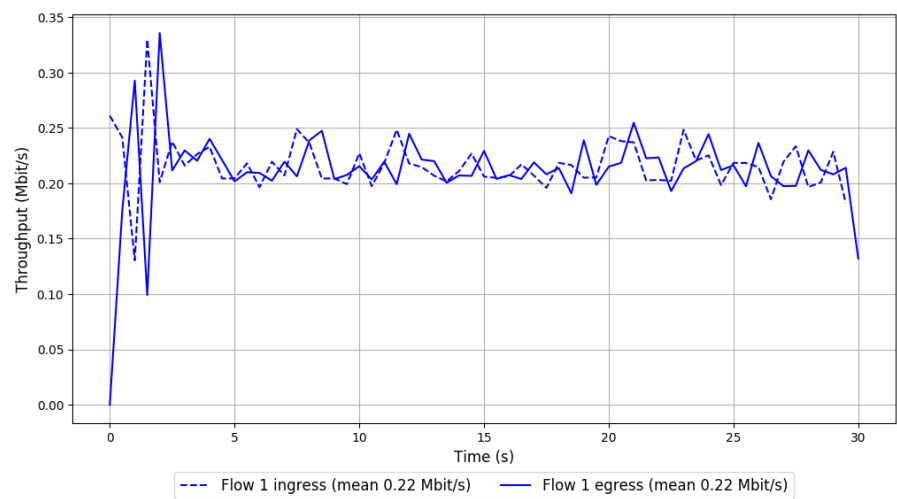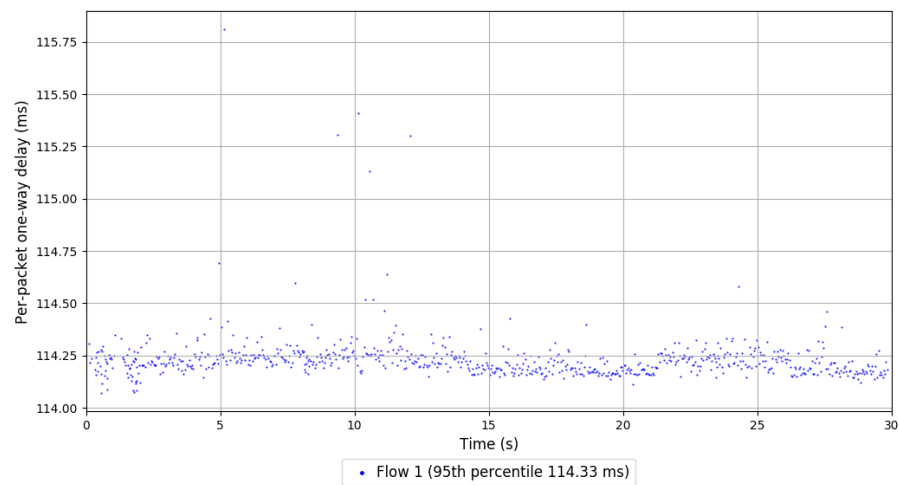
Run 4: Report of SCReAM — Data Link

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

Flow 1 (95th percentile 114.33 ms)

```
Run 5: Statistics of SCReAM

Start at: 2018-09-07 10:38:52
End at: 2018-09-07 10:39:22
Local clock offset: 1.175 ms
Remote clock offset: 2.167 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 110.813 ms
Loss rate: 0.64%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 110.813 ms
Loss rate: 0.64%
```
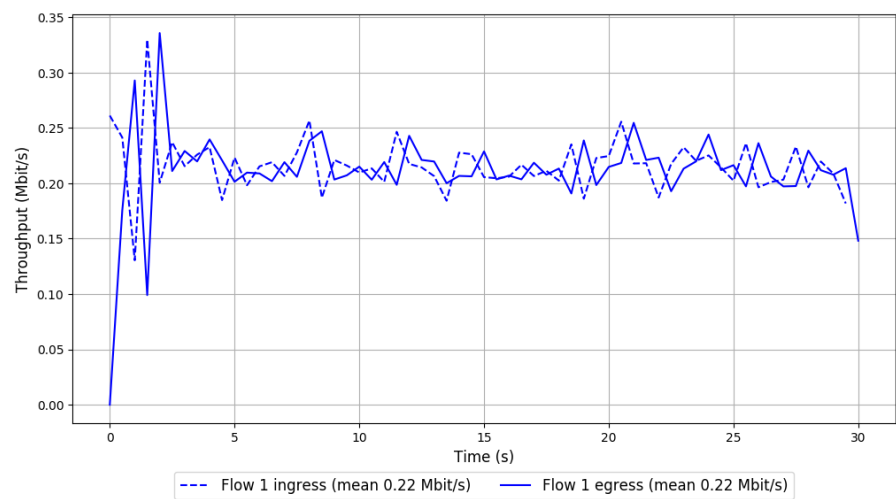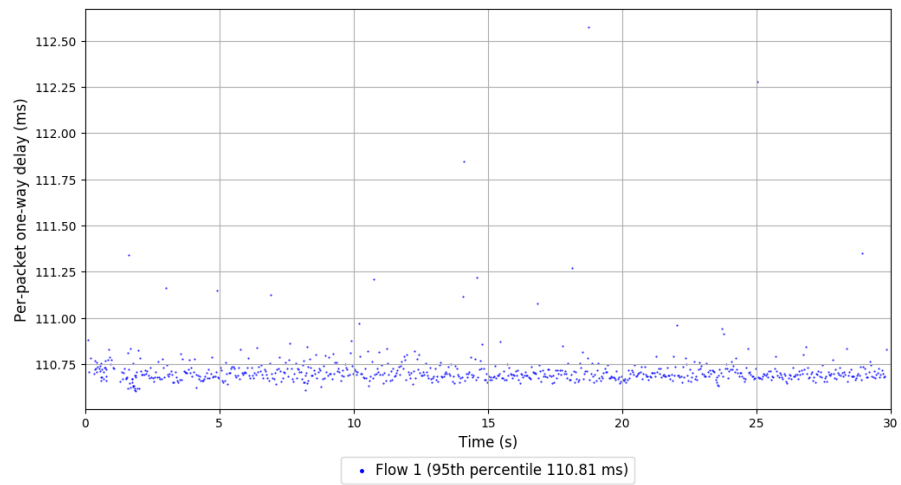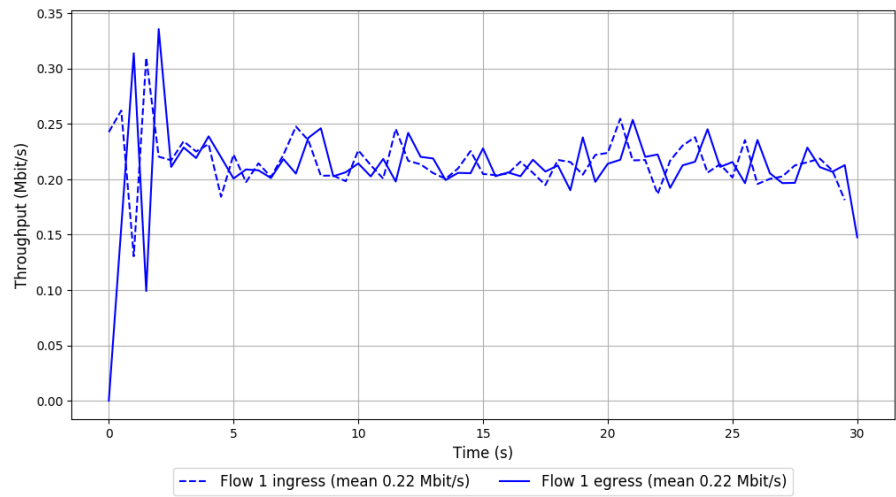
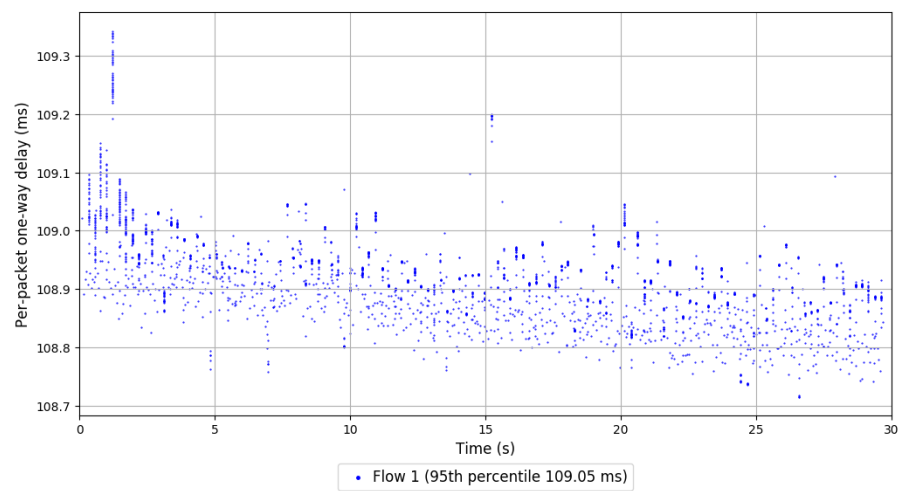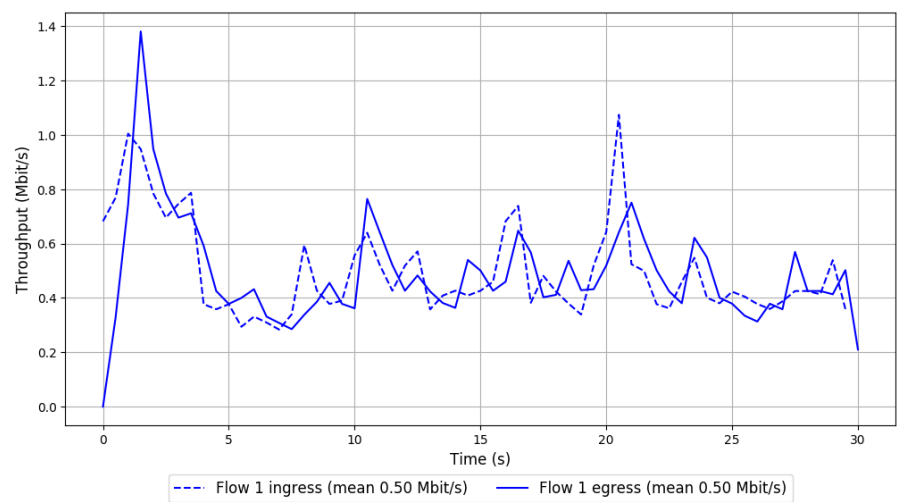# Run 5: Report of SCReAM — Data Link

```
Run 1: Statistics of Sprout

Start at: 2018-09-07 09:00:28
End at: 2018-09-07 09:00:58
Local clock offset: 35.45 ms
Remote clock offset: 36.887 ms

# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 109.045 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 109.045 ms
Loss rate: 0.63%
```
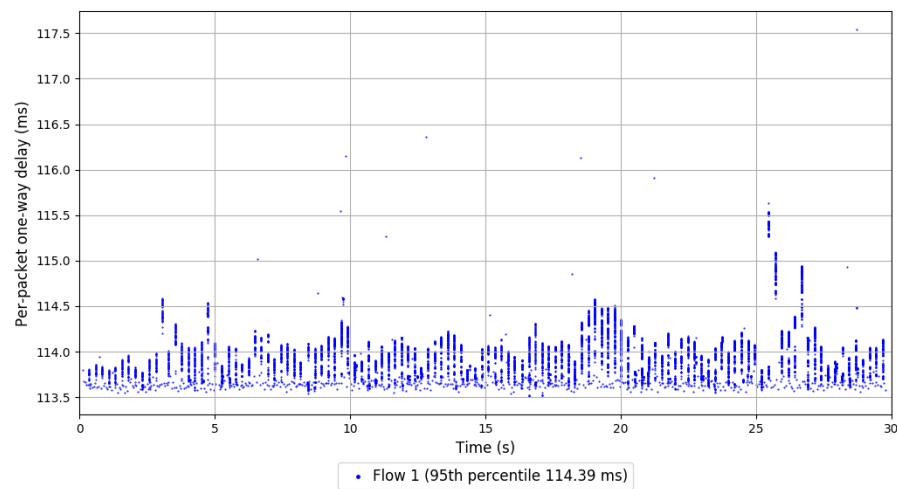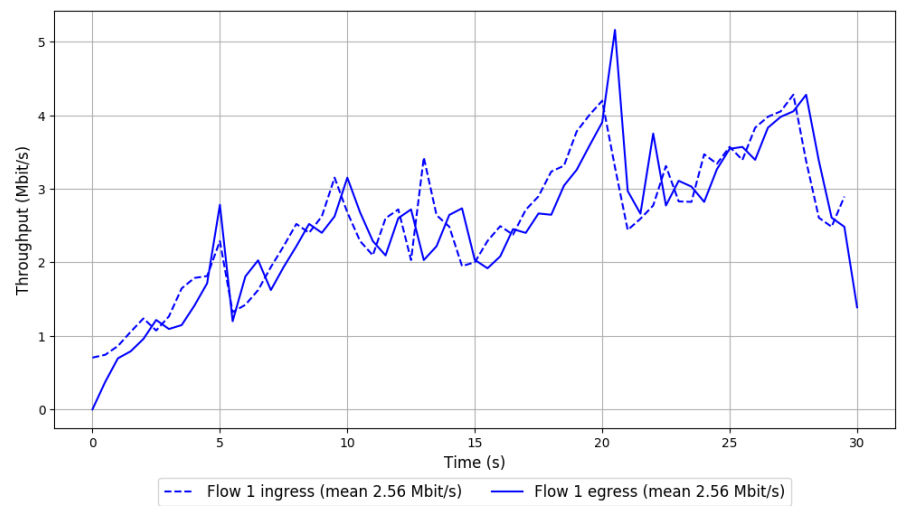
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-09-07 09:27:01
End at: 2018-09-07 09:27:31
Local clock offset: 16.01 ms
Remote clock offset: 16.571 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.56 Mbit/s
95th percentile per-packet one-way delay: 114.388 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 2.56 Mbit/s
95th percentile per-packet one-way delay: 114.388 ms
Loss rate: 0.98%
```

Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-09-07 09:53:36
End at: 2018-09-07 09:54:06
Local clock offset: 6.246 ms
Remote clock offset: 7.146 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 106.440 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 106.440 ms
Loss rate: 0.78%
```
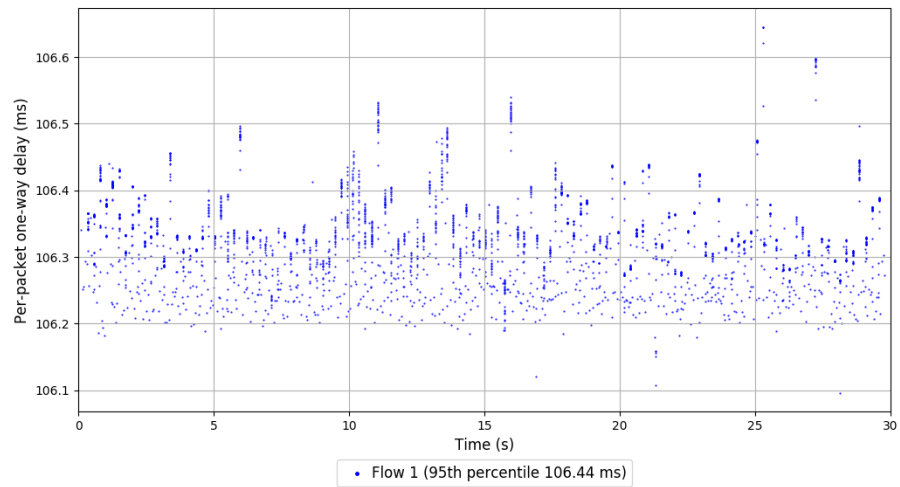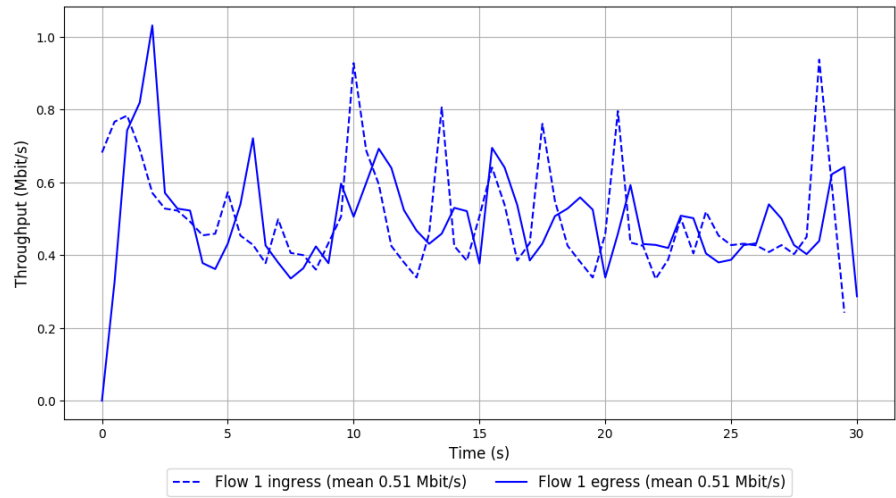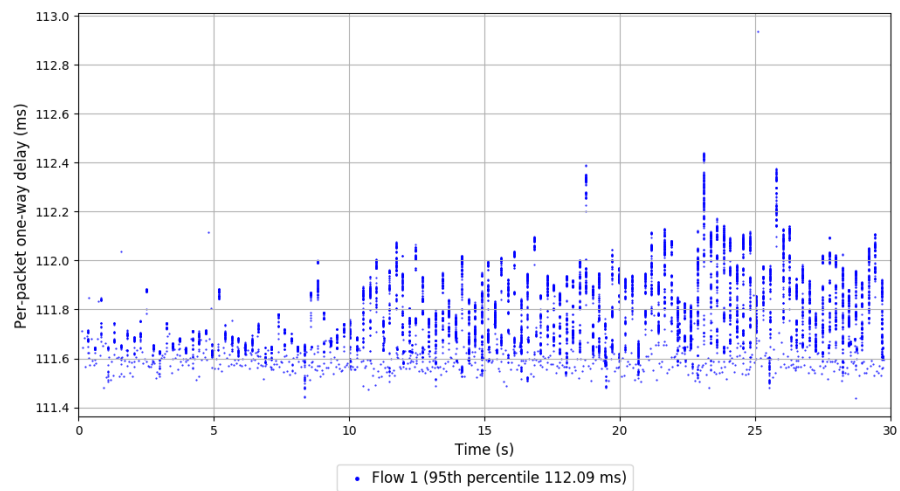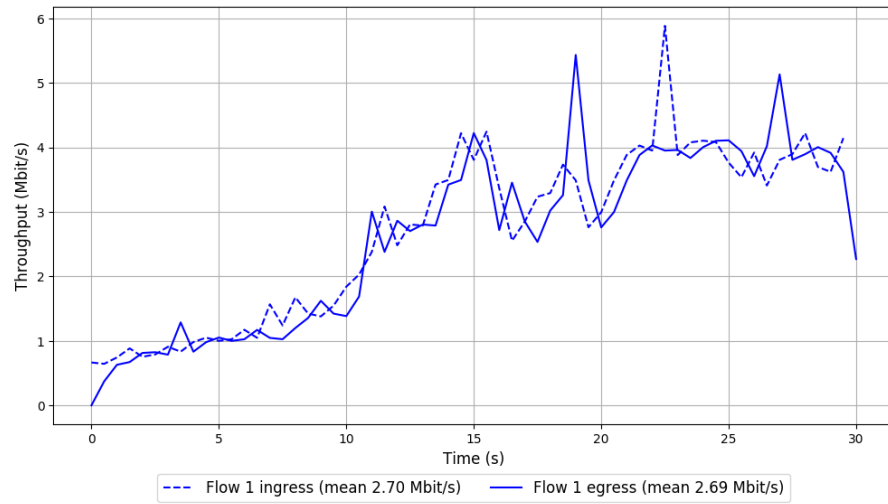
Run 3: Report of Sprout — Data Link

```
Run 4: Statistics of Sprout

Start at: 2018-09-07 10:20:35
End at: 2018-09-07 10:21:05
Local clock offset: 2.812 ms
Remote clock offset: 2.997 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.69 Mbit/s
95th percentile per-packet one-way delay: 112.089 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 2.69 Mbit/s
95th percentile per-packet one-way delay: 112.089 ms
Loss rate: 1.16%
```

Run 4: Report of Sprout — Data Link

```
Run 5: Statistics of Sprout

Start at: 2018-09-07 10:47:25
End at: 2018-09-07 10:47:55
Local clock offset: 1.95 ms
Remote clock offset: 1.445 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 112.002 ms
Loss rate: 0.59%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 112.002 ms
Loss rate: 0.59%
```
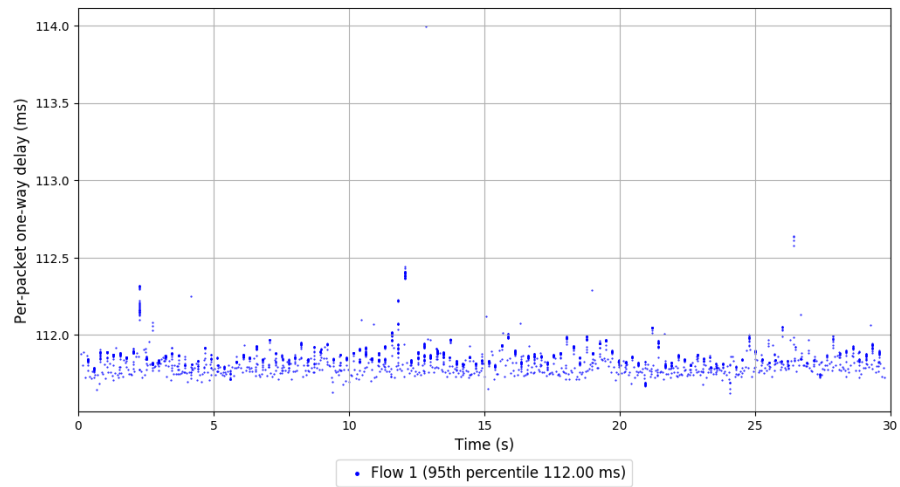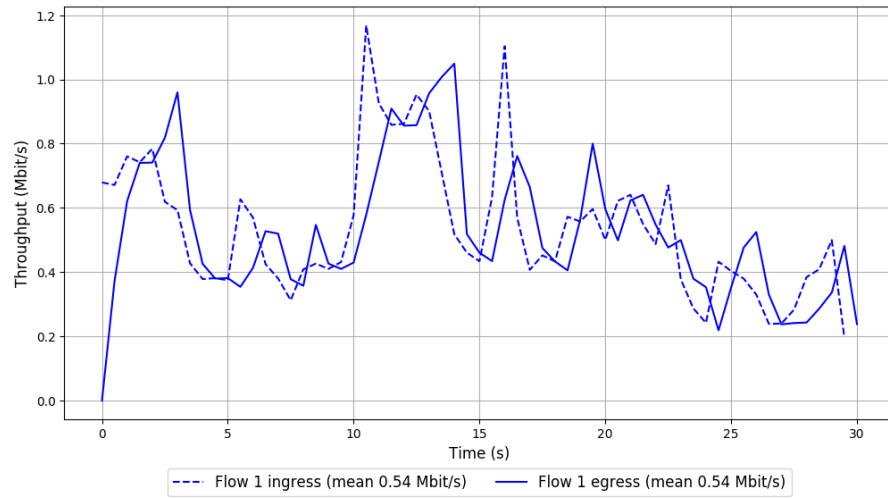
Run 5: Report of Sprout — Data Link

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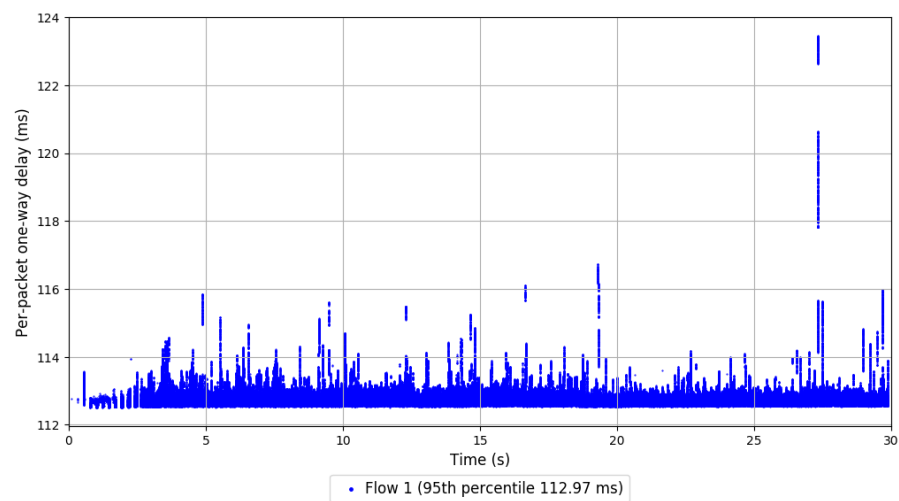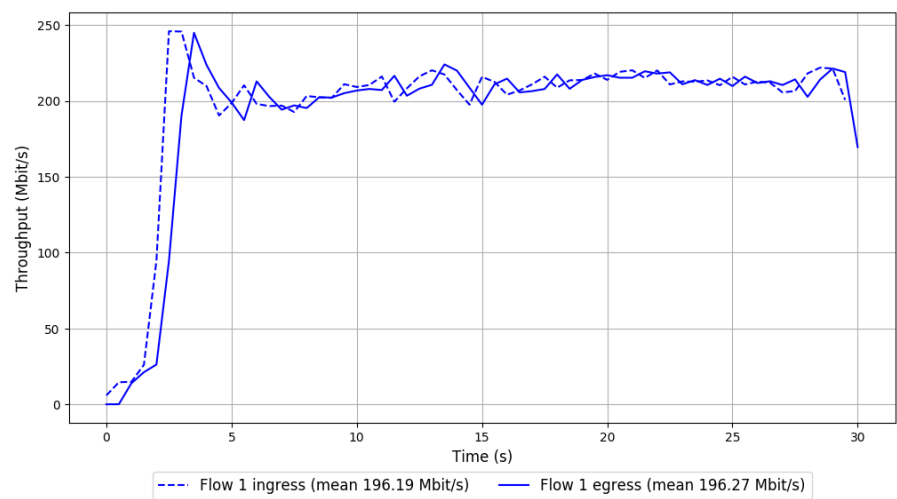

Flow 1 (95th percentile 112.00 ms)

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

Start at: 2018-09-07 08:59:00
End at: 2018-09-07 08:59:30
Local clock offset: 34.526 ms
Remote clock offset: 37.551 ms

# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 196.27 Mbit/s
95th percentile per-packet one-way delay: 112.971 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 196.27 Mbit/s
95th percentile per-packet one-way delay: 112.971 ms
Loss rate: 0.70%
```

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

Flow 1 ingress (mean 196.19 Mbit/s) — Flow 1 egress (mean 196.27 Mbit/s)

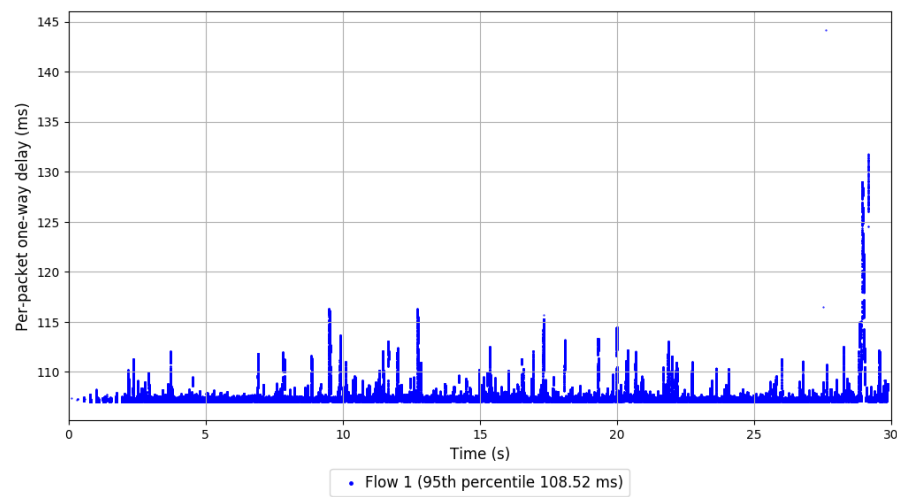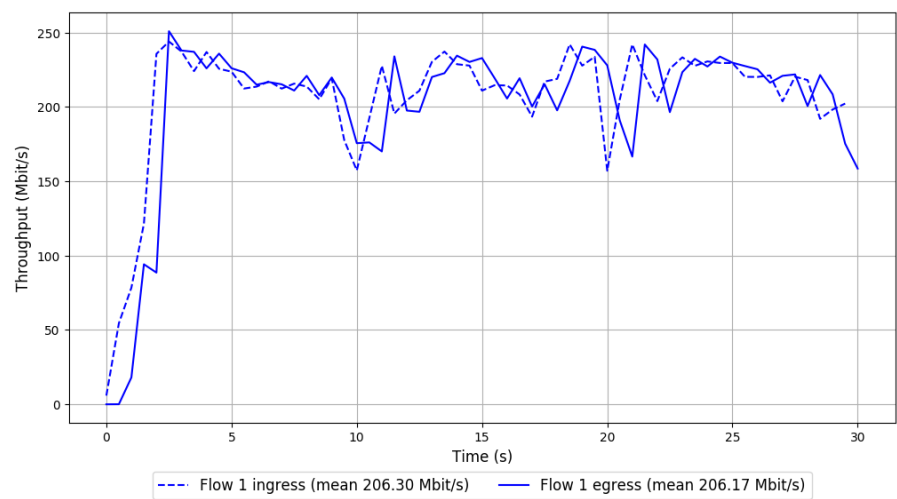
• Flow 1 (95th percentile 112.97 ms)

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

Start at: 2018-09-07 09:25:31
End at: 2018-09-07 09:26:01
Local clock offset: 14.338 ms
Remote clock offset: 16.097 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 206.17 Mbit/s
95th percentile per-packet one-way delay: 108.520 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 206.17 Mbit/s
95th percentile per-packet one-way delay: 108.520 ms
Loss rate: 0.78%
```

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

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

Start at: 2018-09-07 09:52:25
End at: 2018-09-07 09:52:55
Local clock offset: 6.417 ms
Remote clock offset: 7.165 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.13 Mbit/s
95th percentile per-packet one-way delay: 106.366 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 16.13 Mbit/s
95th percentile per-packet one-way delay: 106.366 ms
Loss rate: 0.74%
```
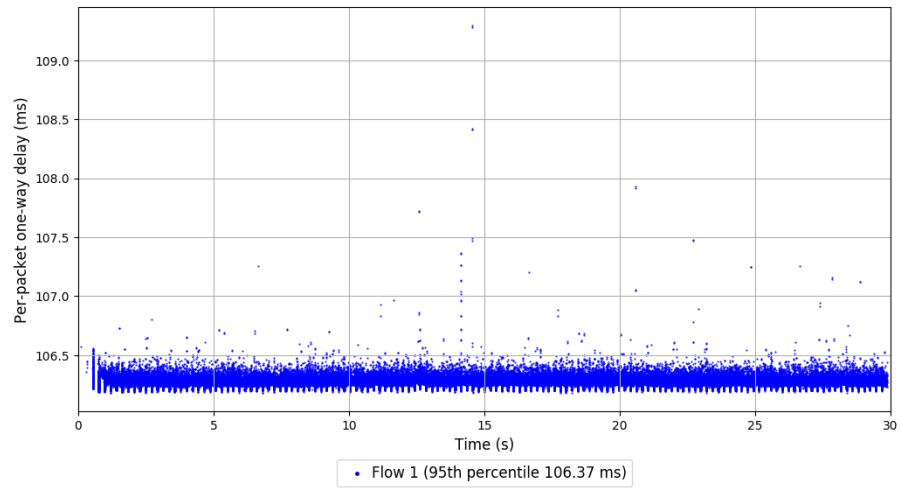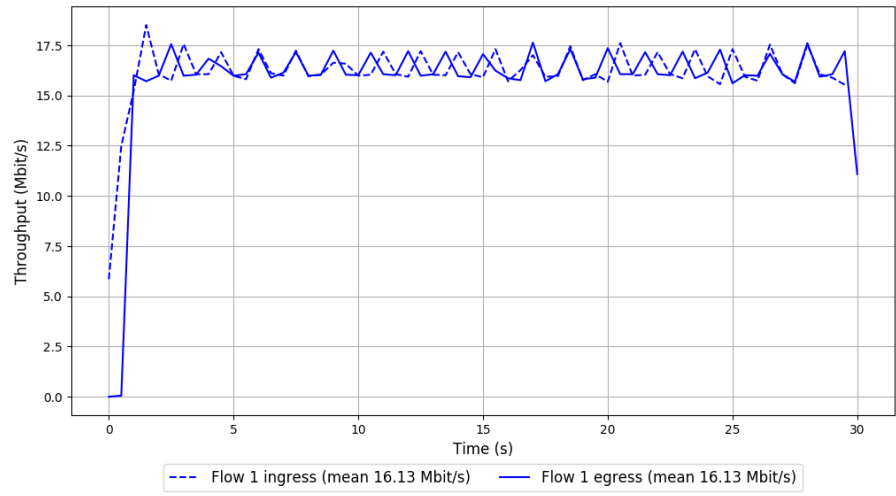
Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 16.13 Mbit/s) ----   Flow 1 egress (mean 16.13 Mbit/s) ——

Flow 1 (95th percentile 106.37 ms)

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

Start at: 2018-09-07 10:19:06
End at: 2018-09-07 10:19:36
Local clock offset: 4.299 ms
Remote clock offset: 3.357 ms


# Below is generated by plot.py at 2018-09-07 12:19:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 205.30 Mbit/s
95th percentile per-packet one-way delay: 109.670 ms
Loss rate: 0.77%
-- Flow 1:
Average throughput: 205.30 Mbit/s
95th percentile per-packet one-way delay: 109.670 ms
Loss rate: 0.77%
```
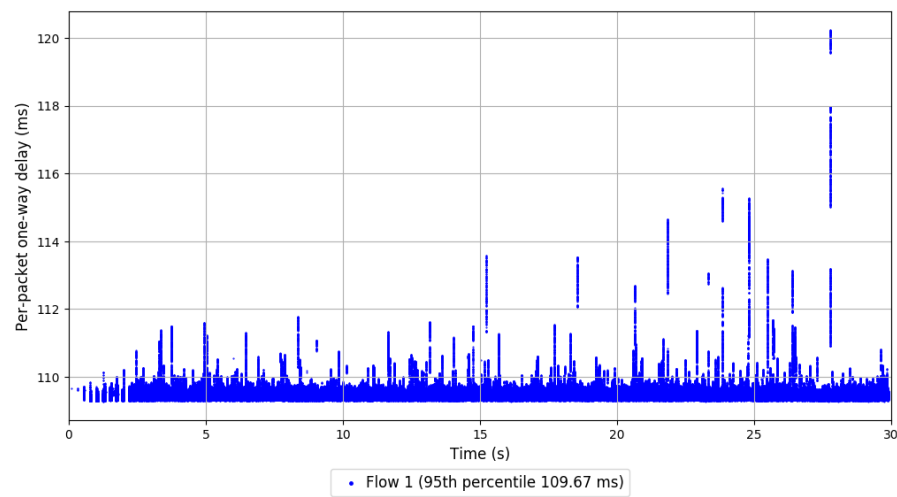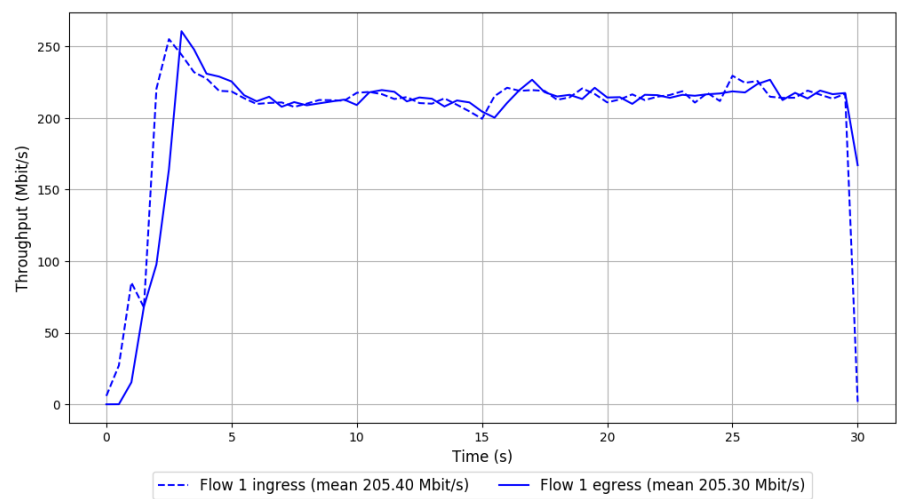
Run 4: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 205.40 Mbit/s) ——— Flow 1 egress (mean 205.30 Mbit/s)

· Flow 1 (95th percentile 109.67 ms)

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

Start at: 2018-09-07 10:45:55
End at: 2018-09-07 10:46:25
Local clock offset: 2.157 ms
Remote clock offset: 1.612 ms


# Below is generated by plot.py at 2018-09-07 12:19:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 206.79 Mbit/s
95th percentile per-packet one-way delay: 111.877 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 206.79 Mbit/s
95th percentile per-packet one-way delay: 111.877 ms
Loss rate: 0.78%
```
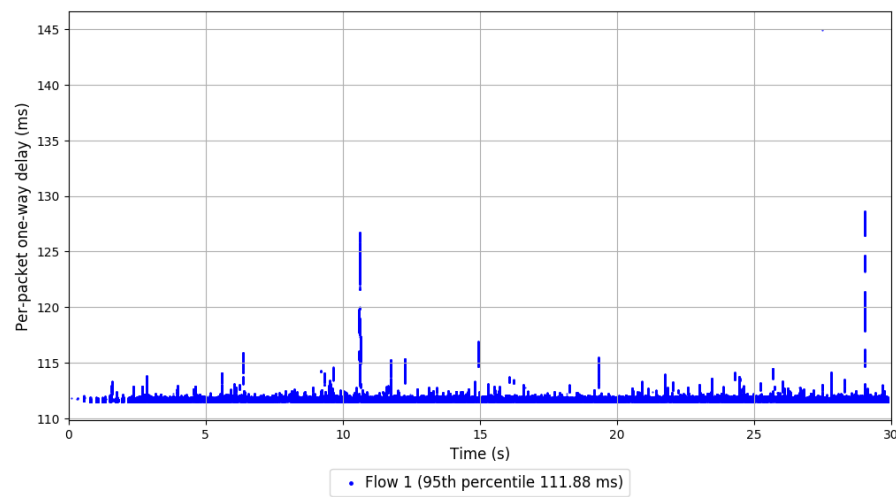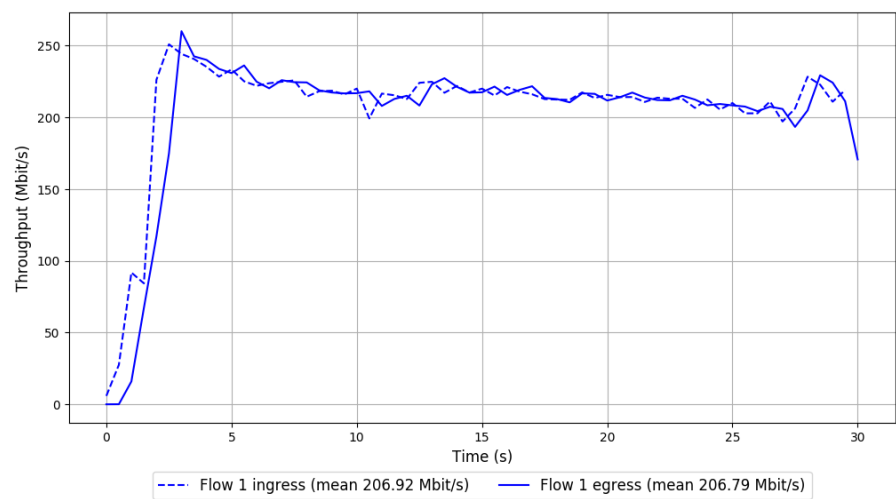
Run 5: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 206.92 Mbit/s)   Flow 1 egress (mean 206.79 Mbit/s)
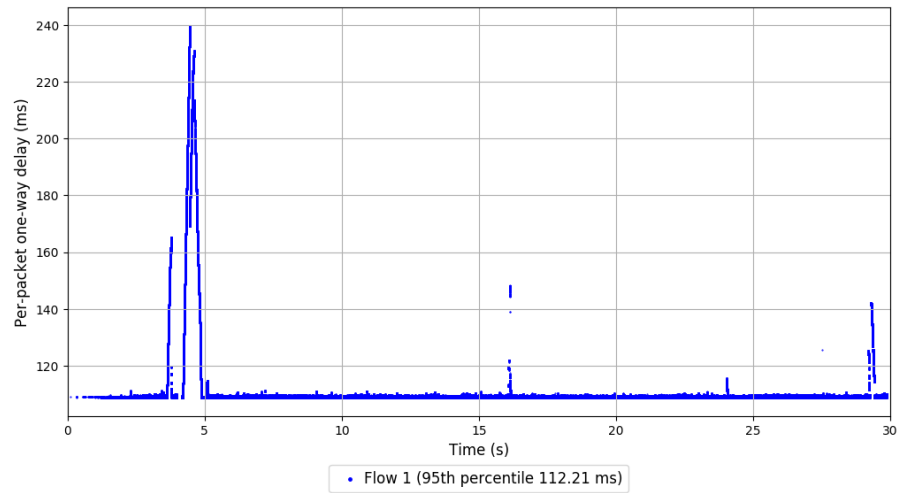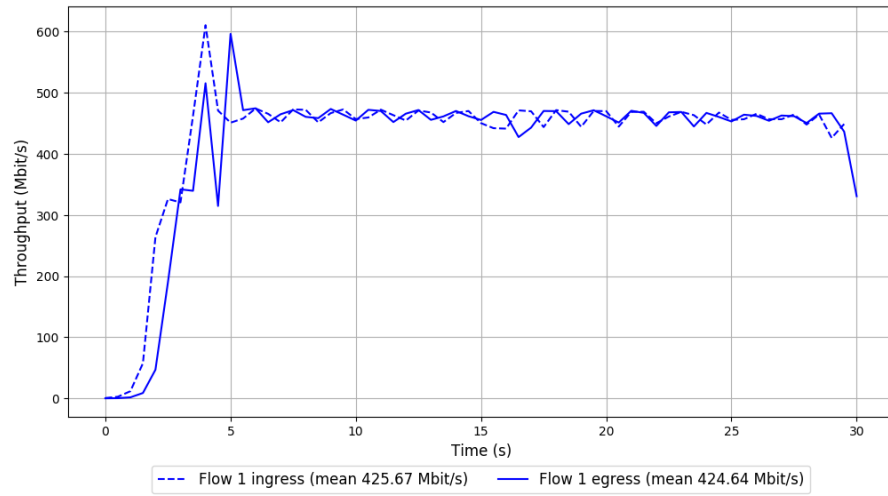

Flow 1 (95th percentile 111.88 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2018-09-07 08:47:37
End at: 2018-09-07 08:48:07
Local clock offset: 24.942 ms
Remote clock offset: 26.245 ms


# Below is generated by plot.py at 2018-09-07 12:19:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 424.64 Mbit/s
95th percentile per-packet one-way delay: 112.208 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 424.64 Mbit/s
95th percentile per-packet one-way delay: 112.208 ms
Loss rate: 0.96%
```

Run 1: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 425.67 Mbit/s)   Flow 1 egress (mean 424.64 Mbit/s)
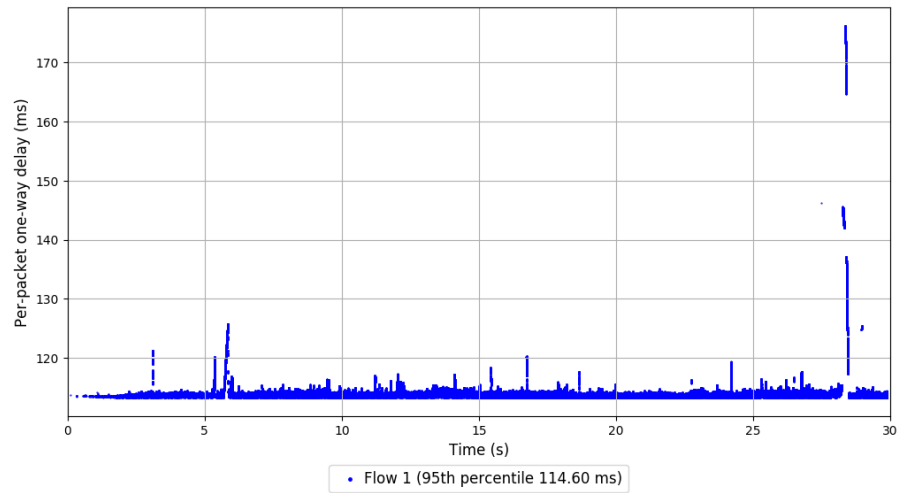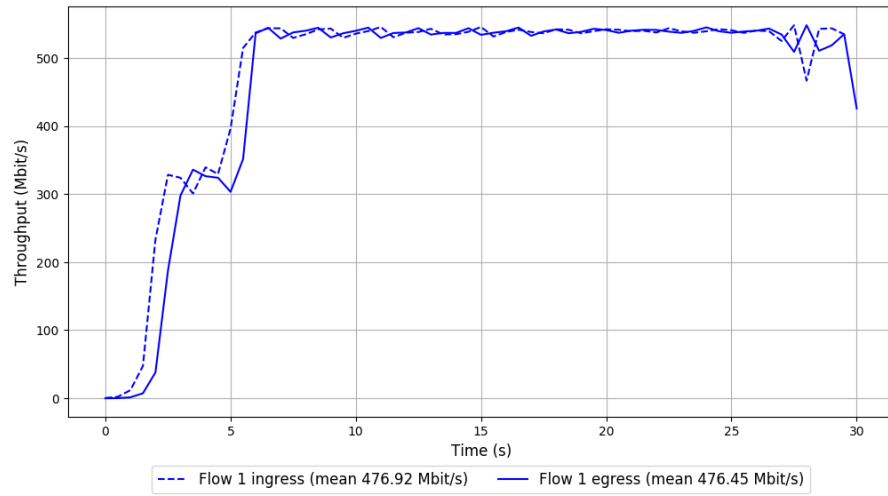

Flow 1 (95th percentile 112.21 ms)

```
Run 2: Statistics of TCP Vegas

Start at: 2018-09-07 09:14:36
End at: 2018-09-07 09:15:06
Local clock offset: 14.378 ms
Remote clock offset: 14.991 ms


# Below is generated by plot.py at 2018-09-07 12:20:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 476.45 Mbit/s
95th percentile per-packet one-way delay: 114.604 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 476.45 Mbit/s
95th percentile per-packet one-way delay: 114.604 ms
Loss rate: 0.83%
```

Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-09-07 09:41:04
End at: 2018-09-07 09:41:34
Local clock offset: 10.874 ms
Remote clock offset: 10.5 ms


# Below is generated by plot.py at 2018-09-07 12:23:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 393.97 Mbit/s
95th percentile per-packet one-way delay: 111.635 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 393.97 Mbit/s
95th percentile per-packet one-way delay: 111.635 ms
Loss rate: 0.99%
```
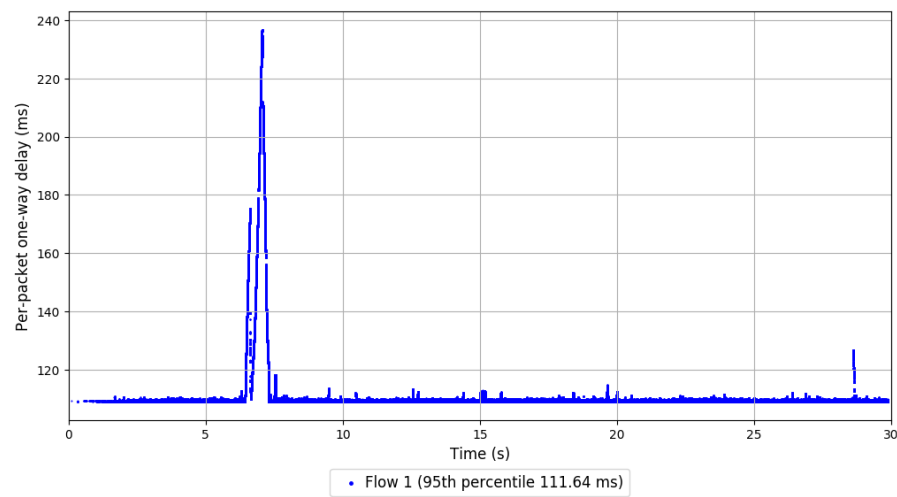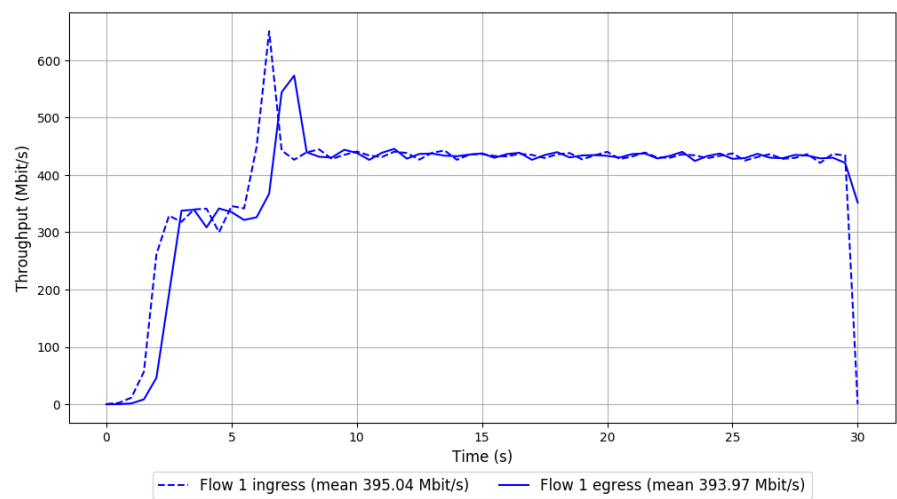
Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 395.04 Mbit/s)   Flow 1 egress (mean 393.97 Mbit/s)

• Flow 1 (95th percentile 111.64 ms)

```
Run 4: Statistics of TCP Vegas

Start at: 2018-09-07 10:07:37
End at: 2018-09-07 10:08:07
Local clock offset: 8.638 ms
Remote clock offset: 9.327 ms


# Below is generated by plot.py at 2018-09-07 12:25:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 475.31 Mbit/s
95th percentile per-packet one-way delay: 109.627 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 475.31 Mbit/s
95th percentile per-packet one-way delay: 109.627 ms
Loss rate: 0.83%
```
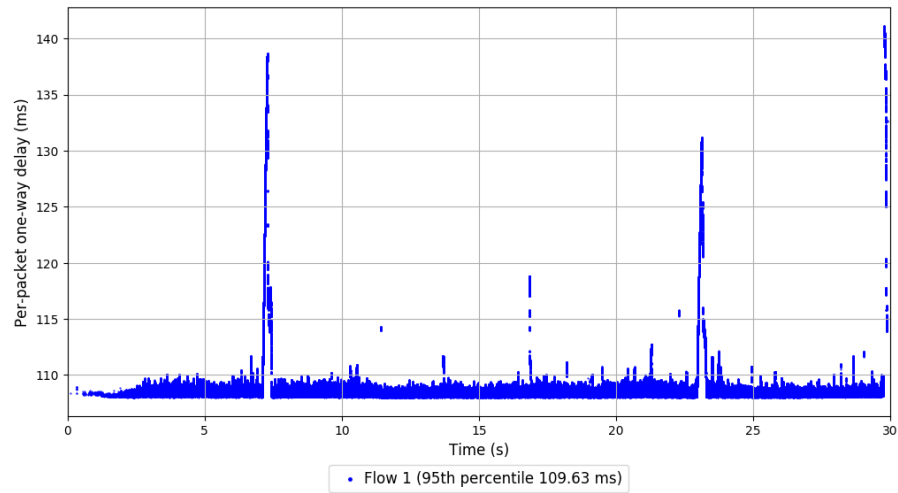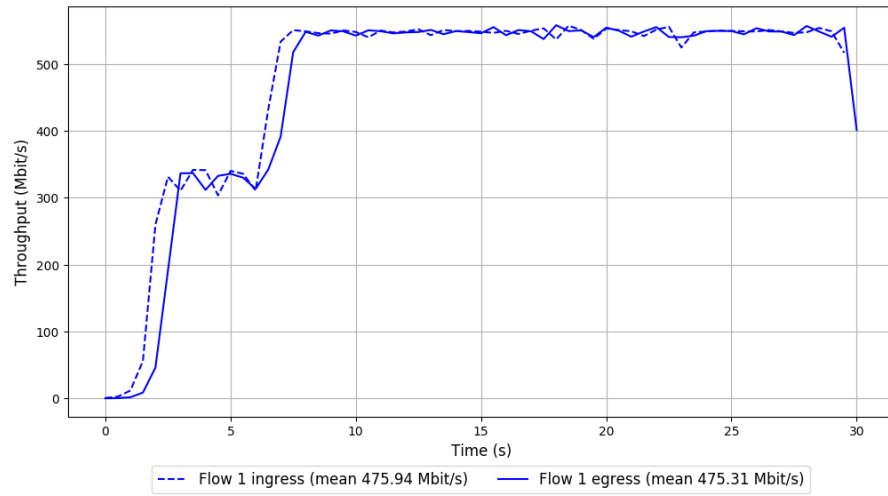
Run 4: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 475.94 Mbit/s) — — — Flow 1 egress (mean 475.31 Mbit/s)

Flow 1 (95th percentile 109.63 ms)

```
Run 5: Statistics of TCP Vegas

Start at: 2018-09-07 10:34:36
End at: 2018-09-07 10:35:06
Local clock offset: 1.812 ms
Remote clock offset: 1.837 ms


# Below is generated by plot.py at 2018-09-07 12:25:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 391.84 Mbit/s
95th percentile per-packet one-way delay: 114.844 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 391.84 Mbit/s
95th percentile per-packet one-way delay: 114.844 ms
Loss rate: 0.45%
```
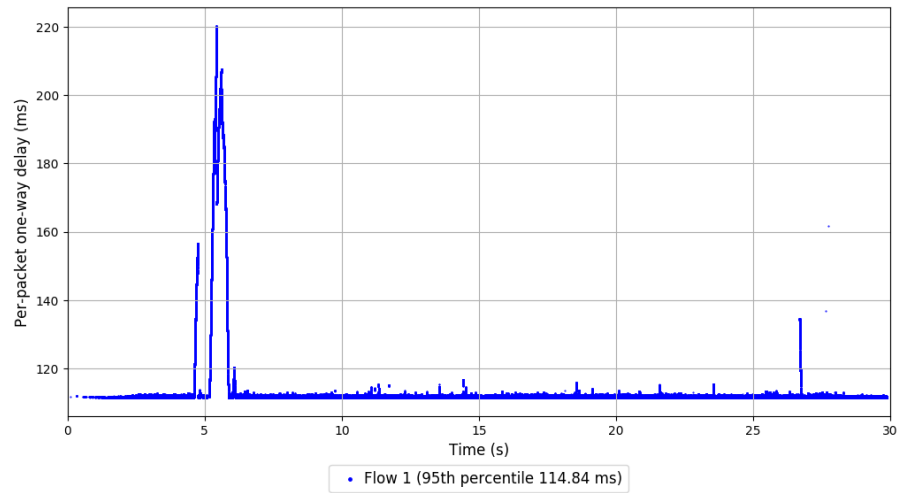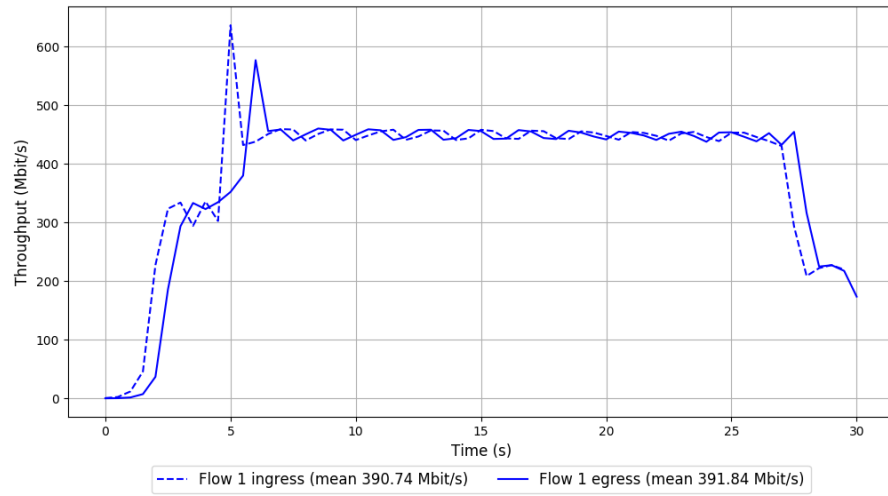
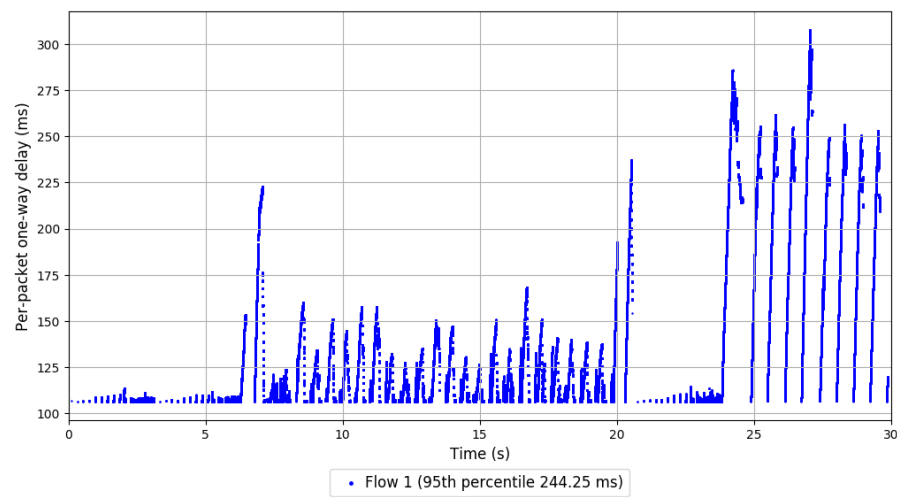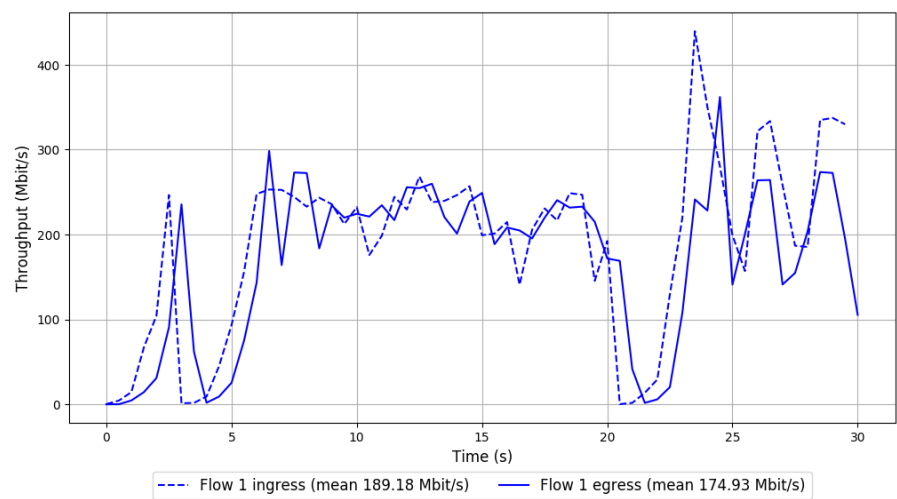Run 5: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2018-09-07 08:57:33
End at: 2018-09-07 08:58:03
Local clock offset: 33.76 ms
Remote clock offset: 36.811 ms


# Below is generated by plot.py at 2018-09-07 12:25:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 174.93 Mbit/s
95th percentile per-packet one-way delay: 244.250 ms
Loss rate: 8.18%
-- Flow 1:
Average throughput: 174.93 Mbit/s
95th percentile per-packet one-way delay: 244.250 ms
Loss rate: 8.18%
```

Run 1: Report of Verus — Data Link

Flow 1 ingress (mean 189.18 Mbit/s)   Flow 1 egress (mean 174.93 Mbit/s)
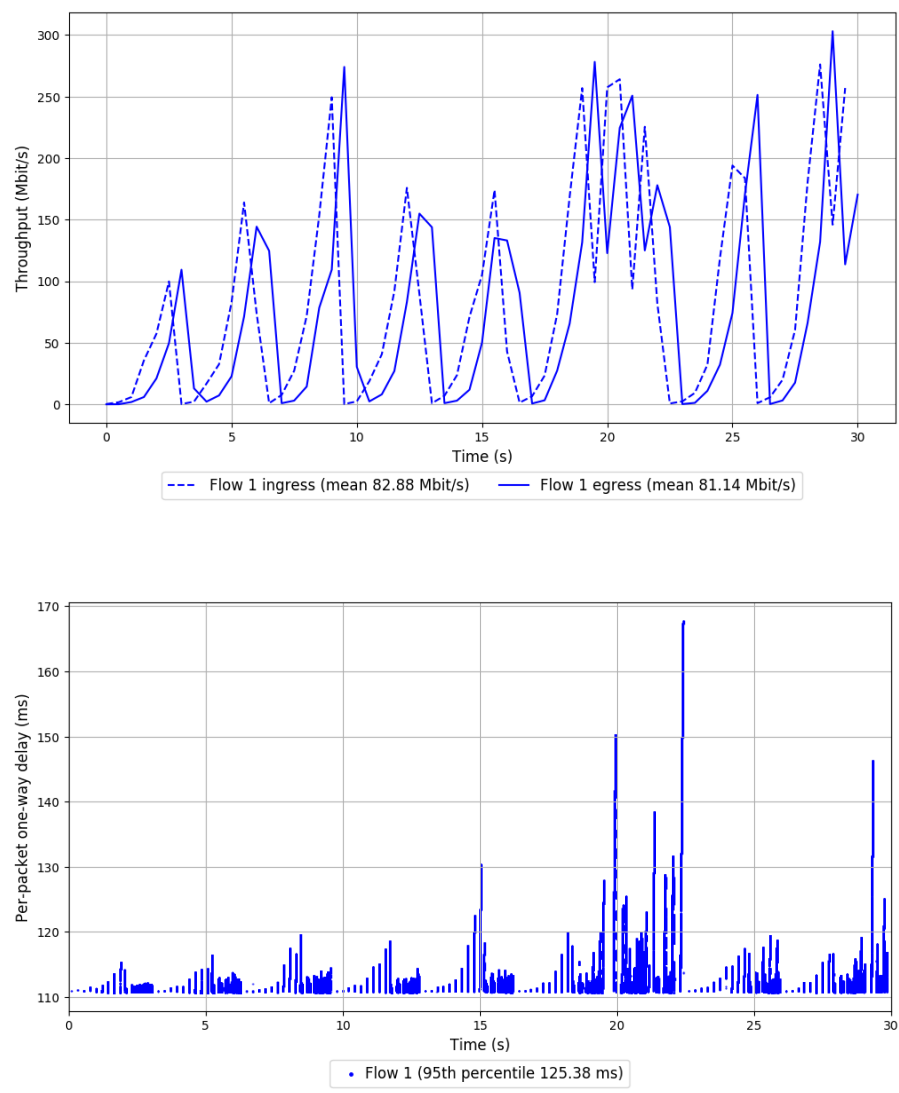

Flow 1 (95th percentile 244.25 ms)

```
Run 2: Statistics of Verus

Start at: 2018-09-07 09:24:14
End at: 2018-09-07 09:24:44
Local clock offset: 13.377 ms
Remote clock offset: 15.626 ms


# Below is generated by plot.py at 2018-09-07 12:25:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 81.14 Mbit/s
95th percentile per-packet one-way delay: 125.381 ms
Loss rate: 2.82%
-- Flow 1:
Average throughput: 81.14 Mbit/s
95th percentile per-packet one-way delay: 125.381 ms
Loss rate: 2.82%
```

Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-09-07 09:50:58
End at: 2018-09-07 09:51:28
Local clock offset: 6.909 ms
Remote clock offset: 7.52 ms


# Below is generated by plot.py at 2018-09-07 12:25:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 181.94 Mbit/s
95th percentile per-packet one-way delay: 209.588 ms
Loss rate: 2.57%
-- Flow 1:
Average throughput: 181.94 Mbit/s
95th percentile per-packet one-way delay: 209.588 ms
Loss rate: 2.57%
```
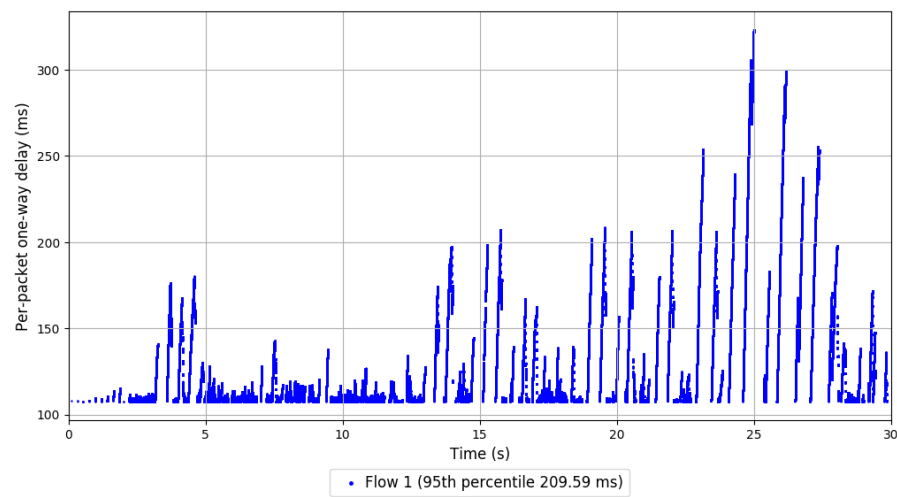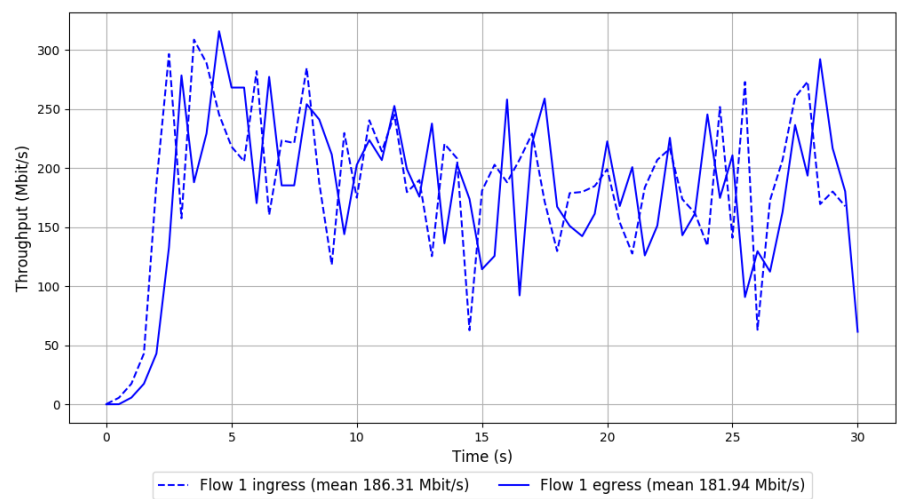
Run 3: Report of Verus — Data Link

```
Run 4: Statistics of Verus

Start at: 2018-09-07 10:17:42
End at: 2018-09-07 10:18:12
Local clock offset: 4.022 ms
Remote clock offset: 3.74 ms


# Below is generated by plot.py at 2018-09-07 12:25:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 148.95 Mbit/s
95th percentile per-packet one-way delay: 262.218 ms
Loss rate: 5.22%
-- Flow 1:
Average throughput: 148.95 Mbit/s
95th percentile per-packet one-way delay: 262.218 ms
Loss rate: 5.22%
```
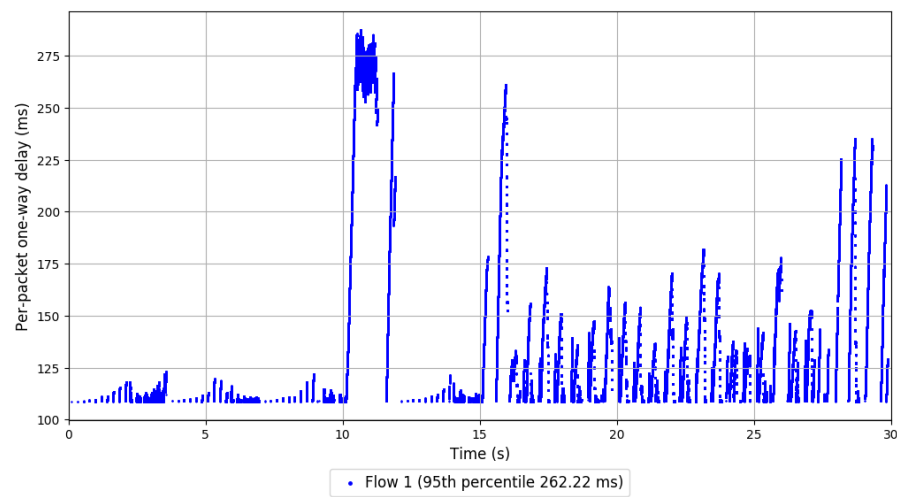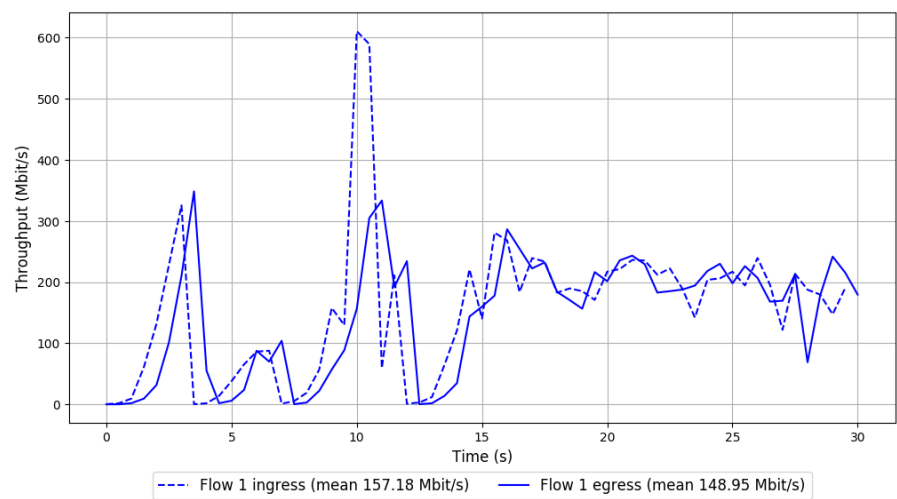
Run 4: Report of Verus — Data Link

```
Run 5: Statistics of Verus

Start at: 2018-09-07 10:44:28
End at: 2018-09-07 10:44:58
Local clock offset: 0.956 ms
Remote clock offset: 2.242 ms


# Below is generated by plot.py at 2018-09-07 12:26:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 171.59 Mbit/s
95th percentile per-packet one-way delay: 264.542 ms
Loss rate: 18.12%
-- Flow 1:
Average throughput: 171.59 Mbit/s
95th percentile per-packet one-way delay: 264.542 ms
Loss rate: 18.12%
```
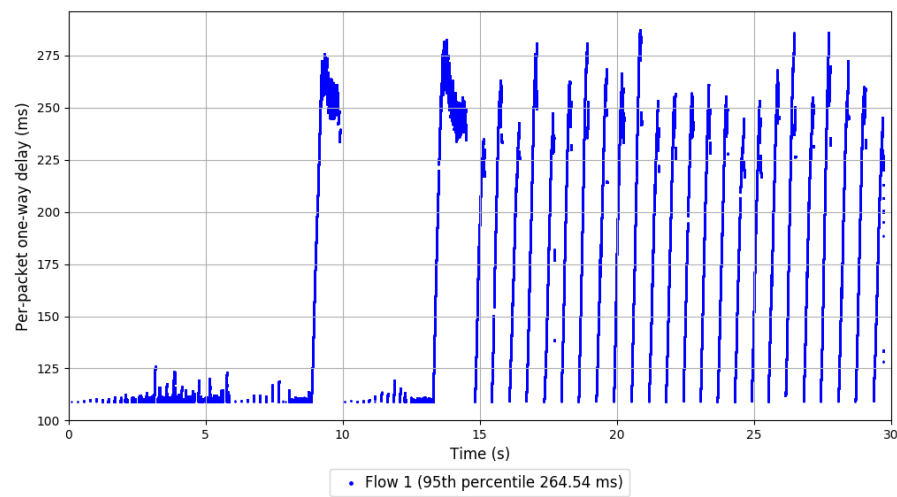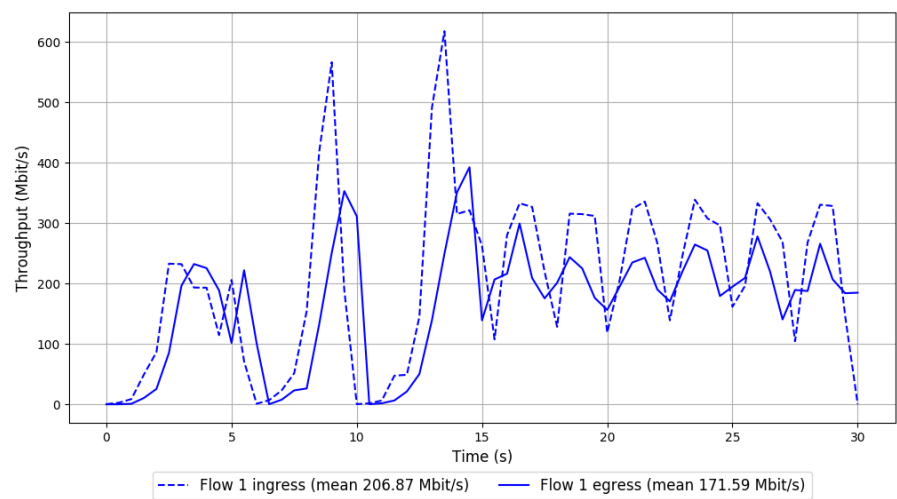
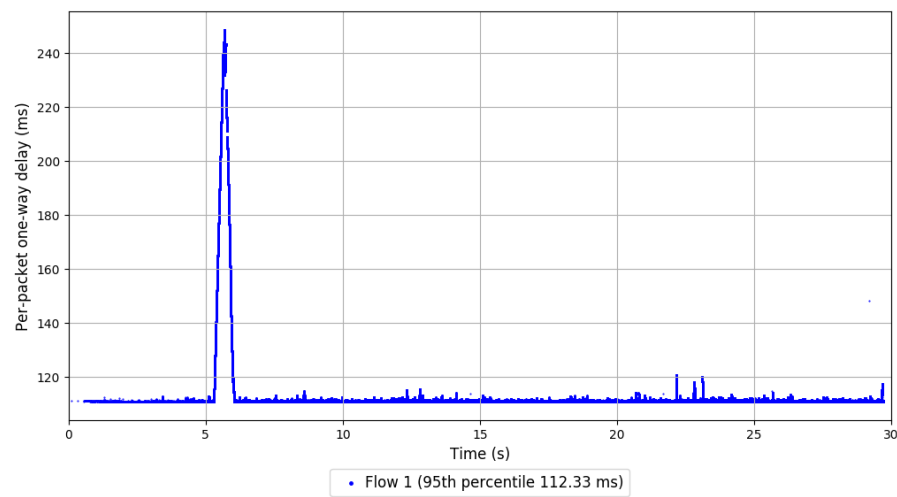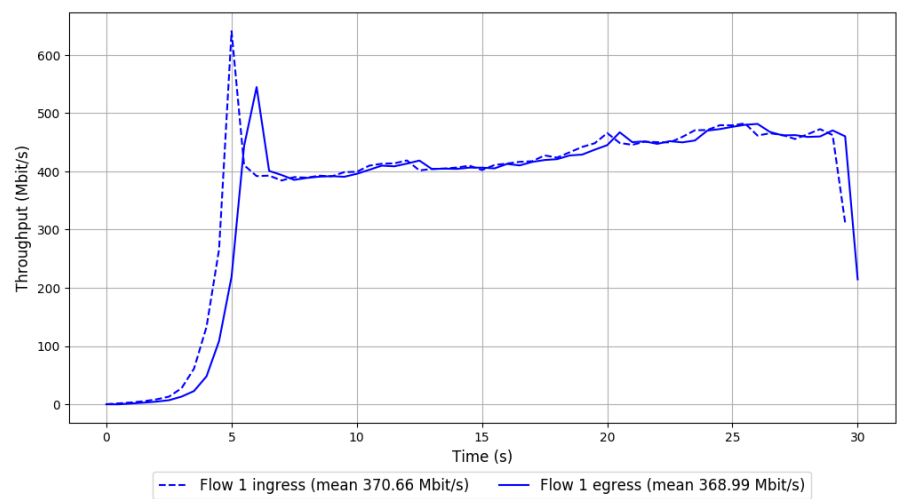## Run 5: Report of Verus — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2018-09-07 08:49:08
End at: 2018-09-07 08:49:38
Local clock offset: 24.685 ms
Remote clock offset: 27.949 ms


# Below is generated by plot.py at 2018-09-07 12:26:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 368.99 Mbit/s
95th percentile per-packet one-way delay: 112.328 ms
Loss rate: 1.19%
-- Flow 1:
Average throughput: 368.99 Mbit/s
95th percentile per-packet one-way delay: 112.328 ms
Loss rate: 1.19%
```

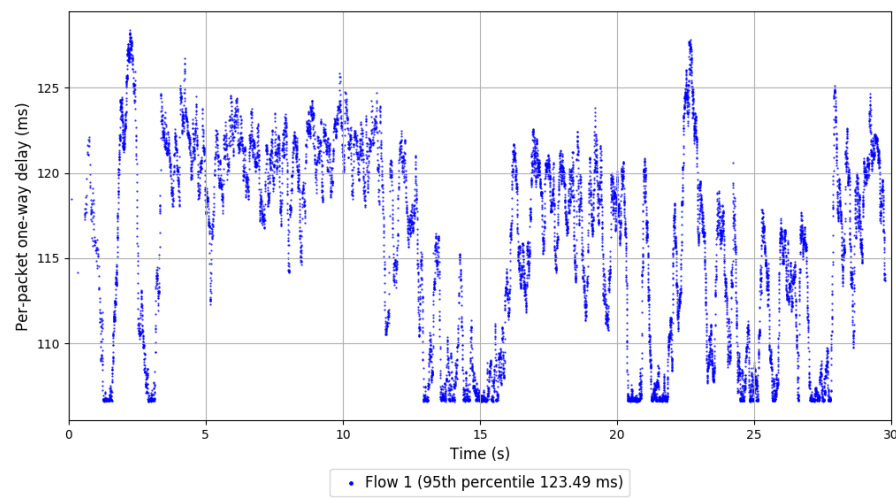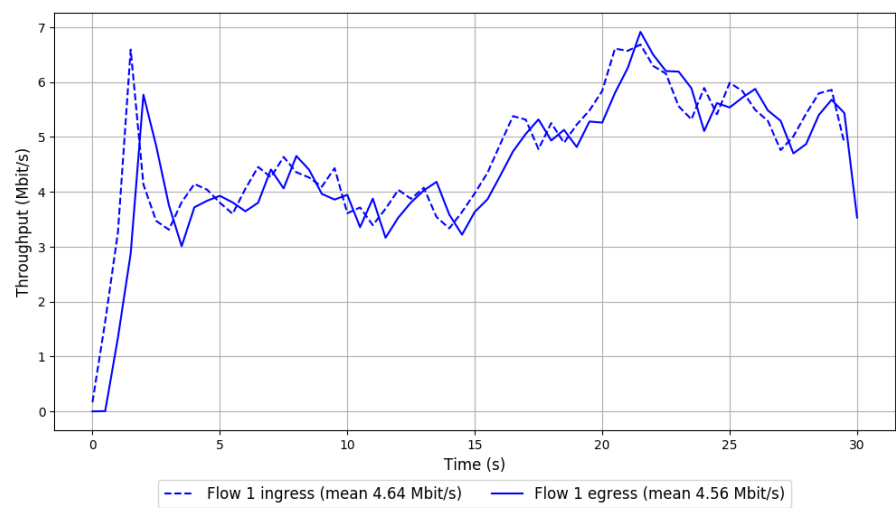Run 1: Report of PCC-Vivace — Data Link

```
Run 2: Statistics of PCC-Vivace

Start at: 2018-09-07 09:16:10
End at: 2018-09-07 09:16:40
Local clock offset: 12.637 ms
Remote clock offset: 14.716 ms


# Below is generated by plot.py at 2018-09-07 12:26:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.56 Mbit/s
95th percentile per-packet one-way delay: 123.487 ms
Loss rate: 2.49%
-- Flow 1:
Average throughput: 4.56 Mbit/s
95th percentile per-packet one-way delay: 123.487 ms
Loss rate: 2.49%
```

Run 2: Report of PCC-Vivace — Data Link

```
Run 3: Statistics of PCC-Vivace

Start at: 2018-09-07 09:42:35
End at: 2018-09-07 09:43:05
Local clock offset: 9.035 ms
Remote clock offset: 9.481 ms


# Below is generated by plot.py at 2018-09-07 12:27:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 388.46 Mbit/s
95th percentile per-packet one-way delay: 109.562 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 388.46 Mbit/s
95th percentile per-packet one-way delay: 109.562 ms
Loss rate: 1.02%
```
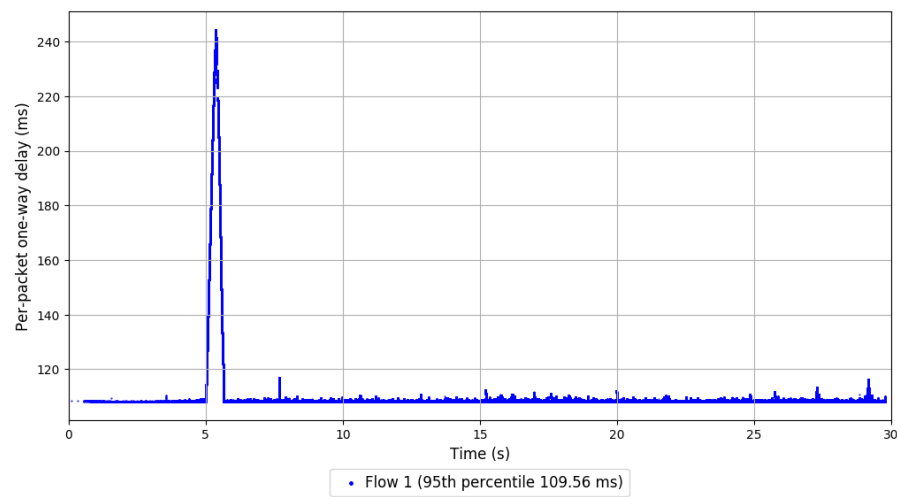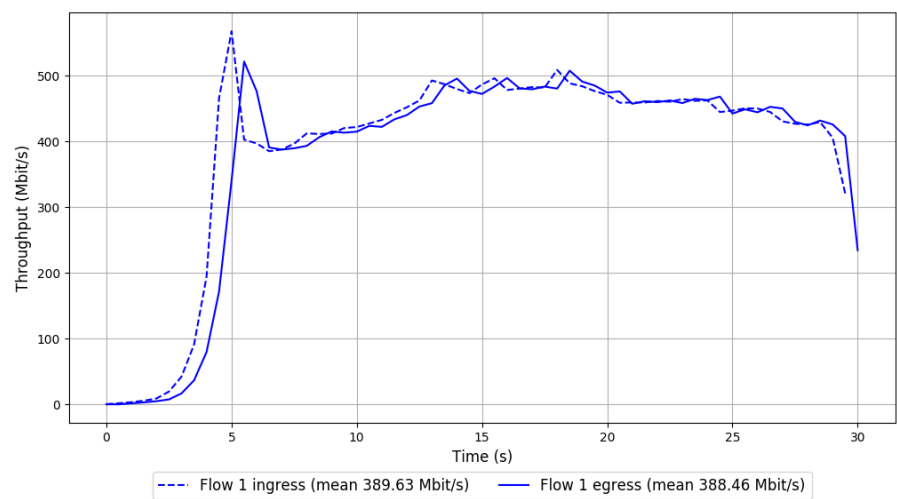
Run 3: Report of PCC-Vivace — Data Link

- - - - Flow 1 ingress (mean 389.63 Mbit/s) ——— Flow 1 egress (mean 388.46 Mbit/s)

• Flow 1 (95th percentile 109.56 ms)

```
Run 4: Statistics of PCC-Vivace

Start at: 2018-09-07 10:09:12
End at: 2018-09-07 10:09:42
Local clock offset: 8.186 ms
Remote clock offset: 8.514 ms


# Below is generated by plot.py at 2018-09-07 12:27:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 388.52 Mbit/s
95th percentile per-packet one-way delay: 211.753 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 388.52 Mbit/s
95th percentile per-packet one-way delay: 211.753 ms
Loss rate: 0.58%
```
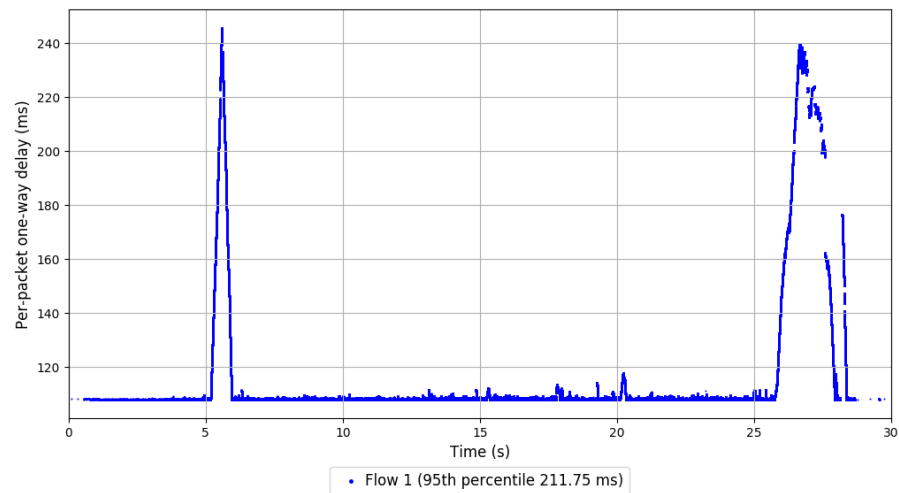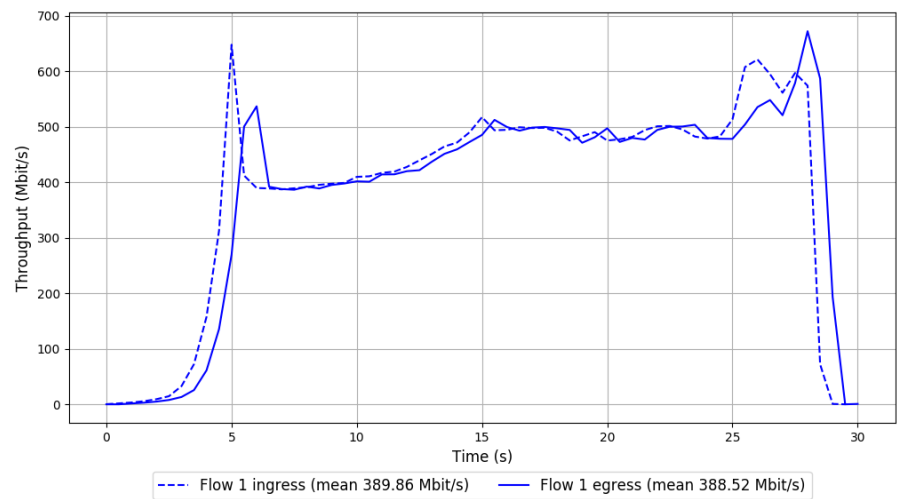
Run 4: Report of PCC-Vivace — Data Link

```
Run 5: Statistics of PCC-Vivace

Start at: 2018-09-07 10:36:06
End at: 2018-09-07 10:36:36
Local clock offset: 2.201 ms
Remote clock offset: 2.101 ms


# Below is generated by plot.py at 2018-09-07 12:27:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 383.63 Mbit/s
95th percentile per-packet one-way delay: 155.757 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 383.63 Mbit/s
95th percentile per-packet one-way delay: 155.757 ms
Loss rate: 1.10%
```
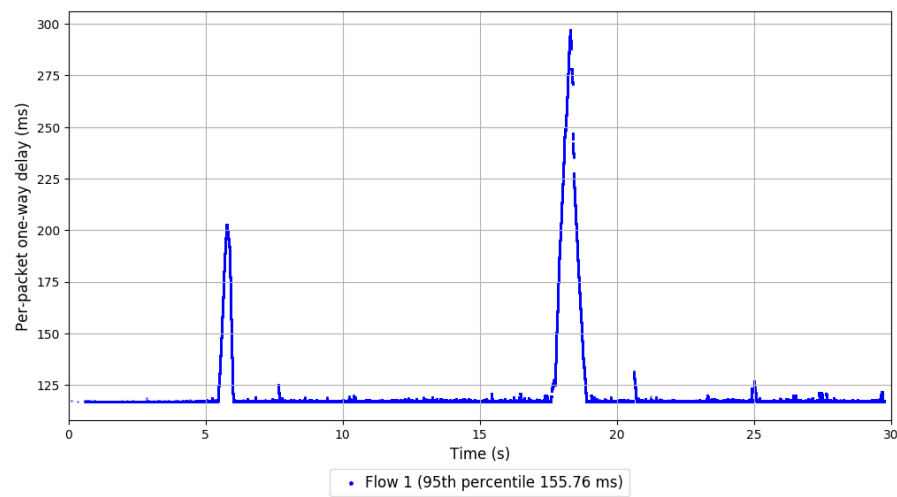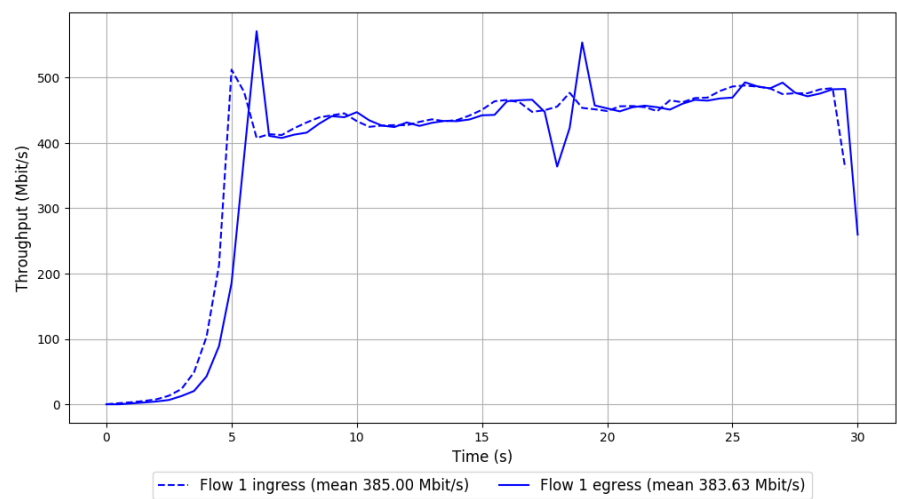
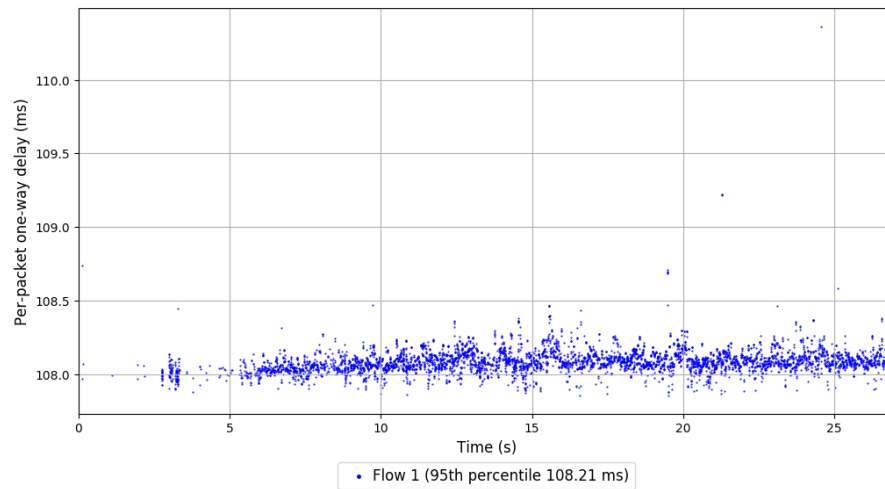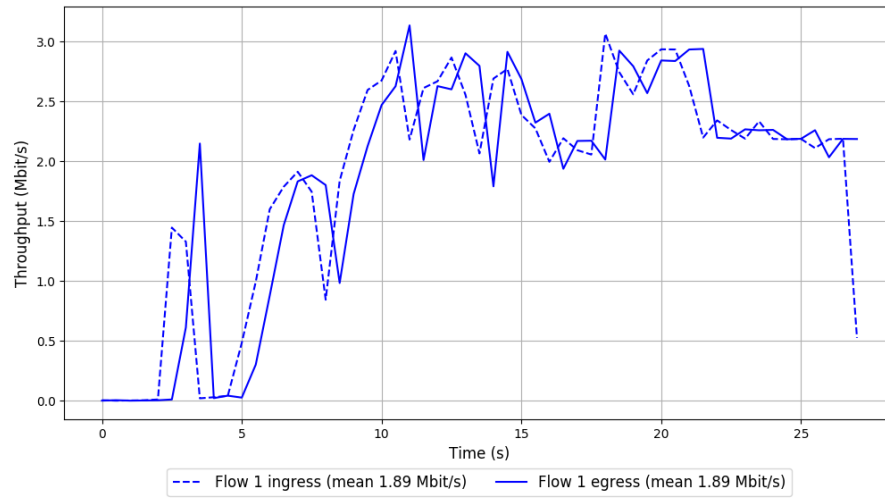# Run 5: Report of PCC-Vivace — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2018-09-07 08:56:24
End at: 2018-09-07 08:56:54
Local clock offset: 32.852 ms
Remote clock offset: 35.521 ms


# Below is generated by plot.py at 2018-09-07 12:27:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 108.211 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 108.211 ms
Loss rate: 1.03%
```

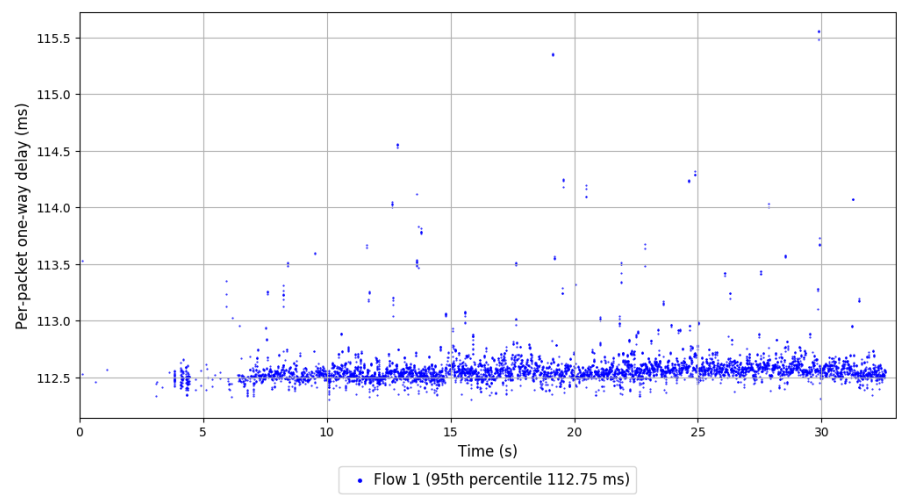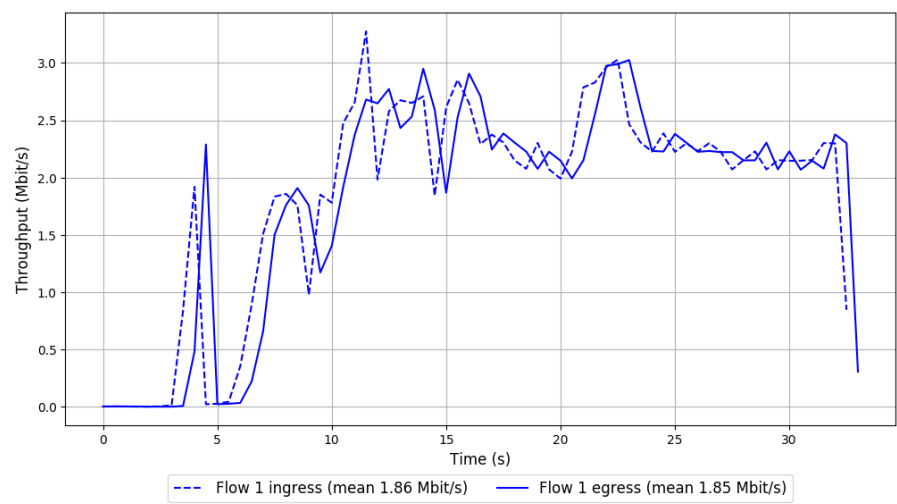Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-09-07 09:23:05
End at: 2018-09-07 09:23:35
Local clock offset: 13.667 ms
Remote clock offset: 15.304 ms


# Below is generated by plot.py at 2018-09-07 12:27:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 112.753 ms
Loss rate: 0.82%
-- Flow 1:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 112.753 ms
Loss rate: 0.82%
```

Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-09-07 09:49:49
End at: 2018-09-07 09:50:19
Local clock offset: 7.518 ms
Remote clock offset: 7.241 ms


# Below is generated by plot.py at 2018-09-07 12:27:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 113.978 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 113.978 ms
Loss rate: 0.83%
```
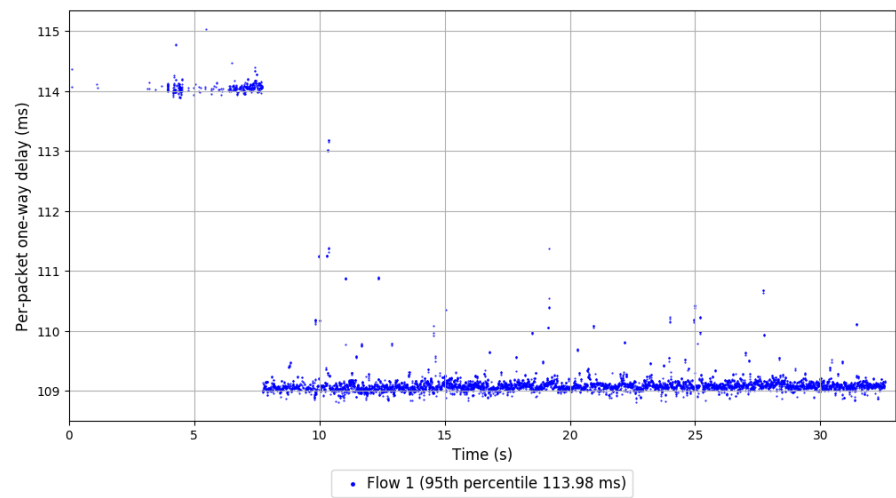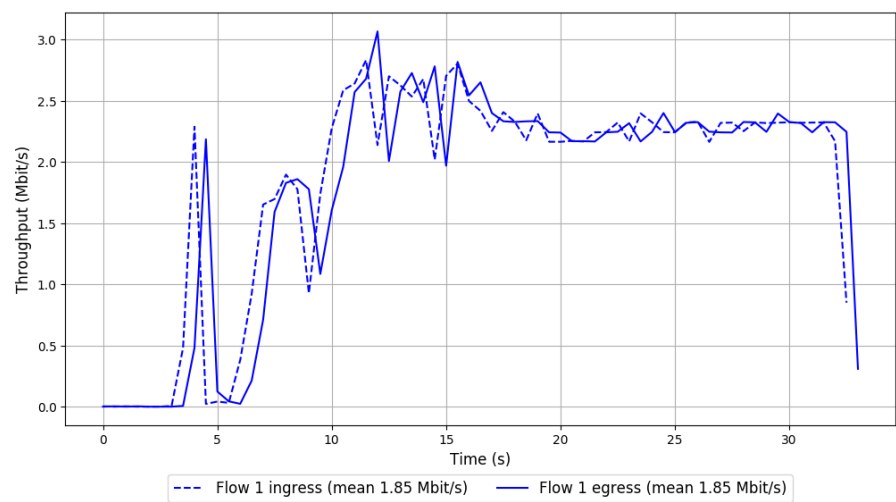
Run 3: Report of WebRTC media — Data Link

Flow 1 ingress (mean 1.85 Mbit/s) —— Flow 1 egress (mean 1.85 Mbit/s)

• Flow 1 (95th percentile 113.98 ms)

```
Run 4: Statistics of WebRTC media

Start at: 2018-09-07 10:16:33
End at: 2018-09-07 10:17:03
Local clock offset: 3.631 ms
Remote clock offset: 4.476 ms


# Below is generated by plot.py at 2018-09-07 12:27:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 107.859 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 107.859 ms
Loss rate: 0.74%
```
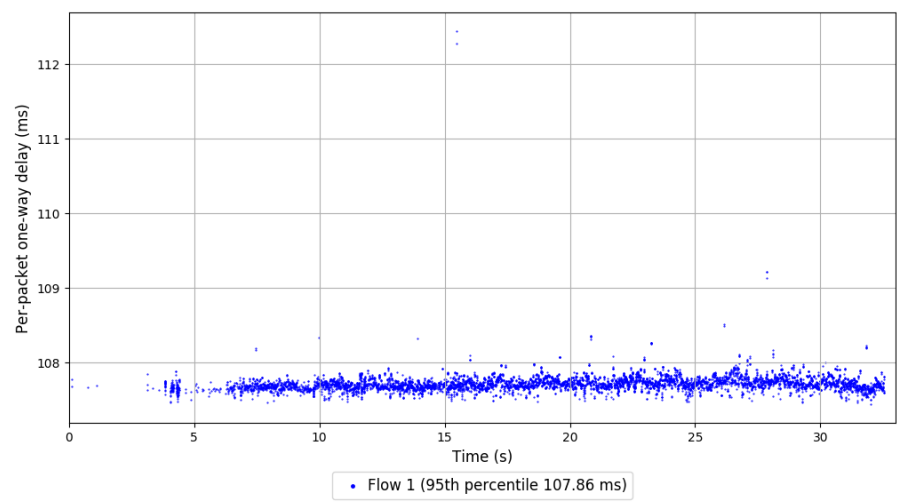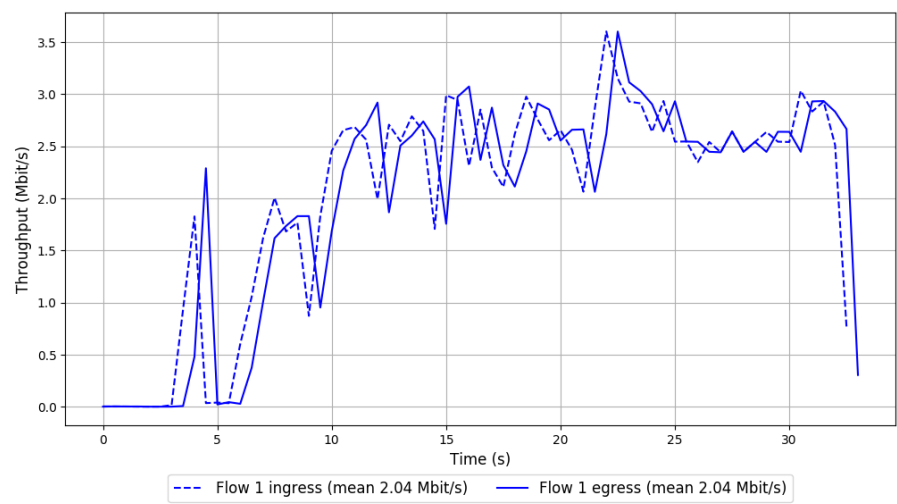
Run 4: Report of WebRTC media — Data Link

Flow 1 ingress (mean 2.04 Mbit/s)   Flow 1 egress (mean 2.04 Mbit/s)

Flow 1 (95th percentile 107.86 ms)

```
Run 5: Statistics of WebRTC media

Start at: 2018-09-07 10:43:19
End at: 2018-09-07 10:43:49
Local clock offset: 1.932 ms
Remote clock offset: 2.119 ms


# Below is generated by plot.py at 2018-09-07 12:27:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 110.289 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 110.289 ms
Loss rate: 0.74%
```

Run 5: Report of WebRTC media — Data Link

Flow 1 ingress (mean 1.91 Mbit/s) ---- Flow 1 egress (mean 1.91 Mbit/s) ——

Flow 1 (95th percentile 110.29 ms)