Pantheon Report

Generated at 2019-01-03 19:49:31 (UTC).

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

Repeated the test of 19 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.
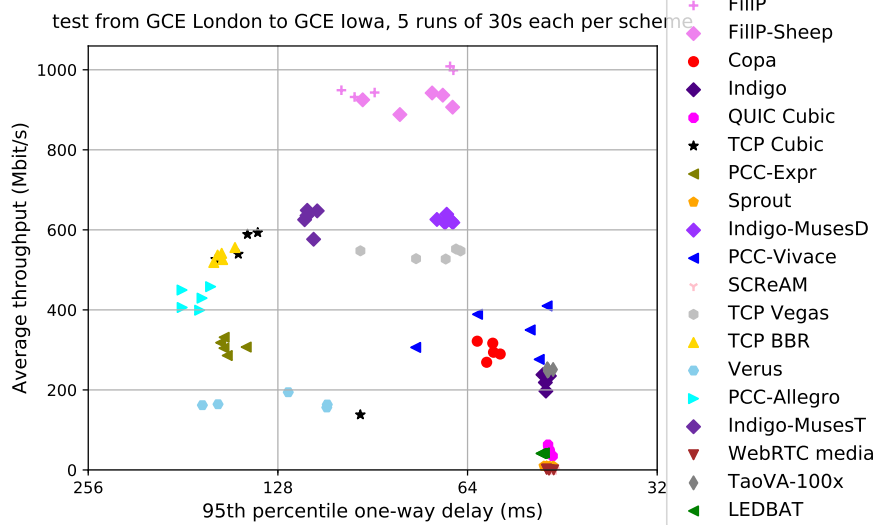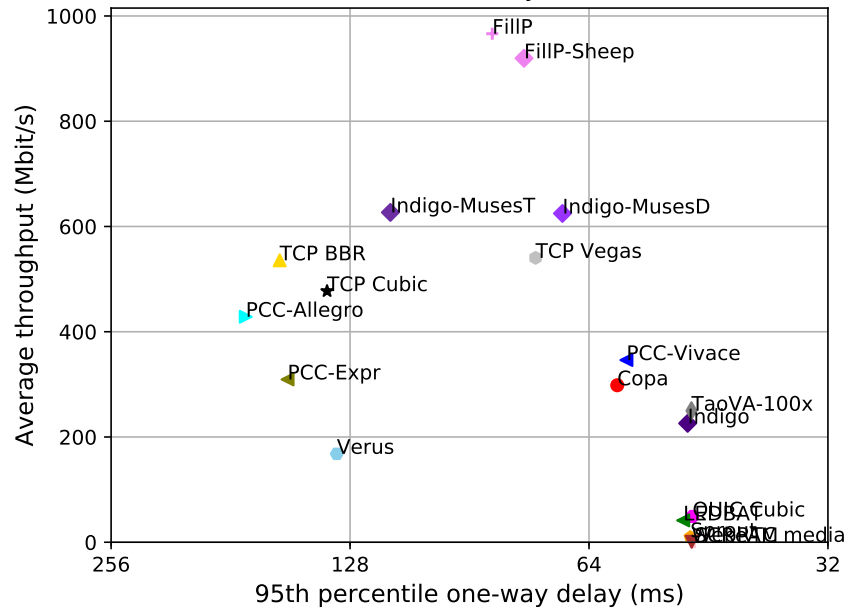
```
System info:
Linux 4.15.0-1025-gcp
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912

Git summary:
branch: muses @ c654af0b7d59d4ef4b914cfac404e1fc2e96dc68
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
third_party/muses-refactored @ 31f8f0ba8ef8b1da76c2bc0cd0a7850c33ff64fb
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
 M receiver/src/buffer.h
 M receiver/src/core.cpp
 M sender/src/buffer.h
 M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
 M src/ScreamClient
 M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
 M src/examples/cellsim.cc
 M src/examples/sproutbt2.cc
 M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
 M src/verus.hpp
 M tools/plot.py
```

```
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from GCE London to GCE Iowa, 5 runs of 30s each per scheme
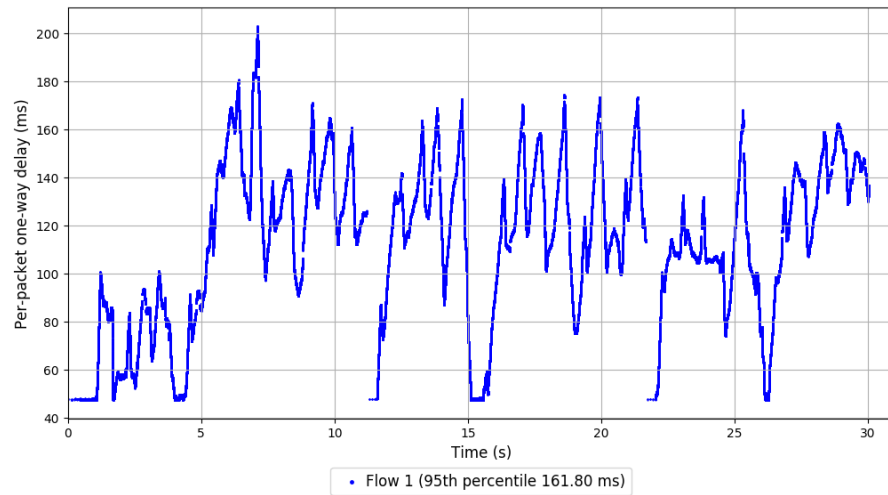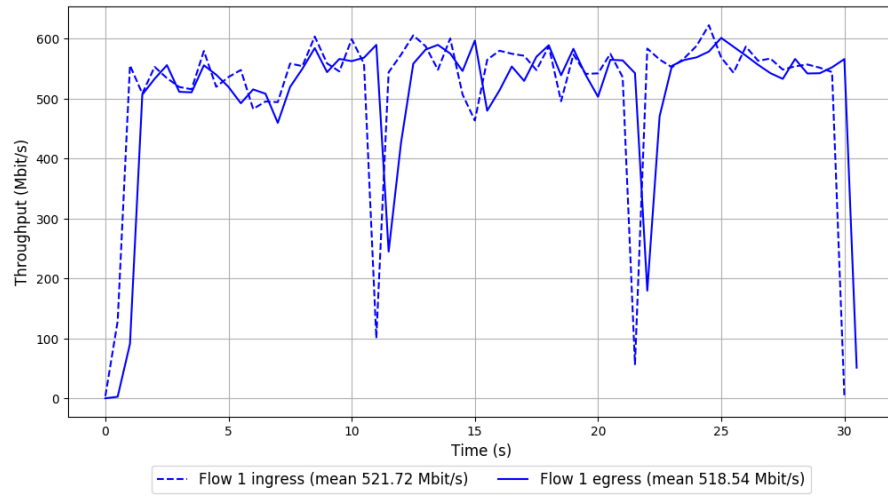(mean of all runs by scheme)

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

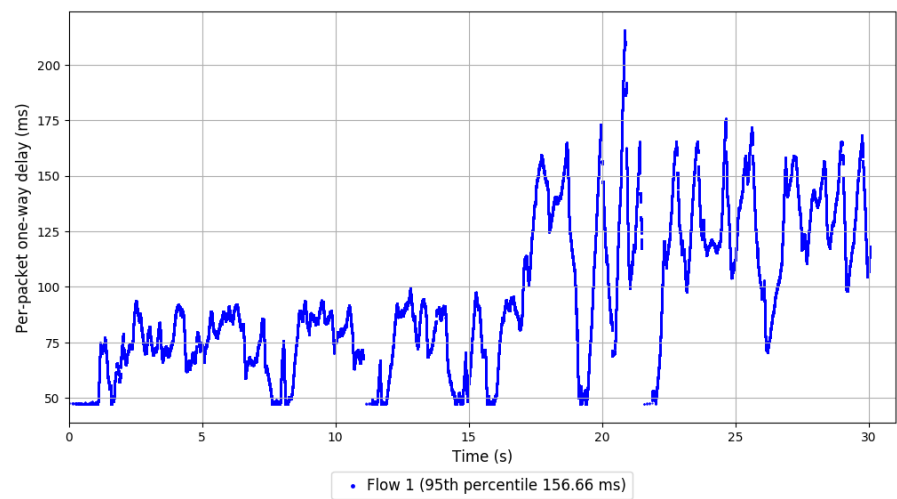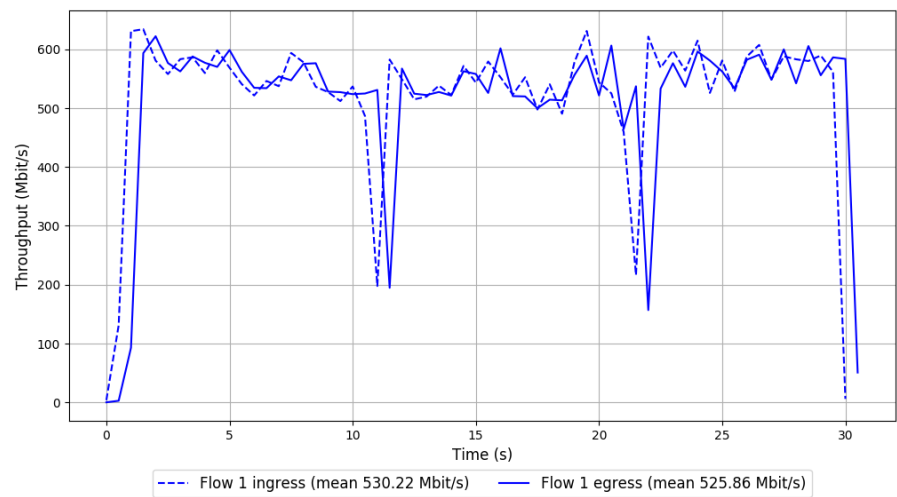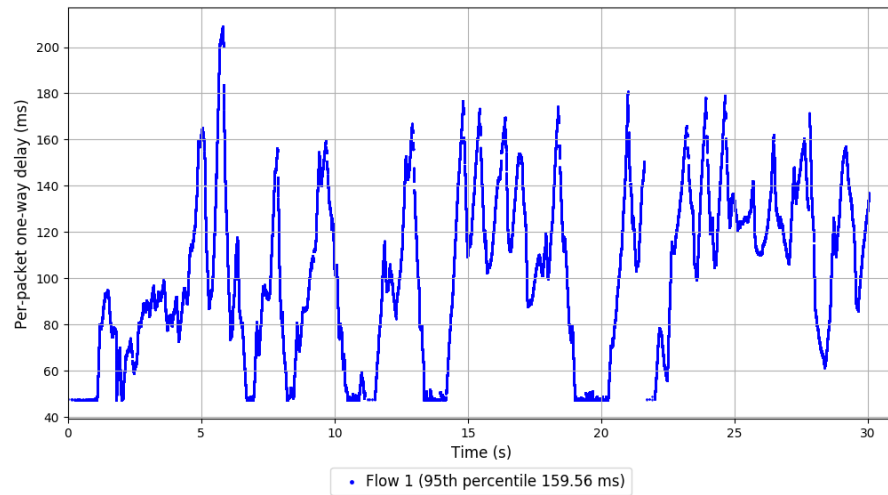| scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	5	535.76	156.99	0.89
Copa	5	298.28	58.96	0.01
TCP Cubic	5	477.20	136.83	0.14
FillP	5	966.30	84.74	0.30
FillP-Sheep	5	919.66	77.27	0.26
Indigo	5	225.95	48.07	0.00
Indigo-MusesD	5	624.75	69.12	0.02
Indigo-MusesT	5	626.74	113.86	0.12
LEDBAT	5	41.47	48.70	0.00
PCC-Allegro	5	428.44	173.23	4.98
PCC-Expr	5	309.39	153.45	3.44
QUIC Cubic	5	49.02	47.41	0.00
SCReAM	5	0.22	47.16	0.00
Sprout	5	9.61	47.70	0.00
TaoVA-100x	5	249.97	47.55	0.00
TCP Vegas	5	540.40	74.73	0.03
Verus	5	168.01	133.02	0.54
PCC-Vivace	5	346.24	57.42	0.00
WebRTC media	5	0.82	47.53	0.00

```
Run 1: Statistics of TCP BBR

Start at: 2019-01-03 15:47:19
End at: 2019-01-03 15:47:49
Local clock offset: -0.27 ms
Remote clock offset: -0.083 ms


# Below is generated by plot.py at 2019-01-03 18:18:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 518.54 Mbit/s
95th percentile per-packet one-way delay: 161.796 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 518.54 Mbit/s
95th percentile per-packet one-way delay: 161.796 ms
Loss rate: 0.61%
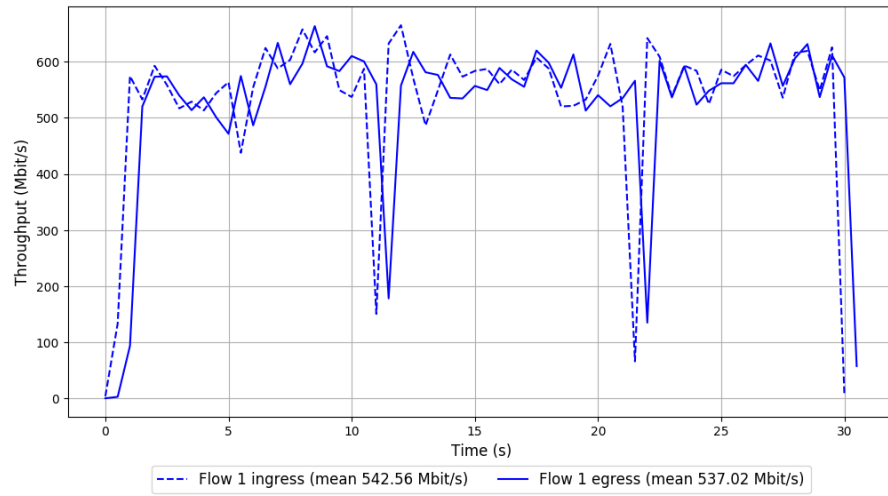```

Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2019-01-03 16:14:53
End at: 2019-01-03 16:15:23
Local clock offset: -0.145 ms
Remote clock offset: -0.064 ms

Below is generated by plot.py at 2019-01-03 18:18:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 525.86 Mbit/s
95th percentile per-packet one-way delay: 156.659 ms
Loss rate: 0.82%
-- Flow 1:
Average throughput: 525.86 Mbit/s
95th percentile per-packet one-way delay: 156.659 ms
Loss rate: 0.82%
```
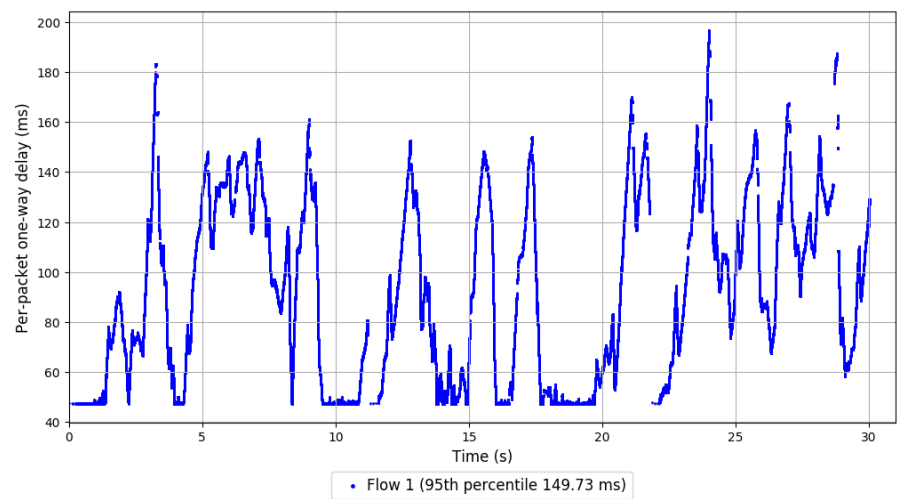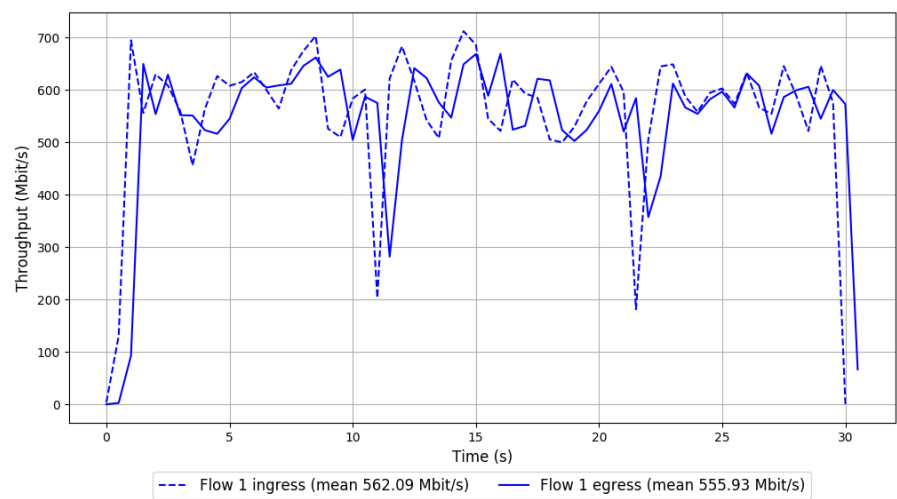
Run 2: Report of TCP BBR — Data Link



Flow 1 ingress (mean 530.22 Mbit/s) ----    Flow 1 egress (mean 525.86 Mbit/s) ——



Flow 1 (95th percentile 156.66 ms)

```
Run 3: Statistics of TCP BBR

Start at: 2019-01-03 16:42:19
End at: 2019-01-03 16:42:49
Local clock offset: -0.061 ms
Remote clock offset: -0.044 ms

Below is generated by plot.py at 2019-01-03 18:18:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 537.02 Mbit/s
95th percentile per-packet one-way delay: 159.560 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 537.02 Mbit/s
95th percentile per-packet one-way delay: 159.560 ms
Loss rate: 1.02%
```
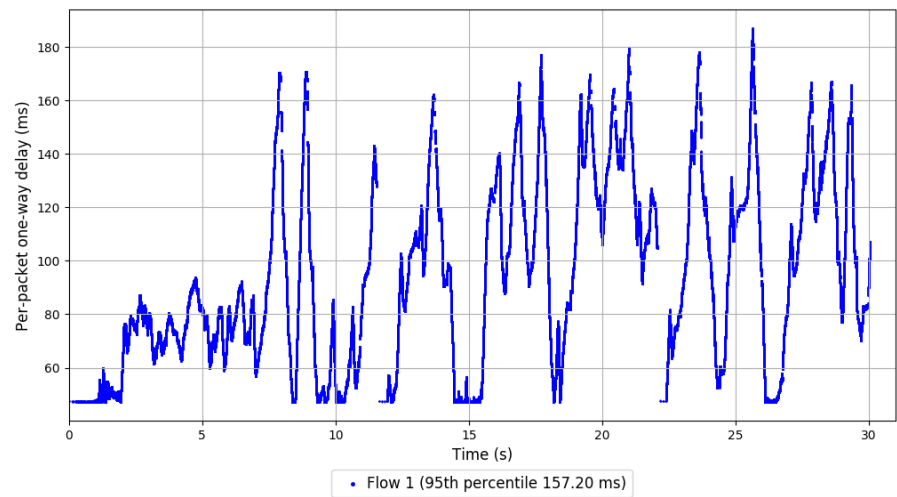
Run 3: Report of TCP BBR — Data Link

```
Run 4: Statistics of TCP BBR

Start at: 2019-01-03 17:09:28
End at: 2019-01-03 17:09:58
Local clock offset: -0.082 ms
Remote clock offset: -0.003 ms

Below is generated by plot.py at 2019-01-03 18:18:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 555.93 Mbit/s
95th percentile per-packet one-way delay: 149.726 ms
Loss rate: 1.17%
-- Flow 1:
Average throughput: 555.93 Mbit/s
95th percentile per-packet one-way delay: 149.726 ms
Loss rate: 1.17%
```
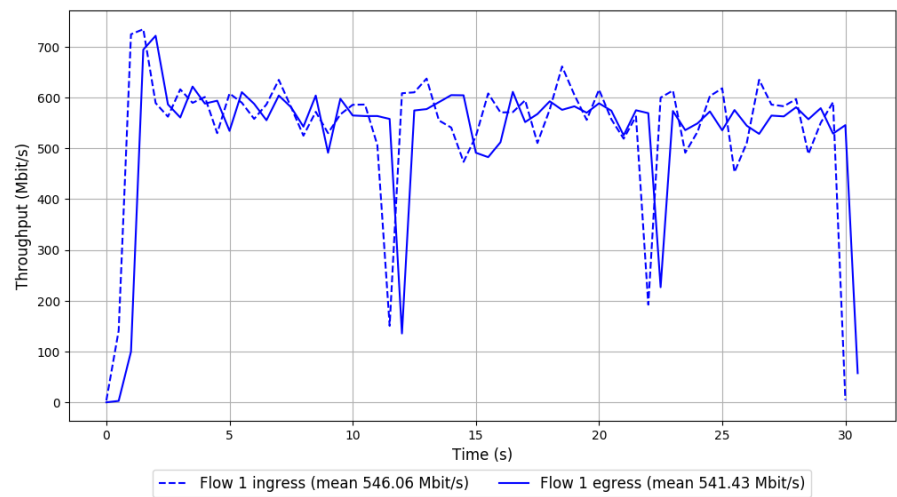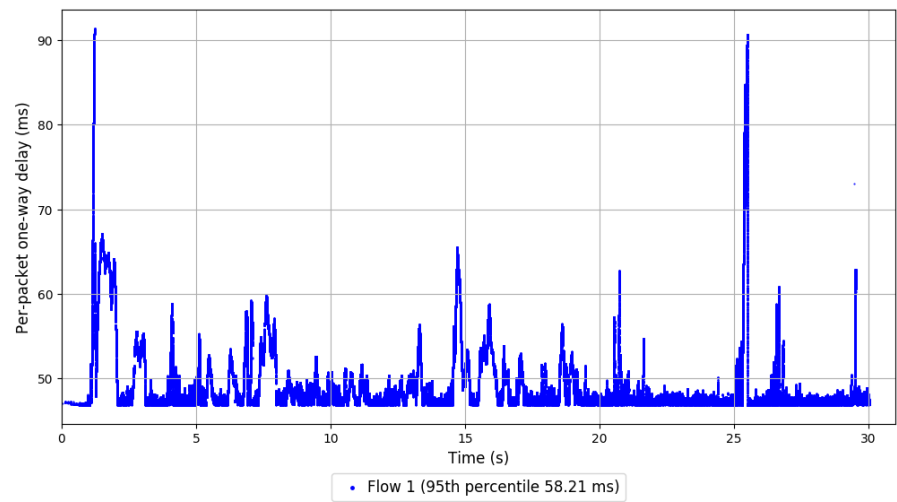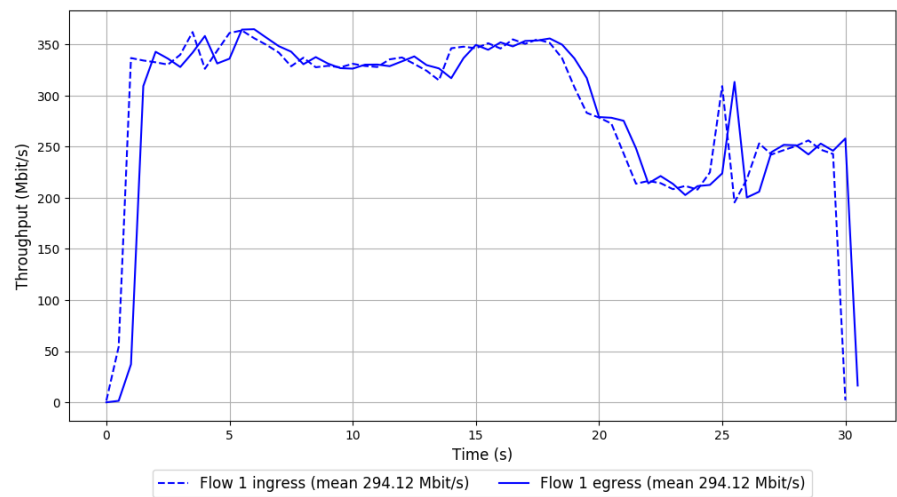
Run 4: Report of TCP BBR — Data Link



Flow 1 ingress (mean 562.09 Mbit/s) — — — — Flow 1 egress (mean 555.93 Mbit/s)
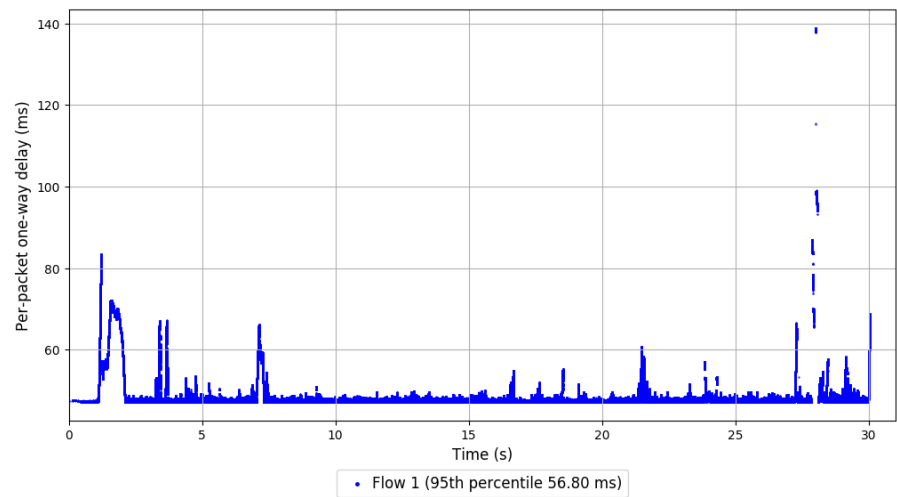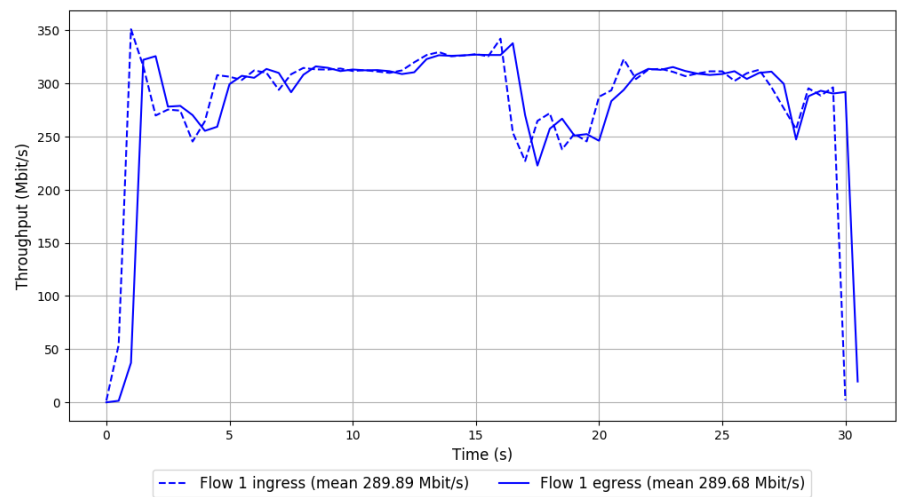


Flow 1 (95th percentile 149.73 ms)

```
Run 5: Statistics of TCP BBR

Start at: 2019-01-03 17:37:18
End at: 2019-01-03 17:37:48
Local clock offset: -0.124 ms
Remote clock offset: 0.04 ms


# Below is generated by plot.py at 2019-01-03 18:18:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 541.43 Mbit/s
95th percentile per-packet one-way delay: 157.196 ms
Loss rate: 0.85%
-- Flow 1:
Average throughput: 541.43 Mbit/s
95th percentile per-packet one-way delay: 157.196 ms
Loss rate: 0.85%
```

Run 5: Report of TCP BBR — Data Link

Flow 1 ingress (mean 546.06 Mbit/s) --- Flow 1 egress (mean 541.43 Mbit/s)

Flow 1 (95th percentile 157.20 ms)

14

```
Run 1: Statistics of Copa

Start at: 2019-01-03 16:05:32
End at: 2019-01-03 16:06:02
Local clock offset: 0.108 ms
Remote clock offset: -0.108 ms


# Below is generated by plot.py at 2019-01-03 18:18:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 294.12 Mbit/s
95th percentile per-packet one-way delay: 58.206 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 294.12 Mbit/s
95th percentile per-packet one-way delay: 58.206 ms
Loss rate: 0.00%
```
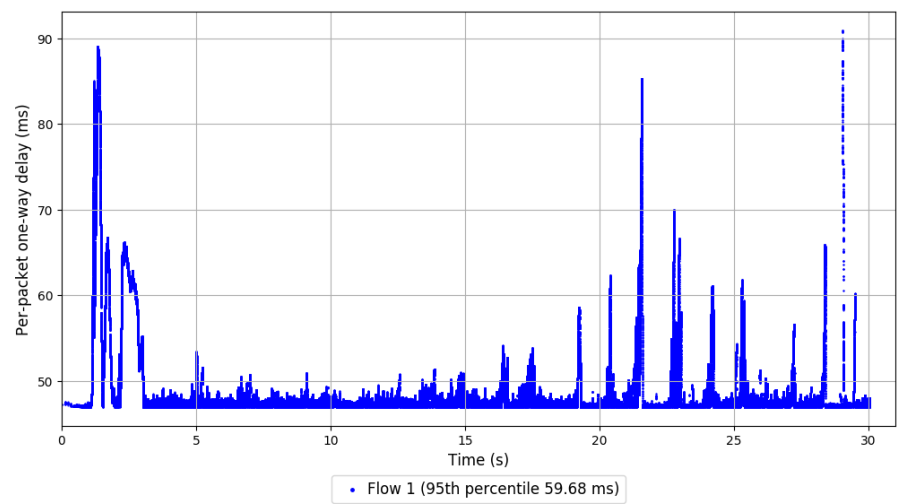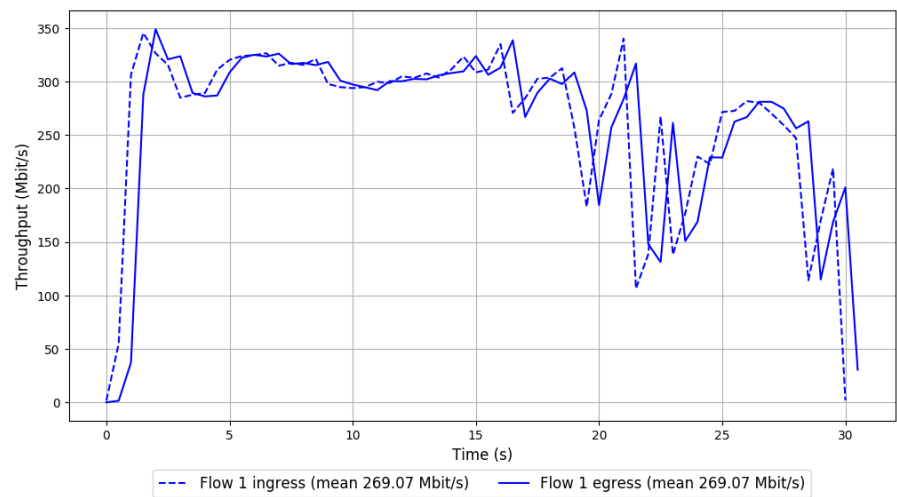
Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2019-01-03 16:33:01
End at: 2019-01-03 16:33:31
Local clock offset: -0.051 ms
Remote clock offset: -0.023 ms


# Below is generated by plot.py at 2019-01-03 18:18:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 289.68 Mbit/s
95th percentile per-packet one-way delay: 56.797 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 289.68 Mbit/s
95th percentile per-packet one-way delay: 56.797 ms
Loss rate: 0.07%
```
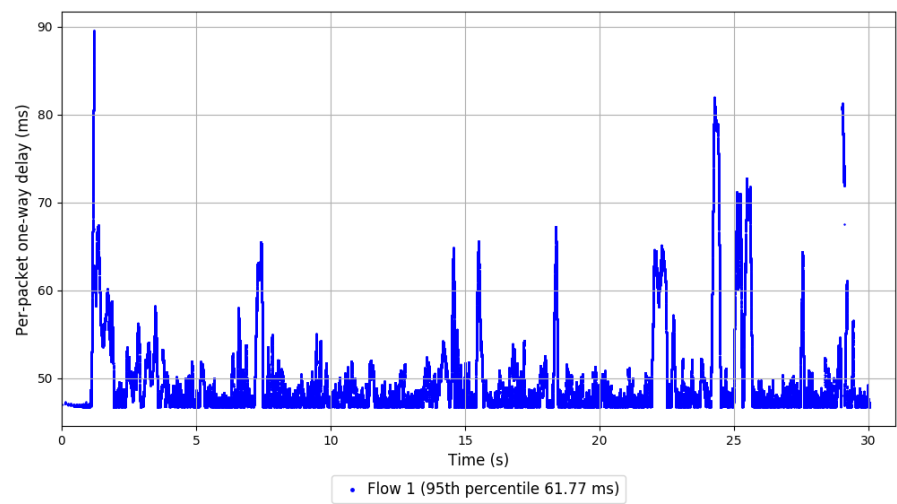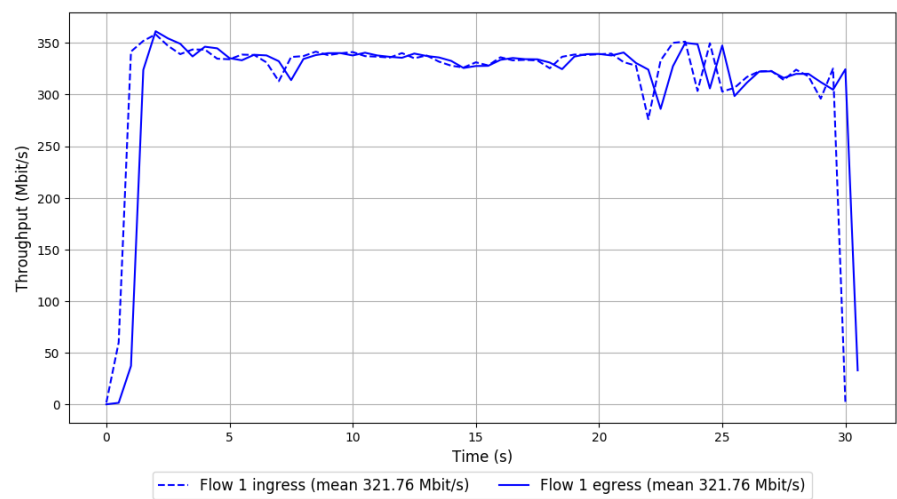
Run 2: Report of Copa — Data Link

Flow 1 ingress (mean 289.89 Mbit/s)   Flow 1 egress (mean 289.68 Mbit/s)

• Flow 1 (95th percentile 56.80 ms)

```
Run 3: Statistics of Copa

Start at: 2019-01-03 17:00:32
End at: 2019-01-03 17:01:02
Local clock offset: 0.266 ms
Remote clock offset: 0.031 ms


# Below is generated by plot.py at 2019-01-03 18:18:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 269.07 Mbit/s
95th percentile per-packet one-way delay: 59.681 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 269.07 Mbit/s
95th percentile per-packet one-way delay: 59.681 ms
Loss rate: 0.00%
```
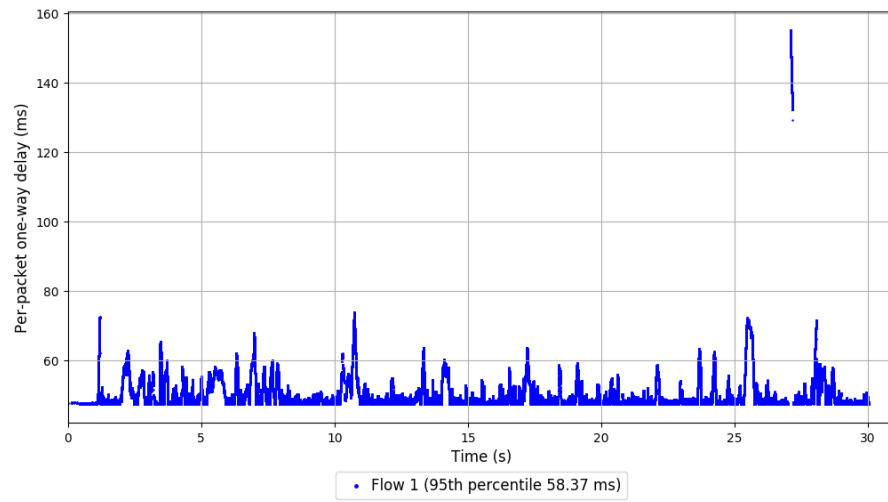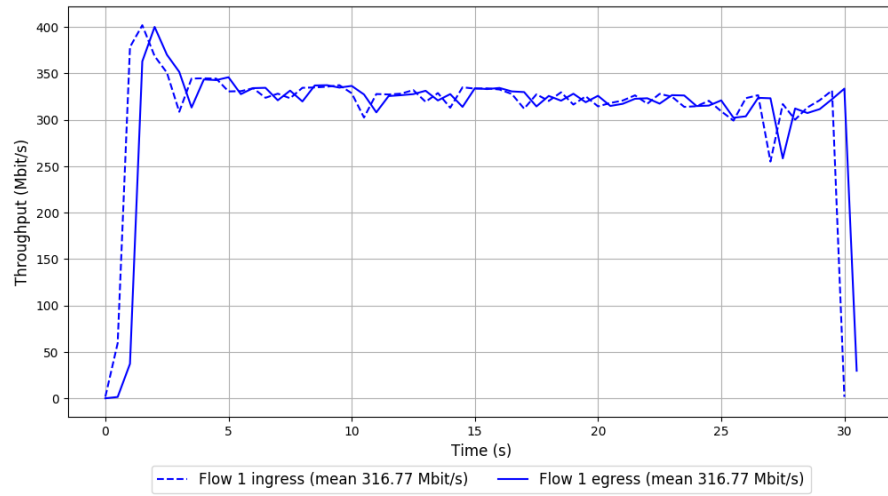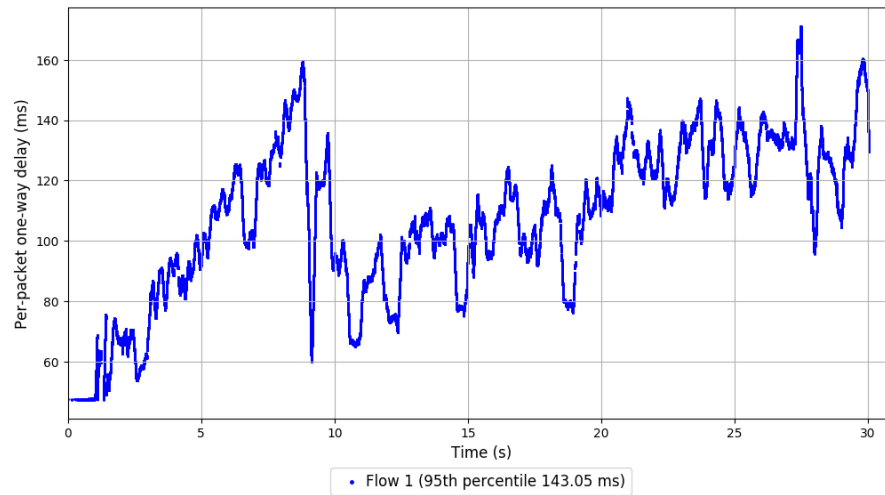
Run 3: Report of Copa — Data Link

```
Run 4: Statistics of Copa

Start at: 2019-01-03 17:27:57
End at: 2019-01-03 17:28:27
Local clock offset: -0.496 ms
Remote clock offset: 0.036 ms


# Below is generated by plot.py at 2019-01-03 18:28:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 321.76 Mbit/s
95th percentile per-packet one-way delay: 61.769 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 321.76 Mbit/s
95th percentile per-packet one-way delay: 61.769 ms
Loss rate: 0.00%
```

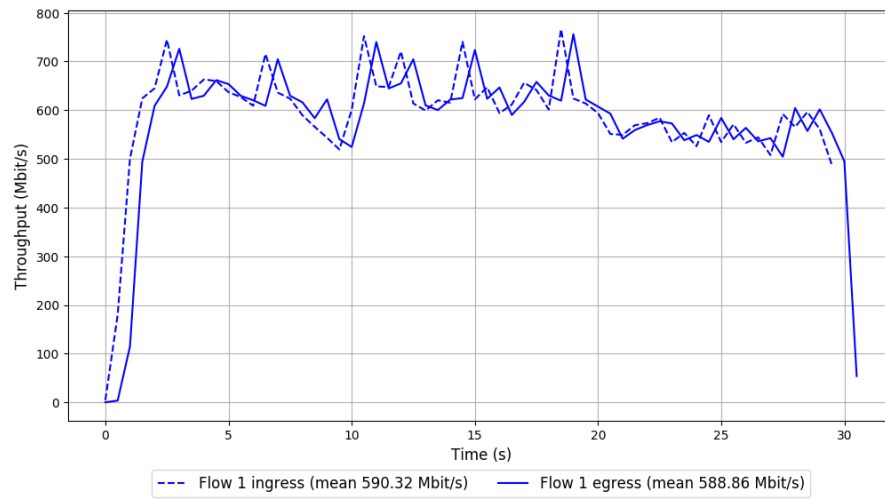## Run 4: Report of Copa — Data Link

Flow 1 ingress (mean 321.76 Mbit/s)   Flow 1 egress (mean 321.76 Mbit/s)

Flow 1 (95th percentile 61.77 ms)

```
Run 5: Statistics of Copa

Start at: 2019-01-03 17:55:41
End at: 2019-01-03 17:56:11
Local clock offset: -0.12 ms
Remote clock offset: 0.05 ms


# Below is generated by plot.py at 2019-01-03 18:28:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 316.77 Mbit/s
95th percentile per-packet one-way delay: 58.368 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 316.77 Mbit/s
95th percentile per-packet one-way delay: 58.368 ms
Loss rate: 0.00%
```

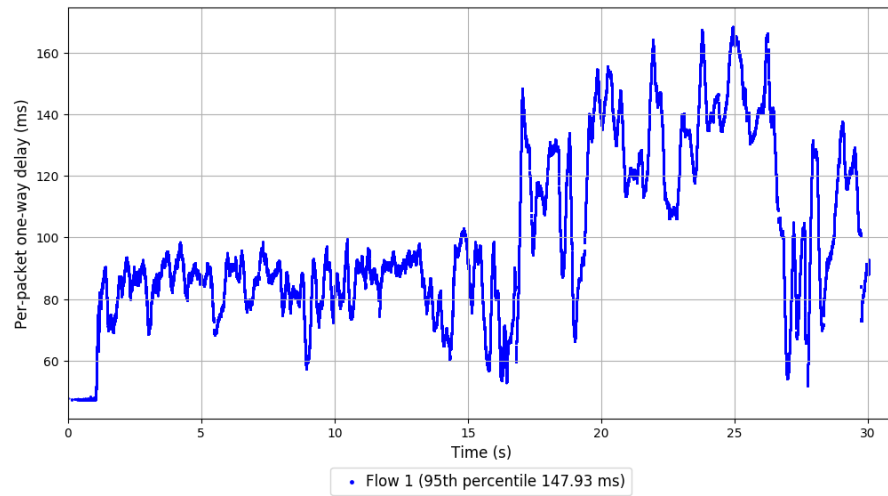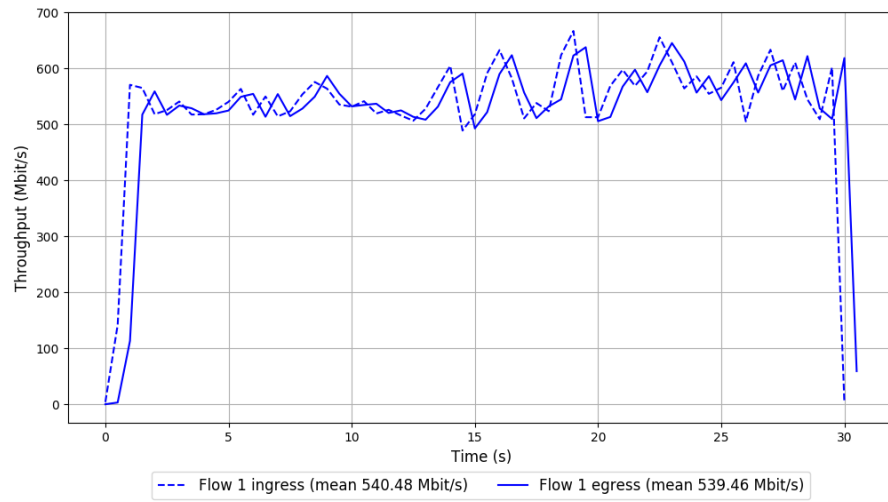Run 5: Report of Copa — Data Link

```
Run 1: Statistics of TCP Cubic

Start at: 2019-01-03 15:40:40
End at: 2019-01-03 15:41:10
Local clock offset: -0.224 ms
Remote clock offset: -0.056 ms


# Below is generated by plot.py at 2019-01-03 18:28:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 588.86 Mbit/s
95th percentile per-packet one-way delay: 143.054 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 588.86 Mbit/s
95th percentile per-packet one-way delay: 143.054 ms
Loss rate: 0.25%
```
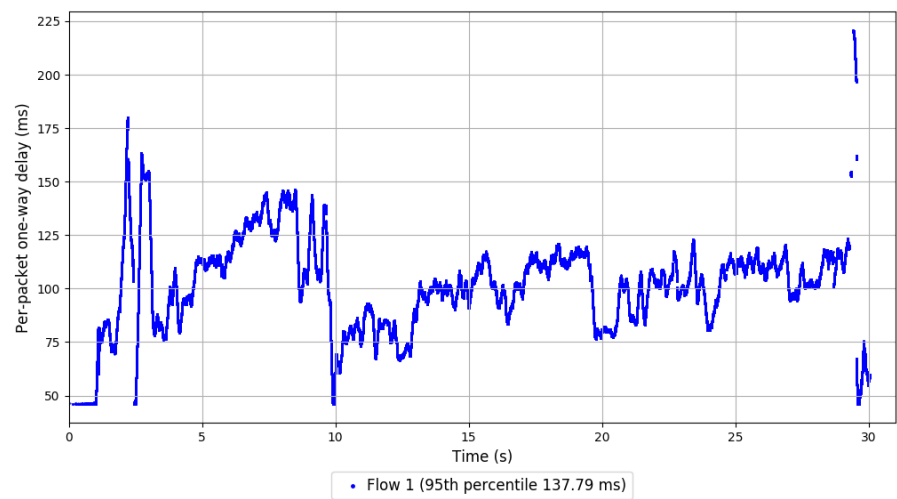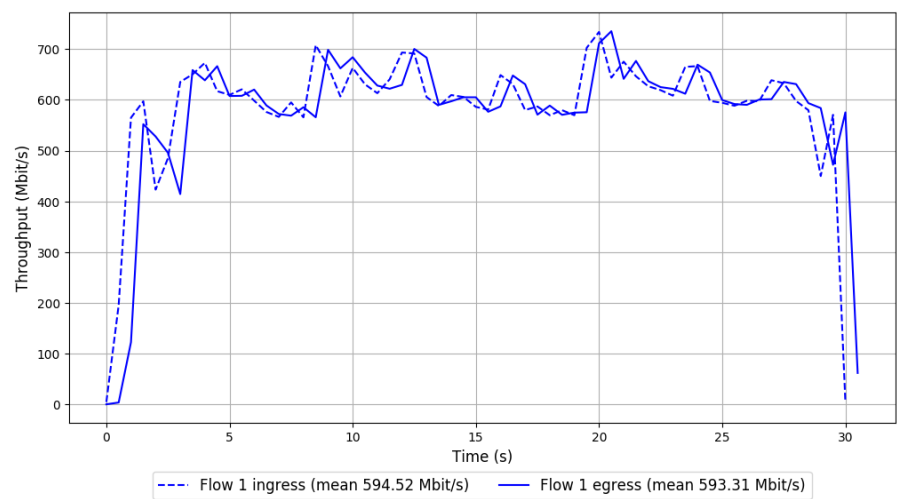
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2019-01-03 16:08:16
End at: 2019-01-03 16:08:46
Local clock offset: -0.276 ms
Remote clock offset: -0.116 ms


# Below is generated by plot.py at 2019-01-03 18:28:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 539.46 Mbit/s
95th percentile per-packet one-way delay: 147.929 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 539.46 Mbit/s
95th percentile per-packet one-way delay: 147.929 ms
Loss rate: 0.19%
```
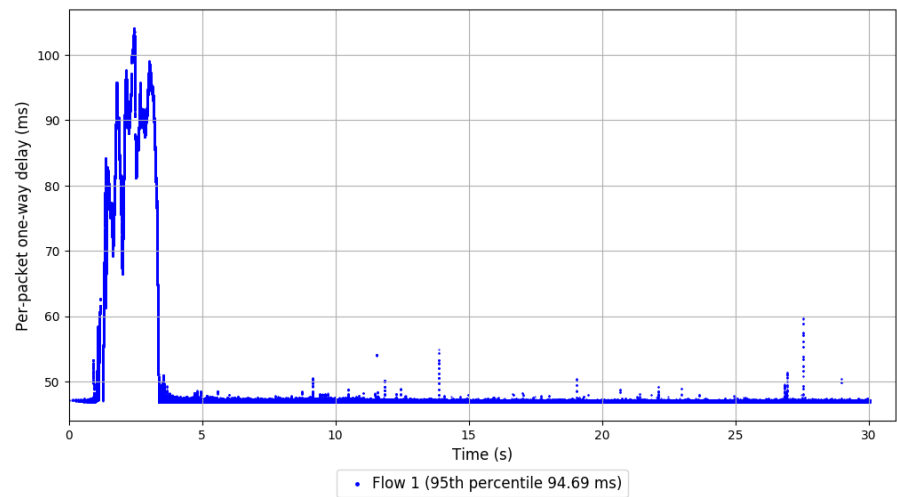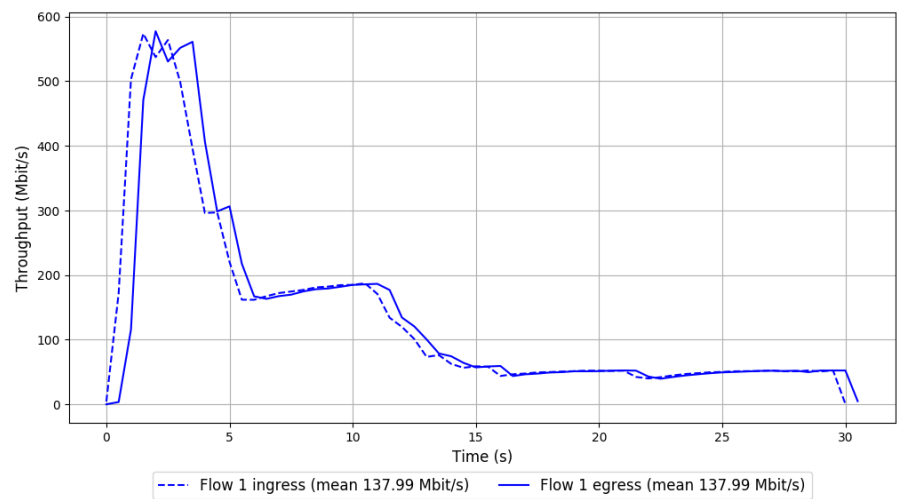
Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 540.48 Mbit/s) — — — Flow 1 egress (mean 539.46 Mbit/s)

• Flow 1 (95th percentile 147.93 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2019-01-03 16:35:45
End at: 2019-01-03 16:36:15
Local clock offset: 0.337 ms
Remote clock offset: -0.045 ms


# Below is generated by plot.py at 2019-01-03 18:28:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 593.31 Mbit/s
95th percentile per-packet one-way delay: 137.788 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 593.31 Mbit/s
95th percentile per-packet one-way delay: 137.788 ms
Loss rate: 0.20%
```
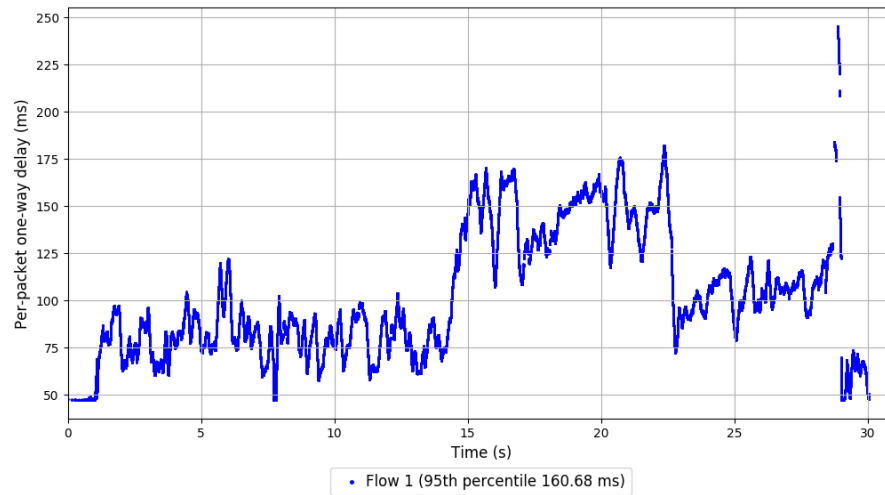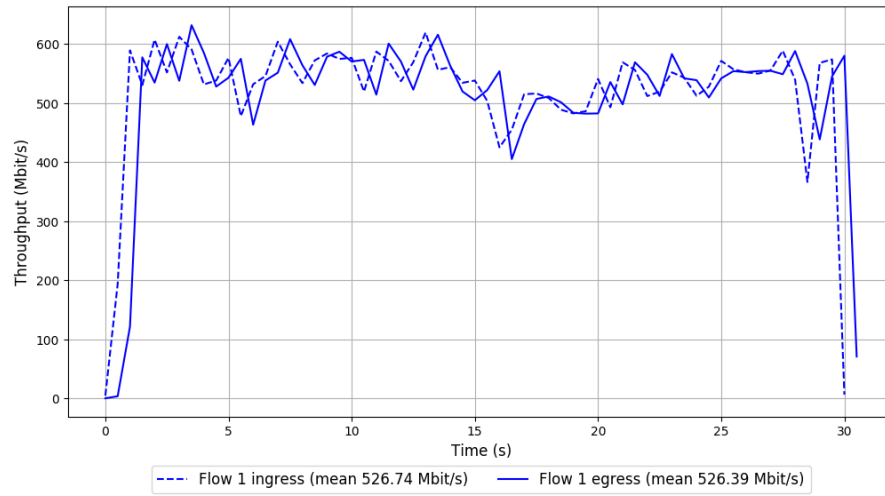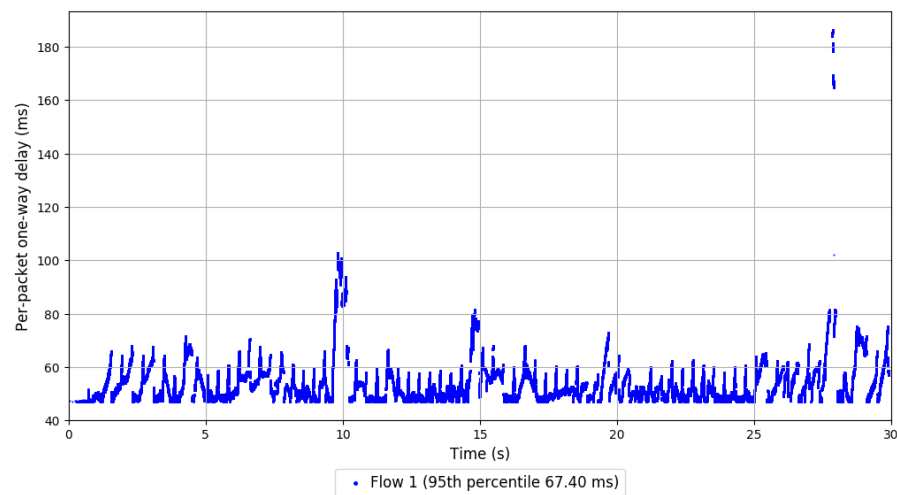
Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 594.52 Mbit/s)   Flow 1 egress (mean 593.31 Mbit/s)

Flow 1 (95th percentile 137.79 ms)

```
Run 4: Statistics of TCP Cubic

Start at: 2019-01-03 17:03:14
End at: 2019-01-03 17:03:44
Local clock offset: 0.283 ms
Remote clock offset: 0.039 ms


# Below is generated by plot.py at 2019-01-03 18:28:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 137.99 Mbit/s
95th percentile per-packet one-way delay: 94.693 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 137.99 Mbit/s
95th percentile per-packet one-way delay: 94.693 ms
Loss rate: 0.00%
```
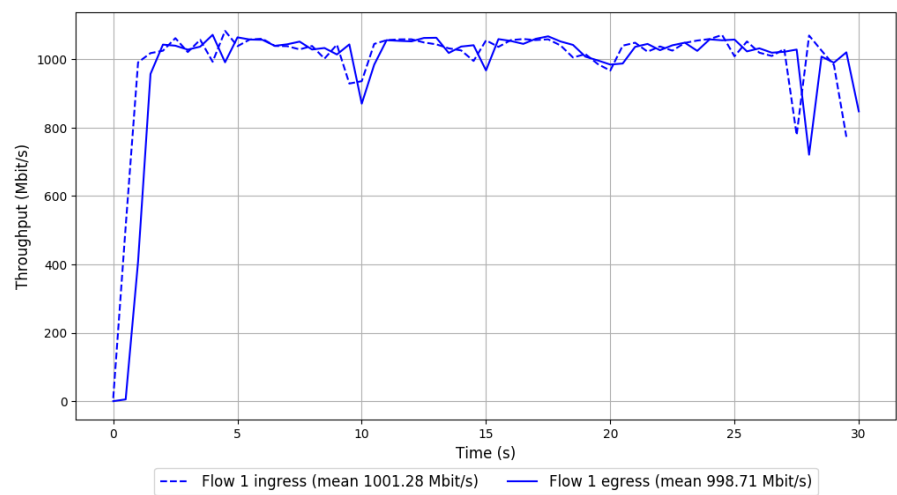
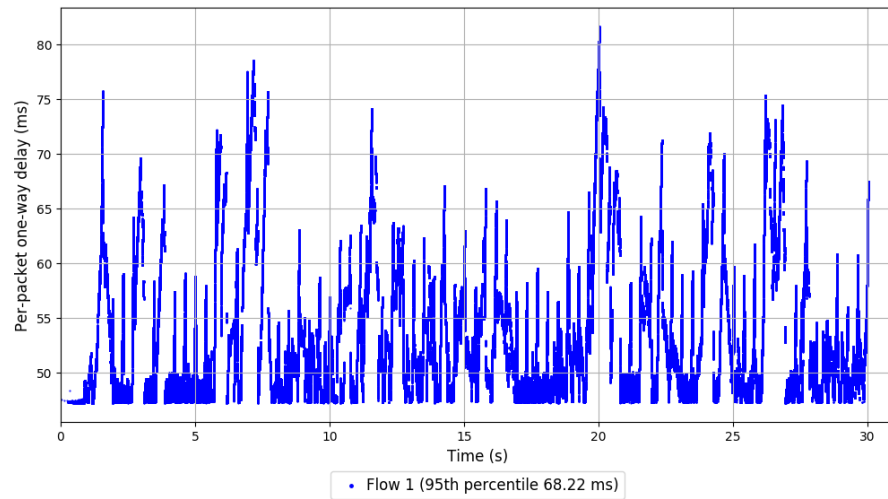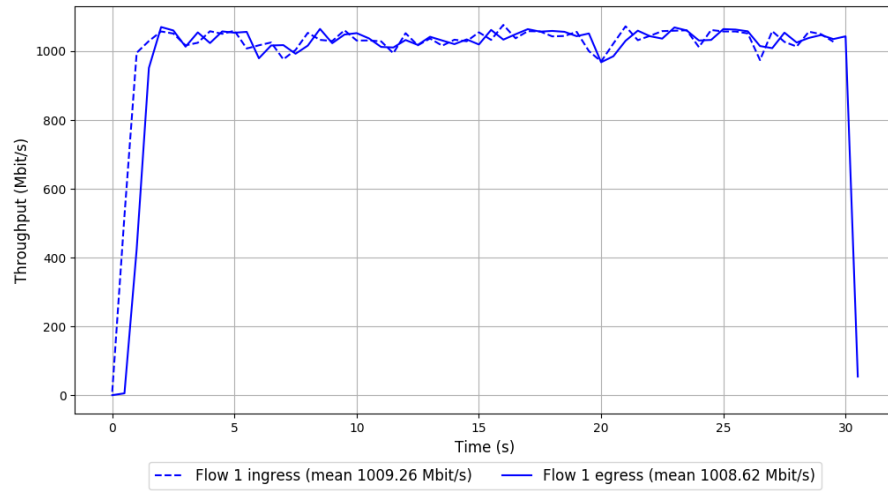Run 4: Report of TCP Cubic — Data Link

```
Run 5: Statistics of TCP Cubic

Start at: 2019-01-03 17:30:43
End at: 2019-01-03 17:31:13
Local clock offset: -0.176 ms
Remote clock offset: 0.041 ms


# Below is generated by plot.py at 2019-01-03 18:28:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 526.39 Mbit/s
95th percentile per-packet one-way delay: 160.679 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 526.39 Mbit/s
95th percentile per-packet one-way delay: 160.679 ms
Loss rate: 0.06%
```

Run 5: Report of TCP Cubic — Data Link

```
Run 1: Statistics of FillP

Start at: 2019-01-03 15:42:18
End at: 2019-01-03 15:42:48
Local clock offset: -0.21 ms
Remote clock offset: -0.038 ms


# Below is generated by plot.py at 2019-01-03 18:37:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 998.71 Mbit/s
95th percentile per-packet one-way delay: 67.399 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 998.71 Mbit/s
95th percentile per-packet one-way delay: 67.399 ms
Loss rate: 0.26%
```

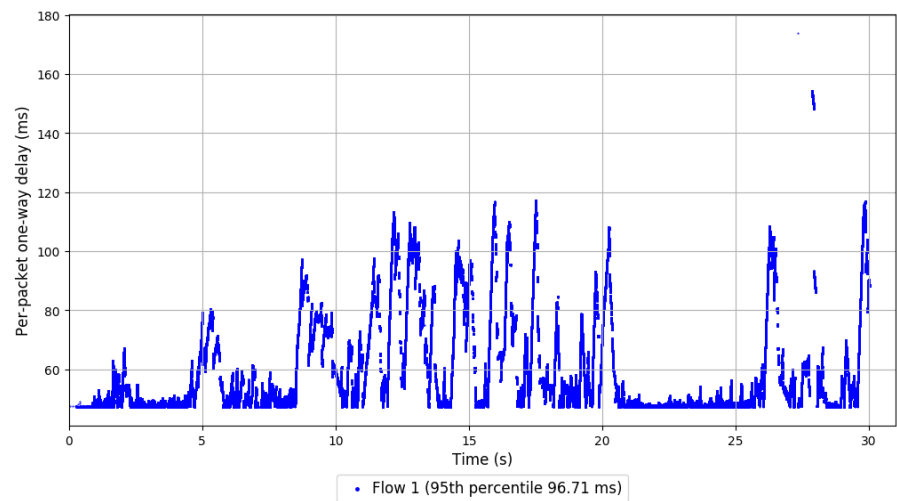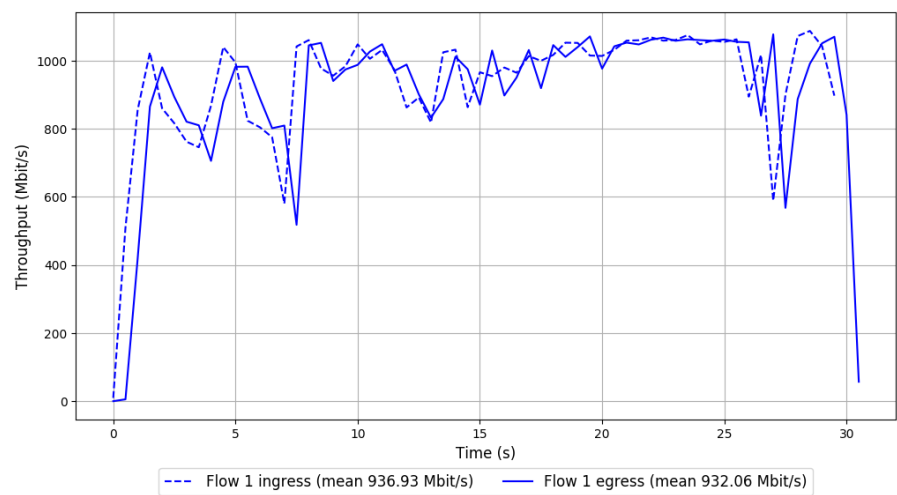Run 1: Report of FillP — Data Link

Flow 1 ingress (mean 1001.28 Mbit/s) --- Flow 1 egress (mean 998.71 Mbit/s)

Flow 1 (95th percentile 67.40 ms)

```
Run 2: Statistics of FillP

Start at: 2019-01-03 16:09:50
End at: 2019-01-03 16:10:20
Local clock offset: -0.262 ms
Remote clock offset: -0.117 ms


# Below is generated by plot.py at 2019-01-03 18:39:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1008.62 Mbit/s
95th percentile per-packet one-way delay: 68.219 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 1008.62 Mbit/s
95th percentile per-packet one-way delay: 68.219 ms
Loss rate: 0.06%
```
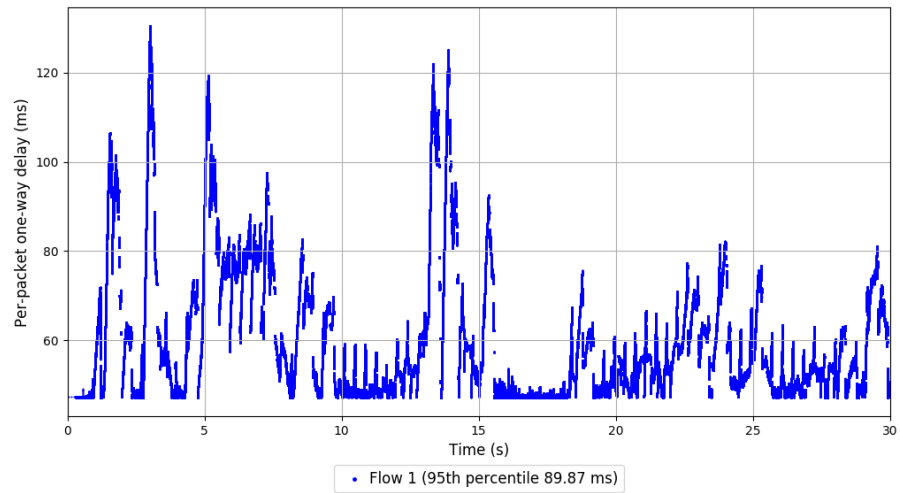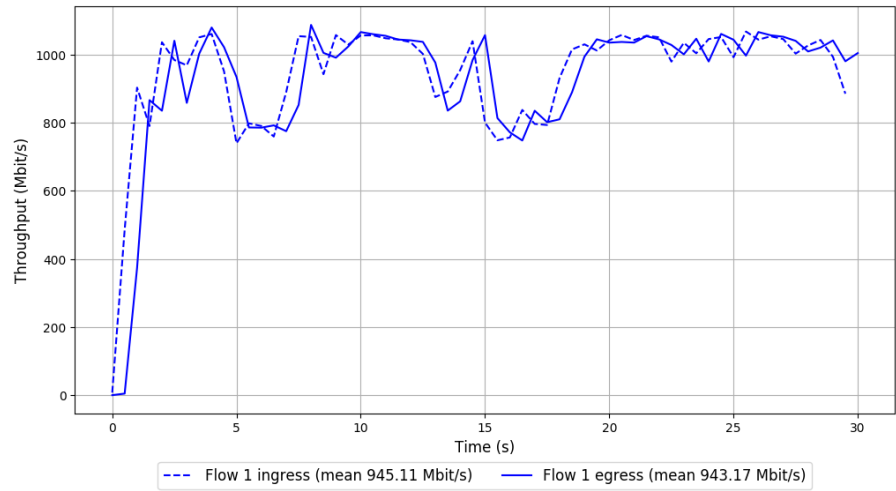
Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2019-01-03 16:37:20
End at: 2019-01-03 16:37:50
Local clock offset: -0.016 ms
Remote clock offset: -0.058 ms


# Below is generated by plot.py at 2019-01-03 18:48:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 932.06 Mbit/s
95th percentile per-packet one-way delay: 96.713 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 932.06 Mbit/s
95th percentile per-packet one-way delay: 96.713 ms
Loss rate: 0.52%
```
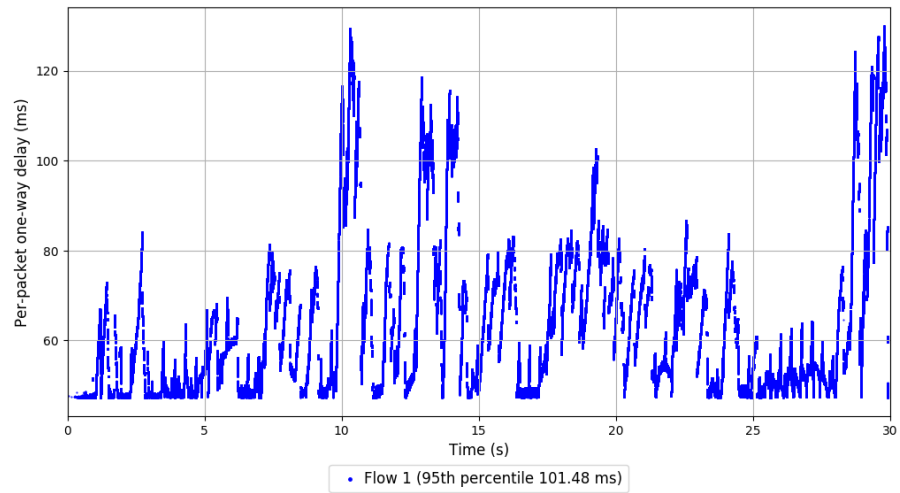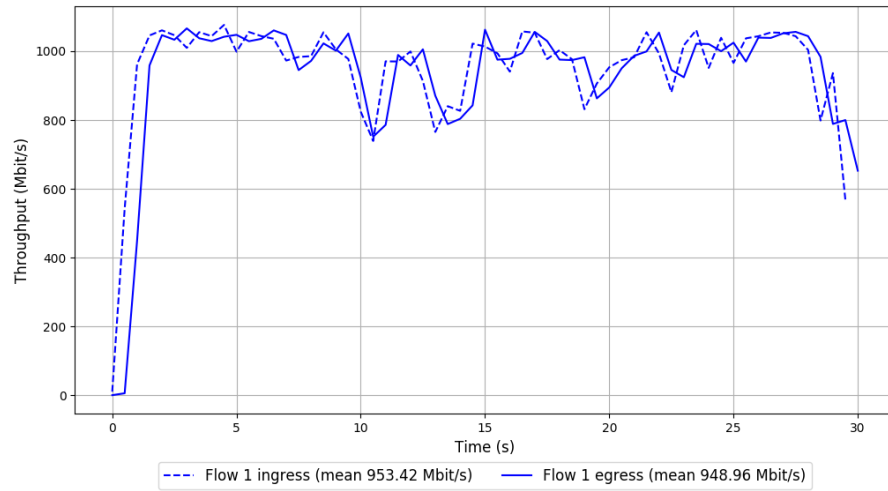
Run 3: Report of FillP — Data Link

Flow 1 ingress (mean 936.93 Mbit/s)   Flow 1 egress (mean 932.06 Mbit/s)

Flow 1 (95th percentile 96.71 ms)

```
Run 4: Statistics of FillP

Start at: 2019-01-03 17:04:28
End at: 2019-01-03 17:04:58
Local clock offset: -0.105 ms
Remote clock offset: 0.005 ms


# Below is generated by plot.py at 2019-01-03 18:48:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 943.17 Mbit/s
95th percentile per-packet one-way delay: 89.868 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 943.17 Mbit/s
95th percentile per-packet one-way delay: 89.868 ms
Loss rate: 0.20%
```
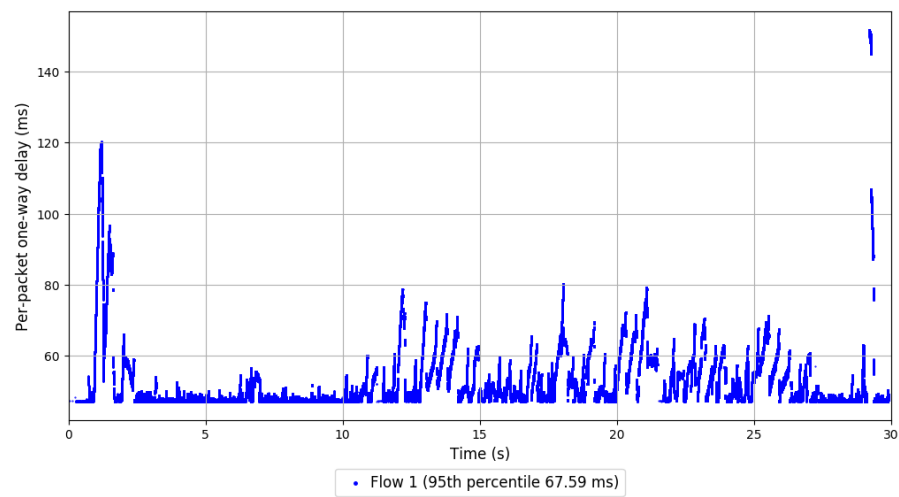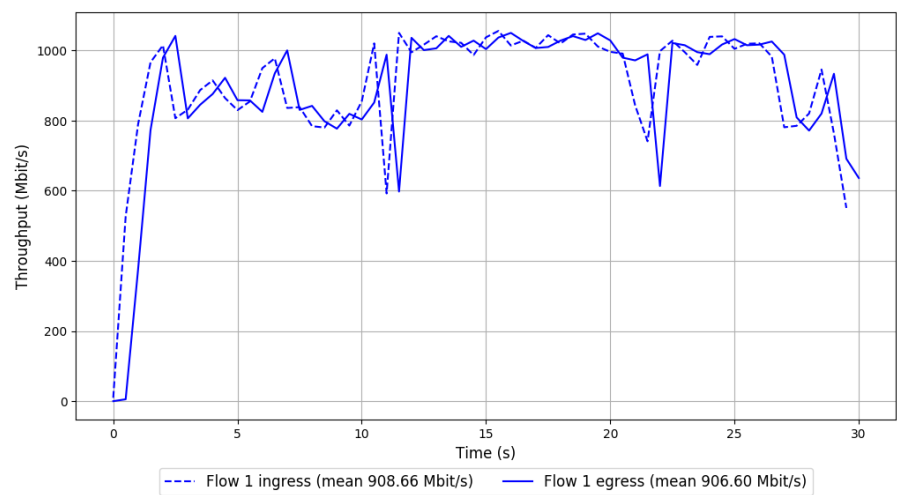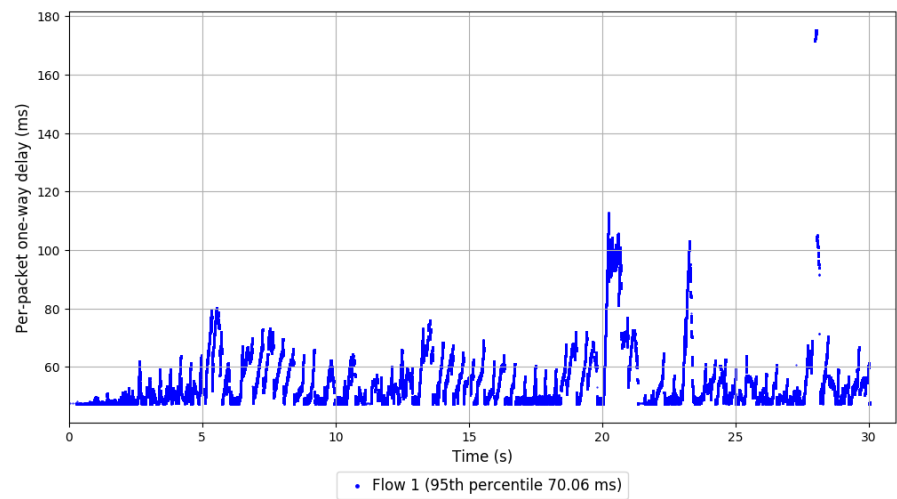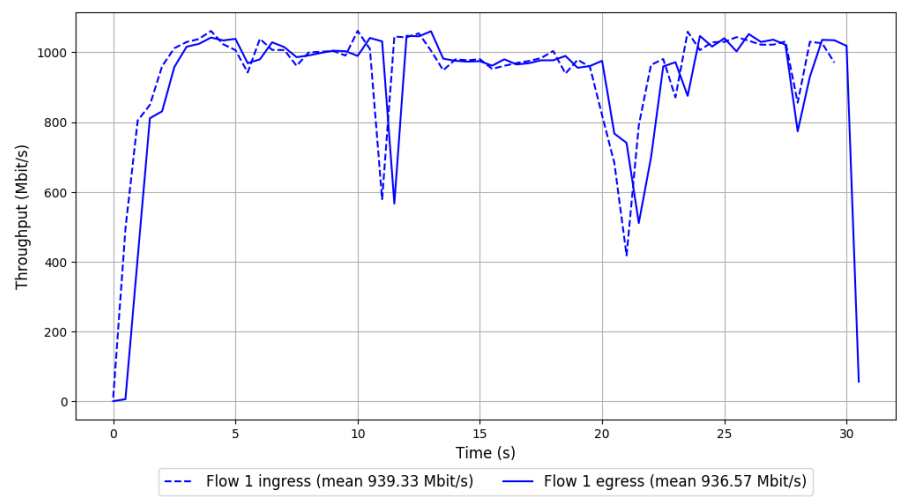
Run 4: Report of FillP — Data Link

```
Run 5: Statistics of FillP

Start at: 2019-01-03 17:32:16
End at: 2019-01-03 17:32:46
Local clock offset: -0.127 ms
Remote clock offset: 0.033 ms


# Below is generated by plot.py at 2019-01-03 18:48:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 948.96 Mbit/s
95th percentile per-packet one-way delay: 101.482 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 948.96 Mbit/s
95th percentile per-packet one-way delay: 101.482 ms
Loss rate: 0.47%
```

Run 5: Report of FillP — Data Link

Flow 1 ingress (mean 953.42 Mbit/s) --- Flow 1 egress (mean 948.96 Mbit/s)

• Flow 1 (95th percentile 101.48 ms)

```
Run 1: Statistics of FillP-Sheep

Start at: 2019-01-03 15:44:04
End at: 2019-01-03 15:44:34
Local clock offset: -0.199 ms
Remote clock offset: -0.075 ms


# Below is generated by plot.py at 2019-01-03 18:48:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 906.60 Mbit/s
95th percentile per-packet one-way delay: 67.590 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 906.60 Mbit/s
95th percentile per-packet one-way delay: 67.590 ms
Loss rate: 0.23%
```
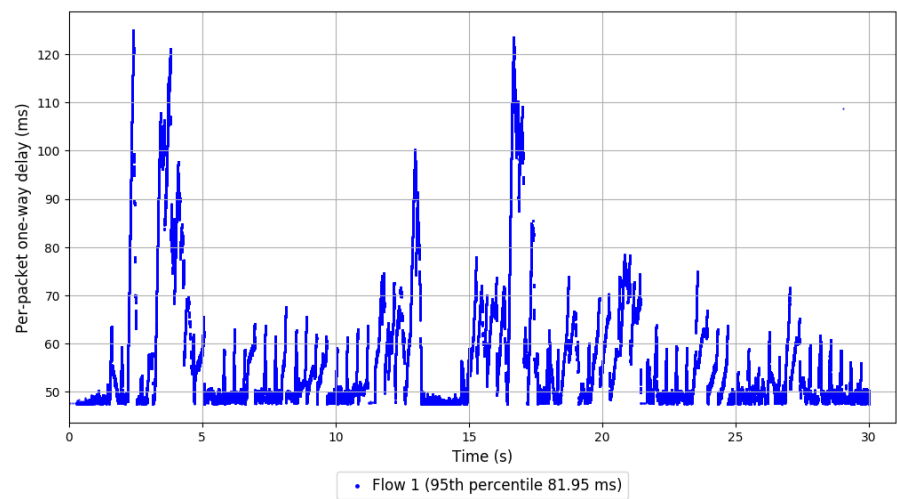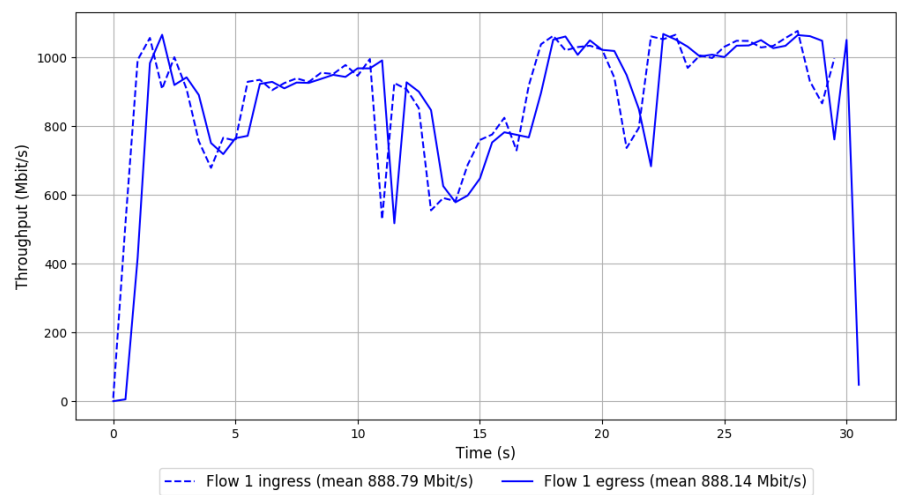
Run 1: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 908.66 Mbit/s) ----   Flow 1 egress (mean 906.60 Mbit/s) ——

• Flow 1 (95th percentile 67.59 ms)

```
Run 2: Statistics of FillP-Sheep

Start at: 2019-01-03 16:11:37
End at: 2019-01-03 16:12:07
Local clock offset: -0.255 ms
Remote clock offset: -0.106 ms


# Below is generated by plot.py at 2019-01-03 18:48:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 936.57 Mbit/s
95th percentile per-packet one-way delay: 70.063 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 936.57 Mbit/s
95th percentile per-packet one-way delay: 70.063 ms
Loss rate: 0.29%
```
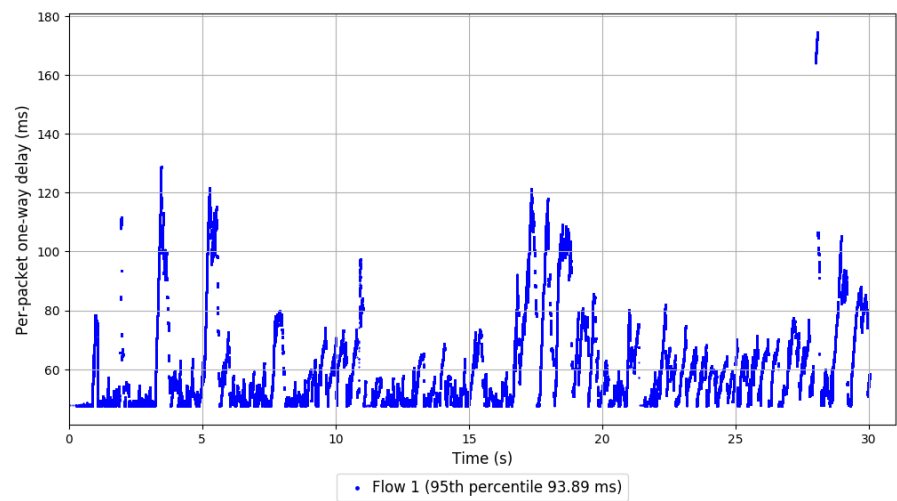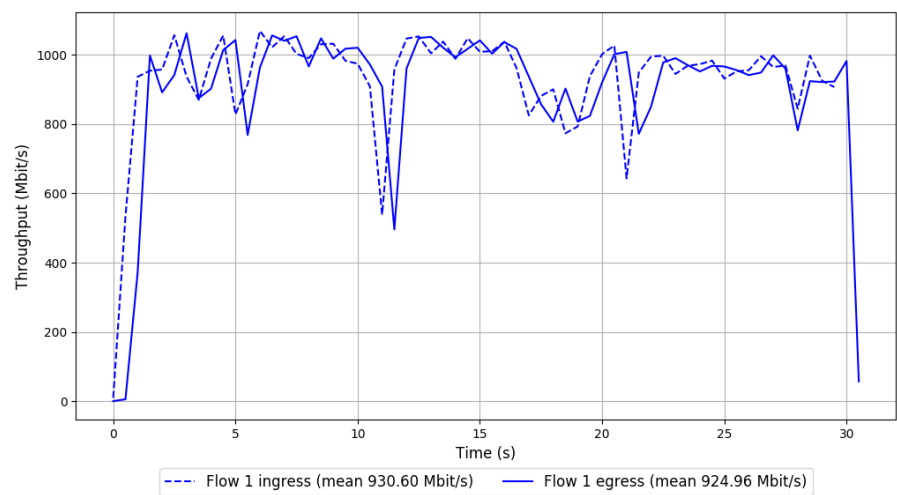
Run 2: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 939.33 Mbit/s) --- Flow 1 egress (mean 936.57 Mbit/s)

• Flow 1 (95th percentile 70.06 ms)

```
Run 3: Statistics of FillP-Sheep

Start at: 2019-01-03 16:39:03
End at: 2019-01-03 16:39:33
Local clock offset: -0.016 ms
Remote clock offset: -0.02 ms


# Below is generated by plot.py at 2019-01-03 18:48:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 888.14 Mbit/s
95th percentile per-packet one-way delay: 81.951 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 888.14 Mbit/s
95th percentile per-packet one-way delay: 81.951 ms
Loss rate: 0.07%
```
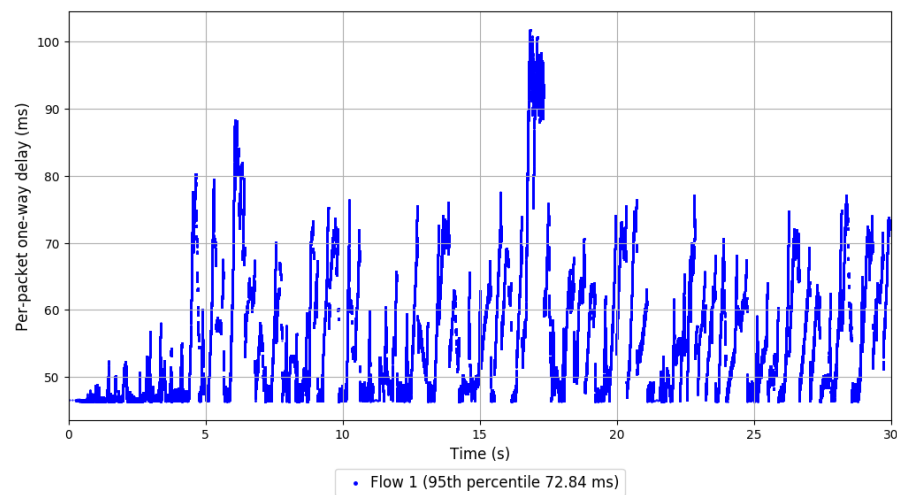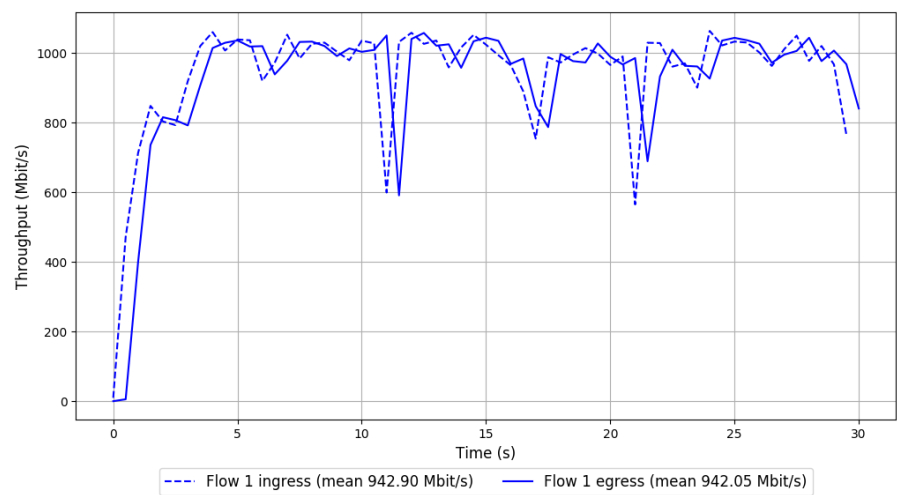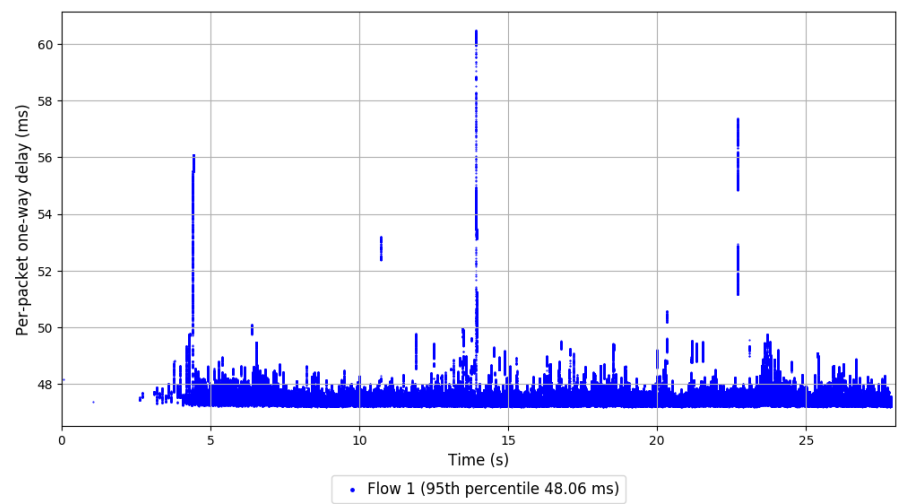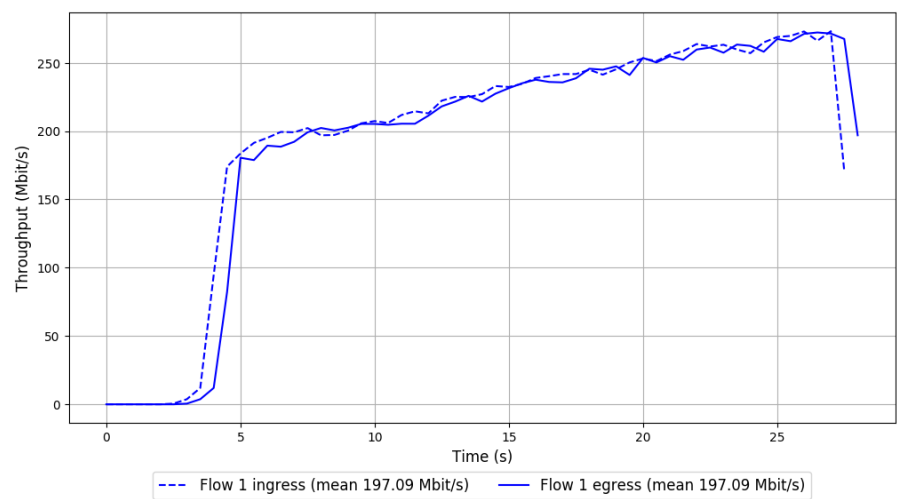
Run 3: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 888.79 Mbit/s)   Flow 1 egress (mean 888.14 Mbit/s)

• Flow 1 (95th percentile 81.95 ms)

```
Run 4: Statistics of FillP-Sheep

Start at: 2019-01-03 17:06:12
End at: 2019-01-03 17:06:42
Local clock offset: -0.093 ms
Remote clock offset: 0.047 ms


# Below is generated by plot.py at 2019-01-03 19:00:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 924.96 Mbit/s
95th percentile per-packet one-way delay: 93.885 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 924.96 Mbit/s
95th percentile per-packet one-way delay: 93.885 ms
Loss rate: 0.60%
```
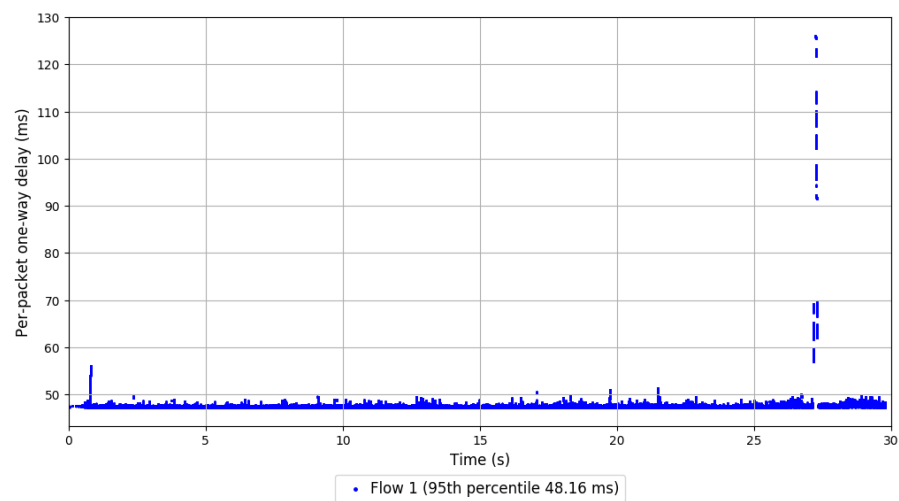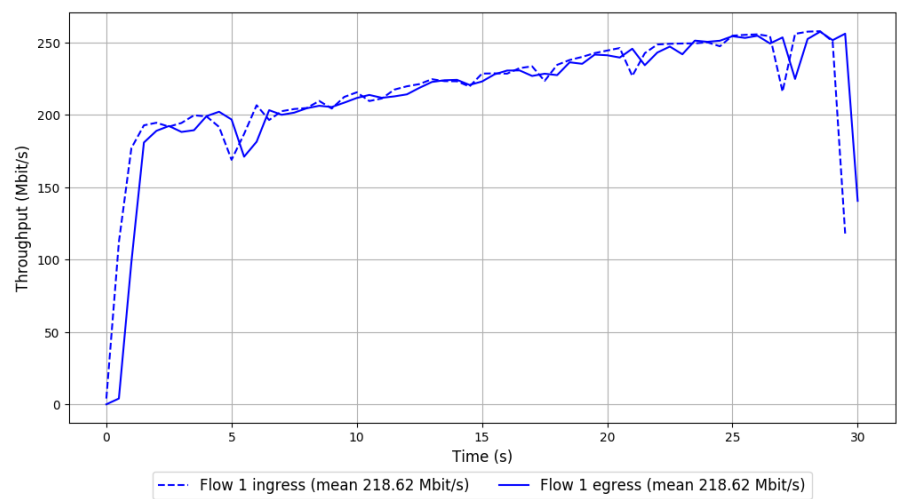
Run 4: Report of FillP-Sheep — Data Link

```
Run 5: Statistics of FillP-Sheep

Start at: 2019-01-03 17:34:00
End at: 2019-01-03 17:34:30
Local clock offset: -0.14 ms
Remote clock offset: 0.048 ms


# Below is generated by plot.py at 2019-01-03 19:02:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 942.05 Mbit/s
95th percentile per-packet one-way delay: 72.841 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 942.05 Mbit/s
95th percentile per-packet one-way delay: 72.841 ms
Loss rate: 0.09%
```
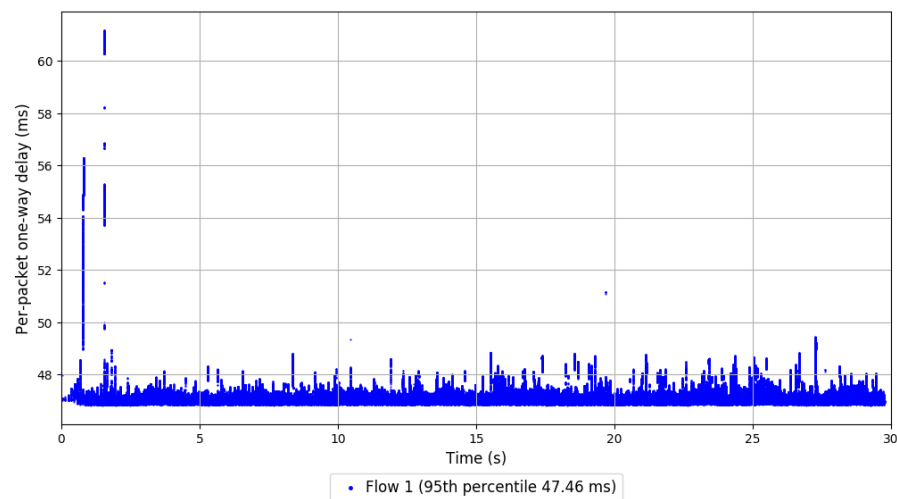
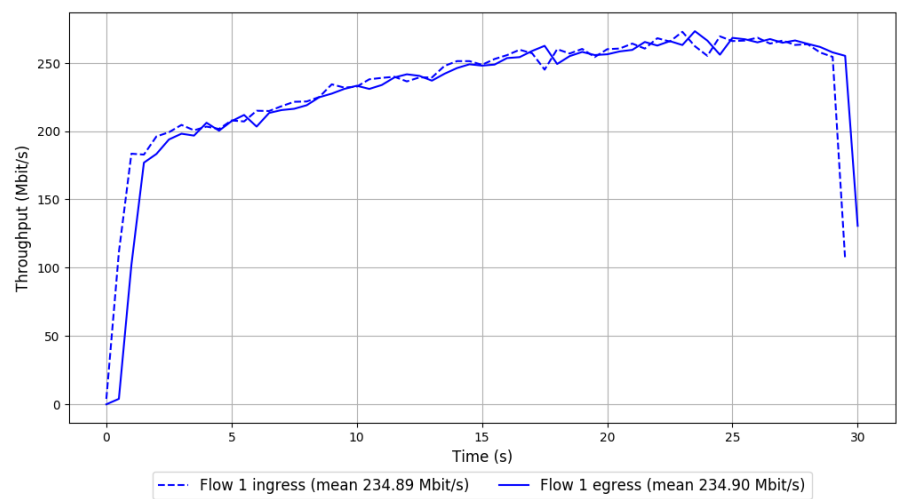Run 5: Report of FillP-Sheep — Data Link

```
Run 1: Statistics of Indigo

Start at: 2019-01-03 15:55:35
End at: 2019-01-03 15:56:05
Local clock offset: -0.235 ms
Remote clock offset: -0.085 ms


# Below is generated by plot.py at 2019-01-03 19:02:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 197.09 Mbit/s
95th percentile per-packet one-way delay: 48.063 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 197.09 Mbit/s
95th percentile per-packet one-way delay: 48.063 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2019-01-03 16:23:07
End at: 2019-01-03 16:23:37
Local clock offset: -0.097 ms
Remote clock offset: -0.045 ms


# Below is generated by plot.py at 2019-01-03 19:02:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 218.62 Mbit/s
95th percentile per-packet one-way delay: 48.159 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 218.62 Mbit/s
95th percentile per-packet one-way delay: 48.159 ms
Loss rate: 0.00%
```
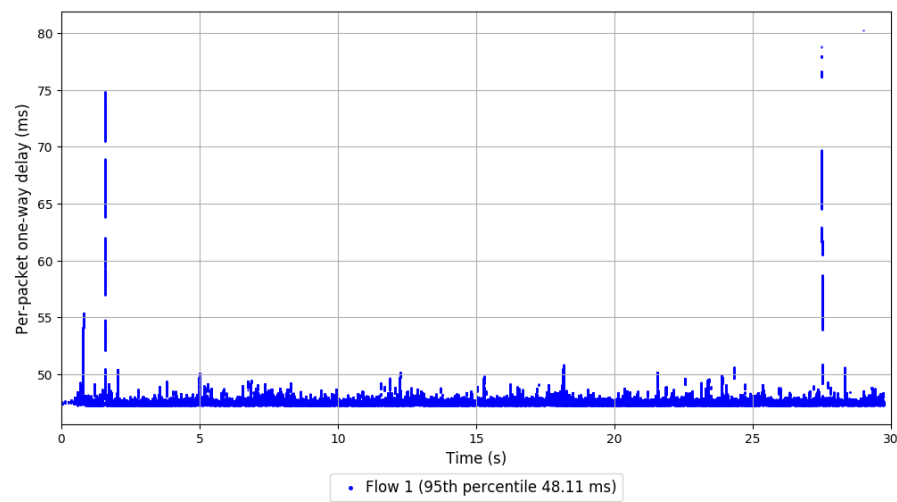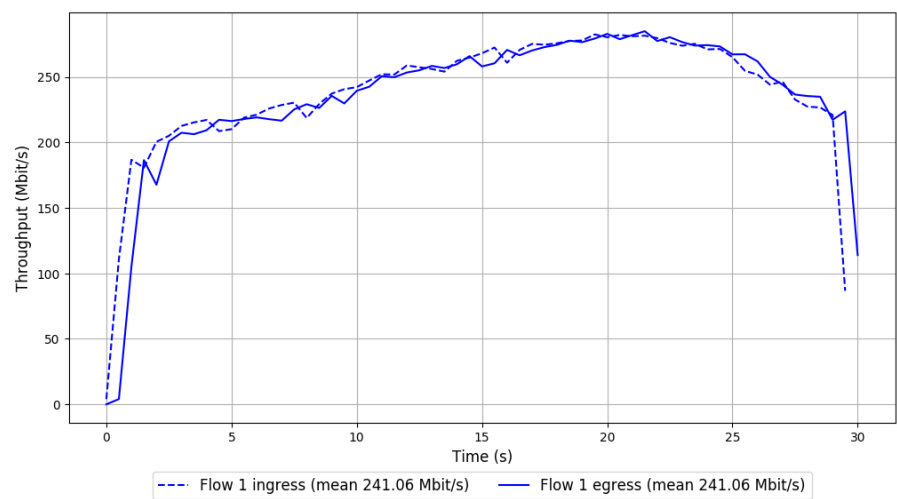
Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2019-01-03 16:50:36
End at: 2019-01-03 16:51:06
Local clock offset: 0.305 ms
Remote clock offset: -0.026 ms


# Below is generated by plot.py at 2019-01-03 19:02:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 234.90 Mbit/s
95th percentile per-packet one-way delay: 47.457 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 234.90 Mbit/s
95th percentile per-packet one-way delay: 47.457 ms
Loss rate: 0.00%
```
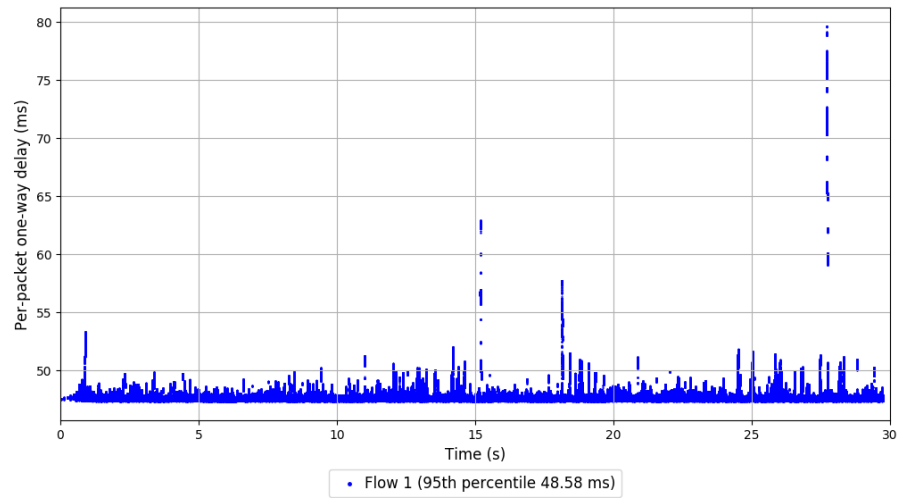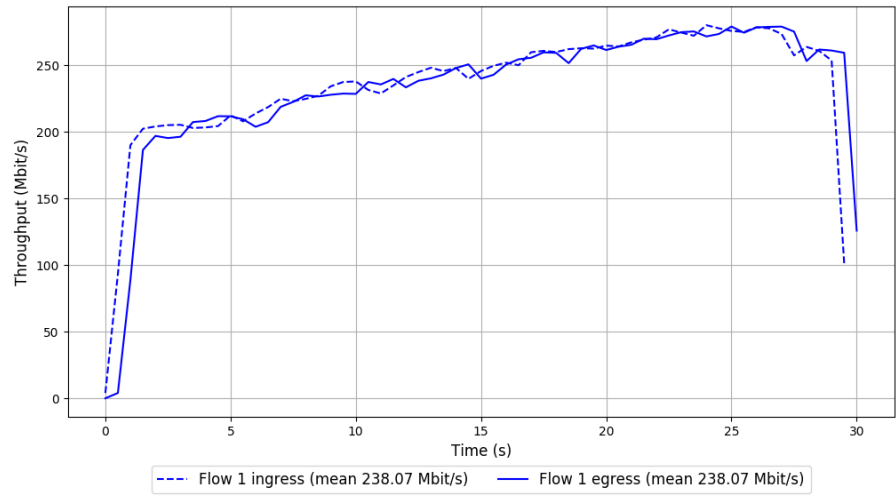
Run 3: Report of Indigo — Data Link

```
Run 4: Statistics of Indigo

Start at: 2019-01-03 17:17:56
End at: 2019-01-03 17:18:26
Local clock offset: -0.077 ms
Remote clock offset: 0.081 ms


# Below is generated by plot.py at 2019-01-03 19:02:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 241.06 Mbit/s
95th percentile per-packet one-way delay: 48.108 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 241.06 Mbit/s
95th percentile per-packet one-way delay: 48.108 ms
Loss rate: 0.00%
```
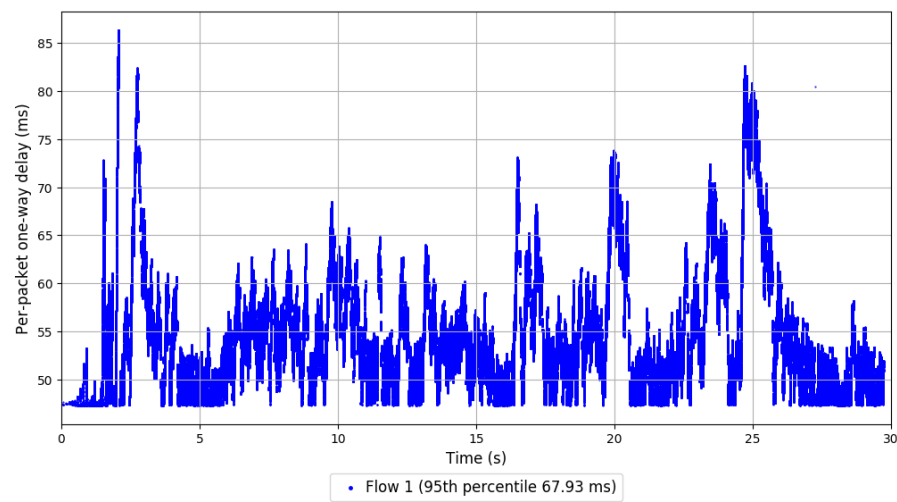
Run 4: Report of Indigo — Data Link

```
Run 5: Statistics of Indigo

Start at: 2019-01-03 17:45:40
End at: 2019-01-03 17:46:10
Local clock offset: -0.135 ms
Remote clock offset: 0.114 ms


# Below is generated by plot.py at 2019-01-03 19:02:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 238.07 Mbit/s
95th percentile per-packet one-way delay: 48.581 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 238.07 Mbit/s
95th percentile per-packet one-way delay: 48.581 ms
Loss rate: 0.00%
```
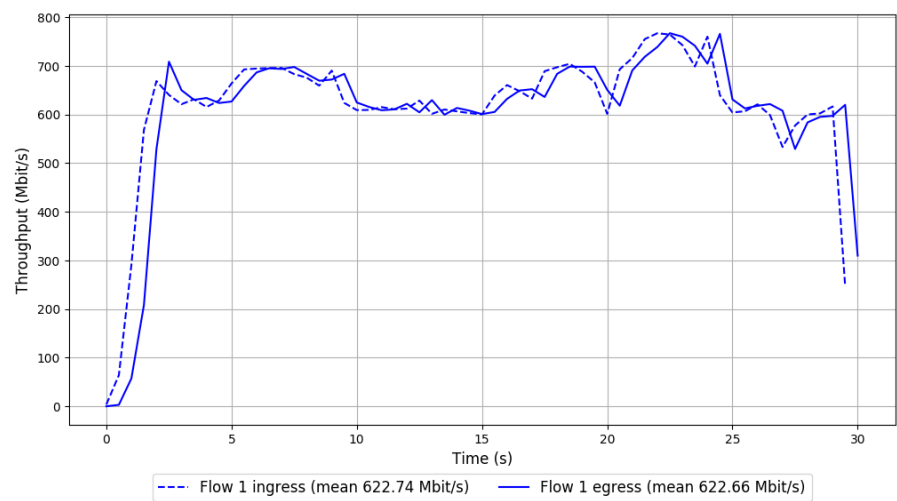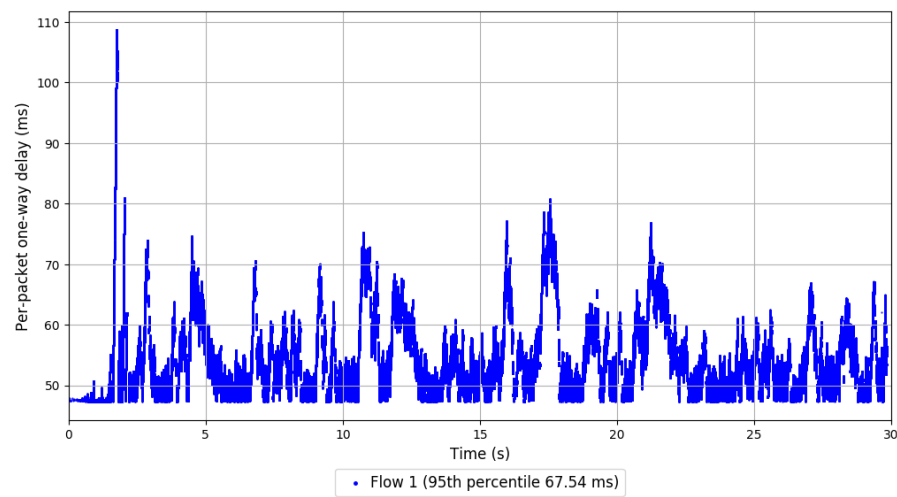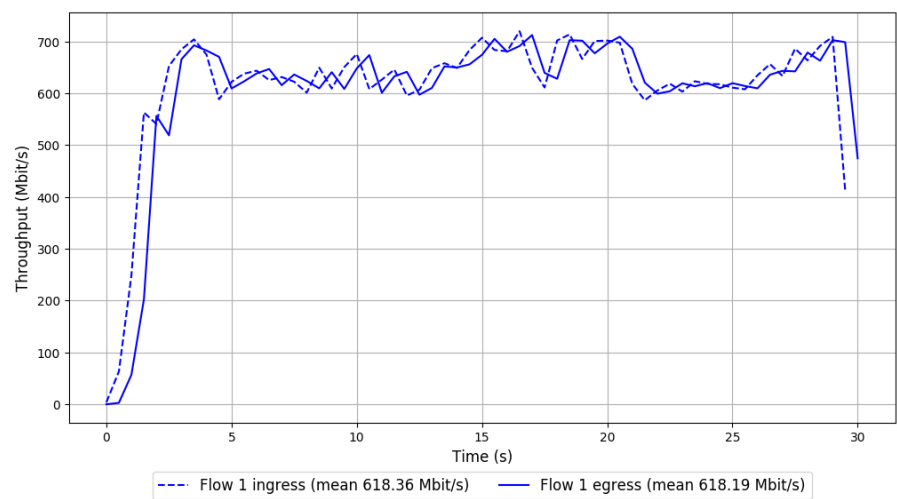
Run 5: Report of Indigo — Data Link

```
Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-03 16:03:54
End at: 2019-01-03 16:04:25
Local clock offset: -0.287 ms
Remote clock offset: -0.091 ms


# Below is generated by plot.py at 2019-01-03 19:02:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 622.66 Mbit/s
95th percentile per-packet one-way delay: 67.934 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 622.66 Mbit/s
95th percentile per-packet one-way delay: 67.934 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo-MusesD — Data Link

```
Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-03 16:31:25
End at: 2019-01-03 16:31:55
Local clock offset: -0.049 ms
Remote clock offset: -0.034 ms


# Below is generated by plot.py at 2019-01-03 19:06:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 618.19 Mbit/s
95th percentile per-packet one-way delay: 67.539 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 618.19 Mbit/s
95th percentile per-packet one-way delay: 67.539 ms
Loss rate: 0.03%
```
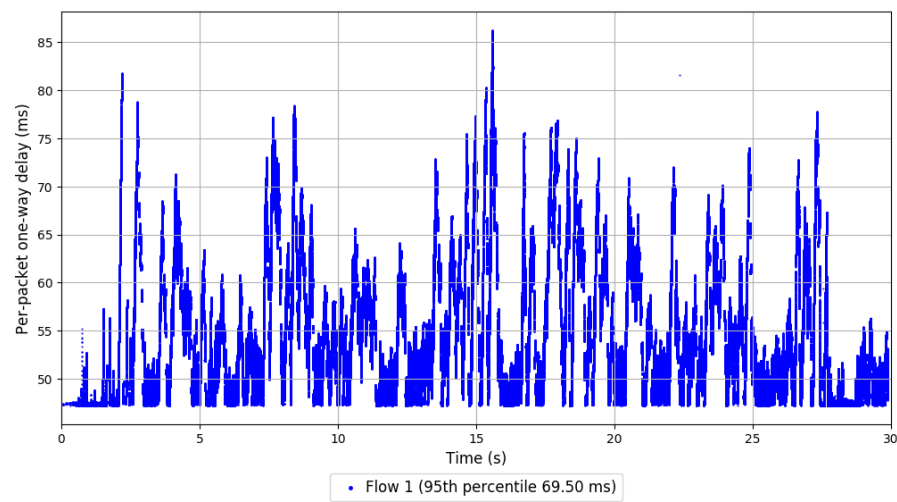
Run 2: Report of Indigo-MusesD — Data Link

```
Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-03 16:58:56
End at: 2019-01-03 16:59:26
Local clock offset: -0.094 ms
Remote clock offset: 0.01 ms


# Below is generated by plot.py at 2019-01-03 19:07:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 617.91 Mbit/s
95th percentile per-packet one-way delay: 69.498 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 617.91 Mbit/s
95th percentile per-packet one-way delay: 69.498 ms
Loss rate: 0.02%
```
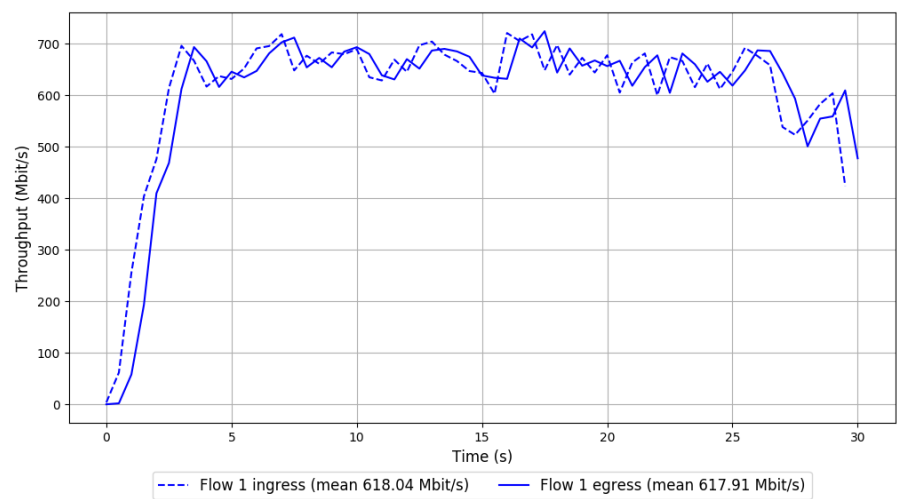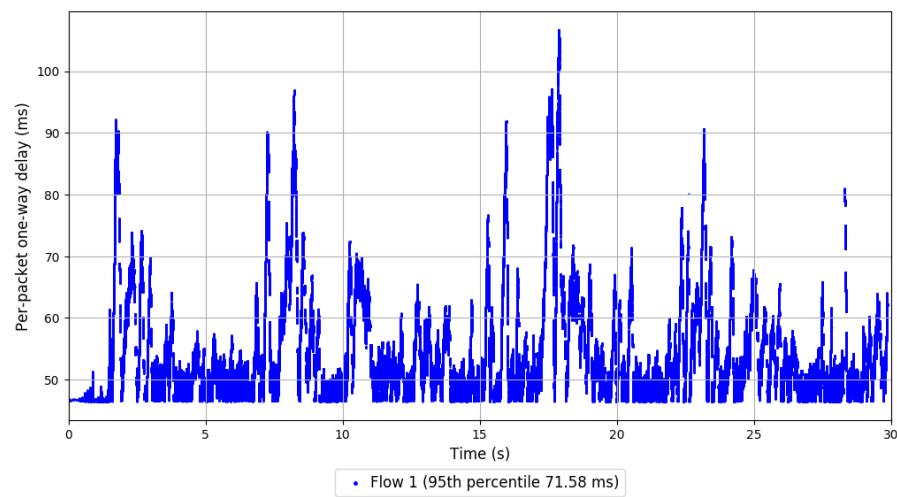
Run 3: Report of Indigo-MusesD — Data Link

```
Run 4: Statistics of Indigo-MusesD

Start at: 2019-01-03 17:26:19
End at: 2019-01-03 17:26:49
Local clock offset: -0.126 ms
Remote clock offset: 0.036 ms


# Below is generated by plot.py at 2019-01-03 19:08:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 625.96 Mbit/s
95th percentile per-packet one-way delay: 71.583 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 625.96 Mbit/s
95th percentile per-packet one-way delay: 71.583 ms
Loss rate: 0.06%
```
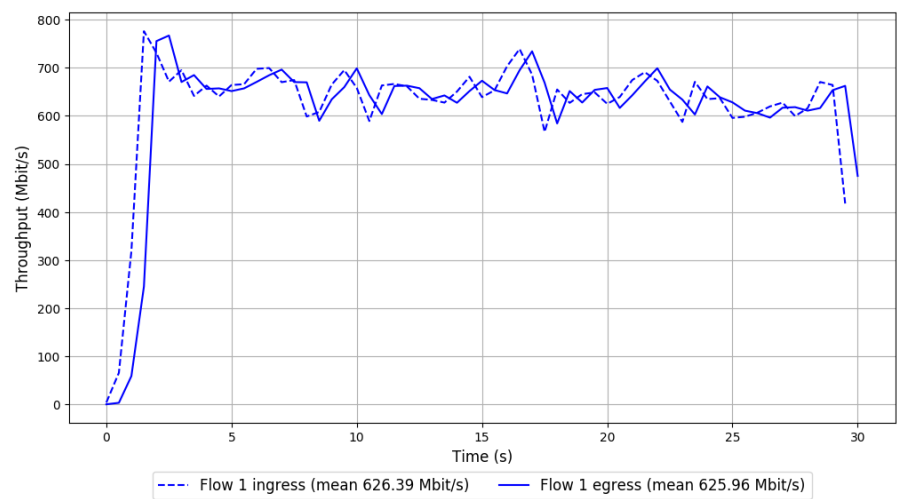
Run 4: Report of Indigo-MusesD — Data Link

```
Run 5: Statistics of Indigo-MusesD

Start at: 2019-01-03 17:54:03
End at: 2019-01-03 17:54:34
Local clock offset: -0.107 ms
Remote clock offset: 0.03 ms


# Below is generated by plot.py at 2019-01-03 19:08:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 639.03 Mbit/s
95th percentile per-packet one-way delay: 69.063 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 639.03 Mbit/s
95th percentile per-packet one-way delay: 69.063 ms
Loss rate: 0.01%
```
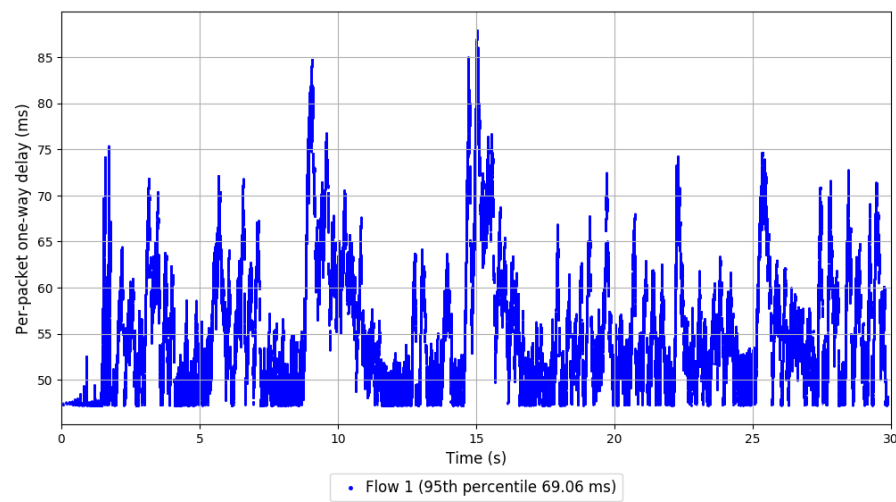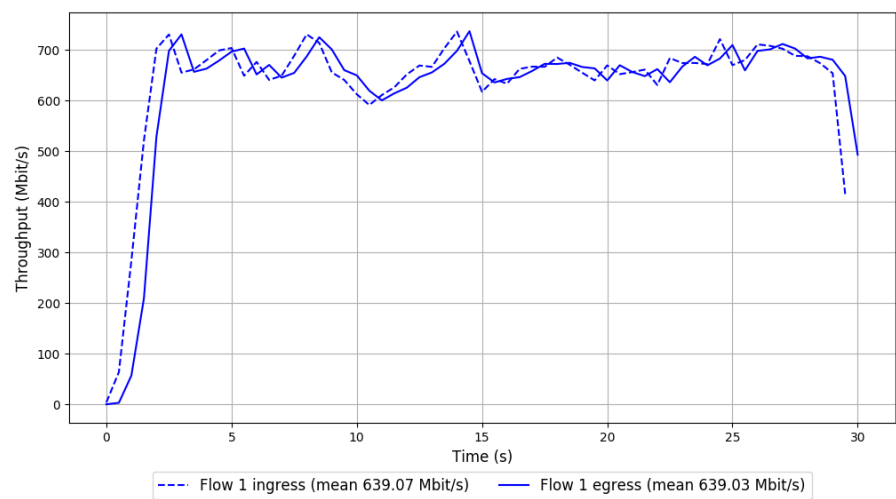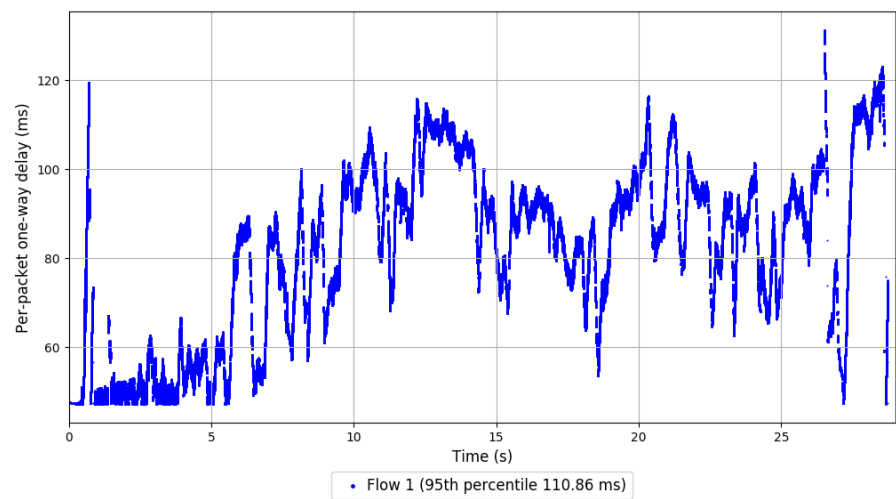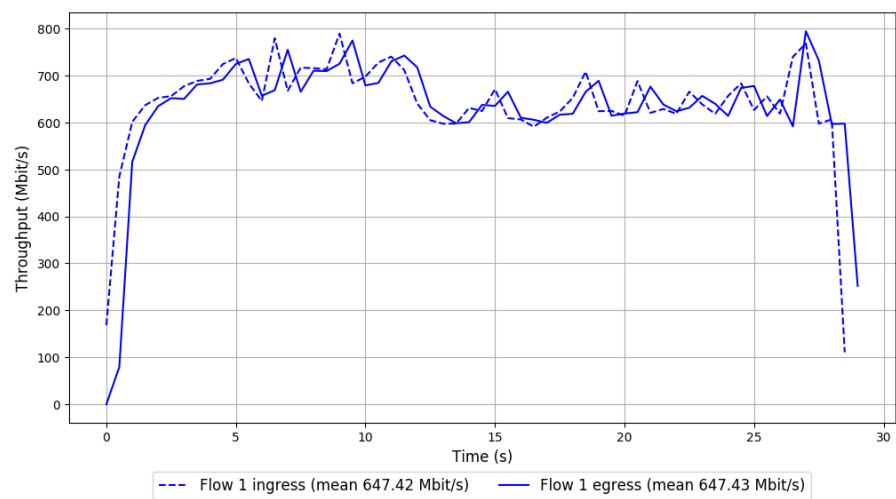
Run 5: Report of Indigo-MusesD — Data Link

```
Run 1: Statistics of Indigo-MusesT

Start at: 2019-01-03 15:56:59
End at: 2019-01-03 15:57:29
Local clock offset: -0.275 ms
Remote clock offset: -0.053 ms


# Below is generated by plot.py at 2019-01-03 19:08:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 647.43 Mbit/s
95th percentile per-packet one-way delay: 110.858 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 647.43 Mbit/s
95th percentile per-packet one-way delay: 110.858 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo-MusesT — Data Link

```
Run 2: Statistics of Indigo-MusesT

Start at: 2019-01-03 16:24:34
End at: 2019-01-03 16:25:04
Local clock offset: -0.057 ms
Remote clock offset: -0.019 ms


# Below is generated by plot.py at 2019-01-03 19:10:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 576.51 Mbit/s
95th percentile per-packet one-way delay: 112.338 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 576.51 Mbit/s
95th percentile per-packet one-way delay: 112.338 ms
Loss rate: 0.13%
```
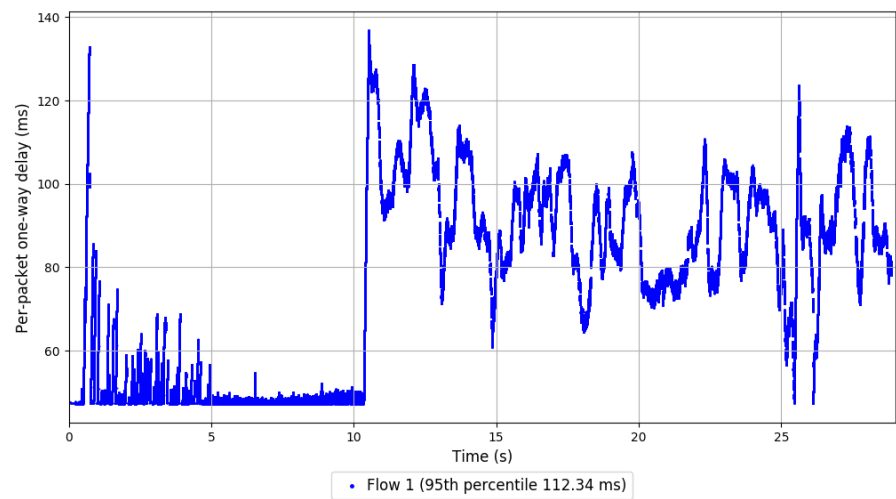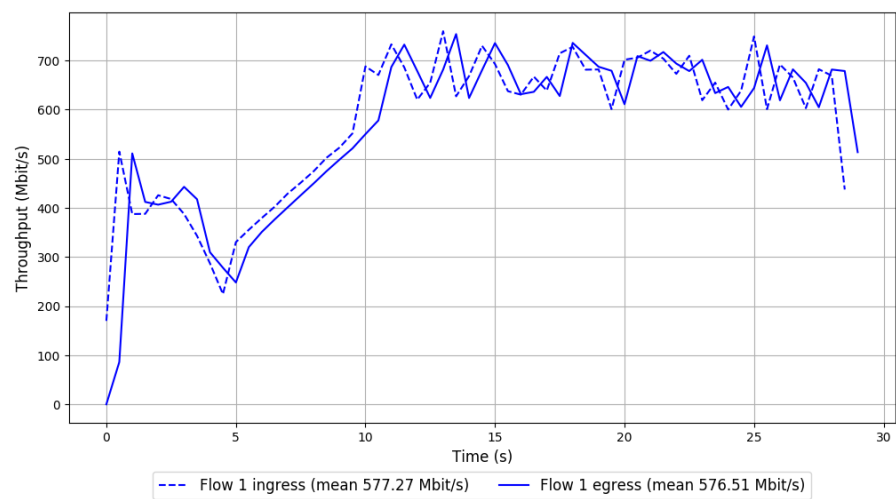
Run 2: Report of Indigo-MusesT — Data Link

```
Run 3: Statistics of Indigo-MusesT

Start at: 2019-01-03 16:52:03
End at: 2019-01-03 16:52:33
Local clock offset: -0.093 ms
Remote clock offset: -0.028 ms


# Below is generated by plot.py at 2019-01-03 19:12:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 635.62 Mbit/s
95th percentile per-packet one-way delay: 115.058 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 635.62 Mbit/s
95th percentile per-packet one-way delay: 115.058 ms
Loss rate: 0.14%
```
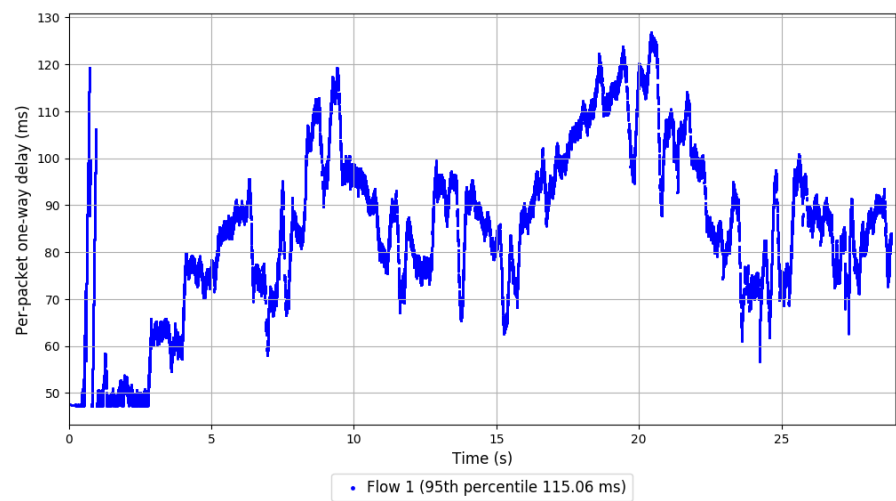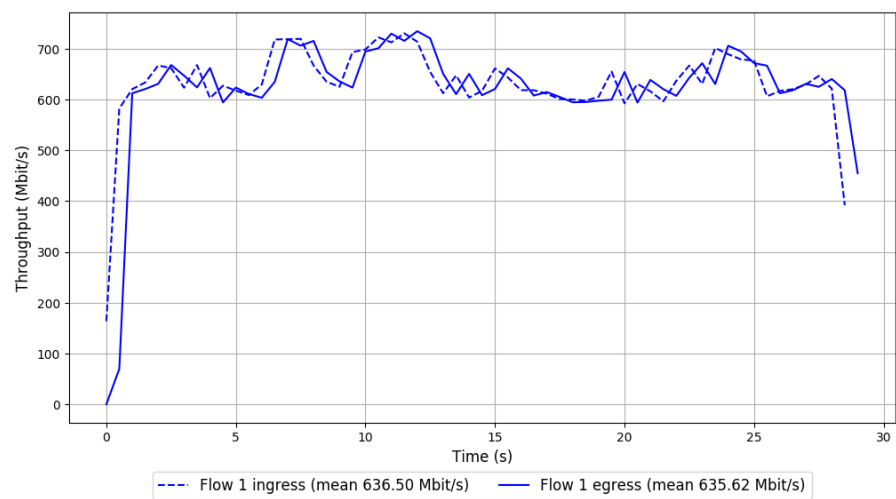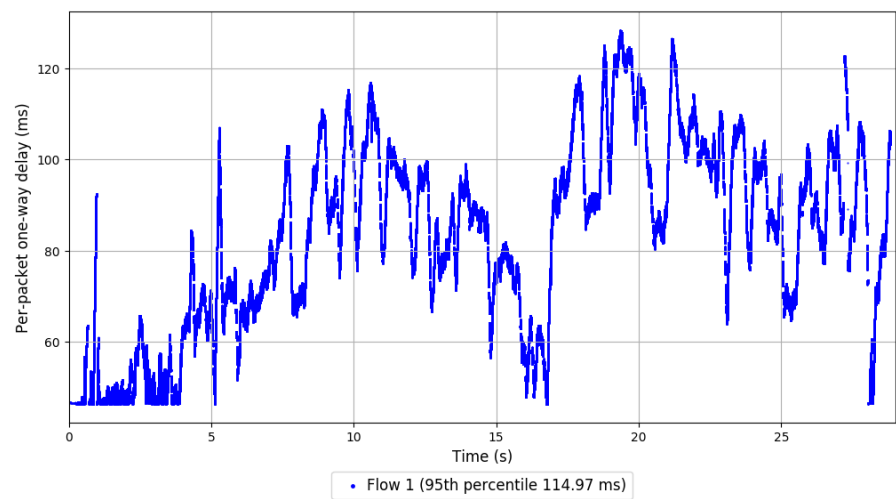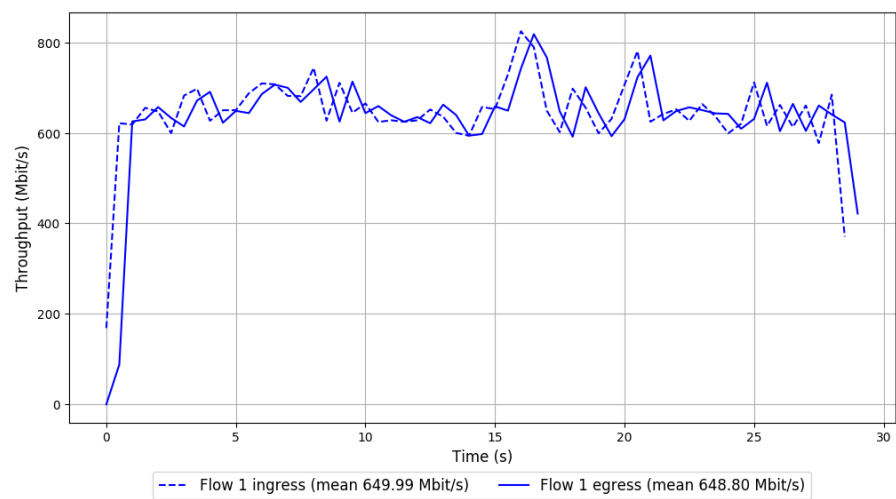
Run 3: Report of Indigo-MusesT — Data Link

Flow 1 ingress (mean 636.50 Mbit/s)   Flow 1 egress (mean 635.62 Mbit/s)

Flow 1 (95th percentile 115.06 ms)

```
Run 4: Statistics of Indigo-MusesT

Start at: 2019-01-03 17:19:24
End at: 2019-01-03 17:19:54
Local clock offset: -0.068 ms
Remote clock offset: 0.023 ms


# Below is generated by plot.py at 2019-01-03 19:14:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 648.80 Mbit/s
95th percentile per-packet one-way delay: 114.971 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 648.80 Mbit/s
95th percentile per-packet one-way delay: 114.971 ms
Loss rate: 0.18%
```
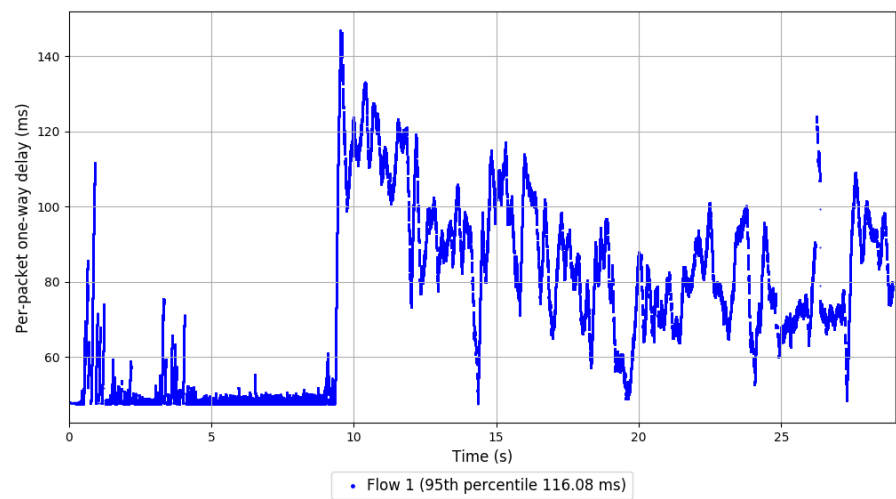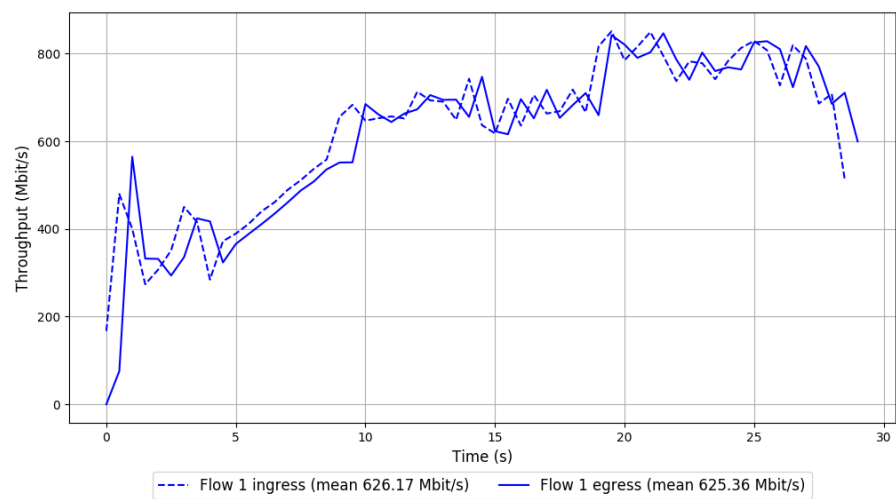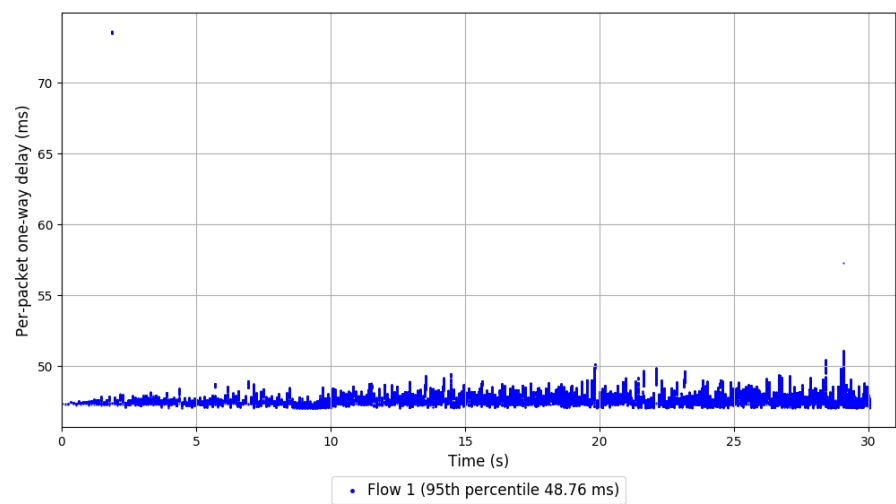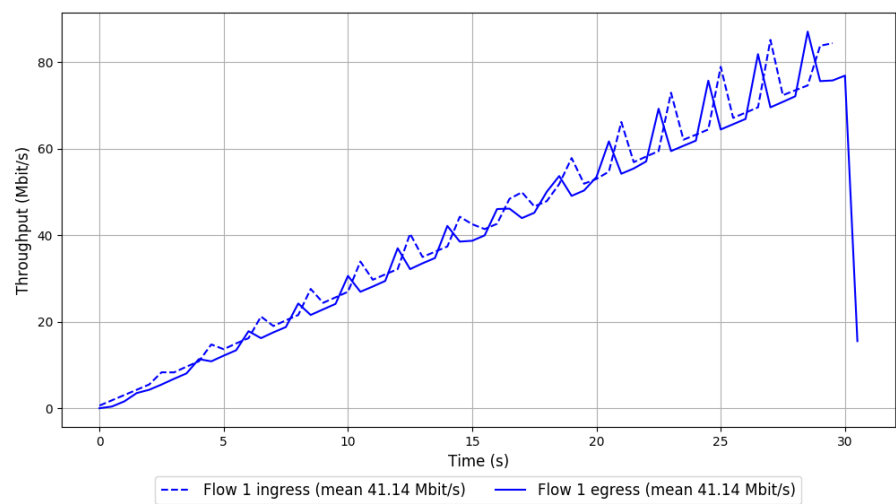
Run 4: Report of Indigo-MusesT — Data Link

Flow 1 ingress (mean 649.99 Mbit/s)   Flow 1 egress (mean 648.80 Mbit/s)

Flow 1 (95th percentile 114.97 ms)

```
Run 5: Statistics of Indigo-MusesT

Start at: 2019-01-03 17:47:08
End at: 2019-01-03 17:47:38
Local clock offset: -0.128 ms
Remote clock offset: 0.041 ms


# Below is generated by plot.py at 2019-01-03 19:15:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 625.36 Mbit/s
95th percentile per-packet one-way delay: 116.081 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 625.36 Mbit/s
95th percentile per-packet one-way delay: 116.081 ms
Loss rate: 0.13%
```

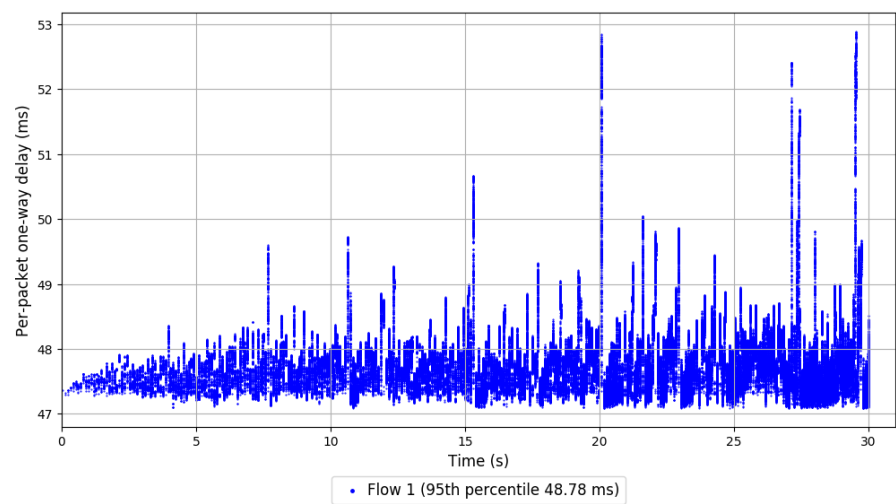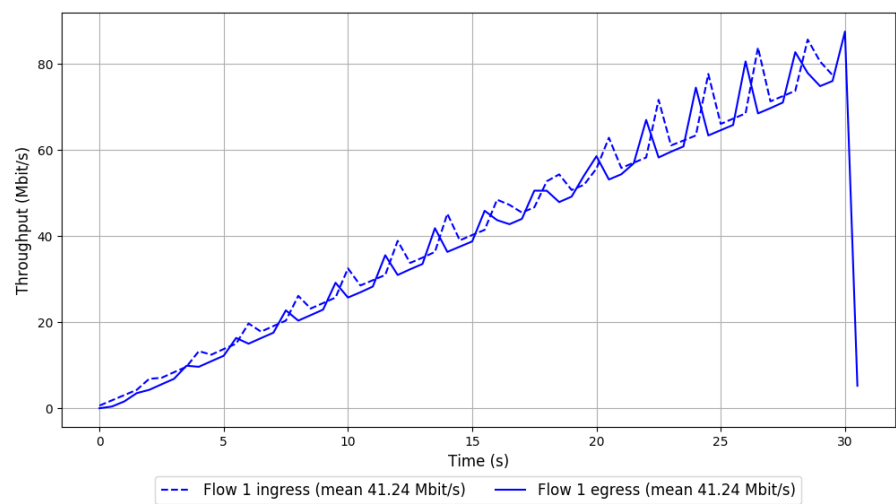Run 5: Report of Indigo-MusesT — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2019-01-03 16:07:05
End at: 2019-01-03 16:07:35
Local clock offset: -0.24 ms
Remote clock offset: -0.102 ms


# Below is generated by plot.py at 2019-01-03 19:15:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 41.14 Mbit/s
95th percentile per-packet one-way delay: 48.755 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 41.14 Mbit/s
95th percentile per-packet one-way delay: 48.755 ms
Loss rate: 0.00%
```

Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2019-01-03 16:34:34
End at: 2019-01-03 16:35:04
Local clock offset: 0.025 ms
Remote clock offset: -0.064 ms


# Below is generated by plot.py at 2019-01-03 19:15:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 41.24 Mbit/s
95th percentile per-packet one-way delay: 48.779 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 41.24 Mbit/s
95th percentile per-packet one-way delay: 48.779 ms
Loss rate: 0.00%
```
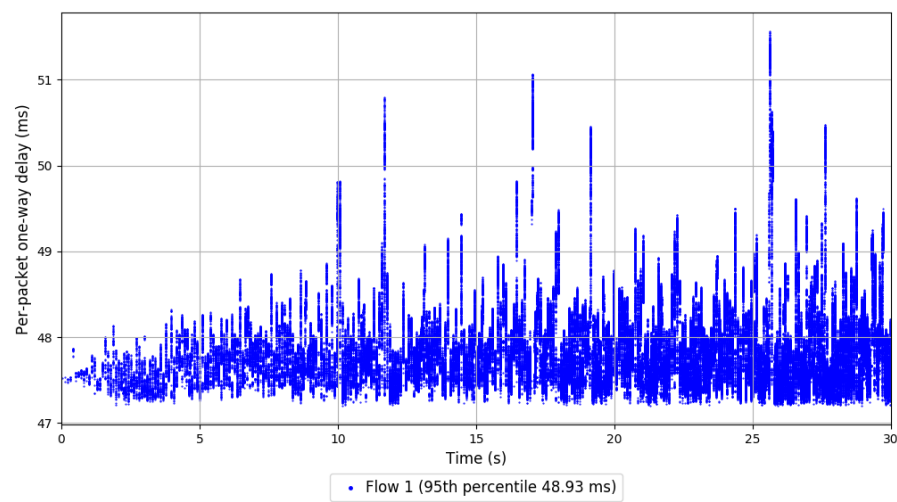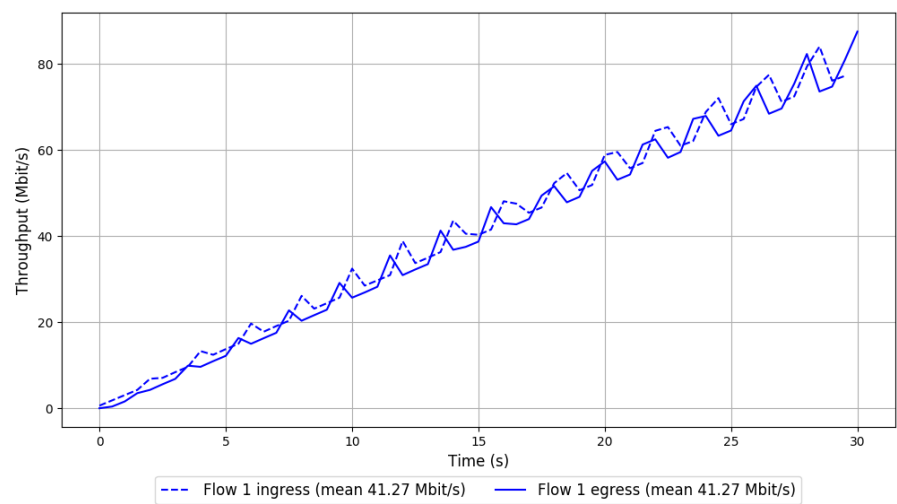
Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2019-01-03 17:02:03
End at: 2019-01-03 17:02:33
Local clock offset: -0.056 ms
Remote clock offset: 0.017 ms


# Below is generated by plot.py at 2019-01-03 19:15:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 41.27 Mbit/s
95th percentile per-packet one-way delay: 48.928 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 41.27 Mbit/s
95th percentile per-packet one-way delay: 48.928 ms
Loss rate: 0.00%
```
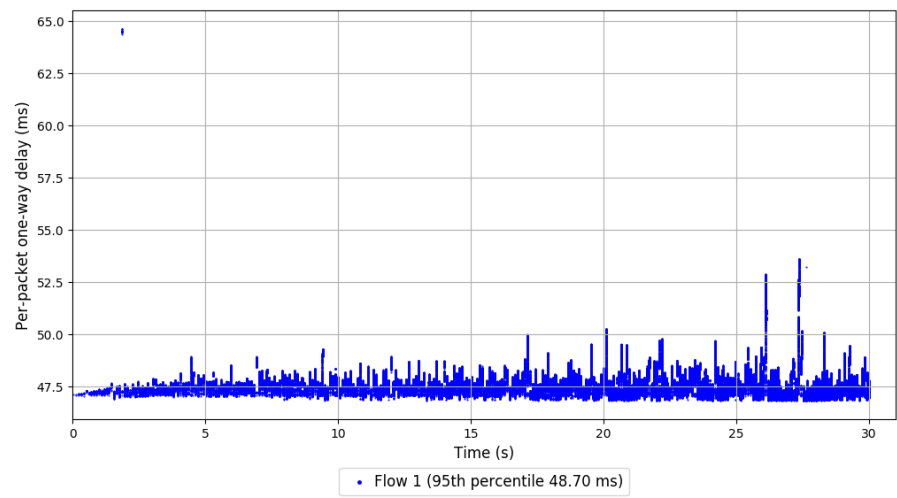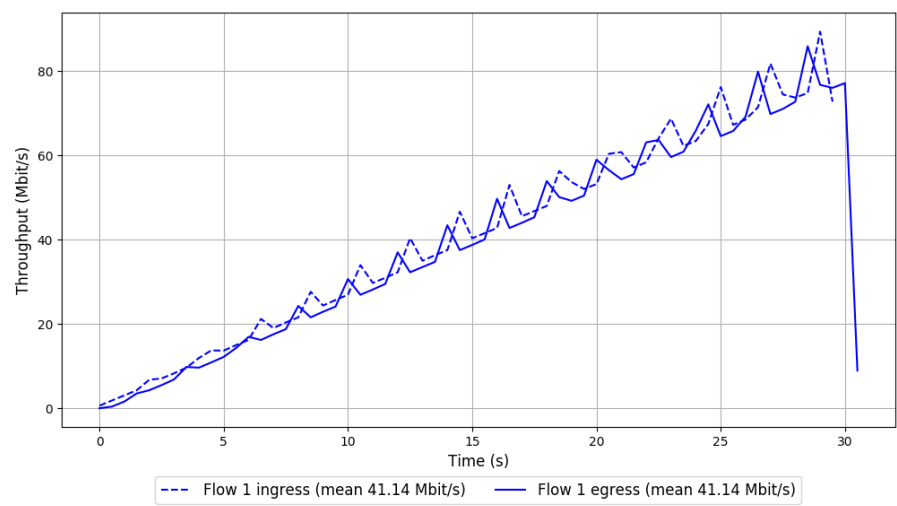
Run 3: Report of LEDBAT — Data Link

```
Run 4: Statistics of LEDBAT

Start at: 2019-01-03 17:29:32
End at: 2019-01-03 17:30:02
Local clock offset: 0.265 ms
Remote clock offset: 0.042 ms


# Below is generated by plot.py at 2019-01-03 19:15:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 41.14 Mbit/s
95th percentile per-packet one-way delay: 48.699 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 41.14 Mbit/s
95th percentile per-packet one-way delay: 48.699 ms
Loss rate: 0.00%
```
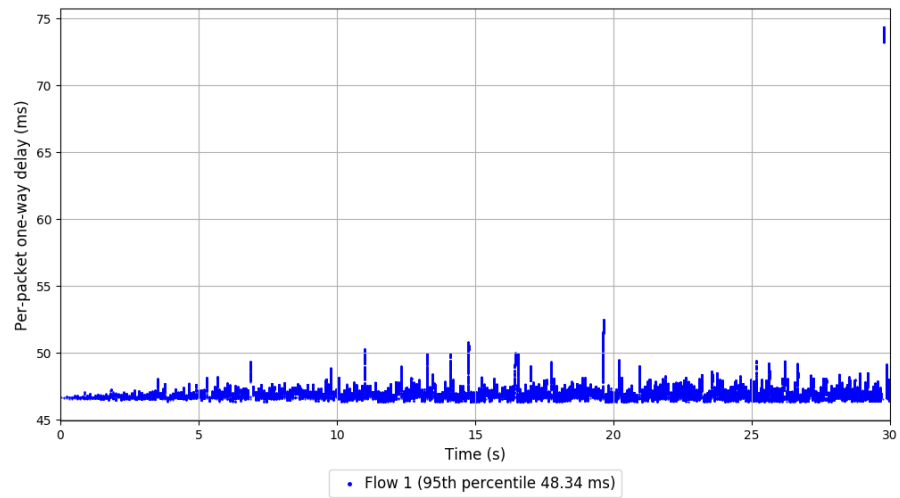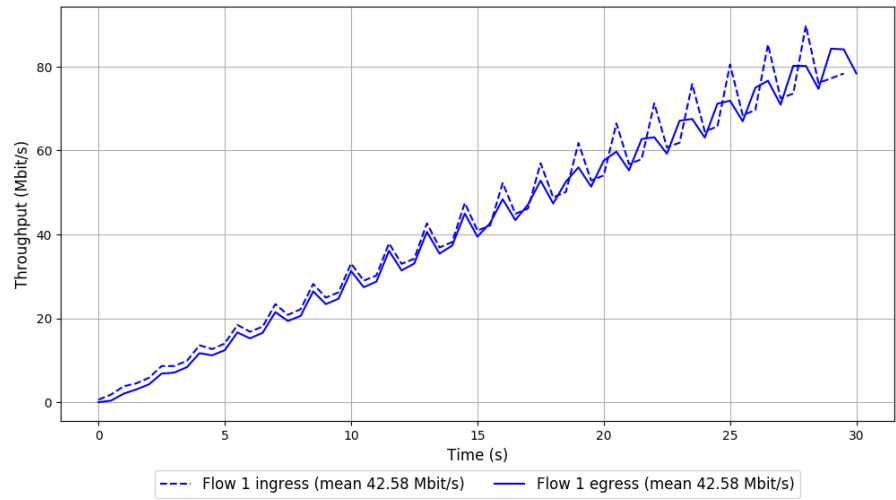
Run 4: Report of LEDBAT — Data Link

```
Run 5: Statistics of LEDBAT

Start at: 2019-01-03 17:57:17
End at: 2019-01-03 17:57:47
Local clock offset: -0.09 ms
Remote clock offset: 0.007 ms


# Below is generated by plot.py at 2019-01-03 19:15:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 42.58 Mbit/s
95th percentile per-packet one-way delay: 48.336 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 42.58 Mbit/s
95th percentile per-packet one-way delay: 48.336 ms
Loss rate: 0.00%
```

Run 5: Report of LEDBAT — Data Link

Flow 1 ingress (mean 42.58 Mbit/s)   Flow 1 egress (mean 42.58 Mbit/s)

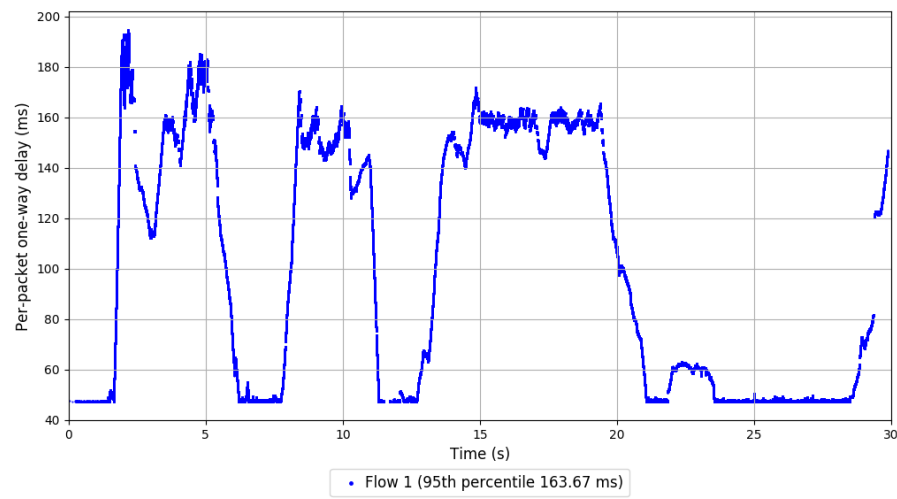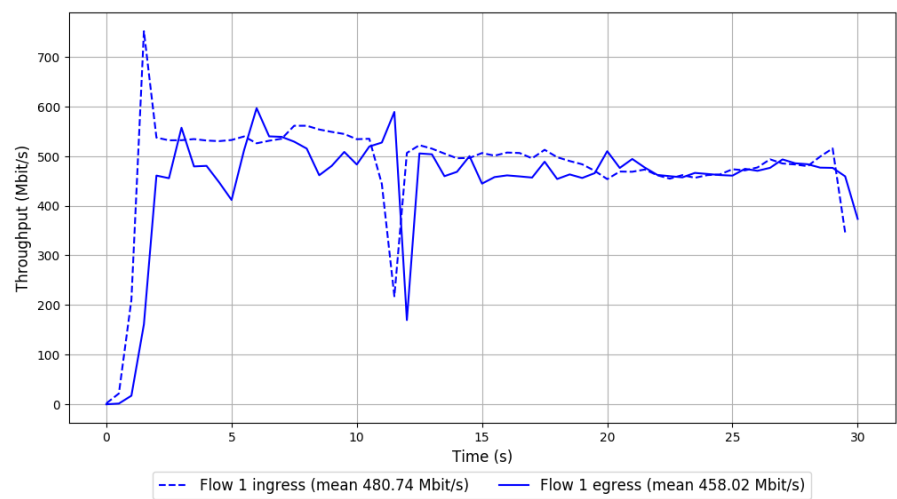Flow 1 (95th percentile 48.34 ms)

```
Run 1: Statistics of PCC-Allegro

Start at: 2019-01-03 15:48:52
End at: 2019-01-03 15:49:22
Local clock offset: -0.258 ms
Remote clock offset: -0.099 ms


# Below is generated by plot.py at 2019-01-03 19:26:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 458.02 Mbit/s
95th percentile per-packet one-way delay: 163.667 ms
Loss rate: 4.74%
-- Flow 1:
Average throughput: 458.02 Mbit/s
95th percentile per-packet one-way delay: 163.667 ms
Loss rate: 4.74%
```
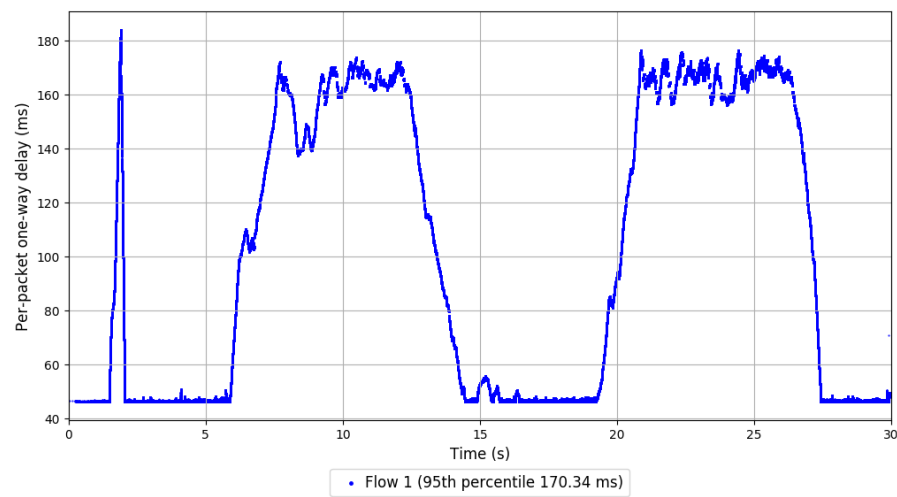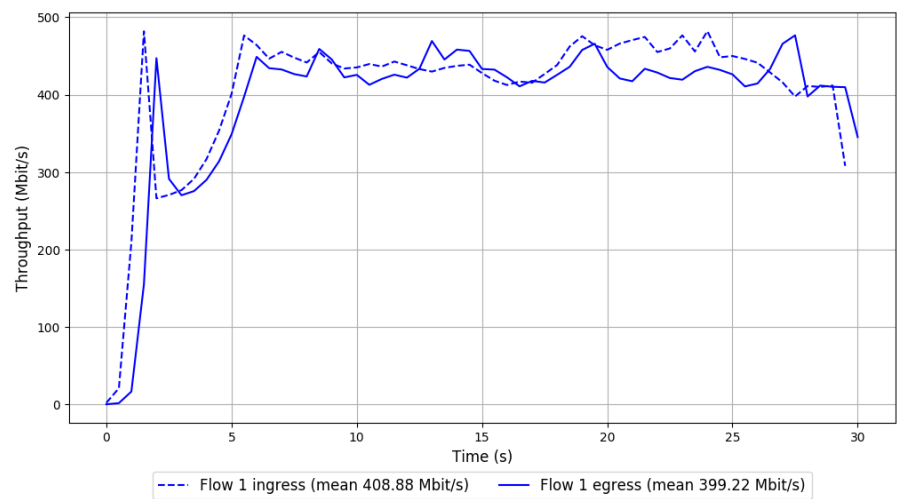
Run 1: Report of PCC-Allegro — Data Link

```
Run 2: Statistics of PCC-Allegro

Start at: 2019-01-03 16:16:26
End at: 2019-01-03 16:16:56
Local clock offset: -0.148 ms
Remote clock offset: -0.085 ms


# Below is generated by plot.py at 2019-01-03 19:26:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 399.22 Mbit/s
95th percentile per-packet one-way delay: 170.336 ms
Loss rate: 2.36%
-- Flow 1:
Average throughput: 399.22 Mbit/s
95th percentile per-packet one-way delay: 170.336 ms
Loss rate: 2.36%
```
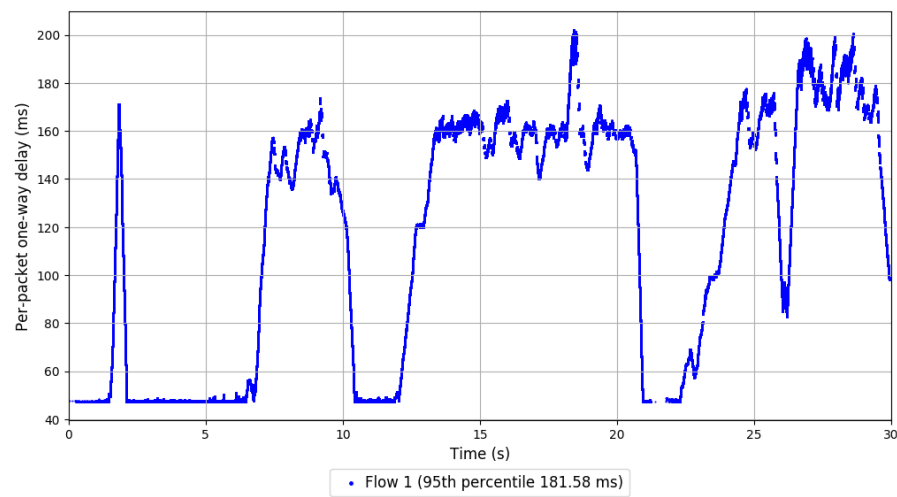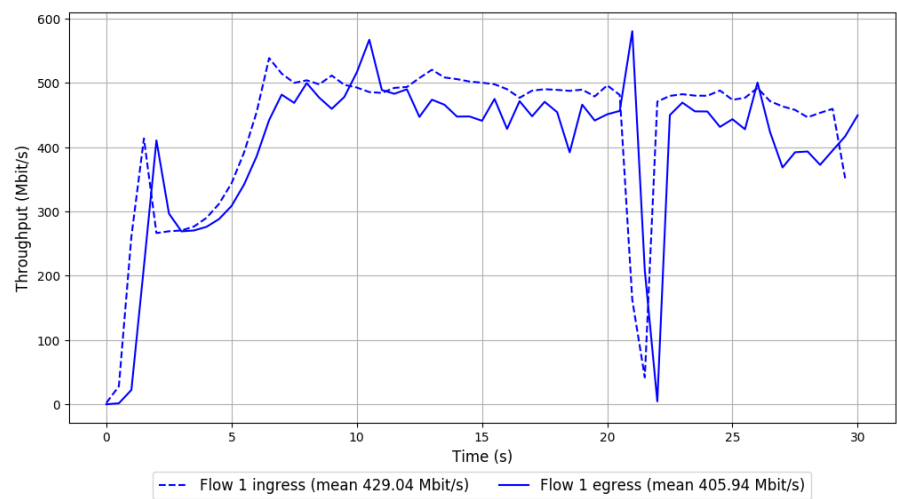
Run 2: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 408.88 Mbit/s) --- Flow 1 egress (mean 399.22 Mbit/s)

• Flow 1 (95th percentile 170.34 ms)

98

```
Run 3: Statistics of PCC-Allegro

Start at: 2019-01-03 16:43:54
End at: 2019-01-03 16:44:24
Local clock offset: -0.027 ms
Remote clock offset: -0.037 ms


# Below is generated by plot.py at 2019-01-03 19:26:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 405.94 Mbit/s
95th percentile per-packet one-way delay: 181.584 ms
Loss rate: 5.38%
-- Flow 1:
Average throughput: 405.94 Mbit/s
95th percentile per-packet one-way delay: 181.584 ms
Loss rate: 5.38%
```
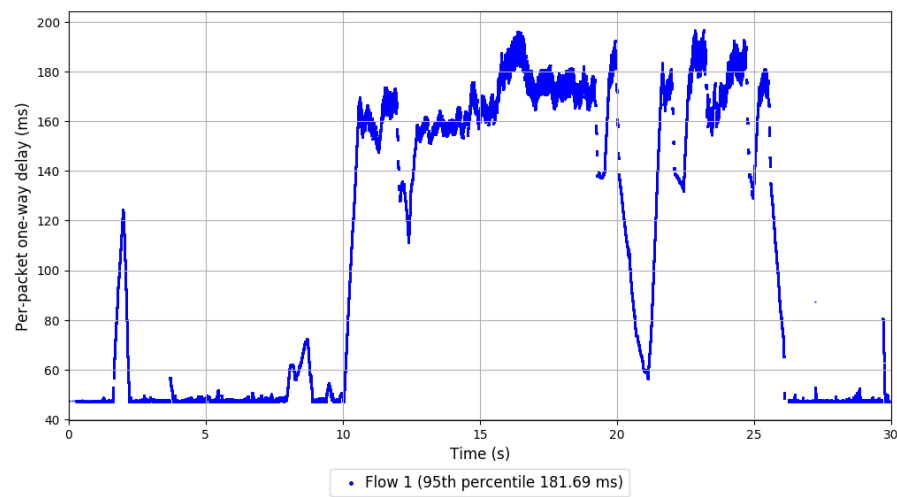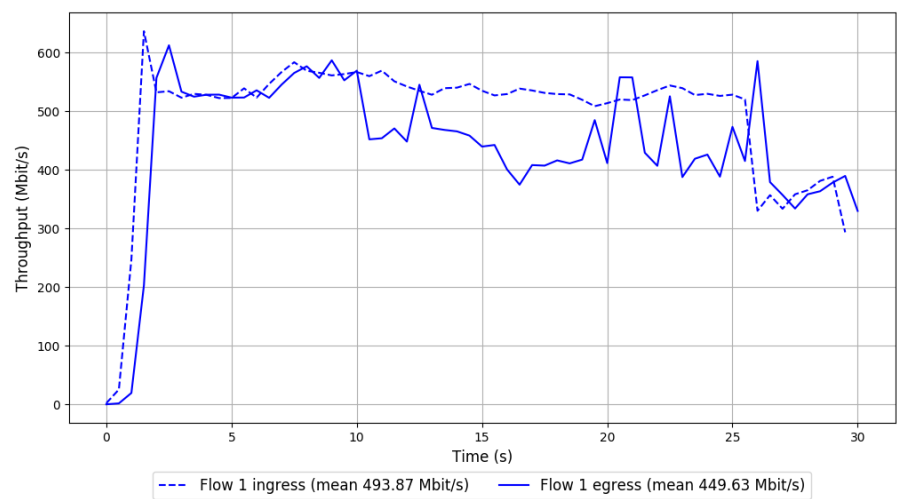
Run 3: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 429.04 Mbit/s)   Flow 1 egress (mean 405.94 Mbit/s)

Flow 1 (95th percentile 181.58 ms)

```
Run 4: Statistics of PCC-Allegro

Start at: 2019-01-03 17:11:05
End at: 2019-01-03 17:11:35
Local clock offset: -0.084 ms
Remote clock offset: 0.049 ms


# Below is generated by plot.py at 2019-01-03 19:26:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 449.63 Mbit/s
95th percentile per-packet one-way delay: 181.689 ms
Loss rate: 8.96%
-- Flow 1:
Average throughput: 449.63 Mbit/s
95th percentile per-packet one-way delay: 181.689 ms
Loss rate: 8.96%
```
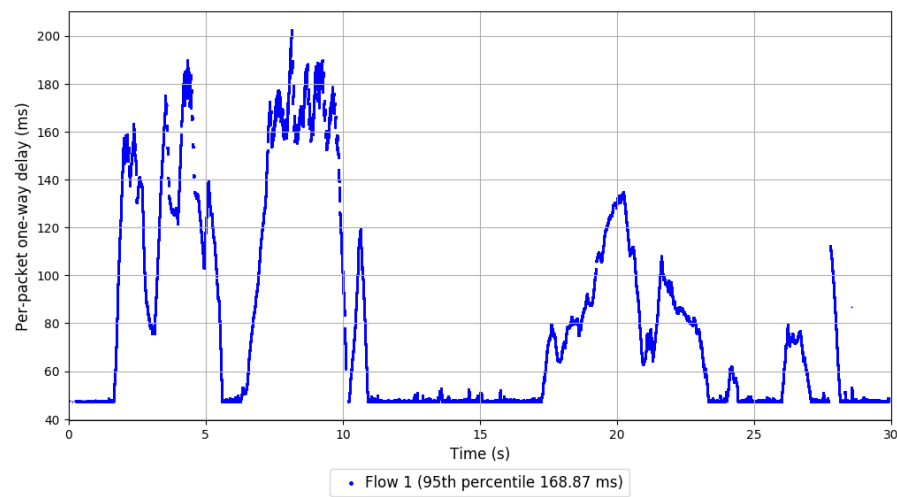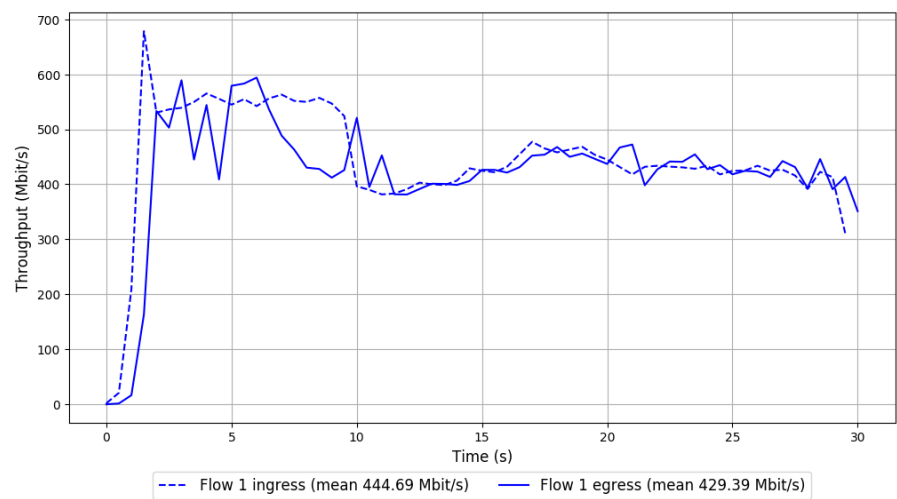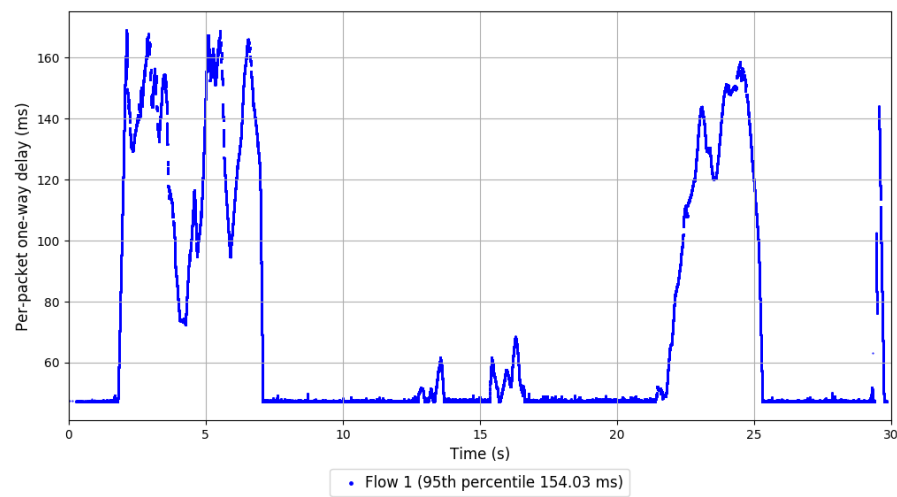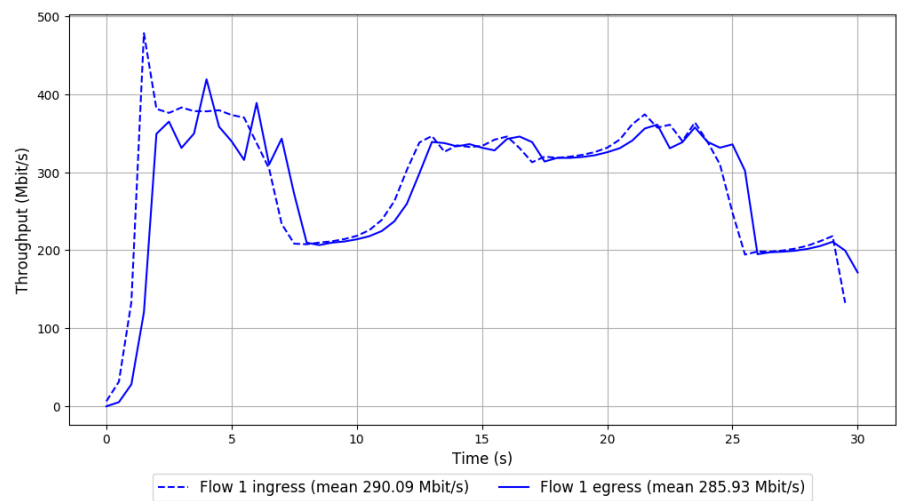
Run 4: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 493.87 Mbit/s)   Flow 1 egress (mean 449.63 Mbit/s)

• Flow 1 (95th percentile 181.69 ms)

```
Run 5: Statistics of PCC-Allegro

Start at: 2019-01-03 17:38:54
End at: 2019-01-03 17:39:24
Local clock offset: -0.126 ms
Remote clock offset: 0.043 ms


# Below is generated by plot.py at 2019-01-03 19:26:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 429.39 Mbit/s
95th percentile per-packet one-way delay: 168.866 ms
Loss rate: 3.44%
-- Flow 1:
Average throughput: 429.39 Mbit/s
95th percentile per-packet one-way delay: 168.866 ms
Loss rate: 3.44%
```

Run 5: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 444.69 Mbit/s)   Flow 1 egress (mean 429.39 Mbit/s)
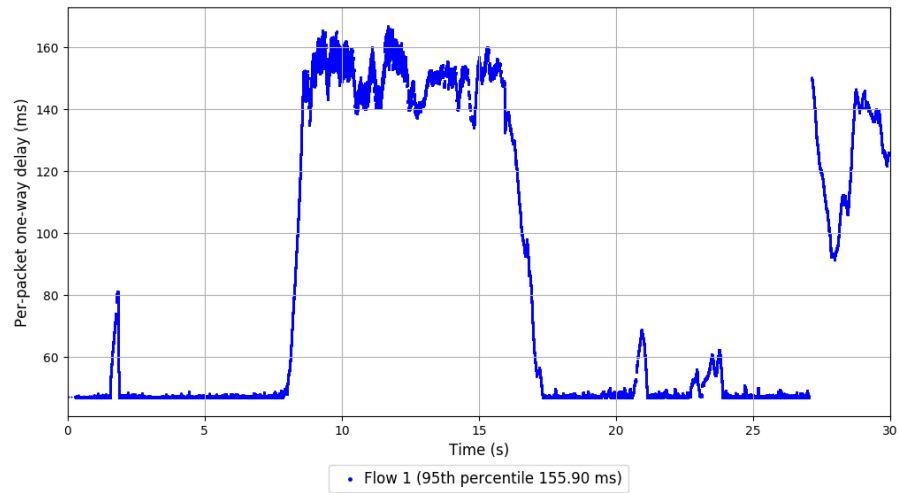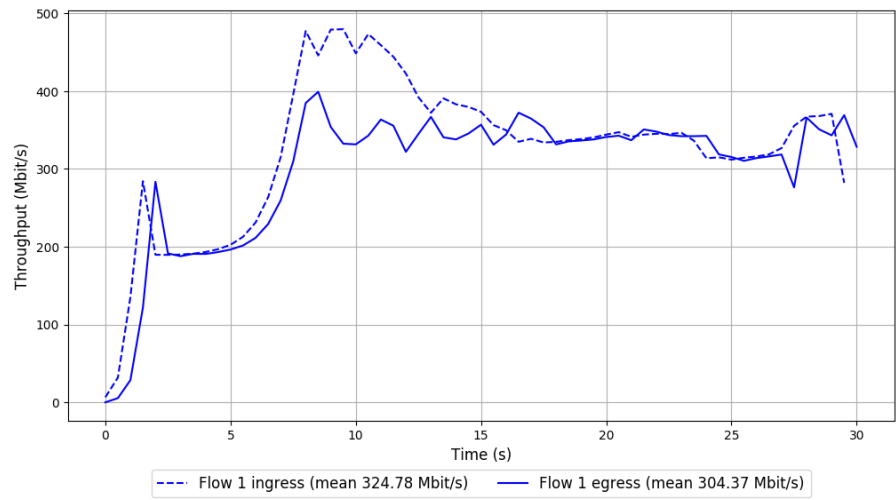

Flow 1 (95th percentile 168.87 ms)

```
Run 1: Statistics of PCC-Expr

Start at: 2019-01-03 15:45:47
End at: 2019-01-03 15:46:17
Local clock offset: -0.221 ms
Remote clock offset: -0.078 ms


# Below is generated by plot.py at 2019-01-03 19:26:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 285.93 Mbit/s
95th percentile per-packet one-way delay: 154.035 ms
Loss rate: 1.43%
-- Flow 1:
Average throughput: 285.93 Mbit/s
95th percentile per-packet one-way delay: 154.035 ms
Loss rate: 1.43%
```
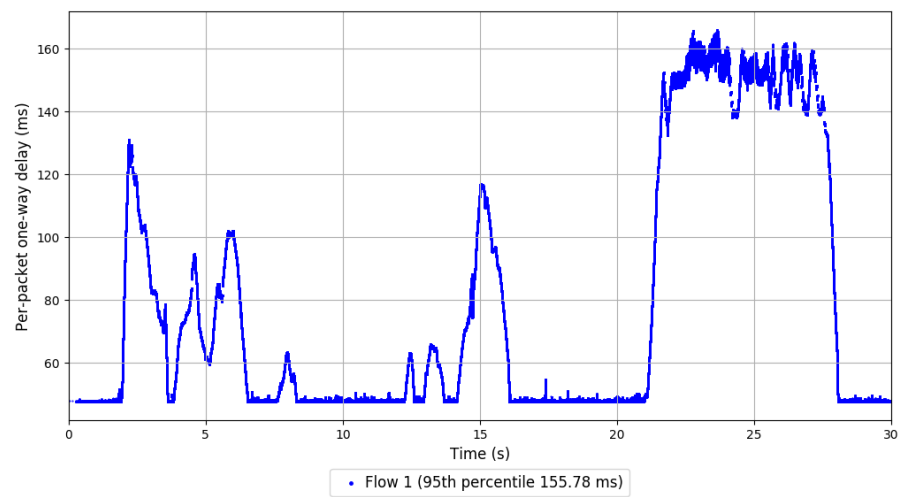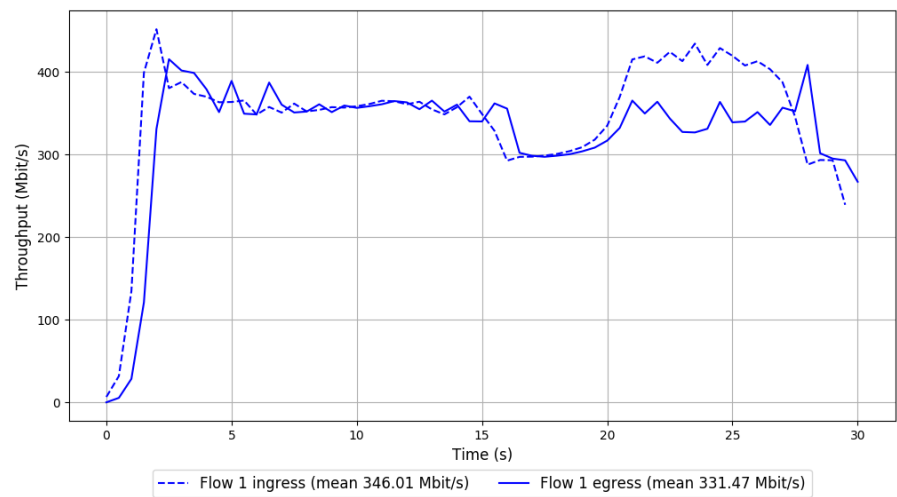
Run 1: Report of PCC-Expr — Data Link

```
Run 2: Statistics of PCC-Expr

Start at: 2019-01-03 16:13:20
End at: 2019-01-03 16:13:50
Local clock offset: 0.188 ms
Remote clock offset: -0.075 ms

# Below is generated by plot.py at 2019-01-03 19:26:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 304.37 Mbit/s
95th percentile per-packet one-way delay: 155.902 ms
Loss rate: 6.29%
-- Flow 1:
Average throughput: 304.37 Mbit/s
95th percentile per-packet one-way delay: 155.902 ms
Loss rate: 6.29%
```

Run 2: Report of PCC-Expr — Data Link

```
Run 3: Statistics of PCC-Expr

Start at: 2019-01-03 16:40:43
End at: 2019-01-03 16:41:13
Local clock offset: -0.388 ms
Remote clock offset: -0.044 ms


# Below is generated by plot.py at 2019-01-03 19:28:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 331.47 Mbit/s
95th percentile per-packet one-way delay: 155.782 ms
Loss rate: 4.20%
-- Flow 1:
Average throughput: 331.47 Mbit/s
95th percentile per-packet one-way delay: 155.782 ms
Loss rate: 4.20%
```
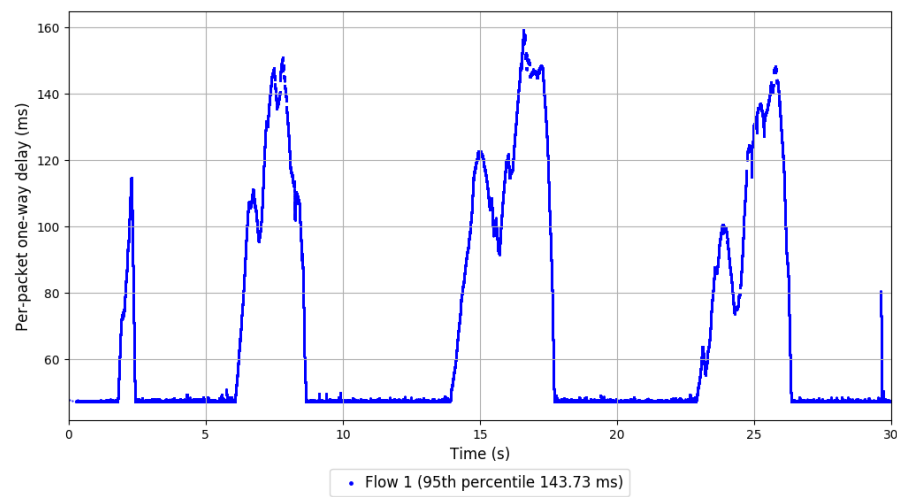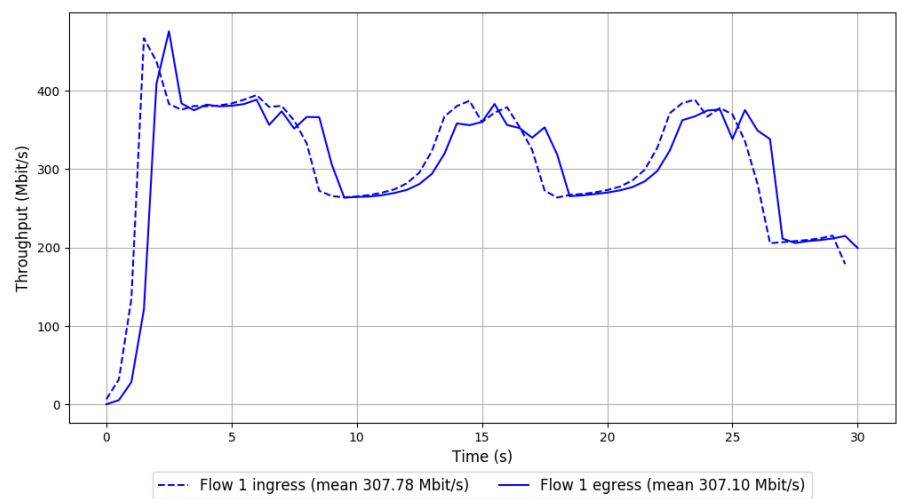
Run 3: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 346.01 Mbit/s)   Flow 1 egress (mean 331.47 Mbit/s)

Flow 1 (95th percentile 155.78 ms)

```
Run 4: Statistics of PCC-Expr

Start at: 2019-01-03 17:07:55
End at: 2019-01-03 17:08:25
Local clock offset: -0.069 ms
Remote clock offset: 0.037 ms


# Below is generated by plot.py at 2019-01-03 19:31:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 307.10 Mbit/s
95th percentile per-packet one-way delay: 143.727 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 307.10 Mbit/s
95th percentile per-packet one-way delay: 143.727 ms
Loss rate: 0.22%
```
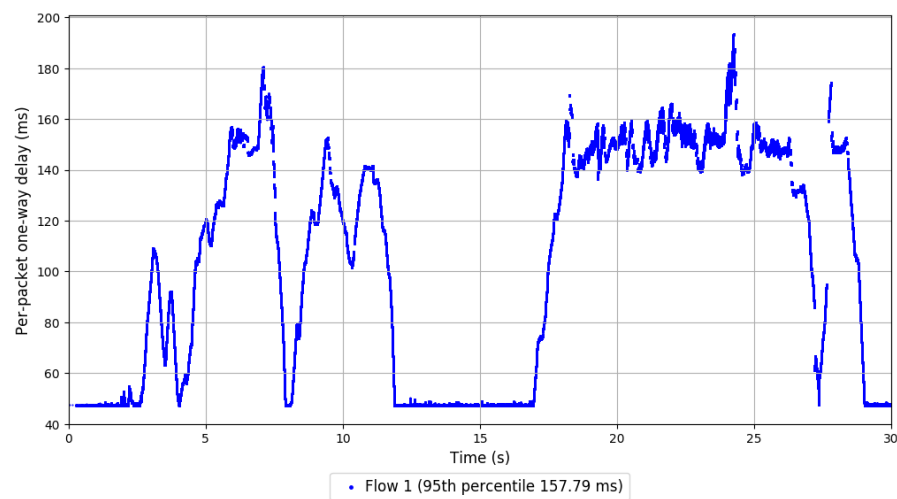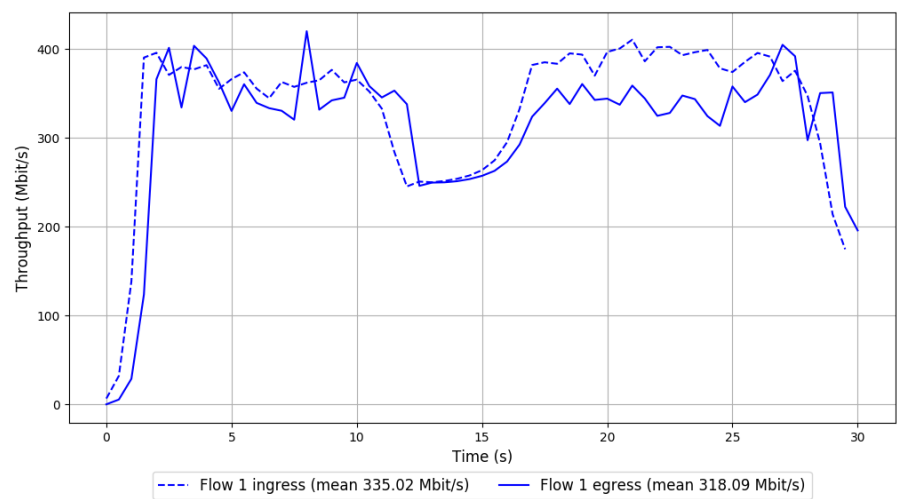
Run 4: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 307.78 Mbit/s)   Flow 1 egress (mean 307.10 Mbit/s)

• Flow 1 (95th percentile 143.73 ms)

```
Run 5: Statistics of PCC-Expr

Start at: 2019-01-03 17:35:43
End at: 2019-01-03 17:36:13
Local clock offset: -0.137 ms
Remote clock offset: 0.063 ms


# Below is generated by plot.py at 2019-01-03 19:35:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 318.09 Mbit/s
95th percentile per-packet one-way delay: 157.795 ms
Loss rate: 5.05%
-- Flow 1:
Average throughput: 318.09 Mbit/s
95th percentile per-packet one-way delay: 157.795 ms
Loss rate: 5.05%
```
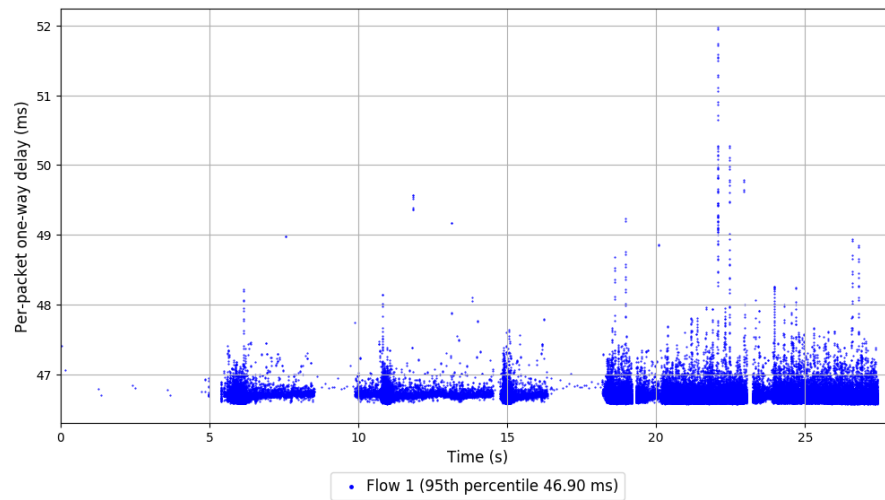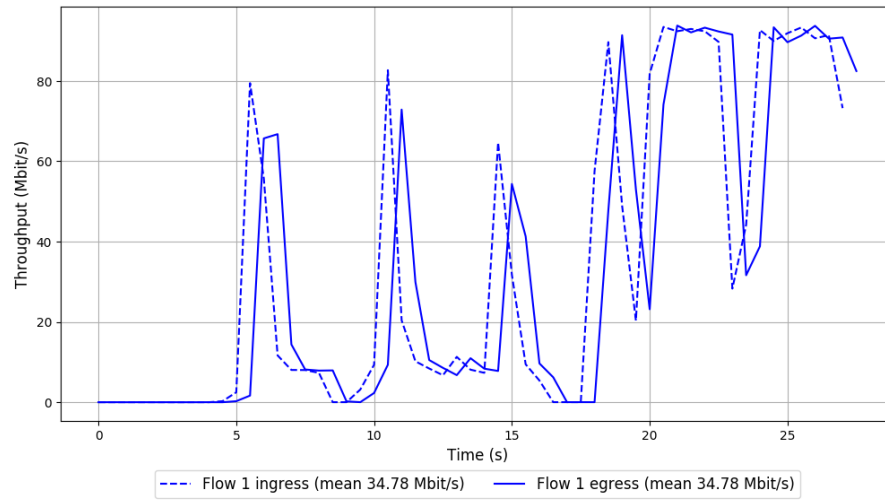
Run 5: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 335.02 Mbit/s)   Flow 1 egress (mean 318.09 Mbit/s)
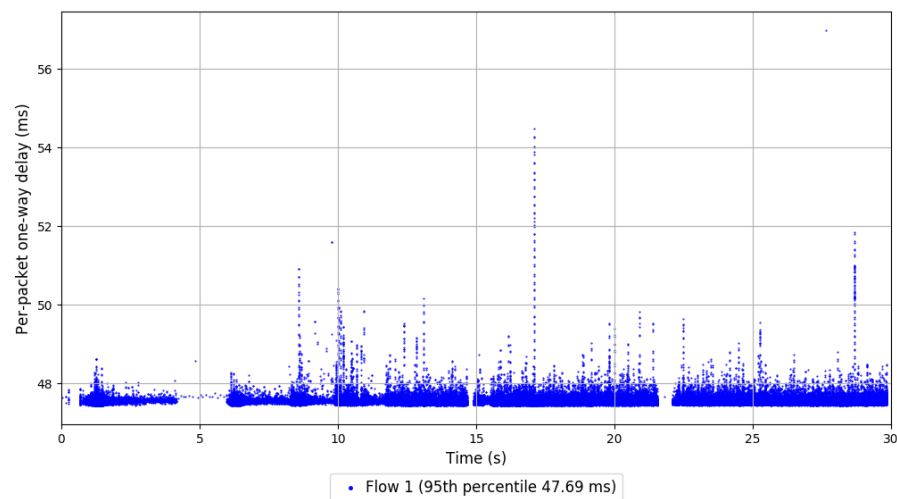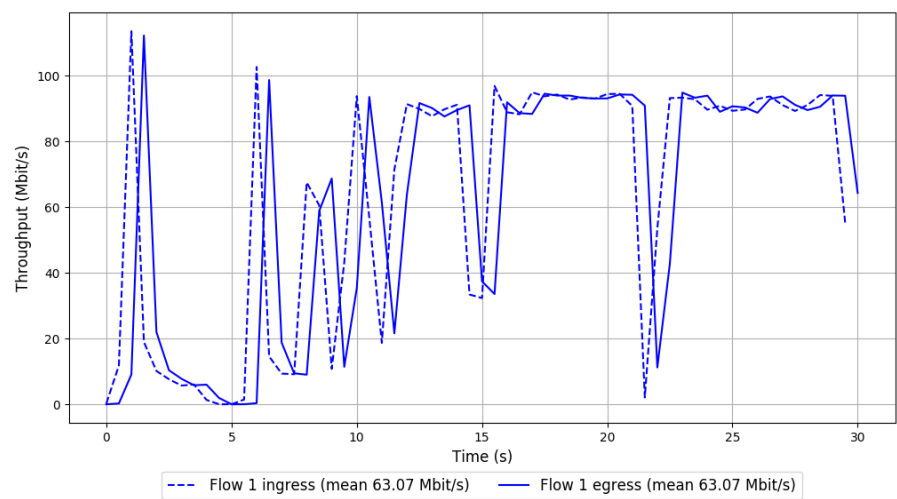

Flow 1 (95th percentile 157.79 ms)

```
Run 1: Statistics of QUIC Cubic

Start at: 2019-01-03 15:53:04
End at: 2019-01-03 15:53:34
Local clock offset: -0.213 ms
Remote clock offset: -0.069 ms


# Below is generated by plot.py at 2019-01-03 19:35:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 34.78 Mbit/s
95th percentile per-packet one-way delay: 46.895 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 34.78 Mbit/s
95th percentile per-packet one-way delay: 46.895 ms
Loss rate: 0.00%
```

Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2019-01-03 16:20:31
End at: 2019-01-03 16:21:01
Local clock offset: -0.118 ms
Remote clock offset: -0.062 ms


# Below is generated by plot.py at 2019-01-03 19:35:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 63.07 Mbit/s
95th percentile per-packet one-way delay: 47.686 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 63.07 Mbit/s
95th percentile per-packet one-way delay: 47.686 ms
Loss rate: 0.00%
```
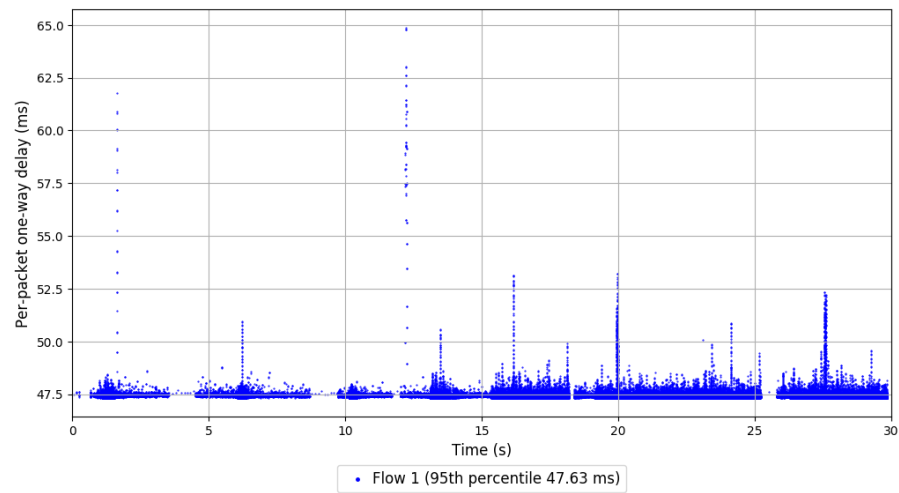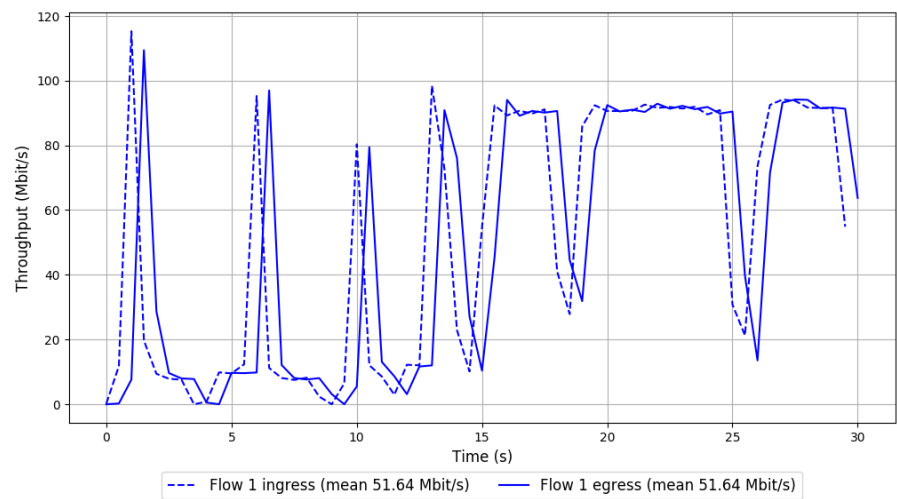
Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2019-01-03 16:48:04
End at: 2019-01-03 16:48:34
Local clock offset: -0.09 ms
Remote clock offset: 0.002 ms


# Below is generated by plot.py at 2019-01-03 19:35:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 51.64 Mbit/s
95th percentile per-packet one-way delay: 47.628 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 51.64 Mbit/s
95th percentile per-packet one-way delay: 47.628 ms
Loss rate: 0.00%
```
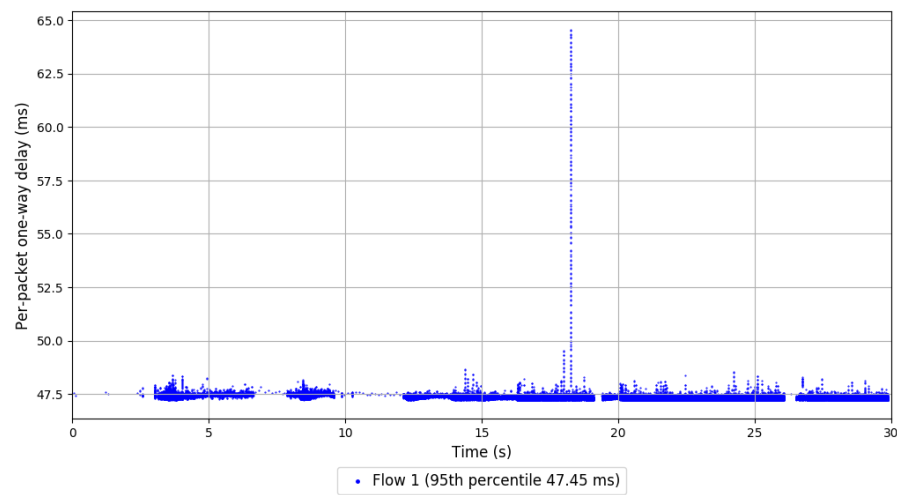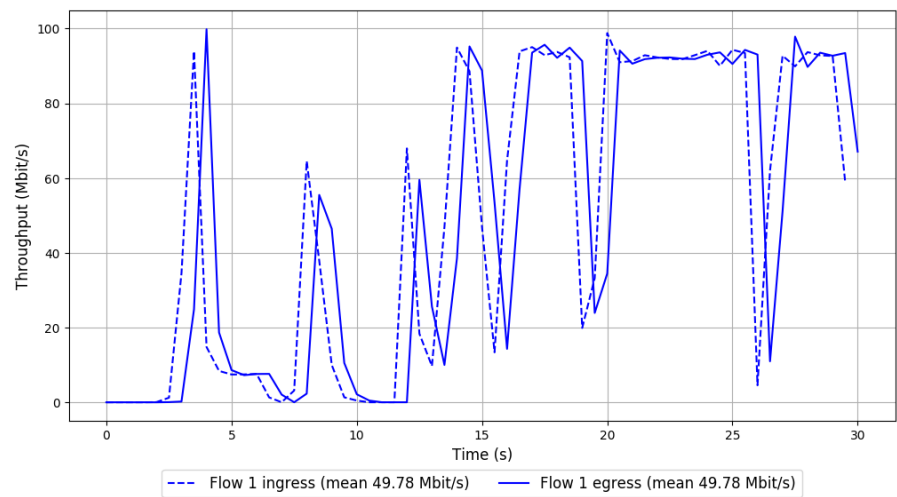
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 51.64 Mbit/s)   Flow 1 egress (mean 51.64 Mbit/s)

Flow 1 (95th percentile 47.63 ms)

```
Run 4: Statistics of QUIC Cubic

Start at: 2019-01-03 17:15:24
End at: 2019-01-03 17:15:54
Local clock offset: -0.101 ms
Remote clock offset: 0.027 ms


# Below is generated by plot.py at 2019-01-03 19:35:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 49.78 Mbit/s
95th percentile per-packet one-way delay: 47.449 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 49.78 Mbit/s
95th percentile per-packet one-way delay: 47.449 ms
Loss rate: 0.00%
```
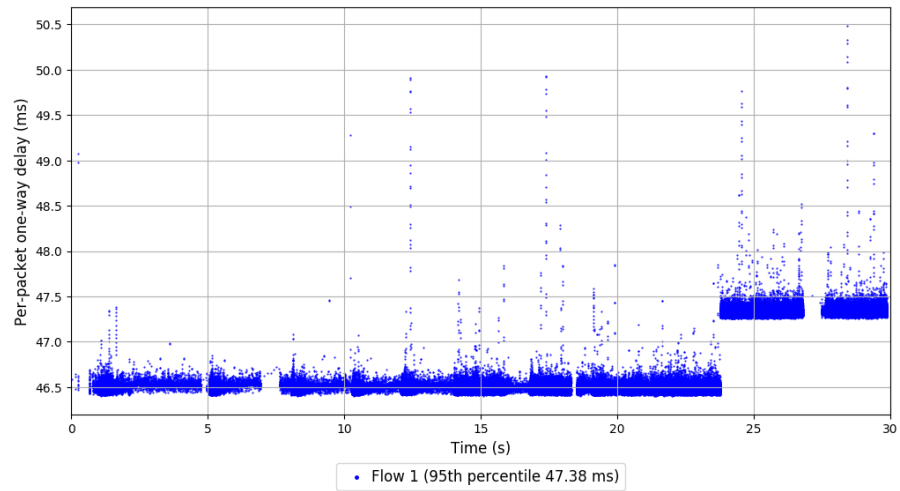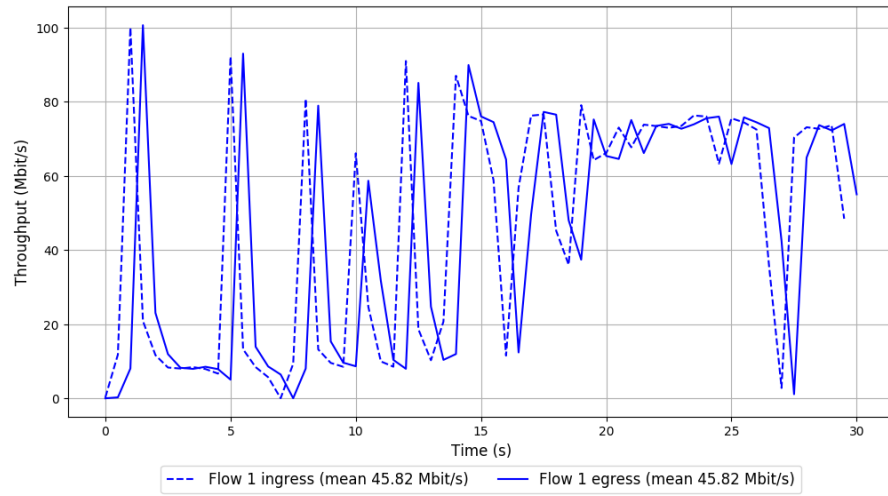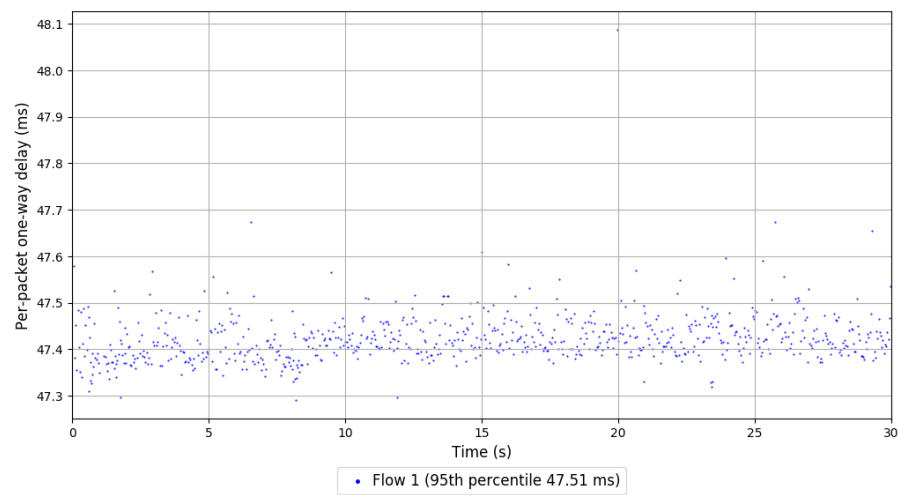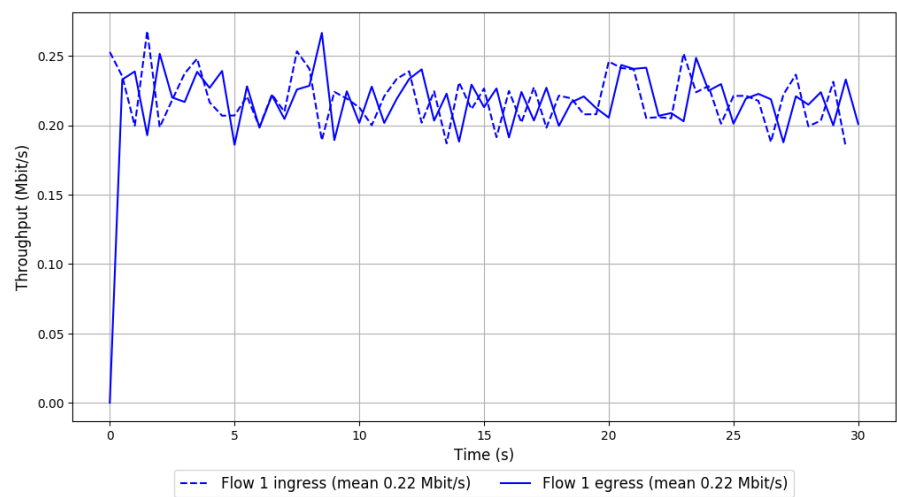
Run 4: Report of QUIC Cubic — Data Link

```
Run 5: Statistics of QUIC Cubic

Start at: 2019-01-03 17:43:09
End at: 2019-01-03 17:43:39
Local clock offset: -0.128 ms
Remote clock offset: 0.067 ms


# Below is generated by plot.py at 2019-01-03 19:35:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 45.82 Mbit/s
95th percentile per-packet one-way delay: 47.377 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 45.82 Mbit/s
95th percentile per-packet one-way delay: 47.377 ms
Loss rate: 0.00%
```
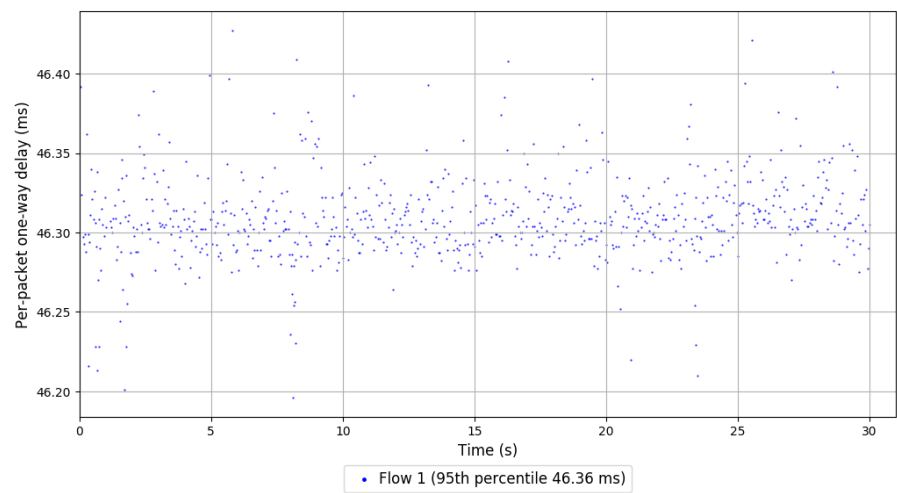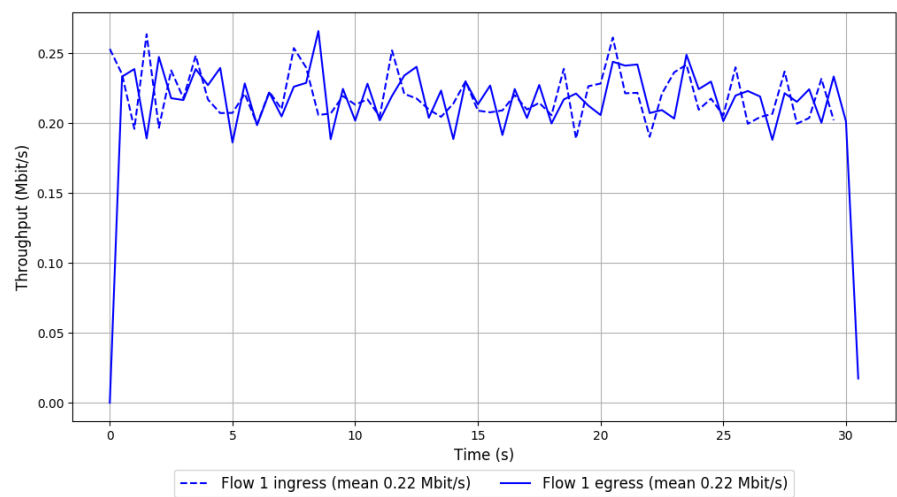
Run 5: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2019-01-03 16:00:05
End at: 2019-01-03 16:00:35
Local clock offset: -0.231 ms
Remote clock offset: -0.1 ms


# Below is generated by plot.py at 2019-01-03 19:35:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 47.507 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 47.507 ms
Loss rate: 0.00%
```
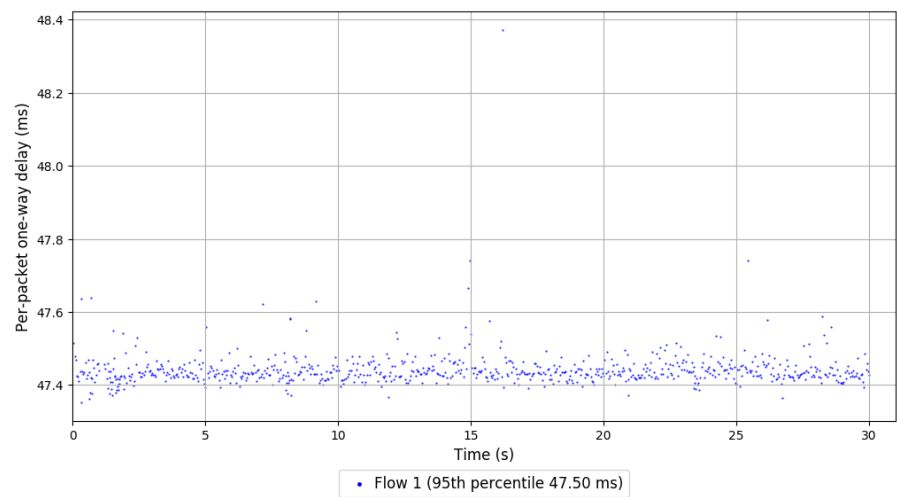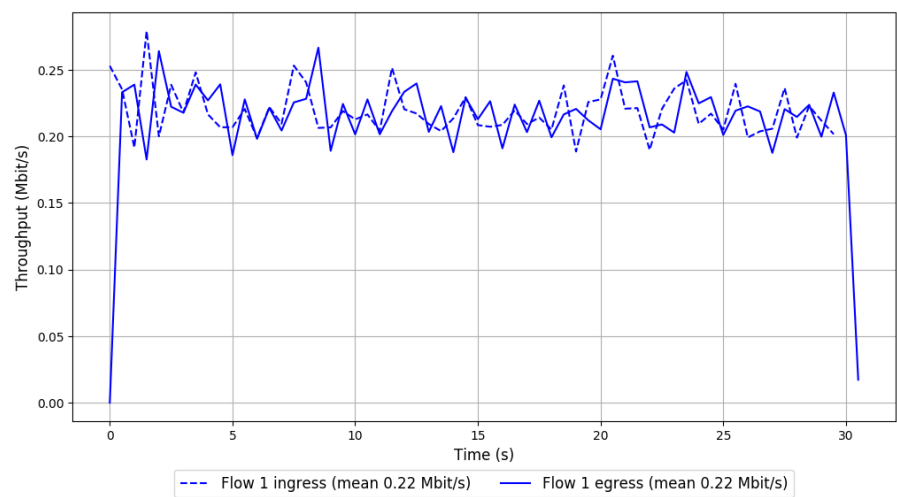
Run 1: Report of SCReAM — Data Link

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

Flow 1 (95th percentile 47.51 ms) •

```
Run 2: Statistics of SCReAM

Start at: 2019-01-03 16:27:36
End at: 2019-01-03 16:28:06
Local clock offset: 0.301 ms
Remote clock offset: -0.026 ms


# Below is generated by plot.py at 2019-01-03 19:35:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 46.356 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 46.356 ms
Loss rate: 0.00%
```

Run 2: 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 46.36 ms)

```
Run 3: Statistics of SCReAM

Start at: 2019-01-03 16:55:08
End at: 2019-01-03 16:55:38
Local clock offset: -0.125 ms
Remote clock offset: -0.009 ms


# Below is generated by plot.py at 2019-01-03 19:35:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 47.502 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 47.502 ms
Loss rate: 0.00%
```
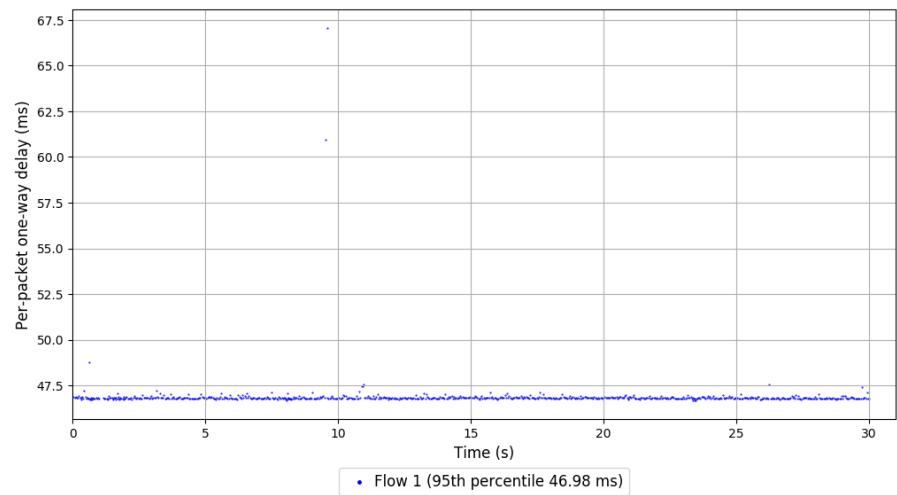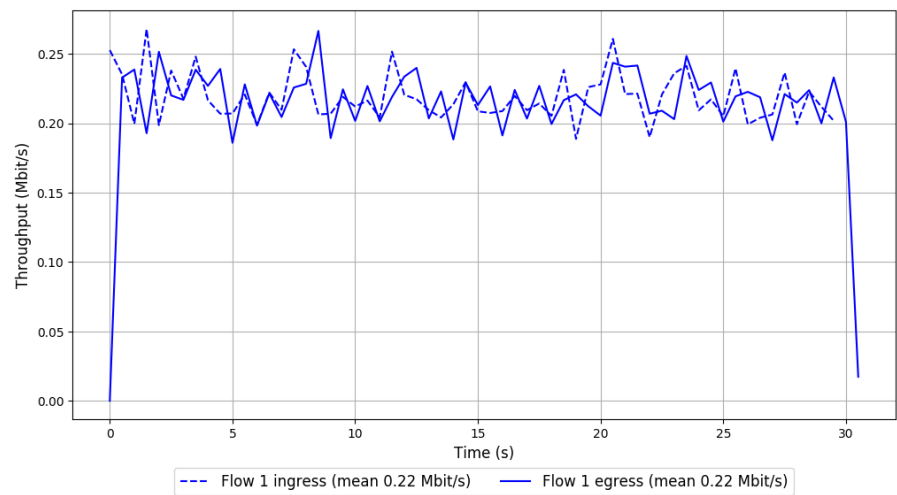
Run 3: Report of SCReAM — Data Link

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

Flow 1 (95th percentile 47.50 ms)

```
Run 4: Statistics of SCReAM

Start at: 2019-01-03 17:22:30
End at: 2019-01-03 17:23:00
Local clock offset: -0.098 ms
Remote clock offset: 0.032 ms


# Below is generated by plot.py at 2019-01-03 19:35:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 46.980 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 46.980 ms
Loss rate: 0.00%
```
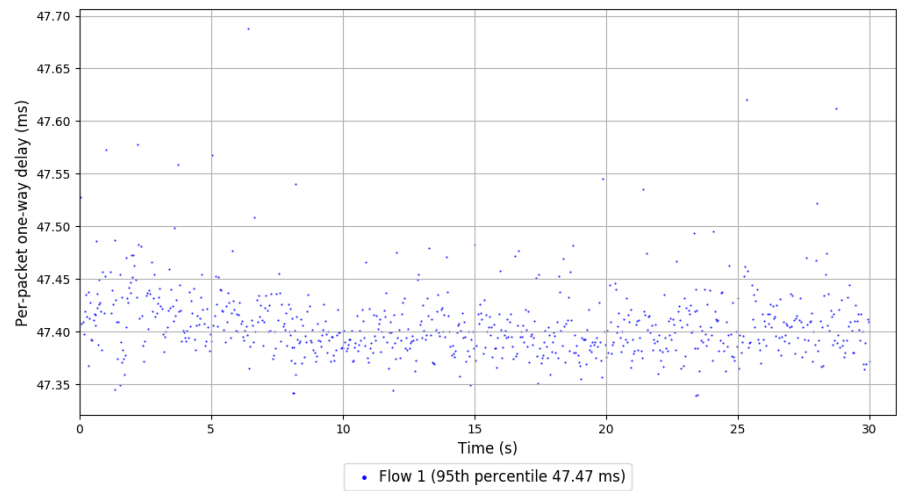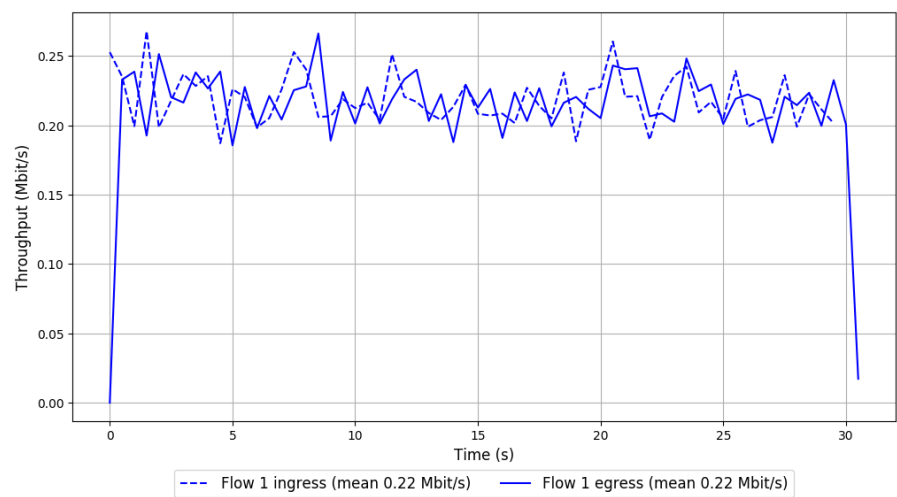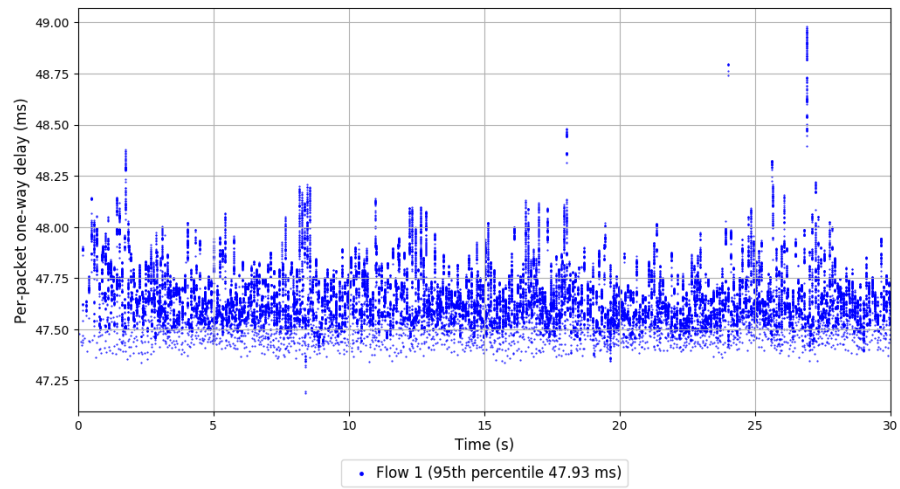
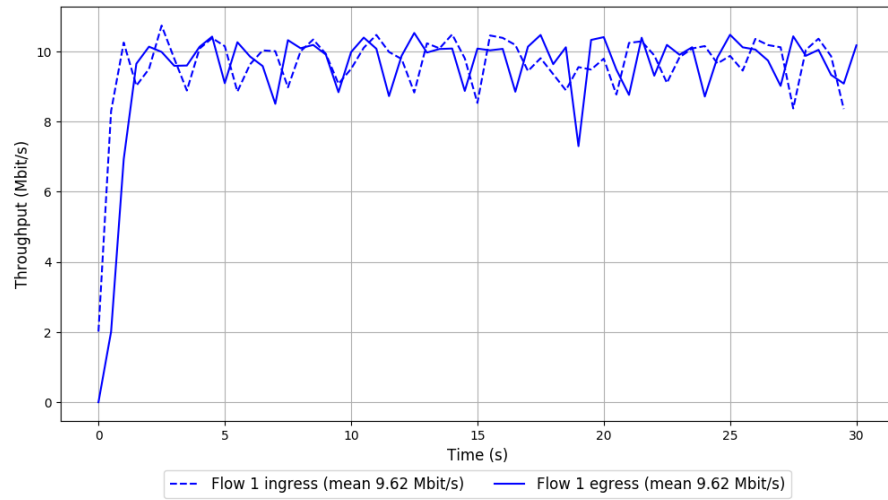# Run 4: Report of SCReAM — Data Link

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

Flow 1 (95th percentile 46.98 ms)

```
Run 5: Statistics of SCReAM

Start at: 2019-01-03 17:50:13
End at: 2019-01-03 17:50:43
Local clock offset: -0.136 ms
Remote clock offset: 0.041 ms


# Below is generated by plot.py at 2019-01-03 19:35:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 47.466 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 47.466 ms
Loss rate: 0.00%
```

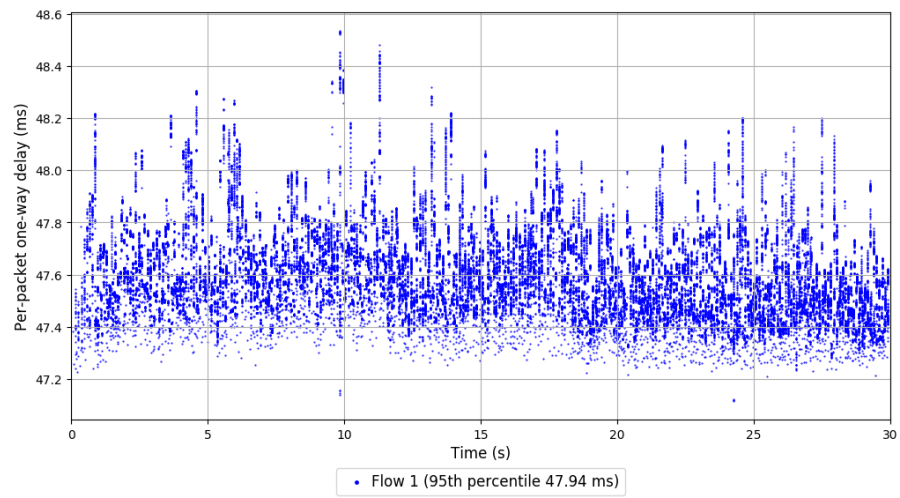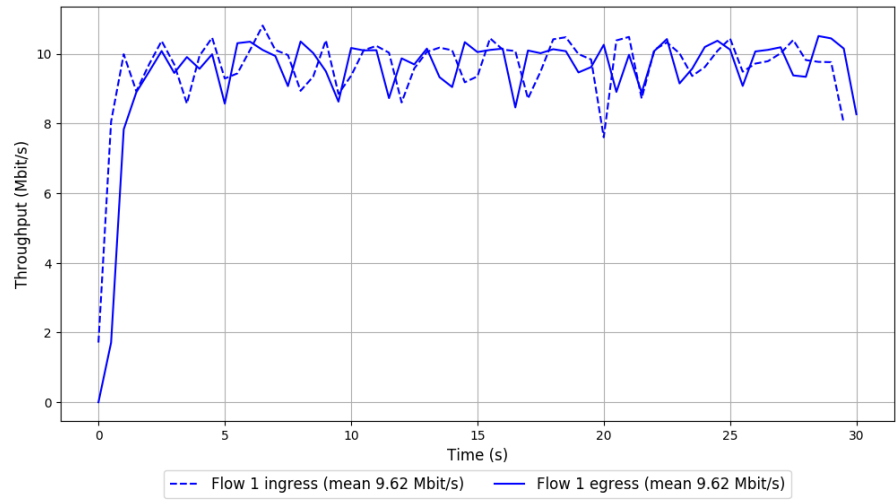# Run 5: Report of SCReAM — Data Link

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

Flow 1 (95th percentile 47.47 ms)

134

```
Run 1: Statistics of Sprout

Start at: 2019-01-03 16:01:12
End at: 2019-01-03 16:01:42
Local clock offset: -0.243 ms
Remote clock offset: -0.108 ms


# Below is generated by plot.py at 2019-01-03 19:35:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.62 Mbit/s
95th percentile per-packet one-way delay: 47.929 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.62 Mbit/s
95th percentile per-packet one-way delay: 47.929 ms
Loss rate: 0.00%
```
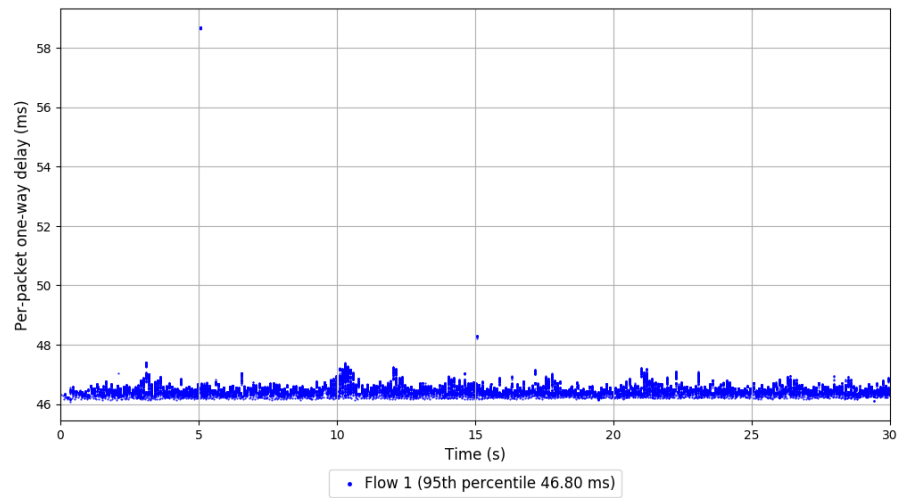
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2019-01-03 16:28:43
End at: 2019-01-03 16:29:13
Local clock offset: -0.009 ms
Remote clock offset: -0.039 ms


# Below is generated by plot.py at 2019-01-03 19:35:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.62 Mbit/s
95th percentile per-packet one-way delay: 47.943 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.62 Mbit/s
95th percentile per-packet one-way delay: 47.943 ms
Loss rate: 0.00%
```
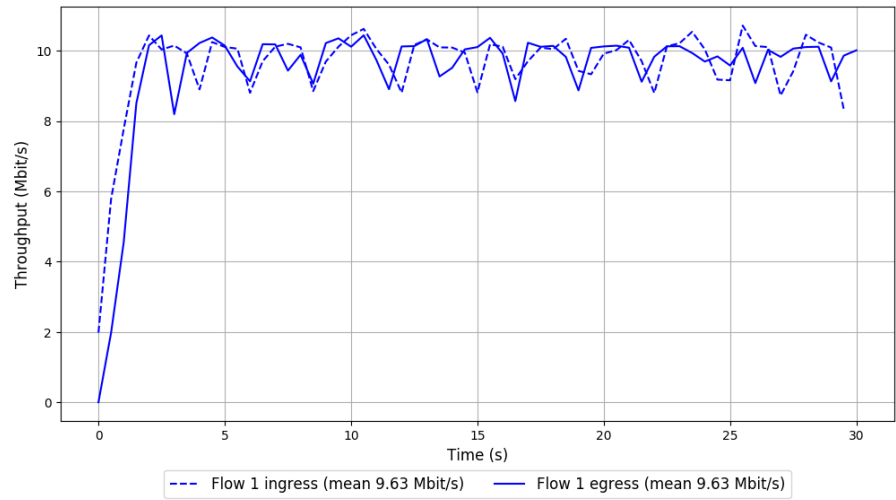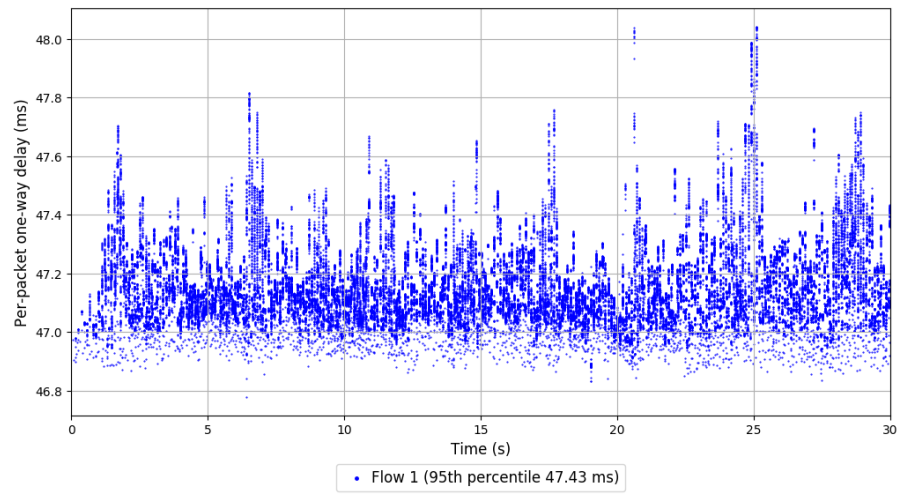
Run 2: Report of Sprout — Data Link

Flow 1 ingress (mean 9.62 Mbit/s) --- Flow 1 egress (mean 9.62 Mbit/s)

Flow 1 (95th percentile 47.94 ms)

```
Run 3: Statistics of Sprout

Start at: 2019-01-03 16:56:16
End at: 2019-01-03 16:56:46
Local clock offset: 0.282 ms
Remote clock offset: 0.044 ms


# Below is generated by plot.py at 2019-01-03 19:35:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.63 Mbit/s
95th percentile per-packet one-way delay: 46.795 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.63 Mbit/s
95th percentile per-packet one-way delay: 46.795 ms
Loss rate: 0.00%
```
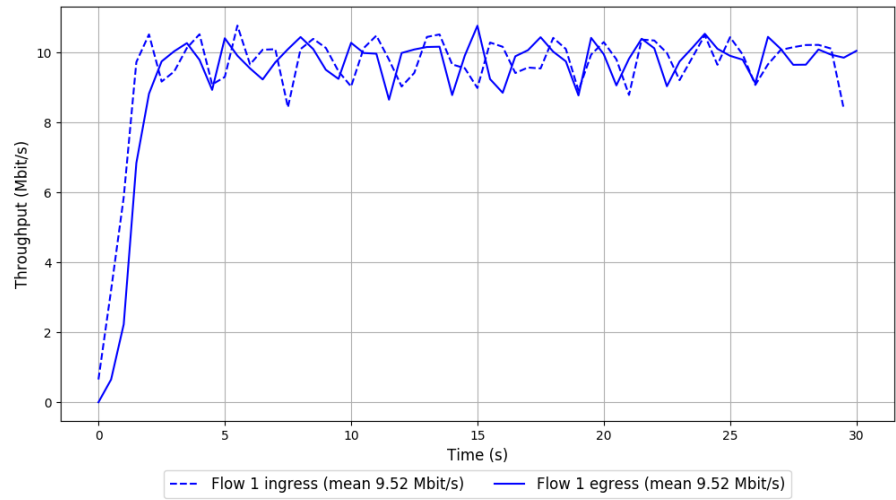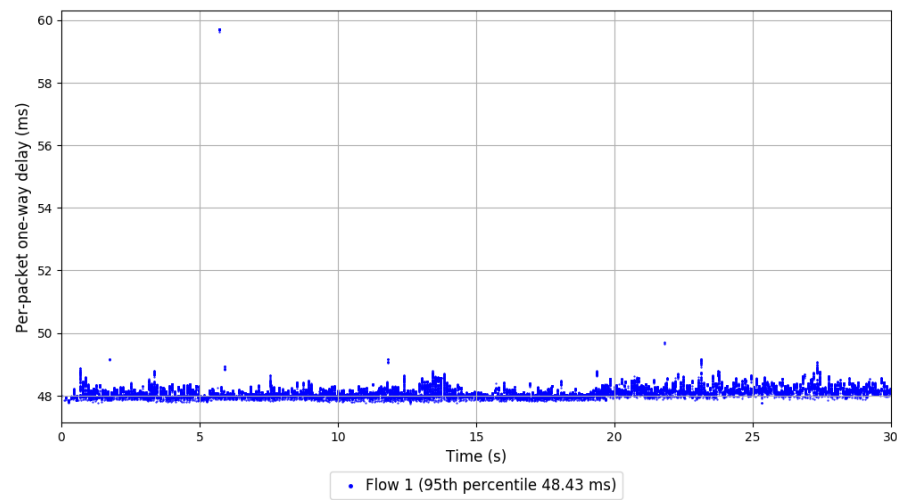
Run 3: Report of Sprout — Data Link

```
Run 4: Statistics of Sprout

Start at: 2019-01-03 17:23:37
End at: 2019-01-03 17:24:07
Local clock offset: 0.217 ms
Remote clock offset: 0.03 ms


# Below is generated by plot.py at 2019-01-03 19:35:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.52 Mbit/s
95th percentile per-packet one-way delay: 47.429 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.52 Mbit/s
95th percentile per-packet one-way delay: 47.429 ms
Loss rate: 0.00%
```
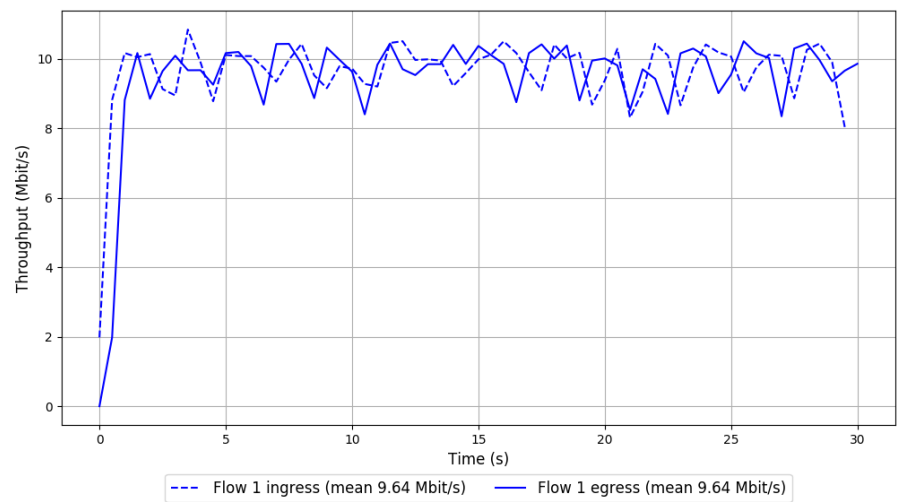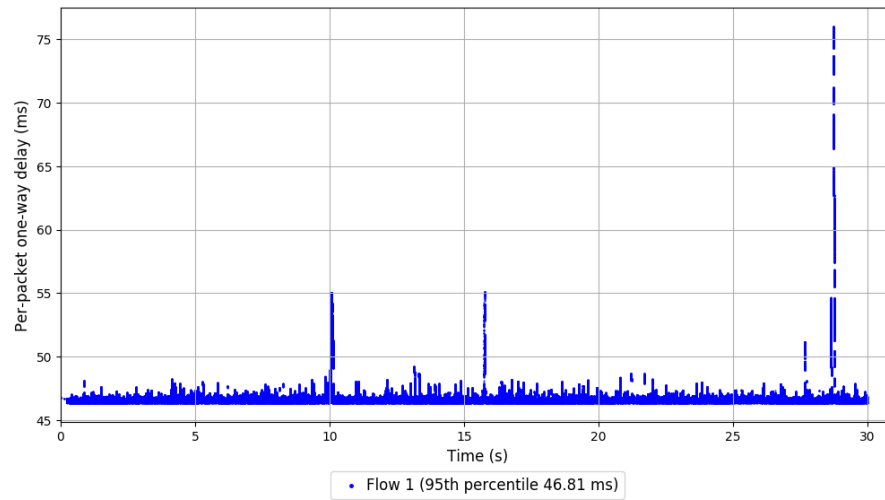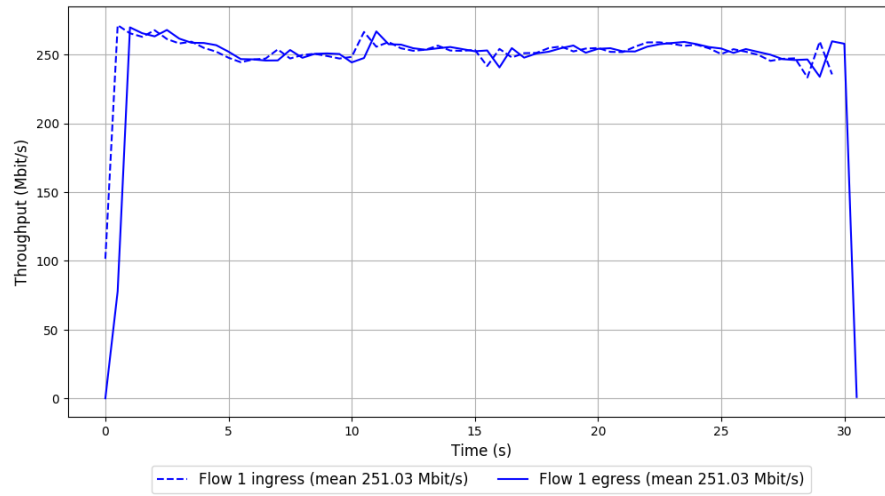
Run 4: Report of Sprout — Data Link

```
Run 5: Statistics of Sprout

Start at: 2019-01-03 17:51:21
End at: 2019-01-03 17:51:51
Local clock offset: -0.511 ms
Remote clock offset: 0.074 ms


# Below is generated by plot.py at 2019-01-03 19:35:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.64 Mbit/s
95th percentile per-packet one-way delay: 48.426 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.64 Mbit/s
95th percentile per-packet one-way delay: 48.426 ms
Loss rate: 0.00%
```

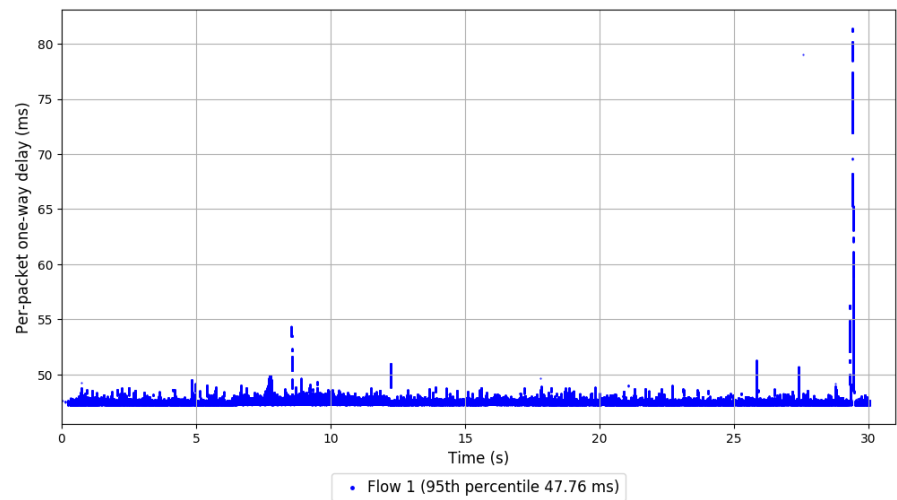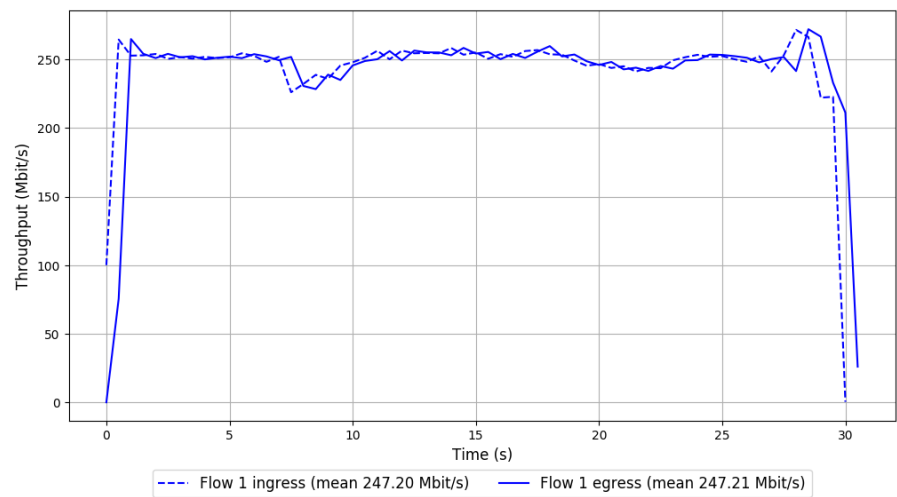## Run 5: Report of Sprout — Data Link

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

Start at: 2019-01-03 15:58:36
End at: 2019-01-03 15:59:06
Local clock offset: -0.249 ms
Remote clock offset: -0.081 ms


# Below is generated by plot.py at 2019-01-03 19:36:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 251.03 Mbit/s
95th percentile per-packet one-way delay: 46.808 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 251.03 Mbit/s
95th percentile per-packet one-way delay: 46.808 ms
Loss rate: 0.00%
```

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

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

Start at: 2019-01-03 16:26:08
End at: 2019-01-03 16:26:38
Local clock offset: -0.053 ms
Remote clock offset: -0.035 ms


# Below is generated by plot.py at 2019-01-03 19:36:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 247.21 Mbit/s
95th percentile per-packet one-way delay: 47.763 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 247.21 Mbit/s
95th percentile per-packet one-way delay: 47.763 ms
Loss rate: 0.00%
```
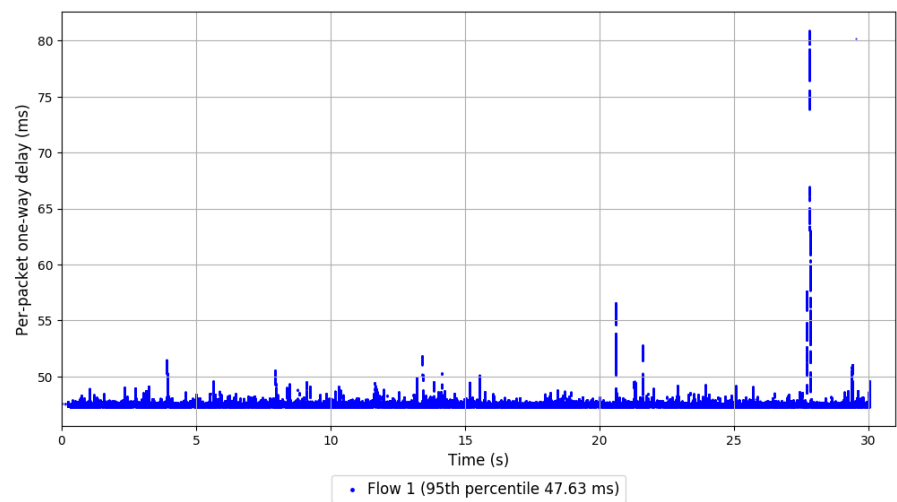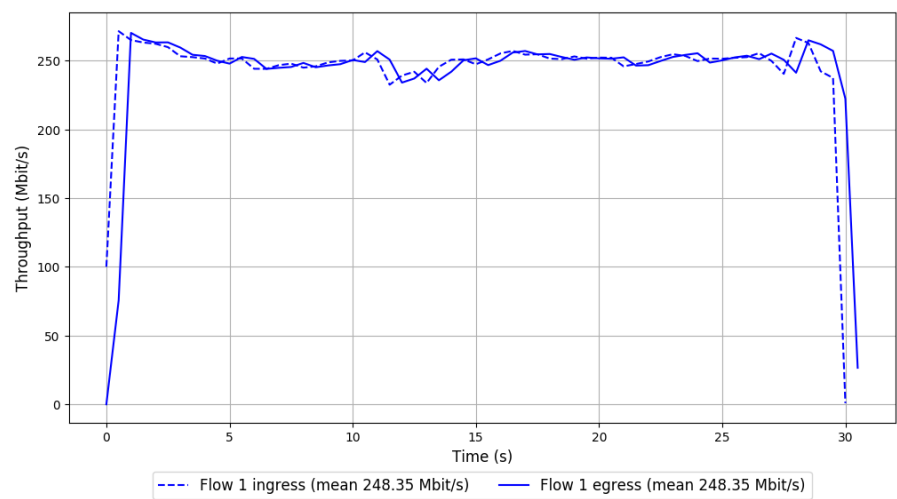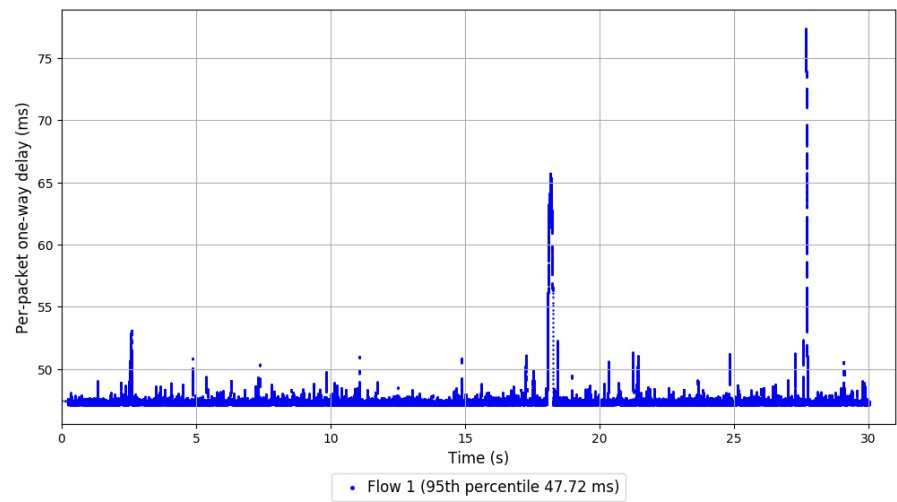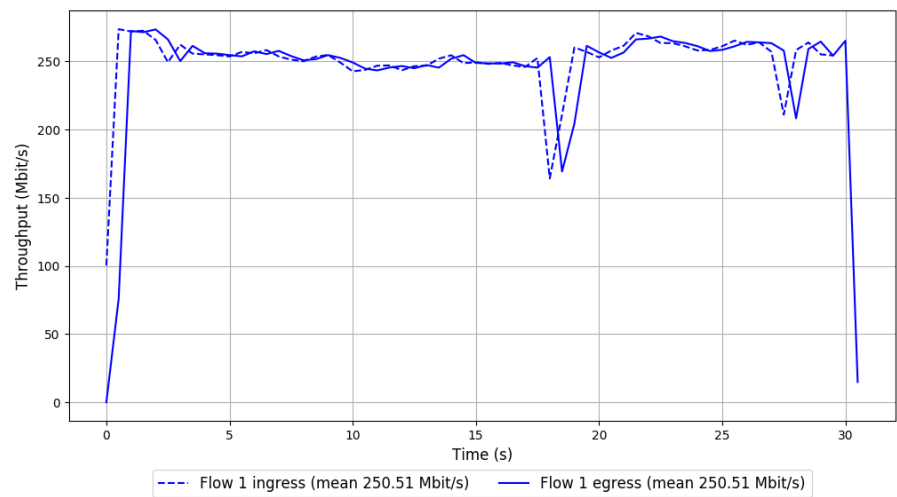
Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2019-01-03 16:53:39
End at: 2019-01-03 16:54:09
Local clock offset: -0.062 ms
Remote clock offset: 0.061 ms


# Below is generated by plot.py at 2019-01-03 19:36:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 248.35 Mbit/s
95th percentile per-packet one-way delay: 47.630 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 248.35 Mbit/s
95th percentile per-packet one-way delay: 47.630 ms
Loss rate: 0.00%
```

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

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

Start at: 2019-01-03 17:21:01
End at: 2019-01-03 17:21:31
Local clock offset: -0.099 ms
Remote clock offset: -0.006 ms


# Below is generated by plot.py at 2019-01-03 19:36:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 250.51 Mbit/s
95th percentile per-packet one-way delay: 47.716 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 250.51 Mbit/s
95th percentile per-packet one-way delay: 47.716 ms
Loss rate: 0.00%
```
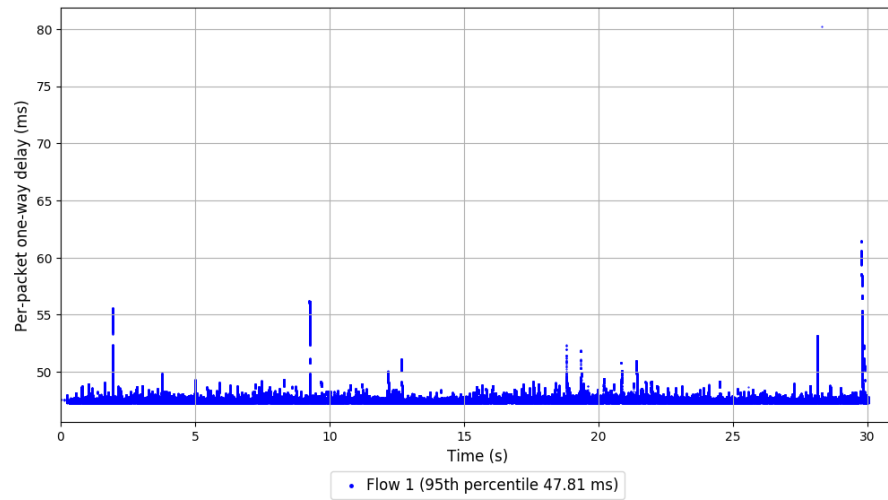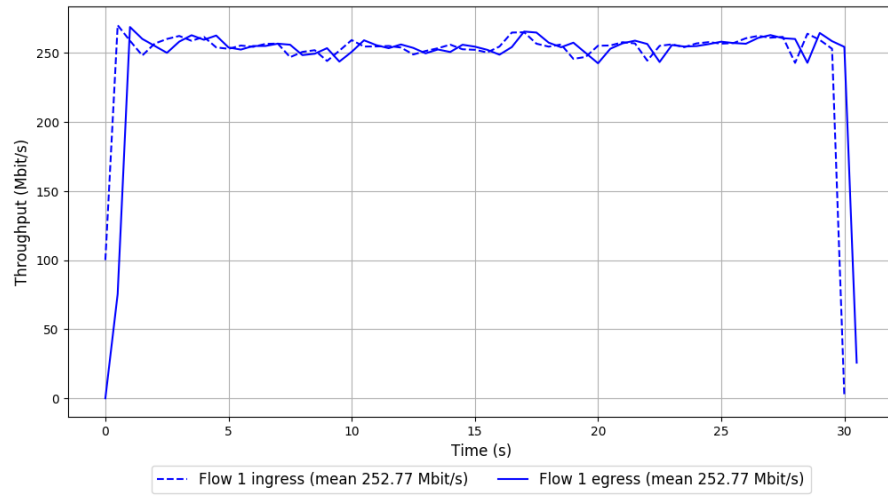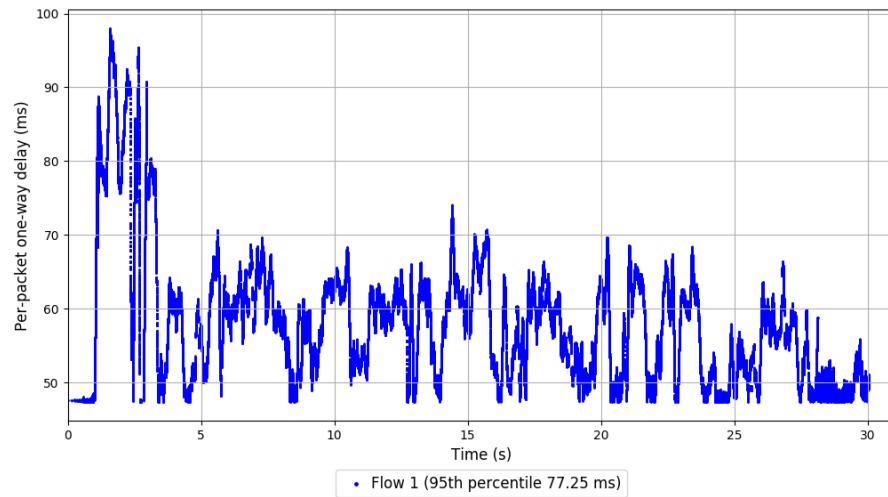
Run 4: Report of TaoVA-100x — Data Link

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

Start at: 2019-01-03 17:48:44
End at: 2019-01-03 17:49:14
Local clock offset: -0.115 ms
Remote clock offset: 0.087 ms


# Below is generated by plot.py at 2019-01-03 19:36:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 252.77 Mbit/s
95th percentile per-packet one-way delay: 47.812 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 252.77 Mbit/s
95th percentile per-packet one-way delay: 47.812 ms
Loss rate: 0.00%
```
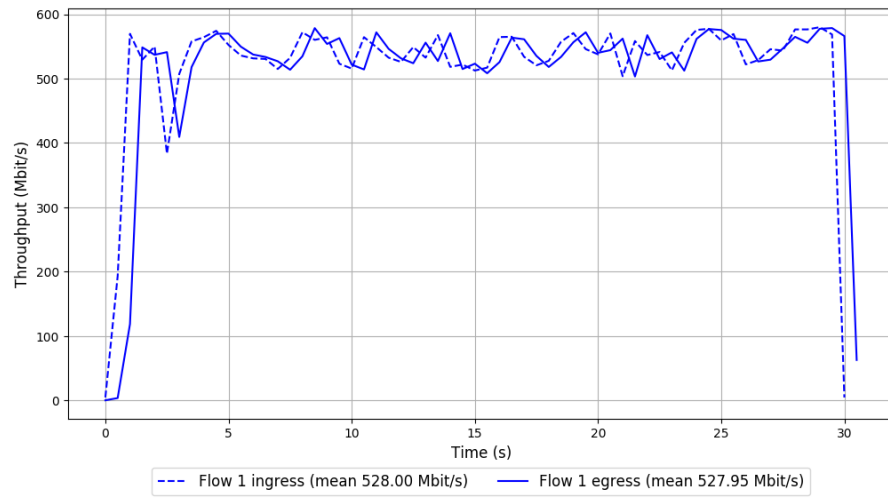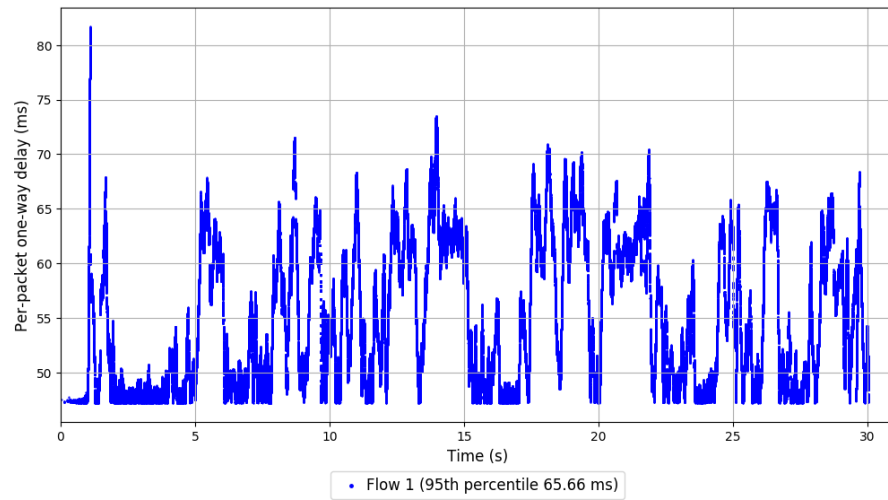
Run 5: Report of TaoVA-100x — Data Link

```
Run 1: Statistics of TCP Vegas

Start at: 2019-01-03 16:02:21
End at: 2019-01-03 16:02:51
Local clock offset: -0.293 ms
Remote clock offset: -0.082 ms


# Below is generated by plot.py at 2019-01-03 19:38:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 527.95 Mbit/s
95th percentile per-packet one-way delay: 77.248 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 527.95 Mbit/s
95th percentile per-packet one-way delay: 77.248 ms
Loss rate: 0.01%
```
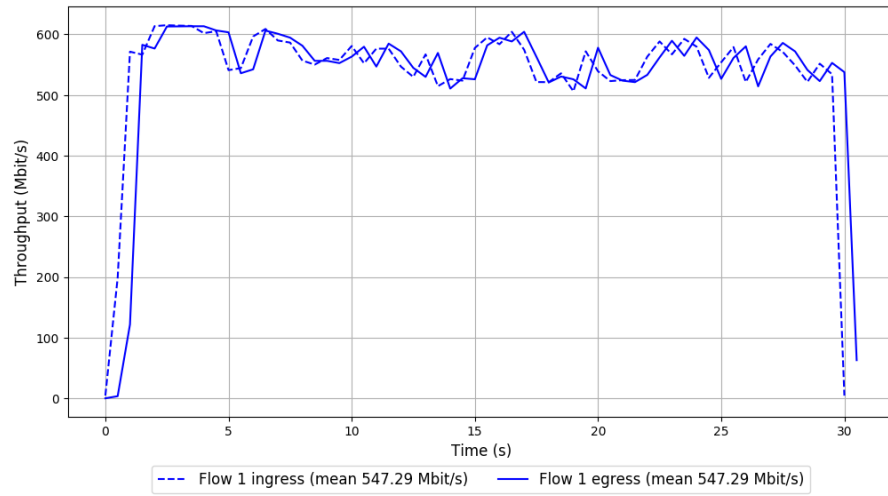
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2019-01-03 16:29:52
End at: 2019-01-03 16:30:22
Local clock offset: -0.028 ms
Remote clock offset: -0.038 ms


# Below is generated by plot.py at 2019-01-03 19:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 547.29 Mbit/s
95th percentile per-packet one-way delay: 65.663 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 547.29 Mbit/s
95th percentile per-packet one-way delay: 65.663 ms
Loss rate: 0.00%
```

Run 2: Report of TCP Vegas — Data Link

158

```
Run 3: Statistics of TCP Vegas

Start at: 2019-01-03 16:57:24
End at: 2019-01-03 16:57:54
Local clock offset: -0.11 ms
Remote clock offset: 0.006 ms


# Below is generated by plot.py at 2019-01-03 19:46:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 527.06 Mbit/s
95th percentile per-packet one-way delay: 69.318 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 527.06 Mbit/s
95th percentile per-packet one-way delay: 69.318 ms
Loss rate: 0.05%
```
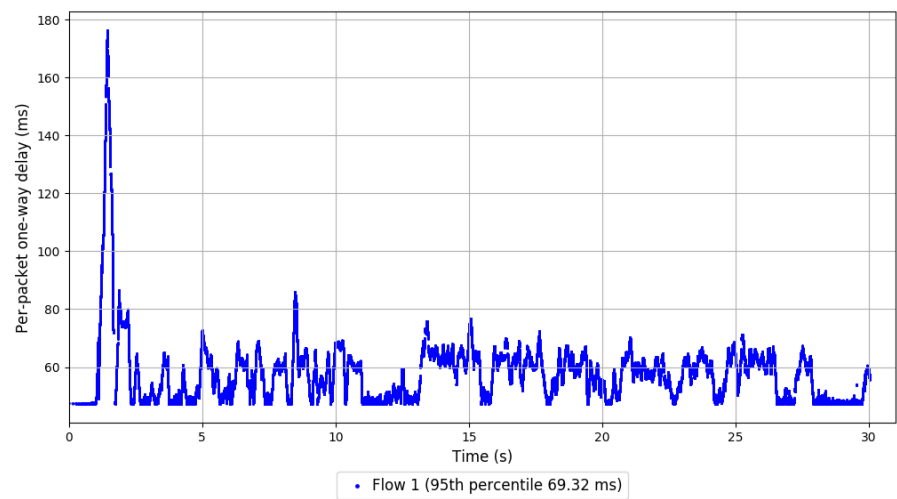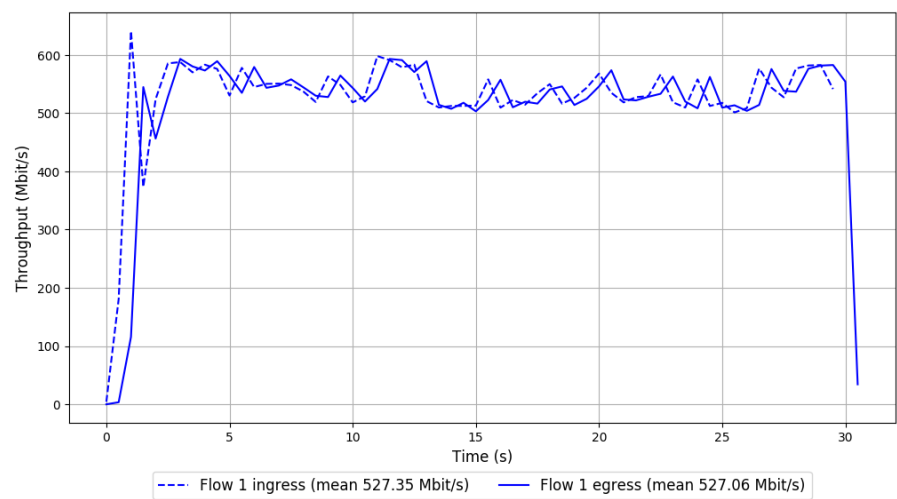
Run 3: Report of TCP Vegas — Data Link

```
Run 4: Statistics of TCP Vegas

Start at: 2019-01-03 17:24:46
End at: 2019-01-03 17:25:16
Local clock offset: 0.243 ms
Remote clock offset: 0.059 ms


# Below is generated by plot.py at 2019-01-03 19:47:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 547.61 Mbit/s
95th percentile per-packet one-way delay: 94.676 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 547.61 Mbit/s
95th percentile per-packet one-way delay: 94.676 ms
Loss rate: 0.01%
```
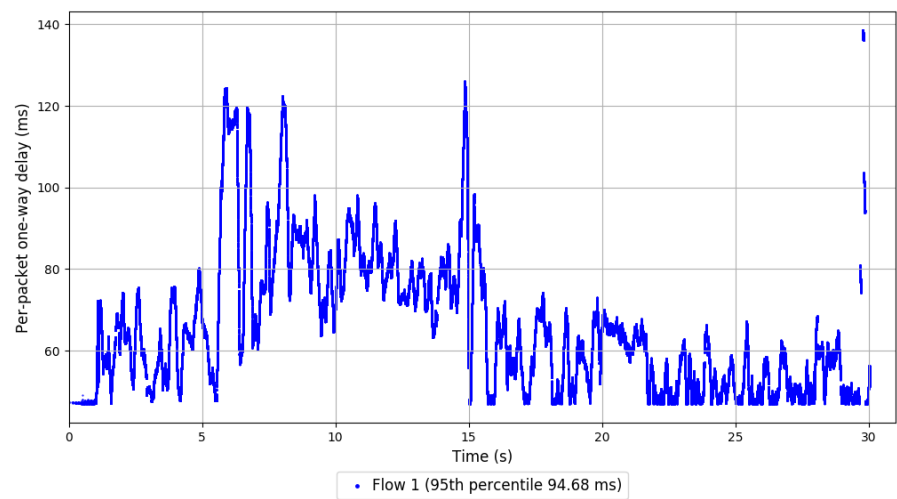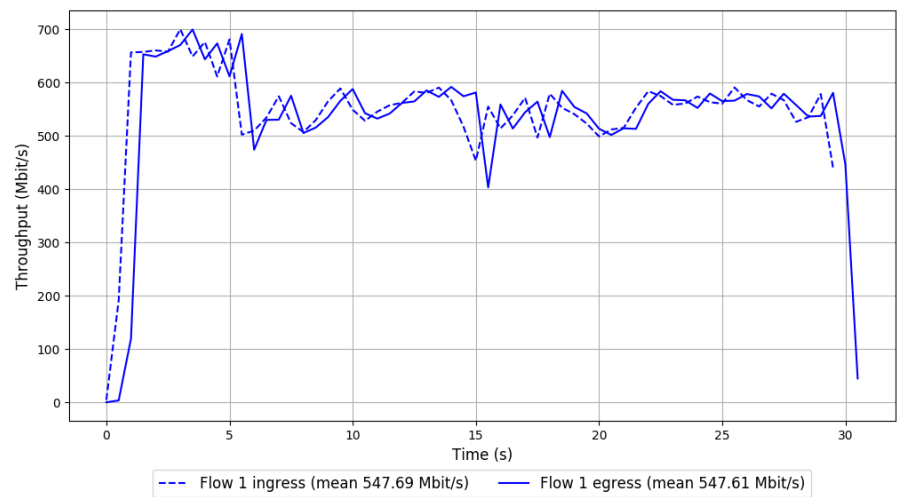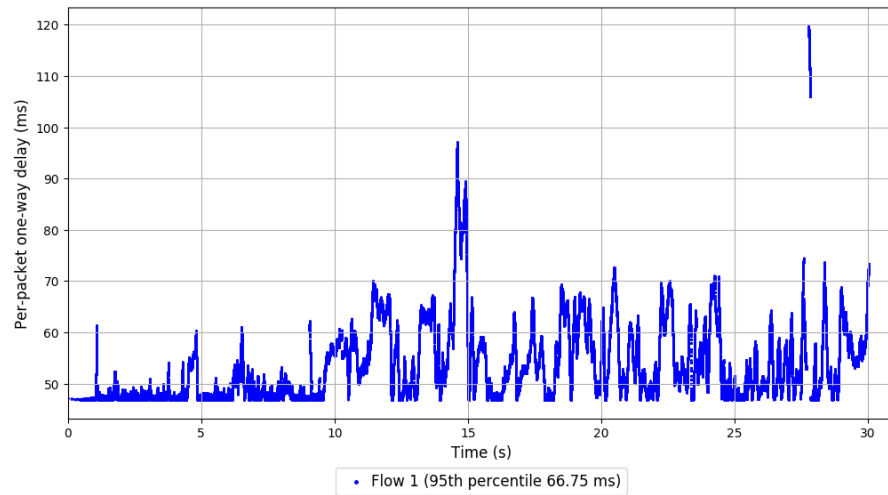
Run 4: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 547.69 Mbit/s) — Flow 1 egress (mean 547.61 Mbit/s)

Flow 1 (95th percentile 94.68 ms)

```
Run 5: Statistics of TCP Vegas

Start at: 2019-01-03 17:52:29
End at: 2019-01-03 17:52:59
Local clock offset: 0.251 ms
Remote clock offset: 0.04 ms


# Below is generated by plot.py at 2019-01-03 19:47:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 552.09 Mbit/s
95th percentile per-packet one-way delay: 66.751 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 552.09 Mbit/s
95th percentile per-packet one-way delay: 66.751 ms
Loss rate: 0.07%
```
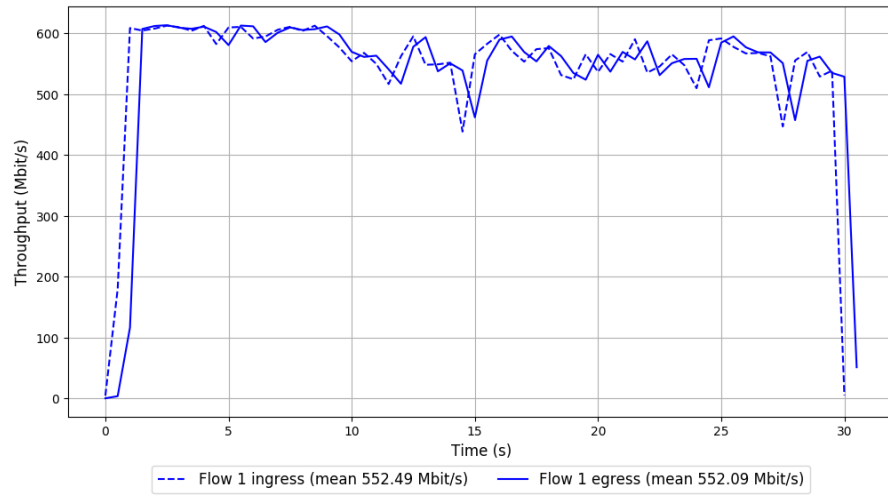
Run 5: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2019-01-03 15:54:13
End at: 2019-01-03 15:54:43
Local clock offset: -0.288 ms
Remote clock offset: -0.05 ms


# Below is generated by plot.py at 2019-01-03 19:47:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 163.53 Mbit/s
95th percentile per-packet one-way delay: 106.859 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 163.53 Mbit/s
95th percentile per-packet one-way delay: 106.859 ms
Loss rate: 1.47%
```
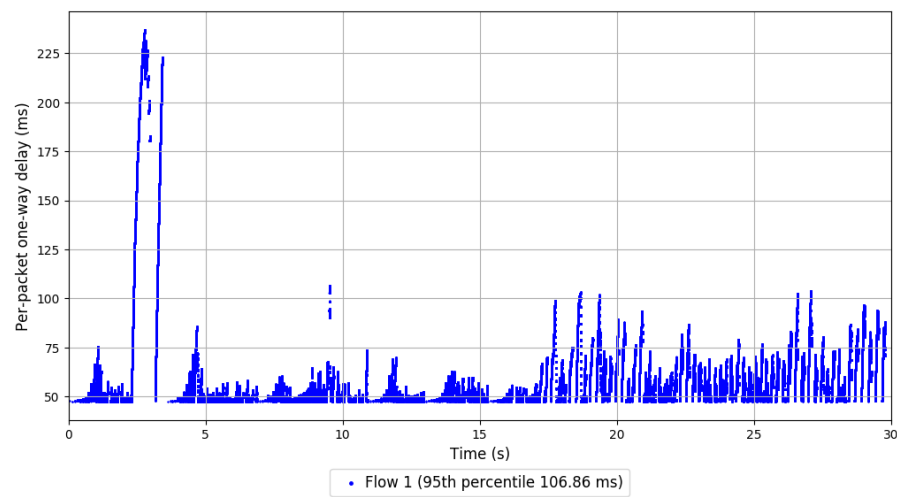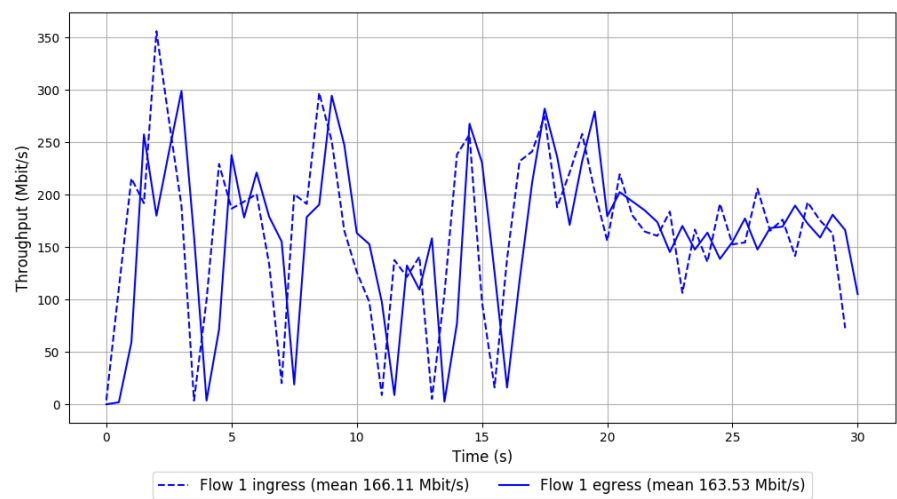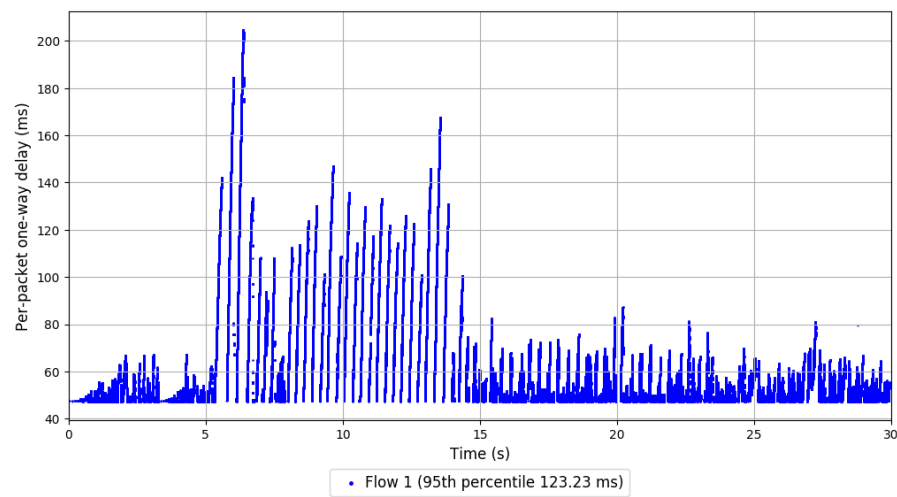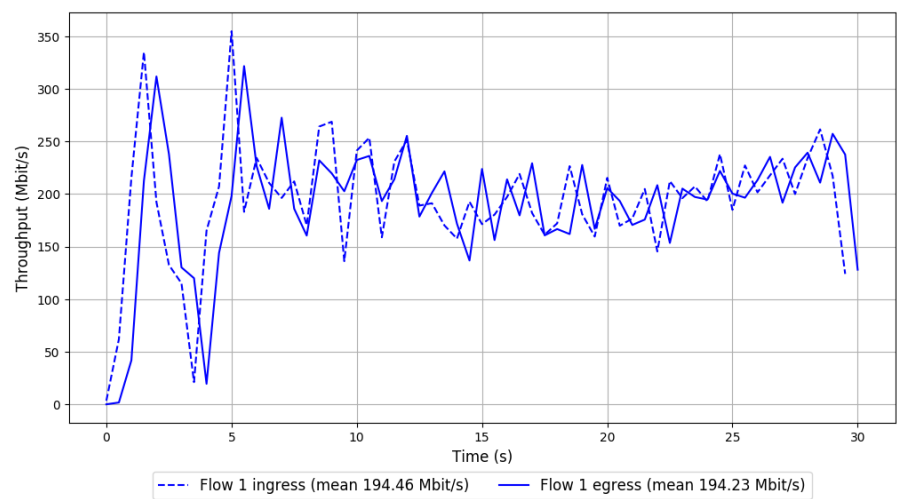
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2019-01-03 16:21:42
End at: 2019-01-03 16:22:12
Local clock offset: -0.055 ms
Remote clock offset: -0.055 ms


# Below is generated by plot.py at 2019-01-03 19:47:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 194.23 Mbit/s
95th percentile per-packet one-way delay: 123.232 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 194.23 Mbit/s
95th percentile per-packet one-way delay: 123.232 ms
Loss rate: 0.11%
```

Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2019-01-03 16:49:14
End at: 2019-01-03 16:49:44
Local clock offset: -0.072 ms
Remote clock offset: 0.0 ms


# Below is generated by plot.py at 2019-01-03 19:47:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 156.17 Mbit/s
95th percentile per-packet one-way delay: 107.051 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 156.17 Mbit/s
95th percentile per-packet one-way delay: 107.051 ms
Loss rate: 0.28%
```
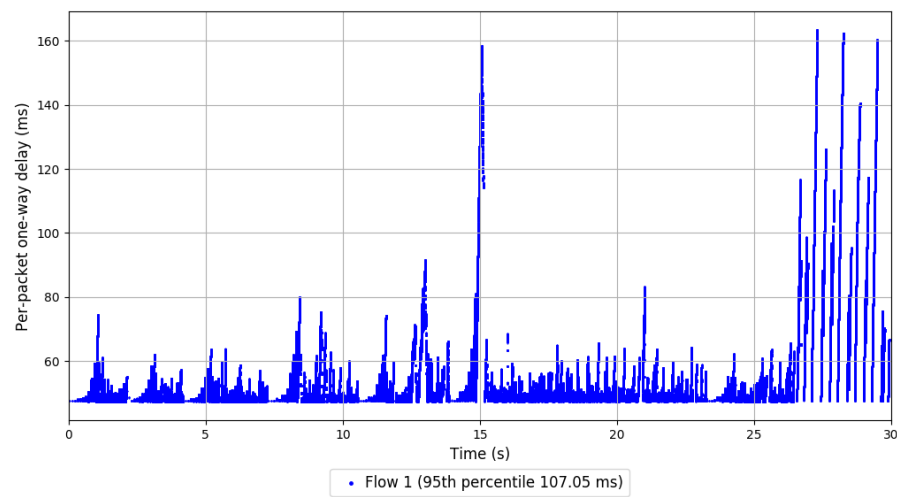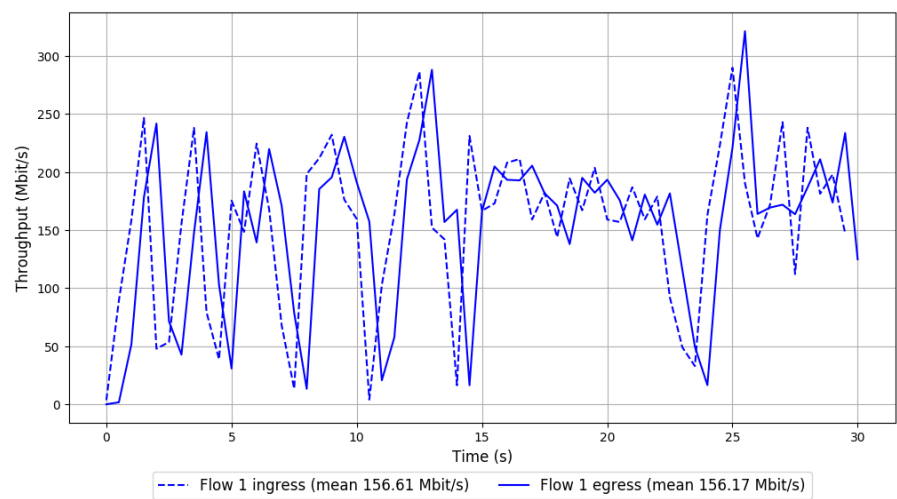
Run 3: Report of Verus — Data Link

```
Run 4: Statistics of Verus

Start at: 2019-01-03 17:16:34
End at: 2019-01-03 17:17:04
Local clock offset: -0.129 ms
Remote clock offset: 0.032 ms


# Below is generated by plot.py at 2019-01-03 19:47:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 164.24 Mbit/s
95th percentile per-packet one-way delay: 159.294 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 164.24 Mbit/s
95th percentile per-packet one-way delay: 159.294 ms
Loss rate: 0.56%
```
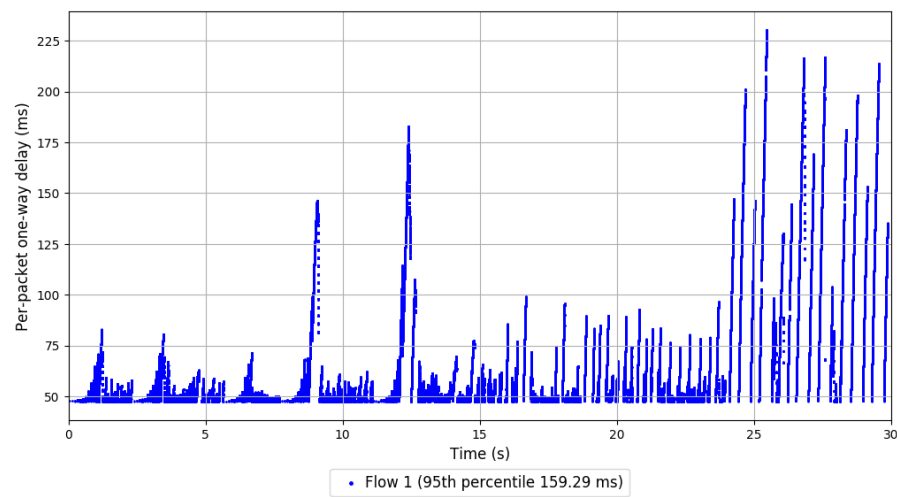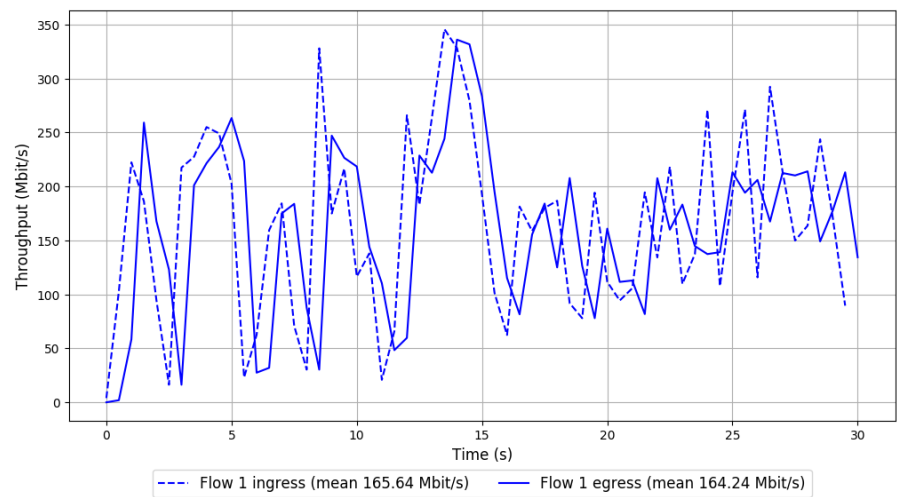
Run 4: Report of Verus — Data Link

```
Run 5: Statistics of Verus

Start at: 2019-01-03 17:44:19
End at: 2019-01-03 17:44:49
Local clock offset: -0.119 ms
Remote clock offset: 0.056 ms


# Below is generated by plot.py at 2019-01-03 19:48:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 161.89 Mbit/s
95th percentile per-packet one-way delay: 168.678 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 161.89 Mbit/s
95th percentile per-packet one-way delay: 168.678 ms
Loss rate: 0.28%
```
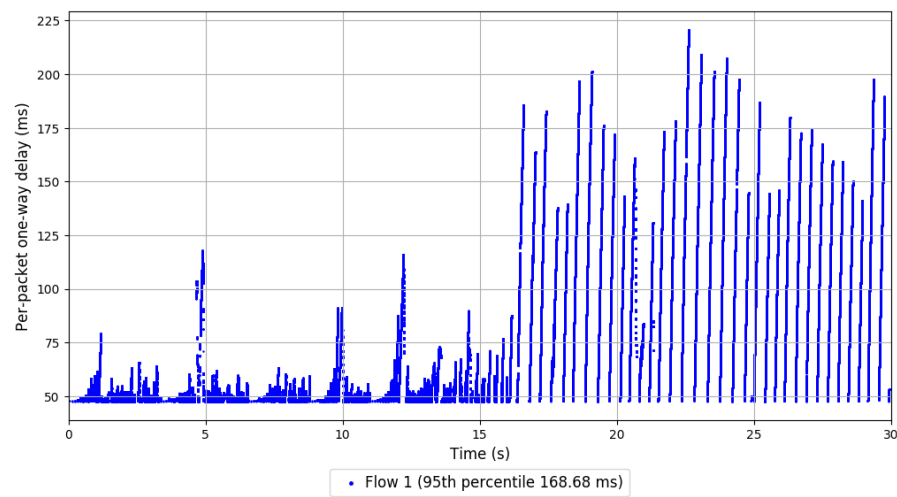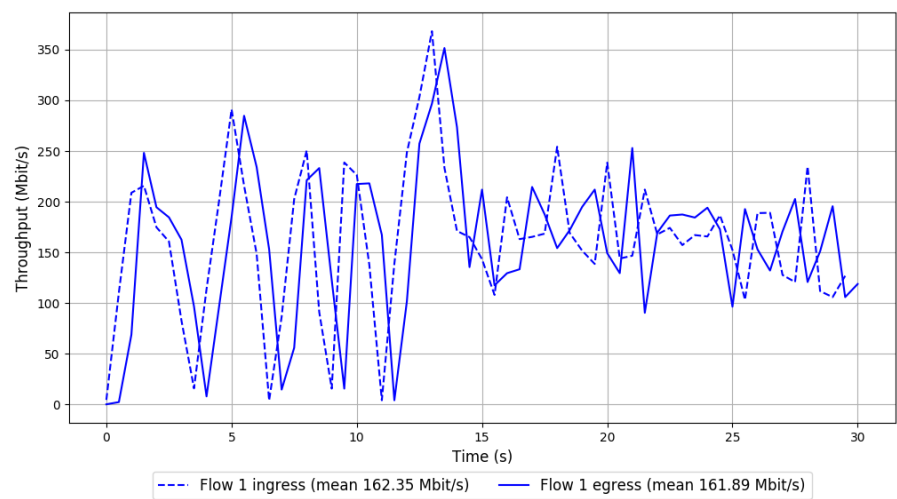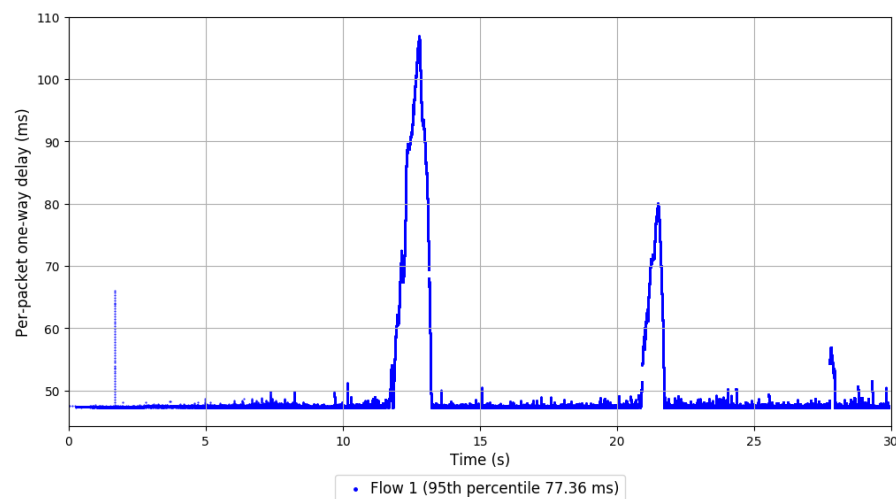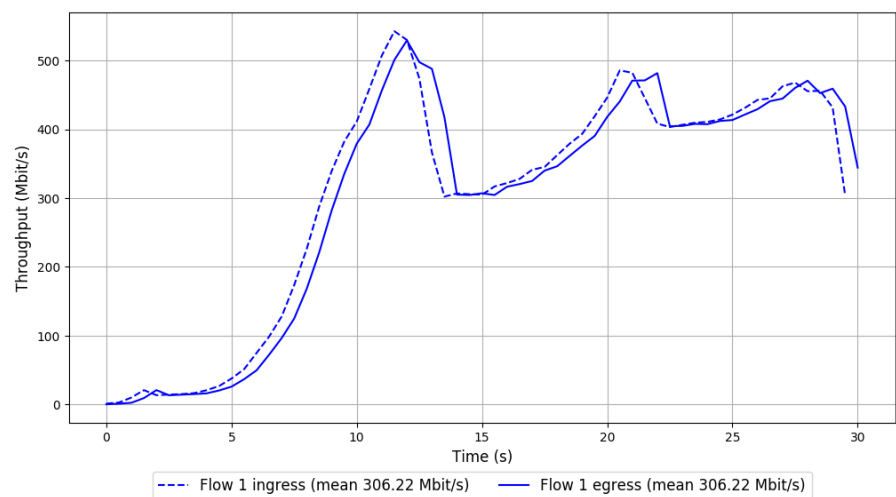
Run 5: Report of Verus — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2019-01-03 15:50:29
End at: 2019-01-03 15:50:59
Local clock offset: -0.208 ms
Remote clock offset: -0.076 ms


# Below is generated by plot.py at 2019-01-03 19:48:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 306.22 Mbit/s
95th percentile per-packet one-way delay: 77.364 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 306.22 Mbit/s
95th percentile per-packet one-way delay: 77.364 ms
Loss rate: 0.00%
```
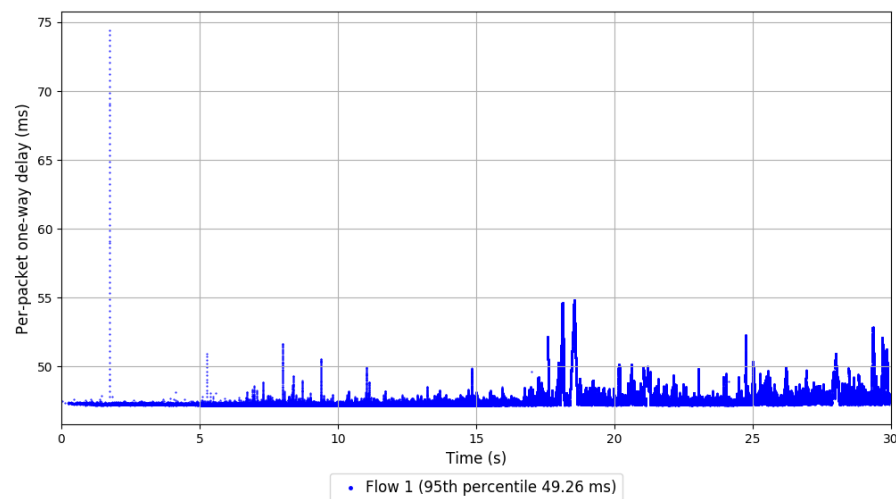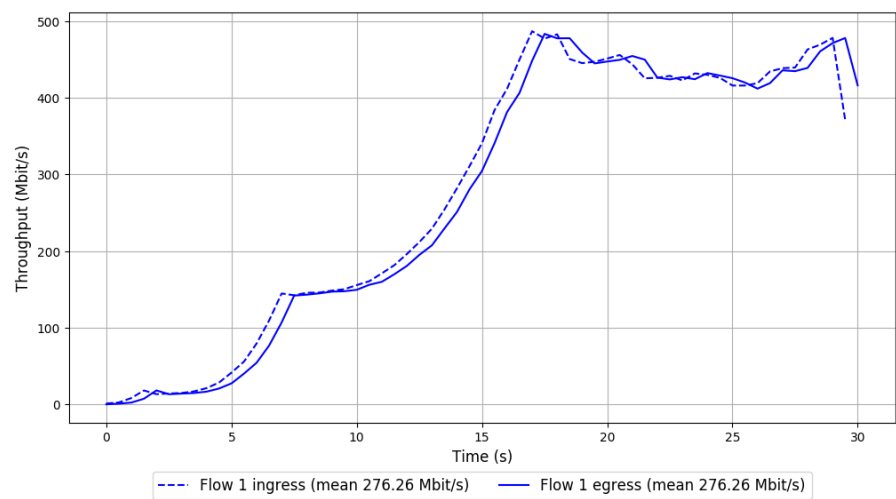
Run 1: Report of PCC-Vivace — Data Link

```
Run 2: Statistics of PCC-Vivace

Start at: 2019-01-03 16:17:58
End at: 2019-01-03 16:18:28
Local clock offset: -0.118 ms
Remote clock offset: -0.074 ms


# Below is generated by plot.py at 2019-01-03 19:48:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 276.26 Mbit/s
95th percentile per-packet one-way delay: 49.256 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 276.26 Mbit/s
95th percentile per-packet one-way delay: 49.256 ms
Loss rate: 0.00%
```

Run 2: Report of PCC-Vivace — Data Link

```
Run 3: Statistics of PCC-Vivace

Start at: 2019-01-03 16:45:27
End at: 2019-01-03 16:45:57
Local clock offset: -0.036 ms
Remote clock offset: -0.02 ms


# Below is generated by plot.py at 2019-01-03 19:48:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 349.87 Mbit/s
95th percentile per-packet one-way delay: 50.910 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 349.87 Mbit/s
95th percentile per-packet one-way delay: 50.910 ms
Loss rate: 0.00%
```
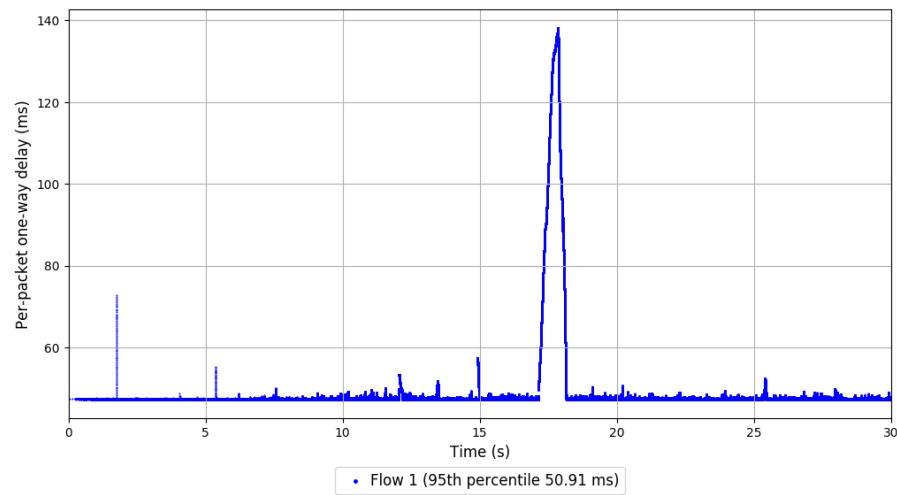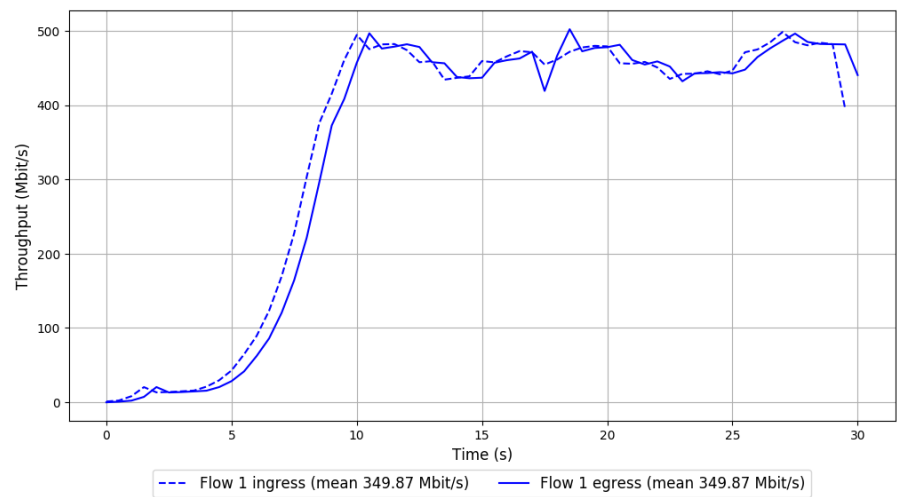
Run 3: Report of PCC-Vivace — Data Link

```
Run 4: Statistics of PCC-Vivace

Start at: 2019-01-03 17:12:42
End at: 2019-01-03 17:13:12
Local clock offset: -0.108 ms
Remote clock offset: 0.04 ms


# Below is generated by plot.py at 2019-01-03 19:49:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 409.93 Mbit/s
95th percentile per-packet one-way delay: 47.855 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 409.93 Mbit/s
95th percentile per-packet one-way delay: 47.855 ms
Loss rate: 0.00%
```
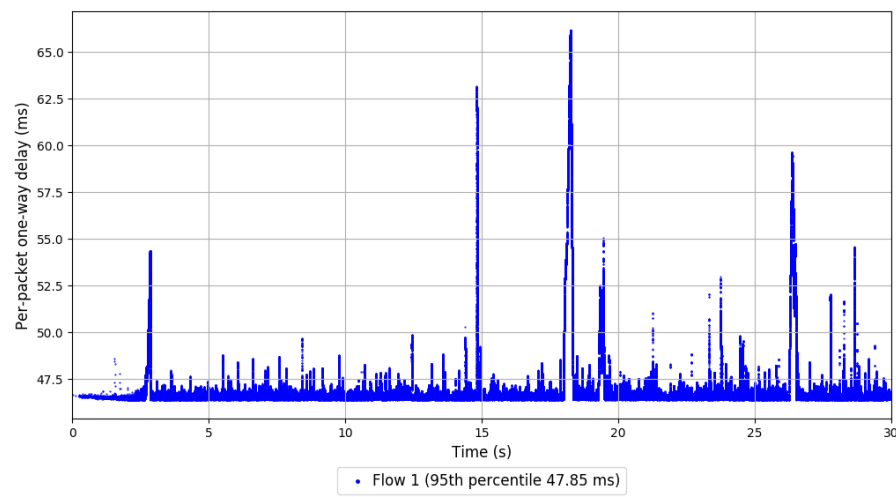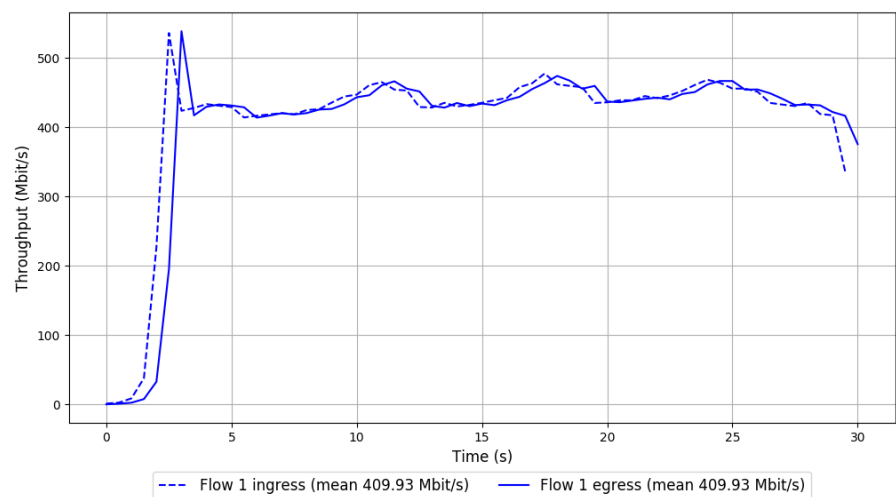
Run 4: Report of PCC-Vivace — Data Link

```
Run 5: Statistics of PCC-Vivace

Start at: 2019-01-03 17:40:28
End at: 2019-01-03 17:40:59
Local clock offset: -0.214 ms
Remote clock offset: 0.063 ms


# Below is generated by plot.py at 2019-01-03 19:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 388.92 Mbit/s
95th percentile per-packet one-way delay: 61.711 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 388.92 Mbit/s
95th percentile per-packet one-way delay: 61.711 ms
Loss rate: 0.00%
```
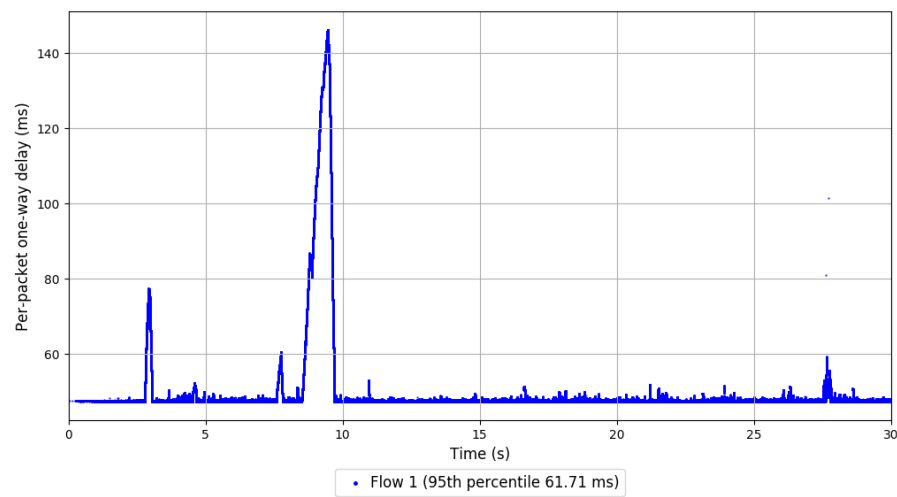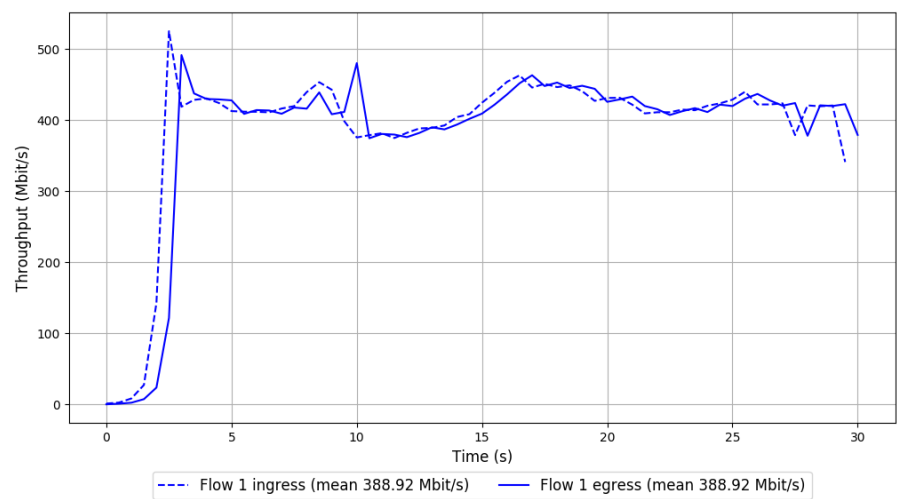
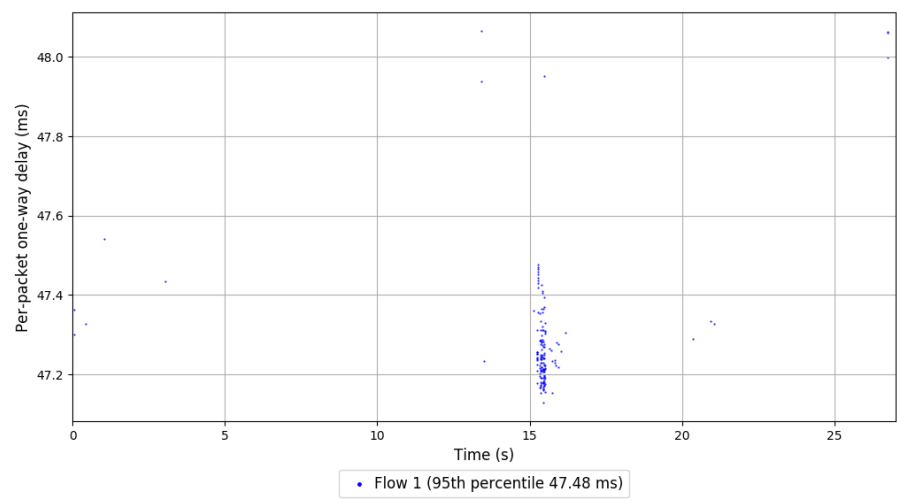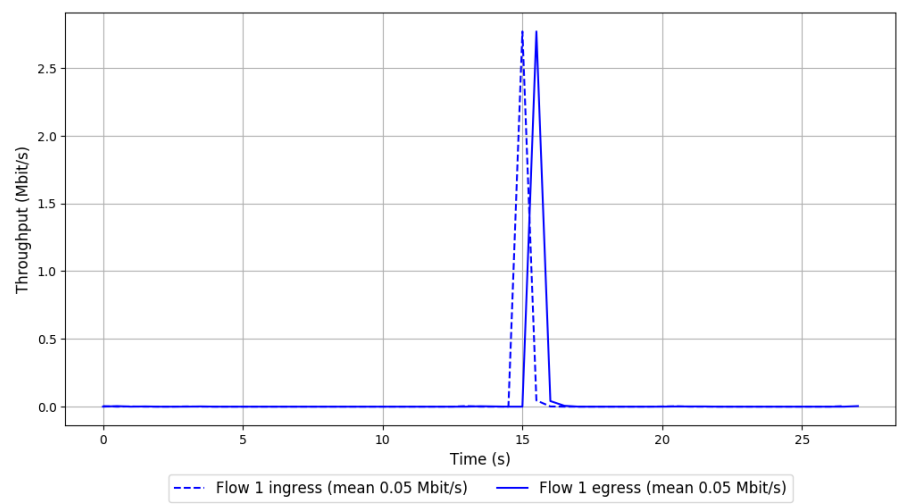## Run 5: Report of PCC-Vivace — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2019-01-03 15:51:57
End at: 2019-01-03 15:52:27
Local clock offset: -0.255 ms
Remote clock offset: -0.083 ms


# Below is generated by plot.py at 2019-01-03 19:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 47.476 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 47.476 ms
Loss rate: 0.00%
```

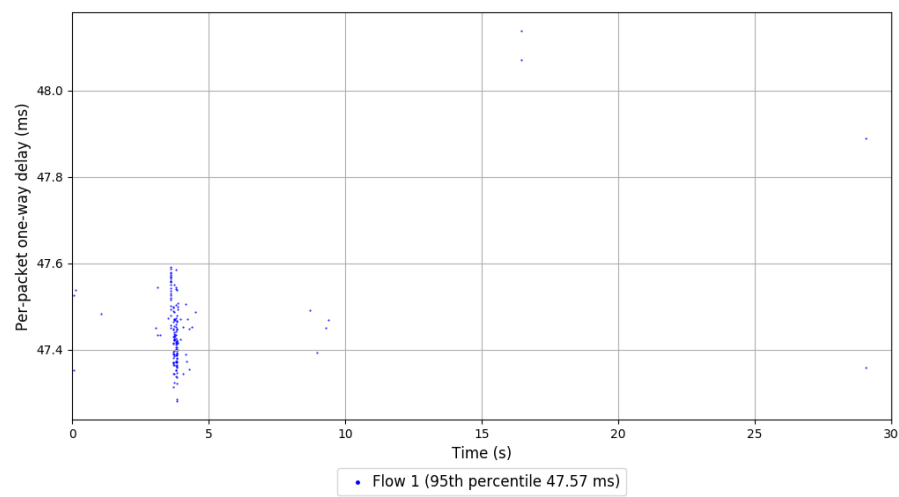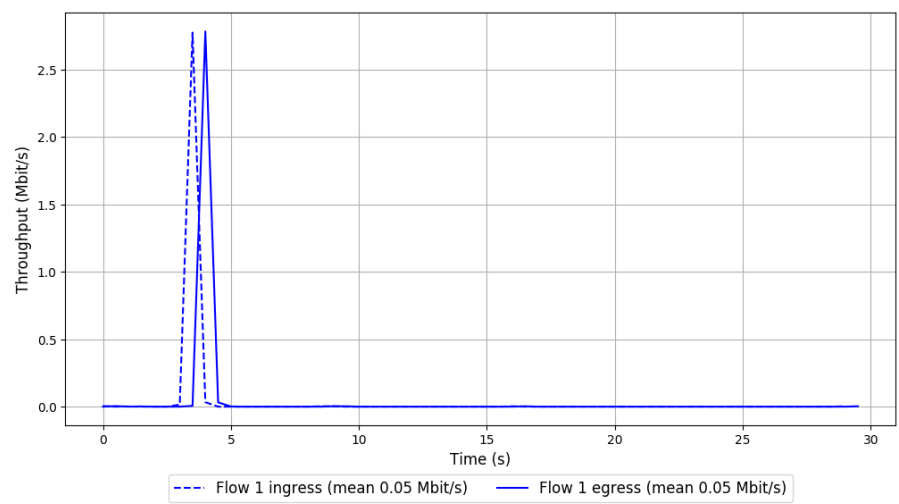Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2019-01-03 16:19:24
End at: 2019-01-03 16:19:54
Local clock offset: -0.129 ms
Remote clock offset: -0.057 ms


# Below is generated by plot.py at 2019-01-03 19:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 47.572 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 47.572 ms
Loss rate: 0.00%
```

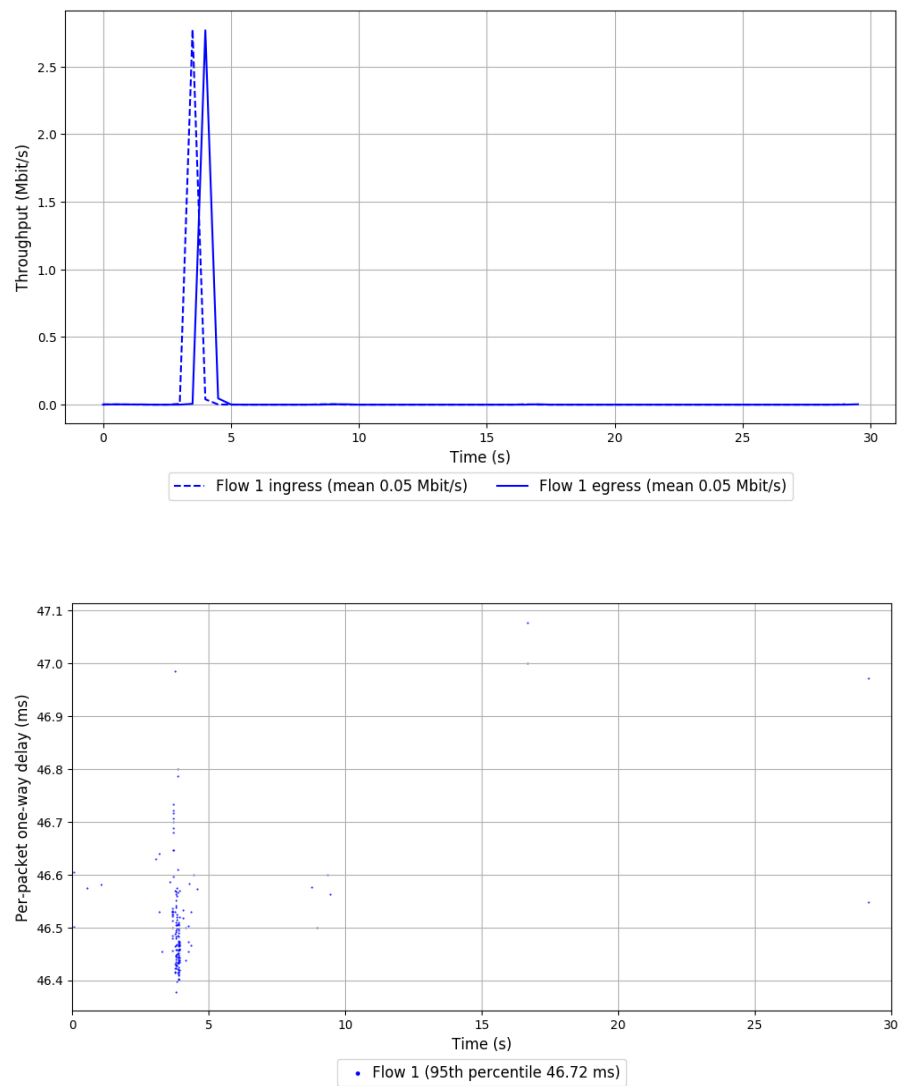Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2019-01-03 16:46:57
End at: 2019-01-03 16:47:27
Local clock offset: -0.052 ms
Remote clock offset: -0.043 ms


# Below is generated by plot.py at 2019-01-03 19:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 46.717 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 46.717 ms
Loss rate: 0.00%
```

Run 3: Report of WebRTC media — Data Link

```
Run 4: Statistics of WebRTC media

Start at: 2019-01-03 17:14:16
End at: 2019-01-03 17:14:46
Local clock offset: -0.444 ms
Remote clock offset: 0.062 ms


# Below is generated by plot.py at 2019-01-03 19:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 47.934 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 47.934 ms
Loss rate: 0.00%
```
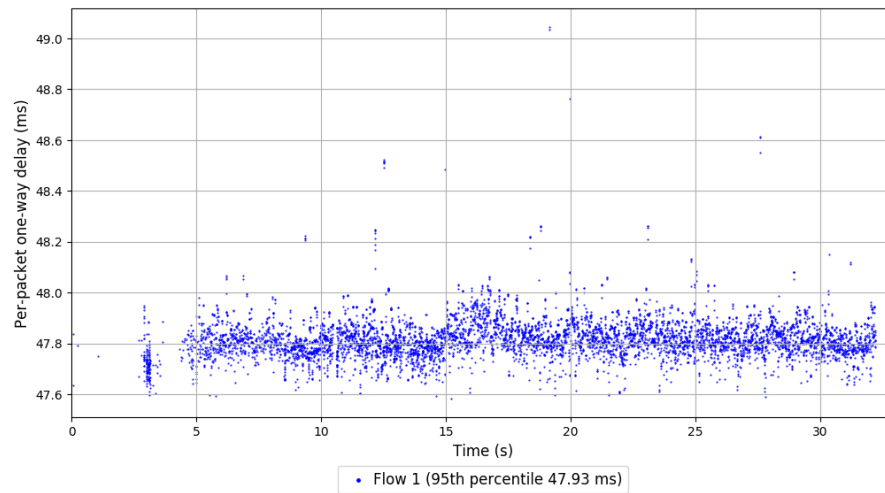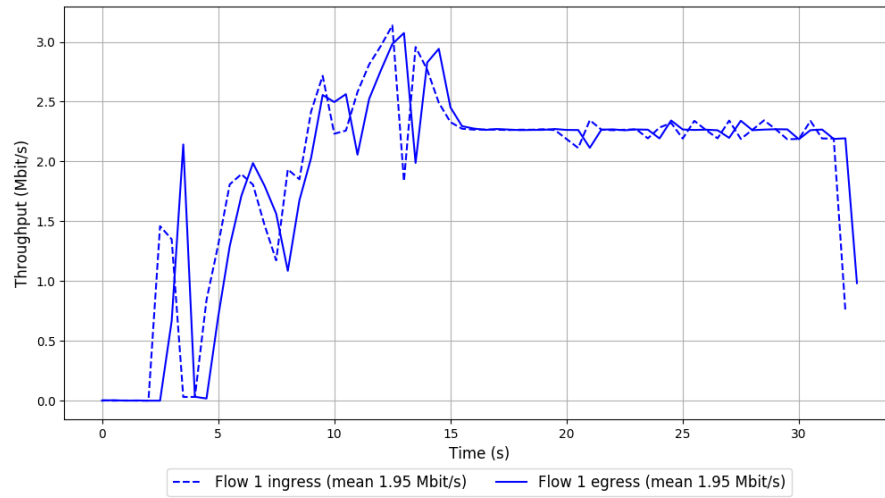
Run 4: Report of WebRTC media — Data Link

```
Run 5: Statistics of WebRTC media

Start at: 2019-01-03 17:42:01
End at: 2019-01-03 17:42:31
Local clock offset: -0.12 ms
Remote clock offset: 0.118 ms


# Below is generated by plot.py at 2019-01-03 19:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.00 Mbit/s
95th percentile per-packet one-way delay: 47.928 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.00 Mbit/s
95th percentile per-packet one-way delay: 47.928 ms
Loss rate: 0.00%
```

Run 5: Report of WebRTC media — Data Link