Pantheon Report

Generated at 2018-12-11 23:10:04 (UTC).

Data path: GCE Iowa on ens4 (*local*) →GCE Tokyo 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.
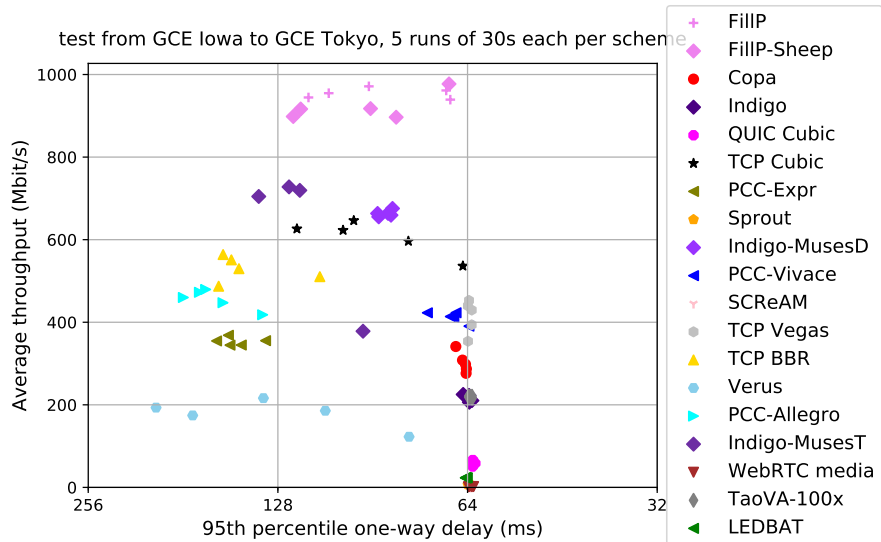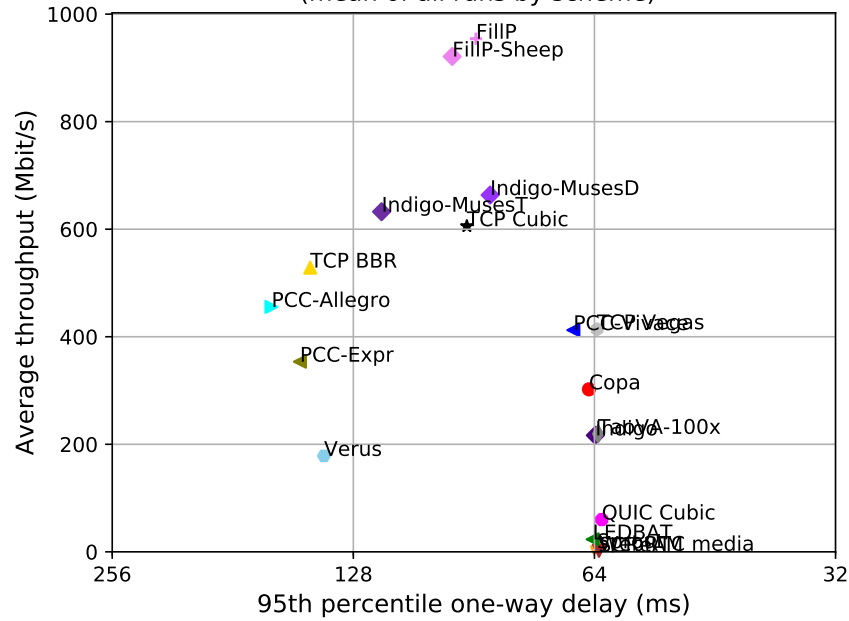
```
System info:
Linux 4.15.0-1024-gcp
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912

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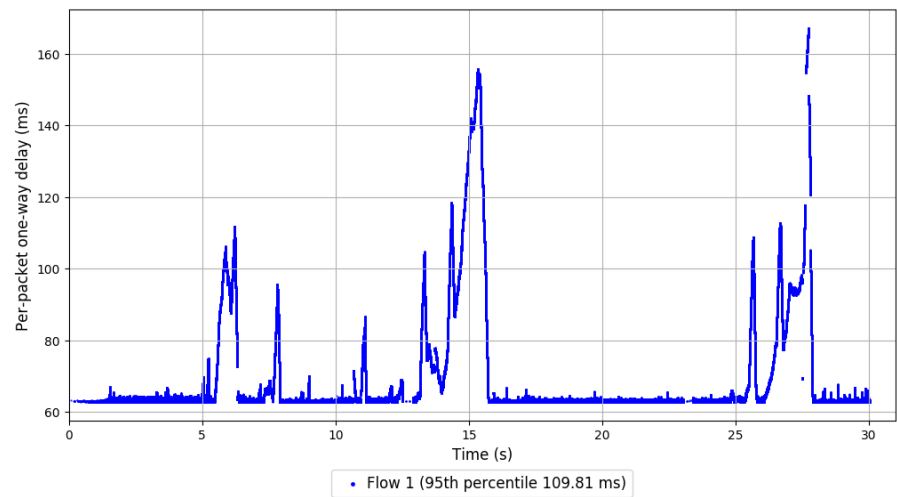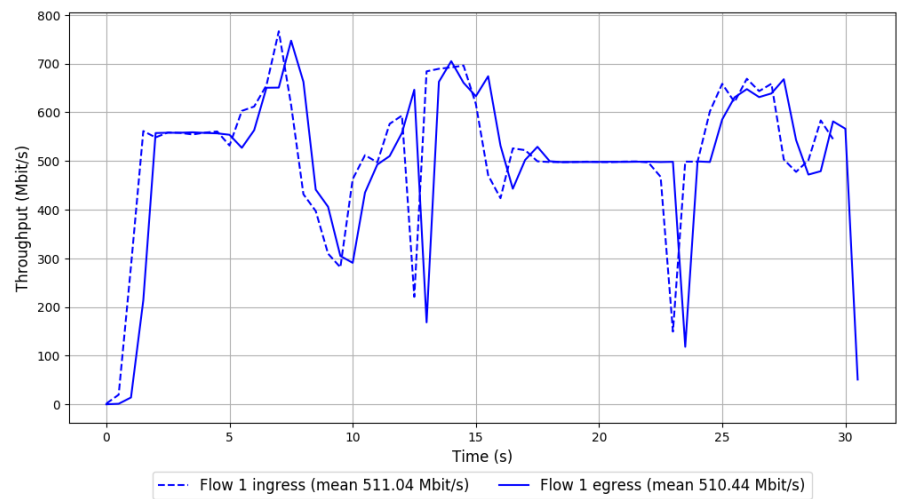(mean of all runs by scheme)

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

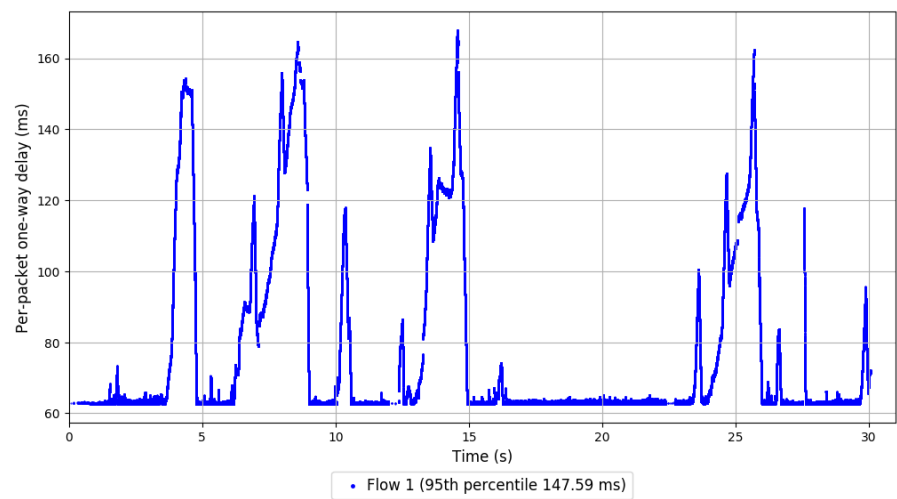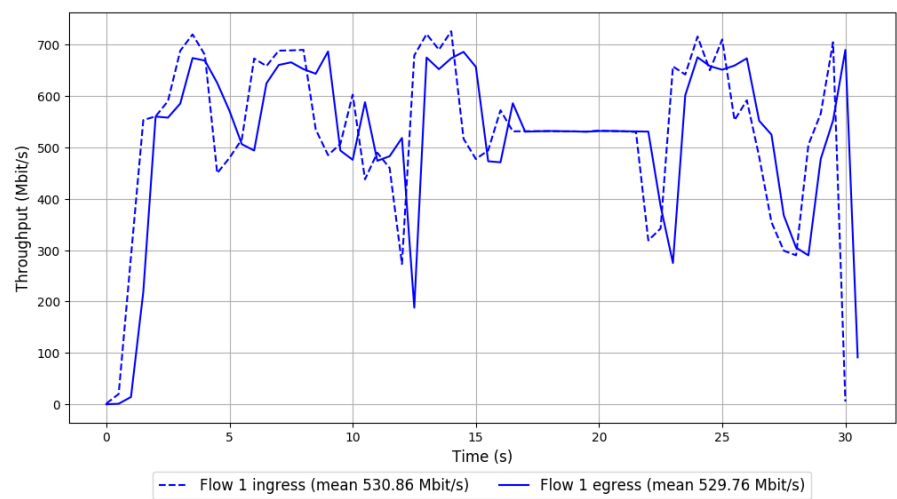| scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	5	528.53	144.88	0.54
Copa	5	302.20	65.02	0.00
TCP Cubic	5	605.63	92.36	0.03
FillP	5	954.22	89.98	0.35
FillP-Sheep	5	921.19	96.32	0.42
Indigo	5	216.60	63.83	0.00
Indigo-MusesD	5	663.49	86.38	0.02
Indigo-MusesT	4	632.53	118.02	0.29
LEDBAT	5	23.25	64.33	0.00
PCC-Allegro	5	455.45	161.94	1.52
PCC-Expr	5	353.58	149.26	1.84
QUIC Cubic	4	60.05	62.67	0.02
SCReAM	5	0.22	63.28	0.00
Sprout	5	6.79	63.54	0.00
TaoVA-100x	5	219.39	63.34	0.01
TCP Vegas	5	413.91	63.51	0.00
Verus	5	178.42	139.27	1.85
PCC-Vivace	5	412.38	68.00	0.00
WebRTC media	5	1.97	63.16	0.00

```
Run 1: Statistics of TCP BBR

Start at: 2018-12-11 19:19:14
End at: 2018-12-11 19:19:44
Local clock offset: -0.097 ms
Remote clock offset: -0.387 ms

# Below is generated by plot.py at 2018-12-11 21:35:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 510.44 Mbit/s
95th percentile per-packet one-way delay: 109.808 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 510.44 Mbit/s
95th percentile per-packet one-way delay: 109.808 ms
Loss rate: 0.12%
```
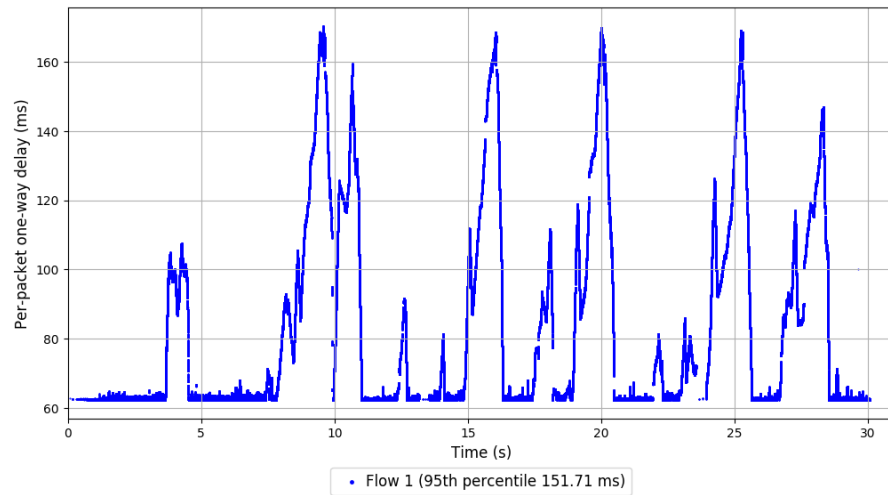
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2018-12-11 19:47:45
End at: 2018-12-11 19:48:15
Local clock offset: 0.004 ms
Remote clock offset: -0.129 ms


# Below is generated by plot.py at 2018-12-11 21:36:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 529.76 Mbit/s
95th percentile per-packet one-way delay: 147.588 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 529.76 Mbit/s
95th percentile per-packet one-way delay: 147.588 ms
Loss rate: 0.21%
```
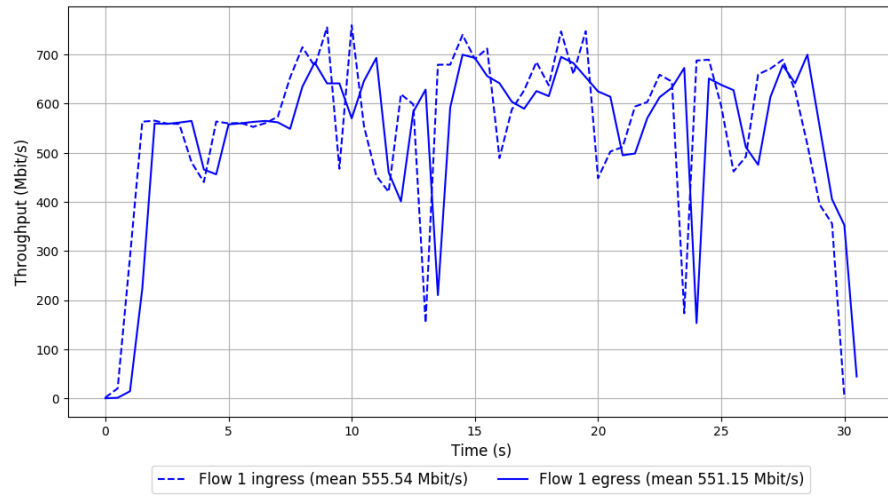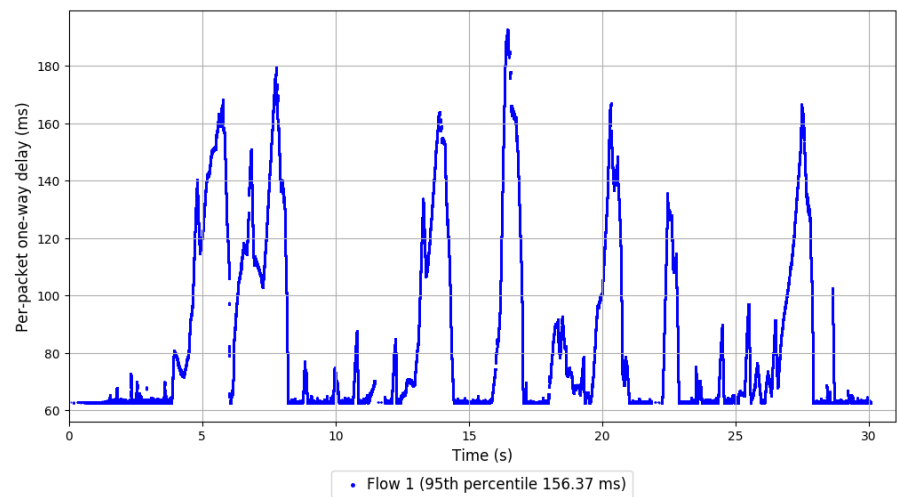
Run 2: Report of TCP BBR — Data Link

Flow 1 ingress (mean 530.86 Mbit/s)   Flow 1 egress (mean 529.76 Mbit/s)

Flow 1 (95th percentile 147.59 ms)

```
Run 3: Statistics of TCP BBR

Start at: 2018-12-11 20:16:15
End at: 2018-12-11 20:16:45
Local clock offset: -0.08 ms
Remote clock offset: -0.77 ms


# Below is generated by plot.py at 2018-12-11 21:36:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 551.15 Mbit/s
95th percentile per-packet one-way delay: 151.712 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 551.15 Mbit/s
95th percentile per-packet one-way delay: 151.712 ms
Loss rate: 0.79%
```
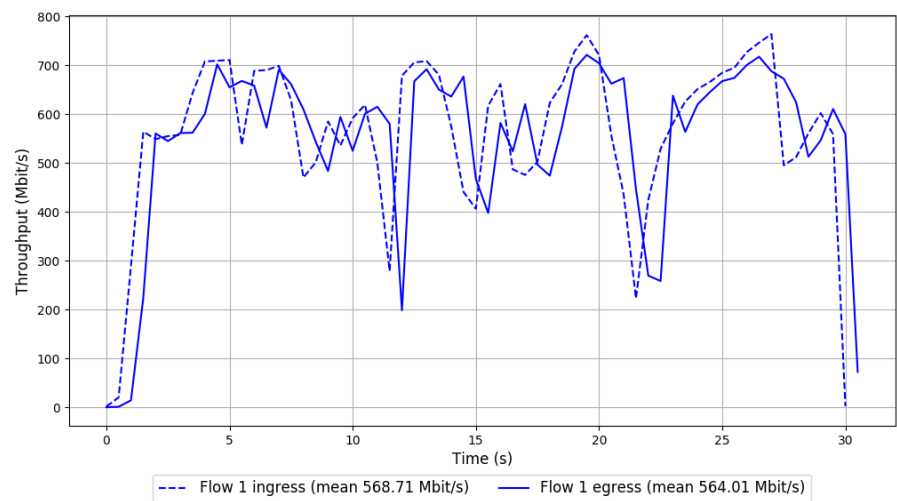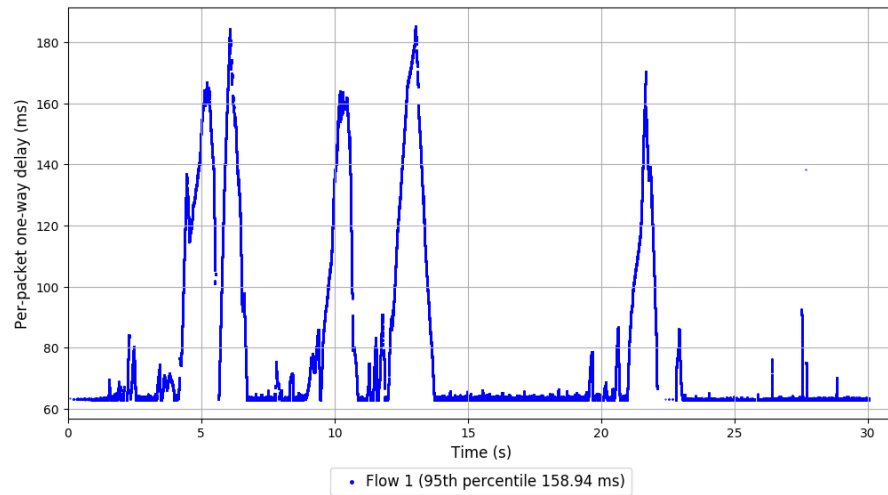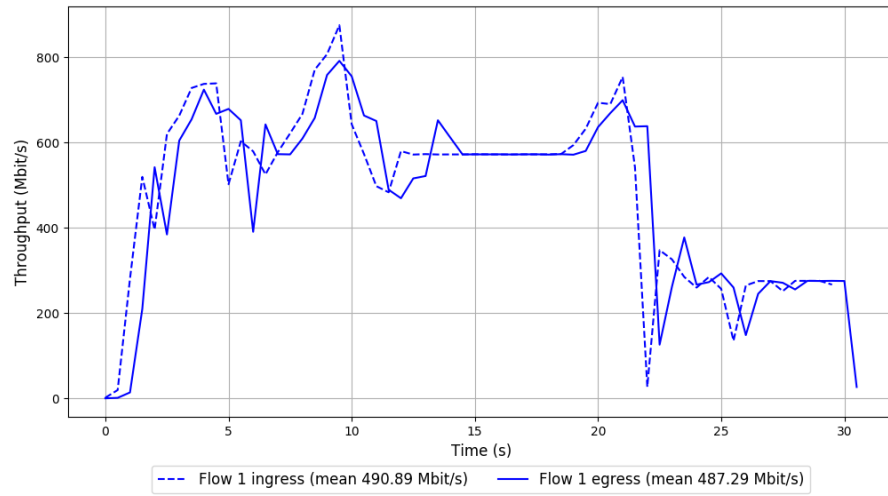
Run 3: Report of TCP BBR — Data Link

```
Run 4: Statistics of TCP BBR

Start at: 2018-12-11 20:44:24
End at: 2018-12-11 20:44:54
Local clock offset: -0.042 ms
Remote clock offset: -0.08 ms


# Below is generated by plot.py at 2018-12-11 21:36:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 564.01 Mbit/s
95th percentile per-packet one-way delay: 156.373 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 564.01 Mbit/s
95th percentile per-packet one-way delay: 156.373 ms
Loss rate: 0.83%
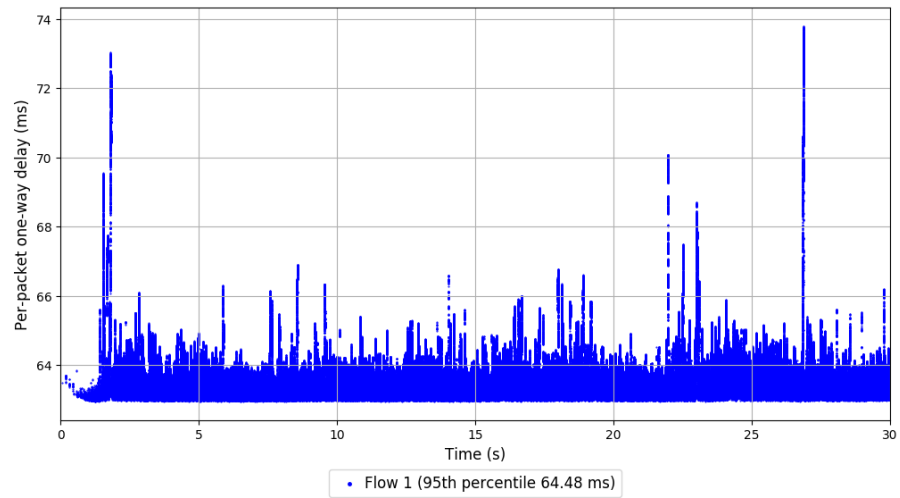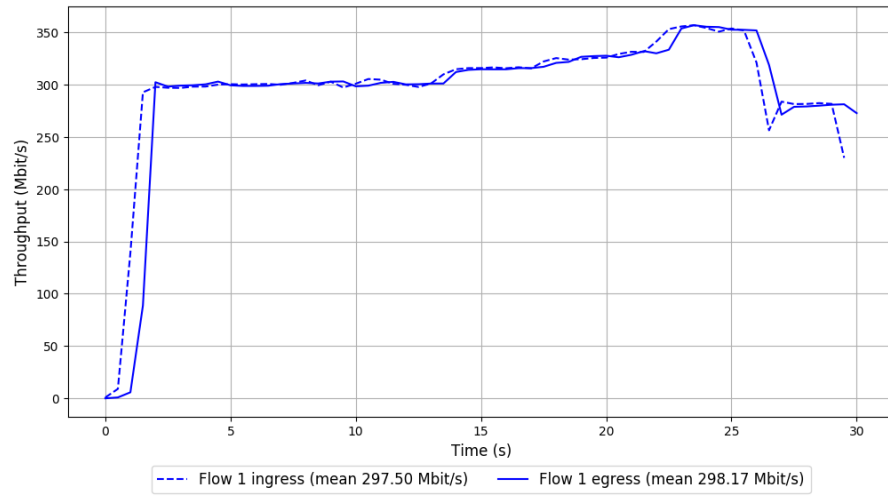```
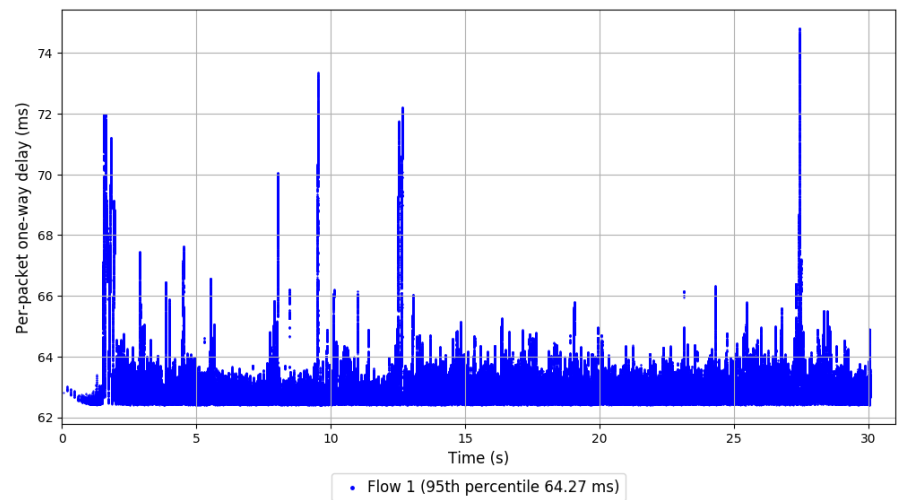
Run 4: Report of TCP BBR — Data Link

```
Run 5: Statistics of TCP BBR

Start at: 2018-12-11 21:12:56
End at: 2018-12-11 21:13:26
Local clock offset: -0.039 ms
Remote clock offset: -0.313 ms


# Below is generated by plot.py at 2018-12-11 21:36:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 487.29 Mbit/s
95th percentile per-packet one-way delay: 158.943 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 487.29 Mbit/s
95th percentile per-packet one-way delay: 158.943 ms
Loss rate: 0.73%
```

Run 5: Report of TCP BBR — Data Link

Flow 1 ingress (mean 490.89 Mbit/s)   Flow 1 egress (mean 487.29 Mbit/s)
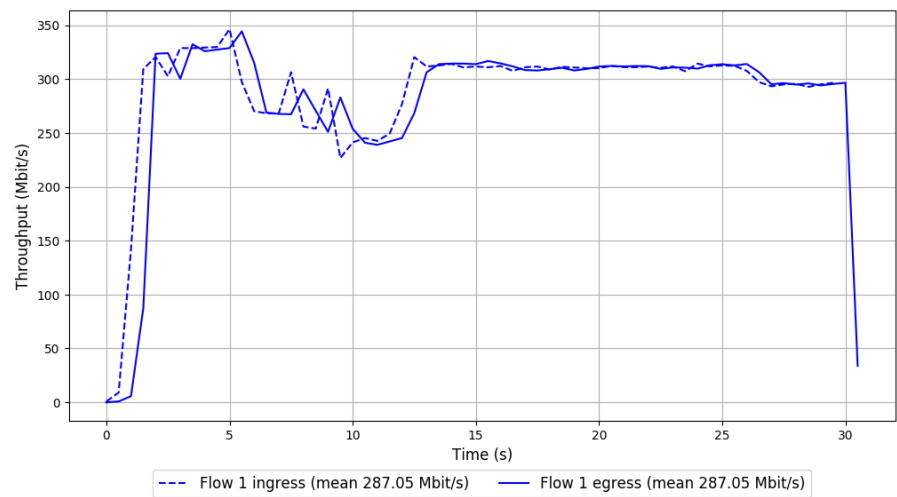

Flow 1 (95th percentile 158.94 ms)

```
Run 1: Statistics of Copa

Start at: 2018-12-11 18:56:42
End at: 2018-12-11 18:57:12
Local clock offset: -0.086 ms
Remote clock offset: -0.108 ms


# Below is generated by plot.py at 2018-12-11 21:36:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 298.17 Mbit/s
95th percentile per-packet one-way delay: 64.480 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 298.17 Mbit/s
95th percentile per-packet one-way delay: 64.480 ms
Loss rate: 0.00%
```

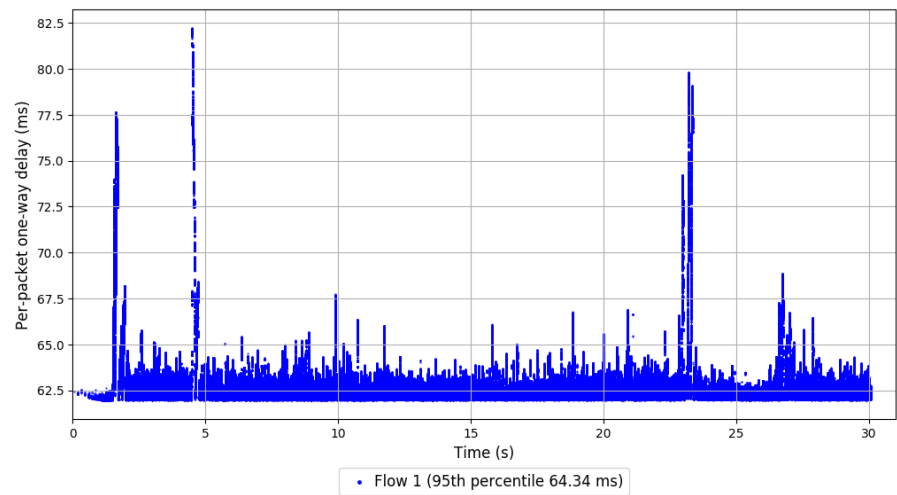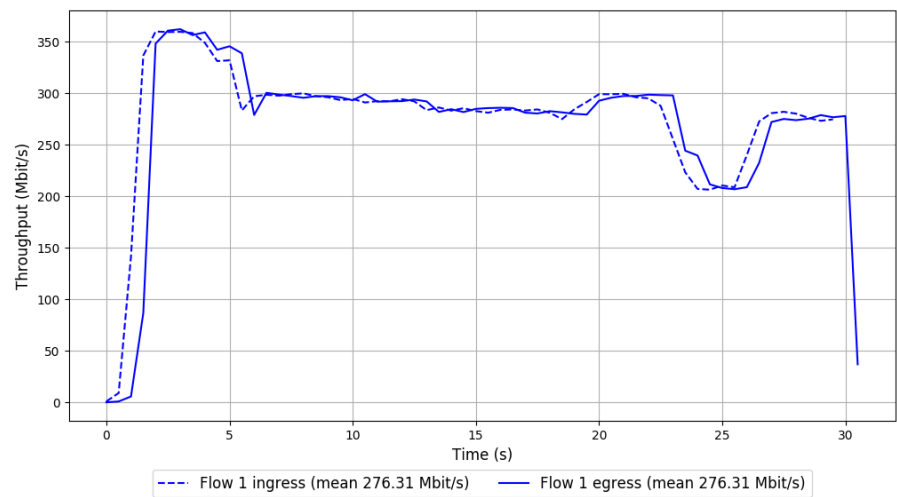Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2018-12-11 19:24:35
End at: 2018-12-11 19:25:05
Local clock offset: -0.031 ms
Remote clock offset: -0.168 ms


# Below is generated by plot.py at 2018-12-11 21:36:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 287.05 Mbit/s
95th percentile per-packet one-way delay: 64.270 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 287.05 Mbit/s
95th percentile per-packet one-way delay: 64.270 ms
Loss rate: 0.00%
```

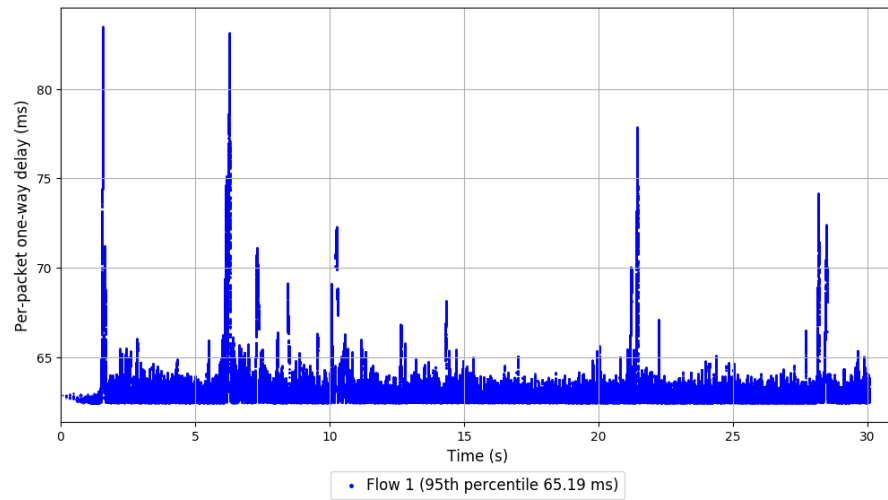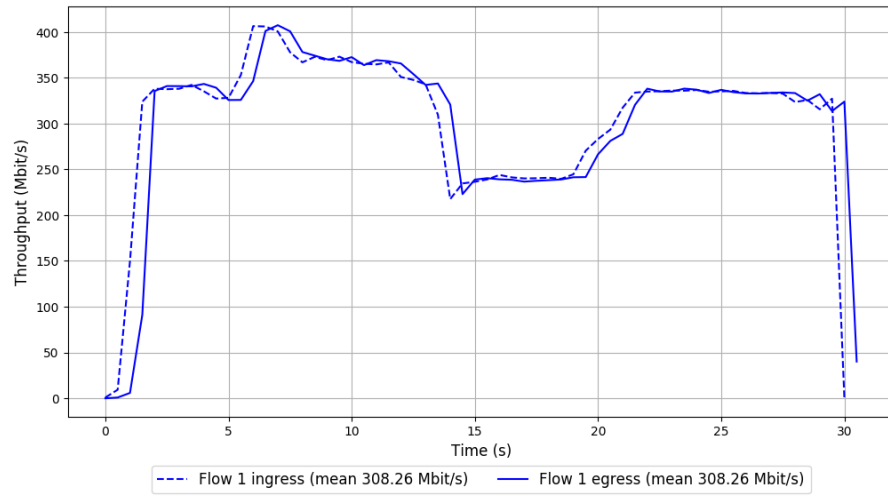Run 2: Report of Copa — Data Link

Flow 1 ingress (mean 287.05 Mbit/s)   Flow 1 egress (mean 287.05 Mbit/s)

Flow 1 (95th percentile 64.27 ms)

```
Run 3: Statistics of Copa

Start at: 2018-12-11 19:53:04
End at: 2018-12-11 19:53:34
Local clock offset: 0.028 ms
Remote clock offset: -0.585 ms


# Below is generated by plot.py at 2018-12-11 21:36:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 276.31 Mbit/s
95th percentile per-packet one-way delay: 64.337 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 276.31 Mbit/s
95th percentile per-packet one-way delay: 64.337 ms
Loss rate: 0.00%
```
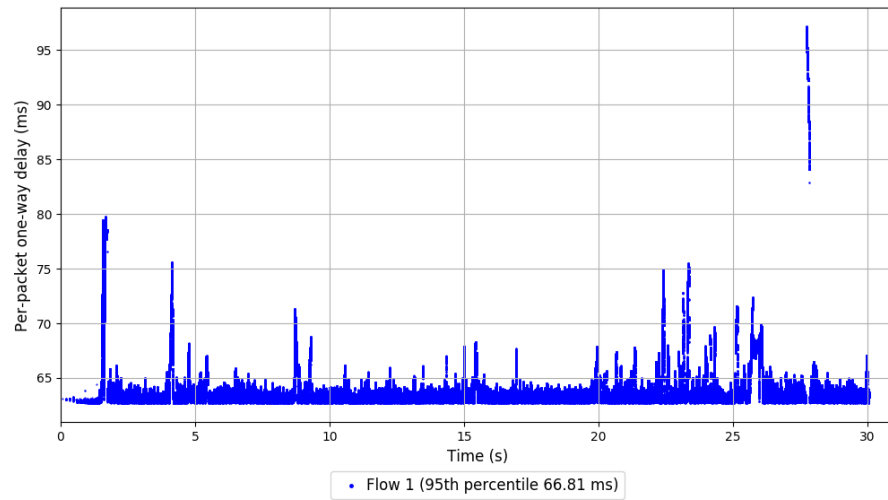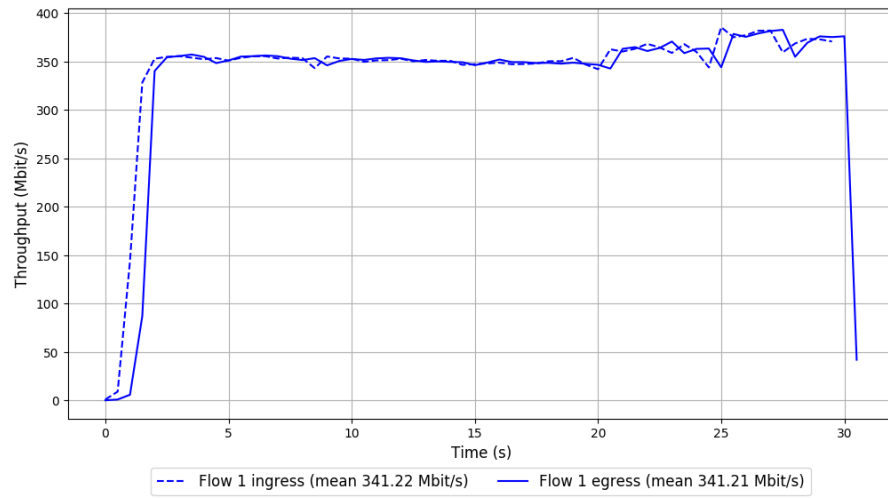
Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 276.31 Mbit/s) ----   Flow 1 egress (mean 276.31 Mbit/s) ——

Flow 1 (95th percentile 64.34 ms)

```
Run 4: Statistics of Copa

Start at: 2018-12-11 20:21:37
End at: 2018-12-11 20:22:07
Local clock offset: -0.053 ms
Remote clock offset: -0.356 ms


# Below is generated by plot.py at 2018-12-11 21:46:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 308.26 Mbit/s
95th percentile per-packet one-way delay: 65.188 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 308.26 Mbit/s
95th percentile per-packet one-way delay: 65.188 ms
Loss rate: 0.00%
```
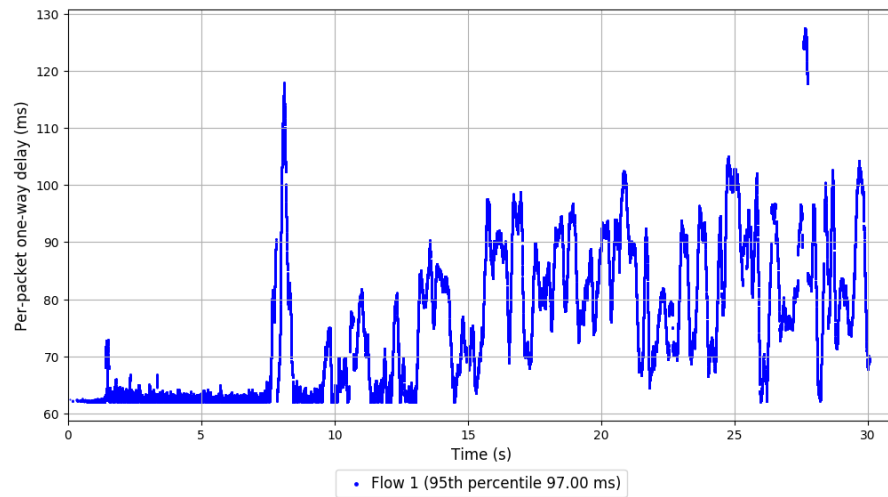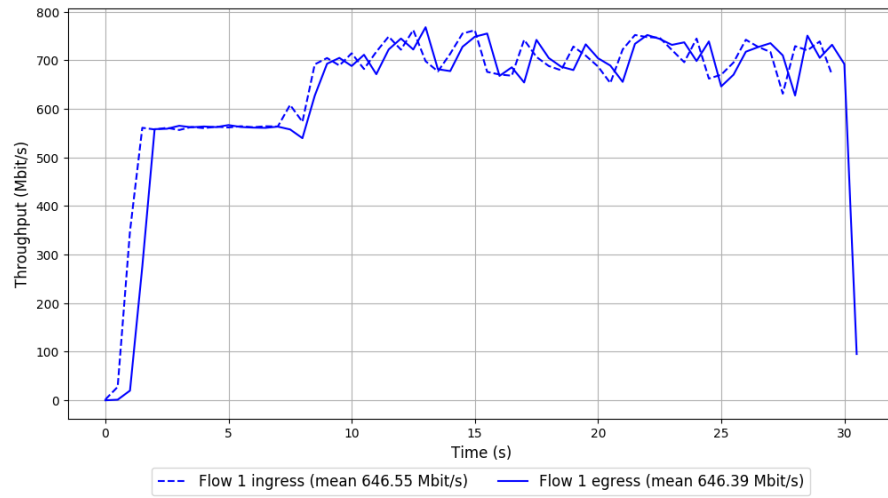
Run 4: Report of Copa — Data Link

```
Run 5: Statistics of Copa

Start at: 2018-12-11 20:49:42
End at: 2018-12-11 20:50:12
Local clock offset: -0.007 ms
Remote clock offset: -0.075 ms


# Below is generated by plot.py at 2018-12-11 21:47:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 341.21 Mbit/s
95th percentile per-packet one-way delay: 66.805 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 341.21 Mbit/s
95th percentile per-packet one-way delay: 66.805 ms
Loss rate: 0.00%
```

Run 5: Report of Copa — Data Link

Flow 1 ingress (mean 341.22 Mbit/s)   Flow 1 egress (mean 341.21 Mbit/s)

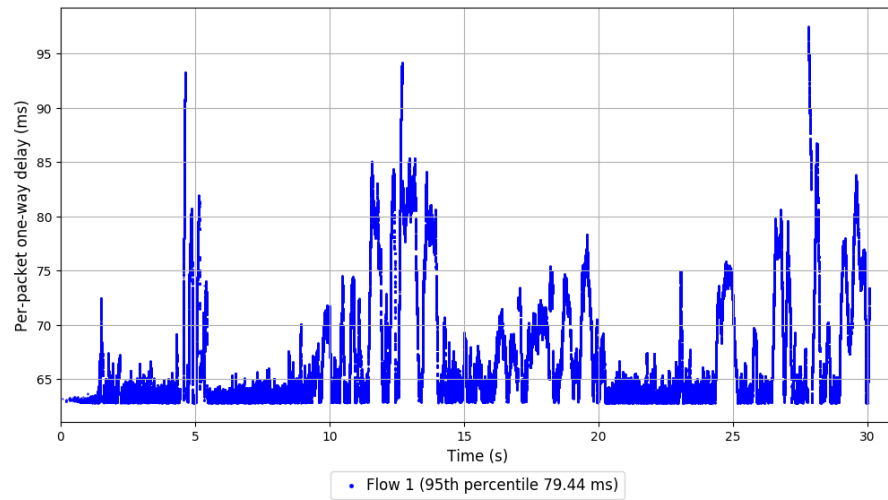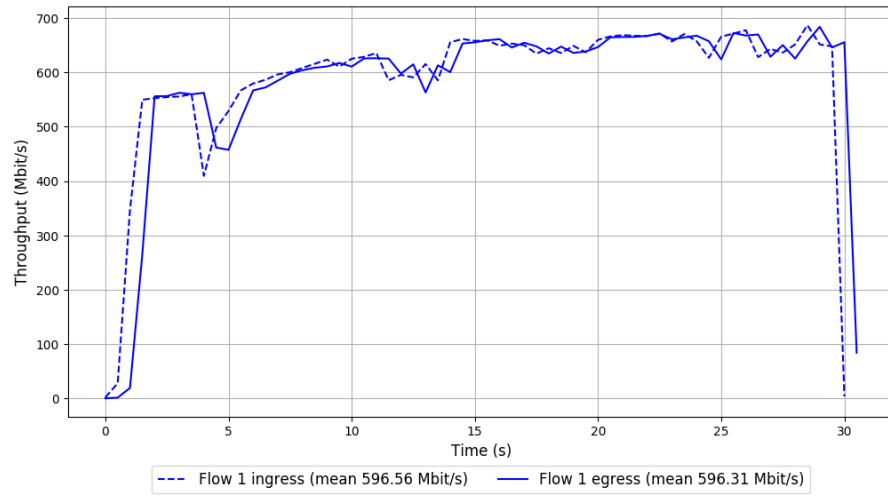Flow 1 (95th percentile 66.81 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2018-12-11 19:05:26
End at: 2018-12-11 19:05:56
Local clock offset: -0.069 ms
Remote clock offset: -0.836 ms

# Below is generated by plot.py at 2018-12-11 21:47:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 646.39 Mbit/s
95th percentile per-packet one-way delay: 97.001 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 646.39 Mbit/s
95th percentile per-packet one-way delay: 97.001 ms
Loss rate: 0.02%
```
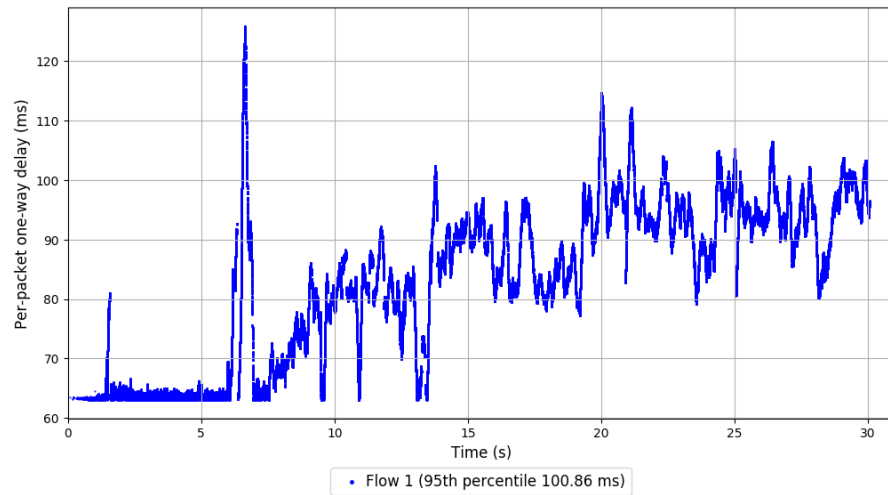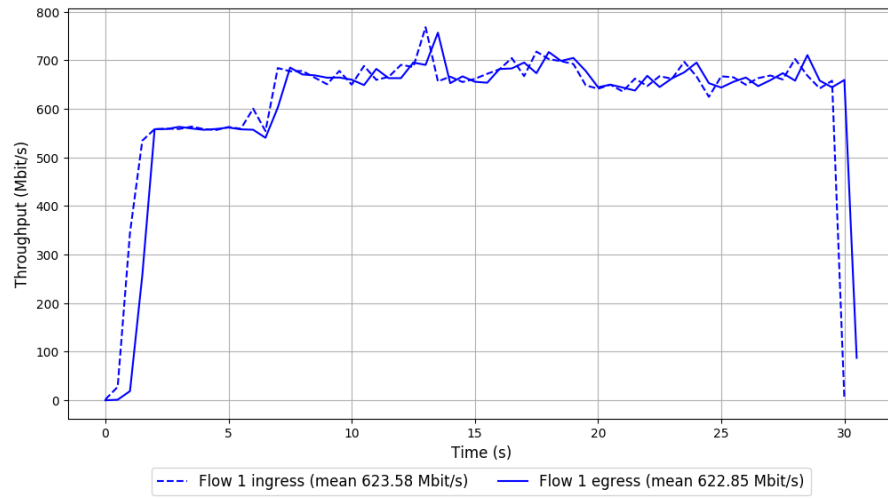
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-12-11 19:33:24
End at: 2018-12-11 19:33:54
Local clock offset: -0.014 ms
Remote clock offset: -0.138 ms


# Below is generated by plot.py at 2018-12-11 21:47:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 596.31 Mbit/s
95th percentile per-packet one-way delay: 79.445 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 596.31 Mbit/s
95th percentile per-packet one-way delay: 79.445 ms
Loss rate: 0.04%
```
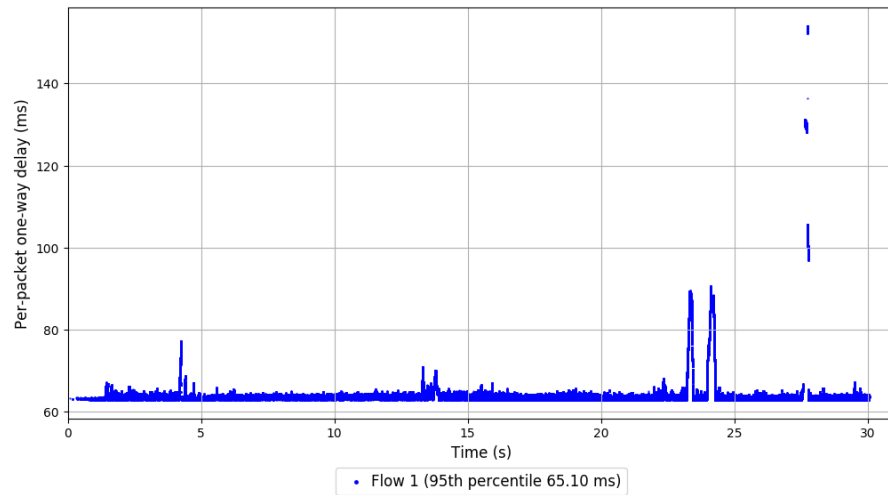
Run 2: Report of TCP Cubic — Data Link

```
Run 3: Statistics of TCP Cubic

Start at: 2018-12-11 20:01:55
End at: 2018-12-11 20:02:25
Local clock offset: -0.072 ms
Remote clock offset: -0.01 ms


# Below is generated by plot.py at 2018-12-11 21:47:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 622.85 Mbit/s
95th percentile per-packet one-way delay: 100.864 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 622.85 Mbit/s
95th percentile per-packet one-way delay: 100.864 ms
Loss rate: 0.11%
```
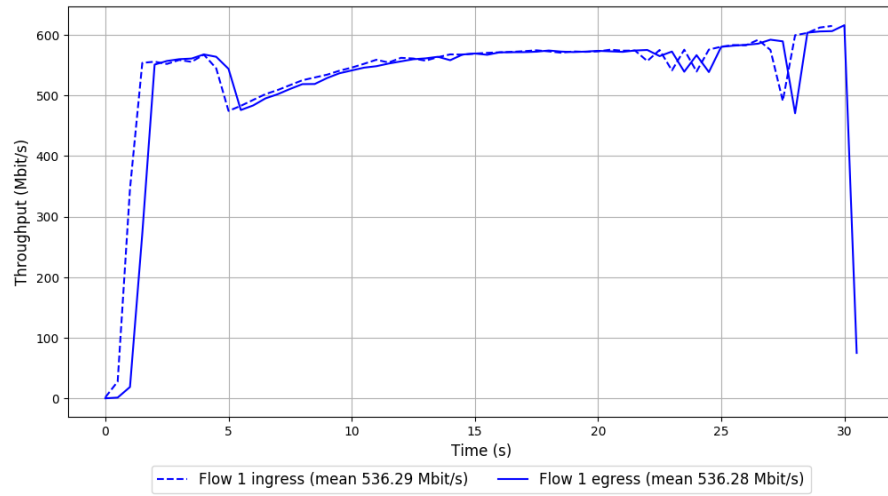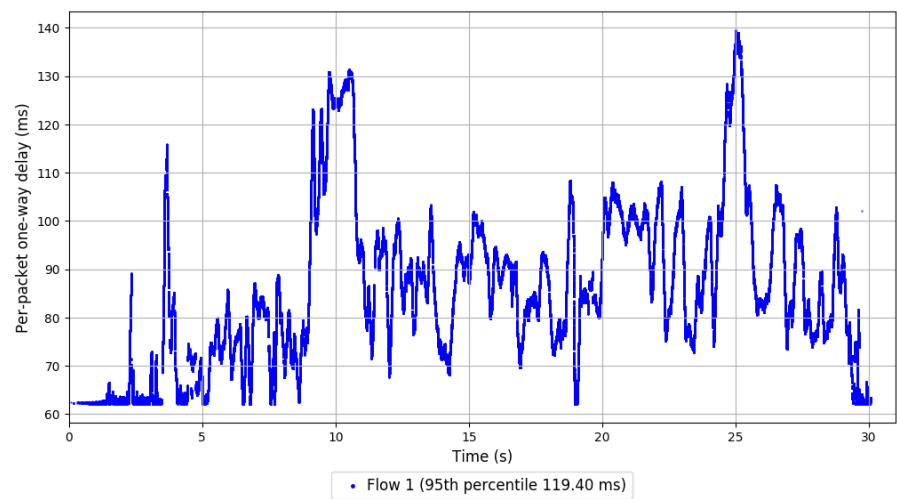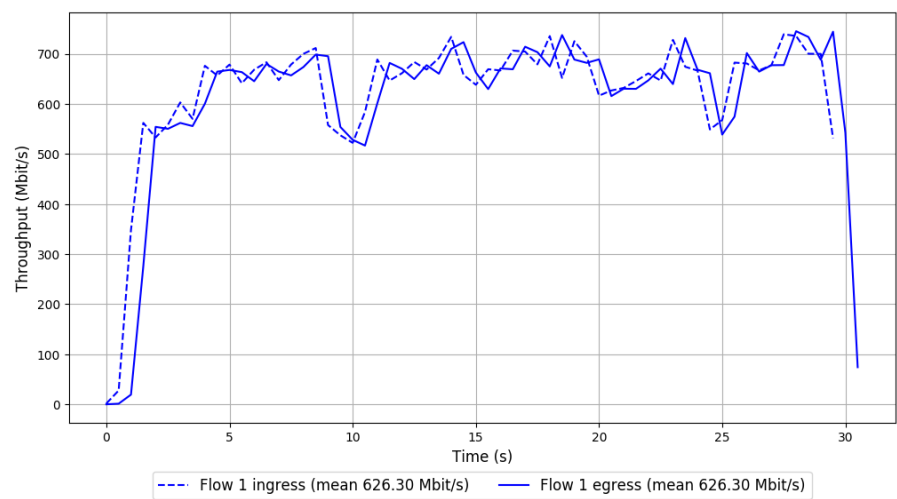
Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 623.58 Mbit/s)   Flow 1 egress (mean 622.85 Mbit/s)

Flow 1 (95th percentile 100.86 ms)

```
Run 4: Statistics of TCP Cubic

Start at: 2018-12-11 20:30:31
End at: 2018-12-11 20:31:01
Local clock offset: -0.048 ms
Remote clock offset: 0.016 ms


# Below is generated by plot.py at 2018-12-11 21:47:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 536.28 Mbit/s
95th percentile per-packet one-way delay: 65.103 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 536.28 Mbit/s
95th percentile per-packet one-way delay: 65.103 ms
Loss rate: 0.00%
```
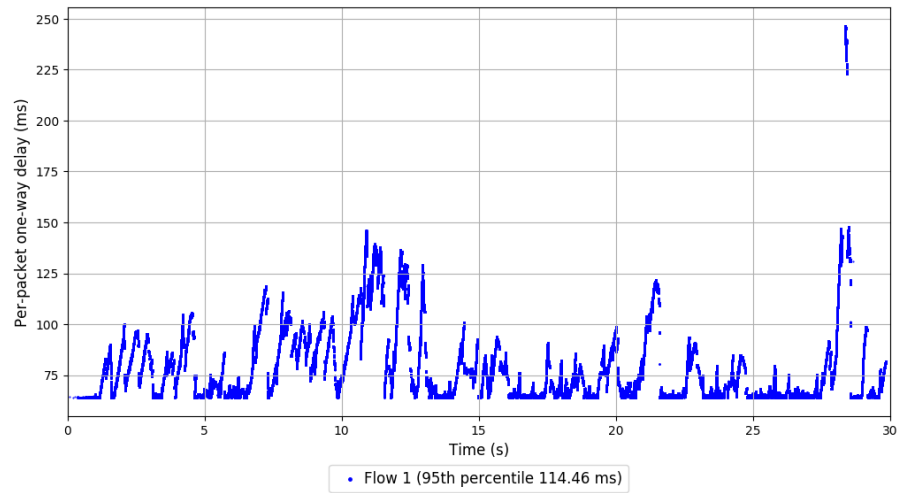
Run 4: Report of TCP Cubic — Data Link

```
Run 5: Statistics of TCP Cubic

Start at: 2018-12-11 20:58:34
End at: 2018-12-11 20:59:05
Local clock offset: -0.004 ms
Remote clock offset: -0.802 ms


# Below is generated by plot.py at 2018-12-11 21:47:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 626.30 Mbit/s
95th percentile per-packet one-way delay: 119.399 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 626.30 Mbit/s
95th percentile per-packet one-way delay: 119.399 ms
Loss rate: 0.00%
```
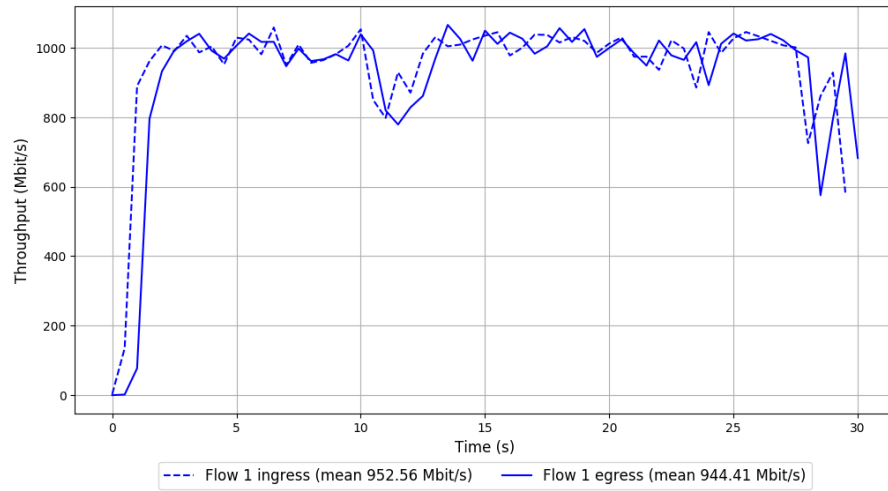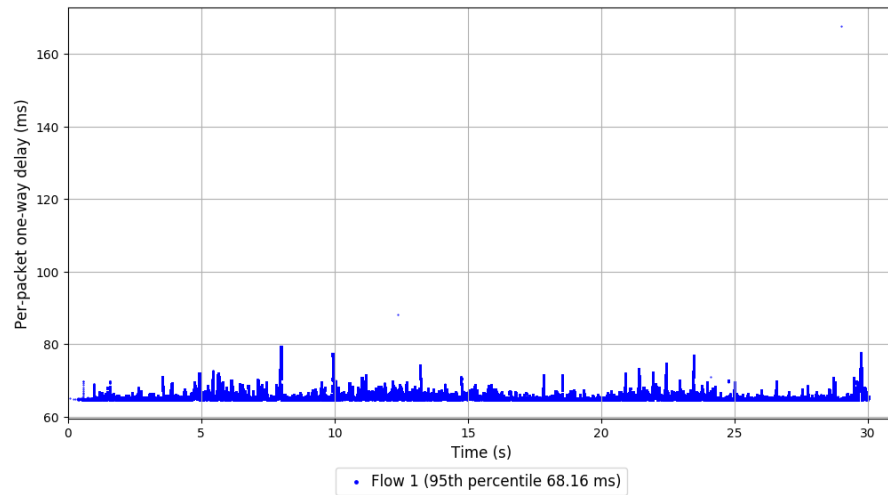
Run 5: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 626.30 Mbit/s)   Flow 1 egress (mean 626.30 Mbit/s)

Flow 1 (95th percentile 119.40 ms)

```
Run 1: Statistics of FillP

Start at: 2018-12-11 19:17:28
End at: 2018-12-11 19:17:58
Local clock offset: -0.062 ms
Remote clock offset: 1.229 ms


# Below is generated by plot.py at 2018-12-11 21:55:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 944.41 Mbit/s
95th percentile per-packet one-way delay: 114.458 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 944.41 Mbit/s
95th percentile per-packet one-way delay: 114.458 ms
Loss rate: 0.86%
```
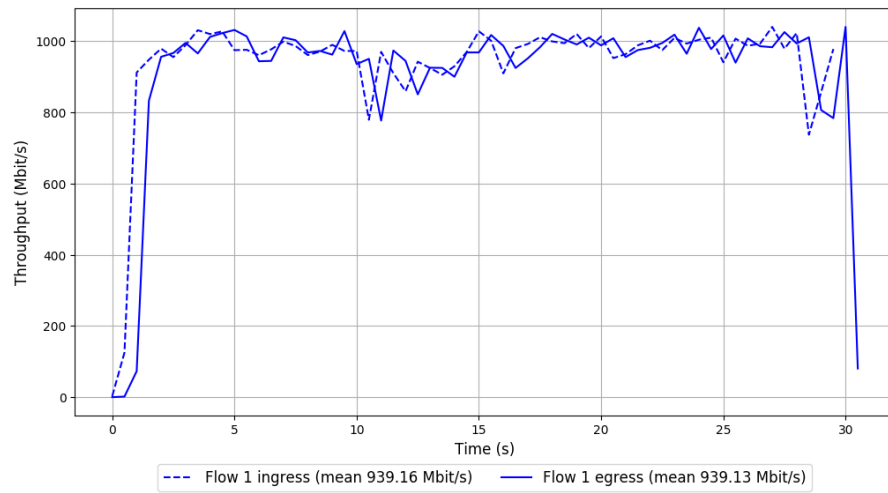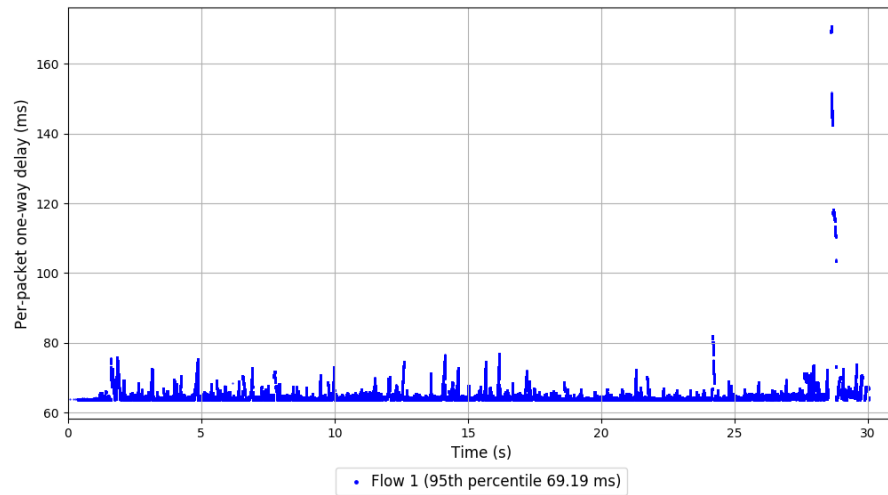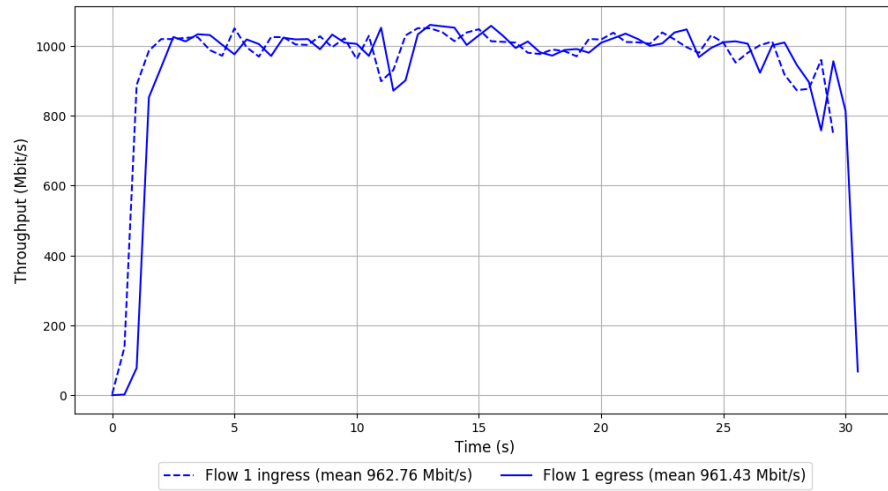
Run 1: Report of FillP — Data Link

Flow 1 ingress (mean 952.56 Mbit/s) ---- Flow 1 egress (mean 944.41 Mbit/s) ——

• Flow 1 (95th percentile 114.46 ms)

```
Run 2: Statistics of FillP

Start at: 2018-12-11 19:45:56
End at: 2018-12-11 19:46:26
Local clock offset: 0.019 ms
Remote clock offset: 1.605 ms


# Below is generated by plot.py at 2018-12-11 22:07:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 939.13 Mbit/s
95th percentile per-packet one-way delay: 68.160 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 939.13 Mbit/s
95th percentile per-packet one-way delay: 68.160 ms
Loss rate: 0.00%
```

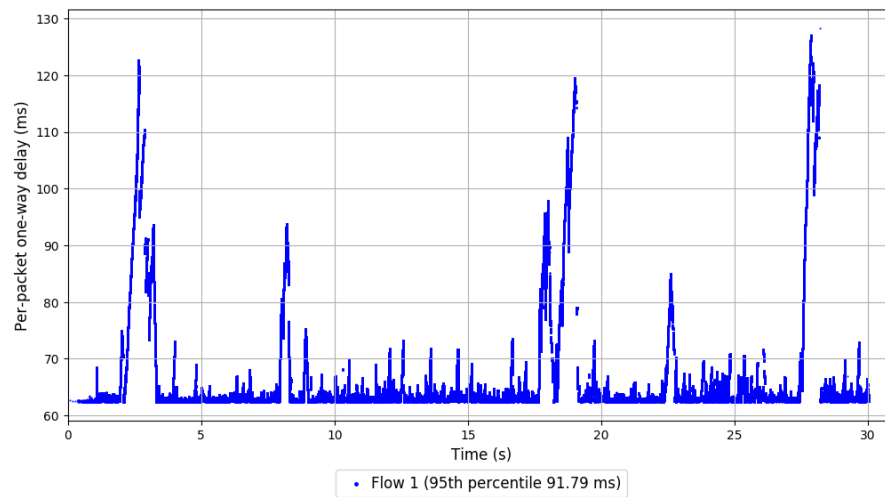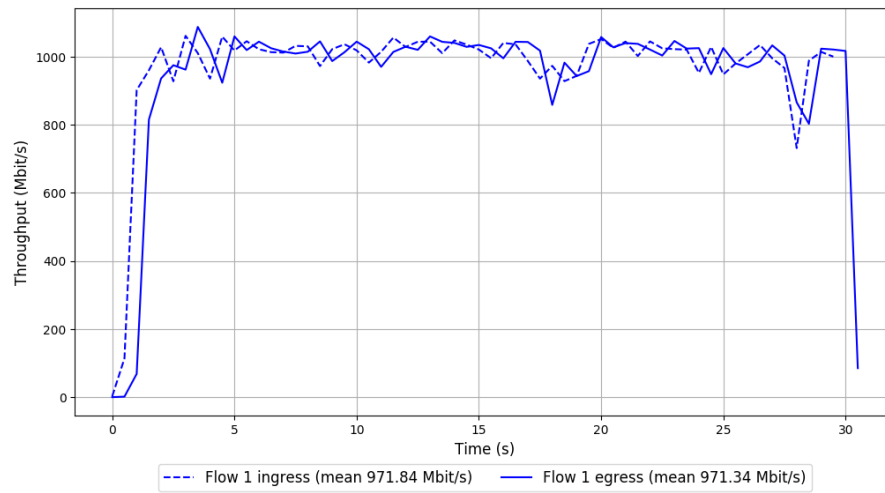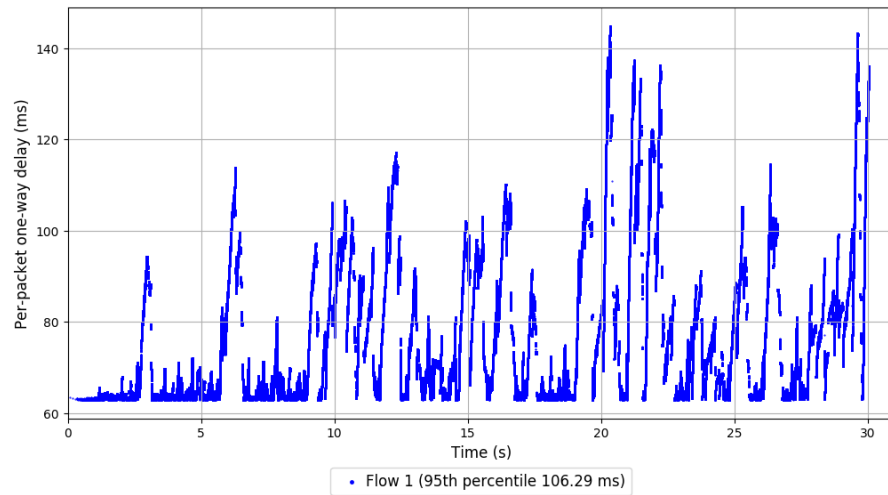Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-12-11 20:14:26
End at: 2018-12-11 20:14:56
Local clock offset: -0.009 ms
Remote clock offset: 0.509 ms


# Below is generated by plot.py at 2018-12-11 22:08:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 961.43 Mbit/s
95th percentile per-packet one-way delay: 69.189 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 961.43 Mbit/s
95th percentile per-packet one-way delay: 69.189 ms
Loss rate: 0.14%
```

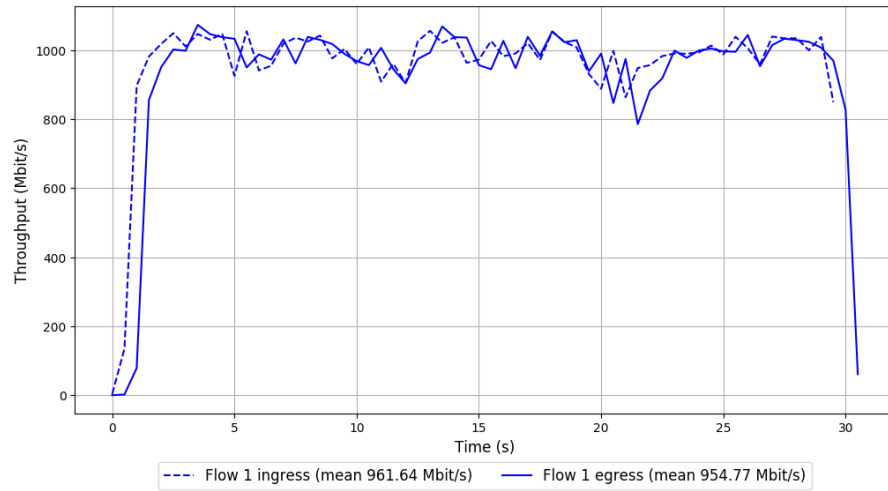Run 3: Report of FillP — Data Link

```
Run 4: Statistics of FillP

Start at: 2018-12-11 20:42:37
End at: 2018-12-11 20:43:07
Local clock offset: -0.023 ms
Remote clock offset: -0.285 ms


# Below is generated by plot.py at 2018-12-11 22:09:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 971.34 Mbit/s
95th percentile per-packet one-way delay: 91.787 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 971.34 Mbit/s
95th percentile per-packet one-way delay: 91.787 ms
Loss rate: 0.05%
```
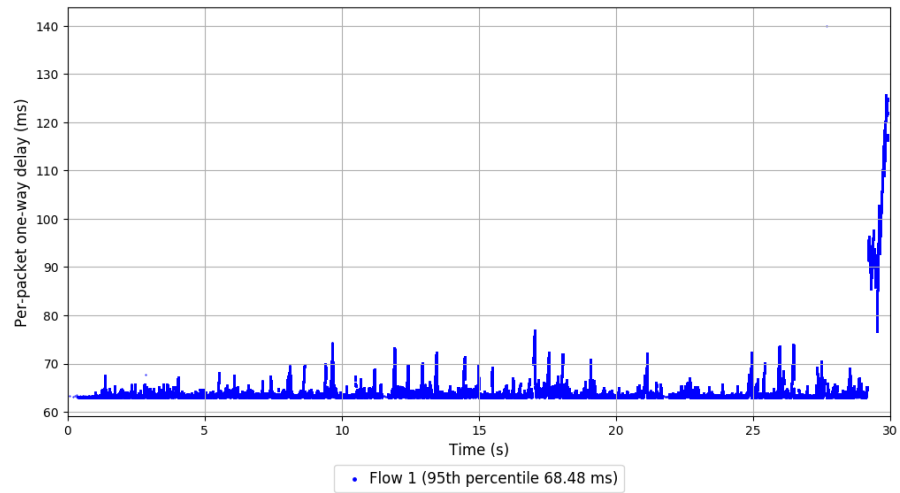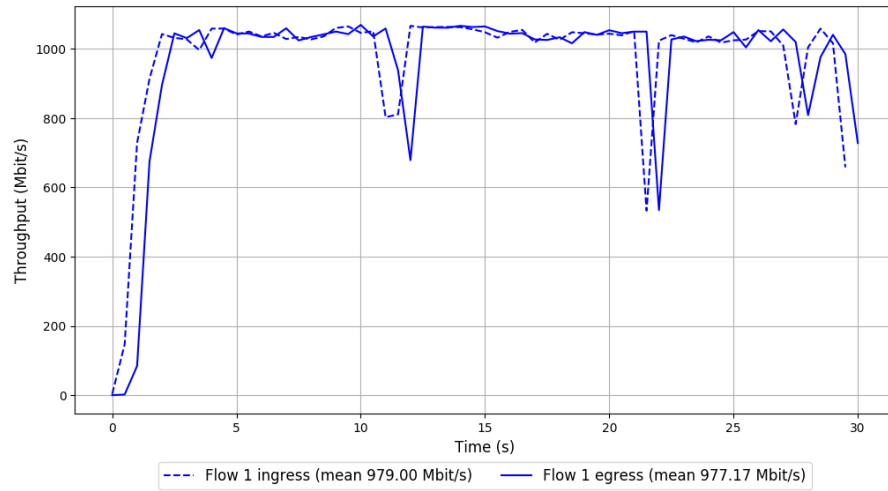
Run 4: Report of FillP — Data Link

Flow 1 ingress (mean 971.84 Mbit/s) ----- Flow 1 egress (mean 971.34 Mbit/s)

• Flow 1 (95th percentile 91.79 ms)

```
Run 5: Statistics of FillP

Start at: 2018-12-11 21:11:06
End at: 2018-12-11 21:11:36
Local clock offset: -0.03 ms
Remote clock offset: -0.011 ms

# Below is generated by plot.py at 2018-12-11 22:09:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 954.77 Mbit/s
95th percentile per-packet one-way delay: 106.289 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 954.77 Mbit/s
95th percentile per-packet one-way delay: 106.289 ms
Loss rate: 0.71%
```

Run 5: Report of FillP — Data Link

Flow 1 ingress (mean 961.64 Mbit/s) ----   Flow 1 egress (mean 954.77 Mbit/s) ——
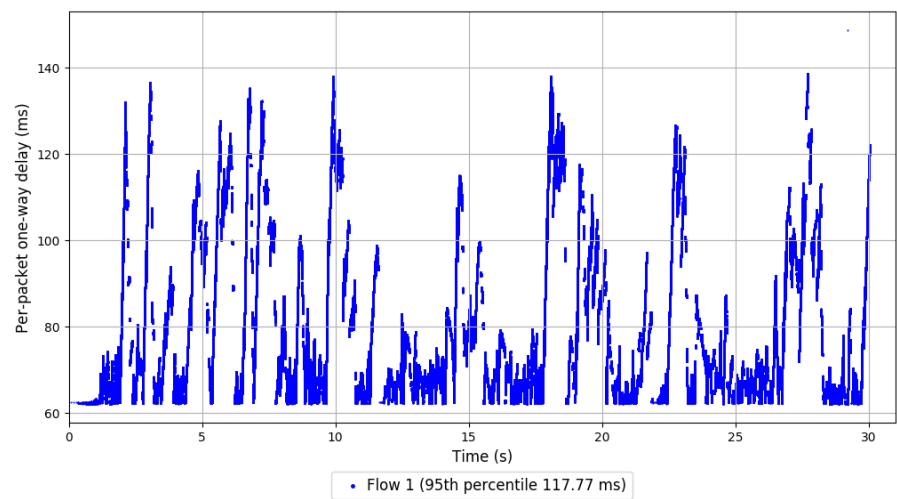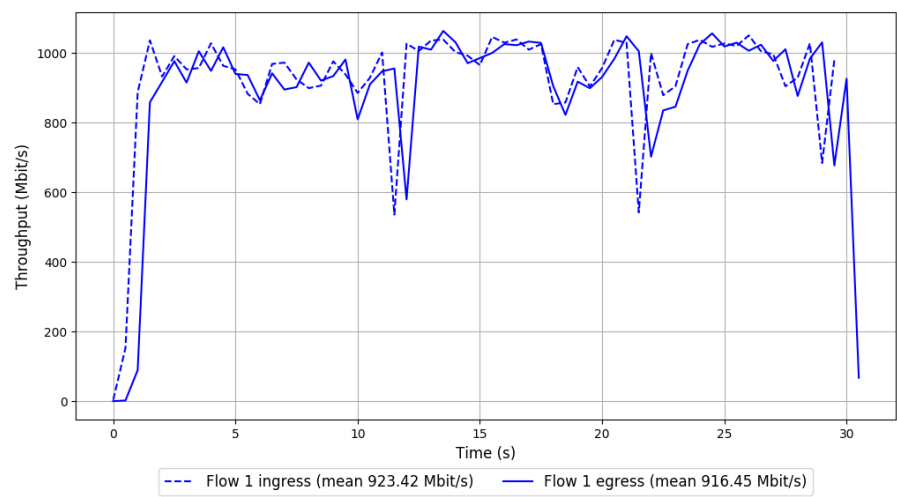

• Flow 1 (95th percentile 106.29 ms)

44

```
Run 1: Statistics of FillP-Sheep

Start at: 2018-12-11 19:03:38
End at: 2018-12-11 19:04:09
Local clock offset: -0.066 ms
Remote clock offset: -0.12 ms


# Below is generated by plot.py at 2018-12-11 22:09:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 977.17 Mbit/s
95th percentile per-packet one-way delay: 68.482 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 977.17 Mbit/s
95th percentile per-packet one-way delay: 68.482 ms
Loss rate: 0.17%
```
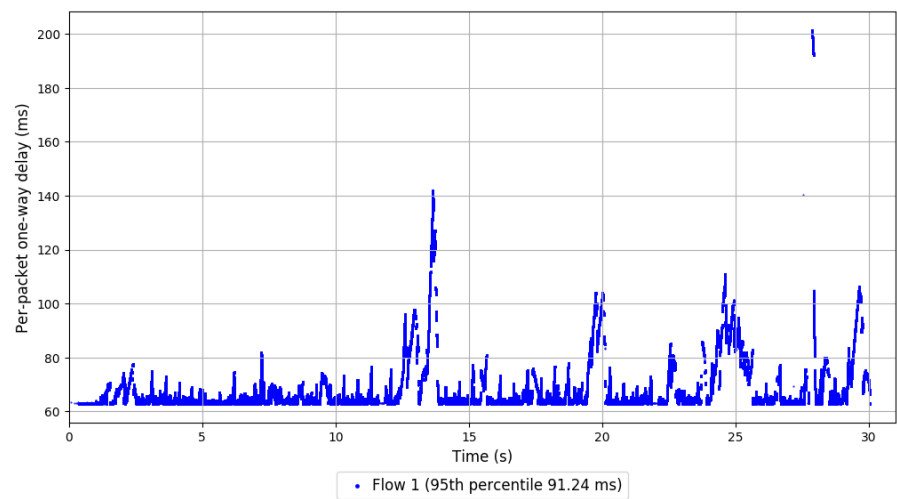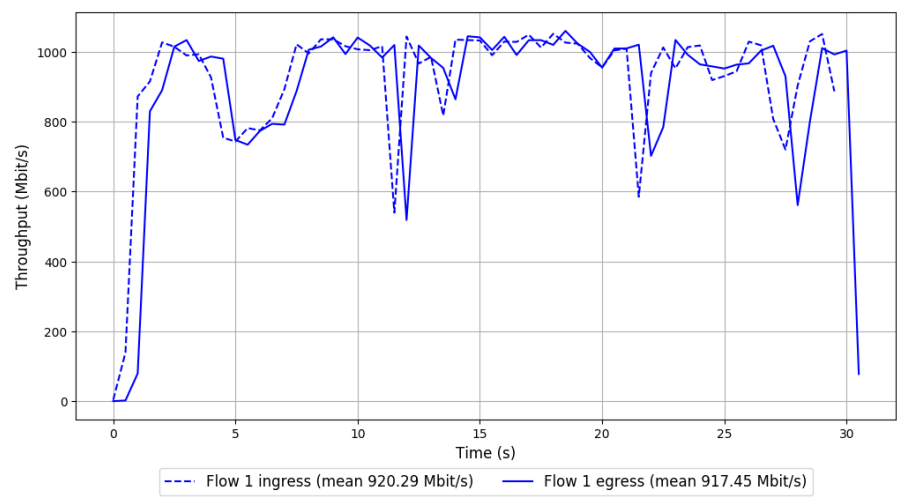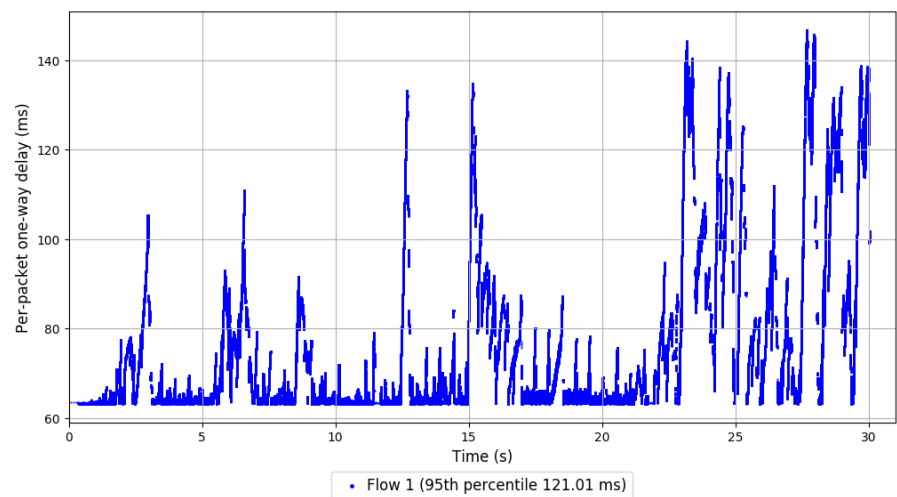
Run 1: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 979.00 Mbit/s)   Flow 1 egress (mean 977.17 Mbit/s)

Flow 1 (95th percentile 68.48 ms)

```
Run 2: Statistics of FillP-Sheep

Start at: 2018-12-11 19:31:37
End at: 2018-12-11 19:32:07
Local clock offset: -0.018 ms
Remote clock offset: -0.486 ms


# Below is generated by plot.py at 2018-12-11 22:09:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 916.45 Mbit/s
95th percentile per-packet one-way delay: 117.773 ms
Loss rate: 0.75%
-- Flow 1:
Average throughput: 916.45 Mbit/s
95th percentile per-packet one-way delay: 117.773 ms
Loss rate: 0.75%
```
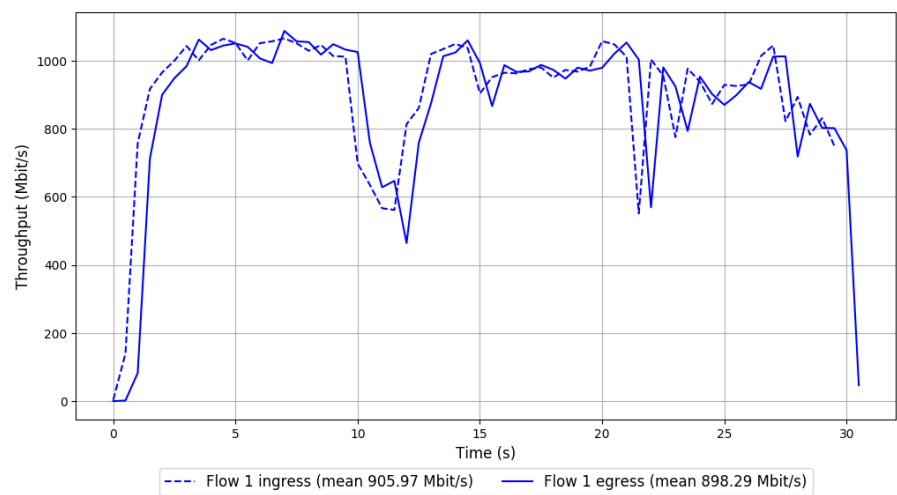
Run 2: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 923.42 Mbit/s)   Flow 1 egress (mean 916.45 Mbit/s)
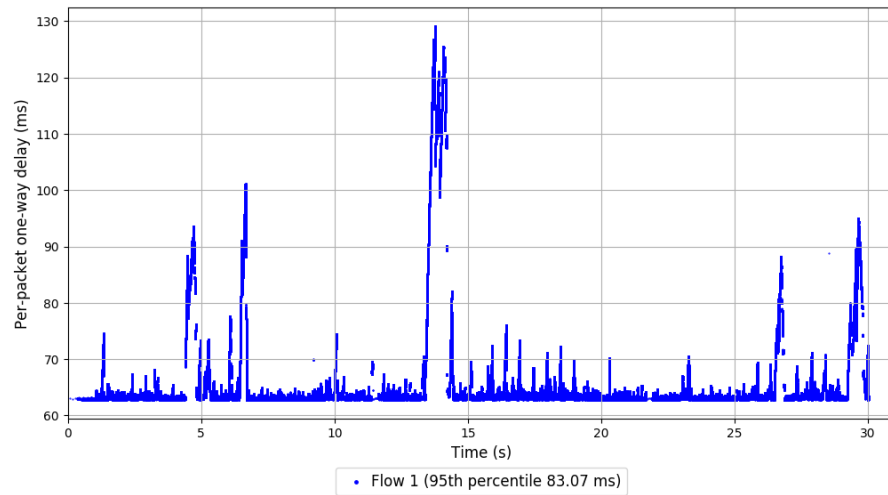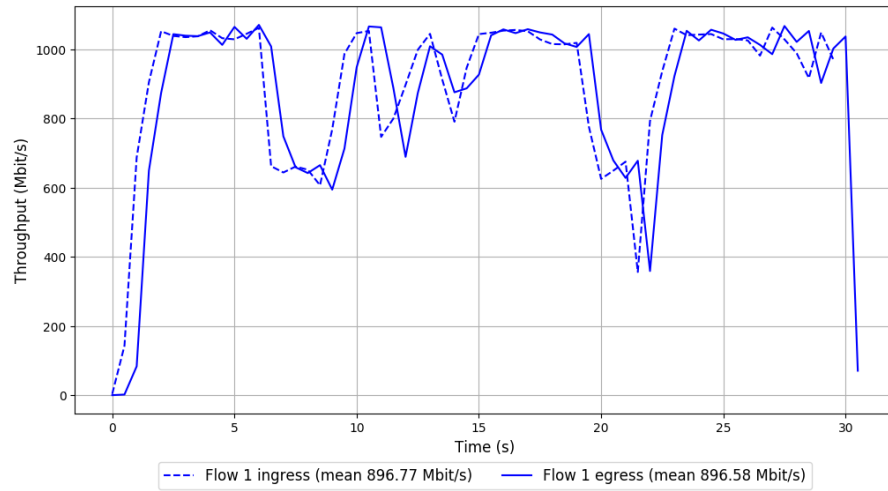

• Flow 1 (95th percentile 117.77 ms)

```
Run 3: Statistics of FillP-Sheep

Start at: 2018-12-11 20:00:10
End at: 2018-12-11 20:00:40
Local clock offset: -0.03 ms
Remote clock offset: -0.48 ms


# Below is generated by plot.py at 2018-12-11 22:09:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 917.45 Mbit/s
95th percentile per-packet one-way delay: 91.237 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 917.45 Mbit/s
95th percentile per-packet one-way delay: 91.237 ms
Loss rate: 0.31%
```
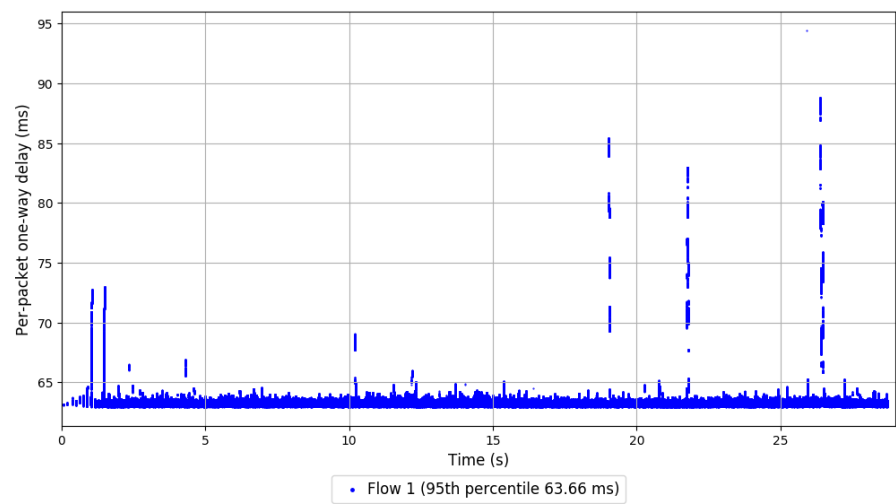
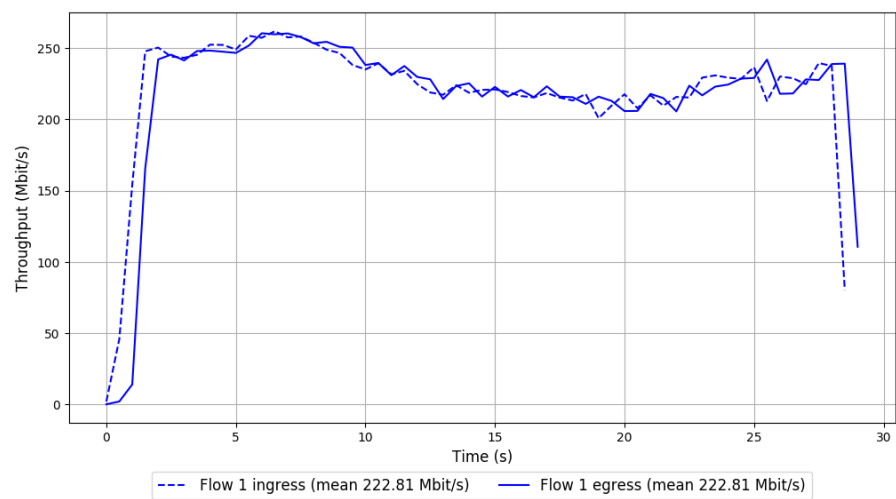Run 3: Report of FillP-Sheep — Data Link

```
Run 4: Statistics of FillP-Sheep

Start at: 2018-12-11 20:28:47
End at: 2018-12-11 20:29:17
Local clock offset: -0.046 ms
Remote clock offset: -0.152 ms


# Below is generated by plot.py at 2018-12-11 22:17:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 898.29 Mbit/s
95th percentile per-packet one-way delay: 121.013 ms
Loss rate: 0.85%
-- Flow 1:
Average throughput: 898.29 Mbit/s
95th percentile per-packet one-way delay: 121.013 ms
Loss rate: 0.85%
```

Run 4: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 905.97 Mbit/s)   Flow 1 egress (mean 898.29 Mbit/s)

• Flow 1 (95th percentile 121.01 ms)

```
Run 5: Statistics of FillP-Sheep

Start at: 2018-12-11 20:56:51
End at: 2018-12-11 20:57:21
Local clock offset: -0.036 ms
Remote clock offset: -0.263 ms


# Below is generated by plot.py at 2018-12-11 22:28:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 896.58 Mbit/s
95th percentile per-packet one-way delay: 83.074 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 896.58 Mbit/s
95th percentile per-packet one-way delay: 83.074 ms
Loss rate: 0.02%
```
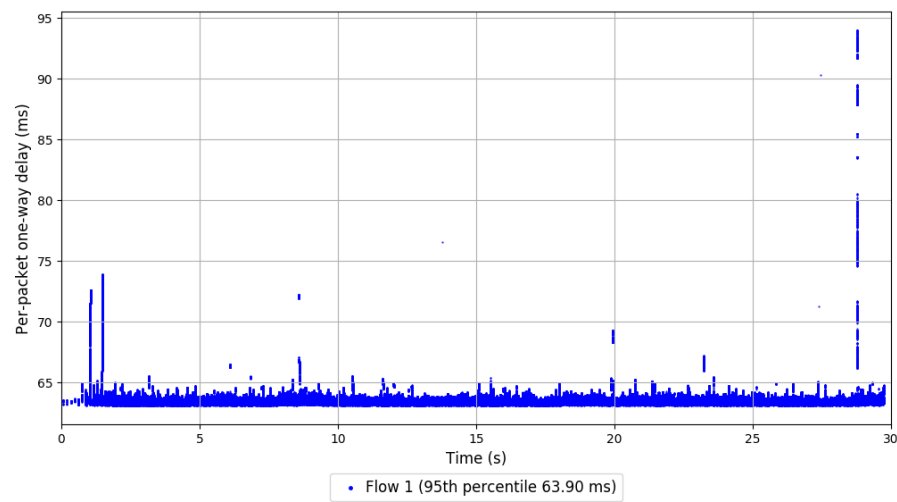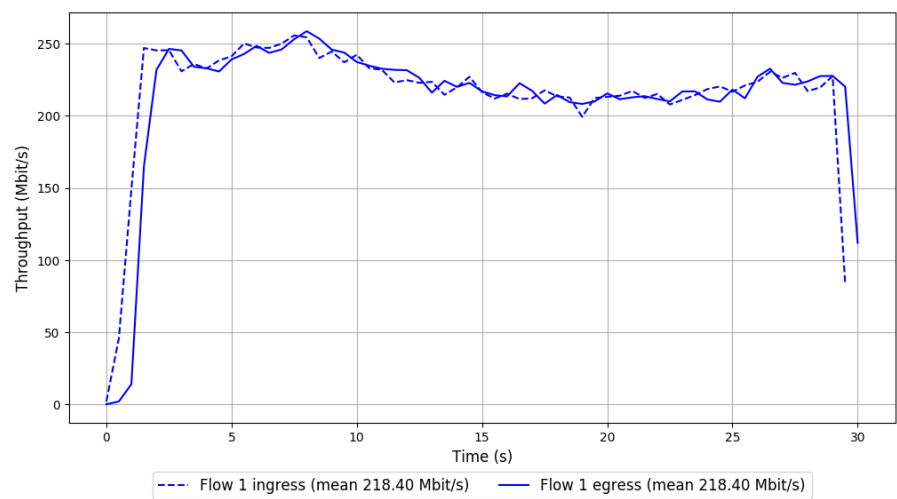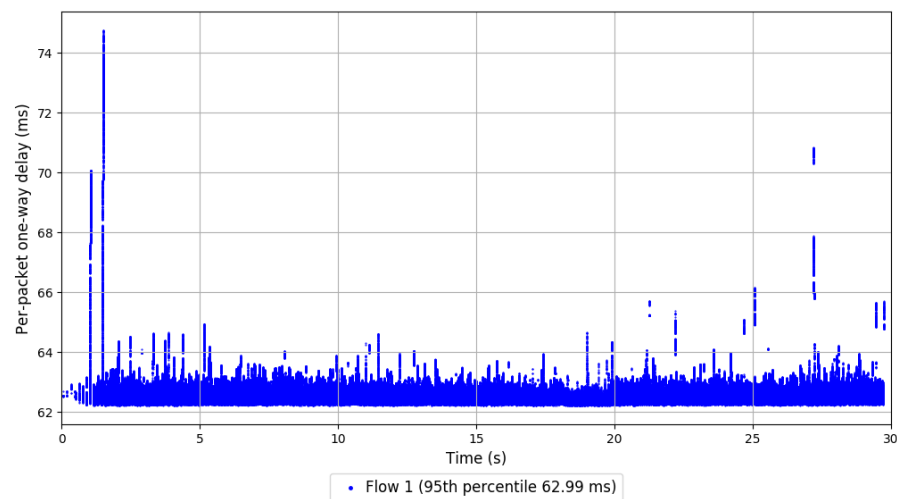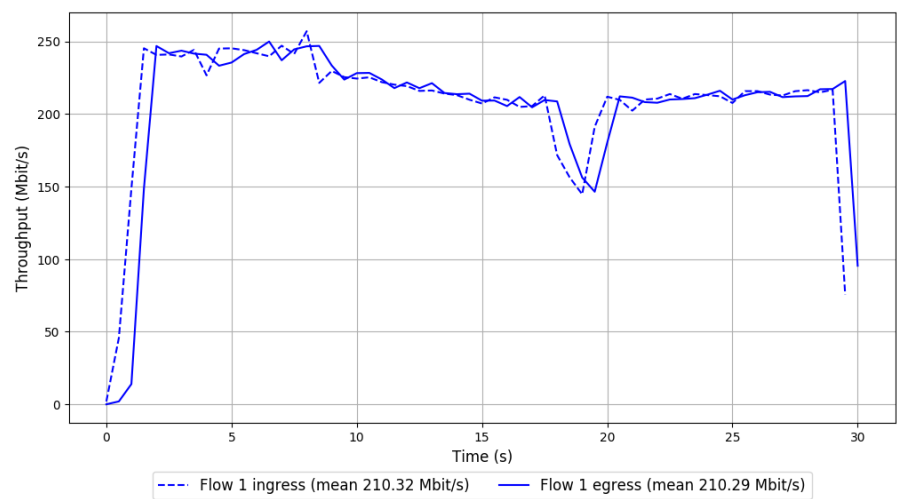
Run 5: Report of FillP-Sheep — Data Link

```
Run 1: Statistics of Indigo

Start at: 2018-12-11 19:11:38
End at: 2018-12-11 19:12:08
Local clock offset: -0.043 ms
Remote clock offset: -0.096 ms


# Below is generated by plot.py at 2018-12-11 22:28:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 222.81 Mbit/s
95th percentile per-packet one-way delay: 63.663 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 222.81 Mbit/s
95th percentile per-packet one-way delay: 63.663 ms
Loss rate: 0.00%
```
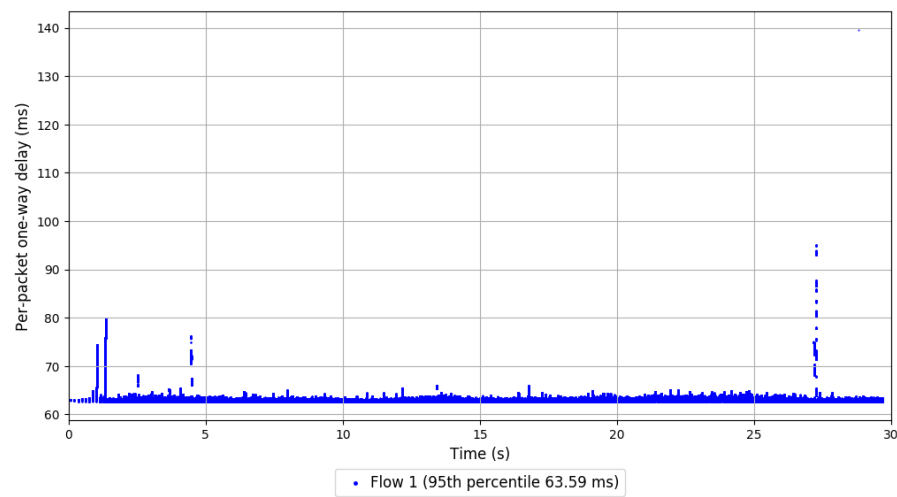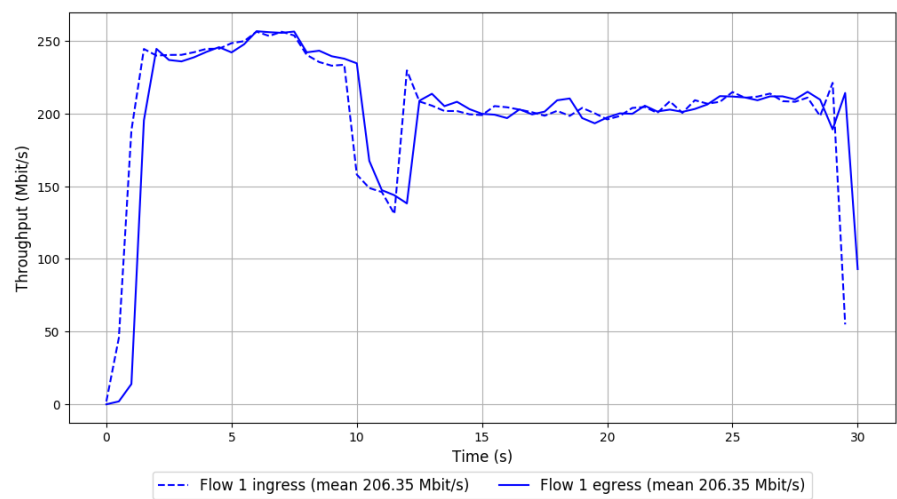
Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2018-12-11 19:40:05
End at: 2018-12-11 19:40:35
Local clock offset: 0.009 ms
Remote clock offset: 0.2 ms


# Below is generated by plot.py at 2018-12-11 22:28:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 218.40 Mbit/s
95th percentile per-packet one-way delay: 63.897 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 218.40 Mbit/s
95th percentile per-packet one-way delay: 63.897 ms
Loss rate: 0.00%
```

Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2018-12-11 20:08:32
End at: 2018-12-11 20:09:02
Local clock offset: -0.018 ms
Remote clock offset: -0.528 ms


# Below is generated by plot.py at 2018-12-11 22:28:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 210.29 Mbit/s
95th percentile per-packet one-way delay: 62.988 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 210.29 Mbit/s
95th percentile per-packet one-way delay: 62.988 ms
Loss rate: 0.01%
```
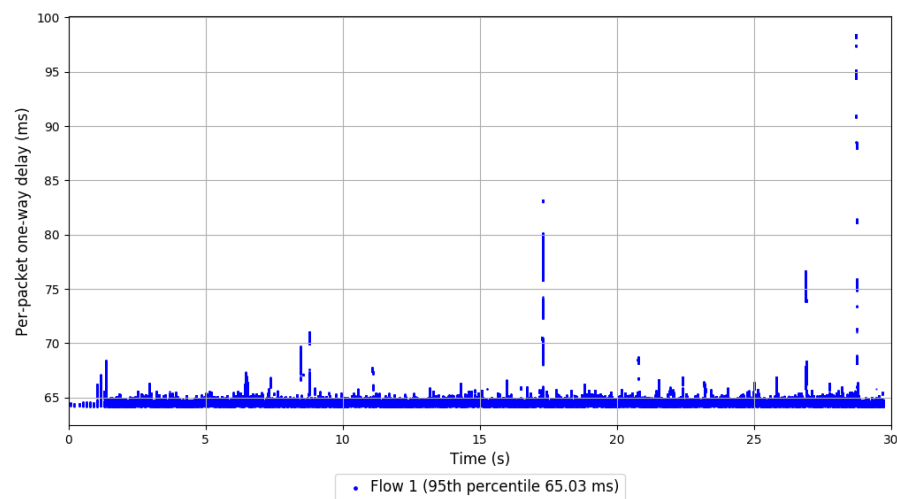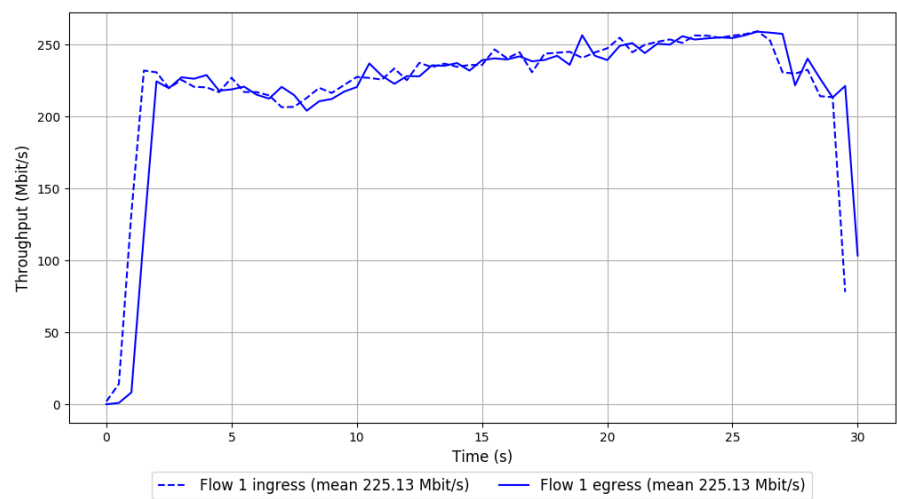
Run 3: Report of Indigo — Data Link

```
Run 4: Statistics of Indigo

Start at: 2018-12-11 20:36:49
End at: 2018-12-11 20:37:19
Local clock offset: -0.032 ms
Remote clock offset: -0.052 ms


# Below is generated by plot.py at 2018-12-11 22:28:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 206.35 Mbit/s
95th percentile per-packet one-way delay: 63.585 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 206.35 Mbit/s
95th percentile per-packet one-way delay: 63.585 ms
Loss rate: 0.00%
```
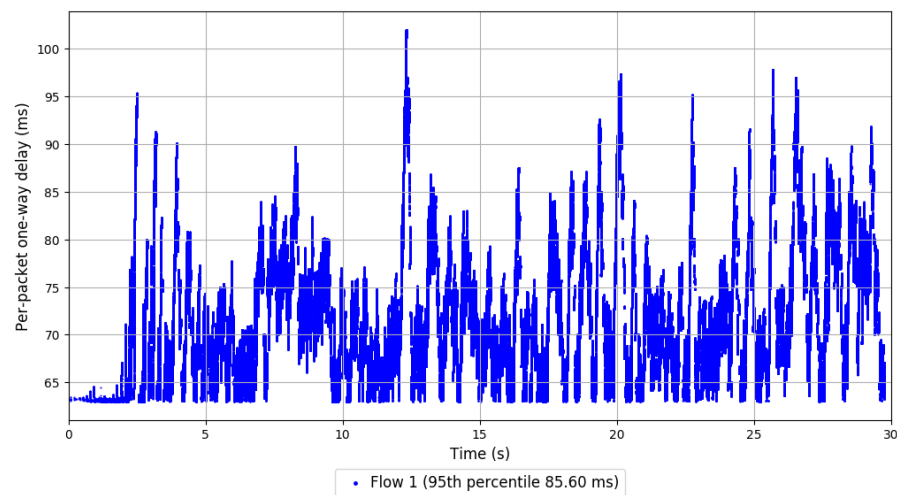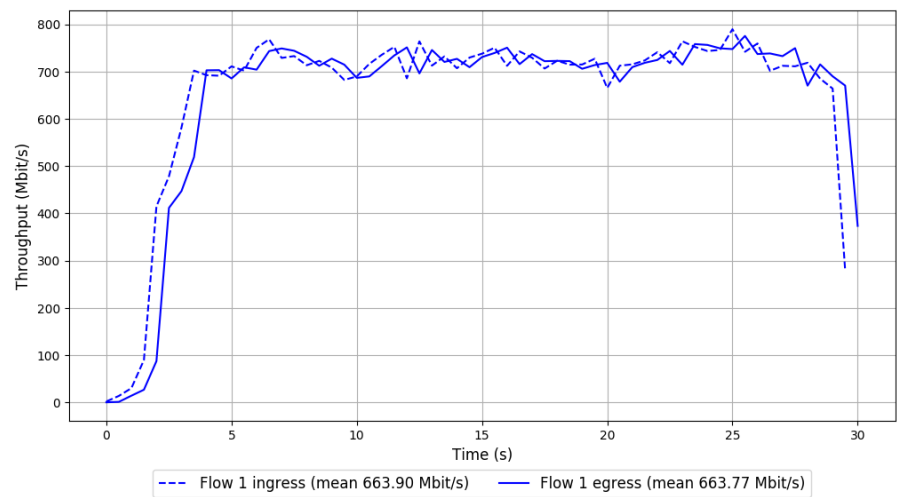
Run 4: Report of Indigo — Data Link

```
Run 5: Statistics of Indigo

Start at: 2018-12-11 21:05:16
End at: 2018-12-11 21:05:46
Local clock offset: -0.01 ms
Remote clock offset: 1.185 ms


# Below is generated by plot.py at 2018-12-11 22:28:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 225.13 Mbit/s
95th percentile per-packet one-way delay: 65.029 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 225.13 Mbit/s
95th percentile per-packet one-way delay: 65.029 ms
Loss rate: 0.00%
```
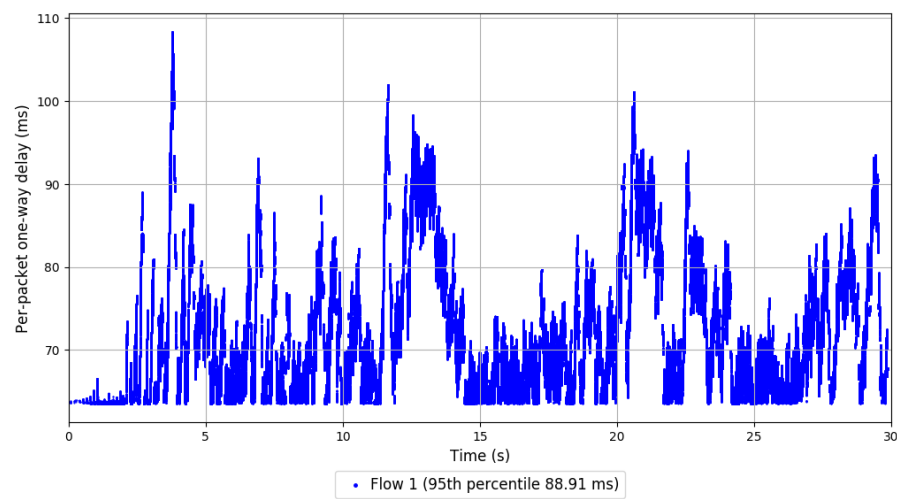
Run 5: Report of Indigo — Data Link

```
Run 1: Statistics of Indigo-MusesD

Start at: 2018-12-11 19:13:06
End at: 2018-12-11 19:13:36
Local clock offset: -0.035 ms
Remote clock offset: -0.071 ms

# Below is generated by plot.py at 2018-12-11 22:28:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 663.77 Mbit/s
95th percentile per-packet one-way delay: 85.598 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 663.77 Mbit/s
95th percentile per-packet one-way delay: 85.598 ms
Loss rate: 0.02%
```
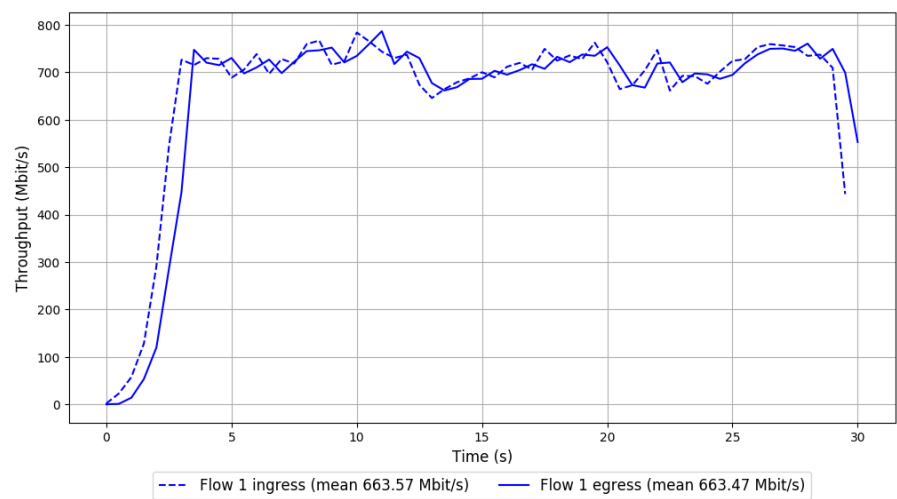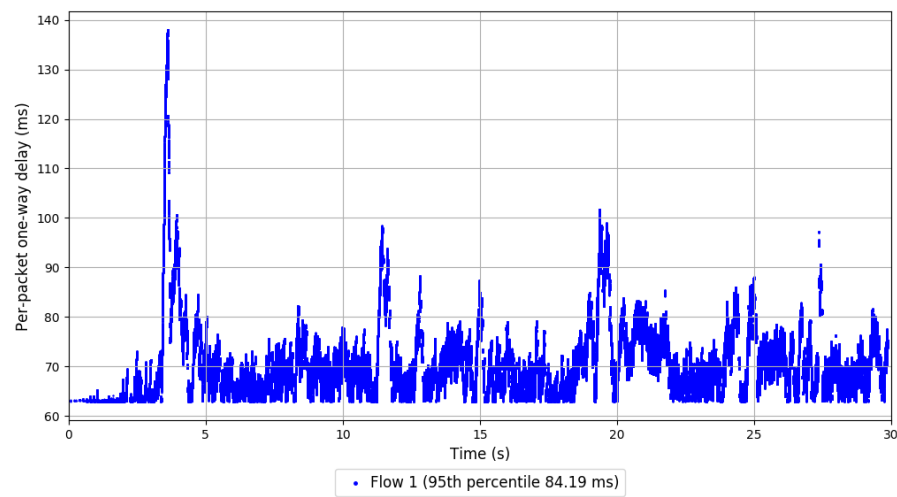
Run 1: Report of Indigo-MusesD — Data Link

Flow 1 ingress (mean 663.90 Mbit/s) —— Flow 1 egress (mean 663.77 Mbit/s)

• Flow 1 (95th percentile 85.60 ms)

```
Run 2: Statistics of Indigo-MusesD

Start at: 2018-12-11 19:41:35
End at: 2018-12-11 19:42:05
Local clock offset: 0.002 ms
Remote clock offset: 0.457 ms


# Below is generated by plot.py at 2018-12-11 22:28:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 663.47 Mbit/s
95th percentile per-packet one-way delay: 88.914 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 663.47 Mbit/s
95th percentile per-packet one-way delay: 88.914 ms
Loss rate: 0.01%
```
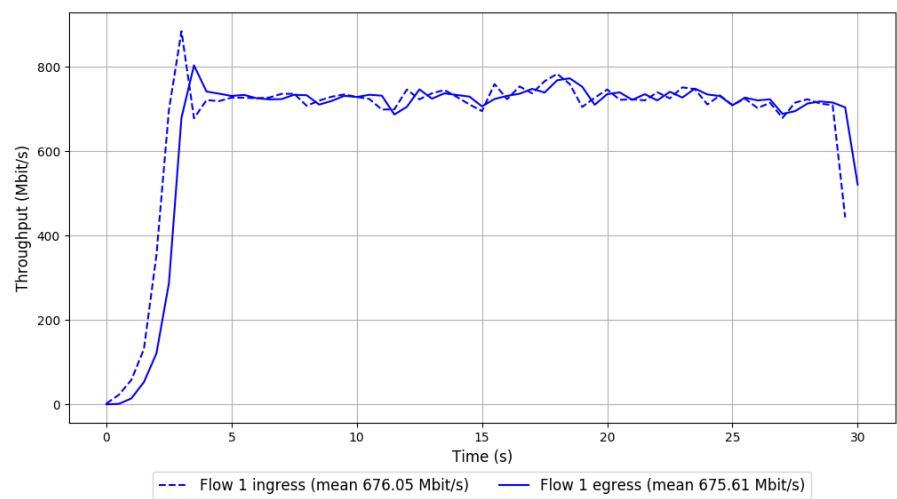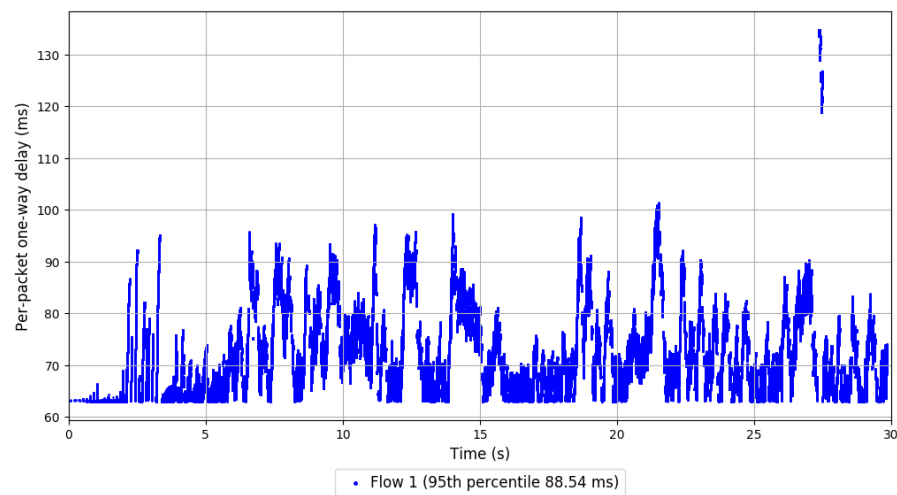
Run 2: Report of Indigo-MusesD — Data Link

```
Run 3: Statistics of Indigo-MusesD

Start at: 2018-12-11 20:10:04
End at: 2018-12-11 20:10:34
Local clock offset: -0.044 ms
Remote clock offset: -0.15 ms


# Below is generated by plot.py at 2018-12-11 22:29:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 675.61 Mbit/s
95th percentile per-packet one-way delay: 84.195 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 675.61 Mbit/s
95th percentile per-packet one-way delay: 84.195 ms
Loss rate: 0.06%
```
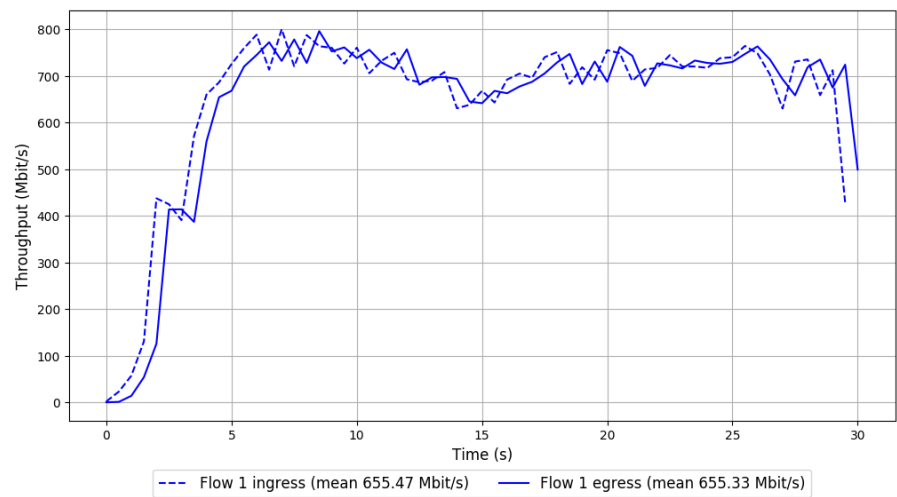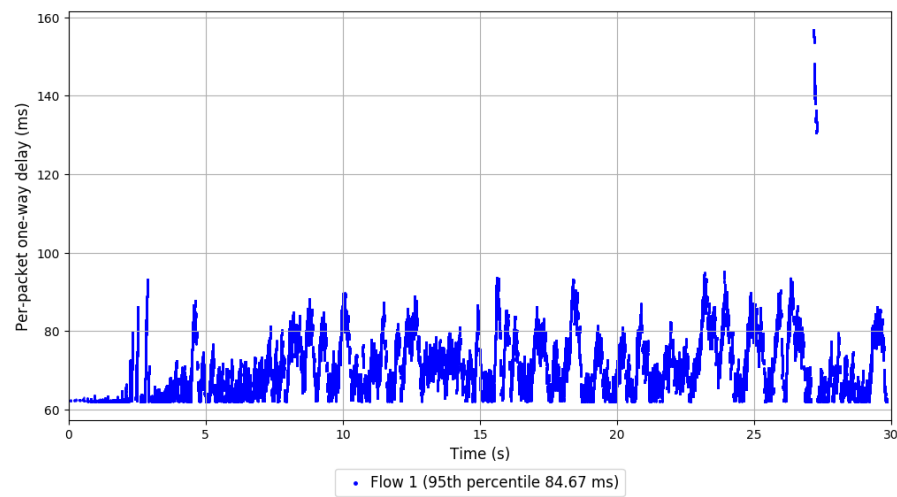
Run 3: Report of Indigo-MusesD — Data Link

```
Run 4: Statistics of Indigo-MusesD

Start at: 2018-12-11 20:38:16
End at: 2018-12-11 20:38:46
Local clock offset: -0.028 ms
Remote clock offset: -0.072 ms


# Below is generated by plot.py at 2018-12-11 22:29:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 655.33 Mbit/s
95th percentile per-packet one-way delay: 88.537 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 655.33 Mbit/s
95th percentile per-packet one-way delay: 88.537 ms
Loss rate: 0.02%
```
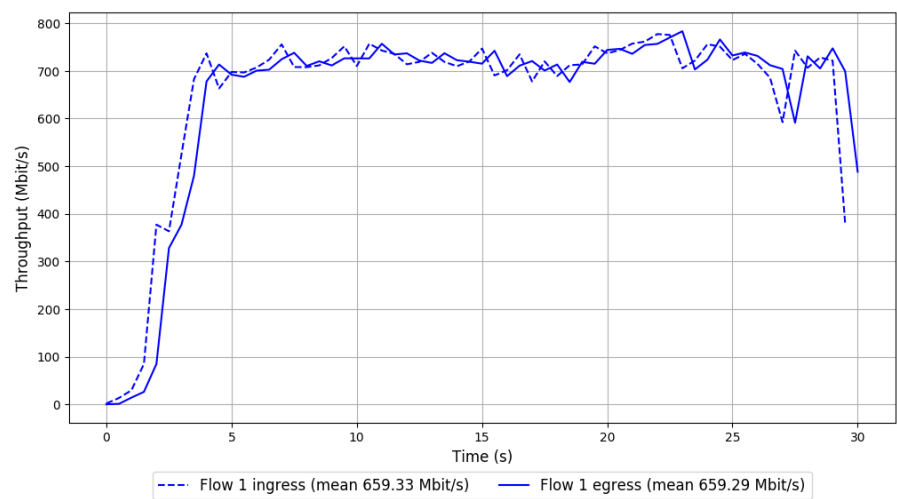
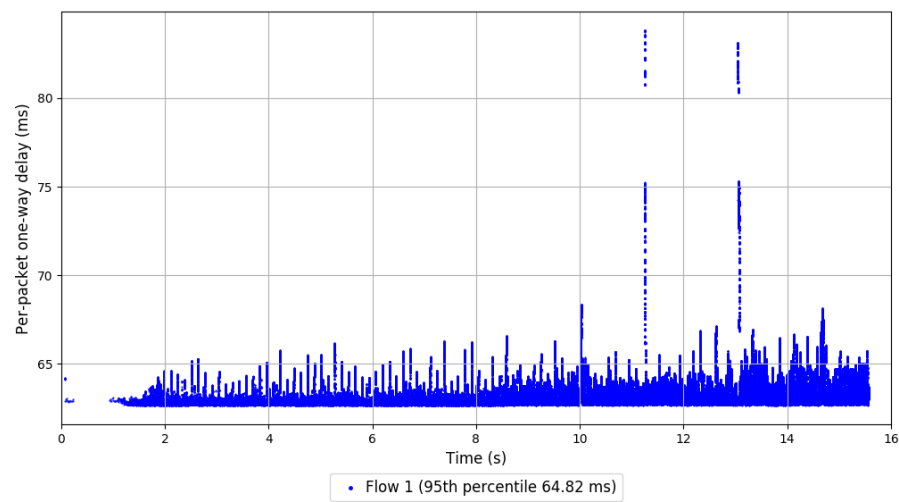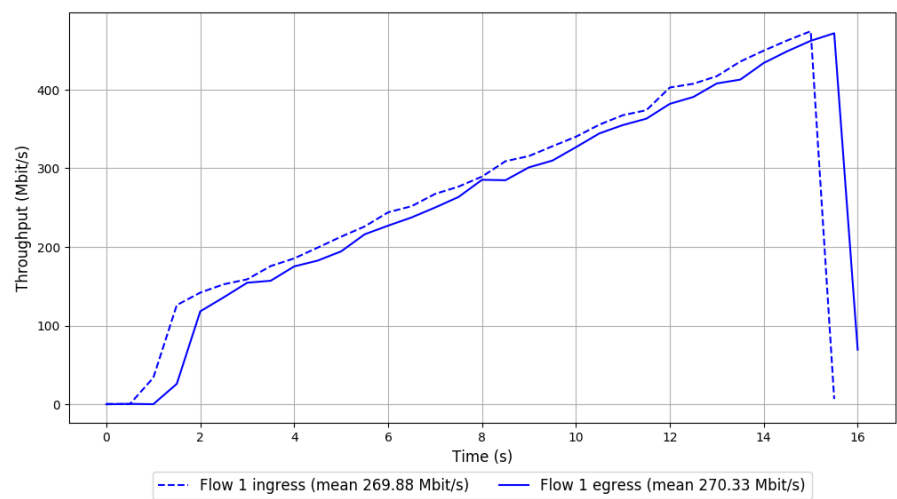Run 4: Report of Indigo-MusesD — Data Link

```
Run 5: Statistics of Indigo-MusesD

Start at: 2018-12-11 21:06:45
End at: 2018-12-11 21:07:15
Local clock offset: 0.006 ms
Remote clock offset: -0.725 ms


# Below is generated by plot.py at 2018-12-11 22:29:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 659.29 Mbit/s
95th percentile per-packet one-way delay: 84.666 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 659.29 Mbit/s
95th percentile per-packet one-way delay: 84.666 ms
Loss rate: 0.00%
```
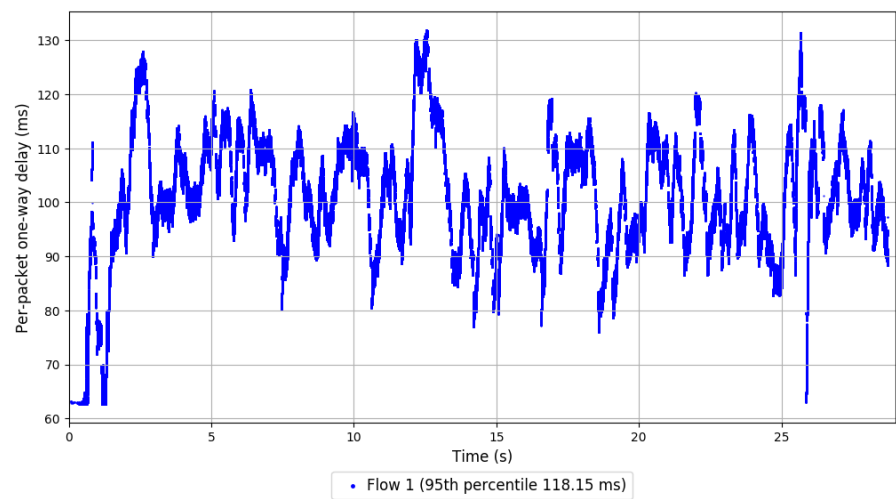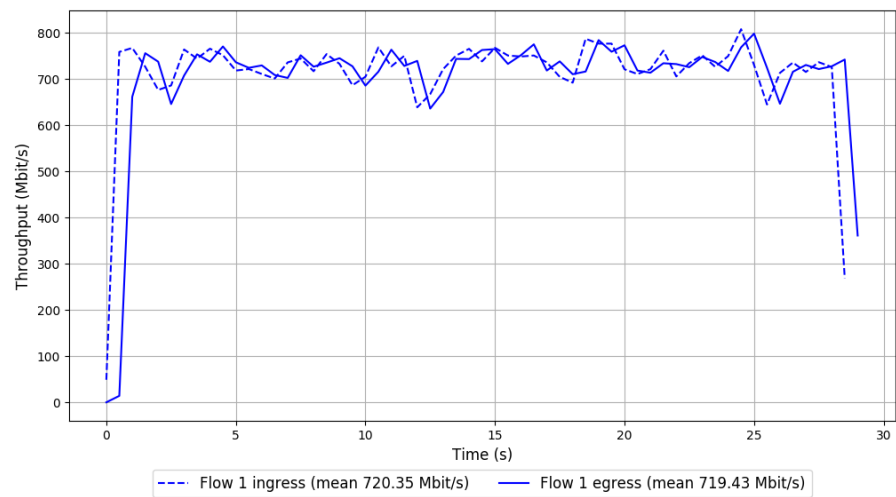
Run 5: Report of Indigo-MusesD — Data Link

74

```
Run 1: Statistics of Indigo-MusesT

Start at: 2018-12-11 19:07:05
End at: 2018-12-11 19:07:35
Local clock offset: 0.002 ms
Remote clock offset: -0.125 ms
```

Run 1: Report of Indigo-MusesT — Data Link

```
Run 2: Statistics of Indigo-MusesT

Start at: 2018-12-11 19:35:03
End at: 2018-12-11 19:35:33
Local clock offset: 0.019 ms
Remote clock offset: 0.129 ms


# Below is generated by plot.py at 2018-12-11 22:31:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 719.43 Mbit/s
95th percentile per-packet one-way delay: 118.150 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 719.43 Mbit/s
95th percentile per-packet one-way delay: 118.150 ms
Loss rate: 0.12%
```

Run 2: Report of Indigo-MusesT — Data Link

```
Run 3: Statistics of Indigo-MusesT

Start at: 2018-12-11 20:03:33
End at: 2018-12-11 20:04:03
Local clock offset: -0.019 ms
Remote clock offset: -0.103 ms


# Below is generated by plot.py at 2018-12-11 22:33:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 727.82 Mbit/s
95th percentile per-packet one-way delay: 122.885 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 727.82 Mbit/s
95th percentile per-packet one-way delay: 122.885 ms
Loss rate: 0.35%
```
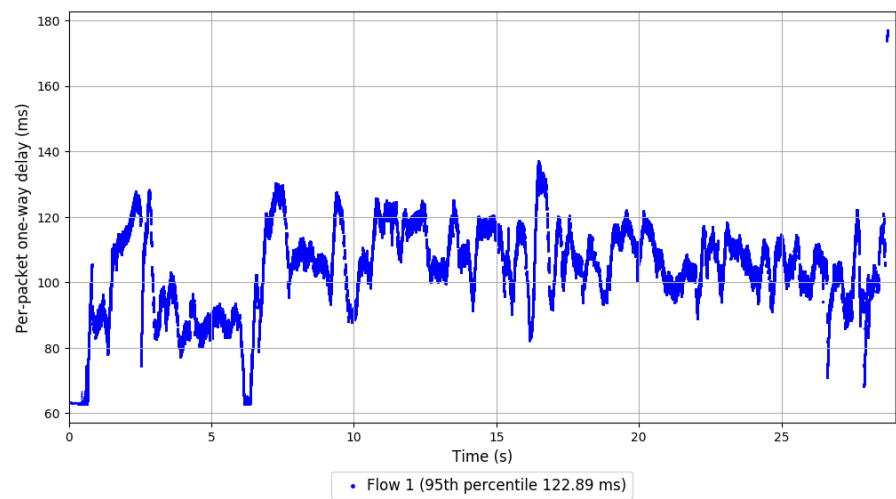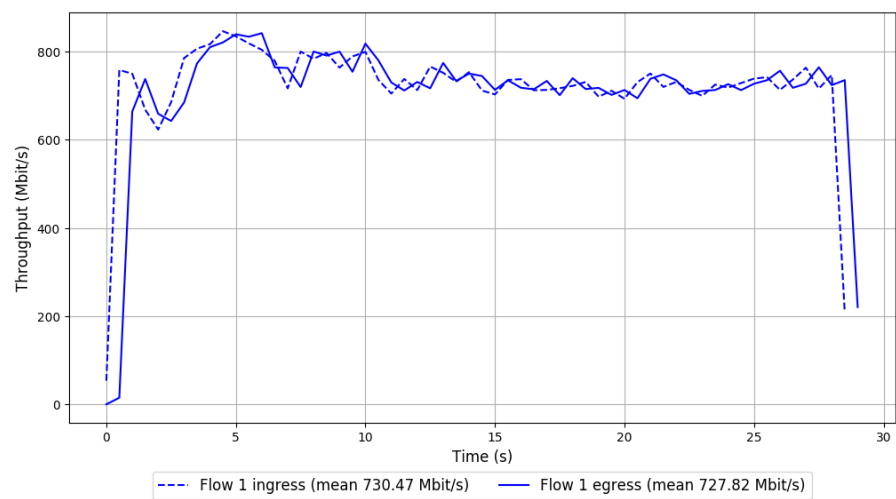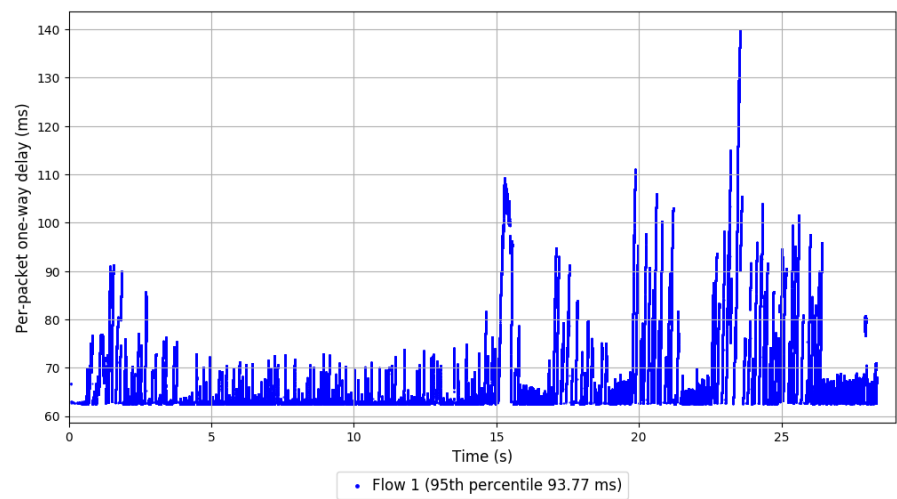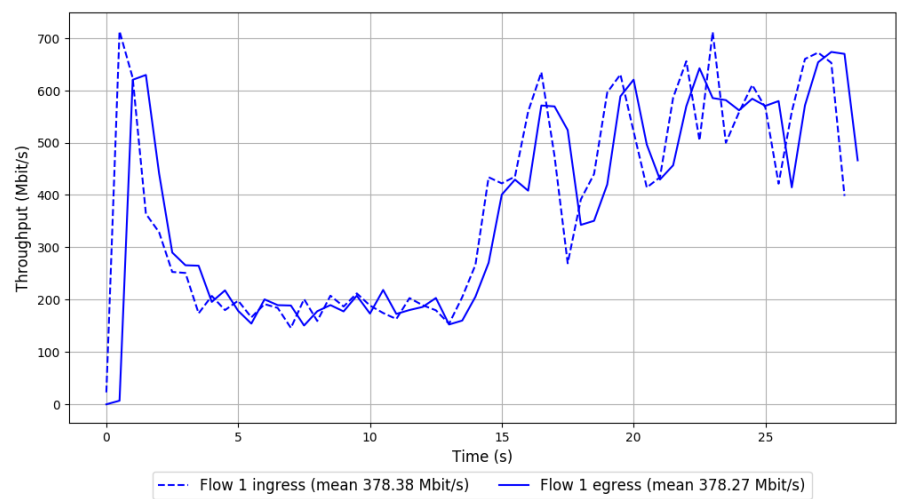
Run 3: Report of Indigo-MusesT — Data Link

Flow 1 ingress (mean 730.47 Mbit/s) Flow 1 egress (mean 727.82 Mbit/s)

Flow 1 (95th percentile 122.89 ms)

```
Run 4: Statistics of Indigo-MusesT

Start at: 2018-12-11 20:32:04
End at: 2018-12-11 20:32:34
Local clock offset: -0.035 ms
Remote clock offset: -0.372 ms


# Below is generated by plot.py at 2018-12-11 22:33:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 378.27 Mbit/s
95th percentile per-packet one-way delay: 93.770 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 378.27 Mbit/s
95th percentile per-packet one-way delay: 93.770 ms
Loss rate: 0.03%
```

Run 4: Report of Indigo-MusesT — Data Link

```
Run 5: Statistics of Indigo-MusesT

Start at: 2018-12-11 21:00:14
End at: 2018-12-11 21:00:44
Local clock offset: -0.036 ms
Remote clock offset: -0.206 ms


# Below is generated by plot.py at 2018-12-11 22:38:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 704.62 Mbit/s
95th percentile per-packet one-way delay: 137.274 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 704.62 Mbit/s
95th percentile per-packet one-way delay: 137.274 ms
Loss rate: 0.66%
```
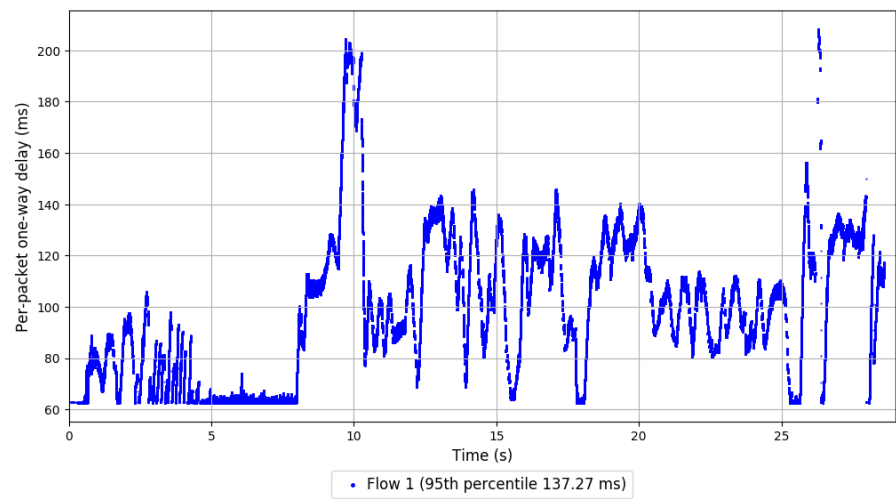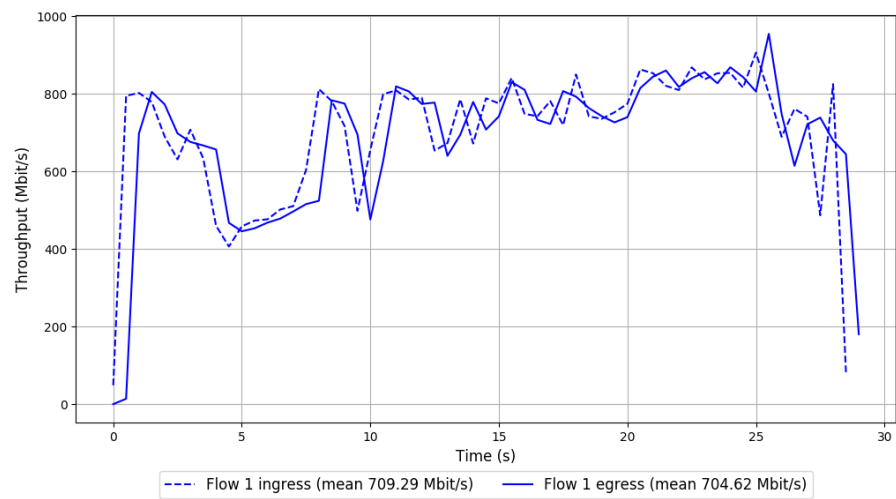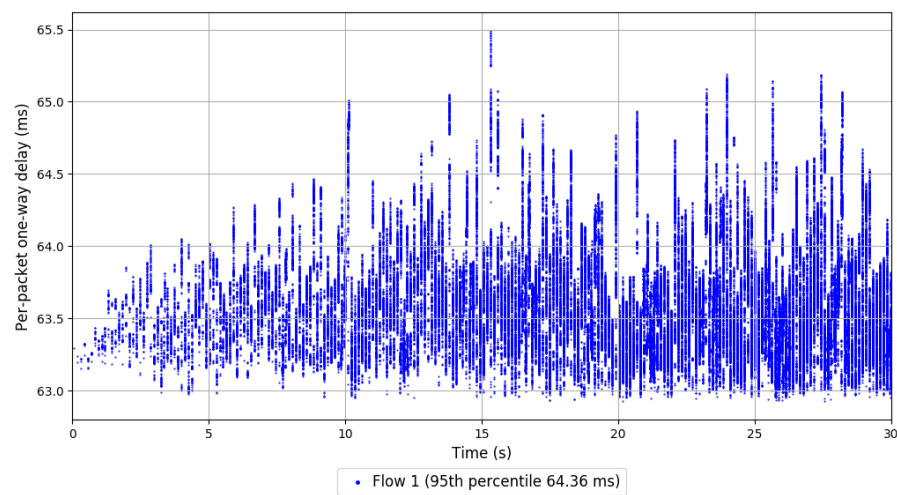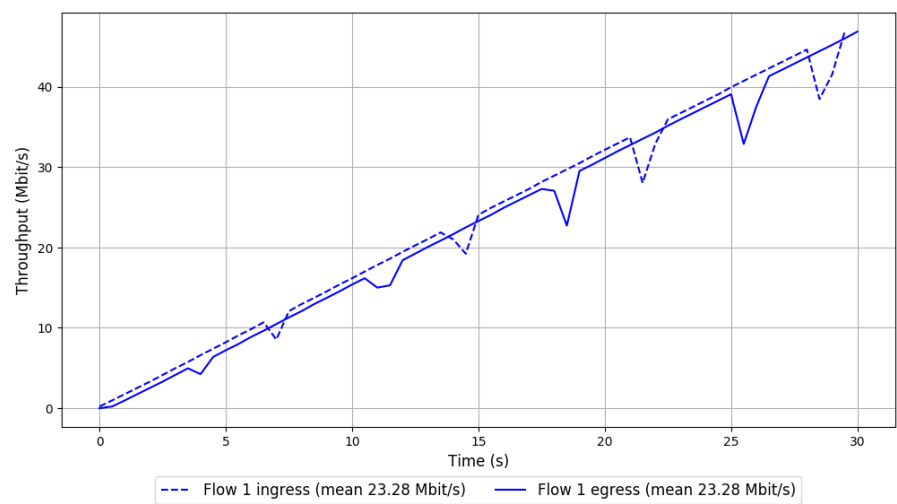
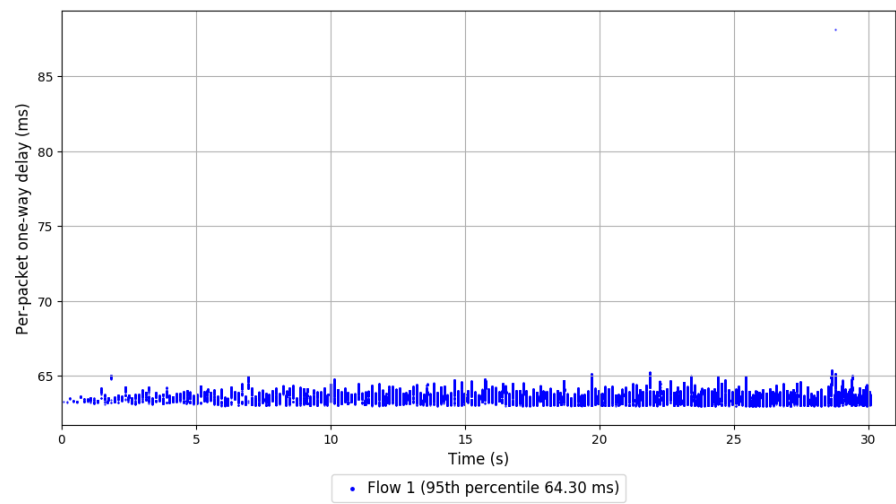## Run 5: Report of Indigo-MusesT — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2018-12-11 19:14:49
End at: 2018-12-11 19:15:19
Local clock offset: -0.027 ms
Remote clock offset: -0.08 ms


# Below is generated by plot.py at 2018-12-11 22:38:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 23.28 Mbit/s
95th percentile per-packet one-way delay: 64.359 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 23.28 Mbit/s
95th percentile per-packet one-way delay: 64.359 ms
Loss rate: 0.00%
```

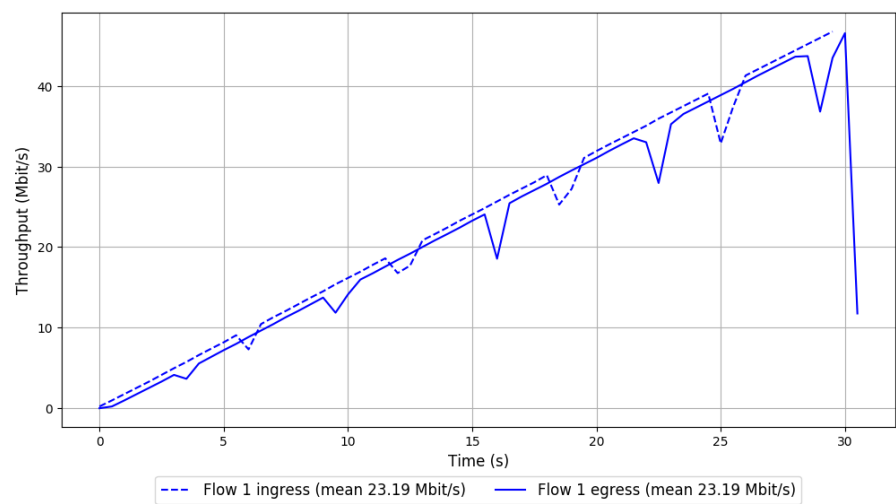# Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-12-11 19:43:16
End at: 2018-12-11 19:43:46
Local clock offset: -0.011 ms
Remote clock offset: -0.071 ms


# Below is generated by plot.py at 2018-12-11 22:38:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 23.19 Mbit/s
95th percentile per-packet one-way delay: 64.300 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 23.19 Mbit/s
95th percentile per-packet one-way delay: 64.300 ms
Loss rate: 0.00%
```

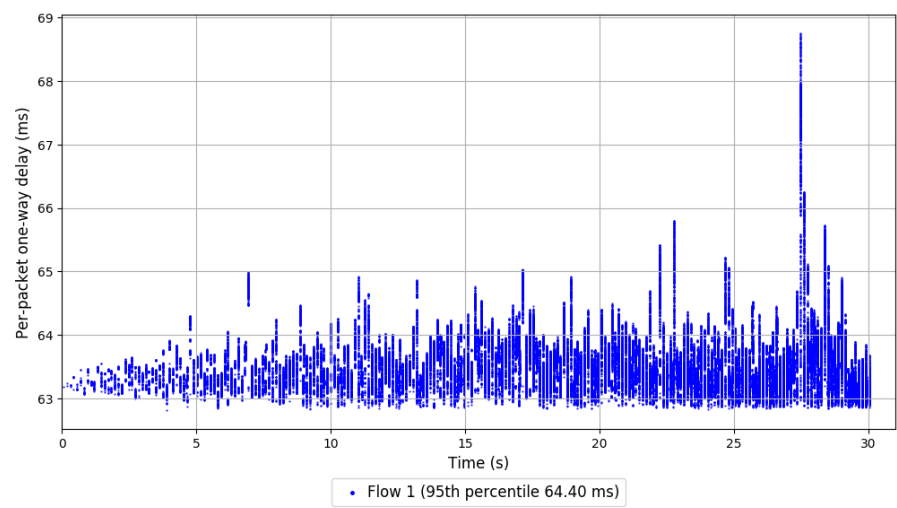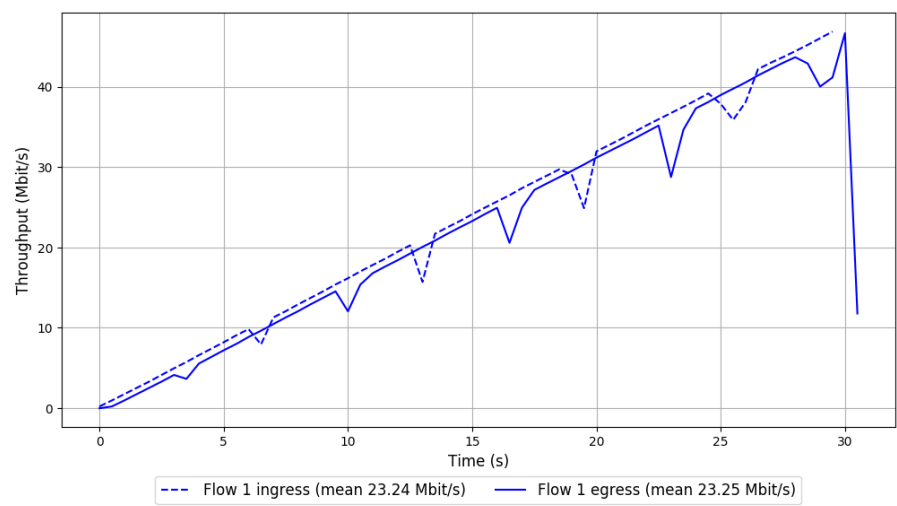Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2018-12-11 20:11:47
End at: 2018-12-11 20:12:17
Local clock offset: -0.046 ms
Remote clock offset: -0.203 ms


# Below is generated by plot.py at 2018-12-11 22:38:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 23.25 Mbit/s
95th percentile per-packet one-way delay: 64.402 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 23.25 Mbit/s
95th percentile per-packet one-way delay: 64.402 ms
Loss rate: 0.00%
```
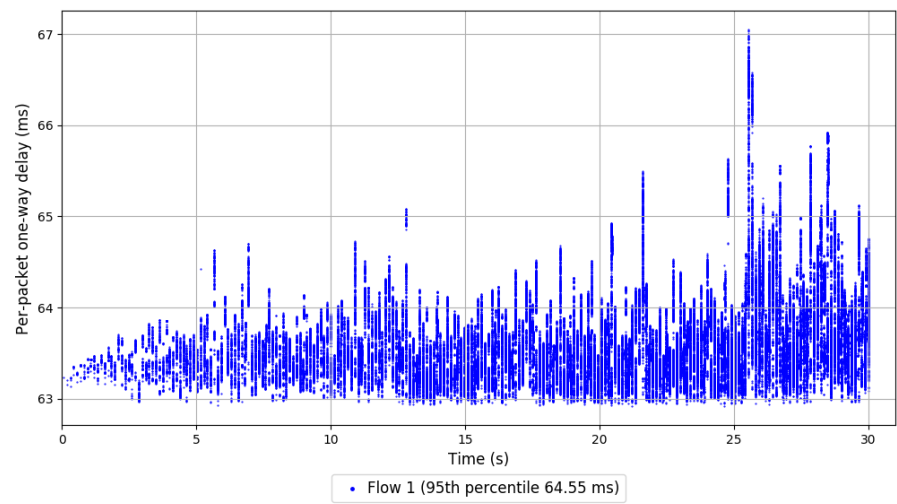
Run 3: Report of LEDBAT — Data Link

```
Run 4: Statistics of LEDBAT

Start at: 2018-12-11 20:39:56
End at: 2018-12-11 20:40:26
Local clock offset: -0.037 ms
Remote clock offset: 0.02 ms


# Below is generated by plot.py at 2018-12-11 22:38:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 23.25 Mbit/s
95th percentile per-packet one-way delay: 64.547 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 23.25 Mbit/s
95th percentile per-packet one-way delay: 64.547 ms
Loss rate: 0.00%
```
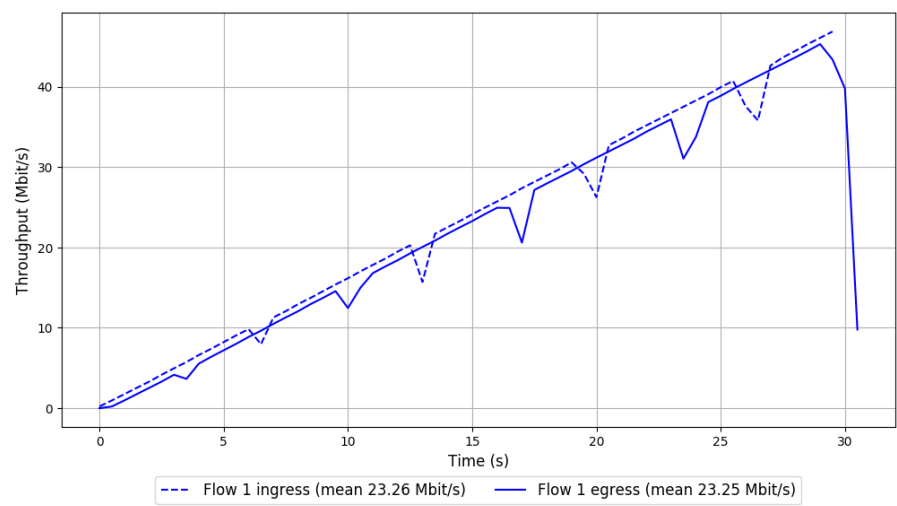
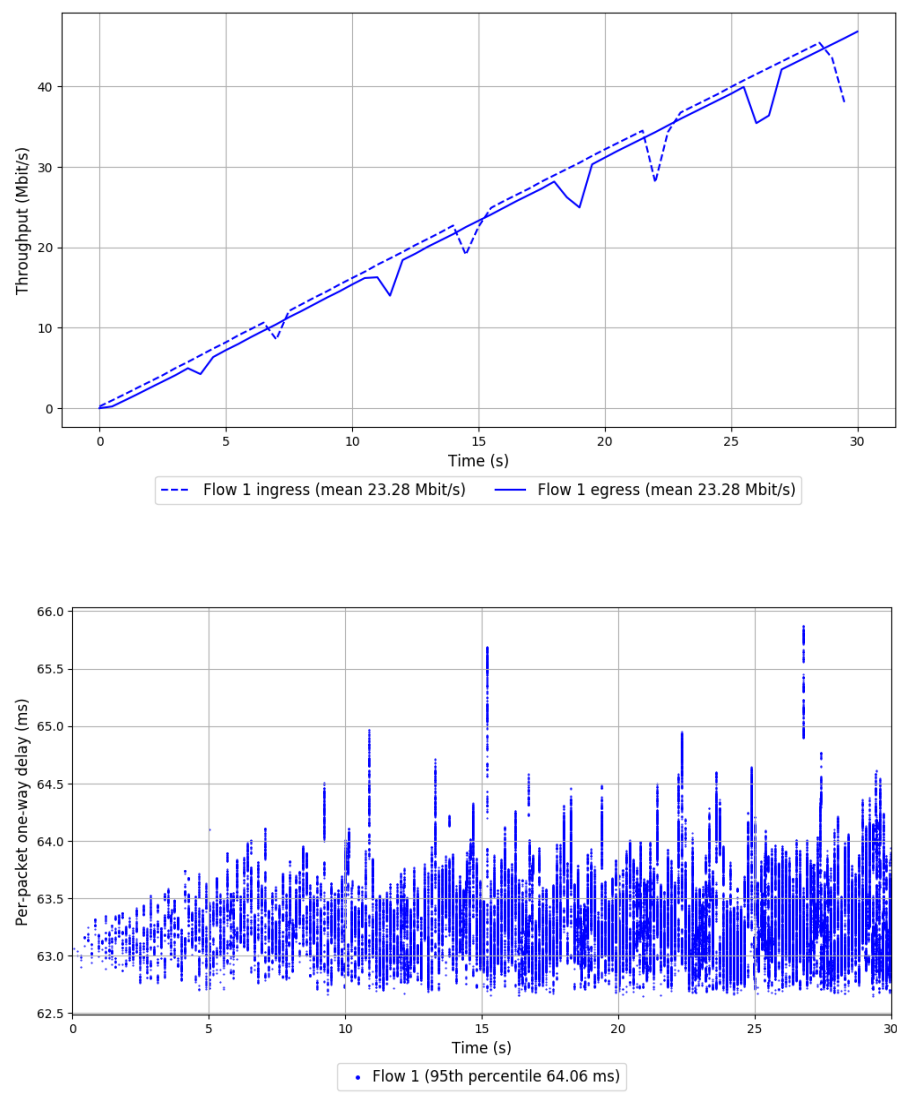# Run 4: Report of LEDBAT — Data Link

```
Run 5: Statistics of LEDBAT

Start at: 2018-12-11 21:08:27
End at: 2018-12-11 21:08:57
Local clock offset: -0.001 ms
Remote clock offset: -0.201 ms


# Below is generated by plot.py at 2018-12-11 22:38:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 23.28 Mbit/s
95th percentile per-packet one-way delay: 64.064 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 23.28 Mbit/s
95th percentile per-packet one-way delay: 64.064 ms
Loss rate: 0.00%
```
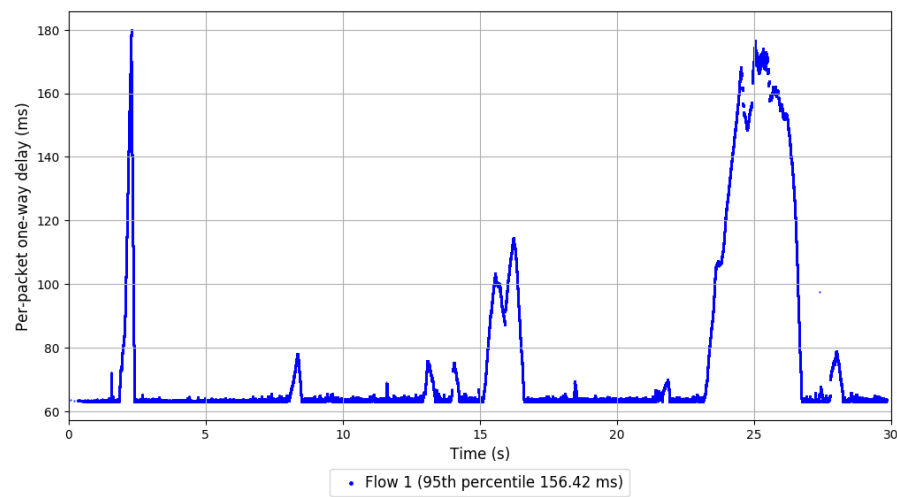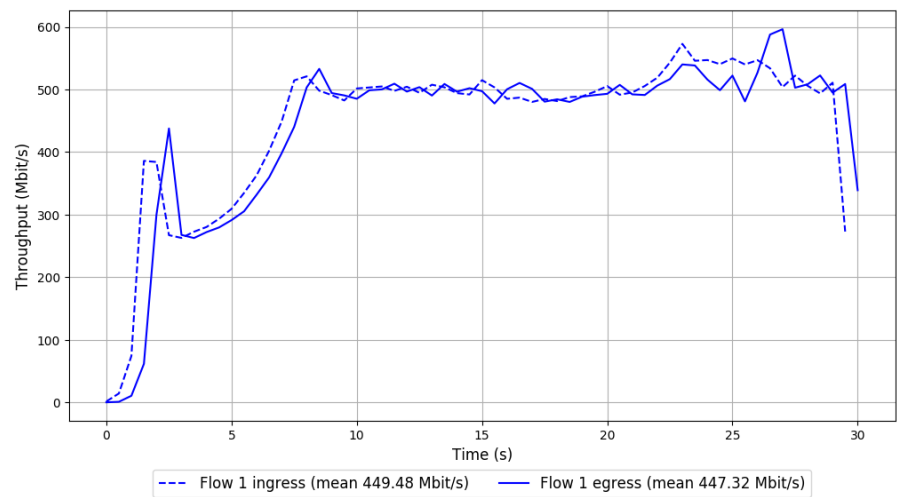
Run 5: Report of LEDBAT — Data Link

Flow 1 ingress (mean 23.28 Mbit/s)   Flow 1 egress (mean 23.28 Mbit/s)

Flow 1 (95th percentile 64.06 ms)

```
Run 1: Statistics of PCC-Allegro

Start at: 2018-12-11 18:58:18
End at: 2018-12-11 18:58:48
Local clock offset: -0.054 ms
Remote clock offset: -0.075 ms

# Below is generated by plot.py at 2018-12-11 22:46:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 447.32 Mbit/s
95th percentile per-packet one-way delay: 156.424 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 447.32 Mbit/s
95th percentile per-packet one-way delay: 156.424 ms
Loss rate: 0.48%
```

Run 1: Report of PCC-Allegro — Data Link

- - - Flow 1 ingress (mean 449.48 Mbit/s) —— Flow 1 egress (mean 447.32 Mbit/s)
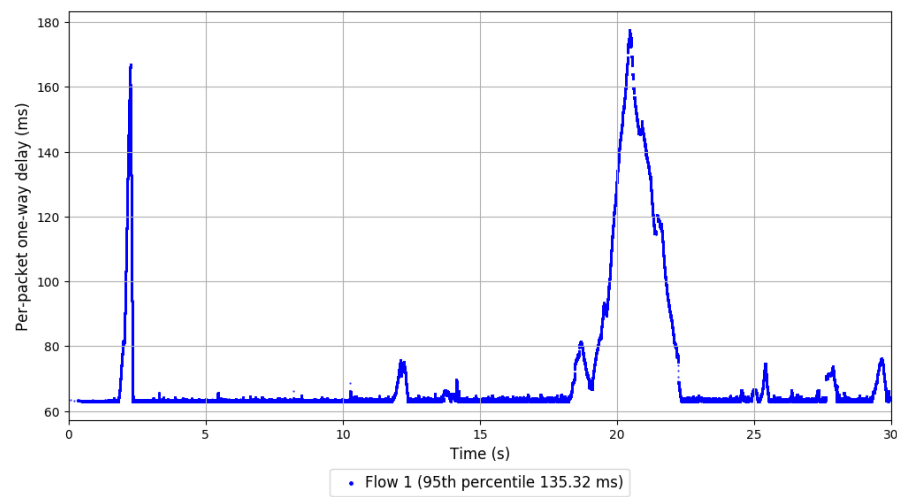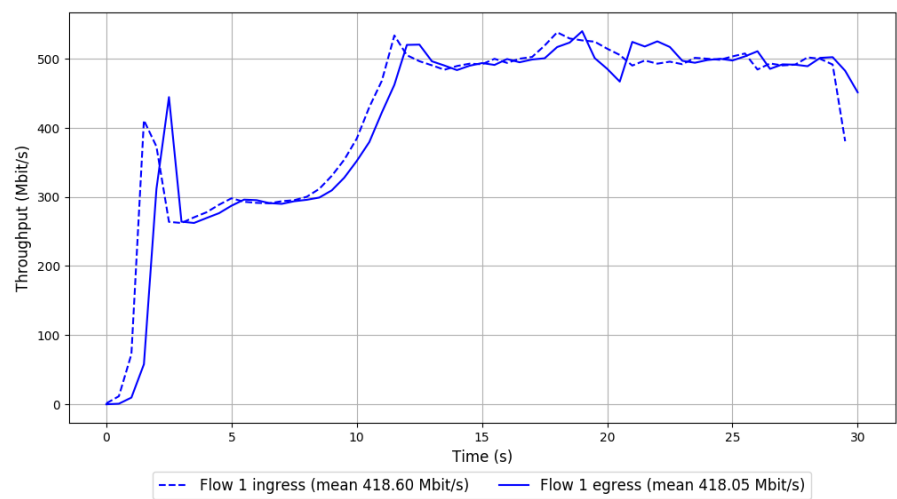

• Flow 1 (95th percentile 156.42 ms)

```
Run 2: Statistics of PCC-Allegro

Start at: 2018-12-11 19:26:10
End at: 2018-12-11 19:26:40
Local clock offset: -0.008 ms
Remote clock offset: -0.031 ms


# Below is generated by plot.py at 2018-12-11 22:46:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 418.05 Mbit/s
95th percentile per-packet one-way delay: 135.317 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 418.05 Mbit/s
95th percentile per-packet one-way delay: 135.317 ms
Loss rate: 0.13%
```

Run 2: Report of PCC-Allegro — Data Link

```
Run 3: Statistics of PCC-Allegro

Start at: 2018-12-11 19:54:38
End at: 2018-12-11 19:55:09
Local clock offset: 0.014 ms
Remote clock offset: 0.026 ms


# Below is generated by plot.py at 2018-12-11 22:47:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 472.52 Mbit/s
95th percentile per-packet one-way delay: 170.505 ms
Loss rate: 1.76%
-- Flow 1:
Average throughput: 472.52 Mbit/s
95th percentile per-packet one-way delay: 170.505 ms
Loss rate: 1.76%
```
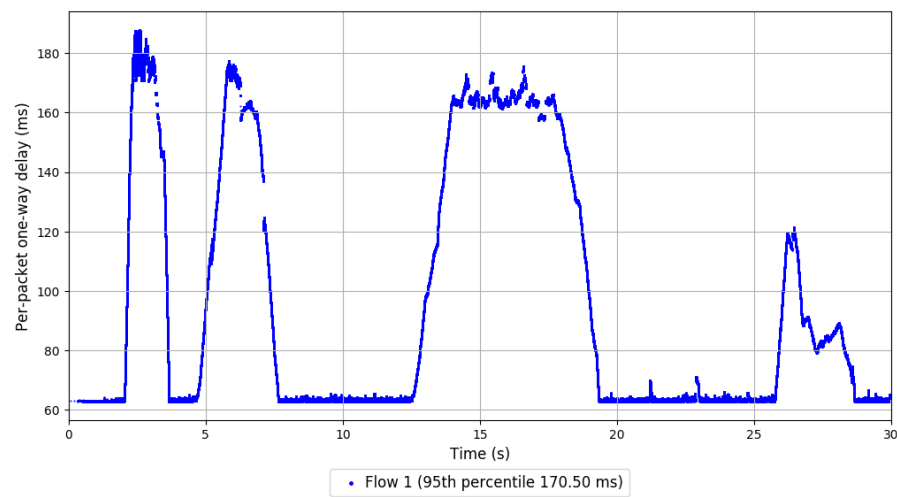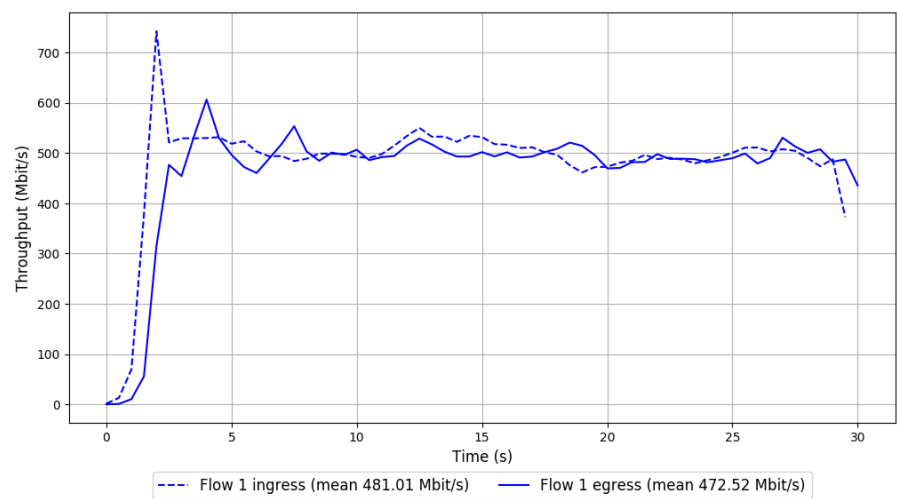
Run 3: Report of PCC-Allegro — Data Link

```
Run 4: Statistics of PCC-Allegro

Start at: 2018-12-11 20:23:14
End at: 2018-12-11 20:23:44
Local clock offset: -0.046 ms
Remote clock offset: 0.134 ms

# Below is generated by plot.py at 2018-12-11 22:47:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 479.42 Mbit/s
95th percentile per-packet one-way delay: 166.649 ms
Loss rate: 1.21%
-- Flow 1:
Average throughput: 479.42 Mbit/s
95th percentile per-packet one-way delay: 166.649 ms
Loss rate: 1.21%
```
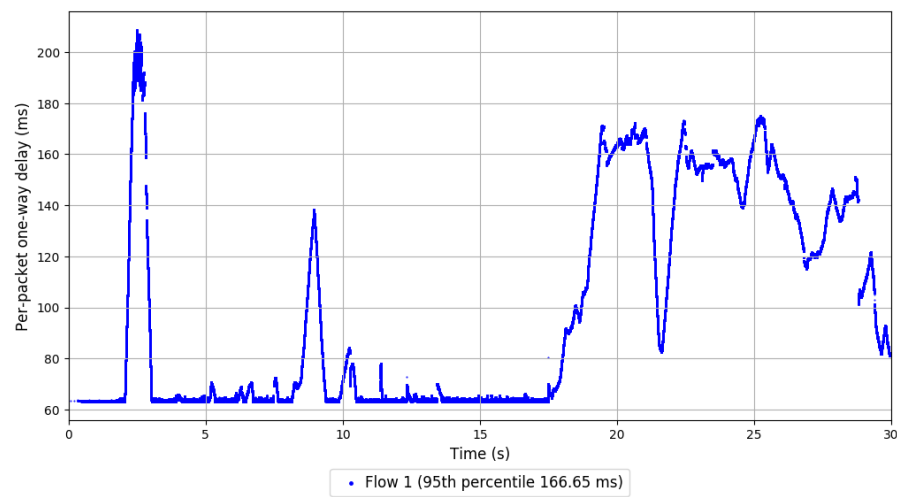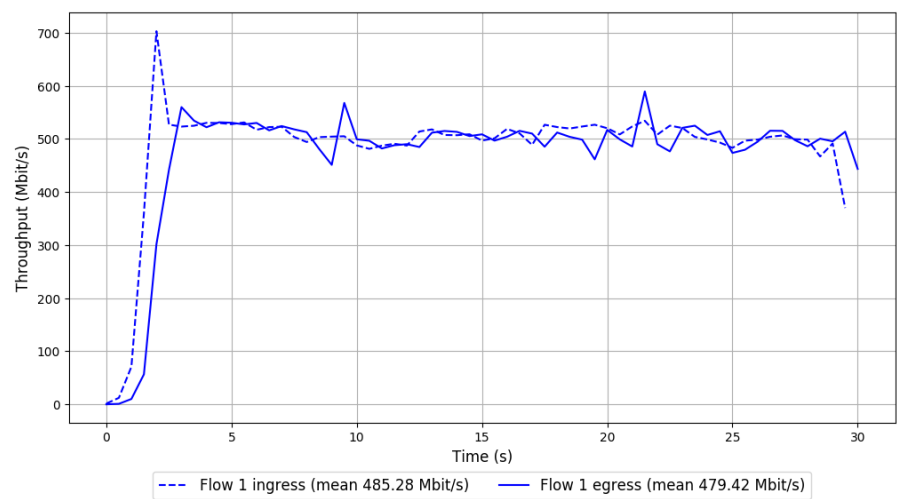
Run 4: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 485.28 Mbit/s)   Flow 1 egress (mean 479.42 Mbit/s)
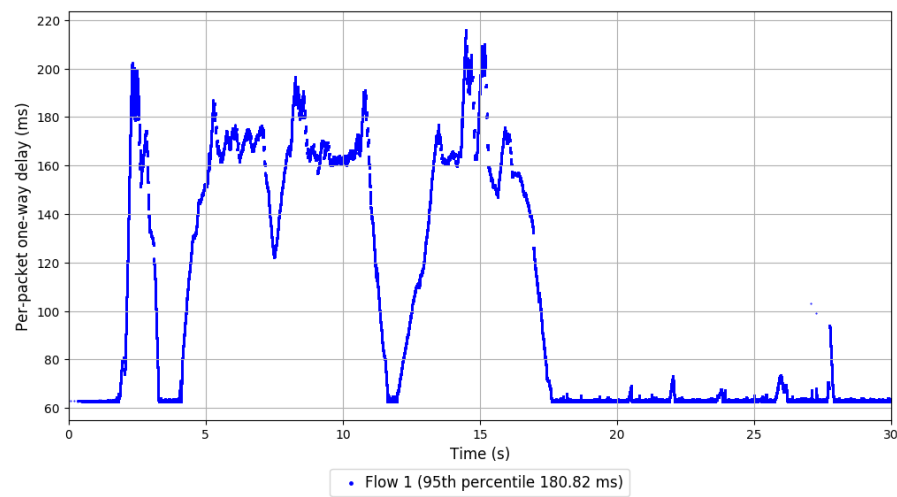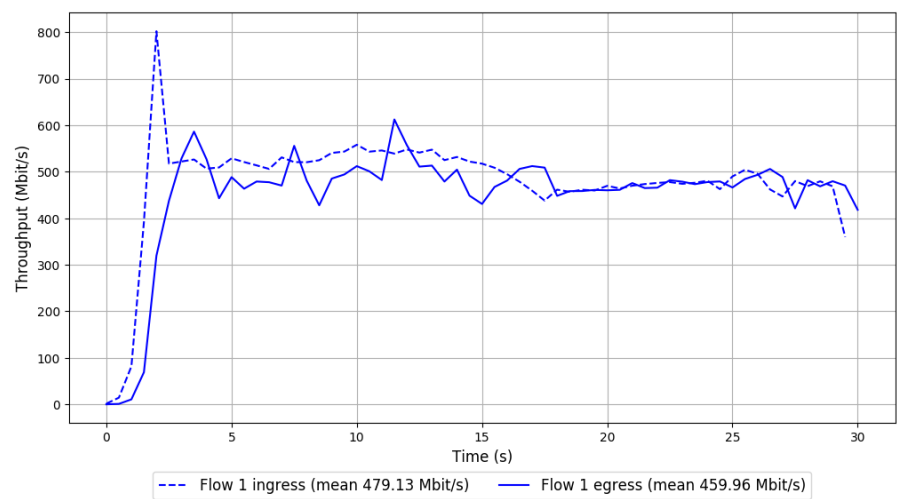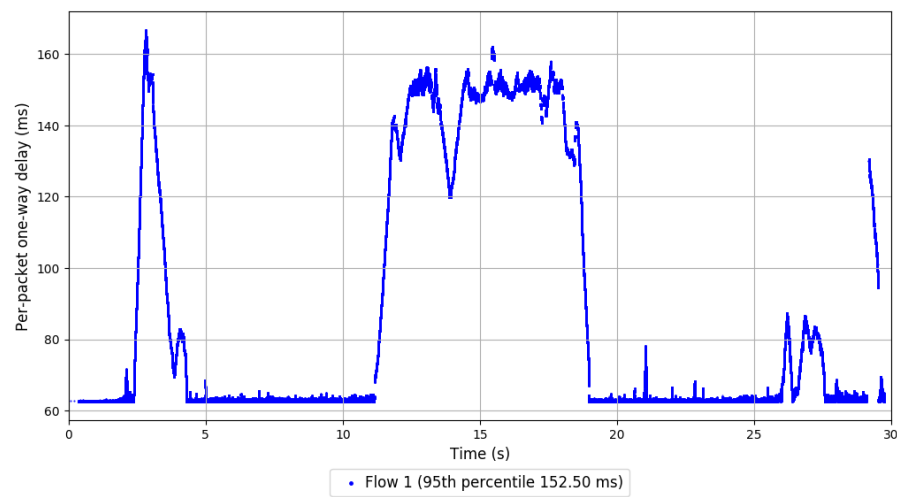

Flow 1 (95th percentile 166.65 ms)

```
Run 5: Statistics of PCC-Allegro

Start at: 2018-12-11 20:51:22
End at: 2018-12-11 20:51:52
Local clock offset: -0.025 ms
Remote clock offset: -0.031 ms


# Below is generated by plot.py at 2018-12-11 22:47:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 459.96 Mbit/s
95th percentile per-packet one-way delay: 180.820 ms
Loss rate: 4.00%
-- Flow 1:
Average throughput: 459.96 Mbit/s
95th percentile per-packet one-way delay: 180.820 ms
Loss rate: 4.00%
```

Run 5: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 479.13 Mbit/s) —— Flow 1 egress (mean 459.96 Mbit/s)
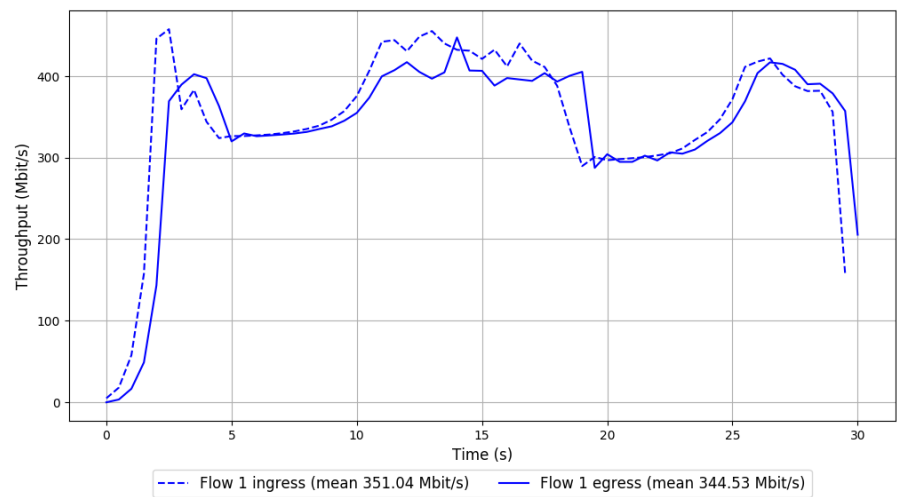

• Flow 1 (95th percentile 180.82 ms)

```
Run 1: Statistics of PCC-Expr

Start at: 2018-12-11 19:09:56
End at: 2018-12-11 19:10:26
Local clock offset: -0.049 ms
Remote clock offset: -0.281 ms


# Below is generated by plot.py at 2018-12-11 22:47:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 344.53 Mbit/s
95th percentile per-packet one-way delay: 152.499 ms
Loss rate: 1.86%
-- Flow 1:
Average throughput: 344.53 Mbit/s
95th percentile per-packet one-way delay: 152.499 ms
Loss rate: 1.86%
```
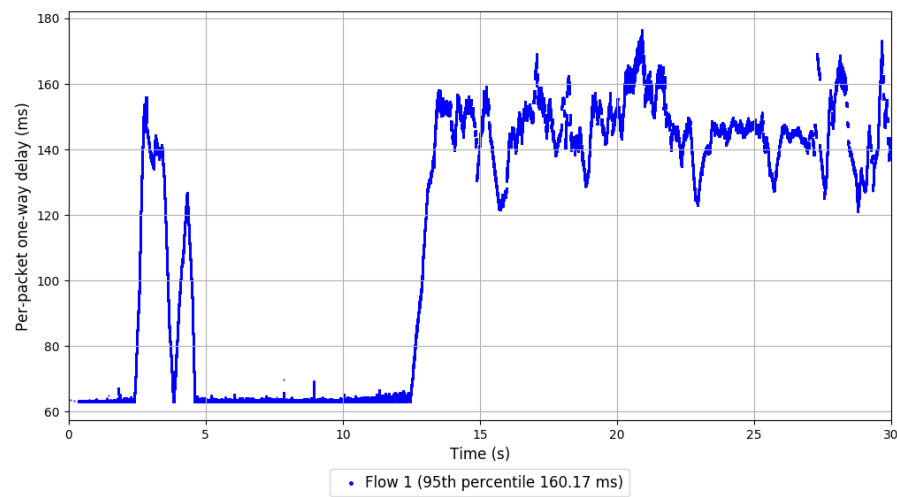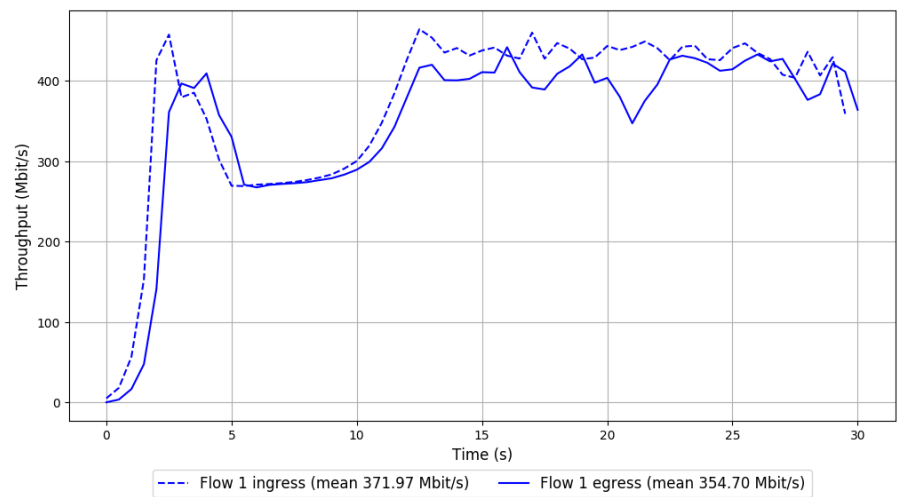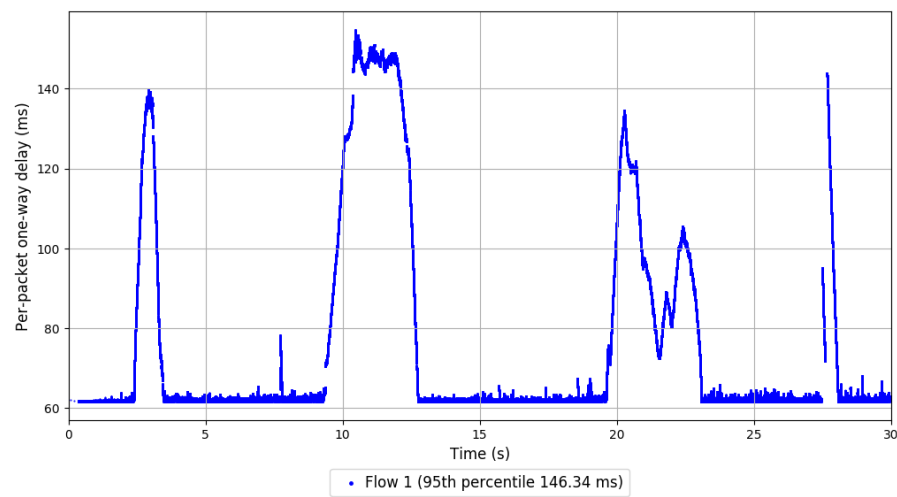
Run 1: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 351.04 Mbit/s) --- Flow 1 egress (mean 344.53 Mbit/s)
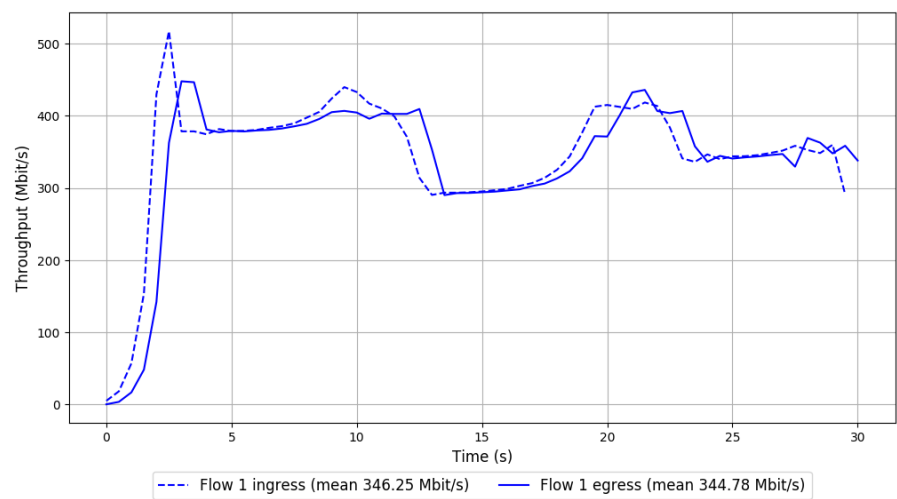

• Flow 1 (95th percentile 152.50 ms)

```
Run 2: Statistics of PCC-Expr

Start at: 2018-12-11 19:38:24
End at: 2018-12-11 19:38:54
Local clock offset: 0.016 ms
Remote clock offset: -0.13 ms

# Below is generated by plot.py at 2018-12-11 22:47:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 354.70 Mbit/s
95th percentile per-packet one-way delay: 160.167 ms
Loss rate: 4.64%
-- Flow 1:
Average throughput: 354.70 Mbit/s
95th percentile per-packet one-way delay: 160.167 ms
Loss rate: 4.64%
```

Run 2: Report of PCC-Expr — Data Link

```
Run 3: Statistics of PCC-Expr

Start at: 2018-12-11 20:06:53
End at: 2018-12-11 20:07:23
Local clock offset: -0.064 ms
Remote clock offset: -1.439 ms


# Below is generated by plot.py at 2018-12-11 22:51:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 344.78 Mbit/s
95th percentile per-packet one-way delay: 146.336 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 344.78 Mbit/s
95th percentile per-packet one-way delay: 146.336 ms
Loss rate: 0.42%
```
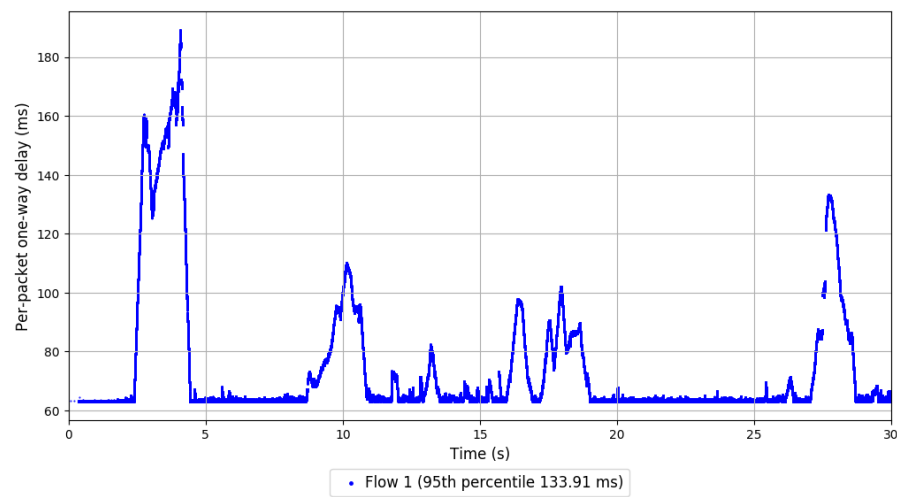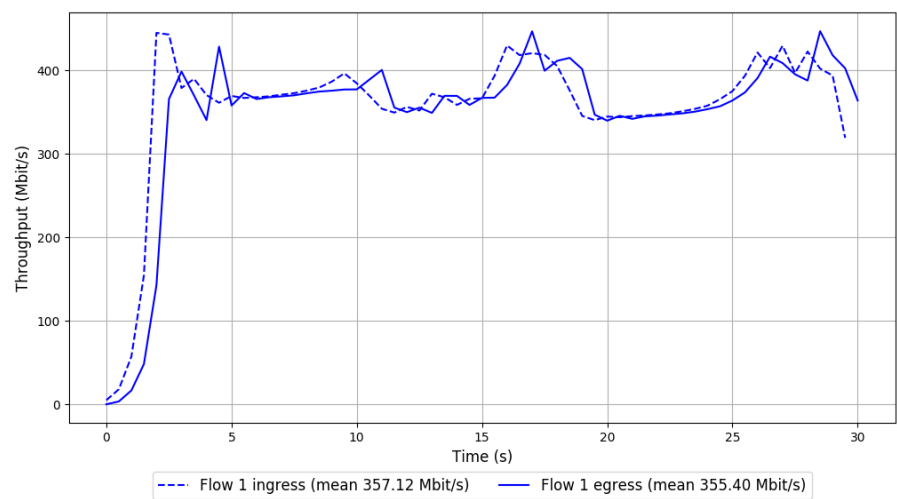
Run 3: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 346.25 Mbit/s) --- Flow 1 egress (mean 344.78 Mbit/s)
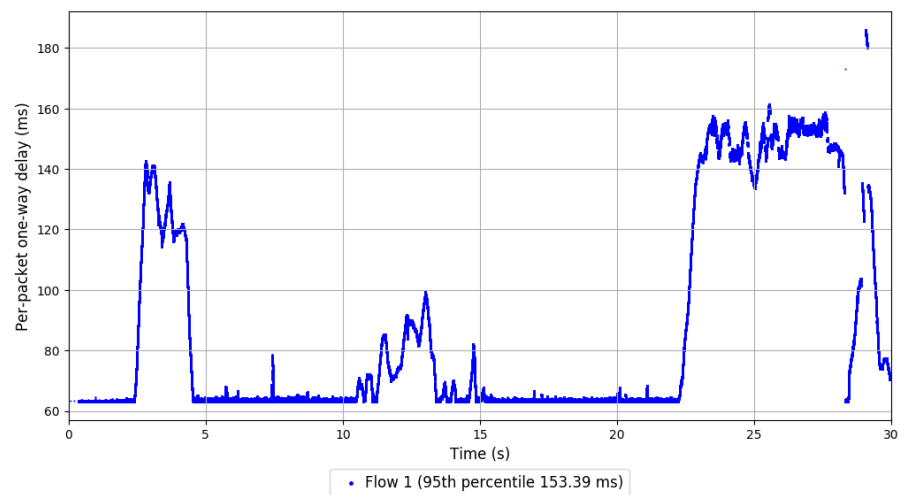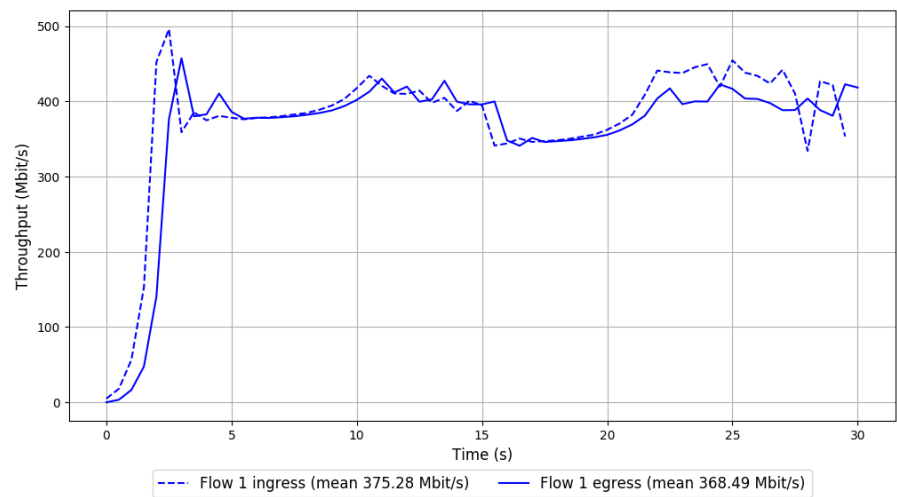

• Flow 1 (95th percentile 146.34 ms)

```
Run 4: Statistics of PCC-Expr

Start at: 2018-12-11 20:35:08
End at: 2018-12-11 20:35:38
Local clock offset: -0.036 ms
Remote clock offset: 0.006 ms

# Below is generated by plot.py at 2018-12-11 22:56:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 355.40 Mbit/s
95th percentile per-packet one-way delay: 133.905 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 355.40 Mbit/s
95th percentile per-packet one-way delay: 133.905 ms
Loss rate: 0.48%
```

Run 4: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 357.12 Mbit/s)   Flow 1 egress (mean 355.40 Mbit/s)

• Flow 1 (95th percentile 133.91 ms)

```
Run 5: Statistics of PCC-Expr

Start at: 2018-12-11 21:03:33
End at: 2018-12-11 21:04:03
Local clock offset: -0.025 ms
Remote clock offset: -0.076 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 368.49 Mbit/s
95th percentile per-packet one-way delay: 153.391 ms
Loss rate: 1.81%
-- Flow 1:
Average throughput: 368.49 Mbit/s
95th percentile per-packet one-way delay: 153.391 ms
Loss rate: 1.81%
```
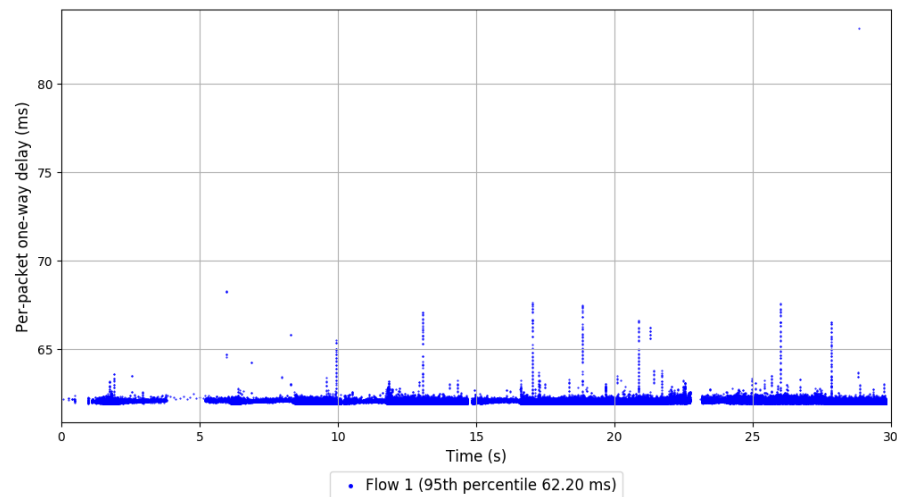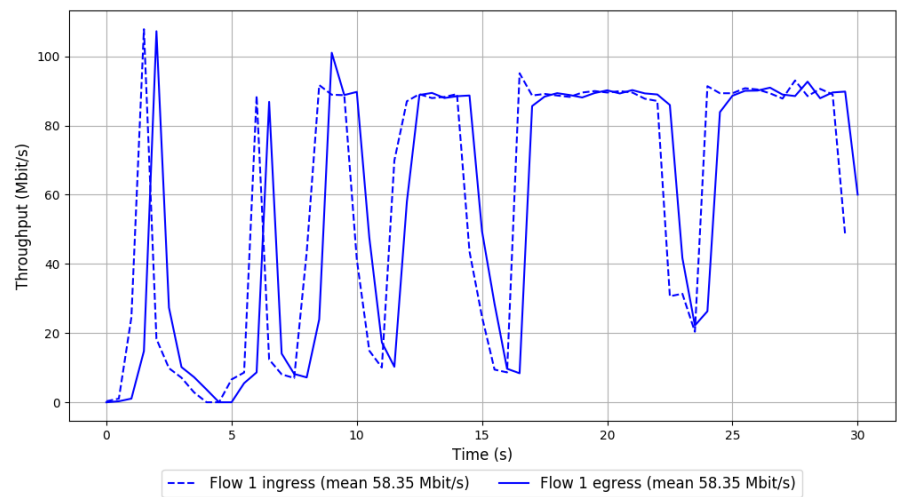
Run 5: Report of PCC-Expr — Data Link

Run 1: Statistics of QUIC Cubic

Start at: 2018-12-11 19:02:30
End at: 2018-12-11 19:03:00
Local clock offset: -0.1 ms
Remote clock offset: -0.211 ms

Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-12-11 19:30:25
End at: 2018-12-11 19:30:55
Local clock offset: 0.004 ms
Remote clock offset: -0.735 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 58.35 Mbit/s
95th percentile per-packet one-way delay: 62.204 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 58.35 Mbit/s
95th percentile per-packet one-way delay: 62.204 ms
Loss rate: 0.00%
```
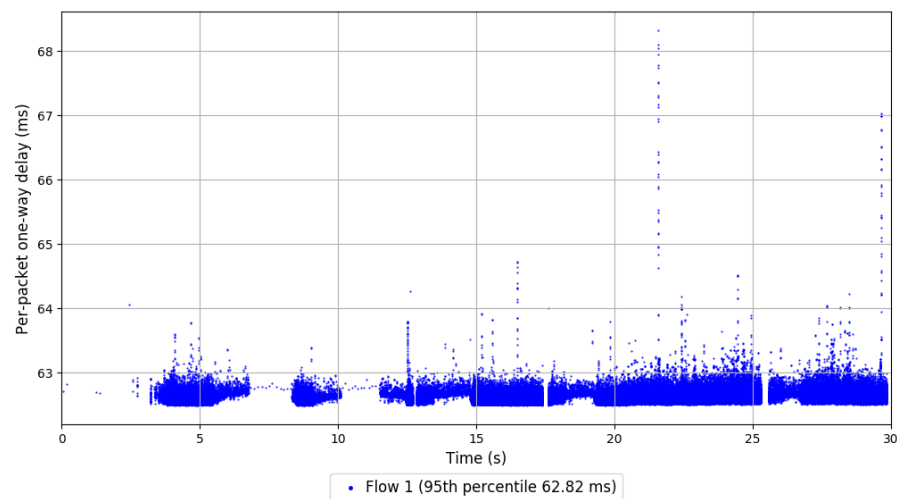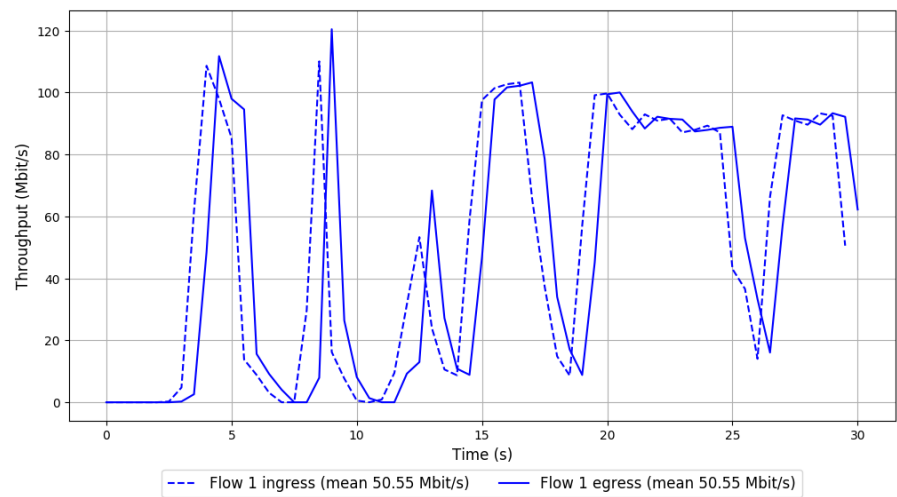
Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-12-11 19:58:58
End at: 2018-12-11 19:59:28
Local clock offset: -0.025 ms
Remote clock offset: -0.176 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 50.55 Mbit/s
95th percentile per-packet one-way delay: 62.818 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 50.55 Mbit/s
95th percentile per-packet one-way delay: 62.818 ms
Loss rate: 0.00%
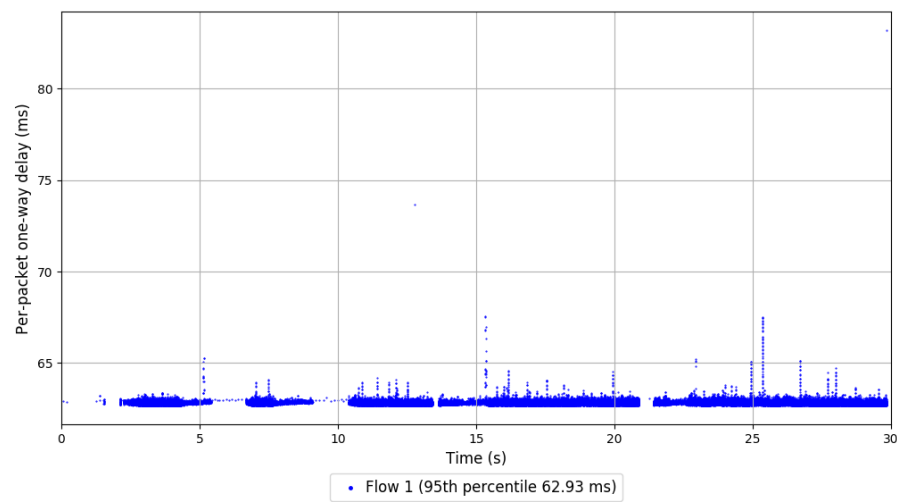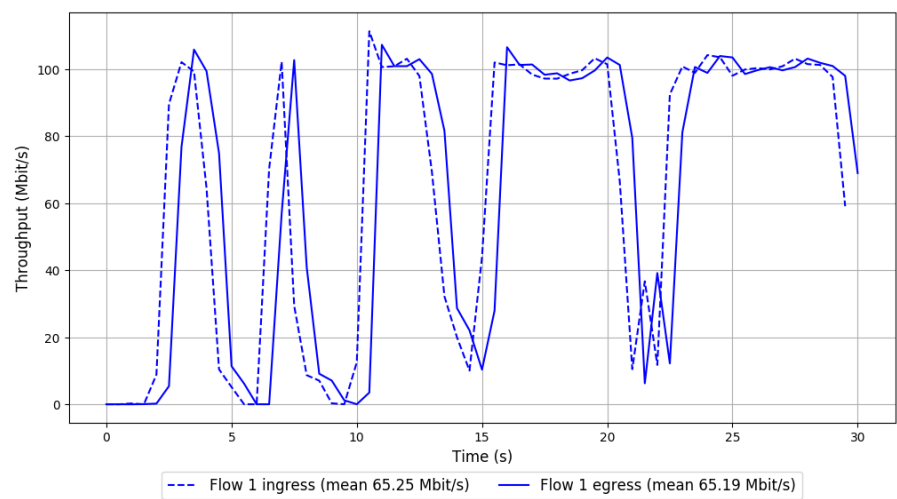```

Run 3: Report of QUIC Cubic — Data Link

```
Run 4: Statistics of QUIC Cubic

Start at: 2018-12-11 20:27:30
End at: 2018-12-11 20:28:01
Local clock offset: -0.073 ms
Remote clock offset: -0.369 ms

Below is generated by plot.py at 2018-12-11 22:58:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 65.19 Mbit/s
95th percentile per-packet one-way delay: 62.926 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 65.19 Mbit/s
95th percentile per-packet one-way delay: 62.926 ms
Loss rate: 0.07%
```
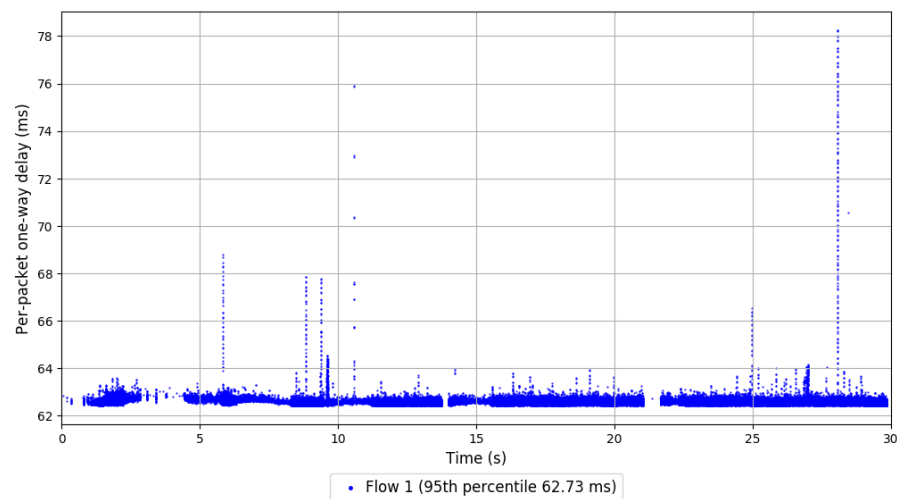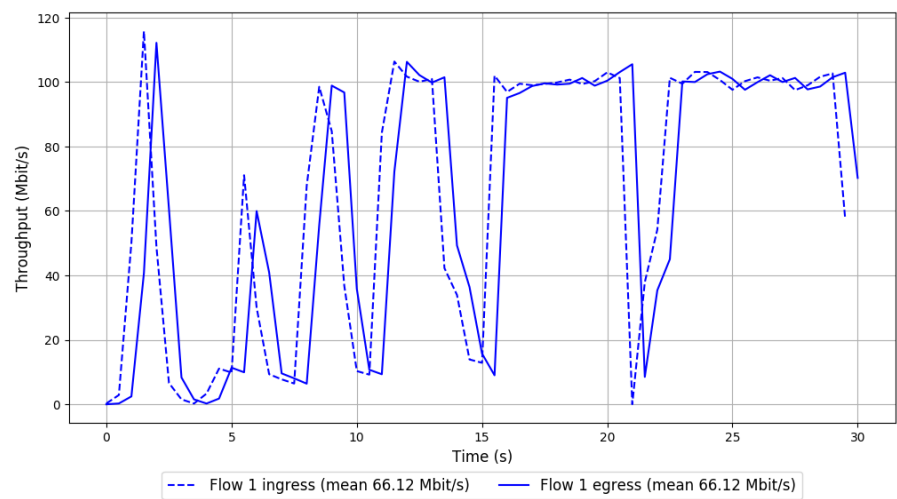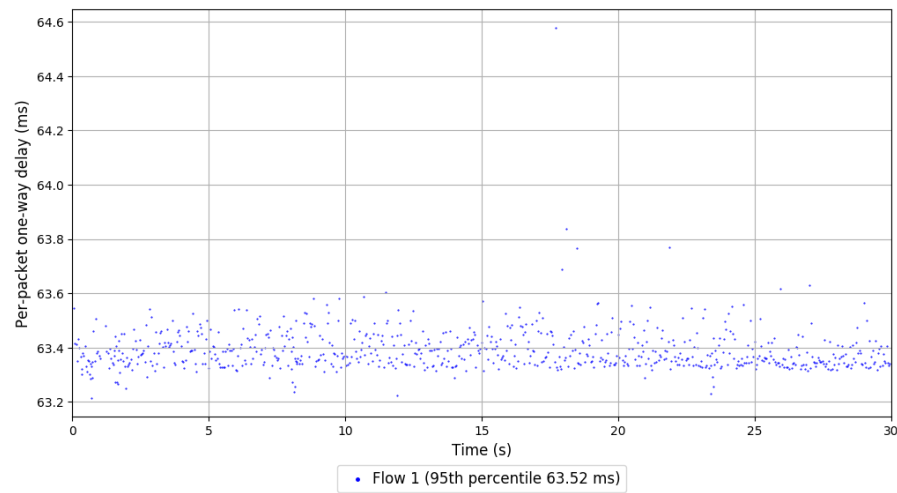
# Run 4: Report of QUIC Cubic — Data Link



Flow 1 ingress (mean 65.25 Mbit/s)     Flow 1 egress (mean 65.19 Mbit/s)



Flow 1 (95th percentile 62.93 ms)

```
Run 5: Statistics of QUIC Cubic

Start at: 2018-12-11 20:55:39
End at: 2018-12-11 20:56:09
Local clock offset: -0.036 ms
Remote clock offset: -0.72 ms

Below is generated by plot.py at 2018-12-11 22:58:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 66.12 Mbit/s
95th percentile per-packet one-way delay: 62.733 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 66.12 Mbit/s
95th percentile per-packet one-way delay: 62.733 ms
Loss rate: 0.00%
```
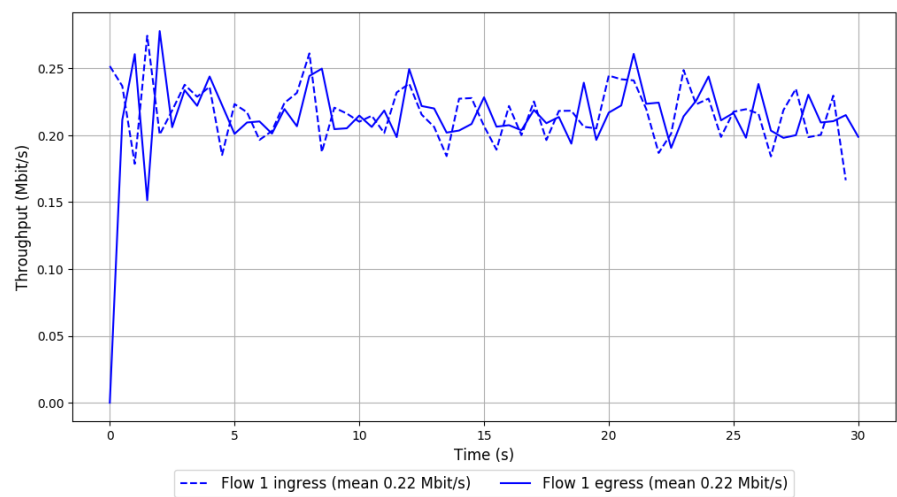
# Run 5: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2018-12-11 18:55:34
End at: 2018-12-11 18:56:04
Local clock offset: -0.055 ms
Remote clock offset: -0.127 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.516 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.516 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)

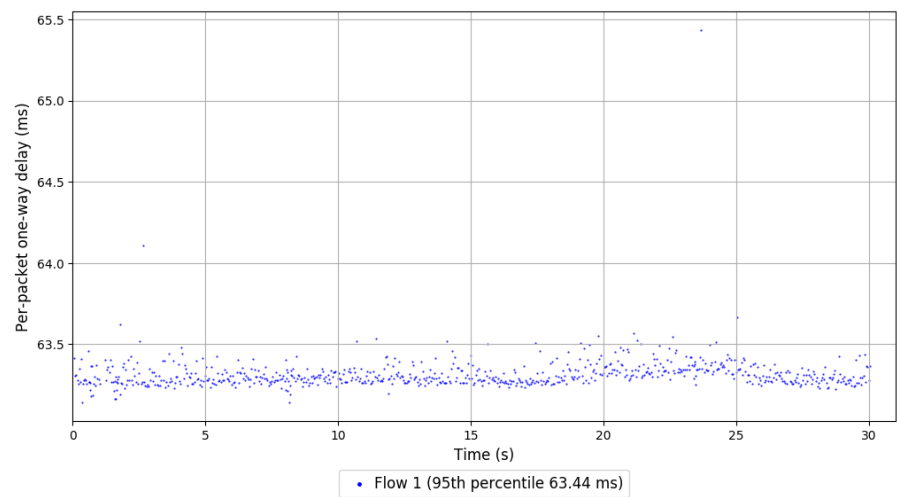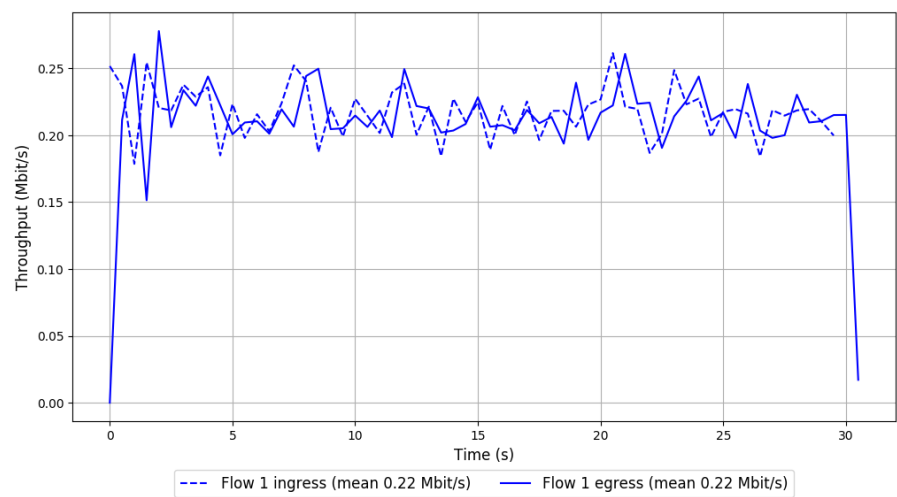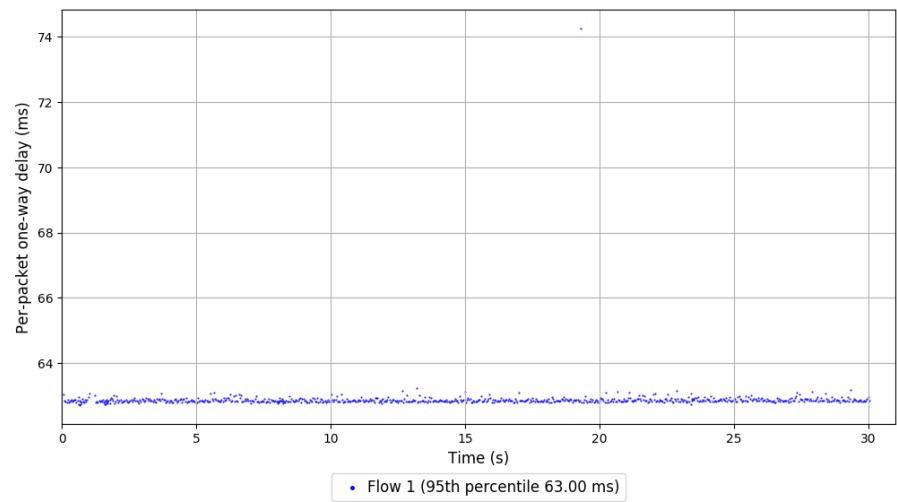Flow 1 (95th percentile 63.52 ms)

```
Run 2: Statistics of SCReAM

Start at: 2018-12-11 19:23:27
End at: 2018-12-11 19:23:57
Local clock offset: 0.021 ms
Remote clock offset: -0.088 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.437 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.437 ms
Loss rate: 0.00%
```

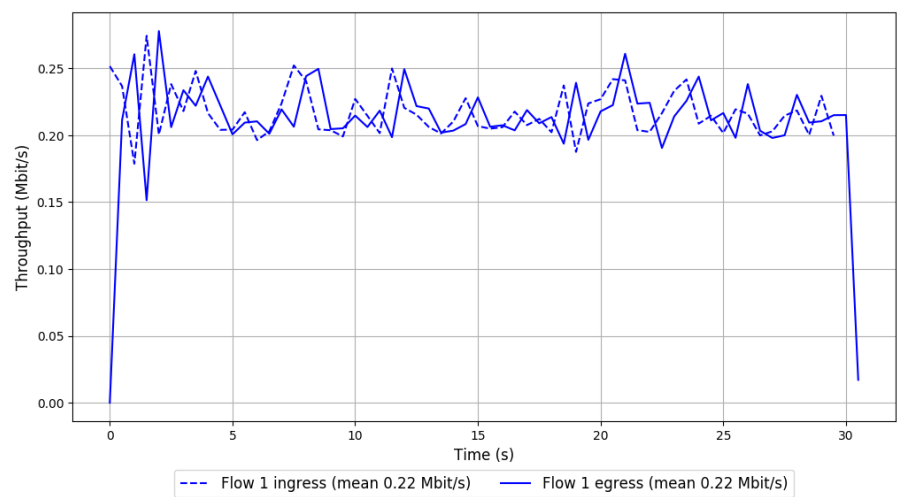Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-12-11 19:51:56
End at: 2018-12-11 19:52:26
Local clock offset: 0.012 ms
Remote clock offset: -0.347 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.003 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.003 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 63.00 ms)

```
Run 4: Statistics of SCReAM

Start at: 2018-12-11 20:20:28
End at: 2018-12-11 20:20:58
Local clock offset: -0.068 ms
Remote clock offset: -0.495 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.319 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.319 ms
Loss rate: 0.00%
```
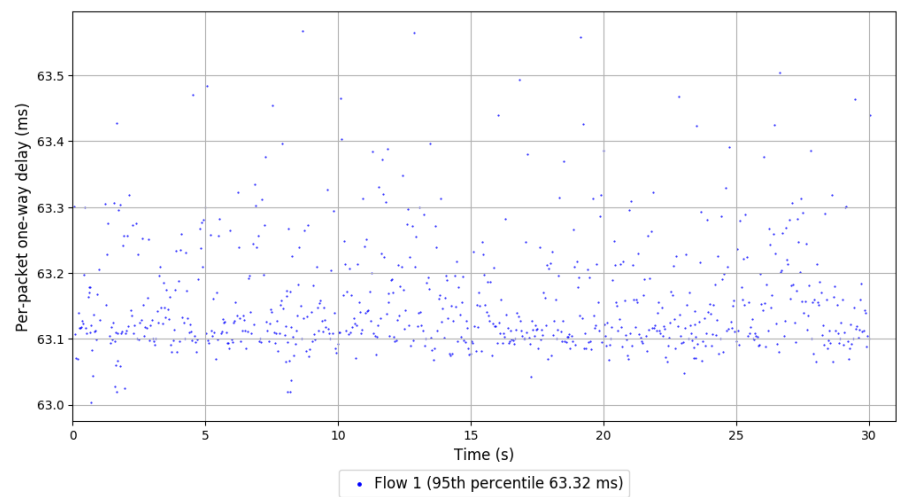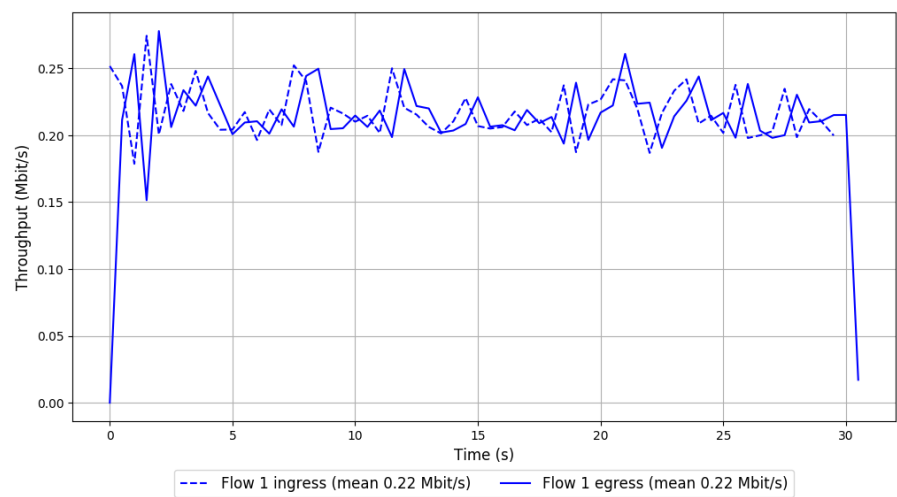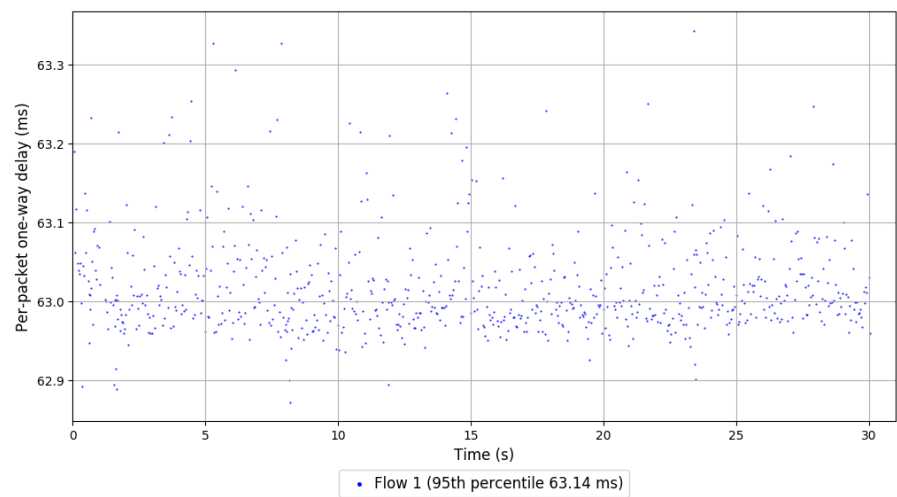
Run 4: Report of SCReAM — Data Link

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

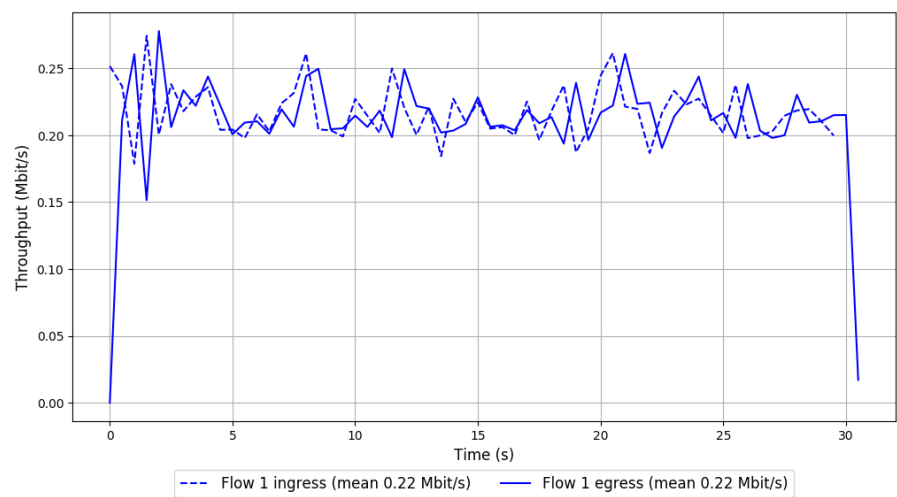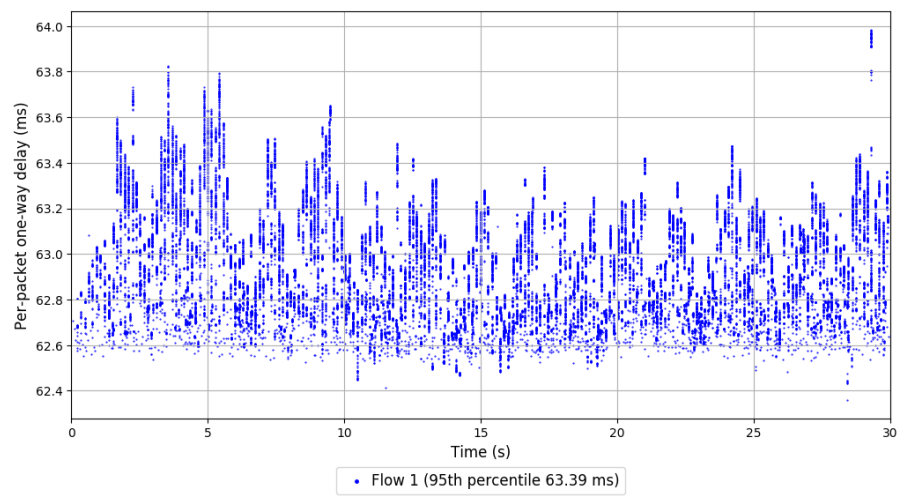• Flow 1 (95th percentile 63.32 ms)

```
Run 5: Statistics of SCReAM

Start at: 2018-12-11 20:48:33
End at: 2018-12-11 20:49:03
Local clock offset: -0.009 ms
Remote clock offset: -0.067 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.137 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.137 ms
Loss rate: 0.00%
```

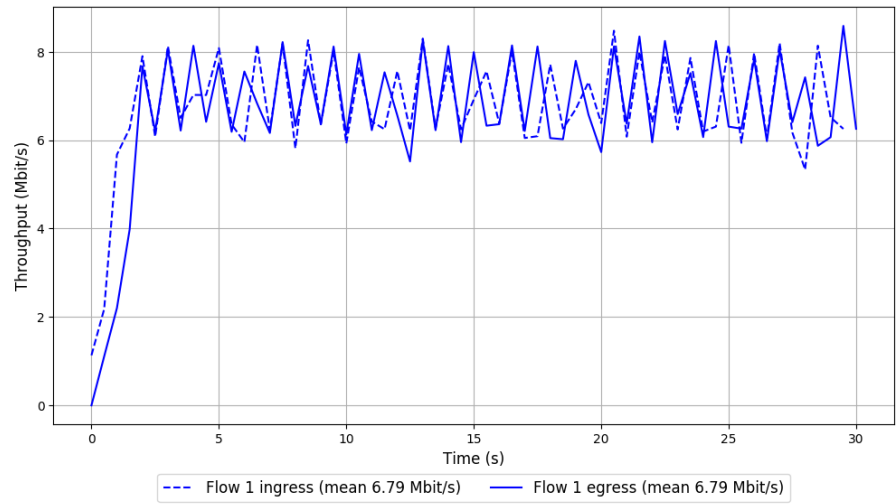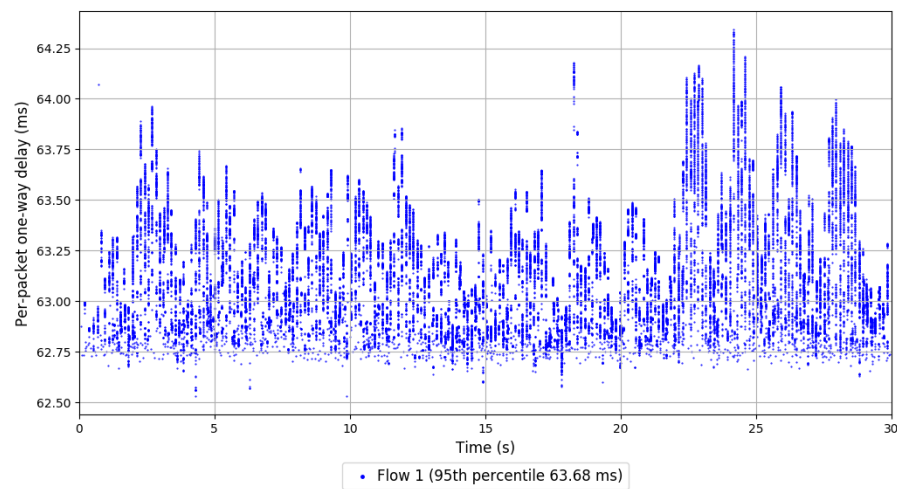Run 5: Report of SCReAM — Data Link

```
Run 1: Statistics of Sprout

Start at: 2018-12-11 19:01:21
End at: 2018-12-11 19:01:51
Local clock offset: -0.023 ms
Remote clock offset: -0.805 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.79 Mbit/s
95th percentile per-packet one-way delay: 63.390 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.79 Mbit/s
95th percentile per-packet one-way delay: 63.390 ms
Loss rate: 0.00%
```

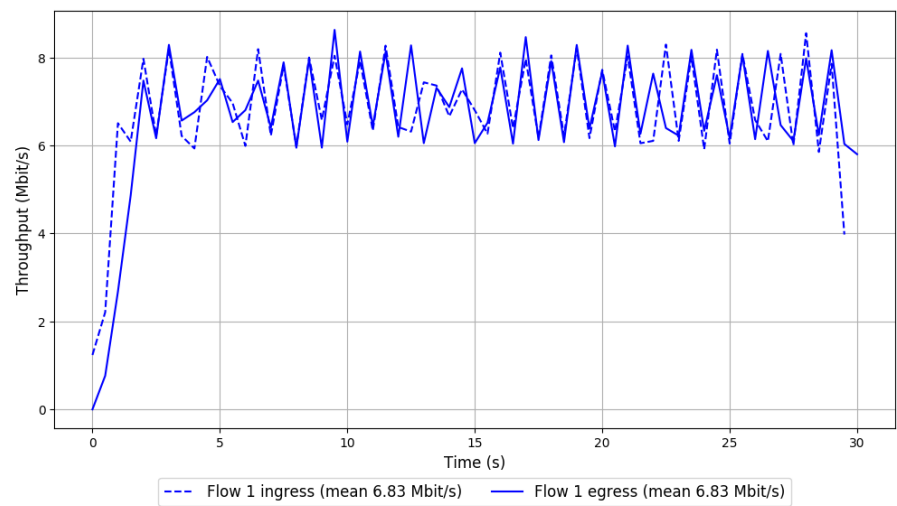Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-12-11 19:29:16
End at: 2018-12-11 19:29:46
Local clock offset: 0.001 ms
Remote clock offset: -0.033 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.83 Mbit/s
95th percentile per-packet one-way delay: 63.678 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.83 Mbit/s
95th percentile per-packet one-way delay: 63.678 ms
Loss rate: 0.00%
```
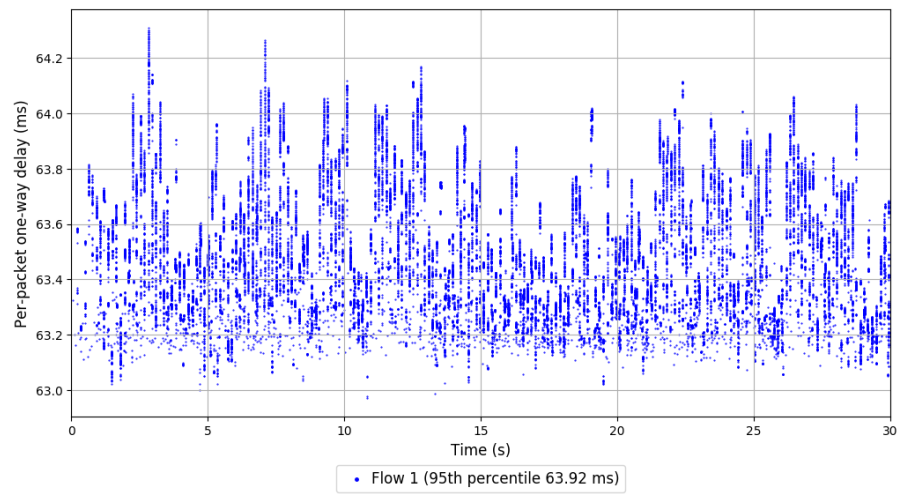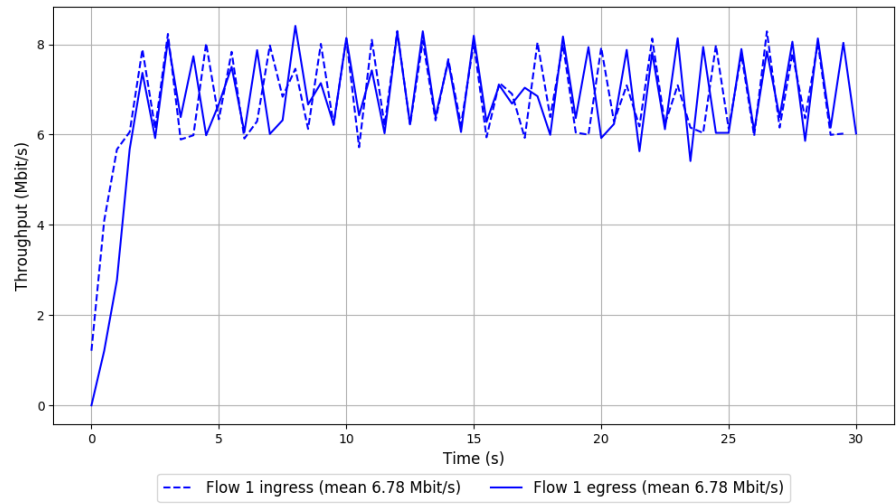
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-12-11 19:57:49
End at: 2018-12-11 19:58:19
Local clock offset: -0.033 ms
Remote clock offset: -0.28 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.78 Mbit/s
95th percentile per-packet one-way delay: 63.922 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.78 Mbit/s
95th percentile per-packet one-way delay: 63.922 ms
Loss rate: 0.00%
```

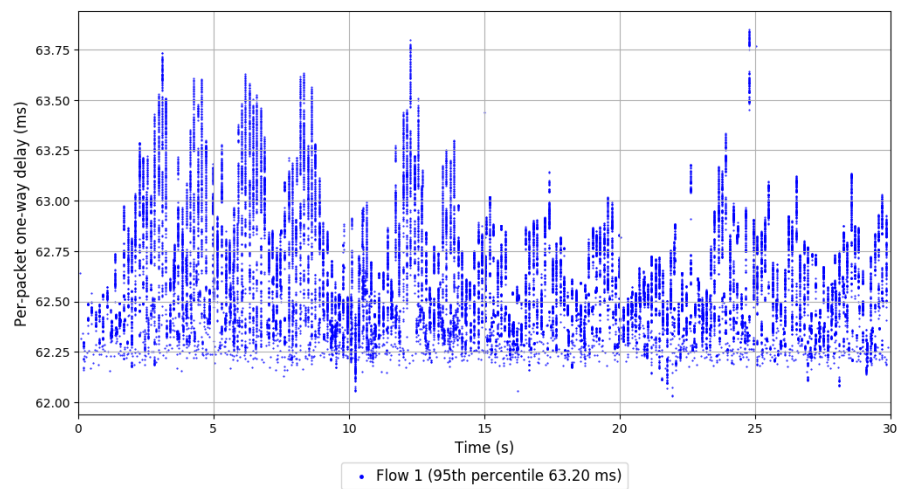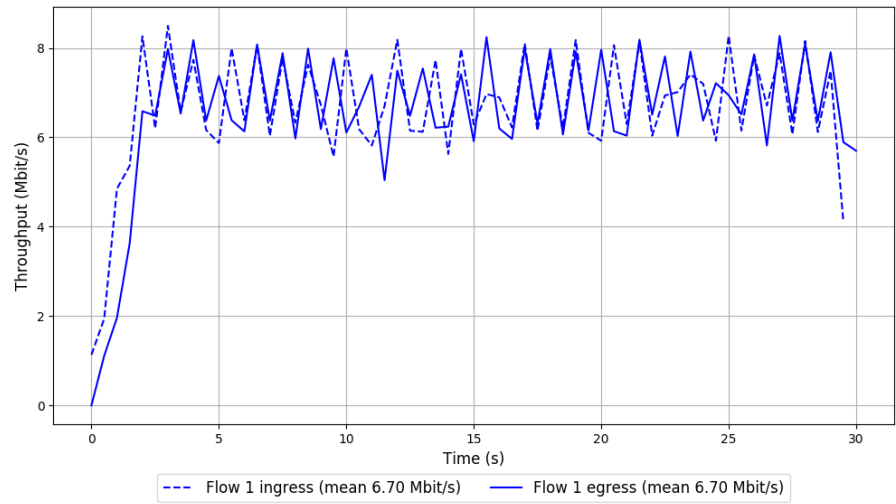## Run 3: Report of Sprout — Data Link

```
Run 4: Statistics of Sprout

Start at: 2018-12-11 20:26:21
End at: 2018-12-11 20:26:51
Local clock offset: -0.091 ms
Remote clock offset: -0.859 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.70 Mbit/s
95th percentile per-packet one-way delay: 63.204 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.70 Mbit/s
95th percentile per-packet one-way delay: 63.204 ms
Loss rate: 0.00%
```
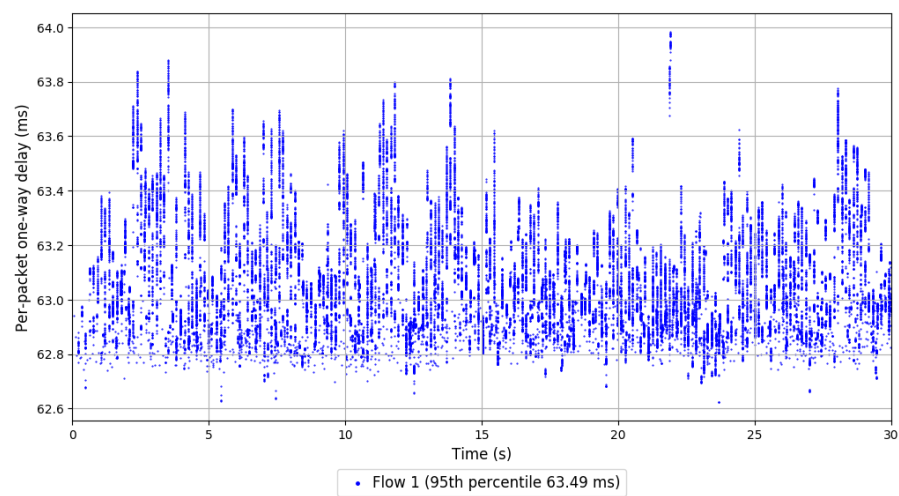
Run 4: Report of Sprout — Data Link

```
Run 5: Statistics of Sprout

Start at: 2018-12-11 20:54:30
End at: 2018-12-11 20:55:00
Local clock offset: -0.003 ms
Remote clock offset: -0.07 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.83 Mbit/s
95th percentile per-packet one-way delay: 63.491 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.83 Mbit/s
95th percentile per-packet one-way delay: 63.491 ms
Loss rate: 0.00%
```
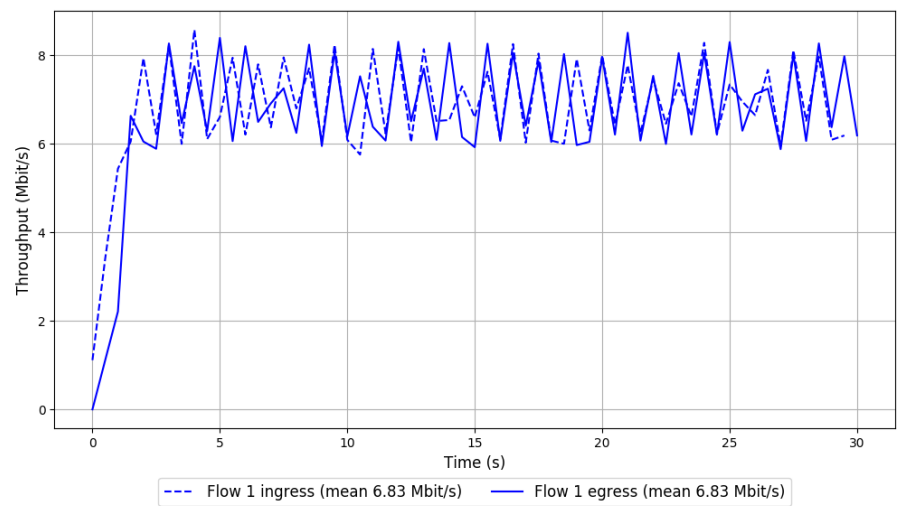
Run 5: Report of Sprout — Data Link

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

Start at: 2018-12-11 19:15:59
End at: 2018-12-11 19:16:29
Local clock offset: -0.05 ms
Remote clock offset: -0.048 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 218.76 Mbit/s
95th percentile per-packet one-way delay: 63.736 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 218.76 Mbit/s
95th percentile per-packet one-way delay: 63.736 ms
Loss rate: 0.04%
```
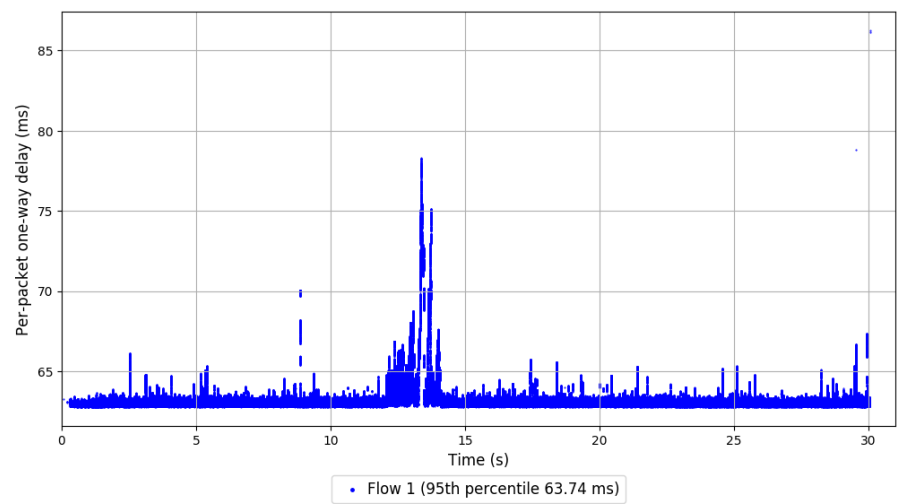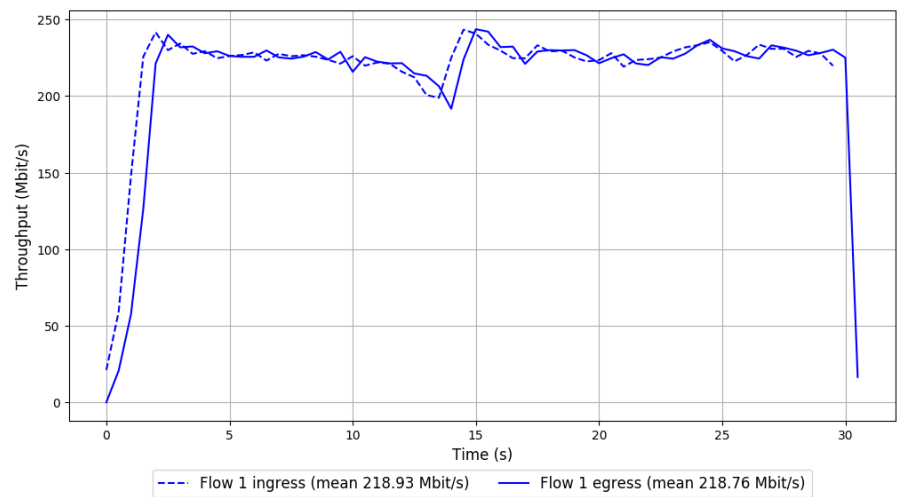
Run 1: Report of TaoVA-100x — Data Link

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

Start at: 2018-12-11 19:44:27
End at: 2018-12-11 19:44:57
Local clock offset: 0.022 ms
Remote clock offset: -0.087 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 220.35 Mbit/s
95th percentile per-packet one-way delay: 63.350 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 220.35 Mbit/s
95th percentile per-packet one-way delay: 63.350 ms
Loss rate: 0.00%
```
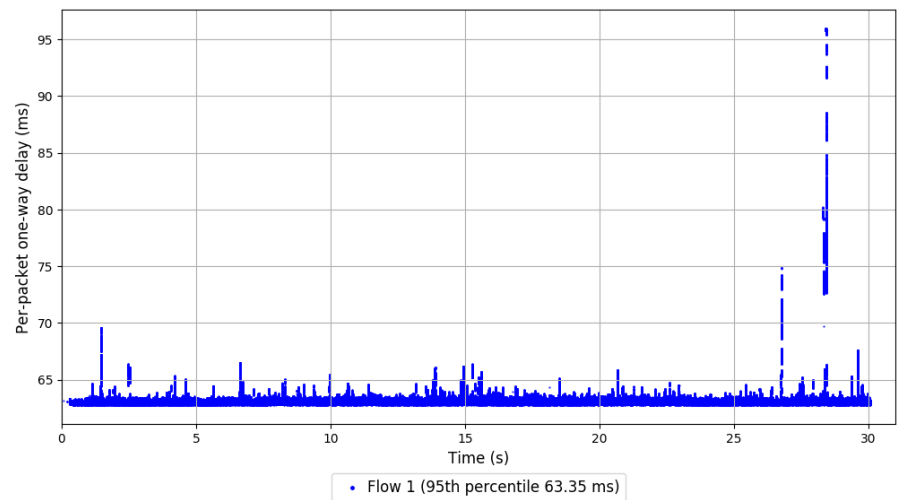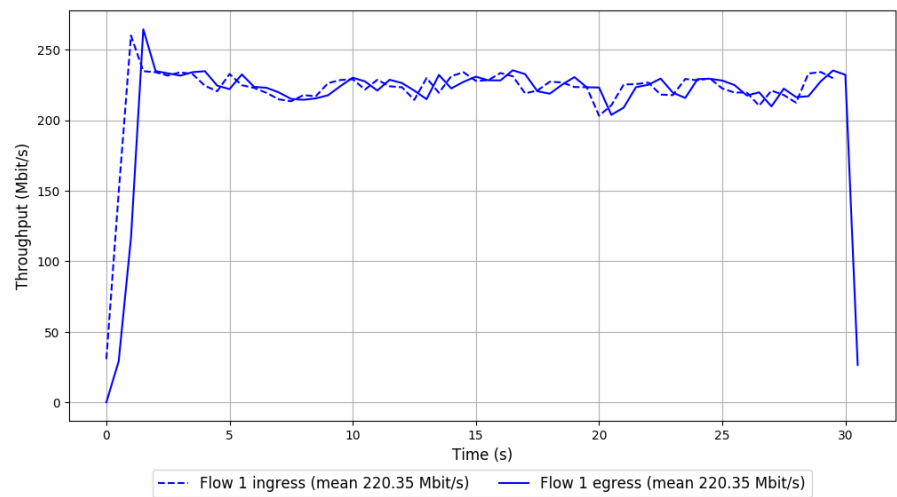
Run 2: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 220.35 Mbit/s) ---- Flow 1 egress (mean 220.35 Mbit/s)
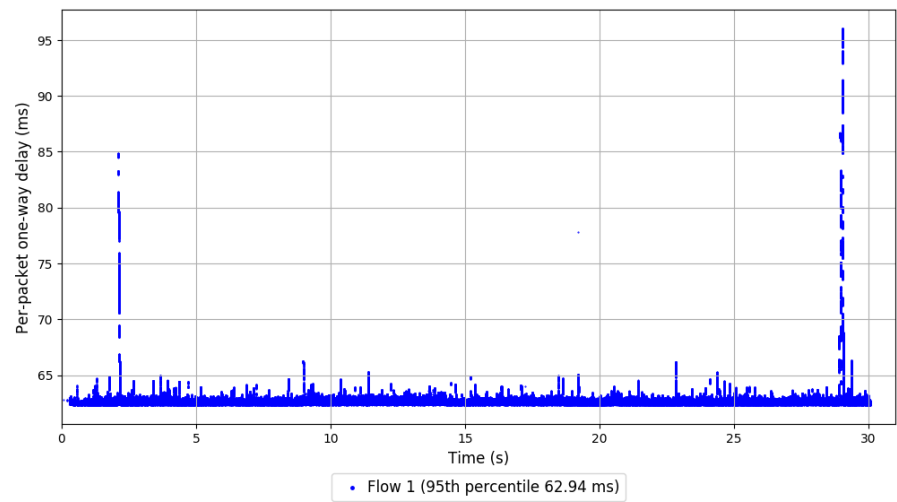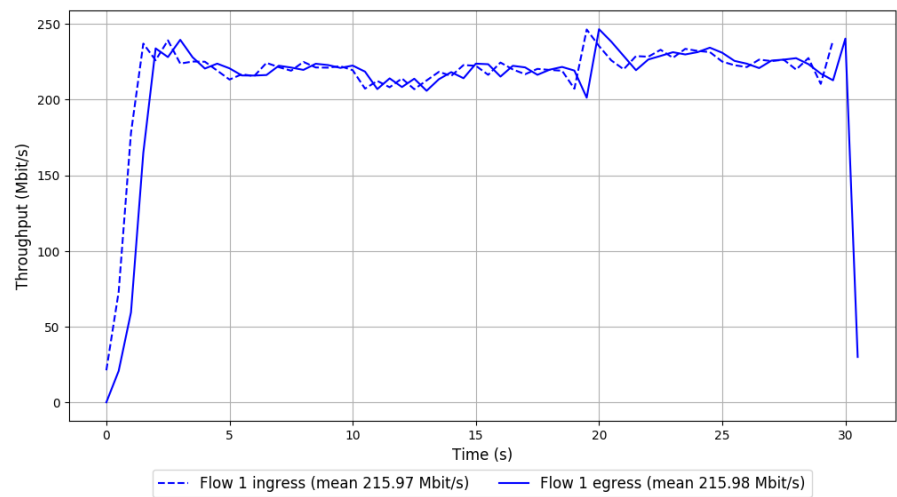

• Flow 1 (95th percentile 63.35 ms)

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

Start at: 2018-12-11 20:12:57
End at: 2018-12-11 20:13:27
Local clock offset: -0.008 ms
Remote clock offset: -0.407 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 215.98 Mbit/s
95th percentile per-packet one-way delay: 62.938 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 215.98 Mbit/s
95th percentile per-packet one-way delay: 62.938 ms
Loss rate: 0.00%
```
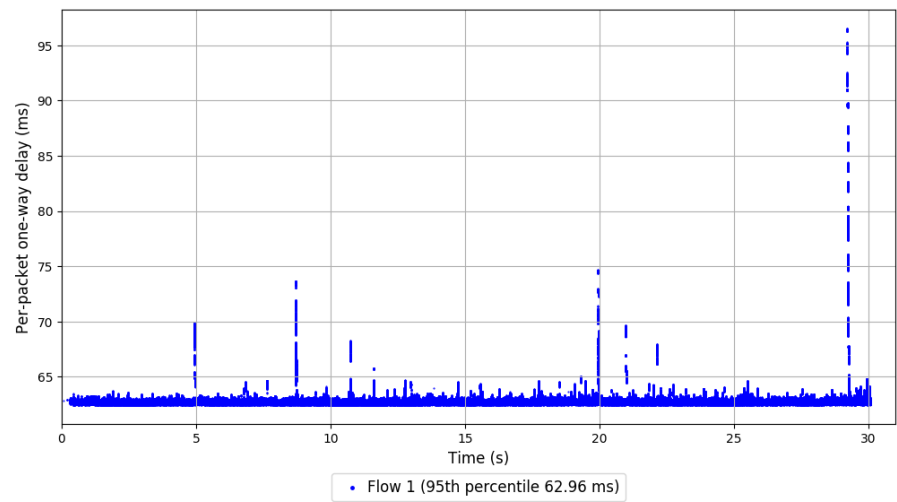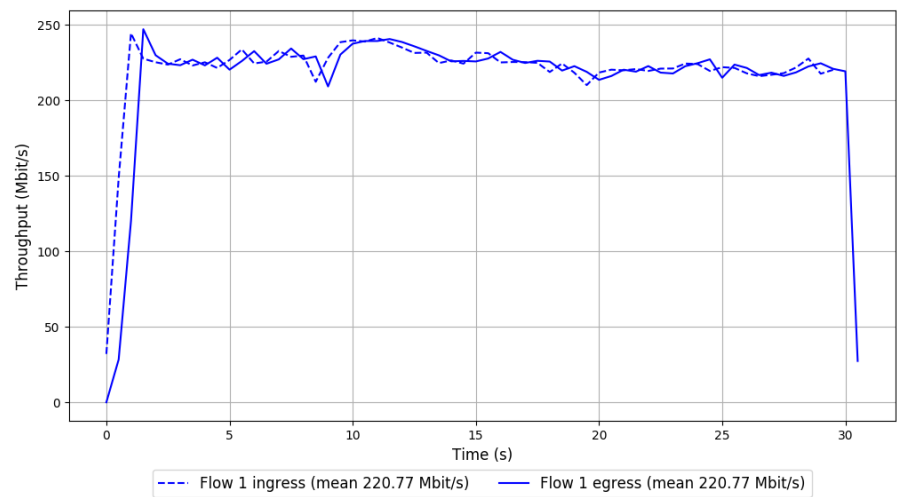
Run 3: Report of TaoVA-100x — Data Link

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

Start at: 2018-12-11 20:41:07
End at: 2018-12-11 20:41:37
Local clock offset: -0.048 ms
Remote clock offset: -0.584 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 220.77 Mbit/s
95th percentile per-packet one-way delay: 62.964 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 220.77 Mbit/s
95th percentile per-packet one-way delay: 62.964 ms
Loss rate: 0.00%
```

Run 4: Report of TaoVA-100x — Data Link

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

Start at: 2018-12-11 21:09:37
End at: 2018-12-11 21:10:07
Local clock offset: -0.047 ms
Remote clock offset: 0.062 ms


# Below is generated by plot.py at 2018-12-11 22:58:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 221.11 Mbit/s
95th percentile per-packet one-way delay: 63.720 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 221.11 Mbit/s
95th percentile per-packet one-way delay: 63.720 ms
Loss rate: 0.01%
```
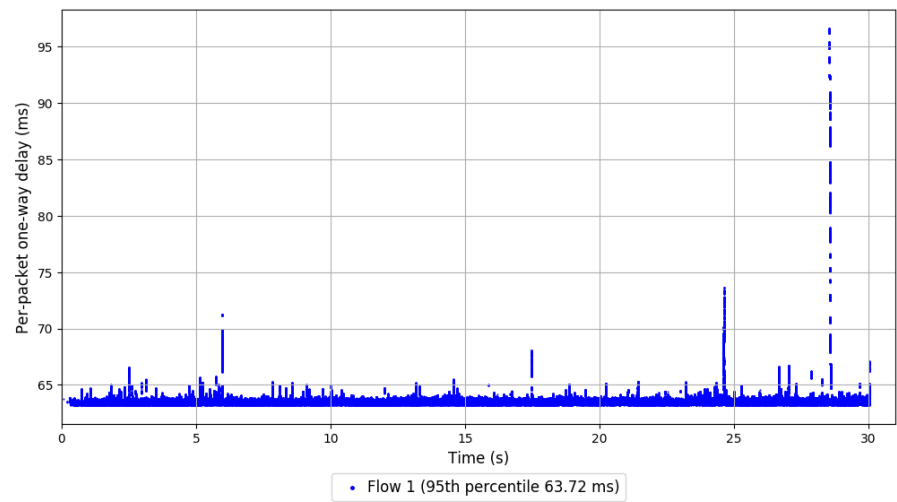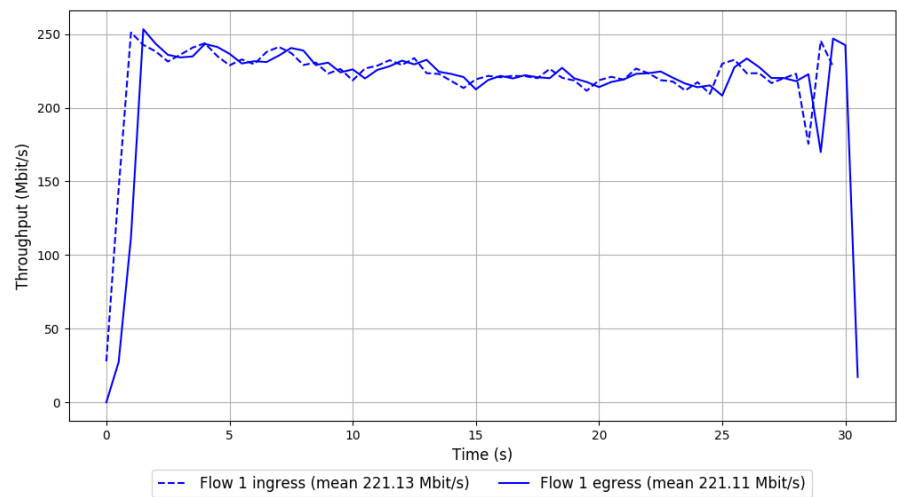
Run 5: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 221.13 Mbit/s) — Flow 1 egress (mean 221.11 Mbit/s)

Flow 1 (95th percentile 63.72 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2018-12-11 18:59:56
End at: 2018-12-11 19:00:26
Local clock offset: -0.05 ms
Remote clock offset: -0.12 ms


# Below is generated by plot.py at 2018-12-11 22:58:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 353.96 Mbit/s
95th percentile per-packet one-way delay: 63.891 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 353.96 Mbit/s
95th percentile per-packet one-way delay: 63.891 ms
Loss rate: 0.00%
```
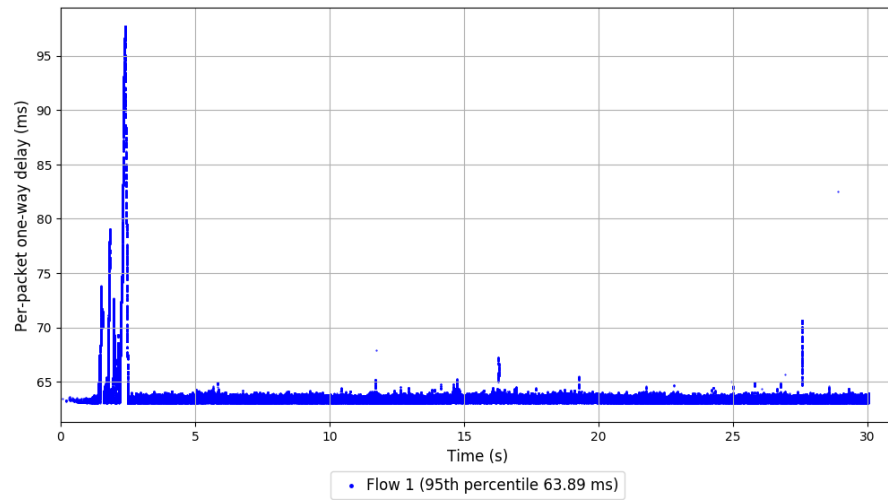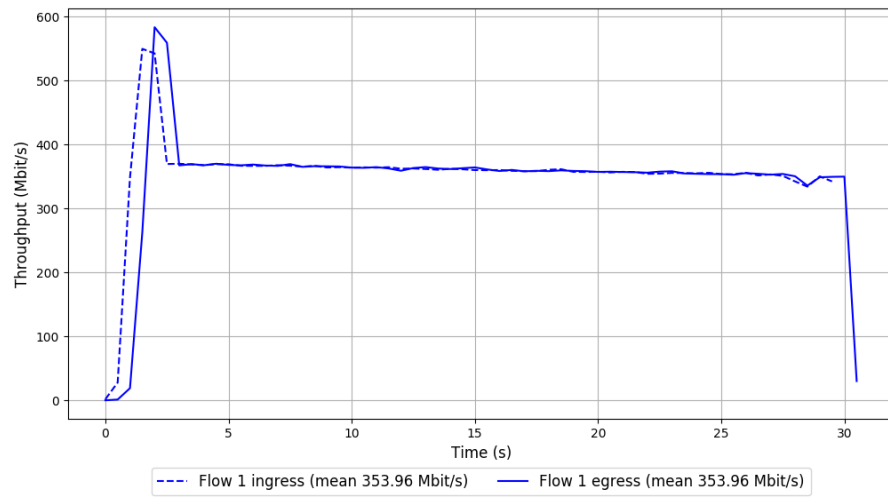
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-12-11 19:27:46
End at: 2018-12-11 19:28:16
Local clock offset: -0.022 ms
Remote clock offset: -1.28 ms


# Below is generated by plot.py at 2018-12-11 23:04:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 429.52 Mbit/s
95th percentile per-packet one-way delay: 63.027 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 429.52 Mbit/s
95th percentile per-packet one-way delay: 63.027 ms
Loss rate: 0.02%
```
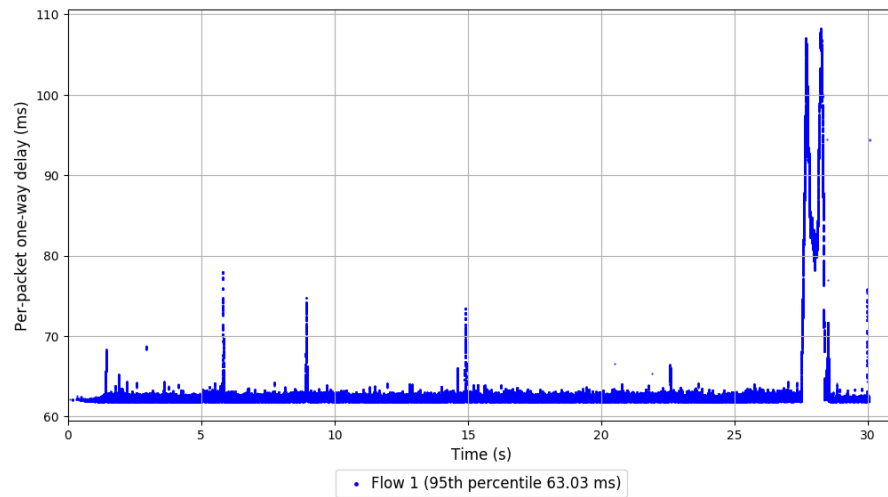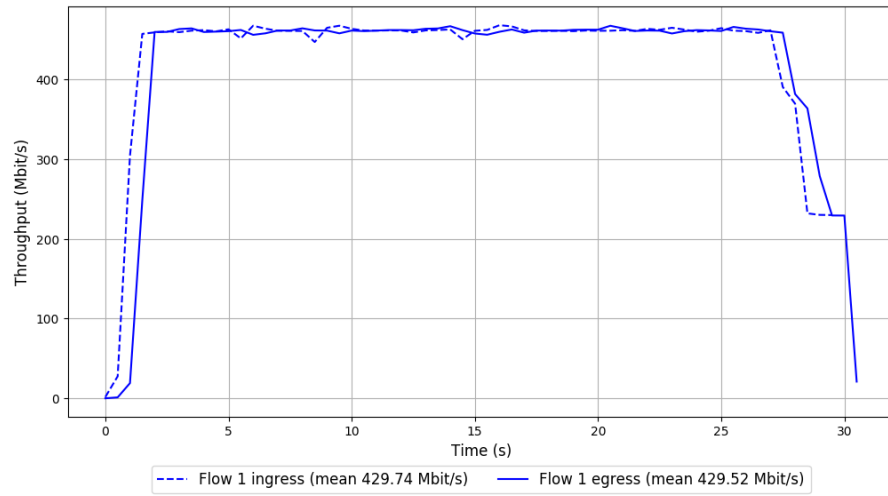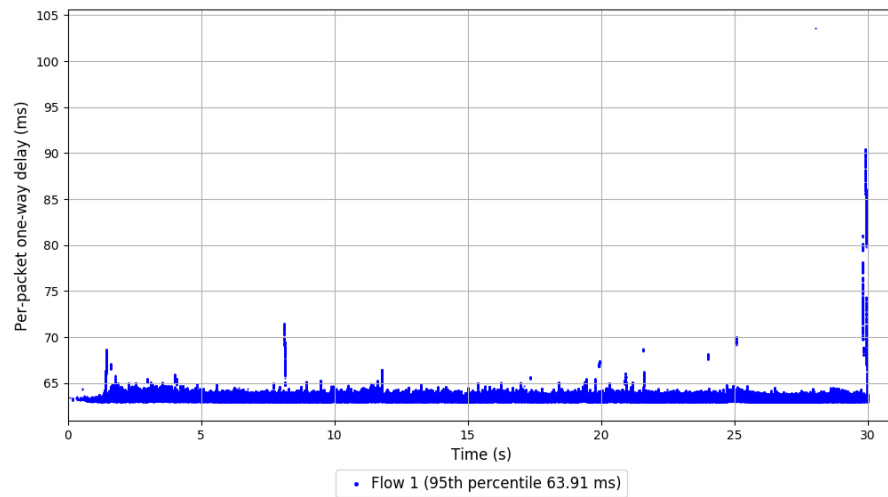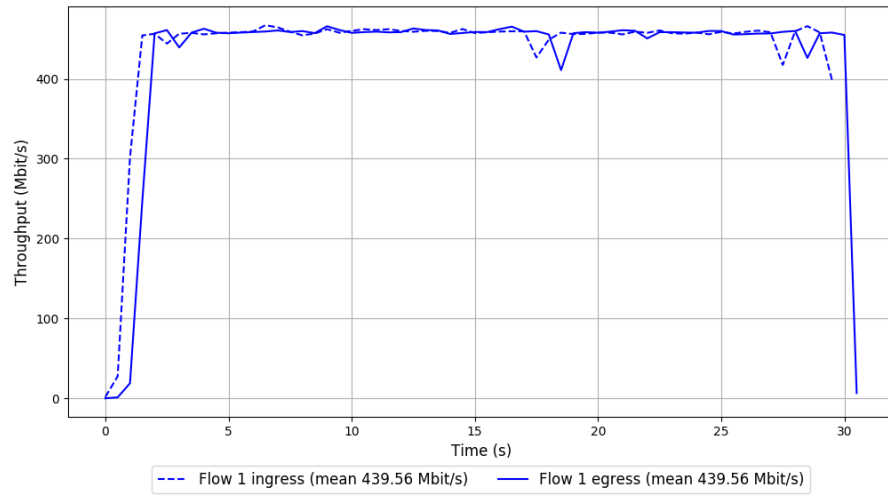
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-12-11 19:56:19
End at: 2018-12-11 19:56:49
Local clock offset: -0.003 ms
Remote clock offset: -0.069 ms


# Below is generated by plot.py at 2018-12-11 23:04:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 439.56 Mbit/s
95th percentile per-packet one-way delay: 63.913 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 439.56 Mbit/s
95th percentile per-packet one-way delay: 63.913 ms
Loss rate: 0.00%
```

Run 3: Report of TCP Vegas — Data Link

```
Run 4: Statistics of TCP Vegas

Start at: 2018-12-11 20:24:55
End at: 2018-12-11 20:25:25
Local clock offset: -0.061 ms
Remote clock offset: -0.79 ms


# Below is generated by plot.py at 2018-12-11 23:04:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 393.75 Mbit/s
95th percentile per-packet one-way delay: 63.041 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 393.75 Mbit/s
95th percentile per-packet one-way delay: 63.041 ms
Loss rate: 0.00%
```
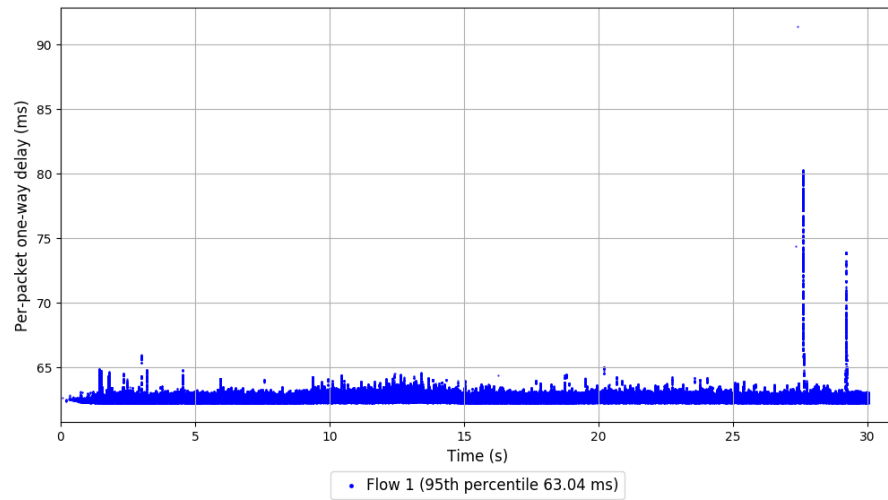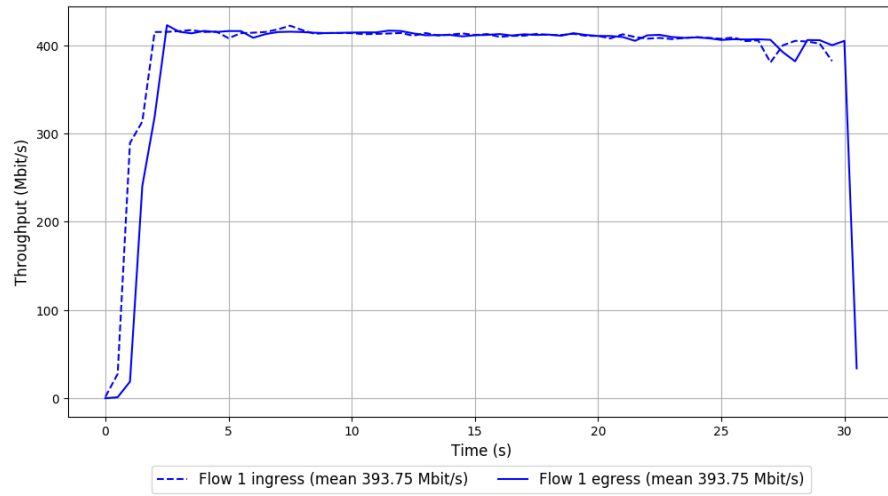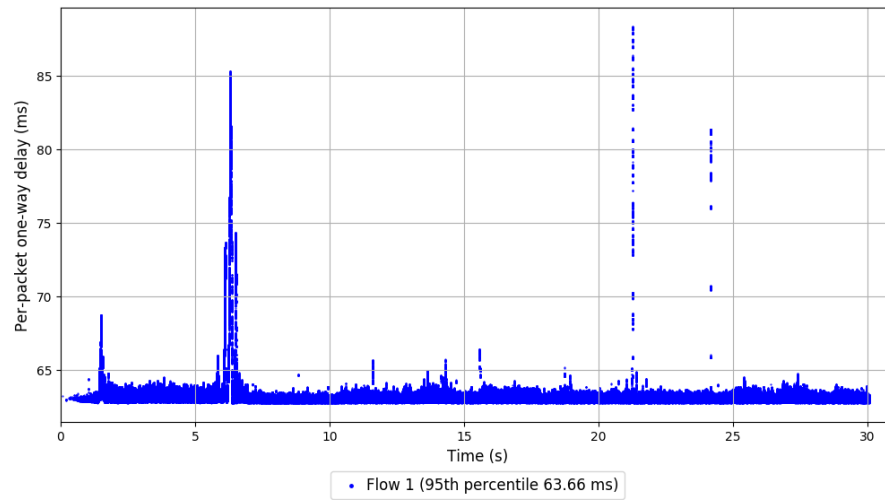
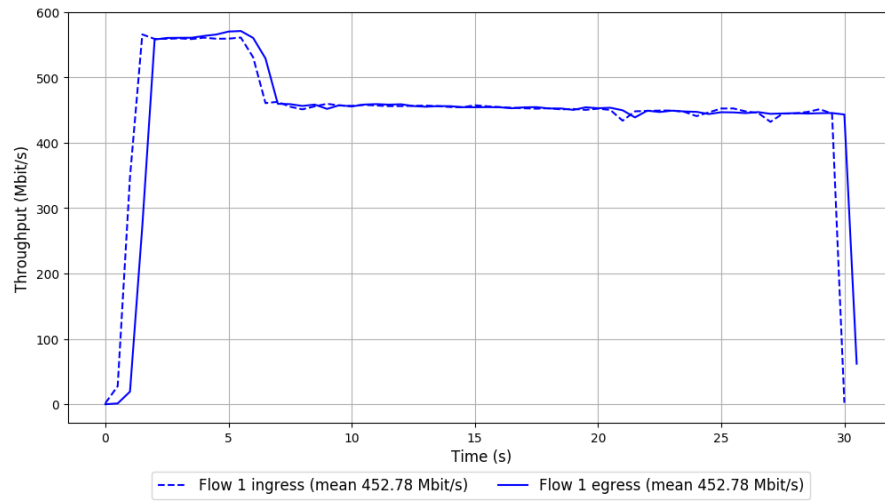Run 4: Report of TCP Vegas — Data Link

```
Run 5: Statistics of TCP Vegas

Start at: 2018-12-11 20:53:00
End at: 2018-12-11 20:53:30
Local clock offset: 0.009 ms
Remote clock offset: -0.089 ms


# Below is generated by plot.py at 2018-12-11 23:05:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 452.78 Mbit/s
95th percentile per-packet one-way delay: 63.658 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 452.78 Mbit/s
95th percentile per-packet one-way delay: 63.658 ms
Loss rate: 0.00%
```

Run 5: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2018-12-11 18:54:07
End at: 2018-12-11 18:54:37
Local clock offset: -0.061 ms
Remote clock offset: -0.21 ms


# Below is generated by plot.py at 2018-12-11 23:05:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 193.24 Mbit/s
95th percentile per-packet one-way delay: 199.786 ms
Loss rate: 6.96%
-- Flow 1:
Average throughput: 193.24 Mbit/s
95th percentile per-packet one-way delay: 199.786 ms
Loss rate: 6.96%
```
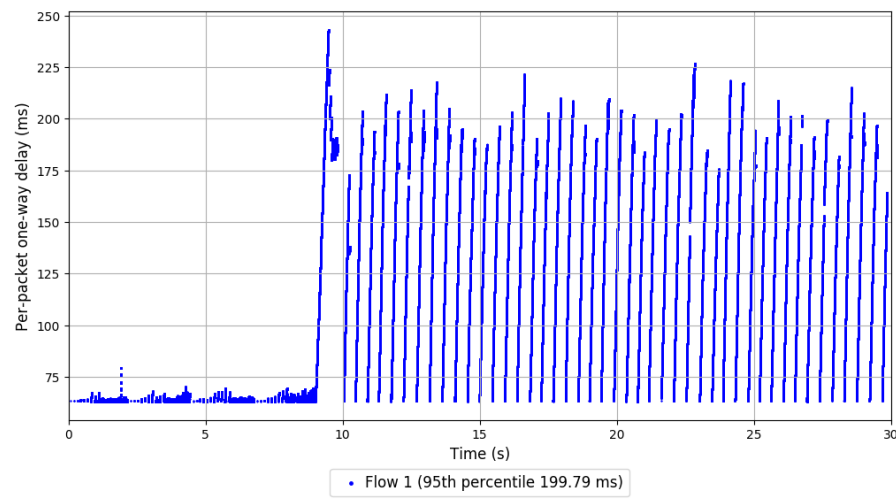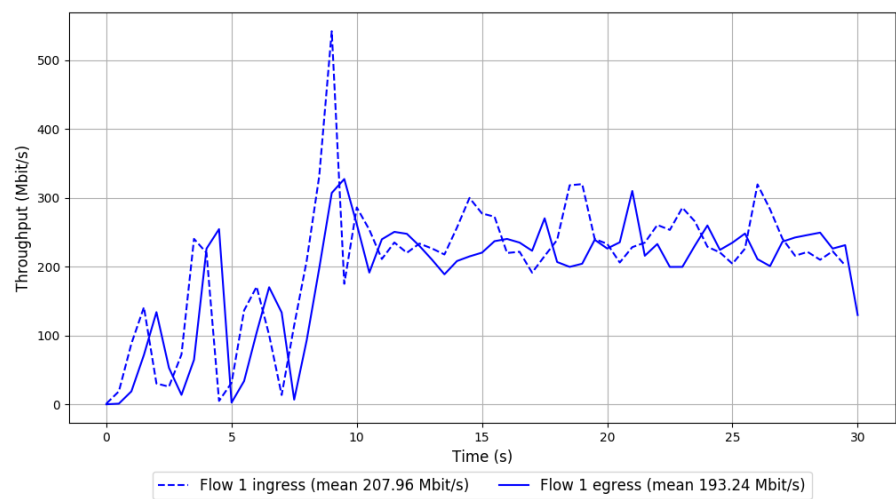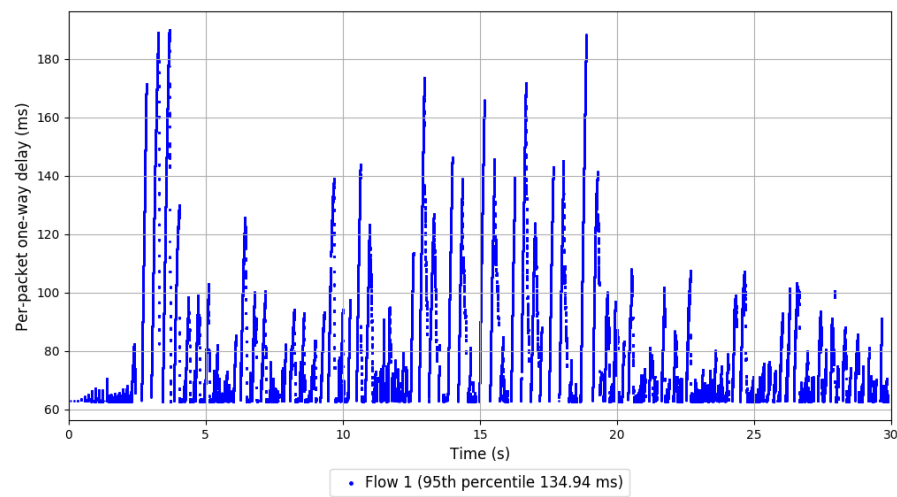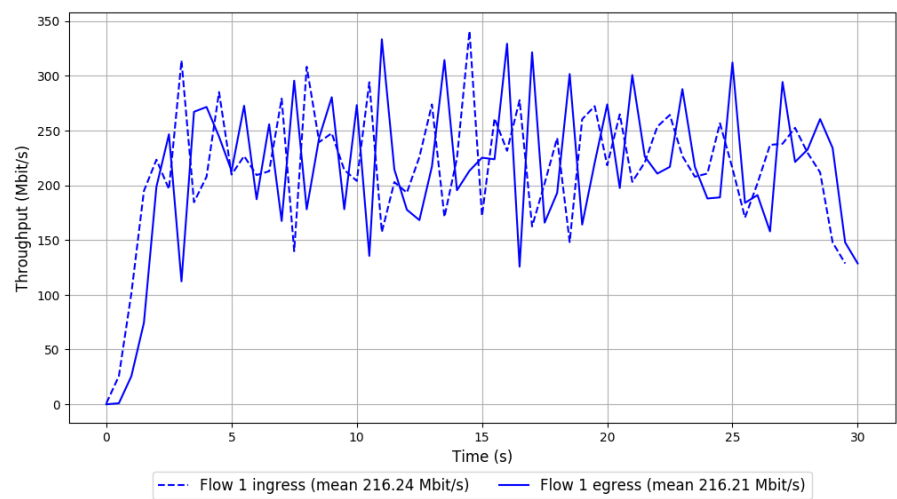
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2018-12-11 19:21:58
End at: 2018-12-11 19:22:28
Local clock offset: -0.049 ms
Remote clock offset: -0.225 ms


# Below is generated by plot.py at 2018-12-11 23:05:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 216.21 Mbit/s
95th percentile per-packet one-way delay: 134.943 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 216.21 Mbit/s
95th percentile per-packet one-way delay: 134.943 ms
Loss rate: 0.01%
```
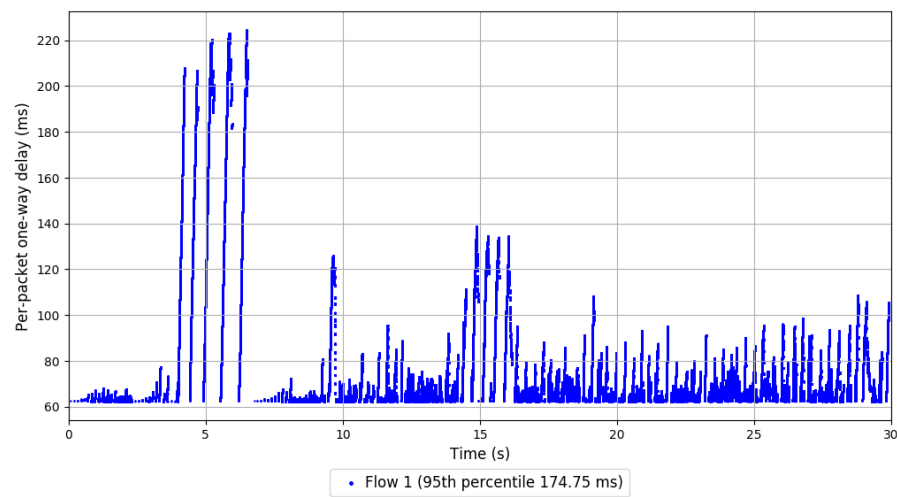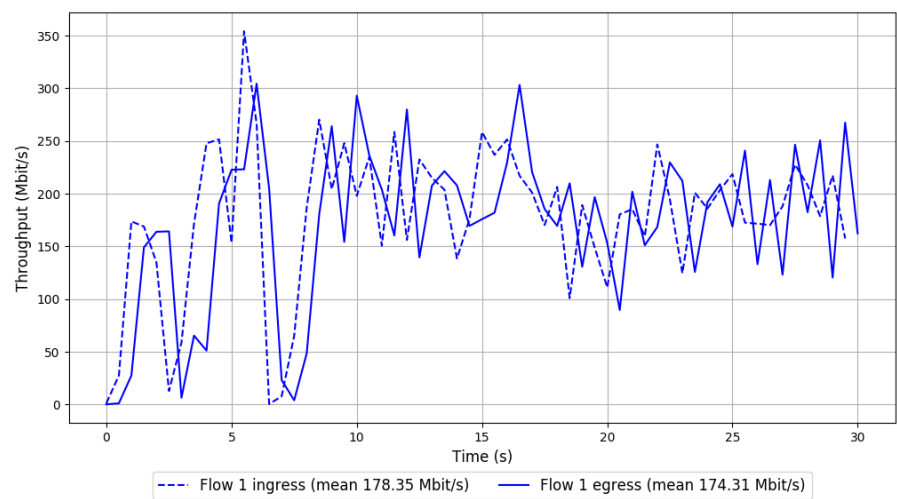
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-12-11 19:50:30
End at: 2018-12-11 19:51:00
Local clock offset: -0.021 ms
Remote clock offset: -0.447 ms


# Below is generated by plot.py at 2018-12-11 23:05:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 174.31 Mbit/s
95th percentile per-packet one-way delay: 174.753 ms
Loss rate: 2.25%
-- Flow 1:
Average throughput: 174.31 Mbit/s
95th percentile per-packet one-way delay: 174.753 ms
Loss rate: 2.25%
```
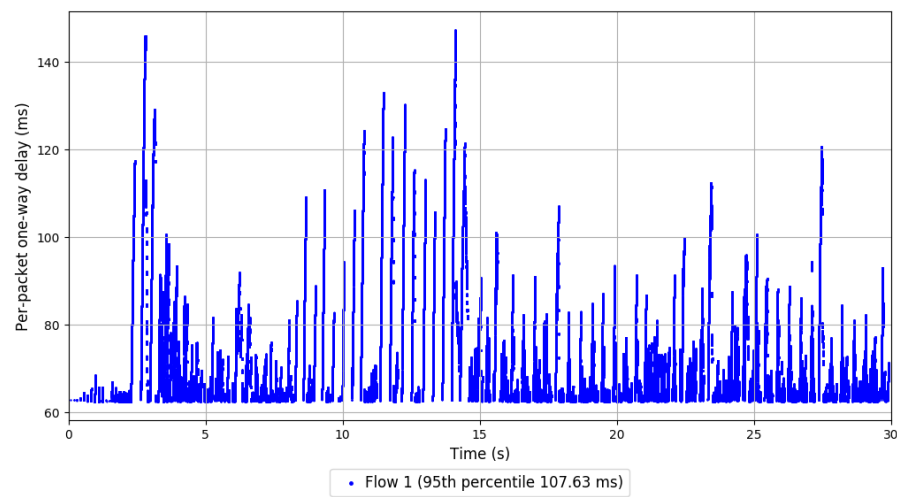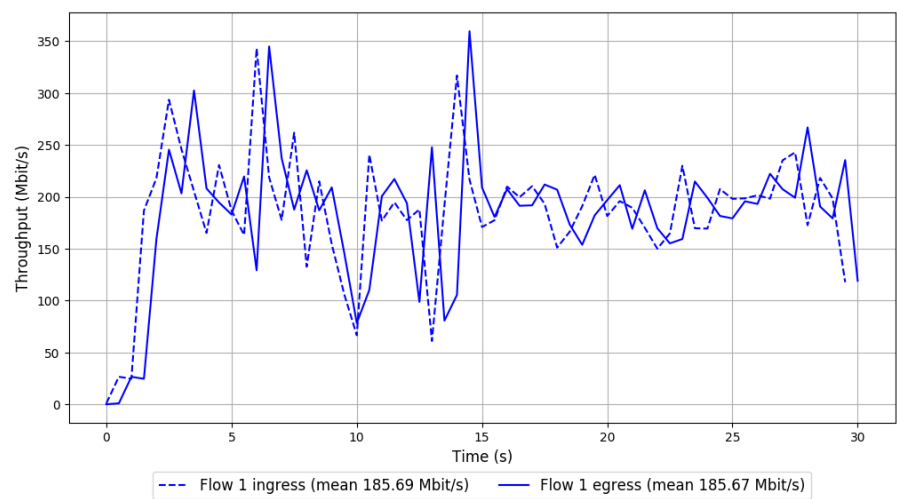
Run 3: Report of Verus — Data Link

```
Run 4: Statistics of Verus

Start at: 2018-12-11 20:19:03
End at: 2018-12-11 20:19:33
Local clock offset: -0.032 ms
Remote clock offset: -0.404 ms


# Below is generated by plot.py at 2018-12-11 23:05:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 185.67 Mbit/s
95th percentile per-packet one-way delay: 107.627 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 185.67 Mbit/s
95th percentile per-packet one-way delay: 107.627 ms
Loss rate: 0.01%
```
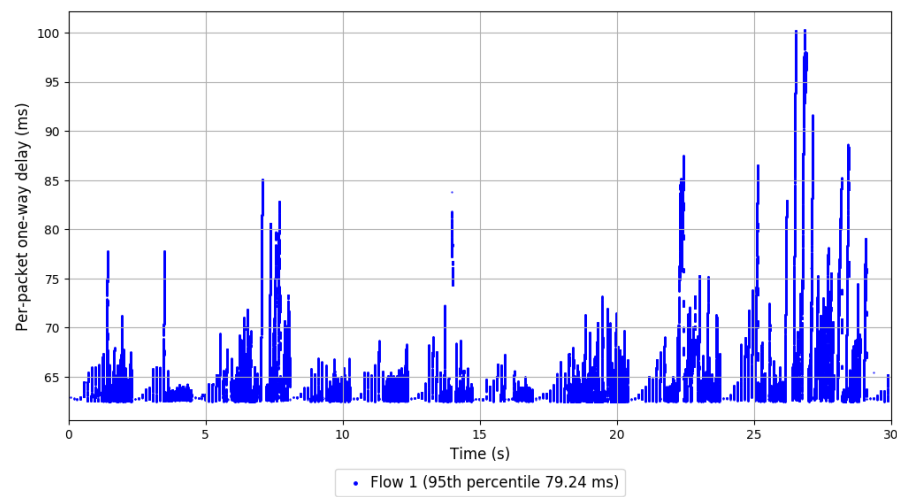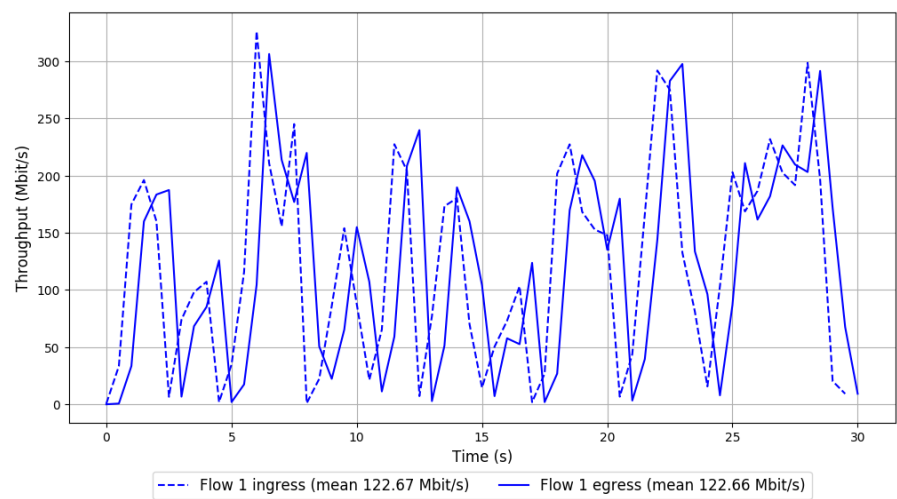
Run 4: Report of Verus — Data Link

```
Run 5: Statistics of Verus

Start at: 2018-12-11 20:47:13
End at: 2018-12-11 20:47:43
Local clock offset: -0.038 ms
Remote clock offset: -0.177 ms


# Below is generated by plot.py at 2018-12-11 23:06:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 122.66 Mbit/s
95th percentile per-packet one-way delay: 79.244 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 122.66 Mbit/s
95th percentile per-packet one-way delay: 79.244 ms
Loss rate: 0.00%
```

Run 5: Report of Verus — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2018-12-11 19:08:20
End at: 2018-12-11 19:08:50
Local clock offset: -0.044 ms
Remote clock offset: 0.433 ms


# Below is generated by plot.py at 2018-12-11 23:09:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 411.78 Mbit/s
95th percentile per-packet one-way delay: 67.297 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 411.78 Mbit/s
95th percentile per-packet one-way delay: 67.297 ms
Loss rate: 0.00%
```
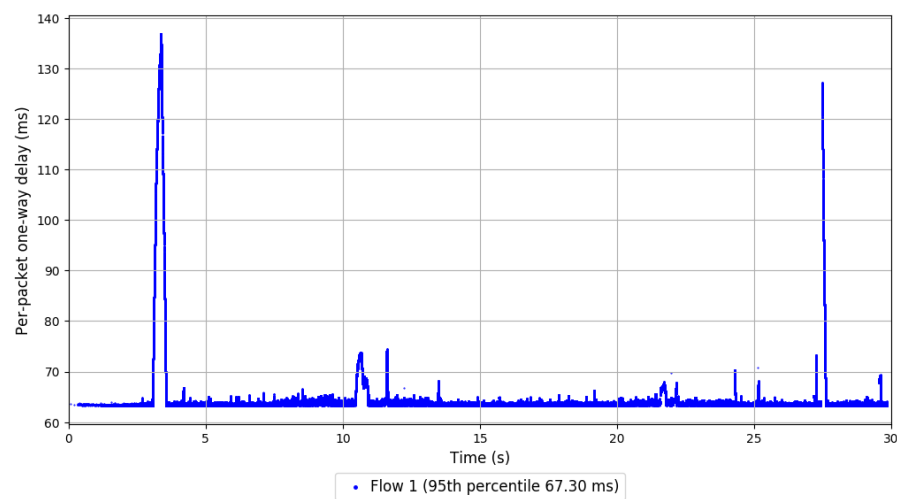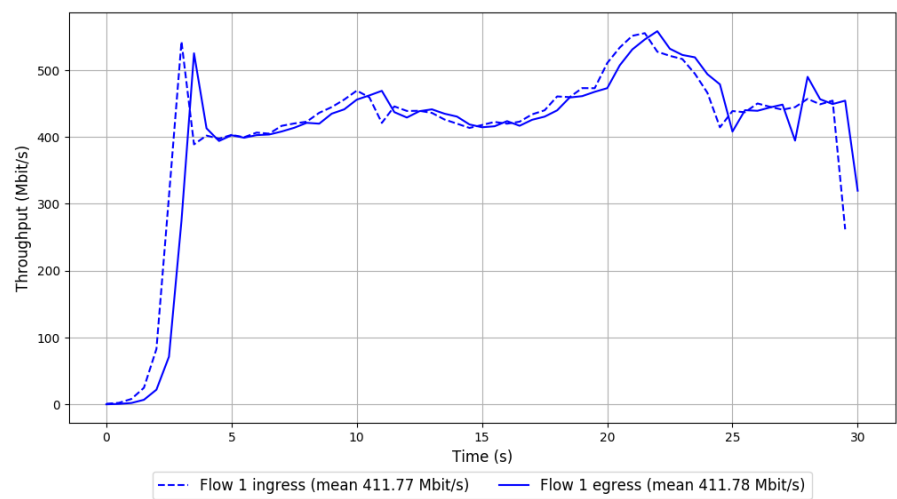
Run 1: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 411.77 Mbit/s) — Flow 1 egress (mean 411.78 Mbit/s)

Flow 1 (95th percentile 67.30 ms)

```
Run 2: Statistics of PCC-Vivace

Start at: 2018-12-11 19:36:46
End at: 2018-12-11 19:37:16
Local clock offset: -0.015 ms
Remote clock offset: 0.03 ms


# Below is generated by plot.py at 2018-12-11 23:09:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 422.87 Mbit/s
95th percentile per-packet one-way delay: 74.131 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 422.87 Mbit/s
95th percentile per-packet one-way delay: 74.131 ms
Loss rate: 0.00%
```
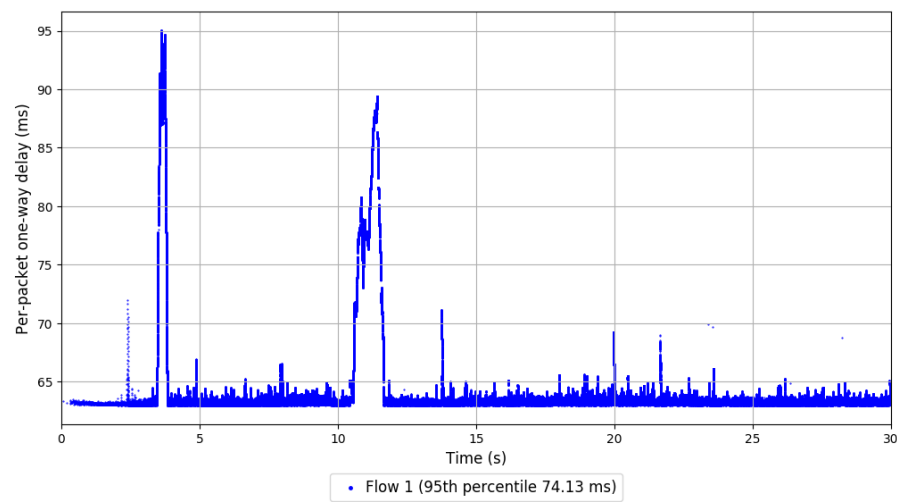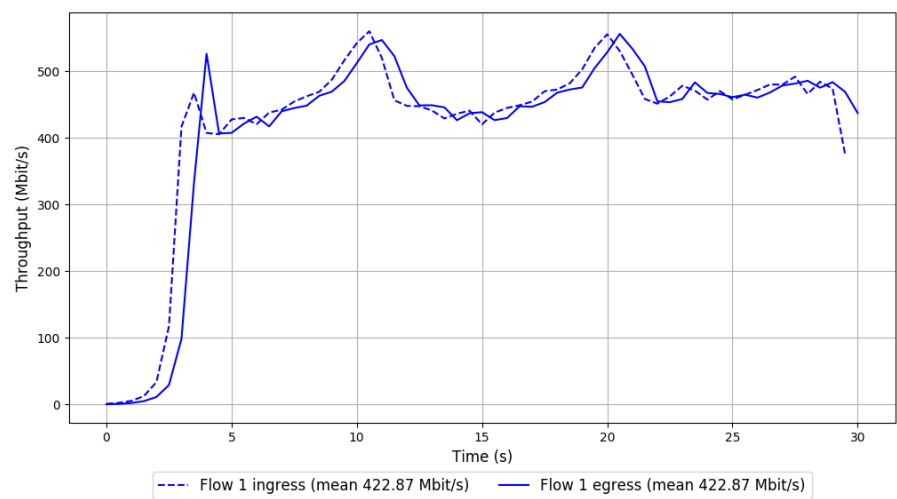
Run 2: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 422.87 Mbit/s) — — — Flow 1 egress (mean 422.87 Mbit/s)

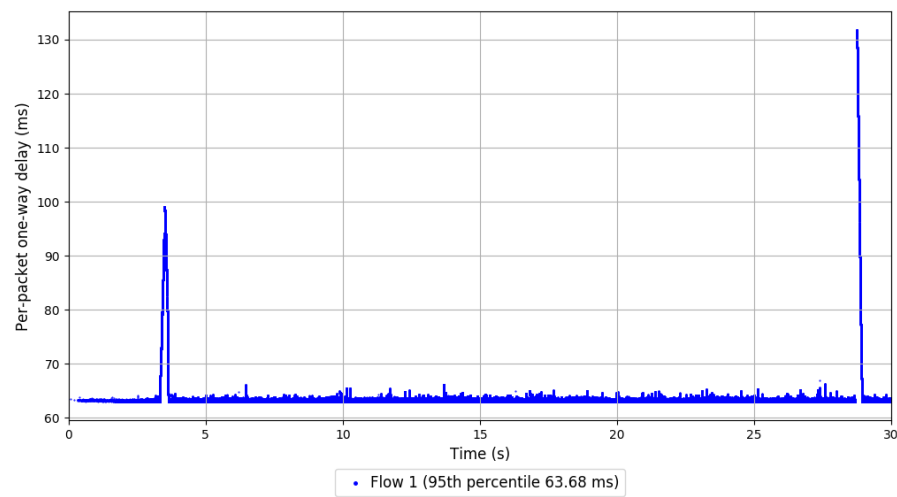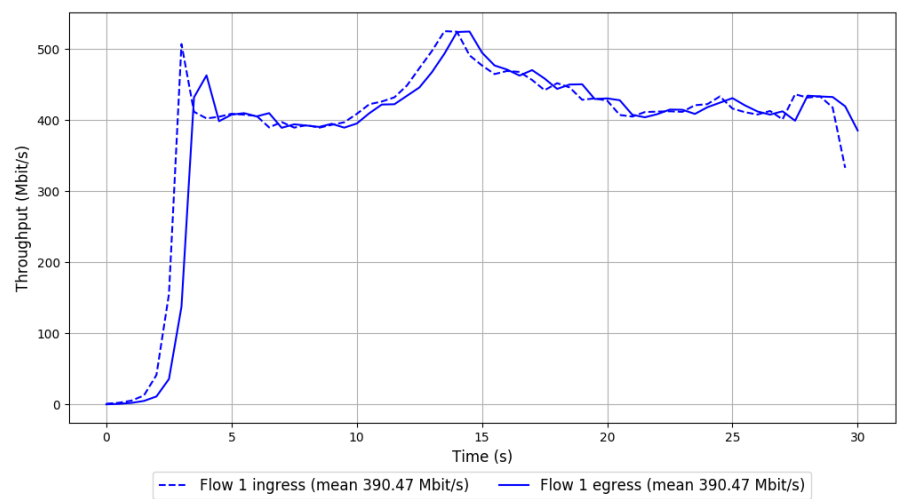

• Flow 1 (95th percentile 74.13 ms)

```
Run 3: Statistics of PCC-Vivace

Start at: 2018-12-11 20:05:17
End at: 2018-12-11 20:05:47
Local clock offset: -0.02 ms
Remote clock offset: -0.193 ms


# Below is generated by plot.py at 2018-12-11 23:09:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 390.47 Mbit/s
95th percentile per-packet one-way delay: 63.681 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 390.47 Mbit/s
95th percentile per-packet one-way delay: 63.681 ms
Loss rate: 0.00%
```

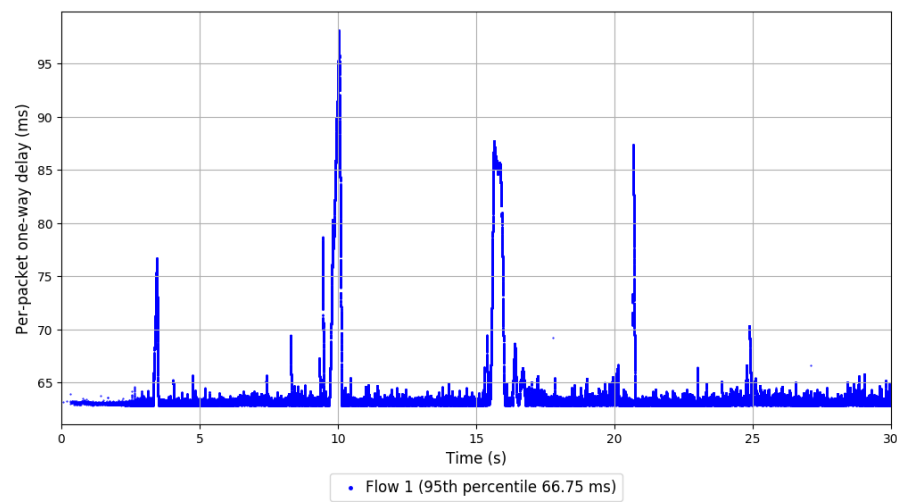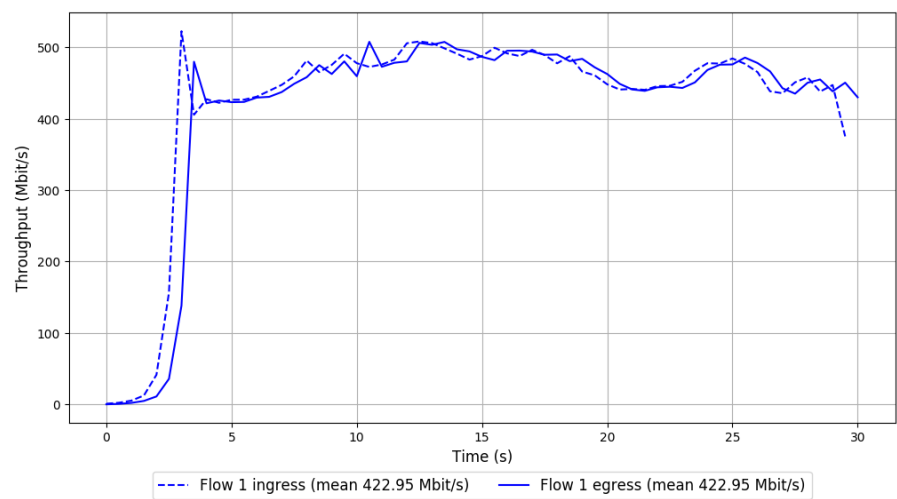Run 3: Report of PCC-Vivace — Data Link

```
Run 4: Statistics of PCC-Vivace

Start at: 2018-12-11 20:33:31
End at: 2018-12-11 20:34:01
Local clock offset: -0.054 ms
Remote clock offset: -0.121 ms


# Below is generated by plot.py at 2018-12-11 23:10:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 422.95 Mbit/s
95th percentile per-packet one-way delay: 66.749 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 422.95 Mbit/s
95th percentile per-packet one-way delay: 66.749 ms
Loss rate: 0.00%
```

Run 4: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 422.95 Mbit/s)   Flow 1 egress (mean 422.95 Mbit/s)
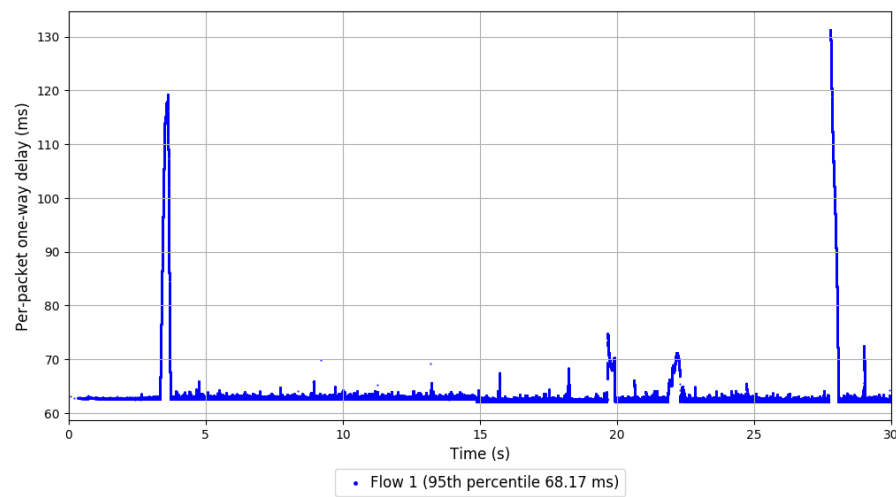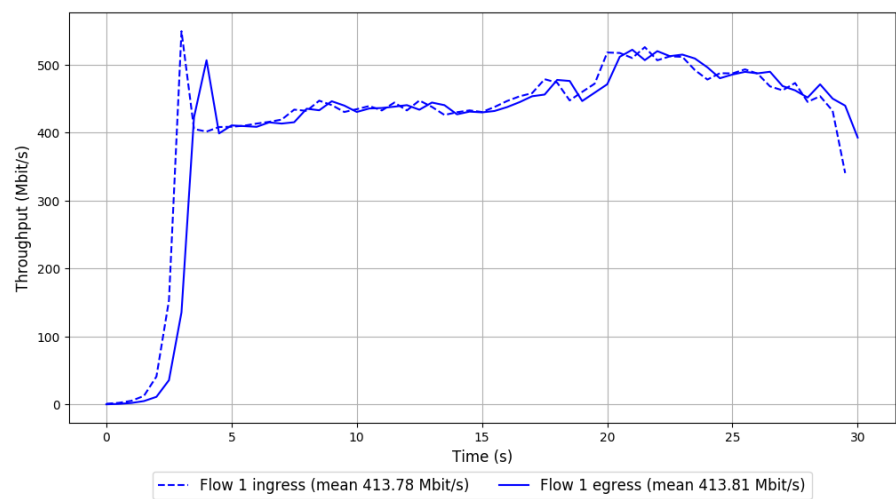

Flow 1 (95th percentile 66.75 ms)

```
Run 5: Statistics of PCC-Vivace

Start at: 2018-12-11 21:01:56
End at: 2018-12-11 21:02:26
Local clock offset: -0.001 ms
Remote clock offset: -0.627 ms


# Below is generated by plot.py at 2018-12-11 23:10:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 413.81 Mbit/s
95th percentile per-packet one-way delay: 68.167 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 413.81 Mbit/s
95th percentile per-packet one-way delay: 68.167 ms
Loss rate: 0.00%
```

Run 5: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 413.78 Mbit/s) ---- Flow 1 egress (mean 413.81 Mbit/s)

• Flow 1 (95th percentile 68.17 ms)

```
Run 1: Statistics of WebRTC media

Start at: 2018-12-11 18:52:59
End at: 2018-12-11 18:53:29
Local clock offset: -0.014 ms
Remote clock offset: 0.097 ms

# Below is generated by plot.py at 2018-12-11 23:10:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 63.783 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 63.783 ms
Loss rate: 0.00%
```
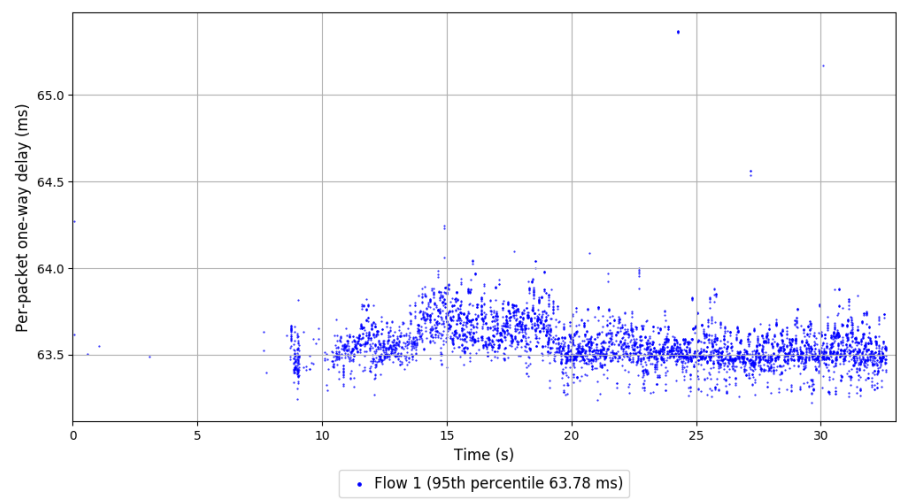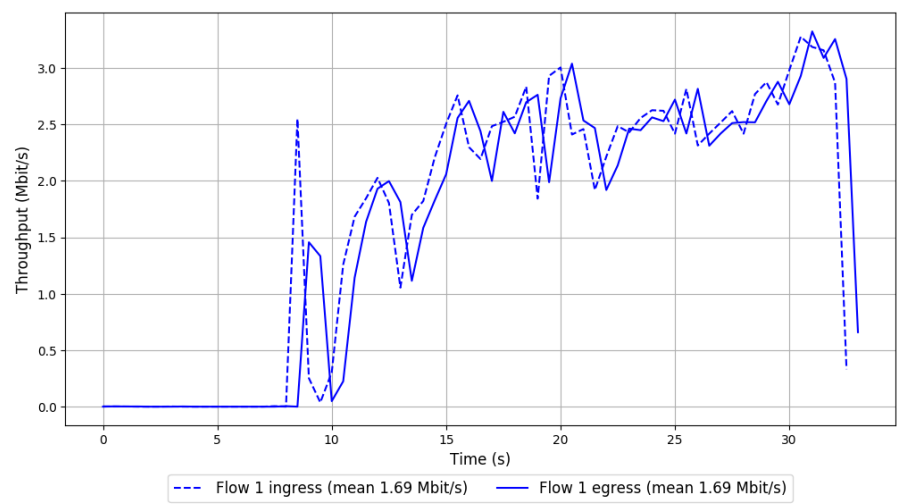
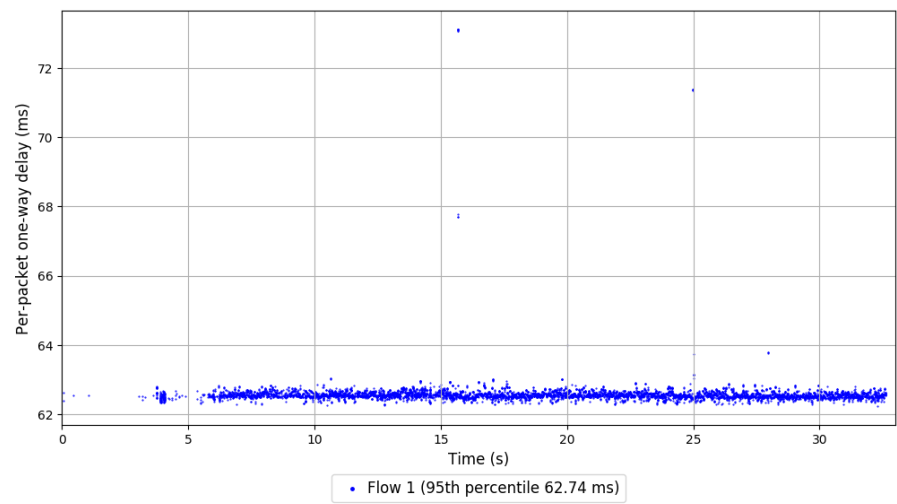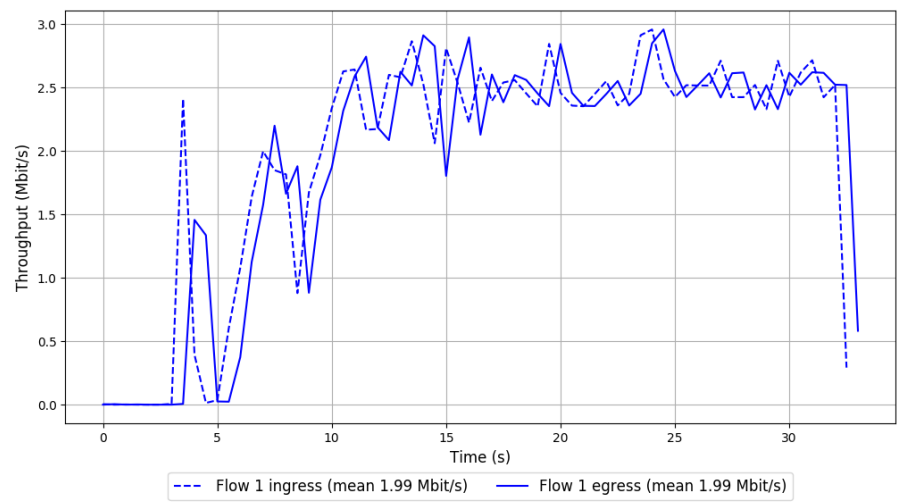Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-12-11 19:20:50
End at: 2018-12-11 19:21:20
Local clock offset: -0.033 ms
Remote clock offset: -0.761 ms


# Below is generated by plot.py at 2018-12-11 23:10:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.99 Mbit/s
95th percentile per-packet one-way delay: 62.738 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.99 Mbit/s
95th percentile per-packet one-way delay: 62.738 ms
Loss rate: 0.00%
```

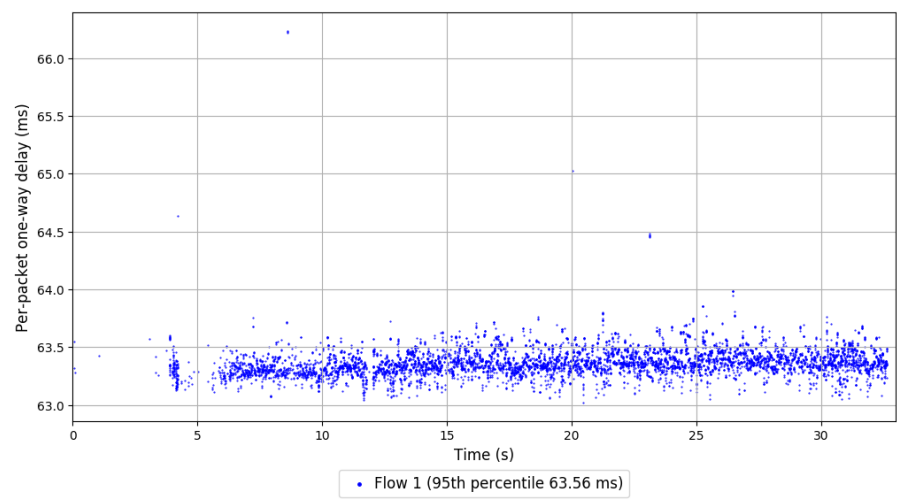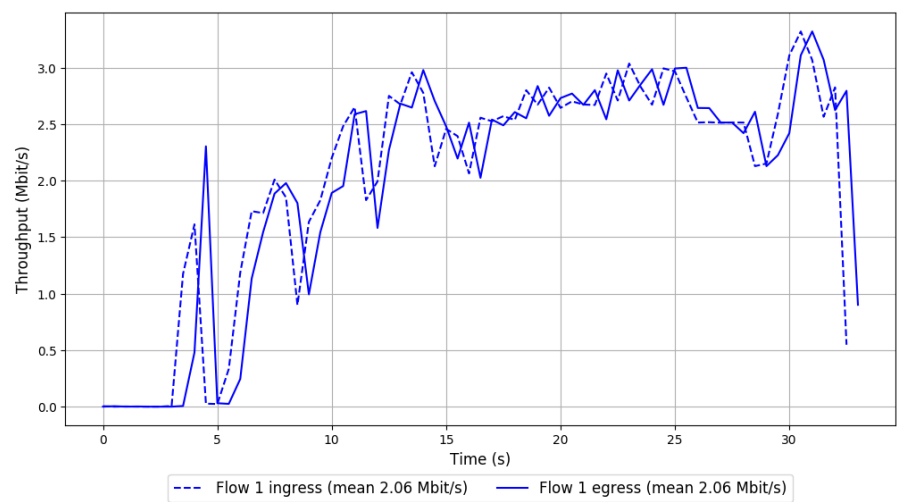Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-12-11 19:49:22
End at: 2018-12-11 19:49:52
Local clock offset: -0.006 ms
Remote clock offset: -0.039 ms


# Below is generated by plot.py at 2018-12-11 23:10:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 63.562 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 63.562 ms
Loss rate: 0.00%
```

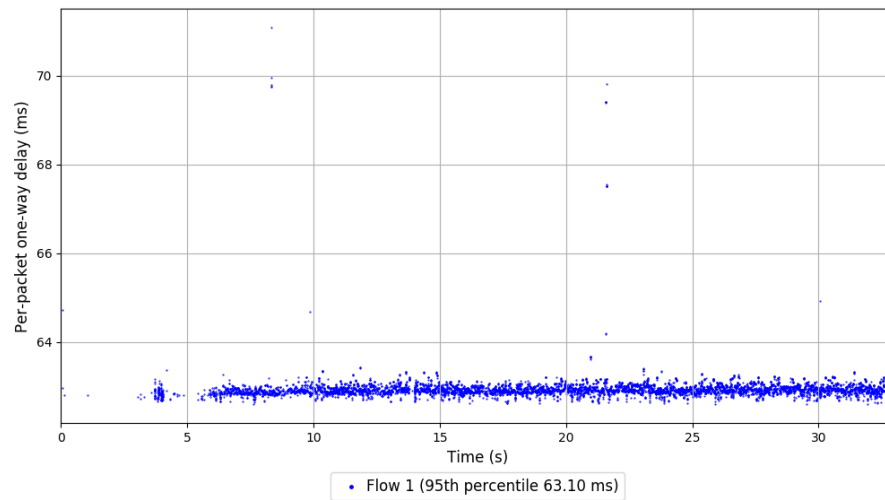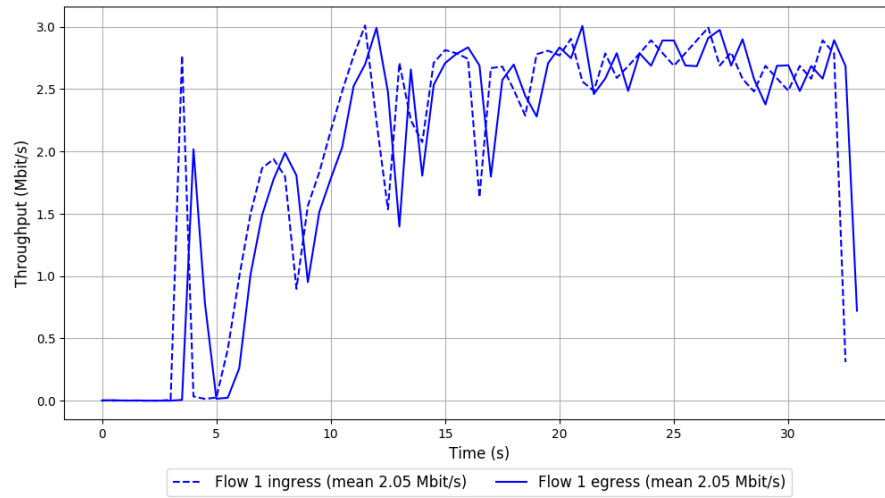Run 3: Report of WebRTC media — Data Link

```
Run 4: Statistics of WebRTC media

Start at: 2018-12-11 20:17:54
End at: 2018-12-11 20:18:24
Local clock offset: -0.067 ms
Remote clock offset: -0.373 ms


# Below is generated by plot.py at 2018-12-11 23:10:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 63.100 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 63.100 ms
Loss rate: 0.00%
```

Run 4: Report of WebRTC media — Data Link

```
Run 5: Statistics of WebRTC media

Start at: 2018-12-11 20:46:04
End at: 2018-12-11 20:46:34
Local clock offset: -0.021 ms
Remote clock offset: -0.629 ms


# Below is generated by plot.py at 2018-12-11 23:10:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 62.614 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 62.614 ms
Loss rate: 0.00%
```

Run 5: Report of WebRTC media — Data Link