Pantheon Report

Generated at 2018-12-02 11:43:27 (UTC).

Data path: India on em1 (*remote*) →AWS India 1 on ens5 (*local*).

Repeated the test of 19 congestion control schemes 5 times.

Each test lasted for 30 seconds running 1 flow.

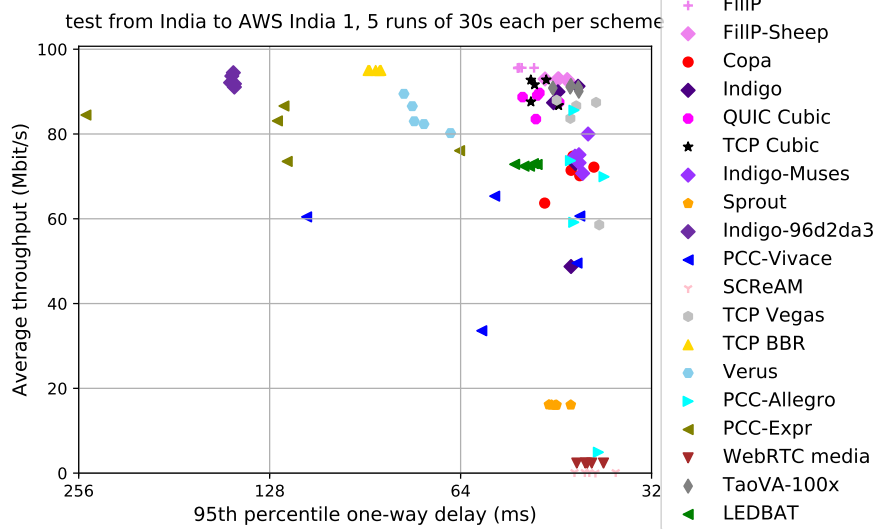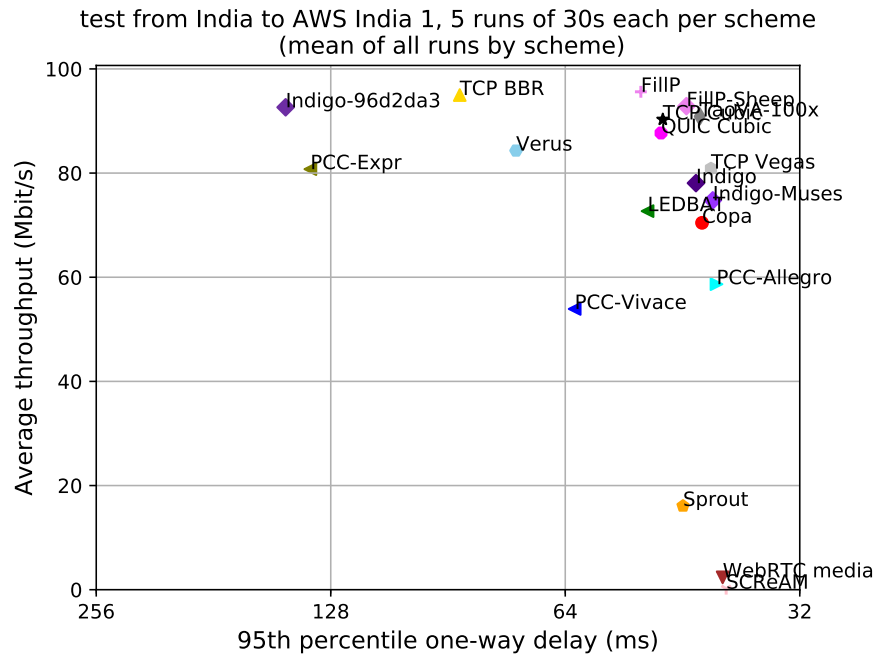NTP offsets were measured against nets.org.sg and have been applied to correct the timestamps in logs.

```
System info:
Linux 4.15.0-1027-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

```
Git summary:
branch: muses @ 7b6dad87cde3ab65f7c4052140eb54098aa58e9d
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-96d2da3 @ 8413272d46f8aa0bcb967ed7048b6a8f994abb95
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
 M receiver/src/buffer.h
 M receiver/src/core.cpp
 M sender/src/buffer.h
 M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
 M src/ScreamClient
 M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
 M src/examples/cellsim.cc
 M src/examples/sproutbt2.cc
 M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
 M src/verus.hpp
 M tools/plot.py
```

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

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

test from India to AWS India 1, 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	94.99	87.42	3.09
Copa	5	70.45	42.72	0.15
TCP Cubic	5	90.30	47.97	0.17
FillP	5	95.61	51.18	0.19
FillP-Sheep	5	92.85	44.74	0.16
Indigo	5	78.07	43.49	0.15
Indigo-96d2da3	5	92.63	146.27	1.76
LEDBAT	5	72.70	50.18	0.18
Indigo-Muses	5	74.76	41.38	0.16
PCC-Allegro	5	58.67	40.93	0.17
PCC-Expr	5	80.75	135.95	0.41
QUIC Cubic	5	87.70	48.22	0.19
SCReAM	5	0.20	39.78	0.18
Sprout	5	16.08	45.19	0.17
TaoVA-100x	5	90.88	43.01	0.15
TCP Vegas	5	80.86	41.60	0.18
Verus	5	84.32	74.02	0.30
PCC-Vivace	5	53.91	62.25	0.29
WebRTC media	5	2.37	40.19	0.16

```
Run 1: Statistics of TCP BBR

Start at: 2018-12-02 09:50:45
End at: 2018-12-02 09:51:15
Local clock offset: 1.092 ms
Remote clock offset: -3.602 ms


# Below is generated by plot.py at 2018-12-02 11:32:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 94.99 Mbit/s
95th percentile per-packet one-way delay: 89.519 ms
Loss rate: 3.43%
-- Flow 1:
Average throughput: 94.99 Mbit/s
95th percentile per-packet one-way delay: 89.519 ms
Loss rate: 3.43%
```
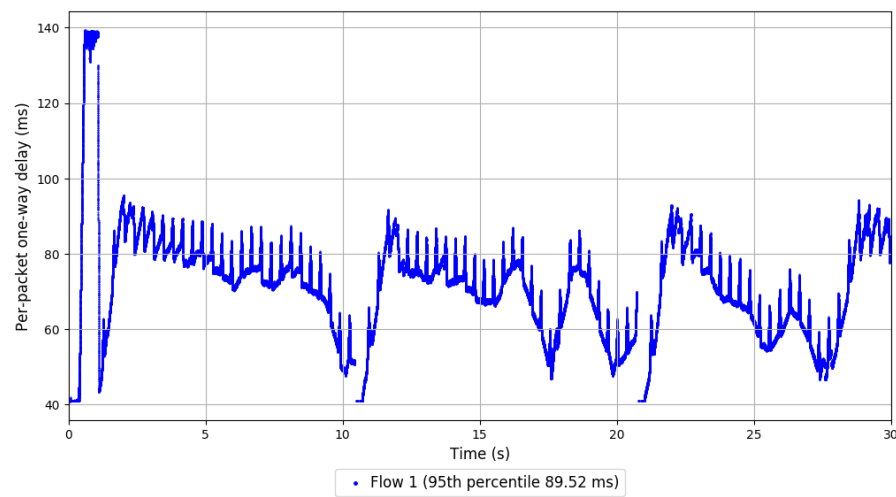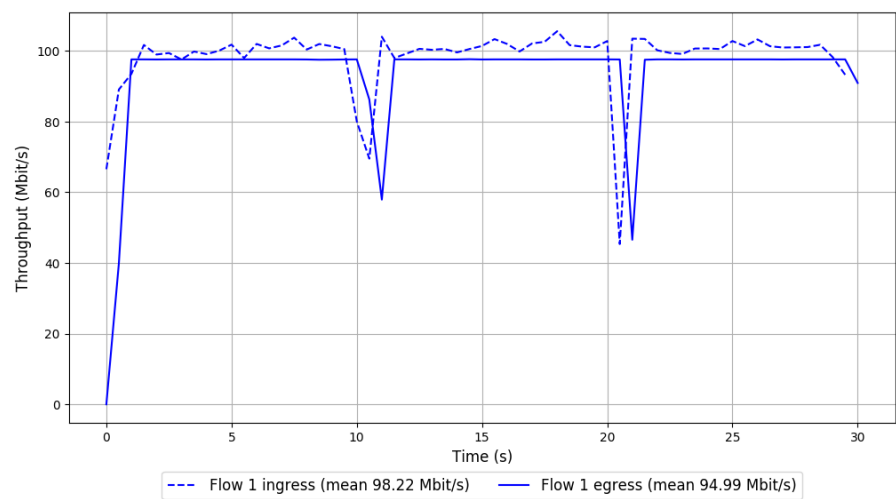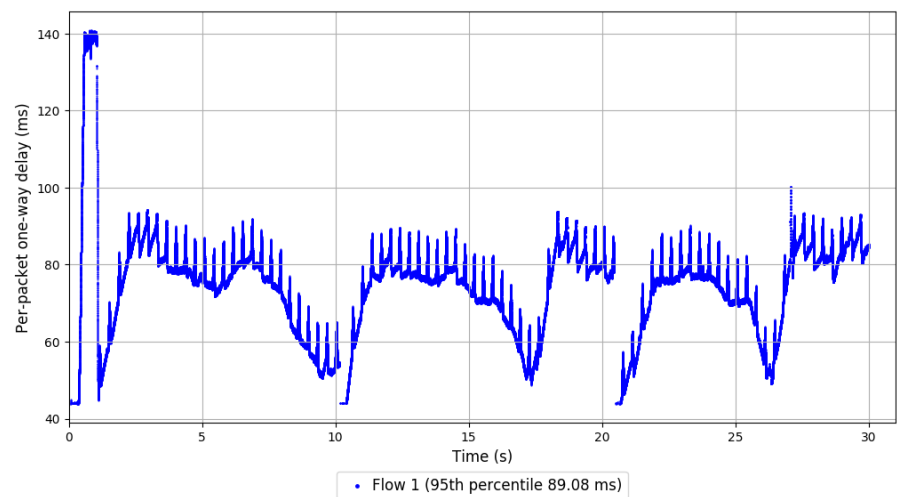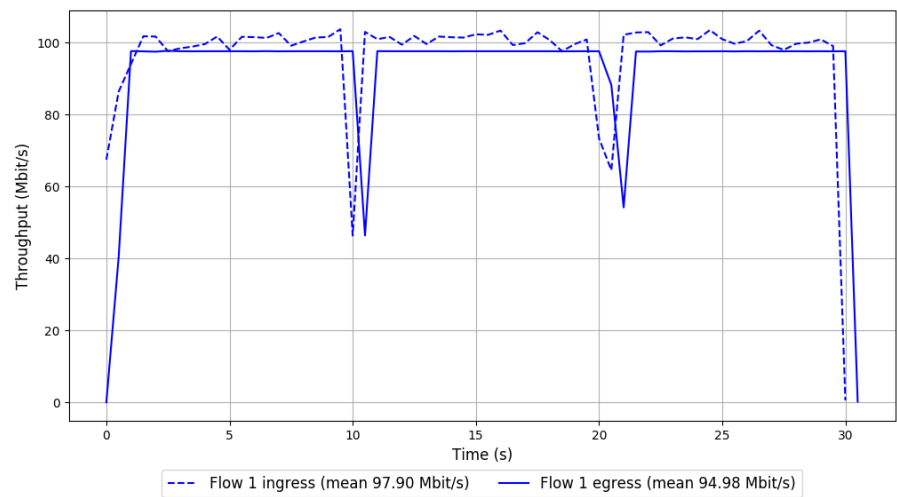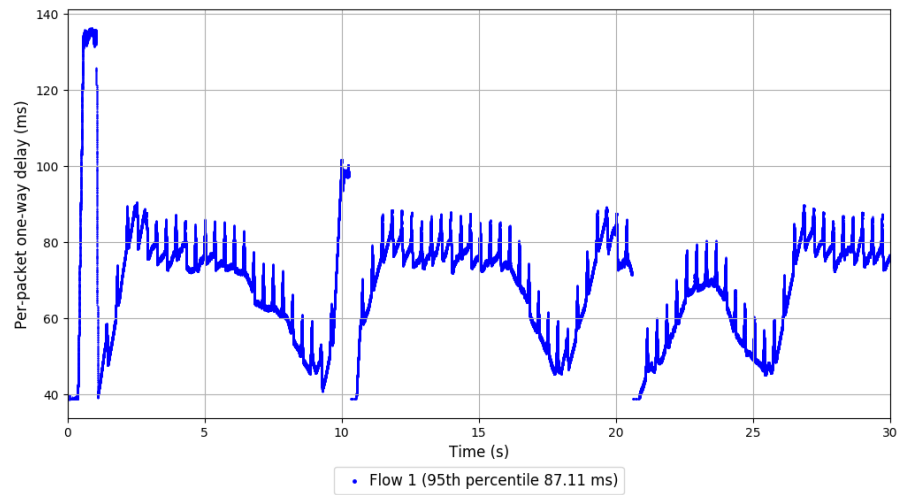
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2018-12-02 10:14:29
End at: 2018-12-02 10:14:59
Local clock offset: 3.758 ms
Remote clock offset: -4.135 ms


# Below is generated by plot.py at 2018-12-02 11:32:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 94.98 Mbit/s
95th percentile per-packet one-way delay: 89.077 ms
Loss rate: 3.13%
-- Flow 1:
Average throughput: 94.98 Mbit/s
95th percentile per-packet one-way delay: 89.077 ms
Loss rate: 3.13%
```
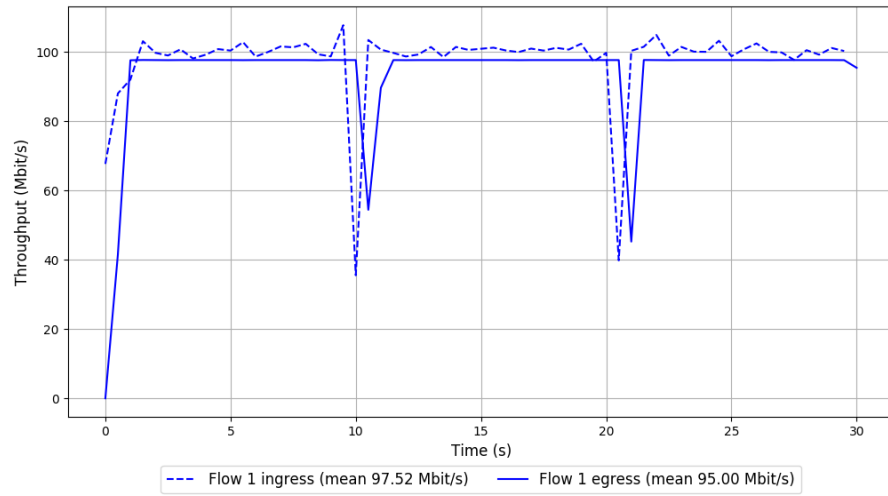
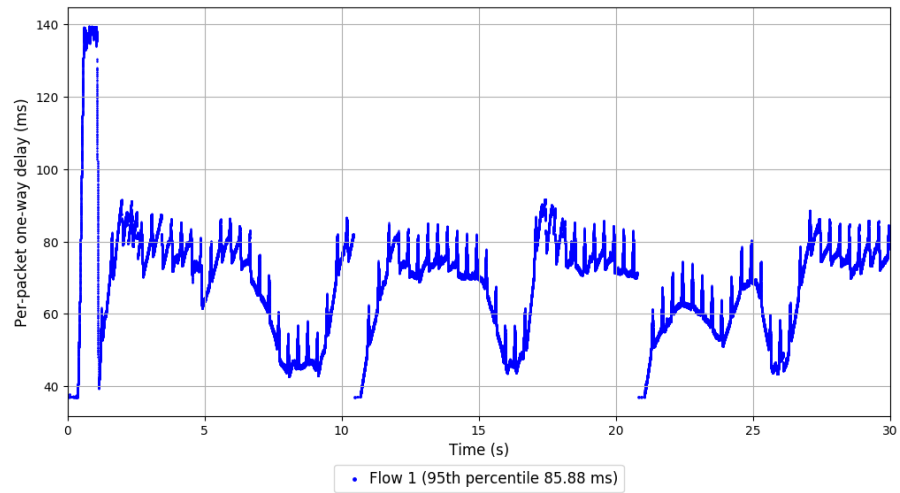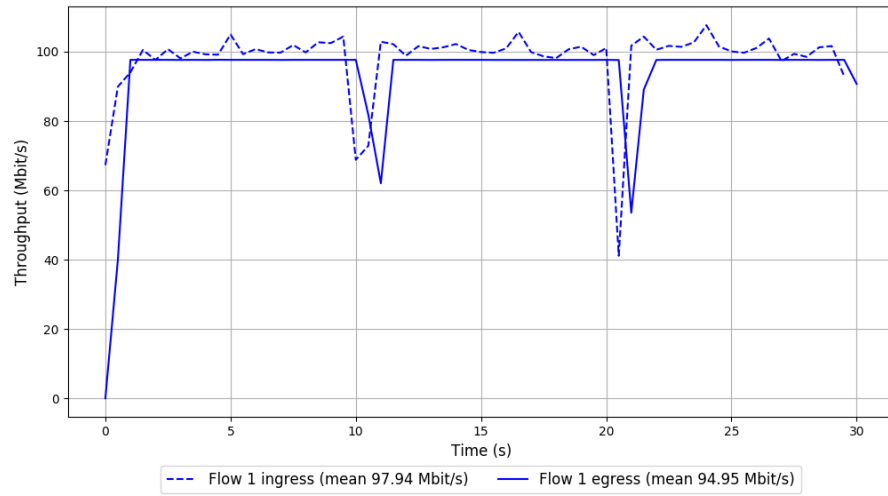Run 2: Report of TCP BBR — Data Link

Flow 1 ingress (mean 97.90 Mbit/s)   Flow 1 egress (mean 94.98 Mbit/s)

Flow 1 (95th percentile 89.08 ms)

```
Run 3: Statistics of TCP BBR

Start at: 2018-12-02 10:37:53
End at: 2018-12-02 10:38:23
Local clock offset: 2.798 ms
Remote clock offset: -0.71 ms


# Below is generated by plot.py at 2018-12-02 11:32:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.00 Mbit/s
95th percentile per-packet one-way delay: 87.113 ms
Loss rate: 2.73%
-- Flow 1:
Average throughput: 95.00 Mbit/s
95th percentile per-packet one-way delay: 87.113 ms
Loss rate: 2.73%
```

Run 3: Report of TCP BBR — Data Link

```
Run 4: Statistics of TCP BBR

Start at: 2018-12-02 11:00:42
End at: 2018-12-02 11:01:12
Local clock offset: 0.563 ms
Remote clock offset: -0.353 ms


# Below is generated by plot.py at 2018-12-02 11:32:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 94.95 Mbit/s
95th percentile per-packet one-way delay: 85.882 ms
Loss rate: 3.20%
-- Flow 1:
Average throughput: 94.95 Mbit/s
95th percentile per-packet one-way delay: 85.882 ms
Loss rate: 3.20%
```
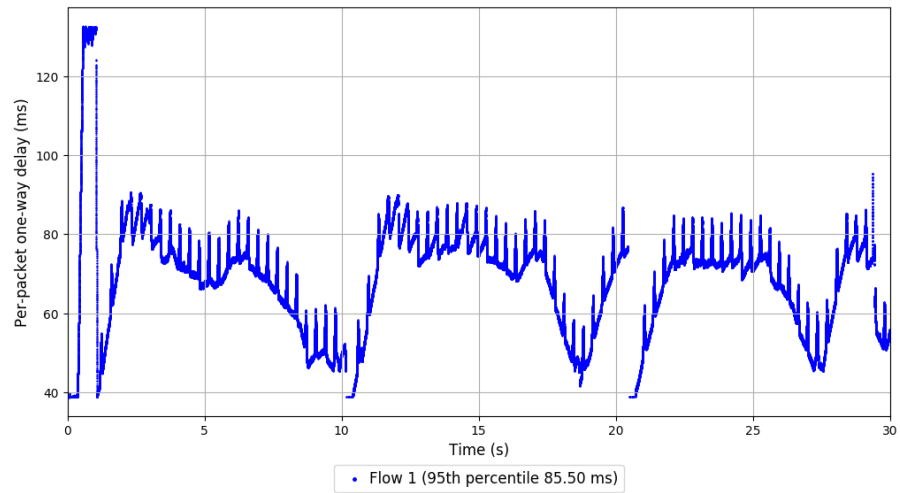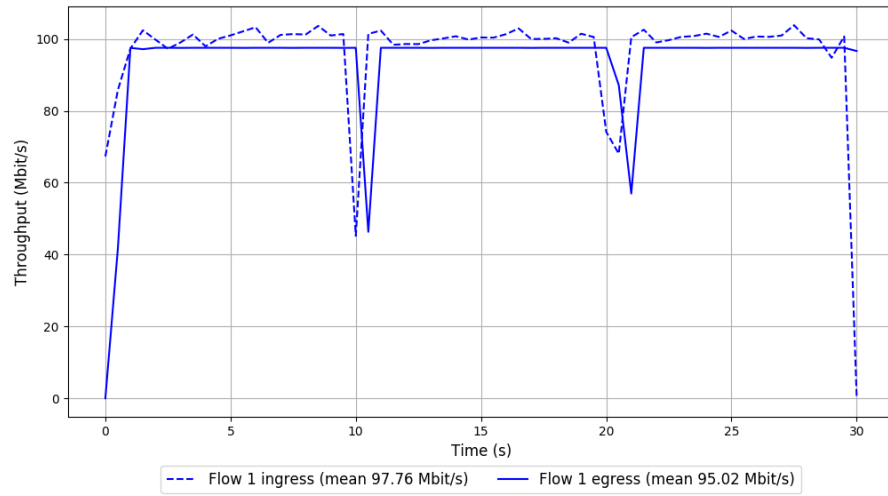
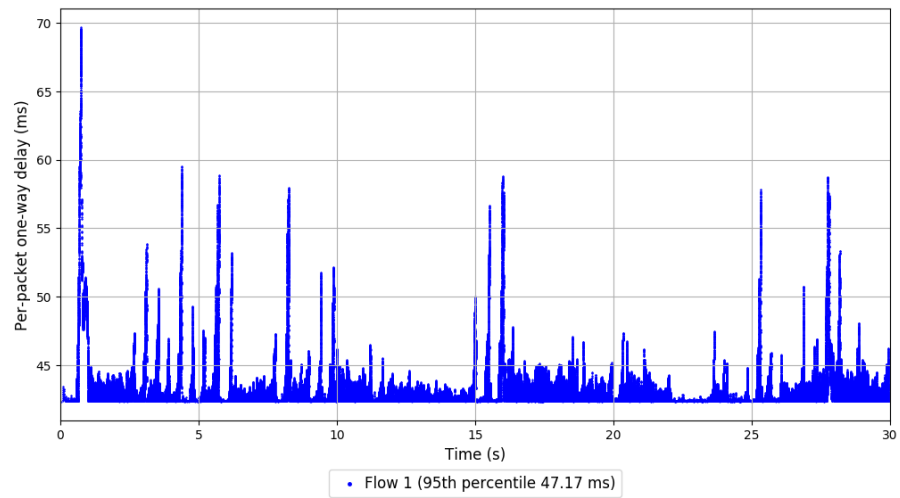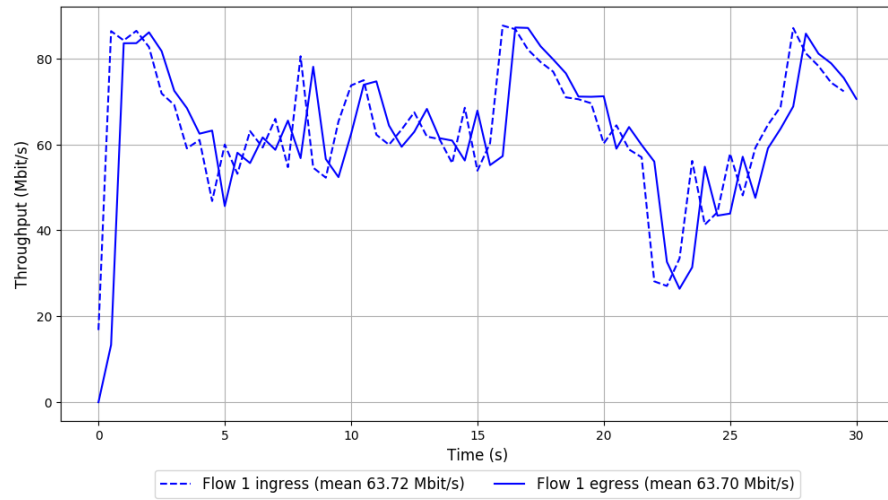# Run 4: Report of TCP BBR — Data Link

Flow 1 ingress (mean 97.94 Mbit/s)   Flow 1 egress (mean 94.95 Mbit/s)

Flow 1 (95th percentile 85.88 ms)

```
Run 5: Statistics of TCP BBR

Start at: 2018-12-02 11:24:05
End at: 2018-12-02 11:24:35
Local clock offset: 0.691 ms
Remote clock offset: -2.092 ms


# Below is generated by plot.py at 2018-12-02 11:32:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.02 Mbit/s
95th percentile per-packet one-way delay: 85.500 ms
Loss rate: 2.95%
-- Flow 1:
Average throughput: 95.02 Mbit/s
95th percentile per-packet one-way delay: 85.500 ms
Loss rate: 2.95%
```

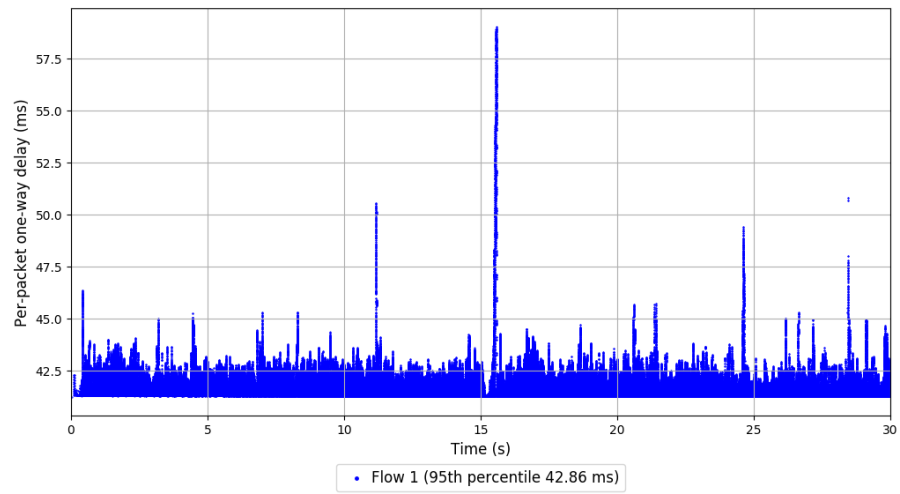Run 5: Report of TCP BBR — Data Link

Flow 1 ingress (mean 97.76 Mbit/s)   Flow 1 egress (mean 95.02 Mbit/s)

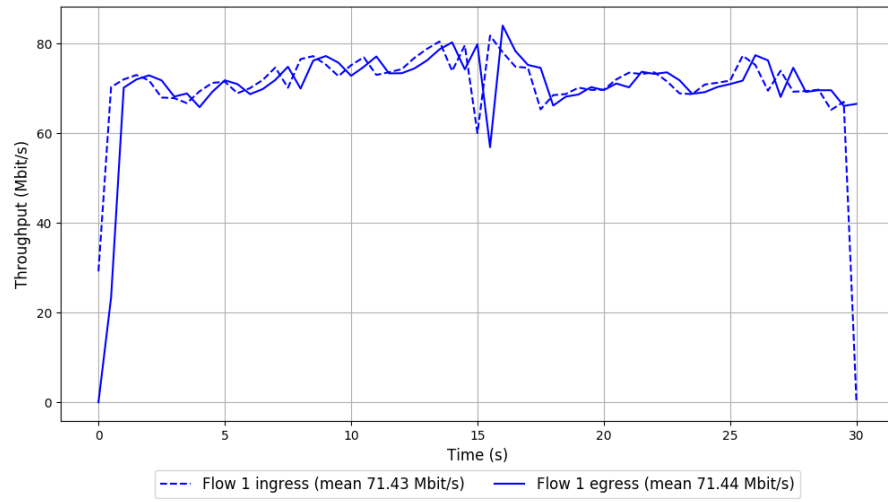Flow 1 (95th percentile 85.50 ms)

```
Run 1: Statistics of Copa

Start at: 2018-12-02 09:55:42
End at: 2018-12-02 09:56:13
Local clock offset: 2.279 ms
Remote clock offset: -3.852 ms

# Below is generated by plot.py at 2018-12-02 11:32:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 63.70 Mbit/s
95th percentile per-packet one-way delay: 47.167 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 63.70 Mbit/s
95th percentile per-packet one-way delay: 47.167 ms
Loss rate: 0.19%
```
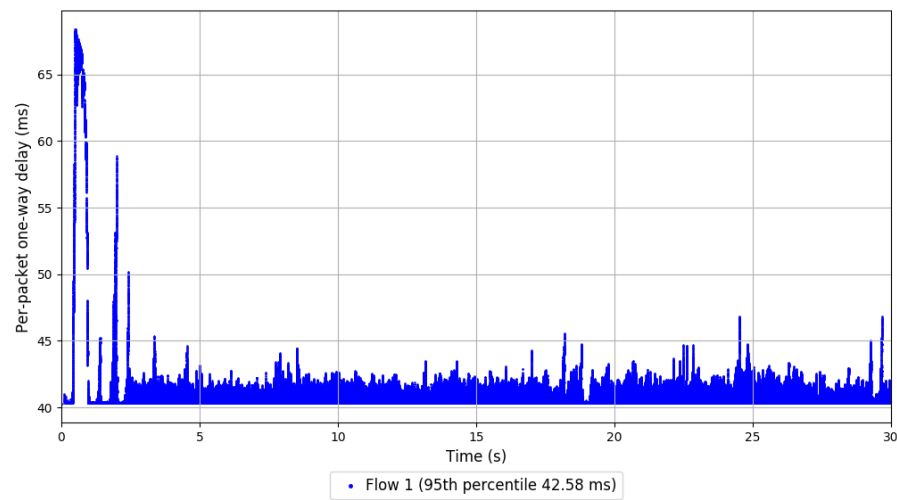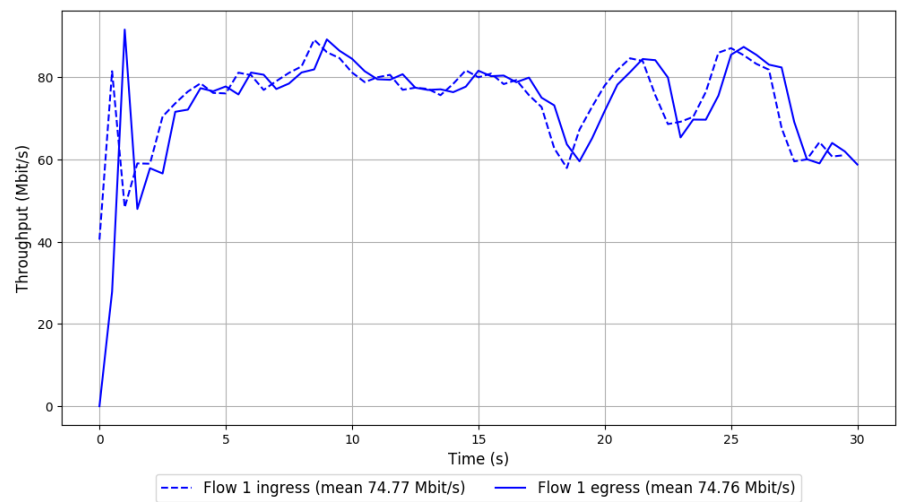
Run 1: Report of Copa — Data Link

Flow 1 ingress (mean 63.72 Mbit/s) ----- Flow 1 egress (mean 63.70 Mbit/s)

• Flow 1 (95th percentile 47.17 ms)

```
Run 2: Statistics of Copa

Start at: 2018-12-02 10:19:30
End at: 2018-12-02 10:20:00
Local clock offset: 2.036 ms
Remote clock offset: -3.414 ms


# Below is generated by plot.py at 2018-12-02 11:33:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 71.44 Mbit/s
95th percentile per-packet one-way delay: 42.856 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 71.44 Mbit/s
95th percentile per-packet one-way delay: 42.856 ms
Loss rate: 0.13%
```
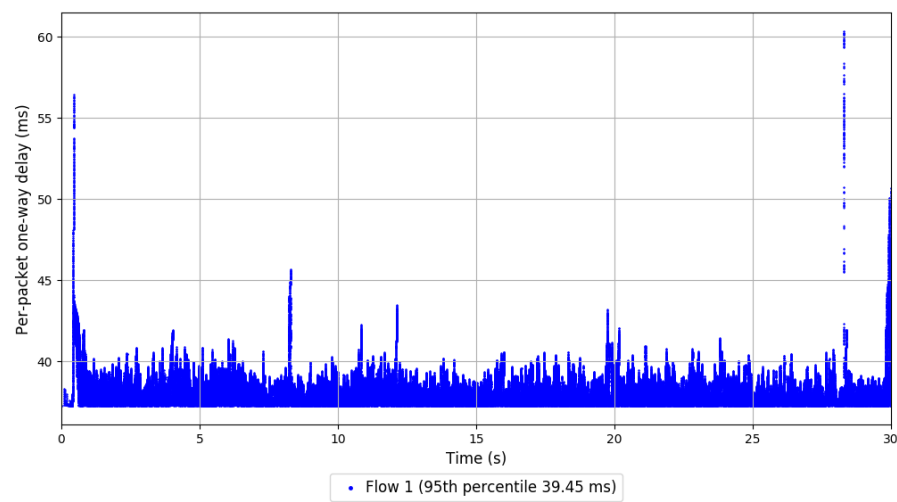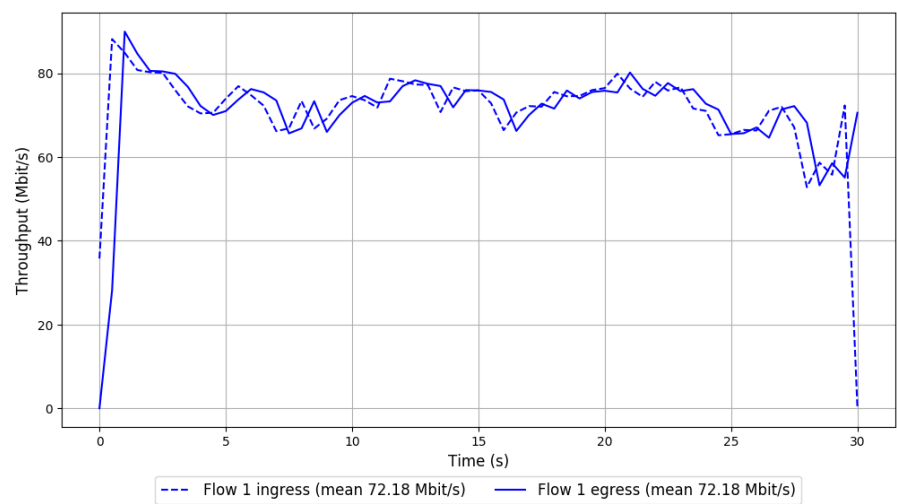
Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-12-02 10:42:45
End at: 2018-12-02 10:43:15
Local clock offset: 4.475 ms
Remote clock offset: -0.484 ms


# Below is generated by plot.py at 2018-12-02 11:33:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 74.76 Mbit/s
95th percentile per-packet one-way delay: 42.575 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 74.76 Mbit/s
95th percentile per-packet one-way delay: 42.575 ms
Loss rate: 0.15%
```
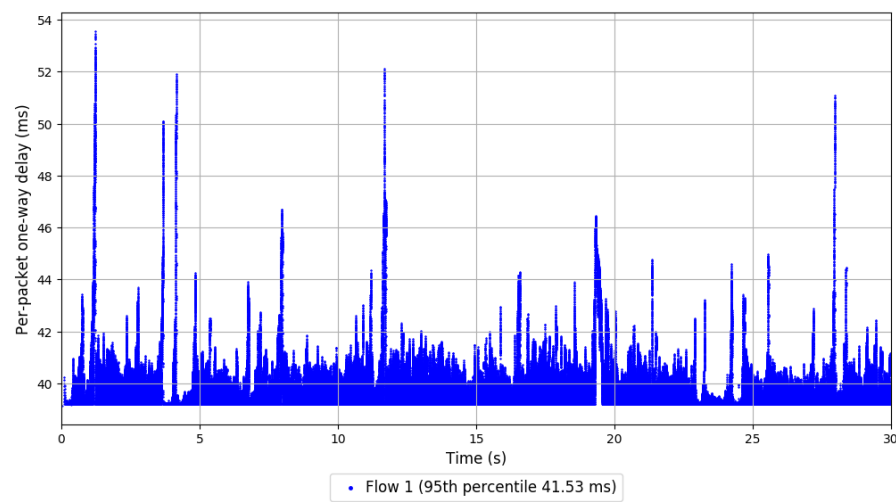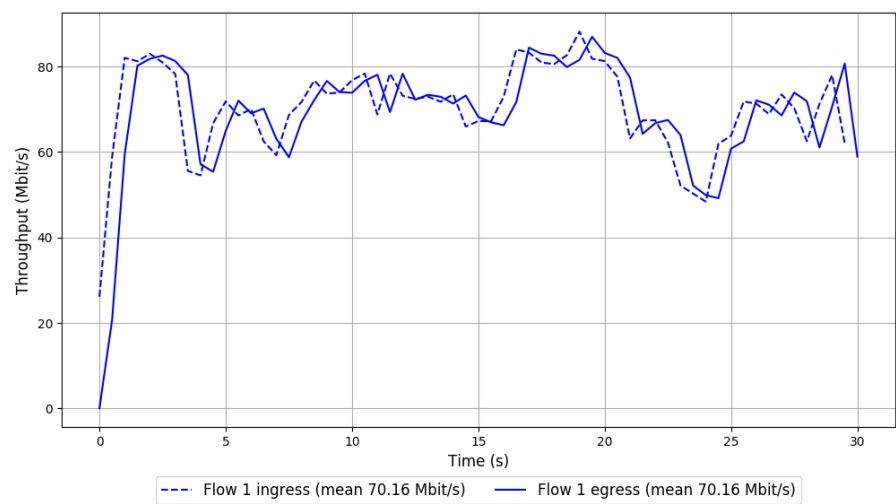
Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 74.77 Mbit/s) ----   Flow 1 egress (mean 74.76 Mbit/s) ——

• Flow 1 (95th percentile 42.58 ms)

20

```
Run 4: Statistics of Copa

Start at: 2018-12-02 11:05:40
End at: 2018-12-02 11:06:10
Local clock offset: 0.712 ms
Remote clock offset: -0.487 ms


# Below is generated by plot.py at 2018-12-02 11:34:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.18 Mbit/s
95th percentile per-packet one-way delay: 39.452 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 72.18 Mbit/s
95th percentile per-packet one-way delay: 39.452 ms
Loss rate: 0.15%
```
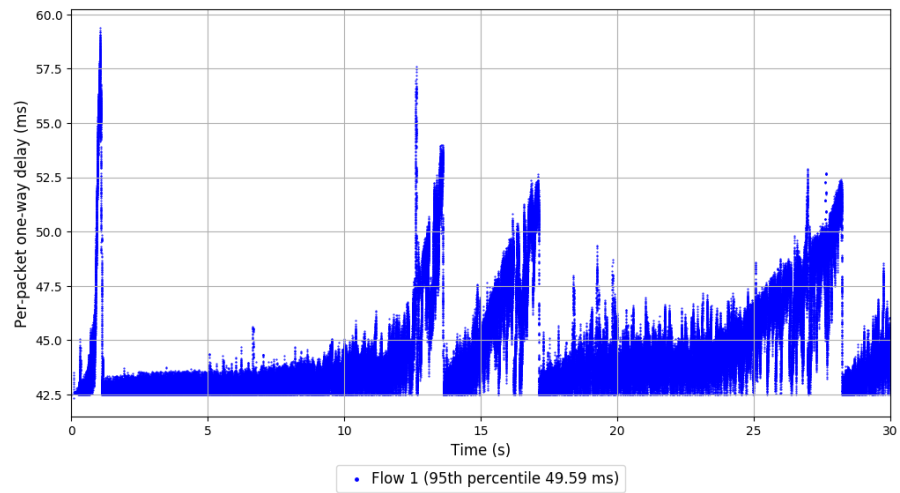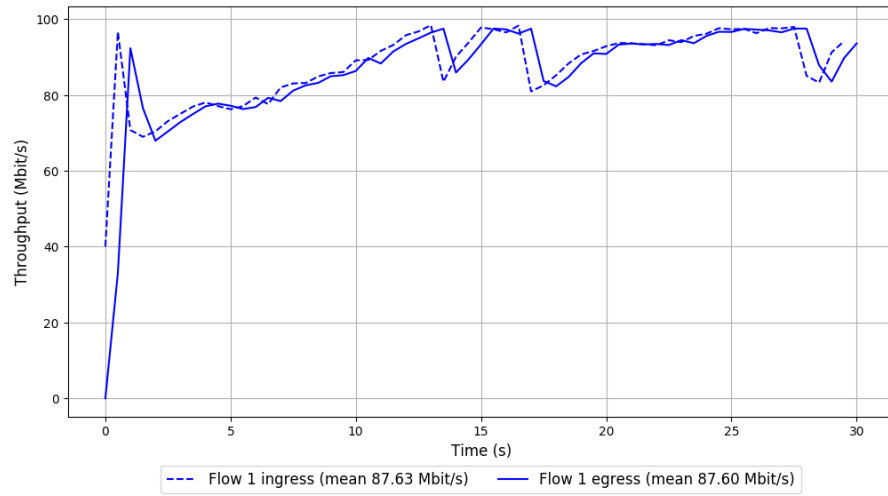
Run 4: Report of Copa — Data Link

Flow 1 ingress (mean 72.18 Mbit/s) --- Flow 1 egress (mean 72.18 Mbit/s) ———

Flow 1 (95th percentile 39.45 ms)

```
Run 5: Statistics of Copa

Start at: 2018-12-02 11:29:05
End at: 2018-12-02 11:29:35
Local clock offset: 2.284 ms
Remote clock offset: -1.052 ms


# Below is generated by plot.py at 2018-12-02 11:34:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 70.16 Mbit/s
95th percentile per-packet one-way delay: 41.530 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 70.16 Mbit/s
95th percentile per-packet one-way delay: 41.530 ms
Loss rate: 0.15%
```
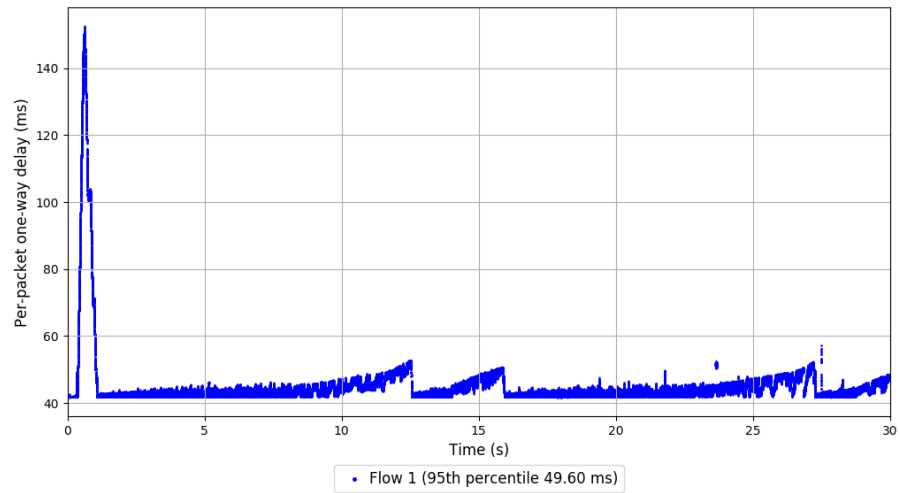
Run 5: Report of Copa — Data Link

Flow 1 ingress (mean 70.16 Mbit/s) — — — — Flow 1 egress (mean 70.16 Mbit/s) ———

Flow 1 (95th percentile 41.53 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2018-12-02 09:49:31
End at: 2018-12-02 09:50:01
Local clock offset: 2.589 ms
Remote clock offset: -3.655 ms


# Below is generated by plot.py at 2018-12-02 11:34:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 87.60 Mbit/s
95th percentile per-packet one-way delay: 49.587 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 87.60 Mbit/s
95th percentile per-packet one-way delay: 49.587 ms
Loss rate: 0.18%
```
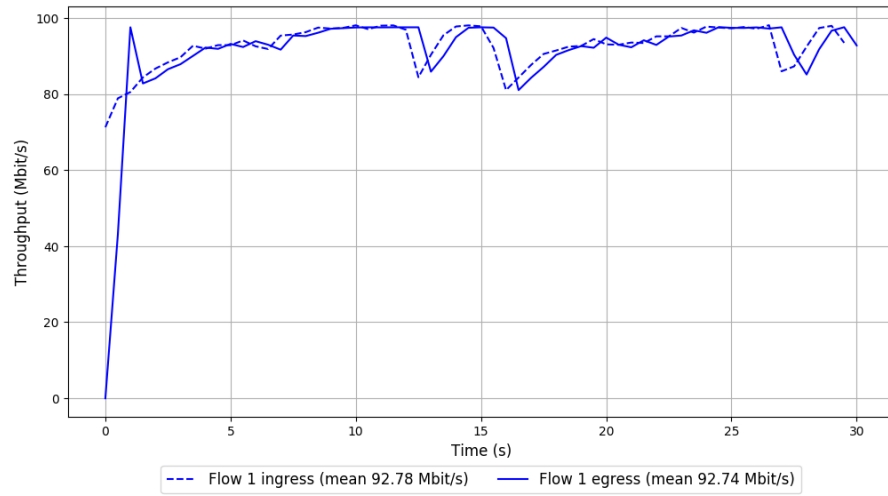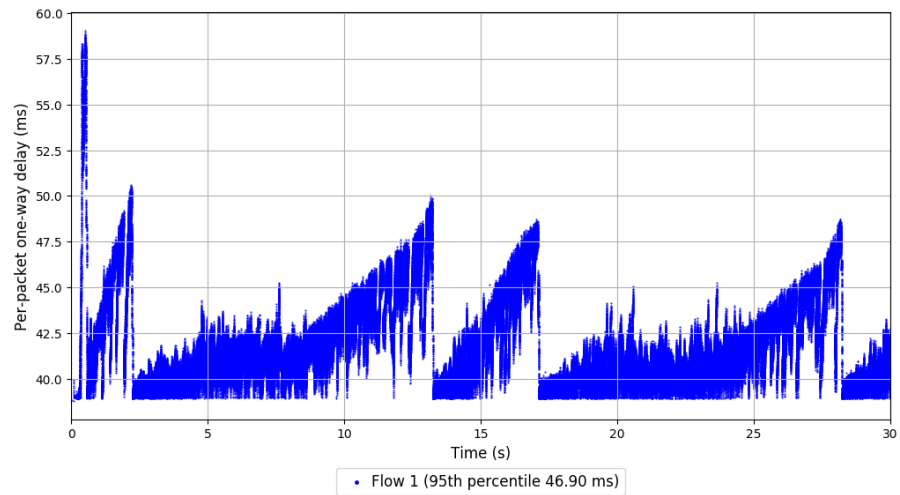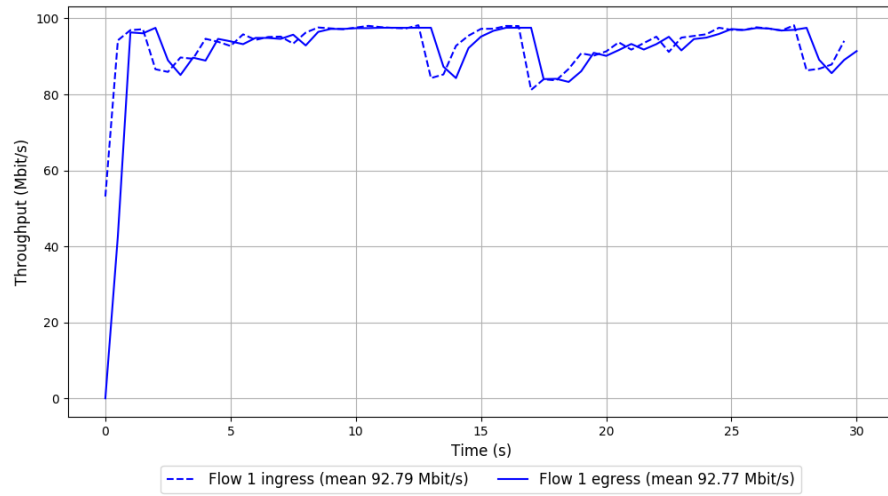
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-12-02 10:13:17
End at: 2018-12-02 10:13:47
Local clock offset: -5.251 ms
Remote clock offset: -10.9 ms


# Below is generated by plot.py at 2018-12-02 11:34:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.74 Mbit/s
95th percentile per-packet one-way delay: 49.600 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 92.74 Mbit/s
95th percentile per-packet one-way delay: 49.600 ms
Loss rate: 0.18%
```
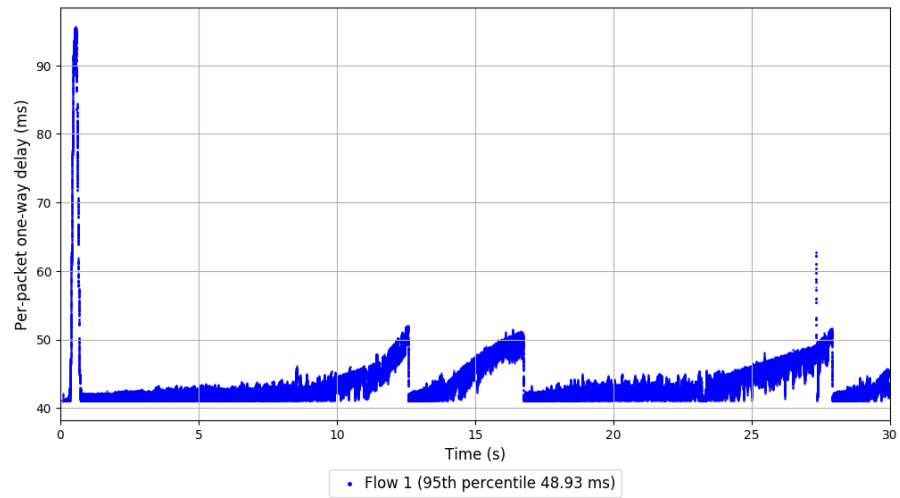
Run 2: Report of TCP Cubic — Data Link

```
Run 3: Statistics of TCP Cubic

Start at: 2018-12-02 10:36:42
End at: 2018-12-02 10:37:12
Local clock offset: 3.105 ms
Remote clock offset: -0.493 ms


# Below is generated by plot.py at 2018-12-02 11:34:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.77 Mbit/s
95th percentile per-packet one-way delay: 46.895 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 92.77 Mbit/s
95th percentile per-packet one-way delay: 46.895 ms
Loss rate: 0.16%
```
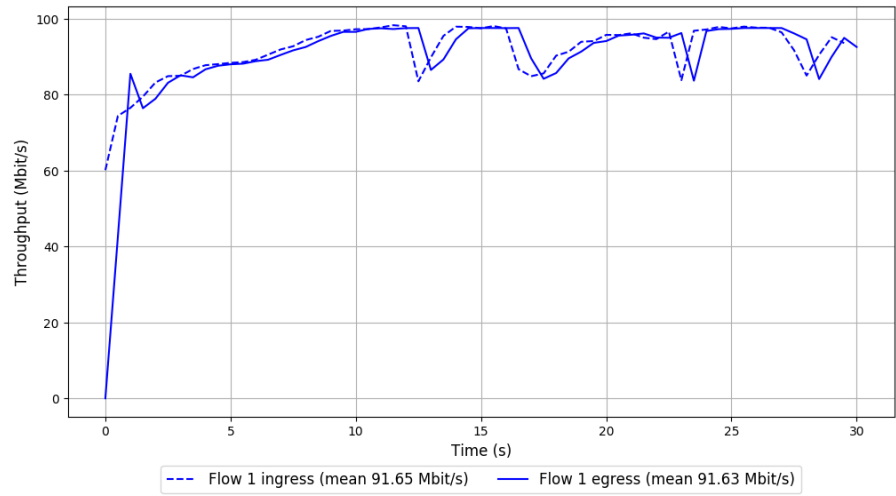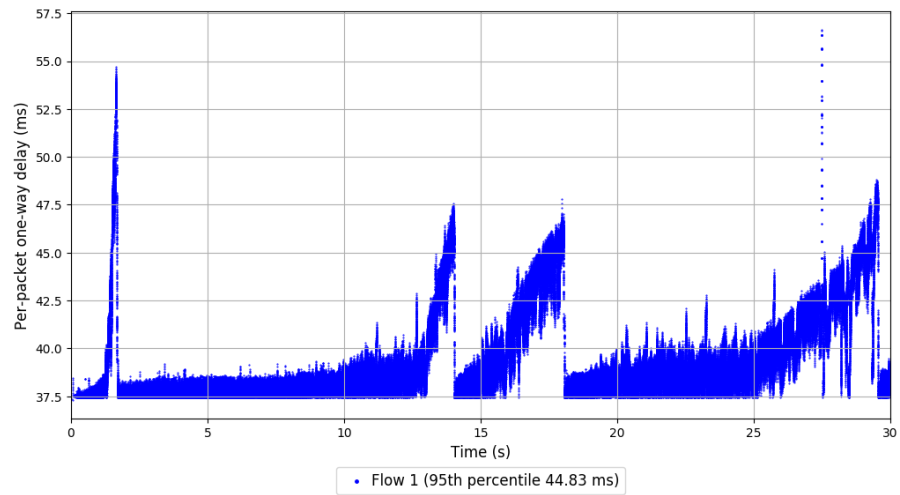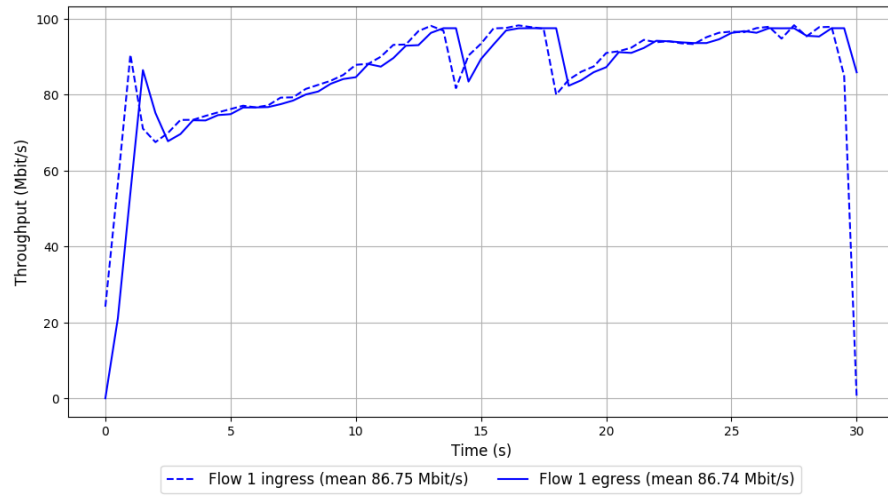
Run 3: Report of TCP Cubic — Data Link

```
Run 4: Statistics of TCP Cubic

Start at: 2018-12-02 10:59:28
End at: 2018-12-02 10:59:58
Local clock offset: 4.452 ms
Remote clock offset: -0.62 ms


# Below is generated by plot.py at 2018-12-02 11:34:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.63 Mbit/s
95th percentile per-packet one-way delay: 48.928 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 91.63 Mbit/s
95th percentile per-packet one-way delay: 48.928 ms
Loss rate: 0.17%
```
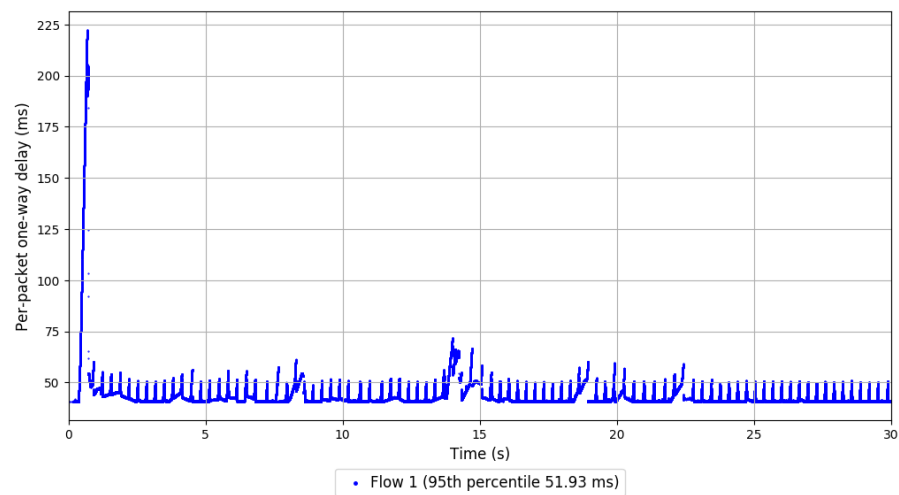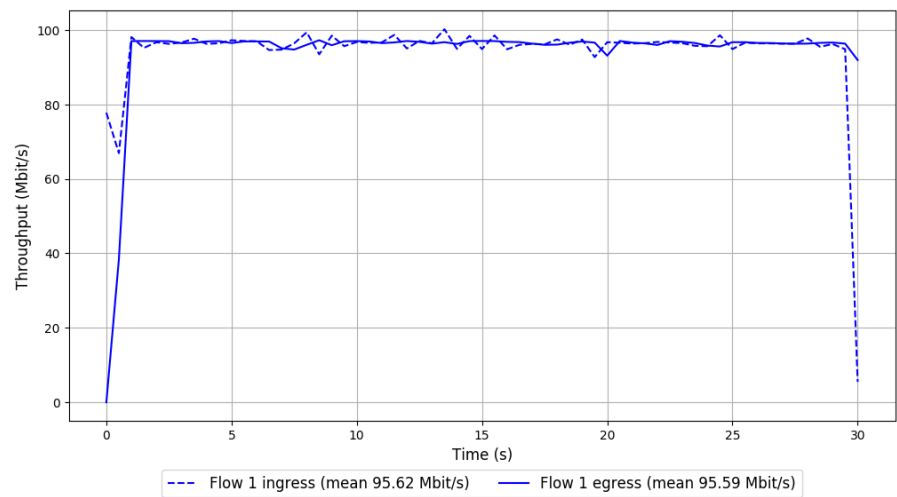
Run 4: Report of TCP Cubic — Data Link

```
Run 5: Statistics of TCP Cubic

Start at: 2018-12-02 11:22:50
End at: 2018-12-02 11:23:20
Local clock offset: 0.502 ms
Remote clock offset: -0.932 ms


# Below is generated by plot.py at 2018-12-02 11:34:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.74 Mbit/s
95th percentile per-packet one-way delay: 44.834 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 86.74 Mbit/s
95th percentile per-packet one-way delay: 44.834 ms
Loss rate: 0.16%
```

Run 5: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 86.75 Mbit/s)   ——— Flow 1 egress (mean 86.74 Mbit/s)
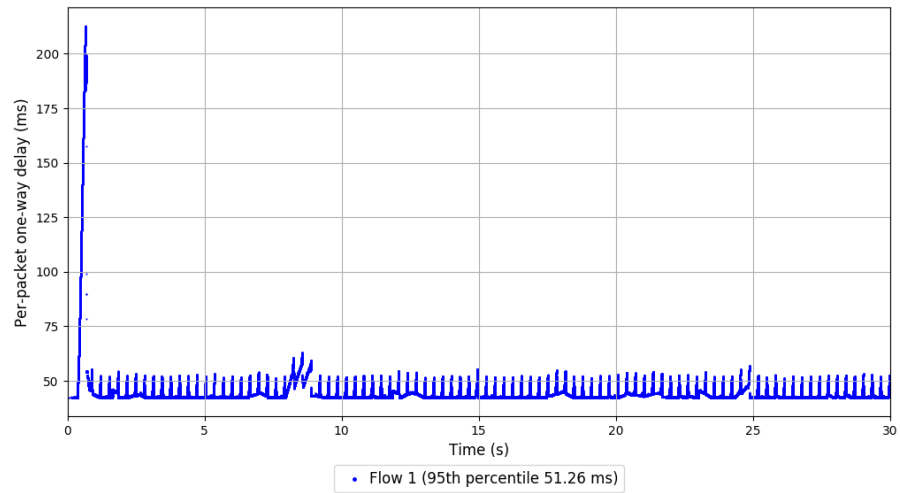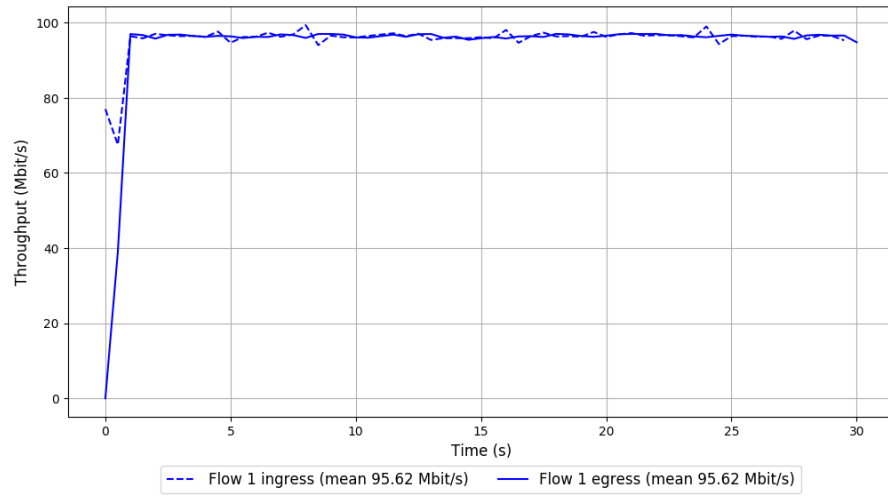

• Flow 1 (95th percentile 44.83 ms)

```
Run 1: Statistics of FillP

Start at: 2018-12-02 09:44:20
End at: 2018-12-02 09:44:50
Local clock offset: 0.59 ms
Remote clock offset: -3.884 ms


# Below is generated by plot.py at 2018-12-02 11:34:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.59 Mbit/s
95th percentile per-packet one-way delay: 51.933 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 95.59 Mbit/s
95th percentile per-packet one-way delay: 51.933 ms
Loss rate: 0.31%
```
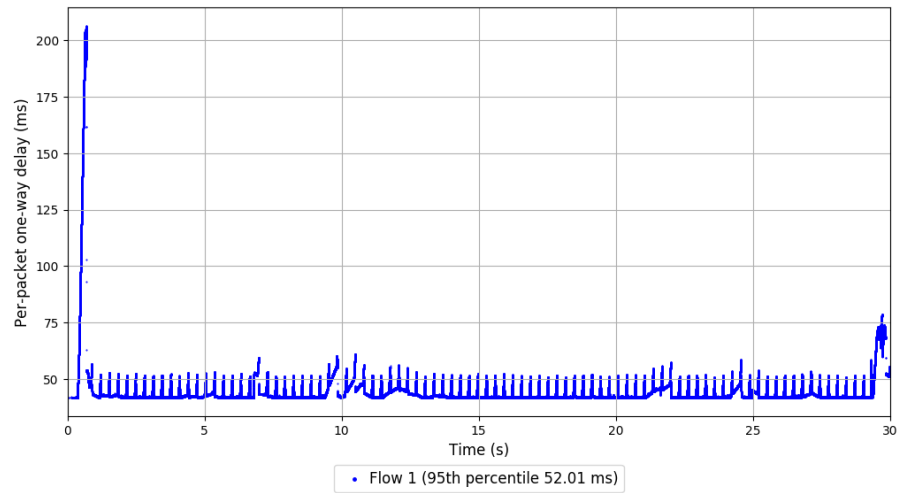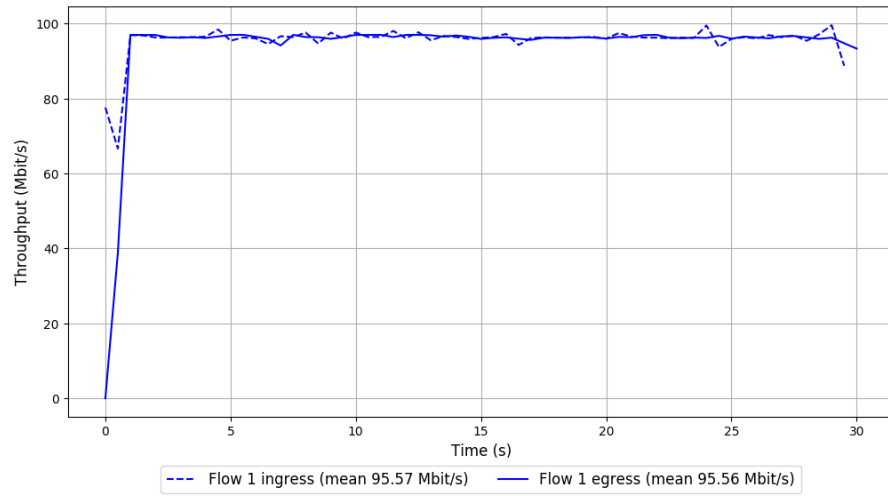
Run 1: Report of FillP — Data Link

Flow 1 ingress (mean 95.62 Mbit/s)   Flow 1 egress (mean 95.59 Mbit/s)

Flow 1 (95th percentile 51.93 ms)

```
Run 2: Statistics of FillP

Start at: 2018-12-02 10:08:16
End at: 2018-12-02 10:08:46
Local clock offset: 2.603 ms
Remote clock offset: -3.605 ms


# Below is generated by plot.py at 2018-12-02 11:34:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.62 Mbit/s
95th percentile per-packet one-way delay: 51.258 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 95.62 Mbit/s
95th percentile per-packet one-way delay: 51.258 ms
Loss rate: 0.15%
```

Run 2: Report of FillP — Data Link

Flow 1 ingress (mean 95.62 Mbit/s)   Flow 1 egress (mean 95.62 Mbit/s)

Flow 1 (95th percentile 51.26 ms)

```
Run 3: Statistics of FillP

Start at: 2018-12-02 10:31:41
End at: 2018-12-02 10:32:11
Local clock offset: 4.259 ms
Remote clock offset: -2.177 ms


# Below is generated by plot.py at 2018-12-02 11:34:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.56 Mbit/s
95th percentile per-packet one-way delay: 52.011 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 95.56 Mbit/s
95th percentile per-packet one-way delay: 52.011 ms
Loss rate: 0.16%
```
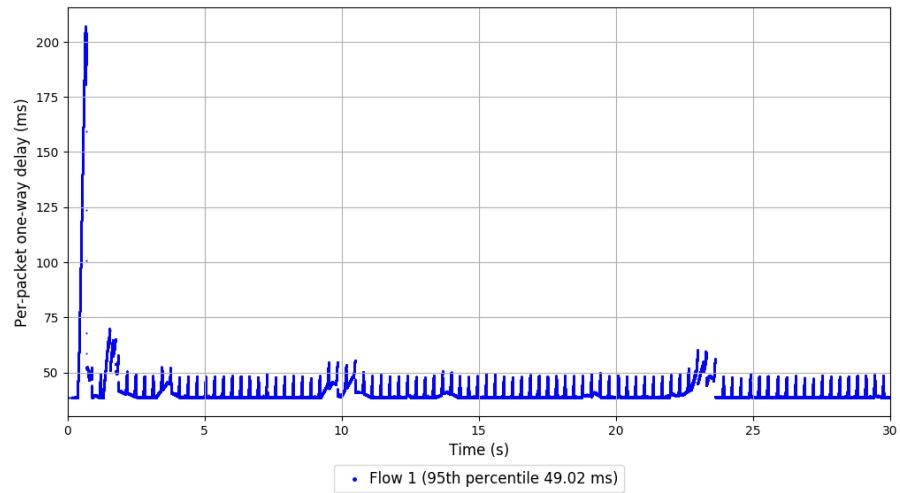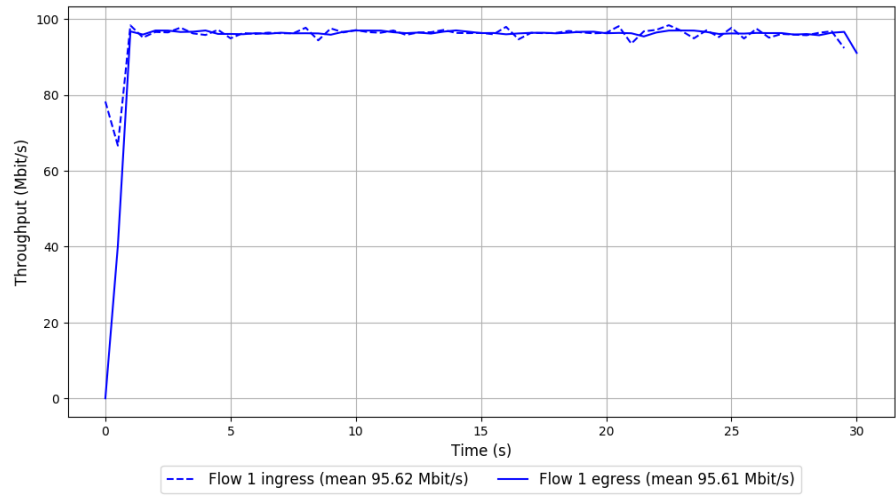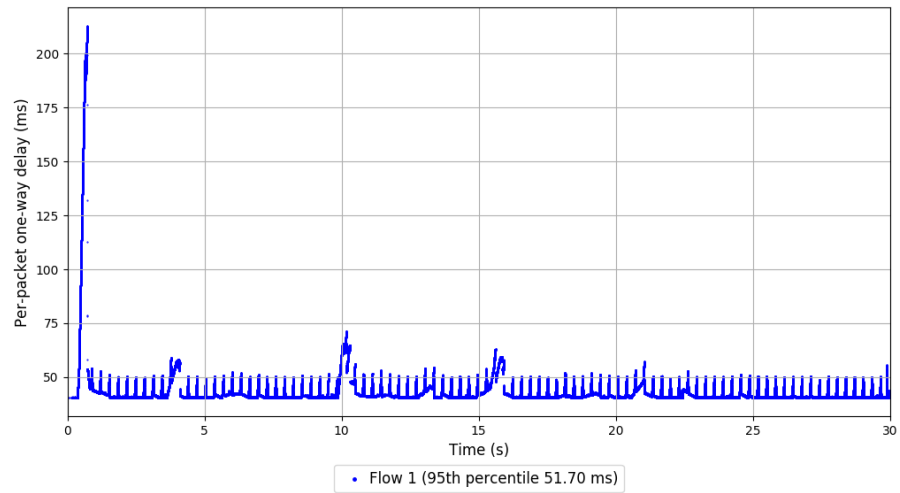
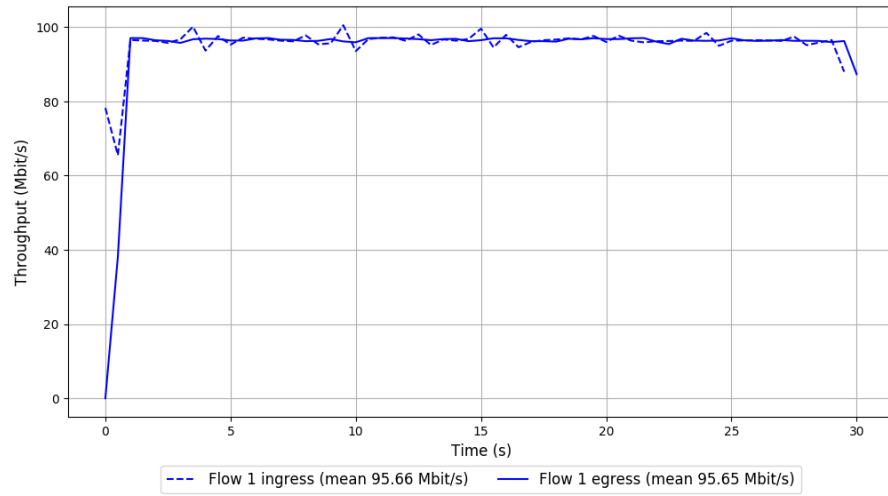## Run 3: Report of FillP — Data Link

Flow 1 ingress (mean 95.57 Mbit/s) --- Flow 1 egress (mean 95.56 Mbit/s)

Flow 1 (95th percentile 52.01 ms)

```
Run 4: Statistics of FillP

Start at: 2018-12-02 10:54:42
End at: 2018-12-02 10:55:12
Local clock offset: 2.894 ms
Remote clock offset: 0.135 ms


# Below is generated by plot.py at 2018-12-02 11:34:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.61 Mbit/s
95th percentile per-packet one-way delay: 49.016 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 95.61 Mbit/s
95th percentile per-packet one-way delay: 49.016 ms
Loss rate: 0.17%
```
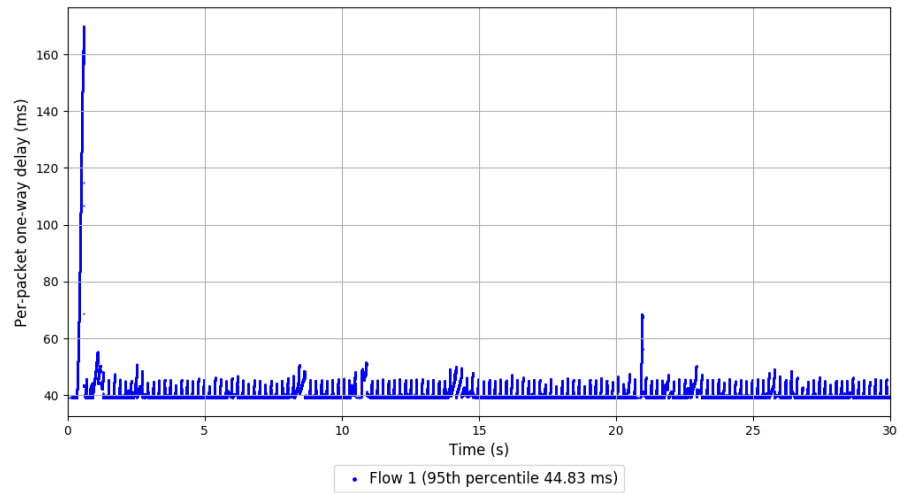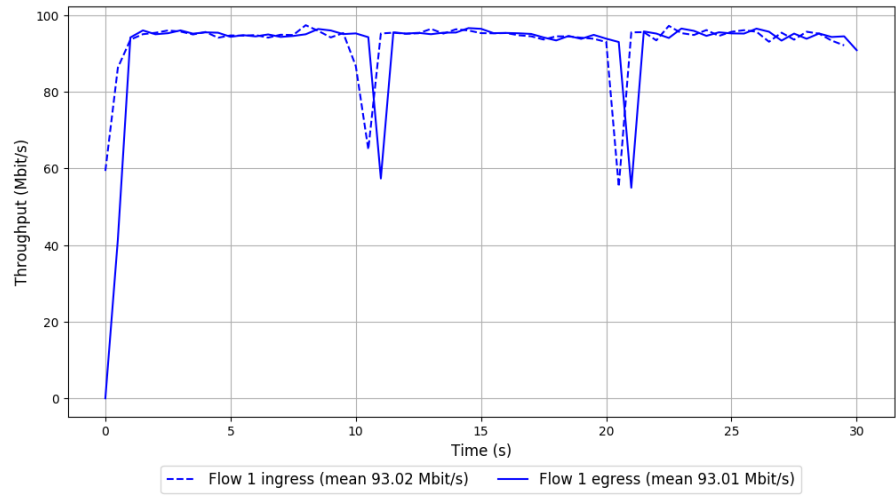
Run 4: Report of FillP — Data Link

Flow 1 ingress (mean 95.62 Mbit/s) --- Flow 1 egress (mean 95.61 Mbit/s)

Flow 1 (95th percentile 49.02 ms)

```
Run 5: Statistics of FillP

Start at: 2018-12-02 11:17:51
End at: 2018-12-02 11:18:21
Local clock offset: 4.049 ms
Remote clock offset: -0.501 ms


# Below is generated by plot.py at 2018-12-02 11:35:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.65 Mbit/s
95th percentile per-packet one-way delay: 51.703 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 95.65 Mbit/s
95th percentile per-packet one-way delay: 51.703 ms
Loss rate: 0.16%
```
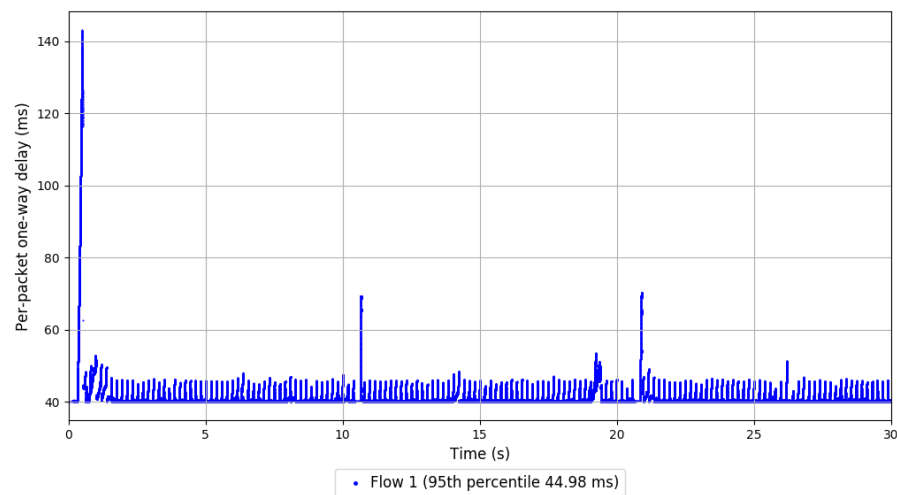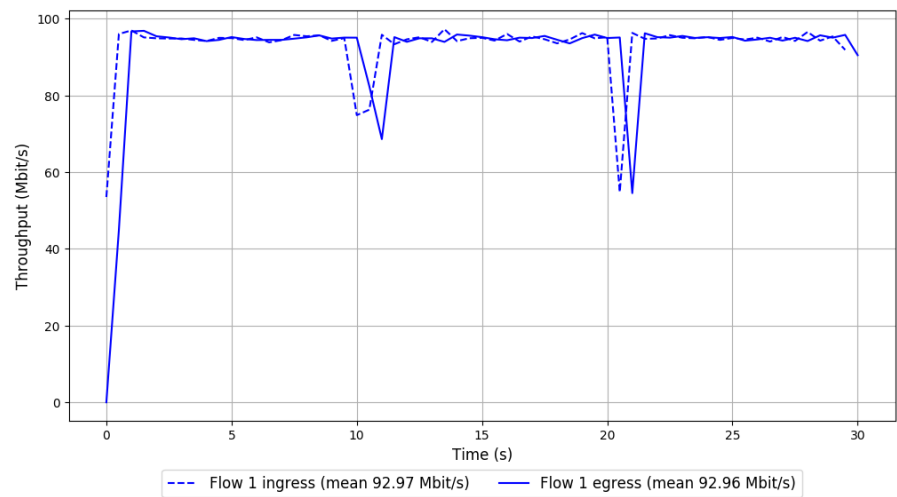
Run 5: Report of FillP — Data Link

Flow 1 ingress (mean 95.66 Mbit/s)   Flow 1 egress (mean 95.65 Mbit/s)

Flow 1 (95th percentile 51.70 ms)

```
Run 1: Statistics of FillP-Sheep

Start at: 2018-12-02 09:33:30
End at: 2018-12-02 09:34:00
Local clock offset: 0.006 ms
Remote clock offset: -2.683 ms


# Below is generated by plot.py at 2018-12-02 11:35:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 93.01 Mbit/s
95th percentile per-packet one-way delay: 44.834 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 93.01 Mbit/s
95th percentile per-packet one-way delay: 44.834 ms
Loss rate: 0.16%
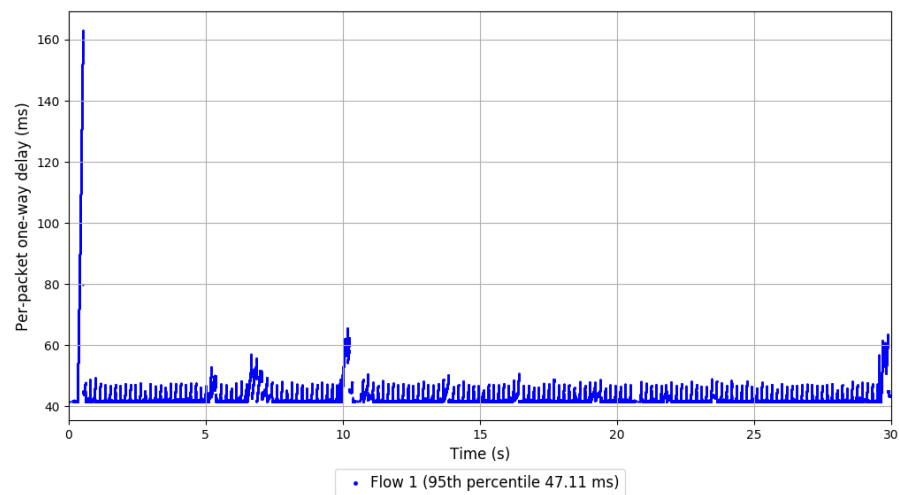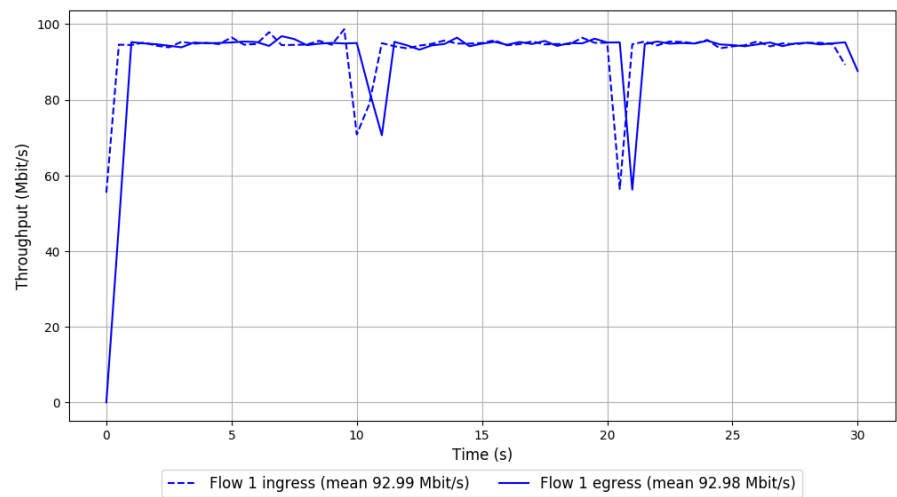```

Run 1: Report of FillP-Sheep — Data Link



Flow 1 ingress (mean 93.02 Mbit/s) ---- Flow 1 egress (mean 93.01 Mbit/s)



• Flow 1 (95th percentile 44.83 ms)

```
Run 2: Statistics of FillP-Sheep

Start at: 2018-12-02 09:56:59
End at: 2018-12-02 09:57:29
Local clock offset: 0.557 ms
Remote clock offset: -3.394 ms

Below is generated by plot.py at 2018-12-02 11:35:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 92.96 Mbit/s
95th percentile per-packet one-way delay: 44.976 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 92.96 Mbit/s
95th percentile per-packet one-way delay: 44.976 ms
Loss rate: 0.16%
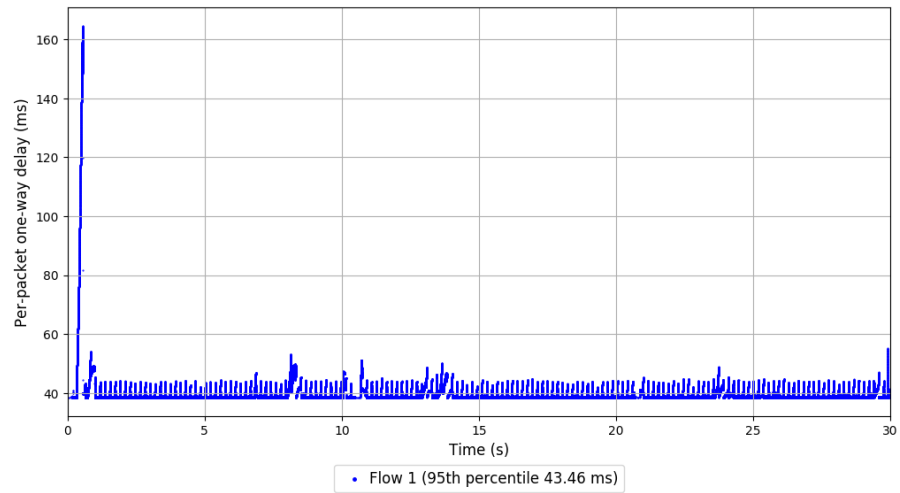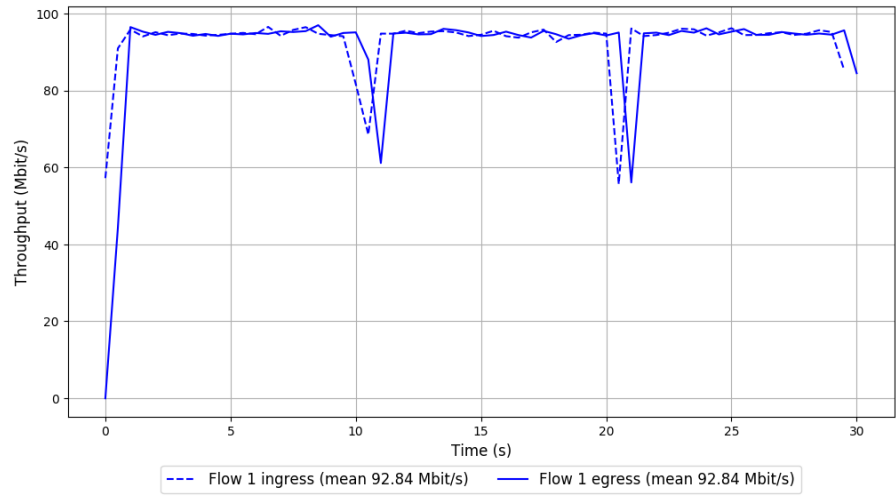```

Run 2: Report of FillP-Sheep — Data Link

```
Run 3: Statistics of FillP-Sheep

Start at: 2018-12-02 10:20:51
End at: 2018-12-02 10:21:21
Local clock offset: 1.812 ms
Remote clock offset: -4.012 ms


# Below is generated by plot.py at 2018-12-02 11:35:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.98 Mbit/s
95th percentile per-packet one-way delay: 47.108 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 92.98 Mbit/s
95th percentile per-packet one-way delay: 47.108 ms
Loss rate: 0.17%
```
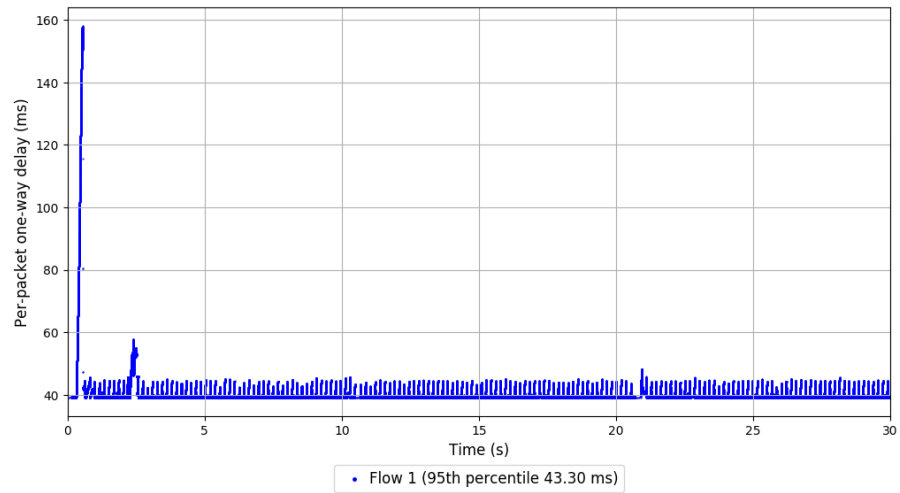
Run 3: Report of FillP-Sheep — Data Link

```
Run 4: Statistics of FillP-Sheep

Start at: 2018-12-02 10:44:03
End at: 2018-12-02 10:44:33
Local clock offset: 2.277 ms
Remote clock offset: -0.927 ms


# Below is generated by plot.py at 2018-12-02 11:35:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.84 Mbit/s
95th percentile per-packet one-way delay: 43.460 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 92.84 Mbit/s
95th percentile per-packet one-way delay: 43.460 ms
Loss rate: 0.16%
```
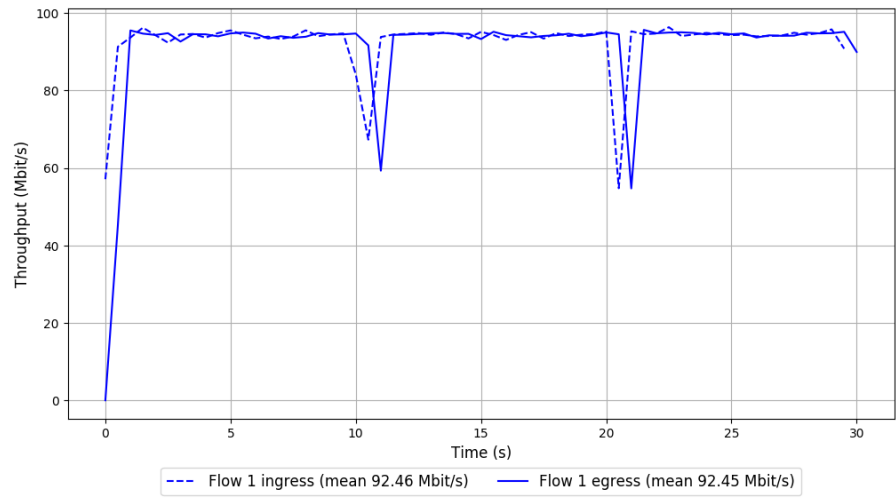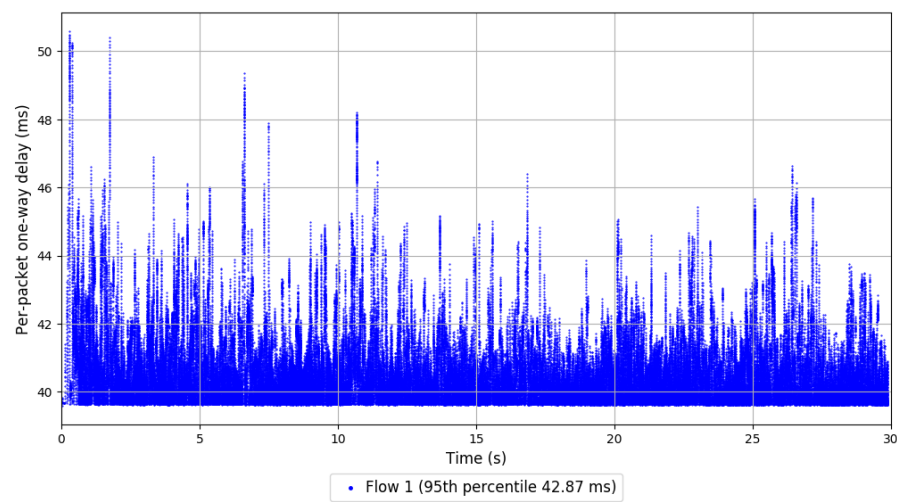
Run 4: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 92.84 Mbit/s) Flow 1 egress (mean 92.84 Mbit/s)

Flow 1 (95th percentile 43.46 ms)

```
Run 5: Statistics of FillP-Sheep

Start at: 2018-12-02 11:06:55
End at: 2018-12-02 11:07:25
Local clock offset: 1.817 ms
Remote clock offset: -1.366 ms


# Below is generated by plot.py at 2018-12-02 11:36:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.45 Mbit/s
95th percentile per-packet one-way delay: 43.305 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 92.45 Mbit/s
95th percentile per-packet one-way delay: 43.305 ms
Loss rate: 0.16%
```
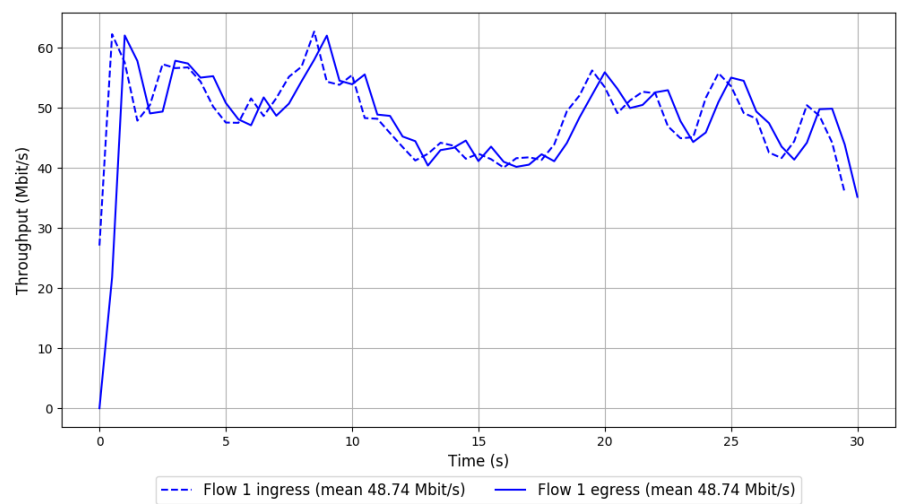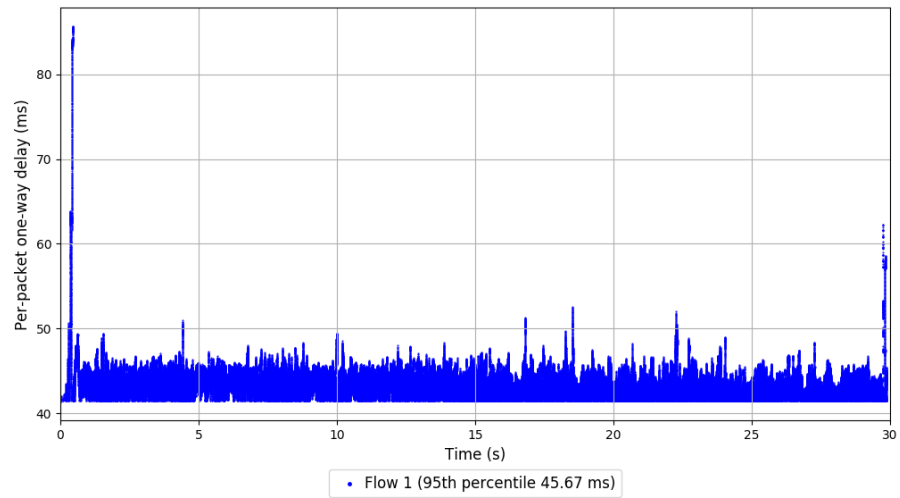
Run 5: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 92.46 Mbit/s)   Flow 1 egress (mean 92.45 Mbit/s)

Flow 1 (95th percentile 43.30 ms)

```
Run 1: Statistics of Indigo

Start at: 2018-12-02 09:45:36
End at: 2018-12-02 09:46:06
Local clock offset: 0.247 ms
Remote clock offset: -3.112 ms


# Below is generated by plot.py at 2018-12-02 11:36:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 48.74 Mbit/s
95th percentile per-packet one-way delay: 42.865 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 48.74 Mbit/s
95th percentile per-packet one-way delay: 42.865 ms
Loss rate: 0.15%
```
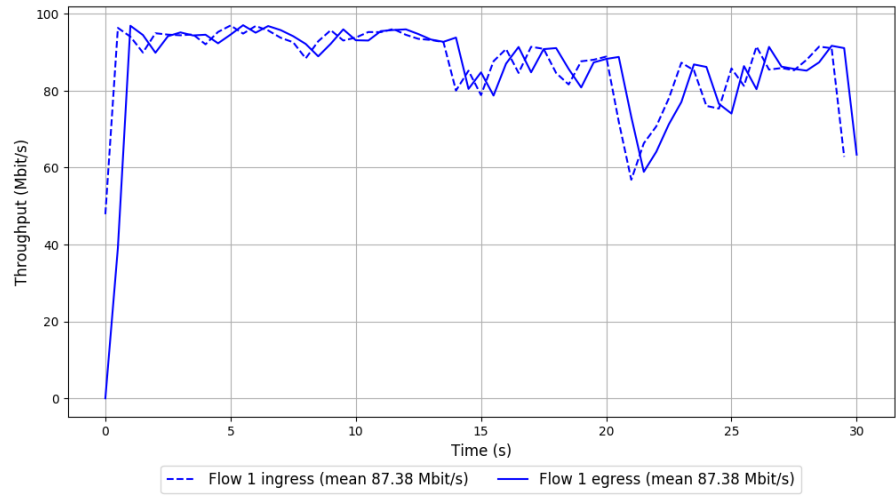
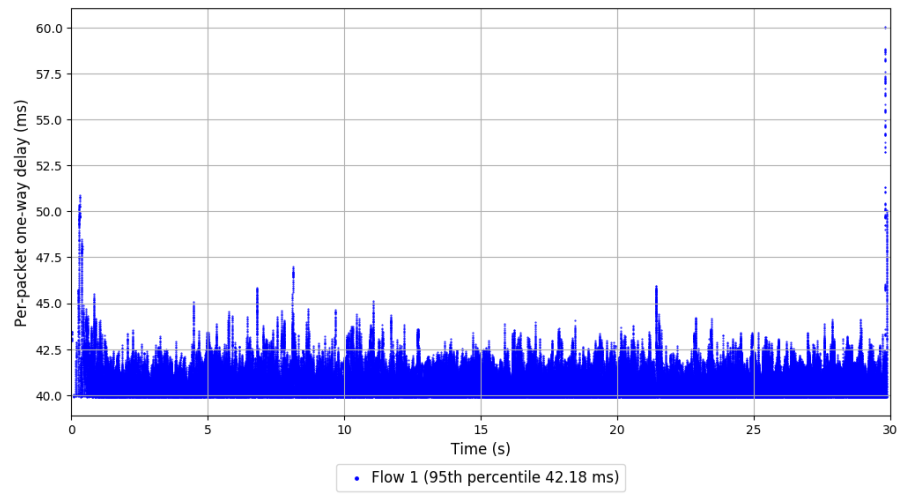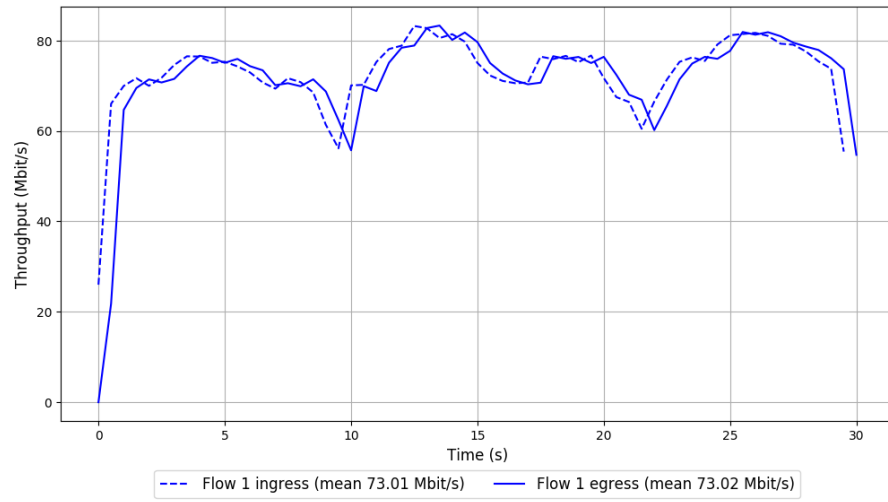Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2018-12-02 10:09:39
End at: 2018-12-02 10:10:09
Local clock offset: 2.459 ms
Remote clock offset: -2.92 ms


# Below is generated by plot.py at 2018-12-02 11:36:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 87.38 Mbit/s
95th percentile per-packet one-way delay: 45.674 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 87.38 Mbit/s
95th percentile per-packet one-way delay: 45.674 ms
Loss rate: 0.14%
```
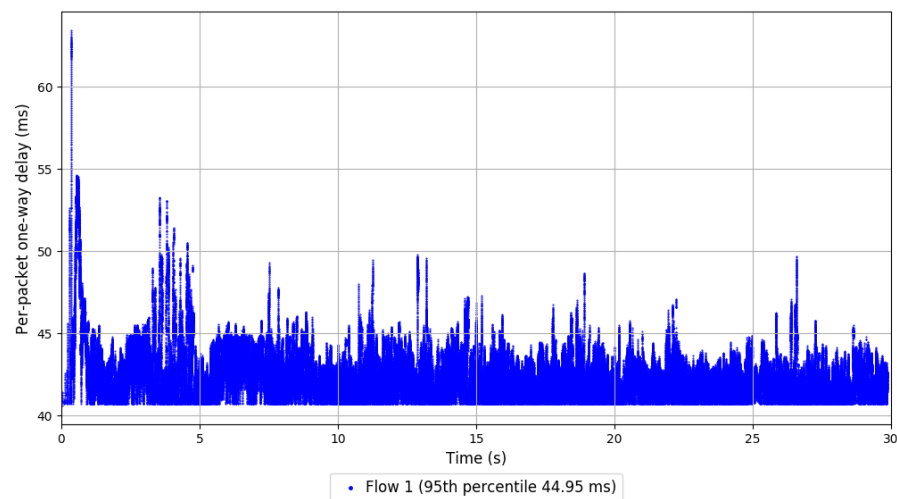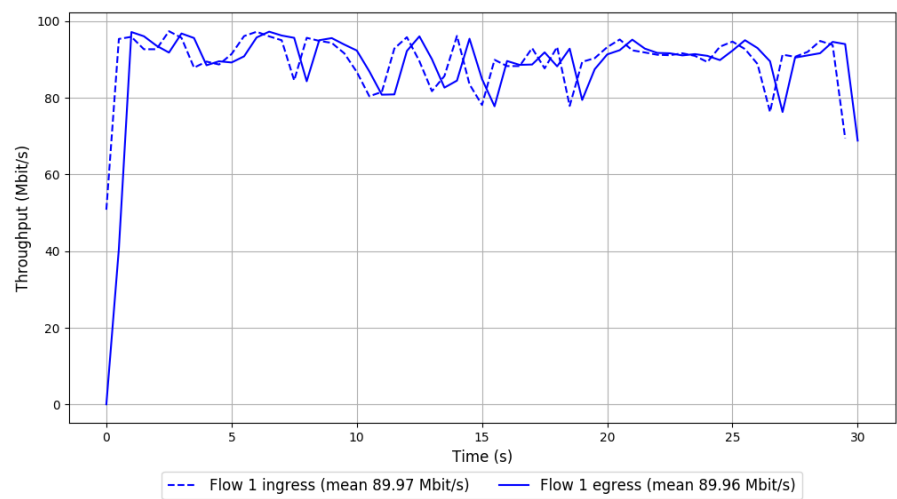
Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2018-12-02 10:32:57
End at: 2018-12-02 10:33:27
Local clock offset: 3.207 ms
Remote clock offset: -1.306 ms


# Below is generated by plot.py at 2018-12-02 11:36:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 73.02 Mbit/s
95th percentile per-packet one-way delay: 42.179 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 73.02 Mbit/s
95th percentile per-packet one-way delay: 42.179 ms
Loss rate: 0.15%
```

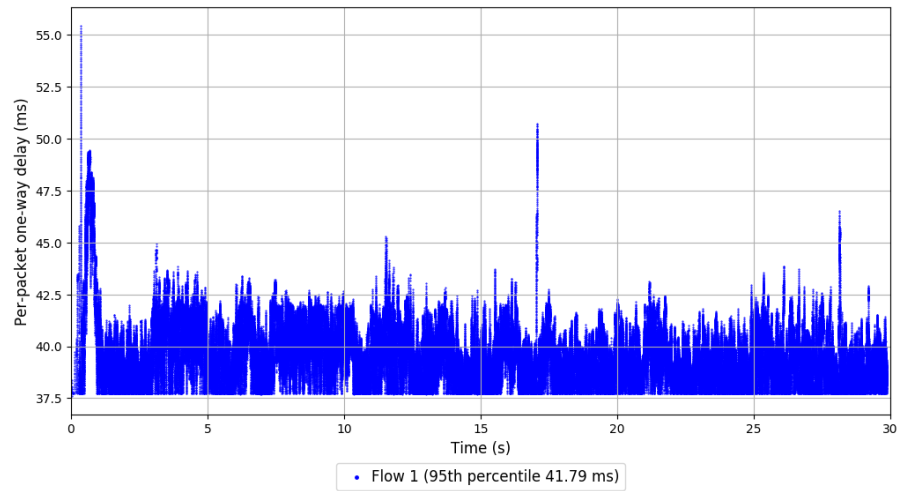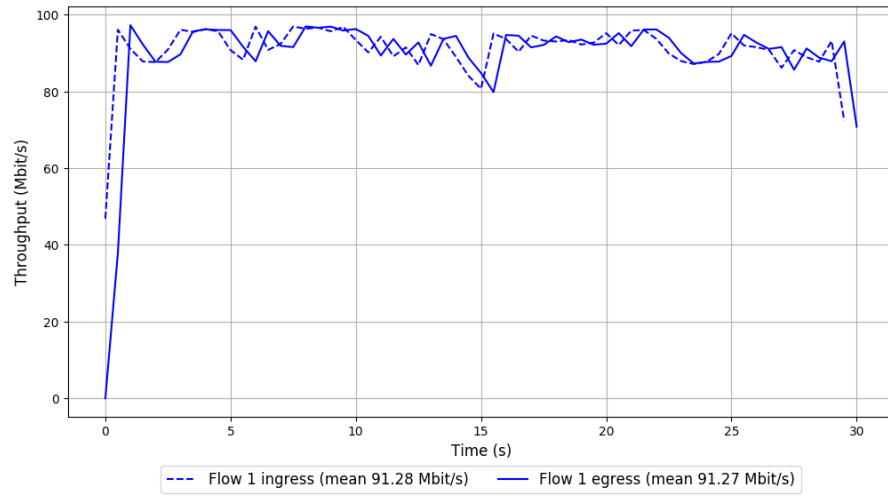Run 3: Report of Indigo — Data Link

Run 4: Statistics of Indigo

Start at: 2018-12-02 10:55:54
End at: 2018-12-02 10:56:24
Local clock offset: 4.13 ms
Remote clock offset: -0.582 ms

Below is generated by plot.py at 2018-12-02 11:36:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 89.96 Mbit/s
95th percentile per-packet one-way delay: 44.947 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 89.96 Mbit/s
95th percentile per-packet one-way delay: 44.947 ms
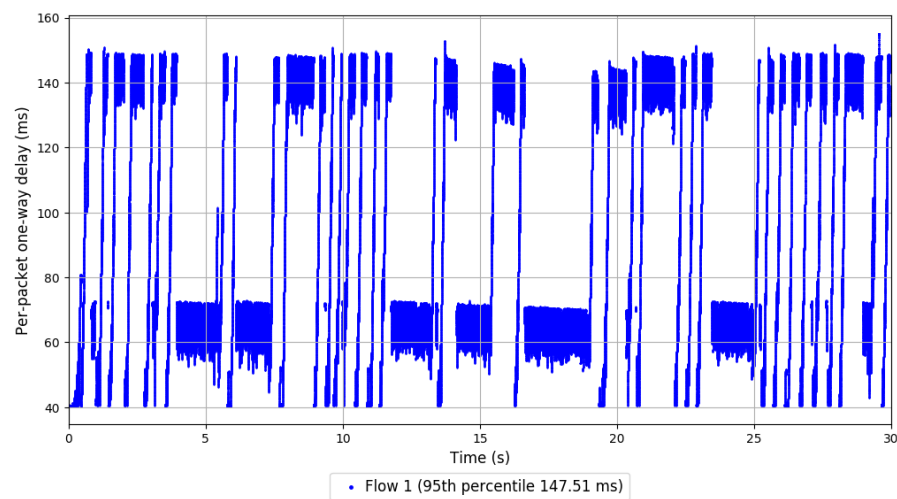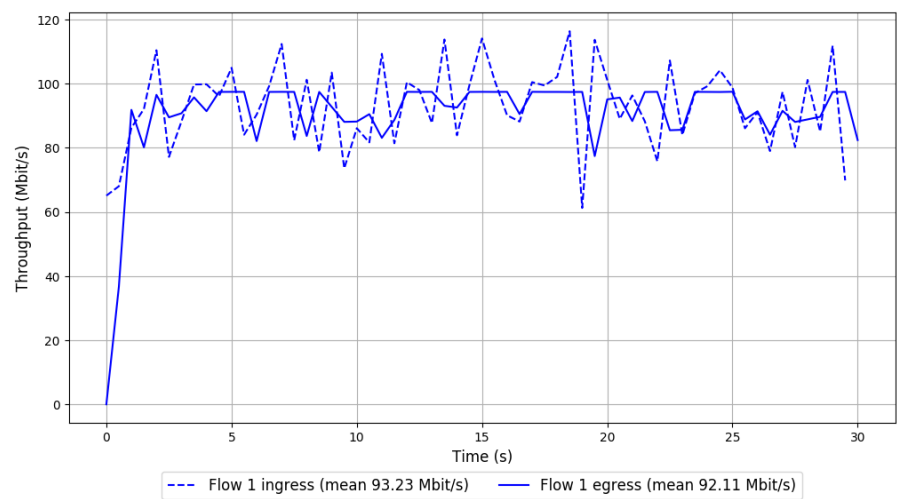Loss rate: 0.16%

Run 4: Report of Indigo — Data Link

```
Run 5: Statistics of Indigo

Start at: 2018-12-02 11:19:07
End at: 2018-12-02 11:19:37
Local clock offset: 0.24 ms
Remote clock offset: -1.502 ms

# Below is generated by plot.py at 2018-12-02 11:36:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.27 Mbit/s
95th percentile per-packet one-way delay: 41.788 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 91.27 Mbit/s
95th percentile per-packet one-way delay: 41.788 ms
Loss rate: 0.16%
```
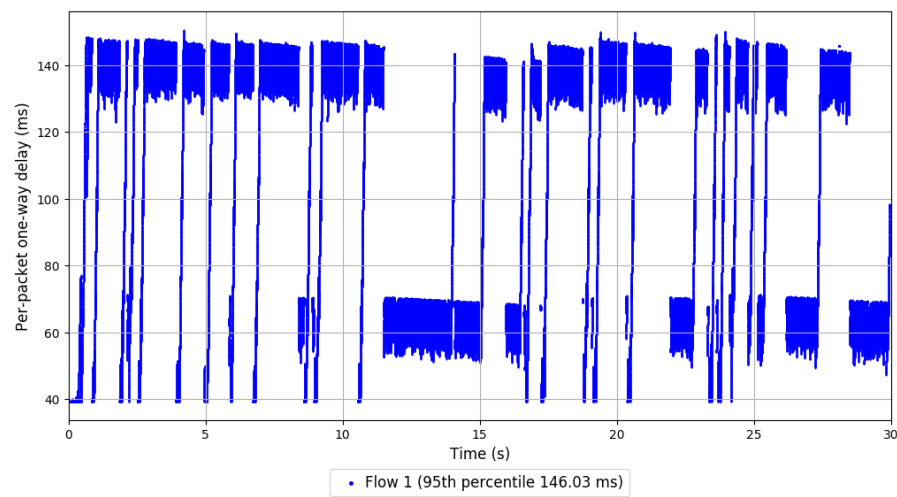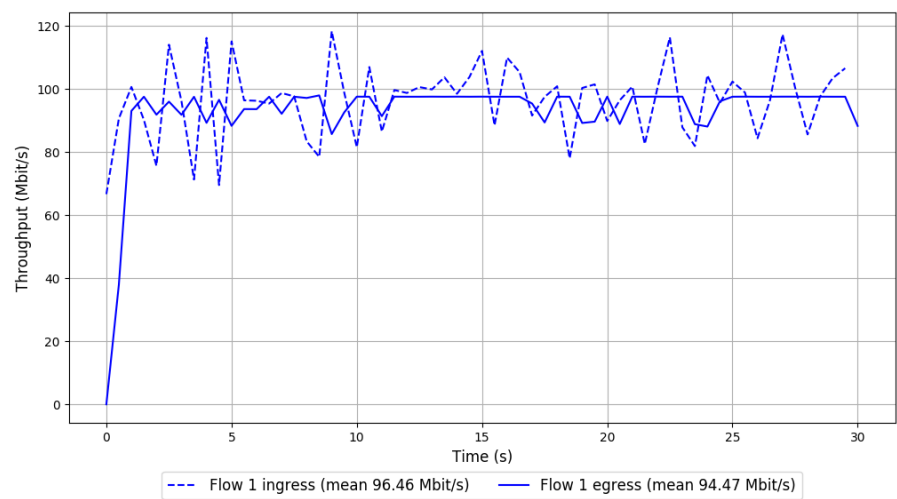
Run 5: Report of Indigo — Data Link

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

Start at: 2018-12-02 09:46:51
End at: 2018-12-02 09:47:21
Local clock offset: 2.531 ms
Remote clock offset: -1.687 ms


# Below is generated by plot.py at 2018-12-02 11:36:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.11 Mbit/s
95th percentile per-packet one-way delay: 147.511 ms
Loss rate: 1.35%
-- Flow 1:
Average throughput: 92.11 Mbit/s
95th percentile per-packet one-way delay: 147.511 ms
Loss rate: 1.35%
```
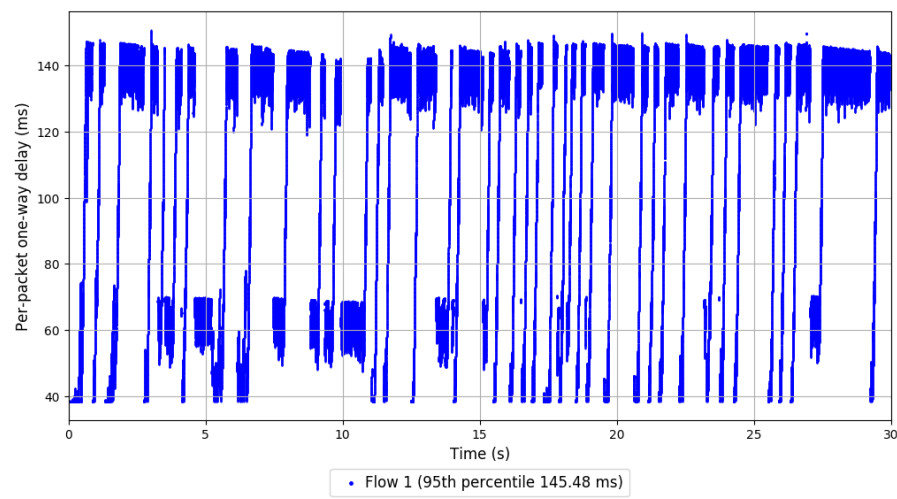
Run 1: Report of Indigo-96d2da3 — Data Link

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

Start at: 2018-12-02 10:10:58
End at: 2018-12-02 10:11:28
Local clock offset: 0.187 ms
Remote clock offset: -3.042 ms


# Below is generated by plot.py at 2018-12-02 11:36:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 94.47 Mbit/s
95th percentile per-packet one-way delay: 146.031 ms
Loss rate: 2.19%
-- Flow 1:
Average throughput: 94.47 Mbit/s
95th percentile per-packet one-way delay: 146.031 ms
Loss rate: 2.19%
```
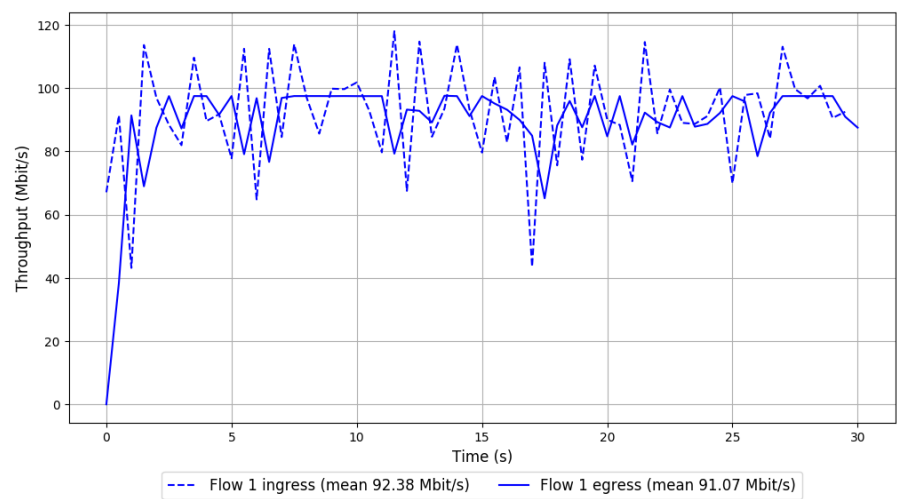
Run 2: Report of Indigo-96d2da3 — Data Link

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

Start at: 2018-12-02 10:34:17
End at: 2018-12-02 10:34:47
Local clock offset: 1.797 ms
Remote clock offset: -1.257 ms


# Below is generated by plot.py at 2018-12-02 11:37:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.07 Mbit/s
95th percentile per-packet one-way delay: 145.480 ms
Loss rate: 1.56%
-- Flow 1:
Average throughput: 91.07 Mbit/s
95th percentile per-packet one-way delay: 145.480 ms
Loss rate: 1.56%
```
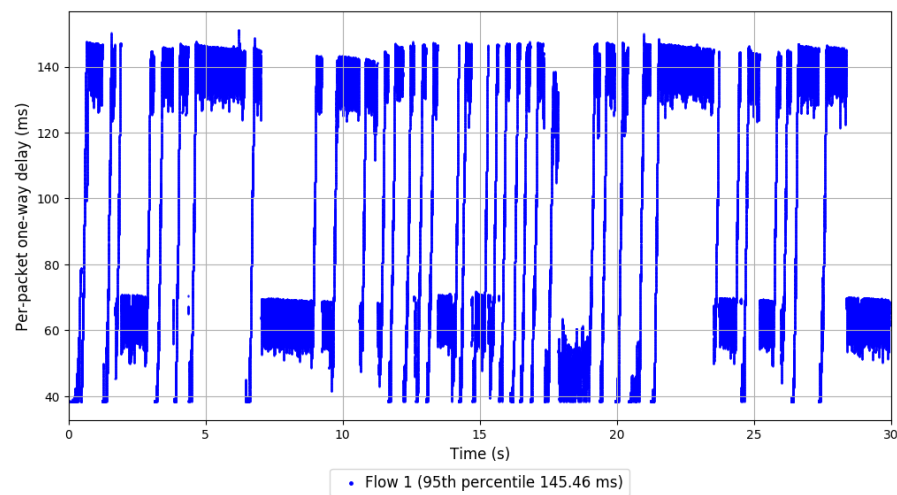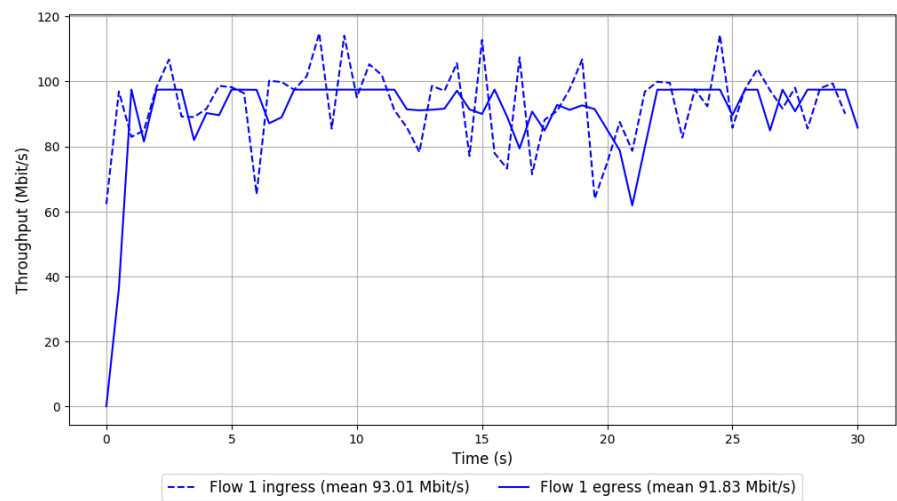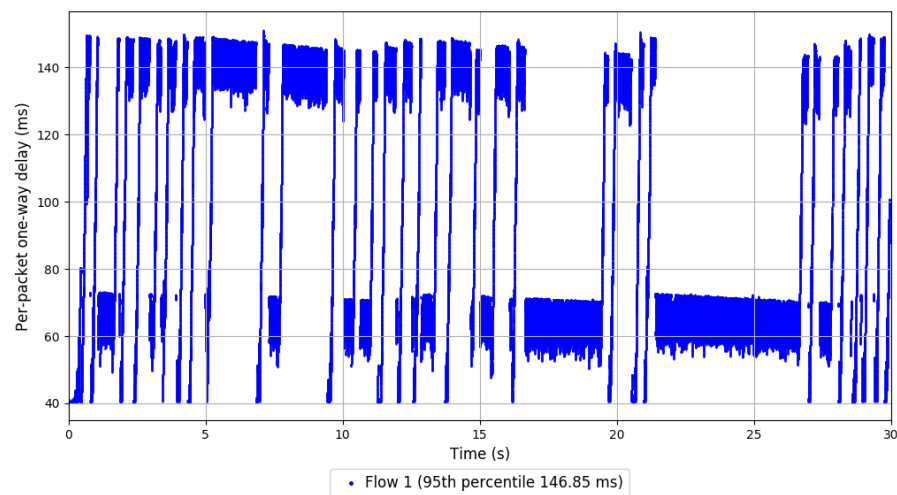
Run 3: Report of Indigo-96d2da3 — Data Link

Flow 1 ingress (mean 92.38 Mbit/s) ——— Flow 1 egress (mean 91.07 Mbit/s)

• Flow 1 (95th percentile 145.48 ms)

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

Start at: 2018-12-02 10:57:10
End at: 2018-12-02 10:57:40
Local clock offset: 2.514 ms
Remote clock offset: 0.135 ms


# Below is generated by plot.py at 2018-12-02 11:37:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.83 Mbit/s
95th percentile per-packet one-way delay: 145.458 ms
Loss rate: 1.41%
-- Flow 1:
Average throughput: 91.83 Mbit/s
95th percentile per-packet one-way delay: 145.458 ms
Loss rate: 1.41%
```
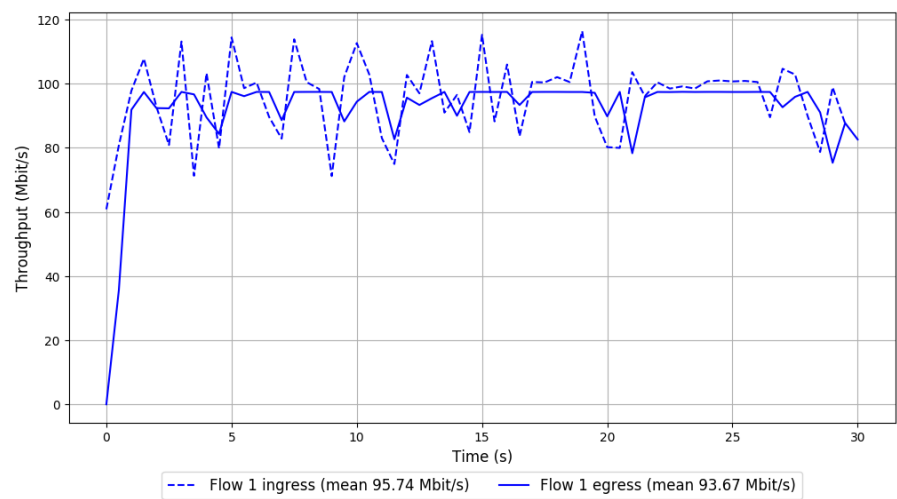
Run 4: Report of Indigo-96d2da3 — Data Link

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

Start at: 2018-12-02 11:20:29
End at: 2018-12-02 11:20:59
Local clock offset: 2.912 ms
Remote clock offset: -1.555 ms

# Below is generated by plot.py at 2018-12-02 11:37:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 93.67 Mbit/s
95th percentile per-packet one-way delay: 146.849 ms
Loss rate: 2.31%
-- Flow 1:
Average throughput: 93.67 Mbit/s
95th percentile per-packet one-way delay: 146.849 ms
Loss rate: 2.31%
```

Run 5: Report of Indigo-96d2da3 — Data Link
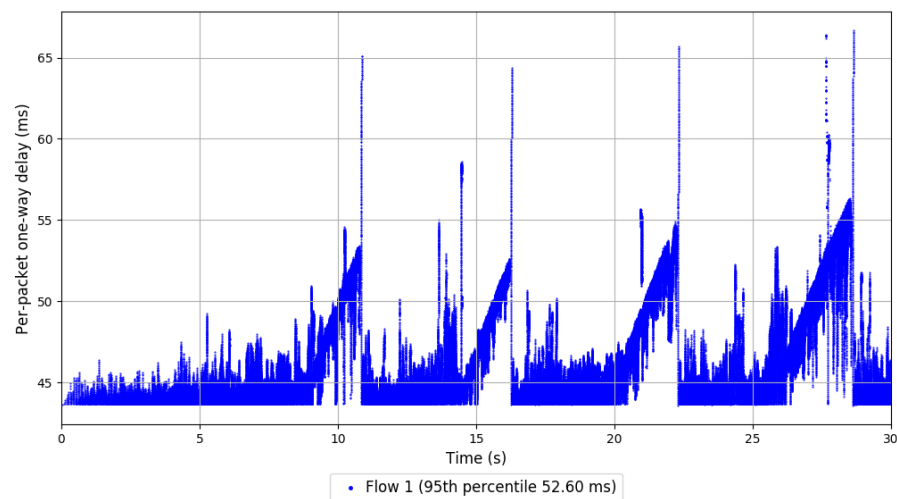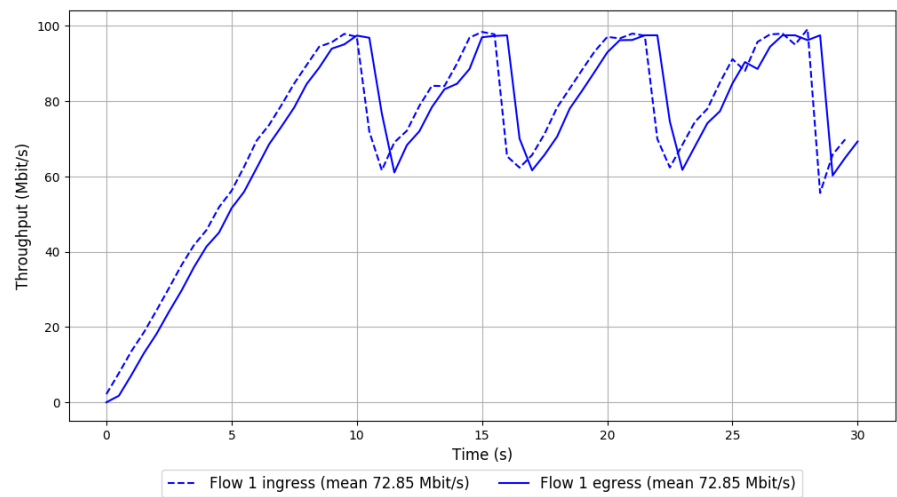
```
Run 1: Statistics of LEDBAT

Start at: 2018-12-02 09:43:06
End at: 2018-12-02 09:43:36
Local clock offset: 3.395 ms
Remote clock offset: -3.972 ms


# Below is generated by plot.py at 2018-12-02 11:37:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.85 Mbit/s
95th percentile per-packet one-way delay: 52.602 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 72.85 Mbit/s
95th percentile per-packet one-way delay: 52.602 ms
Loss rate: 0.16%
```

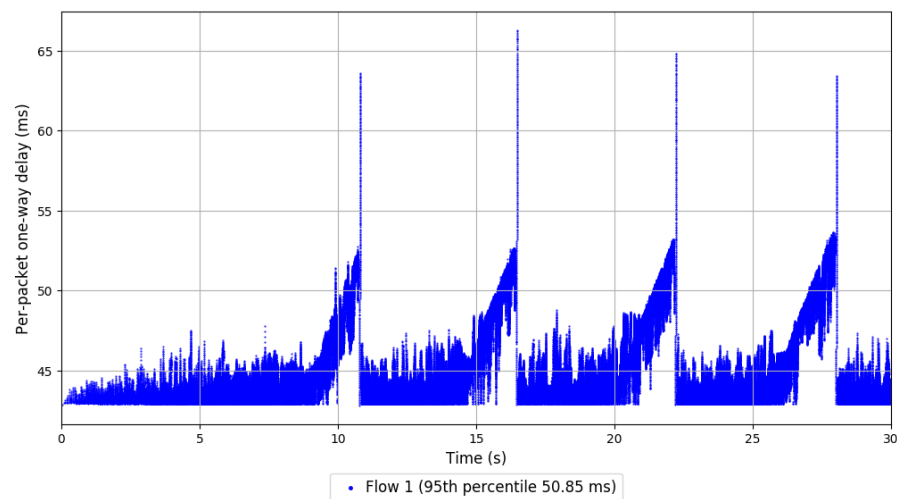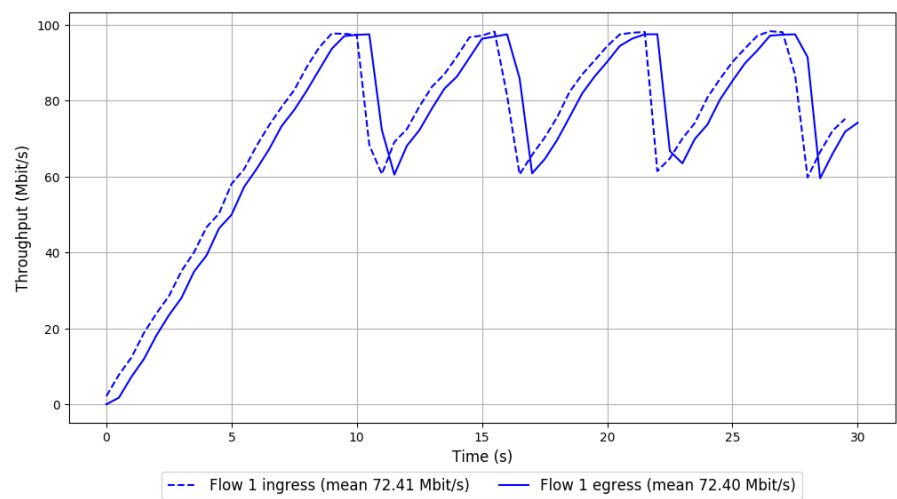Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-12-02 10:06:59
End at: 2018-12-02 10:07:29
Local clock offset: 3.107 ms
Remote clock offset: -3.701 ms


# Below is generated by plot.py at 2018-12-02 11:37:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.40 Mbit/s
95th percentile per-packet one-way delay: 50.847 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 72.40 Mbit/s
95th percentile per-packet one-way delay: 50.847 ms
Loss rate: 0.17%
```

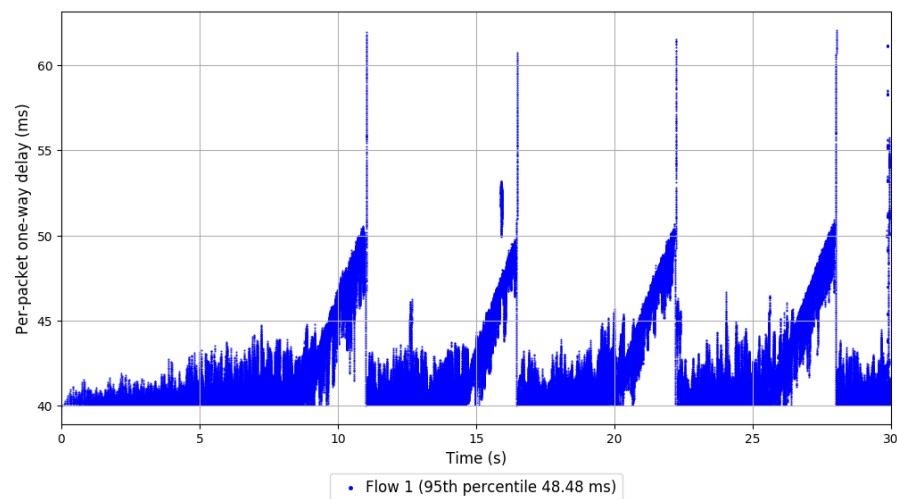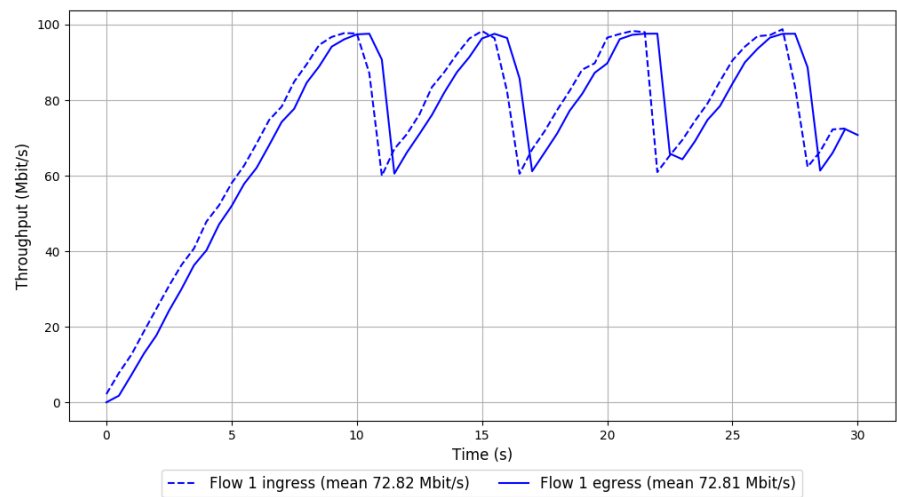Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2018-12-02 10:30:29
End at: 2018-12-02 10:30:59
Local clock offset: 3.768 ms
Remote clock offset: -0.894 ms


# Below is generated by plot.py at 2018-12-02 11:37:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.81 Mbit/s
95th percentile per-packet one-way delay: 48.485 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 72.81 Mbit/s
95th percentile per-packet one-way delay: 48.485 ms
Loss rate: 0.17%
```

Run 3: Report of LEDBAT — Data Link

```
Run 4: Statistics of LEDBAT

Start at: 2018-12-02 10:53:31
End at: 2018-12-02 10:54:02
Local clock offset: 5.308 ms
Remote clock offset: 0.041 ms


# Below is generated by plot.py at 2018-12-02 11:37:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 73.01 Mbit/s
95th percentile per-packet one-way delay: 49.138 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 73.01 Mbit/s
95th percentile per-packet one-way delay: 49.138 ms
Loss rate: 0.21%
```
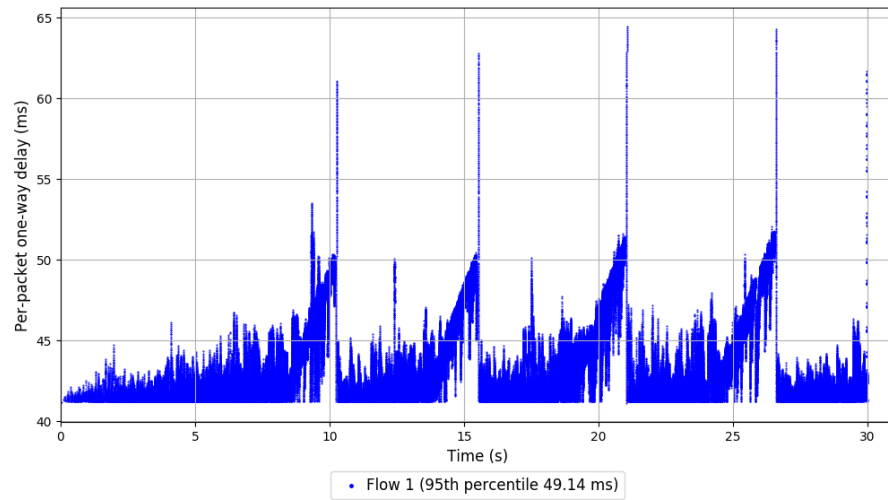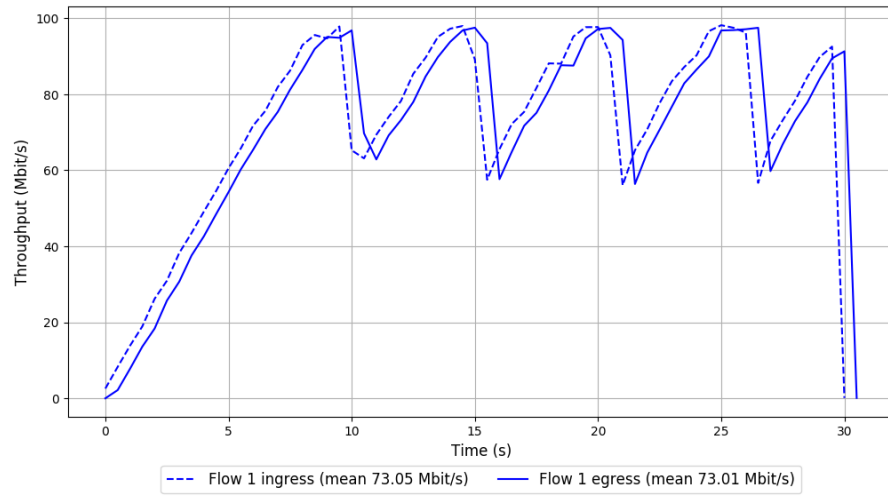
Run 4: Report of LEDBAT — Data Link

Flow 1 ingress (mean 73.05 Mbit/s)   Flow 1 egress (mean 73.01 Mbit/s)

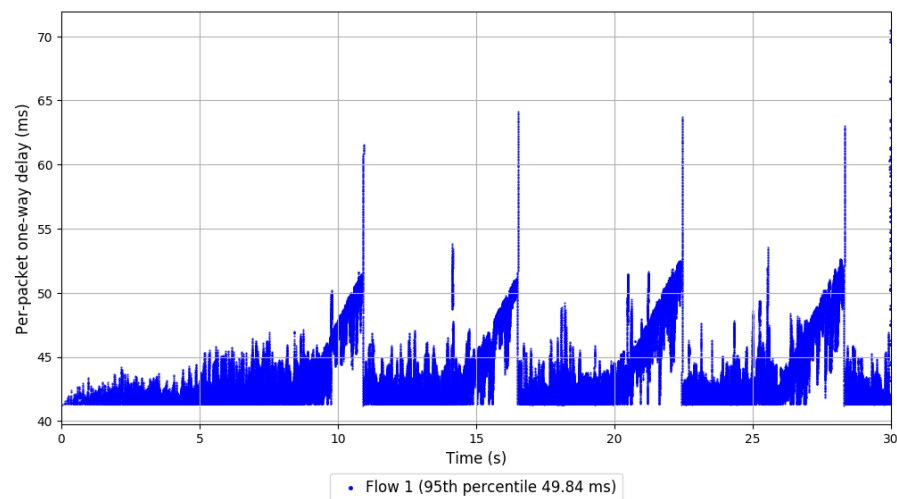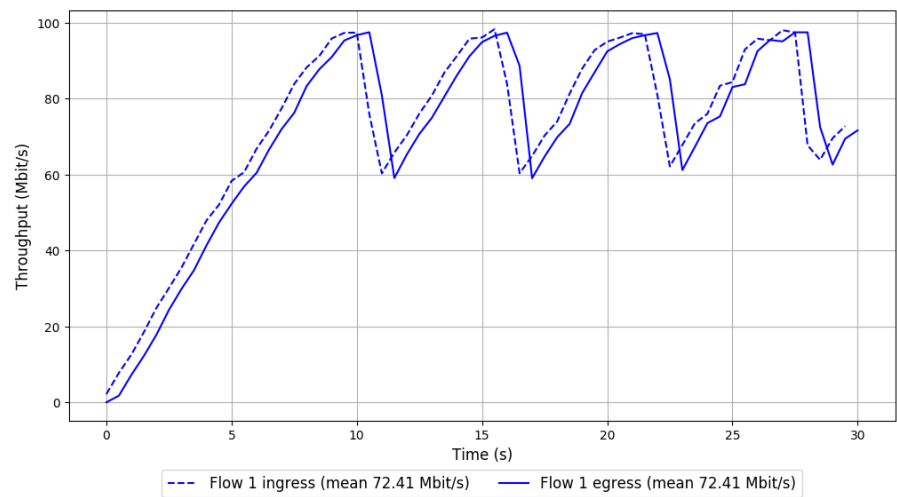Flow 1 (95th percentile 49.14 ms)

```
Run 5: Statistics of LEDBAT

Start at: 2018-12-02 11:16:34
End at: 2018-12-02 11:17:04
Local clock offset: 4.364 ms
Remote clock offset: -1.013 ms


# Below is generated by plot.py at 2018-12-02 11:37:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.41 Mbit/s
95th percentile per-packet one-way delay: 49.839 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 72.41 Mbit/s
95th percentile per-packet one-way delay: 49.839 ms
Loss rate: 0.17%
```

Run 5: Report of LEDBAT — Data Link

```
Run 1: Statistics of Indigo-Muses

Start at: 2018-12-02 09:53:26
End at: 2018-12-02 09:53:56
Local clock offset: 0.909 ms
Remote clock offset: -3.21 ms


# Below is generated by plot.py at 2018-12-02 11:37:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 75.10 Mbit/s
95th percentile per-packet one-way delay: 41.651 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 75.10 Mbit/s
95th percentile per-packet one-way delay: 41.651 ms
Loss rate: 0.16%
```
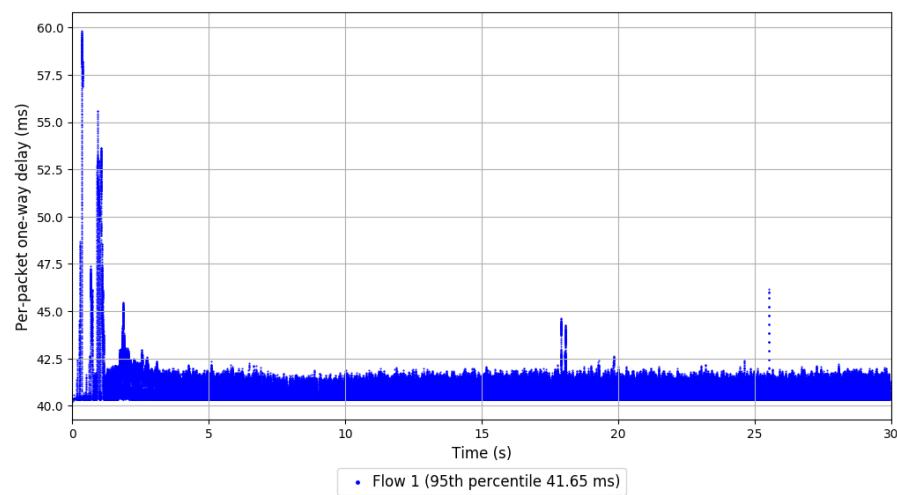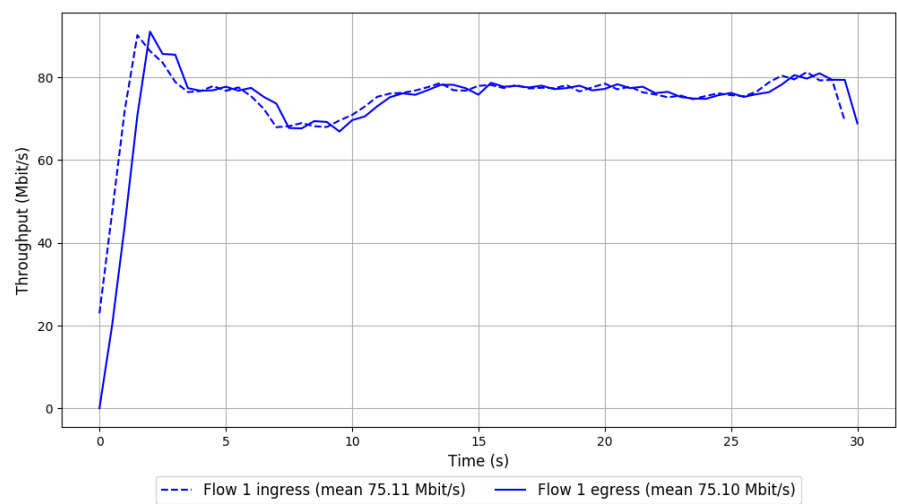
Run 1: Report of Indigo-Muses — Data Link

Flow 1 ingress (mean 75.11 Mbit/s)   Flow 1 egress (mean 75.10 Mbit/s)
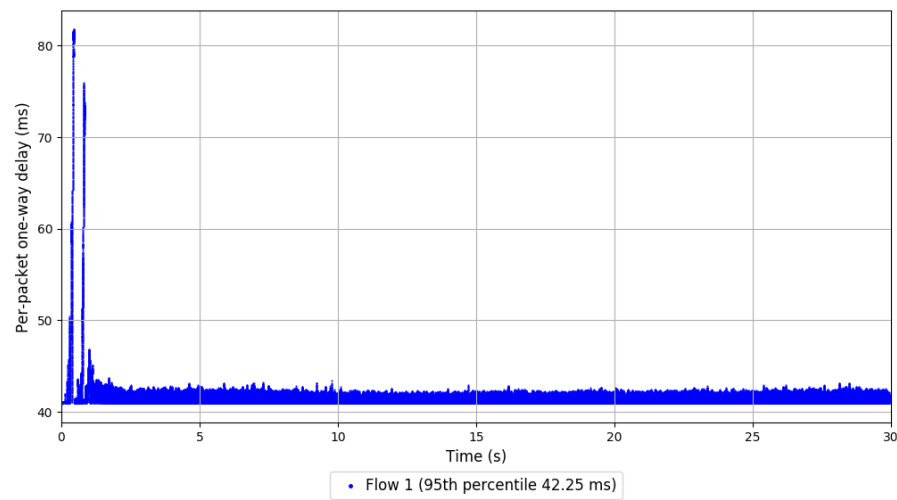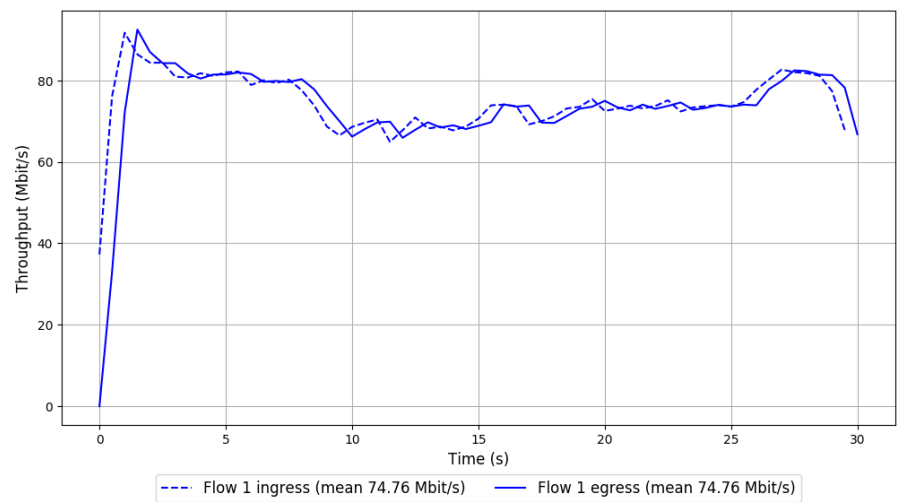

Flow 1 (95th percentile 41.65 ms)

```
Run 2: Statistics of Indigo-Muses

Start at: 2018-12-02 10:17:09
End at: 2018-12-02 10:17:39
Local clock offset: 1.149 ms
Remote clock offset: -3.859 ms


# Below is generated by plot.py at 2018-12-02 11:38:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 74.76 Mbit/s
95th percentile per-packet one-way delay: 42.250 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 74.76 Mbit/s
95th percentile per-packet one-way delay: 42.250 ms
Loss rate: 0.16%
```
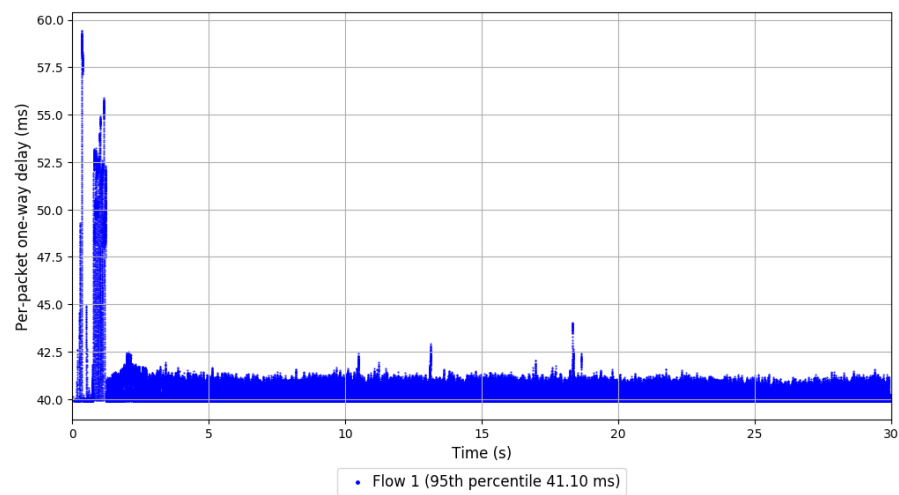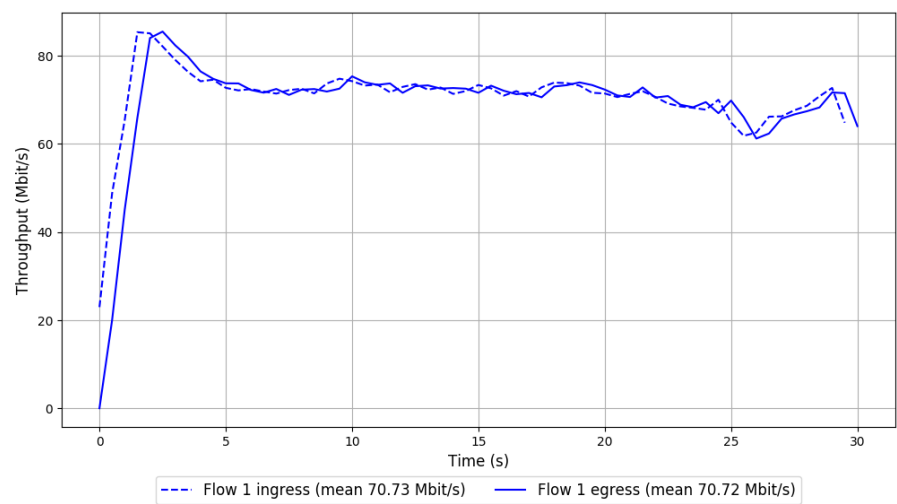
Run 2: Report of Indigo-Muses — Data Link

```
Run 3: Statistics of Indigo-Muses

Start at: 2018-12-02 10:40:27
End at: 2018-12-02 10:40:57
Local clock offset: 3.799 ms
Remote clock offset: -0.741 ms


# Below is generated by plot.py at 2018-12-02 11:38:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 70.72 Mbit/s
95th percentile per-packet one-way delay: 41.097 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 70.72 Mbit/s
95th percentile per-packet one-way delay: 41.097 ms
Loss rate: 0.17%
```
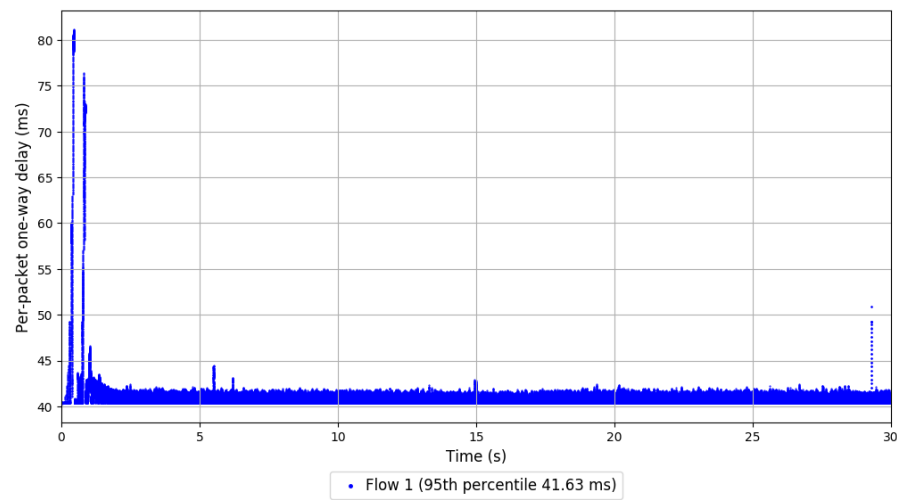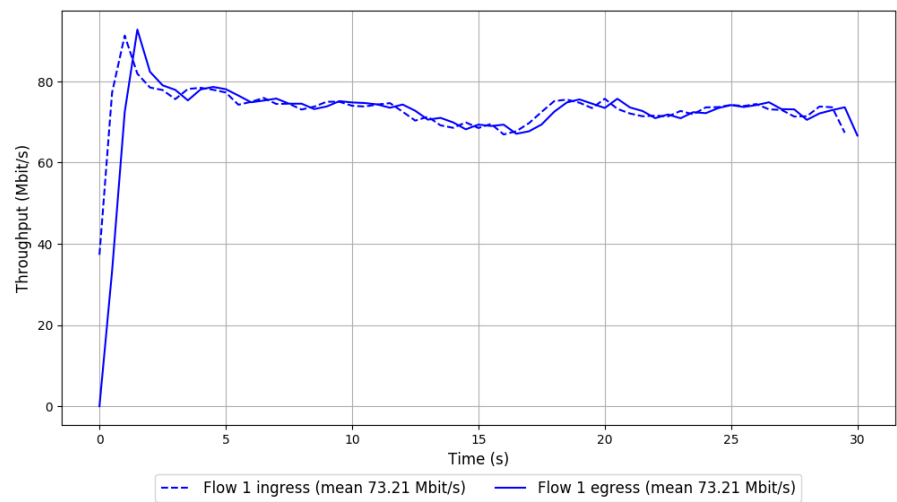
Run 3: Report of Indigo-Muses — Data Link

```
Run 4: Statistics of Indigo-Muses

Start at: 2018-12-02 11:03:22
End at: 2018-12-02 11:03:52
Local clock offset: 2.7 ms
Remote clock offset: -1.637 ms


# Below is generated by plot.py at 2018-12-02 11:38:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 73.21 Mbit/s
95th percentile per-packet one-way delay: 41.630 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 73.21 Mbit/s
95th percentile per-packet one-way delay: 41.630 ms
Loss rate: 0.16%
```

Run 4: Report of Indigo-Muses — Data Link

```
Run 5: Statistics of Indigo-Muses

Start at: 2018-12-02 11:26:44
End at: 2018-12-02 11:27:14
Local clock offset: 0.013 ms
Remote clock offset: -2.733 ms


# Below is generated by plot.py at 2018-12-02 11:38:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 80.00 Mbit/s
95th percentile per-packet one-way delay: 40.292 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 80.00 Mbit/s
95th percentile per-packet one-way delay: 40.292 ms
Loss rate: 0.16%
```
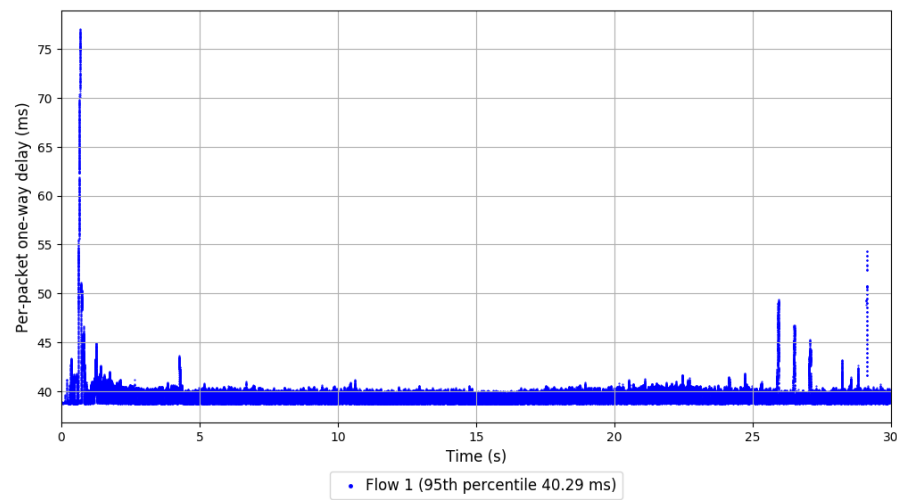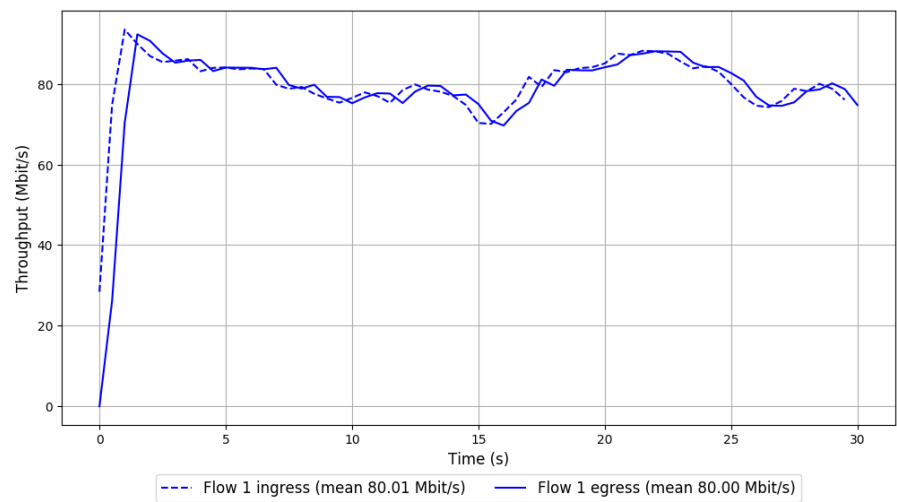
Run 5: Report of Indigo-Muses — Data Link

```
Run 1: Statistics of PCC-Allegro

Start at: 2018-12-02 09:48:10
End at: 2018-12-02 09:48:40
Local clock offset: 3.192 ms
Remote clock offset: -3.42 ms


# Below is generated by plot.py at 2018-12-02 11:38:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 73.72 Mbit/s
95th percentile per-packet one-way delay: 42.952 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 73.72 Mbit/s
95th percentile per-packet one-way delay: 42.952 ms
Loss rate: 0.18%
```
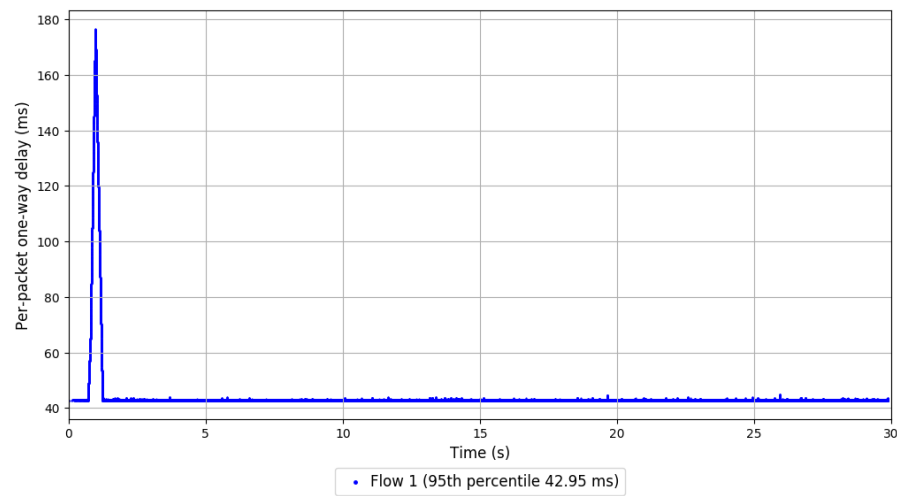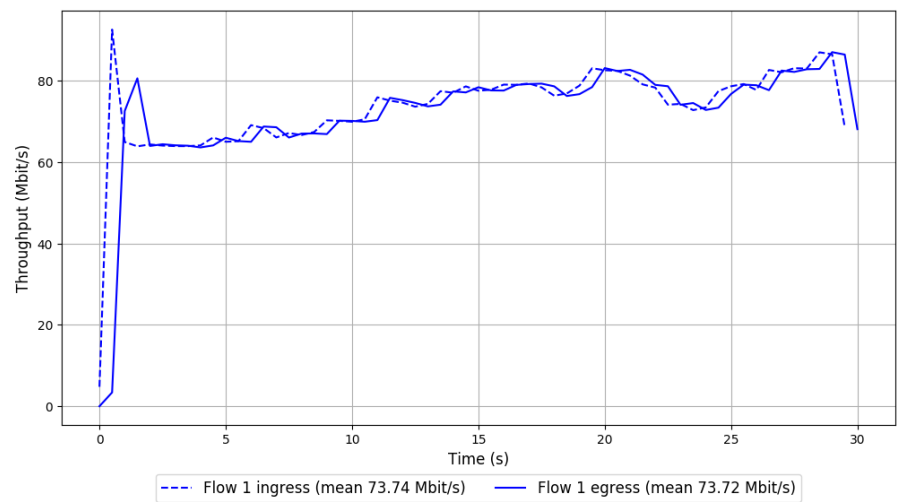
Run 1: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 73.74 Mbit/s)   Flow 1 egress (mean 73.72 Mbit/s)

Flow 1 (95th percentile 42.95 ms)

```
Run 2: Statistics of PCC-Allegro

Start at: 2018-12-02 10:12:09
End at: 2018-12-02 10:12:39
Local clock offset: 2.305 ms
Remote clock offset: -3.898 ms


# Below is generated by plot.py at 2018-12-02 11:38:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 59.17 Mbit/s
95th percentile per-packet one-way delay: 42.439 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 59.17 Mbit/s
95th percentile per-packet one-way delay: 42.439 ms
Loss rate: 0.18%
```
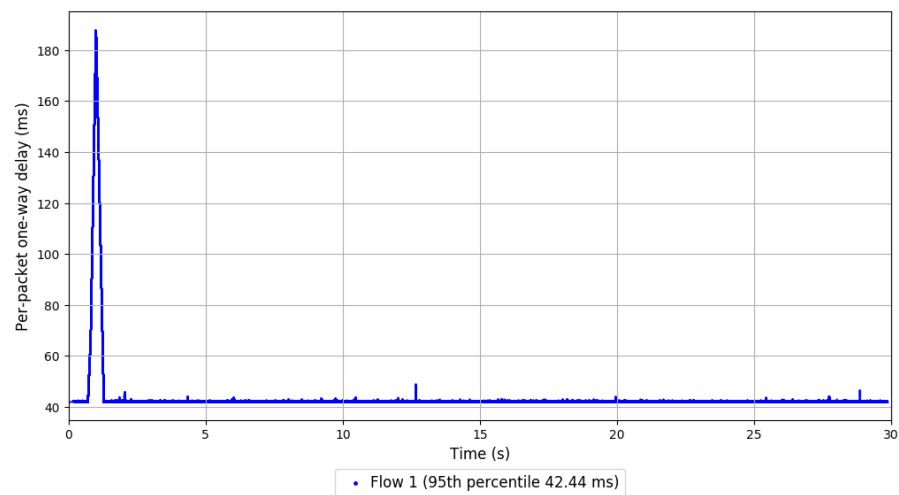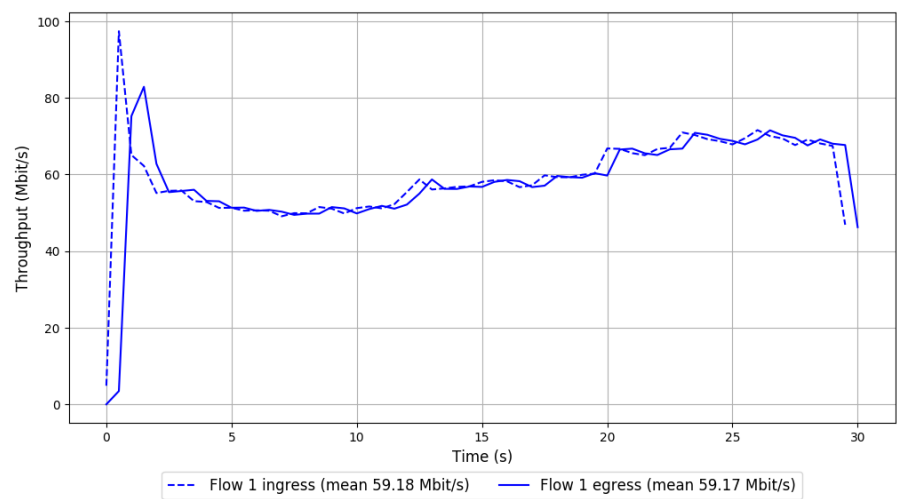
Run 2: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 59.18 Mbit/s) — Flow 1 egress (mean 59.17 Mbit/s)
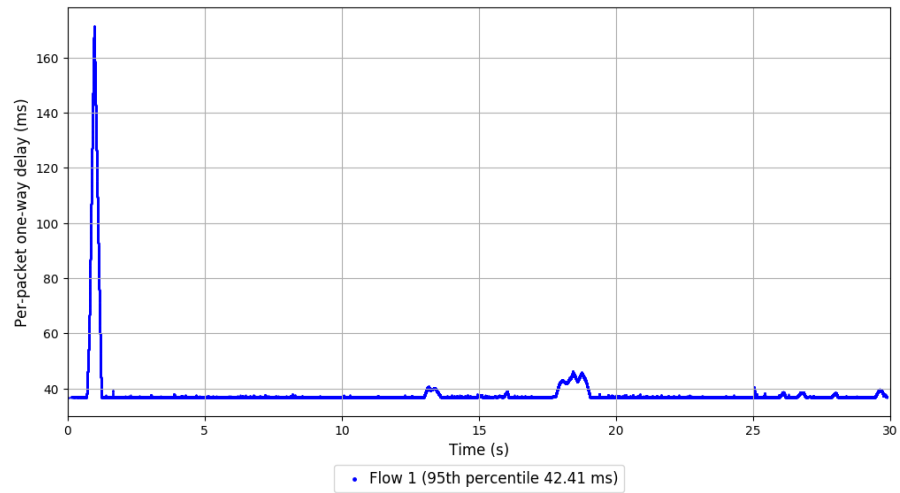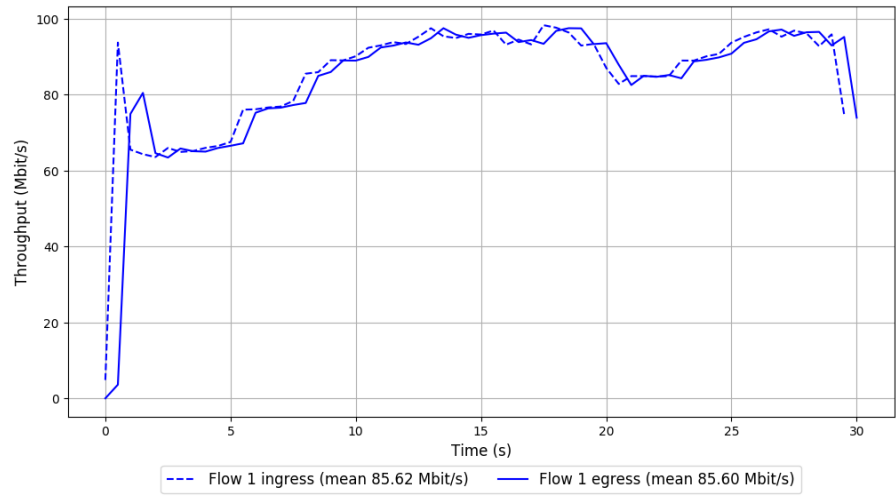

Flow 1 (95th percentile 42.44 ms)

```
Run 3: Statistics of PCC-Allegro

Start at: 2018-12-02 10:35:30
End at: 2018-12-02 10:36:00
Local clock offset: 0.93 ms
Remote clock offset: -0.611 ms


# Below is generated by plot.py at 2018-12-02 11:38:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 85.60 Mbit/s
95th percentile per-packet one-way delay: 42.409 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 85.60 Mbit/s
95th percentile per-packet one-way delay: 42.409 ms
Loss rate: 0.17%
```

Run 3: Report of PCC-Allegro — Data Link

```
Run 4: Statistics of PCC-Allegro

Start at: 2018-12-02 10:58:22
End at: 2018-12-02 10:58:52
Local clock offset: 2.163 ms
Remote clock offset: -0.556 ms


# Below is generated by plot.py at 2018-12-02 11:38:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.92 Mbit/s
95th percentile per-packet one-way delay: 38.815 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 4.92 Mbit/s
95th percentile per-packet one-way delay: 38.815 ms
Loss rate: 0.16%
```
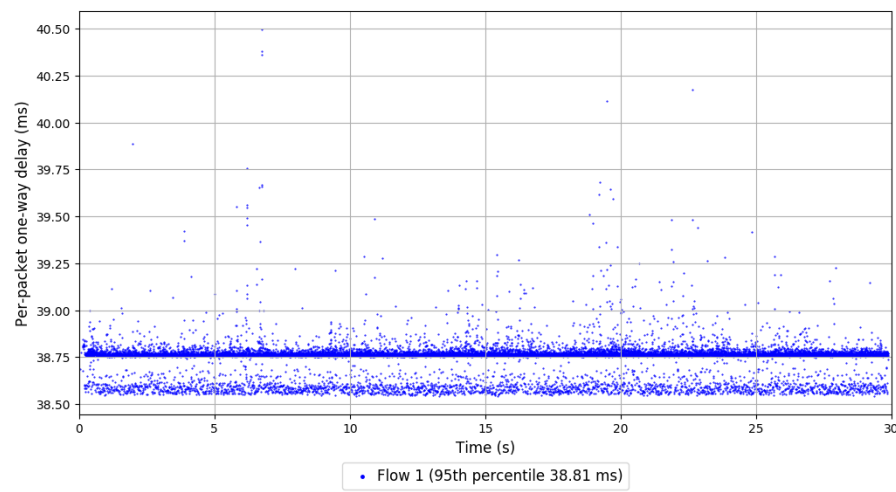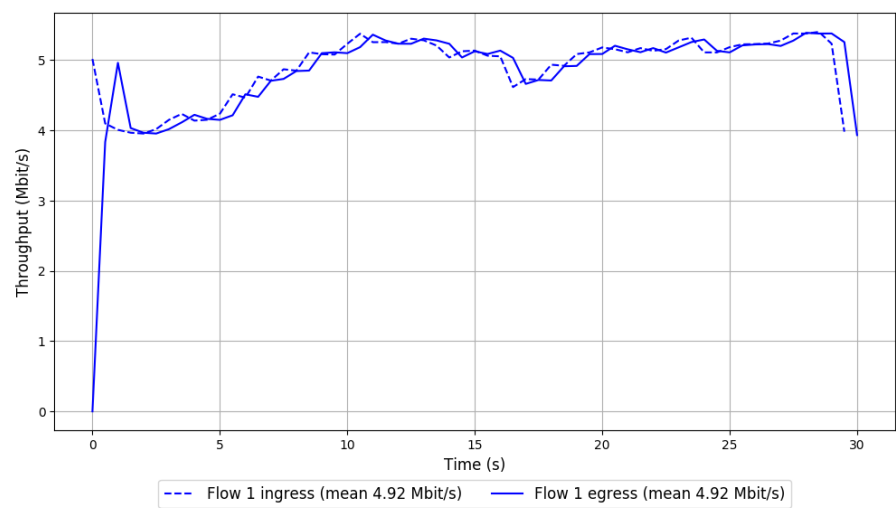
Run 4: Report of PCC-Allegro — Data Link

```
Run 5: Statistics of PCC-Allegro

Start at: 2018-12-02 11:21:42
End at: 2018-12-02 11:22:12
Local clock offset: -0.044 ms
Remote clock offset: -1.938 ms


# Below is generated by plot.py at 2018-12-02 11:38:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 69.92 Mbit/s
95th percentile per-packet one-way delay: 38.022 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 69.92 Mbit/s
95th percentile per-packet one-way delay: 38.022 ms
Loss rate: 0.18%
```
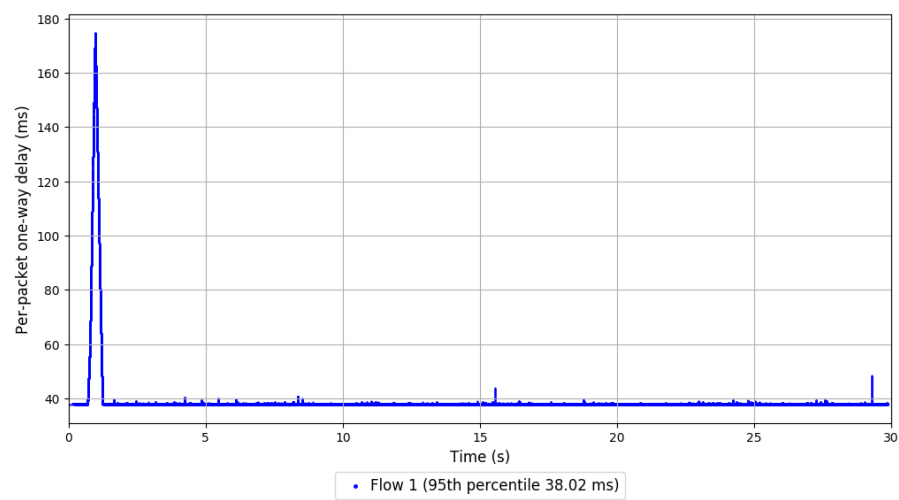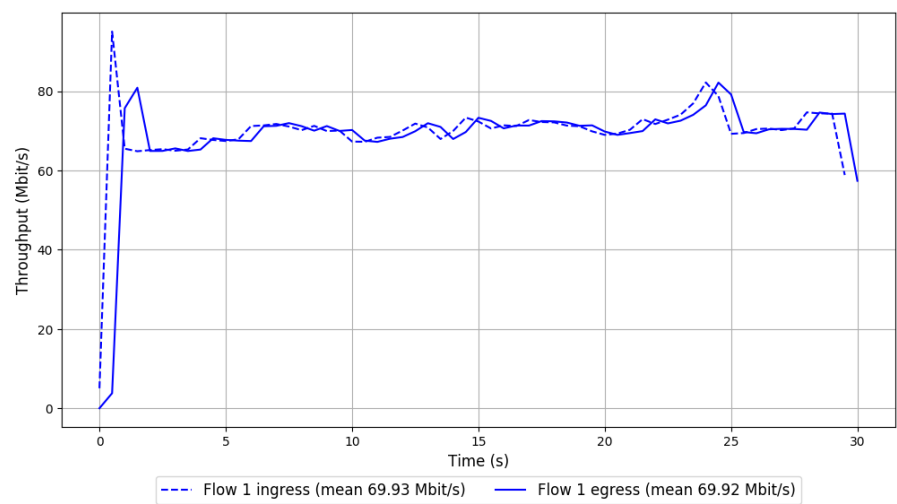
Run 5: Report of PCC-Allegro — Data Link

```
Run 1: Statistics of PCC-Expr

Start at: 2018-12-02 09:52:12
End at: 2018-12-02 09:52:42
Local clock offset: 3.891 ms
Remote clock offset: -3.756 ms


# Below is generated by plot.py at 2018-12-02 11:39:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 76.07 Mbit/s
95th percentile per-packet one-way delay: 64.240 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 76.07 Mbit/s
95th percentile per-packet one-way delay: 64.240 ms
Loss rate: 0.20%
```
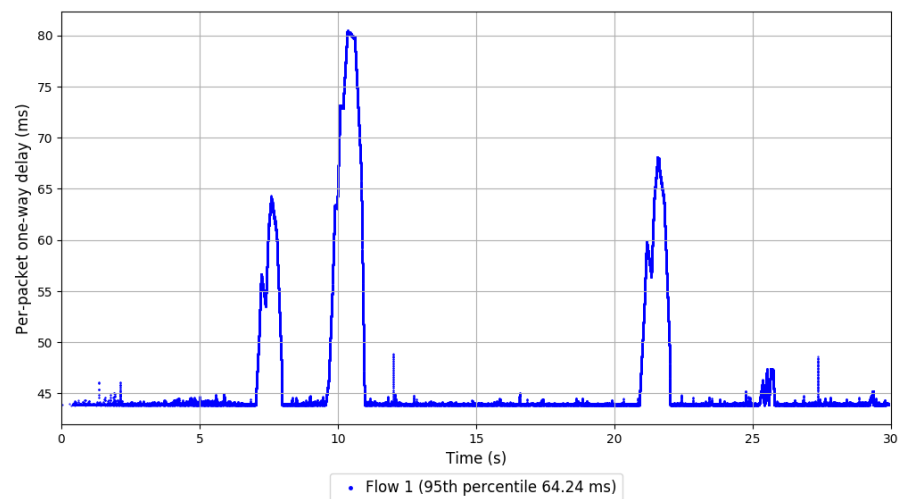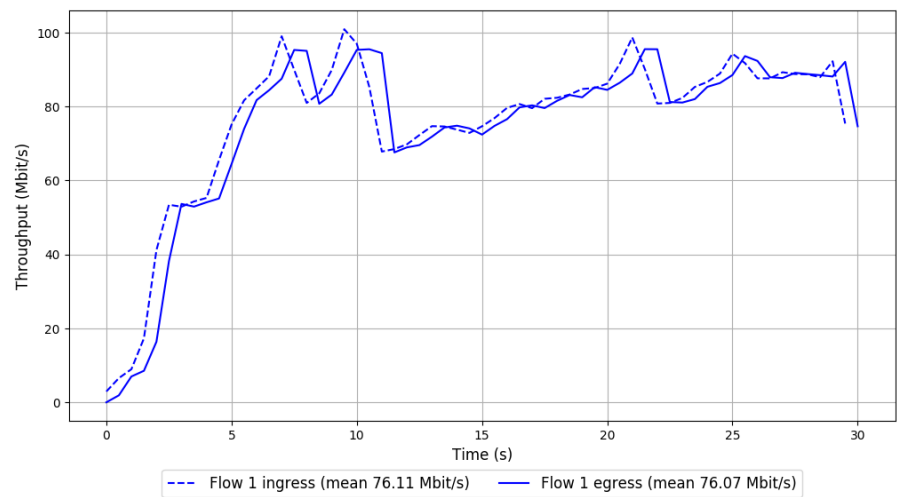
Run 1: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 76.11 Mbit/s) --- Flow 1 egress (mean 76.07 Mbit/s)
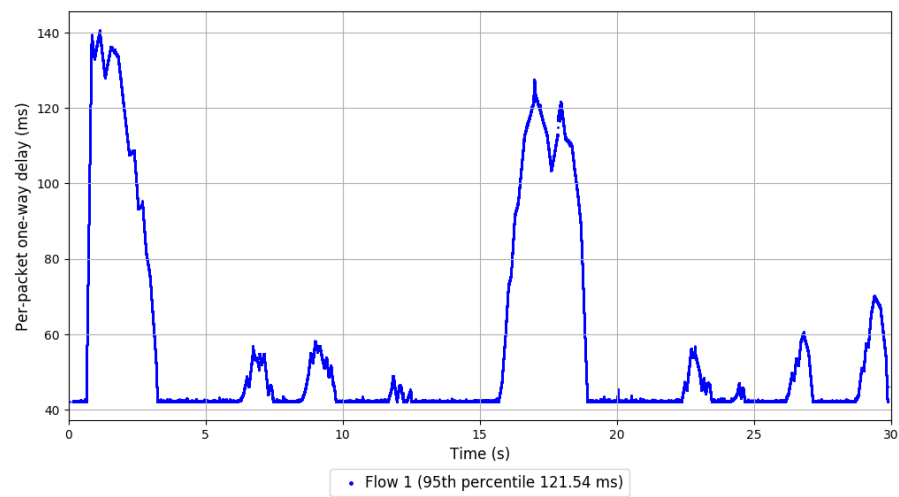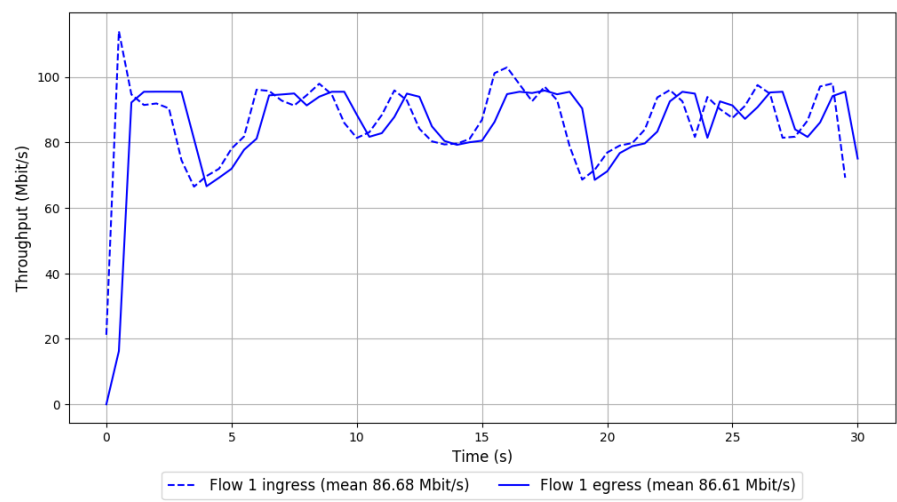

• Flow 1 (95th percentile 64.24 ms)

```
Run 2: Statistics of PCC-Expr

Start at: 2018-12-02 10:15:48
End at: 2018-12-02 10:16:18
Local clock offset: 3.057 ms
Remote clock offset: -3.153 ms


# Below is generated by plot.py at 2018-12-02 11:40:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.61 Mbit/s
95th percentile per-packet one-way delay: 121.536 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 86.61 Mbit/s
95th percentile per-packet one-way delay: 121.536 ms
Loss rate: 0.22%
```

Run 2: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 86.68 Mbit/s) --- Flow 1 egress (mean 86.61 Mbit/s)
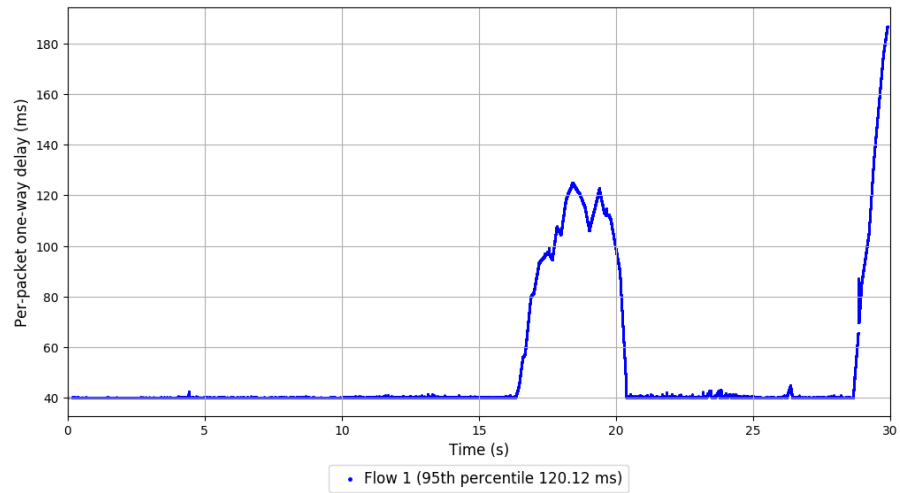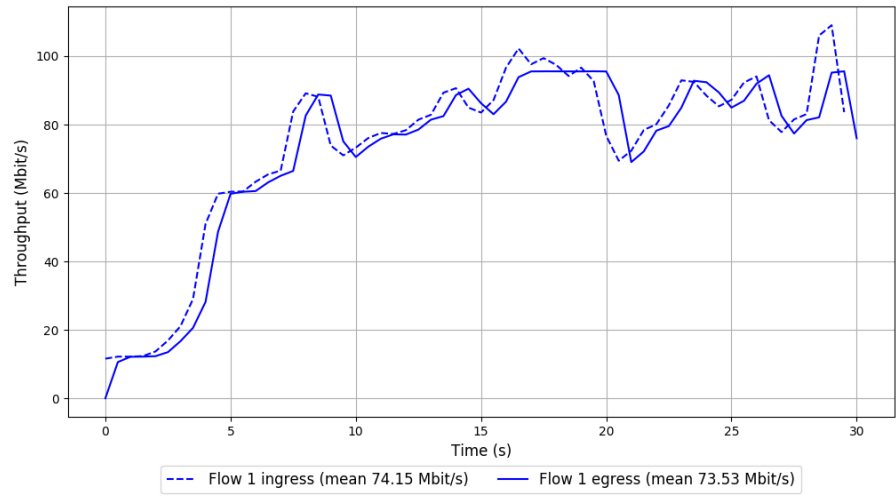

Flow 1 (95th percentile 121.54 ms)

108

```
Run 3: Statistics of PCC-Expr

Start at: 2018-12-02 10:39:12
End at: 2018-12-02 10:39:42
Local clock offset: 4.838 ms
Remote clock offset: -0.003 ms


# Below is generated by plot.py at 2018-12-02 11:40:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 73.53 Mbit/s
95th percentile per-packet one-way delay: 120.118 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 73.53 Mbit/s
95th percentile per-packet one-way delay: 120.118 ms
Loss rate: 0.99%
```

Run 3: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 74.15 Mbit/s)   Flow 1 egress (mean 73.53 Mbit/s)

Flow 1 (95th percentile 120.12 ms)

110

```
Run 4: Statistics of PCC-Expr

Start at: 2018-12-02 11:02:02
End at: 2018-12-02 11:02:32
Local clock offset: 2.316 ms
Remote clock offset: -0.143 ms


# Below is generated by plot.py at 2018-12-02 11:40:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 83.09 Mbit/s
95th percentile per-packet one-way delay: 124.452 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 83.09 Mbit/s
95th percentile per-packet one-way delay: 124.452 ms
Loss rate: 0.21%
```
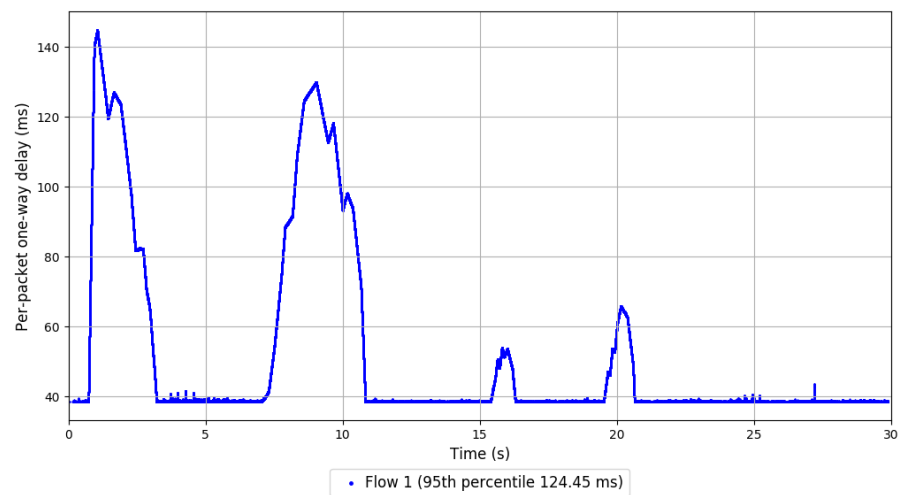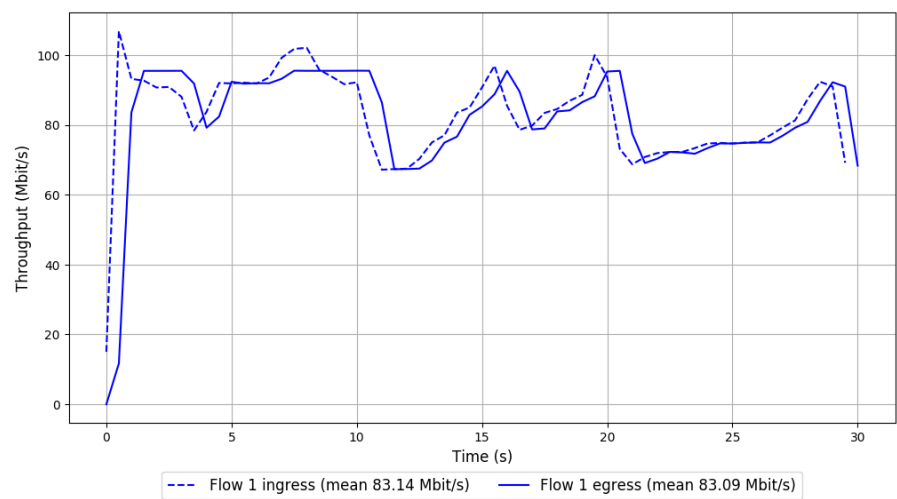
Run 4: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 83.14 Mbit/s) —— Flow 1 egress (mean 83.09 Mbit/s)

• Flow 1 (95th percentile 124.45 ms)

```
Run 5: Statistics of PCC-Expr

Start at: 2018-12-02 11:25:26
End at: 2018-12-02 11:25:56
Local clock offset: 2.508 ms
Remote clock offset: -0.519 ms


# Below is generated by plot.py at 2018-12-02 11:40:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 84.47 Mbit/s
95th percentile per-packet one-way delay: 249.401 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 84.47 Mbit/s
95th percentile per-packet one-way delay: 249.401 ms
Loss rate: 0.42%
```
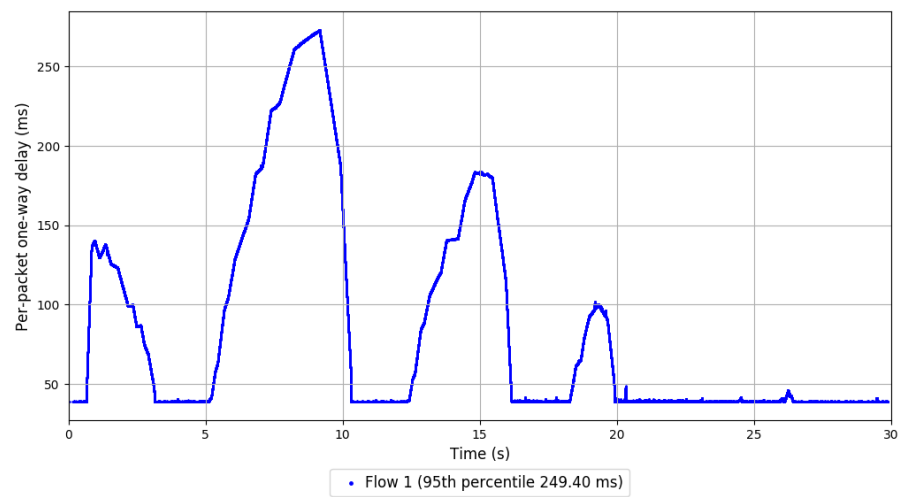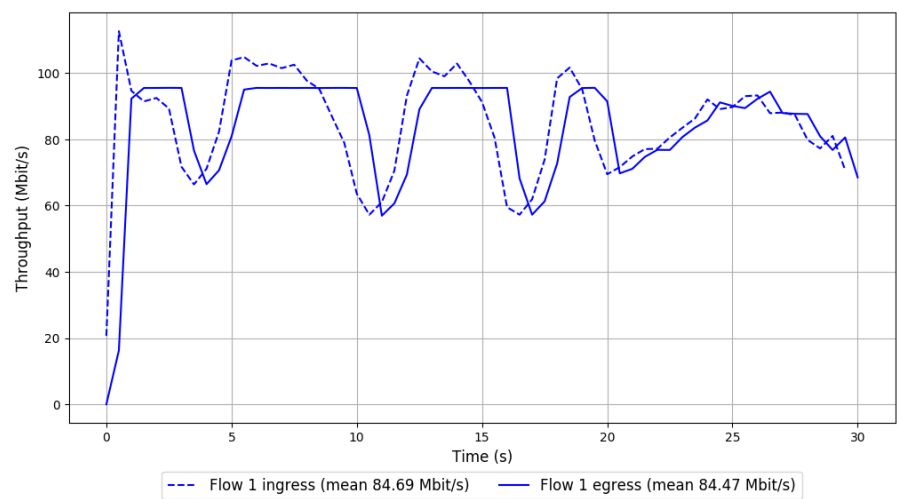
Run 5: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 84.69 Mbit/s) — Flow 1 egress (mean 84.47 Mbit/s)

Flow 1 (95th percentile 249.40 ms)

114

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-12-02 09:34:43
End at: 2018-12-02 09:35:13
Local clock offset: 0.756 ms
Remote clock offset: -2.601 ms


# Below is generated by plot.py at 2018-12-02 11:40:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 83.51 Mbit/s
95th percentile per-packet one-way delay: 48.697 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 83.51 Mbit/s
95th percentile per-packet one-way delay: 48.697 ms
Loss rate: 0.21%
```
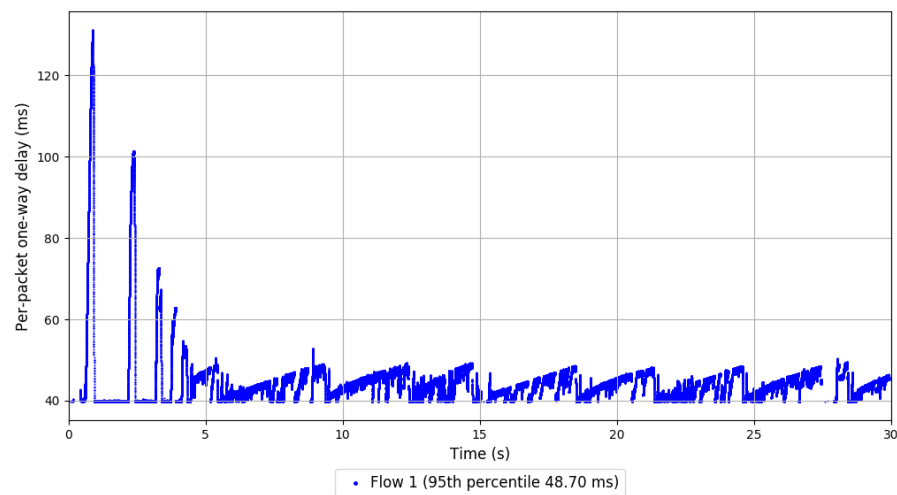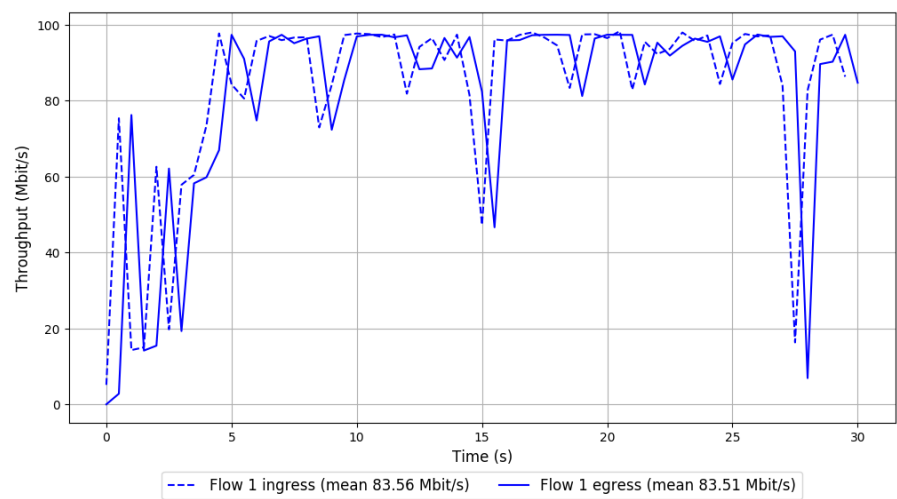
Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-12-02 09:58:10
End at: 2018-12-02 09:58:40
Local clock offset: 3.736 ms
Remote clock offset: -2.896 ms


# Below is generated by plot.py at 2018-12-02 11:40:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 88.71 Mbit/s
95th percentile per-packet one-way delay: 51.105 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 88.71 Mbit/s
95th percentile per-packet one-way delay: 51.105 ms
Loss rate: 0.17%
```
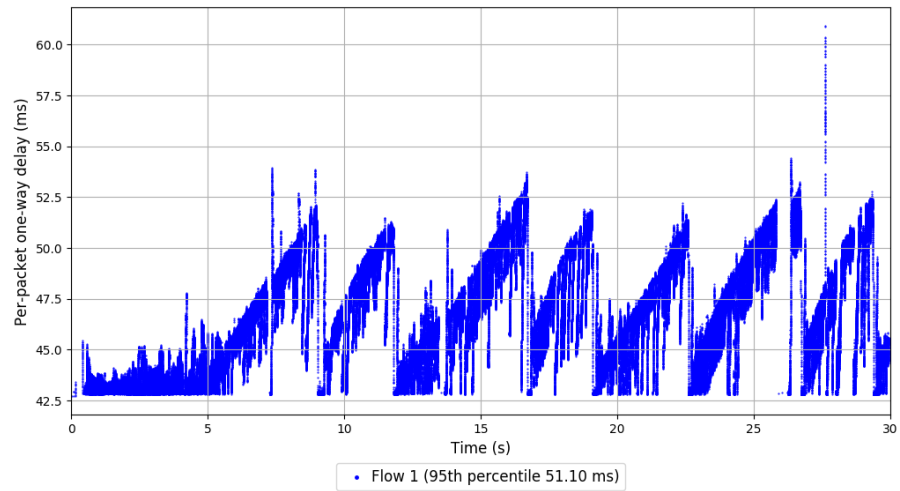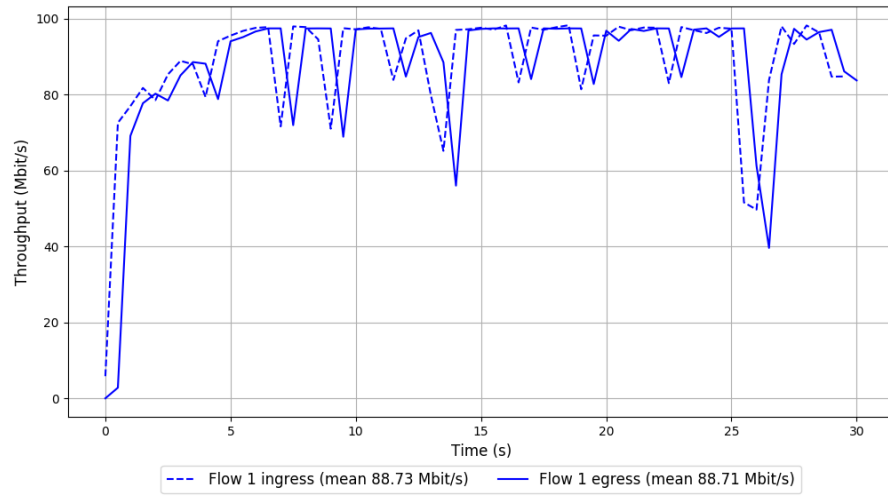
Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-12-02 10:22:07
End at: 2018-12-02 10:22:37
Local clock offset: 1.316 ms
Remote clock offset: -4.043 ms


# Below is generated by plot.py at 2018-12-02 11:40:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 87.47 Mbit/s
95th percentile per-packet one-way delay: 44.744 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 87.47 Mbit/s
95th percentile per-packet one-way delay: 44.744 ms
Loss rate: 0.18%
```
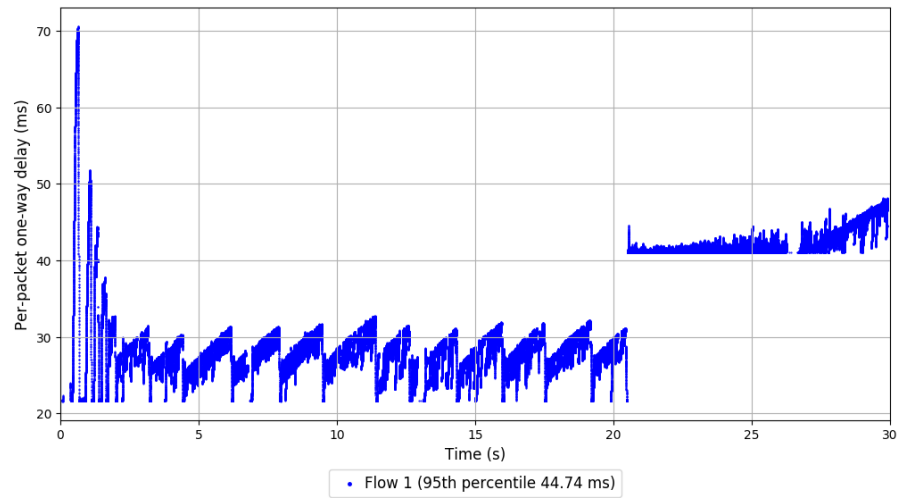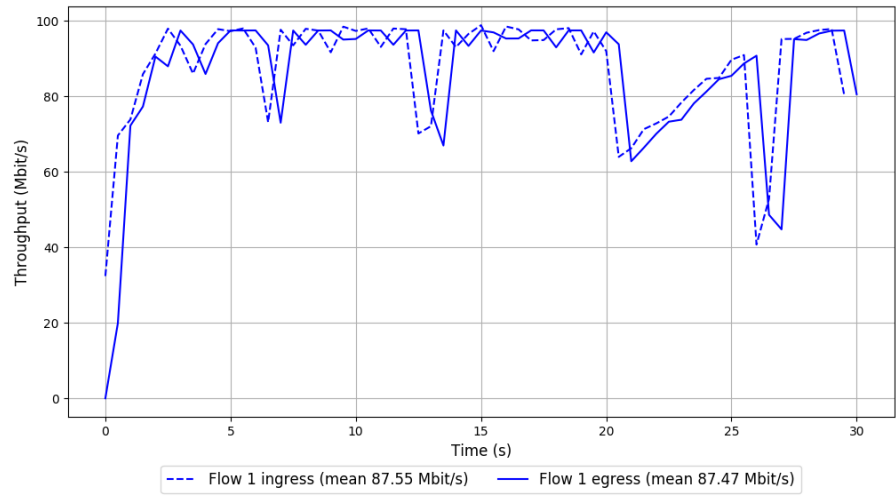
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 87.55 Mbit/s) ----- Flow 1 egress (mean 87.47 Mbit/s)

• Flow 1 (95th percentile 44.74 ms)

```
Run 4: Statistics of QUIC Cubic

Start at: 2018-12-02 10:45:17
End at: 2018-12-02 10:45:47
Local clock offset: 4.596 ms
Remote clock offset: 0.05 ms


# Below is generated by plot.py at 2018-12-02 11:40:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.70 Mbit/s
95th percentile per-packet one-way delay: 48.086 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 89.70 Mbit/s
95th percentile per-packet one-way delay: 48.086 ms
Loss rate: 0.19%
```
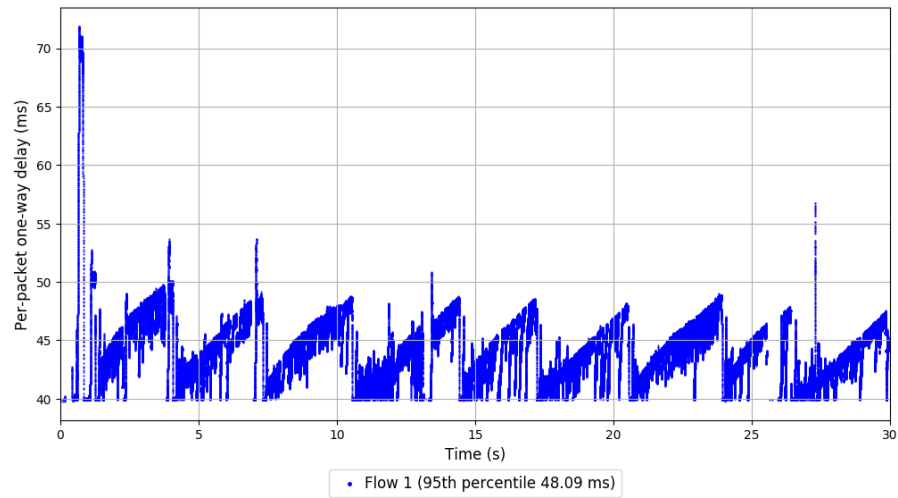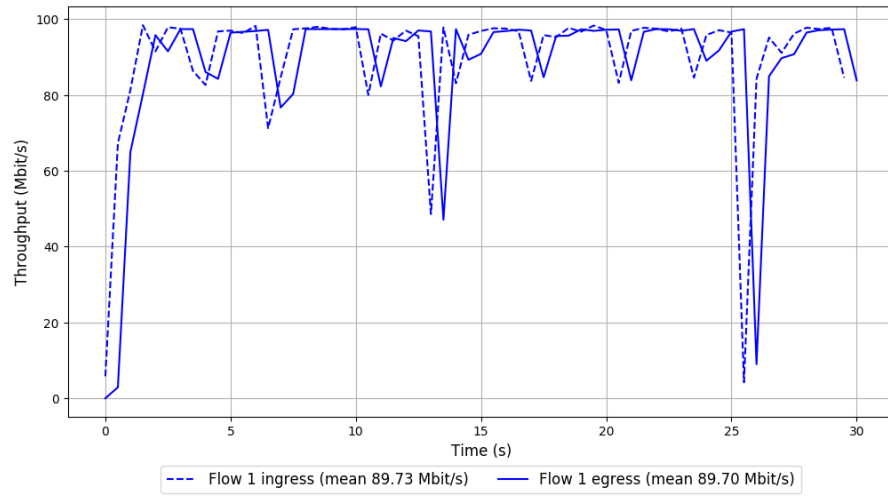
Run 4: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 89.73 Mbit/s)   Flow 1 egress (mean 89.70 Mbit/s)

Flow 1 (95th percentile 48.09 ms)

```
Run 5: Statistics of QUIC Cubic

Start at: 2018-12-02 11:08:06
End at: 2018-12-02 11:08:36
Local clock offset: 2.362 ms
Remote clock offset: -1.657 ms


# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.09 Mbit/s
95th percentile per-packet one-way delay: 48.467 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 89.09 Mbit/s
95th percentile per-packet one-way delay: 48.467 ms
Loss rate: 0.18%
```
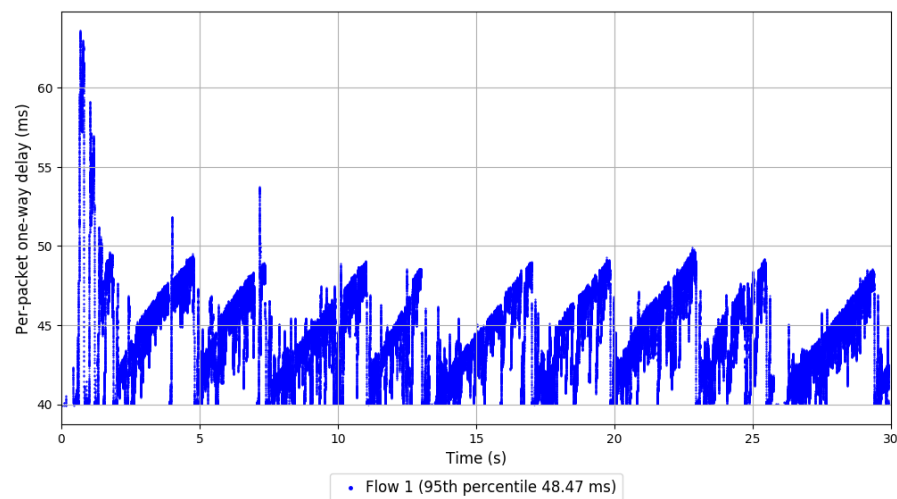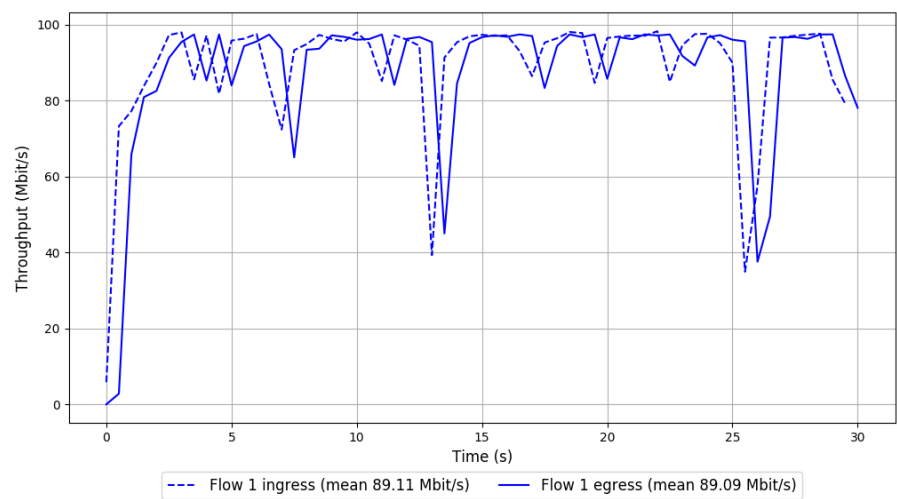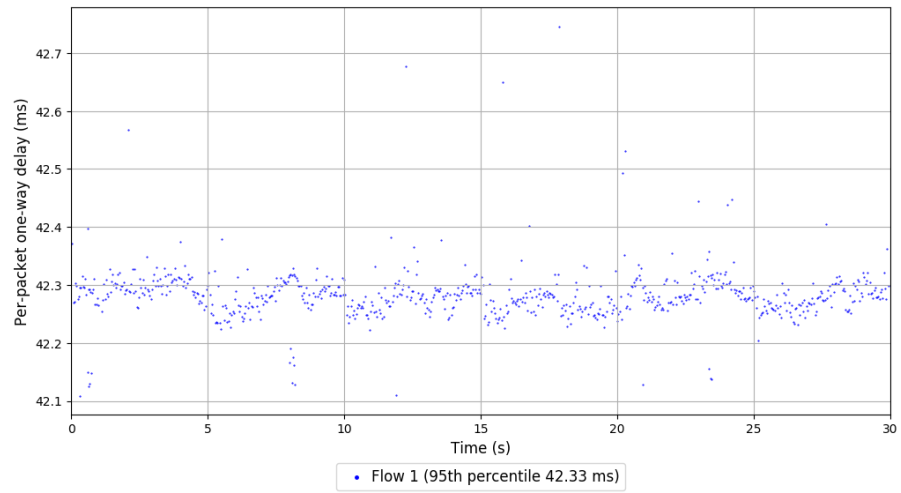
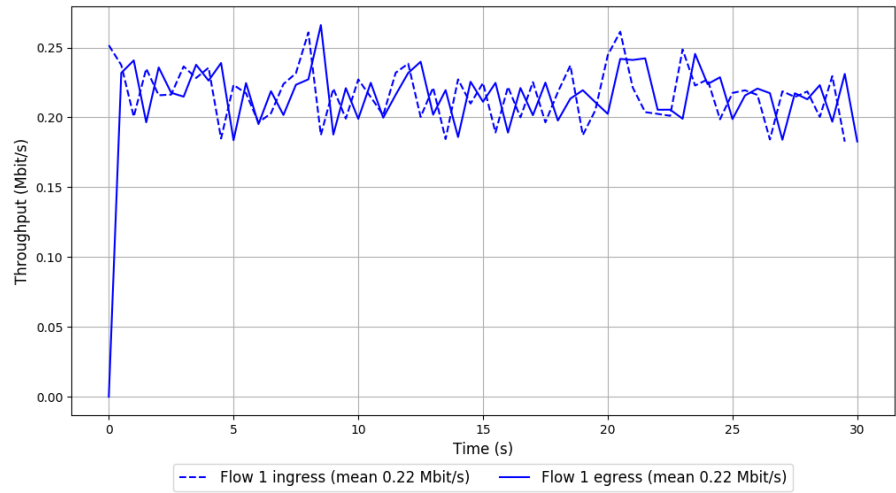Run 5: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2018-12-02 09:40:43
End at: 2018-12-02 09:41:13
Local clock offset: 2.924 ms
Remote clock offset: -3.037 ms


# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 42.329 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 42.329 ms
Loss rate: 0.13%
```

Run 1: Report of SCReAM — Data Link

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

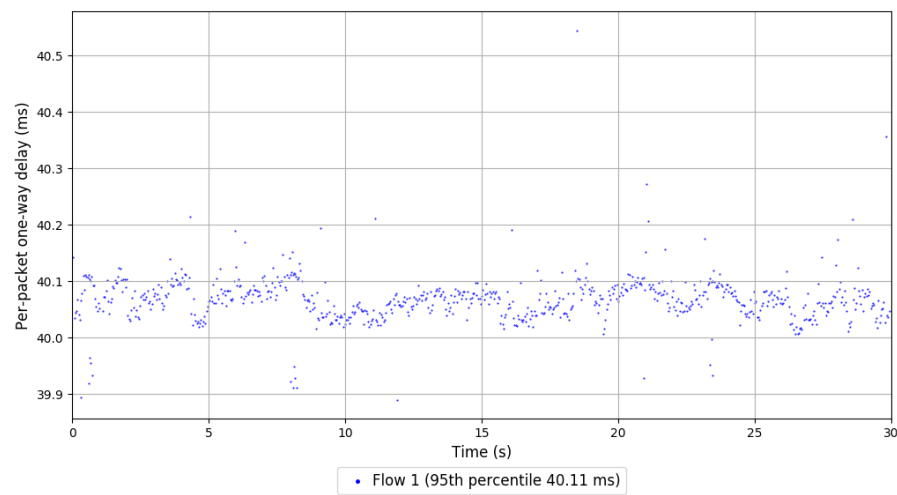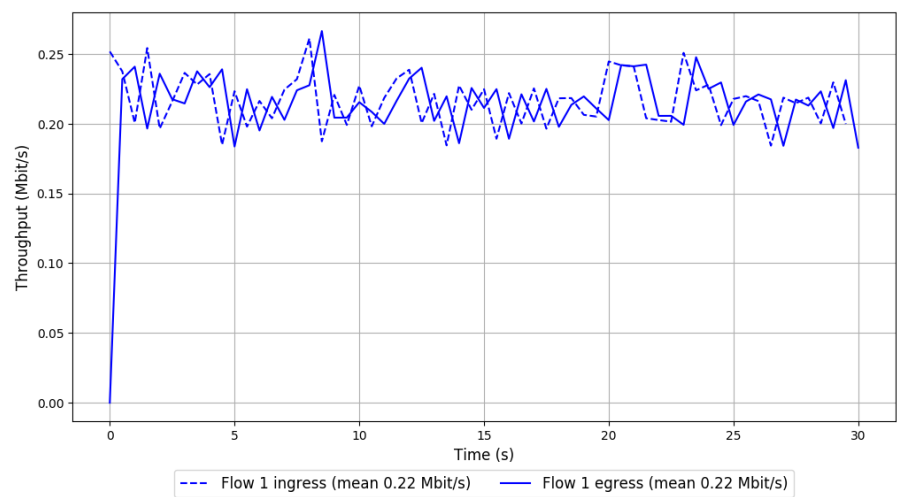

Flow 1 (95th percentile 42.33 ms)

```
Run 2: Statistics of SCReAM

Start at: 2018-12-02 10:04:25
End at: 2018-12-02 10:04:55
Local clock offset: 0.57 ms
Remote clock offset: -3.326 ms


# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.113 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.113 ms
Loss rate: 0.26%
```

Run 2: Report of SCReAM — Data Link

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

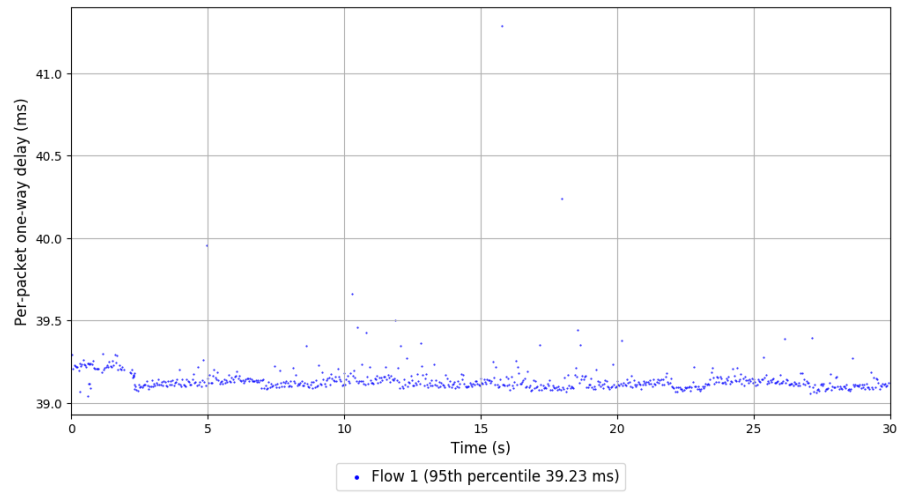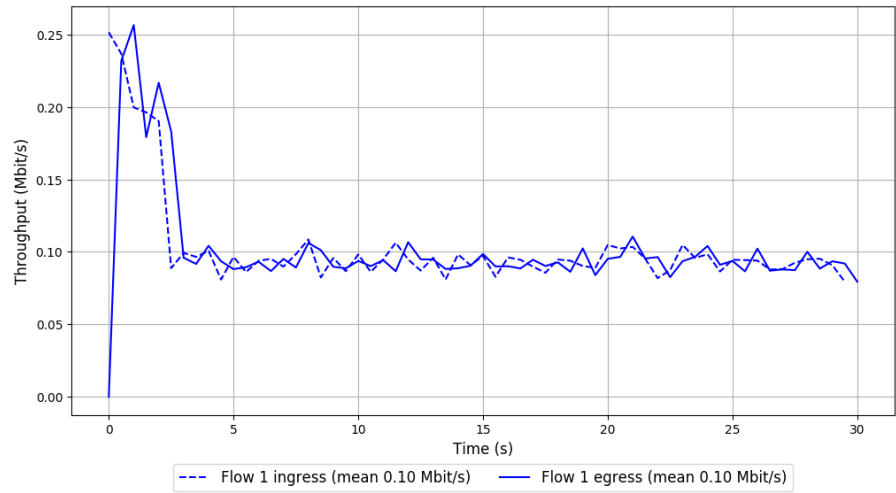Flow 1 (95th percentile 40.11 ms)

```
Run 3: Statistics of SCReAM

Start at: 2018-12-02 10:28:06
End at: 2018-12-02 10:28:36
Local clock offset: 1.946 ms
Remote clock offset: -1.753 ms


# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 39.232 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 39.232 ms
Loss rate: 0.11%
```

Run 3: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.10 Mbit/s) ----   Flow 1 egress (mean 0.10 Mbit/s) ——

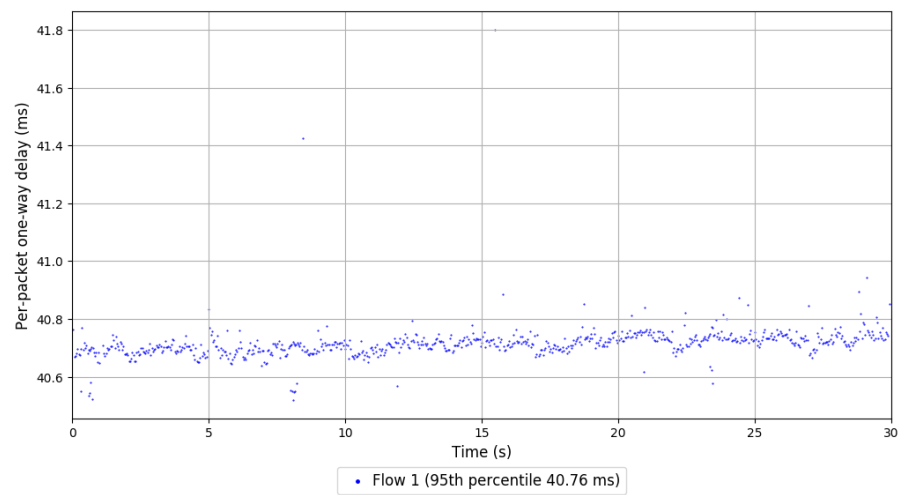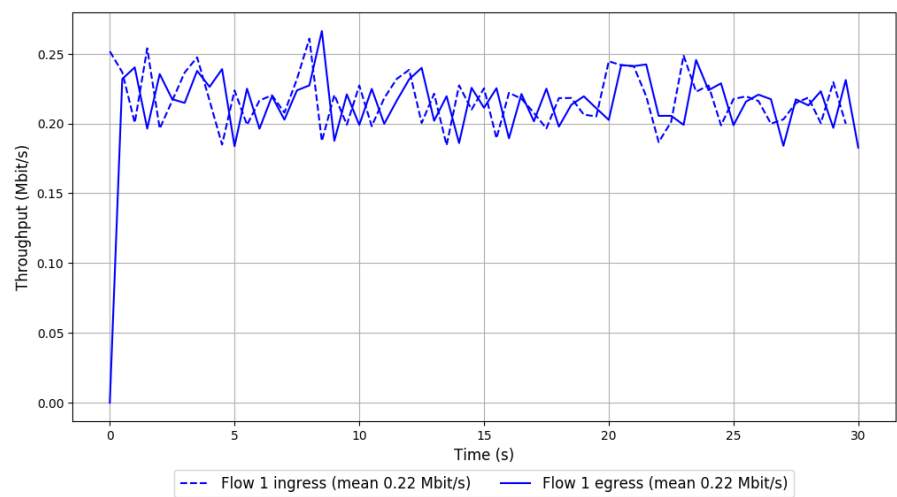• Flow 1 (95th percentile 39.23 ms)

```
Run 4: Statistics of SCReAM

Start at: 2018-12-02 10:51:11
End at: 2018-12-02 10:51:41
Local clock offset: 4.057 ms
Remote clock offset: -0.838 ms

# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.764 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.764 ms
Loss rate: 0.26%
```

Run 4: Report of SCReAM — Data Link

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

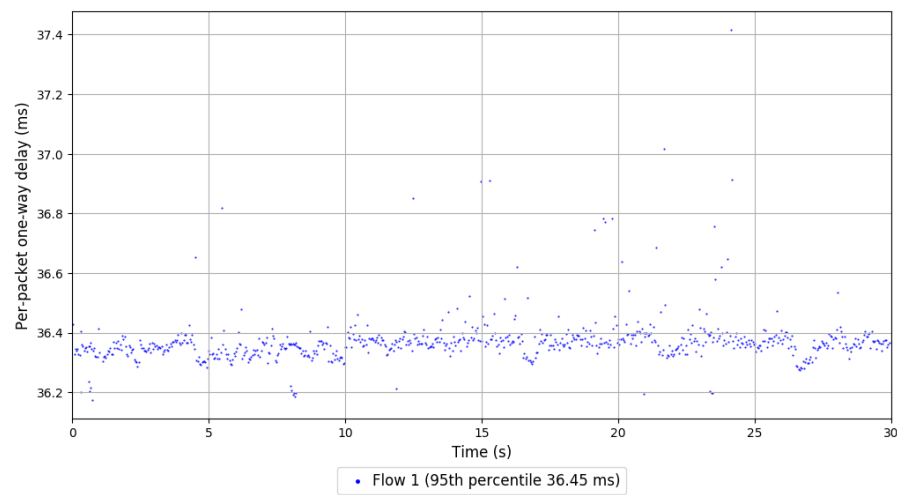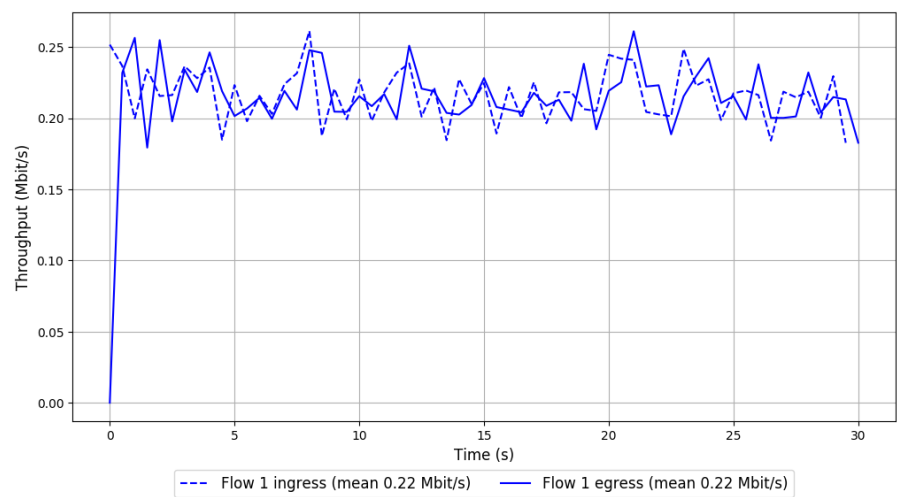Flow 1 (95th percentile 40.76 ms)

```
Run 5: Statistics of SCReAM

Start at: 2018-12-02 11:14:11
End at: 2018-12-02 11:14:41
Local clock offset: 0.12 ms
Remote clock offset: -0.217 ms


# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 36.446 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 36.446 ms
Loss rate: 0.13%
```

Run 5: Report of SCReAM — Data Link

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

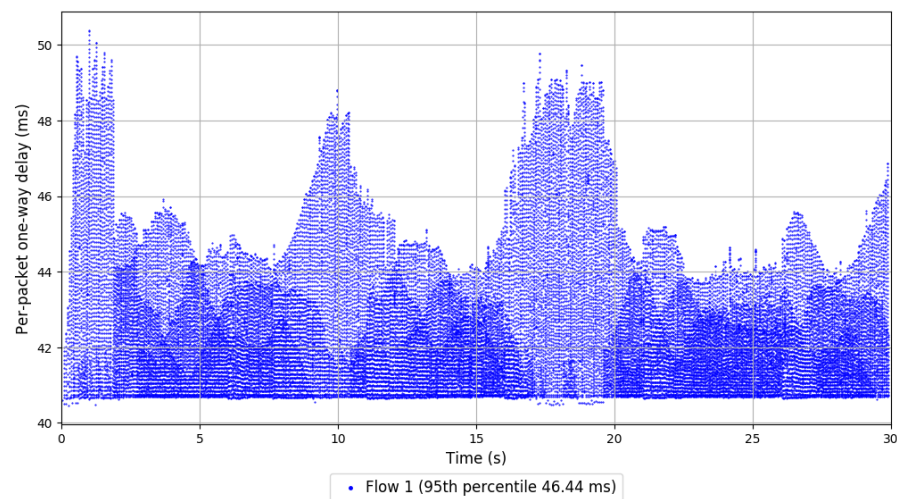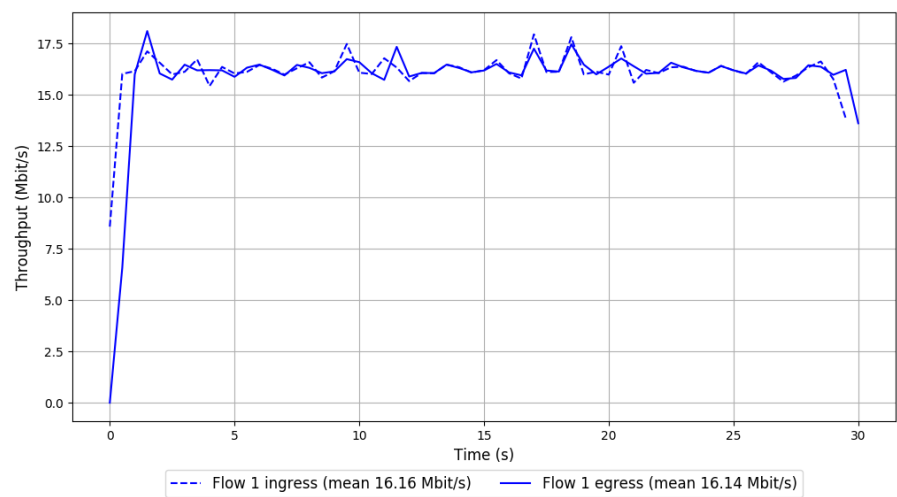Flow 1 (95th percentile 36.45 ms)

```
Run 1: Statistics of Sprout

Start at: 2018-12-02 09:54:36
End at: 2018-12-02 09:55:06
Local clock offset: 1.186 ms
Remote clock offset: -3.232 ms


# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.14 Mbit/s
95th percentile per-packet one-way delay: 46.436 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 16.14 Mbit/s
95th percentile per-packet one-way delay: 46.436 ms
Loss rate: 0.16%
```

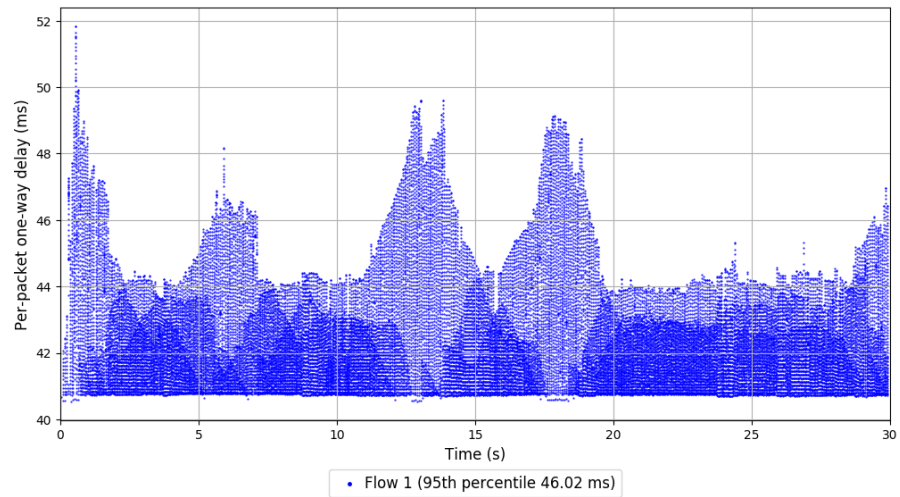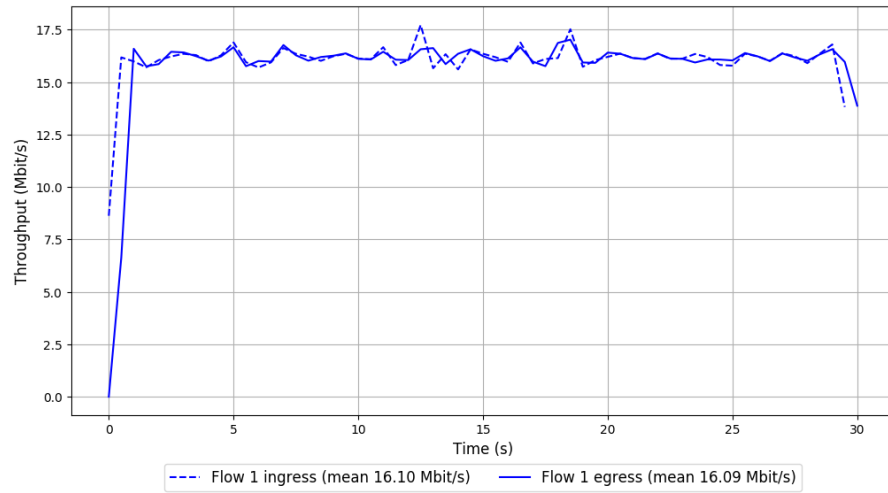Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-12-02 10:18:24
End at: 2018-12-02 10:18:54
Local clock offset: 1.417 ms
Remote clock offset: -3.379 ms


# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.09 Mbit/s
95th percentile per-packet one-way delay: 46.016 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 16.09 Mbit/s
95th percentile per-packet one-way delay: 46.016 ms
Loss rate: 0.18%
```

Run 2: Report of Sprout — Data Link

Flow 1 ingress (mean 16.10 Mbit/s)   Flow 1 egress (mean 16.09 Mbit/s)

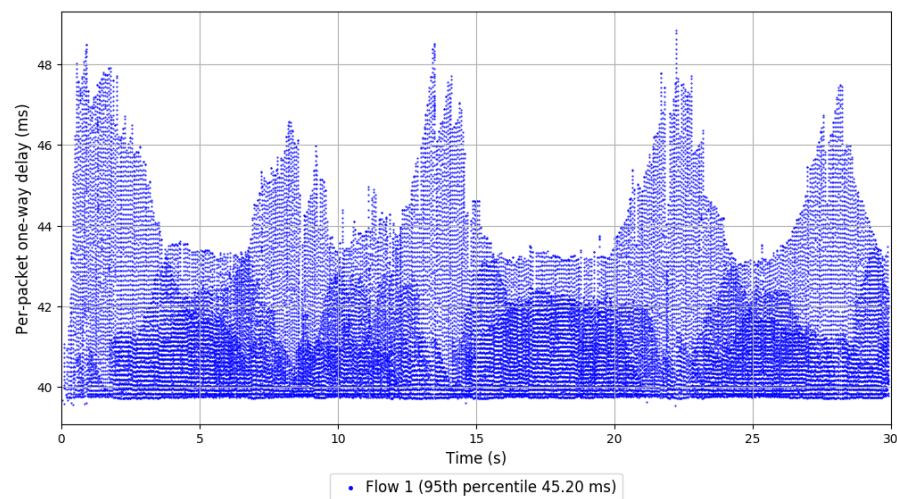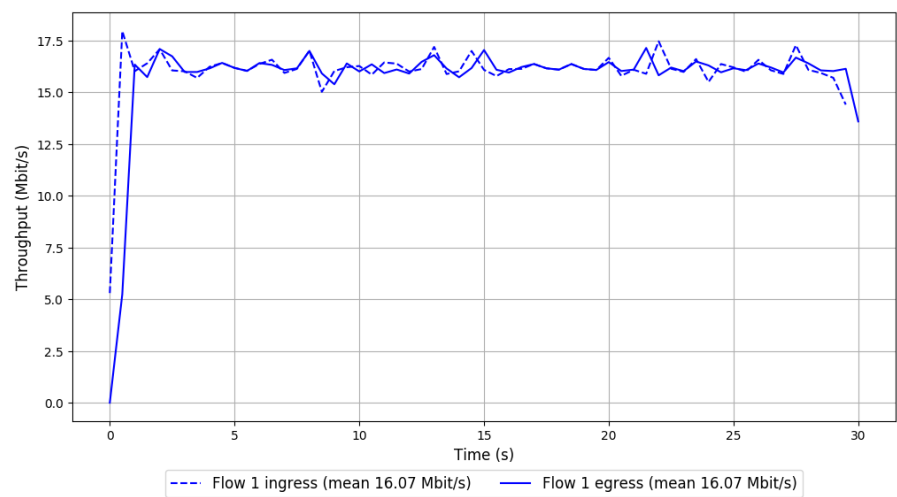Flow 1 (95th percentile 46.02 ms)

```
Run 3: Statistics of Sprout

Start at: 2018-12-02 10:41:39
End at: 2018-12-02 10:42:09
Local clock offset: 3.64 ms
Remote clock offset: -0.725 ms


# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.07 Mbit/s
95th percentile per-packet one-way delay: 45.196 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 16.07 Mbit/s
95th percentile per-packet one-way delay: 45.196 ms
Loss rate: 0.20%
```

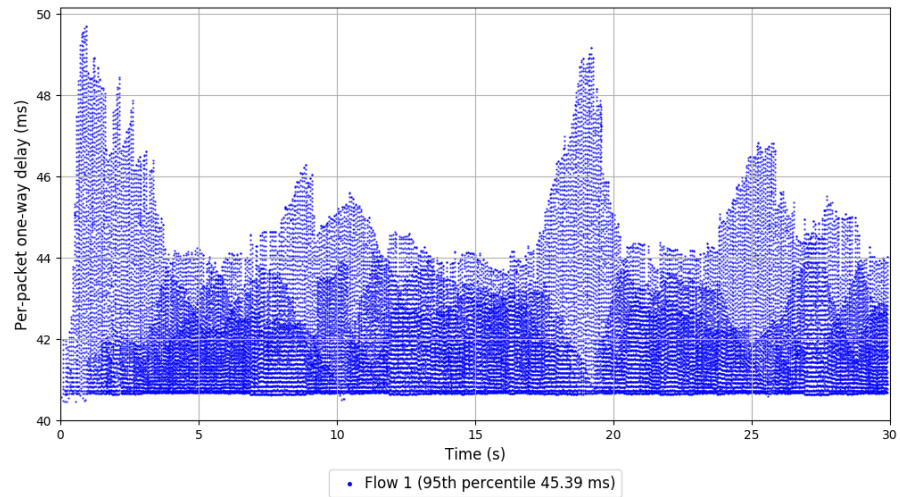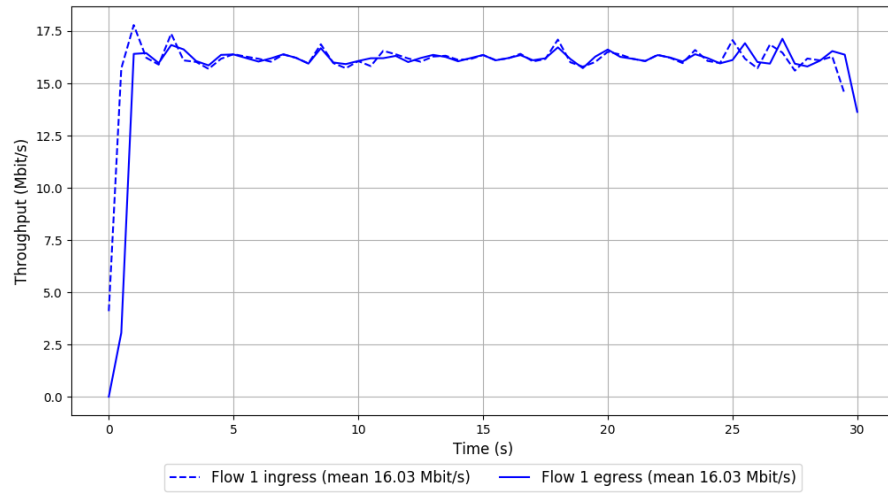## Run 3: Report of Sprout — Data Link

```
Run 4: Statistics of Sprout

Start at: 2018-12-02 11:04:34
End at: 2018-12-02 11:05:04
Local clock offset: 3.071 ms
Remote clock offset: -1.489 ms


# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.03 Mbit/s
95th percentile per-packet one-way delay: 45.389 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 16.03 Mbit/s
95th percentile per-packet one-way delay: 45.389 ms
Loss rate: 0.20%
```

Run 4: Report of Sprout — Data Link

Flow 1 ingress (mean 16.03 Mbit/s)   Flow 1 egress (mean 16.03 Mbit/s)

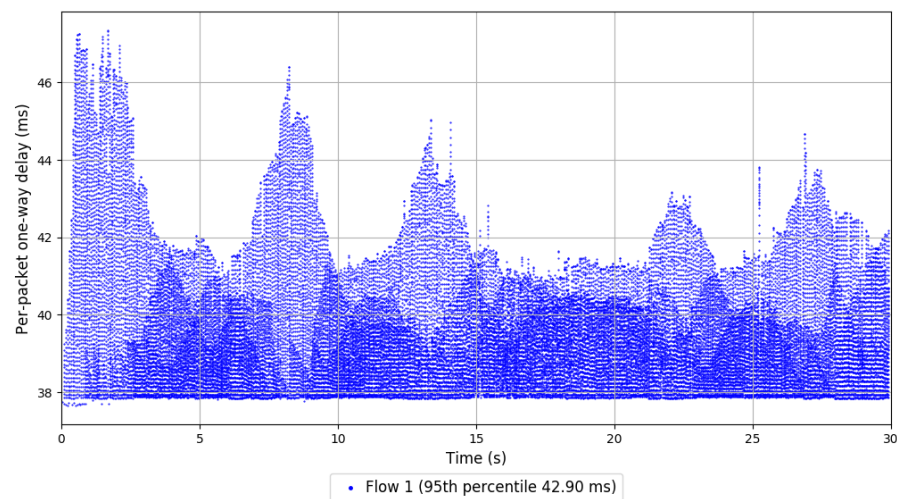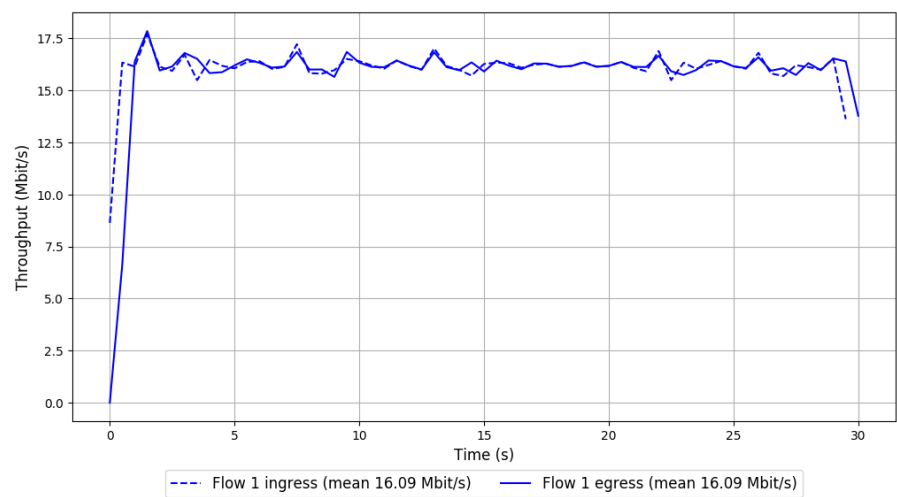Flow 1 (95th percentile 45.39 ms)

```
Run 5: Statistics of Sprout

Start at: 2018-12-02 11:27:59
End at: 2018-12-02 11:28:29
Local clock offset: 1.738 ms
Remote clock offset: -0.072 ms


# Below is generated by plot.py at 2018-12-02 11:40:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.09 Mbit/s
95th percentile per-packet one-way delay: 42.903 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 16.09 Mbit/s
95th percentile per-packet one-way delay: 42.903 ms
Loss rate: 0.10%
```

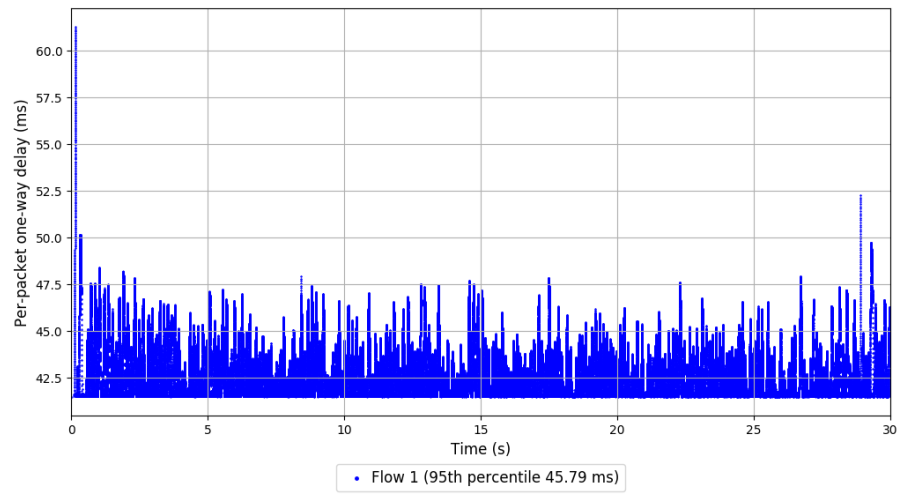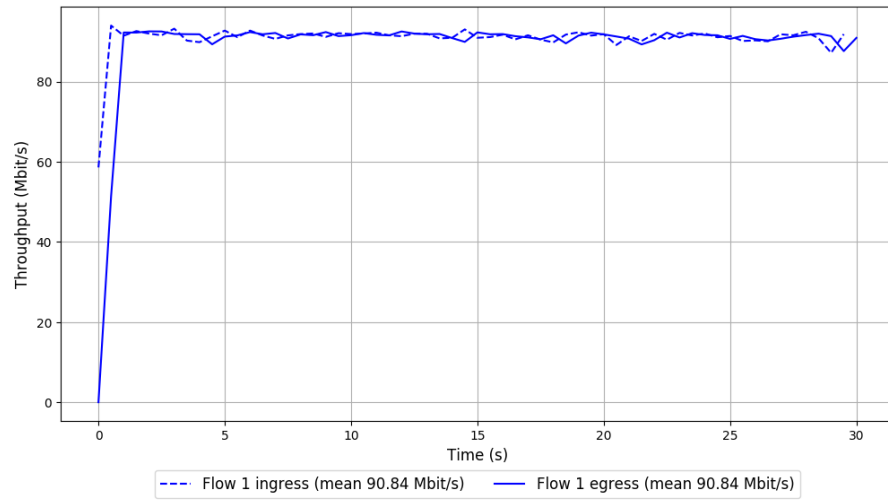## Run 5: Report of Sprout — Data Link

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

Start at: 2018-12-02 09:41:48
End at: 2018-12-02 09:42:18
Local clock offset: 1.586 ms
Remote clock offset: -3.63 ms


# Below is generated by plot.py at 2018-12-02 11:42:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.84 Mbit/s
95th percentile per-packet one-way delay: 45.791 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 90.84 Mbit/s
95th percentile per-packet one-way delay: 45.791 ms
Loss rate: 0.15%
```

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

Flow 1 ingress (mean 90.84 Mbit/s) --- Flow 1 egress (mean 90.84 Mbit/s)

Flow 1 (95th percentile 45.79 ms)

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

Start at: 2018-12-02 10:05:30
End at: 2018-12-02 10:06:00
Local clock offset: 0.768 ms
Remote clock offset: -3.304 ms


# Below is generated by plot.py at 2018-12-02 11:42:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.08 Mbit/s
95th percentile per-packet one-way delay: 42.987 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 91.08 Mbit/s
95th percentile per-packet one-way delay: 42.987 ms
Loss rate: 0.16%
```
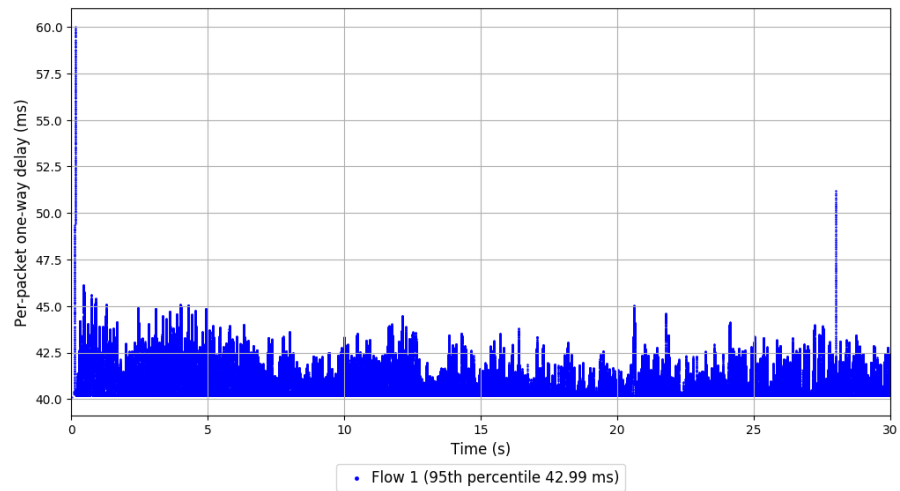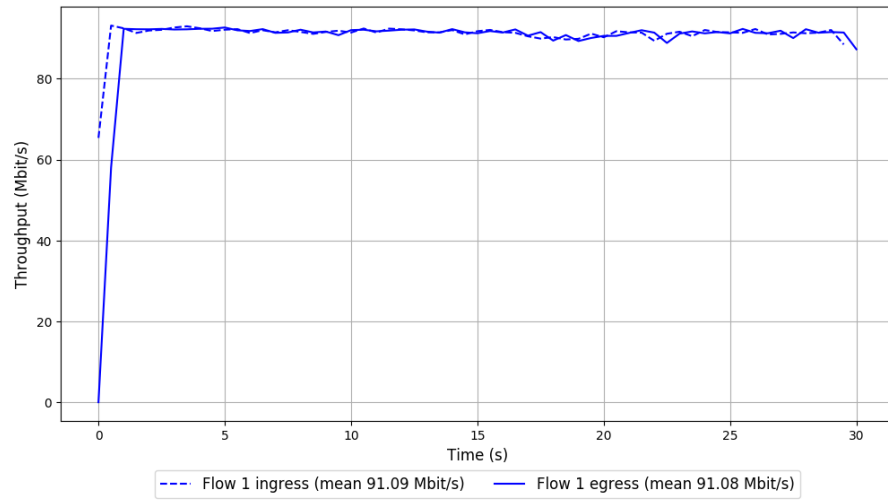
Run 2: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 91.09 Mbit/s) ----- Flow 1 egress (mean 91.08 Mbit/s)

Flow 1 (95th percentile 42.99 ms)

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

Start at: 2018-12-02 10:29:11
End at: 2018-12-02 10:29:41
Local clock offset: 1.624 ms
Remote clock offset: -1.134 ms


# Below is generated by plot.py at 2018-12-02 11:42:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.46 Mbit/s
95th percentile per-packet one-way delay: 42.882 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 91.46 Mbit/s
95th percentile per-packet one-way delay: 42.882 ms
Loss rate: 0.16%
```
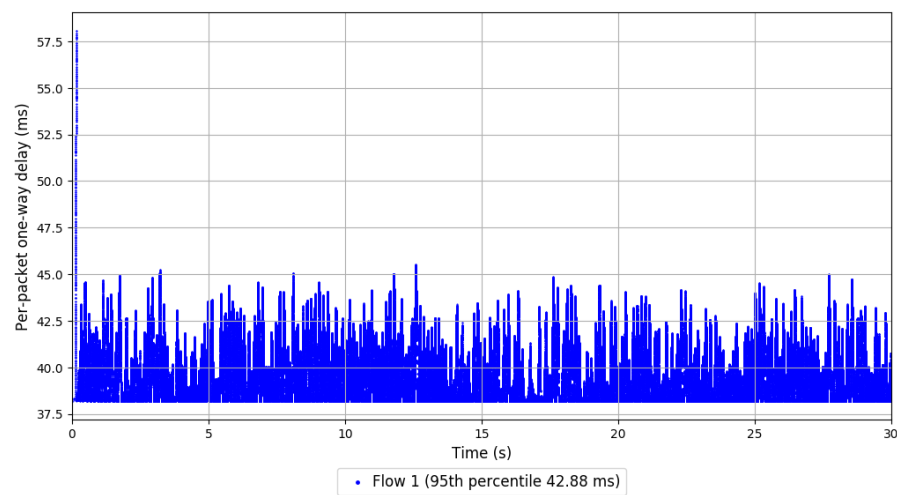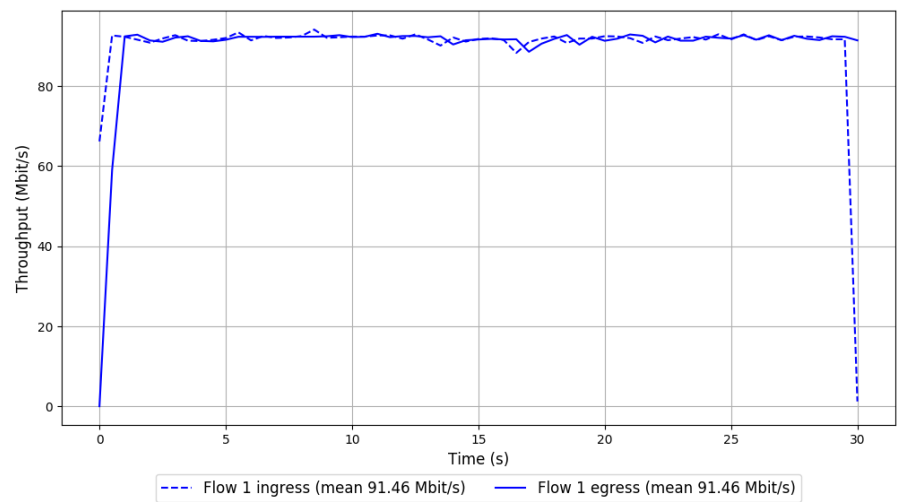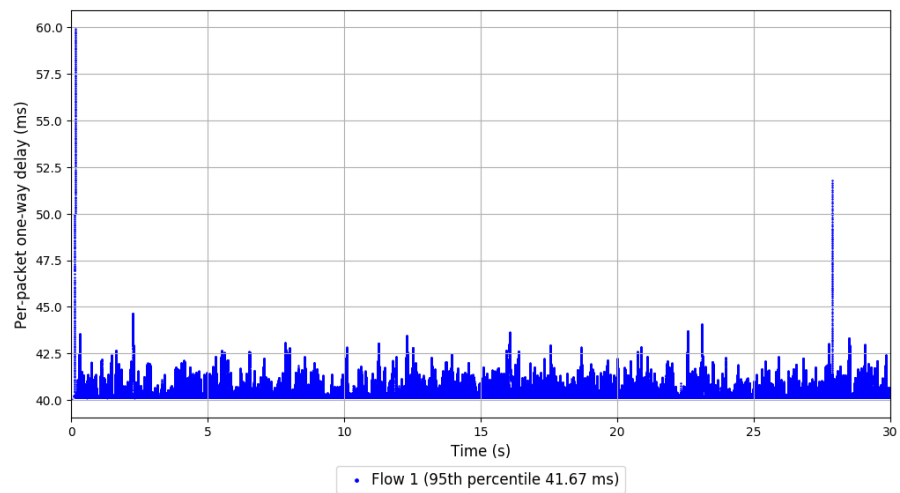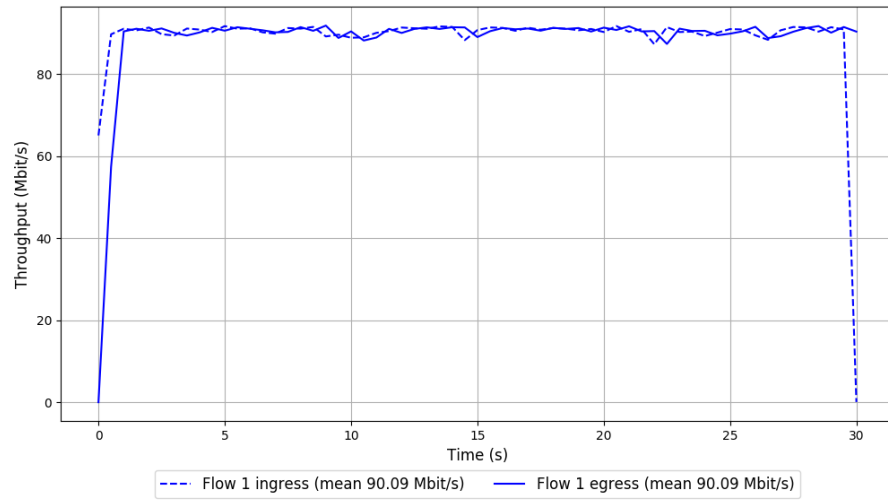
Run 3: Report of TaoVA-100x — Data Link

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

Start at: 2018-12-02 10:52:17
End at: 2018-12-02 10:52:47
Local clock offset: 3.935 ms
Remote clock offset: -0.326 ms


# Below is generated by plot.py at 2018-12-02 11:42:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.09 Mbit/s
95th percentile per-packet one-way delay: 41.670 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 90.09 Mbit/s
95th percentile per-packet one-way delay: 41.670 ms
Loss rate: 0.15%
```

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

Flow 1 ingress (mean 90.09 Mbit/s) --- Flow 1 egress (mean 90.09 Mbit/s)

Flow 1 (95th percentile 41.67 ms)

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

Start at: 2018-12-02 11:15:16
End at: 2018-12-02 11:15:46
Local clock offset: 1.725 ms
Remote clock offset: -1.357 ms


# Below is generated by plot.py at 2018-12-02 11:42:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.93 Mbit/s
95th percentile per-packet one-way delay: 41.738 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 90.93 Mbit/s
95th percentile per-packet one-way delay: 41.738 ms
Loss rate: 0.14%
```
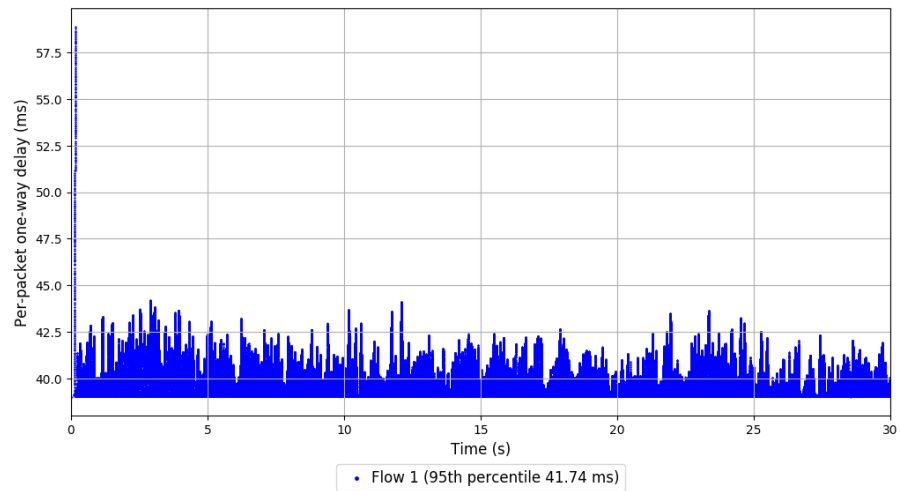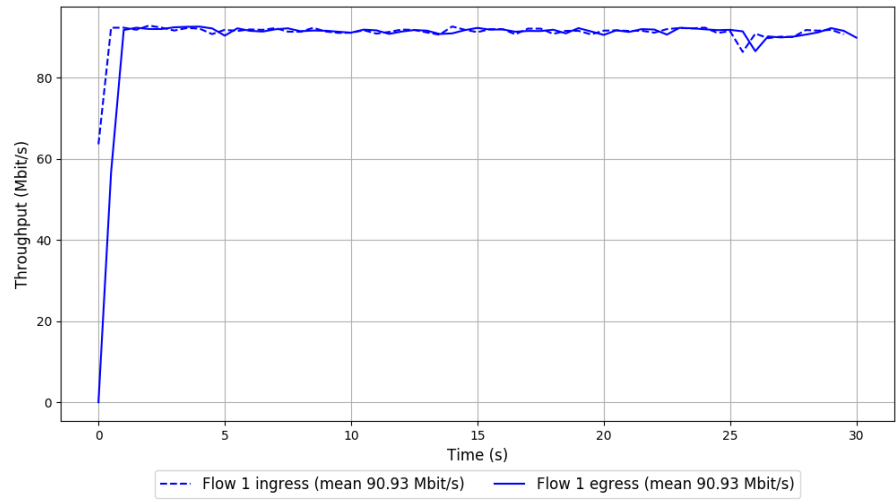
Run 5: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 90.93 Mbit/s)   Flow 1 egress (mean 90.93 Mbit/s)

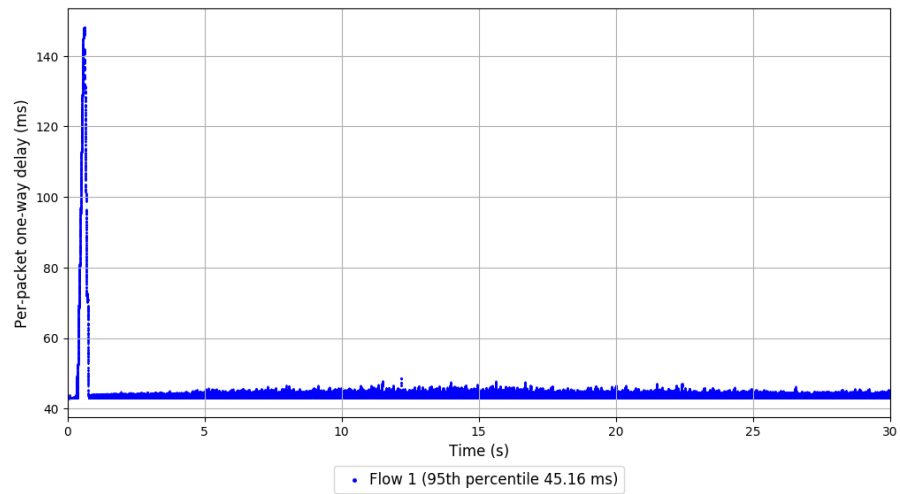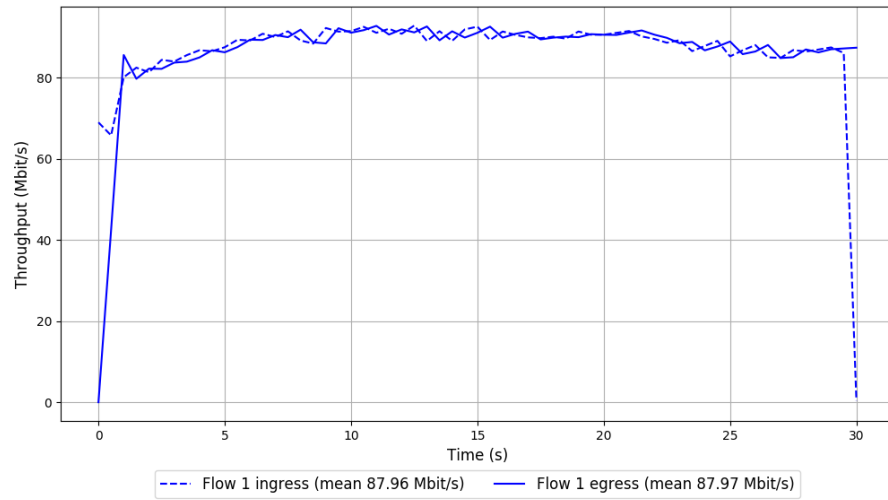
Flow 1 (95th percentile 41.74 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2018-12-02 09:35:57
End at: 2018-12-02 09:36:27
Local clock offset: 4.029 ms
Remote clock offset: -2.528 ms


# Below is generated by plot.py at 2018-12-02 11:42:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 87.97 Mbit/s
95th percentile per-packet one-way delay: 45.158 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 87.97 Mbit/s
95th percentile per-packet one-way delay: 45.158 ms
Loss rate: 0.14%
```

Run 1: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 87.96 Mbit/s)   Flow 1 egress (mean 87.97 Mbit/s)

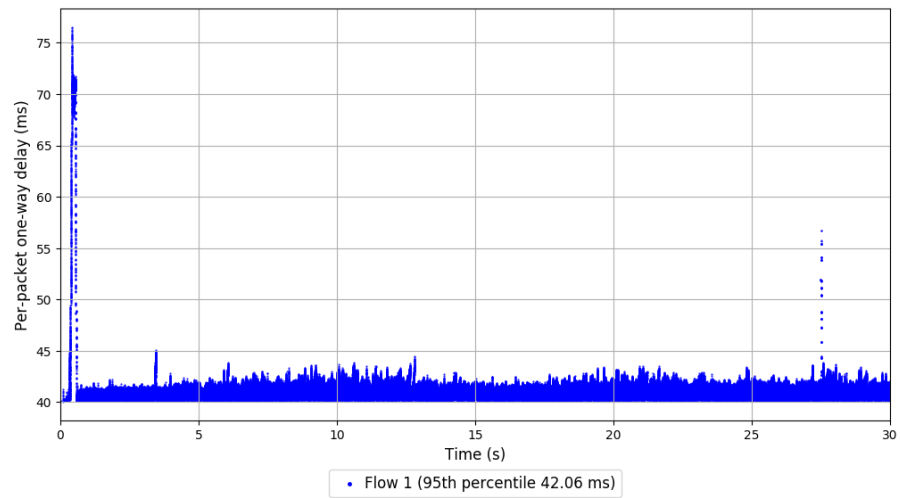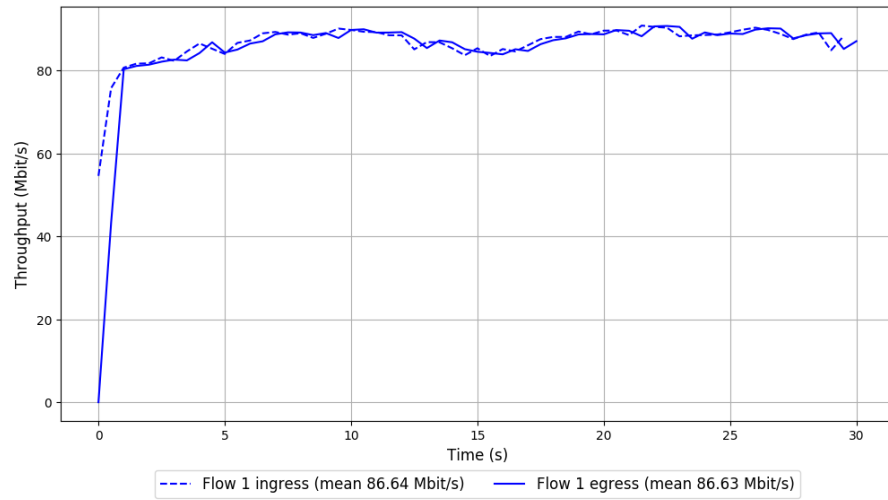
Flow 1 (95th percentile 45.16 ms)

```
Run 2: Statistics of TCP Vegas

Start at: 2018-12-02 09:59:22
End at: 2018-12-02 09:59:52
Local clock offset: 0.773 ms
Remote clock offset: -3.234 ms


# Below is generated by plot.py at 2018-12-02 11:42:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.63 Mbit/s
95th percentile per-packet one-way delay: 42.062 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 86.63 Mbit/s
95th percentile per-packet one-way delay: 42.062 ms
Loss rate: 0.16%
```
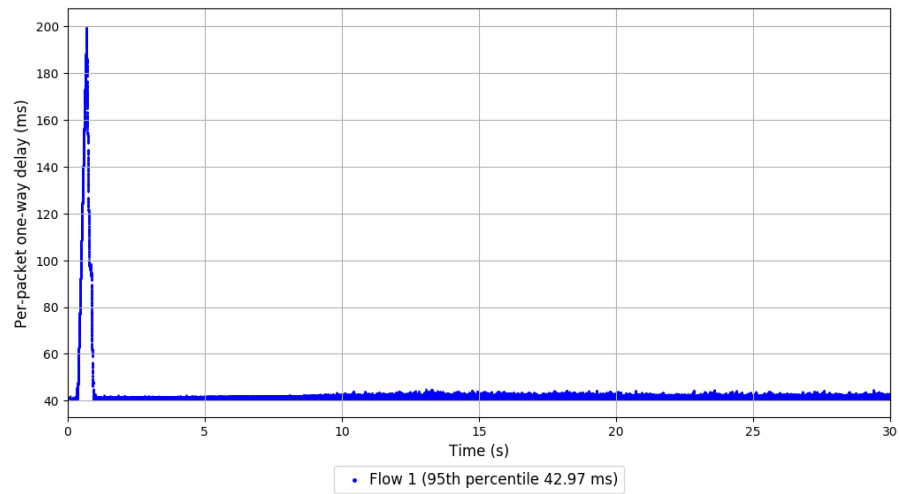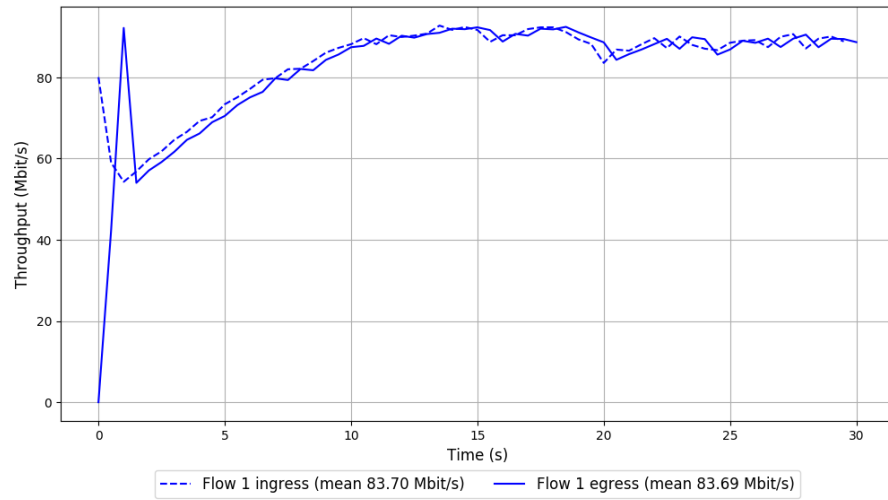
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-12-02 10:23:19
End at: 2018-12-02 10:23:49
Local clock offset: 3.089 ms
Remote clock offset: -2.108 ms


# Below is generated by plot.py at 2018-12-02 11:42:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 83.69 Mbit/s
95th percentile per-packet one-way delay: 42.966 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 83.69 Mbit/s
95th percentile per-packet one-way delay: 42.966 ms
Loss rate: 0.17%
```
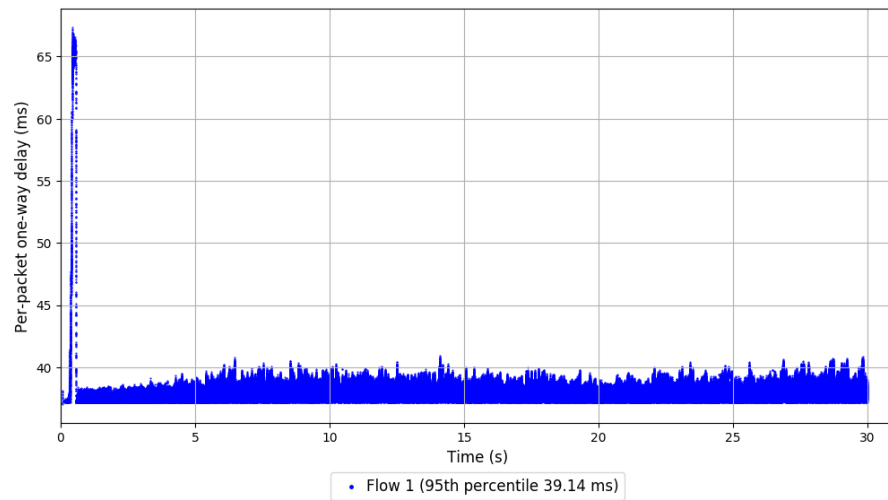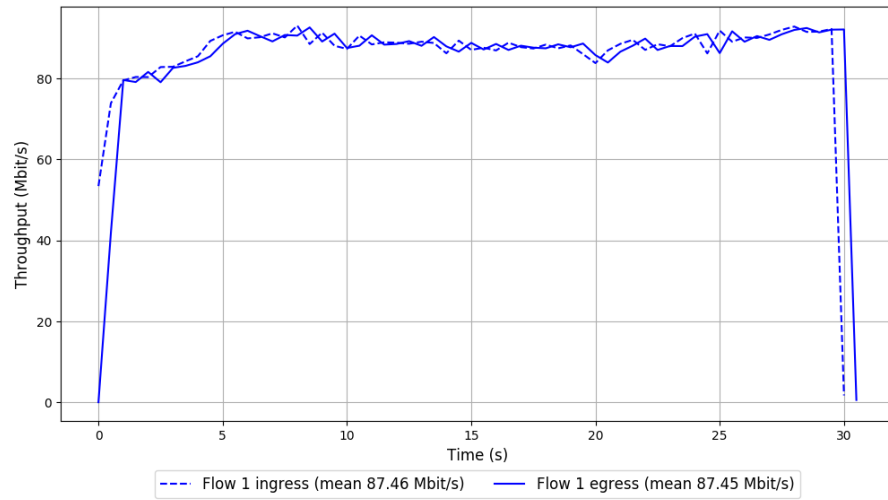
Run 3: Report of TCP Vegas — Data Link

```
Run 4: Statistics of TCP Vegas

Start at: 2018-12-02 10:46:30
End at: 2018-12-02 10:47:00
Local clock offset: 1.221 ms
Remote clock offset: -0.594 ms


# Below is generated by plot.py at 2018-12-02 11:42:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 87.45 Mbit/s
95th percentile per-packet one-way delay: 39.137 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 87.45 Mbit/s
95th percentile per-packet one-way delay: 39.137 ms
Loss rate: 0.16%
```

Run 4: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 87.46 Mbit/s)   Flow 1 egress (mean 87.45 Mbit/s)
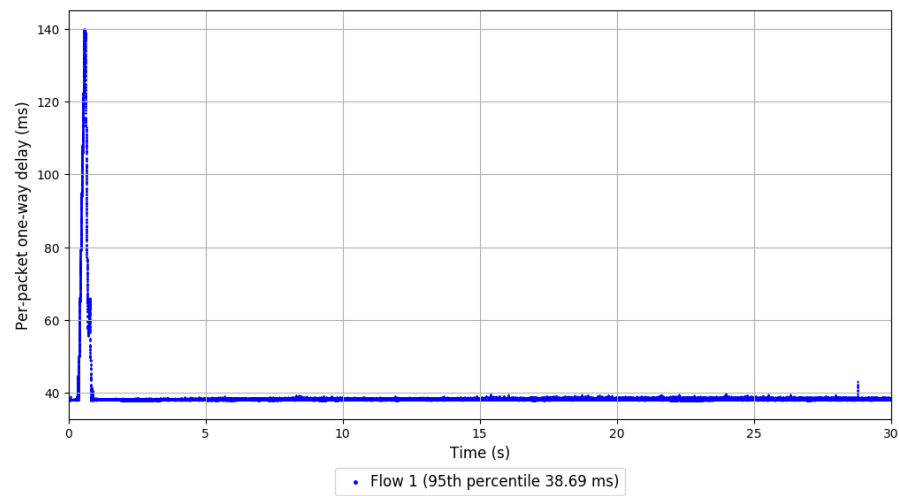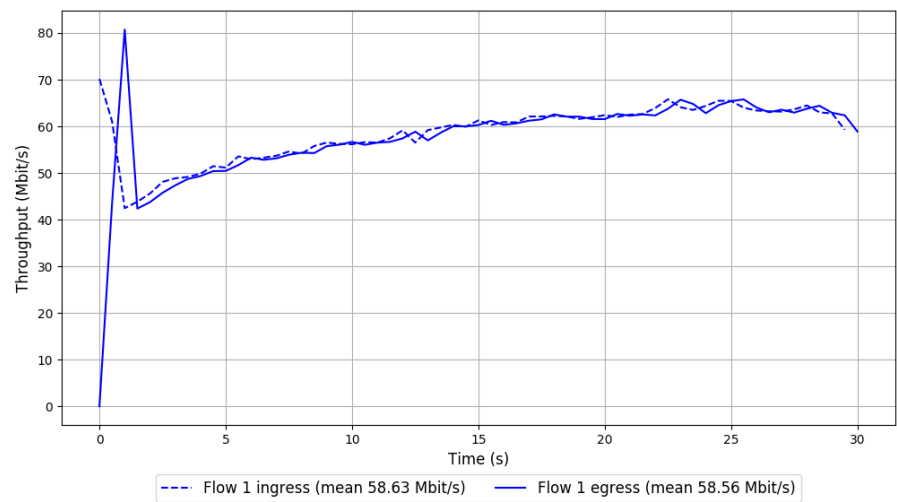

Flow 1 (95th percentile 39.14 ms)

```
Run 5: Statistics of TCP Vegas

Start at: 2018-12-02 11:09:25
End at: 2018-12-02 11:09:55
Local clock offset: 0.307 ms
Remote clock offset: -1.695 ms


# Below is generated by plot.py at 2018-12-02 11:42:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 58.56 Mbit/s
95th percentile per-packet one-way delay: 38.693 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 58.56 Mbit/s
95th percentile per-packet one-way delay: 38.693 ms
Loss rate: 0.27%
```

Run 5: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 58.63 Mbit/s)   Flow 1 egress (mean 58.56 Mbit/s)

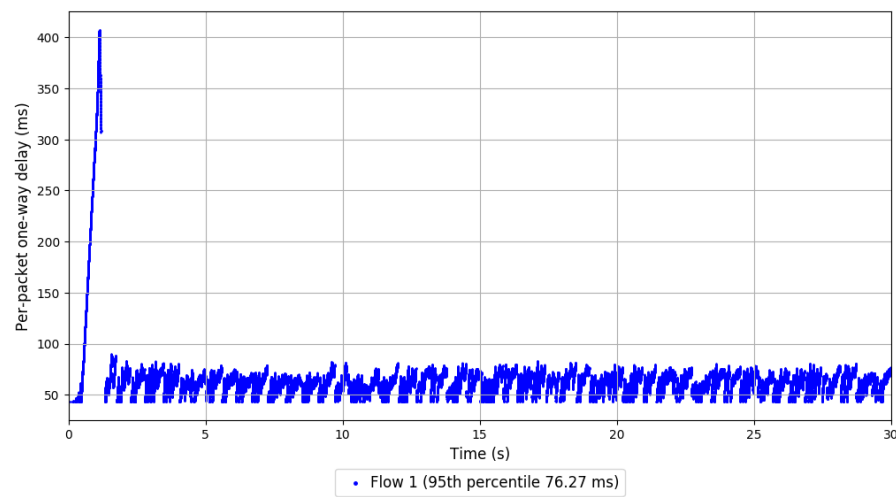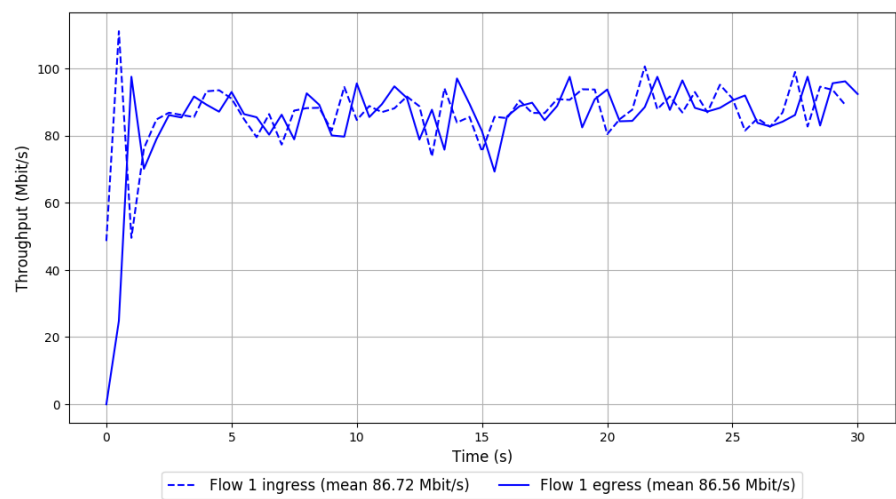Flow 1 (95th percentile 38.69 ms)

```
Run 1: Statistics of Verus

Start at: 2018-12-02 09:38:15
End at: 2018-12-02 09:38:45
Local clock offset: 3.21 ms
Remote clock offset: -3.715 ms


# Below is generated by plot.py at 2018-12-02 11:43:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.56 Mbit/s
95th percentile per-packet one-way delay: 76.273 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 86.56 Mbit/s
95th percentile per-packet one-way delay: 76.273 ms
Loss rate: 0.27%
```

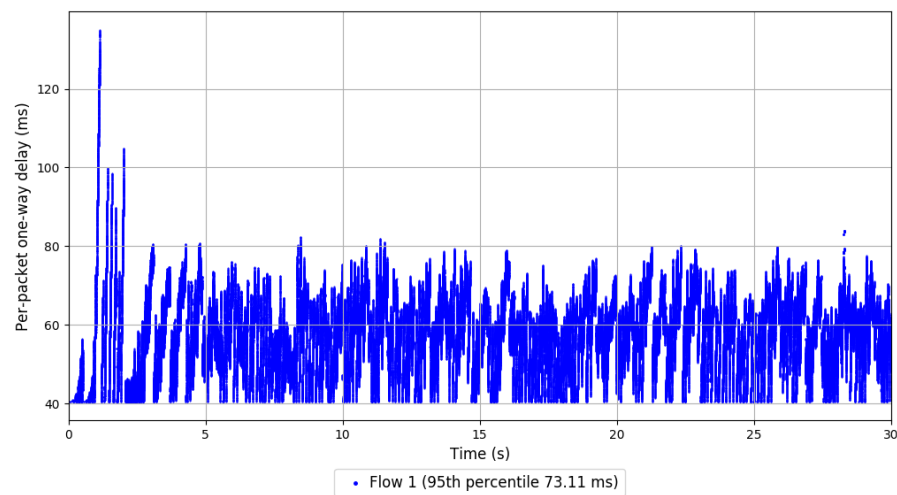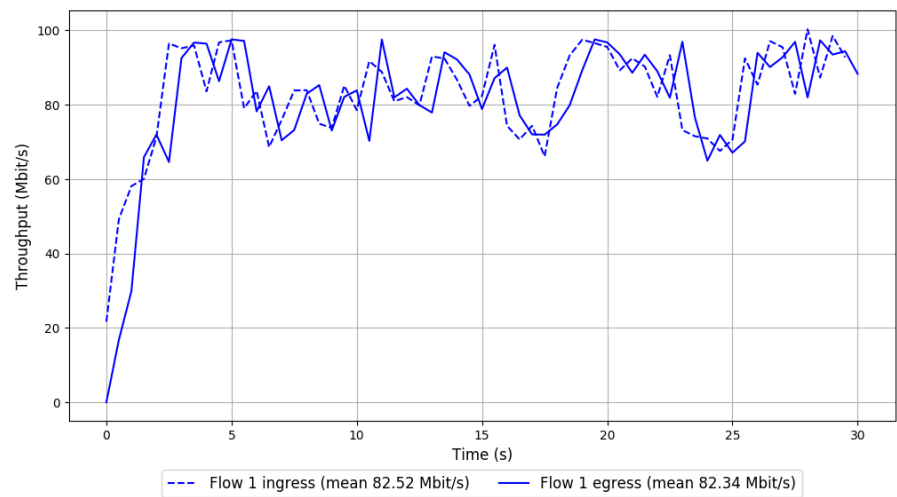Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2018-12-02 10:02:00
End at: 2018-12-02 10:02:30
Local clock offset: 1.096 ms
Remote clock offset: -3.082 ms


# Below is generated by plot.py at 2018-12-02 11:43:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 82.34 Mbit/s
95th percentile per-packet one-way delay: 73.114 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 82.34 Mbit/s
95th percentile per-packet one-way delay: 73.114 ms
Loss rate: 0.37%
```

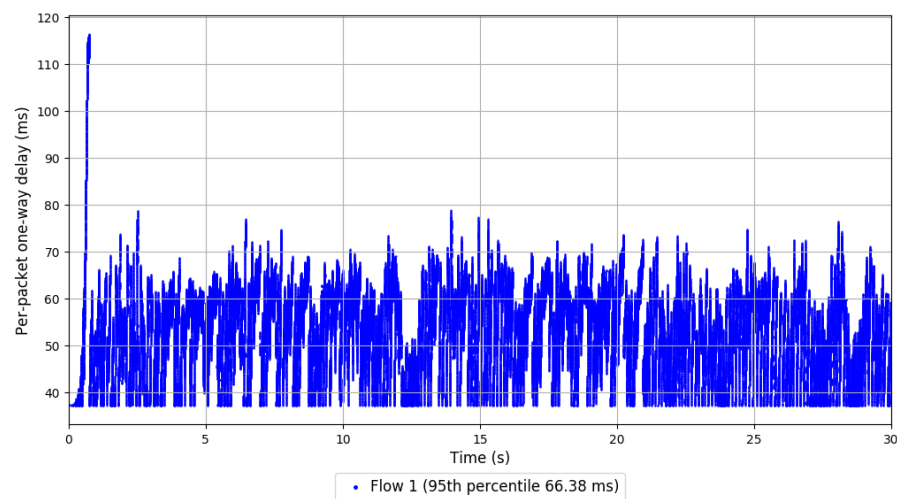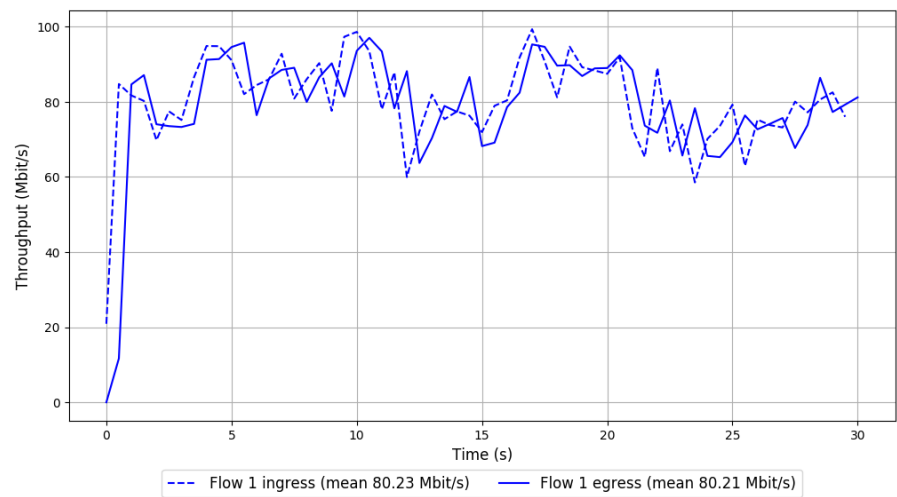Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-12-02 10:25:34
End at: 2018-12-02 10:26:04
Local clock offset: 0.995 ms
Remote clock offset: -0.607 ms


# Below is generated by plot.py at 2018-12-02 11:43:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 80.21 Mbit/s
95th percentile per-packet one-way delay: 66.378 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 80.21 Mbit/s
95th percentile per-packet one-way delay: 66.378 ms
Loss rate: 0.17%
```

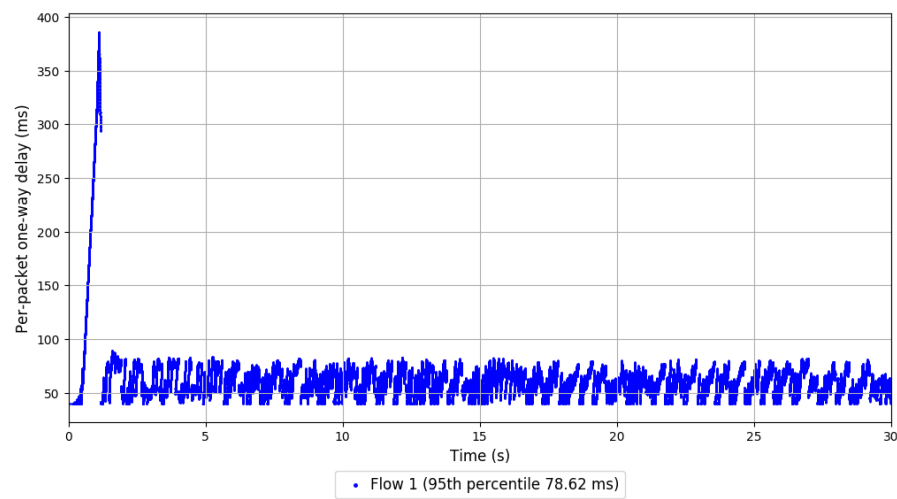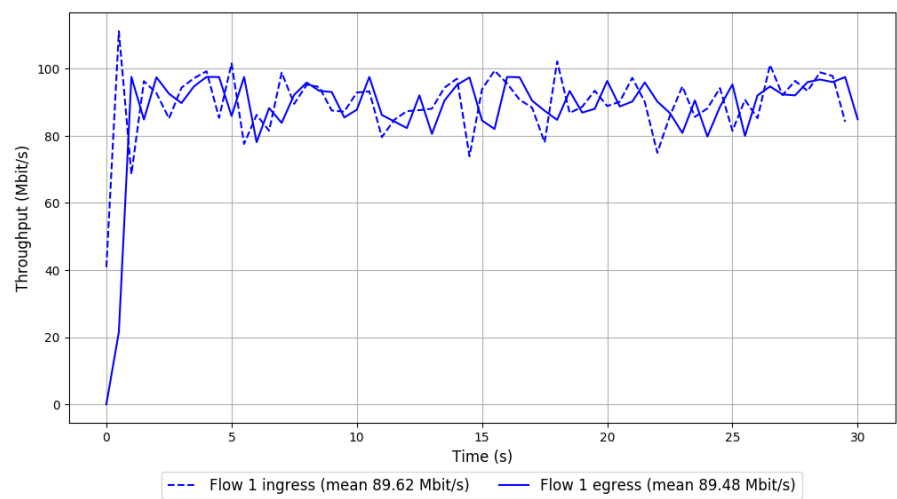Run 3: Report of Verus — Data Link

```
Run 4: Statistics of Verus

Start at: 2018-12-02 10:48:48
End at: 2018-12-02 10:49:18
Local clock offset: 4.196 ms
Remote clock offset: -0.175 ms


# Below is generated by plot.py at 2018-12-02 11:43:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.48 Mbit/s
95th percentile per-packet one-way delay: 78.618 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 89.48 Mbit/s
95th percentile per-packet one-way delay: 78.618 ms
Loss rate: 0.35%
```

Run 4: Report of Verus — Data Link

Flow 1 ingress (mean 89.62 Mbit/s)   Flow 1 egress (mean 89.48 Mbit/s)

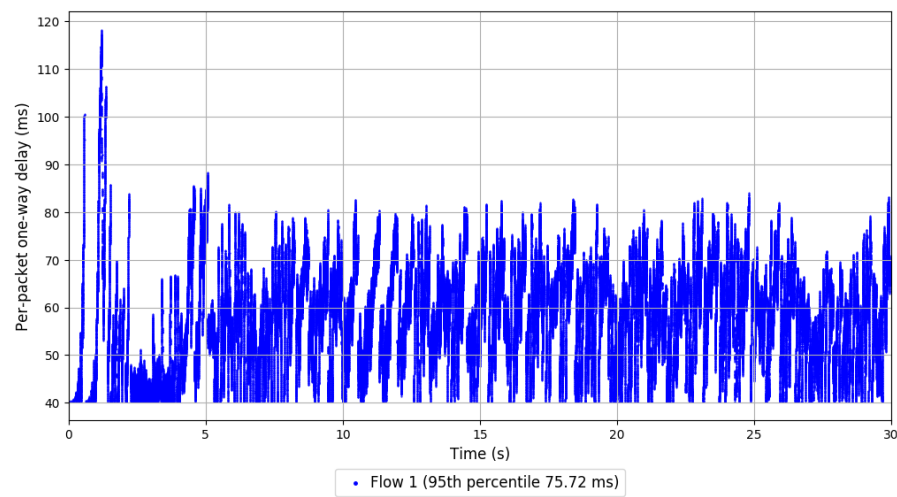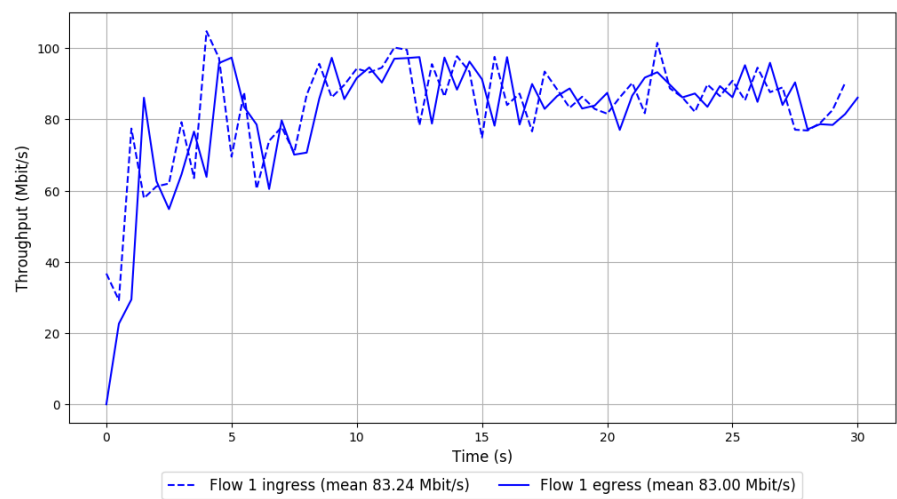

Flow 1 (95th percentile 78.62 ms)

```
Run 5: Statistics of Verus

Start at: 2018-12-02 11:11:42
End at: 2018-12-02 11:12:12
Local clock offset: 2.882 ms
Remote clock offset: -1.345 ms


# Below is generated by plot.py at 2018-12-02 11:43:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 83.00 Mbit/s
95th percentile per-packet one-way delay: 75.725 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 83.00 Mbit/s
95th percentile per-packet one-way delay: 75.725 ms
Loss rate: 0.35%
```

Run 5: Report of Verus — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2018-12-02 09:39:29
End at: 2018-12-02 09:39:59
Local clock offset: 2.345 ms
Remote clock offset: -3.237 ms


# Below is generated by plot.py at 2018-12-02 11:43:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 49.55 Mbit/s
95th percentile per-packet one-way delay: 41.947 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 49.55 Mbit/s
95th percentile per-packet one-way delay: 41.947 ms
Loss rate: 0.19%
```
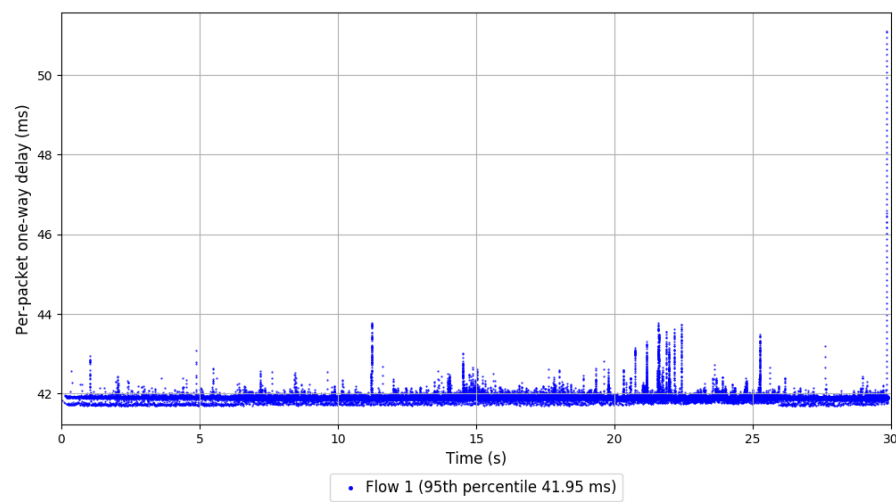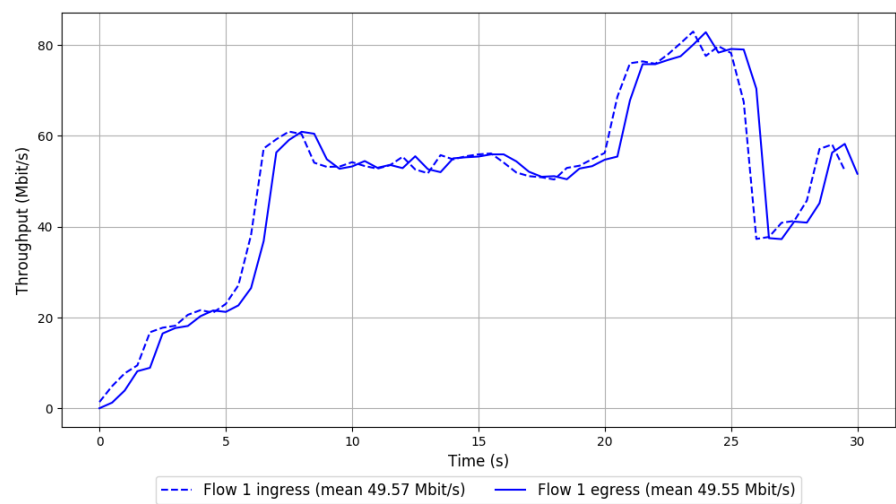
Run 1: Report of PCC-Vivace — Data Link

```
Run 2: Statistics of PCC-Vivace

Start at: 2018-12-02 10:03:16
End at: 2018-12-02 10:03:46
Local clock offset: 2.967 ms
Remote clock offset: -3.428 ms


# Below is generated by plot.py at 2018-12-02 11:43:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 33.59 Mbit/s
95th percentile per-packet one-way delay: 59.269 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 33.59 Mbit/s
95th percentile per-packet one-way delay: 59.269 ms
Loss rate: 0.49%
```
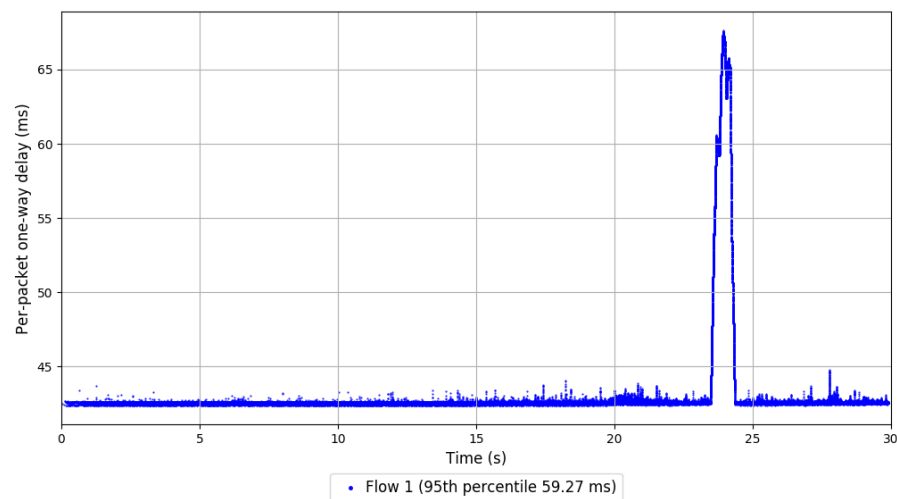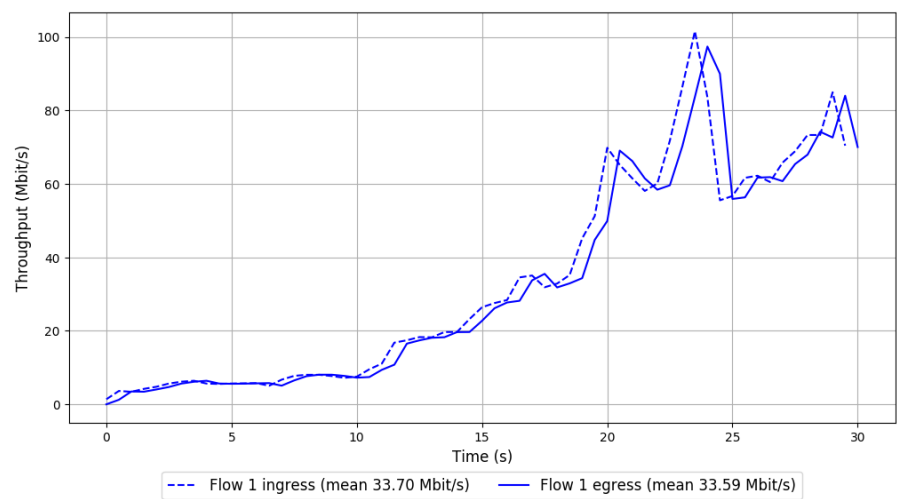
Run 2: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 33.70 Mbit/s)   Flow 1 egress (mean 33.59 Mbit/s)

Flow 1 (95th percentile 59.27 ms)

```
Run 3: Statistics of PCC-Vivace

Start at: 2018-12-02 10:26:53
End at: 2018-12-02 10:27:23
Local clock offset: 3.004 ms
Remote clock offset: -0.714 ms


# Below is generated by plot.py at 2018-12-02 11:43:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 60.64 Mbit/s
95th percentile per-packet one-way delay: 41.523 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 60.64 Mbit/s
95th percentile per-packet one-way delay: 41.523 ms
Loss rate: 0.22%
```
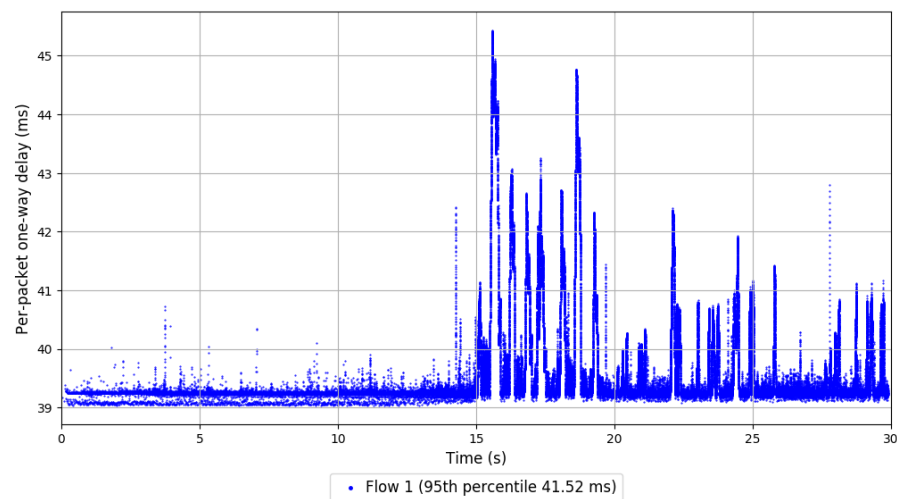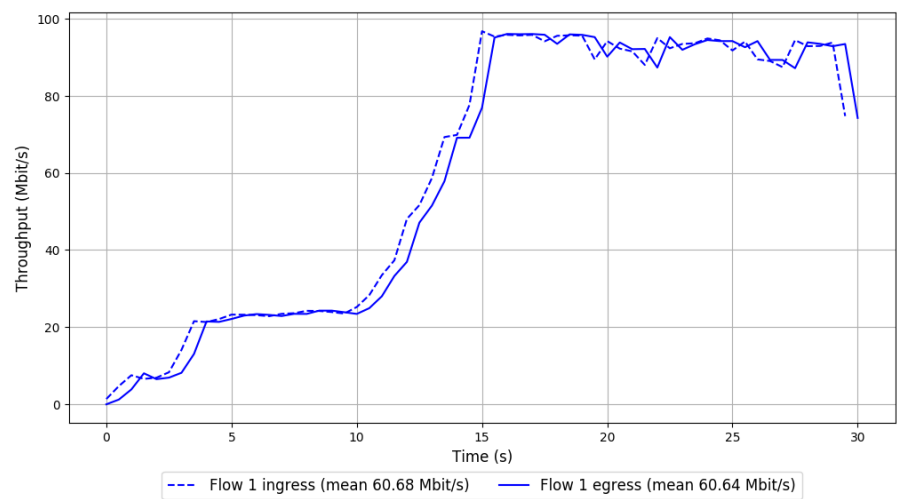
Run 3: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 60.68 Mbit/s)   Flow 1 egress (mean 60.64 Mbit/s)
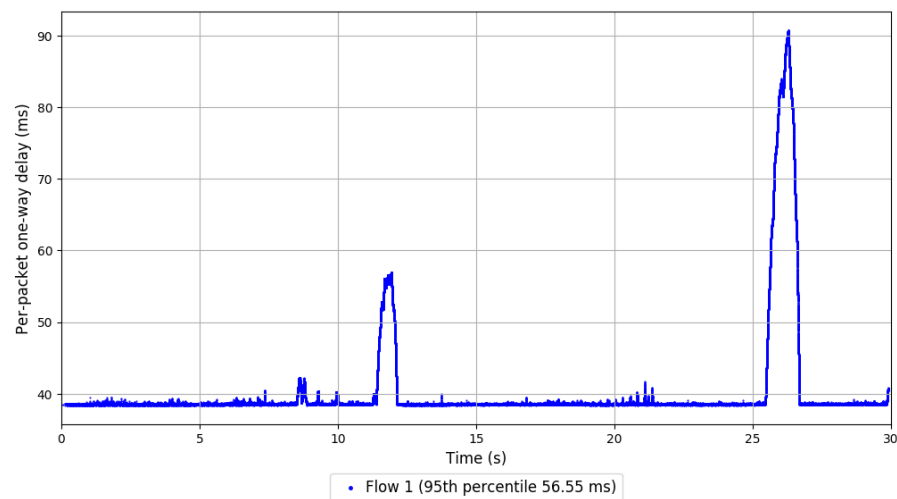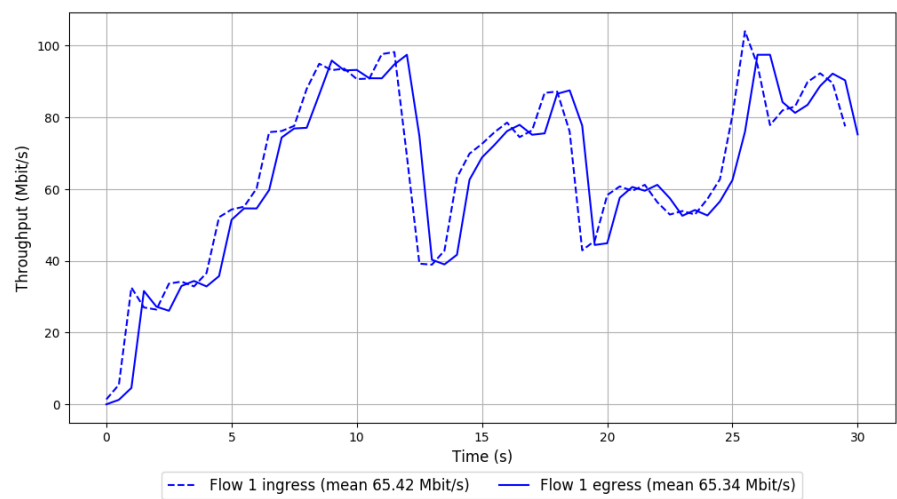

Flow 1 (95th percentile 41.52 ms)

```
Run 4: Statistics of PCC-Vivace

Start at: 2018-12-02 10:50:00
End at: 2018-12-02 10:50:30
Local clock offset: 2.525 ms
Remote clock offset: -0.342 ms


# Below is generated by plot.py at 2018-12-02 11:43:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 65.34 Mbit/s
95th percentile per-packet one-way delay: 56.554 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 65.34 Mbit/s
95th percentile per-packet one-way delay: 56.554 ms
Loss rate: 0.28%
```

Run 4: Report of PCC-Vivace — Data Link

```
Run 5: Statistics of PCC-Vivace

Start at: 2018-12-02 11:12:59
End at: 2018-12-02 11:13:29
Local clock offset: 0.464 ms
Remote clock offset: -0.826 ms


# Below is generated by plot.py at 2018-12-02 11:43:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 60.44 Mbit/s
95th percentile per-packet one-way delay: 111.940 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 60.44 Mbit/s
95th percentile per-packet one-way delay: 111.940 ms
Loss rate: 0.27%
```
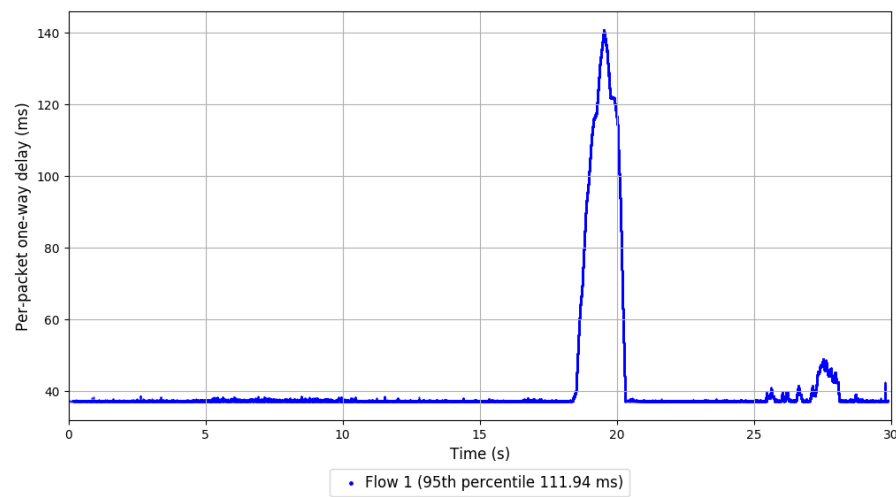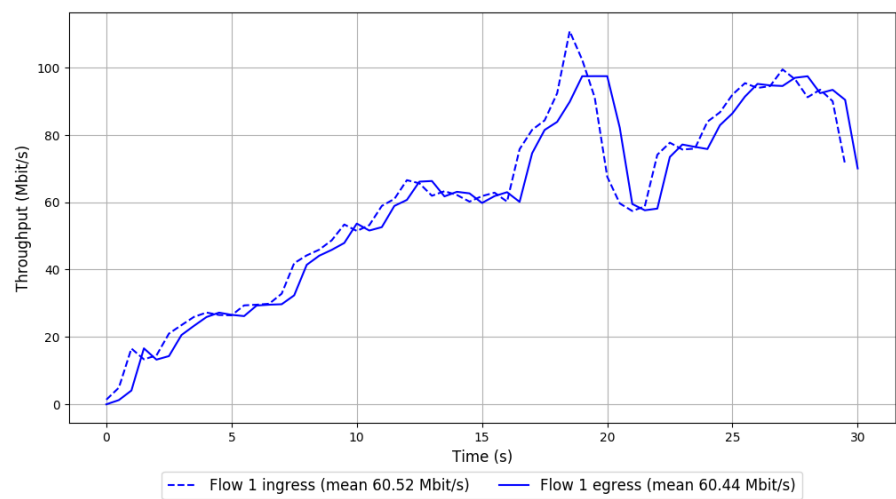
Run 5: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 60.52 Mbit/s) --- Flow 1 egress (mean 60.44 Mbit/s)

• Flow 1 (95th percentile 111.94 ms)

```
Run 1: Statistics of WebRTC media

Start at: 2018-12-02 09:37:09
End at: 2018-12-02 09:37:39
Local clock offset: 0.608 ms
Remote clock offset: -2.97 ms


# Below is generated by plot.py at 2018-12-02 11:43:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 40.414 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 40.414 ms
Loss rate: 0.20%
```
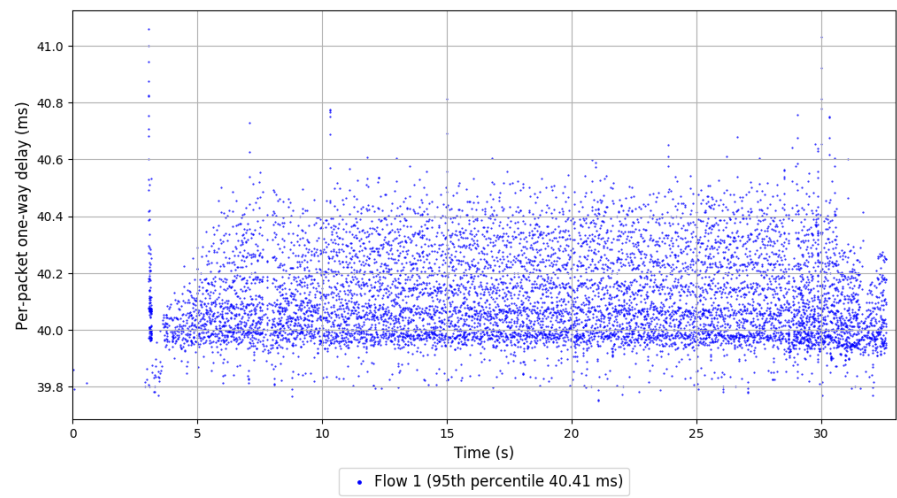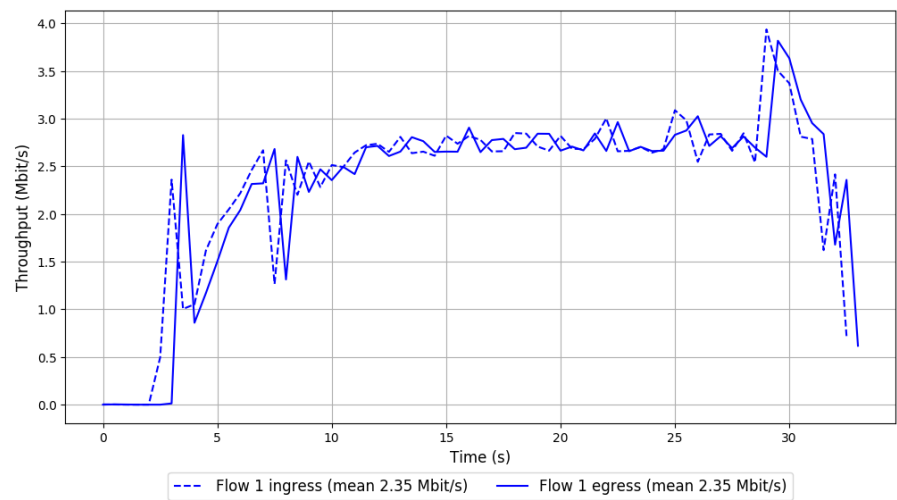
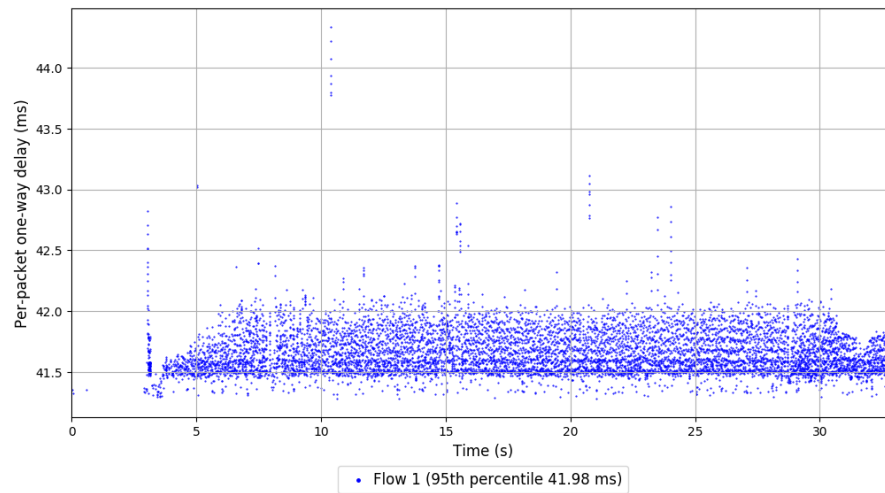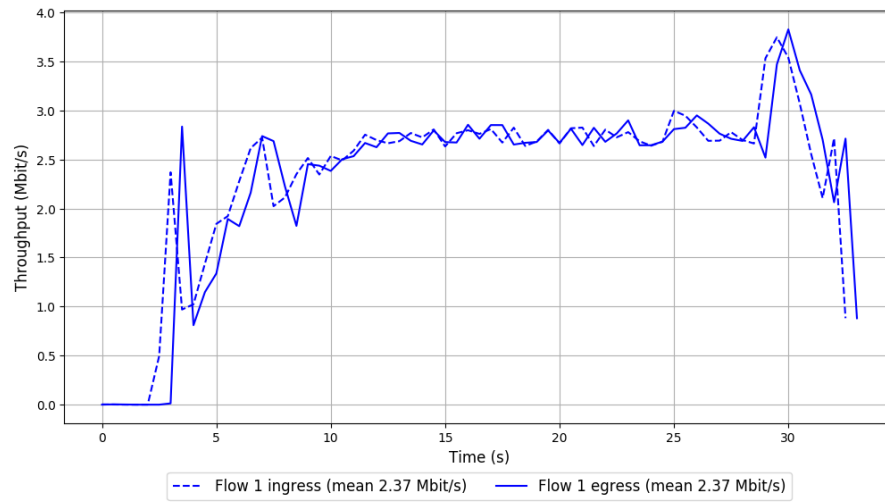# Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-12-02 10:00:55
End at: 2018-12-02 10:01:25
Local clock offset: 2.149 ms
Remote clock offset: -3.121 ms


# Below is generated by plot.py at 2018-12-02 11:43:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 41.977 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 41.977 ms
Loss rate: 0.13%
```

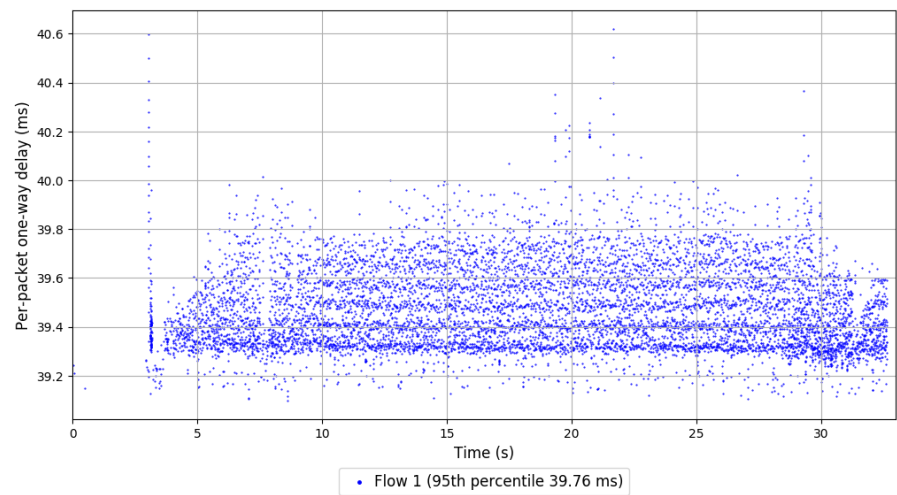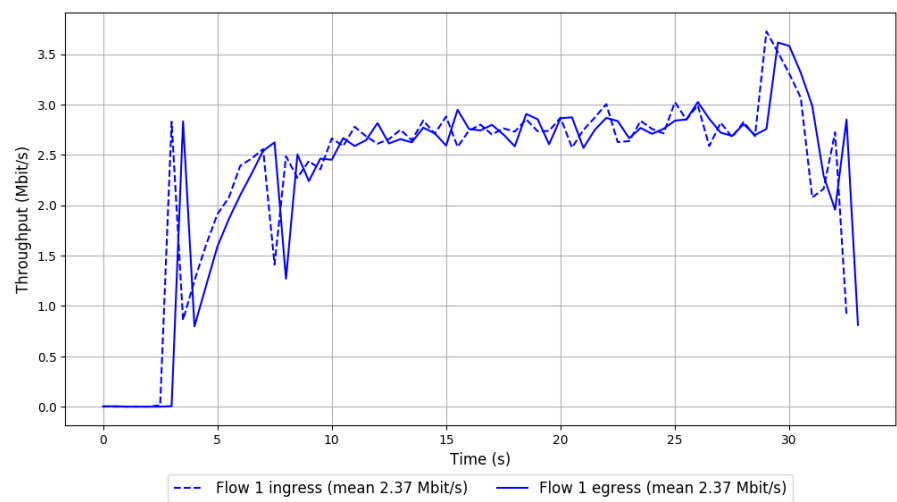Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-12-02 10:24:28
End at: 2018-12-02 10:24:58
Local clock offset: 2.139 ms
Remote clock offset: -1.545 ms


# Below is generated by plot.py at 2018-12-02 11:43:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 39.764 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 39.764 ms
Loss rate: 0.17%
```

Run 3: Report of WebRTC media — Data Link

Flow 1 ingress (mean 2.37 Mbit/s)　　Flow 1 egress (mean 2.37 Mbit/s)
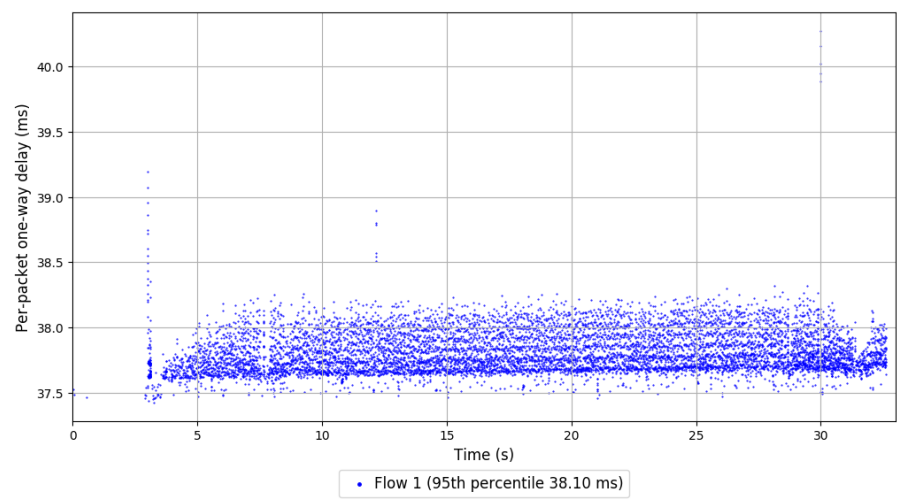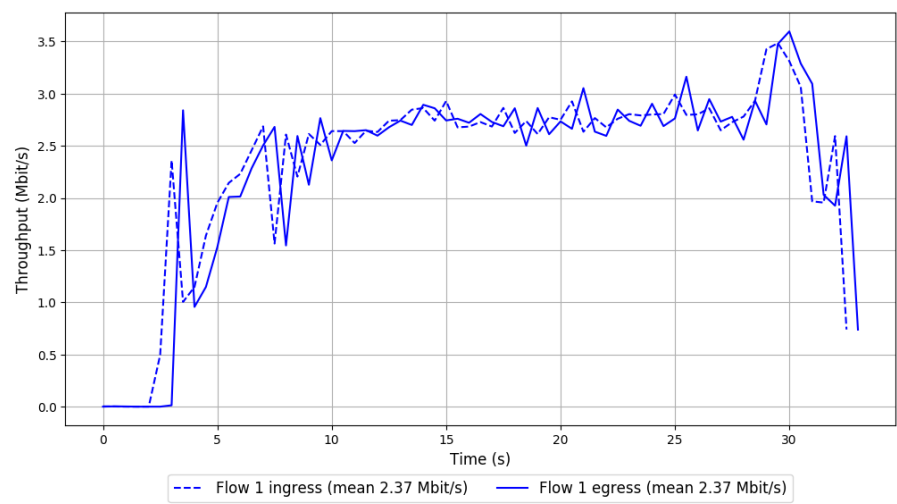

Flow 1 (95th percentile 39.76 ms)

```
Run 4: Statistics of WebRTC media

Start at: 2018-12-02 10:47:42
End at: 2018-12-02 10:48:12
Local clock offset: 1.765 ms
Remote clock offset: -0.446 ms


# Below is generated by plot.py at 2018-12-02 11:43:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 38.098 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 38.098 ms
Loss rate: 0.11%
```

Run 4: Report of WebRTC media — Data Link

```
Run 5: Statistics of WebRTC media

Start at: 2018-12-02 11:10:37
End at: 2018-12-02 11:11:07
Local clock offset: 2.656 ms
Remote clock offset: -1.553 ms


# Below is generated by plot.py at 2018-12-02 11:43:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 40.706 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 40.706 ms
Loss rate: 0.20%
```

Run 5: Report of WebRTC media — Data Link