Pantheon Report

Generated at 2019-01-03 07:04:54 (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.
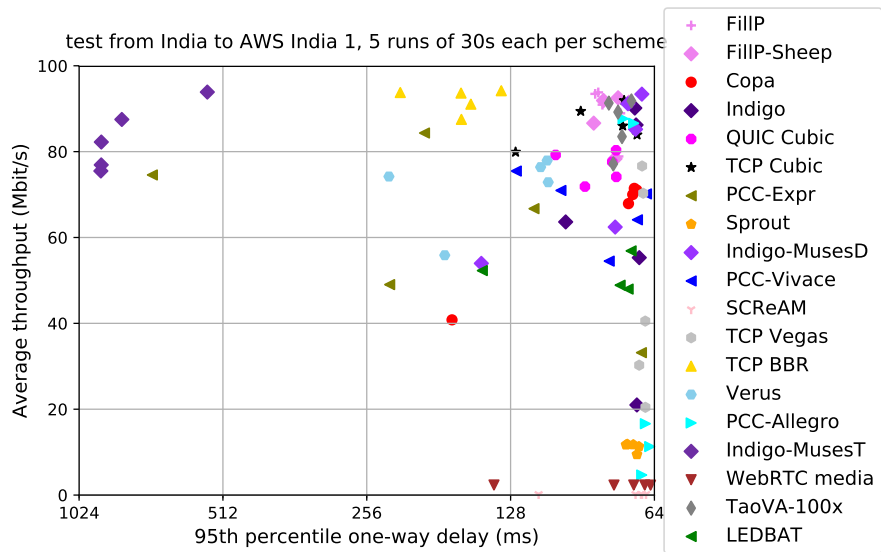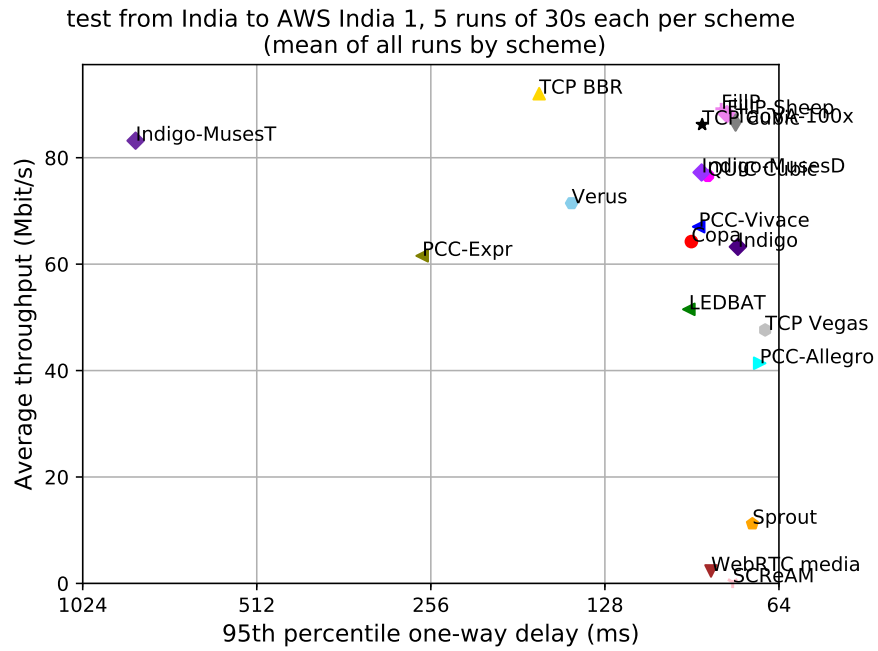
```
System info:
Linux 4.15.0-1029-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912

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

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

test from 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

3

scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	5	92.03	166.29	2.05
Copa	5	64.24	90.70	0.25
TCP Cubic	5	86.23	86.90	0.29
FillP	5	89.20	80.54	0.29
FillP-Sheep	5	88.18	78.71	0.26
Indigo	5	63.26	75.38	0.24
Indigo-MusesD	5	77.23	87.10	0.18
Indigo-MusesT	5	83.20	829.56	3.32
LEDBAT	4	51.51	91.62	0.30
PCC-Allegro	5	41.37	69.10	0.28
PCC-Expr	5	61.56	265.00	1.81
QUIC Cubic	5	76.62	84.96	0.21
SCReAM	5	0.22	76.95	0.26
Sprout	5	11.21	71.14	0.26
TaoVA-100x	5	86.59	76.06	0.24
TCP Vegas	5	47.64	67.62	0.31
Verus	5	71.45	146.14	0.36
PCC-Vivace	5	67.04	88.11	0.38
WebRTC media	5	2.34	83.88	0.25

```
Run 1: Statistics of TCP BBR

Start at: 2019-01-03 05:02:39
End at: 2019-01-03 05:03:09
Local clock offset: 2.999 ms
Remote clock offset: -6.362 ms


# Below is generated by plot.py at 2019-01-03 06:55:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 94.19 Mbit/s
95th percentile per-packet one-way delay: 133.874 ms
Loss rate: 2.29%
-- Flow 1:
Average throughput: 94.19 Mbit/s
95th percentile per-packet one-way delay: 133.874 ms
Loss rate: 2.29%
```
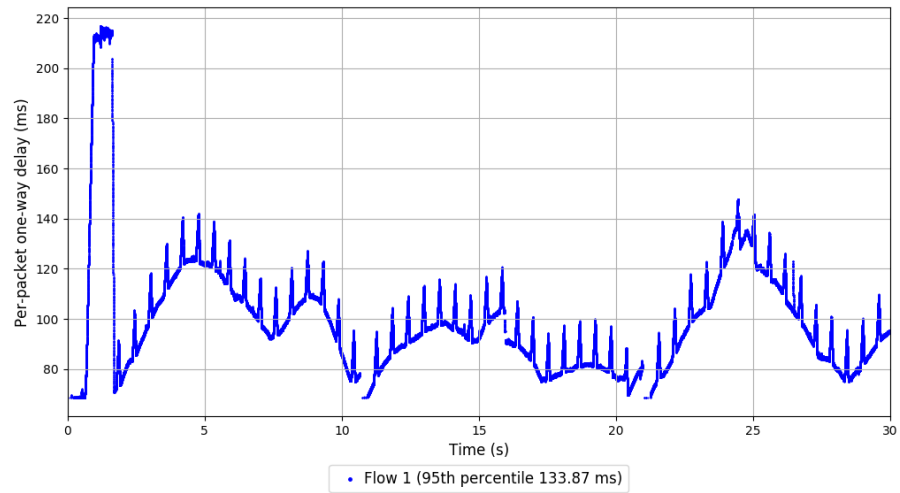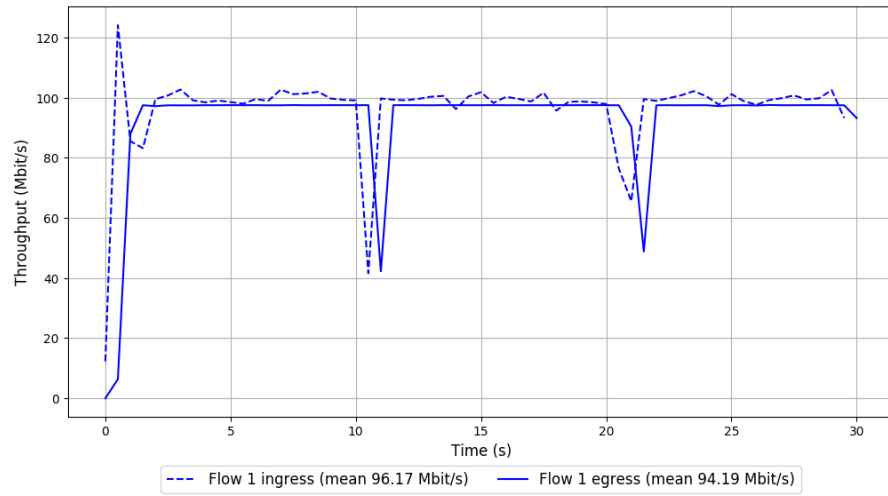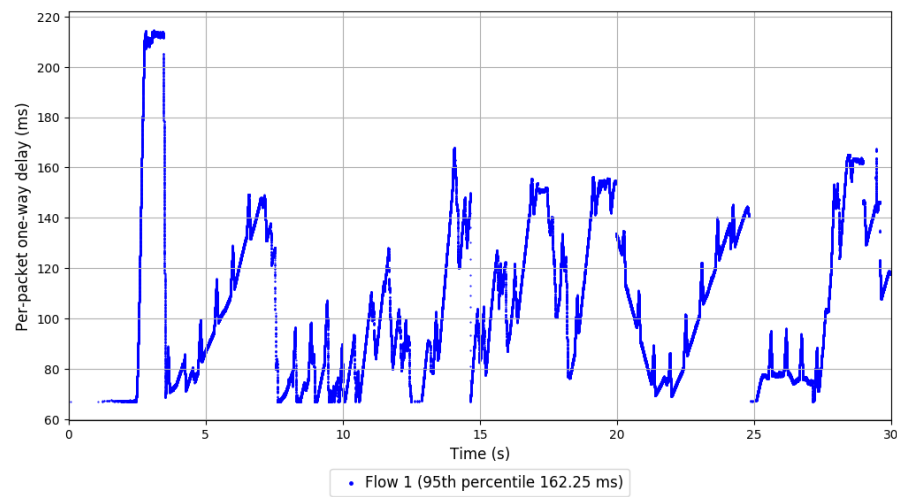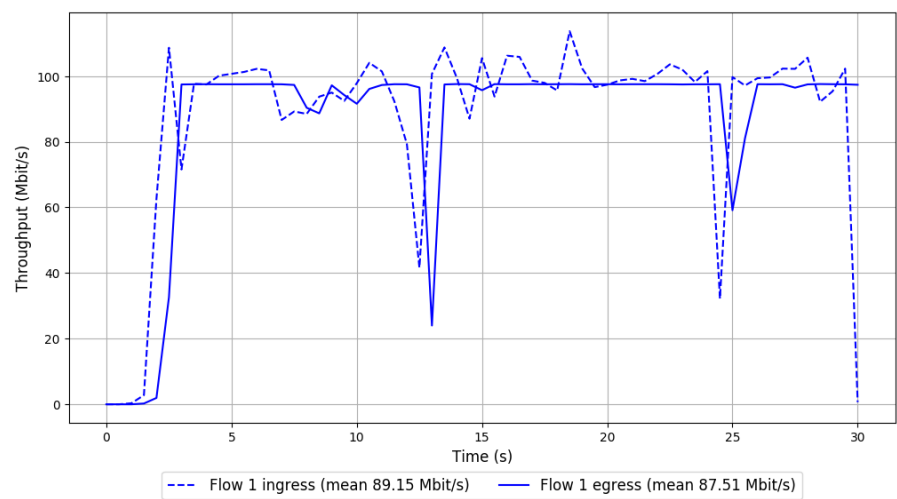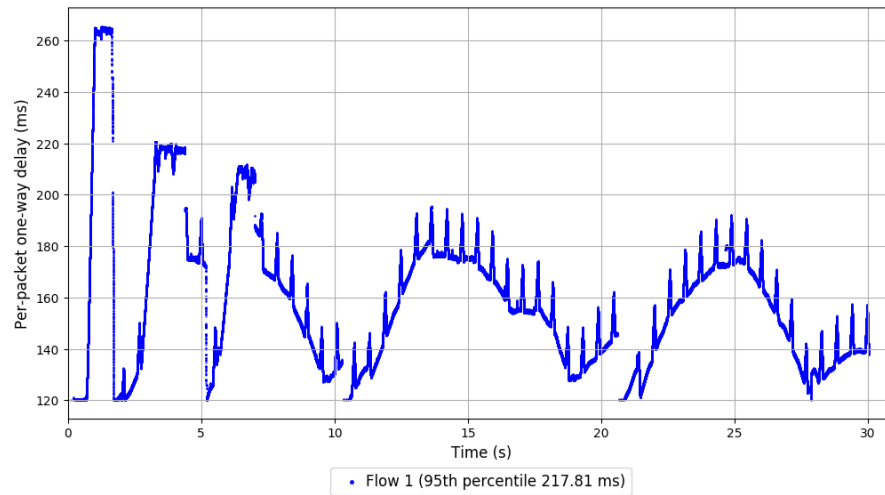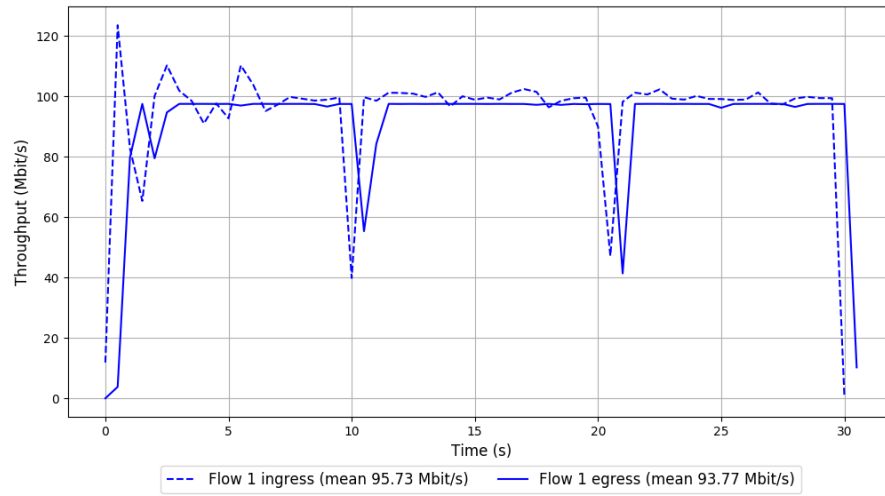
Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 96.17 Mbit/s)   Flow 1 egress (mean 94.19 Mbit/s)
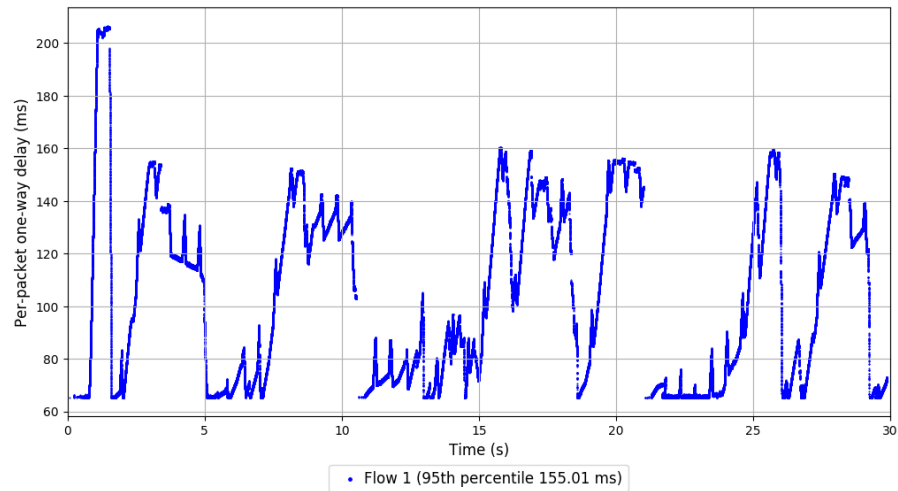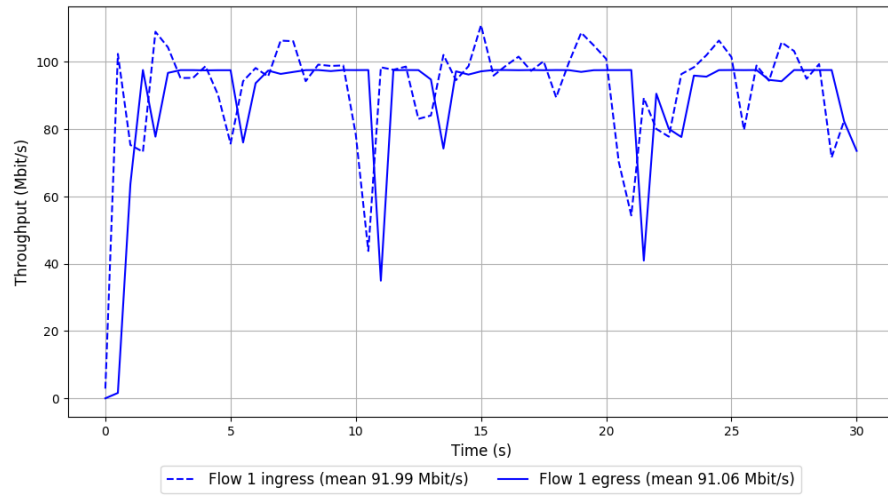

Flow 1 (95th percentile 133.87 ms)

```
Run 2: Statistics of TCP BBR

Start at: 2019-01-03 05:29:56
End at: 2019-01-03 05:30:26
Local clock offset: 0.51 ms
Remote clock offset: -7.066 ms


# Below is generated by plot.py at 2019-01-03 06:55:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 87.51 Mbit/s
95th percentile per-packet one-way delay: 162.245 ms
Loss rate: 2.07%
-- Flow 1:
Average throughput: 87.51 Mbit/s
95th percentile per-packet one-way delay: 162.245 ms
Loss rate: 2.07%
```

Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2019-01-03 05:55:12
End at: 2019-01-03 05:55:42
Local clock offset: 0.449 ms
Remote clock offset: -59.483 ms


# Below is generated by plot.py at 2019-01-03 06:55:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 93.77 Mbit/s
95th percentile per-packet one-way delay: 217.805 ms
Loss rate: 2.28%
-- Flow 1:
Average throughput: 93.77 Mbit/s
95th percentile per-packet one-way delay: 217.805 ms
Loss rate: 2.28%
```
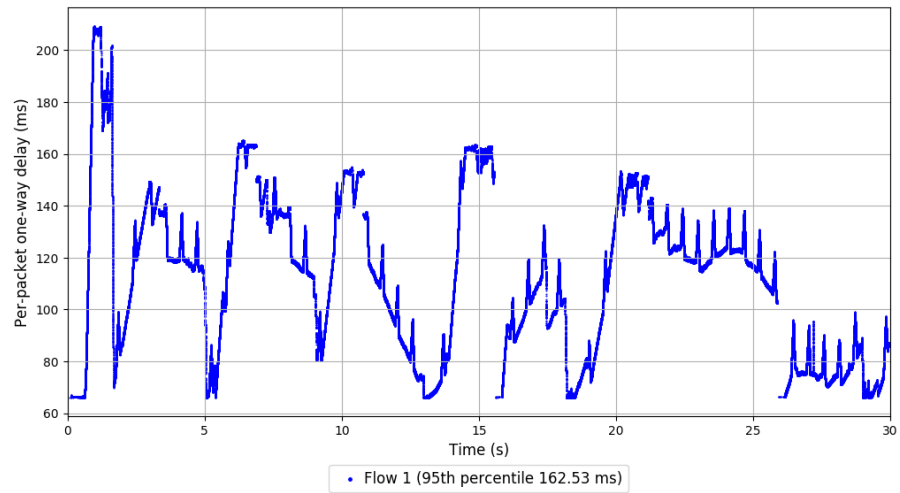
Run 3: Report of TCP BBR — Data Link

```
Run 4: Statistics of TCP BBR

Start at: 2019-01-03 06:19:51
End at: 2019-01-03 06:20:21
Local clock offset: 2.05 ms
Remote clock offset: -4.073 ms


# Below is generated by plot.py at 2019-01-03 06:55:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.06 Mbit/s
95th percentile per-packet one-way delay: 155.014 ms
Loss rate: 1.35%
-- Flow 1:
Average throughput: 91.06 Mbit/s
95th percentile per-packet one-way delay: 155.014 ms
Loss rate: 1.35%
```
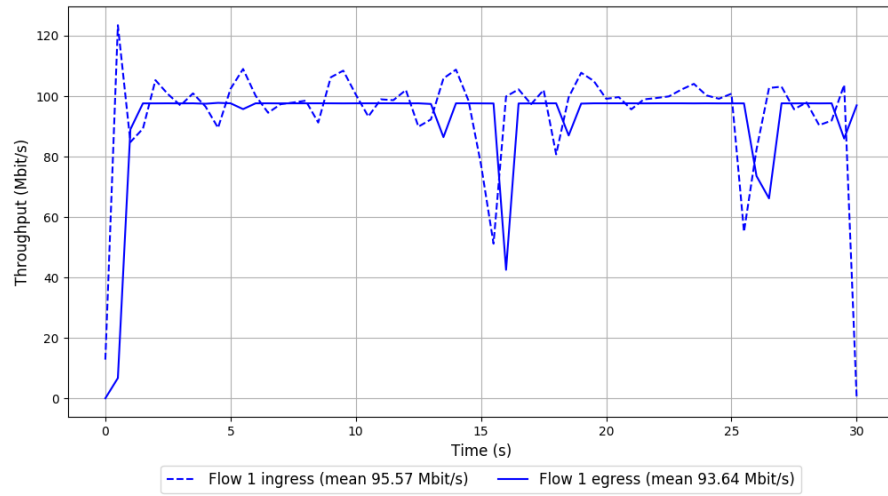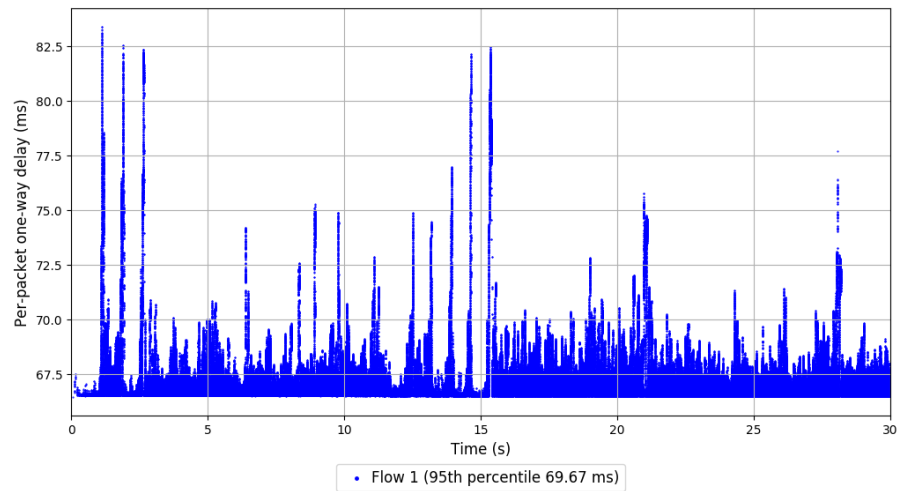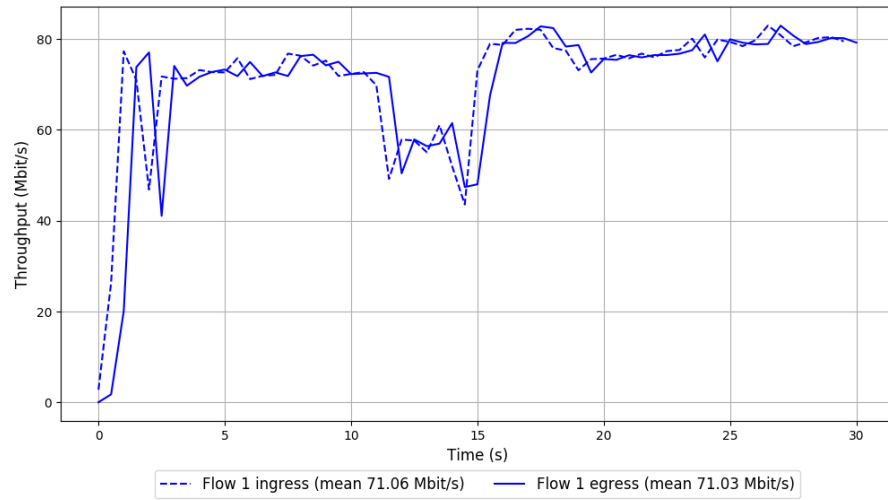
Run 4: Report of TCP BBR — Data Link

Flow 1 ingress (mean 91.99 Mbit/s)   Flow 1 egress (mean 91.06 Mbit/s)

• Flow 1 (95th percentile 155.01 ms)

```
Run 5: Statistics of TCP BBR

Start at: 2019-01-03 06:43:34
End at: 2019-01-03 06:44:04
Local clock offset: 0.041 ms
Remote clock offset: -3.618 ms


# Below is generated by plot.py at 2019-01-03 06:55:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 93.64 Mbit/s
95th percentile per-packet one-way delay: 162.530 ms
Loss rate: 2.25%
-- Flow 1:
Average throughput: 93.64 Mbit/s
95th percentile per-packet one-way delay: 162.530 ms
Loss rate: 2.25%
```

Run 5: Report of TCP BBR — Data Link

Flow 1 ingress (mean 95.57 Mbit/s) --- Flow 1 egress (mean 93.64 Mbit/s)

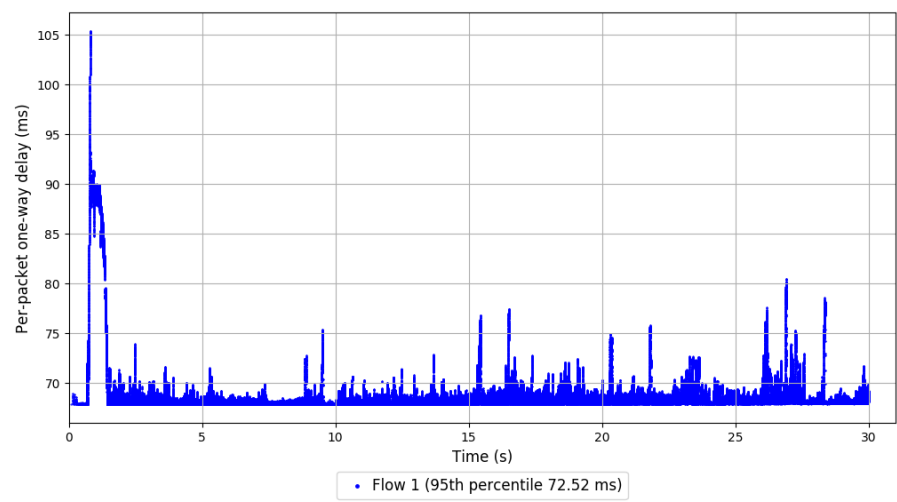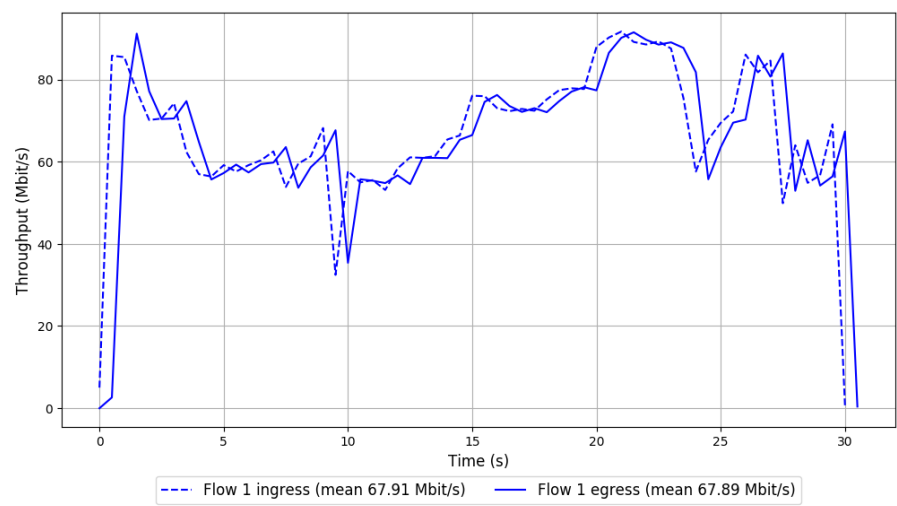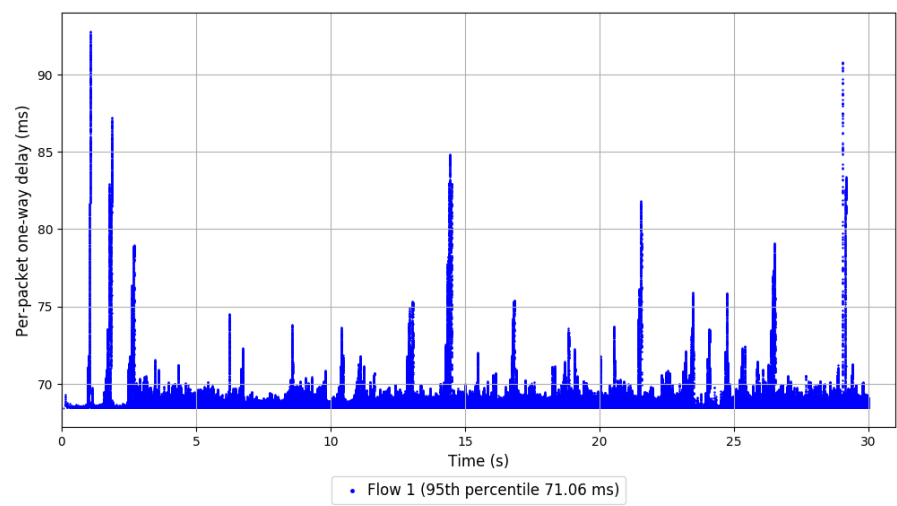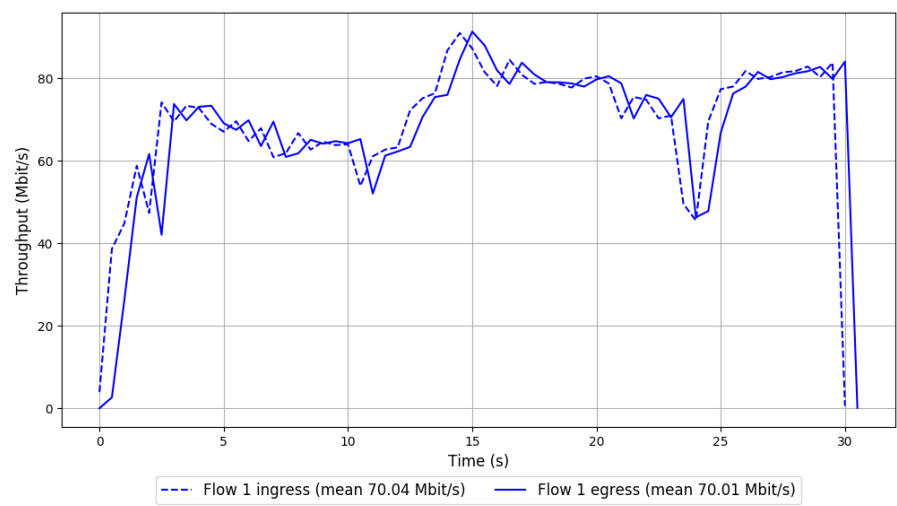• Flow 1 (95th percentile 162.53 ms)

14

```
Run 1: Statistics of Copa

Start at: 2019-01-03 05:00:55
End at: 2019-01-03 05:01:25
Local clock offset: 2.795 ms
Remote clock offset: -5.968 ms


# Below is generated by plot.py at 2019-01-03 06:56:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 71.03 Mbit/s
95th percentile per-packet one-way delay: 69.674 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 71.03 Mbit/s
95th percentile per-packet one-way delay: 69.674 ms
Loss rate: 0.26%
```

Run 1: Report of Copa — Data Link

Flow 1 ingress (mean 71.06 Mbit/s)   Flow 1 egress (mean 71.03 Mbit/s)
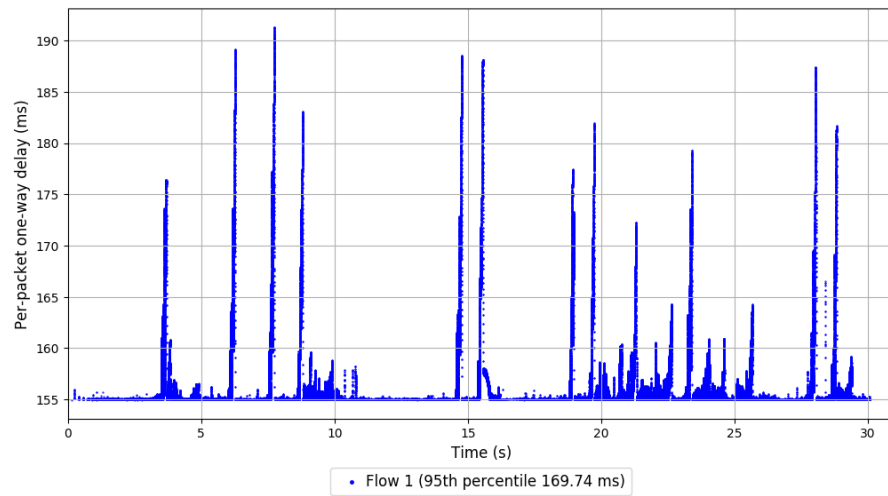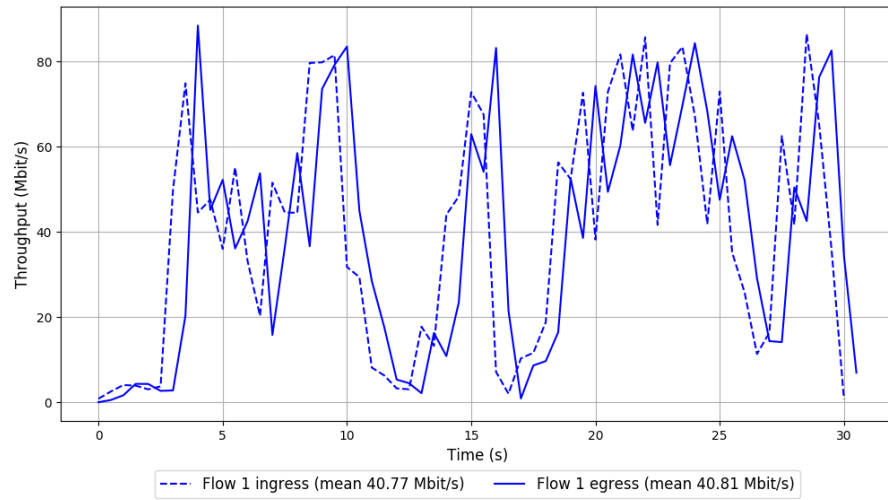

Flow 1 (95th percentile 69.67 ms)

```
Run 2: Statistics of Copa

Start at: 2019-01-03 05:28:11
End at: 2019-01-03 05:28:41
Local clock offset: 2.9 ms
Remote clock offset: -7.332 ms


# Below is generated by plot.py at 2019-01-03 06:56:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 67.89 Mbit/s
95th percentile per-packet one-way delay: 72.524 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 67.89 Mbit/s
95th percentile per-packet one-way delay: 72.524 ms
Loss rate: 0.26%
```

Run 2: Report of Copa — Data Link

Flow 1 ingress (mean 67.91 Mbit/s) ----- Flow 1 egress (mean 67.89 Mbit/s)

Flow 1 (95th percentile 72.52 ms)

```
Run 3: Statistics of Copa

Start at: 2019-01-03 05:53:52
End at: 2019-01-03 05:54:22
Local clock offset: 2.074 ms
Remote clock offset: -5.999 ms


# Below is generated by plot.py at 2019-01-03 06:56:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 70.01 Mbit/s
95th percentile per-packet one-way delay: 71.055 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 70.01 Mbit/s
95th percentile per-packet one-way delay: 71.055 ms
Loss rate: 0.28%
```
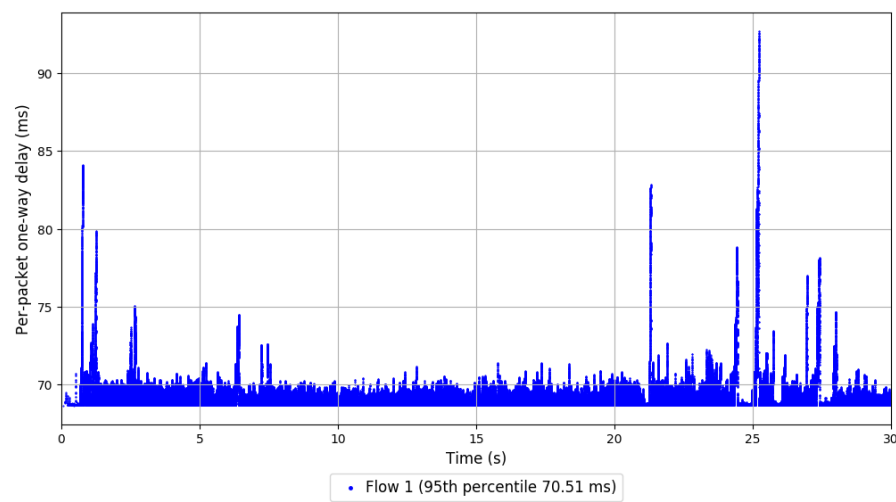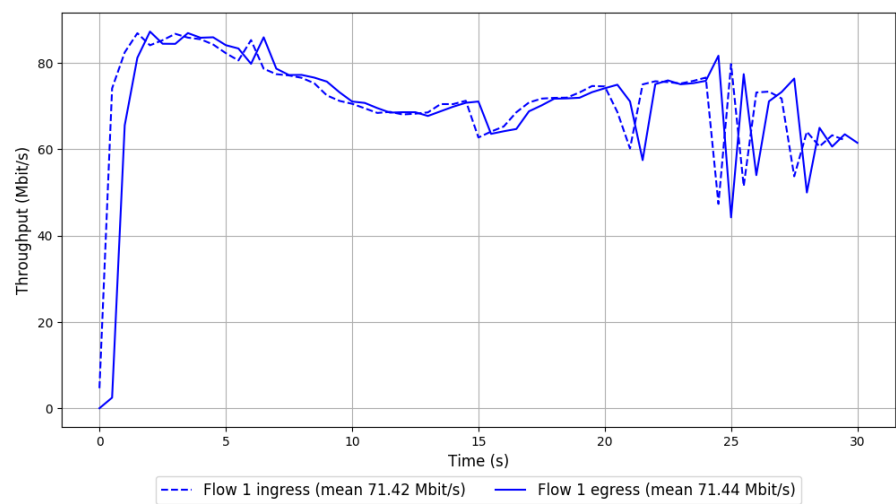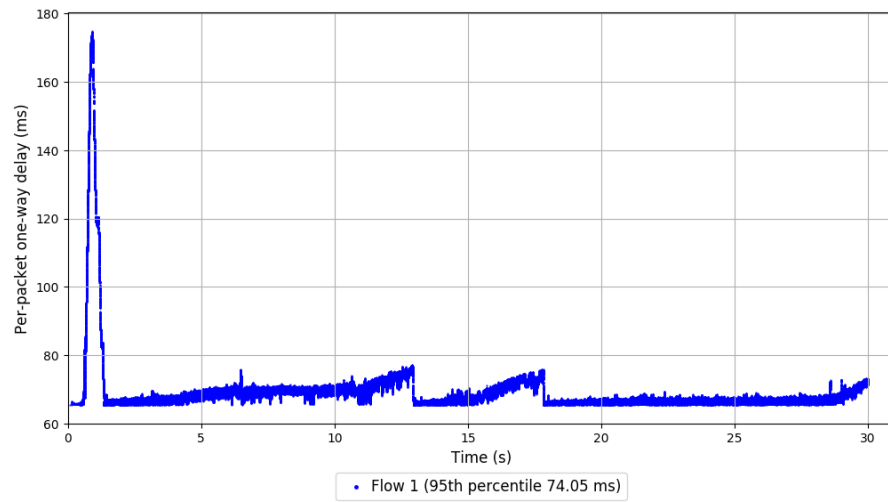
Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 70.04 Mbit/s) — Flow 1 egress (mean 70.01 Mbit/s)

• Flow 1 (95th percentile 71.06 ms)

```
Run 4: Statistics of Copa

Start at: 2019-01-03 06:18:17
End at: 2019-01-03 06:18:47
Local clock offset: 1.97 ms
Remote clock offset: -92.644 ms

# Below is generated by plot.py at 2019-01-03 06:56:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 40.81 Mbit/s
95th percentile per-packet one-way delay: 169.744 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 40.81 Mbit/s
95th percentile per-packet one-way delay: 169.744 ms
Loss rate: 0.24%
```
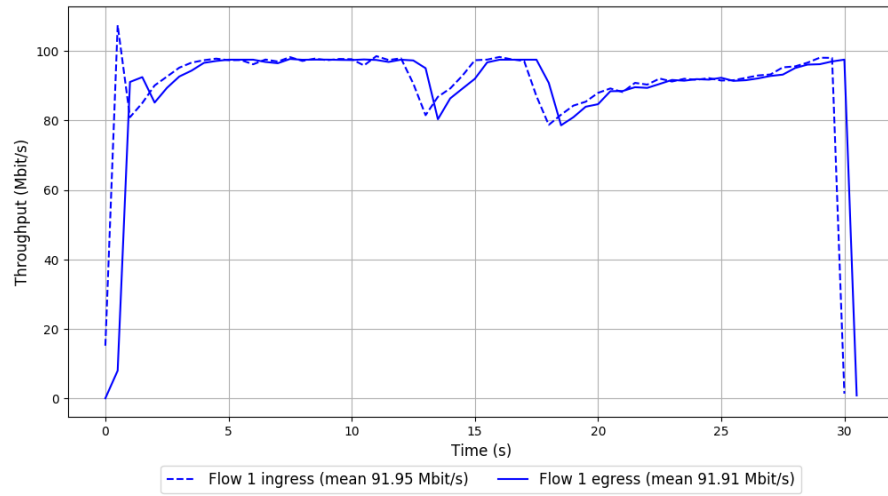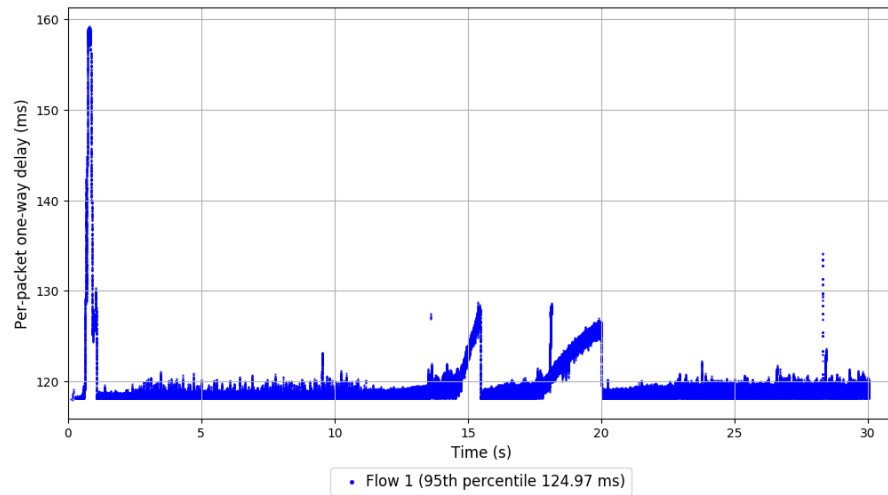
Run 4: Report of Copa — Data Link

Flow 1 ingress (mean 40.77 Mbit/s) ----   Flow 1 egress (mean 40.81 Mbit/s) ——

• Flow 1 (95th percentile 169.74 ms)

```
Run 5: Statistics of Copa

Start at: 2019-01-03 06:42:17
End at: 2019-01-03 06:42:47
Local clock offset: 0.552 ms
Remote clock offset: -5.726 ms


# Below is generated by plot.py at 2019-01-03 06:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 71.44 Mbit/s
95th percentile per-packet one-way delay: 70.513 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 71.44 Mbit/s
95th percentile per-packet one-way delay: 70.513 ms
Loss rate: 0.21%
```
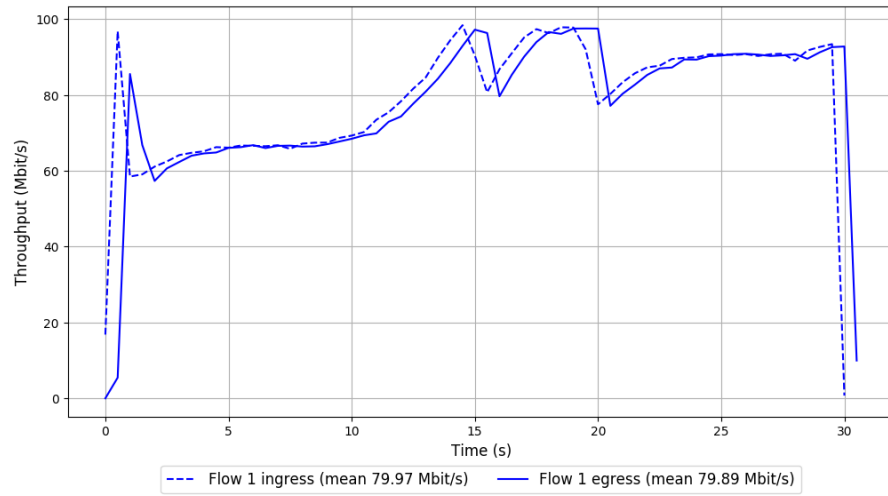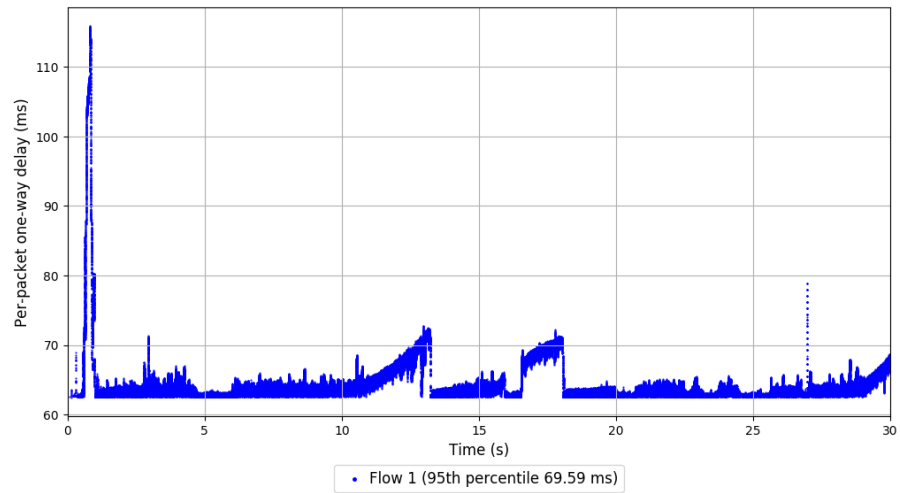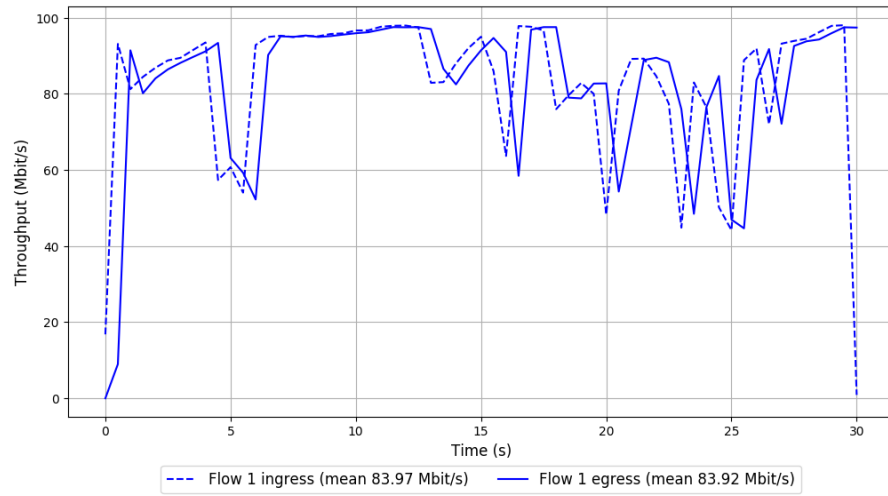
Run 5: Report of Copa — Data Link

Flow 1 ingress (mean 71.42 Mbit/s) ----- Flow 1 egress (mean 71.44 Mbit/s) ——

• Flow 1 (95th percentile 70.51 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2019-01-03 04:53:23
End at: 2019-01-03 04:53:53
Local clock offset: -0.486 ms
Remote clock offset: -7.467 ms


# Below is generated by plot.py at 2019-01-03 06:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.91 Mbit/s
95th percentile per-packet one-way delay: 74.053 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 91.91 Mbit/s
95th percentile per-packet one-way delay: 74.053 ms
Loss rate: 0.28%
```
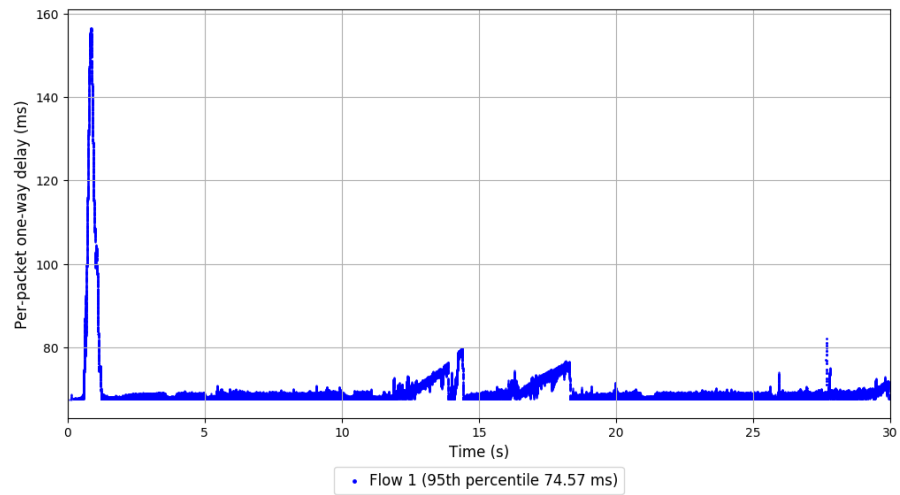
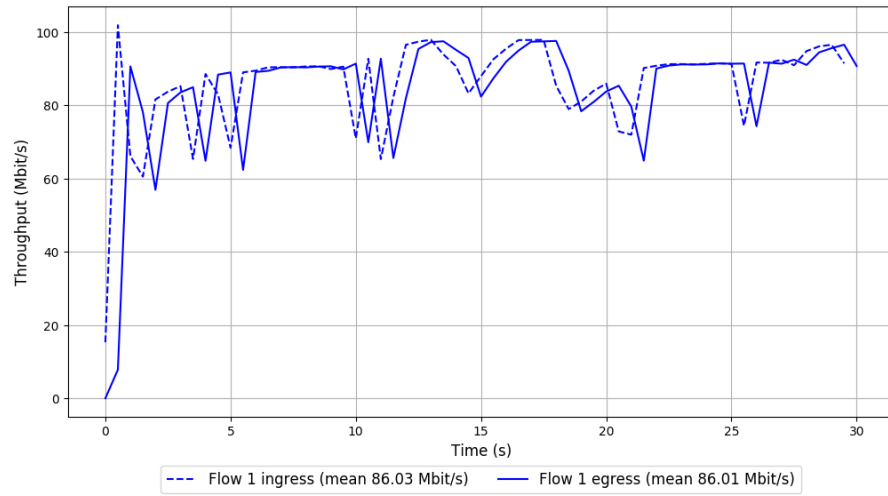Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2019-01-03 05:20:49
End at: 2019-01-03 05:21:19
Local clock offset: 2.974 ms
Remote clock offset: -57.978 ms


# Below is generated by plot.py at 2019-01-03 06:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 79.89 Mbit/s
95th percentile per-packet one-way delay: 124.968 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 79.89 Mbit/s
95th percentile per-packet one-way delay: 124.968 ms
Loss rate: 0.32%
```

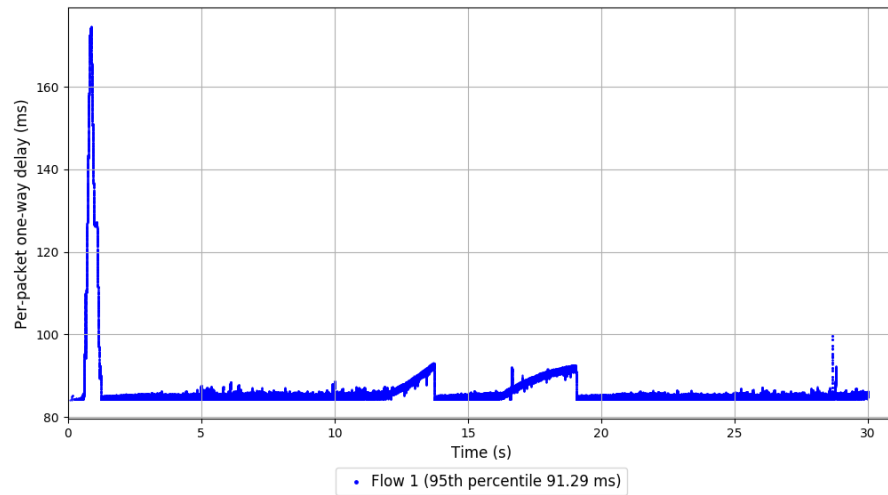Run 2: Report of TCP Cubic — Data Link

```
Run 3: Statistics of TCP Cubic

Start at: 2019-01-03 05:47:14
End at: 2019-01-03 05:47:44
Local clock offset: -1.215 ms
Remote clock offset: -5.282 ms


# Below is generated by plot.py at 2019-01-03 06:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 83.92 Mbit/s
95th percentile per-packet one-way delay: 69.591 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 83.92 Mbit/s
95th percentile per-packet one-way delay: 69.591 ms
Loss rate: 0.29%
```
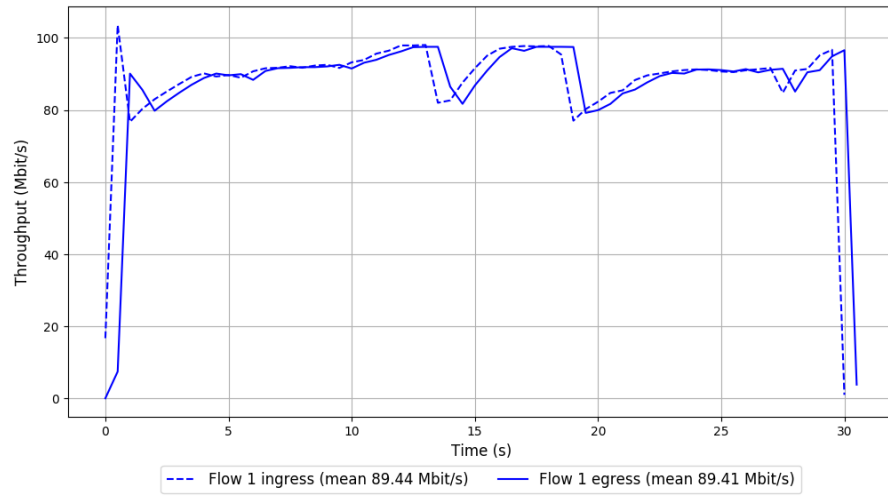
Run 3: Report of TCP Cubic — Data Link

```
Run 4: Statistics of TCP Cubic

Start at: 2019-01-03 06:11:18
End at: 2019-01-03 06:11:48
Local clock offset: 2.292 ms
Remote clock offset: -5.115 ms


# Below is generated by plot.py at 2019-01-03 06:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.01 Mbit/s
95th percentile per-packet one-way delay: 74.573 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 86.01 Mbit/s
95th percentile per-packet one-way delay: 74.573 ms
Loss rate: 0.28%
```
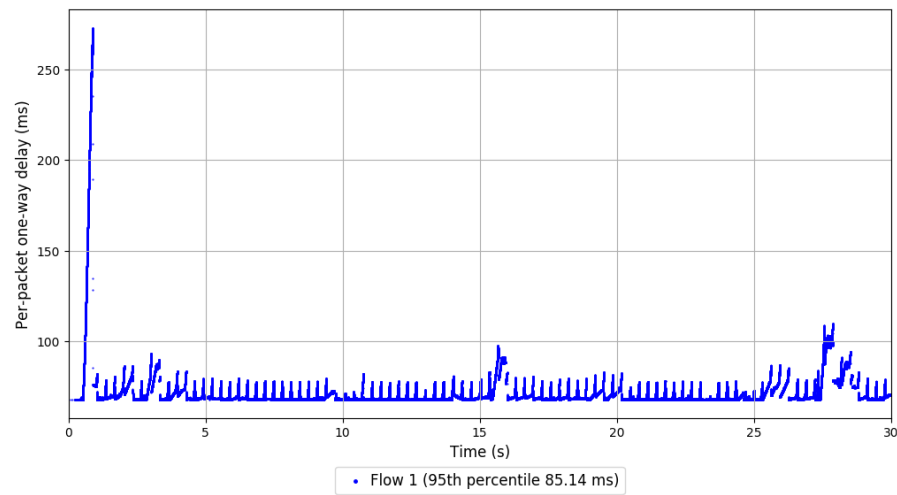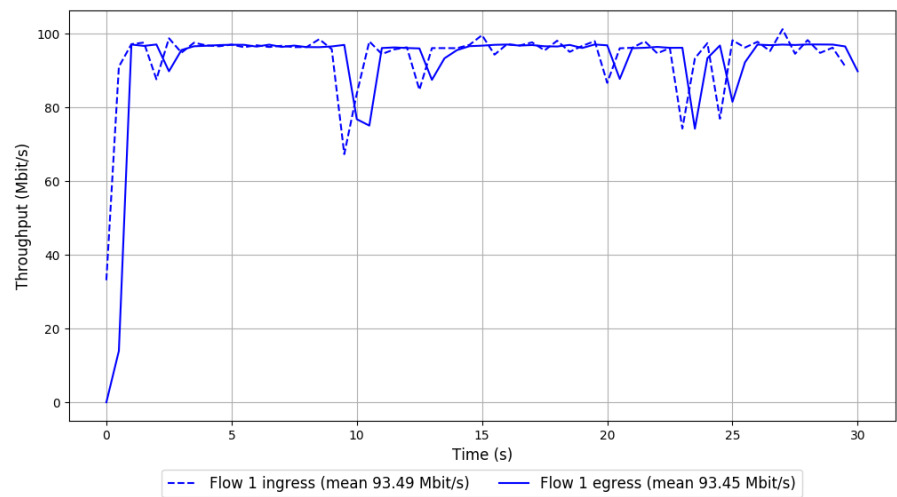
Run 4: Report of TCP Cubic — Data Link

```
Run 5: Statistics of TCP Cubic

Start at: 2019-01-03 06:35:59
End at: 2019-01-03 06:36:29
Local clock offset: 1.939 ms
Remote clock offset: -21.487 ms


# Below is generated by plot.py at 2019-01-03 06:57:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.41 Mbit/s
95th percentile per-packet one-way delay: 91.290 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 89.41 Mbit/s
95th percentile per-packet one-way delay: 91.290 ms
Loss rate: 0.26%
```

Run 5: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 89.44 Mbit/s) — — — Flow 1 egress (mean 89.41 Mbit/s)
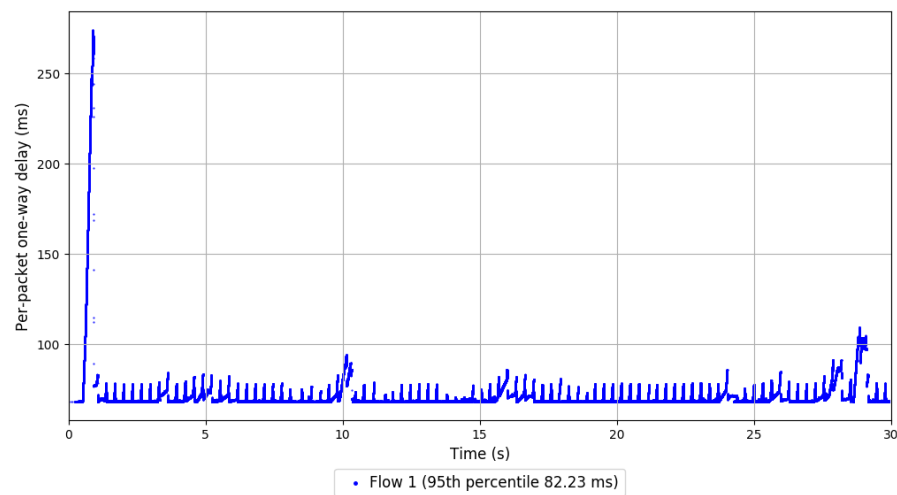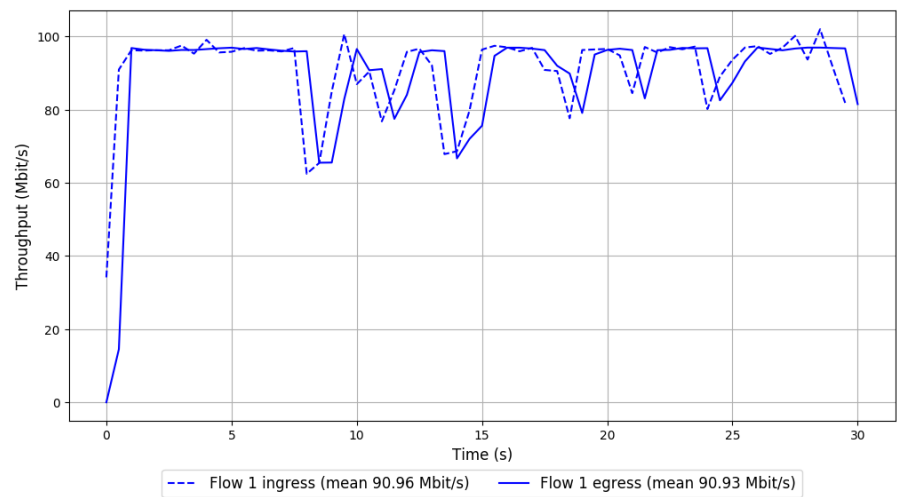

• Flow 1 (95th percentile 91.29 ms)

34

```
Run 1: Statistics of FillP

Start at: 2019-01-03 05:04:26
End at: 2019-01-03 05:04:56
Local clock offset: 2.327 ms
Remote clock offset: -7.655 ms


# Below is generated by plot.py at 2019-01-03 06:57:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 93.45 Mbit/s
95th percentile per-packet one-way delay: 85.145 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 93.45 Mbit/s
95th percentile per-packet one-way delay: 85.145 ms
Loss rate: 0.28%
```
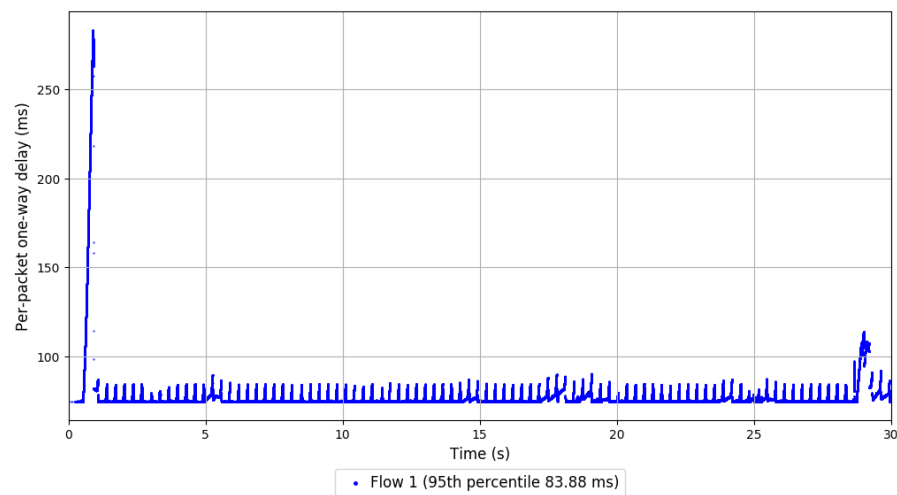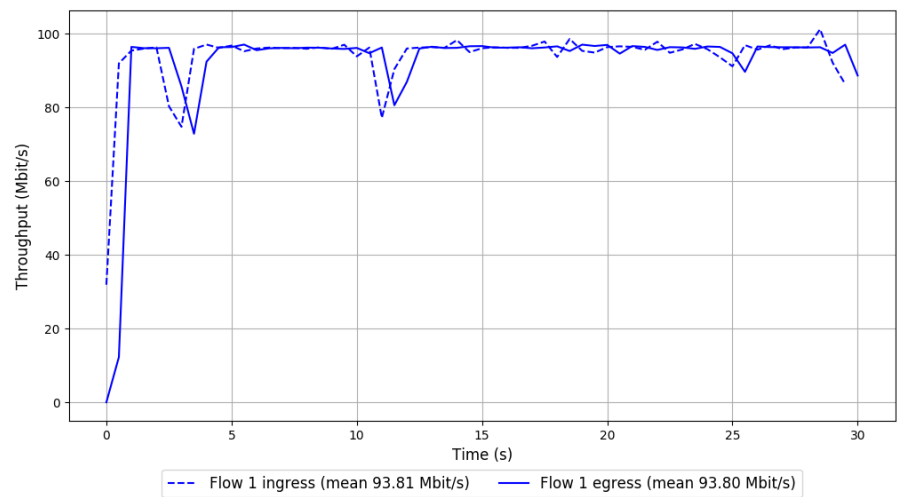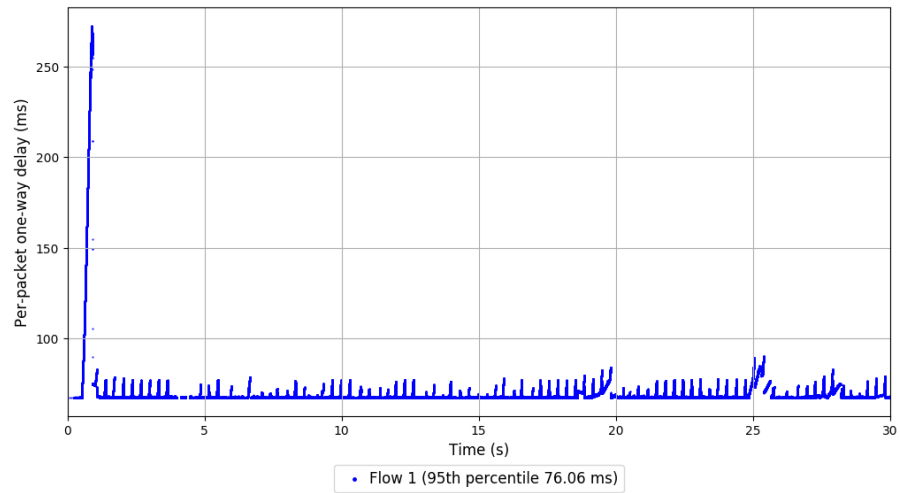
Run 1: Report of FillP — Data Link

```
Run 2: Statistics of FillP

Start at: 2019-01-03 05:31:24
End at: 2019-01-03 05:31:54
Local clock offset: 1.715 ms
Remote clock offset: -7.063 ms


# Below is generated by plot.py at 2019-01-03 06:57:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.93 Mbit/s
95th percentile per-packet one-way delay: 82.227 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 90.93 Mbit/s
95th percentile per-packet one-way delay: 82.227 ms
Loss rate: 0.27%
```
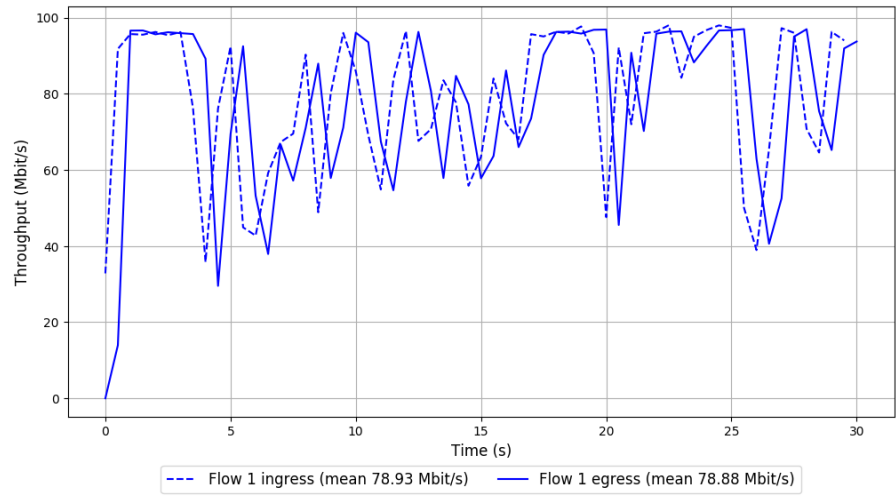
Run 2: Report of FillP — Data Link

Flow 1 ingress (mean 90.96 Mbit/s) --- Flow 1 egress (mean 90.93 Mbit/s)

Flow 1 (95th percentile 82.23 ms)

```
Run 3: Statistics of FillP

Start at: 2019-01-03 05:56:31
End at: 2019-01-03 05:57:01
Local clock offset: 1.798 ms
Remote clock offset: -12.796 ms


# Below is generated by plot.py at 2019-01-03 06:57:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 93.80 Mbit/s
95th percentile per-packet one-way delay: 83.882 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 93.80 Mbit/s
95th percentile per-packet one-way delay: 83.882 ms
Loss rate: 0.24%
```

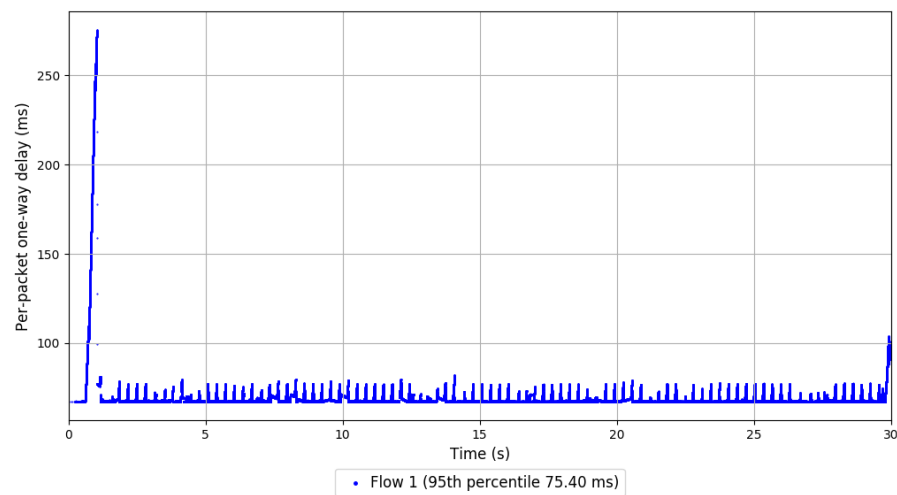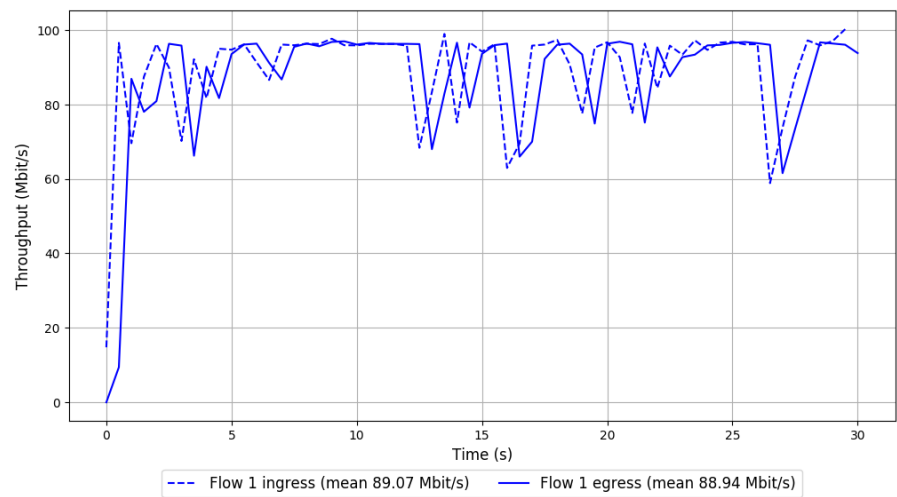## Run 3: Report of FillP — Data Link

Flow 1 ingress (mean 93.81 Mbit/s)   Flow 1 egress (mean 93.80 Mbit/s)

Flow 1 (95th percentile 83.88 ms)

```
Run 4: Statistics of FillP

Start at: 2019-01-03 06:21:16
End at: 2019-01-03 06:21:46
Local clock offset: 2.547 ms
Remote clock offset: -4.437 ms


# Below is generated by plot.py at 2019-01-03 06:57:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 78.88 Mbit/s
95th percentile per-packet one-way delay: 76.062 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 78.88 Mbit/s
95th percentile per-packet one-way delay: 76.062 ms
Loss rate: 0.29%
```
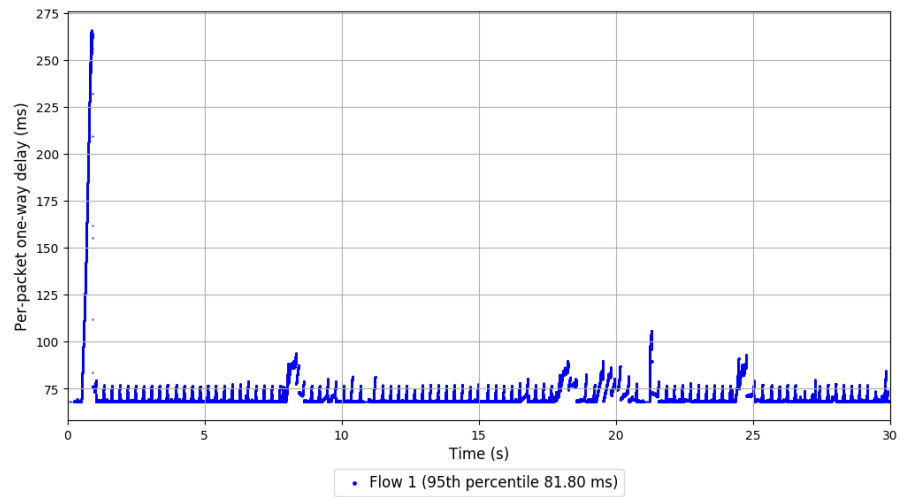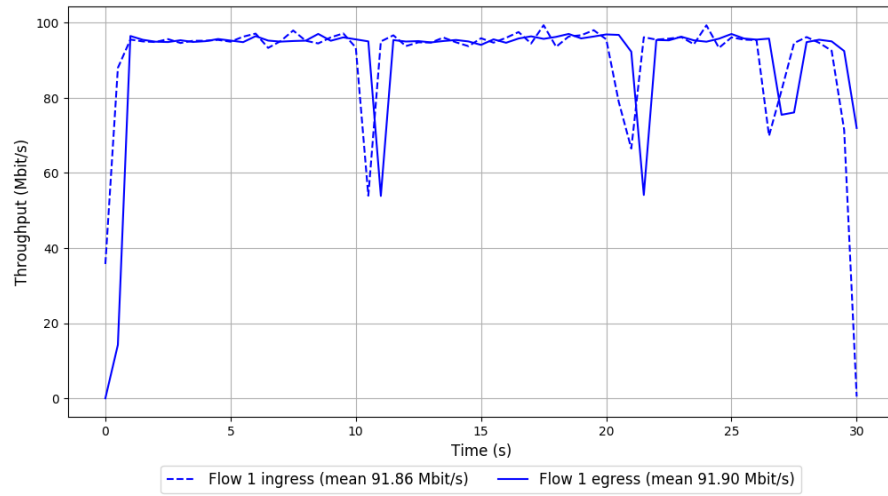
Run 4: Report of FillP — Data Link

Flow 1 ingress (mean 78.93 Mbit/s)   Flow 1 egress (mean 78.88 Mbit/s)

Flow 1 (95th percentile 76.06 ms)

```
Run 5: Statistics of FillP

Start at: 2019-01-03 06:44:50
End at: 2019-01-03 06:45:20
Local clock offset: -0.565 ms
Remote clock offset: -4.707 ms


# Below is generated by plot.py at 2019-01-03 06:57:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 88.94 Mbit/s
95th percentile per-packet one-way delay: 75.400 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 88.94 Mbit/s
95th percentile per-packet one-way delay: 75.400 ms
Loss rate: 0.38%
```
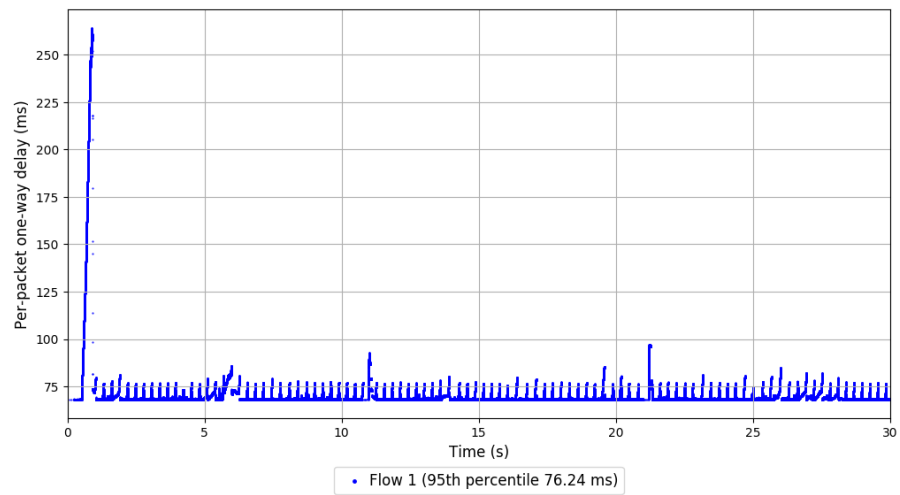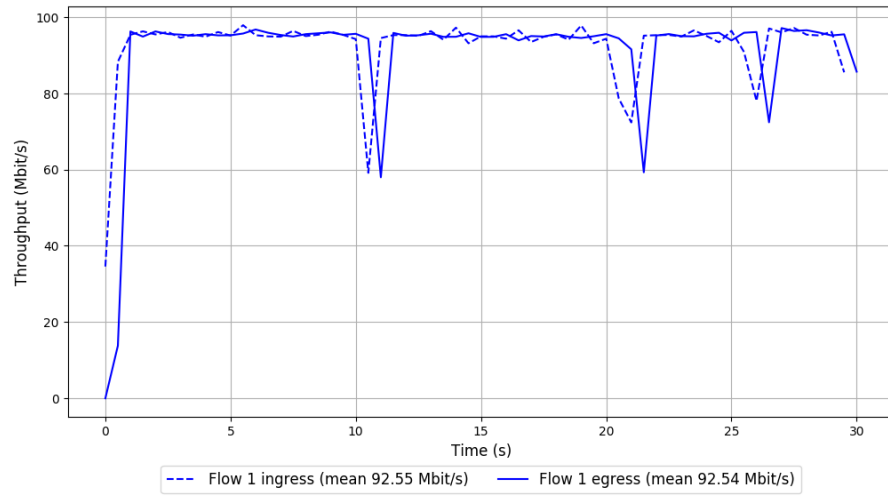
Run 5: Report of FillP — Data Link

```
Run 1: Statistics of FillP-Sheep

Start at: 2019-01-03 05:11:45
End at: 2019-01-03 05:12:15
Local clock offset: 2.531 ms
Remote clock offset: -6.08 ms


# Below is generated by plot.py at 2019-01-03 06:58:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.90 Mbit/s
95th percentile per-packet one-way delay: 81.799 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 91.90 Mbit/s
95th percentile per-packet one-way delay: 81.799 ms
Loss rate: 0.25%
```
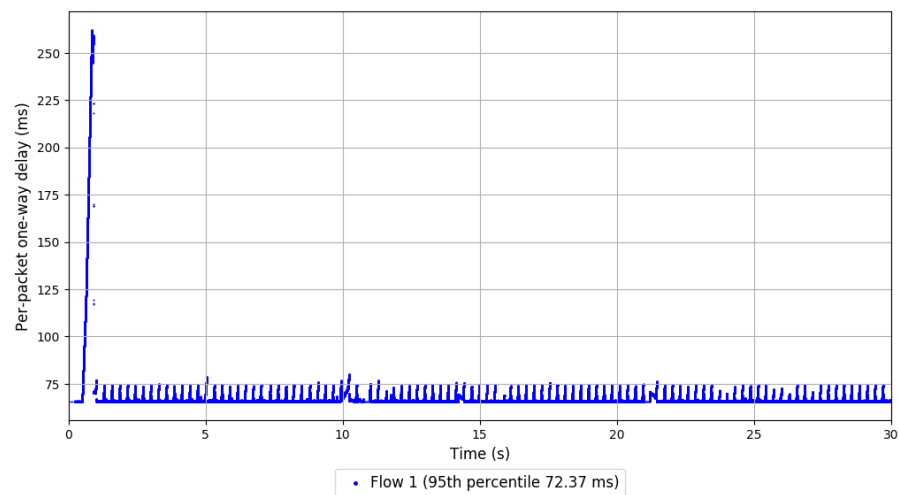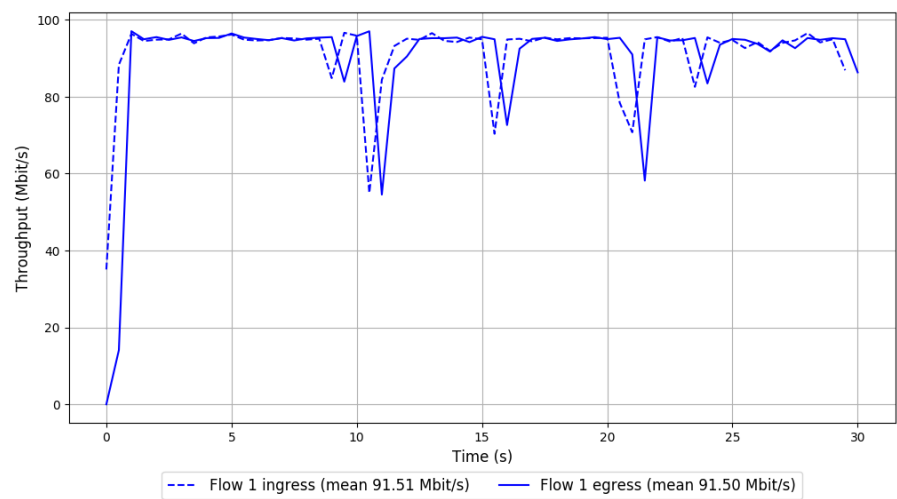
Run 1: Report of FillP-Sheep — Data Link

```
Run 2: Statistics of FillP-Sheep

Start at: 2019-01-03 05:38:16
End at: 2019-01-03 05:38:46
Local clock offset: 1.552 ms
Remote clock offset: -6.555 ms


# Below is generated by plot.py at 2019-01-03 06:58:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.54 Mbit/s
95th percentile per-packet one-way delay: 76.242 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 92.54 Mbit/s
95th percentile per-packet one-way delay: 76.242 ms
Loss rate: 0.25%
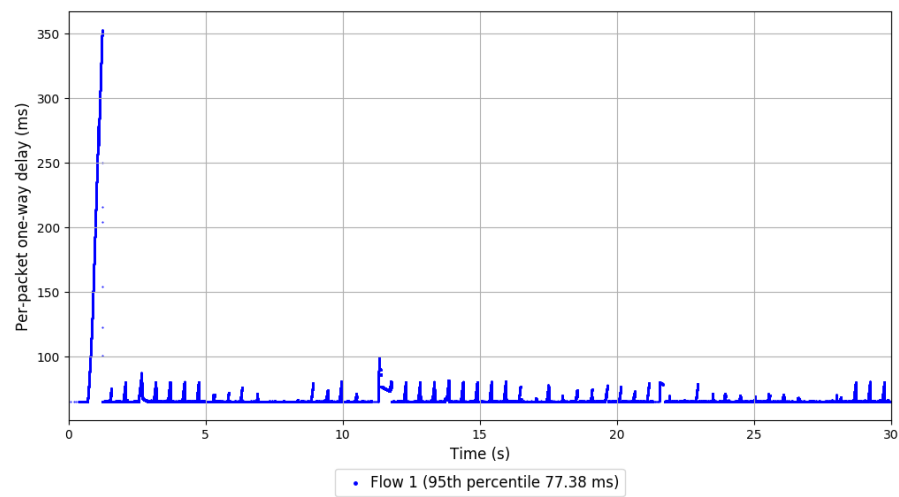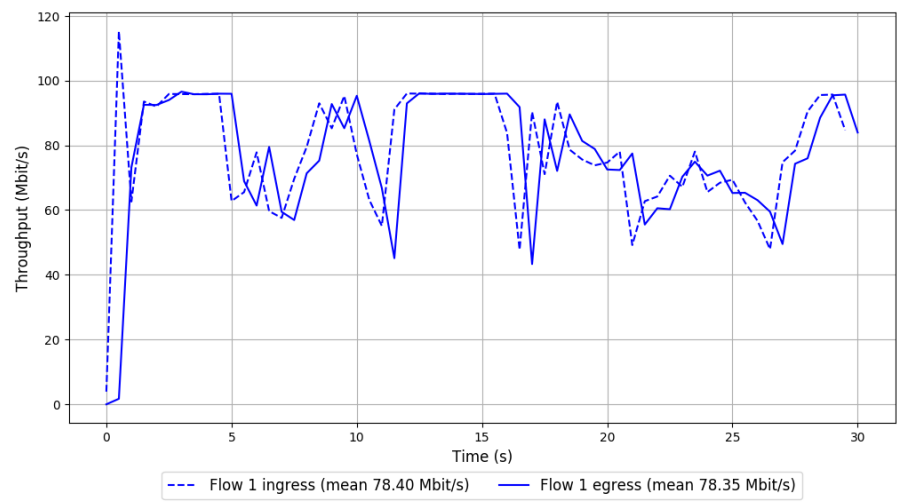```

Run 2: Report of FillP-Sheep — Data Link

```
Run 3: Statistics of FillP-Sheep

Start at: 2019-01-03 06:02:43
End at: 2019-01-03 06:03:13
Local clock offset: 0.262 ms
Remote clock offset: -5.435 ms

Below is generated by plot.py at 2019-01-03 06:58:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 91.50 Mbit/s
95th percentile per-packet one-way delay: 72.370 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 91.50 Mbit/s
95th percentile per-packet one-way delay: 72.370 ms
Loss rate: 0.24%
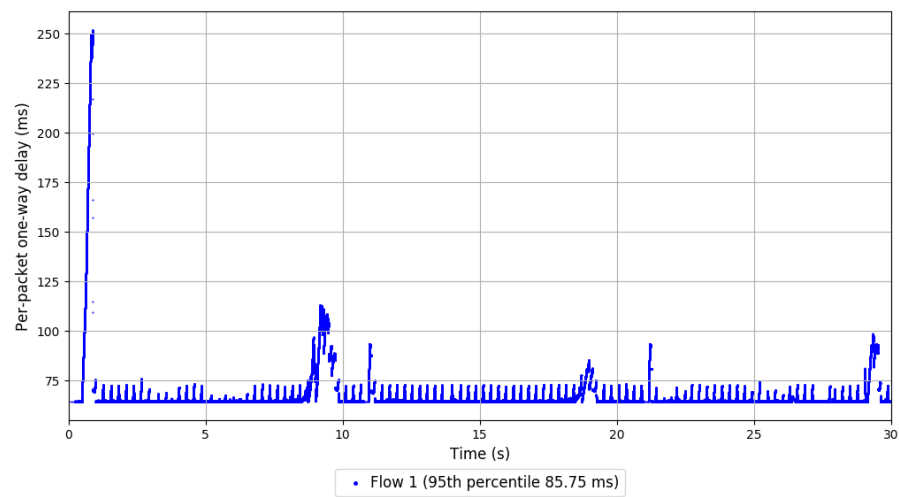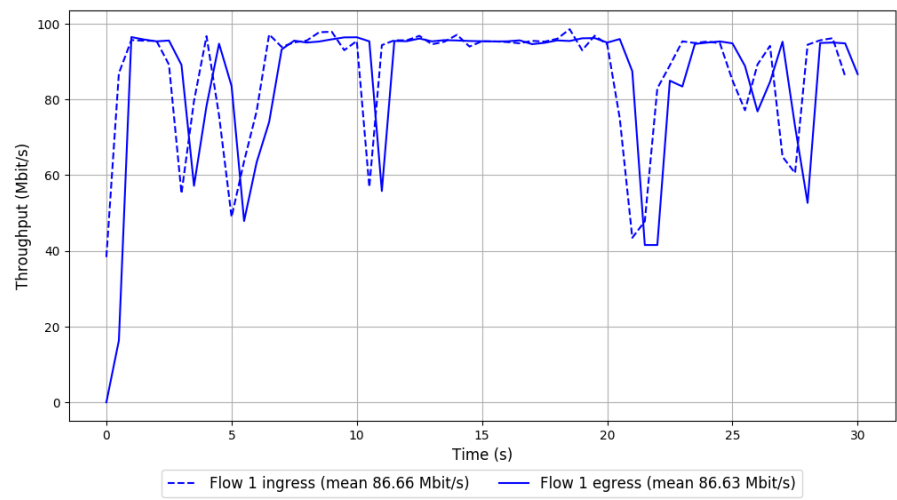```

Run 3: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 91.51 Mbit/s) — — — Flow 1 egress (mean 91.50 Mbit/s)

Flow 1 (95th percentile 72.37 ms)

```
Run 4: Statistics of FillP-Sheep

Start at: 2019-01-03 06:27:25
End at: 2019-01-03 06:27:55
Local clock offset: 1.507 ms
Remote clock offset: -4.174 ms


# Below is generated by plot.py at 2019-01-03 06:58:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 78.35 Mbit/s
95th percentile per-packet one-way delay: 77.375 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 78.35 Mbit/s
95th percentile per-packet one-way delay: 77.375 ms
Loss rate: 0.29%
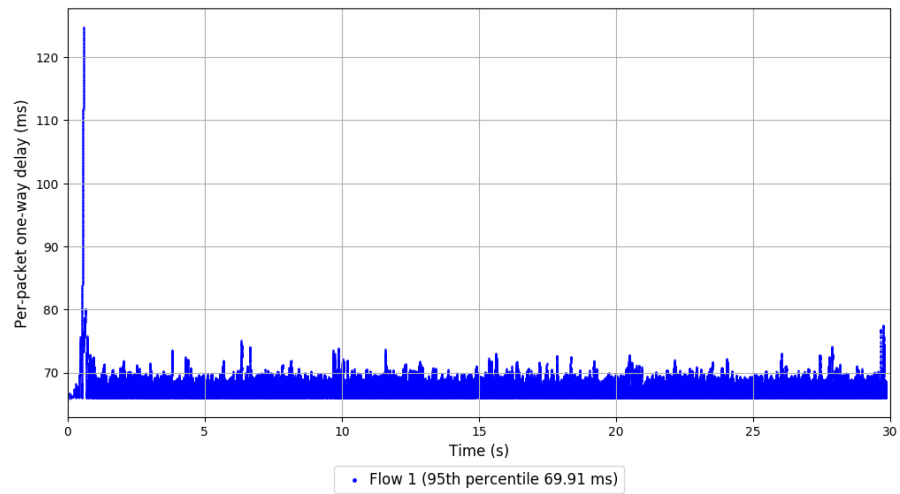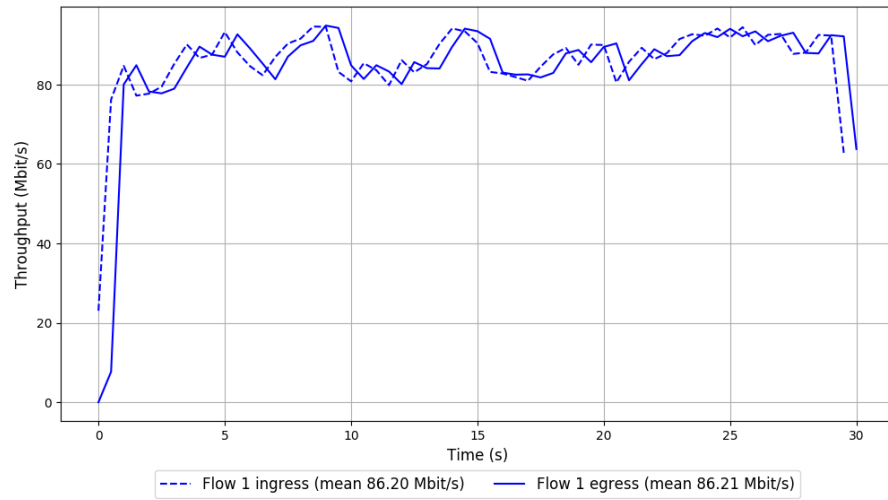```

## Run 4: Report of FillP-Sheep — Data Link



Flow 1 ingress (mean 78.40 Mbit/s)    Flow 1 egress (mean 78.35 Mbit/s)



Flow 1 (95th percentile 77.38 ms)

```
Run 5: Statistics of FillP-Sheep

Start at: 2019-01-03 06:51:13
End at: 2019-01-03 06:51:43
Local clock offset: -1.156 ms
Remote clock offset: -4.202 ms

Below is generated by plot.py at 2019-01-03 06:58:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 86.63 Mbit/s
95th percentile per-packet one-way delay: 85.755 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 86.63 Mbit/s
95th percentile per-packet one-way delay: 85.755 ms
Loss rate: 0.26%
```
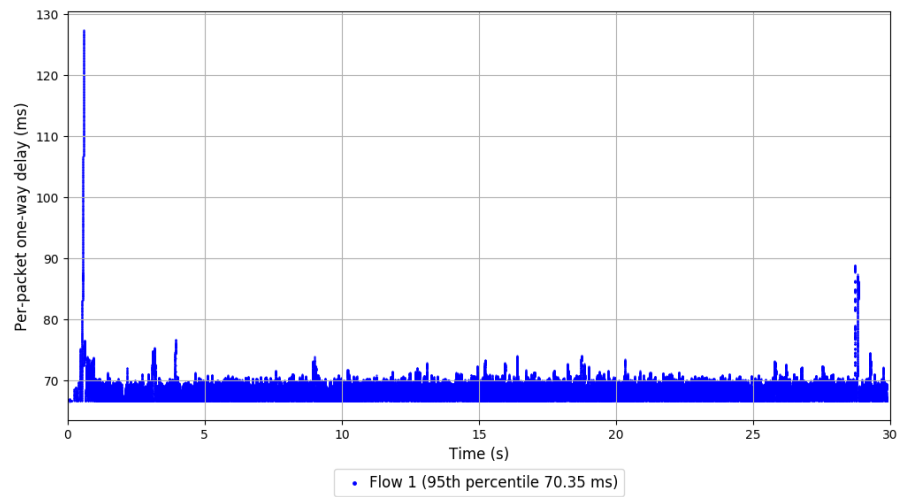
## Run 5: Report of FillP-Sheep — Data Link



Flow 1 ingress (mean 86.66 Mbit/s)    Flow 1 egress (mean 86.63 Mbit/s)



Flow 1 (95th percentile 85.75 ms)

```
Run 1: Statistics of Indigo

Start at: 2019-01-03 04:55:00
End at: 2019-01-03 04:55:30
Local clock offset: -0.515 ms
Remote clock offset: -5.957 ms

Below is generated by plot.py at 2019-01-03 06:58:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 86.21 Mbit/s
95th percentile per-packet one-way delay: 69.913 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 86.21 Mbit/s
95th percentile per-packet one-way delay: 69.913 ms
Loss rate: 0.23%
```
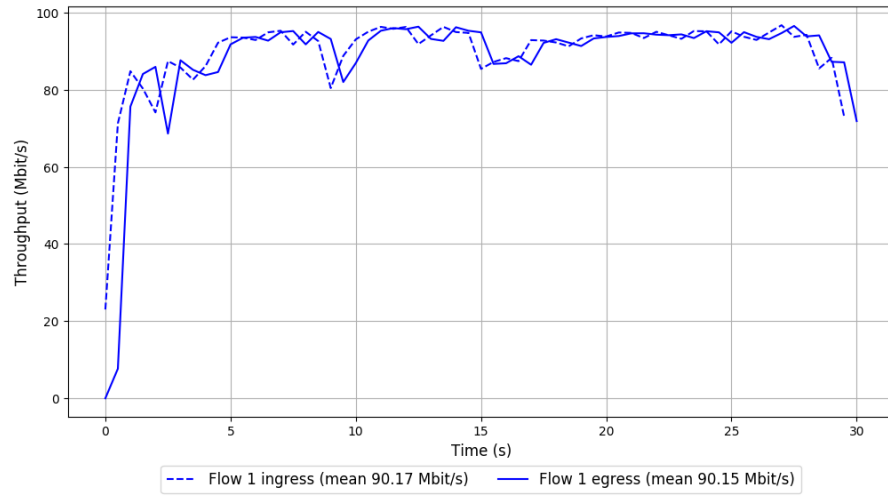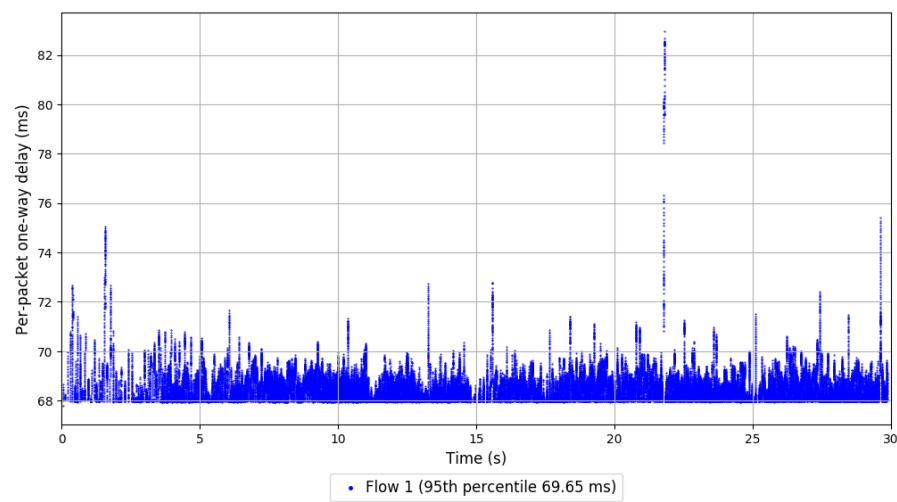
Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2019-01-03 05:22:05
End at: 2019-01-03 05:22:36
Local clock offset: 0.568 ms
Remote clock offset: -7.308 ms

Below is generated by plot.py at 2019-01-03 06:58:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 90.15 Mbit/s
95th percentile per-packet one-way delay: 70.346 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 90.15 Mbit/s
95th percentile per-packet one-way delay: 70.346 ms
Loss rate: 0.25%
```
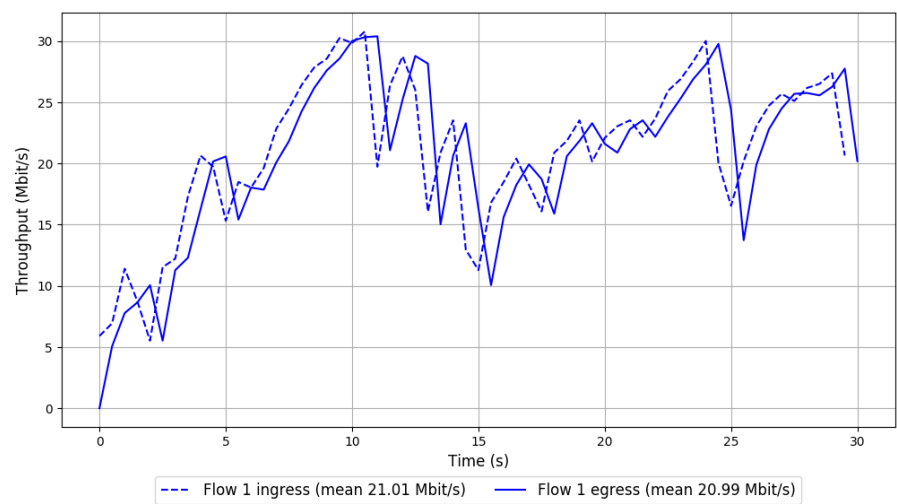
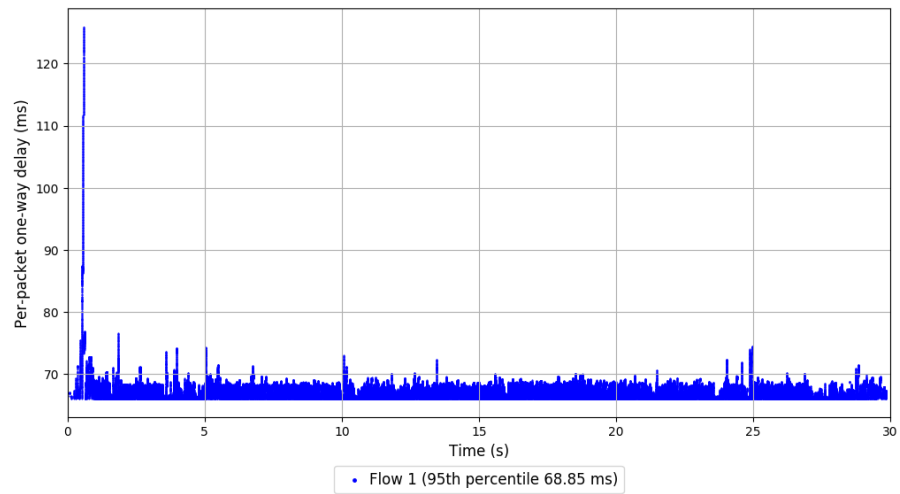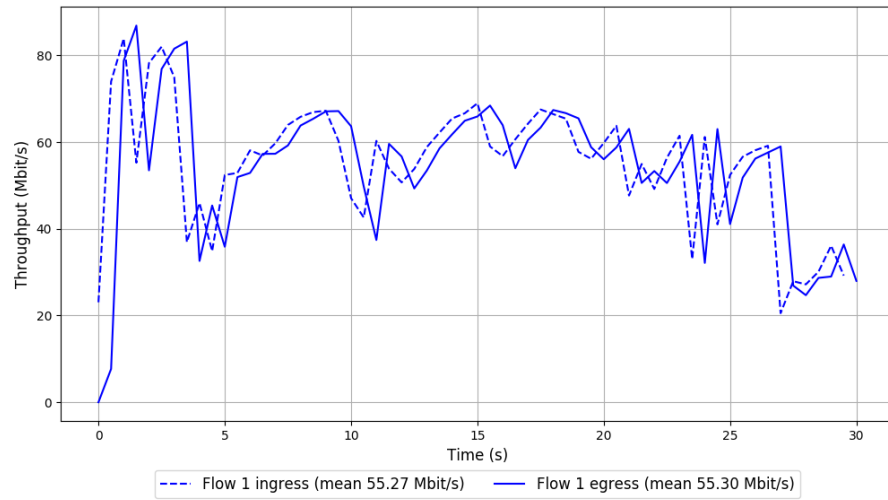Run 2: Report of Indigo — Data Link



Flow 1 ingress (mean 90.17 Mbit/s) ---- Flow 1 egress (mean 90.15 Mbit/s)



Flow 1 (95th percentile 70.35 ms)

```
Run 3: Statistics of Indigo

Start at: 2019-01-03 05:48:30
End at: 2019-01-03 05:49:00
Local clock offset: 0.794 ms
Remote clock offset: -6.46 ms

Below is generated by plot.py at 2019-01-03 06:58:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 20.99 Mbit/s
95th percentile per-packet one-way delay: 69.649 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 20.99 Mbit/s
95th percentile per-packet one-way delay: 69.649 ms
Loss rate: 0.31%
```
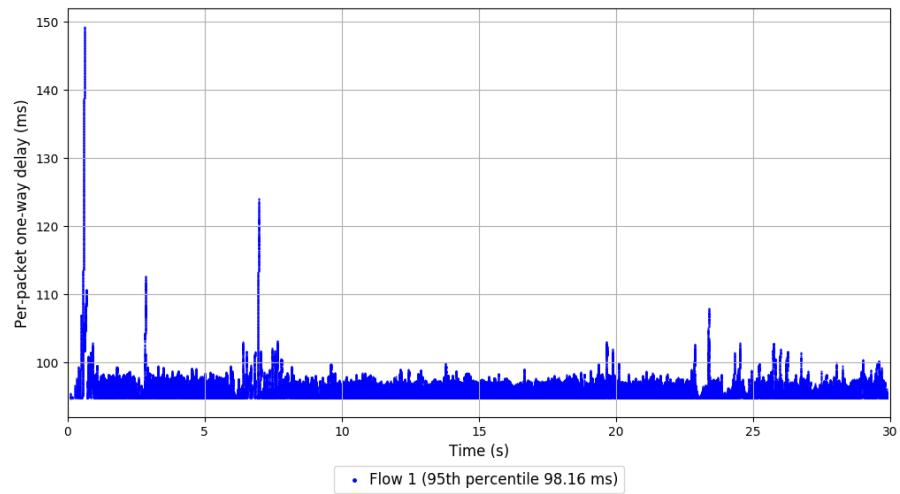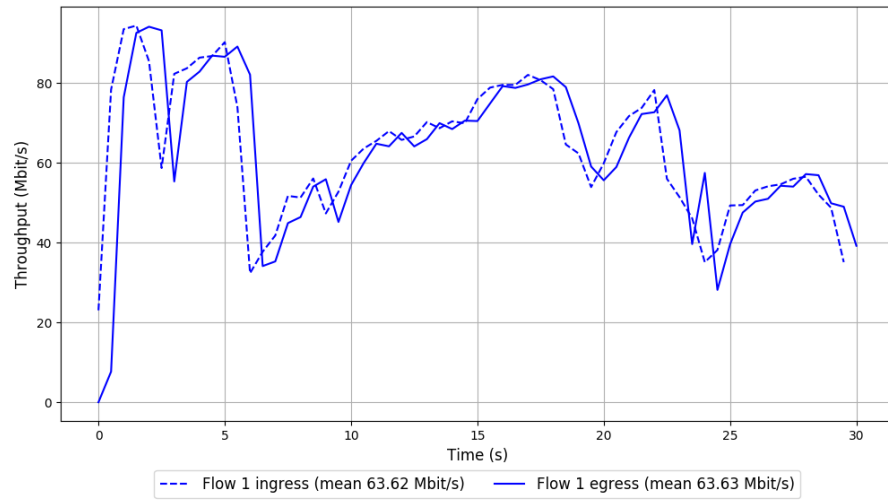
Run 3: Report of Indigo — Data Link



Flow 1 ingress (mean 21.01 Mbit/s)    Flow 1 egress (mean 20.99 Mbit/s)



Flow 1 (95th percentile 69.65 ms)

```
Run 4: Statistics of Indigo

Start at: 2019-01-03 06:12:34
End at: 2019-01-03 06:13:04
Local clock offset: 0.78 ms
Remote clock offset: -4.876 ms


# Below is generated by plot.py at 2019-01-03 06:58:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 55.30 Mbit/s
95th percentile per-packet one-way delay: 68.846 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 55.30 Mbit/s
95th percentile per-packet one-way delay: 68.846 ms
Loss rate: 0.17%
```

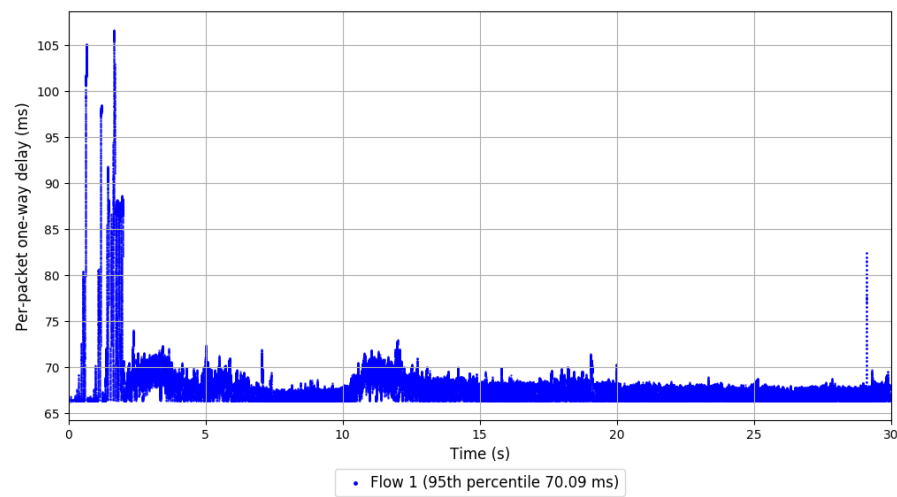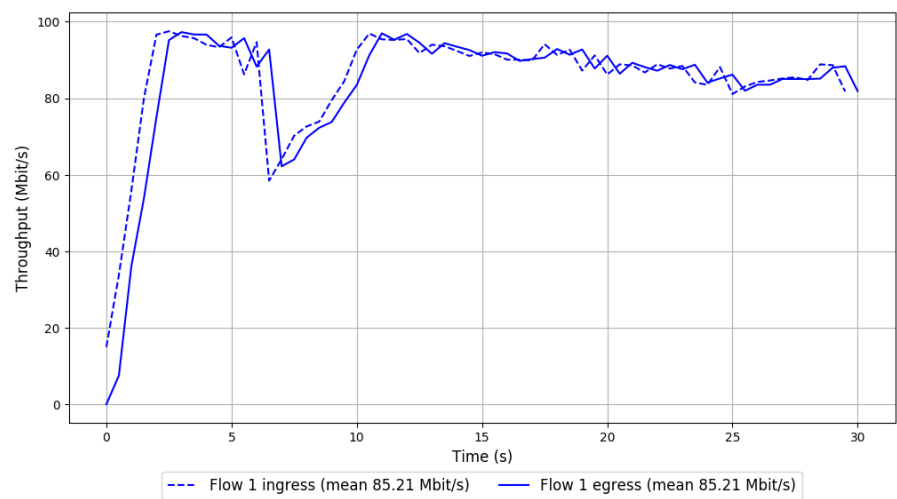Run 4: Report of Indigo — Data Link

Flow 1 ingress (mean 55.27 Mbit/s) ----- Flow 1 egress (mean 55.30 Mbit/s)

Flow 1 (95th percentile 68.85 ms)

```
Run 5: Statistics of Indigo

Start at: 2019-01-03 06:37:13
End at: 2019-01-03 06:37:43
Local clock offset: -0.392 ms
Remote clock offset: -33.026 ms

# Below is generated by plot.py at 2019-01-03 06:59:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 63.63 Mbit/s
95th percentile per-packet one-way delay: 98.159 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 63.63 Mbit/s
95th percentile per-packet one-way delay: 98.159 ms
Loss rate: 0.23%
```
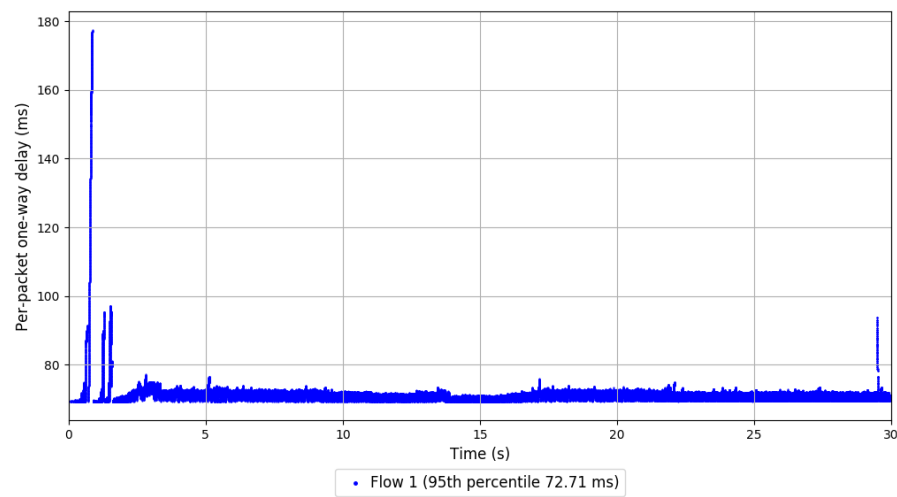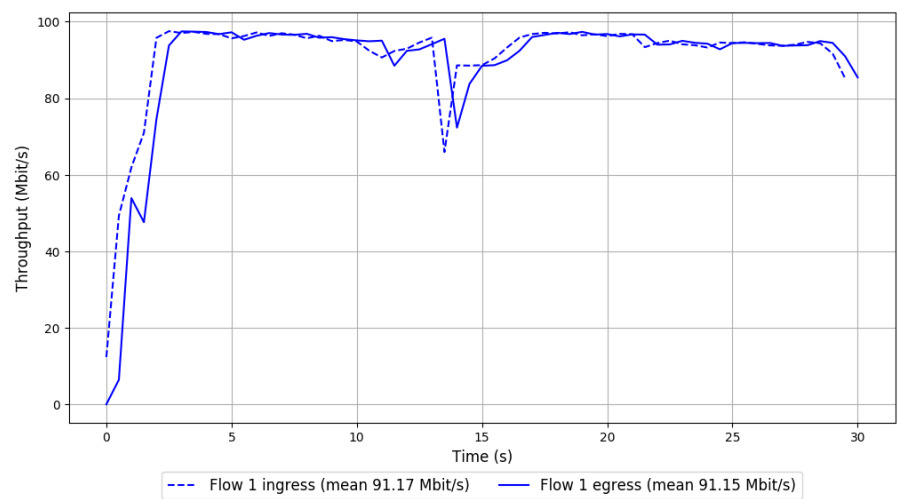
Run 5: Report of Indigo — Data Link

```
Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-03 04:59:27
End at: 2019-01-03 04:59:57
Local clock offset: 1.917 ms
Remote clock offset: -6.577 ms


# Below is generated by plot.py at 2019-01-03 06:59:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 85.21 Mbit/s
95th percentile per-packet one-way delay: 70.091 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 85.21 Mbit/s
95th percentile per-packet one-way delay: 70.091 ms
Loss rate: 0.24%
```
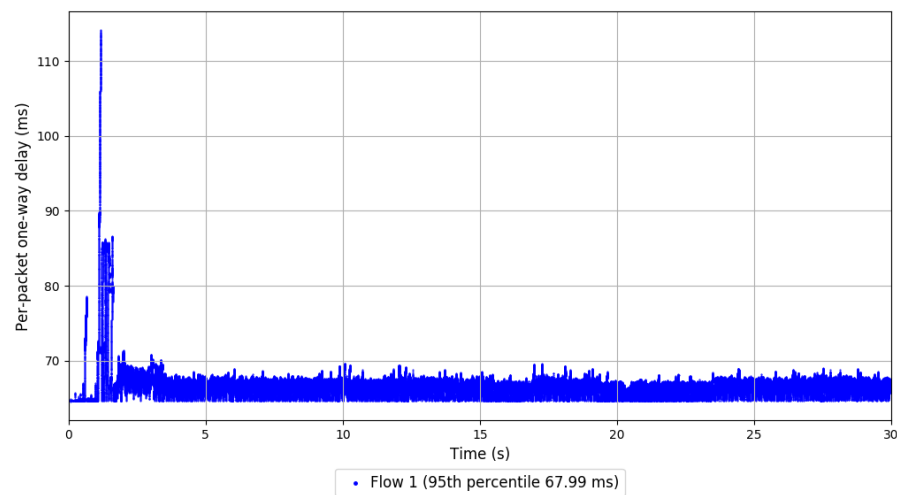
Run 1: Report of Indigo-MusesD — Data Link

66

```
Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-03 05:26:46
End at: 2019-01-03 05:27:16
Local clock offset: 2.781 ms
Remote clock offset: -7.477 ms


# Below is generated by plot.py at 2019-01-03 06:59:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.15 Mbit/s
95th percentile per-packet one-way delay: 72.712 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 91.15 Mbit/s
95th percentile per-packet one-way delay: 72.712 ms
Loss rate: 0.25%
```
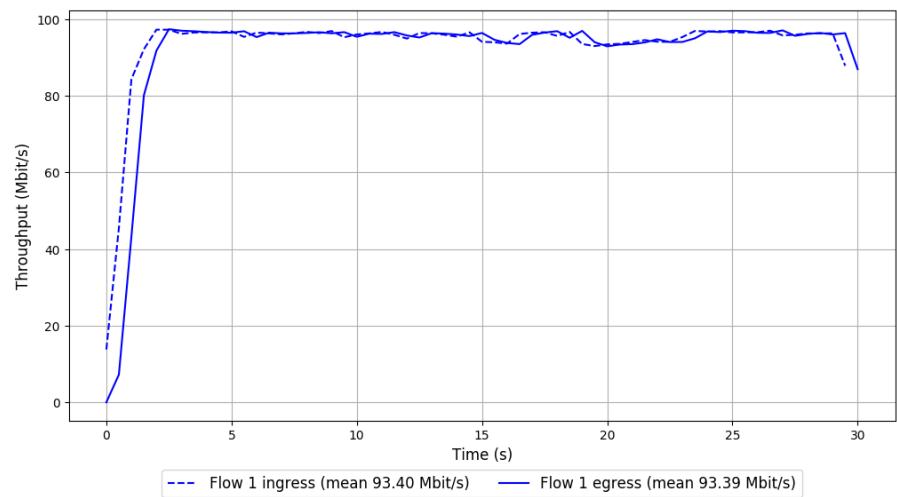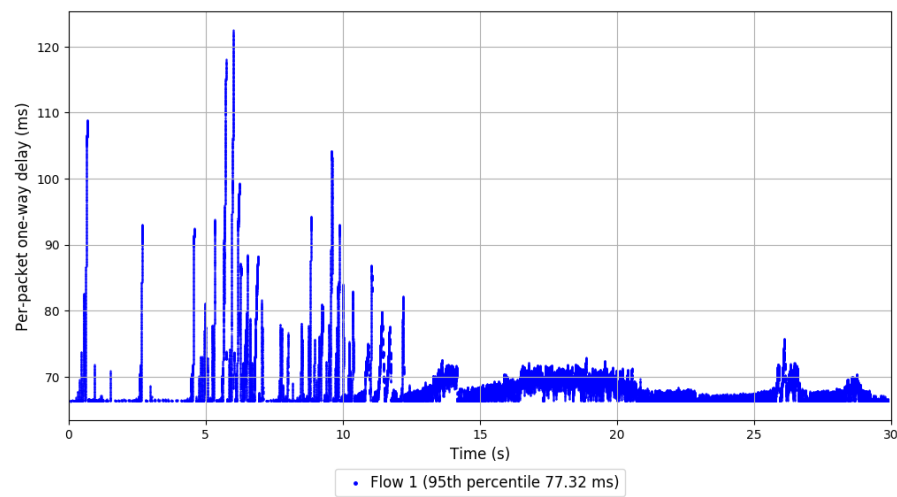
Run 2: Report of Indigo-MusesD — Data Link

```
Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-03 05:52:33
End at: 2019-01-03 05:53:03
Local clock offset: 0.86 ms
Remote clock offset: -5.088 ms


# Below is generated by plot.py at 2019-01-03 06:59:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 93.39 Mbit/s
95th percentile per-packet one-way delay: 67.994 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 93.39 Mbit/s
95th percentile per-packet one-way delay: 67.994 ms
Loss rate: 0.24%
```
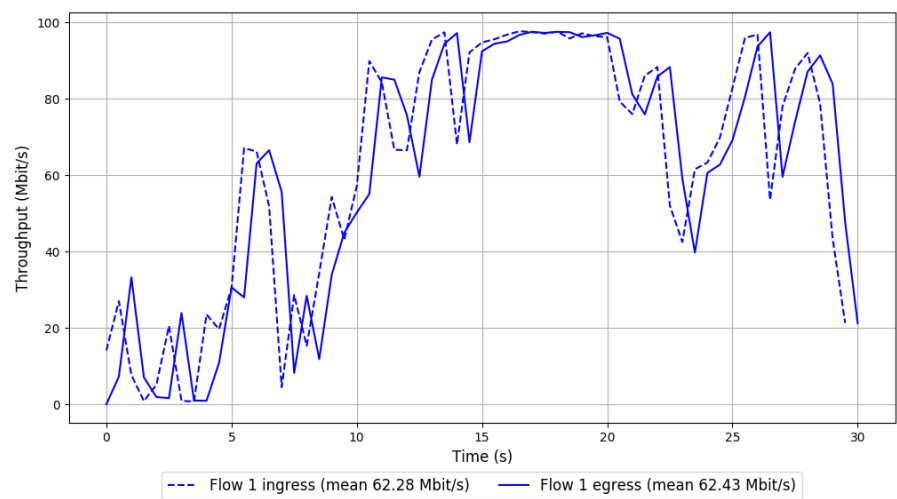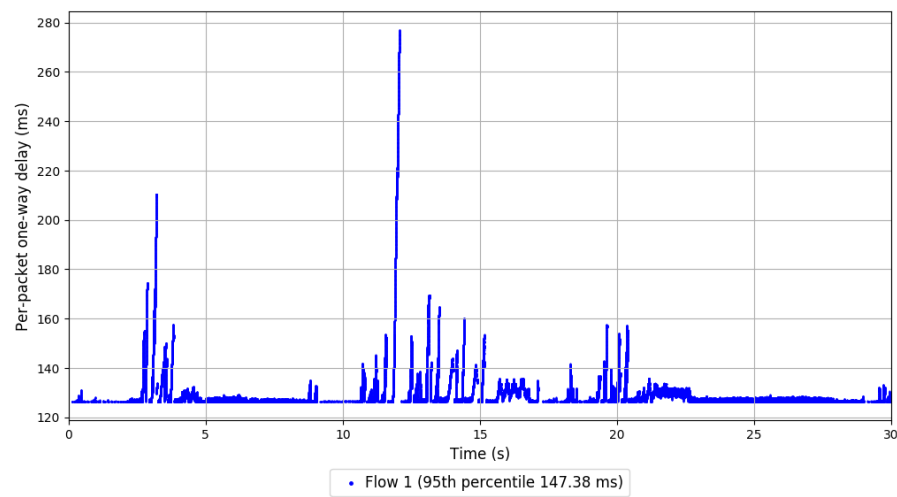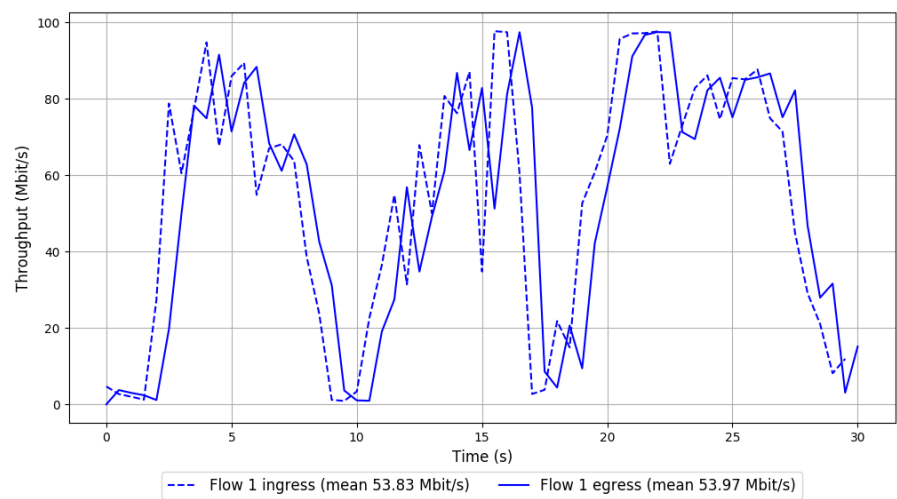
Run 3: Report of Indigo-MusesD — Data Link

```
Run 4: Statistics of Indigo-MusesD

Start at: 2019-01-03 06:16:58
End at: 2019-01-03 06:17:28
Local clock offset: 2.808 ms
Remote clock offset: -4.762 ms


# Below is generated by plot.py at 2019-01-03 06:59:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 62.43 Mbit/s
95th percentile per-packet one-way delay: 77.318 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 62.43 Mbit/s
95th percentile per-packet one-way delay: 77.318 ms
Loss rate: 0.10%
```
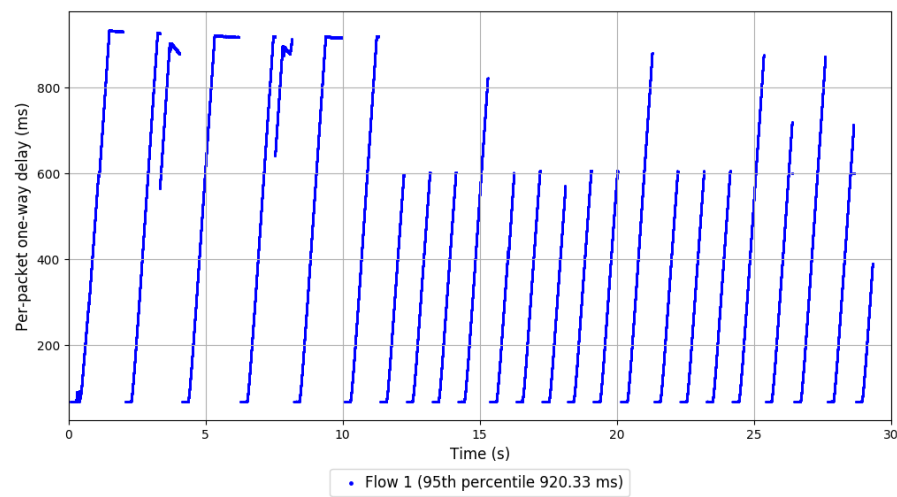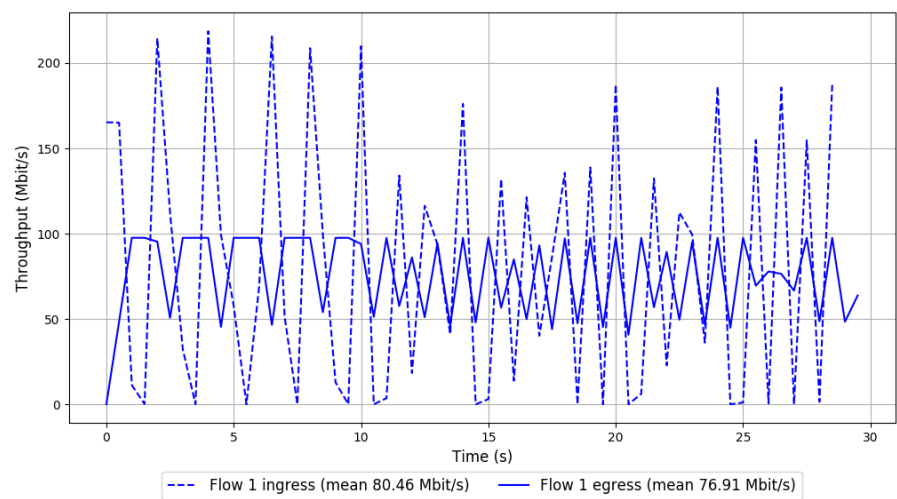
Run 4: Report of Indigo-MusesD — Data Link

```
Run 5: Statistics of Indigo-MusesD

Start at: 2019-01-03 06:41:06
End at: 2019-01-03 06:41:36
Local clock offset: -1.353 ms
Remote clock offset: -66.979 ms


# Below is generated by plot.py at 2019-01-03 06:59:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 53.97 Mbit/s
95th percentile per-packet one-way delay: 147.385 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 53.97 Mbit/s
95th percentile per-packet one-way delay: 147.385 ms
Loss rate: 0.07%
```

Run 5: Report of Indigo-MusesD — Data Link

Flow 1 ingress (mean 53.83 Mbit/s) —— Flow 1 egress (mean 53.97 Mbit/s)
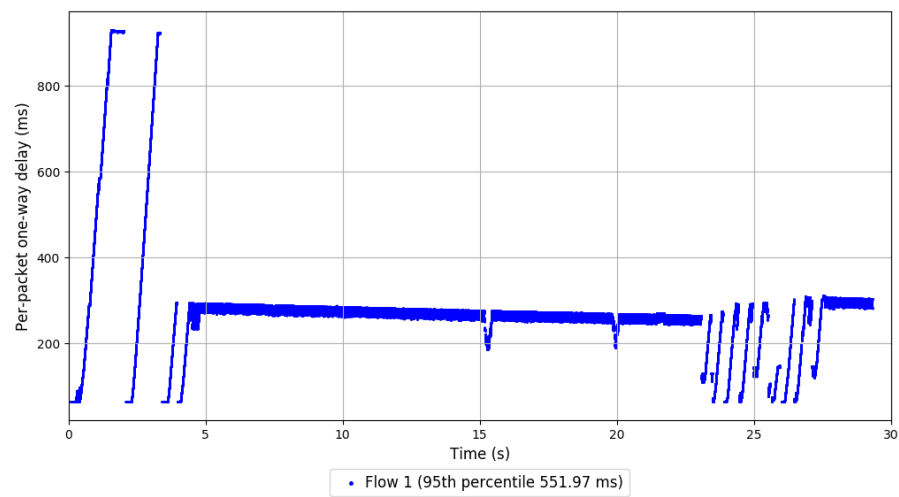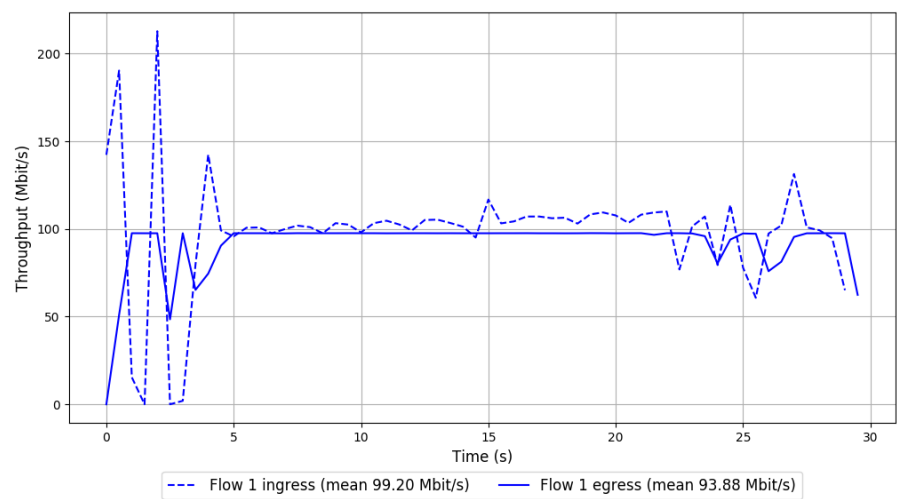

• Flow 1 (95th percentile 147.38 ms)

```
Run 1: Statistics of Indigo-MusesT

Start at: 2019-01-03 05:08:31
End at: 2019-01-03 05:09:01
Local clock offset: 2.591 ms
Remote clock offset: -5.643 ms


# Below is generated by plot.py at 2019-01-03 06:59:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 76.91 Mbit/s
95th percentile per-packet one-way delay: 920.333 ms
Loss rate: 3.46%
-- Flow 1:
Average throughput: 76.91 Mbit/s
95th percentile per-packet one-way delay: 920.333 ms
Loss rate: 3.46%
```

Run 1: Report of Indigo-MusesT — Data Link

```
Run 2: Statistics of Indigo-MusesT

Start at: 2019-01-03 05:35:35
End at: 2019-01-03 05:36:05
Local clock offset: -0.627 ms
Remote clock offset: -6.752 ms


# Below is generated by plot.py at 2019-01-03 06:59:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 93.88 Mbit/s
95th percentile per-packet one-way delay: 551.969 ms
Loss rate: 5.54%
-- Flow 1:
Average throughput: 93.88 Mbit/s
95th percentile per-packet one-way delay: 551.969 ms
Loss rate: 5.54%
```
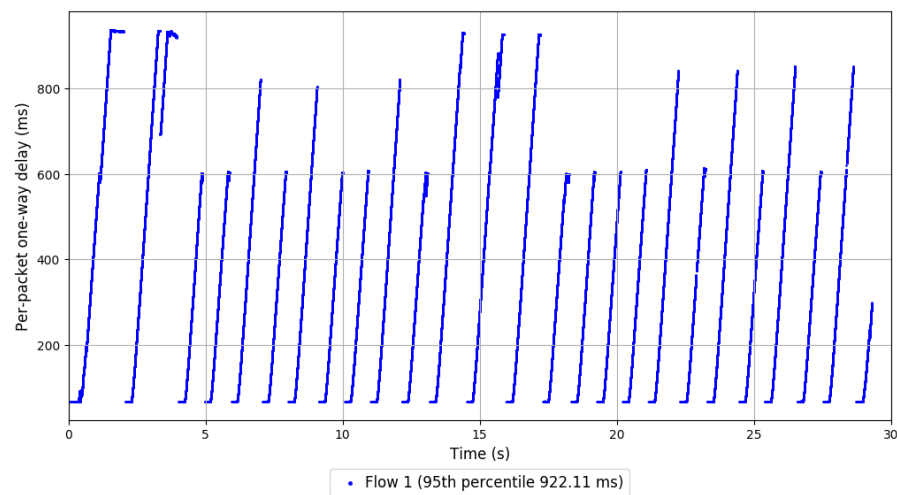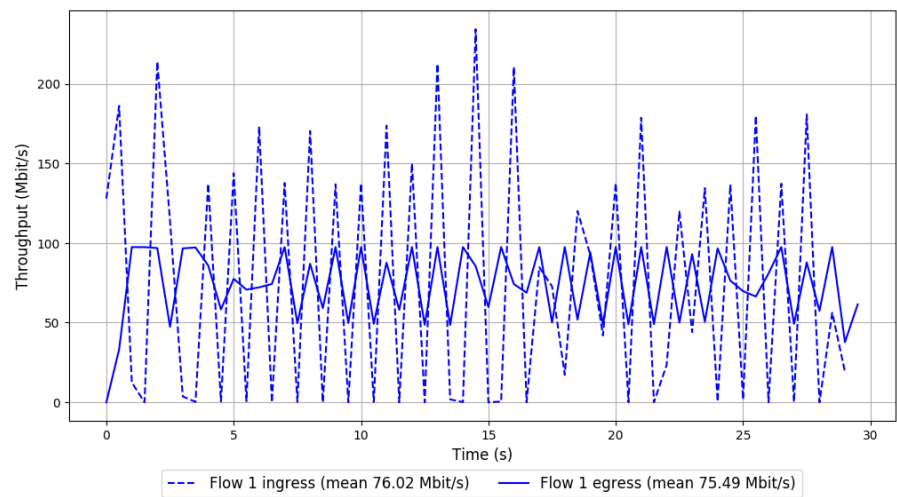
Run 2: Report of Indigo-MusesT — Data Link

Flow 1 ingress (mean 99.20 Mbit/s) ---- Flow 1 egress (mean 93.88 Mbit/s) ——

Flow 1 (95th percentile 551.97 ms)

```
Run 3: Statistics of Indigo-MusesT

Start at: 2019-01-03 06:00:16
End at: 2019-01-03 06:00:46
Local clock offset: 2.12 ms
Remote clock offset: -6.339 ms


# Below is generated by plot.py at 2019-01-03 06:59:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 75.49 Mbit/s
95th percentile per-packet one-way delay: 922.109 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 75.49 Mbit/s
95th percentile per-packet one-way delay: 922.109 ms
Loss rate: 0.96%
```
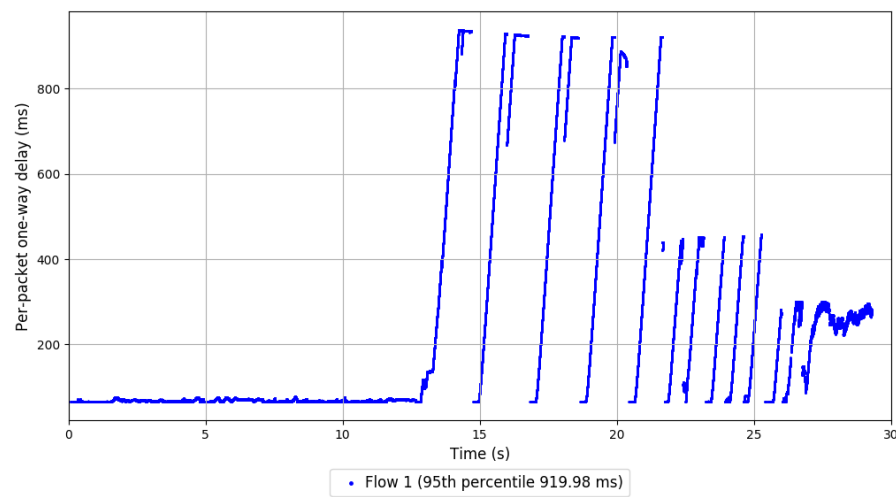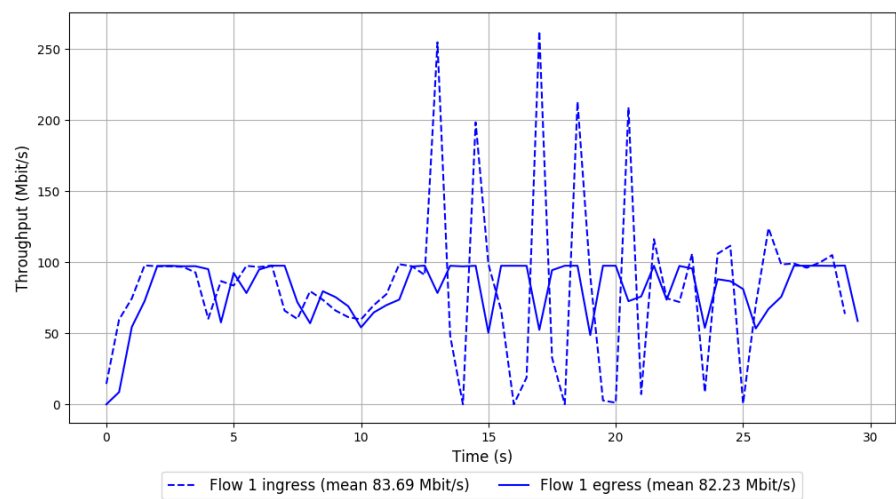
Run 3: Report of Indigo-MusesT — Data Link

Flow 1 ingress (mean 76.02 Mbit/s) --- Flow 1 egress (mean 75.49 Mbit/s)

• Flow 1 (95th percentile 922.11 ms)

```
Run 4: Statistics of Indigo-MusesT

Start at: 2019-01-03 06:24:58
End at: 2019-01-03 06:25:28
Local clock offset: 2.011 ms
Remote clock offset: -5.065 ms


# Below is generated by plot.py at 2019-01-03 07:00:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 82.23 Mbit/s
95th percentile per-packet one-way delay: 919.975 ms
Loss rate: 1.97%
-- Flow 1:
Average throughput: 82.23 Mbit/s
95th percentile per-packet one-way delay: 919.975 ms
Loss rate: 1.97%
```
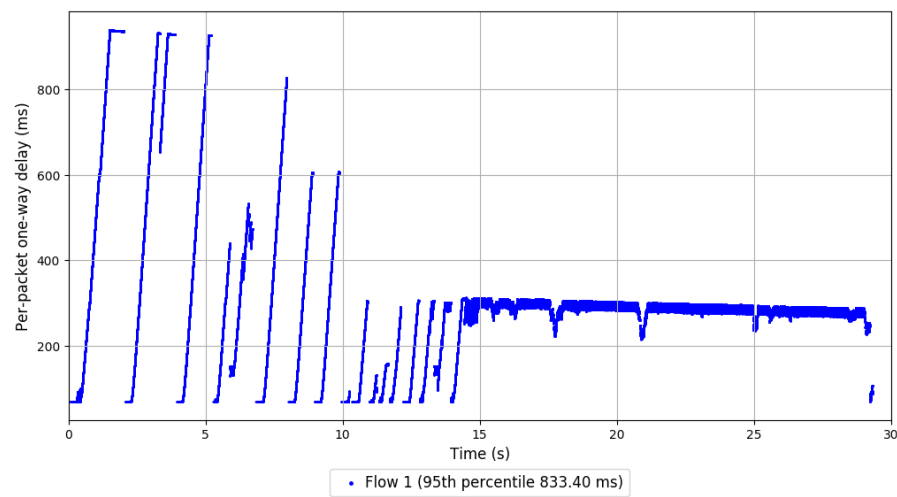
Run 4: Report of Indigo-MusesT — Data Link

```
Run 5: Statistics of Indigo-MusesT

Start at: 2019-01-03 06:48:42
End at: 2019-01-03 06:49:12
Local clock offset: 2.2 ms
Remote clock offset: -4.005 ms


# Below is generated by plot.py at 2019-01-03 07:00:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 87.49 Mbit/s
95th percentile per-packet one-way delay: 833.402 ms
Loss rate: 4.68%
-- Flow 1:
Average throughput: 87.49 Mbit/s
95th percentile per-packet one-way delay: 833.402 ms
Loss rate: 4.68%
```
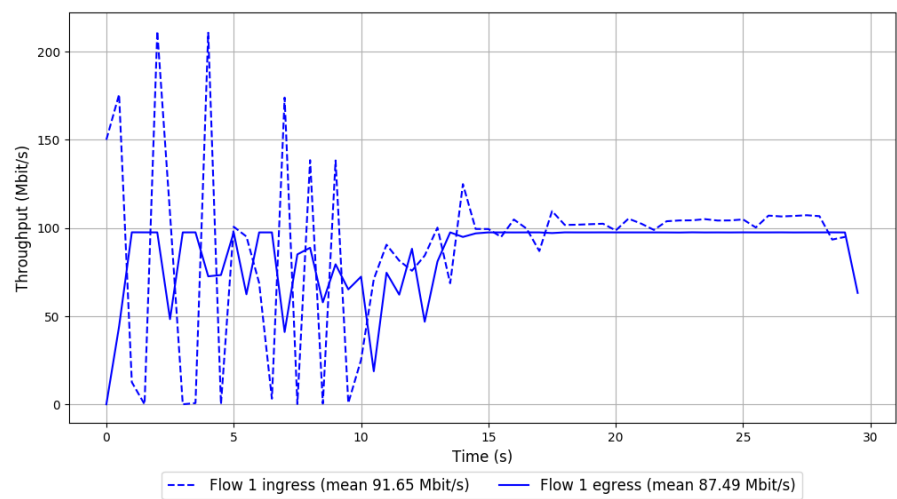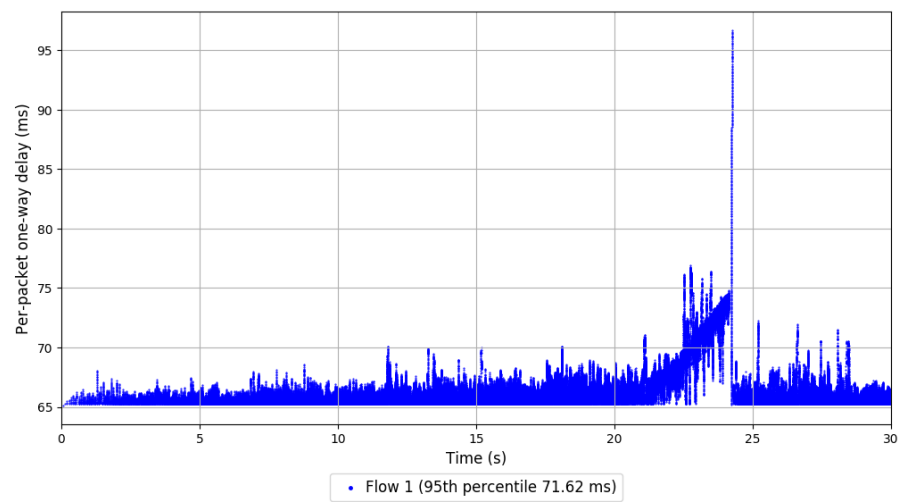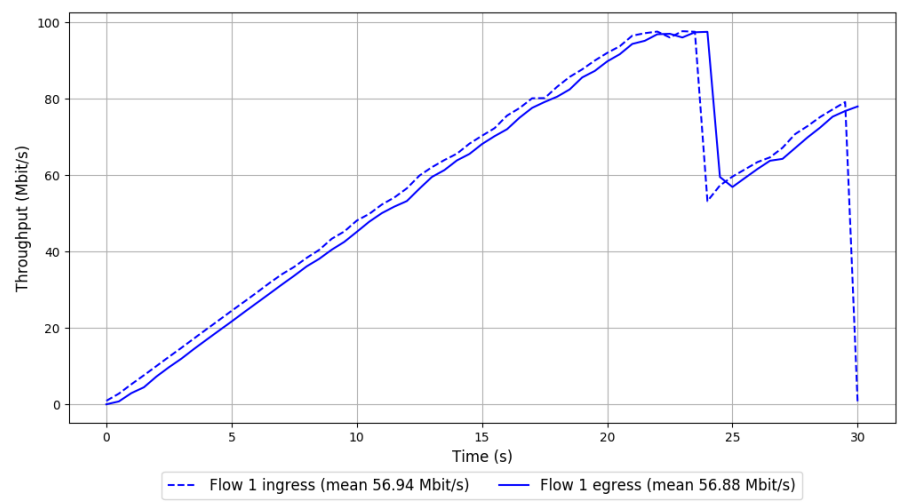
Run 5: Report of Indigo-MusesT — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2019-01-03 04:50:22
End at: 2019-01-03 04:50:52
Local clock offset: -0.45 ms
Remote clock offset: -5.565 ms

# Below is generated by plot.py at 2019-01-03 07:00:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 56.88 Mbit/s
95th percentile per-packet one-way delay: 71.620 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 56.88 Mbit/s
95th percentile per-packet one-way delay: 71.620 ms
Loss rate: 0.34%
```

Run 1: Report of LEDBAT — Data Link

Flow 1 ingress (mean 56.94 Mbit/s) — — — Flow 1 egress (mean 56.88 Mbit/s)

• Flow 1 (95th percentile 71.62 ms)

```
Run 2: Statistics of LEDBAT

Start at: 2019-01-03 05:18:19
End at: 2019-01-03 05:18:49
Local clock offset: 2.133 ms
Remote clock offset: -7.841 ms
```
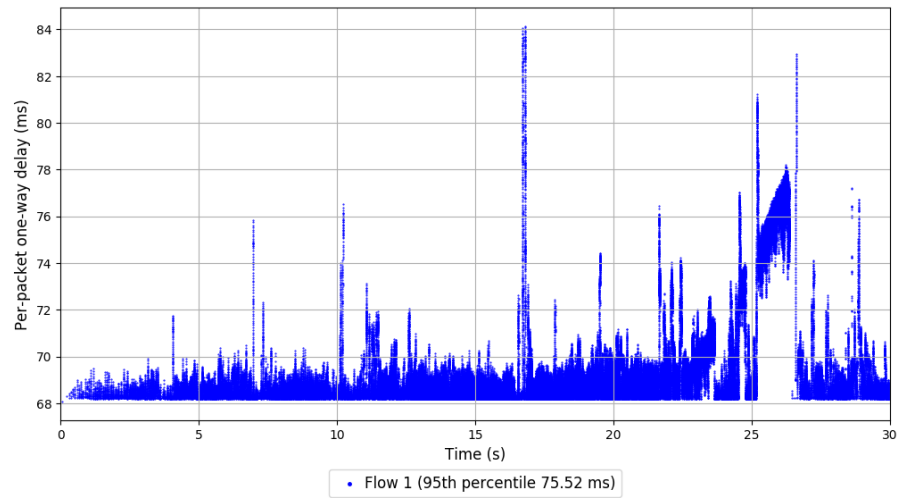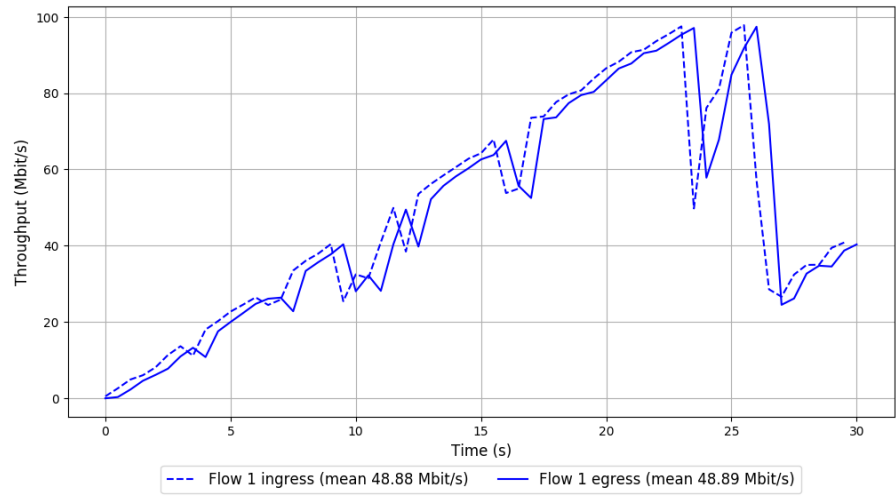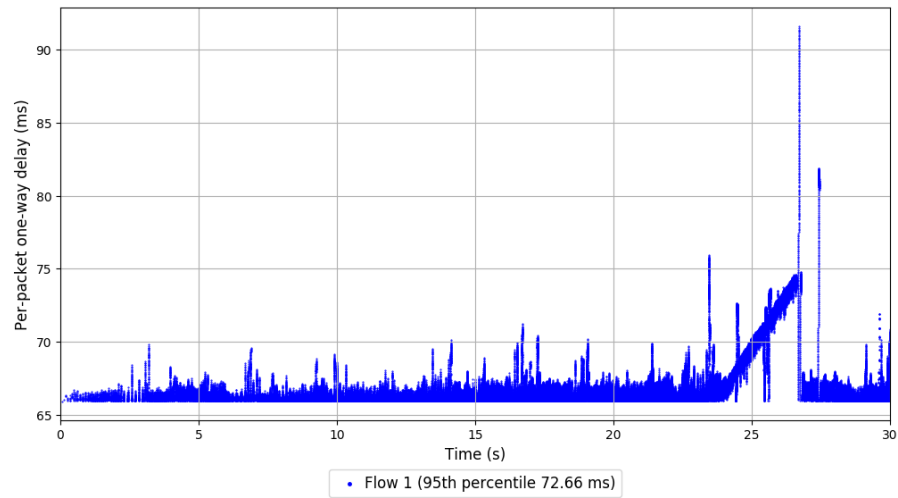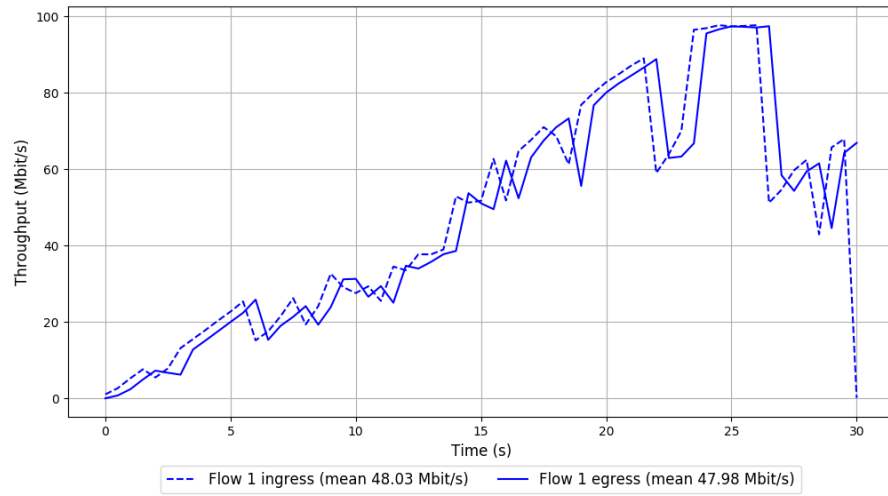
Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2019-01-03 05:44:34
End at: 2019-01-03 05:45:04
Local clock offset: -0.774 ms
Remote clock offset: -8.852 ms


# Below is generated by plot.py at 2019-01-03 07:00:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 48.89 Mbit/s
95th percentile per-packet one-way delay: 75.517 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 48.89 Mbit/s
95th percentile per-packet one-way delay: 75.517 ms
Loss rate: 0.22%
```
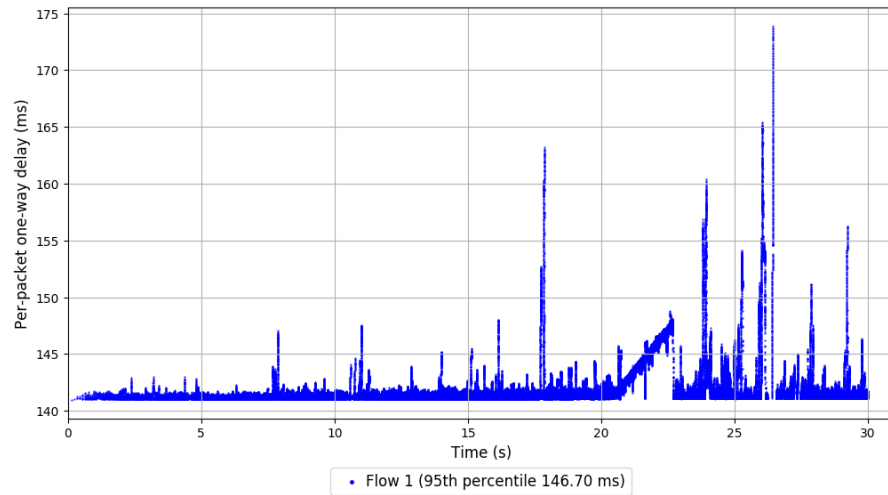
Run 3: Report of LEDBAT — Data Link

```
Run 4: Statistics of LEDBAT

Start at: 2019-01-03 06:08:53
End at: 2019-01-03 06:09:23
Local clock offset: 1.566 ms
Remote clock offset: -5.875 ms


# Below is generated by plot.py at 2019-01-03 07:00:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 47.98 Mbit/s
95th percentile per-packet one-way delay: 72.658 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 47.98 Mbit/s
95th percentile per-packet one-way delay: 72.658 ms
Loss rate: 0.34%
```

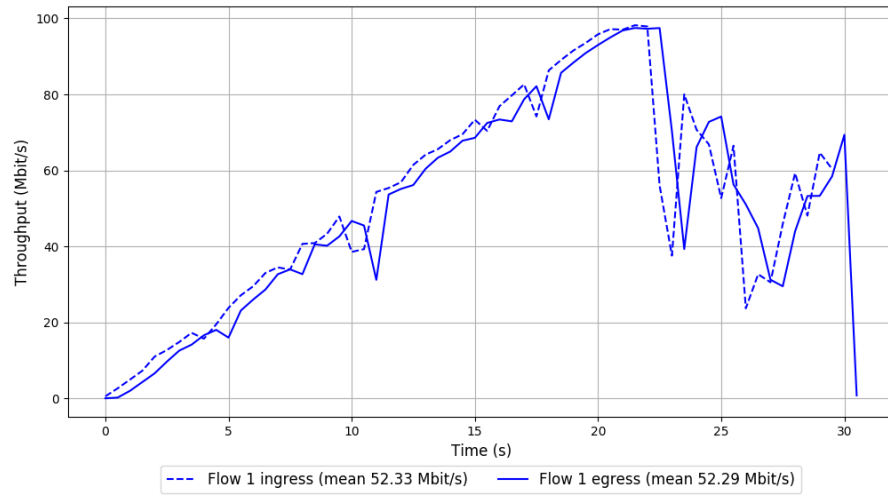Run 4: Report of LEDBAT — Data Link

```
Run 5: Statistics of LEDBAT

Start at: 2019-01-03 06:33:31
End at: 2019-01-03 06:34:01
Local clock offset: -0.319 ms
Remote clock offset: -81.243 ms

# Below is generated by plot.py at 2019-01-03 07:00:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 52.29 Mbit/s
95th percentile per-packet one-way delay: 146.701 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 52.29 Mbit/s
95th percentile per-packet one-way delay: 146.701 ms
Loss rate: 0.31%
```

Run 5: Report of LEDBAT — Data Link

Flow 1 ingress (mean 52.33 Mbit/s)   Flow 1 egress (mean 52.29 Mbit/s)

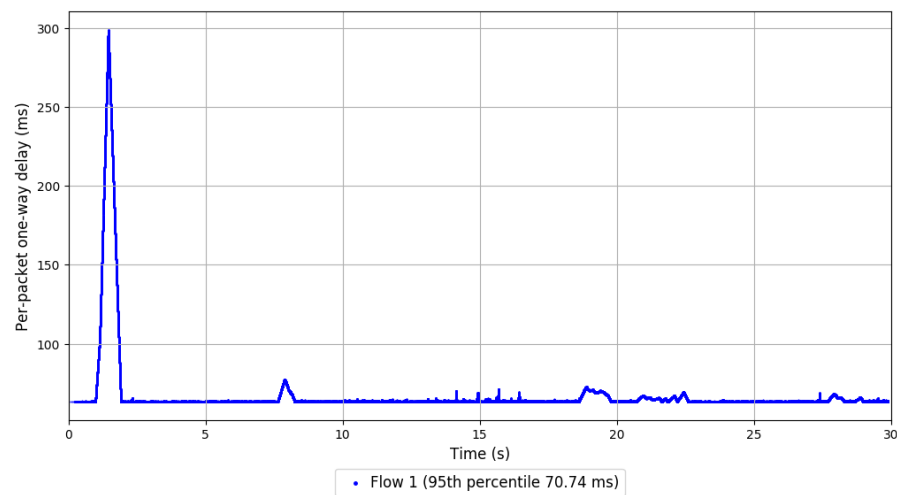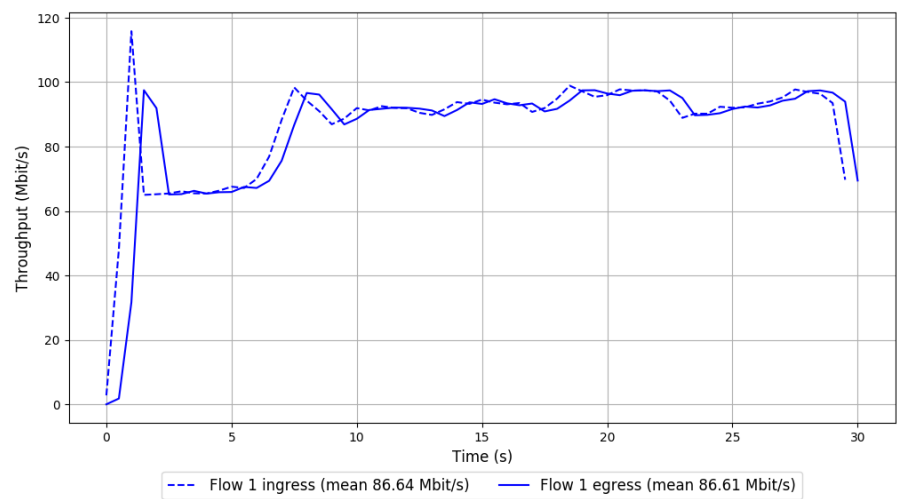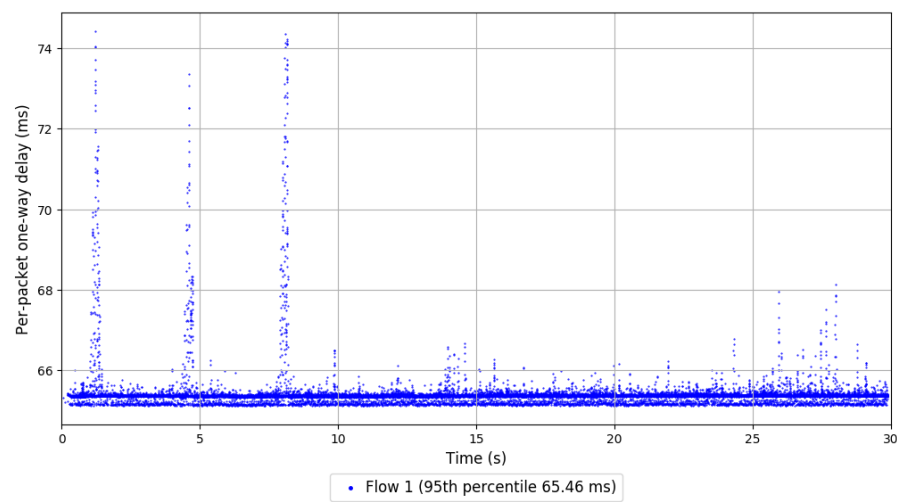Flow 1 (95th percentile 146.70 ms)

```
Run 1: Statistics of PCC-Allegro

Start at: 2019-01-03 05:10:04
End at: 2019-01-03 05:10:34
Local clock offset: 0.319 ms
Remote clock offset: -5.8 ms


# Below is generated by plot.py at 2019-01-03 07:00:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.61 Mbit/s
95th percentile per-packet one-way delay: 70.742 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 86.61 Mbit/s
95th percentile per-packet one-way delay: 70.742 ms
Loss rate: 0.26%
```
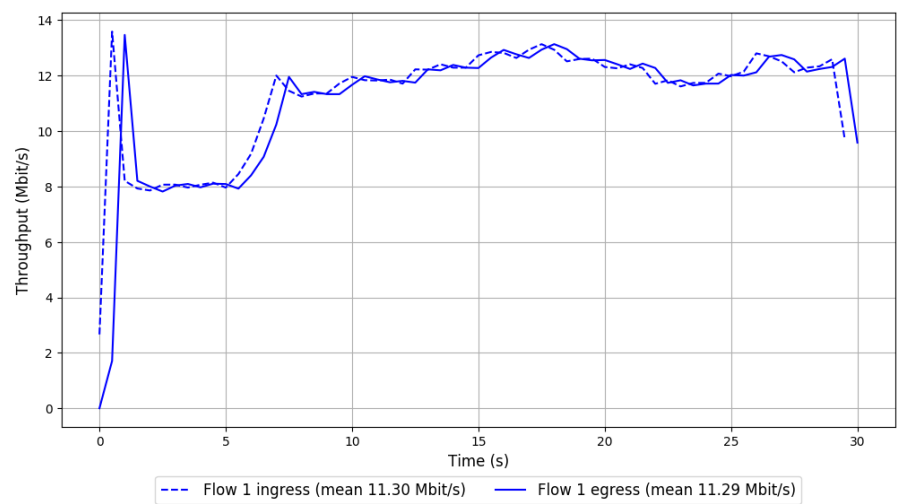
Run 1: Report of PCC-Allegro — Data Link

```
Run 2: Statistics of PCC-Allegro

Start at: 2019-01-03 05:37:09
End at: 2019-01-03 05:37:39
Local clock offset: -0.933 ms
Remote clock offset: -6.263 ms


# Below is generated by plot.py at 2019-01-03 07:00:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.29 Mbit/s
95th percentile per-packet one-way delay: 65.456 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 11.29 Mbit/s
95th percentile per-packet one-way delay: 65.456 ms
Loss rate: 0.26%
```
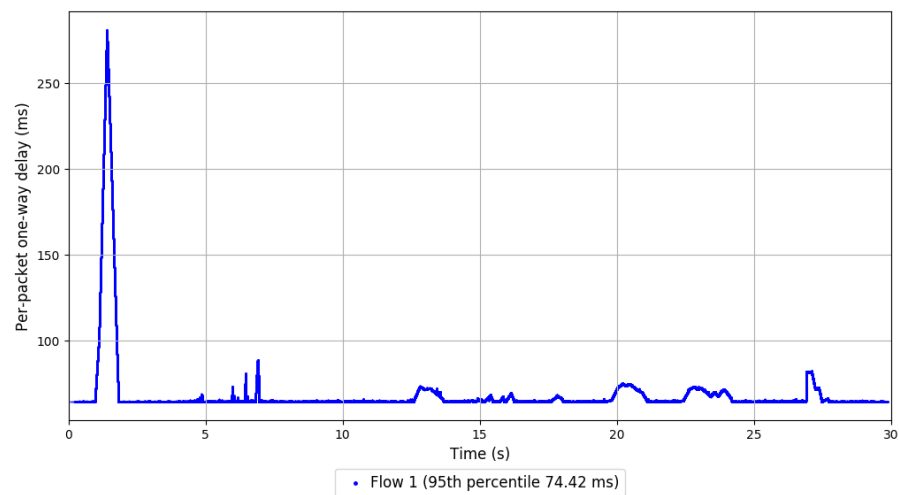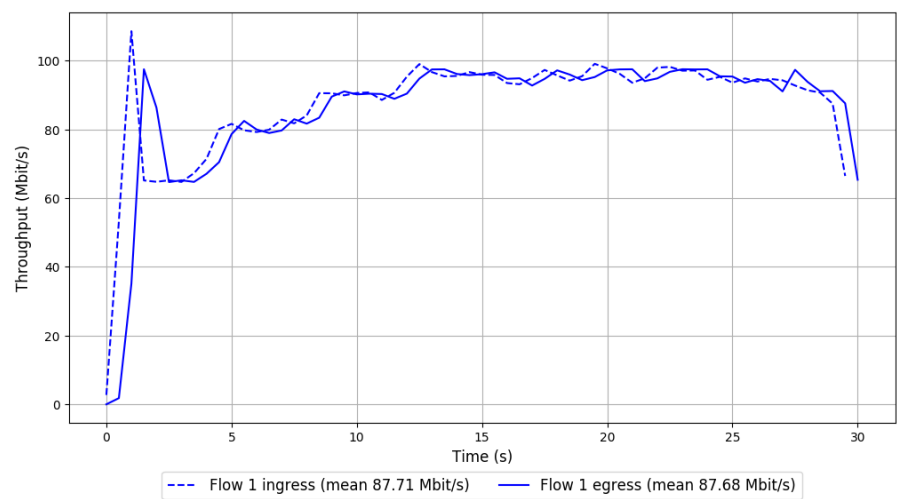
Run 2: Report of PCC-Allegro — Data Link

```
Run 3: Statistics of PCC-Allegro

Start at: 2019-01-03 06:01:31
End at: 2019-01-03 06:02:01
Local clock offset: 0.015 ms
Remote clock offset: -5.664 ms


# Below is generated by plot.py at 2019-01-03 07:01:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 87.68 Mbit/s
95th percentile per-packet one-way delay: 74.420 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 87.68 Mbit/s
95th percentile per-packet one-way delay: 74.420 ms
Loss rate: 0.27%
```

Run 3: Report of PCC-Allegro — Data Link

```
Run 4: Statistics of PCC-Allegro

Start at: 2019-01-03 06:26:18
End at: 2019-01-03 06:26:48
Local clock offset: 0.852 ms
Remote clock offset: -5.107 ms


# Below is generated by plot.py at 2019-01-03 07:01:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.62 Mbit/s
95th percentile per-packet one-way delay: 66.851 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 16.62 Mbit/s
95th percentile per-packet one-way delay: 66.851 ms
Loss rate: 0.27%
```
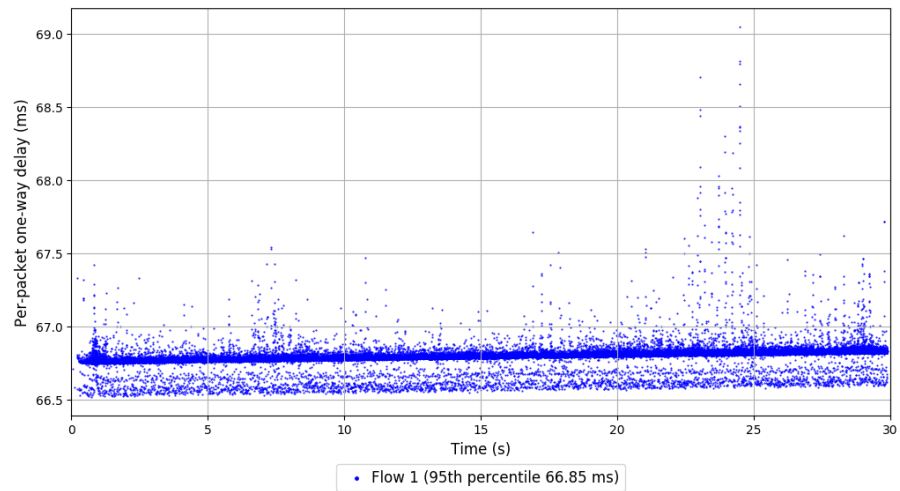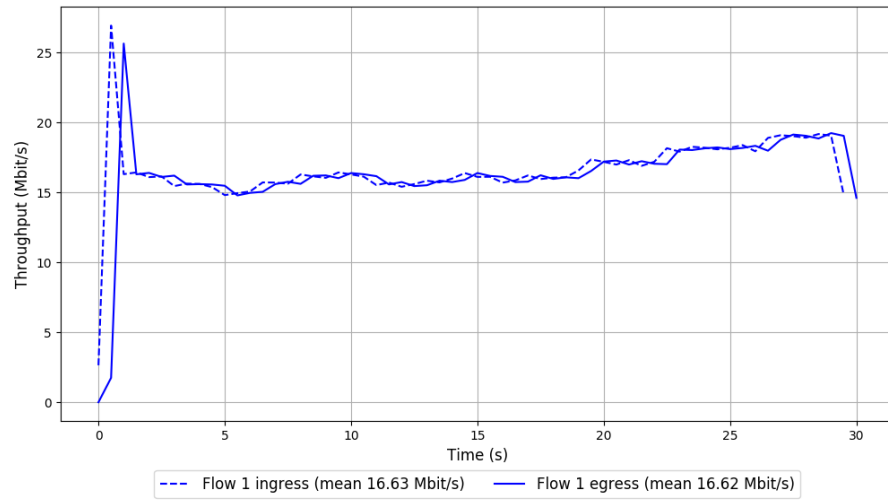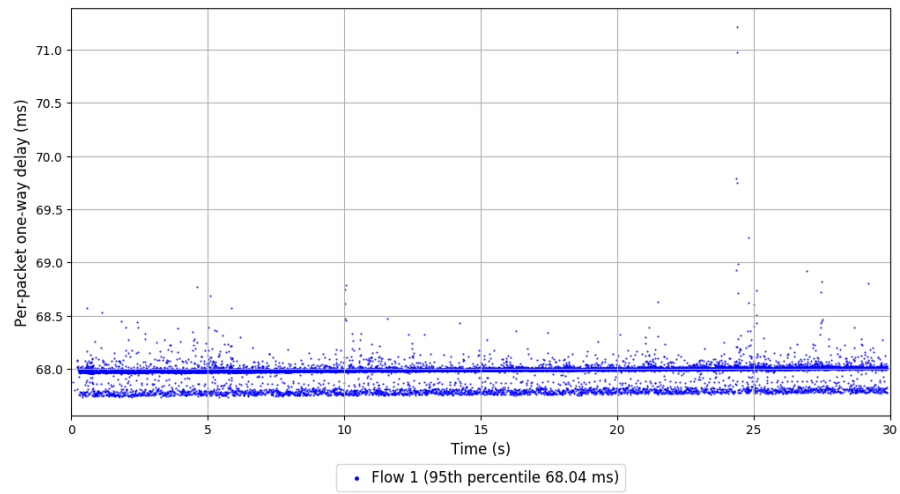
Run 4: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 16.63 Mbit/s)   Flow 1 egress (mean 16.62 Mbit/s)

Flow 1 (95th percentile 66.85 ms)

```
Run 5: Statistics of PCC-Allegro

Start at: 2019-01-03 06:50:05
End at: 2019-01-03 06:50:35
Local clock offset: 0.841 ms
Remote clock offset: -4.316 ms


# Below is generated by plot.py at 2019-01-03 07:01:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.67 Mbit/s
95th percentile per-packet one-way delay: 68.037 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 4.67 Mbit/s
95th percentile per-packet one-way delay: 68.037 ms
Loss rate: 0.36%
```
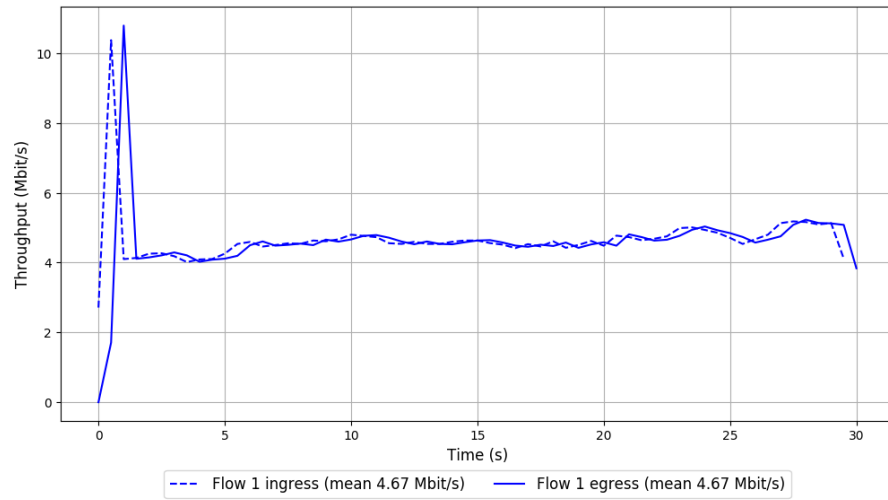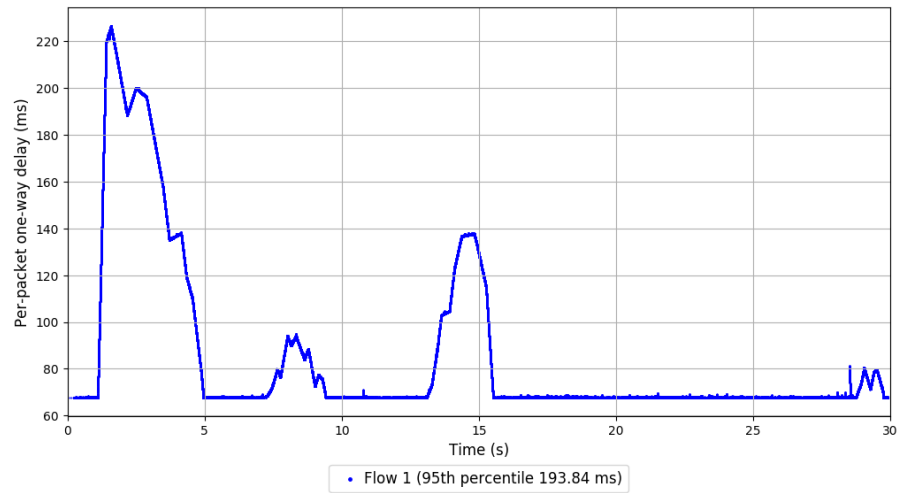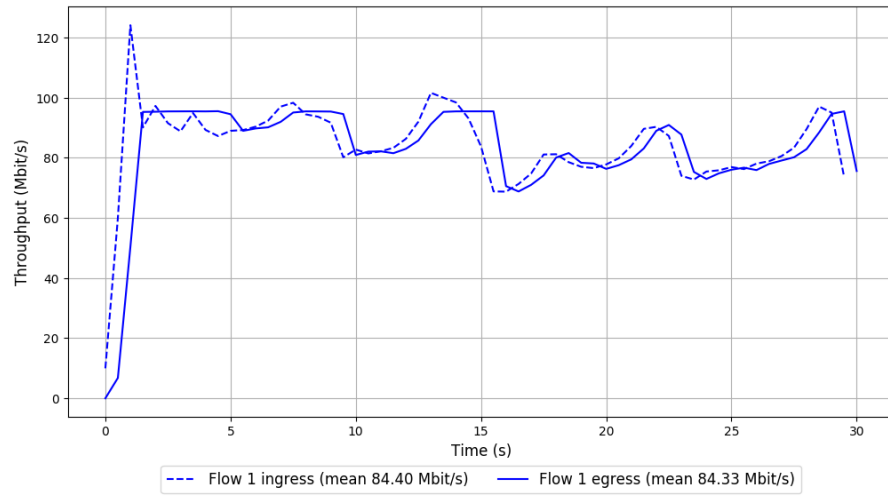
Run 5: Report of PCC-Allegro — Data Link

```
Run 1: Statistics of PCC-Expr

Start at: 2019-01-03 04:47:41
End at: 2019-01-03 04:48:11
Local clock offset: 2.385 ms
Remote clock offset: -6.984 ms


# Below is generated by plot.py at 2019-01-03 07:02:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 84.33 Mbit/s
95th percentile per-packet one-way delay: 193.836 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 84.33 Mbit/s
95th percentile per-packet one-way delay: 193.836 ms
Loss rate: 0.31%
```
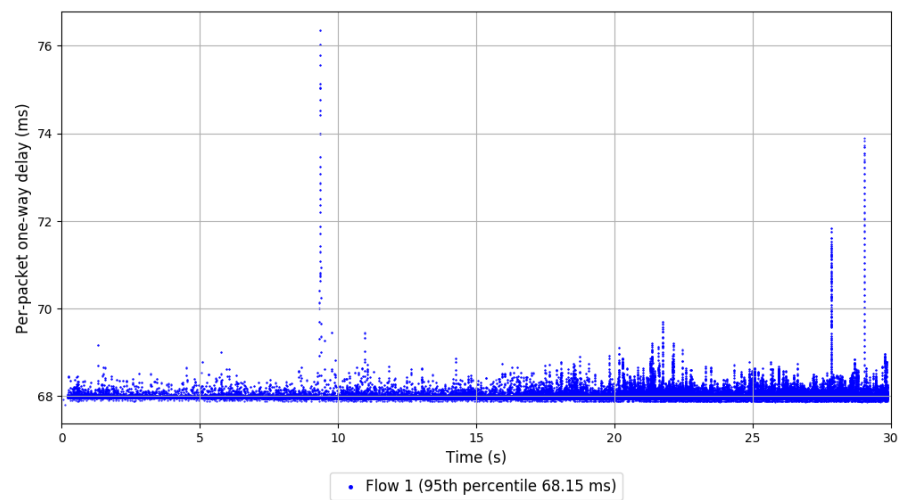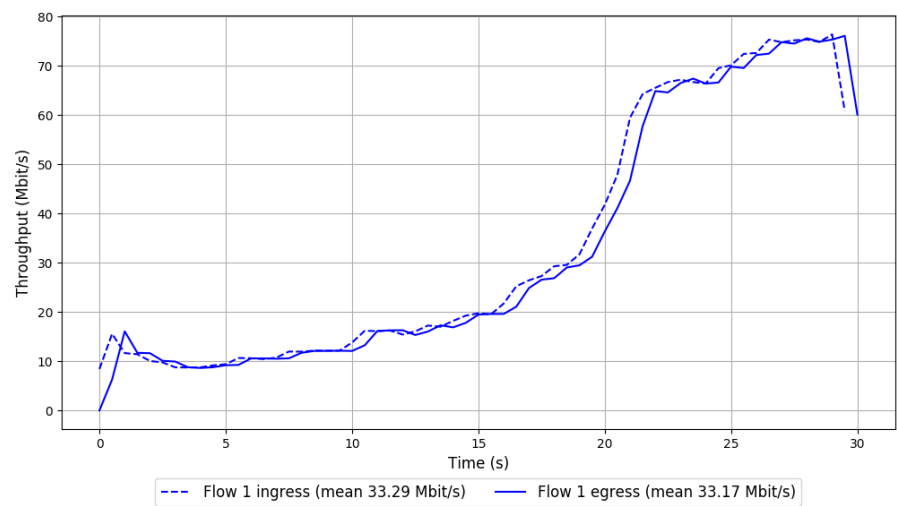
Run 1: Report of PCC-Expr — Data Link

```
Run 2: Statistics of PCC-Expr

Start at: 2019-01-03 05:15:43
End at: 2019-01-03 05:16:13
Local clock offset: 3.432 ms
Remote clock offset: -7.141 ms


# Below is generated by plot.py at 2019-01-03 07:02:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 33.17 Mbit/s
95th percentile per-packet one-way delay: 68.146 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 33.17 Mbit/s
95th percentile per-packet one-way delay: 68.146 ms
Loss rate: 0.57%
```
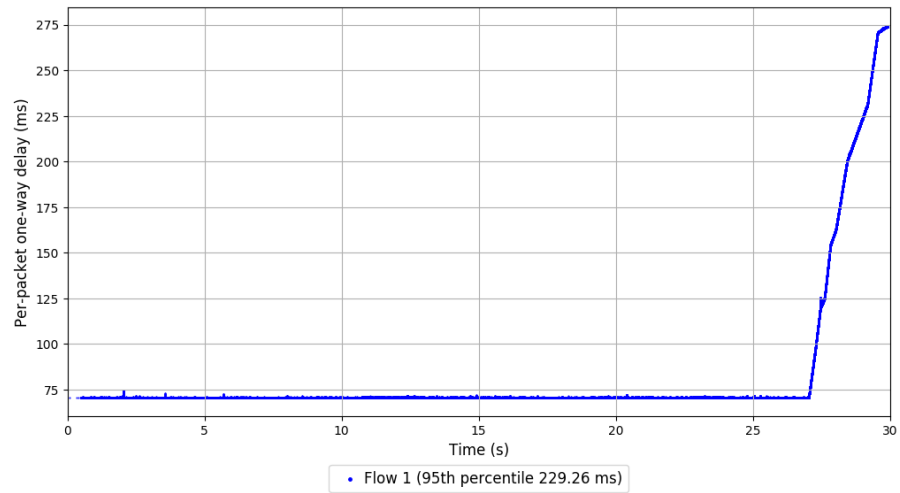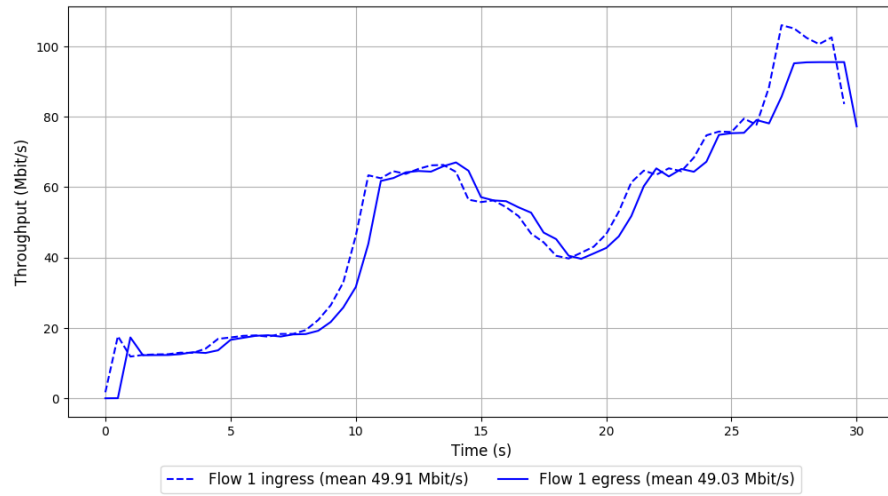
Run 2: Report of PCC-Expr — Data Link

```
Run 3: Statistics of PCC-Expr

Start at: 2019-01-03 05:42:01
End at: 2019-01-03 05:42:32
Local clock offset: 2.903 ms
Remote clock offset: -7.715 ms


# Below is generated by plot.py at 2019-01-03 07:02:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 49.03 Mbit/s
95th percentile per-packet one-way delay: 229.265 ms
Loss rate: 2.00%
-- Flow 1:
Average throughput: 49.03 Mbit/s
95th percentile per-packet one-way delay: 229.265 ms
Loss rate: 2.00%
```

Run 3: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 49.91 Mbit/s) —— Flow 1 egress (mean 49.03 Mbit/s)

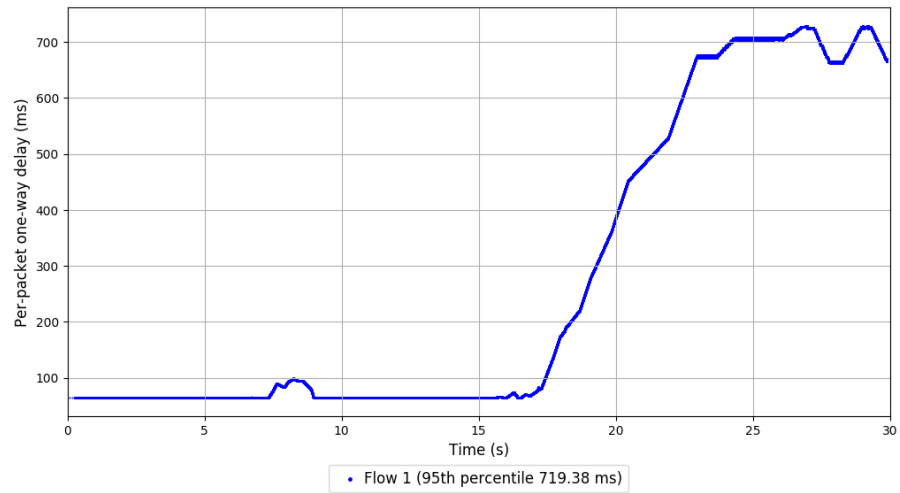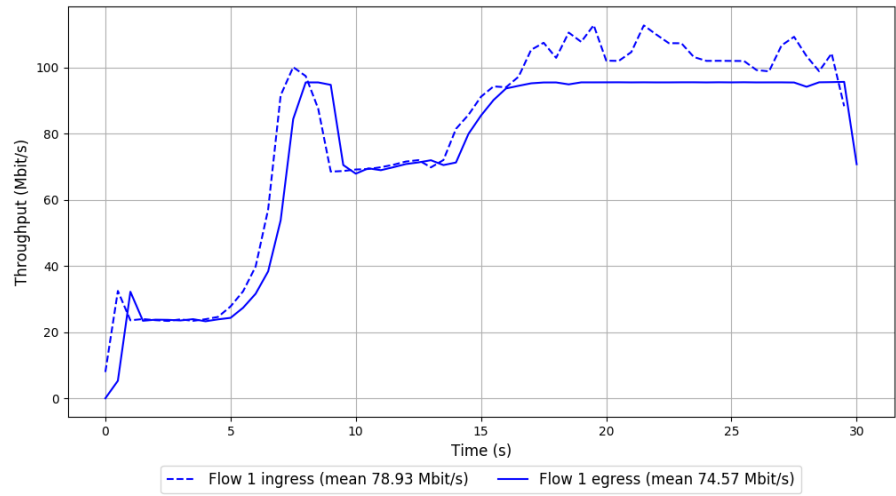• Flow 1 (95th percentile 229.26 ms)

```
Run 4: Statistics of PCC-Expr

Start at: 2019-01-03 06:06:17
End at: 2019-01-03 06:06:47
Local clock offset: 0.188 ms
Remote clock offset: -5.932 ms


# Below is generated by plot.py at 2019-01-03 07:02:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 74.57 Mbit/s
95th percentile per-packet one-way delay: 719.378 ms
Loss rate: 5.84%
-- Flow 1:
Average throughput: 74.57 Mbit/s
95th percentile per-packet one-way delay: 719.378 ms
Loss rate: 5.84%
```

Run 4: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 78.93 Mbit/s)   Flow 1 egress (mean 74.57 Mbit/s)

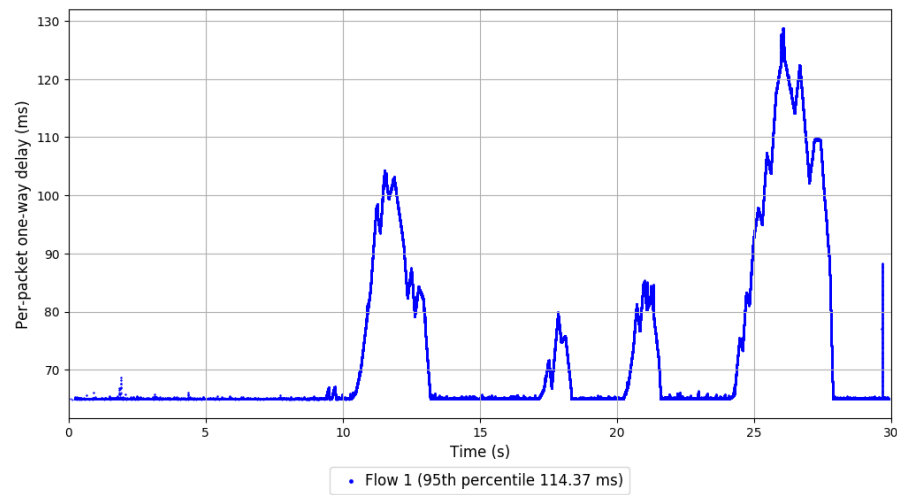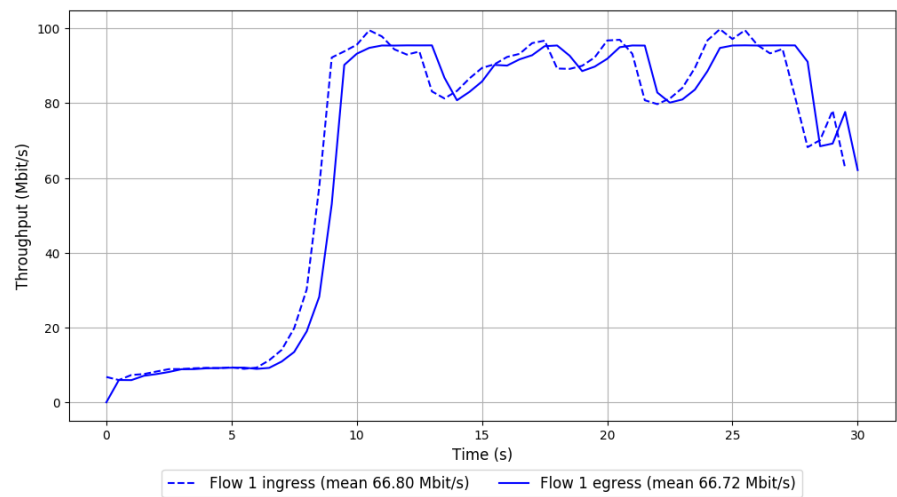Flow 1 (95th percentile 719.38 ms)

```
Run 5: Statistics of PCC-Expr

Start at: 2019-01-03 06:31:04
End at: 2019-01-03 06:31:34
Local clock offset: 1.587 ms
Remote clock offset: -3.594 ms


# Below is generated by plot.py at 2019-01-03 07:02:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 66.72 Mbit/s
95th percentile per-packet one-way delay: 114.367 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 66.72 Mbit/s
95th percentile per-packet one-way delay: 114.367 ms
Loss rate: 0.35%
```

Run 5: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 66.80 Mbit/s)   Flow 1 egress (mean 66.72 Mbit/s)

• Flow 1 (95th percentile 114.37 ms)

```
Run 1: Statistics of QUIC Cubic

Start at: 2019-01-03 04:51:48
End at: 2019-01-03 04:52:18
Local clock offset: 1.209 ms
Remote clock offset: -7.443 ms


# Below is generated by plot.py at 2019-01-03 07:02:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 71.86 Mbit/s
95th percentile per-packet one-way delay: 89.456 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 71.86 Mbit/s
95th percentile per-packet one-way delay: 89.456 ms
Loss rate: 0.20%
```
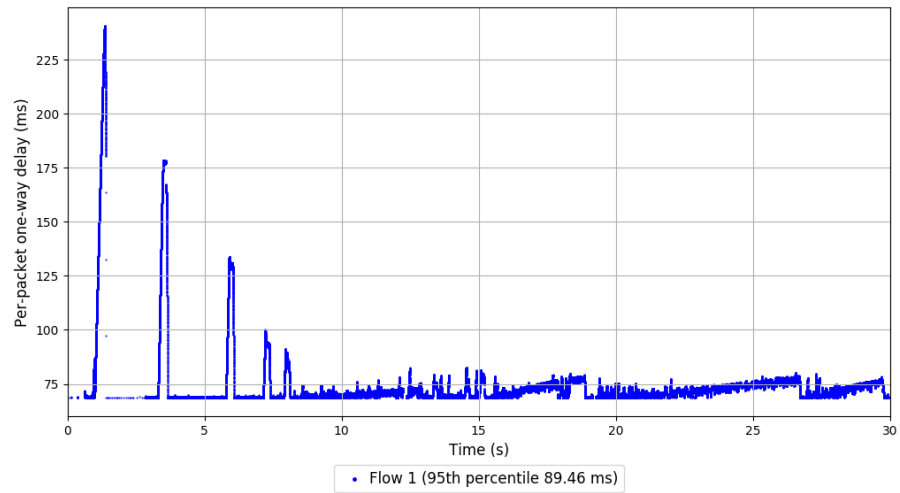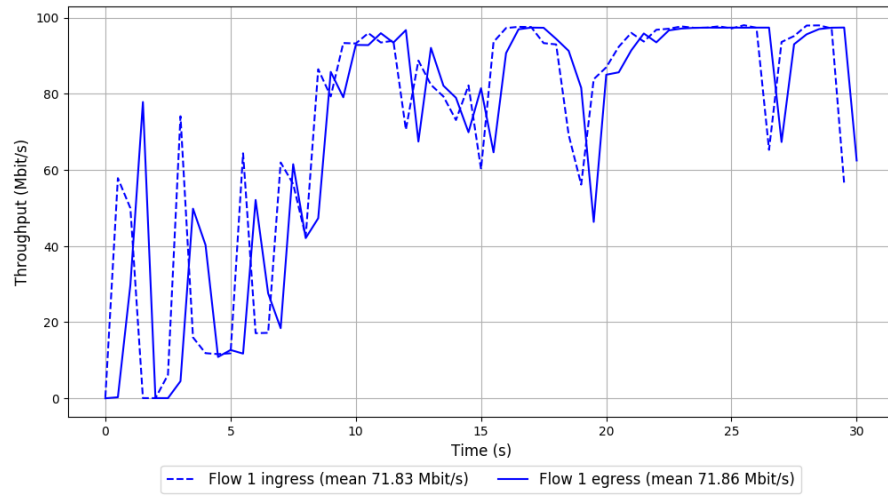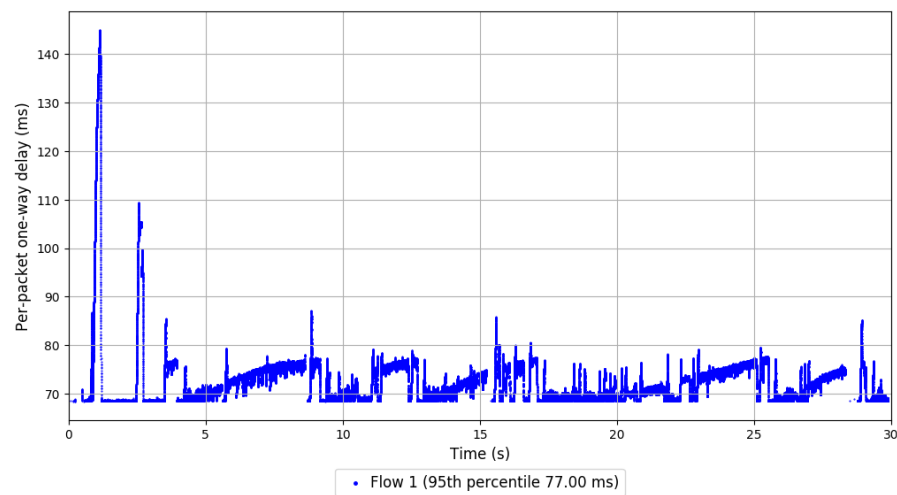
Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 71.83 Mbit/s) — — — Flow 1 egress (mean 71.86 Mbit/s)

• Flow 1 (95th percentile 89.46 ms)

```
Run 2: Statistics of QUIC Cubic

Start at: 2019-01-03 05:19:25
End at: 2019-01-03 05:19:55
Local clock offset: 3.032 ms
Remote clock offset: -6.644 ms


# Below is generated by plot.py at 2019-01-03 07:02:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 80.31 Mbit/s
95th percentile per-packet one-way delay: 76.996 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 80.31 Mbit/s
95th percentile per-packet one-way delay: 76.996 ms
Loss rate: 0.28%
```
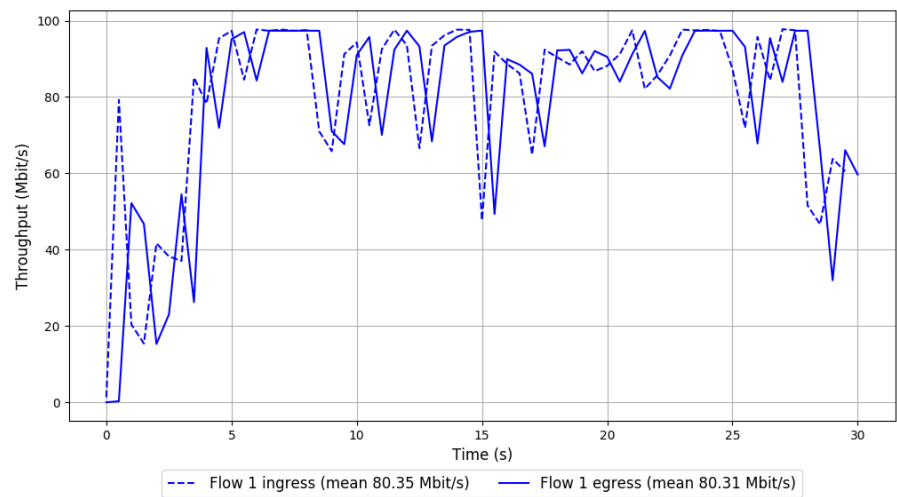
Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2019-01-03 05:45:53
End at: 2019-01-03 05:46:23
Local clock offset: 1.815 ms
Remote clock offset: -7.406 ms


# Below is generated by plot.py at 2019-01-03 07:02:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 77.60 Mbit/s
95th percentile per-packet one-way delay: 78.428 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 77.60 Mbit/s
95th percentile per-packet one-way delay: 78.428 ms
Loss rate: 0.05%
```
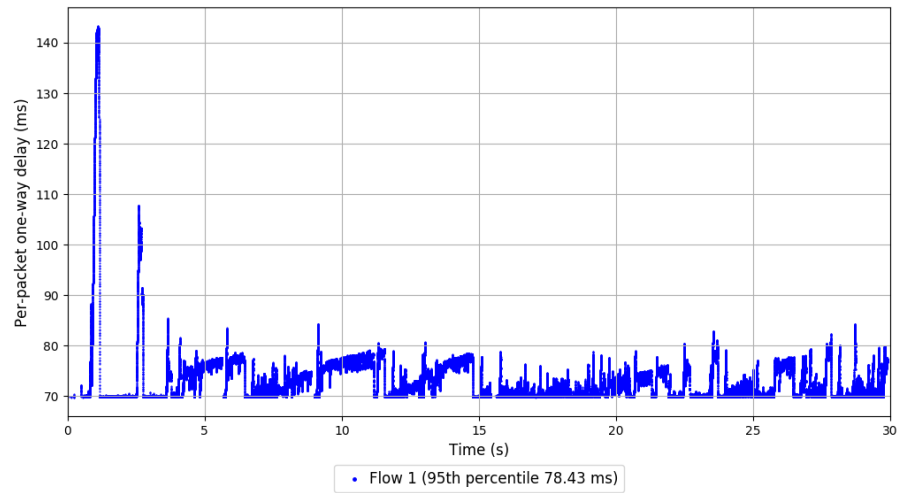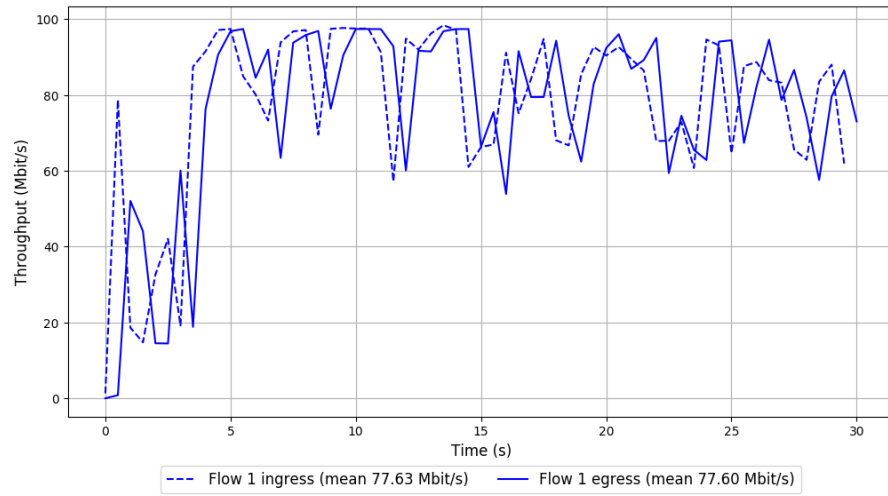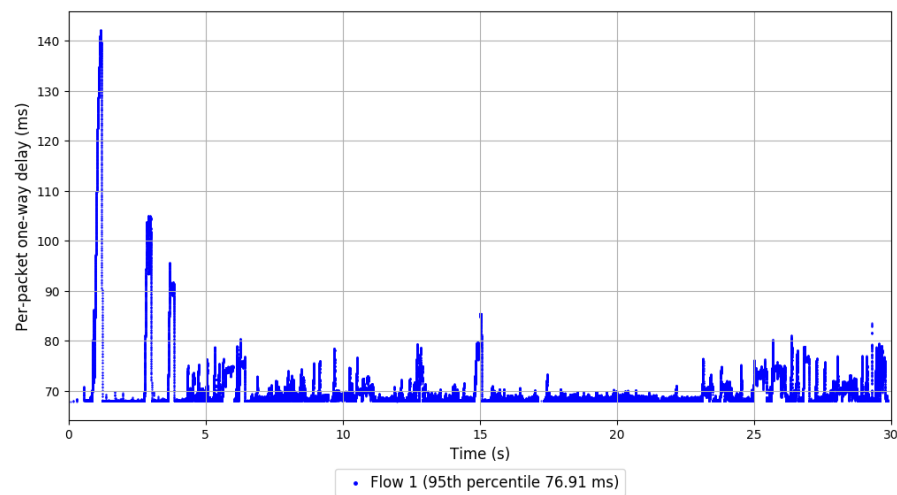
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 77.63 Mbit/s) --- Flow 1 egress (mean 77.60 Mbit/s)

Flow 1 (95th percentile 78.43 ms)

```
Run 4: Statistics of QUIC Cubic

Start at: 2019-01-03 06:10:04
End at: 2019-01-03 06:10:34
Local clock offset: -0.032 ms
Remote clock offset: -8.963 ms


# Below is generated by plot.py at 2019-01-03 07:02:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 74.12 Mbit/s
95th percentile per-packet one-way delay: 76.909 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 74.12 Mbit/s
95th percentile per-packet one-way delay: 76.909 ms
Loss rate: 0.21%
```
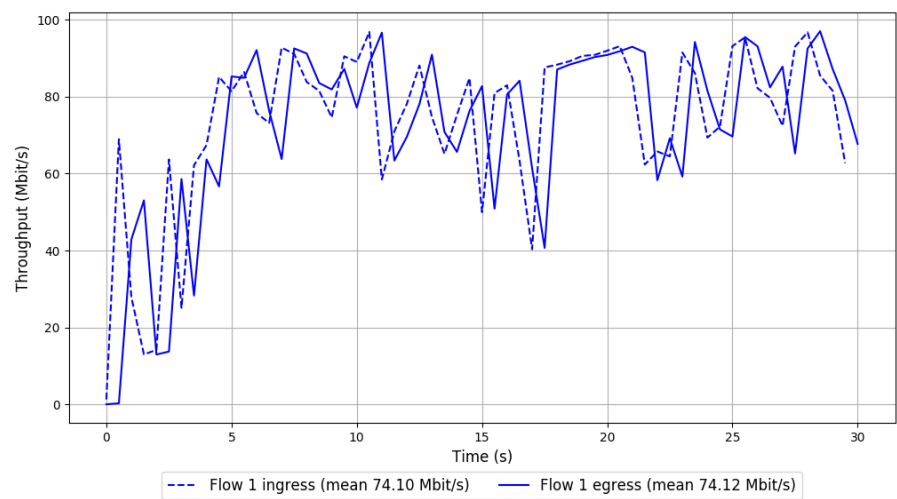
Run 4: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 74.10 Mbit/s) ——— Flow 1 egress (mean 74.12 Mbit/s)
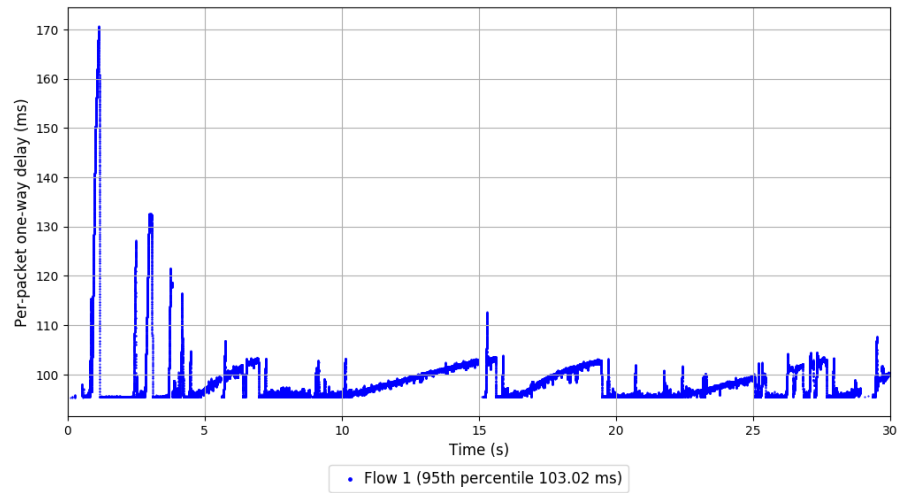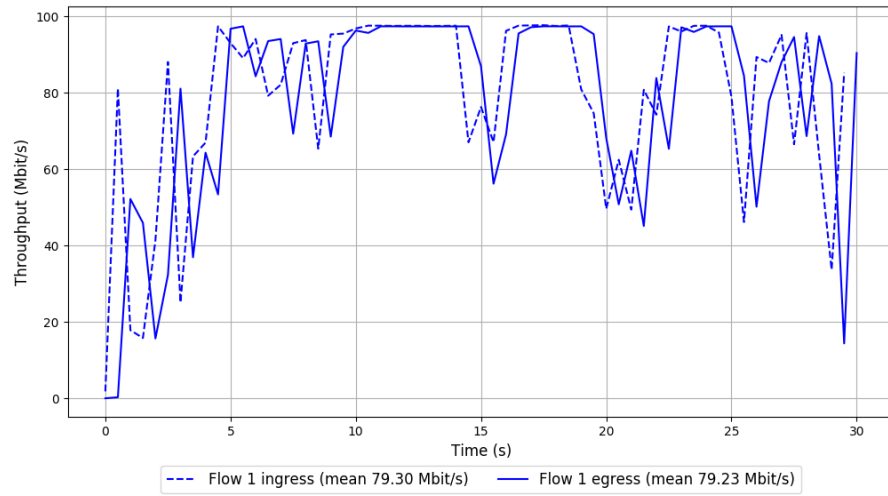

Flow 1 (95th percentile 76.91 ms)

```
Run 5: Statistics of QUIC Cubic

Start at: 2019-01-03 06:34:45
End at: 2019-01-03 06:35:15
Local clock offset: -0.787 ms
Remote clock offset: -35.943 ms


# Below is generated by plot.py at 2019-01-03 07:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 79.23 Mbit/s
95th percentile per-packet one-way delay: 103.023 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 79.23 Mbit/s
95th percentile per-packet one-way delay: 103.023 ms
Loss rate: 0.32%
```
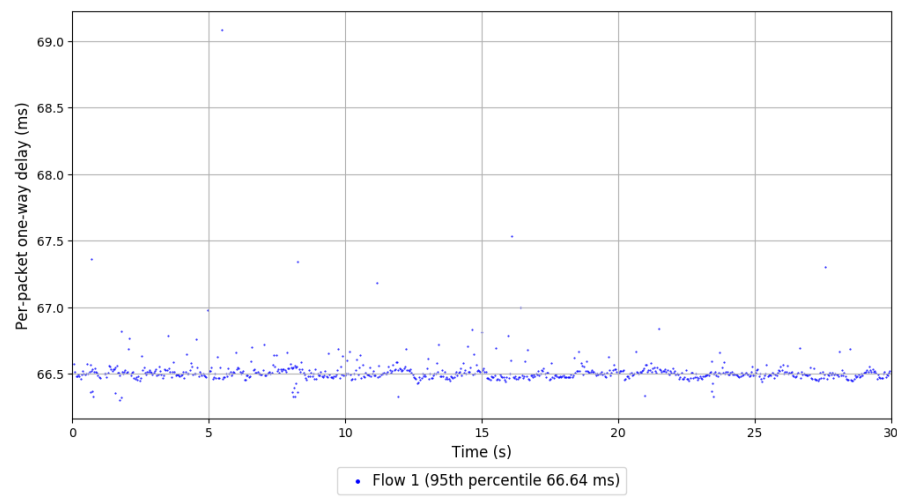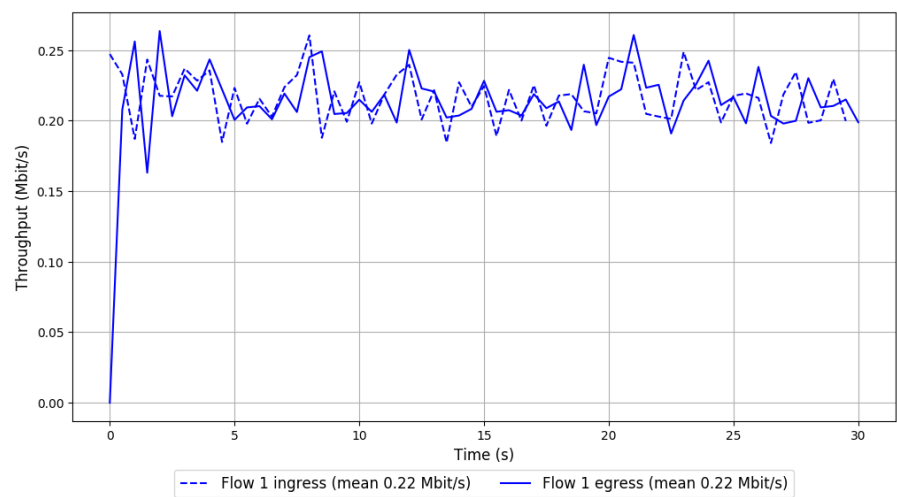
Run 5: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2019-01-03 05:13:11
End at: 2019-01-03 05:13:42
Local clock offset: 0.553 ms
Remote clock offset: -6.879 ms


# Below is generated by plot.py at 2019-01-03 07:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 66.639 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 66.639 ms
Loss rate: 0.26%
```

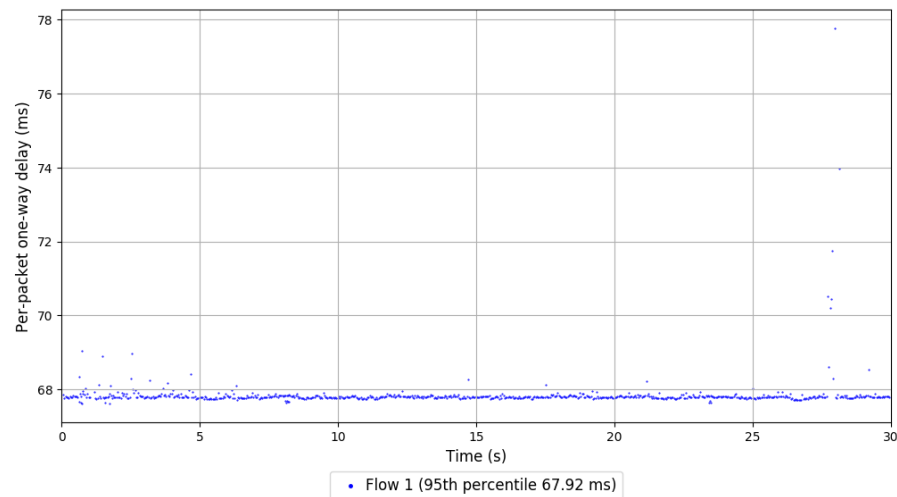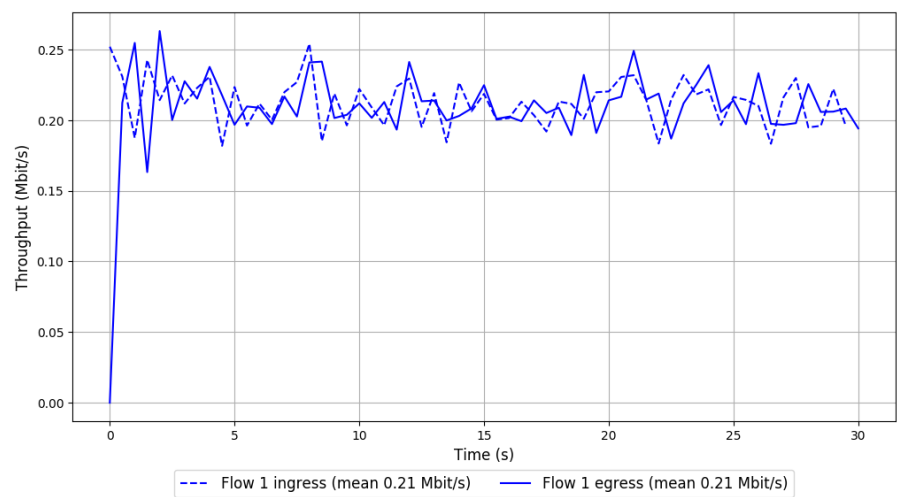Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2019-01-03 05:39:43
End at: 2019-01-03 05:40:13
Local clock offset: 1.499 ms
Remote clock offset: -7.841 ms


# Below is generated by plot.py at 2019-01-03 07:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 67.925 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 67.925 ms
Loss rate: 0.26%
```

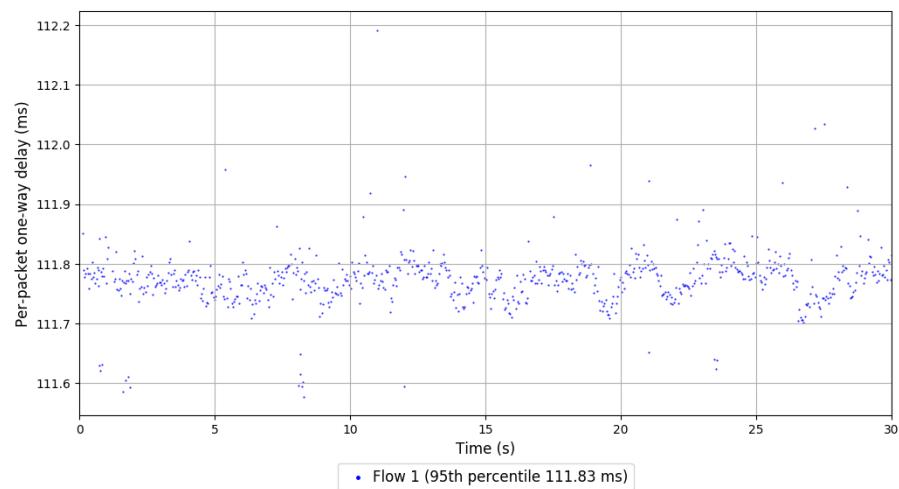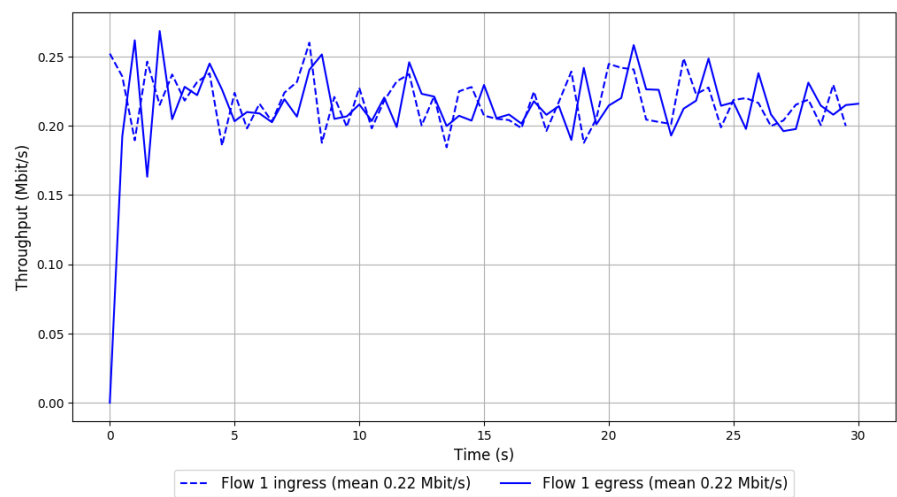Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2019-01-03 06:04:00
End at: 2019-01-03 06:04:30
Local clock offset: 1.406 ms
Remote clock offset: -51.909 ms


# Below is generated by plot.py at 2019-01-03 07:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 111.826 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 111.826 ms
Loss rate: 0.26%
```

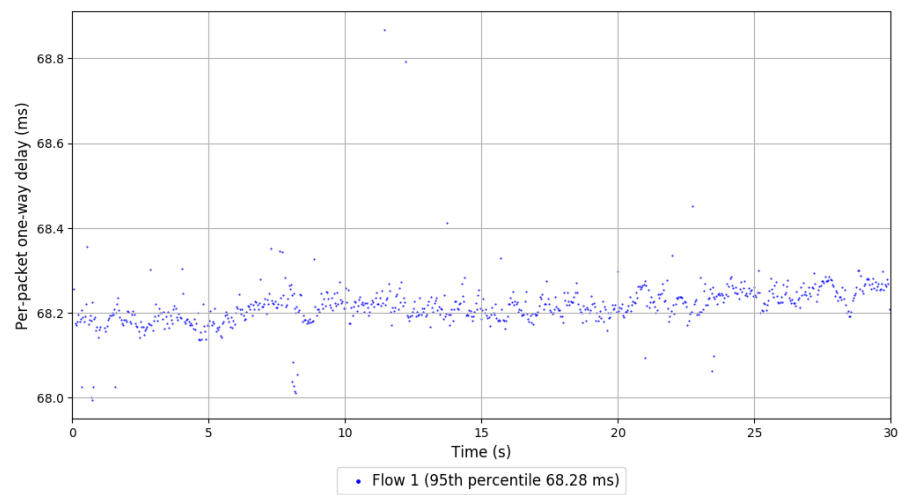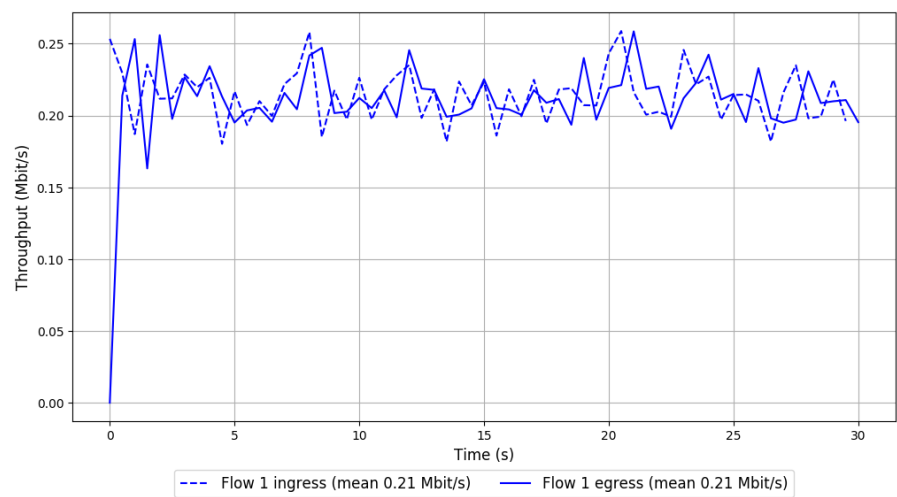# Run 3: Report of SCReAM — Data Link

```
Run 4: Statistics of SCReAM

Start at: 2019-01-03 06:28:43
End at: 2019-01-03 06:29:13
Local clock offset: 2.498 ms
Remote clock offset: -6.183 ms


# Below is generated by plot.py at 2019-01-03 07:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 68.277 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 68.277 ms
Loss rate: 0.25%
```

Run 4: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.21 Mbit/s) --- Flow 1 egress (mean 0.21 Mbit/s)

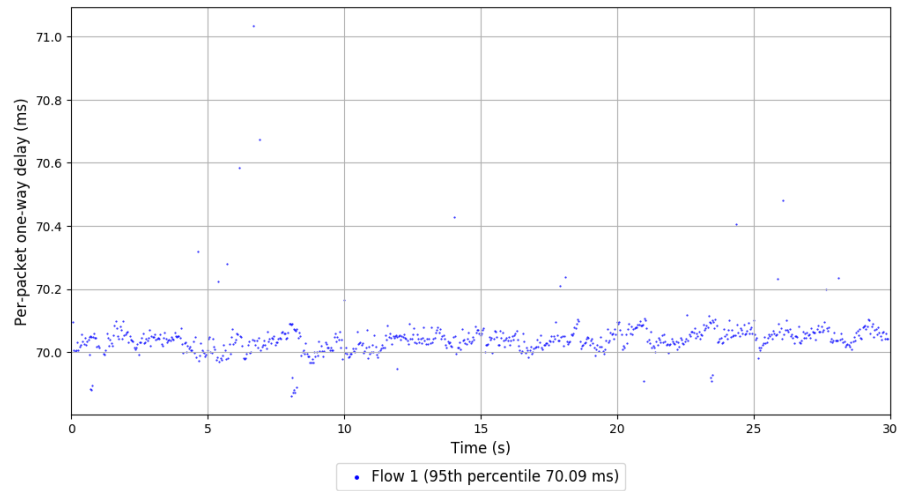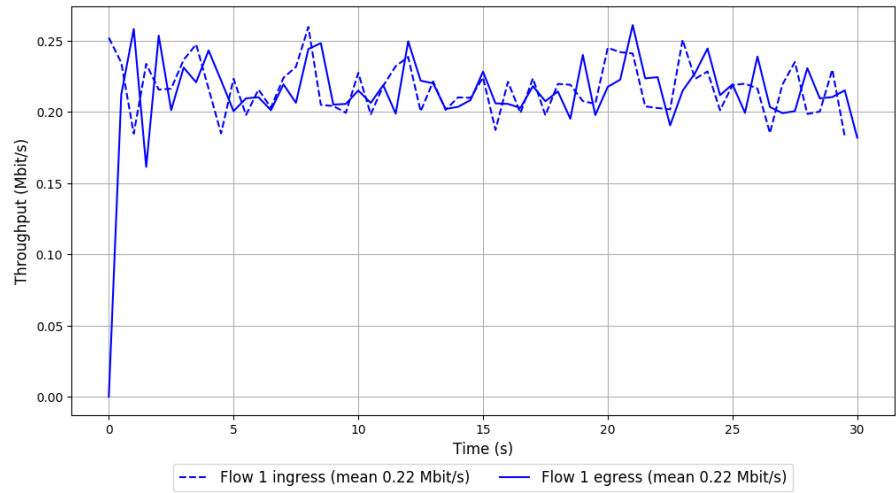• Flow 1 (95th percentile 68.28 ms)

```
Run 5: Statistics of SCReAM

Start at: 2019-01-03 06:52:31
End at: 2019-01-03 06:53:01
Local clock offset: 2.826 ms
Remote clock offset: -3.739 ms

# Below is generated by plot.py at 2019-01-03 07:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 70.093 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 70.093 ms
Loss rate: 0.26%
```

Run 5: Report of SCReAM — Data Link

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

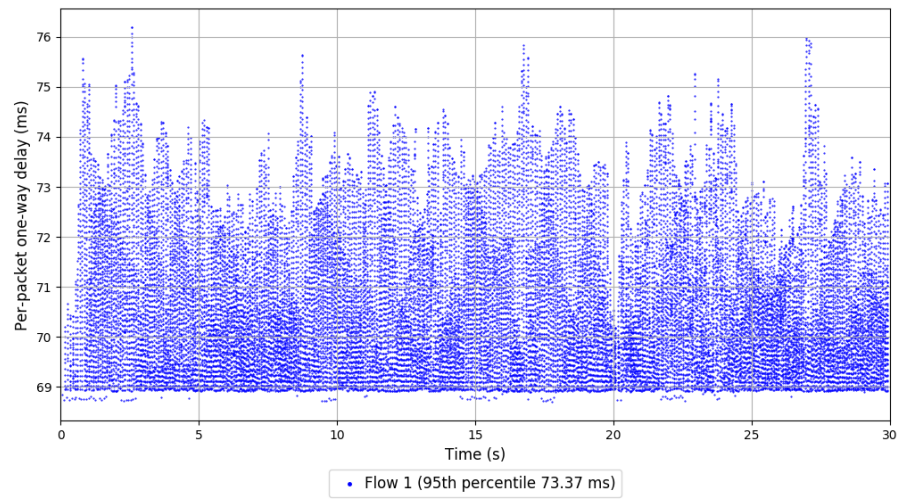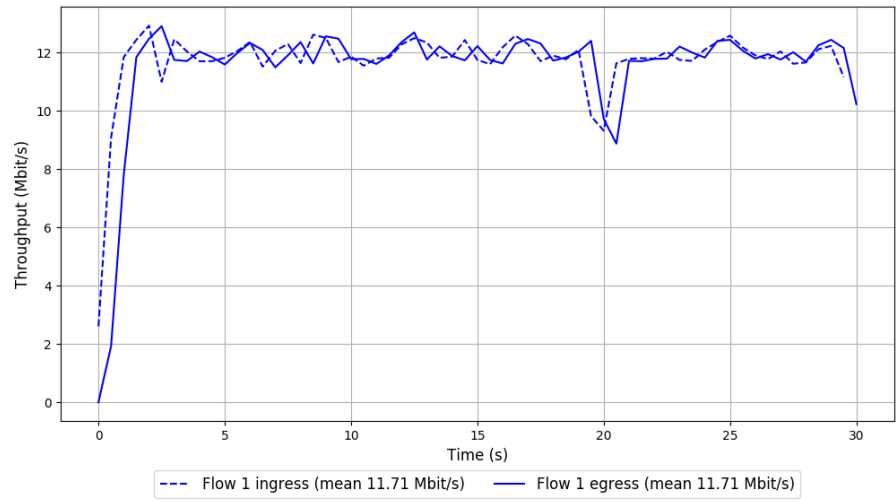Flow 1 (95th percentile 70.09 ms)

```
Run 1: Statistics of Sprout

Start at: 2019-01-03 05:05:48
End at: 2019-01-03 05:06:18
Local clock offset: 3.082 ms
Remote clock offset: -6.711 ms


# Below is generated by plot.py at 2019-01-03 07:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.71 Mbit/s
95th percentile per-packet one-way delay: 73.372 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 11.71 Mbit/s
95th percentile per-packet one-way delay: 73.372 ms
Loss rate: 0.28%
```

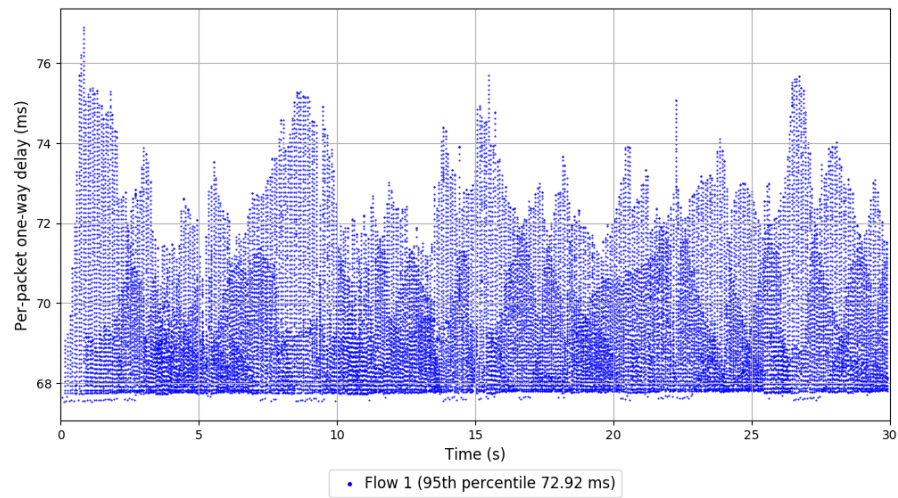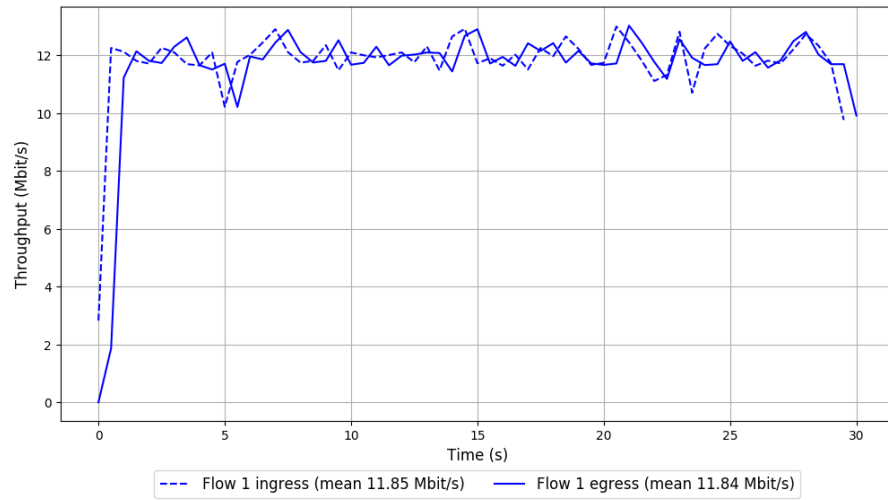## Run 1: Report of Sprout — Data Link

Run 2: Statistics of Sprout

Start at: 2019-01-03 05:32:55
End at: 2019-01-03 05:33:25
Local clock offset: 2.847 ms
Remote clock offset: -6.717 ms

Below is generated by plot.py at 2019-01-03 07:02:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.84 Mbit/s
95th percentile per-packet one-way delay: 72.915 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 11.84 Mbit/s
95th percentile per-packet one-way delay: 72.915 ms
Loss rate: 0.26%

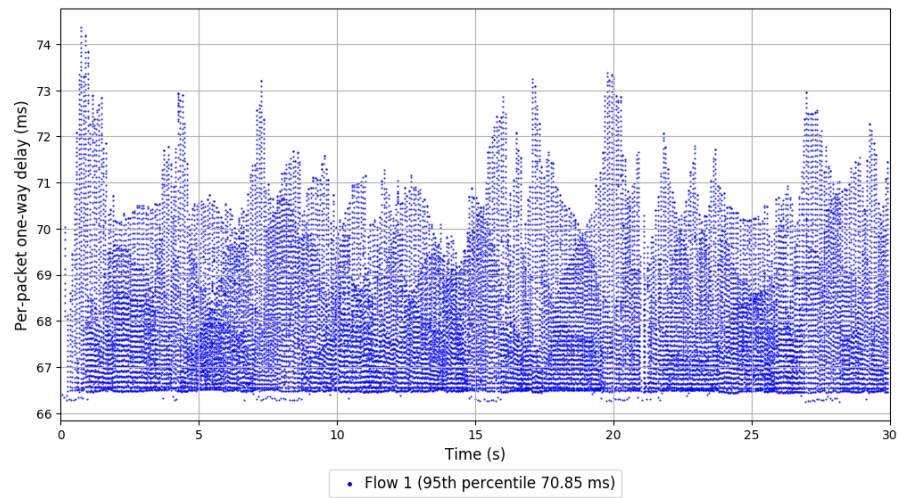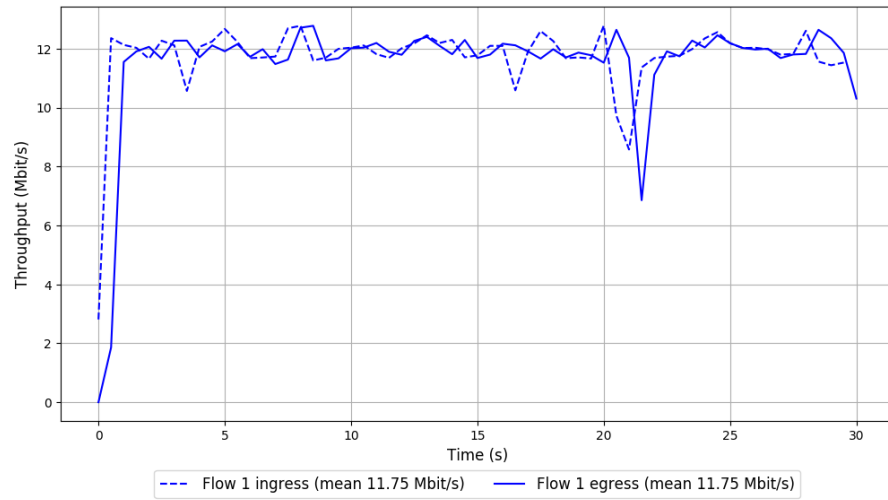Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2019-01-03 05:57:44
End at: 2019-01-03 05:58:14
Local clock offset: 0.85 ms
Remote clock offset: -5.401 ms


# Below is generated by plot.py at 2019-01-03 07:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.75 Mbit/s
95th percentile per-packet one-way delay: 70.847 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 11.75 Mbit/s
95th percentile per-packet one-way delay: 70.847 ms
Loss rate: 0.28%
```

Run 3: Report of Sprout — Data Link

Flow 1 ingress (mean 11.75 Mbit/s)   Flow 1 egress (mean 11.75 Mbit/s)

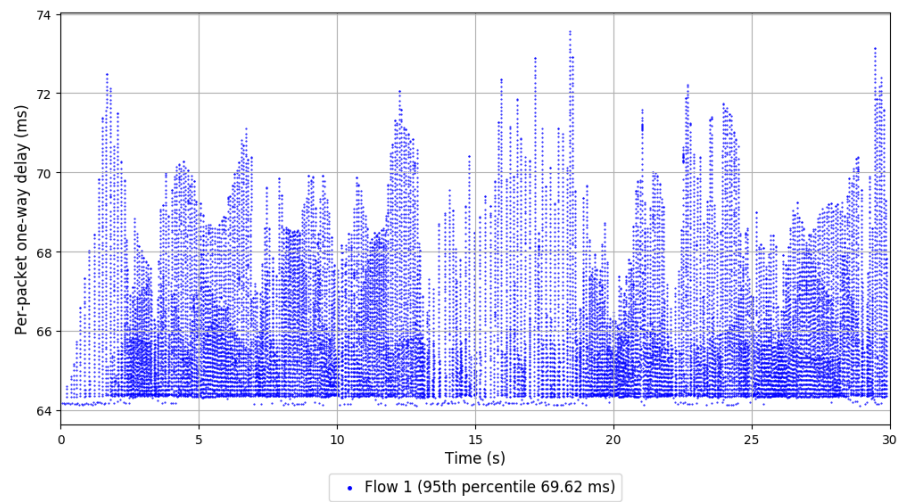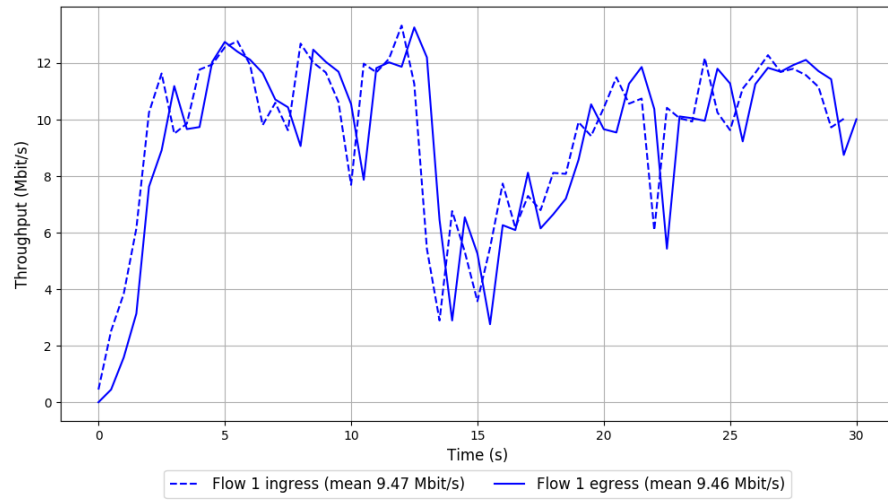Flow 1 (95th percentile 70.85 ms)

```
Run 4: Statistics of Sprout

Start at: 2019-01-03 06:22:33
End at: 2019-01-03 06:23:03
Local clock offset: 0.709 ms
Remote clock offset: -4.868 ms


# Below is generated by plot.py at 2019-01-03 07:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.46 Mbit/s
95th percentile per-packet one-way delay: 69.622 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 9.46 Mbit/s
95th percentile per-packet one-way delay: 69.622 ms
Loss rate: 0.35%
```

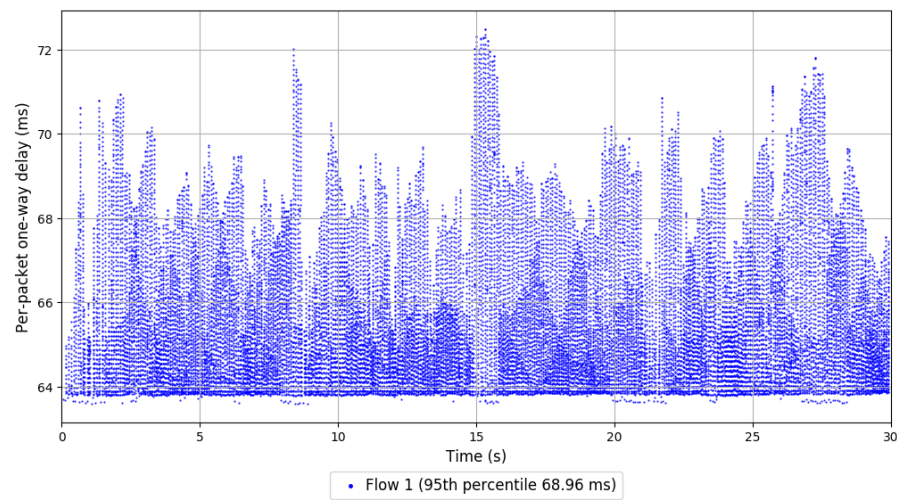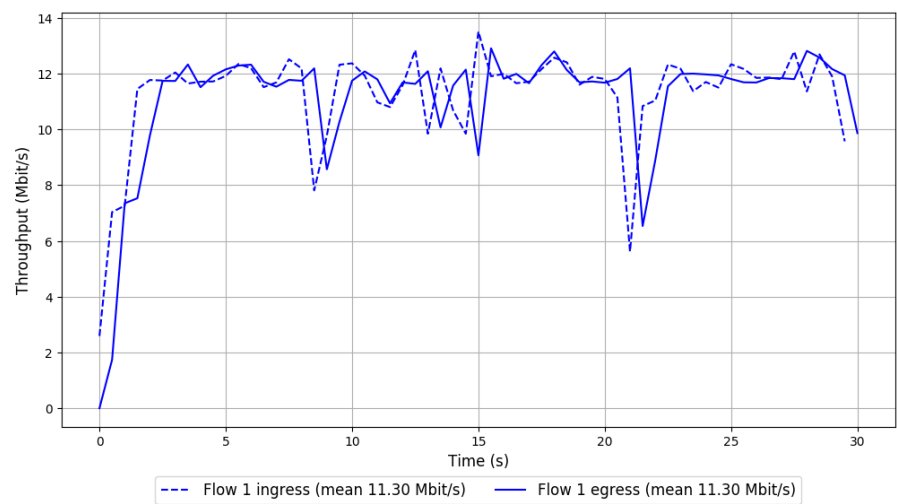Run 4: Report of Sprout — Data Link

```
Run 5: Statistics of Sprout

Start at: 2019-01-03 06:46:08
End at: 2019-01-03 06:46:38
Local clock offset: -0.874 ms
Remote clock offset: -3.676 ms


# Below is generated by plot.py at 2019-01-03 07:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.30 Mbit/s
95th percentile per-packet one-way delay: 68.963 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 11.30 Mbit/s
95th percentile per-packet one-way delay: 68.963 ms
Loss rate: 0.14%
```

Run 5: Report of Sprout — Data Link

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

Start at: 2019-01-03 04:56:27
End at: 2019-01-03 04:56:57
Local clock offset: 2.762 ms
Remote clock offset: -6.941 ms


# Below is generated by plot.py at 2019-01-03 07:04:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.31 Mbit/s
95th percentile per-packet one-way delay: 79.721 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 91.31 Mbit/s
95th percentile per-packet one-way delay: 79.721 ms
Loss rate: 0.26%
```
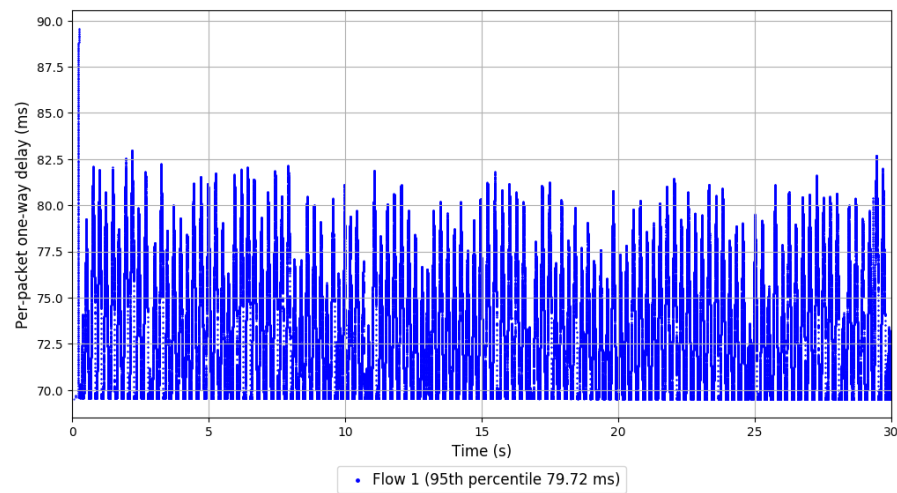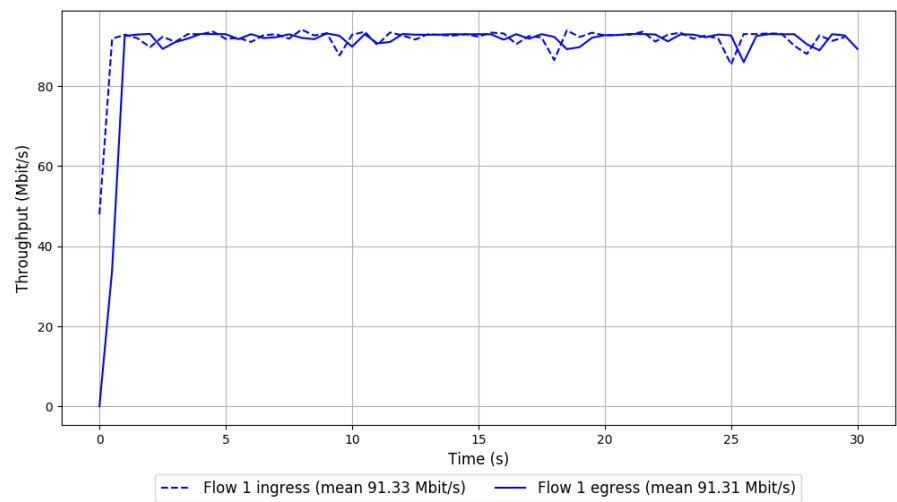
Run 1: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 91.33 Mbit/s) --- Flow 1 egress (mean 91.31 Mbit/s)

Flow 1 (95th percentile 79.72 ms)

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

Start at: 2019-01-03 05:23:36
End at: 2019-01-03 05:24:06
Local clock offset: 0.273 ms
Remote clock offset: -6.906 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.81 Mbit/s
95th percentile per-packet one-way delay: 71.495 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 91.81 Mbit/s
95th percentile per-packet one-way delay: 71.495 ms
Loss rate: 0.27%
```
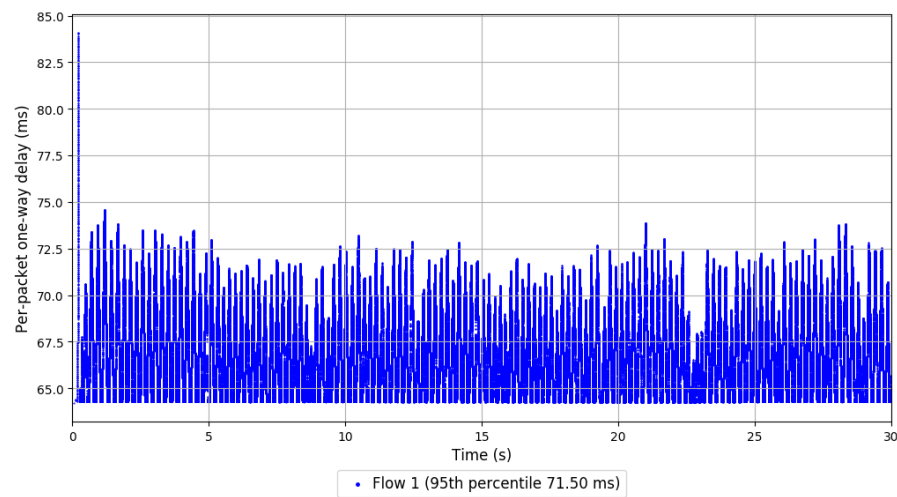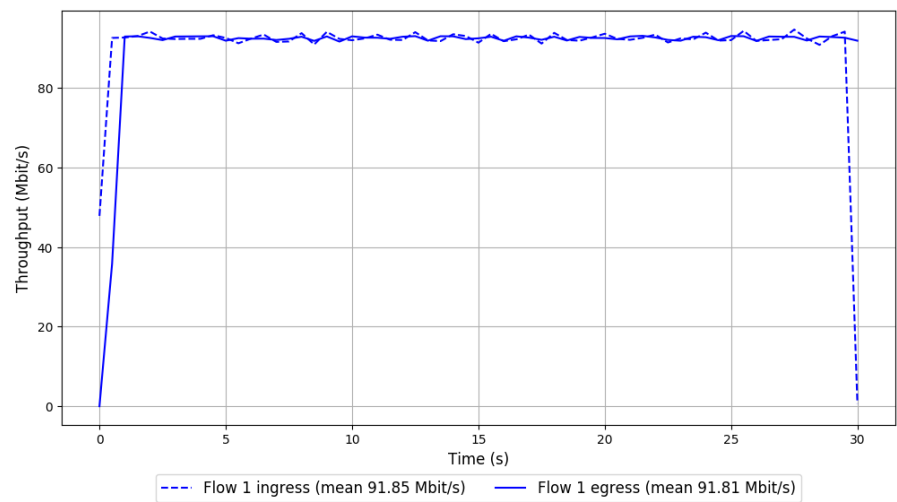
Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2019-01-03 05:49:42
End at: 2019-01-03 05:50:12
Local clock offset: 1.024 ms
Remote clock offset: -6.246 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 83.50 Mbit/s
95th percentile per-packet one-way delay: 74.817 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 83.50 Mbit/s
95th percentile per-packet one-way delay: 74.817 ms
Loss rate: 0.26%
```
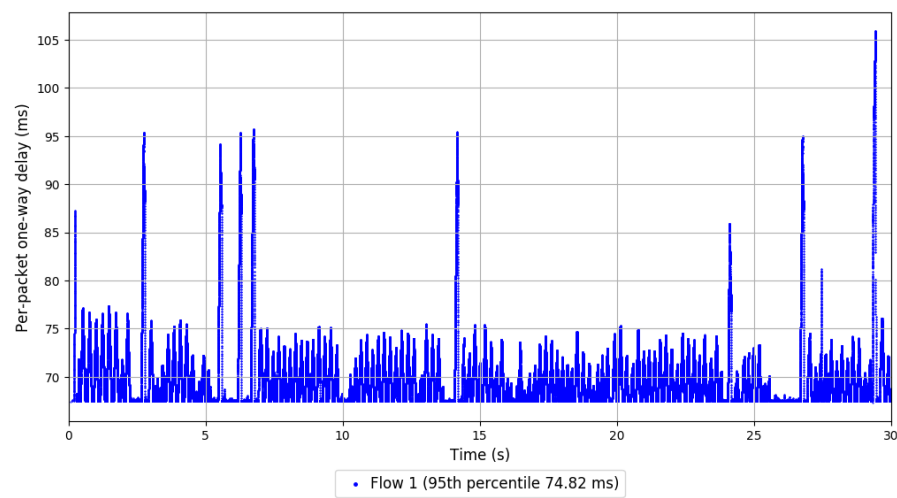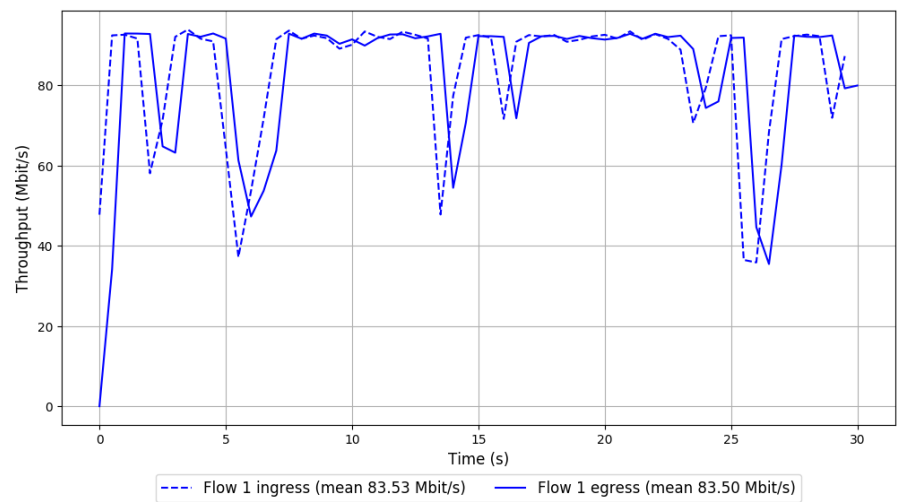
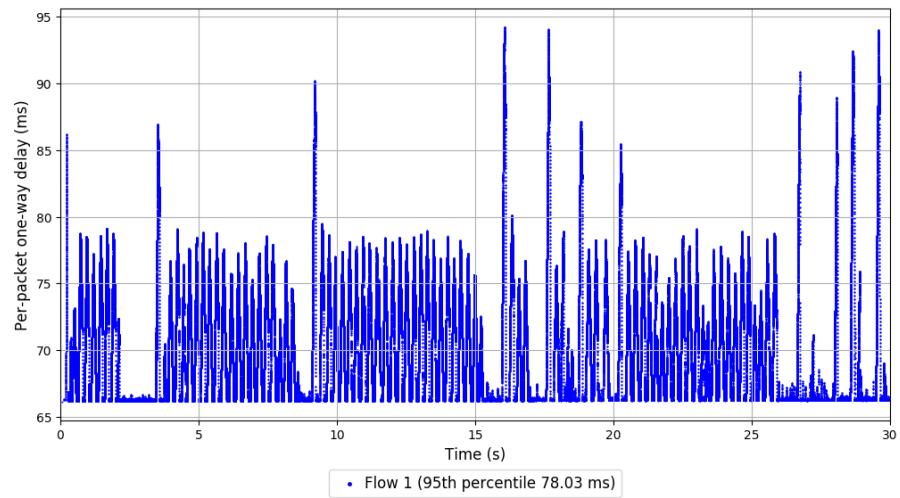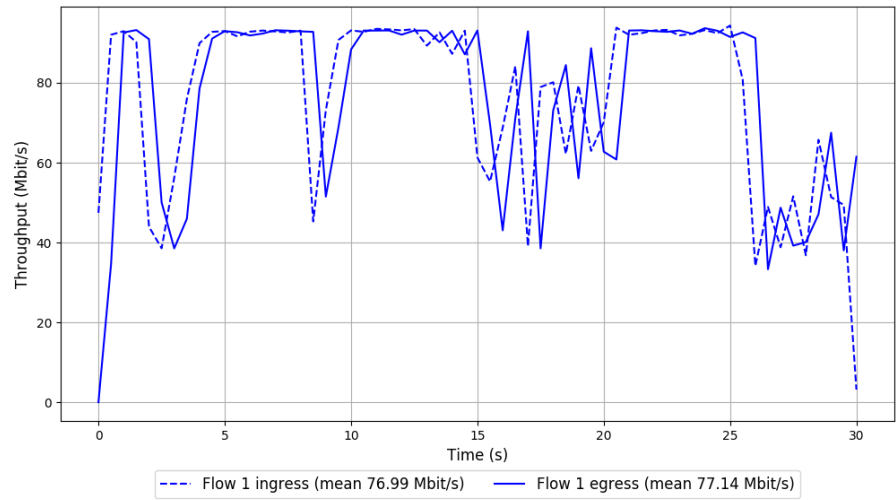# Run 3: Report of TaoVA-100x — Data Link

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

Start at: 2019-01-03 06:13:55
End at: 2019-01-03 06:14:25
Local clock offset: 0.178 ms
Remote clock offset: -5.713 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 77.14 Mbit/s
95th percentile per-packet one-way delay: 78.026 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 77.14 Mbit/s
95th percentile per-packet one-way delay: 78.026 ms
Loss rate: 0.19%
```

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

Flow 1 ingress (mean 76.99 Mbit/s)   Flow 1 egress (mean 77.14 Mbit/s)
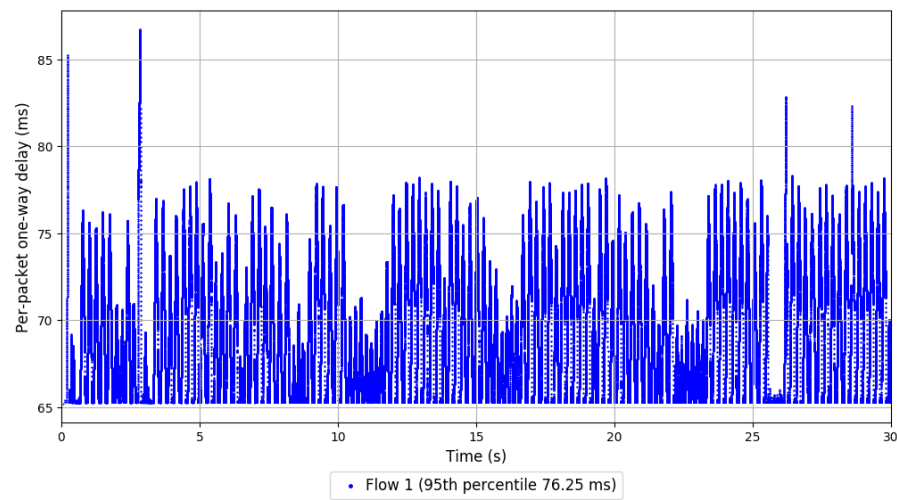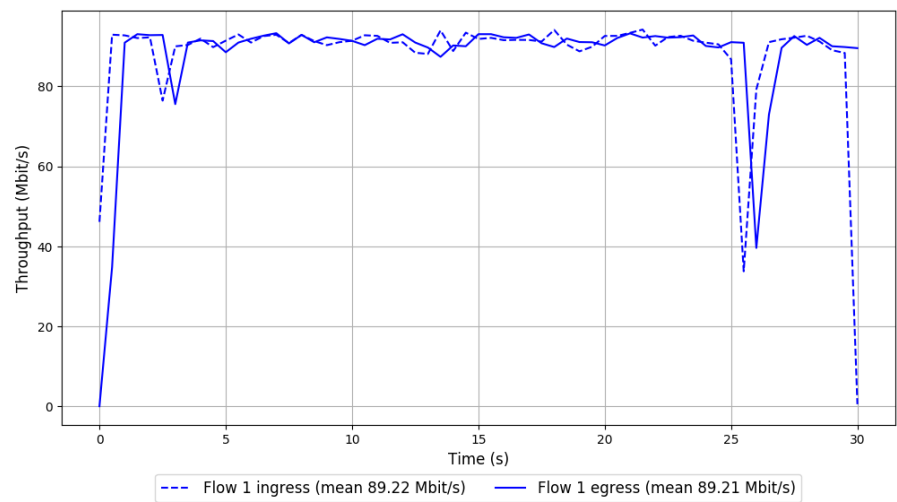

Flow 1 (95th percentile 78.03 ms)

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

Start at: 2019-01-03 06:38:27
End at: 2019-01-03 06:38:57
Local clock offset: -0.659 ms
Remote clock offset: -5.344 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.21 Mbit/s
95th percentile per-packet one-way delay: 76.253 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 89.21 Mbit/s
95th percentile per-packet one-way delay: 76.253 ms
Loss rate: 0.24%
```

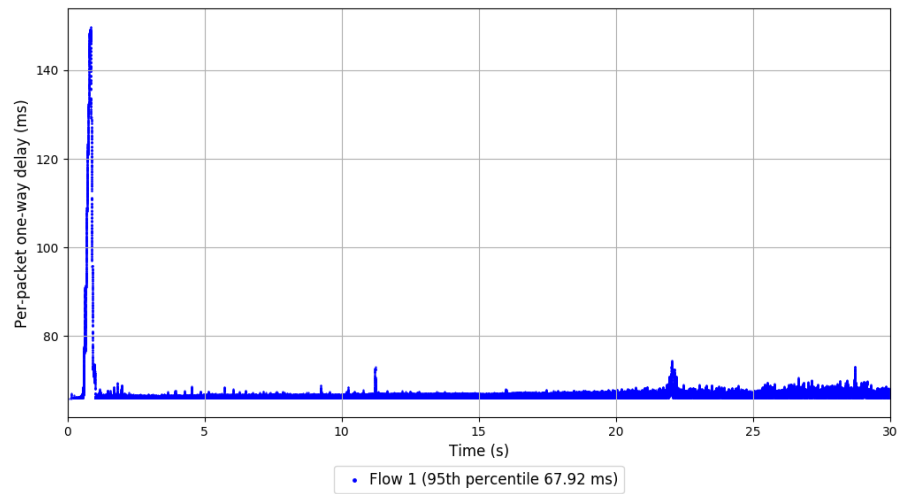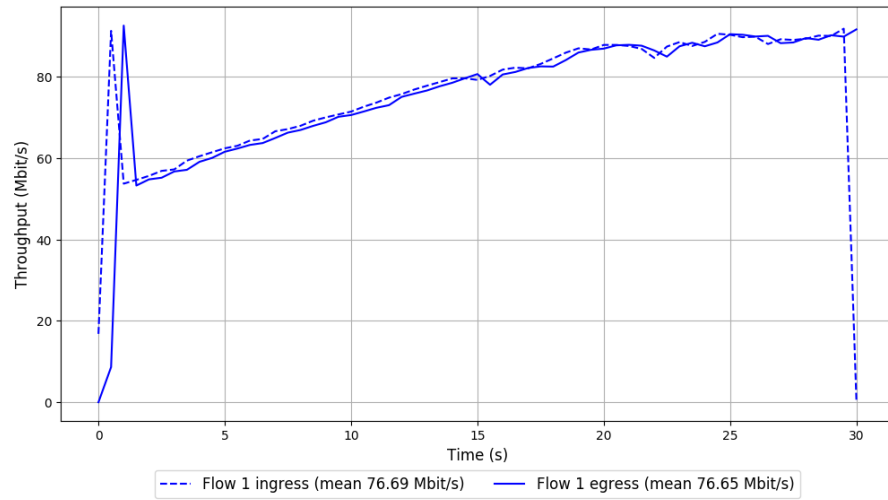Run 5: Report of TaoVA-100x — Data Link

```
Run 1: Statistics of TCP Vegas

Start at: 2019-01-03 04:46:21
End at: 2019-01-03 04:46:52
Local clock offset: 1.716 ms
Remote clock offset: -5.832 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 76.65 Mbit/s
95th percentile per-packet one-way delay: 67.918 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 76.65 Mbit/s
95th percentile per-packet one-way delay: 67.918 ms
Loss rate: 0.28%
```

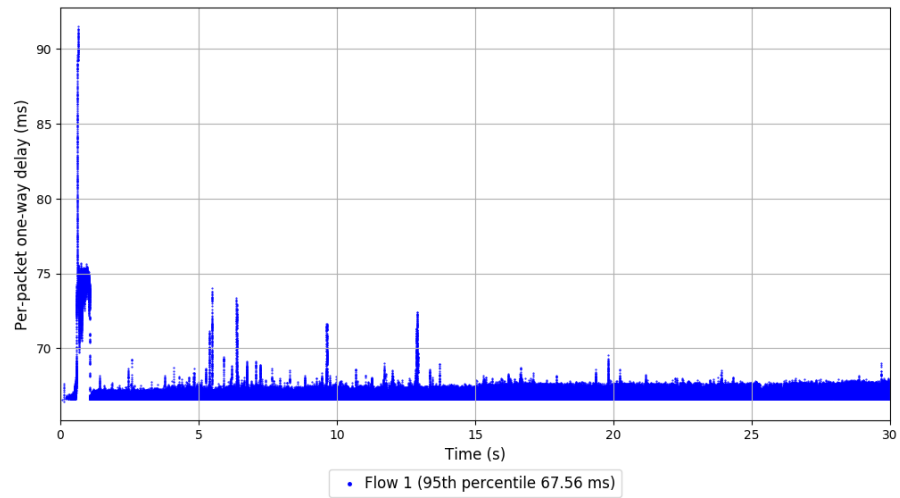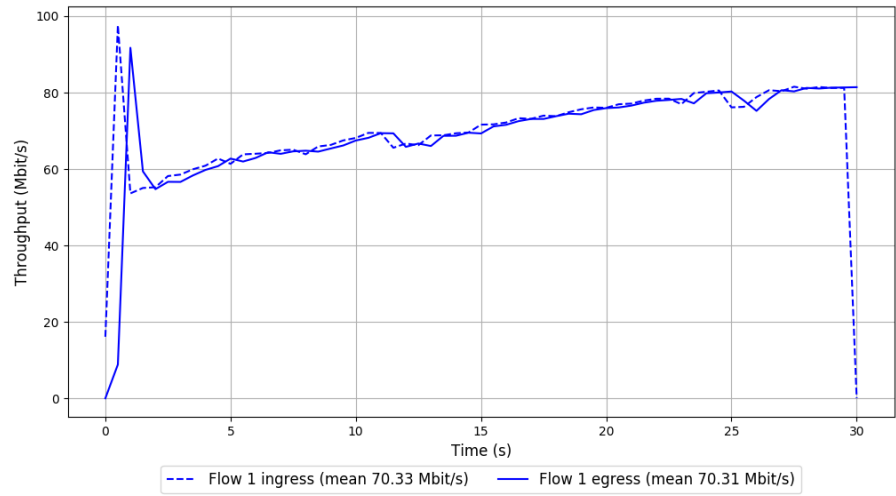Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2019-01-03 05:14:18
End at: 2019-01-03 05:14:48
Local clock offset: 1.974 ms
Remote clock offset: -7.233 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 70.31 Mbit/s
95th percentile per-packet one-way delay: 67.564 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 70.31 Mbit/s
95th percentile per-packet one-way delay: 67.564 ms
Loss rate: 0.26%
```

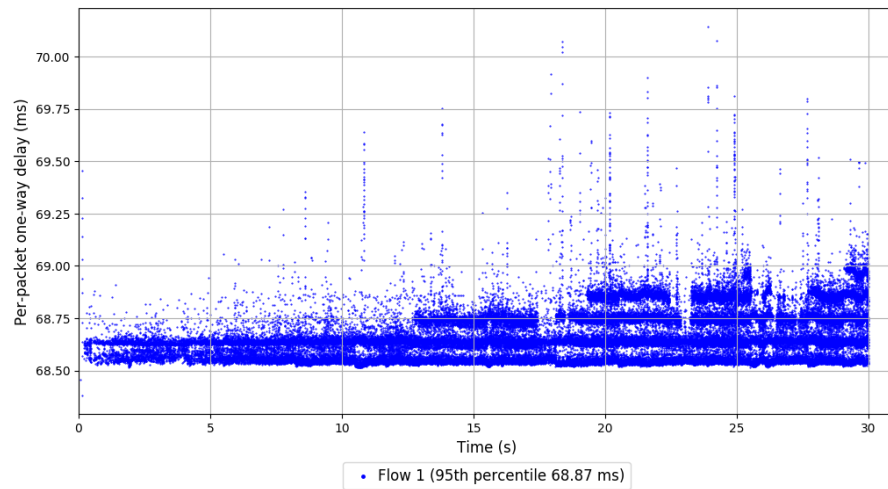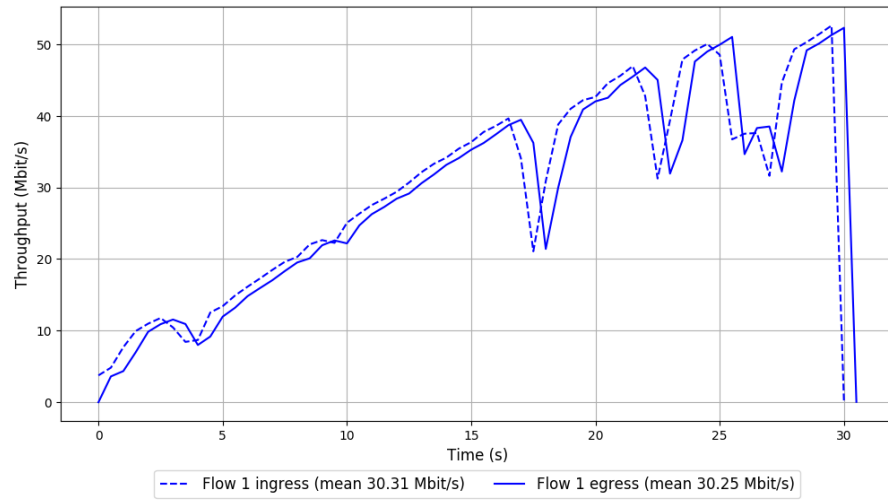Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2019-01-03 05:40:49
End at: 2019-01-03 05:41:19
Local clock offset: 0.67 ms
Remote clock offset: -7.288 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 30.25 Mbit/s
95th percentile per-packet one-way delay: 68.872 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 30.25 Mbit/s
95th percentile per-packet one-way delay: 68.872 ms
Loss rate: 0.41%
```

Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 30.31 Mbit/s) ——— Flow 1 egress (mean 30.25 Mbit/s)

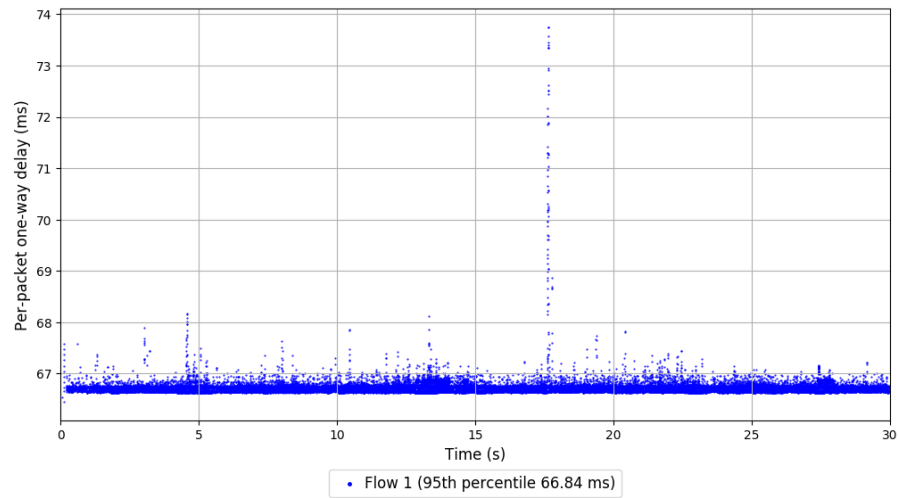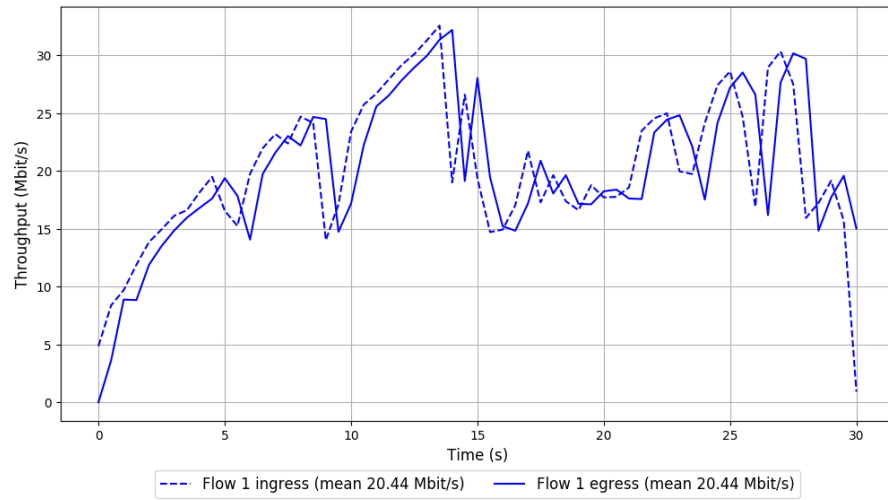

• Flow 1 (95th percentile 68.87 ms)

```
Run 4: Statistics of TCP Vegas

Start at: 2019-01-03 06:05:07
End at: 2019-01-03 06:05:37
Local clock offset: 2.399 ms
Remote clock offset: -5.765 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 20.44 Mbit/s
95th percentile per-packet one-way delay: 66.845 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 20.44 Mbit/s
95th percentile per-packet one-way delay: 66.845 ms
Loss rate: 0.30%
```

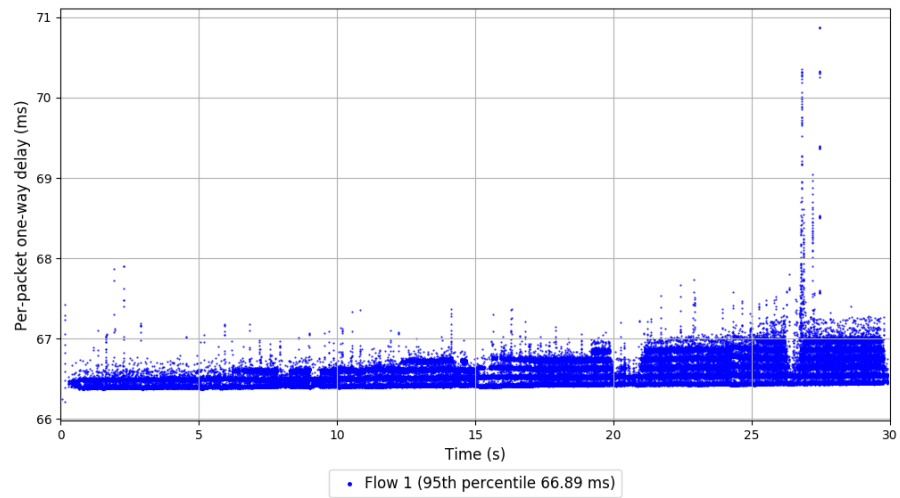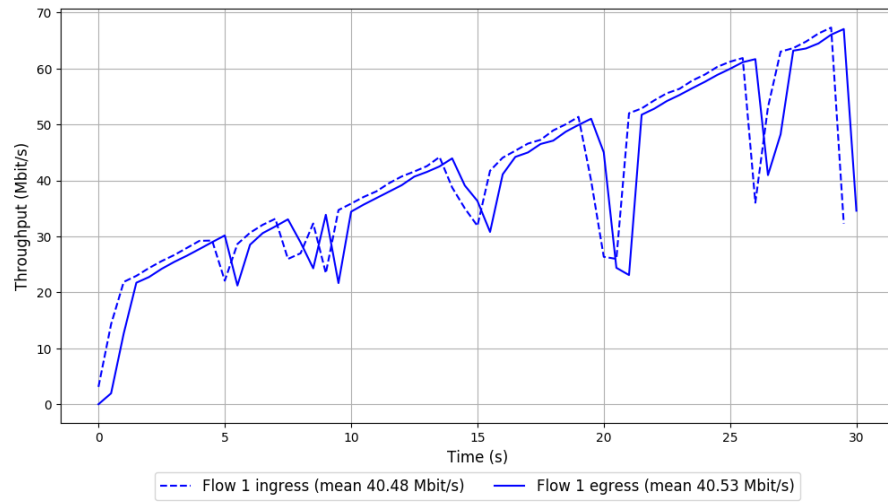## Run 4: Report of TCP Vegas — Data Link

```
Run 5: Statistics of TCP Vegas

Start at: 2019-01-03 06:29:49
End at: 2019-01-03 06:30:19
Local clock offset: 0.956 ms
Remote clock offset: -4.146 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 40.53 Mbit/s
95th percentile per-packet one-way delay: 66.889 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 40.53 Mbit/s
95th percentile per-packet one-way delay: 66.889 ms
Loss rate: 0.28%
```

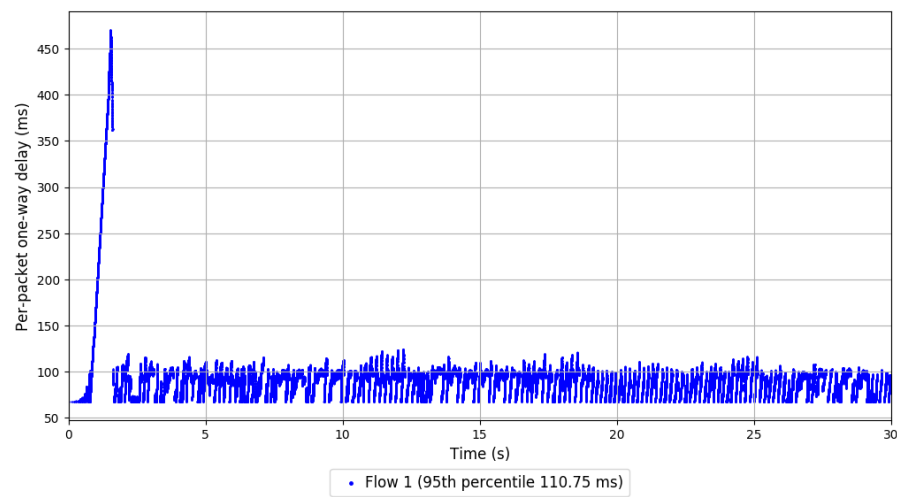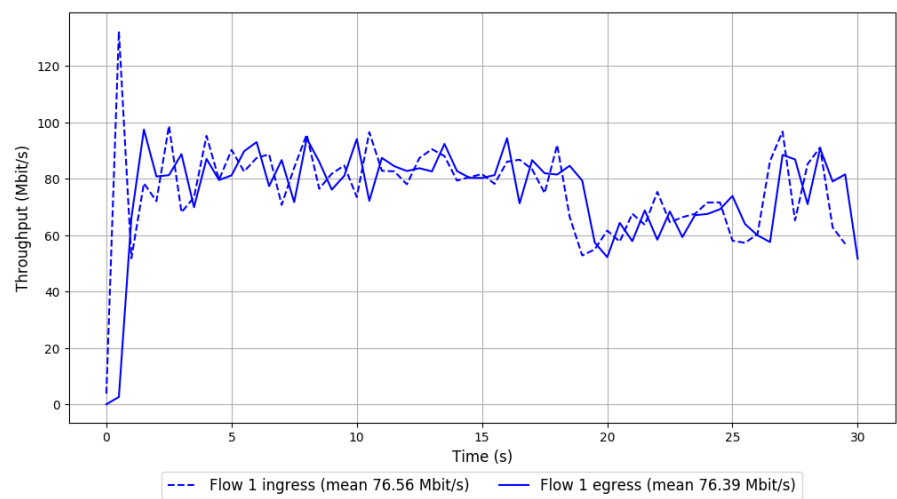Run 5: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2019-01-03 05:06:55
End at: 2019-01-03 05:07:25
Local clock offset: 2.124 ms
Remote clock offset: -6.295 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 76.39 Mbit/s
95th percentile per-packet one-way delay: 110.751 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 76.39 Mbit/s
95th percentile per-packet one-way delay: 110.751 ms
Loss rate: 0.22%
```

Run 1: Report of Verus — Data Link

Flow 1 ingress (mean 76.56 Mbit/s) ---- Flow 1 egress (mean 76.39 Mbit/s) ——
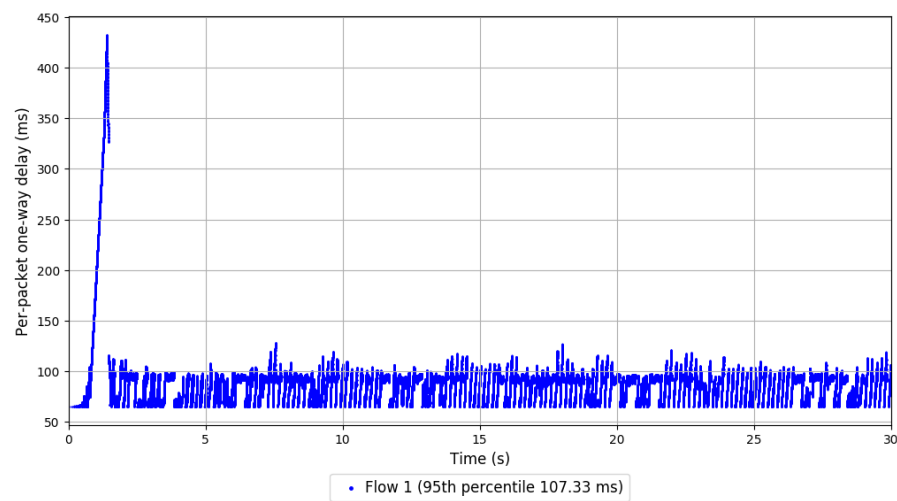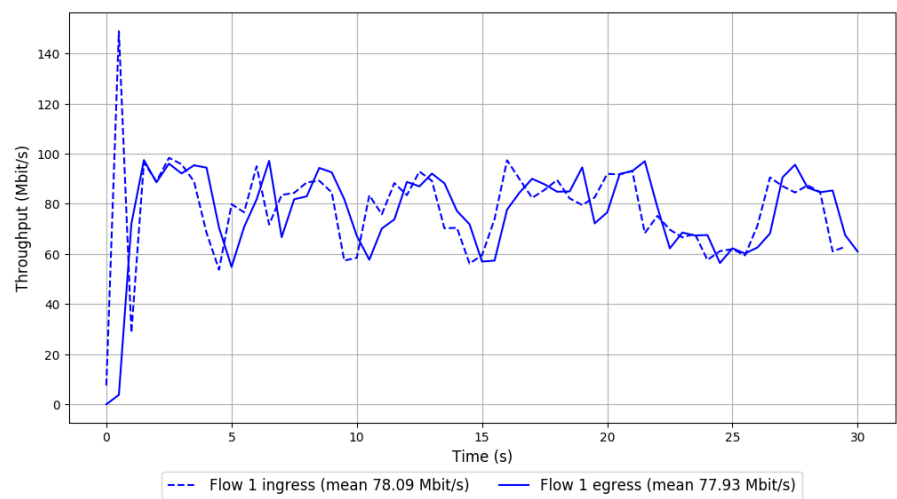

Flow 1 (95th percentile 110.75 ms)

```
Run 2: Statistics of Verus

Start at: 2019-01-03 05:34:04
End at: 2019-01-03 05:34:34
Local clock offset: -0.16 ms
Remote clock offset: -6.828 ms


# Below is generated by plot.py at 2019-01-03 07:04:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 77.93 Mbit/s
95th percentile per-packet one-way delay: 107.325 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 77.93 Mbit/s
95th percentile per-packet one-way delay: 107.325 ms
Loss rate: 0.17%
```

Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2019-01-03 05:58:52
End at: 2019-01-03 05:59:22
Local clock offset: 0.712 ms
Remote clock offset: -6.23 ms


# Below is generated by plot.py at 2019-01-03 07:04:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 74.20 Mbit/s
95th percentile per-packet one-way delay: 230.051 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 74.20 Mbit/s
95th percentile per-packet one-way delay: 230.051 ms
Loss rate: 0.41%
```
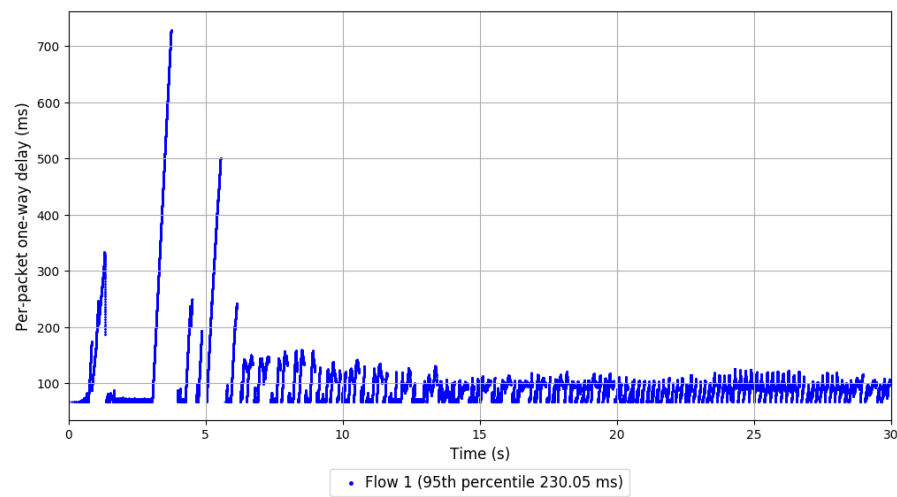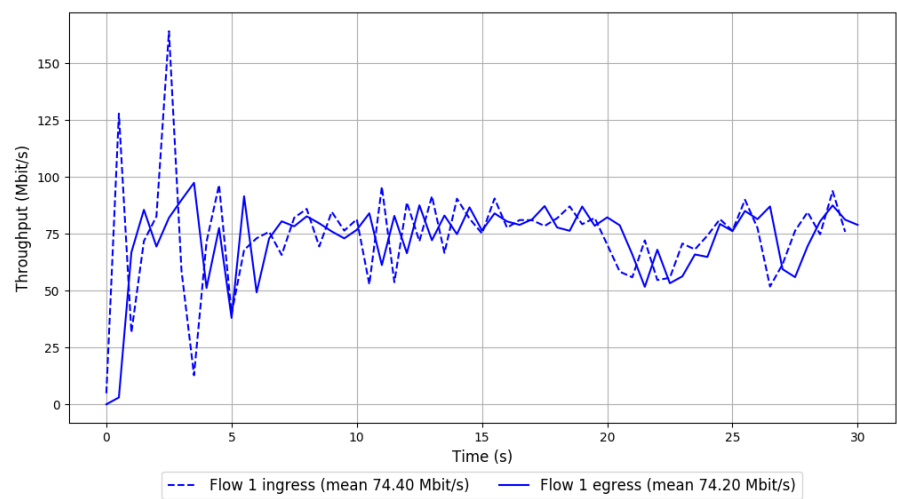
Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 74.40 Mbit/s)   Flow 1 egress (mean 74.20 Mbit/s)
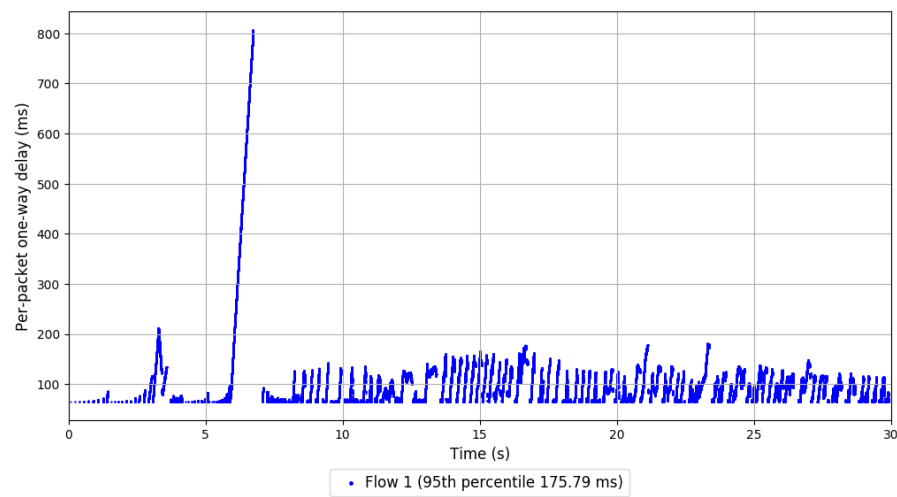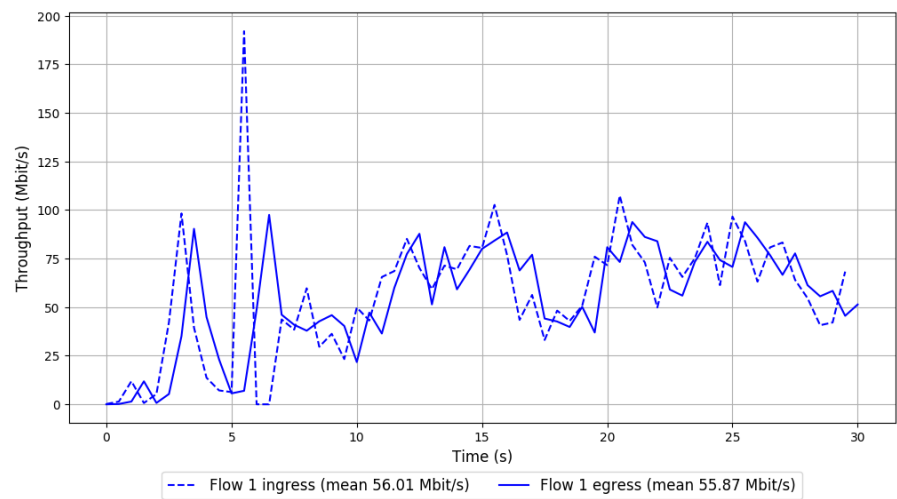

Flow 1 (95th percentile 230.05 ms)

```
Run 4: Statistics of Verus

Start at: 2019-01-03 06:23:40
End at: 2019-01-03 06:24:10
Local clock offset: -0.022 ms
Remote clock offset: -4.368 ms


# Below is generated by plot.py at 2019-01-03 07:04:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 55.87 Mbit/s
95th percentile per-packet one-way delay: 175.789 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 55.87 Mbit/s
95th percentile per-packet one-way delay: 175.789 ms
Loss rate: 0.60%
```

Run 4: Report of Verus — Data Link

Flow 1 ingress (mean 56.01 Mbit/s)   Flow 1 egress (mean 55.87 Mbit/s)
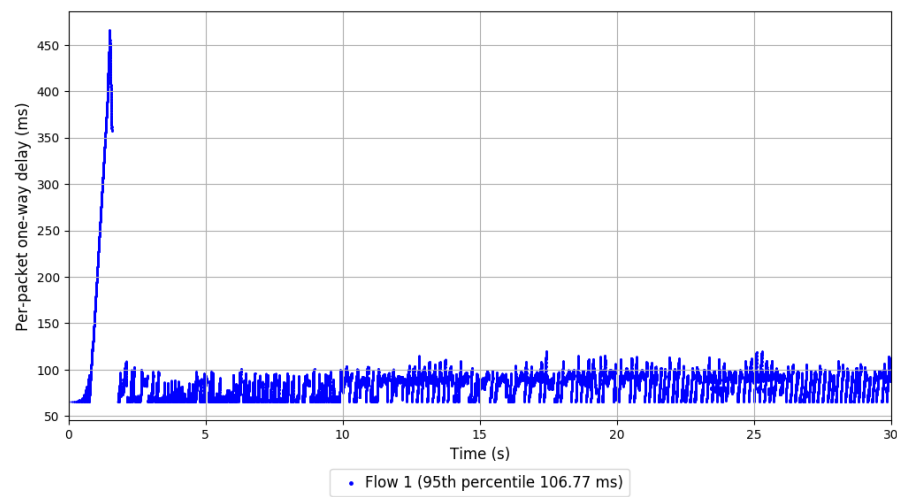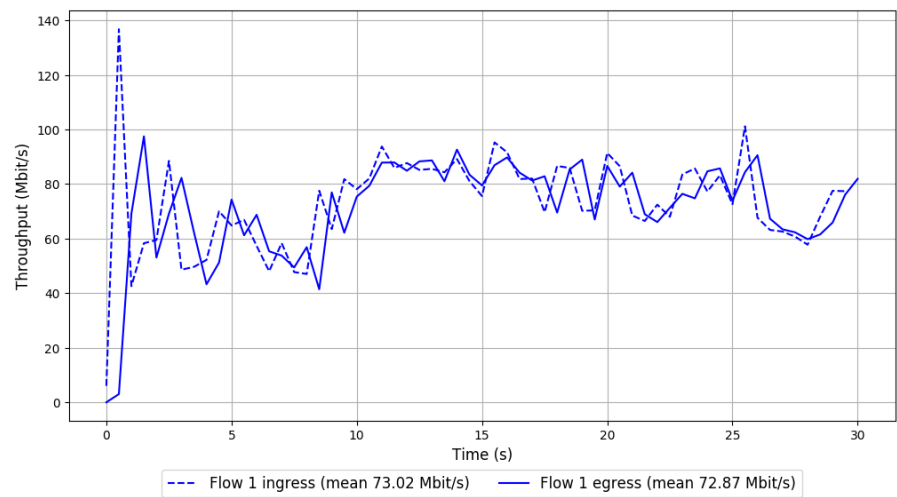

Flow 1 (95th percentile 175.79 ms)

```
Run 5: Statistics of Verus

Start at: 2019-01-03 06:47:16
End at: 2019-01-03 06:47:46
Local clock offset: -0.354 ms
Remote clock offset: -4.784 ms


# Below is generated by plot.py at 2019-01-03 07:04:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.87 Mbit/s
95th percentile per-packet one-way delay: 106.773 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 72.87 Mbit/s
95th percentile per-packet one-way delay: 106.773 ms
Loss rate: 0.41%
```

Run 5: Report of Verus — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2019-01-03 04:58:04
End at: 2019-01-03 04:58:34
Local clock offset: 0.75 ms
Remote clock offset: -6.883 ms


# Below is generated by plot.py at 2019-01-03 07:04:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 70.15 Mbit/s
95th percentile per-packet one-way delay: 66.504 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 70.15 Mbit/s
95th percentile per-packet one-way delay: 66.504 ms
Loss rate: 0.28%
```
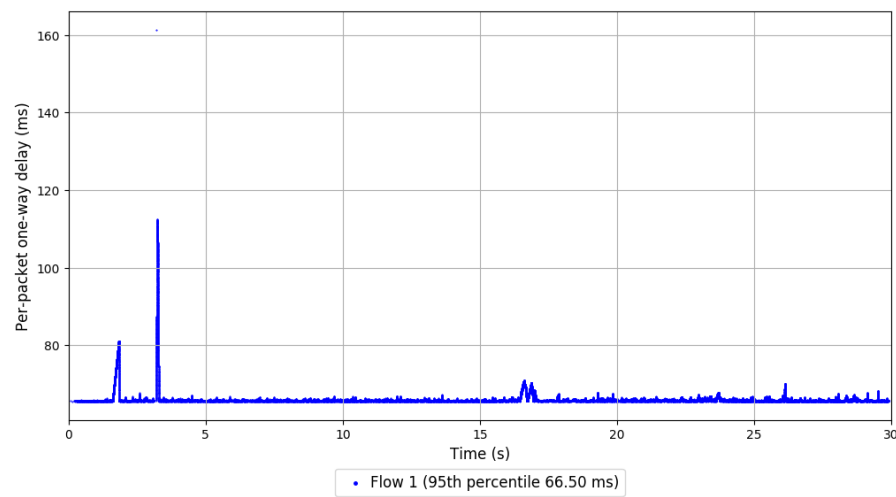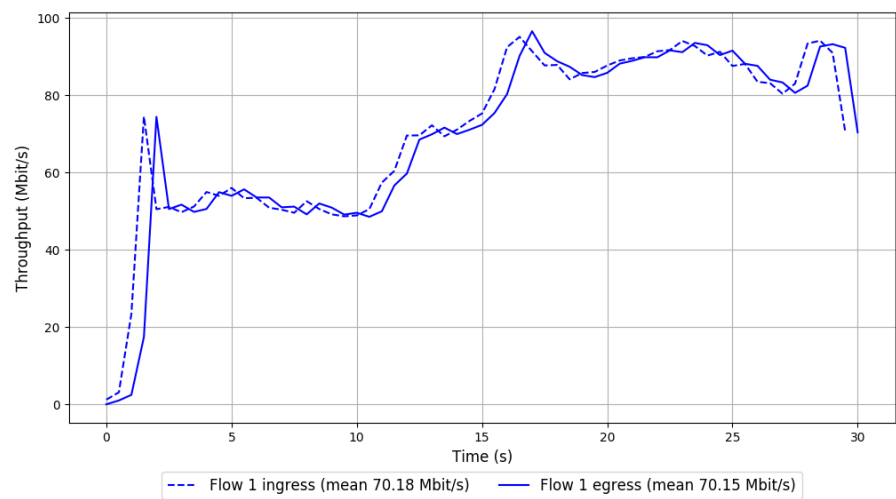
Run 1: Report of PCC-Vivace — Data Link

176

```
Run 2: Statistics of PCC-Vivace

Start at: 2019-01-03 05:25:17
End at: 2019-01-03 05:25:47
Local clock offset: 2.361 ms
Remote clock offset: -7.052 ms


# Below is generated by plot.py at 2019-01-03 07:04:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 64.12 Mbit/s
95th percentile per-packet one-way delay: 69.467 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 64.12 Mbit/s
95th percentile per-packet one-way delay: 69.467 ms
Loss rate: 0.35%
```
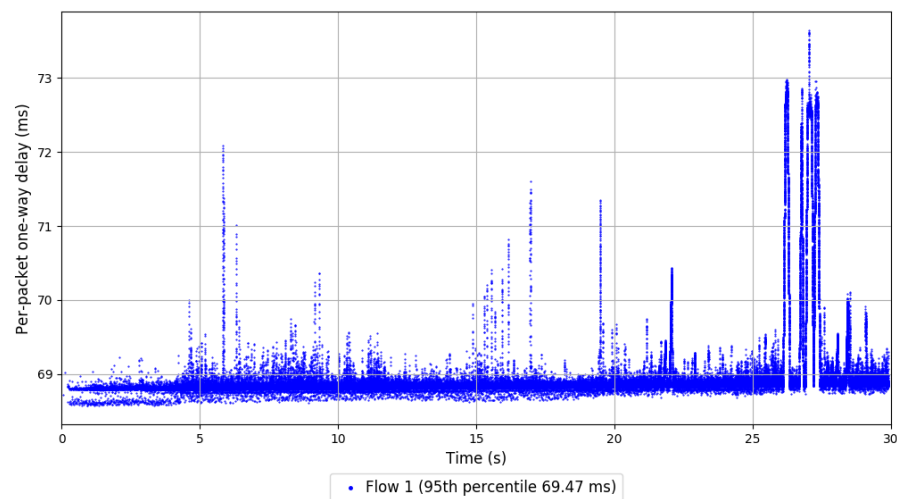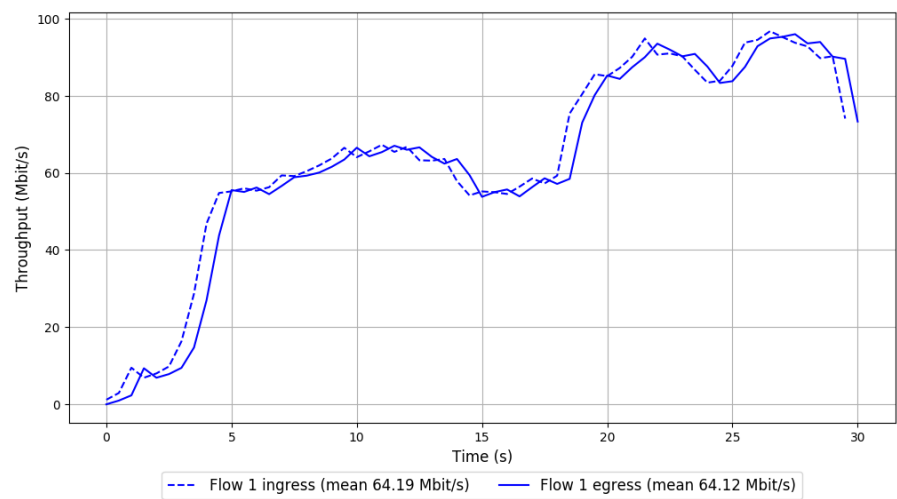
Run 2: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 64.19 Mbit/s)   Flow 1 egress (mean 64.12 Mbit/s)
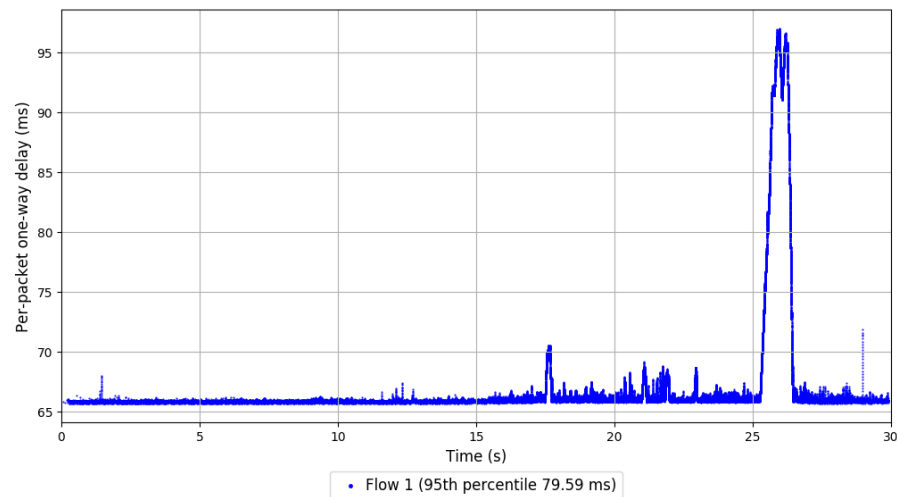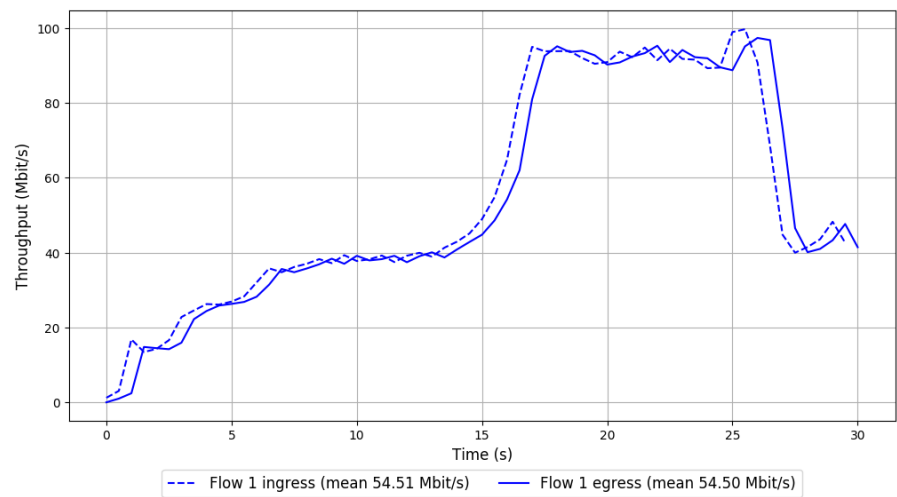

Flow 1 (95th percentile 69.47 ms)

```
Run 3: Statistics of PCC-Vivace

Start at: 2019-01-03 05:51:18
End at: 2019-01-03 05:51:48
Local clock offset: 2.209 ms
Remote clock offset: -5.023 ms


# Below is generated by plot.py at 2019-01-03 07:04:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 54.50 Mbit/s
95th percentile per-packet one-way delay: 79.592 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 54.50 Mbit/s
95th percentile per-packet one-way delay: 79.592 ms
Loss rate: 0.26%
```

Run 3: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 54.51 Mbit/s)   Flow 1 egress (mean 54.50 Mbit/s)

Flow 1 (95th percentile 79.59 ms)

```
Run 4: Statistics of PCC-Vivace

Start at: 2019-01-03 06:15:28
End at: 2019-01-03 06:15:58
Local clock offset: 1.428 ms
Remote clock offset: -6.021 ms


# Below is generated by plot.py at 2019-01-03 07:04:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 75.47 Mbit/s
95th percentile per-packet one-way delay: 124.544 ms
Loss rate: 0.62%
-- Flow 1:
Average throughput: 75.47 Mbit/s
95th percentile per-packet one-way delay: 124.544 ms
Loss rate: 0.62%
```
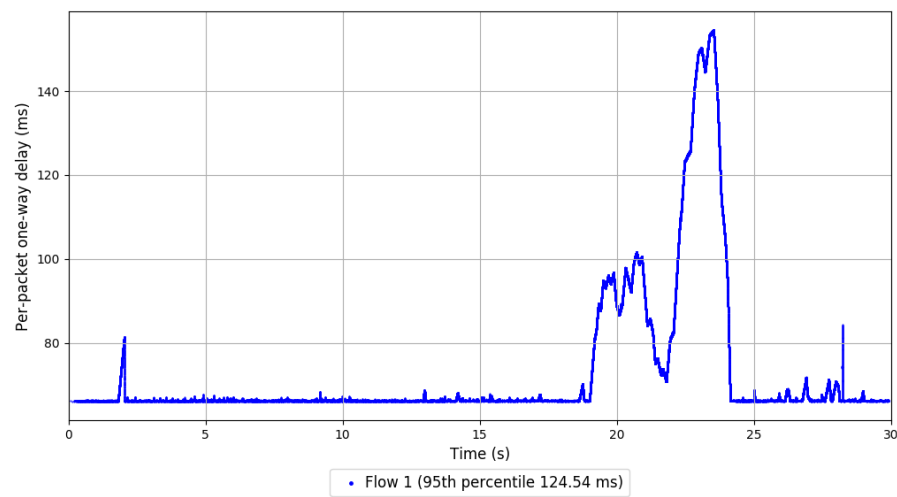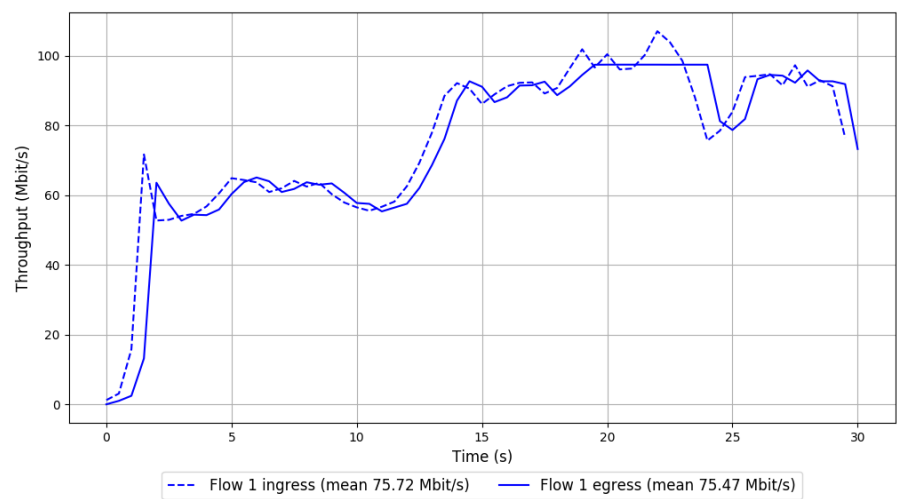
Run 4: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 75.72 Mbit/s)   Flow 1 egress (mean 75.47 Mbit/s)

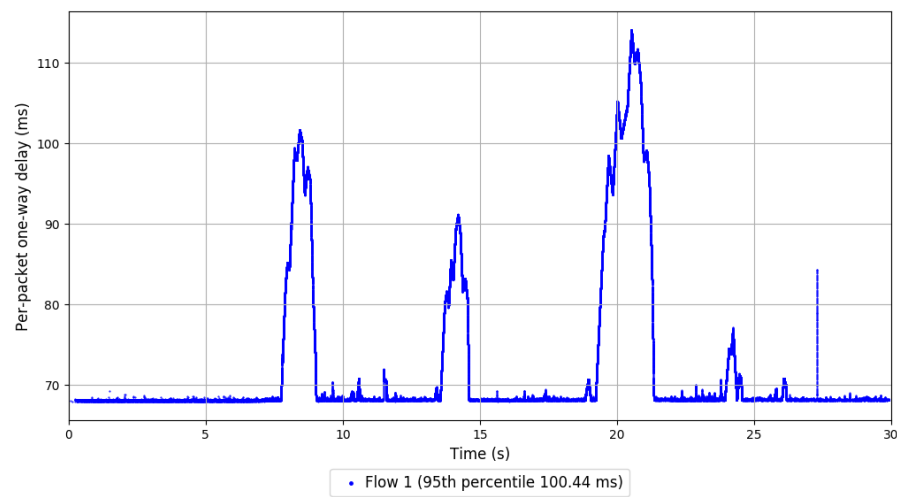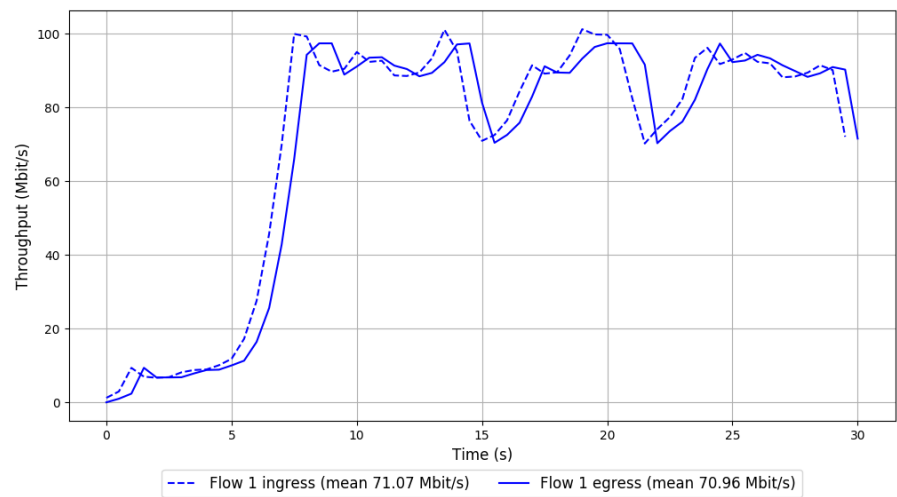
• Flow 1 (95th percentile 124.54 ms)

```
Run 5: Statistics of PCC-Vivace

Start at: 2019-01-03 06:39:51
End at: 2019-01-03 06:40:21
Local clock offset: -1.484 ms
Remote clock offset: -7.336 ms


# Below is generated by plot.py at 2019-01-03 07:04:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 70.96 Mbit/s
95th percentile per-packet one-way delay: 100.445 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 70.96 Mbit/s
95th percentile per-packet one-way delay: 100.445 ms
Loss rate: 0.39%
```

Run 5: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 71.07 Mbit/s) --- Flow 1 egress (mean 70.96 Mbit/s)

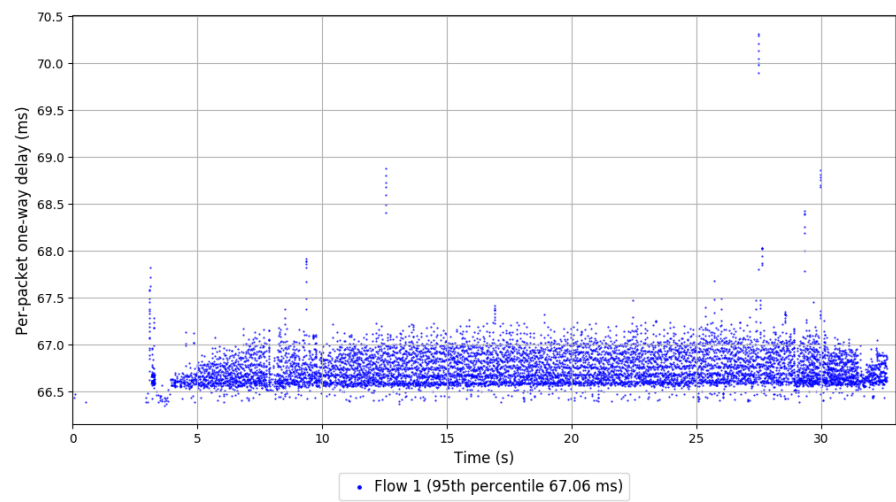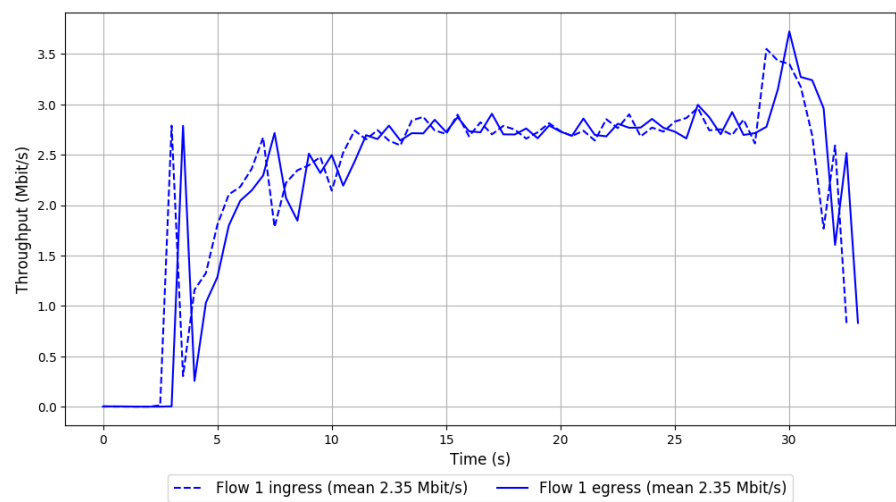
• Flow 1 (95th percentile 100.44 ms)

```
Run 1: Statistics of WebRTC media

Start at: 2019-01-03 04:49:16
End at: 2019-01-03 04:49:46
Local clock offset: 0.951 ms
Remote clock offset: -6.657 ms


# Below is generated by plot.py at 2019-01-03 07:04:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 67.063 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 67.063 ms
Loss rate: 0.24%
```

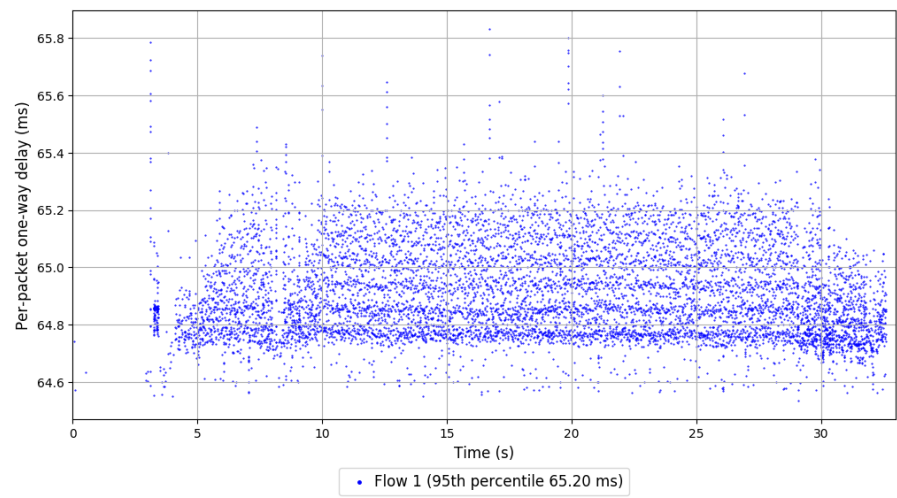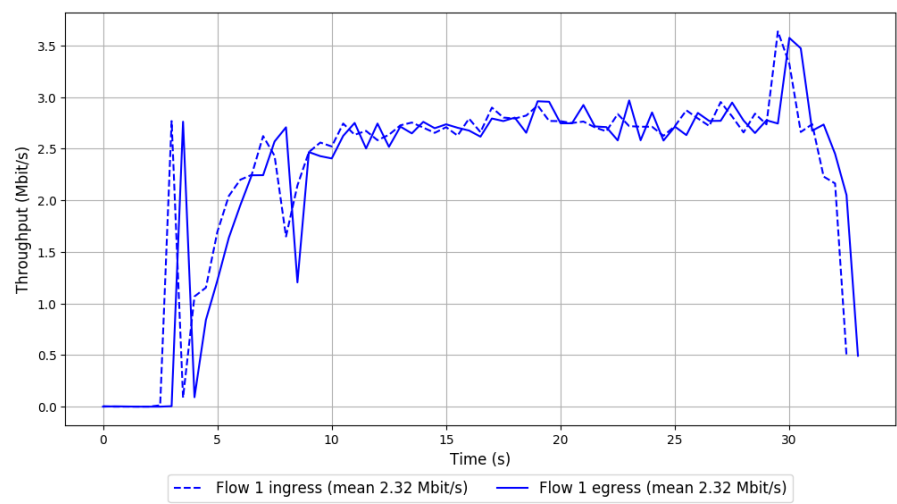Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2019-01-03 05:17:13
End at: 2019-01-03 05:17:43
Local clock offset: 0.623 ms
Remote clock offset: -6.786 ms


# Below is generated by plot.py at 2019-01-03 07:04:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 65.204 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 65.204 ms
Loss rate: 0.20%
```

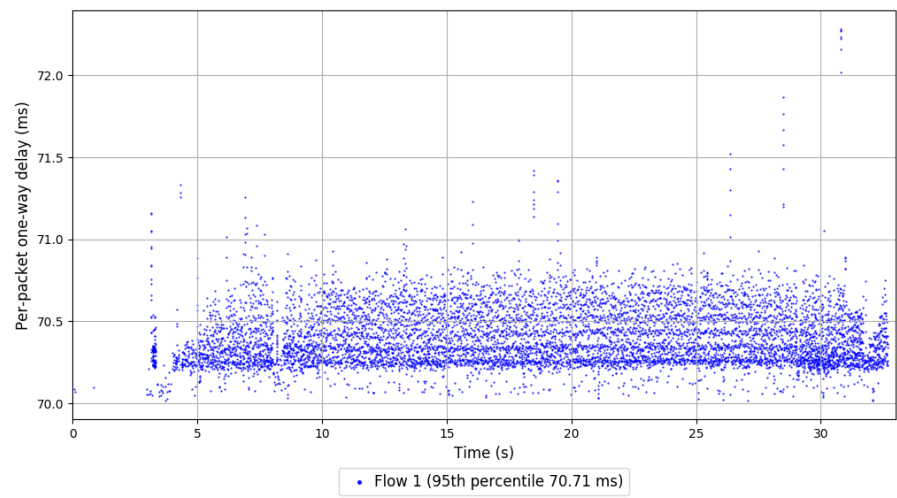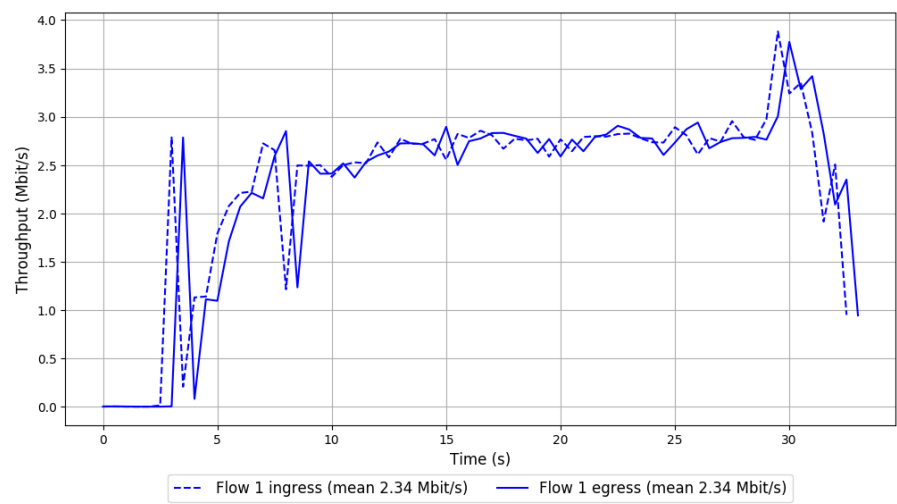Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2019-01-03 05:43:28
End at: 2019-01-03 05:43:58
Local clock offset: -0.073 ms
Remote clock offset: -10.171 ms


# Below is generated by plot.py at 2019-01-03 07:04:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 70.707 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 70.707 ms
Loss rate: 0.26%
```

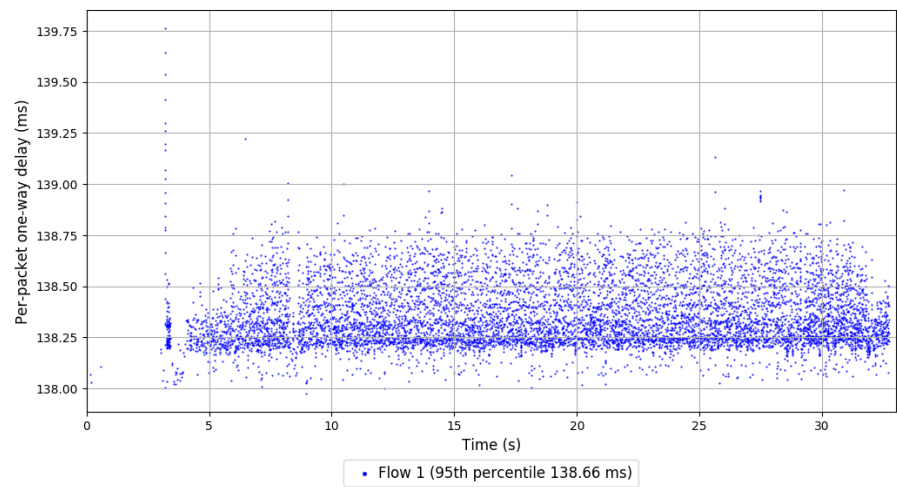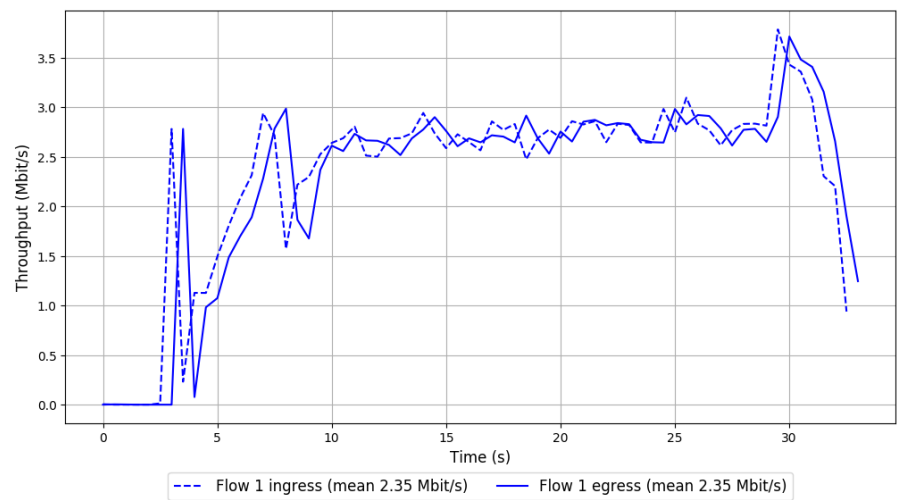Run 3: Report of WebRTC media — Data Link

```
Run 4: Statistics of WebRTC media

Start at: 2019-01-03 06:07:47
End at: 2019-01-03 06:08:17
Local clock offset: 3.061 ms
Remote clock offset: -75.016 ms


# Below is generated by plot.py at 2019-01-03 07:04:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 138.663 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 138.663 ms
Loss rate: 0.29%
```

Run 4: Report of WebRTC media — Data Link

Flow 1 ingress (mean 2.35 Mbit/s)   Flow 1 egress (mean 2.35 Mbit/s)

Flow 1 (95th percentile 138.66 ms)

```
Run 5: Statistics of WebRTC media

Start at: 2019-01-03 06:32:24
End at: 2019-01-03 06:32:54
Local clock offset: 1.512 ms
Remote clock offset: -13.668 ms


# Below is generated by plot.py at 2019-01-03 07:04:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 77.767 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 77.767 ms
Loss rate: 0.26%
```

Run 5: Report of WebRTC media — Data Link

Flow 1 ingress (mean 2.33 Mbit/s) --- Flow 1 egress (mean 2.33 Mbit/s) ——

Flow 1 (95th percentile 77.77 ms)