# Pantheon Report

Generated at 2018-10-26 08:02:53 (UTC).

Data path: China on `eno1` (*remote*) →AWS Korea on `ens5` (*local*).

Repeated the test of 18 congestion control schemes 5 times.

Each test lasted for 30 seconds running 1 flow.

NTP offsets were measured against `ntp.nict.jp` and have been applied to correct the timestamps in logs.
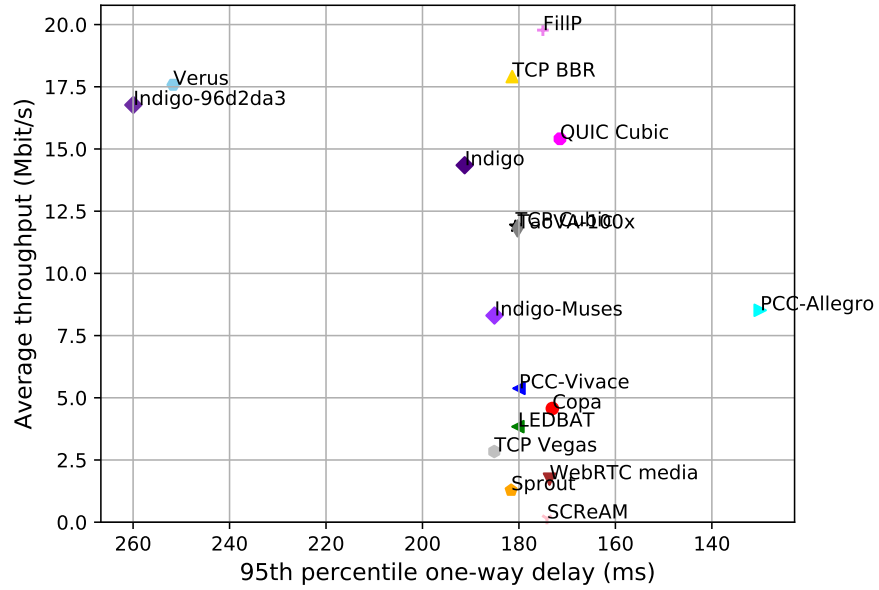
```
System info:
Linux 4.15.0-1023-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912

Git summary:
branch: muses @ 2e19c0464530faa92c63f8217c9971438a26a3be
third_party/fillp @ 5332fc9127c63565e13f4933b336c02d1aabdac6
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-96d2da3 @ 8413272d46f8aa0bcb967ed7048b6a8f994abb95
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
 M receiver/src/buffer.h
 M receiver/src/core.cpp
 M sender/src/buffer.h
 M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
 M src/ScreamClient
 M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
 M src/examples/cellsim.cc
 M src/examples/sproutbt2.cc
 M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
 M src/verus.hpp
 M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
```
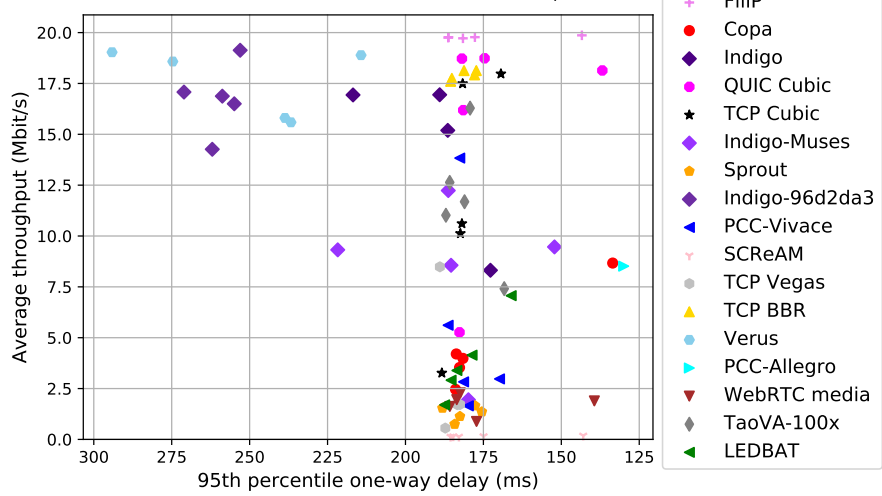
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851

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

FillP

Verus
Indigo-96d2da3

TCP BBR

QUIC Cubic

Indigo

TaoVA-100x

Indigo-Muses

PCC-Allegro

PCC-Vivace
Copa
LEDBAT
TCP Vegas
WebRTC media
Sprout
SCReAM

Average throughput (Mbit/s)
95th percentile one-way delay (ms)

test from China to AWS Korea, 5 runs of 30s each per scheme

Average throughput (Mbit/s)
95th percentile one-way delay (ms)

FillP
Copa
Indigo
QUIC Cubic
TCP Cubic
Indigo-Muses
Sprout
Indigo-96d2da3
PCC-Vivace
SCReAM
TCP Vegas
TCP BBR
Verus
PCC-Allegro
WebRTC media
TaoVA-100x
LEDBAT

3

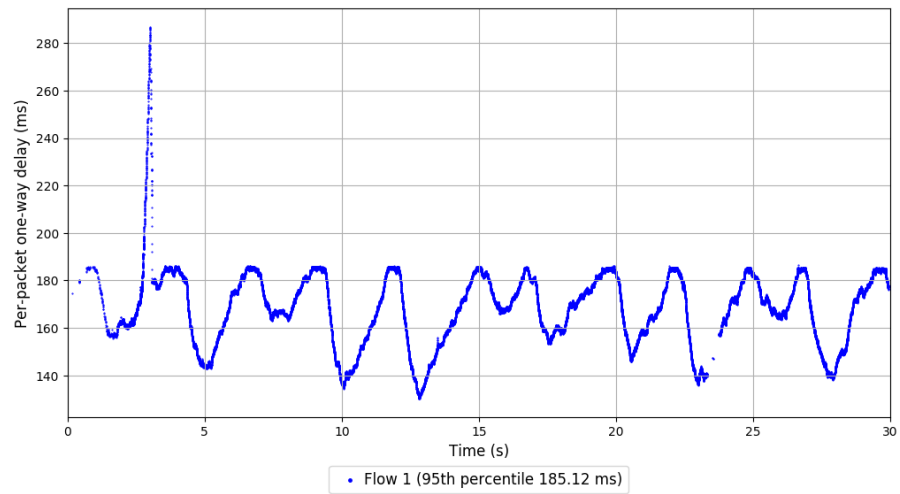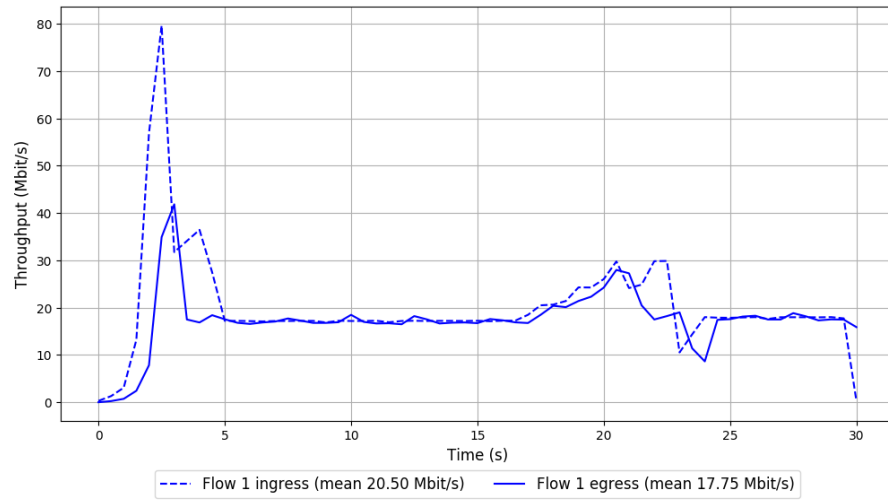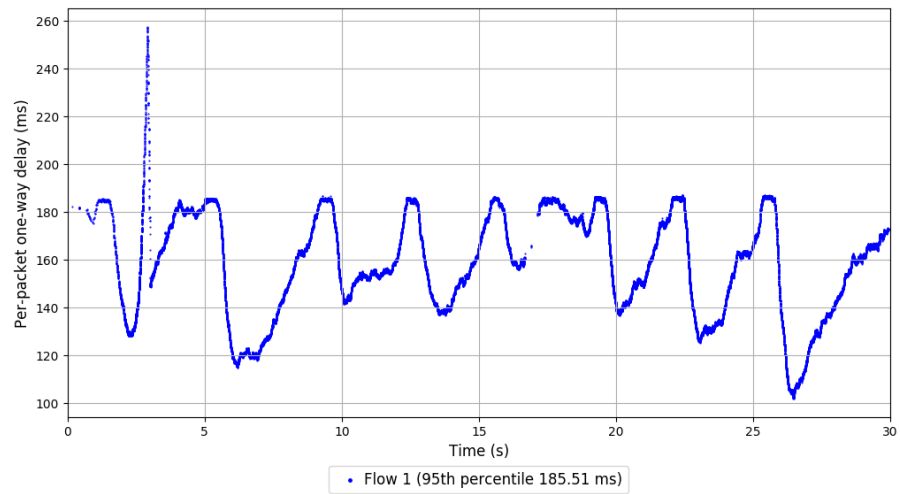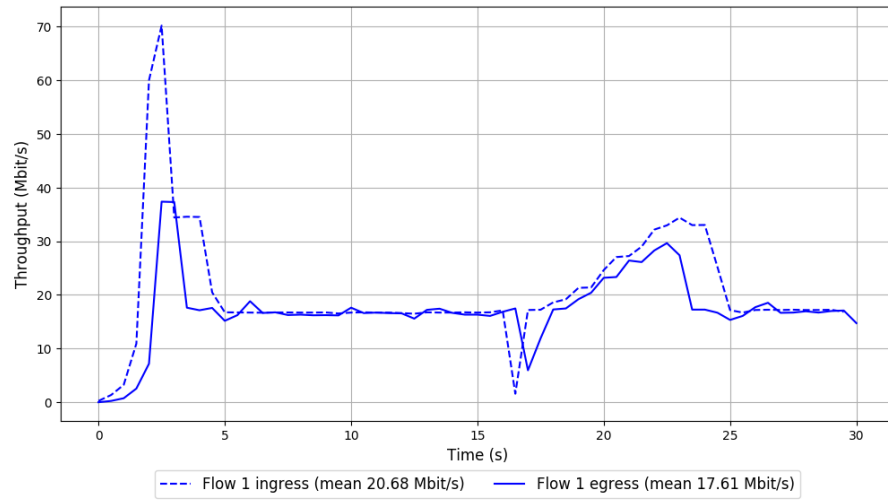| scheme | # runs | mean avg tput (Mbit/s) flow 1 | mean 95th-%ile delay (ms) flow 1 | mean loss rate (%) flow 1 |
|---|---|---|---|---|
| TCP BBR | 5 | 17.91 | 181.39 | 15.36 |
| Copa | 5 | 4.57 | 173.07 | 1.03 |
| TCP Cubic | 5 | 11.89 | 180.73 | 3.73 |
| FillP | 5 | 19.78 | 175.03 | 30.60 |
| Indigo | 4 | 14.35 | 191.26 | 45.05 |
| Indigo-96d2da3 | 5 | 16.77 | 259.95 | 57.15 |
| LEDBAT | 5 | 3.84 | 180.21 | 1.23 |
| Indigo-Muses | 5 | 8.31 | 185.08 | 5.42 |
| PCC-Allegro | 1 | 8.52 | 129.98 | 0.60 |
| PCC-Expr | 0 | N/A | N/A | N/A |
| QUIC Cubic | 5 | 15.41 | 171.49 | 3.44 |
| SCReAM | 5 | 0.15 | 174.19 | 0.53 |
| Sprout | 5 | 1.29 | 181.62 | 0.60 |
| TaoVA-100x | 5 | 11.81 | 180.29 | 5.26 |
| TCP Vegas | 5 | 2.84 | 185.12 | 4.93 |
| Verus | 5 | 17.58 | 251.69 | 62.04 |
| PCC-Vivace | 5 | 5.38 | 179.99 | 2.07 |
| WebRTC media | 5 | 1.73 | 173.66 | 0.86 |

```
Run 1: Statistics of TCP BBR

Start at: 2018-10-26 06:29:48
End at: 2018-10-26 06:30:18
Local clock offset: 1.585 ms
Remote clock offset: -28.166 ms

# Below is generated by plot.py at 2018-10-26 08:01:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 18.13 Mbit/s
95th percentile per-packet one-way delay: 177.276 ms
Loss rate: 15.61%
-- Flow 1:
Average throughput: 18.13 Mbit/s
95th percentile per-packet one-way delay: 177.276 ms
Loss rate: 15.61%
```

Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2018-10-26 06:52:07
End at: 2018-10-26 06:52:37
Local clock offset: -0.464 ms
Remote clock offset: -50.152 ms


# Below is generated by plot.py at 2018-10-26 08:01:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 17.75 Mbit/s
95th percentile per-packet one-way delay: 185.118 ms
Loss rate: 14.12%
-- Flow 1:
Average throughput: 17.75 Mbit/s
95th percentile per-packet one-way delay: 185.118 ms
Loss rate: 14.12%
```
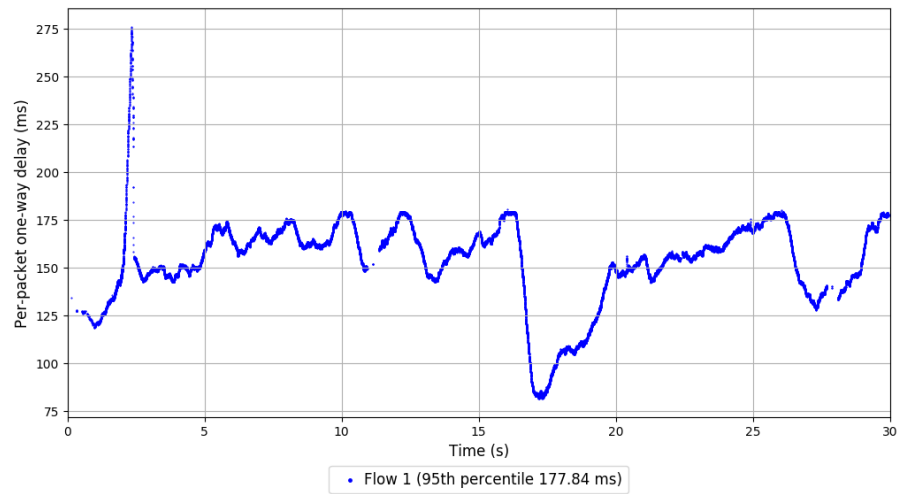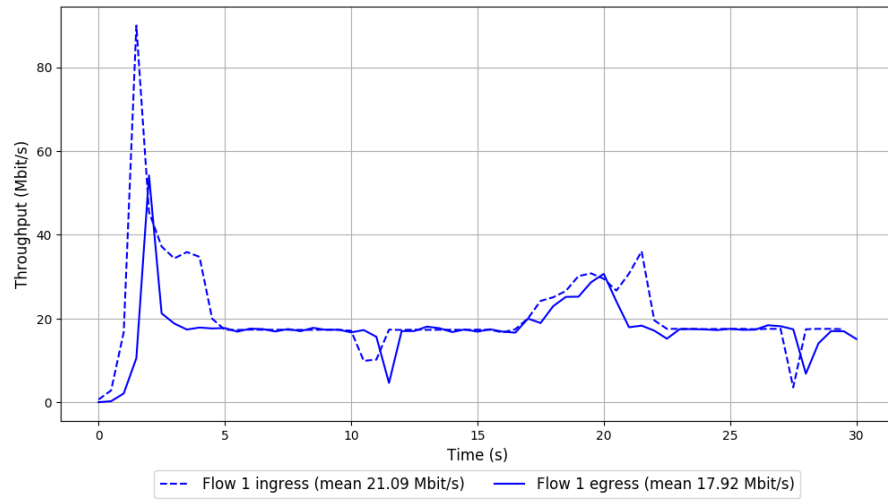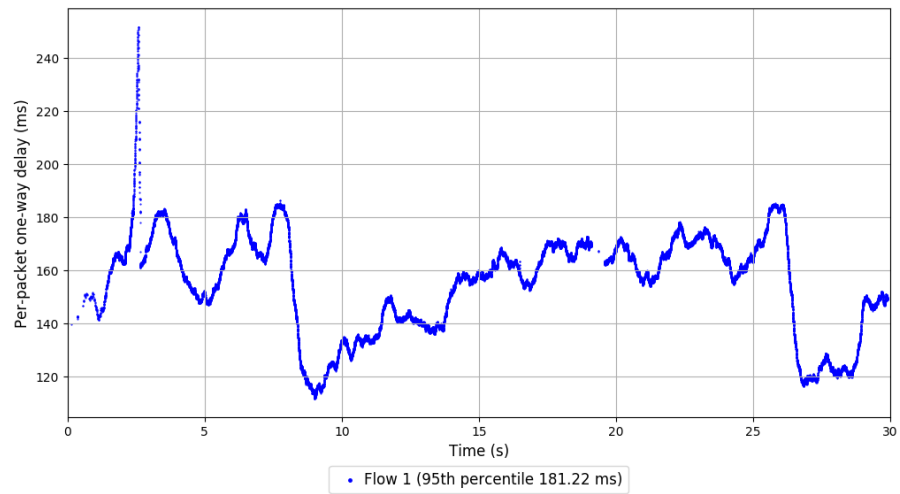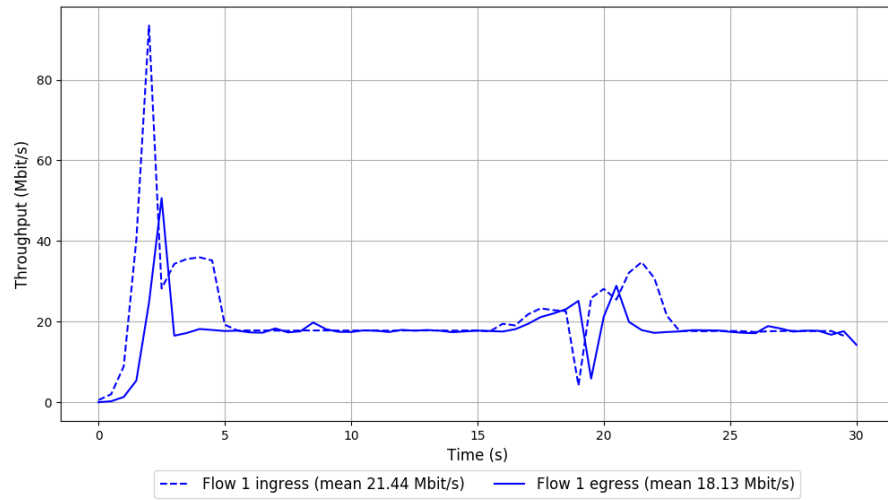
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2018-10-26 07:14:36
End at: 2018-10-26 07:15:06
Local clock offset: 13.863 ms
Remote clock offset: -23.616 ms


# Below is generated by plot.py at 2018-10-26 08:01:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 17.61 Mbit/s
95th percentile per-packet one-way delay: 185.511 ms
Loss rate: 15.55%
-- Flow 1:
Average throughput: 17.61 Mbit/s
95th percentile per-packet one-way delay: 185.511 ms
Loss rate: 15.55%
```

Run 3: Report of TCP BBR — Data Link



Flow 1 ingress (mean 20.68 Mbit/s) ----    Flow 1 egress (mean 17.61 Mbit/s) ——



• Flow 1 (95th percentile 185.51 ms)

```
Run 4: Statistics of TCP BBR

Start at: 2018-10-26 07:37:03
End at: 2018-10-26 07:37:33
Local clock offset: 18.777 ms
Remote clock offset: 3.441 ms


# Below is generated by plot.py at 2018-10-26 08:01:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 17.92 Mbit/s
95th percentile per-packet one-way delay: 177.843 ms
Loss rate: 15.55%
-- Flow 1:
Average throughput: 17.92 Mbit/s
95th percentile per-packet one-way delay: 177.843 ms
Loss rate: 15.55%
```
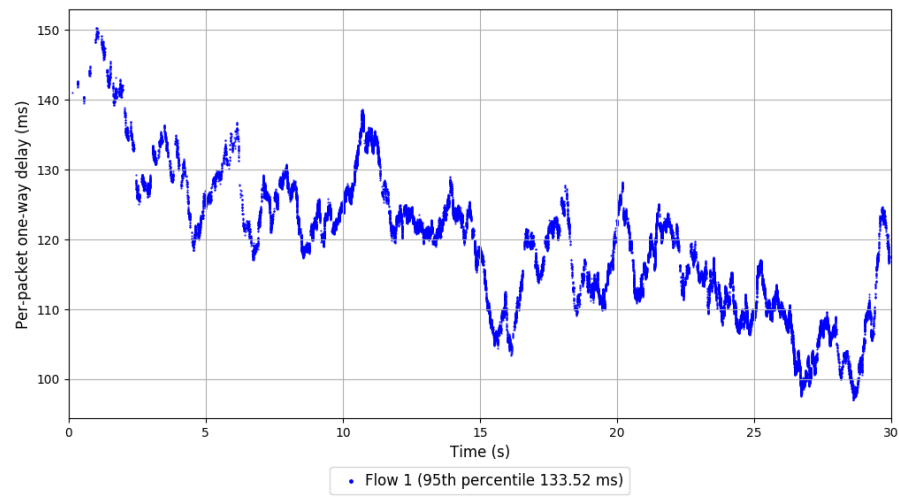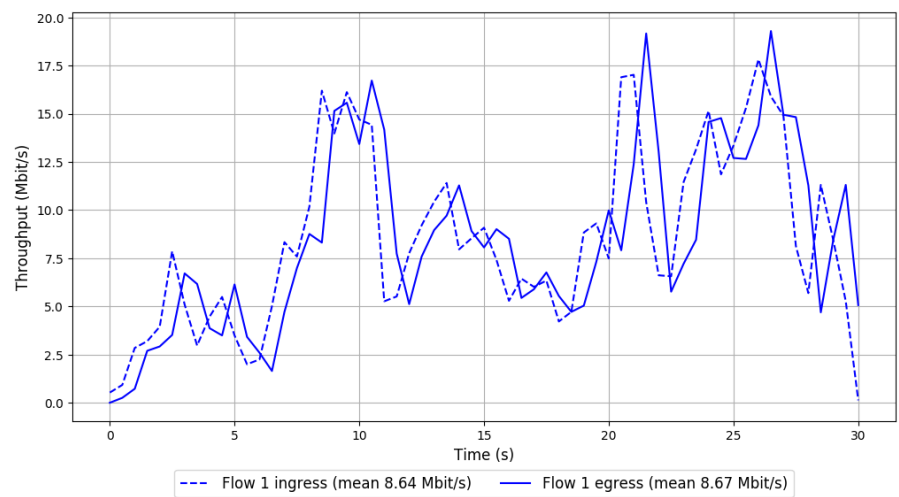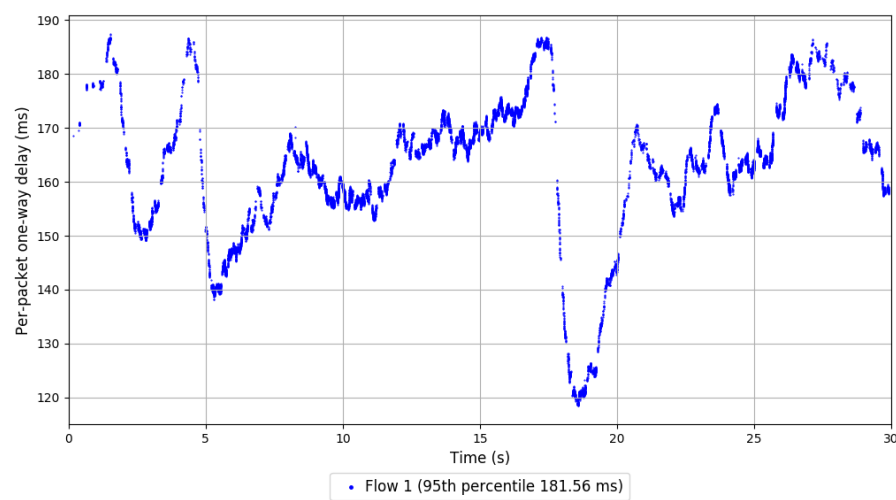
Run 4: Report of TCP BBR — Data Link

```
Run 5: Statistics of TCP BBR

Start at: 2018-10-26 07:59:45
End at: 2018-10-26 08:00:15
Local clock offset: 19.748 ms
Remote clock offset: -19.688 ms

# Below is generated by plot.py at 2018-10-26 08:01:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 18.13 Mbit/s
95th percentile per-packet one-way delay: 181.218 ms
Loss rate: 15.98%
-- Flow 1:
Average throughput: 18.13 Mbit/s
95th percentile per-packet one-way delay: 181.218 ms
Loss rate: 15.98%
```
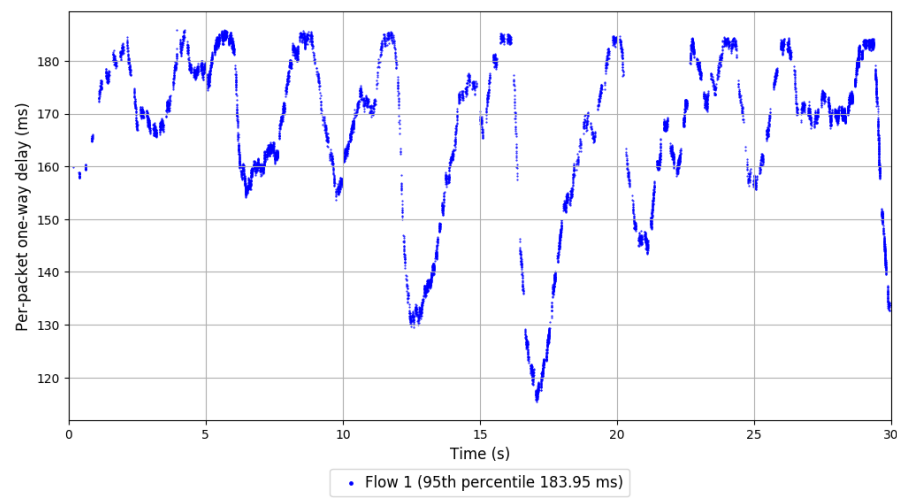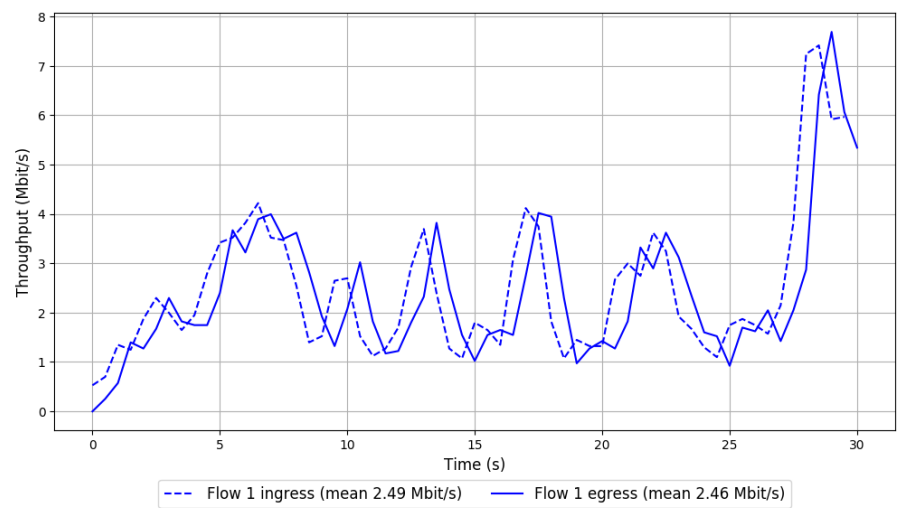
Run 5: Report of TCP BBR — Data Link

```
Run 1: Statistics of Copa

Start at: 2018-10-26 06:16:31
End at: 2018-10-26 06:17:01
Local clock offset: 3.057 ms
Remote clock offset: 88.57 ms


# Below is generated by plot.py at 2018-10-26 08:01:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.67 Mbit/s
95th percentile per-packet one-way delay: 133.517 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 8.67 Mbit/s
95th percentile per-packet one-way delay: 133.517 ms
Loss rate: 0.33%
```
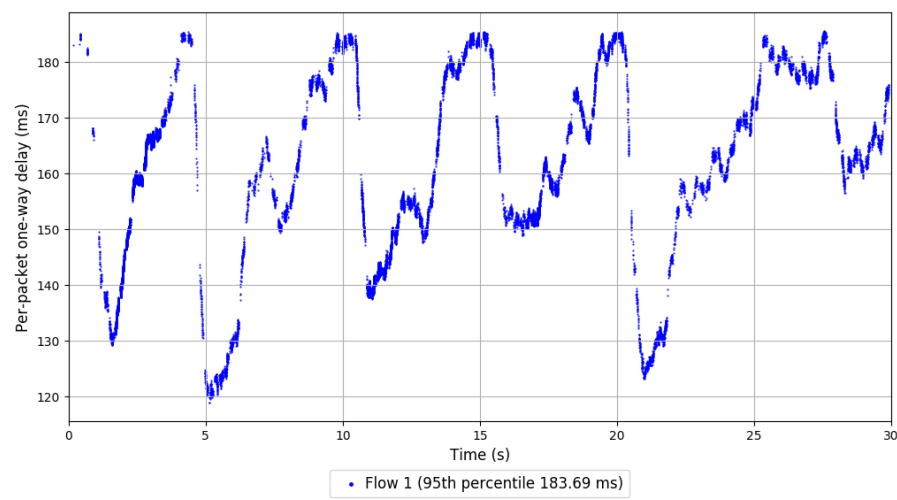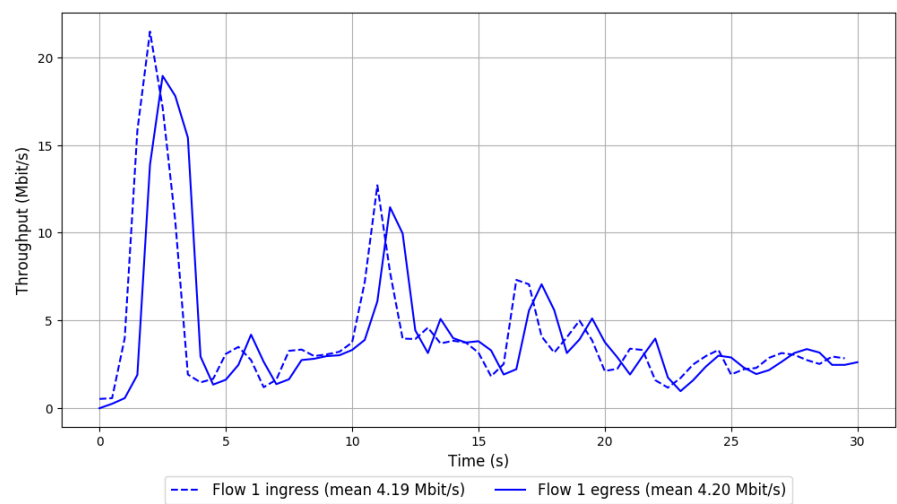
Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2018-10-26 06:38:40
End at: 2018-10-26 06:39:10
Local clock offset: 0.521 ms
Remote clock offset: -34.72 ms


# Below is generated by plot.py at 2018-10-26 08:01:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.98 Mbit/s
95th percentile per-packet one-way delay: 181.558 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 3.98 Mbit/s
95th percentile per-packet one-way delay: 181.558 ms
Loss rate: 1.51%
```
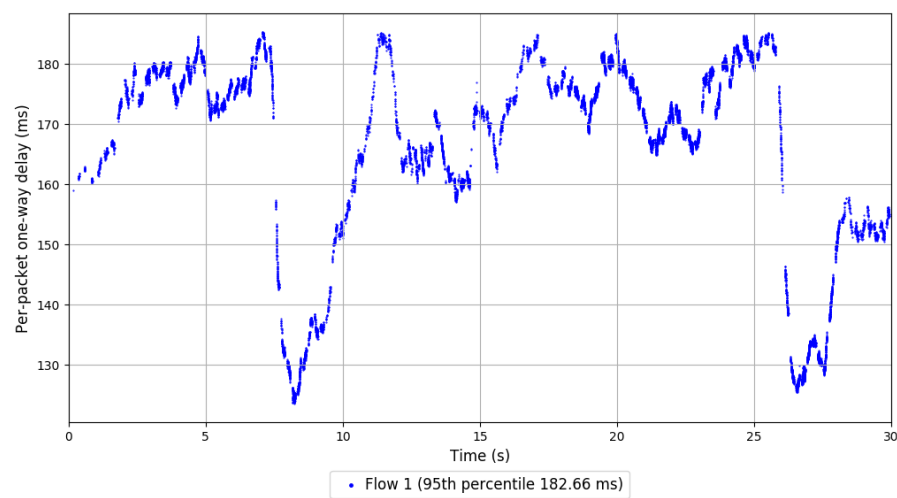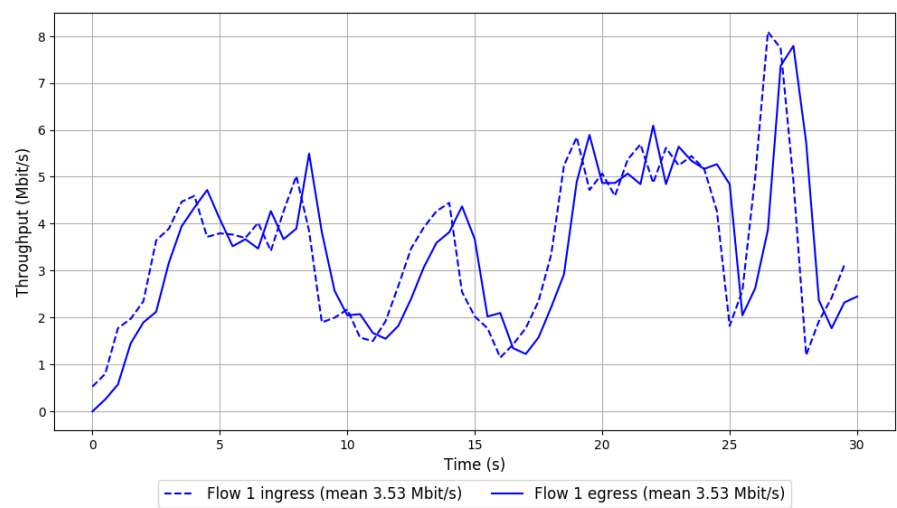
Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-10-26 07:01:18
End at: 2018-10-26 07:01:48
Local clock offset: -0.997 ms
Remote clock offset: -67.692 ms

# Below is generated by plot.py at 2018-10-26 08:01:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 183.946 ms
Loss rate: 2.03%
-- Flow 1:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 183.946 ms
Loss rate: 2.03%
```

Run 3: Report of Copa — Data Link



Flow 1 ingress (mean 2.49 Mbit/s)    Flow 1 egress (mean 2.46 Mbit/s)



• Flow 1 (95th percentile 183.95 ms)

```
Run 4: Statistics of Copa

Start at: 2018-10-26 07:23:39
End at: 2018-10-26 07:24:09
Local clock offset: 17.568 ms
Remote clock offset: -5.152 ms


# Below is generated by plot.py at 2018-10-26 08:01:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.20 Mbit/s
95th percentile per-packet one-way delay: 183.695 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 4.20 Mbit/s
95th percentile per-packet one-way delay: 183.695 ms
Loss rate: 0.66%
```
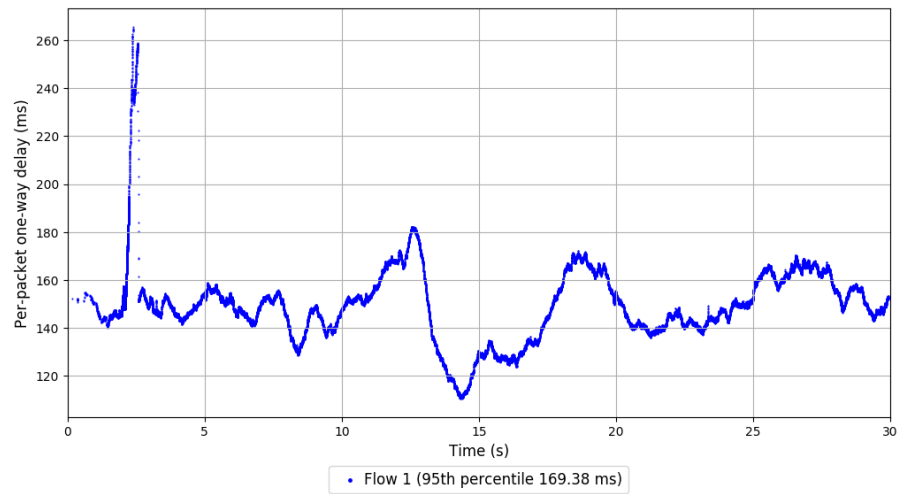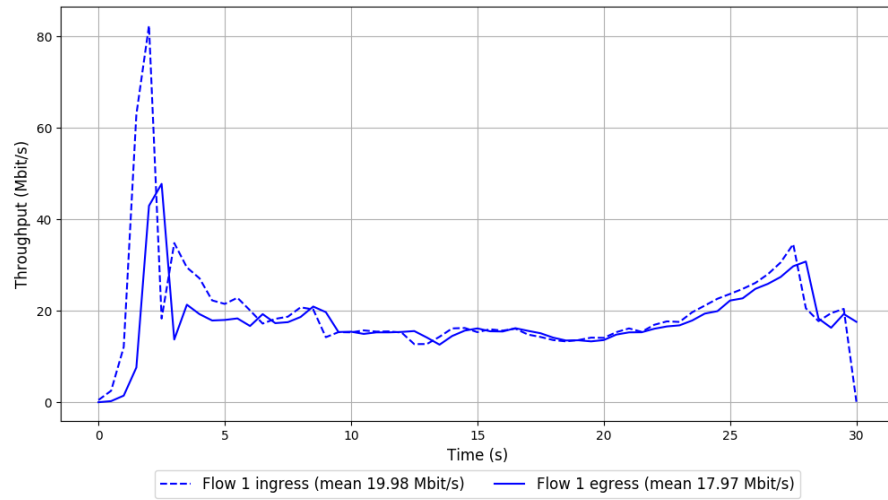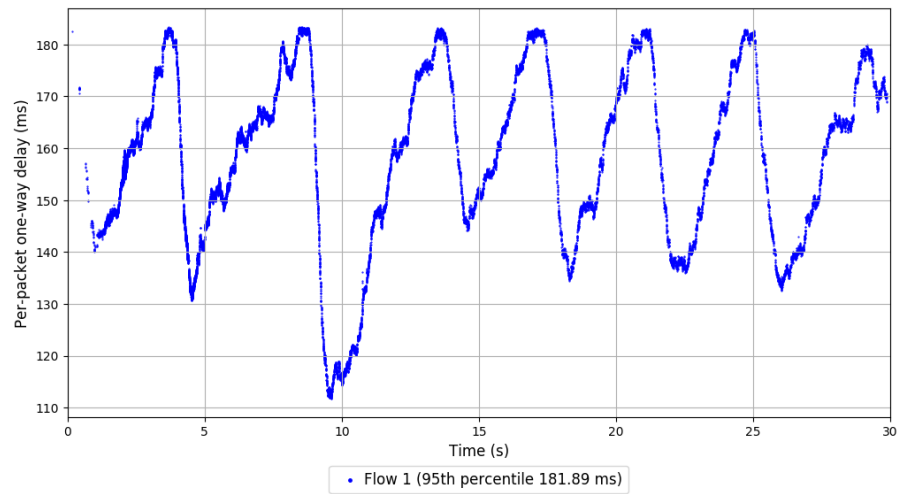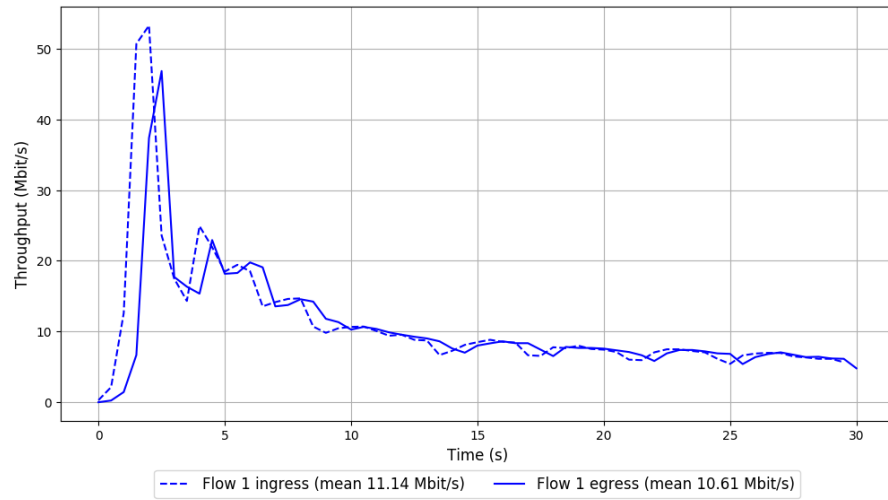
Run 4: Report of Copa — Data Link

```
Run 5: Statistics of Copa

Start at: 2018-10-26 07:46:15
End at: 2018-10-26 07:46:45
Local clock offset: 18.429 ms
Remote clock offset: -9.717 ms


# Below is generated by plot.py at 2018-10-26 08:01:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.53 Mbit/s
95th percentile per-packet one-way delay: 182.655 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 3.53 Mbit/s
95th percentile per-packet one-way delay: 182.655 ms
Loss rate: 0.61%
```
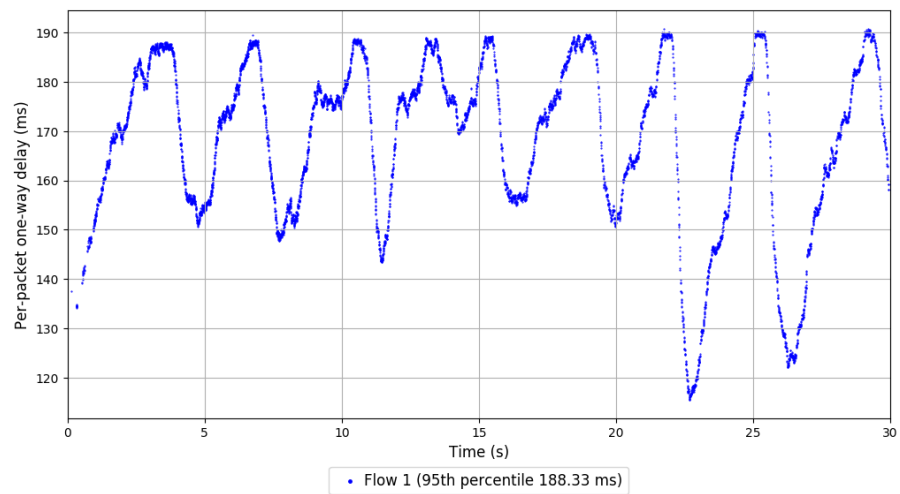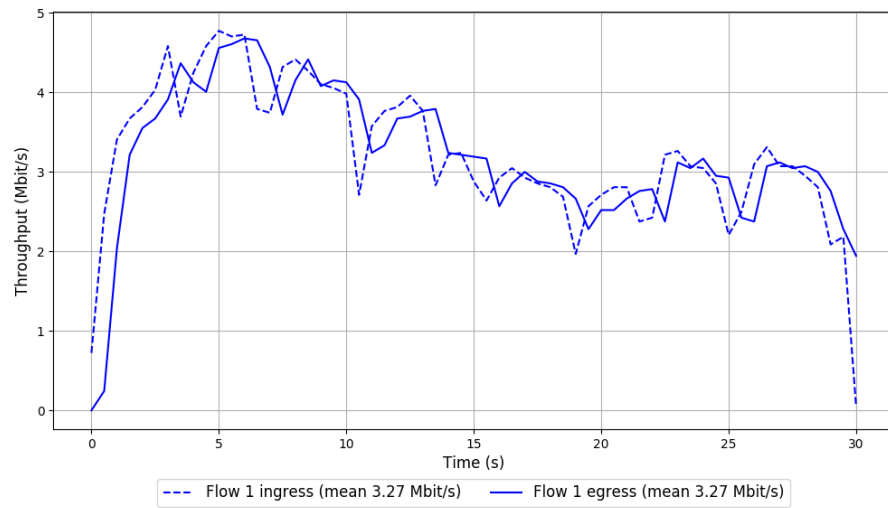
Run 5: Report of Copa — Data Link

```
Run 1: Statistics of TCP Cubic

Start at: 2018-10-26 06:24:53
End at: 2018-10-26 06:25:23
Local clock offset: 1.848 ms
Remote clock offset: -5.3 ms


# Below is generated by plot.py at 2018-10-26 08:01:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 17.97 Mbit/s
95th percentile per-packet one-way delay: 169.378 ms
Loss rate: 10.69%
-- Flow 1:
Average throughput: 17.97 Mbit/s
95th percentile per-packet one-way delay: 169.378 ms
Loss rate: 10.69%
```

Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-10-26 06:47:09
End at: 2018-10-26 06:47:39
Local clock offset: -0.206 ms
Remote clock offset: -39.645 ms


# Below is generated by plot.py at 2018-10-26 08:01:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.61 Mbit/s
95th percentile per-packet one-way delay: 181.890 ms
Loss rate: 5.52%
-- Flow 1:
Average throughput: 10.61 Mbit/s
95th percentile per-packet one-way delay: 181.890 ms
Loss rate: 5.52%
```
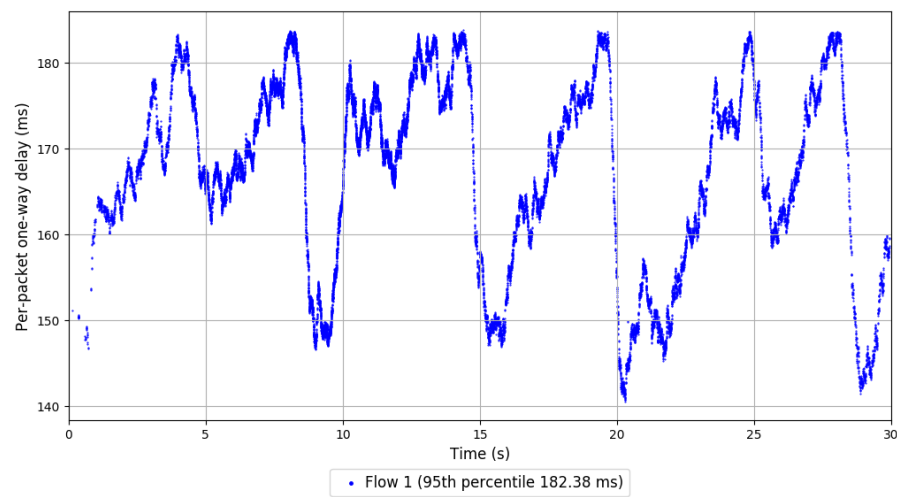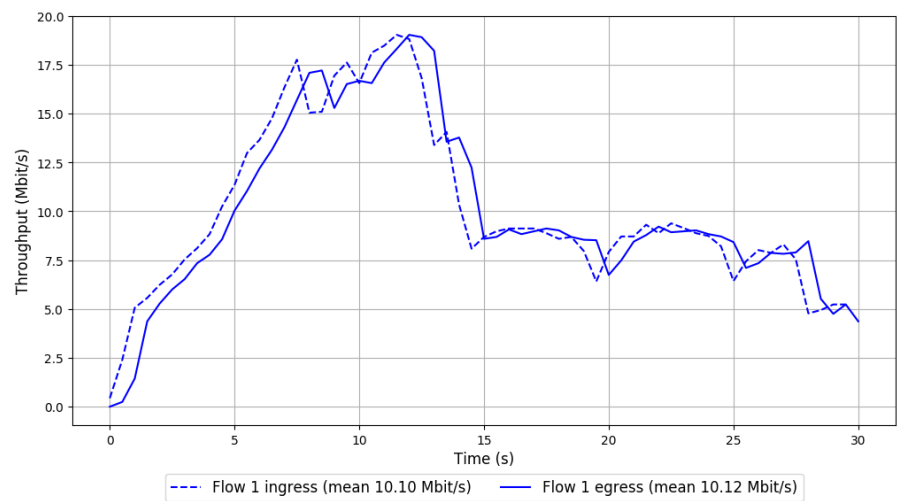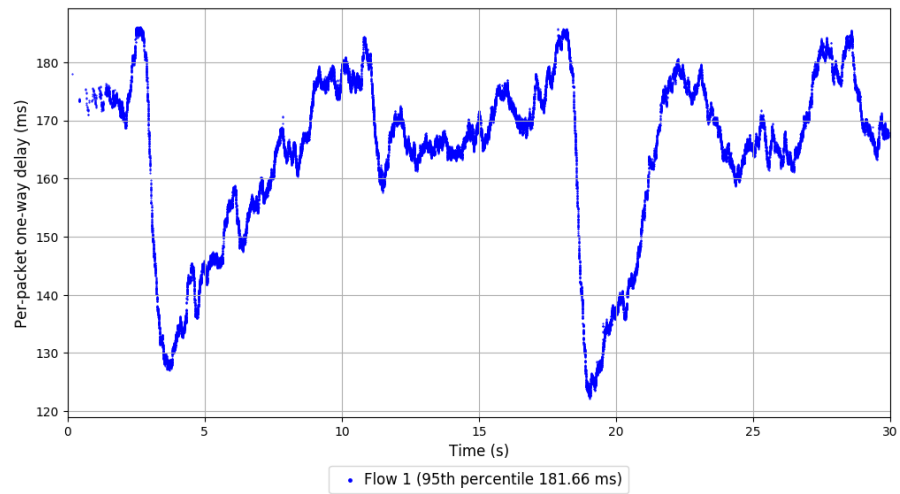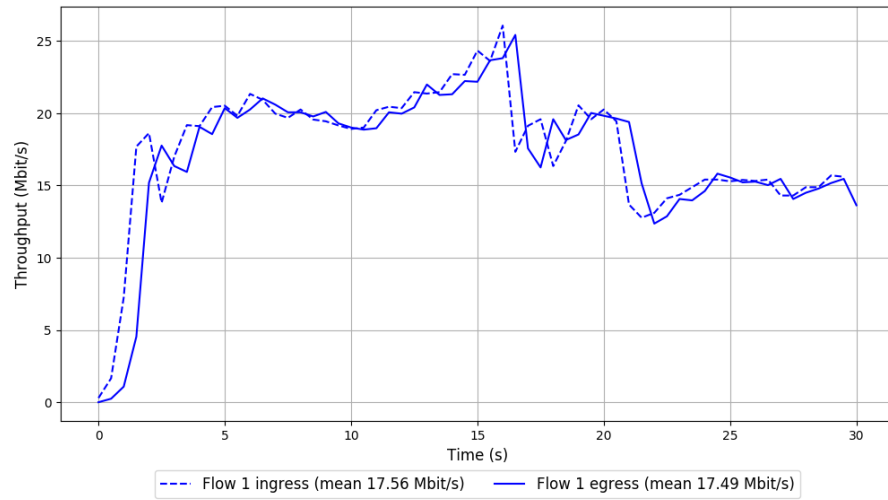
Run 2: Report of TCP Cubic — Data Link



Flow 1 ingress (mean 11.14 Mbit/s) ——— Flow 1 egress (mean 10.61 Mbit/s)



• Flow 1 (95th percentile 181.89 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2018-10-26 07:09:39
End at: 2018-10-26 07:10:09
Local clock offset: 10.156 ms
Remote clock offset: -52.405 ms


# Below is generated by plot.py at 2018-10-26 08:01:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.27 Mbit/s
95th percentile per-packet one-way delay: 188.331 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 3.27 Mbit/s
95th percentile per-packet one-way delay: 188.331 ms
Loss rate: 0.79%
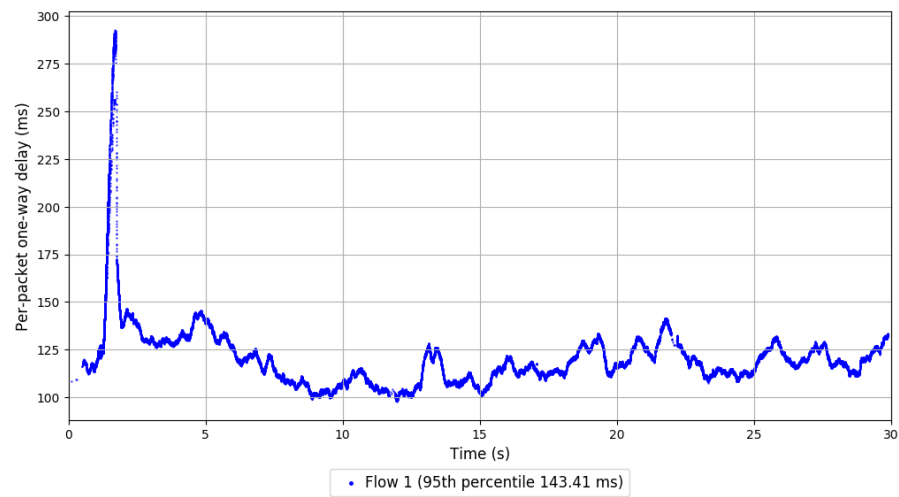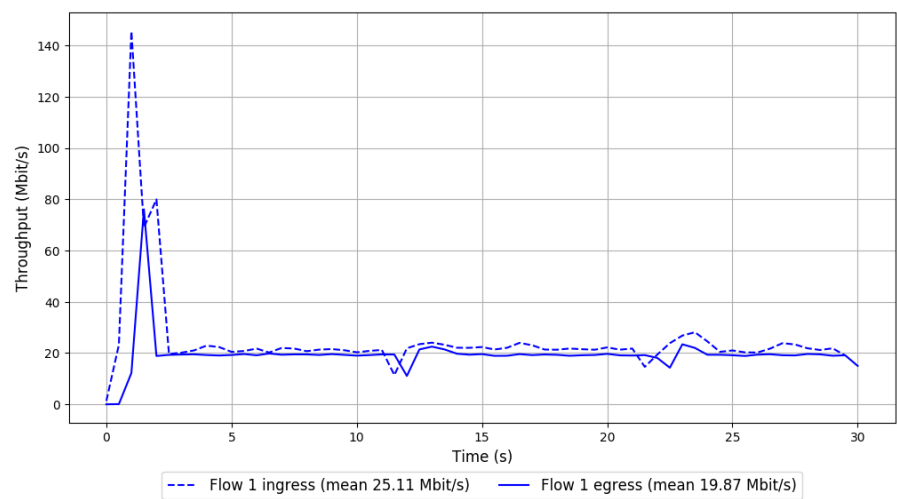```

Run 3: Report of TCP Cubic — Data Link

```
Run 4: Statistics of TCP Cubic

Start at: 2018-10-26 07:32:07
End at: 2018-10-26 07:32:37
Local clock offset: 19.602 ms
Remote clock offset: 0.002 ms

# Below is generated by plot.py at 2018-10-26 08:01:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.12 Mbit/s
95th percentile per-packet one-way delay: 182.378 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 10.12 Mbit/s
95th percentile per-packet one-way delay: 182.378 ms
Loss rate: 0.45%
```
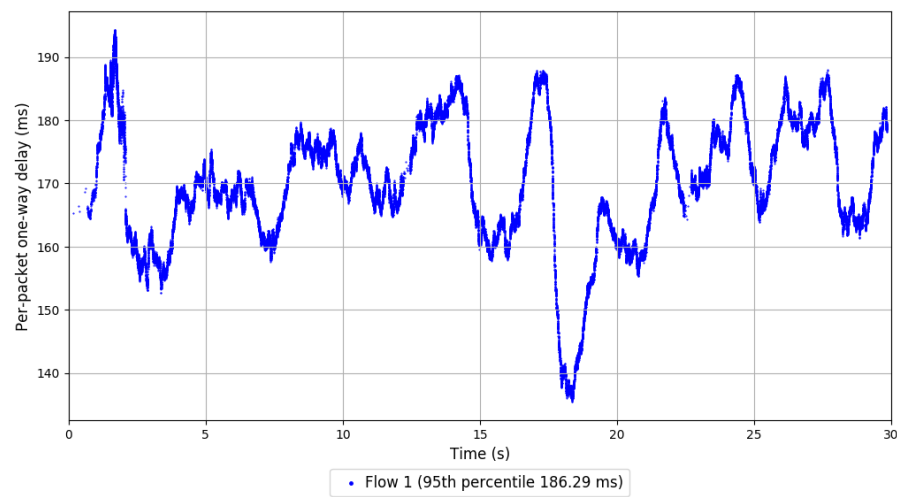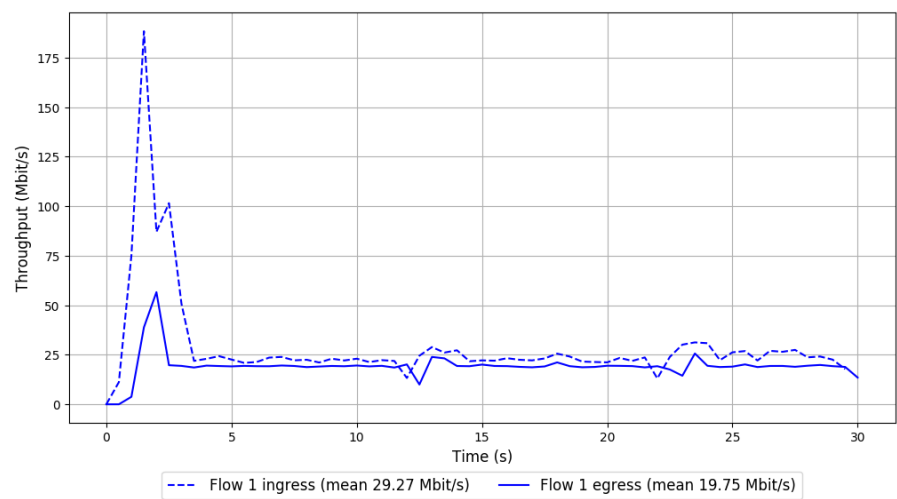
Run 4: Report of TCP Cubic — Data Link

```
Run 5: Statistics of TCP Cubic

Start at: 2018-10-26 07:54:41
End at: 2018-10-26 07:55:11
Local clock offset: 19.099 ms
Remote clock offset: -16.943 ms


# Below is generated by plot.py at 2018-10-26 08:01:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 17.49 Mbit/s
95th percentile per-packet one-way delay: 181.660 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 17.49 Mbit/s
95th percentile per-packet one-way delay: 181.660 ms
Loss rate: 1.18%
```
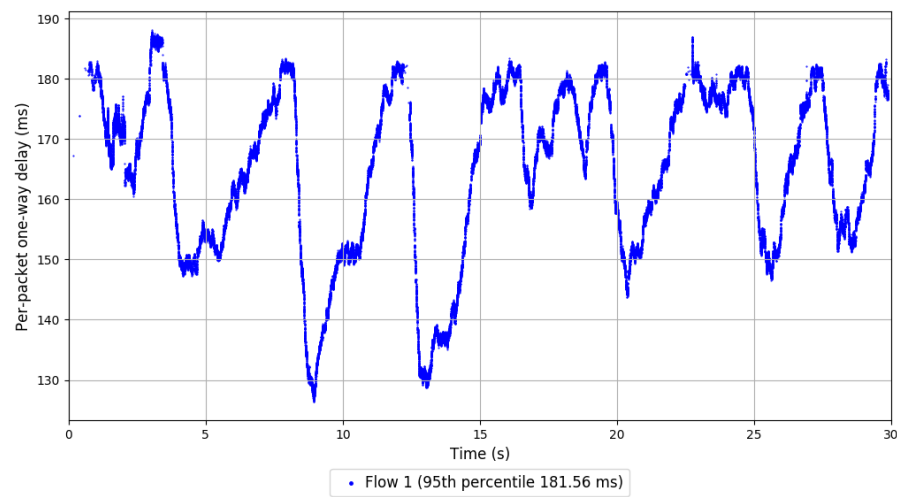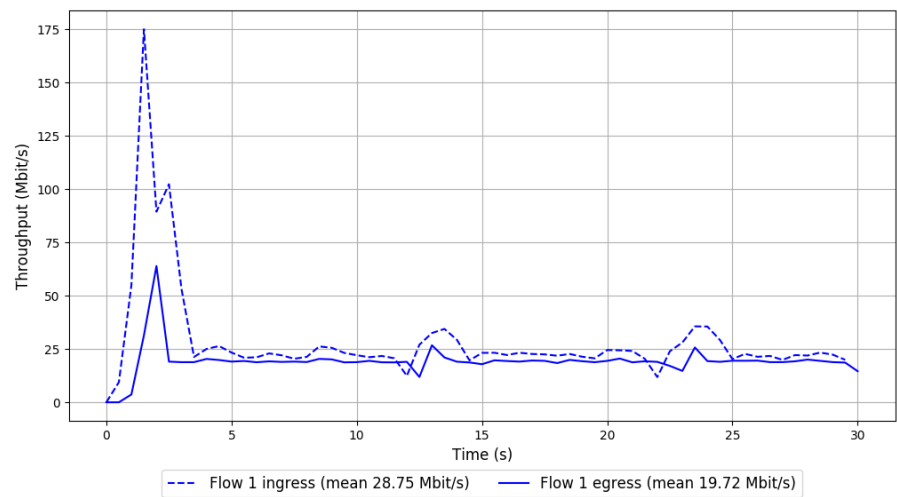
Run 5: Report of TCP Cubic — Data Link

```
Run 1: Statistics of FillP

Start at: 2018-10-26 06:11:27
End at: 2018-10-26 06:11:57
Local clock offset: 4.685 ms
Remote clock offset: 104.059 ms


# Below is generated by plot.py at 2018-10-26 08:01:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 19.87 Mbit/s
95th percentile per-packet one-way delay: 143.406 ms
Loss rate: 21.34%
-- Flow 1:
Average throughput: 19.87 Mbit/s
95th percentile per-packet one-way delay: 143.406 ms
Loss rate: 21.34%
```
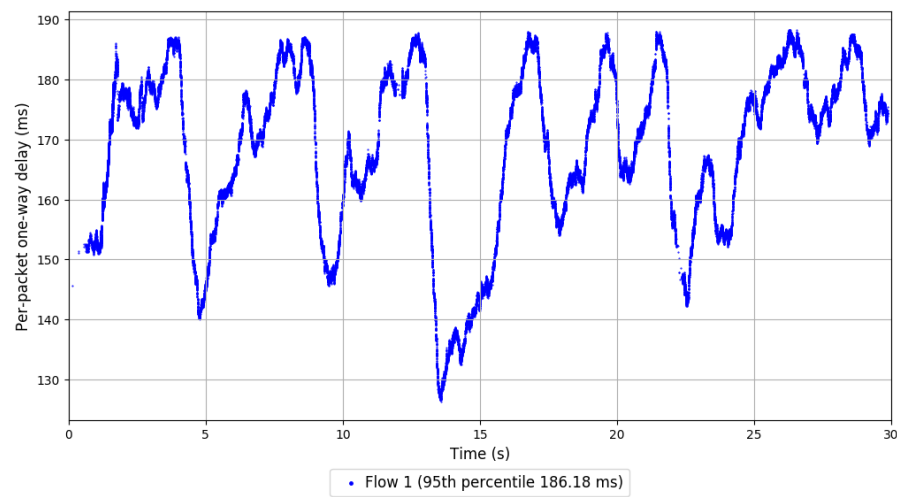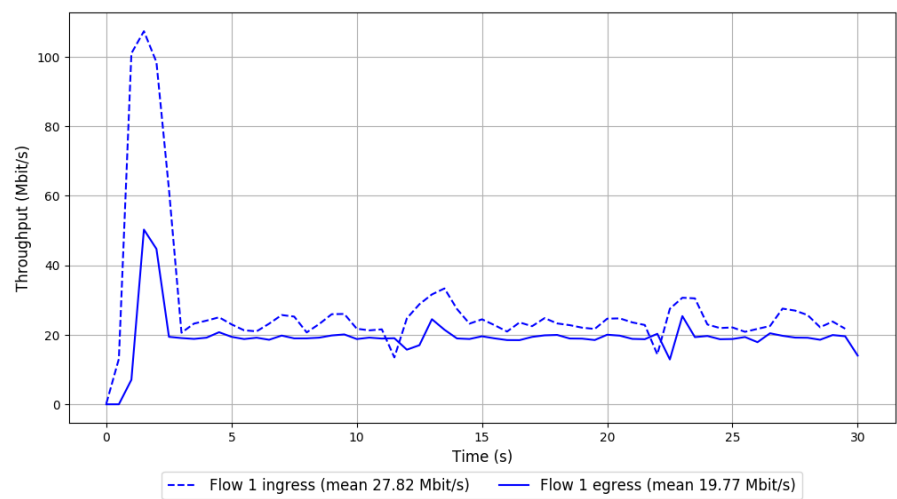
Run 1: Report of FillP — Data Link



Flow 1 ingress (mean 25.11 Mbit/s)    Flow 1 egress (mean 19.87 Mbit/s)



• Flow 1 (95th percentile 143.41 ms)

```
Run 2: Statistics of FillP

Start at: 2018-10-26 06:33:32
End at: 2018-10-26 06:34:02
Local clock offset: 1.098 ms
Remote clock offset: -35.758 ms


# Below is generated by plot.py at 2018-10-26 08:01:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 19.75 Mbit/s
95th percentile per-packet one-way delay: 186.288 ms
Loss rate: 33.02%
-- Flow 1:
Average throughput: 19.75 Mbit/s
95th percentile per-packet one-way delay: 186.288 ms
Loss rate: 33.02%
```

Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-10-26 06:56:00
End at: 2018-10-26 06:56:30
Local clock offset: -0.381 ms
Remote clock offset: -53.679 ms

# Below is generated by plot.py at 2018-10-26 08:01:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 19.72 Mbit/s
95th percentile per-packet one-way delay: 181.563 ms
Loss rate: 31.94%
-- Flow 1:
Average throughput: 19.72 Mbit/s
95th percentile per-packet one-way delay: 181.563 ms
Loss rate: 31.94%
```
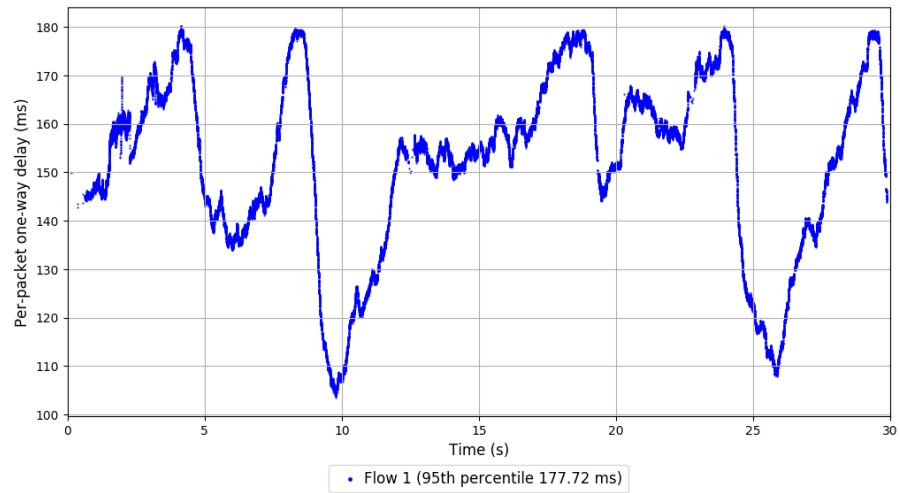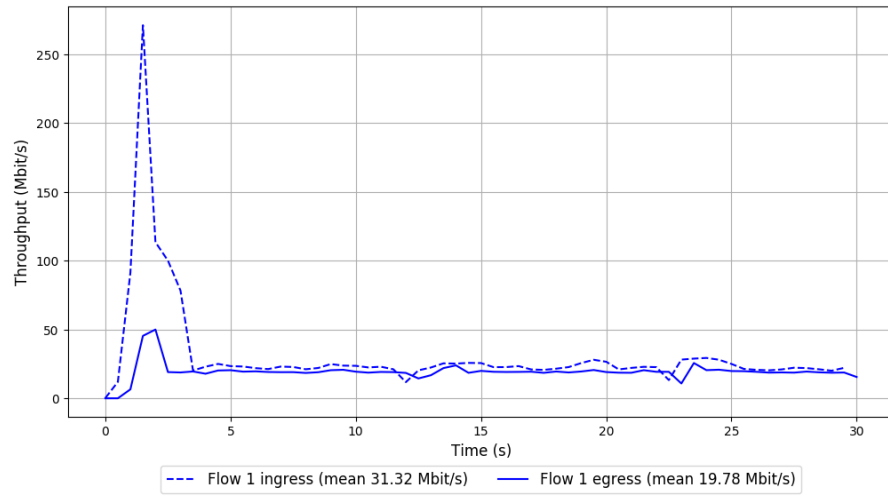
Run 3: Report of FillP — Data Link
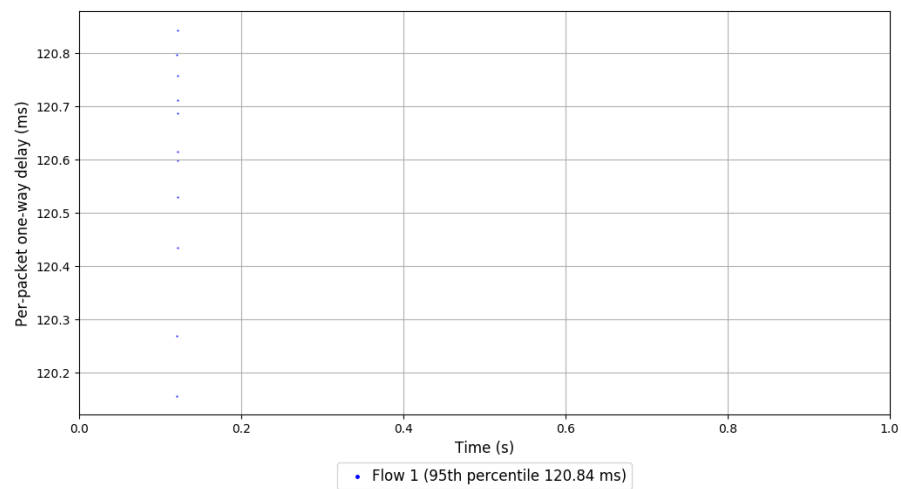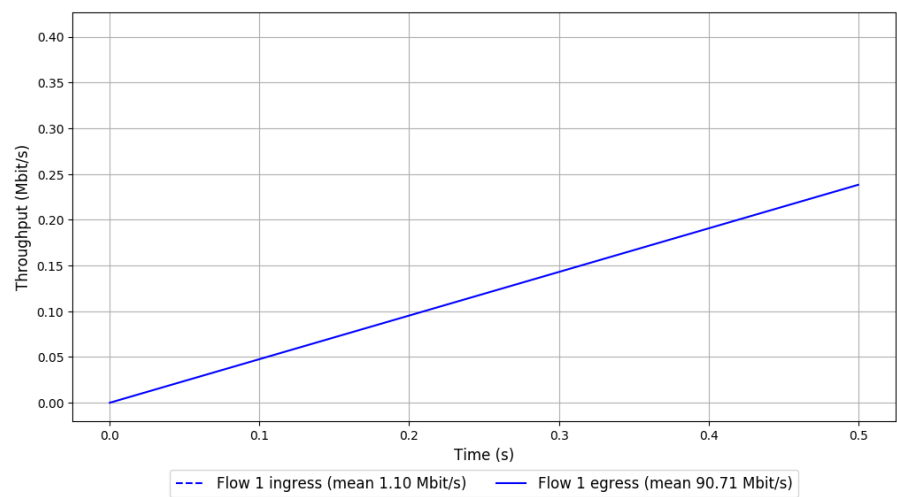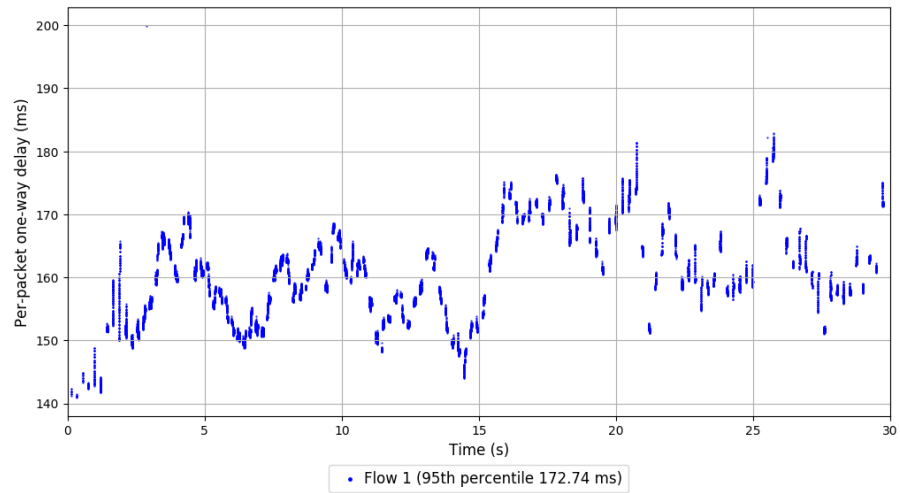
```
Run 4: Statistics of FillP

Start at: 2018-10-26 07:18:33
End at: 2018-10-26 07:19:03
Local clock offset: 15.675 ms
Remote clock offset: -13.996 ms


# Below is generated by plot.py at 2018-10-26 08:01:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 19.77 Mbit/s
95th percentile per-packet one-way delay: 186.182 ms
Loss rate: 29.39%
-- Flow 1:
Average throughput: 19.77 Mbit/s
95th percentile per-packet one-way delay: 186.182 ms
Loss rate: 29.39%
```

Run 4: Report of FillP — Data Link



Flow 1 ingress (mean 27.82 Mbit/s) — — — Flow 1 egress (mean 19.77 Mbit/s) ———
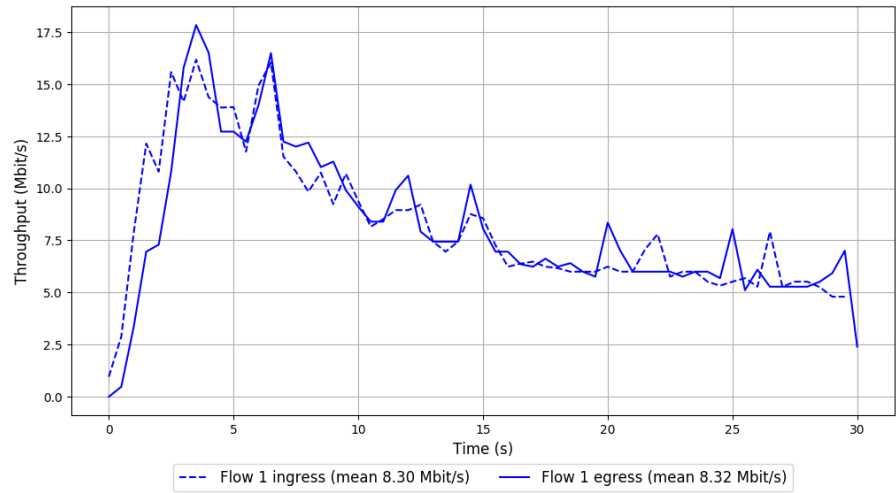


• Flow 1 (95th percentile 186.18 ms)

```
Run 5: Statistics of FillP

Start at: 2018-10-26 07:40:56
End at: 2018-10-26 07:41:26
Local clock offset: 18.273 ms
Remote clock offset: 1.006 ms


# Below is generated by plot.py at 2018-10-26 08:01:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 19.78 Mbit/s
95th percentile per-packet one-way delay: 177.724 ms
Loss rate: 37.33%
-- Flow 1:
Average throughput: 19.78 Mbit/s
95th percentile per-packet one-way delay: 177.724 ms
Loss rate: 37.33%
```
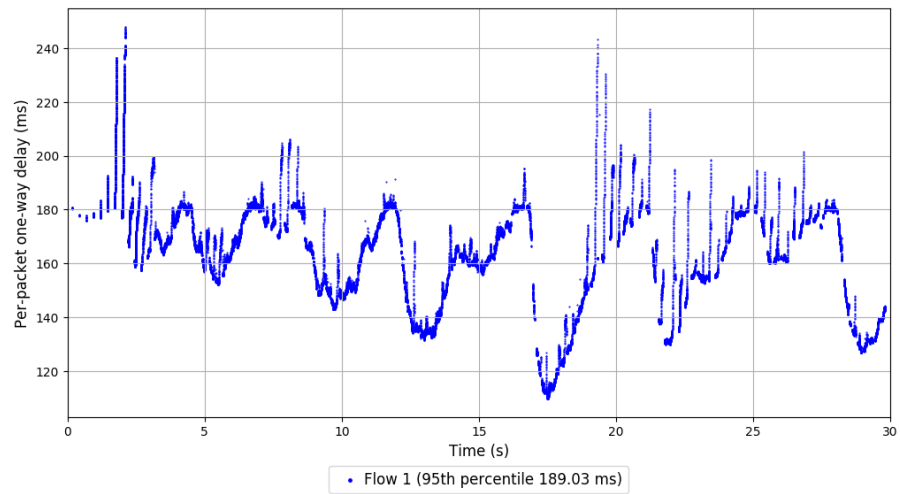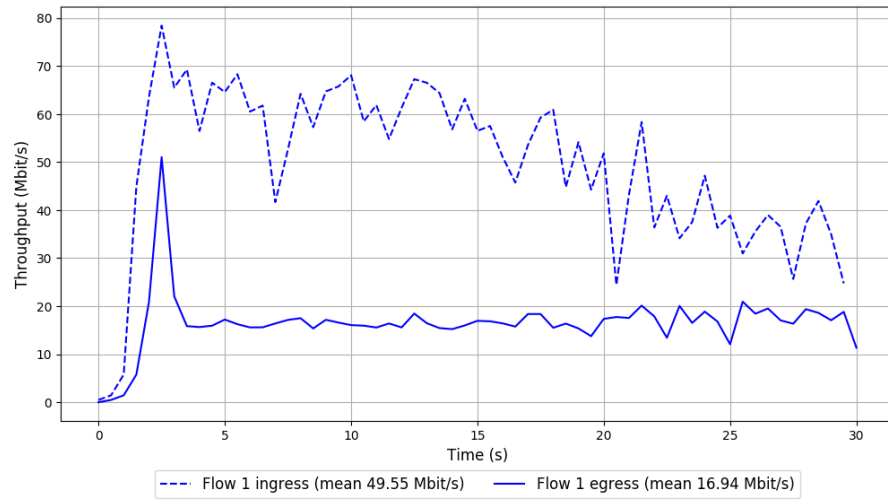
Run 5: Report of FillP — Data Link



Flow 1 ingress (mean 31.32 Mbit/s) — Flow 1 egress (mean 19.78 Mbit/s)



• Flow 1 (95th percentile 177.72 ms)

44

```
Run 1: Statistics of Indigo

Start at: 2018-10-26 06:09:03
End at: 2018-10-26 06:09:34
Local clock offset: 5.702 ms
Remote clock offset: 101.318 ms
```

Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2018-10-26 06:31:03
End at: 2018-10-26 06:31:33
Local clock offset: 1.253 ms
Remote clock offset: -29.438 ms


# Below is generated by plot.py at 2018-10-26 08:01:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.32 Mbit/s
95th percentile per-packet one-way delay: 172.742 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 8.32 Mbit/s
95th percentile per-packet one-way delay: 172.742 ms
Loss rate: 0.49%
```
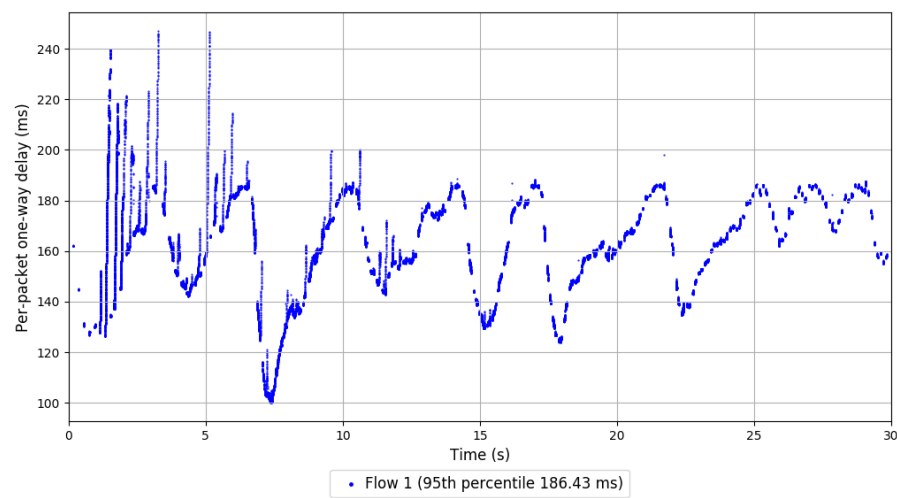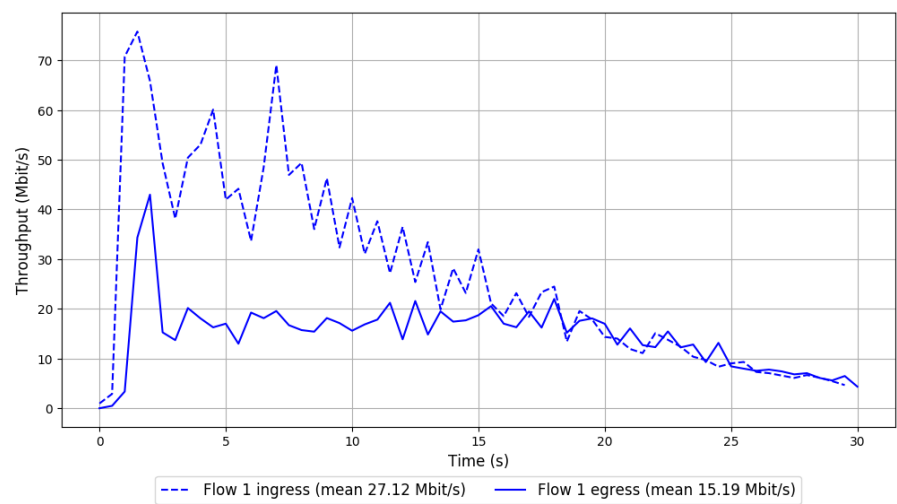
Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2018-10-26 06:53:24
End at: 2018-10-26 06:53:54
Local clock offset: -0.639 ms
Remote clock offset: -48.577 ms


# Below is generated by plot.py at 2018-10-26 08:01:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.94 Mbit/s
95th percentile per-packet one-way delay: 189.026 ms
Loss rate: 66.09%
-- Flow 1:
Average throughput: 16.94 Mbit/s
95th percentile per-packet one-way delay: 189.026 ms
Loss rate: 66.09%
```
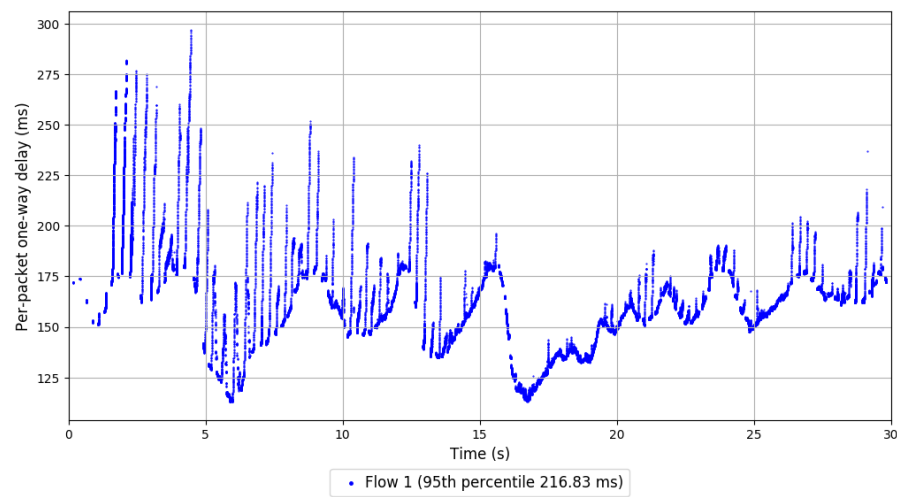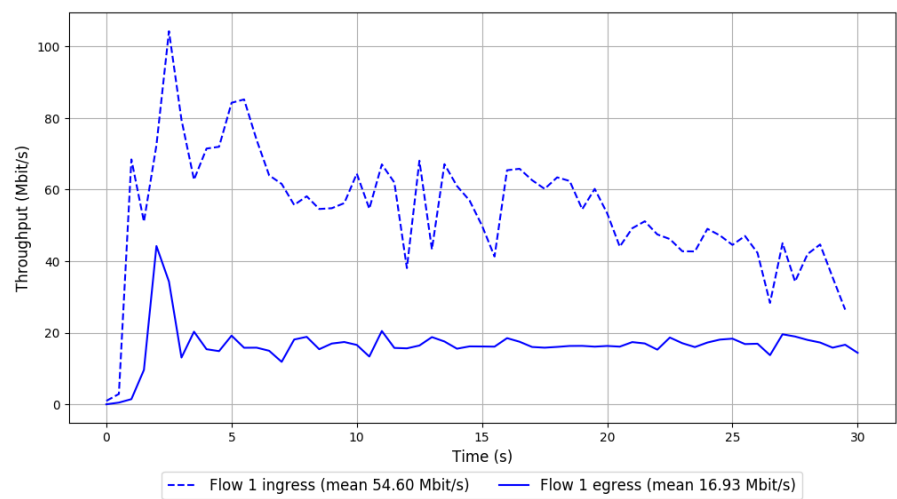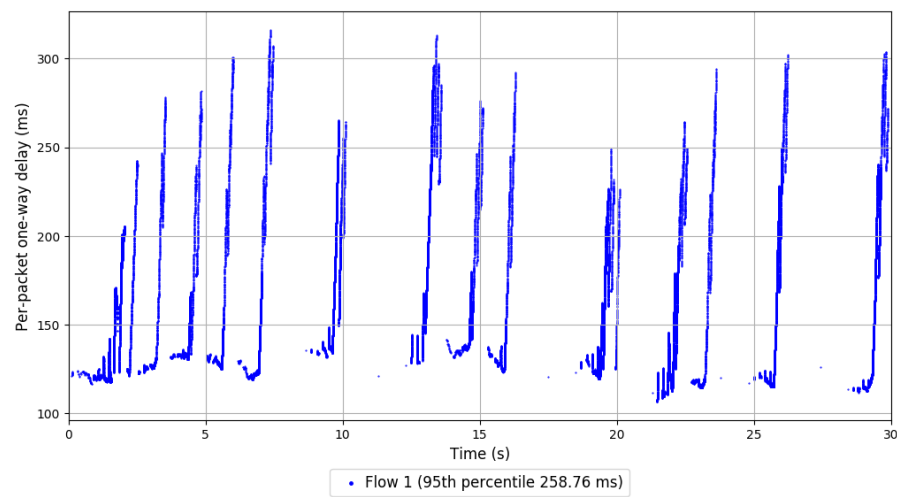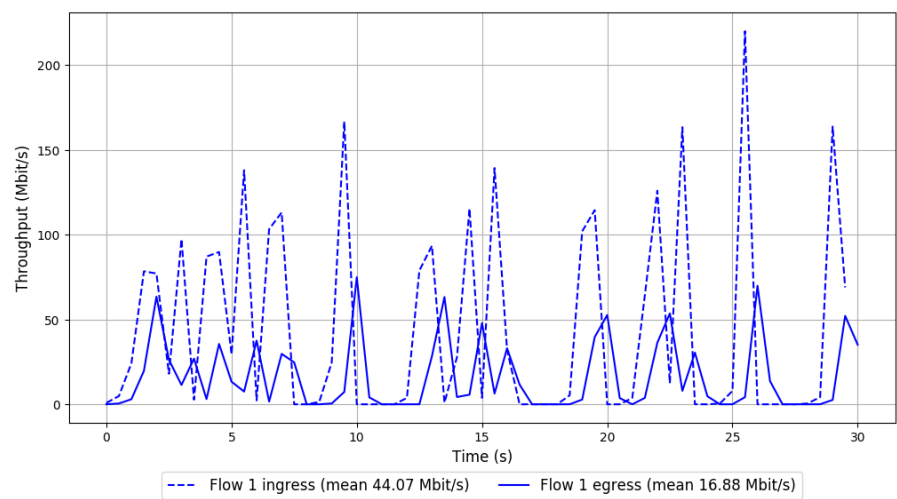
Run 3: Report of Indigo — Data Link

```
Run 4: Statistics of Indigo

Start at: 2018-10-26 07:15:57
End at: 2018-10-26 07:16:27
Local clock offset: 14.501 ms
Remote clock offset: -19.371 ms


# Below is generated by plot.py at 2018-10-26 08:01:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.19 Mbit/s
95th percentile per-packet one-way delay: 186.429 ms
Loss rate: 44.40%
-- Flow 1:
Average throughput: 15.19 Mbit/s
95th percentile per-packet one-way delay: 186.429 ms
Loss rate: 44.40%
```
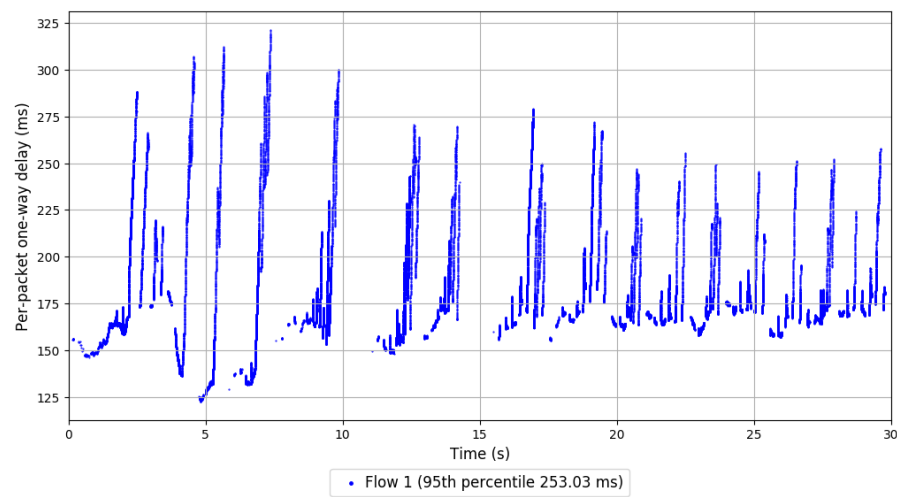
Run 4: Report of Indigo — Data Link

```
Run 5: Statistics of Indigo

Start at: 2018-10-26 07:38:19
End at: 2018-10-26 07:38:49
Local clock offset: 18.501 ms
Remote clock offset: 1.619 ms


# Below is generated by plot.py at 2018-10-26 08:01:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.93 Mbit/s
95th percentile per-packet one-way delay: 216.826 ms
Loss rate: 69.23%
-- Flow 1:
Average throughput: 16.93 Mbit/s
95th percentile per-packet one-way delay: 216.826 ms
Loss rate: 69.23%
```

Run 5: Report of Indigo — Data Link



Flow 1 ingress (mean 54.60 Mbit/s) --- Flow 1 egress (mean 16.93 Mbit/s)
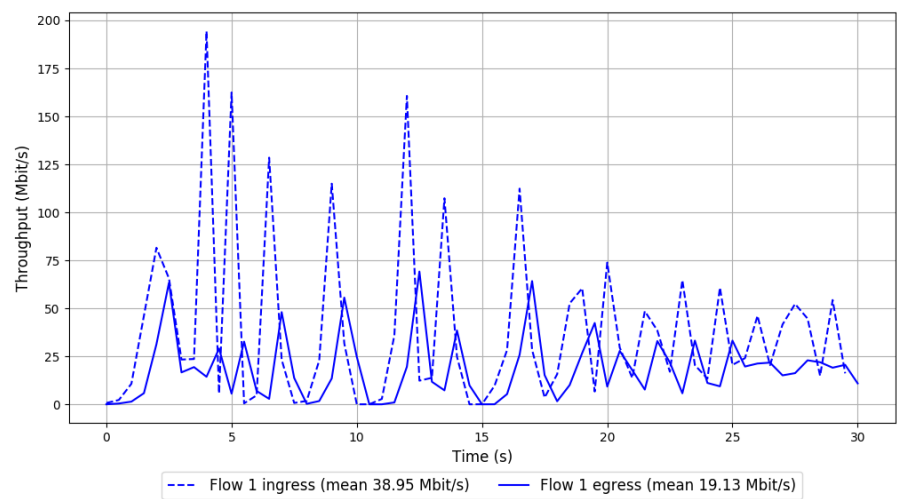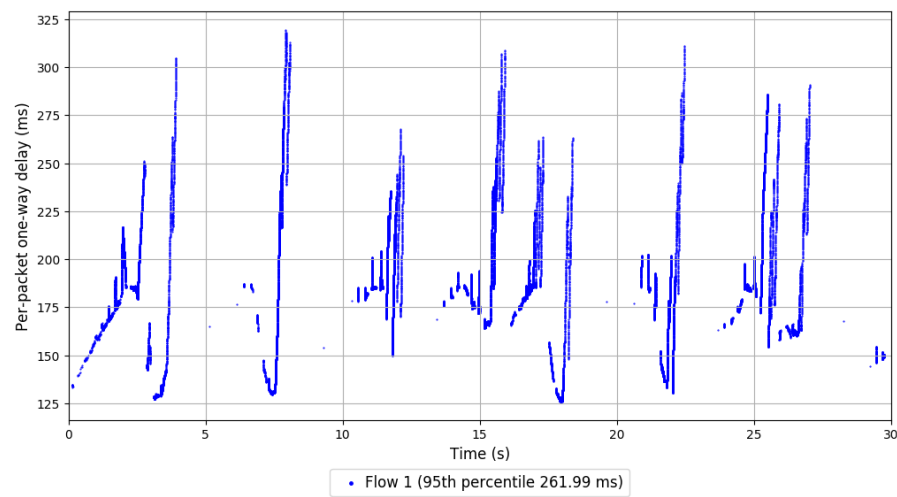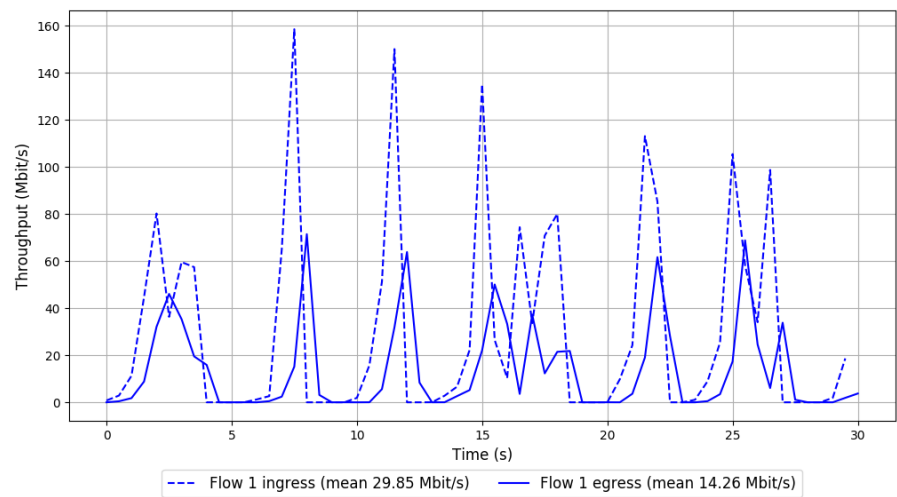


Flow 1 (95th percentile 216.83 ms)

54

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

Start at: 2018-10-26 06:15:13
End at: 2018-10-26 06:15:43
Local clock offset: 3.365 ms
Remote clock offset: 110.163 ms

# Below is generated by plot.py at 2018-10-26 08:01:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.88 Mbit/s
95th percentile per-packet one-way delay: 258.760 ms
Loss rate: 61.53%
-- Flow 1:
Average throughput: 16.88 Mbit/s
95th percentile per-packet one-way delay: 258.760 ms
Loss rate: 61.53%
```
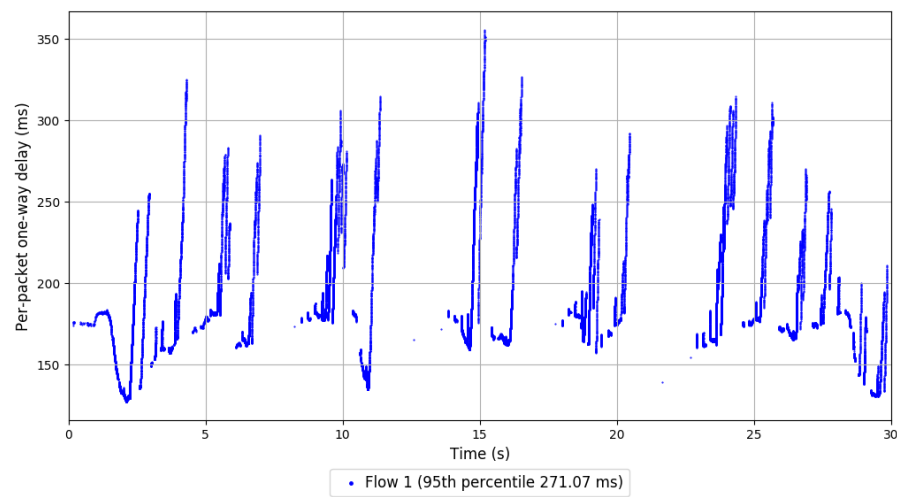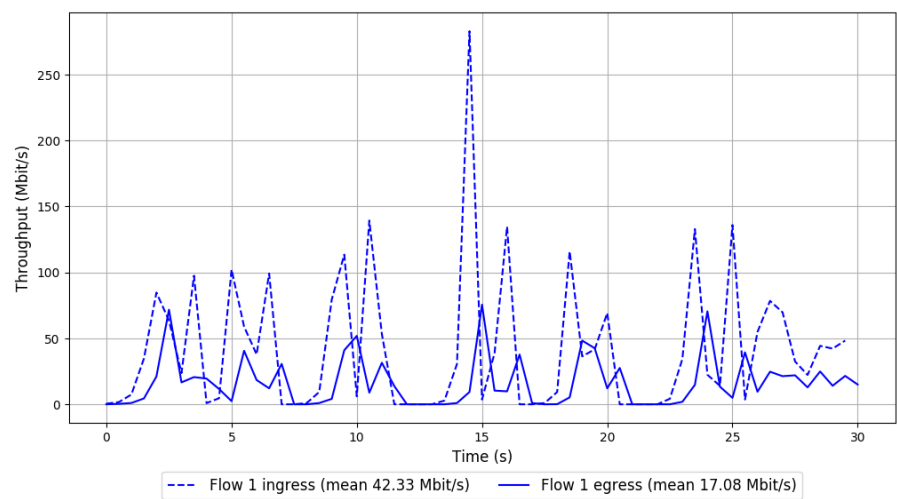
Run 1: Report of Indigo-96d2da3 — Data Link

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

Start at: 2018-10-26 06:37:22
End at: 2018-10-26 06:37:52
Local clock offset: 0.667 ms
Remote clock offset: -31.815 ms


# Below is generated by plot.py at 2018-10-26 08:01:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 19.13 Mbit/s
95th percentile per-packet one-way delay: 253.035 ms
Loss rate: 51.43%
-- Flow 1:
Average throughput: 19.13 Mbit/s
95th percentile per-packet one-way delay: 253.035 ms
Loss rate: 51.43%
```

Run 2: Report of Indigo-96d2da3 — Data Link



Flow 1 ingress (mean 38.95 Mbit/s)    Flow 1 egress (mean 19.13 Mbit/s)



Flow 1 (95th percentile 253.03 ms)

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

Start at: 2018-10-26 06:59:54
End at: 2018-10-26 07:00:24
Local clock offset: -0.942 ms
Remote clock offset: -64.781 ms


# Below is generated by plot.py at 2018-10-26 08:01:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 14.26 Mbit/s
95th percentile per-packet one-way delay: 261.986 ms
Loss rate: 52.66%
-- Flow 1:
Average throughput: 14.26 Mbit/s
95th percentile per-packet one-way delay: 261.986 ms
Loss rate: 52.66%
```
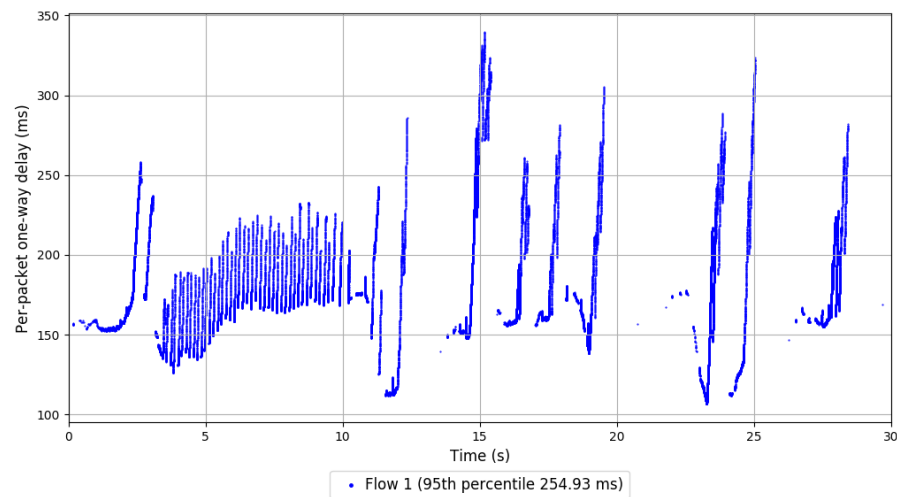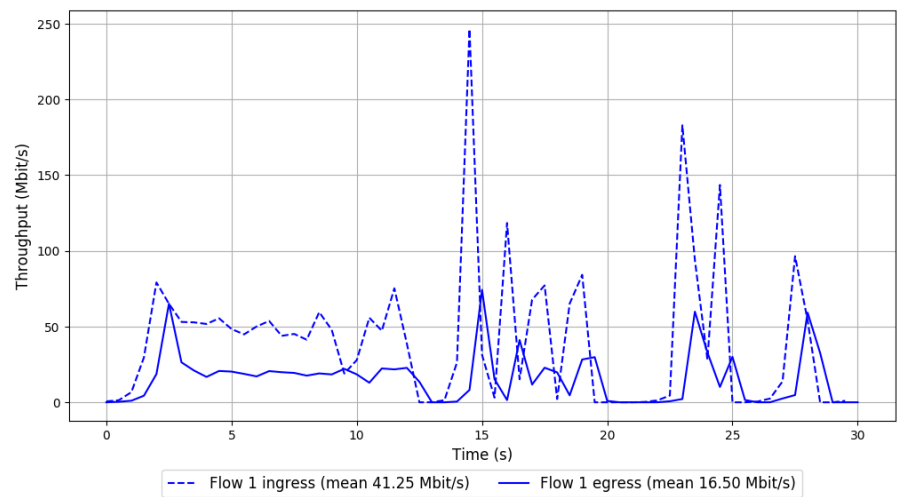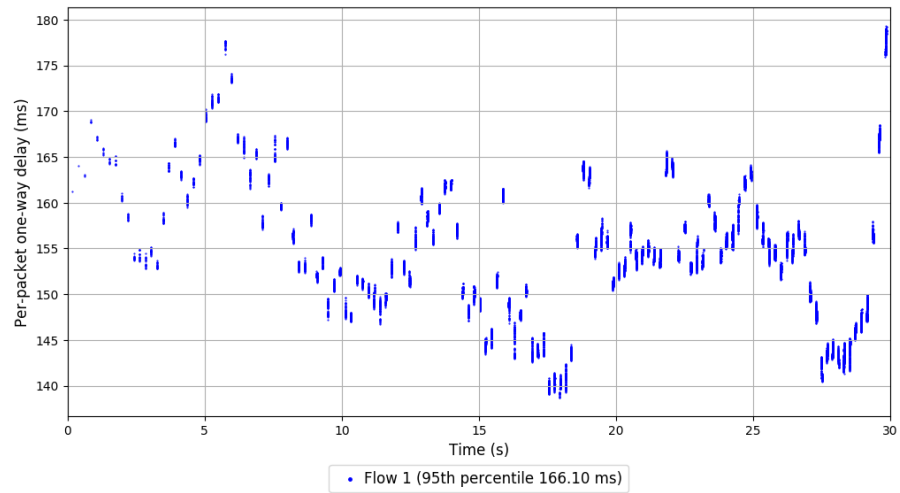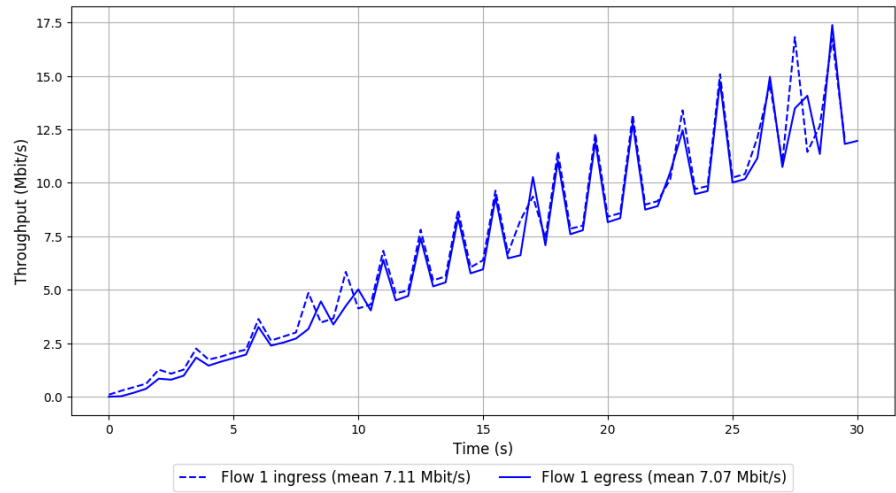
Run 3: Report of Indigo-96d2da3 — Data Link

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

Start at: 2018-10-26 07:22:20
End at: 2018-10-26 07:22:50
Local clock offset: 17.026 ms
Remote clock offset: -3.569 ms


# Below is generated by plot.py at 2018-10-26 08:01:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 17.08 Mbit/s
95th percentile per-packet one-way delay: 271.066 ms
Loss rate: 59.84%
-- Flow 1:
Average throughput: 17.08 Mbit/s
95th percentile per-packet one-way delay: 271.066 ms
Loss rate: 59.84%
```
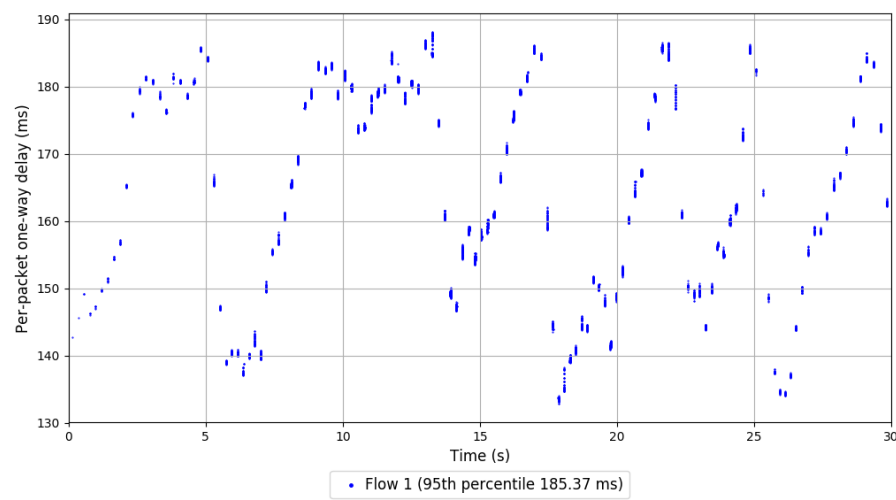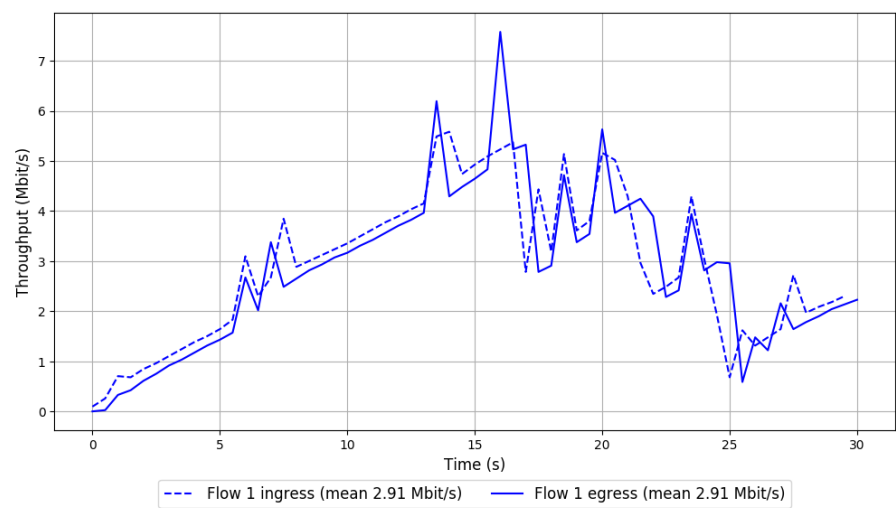
Run 4: Report of Indigo-96d2da3 — Data Link

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

Start at: 2018-10-26 07:44:56
End at: 2018-10-26 07:45:26
Local clock offset: 18.37 ms
Remote clock offset: 0.309 ms


# Below is generated by plot.py at 2018-10-26 08:01:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.50 Mbit/s
95th percentile per-packet one-way delay: 254.926 ms
Loss rate: 60.31%
-- Flow 1:
Average throughput: 16.50 Mbit/s
95th percentile per-packet one-way delay: 254.926 ms
Loss rate: 60.31%
```

Run 5: Report of Indigo-96d2da3 — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2018-10-26 06:26:09
End at: 2018-10-26 06:26:39
Local clock offset: 1.721 ms
Remote clock offset: -13.103 ms

# Below is generated by plot.py at 2018-10-26 08:01:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.07 Mbit/s
95th percentile per-packet one-way delay: 166.097 ms
Loss rate: 1.42%
-- Flow 1:
Average throughput: 7.07 Mbit/s
95th percentile per-packet one-way delay: 166.097 ms
Loss rate: 1.42%
```
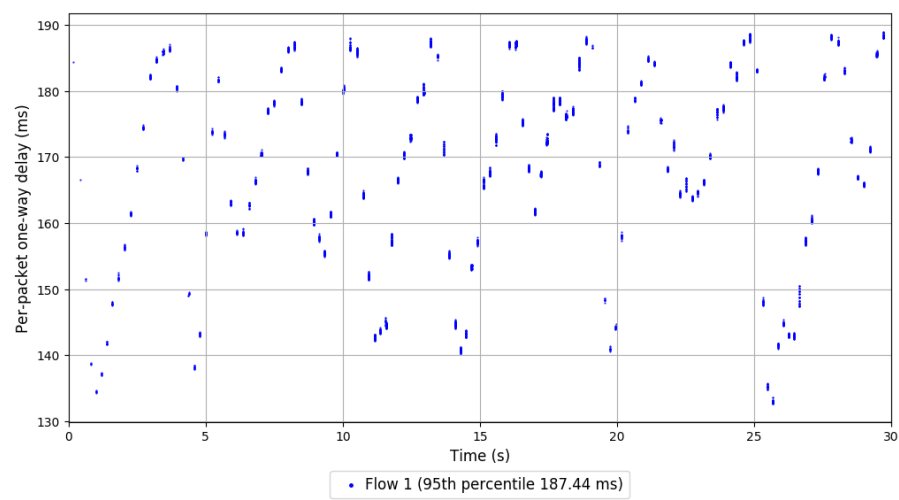
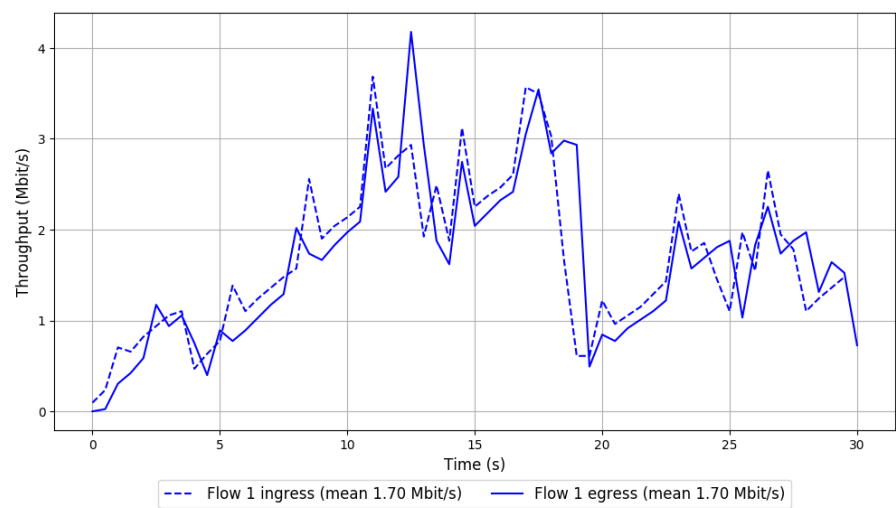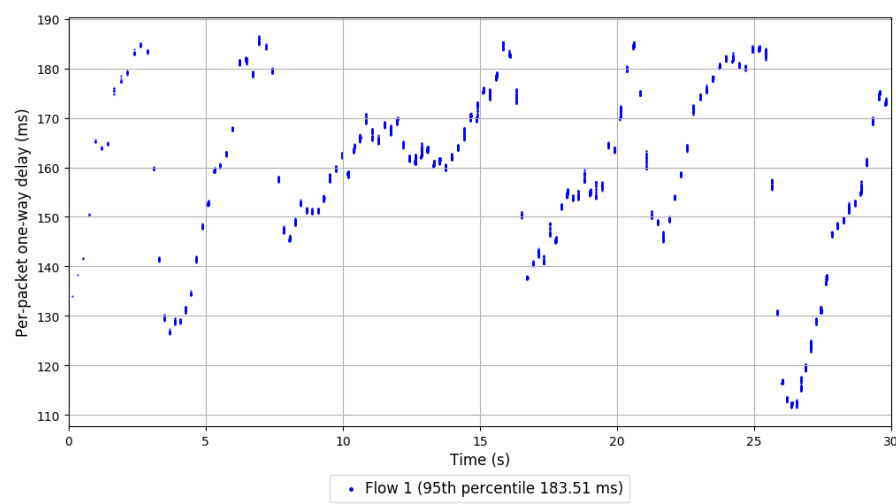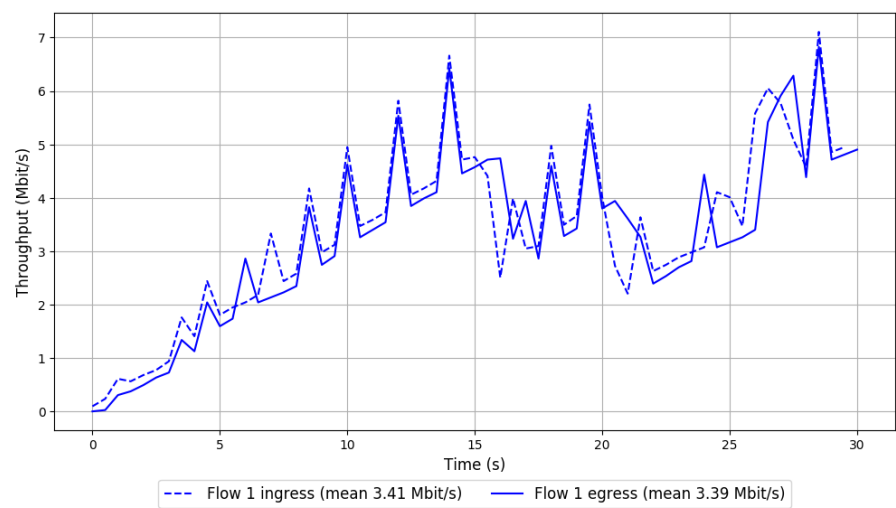Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-10-26 06:48:27
End at: 2018-10-26 06:48:57
Local clock offset: -0.344 ms
Remote clock offset: -44.875 ms

# Below is generated by plot.py at 2018-10-26 08:01:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 185.374 ms
Loss rate: 0.85%
-- Flow 1:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 185.374 ms
Loss rate: 0.85%
```

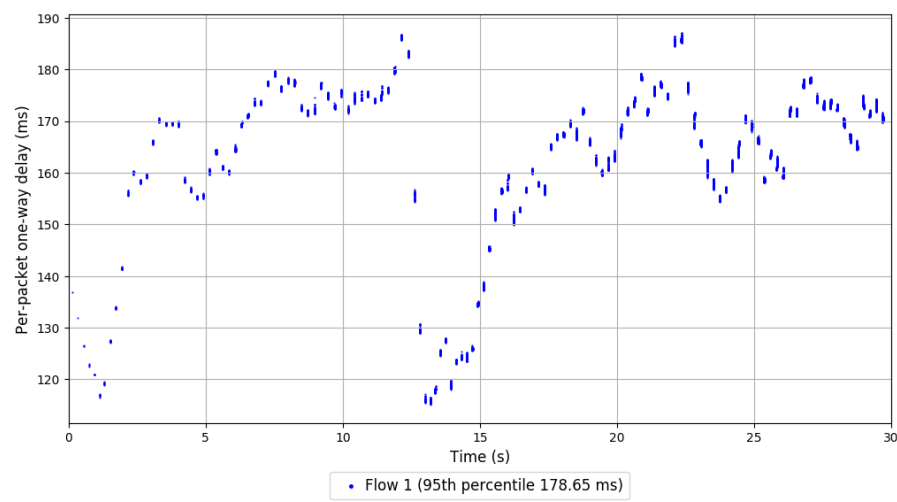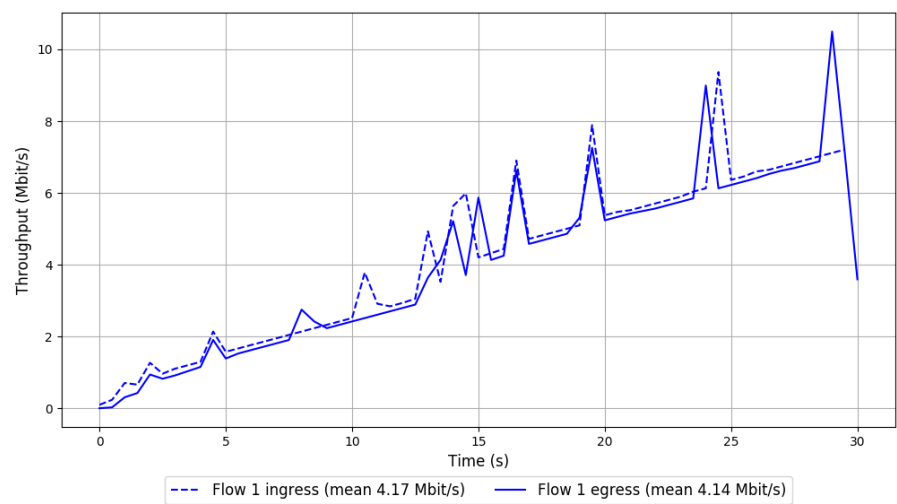Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2018-10-26 07:10:51
End at: 2018-10-26 07:11:21
Local clock offset: 11.164 ms
Remote clock offset: -43.12 ms


# Below is generated by plot.py at 2018-10-26 08:01:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 187.437 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 187.437 ms
Loss rate: 1.13%
```
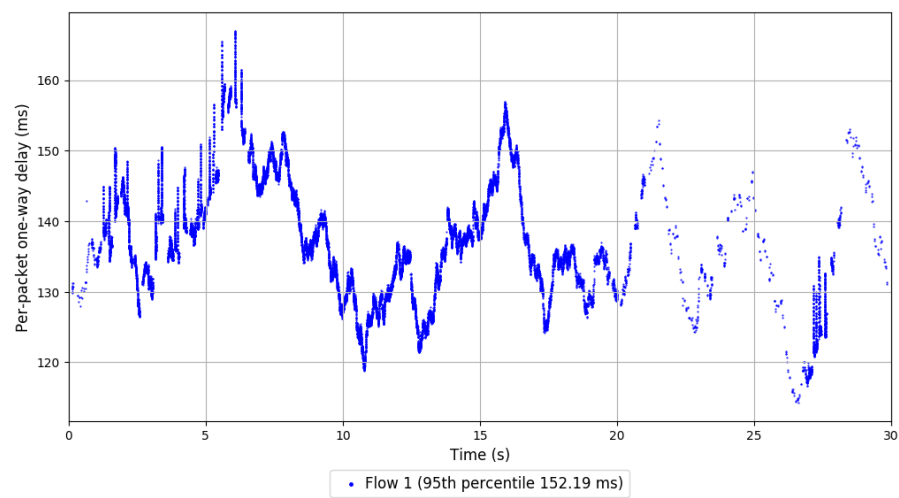
# Run 3: Report of LEDBAT — Data Link

```
Run 4: Statistics of LEDBAT

Start at: 2018-10-26 07:33:21
End at: 2018-10-26 07:33:51
Local clock offset: 19.402 ms
Remote clock offset: -1.982 ms


# Below is generated by plot.py at 2018-10-26 08:01:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.39 Mbit/s
95th percentile per-packet one-way delay: 183.508 ms
Loss rate: 1.29%
-- Flow 1:
Average throughput: 3.39 Mbit/s
95th percentile per-packet one-way delay: 183.508 ms
Loss rate: 1.29%
```

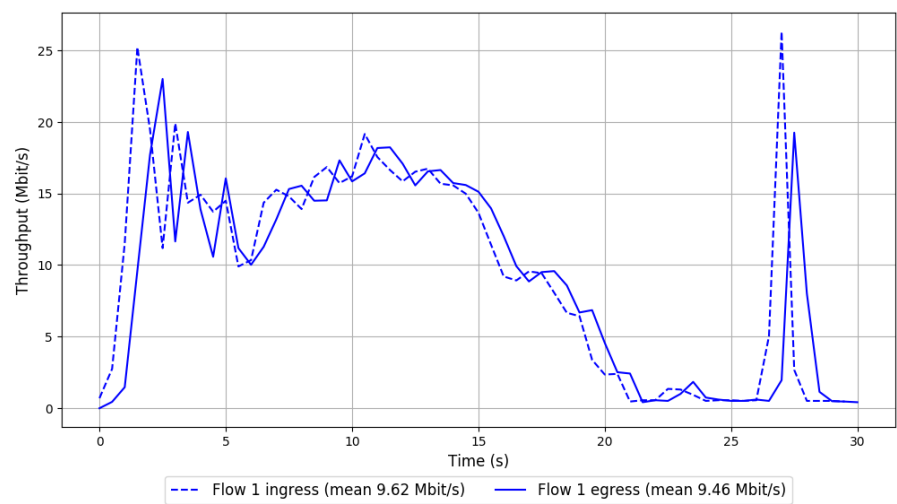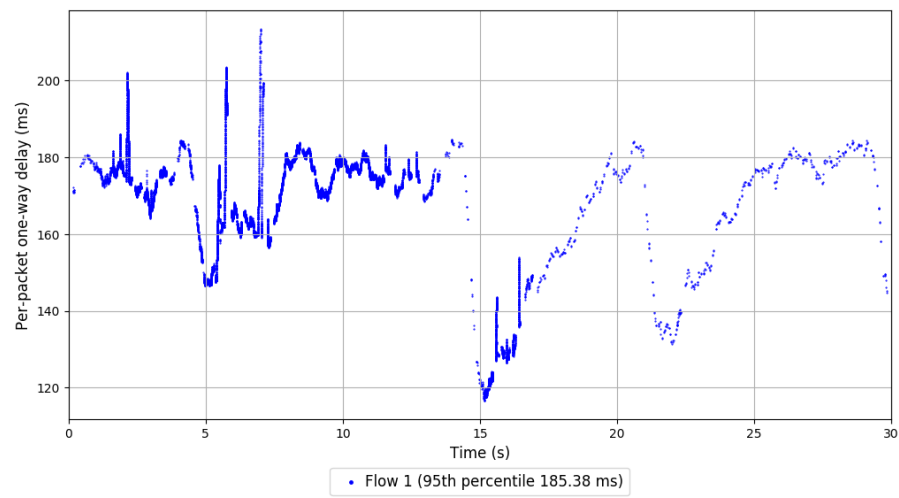# Run 4: Report of LEDBAT — Data Link



Flow 1 ingress (mean 3.41 Mbit/s)     Flow 1 egress (mean 3.39 Mbit/s)



Flow 1 (95th percentile 183.51 ms)

```
Run 5: Statistics of LEDBAT

Start at: 2018-10-26 07:55:59
End at: 2018-10-26 07:56:29
Local clock offset: 19.154 ms
Remote clock offset: -18.568 ms


# Below is generated by plot.py at 2018-10-26 08:01:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.14 Mbit/s
95th percentile per-packet one-way delay: 178.647 ms
Loss rate: 1.45%
-- Flow 1:
Average throughput: 4.14 Mbit/s
95th percentile per-packet one-way delay: 178.647 ms
Loss rate: 1.45%
```
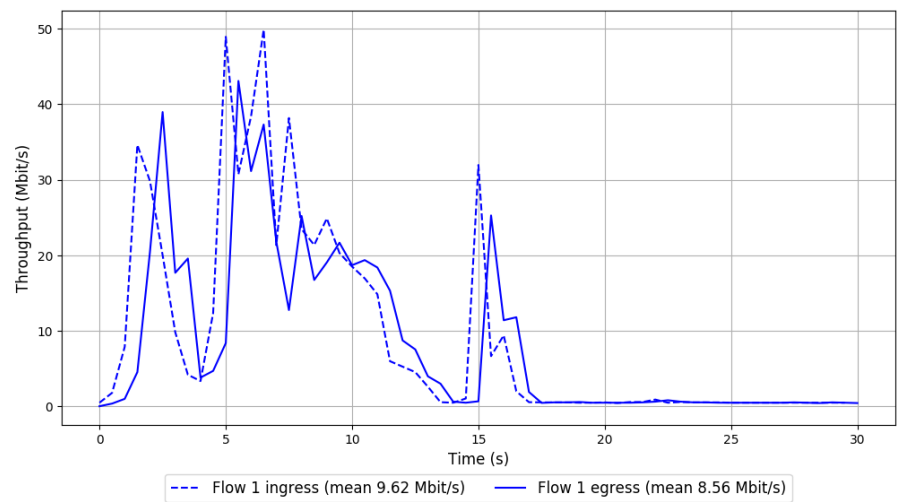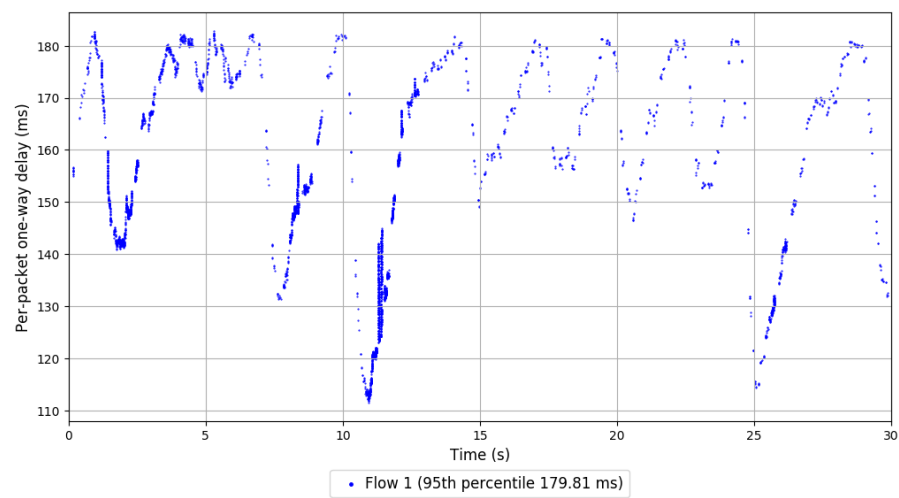
# Run 5: Report of LEDBAT — Data Link

```
Run 1: Statistics of Indigo-Muses

Start at: 2018-10-26 06:20:05
End at: 2018-10-26 06:20:35
Local clock offset: 2.601 ms
Remote clock offset: 35.573 ms


# Below is generated by plot.py at 2018-10-26 08:01:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.46 Mbit/s
95th percentile per-packet one-way delay: 152.191 ms
Loss rate: 2.31%
-- Flow 1:
Average throughput: 9.46 Mbit/s
95th percentile per-packet one-way delay: 152.191 ms
Loss rate: 2.31%
```
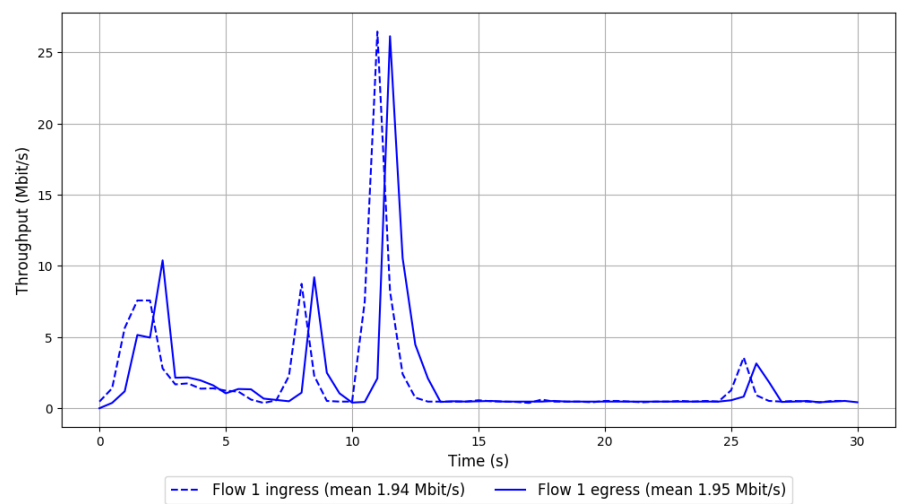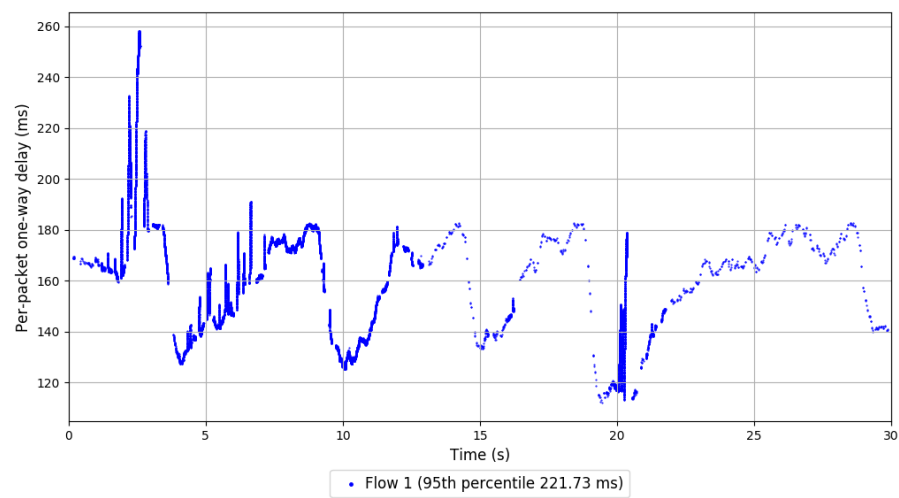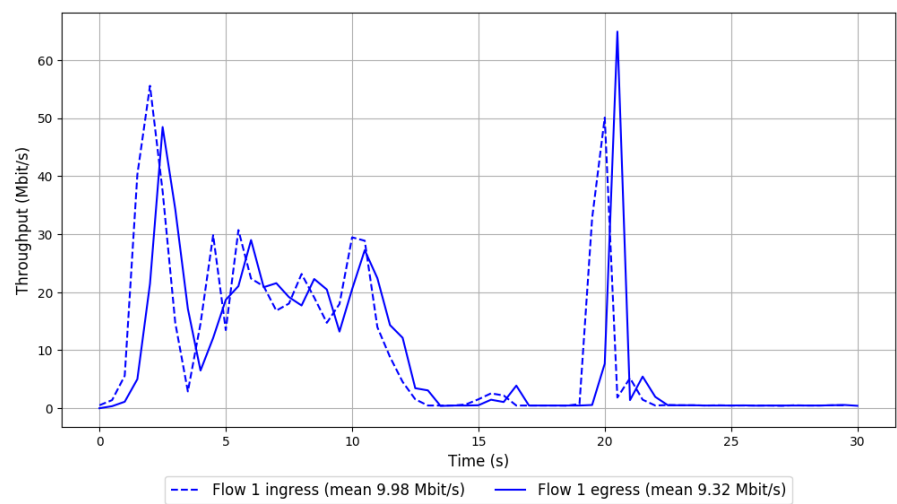
Run 1: Report of Indigo-Muses — Data Link

```
Run 2: Statistics of Indigo-Muses

Start at: 2018-10-26 06:42:16
End at: 2018-10-26 06:42:46
Local clock offset: 0.202 ms
Remote clock offset: -34.842 ms


# Below is generated by plot.py at 2018-10-26 08:01:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.56 Mbit/s
95th percentile per-packet one-way delay: 185.378 ms
Loss rate: 11.70%
-- Flow 1:
Average throughput: 8.56 Mbit/s
95th percentile per-packet one-way delay: 185.378 ms
Loss rate: 11.70%
```
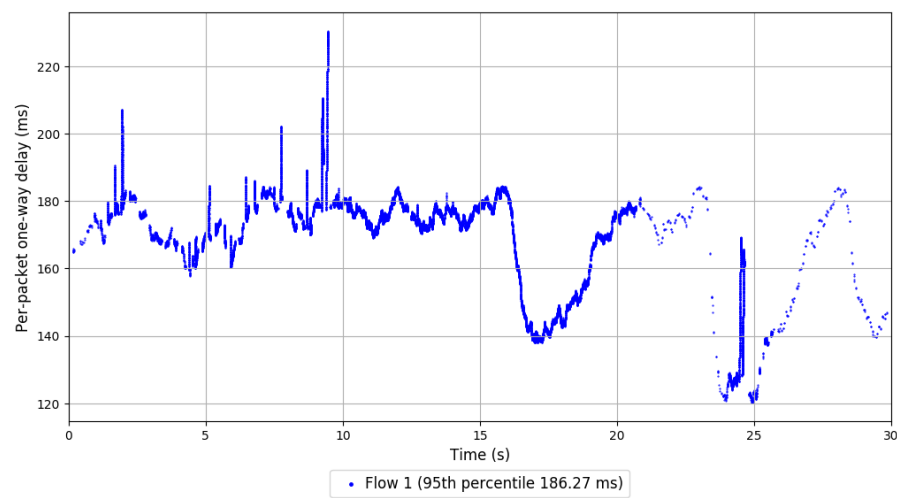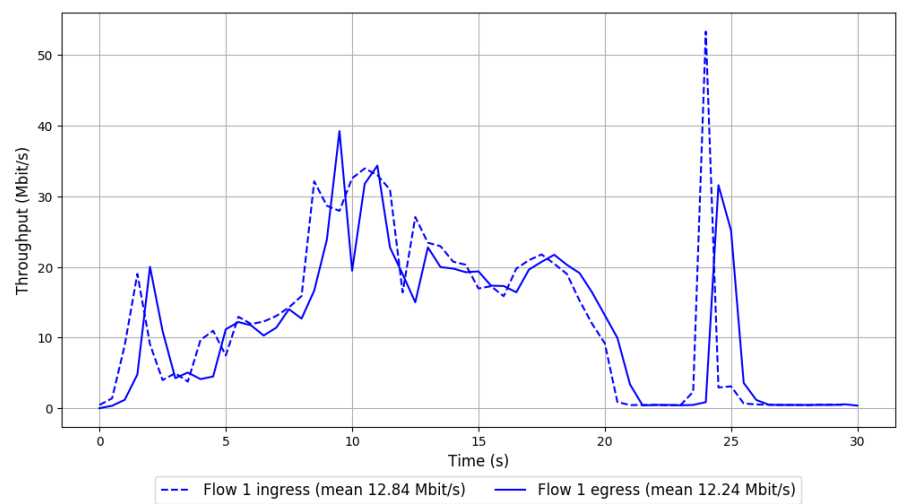
Run 2: Report of Indigo-Muses — Data Link

```
Run 3: Statistics of Indigo-Muses

Start at: 2018-10-26 07:04:53
End at: 2018-10-26 07:05:23
Local clock offset: 4.871 ms
Remote clock offset: -70.984 ms


# Below is generated by plot.py at 2018-10-26 08:01:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 179.812 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 179.812 ms
Loss rate: 0.26%
```

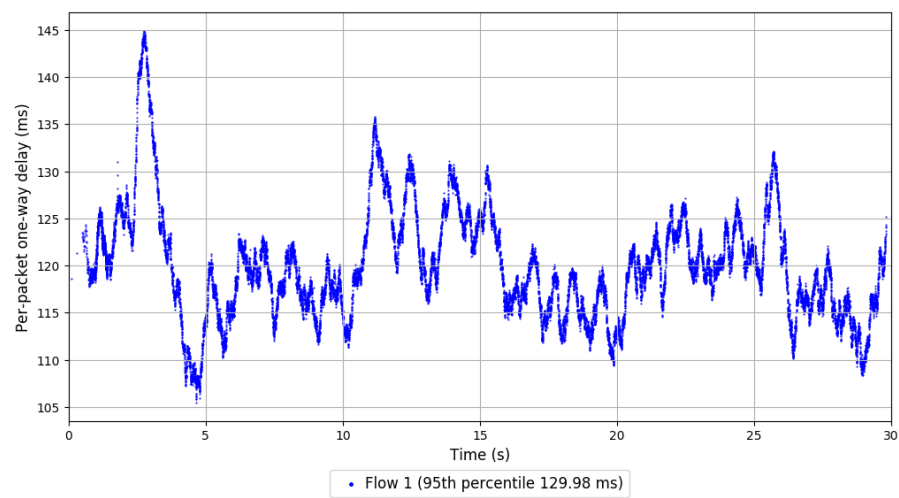Run 3: Report of Indigo-Muses — Data Link

```
Run 4: Statistics of Indigo-Muses

Start at: 2018-10-26 07:27:14
End at: 2018-10-26 07:27:44
Local clock offset: 18.606 ms
Remote clock offset: -0.173 ms


# Below is generated by plot.py at 2018-10-26 08:01:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.32 Mbit/s
95th percentile per-packet one-way delay: 221.734 ms
Loss rate: 7.36%
-- Flow 1:
Average throughput: 9.32 Mbit/s
95th percentile per-packet one-way delay: 221.734 ms
Loss rate: 7.36%
```
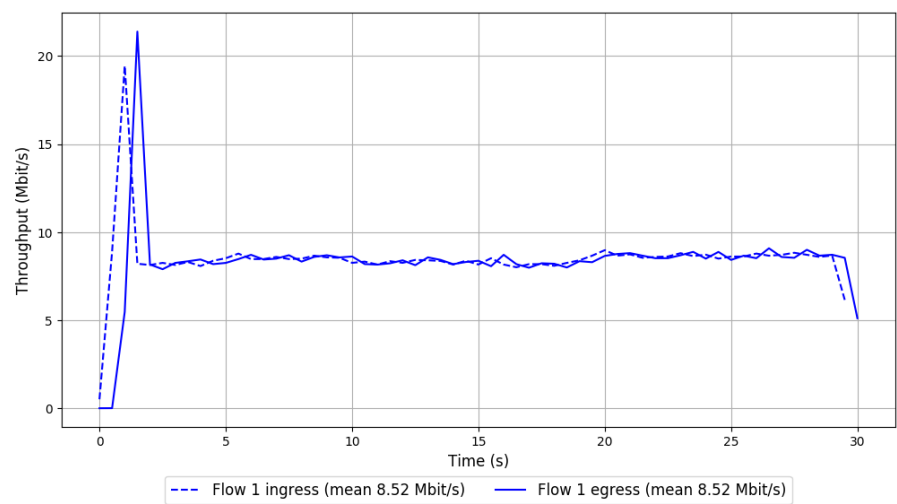
Run 4: Report of Indigo-Muses — Data Link

```
Run 5: Statistics of Indigo-Muses

Start at: 2018-10-26 07:49:50
End at: 2018-10-26 07:50:20
Local clock offset: 18.781 ms
Remote clock offset: -11.313 ms


# Below is generated by plot.py at 2018-10-26 08:02:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.24 Mbit/s
95th percentile per-packet one-way delay: 186.271 ms
Loss rate: 5.49%
-- Flow 1:
Average throughput: 12.24 Mbit/s
95th percentile per-packet one-way delay: 186.271 ms
Loss rate: 5.49%
```

Run 5: Report of Indigo-Muses — Data Link

```
Run 1: Statistics of PCC-Allegro

Start at: 2018-10-26 06:12:43
End at: 2018-10-26 06:13:13
Local clock offset: 4.339 ms
Remote clock offset: 106.297 ms


# Below is generated by plot.py at 2018-10-26 08:02:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.52 Mbit/s
95th percentile per-packet one-way delay: 129.979 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 8.52 Mbit/s
95th percentile per-packet one-way delay: 129.979 ms
Loss rate: 0.60%
```

# Run 1: Report of PCC-Allegro — Data Link



Flow 1 ingress (mean 8.52 Mbit/s)    Flow 1 egress (mean 8.52 Mbit/s)



Flow 1 (95th percentile 129.98 ms)

```
Run 2: Statistics of PCC-Allegro

Start at: 2018-10-26 06:34:49
End at: 2018-10-26 06:35:19
Local clock offset: 1.008 ms
Remote clock offset: -33.631 ms
```

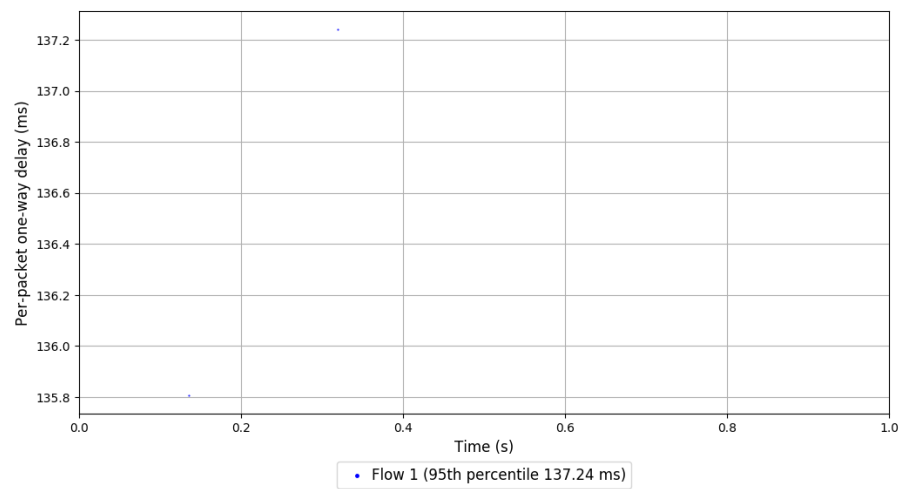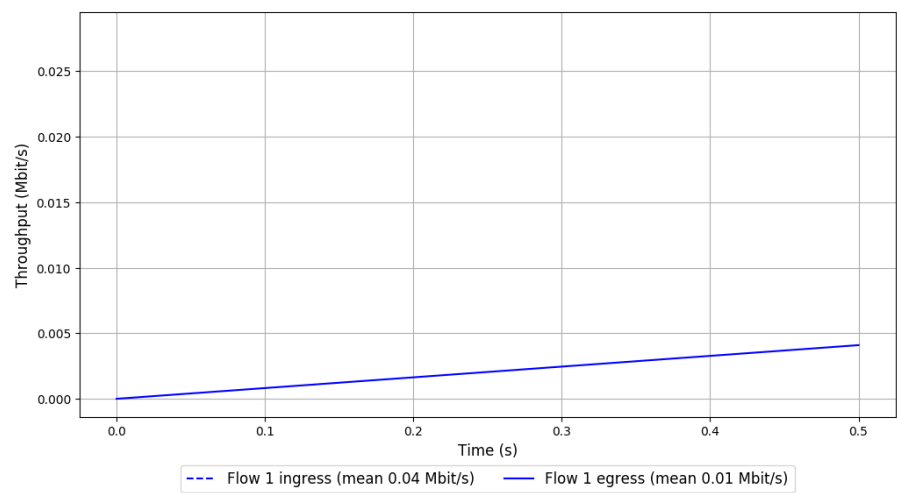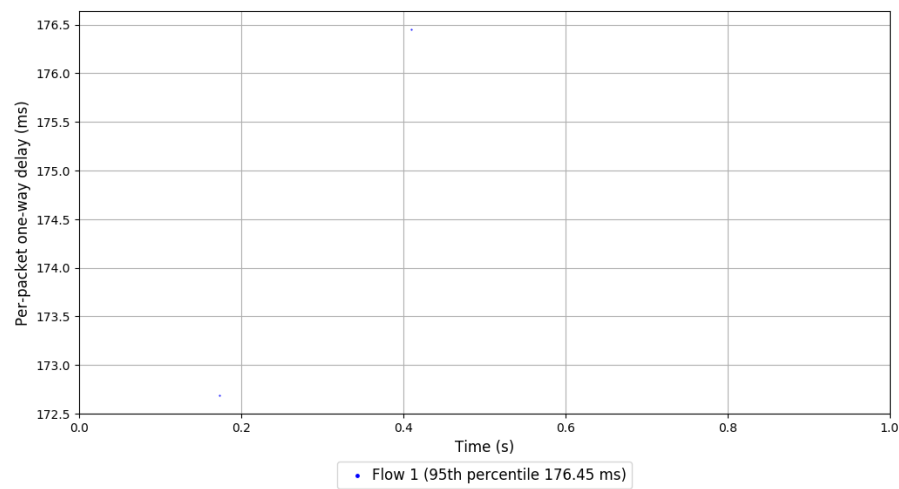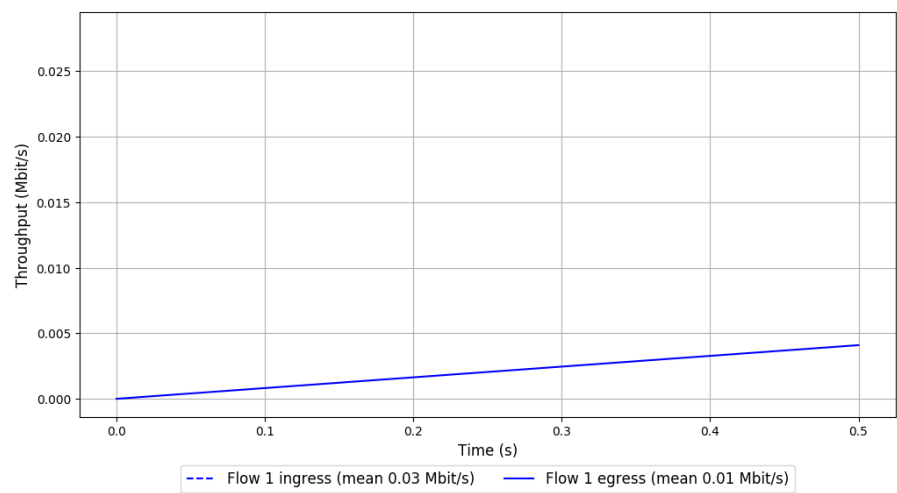# Run 2: Report of PCC-Allegro — Data Link

```
Run 3: Statistics of PCC-Allegro

Start at: 2018-10-26 06:57:18
End at: 2018-10-26 06:57:48
Local clock offset: -0.706 ms
Remote clock offset: -55.921 ms
```

# Run 3: Report of PCC-Allegro — Data Link

```
Run 4: Statistics of PCC-Allegro

Start at: 2018-10-26 07:19:51
End at: 2018-10-26 07:20:21
Local clock offset: 16.351 ms
Remote clock offset: -11.039 ms
```
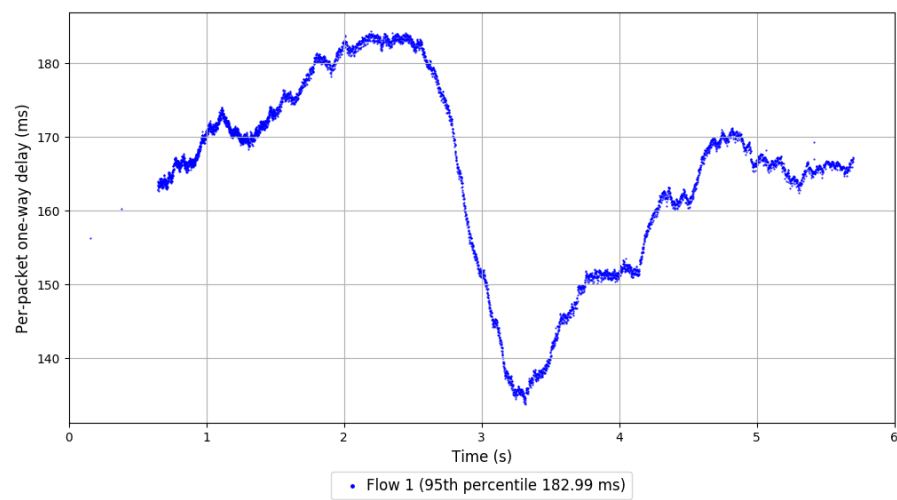
Run 4: Report of PCC-Allegro — Data Link

```
Run 5: Statistics of PCC-Allegro

Start at: 2018-10-26 07:42:14
End at: 2018-10-26 07:42:44
Local clock offset: 18.368 ms
Remote clock offset: -5.845 ms
```

## Run 5: Report of PCC-Allegro — Data Link

```
Run 1: Statistics of PCC-Expr

Start at: 2018-10-26 06:22:30
End at: 2018-10-26 06:23:00
Local clock offset: 2.05 ms
Remote clock offset: 12.575 ms
```
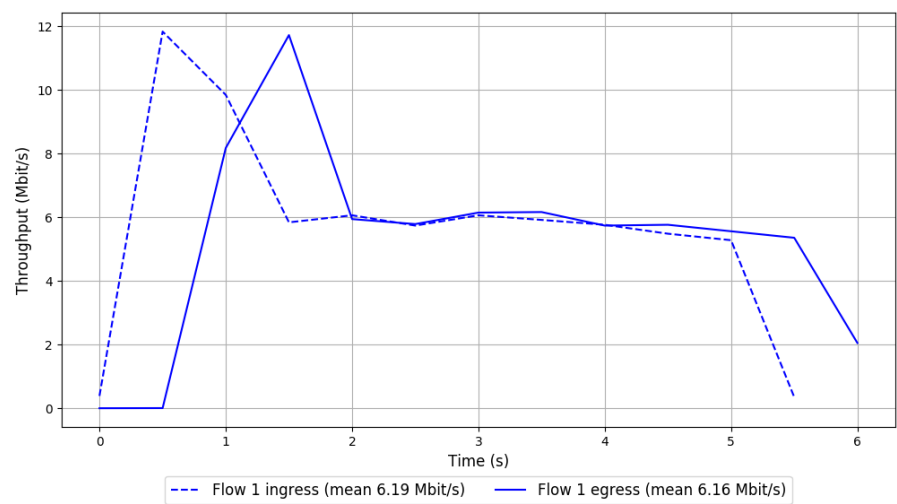
Run 1: Report of PCC-Expr — Data Link

```
Run 2: Statistics of PCC-Expr

Start at: 2018-10-26 06:44:44
End at: 2018-10-26 06:45:14
Local clock offset: -0.089 ms
Remote clock offset: -37.516 ms
```
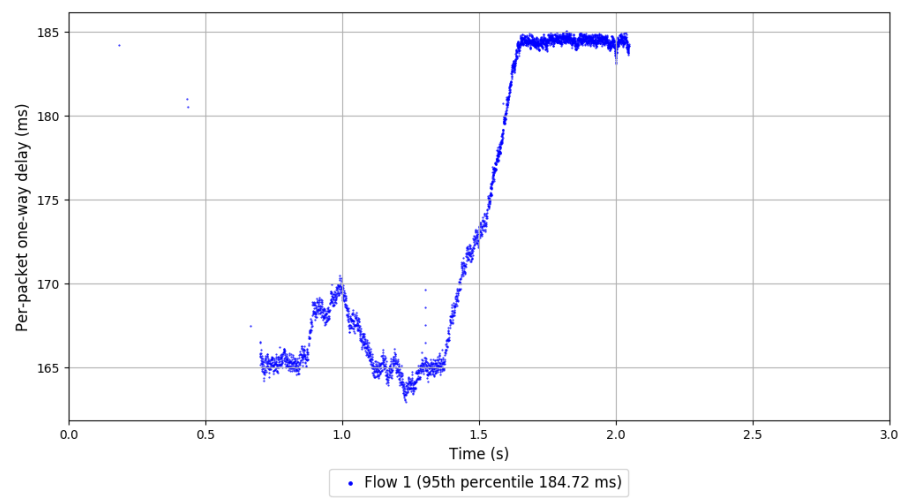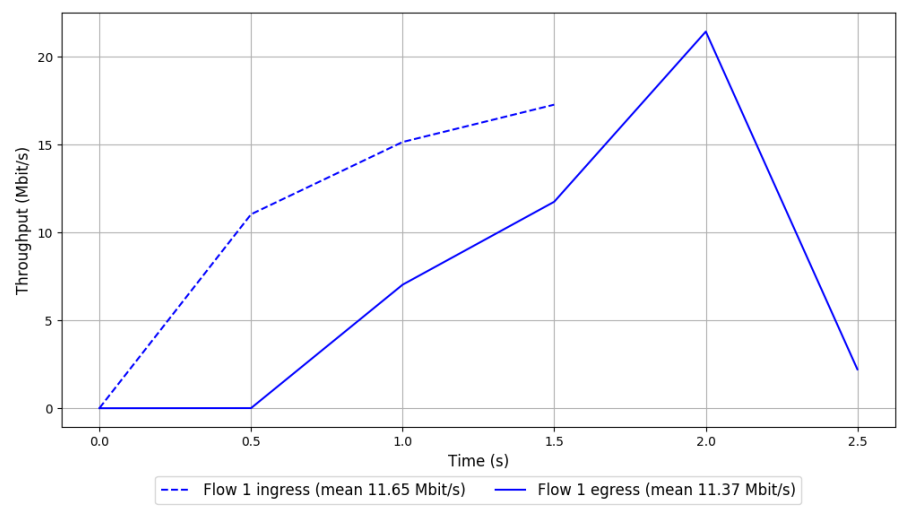
## Run 2: Report of PCC-Expr — Data Link

Run 3: Statistics of PCC-Expr

Start at: 2018-10-26 07:07:17
End at: 2018-10-26 07:07:47
Local clock offset: 7.81 ms
Remote clock offset: -69.848 ms
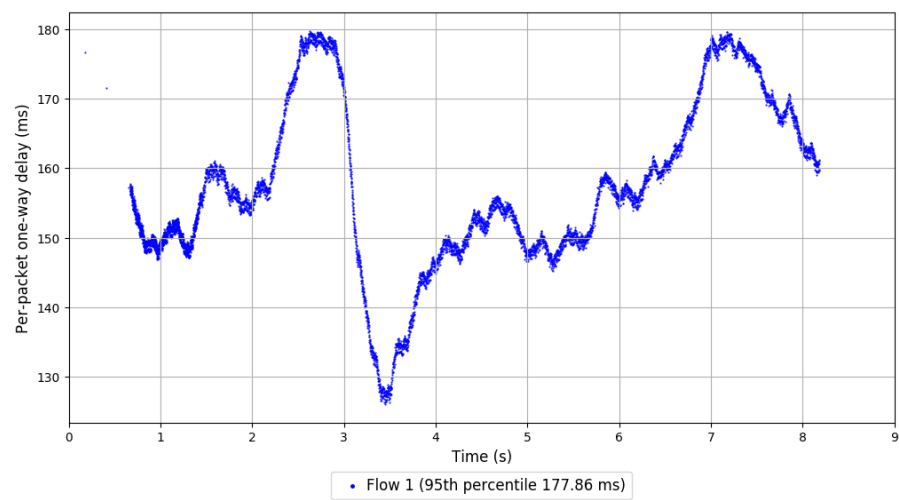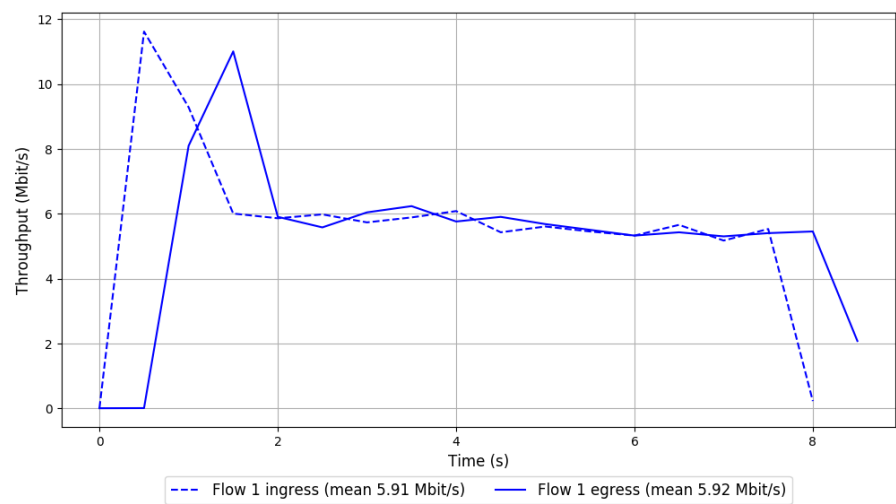
# Run 3: Report of PCC-Expr — Data Link



Flow 1 ingress (mean 11.65 Mbit/s) --- Flow 1 egress (mean 11.37 Mbit/s)



Flow 1 (95th percentile 184.72 ms)

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```
Run 4: Statistics of PCC-Expr

Start at: 2018-10-26 07:29:43
End at: 2018-10-26 07:30:13
Local clock offset: 19.303 ms
Remote clock offset: 3.119 ms
```
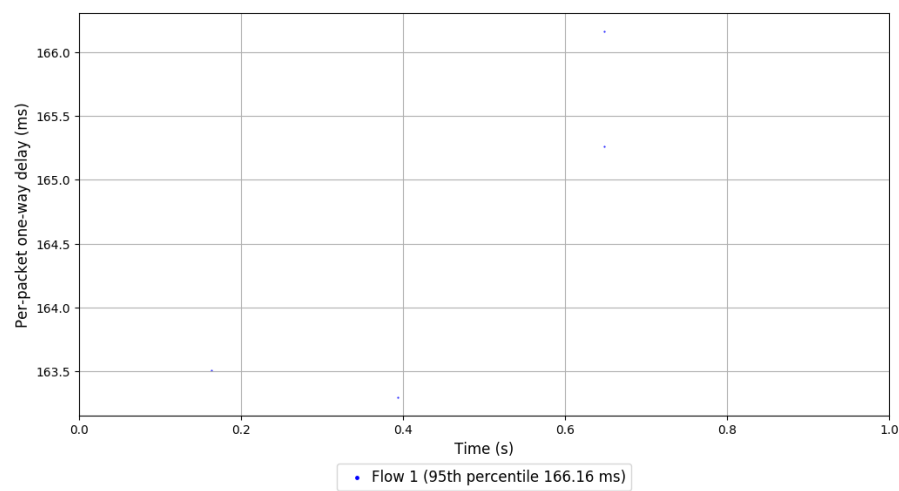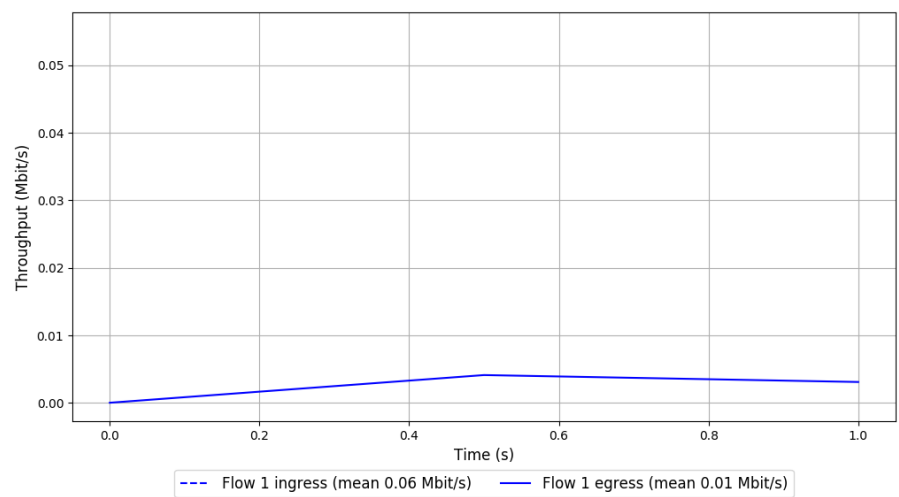
# Run 4: Report of PCC-Expr — Data Link



Flow 1 ingress (mean 5.91 Mbit/s) — Flow 1 egress (mean 5.92 Mbit/s)



Flow 1 (95th percentile 177.86 ms)

```
Run 5: Statistics of PCC-Expr

Start at: 2018-10-26 07:52:19
End at: 2018-10-26 07:52:49
Local clock offset: 18.761 ms
Remote clock offset: -17.493 ms
```

# Run 5: Report of PCC-Expr — Data Link



Flow 1 ingress (mean 0.06 Mbit/s) — Flow 1 egress (mean 0.01 Mbit/s)
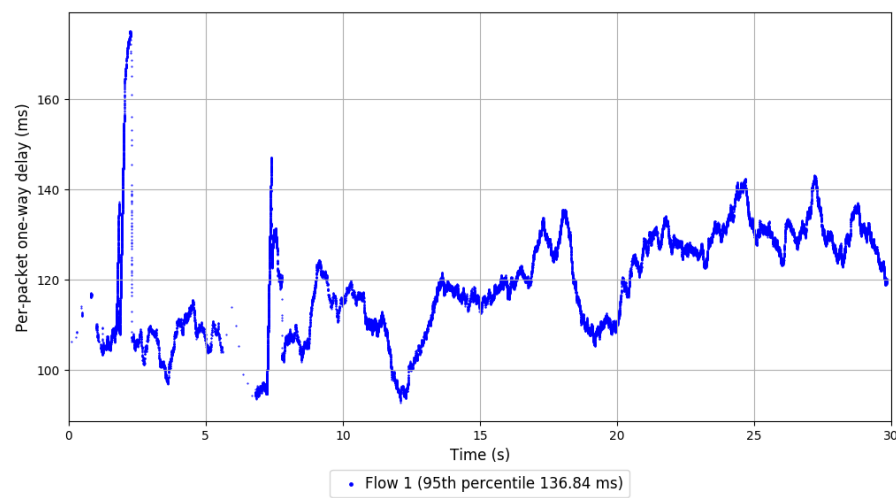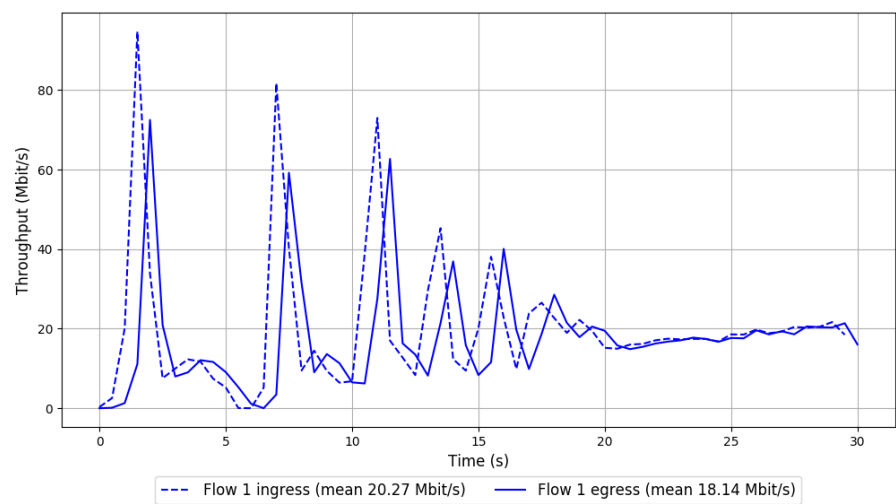


Flow 1 (95th percentile 166.16 ms)

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-10-26 06:10:13
End at: 2018-10-26 06:10:43
Local clock offset: 5.144 ms
Remote clock offset: 104.246 ms


# Below is generated by plot.py at 2018-10-26 08:02:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 18.14 Mbit/s
95th percentile per-packet one-way delay: 136.841 ms
Loss rate: 11.00%
-- Flow 1:
Average throughput: 18.14 Mbit/s
95th percentile per-packet one-way delay: 136.841 ms
Loss rate: 11.00%
```
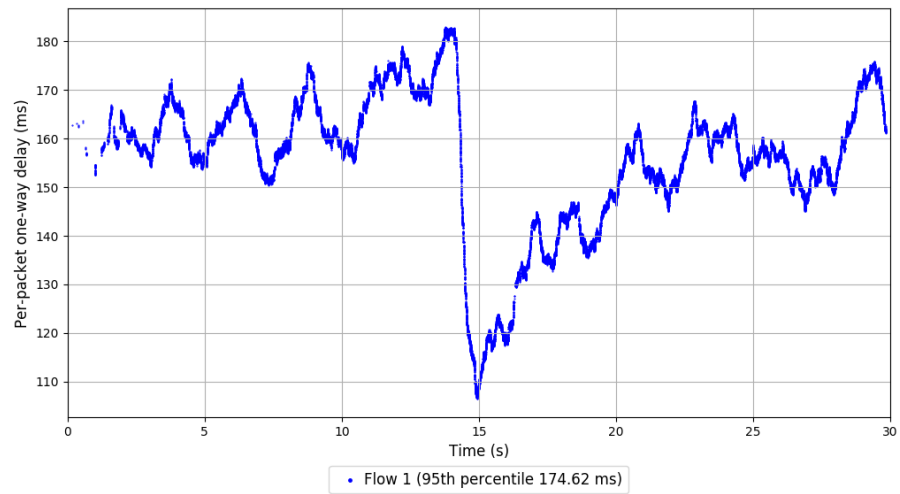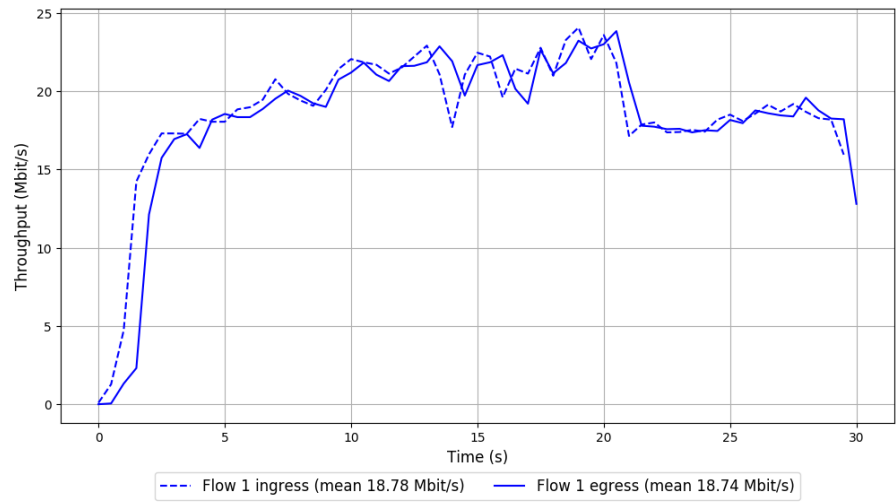
Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-10-26 06:32:17
End at: 2018-10-26 06:32:47
Local clock offset: 1.372 ms
Remote clock offset: -33.044 ms


# Below is generated by plot.py at 2018-10-26 08:02:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 18.74 Mbit/s
95th percentile per-packet one-way delay: 174.620 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 18.74 Mbit/s
95th percentile per-packet one-way delay: 174.620 ms
Loss rate: 0.99%
```

Run 2: Report of QUIC Cubic — Data Link



Flow 1 ingress (mean 18.78 Mbit/s)     Flow 1 egress (mean 18.74 Mbit/s)
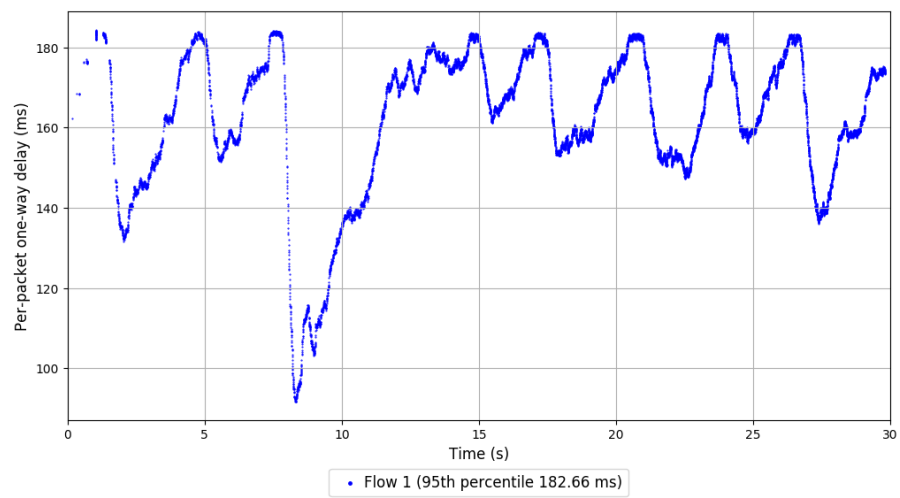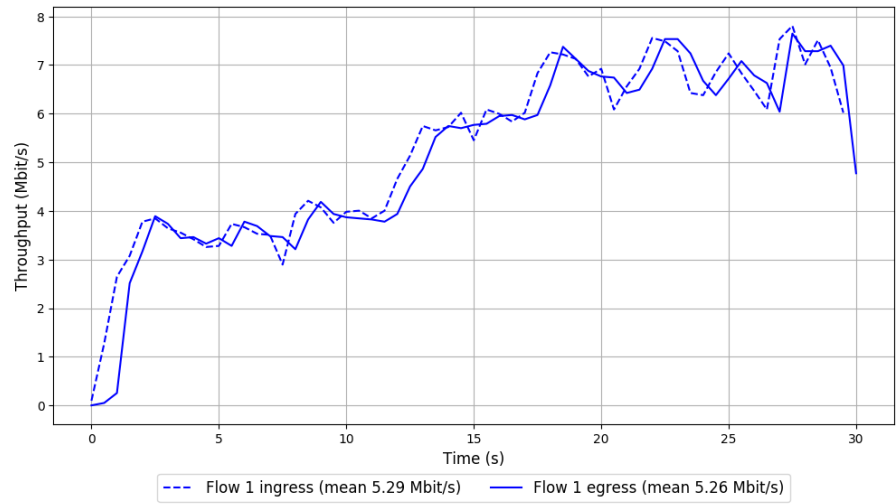


Flow 1 (95th percentile 174.62 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-10-26 06:54:48
End at: 2018-10-26 06:55:18
Local clock offset: -0.631 ms
Remote clock offset: -53.374 ms


# Below is generated by plot.py at 2018-10-26 08:02:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.26 Mbit/s
95th percentile per-packet one-way delay: 182.659 ms
Loss rate: 1.30%
-- Flow 1:
Average throughput: 5.26 Mbit/s
95th percentile per-packet one-way delay: 182.659 ms
Loss rate: 1.30%
```
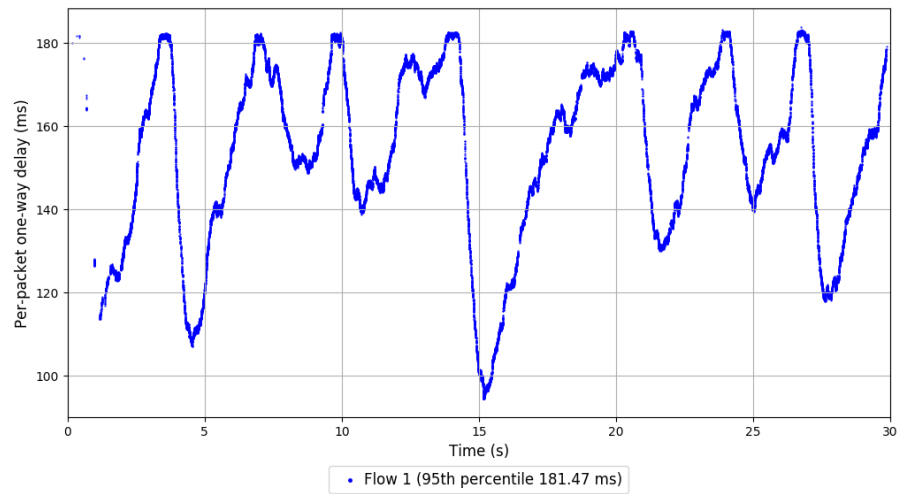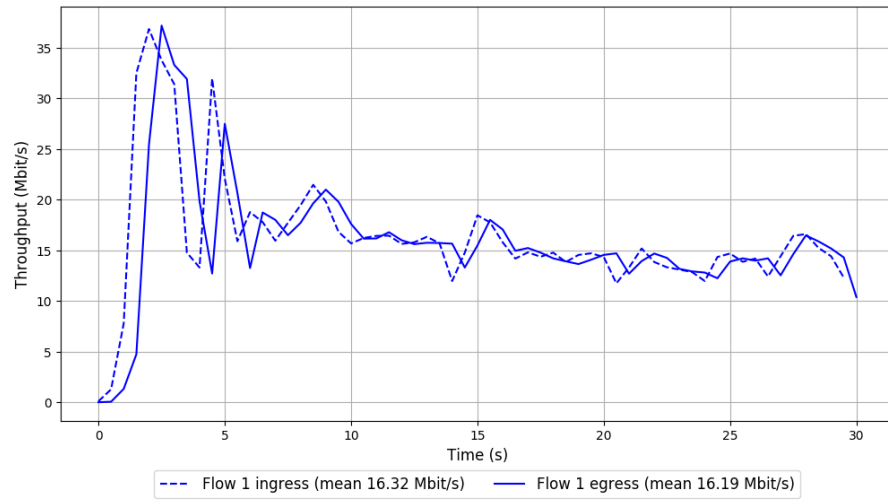
## Run 3: Report of QUIC Cubic — Data Link

```
Run 4: Statistics of QUIC Cubic

Start at: 2018-10-26 07:17:18
End at: 2018-10-26 07:17:48
Local clock offset: 15.14 ms
Remote clock offset: -12.272 ms


# Below is generated by plot.py at 2018-10-26 08:02:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.19 Mbit/s
95th percentile per-packet one-way delay: 181.465 ms
Loss rate: 1.56%
-- Flow 1:
Average throughput: 16.19 Mbit/s
95th percentile per-packet one-way delay: 181.465 ms
Loss rate: 1.56%
```
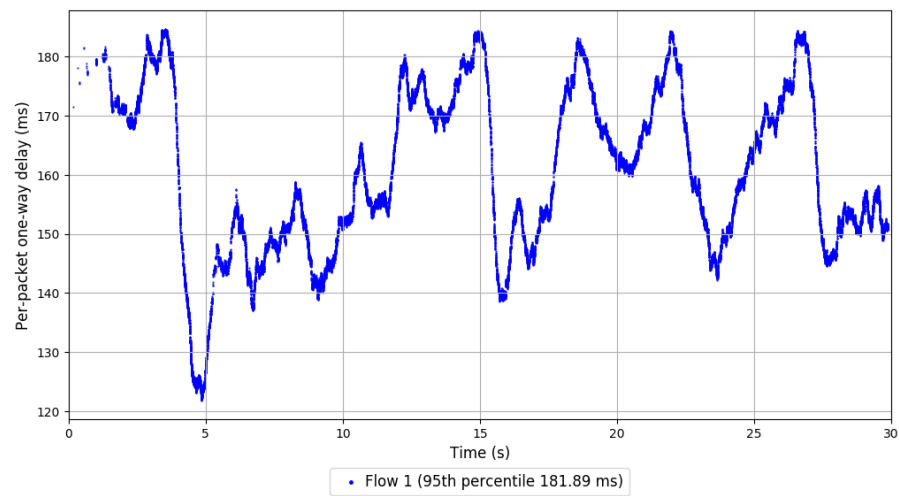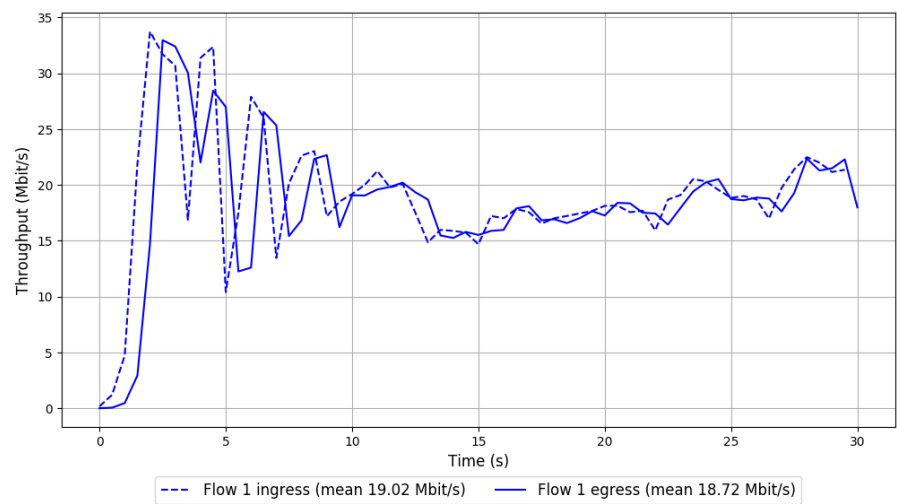
Run 4: Report of QUIC Cubic — Data Link

```
Run 5: Statistics of QUIC Cubic

Start at: 2018-10-26 07:39:40
End at: 2018-10-26 07:40:11
Local clock offset: 18.497 ms
Remote clock offset: -3.122 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 18.72 Mbit/s
95th percentile per-packet one-way delay: 181.886 ms
Loss rate: 2.33%
-- Flow 1:
Average throughput: 18.72 Mbit/s
95th percentile per-packet one-way delay: 181.886 ms
Loss rate: 2.33%
```
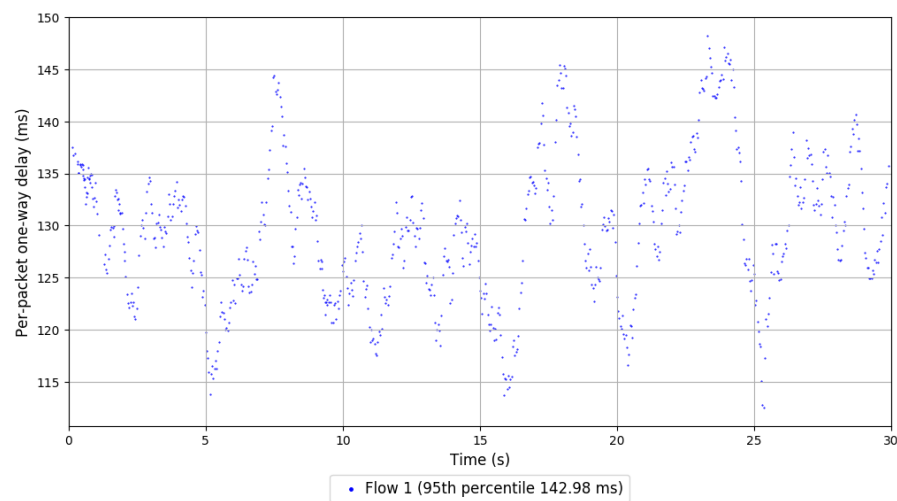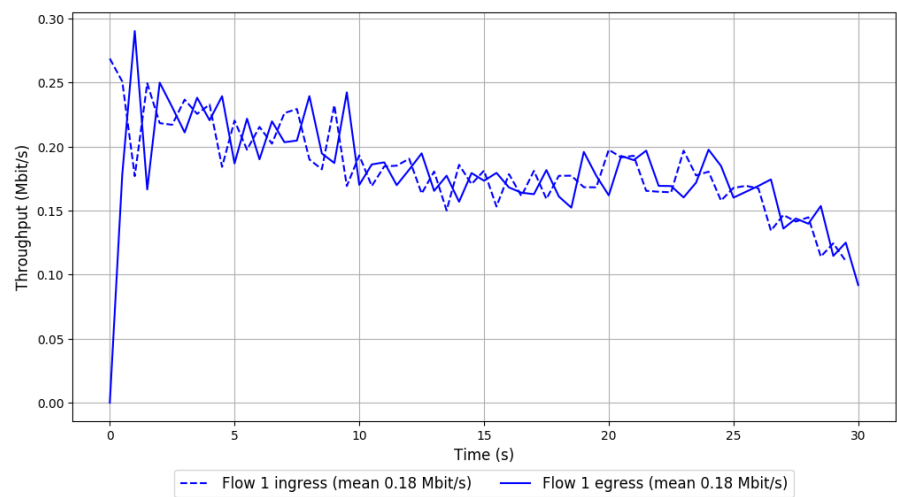
Run 5: Report of QUIC Cubic — Data Link





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```
Run 1: Statistics of SCReAM

Start at: 2018-10-26 06:17:44
End at: 2018-10-26 06:18:14
Local clock offset: 2.722 ms
Remote clock offset: 58.068 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 142.976 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 142.976 ms
Loss rate: 0.42%
```

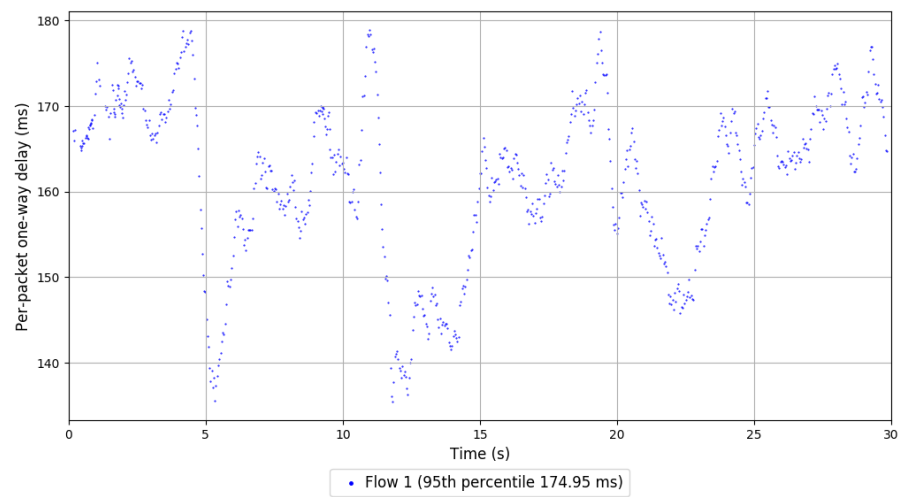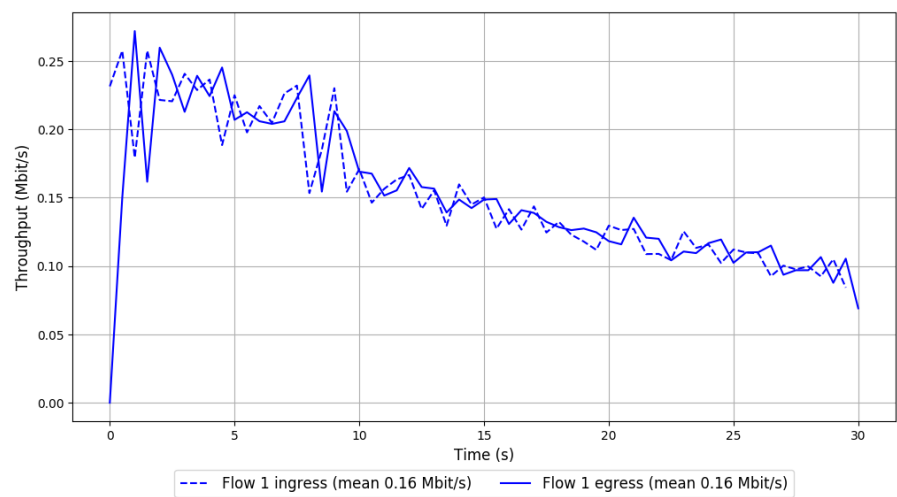Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2018-10-26 06:39:54
End at: 2018-10-26 06:40:24
Local clock offset: 0.254 ms
Remote clock offset: -26.878 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 174.947 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 174.947 ms
Loss rate: 0.49%
```

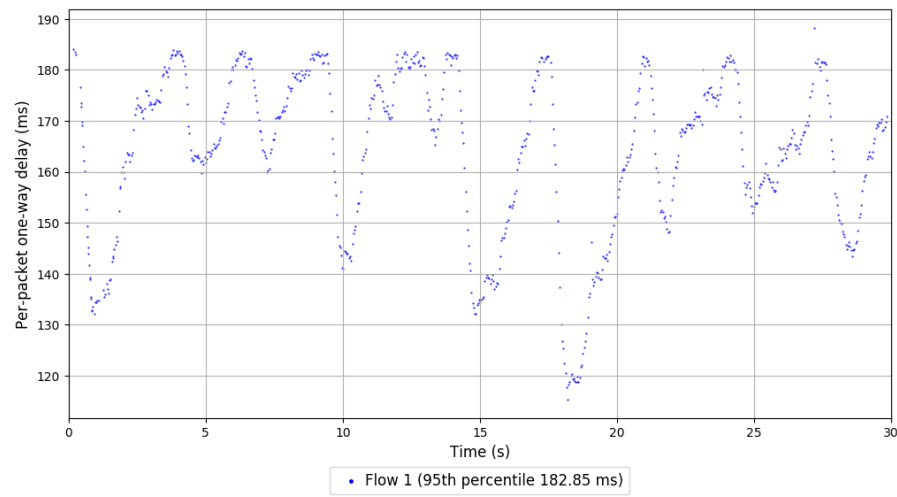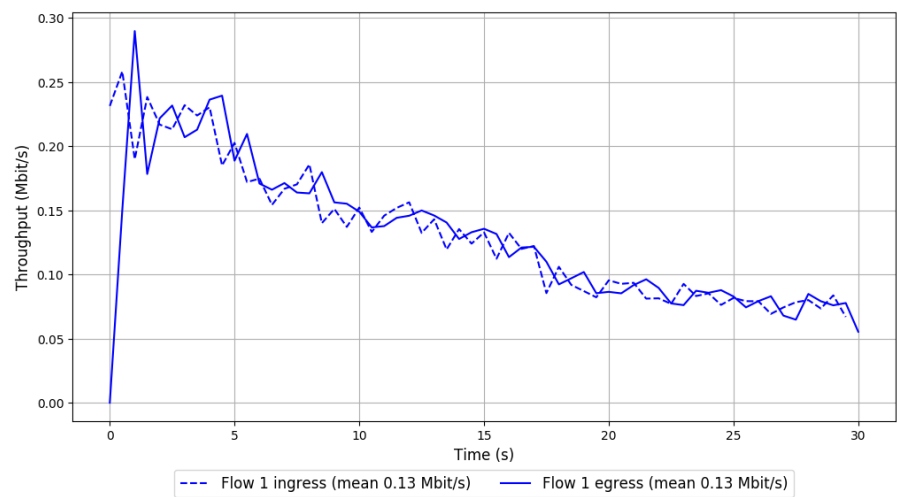Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-10-26 07:02:31
End at: 2018-10-26 07:03:01
Local clock offset: 1.005 ms
Remote clock offset: -68.01 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 182.850 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 182.850 ms
Loss rate: 0.80%
```

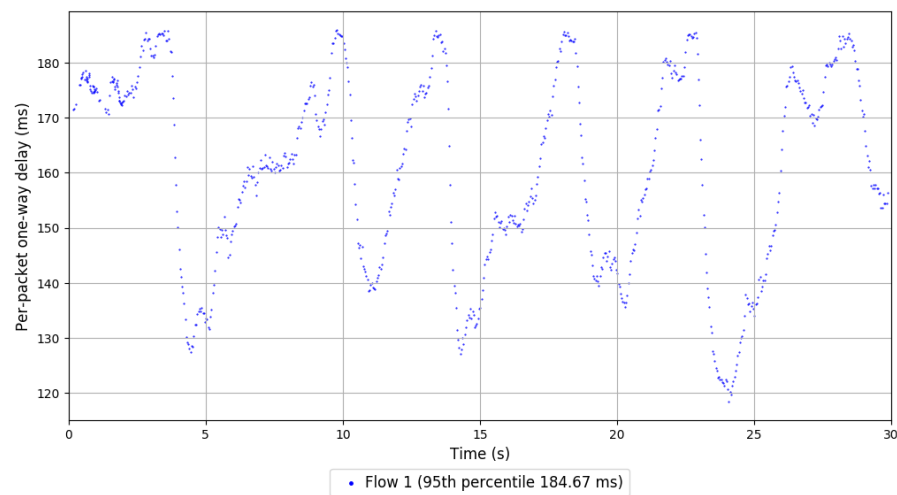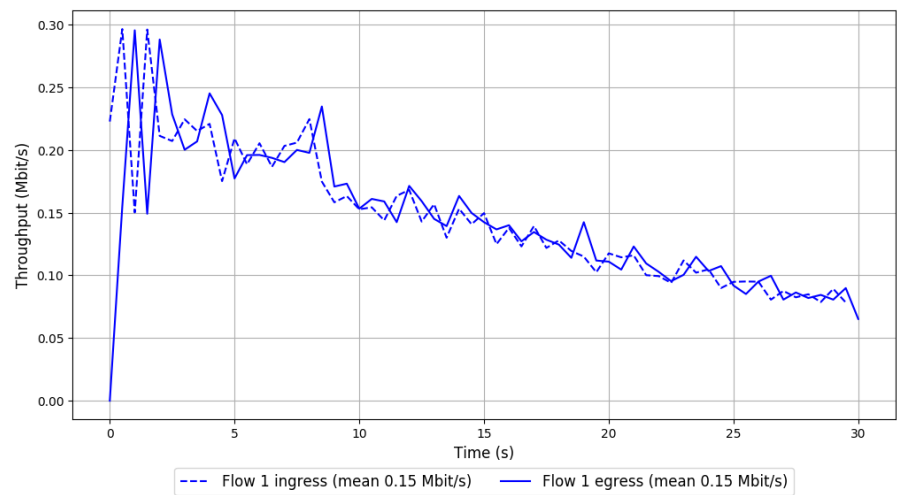Run 3: Report of SCReAM — Data Link

```
Run 4: Statistics of SCReAM

Start at: 2018-10-26 07:24:51
End at: 2018-10-26 07:25:21
Local clock offset: 18.004 ms
Remote clock offset: -4.205 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 184.669 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 184.669 ms
Loss rate: 0.45%
```

## Run 4: Report of SCReAM — Data Link



Flow 1 ingress (mean 0.15 Mbit/s) --- Flow 1 egress (mean 0.15 Mbit/s)
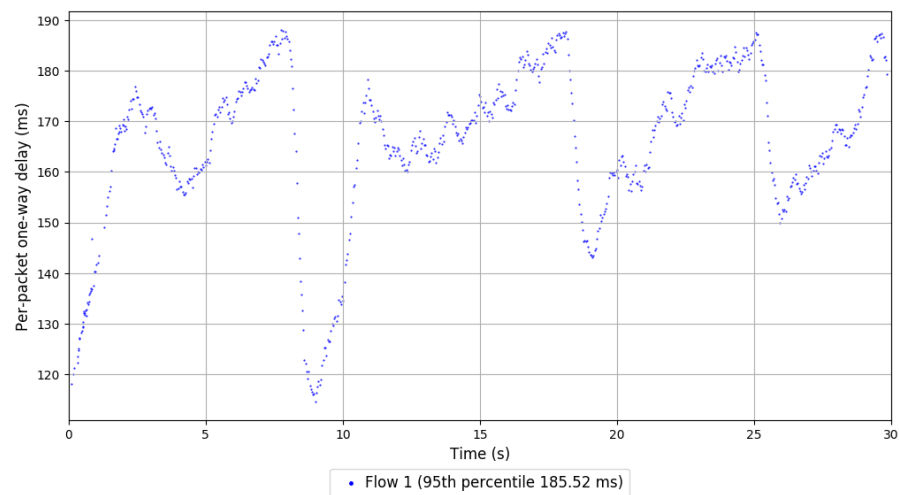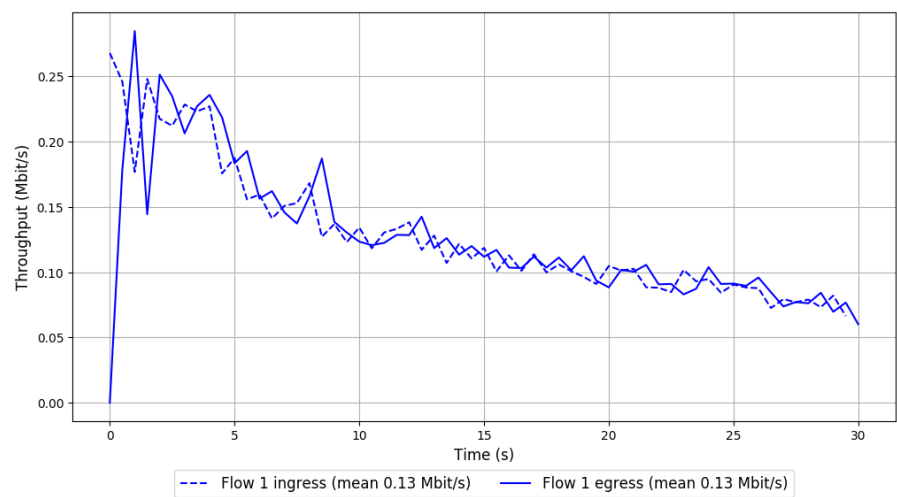


Flow 1 (95th percentile 184.67 ms)

```
Run 5: Statistics of SCReAM

Start at: 2018-10-26 07:47:28
End at: 2018-10-26 07:47:58
Local clock offset: 18.629 ms
Remote clock offset: -13.321 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 185.517 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 185.517 ms
Loss rate: 0.47%
```

Run 5: Report of SCReAM — Data Link



Flow 1 ingress (mean 0.13 Mbit/s) — Flow 1 egress (mean 0.13 Mbit/s)



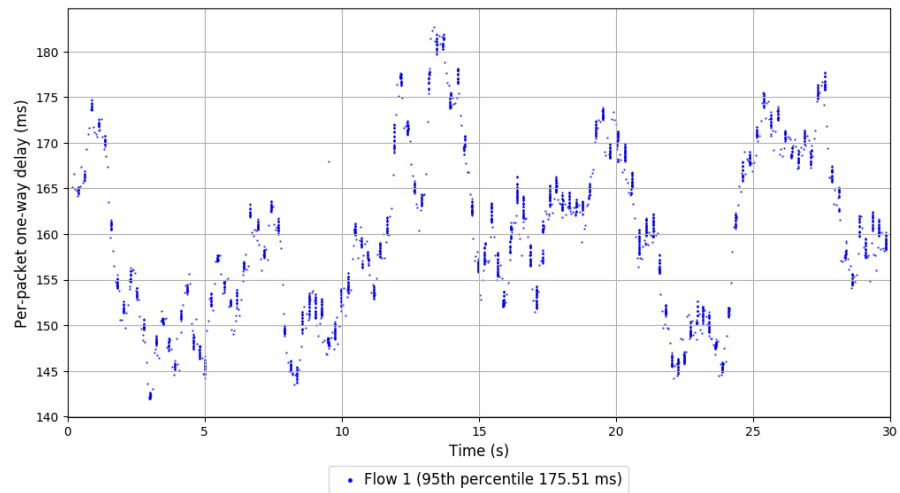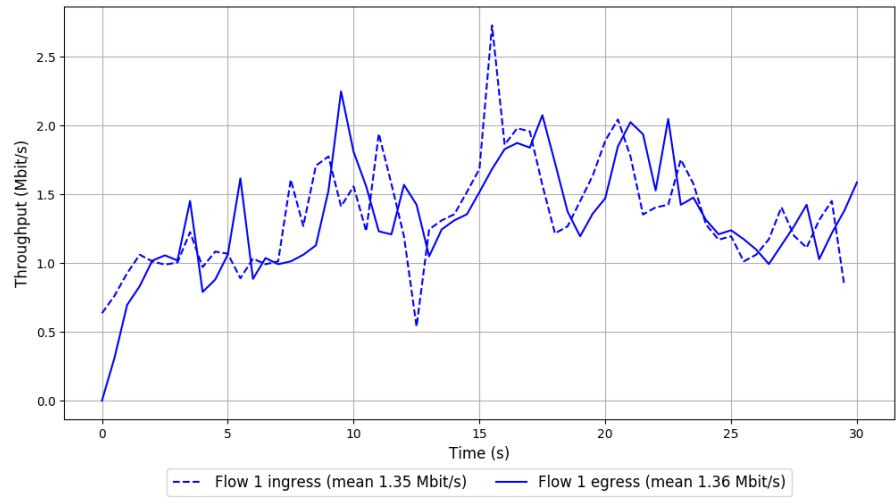Flow 1 (95th percentile 185.52 ms)

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```
Run 1: Statistics of Sprout

Start at: 2018-10-26 06:28:37
End at: 2018-10-26 06:29:07
Local clock offset: 1.45 ms
Remote clock offset: -22.512 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 175.506 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 175.506 ms
Loss rate: 0.01%
```
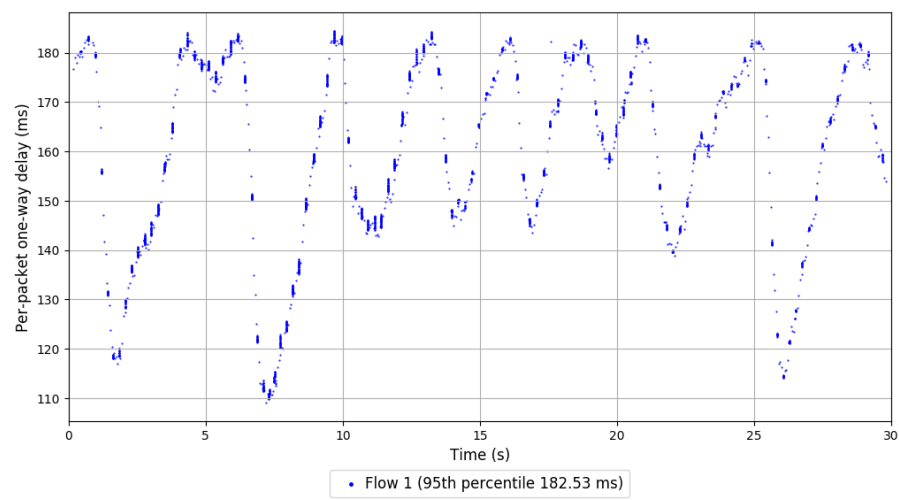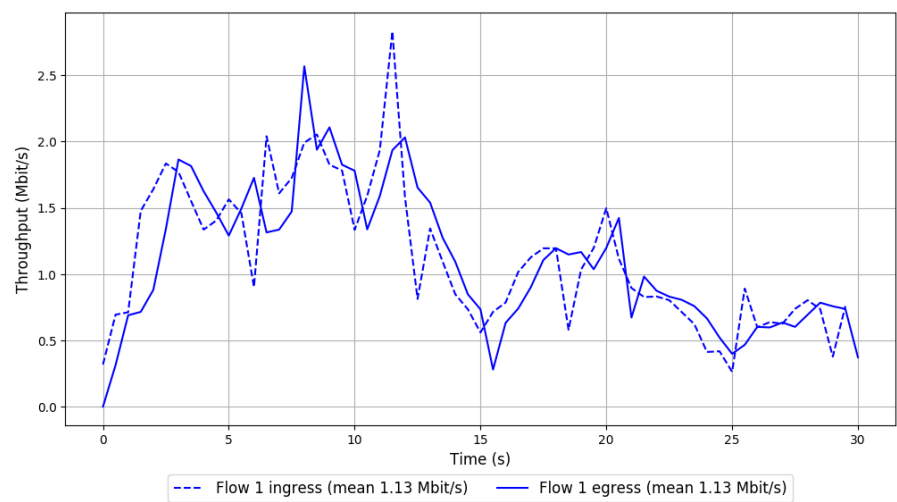
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-10-26 06:50:56
End at: 2018-10-26 06:51:26
Local clock offset: -0.523 ms
Remote clock offset: -45.293 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 182.531 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 182.531 ms
Loss rate: 0.86%
```
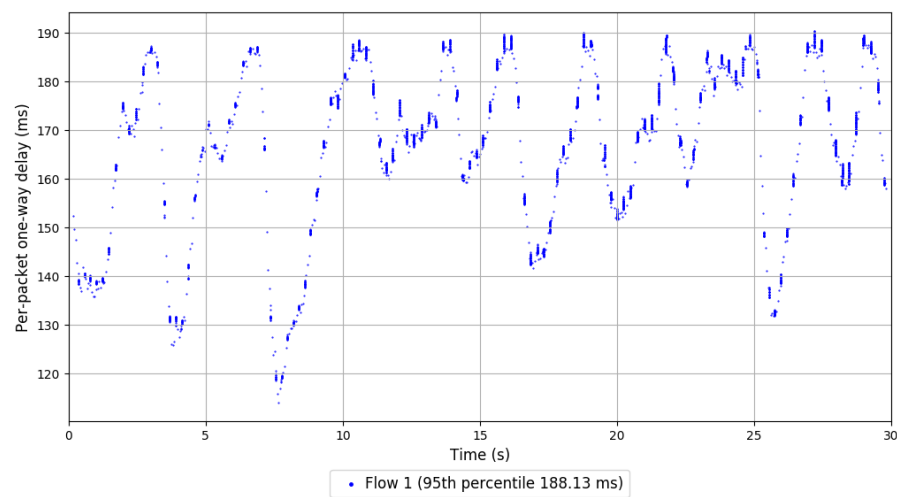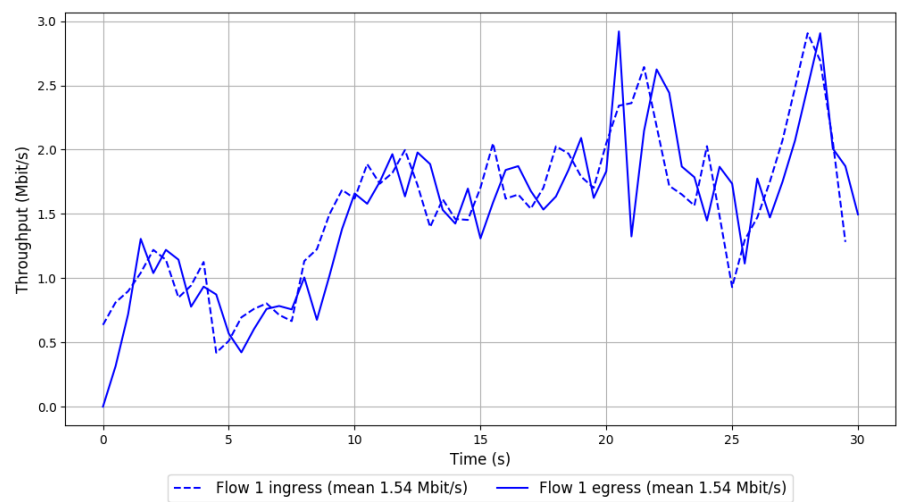
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-10-26 07:13:24
End at: 2018-10-26 07:13:54
Local clock offset: 12.922 ms
Remote clock offset: -30.262 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 188.131 ms
Loss rate: 0.91%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 188.131 ms
Loss rate: 0.91%
```
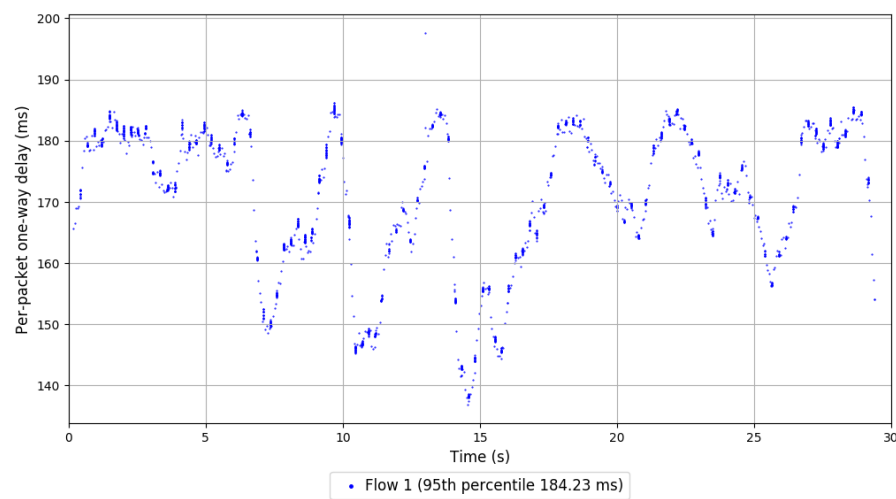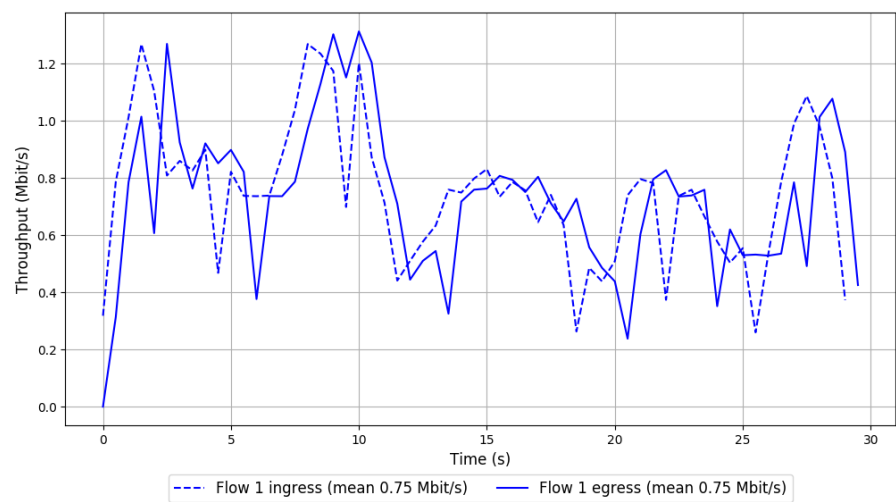
Run 3: Report of Sprout — Data Link

```
Run 4: Statistics of Sprout

Start at: 2018-10-26 07:35:52
End at: 2018-10-26 07:36:22
Local clock offset: 18.873 ms
Remote clock offset: -2.254 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 184.226 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 184.226 ms
Loss rate: 0.76%
```

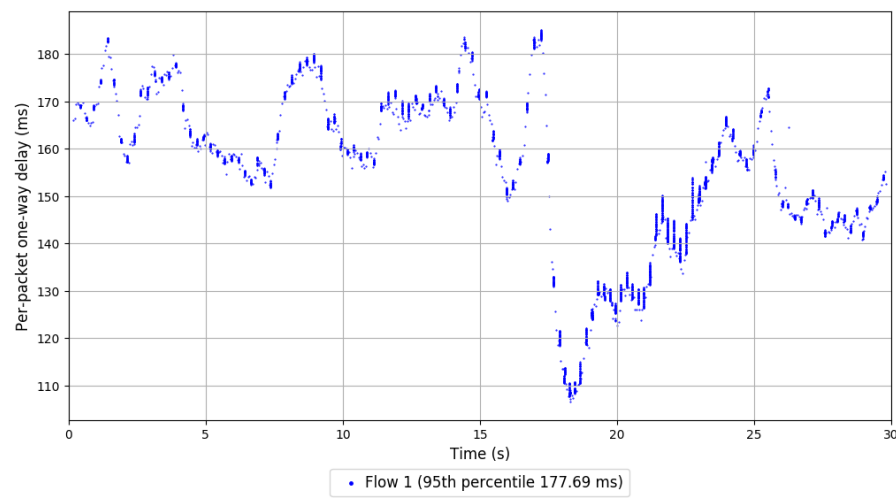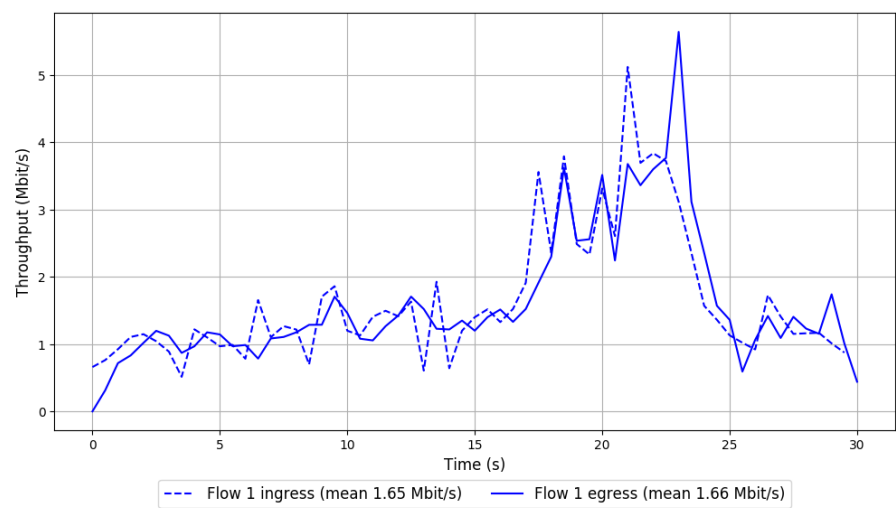Run 4: Report of Sprout — Data Link

```
Run 5: Statistics of Sprout

Start at: 2018-10-26 07:58:34
End at: 2018-10-26 07:59:04
Local clock offset: 19.36 ms
Remote clock offset: -18.258 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 177.686 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 177.686 ms
Loss rate: 0.44%
```

Run 5: Report of Sprout — Data Link

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

Start at: 2018-10-26 06:27:22
End at: 2018-10-26 06:27:52
Local clock offset: 1.678 ms
Remote clock offset: -15.75 ms


# Below is generated by plot.py at 2018-10-26 08:02:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.41 Mbit/s
95th percentile per-packet one-way delay: 168.314 ms
Loss rate: 10.12%
-- Flow 1:
Average throughput: 7.41 Mbit/s
95th percentile per-packet one-way delay: 168.314 ms
Loss rate: 10.12%
```
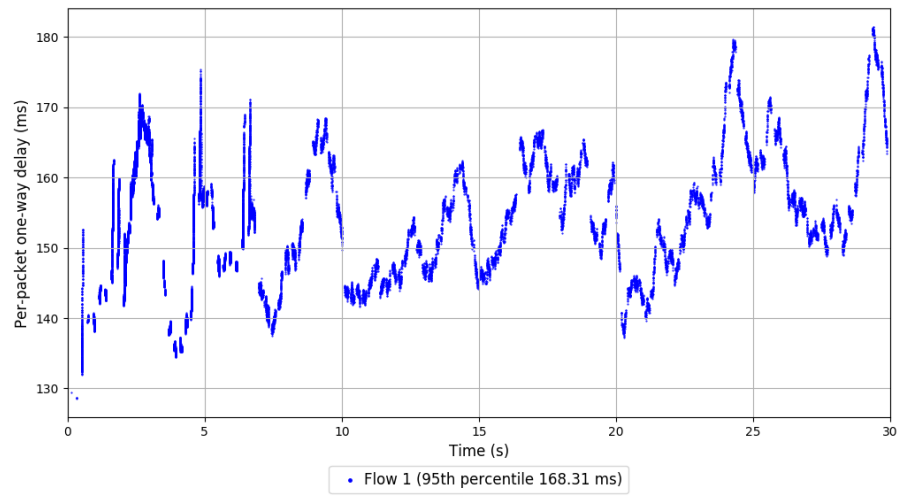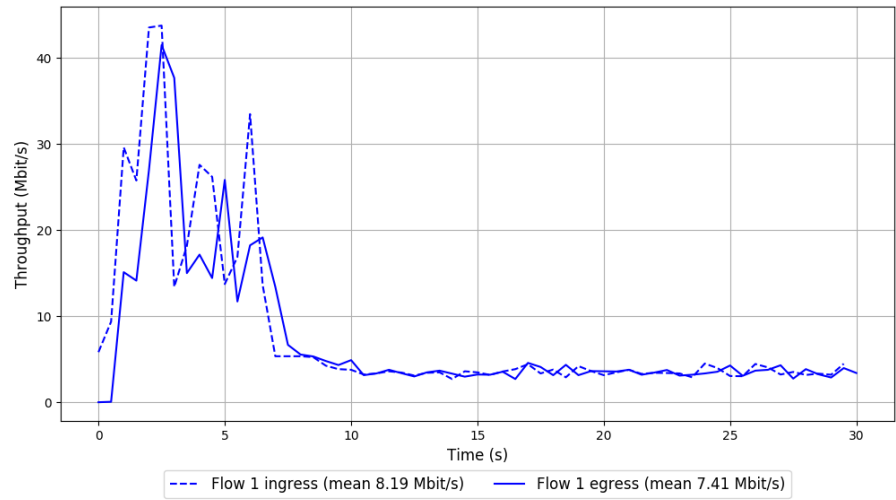
# Run 1: Report of TaoVA-100x — Data Link



Flow 1 ingress (mean 8.19 Mbit/s) ---- Flow 1 egress (mean 7.41 Mbit/s)
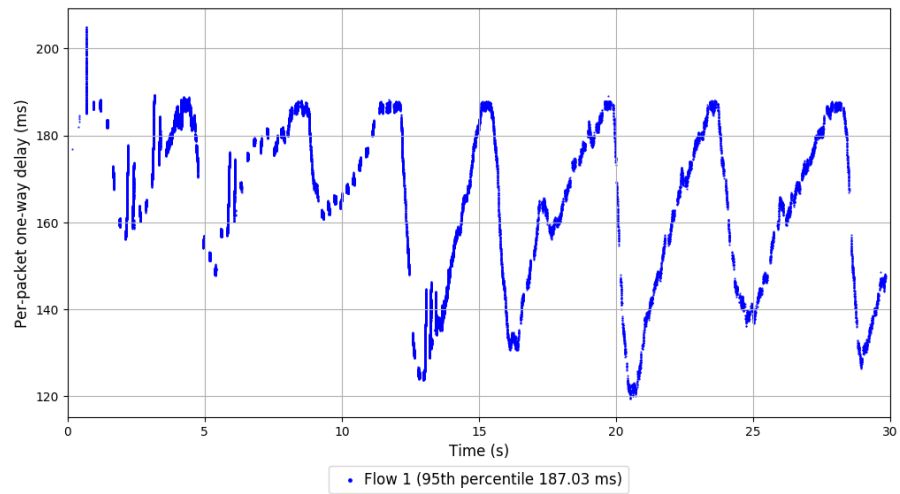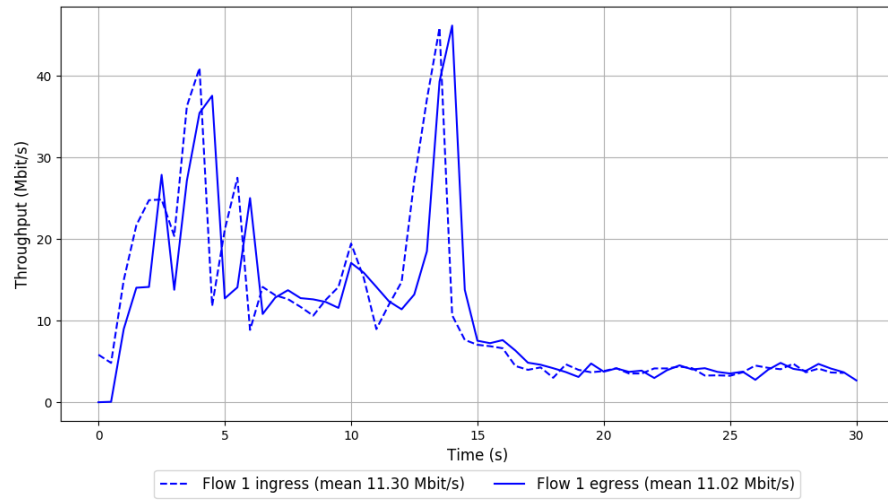


Flow 1 (95th percentile 168.31 ms)

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

Start at: 2018-10-26 06:49:40
End at: 2018-10-26 06:50:10
Local clock offset: -0.442 ms
Remote clock offset: -48.768 ms


# Below is generated by plot.py at 2018-10-26 08:02:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.02 Mbit/s
95th percentile per-packet one-way delay: 187.026 ms
Loss rate: 3.56%
-- Flow 1:
Average throughput: 11.02 Mbit/s
95th percentile per-packet one-way delay: 187.026 ms
Loss rate: 3.56%
```

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



Flow 1 ingress (mean 11.30 Mbit/s)   Flow 1 egress (mean 11.02 Mbit/s)
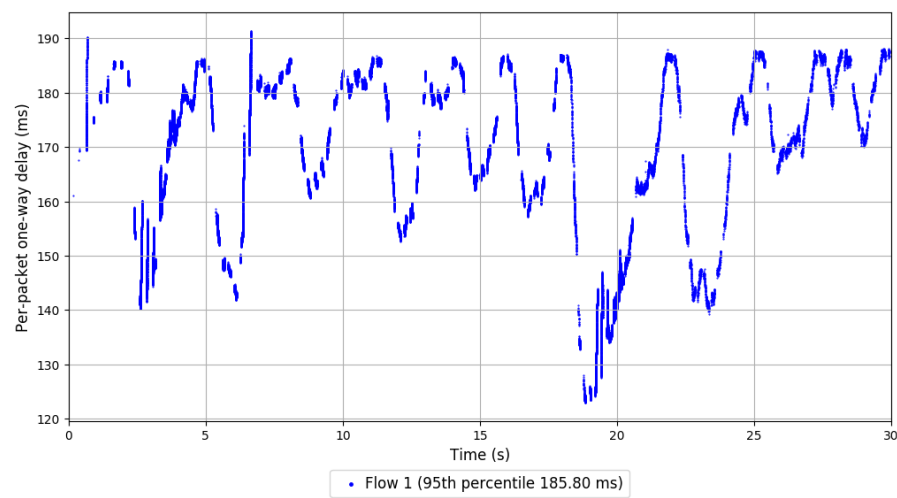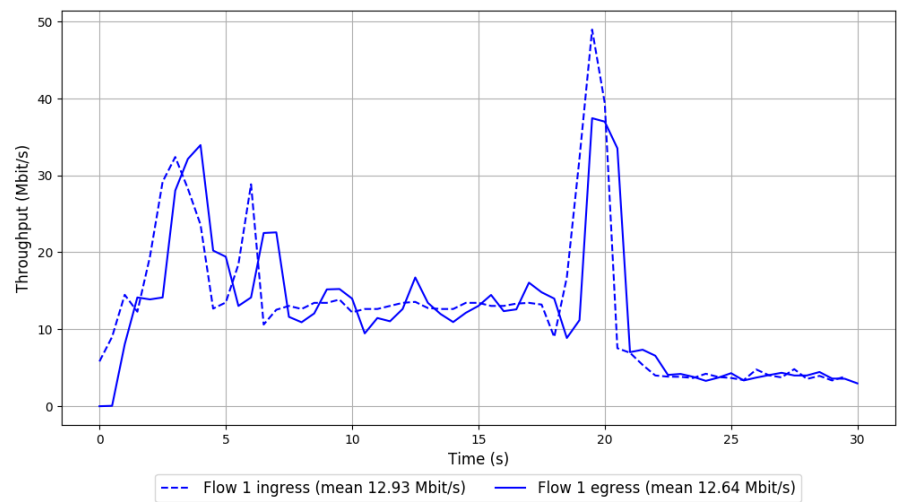


Flow 1 (95th percentile 187.03 ms)

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

Start at: 2018-10-26 07:12:03
End at: 2018-10-26 07:12:33
Local clock offset: 12.076 ms
Remote clock offset: -35.998 ms


# Below is generated by plot.py at 2018-10-26 08:02:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.64 Mbit/s
95th percentile per-packet one-way delay: 185.801 ms
Loss rate: 2.82%
-- Flow 1:
Average throughput: 12.64 Mbit/s
95th percentile per-packet one-way delay: 185.801 ms
Loss rate: 2.82%
```

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

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

Start at: 2018-10-26 07:34:33
End at: 2018-10-26 07:35:03
Local clock offset: 19.034 ms
Remote clock offset: 1.275 ms


# Below is generated by plot.py at 2018-10-26 08:02:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.29 Mbit/s
95th percentile per-packet one-way delay: 179.264 ms
Loss rate: 6.35%
-- Flow 1:
Average throughput: 16.29 Mbit/s
95th percentile per-packet one-way delay: 179.264 ms
Loss rate: 6.35%
```
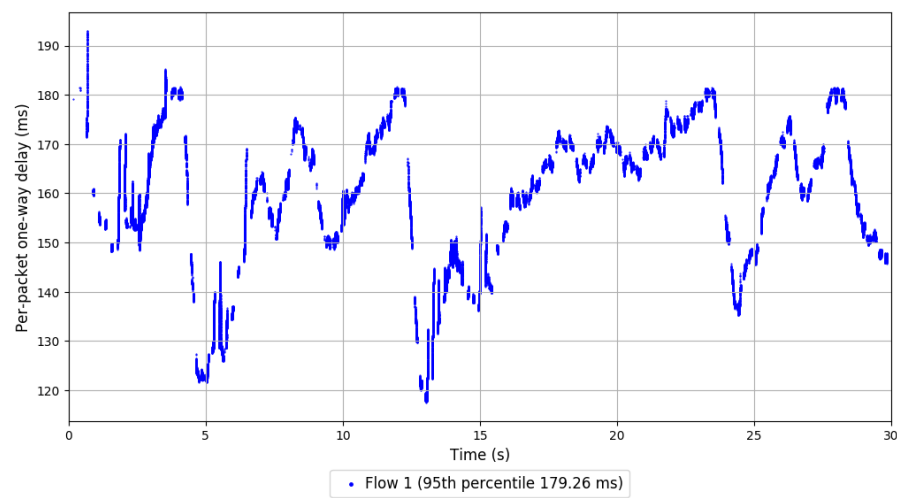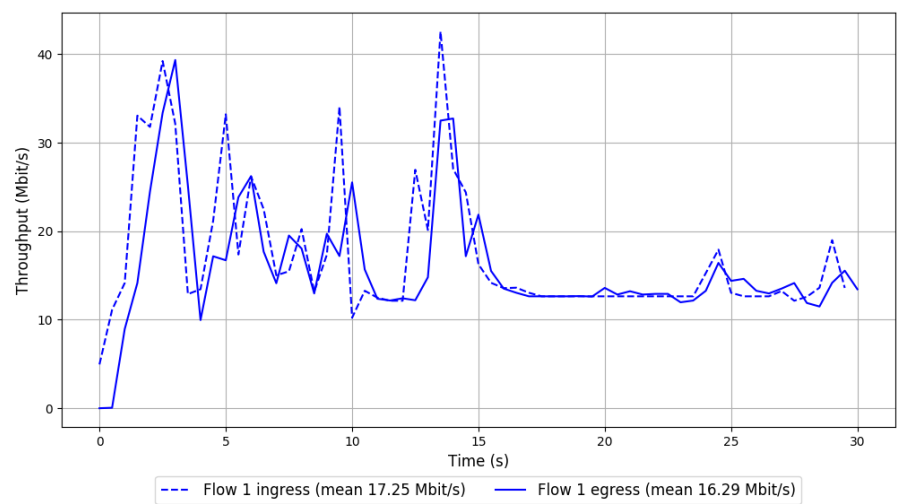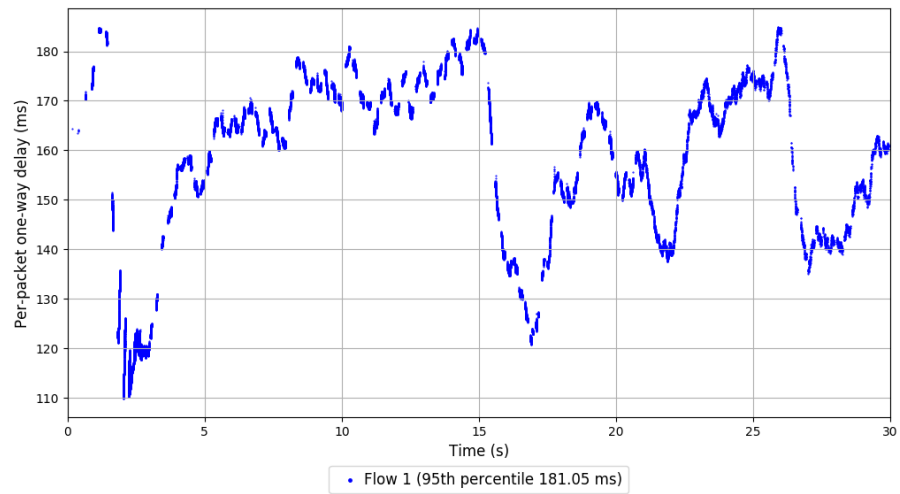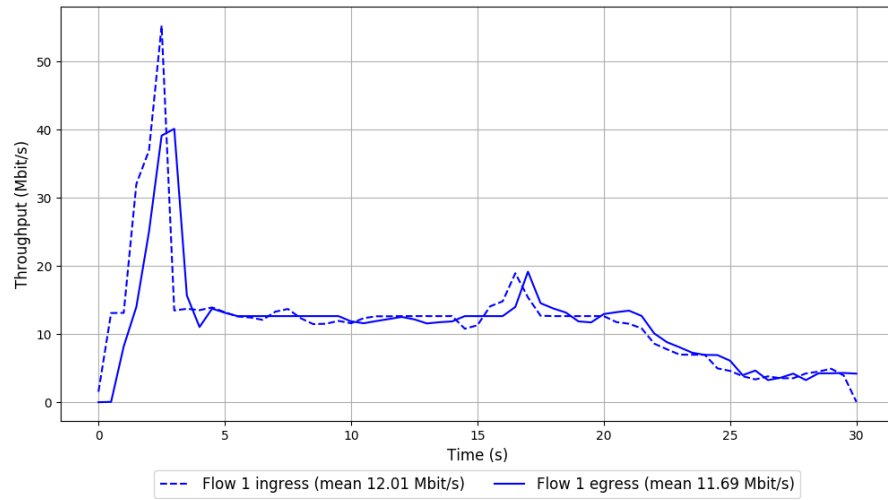
Run 4: Report of TaoVA-100x — Data Link

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

Start at: 2018-10-26 07:57:13
End at: 2018-10-26 07:57:44
Local clock offset: 19.279 ms
Remote clock offset: -17.999 ms

# Below is generated by plot.py at 2018-10-26 08:02:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.69 Mbit/s
95th percentile per-packet one-way delay: 181.047 ms
Loss rate: 3.45%
-- Flow 1:
Average throughput: 11.69 Mbit/s
95th percentile per-packet one-way delay: 181.047 ms
Loss rate: 3.45%
```

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

```
Run 1: Statistics of TCP Vegas

Start at: 2018-10-26 06:23:40
End at: 2018-10-26 06:24:10
Local clock offset: 1.903 ms
Remote clock offset: 3.72 ms


# Below is generated by plot.py at 2018-10-26 08:02:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.48 Mbit/s
95th percentile per-packet one-way delay: 188.968 ms
Loss rate: 22.27%
-- Flow 1:
Average throughput: 8.48 Mbit/s
95th percentile per-packet one-way delay: 188.968 ms
Loss rate: 22.27%
```
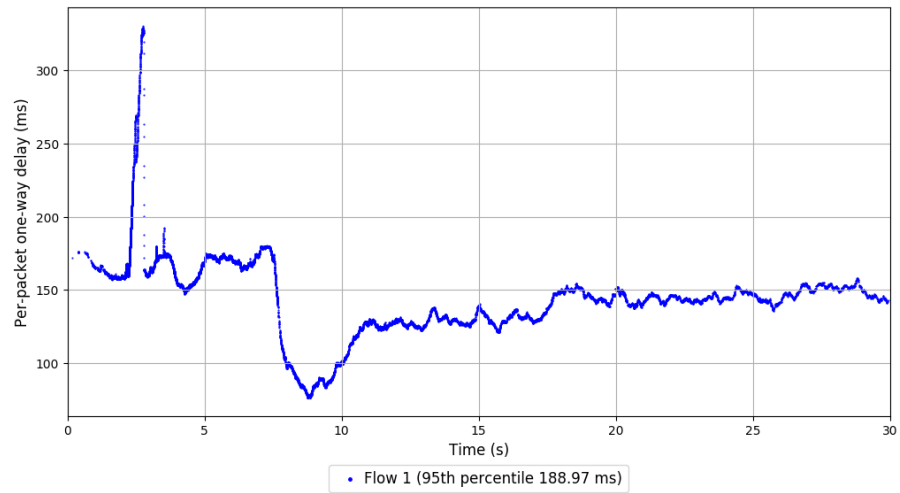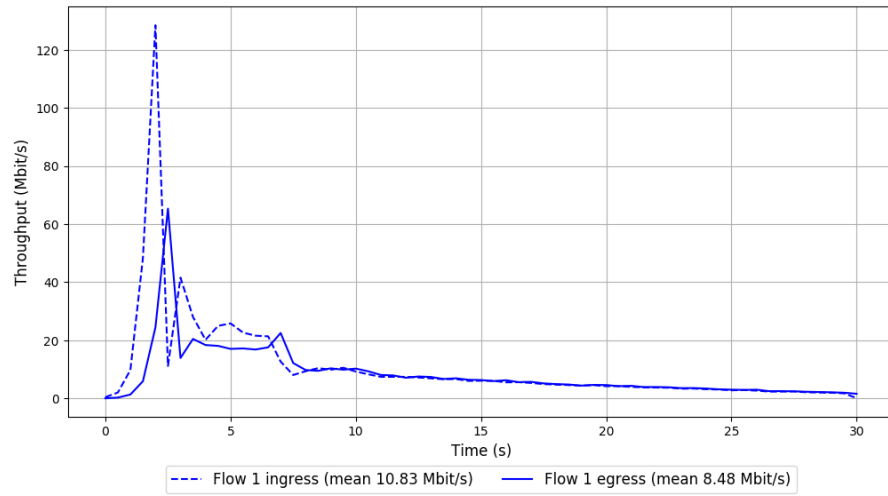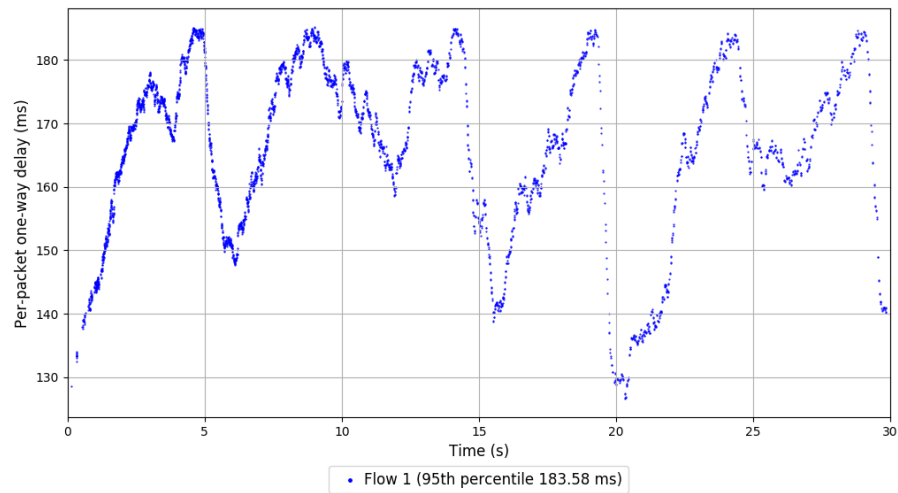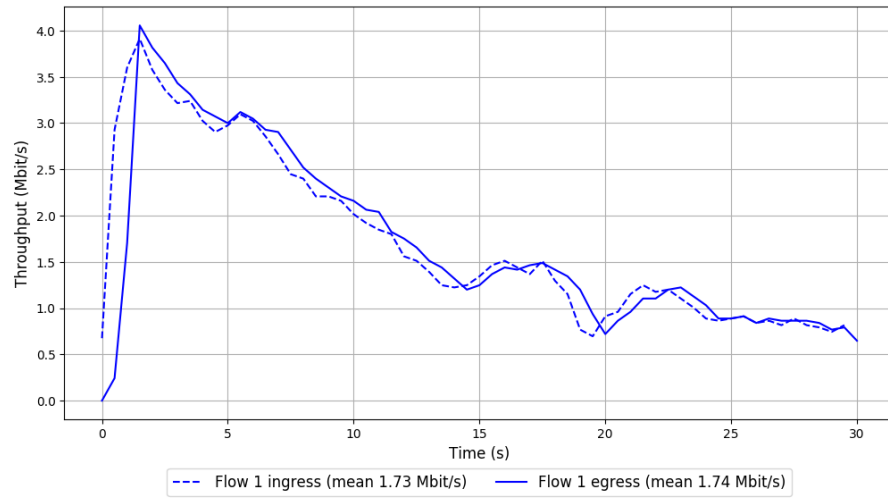
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-10-26 06:45:57
End at: 2018-10-26 06:46:27
Local clock offset: 0.017 ms
Remote clock offset: -39.669 ms


# Below is generated by plot.py at 2018-10-26 08:02:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 183.583 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 183.583 ms
Loss rate: 0.42%
```
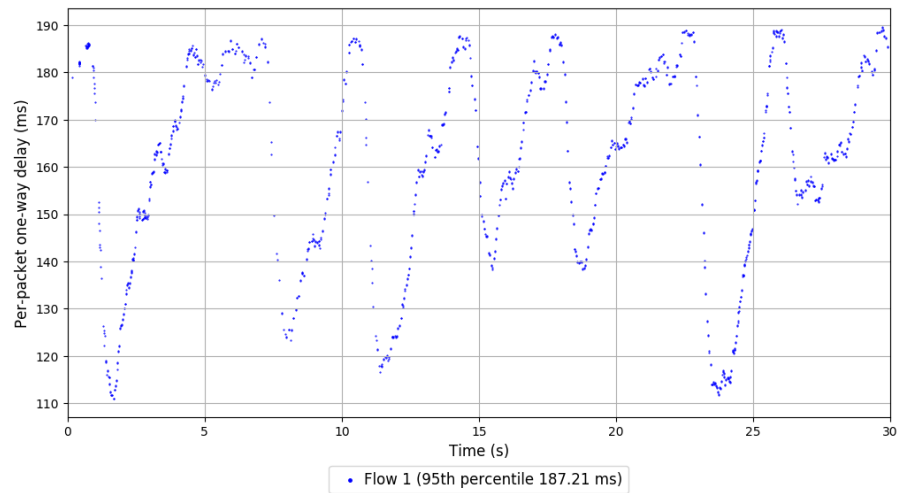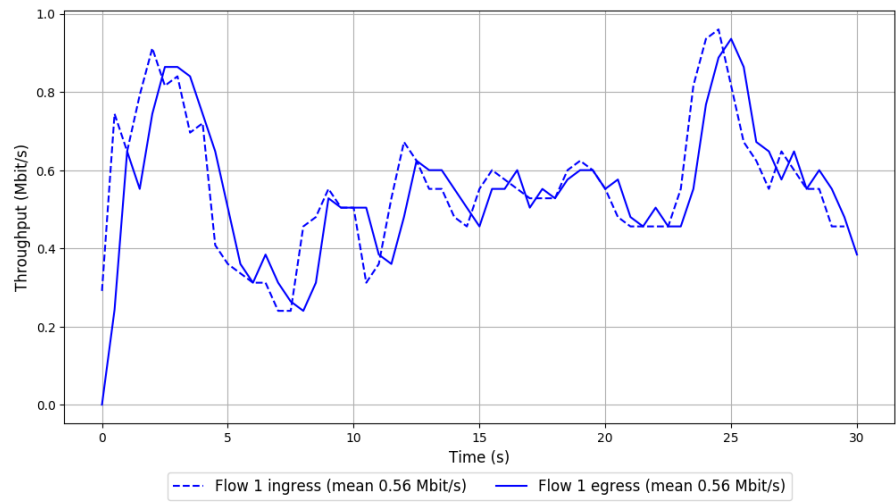
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-10-26 07:08:28
End at: 2018-10-26 07:08:58
Local clock offset: 9.077 ms
Remote clock offset: -59.883 ms


# Below is generated by plot.py at 2018-10-26 08:02:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 187.214 ms
Loss rate: 1.00%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 187.214 ms
Loss rate: 1.00%
```
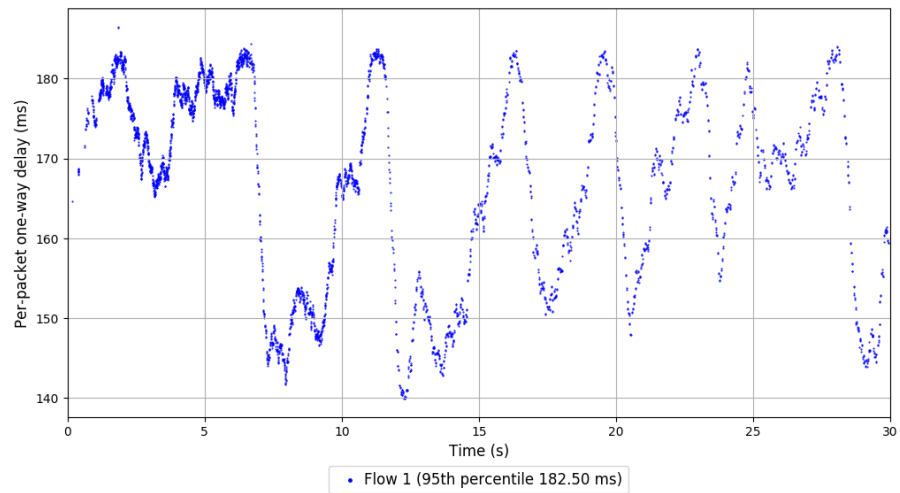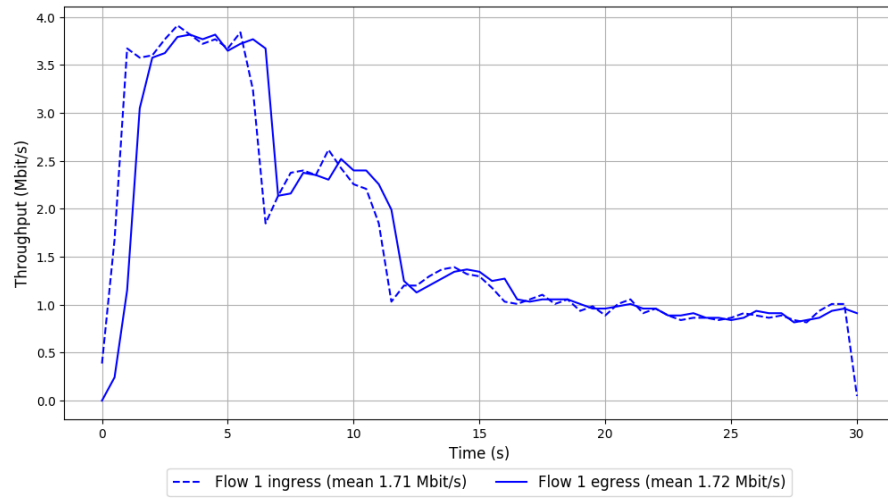
Run 3: Report of TCP Vegas — Data Link

```
Run 4: Statistics of TCP Vegas

Start at: 2018-10-26 07:30:55
End at: 2018-10-26 07:31:25
Local clock offset: 19.605 ms
Remote clock offset: -0.299 ms


# Below is generated by plot.py at 2018-10-26 08:02:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 182.502 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 182.502 ms
Loss rate: 0.49%
```
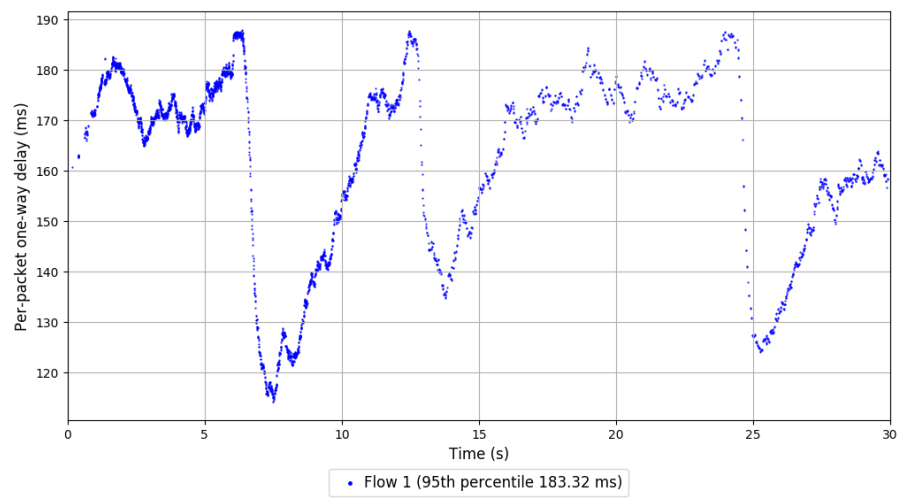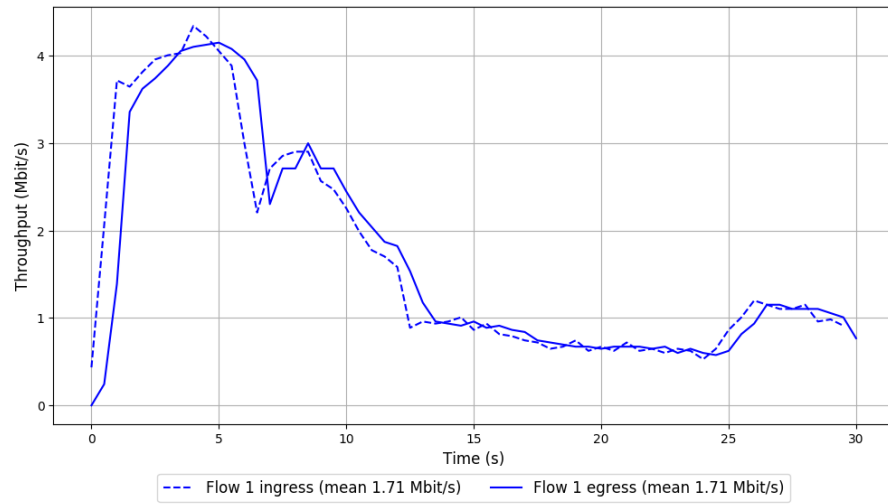
Run 4: Report of TCP Vegas — Data Link

```
Run 5: Statistics of TCP Vegas

Start at: 2018-10-26 07:53:29
End at: 2018-10-26 07:53:59
Local clock offset: 19.113 ms
Remote clock offset: -17.575 ms


# Below is generated by plot.py at 2018-10-26 08:02:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 183.319 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 183.319 ms
Loss rate: 0.49%
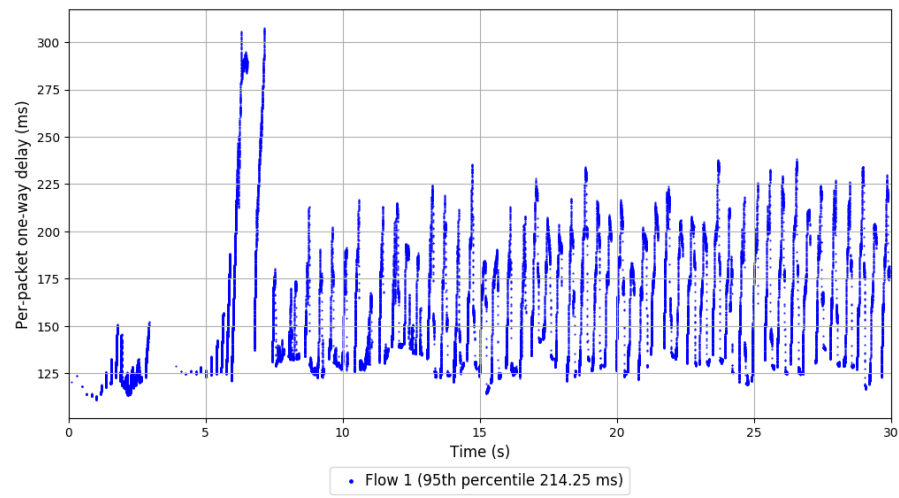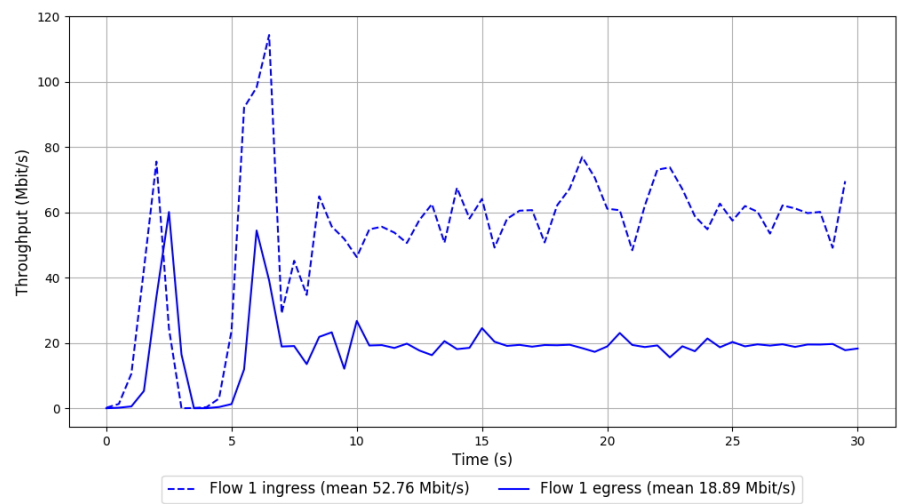```

Run 5: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2018-10-26 06:13:54
End at: 2018-10-26 06:14:24
Local clock offset: 3.776 ms
Remote clock offset: 108.726 ms


# Below is generated by plot.py at 2018-10-26 08:02:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 18.89 Mbit/s
95th percentile per-packet one-way delay: 214.253 ms
Loss rate: 64.40%
-- Flow 1:
Average throughput: 18.89 Mbit/s
95th percentile per-packet one-way delay: 214.253 ms
Loss rate: 64.40%
```
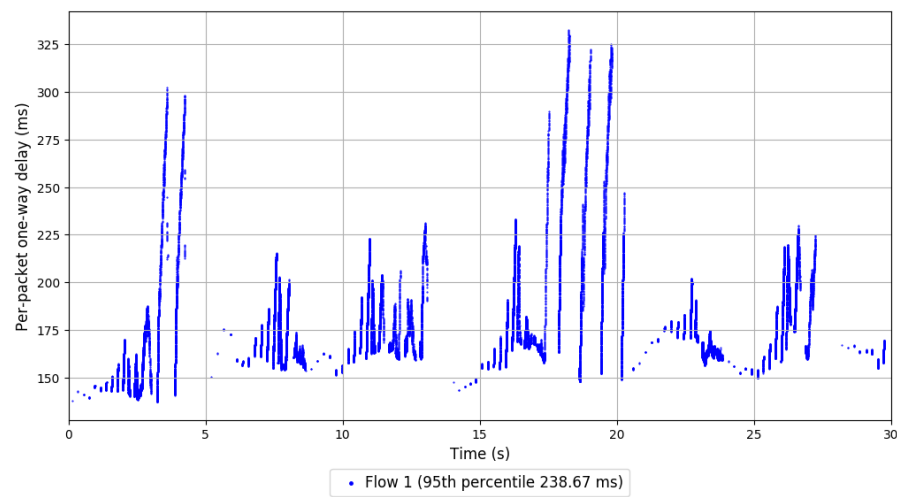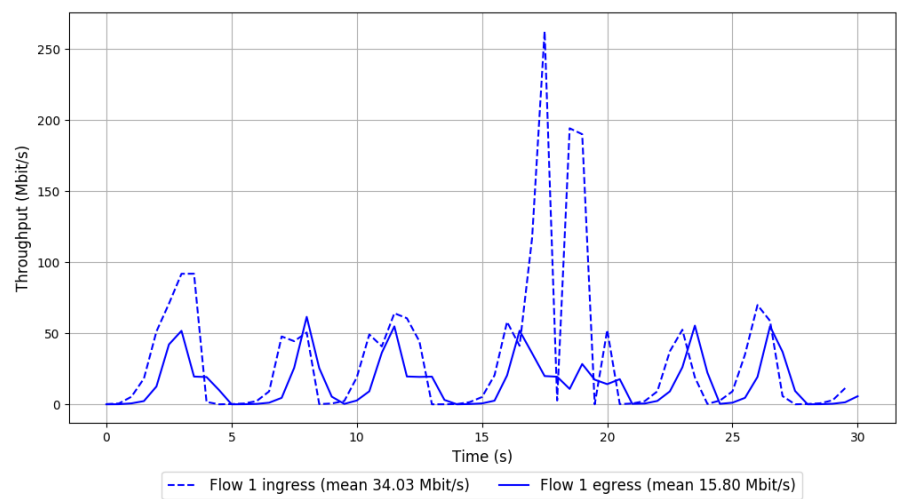
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2018-10-26 06:36:00
End at: 2018-10-26 06:36:30
Local clock offset: 0.908 ms
Remote clock offset: -32.753 ms


# Below is generated by plot.py at 2018-10-26 08:02:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.80 Mbit/s
95th percentile per-packet one-way delay: 238.671 ms
Loss rate: 53.88%
-- Flow 1:
Average throughput: 15.80 Mbit/s
95th percentile per-packet one-way delay: 238.671 ms
Loss rate: 53.88%
```
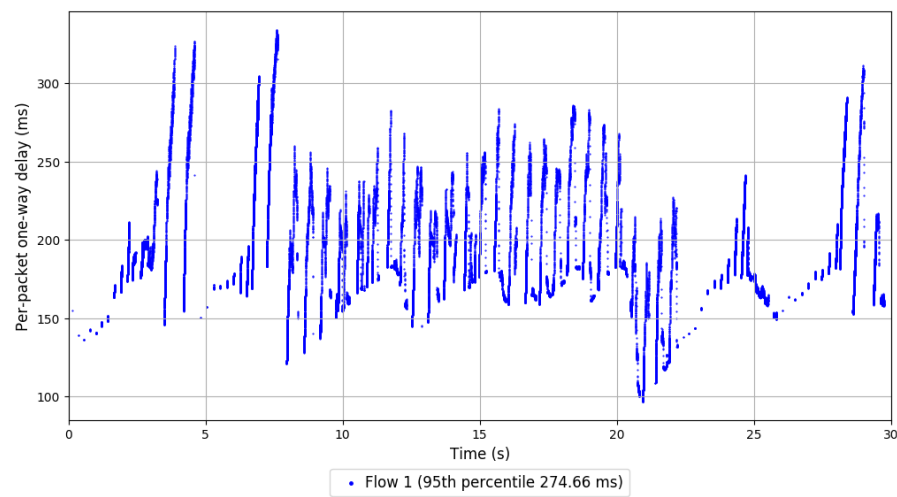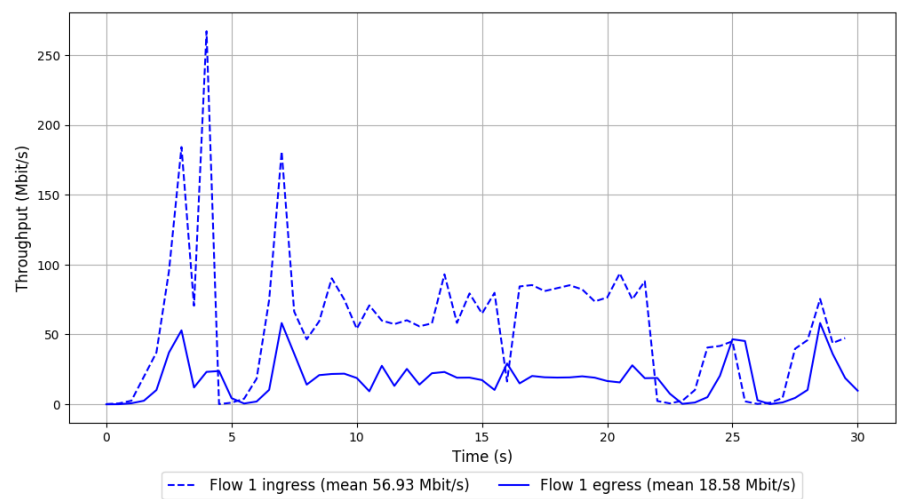
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-10-26 06:58:29
End at: 2018-10-26 06:58:59
Local clock offset: -0.64 ms
Remote clock offset: -59.207 ms


# Below is generated by plot.py at 2018-10-26 08:02:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 18.58 Mbit/s
95th percentile per-packet one-way delay: 274.657 ms
Loss rate: 67.78%
-- Flow 1:
Average throughput: 18.58 Mbit/s
95th percentile per-packet one-way delay: 274.657 ms
Loss rate: 67.78%
```
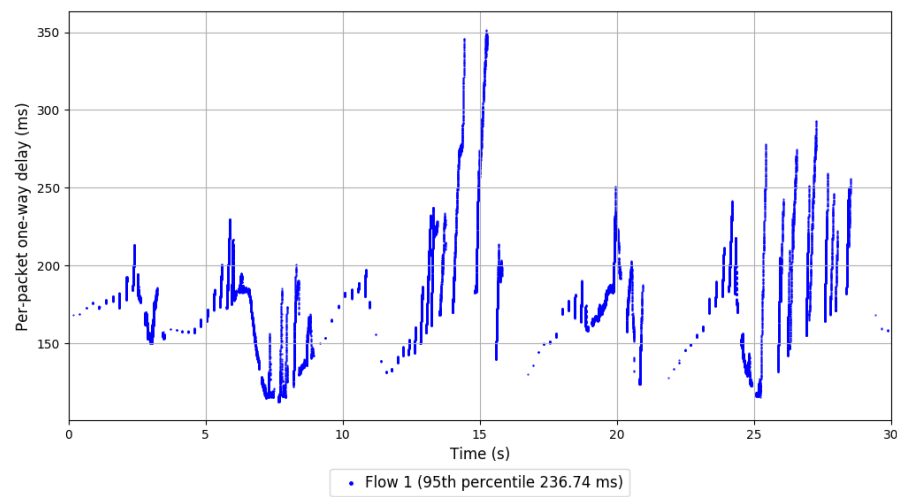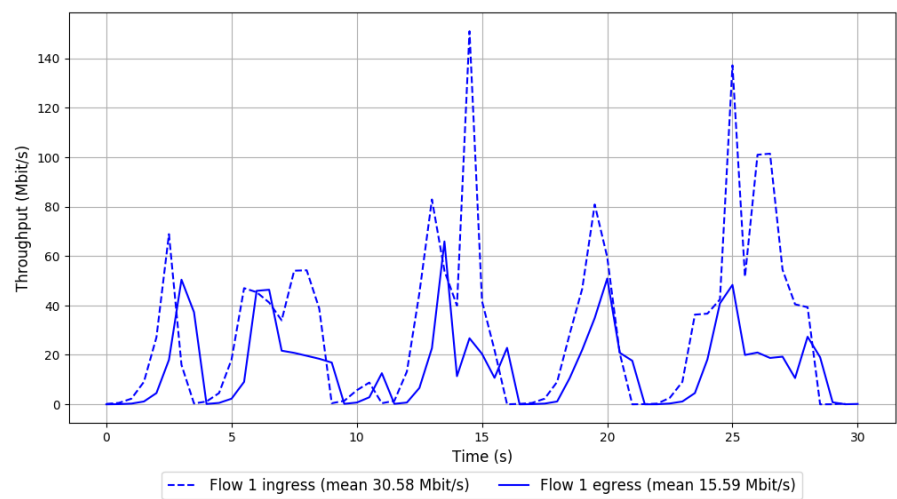
# Run 3: Report of Verus — Data Link

```
Run 4: Statistics of Verus

Start at: 2018-10-26 07:21:01
End at: 2018-10-26 07:21:31
Local clock offset: 16.653 ms
Remote clock offset: -6.176 ms


# Below is generated by plot.py at 2018-10-26 08:02:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.59 Mbit/s
95th percentile per-packet one-way delay: 236.736 ms
Loss rate: 49.42%
-- Flow 1:
Average throughput: 15.59 Mbit/s
95th percentile per-packet one-way delay: 236.736 ms
Loss rate: 49.42%
```

Run 4: Report of Verus — Data Link

```
Run 5: Statistics of Verus

Start at: 2018-10-26 07:43:24
End at: 2018-10-26 07:43:55
Local clock offset: 18.146 ms
Remote clock offset: 0.572 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 19.03 Mbit/s
95th percentile per-packet one-way delay: 294.137 ms
Loss rate: 74.71%
-- Flow 1:
Average throughput: 19.03 Mbit/s
95th percentile per-packet one-way delay: 294.137 ms
Loss rate: 74.71%
```
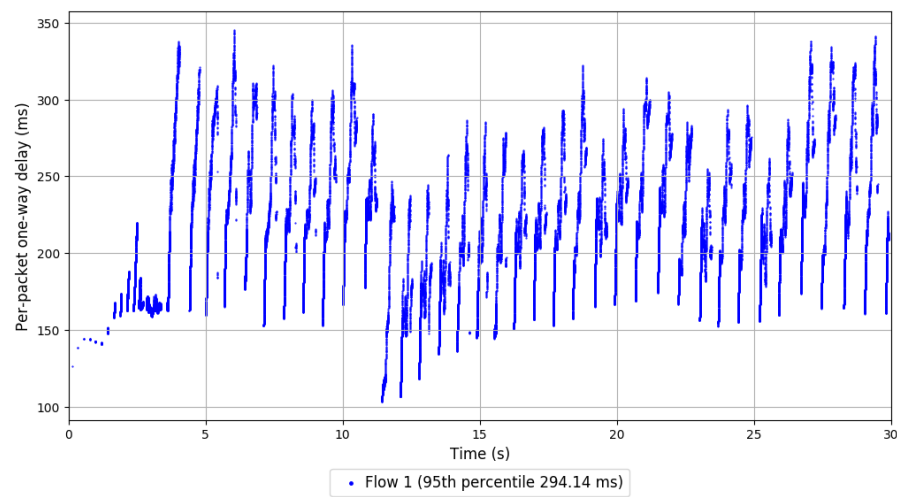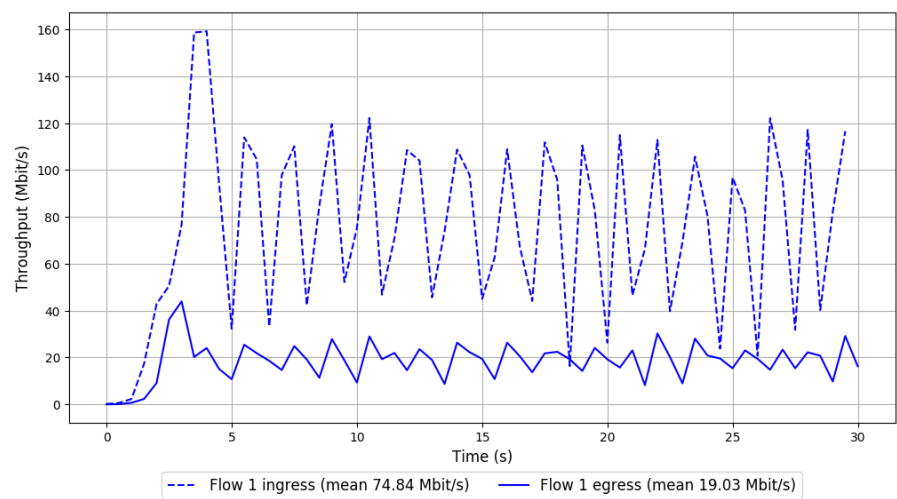
Run 5: Report of Verus — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2018-10-26 06:21:17
End at: 2018-10-26 06:21:47
Local clock offset: 2.332 ms
Remote clock offset: 20.879 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.97 Mbit/s
95th percentile per-packet one-way delay: 169.839 ms
Loss rate: 1.61%
-- Flow 1:
Average throughput: 2.97 Mbit/s
95th percentile per-packet one-way delay: 169.839 ms
Loss rate: 1.61%
```
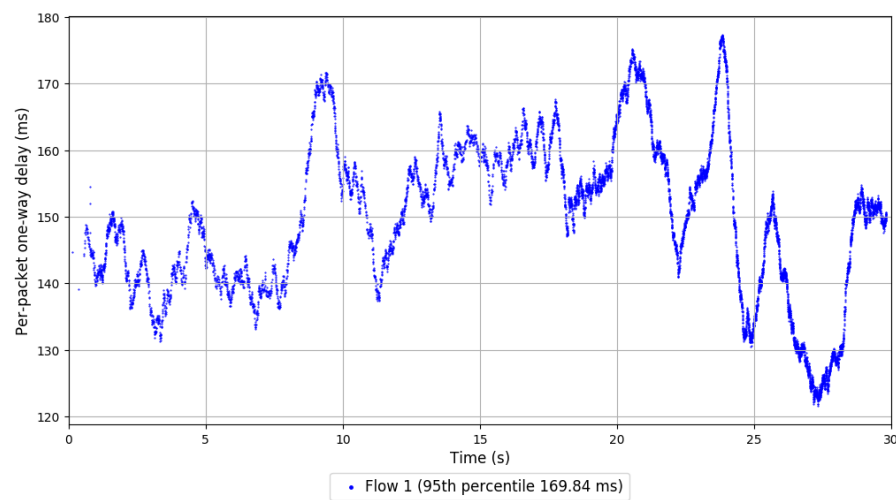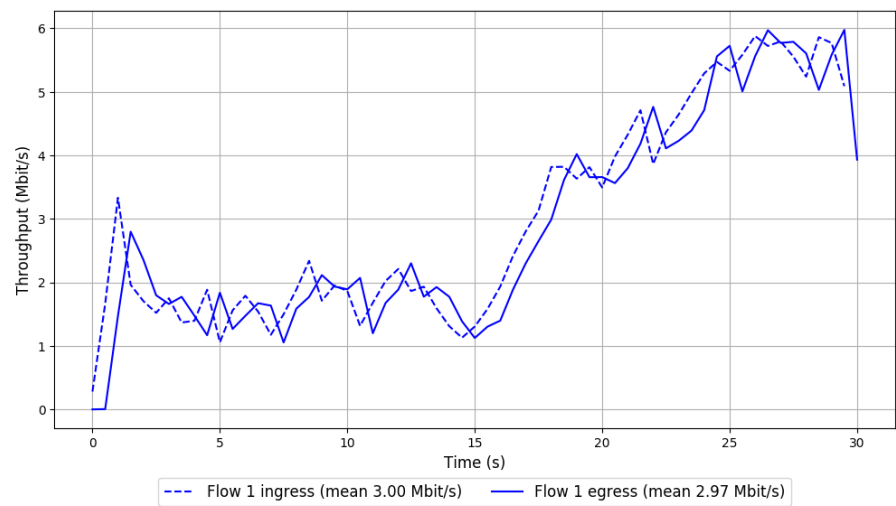
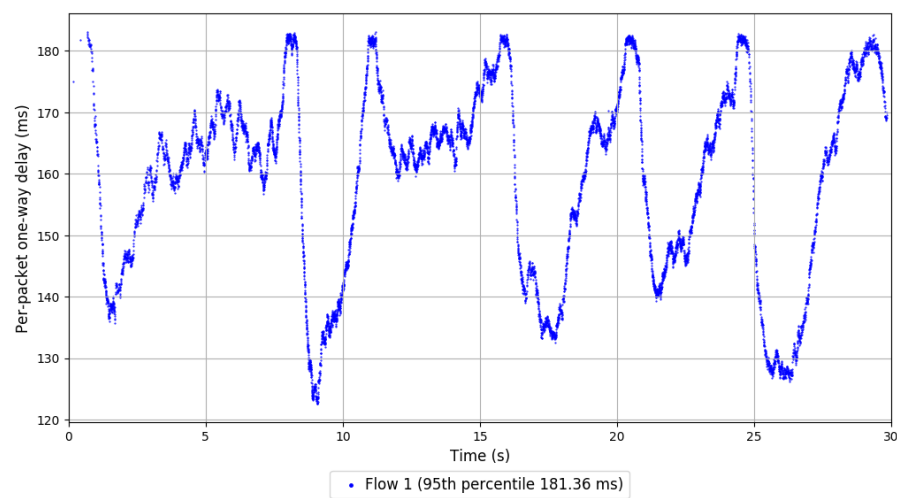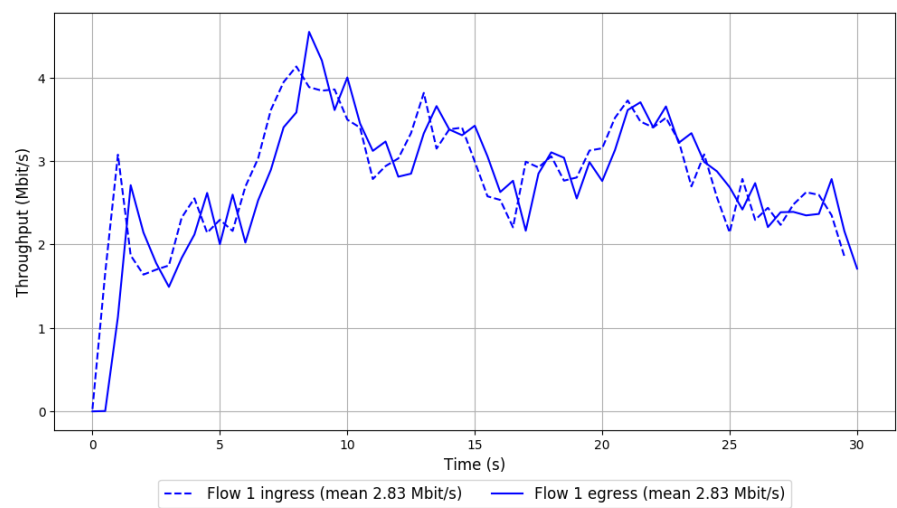Run 1: Report of PCC-Vivace — Data Link

```
Run 2: Statistics of PCC-Vivace

Start at: 2018-10-26 06:43:30
End at: 2018-10-26 06:44:00
Local clock offset: 0.131 ms
Remote clock offset: -34.618 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.83 Mbit/s
95th percentile per-packet one-way delay: 181.364 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 2.83 Mbit/s
95th percentile per-packet one-way delay: 181.364 ms
Loss rate: 0.74%
```

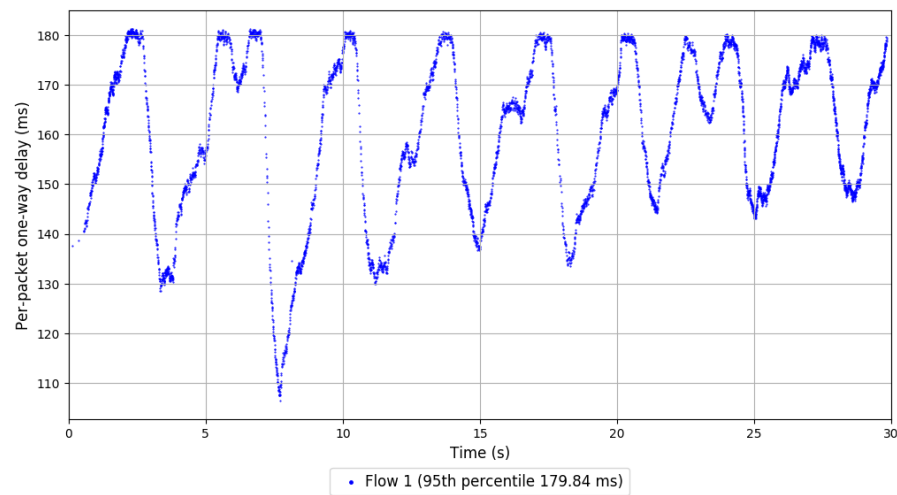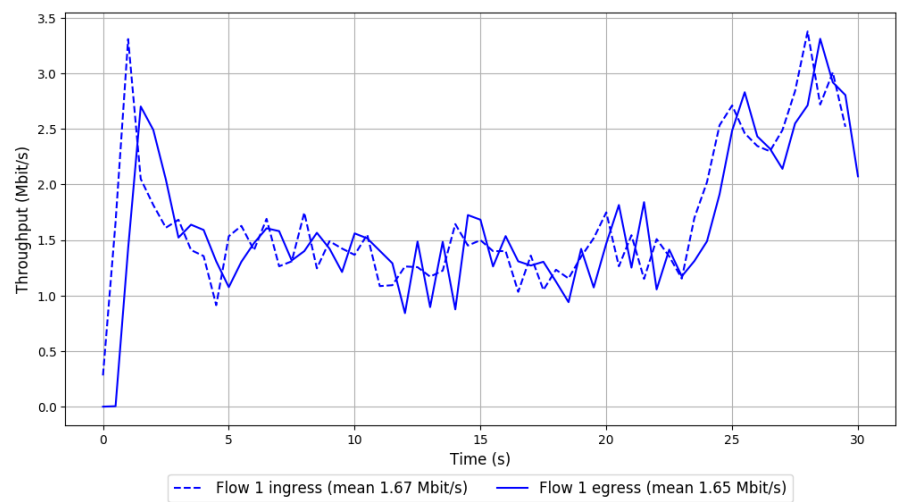Run 2: Report of PCC-Vivace — Data Link

```
Run 3: Statistics of PCC-Vivace

Start at: 2018-10-26 07:06:05
End at: 2018-10-26 07:06:35
Local clock offset: 6.556 ms
Remote clock offset: -71.208 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 179.845 ms
Loss rate: 1.68%
-- Flow 1:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 179.845 ms
Loss rate: 1.68%
```

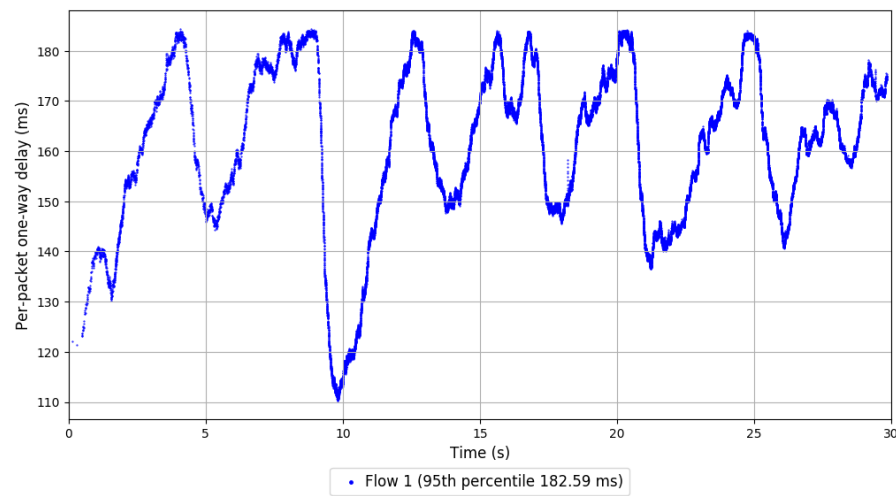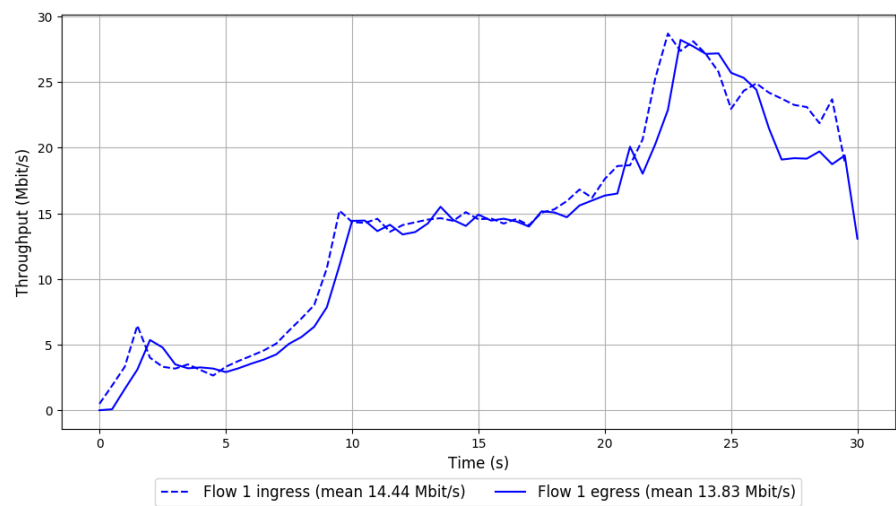## Run 3: Report of PCC-Vivace — Data Link

```
Run 4: Statistics of PCC-Vivace

Start at: 2018-10-26 07:28:27
End at: 2018-10-26 07:28:57
Local clock offset: 18.925 ms
Remote clock offset: -0.995 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.83 Mbit/s
95th percentile per-packet one-way delay: 182.591 ms
Loss rate: 4.83%
-- Flow 1:
Average throughput: 13.83 Mbit/s
95th percentile per-packet one-way delay: 182.591 ms
Loss rate: 4.83%
```

# Run 4: Report of PCC-Vivace — Data Link



Flow 1 ingress (mean 14.44 Mbit/s)    Flow 1 egress (mean 13.83 Mbit/s)
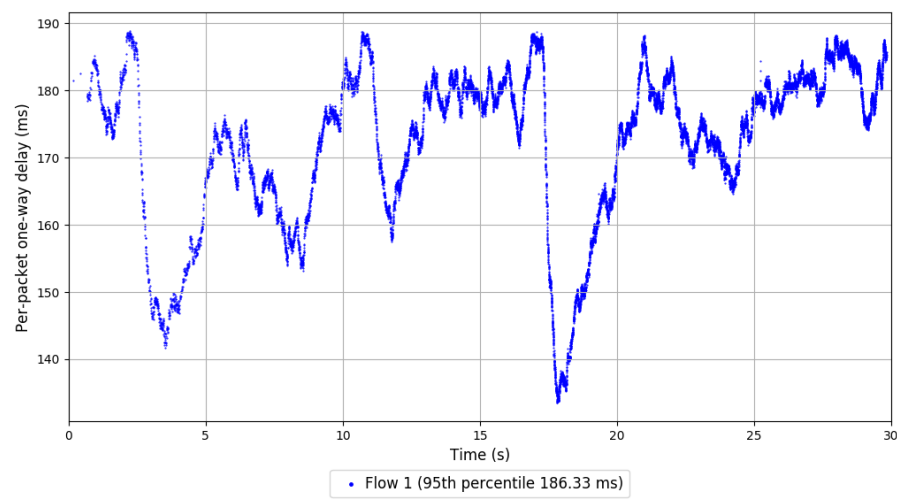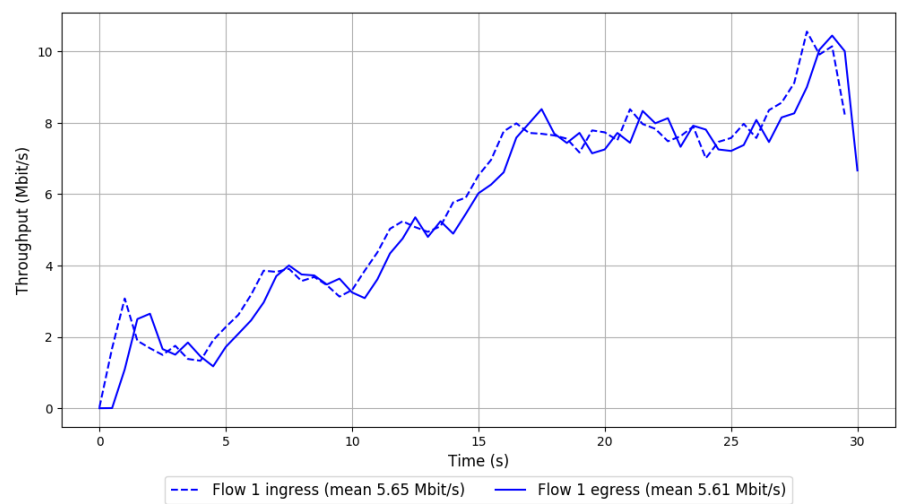


Flow 1 (95th percentile 182.59 ms)

```
Run 5: Statistics of PCC-Vivace

Start at: 2018-10-26 07:51:05
End at: 2018-10-26 07:51:35
Local clock offset: 18.79 ms
Remote clock offset: -16.42 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.61 Mbit/s
95th percentile per-packet one-way delay: 186.326 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 5.61 Mbit/s
95th percentile per-packet one-way delay: 186.326 ms
Loss rate: 1.51%
```

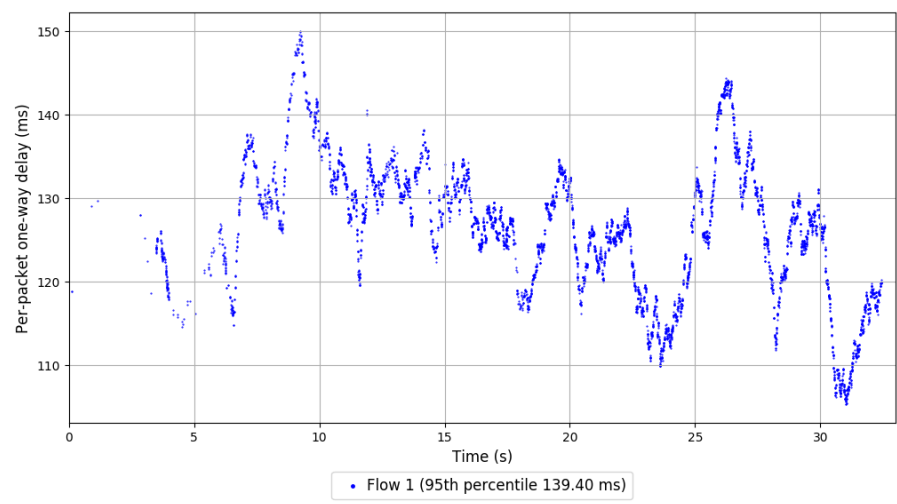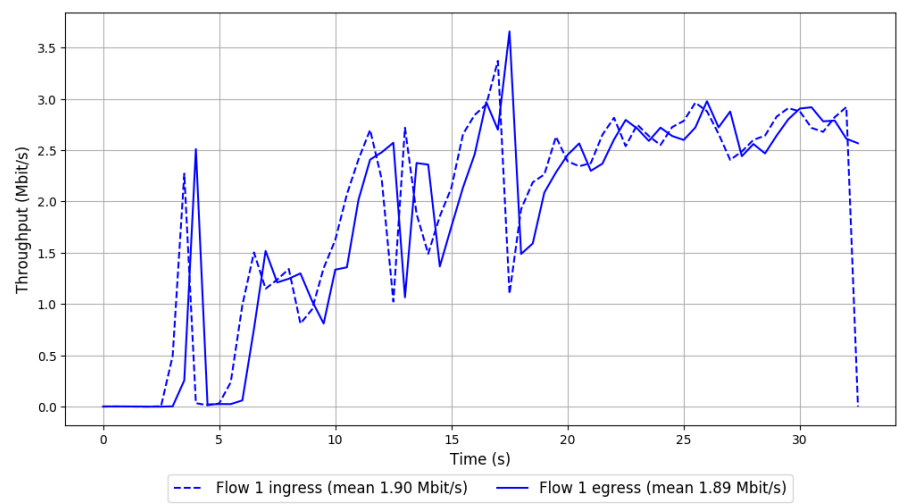Run 5: Report of PCC-Vivace — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2018-10-26 06:18:55
End at: 2018-10-26 06:19:25
Local clock offset: 2.431 ms
Remote clock offset: 44.842 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 139.398 ms
Loss rate: 0.84%
-- Flow 1:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 139.398 ms
Loss rate: 0.84%
```

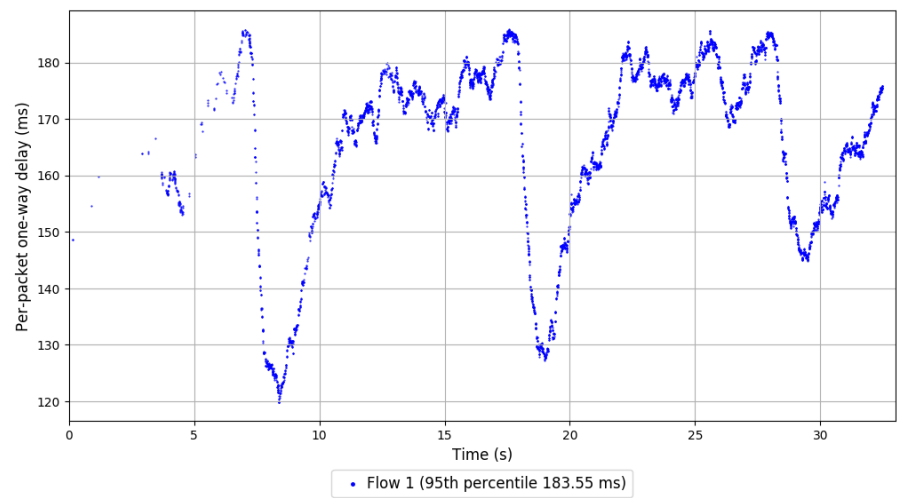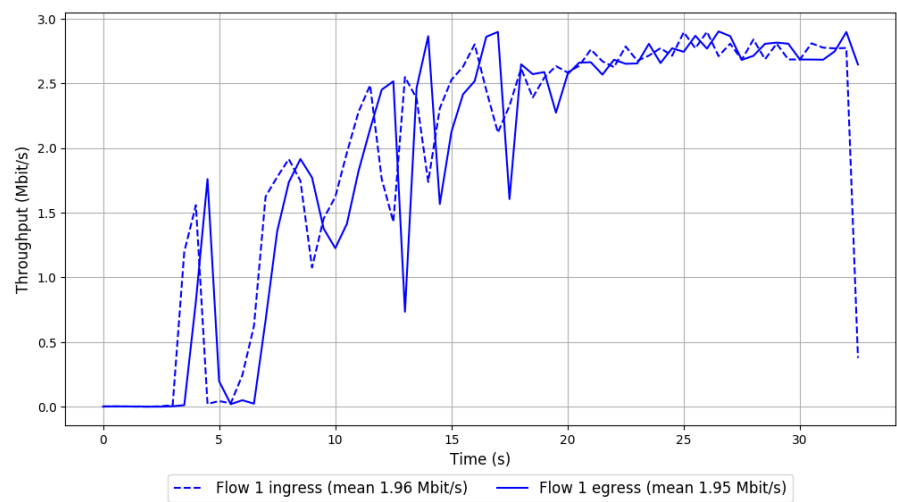Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-10-26 06:41:05
End at: 2018-10-26 06:41:35
Local clock offset: 0.3 ms
Remote clock offset: -35.031 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 183.552 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 183.552 ms
Loss rate: 1.09%
```

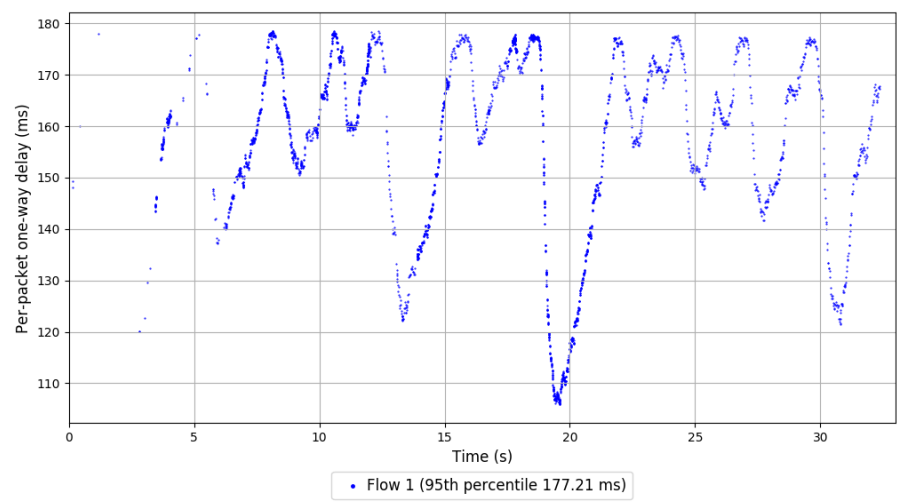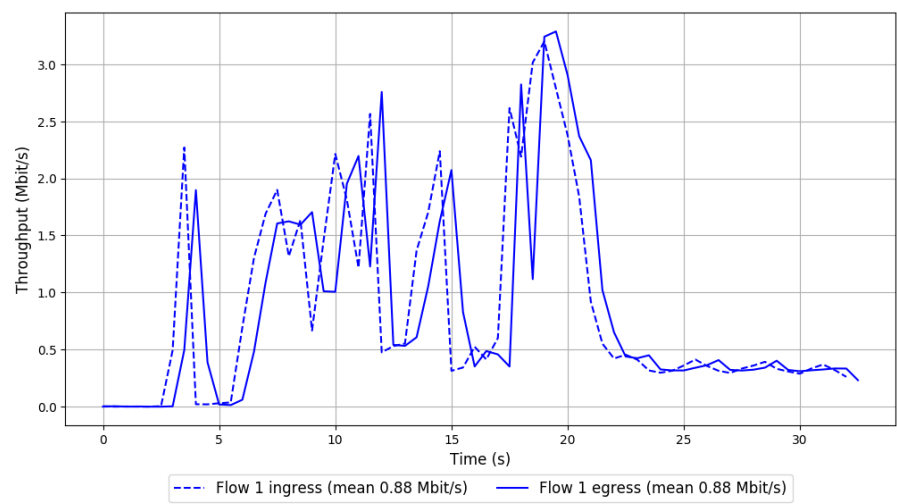Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-10-26 07:03:42
End at: 2018-10-26 07:04:12
Local clock offset: 2.764 ms
Remote clock offset: -65.104 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 177.207 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 177.207 ms
Loss rate: 0.51%
```

Run 3: Report of WebRTC media — Data Link

```
Run 4: Statistics of WebRTC media

Start at: 2018-10-26 07:26:02
End at: 2018-10-26 07:26:32
Local clock offset: 18.382 ms
Remote clock offset: -1.74 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 182.397 ms
Loss rate: 0.87%
-- Flow 1:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 182.397 ms
Loss rate: 0.87%
```
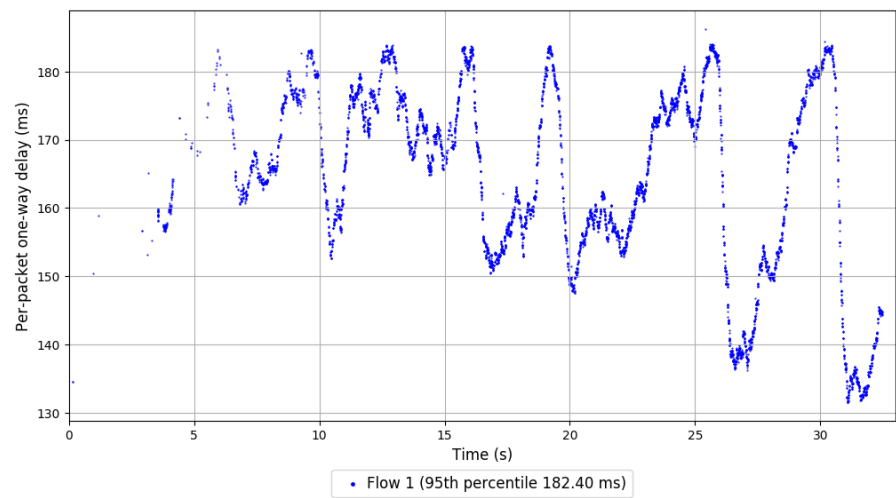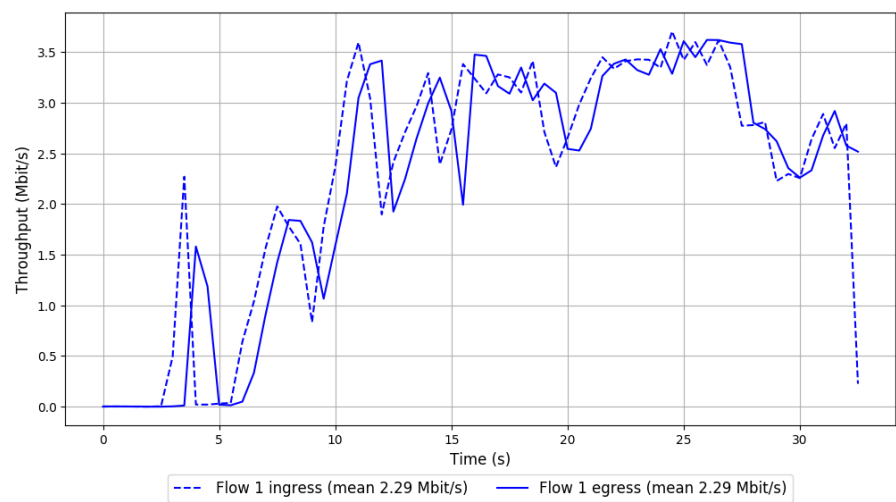
Run 4: Report of WebRTC media — Data Link

```
Run 5: Statistics of WebRTC media

Start at: 2018-10-26 07:48:39
End at: 2018-10-26 07:49:09
Local clock offset: 18.476 ms
Remote clock offset: -13.546 ms


# Below is generated by plot.py at 2018-10-26 08:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 185.768 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 185.768 ms
Loss rate: 0.98%
```

Run 5: Report of WebRTC media — Data Link