Pantheon Report

Generated at 2019-01-24 14:12:39 (UTC).

Data path: AWS Brazil 2 on `ens5` (*local*) →Colombia cellular on `ppp0` (*remote*).

Repeated the test of 21 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.
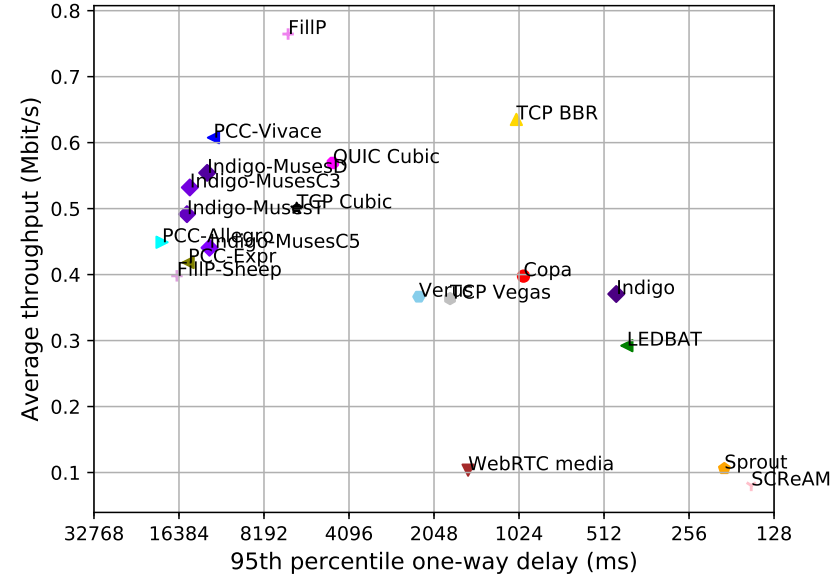
```
System info:
Linux 4.15.0-1031-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912

Git summary:
branch: muses @ 0b8e9a949603c3842368430acf469eec3b941f9f
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ d9c5ea33091330aca25ecd105ab2db6d34d5c40d
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
```
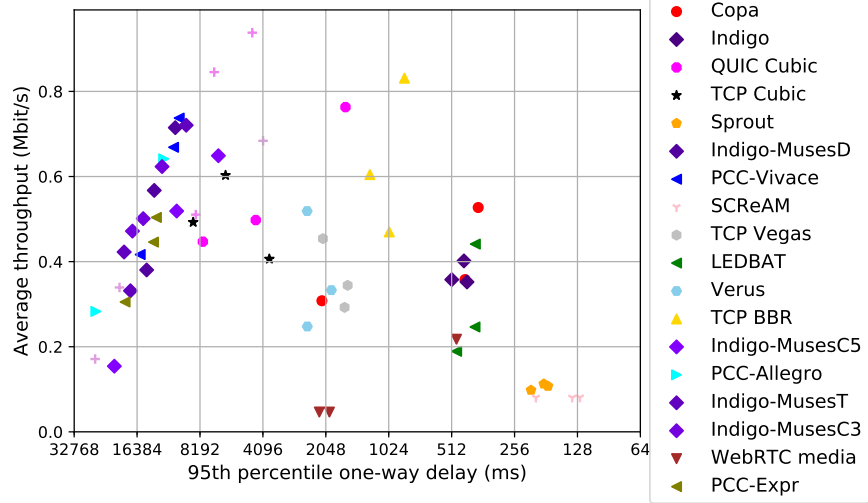
```
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from AWS Brazil 2 to Colombia cellular, 3 runs of 30s each per scheme
(mean of all runs by scheme)

test from AWS Brazil 2 to Colombia cellular, 3 runs of 30s each per scheme

scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	0.63	1046.38	1.50
Copa	3	0.40	987.38	1.33
TCP Cubic	3	0.50	6275.93	19.20
FillP	3	0.77	6729.18	20.17
FillP-Sheep	3	0.40	16658.16	47.34
Indigo	3	0.37	463.53	0.15
Indigo-MusesC3	3	0.53	14999.34	71.59
Indigo-MusesC5	3	0.44	12776.17	51.12
Indigo-MusesD	3	0.55	13020.57	52.49
Indigo-MusesT	3	0.49	15355.12	72.69
LEDBAT	3	0.29	425.07	0.59
PCC-Allegro	3	0.45	18807.31	98.66
PCC-Expr	3	0.42	15210.64	92.75
QUIC Cubic	3	0.57	4672.42	12.18
SCReAM	3	0.08	154.18	0.26
Sprout	3	0.11	192.01	0.01
TaoVA-100x	0	N/A	N/A	N/A
TCP Vegas	3	0.36	1796.78	1.78
Verus	3	0.37	2317.71	2.67
PCC-Vivace	3	0.61	12367.90	56.51
WebRTC media	3	0.11	1551.11	0.09

```
Run 1: Statistics of TCP BBR

Start at: 2019-01-24 13:02:03
End at: 2019-01-24 13:02:33
Local clock offset: -6.336 ms
Remote clock offset: 8.648 ms


# Below is generated by plot.py at 2019-01-24 14:12:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1260.159 ms
Loss rate: 1.95%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1260.159 ms
Loss rate: 1.95%
```
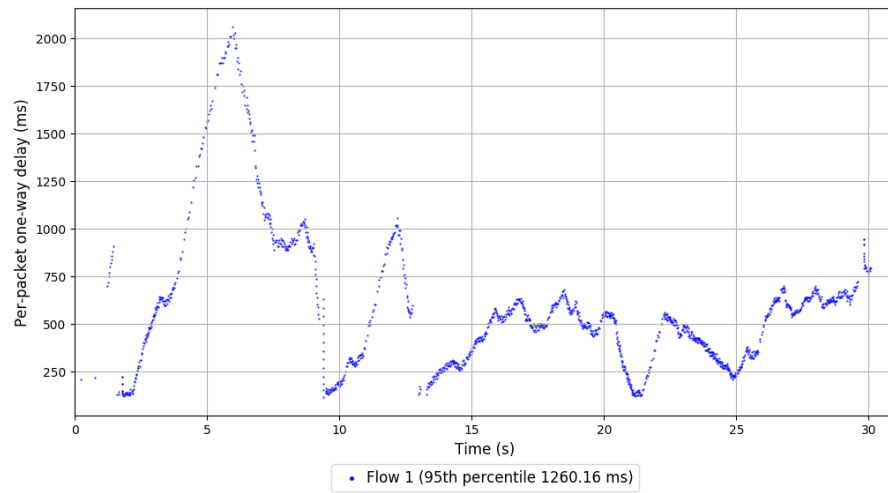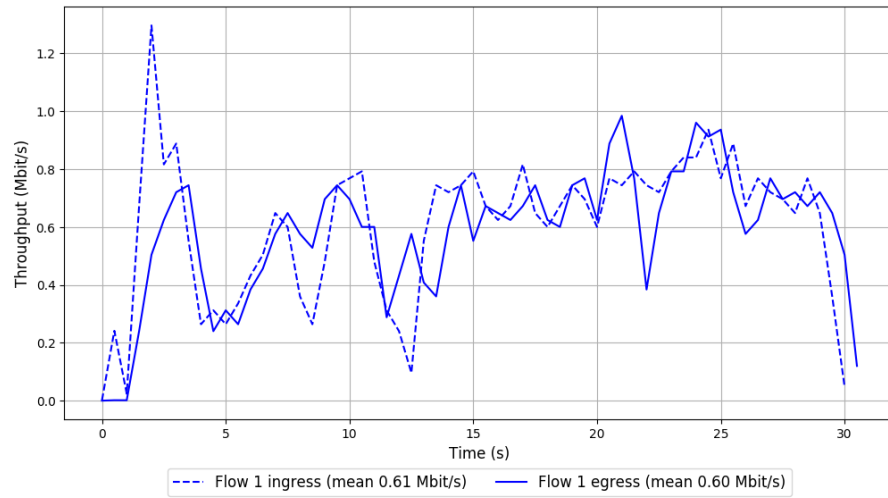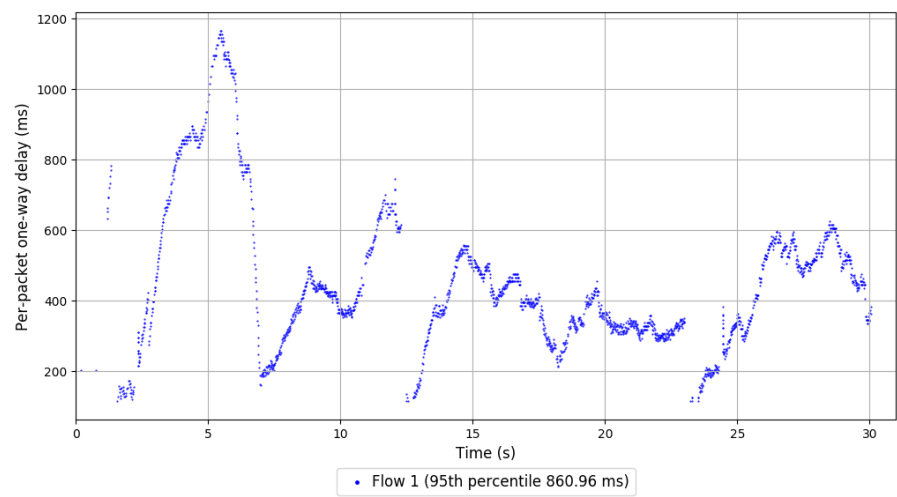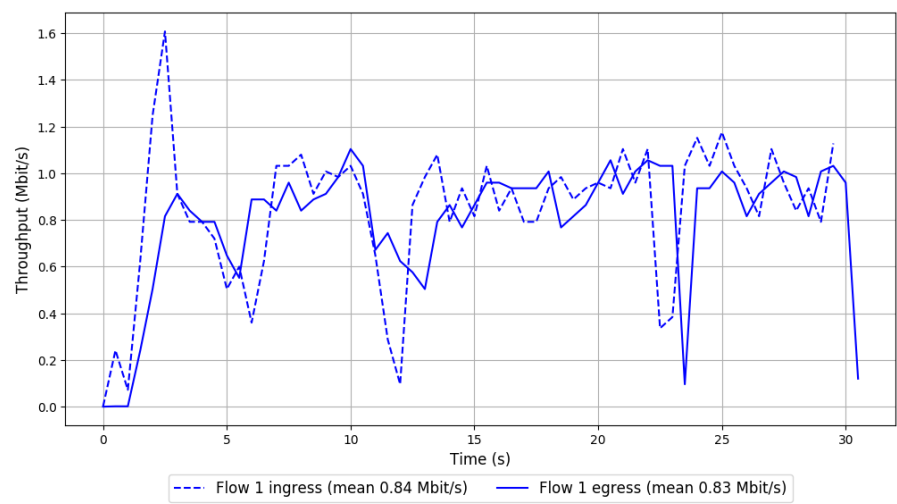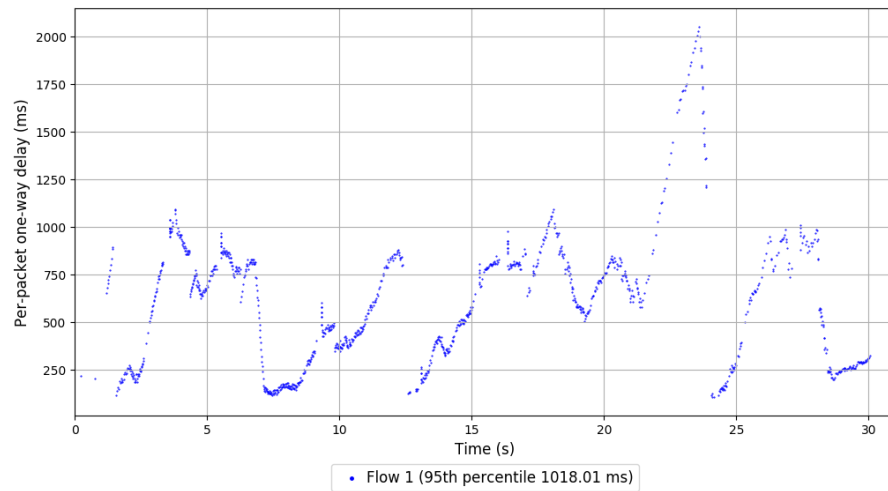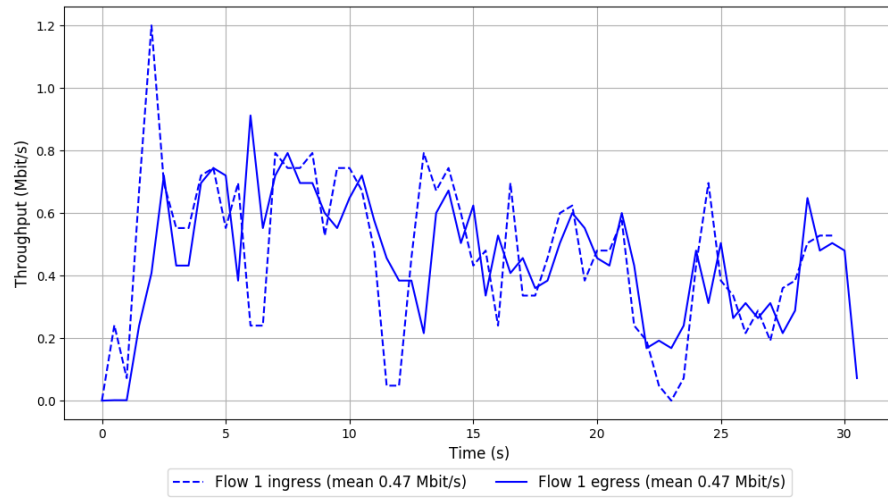
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2019-01-24 13:25:58
End at: 2019-01-24 13:26:28
Local clock offset: -2.41 ms
Remote clock offset: 10.87 ms


# Below is generated by plot.py at 2019-01-24 14:12:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 860.957 ms
Loss rate: 1.62%
-- Flow 1:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 860.957 ms
Loss rate: 1.62%
```

Run 2: Report of TCP BBR — Data Link

Flow 1 ingress (mean 0.84 Mbit/s)   Flow 1 egress (mean 0.83 Mbit/s)

Flow 1 (95th percentile 860.96 ms)

```
Run 3: Statistics of TCP BBR

Start at: 2019-01-24 13:49:49
End at: 2019-01-24 13:50:19
Local clock offset: -0.9 ms
Remote clock offset: 10.216 ms


# Below is generated by plot.py at 2019-01-24 14:12:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 1018.015 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 1018.015 ms
Loss rate: 0.93%
```
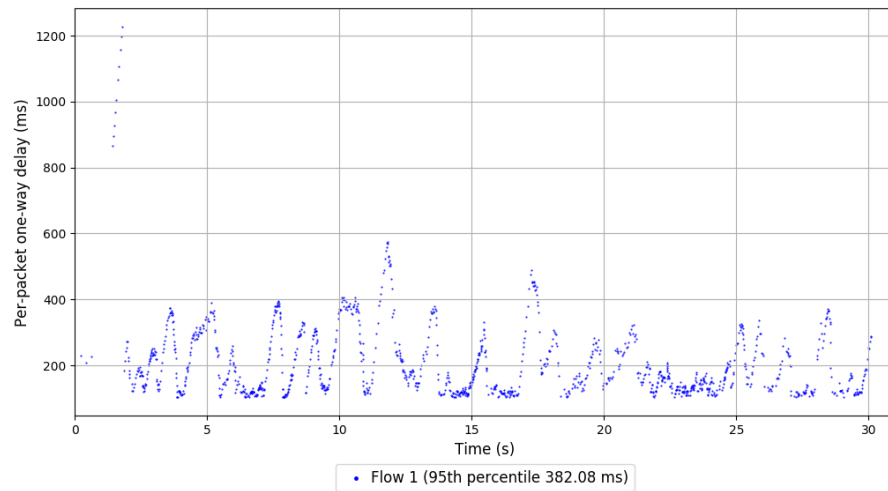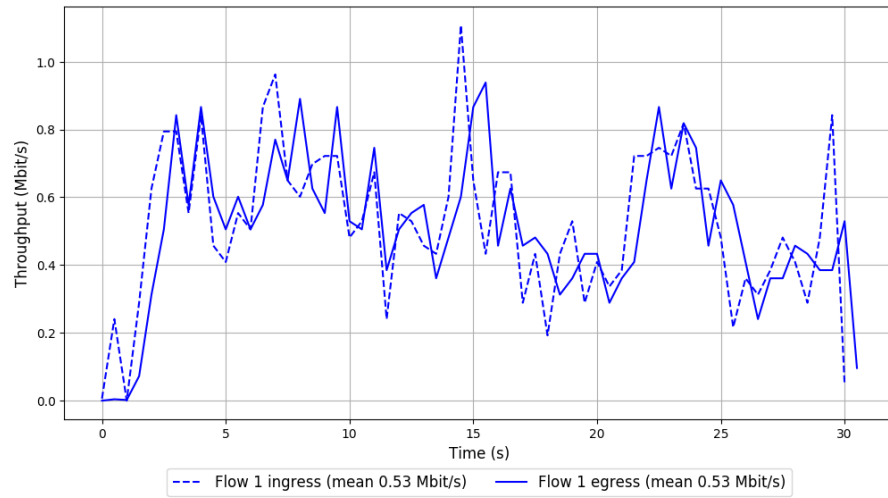
Run 3: Report of TCP BBR — Data Link

```
Run 1: Statistics of Copa

Start at: 2019-01-24 13:11:08
End at: 2019-01-24 13:11:38
Local clock offset: -4.185 ms
Remote clock offset: 6.62 ms


# Below is generated by plot.py at 2019-01-24 14:12:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 382.076 ms
Loss rate: 1.36%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 382.076 ms
Loss rate: 1.36%
```
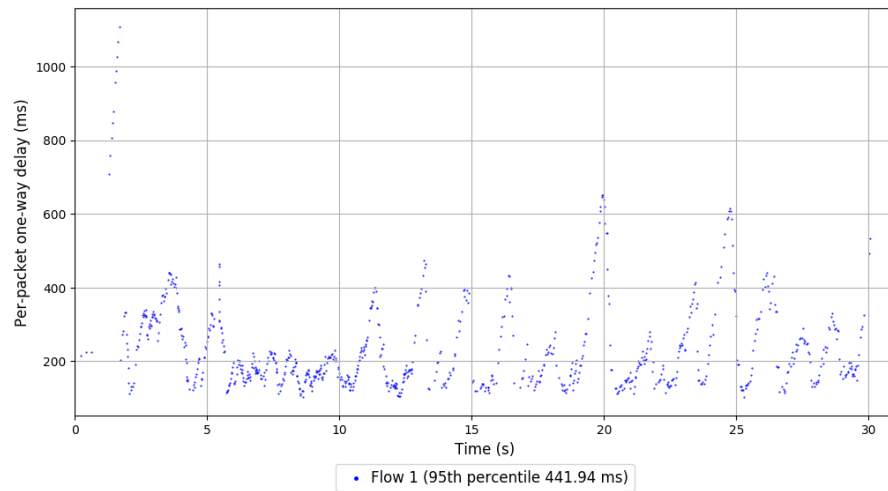
Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2019-01-24 13:35:03
End at: 2019-01-24 13:35:33
Local clock offset: -1.964 ms
Remote clock offset: 6.23 ms


# Below is generated by plot.py at 2019-01-24 14:12:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 441.940 ms
Loss rate: 2.10%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 441.940 ms
Loss rate: 2.10%
```
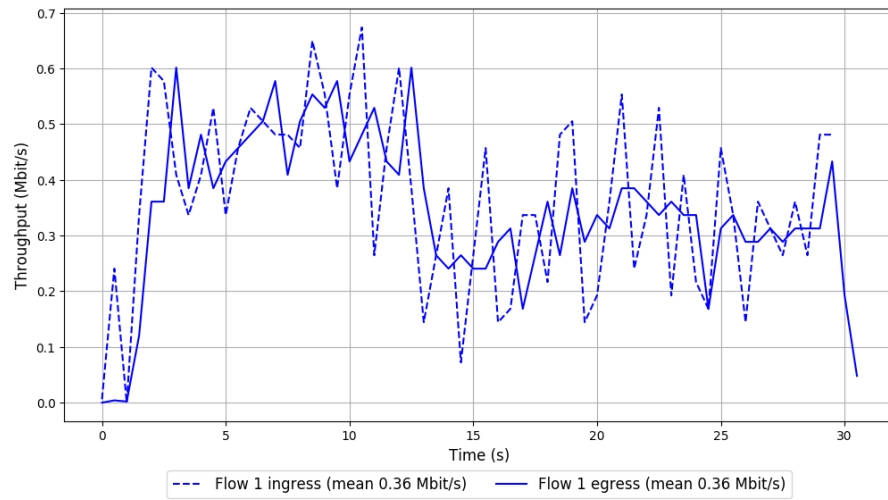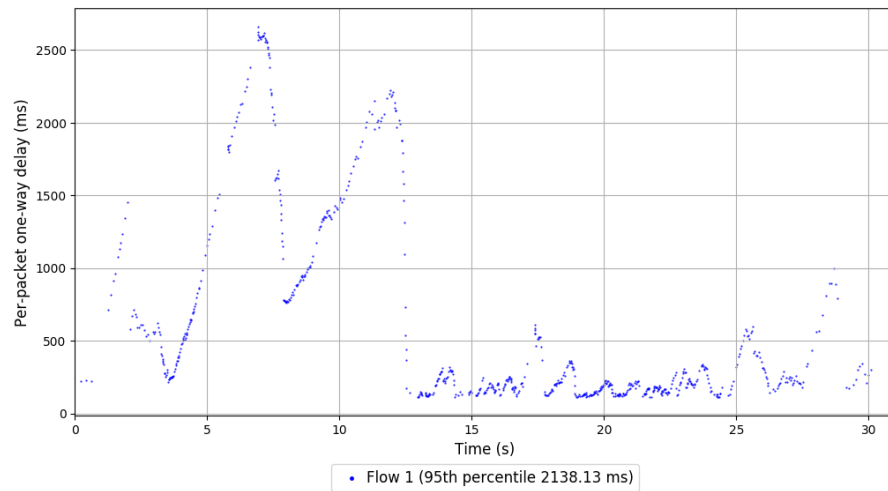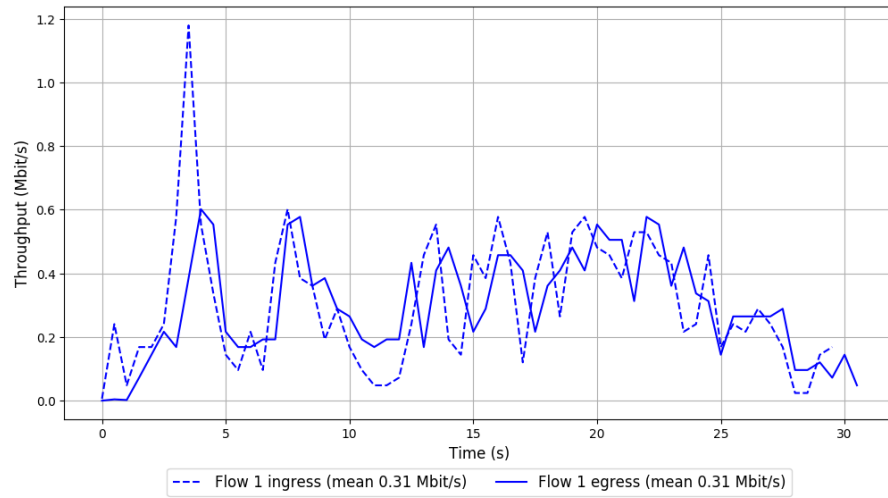
Run 2: Report of Copa — Data Link

Flow 1 ingress (mean 0.36 Mbit/s)   Flow 1 egress (mean 0.36 Mbit/s)

Flow 1 (95th percentile 441.94 ms)

```
Run 3: Statistics of Copa

Start at: 2019-01-24 13:58:54
End at: 2019-01-24 13:59:24
Local clock offset: 1.055 ms
Remote clock offset: 10.676 ms


# Below is generated by plot.py at 2019-01-24 14:12:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 2138.128 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 2138.128 ms
Loss rate: 0.52%
```
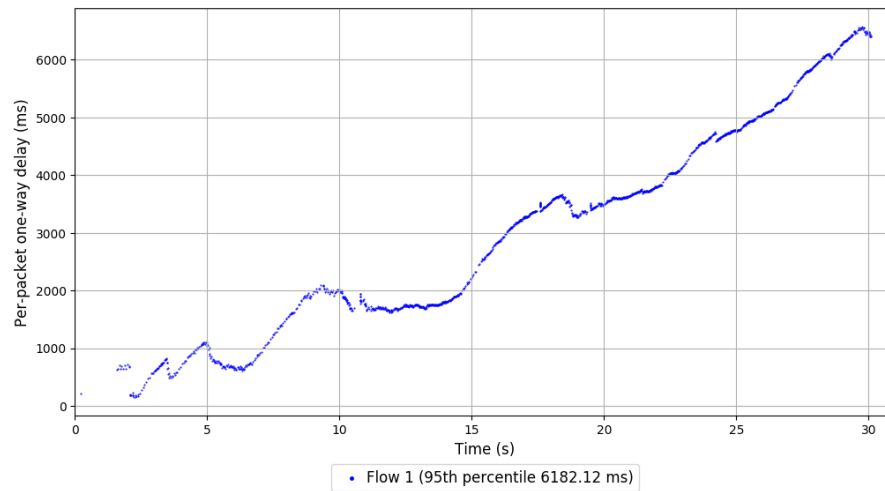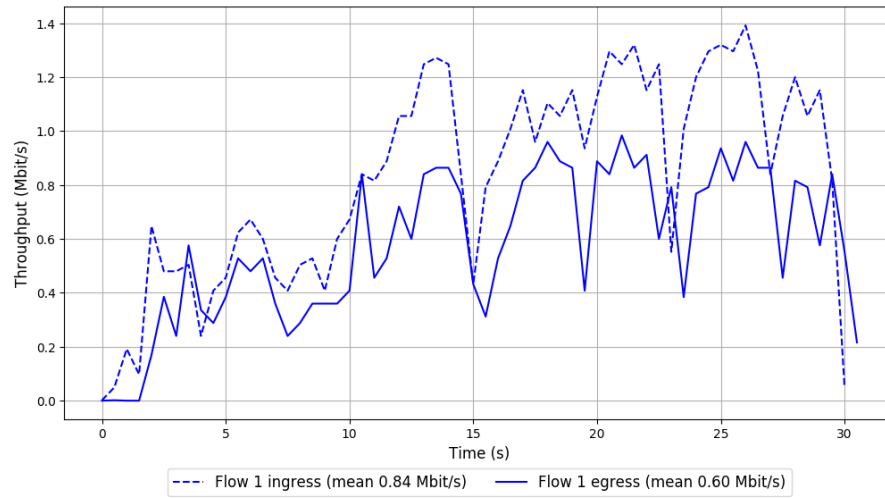
Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 0.31 Mbit/s)   Flow 1 egress (mean 0.31 Mbit/s)

Flow 1 (95th percentile 2138.13 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2019-01-24 13:12:16
End at: 2019-01-24 13:12:46
Local clock offset: -3.378 ms
Remote clock offset: 7.688 ms


# Below is generated by plot.py at 2019-01-24 14:12:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 6182.123 ms
Loss rate: 28.87%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 6182.123 ms
Loss rate: 28.87%
```
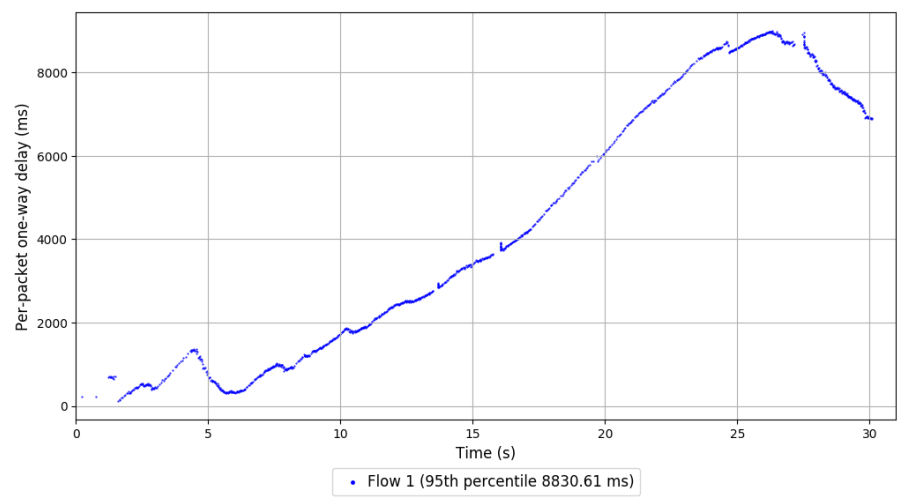
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2019-01-24 13:36:11
End at: 2019-01-24 13:36:41
Local clock offset: -2.692 ms
Remote clock offset: 6.543 ms


# Below is generated by plot.py at 2019-01-24 14:12:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 8830.608 ms
Loss rate: 23.13%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 8830.608 ms
Loss rate: 23.13%
```
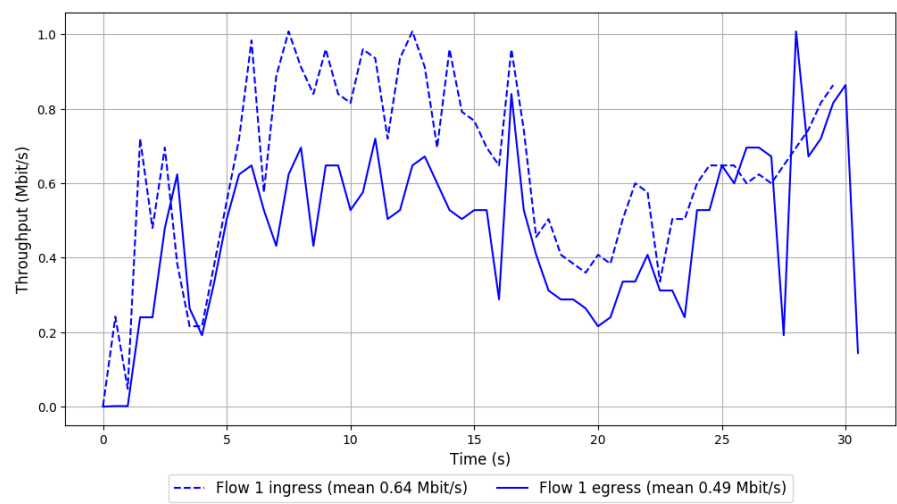
Run 2: Report of TCP Cubic — Data Link

```
Run 3: Statistics of TCP Cubic

Start at: 2019-01-24 14:00:02
End at: 2019-01-24 14:00:32
Local clock offset: 2.011 ms
Remote clock offset: 9.436 ms


# Below is generated by plot.py at 2019-01-24 14:12:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 3815.060 ms
Loss rate: 5.60%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 3815.060 ms
Loss rate: 5.60%
```
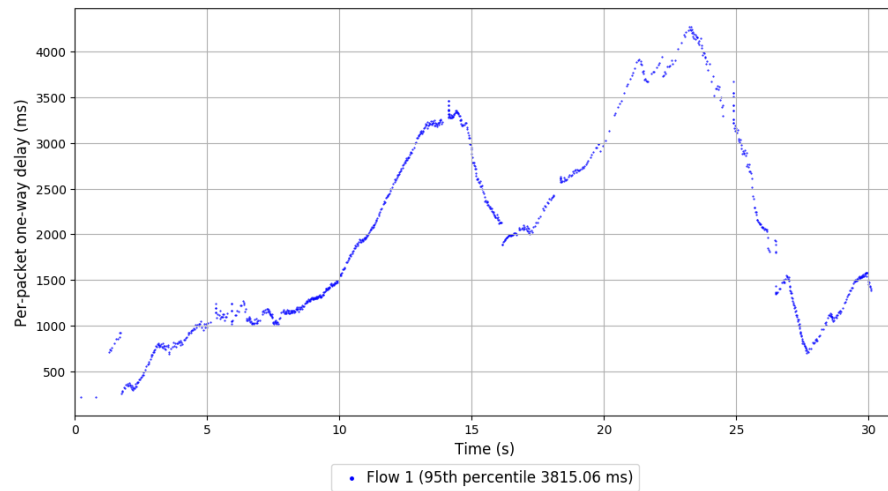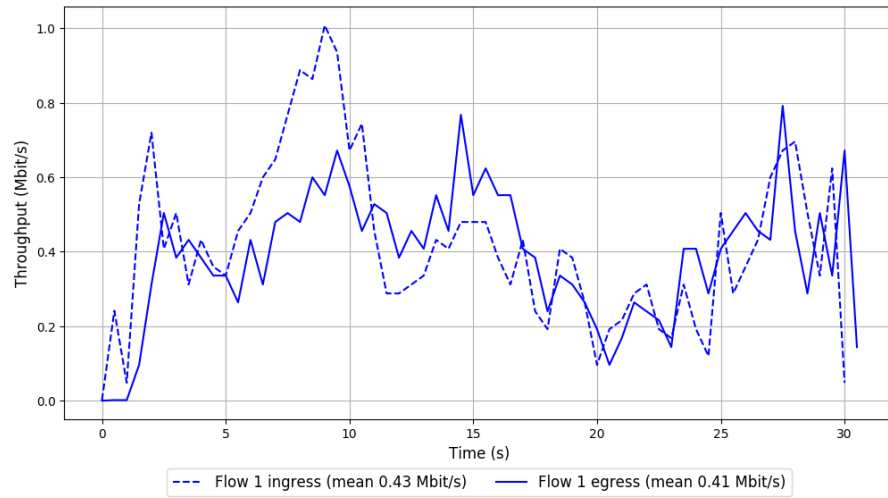
Run 3: Report of TCP Cubic — Data Link

```
Run 1: Statistics of FillP

Start at: 2019-01-24 13:07:43
End at: 2019-01-24 13:08:13
Local clock offset: -3.041 ms
Remote clock offset: 3.825 ms


# Below is generated by plot.py at 2019-01-24 14:12:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 7005.104 ms
Loss rate: 18.09%
-- Flow 1:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 7005.104 ms
Loss rate: 18.09%
```
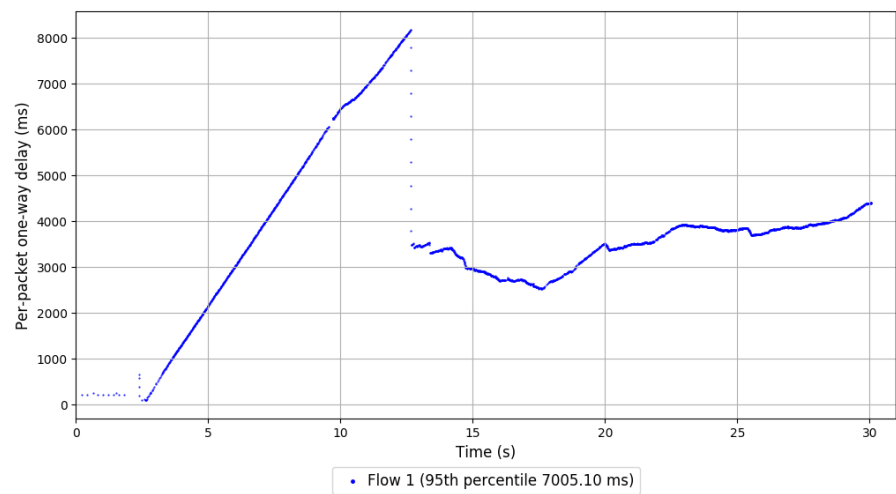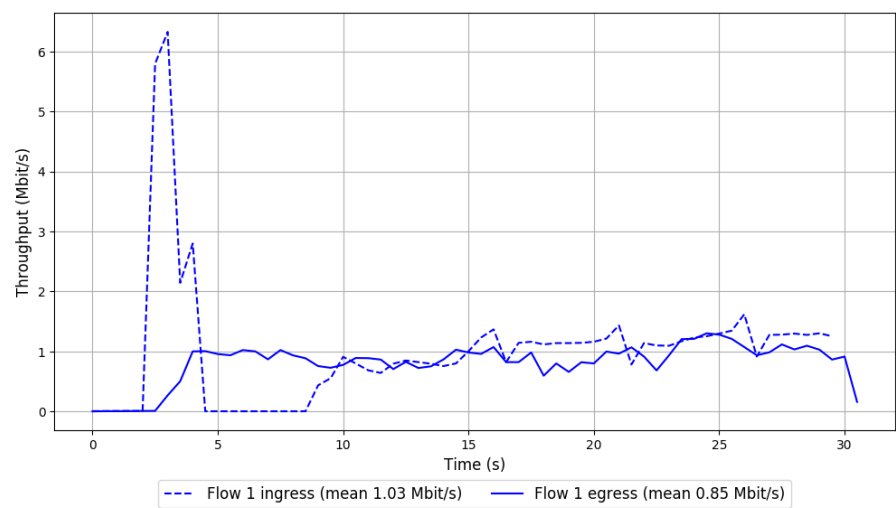
Run 1: Report of FillP — Data Link

```
Run 2: Statistics of FillP

Start at: 2019-01-24 13:31:38
End at: 2019-01-24 13:32:08
Local clock offset: -1.807 ms
Remote clock offset: 5.139 ms


# Below is generated by plot.py at 2019-01-24 14:12:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 4605.858 ms
Loss rate: 16.28%
-- Flow 1:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 4605.858 ms
Loss rate: 16.28%
```
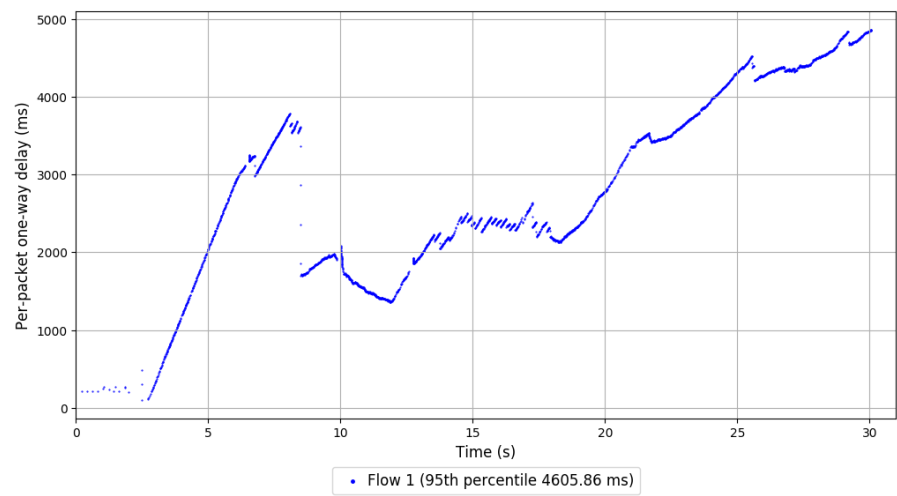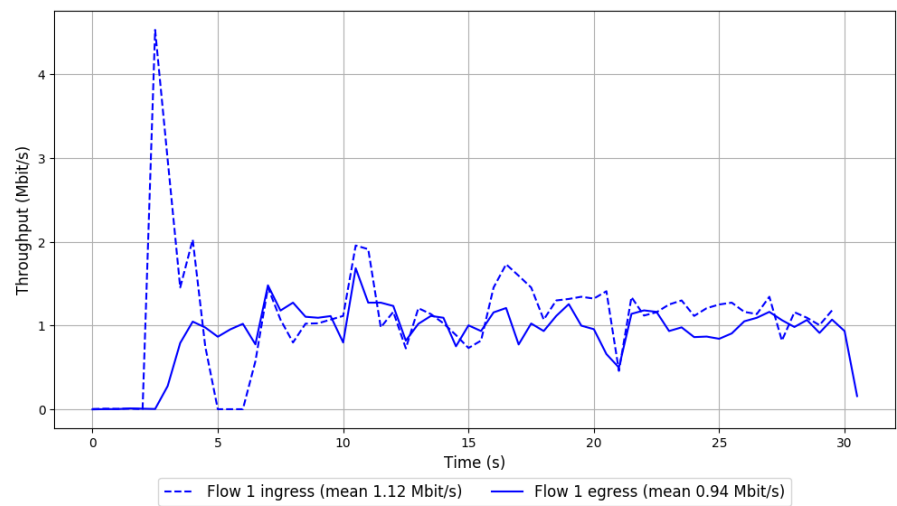
Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2019-01-24 13:55:30
End at: 2019-01-24 13:56:00
Local clock offset: 1.114 ms
Remote clock offset: 10.8 ms


# Below is generated by plot.py at 2019-01-24 14:12:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 8576.569 ms
Loss rate: 26.13%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 8576.569 ms
Loss rate: 26.13%
```
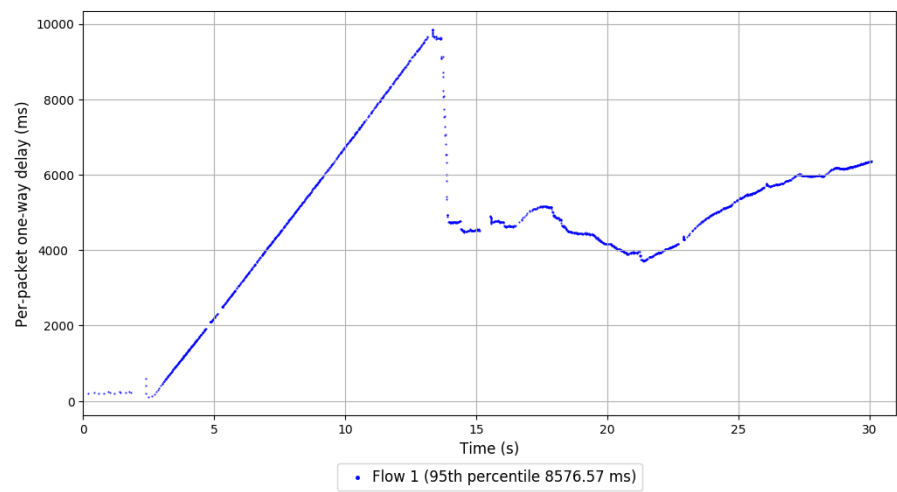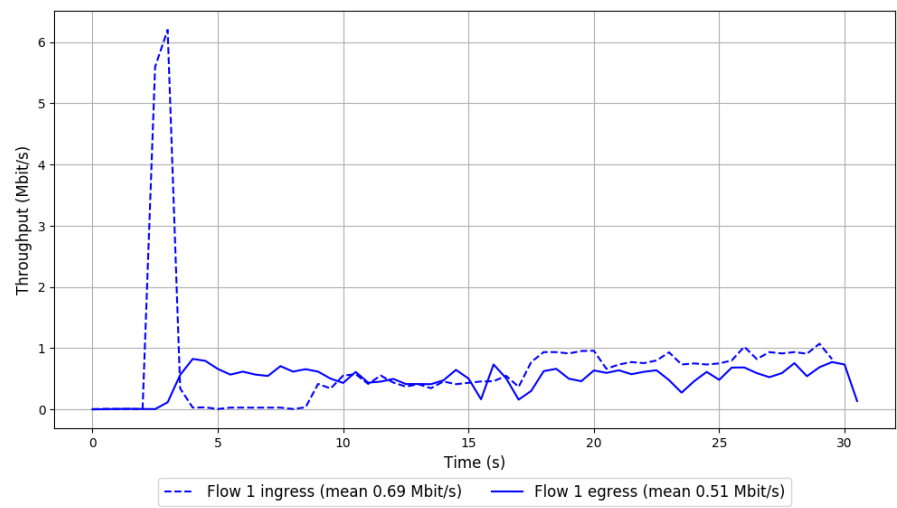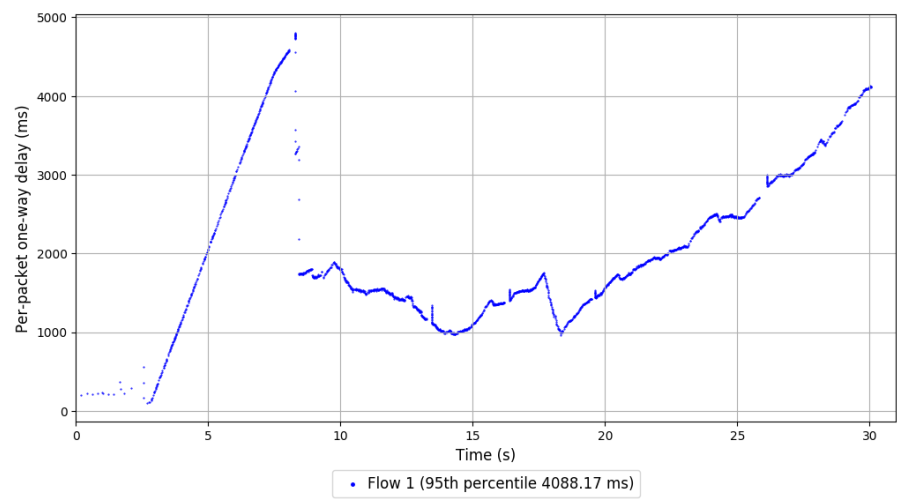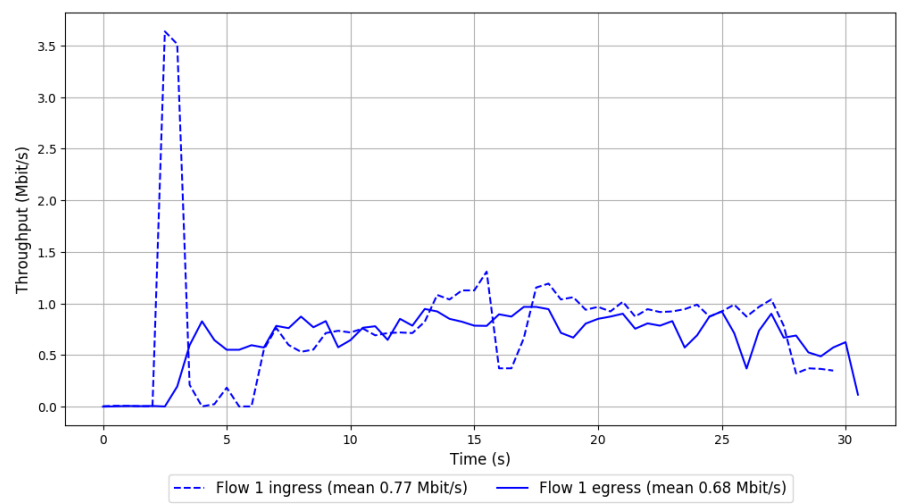
Run 3: Report of FillP — Data Link

Flow 1 ingress (mean 0.69 Mbit/s) --- Flow 1 egress (mean 0.51 Mbit/s)
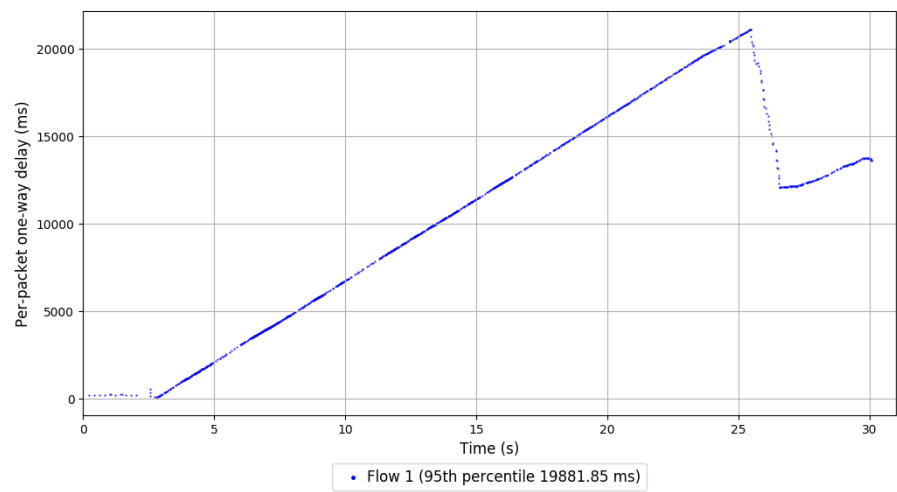

• Flow 1 (95th percentile 8576.57 ms)

```
Run 1: Statistics of FillP-Sheep

Start at: 2019-01-24 13:17:57
End at: 2019-01-24 13:18:27
Local clock offset: -3.382 ms
Remote clock offset: 8.738 ms


# Below is generated by plot.py at 2019-01-24 14:12:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 4088.172 ms
Loss rate: 11.26%
-- Flow 1:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 4088.172 ms
Loss rate: 11.26%
```

Run 1: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 0.77 Mbit/s)   Flow 1 egress (mean 0.68 Mbit/s)
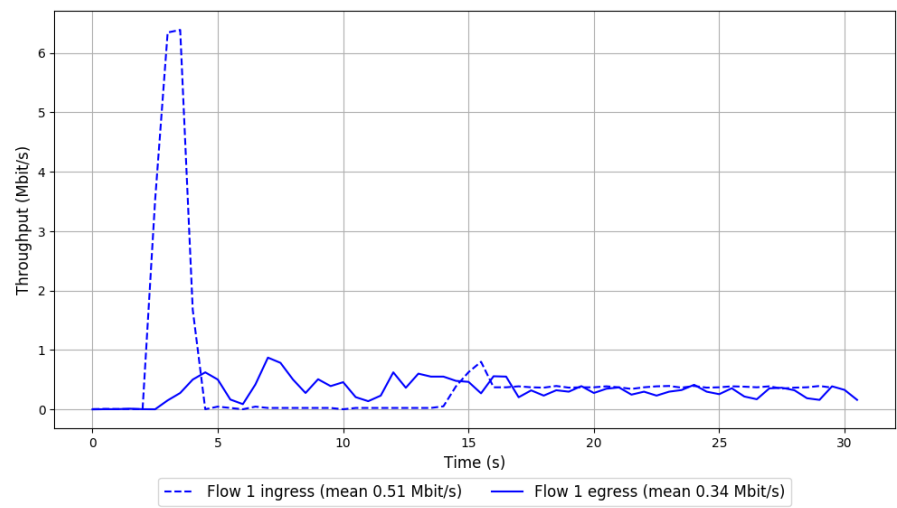

Flow 1 (95th percentile 4088.17 ms)

```
Run 2: Statistics of FillP-Sheep

Start at: 2019-01-24 13:41:52
End at: 2019-01-24 13:42:22
Local clock offset: -2.185 ms
Remote clock offset: 10.793 ms


# Below is generated by plot.py at 2019-01-24 14:12:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 19881.845 ms
Loss rate: 34.14%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 19881.845 ms
Loss rate: 34.14%
```
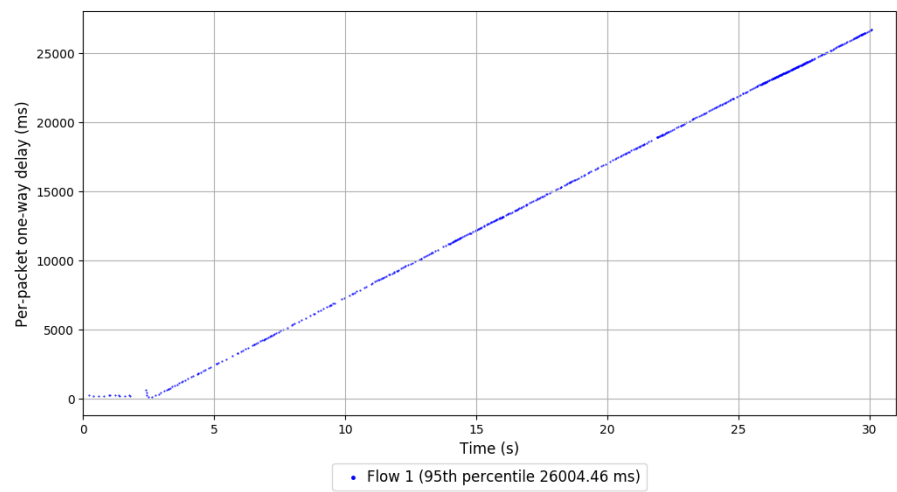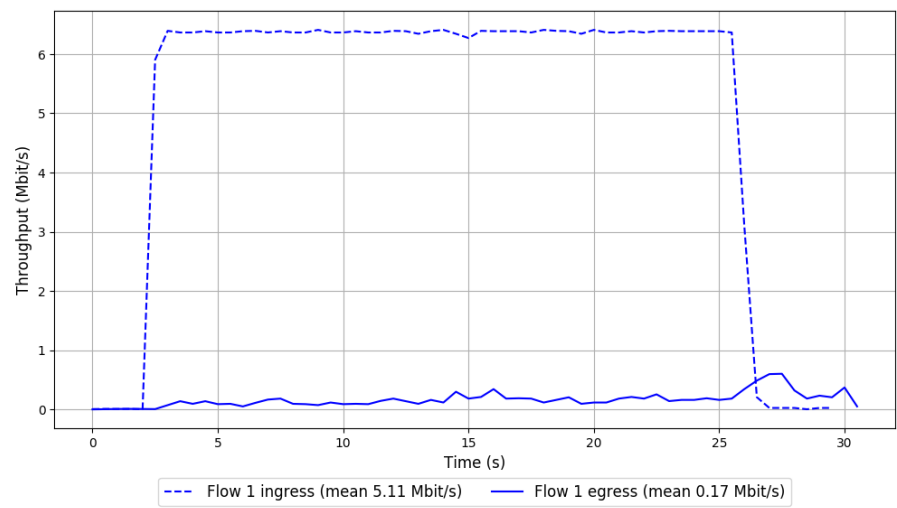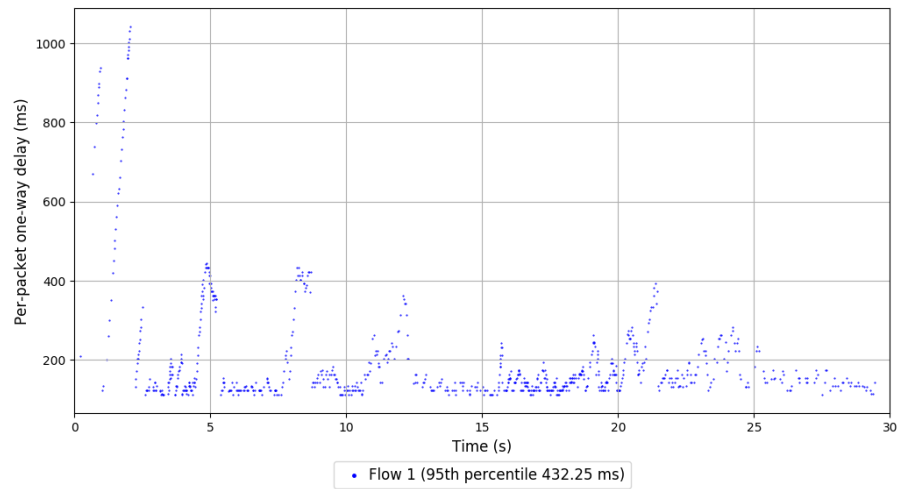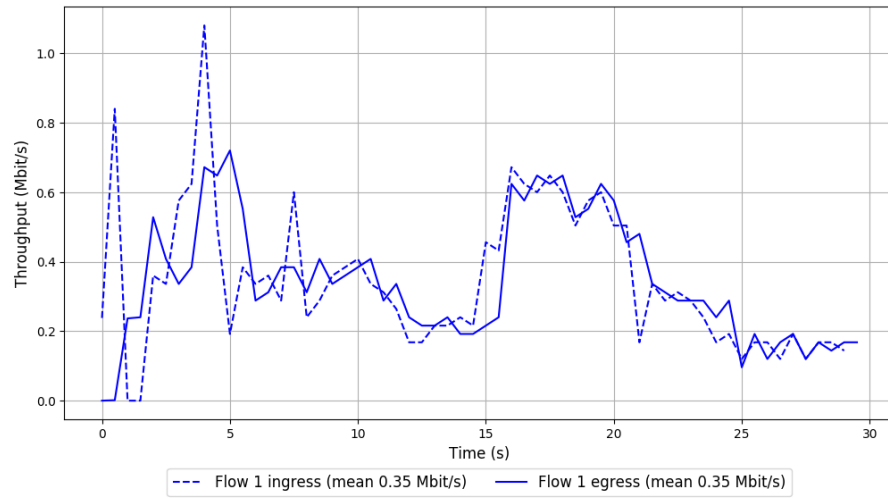
Run 2: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 0.51 Mbit/s) --- Flow 1 egress (mean 0.34 Mbit/s)

Flow 1 (95th percentile 19881.85 ms)

```
Run 3: Statistics of FillP-Sheep

Start at: 2019-01-24 14:05:43
End at: 2019-01-24 14:06:13
Local clock offset: -1.446 ms
Remote clock offset: 5.561 ms


# Below is generated by plot.py at 2019-01-24 14:12:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 26004.463 ms
Loss rate: 96.63%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 26004.463 ms
Loss rate: 96.63%
```

Run 3: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 5.11 Mbit/s)   Flow 1 egress (mean 0.17 Mbit/s)

Flow 1 (95th percentile 26004.46 ms)

```
Run 1: Statistics of Indigo

Start at: 2019-01-24 13:04:19
End at: 2019-01-24 13:04:49
Local clock offset: -4.929 ms
Remote clock offset: 7.532 ms


# Below is generated by plot.py at 2019-01-24 14:12:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 432.252 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 432.252 ms
Loss rate: 0.12%
```
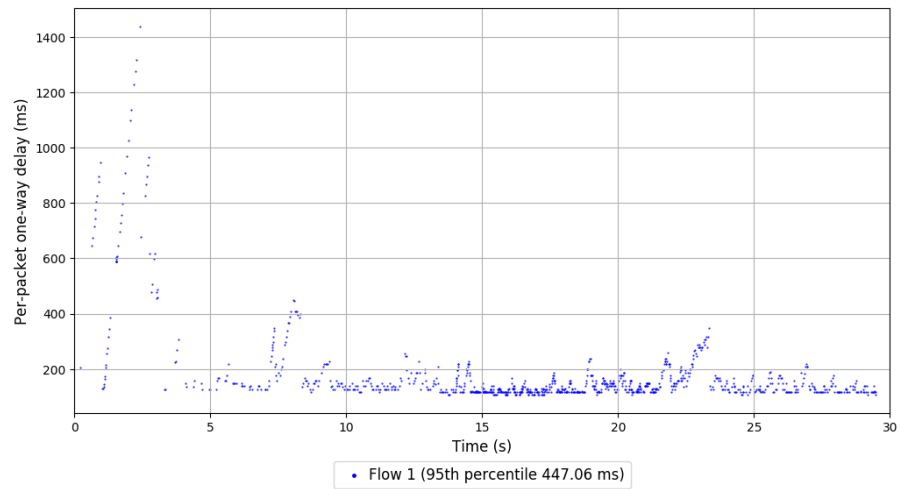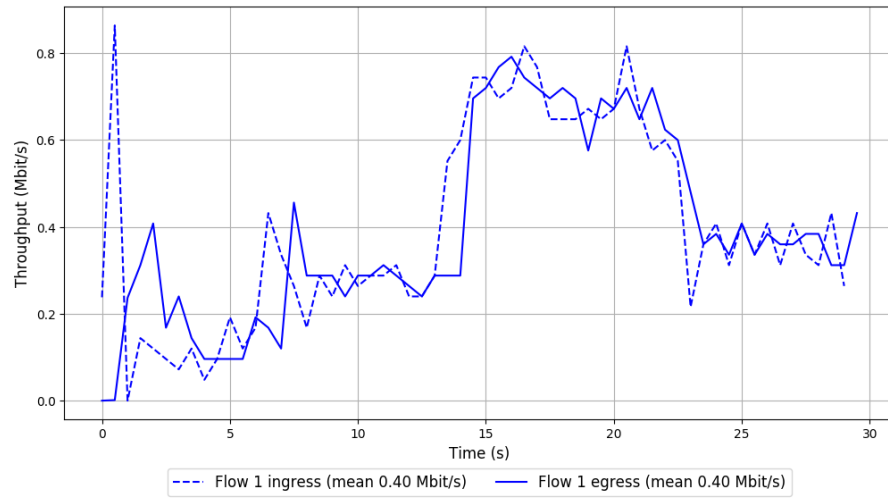
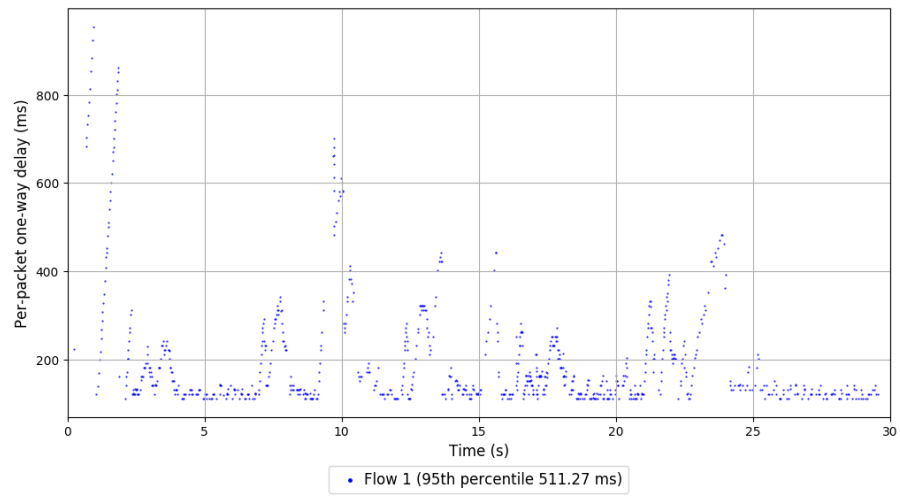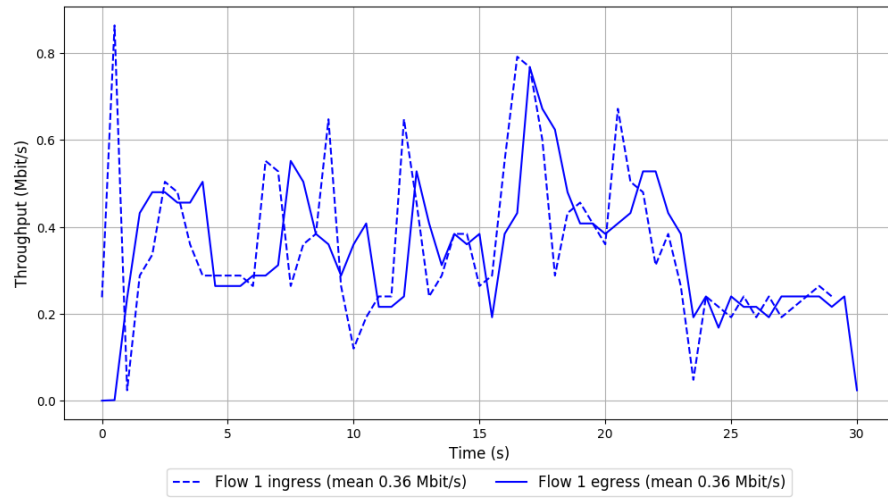Run 1: Report of Indigo — Data Link

Flow 1 ingress (mean 0.35 Mbit/s)   Flow 1 egress (mean 0.35 Mbit/s)

Flow 1 (95th percentile 432.25 ms)

```
Run 2: Statistics of Indigo

Start at: 2019-01-24 13:28:14
End at: 2019-01-24 13:28:44
Local clock offset: -2.768 ms
Remote clock offset: 4.825 ms


# Below is generated by plot.py at 2019-01-24 14:12:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 447.061 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 447.061 ms
Loss rate: 0.10%
```

Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2019-01-24 13:52:05
End at: 2019-01-24 13:52:35
Local clock offset: -0.411 ms
Remote clock offset: 10.079 ms


# Below is generated by plot.py at 2019-01-24 14:12:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 511.266 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 511.266 ms
Loss rate: 0.23%
```

Run 3: Report of Indigo — Data Link

```
Run 1: Statistics of Indigo-MusesC3

Start at: 2019-01-24 13:20:14
End at: 2019-01-24 13:20:44
Local clock offset: -2.983 ms
Remote clock offset: 5.256 ms


# Below is generated by plot.py at 2019-01-24 14:12:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 12442.057 ms
Loss rate: 62.66%
-- Flow 1:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 12442.057 ms
Loss rate: 62.66%
```
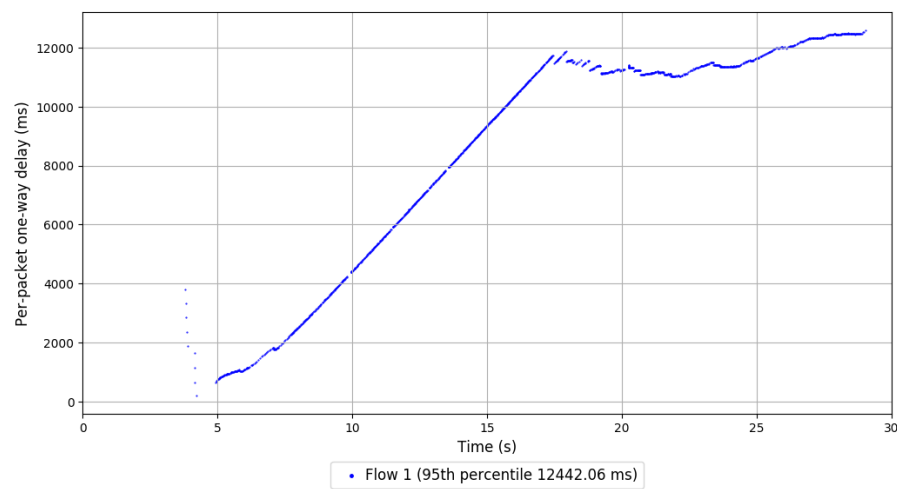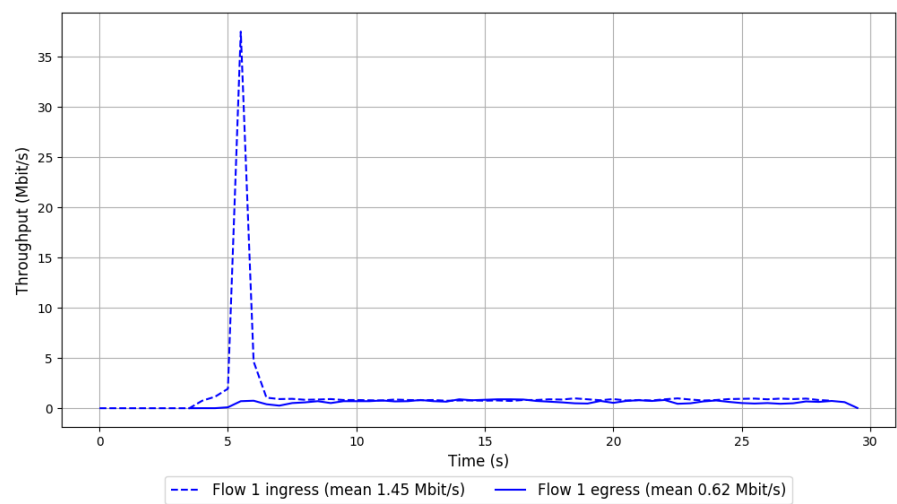
Run 1: Report of Indigo-MusesC3 — Data Link

```
Run 2: Statistics of Indigo-MusesC3

Start at: 2019-01-24 13:44:09
End at: 2019-01-24 13:44:39
Local clock offset: -1.936 ms
Remote clock offset: 11.72 ms


# Below is generated by plot.py at 2019-01-24 14:12:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 15312.595 ms
Loss rate: 69.96%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 15312.595 ms
Loss rate: 69.96%
```
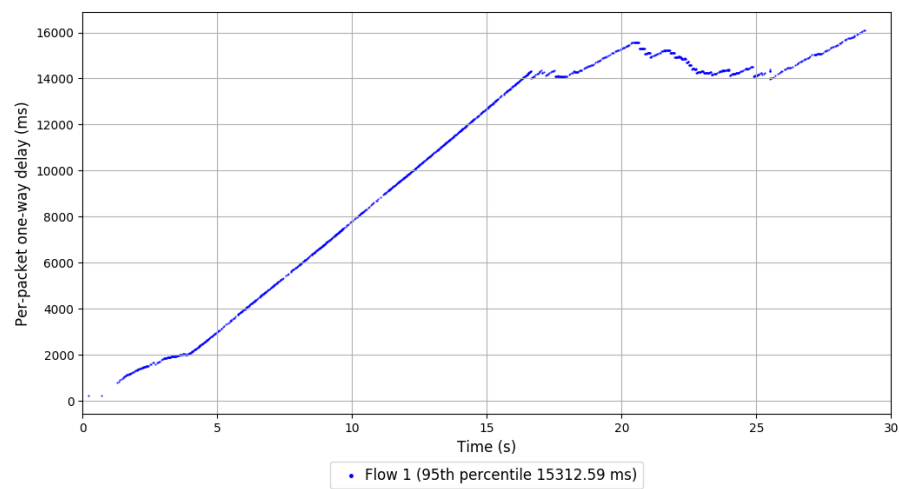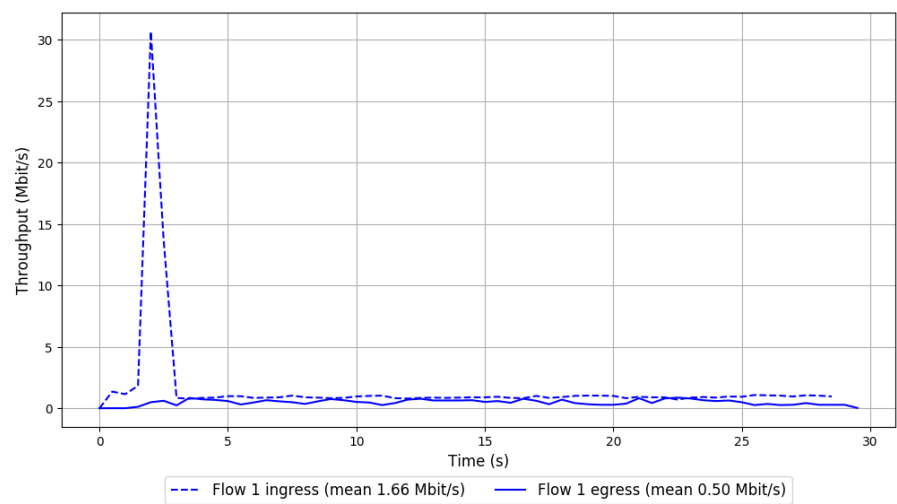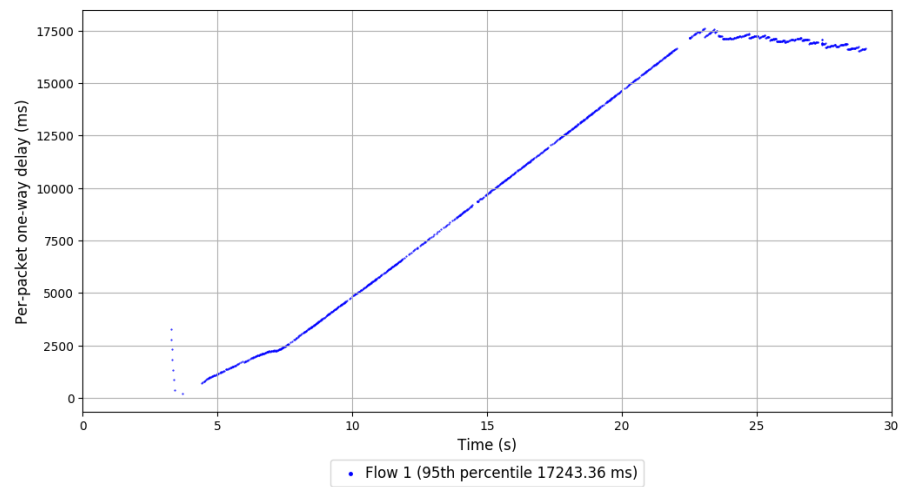
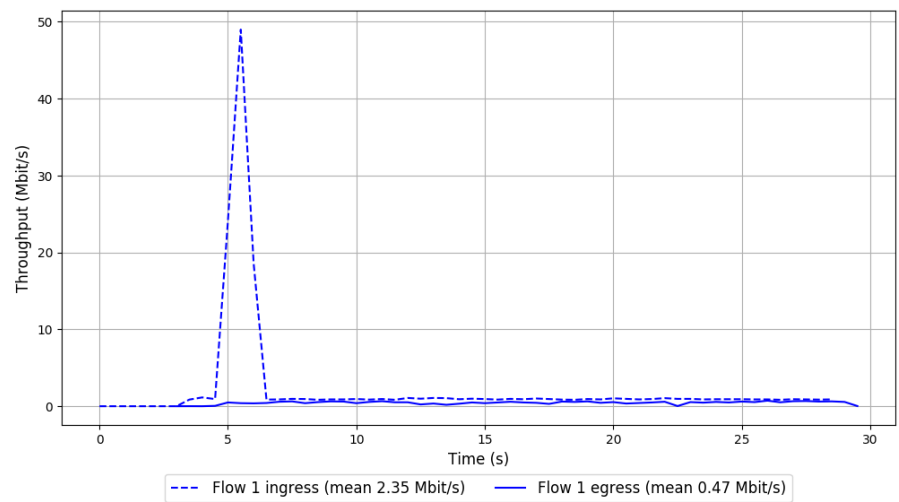Run 2: Report of Indigo-MusesC3 — Data Link

```
Run 3: Statistics of Indigo-MusesC3

Start at: 2019-01-24 14:07:59
End at: 2019-01-24 14:08:29
Local clock offset: -3.019 ms
Remote clock offset: 10.625 ms


# Below is generated by plot.py at 2019-01-24 14:12:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 17243.356 ms
Loss rate: 82.16%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 17243.356 ms
Loss rate: 82.16%
```
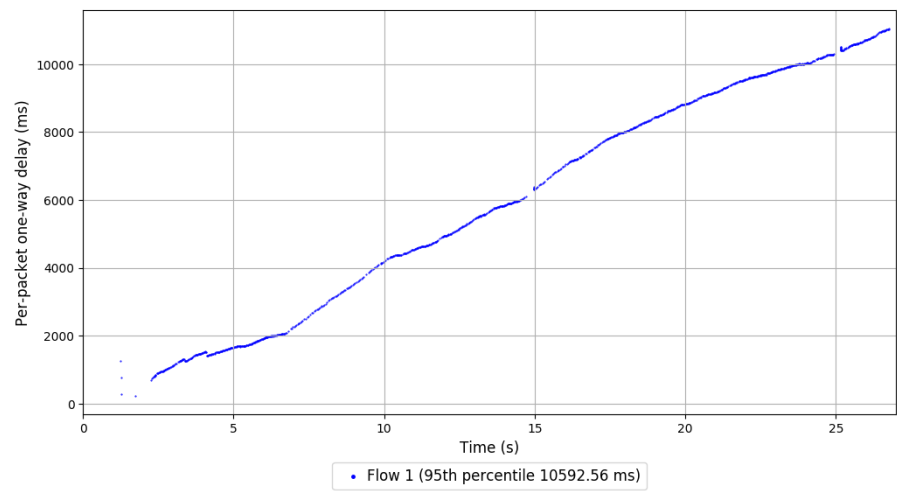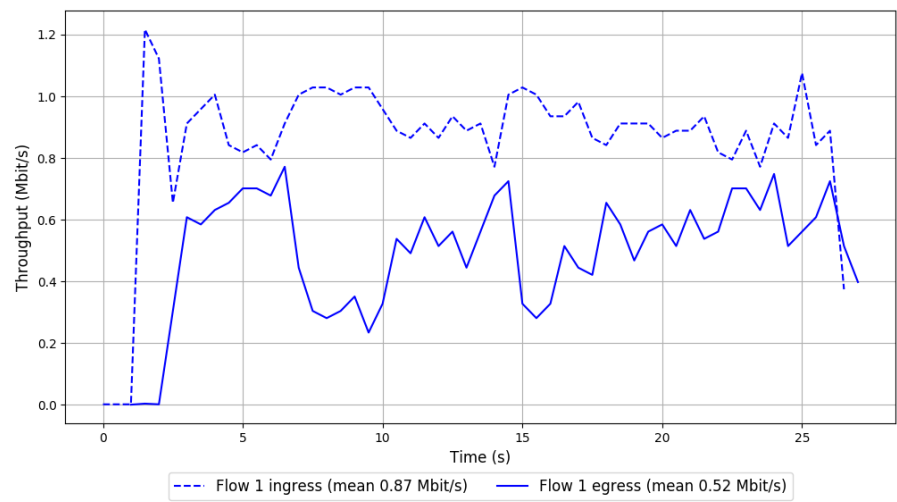
Run 3: Report of Indigo-MusesC3 — Data Link

Flow 1 ingress (mean 2.35 Mbit/s) --- Flow 1 egress (mean 0.47 Mbit/s)

Flow 1 (95th percentile 17243.36 ms)

```
Run 1: Statistics of Indigo-MusesC5

Start at: 2019-01-24 13:00:54
End at: 2019-01-24 13:01:25
Local clock offset: -5.628 ms
Remote clock offset: 7.781 ms


# Below is generated by plot.py at 2019-01-24 14:12:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 10592.563 ms
Loss rate: 42.78%
-- Flow 1:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 10592.563 ms
Loss rate: 42.78%
```

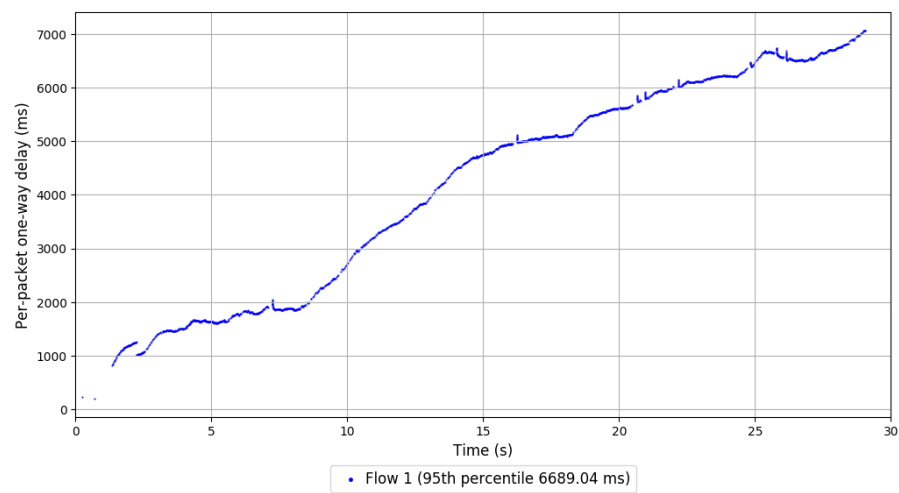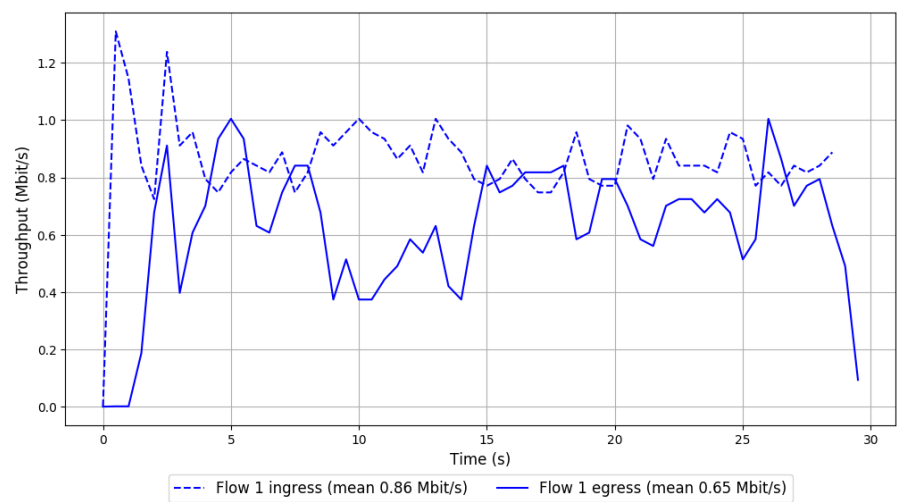Run 1: Report of Indigo-MusesC5 — Data Link

```
Run 2: Statistics of Indigo-MusesC5

Start at: 2019-01-24 13:24:50
End at: 2019-01-24 13:25:20
Local clock offset: -2.663 ms
Remote clock offset: 10.422 ms


# Below is generated by plot.py at 2019-01-24 14:12:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 6689.041 ms
Loss rate: 24.98%
-- Flow 1:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 6689.041 ms
Loss rate: 24.98%
```
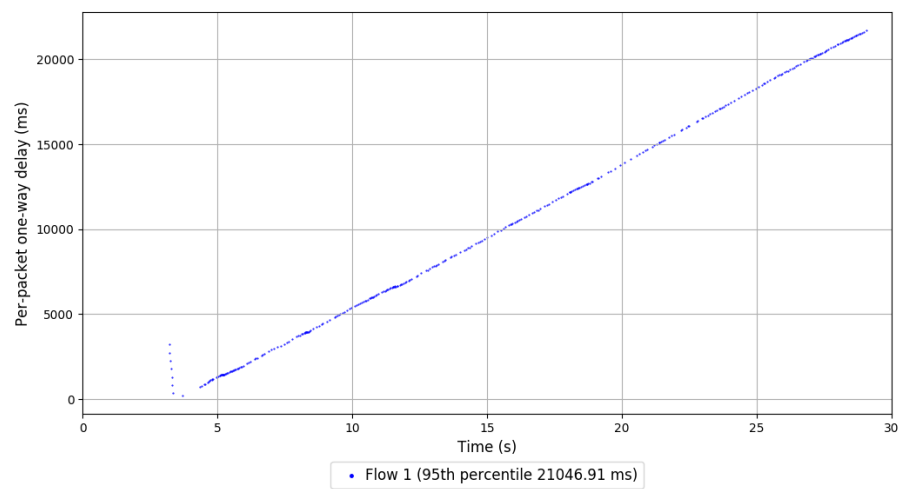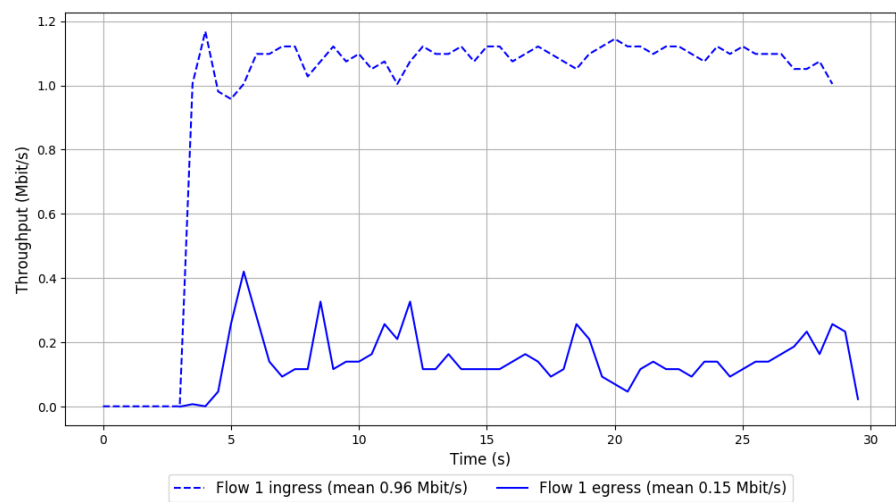
Run 2: Report of Indigo-MusesC5 — Data Link

Flow 1 ingress (mean 0.86 Mbit/s)   Flow 1 egress (mean 0.65 Mbit/s)

Flow 1 (95th percentile 6689.04 ms)

```
Run 3: Statistics of Indigo-MusesC5

Start at: 2019-01-24 13:48:42
End at: 2019-01-24 13:49:12
Local clock offset: -1.056 ms
Remote clock offset: 5.527 ms


# Below is generated by plot.py at 2019-01-24 14:12:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 21046.907 ms
Loss rate: 85.60%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 21046.907 ms
Loss rate: 85.60%
```

Run 3: Report of Indigo-MusesC5 — Data Link

Flow 1 ingress (mean 0.96 Mbit/s)   Flow 1 egress (mean 0.15 Mbit/s)
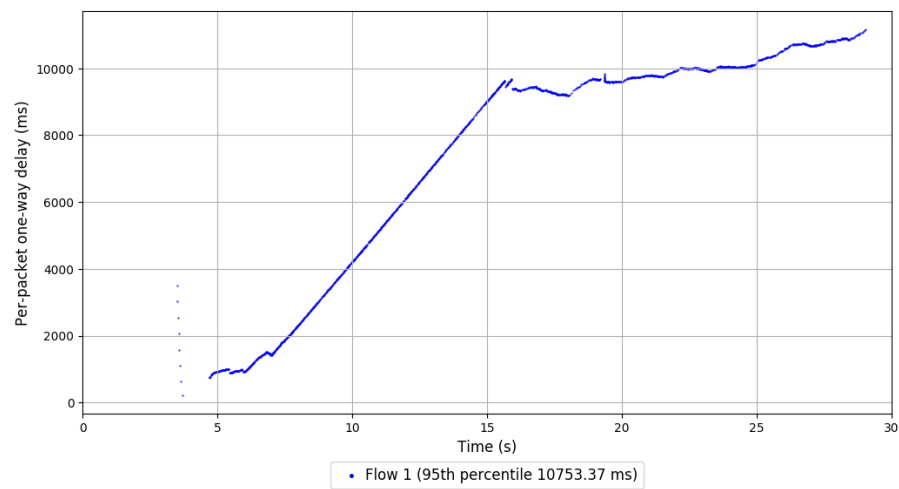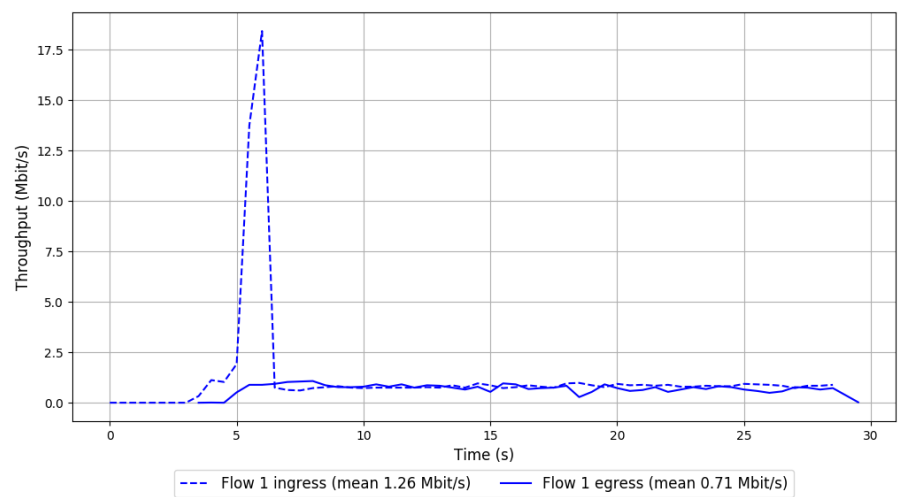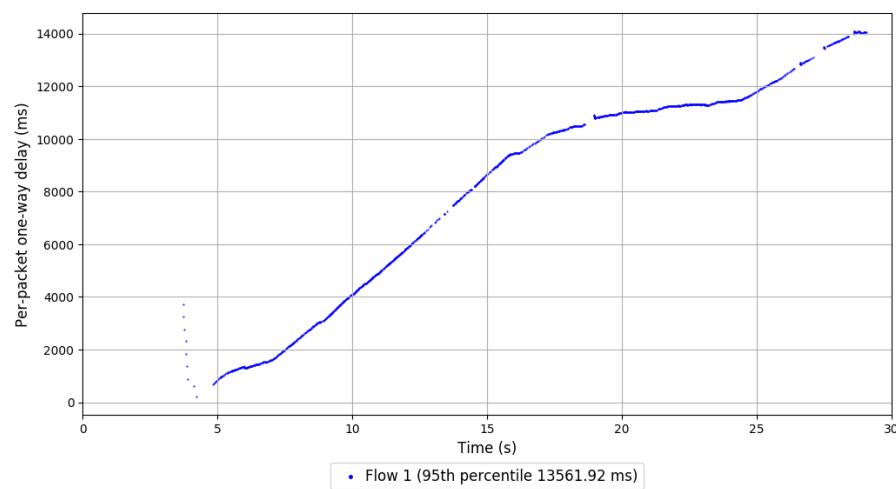

• Flow 1 (95th percentile 21046.91 ms)

```
Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-24 13:13:24
End at: 2019-01-24 13:13:54
Local clock offset: -4.002 ms
Remote clock offset: 4.029 ms


# Below is generated by plot.py at 2019-01-24 14:12:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 10753.367 ms
Loss rate: 50.06%
-- Flow 1:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 10753.367 ms
Loss rate: 50.06%
```

Run 1: Report of Indigo-MusesD — Data Link

Flow 1 ingress (mean 1.26 Mbit/s) --- Flow 1 egress (mean 0.71 Mbit/s)
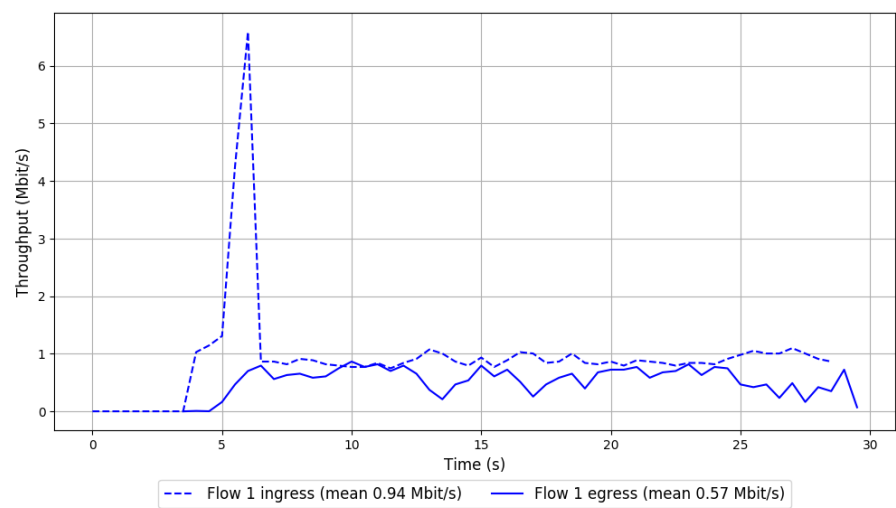

• Flow 1 (95th percentile 10753.37 ms)

```
Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-24 13:37:19
End at: 2019-01-24 13:37:49
Local clock offset: -1.948 ms
Remote clock offset: 10.316 ms


# Below is generated by plot.py at 2019-01-24 14:12:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 13561.917 ms
Loss rate: 47.04%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 13561.917 ms
Loss rate: 47.04%
```

Run 2: Report of Indigo-MusesD — Data Link

```
Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-24 14:01:10
End at: 2019-01-24 14:01:40
Local clock offset: 1.085 ms
Remote clock offset: 9.637 ms


# Below is generated by plot.py at 2019-01-24 14:12:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 14746.411 ms
Loss rate: 60.38%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 14746.411 ms
Loss rate: 60.38%
```
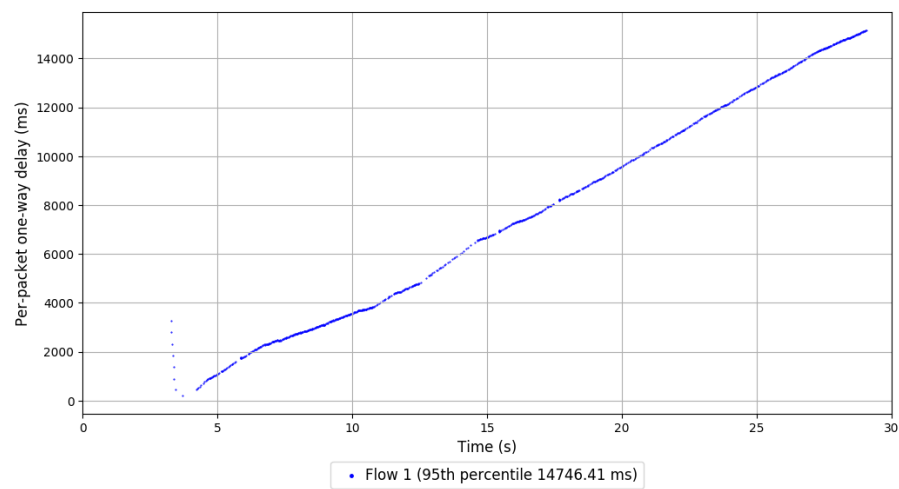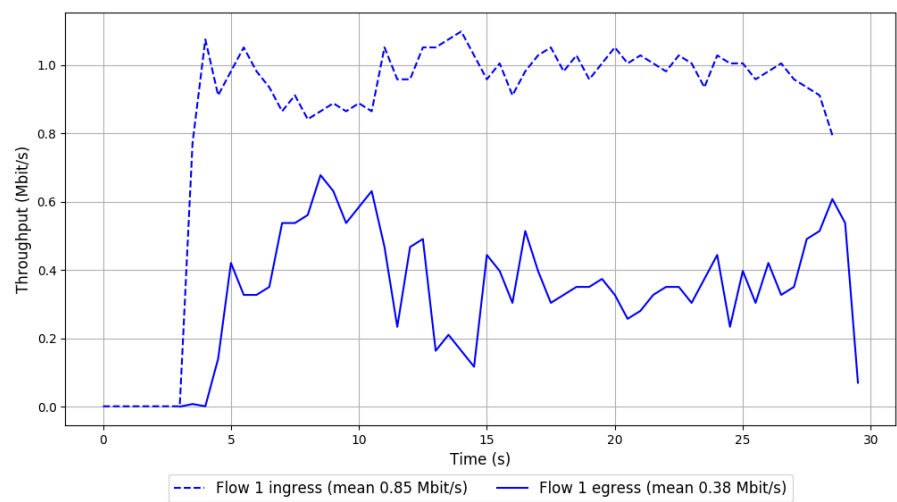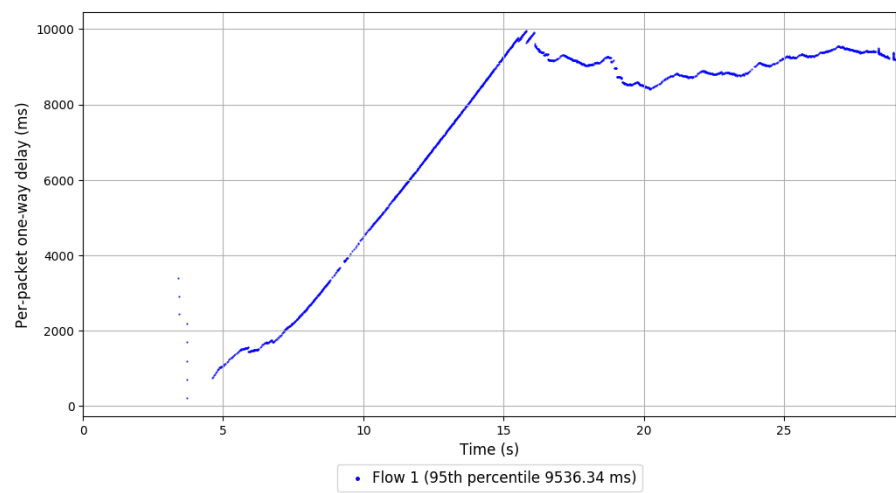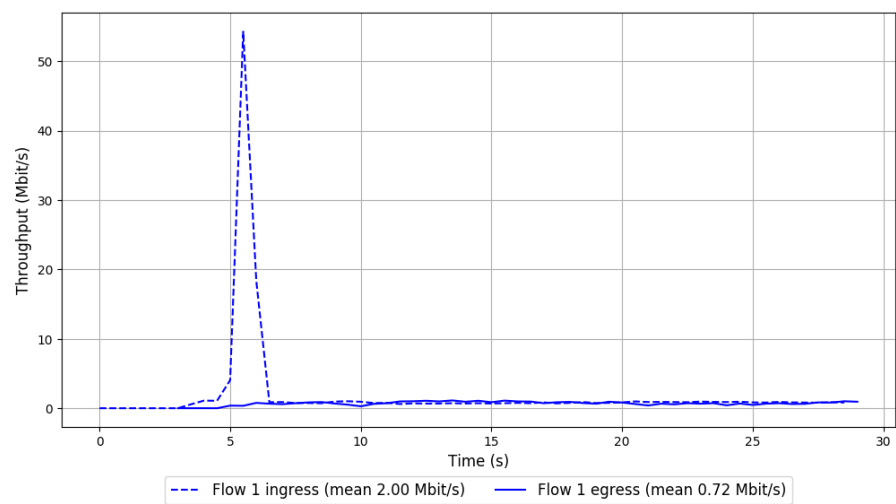
Run 3: Report of Indigo-MusesD — Data Link

Flow 1 ingress (mean 0.85 Mbit/s)   Flow 1 egress (mean 0.38 Mbit/s)

Flow 1 (95th percentile 14746.41 ms)

```
Run 1: Statistics of Indigo-MusesT

Start at: 2019-01-24 13:06:35
End at: 2019-01-24 13:07:05
Local clock offset: -2.839 ms
Remote clock offset: 6.723 ms


# Below is generated by plot.py at 2019-01-24 14:12:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 9536.343 ms
Loss rate: 68.23%
-- Flow 1:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 9536.343 ms
Loss rate: 68.23%
```

Run 1: Report of Indigo-MusesT — Data Link

```
Run 2: Statistics of Indigo-MusesT

Start at: 2019-01-24 13:30:30
End at: 2019-01-24 13:31:00
Local clock offset: -1.615 ms
Remote clock offset: 9.885 ms


# Below is generated by plot.py at 2019-01-24 14:12:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 17624.919 ms
Loss rate: 65.84%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 17624.919 ms
Loss rate: 65.84%
```
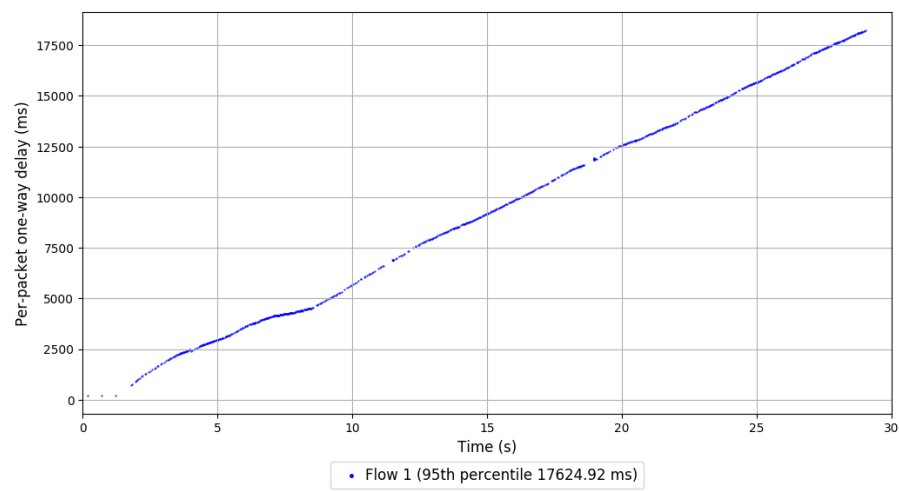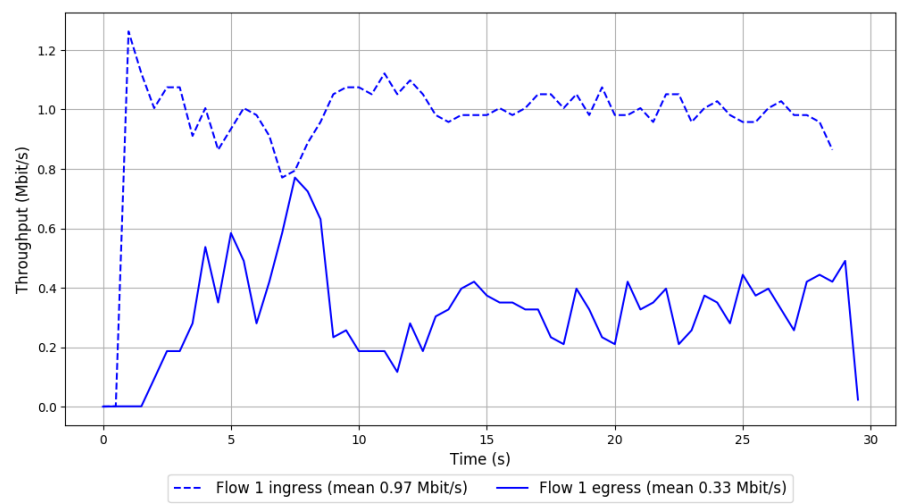
Run 2: Report of Indigo-MusesT — Data Link

```
Run 3: Statistics of Indigo-MusesT

Start at: 2019-01-24 13:54:22
End at: 2019-01-24 13:54:52
Local clock offset: 0.853 ms
Remote clock offset: 4.706 ms


# Below is generated by plot.py at 2019-01-24 14:12:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 18904.113 ms
Loss rate: 84.01%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 18904.113 ms
Loss rate: 84.01%
```
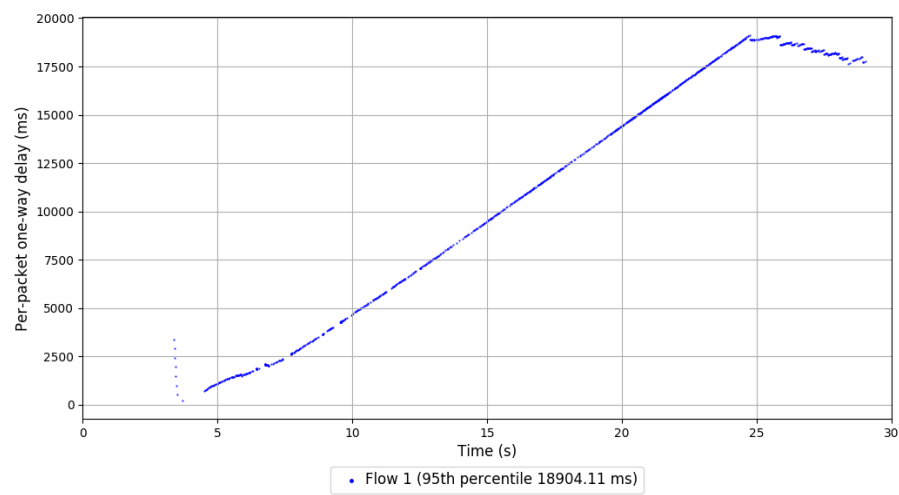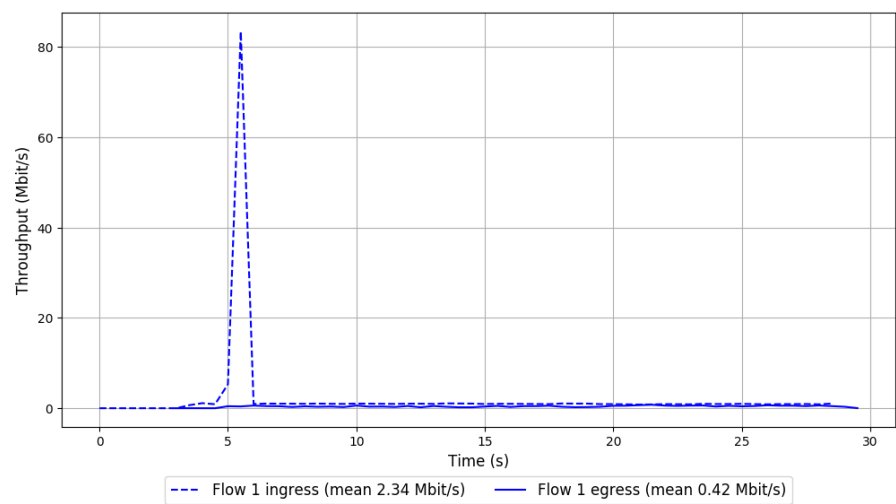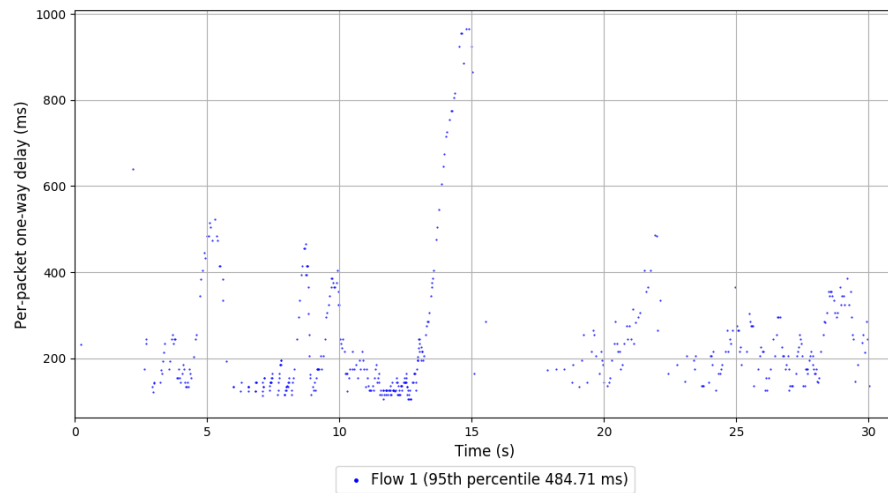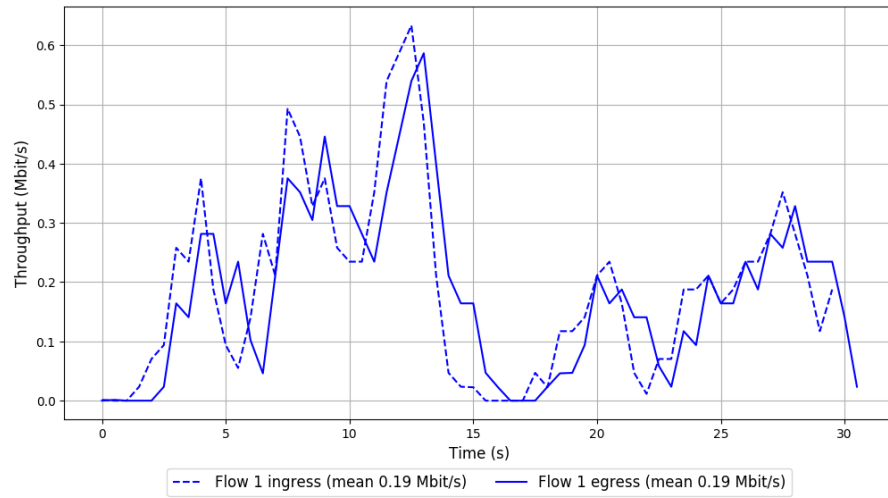
Run 3: Report of Indigo-MusesT — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2019-01-24 13:05:27
End at: 2019-01-24 13:05:57
Local clock offset: -3.562 ms
Remote clock offset: 8.776 ms


# Below is generated by plot.py at 2019-01-24 14:12:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 484.710 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 484.710 ms
Loss rate: 0.83%
```

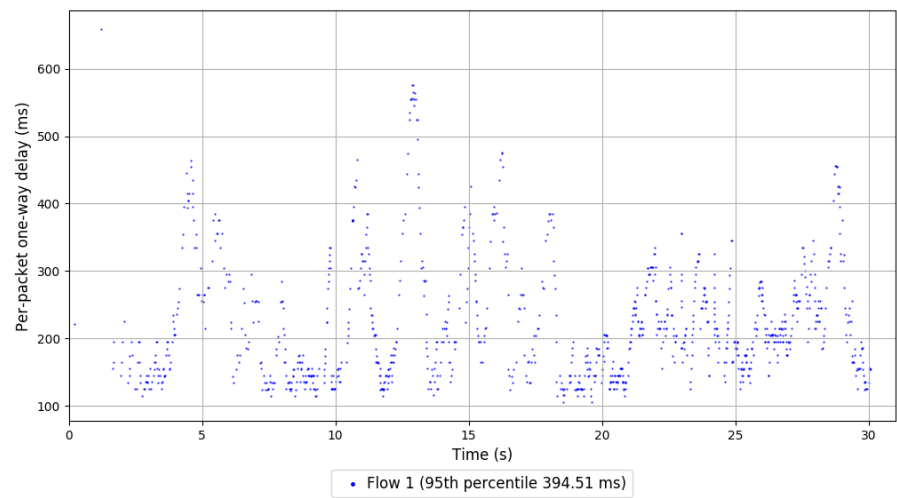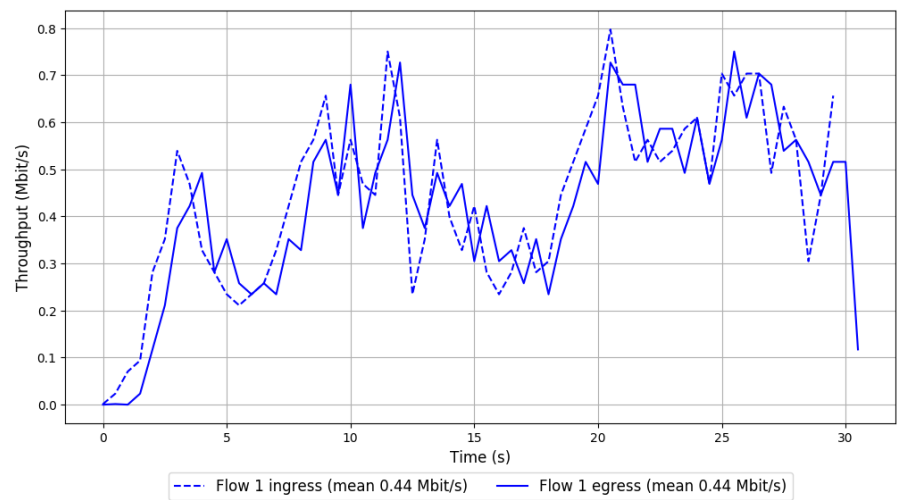Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2019-01-24 13:29:22
End at: 2019-01-24 13:29:52
Local clock offset: -1.705 ms
Remote clock offset: 10.102 ms


# Below is generated by plot.py at 2019-01-24 14:12:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 394.509 ms
Loss rate: 0.62%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 394.509 ms
Loss rate: 0.62%
```

Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2019-01-24 13:53:14
End at: 2019-01-24 13:53:44
Local clock offset: -0.171 ms
Remote clock offset: 4.929 ms


# Below is generated by plot.py at 2019-01-24 14:12:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 396.005 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 396.005 ms
Loss rate: 0.33%
```
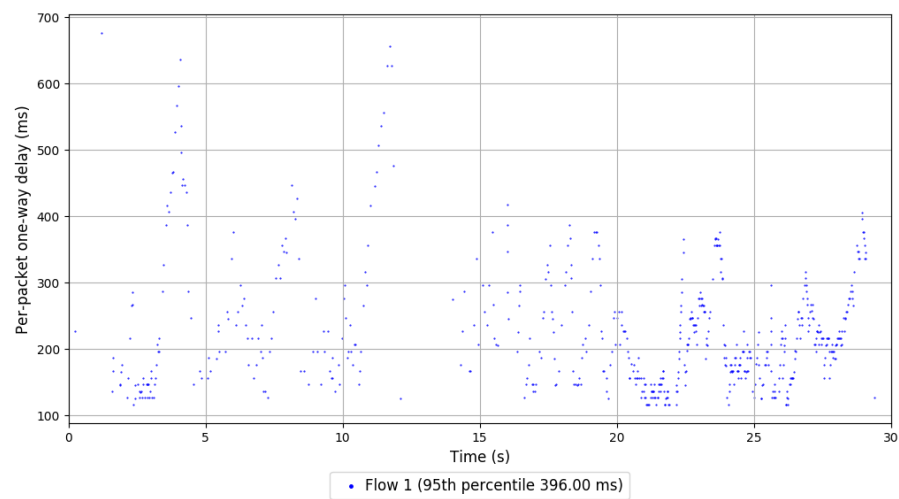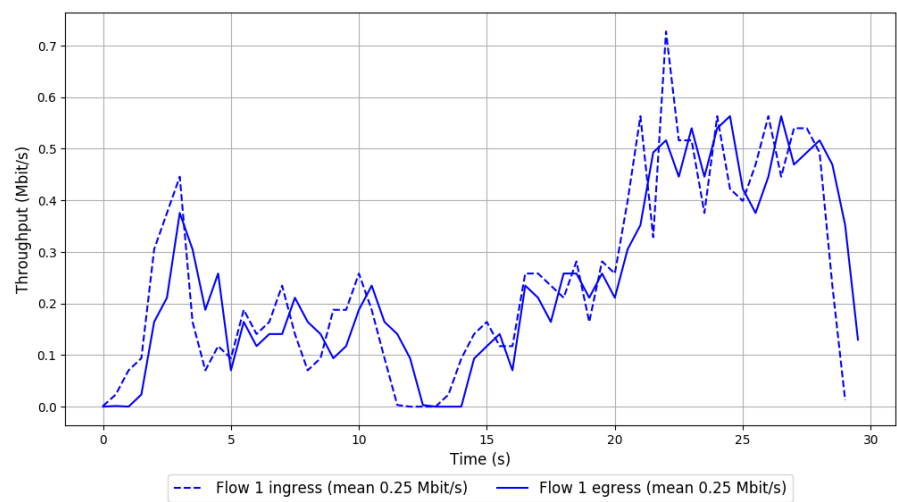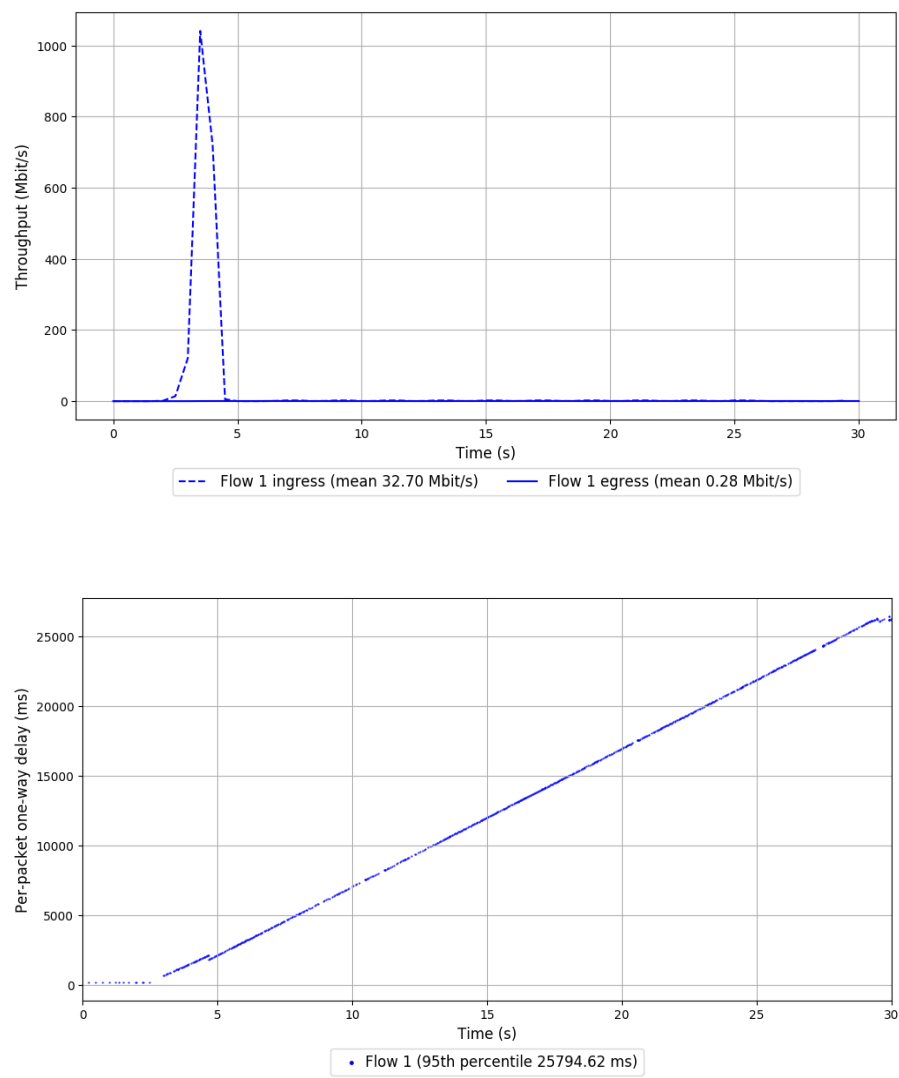
Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 0.25 Mbit/s) --- Flow 1 egress (mean 0.25 Mbit/s)

Flow 1 (95th percentile 396.00 ms)

```
Run 1: Statistics of PCC-Allegro

Start at: 2019-01-24 13:23:41
End at: 2019-01-24 13:24:11
Local clock offset: -3.558 ms
Remote clock offset: 9.408 ms


# Below is generated by plot.py at 2019-01-24 14:12:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 25794.619 ms
Loss rate: 99.14%
-- Flow 1:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 25794.619 ms
Loss rate: 99.14%
```
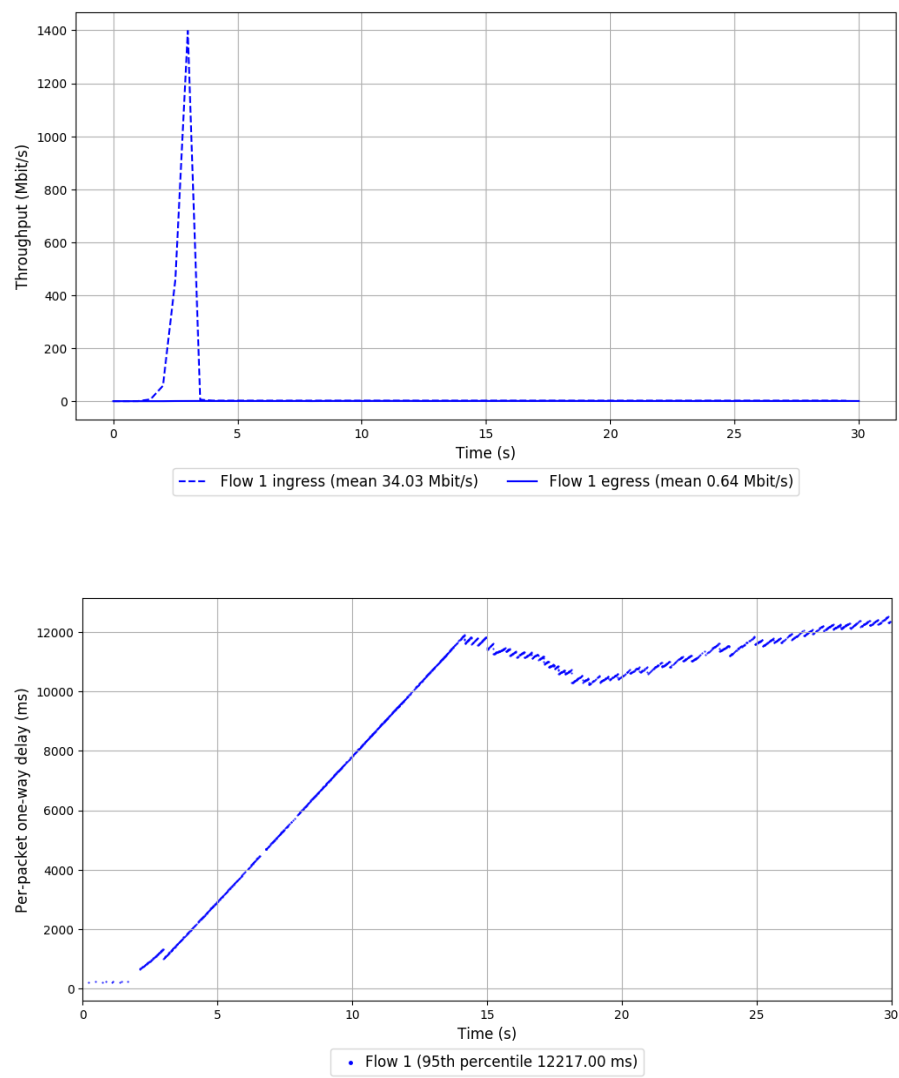
Run 1: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 32.70 Mbit/s) --- Flow 1 egress (mean 0.28 Mbit/s)

• Flow 1 (95th percentile 25794.62 ms)

```
Run 2: Statistics of PCC-Allegro

Start at: 2019-01-24 13:47:33
End at: 2019-01-24 13:48:03
Local clock offset: -0.495 ms
Remote clock offset: 9.487 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 12217.004 ms
Loss rate: 98.12%
-- Flow 1:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 12217.004 ms
Loss rate: 98.12%
```
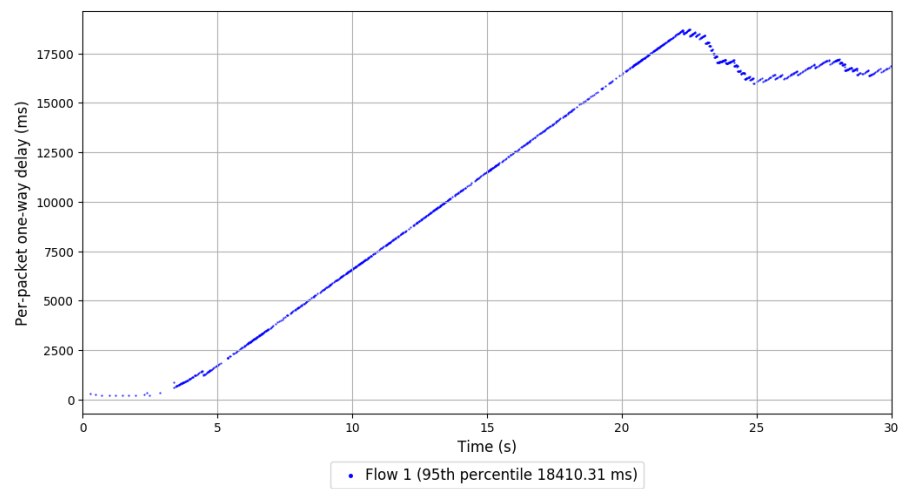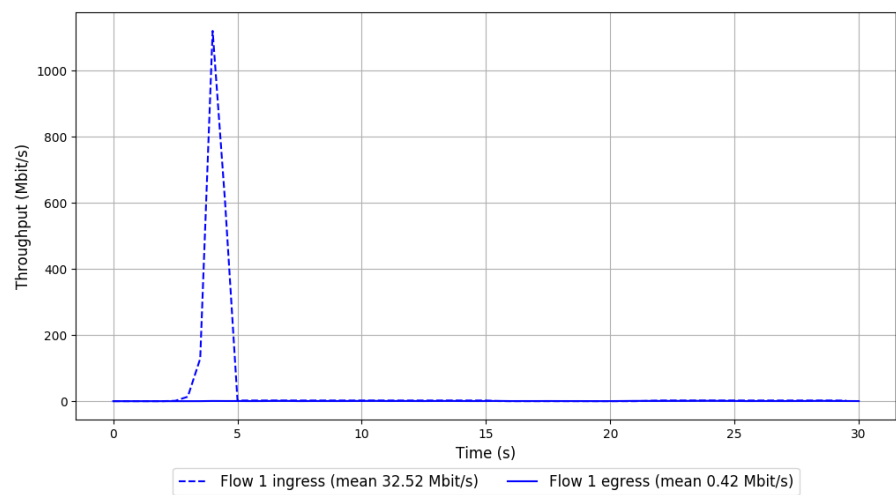
Run 2: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 34.03 Mbit/s)   Flow 1 egress (mean 0.64 Mbit/s)

Flow 1 (95th percentile 12217.00 ms)

```
Run 3: Statistics of PCC-Allegro

Start at: 2019-01-24 14:11:23
End at: 2019-01-24 14:11:53
Local clock offset: -3.021 ms
Remote clock offset: 4.388 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 18410.314 ms
Loss rate: 98.71%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 18410.314 ms
Loss rate: 98.71%
```
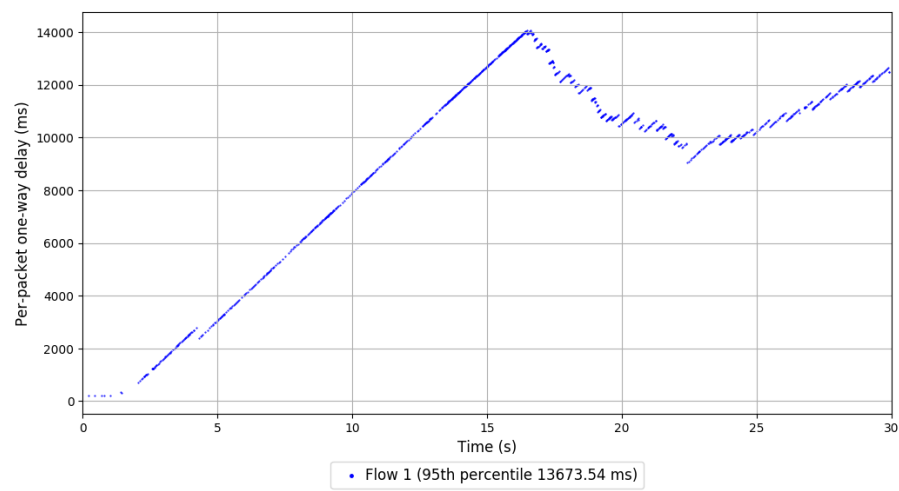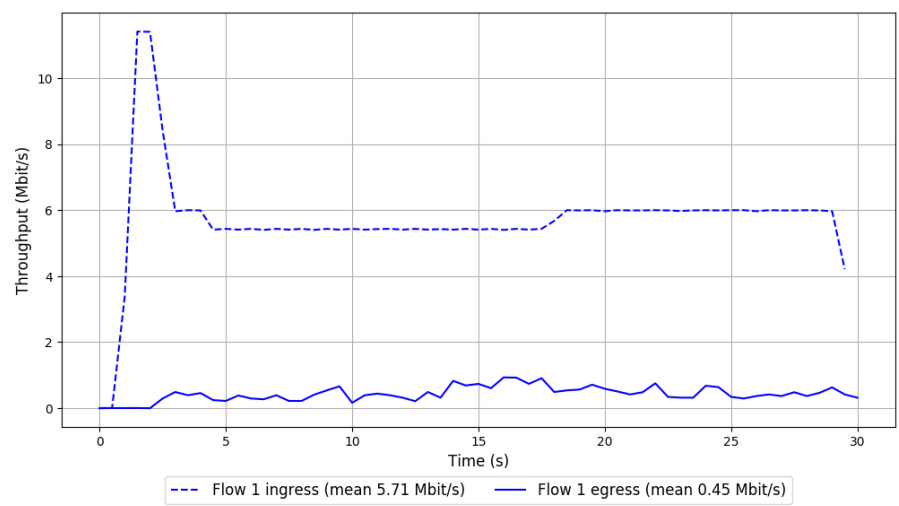
Run 3: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 32.52 Mbit/s) —— Flow 1 egress (mean 0.42 Mbit/s)
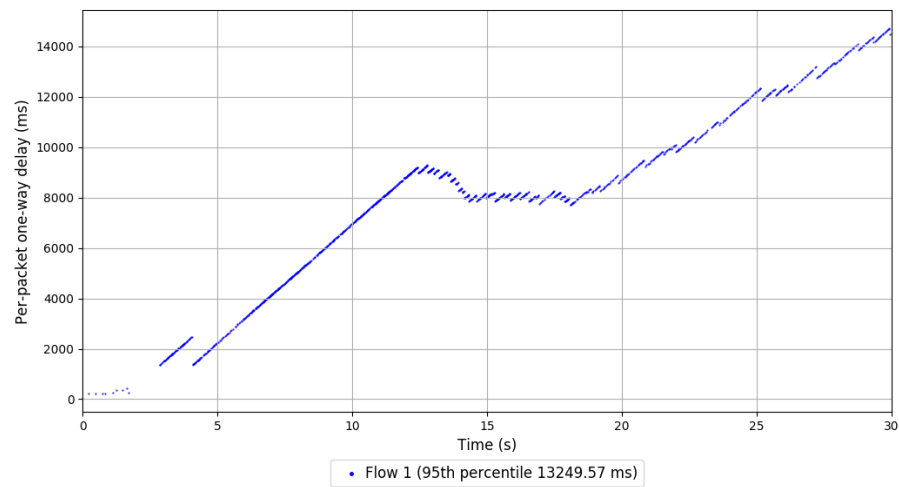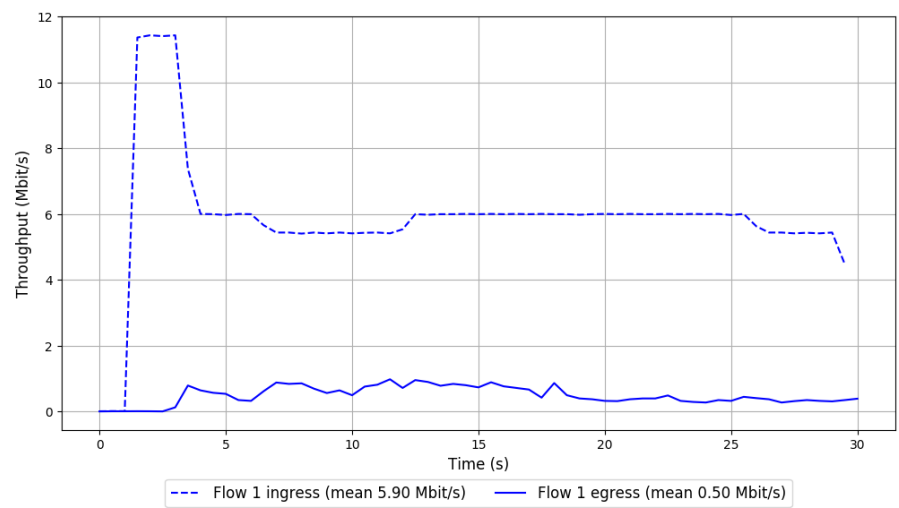

• Flow 1 (95th percentile 18410.31 ms)

```
Run 1: Statistics of PCC-Expr

Start at: 2019-01-24 13:10:00
End at: 2019-01-24 13:10:30
Local clock offset: -2.982 ms
Remote clock offset: 2.735 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 13673.543 ms
Loss rate: 92.23%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 13673.543 ms
Loss rate: 92.23%
```

Run 1: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 5.71 Mbit/s)   Flow 1 egress (mean 0.45 Mbit/s)

Flow 1 (95th percentile 13673.54 ms)

```
Run 2: Statistics of PCC-Expr

Start at: 2019-01-24 13:33:55
End at: 2019-01-24 13:34:25
Local clock offset: -1.996 ms
Remote clock offset: 10.177 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 13249.570 ms
Loss rate: 91.50%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 13249.570 ms
Loss rate: 91.50%
```
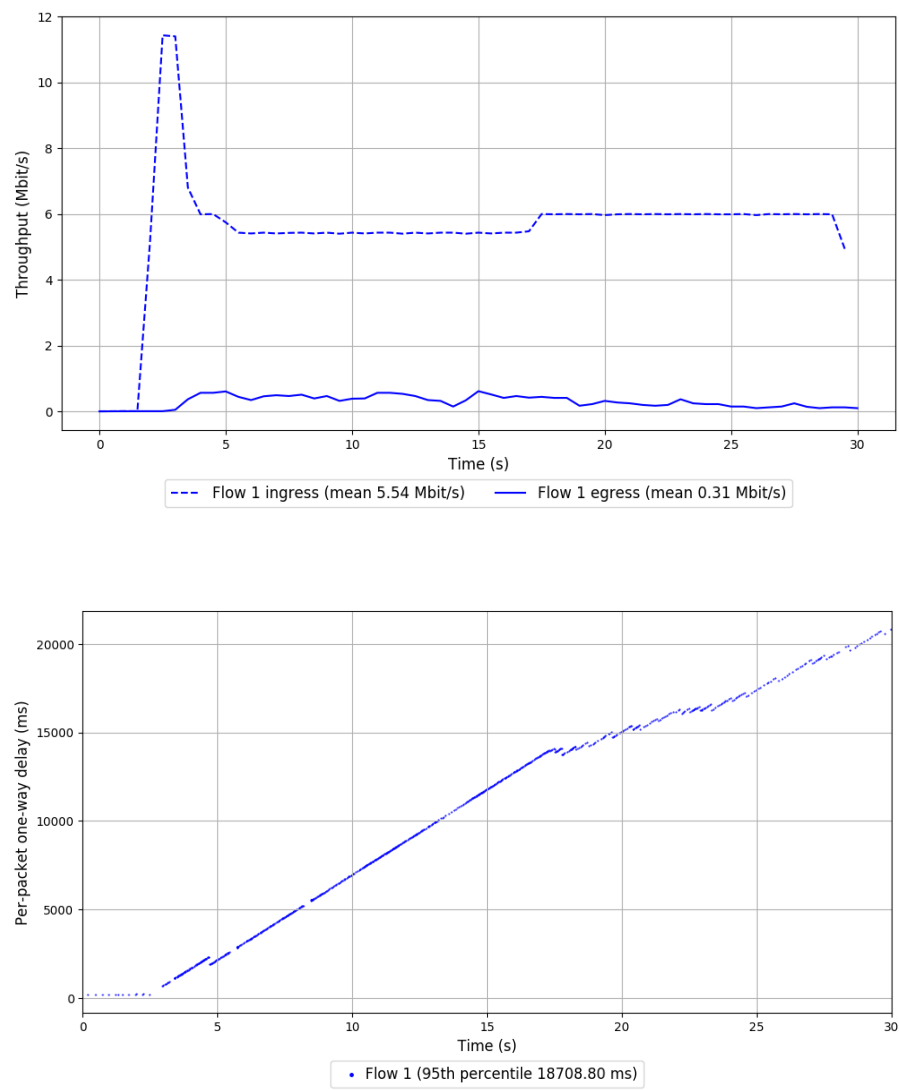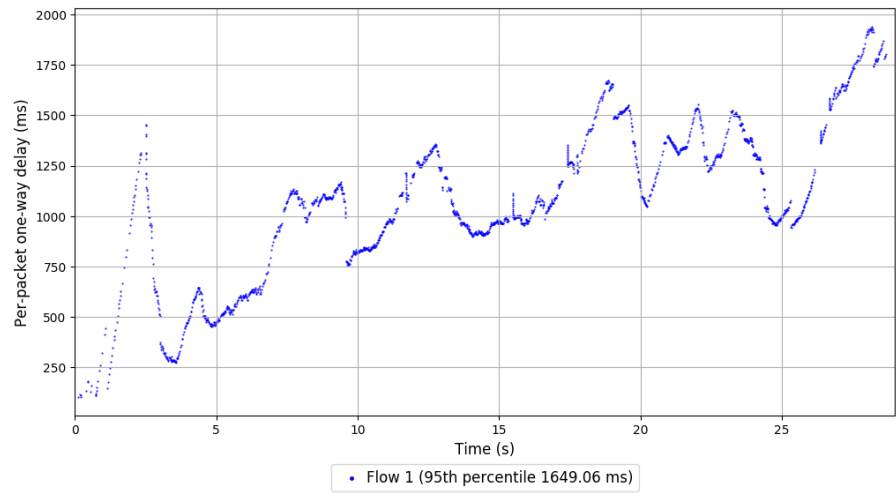
Run 2: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 5.90 Mbit/s)   Flow 1 egress (mean 0.50 Mbit/s)

Flow 1 (95th percentile 13249.57 ms)

```
Run 3: Statistics of PCC-Expr

Start at: 2019-01-24 13:57:46
End at: 2019-01-24 13:58:16
Local clock offset: 1.627 ms
Remote clock offset: 4.709 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 18708.802 ms
Loss rate: 94.52%
-- Flow 1:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 18708.802 ms
Loss rate: 94.52%
```
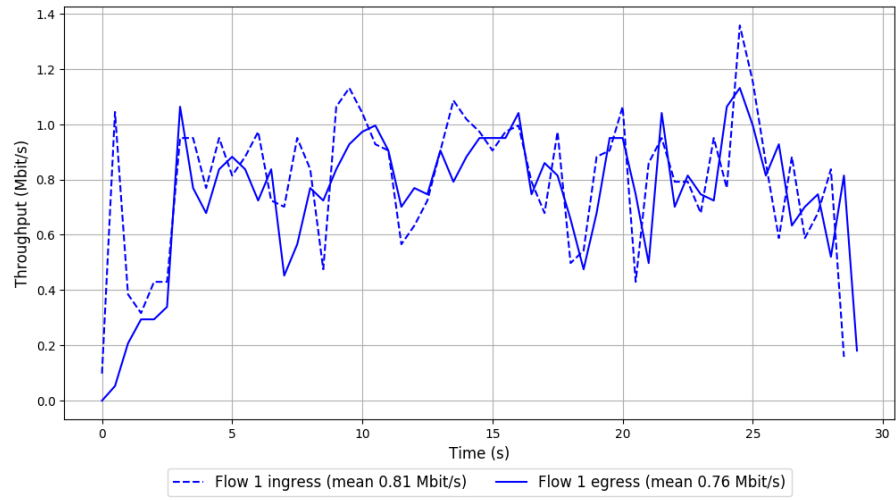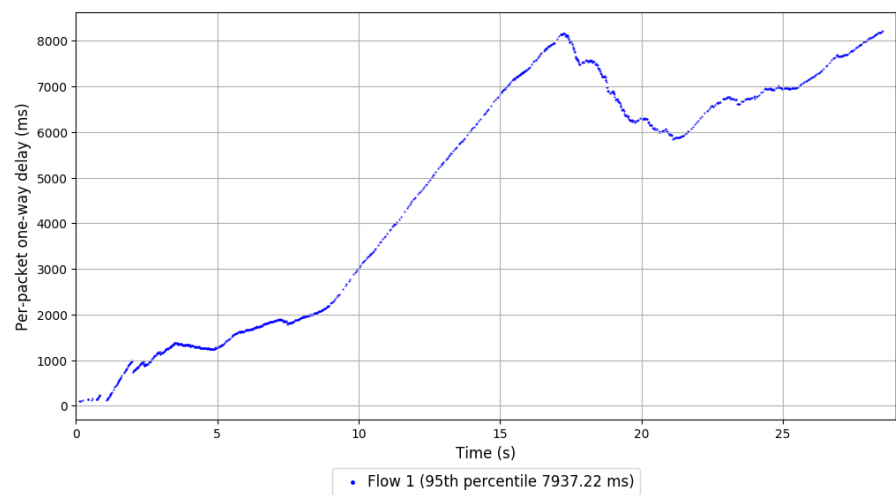
Run 3: Report of PCC-Expr — Data Link

```
Run 1: Statistics of QUIC Cubic

Start at: 2019-01-24 13:15:40
End at: 2019-01-24 13:16:10
Local clock offset: -2.614 ms
Remote clock offset: 4.579 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 1649.060 ms
Loss rate: 5.63%
-- Flow 1:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 1649.060 ms
Loss rate: 5.63%
```
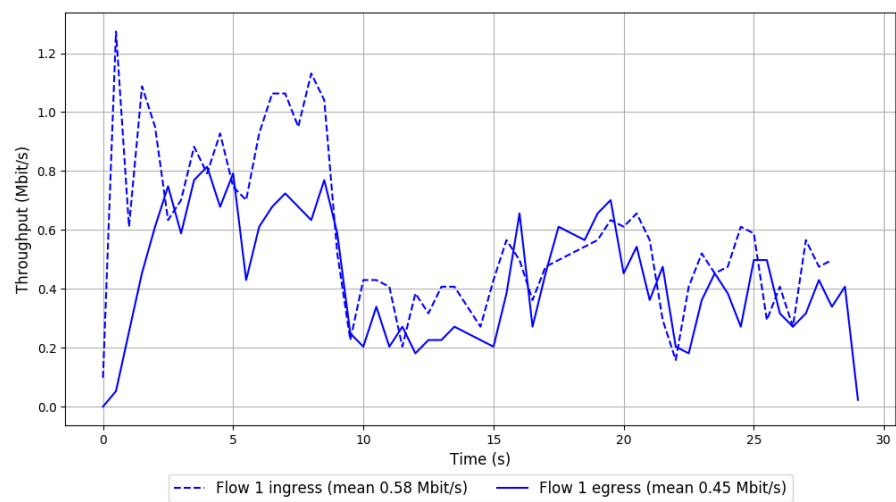
Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2019-01-24 13:39:36
End at: 2019-01-24 13:40:06
Local clock offset: -2.48 ms
Remote clock offset: 6.606 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 7937.224 ms
Loss rate: 22.72%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 7937.224 ms
Loss rate: 22.72%
```
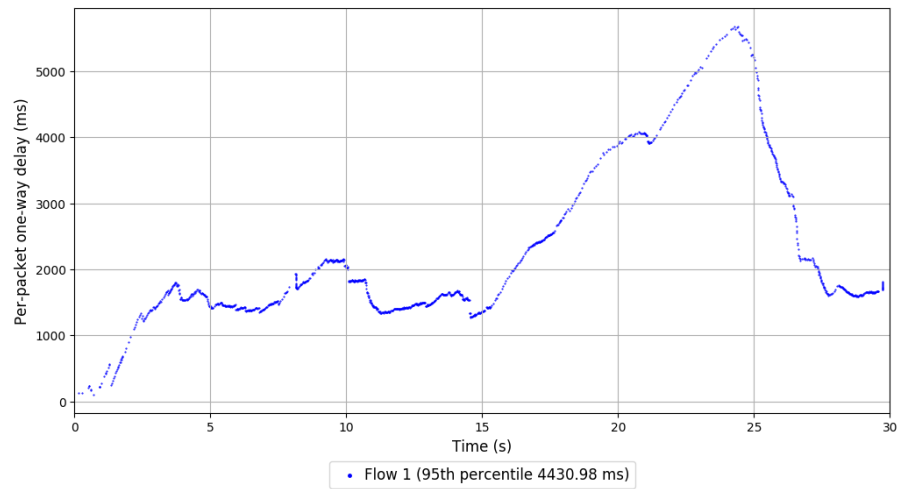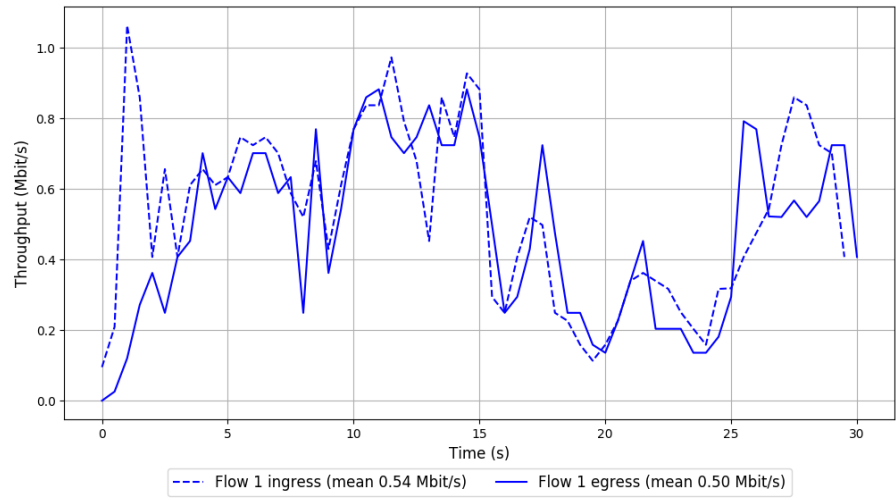
Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 0.58 Mbit/s)   Flow 1 egress (mean 0.45 Mbit/s)

Flow 1 (95th percentile 7937.22 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2019-01-24 14:03:27
End at: 2019-01-24 14:03:57
Local clock offset: -1.238 ms
Remote clock offset: 4.21 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 4430.984 ms
Loss rate: 8.18%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 4430.984 ms
Loss rate: 8.18%
```
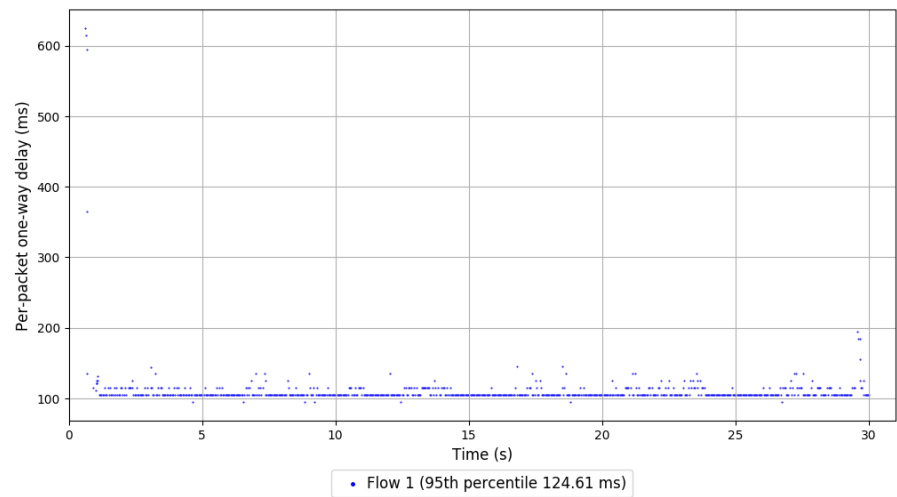
Run 3: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2019-01-24 13:16:49
End at: 2019-01-24 13:17:19
Local clock offset: -2.319 ms
Remote clock offset: 4.786 ms

# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 124.606 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 124.606 ms
Loss rate: 0.37%
```
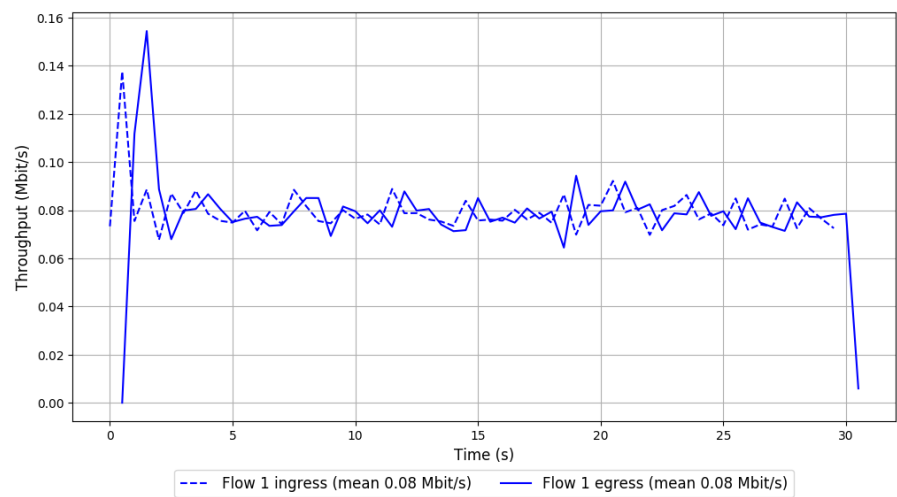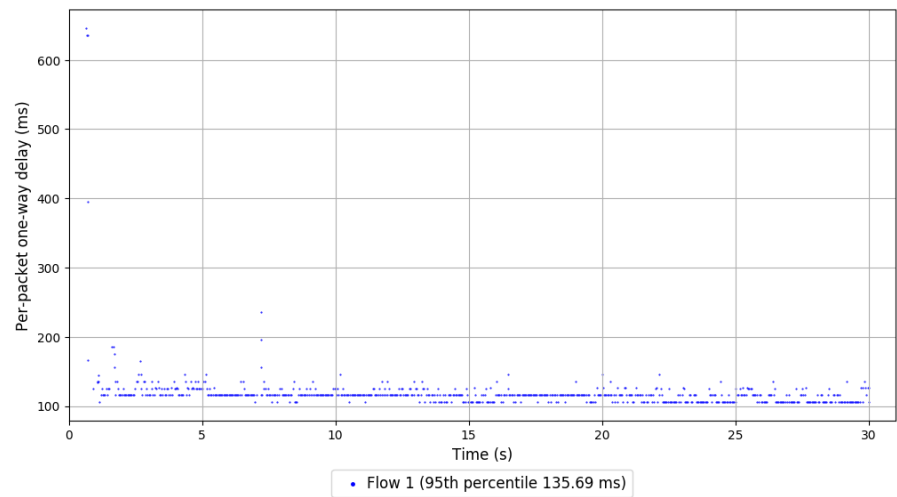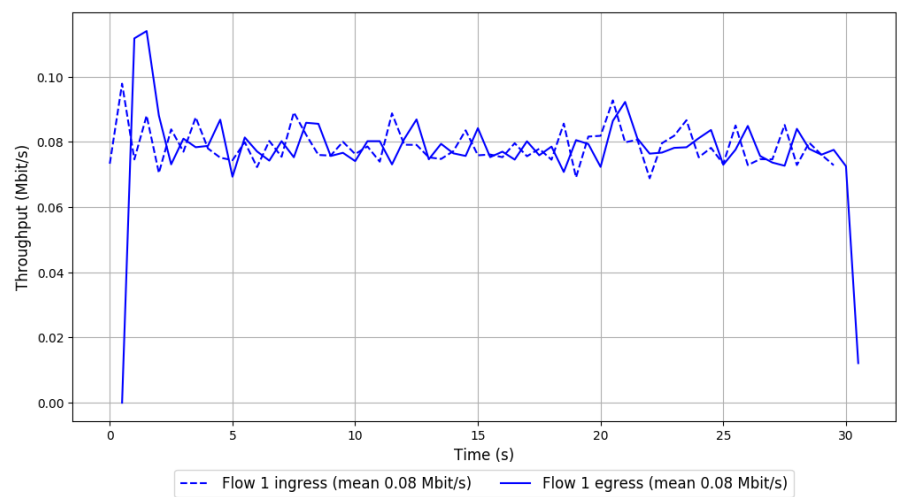
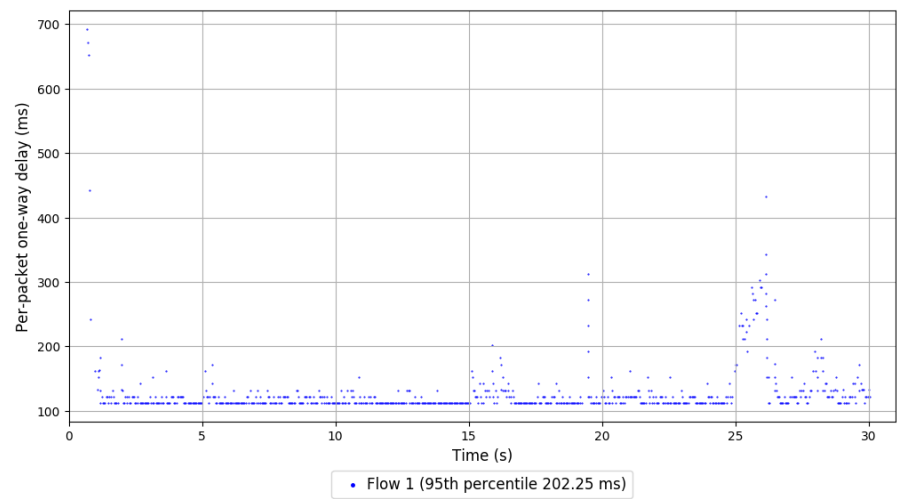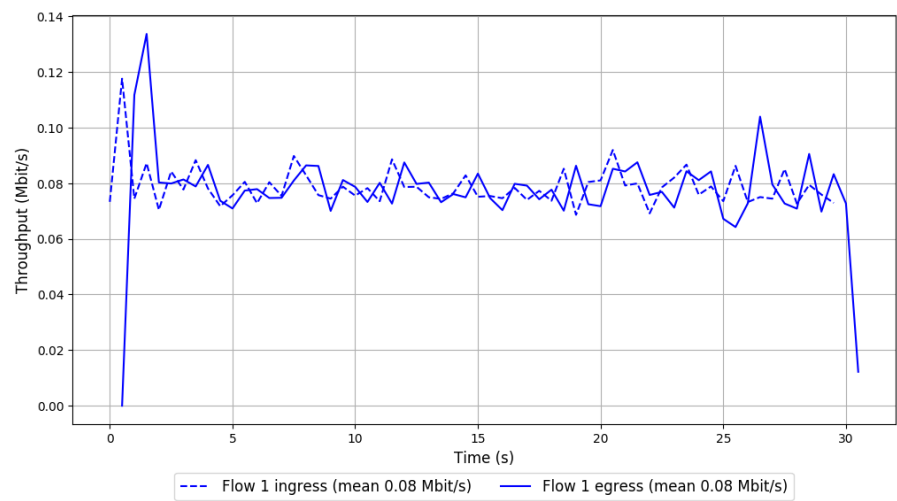Run 1: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.08 Mbit/s)   Flow 1 egress (mean 0.08 Mbit/s)

Flow 1 (95th percentile 124.61 ms)

```
Run 2: Statistics of SCReAM

Start at: 2019-01-24 13:40:44
End at: 2019-01-24 13:41:14
Local clock offset: -1.588 ms
Remote clock offset: 5.522 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 135.686 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 135.686 ms
Loss rate: 0.13%
```

Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2019-01-24 14:04:35
End at: 2019-01-24 14:05:05
Local clock offset: -1.009 ms
Remote clock offset: 10.802 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 202.252 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 202.252 ms
Loss rate: 0.27%
```
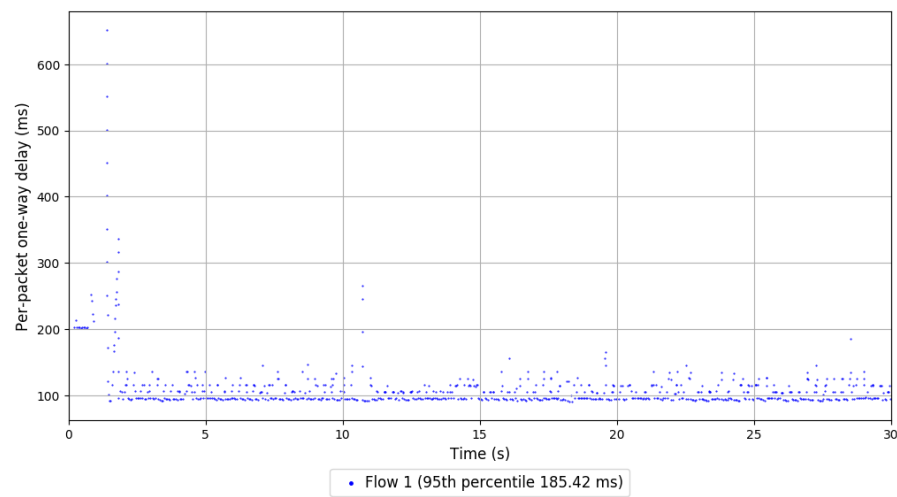
Run 3: Report of SCReAM — Data Link

```
Run 1: Statistics of Sprout

Start at: 2019-01-24 13:08:51
End at: 2019-01-24 13:09:21
Local clock offset: -2.134 ms
Remote clock offset: 3.795 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 185.418 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 185.418 ms
Loss rate: 0.00%
```
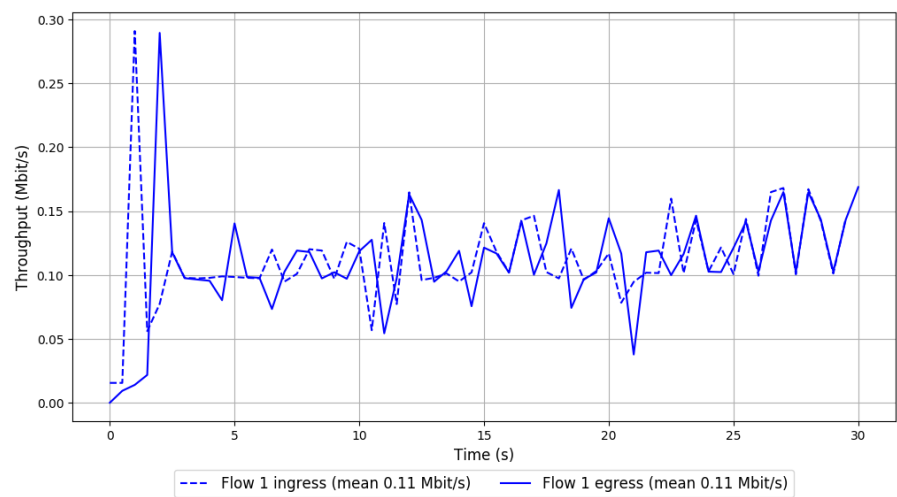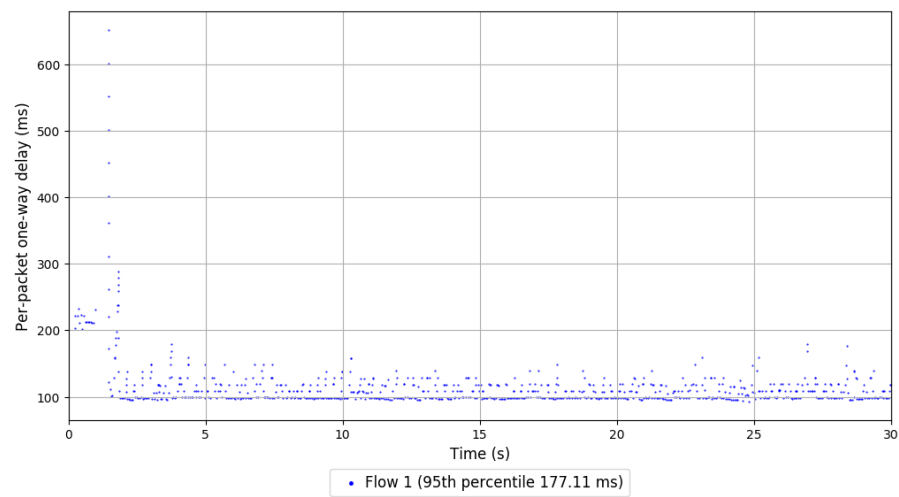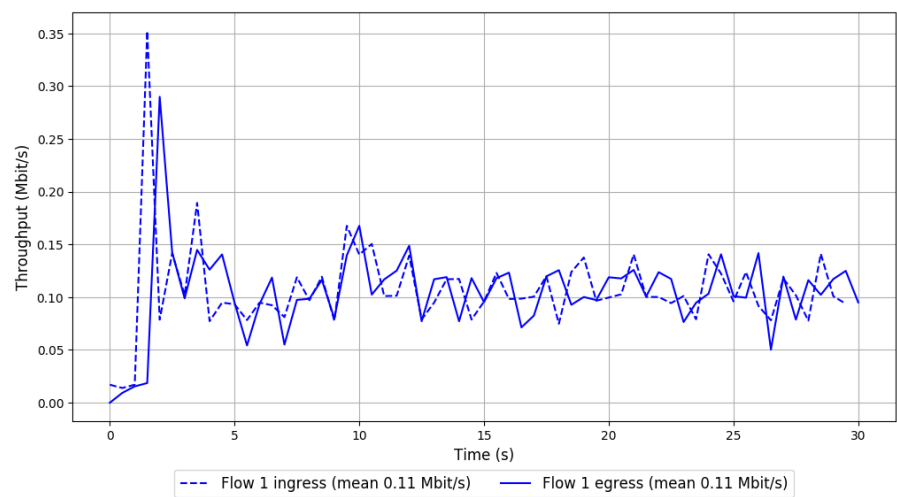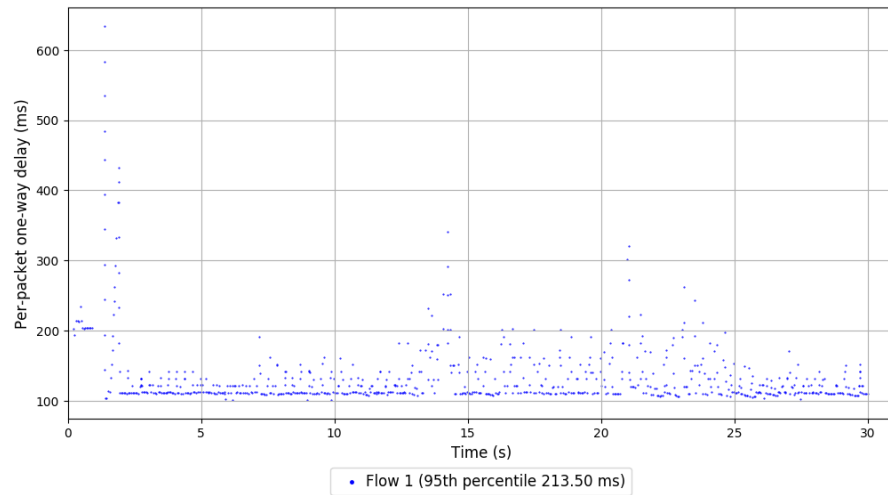
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2019-01-24 13:32:47
End at: 2019-01-24 13:33:17
Local clock offset: -1.882 ms
Remote clock offset: 6.09 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 177.112 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 177.112 ms
Loss rate: 0.03%
```

Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2019-01-24 13:56:38
End at: 2019-01-24 13:57:08
Local clock offset: 0.516 ms
Remote clock offset: 5.908 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 213.499 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 213.499 ms
Loss rate: 0.00%
```
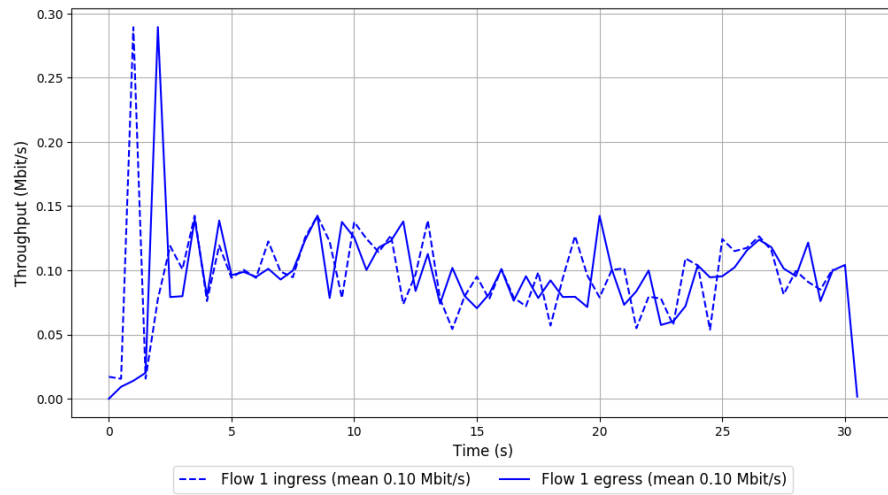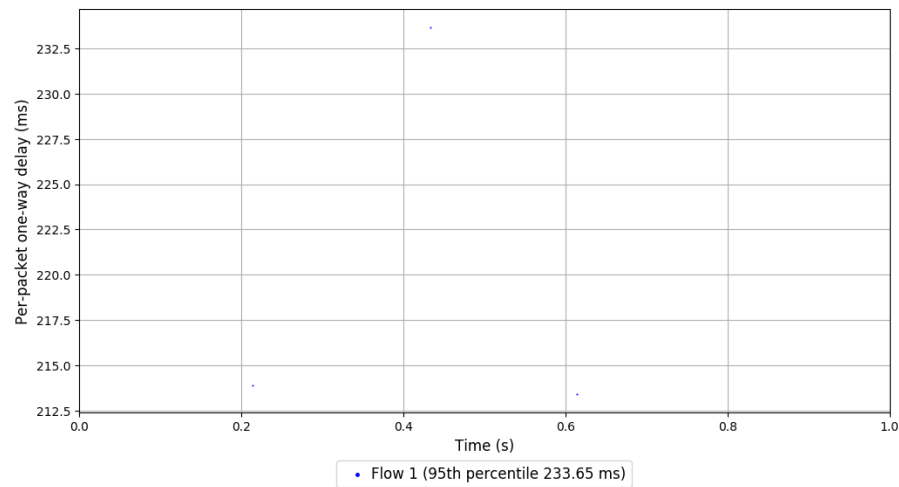
Run 3: Report of Sprout — Data Link
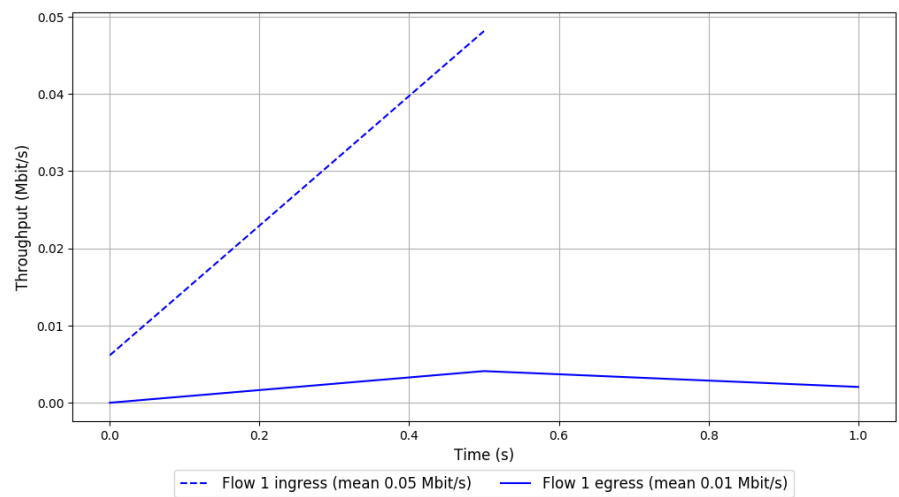
```
Run 1: Statistics of TaoVA-100x

Start at: 2019-01-24 13:03:11
End at: 2019-01-24 13:03:41
Local clock offset: -5.586 ms
Remote clock offset: 2.621 ms
```

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

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

Start at: 2019-01-24 13:27:06
End at: 2019-01-24 13:27:36
Local clock offset: -2.165 ms
Remote clock offset: 9.731 ms
```
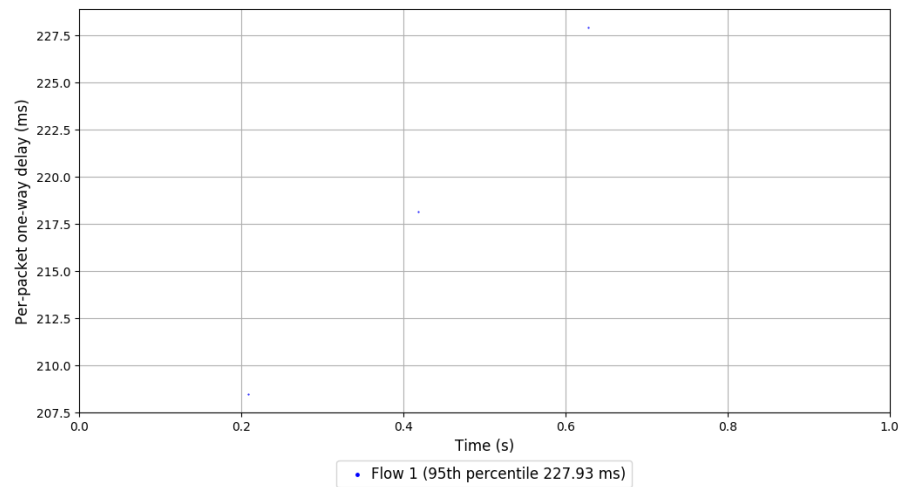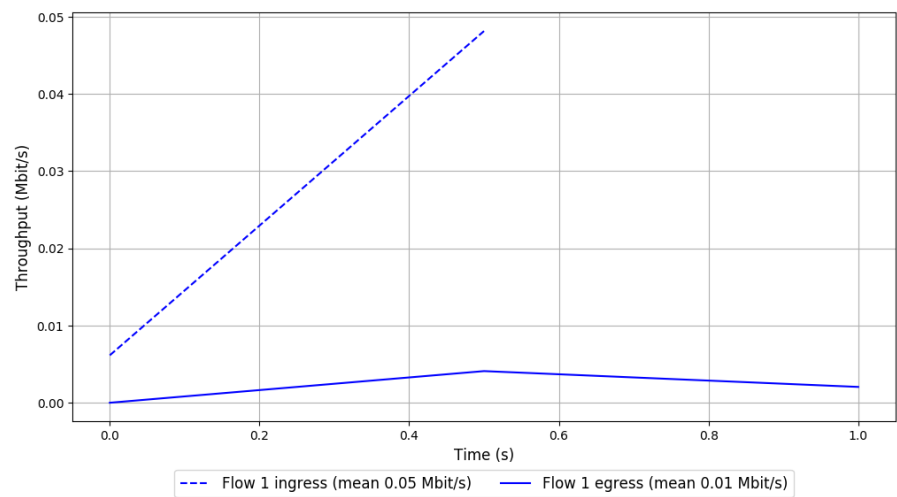
Run 2: Report of TaoVA-100x — Data Link
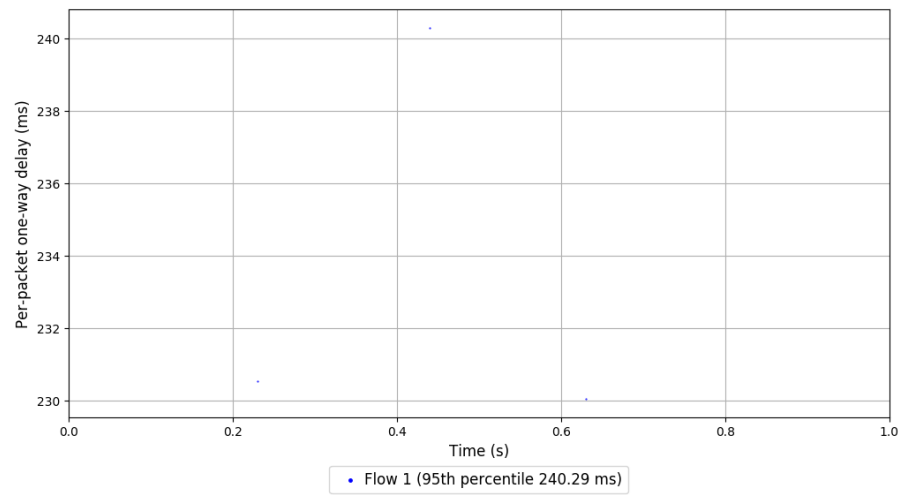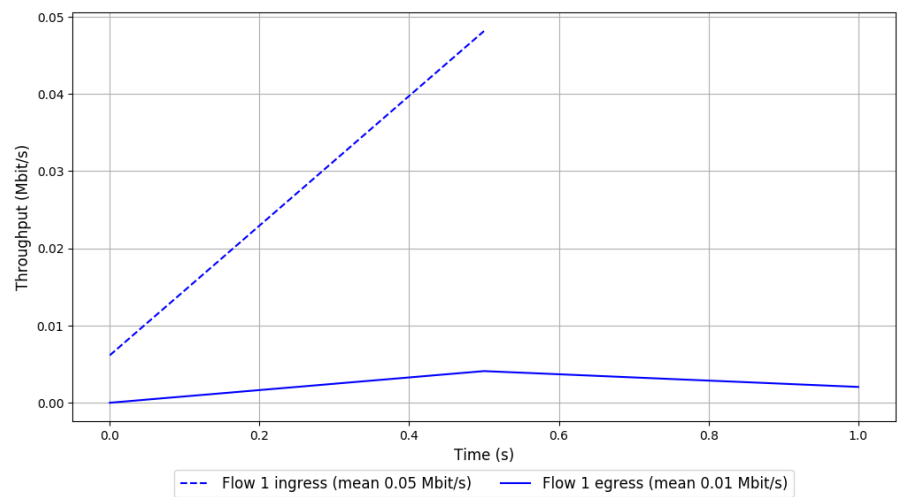
```
Run 3: Statistics of TaoVA-100x

Start at: 2019-01-24 13:50:57
End at: 2019-01-24 13:51:27
Local clock offset: -0.651 ms
Remote clock offset: 11.337 ms
```

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

```
Run 1: Statistics of TCP Vegas

Start at: 2019-01-24 13:21:24
End at: 2019-01-24 13:21:54
Local clock offset: -3.043 ms
Remote clock offset: 8.116 ms

# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 1665.020 ms
Loss rate: 1.49%
-- Flow 1:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 1665.020 ms
Loss rate: 1.49%
```
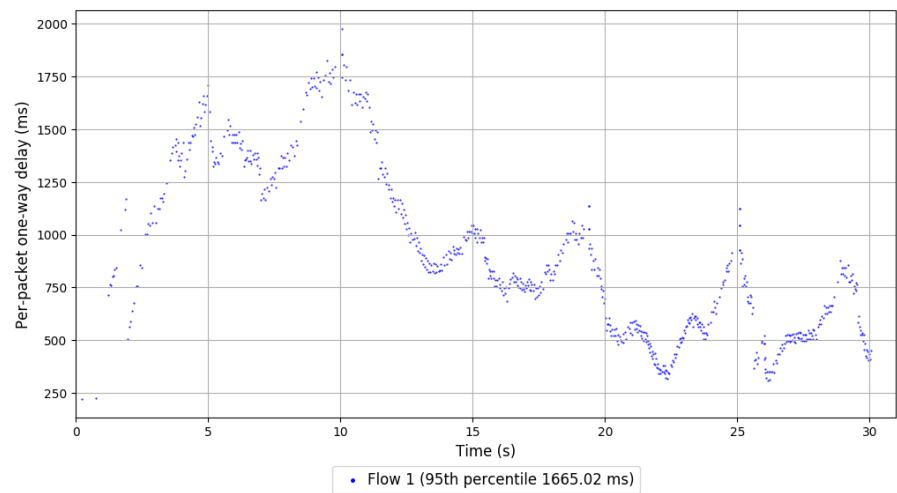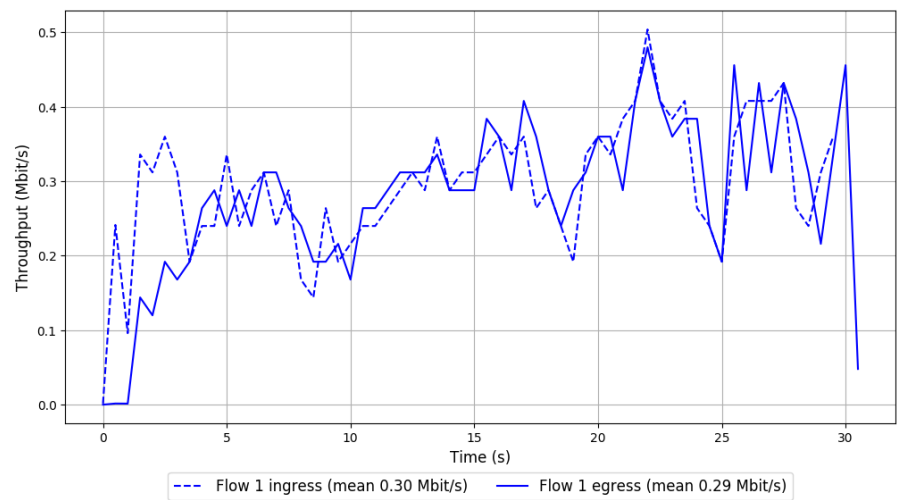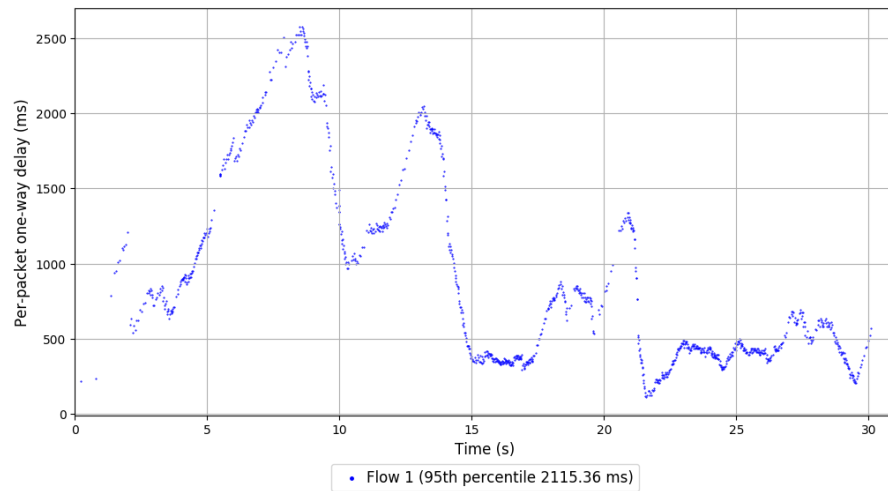
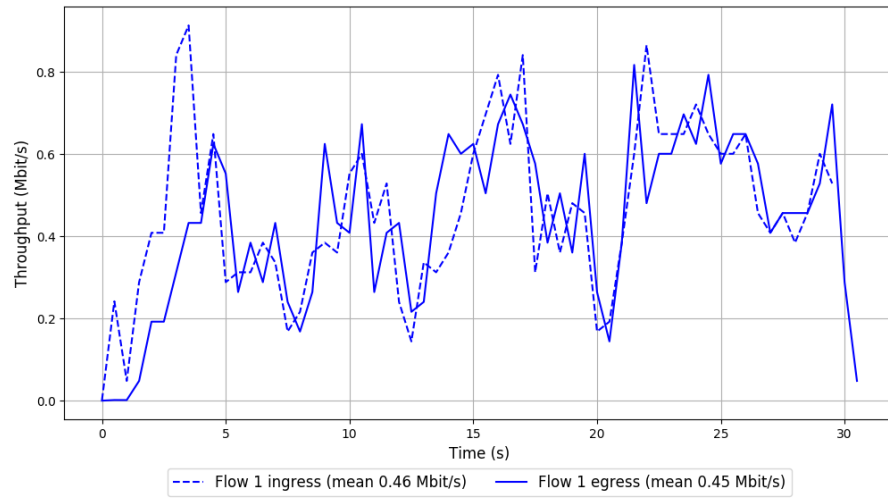Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2019-01-24 13:45:17
End at: 2019-01-24 13:45:47
Local clock offset: -0.889 ms
Remote clock offset: 10.695 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 2115.355 ms
Loss rate: 1.91%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 2115.355 ms
Loss rate: 1.91%
```

Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2019-01-24 14:09:07
End at: 2019-01-24 14:09:37
Local clock offset: -3.42 ms
Remote clock offset: 4.383 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 1609.976 ms
Loss rate: 1.95%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 1609.976 ms
Loss rate: 1.95%
```
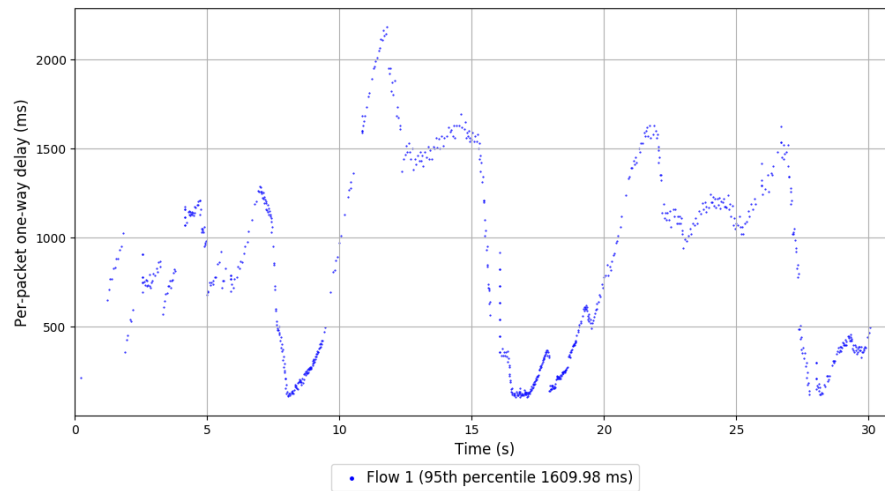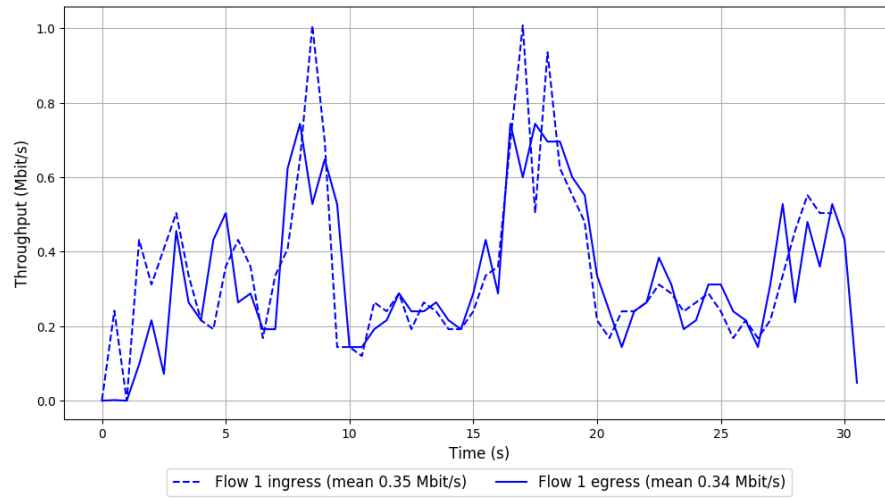
Run 3: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2019-01-24 13:22:33
End at: 2019-01-24 13:23:03
Local clock offset: -2.89 ms
Remote clock offset: 7.981 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 2510.783 ms
Loss rate: 3.66%
-- Flow 1:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 2510.783 ms
Loss rate: 3.66%
```
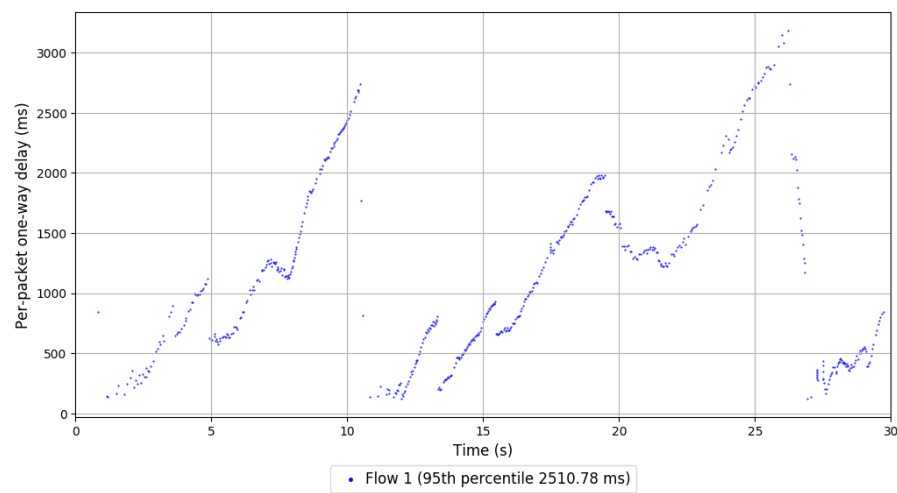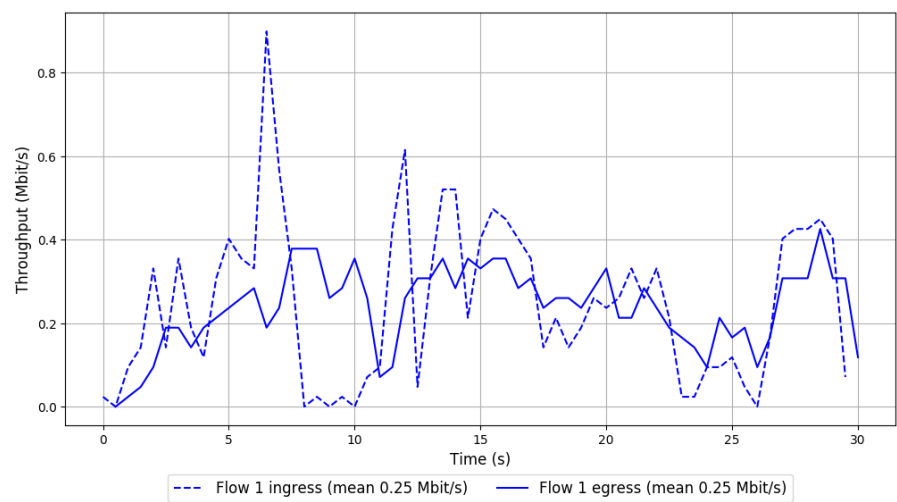
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2019-01-24 13:46:25
End at: 2019-01-24 13:46:55
Local clock offset: -0.726 ms
Remote clock offset: 5.939 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 2516.053 ms
Loss rate: 1.85%
-- Flow 1:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 2516.053 ms
Loss rate: 1.85%
```
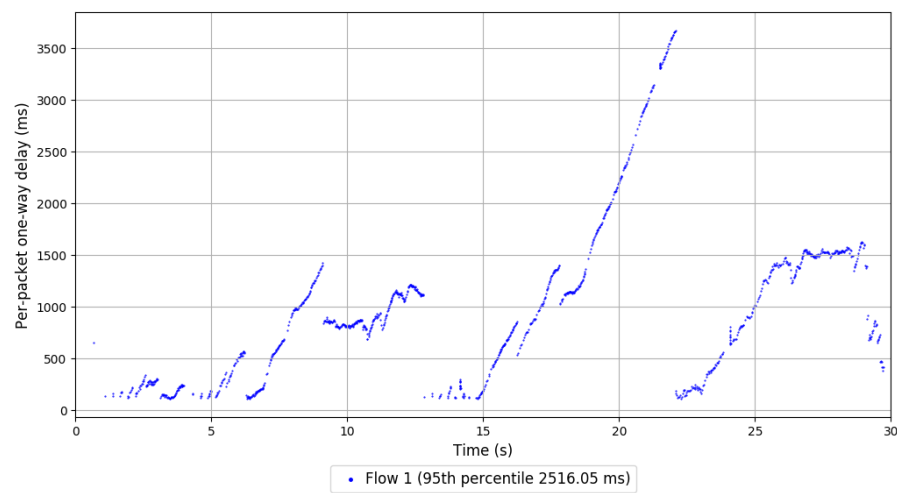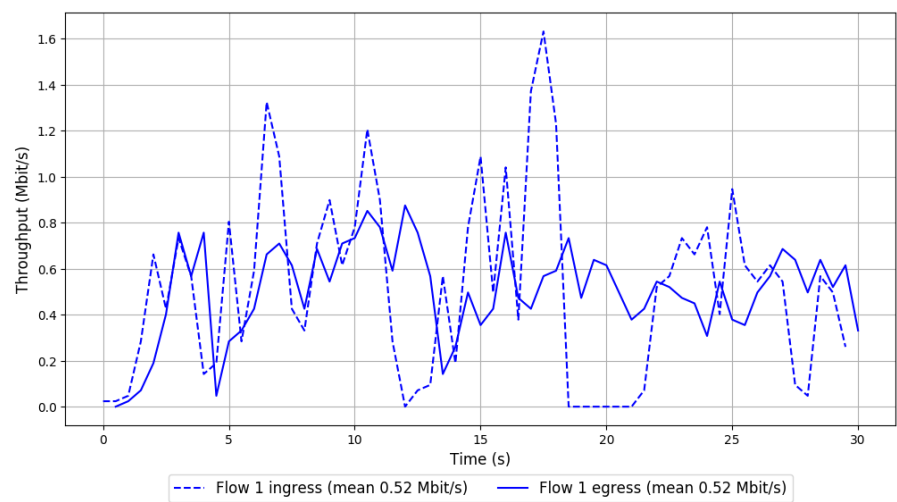
Run 2: Report of Verus — Data Link

Flow 1 ingress (mean 0.52 Mbit/s)   Flow 1 egress (mean 0.52 Mbit/s)

Flow 1 (95th percentile 2516.05 ms)

```
Run 3: Statistics of Verus

Start at: 2019-01-24 14:10:15
End at: 2019-01-24 14:10:45
Local clock offset: -3.57 ms
Remote clock offset: 5.523 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 1926.309 ms
Loss rate: 2.50%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 1926.309 ms
Loss rate: 2.50%
```
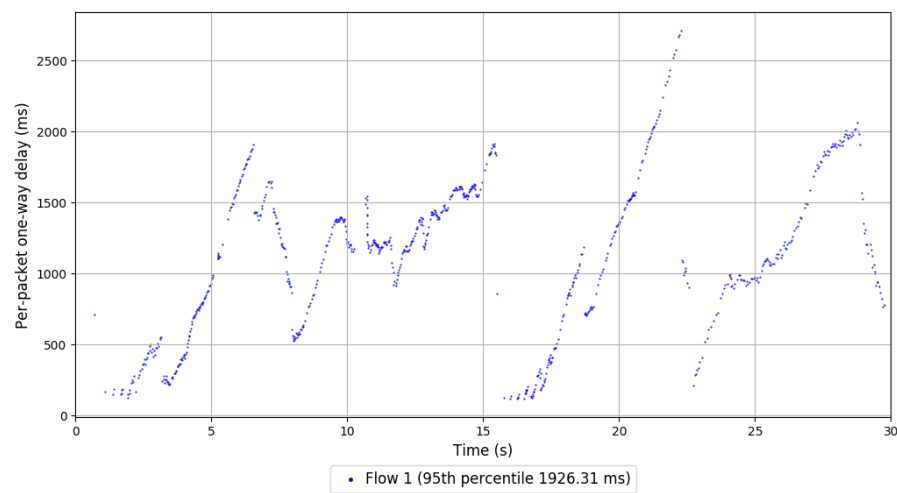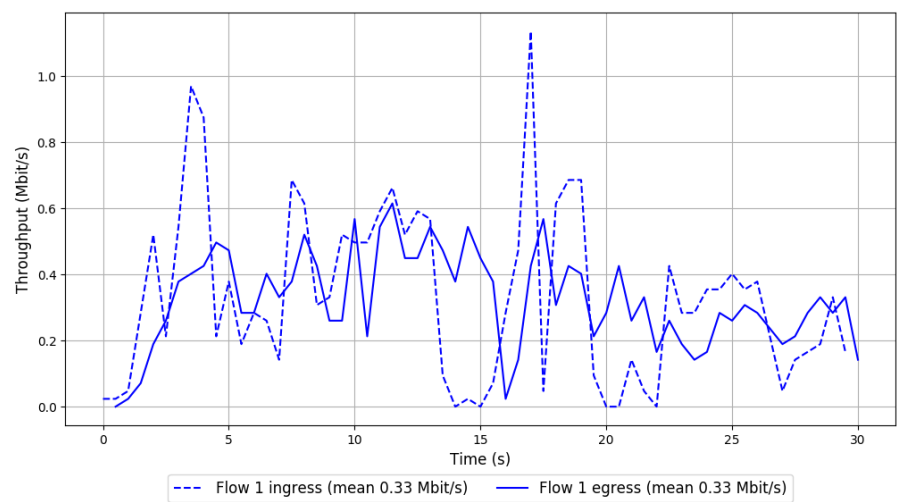
Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 0.33 Mbit/s)   Flow 1 egress (mean 0.33 Mbit/s)

Flow 1 (95th percentile 1926.31 ms)

```
Run 1: Statistics of PCC-Vivace

Start at: 2019-01-24 13:14:32
End at: 2019-01-24 13:15:02
Local clock offset: -3.726 ms
Remote clock offset: 9.24 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 10304.322 ms
Loss rate: 45.66%
-- Flow 1:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 10304.322 ms
Loss rate: 45.66%
```
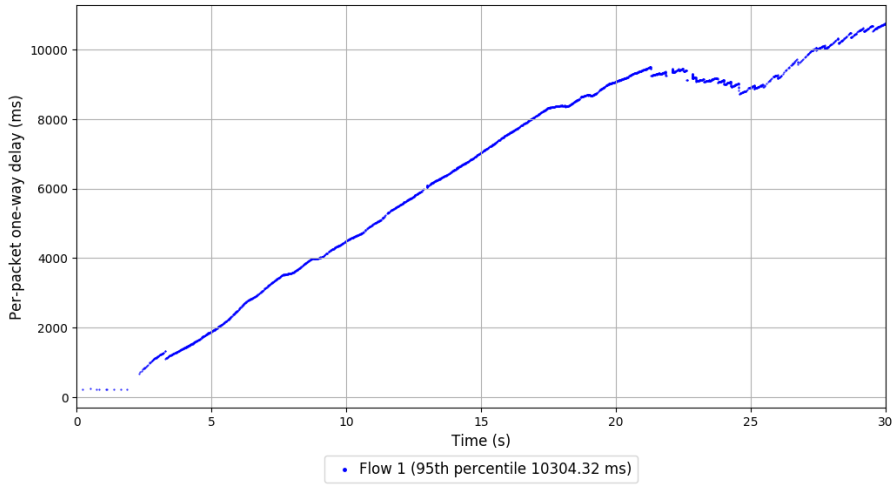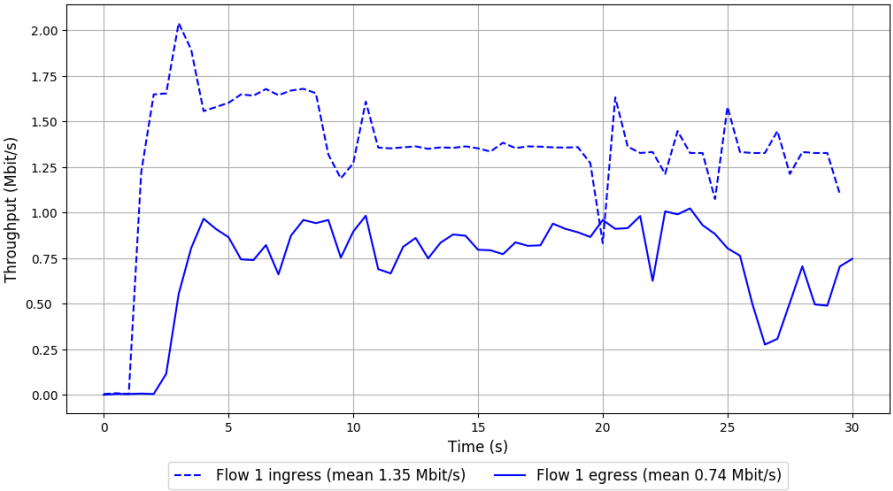
Run 1: Report of PCC-Vivace — Data Link

```
Run 2: Statistics of PCC-Vivace

Start at: 2019-01-24 13:38:27
End at: 2019-01-24 13:38:57
Local clock offset: -1.809 ms
Remote clock offset: 5.43 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 10962.016 ms
Loss rate: 52.48%
-- Flow 1:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 10962.016 ms
Loss rate: 52.48%
```
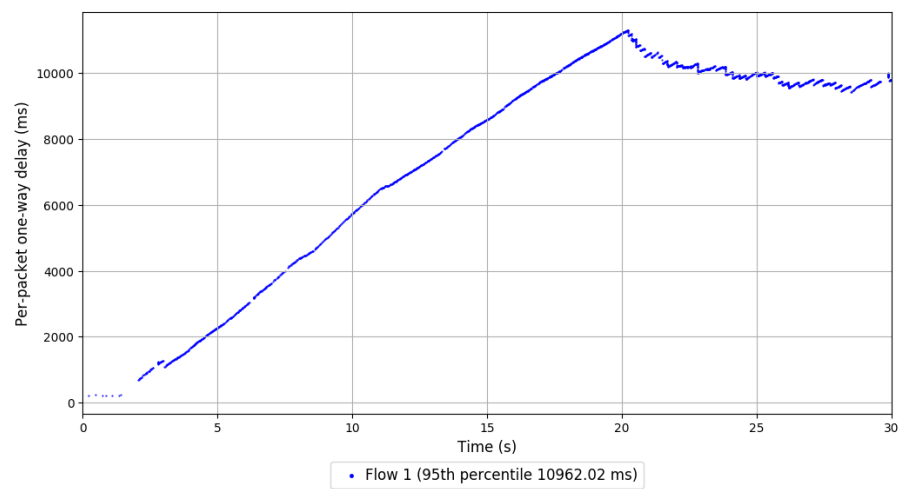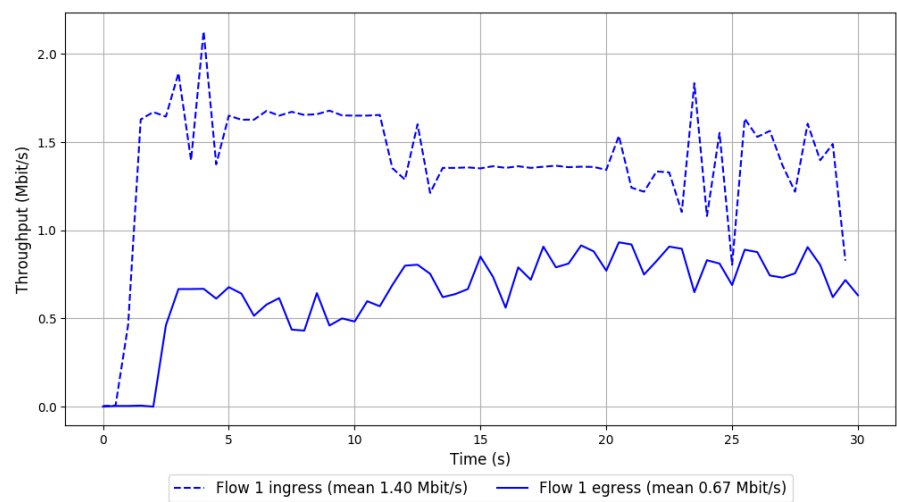
Run 2: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 1.40 Mbit/s)   Flow 1 egress (mean 0.67 Mbit/s)

• Flow 1 (95th percentile 10962.02 ms)

```
Run 3: Statistics of PCC-Vivace

Start at: 2019-01-24 14:02:18
End at: 2019-01-24 14:02:48
Local clock offset: 0.397 ms
Remote clock offset: 4.273 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 15837.377 ms
Loss rate: 71.40%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 15837.377 ms
Loss rate: 71.40%
```
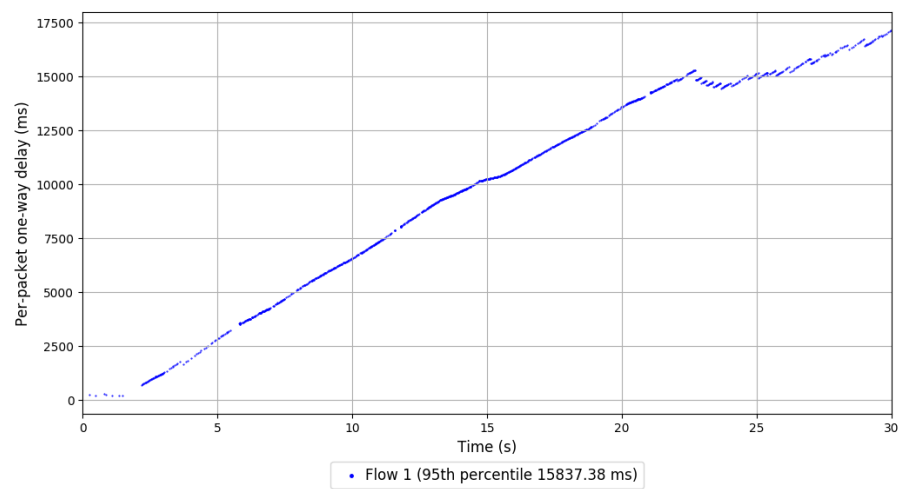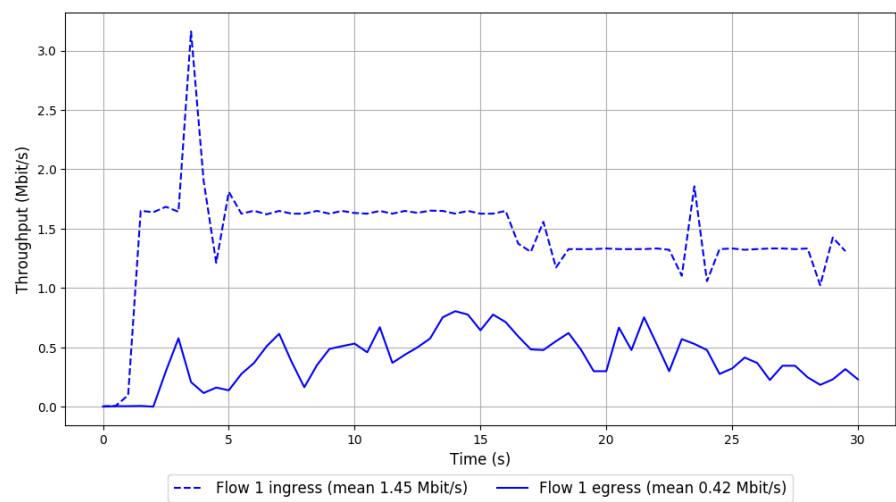
Run 3: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 1.45 Mbit/s)   Flow 1 egress (mean 0.42 Mbit/s)

Flow 1 (95th percentile 15837.38 ms)

```
Run 1: Statistics of WebRTC media

Start at: 2019-01-24 13:19:05
End at: 2019-01-24 13:19:35
Local clock offset: -3.629 ms
Remote clock offset: 3.882 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 485.516 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 485.516 ms
Loss rate: 0.27%
```
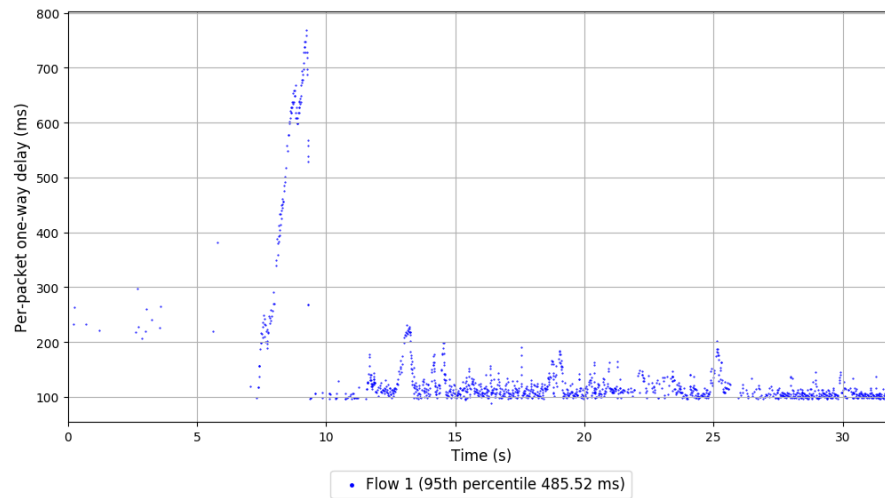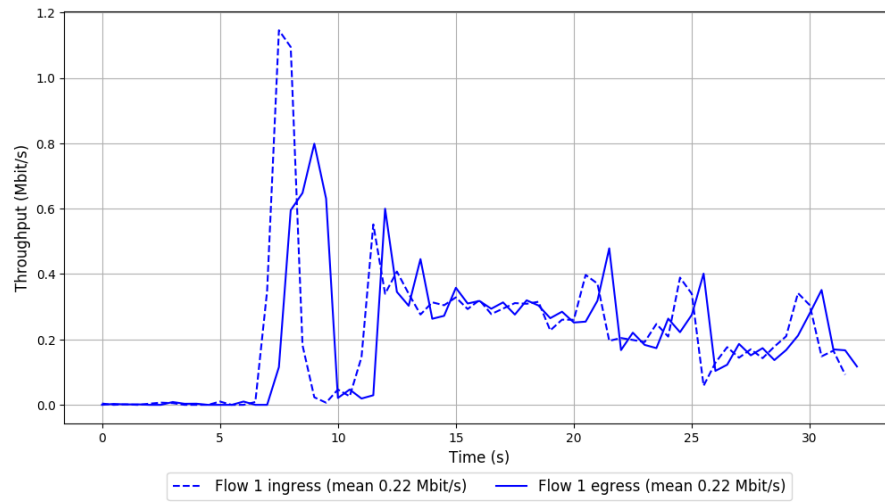
Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2019-01-24 13:43:00
End at: 2019-01-24 13:43:30
Local clock offset: -1.266 ms
Remote clock offset: 5.733 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 1968.288 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 1968.288 ms
Loss rate: 0.00%
```
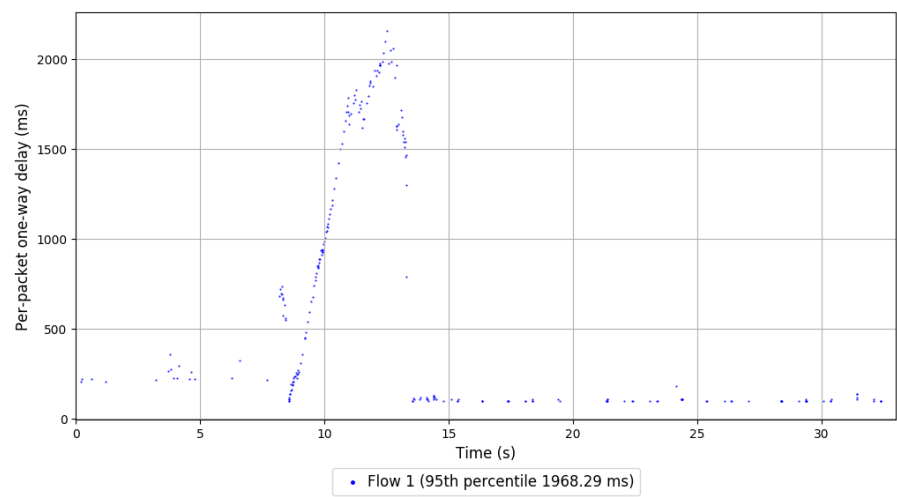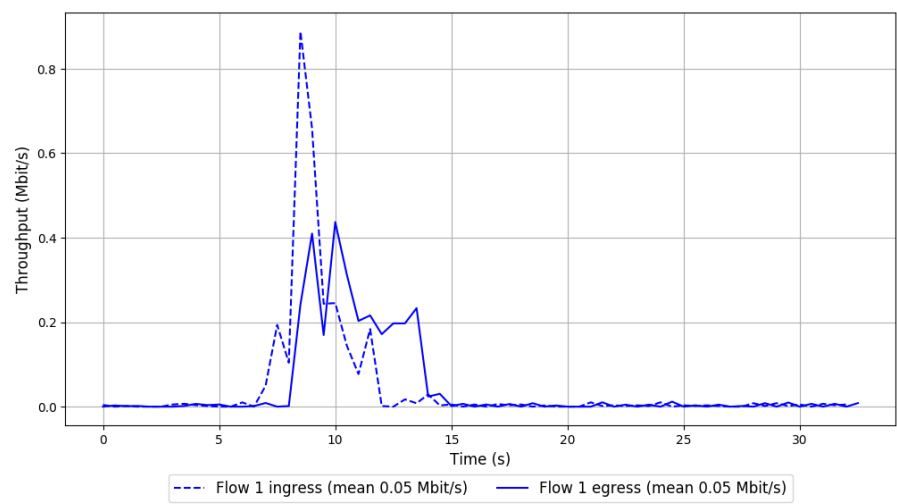
Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2019-01-24 14:06:51
End at: 2019-01-24 14:07:21
Local clock offset: -1.909 ms
Remote clock offset: 9.379 ms


# Below is generated by plot.py at 2019-01-24 14:12:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 2199.513 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 2199.513 ms
Loss rate: 0.00%
```

Run 3: Report of WebRTC media — Data Link