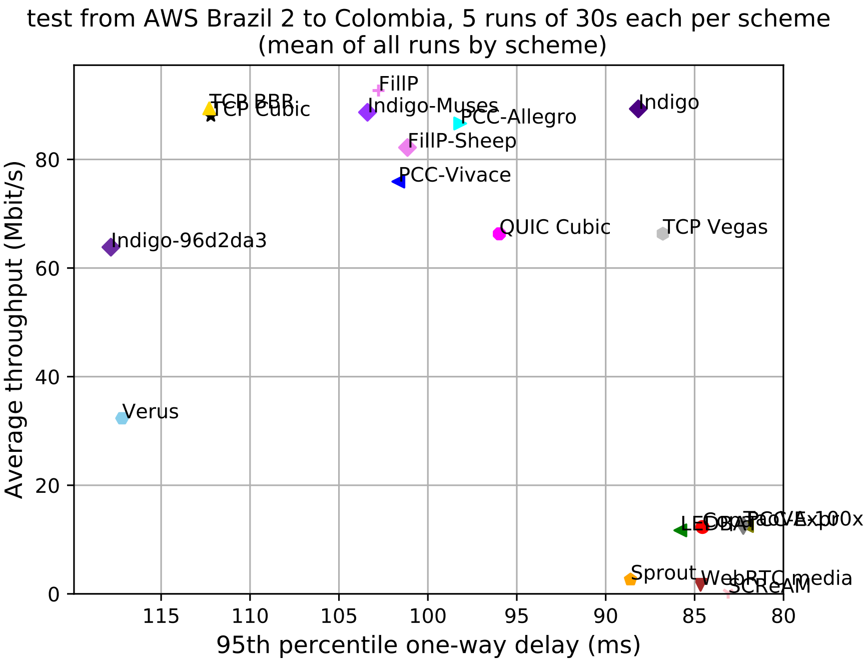
Pantheon Report

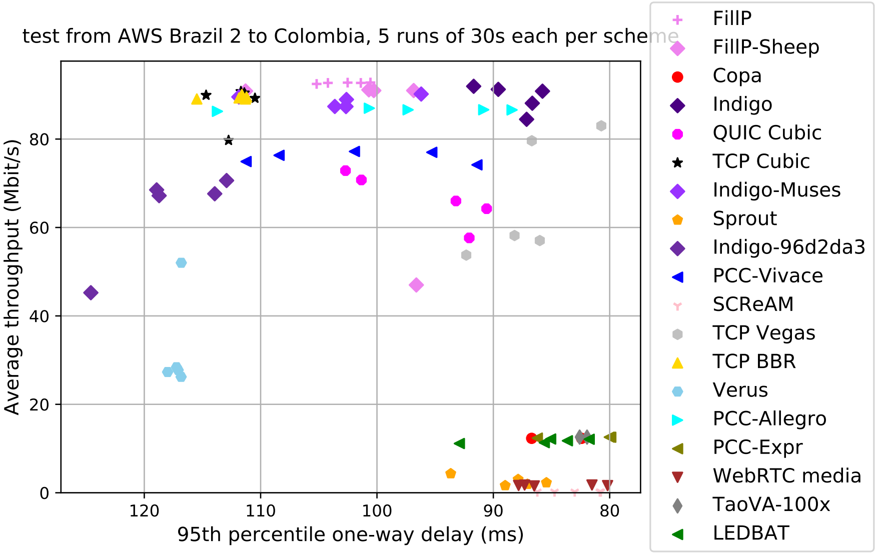
Generated at 2018-12-02 02:19:47 (UTC).
Data path: AWS Brazil 2 on `ens5` (*local*) →Colombia on `p4p1` (*remote*).
Repeated the test of 19 congestion control schemes 5 times.
Each test lasted for 30 seconds running 1 flow.
NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

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

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

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

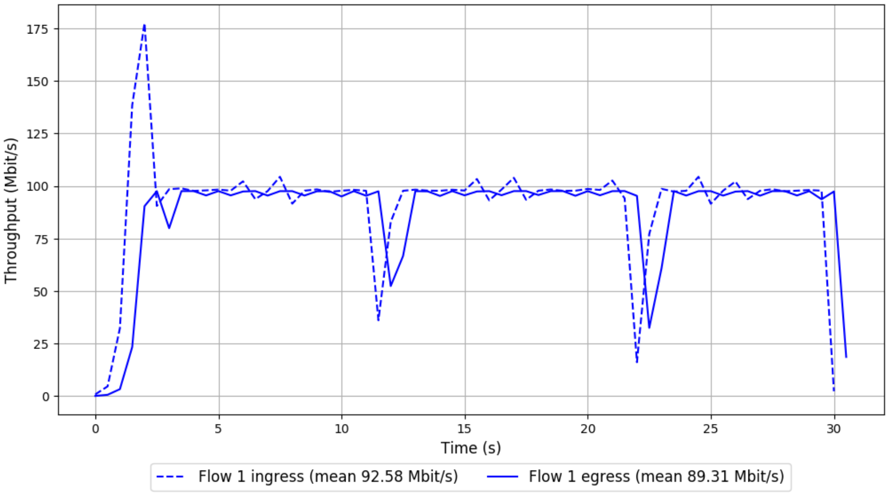

test from AWS Brazil 2 to Colombia, 5 runs of 30s each per scheme
(mean of all runs by scheme)
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
0
20
40
60
80
115
110
105
100
95
90
85
80
FillP
TCP BBR
TCP Cubic
Indigo-Muses
PCC-Allegro
FillP-Sheep
Indigo
PCC-Vivace
QUIC Cubic
TCP Vegas
Indigo-96d2da3
Verus
LEDBAT
Copa
TaoVA-100x
PCC-Expr
Sprout
WebRTC media
SCReAM

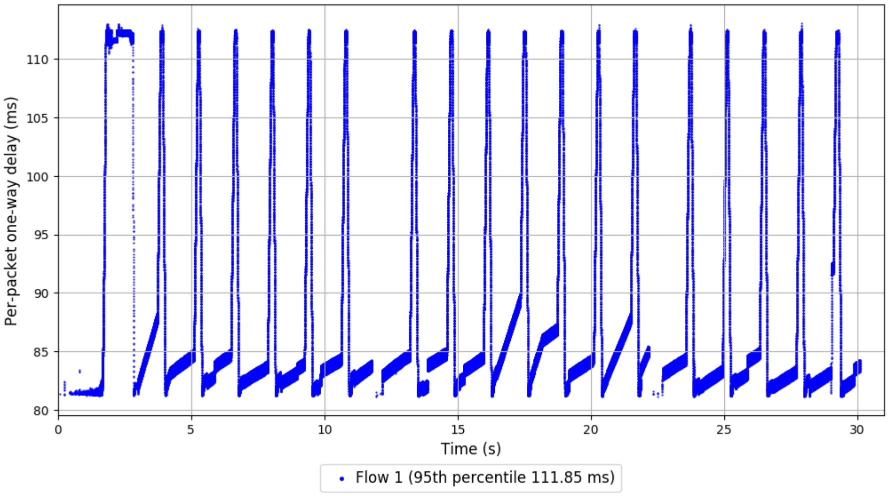

test from AWS Brazil 2 to Colombia, 5 runs of 30s each per scheme
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
0
20
40
60
80
120
110
100
90
80
FillP
FillP-Sheep
Copa
Indigo
QUIC Cubic
TCP Cubic
Indigo-Muses
Sprout
Indigo-96d2da3
PCC-Vivace
SCReAM
TCP Vegas
TCP BBR
Verus
PCC-Allegro
PCC-Expr
WebRTC media
TaoVA-100x
LEDBAT

scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	5	89.41	112.29	2.80
Copa	2	12.31	84.56	73.32
TCP Cubic	5	88.02	112.20	0.53
FillP	5	92.69	102.78	1.22
FillP-Sheep	5	82.19	101.15	1.30
Indigo	5	89.32	88.17	1.20
Indigo-96d2da3	5	63.84	117.82	49.19
LEDBAT	5	11.70	85.80	0.00
Indigo-Muses	5	88.68	103.40	2.58
PCC-Allegro	5	86.62	98.18	1.49
PCC-Expr	3	12.50	82.05	46.86
QUIC Cubic	5	66.30	95.98	0.39
SCReAM	5	0.22	83.11	0.00
Sprout	5	2.64	88.60	0.00
TaoVA-100x	2	12.59	82.26	30.43
TCP Vegas	5	66.32	86.79	0.81
Verus	5	32.34	117.19	12.47
PCC-Vivace	5	75.92	101.66	0.09
WebRTC media	5	1.66	84.66	0.00

```
Run 1: Statistics of TCP BBR

Start at: 2018-12-02 00:23:03
End at: 2018-12-02 00:23:33
Local clock offset: -4.45 ms
Remote clock offset: -15.515 ms

# Below is generated by plot.py at 2018-12-02 02:12:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.31 Mbit/s
95th percentile per-packet one-way delay: 111.852 ms
Loss rate: 3.53%
-- Flow 1:
Average throughput: 89.31 Mbit/s
95th percentile per-packet one-way delay: 111.852 ms
Loss rate: 3.53%
```

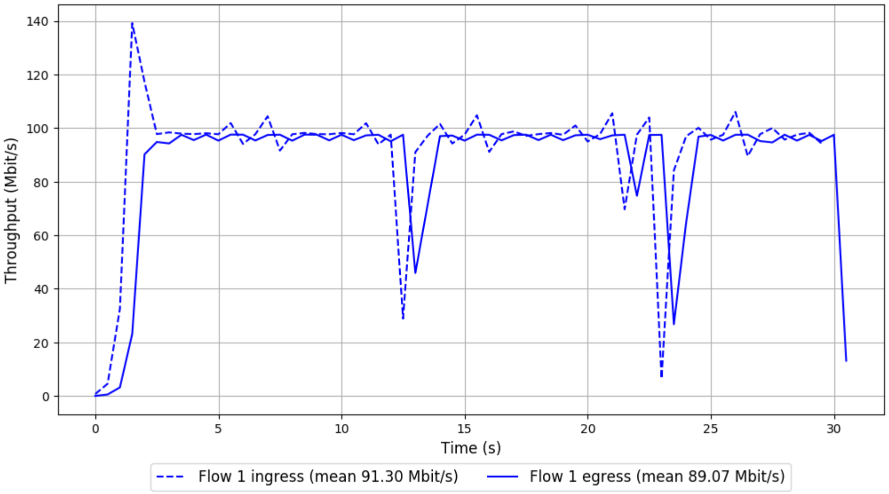
Run 1: Report of TCP BBR — Data Link

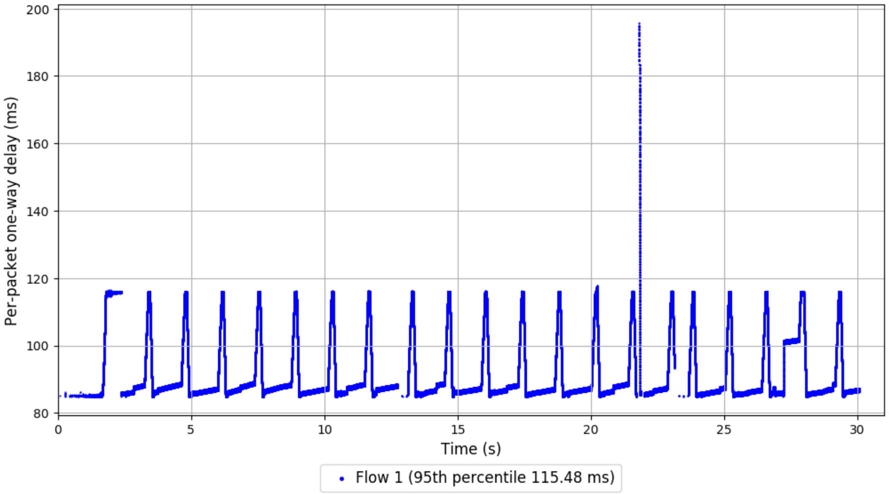




```
Run 2: Statistics of TCP BBR

Start at: 2018-12-02 00:45:18
End at: 2018-12-02 00:45:48
Local clock offset: -4.506 ms
Remote clock offset: -11.98 ms

# Below is generated by plot.py at 2018-12-02 02:12:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.07 Mbit/s
95th percentile per-packet one-way delay: 115.483 ms
Loss rate: 2.45%
-- Flow 1:
Average throughput: 89.07 Mbit/s
95th percentile per-packet one-way delay: 115.483 ms
Loss rate: 2.45%
```

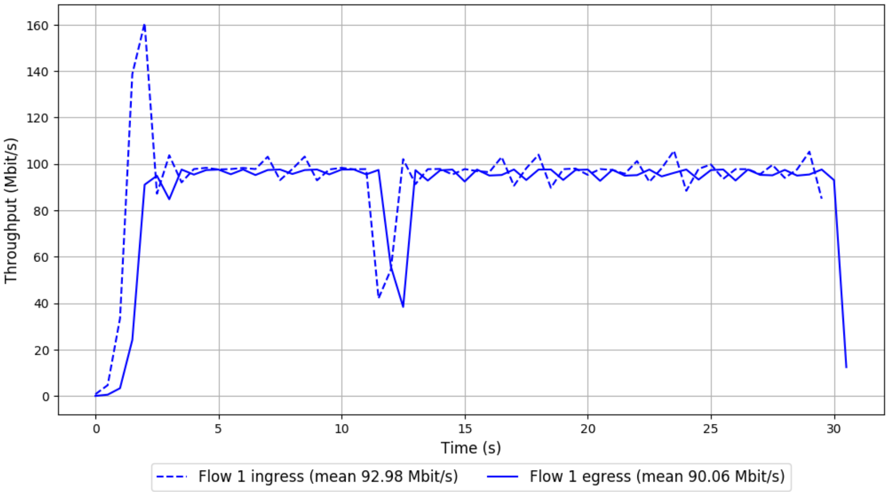
Run 2: Report of TCP BBR — Data Link

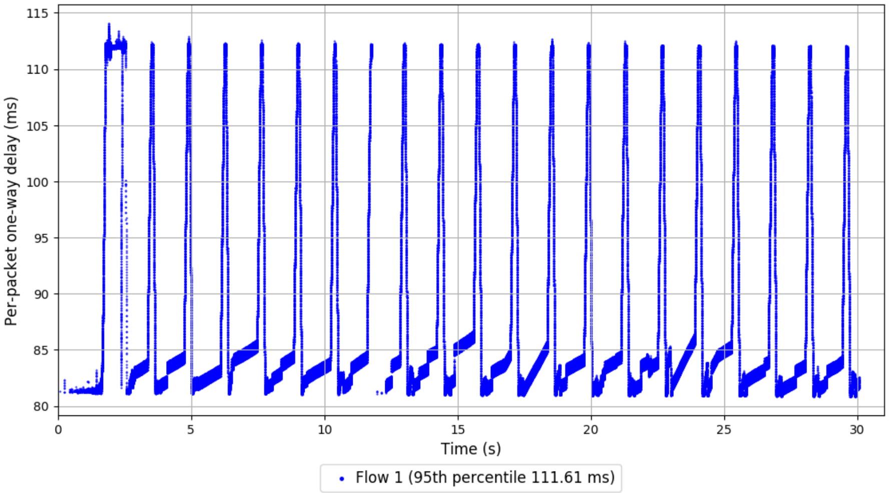




```
Run 3: Statistics of TCP BBR

Start at: 2018-12-02 01:07:31
End at: 2018-12-02 01:08:01
Local clock offset: -1.078 ms
Remote clock offset: 14.239 ms

# Below is generated by plot.py at 2018-12-02 02:12:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.06 Mbit/s
95th percentile per-packet one-way delay: 111.609 ms
Loss rate: 3.14%
-- Flow 1:
Average throughput: 90.06 Mbit/s
95th percentile per-packet one-way delay: 111.609 ms
Loss rate: 3.14%
```

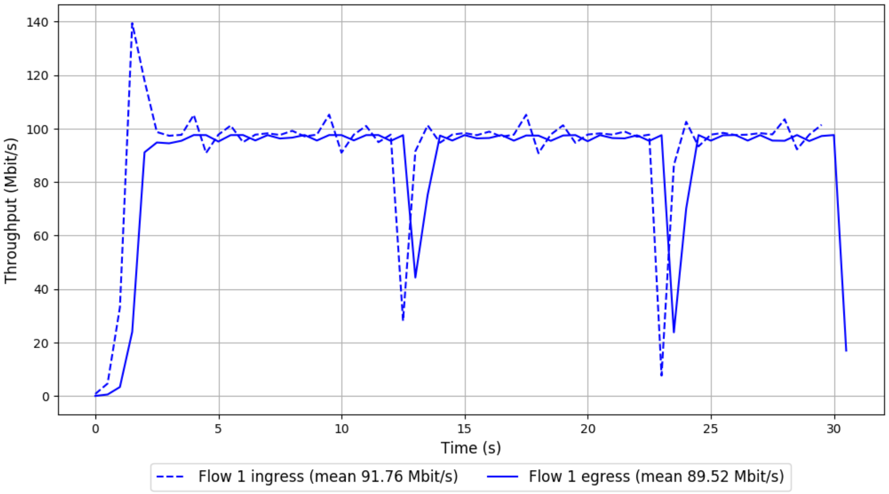
Run 3: Report of TCP BBR — Data Link

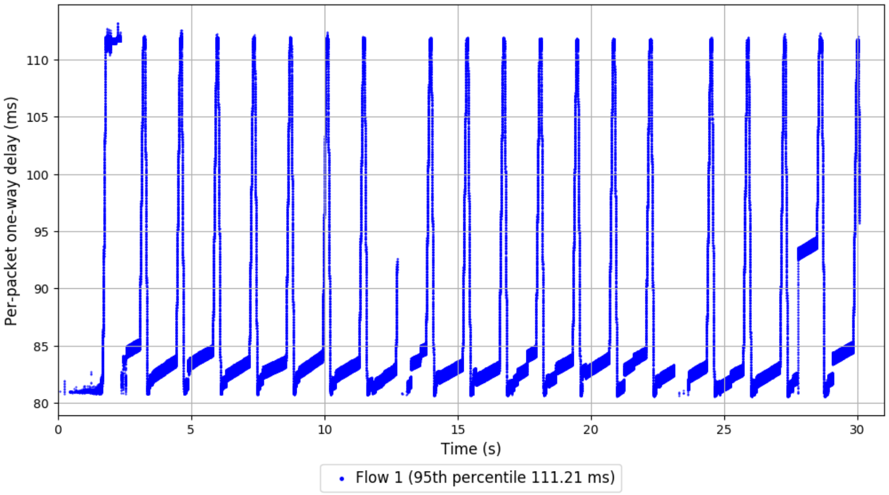




```
Run 4: Statistics of TCP BBR

Start at: 2018-12-02 01:29:50
End at: 2018-12-02 01:30:20
Local clock offset: -4.67 ms
Remote clock offset: 23.89 ms

# Below is generated by plot.py at 2018-12-02 02:12:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.52 Mbit/s
95th percentile per-packet one-way delay: 111.211 ms
Loss rate: 2.39%
-- Flow 1:
Average throughput: 89.52 Mbit/s
95th percentile per-packet one-way delay: 111.211 ms
Loss rate: 2.39%
```

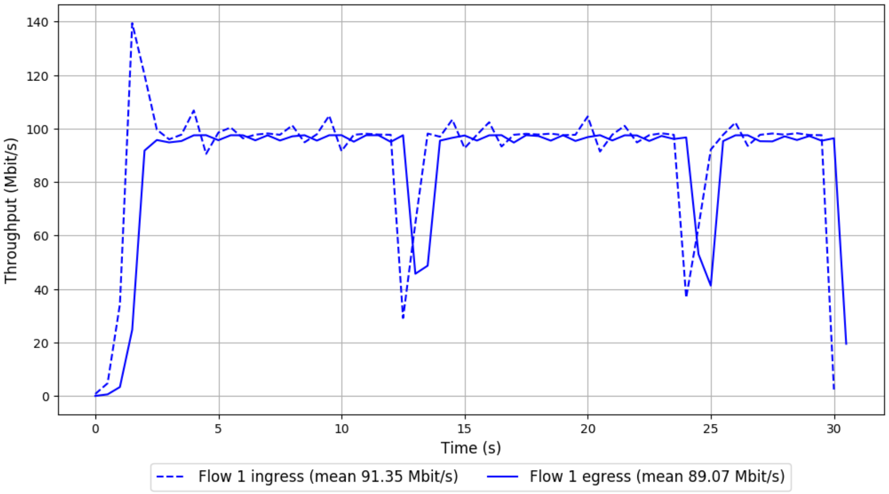
Run 4: Report of TCP BBR — Data Link

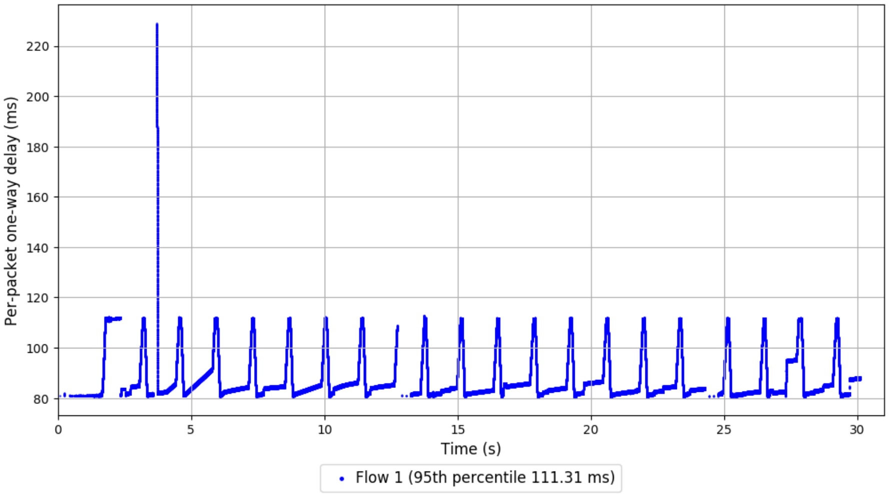




```
Run 5: Statistics of TCP BBR

Start at: 2018-12-02 01:52:01
End at: 2018-12-02 01:52:31
Local clock offset: -5.773 ms
Remote clock offset: 33.061 ms

# Below is generated by plot.py at 2018-12-02 02:12:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.07 Mbit/s
95th percentile per-packet one-way delay: 111.310 ms
Loss rate: 2.47%
-- Flow 1:
Average throughput: 89.07 Mbit/s
95th percentile per-packet one-way delay: 111.310 ms
Loss rate: 2.47%
```

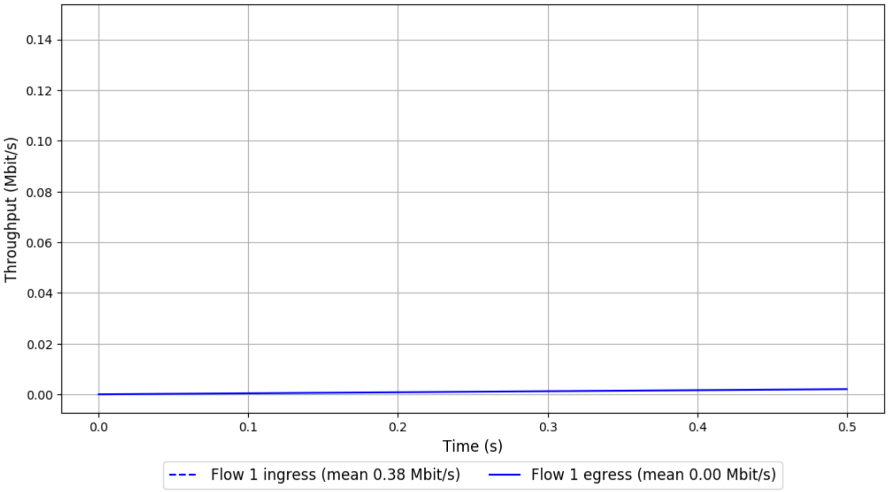
Run 5: Report of TCP BBR — Data Link

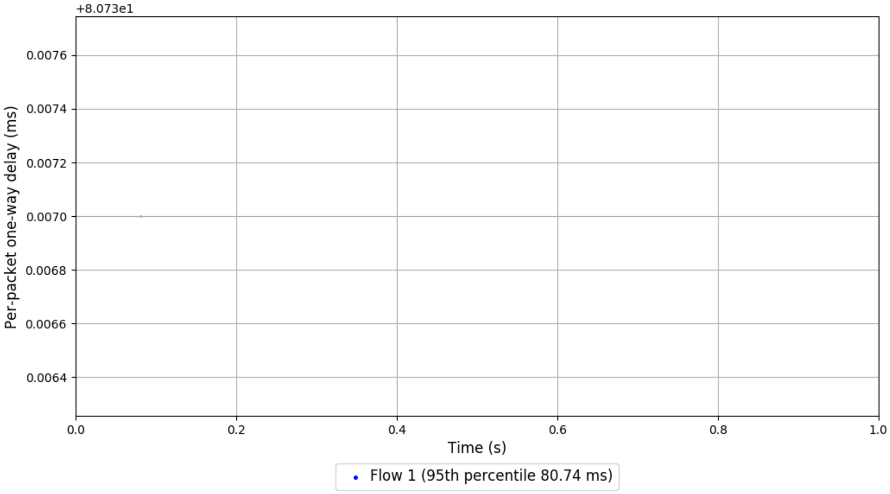




```
Run 1: Statistics of Copa

Start at: 2018-12-02 00:21:56
End at: 2018-12-02 00:22:26
Local clock offset: -3.343 ms
Remote clock offset: -15.253 ms
```

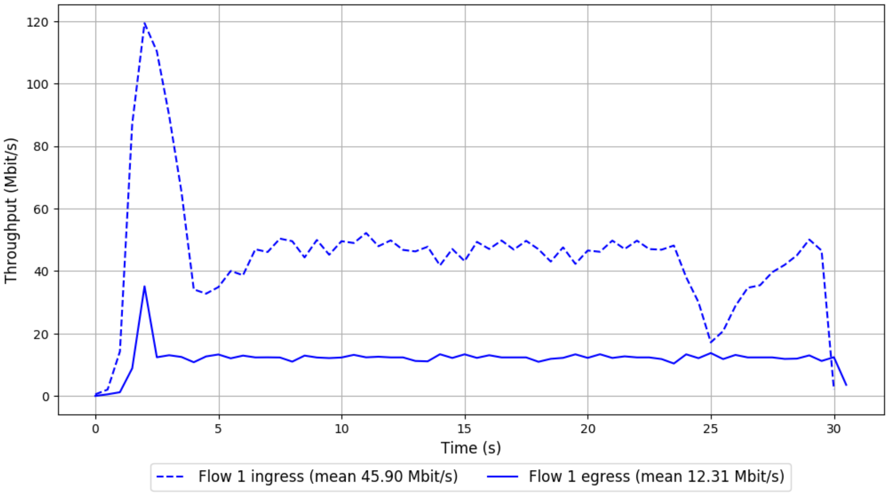
Run 1: Report of Copa — Data Link

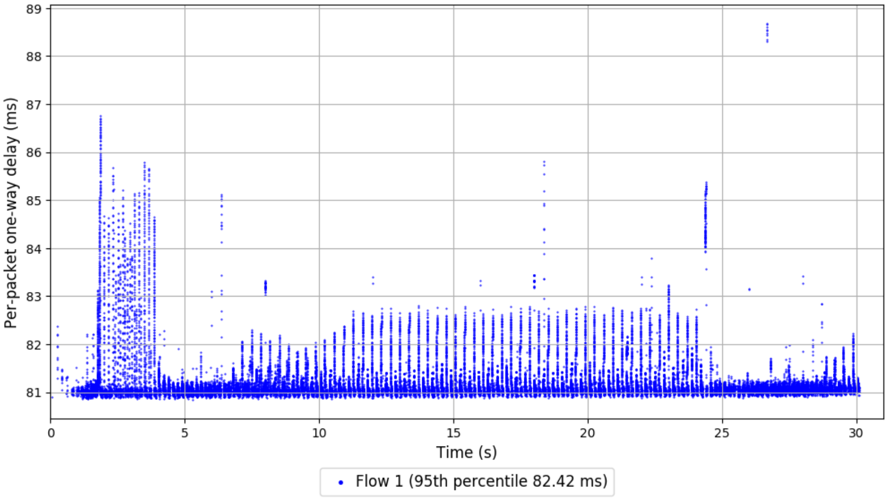




```
Run 2: Statistics of Copa

Start at: 2018-12-02 00:44:09
End at: 2018-12-02 00:44:39
Local clock offset: -5.299 ms
Remote clock offset: -14.878 ms

# Below is generated by plot.py at 2018-12-02 02:12:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.31 Mbit/s
95th percentile per-packet one-way delay: 82.416 ms
Loss rate: 73.19%
-- Flow 1:
Average throughput: 12.31 Mbit/s
95th percentile per-packet one-way delay: 82.416 ms
Loss rate: 73.19%
```

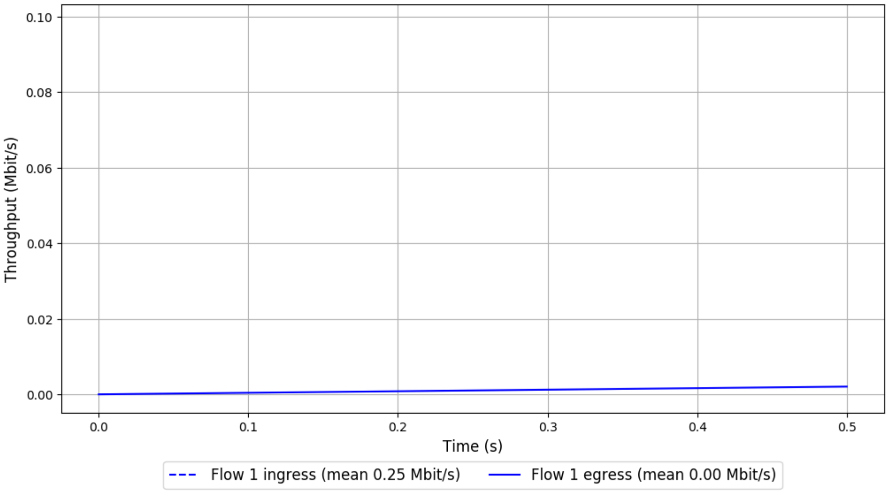
Run 2: Report of Copa — Data Link

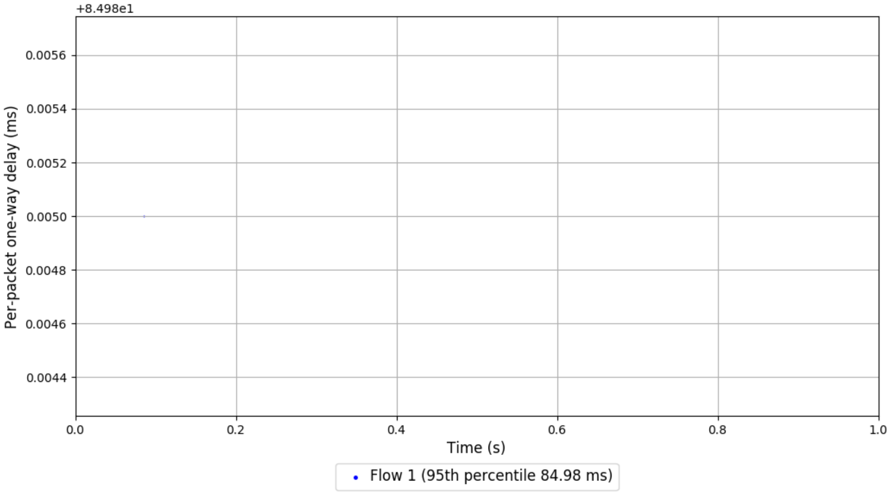




```
Run 3: Statistics of Copa

Start at: 2018-12-02 01:06:24
End at: 2018-12-02 01:06:54
Local clock offset: -1.207 ms
Remote clock offset: 12.466 ms
```

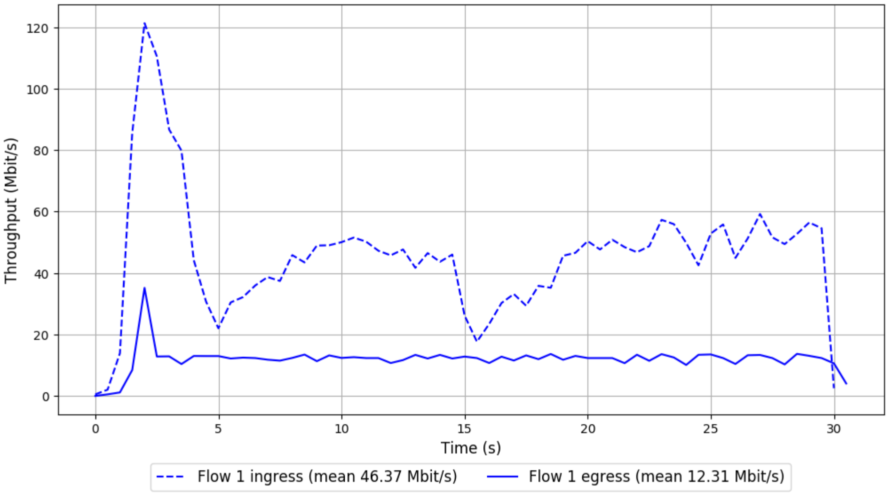
Run 3: Report of Copa — Data Link

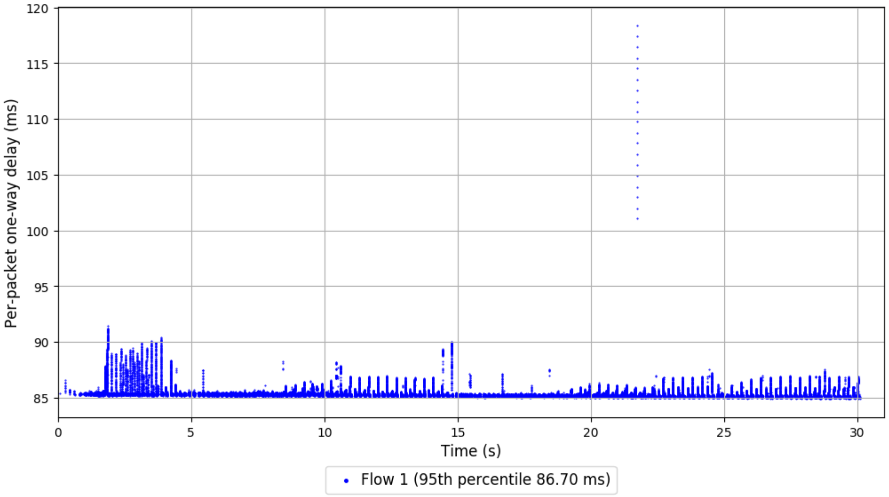




```
Run 4: Statistics of Copa

Start at: 2018-12-02 01:28:41
End at: 2018-12-02 01:29:11
Local clock offset: -3.823 ms
Remote clock offset: 29.596 ms

# Below is generated by plot.py at 2018-12-02 02:12:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.31 Mbit/s
95th percentile per-packet one-way delay: 86.705 ms
Loss rate: 73.46%
-- Flow 1:
Average throughput: 12.31 Mbit/s
95th percentile per-packet one-way delay: 86.705 ms
Loss rate: 73.46%
```

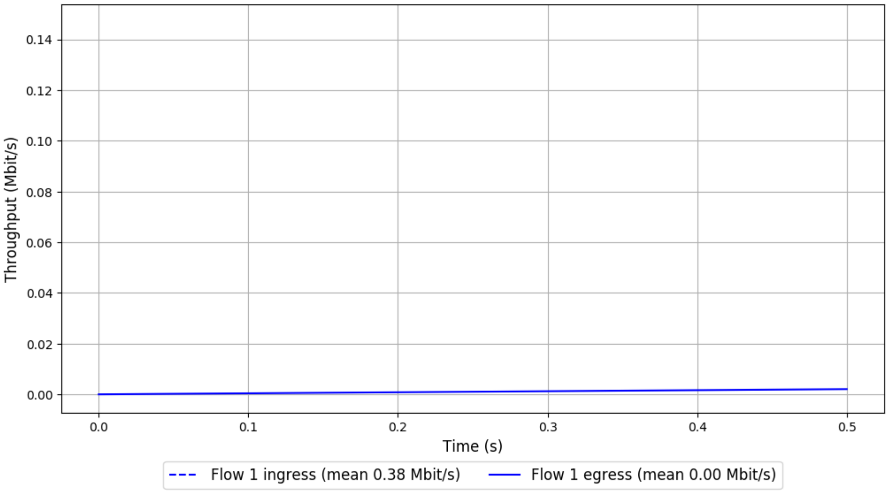
Run 4: Report of Copa — Data Link

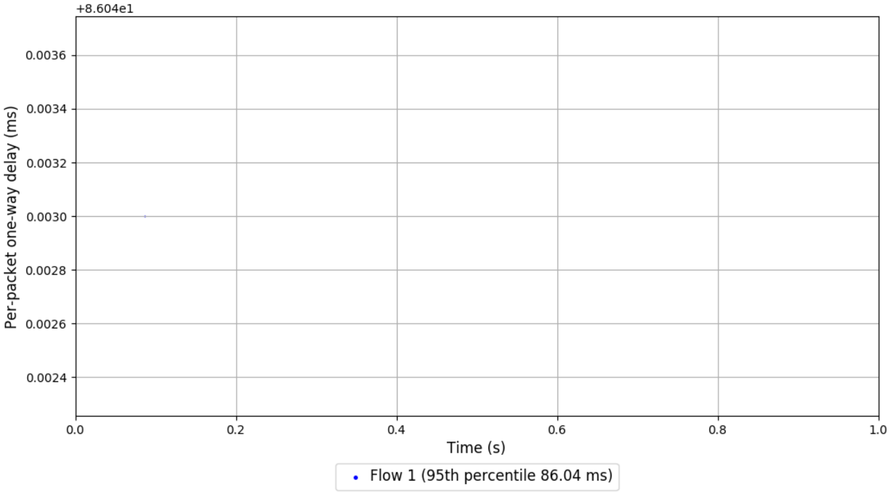




```
Run 5: Statistics of Copa

Start at: 2018-12-02 01:50:54
End at: 2018-12-02 01:51:24
Local clock offset: -5.058 ms
Remote clock offset: 36.684 ms
```

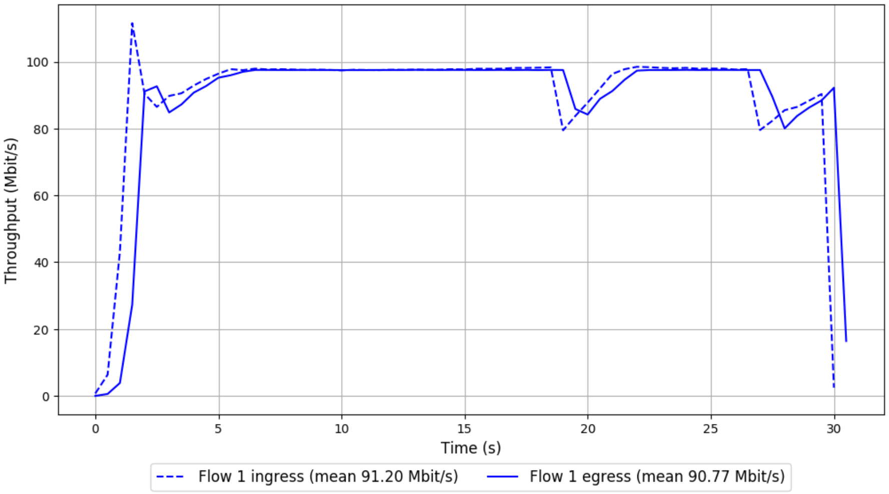
Run 5: Report of Copa — Data Link

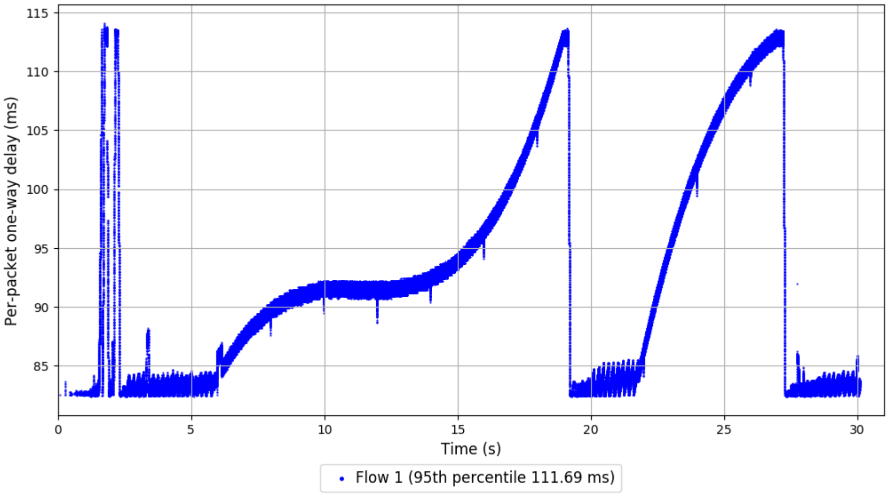




```
Run 1: Statistics of TCP Cubic

Start at: 2018-12-02 00:31:21
End at: 2018-12-02 00:31:51
Local clock offset: -5.507 ms
Remote clock offset: -15.73 ms

# Below is generated by plot.py at 2018-12-02 02:12:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.77 Mbit/s
95th percentile per-packet one-way delay: 111.694 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 90.77 Mbit/s
95th percentile per-packet one-way delay: 111.694 ms
Loss rate: 0.47%
```

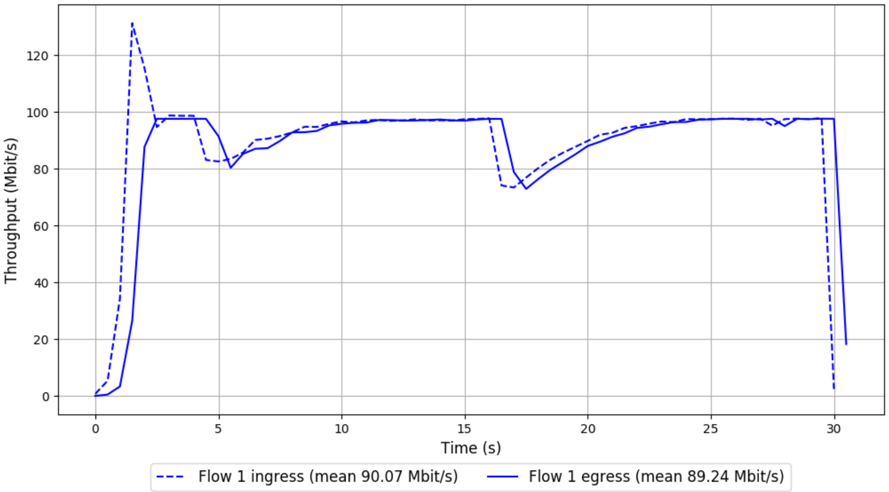
Run 1: Report of TCP Cubic — Data Link

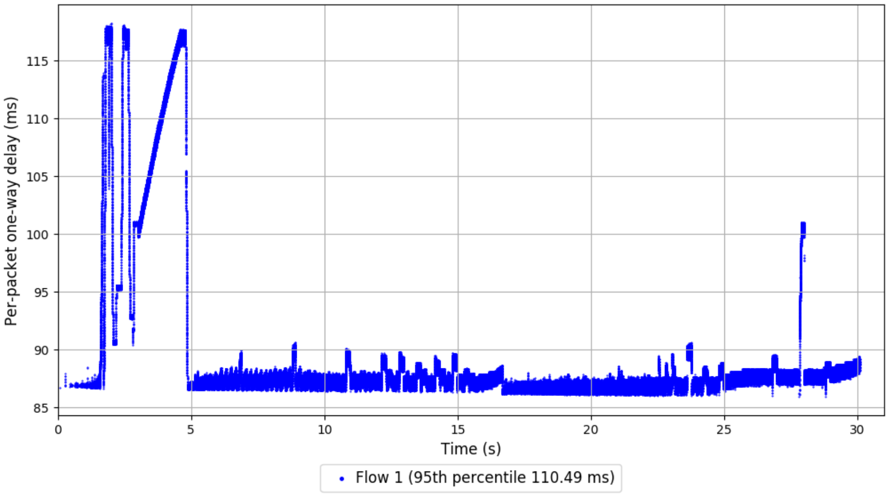




```
Run 2: Statistics of TCP Cubic

Start at: 2018-12-02 00:53:34
End at: 2018-12-02 00:54:05
Local clock offset: -3.852 ms
Remote clock offset: -3.927 ms

# Below is generated by plot.py at 2018-12-02 02:12:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.24 Mbit/s
95th percentile per-packet one-way delay: 110.486 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 89.24 Mbit/s
95th percentile per-packet one-way delay: 110.486 ms
Loss rate: 0.94%
```

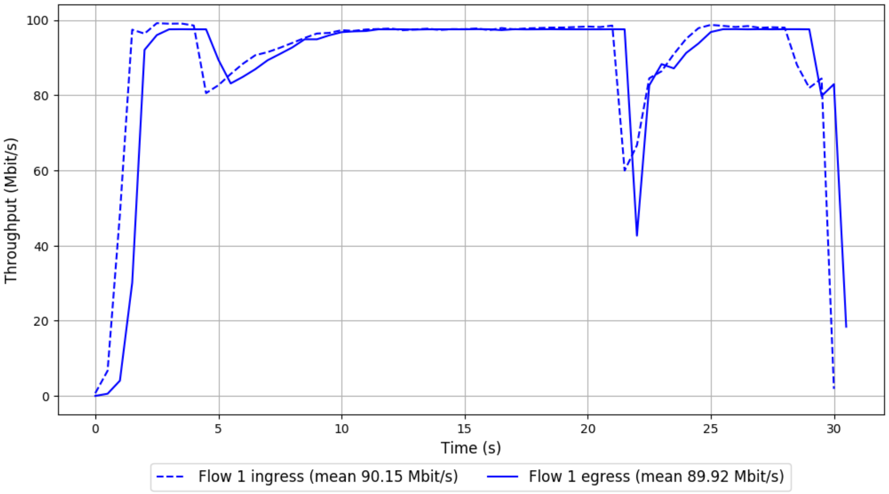
Run 2: Report of TCP Cubic — Data Link

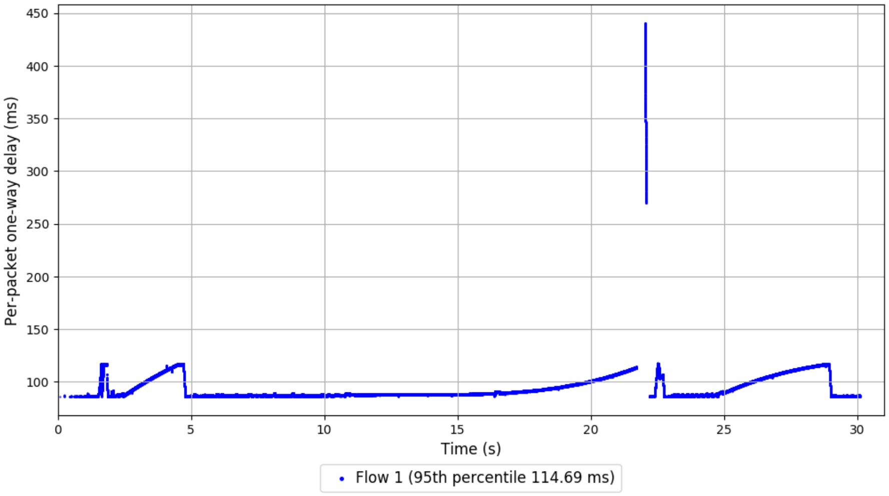




```
Run 3: Statistics of TCP Cubic

Start at: 2018-12-02 01:15:52
End at: 2018-12-02 01:16:23
Local clock offset: -0.934 ms
Remote clock offset: 24.219 ms

# Below is generated by plot.py at 2018-12-02 02:12:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.92 Mbit/s
95th percentile per-packet one-way delay: 114.688 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 89.92 Mbit/s
95th percentile per-packet one-way delay: 114.688 ms
Loss rate: 0.25%
```

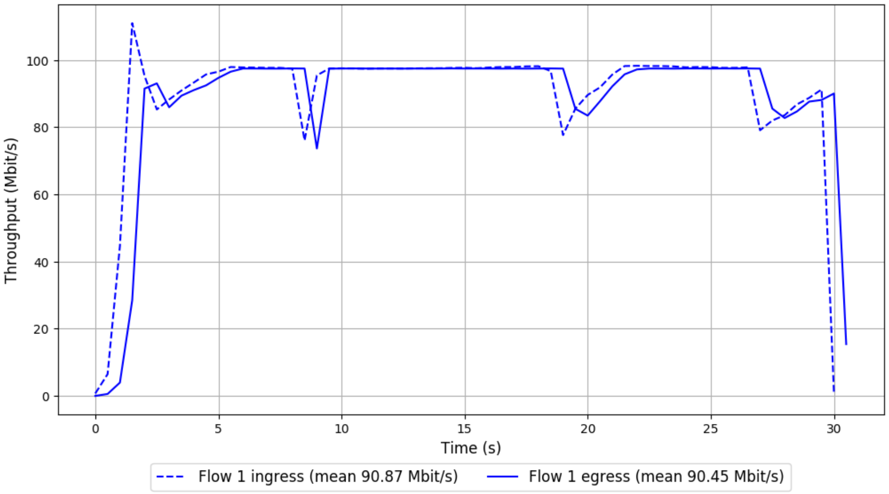
Run 3: Report of TCP Cubic — Data Link

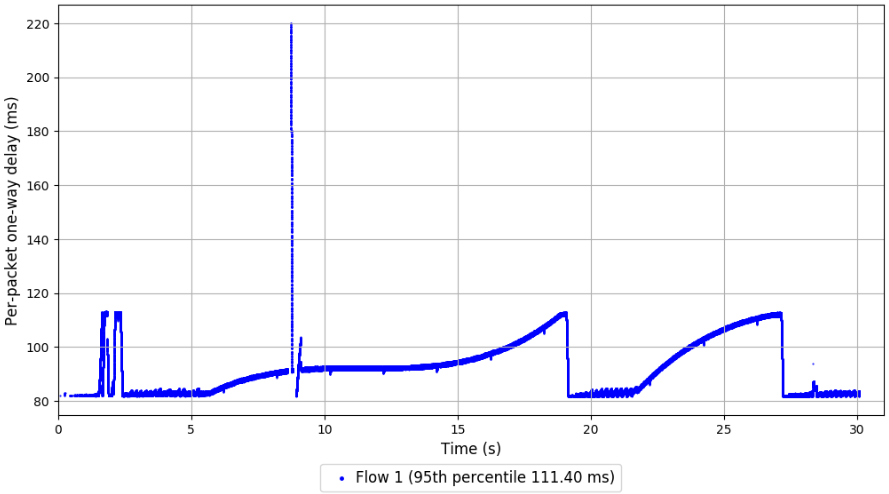




```
Run 4: Statistics of TCP Cubic

Start at: 2018-12-02 01:38:05
End at: 2018-12-02 01:38:35
Local clock offset: -4.632 ms
Remote clock offset: 28.125 ms

# Below is generated by plot.py at 2018-12-02 02:13:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.45 Mbit/s
95th percentile per-packet one-way delay: 111.400 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 90.45 Mbit/s
95th percentile per-packet one-way delay: 111.400 ms
Loss rate: 0.46%
```

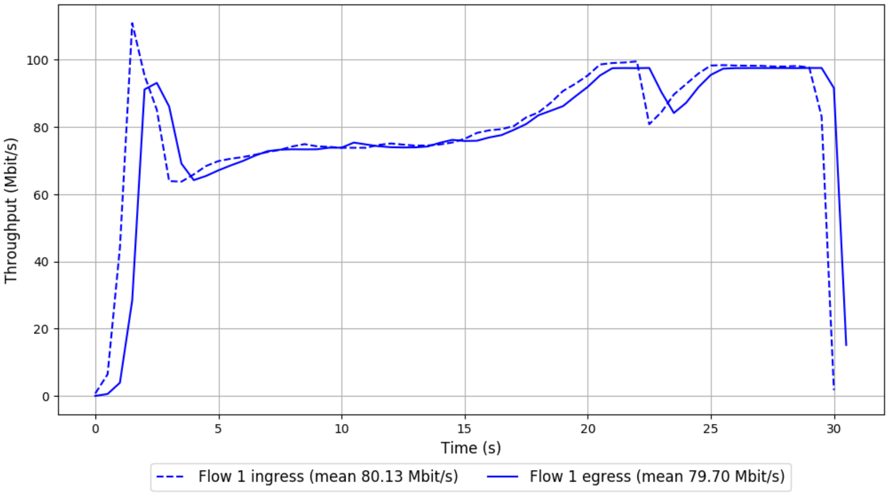
Run 4: Report of TCP Cubic — Data Link

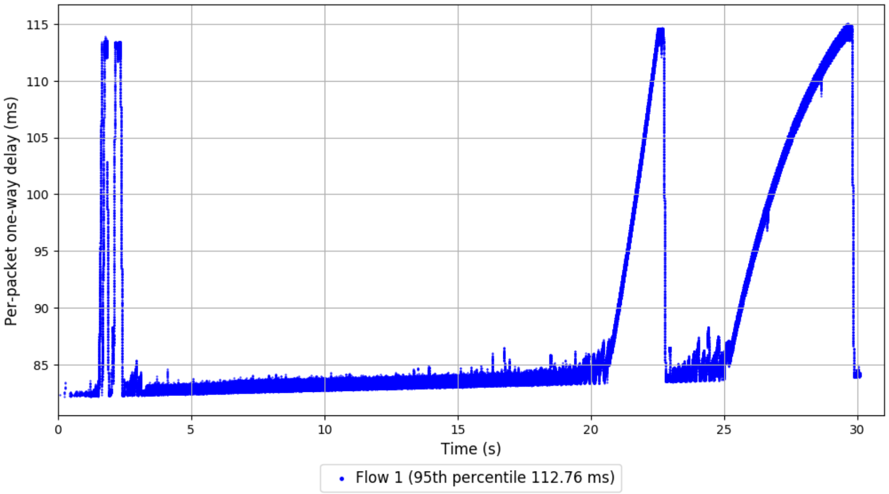




```
Run 5: Statistics of TCP Cubic

Start at: 2018-12-02 02:00:19
End at: 2018-12-02 02:00:49
Local clock offset: -5.226 ms
Remote clock offset: 32.502 ms

# Below is generated by plot.py at 2018-12-02 02:13:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 79.70 Mbit/s
95th percentile per-packet one-way delay: 112.756 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 79.70 Mbit/s
95th percentile per-packet one-way delay: 112.756 ms
Loss rate: 0.53%
```

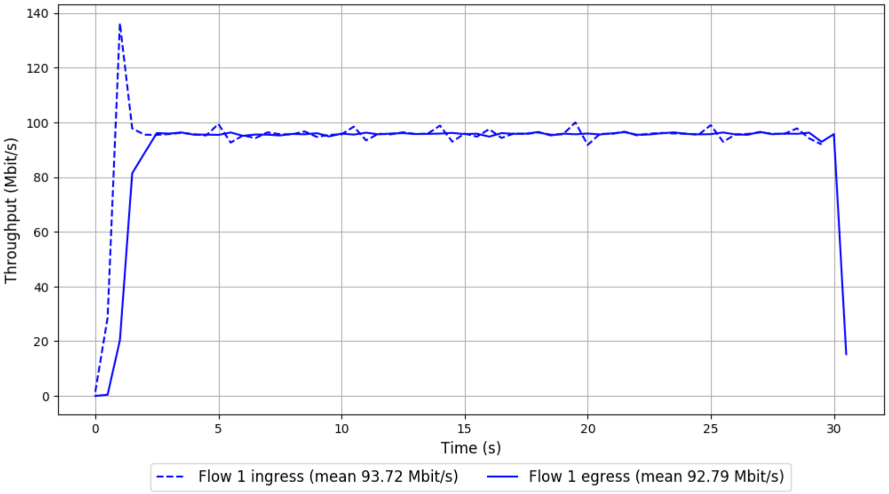
Run 5: Report of TCP Cubic — Data Link

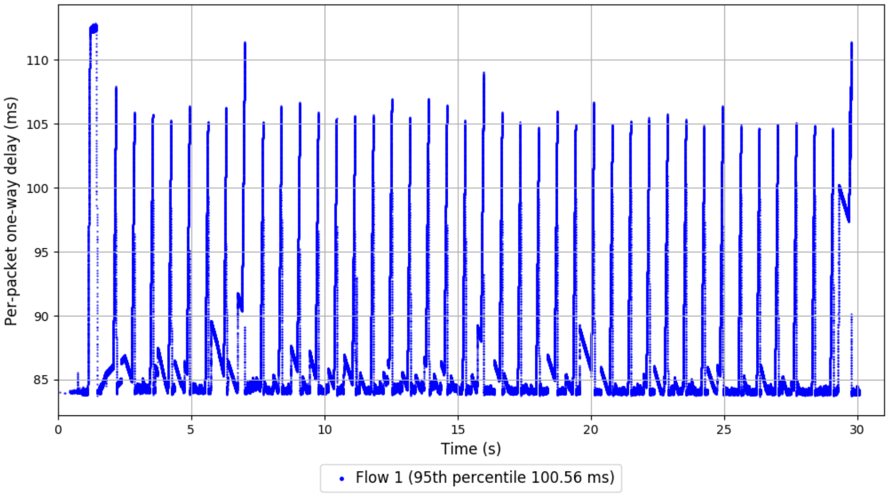




```
Run 1: Statistics of FillP

Start at: 2018-12-02 00:20:45
End at: 2018-12-02 00:21:15
Local clock offset: -3.019 ms
Remote clock offset: -10.187 ms

# Below is generated by plot.py at 2018-12-02 02:13:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.79 Mbit/s
95th percentile per-packet one-way delay: 100.562 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 92.79 Mbit/s
95th percentile per-packet one-way delay: 100.562 ms
Loss rate: 0.99%
```

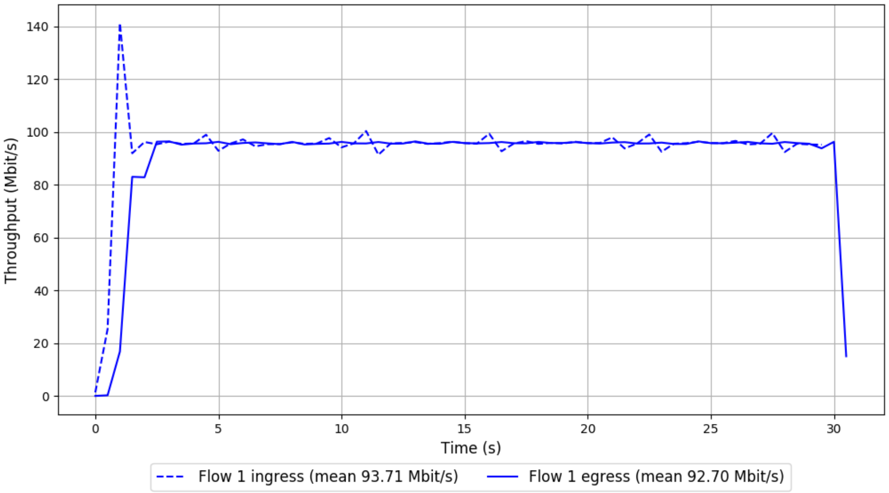
Run 1: Report of FillP — Data Link

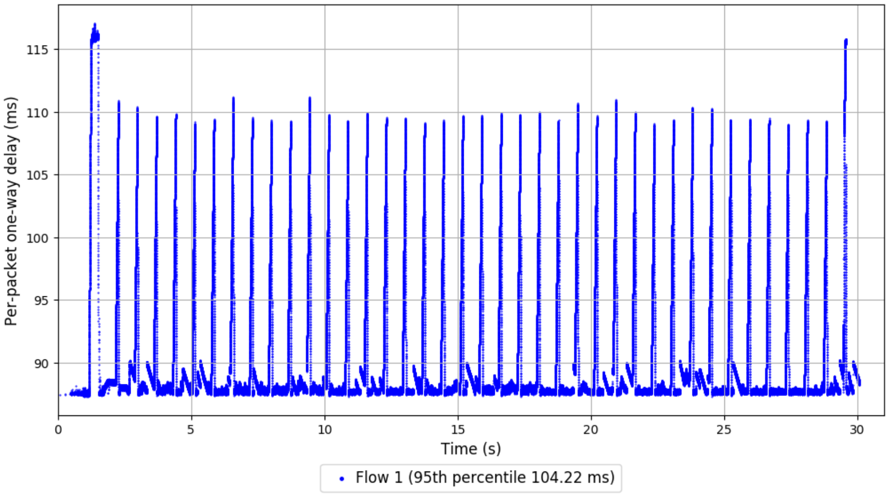




```
Run 2: Statistics of FillP

Start at: 2018-12-02 00:42:58
End at: 2018-12-02 00:43:28
Local clock offset: -4.593 ms
Remote clock offset: -15.043 ms

# Below is generated by plot.py at 2018-12-02 02:13:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.70 Mbit/s
95th percentile per-packet one-way delay: 104.218 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 92.70 Mbit/s
95th percentile per-packet one-way delay: 104.218 ms
Loss rate: 1.10%
```

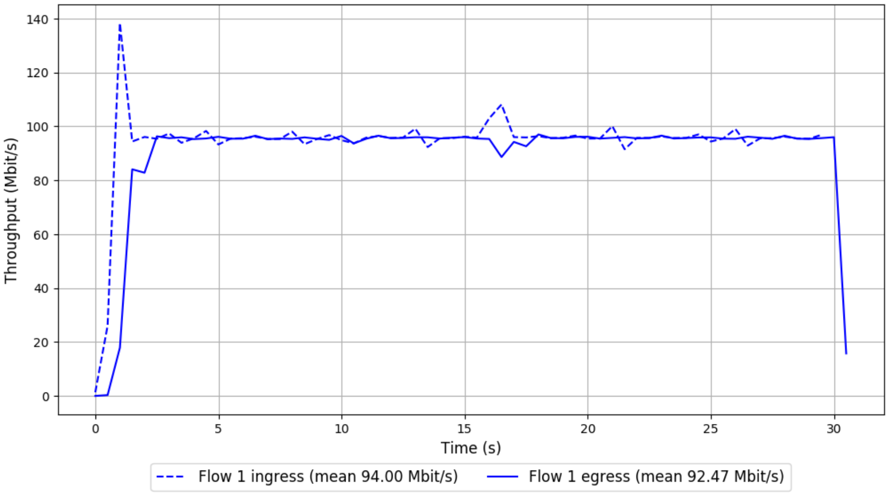
Run 2: Report of FillP — Data Link

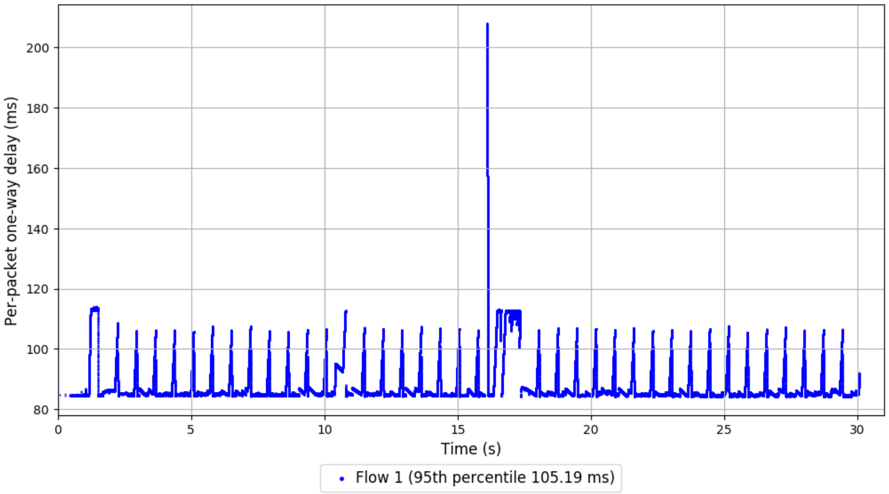




```
Run 3: Statistics of FillP

Start at: 2018-12-02 01:05:12
End at: 2018-12-02 01:05:42
Local clock offset: -1.368 ms
Remote clock offset: 11.276 ms

# Below is generated by plot.py at 2018-12-02 02:13:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.47 Mbit/s
95th percentile per-packet one-way delay: 105.185 ms
Loss rate: 1.62%
-- Flow 1:
Average throughput: 92.47 Mbit/s
95th percentile per-packet one-way delay: 105.185 ms
Loss rate: 1.62%
```

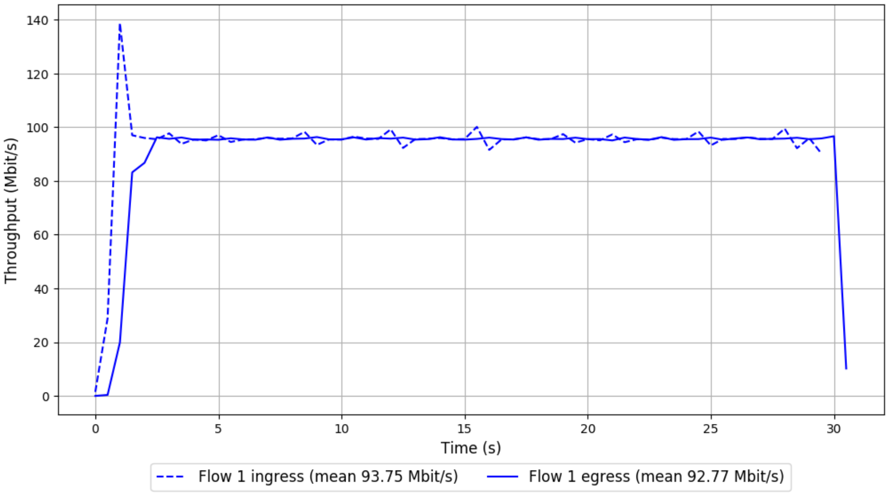
Run 3: Report of FillP — Data Link

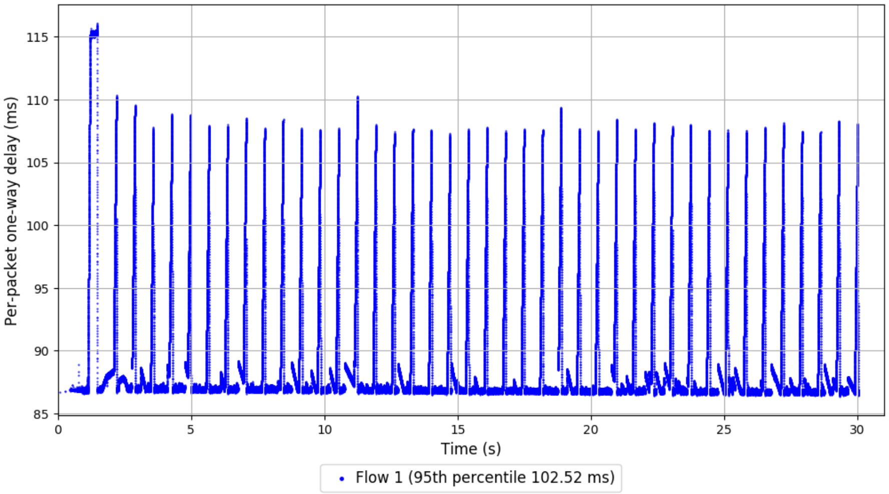




```
Run 4: Statistics of FillP

Start at: 2018-12-02 01:27:29
End at: 2018-12-02 01:27:59
Local clock offset: -4.306 ms
Remote clock offset: 28.274 ms

# Below is generated by plot.py at 2018-12-02 02:13:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.77 Mbit/s
95th percentile per-packet one-way delay: 102.521 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 92.77 Mbit/s
95th percentile per-packet one-way delay: 102.521 ms
Loss rate: 1.05%
```

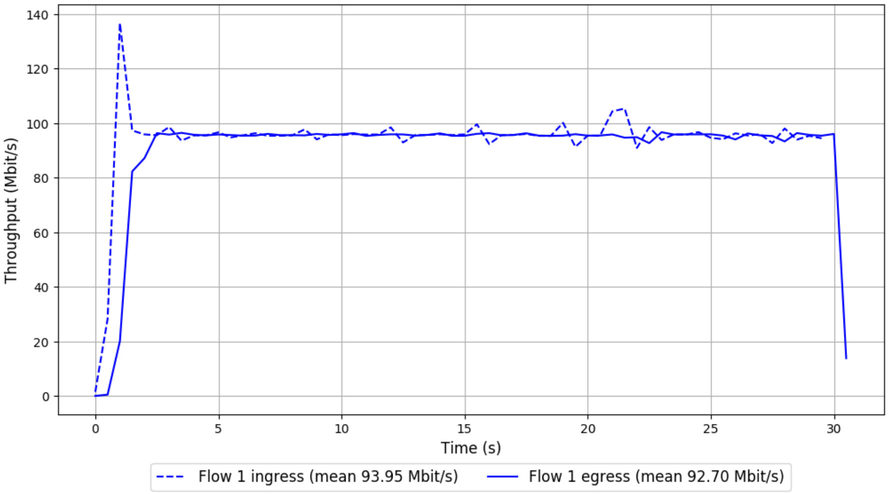
Run 4: Report of FillP — Data Link

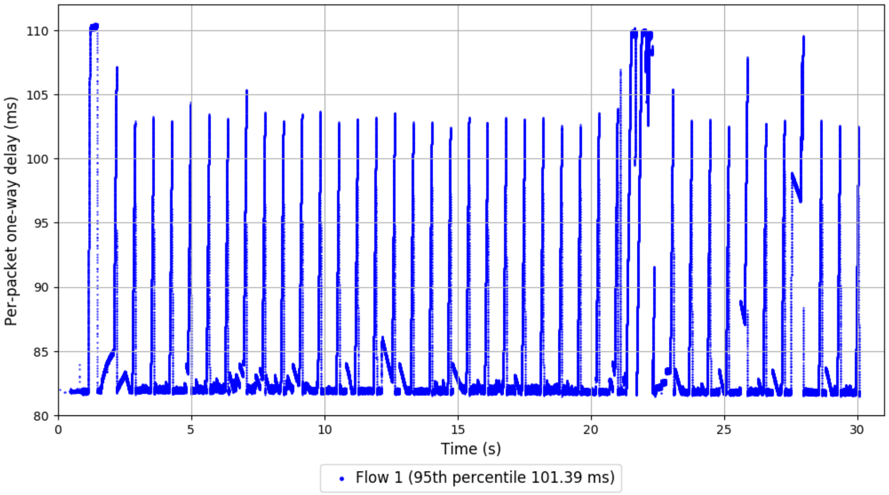




```
Run 5: Statistics of FillP

Start at: 2018-12-02 01:49:42
End at: 2018-12-02 01:50:12
Local clock offset: -4.934 ms
Remote clock offset: 32.283 ms

# Below is generated by plot.py at 2018-12-02 02:14:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 92.70 Mbit/s
95th percentile per-packet one-way delay: 101.389 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 92.70 Mbit/s
95th percentile per-packet one-way delay: 101.389 ms
Loss rate: 1.33%
```

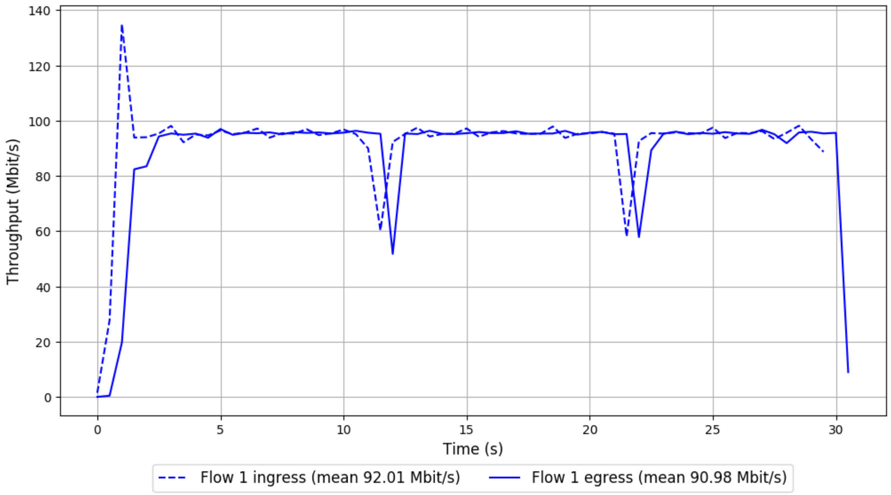
Run 5: Report of FillP — Data Link

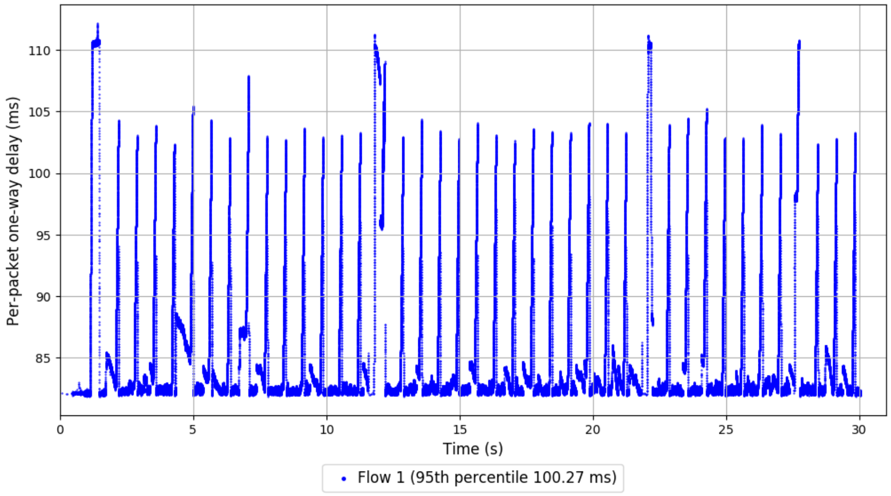




```
Run 1: Statistics of FillP-Sheep

Start at: 2018-12-02 00:26:40
End at: 2018-12-02 00:27:10
Local clock offset: -4.36 ms
Remote clock offset: -14.543 ms

# Below is generated by plot.py at 2018-12-02 02:14:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.98 Mbit/s
95th percentile per-packet one-way delay: 100.273 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 90.98 Mbit/s
95th percentile per-packet one-way delay: 100.273 ms
Loss rate: 1.12%
```

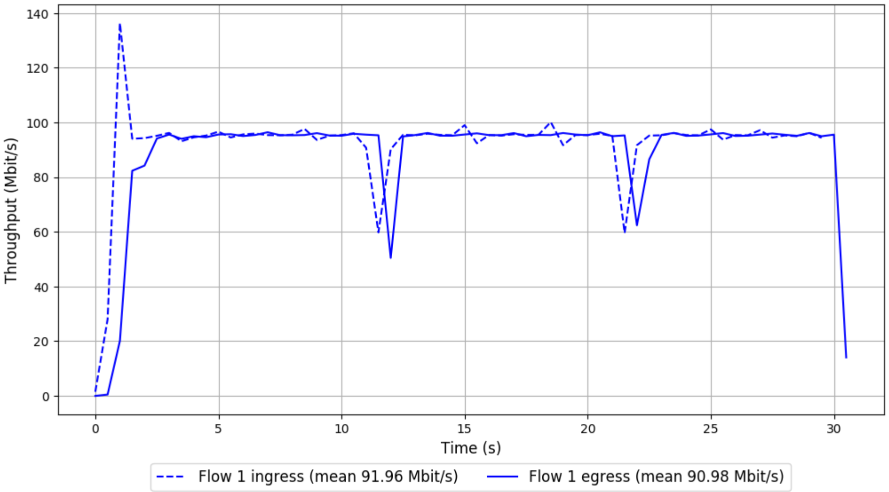
Run 1: Report of FillP-Sheep — Data Link

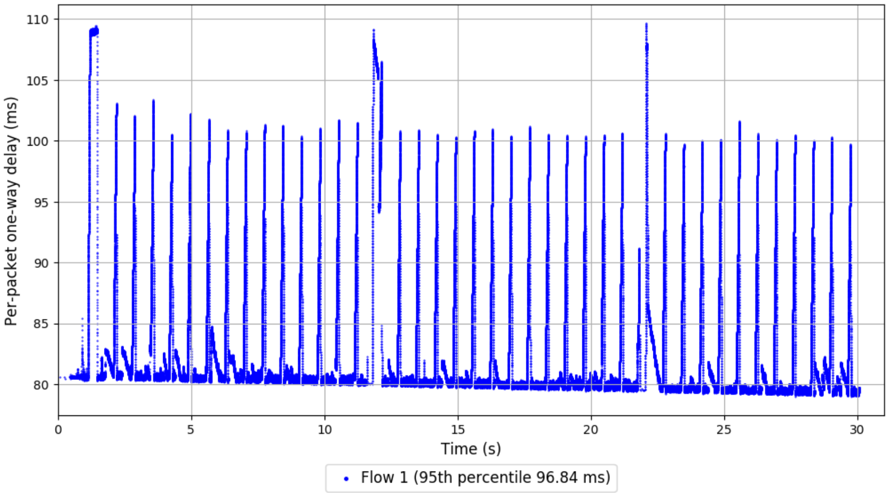




```
Run 2: Statistics of FillP-Sheep

Start at: 2018-12-02 00:48:55
End at: 2018-12-02 00:49:25
Local clock offset: -4.091 ms
Remote clock offset: -15.485 ms

# Below is generated by plot.py at 2018-12-02 02:14:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.98 Mbit/s
95th percentile per-packet one-way delay: 96.845 ms
Loss rate: 1.08%
-- Flow 1:
Average throughput: 90.98 Mbit/s
95th percentile per-packet one-way delay: 96.845 ms
Loss rate: 1.08%
```

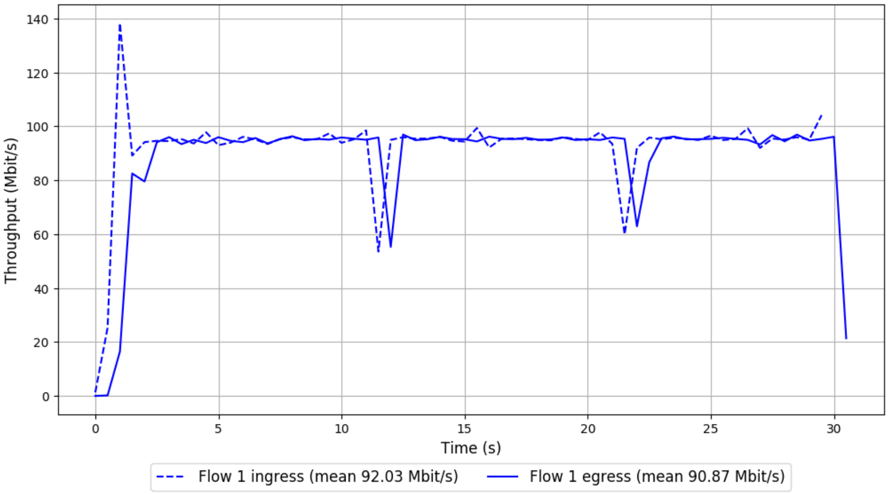
Run 2: Report of FillP-Sheep — Data Link

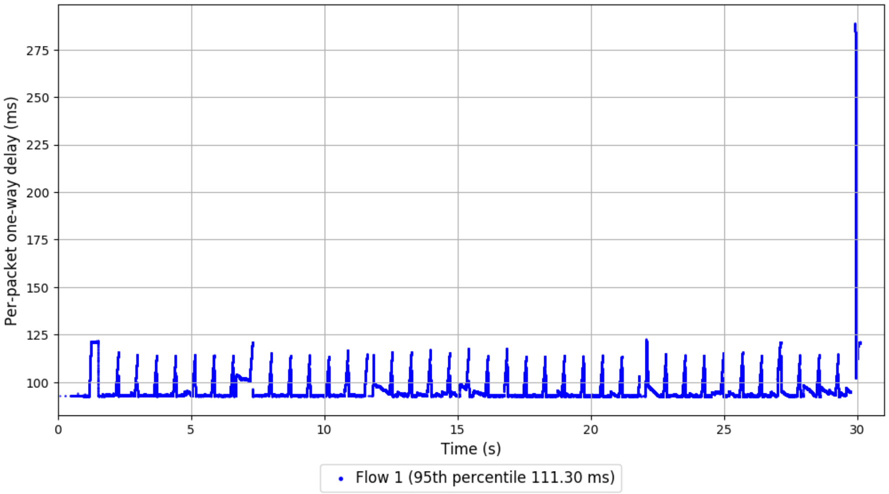




```
Run 3: Statistics of FillP-Sheep

Start at: 2018-12-02 01:11:11
End at: 2018-12-02 01:11:41
Local clock offset: -0.744 ms
Remote clock offset: 21.525 ms

# Below is generated by plot.py at 2018-12-02 02:14:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.87 Mbit/s
95th percentile per-packet one-way delay: 111.296 ms
Loss rate: 1.19%
-- Flow 1:
Average throughput: 90.87 Mbit/s
95th percentile per-packet one-way delay: 111.296 ms
Loss rate: 1.19%
```

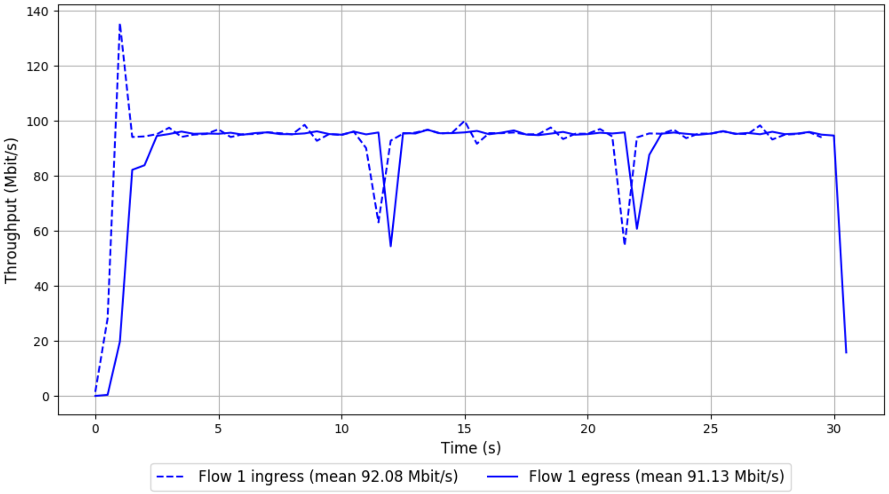
Run 3: Report of FillP-Sheep — Data Link

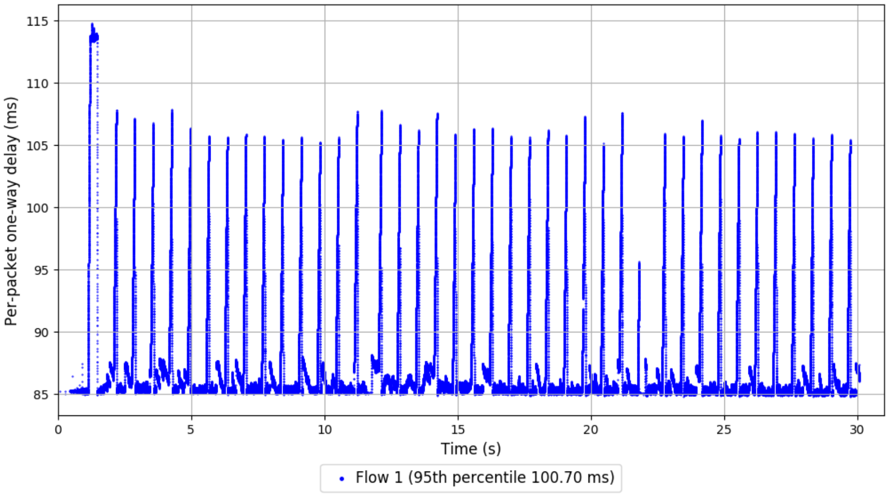




```
Run 4: Statistics of FillP-Sheep

Start at: 2018-12-02 01:33:25
End at: 2018-12-02 01:33:55
Local clock offset: -5.164 ms
Remote clock offset: 28.909 ms

# Below is generated by plot.py at 2018-12-02 02:15:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.13 Mbit/s
95th percentile per-packet one-way delay: 100.697 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 91.13 Mbit/s
95th percentile per-packet one-way delay: 100.697 ms
Loss rate: 1.02%
```

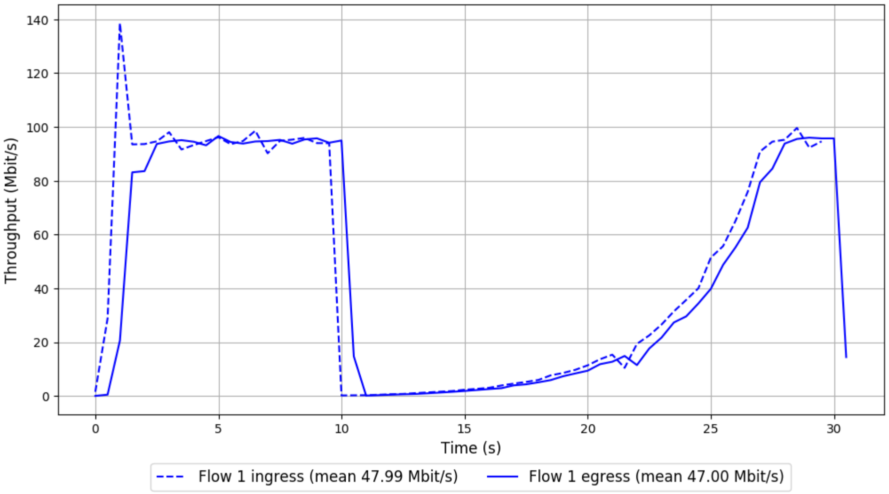
Run 4: Report of FillP-Sheep — Data Link

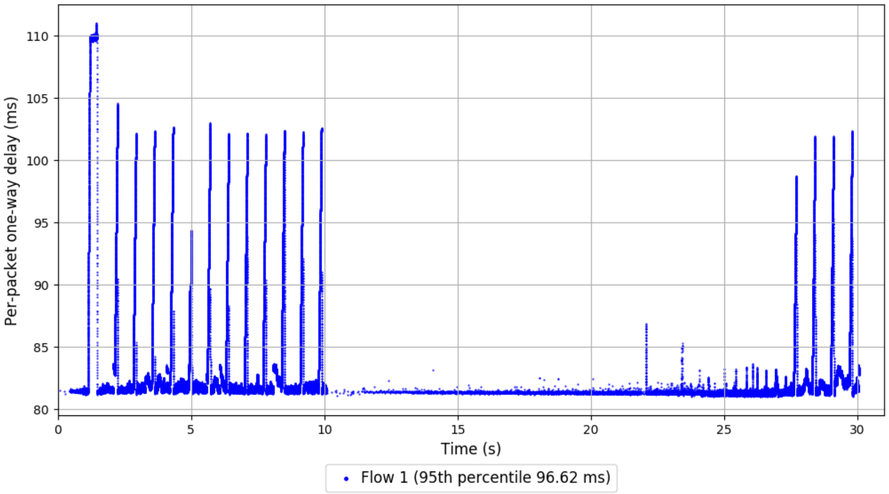




```
Run 5: Statistics of FillP-Sheep

Start at: 2018-12-02 01:55:37
End at: 2018-12-02 01:56:07
Local clock offset: -5.863 ms
Remote clock offset: 33.274 ms

# Below is generated by plot.py at 2018-12-02 02:15:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 47.00 Mbit/s
95th percentile per-packet one-way delay: 96.618 ms
Loss rate: 2.07%
-- Flow 1:
Average throughput: 47.00 Mbit/s
95th percentile per-packet one-way delay: 96.618 ms
Loss rate: 2.07%
```

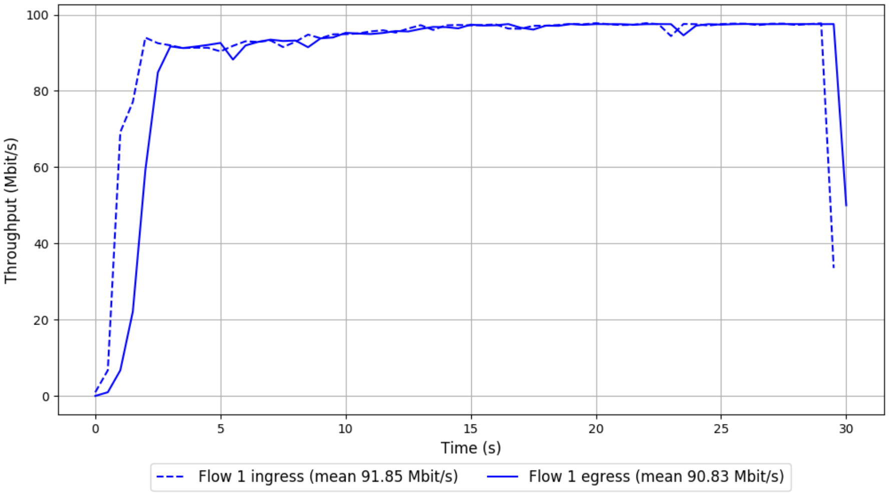
Run 5: Report of FillP-Sheep — Data Link

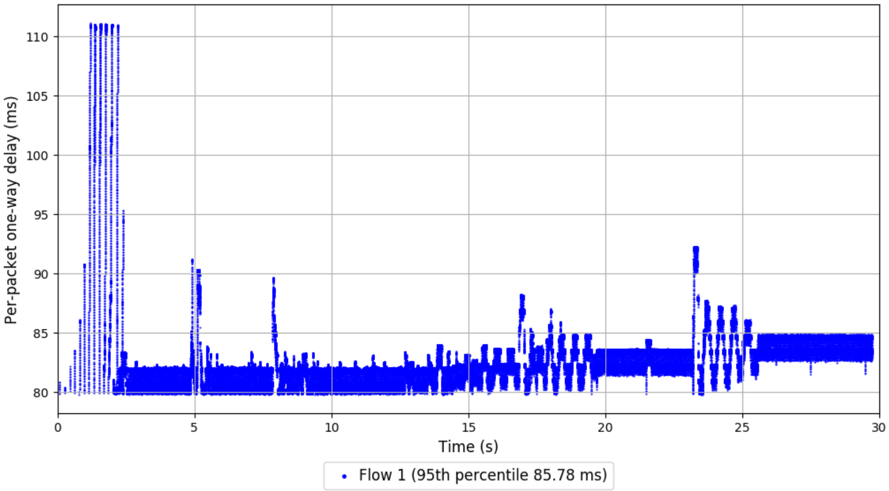




```
Run 1: Statistics of Indigo

Start at: 2018-12-02 00:24:15
End at: 2018-12-02 00:24:45
Local clock offset: -4.757 ms
Remote clock offset: -15.283 ms

# Below is generated by plot.py at 2018-12-02 02:15:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.83 Mbit/s
95th percentile per-packet one-way delay: 85.776 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 90.83 Mbit/s
95th percentile per-packet one-way delay: 85.776 ms
Loss rate: 1.10%
```

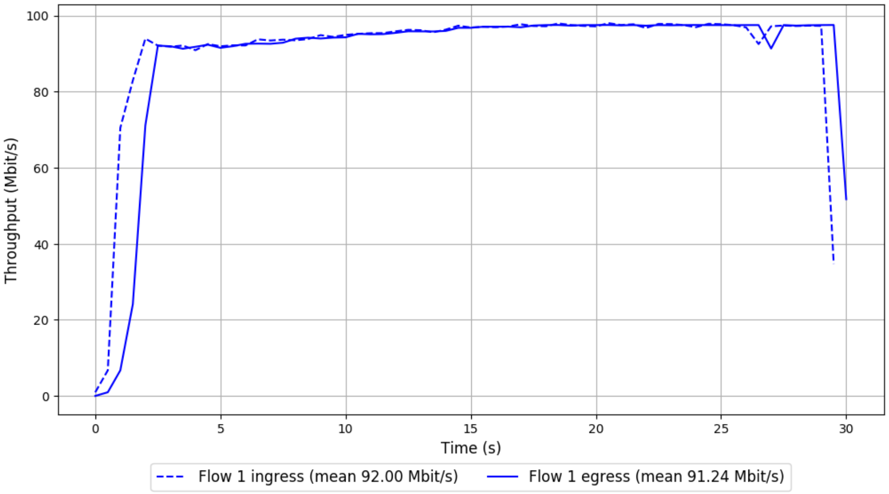
Run 1: Report of Indigo — Data Link

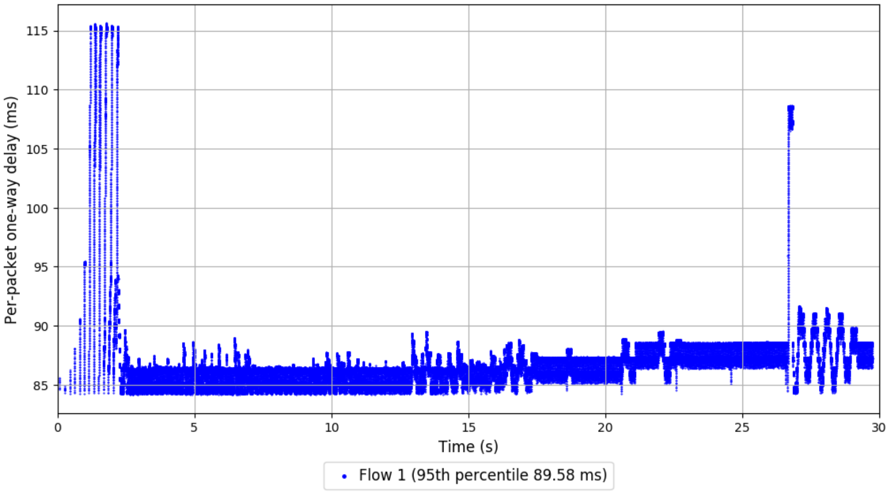




```
Run 2: Statistics of Indigo

Start at: 2018-12-02 00:46:30
End at: 2018-12-02 00:47:00
Local clock offset: -4.416 ms
Remote clock offset: -10.876 ms

# Below is generated by plot.py at 2018-12-02 02:15:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.24 Mbit/s
95th percentile per-packet one-way delay: 89.576 ms
Loss rate: 0.82%
-- Flow 1:
Average throughput: 91.24 Mbit/s
95th percentile per-packet one-way delay: 89.576 ms
Loss rate: 0.82%
```

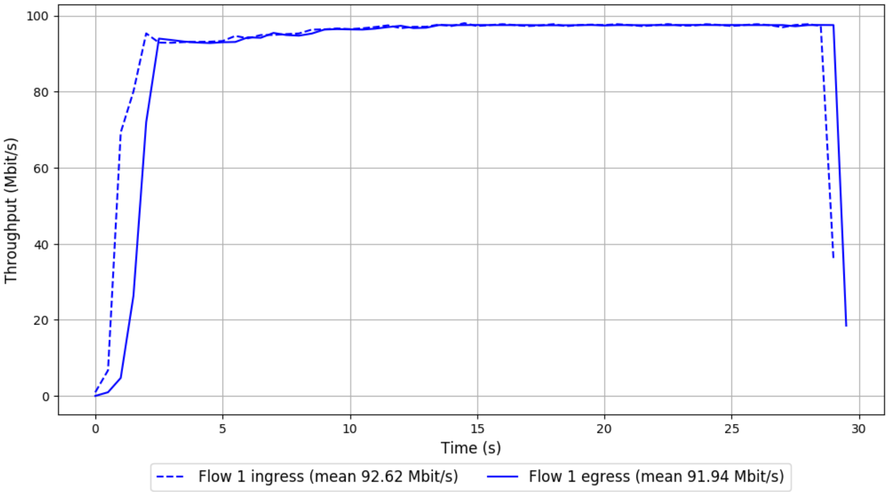
Run 2: Report of Indigo — Data Link

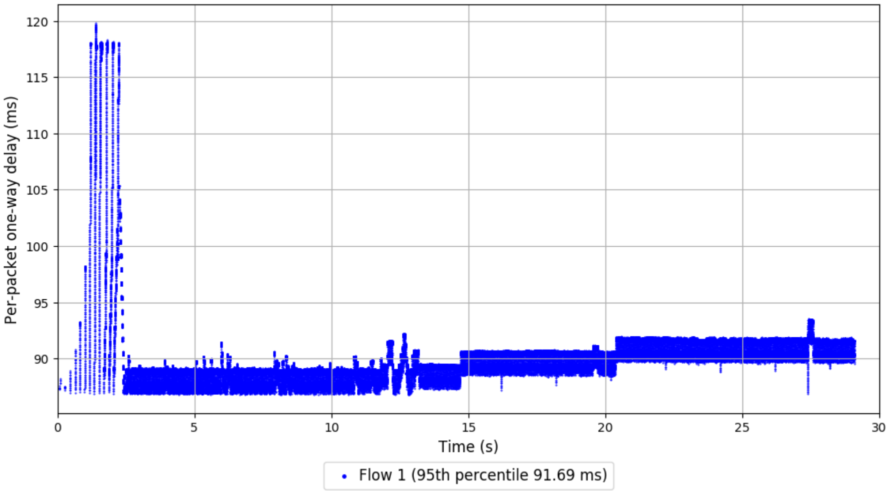




```
Run 3: Statistics of Indigo

Start at: 2018-12-02 01:08:43
End at: 2018-12-02 01:09:13
Local clock offset: -0.944 ms
Remote clock offset: 19.092 ms

# Below is generated by plot.py at 2018-12-02 02:15:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 91.94 Mbit/s
95th percentile per-packet one-way delay: 91.690 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 91.94 Mbit/s
95th percentile per-packet one-way delay: 91.690 ms
Loss rate: 1.34%
```

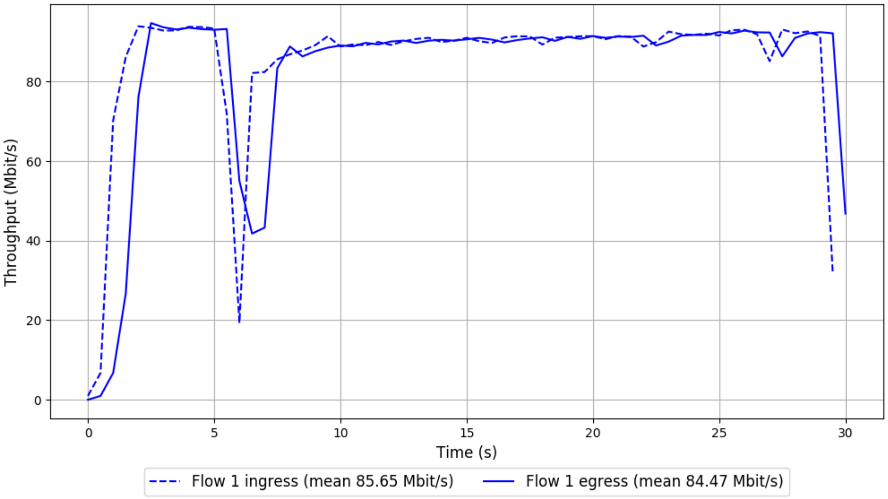
Run 3: Report of Indigo — Data Link

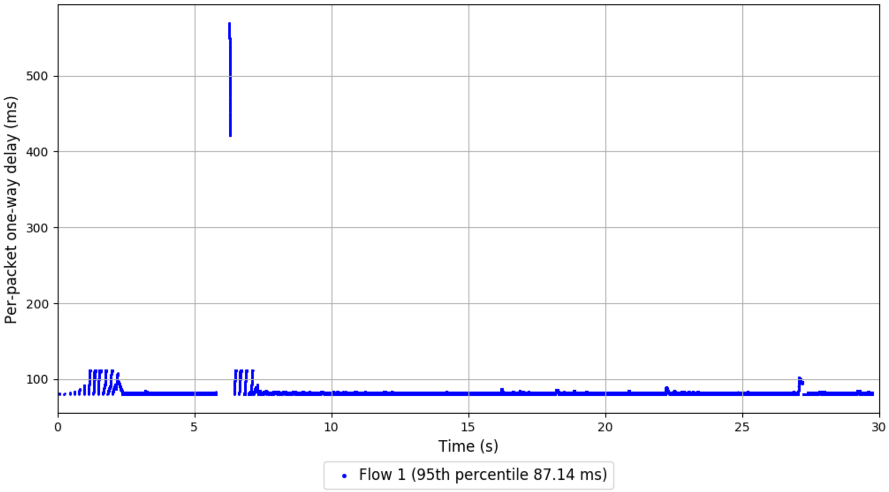




```
Run 4: Statistics of Indigo

Start at: 2018-12-02 01:31:02
End at: 2018-12-02 01:31:32
Local clock offset: -4.076 ms
Remote clock offset: 25.216 ms

# Below is generated by plot.py at 2018-12-02 02:15:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 84.47 Mbit/s
95th percentile per-packet one-way delay: 87.140 ms
Loss rate: 1.38%
-- Flow 1:
Average throughput: 84.47 Mbit/s
95th percentile per-packet one-way delay: 87.140 ms
Loss rate: 1.38%
```

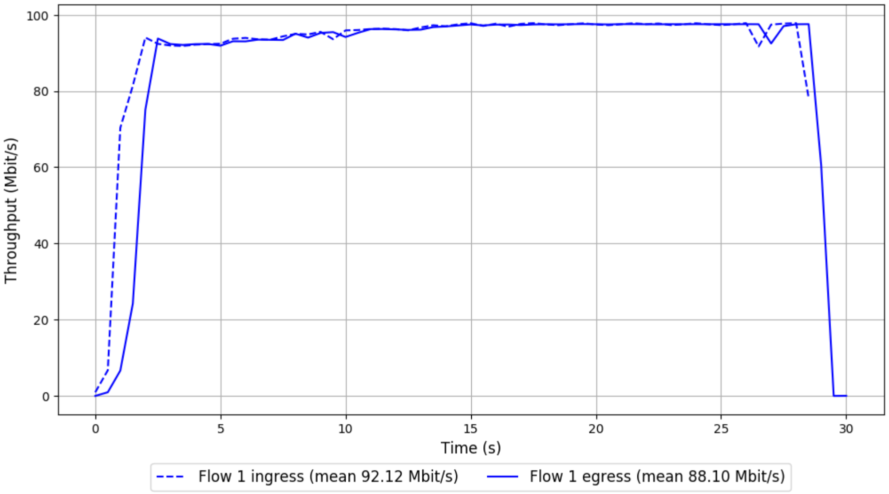
Run 4: Report of Indigo — Data Link

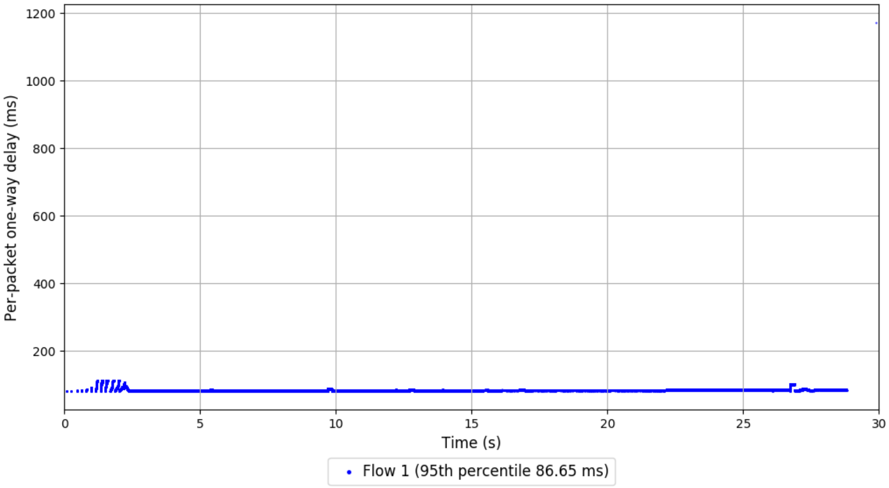




```
Run 5: Statistics of Indigo

Start at: 2018-12-02 01:53:13
End at: 2018-12-02 01:53:43
Local clock offset: -5.049 ms
Remote clock offset: 33.568 ms

# Below is generated by plot.py at 2018-12-02 02:15:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 88.10 Mbit/s
95th percentile per-packet one-way delay: 86.652 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 88.10 Mbit/s
95th percentile per-packet one-way delay: 86.652 ms
Loss rate: 1.34%
```

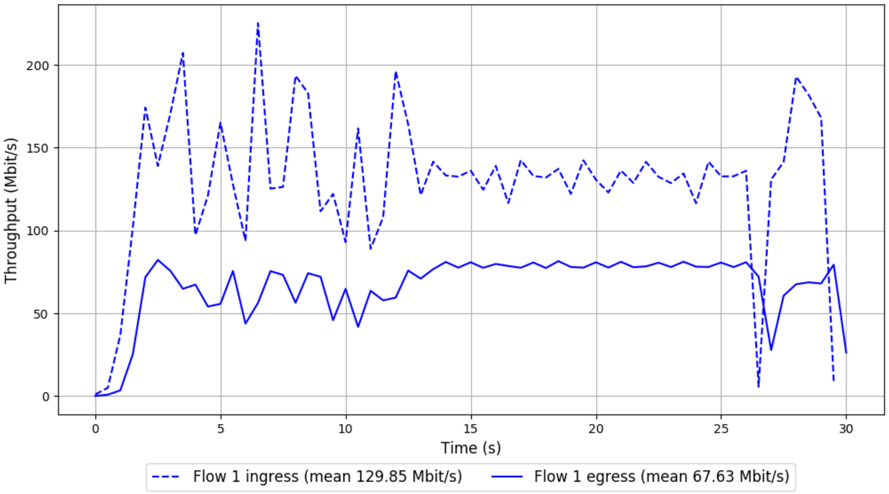
Run 5: Report of Indigo — Data Link

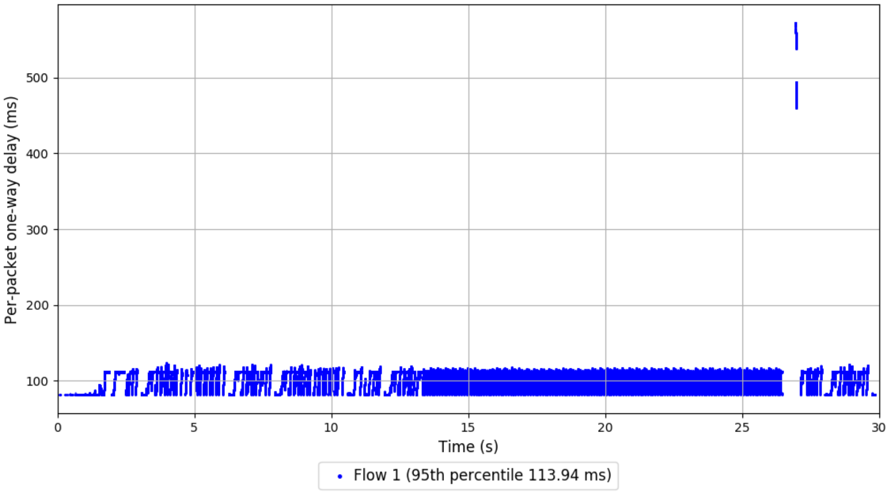




```
Run 1: Statistics of Indigo-96d2da3

Start at: 2018-12-02 00:25:28
End at: 2018-12-02 00:25:58
Local clock offset: -4.919 ms
Remote clock offset: -15.323 ms

# Below is generated by plot.py at 2018-12-02 02:15:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 67.63 Mbit/s
95th percentile per-packet one-way delay: 113.944 ms
Loss rate: 47.92%
-- Flow 1:
Average throughput: 67.63 Mbit/s
95th percentile per-packet one-way delay: 113.944 ms
Loss rate: 47.92%
```

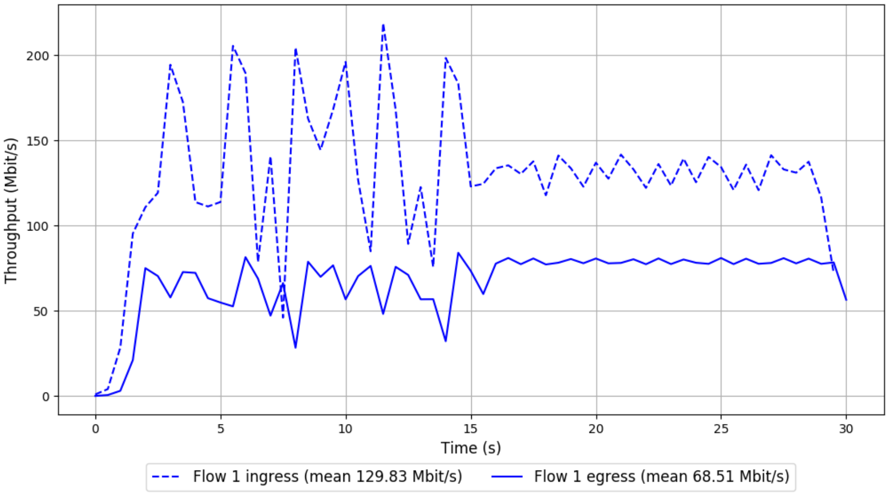
Run 1: Report of Indigo-96d2da3 — Data Link

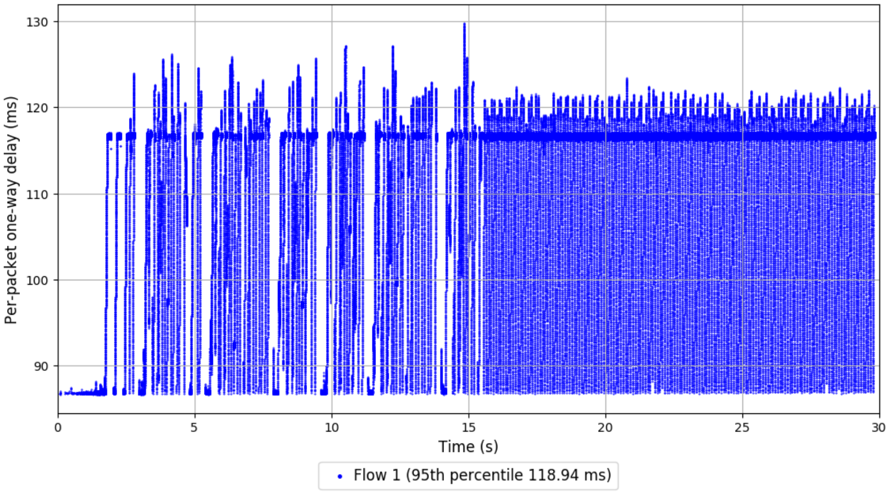




```
Run 2: Statistics of Indigo-96d2da3

Start at: 2018-12-02 00:47:43
End at: 2018-12-02 00:48:13
Local clock offset: -5.093 ms
Remote clock offset: -10.962 ms

# Below is generated by plot.py at 2018-12-02 02:16:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 68.51 Mbit/s
95th percentile per-packet one-way delay: 118.937 ms
Loss rate: 47.27%
-- Flow 1:
Average throughput: 68.51 Mbit/s
95th percentile per-packet one-way delay: 118.937 ms
Loss rate: 47.27%
```

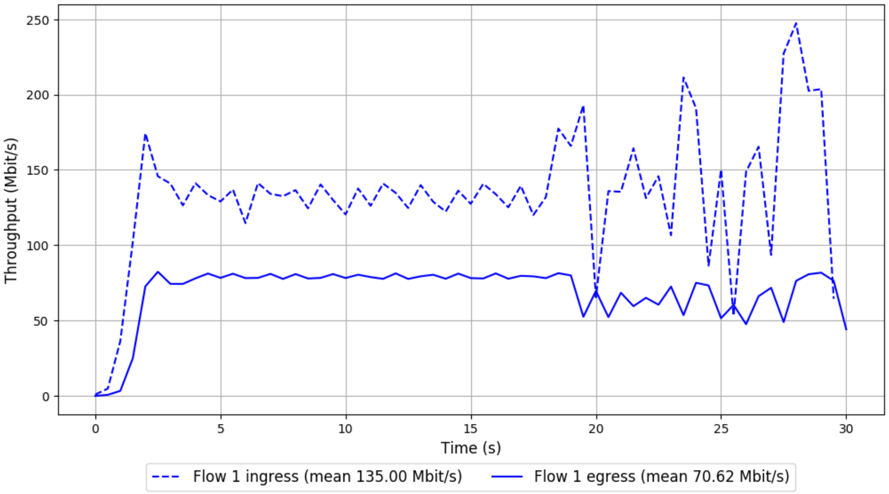
Run 2: Report of Indigo-96d2da3 — Data Link

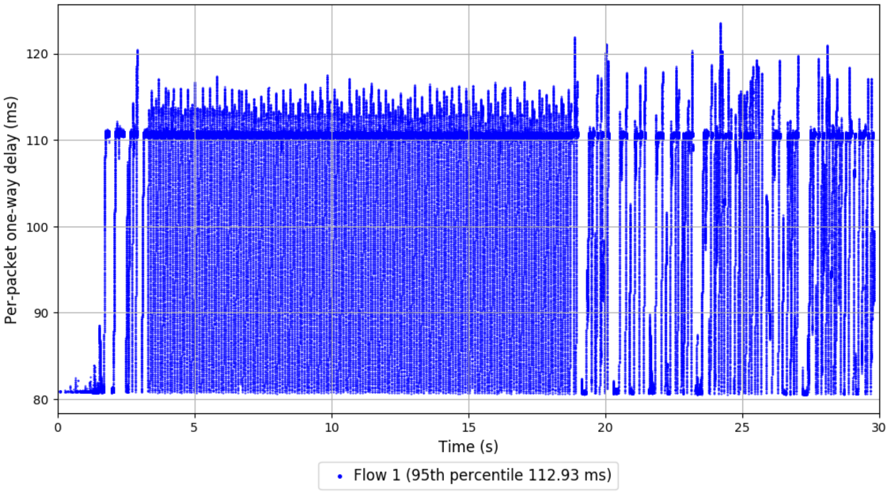




```
Run 3: Statistics of Indigo-96d2da3

Start at: 2018-12-02 01:09:59
End at: 2018-12-02 01:10:29
Local clock offset: -0.801 ms
Remote clock offset: 14.769 ms

# Below is generated by plot.py at 2018-12-02 02:16:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 70.62 Mbit/s
95th percentile per-packet one-way delay: 112.926 ms
Loss rate: 47.65%
-- Flow 1:
Average throughput: 70.62 Mbit/s
95th percentile per-packet one-way delay: 112.926 ms
Loss rate: 47.65%
```

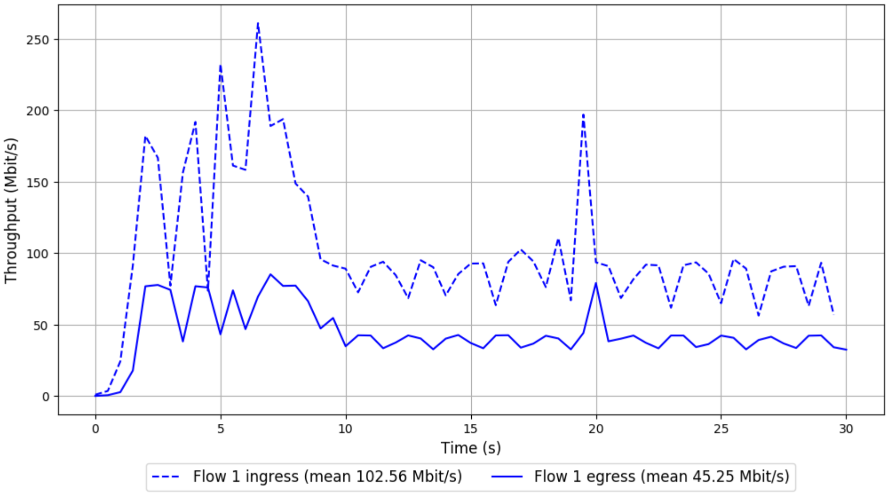
Run 3: Report of Indigo-96d2da3 — Data Link

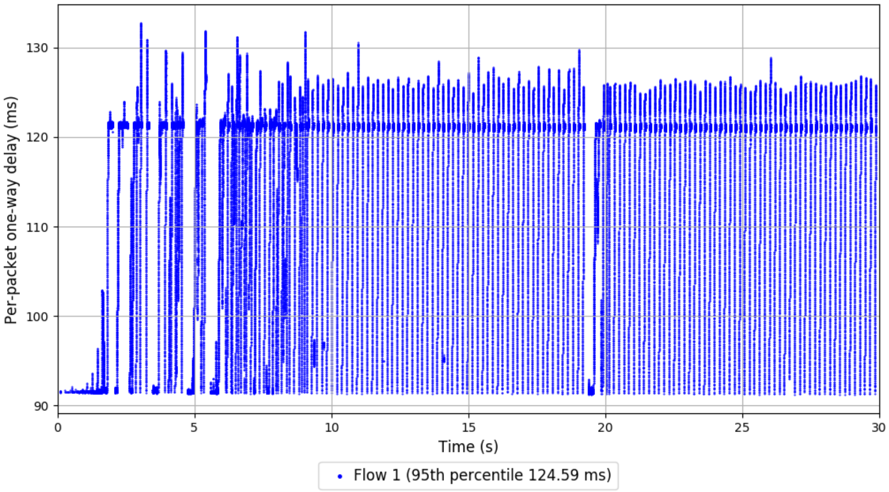




```
Run 4: Statistics of Indigo-96d2da3

Start at: 2018-12-02 01:32:15
End at: 2018-12-02 01:32:45
Local clock offset: -4.996 ms
Remote clock offset: 28.822 ms

# Below is generated by plot.py at 2018-12-02 02:16:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 45.25 Mbit/s
95th percentile per-packet one-way delay: 124.592 ms
Loss rate: 55.84%
-- Flow 1:
Average throughput: 45.25 Mbit/s
95th percentile per-packet one-way delay: 124.592 ms
Loss rate: 55.84%
```

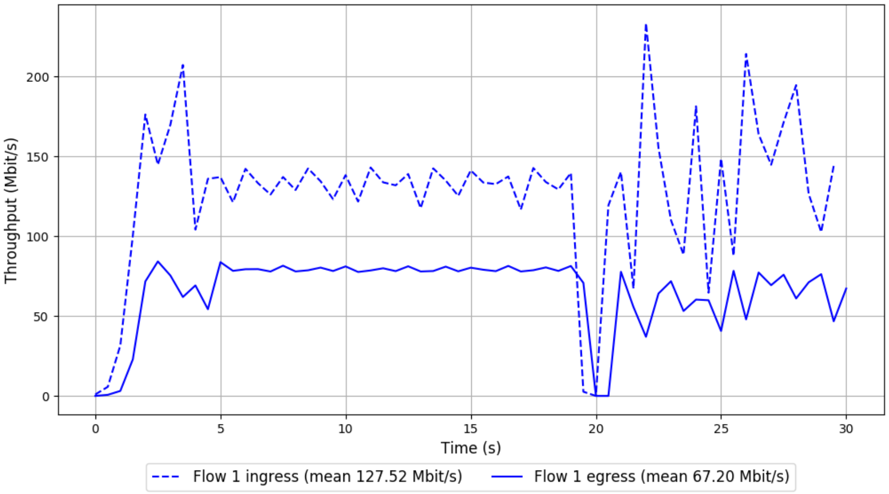
Run 4: Report of Indigo-96d2da3 — Data Link

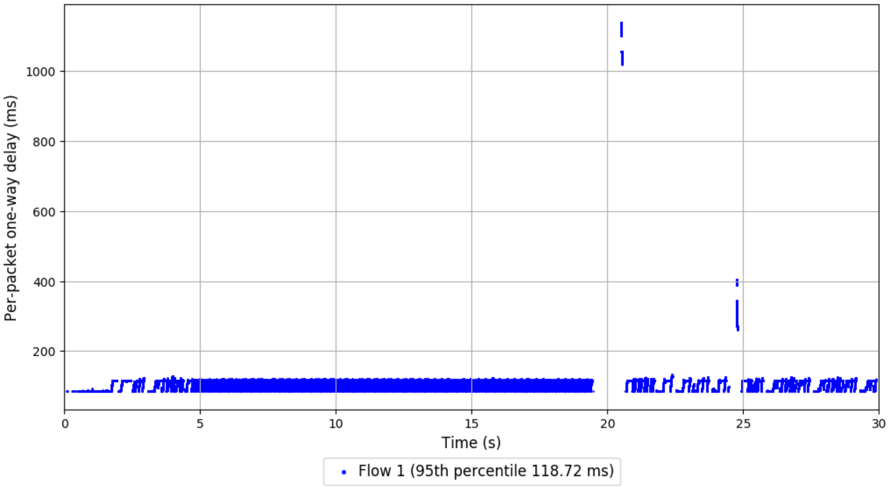




```
Run 5: Statistics of Indigo-96d2da3

Start at: 2018-12-02 01:54:26
End at: 2018-12-02 01:54:56
Local clock offset: -5.079 ms
Remote clock offset: 39.215 ms

# Below is generated by plot.py at 2018-12-02 02:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 67.20 Mbit/s
95th percentile per-packet one-way delay: 118.723 ms
Loss rate: 47.25%
-- Flow 1:
Average throughput: 67.20 Mbit/s
95th percentile per-packet one-way delay: 118.723 ms
Loss rate: 47.25%
```

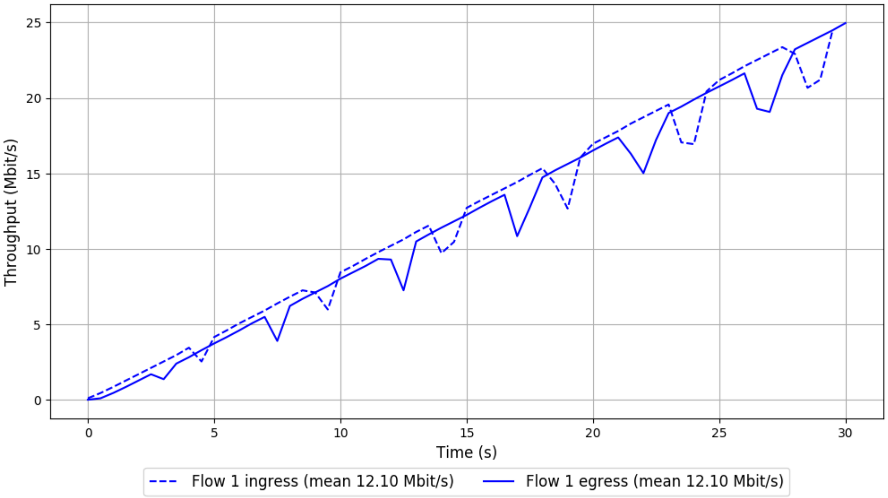
Run 5: Report of Indigo-96d2da3 — Data Link

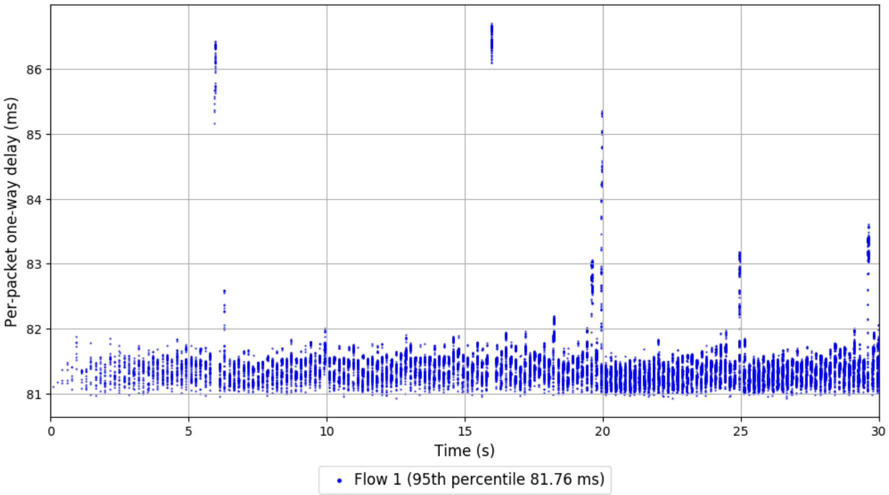




```
Run 1: Statistics of LEDBAT

Start at: 2018-12-02 00:33:46
End at: 2018-12-02 00:34:16
Local clock offset: -5.581 ms
Remote clock offset: -14.451 ms

# Below is generated by plot.py at 2018-12-02 02:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.10 Mbit/s
95th percentile per-packet one-way delay: 81.763 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 12.10 Mbit/s
95th percentile per-packet one-way delay: 81.763 ms
Loss rate: 0.00%
```

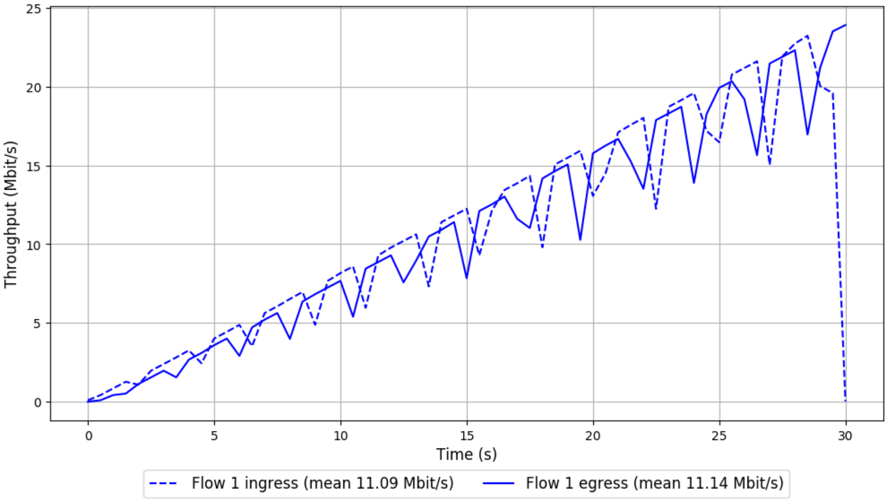
Run 1: Report of LEDBAT — Data Link

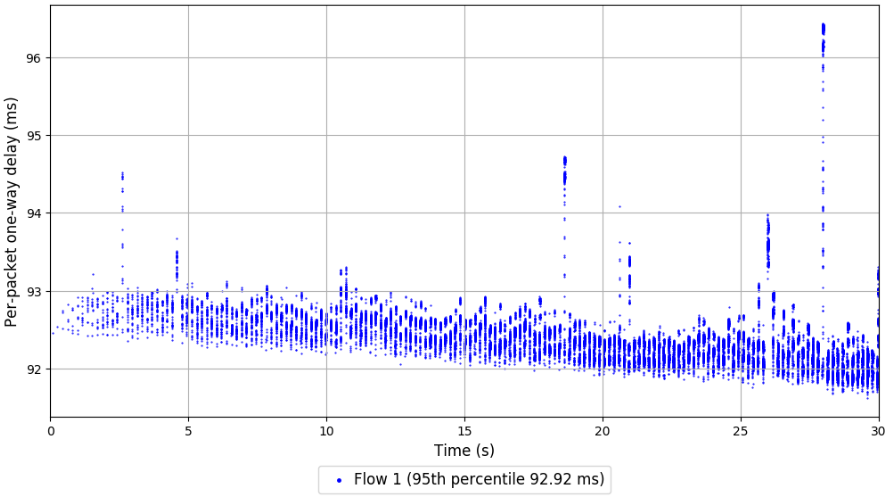




```
Run 2: Statistics of LEDBAT

Start at: 2018-12-02 00:55:59
End at: 2018-12-02 00:56:29
Local clock offset: -3.412 ms
Remote clock offset: 6.179 ms

# Below is generated by plot.py at 2018-12-02 02:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.14 Mbit/s
95th percentile per-packet one-way delay: 92.922 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 11.14 Mbit/s
95th percentile per-packet one-way delay: 92.922 ms
Loss rate: 0.00%
```

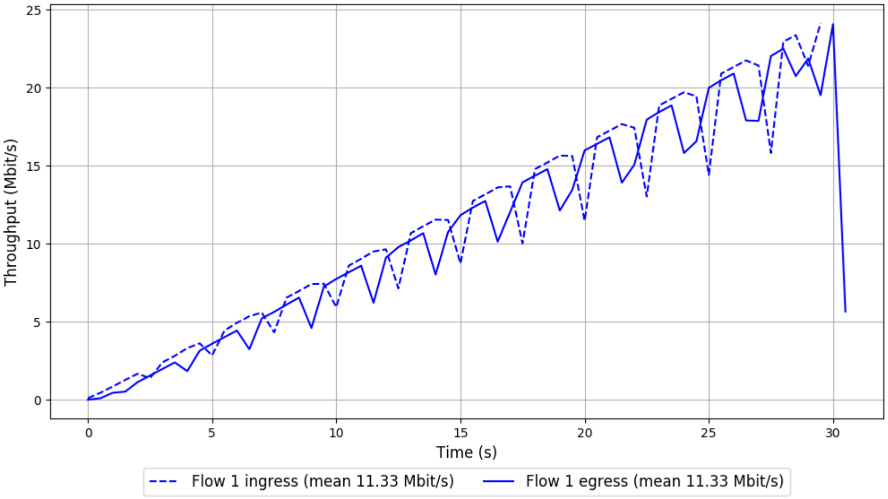
Run 2: Report of LEDBAT — Data Link

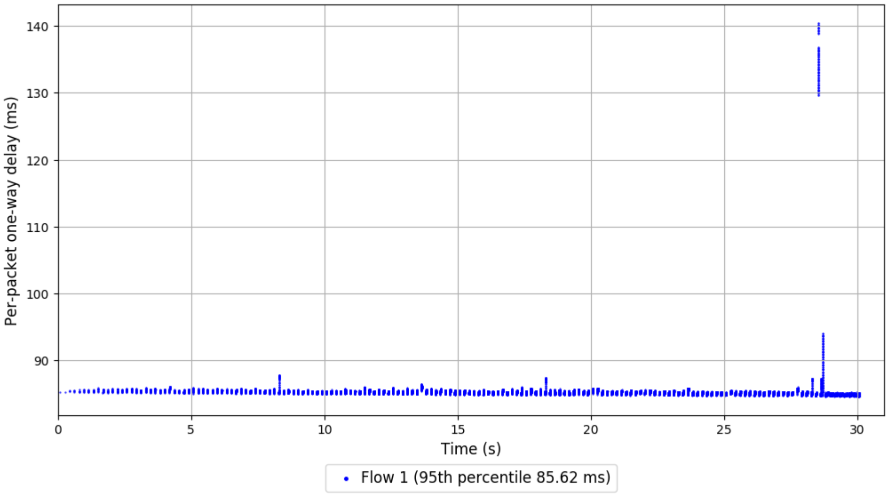




```
Run 3: Statistics of LEDBAT

Start at: 2018-12-02 01:18:17
End at: 2018-12-02 01:18:47
Local clock offset: -0.885 ms
Remote clock offset: 18.86 ms

# Below is generated by plot.py at 2018-12-02 02:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.33 Mbit/s
95th percentile per-packet one-way delay: 85.622 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 11.33 Mbit/s
95th percentile per-packet one-way delay: 85.622 ms
Loss rate: 0.00%
```

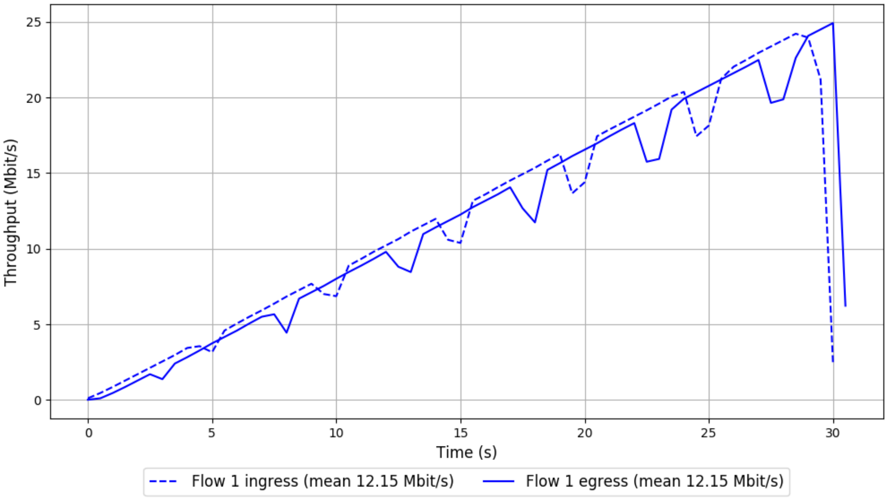
Run 3: Report of LEDBAT — Data Link

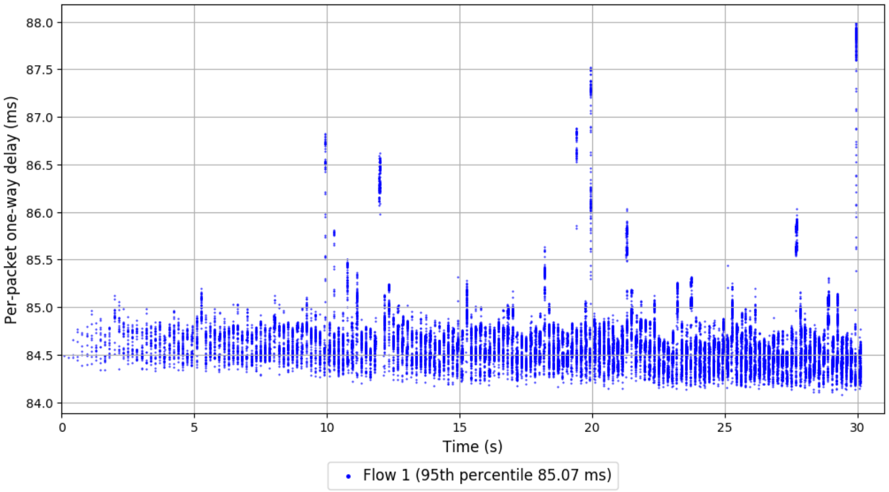




```
Run 4: Statistics of LEDBAT

Start at: 2018-12-02 01:40:29
End at: 2018-12-02 01:40:59
Local clock offset: -4.725 ms
Remote clock offset: 33.179 ms

# Below is generated by plot.py at 2018-12-02 02:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.15 Mbit/s
95th percentile per-packet one-way delay: 85.074 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 12.15 Mbit/s
95th percentile per-packet one-way delay: 85.074 ms
Loss rate: 0.00%
```

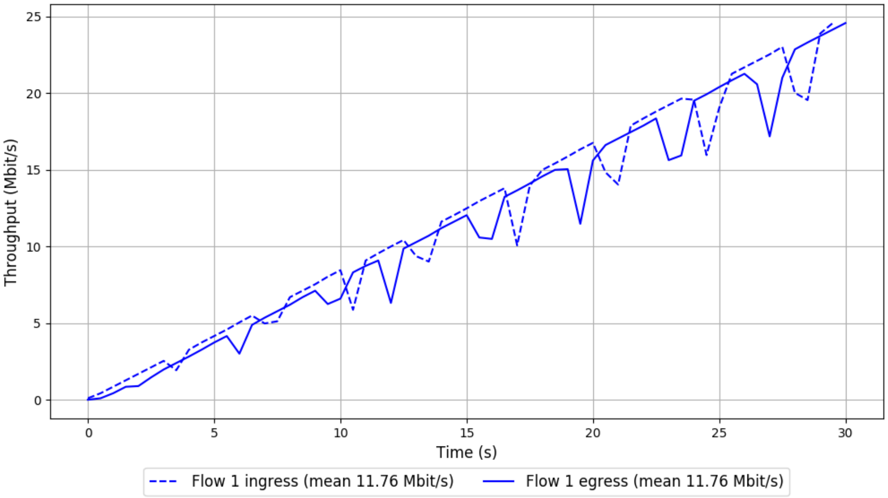
Run 4: Report of LEDBAT — Data Link

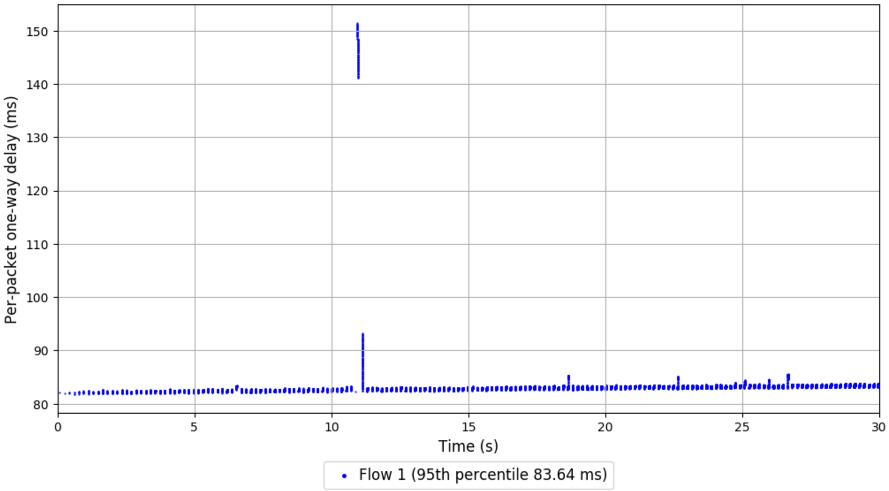




```
Run 5: Statistics of LEDBAT

Start at: 2018-12-02 02:02:43
End at: 2018-12-02 02:03:13
Local clock offset: -6.009 ms
Remote clock offset: 23.636 ms

# Below is generated by plot.py at 2018-12-02 02:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.76 Mbit/s
95th percentile per-packet one-way delay: 83.636 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 11.76 Mbit/s
95th percentile per-packet one-way delay: 83.636 ms
Loss rate: 0.00%
```

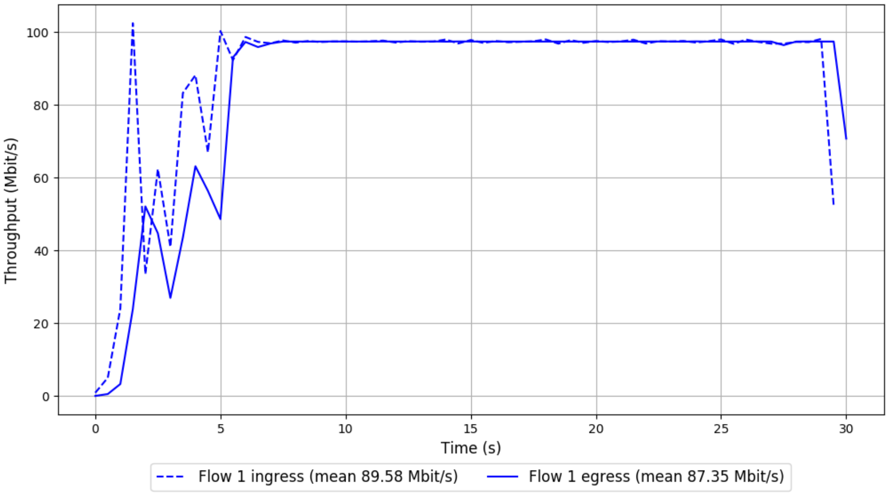
Run 5: Report of LEDBAT — Data Link

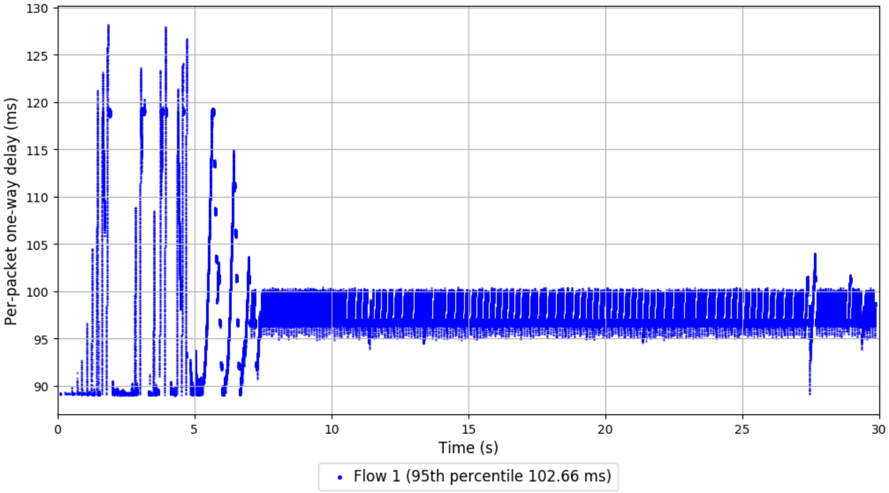




```
Run 1: Statistics of Indigo-Muses

Start at: 2018-12-02 00:30:10
End at: 2018-12-02 00:30:40
Local clock offset: -4.681 ms
Remote clock offset: -11.562 ms

# Below is generated by plot.py at 2018-12-02 02:16:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 87.35 Mbit/s
95th percentile per-packet one-way delay: 102.664 ms
Loss rate: 2.47%
-- Flow 1:
Average throughput: 87.35 Mbit/s
95th percentile per-packet one-way delay: 102.664 ms
Loss rate: 2.47%
```

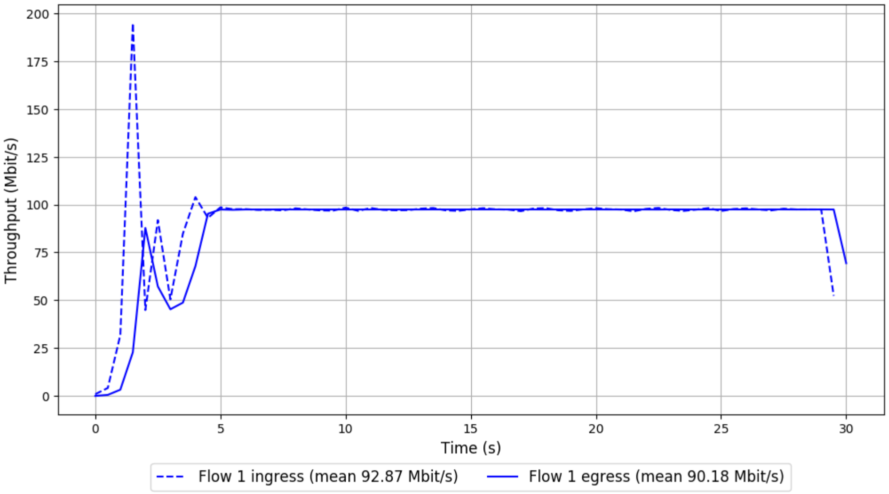
Run 1: Report of Indigo-Muses — Data Link

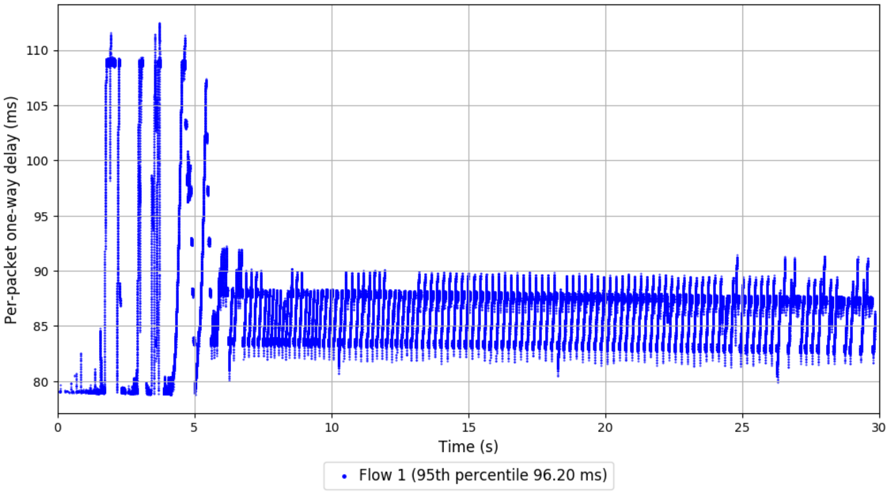




```
Run 2: Statistics of Indigo-Muses

Start at: 2018-12-02 00:52:23
End at: 2018-12-02 00:52:53
Local clock offset: -3.291 ms
Remote clock offset: -6.125 ms

# Below is generated by plot.py at 2018-12-02 02:16:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 90.18 Mbit/s
95th percentile per-packet one-way delay: 96.200 ms
Loss rate: 2.87%
-- Flow 1:
Average throughput: 90.18 Mbit/s
95th percentile per-packet one-way delay: 96.200 ms
Loss rate: 2.87%
```

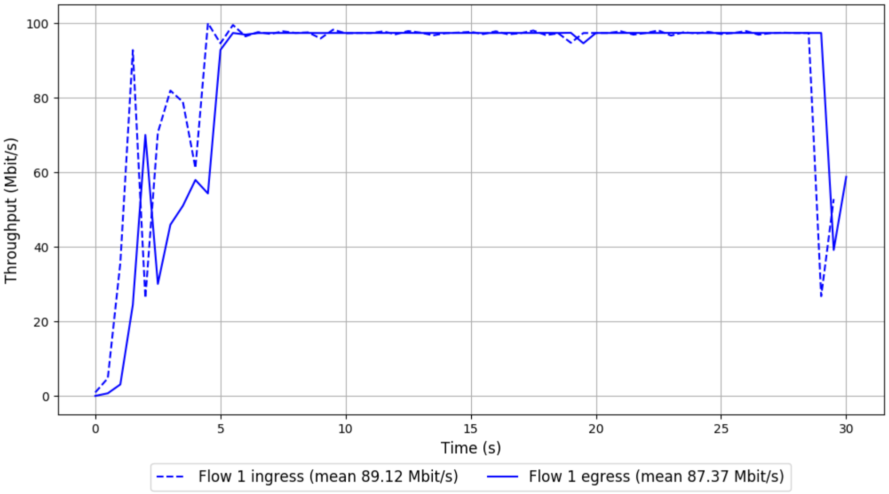
Run 2: Report of Indigo-Muses — Data Link



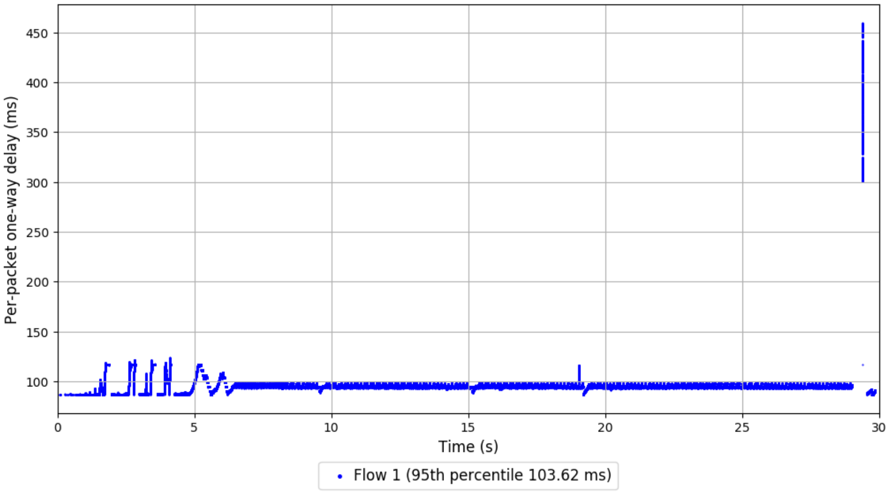


```
Run 3: Statistics of Indigo-Muses

Start at: 2018-12-02 01:14:41
End at: 2018-12-02 01:15:11
Local clock offset: -1.057 ms
Remote clock offset: 22.656 ms

# Below is generated by plot.py at 2018-12-02 02:16:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 87.37 Mbit/s
95th percentile per-packet one-way delay: 103.623 ms
Loss rate: 1.94%
-- Flow 1:
Average throughput: 87.37 Mbit/s
95th percentile per-packet one-way delay: 103.623 ms
Loss rate: 1.94%
```

Run 3: Report of Indigo-Muses — Data Link



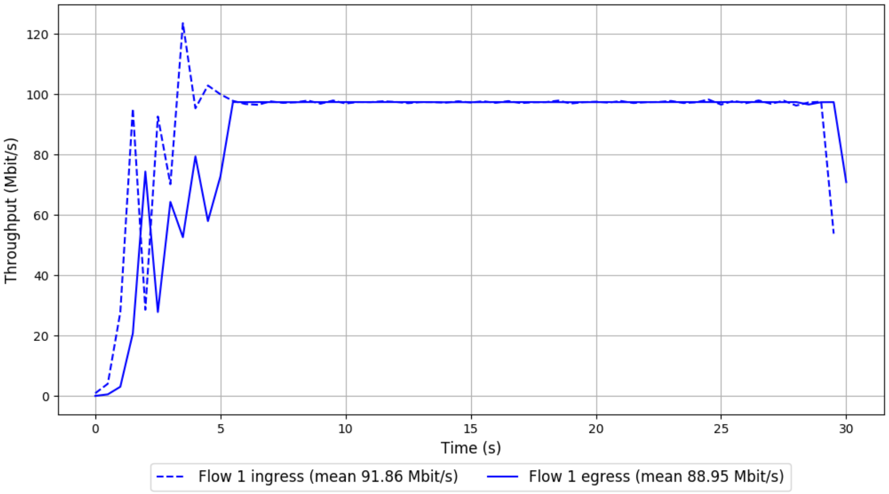
Flow 1 ingress (mean 89.12 Mbit/s) Flow 1 egress (mean 87.37 Mbit/s)

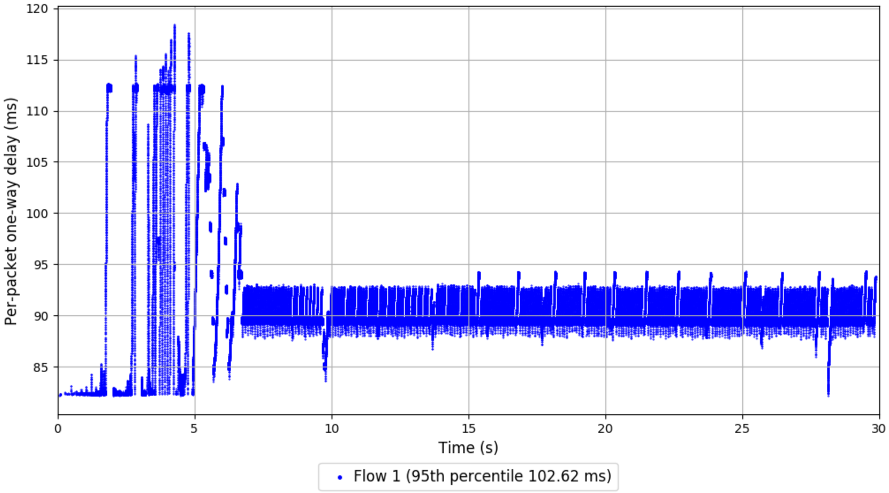


Flow 1 (95th percentile 103.62 ms)

```
Run 4: Statistics of Indigo-Muses

Start at: 2018-12-02 01:36:53
End at: 2018-12-02 01:37:23
Local clock offset: -4.578 ms
Remote clock offset: 27.605 ms

# Below is generated by plot.py at 2018-12-02 02:16:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 88.95 Mbit/s
95th percentile per-packet one-way delay: 102.623 ms
Loss rate: 3.14%
-- Flow 1:
Average throughput: 88.95 Mbit/s
95th percentile per-packet one-way delay: 102.623 ms
Loss rate: 3.14%
```

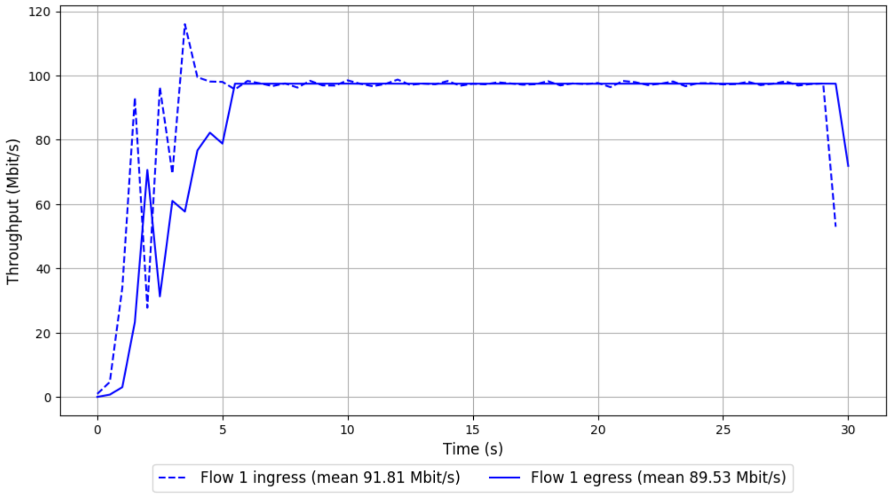
Run 4: Report of Indigo-Muses — Data Link

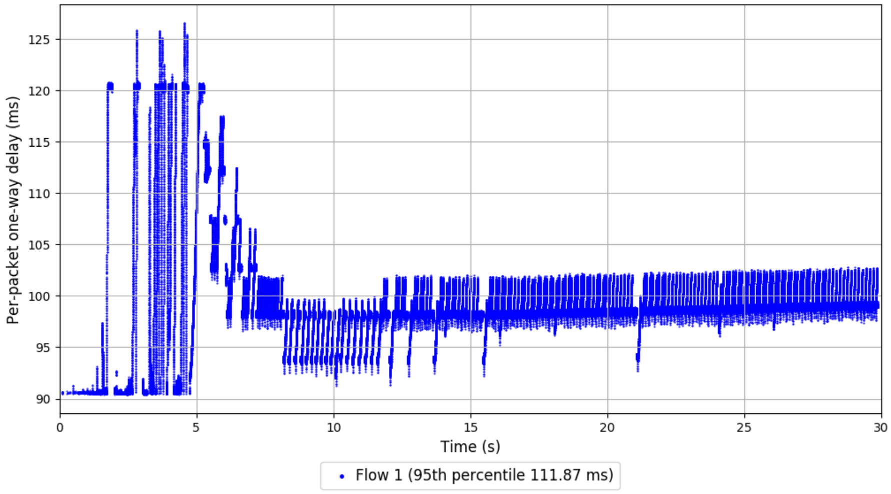




```
Run 5: Statistics of Indigo-Muses

Start at: 2018-12-02 01:59:07
End at: 2018-12-02 01:59:37
Local clock offset: -5.932 ms
Remote clock offset: 43.575 ms

# Below is generated by plot.py at 2018-12-02 02:17:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.53 Mbit/s
95th percentile per-packet one-way delay: 111.871 ms
Loss rate: 2.46%
-- Flow 1:
Average throughput: 89.53 Mbit/s
95th percentile per-packet one-way delay: 111.871 ms
Loss rate: 2.46%
```

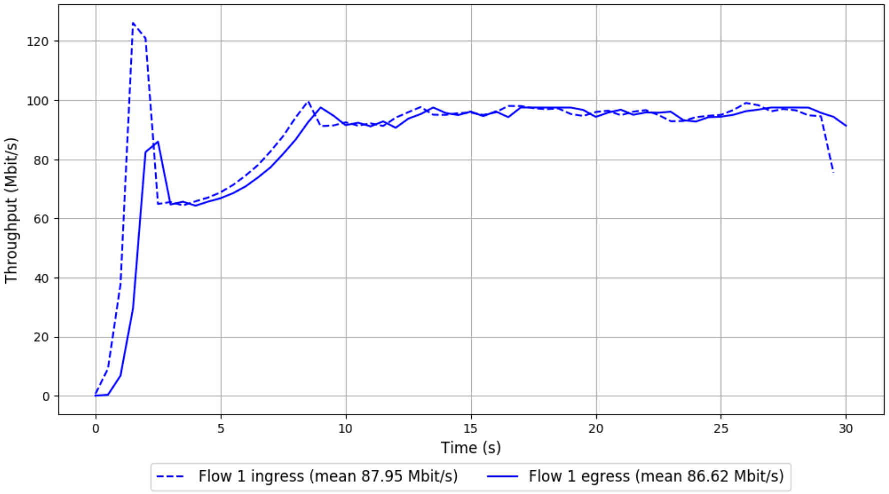
Run 5: Report of Indigo-Muses — Data Link

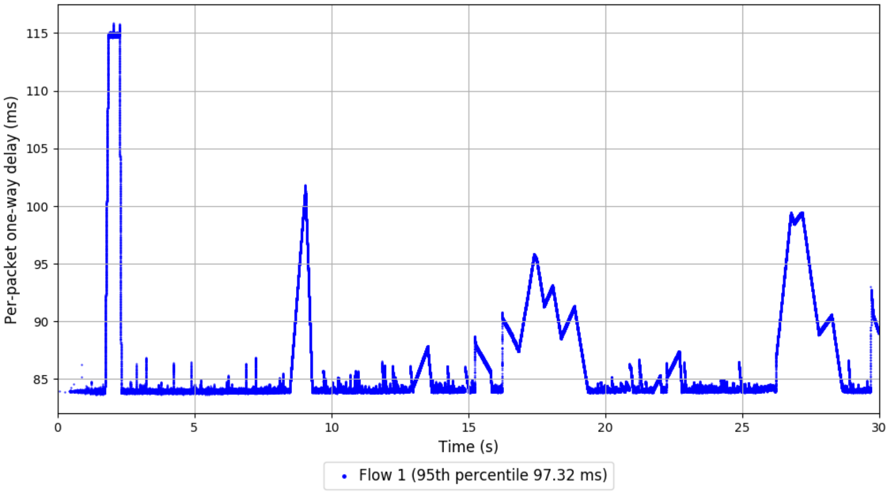




```
Run 1: Statistics of PCC-Allegro

Start at: 2018-12-02 00:34:54
End at: 2018-12-02 00:35:24
Local clock offset: -5.606 ms
Remote clock offset: -11.718 ms

# Below is generated by plot.py at 2018-12-02 02:17:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.62 Mbit/s
95th percentile per-packet one-way delay: 97.324 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 86.62 Mbit/s
95th percentile per-packet one-way delay: 97.324 ms
Loss rate: 1.51%
```

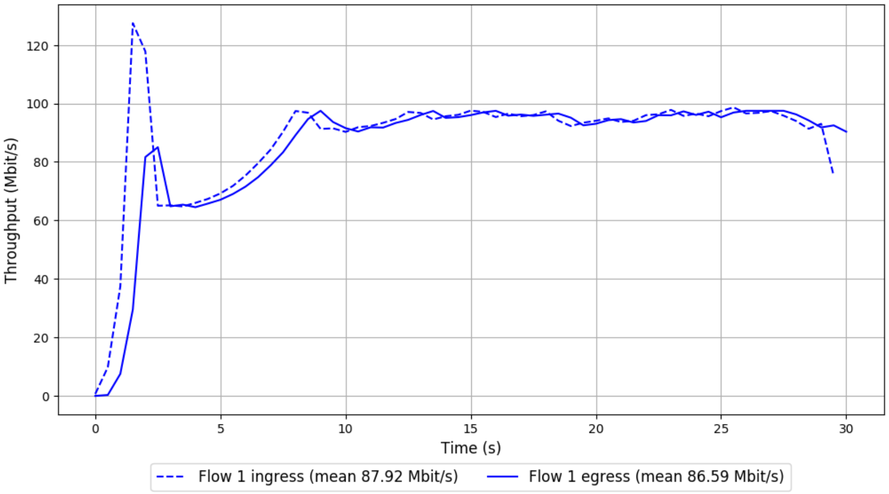
Run 1: Report of PCC-Allegro — Data Link

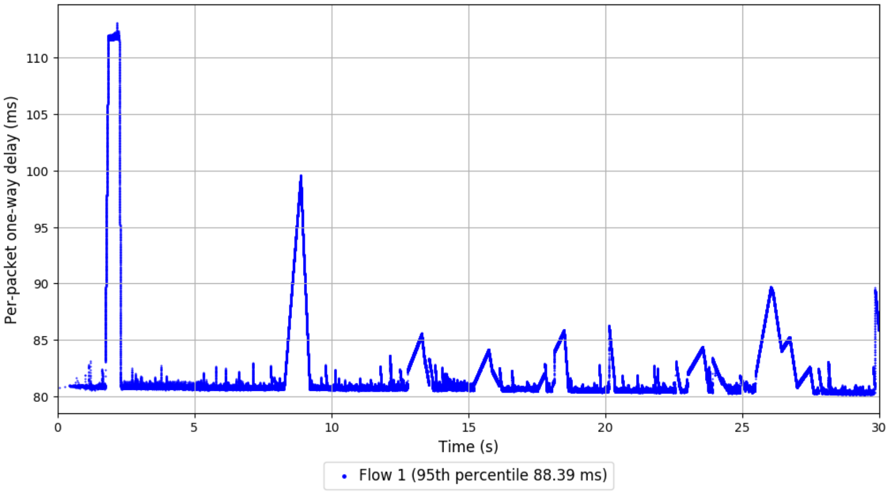




```
Run 2: Statistics of PCC-Allegro

Start at: 2018-12-02 00:57:07
End at: 2018-12-02 00:57:37
Local clock offset: -3.242 ms
Remote clock offset: 3.883 ms

# Below is generated by plot.py at 2018-12-02 02:17:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.59 Mbit/s
95th percentile per-packet one-way delay: 88.387 ms
Loss rate: 1.50%
-- Flow 1:
Average throughput: 86.59 Mbit/s
95th percentile per-packet one-way delay: 88.387 ms
Loss rate: 1.50%
```

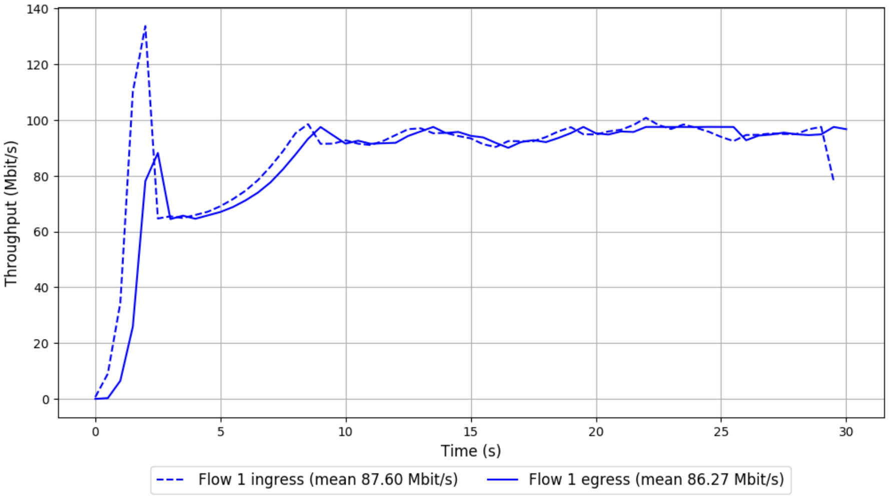
Run 2: Report of PCC-Allegro — Data Link

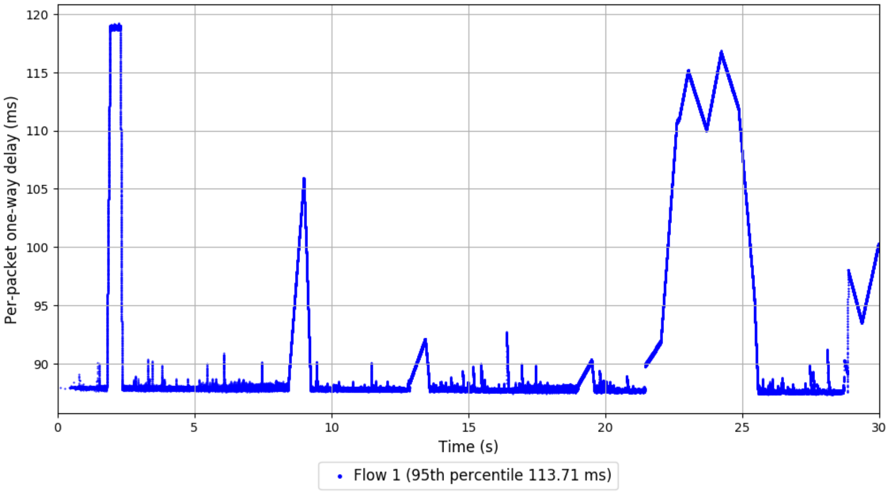




```
Run 3: Statistics of PCC-Allegro

Start at: 2018-12-02 01:19:26
End at: 2018-12-02 01:19:56
Local clock offset: -1.502 ms
Remote clock offset: 25.68 ms

# Below is generated by plot.py at 2018-12-02 02:17:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.27 Mbit/s
95th percentile per-packet one-way delay: 113.712 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 86.27 Mbit/s
95th percentile per-packet one-way delay: 113.712 ms
Loss rate: 1.48%
```

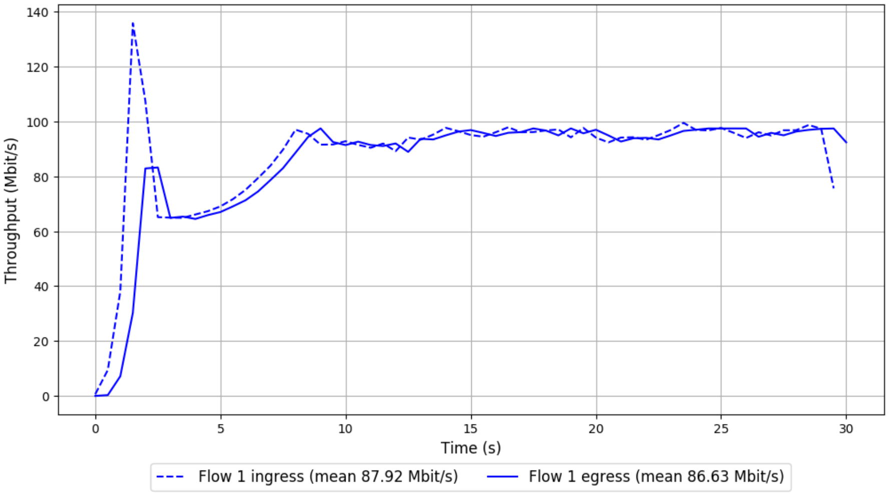
Run 3: Report of PCC-Allegro — Data Link

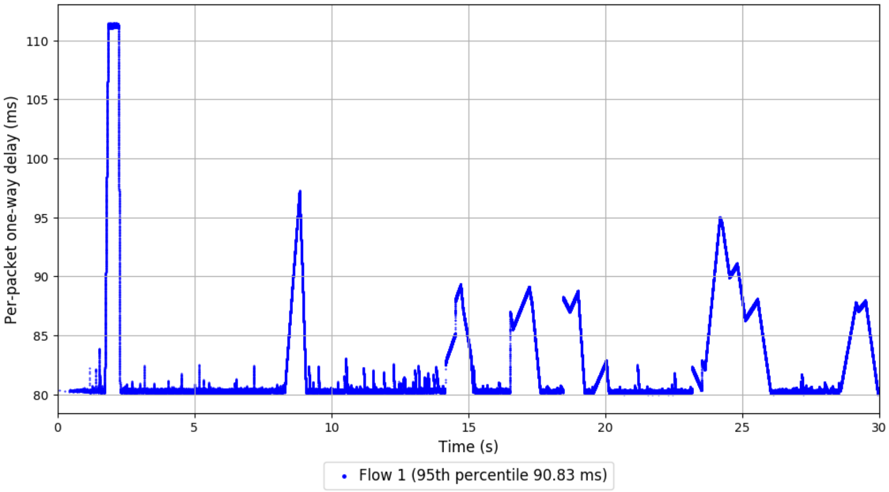




```
Run 4: Statistics of PCC-Allegro

Start at: 2018-12-02 01:41:38
End at: 2018-12-02 01:42:08
Local clock offset: -5.524 ms
Remote clock offset: 28.248 ms

# Below is generated by plot.py at 2018-12-02 02:17:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.63 Mbit/s
95th percentile per-packet one-way delay: 90.825 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 86.63 Mbit/s
95th percentile per-packet one-way delay: 90.825 ms
Loss rate: 1.47%
```

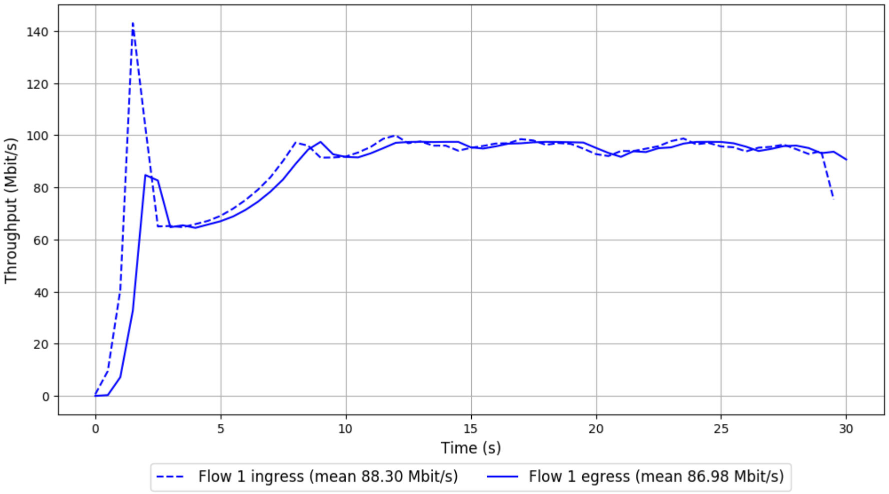
Run 4: Report of PCC-Allegro — Data Link

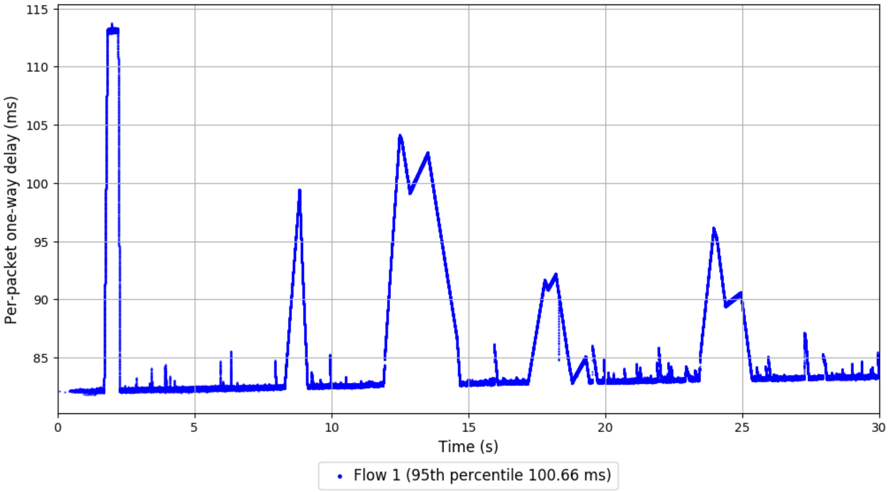




```
Run 5: Statistics of PCC-Allegro

Start at: 2018-12-02 02:03:51
End at: 2018-12-02 02:04:21
Local clock offset: -5.17 ms
Remote clock offset: 21.669 ms

# Below is generated by plot.py at 2018-12-02 02:18:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 86.98 Mbit/s
95th percentile per-packet one-way delay: 100.657 ms
Loss rate: 1.50%
-- Flow 1:
Average throughput: 86.98 Mbit/s
95th percentile per-packet one-way delay: 100.657 ms
Loss rate: 1.50%
```

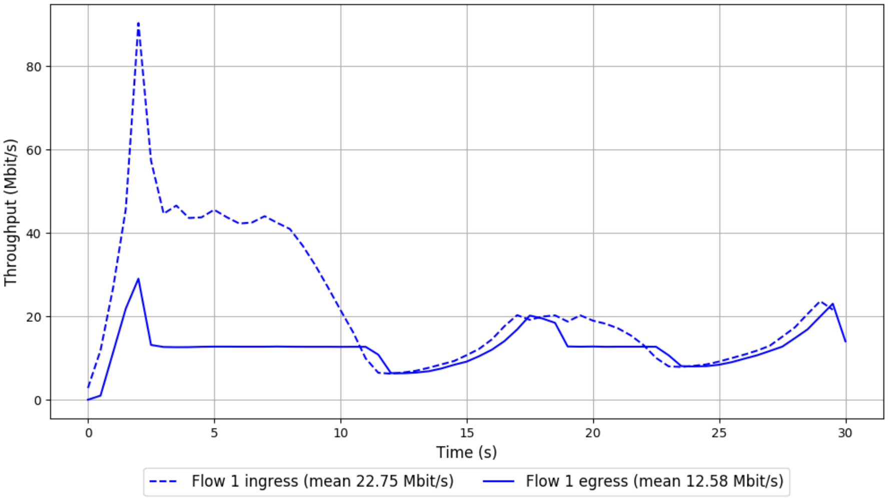
Run 5: Report of PCC-Allegro — Data Link

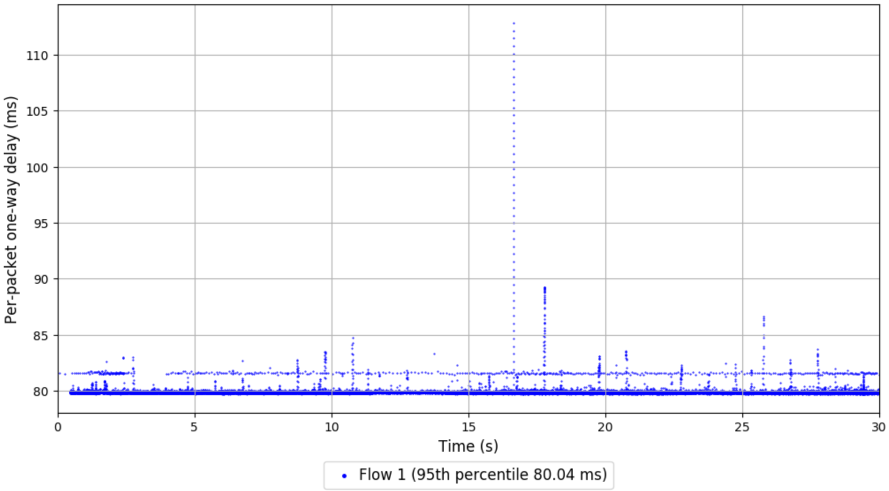




```
Run 1: Statistics of PCC-Expr

Start at: 2018-12-02 00:29:01
End at: 2018-12-02 00:29:31
Local clock offset: -5.344 ms
Remote clock offset: -15.47 ms

# Below is generated by plot.py at 2018-12-02 02:18:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.58 Mbit/s
95th percentile per-packet one-way delay: 80.036 ms
Loss rate: 44.72%
-- Flow 1:
Average throughput: 12.58 Mbit/s
95th percentile per-packet one-way delay: 80.036 ms
Loss rate: 44.72%
```

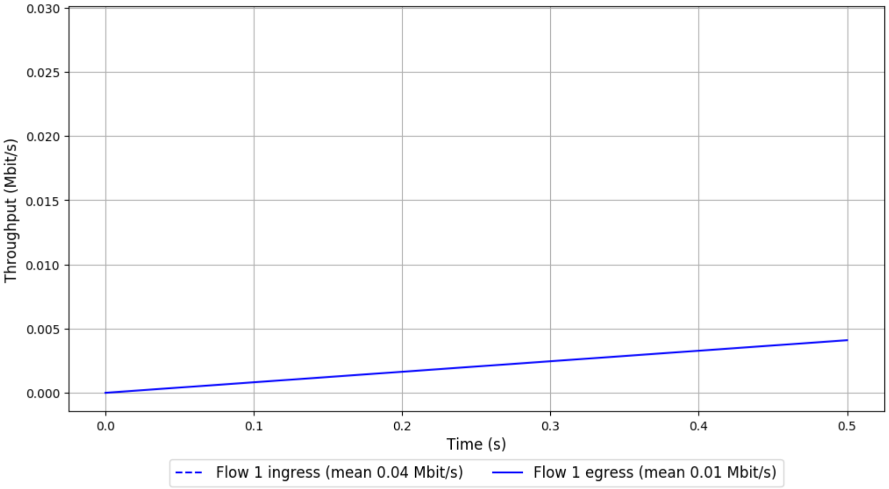
Run 1: Report of PCC-Expr — Data Link

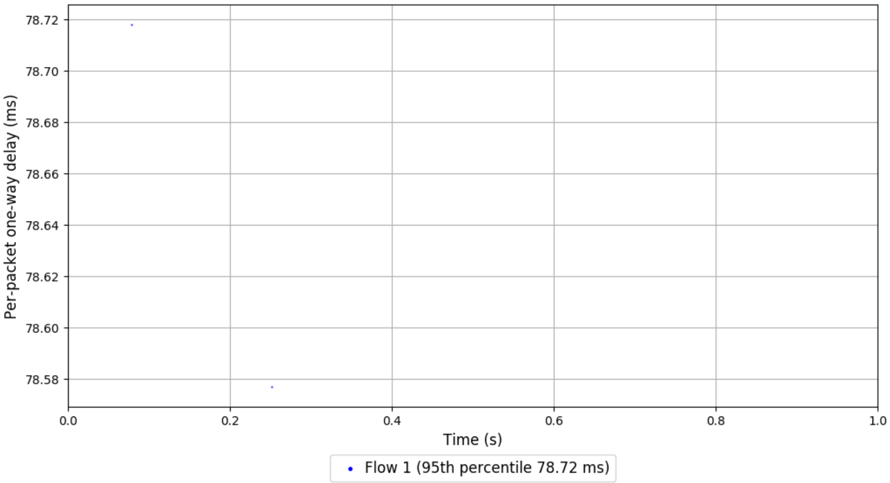




```
Run 2: Statistics of PCC-Expr

Start at: 2018-12-02 00:51:16
End at: 2018-12-02 00:51:46
Local clock offset: -3.573 ms
Remote clock offset: -9.088 ms
```

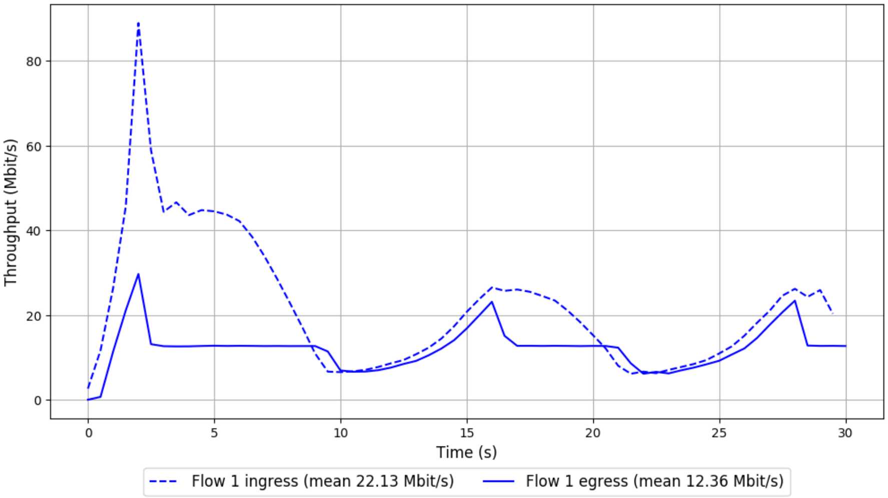
Run 2: Report of PCC-Expr — Data Link

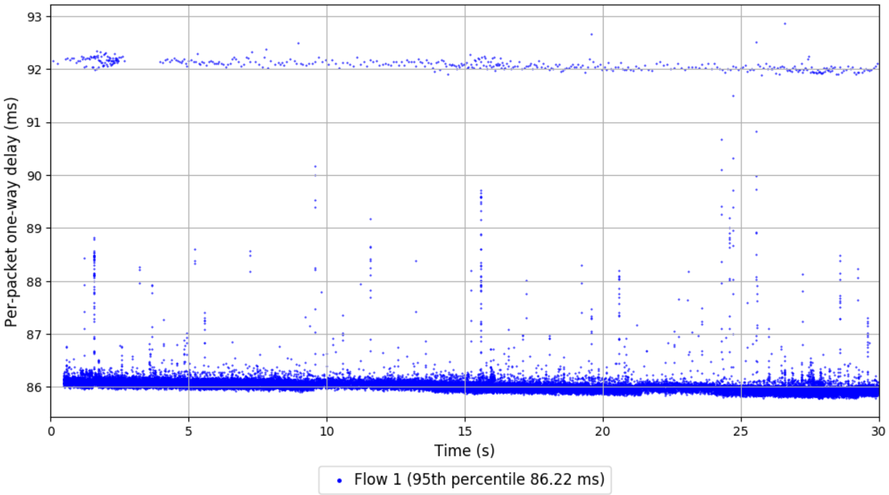




```
Run 3: Statistics of PCC-Expr

Start at: 2018-12-02 01:13:32
End at: 2018-12-02 01:14:02
Local clock offset: -1.223 ms
Remote clock offset: 22.99 ms

# Below is generated by plot.py at 2018-12-02 02:18:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.36 Mbit/s
95th percentile per-packet one-way delay: 86.220 ms
Loss rate: 44.15%
-- Flow 1:
Average throughput: 12.36 Mbit/s
95th percentile per-packet one-way delay: 86.220 ms
Loss rate: 44.15%
```

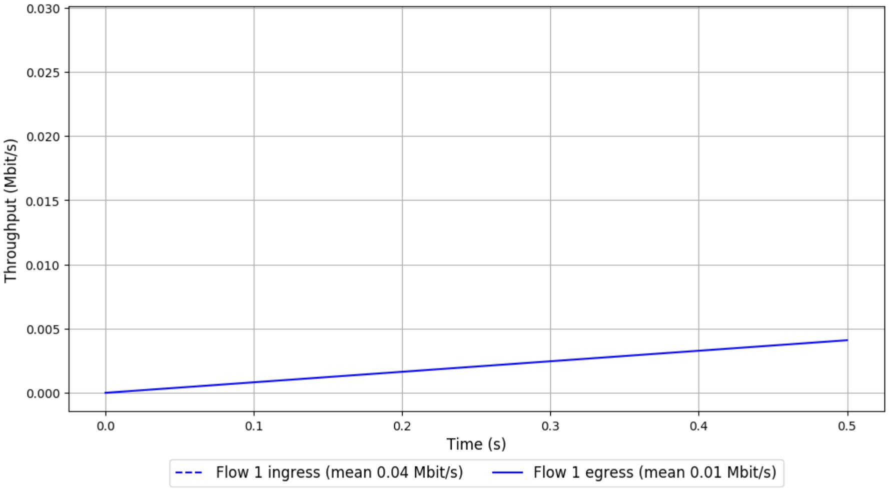
Run 3: Report of PCC-Expr — Data Link

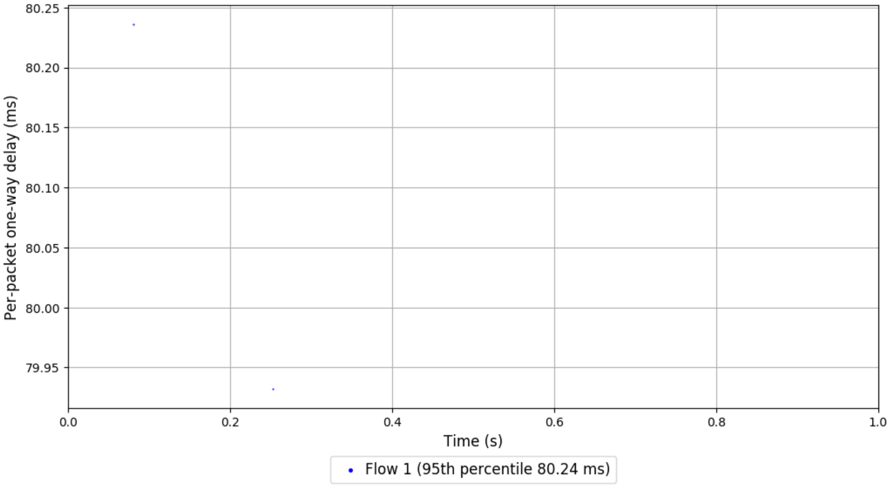




```
Run 4: Statistics of PCC-Expr

Start at: 2018-12-02 01:35:46
End at: 2018-12-02 01:36:16
Local clock offset: -4.609 ms
Remote clock offset: 27.12 ms
```

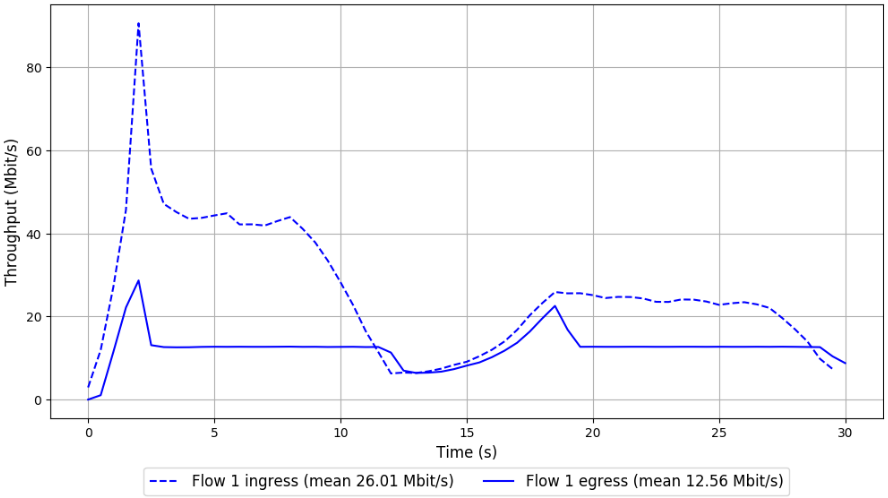
Run 4: Report of PCC-Expr — Data Link

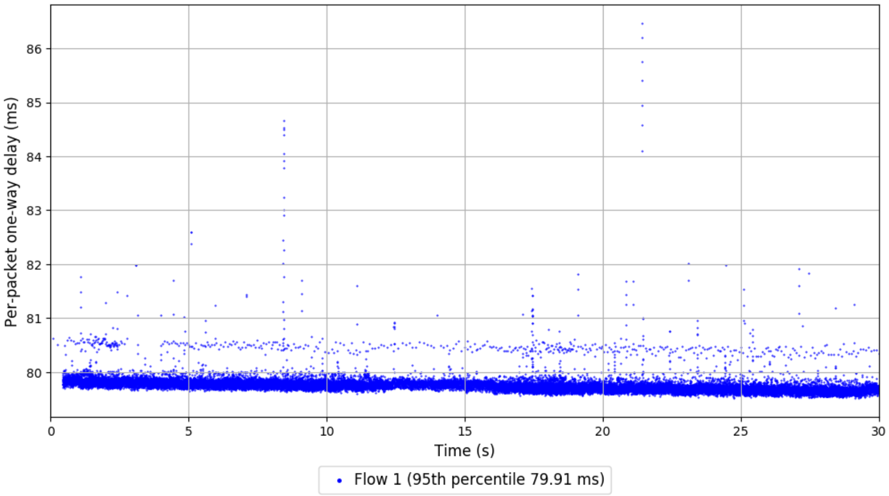




```
Run 5: Statistics of PCC-Expr

Start at: 2018-12-02 01:57:58
End at: 2018-12-02 01:58:28
Local clock offset: -5.957 ms
Remote clock offset: 34.146 ms

# Below is generated by plot.py at 2018-12-02 02:18:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.56 Mbit/s
95th percentile per-packet one-way delay: 79.907 ms
Loss rate: 51.72%
-- Flow 1:
Average throughput: 12.56 Mbit/s
95th percentile per-packet one-way delay: 79.907 ms
Loss rate: 51.72%
```

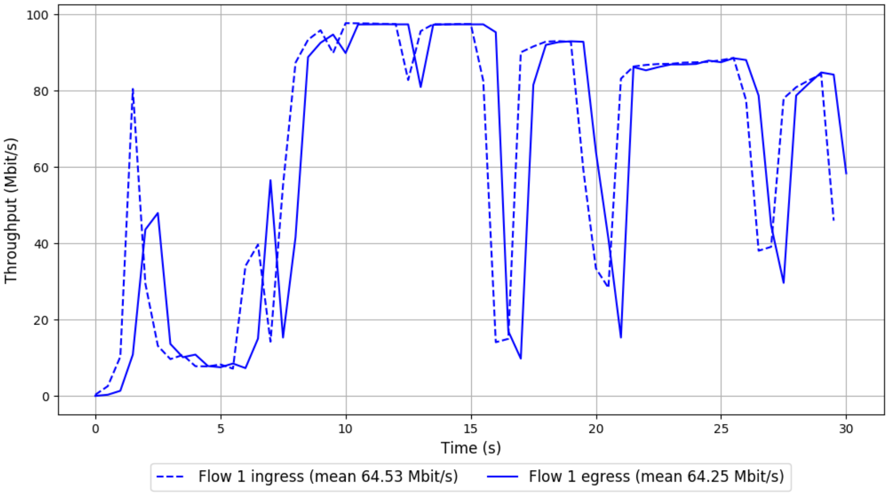
Run 5: Report of PCC-Expr — Data Link

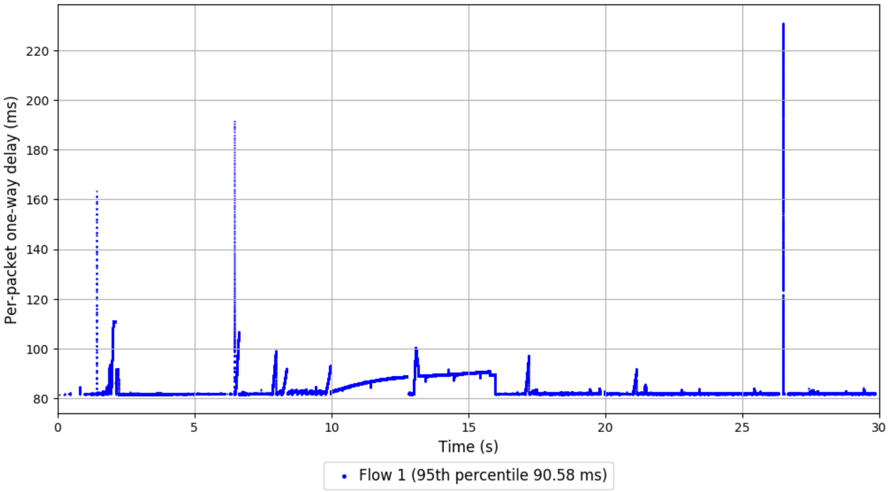




```
Run 1: Statistics of QUIC Cubic

Start at: 2018-12-02 00:39:28
End at: 2018-12-02 00:39:58
Local clock offset: -5.562 ms
Remote clock offset: -15.821 ms

# Below is generated by plot.py at 2018-12-02 02:18:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 64.25 Mbit/s
95th percentile per-packet one-way delay: 90.576 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 64.25 Mbit/s
95th percentile per-packet one-way delay: 90.576 ms
Loss rate: 0.44%
```

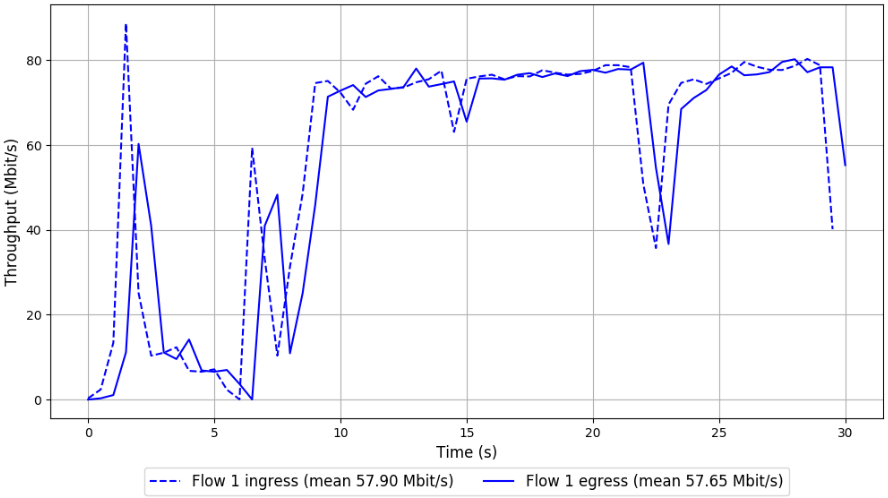
Run 1: Report of QUIC Cubic — Data Link

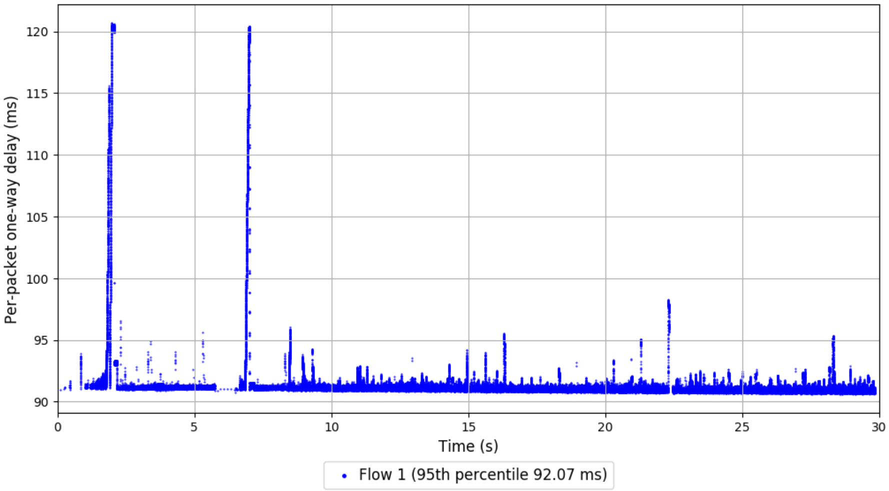




```
Run 2: Statistics of QUIC Cubic

Start at: 2018-12-02 01:01:42
End at: 2018-12-02 01:02:12
Local clock offset: -1.801 ms
Remote clock offset: 14.636 ms

# Below is generated by plot.py at 2018-12-02 02:18:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 57.65 Mbit/s
95th percentile per-packet one-way delay: 92.069 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 57.65 Mbit/s
95th percentile per-packet one-way delay: 92.069 ms
Loss rate: 0.45%
```

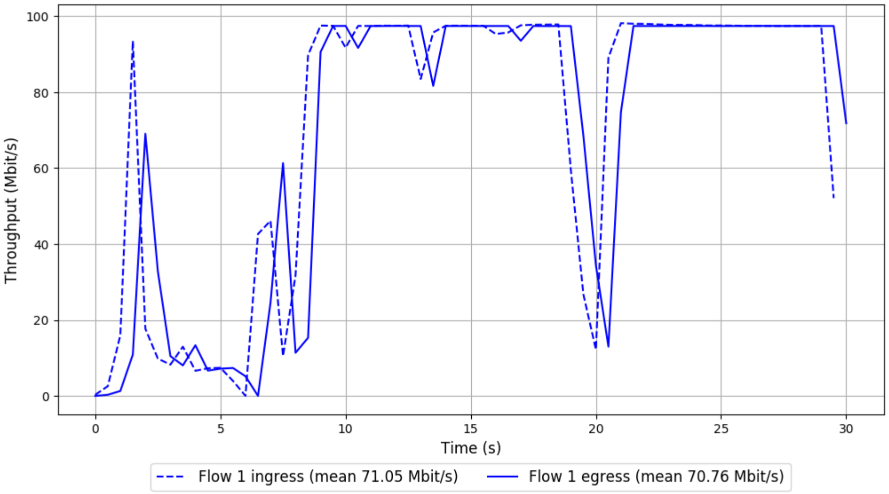
Run 2: Report of QUIC Cubic — Data Link

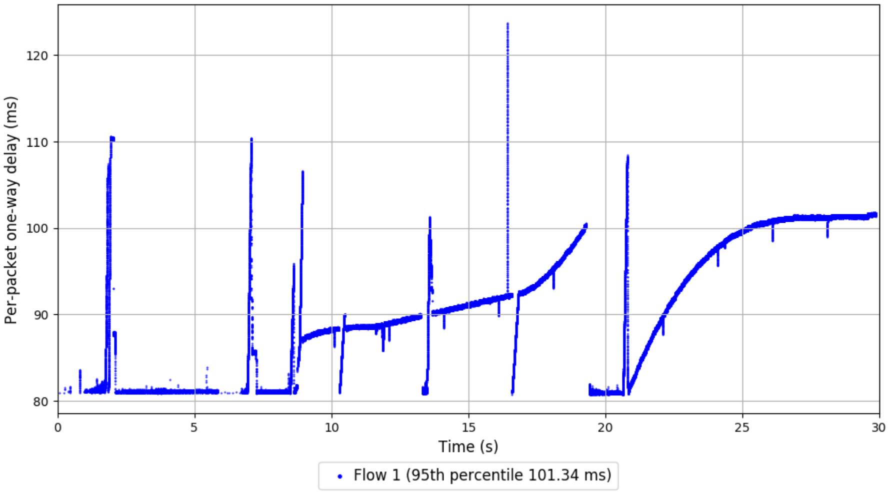




```
Run 3: Statistics of QUIC Cubic

Start at: 2018-12-02 01:23:59
End at: 2018-12-02 01:24:29
Local clock offset: -3.394 ms
Remote clock offset: 21.204 ms

# Below is generated by plot.py at 2018-12-02 02:18:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 70.76 Mbit/s
95th percentile per-packet one-way delay: 101.341 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 70.76 Mbit/s
95th percentile per-packet one-way delay: 101.341 ms
Loss rate: 0.34%
```

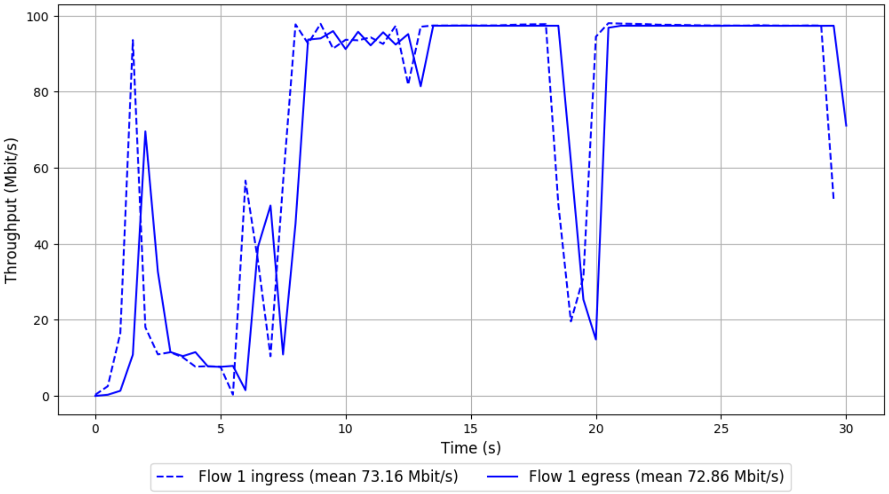
Run 3: Report of QUIC Cubic — Data Link

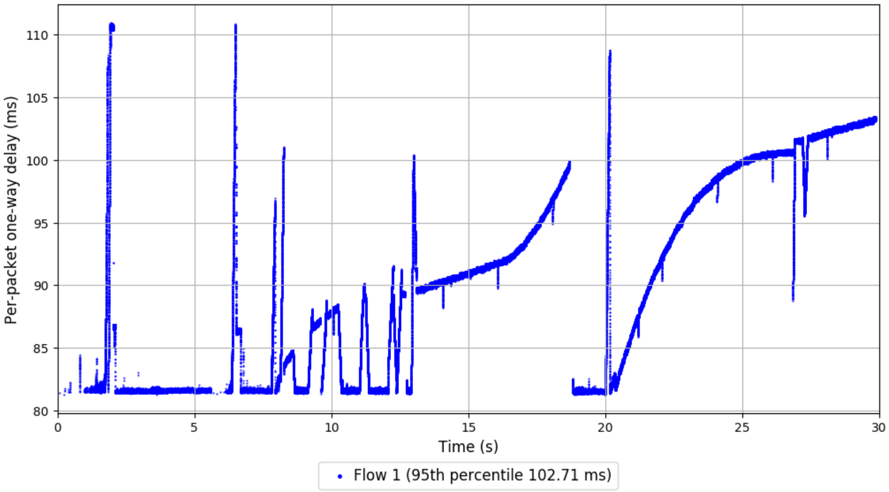




```
Run 4: Statistics of QUIC Cubic

Start at: 2018-12-02 01:46:13
End at: 2018-12-02 01:46:43
Local clock offset: -5.596 ms
Remote clock offset: 29.893 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.86 Mbit/s
95th percentile per-packet one-way delay: 102.706 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 72.86 Mbit/s
95th percentile per-packet one-way delay: 102.706 ms
Loss rate: 0.34%
```

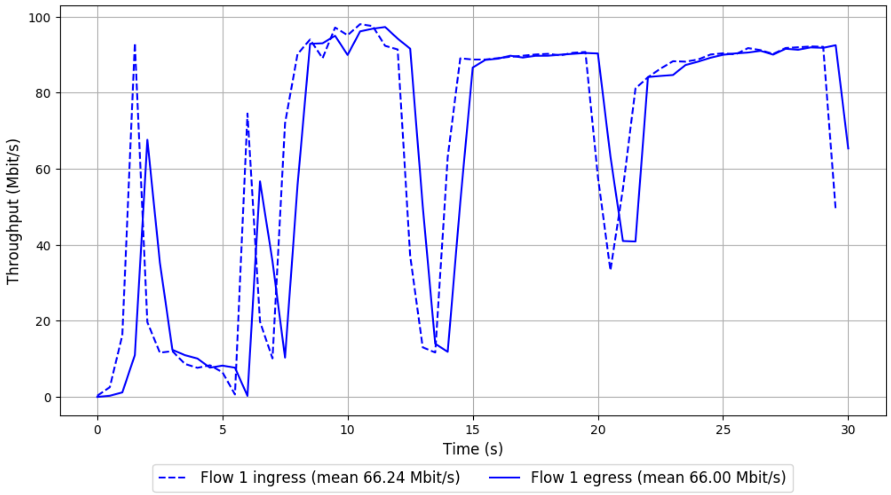
Run 4: Report of QUIC Cubic — Data Link

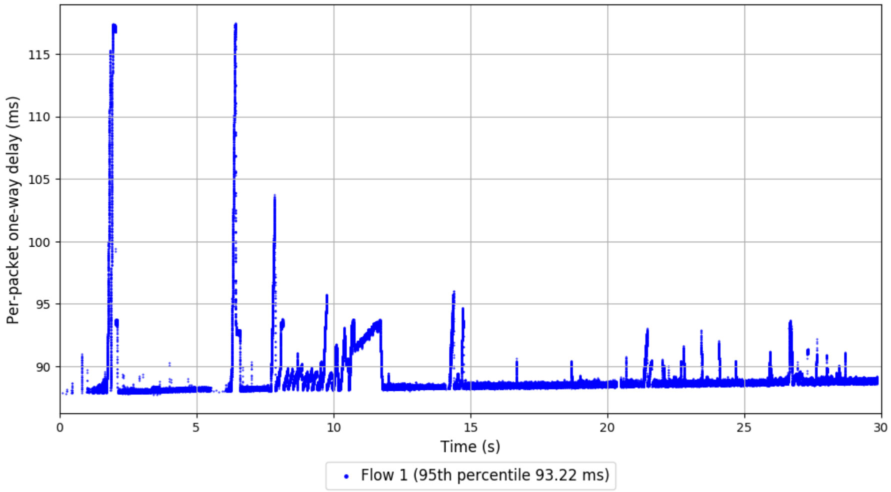




```
Run 5: Statistics of QUIC Cubic

Start at: 2018-12-02 02:08:24
End at: 2018-12-02 02:08:54
Local clock offset: -5.178 ms
Remote clock offset: 18.0 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 66.00 Mbit/s
95th percentile per-packet one-way delay: 93.215 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 66.00 Mbit/s
95th percentile per-packet one-way delay: 93.215 ms
Loss rate: 0.37%
```

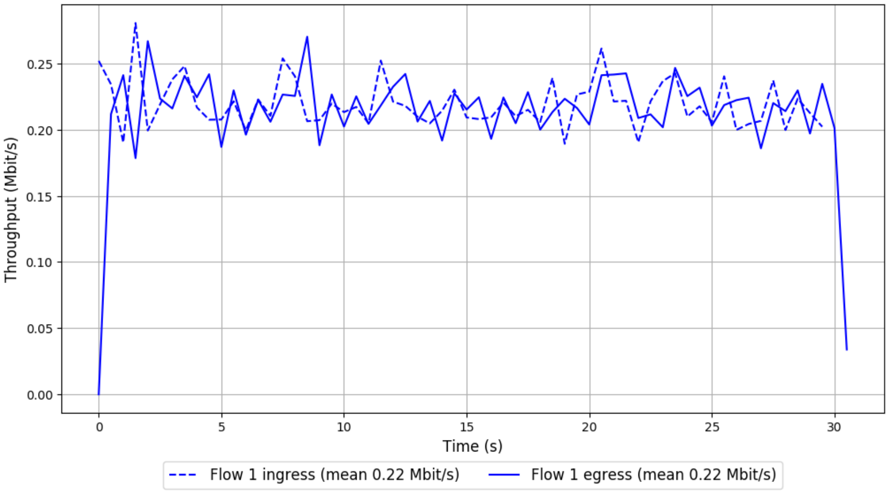
Run 5: Report of QUIC Cubic — Data Link

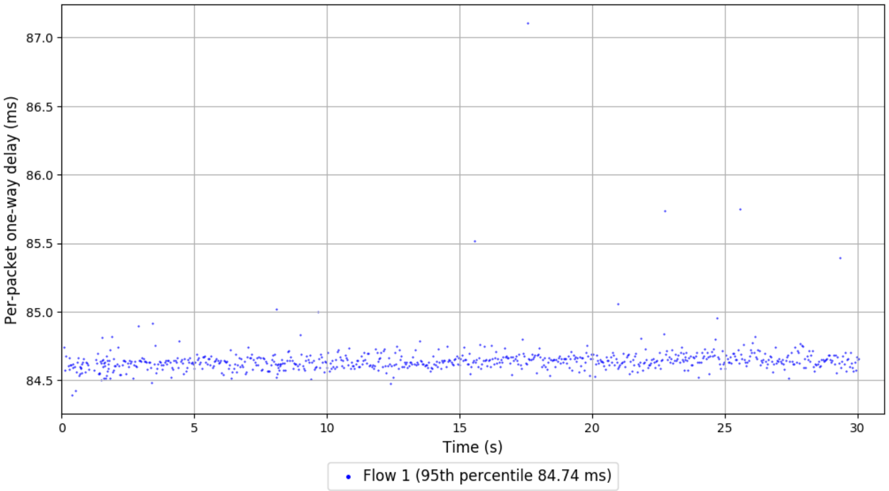




```
Run 1: Statistics of SCReAM

Start at: 2018-12-02 00:37:13
End at: 2018-12-02 00:37:43
Local clock offset: -4.863 ms
Remote clock offset: -10.6 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 84.739 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 84.739 ms
Loss rate: 0.00%
```

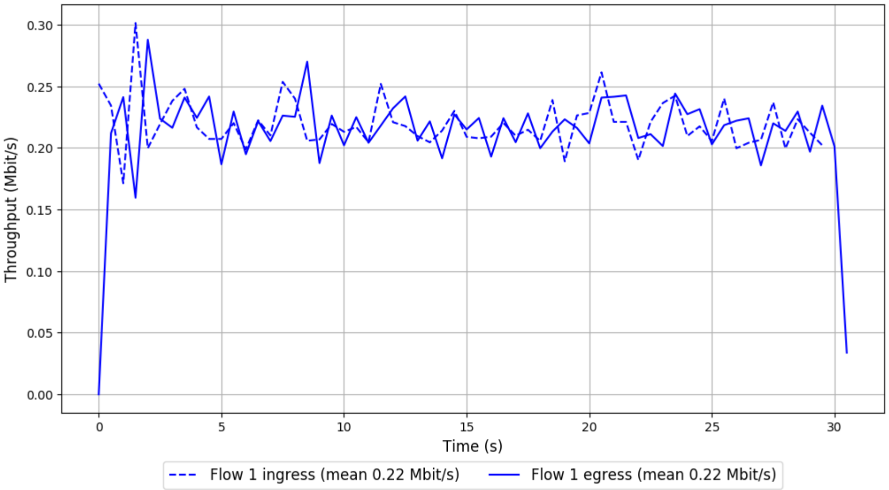
Run 1: Report of SCReAM — Data Link

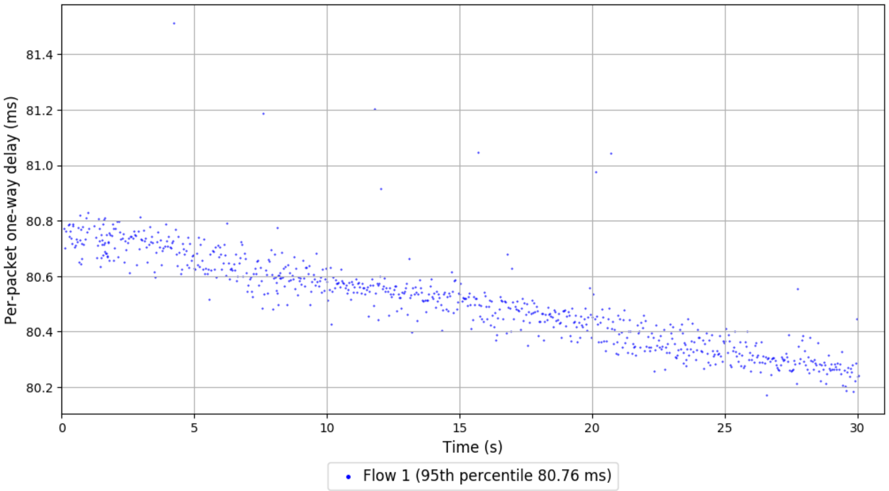




```
Run 2: Statistics of SCReAM

Start at: 2018-12-02 00:59:26
End at: 2018-12-02 00:59:56
Local clock offset: -2.11 ms
Remote clock offset: 5.809 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.762 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.762 ms
Loss rate: 0.00%
```

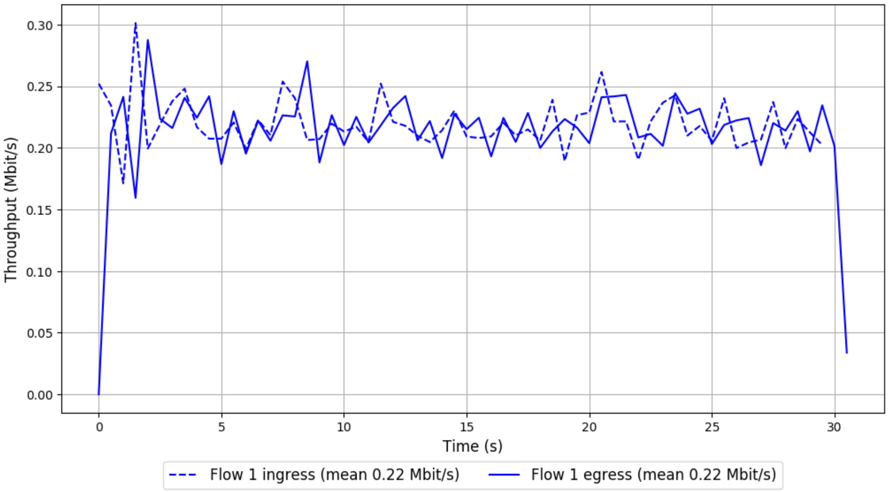
Run 2: Report of SCReAM — Data Link

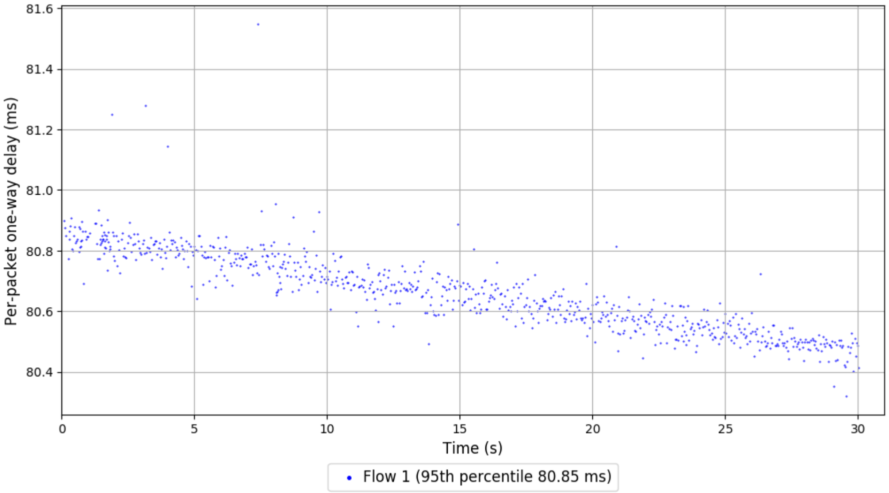




```
Run 3: Statistics of SCReAM

Start at: 2018-12-02 01:21:44
End at: 2018-12-02 01:22:14
Local clock offset: -2.556 ms
Remote clock offset: 21.802 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.849 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.849 ms
Loss rate: 0.00%
```

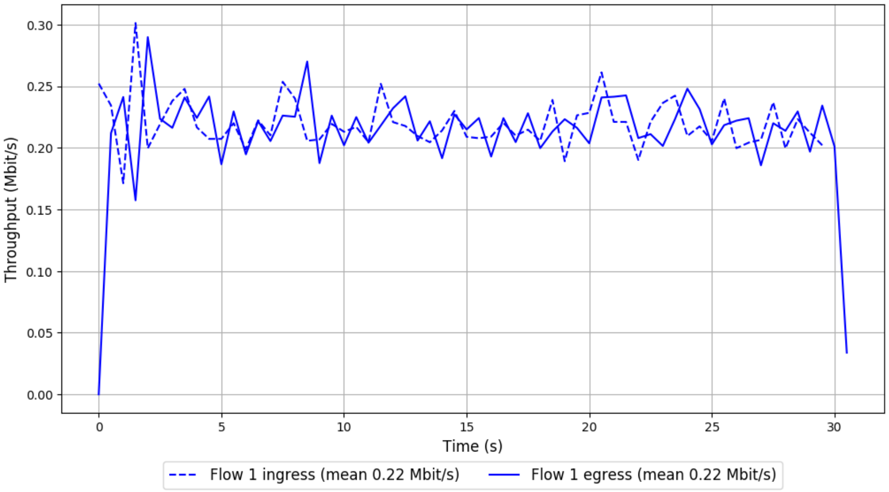
Run 3: Report of SCReAM — Data Link

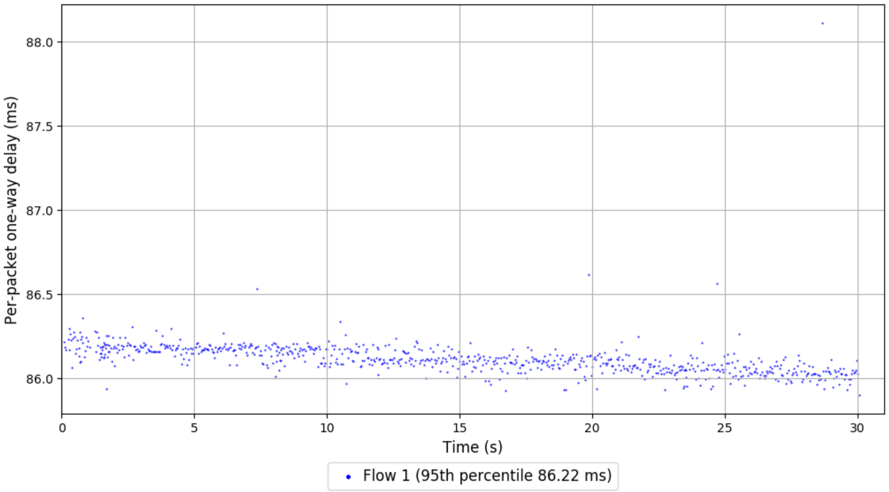




```
Run 4: Statistics of SCReAM

Start at: 2018-12-02 01:43:57
End at: 2018-12-02 01:44:27
Local clock offset: -4.813 ms
Remote clock offset: 33.993 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 86.217 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 86.217 ms
Loss rate: 0.00%
```

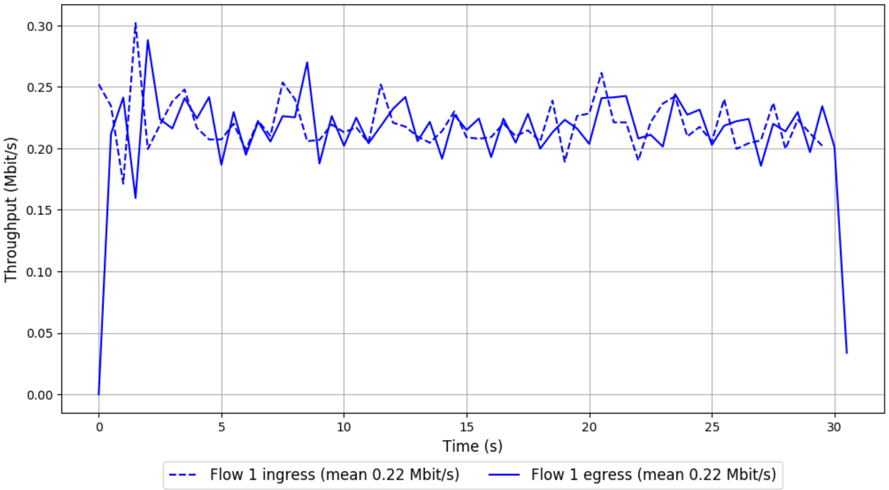
Run 4: Report of SCReAM — Data Link

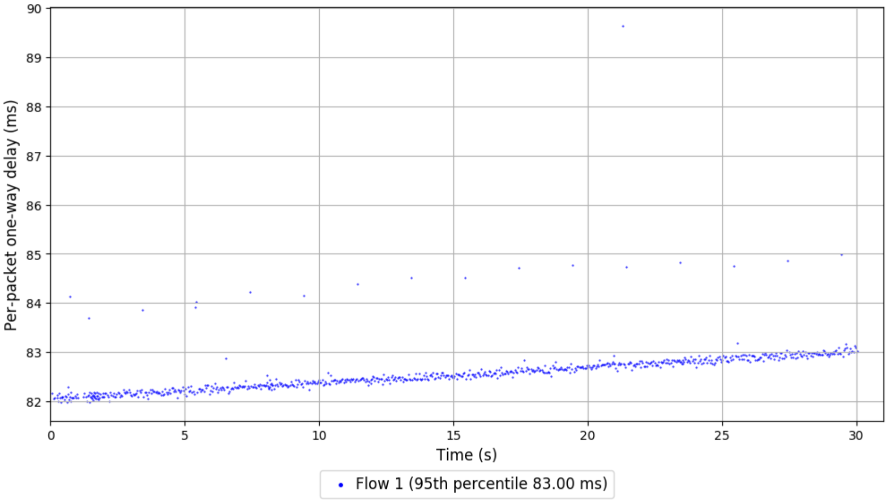




```
Run 5: Statistics of SCReAM

Start at: 2018-12-02 02:06:10
End at: 2018-12-02 02:06:40
Local clock offset: -5.953 ms
Remote clock offset: 15.715 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 83.005 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 83.005 ms
Loss rate: 0.00%
```

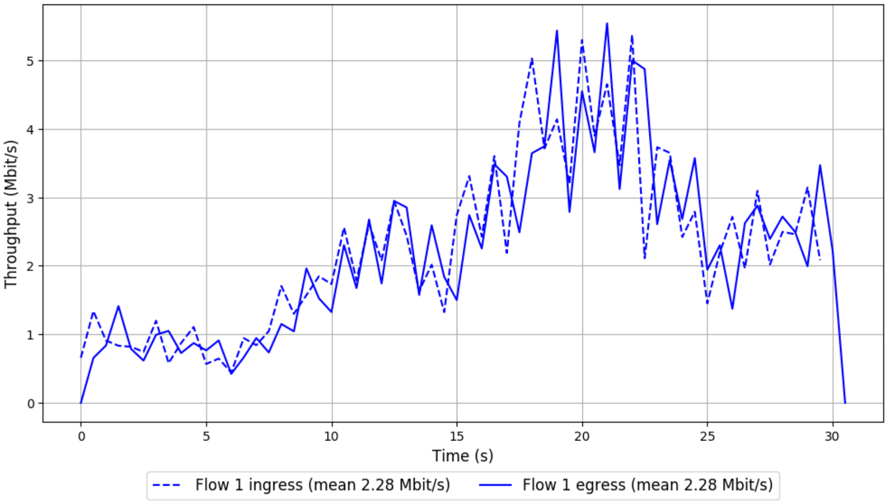
Run 5: Report of SCReAM — Data Link

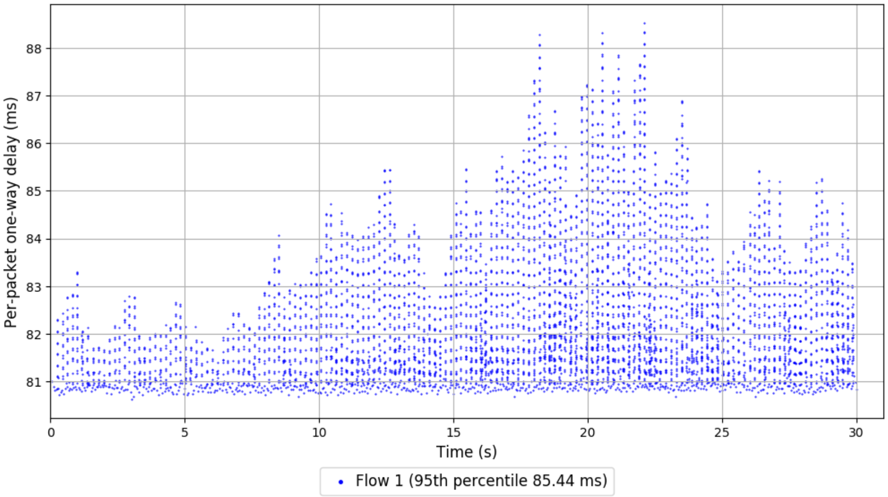




```
Run 1: Statistics of Sprout

Start at: 2018-12-02 00:36:05
End at: 2018-12-02 00:36:35
Local clock offset: -4.831 ms
Remote clock offset: -15.661 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.28 Mbit/s
95th percentile per-packet one-way delay: 85.439 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.28 Mbit/s
95th percentile per-packet one-way delay: 85.439 ms
Loss rate: 0.00%
```

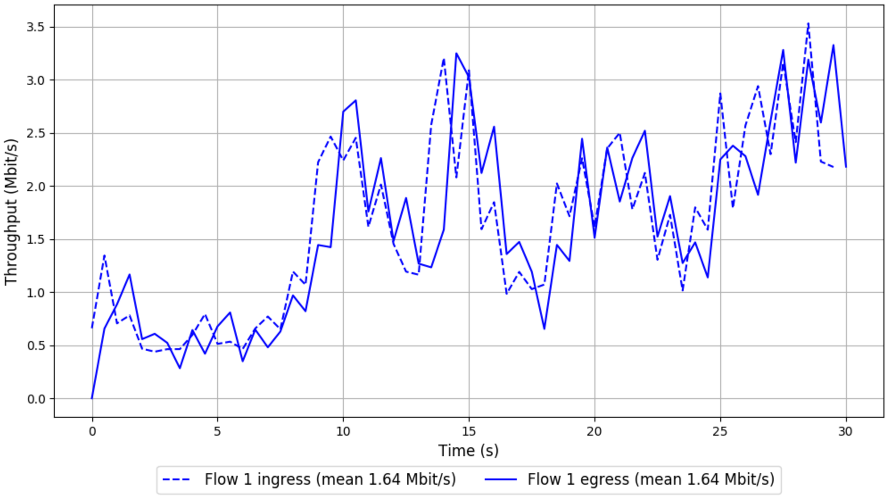
Run 1: Report of Sprout — Data Link

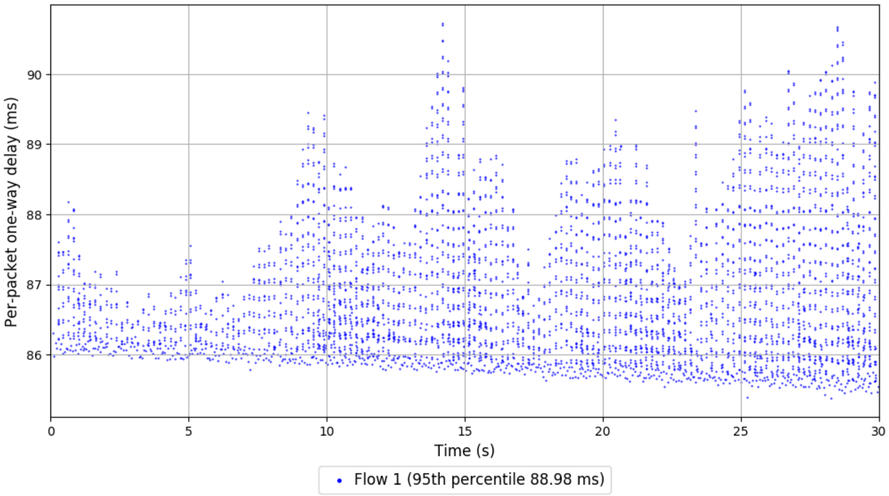




```
Run 2: Statistics of Sprout

Start at: 2018-12-02 00:58:18
End at: 2018-12-02 00:58:48
Local clock offset: -3.119 ms
Remote clock offset: 7.93 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.64 Mbit/s
95th percentile per-packet one-way delay: 88.980 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.64 Mbit/s
95th percentile per-packet one-way delay: 88.980 ms
Loss rate: 0.00%
```

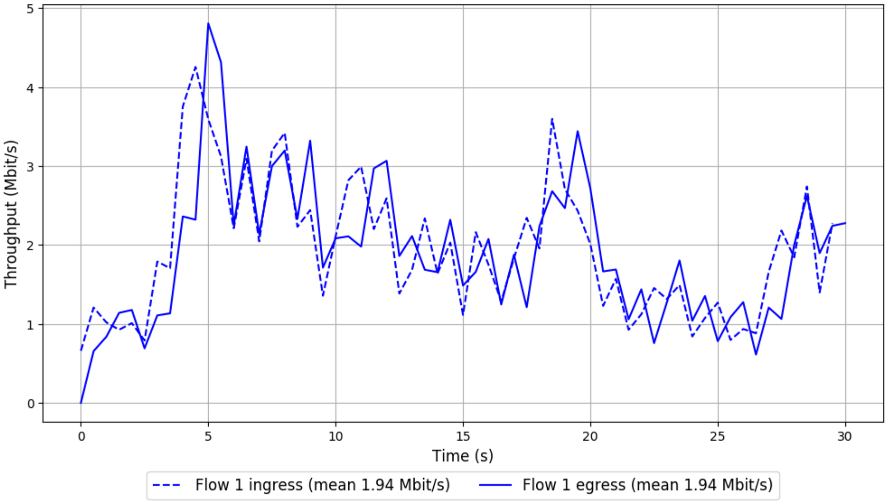
Run 2: Report of Sprout — Data Link

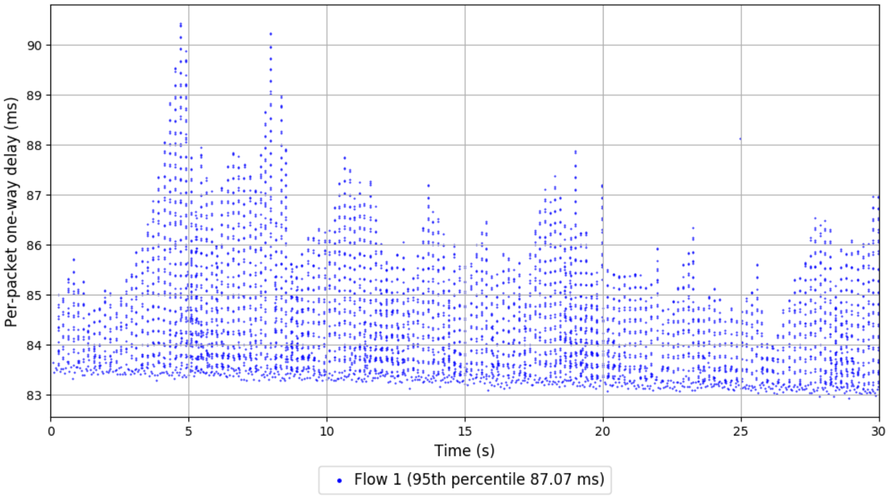




```
Run 3: Statistics of Sprout

Start at: 2018-12-02 01:20:37
End at: 2018-12-02 01:21:07
Local clock offset: -2.061 ms
Remote clock offset: 24.125 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 87.068 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 87.068 ms
Loss rate: 0.00%
```

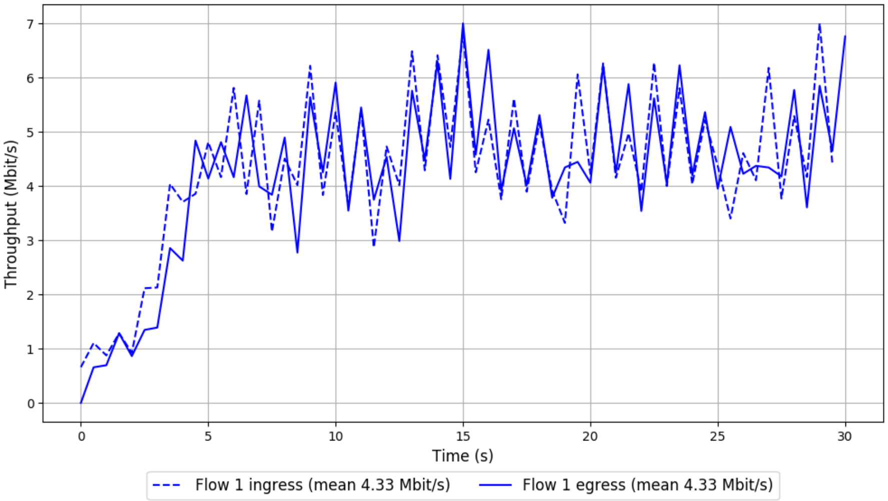
Run 3: Report of Sprout — Data Link

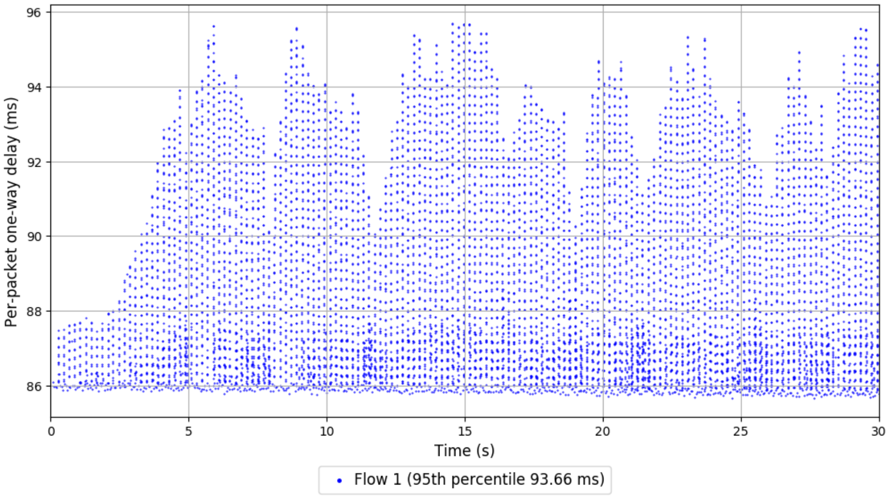




```
Run 4: Statistics of Sprout

Start at: 2018-12-02 01:42:49
End at: 2018-12-02 01:43:19
Local clock offset: -4.787 ms
Remote clock offset: 29.861 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.33 Mbit/s
95th percentile per-packet one-way delay: 93.660 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 4.33 Mbit/s
95th percentile per-packet one-way delay: 93.660 ms
Loss rate: 0.00%
```

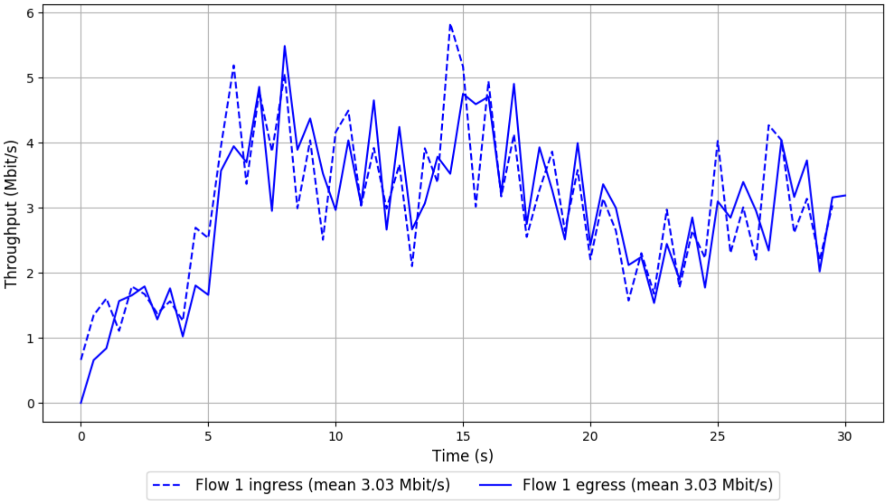
Run 4: Report of Sprout — Data Link

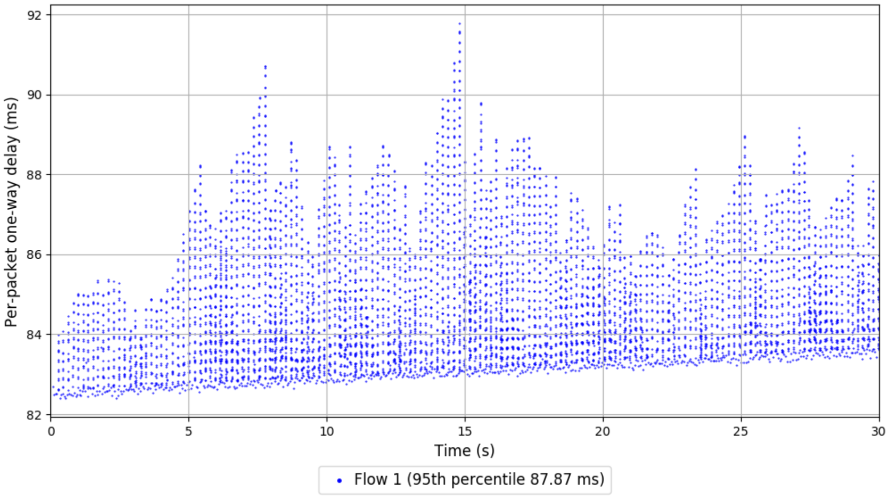




```
Run 5: Statistics of Sprout

Start at: 2018-12-02 02:05:02
End at: 2018-12-02 02:05:32
Local clock offset: -5.194 ms
Remote clock offset: 19.373 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.03 Mbit/s
95th percentile per-packet one-way delay: 87.868 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 3.03 Mbit/s
95th percentile per-packet one-way delay: 87.868 ms
Loss rate: 0.00%
```

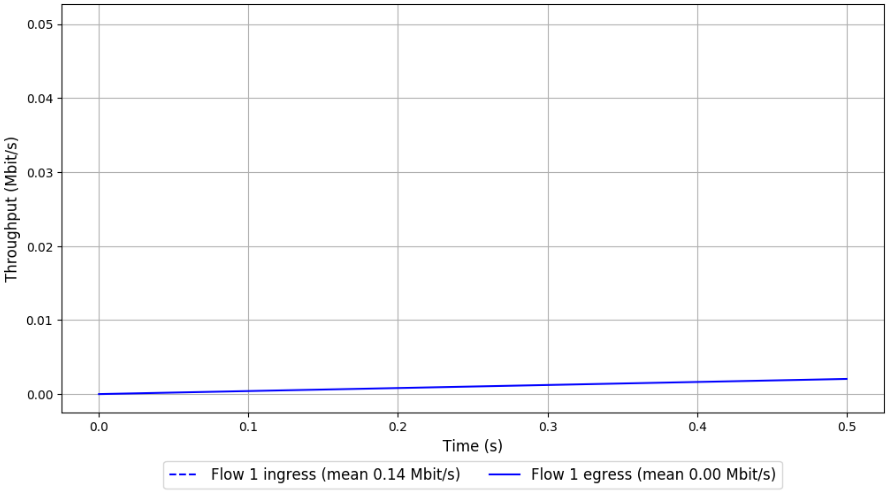
Run 5: Report of Sprout — Data Link

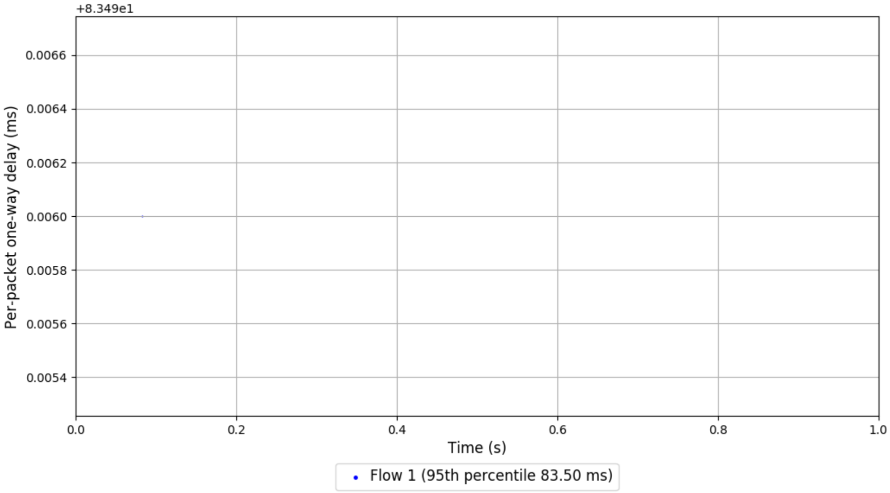




```
Run 1: Statistics of TaoVA-100x

Start at: 2018-12-02 00:38:20
End at: 2018-12-02 00:38:50
Local clock offset: -5.545 ms
Remote clock offset: -14.561 ms
```

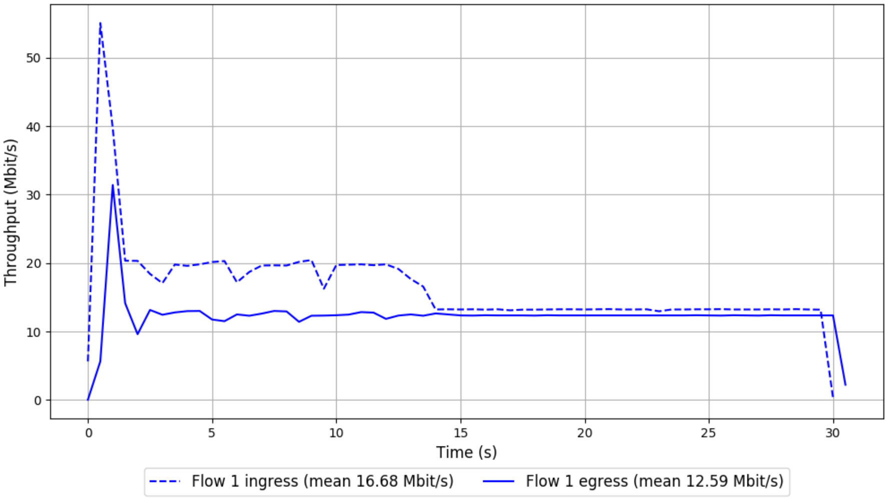
Run 1: Report of TaoVA-100x — Data Link

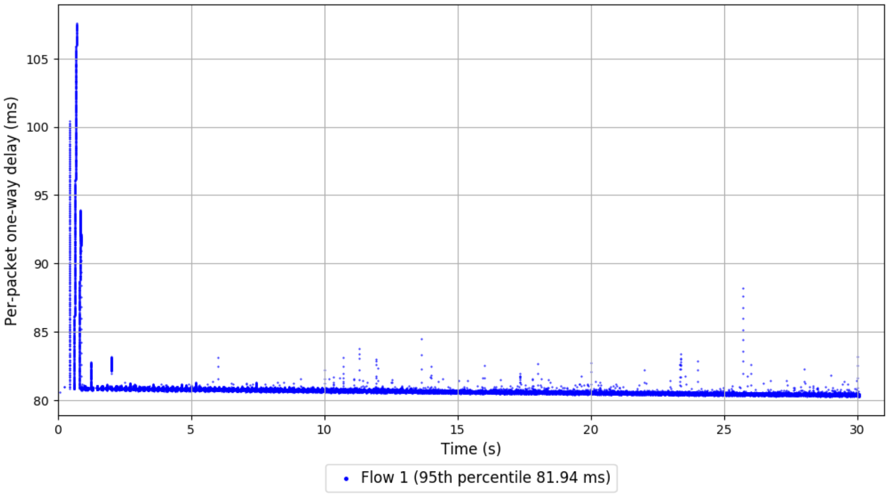




```
Run 2: Statistics of TaoVA-100x

Start at: 2018-12-02 01:00:33
End at: 2018-12-02 01:01:03
Local clock offset: -1.959 ms
Remote clock offset: 7.163 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.59 Mbit/s
95th percentile per-packet one-way delay: 81.945 ms
Loss rate: 24.55%
-- Flow 1:
Average throughput: 12.59 Mbit/s
95th percentile per-packet one-way delay: 81.945 ms
Loss rate: 24.55%
```

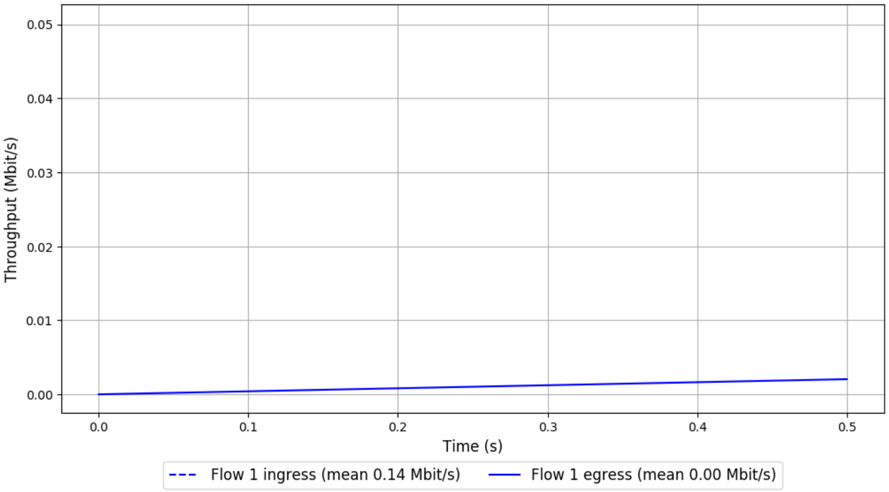
Run 2: Report of TaoVA-100x — Data Link

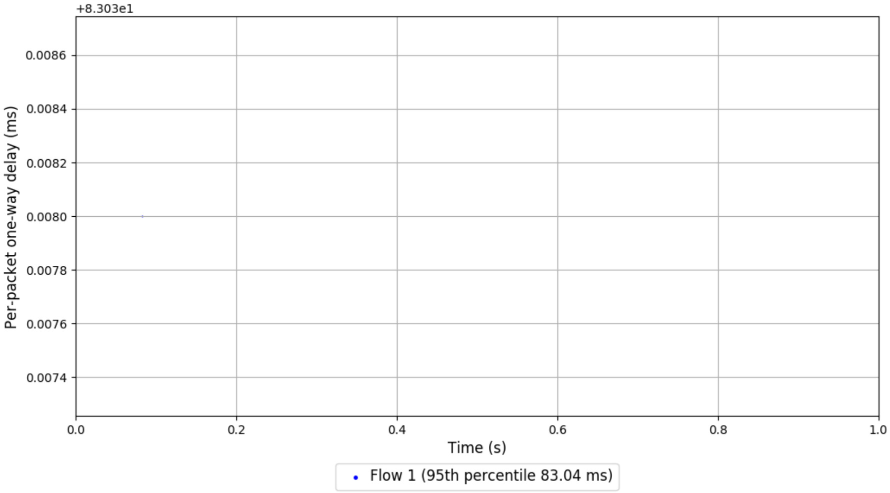




```
Run 3: Statistics of TaoVA-100x

Start at: 2018-12-02 01:22:52
End at: 2018-12-02 01:23:22
Local clock offset: -3.077 ms
Remote clock offset: 22.073 ms
```

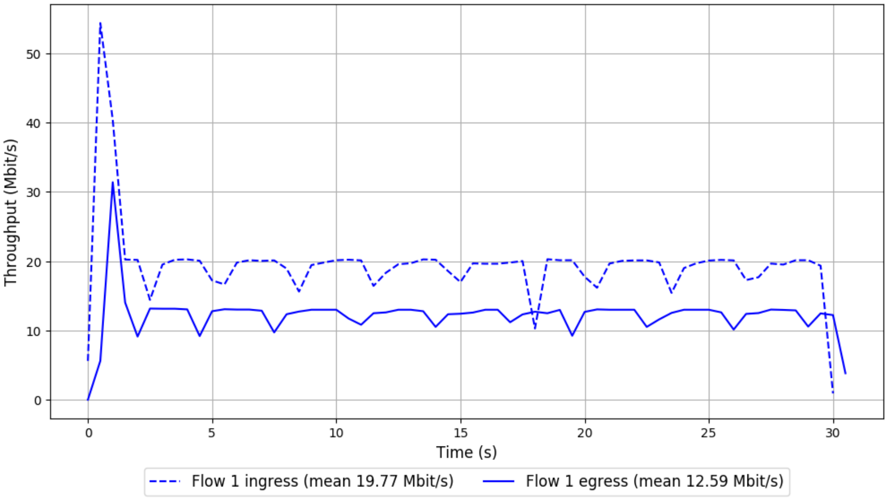
Run 3: Report of TaoVA-100x — Data Link

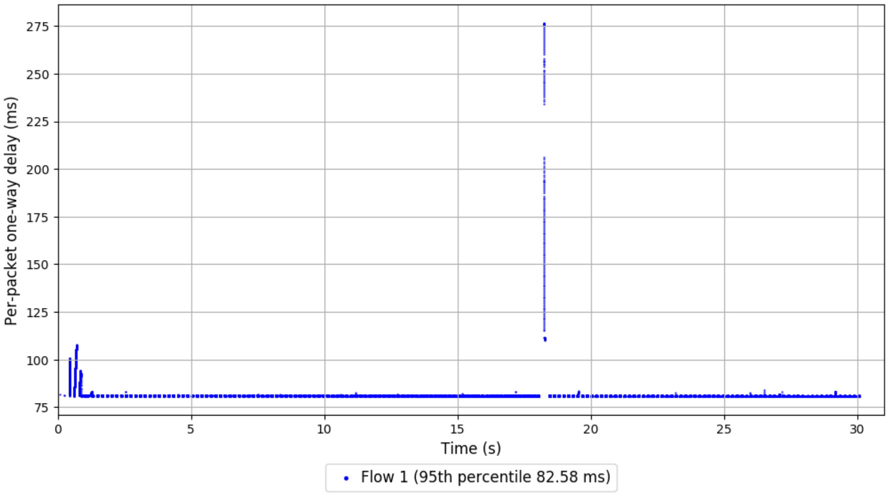




```
Run 4: Statistics of TaoVA-100x

Start at: 2018-12-02 01:45:04
End at: 2018-12-02 01:45:34
Local clock offset: -4.896 ms
Remote clock offset: 29.561 ms

# Below is generated by plot.py at 2018-12-02 02:18:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.59 Mbit/s
95th percentile per-packet one-way delay: 82.583 ms
Loss rate: 36.31%
-- Flow 1:
Average throughput: 12.59 Mbit/s
95th percentile per-packet one-way delay: 82.583 ms
Loss rate: 36.31%
```

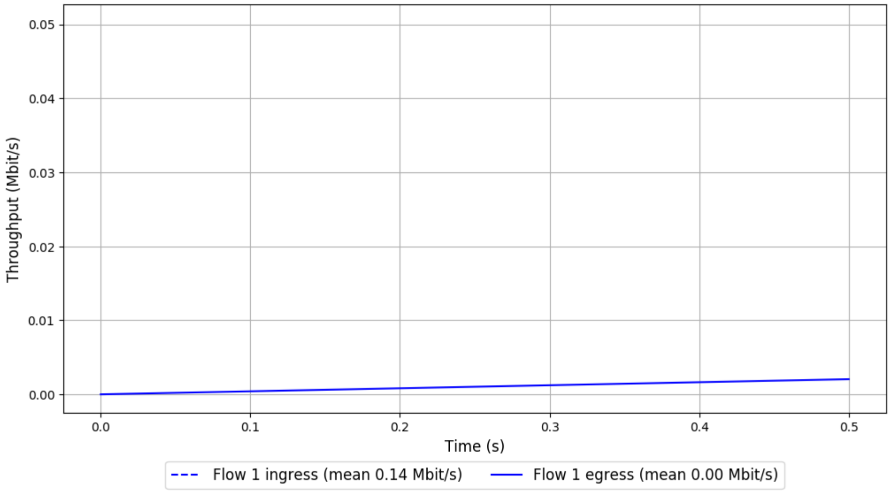
Run 4: Report of TaoVA-100x — Data Link

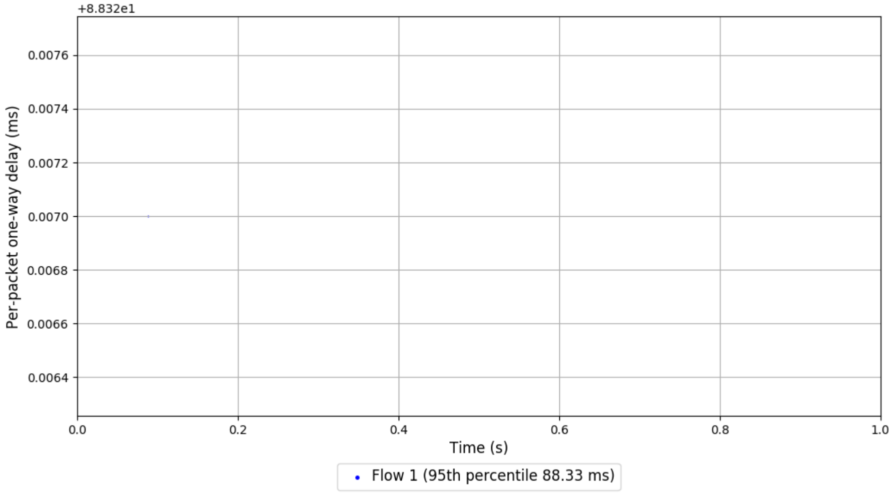




```
Run 5: Statistics of TaoVA-100x

Start at: 2018-12-02 02:07:17
End at: 2018-12-02 02:07:47
Local clock offset: -5.958 ms
Remote clock offset: 19.89 ms
```

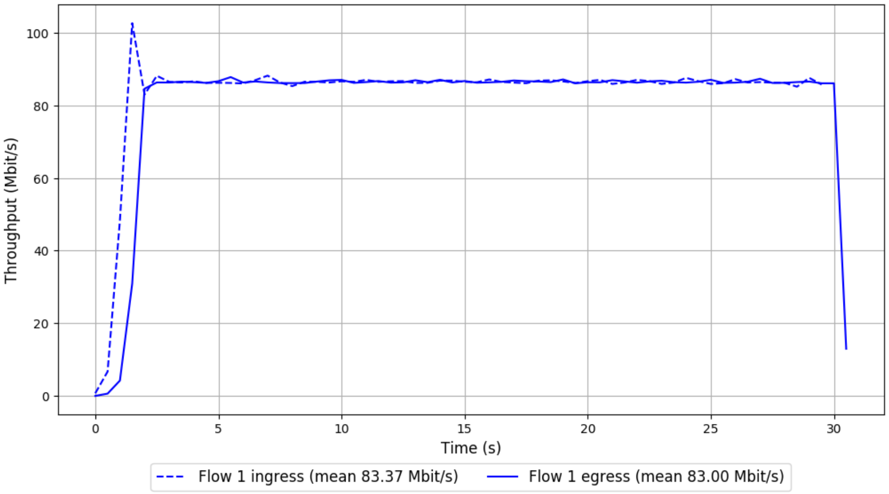
Run 5: Report of TaoVA-100x — Data Link

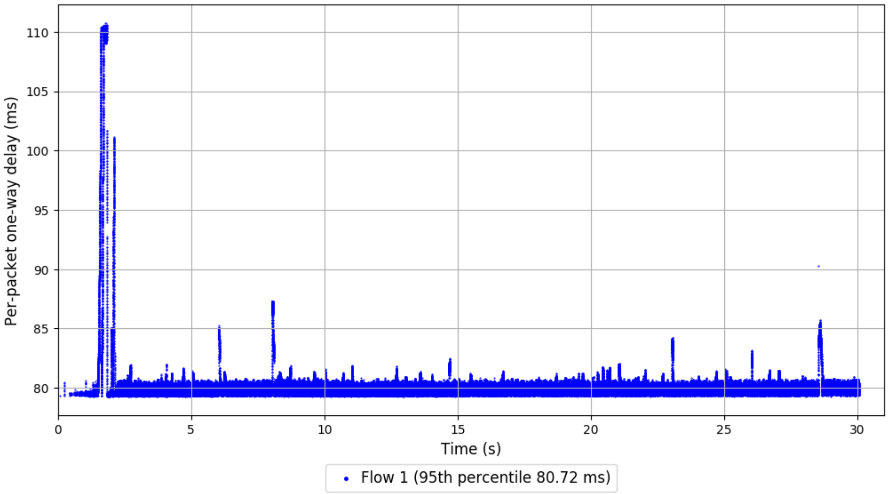




```
Run 1: Statistics of TCP Vegas

Start at: 2018-12-02 00:40:39
End at: 2018-12-02 00:41:09
Local clock offset: -4.704 ms
Remote clock offset: -15.888 ms

# Below is generated by plot.py at 2018-12-02 02:19:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 83.00 Mbit/s
95th percentile per-packet one-way delay: 80.720 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 83.00 Mbit/s
95th percentile per-packet one-way delay: 80.720 ms
Loss rate: 0.44%
```

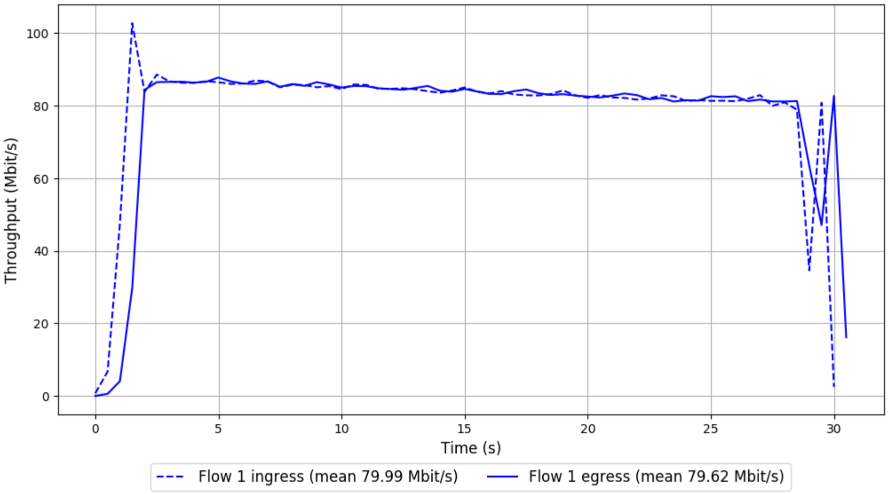
Run 1: Report of TCP Vegas — Data Link

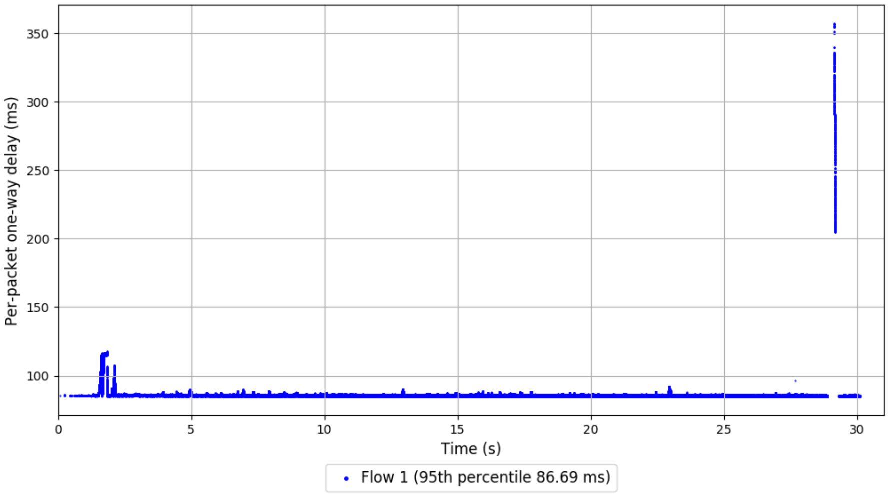




```
Run 2: Statistics of TCP Vegas

Start at: 2018-12-02 01:02:53
End at: 2018-12-02 01:03:23
Local clock offset: -2.403 ms
Remote clock offset: 14.44 ms

# Below is generated by plot.py at 2018-12-02 02:19:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 79.62 Mbit/s
95th percentile per-packet one-way delay: 86.694 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 79.62 Mbit/s
95th percentile per-packet one-way delay: 86.694 ms
Loss rate: 0.47%
```

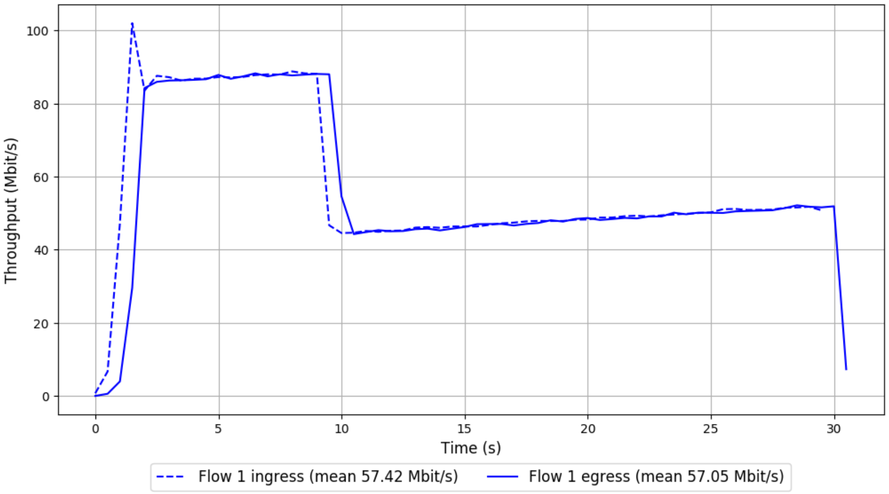
Run 2: Report of TCP Vegas — Data Link

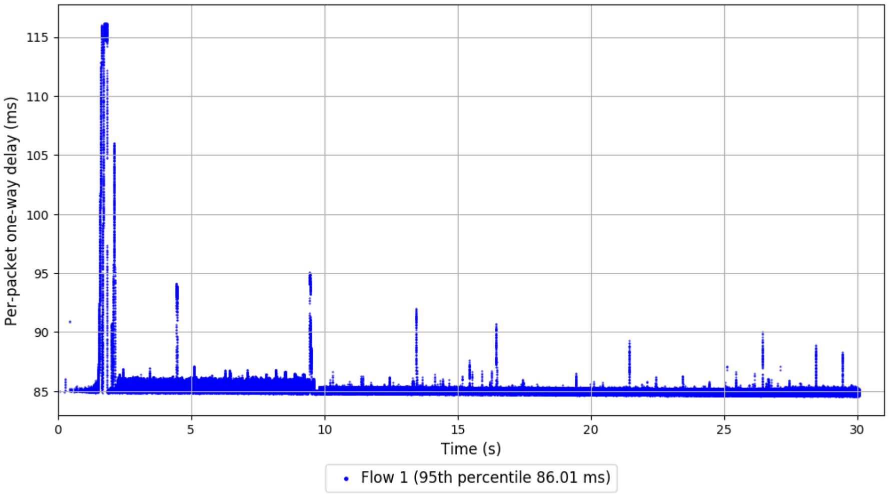




```
Run 3: Statistics of TCP Vegas

Start at: 2018-12-02 01:25:10
End at: 2018-12-02 01:25:40
Local clock offset: -3.72 ms
Remote clock offset: 27.009 ms

# Below is generated by plot.py at 2018-12-02 02:19:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 57.05 Mbit/s
95th percentile per-packet one-way delay: 86.008 ms
Loss rate: 0.64%
-- Flow 1:
Average throughput: 57.05 Mbit/s
95th percentile per-packet one-way delay: 86.008 ms
Loss rate: 0.64%
```

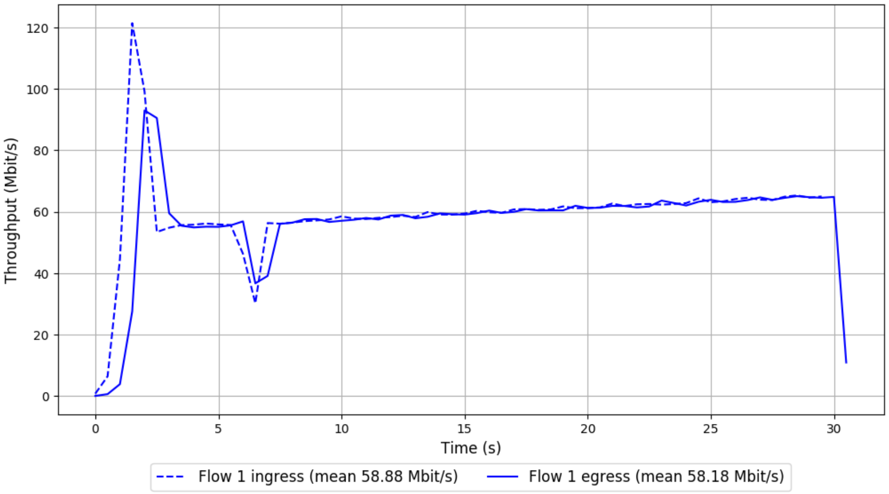
Run 3: Report of TCP Vegas — Data Link

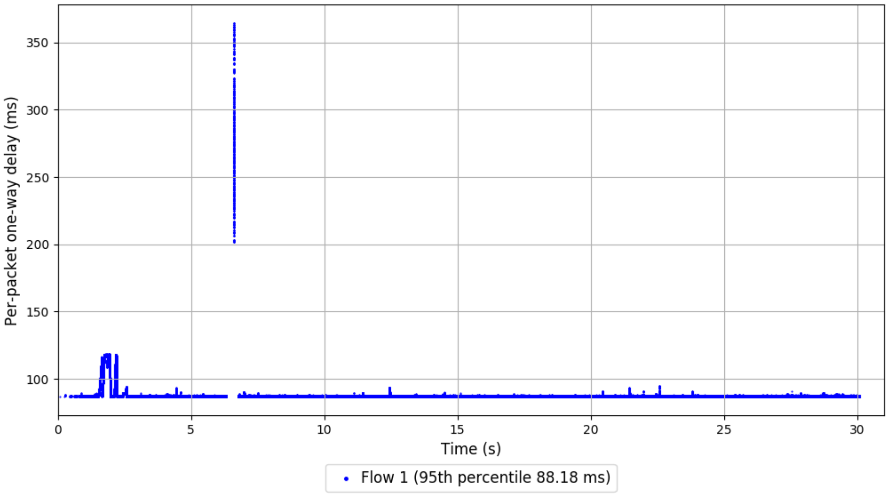




```
Run 4: Statistics of TCP Vegas

Start at: 2018-12-02 01:47:24
End at: 2018-12-02 01:47:54
Local clock offset: -5.602 ms
Remote clock offset: 35.332 ms

# Below is generated by plot.py at 2018-12-02 02:19:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 58.18 Mbit/s
95th percentile per-packet one-way delay: 88.177 ms
Loss rate: 1.19%
-- Flow 1:
Average throughput: 58.18 Mbit/s
95th percentile per-packet one-way delay: 88.177 ms
Loss rate: 1.19%
```

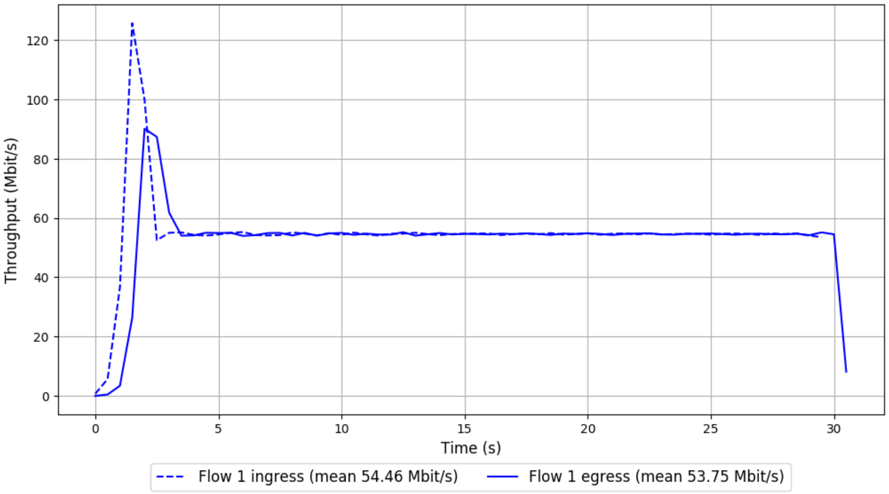
Run 4: Report of TCP Vegas — Data Link

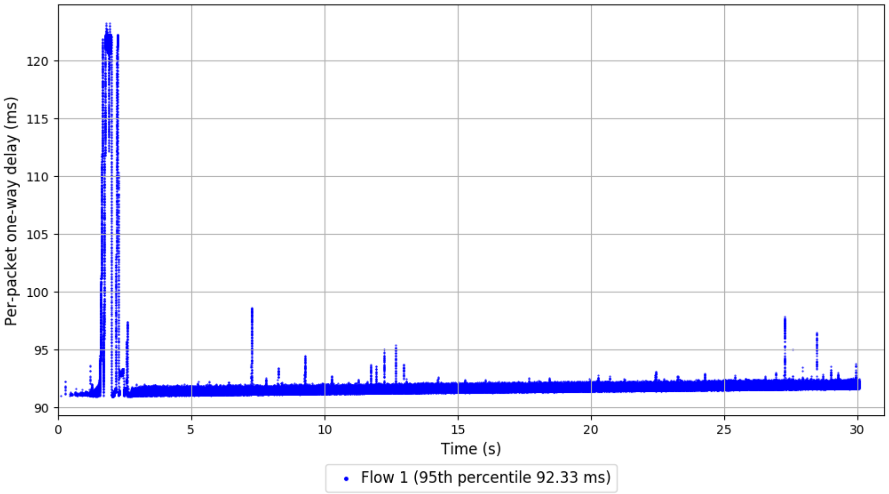




```
Run 5: Statistics of TCP Vegas

Start at: 2018-12-02 02:09:35
End at: 2018-12-02 02:10:05
Local clock offset: -5.939 ms
Remote clock offset: 14.924 ms

# Below is generated by plot.py at 2018-12-02 02:19:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 53.75 Mbit/s
95th percentile per-packet one-way delay: 92.327 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 53.75 Mbit/s
95th percentile per-packet one-way delay: 92.327 ms
Loss rate: 1.32%
```

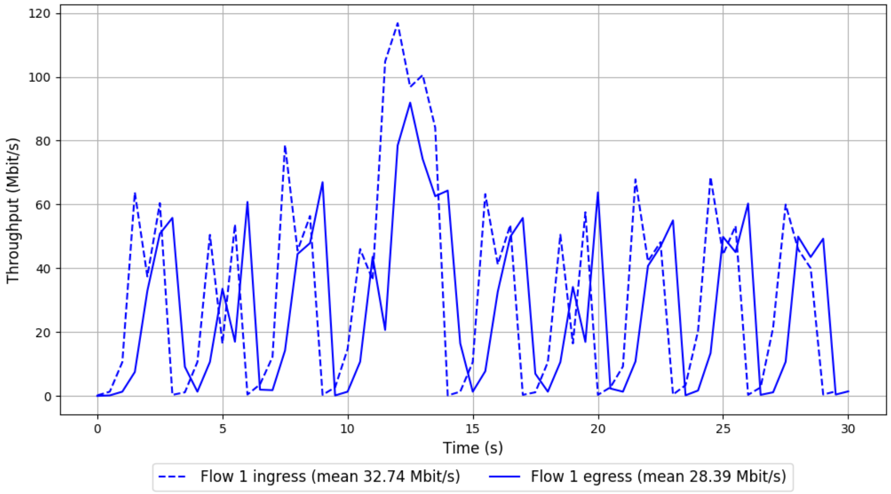
Run 5: Report of TCP Vegas — Data Link

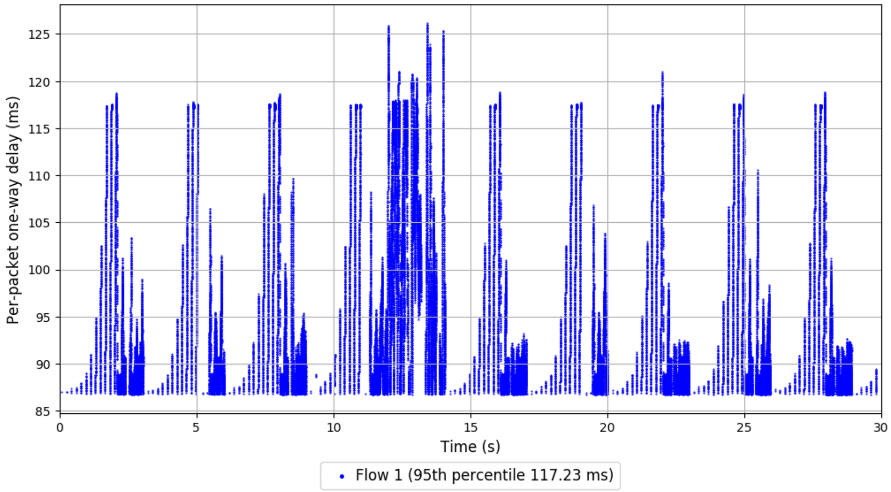




```
Run 1: Statistics of Verus

Start at: 2018-12-02 00:27:51
End at: 2018-12-02 00:28:21
Local clock offset: -5.233 ms
Remote clock offset: -10.604 ms

# Below is generated by plot.py at 2018-12-02 02:19:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 28.39 Mbit/s
95th percentile per-packet one-way delay: 117.231 ms
Loss rate: 13.26%
-- Flow 1:
Average throughput: 28.39 Mbit/s
95th percentile per-packet one-way delay: 117.231 ms
Loss rate: 13.26%
```

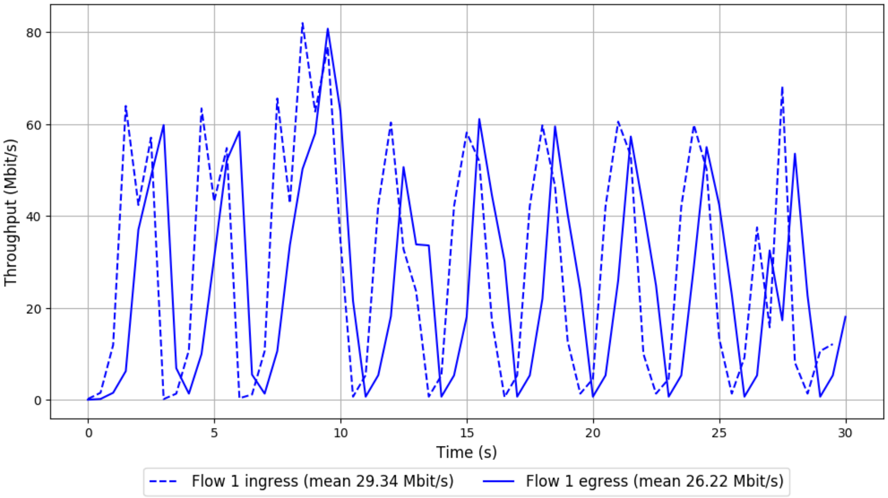
Run 1: Report of Verus — Data Link

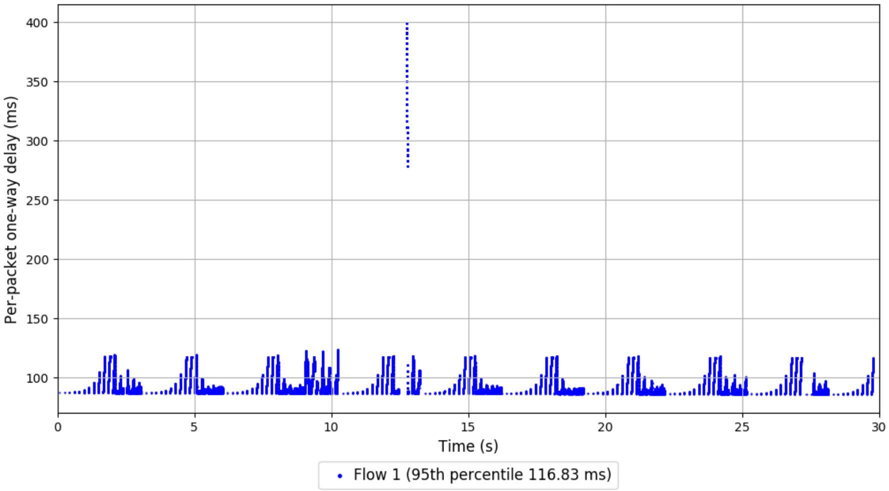




```
Run 2: Statistics of Verus

Start at: 2018-12-02 00:50:06
End at: 2018-12-02 00:50:36
Local clock offset: -4.595 ms
Remote clock offset: -8.069 ms

# Below is generated by plot.py at 2018-12-02 02:19:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 26.22 Mbit/s
95th percentile per-packet one-way delay: 116.833 ms
Loss rate: 10.55%
-- Flow 1:
Average throughput: 26.22 Mbit/s
95th percentile per-packet one-way delay: 116.833 ms
Loss rate: 10.55%
```

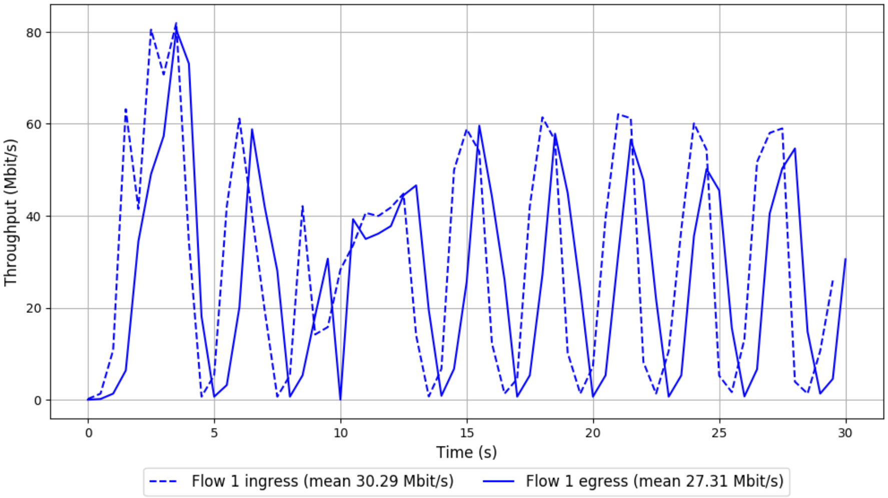
Run 2: Report of Verus — Data Link

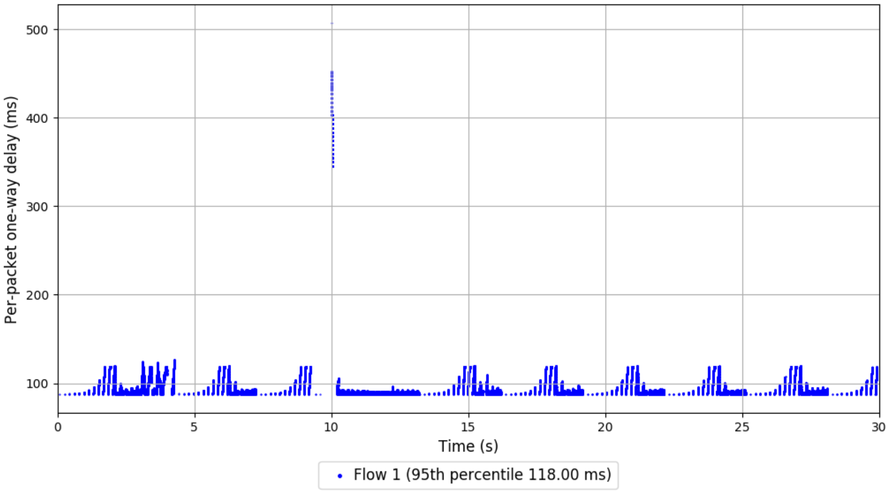




```
Run 3: Statistics of Verus

Start at: 2018-12-02 01:12:22
End at: 2018-12-02 01:12:52
Local clock offset: -1.308 ms
Remote clock offset: 21.215 ms

# Below is generated by plot.py at 2018-12-02 02:19:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 27.31 Mbit/s
95th percentile per-packet one-way delay: 117.996 ms
Loss rate: 9.73%
-- Flow 1:
Average throughput: 27.31 Mbit/s
95th percentile per-packet one-way delay: 117.996 ms
Loss rate: 9.73%
```

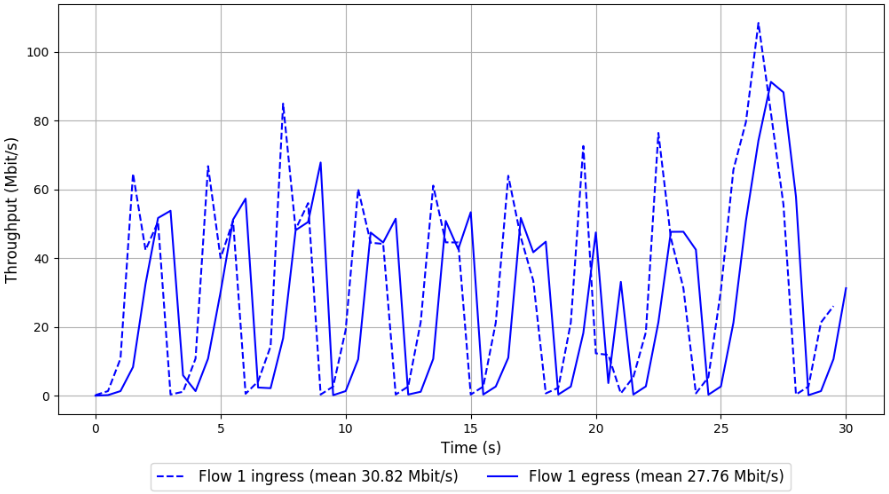
Run 3: Report of Verus — Data Link

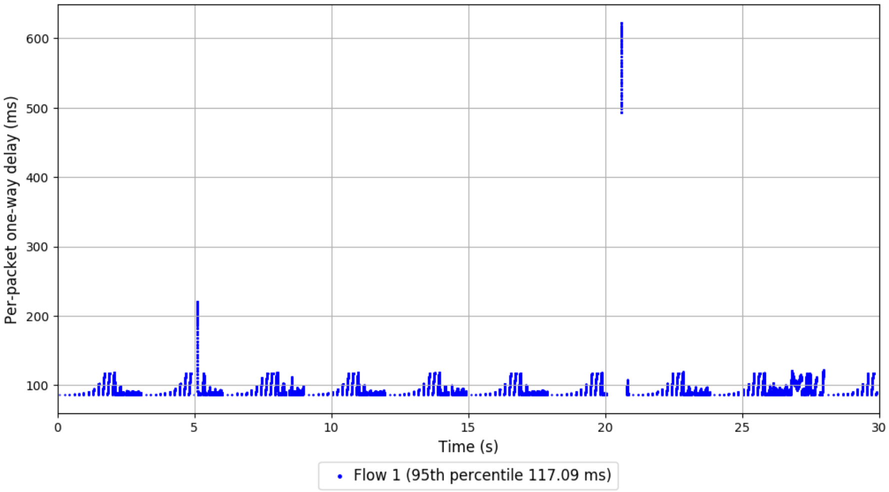




```
Run 4: Statistics of Verus

Start at: 2018-12-02 01:34:37
End at: 2018-12-02 01:35:07
Local clock offset: -5.29 ms
Remote clock offset: 30.729 ms

# Below is generated by plot.py at 2018-12-02 02:19:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 27.76 Mbit/s
95th percentile per-packet one-way delay: 117.088 ms
Loss rate: 9.92%
-- Flow 1:
Average throughput: 27.76 Mbit/s
95th percentile per-packet one-way delay: 117.088 ms
Loss rate: 9.92%
```

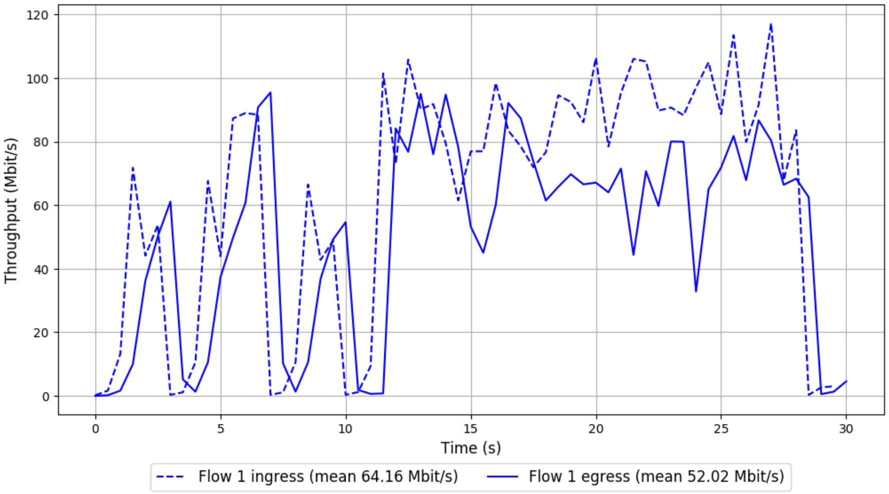
Run 4: Report of Verus — Data Link

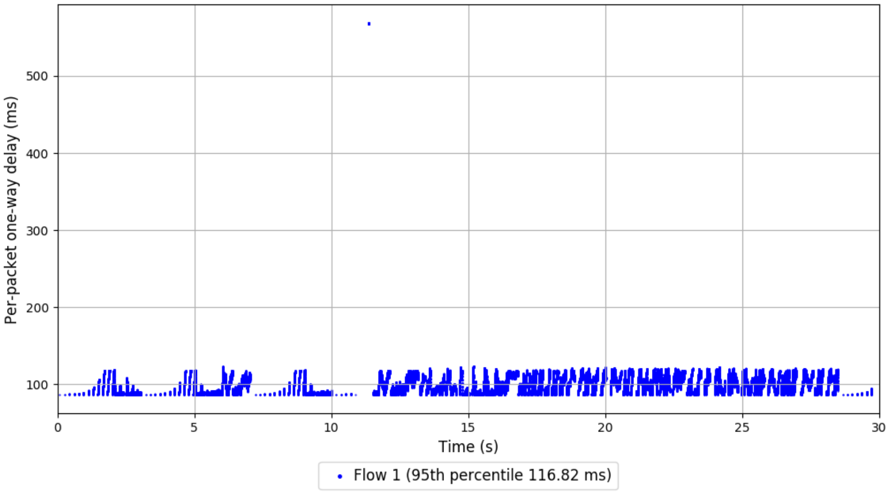




```
Run 5: Statistics of Verus

Start at: 2018-12-02 01:56:47
End at: 2018-12-02 01:57:17
Local clock offset: -5.901 ms
Remote clock offset: 38.81 ms

# Below is generated by plot.py at 2018-12-02 02:19:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 52.02 Mbit/s
95th percentile per-packet one-way delay: 116.819 ms
Loss rate: 18.91%
-- Flow 1:
Average throughput: 52.02 Mbit/s
95th percentile per-packet one-way delay: 116.819 ms
Loss rate: 18.91%
```

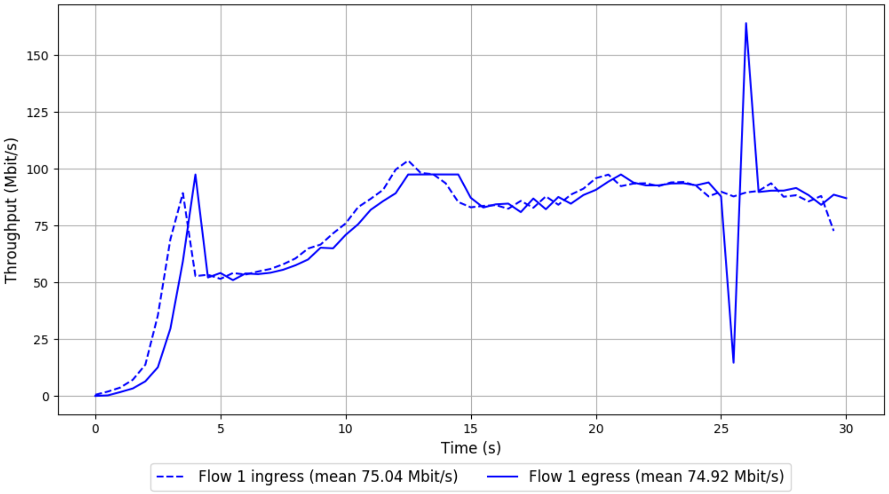
Run 5: Report of Verus — Data Link

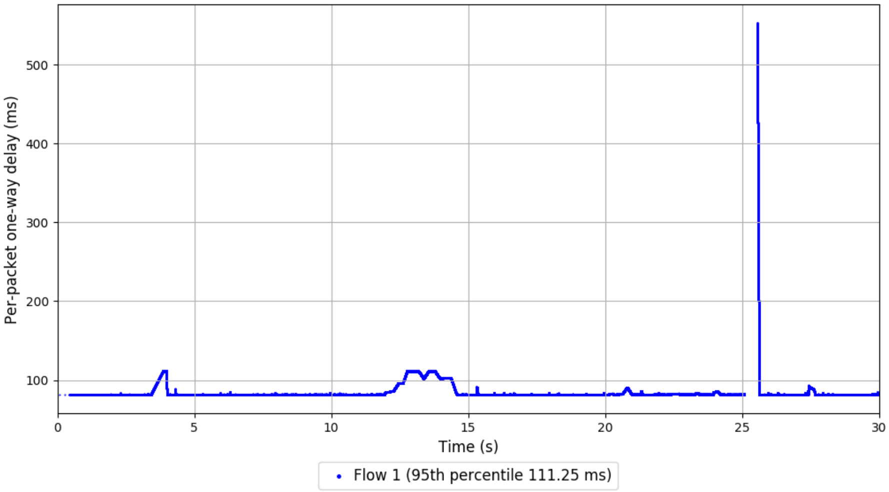




```
Run 1: Statistics of PCC-Vivace

Start at: 2018-12-02 00:32:33
End at: 2018-12-02 00:33:03
Local clock offset: -5.547 ms
Remote clock offset: -14.444 ms

# Below is generated by plot.py at 2018-12-02 02:19:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 74.92 Mbit/s
95th percentile per-packet one-way delay: 111.251 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 74.92 Mbit/s
95th percentile per-packet one-way delay: 111.251 ms
Loss rate: 0.16%
```

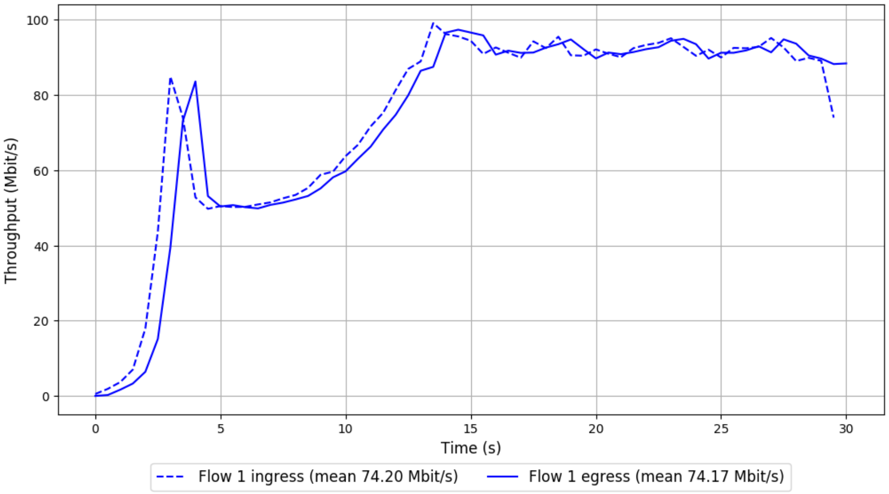
Run 1: Report of PCC-Vivace — Data Link

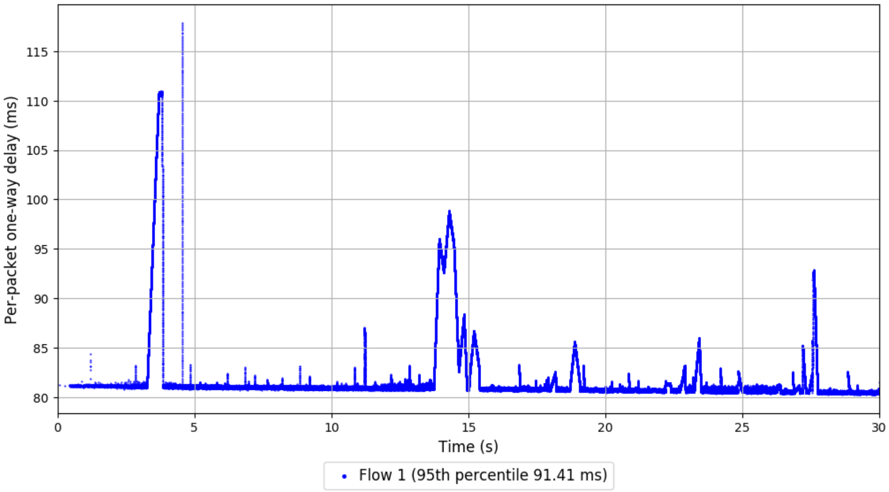




```
Run 2: Statistics of PCC-Vivace

Start at: 2018-12-02 00:54:46
End at: 2018-12-02 00:55:16
Local clock offset: -3.637 ms
Remote clock offset: -1.387 ms

# Below is generated by plot.py at 2018-12-02 02:19:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 74.17 Mbit/s
95th percentile per-packet one-way delay: 91.409 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 74.17 Mbit/s
95th percentile per-packet one-way delay: 91.409 ms
Loss rate: 0.05%
```

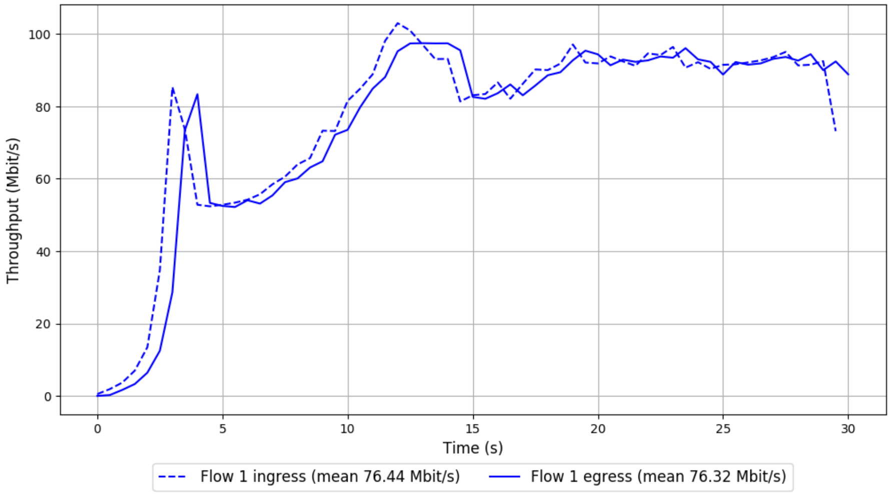
Run 2: Report of PCC-Vivace — Data Link

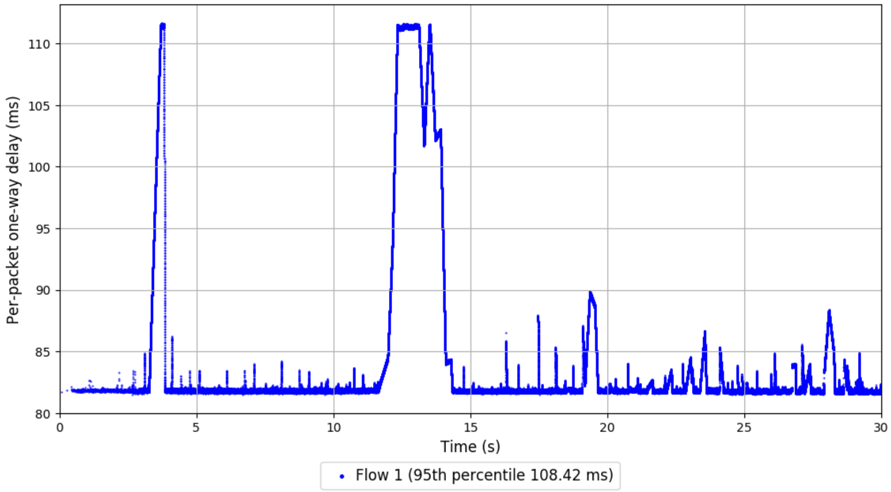




```
Run 3: Statistics of PCC-Vivace

Start at: 2018-12-02 01:17:04
End at: 2018-12-02 01:17:34
Local clock offset: -0.802 ms
Remote clock offset: 18.586 ms

# Below is generated by plot.py at 2018-12-02 02:19:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 76.32 Mbit/s
95th percentile per-packet one-way delay: 108.418 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 76.32 Mbit/s
95th percentile per-packet one-way delay: 108.418 ms
Loss rate: 0.15%
```

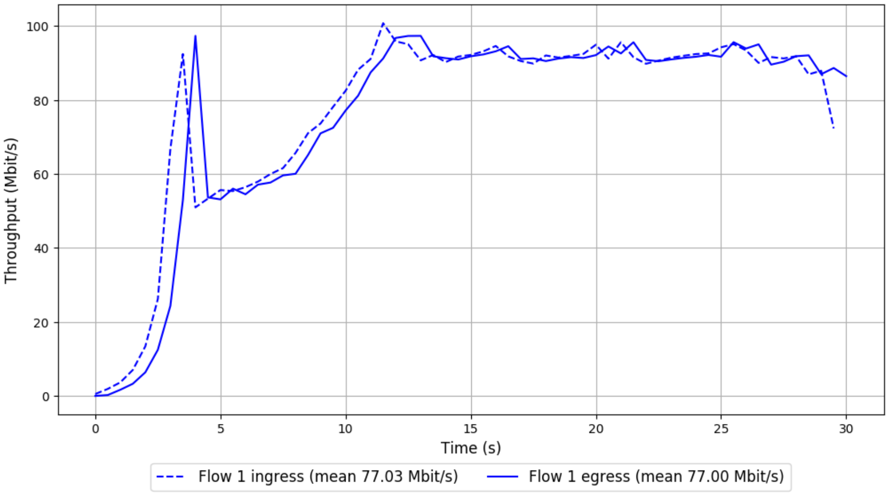
Run 3: Report of PCC-Vivace — Data Link

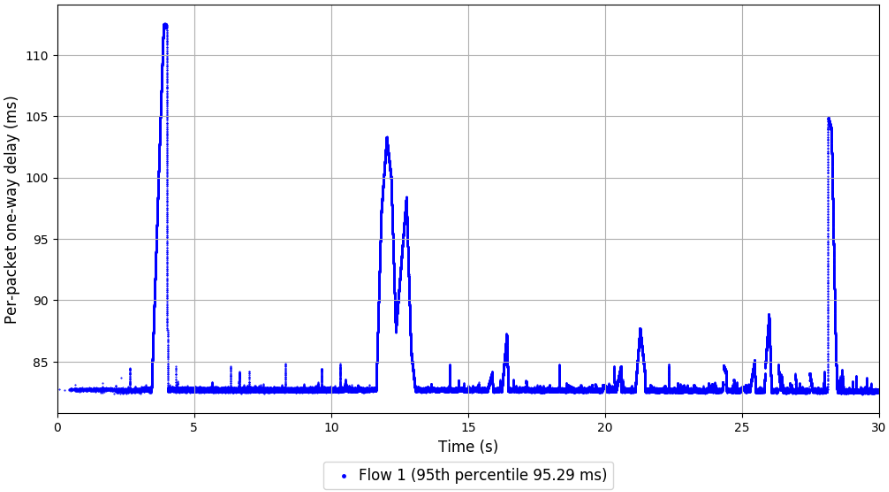




```
Run 4: Statistics of PCC-Vivace

Start at: 2018-12-02 01:39:17
End at: 2018-12-02 01:39:47
Local clock offset: -5.462 ms
Remote clock offset: 28.566 ms

# Below is generated by plot.py at 2018-12-02 02:19:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 77.00 Mbit/s
95th percentile per-packet one-way delay: 95.290 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 77.00 Mbit/s
95th percentile per-packet one-way delay: 95.290 ms
Loss rate: 0.04%
```

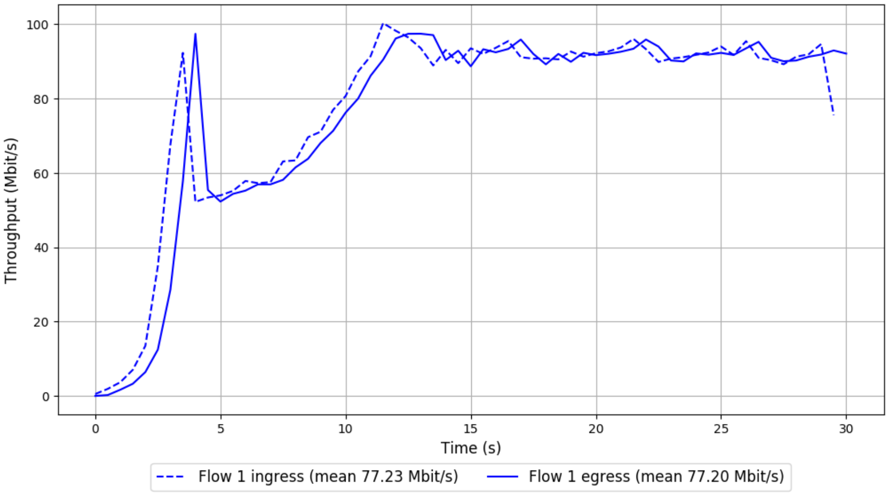
Run 4: Report of PCC-Vivace — Data Link

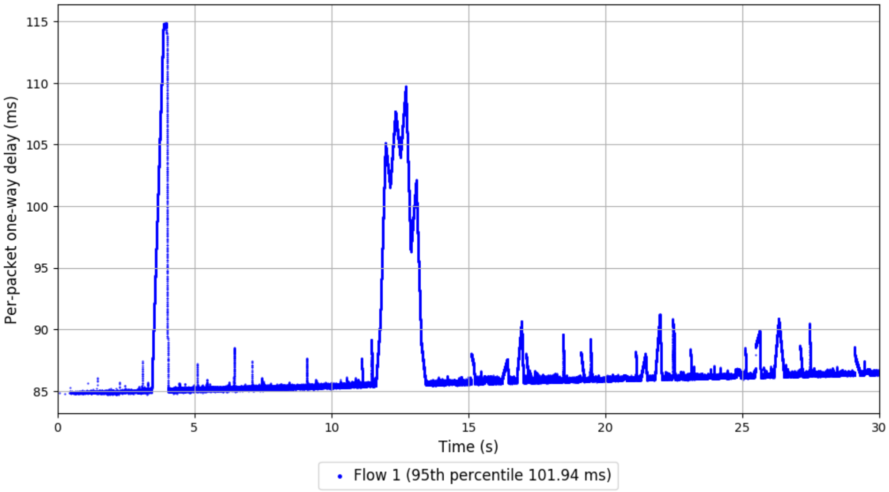




```
Run 5: Statistics of PCC-Vivace

Start at: 2018-12-02 02:01:30
End at: 2018-12-02 02:02:00
Local clock offset: -5.236 ms
Remote clock offset: 31.434 ms

# Below is generated by plot.py at 2018-12-02 02:19:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 77.20 Mbit/s
95th percentile per-packet one-way delay: 101.940 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 77.20 Mbit/s
95th percentile per-packet one-way delay: 101.940 ms
Loss rate: 0.04%
```

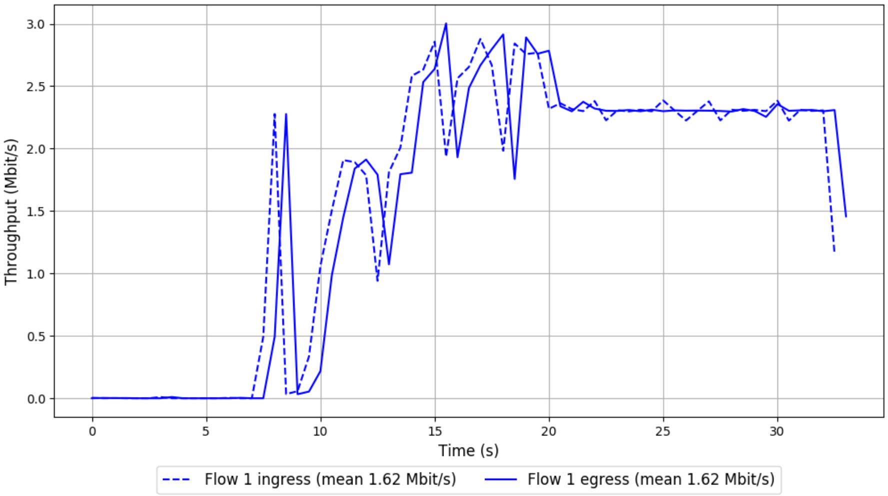
Run 5: Report of PCC-Vivace — Data Link

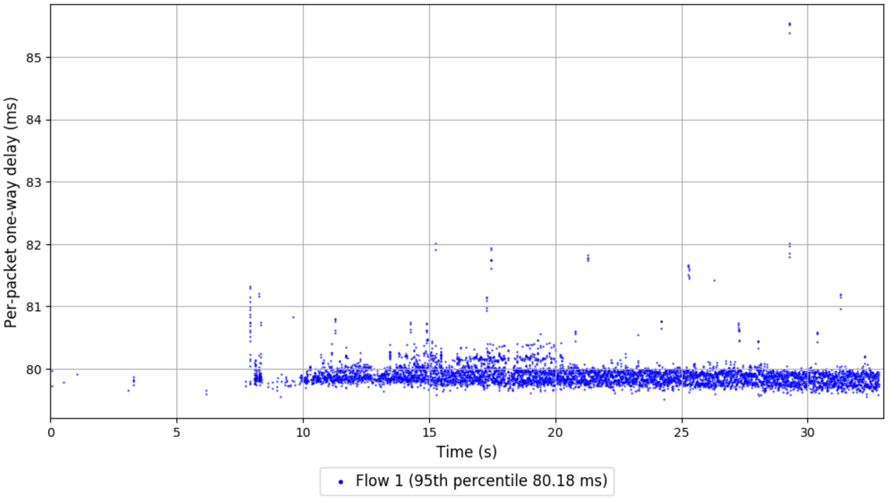




```
Run 1: Statistics of WebRTC media

Start at: 2018-12-02 00:19:37
End at: 2018-12-02 00:20:07
Local clock offset: -3.37 ms
Remote clock offset: -15.147 ms

# Below is generated by plot.py at 2018-12-02 02:19:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 80.181 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 80.181 ms
Loss rate: 0.00%
```

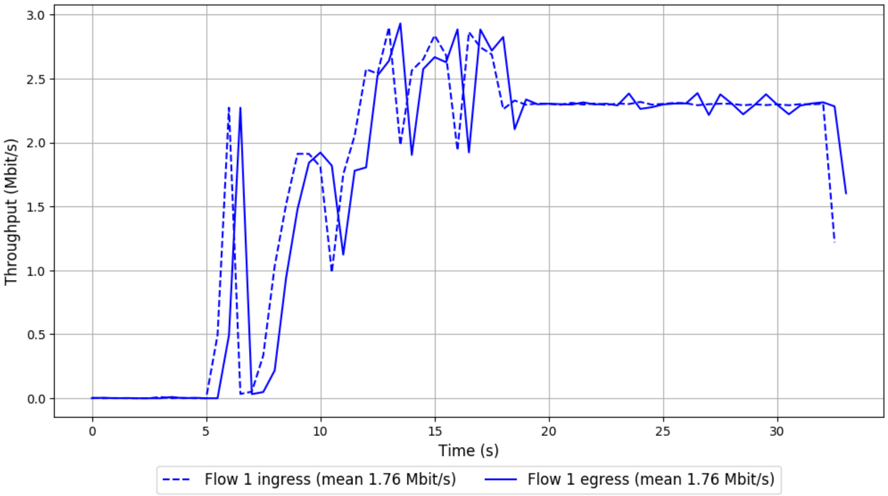
Run 1: Report of WebRTC media — Data Link

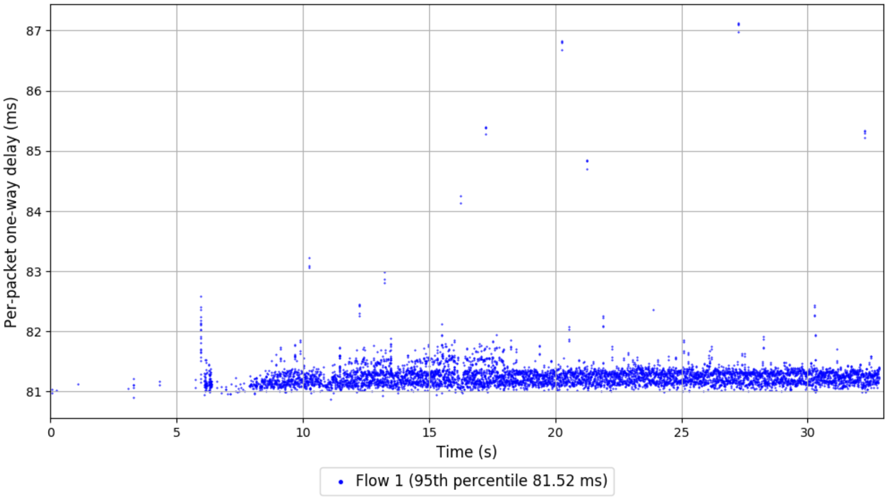




```
Run 2: Statistics of WebRTC media

Start at: 2018-12-02 00:41:50
End at: 2018-12-02 00:42:20
Local clock offset: -5.492 ms
Remote clock offset: -14.844 ms

# Below is generated by plot.py at 2018-12-02 02:19:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 81.522 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 81.522 ms
Loss rate: 0.00%
```

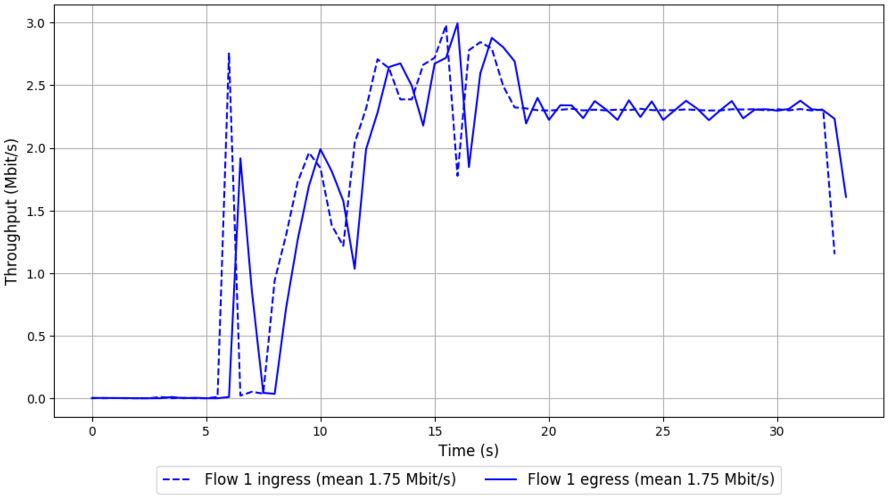
Run 2: Report of WebRTC media — Data Link

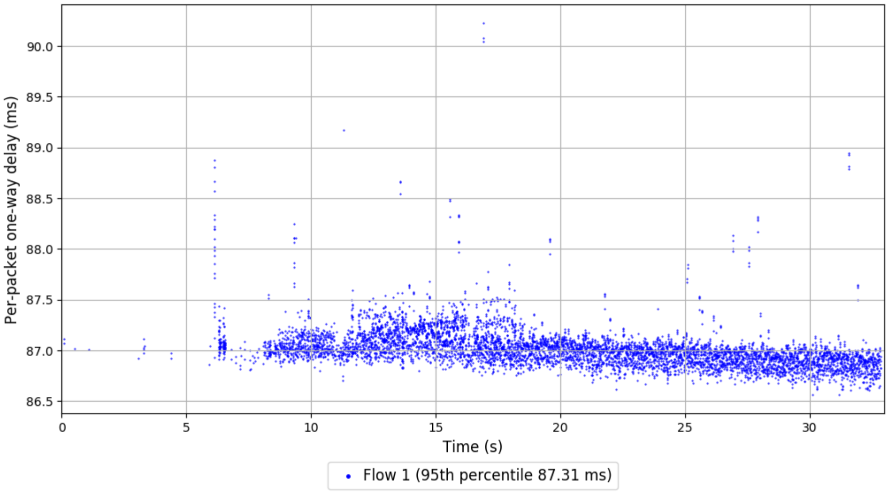




```
Run 3: Statistics of WebRTC media

Start at: 2018-12-02 01:04:04
End at: 2018-12-02 01:04:34
Local clock offset: -1.486 ms
Remote clock offset: 16.762 ms

# Below is generated by plot.py at 2018-12-02 02:19:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 87.312 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 87.312 ms
Loss rate: 0.00%
```

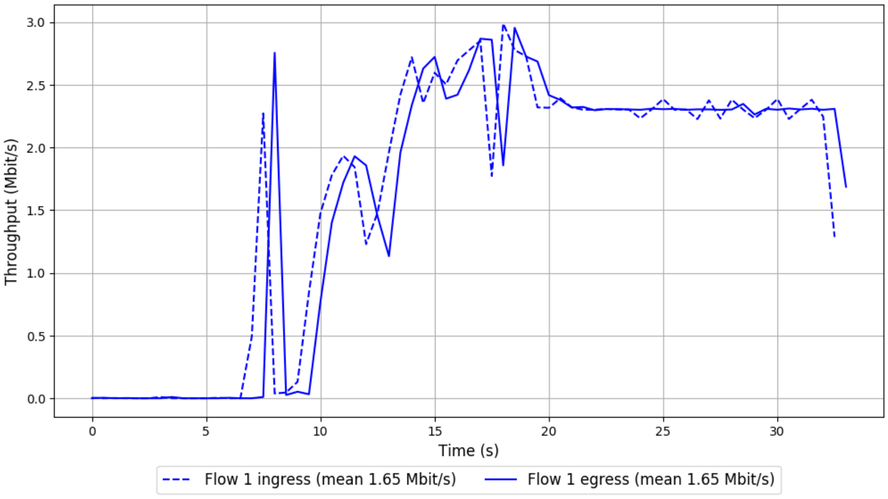
Run 3: Report of WebRTC media — Data Link

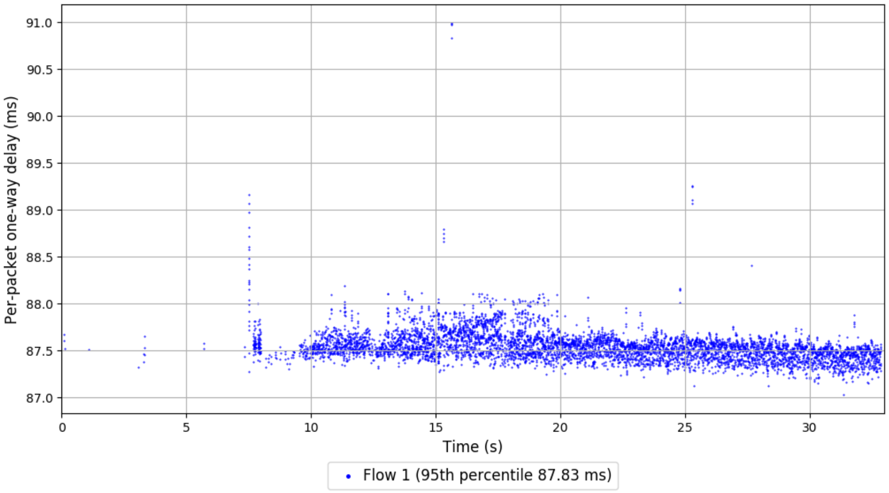




```
Run 4: Statistics of WebRTC media

Start at: 2018-12-02 01:26:21
End at: 2018-12-02 01:26:51
Local clock offset: -3.264 ms
Remote clock offset: 23.453 ms

# Below is generated by plot.py at 2018-12-02 02:19:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 87.828 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 87.828 ms
Loss rate: 0.00%
```

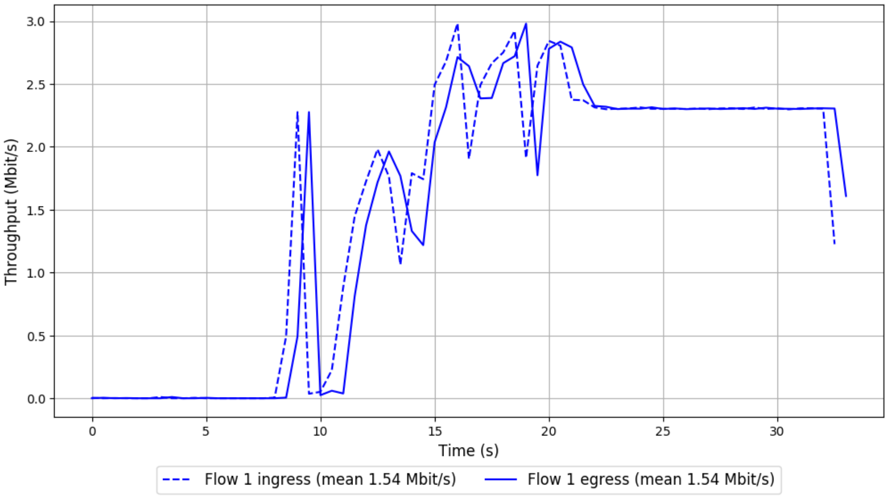
Run 4: Report of WebRTC media — Data Link



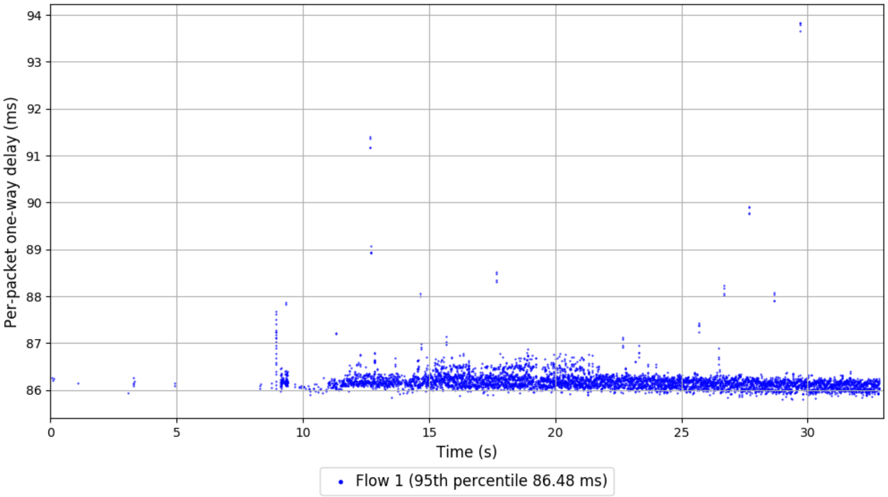


```
Run 5: Statistics of WebRTC media

Start at: 2018-12-02 01:48:35
End at: 2018-12-02 01:49:05
Local clock offset: -4.87 ms
Remote clock offset: 31.759 ms

# Below is generated by plot.py at 2018-12-02 02:19:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 86.482 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 86.482 ms
Loss rate: 0.00%
```

Run 5: Report of WebRTC media — Data Link



Throughput (Mbit/s)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
5
10
15
20
25
30
Time (s)
Flow 1 ingress (mean 1.54 Mbit/s)
Flow 1 egress (mean 1.54 Mbit/s)



Per-packet one-way delay (ms)
94
93
92
91
90
89
88
87
86
0
5
10
15
20
25
30
Time (s)
Flow 1 (95th percentile 86.48 ms)