Pantheon Report

Generated at 2018-10-02 16:00:01 (UTC).

Data path: GCE Tokyo on `ens4` (*local*) →GCE London on `ens4` (*remote*).

Repeated the test of 18 congestion control schemes 5 times.

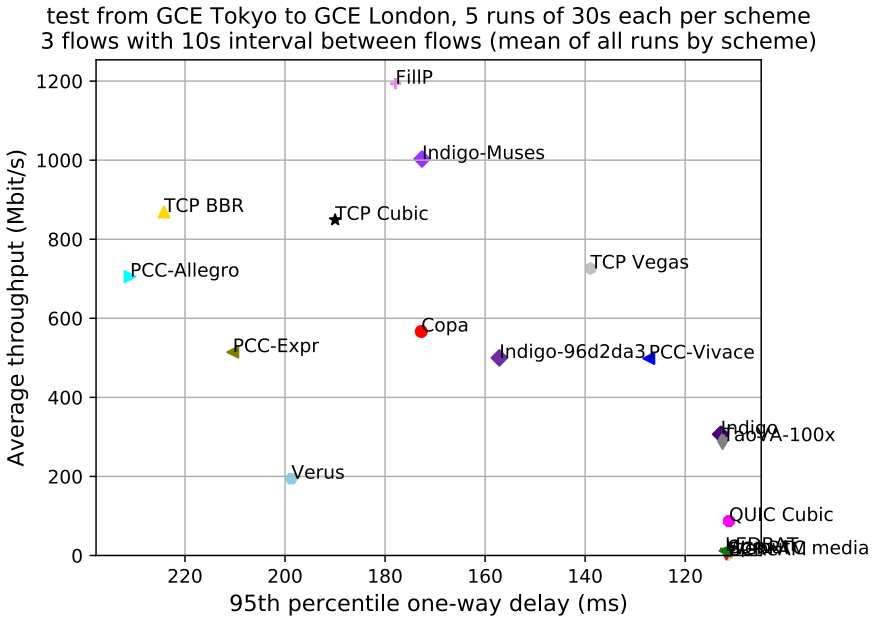
Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.

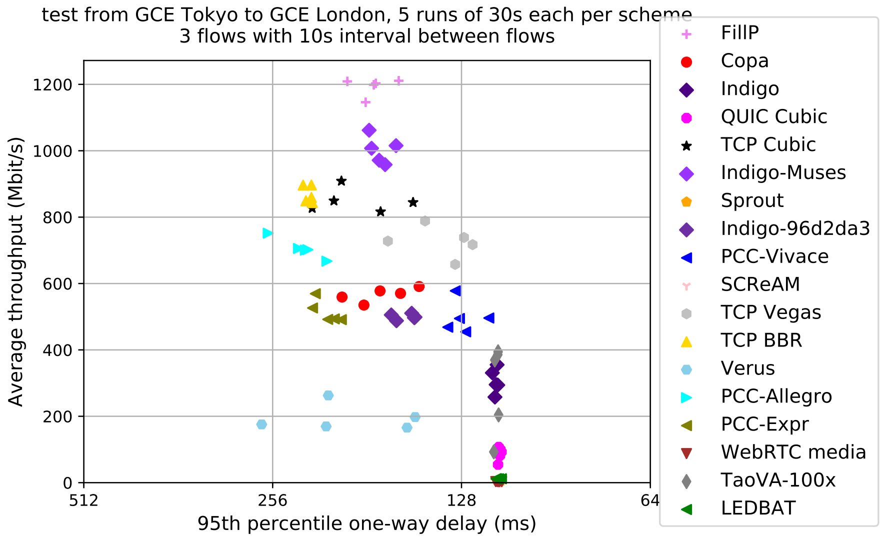
NTP offsets were measured against `time.google.com` and have been applied to correct the timestamps in logs.

```
System info:
Linux 4.15.0-1019-gcp
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

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

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

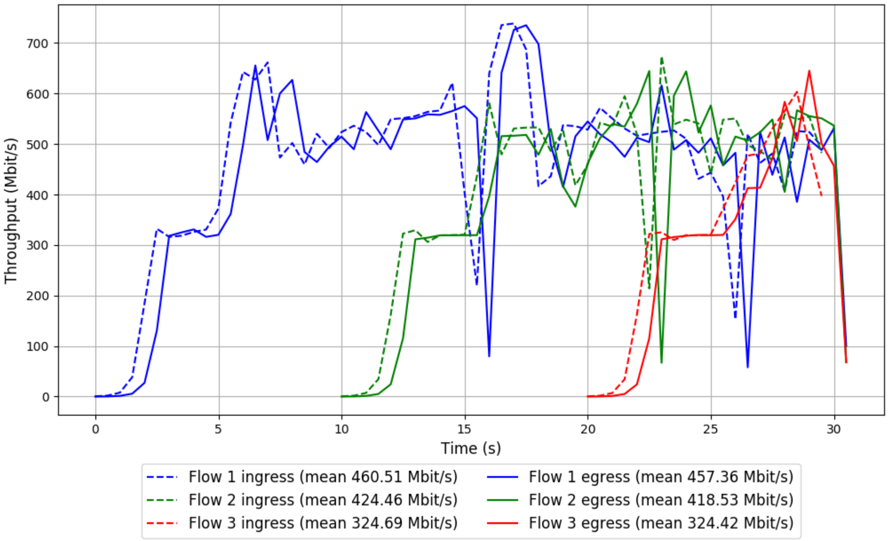

test from GCE Tokyo to GCE London, 5 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
0
200
400
600
800
1000
1200
220
200
180
160
140
120
FillP
Indigo-Muses
TCP BBR
TCP Cubic
PCC-Allegro
TCP Vegas
Copa
PCC-Expr
Indigo-96d2da3
PCC-Vivace
Indigo
TaoVA-100x
Verus
QUIC Cubic
LEDBAT
WebRTC media

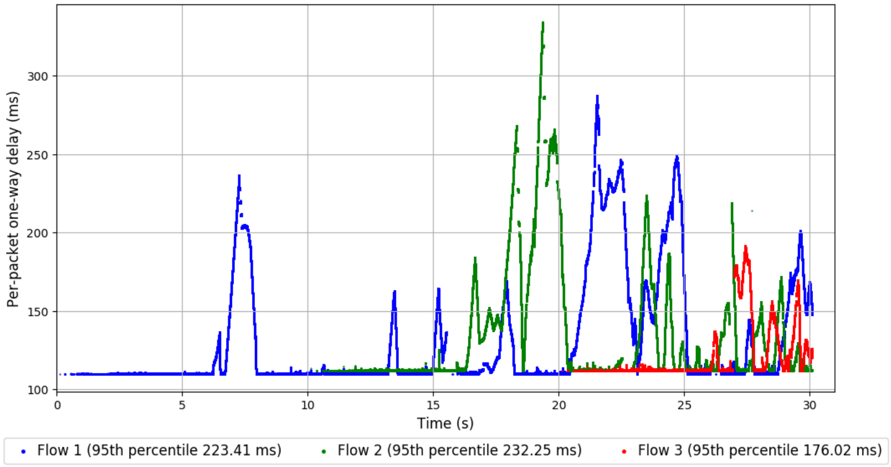

test from GCE Tokyo to GCE London, 5 runs of 30s each per scheme
3 flows with 10s interval between flows
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
0
200
400
600
800
1000
1200
512
256
128
64
FillP
Copa
Indigo
QUIC Cubic
TCP Cubic
Indigo-Muses
Sprout
Indigo-96d2da3
PCC-Vivace
SCReAM
TCP Vegas
TCP BBR
Verus
PCC-Allegro
PCC-Expr
WebRTC media
TaoVA-100x
LEDBAT

scheme	# runs	mean avg tput (Mbit/s) flow 1	flow 2	flow 3	mean 95th-%ile delay (ms) flow 1	flow 2	flow 3	mean loss rate (%) flow 1	flow 2	flow 3
TCP BBR	5	471.86	432.70	328.02	218.59	228.66	193.38	1.09	2.40	0.95
Copa	5	305.92	272.23	238.01	150.41	178.14	185.26	0.06	0.08	0.18
TCP Cubic	5	455.71	437.87	306.20	182.50	185.49	168.85	0.14	0.19	0.65
FillP	5	659.86	568.19	468.95	183.07	176.86	137.07	2.15	1.10	0.01
Indigo	5	157.72	160.28	133.37	111.96	113.18	113.58	0.00	0.00	0.01
Indigo-96d2da3	5	269.18	248.06	206.20	161.44	155.62	153.46	0.13	0.16	0.08
LEDBAT	5	7.61	5.03	2.44	111.88	111.56	111.74	0.00	0.00	0.00
Indigo-Muses	5	574.85	482.71	333.32	164.94	180.11	190.65	0.05	0.34	0.66
PCC-Allegro	5	400.71	334.16	251.86	232.56	199.49	242.85	3.18	2.00	5.45
PCC-Expr	5	306.81	225.10	175.20	209.33	180.74	166.21	3.32	0.66	1.58
QUIC Cubic	5	43.80	47.64	36.61	111.05	110.96	110.55	0.00	0.00	0.00
SCReAM	5	0.20	0.20	0.22	111.28	110.53	111.06	0.00	0.00	0.07
Sprout	5	3.03	2.84	2.44	111.14	111.43	110.09	0.00	0.00	0.00
TaoVA-100x	5	124.91	155.19	183.54	112.25	112.81	112.53	0.00	0.00	0.00
TCP Vegas	5	384.60	366.65	292.14	122.14	141.11	150.13	0.03	0.13	0.35
Verus	5	102.97	106.41	64.14	178.45	182.70	138.00	0.19	1.56	0.01
PCC-Vivace	5	323.68	194.35	137.41	126.10	143.60	164.36	0.11	1.79	0.82
WebRTC media	5	1.86	1.09	0.37	111.65	111.22	111.76	0.00	0.00	0.04

```
Run 1: Statistics of TCP BBR

Start at: 2018-10-02 11:23:19
End at: 2018-10-02 11:23:49
Local clock offset: -0.255 ms
Remote clock offset: 0.307 ms

# Below is generated by plot.py at 2018-10-02 14:16:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 843.79 Mbit/s
95th percentile per-packet one-way delay: 221.267 ms
Loss rate: 0.85%
-- Flow 1:
Average throughput: 457.36 Mbit/s
95th percentile per-packet one-way delay: 223.409 ms
Loss rate: 0.68%
-- Flow 2:
Average throughput: 418.53 Mbit/s
95th percentile per-packet one-way delay: 232.252 ms
Loss rate: 1.41%
-- Flow 3:
Average throughput: 324.42 Mbit/s
95th percentile per-packet one-way delay: 176.018 ms
Loss rate: 0.09%
```

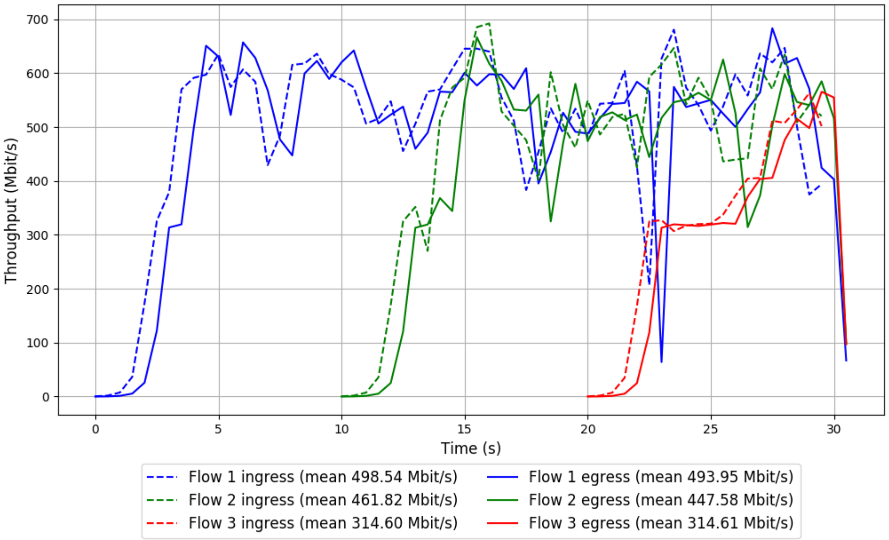
Run 1: Report of TCP BBR — Data Link

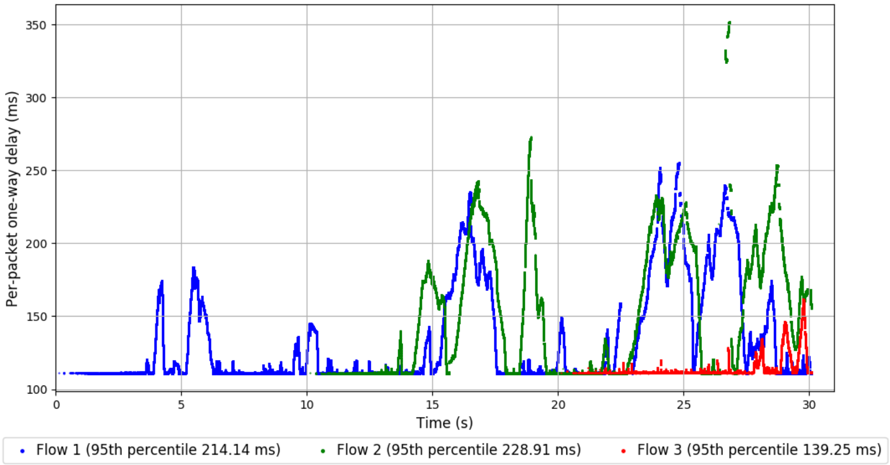




```
Run 2: Statistics of TCP BBR

Start at: 2018-10-02 11:55:32
End at: 2018-10-02 11:56:02
Local clock offset: 0.084 ms
Remote clock offset: -0.036 ms

# Below is generated by plot.py at 2018-10-02 14:16:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 896.57 Mbit/s
95th percentile per-packet one-way delay: 222.077 ms
Loss rate: 1.55%
-- Flow 1:
Average throughput: 493.95 Mbit/s
95th percentile per-packet one-way delay: 214.136 ms
Loss rate: 0.92%
-- Flow 2:
Average throughput: 447.58 Mbit/s
95th percentile per-packet one-way delay: 228.909 ms
Loss rate: 3.09%
-- Flow 3:
Average throughput: 314.61 Mbit/s
95th percentile per-packet one-way delay: 139.247 ms
Loss rate: 0.00%
```

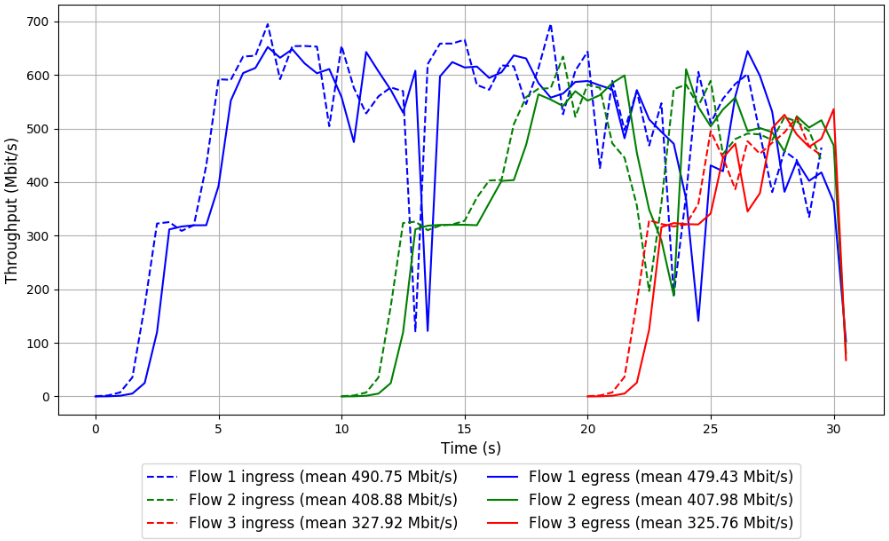
Run 2: Report of TCP BBR — Data Link

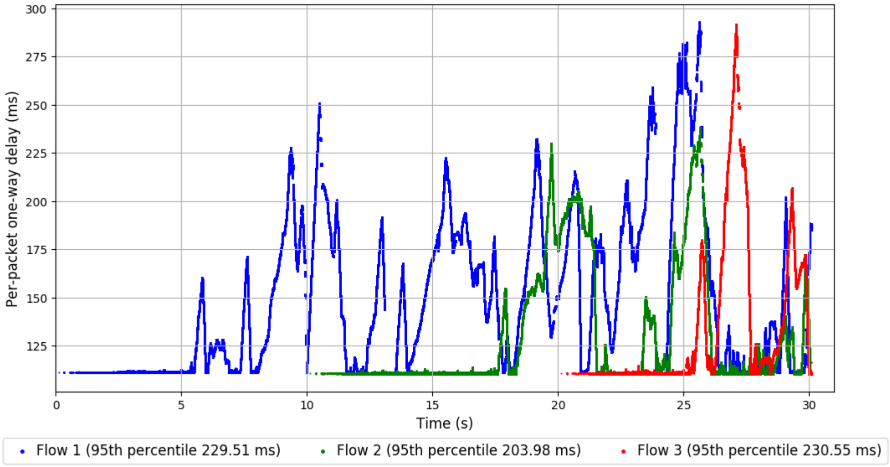




```
Run 3: Statistics of TCP BBR

Start at: 2018-10-02 12:28:23
End at: 2018-10-02 12:28:53
Local clock offset: 0.556 ms
Remote clock offset: 0.141 ms

# Below is generated by plot.py at 2018-10-02 14:16:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 859.23 Mbit/s
95th percentile per-packet one-way delay: 222.100 ms
Loss rate: 1.43%
-- Flow 1:
Average throughput: 479.43 Mbit/s
95th percentile per-packet one-way delay: 229.510 ms
Loss rate: 2.27%
-- Flow 2:
Average throughput: 407.98 Mbit/s
95th percentile per-packet one-way delay: 203.977 ms
Loss rate: 0.22%
-- Flow 3:
Average throughput: 325.76 Mbit/s
95th percentile per-packet one-way delay: 230.550 ms
Loss rate: 0.66%
```

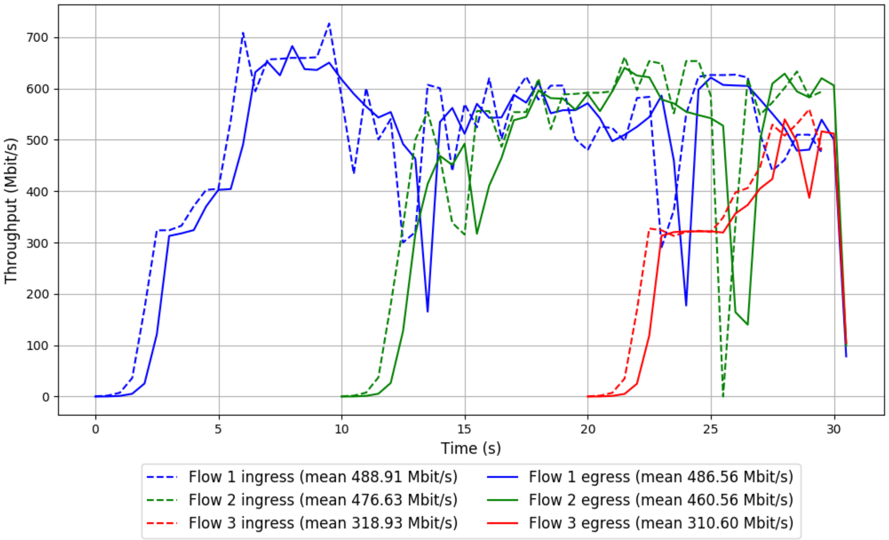
Run 3: Report of TCP BBR — Data Link

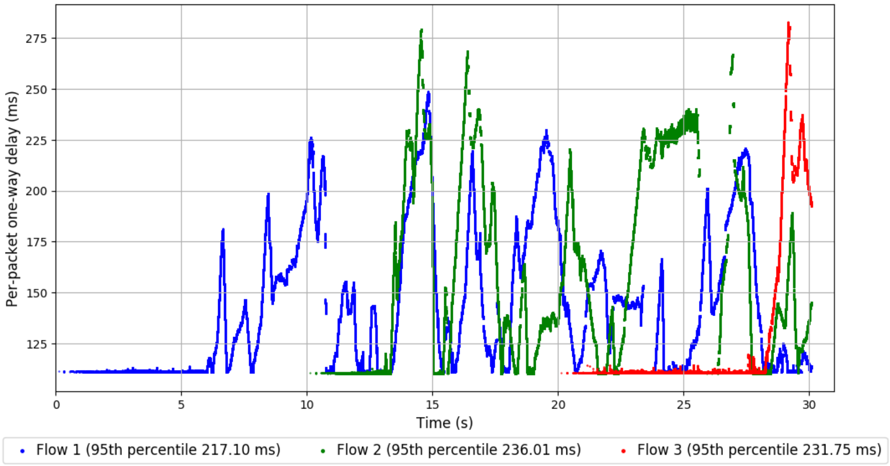




```
Run 4: Statistics of TCP BBR

Start at: 2018-10-02 13:00:59
End at: 2018-10-02 13:01:29
Local clock offset: 0.542 ms
Remote clock offset: -0.204 ms

# Below is generated by plot.py at 2018-10-02 14:16:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 896.47 Mbit/s
95th percentile per-packet one-way delay: 228.915 ms
Loss rate: 1.73%
-- Flow 1:
Average throughput: 486.56 Mbit/s
95th percentile per-packet one-way delay: 217.105 ms
Loss rate: 0.48%
-- Flow 2:
Average throughput: 460.56 Mbit/s
95th percentile per-packet one-way delay: 236.013 ms
Loss rate: 3.37%
-- Flow 3:
Average throughput: 310.60 Mbit/s
95th percentile per-packet one-way delay: 231.751 ms
Loss rate: 2.61%
```

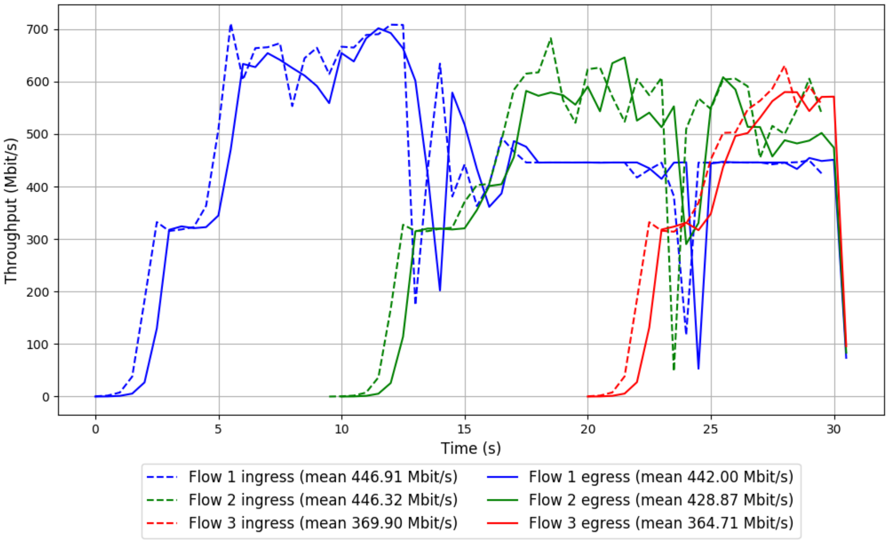
Run 4: Report of TCP BBR — Data Link

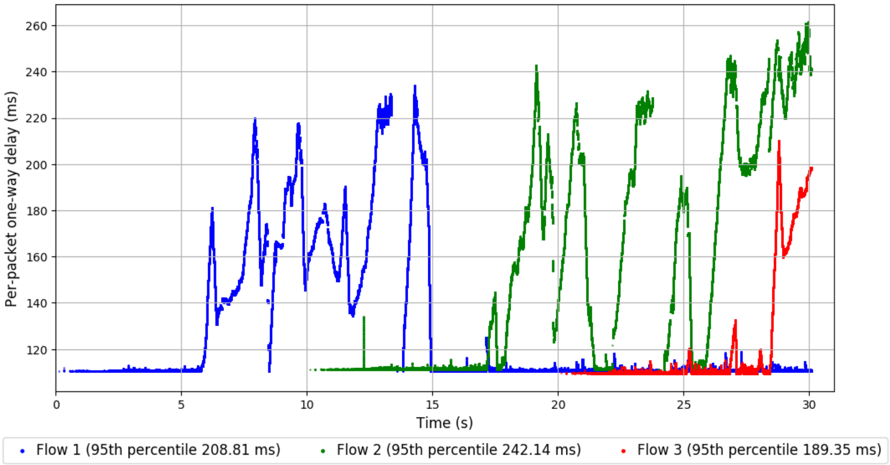




```
Run 5: Statistics of TCP BBR

Start at: 2018-10-02 13:33:15
End at: 2018-10-02 13:33:45
Local clock offset: -0.061 ms
Remote clock offset: 0.513 ms

# Below is generated by plot.py at 2018-10-02 14:16:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 849.13 Mbit/s
95th percentile per-packet one-way delay: 226.582 ms
Loss rate: 2.10%
-- Flow 1:
Average throughput: 442.00 Mbit/s
95th percentile per-packet one-way delay: 208.807 ms
Loss rate: 1.10%
-- Flow 2:
Average throughput: 428.87 Mbit/s
95th percentile per-packet one-way delay: 242.141 ms
Loss rate: 3.91%
-- Flow 3:
Average throughput: 364.71 Mbit/s
95th percentile per-packet one-way delay: 189.351 ms
Loss rate: 1.39%
```

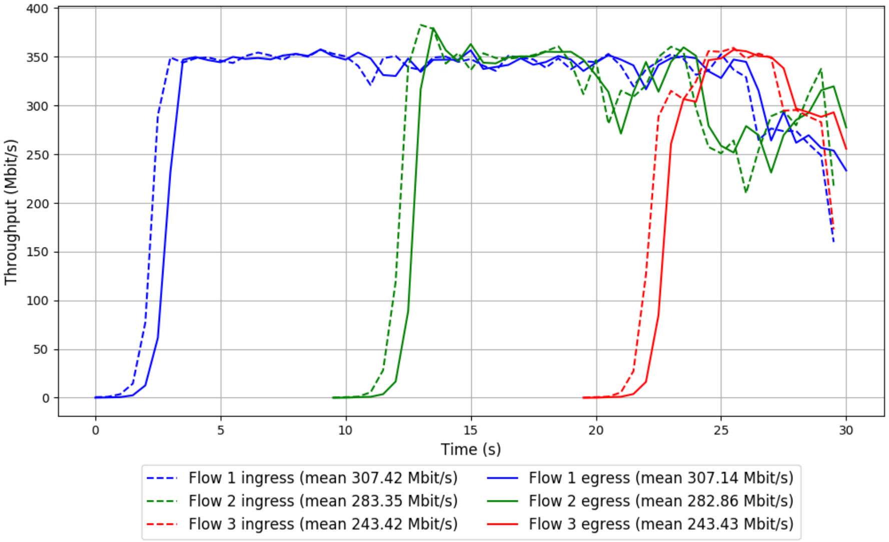
Run 5: Report of TCP BBR — Data Link

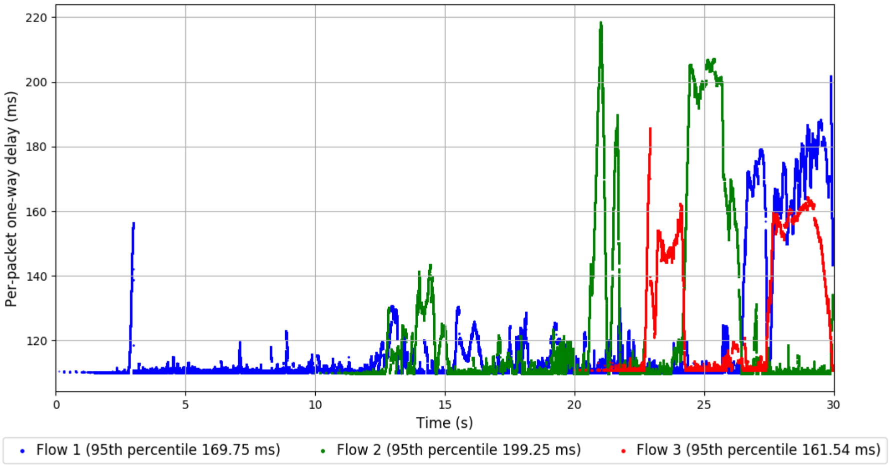




```
Run 1: Statistics of Copa

Start at: 2018-10-02 11:05:40
End at: 2018-10-02 11:06:10
Local clock offset: 0.075 ms
Remote clock offset: -0.078 ms

# Below is generated by plot.py at 2018-10-02 14:19:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 577.75 Mbit/s
95th percentile per-packet one-way delay: 172.591 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 307.14 Mbit/s
95th percentile per-packet one-way delay: 169.755 ms
Loss rate: 0.09%
-- Flow 2:
Average throughput: 282.86 Mbit/s
95th percentile per-packet one-way delay: 199.246 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 243.43 Mbit/s
95th percentile per-packet one-way delay: 161.543 ms
Loss rate: 0.01%
```

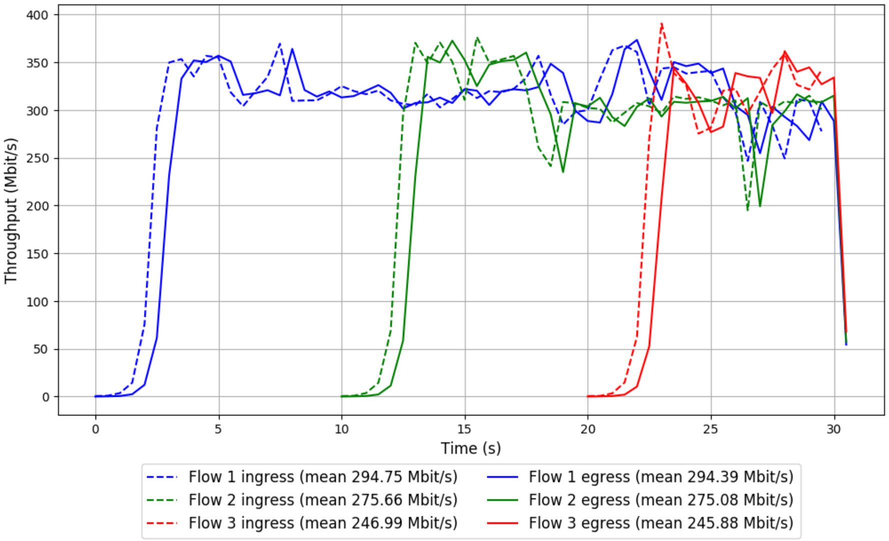
Run 1: Report of Copa — Data Link

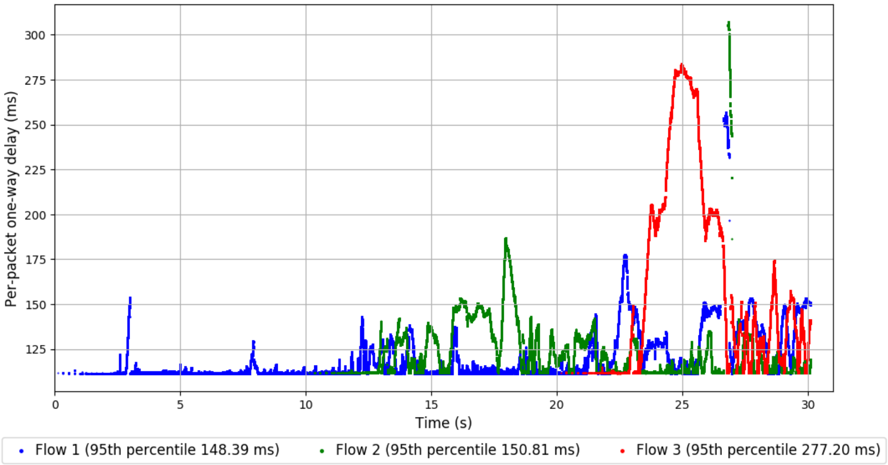




```
Run 2: Statistics of Copa

Start at: 2018-10-02 11:38:13
End at: 2018-10-02 11:38:44
Local clock offset: -0.232 ms
Remote clock offset: 0.298 ms

# Below is generated by plot.py at 2018-10-02 14:19:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 559.21 Mbit/s
95th percentile per-packet one-way delay: 198.430 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 294.39 Mbit/s
95th percentile per-packet one-way delay: 148.390 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 275.08 Mbit/s
95th percentile per-packet one-way delay: 150.807 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 245.88 Mbit/s
95th percentile per-packet one-way delay: 277.205 ms
Loss rate: 0.44%
```

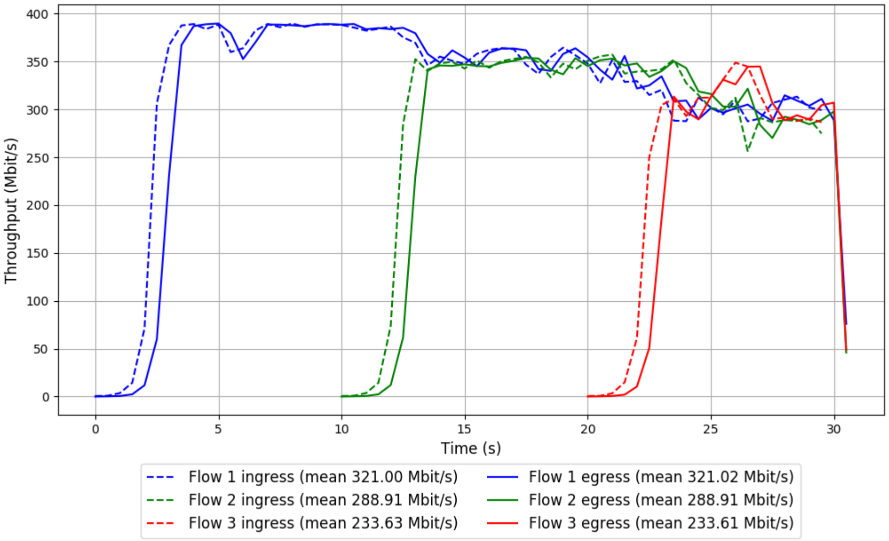
Run 2: Report of Copa — Data Link

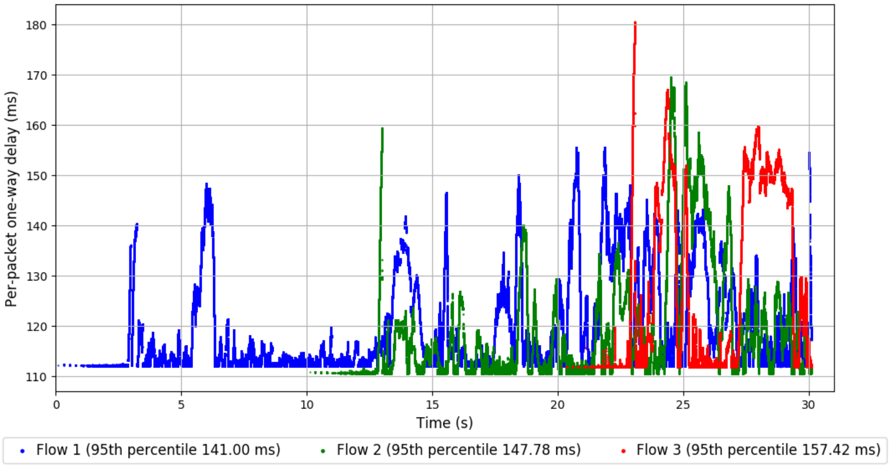




```
Run 3: Statistics of Copa

Start at: 2018-10-02 12:10:33
End at: 2018-10-02 12:11:03
Local clock offset: -0.066 ms
Remote clock offset: 0.228 ms

# Below is generated by plot.py at 2018-10-02 14:20:34
# Datalink statistics
-- Total of 3 flows:
Average throughput: 590.99 Mbit/s
95th percentile per-packet one-way delay: 149.547 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 321.02 Mbit/s
95th percentile per-packet one-way delay: 140.999 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 288.91 Mbit/s
95th percentile per-packet one-way delay: 147.782 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 233.61 Mbit/s
95th percentile per-packet one-way delay: 157.424 ms
Loss rate: 0.02%
```

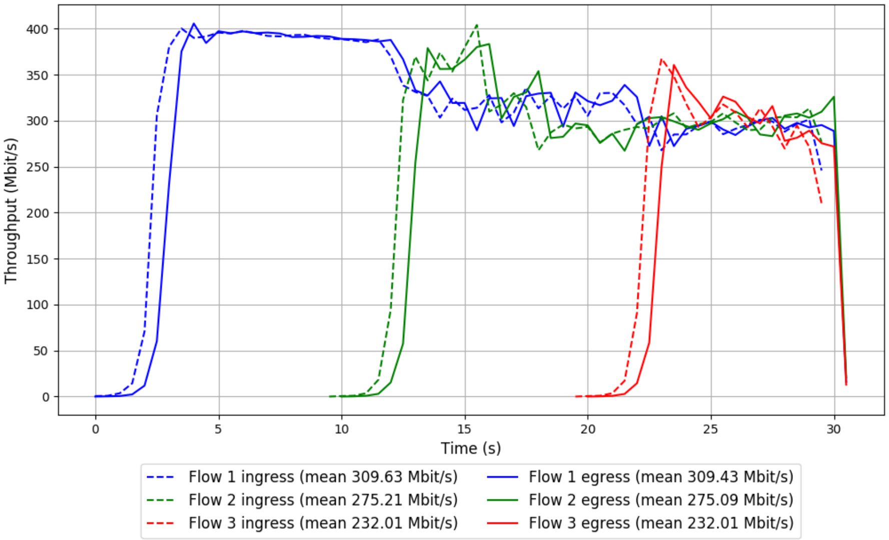
Run 3: Report of Copa — Data Link

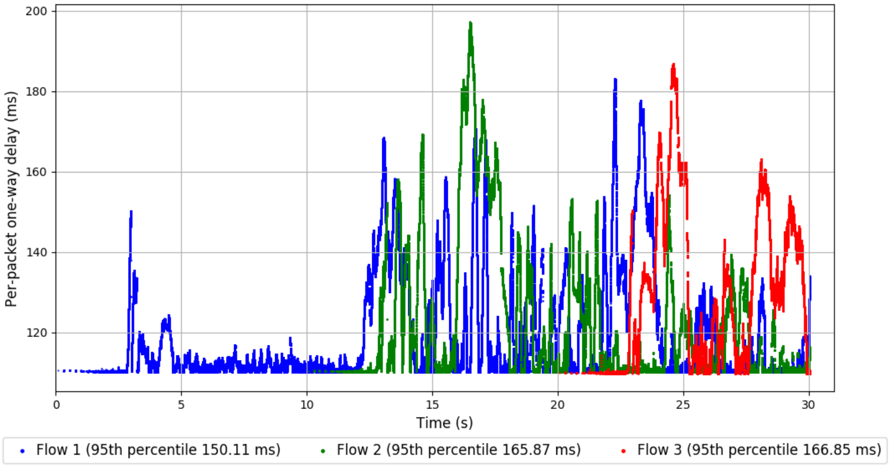




```
Run 4: Statistics of Copa

Start at: 2018-10-02 12:43:11
End at: 2018-10-02 12:43:41
Local clock offset: 0.992 ms
Remote clock offset: -0.2 ms

# Below is generated by plot.py at 2018-10-02 14:33:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 570.25 Mbit/s
95th percentile per-packet one-way delay: 160.111 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 309.43 Mbit/s
95th percentile per-packet one-way delay: 150.109 ms
Loss rate: 0.06%
-- Flow 2:
Average throughput: 275.09 Mbit/s
95th percentile per-packet one-way delay: 165.867 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 232.01 Mbit/s
95th percentile per-packet one-way delay: 166.848 ms
Loss rate: 0.00%
```

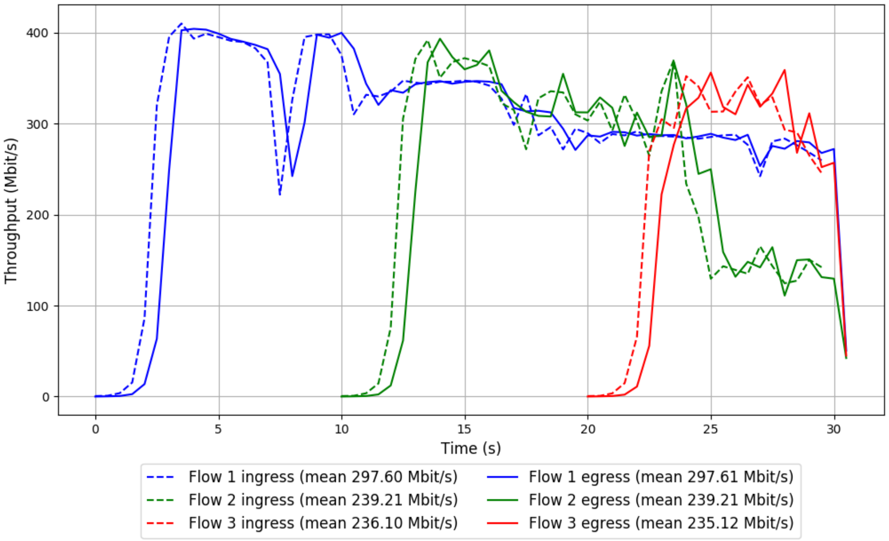
Run 4: Report of Copa — Data Link

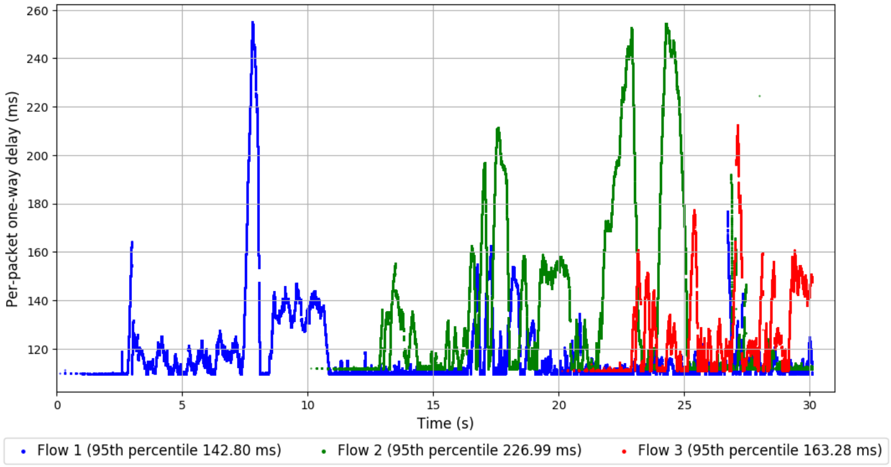




```
Run 5: Statistics of Copa

Start at: 2018-10-02 13:15:42
End at: 2018-10-02 13:16:12
Local clock offset: -0.198 ms
Remote clock offset: 0.059 ms

# Below is generated by plot.py at 2018-10-02 14:33:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 535.04 Mbit/s
95th percentile per-packet one-way delay: 183.125 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 297.61 Mbit/s
95th percentile per-packet one-way delay: 142.802 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 239.21 Mbit/s
95th percentile per-packet one-way delay: 226.992 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 235.12 Mbit/s
95th percentile per-packet one-way delay: 163.283 ms
Loss rate: 0.41%
```

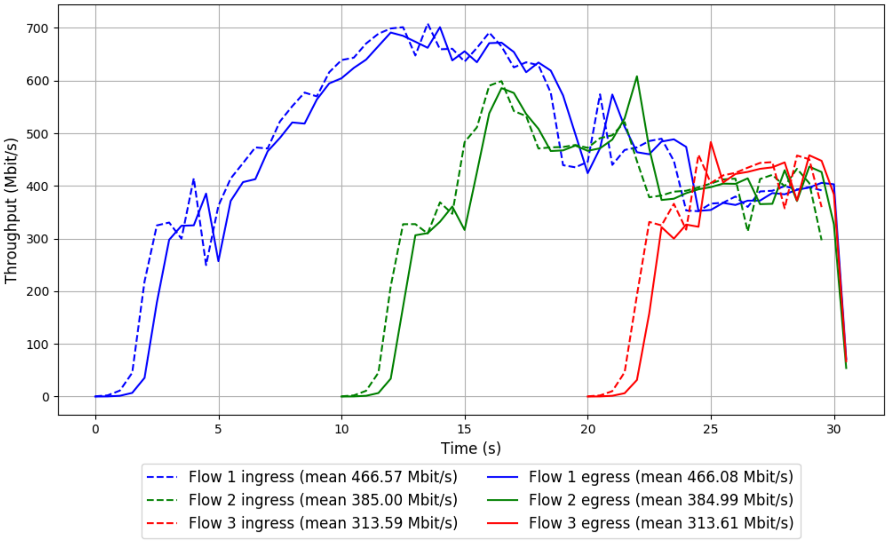
Run 5: Report of Copa — Data Link

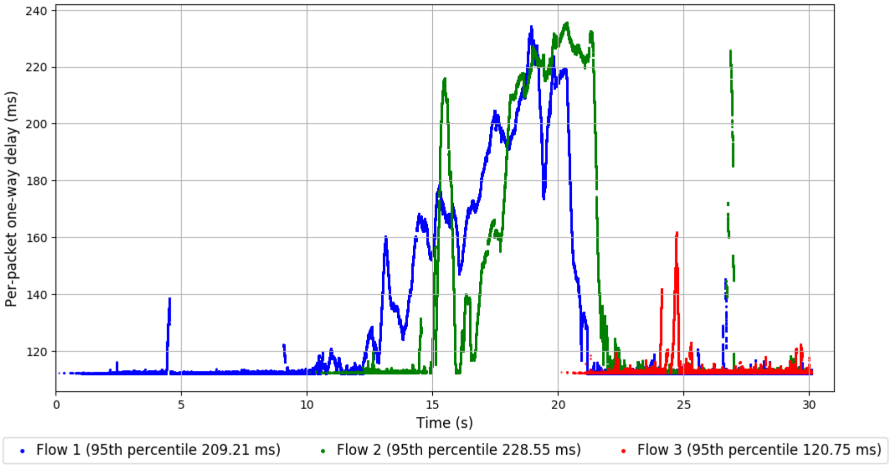




```
Run 1: Statistics of TCP Cubic

Start at: 2018-10-02 11:18:39
End at: 2018-10-02 11:19:09
Local clock offset: -0.822 ms
Remote clock offset: -0.052 ms

# Below is generated by plot.py at 2018-10-02 14:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 826.78 Mbit/s
95th percentile per-packet one-way delay: 221.417 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 466.08 Mbit/s
95th percentile per-packet one-way delay: 209.205 ms
Loss rate: 0.11%
-- Flow 2:
Average throughput: 384.99 Mbit/s
95th percentile per-packet one-way delay: 228.548 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 313.61 Mbit/s
95th percentile per-packet one-way delay: 120.754 ms
Loss rate: 0.01%
```

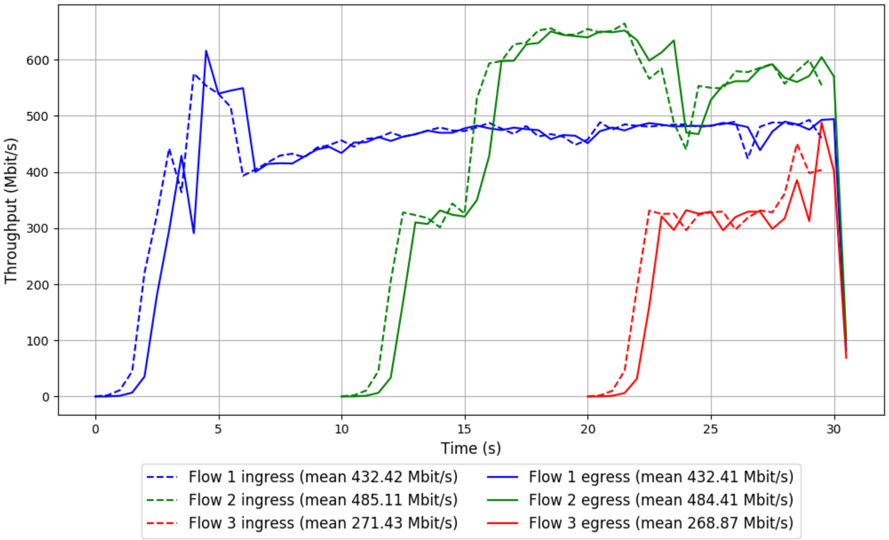
Run 1: Report of TCP Cubic — Data Link

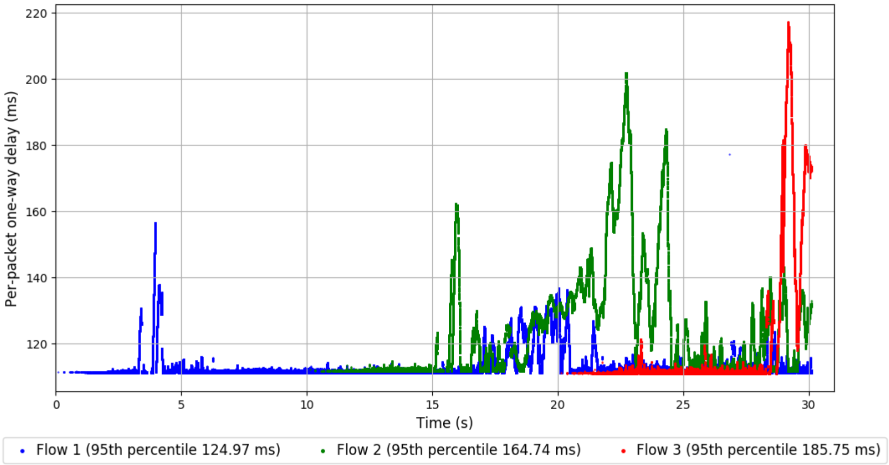




```
Run 2: Statistics of TCP Cubic

Start at: 2018-10-02 11:50:48
End at: 2018-10-02 11:51:18
Local clock offset: -0.135 ms
Remote clock offset: -0.108 ms

# Below is generated by plot.py at 2018-10-02 14:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 844.29 Mbit/s
95th percentile per-packet one-way delay: 152.898 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 432.41 Mbit/s
95th percentile per-packet one-way delay: 124.972 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 484.41 Mbit/s
95th percentile per-packet one-way delay: 164.741 ms
Loss rate: 0.14%
-- Flow 3:
Average throughput: 268.87 Mbit/s
95th percentile per-packet one-way delay: 185.745 ms
Loss rate: 0.95%
```

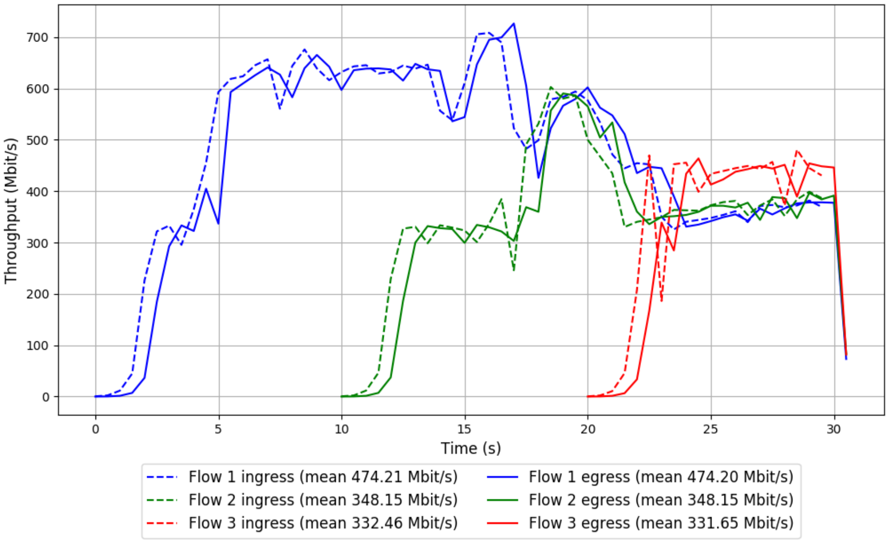
Run 2: Report of TCP Cubic — Data Link

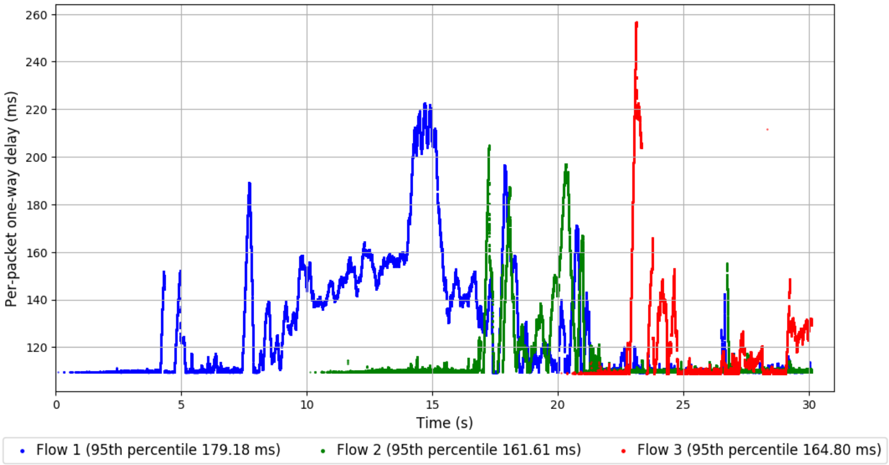




```
Run 3: Statistics of TCP Cubic

Start at: 2018-10-02 12:23:39
End at: 2018-10-02 12:24:09
Local clock offset: 1.147 ms
Remote clock offset: -0.18 ms

# Below is generated by plot.py at 2018-10-02 14:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 816.29 Mbit/s
95th percentile per-packet one-way delay: 172.250 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 474.20 Mbit/s
95th percentile per-packet one-way delay: 179.182 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 348.15 Mbit/s
95th percentile per-packet one-way delay: 161.611 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 331.65 Mbit/s
95th percentile per-packet one-way delay: 164.800 ms
Loss rate: 0.22%
```

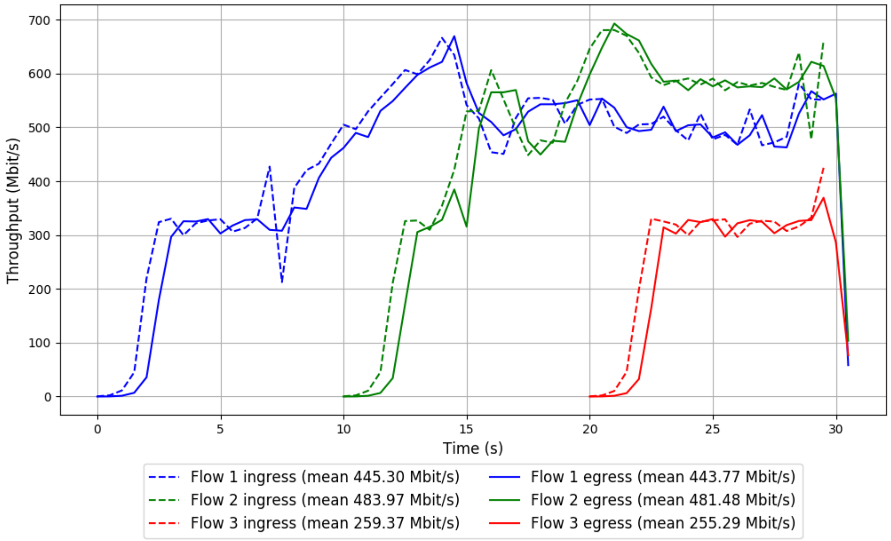
Run 3: Report of TCP Cubic — Data Link

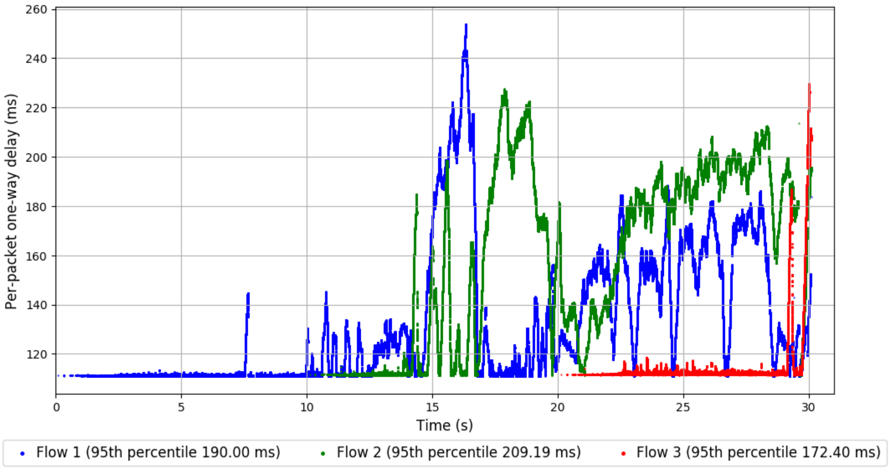




```
Run 4: Statistics of TCP Cubic

Start at: 2018-10-02 12:56:15
End at: 2018-10-02 12:56:45
Local clock offset: -0.165 ms
Remote clock offset: -0.23 ms

# Below is generated by plot.py at 2018-10-02 14:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 849.18 Mbit/s
95th percentile per-packet one-way delay: 204.444 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 443.77 Mbit/s
95th percentile per-packet one-way delay: 190.005 ms
Loss rate: 0.32%
-- Flow 2:
Average throughput: 481.48 Mbit/s
95th percentile per-packet one-way delay: 209.191 ms
Loss rate: 0.51%
-- Flow 3:
Average throughput: 255.29 Mbit/s
95th percentile per-packet one-way delay: 172.396 ms
Loss rate: 1.57%
```

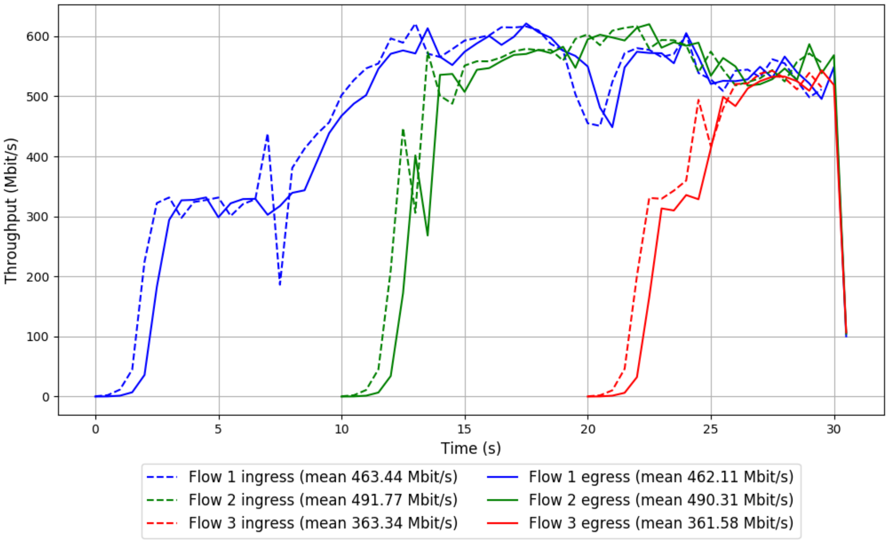
Run 4: Report of TCP Cubic — Data Link

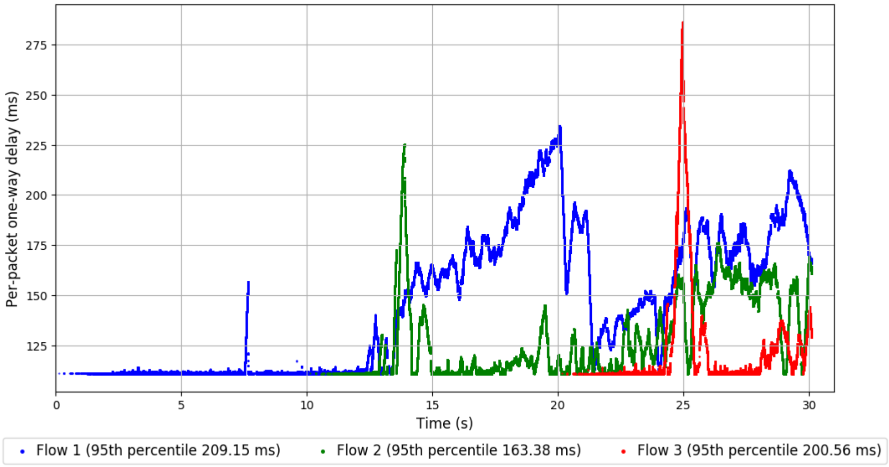




```
Run 5: Statistics of TCP Cubic

Start at: 2018-10-02 13:28:28
End at: 2018-10-02 13:28:58
Local clock offset: -0.217 ms
Remote clock offset: 0.165 ms

# Below is generated by plot.py at 2018-10-02 14:35:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 908.73 Mbit/s
95th percentile per-packet one-way delay: 198.906 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 462.11 Mbit/s
95th percentile per-packet one-way delay: 209.152 ms
Loss rate: 0.29%
-- Flow 2:
Average throughput: 490.31 Mbit/s
95th percentile per-packet one-way delay: 163.378 ms
Loss rate: 0.30%
-- Flow 3:
Average throughput: 361.58 Mbit/s
95th percentile per-packet one-way delay: 200.562 ms
Loss rate: 0.49%
```

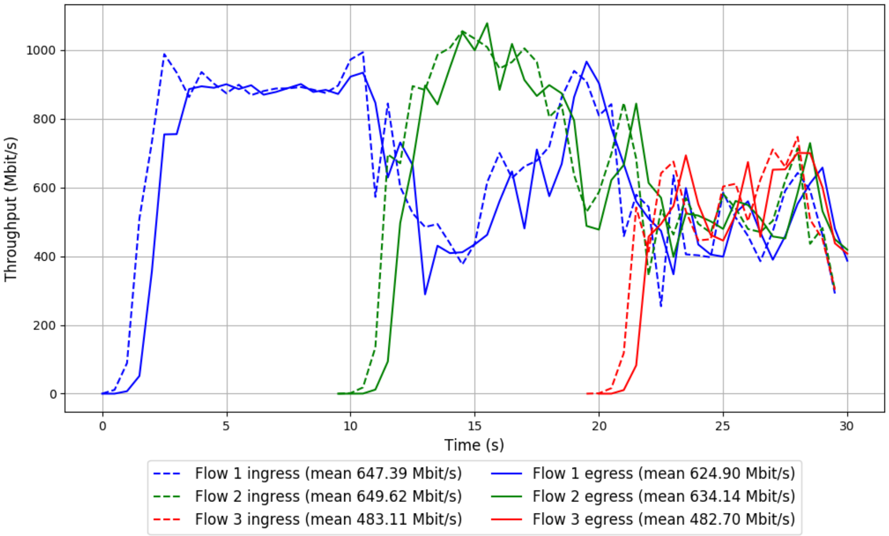
Run 5: Report of TCP Cubic — Data Link

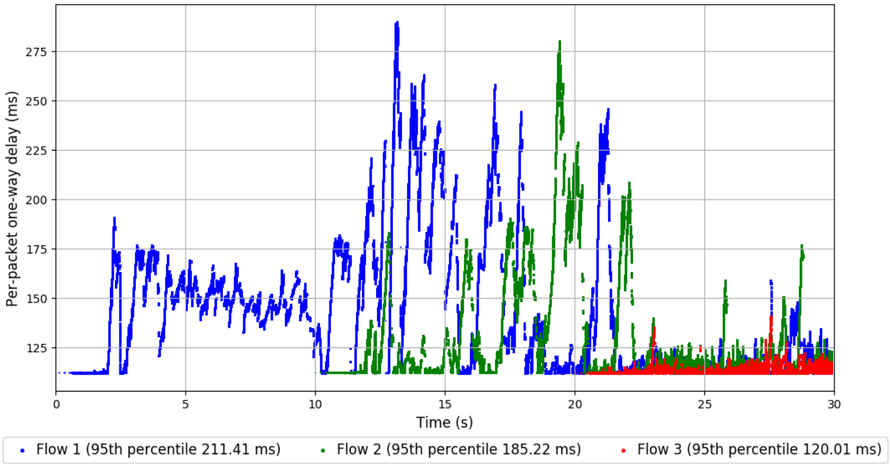




```
Run 1: Statistics of FillP

Start at: 2018-10-02 11:36:02
End at: 2018-10-02 11:36:32
Local clock offset: -1.254 ms
Remote clock offset: -0.024 ms

# Below is generated by plot.py at 2018-10-02 14:44:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1208.98 Mbit/s
95th percentile per-packet one-way delay: 194.615 ms
Loss rate: 2.64%
-- Flow 1:
Average throughput: 624.90 Mbit/s
95th percentile per-packet one-way delay: 211.408 ms
Loss rate: 3.46%
-- Flow 2:
Average throughput: 634.14 Mbit/s
95th percentile per-packet one-way delay: 185.218 ms
Loss rate: 2.38%
-- Flow 3:
Average throughput: 482.70 Mbit/s
95th percentile per-packet one-way delay: 120.012 ms
Loss rate: 0.05%
```

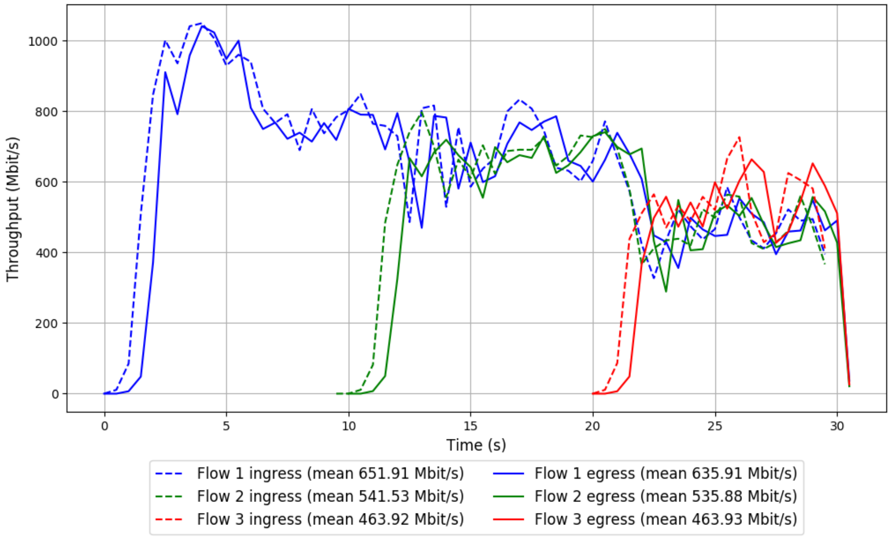
Run 1: Report of FillP — Data Link

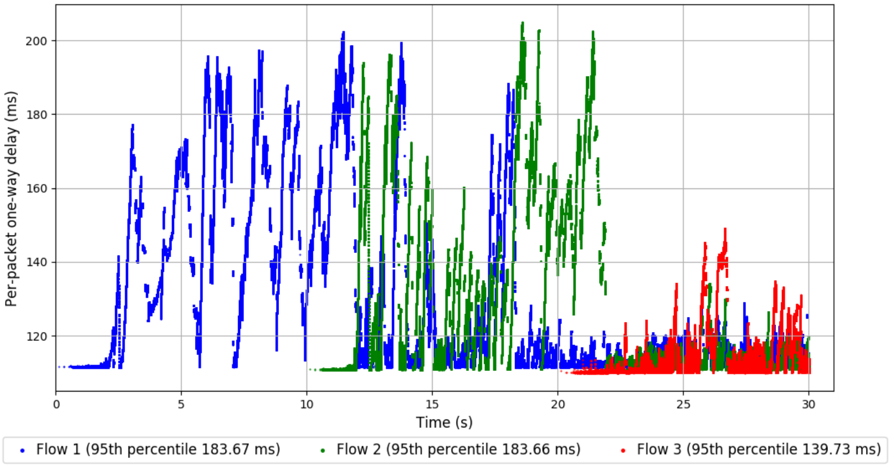




```
Run 2: Statistics of FillP

Start at: 2018-10-02 12:08:24
End at: 2018-10-02 12:08:54
Local clock offset: 0.081 ms
Remote clock offset: -0.124 ms

# Below is generated by plot.py at 2018-10-02 14:54:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1146.23 Mbit/s
95th percentile per-packet one-way delay: 181.962 ms
Loss rate: 1.69%
-- Flow 1:
Average throughput: 635.91 Mbit/s
95th percentile per-packet one-way delay: 183.669 ms
Loss rate: 2.45%
-- Flow 2:
Average throughput: 535.88 Mbit/s
95th percentile per-packet one-way delay: 183.665 ms
Loss rate: 1.04%
-- Flow 3:
Average throughput: 463.93 Mbit/s
95th percentile per-packet one-way delay: 139.729 ms
Loss rate: 0.00%
```

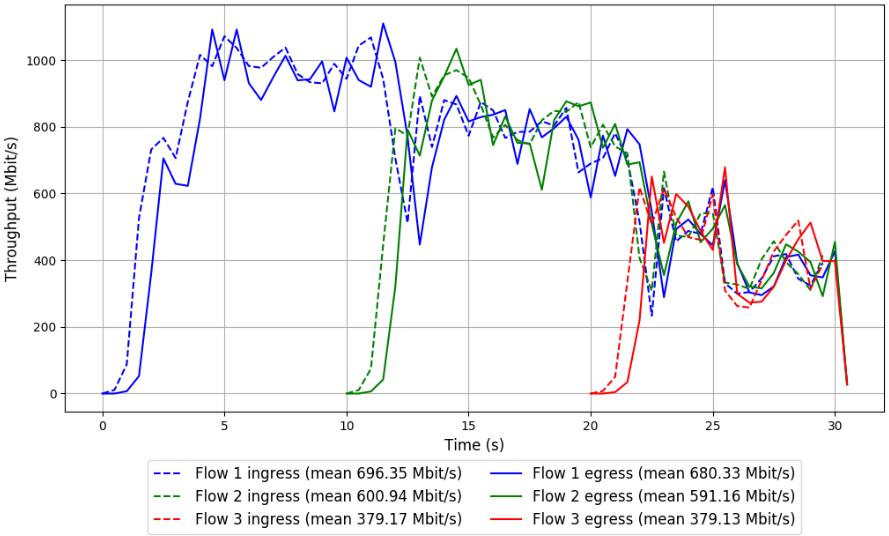
Run 2: Report of FillP — Data Link

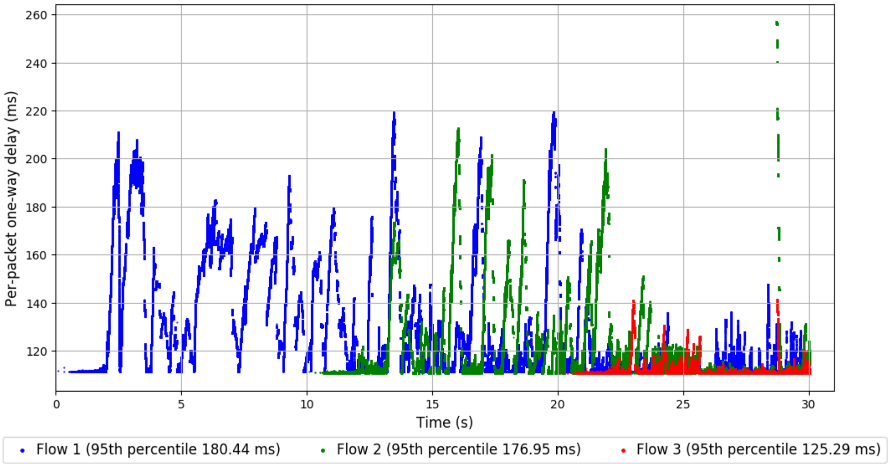




```
Run 3: Statistics of FillP

Start at: 2018-10-02 12:41:00
End at: 2018-10-02 12:41:30
Local clock offset: 0.057 ms
Remote clock offset: -0.206 ms

# Below is generated by plot.py at 2018-10-02 14:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1198.90 Mbit/s
95th percentile per-packet one-way delay: 176.609 ms
Loss rate: 1.83%
-- Flow 1:
Average throughput: 680.33 Mbit/s
95th percentile per-packet one-way delay: 180.440 ms
Loss rate: 2.30%
-- Flow 2:
Average throughput: 591.16 Mbit/s
95th percentile per-packet one-way delay: 176.948 ms
Loss rate: 1.59%
-- Flow 3:
Average throughput: 379.13 Mbit/s
95th percentile per-packet one-way delay: 125.288 ms
Loss rate: 0.00%
```

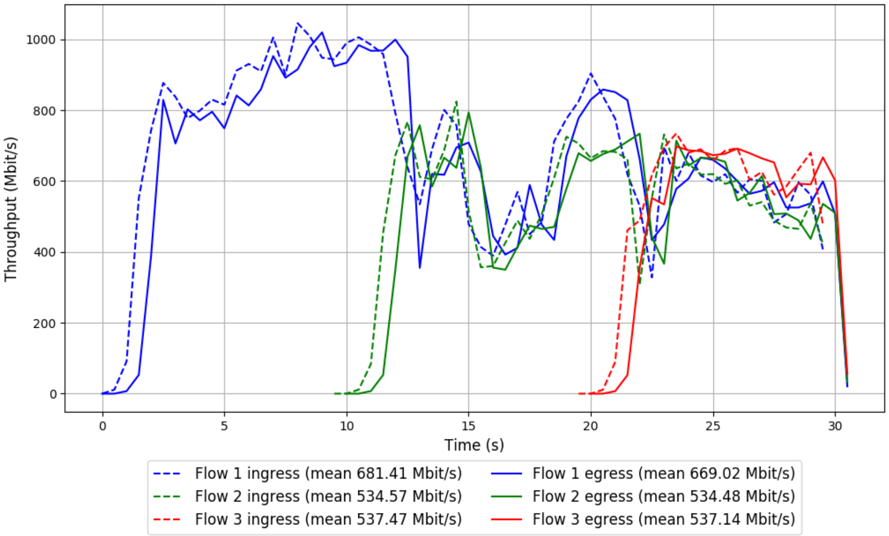
Run 3: Report of FillP — Data Link

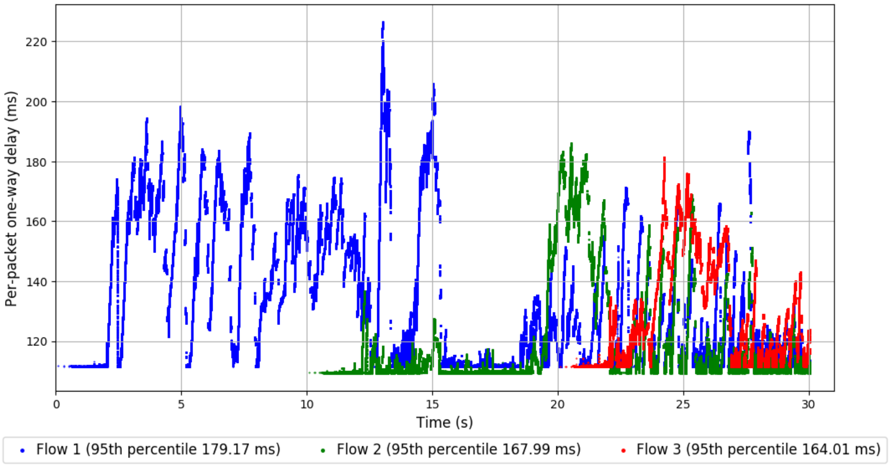




```
Run 4: Statistics of FillP

Start at: 2018-10-02 13:13:32
End at: 2018-10-02 13:14:02
Local clock offset: -0.08 ms
Remote clock offset: 0.016 ms

# Below is generated by plot.py at 2018-10-02 14:56:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1203.07 Mbit/s
95th percentile per-packet one-way delay: 175.289 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 669.02 Mbit/s
95th percentile per-packet one-way delay: 179.166 ms
Loss rate: 1.82%
-- Flow 2:
Average throughput: 534.48 Mbit/s
95th percentile per-packet one-way delay: 167.986 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 537.14 Mbit/s
95th percentile per-packet one-way delay: 164.010 ms
Loss rate: 0.01%
```

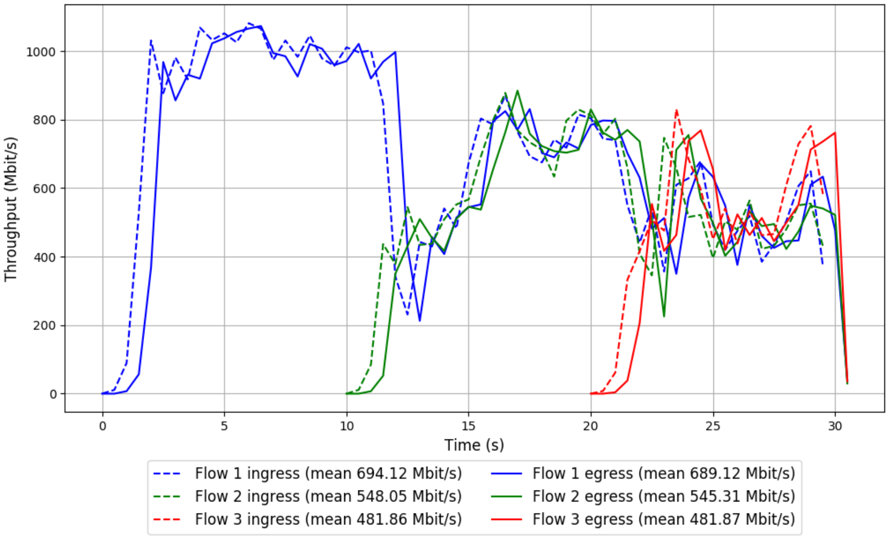
Run 4: Report of FillP — Data Link

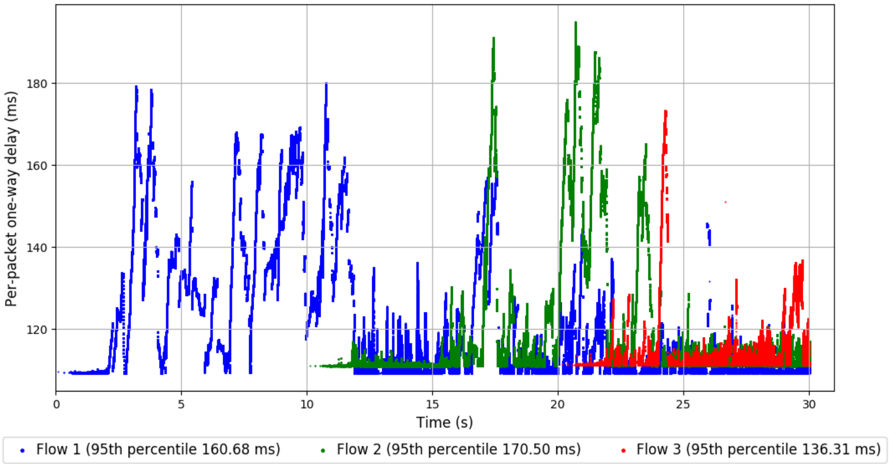




```
Run 5: Statistics of FillP

Start at: 2018-10-02 13:45:49
End at: 2018-10-02 13:46:19
Local clock offset: -0.127 ms
Remote clock offset: 0.236 ms

# Below is generated by plot.py at 2018-10-02 14:58:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1210.83 Mbit/s
95th percentile per-packet one-way delay: 161.161 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 689.12 Mbit/s
95th percentile per-packet one-way delay: 160.679 ms
Loss rate: 0.72%
-- Flow 2:
Average throughput: 545.31 Mbit/s
95th percentile per-packet one-way delay: 170.498 ms
Loss rate: 0.50%
-- Flow 3:
Average throughput: 481.87 Mbit/s
95th percentile per-packet one-way delay: 136.313 ms
Loss rate: 0.00%
```

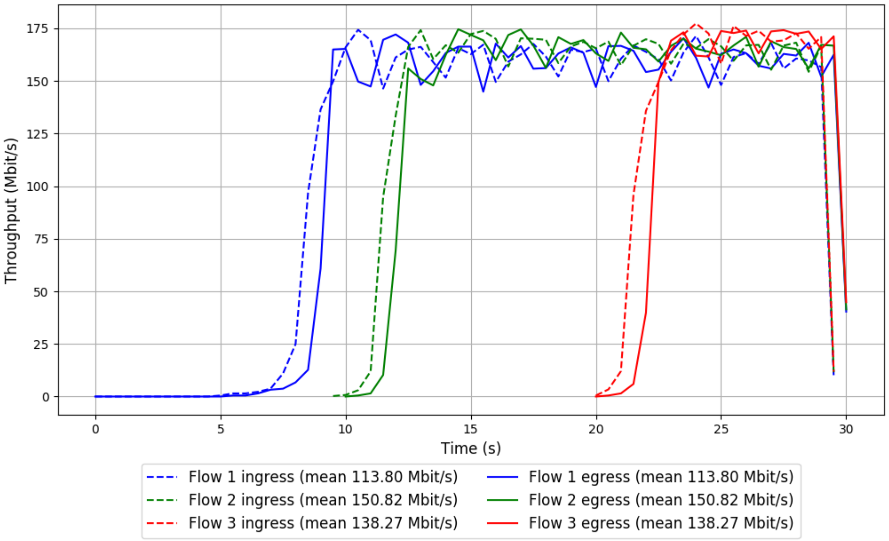
Run 5: Report of FillP — Data Link

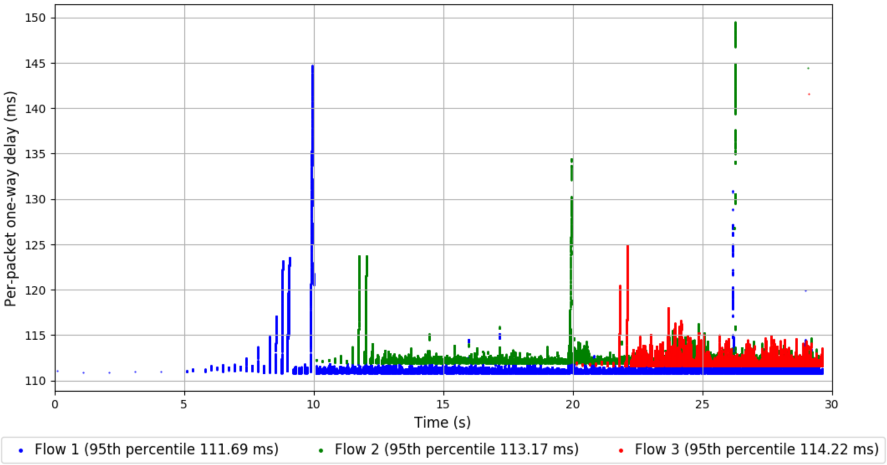




```
Run 1: Statistics of Indigo

Start at: 2018-10-02 11:07:56
End at: 2018-10-02 11:08:26
Local clock offset: -0.734 ms
Remote clock offset: -0.048 ms

# Below is generated by plot.py at 2018-10-02 14:58:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 257.93 Mbit/s
95th percentile per-packet one-way delay: 113.213 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 113.80 Mbit/s
95th percentile per-packet one-way delay: 111.687 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 150.82 Mbit/s
95th percentile per-packet one-way delay: 113.169 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 138.27 Mbit/s
95th percentile per-packet one-way delay: 114.222 ms
Loss rate: 0.01%
```

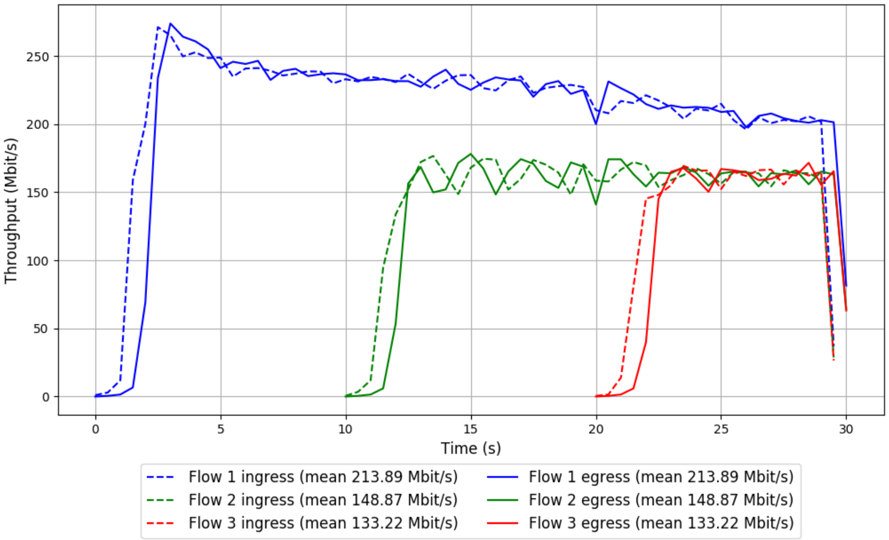
Run 1: Report of Indigo — Data Link

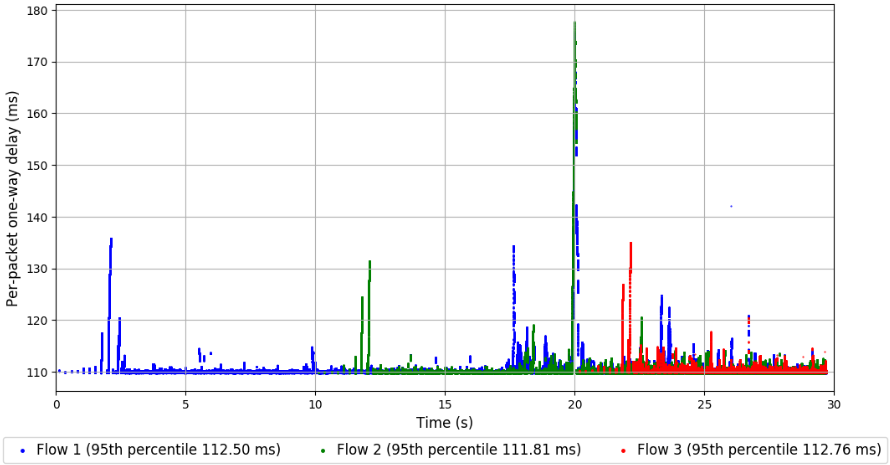




```
Run 2: Statistics of Indigo

Start at: 2018-10-02 11:40:28
End at: 2018-10-02 11:40:58
Local clock offset: 1.025 ms
Remote clock offset: -0.062 ms

# Below is generated by plot.py at 2018-10-02 14:58:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 355.20 Mbit/s
95th percentile per-packet one-way delay: 112.313 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 213.89 Mbit/s
95th percentile per-packet one-way delay: 112.499 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 148.87 Mbit/s
95th percentile per-packet one-way delay: 111.814 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 133.22 Mbit/s
95th percentile per-packet one-way delay: 112.759 ms
Loss rate: 0.00%
```

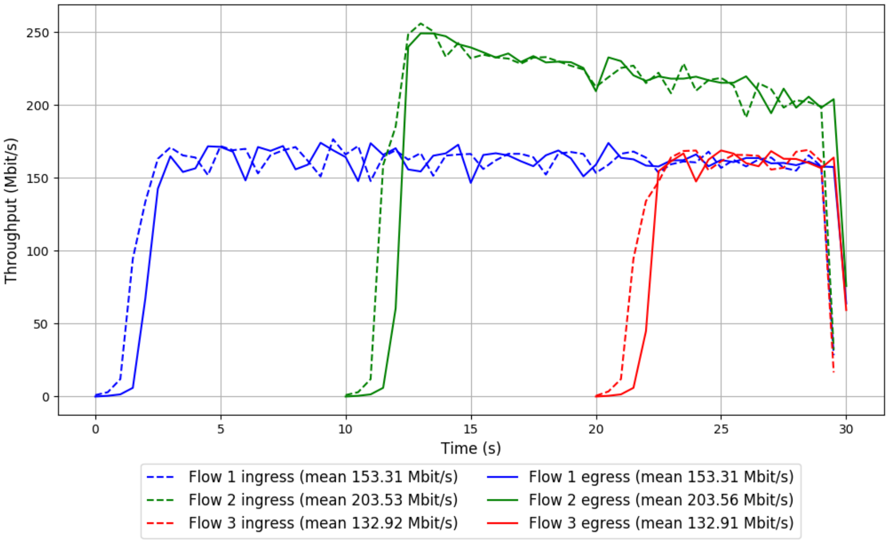
Run 2: Report of Indigo — Data Link

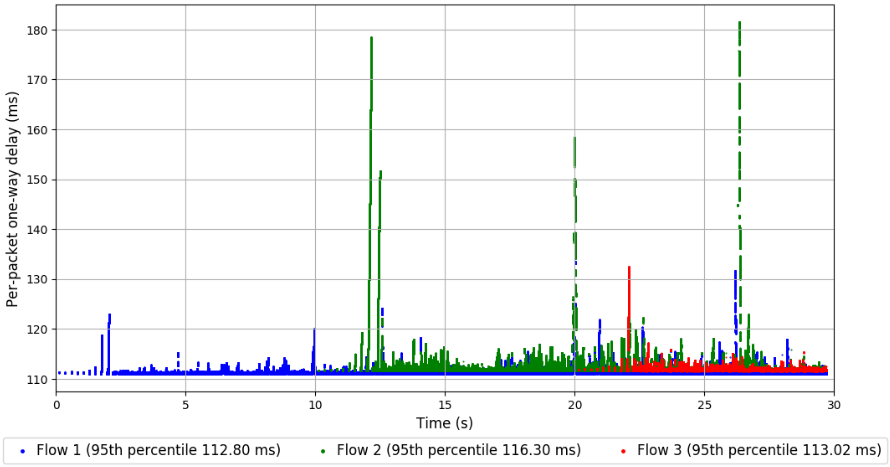




```
Run 3: Statistics of Indigo

Start at: 2018-10-02 12:12:50
End at: 2018-10-02 12:13:20
Local clock offset: -0.259 ms
Remote clock offset: -0.165 ms

# Below is generated by plot.py at 2018-10-02 14:58:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 330.84 Mbit/s
95th percentile per-packet one-way delay: 114.297 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 153.31 Mbit/s
95th percentile per-packet one-way delay: 112.798 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 203.56 Mbit/s
95th percentile per-packet one-way delay: 116.301 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 132.91 Mbit/s
95th percentile per-packet one-way delay: 113.024 ms
Loss rate: 0.02%
```

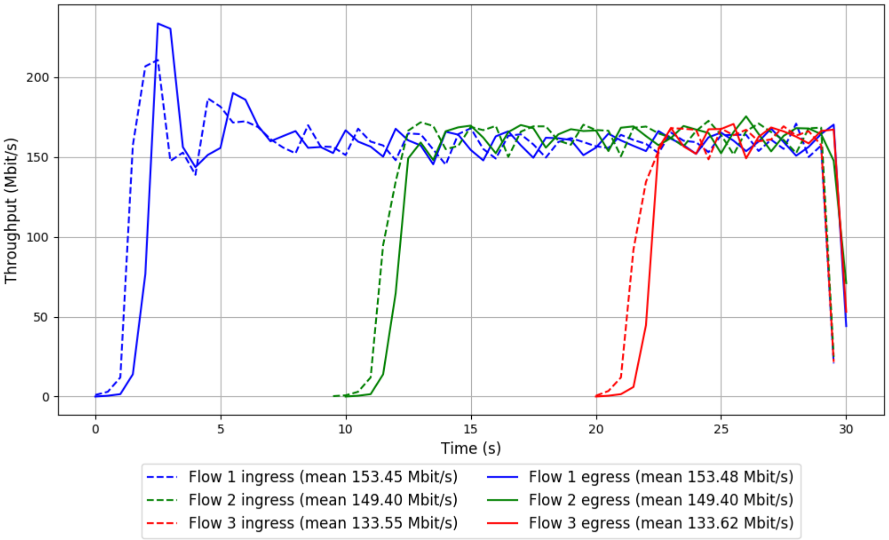
Run 3: Report of Indigo — Data Link

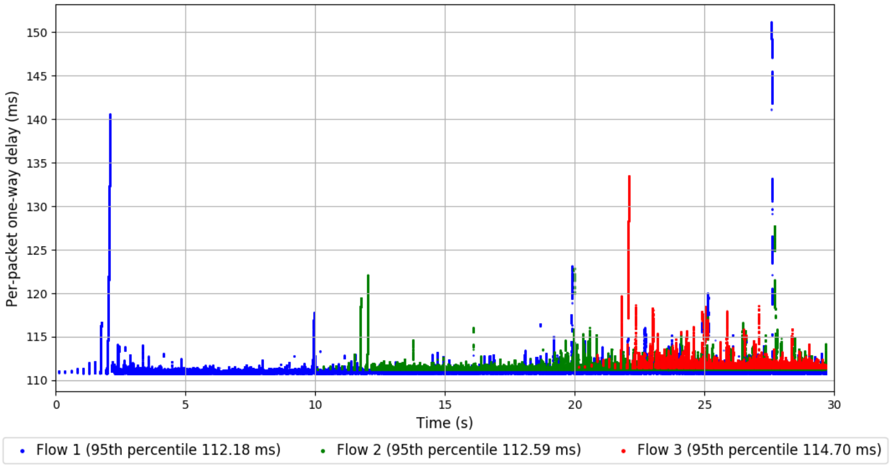




```
Run 4: Statistics of Indigo

Start at: 2018-10-02 12:45:26
End at: 2018-10-02 12:45:56
Local clock offset: -0.061 ms
Remote clock offset: -0.237 ms

# Below is generated by plot.py at 2018-10-02 14:58:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 295.45 Mbit/s
95th percentile per-packet one-way delay: 112.710 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 153.48 Mbit/s
95th percentile per-packet one-way delay: 112.180 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 149.40 Mbit/s
95th percentile per-packet one-way delay: 112.589 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 133.62 Mbit/s
95th percentile per-packet one-way delay: 114.705 ms
Loss rate: 0.00%
```

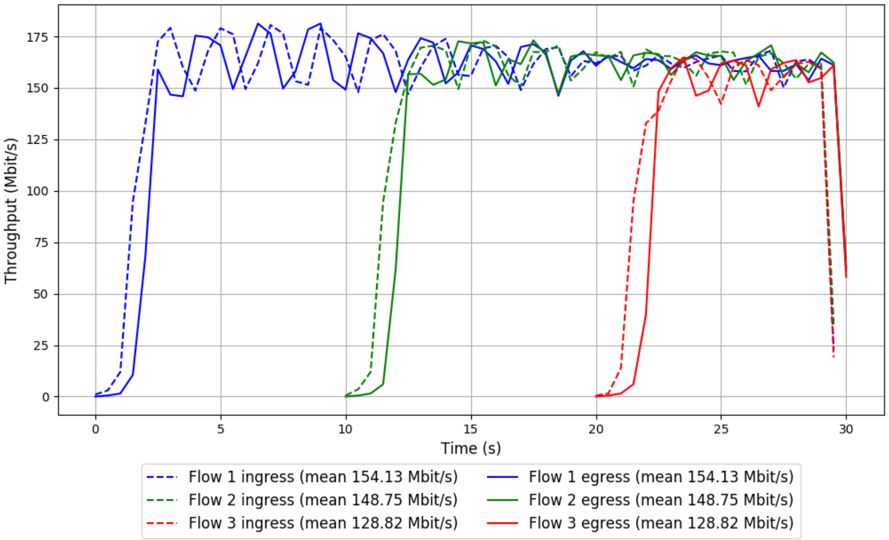
Run 4: Report of Indigo — Data Link

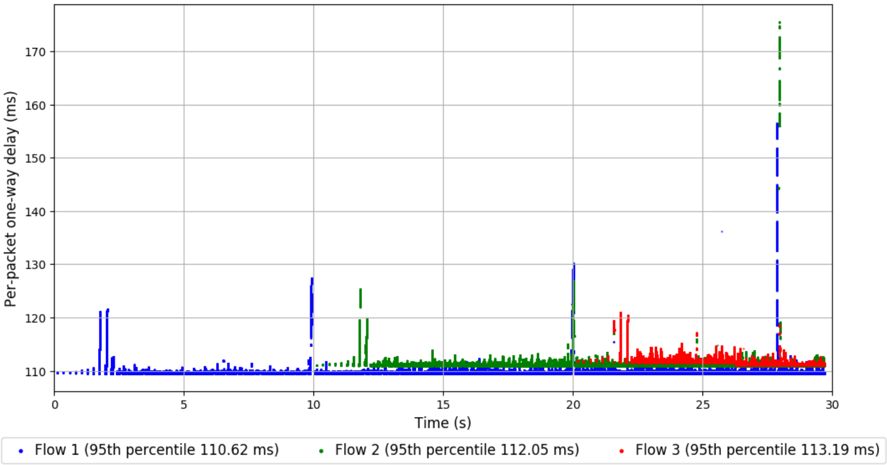




```
Run 5: Statistics of Indigo

Start at: 2018-10-02 13:17:54
End at: 2018-10-02 13:18:24
Local clock offset: -0.283 ms
Remote clock offset: 0.051 ms

# Below is generated by plot.py at 2018-10-02 14:58:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 294.01 Mbit/s
95th percentile per-packet one-way delay: 112.046 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 154.13 Mbit/s
95th percentile per-packet one-way delay: 110.616 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 148.75 Mbit/s
95th percentile per-packet one-way delay: 112.047 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 128.82 Mbit/s
95th percentile per-packet one-way delay: 113.190 ms
Loss rate: 0.00%
```

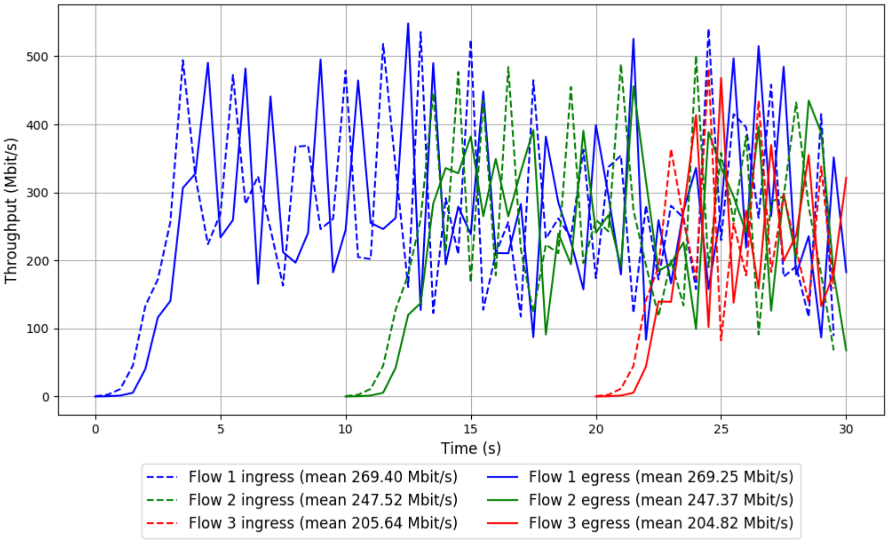
Run 5: Report of Indigo — Data Link

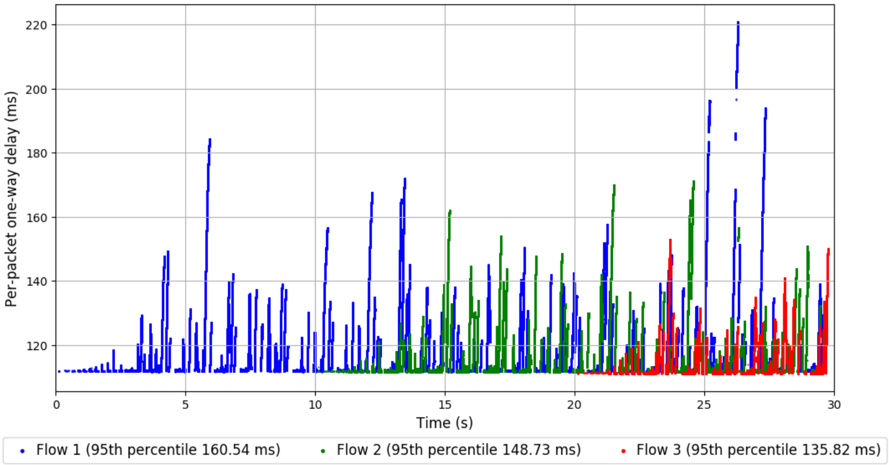




```
Run 1: Statistics of Indigo-96d2da3

Start at: 2018-10-02 11:33:03
End at: 2018-10-02 11:33:33
Local clock offset: -0.332 ms
Remote clock offset: -0.048 ms

# Below is generated by plot.py at 2018-10-02 14:58:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 498.80 Mbit/s
95th percentile per-packet one-way delay: 151.815 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 269.25 Mbit/s
95th percentile per-packet one-way delay: 160.538 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 247.37 Mbit/s
95th percentile per-packet one-way delay: 148.728 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 204.82 Mbit/s
95th percentile per-packet one-way delay: 135.816 ms
Loss rate: 0.00%
```

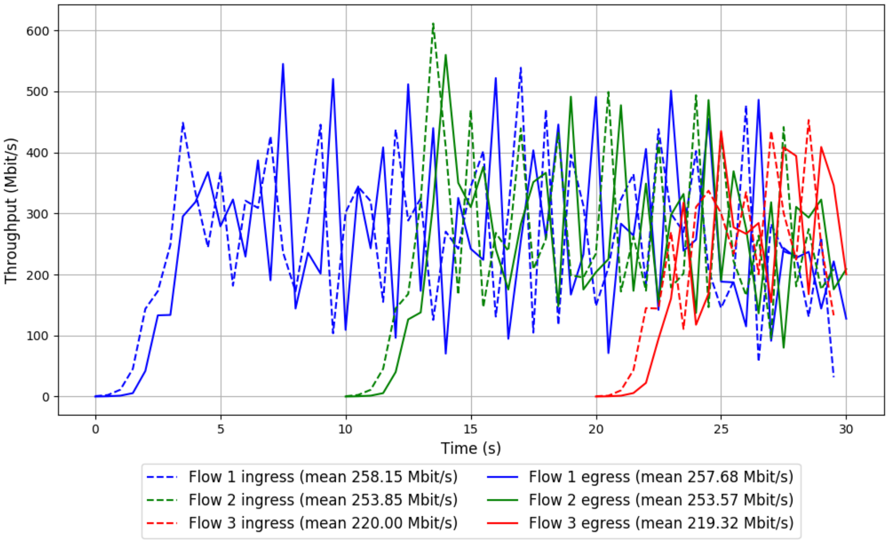
Run 1: Report of Indigo-96d2da3 — Data Link

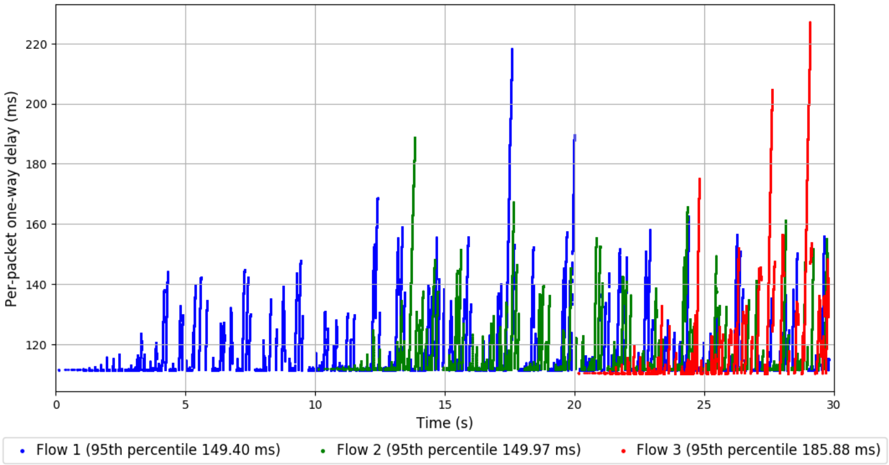




```
Run 2: Statistics of Indigo-96d2da3

Start at: 2018-10-02 12:05:25
End at: 2018-10-02 12:05:55
Local clock offset: -0.139 ms
Remote clock offset: 0.236 ms

# Below is generated by plot.py at 2018-10-02 14:58:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 496.95 Mbit/s
95th percentile per-packet one-way delay: 152.176 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 257.68 Mbit/s
95th percentile per-packet one-way delay: 149.397 ms
Loss rate: 0.18%
-- Flow 2:
Average throughput: 253.57 Mbit/s
95th percentile per-packet one-way delay: 149.975 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 219.32 Mbit/s
95th percentile per-packet one-way delay: 185.885 ms
Loss rate: 0.11%
```

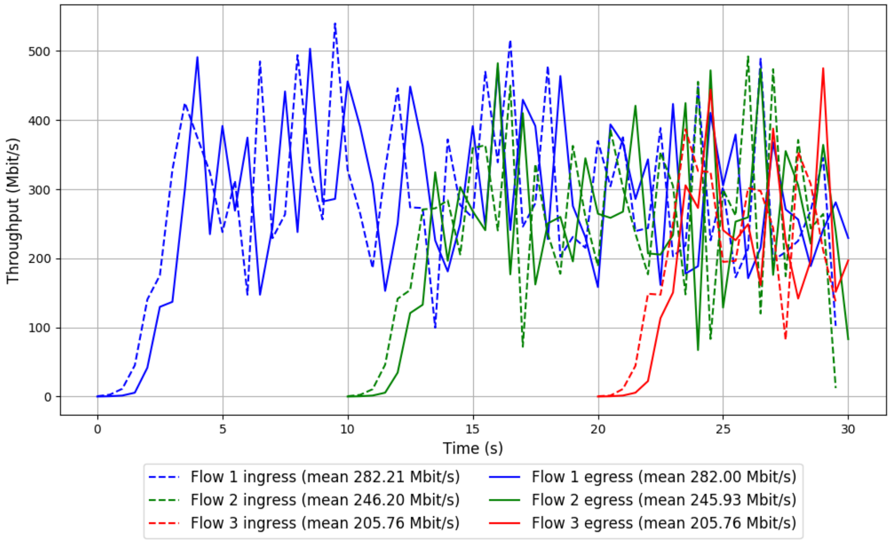
Run 2: Report of Indigo-96d2da3 — Data Link

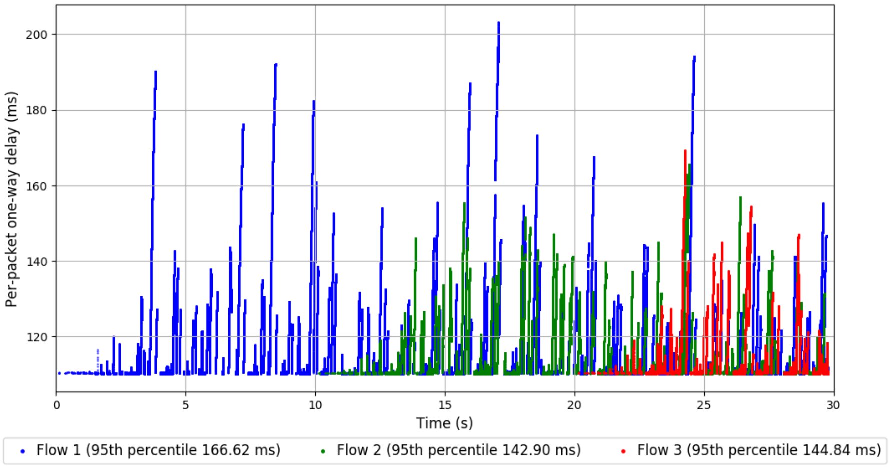




```
Run 3: Statistics of Indigo-96d2da3

Start at: 2018-10-02 12:37:59
End at: 2018-10-02 12:38:29
Local clock offset: 0.603 ms
Remote clock offset: -0.28 ms

# Below is generated by plot.py at 2018-10-02 15:00:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 510.46 Mbit/s
95th percentile per-packet one-way delay: 153.684 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 282.00 Mbit/s
95th percentile per-packet one-way delay: 166.623 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 245.93 Mbit/s
95th percentile per-packet one-way delay: 142.901 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 205.76 Mbit/s
95th percentile per-packet one-way delay: 144.845 ms
Loss rate: 0.00%
```

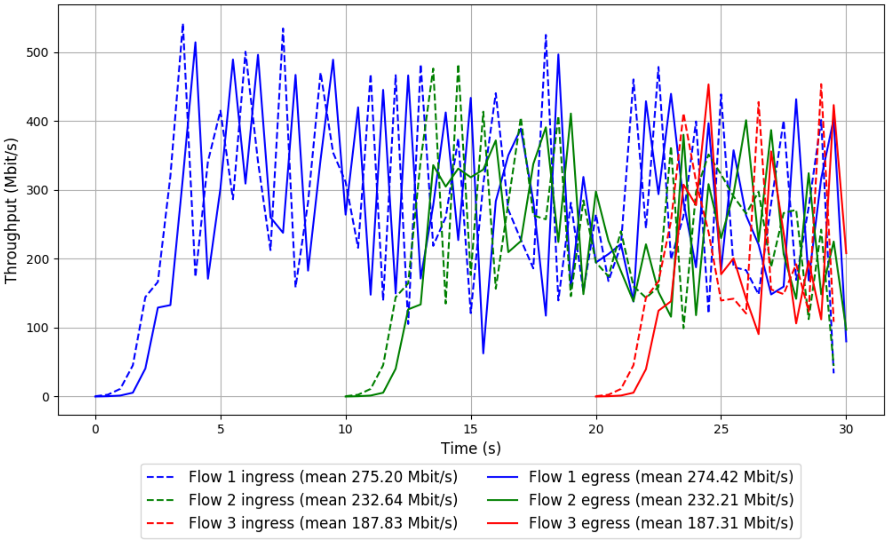
Run 3: Report of Indigo-96d2da3 — Data Link

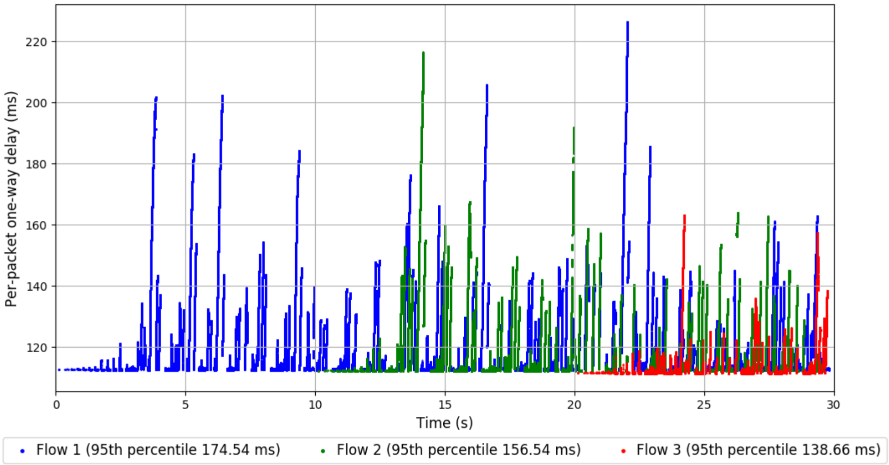




```
Run 4: Statistics of Indigo-96d2da3

Start at: 2018-10-02 13:10:33
End at: 2018-10-02 13:11:03
Local clock offset: -1.346 ms
Remote clock offset: -0.079 ms

# Below is generated by plot.py at 2018-10-02 15:01:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 487.84 Mbit/s
95th percentile per-packet one-way delay: 162.489 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 274.42 Mbit/s
95th percentile per-packet one-way delay: 174.537 ms
Loss rate: 0.28%
-- Flow 2:
Average throughput: 232.21 Mbit/s
95th percentile per-packet one-way delay: 156.536 ms
Loss rate: 0.14%
-- Flow 3:
Average throughput: 187.31 Mbit/s
95th percentile per-packet one-way delay: 138.659 ms
Loss rate: 0.00%
```

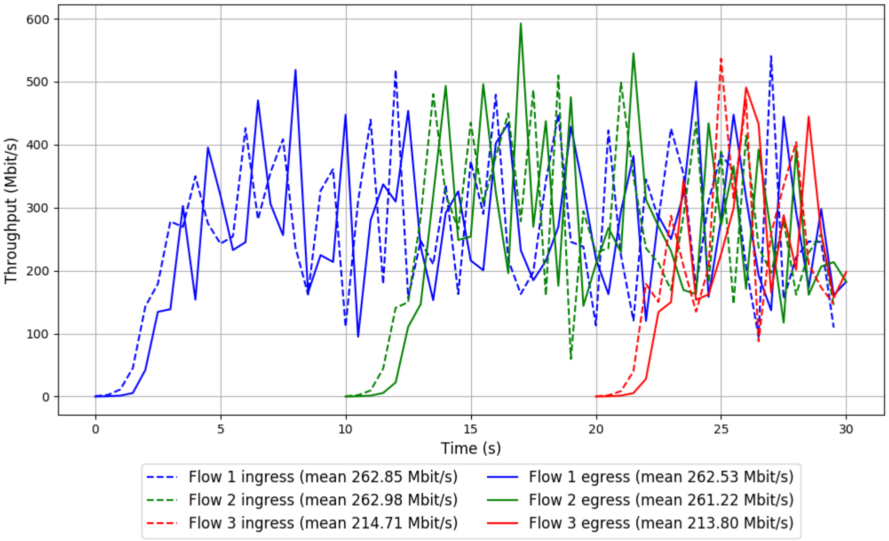
Run 4: Report of Indigo-96d2da3 — Data Link

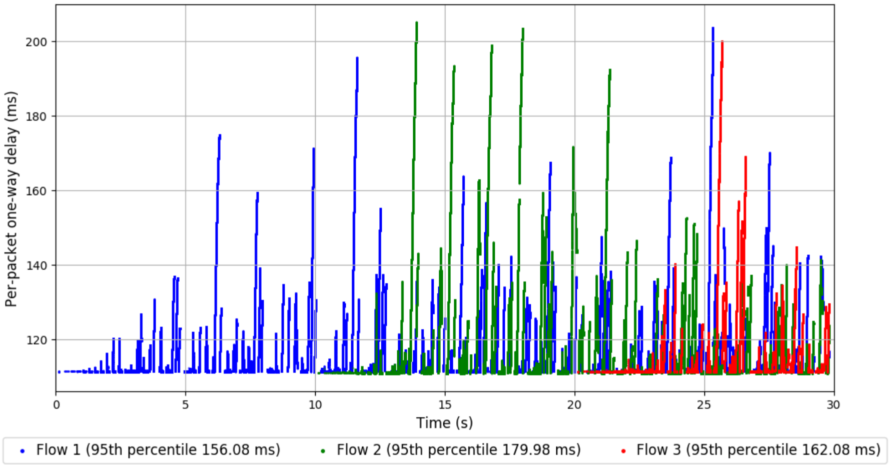




```
Run 5: Statistics of Indigo-96d2da3

Start at: 2018-10-02 13:42:50
End at: 2018-10-02 13:43:20
Local clock offset: -0.15 ms
Remote clock offset: 0.222 ms

# Below is generated by plot.py at 2018-10-02 15:02:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 505.40 Mbit/s
95th percentile per-packet one-way delay: 165.640 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 262.53 Mbit/s
95th percentile per-packet one-way delay: 156.083 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 261.22 Mbit/s
95th percentile per-packet one-way delay: 179.984 ms
Loss rate: 0.67%
-- Flow 3:
Average throughput: 213.80 Mbit/s
95th percentile per-packet one-way delay: 162.077 ms
Loss rate: 0.30%
```

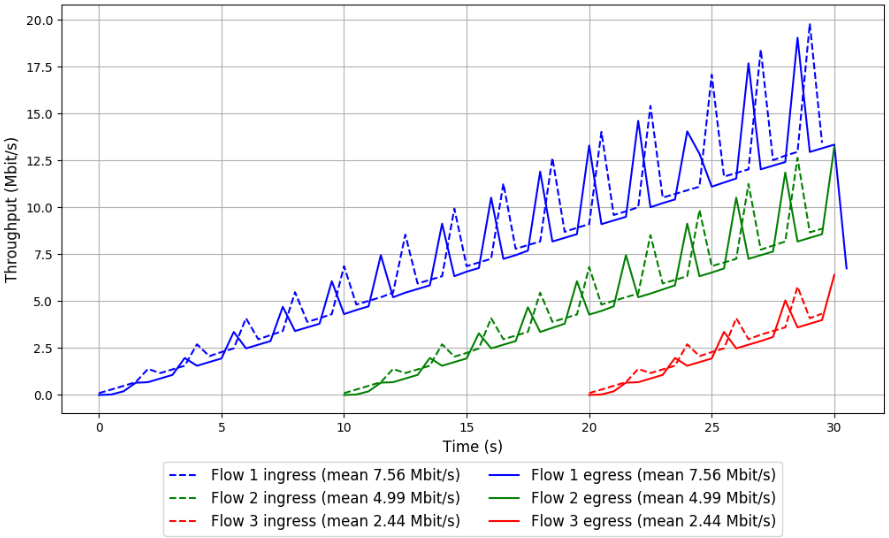
Run 5: Report of Indigo-96d2da3 — Data Link

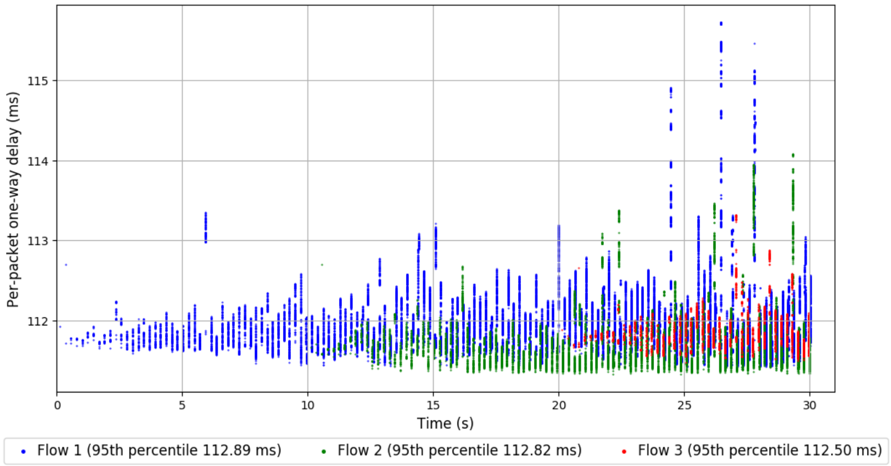




```
Run 1: Statistics of LEDBAT

Start at: 2018-10-02 11:29:46
End at: 2018-10-02 11:30:16
Local clock offset: -0.086 ms
Remote clock offset: -0.041 ms

# Below is generated by plot.py at 2018-10-02 15:02:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 11.68 Mbit/s
95th percentile per-packet one-way delay: 112.809 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 7.56 Mbit/s
95th percentile per-packet one-way delay: 112.889 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 4.99 Mbit/s
95th percentile per-packet one-way delay: 112.816 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 112.502 ms
Loss rate: 0.00%
```

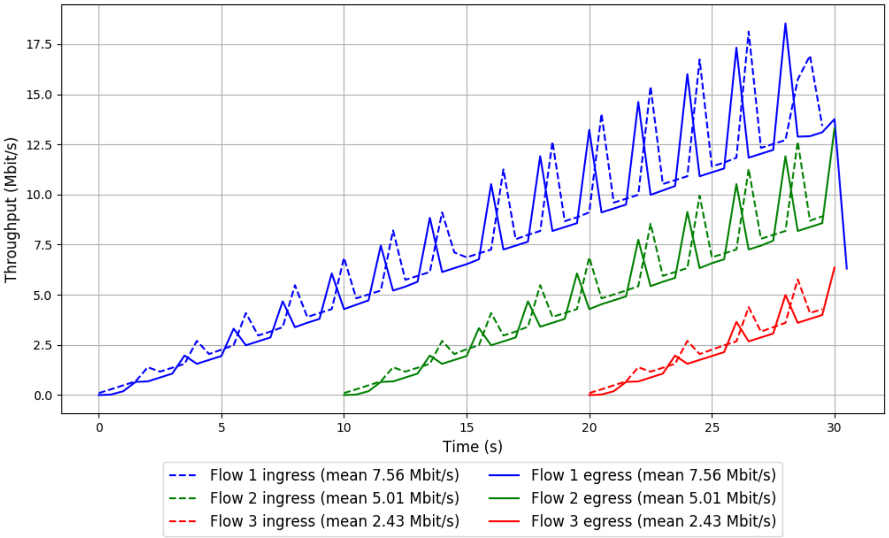
Run 1: Report of LEDBAT — Data Link

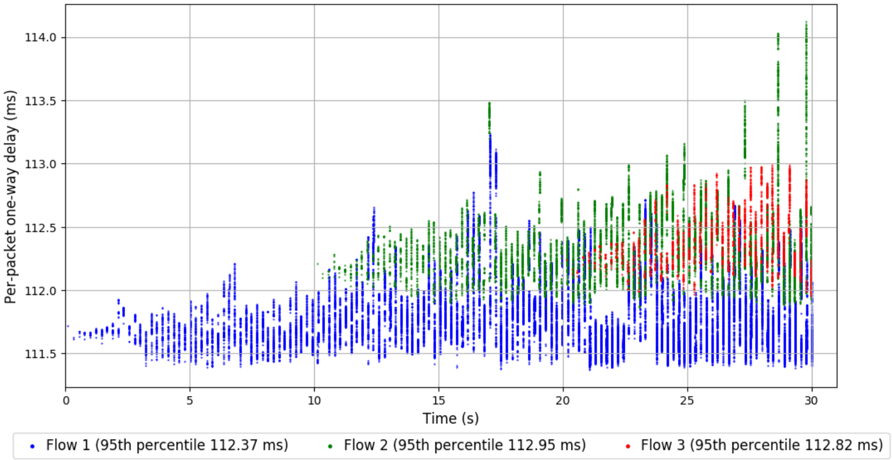




```
Run 2: Statistics of LEDBAT

Start at: 2018-10-02 12:02:14
End at: 2018-10-02 12:02:44
Local clock offset: -0.596 ms
Remote clock offset: -0.109 ms

# Below is generated by plot.py at 2018-10-02 15:02:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 11.68 Mbit/s
95th percentile per-packet one-way delay: 112.689 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 7.56 Mbit/s
95th percentile per-packet one-way delay: 112.370 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 5.01 Mbit/s
95th percentile per-packet one-way delay: 112.954 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.43 Mbit/s
95th percentile per-packet one-way delay: 112.817 ms
Loss rate: 0.00%
```

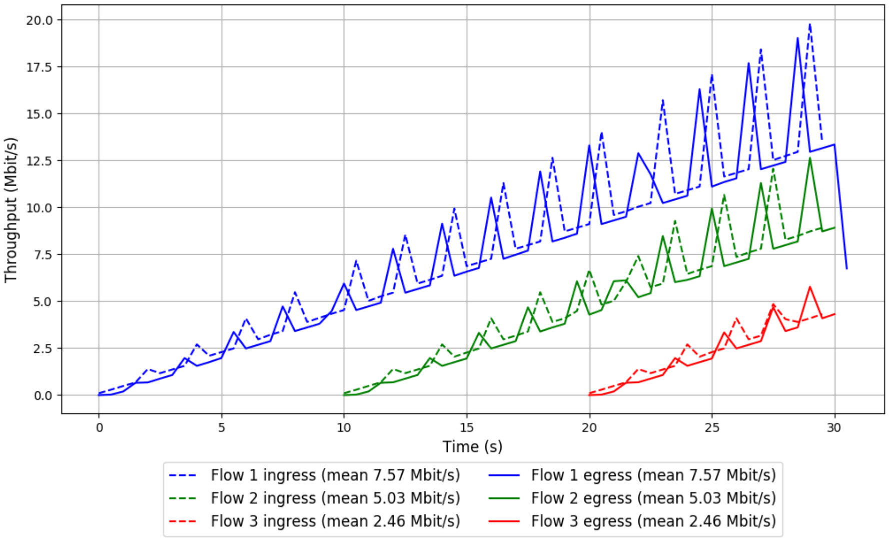
Run 2: Report of LEDBAT — Data Link

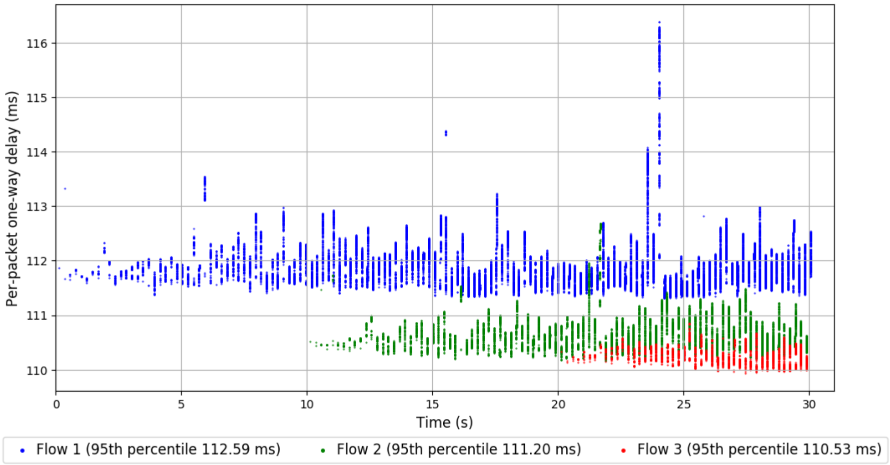




```
Run 3: Statistics of LEDBAT

Start at: 2018-10-02 12:34:49
End at: 2018-10-02 12:35:19
Local clock offset: -0.18 ms
Remote clock offset: -0.241 ms

# Below is generated by plot.py at 2018-10-02 15:02:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 11.69 Mbit/s
95th percentile per-packet one-way delay: 112.452 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 7.57 Mbit/s
95th percentile per-packet one-way delay: 112.591 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 5.03 Mbit/s
95th percentile per-packet one-way delay: 111.203 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 110.525 ms
Loss rate: 0.00%
```

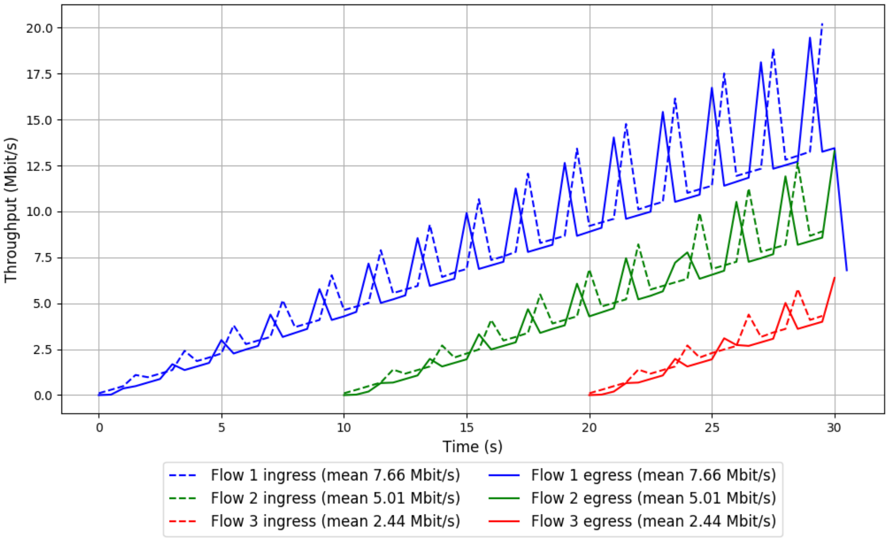
Run 3: Report of LEDBAT — Data Link

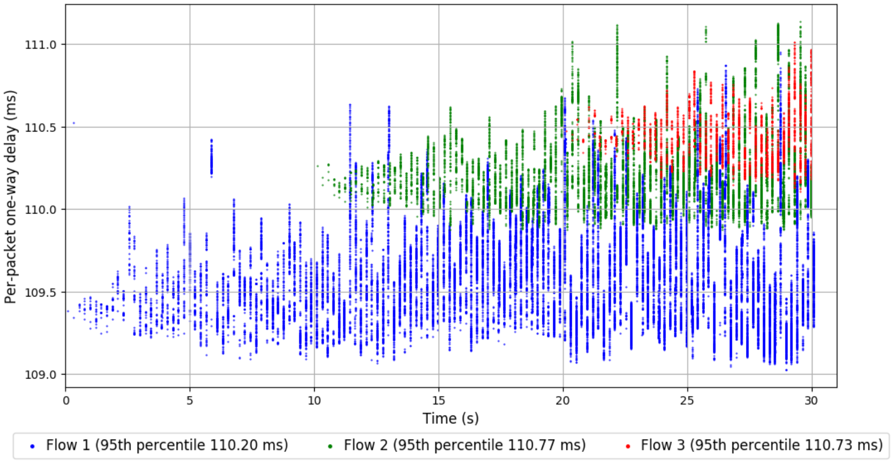




```
Run 4: Statistics of LEDBAT

Start at: 2018-10-02 13:07:23
End at: 2018-10-02 13:07:53
Local clock offset: 1.108 ms
Remote clock offset: -0.123 ms

# Below is generated by plot.py at 2018-10-02 15:02:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 11.78 Mbit/s
95th percentile per-packet one-way delay: 110.565 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 7.66 Mbit/s
95th percentile per-packet one-way delay: 110.203 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 5.01 Mbit/s
95th percentile per-packet one-way delay: 110.766 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 110.730 ms
Loss rate: 0.00%
```

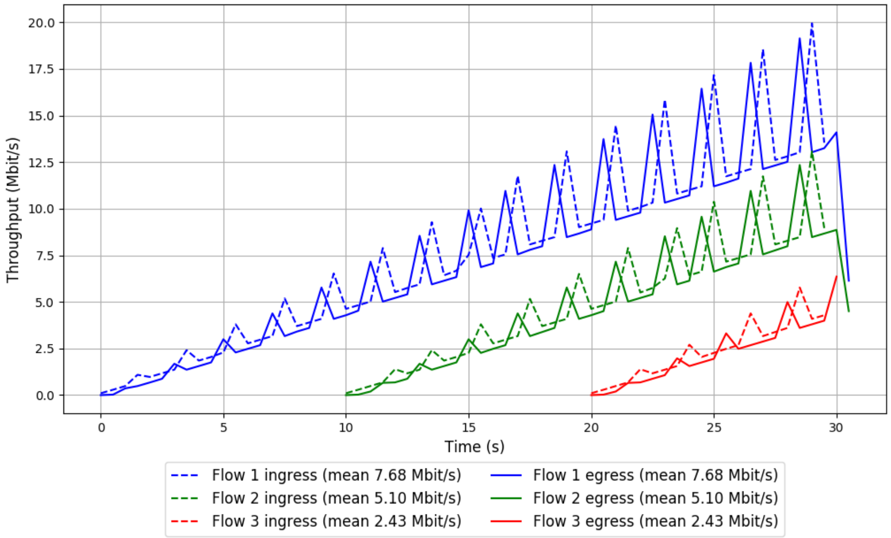
Run 4: Report of LEDBAT — Data Link

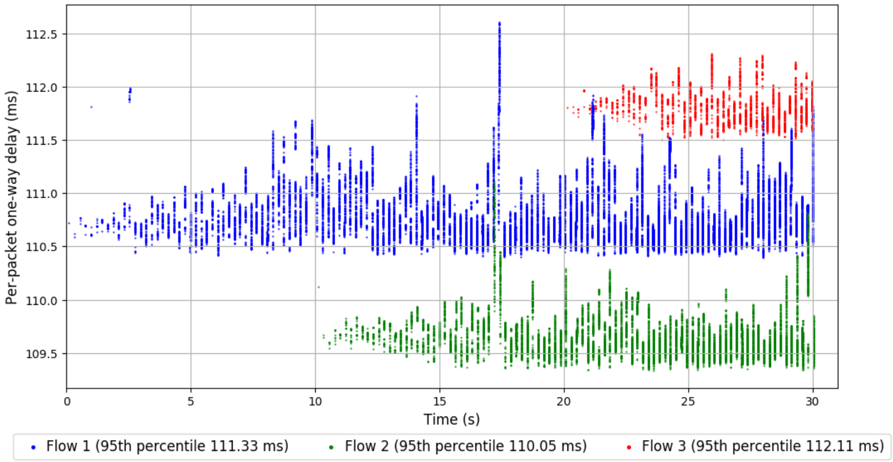




```
Run 5: Statistics of LEDBAT

Start at: 2018-10-02 13:39:37
End at: 2018-10-02 13:40:07
Local clock offset: -0.261 ms
Remote clock offset: 0.221 ms

# Below is generated by plot.py at 2018-10-02 15:02:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 11.86 Mbit/s
95th percentile per-packet one-way delay: 111.725 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 7.68 Mbit/s
95th percentile per-packet one-way delay: 111.325 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 5.10 Mbit/s
95th percentile per-packet one-way delay: 110.046 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.43 Mbit/s
95th percentile per-packet one-way delay: 112.109 ms
Loss rate: 0.00%
```

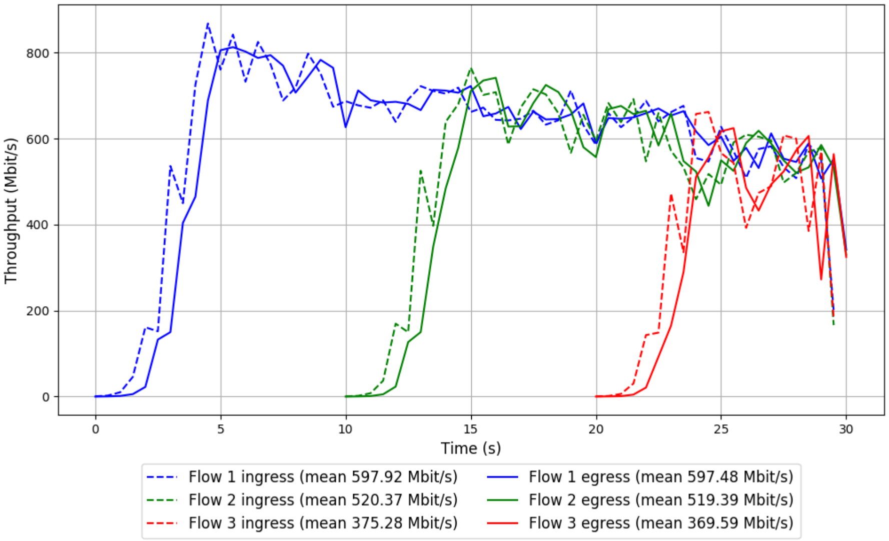
Run 5: Report of LEDBAT — Data Link

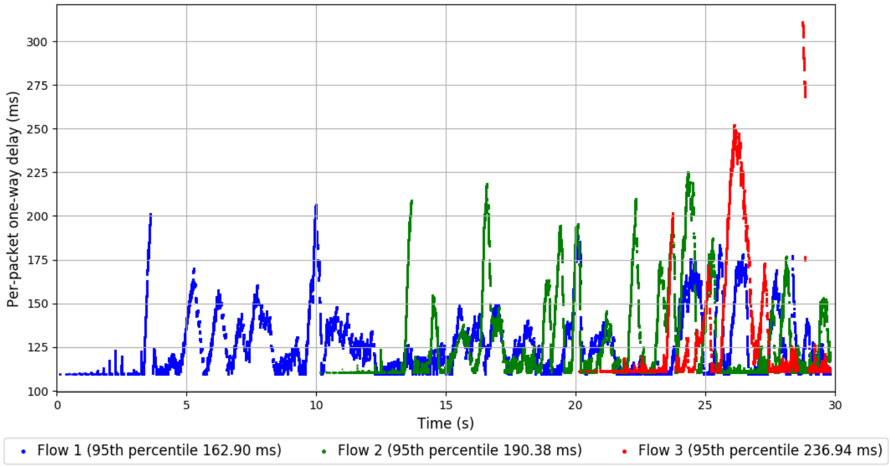




```
Run 1: Statistics of Indigo-Muses

Start at: 2018-10-02 11:16:24
End at: 2018-10-02 11:16:54
Local clock offset: 0.303 ms
Remote clock offset: -0.089 ms

# Below is generated by plot.py at 2018-10-02 15:12:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1061.81 Mbit/s
95th percentile per-packet one-way delay: 179.652 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 597.48 Mbit/s
95th percentile per-packet one-way delay: 162.904 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 519.39 Mbit/s
95th percentile per-packet one-way delay: 190.379 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 369.59 Mbit/s
95th percentile per-packet one-way delay: 236.937 ms
Loss rate: 1.52%
```

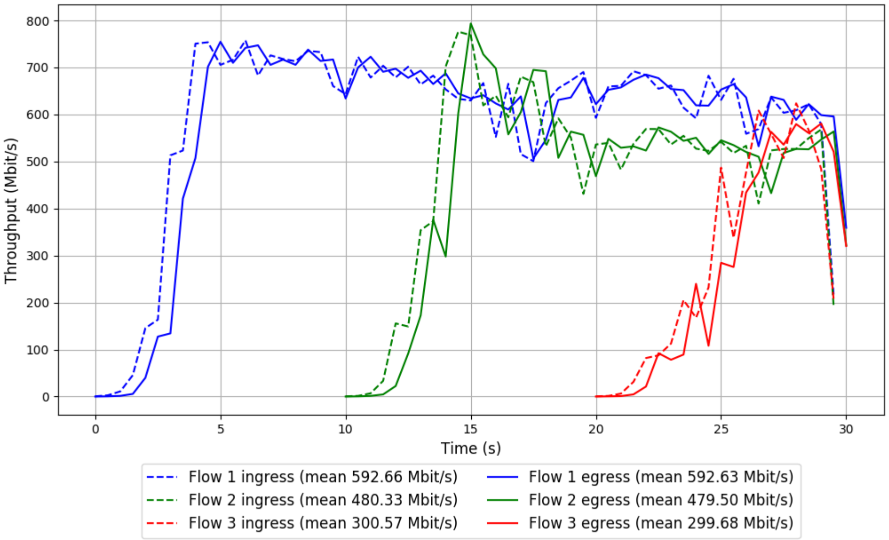
Run 1: Report of Indigo-Muses — Data Link

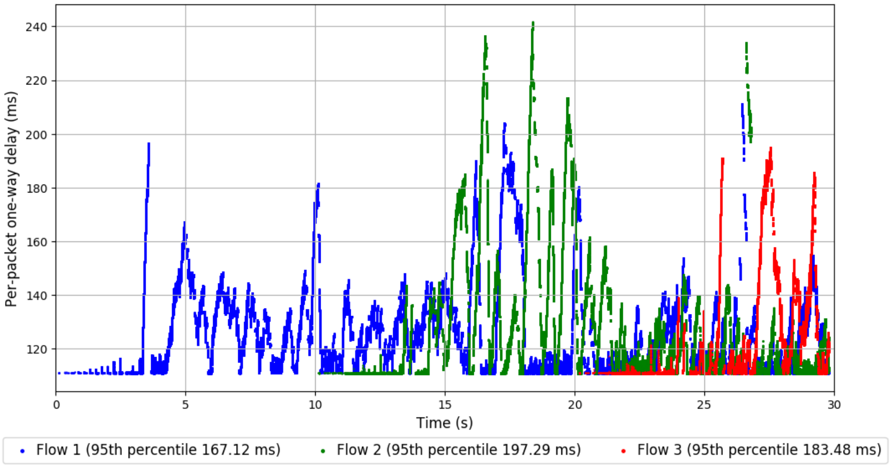




```
Run 2: Statistics of Indigo-Muses

Start at: 2018-10-02 11:48:36
End at: 2018-10-02 11:49:06
Local clock offset: -0.071 ms
Remote clock offset: -0.078 ms

# Below is generated by plot.py at 2018-10-02 15:12:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1007.43 Mbit/s
95th percentile per-packet one-way delay: 178.061 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 592.63 Mbit/s
95th percentile per-packet one-way delay: 167.118 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 479.50 Mbit/s
95th percentile per-packet one-way delay: 197.290 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 299.68 Mbit/s
95th percentile per-packet one-way delay: 183.483 ms
Loss rate: 0.29%
```

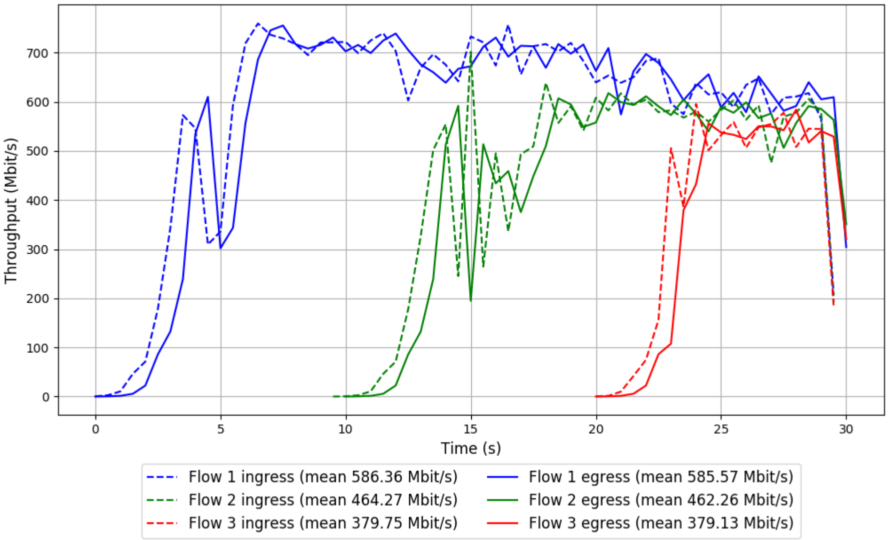
Run 2: Report of Indigo-Muses — Data Link

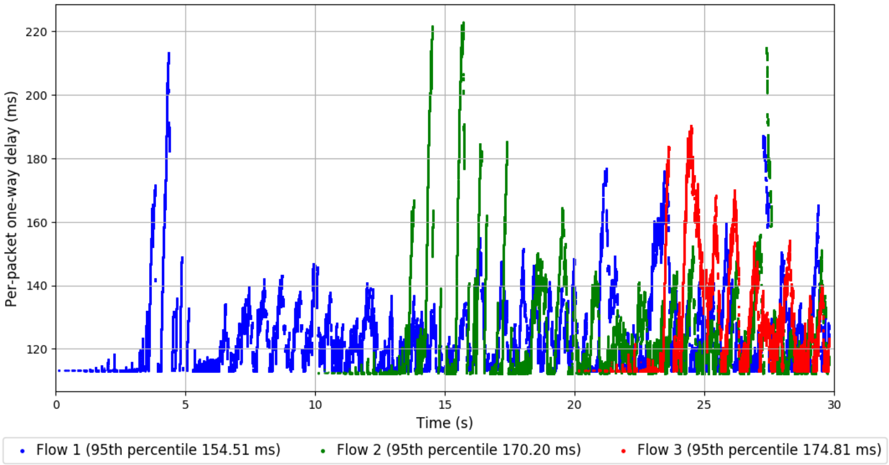




```
Run 3: Statistics of Indigo-Muses

Start at: 2018-10-02 12:21:26
End at: 2018-10-02 12:21:56
Local clock offset: -1.561 ms
Remote clock offset: -0.178 ms

# Below is generated by plot.py at 2018-10-02 15:12:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1015.44 Mbit/s
95th percentile per-packet one-way delay: 162.762 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 585.57 Mbit/s
95th percentile per-packet one-way delay: 154.512 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 462.26 Mbit/s
95th percentile per-packet one-way delay: 170.196 ms
Loss rate: 0.43%
-- Flow 3:
Average throughput: 379.13 Mbit/s
95th percentile per-packet one-way delay: 174.813 ms
Loss rate: 0.16%
```

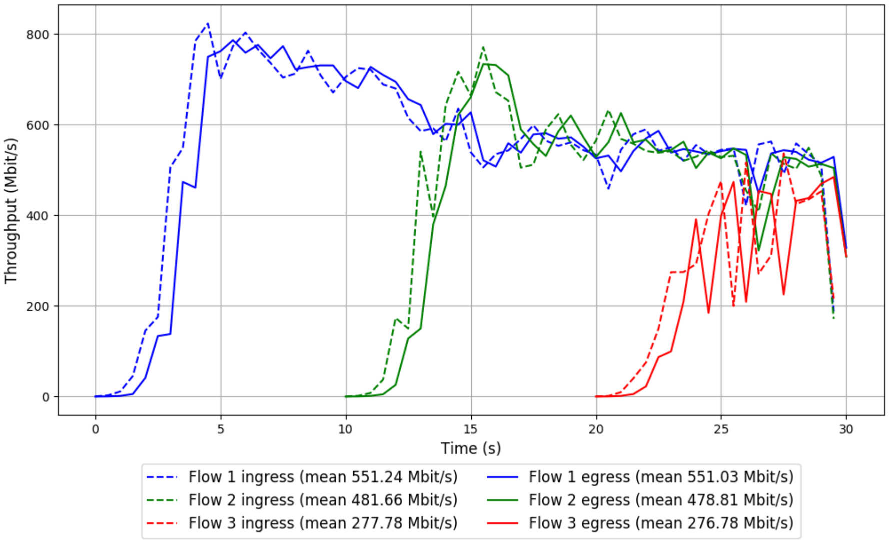
Run 3: Report of Indigo-Muses — Data Link

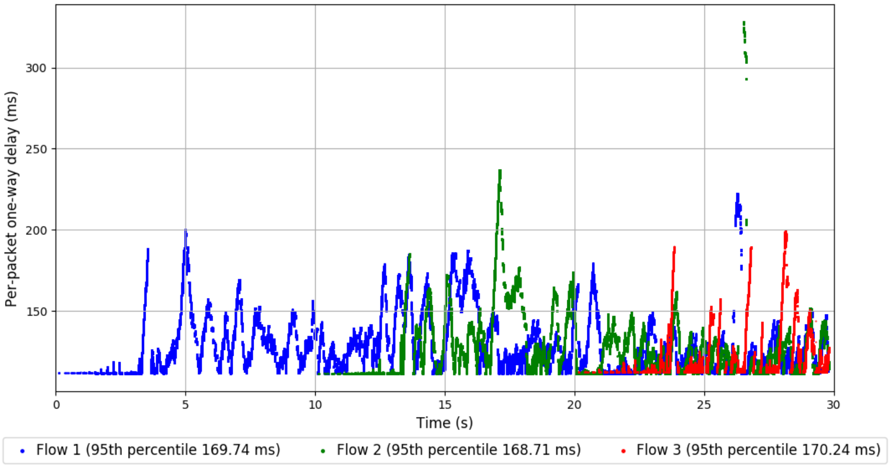




```
Run 4: Statistics of Indigo-Muses

Start at: 2018-10-02 12:54:04
End at: 2018-10-02 12:54:34
Local clock offset: -1.516 ms
Remote clock offset: -0.223 ms

# Below is generated by plot.py at 2018-10-02 15:12:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 958.12 Mbit/s
95th percentile per-packet one-way delay: 169.410 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 551.03 Mbit/s
95th percentile per-packet one-way delay: 169.735 ms
Loss rate: 0.03%
-- Flow 2:
Average throughput: 478.81 Mbit/s
95th percentile per-packet one-way delay: 168.708 ms
Loss rate: 0.58%
-- Flow 3:
Average throughput: 276.78 Mbit/s
95th percentile per-packet one-way delay: 170.243 ms
Loss rate: 0.34%
```

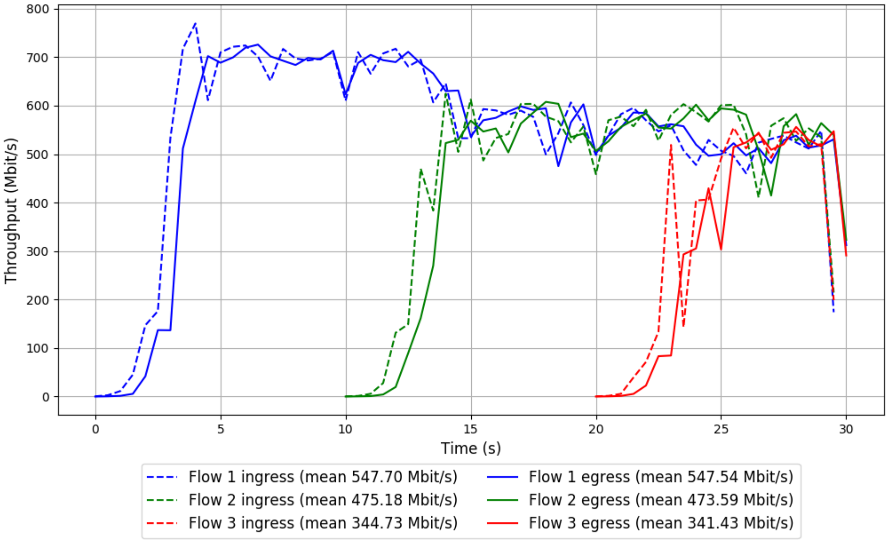
Run 4: Report of Indigo-Muses — Data Link

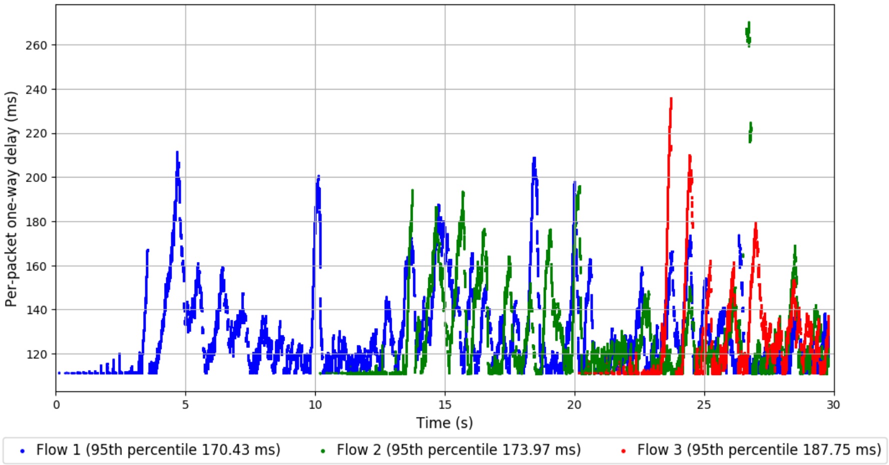




```
Run 5: Statistics of Indigo-Muses

Start at: 2018-10-02 13:26:18
End at: 2018-10-02 13:26:48
Local clock offset: -0.374 ms
Remote clock offset: 0.093 ms

# Below is generated by plot.py at 2018-10-02 15:13:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 971.42 Mbit/s
95th percentile per-packet one-way delay: 173.169 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 547.54 Mbit/s
95th percentile per-packet one-way delay: 170.429 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 473.59 Mbit/s
95th percentile per-packet one-way delay: 173.974 ms
Loss rate: 0.35%
-- Flow 3:
Average throughput: 341.43 Mbit/s
95th percentile per-packet one-way delay: 187.754 ms
Loss rate: 0.99%
```

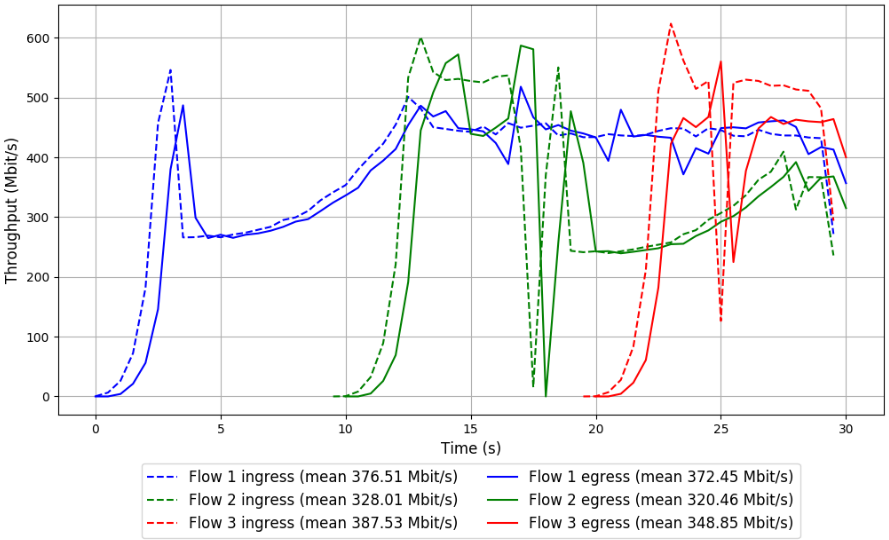
Run 5: Report of Indigo-Muses — Data Link

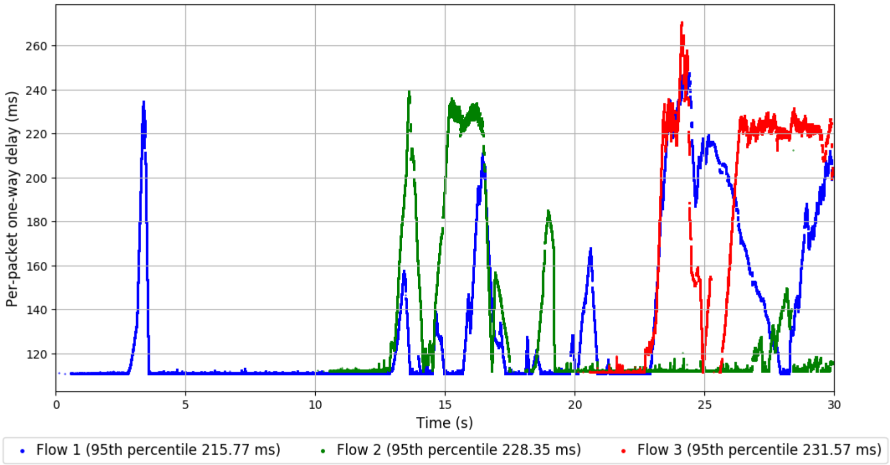




```
Run 1: Statistics of PCC-Allegro

Start at: 2018-10-02 11:25:28
End at: 2018-10-02 11:25:58
Local clock offset: -0.261 ms
Remote clock offset: 0.305 ms

# Below is generated by plot.py at 2018-10-02 15:22:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 700.72 Mbit/s
95th percentile per-packet one-way delay: 227.075 ms
Loss rate: 3.04%
-- Flow 1:
Average throughput: 372.45 Mbit/s
95th percentile per-packet one-way delay: 215.773 ms
Loss rate: 1.09%
-- Flow 2:
Average throughput: 320.46 Mbit/s
95th percentile per-packet one-way delay: 228.350 ms
Loss rate: 2.32%
-- Flow 3:
Average throughput: 348.85 Mbit/s
95th percentile per-packet one-way delay: 231.567 ms
Loss rate: 10.00%
```

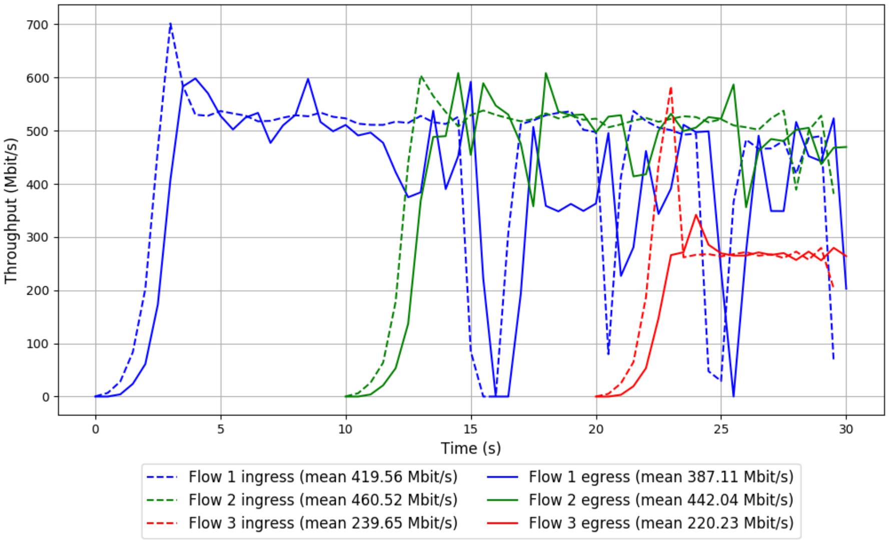
Run 1: Report of PCC-Allegro — Data Link

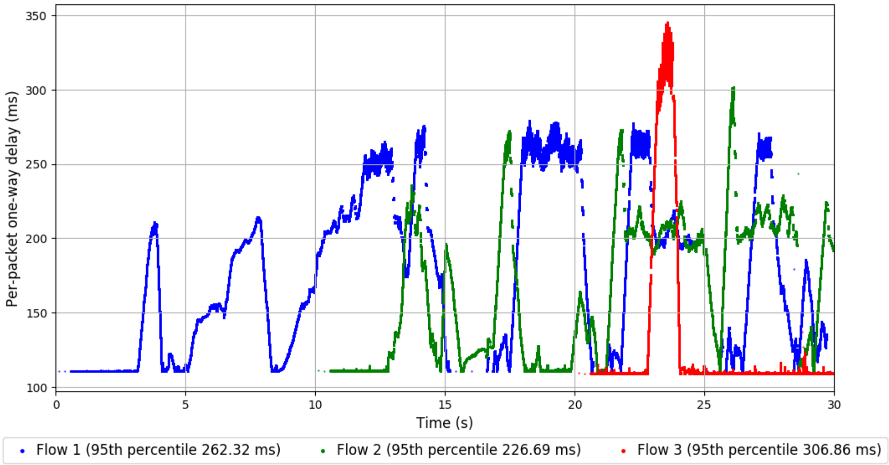




```
Run 2: Statistics of PCC-Allegro

Start at: 2018-10-02 11:57:46
End at: 2018-10-02 11:58:16
Local clock offset: 0.005 ms
Remote clock offset: -0.1 ms

# Below is generated by plot.py at 2018-10-02 15:26:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 751.59 Mbit/s
95th percentile per-packet one-way delay: 260.209 ms
Loss rate: 6.35%
-- Flow 1:
Average throughput: 387.11 Mbit/s
95th percentile per-packet one-way delay: 262.319 ms
Loss rate: 7.73%
-- Flow 2:
Average throughput: 442.04 Mbit/s
95th percentile per-packet one-way delay: 226.695 ms
Loss rate: 4.01%
-- Flow 3:
Average throughput: 220.23 Mbit/s
95th percentile per-packet one-way delay: 306.863 ms
Loss rate: 8.10%
```

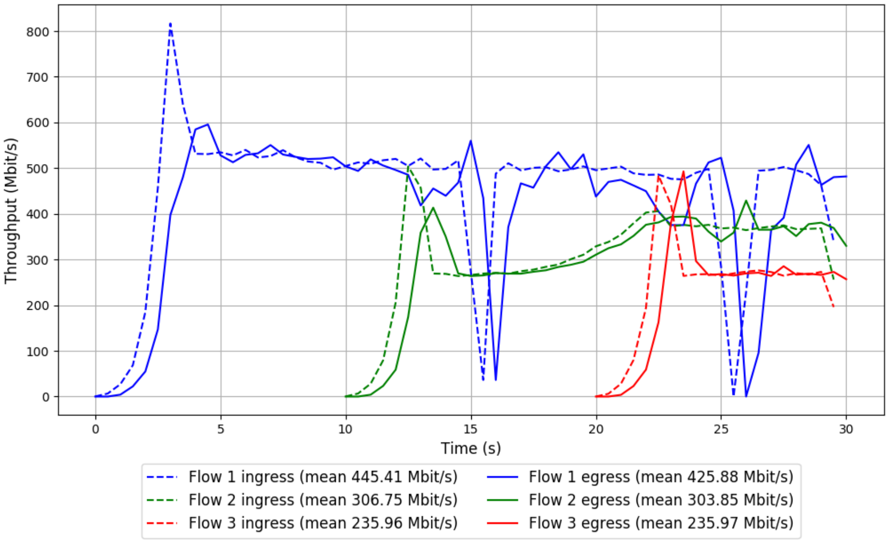
Run 2: Report of PCC-Allegro — Data Link

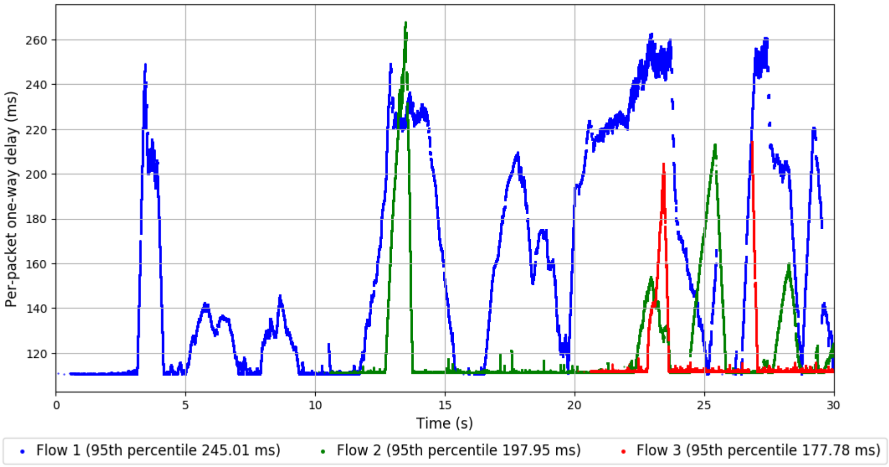




```
Run 3: Statistics of PCC-Allegro

Start at: 2018-10-02 12:30:34
End at: 2018-10-02 12:31:04
Local clock offset: -0.425 ms
Remote clock offset: -0.174 ms

# Below is generated by plot.py at 2018-10-02 15:26:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 705.51 Mbit/s
95th percentile per-packet one-way delay: 232.863 ms
Loss rate: 2.95%
-- Flow 1:
Average throughput: 425.88 Mbit/s
95th percentile per-packet one-way delay: 245.013 ms
Loss rate: 4.38%
-- Flow 2:
Average throughput: 303.85 Mbit/s
95th percentile per-packet one-way delay: 197.951 ms
Loss rate: 0.94%
-- Flow 3:
Average throughput: 235.97 Mbit/s
95th percentile per-packet one-way delay: 177.776 ms
Loss rate: 0.00%
```

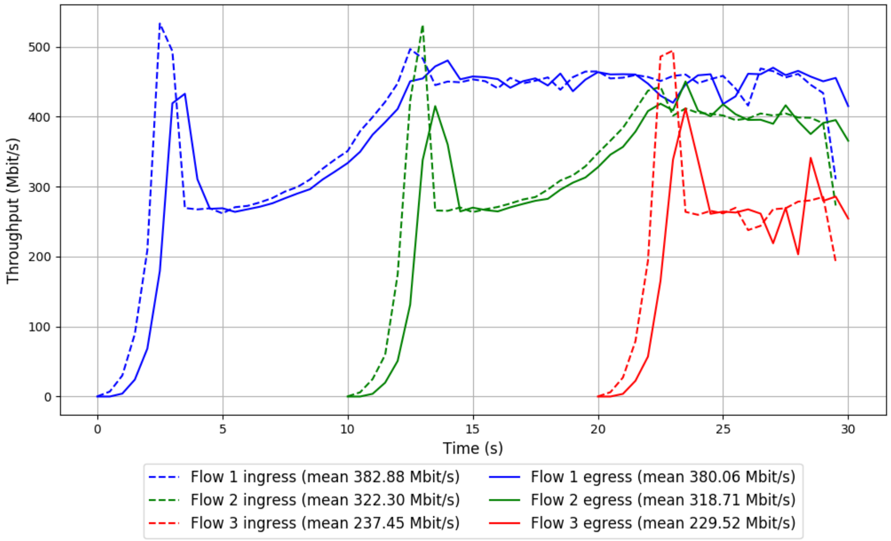
Run 3: Report of PCC-Allegro — Data Link

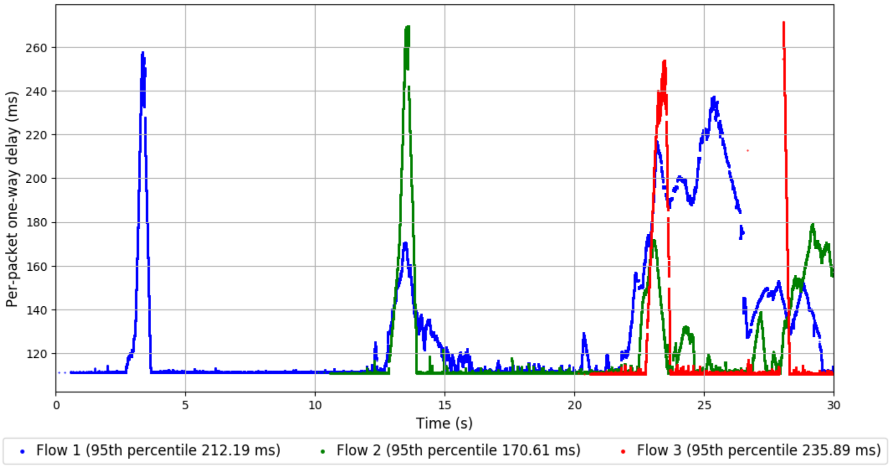




```
Run 4: Statistics of PCC-Allegro

Start at: 2018-10-02 13:03:12
End at: 2018-10-02 13:03:42
Local clock offset: 0.514 ms
Remote clock offset: 0.08 ms

# Below is generated by plot.py at 2018-10-02 15:34:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 667.45 Mbit/s
95th percentile per-packet one-way delay: 209.731 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 380.06 Mbit/s
95th percentile per-packet one-way delay: 212.195 ms
Loss rate: 0.73%
-- Flow 2:
Average throughput: 318.71 Mbit/s
95th percentile per-packet one-way delay: 170.614 ms
Loss rate: 1.11%
-- Flow 3:
Average throughput: 229.52 Mbit/s
95th percentile per-packet one-way delay: 235.886 ms
Loss rate: 3.34%
```

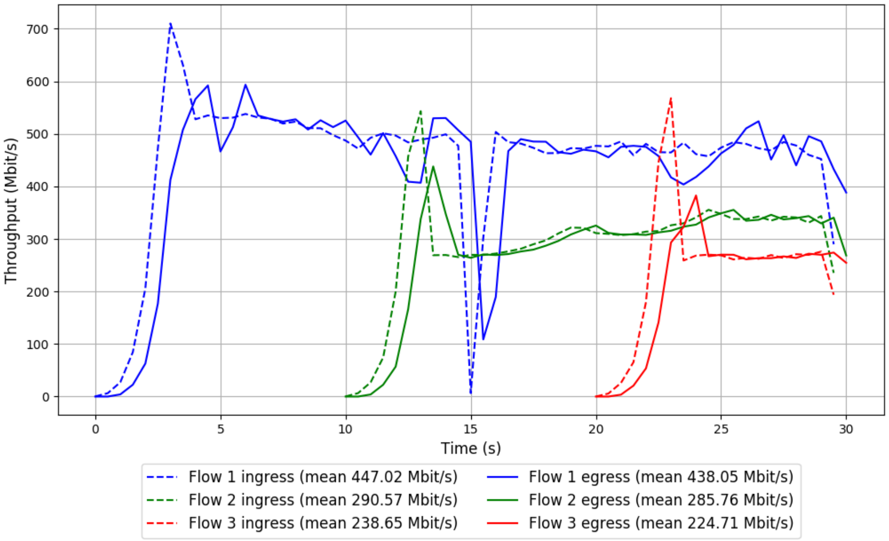
Run 4: Report of PCC-Allegro — Data Link

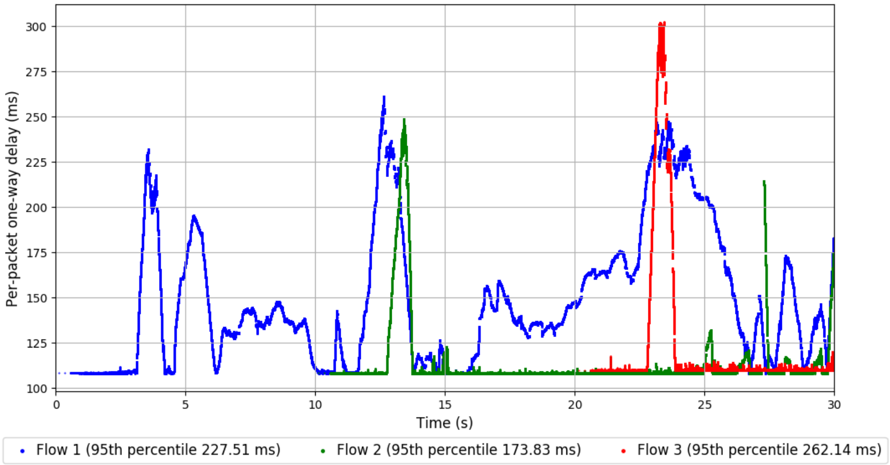




```
Run 5: Statistics of PCC-Allegro

Start at: 2018-10-02 13:35:23
End at: 2018-10-02 13:35:53
Local clock offset: 0.955 ms
Remote clock offset: 0.144 ms

# Below is generated by plot.py at 2018-10-02 15:36:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 701.91 Mbit/s
95th percentile per-packet one-way delay: 225.006 ms
Loss rate: 2.32%
-- Flow 1:
Average throughput: 438.05 Mbit/s
95th percentile per-packet one-way delay: 227.513 ms
Loss rate: 1.99%
-- Flow 2:
Average throughput: 285.76 Mbit/s
95th percentile per-packet one-way delay: 173.826 ms
Loss rate: 1.64%
-- Flow 3:
Average throughput: 224.71 Mbit/s
95th percentile per-packet one-way delay: 262.144 ms
Loss rate: 5.83%
```

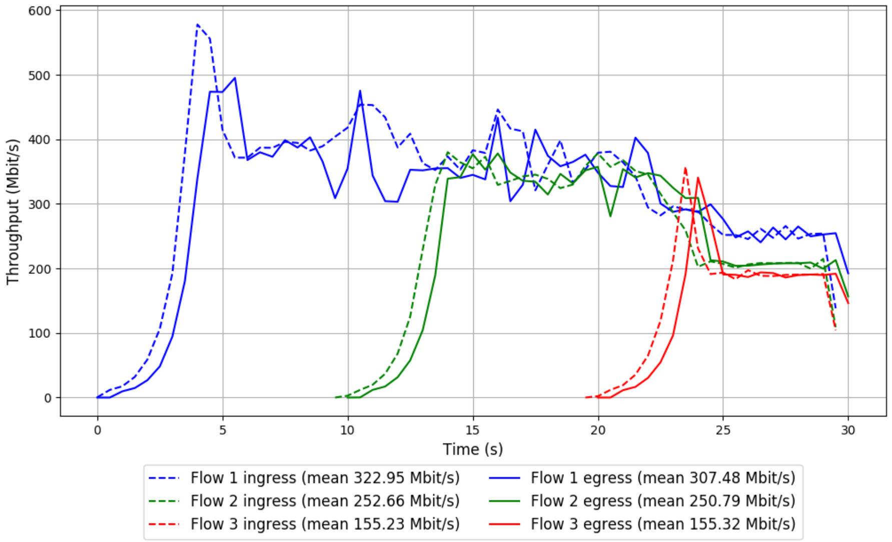
Run 5: Report of PCC-Allegro — Data Link

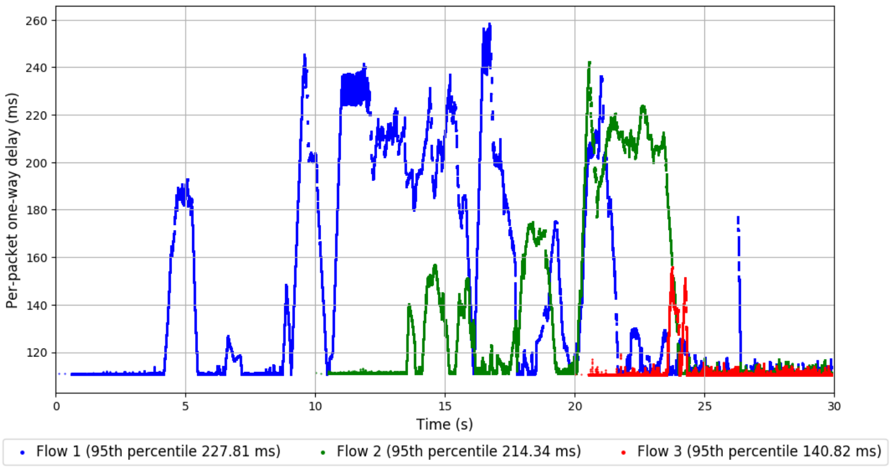




```
Run 1: Statistics of PCC-Expr

Start at: 2018-10-02 11:27:36
End at: 2018-10-02 11:28:06
Local clock offset: 0.256 ms
Remote clock offset: -0.115 ms

# Below is generated by plot.py at 2018-10-02 15:36:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 526.30 Mbit/s
95th percentile per-packet one-way delay: 221.146 ms
Loss rate: 3.08%
-- Flow 1:
Average throughput: 307.48 Mbit/s
95th percentile per-packet one-way delay: 227.810 ms
Loss rate: 4.79%
-- Flow 2:
Average throughput: 250.79 Mbit/s
95th percentile per-packet one-way delay: 214.344 ms
Loss rate: 0.75%
-- Flow 3:
Average throughput: 155.32 Mbit/s
95th percentile per-packet one-way delay: 140.823 ms
Loss rate: 0.01%
```

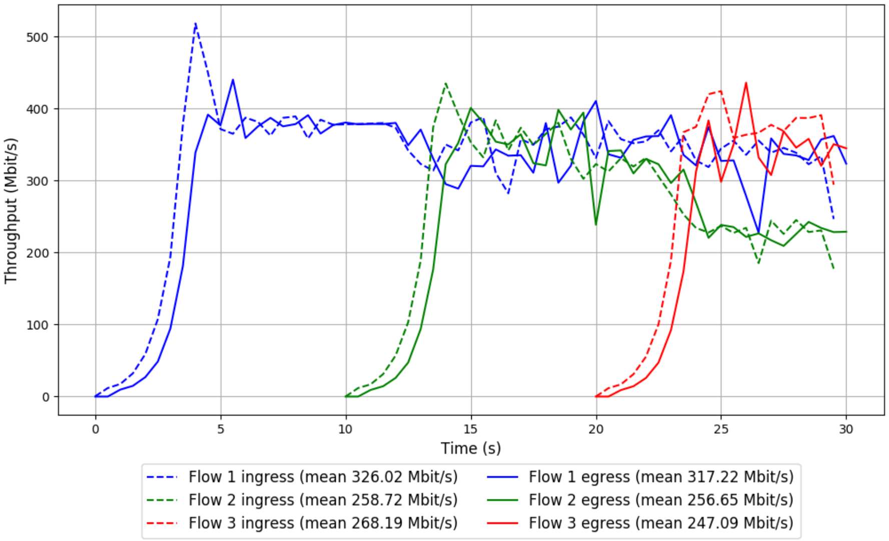
Run 1: Report of PCC-Expr — Data Link

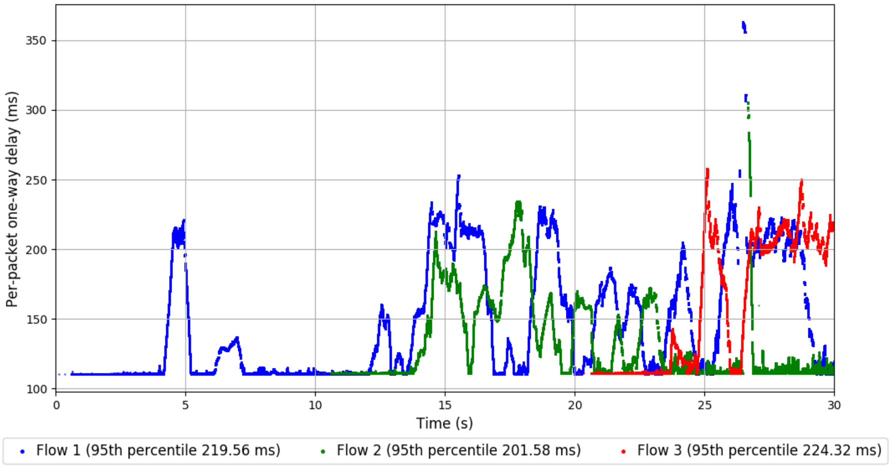




```
Run 2: Statistics of PCC-Expr

Start at: 2018-10-02 11:59:58
End at: 2018-10-02 12:00:28
Local clock offset: 0.665 ms
Remote clock offset: -0.094 ms

# Below is generated by plot.py at 2018-10-02 15:36:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 569.37 Mbit/s
95th percentile per-packet one-way delay: 218.900 ms
Loss rate: 2.92%
-- Flow 1:
Average throughput: 317.22 Mbit/s
95th percentile per-packet one-way delay: 219.559 ms
Loss rate: 2.70%
-- Flow 2:
Average throughput: 256.65 Mbit/s
95th percentile per-packet one-way delay: 201.580 ms
Loss rate: 0.80%
-- Flow 3:
Average throughput: 247.09 Mbit/s
95th percentile per-packet one-way delay: 224.320 ms
Loss rate: 7.84%
```

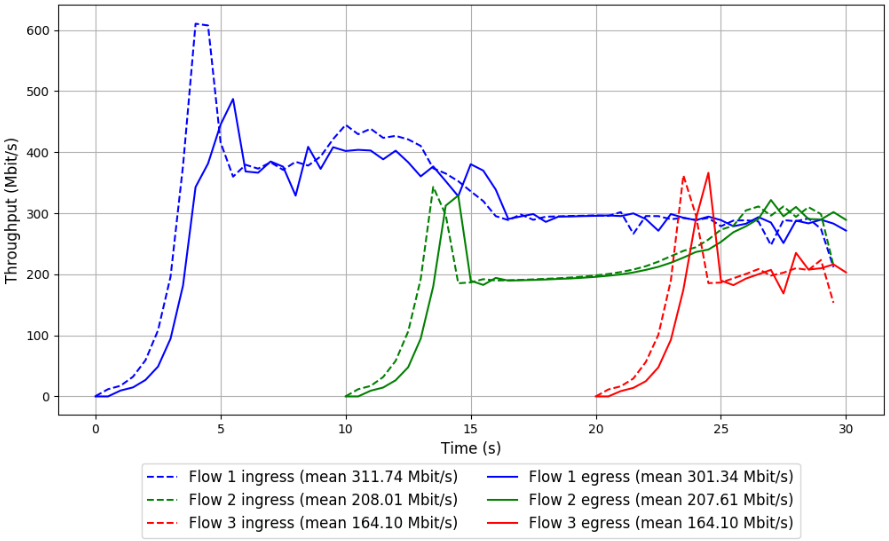
Run 2: Report of PCC-Expr — Data Link

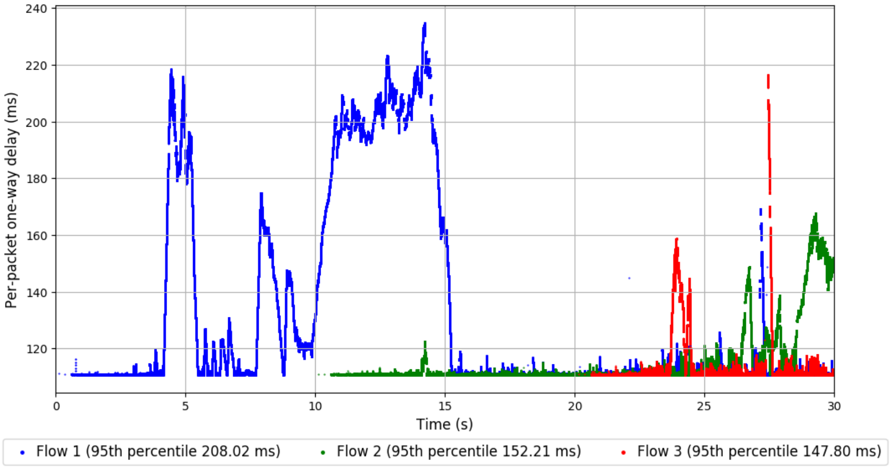




```
Run 3: Statistics of PCC-Expr

Start at: 2018-10-02 12:32:42
End at: 2018-10-02 12:33:12
Local clock offset: -0.016 ms
Remote clock offset: -0.196 ms

# Below is generated by plot.py at 2018-10-02 15:36:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 493.47 Mbit/s
95th percentile per-packet one-way delay: 204.116 ms
Loss rate: 2.12%
-- Flow 1:
Average throughput: 301.34 Mbit/s
95th percentile per-packet one-way delay: 208.018 ms
Loss rate: 3.33%
-- Flow 2:
Average throughput: 207.61 Mbit/s
95th percentile per-packet one-way delay: 152.207 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 164.10 Mbit/s
95th percentile per-packet one-way delay: 147.801 ms
Loss rate: 0.00%
```

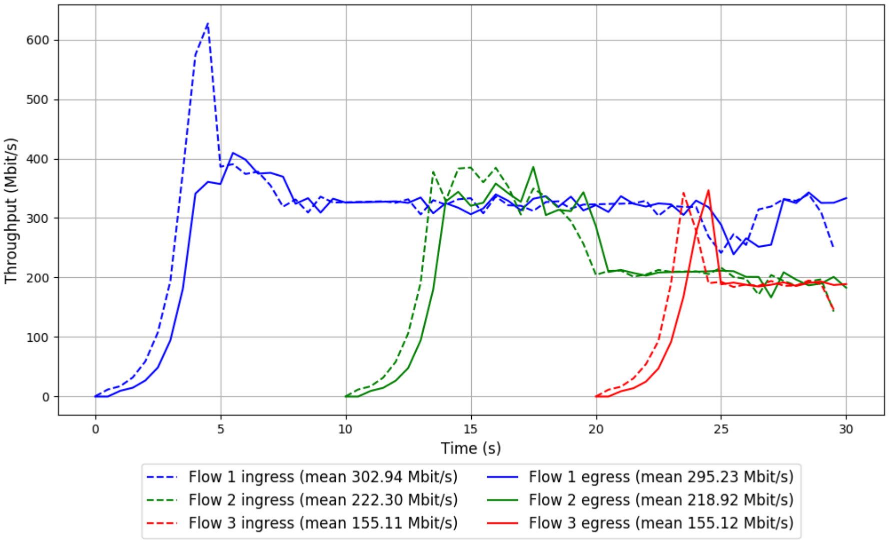
Run 3: Report of PCC-Expr — Data Link

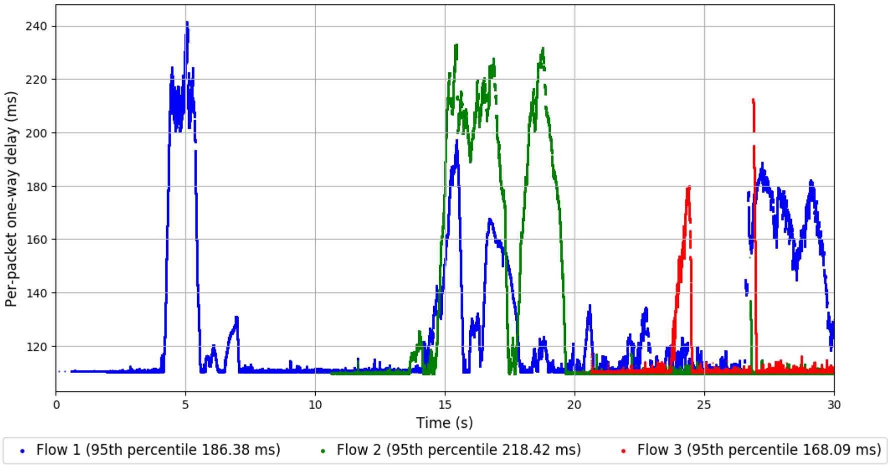




```
Run 4: Statistics of PCC-Expr

Start at: 2018-10-02 13:05:17
End at: 2018-10-02 13:05:47
Local clock offset: 1.066 ms
Remote clock offset: -0.178 ms

# Below is generated by plot.py at 2018-10-02 15:39:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 491.95 Mbit/s
95th percentile per-packet one-way delay: 209.152 ms
Loss rate: 1.98%
-- Flow 1:
Average throughput: 295.23 Mbit/s
95th percentile per-packet one-way delay: 186.375 ms
Loss rate: 2.55%
-- Flow 2:
Average throughput: 218.92 Mbit/s
95th percentile per-packet one-way delay: 218.419 ms
Loss rate: 1.52%
-- Flow 3:
Average throughput: 155.12 Mbit/s
95th percentile per-packet one-way delay: 168.086 ms
Loss rate: 0.01%
```

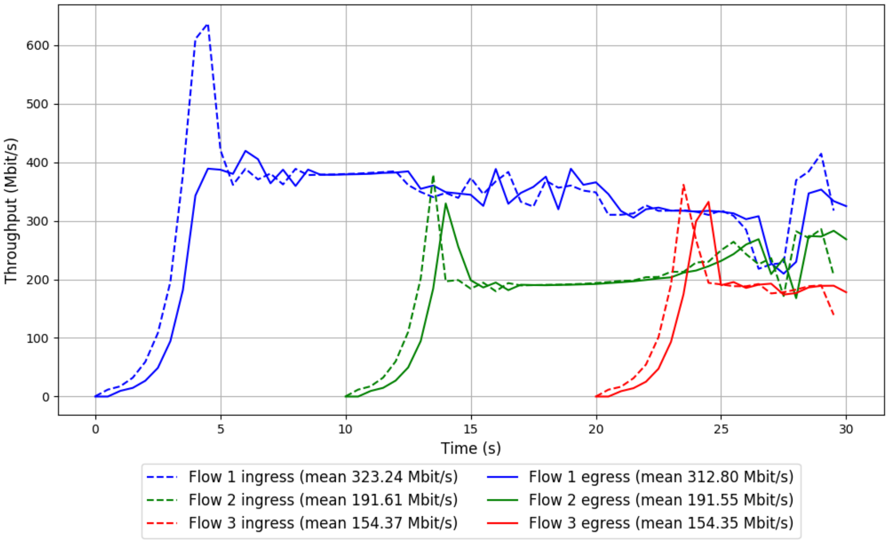
Run 4: Report of PCC-Expr — Data Link

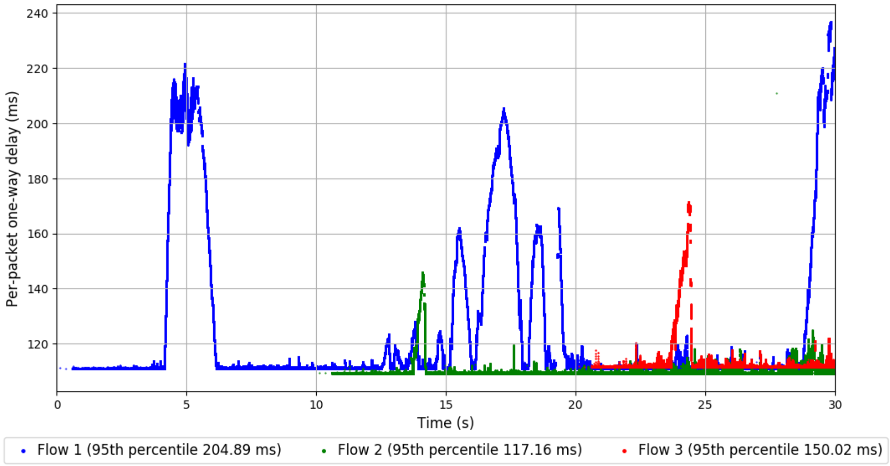




```
Run 5: Statistics of PCC-Expr

Start at: 2018-10-02 13:37:31
End at: 2018-10-02 13:38:01
Local clock offset: -0.247 ms
Remote clock offset: 0.171 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 491.08 Mbit/s
95th percentile per-packet one-way delay: 198.945 ms
Loss rate: 2.10%
-- Flow 1:
Average throughput: 312.80 Mbit/s
95th percentile per-packet one-way delay: 204.887 ms
Loss rate: 3.24%
-- Flow 2:
Average throughput: 191.55 Mbit/s
95th percentile per-packet one-way delay: 117.161 ms
Loss rate: 0.04%
-- Flow 3:
Average throughput: 154.35 Mbit/s
95th percentile per-packet one-way delay: 150.016 ms
Loss rate: 0.02%
```

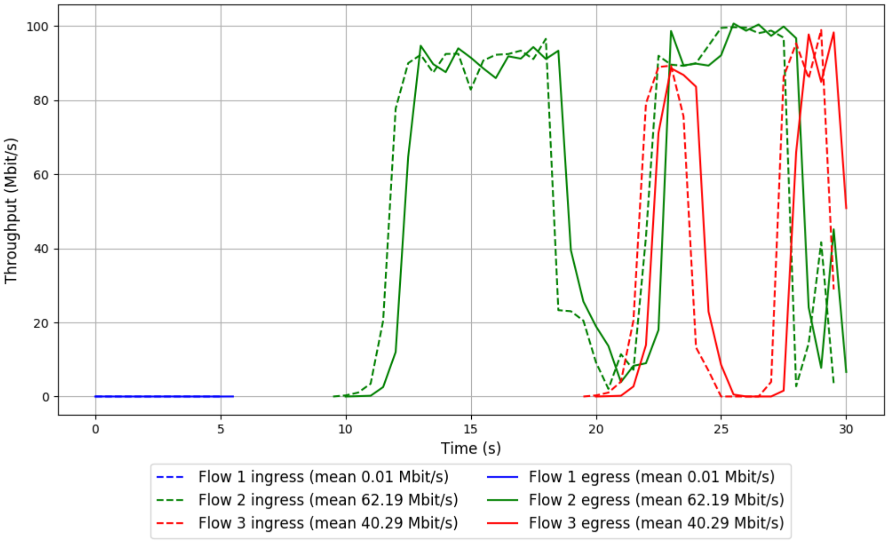
Run 5: Report of PCC-Expr — Data Link

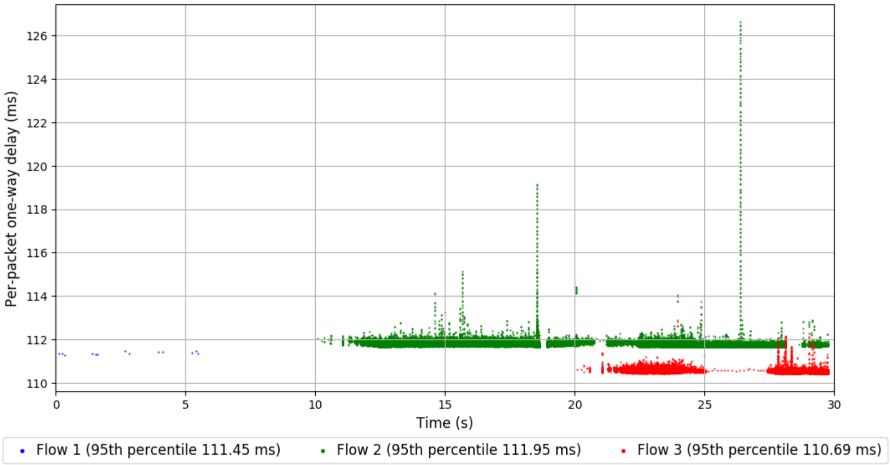




```
Run 1: Statistics of QUIC Cubic

Start at: 2018-10-02 11:21:59
End at: 2018-10-02 11:22:29
Local clock offset: -0.174 ms
Remote clock offset: 0.278 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 54.38 Mbit/s
95th percentile per-packet one-way delay: 111.928 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 111.447 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 62.19 Mbit/s
95th percentile per-packet one-way delay: 111.947 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 40.29 Mbit/s
95th percentile per-packet one-way delay: 110.686 ms
Loss rate: 0.00%
```

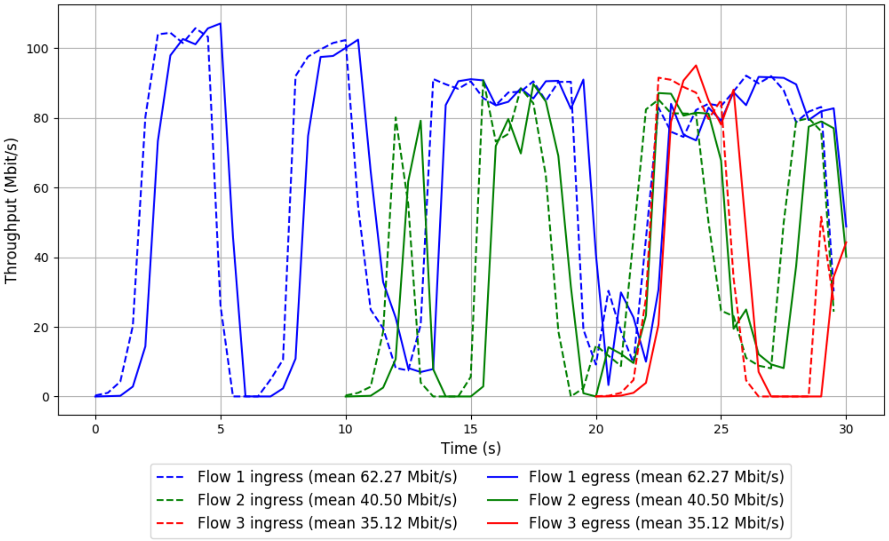
Run 1: Report of QUIC Cubic — Data Link

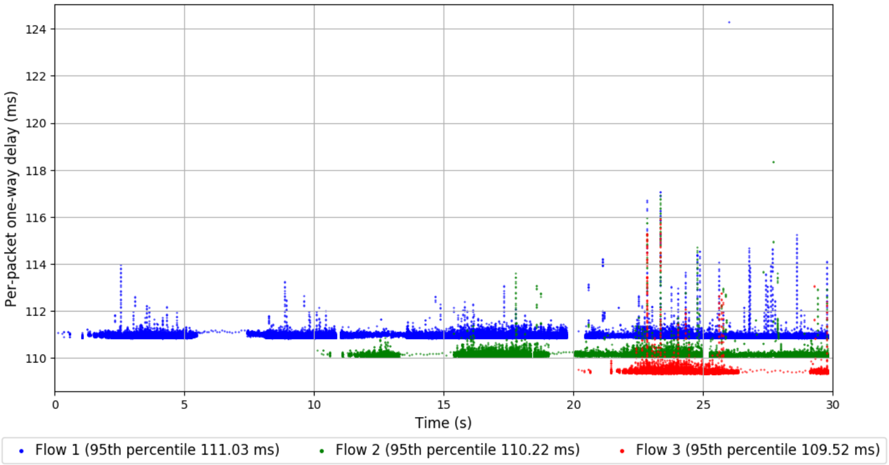




```
Run 2: Statistics of QUIC Cubic

Start at: 2018-10-02 11:54:10
End at: 2018-10-02 11:54:40
Local clock offset: -0.11 ms
Remote clock offset: -0.088 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 100.48 Mbit/s
95th percentile per-packet one-way delay: 111.005 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 62.27 Mbit/s
95th percentile per-packet one-way delay: 111.029 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 40.50 Mbit/s
95th percentile per-packet one-way delay: 110.221 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 35.12 Mbit/s
95th percentile per-packet one-way delay: 109.519 ms
Loss rate: 0.00%
```

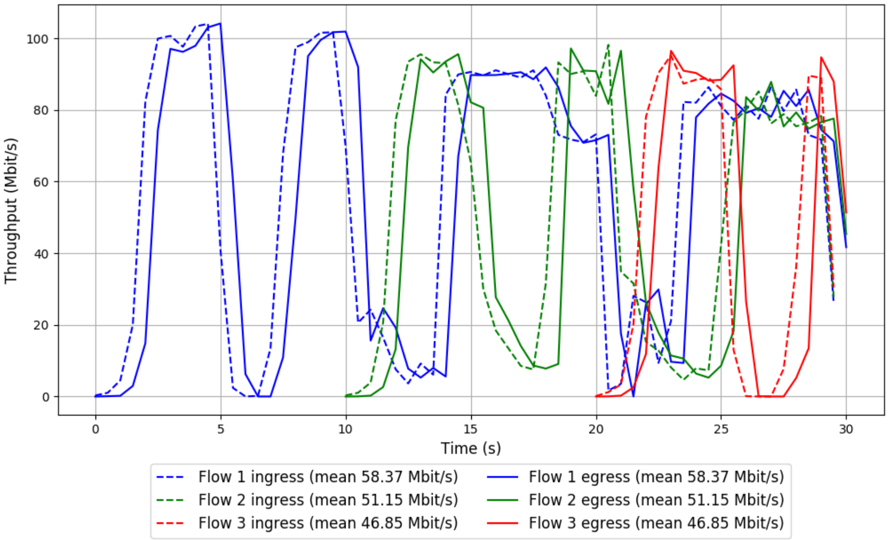
Run 2: Report of QUIC Cubic — Data Link

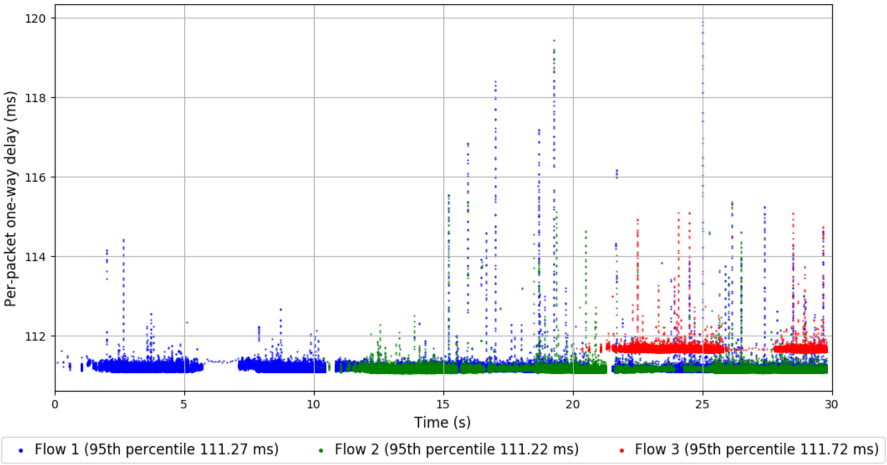




```
Run 3: Statistics of QUIC Cubic

Start at: 2018-10-02 12:27:00
End at: 2018-10-02 12:27:30
Local clock offset: -0.094 ms
Remote clock offset: 0.164 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 107.49 Mbit/s
95th percentile per-packet one-way delay: 111.655 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 58.37 Mbit/s
95th percentile per-packet one-way delay: 111.266 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 51.15 Mbit/s
95th percentile per-packet one-way delay: 111.217 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 46.85 Mbit/s
95th percentile per-packet one-way delay: 111.720 ms
Loss rate: 0.00%
```

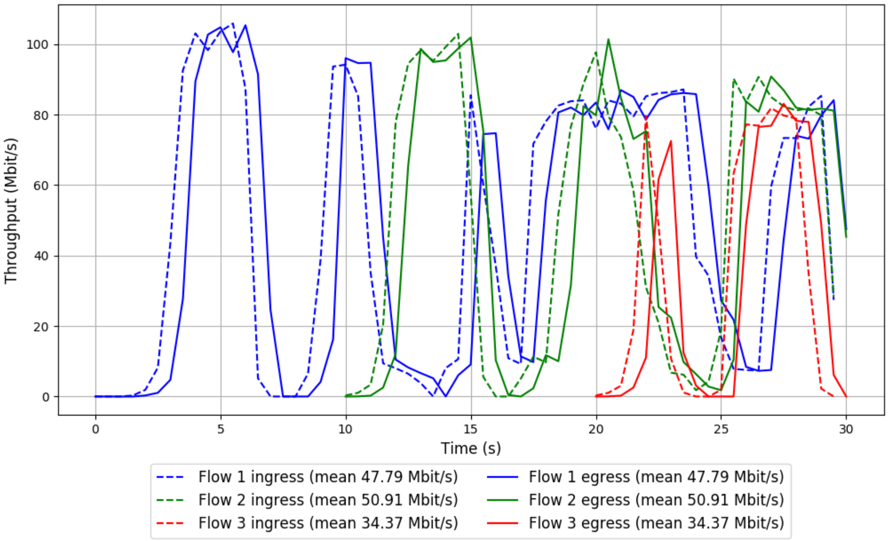
Run 3: Report of QUIC Cubic — Data Link

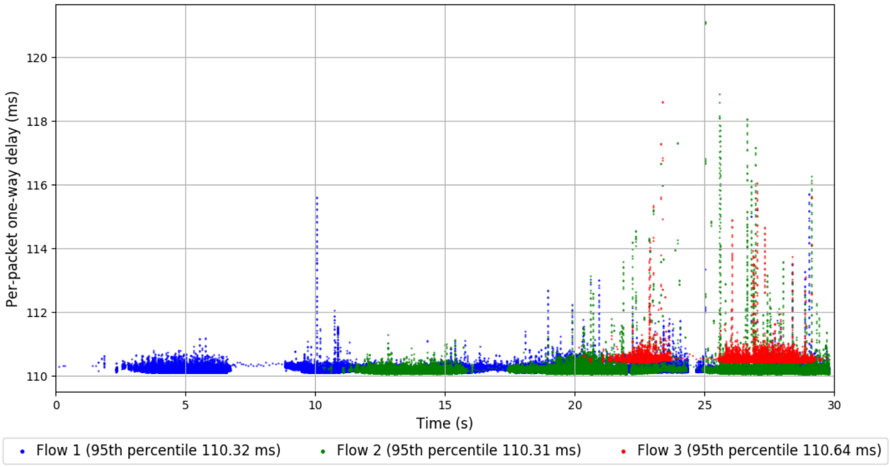




```
Run 4: Statistics of QUIC Cubic

Start at: 2018-10-02 12:59:37
End at: 2018-10-02 13:00:07
Local clock offset: 0.661 ms
Remote clock offset: -0.213 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 92.64 Mbit/s
95th percentile per-packet one-way delay: 110.511 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 47.79 Mbit/s
95th percentile per-packet one-way delay: 110.321 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 50.91 Mbit/s
95th percentile per-packet one-way delay: 110.312 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 34.37 Mbit/s
95th percentile per-packet one-way delay: 110.635 ms
Loss rate: 0.00%
```

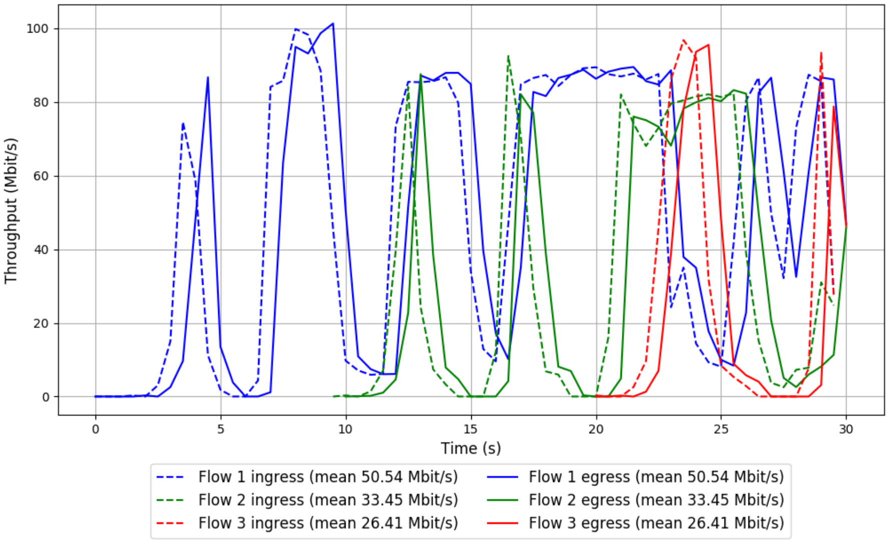
Run 4: Report of QUIC Cubic — Data Link

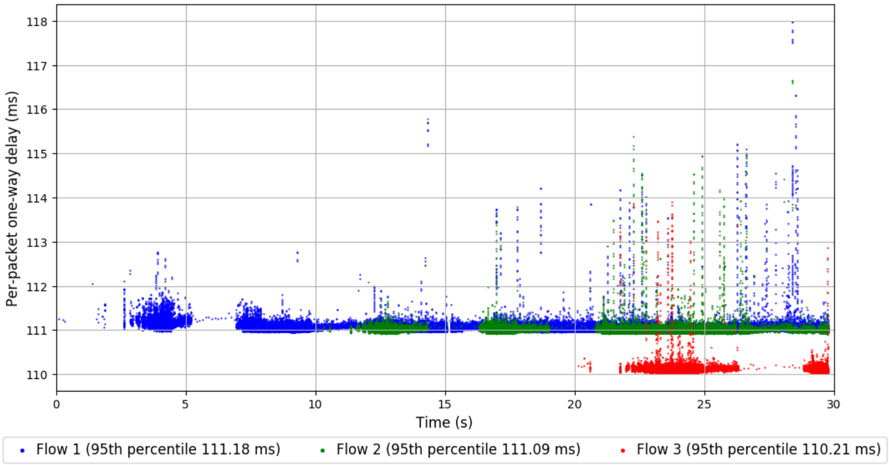




```
Run 5: Statistics of QUIC Cubic

Start at: 2018-10-02 13:31:54
End at: 2018-10-02 13:32:24
Local clock offset: -0.294 ms
Remote clock offset: 0.151 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 81.30 Mbit/s
95th percentile per-packet one-way delay: 111.151 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 50.54 Mbit/s
95th percentile per-packet one-way delay: 111.178 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 33.45 Mbit/s
95th percentile per-packet one-way delay: 111.093 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 26.41 Mbit/s
95th percentile per-packet one-way delay: 110.212 ms
Loss rate: 0.00%
```

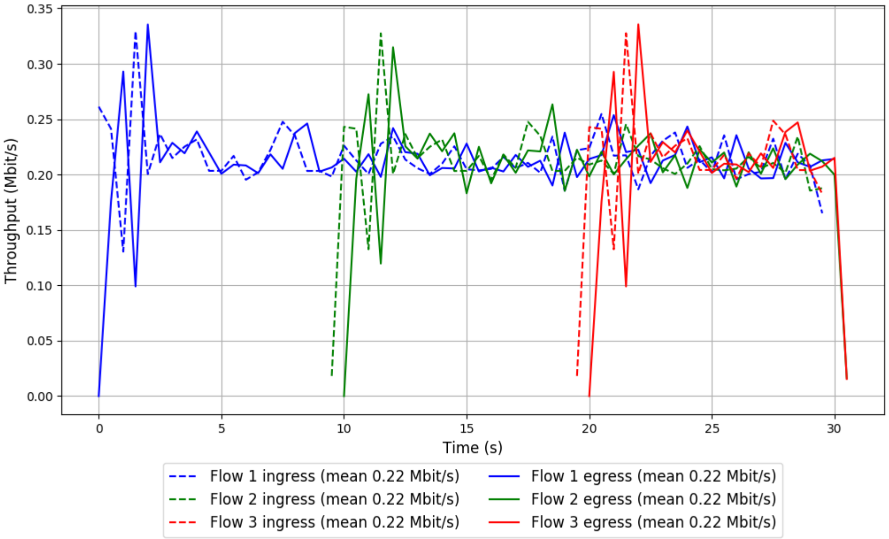
Run 5: Report of QUIC Cubic — Data Link

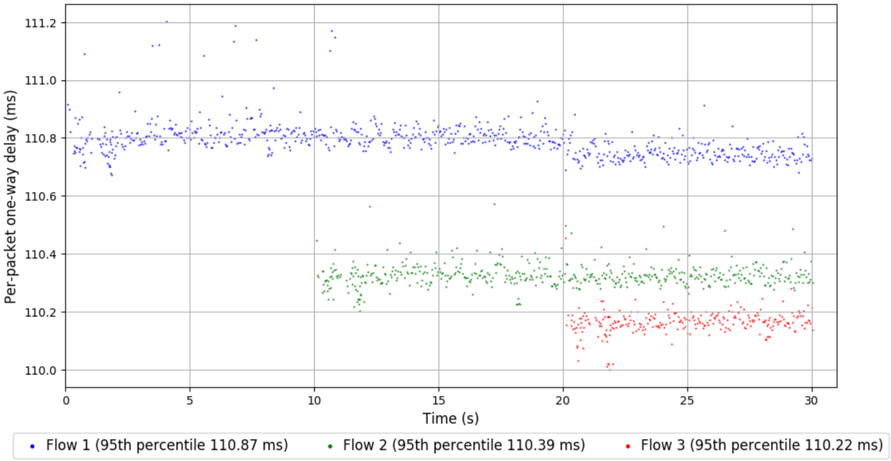




```
Run 1: Statistics of SCReAM

Start at: 2018-10-02 11:34:47
End at: 2018-10-02 11:35:17
Local clock offset: 1.202 ms
Remote clock offset: 0.314 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 110.841 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 110.868 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 110.392 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 110.223 ms
Loss rate: 0.00%
```

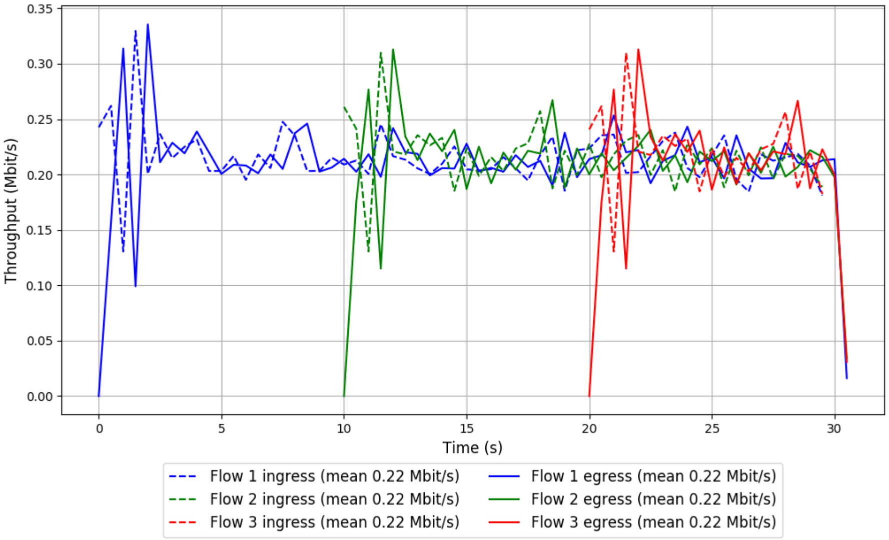
Run 1: Report of SCReAM — Data Link

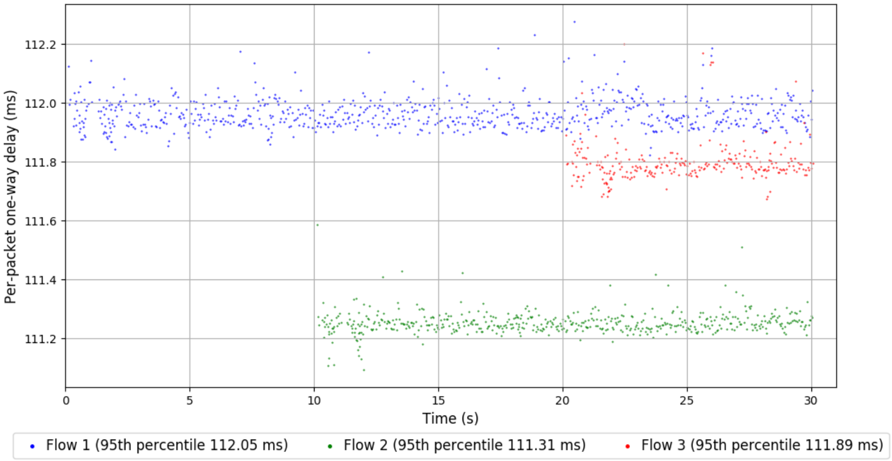




```
Run 2: Statistics of SCReAM

Start at: 2018-10-02 12:07:09
End at: 2018-10-02 12:07:39
Local clock offset: -0.023 ms
Remote clock offset: 0.203 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 112.024 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 112.047 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 111.309 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 111.886 ms
Loss rate: 0.00%
```

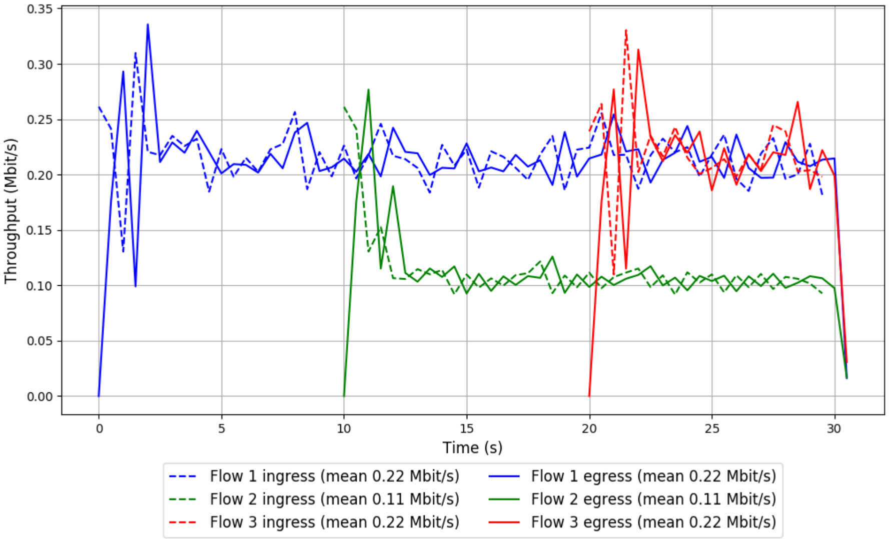
Run 2: Report of SCReAM — Data Link

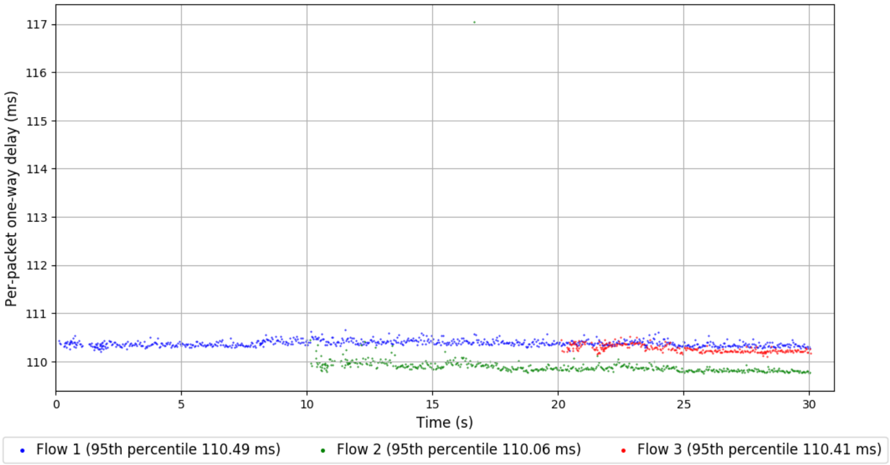




```
Run 3: Statistics of SCReAM

Start at: 2018-10-02 12:39:45
End at: 2018-10-02 12:40:15
Local clock offset: 0.981 ms
Remote clock offset: 0.146 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 110.464 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 110.491 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 110.056 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 110.410 ms
Loss rate: 0.00%
```

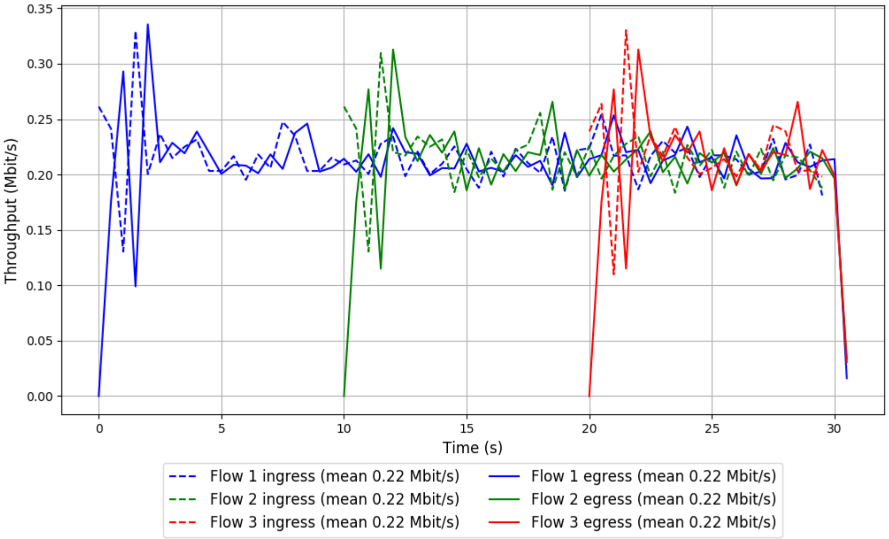
Run 3: Report of SCReAM — Data Link

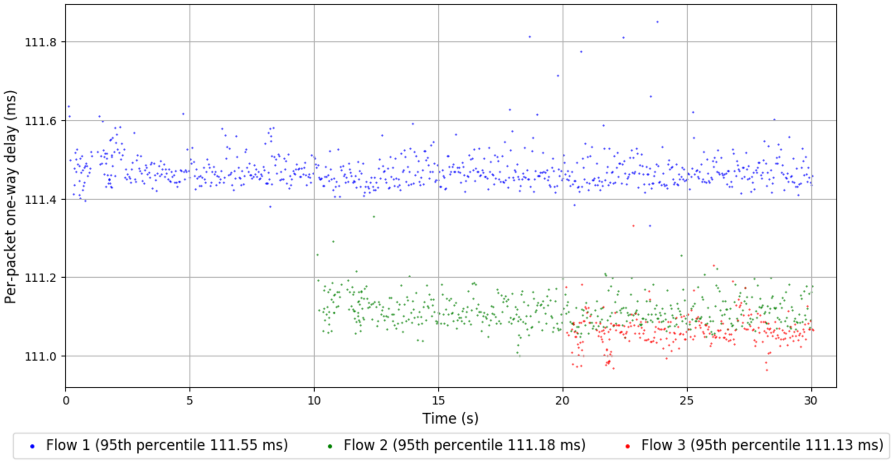




```
Run 4: Statistics of SCReAM

Start at: 2018-10-02 13:12:16
End at: 2018-10-02 13:12:46
Local clock offset: -0.151 ms
Remote clock offset: -0.015 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 111.521 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 111.546 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 111.180 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 111.128 ms
Loss rate: 0.00%
```

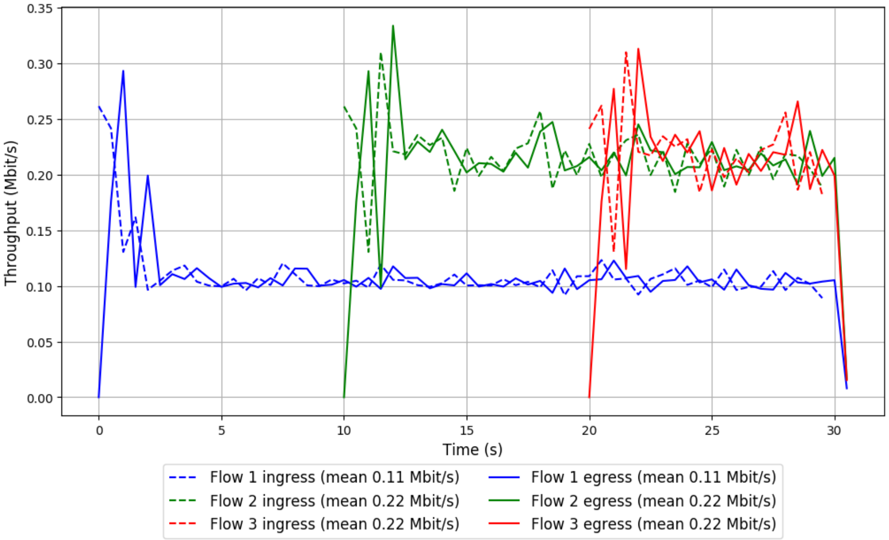
Run 4: Report of SCReAM — Data Link

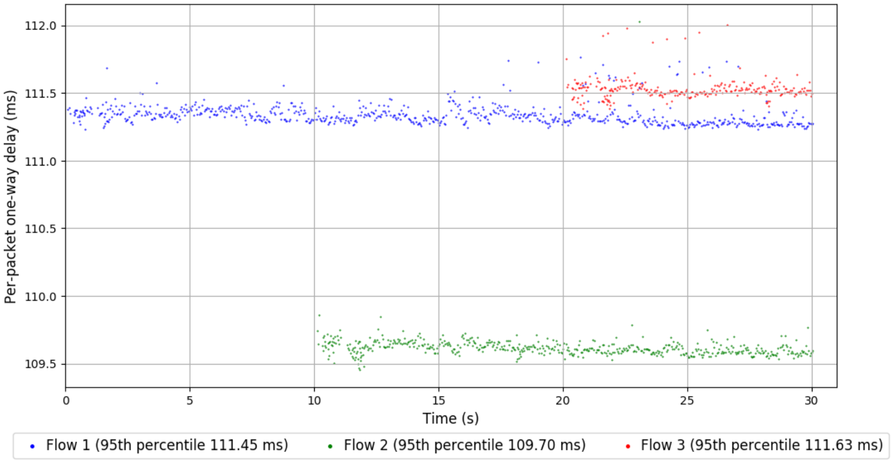




```
Run 5: Statistics of SCReAM

Start at: 2018-10-02 13:44:34
End at: 2018-10-02 13:45:04
Local clock offset: -0.365 ms
Remote clock offset: 0.263 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 111.560 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 111.450 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 109.698 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 111.631 ms
Loss rate: 0.35%
```

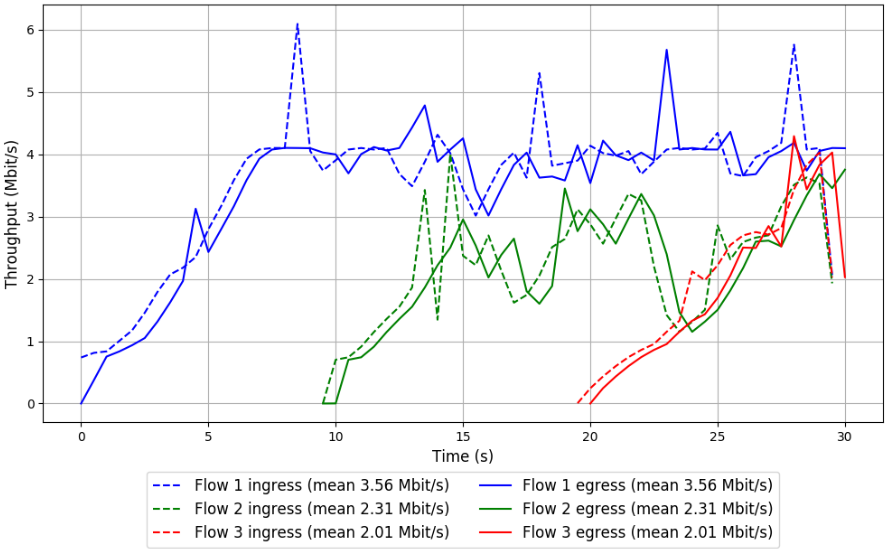
Run 5: Report of SCReAM — Data Link

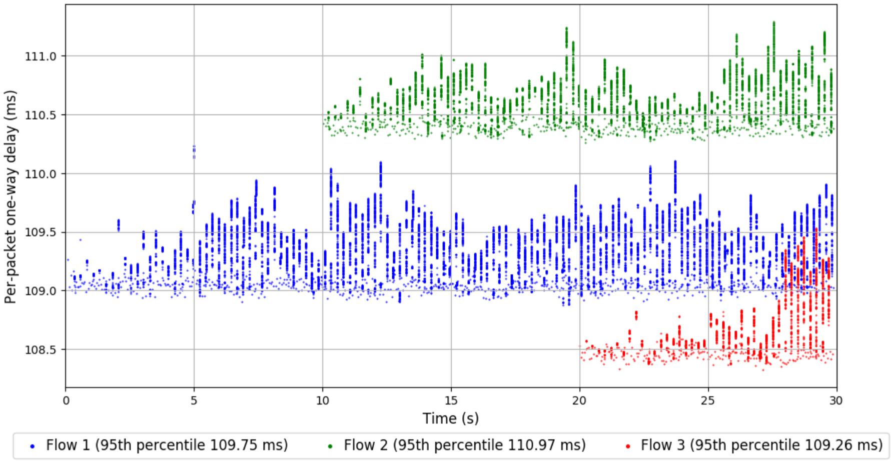




```
Run 1: Statistics of Sprout

Start at: 2018-10-02 11:20:43
End at: 2018-10-02 11:21:13
Local clock offset: 0.87 ms
Remote clock offset: -0.062 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.77 Mbit/s
95th percentile per-packet one-way delay: 110.801 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 3.56 Mbit/s
95th percentile per-packet one-way delay: 109.749 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 110.973 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 109.258 ms
Loss rate: 0.00%
```

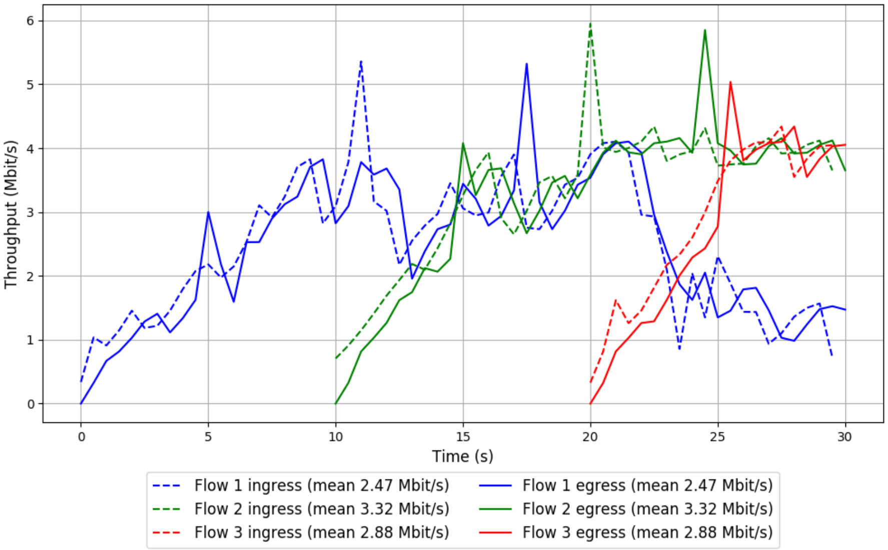
Run 1: Report of Sprout — Data Link

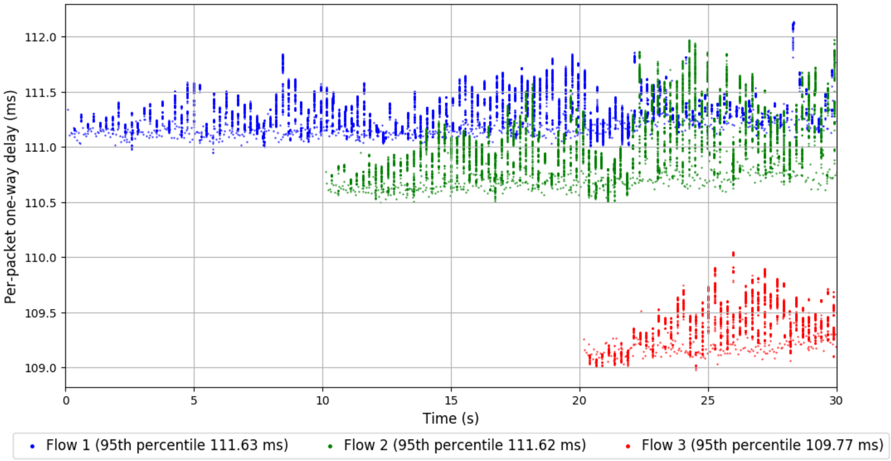




```
Run 2: Statistics of Sprout

Start at: 2018-10-02 11:52:53
End at: 2018-10-02 11:53:23
Local clock offset: 0.331 ms
Remote clock offset: -0.085 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.63 Mbit/s
95th percentile per-packet one-way delay: 111.600 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.47 Mbit/s
95th percentile per-packet one-way delay: 111.626 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 3.32 Mbit/s
95th percentile per-packet one-way delay: 111.616 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.88 Mbit/s
95th percentile per-packet one-way delay: 109.767 ms
Loss rate: 0.00%
```

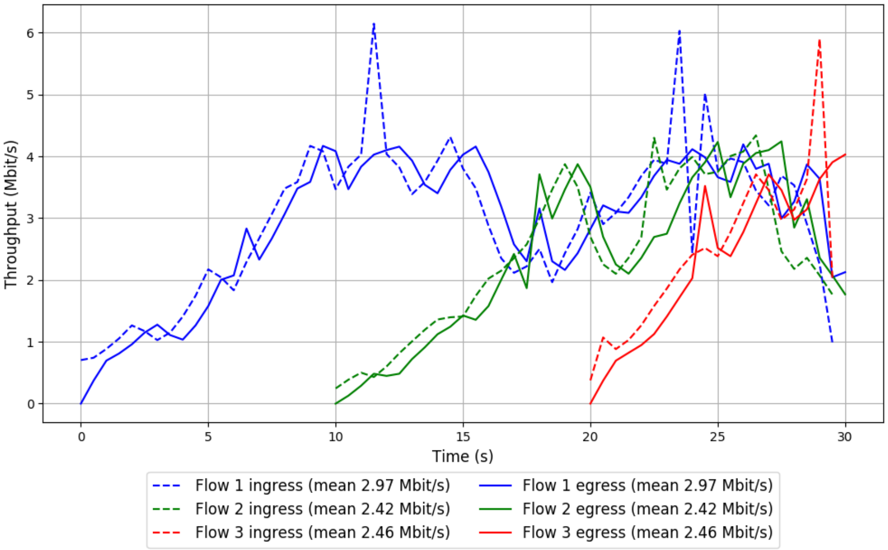
Run 2: Report of Sprout — Data Link

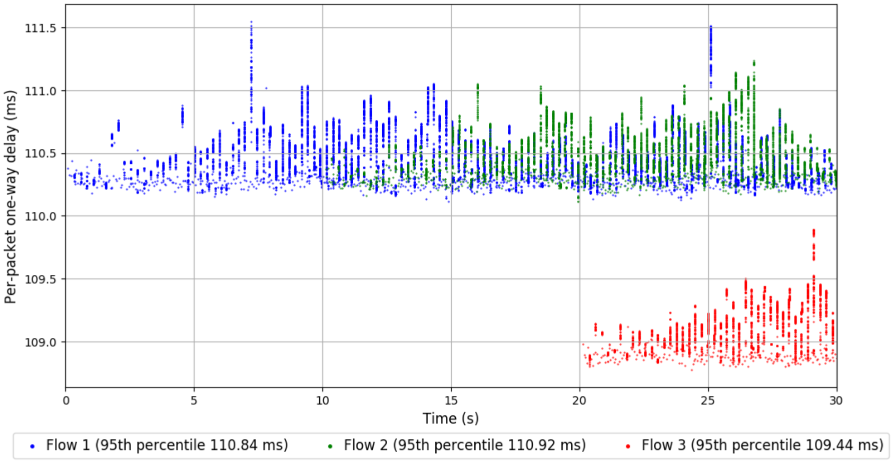




```
Run 3: Statistics of Sprout

Start at: 2018-10-02 12:25:43
End at: 2018-10-02 12:26:13
Local clock offset: 1.102 ms
Remote clock offset: -0.176 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.38 Mbit/s
95th percentile per-packet one-way delay: 110.840 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.97 Mbit/s
95th percentile per-packet one-way delay: 110.840 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.42 Mbit/s
95th percentile per-packet one-way delay: 110.923 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 109.437 ms
Loss rate: 0.00%
```

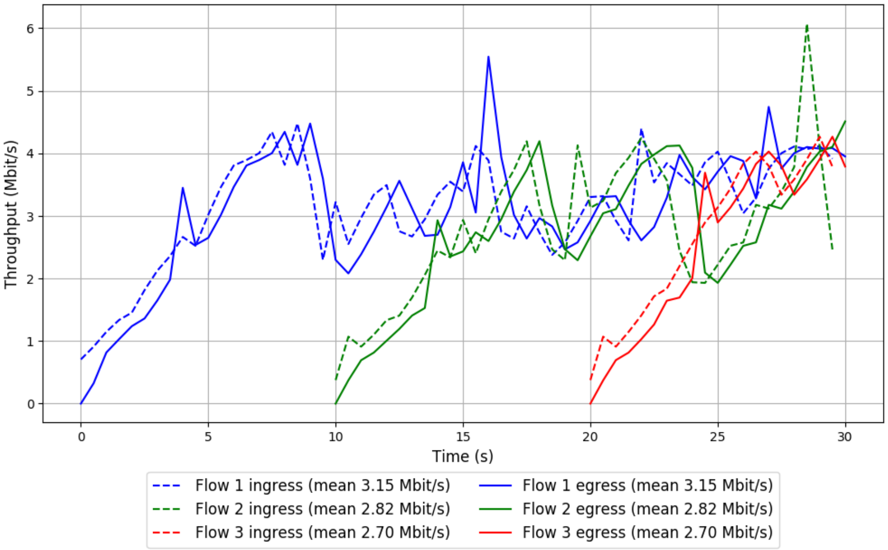
Run 3: Report of Sprout — Data Link

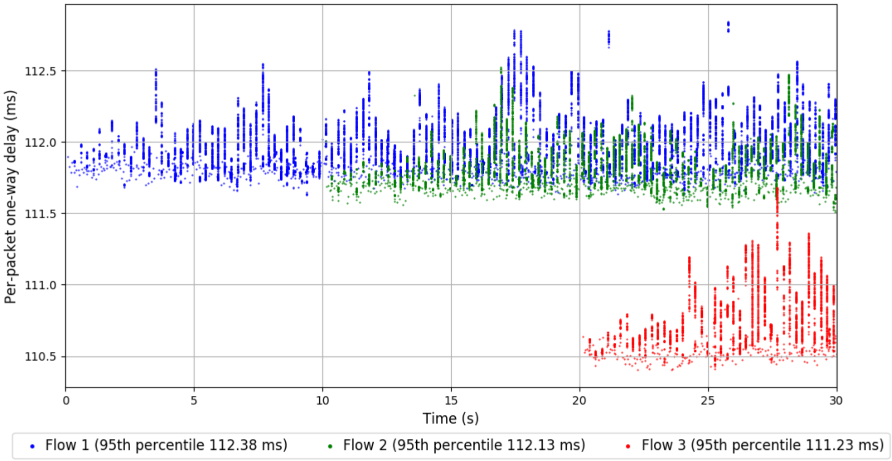




```
Run 4: Statistics of Sprout

Start at: 2018-10-02 12:58:21
End at: 2018-10-02 12:58:51
Local clock offset: -0.232 ms
Remote clock offset: -0.262 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.91 Mbit/s
95th percentile per-packet one-way delay: 112.293 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 3.15 Mbit/s
95th percentile per-packet one-way delay: 112.375 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.82 Mbit/s
95th percentile per-packet one-way delay: 112.132 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.70 Mbit/s
95th percentile per-packet one-way delay: 111.229 ms
Loss rate: 0.00%
```

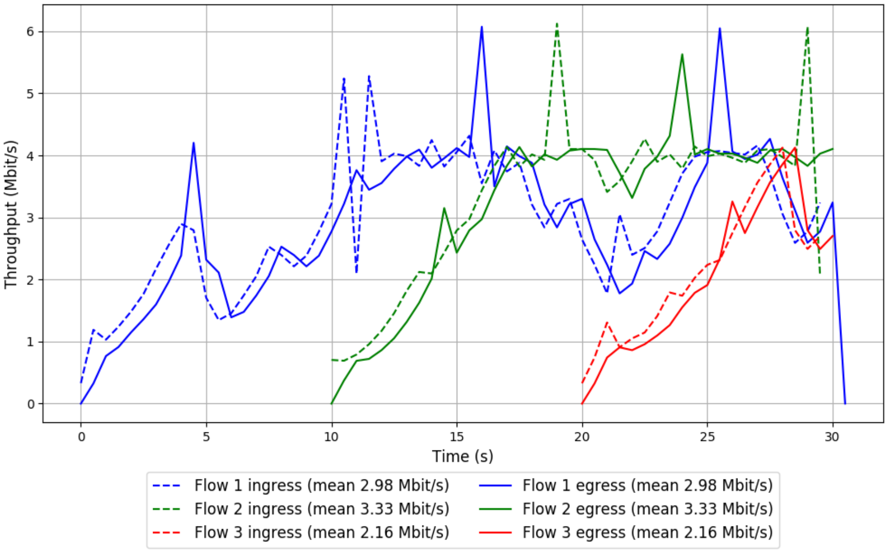
Run 4: Report of Sprout — Data Link

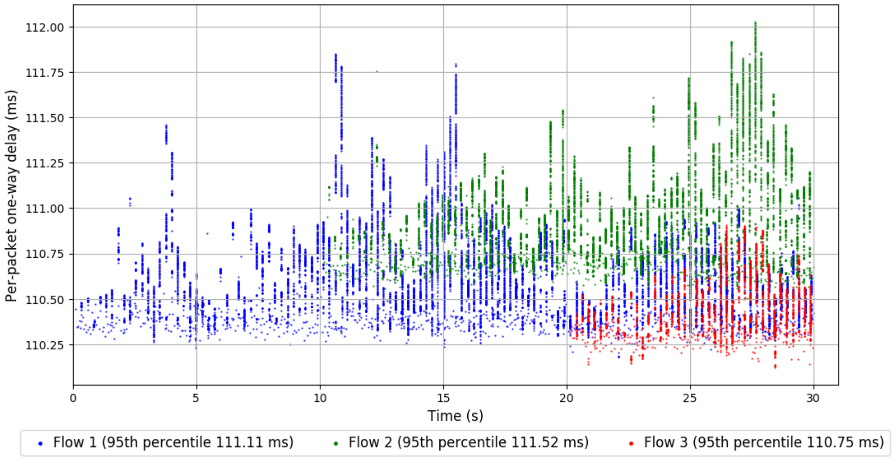




```
Run 5: Statistics of Sprout

Start at: 2018-10-02 13:30:37
End at: 2018-10-02 13:31:07
Local clock offset: 0.541 ms
Remote clock offset: 0.132 ms

# Below is generated by plot.py at 2018-10-02 15:42:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.90 Mbit/s
95th percentile per-packet one-way delay: 111.326 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.98 Mbit/s
95th percentile per-packet one-way delay: 111.108 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 3.33 Mbit/s
95th percentile per-packet one-way delay: 111.524 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 110.755 ms
Loss rate: 0.00%
```

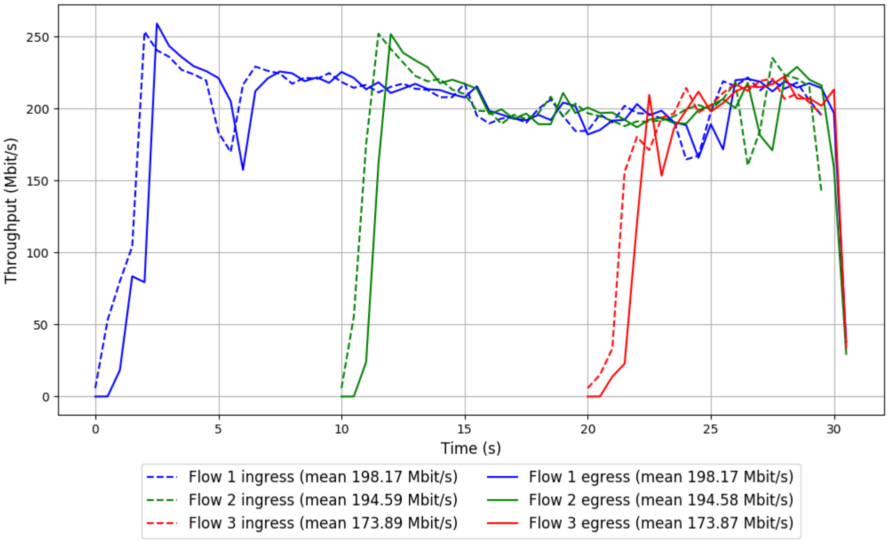
Run 5: Report of Sprout — Data Link

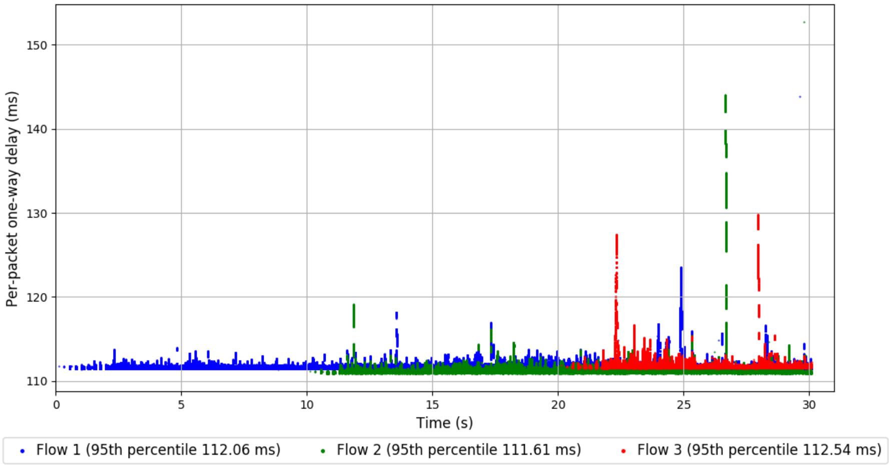




```
Run 1: Statistics of TaoVA-100x

Start at: 2018-10-02 11:14:28
End at: 2018-10-02 11:14:58
Local clock offset: -0.254 ms
Remote clock offset: -0.064 ms

# Below is generated by plot.py at 2018-10-02 15:45:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 385.58 Mbit/s
95th percentile per-packet one-way delay: 112.038 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 198.17 Mbit/s
95th percentile per-packet one-way delay: 112.057 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 194.58 Mbit/s
95th percentile per-packet one-way delay: 111.607 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 173.87 Mbit/s
95th percentile per-packet one-way delay: 112.543 ms
Loss rate: 0.02%
```

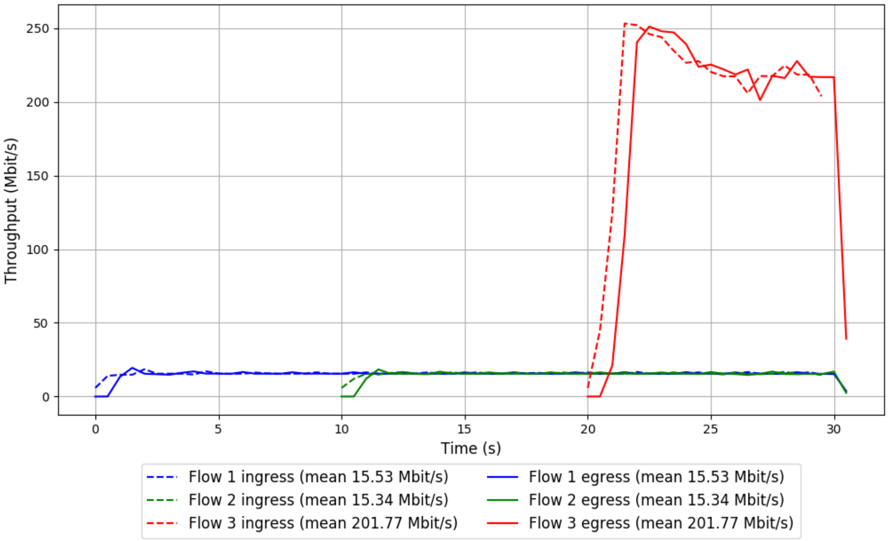
Run 1: Report of TaoVA-100x — Data Link

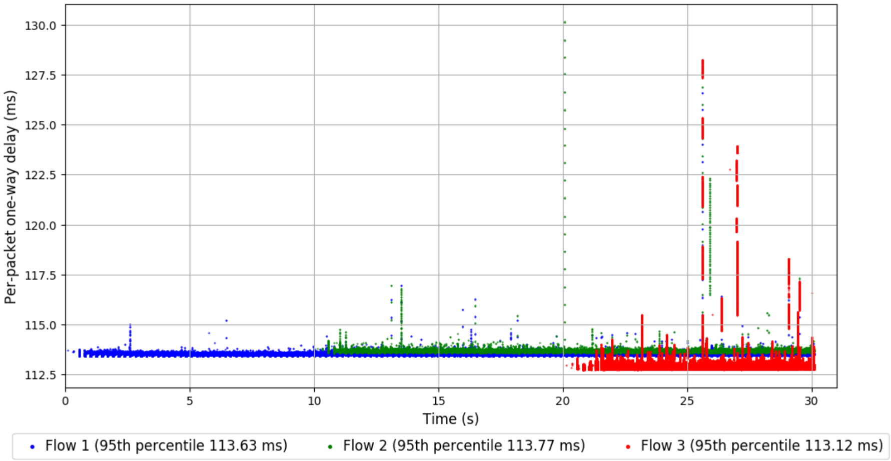




```
Run 2: Statistics of TaoVA-100x

Start at: 2018-10-02 11:47:10
End at: 2018-10-02 11:47:40
Local clock offset: -1.585 ms
Remote clock offset: 0.321 ms

# Below is generated by plot.py at 2018-10-02 15:45:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 92.78 Mbit/s
95th percentile per-packet one-way delay: 113.686 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 15.53 Mbit/s
95th percentile per-packet one-way delay: 113.626 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 15.34 Mbit/s
95th percentile per-packet one-way delay: 113.770 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 201.77 Mbit/s
95th percentile per-packet one-way delay: 113.123 ms
Loss rate: 0.00%
```

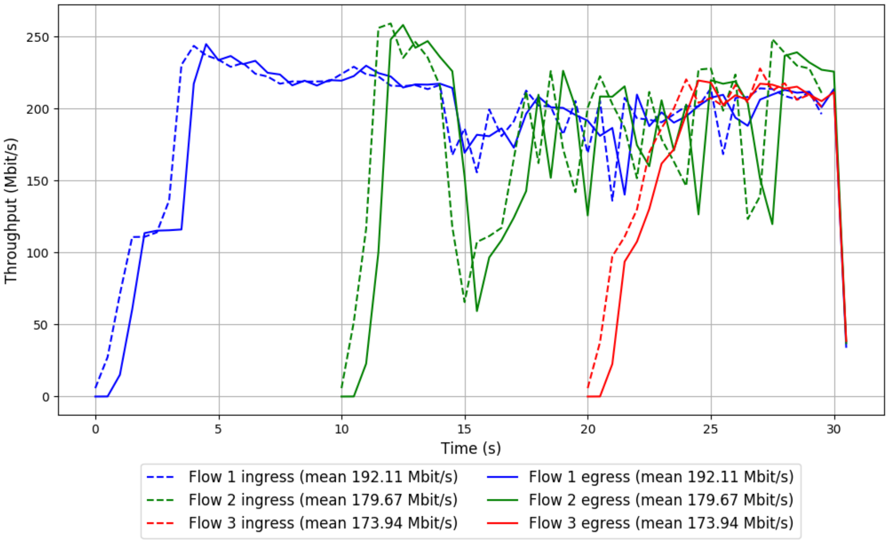
Run 2: Report of TaoVA-100x — Data Link

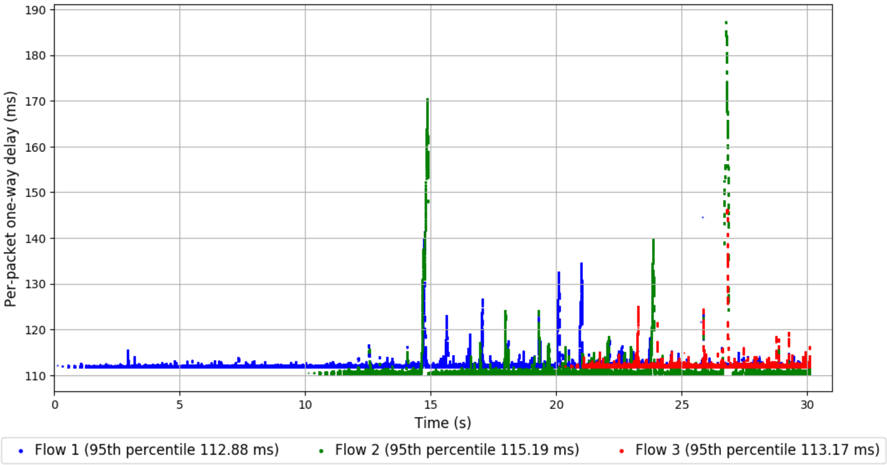




```
Run 3: Statistics of TaoVA-100x

Start at: 2018-10-02 12:19:31
End at: 2018-10-02 12:20:01
Local clock offset: -0.211 ms
Remote clock offset: 0.192 ms

# Below is generated by plot.py at 2018-10-02 15:45:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 369.58 Mbit/s
95th percentile per-packet one-way delay: 113.275 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 192.11 Mbit/s
95th percentile per-packet one-way delay: 112.878 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 179.67 Mbit/s
95th percentile per-packet one-way delay: 115.186 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 173.94 Mbit/s
95th percentile per-packet one-way delay: 113.174 ms
Loss rate: 0.00%
```

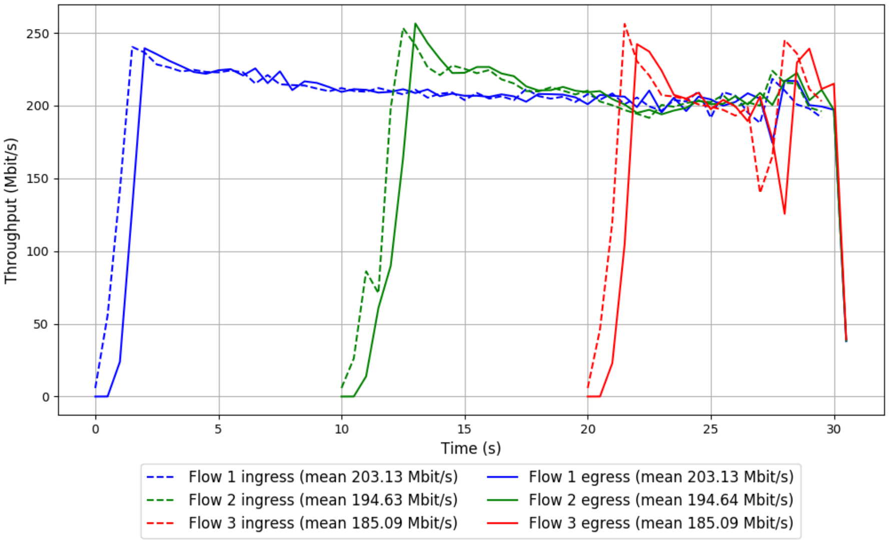
Run 3: Report of TaoVA-100x — Data Link

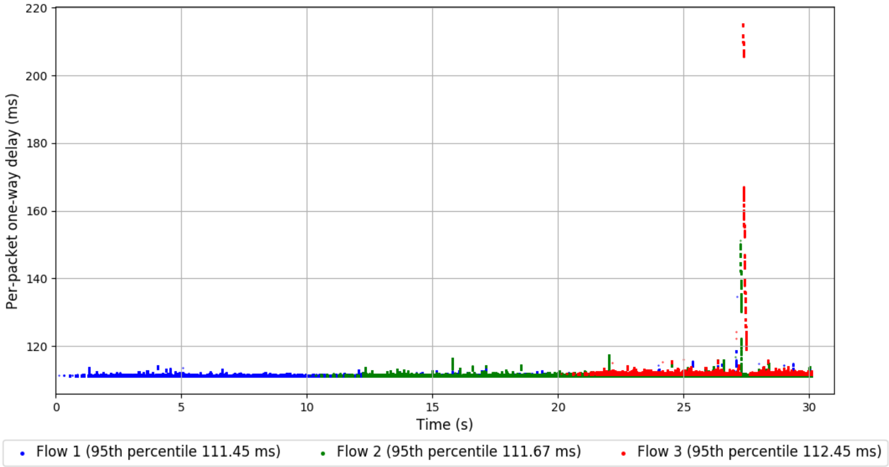




```
Run 4: Statistics of TaoVA-100x

Start at: 2018-10-02 12:52:07
End at: 2018-10-02 12:52:37
Local clock offset: -0.36 ms
Remote clock offset: -0.235 ms

# Below is generated by plot.py at 2018-10-02 15:45:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 394.24 Mbit/s
95th percentile per-packet one-way delay: 111.912 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 203.13 Mbit/s
95th percentile per-packet one-way delay: 111.453 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 194.64 Mbit/s
95th percentile per-packet one-way delay: 111.669 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 185.09 Mbit/s
95th percentile per-packet one-way delay: 112.448 ms
Loss rate: 0.00%
```

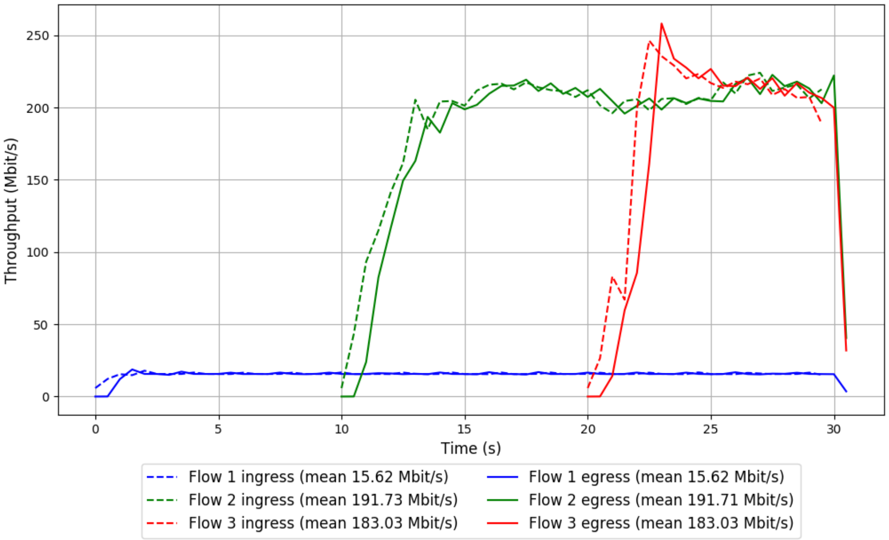
Run 4: Report of TaoVA-100x — Data Link

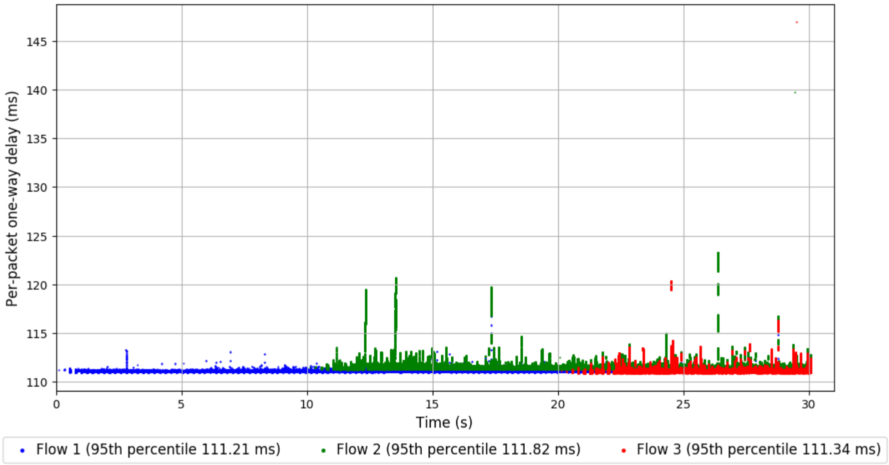




```
Run 5: Statistics of TaoVA-100x

Start at: 2018-10-02 13:24:41
End at: 2018-10-02 13:25:11
Local clock offset: -0.266 ms
Remote clock offset: 0.11 ms

# Below is generated by plot.py at 2018-10-02 15:45:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 204.11 Mbit/s
95th percentile per-packet one-way delay: 111.702 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 15.62 Mbit/s
95th percentile per-packet one-way delay: 111.212 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 191.71 Mbit/s
95th percentile per-packet one-way delay: 111.818 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 183.03 Mbit/s
95th percentile per-packet one-way delay: 111.338 ms
Loss rate: 0.00%
```

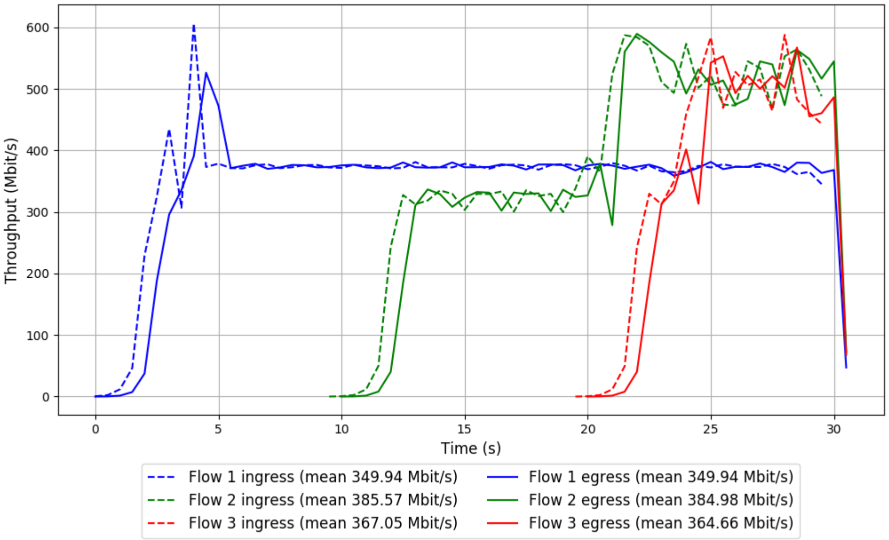
Run 5: Report of TaoVA-100x — Data Link

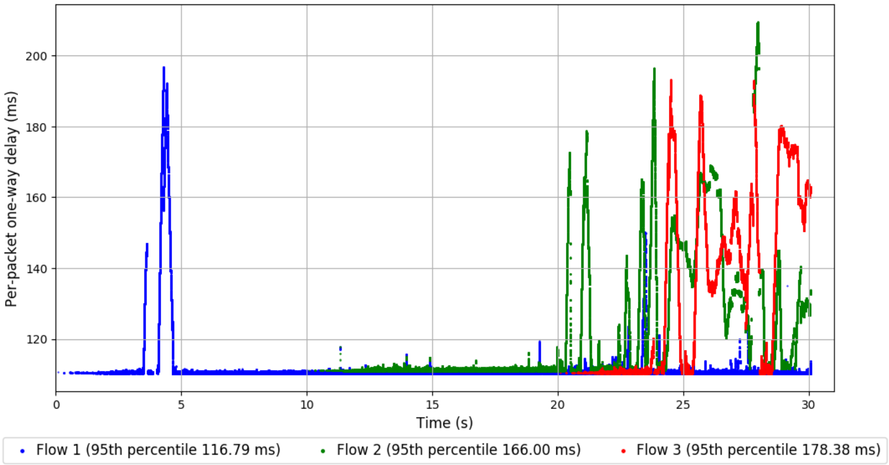




```
Run 1: Statistics of TCP Vegas

Start at: 2018-10-02 11:09:40
End at: 2018-10-02 11:10:10
Local clock offset: 0.017 ms
Remote clock offset: 0.289 ms

# Below is generated by plot.py at 2018-10-02 15:48:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 727.84 Mbit/s
95th percentile per-packet one-way delay: 167.704 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 349.94 Mbit/s
95th percentile per-packet one-way delay: 116.794 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 384.98 Mbit/s
95th percentile per-packet one-way delay: 166.000 ms
Loss rate: 0.16%
-- Flow 3:
Average throughput: 364.66 Mbit/s
95th percentile per-packet one-way delay: 178.382 ms
Loss rate: 0.66%
```

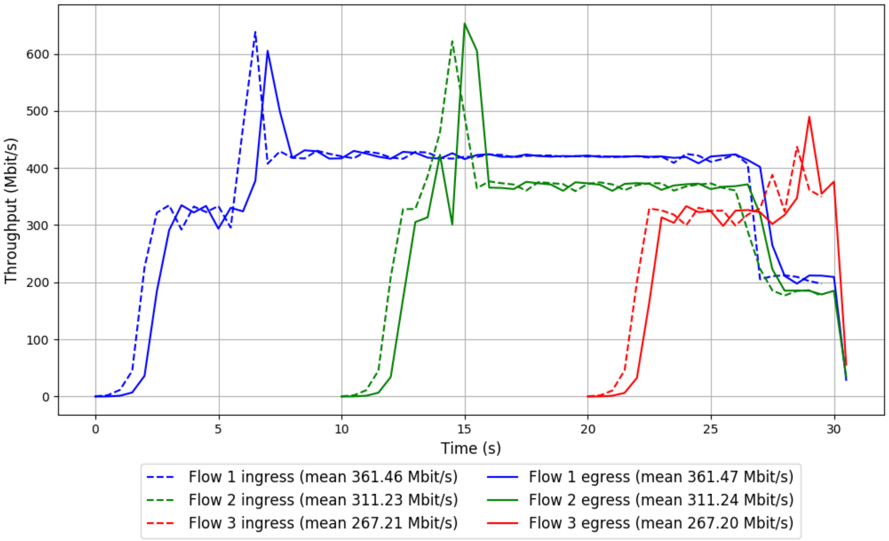
Run 1: Report of TCP Vegas — Data Link

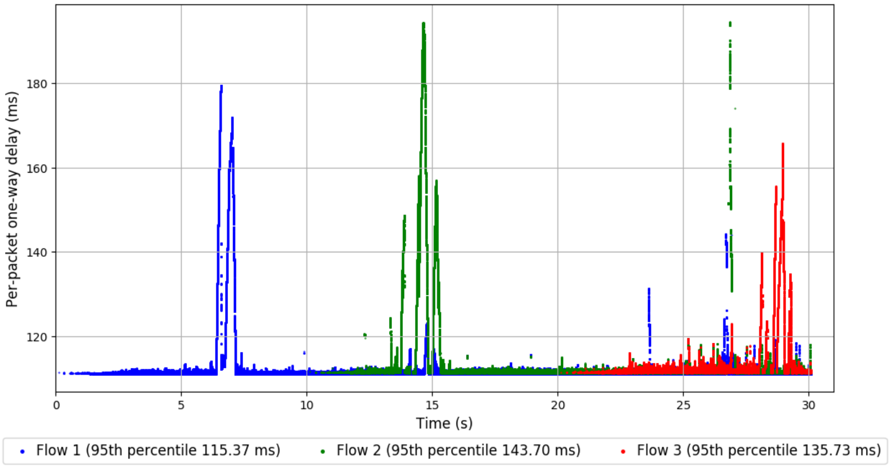




```
Run 2: Statistics of TCP Vegas

Start at: 2018-10-02 11:42:21
End at: 2018-10-02 11:42:51
Local clock offset: -0.315 ms
Remote clock offset: -0.067 ms

# Below is generated by plot.py at 2018-10-02 15:48:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 657.52 Mbit/s
95th percentile per-packet one-way delay: 131.014 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 361.47 Mbit/s
95th percentile per-packet one-way delay: 115.372 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 311.24 Mbit/s
95th percentile per-packet one-way delay: 143.700 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 267.20 Mbit/s
95th percentile per-packet one-way delay: 135.729 ms
Loss rate: 0.00%
```

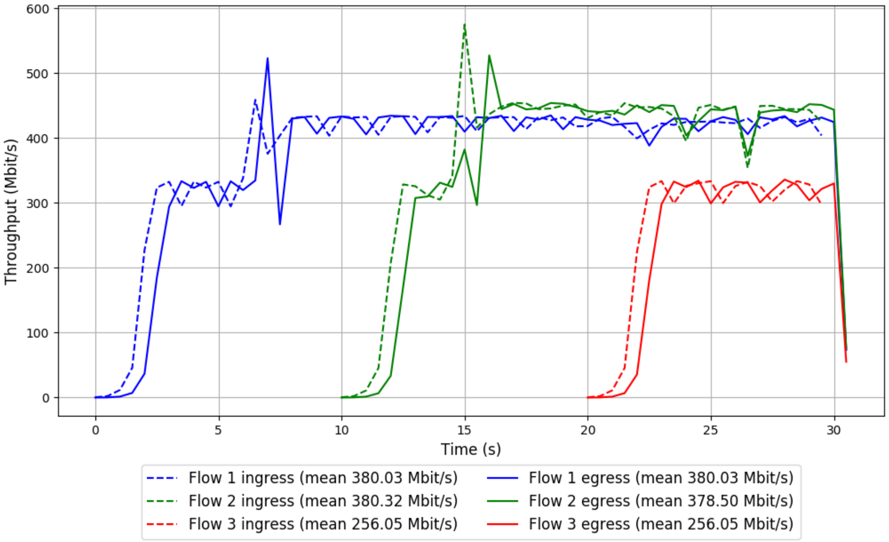
Run 2: Report of TCP Vegas — Data Link

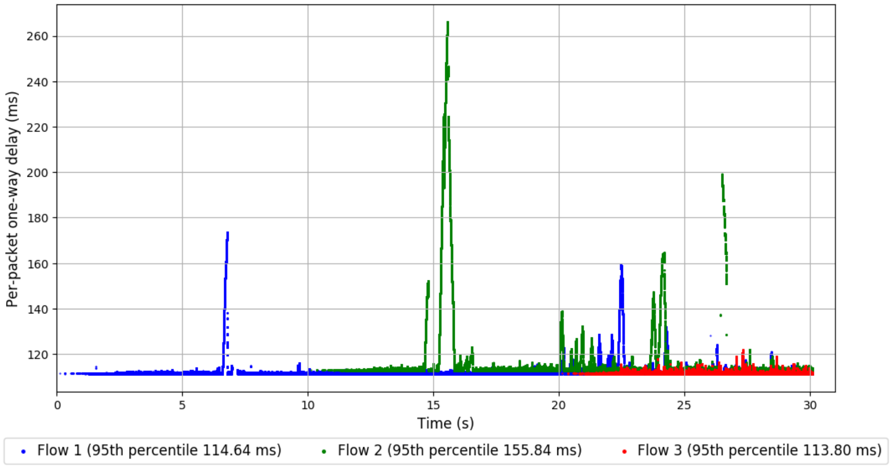




```
Run 3: Statistics of TCP Vegas

Start at: 2018-10-02 12:14:42
End at: 2018-10-02 12:15:12
Local clock offset: -1.467 ms
Remote clock offset: -0.184 ms

# Below is generated by plot.py at 2018-10-02 15:53:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 717.14 Mbit/s
95th percentile per-packet one-way delay: 122.884 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 380.03 Mbit/s
95th percentile per-packet one-way delay: 114.638 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 378.50 Mbit/s
95th percentile per-packet one-way delay: 155.841 ms
Loss rate: 0.48%
-- Flow 3:
Average throughput: 256.05 Mbit/s
95th percentile per-packet one-way delay: 113.799 ms
Loss rate: 0.00%
```

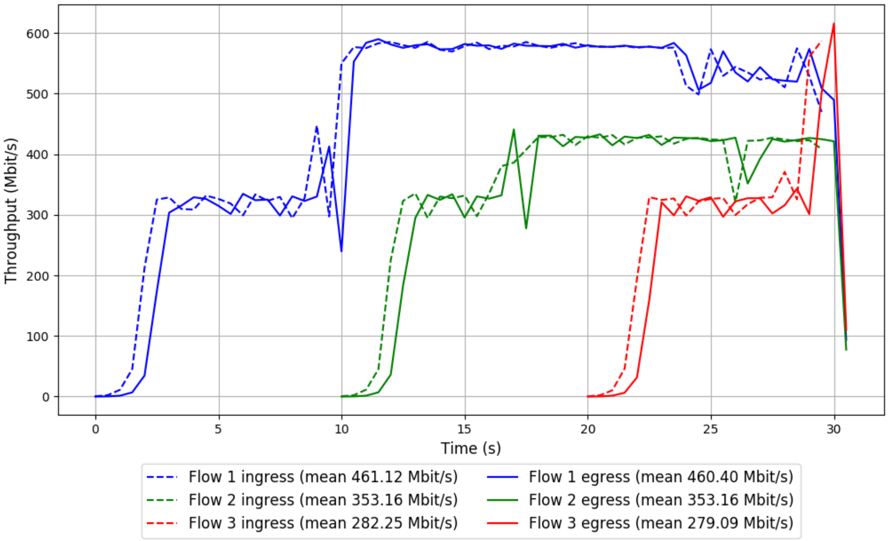
Run 3: Report of TCP Vegas — Data Link

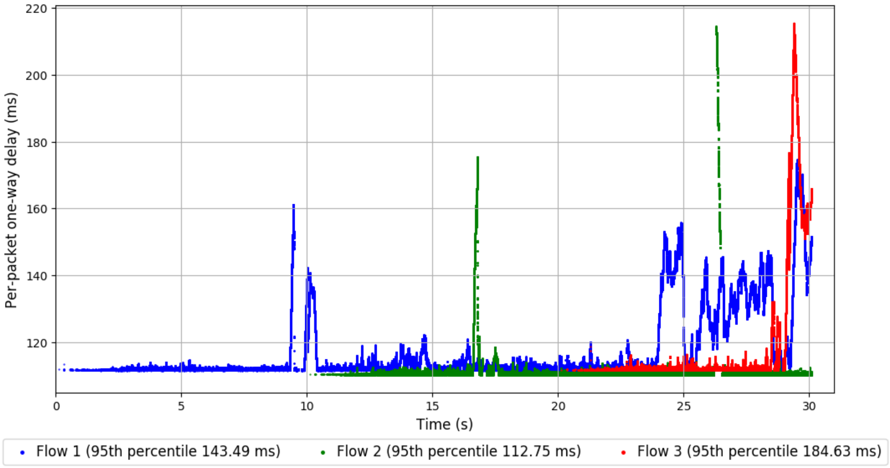




```
Run 4: Statistics of TCP Vegas

Start at: 2018-10-02 12:47:14
End at: 2018-10-02 12:47:44
Local clock offset: -0.269 ms
Remote clock offset: -0.199 ms

# Below is generated by plot.py at 2018-10-02 15:55:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 788.39 Mbit/s
95th percentile per-packet one-way delay: 146.306 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 460.40 Mbit/s
95th percentile per-packet one-way delay: 143.490 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 353.16 Mbit/s
95th percentile per-packet one-way delay: 112.750 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 279.09 Mbit/s
95th percentile per-packet one-way delay: 184.627 ms
Loss rate: 1.11%
```

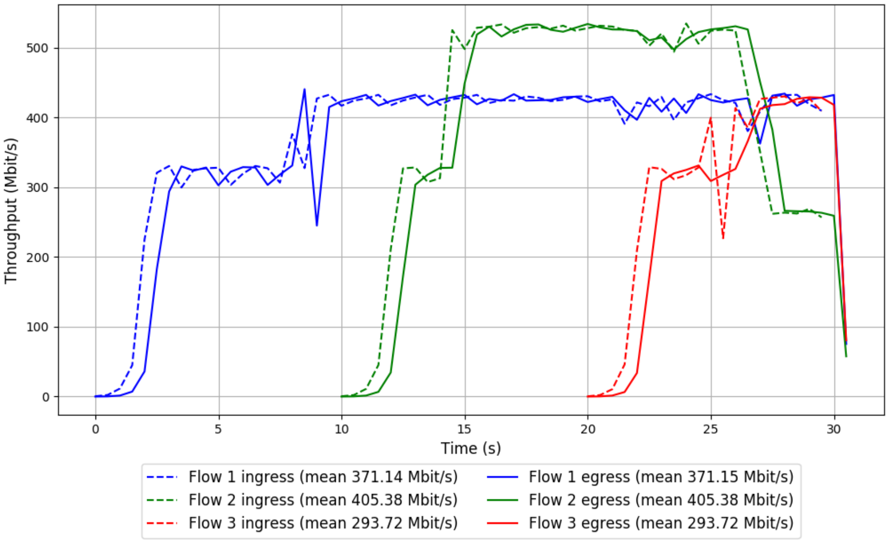
Run 4: Report of TCP Vegas — Data Link

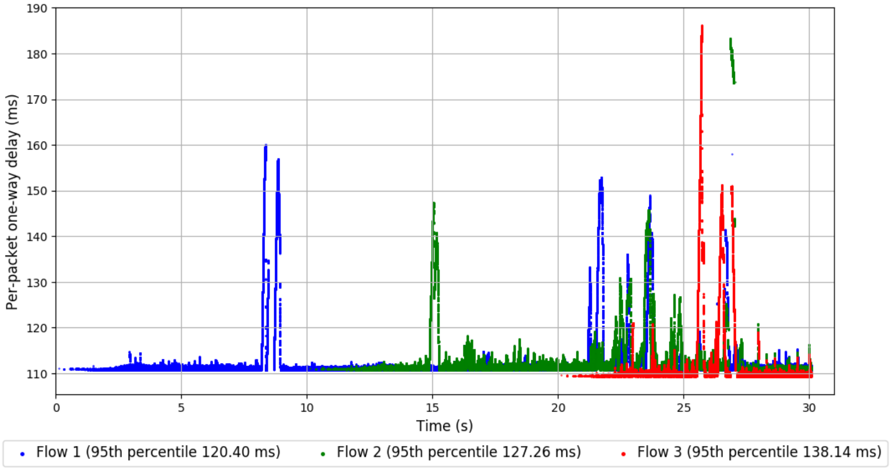




```
Run 5: Statistics of TCP Vegas

Start at: 2018-10-02 13:19:42
End at: 2018-10-02 13:20:12
Local clock offset: -0.103 ms
Remote clock offset: 0.074 ms

# Below is generated by plot.py at 2018-10-02 15:56:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 738.72 Mbit/s
95th percentile per-packet one-way delay: 126.836 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 371.15 Mbit/s
95th percentile per-packet one-way delay: 120.400 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 405.38 Mbit/s
95th percentile per-packet one-way delay: 127.256 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 293.72 Mbit/s
95th percentile per-packet one-way delay: 138.136 ms
Loss rate: 0.00%
```

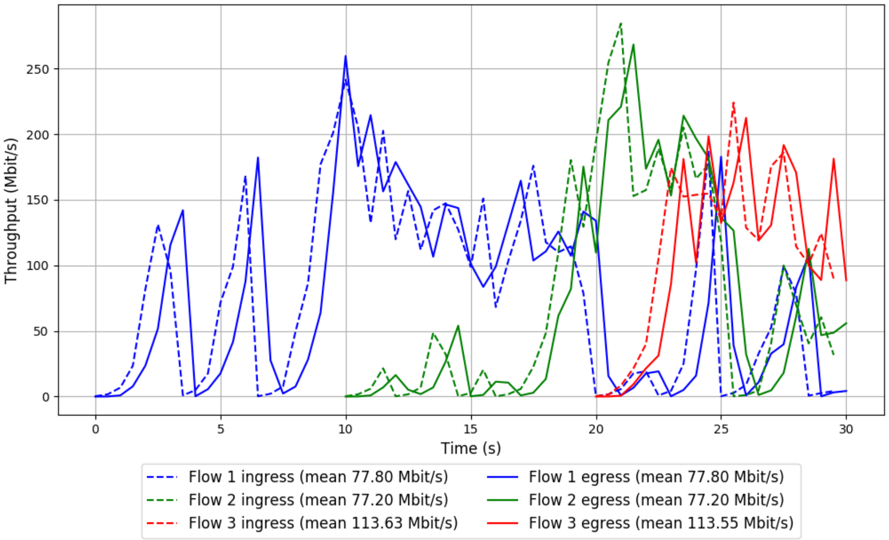
Run 5: Report of TCP Vegas — Data Link

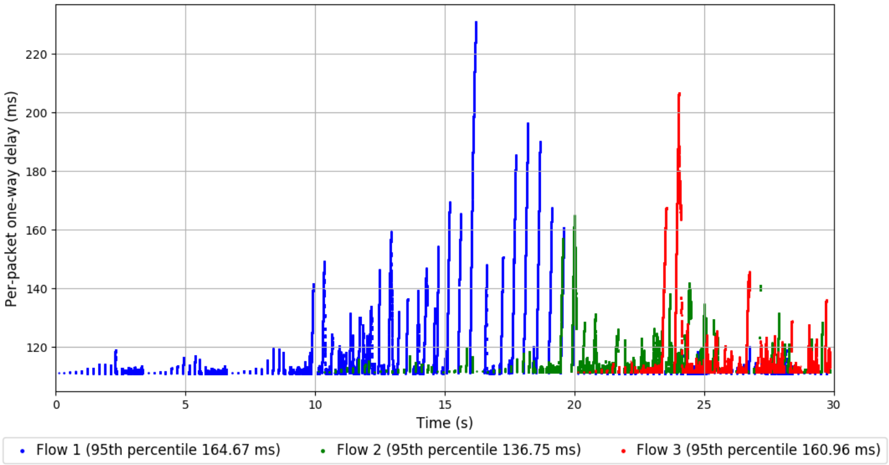




```
Run 1: Statistics of Verus

Start at: 2018-10-02 11:12:53
End at: 2018-10-02 11:13:23
Local clock offset: -0.252 ms
Remote clock offset: -0.058 ms

# Below is generated by plot.py at 2018-10-02 15:56:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 165.82 Mbit/s
95th percentile per-packet one-way delay: 156.332 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 77.80 Mbit/s
95th percentile per-packet one-way delay: 164.670 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 77.20 Mbit/s
95th percentile per-packet one-way delay: 136.746 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 113.55 Mbit/s
95th percentile per-packet one-way delay: 160.959 ms
Loss rate: 0.05%
```

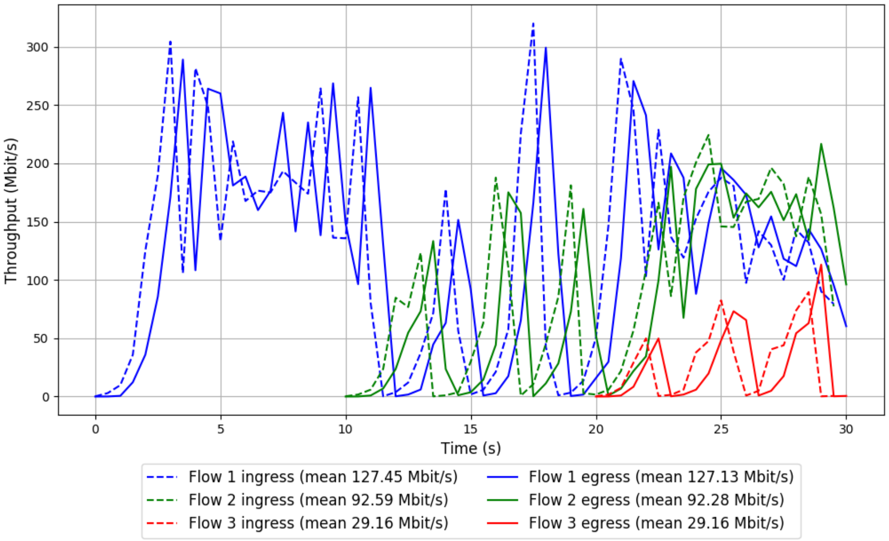
Run 1: Report of Verus — Data Link

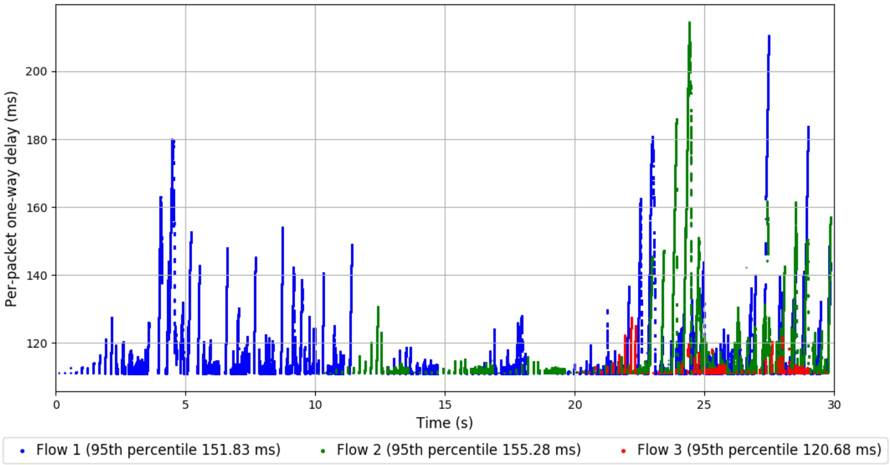




```
Run 2: Statistics of Verus

Start at: 2018-10-02 11:45:32
End at: 2018-10-02 11:46:02
Local clock offset: -0.197 ms
Remote clock offset: -0.089 ms

# Below is generated by plot.py at 2018-10-02 15:56:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 197.71 Mbit/s
95th percentile per-packet one-way delay: 151.748 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 127.13 Mbit/s
95th percentile per-packet one-way delay: 151.830 ms
Loss rate: 0.25%
-- Flow 2:
Average throughput: 92.28 Mbit/s
95th percentile per-packet one-way delay: 155.285 ms
Loss rate: 0.12%
-- Flow 3:
Average throughput: 29.16 Mbit/s
95th percentile per-packet one-way delay: 120.681 ms
Loss rate: 0.00%
```

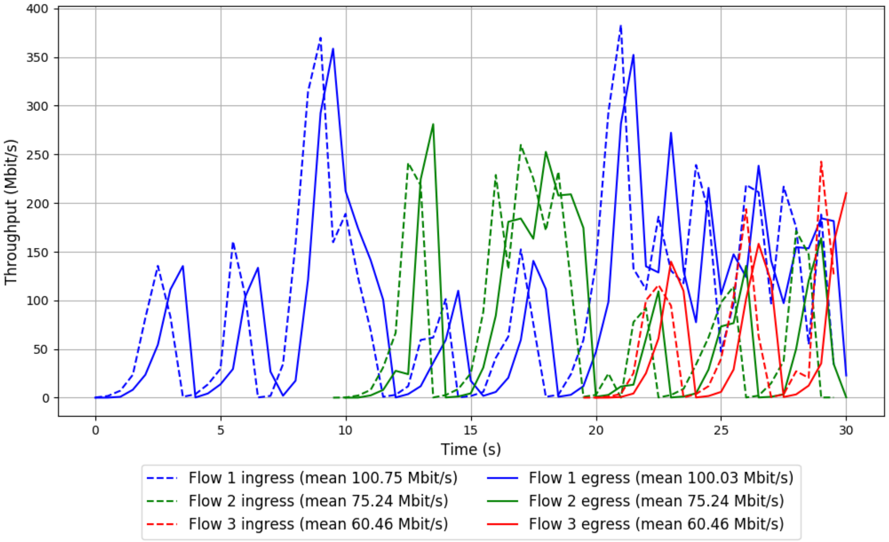
Run 2: Report of Verus — Data Link

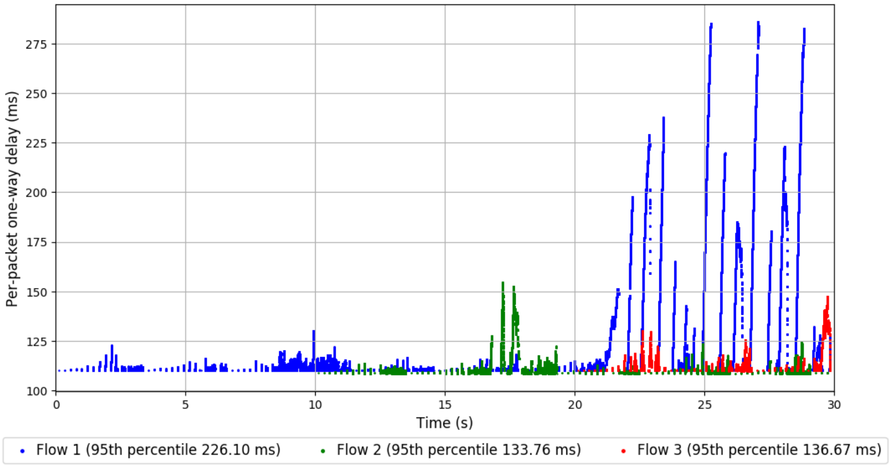




```
Run 3: Statistics of Verus

Start at: 2018-10-02 12:17:56
End at: 2018-10-02 12:18:26
Local clock offset: 1.181 ms
Remote clock offset: -0.164 ms

# Below is generated by plot.py at 2018-10-02 15:56:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 169.49 Mbit/s
95th percentile per-packet one-way delay: 210.359 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 100.03 Mbit/s
95th percentile per-packet one-way delay: 226.101 ms
Loss rate: 0.71%
-- Flow 2:
Average throughput: 75.24 Mbit/s
95th percentile per-packet one-way delay: 133.758 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 60.46 Mbit/s
95th percentile per-packet one-way delay: 136.671 ms
Loss rate: 0.00%
```

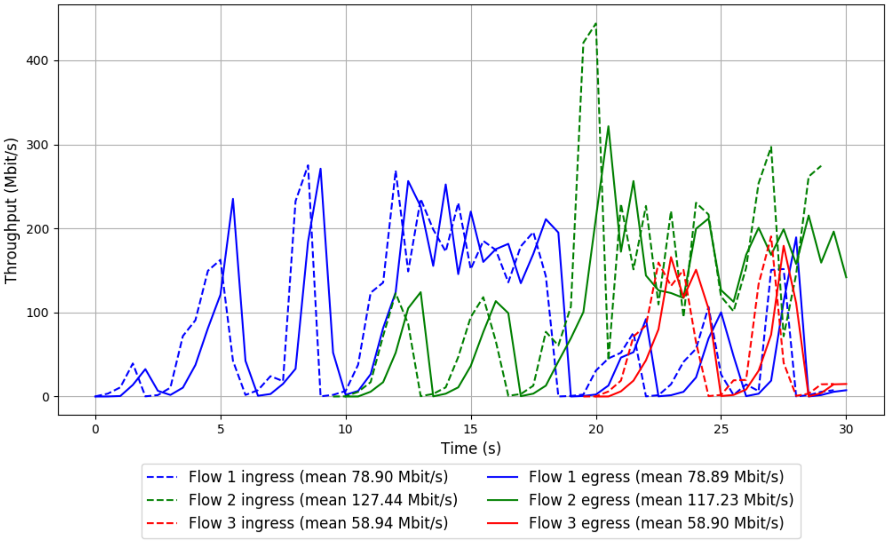
Run 3: Report of Verus — Data Link

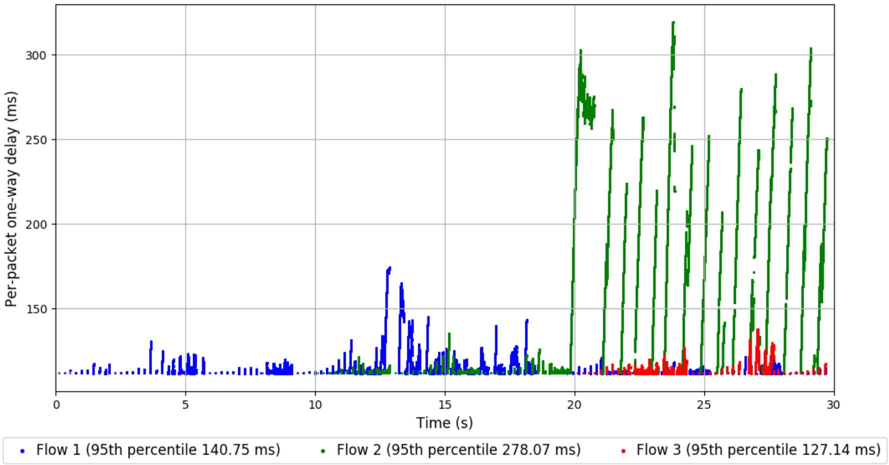




```
Run 4: Statistics of Verus

Start at: 2018-10-02 12:50:31
End at: 2018-10-02 12:51:01
Local clock offset: -0.503 ms
Remote clock offset: -0.22 ms

# Below is generated by plot.py at 2018-10-02 15:56:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 175.51 Mbit/s
95th percentile per-packet one-way delay: 266.511 ms
Loss rate: 3.40%
-- Flow 1:
Average throughput: 78.89 Mbit/s
95th percentile per-packet one-way delay: 140.748 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 117.23 Mbit/s
95th percentile per-packet one-way delay: 278.072 ms
Loss rate: 7.36%
-- Flow 3:
Average throughput: 58.90 Mbit/s
95th percentile per-packet one-way delay: 127.139 ms
Loss rate: 0.00%
```

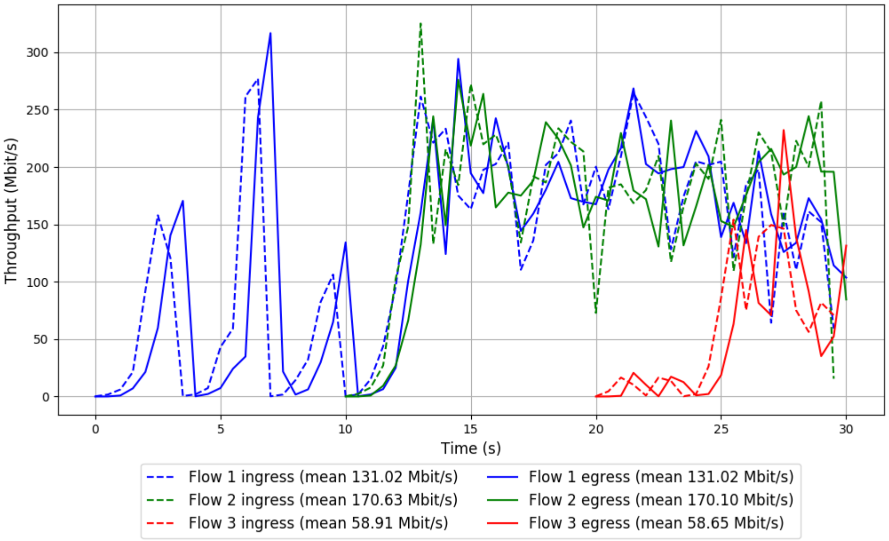
Run 4: Report of Verus — Data Link

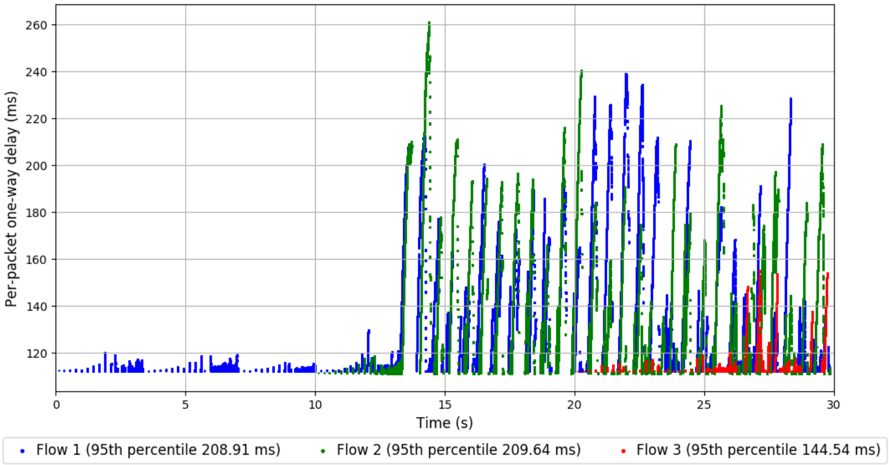




```
Run 5: Statistics of Verus

Start at: 2018-10-02 13:22:56
End at: 2018-10-02 13:23:26
Local clock offset: -1.377 ms
Remote clock offset: 0.129 ms

# Below is generated by plot.py at 2018-10-02 15:57:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 262.81 Mbit/s
95th percentile per-packet one-way delay: 208.700 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 131.02 Mbit/s
95th percentile per-packet one-way delay: 208.910 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 170.10 Mbit/s
95th percentile per-packet one-way delay: 209.643 ms
Loss rate: 0.32%
-- Flow 3:
Average throughput: 58.65 Mbit/s
95th percentile per-packet one-way delay: 144.542 ms
Loss rate: 0.00%
```

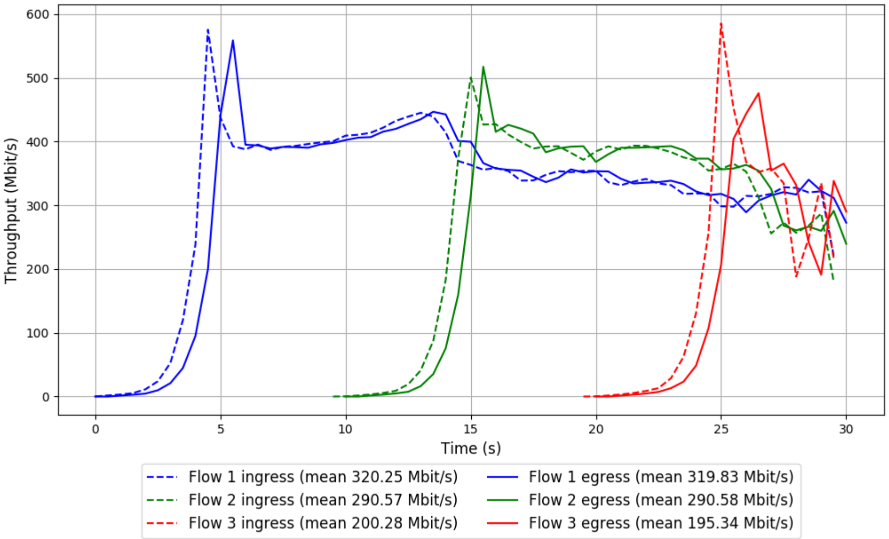
Run 5: Report of Verus — Data Link

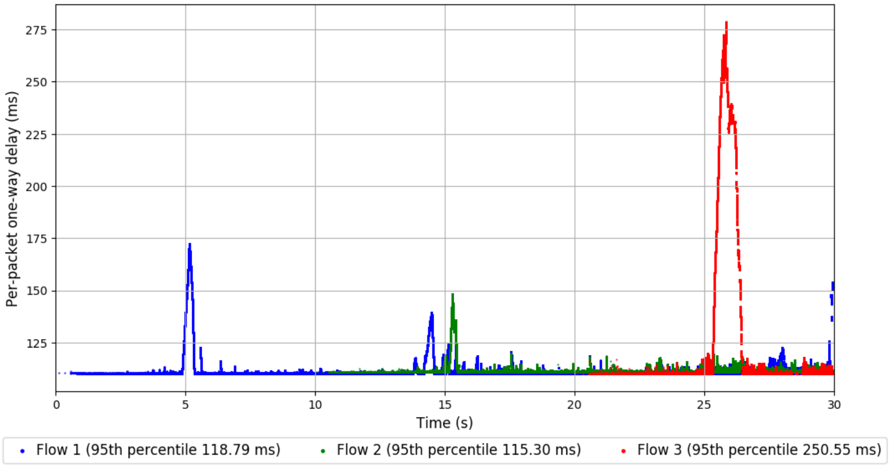




```
Run 1: Statistics of PCC-Vivace

Start at: 2018-10-02 11:31:03
End at: 2018-10-02 11:31:33
Local clock offset: 0.612 ms
Remote clock offset: -0.056 ms

# Below is generated by plot.py at 2018-10-02 15:59:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 577.95 Mbit/s
95th percentile per-packet one-way delay: 130.962 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 319.83 Mbit/s
95th percentile per-packet one-way delay: 118.788 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 290.58 Mbit/s
95th percentile per-packet one-way delay: 115.301 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 195.34 Mbit/s
95th percentile per-packet one-way delay: 250.548 ms
Loss rate: 2.48%
```

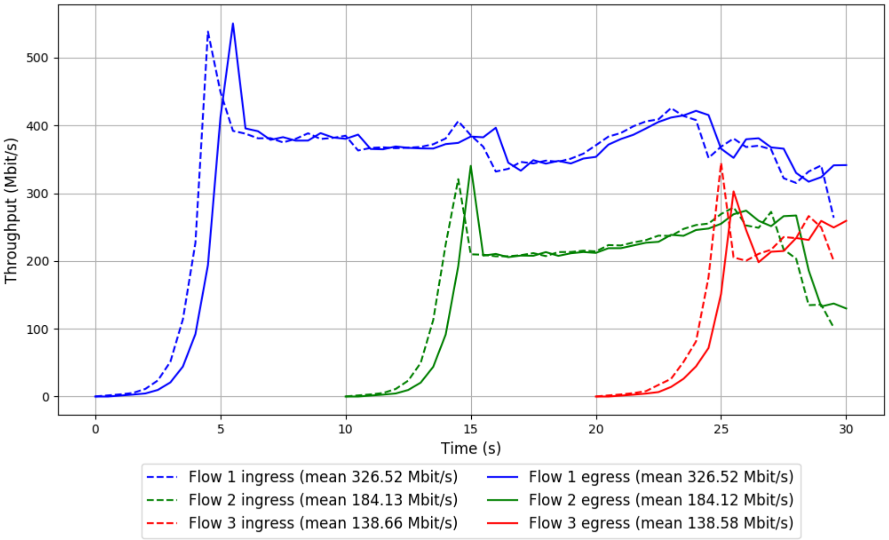
Run 1: Report of PCC-Vivace — Data Link

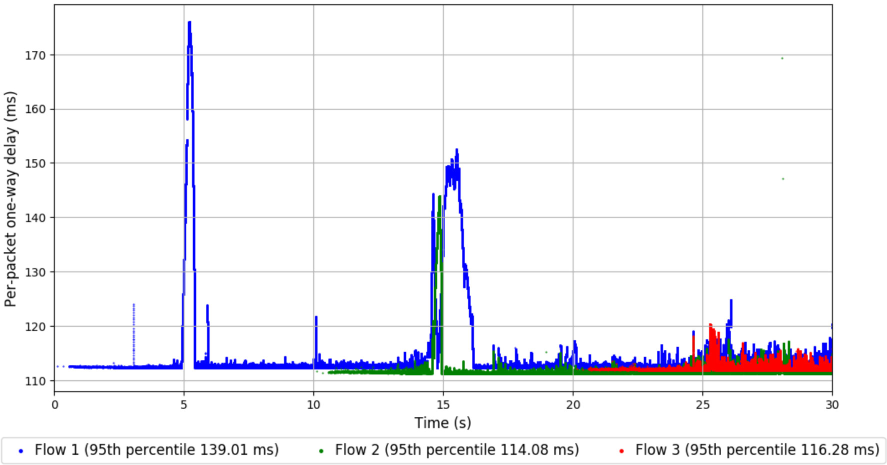




```
Run 2: Statistics of PCC-Vivace

Start at: 2018-10-02 12:03:31
End at: 2018-10-02 12:04:01
Local clock offset: -0.686 ms
Remote clock offset: 0.23 ms

# Below is generated by plot.py at 2018-10-02 15:59:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 494.64 Mbit/s
95th percentile per-packet one-way delay: 128.983 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 326.52 Mbit/s
95th percentile per-packet one-way delay: 139.008 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 184.12 Mbit/s
95th percentile per-packet one-way delay: 114.081 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 138.58 Mbit/s
95th percentile per-packet one-way delay: 116.279 ms
Loss rate: 0.05%
```

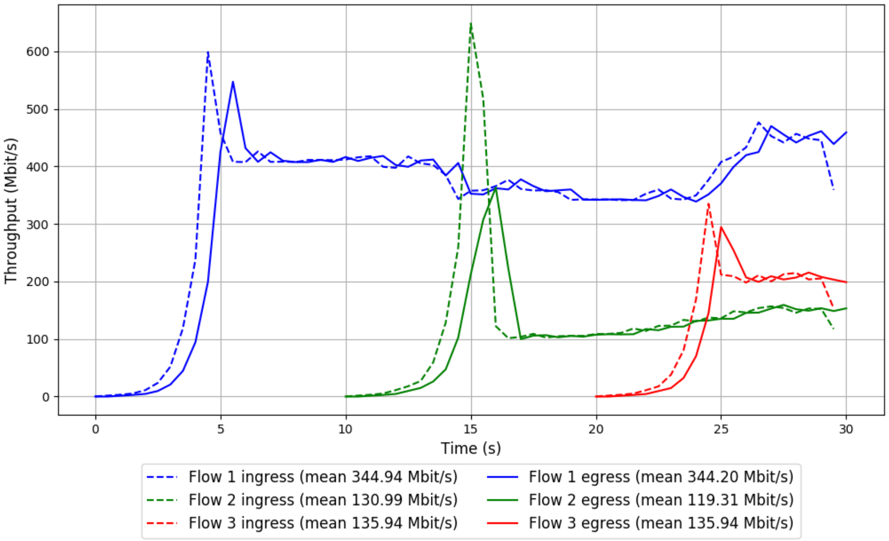
Run 2: Report of PCC-Vivace — Data Link

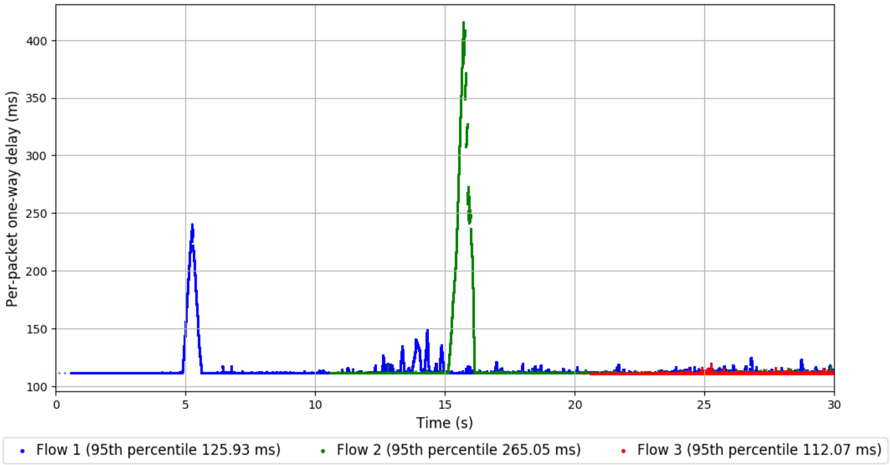




```
Run 3: Statistics of PCC-Vivace

Start at: 2018-10-02 12:36:06
End at: 2018-10-02 12:36:36
Local clock offset: -0.262 ms
Remote clock offset: -0.175 ms

# Below is generated by plot.py at 2018-10-02 15:59:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 468.40 Mbit/s
95th percentile per-packet one-way delay: 134.615 ms
Loss rate: 1.79%
-- Flow 1:
Average throughput: 344.20 Mbit/s
95th percentile per-packet one-way delay: 125.931 ms
Loss rate: 0.22%
-- Flow 2:
Average throughput: 119.31 Mbit/s
95th percentile per-packet one-way delay: 265.048 ms
Loss rate: 8.92%
-- Flow 3:
Average throughput: 135.94 Mbit/s
95th percentile per-packet one-way delay: 112.069 ms
Loss rate: 0.00%
```

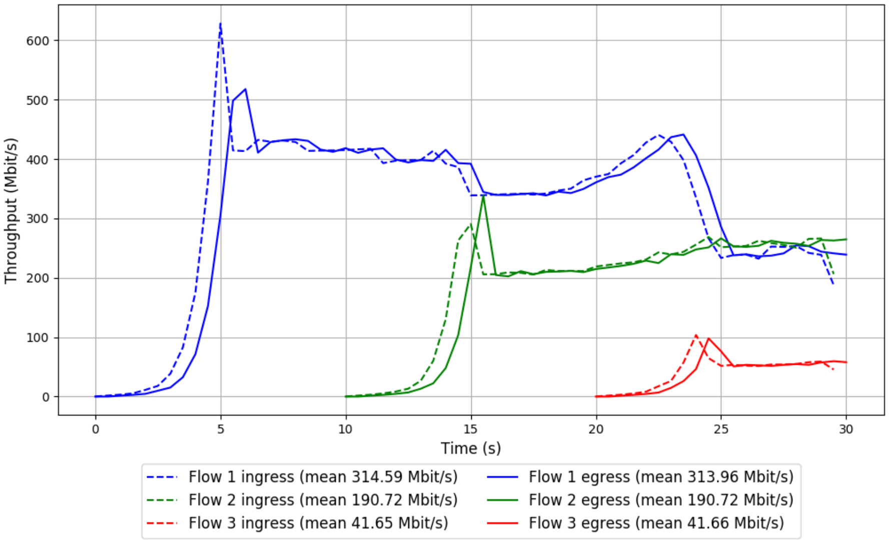
Run 3: Report of PCC-Vivace — Data Link

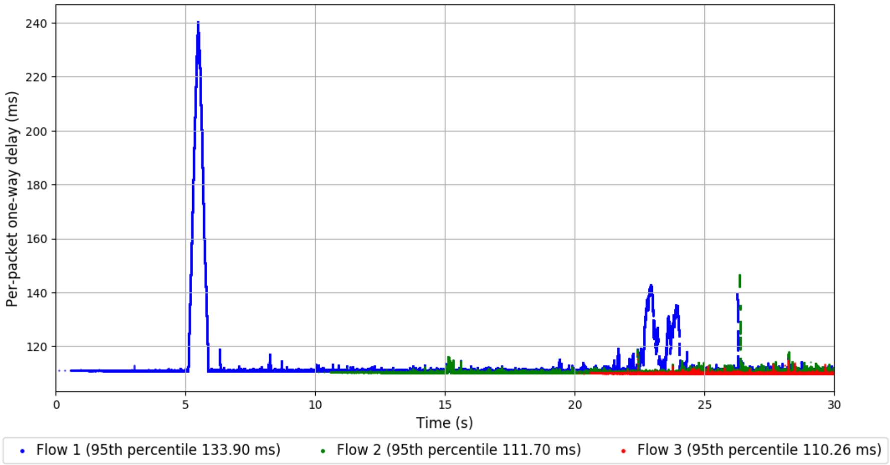




```
Run 4: Statistics of PCC-Vivace

Start at: 2018-10-02 13:08:40
End at: 2018-10-02 13:09:10
Local clock offset: -0.092 ms
Remote clock offset: -0.039 ms

# Below is generated by plot.py at 2018-10-02 15:59:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 454.53 Mbit/s
95th percentile per-packet one-way delay: 126.058 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 313.96 Mbit/s
95th percentile per-packet one-way delay: 133.896 ms
Loss rate: 0.20%
-- Flow 2:
Average throughput: 190.72 Mbit/s
95th percentile per-packet one-way delay: 111.702 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 41.66 Mbit/s
95th percentile per-packet one-way delay: 110.258 ms
Loss rate: 0.00%
```

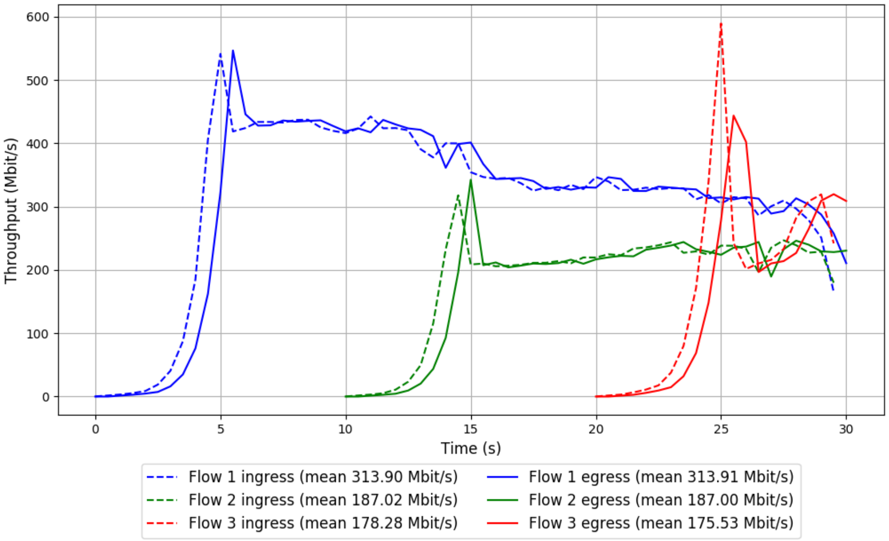
Run 4: Report of PCC-Vivace — Data Link

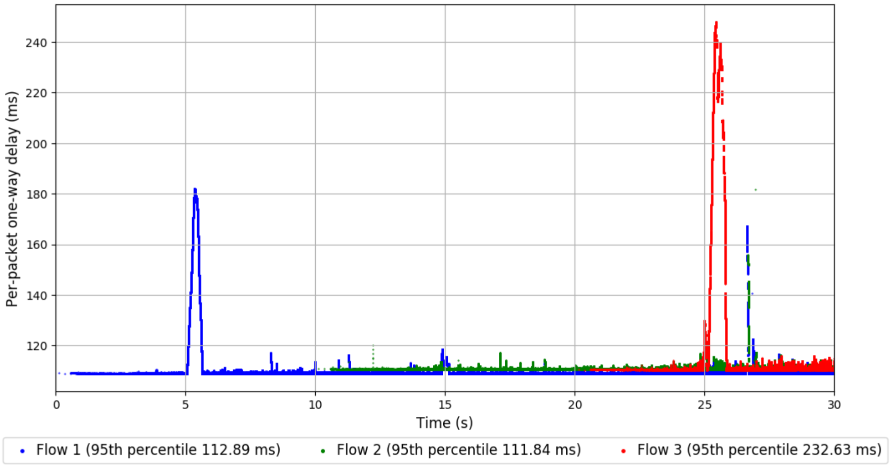




```
Run 5: Statistics of PCC-Vivace

Start at: 2018-10-02 13:40:54
End at: 2018-10-02 13:41:24
Local clock offset: 0.37 ms
Remote clock offset: 0.231 ms

# Below is generated by plot.py at 2018-10-02 15:59:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 496.07 Mbit/s
95th percentile per-packet one-way delay: 115.792 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 313.91 Mbit/s
95th percentile per-packet one-way delay: 112.888 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 187.00 Mbit/s
95th percentile per-packet one-way delay: 111.845 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 175.53 Mbit/s
95th percentile per-packet one-way delay: 232.627 ms
Loss rate: 1.55%
```

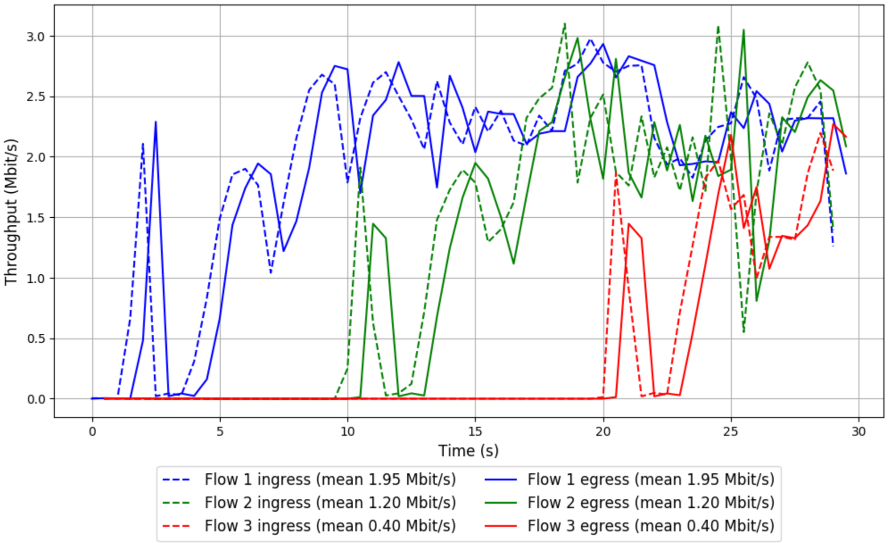
Run 5: Report of PCC-Vivace — Data Link

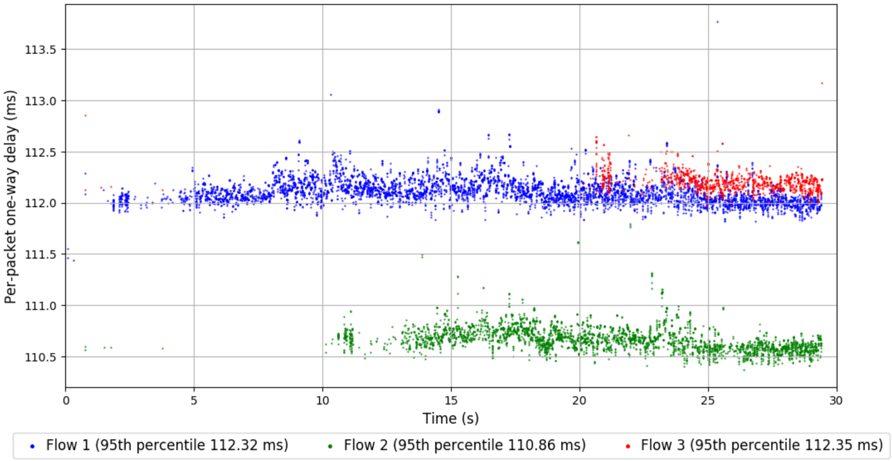




```
Run 1: Statistics of WebRTC media

Start at: 2018-10-02 11:11:37
End at: 2018-10-02 11:12:07
Local clock offset: -0.13 ms
Remote clock offset: 0.278 ms

# Below is generated by plot.py at 2018-10-02 15:59:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.51 Mbit/s
95th percentile per-packet one-way delay: 112.291 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 112.316 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 110.856 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 112.352 ms
Loss rate: 0.17%
```

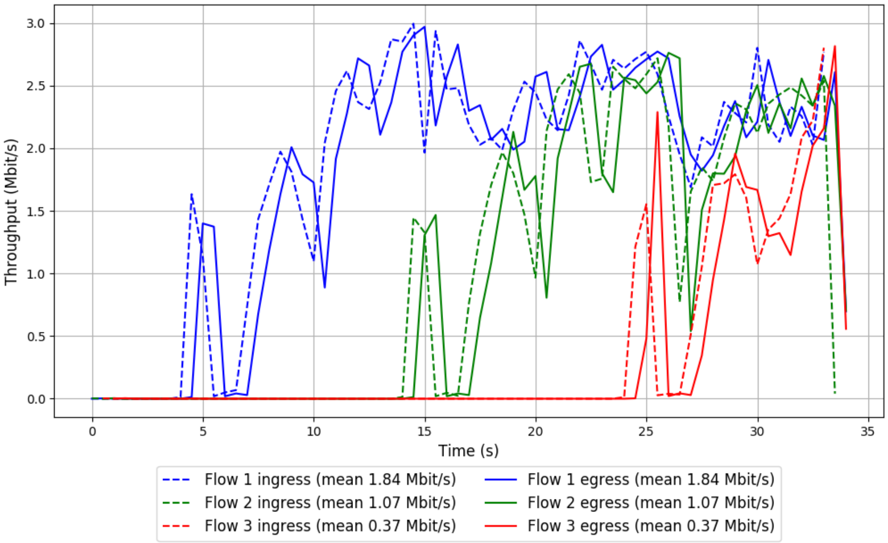
Run 1: Report of WebRTC media — Data Link

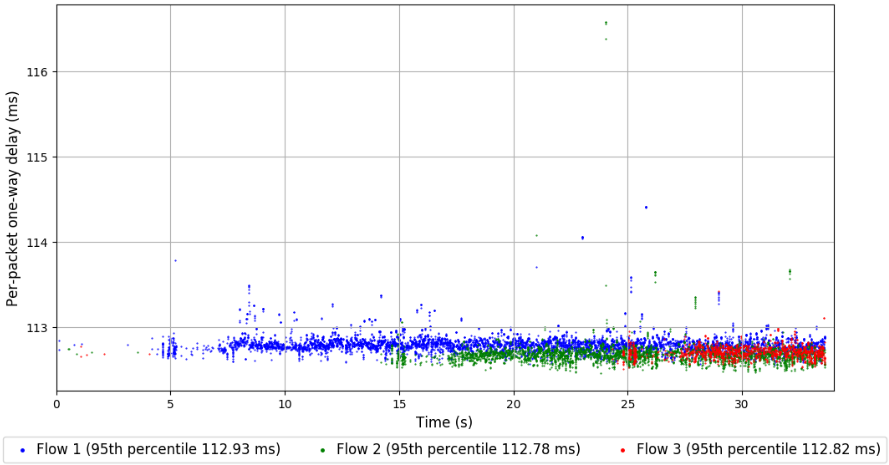




```
Run 2: Statistics of WebRTC media

Start at: 2018-10-02 11:44:16
End at: 2018-10-02 11:44:46
Local clock offset: -1.369 ms
Remote clock offset: 0.244 ms

# Below is generated by plot.py at 2018-10-02 15:59:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.25 Mbit/s
95th percentile per-packet one-way delay: 112.889 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.84 Mbit/s
95th percentile per-packet one-way delay: 112.928 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 112.783 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 112.817 ms
Loss rate: 0.00%
```

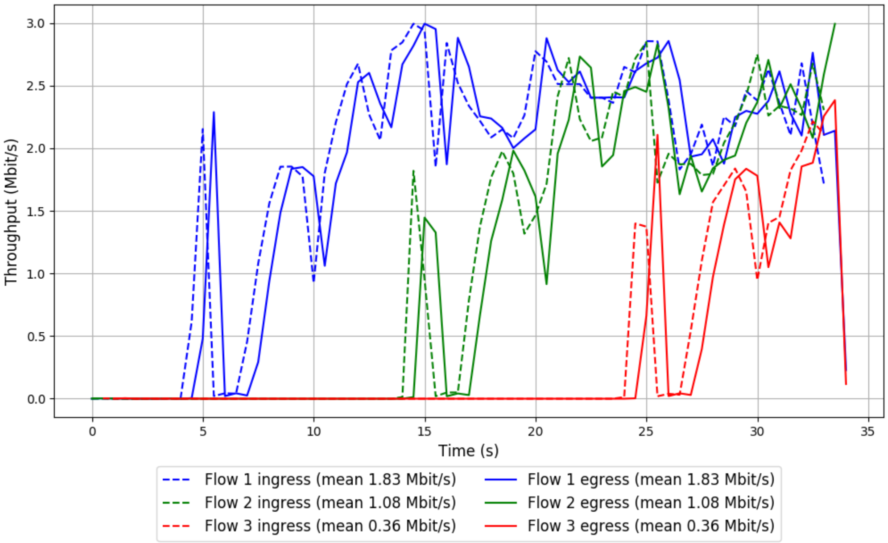
Run 2: Report of WebRTC media — Data Link

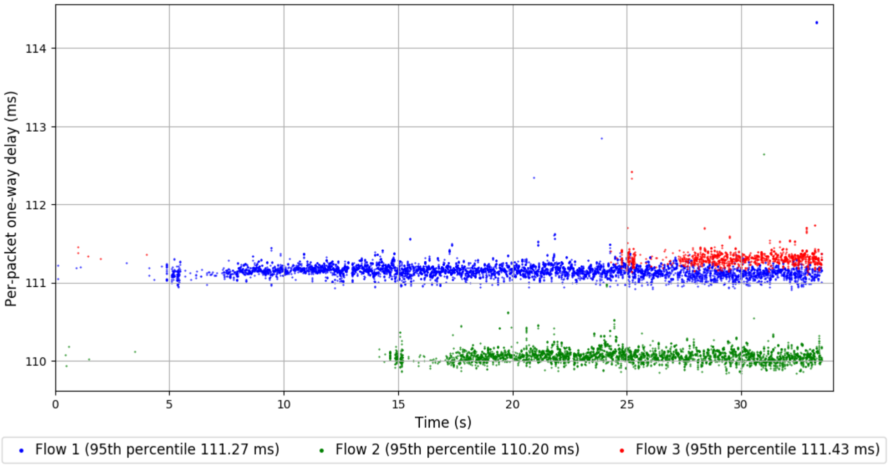




```
Run 3: Statistics of WebRTC media

Start at: 2018-10-02 12:16:40
End at: 2018-10-02 12:17:10
Local clock offset: 0.565 ms
Remote clock offset: 0.158 ms

# Below is generated by plot.py at 2018-10-02 15:59:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.25 Mbit/s
95th percentile per-packet one-way delay: 111.327 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 111.270 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 110.198 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 111.426 ms
Loss rate: 0.01%
```

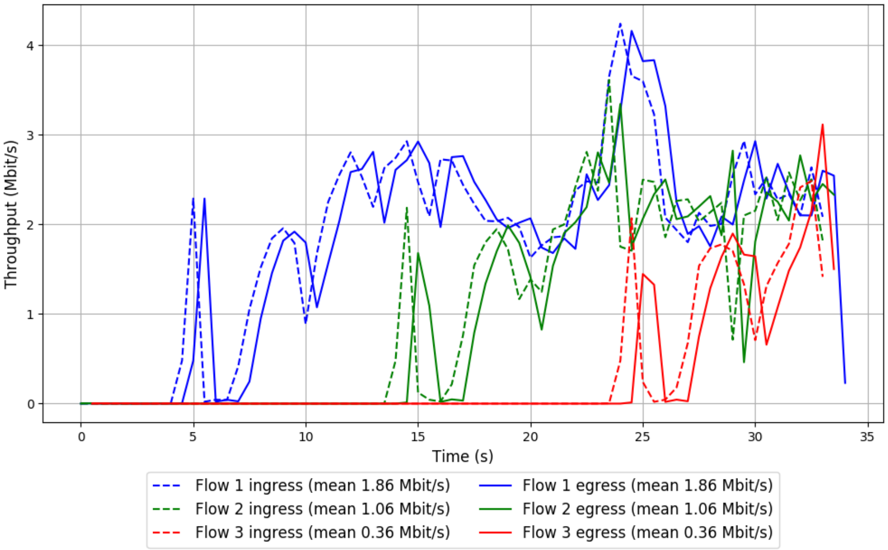
Run 3: Report of WebRTC media — Data Link

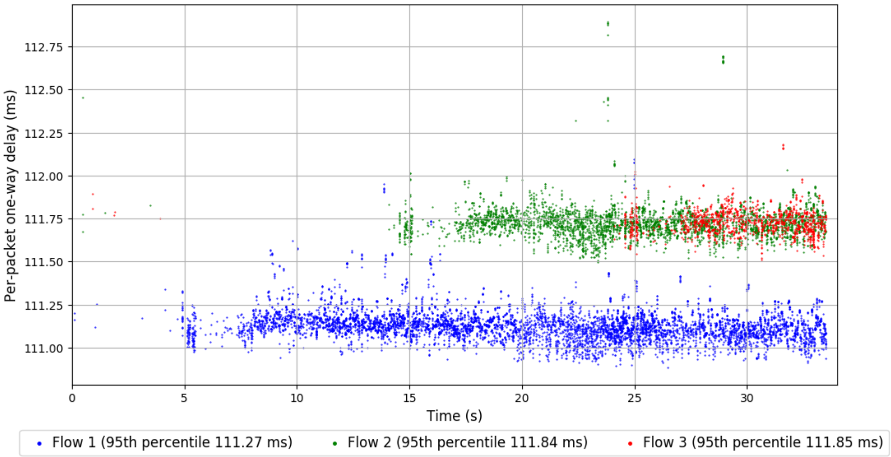




```
Run 4: Statistics of WebRTC media

Start at: 2018-10-02 12:49:15
End at: 2018-10-02 12:49:45
Local clock offset: 0.234 ms
Remote clock offset: 0.169 ms

# Below is generated by plot.py at 2018-10-02 15:59:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.25 Mbit/s
95th percentile per-packet one-way delay: 111.801 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 111.267 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 111.842 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 111.847 ms
Loss rate: 0.00%
```

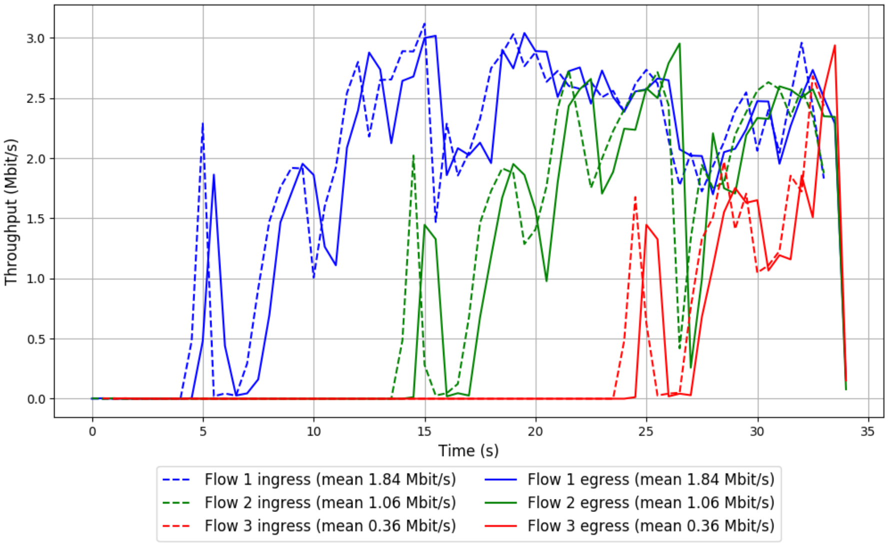
Run 4: Report of WebRTC media — Data Link



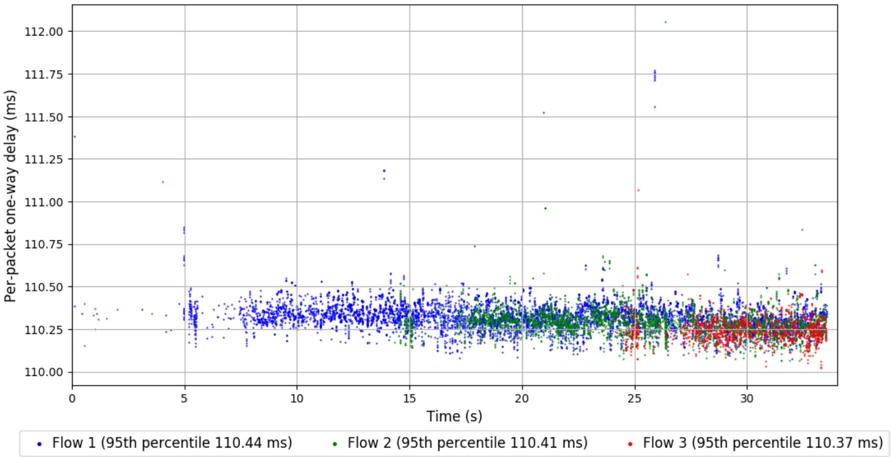


```
Run 5: Statistics of WebRTC media

Start at: 2018-10-02 13:21:41
End at: 2018-10-02 13:22:11
Local clock offset: 0.535 ms
Remote clock offset: 0.018 ms

# Below is generated by plot.py at 2018-10-02 15:59:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.24 Mbit/s
95th percentile per-packet one-way delay: 110.432 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.84 Mbit/s
95th percentile per-packet one-way delay: 110.444 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 110.409 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 110.367 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
35
Time (s)
Flow 1 ingress (mean 1.84 Mbit/s)
Flow 2 ingress (mean 1.06 Mbit/s)
Flow 3 ingress (mean 0.36 Mbit/s)
Flow 1 egress (mean 1.84 Mbit/s)
Flow 2 egress (mean 1.06 Mbit/s)
Flow 3 egress (mean 0.36 Mbit/s)



Per-packet one-way delay (ms)
112.00
111.75
111.50
111.25
111.00
110.75
110.50
110.25
110.00
0
5
10
15
20
25
30
Time (s)
Flow 1 (95th percentile 110.44 ms)
Flow 2 (95th percentile 110.41 ms)
Flow 3 (95th percentile 110.37 ms)