Pantheon Report

Generated at 2019-01-03 02:03:49 (UTC).

Data path: AWS Brazil 1 on `ens5` (*local*) →Brazil on `p4p1` (*remote*).

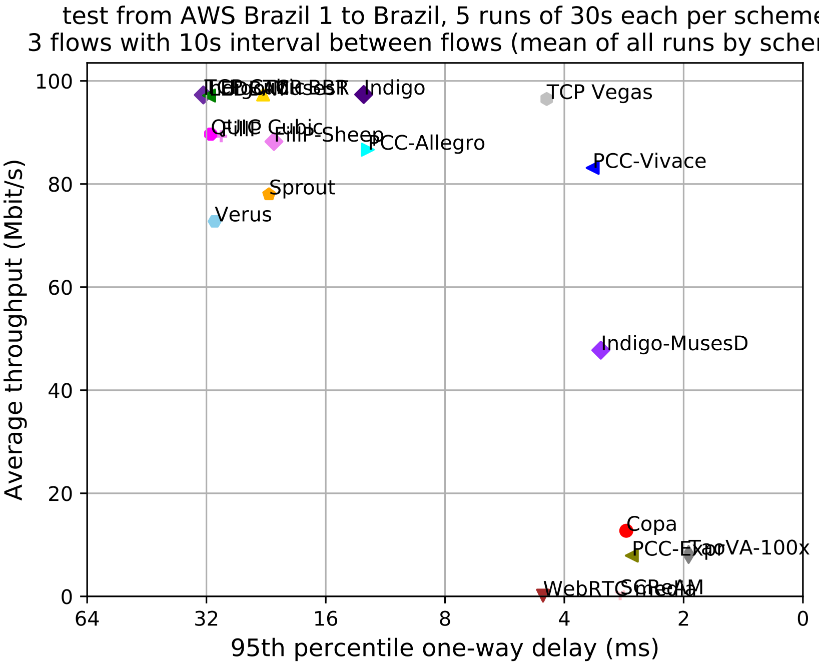
Repeated the test of 19 congestion control schemes 5 times.

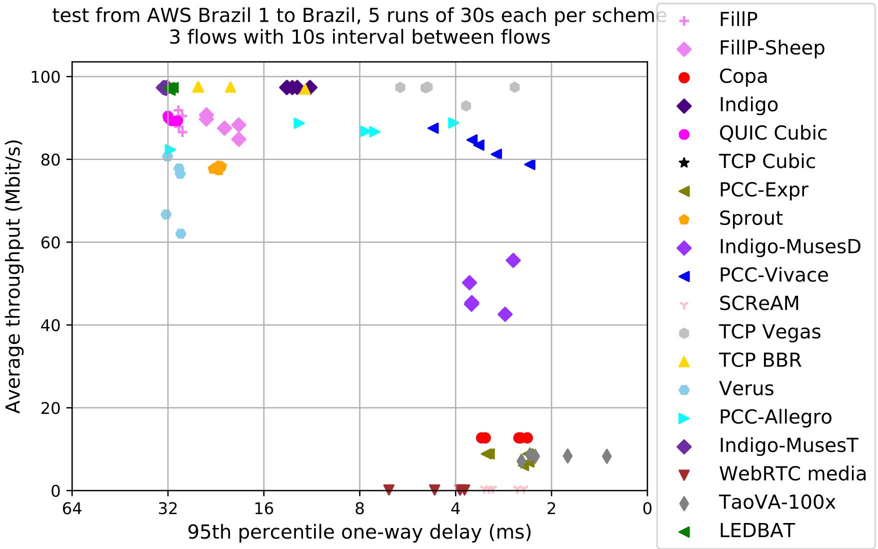
Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.

NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

```
System info:
Linux 4.15.0-1029-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

```
Git summary:
branch: muses @ c654af0b7d59d4ef4b914cfac404e1fc2e96dc68
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
third_party/muses-refactored @ 31f8f0ba8ef8b1da76c2bc0cd0a7850c33ff64fb
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
 M receiver/src/buffer.h
 M receiver/src/core.cpp
 M sender/src/buffer.h
 M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
 M src/ScreamClient
 M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
 M src/examples/cellsim.cc
 M src/examples/sproutbt2.cc
 M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
 M src/verus.hpp
 M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

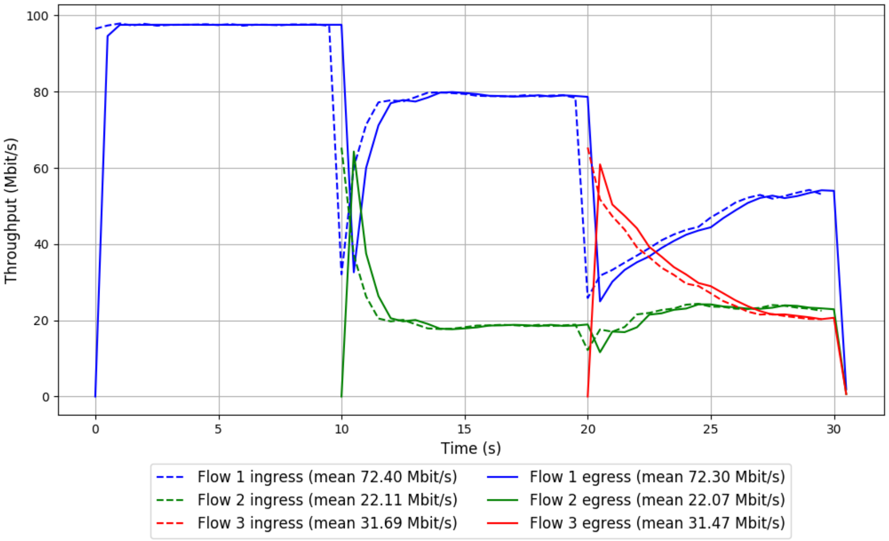

test from AWS Brazil 1 to Brazil, 5 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
100
80
60
40
20
0
64
32
16
8
4
2
0
TCP Cubic
LEDBAT
Indigo-MusesT
TCP BBR
Indigo
TCP Vegas
QUIC Cubic
FillP
FillP-Sheep
PCC-Allegro
PCC-Vivace
Sprout
Verus
Indigo-MusesD
Copa
PCC-Expr
TaoVA-100x
WebRTC media
SCReAM

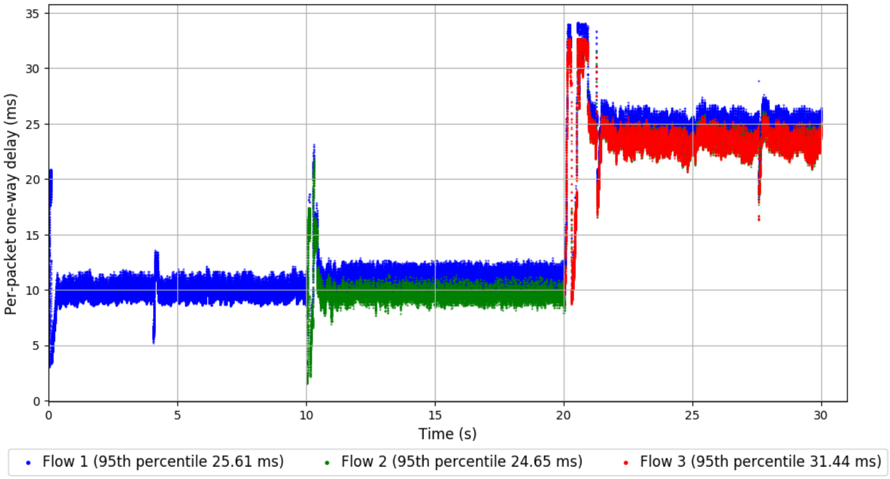

test from AWS Brazil 1 to Brazil, 5 runs of 30s each per scheme
3 flows with 10s interval between flows
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
100
80
60
40
20
0
64
32
16
8
4
2
0
FillP
FillP-Sheep
Copa
Indigo
QUIC Cubic
TCP Cubic
PCC-Expr
Sprout
Indigo-MusesD
PCC-Vivace
SCReAM
TCP Vegas
TCP BBR
Verus
PCC-Allegro
Indigo-MusesT
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	64.50	36.71	25.30	22.63	19.71	25.61	0.19	0.04	0.21
Copa	5	9.13	4.38	4.10	2.82	2.49	2.73	64.82	74.64	73.41
TCP Cubic	5	64.62	36.19	26.36	32.16	32.29	32.03	0.04	0.05	0.06
FillP	5	47.67	42.22	40.65	26.23	29.49	29.33	4.97	15.71	32.96
FillP-Sheep	5	54.00	39.90	23.16	19.28	22.81	24.73	0.81	1.46	4.70
Indigo	5	47.03	42.35	68.16	11.12	12.94	12.87	0.00	0.00	0.01
Indigo-MusesD	5	22.86	24.48	26.06	2.99	2.75	2.65	0.00	0.00	0.01
Indigo-MusesT	5	54.64	46.63	39.26	31.61	32.45	32.42	46.09	33.25	20.57
LEDBAT	5	60.44	39.82	30.79	31.09	31.77	31.79	0.04	0.07	0.11
PCC-Allegro	5	70.05	19.26	11.56	11.49	14.20	16.94	0.08	0.36	0.34
PCC-Expr	5	0.46	8.40	7.03	2.16	2.15	2.48	85.71	25.23	29.06
QUIC Cubic	5	57.39	35.20	27.02	30.95	31.15	30.94	0.16	0.20	0.26
SCReAM	5	0.22	0.22	0.22	2.33	2.30	2.02	0.00	0.00	0.00
Sprout	5	42.21	38.16	31.46	21.25	21.88	23.76	0.00	0.00	0.02
TaoVA-100x	5	0.00	9.19	6.44	1.41	1.64	2.20	95.92	82.48	94.55
TCP Vegas	5	51.41	40.80	53.83	6.45	3.17	4.21	0.01	0.01	0.00
Verus	5	42.86	32.30	25.66	27.55	30.57	32.38	6.43	9.53	15.58
PCC-Vivace	5	50.30	33.67	31.61	2.70	3.59	4.40	0.00	0.00	0.01
WebRTC media	5	0.05	0.05	0.05	3.93	5.28	4.01	0.01	0.00	0.01

```
Run 1: Statistics of TCP BBR

Start at: 2019-01-03 00:17:01
End at: 2019-01-03 00:17:31
Local clock offset: -2.813 ms
Remote clock offset: -0.633 ms

# Below is generated by plot.py at 2019-01-03 01:54:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.48 Mbit/s
95th percentile per-packet one-way delay: 25.633 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 72.30 Mbit/s
95th percentile per-packet one-way delay: 25.607 ms
Loss rate: 0.06%
-- Flow 2:
Average throughput: 22.07 Mbit/s
95th percentile per-packet one-way delay: 24.647 ms
Loss rate: 0.10%
-- Flow 3:
Average throughput: 31.47 Mbit/s
95th percentile per-packet one-way delay: 31.442 ms
Loss rate: 0.54%
```

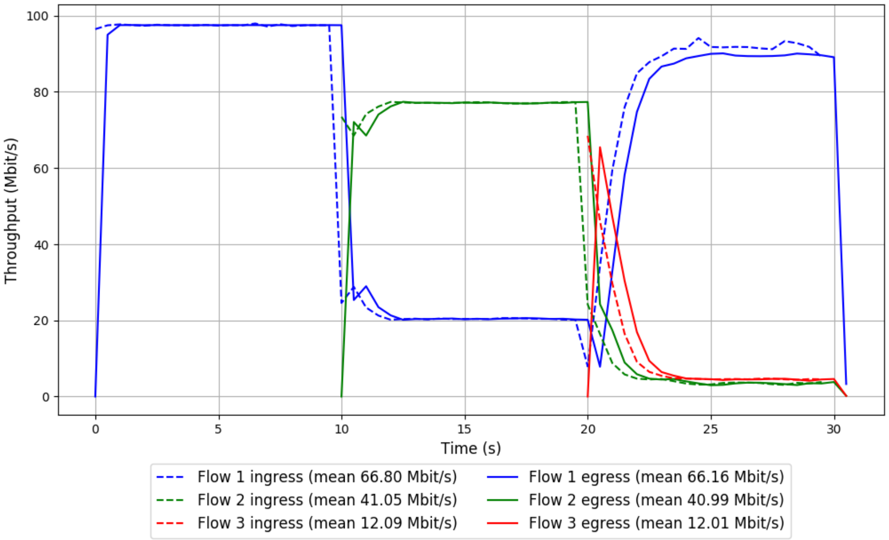
Run 1: Report of TCP BBR — Data Link

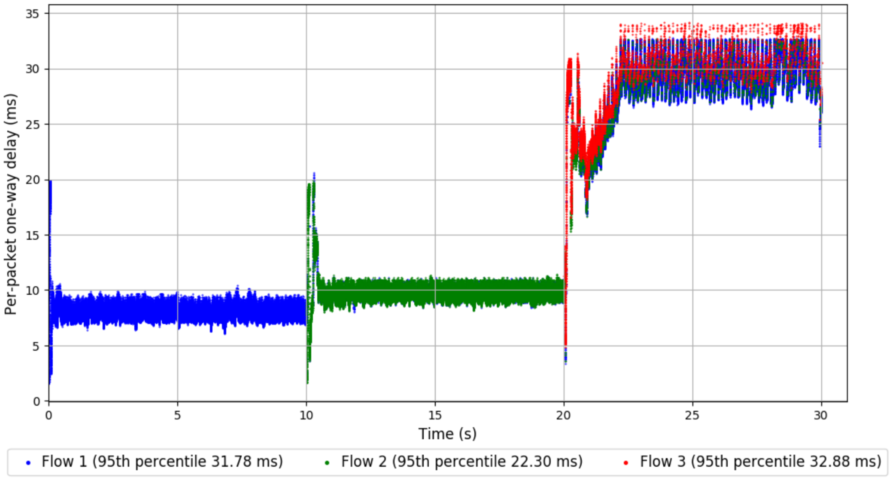




```
Run 2: Statistics of TCP BBR

Start at: 2019-01-03 00:38:40
End at: 2019-01-03 00:39:10
Local clock offset: -3.614 ms
Remote clock offset: -0.438 ms

# Below is generated by plot.py at 2019-01-03 01:54:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.48 Mbit/s
95th percentile per-packet one-way delay: 31.404 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 66.16 Mbit/s
95th percentile per-packet one-way delay: 31.782 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 40.99 Mbit/s
95th percentile per-packet one-way delay: 22.305 ms
Loss rate: 0.05%
-- Flow 3:
Average throughput: 12.01 Mbit/s
95th percentile per-packet one-way delay: 32.880 ms
Loss rate: 0.52%
```

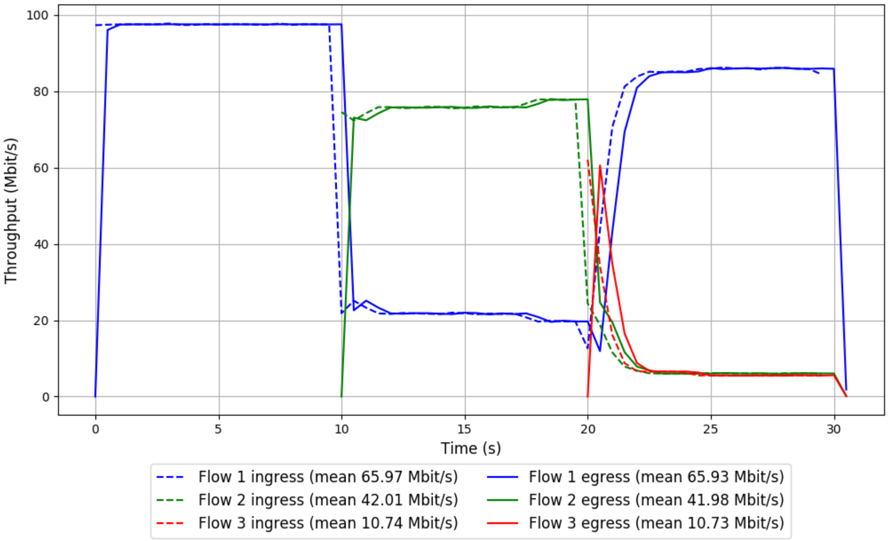
Run 2: Report of TCP BBR — Data Link

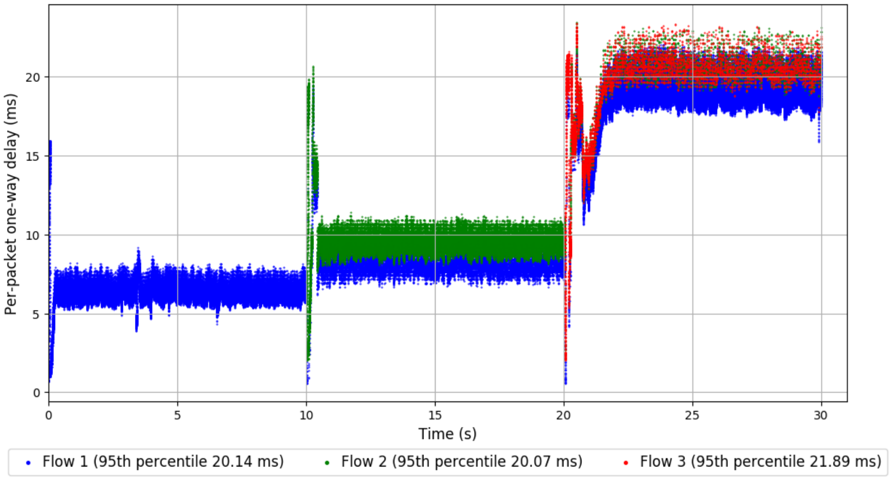




```
Run 3: Statistics of TCP BBR

Start at: 2019-01-03 01:00:15
End at: 2019-01-03 01:00:45
Local clock offset: -4.635 ms
Remote clock offset: -0.384 ms

# Below is generated by plot.py at 2019-01-03 01:54:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.47 Mbit/s
95th percentile per-packet one-way delay: 20.361 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 65.93 Mbit/s
95th percentile per-packet one-way delay: 20.136 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 41.98 Mbit/s
95th percentile per-packet one-way delay: 20.068 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 10.73 Mbit/s
95th percentile per-packet one-way delay: 21.895 ms
Loss rate: 0.00%
```

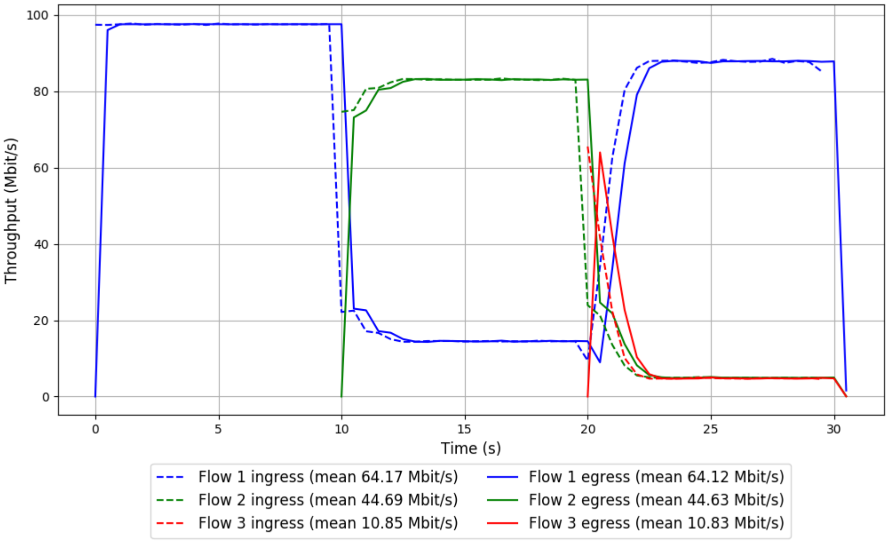
Run 3: Report of TCP BBR — Data Link

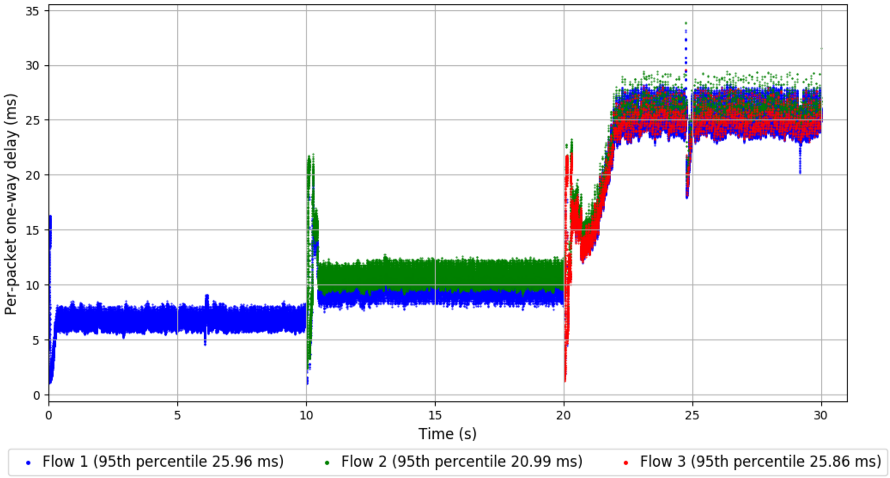




```
Run 4: Statistics of TCP BBR

Start at: 2019-01-03 01:21:52
End at: 2019-01-03 01:22:22
Local clock offset: -6.912 ms
Remote clock offset: -0.074 ms

# Below is generated by plot.py at 2019-01-03 01:54:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.47 Mbit/s
95th percentile per-packet one-way delay: 25.797 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 64.12 Mbit/s
95th percentile per-packet one-way delay: 25.957 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 44.63 Mbit/s
95th percentile per-packet one-way delay: 20.994 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 10.83 Mbit/s
95th percentile per-packet one-way delay: 25.855 ms
Loss rate: 0.00%
```

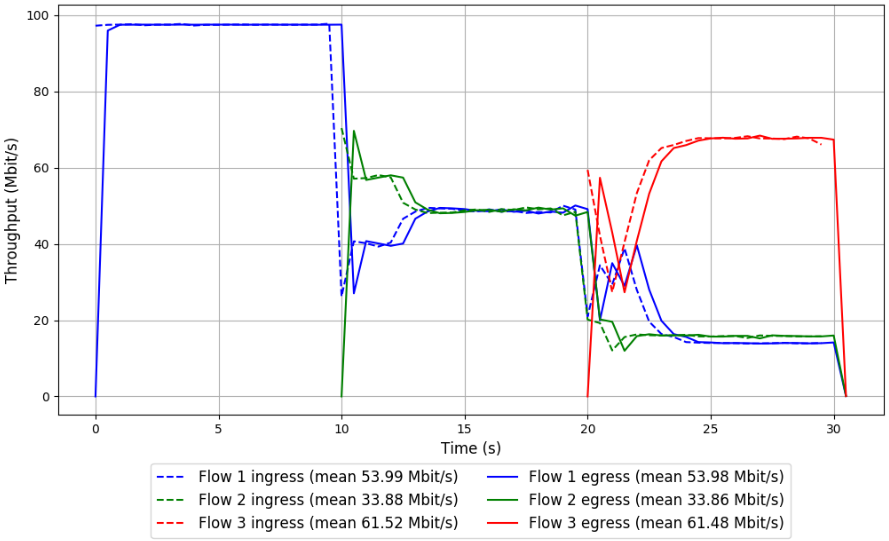
Run 4: Report of TCP BBR — Data Link

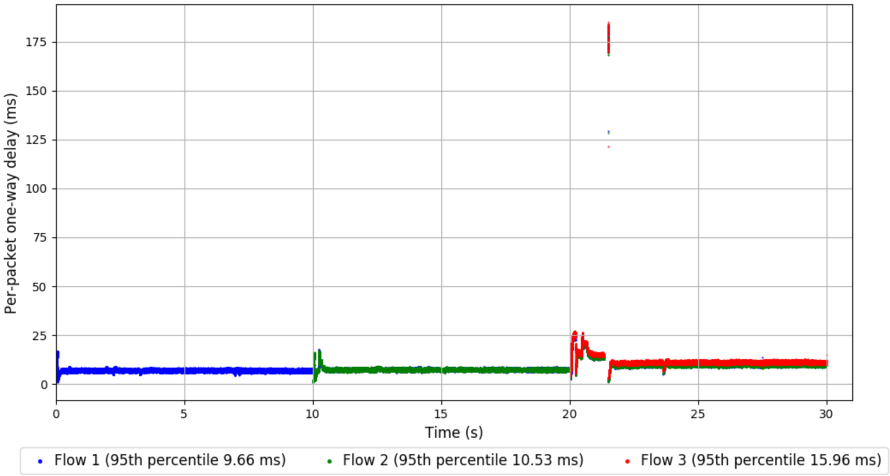




```
Run 5: Statistics of TCP BBR

Start at: 2019-01-03 01:43:29
End at: 2019-01-03 01:43:59
Local clock offset: -6.467 ms
Remote clock offset: -0.015 ms

# Below is generated by plot.py at 2019-01-03 01:54:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.97 Mbit/s
95th percentile per-packet one-way delay: 11.881 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 53.98 Mbit/s
95th percentile per-packet one-way delay: 9.662 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 33.86 Mbit/s
95th percentile per-packet one-way delay: 10.526 ms
Loss rate: 0.05%
-- Flow 3:
Average throughput: 61.48 Mbit/s
95th percentile per-packet one-way delay: 15.955 ms
Loss rate: 0.01%
```

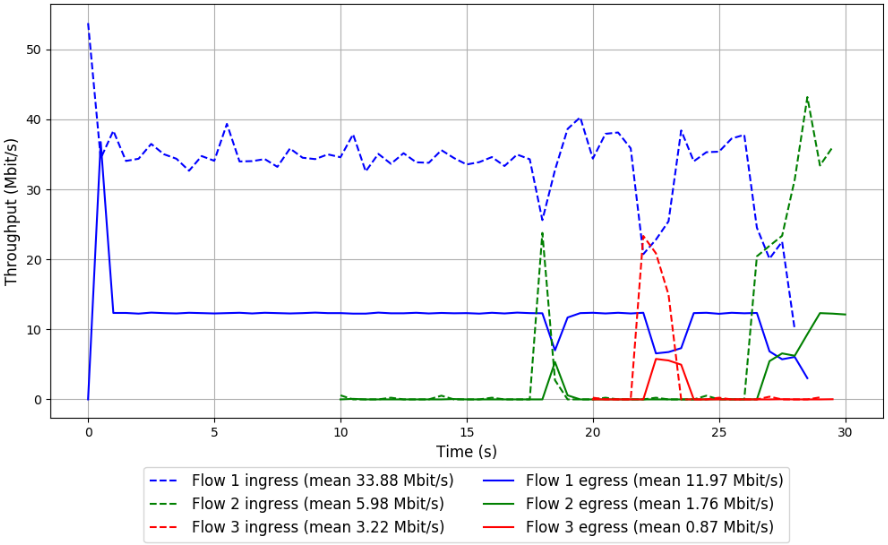
Run 5: Report of TCP BBR — Data Link

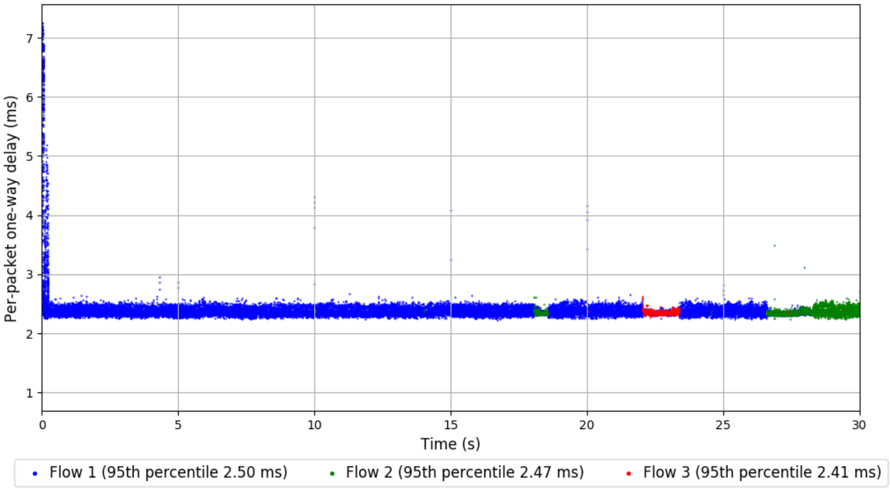




```
Run 1: Statistics of Copa

Start at: 2019-01-03 00:22:44
End at: 2019-01-03 00:23:14
Local clock offset: -2.084 ms
Remote clock offset: -0.575 ms

# Below is generated by plot.py at 2019-01-03 01:54:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.73 Mbit/s
95th percentile per-packet one-way delay: 2.496 ms
Loss rate: 65.53%
-- Flow 1:
Average throughput: 11.97 Mbit/s
95th percentile per-packet one-way delay: 2.501 ms
Loss rate: 64.67%
-- Flow 2:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 2.472 ms
Loss rate: 70.54%
-- Flow 3:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 2.410 ms
Loss rate: 72.90%
```

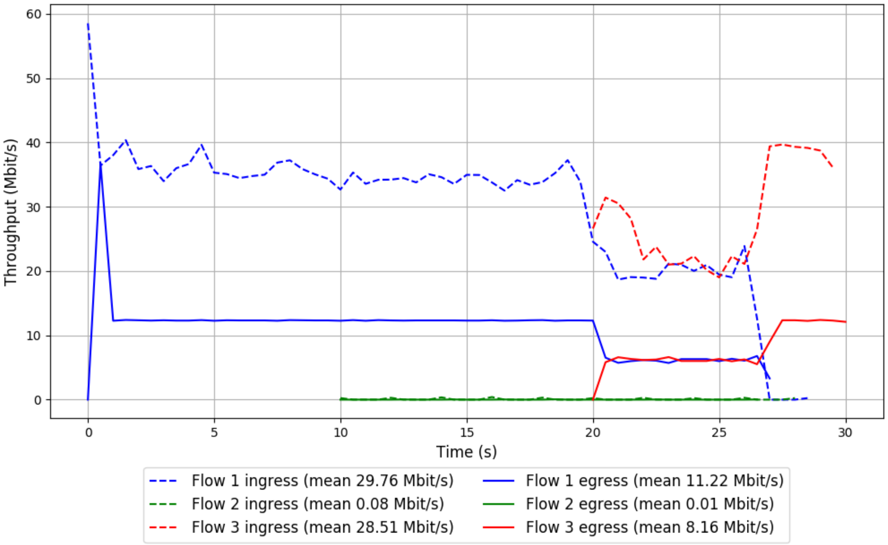
Run 1: Report of Copa — Data Link

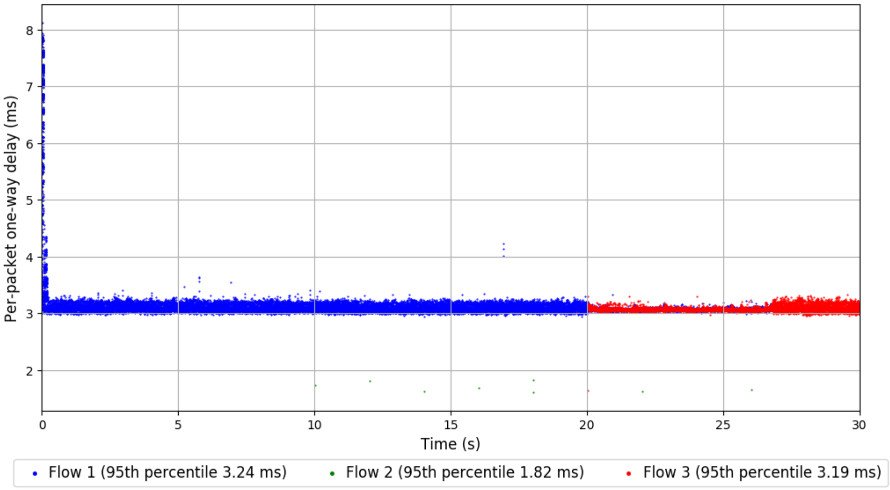




```
Run 2: Statistics of Copa

Start at: 2019-01-03 00:44:23
End at: 2019-01-03 00:44:53
Local clock offset: -3.758 ms
Remote clock offset: -0.416 ms

# Below is generated by plot.py at 2019-01-03 01:54:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.73 Mbit/s
95th percentile per-packet one-way delay: 3.228 ms
Loss rate: 66.57%
-- Flow 1:
Average throughput: 11.22 Mbit/s
95th percentile per-packet one-way delay: 3.242 ms
Loss rate: 64.92%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1.819 ms
Loss rate: 94.15%
-- Flow 3:
Average throughput: 8.16 Mbit/s
95th percentile per-packet one-way delay: 3.191 ms
Loss rate: 71.39%
```

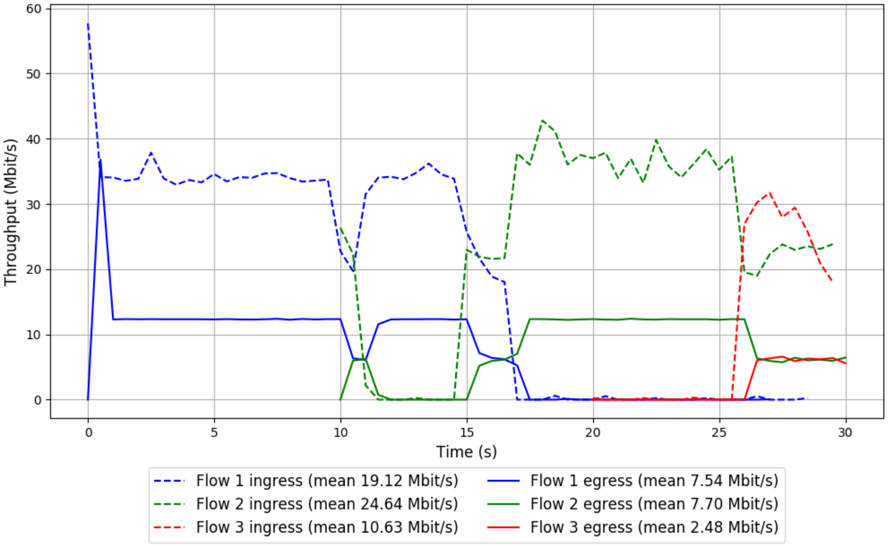
Run 2: Report of Copa — Data Link

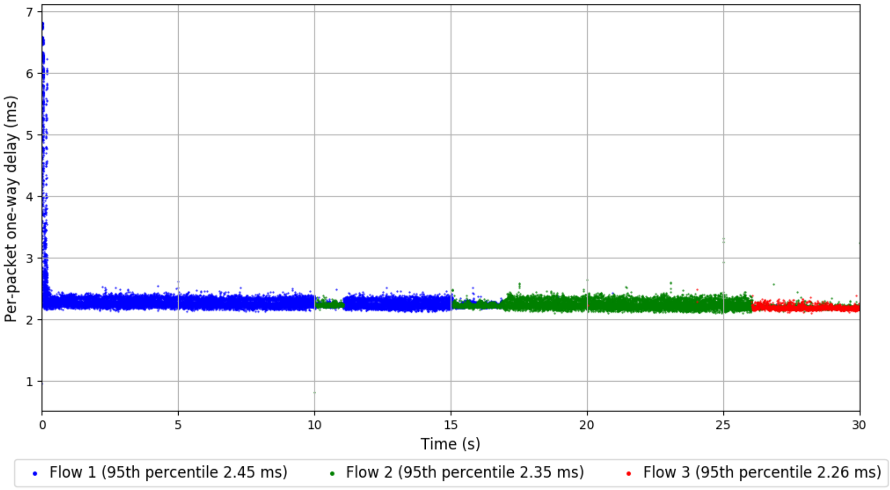




```
Run 3: Statistics of Copa

Start at: 2019-01-03 01:05:59
End at: 2019-01-03 01:06:29
Local clock offset: -5.529 ms
Remote clock offset: -0.264 ms

# Below is generated by plot.py at 2019-01-03 01:54:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.73 Mbit/s
95th percentile per-packet one-way delay: 2.382 ms
Loss rate: 66.85%
-- Flow 1:
Average throughput: 7.54 Mbit/s
95th percentile per-packet one-way delay: 2.451 ms
Loss rate: 63.30%
-- Flow 2:
Average throughput: 7.70 Mbit/s
95th percentile per-packet one-way delay: 2.350 ms
Loss rate: 68.73%
-- Flow 3:
Average throughput: 2.48 Mbit/s
95th percentile per-packet one-way delay: 2.264 ms
Loss rate: 76.69%
```

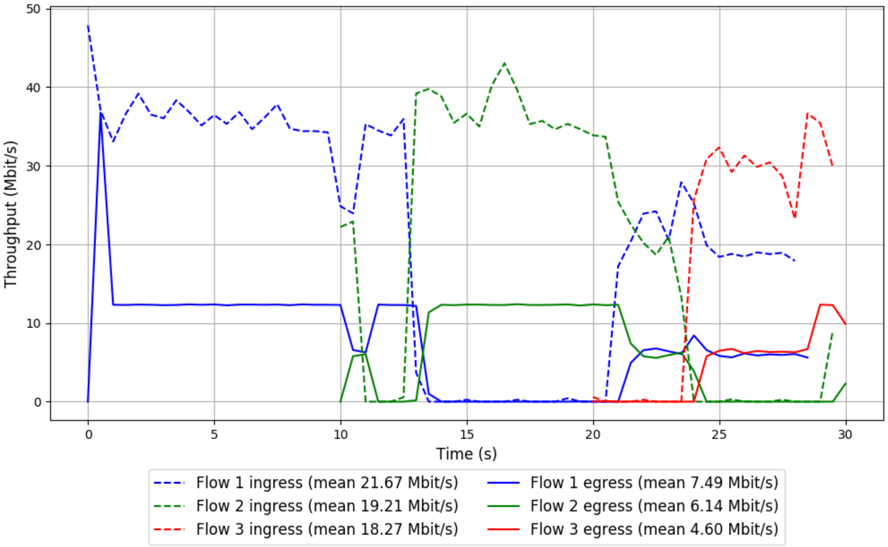
Run 3: Report of Copa — Data Link

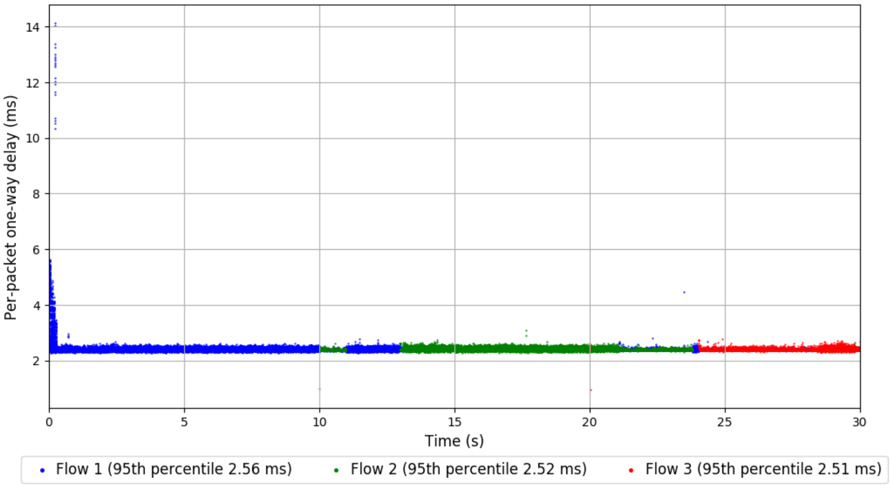




```
Run 4: Statistics of Copa

Start at: 2019-01-03 01:27:35
End at: 2019-01-03 01:28:05
Local clock offset: -6.791 ms
Remote clock offset: -0.185 ms

# Below is generated by plot.py at 2019-01-03 01:54:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.73 Mbit/s
95th percentile per-packet one-way delay: 2.532 ms
Loss rate: 67.73%
-- Flow 1:
Average throughput: 7.49 Mbit/s
95th percentile per-packet one-way delay: 2.556 ms
Loss rate: 65.44%
-- Flow 2:
Average throughput: 6.14 Mbit/s
95th percentile per-packet one-way delay: 2.524 ms
Loss rate: 68.06%
-- Flow 3:
Average throughput: 4.60 Mbit/s
95th percentile per-packet one-way delay: 2.512 ms
Loss rate: 74.81%
```

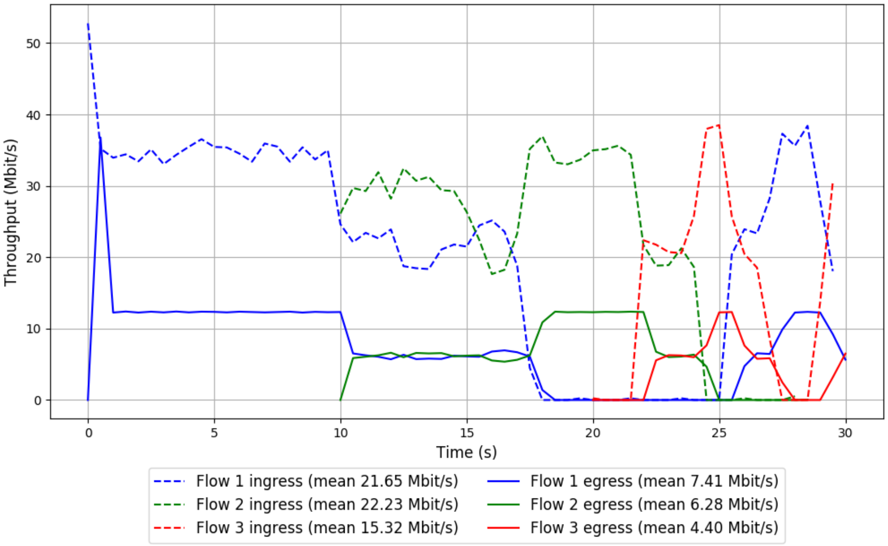
Run 4: Report of Copa — Data Link

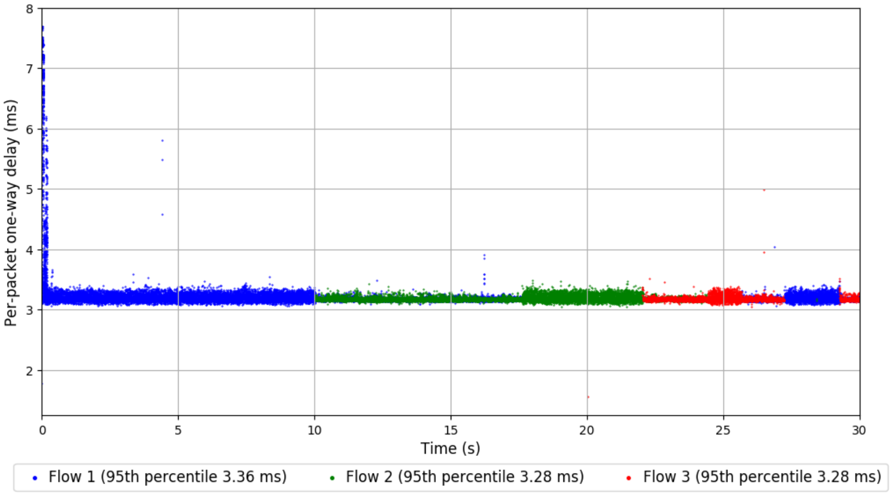




```
Run 5: Statistics of Copa

Start at: 2019-01-03 01:49:12
End at: 2019-01-03 01:49:42
Local clock offset: -7.344 ms
Remote clock offset: 0.04 ms

# Below is generated by plot.py at 2019-01-03 01:54:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.73 Mbit/s
95th percentile per-packet one-way delay: 3.316 ms
Loss rate: 68.48%
-- Flow 1:
Average throughput: 7.41 Mbit/s
95th percentile per-packet one-way delay: 3.362 ms
Loss rate: 65.77%
-- Flow 2:
Average throughput: 6.28 Mbit/s
95th percentile per-packet one-way delay: 3.283 ms
Loss rate: 71.74%
-- Flow 3:
Average throughput: 4.40 Mbit/s
95th percentile per-packet one-way delay: 3.280 ms
Loss rate: 71.28%
```

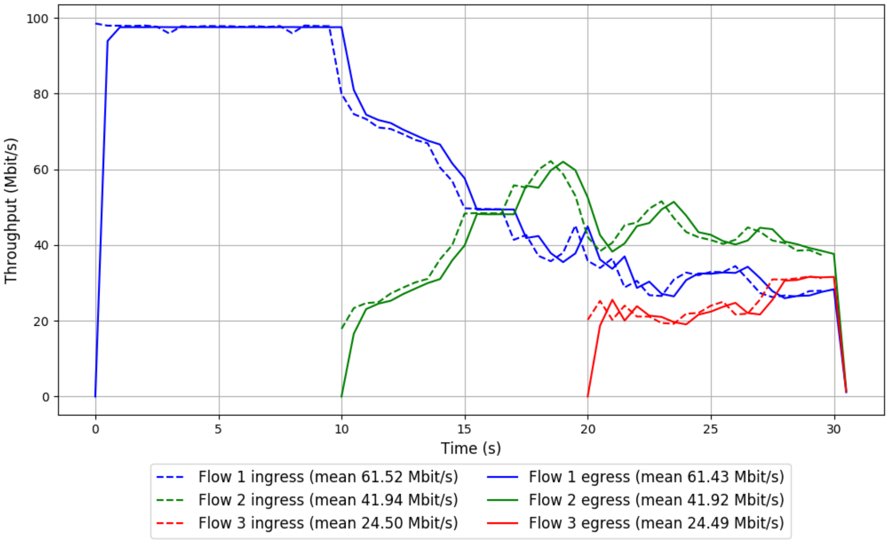
Run 5: Report of Copa — Data Link

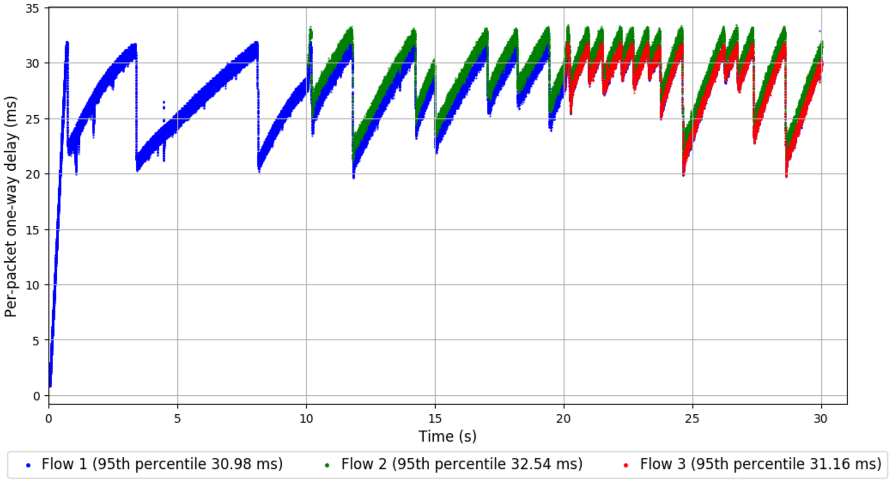




```
Run 1: Statistics of TCP Cubic

Start at: 2019-01-03 00:18:11
End at: 2019-01-03 00:18:41
Local clock offset: -2.133 ms
Remote clock offset: -0.68 ms

# Below is generated by plot.py at 2019-01-03 01:54:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.47 Mbit/s
95th percentile per-packet one-way delay: 31.871 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 61.43 Mbit/s
95th percentile per-packet one-way delay: 30.977 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 41.92 Mbit/s
95th percentile per-packet one-way delay: 32.537 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 24.49 Mbit/s
95th percentile per-packet one-way delay: 31.162 ms
Loss rate: 0.05%
```

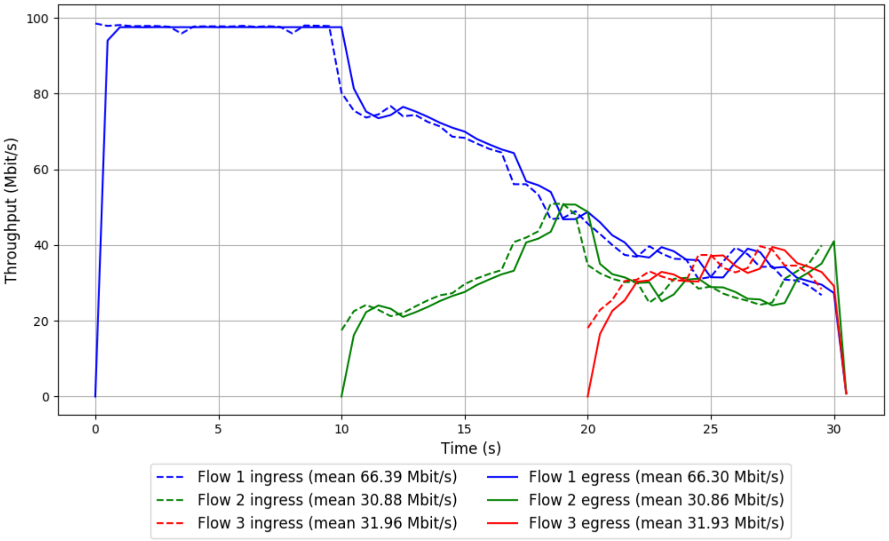
Run 1: Report of TCP Cubic — Data Link

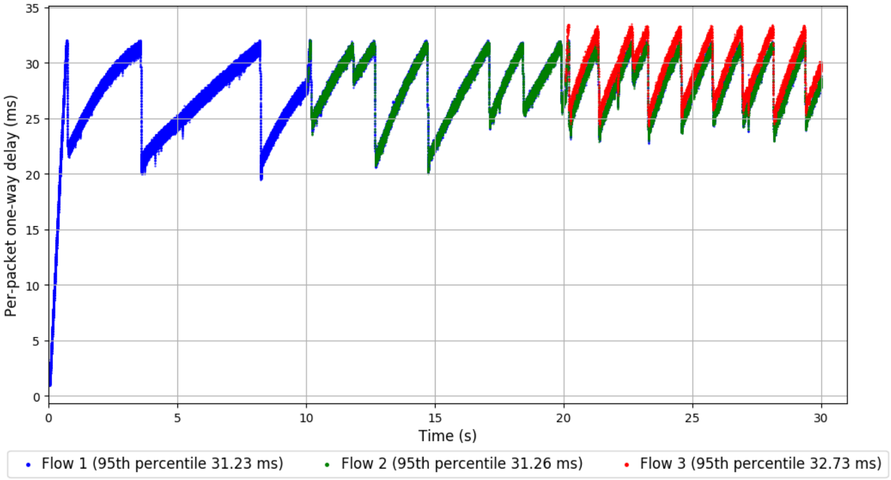




```
Run 2: Statistics of TCP Cubic

Start at: 2019-01-03 00:39:49
End at: 2019-01-03 00:40:19
Local clock offset: -2.955 ms
Remote clock offset: -0.369 ms

# Below is generated by plot.py at 2019-01-03 01:55:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.47 Mbit/s
95th percentile per-packet one-way delay: 31.452 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 66.30 Mbit/s
95th percentile per-packet one-way delay: 31.231 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 30.86 Mbit/s
95th percentile per-packet one-way delay: 31.258 ms
Loss rate: 0.06%
-- Flow 3:
Average throughput: 31.93 Mbit/s
95th percentile per-packet one-way delay: 32.735 ms
Loss rate: 0.06%
```

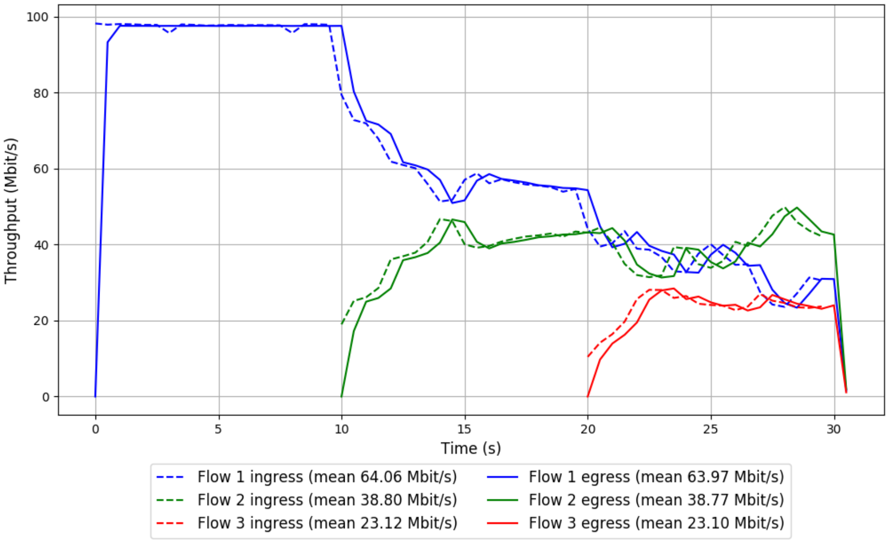
Run 2: Report of TCP Cubic — Data Link

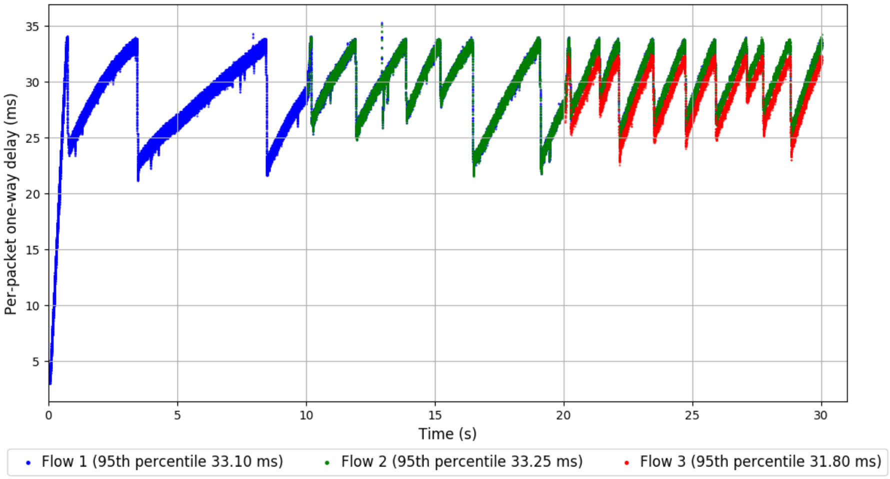




```
Run 3: Statistics of TCP Cubic

Start at: 2019-01-03 01:01:25
End at: 2019-01-03 01:01:55
Local clock offset: -5.647 ms
Remote clock offset: -0.304 ms

# Below is generated by plot.py at 2019-01-03 01:55:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.46 Mbit/s
95th percentile per-packet one-way delay: 33.103 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 63.97 Mbit/s
95th percentile per-packet one-way delay: 33.102 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 38.77 Mbit/s
95th percentile per-packet one-way delay: 33.250 ms
Loss rate: 0.05%
-- Flow 3:
Average throughput: 23.10 Mbit/s
95th percentile per-packet one-way delay: 31.798 ms
Loss rate: 0.05%
```

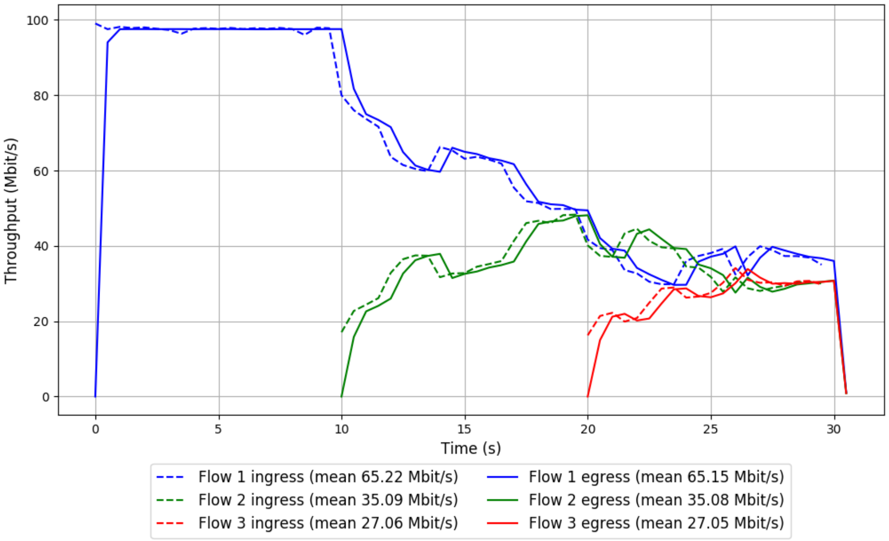
Run 3: Report of TCP Cubic — Data Link

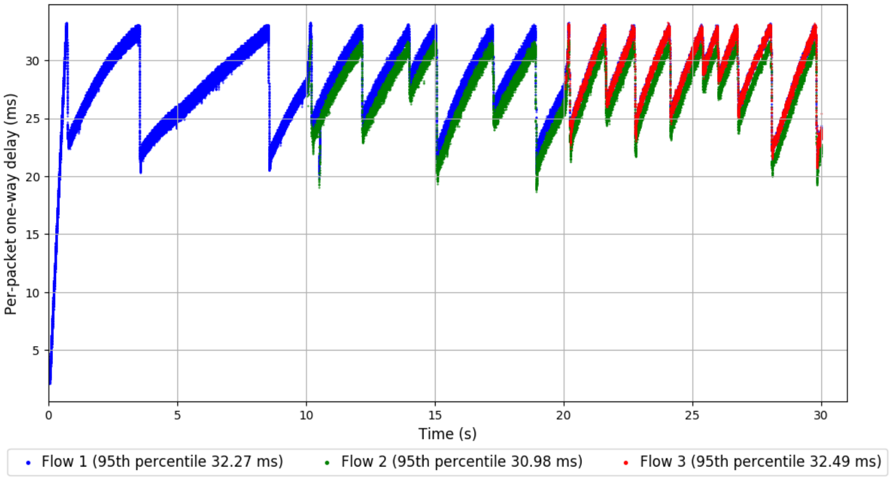




```
Run 4: Statistics of TCP Cubic

Start at: 2019-01-03 01:23:01
End at: 2019-01-03 01:23:31
Local clock offset: -6.901 ms
Remote clock offset: -0.242 ms

# Below is generated by plot.py at 2019-01-03 01:55:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.47 Mbit/s
95th percentile per-packet one-way delay: 32.229 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 65.15 Mbit/s
95th percentile per-packet one-way delay: 32.271 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 35.08 Mbit/s
95th percentile per-packet one-way delay: 30.982 ms
Loss rate: 0.05%
-- Flow 3:
Average throughput: 27.05 Mbit/s
95th percentile per-packet one-way delay: 32.490 ms
Loss rate: 0.08%
```

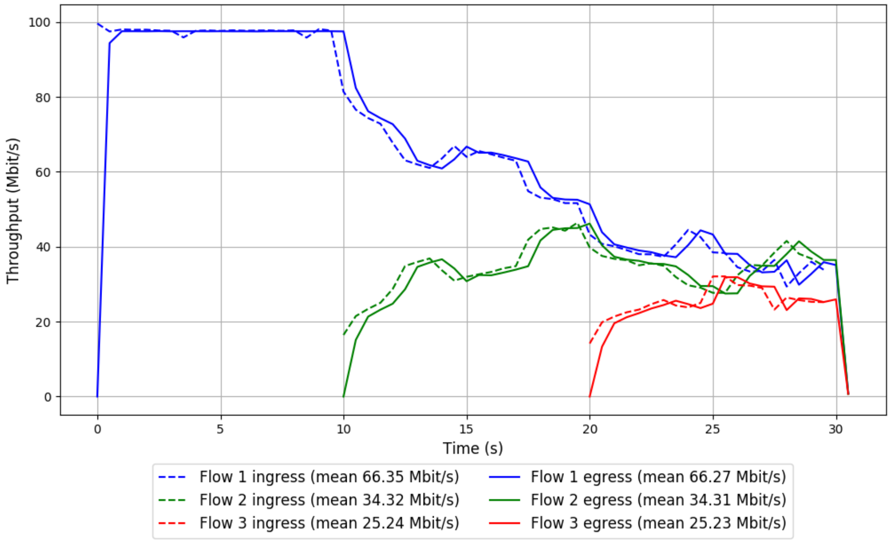
Run 4: Report of TCP Cubic — Data Link

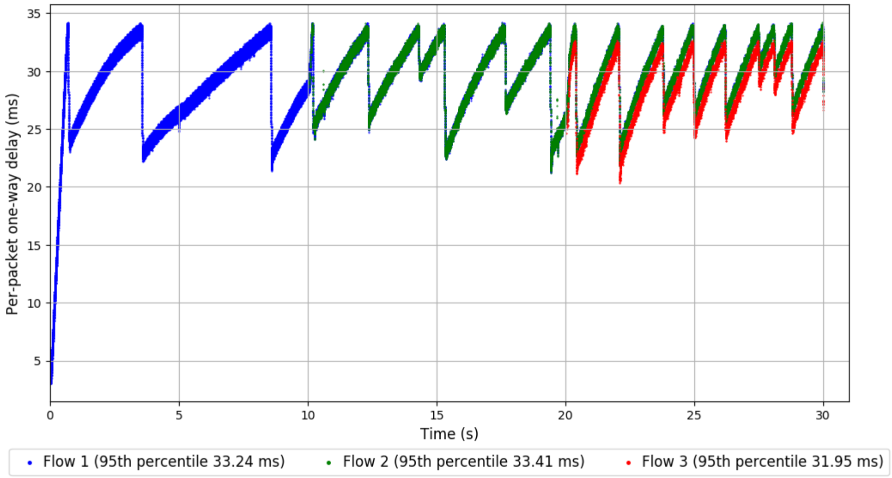




```
Run 5: Statistics of TCP Cubic

Start at: 2019-01-03 01:44:38
End at: 2019-01-03 01:45:08
Local clock offset: -7.236 ms
Remote clock offset: 0.014 ms

# Below is generated by plot.py at 2019-01-03 01:55:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.48 Mbit/s
95th percentile per-packet one-way delay: 33.238 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 66.27 Mbit/s
95th percentile per-packet one-way delay: 33.243 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 34.31 Mbit/s
95th percentile per-packet one-way delay: 33.411 ms
Loss rate: 0.04%
-- Flow 3:
Average throughput: 25.23 Mbit/s
95th percentile per-packet one-way delay: 31.949 ms
Loss rate: 0.04%
```

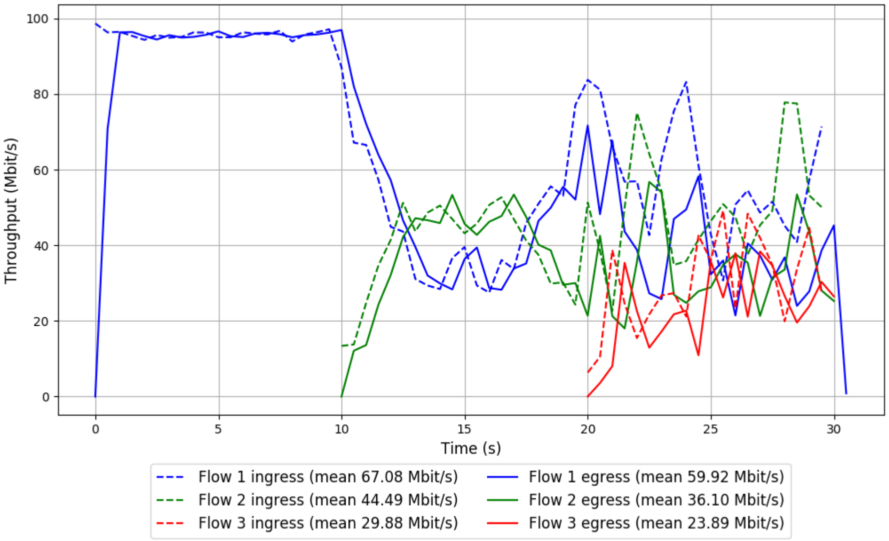
Run 5: Report of TCP Cubic — Data Link

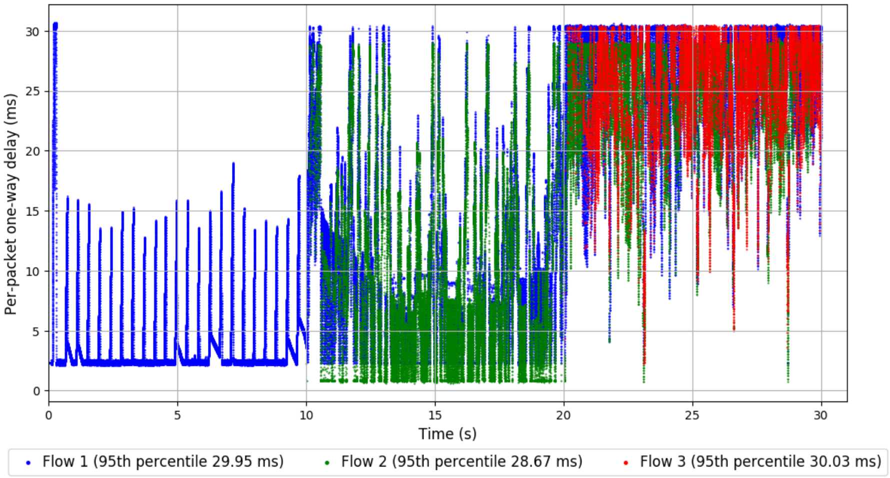




```
Run 1: Statistics of FillP

Start at: 2019-01-03 00:15:53
End at: 2019-01-03 00:16:23
Local clock offset: -2.074 ms
Remote clock offset: -0.654 ms

# Below is generated by plot.py at 2019-01-03 01:55:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.87 Mbit/s
95th percentile per-packet one-way delay: 29.677 ms
Loss rate: 13.74%
-- Flow 1:
Average throughput: 59.92 Mbit/s
95th percentile per-packet one-way delay: 29.949 ms
Loss rate: 10.59%
-- Flow 2:
Average throughput: 36.10 Mbit/s
95th percentile per-packet one-way delay: 28.667 ms
Loss rate: 18.77%
-- Flow 3:
Average throughput: 23.89 Mbit/s
95th percentile per-packet one-way delay: 30.026 ms
Loss rate: 19.95%
```

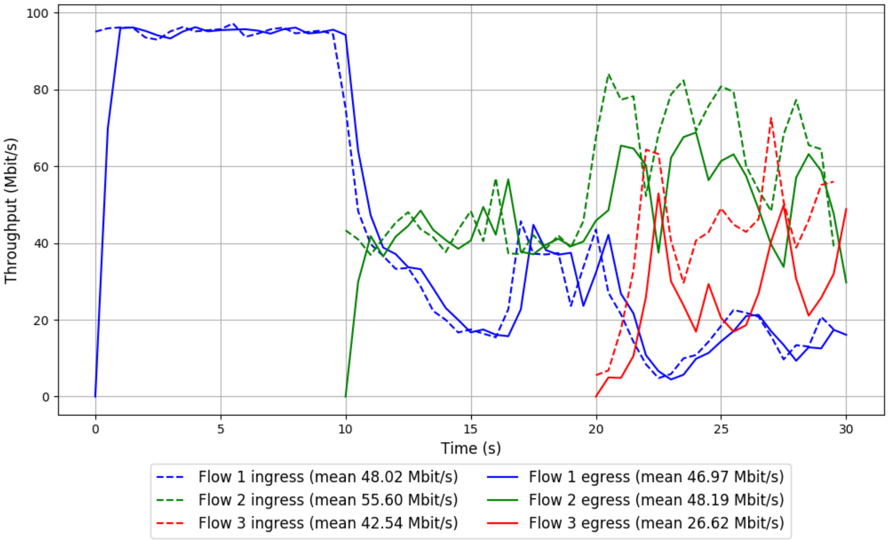
Run 1: Report of FillP — Data Link

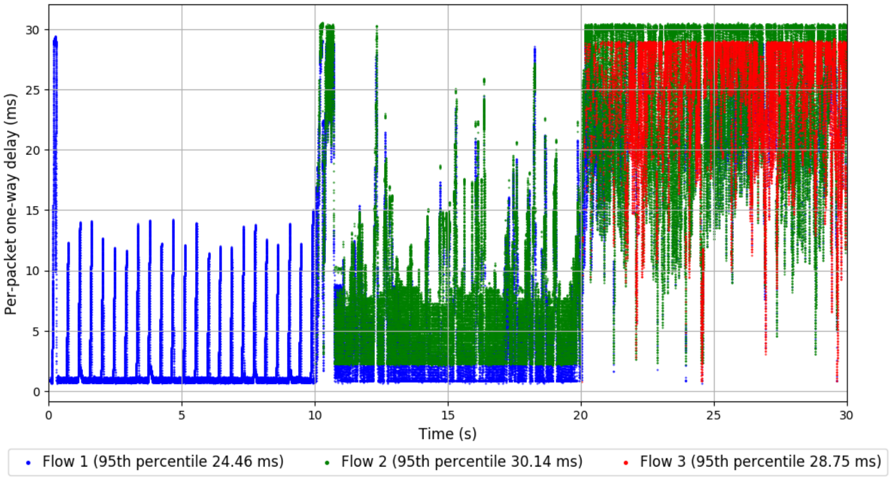




```
Run 2: Statistics of FillP

Start at: 2019-01-03 00:37:31
End at: 2019-01-03 00:38:01
Local clock offset: -2.827 ms
Remote clock offset: -0.435 ms

# Below is generated by plot.py at 2019-01-03 01:55:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 87.89 Mbit/s
95th percentile per-packet one-way delay: 29.577 ms
Loss rate: 11.26%
-- Flow 1:
Average throughput: 46.97 Mbit/s
95th percentile per-packet one-way delay: 24.462 ms
Loss rate: 2.12%
-- Flow 2:
Average throughput: 48.19 Mbit/s
95th percentile per-packet one-way delay: 30.140 ms
Loss rate: 13.20%
-- Flow 3:
Average throughput: 26.62 Mbit/s
95th percentile per-packet one-way delay: 28.755 ms
Loss rate: 37.27%
```

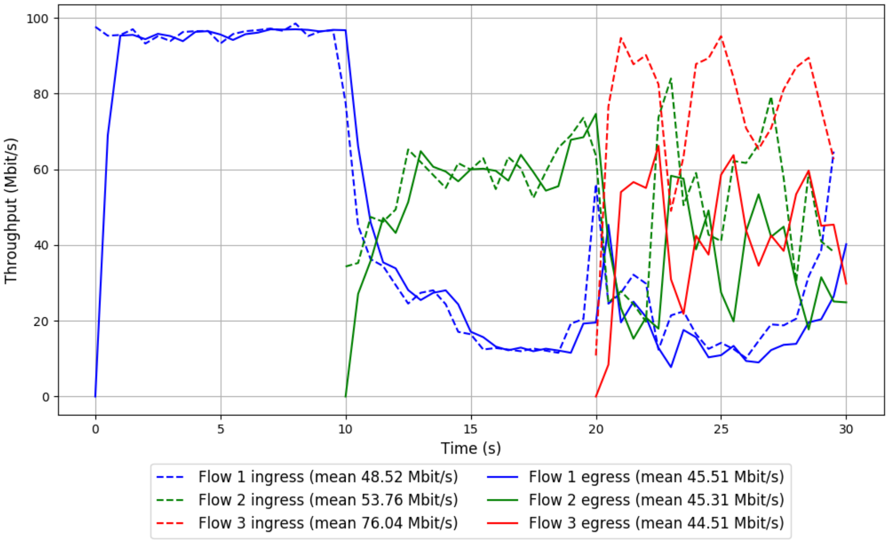
Run 2: Report of FillP — Data Link

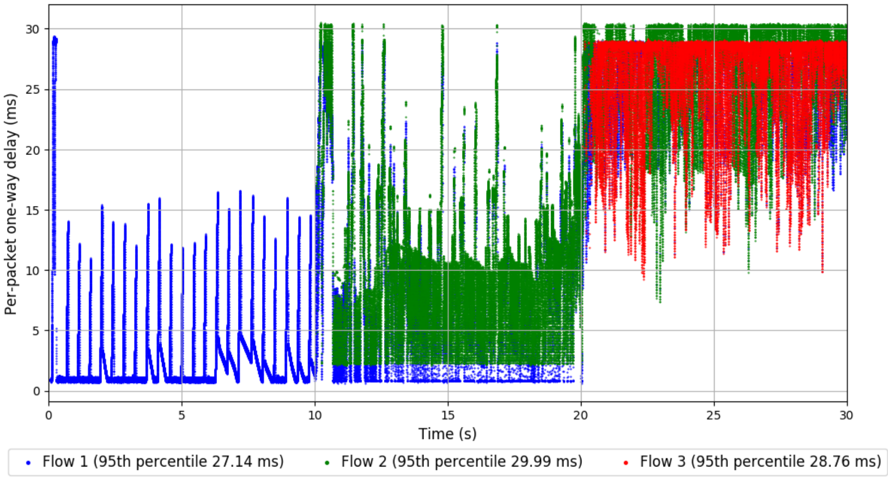




```
Run 3: Statistics of FillP

Start at: 2019-01-03 00:59:07
End at: 2019-01-03 00:59:37
Local clock offset: -4.484 ms
Remote clock offset: -0.248 ms

# Below is generated by plot.py at 2019-01-03 01:55:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 90.47 Mbit/s
95th percentile per-packet one-way delay: 28.853 ms
Loss rate: 17.35%
-- Flow 1:
Average throughput: 45.51 Mbit/s
95th percentile per-packet one-way delay: 27.144 ms
Loss rate: 6.13%
-- Flow 2:
Average throughput: 45.31 Mbit/s
95th percentile per-packet one-way delay: 29.988 ms
Loss rate: 15.61%
-- Flow 3:
Average throughput: 44.51 Mbit/s
95th percentile per-packet one-way delay: 28.764 ms
Loss rate: 41.35%
```

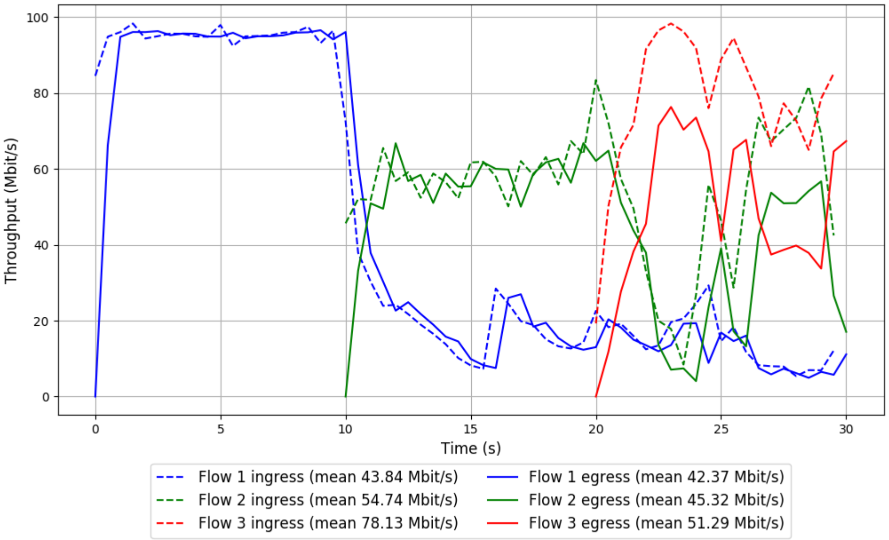
Run 3: Report of FillP — Data Link

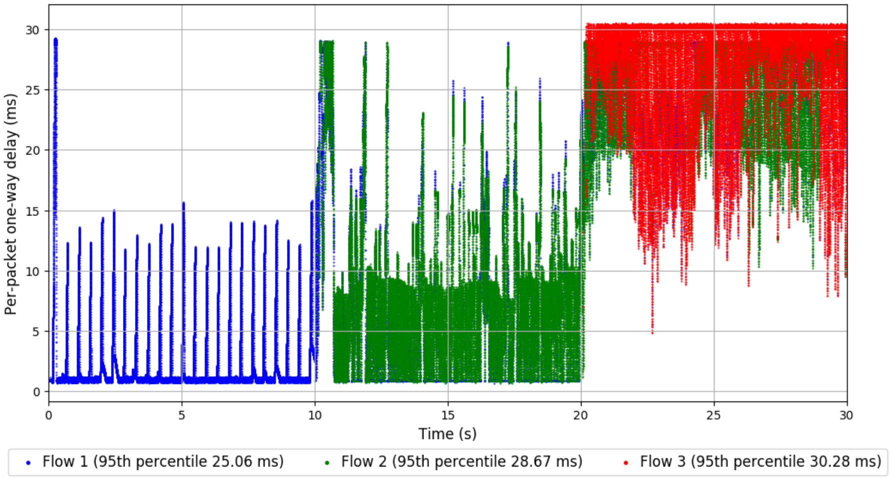




```
Run 4: Statistics of FillP

Start at: 2019-01-03 01:20:43
End at: 2019-01-03 01:21:13
Local clock offset: -6.797 ms
Remote clock offset: -0.098 ms

# Below is generated by plot.py at 2019-01-03 01:56:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.57 Mbit/s
95th percentile per-packet one-way delay: 29.958 ms
Loss rate: 15.58%
-- Flow 1:
Average throughput: 42.37 Mbit/s
95th percentile per-packet one-way delay: 25.060 ms
Loss rate: 3.29%
-- Flow 2:
Average throughput: 45.32 Mbit/s
95th percentile per-packet one-way delay: 28.670 ms
Loss rate: 17.09%
-- Flow 3:
Average throughput: 51.29 Mbit/s
95th percentile per-packet one-way delay: 30.280 ms
Loss rate: 34.27%
```

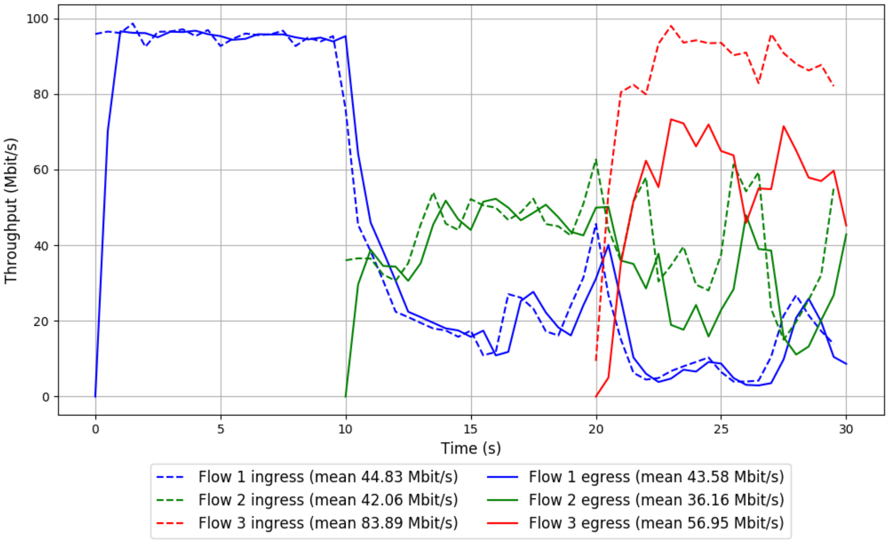
Run 4: Report of FillP — Data Link

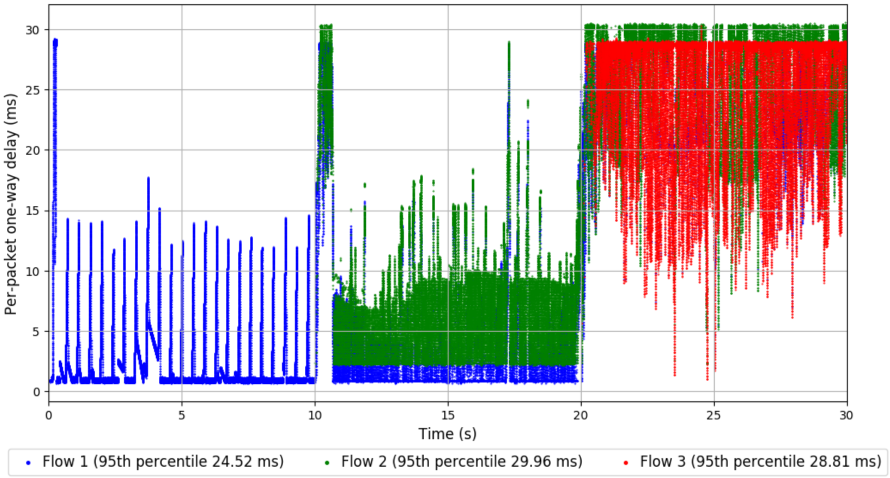




```
Run 5: Statistics of FillP

Start at: 2019-01-03 01:42:20
End at: 2019-01-03 01:42:50
Local clock offset: -6.457 ms
Remote clock offset: -0.03 ms

# Below is generated by plot.py at 2019-01-03 01:56:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.57 Mbit/s
95th percentile per-packet one-way delay: 28.811 ms
Loss rate: 13.90%
-- Flow 1:
Average throughput: 43.58 Mbit/s
95th percentile per-packet one-way delay: 24.518 ms
Loss rate: 2.70%
-- Flow 2:
Average throughput: 36.16 Mbit/s
95th percentile per-packet one-way delay: 29.960 ms
Loss rate: 13.90%
-- Flow 3:
Average throughput: 56.95 Mbit/s
95th percentile per-packet one-way delay: 28.806 ms
Loss rate: 31.96%
```

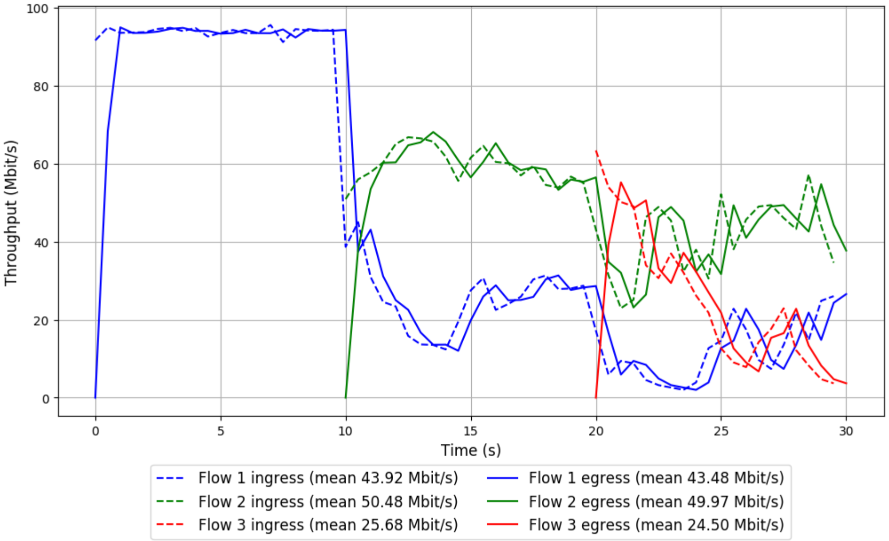
Run 5: Report of FillP — Data Link

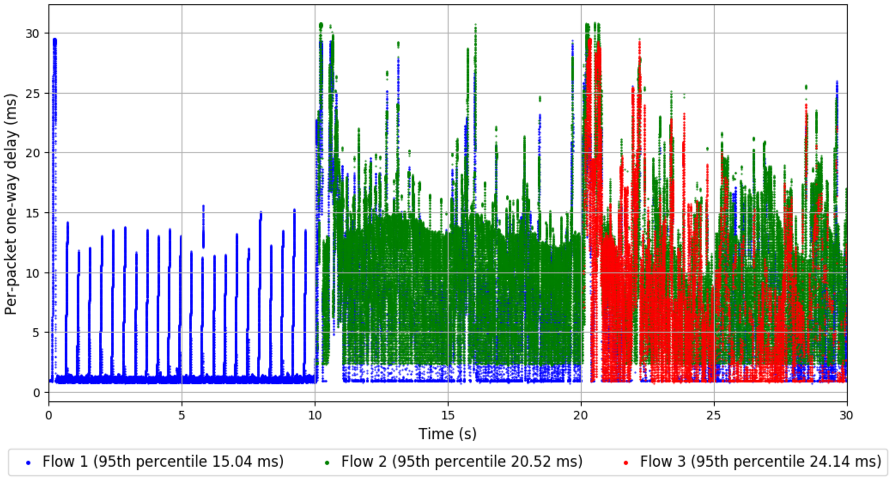




```
Run 1: Statistics of FillP-Sheep

Start at: 2019-01-03 00:10:10
End at: 2019-01-03 00:10:40
Local clock offset: -2.084 ms
Remote clock offset: -0.649 ms

# Below is generated by plot.py at 2019-01-03 01:56:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 84.85 Mbit/s
95th percentile per-packet one-way delay: 19.177 ms
Loss rate: 1.35%
-- Flow 1:
Average throughput: 43.48 Mbit/s
95th percentile per-packet one-way delay: 15.042 ms
Loss rate: 1.00%
-- Flow 2:
Average throughput: 49.97 Mbit/s
95th percentile per-packet one-way delay: 20.523 ms
Loss rate: 0.97%
-- Flow 3:
Average throughput: 24.50 Mbit/s
95th percentile per-packet one-way delay: 24.138 ms
Loss rate: 4.66%
```

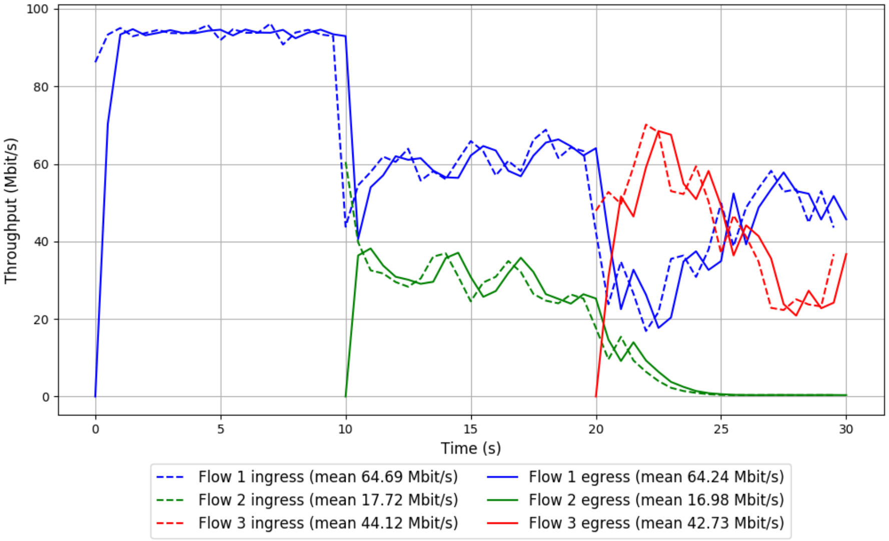
Run 1: Report of FillP-Sheep — Data Link

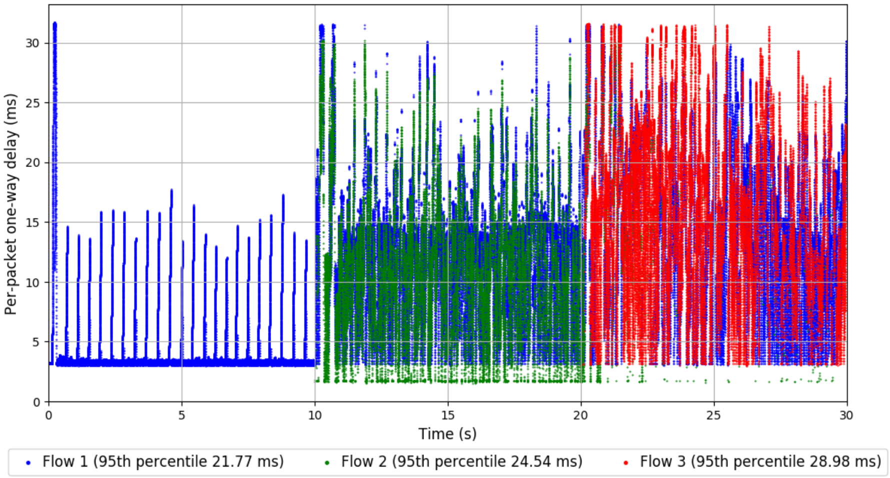




```
Run 2: Statistics of FillP-Sheep

Start at: 2019-01-03 00:31:47
End at: 2019-01-03 00:32:17
Local clock offset: -3.419 ms
Remote clock offset: -0.446 ms

# Below is generated by plot.py at 2019-01-03 01:57:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.74 Mbit/s
95th percentile per-packet one-way delay: 24.247 ms
Loss rate: 1.44%
-- Flow 1:
Average throughput: 64.24 Mbit/s
95th percentile per-packet one-way delay: 21.767 ms
Loss rate: 0.62%
-- Flow 2:
Average throughput: 16.98 Mbit/s
95th percentile per-packet one-way delay: 24.542 ms
Loss rate: 4.07%
-- Flow 3:
Average throughput: 42.73 Mbit/s
95th percentile per-packet one-way delay: 28.981 ms
Loss rate: 2.98%
```

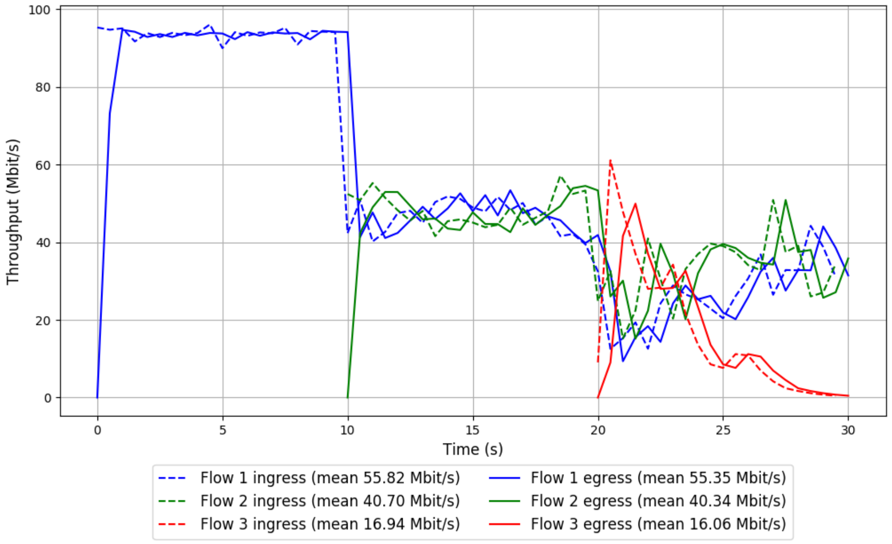
Run 2: Report of FillP-Sheep — Data Link

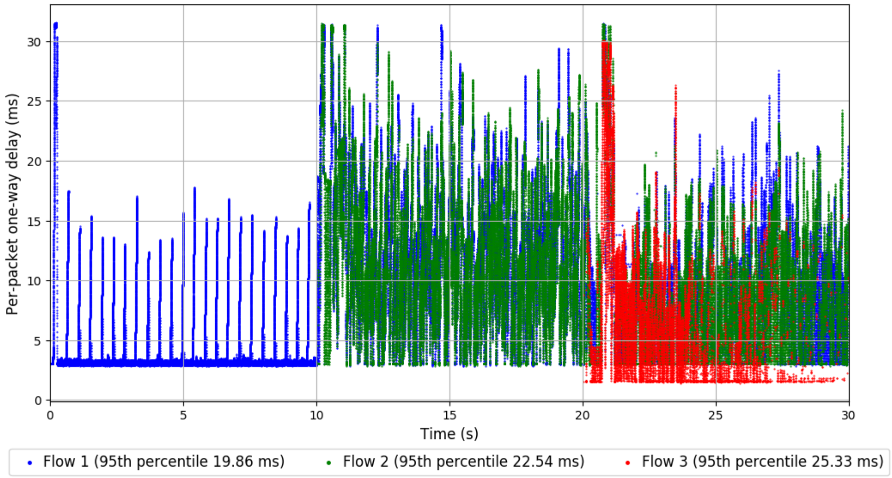




```
Run 3: Statistics of FillP-Sheep

Start at: 2019-01-03 00:53:24
End at: 2019-01-03 00:53:54
Local clock offset: -3.888 ms
Remote clock offset: -0.324 ms

# Below is generated by plot.py at 2019-01-03 01:57:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 87.52 Mbit/s
95th percentile per-packet one-way delay: 21.260 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 55.35 Mbit/s
95th percentile per-packet one-way delay: 19.858 ms
Loss rate: 0.83%
-- Flow 2:
Average throughput: 40.34 Mbit/s
95th percentile per-packet one-way delay: 22.535 ms
Loss rate: 0.85%
-- Flow 3:
Average throughput: 16.06 Mbit/s
95th percentile per-packet one-way delay: 25.329 ms
Loss rate: 5.18%
```

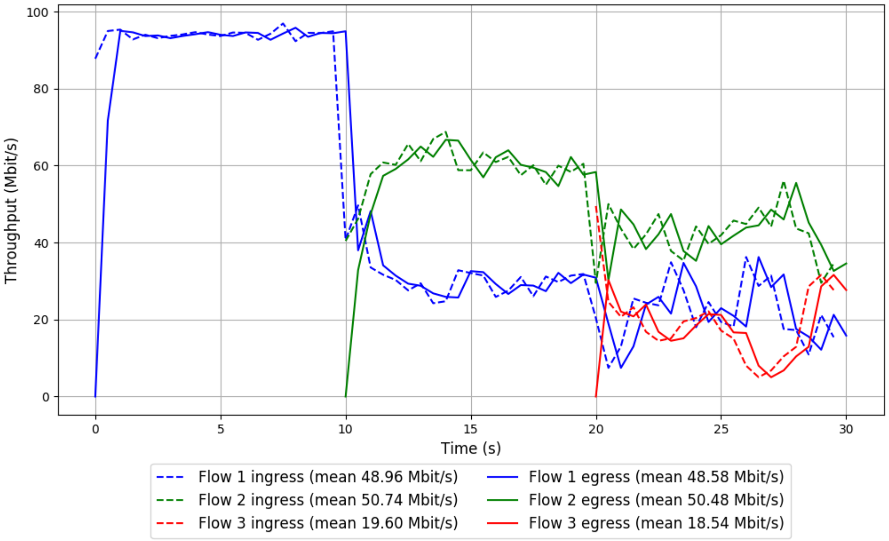
Run 3: Report of FillP-Sheep — Data Link

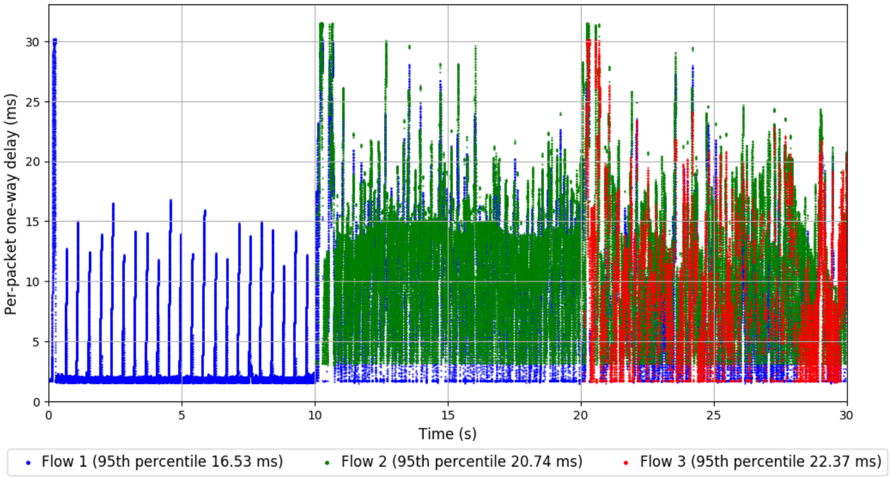




```
Run 4: Statistics of FillP-Sheep

Start at: 2019-01-03 01:15:00
End at: 2019-01-03 01:15:30
Local clock offset: -7.209 ms
Remote clock offset: -0.095 ms

# Below is generated by plot.py at 2019-01-03 01:57:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 88.32 Mbit/s
95th percentile per-packet one-way delay: 19.183 ms
Loss rate: 0.97%
-- Flow 1:
Average throughput: 48.58 Mbit/s
95th percentile per-packet one-way delay: 16.526 ms
Loss rate: 0.75%
-- Flow 2:
Average throughput: 50.48 Mbit/s
95th percentile per-packet one-way delay: 20.736 ms
Loss rate: 0.43%
-- Flow 3:
Average throughput: 18.54 Mbit/s
95th percentile per-packet one-way delay: 22.374 ms
Loss rate: 5.37%
```

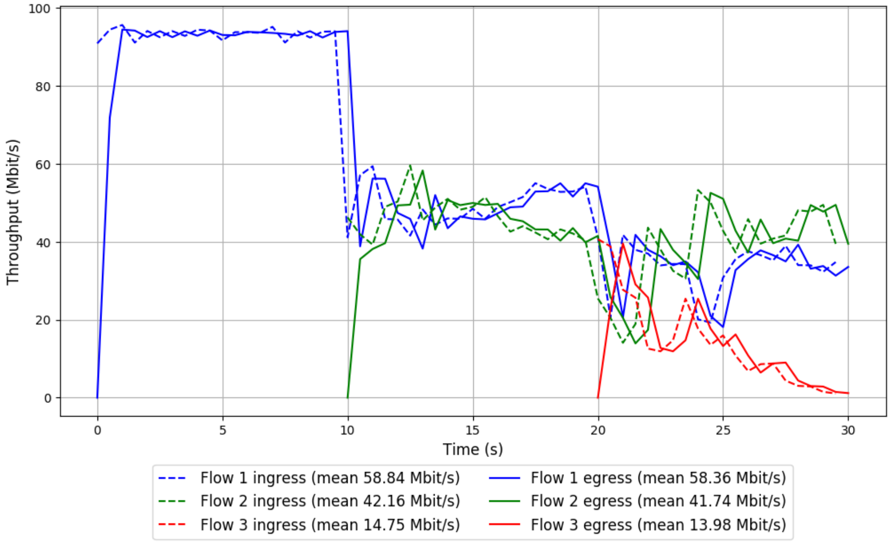
Run 4: Report of FillP-Sheep — Data Link

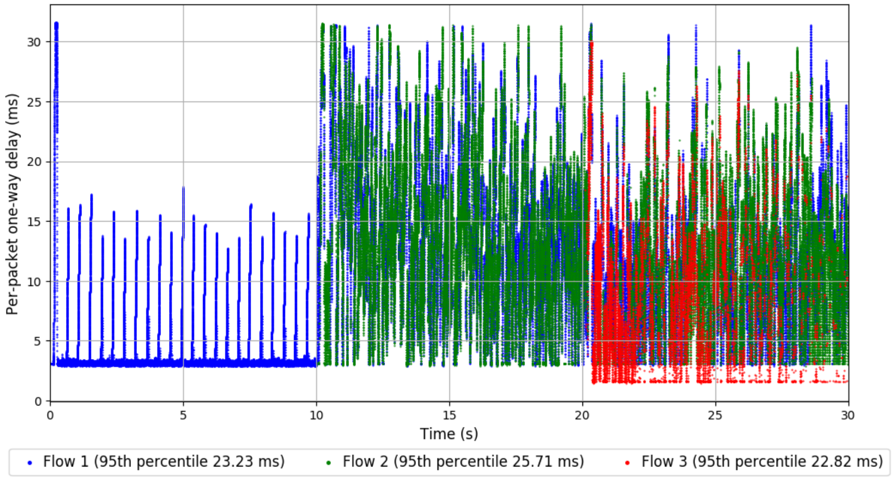




```
Run 5: Statistics of FillP-Sheep

Start at: 2019-01-03 01:36:36
End at: 2019-01-03 01:37:06
Local clock offset: -7.181 ms
Remote clock offset: -0.062 ms

# Below is generated by plot.py at 2019-01-03 01:57:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 90.75 Mbit/s
95th percentile per-packet one-way delay: 24.229 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 58.36 Mbit/s
95th percentile per-packet one-way delay: 23.228 ms
Loss rate: 0.86%
-- Flow 2:
Average throughput: 41.74 Mbit/s
95th percentile per-packet one-way delay: 25.710 ms
Loss rate: 0.96%
-- Flow 3:
Average throughput: 13.98 Mbit/s
95th percentile per-packet one-way delay: 22.817 ms
Loss rate: 5.30%
```

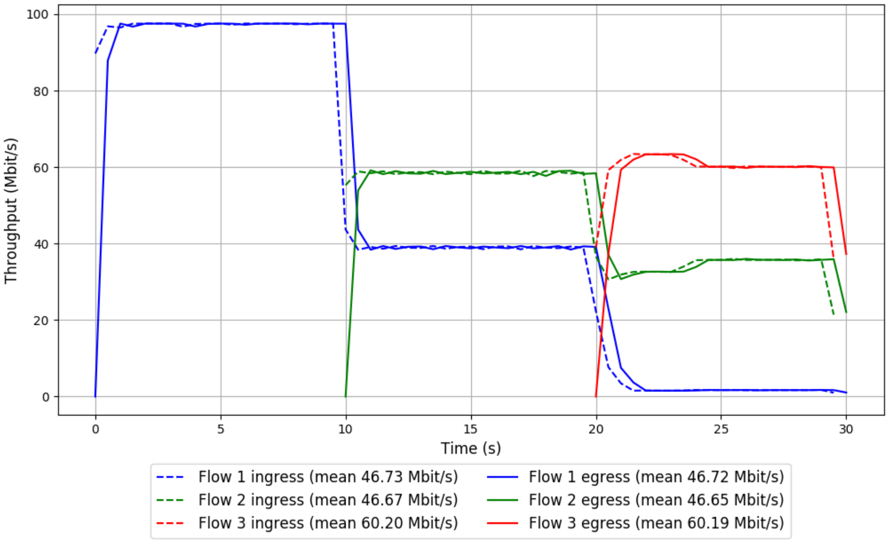
Run 5: Report of FillP-Sheep — Data Link

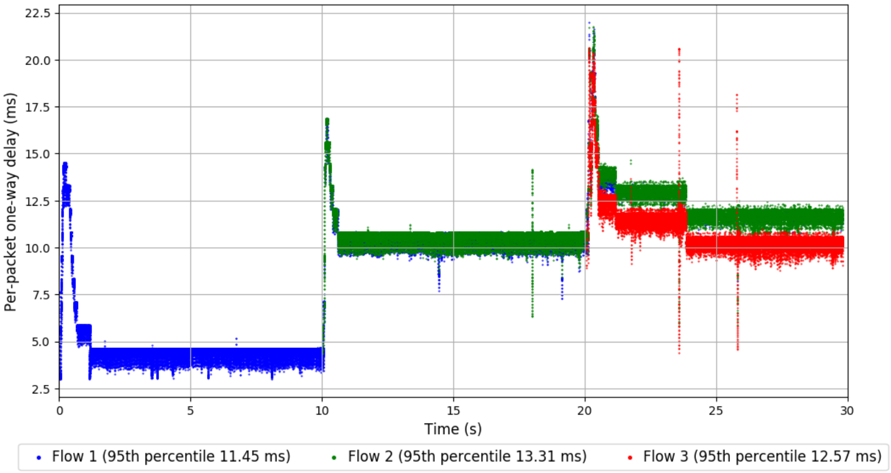




```
Run 1: Statistics of Indigo

Start at: 2019-01-03 00:05:33
End at: 2019-01-03 00:06:03
Local clock offset: -2.707 ms
Remote clock offset: -0.718 ms

# Below is generated by plot.py at 2019-01-03 01:57:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.34 Mbit/s
95th percentile per-packet one-way delay: 13.024 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 46.72 Mbit/s
95th percentile per-packet one-way delay: 11.451 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 46.65 Mbit/s
95th percentile per-packet one-way delay: 13.308 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 60.19 Mbit/s
95th percentile per-packet one-way delay: 12.570 ms
Loss rate: 0.00%
```

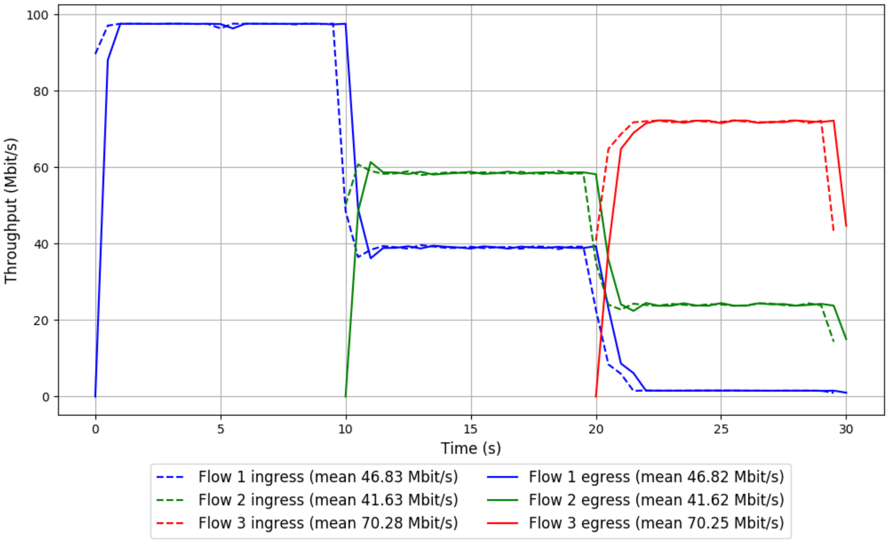
Run 1: Report of Indigo — Data Link

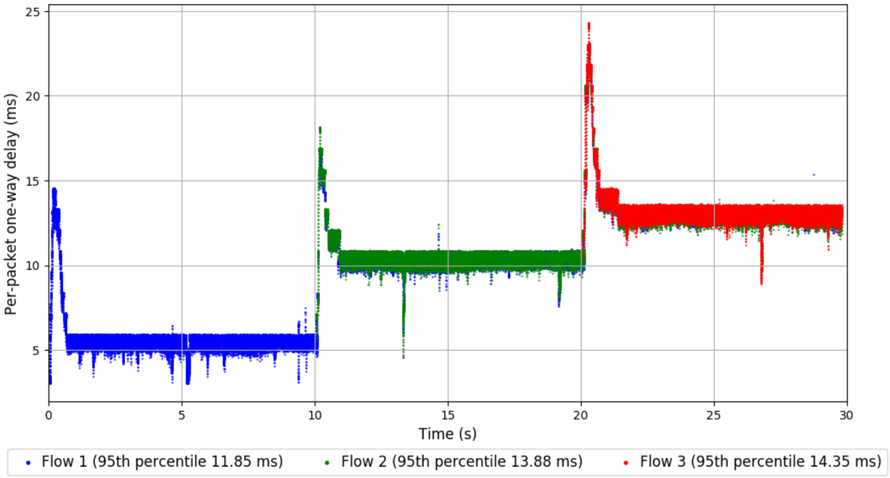




```
Run 2: Statistics of Indigo

Start at: 2019-01-03 00:27:09
End at: 2019-01-03 00:27:39
Local clock offset: -3.067 ms
Remote clock offset: -0.471 ms

# Below is generated by plot.py at 2019-01-03 01:57:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.35 Mbit/s
95th percentile per-packet one-way delay: 13.564 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 46.82 Mbit/s
95th percentile per-packet one-way delay: 11.849 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 41.62 Mbit/s
95th percentile per-packet one-way delay: 13.878 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 70.25 Mbit/s
95th percentile per-packet one-way delay: 14.352 ms
Loss rate: 0.01%
```

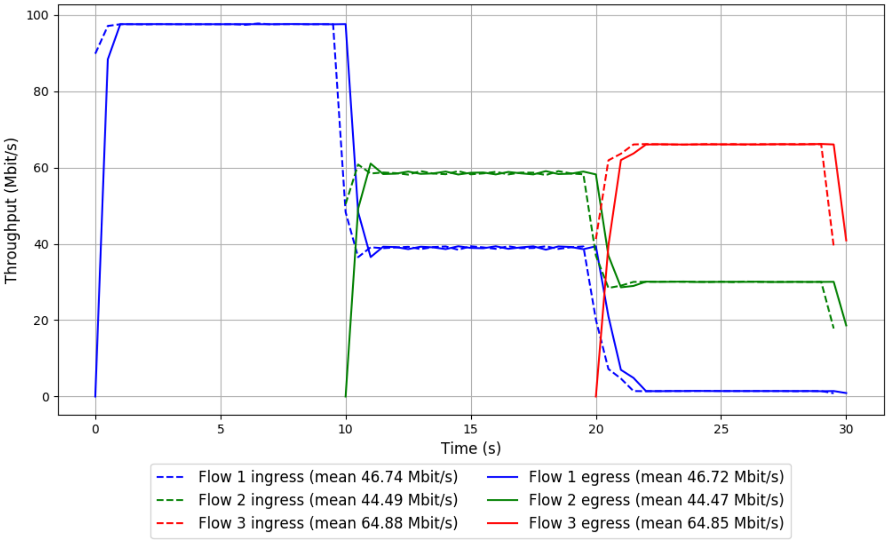
Run 2: Report of Indigo — Data Link

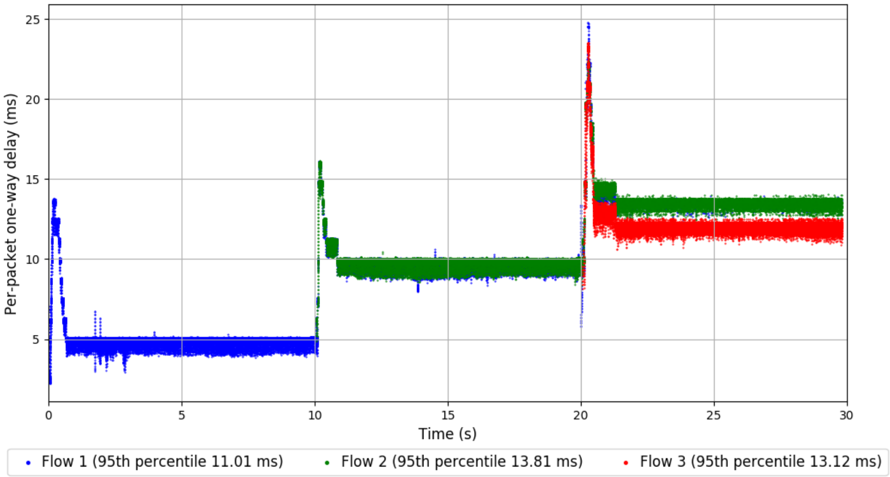




```
Run 3: Statistics of Indigo

Start at: 2019-01-03 00:48:48
End at: 2019-01-03 00:49:18
Local clock offset: -3.079 ms
Remote clock offset: -0.377 ms

# Below is generated by plot.py at 2019-01-03 01:57:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.38 Mbit/s
95th percentile per-packet one-way delay: 13.537 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 46.72 Mbit/s
95th percentile per-packet one-way delay: 11.014 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 44.47 Mbit/s
95th percentile per-packet one-way delay: 13.811 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 64.85 Mbit/s
95th percentile per-packet one-way delay: 13.118 ms
Loss rate: 0.00%
```

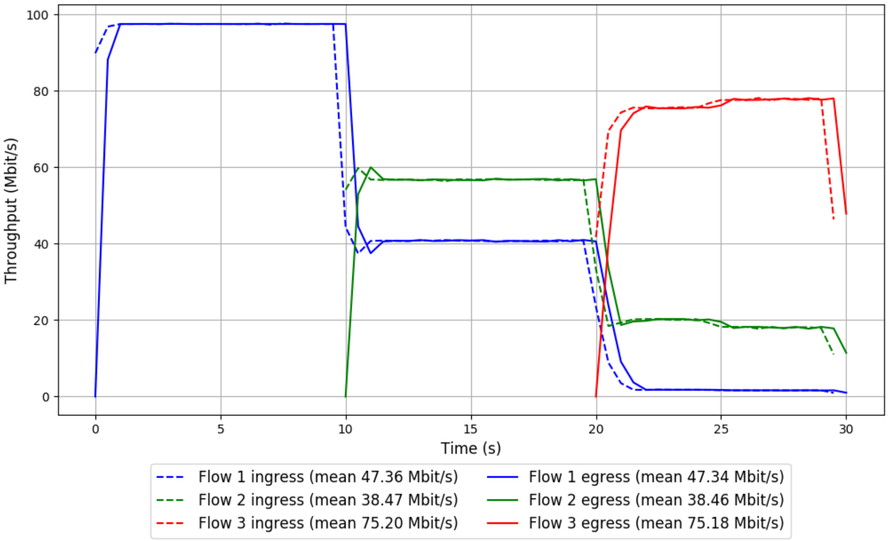
Run 3: Report of Indigo — Data Link

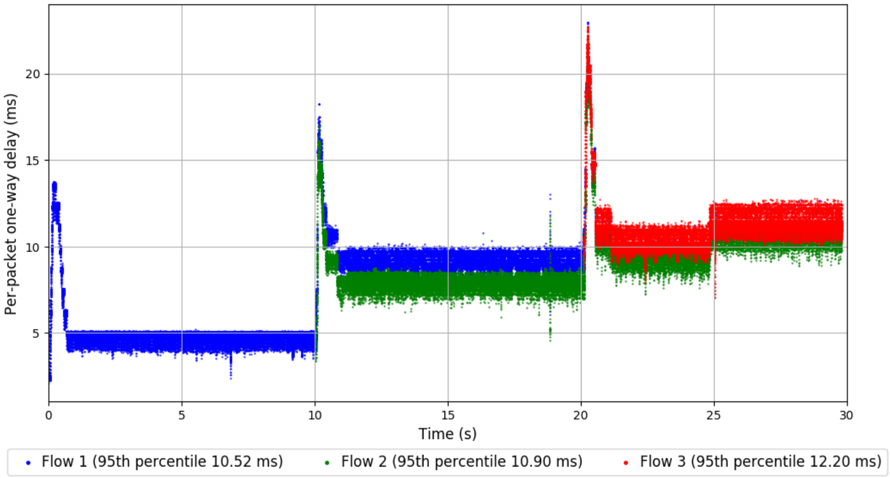




```
Run 4: Statistics of Indigo

Start at: 2019-01-03 01:10:24
End at: 2019-01-03 01:10:54
Local clock offset: -6.017 ms
Remote clock offset: -0.216 ms

# Below is generated by plot.py at 2019-01-03 01:57:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.37 Mbit/s
95th percentile per-packet one-way delay: 11.465 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 47.34 Mbit/s
95th percentile per-packet one-way delay: 10.521 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 38.46 Mbit/s
95th percentile per-packet one-way delay: 10.901 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 75.18 Mbit/s
95th percentile per-packet one-way delay: 12.195 ms
Loss rate: 0.02%
```

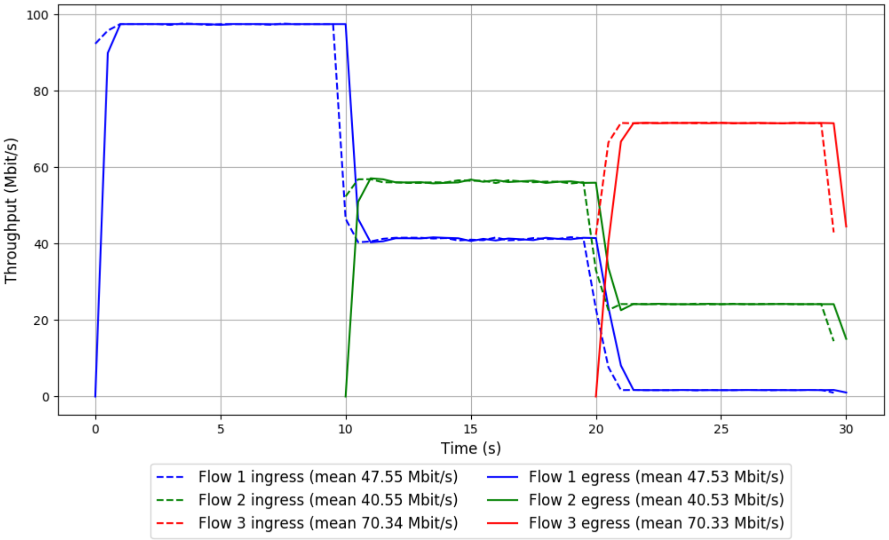
Run 4: Report of Indigo — Data Link

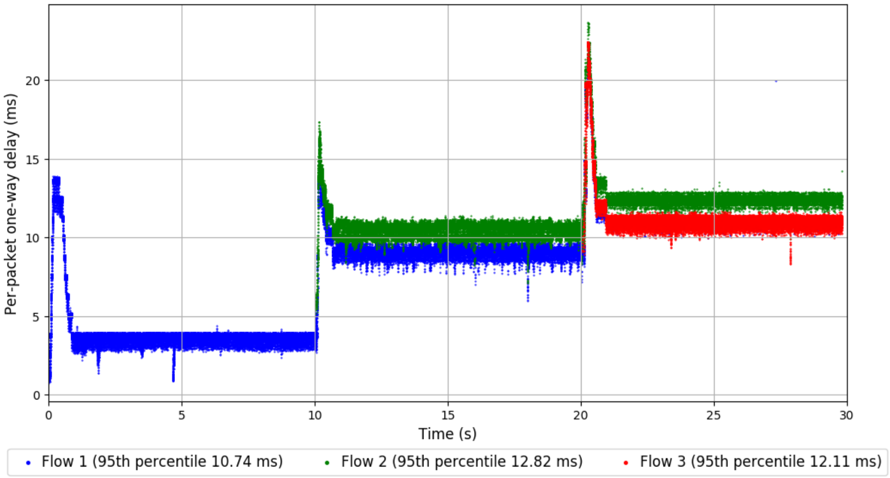




```
Run 5: Statistics of Indigo

Start at: 2019-01-03 01:32:00
End at: 2019-01-03 01:32:30
Local clock offset: -6.502 ms
Remote clock offset: -0.032 ms

# Below is generated by plot.py at 2019-01-03 01:58:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.38 Mbit/s
95th percentile per-packet one-way delay: 12.575 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 47.53 Mbit/s
95th percentile per-packet one-way delay: 10.740 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 40.53 Mbit/s
95th percentile per-packet one-way delay: 12.825 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 70.33 Mbit/s
95th percentile per-packet one-way delay: 12.107 ms
Loss rate: 0.00%
```

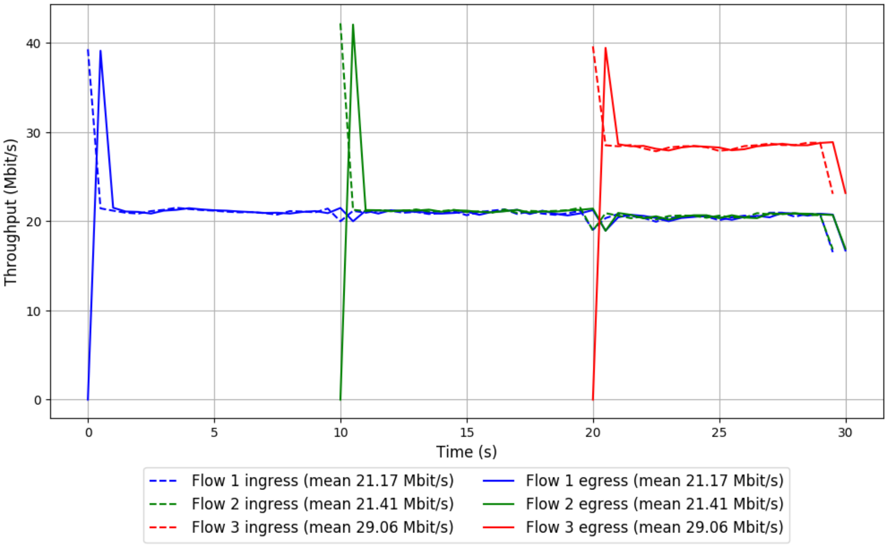
Run 5: Report of Indigo — Data Link

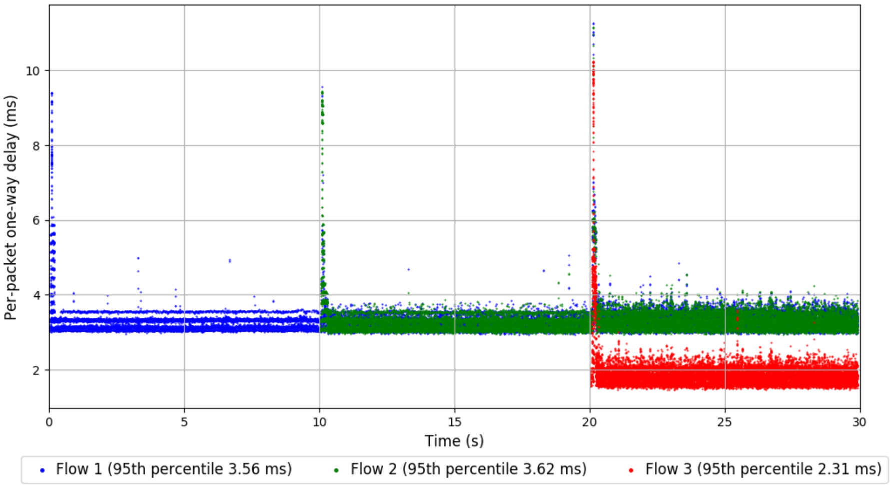




```
Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-03 00:06:44
End at: 2019-01-03 00:07:14
Local clock offset: -2.735 ms
Remote clock offset: -0.727 ms

# Below is generated by plot.py at 2019-01-03 01:58:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 45.01 Mbit/s
95th percentile per-packet one-way delay: 3.568 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 21.17 Mbit/s
95th percentile per-packet one-way delay: 3.561 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 21.41 Mbit/s
95th percentile per-packet one-way delay: 3.623 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 29.06 Mbit/s
95th percentile per-packet one-way delay: 2.307 ms
Loss rate: 0.00%
```

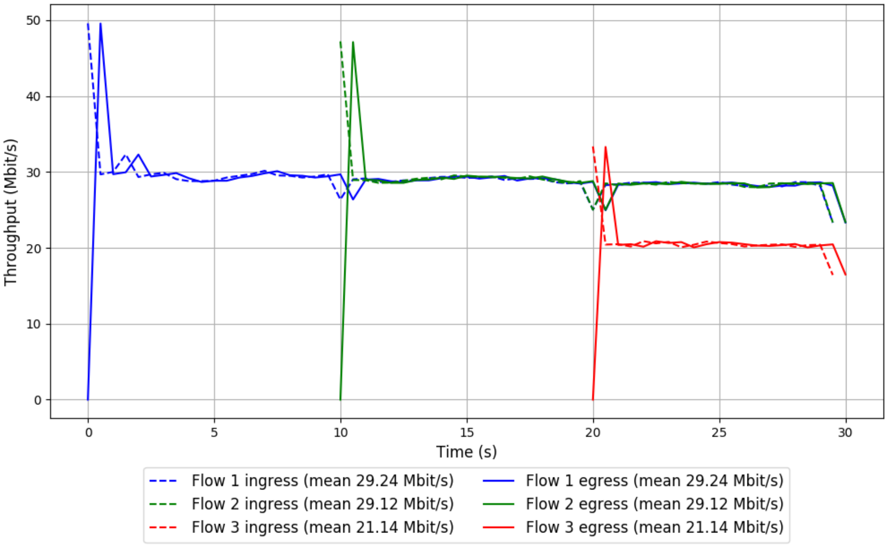
Run 1: Report of Indigo-MusesD — Data Link

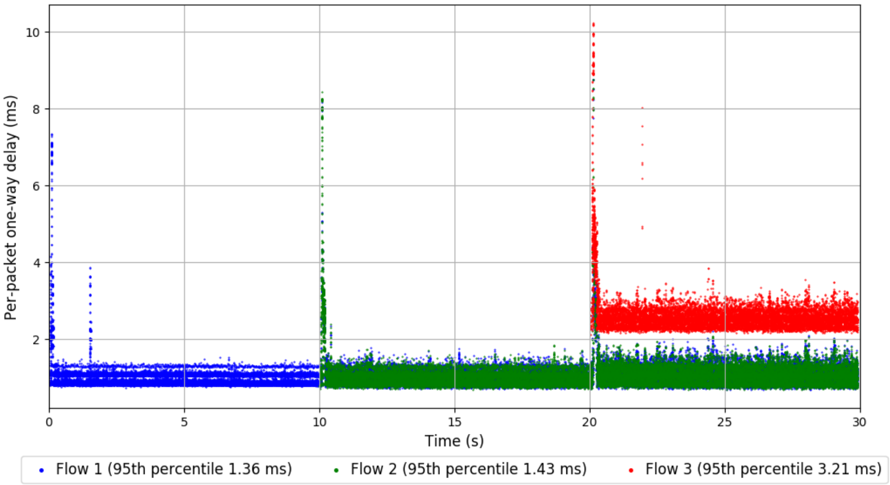




```
Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-03 00:28:20
End at: 2019-01-03 00:28:50
Local clock offset: -2.389 ms
Remote clock offset: -0.505 ms

# Below is generated by plot.py at 2019-01-03 01:58:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 55.60 Mbit/s
95th percentile per-packet one-way delay: 2.637 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 29.24 Mbit/s
95th percentile per-packet one-way delay: 1.356 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 29.12 Mbit/s
95th percentile per-packet one-way delay: 1.425 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 21.14 Mbit/s
95th percentile per-packet one-way delay: 3.212 ms
Loss rate: 0.02%
```

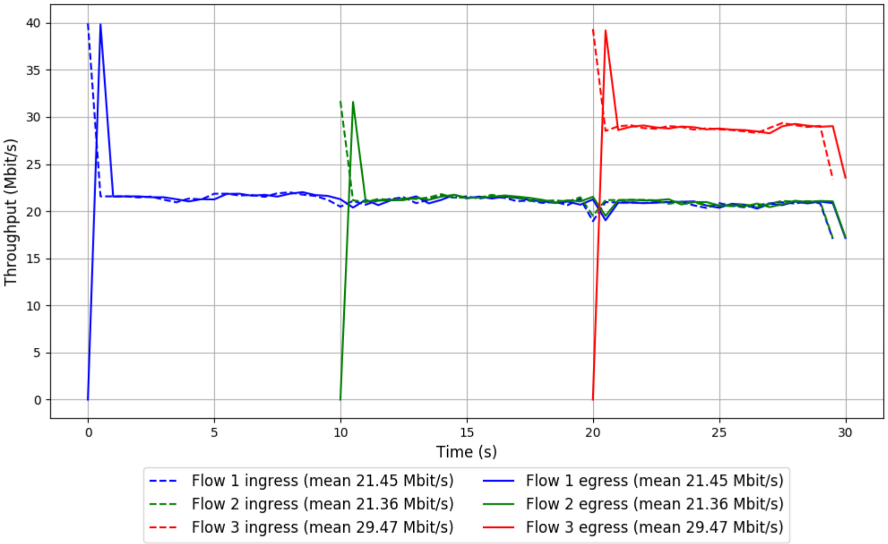
Run 2: Report of Indigo-MusesD — Data Link

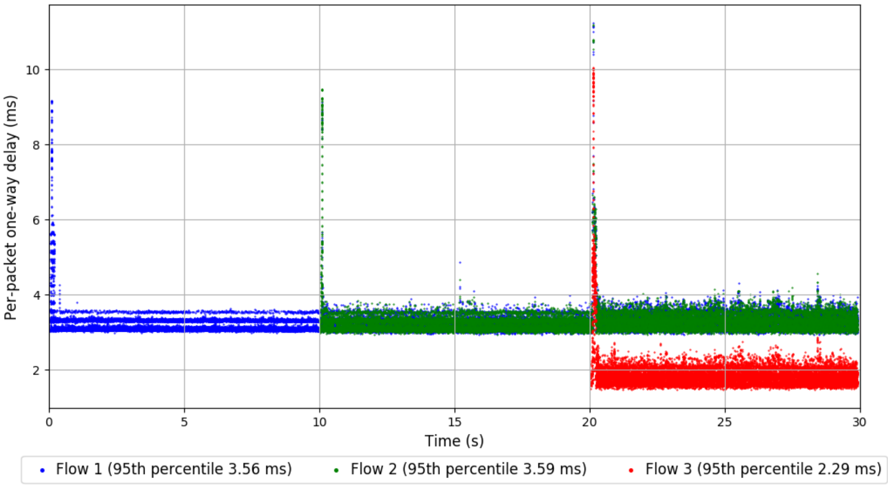




```
Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-03 00:49:59
End at: 2019-01-03 00:50:29
Local clock offset: -3.832 ms
Remote clock offset: -0.332 ms

# Below is generated by plot.py at 2019-01-03 01:58:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 45.39 Mbit/s
95th percentile per-packet one-way delay: 3.559 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 21.45 Mbit/s
95th percentile per-packet one-way delay: 3.561 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 21.36 Mbit/s
95th percentile per-packet one-way delay: 3.587 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 29.47 Mbit/s
95th percentile per-packet one-way delay: 2.293 ms
Loss rate: 0.00%
```

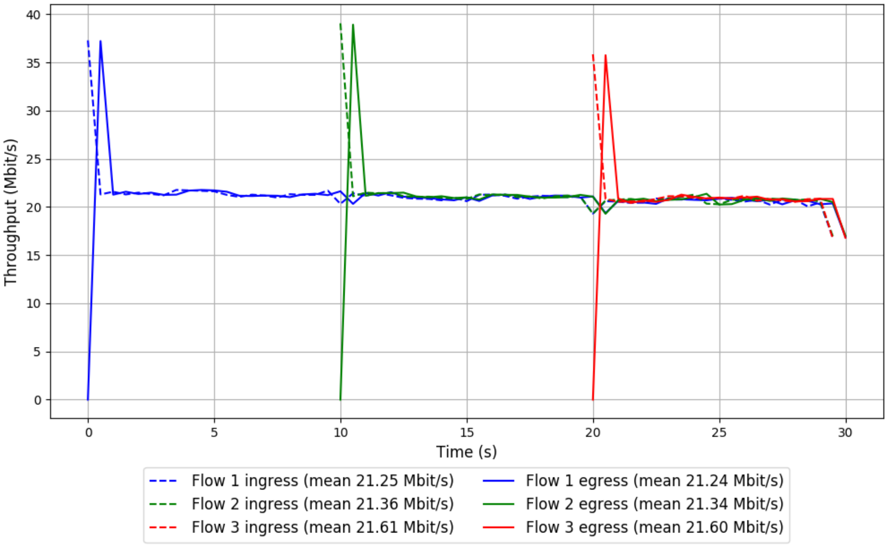
Run 3: Report of Indigo-MusesD — Data Link

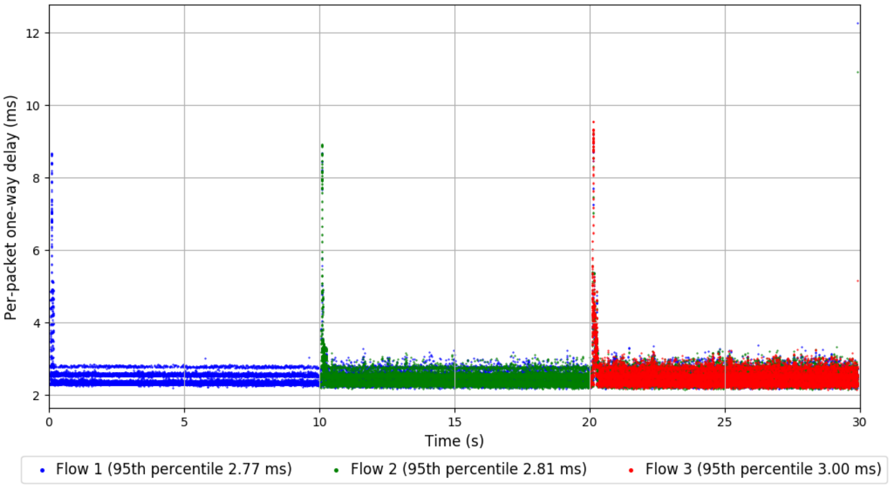




```
Run 4: Statistics of Indigo-MusesD

Start at: 2019-01-03 01:11:34
End at: 2019-01-03 01:12:04
Local clock offset: -6.107 ms
Remote clock offset: -0.172 ms

# Below is generated by plot.py at 2019-01-03 01:58:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 42.58 Mbit/s
95th percentile per-packet one-way delay: 2.797 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 21.24 Mbit/s
95th percentile per-packet one-way delay: 2.769 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 21.34 Mbit/s
95th percentile per-packet one-way delay: 2.810 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 21.60 Mbit/s
95th percentile per-packet one-way delay: 2.998 ms
Loss rate: 0.01%
```

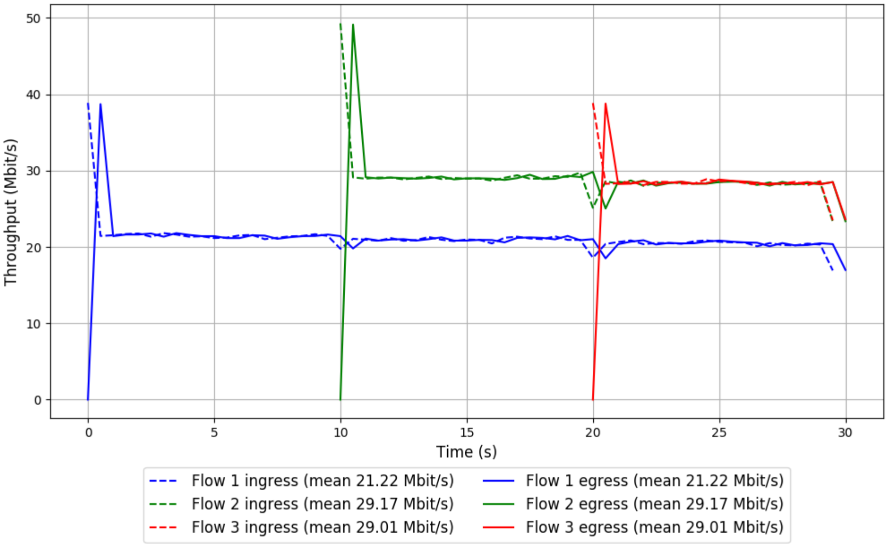
Run 4: Report of Indigo-MusesD — Data Link

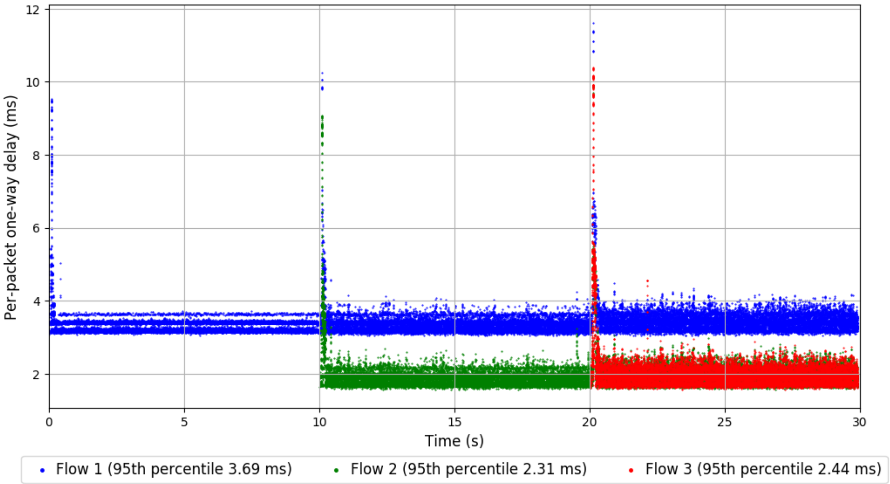




```
Run 5: Statistics of Indigo-MusesD

Start at: 2019-01-03 01:33:11
End at: 2019-01-03 01:33:41
Local clock offset: -7.234 ms
Remote clock offset: -0.017 ms

# Below is generated by plot.py at 2019-01-03 01:58:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 50.21 Mbit/s
95th percentile per-packet one-way delay: 3.618 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 21.22 Mbit/s
95th percentile per-packet one-way delay: 3.689 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 29.17 Mbit/s
95th percentile per-packet one-way delay: 2.305 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 29.01 Mbit/s
95th percentile per-packet one-way delay: 2.437 ms
Loss rate: 0.00%
```

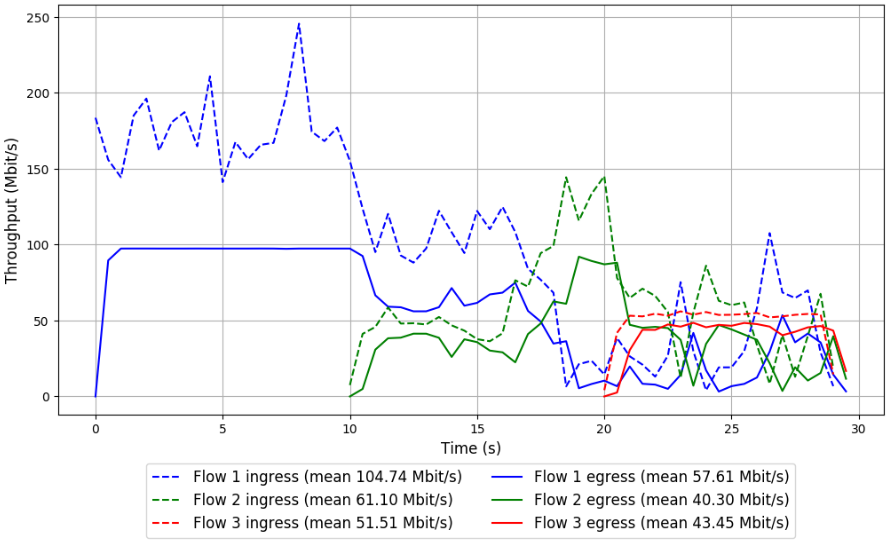
Run 5: Report of Indigo-MusesD — Data Link

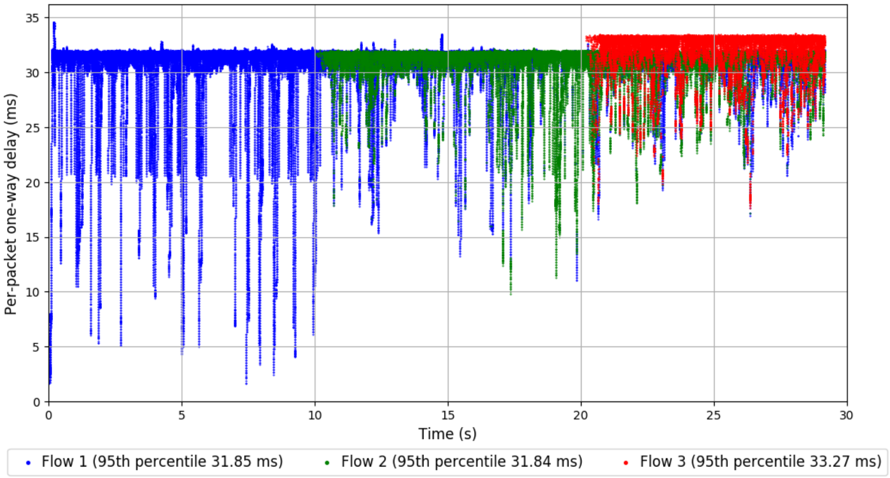




```
Run 1: Statistics of Indigo-MusesT

Start at: 2019-01-03 00:11:18
End at: 2019-01-03 00:11:48
Local clock offset: -2.867 ms
Remote clock offset: -0.697 ms

# Below is generated by plot.py at 2019-01-03 01:58:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.33 Mbit/s
95th percentile per-packet one-way delay: 32.811 ms
Loss rate: 39.33%
-- Flow 1:
Average throughput: 57.61 Mbit/s
95th percentile per-packet one-way delay: 31.854 ms
Loss rate: 44.94%
-- Flow 2:
Average throughput: 40.30 Mbit/s
95th percentile per-packet one-way delay: 31.836 ms
Loss rate: 34.05%
-- Flow 3:
Average throughput: 43.45 Mbit/s
95th percentile per-packet one-way delay: 33.265 ms
Loss rate: 15.64%
```

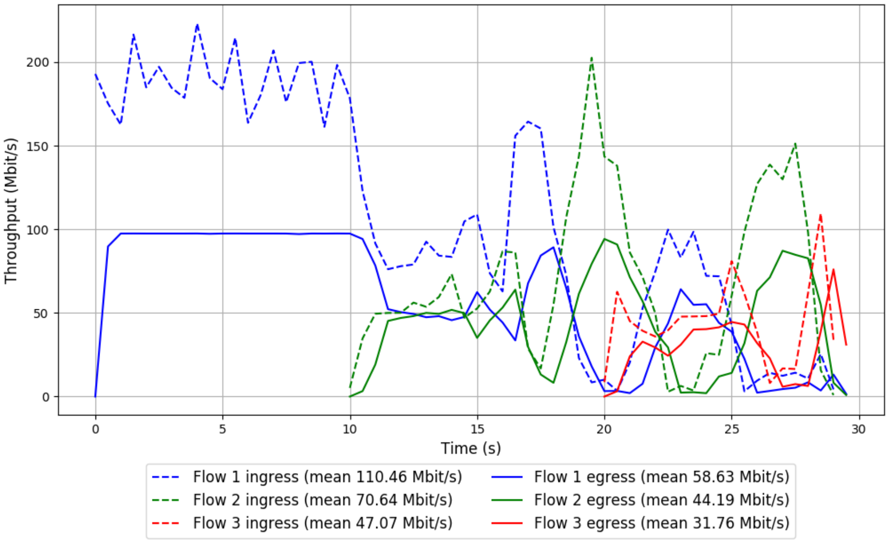
Run 1: Report of Indigo-MusesT — Data Link

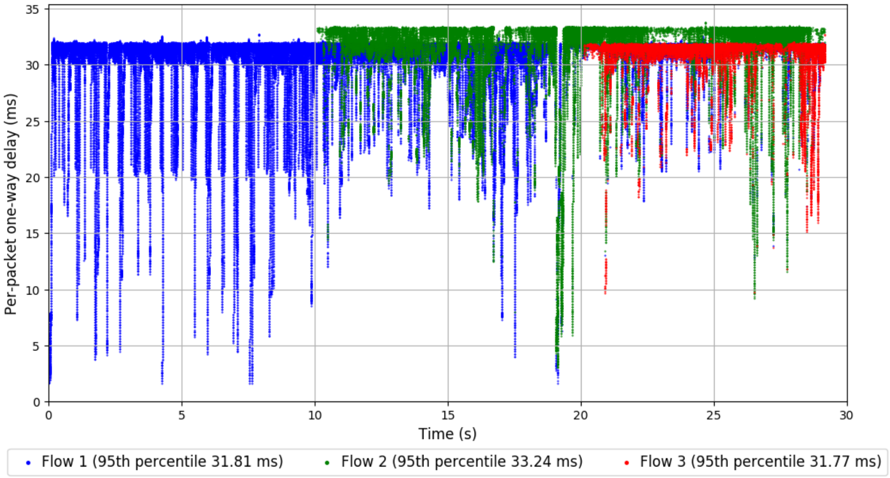




```
Run 2: Statistics of Indigo-MusesT

Start at: 2019-01-03 00:32:55
End at: 2019-01-03 00:33:25
Local clock offset: -3.402 ms
Remote clock offset: -0.442 ms

# Below is generated by plot.py at 2019-01-03 01:58:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.32 Mbit/s
95th percentile per-packet one-way delay: 33.089 ms
Loss rate: 43.11%
-- Flow 1:
Average throughput: 58.63 Mbit/s
95th percentile per-packet one-way delay: 31.813 ms
Loss rate: 46.89%
-- Flow 2:
Average throughput: 44.19 Mbit/s
95th percentile per-packet one-way delay: 33.237 ms
Loss rate: 37.45%
-- Flow 3:
Average throughput: 31.76 Mbit/s
95th percentile per-packet one-way delay: 31.771 ms
Loss rate: 32.52%
```

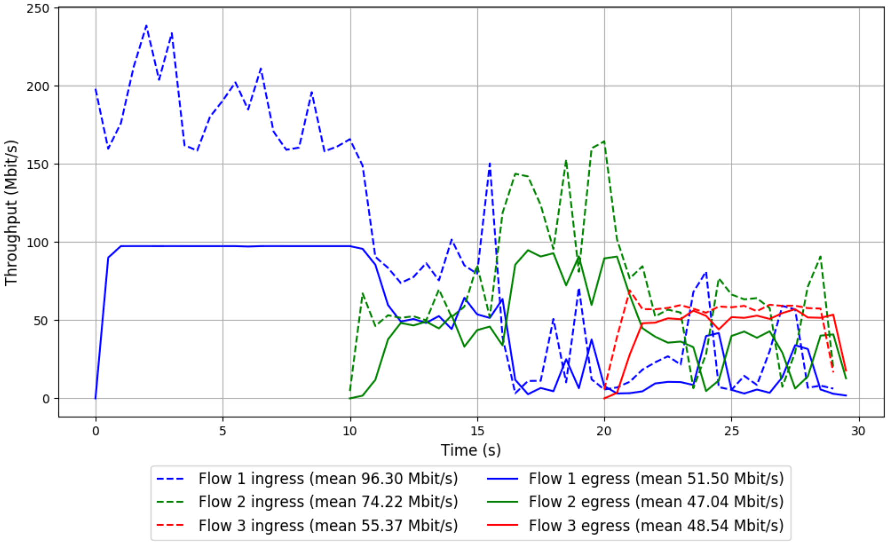
Run 2: Report of Indigo-MusesT — Data Link

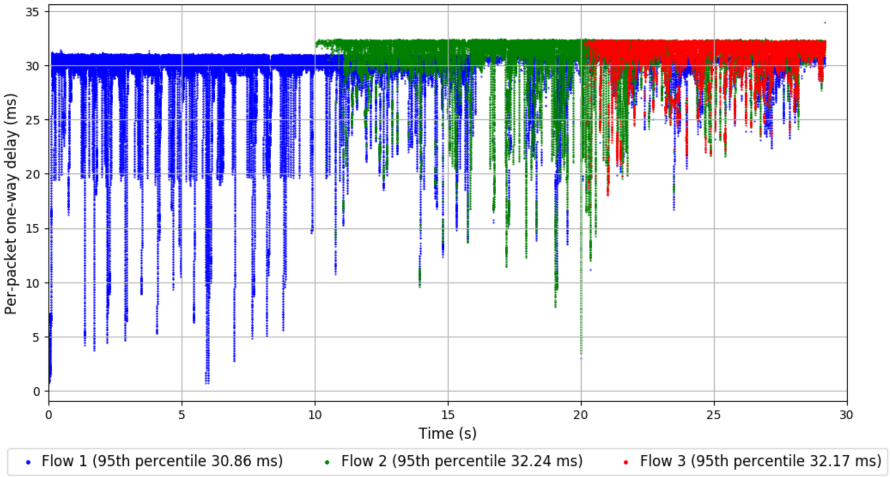




```
Run 3: Statistics of Indigo-MusesT

Start at: 2019-01-03 00:54:32
End at: 2019-01-03 00:55:02
Local clock offset: -3.166 ms
Remote clock offset: -0.303 ms

# Below is generated by plot.py at 2019-01-03 01:58:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.33 Mbit/s
95th percentile per-packet one-way delay: 32.152 ms
Loss rate: 39.90%
-- Flow 1:
Average throughput: 51.50 Mbit/s
95th percentile per-packet one-way delay: 30.863 ms
Loss rate: 46.47%
-- Flow 2:
Average throughput: 47.04 Mbit/s
95th percentile per-packet one-way delay: 32.239 ms
Loss rate: 36.61%
-- Flow 3:
Average throughput: 48.54 Mbit/s
95th percentile per-packet one-way delay: 32.168 ms
Loss rate: 12.35%
```

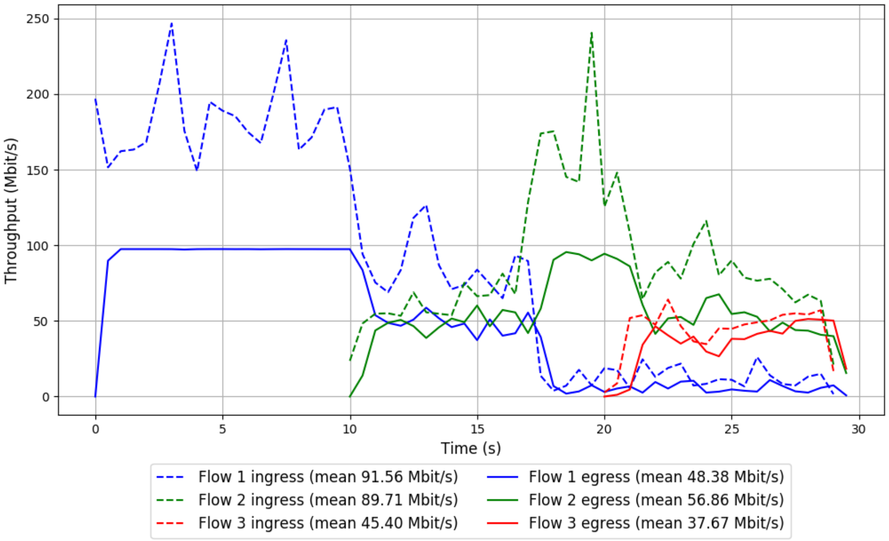
Run 3: Report of Indigo-MusesT — Data Link

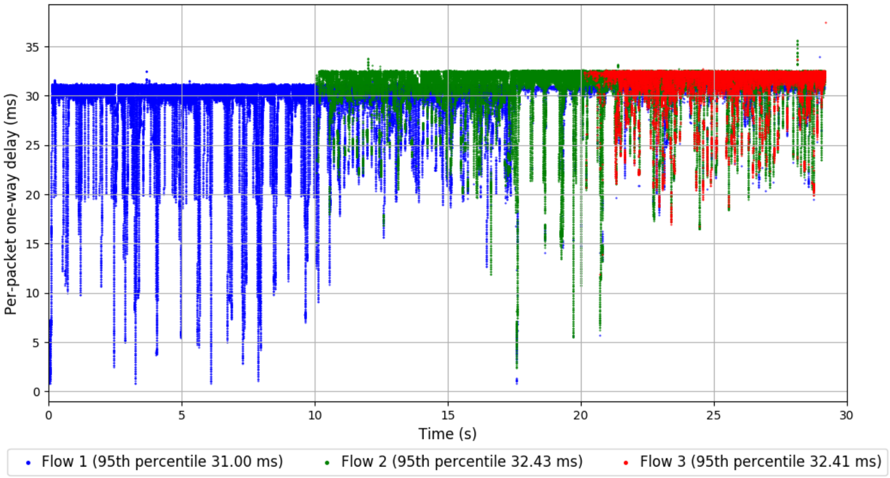




```
Run 4: Statistics of Indigo-MusesT

Start at: 2019-01-03 01:16:08
End at: 2019-01-03 01:16:38
Local clock offset: -6.481 ms
Remote clock offset: -0.175 ms

# Below is generated by plot.py at 2019-01-03 01:59:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.30 Mbit/s
95th percentile per-packet one-way delay: 32.374 ms
Loss rate: 40.77%
-- Flow 1:
Average throughput: 48.38 Mbit/s
95th percentile per-packet one-way delay: 31.000 ms
Loss rate: 47.11%
-- Flow 2:
Average throughput: 56.86 Mbit/s
95th percentile per-packet one-way delay: 32.431 ms
Loss rate: 36.61%
-- Flow 3:
Average throughput: 37.67 Mbit/s
95th percentile per-packet one-way delay: 32.409 ms
Loss rate: 16.98%
```

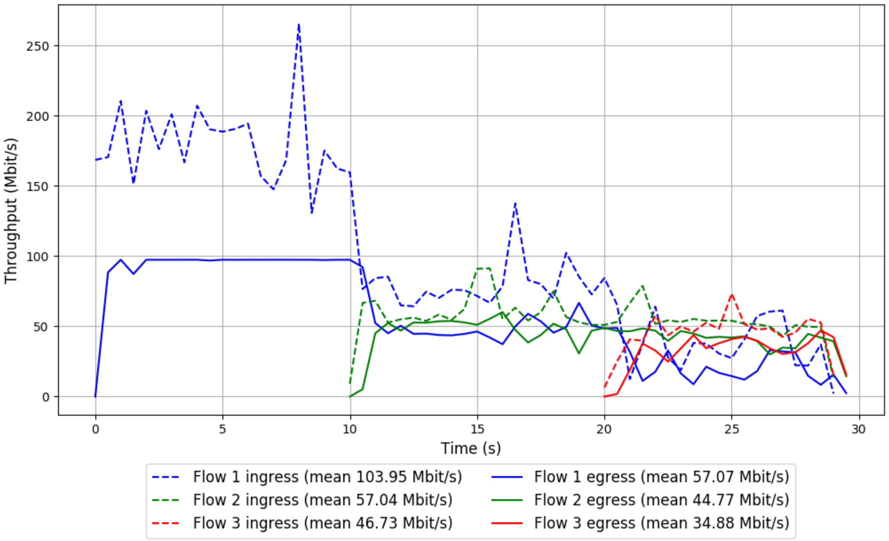
Run 4: Report of Indigo-MusesT — Data Link

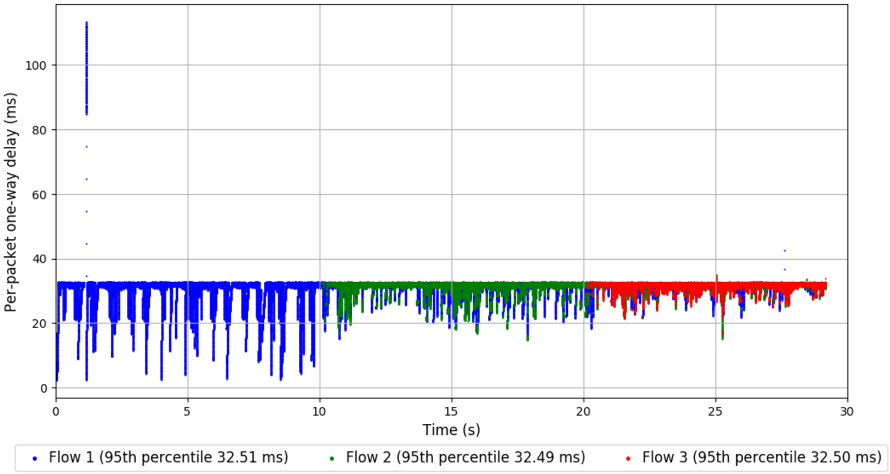




```
Run 5: Statistics of Indigo-MusesT

Start at: 2019-01-03 01:37:45
End at: 2019-01-03 01:38:15
Local clock offset: -6.429 ms
Remote clock offset: -0.042 ms

# Below is generated by plot.py at 2019-01-03 01:59:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.12 Mbit/s
95th percentile per-packet one-way delay: 32.505 ms
Loss rate: 37.57%
-- Flow 1:
Average throughput: 57.07 Mbit/s
95th percentile per-packet one-way delay: 32.512 ms
Loss rate: 45.04%
-- Flow 2:
Average throughput: 44.77 Mbit/s
95th percentile per-packet one-way delay: 32.491 ms
Loss rate: 21.52%
-- Flow 3:
Average throughput: 34.88 Mbit/s
95th percentile per-packet one-way delay: 32.500 ms
Loss rate: 25.35%
```

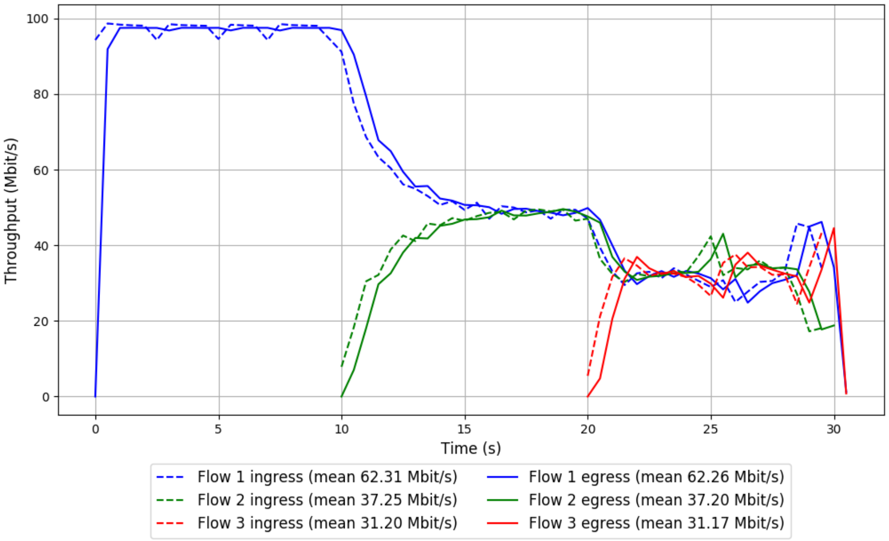
Run 5: Report of Indigo-MusesT — Data Link

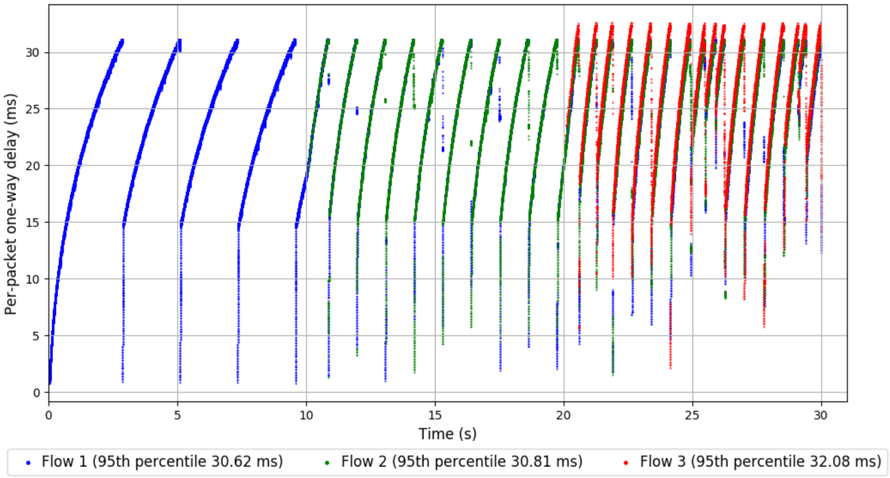




```
Run 1: Statistics of LEDBAT

Start at: 2019-01-03 00:14:42
End at: 2019-01-03 00:15:12
Local clock offset: -2.124 ms
Remote clock offset: -0.762 ms

# Below is generated by plot.py at 2019-01-03 01:59:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.33 Mbit/s
95th percentile per-packet one-way delay: 30.838 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 62.26 Mbit/s
95th percentile per-packet one-way delay: 30.625 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 37.20 Mbit/s
95th percentile per-packet one-way delay: 30.807 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 31.17 Mbit/s
95th percentile per-packet one-way delay: 32.078 ms
Loss rate: 0.10%
```

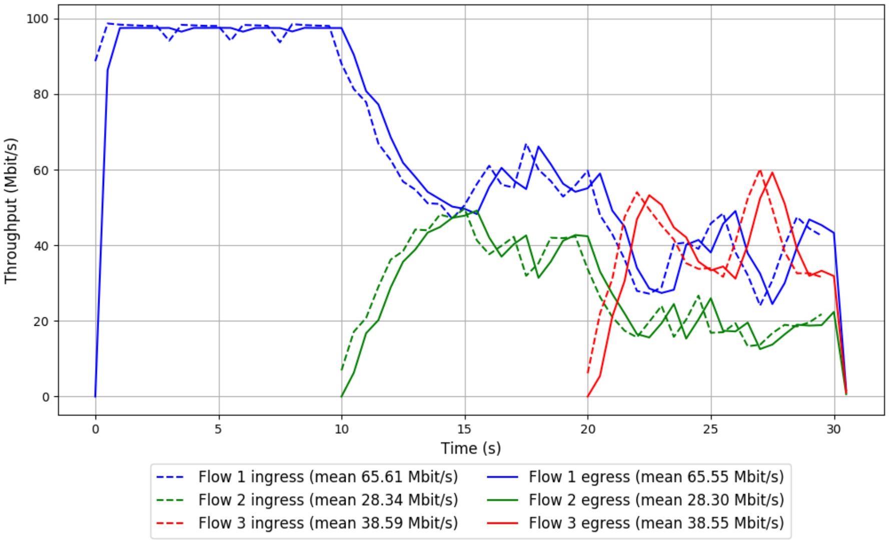
Run 1: Report of LEDBAT — Data Link

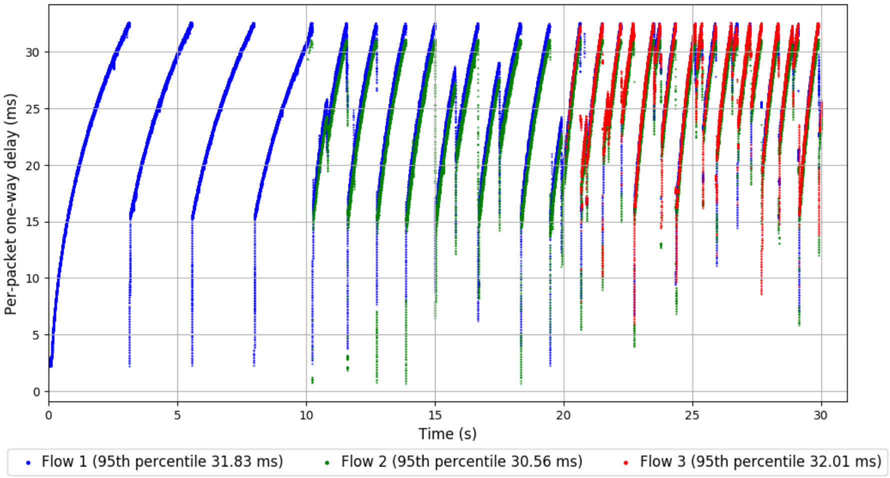




```
Run 2: Statistics of LEDBAT

Start at: 2019-01-03 00:36:20
End at: 2019-01-03 00:36:50
Local clock offset: -2.794 ms
Remote clock offset: -0.521 ms

# Below is generated by plot.py at 2019-01-03 01:59:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.18 Mbit/s
95th percentile per-packet one-way delay: 31.784 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 65.55 Mbit/s
95th percentile per-packet one-way delay: 31.827 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 28.30 Mbit/s
95th percentile per-packet one-way delay: 30.561 ms
Loss rate: 0.18%
-- Flow 3:
Average throughput: 38.55 Mbit/s
95th percentile per-packet one-way delay: 32.005 ms
Loss rate: 0.05%
```

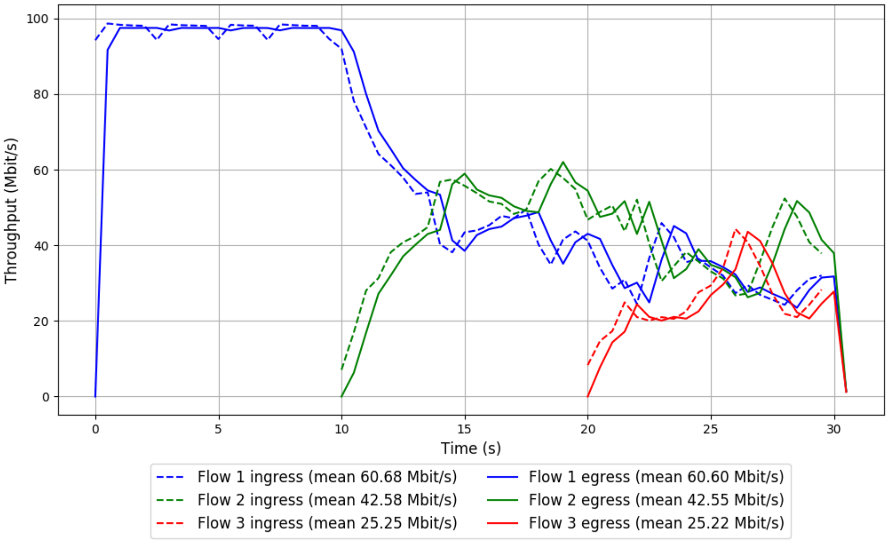
Run 2: Report of LEDBAT — Data Link

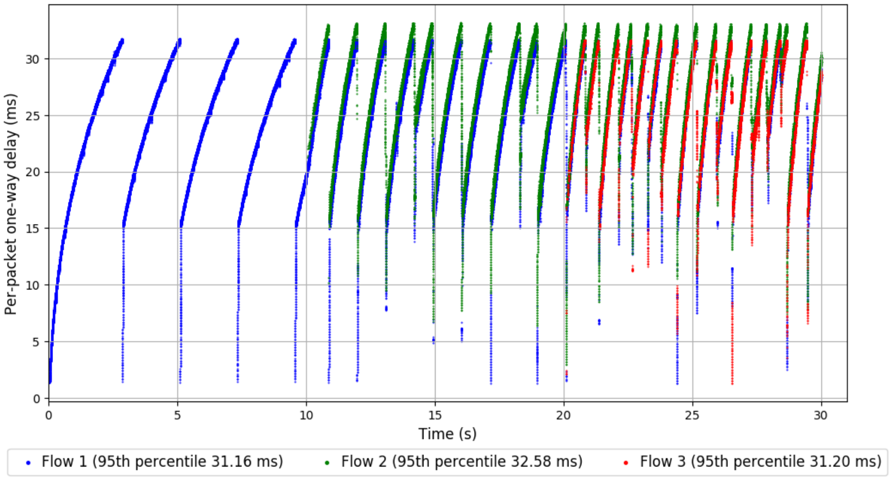




```
Run 3: Statistics of LEDBAT

Start at: 2019-01-03 00:57:56
End at: 2019-01-03 00:58:26
Local clock offset: -4.895 ms
Remote clock offset: -0.389 ms

# Below is generated by plot.py at 2019-01-03 01:59:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.30 Mbit/s
95th percentile per-packet one-way delay: 31.573 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 60.60 Mbit/s
95th percentile per-packet one-way delay: 31.156 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 42.55 Mbit/s
95th percentile per-packet one-way delay: 32.578 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 25.22 Mbit/s
95th percentile per-packet one-way delay: 31.195 ms
Loss rate: 0.15%
```

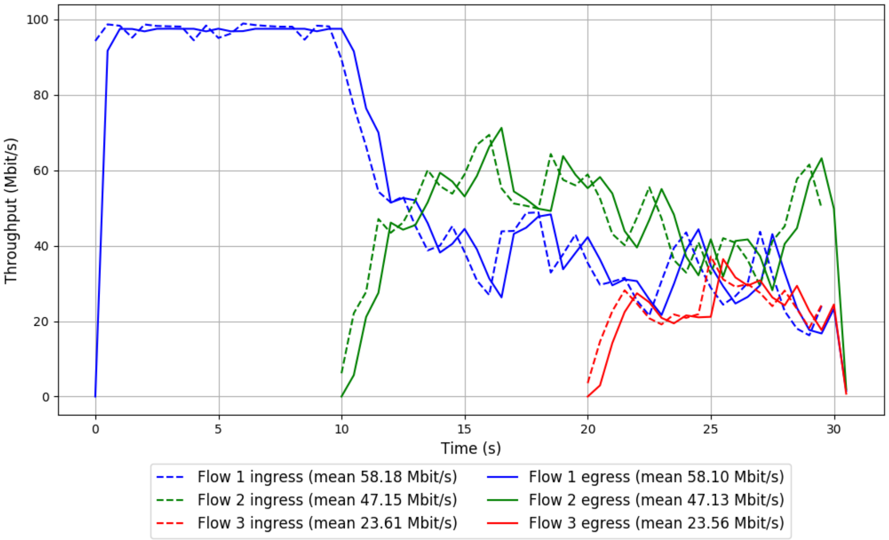
Run 3: Report of LEDBAT — Data Link

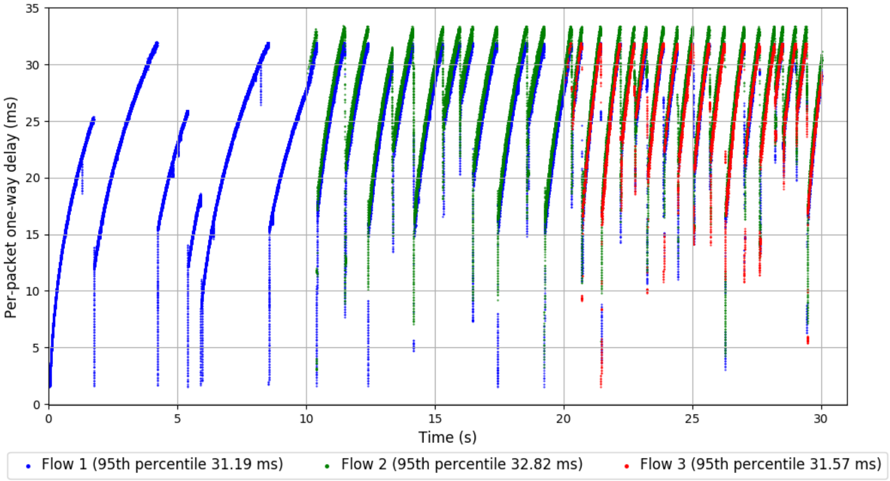




```
Run 4: Statistics of LEDBAT

Start at: 2019-01-03 01:19:33
End at: 2019-01-03 01:20:03
Local clock offset: -7.462 ms
Remote clock offset: -0.13 ms

# Below is generated by plot.py at 2019-01-03 02:00:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.28 Mbit/s
95th percentile per-packet one-way delay: 31.858 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 58.10 Mbit/s
95th percentile per-packet one-way delay: 31.192 ms
Loss rate: 0.05%
-- Flow 2:
Average throughput: 47.13 Mbit/s
95th percentile per-packet one-way delay: 32.821 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 23.56 Mbit/s
95th percentile per-packet one-way delay: 31.574 ms
Loss rate: 0.18%
```

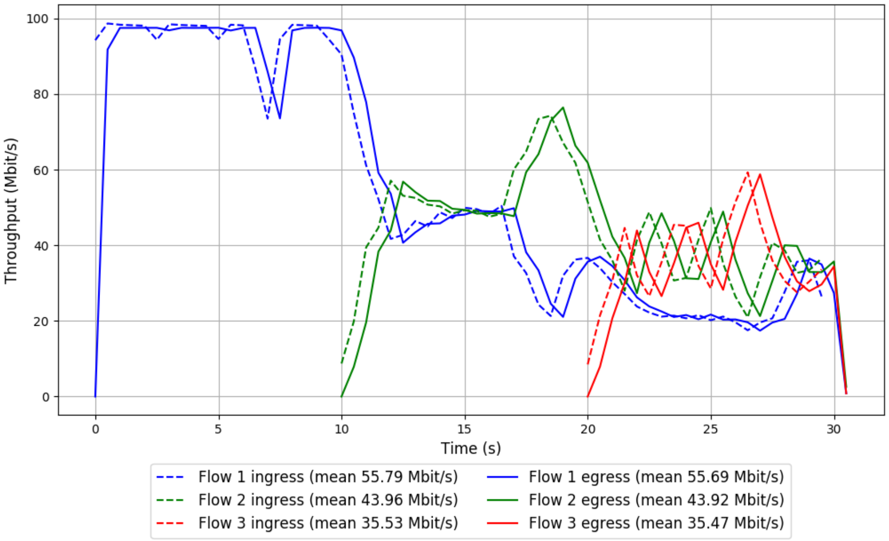
Run 4: Report of LEDBAT — Data Link

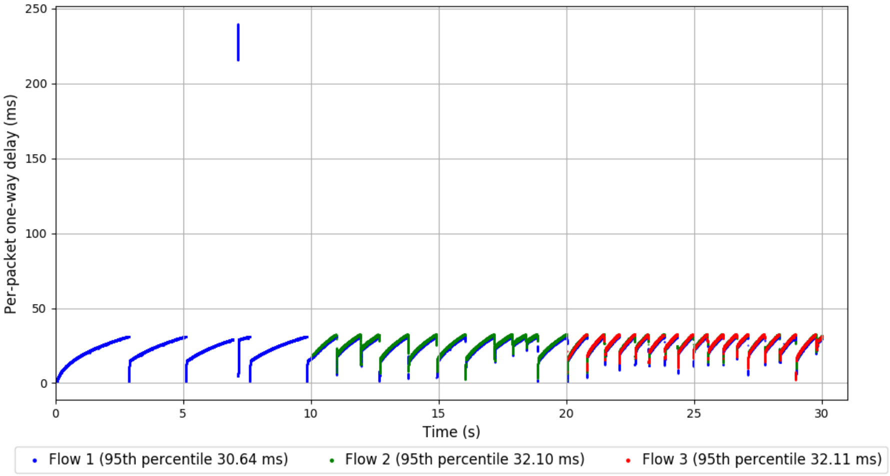




```
Run 5: Statistics of LEDBAT

Start at: 2019-01-03 01:41:10
End at: 2019-01-03 01:41:40
Local clock offset: -6.455 ms
Remote clock offset: -0.06 ms

# Below is generated by plot.py at 2019-01-03 02:00:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.73 Mbit/s
95th percentile per-packet one-way delay: 31.517 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 55.69 Mbit/s
95th percentile per-packet one-way delay: 30.637 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 43.92 Mbit/s
95th percentile per-packet one-way delay: 32.099 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 35.47 Mbit/s
95th percentile per-packet one-way delay: 32.110 ms
Loss rate: 0.08%
```

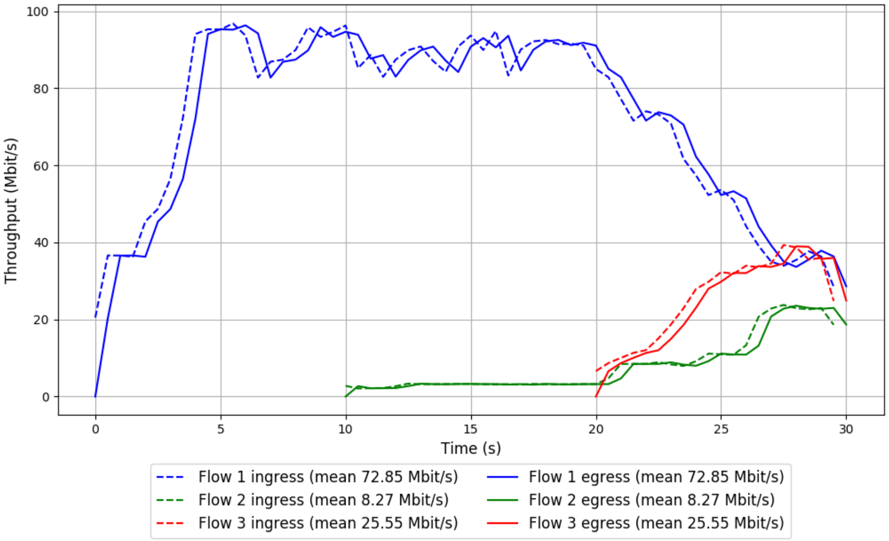
Run 5: Report of LEDBAT — Data Link

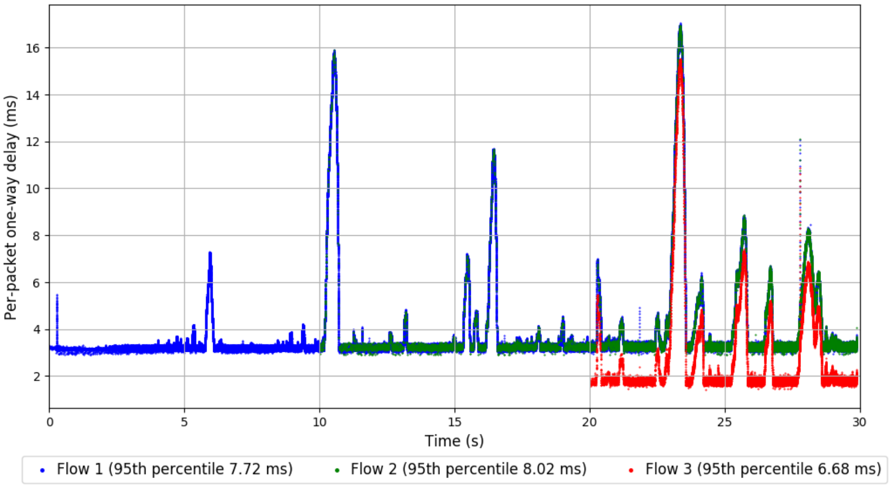




```
Run 1: Statistics of PCC-Allegro

Start at: 2019-01-03 00:12:28
End at: 2019-01-03 00:12:58
Local clock offset: -2.864 ms
Remote clock offset: -0.691 ms

# Below is generated by plot.py at 2019-01-03 02:00:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.78 Mbit/s
95th percentile per-packet one-way delay: 7.644 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 72.85 Mbit/s
95th percentile per-packet one-way delay: 7.725 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 8.27 Mbit/s
95th percentile per-packet one-way delay: 8.022 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 25.55 Mbit/s
95th percentile per-packet one-way delay: 6.678 ms
Loss rate: 0.00%
```

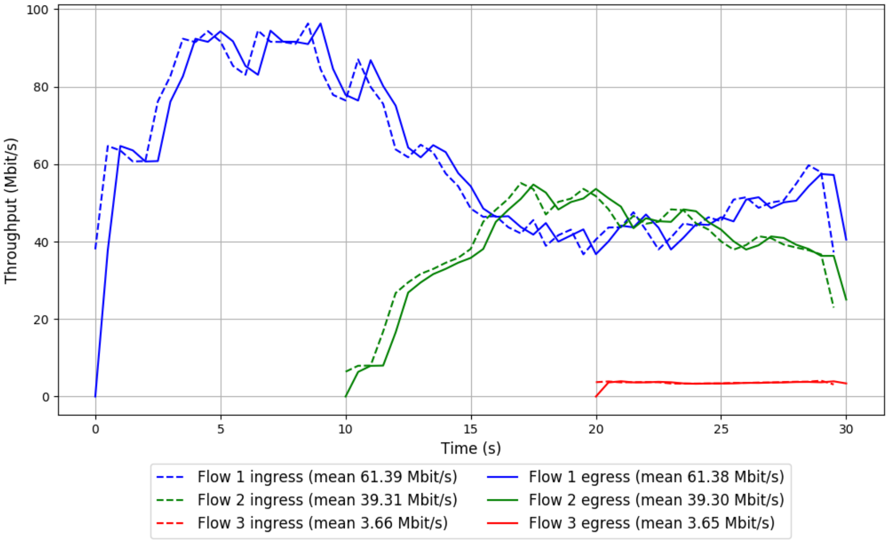
Run 1: Report of PCC-Allegro — Data Link

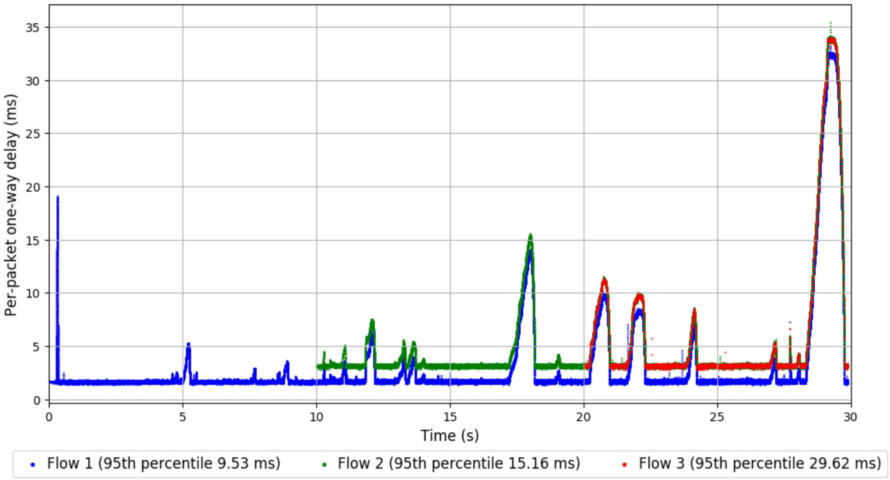




```
Run 2: Statistics of PCC-Allegro

Start at: 2019-01-03 00:34:05
End at: 2019-01-03 00:34:35
Local clock offset: -3.446 ms
Remote clock offset: -0.482 ms

# Below is generated by plot.py at 2019-01-03 02:00:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 88.72 Mbit/s
95th percentile per-packet one-way delay: 12.383 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 61.38 Mbit/s
95th percentile per-packet one-way delay: 9.527 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 39.30 Mbit/s
95th percentile per-packet one-way delay: 15.165 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 3.65 Mbit/s
95th percentile per-packet one-way delay: 29.623 ms
Loss rate: 0.20%
```

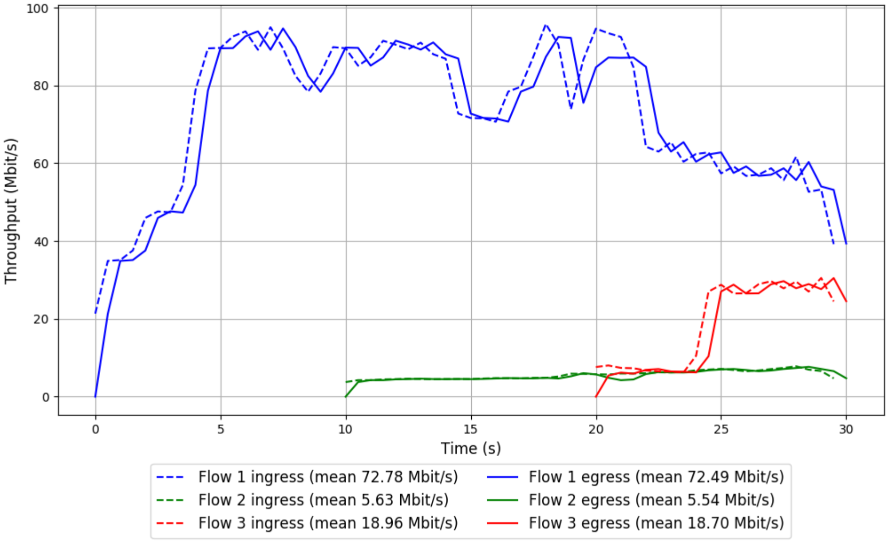
Run 2: Report of PCC-Allegro — Data Link

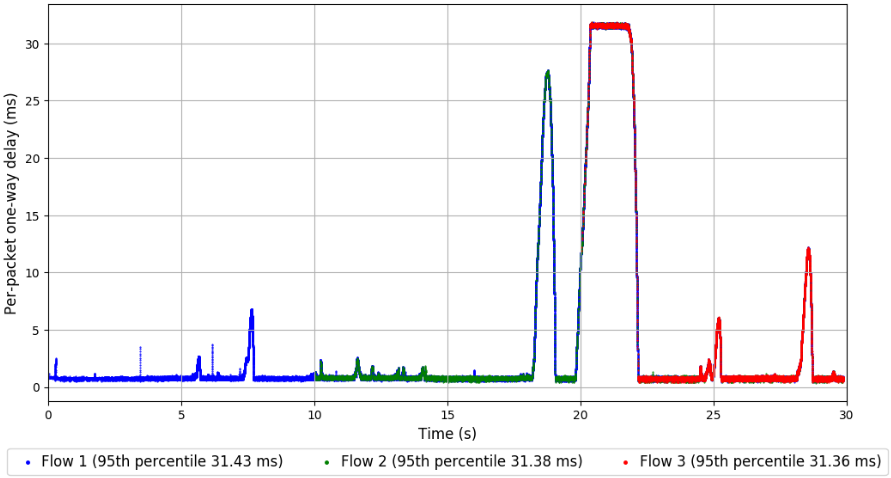




```
Run 3: Statistics of PCC-Allegro

Start at: 2019-01-03 00:55:42
End at: 2019-01-03 00:56:12
Local clock offset: -3.574 ms
Remote clock offset: -0.321 ms

# Below is generated by plot.py at 2019-01-03 02:00:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 82.33 Mbit/s
95th percentile per-packet one-way delay: 31.421 ms
Loss rate: 0.54%
-- Flow 1:
Average throughput: 72.49 Mbit/s
95th percentile per-packet one-way delay: 31.426 ms
Loss rate: 0.40%
-- Flow 2:
Average throughput: 5.54 Mbit/s
95th percentile per-packet one-way delay: 31.376 ms
Loss rate: 1.73%
-- Flow 3:
Average throughput: 18.70 Mbit/s
95th percentile per-packet one-way delay: 31.363 ms
Loss rate: 1.48%
```

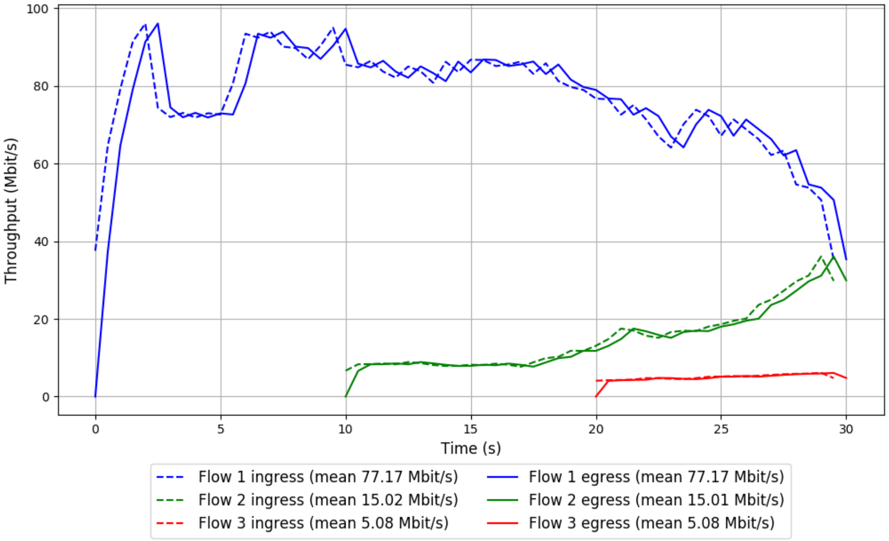
Run 3: Report of PCC-Allegro — Data Link

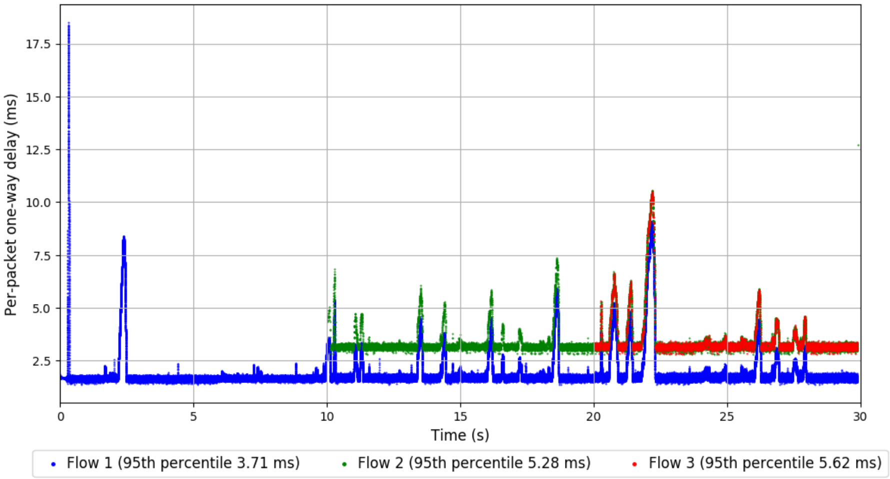




```
Run 4: Statistics of PCC-Allegro

Start at: 2019-01-03 01:17:18
End at: 2019-01-03 01:17:48
Local clock offset: -7.315 ms
Remote clock offset: -0.152 ms

# Below is generated by plot.py at 2019-01-03 02:00:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 88.80 Mbit/s
95th percentile per-packet one-way delay: 4.054 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 77.17 Mbit/s
95th percentile per-packet one-way delay: 3.712 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 15.01 Mbit/s
95th percentile per-packet one-way delay: 5.283 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 5.08 Mbit/s
95th percentile per-packet one-way delay: 5.622 ms
Loss rate: 0.02%
```

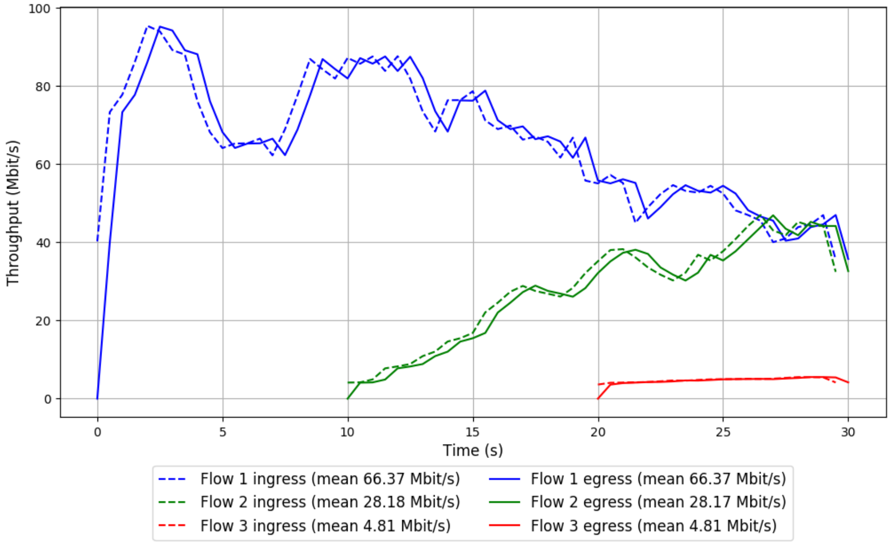
Run 4: Report of PCC-Allegro — Data Link

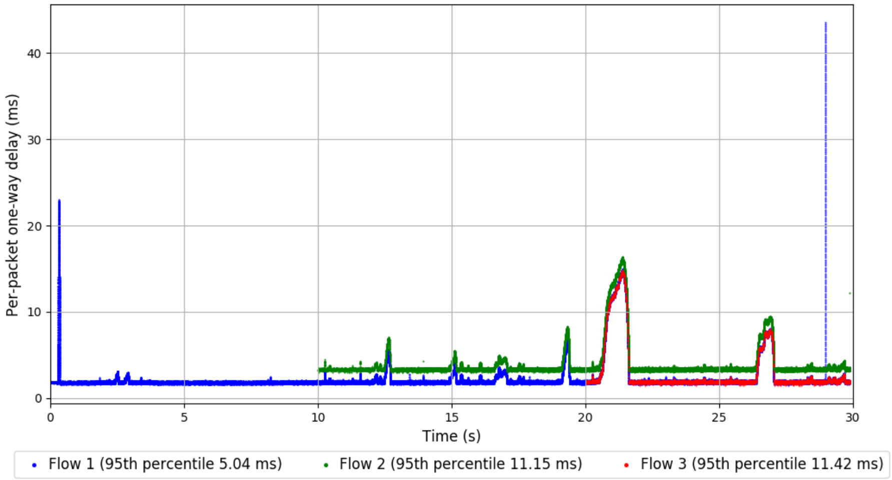




```
Run 5: Statistics of PCC-Allegro

Start at: 2019-01-03 01:38:55
End at: 2019-01-03 01:39:25
Local clock offset: -7.248 ms
Remote clock offset: -0.004 ms

# Below is generated by plot.py at 2019-01-03 02:00:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.67 Mbit/s
95th percentile per-packet one-way delay: 7.170 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 66.37 Mbit/s
95th percentile per-packet one-way delay: 5.043 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 28.17 Mbit/s
95th percentile per-packet one-way delay: 11.151 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 4.81 Mbit/s
95th percentile per-packet one-way delay: 11.417 ms
Loss rate: 0.00%
```

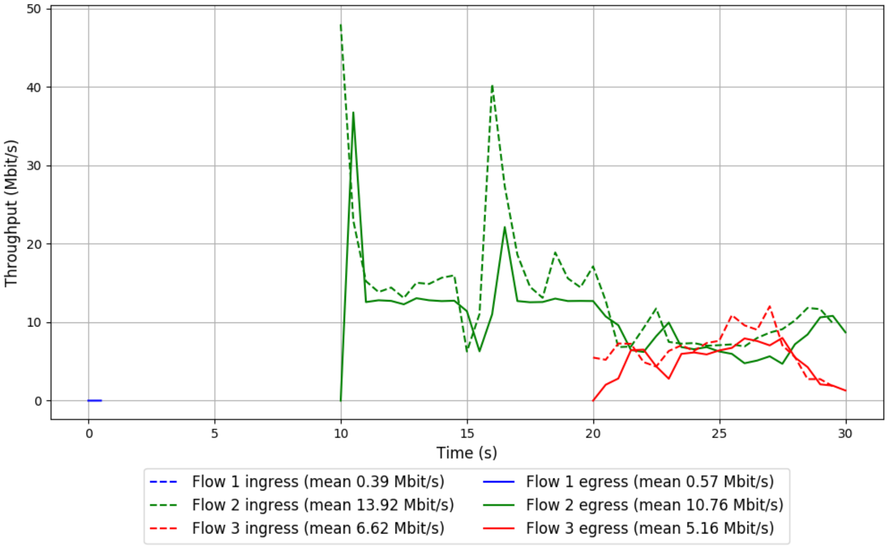
Run 5: Report of PCC-Allegro — Data Link

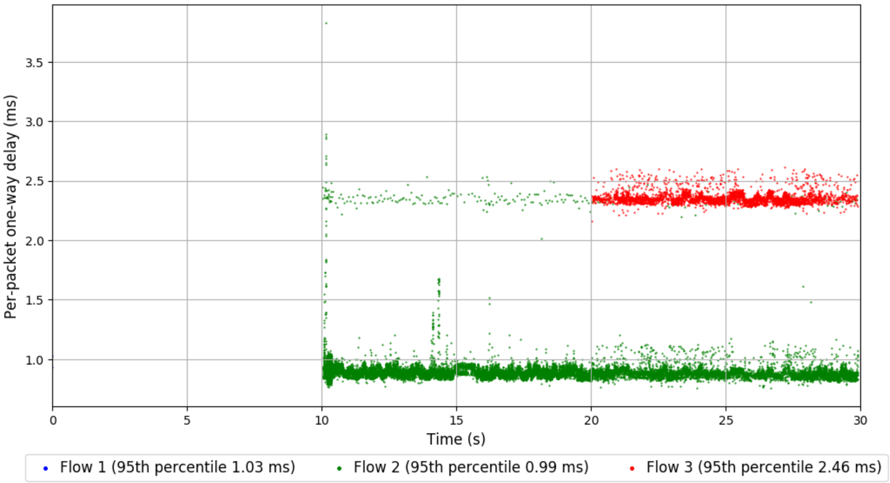




```
Run 1: Statistics of PCC-Expr

Start at: 2019-01-03 00:24:58
End at: 2019-01-03 00:25:28
Local clock offset: -2.121 ms
Remote clock offset: -0.484 ms

# Below is generated by plot.py at 2019-01-03 02:00:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.86 Mbit/s
95th percentile per-packet one-way delay: 2.370 ms
Loss rate: 22.59%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 1.030 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 10.76 Mbit/s
95th percentile per-packet one-way delay: 0.987 ms
Loss rate: 22.69%
-- Flow 3:
Average throughput: 5.16 Mbit/s
95th percentile per-packet one-way delay: 2.455 ms
Loss rate: 22.15%
```

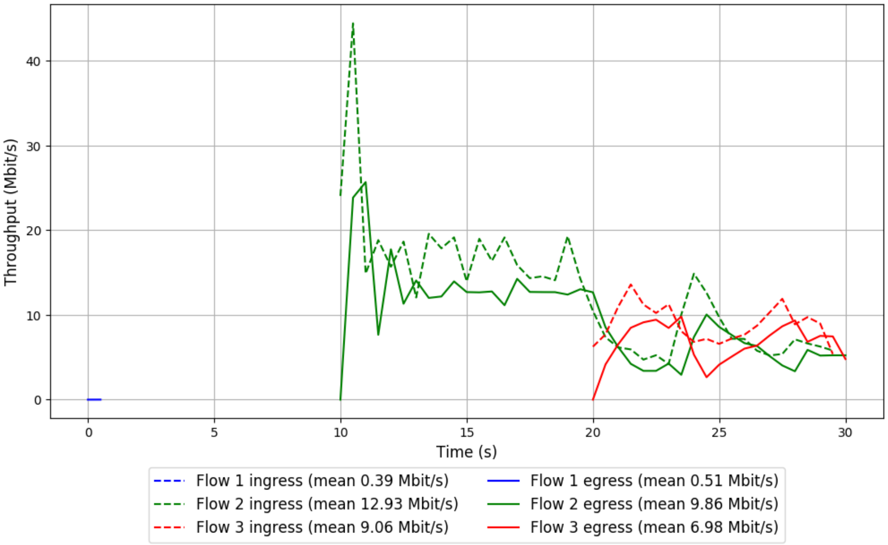
Run 1: Report of PCC-Expr — Data Link

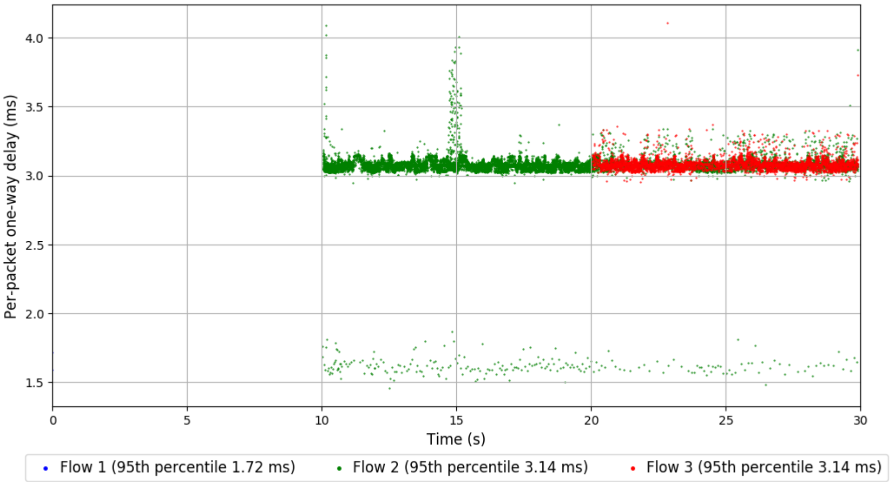




```
Run 2: Statistics of PCC-Expr

Start at: 2019-01-03 00:46:37
End at: 2019-01-03 00:47:07
Local clock offset: -3.799 ms
Remote clock offset: -0.394 ms

# Below is generated by plot.py at 2019-01-03 02:00:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.86 Mbit/s
95th percentile per-packet one-way delay: 3.138 ms
Loss rate: 23.54%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 1.716 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 9.86 Mbit/s
95th percentile per-packet one-way delay: 3.137 ms
Loss rate: 23.76%
-- Flow 3:
Average throughput: 6.98 Mbit/s
95th percentile per-packet one-way delay: 3.139 ms
Loss rate: 22.91%
```

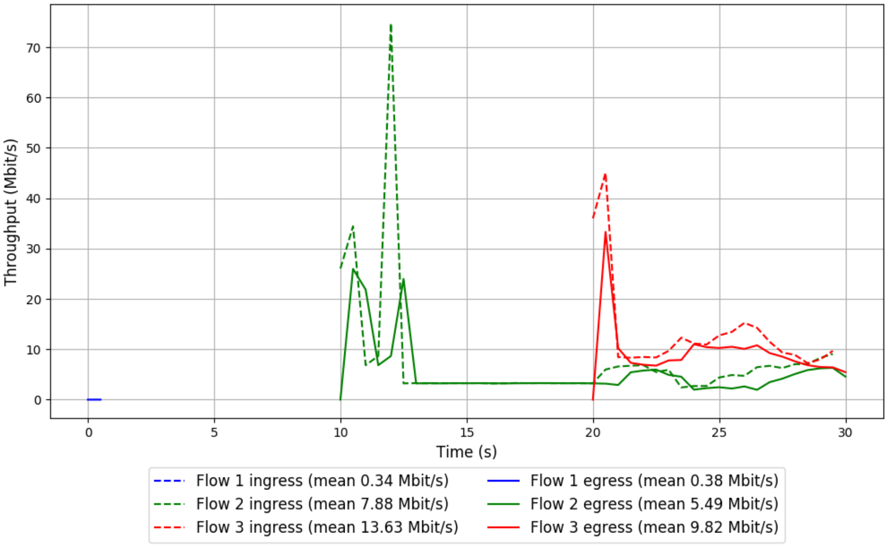
Run 2: Report of PCC-Expr — Data Link

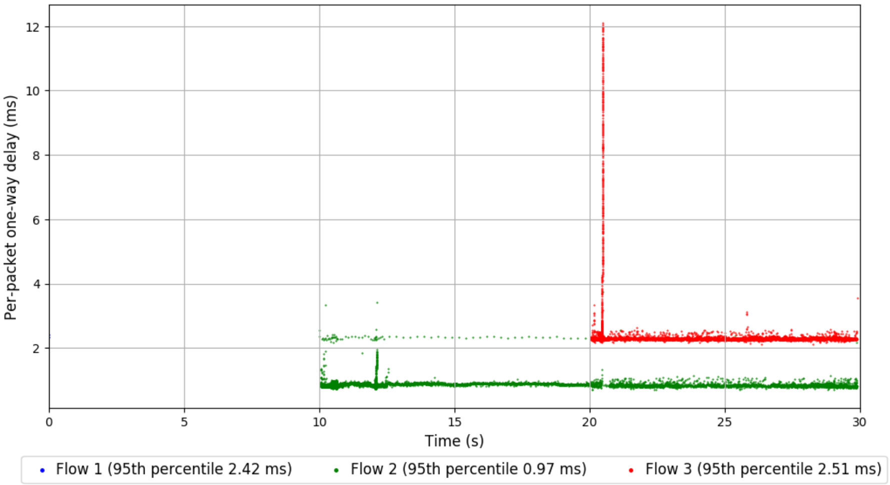




```
Run 3: Statistics of PCC-Expr

Start at: 2019-01-03 01:08:13
End at: 2019-01-03 01:08:43
Local clock offset: -5.809 ms
Remote clock offset: -0.216 ms

# Below is generated by plot.py at 2019-01-03 02:00:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.89 Mbit/s
95th percentile per-packet one-way delay: 2.355 ms
Loss rate: 29.25%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 2.423 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 5.49 Mbit/s
95th percentile per-packet one-way delay: 0.968 ms
Loss rate: 30.35%
-- Flow 3:
Average throughput: 9.82 Mbit/s
95th percentile per-packet one-way delay: 2.512 ms
Loss rate: 27.96%
```

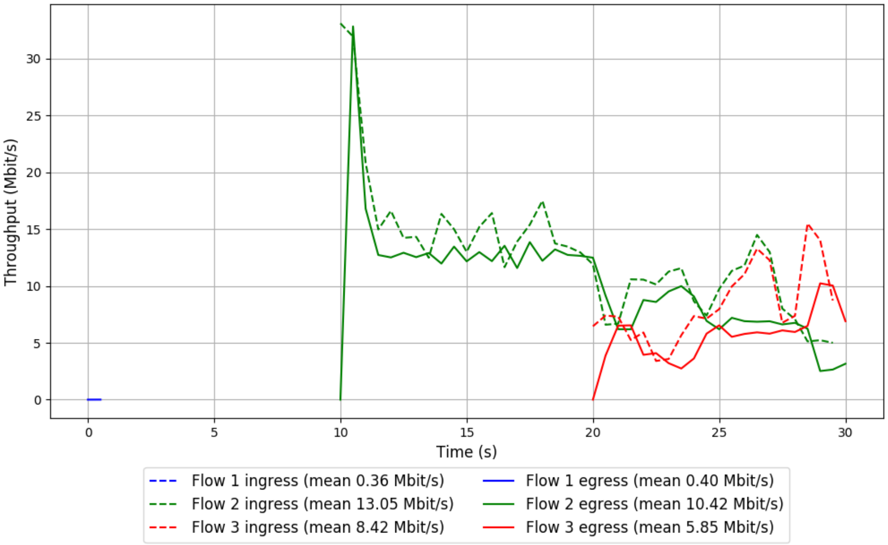
Run 3: Report of PCC-Expr — Data Link

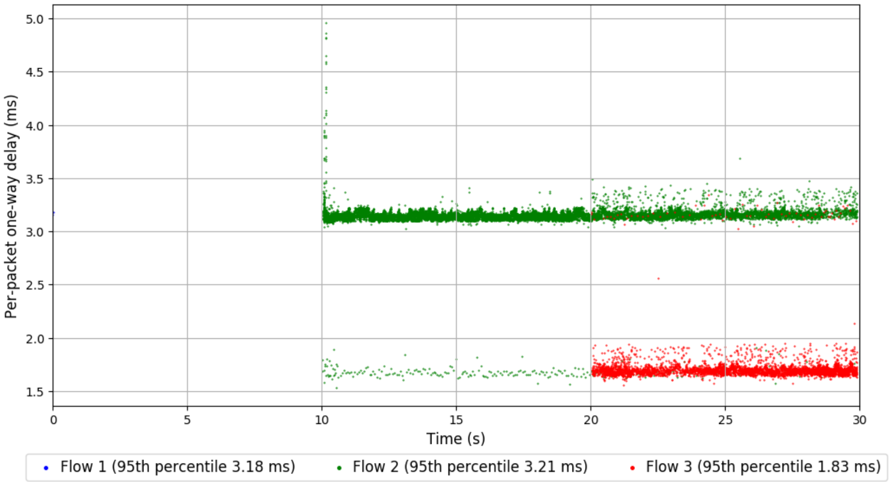




```
Run 4: Statistics of PCC-Expr

Start at: 2019-01-03 01:29:49
End at: 2019-01-03 01:30:19
Local clock offset: -7.357 ms
Remote clock offset: -0.097 ms

# Below is generated by plot.py at 2019-01-03 02:00:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.87 Mbit/s
95th percentile per-packet one-way delay: 3.203 ms
Loss rate: 22.64%
-- Flow 1:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 3.180 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 10.42 Mbit/s
95th percentile per-packet one-way delay: 3.211 ms
Loss rate: 20.12%
-- Flow 3:
Average throughput: 5.85 Mbit/s
95th percentile per-packet one-way delay: 1.828 ms
Loss rate: 30.49%
```

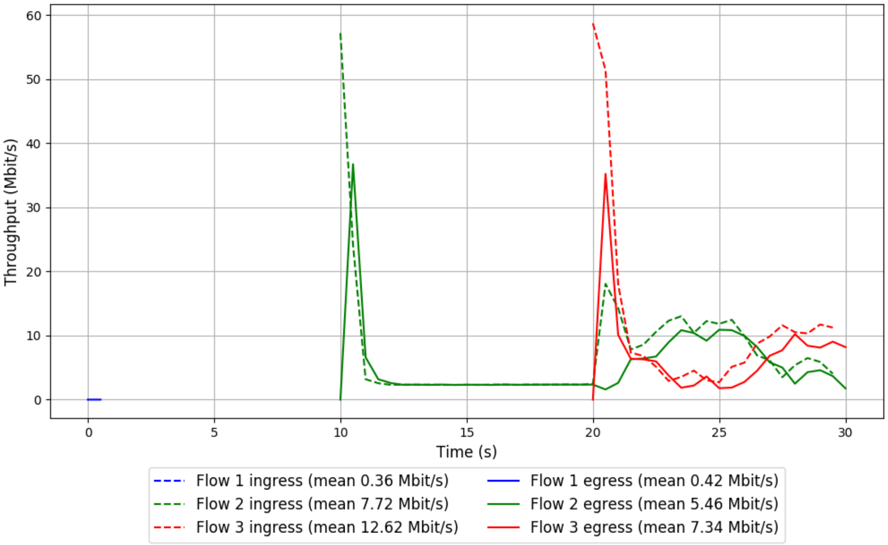
Run 4: Report of PCC-Expr — Data Link

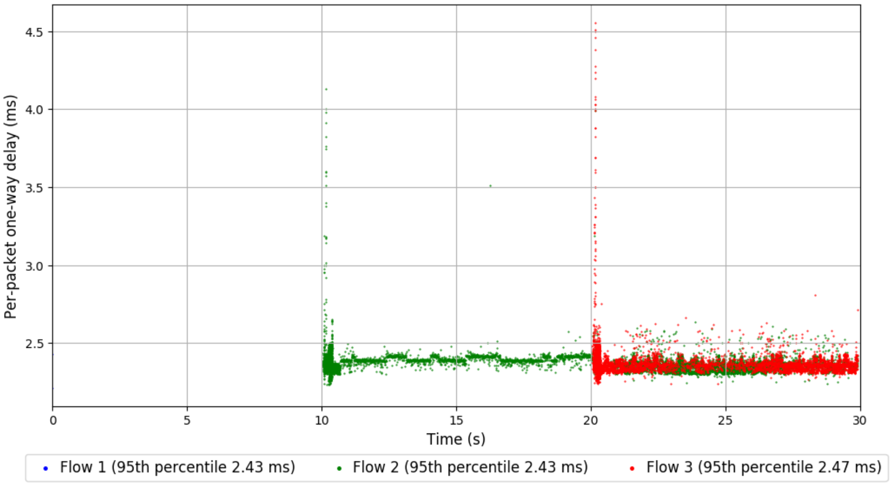




```
Run 5: Statistics of PCC-Expr

Start at: 2019-01-03 01:51:26
End at: 2019-01-03 01:51:56
Local clock offset: -6.689 ms
Remote clock offset: -0.11 ms

# Below is generated by plot.py at 2019-01-03 02:00:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.06 Mbit/s
95th percentile per-packet one-way delay: 2.450 ms
Loss rate: 34.88%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 2.430 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 5.46 Mbit/s
95th percentile per-packet one-way delay: 2.434 ms
Loss rate: 29.25%
-- Flow 3:
Average throughput: 7.34 Mbit/s
95th percentile per-packet one-way delay: 2.474 ms
Loss rate: 41.81%
```

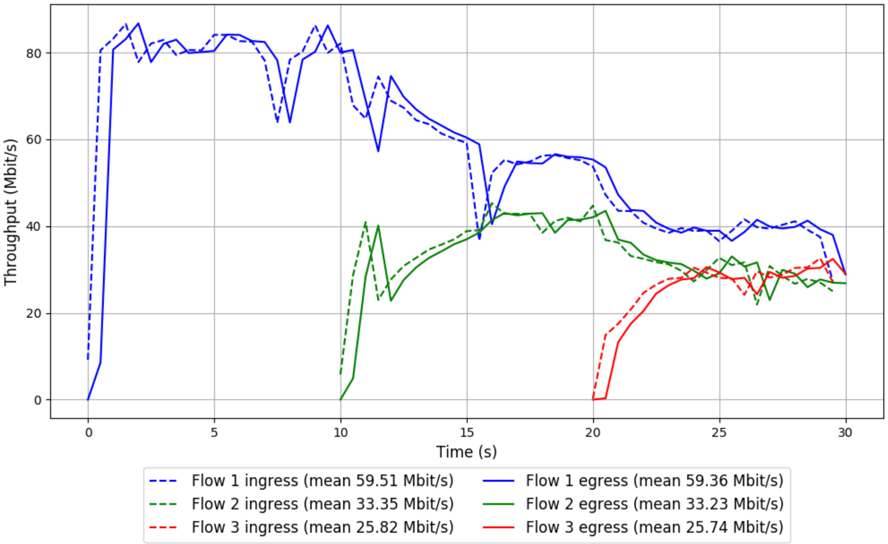
Run 5: Report of PCC-Expr — Data Link

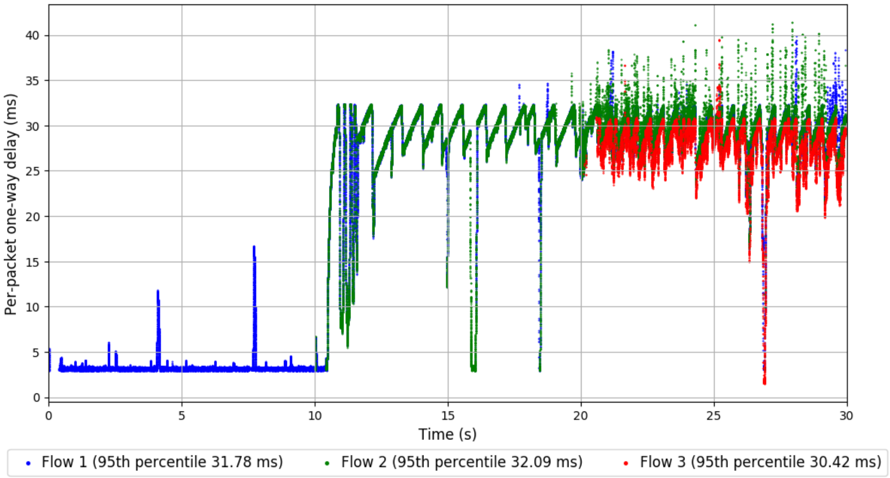




```
Run 1: Statistics of QUIC Cubic

Start at: 2019-01-03 00:19:20
End at: 2019-01-03 00:19:50
Local clock offset: -2.835 ms
Remote clock offset: -0.653 ms

# Below is generated by plot.py at 2019-01-03 02:01:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.94 Mbit/s
95th percentile per-packet one-way delay: 31.865 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 59.36 Mbit/s
95th percentile per-packet one-way delay: 31.782 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 33.23 Mbit/s
95th percentile per-packet one-way delay: 32.089 ms
Loss rate: 0.18%
-- Flow 3:
Average throughput: 25.74 Mbit/s
95th percentile per-packet one-way delay: 30.421 ms
Loss rate: 0.28%
```

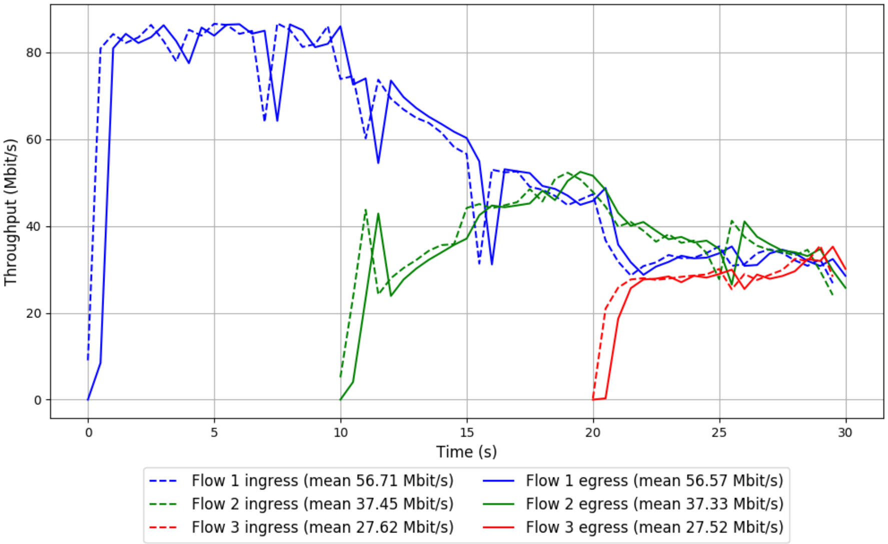
Run 1: Report of QUIC Cubic — Data Link

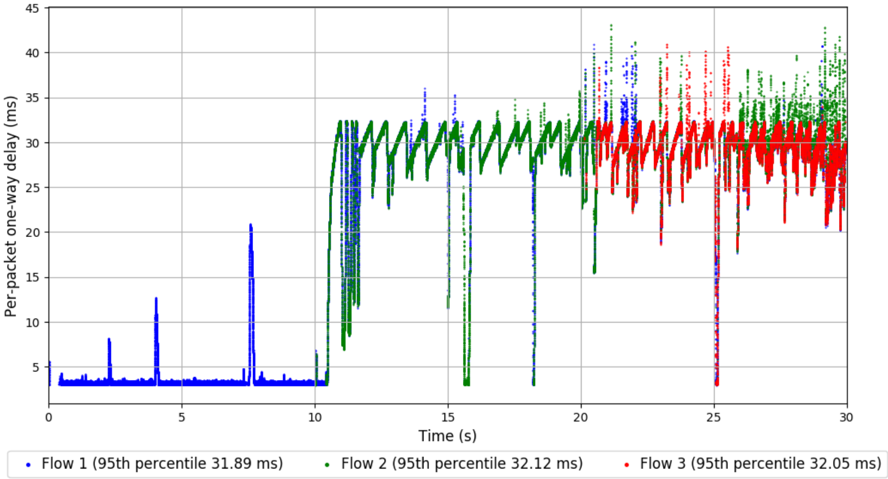




```
Run 2: Statistics of QUIC Cubic

Start at: 2019-01-03 00:40:58
End at: 2019-01-03 00:41:28
Local clock offset: -3.656 ms
Remote clock offset: -0.401 ms

# Below is generated by plot.py at 2019-01-03 02:01:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 90.43 Mbit/s
95th percentile per-packet one-way delay: 32.003 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 56.57 Mbit/s
95th percentile per-packet one-way delay: 31.887 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 37.33 Mbit/s
95th percentile per-packet one-way delay: 32.125 ms
Loss rate: 0.18%
-- Flow 3:
Average throughput: 27.52 Mbit/s
95th percentile per-packet one-way delay: 32.055 ms
Loss rate: 0.32%
```

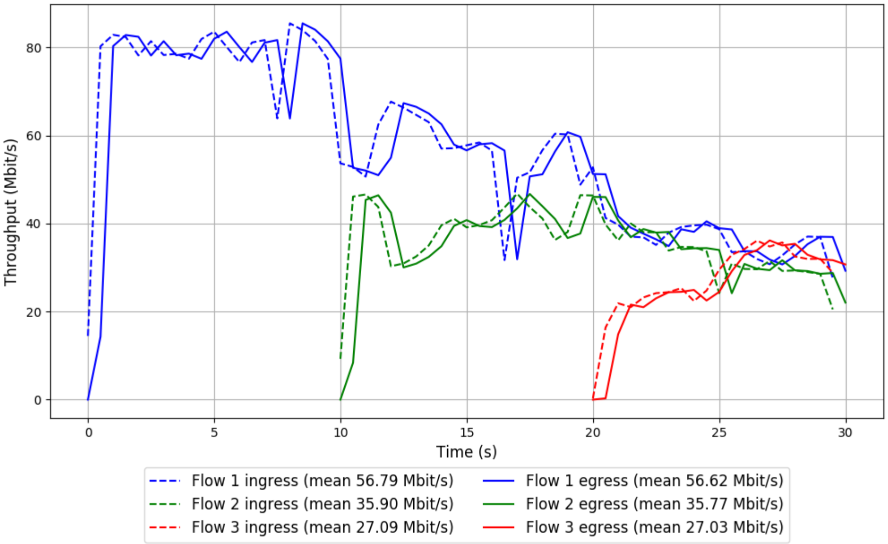
Run 2: Report of QUIC Cubic — Data Link

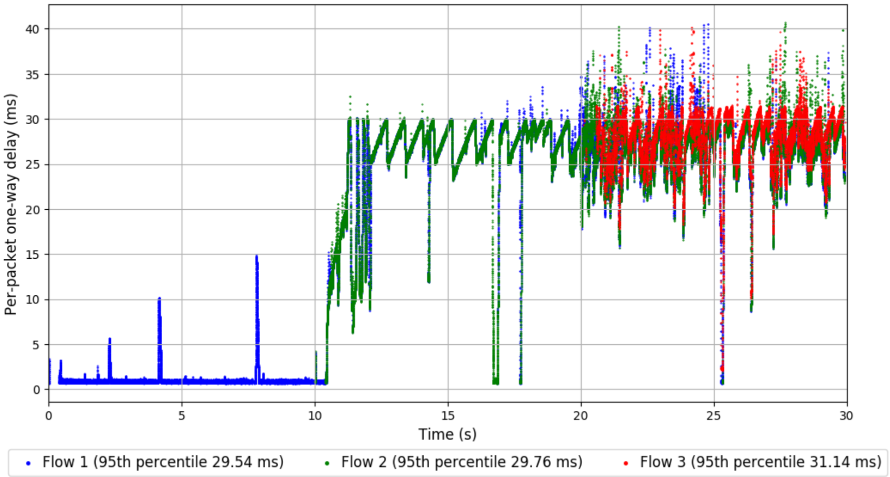




```
Run 3: Statistics of QUIC Cubic

Start at: 2019-01-03 01:02:34
End at: 2019-01-03 01:03:04
Local clock offset: -5.067 ms
Remote clock offset: -0.29 ms

# Below is generated by plot.py at 2019-01-03 02:01:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.29 Mbit/s
95th percentile per-packet one-way delay: 29.832 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 56.62 Mbit/s
95th percentile per-packet one-way delay: 29.538 ms
Loss rate: 0.22%
-- Flow 2:
Average throughput: 35.77 Mbit/s
95th percentile per-packet one-way delay: 29.760 ms
Loss rate: 0.24%
-- Flow 3:
Average throughput: 27.03 Mbit/s
95th percentile per-packet one-way delay: 31.145 ms
Loss rate: 0.23%
```

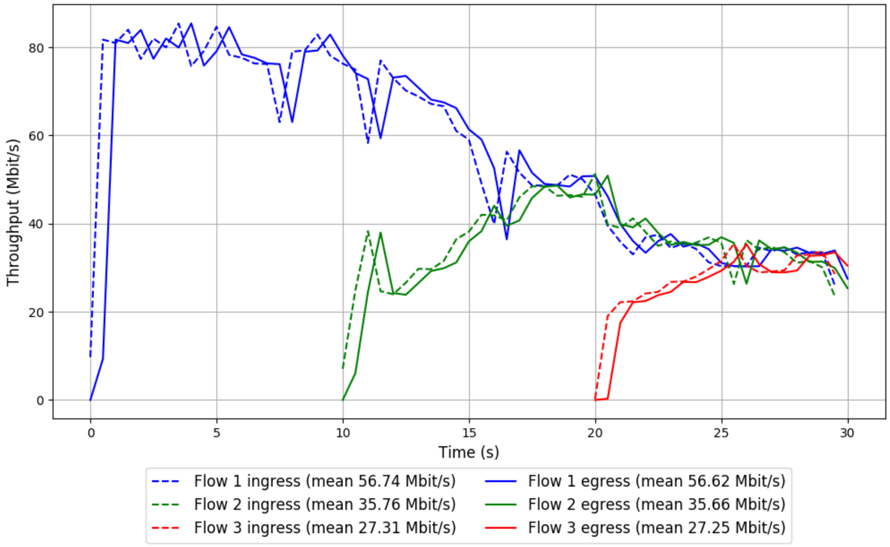
Run 3: Report of QUIC Cubic — Data Link

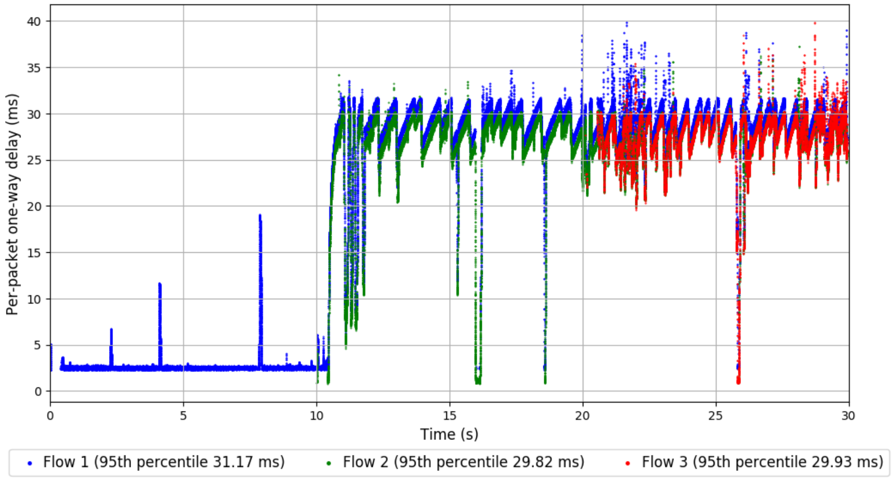




```
Run 4: Statistics of QUIC Cubic

Start at: 2019-01-03 01:24:11
End at: 2019-01-03 01:24:41
Local clock offset: -6.999 ms
Remote clock offset: -0.092 ms

# Below is generated by plot.py at 2019-01-03 02:01:21
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.28 Mbit/s
95th percentile per-packet one-way delay: 30.965 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 56.62 Mbit/s
95th percentile per-packet one-way delay: 31.166 ms
Loss rate: 0.14%
-- Flow 2:
Average throughput: 35.66 Mbit/s
95th percentile per-packet one-way delay: 29.822 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 27.25 Mbit/s
95th percentile per-packet one-way delay: 29.934 ms
Loss rate: 0.22%
```

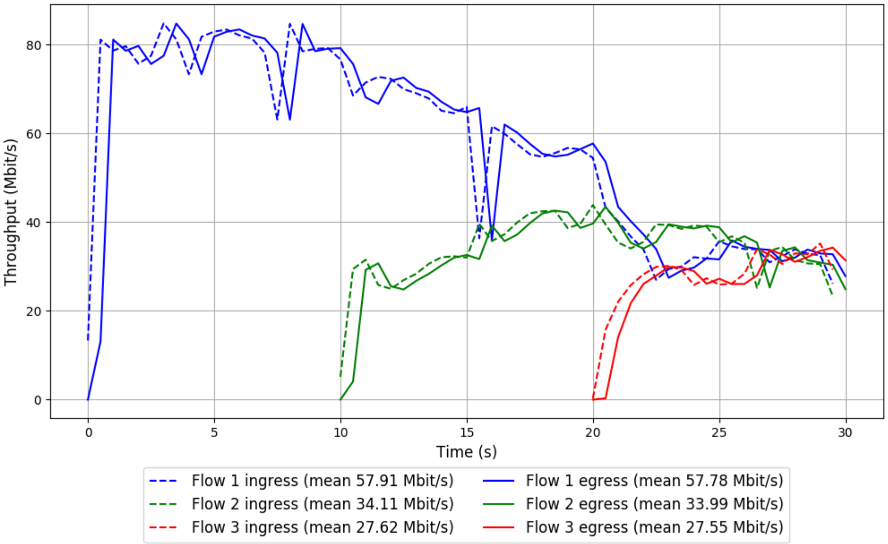
Run 4: Report of QUIC Cubic — Data Link

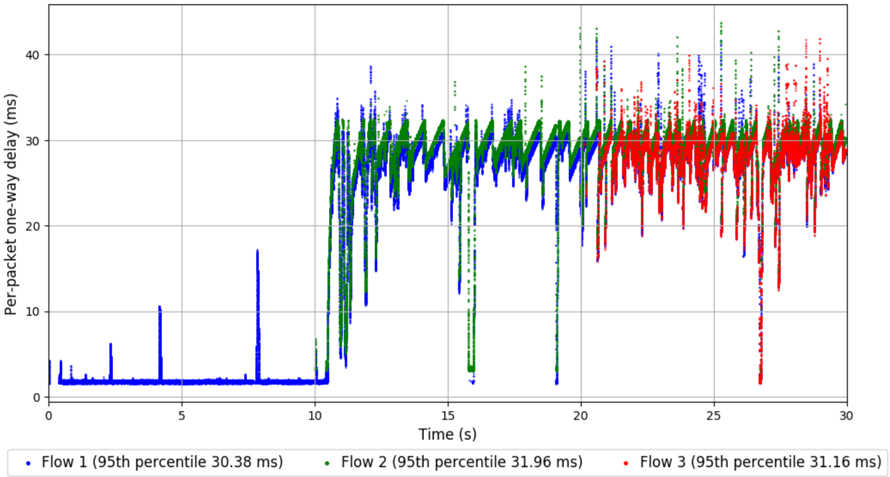




```
Run 5: Statistics of QUIC Cubic

Start at: 2019-01-03 01:45:47
End at: 2019-01-03 01:46:17
Local clock offset: -7.26 ms
Remote clock offset: 0.041 ms

# Below is generated by plot.py at 2019-01-03 02:01:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.44 Mbit/s
95th percentile per-packet one-way delay: 31.403 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 57.78 Mbit/s
95th percentile per-packet one-way delay: 30.379 ms
Loss rate: 0.14%
-- Flow 2:
Average throughput: 33.99 Mbit/s
95th percentile per-packet one-way delay: 31.960 ms
Loss rate: 0.21%
-- Flow 3:
Average throughput: 27.55 Mbit/s
95th percentile per-packet one-way delay: 31.155 ms
Loss rate: 0.25%
```

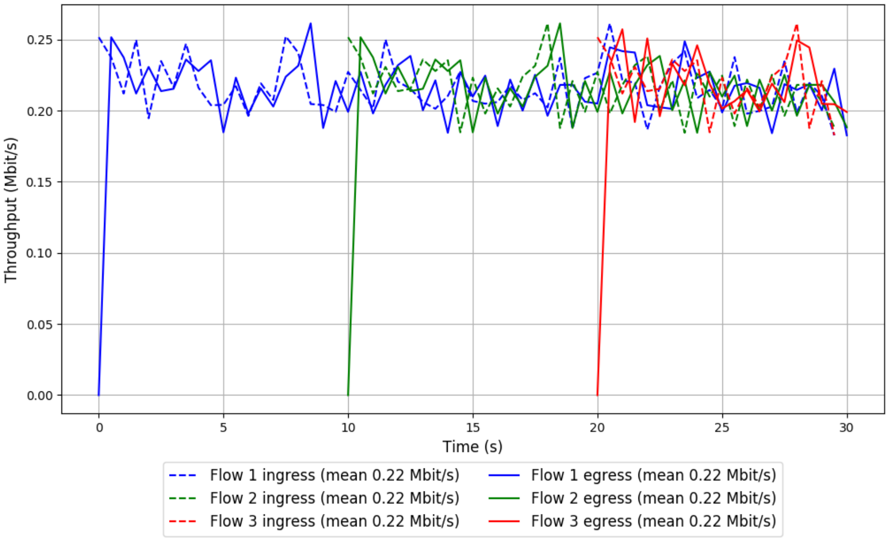
Run 5: Report of QUIC Cubic — Data Link

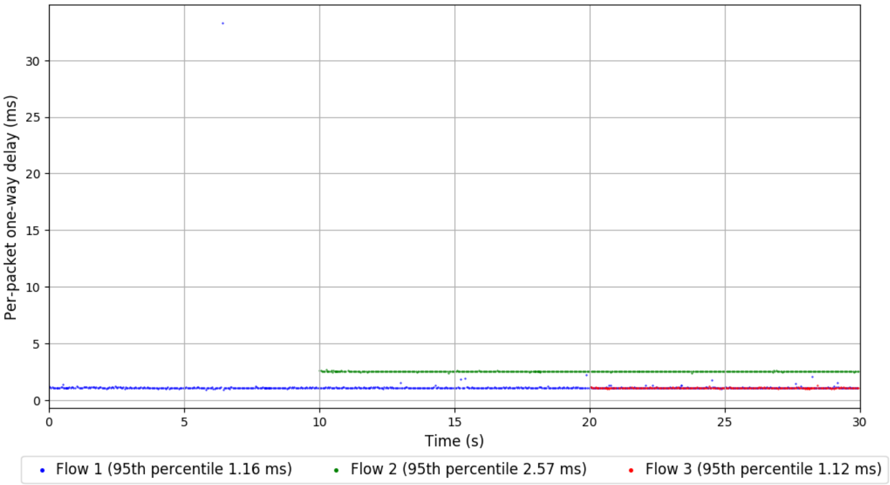




```
Run 1: Statistics of SCReAM

Start at: 2019-01-03 00:21:39
End at: 2019-01-03 00:22:09
Local clock offset: -2.164 ms
Remote clock offset: -0.519 ms

# Below is generated by plot.py at 2019-01-03 02:01:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 2.561 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.156 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 2.572 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.116 ms
Loss rate: 0.00%
```

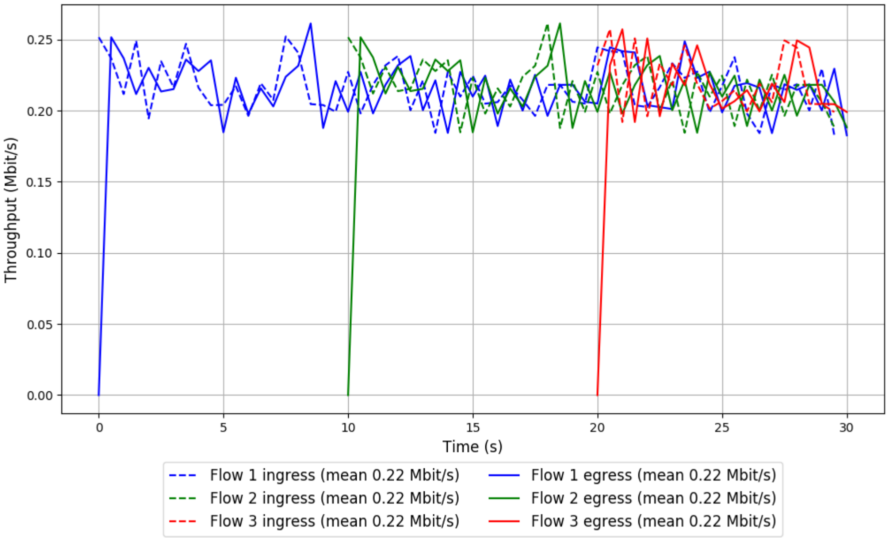
Run 1: Report of SCReAM — Data Link

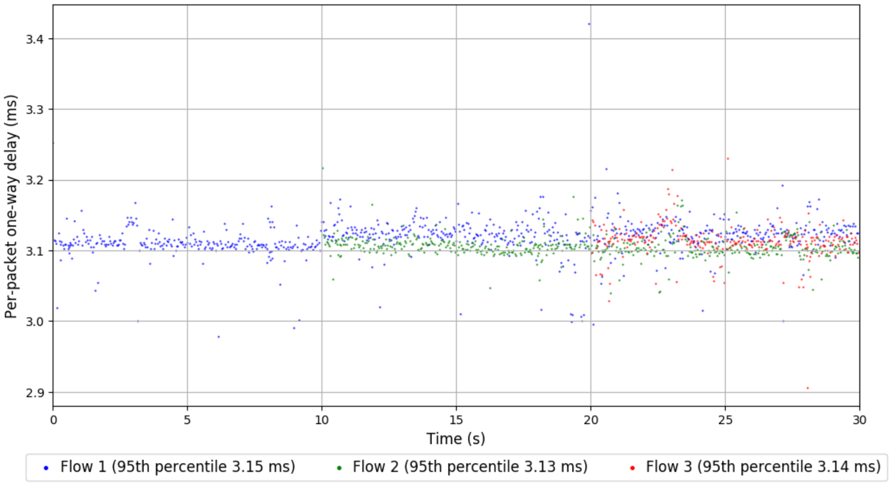




```
Run 2: Statistics of SCReAM

Start at: 2019-01-03 00:43:18
End at: 2019-01-03 00:43:48
Local clock offset: -3.719 ms
Remote clock offset: -0.402 ms

# Below is generated by plot.py at 2019-01-03 02:01:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 3.145 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 3.151 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 3.128 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 3.144 ms
Loss rate: 0.00%
```

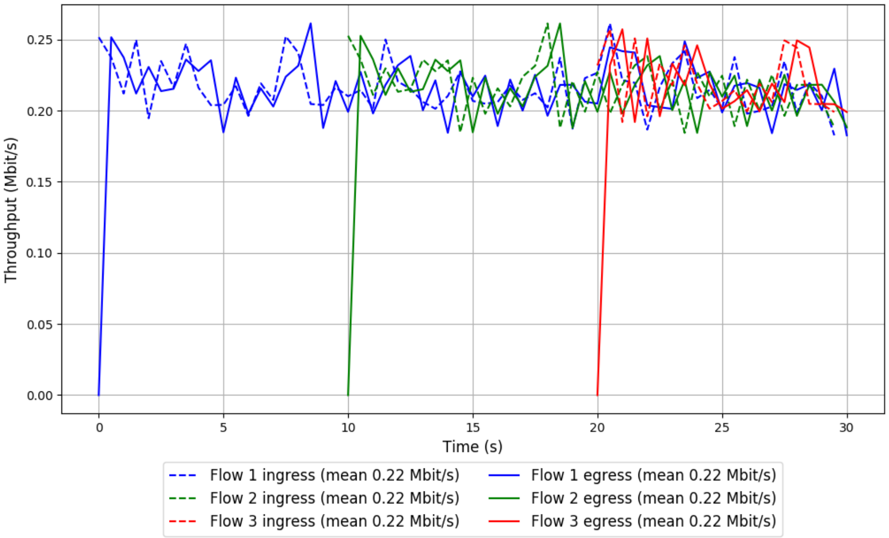
Run 2: Report of SCReAM — Data Link

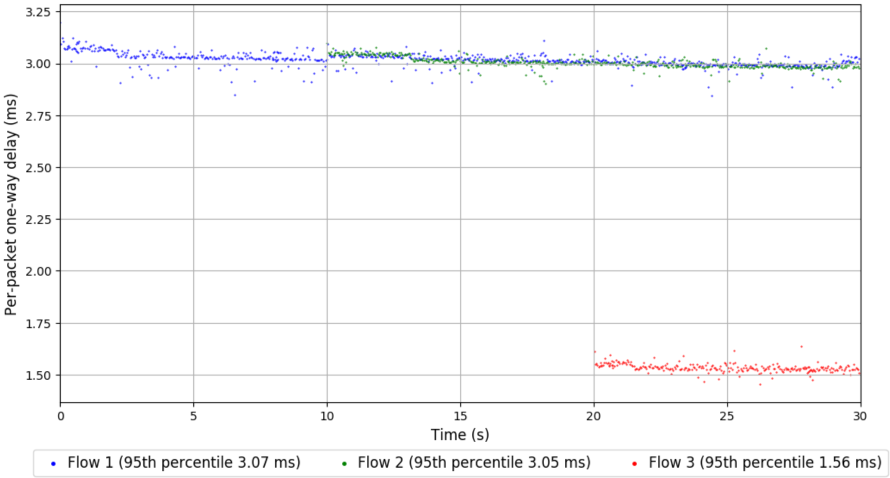




```
Run 3: Statistics of SCReAM

Start at: 2019-01-03 01:04:53
End at: 2019-01-03 01:05:23
Local clock offset: -6.153 ms
Remote clock offset: -0.283 ms

# Below is generated by plot.py at 2019-01-03 02:01:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 3.060 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 3.071 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 3.050 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.562 ms
Loss rate: 0.00%
```

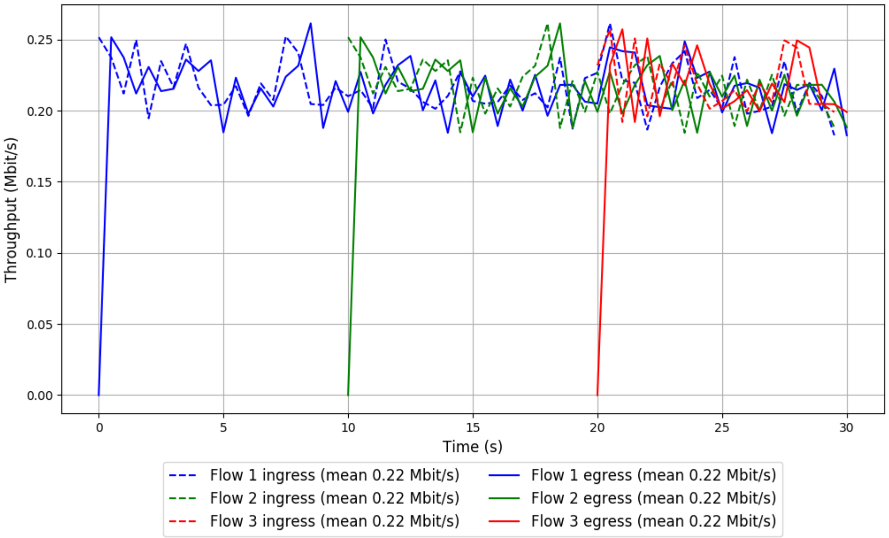
Run 3: Report of SCReAM — Data Link

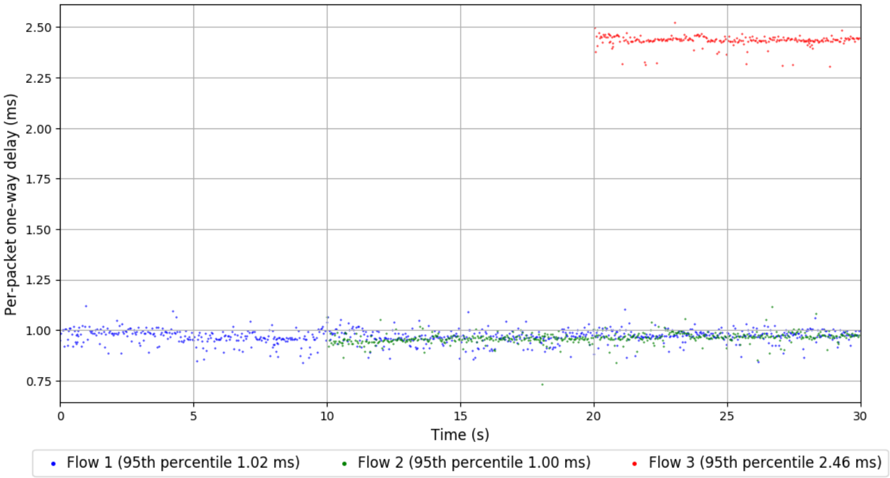




```
Run 4: Statistics of SCReAM

Start at: 2019-01-03 01:26:30
End at: 2019-01-03 01:27:00
Local clock offset: -6.86 ms
Remote clock offset: -0.19 ms

# Below is generated by plot.py at 2019-01-03 02:01:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 2.443 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.018 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 0.999 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 2.463 ms
Loss rate: 0.00%
```

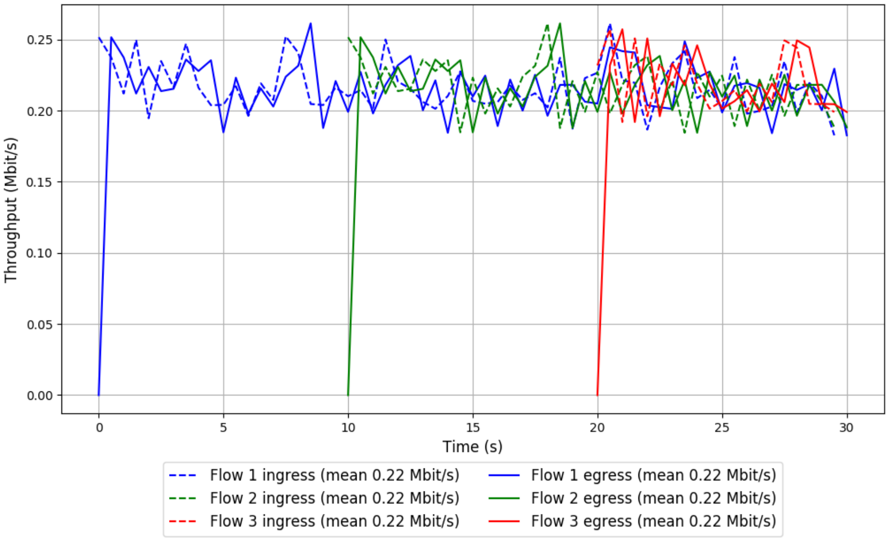
Run 4: Report of SCReAM — Data Link

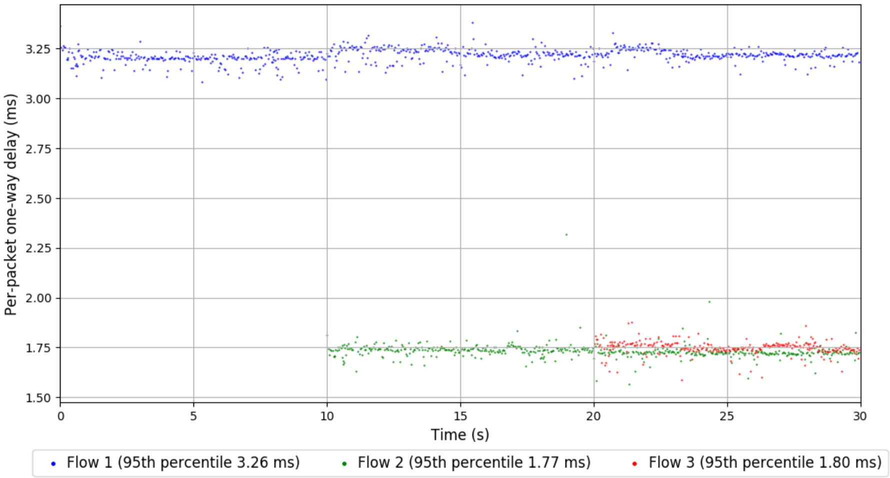




```
Run 5: Statistics of SCReAM

Start at: 2019-01-03 01:48:07
End at: 2019-01-03 01:48:37
Local clock offset: -7.314 ms
Remote clock offset: 0.056 ms

# Below is generated by plot.py at 2019-01-03 02:01:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 3.252 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 3.261 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.774 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.803 ms
Loss rate: 0.00%
```

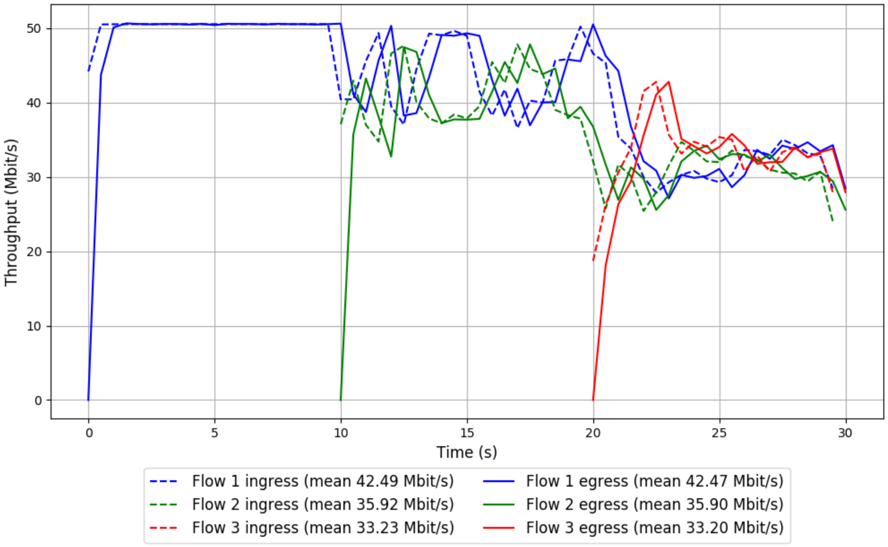
Run 5: Report of SCReAM — Data Link

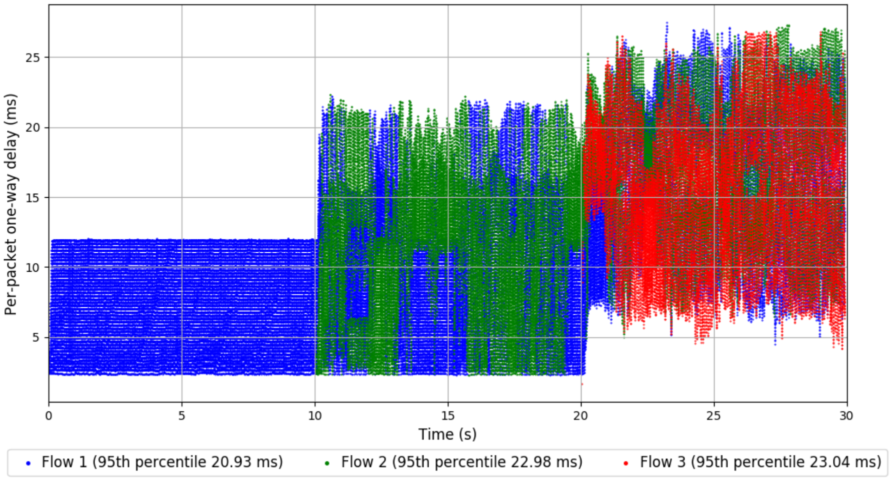




```
Run 1: Statistics of Sprout

Start at: 2019-01-03 00:23:51
End at: 2019-01-03 00:24:21
Local clock offset: -2.084 ms
Remote clock offset: -0.523 ms

# Below is generated by plot.py at 2019-01-03 02:01:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 77.32 Mbit/s
95th percentile per-packet one-way delay: 22.136 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 42.47 Mbit/s
95th percentile per-packet one-way delay: 20.934 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 35.90 Mbit/s
95th percentile per-packet one-way delay: 22.981 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 33.20 Mbit/s
95th percentile per-packet one-way delay: 23.036 ms
Loss rate: 0.00%
```

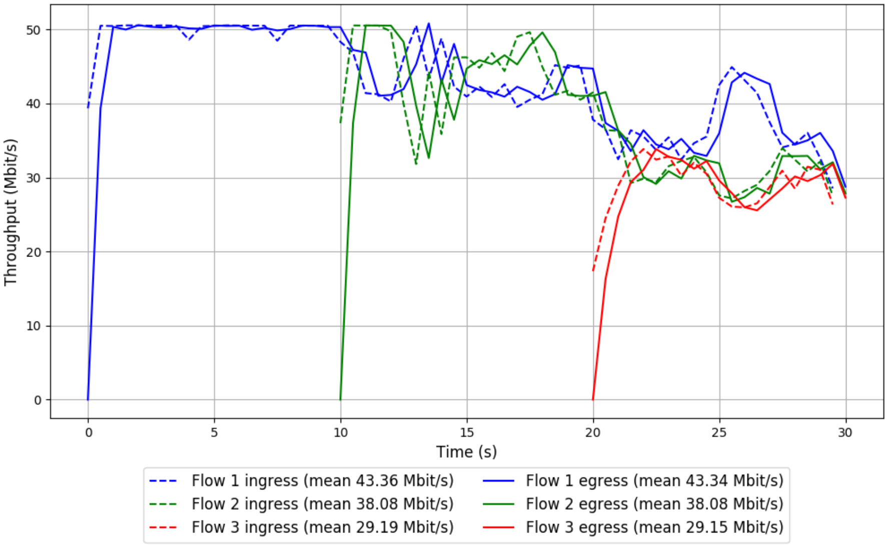
Run 1: Report of Sprout — Data Link

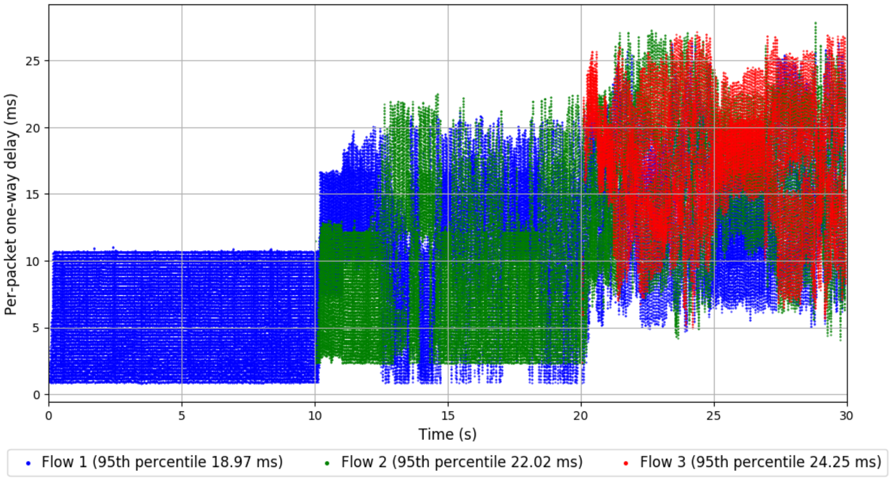




```
Run 2: Statistics of Sprout

Start at: 2019-01-03 00:45:29
End at: 2019-01-03 00:45:59
Local clock offset: -3.019 ms
Remote clock offset: -0.348 ms

# Below is generated by plot.py at 2019-01-03 02:01:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 78.29 Mbit/s
95th percentile per-packet one-way delay: 21.718 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 43.34 Mbit/s
95th percentile per-packet one-way delay: 18.970 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 38.08 Mbit/s
95th percentile per-packet one-way delay: 22.018 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 29.15 Mbit/s
95th percentile per-packet one-way delay: 24.245 ms
Loss rate: 0.00%
```

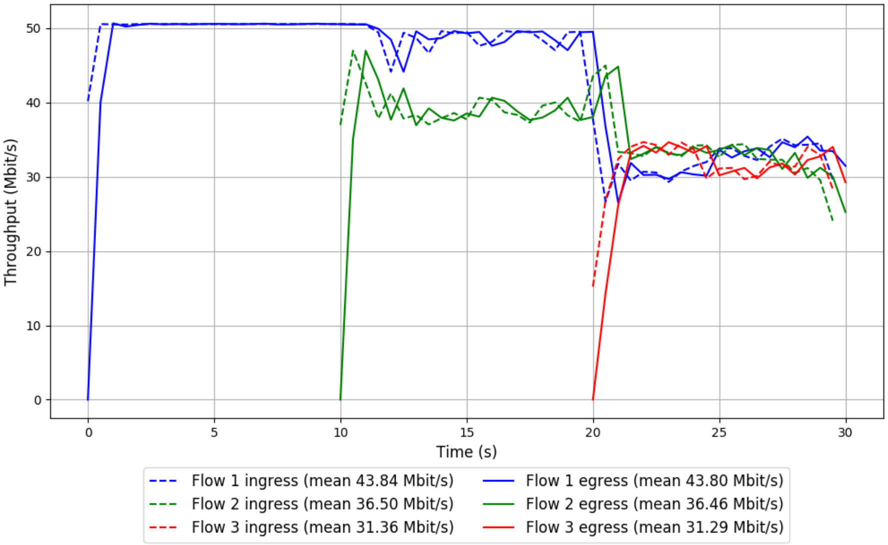
Run 2: Report of Sprout — Data Link

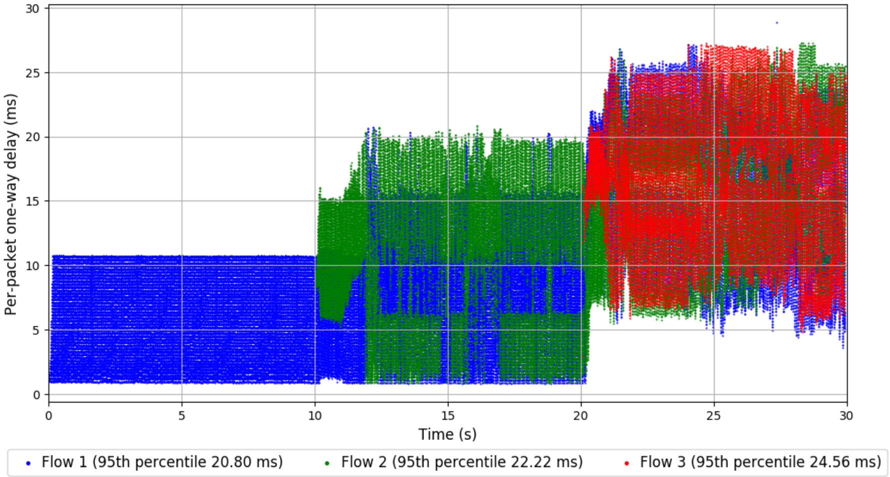




```
Run 3: Statistics of Sprout

Start at: 2019-01-03 01:07:05
End at: 2019-01-03 01:07:35
Local clock offset: -5.723 ms
Remote clock offset: -0.162 ms

# Below is generated by plot.py at 2019-01-03 02:01:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 78.42 Mbit/s
95th percentile per-packet one-way delay: 22.294 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 43.80 Mbit/s
95th percentile per-packet one-way delay: 20.798 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 36.46 Mbit/s
95th percentile per-packet one-way delay: 22.219 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 31.29 Mbit/s
95th percentile per-packet one-way delay: 24.560 ms
Loss rate: 0.00%
```

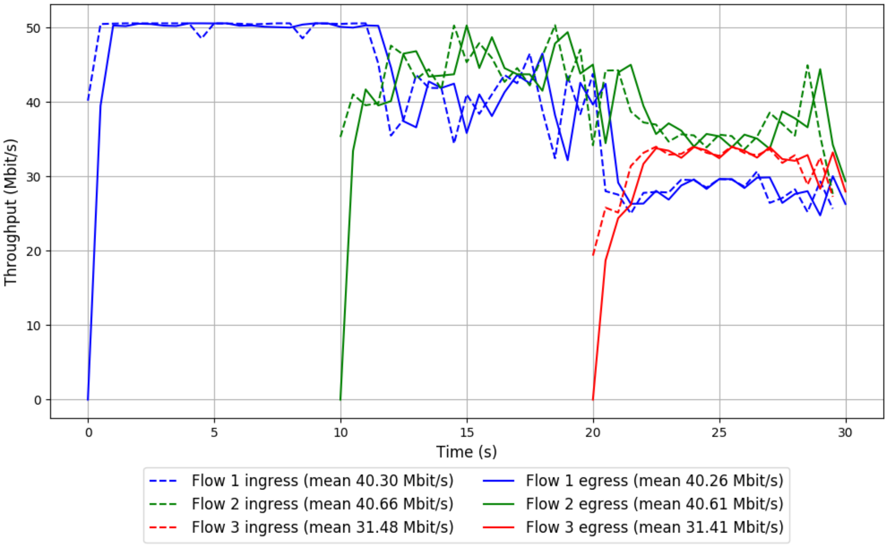
Run 3: Report of Sprout — Data Link

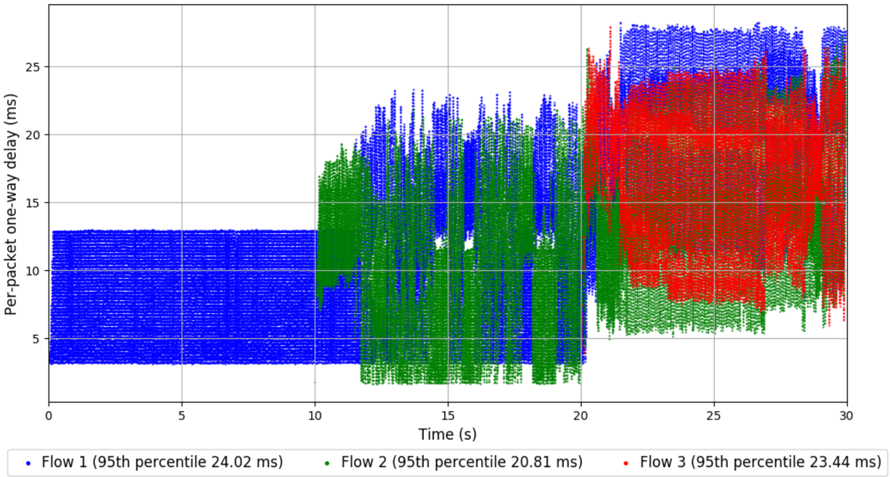




```
Run 4: Statistics of Sprout

Start at: 2019-01-03 01:28:41
End at: 2019-01-03 01:29:11
Local clock offset: -7.412 ms
Remote clock offset: -0.051 ms

# Below is generated by plot.py at 2019-01-03 02:02:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 77.66 Mbit/s
95th percentile per-packet one-way delay: 23.091 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 40.26 Mbit/s
95th percentile per-packet one-way delay: 24.022 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 40.61 Mbit/s
95th percentile per-packet one-way delay: 20.809 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 31.41 Mbit/s
95th percentile per-packet one-way delay: 23.443 ms
Loss rate: 0.08%
```

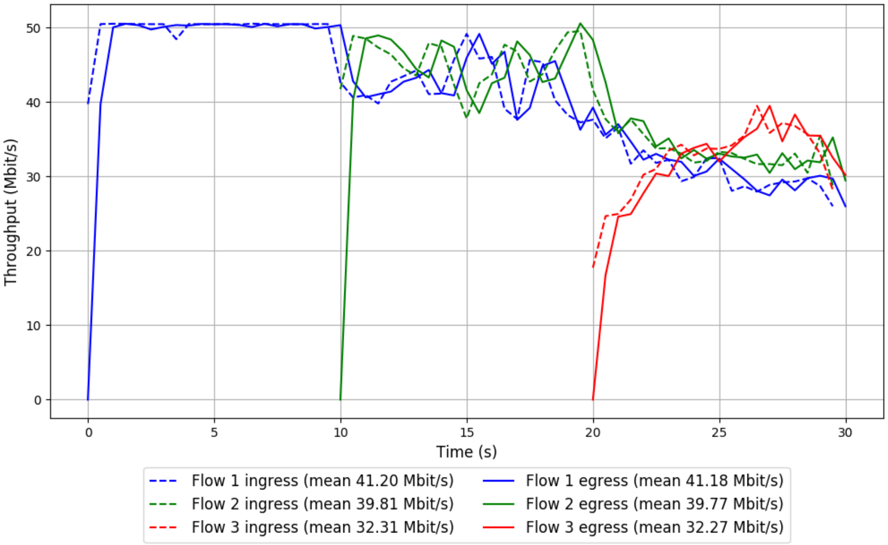
Run 4: Report of Sprout — Data Link

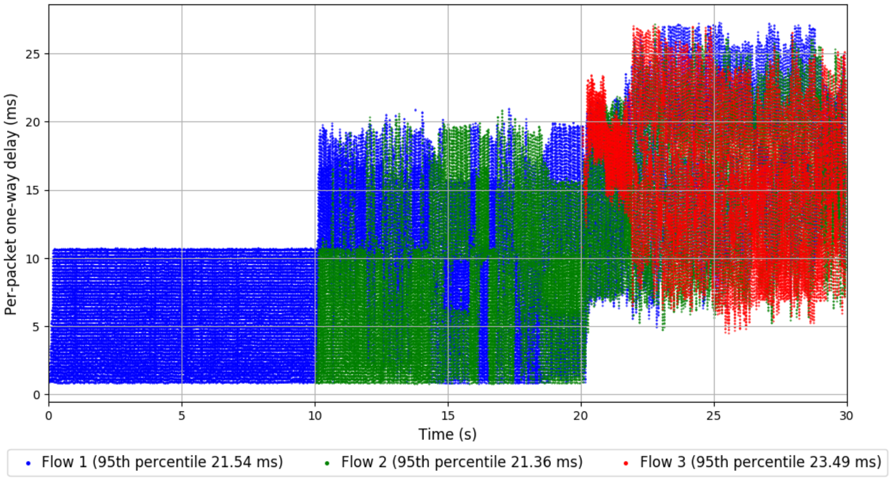




```
Run 5: Statistics of Sprout

Start at: 2019-01-03 01:50:18
End at: 2019-01-03 01:50:48
Local clock offset: -6.649 ms
Remote clock offset: -0.078 ms

# Below is generated by plot.py at 2019-01-03 02:02:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 78.30 Mbit/s
95th percentile per-packet one-way delay: 22.004 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 41.18 Mbit/s
95th percentile per-packet one-way delay: 21.539 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 39.77 Mbit/s
95th percentile per-packet one-way delay: 21.362 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 32.27 Mbit/s
95th percentile per-packet one-way delay: 23.494 ms
Loss rate: 0.00%
```

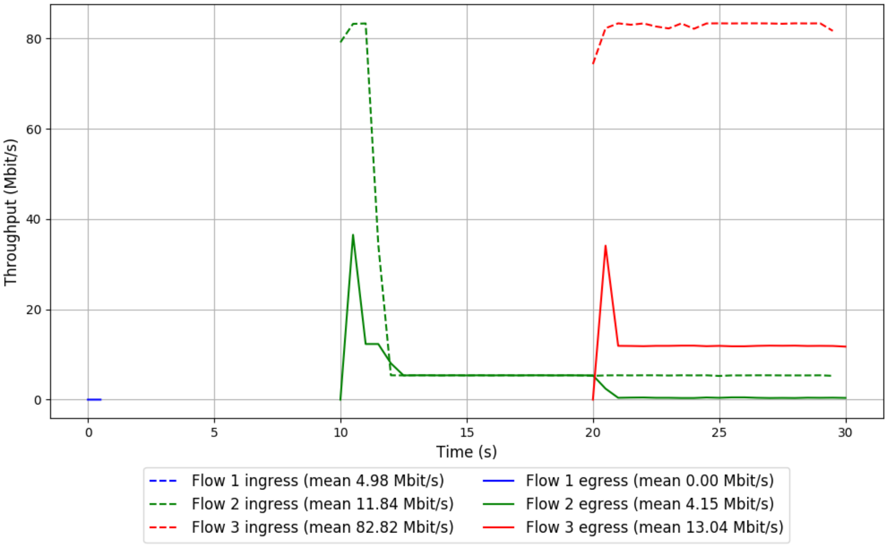
Run 5: Report of Sprout — Data Link

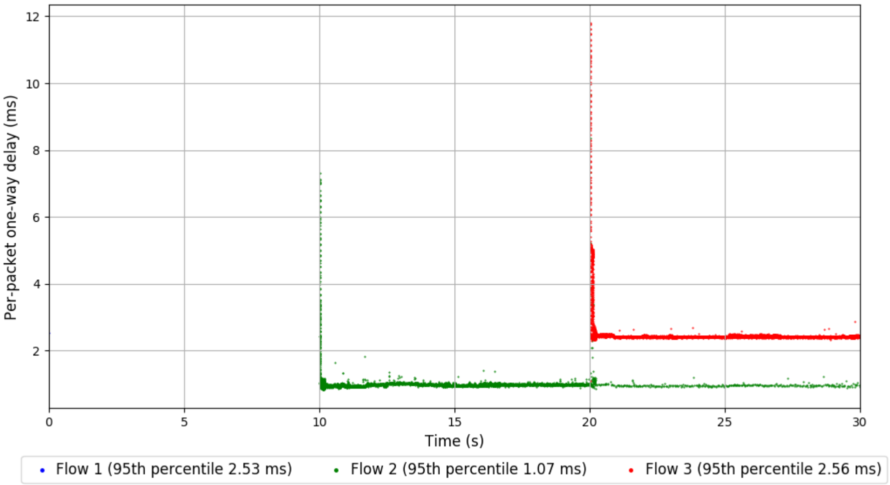




```
Run 1: Statistics of TaoVA-100x

Start at: 2019-01-03 00:13:36
End at: 2019-01-03 00:14:06
Local clock offset: -2.053 ms
Remote clock offset: -0.6 ms

# Below is generated by plot.py at 2019-01-03 02:02:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.10 Mbit/s
95th percentile per-packet one-way delay: 2.486 ms
Loss rate: 79.96%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 2.532 ms
Loss rate: 95.92%
-- Flow 2:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 1.075 ms
Loss rate: 65.00%
-- Flow 3:
Average throughput: 13.04 Mbit/s
95th percentile per-packet one-way delay: 2.564 ms
Loss rate: 84.25%
```

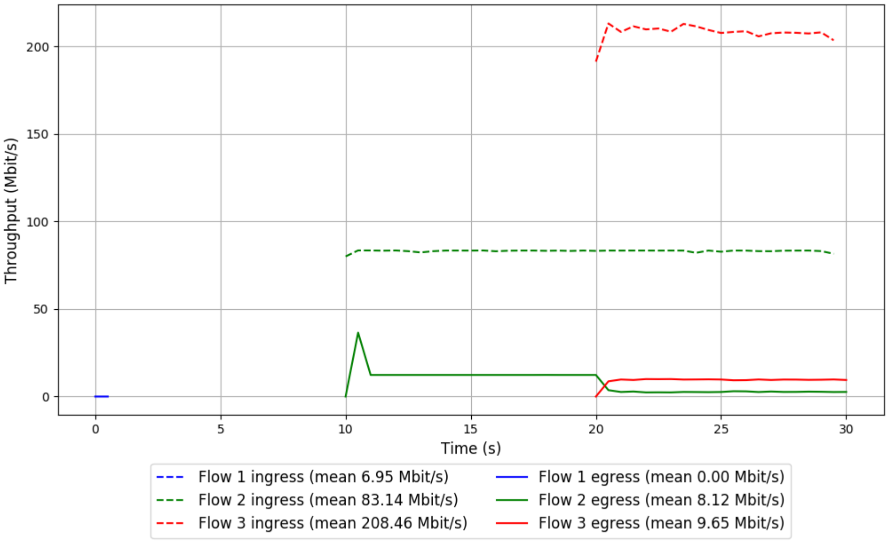
Run 1: Report of TaoVA-100x — Data Link

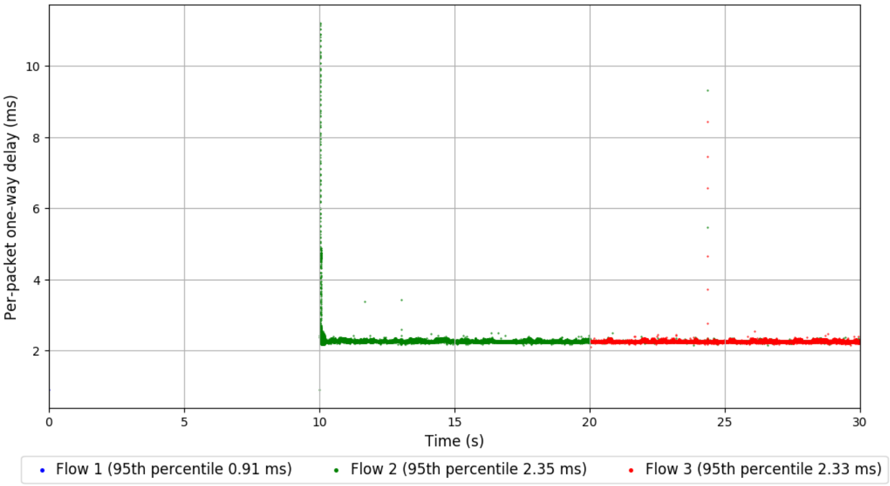




```
Run 2: Statistics of TaoVA-100x

Start at: 2019-01-03 00:35:13
End at: 2019-01-03 00:35:43
Local clock offset: -2.734 ms
Remote clock offset: -0.512 ms

# Below is generated by plot.py at 2019-01-03 02:02:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.62 Mbit/s
95th percentile per-packet one-way delay: 2.338 ms
Loss rate: 93.09%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 0.905 ms
Loss rate: 95.92%
-- Flow 2:
Average throughput: 8.12 Mbit/s
95th percentile per-packet one-way delay: 2.347 ms
Loss rate: 90.23%
-- Flow 3:
Average throughput: 9.65 Mbit/s
95th percentile per-packet one-way delay: 2.329 ms
Loss rate: 95.37%
```

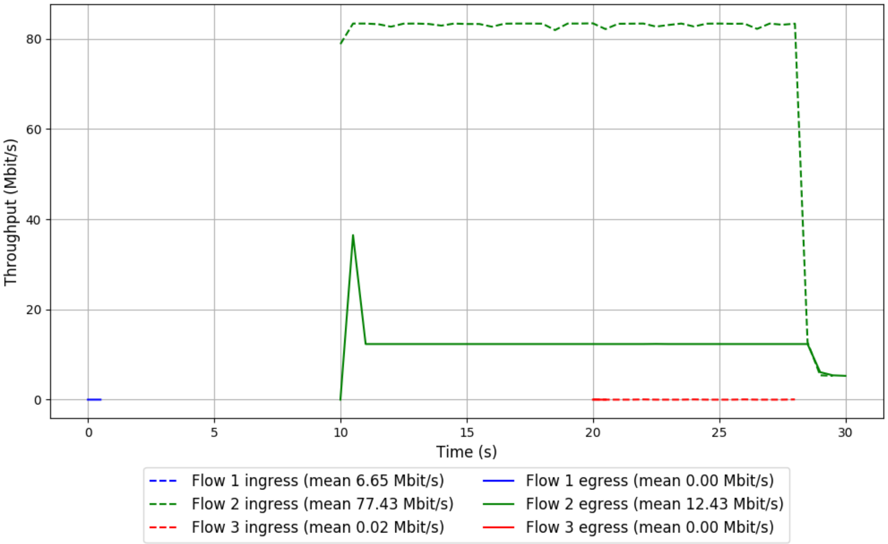
Run 2: Report of TaoVA-100x — Data Link

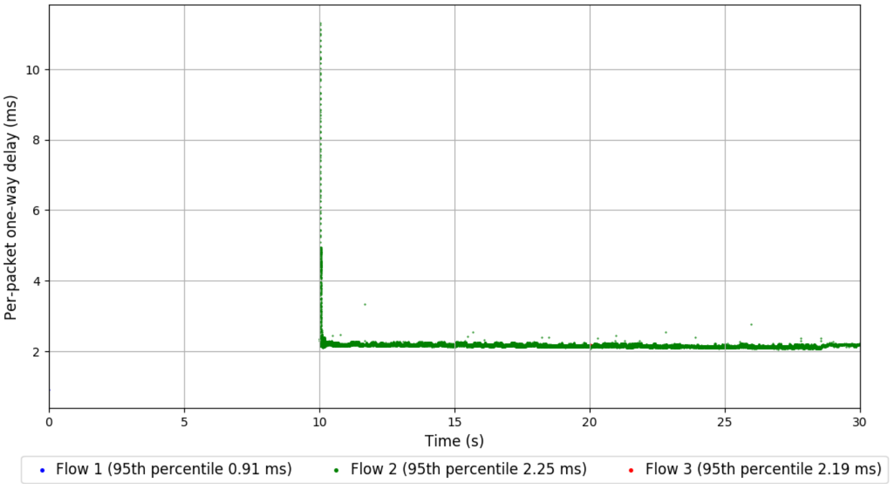




```
Run 3: Statistics of TaoVA-100x

Start at: 2019-01-03 00:56:50
End at: 2019-01-03 00:57:20
Local clock offset: -3.856 ms
Remote clock offset: -0.299 ms

# Below is generated by plot.py at 2019-01-03 02:02:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.28 Mbit/s
95th percentile per-packet one-way delay: 2.252 ms
Loss rate: 83.94%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 0.909 ms
Loss rate: 95.92%
-- Flow 2:
Average throughput: 12.43 Mbit/s
95th percentile per-packet one-way delay: 2.252 ms
Loss rate: 83.94%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 2.193 ms
Loss rate: 99.16%
```

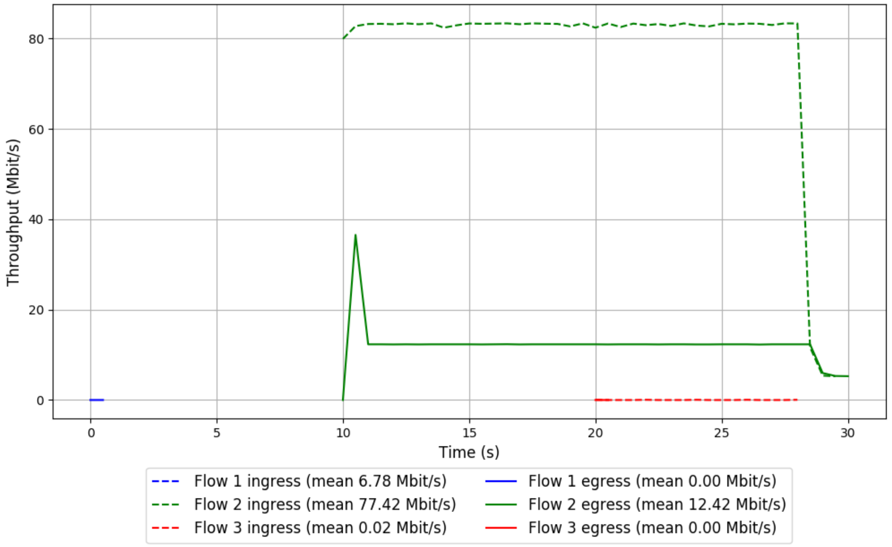
Run 3: Report of TaoVA-100x — Data Link

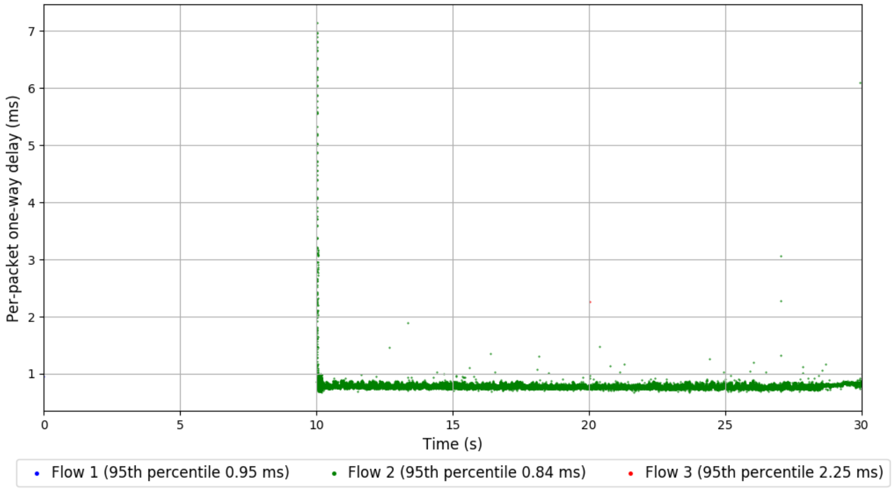




```
Run 4: Statistics of TaoVA-100x

Start at: 2019-01-03 01:18:26
End at: 2019-01-03 01:18:56
Local clock offset: -6.628 ms
Remote clock offset: -0.219 ms

# Below is generated by plot.py at 2019-01-03 02:02:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.28 Mbit/s
95th percentile per-packet one-way delay: 0.845 ms
Loss rate: 83.95%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 0.953 ms
Loss rate: 95.92%
-- Flow 2:
Average throughput: 12.42 Mbit/s
95th percentile per-packet one-way delay: 0.845 ms
Loss rate: 83.95%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 2.249 ms
Loss rate: 99.16%
```

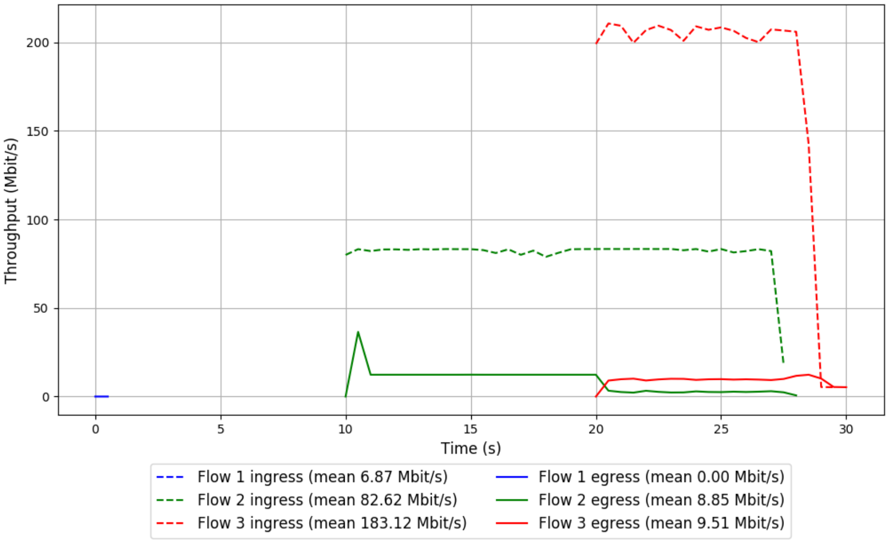
Run 4: Report of TaoVA-100x — Data Link

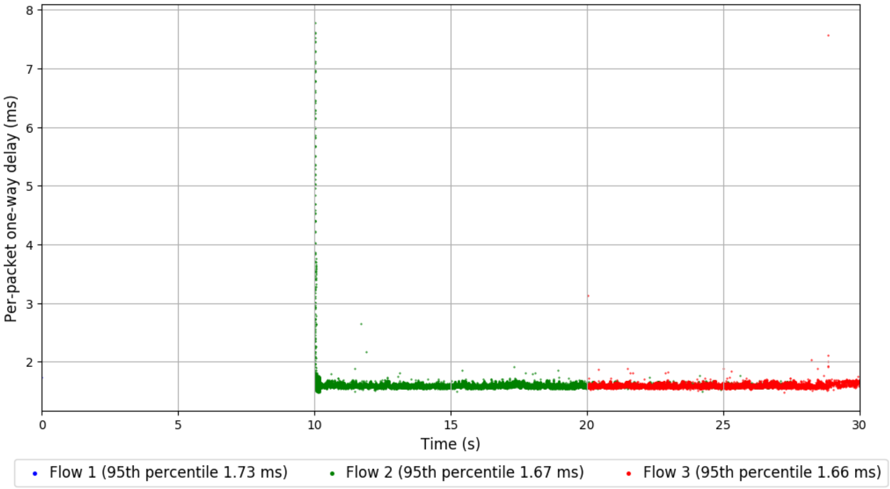




```
Run 5: Statistics of TaoVA-100x

Start at: 2019-01-03 01:40:03
End at: 2019-01-03 01:40:33
Local clock offset: -7.184 ms
Remote clock offset: -0.071 ms

# Below is generated by plot.py at 2019-01-03 02:02:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.35 Mbit/s
95th percentile per-packet one-way delay: 1.663 ms
Loss rate: 92.36%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 1.731 ms
Loss rate: 95.92%
-- Flow 2:
Average throughput: 8.85 Mbit/s
95th percentile per-packet one-way delay: 1.668 ms
Loss rate: 89.29%
-- Flow 3:
Average throughput: 9.51 Mbit/s
95th percentile per-packet one-way delay: 1.658 ms
Loss rate: 94.81%
```

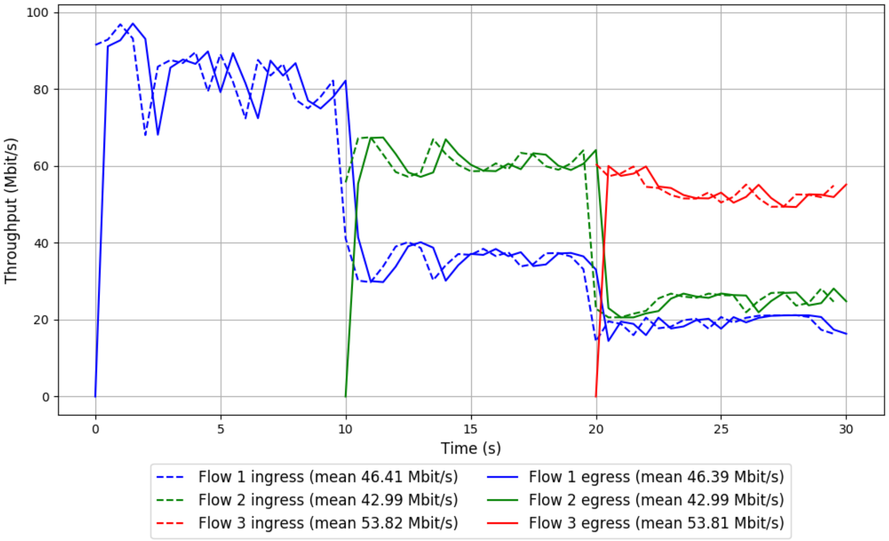
Run 5: Report of TaoVA-100x — Data Link

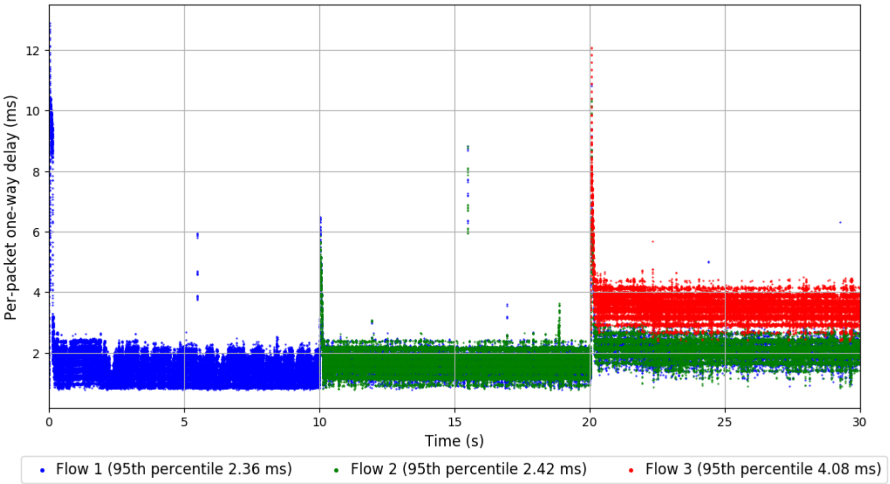




```
Run 1: Statistics of TCP Vegas

Start at: 2019-01-03 00:09:00
End at: 2019-01-03 00:09:31
Local clock offset: -2.012 ms
Remote clock offset: -0.695 ms

# Below is generated by plot.py at 2019-01-03 02:02:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 92.92 Mbit/s
95th percentile per-packet one-way delay: 3.709 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 46.39 Mbit/s
95th percentile per-packet one-way delay: 2.357 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 42.99 Mbit/s
95th percentile per-packet one-way delay: 2.415 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 53.81 Mbit/s
95th percentile per-packet one-way delay: 4.081 ms
Loss rate: 0.01%
```

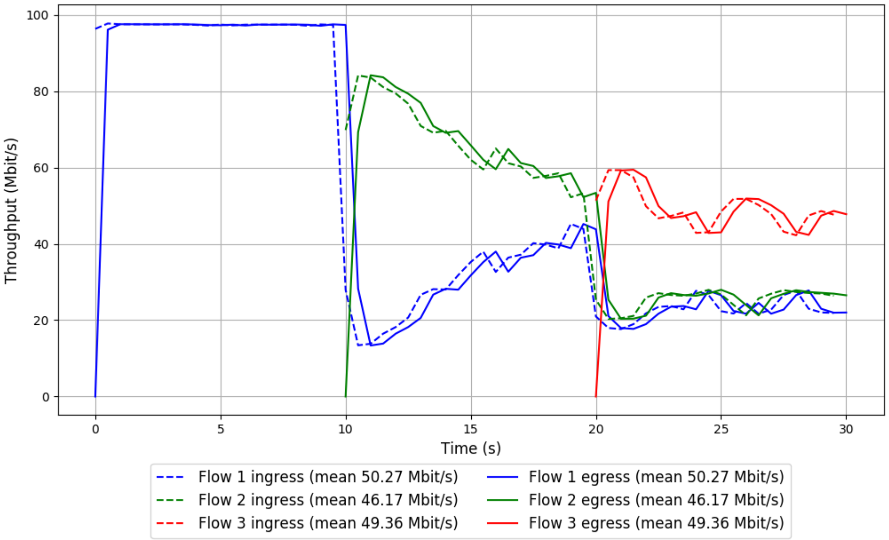
Run 1: Report of TCP Vegas — Data Link

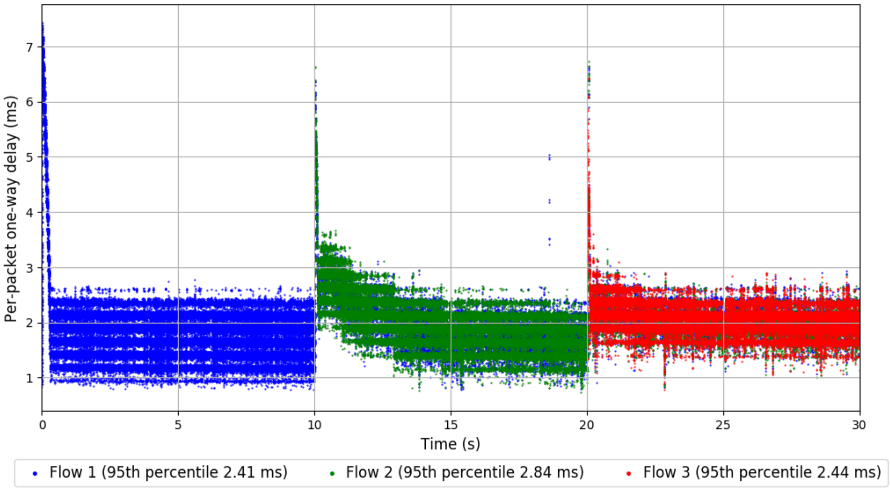




```
Run 2: Statistics of TCP Vegas

Start at: 2019-01-03 00:30:37
End at: 2019-01-03 00:31:07
Local clock offset: -2.546 ms
Remote clock offset: -0.511 ms

# Below is generated by plot.py at 2019-01-03 02:02:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.44 Mbit/s
95th percentile per-packet one-way delay: 2.611 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 50.27 Mbit/s
95th percentile per-packet one-way delay: 2.414 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 46.17 Mbit/s
95th percentile per-packet one-way delay: 2.840 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 49.36 Mbit/s
95th percentile per-packet one-way delay: 2.443 ms
Loss rate: 0.00%
```

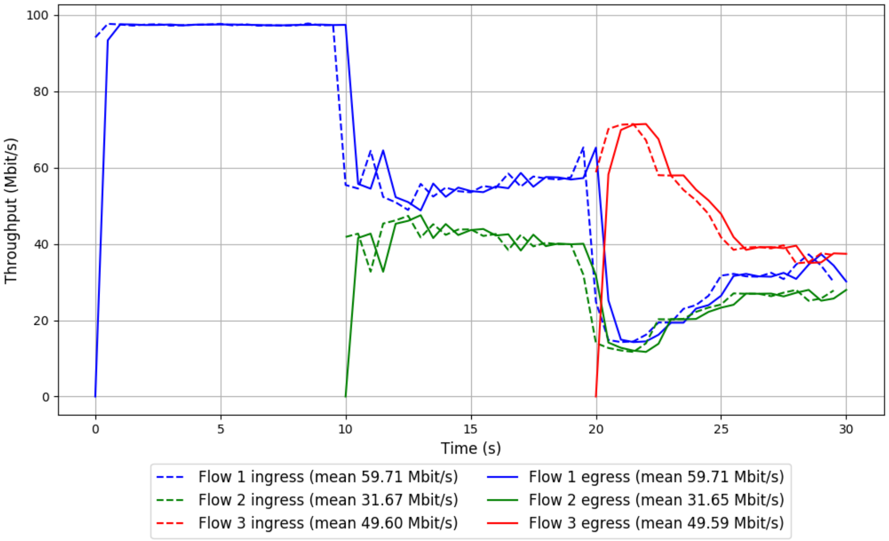
Run 2: Report of TCP Vegas — Data Link

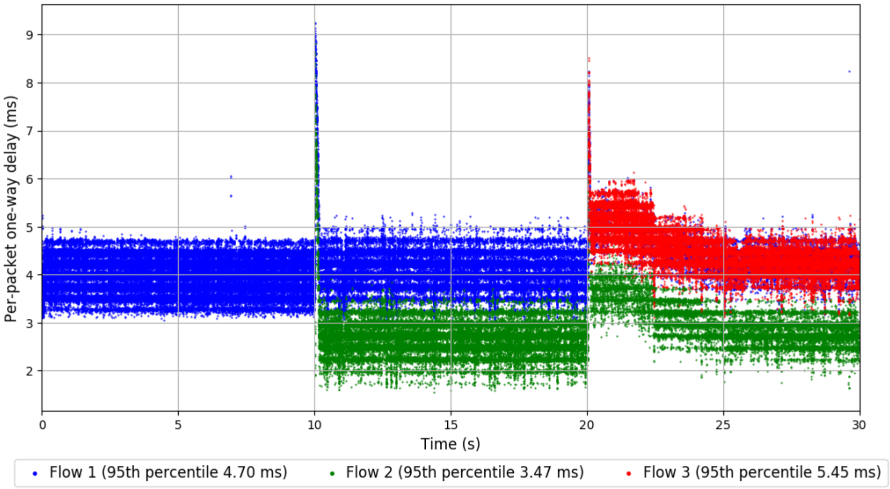




```
Run 3: Statistics of TCP Vegas

Start at: 2019-01-03 00:52:14
End at: 2019-01-03 00:52:44
Local clock offset: -3.945 ms
Remote clock offset: -0.333 ms

# Below is generated by plot.py at 2019-01-03 02:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.28 Mbit/s
95th percentile per-packet one-way delay: 4.974 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 59.71 Mbit/s
95th percentile per-packet one-way delay: 4.700 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 31.65 Mbit/s
95th percentile per-packet one-way delay: 3.468 ms
Loss rate: 0.05%
-- Flow 3:
Average throughput: 49.59 Mbit/s
95th percentile per-packet one-way delay: 5.450 ms
Loss rate: 0.00%
```

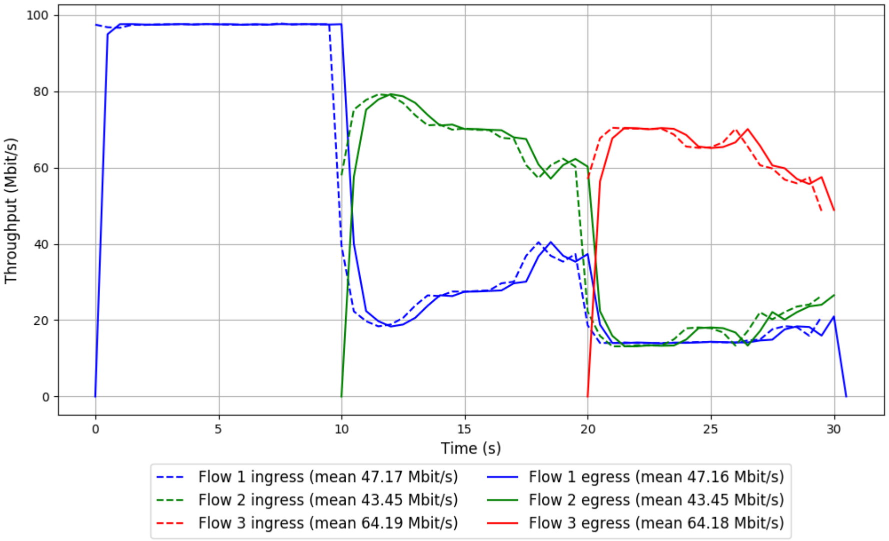
Run 3: Report of TCP Vegas — Data Link

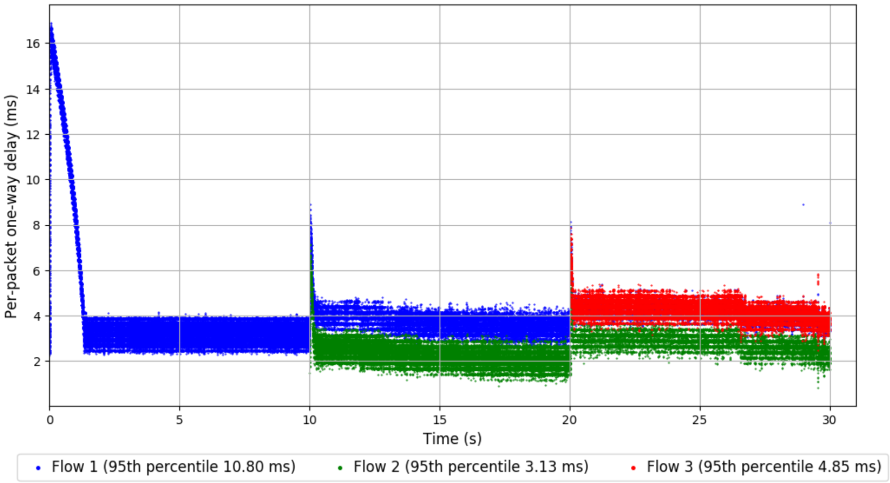




```
Run 4: Statistics of TCP Vegas

Start at: 2019-01-03 01:13:51
End at: 2019-01-03 01:14:21
Local clock offset: -6.311 ms
Remote clock offset: -0.165 ms

# Below is generated by plot.py at 2019-01-03 02:02:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.45 Mbit/s
95th percentile per-packet one-way delay: 4.897 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 47.16 Mbit/s
95th percentile per-packet one-way delay: 10.800 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 43.45 Mbit/s
95th percentile per-packet one-way delay: 3.133 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 64.18 Mbit/s
95th percentile per-packet one-way delay: 4.853 ms
Loss rate: 0.01%
```

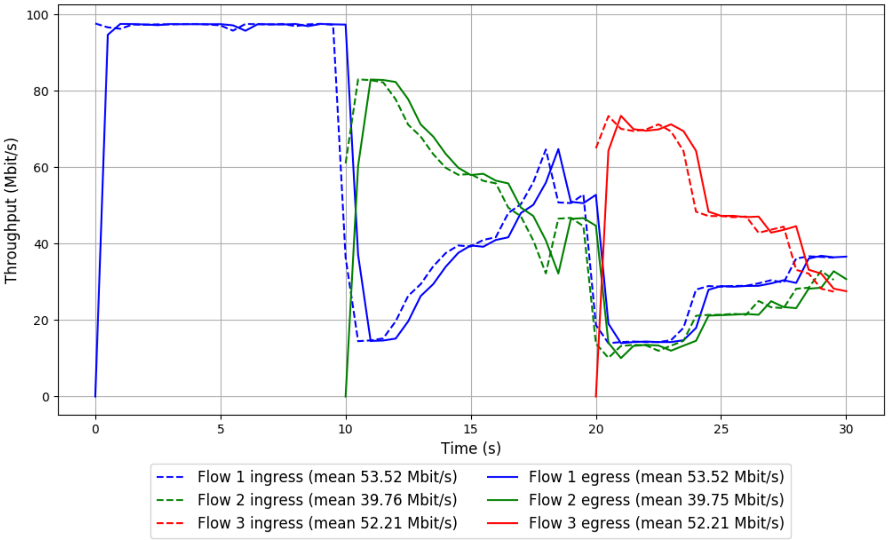
Run 4: Report of TCP Vegas — Data Link

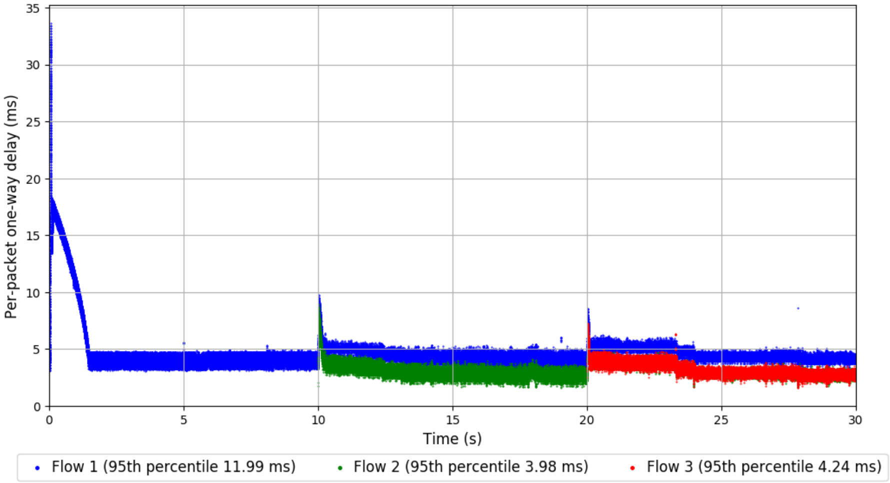




```
Run 5: Statistics of TCP Vegas

Start at: 2019-01-03 01:35:27
End at: 2019-01-03 01:35:57
Local clock offset: -7.202 ms
Remote clock offset: -0.019 ms

# Below is generated by plot.py at 2019-01-03 02:02:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.38 Mbit/s
95th percentile per-packet one-way delay: 5.969 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 53.52 Mbit/s
95th percentile per-packet one-way delay: 11.993 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 39.75 Mbit/s
95th percentile per-packet one-way delay: 3.983 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 52.21 Mbit/s
95th percentile per-packet one-way delay: 4.241 ms
Loss rate: 0.00%
```

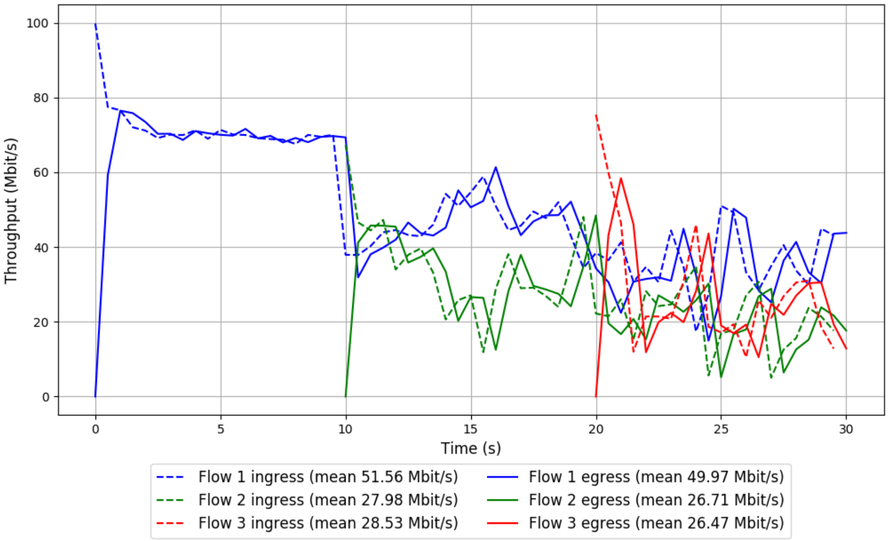
Run 5: Report of TCP Vegas — Data Link

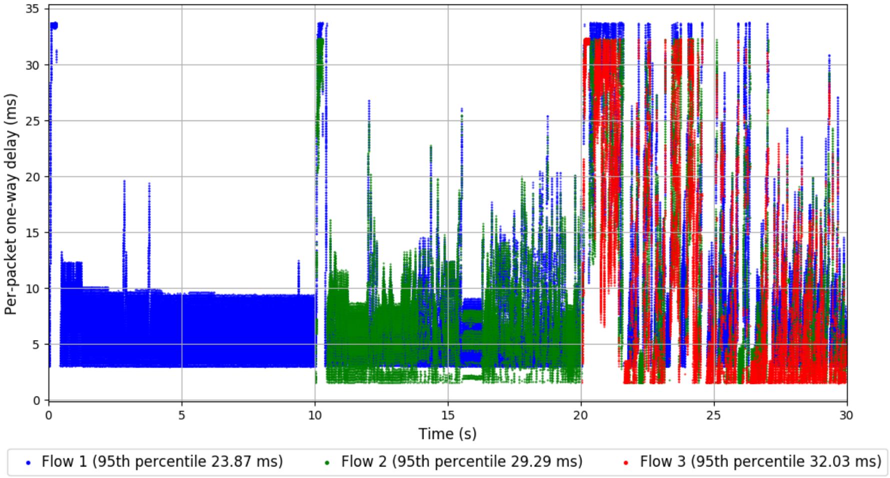




```
Run 1: Statistics of Verus

Start at: 2019-01-03 00:07:51
End at: 2019-01-03 00:08:21
Local clock offset: -2.748 ms
Remote clock offset: -0.704 ms

# Below is generated by plot.py at 2019-01-03 02:02:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 76.52 Mbit/s
95th percentile per-packet one-way delay: 29.282 ms
Loss rate: 3.90%
-- Flow 1:
Average throughput: 49.97 Mbit/s
95th percentile per-packet one-way delay: 23.870 ms
Loss rate: 3.07%
-- Flow 2:
Average throughput: 26.71 Mbit/s
95th percentile per-packet one-way delay: 29.289 ms
Loss rate: 4.52%
-- Flow 3:
Average throughput: 26.47 Mbit/s
95th percentile per-packet one-way delay: 32.031 ms
Loss rate: 7.20%
```

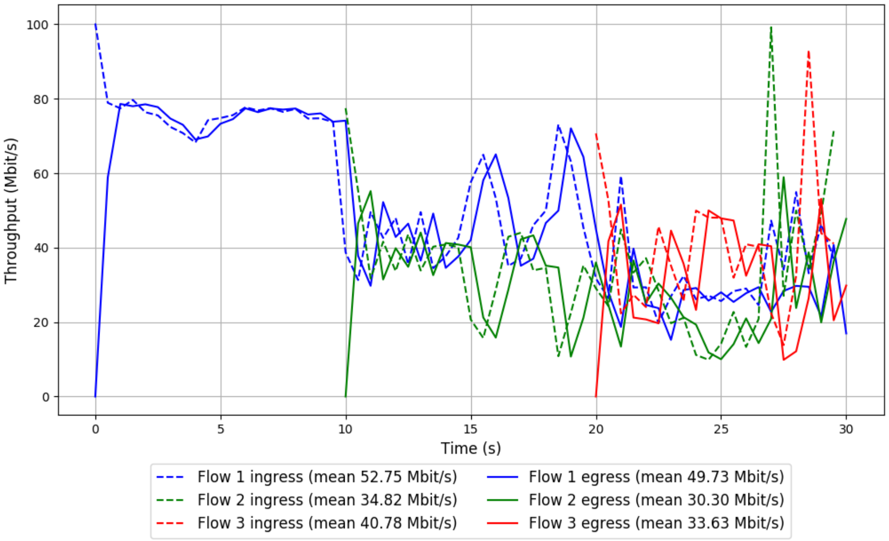
Run 1: Report of Verus — Data Link

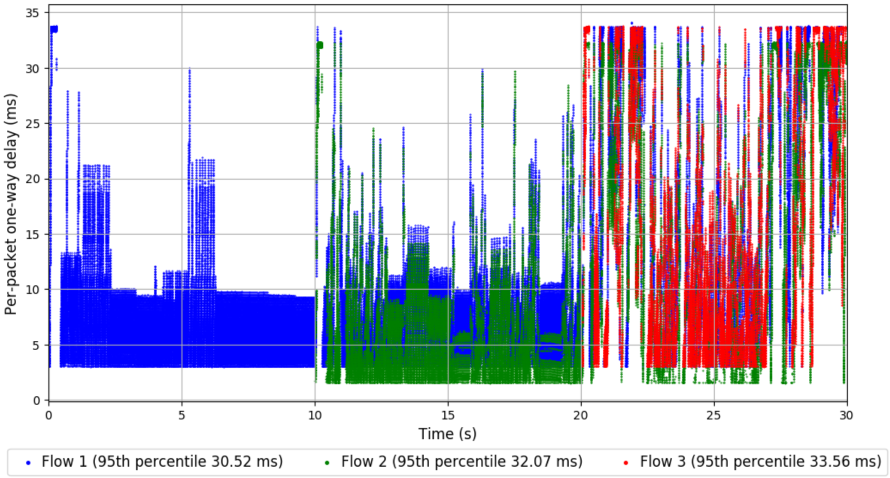




```
Run 2: Statistics of Verus

Start at: 2019-01-03 00:29:28
End at: 2019-01-03 00:29:58
Local clock offset: -3.215 ms
Remote clock offset: -0.454 ms

# Below is generated by plot.py at 2019-01-03 02:03:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 80.72 Mbit/s
95th percentile per-packet one-way delay: 32.099 ms
Loss rate: 9.27%
-- Flow 1:
Average throughput: 49.73 Mbit/s
95th percentile per-packet one-way delay: 30.521 ms
Loss rate: 5.62%
-- Flow 2:
Average throughput: 30.30 Mbit/s
95th percentile per-packet one-way delay: 32.069 ms
Loss rate: 12.84%
-- Flow 3:
Average throughput: 33.63 Mbit/s
95th percentile per-packet one-way delay: 33.565 ms
Loss rate: 17.31%
```

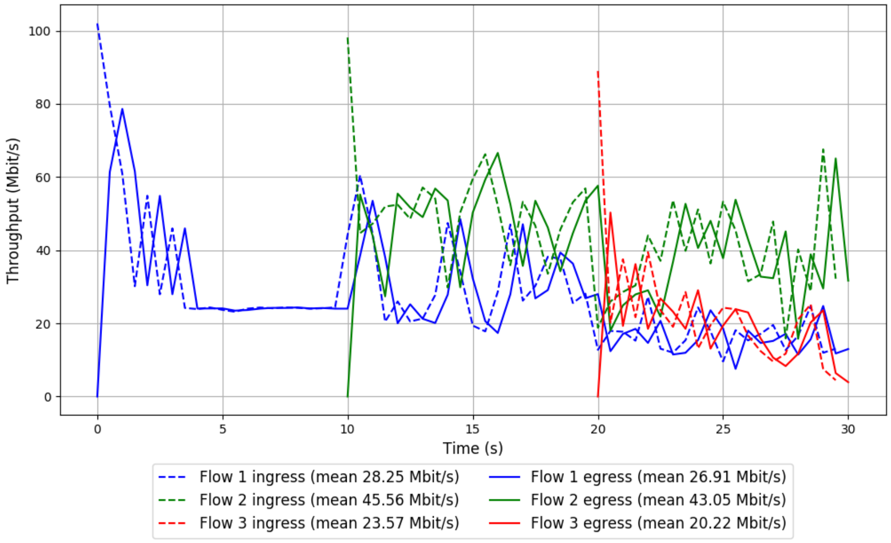
Run 2: Report of Verus — Data Link

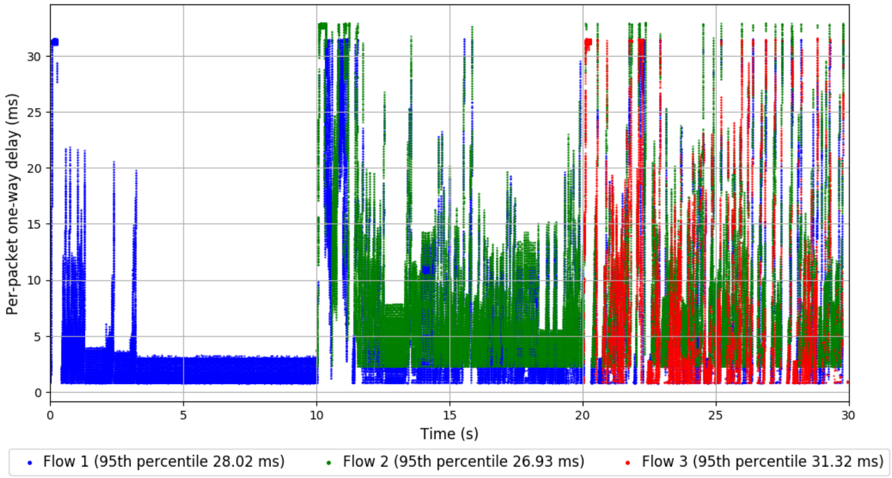




```
Run 3: Statistics of Verus

Start at: 2019-01-03 00:51:06
End at: 2019-01-03 00:51:36
Local clock offset: -3.175 ms
Remote clock offset: -0.395 ms

# Below is generated by plot.py at 2019-01-03 02:03:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 62.05 Mbit/s
95th percentile per-packet one-way delay: 29.162 ms
Loss rate: 6.15%
-- Flow 1:
Average throughput: 26.91 Mbit/s
95th percentile per-packet one-way delay: 28.017 ms
Loss rate: 4.76%
-- Flow 2:
Average throughput: 43.05 Mbit/s
95th percentile per-packet one-way delay: 26.929 ms
Loss rate: 5.35%
-- Flow 3:
Average throughput: 20.22 Mbit/s
95th percentile per-packet one-way delay: 31.319 ms
Loss rate: 14.22%
```

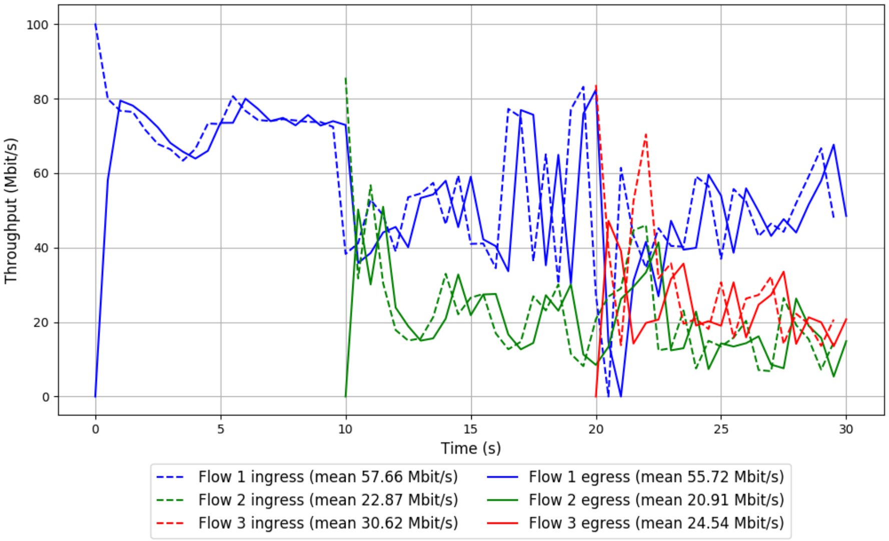
Run 3: Report of Verus — Data Link

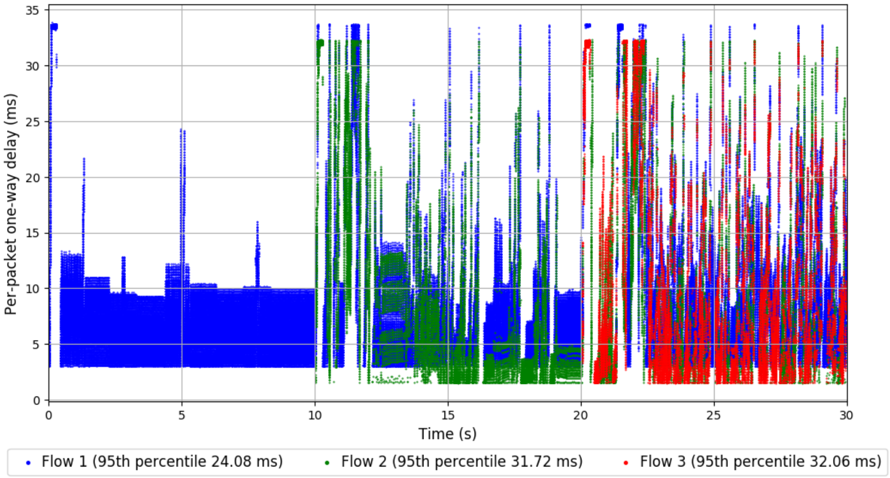




```
Run 4: Statistics of Verus

Start at: 2019-01-03 01:12:41
End at: 2019-01-03 01:13:11
Local clock offset: -6.969 ms
Remote clock offset: -0.153 ms

# Below is generated by plot.py at 2019-01-03 02:03:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 77.78 Mbit/s
95th percentile per-packet one-way delay: 29.538 ms
Loss rate: 6.30%
-- Flow 1:
Average throughput: 55.72 Mbit/s
95th percentile per-packet one-way delay: 24.076 ms
Loss rate: 3.32%
-- Flow 2:
Average throughput: 20.91 Mbit/s
95th percentile per-packet one-way delay: 31.722 ms
Loss rate: 8.58%
-- Flow 3:
Average throughput: 24.54 Mbit/s
95th percentile per-packet one-way delay: 32.060 ms
Loss rate: 19.75%
```

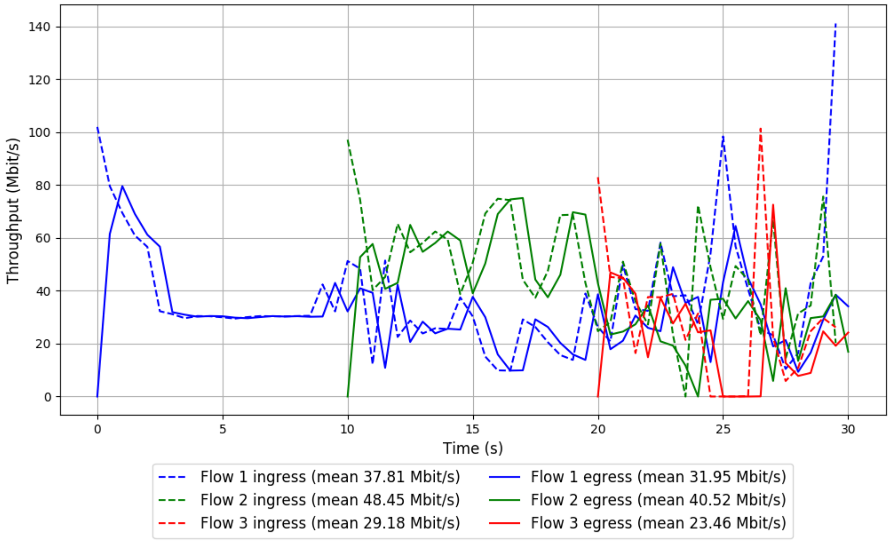
Run 4: Report of Verus — Data Link

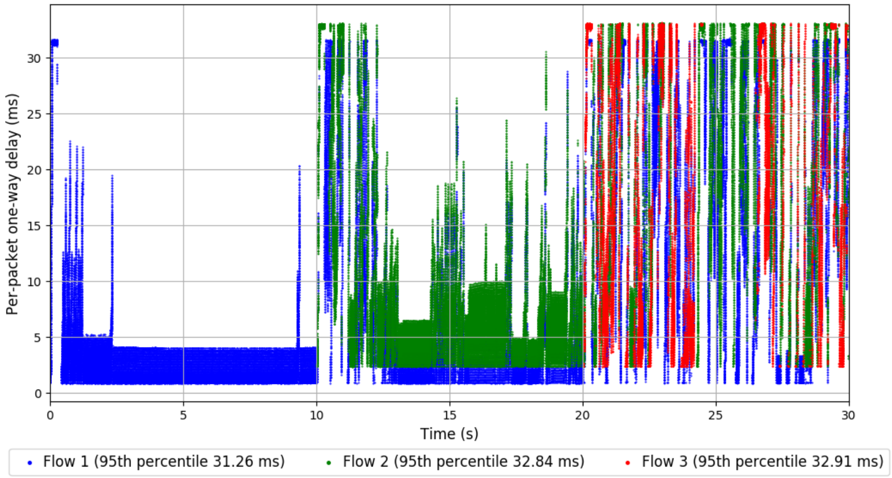




```
Run 5: Statistics of Verus

Start at: 2019-01-03 01:34:18
End at: 2019-01-03 01:34:48
Local clock offset: -6.462 ms
Remote clock offset: -0.007 ms

# Below is generated by plot.py at 2019-01-03 02:03:26
# Datalink statistics
-- Total of 3 flows:
Average throughput: 66.70 Mbit/s
95th percentile per-packet one-way delay: 32.427 ms
Loss rate: 16.28%
-- Flow 1:
Average throughput: 31.95 Mbit/s
95th percentile per-packet one-way delay: 31.256 ms
Loss rate: 15.40%
-- Flow 2:
Average throughput: 40.52 Mbit/s
95th percentile per-packet one-way delay: 32.839 ms
Loss rate: 16.37%
-- Flow 3:
Average throughput: 23.46 Mbit/s
95th percentile per-packet one-way delay: 32.905 ms
Loss rate: 19.42%
```

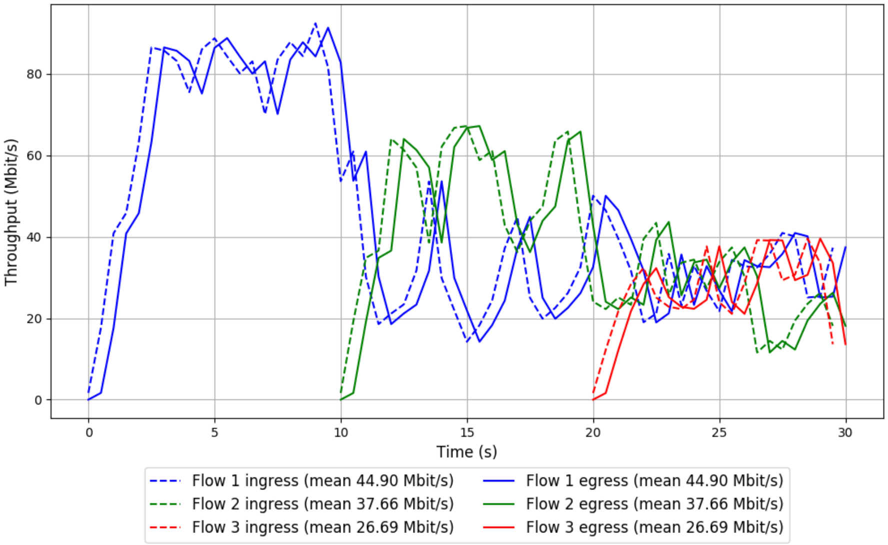
Run 5: Report of Verus — Data Link

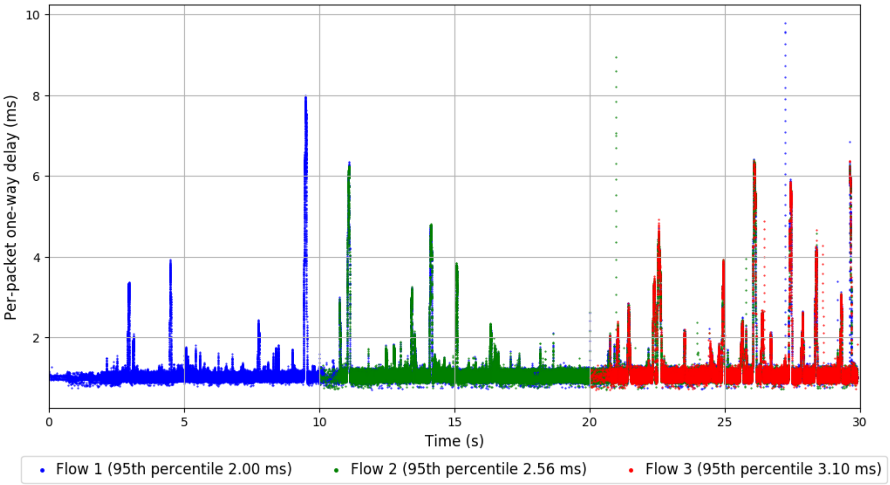




```
Run 1: Statistics of PCC-Vivace

Start at: 2019-01-03 00:20:29
End at: 2019-01-03 00:20:59
Local clock offset: -2.152 ms
Remote clock offset: -0.55 ms

# Below is generated by plot.py at 2019-01-03 02:03:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 78.77 Mbit/s
95th percentile per-packet one-way delay: 2.341 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 44.90 Mbit/s
95th percentile per-packet one-way delay: 2.003 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 37.66 Mbit/s
95th percentile per-packet one-way delay: 2.561 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 26.69 Mbit/s
95th percentile per-packet one-way delay: 3.105 ms
Loss rate: 0.00%
```

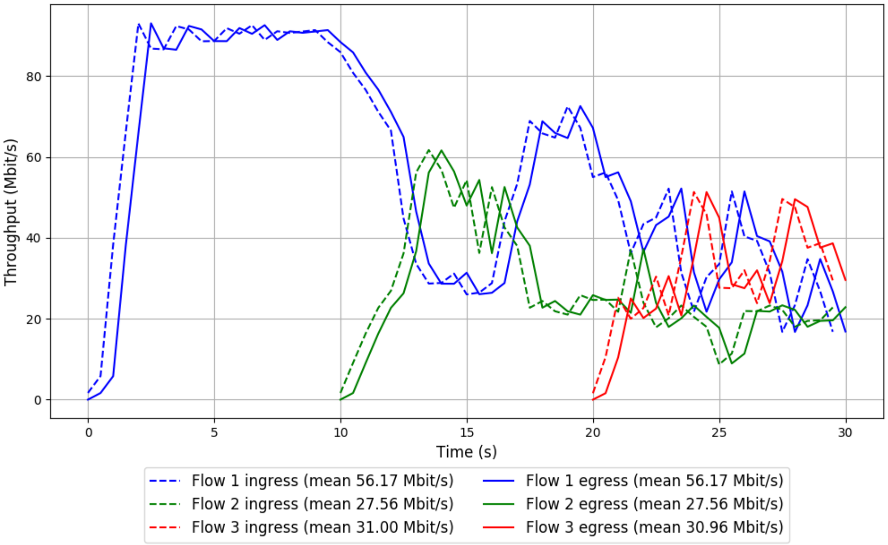
Run 1: Report of PCC-Vivace — Data Link

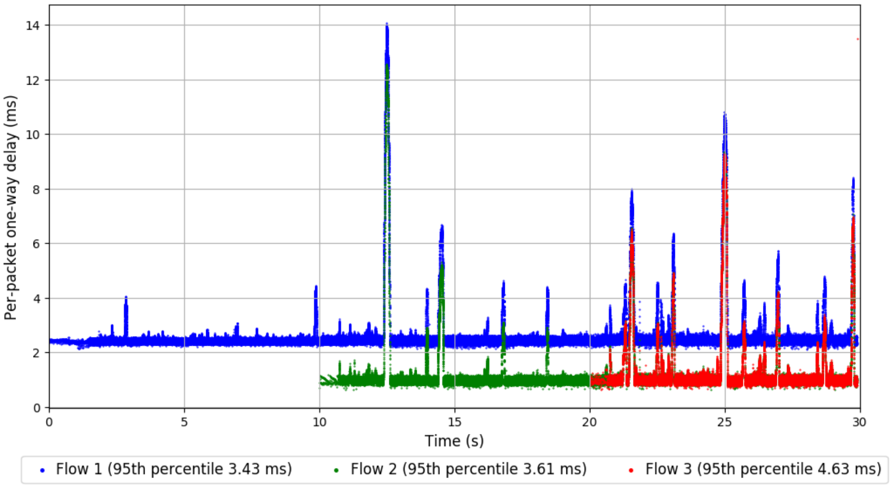




```
Run 2: Statistics of PCC-Vivace

Start at: 2019-01-03 00:42:07
End at: 2019-01-03 00:42:37
Local clock offset: -2.936 ms
Remote clock offset: -0.348 ms

# Below is generated by plot.py at 2019-01-03 02:03:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 84.70 Mbit/s
95th percentile per-packet one-way delay: 3.554 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 56.17 Mbit/s
95th percentile per-packet one-way delay: 3.429 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 27.56 Mbit/s
95th percentile per-packet one-way delay: 3.613 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 30.96 Mbit/s
95th percentile per-packet one-way delay: 4.632 ms
Loss rate: 0.00%
```

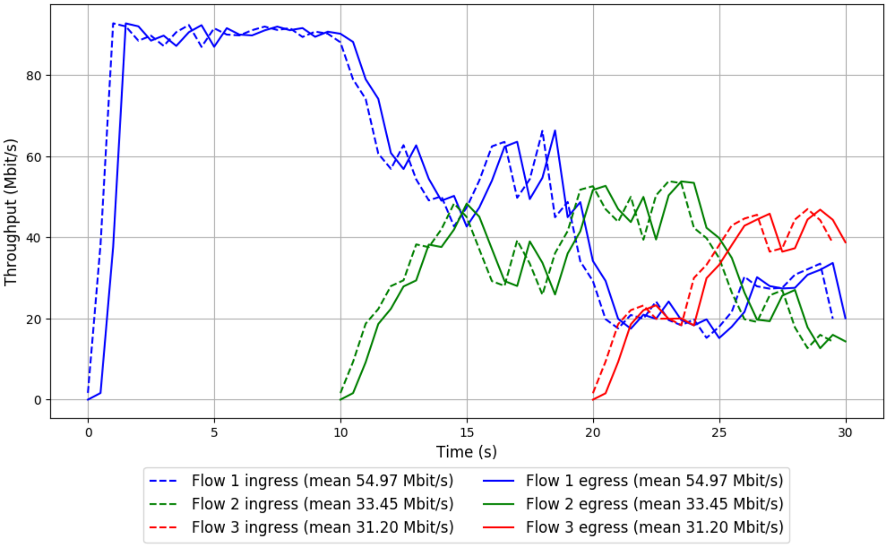
Run 2: Report of PCC-Vivace — Data Link

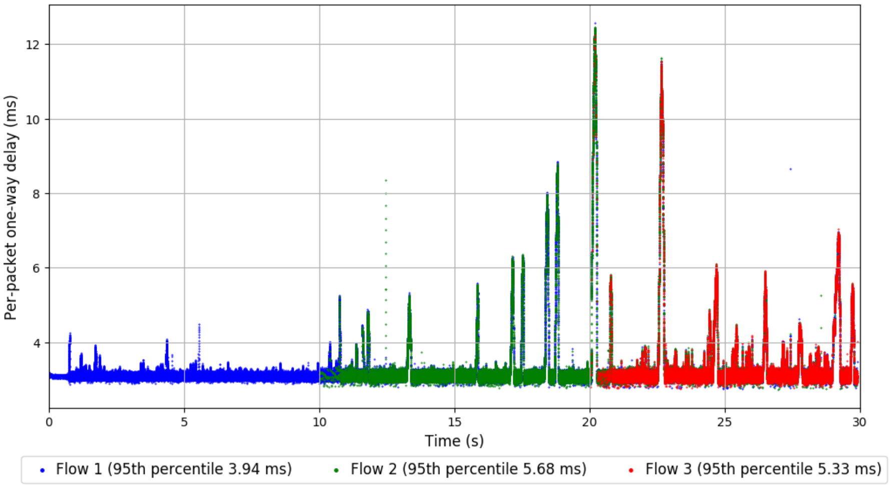




```
Run 3: Statistics of PCC-Vivace

Start at: 2019-01-03 01:03:43
End at: 2019-01-03 01:04:13
Local clock offset: -5.965 ms
Remote clock offset: -0.197 ms

# Below is generated by plot.py at 2019-01-03 02:03:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 87.53 Mbit/s
95th percentile per-packet one-way delay: 4.708 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 54.97 Mbit/s
95th percentile per-packet one-way delay: 3.945 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 33.45 Mbit/s
95th percentile per-packet one-way delay: 5.680 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 31.20 Mbit/s
95th percentile per-packet one-way delay: 5.331 ms
Loss rate: 0.01%
```

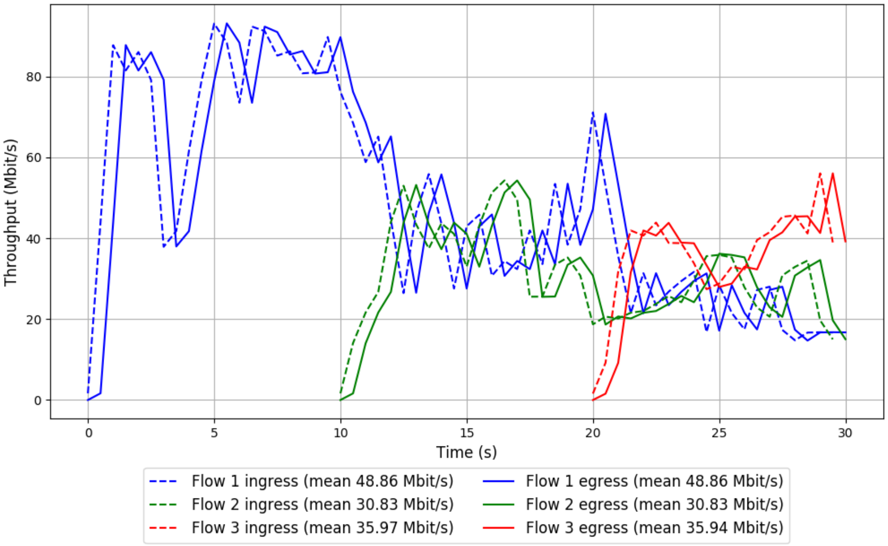
Run 3: Report of PCC-Vivace — Data Link

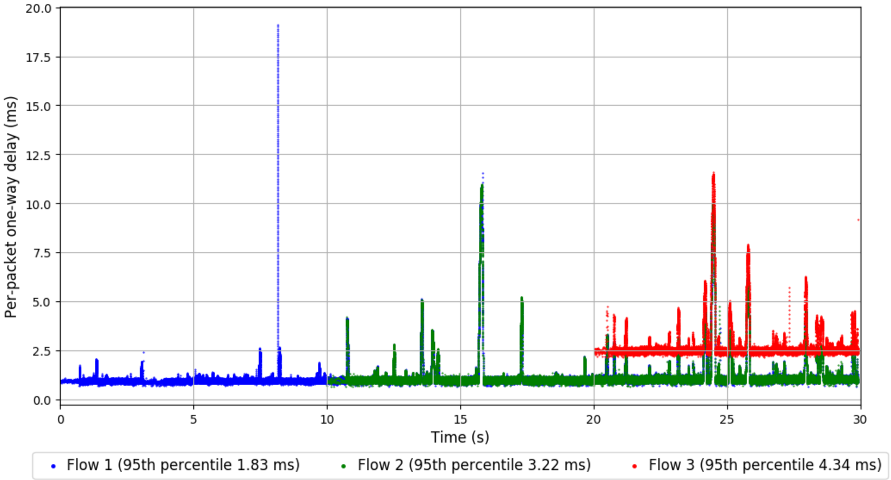




```
Run 4: Statistics of PCC-Vivace

Start at: 2019-01-03 01:25:20
End at: 2019-01-03 01:25:50
Local clock offset: -6.913 ms
Remote clock offset: -0.153 ms

# Below is generated by plot.py at 2019-01-03 02:03:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 81.22 Mbit/s
95th percentile per-packet one-way delay: 2.980 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 48.86 Mbit/s
95th percentile per-packet one-way delay: 1.834 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 30.83 Mbit/s
95th percentile per-packet one-way delay: 3.221 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 35.94 Mbit/s
95th percentile per-packet one-way delay: 4.337 ms
Loss rate: 0.00%
```

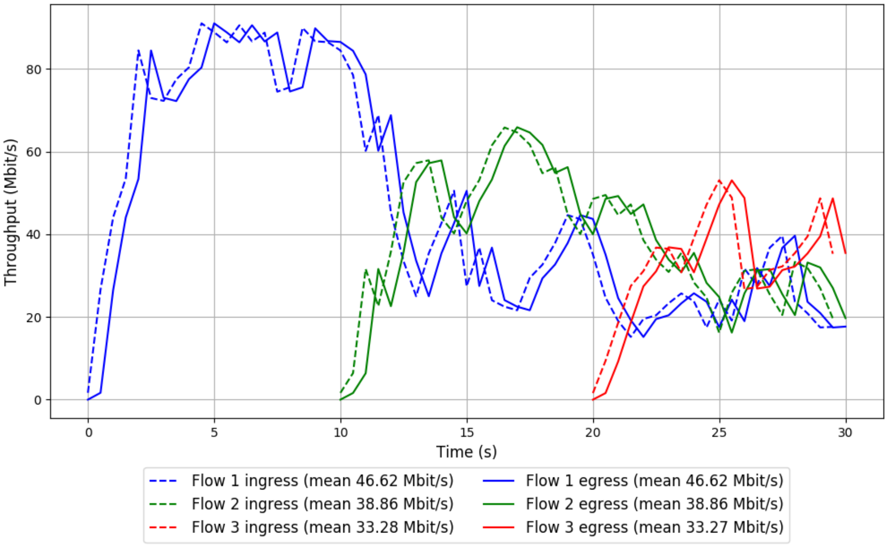
Run 4: Report of PCC-Vivace — Data Link

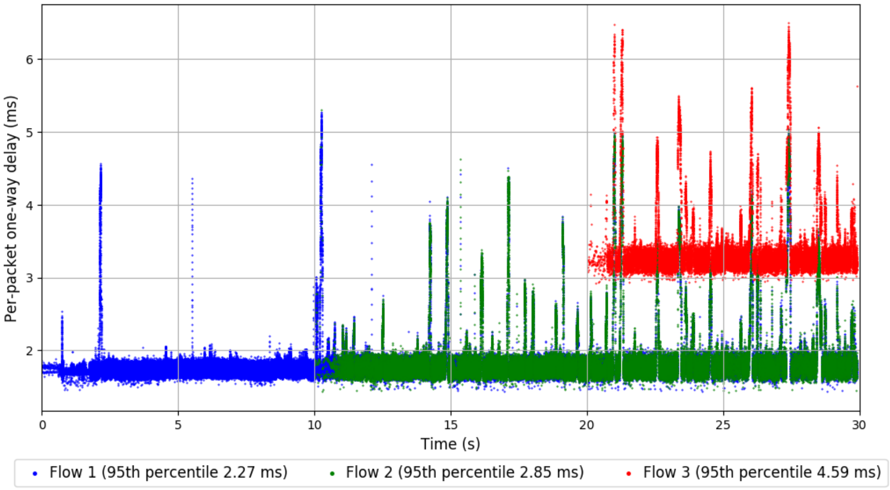




```
Run 5: Statistics of PCC-Vivace

Start at: 2019-01-03 01:46:56
End at: 2019-01-03 01:47:26
Local clock offset: -7.296 ms
Remote clock offset: 0.064 ms

# Below is generated by plot.py at 2019-01-03 02:03:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 83.45 Mbit/s
95th percentile per-packet one-way delay: 3.384 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 46.62 Mbit/s
95th percentile per-packet one-way delay: 2.270 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 38.86 Mbit/s
95th percentile per-packet one-way delay: 2.855 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 33.27 Mbit/s
95th percentile per-packet one-way delay: 4.595 ms
Loss rate: 0.02%
```

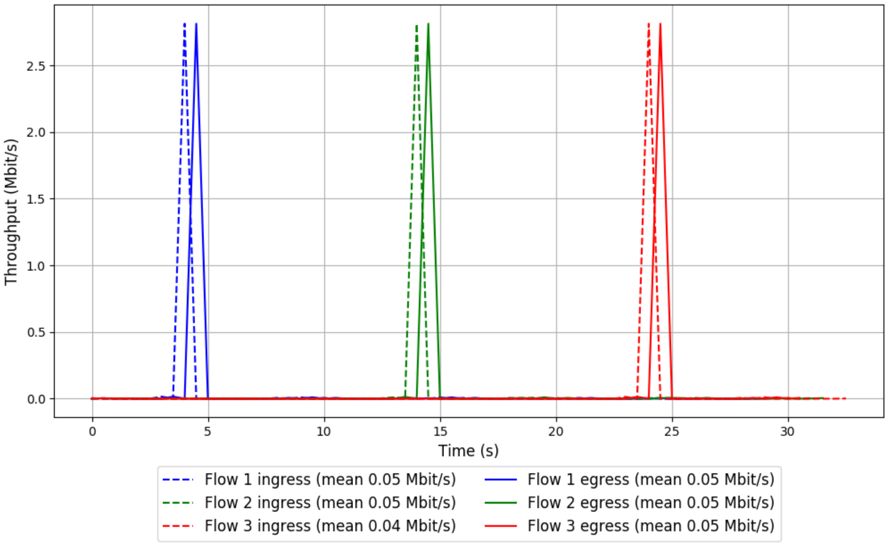
Run 5: Report of PCC-Vivace — Data Link

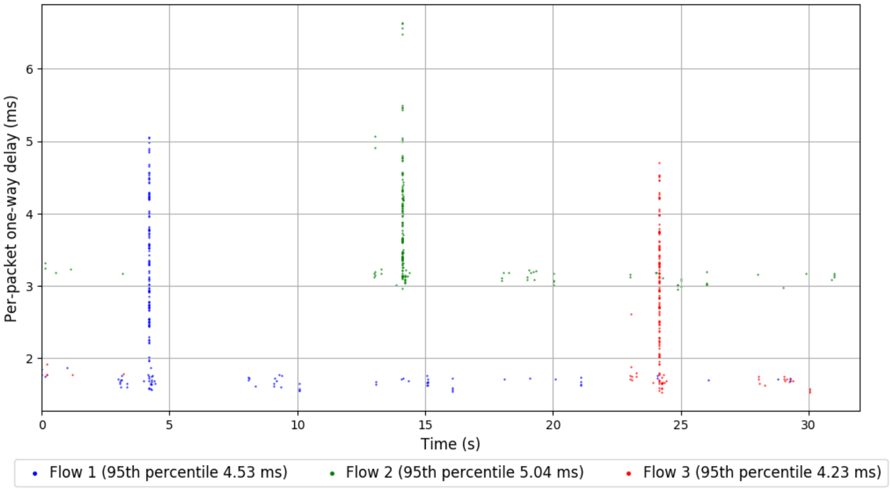




```
Run 1: Statistics of WebRTC media

Start at: 2019-01-03 00:04:28
End at: 2019-01-03 00:04:58
Local clock offset: -2.76 ms
Remote clock offset: -0.732 ms

# Below is generated by plot.py at 2019-01-03 02:03:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 4.656 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 4.528 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 5.043 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 4.228 ms
Loss rate: 0.05%
```

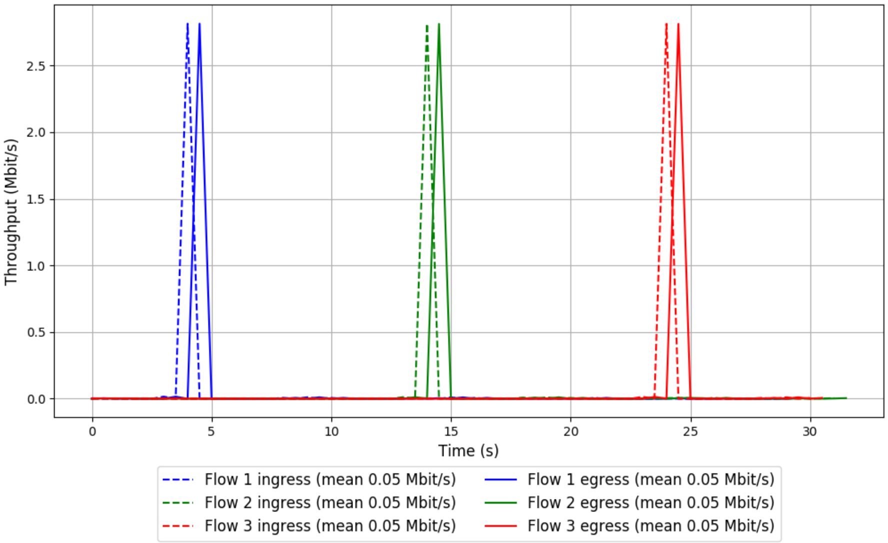
Run 1: Report of WebRTC media — Data Link

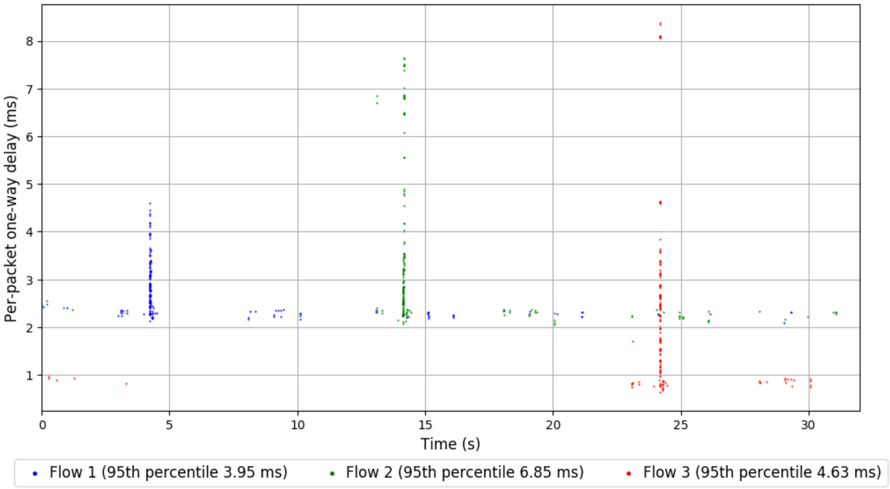




```
Run 2: Statistics of WebRTC media

Start at: 2019-01-03 00:26:04
End at: 2019-01-03 00:26:34
Local clock offset: -2.237 ms
Remote clock offset: -0.545 ms

# Below is generated by plot.py at 2019-01-03 02:03:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 6.479 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 3.949 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 6.852 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 4.632 ms
Loss rate: 0.00%
```

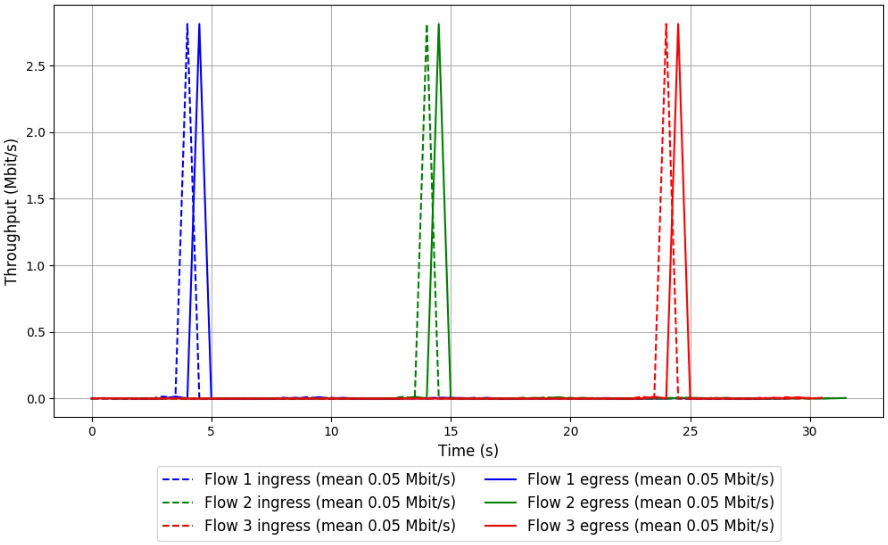
Run 2: Report of WebRTC media — Data Link

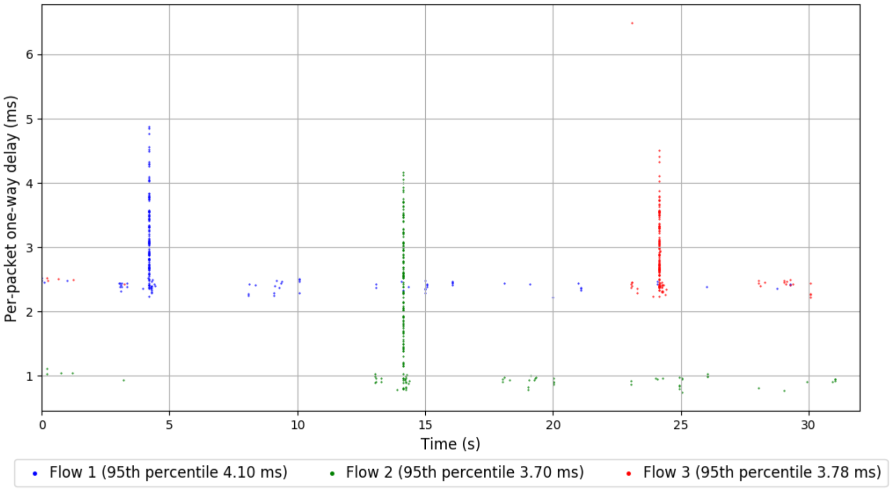




```
Run 3: Statistics of WebRTC media

Start at: 2019-01-03 00:47:43
End at: 2019-01-03 00:48:13
Local clock offset: -3.128 ms
Remote clock offset: -0.353 ms

# Below is generated by plot.py at 2019-01-03 02:03:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 3.880 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 4.096 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 3.701 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 3.776 ms
Loss rate: 0.00%
```

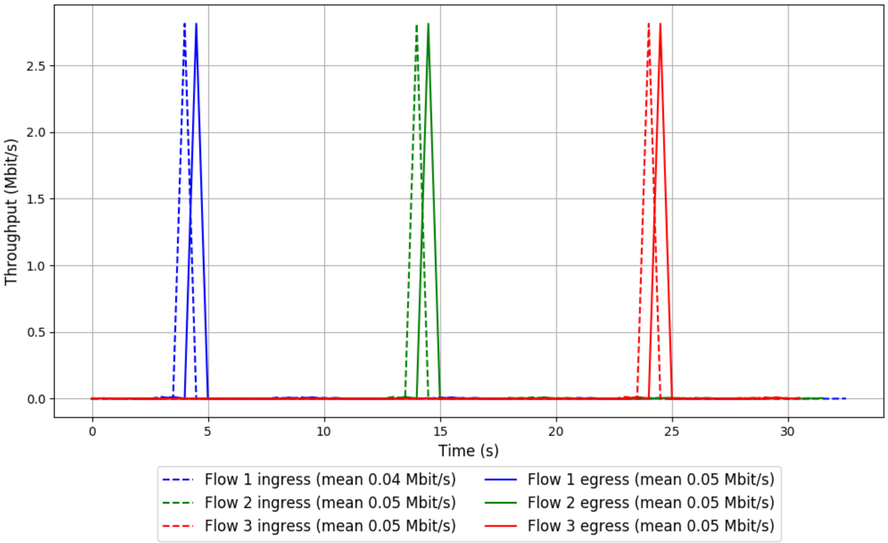
Run 3: Report of WebRTC media — Data Link

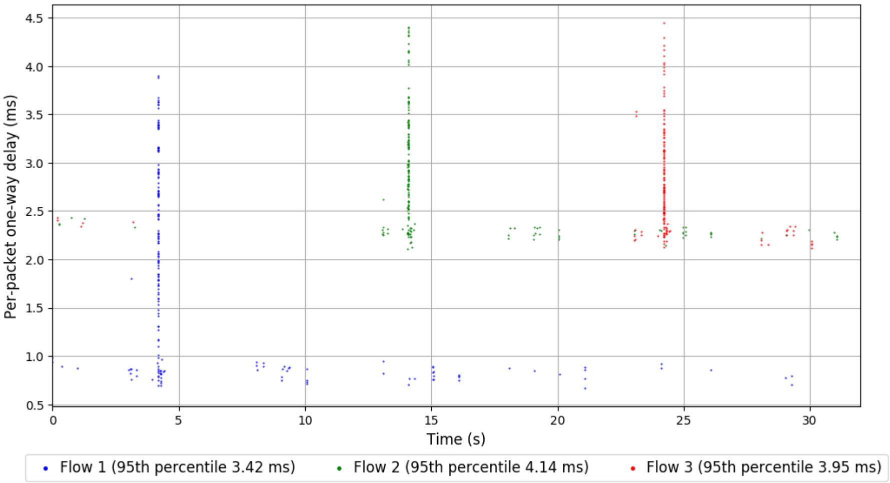




```
Run 4: Statistics of WebRTC media

Start at: 2019-01-03 01:09:18
End at: 2019-01-03 01:09:48
Local clock offset: -5.898 ms
Remote clock offset: -0.192 ms

# Below is generated by plot.py at 2019-01-03 02:03:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 3.749 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 3.424 ms
Loss rate: 0.05%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 4.139 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 3.953 ms
Loss rate: 0.00%
```

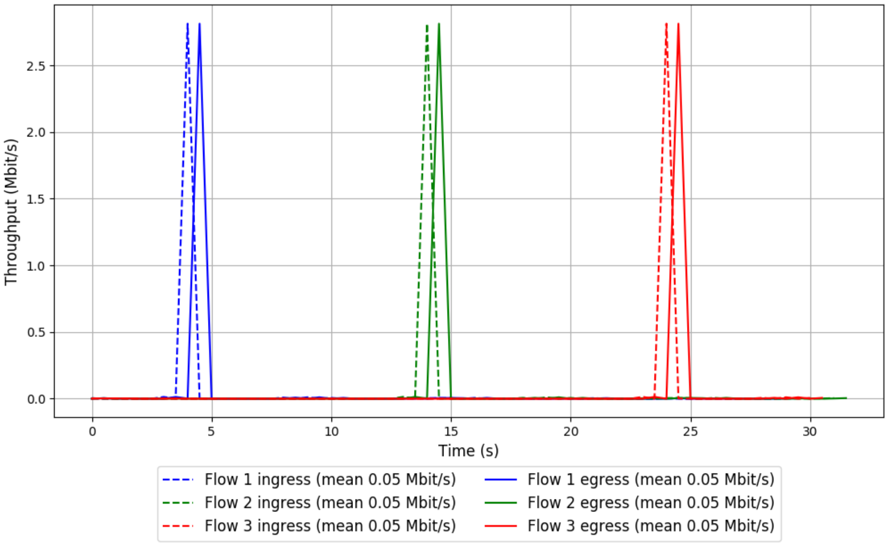
Run 4: Report of WebRTC media — Data Link



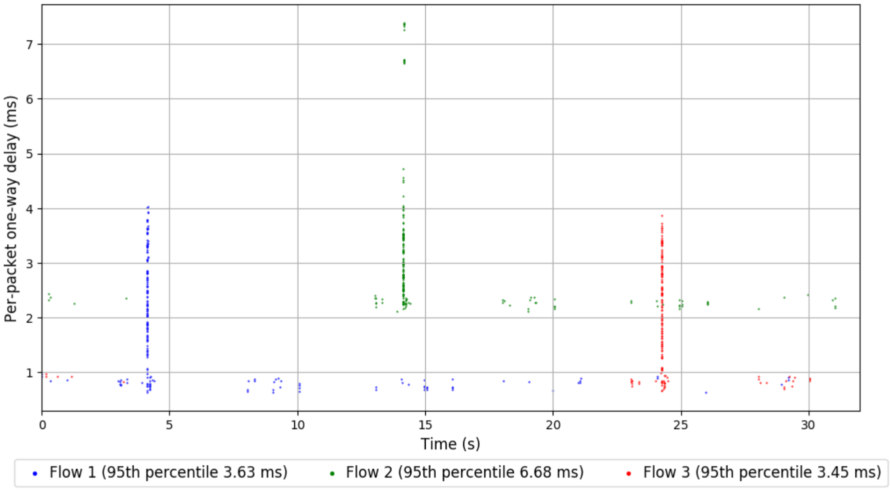


```
Run 5: Statistics of WebRTC media

Start at: 2019-01-03 01:30:55
End at: 2019-01-03 01:31:25
Local clock offset: -6.547 ms
Remote clock offset: -0.165 ms

# Below is generated by plot.py at 2019-01-03 02:03:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 3.871 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 3.632 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 6.685 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 3.453 ms
Loss rate: 0.00%
```

Run 5: Report of WebRTC media — Data Link



Throughput (Mbit/s)
2.5
2.0
1.5
1.0
0.5
0.0
0
5
10
15
20
25
30
Time (s)
Flow 1 ingress (mean 0.05 Mbit/s)
Flow 1 egress (mean 0.05 Mbit/s)
Flow 2 ingress (mean 0.05 Mbit/s)
Flow 2 egress (mean 0.05 Mbit/s)
Flow 3 ingress (mean 0.05 Mbit/s)
Flow 3 egress (mean 0.05 Mbit/s)



Per-packet one-way delay (ms)
7
6
5
4
3
2
1
0
5
10
15
20
25
30
Time (s)
Flow 1 (95th percentile 3.63 ms)
Flow 2 (95th percentile 6.68 ms)
Flow 3 (95th percentile 3.45 ms)