Pantheon Report

Generated at 2018-11-03 11:22:03 (UTC).

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

Repeated the test of 18 congestion control schemes 5 times.

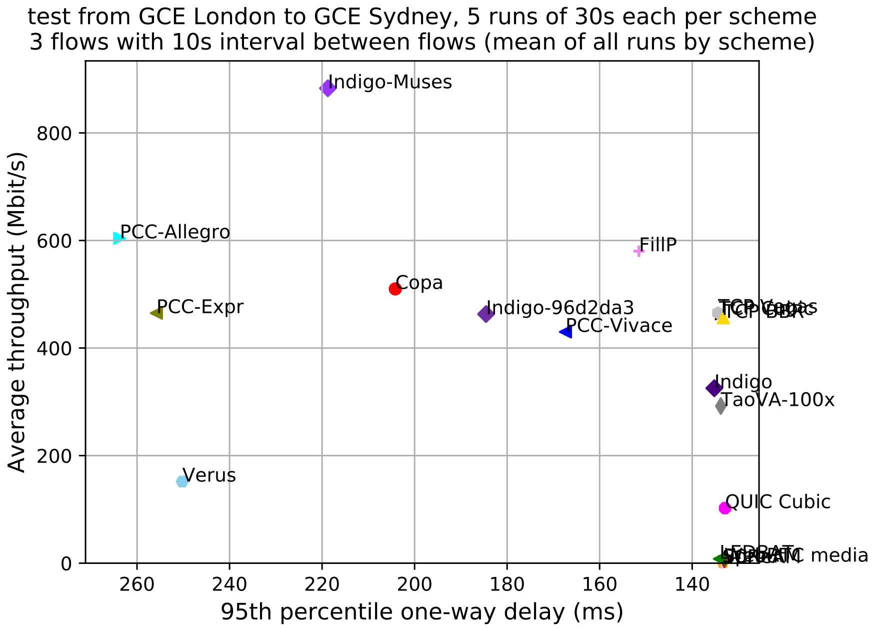
Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.

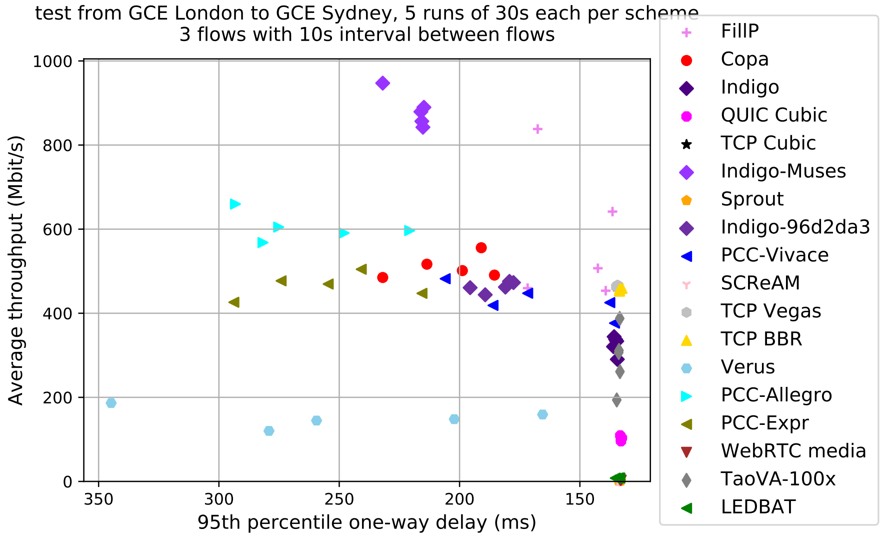
NTP offsets were measured against `time.google.com` and have been applied to correct the timestamps in logs.

```
System info:
Linux 4.15.0-1021-gcp
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

```
Git summary:
branch: muses @ 794ca3866981572cb73700a276691acf79c60f2b
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-96d2da3 @ 8413272d46f8aa0bcb967ed7048b6a8f994abb95
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
 M receiver/src/buffer.h
 M receiver/src/core.cpp
 M sender/src/buffer.h
 M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
 M src/ScreamClient
 M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
 M src/examples/cellsim.cc
 M src/examples/sproutbt2.cc
 M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
 M src/verus.hpp
 M tools/plot.py
```

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

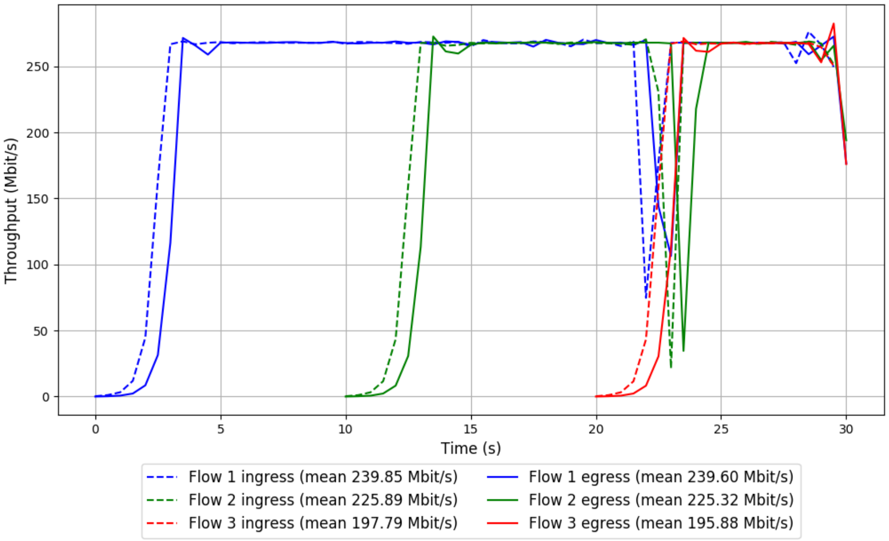

test from GCE London to GCE Sydney, 5 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
0
200
400
600
800
260
240
220
200
180
160
140
Indigo-Muses
PCC-Allegro
FillP
Copa
PCC-Expr
Indigo-96d2da3
PCC-Vivace
TCP Vegas
TCP Cubic
TCP BBR
Indigo
TaoVA-100x
Verus
QUIC Cubic
LEDBAT
Sprout
SCReAM
WebRTC media

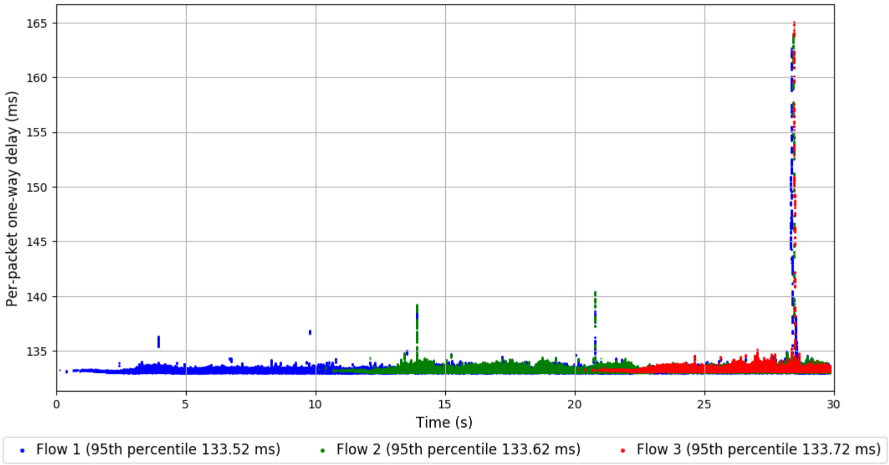

test from GCE London to GCE Sydney, 5 runs of 30s each per scheme
3 flows with 10s interval between flows
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
0
200
400
600
800
1000
350
300
250
200
150
FillP
Copa
Indigo
QUIC Cubic
TCP Cubic
Indigo-Muses
Sprout
Indigo-96d2da3
PCC-Vivace
SCReAM
TCP Vegas
TCP BBR
Verus
PCC-Allegro
PCC-Expr
WebRTC media
TaoVA-100x
LEDBAT

scheme	# runs	mean avg tput (Mbit/s) flow 1	flow 2	flow 3	mean 95th-%ile delay (ms) flow 1	flow 2	flow 3	mean loss rate (%) flow 1	flow 2	flow 3
TCP BBR	5	238.94	230.80	196.36	133.15	133.36	133.25	0.80	1.27	3.61
Copa	5	283.33	244.13	198.37	185.33	228.65	179.93	0.95	1.61	4.18
TCP Cubic	5	245.45	227.90	199.62	134.01	134.07	134.71	0.97	1.50	3.55
FillP	5	261.89	352.48	261.37	157.34	137.27	137.73	0.70	1.27	3.19
Indigo	5	172.21	160.30	145.21	134.70	135.14	138.46	0.83	1.33	3.25
Indigo-96d2da3	5	252.16	226.29	190.42	179.53	192.25	180.20	1.60	2.99	3.13
LEDBAT	5	5.23	3.44	1.67	133.80	133.93	133.44	1.78	2.69	5.40
Indigo-Muses	5	509.79	438.70	257.29	202.93	232.39	230.55	1.24	2.43	7.04
PCC-Allegro	5	339.43	280.91	243.88	266.99	214.37	266.32	7.06	3.02	8.57
PCC-Expr	5	278.87	204.66	156.16	255.96	234.44	248.01	4.78	2.80	8.93
QUIC Cubic	5	58.89	49.03	32.74	132.89	132.76	132.46	1.21	1.90	3.46
SCReAM	5	0.15	0.15	0.16	133.04	133.51	133.09	0.88	1.35	2.38
Sprout	5	0.69	0.64	0.64	133.14	133.36	133.15	1.01	1.43	2.85
TaoVA-100x	5	155.76	150.22	112.68	133.14	133.91	133.55	0.99	1.58	3.01
TCP Vegas	5	245.25	233.82	199.55	134.48	134.29	134.66	0.97	1.52	3.55
Verus	5	80.91	79.42	57.04	217.70	201.91	178.23	4.04	4.27	3.06
PCC-Vivace	5	254.93	202.10	127.47	165.08	158.30	160.51	1.02	1.65	4.84
WebRTC media	5	1.63	0.97	0.30	132.93	132.94	132.99	0.93	1.77	7.66

```
Run 1: Statistics of TCP BBR

Start at: 2018-11-03 06:50:34
End at: 2018-11-03 06:51:04
Local clock offset: 0.215 ms
Remote clock offset: -0.106 ms

# Below is generated by plot.py at 2018-11-03 09:40:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 452.97 Mbit/s
95th percentile per-packet one-way delay: 133.596 ms
Loss rate: 1.56%
-- Flow 1:
Average throughput: 239.60 Mbit/s
95th percentile per-packet one-way delay: 133.518 ms
Loss rate: 0.99%
-- Flow 2:
Average throughput: 225.32 Mbit/s
95th percentile per-packet one-way delay: 133.621 ms
Loss rate: 1.58%
-- Flow 3:
Average throughput: 195.88 Mbit/s
95th percentile per-packet one-way delay: 133.722 ms
Loss rate: 3.61%
```

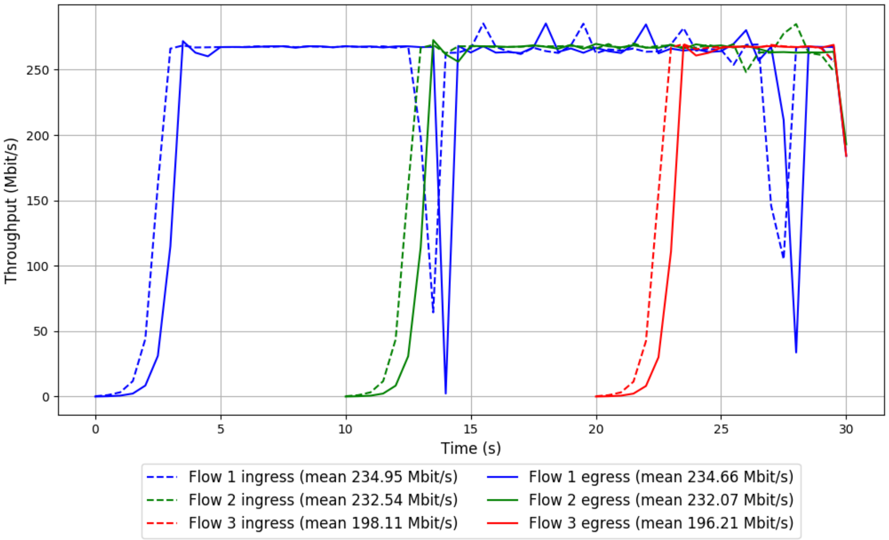
Run 1: Report of TCP BBR — Data Link

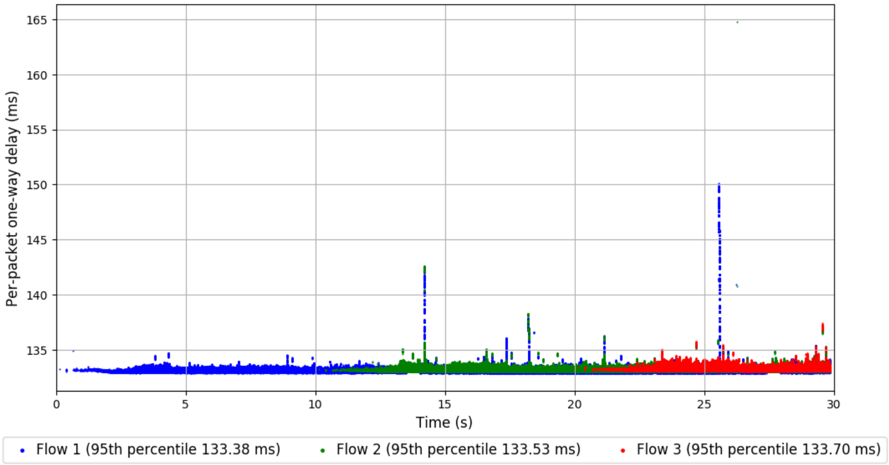




```
Run 2: Statistics of TCP BBR

Start at: 2018-11-03 07:24:19
End at: 2018-11-03 07:24:49
Local clock offset: 0.188 ms
Remote clock offset: -0.104 ms

# Below is generated by plot.py at 2018-11-03 09:40:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 452.59 Mbit/s
95th percentile per-packet one-way delay: 133.524 ms
Loss rate: 1.56%
-- Flow 1:
Average throughput: 234.66 Mbit/s
95th percentile per-packet one-way delay: 133.376 ms
Loss rate: 1.01%
-- Flow 2:
Average throughput: 232.07 Mbit/s
95th percentile per-packet one-way delay: 133.532 ms
Loss rate: 1.53%
-- Flow 3:
Average throughput: 196.21 Mbit/s
95th percentile per-packet one-way delay: 133.703 ms
Loss rate: 3.61%
```

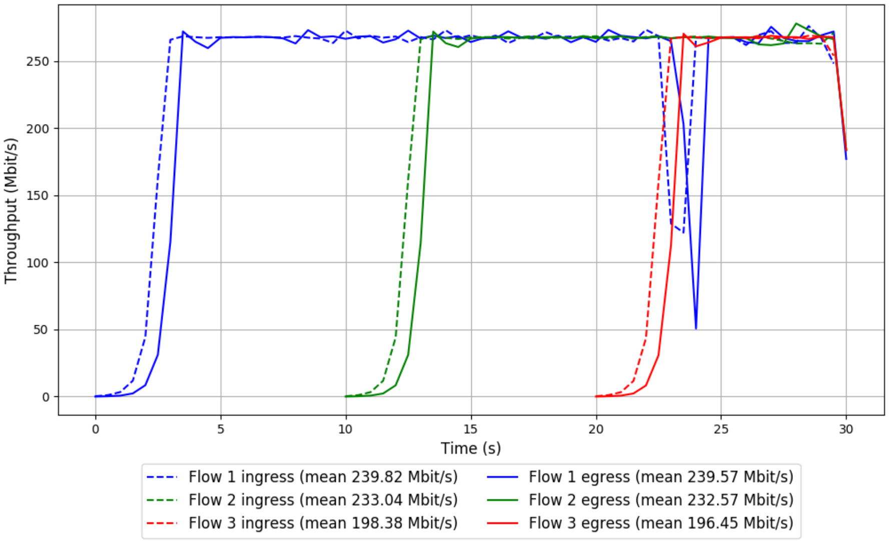
Run 2: Report of TCP BBR — Data Link

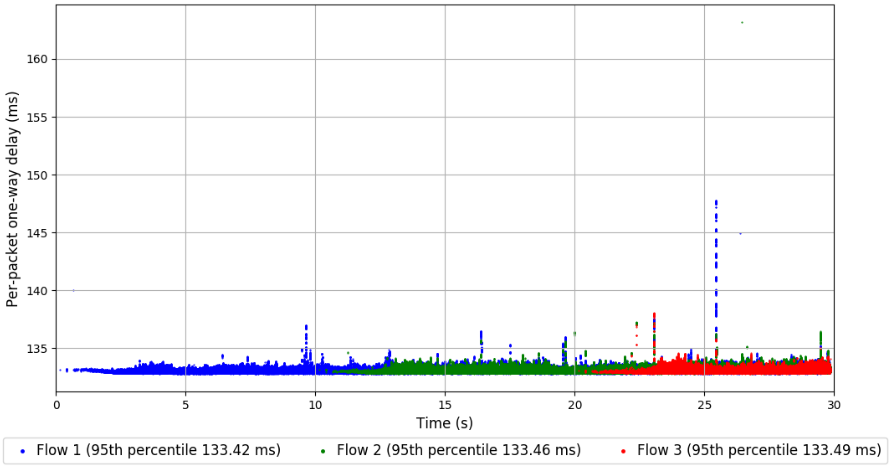




```
Run 3: Statistics of TCP BBR

Start at: 2018-11-03 07:58:20
End at: 2018-11-03 07:58:50
Local clock offset: -0.134 ms
Remote clock offset: -0.072 ms

# Below is generated by plot.py at 2018-11-03 09:40:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 457.94 Mbit/s
95th percentile per-packet one-way delay: 133.446 ms
Loss rate: 1.55%
-- Flow 1:
Average throughput: 239.57 Mbit/s
95th percentile per-packet one-way delay: 133.424 ms
Loss rate: 0.99%
-- Flow 2:
Average throughput: 232.57 Mbit/s
95th percentile per-packet one-way delay: 133.456 ms
Loss rate: 1.53%
-- Flow 3:
Average throughput: 196.45 Mbit/s
95th percentile per-packet one-way delay: 133.494 ms
Loss rate: 3.60%
```

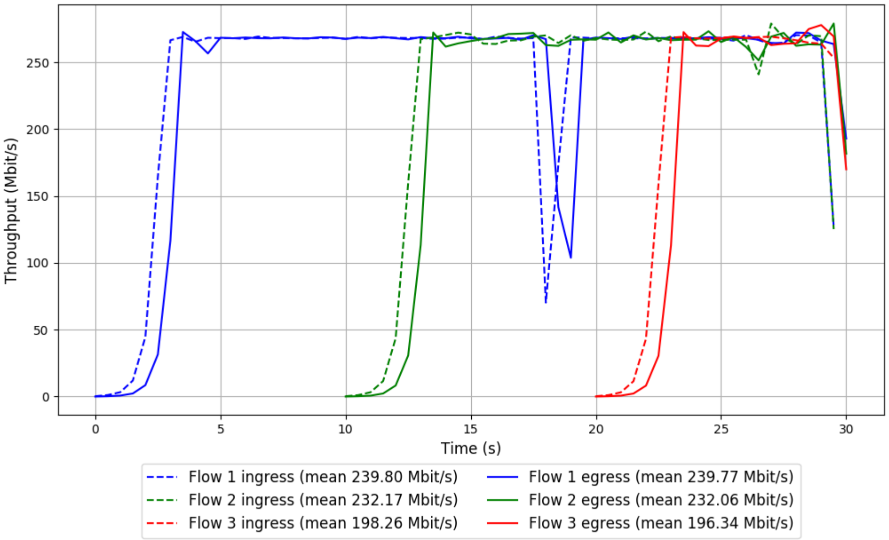
Run 3: Report of TCP BBR — Data Link

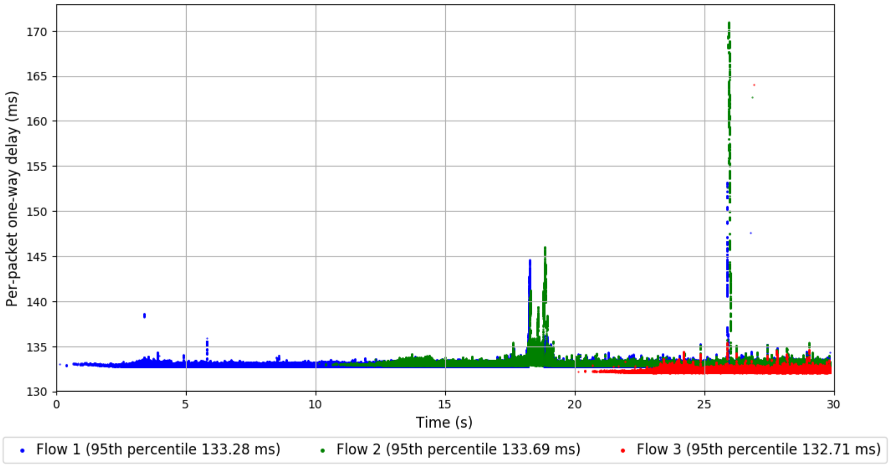




```
Run 4: Statistics of TCP BBR

Start at: 2018-11-03 08:31:50
End at: 2018-11-03 08:32:20
Local clock offset: -0.169 ms
Remote clock offset: -0.077 ms

# Below is generated by plot.py at 2018-11-03 09:40:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 457.72 Mbit/s
95th percentile per-packet one-way delay: 133.360 ms
Loss rate: 0.59%
-- Flow 1:
Average throughput: 239.77 Mbit/s
95th percentile per-packet one-way delay: 133.276 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 232.06 Mbit/s
95th percentile per-packet one-way delay: 133.695 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 196.34 Mbit/s
95th percentile per-packet one-way delay: 132.705 ms
Loss rate: 3.61%
```

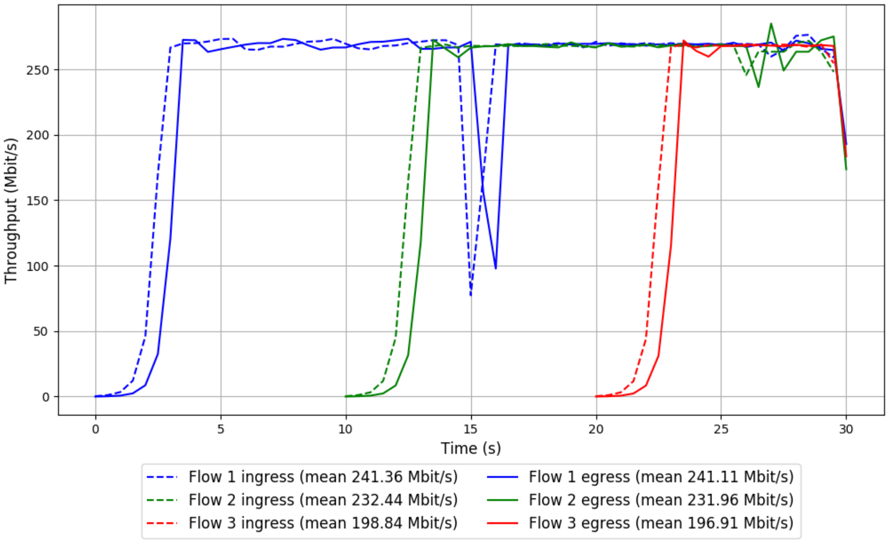
Run 4: Report of TCP BBR — Data Link

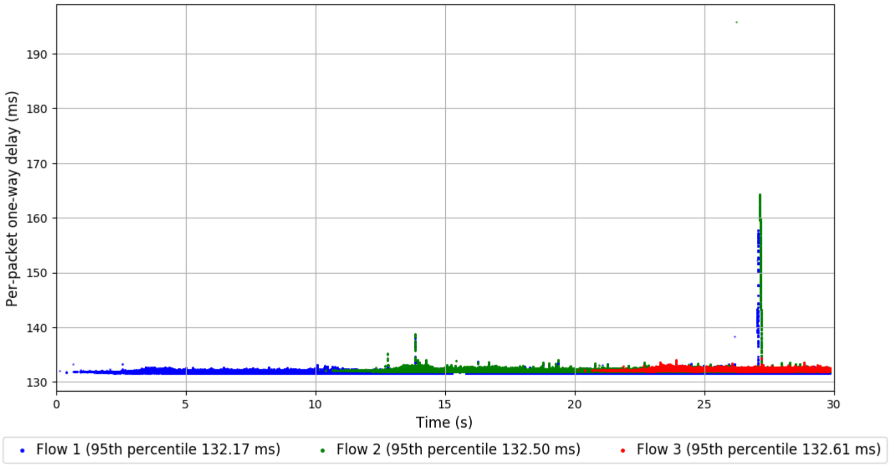




```
Run 5: Statistics of TCP BBR

Start at: 2018-11-03 09:04:29
End at: 2018-11-03 09:04:59
Local clock offset: -0.54 ms
Remote clock offset: -0.053 ms

# Below is generated by plot.py at 2018-11-03 09:40:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 459.26 Mbit/s
95th percentile per-packet one-way delay: 132.448 ms
Loss rate: 1.54%
-- Flow 1:
Average throughput: 241.11 Mbit/s
95th percentile per-packet one-way delay: 132.173 ms
Loss rate: 0.99%
-- Flow 2:
Average throughput: 231.96 Mbit/s
95th percentile per-packet one-way delay: 132.500 ms
Loss rate: 1.53%
-- Flow 3:
Average throughput: 196.91 Mbit/s
95th percentile per-packet one-way delay: 132.606 ms
Loss rate: 3.60%
```

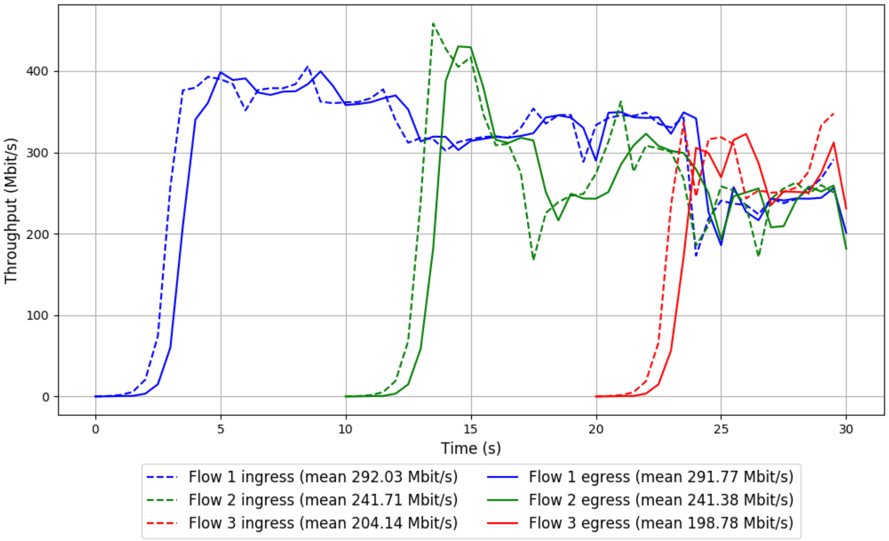
Run 5: Report of TCP BBR — Data Link

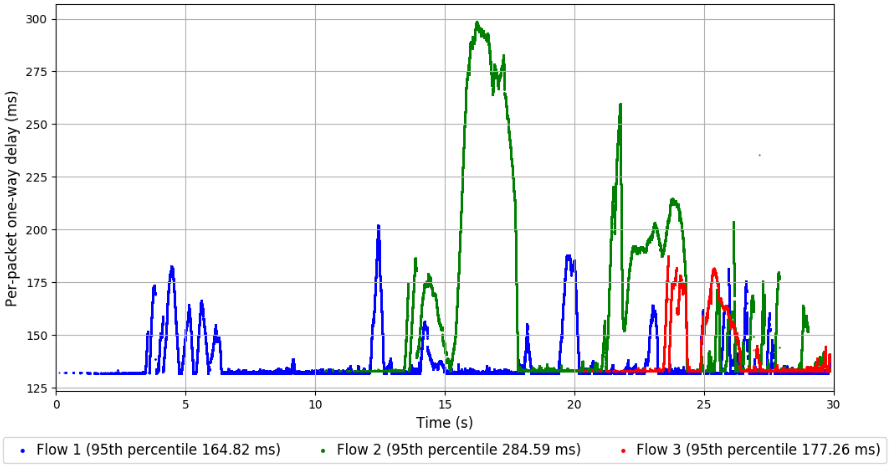




```
Run 1: Statistics of Copa

Start at: 2018-11-03 06:40:10
End at: 2018-11-03 06:40:40
Local clock offset: -0.086 ms
Remote clock offset: 0.012 ms

# Below is generated by plot.py at 2018-11-03 09:50:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 516.65 Mbit/s
95th percentile per-packet one-way delay: 213.580 ms
Loss rate: 1.68%
-- Flow 1:
Average throughput: 291.77 Mbit/s
95th percentile per-packet one-way delay: 164.822 ms
Loss rate: 0.98%
-- Flow 2:
Average throughput: 241.38 Mbit/s
95th percentile per-packet one-way delay: 284.586 ms
Loss rate: 1.47%
-- Flow 3:
Average throughput: 198.78 Mbit/s
95th percentile per-packet one-way delay: 177.259 ms
Loss rate: 5.24%
```

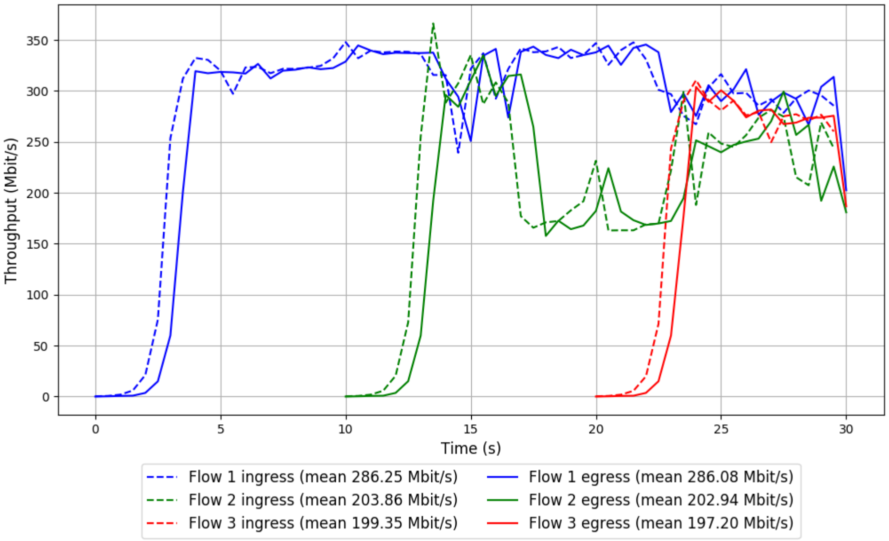
Run 1: Report of Copa — Data Link

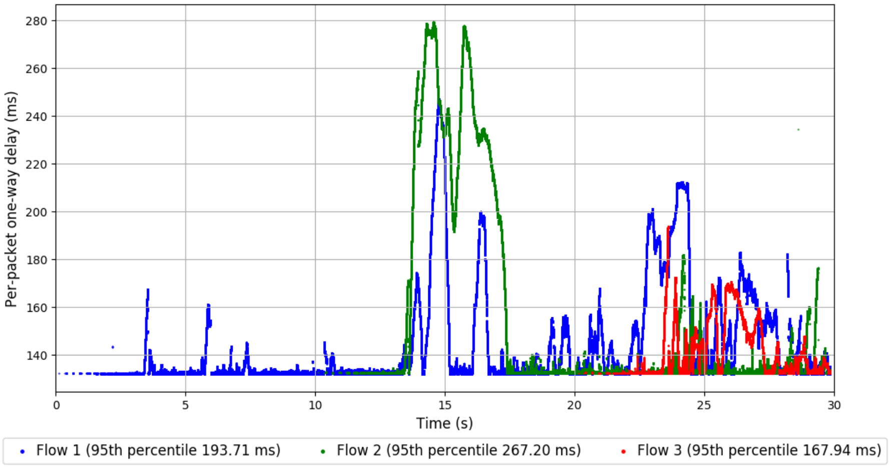




```
Run 2: Statistics of Copa

Start at: 2018-11-03 07:13:45
End at: 2018-11-03 07:14:15
Local clock offset: -0.001 ms
Remote clock offset: -0.159 ms

# Below is generated by plot.py at 2018-11-03 09:50:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 485.04 Mbit/s
95th percentile per-packet one-way delay: 231.934 ms
Loss rate: 1.55%
-- Flow 1:
Average throughput: 286.08 Mbit/s
95th percentile per-packet one-way delay: 193.709 ms
Loss rate: 0.94%
-- Flow 2:
Average throughput: 202.94 Mbit/s
95th percentile per-packet one-way delay: 267.202 ms
Loss rate: 1.77%
-- Flow 3:
Average throughput: 197.20 Mbit/s
95th percentile per-packet one-way delay: 167.939 ms
Loss rate: 3.70%
```

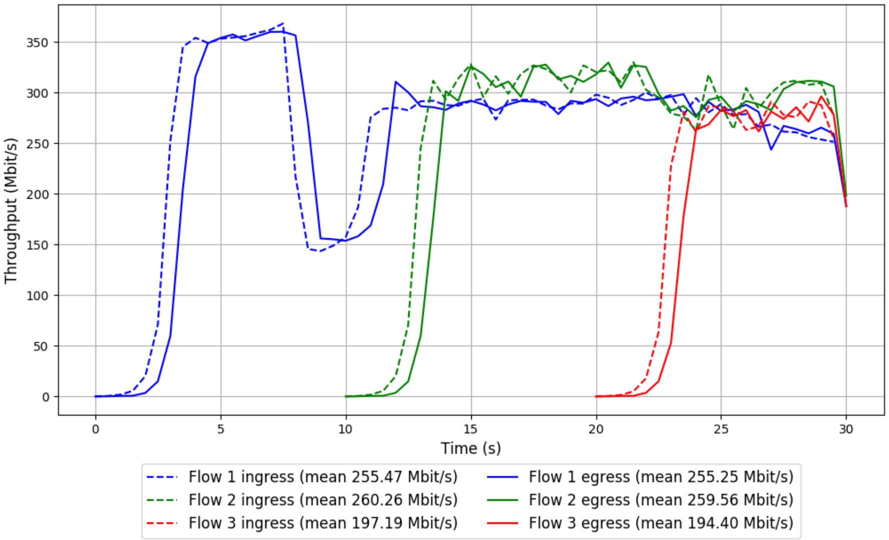
Run 2: Report of Copa — Data Link

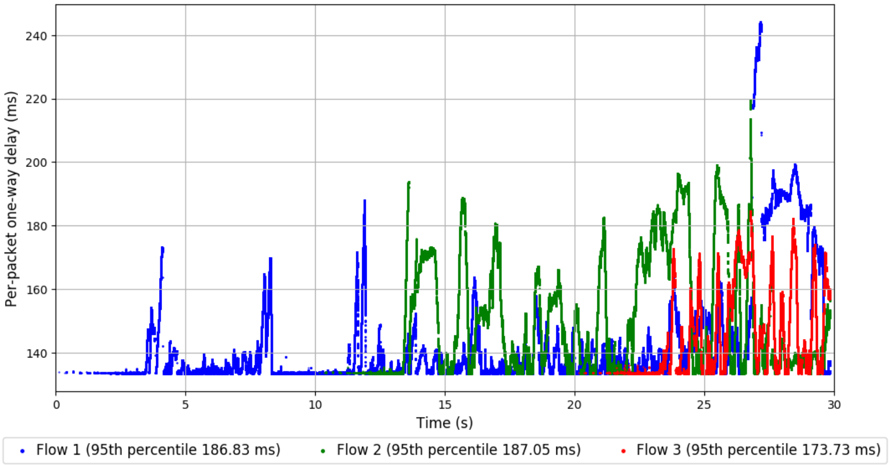




```
Run 3: Statistics of Copa

Start at: 2018-11-03 07:47:40
End at: 2018-11-03 07:48:10
Local clock offset: -0.079 ms
Remote clock offset: -0.571 ms

# Below is generated by plot.py at 2018-11-03 09:50:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 490.69 Mbit/s
95th percentile per-packet one-way delay: 185.503 ms
Loss rate: 1.60%
-- Flow 1:
Average throughput: 255.25 Mbit/s
95th percentile per-packet one-way delay: 186.827 ms
Loss rate: 0.98%
-- Flow 2:
Average throughput: 259.56 Mbit/s
95th percentile per-packet one-way delay: 187.050 ms
Loss rate: 1.60%
-- Flow 3:
Average throughput: 194.40 Mbit/s
95th percentile per-packet one-way delay: 173.732 ms
Loss rate: 4.05%
```

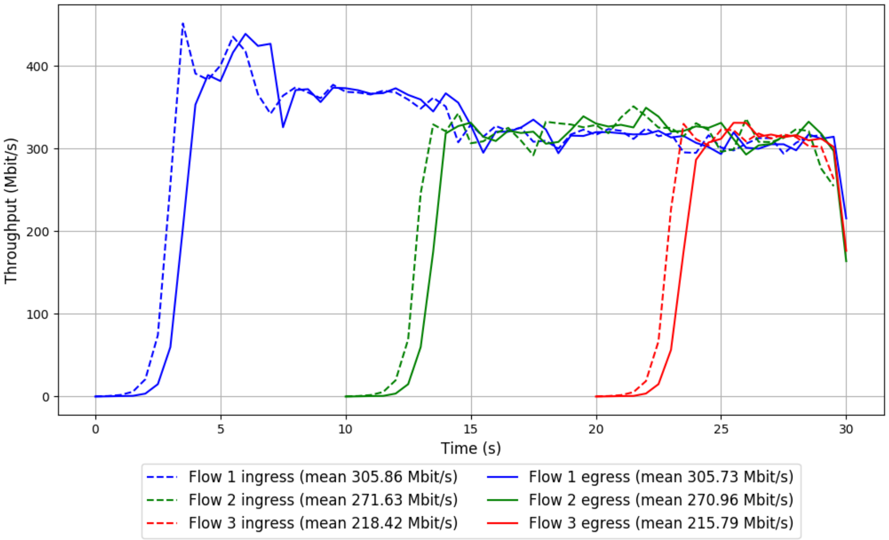
Run 3: Report of Copa — Data Link

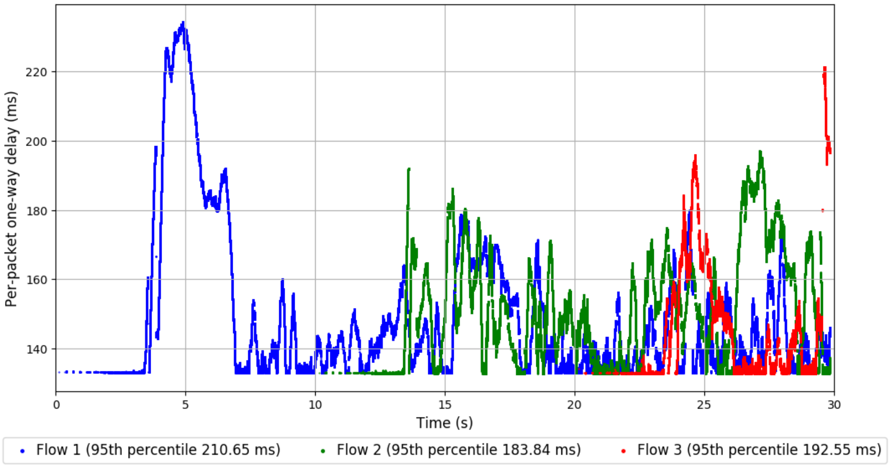




```
Run 4: Statistics of Copa

Start at: 2018-11-03 08:21:36
End at: 2018-11-03 08:22:06
Local clock offset: -0.164 ms
Remote clock offset: -0.024 ms

# Below is generated by plot.py at 2018-11-03 10:01:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 555.81 Mbit/s
95th percentile per-packet one-way delay: 190.977 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 305.73 Mbit/s
95th percentile per-packet one-way delay: 210.650 ms
Loss rate: 0.93%
-- Flow 2:
Average throughput: 270.96 Mbit/s
95th percentile per-packet one-way delay: 183.836 ms
Loss rate: 1.58%
-- Flow 3:
Average throughput: 215.79 Mbit/s
95th percentile per-packet one-way delay: 192.546 ms
Loss rate: 3.84%
```

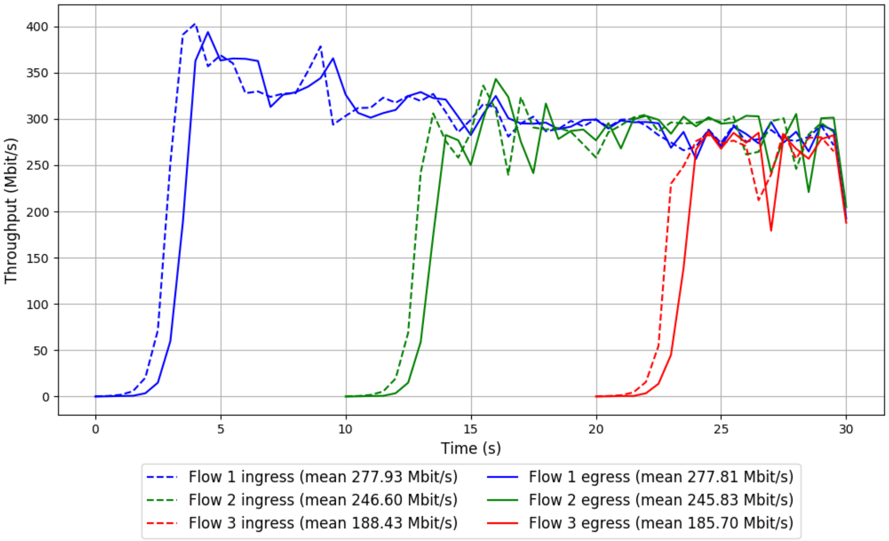
Run 4: Report of Copa — Data Link

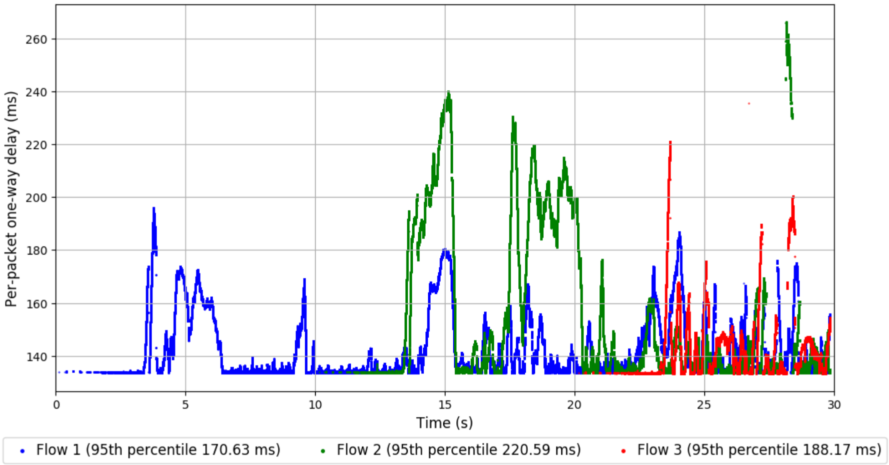




```
Run 5: Statistics of Copa

Start at: 2018-11-03 08:54:34
End at: 2018-11-03 08:55:04
Local clock offset: 0.091 ms
Remote clock offset: -0.397 ms

# Below is generated by plot.py at 2018-11-03 10:01:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 501.41 Mbit/s
95th percentile per-packet one-way delay: 198.835 ms
Loss rate: 1.55%
-- Flow 1:
Average throughput: 277.81 Mbit/s
95th percentile per-packet one-way delay: 170.635 ms
Loss rate: 0.93%
-- Flow 2:
Average throughput: 245.83 Mbit/s
95th percentile per-packet one-way delay: 220.592 ms
Loss rate: 1.64%
-- Flow 3:
Average throughput: 185.70 Mbit/s
95th percentile per-packet one-way delay: 188.173 ms
Loss rate: 4.09%
```

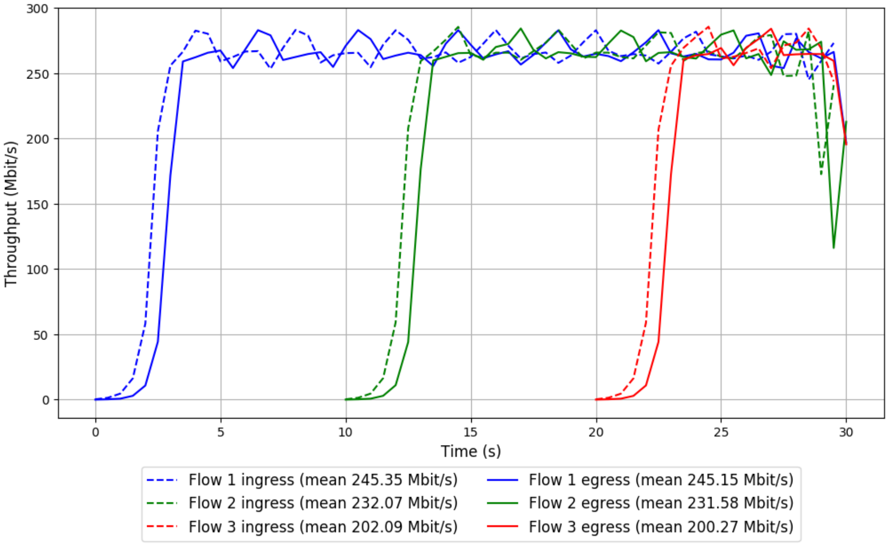
Run 5: Report of Copa — Data Link

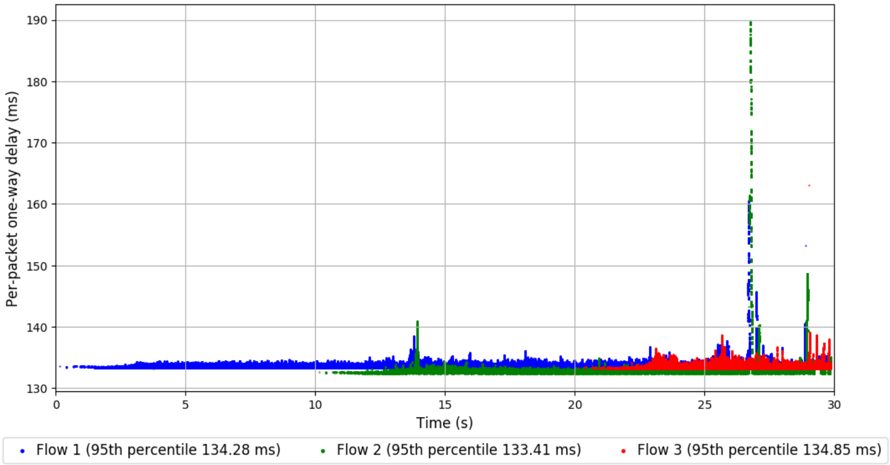




```
Run 1: Statistics of TCP Cubic

Start at: 2018-11-03 06:53:45
End at: 2018-11-03 06:54:15
Local clock offset: -0.029 ms
Remote clock offset: -0.447 ms

# Below is generated by plot.py at 2018-11-03 10:01:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 464.18 Mbit/s
95th percentile per-packet one-way delay: 134.285 ms
Loss rate: 1.53%
-- Flow 1:
Average throughput: 245.15 Mbit/s
95th percentile per-packet one-way delay: 134.277 ms
Loss rate: 0.97%
-- Flow 2:
Average throughput: 231.58 Mbit/s
95th percentile per-packet one-way delay: 133.413 ms
Loss rate: 1.54%
-- Flow 3:
Average throughput: 200.27 Mbit/s
95th percentile per-packet one-way delay: 134.854 ms
Loss rate: 3.53%
```

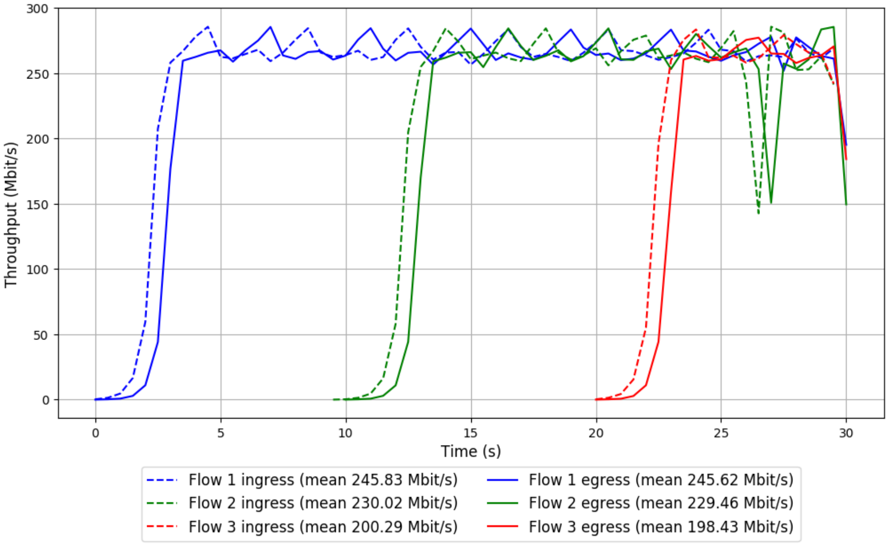
Run 1: Report of TCP Cubic — Data Link

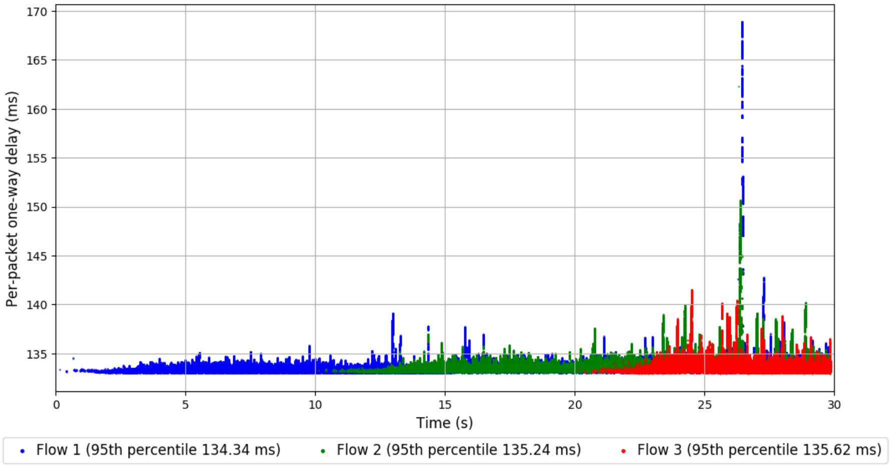




```
Run 2: Statistics of TCP Cubic

Start at: 2018-11-03 07:27:28
End at: 2018-11-03 07:27:58
Local clock offset: -0.273 ms
Remote clock offset: -0.544 ms

# Below is generated by plot.py at 2018-11-03 10:01:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 462.61 Mbit/s
95th percentile per-packet one-way delay: 134.771 ms
Loss rate: 1.53%
-- Flow 1:
Average throughput: 245.62 Mbit/s
95th percentile per-packet one-way delay: 134.336 ms
Loss rate: 0.97%
-- Flow 2:
Average throughput: 229.46 Mbit/s
95th percentile per-packet one-way delay: 135.244 ms
Loss rate: 1.55%
-- Flow 3:
Average throughput: 198.43 Mbit/s
95th percentile per-packet one-way delay: 135.615 ms
Loss rate: 3.57%
```

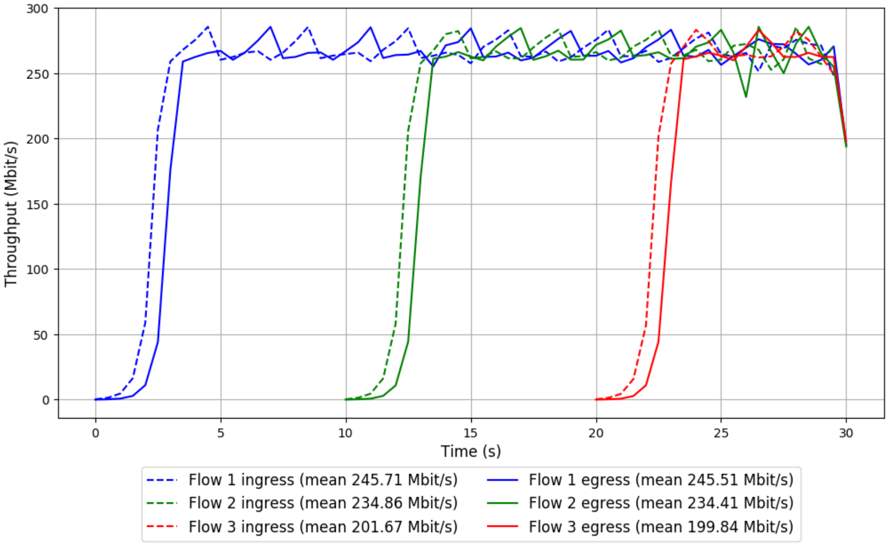
Run 2: Report of TCP Cubic — Data Link

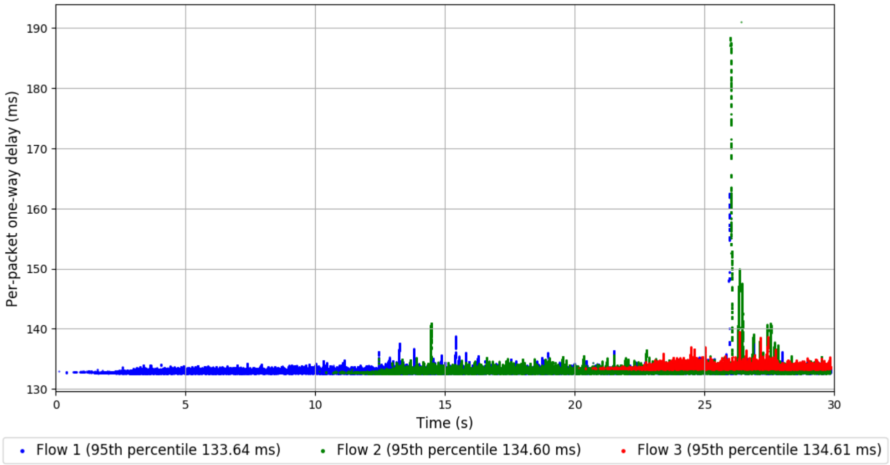




```
Run 3: Statistics of TCP Cubic

Start at: 2018-11-03 08:01:45
End at: 2018-11-03 08:02:15
Local clock offset: 0.045 ms
Remote clock offset: -0.106 ms

# Below is generated by plot.py at 2018-11-03 10:01:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 466.04 Mbit/s
95th percentile per-packet one-way delay: 134.207 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 245.51 Mbit/s
95th percentile per-packet one-way delay: 133.636 ms
Loss rate: 0.96%
-- Flow 2:
Average throughput: 234.41 Mbit/s
95th percentile per-packet one-way delay: 134.597 ms
Loss rate: 1.52%
-- Flow 3:
Average throughput: 199.84 Mbit/s
95th percentile per-packet one-way delay: 134.607 ms
Loss rate: 3.55%
```

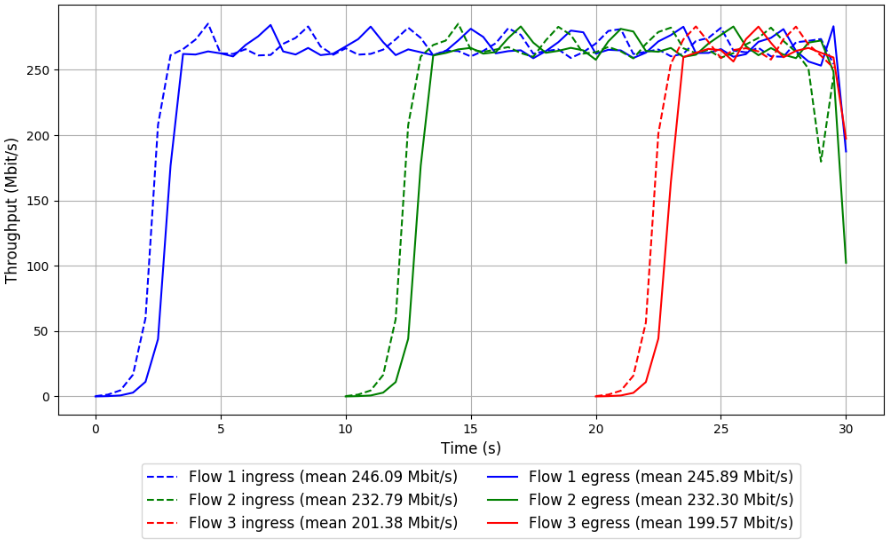
Run 3: Report of TCP Cubic — Data Link

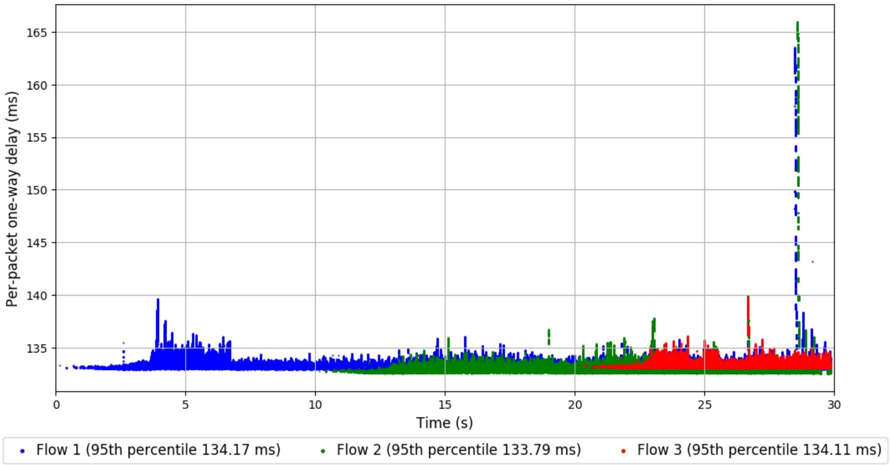




```
Run 4: Statistics of TCP Cubic

Start at: 2018-11-03 08:34:57
End at: 2018-11-03 08:35:27
Local clock offset: 0.06 ms
Remote clock offset: -0.035 ms

# Below is generated by plot.py at 2018-11-03 10:01:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 465.09 Mbit/s
95th percentile per-packet one-way delay: 134.069 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 245.89 Mbit/s
95th percentile per-packet one-way delay: 134.169 ms
Loss rate: 0.97%
-- Flow 2:
Average throughput: 232.30 Mbit/s
95th percentile per-packet one-way delay: 133.794 ms
Loss rate: 1.54%
-- Flow 3:
Average throughput: 199.57 Mbit/s
95th percentile per-packet one-way delay: 134.112 ms
Loss rate: 3.54%
```

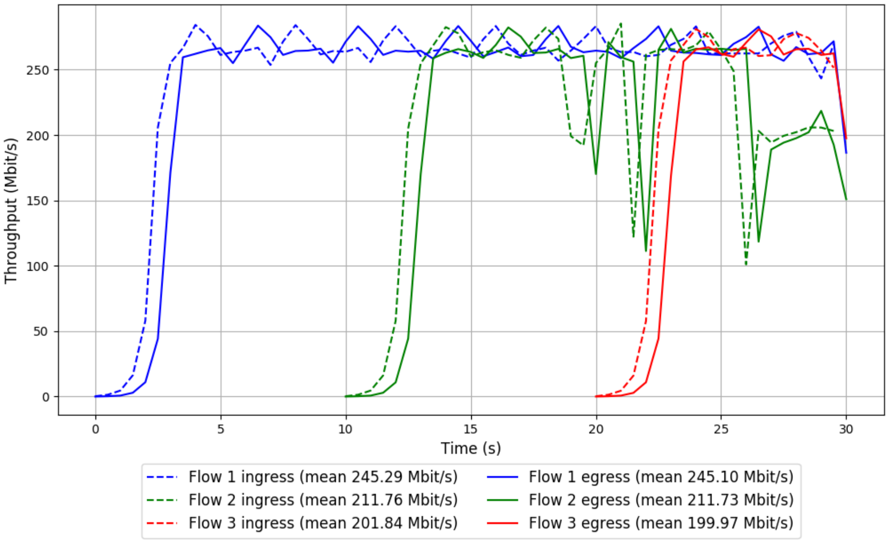
Run 4: Report of TCP Cubic — Data Link

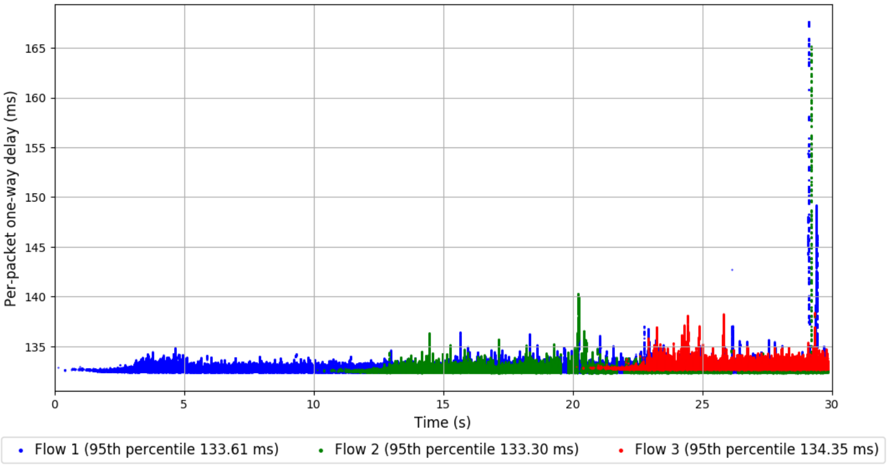




```
Run 5: Statistics of TCP Cubic

Start at: 2018-11-03 09:07:42
End at: 2018-11-03 09:08:12
Local clock offset: -0.521 ms
Remote clock offset: -0.045 ms

# Below is generated by plot.py at 2018-11-03 10:01:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 450.83 Mbit/s
95th percentile per-packet one-way delay: 133.723 ms
Loss rate: 1.46%
-- Flow 1:
Average throughput: 245.10 Mbit/s
95th percentile per-packet one-way delay: 133.610 ms
Loss rate: 0.96%
-- Flow 2:
Average throughput: 211.73 Mbit/s
95th percentile per-packet one-way delay: 133.298 ms
Loss rate: 1.34%
-- Flow 3:
Average throughput: 199.97 Mbit/s
95th percentile per-packet one-way delay: 134.349 ms
Loss rate: 3.54%
```

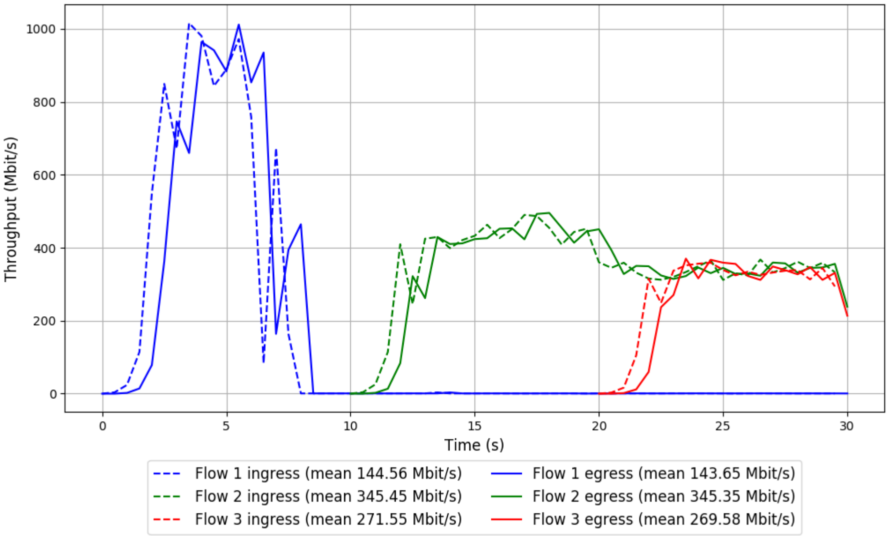
Run 5: Report of TCP Cubic — Data Link

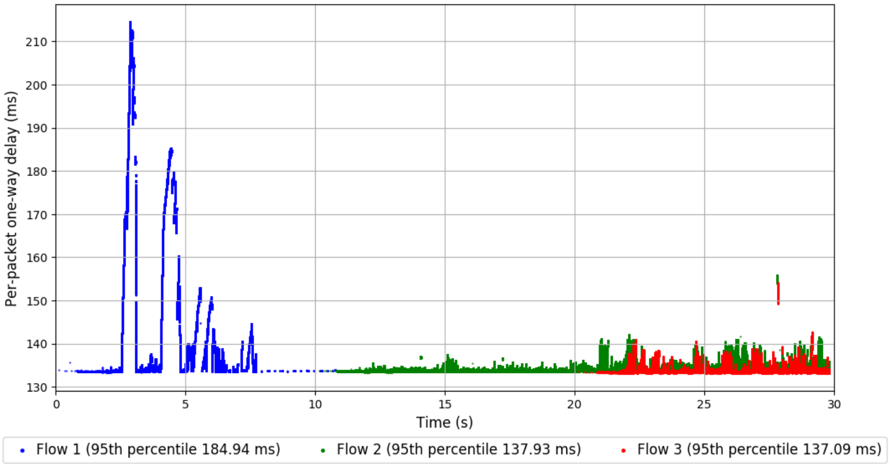




```
Run 1: Statistics of FillP

Start at: 2018-11-03 06:55:37
End at: 2018-11-03 06:56:07
Local clock offset: 0.386 ms
Remote clock offset: -0.116 ms

# Below is generated by plot.py at 2018-11-03 10:01:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 459.67 Mbit/s
95th percentile per-packet one-way delay: 171.714 ms
Loss rate: 1.77%
-- Flow 1:
Average throughput: 143.65 Mbit/s
95th percentile per-packet one-way delay: 184.941 ms
Loss rate: 1.35%
-- Flow 2:
Average throughput: 345.35 Mbit/s
95th percentile per-packet one-way delay: 137.934 ms
Loss rate: 1.45%
-- Flow 3:
Average throughput: 269.58 Mbit/s
95th percentile per-packet one-way delay: 137.085 ms
Loss rate: 3.26%
```

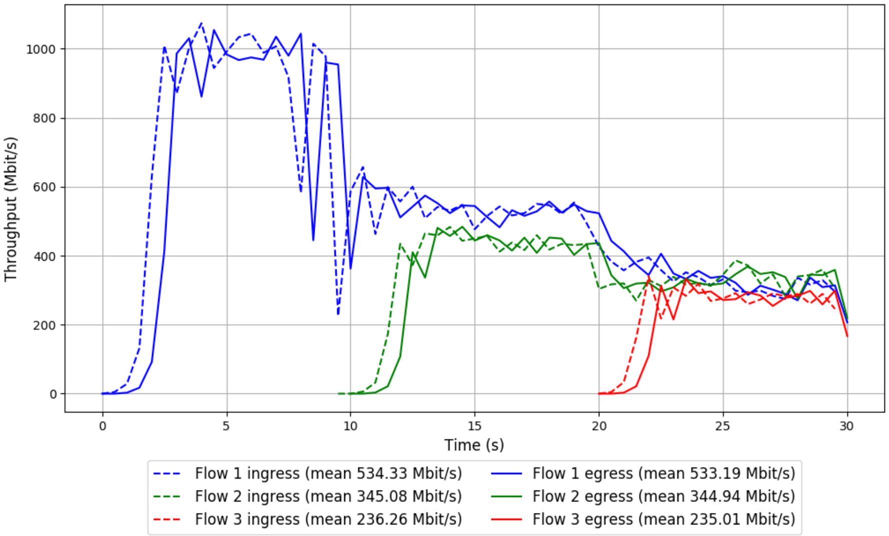
Run 1: Report of FillP — Data Link

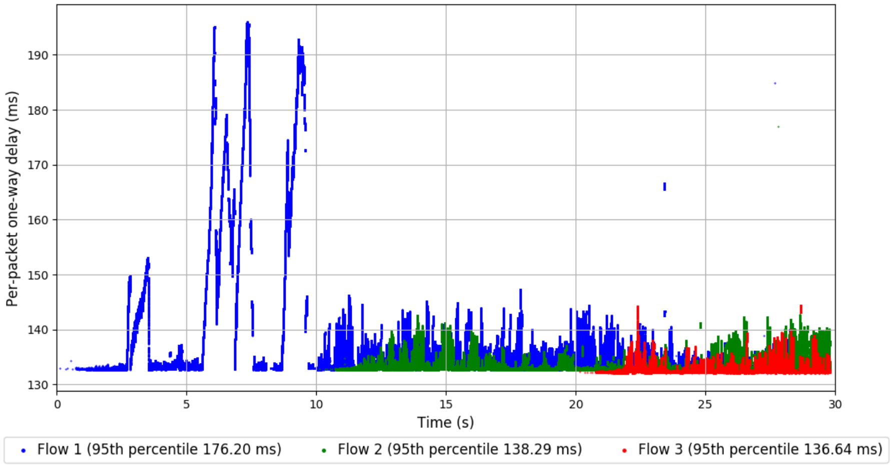




```
Run 2: Statistics of FillP

Start at: 2018-11-03 07:29:25
End at: 2018-11-03 07:29:55
Local clock offset: -0.306 ms
Remote clock offset: -0.223 ms

# Below is generated by plot.py at 2018-11-03 10:11:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 838.15 Mbit/s
95th percentile per-packet one-way delay: 167.536 ms
Loss rate: 1.39%
-- Flow 1:
Average throughput: 533.19 Mbit/s
95th percentile per-packet one-way delay: 176.197 ms
Loss rate: 1.14%
-- Flow 2:
Average throughput: 344.94 Mbit/s
95th percentile per-packet one-way delay: 138.294 ms
Loss rate: 1.33%
-- Flow 3:
Average throughput: 235.01 Mbit/s
95th percentile per-packet one-way delay: 136.644 ms
Loss rate: 3.23%
```

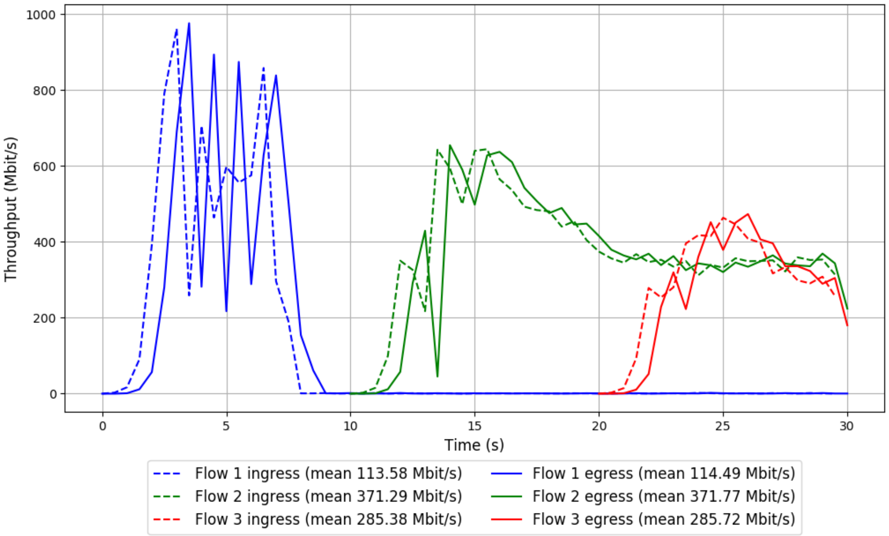
Run 2: Report of FillP — Data Link

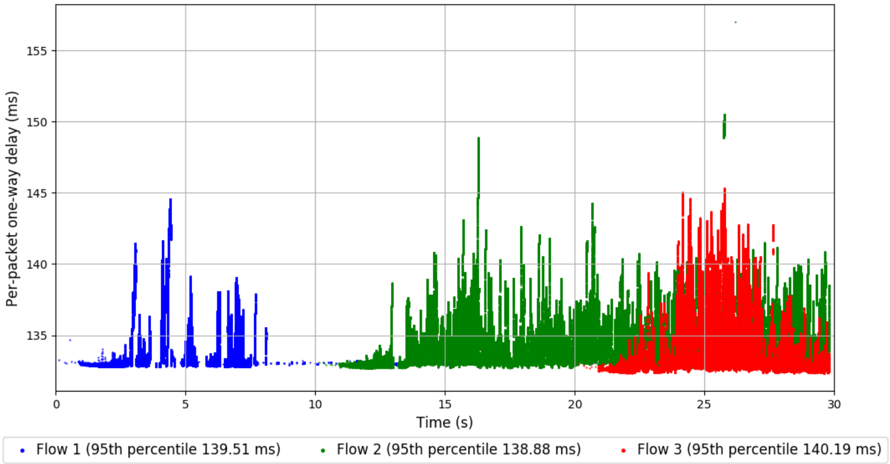




```
Run 3: Statistics of FillP

Start at: 2018-11-03 08:03:41
End at: 2018-11-03 08:04:11
Local clock offset: -0.157 ms
Remote clock offset: -0.087 ms

# Below is generated by plot.py at 2018-11-03 10:11:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 453.64 Mbit/s
95th percentile per-packet one-way delay: 139.261 ms
Loss rate: 1.25%
-- Flow 1:
Average throughput: 114.49 Mbit/s
95th percentile per-packet one-way delay: 139.514 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 371.77 Mbit/s
95th percentile per-packet one-way delay: 138.883 ms
Loss rate: 1.27%
-- Flow 3:
Average throughput: 285.72 Mbit/s
95th percentile per-packet one-way delay: 140.185 ms
Loss rate: 2.67%
```

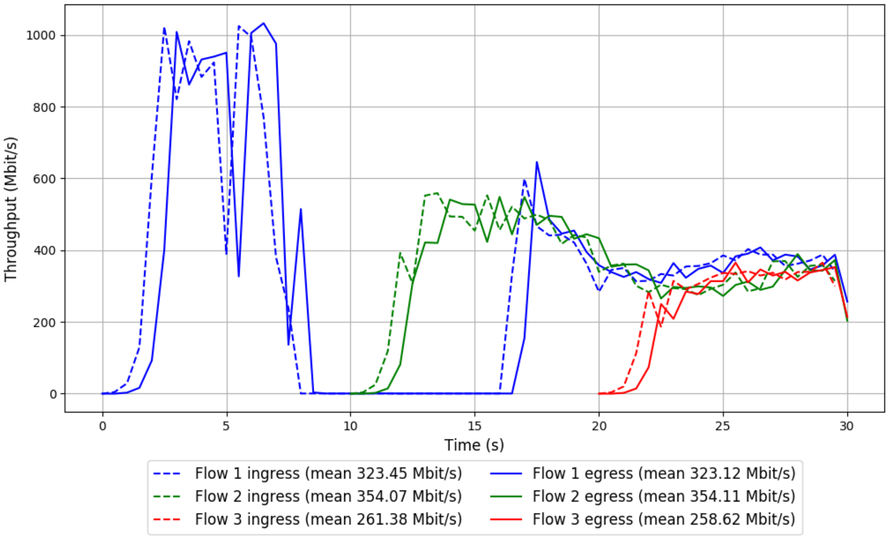
Run 3: Report of FillP — Data Link

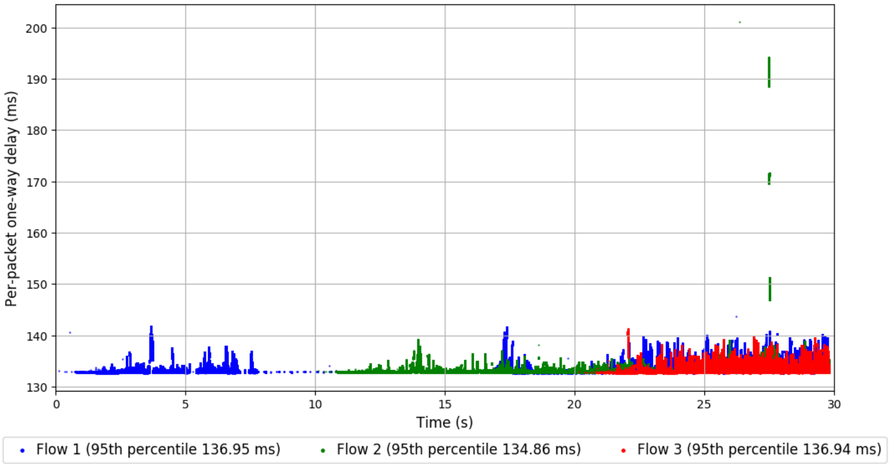




```
Run 4: Statistics of FillP

Start at: 2018-11-03 08:36:47
End at: 2018-11-03 08:37:17
Local clock offset: -0.101 ms
Remote clock offset: 0.036 ms

# Below is generated by plot.py at 2018-11-03 10:11:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 641.78 Mbit/s
95th percentile per-packet one-way delay: 136.451 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 323.12 Mbit/s
95th percentile per-packet one-way delay: 136.952 ms
Loss rate: 1.00%
-- Flow 2:
Average throughput: 354.11 Mbit/s
95th percentile per-packet one-way delay: 134.864 ms
Loss rate: 1.34%
-- Flow 3:
Average throughput: 258.62 Mbit/s
95th percentile per-packet one-way delay: 136.943 ms
Loss rate: 3.67%
```

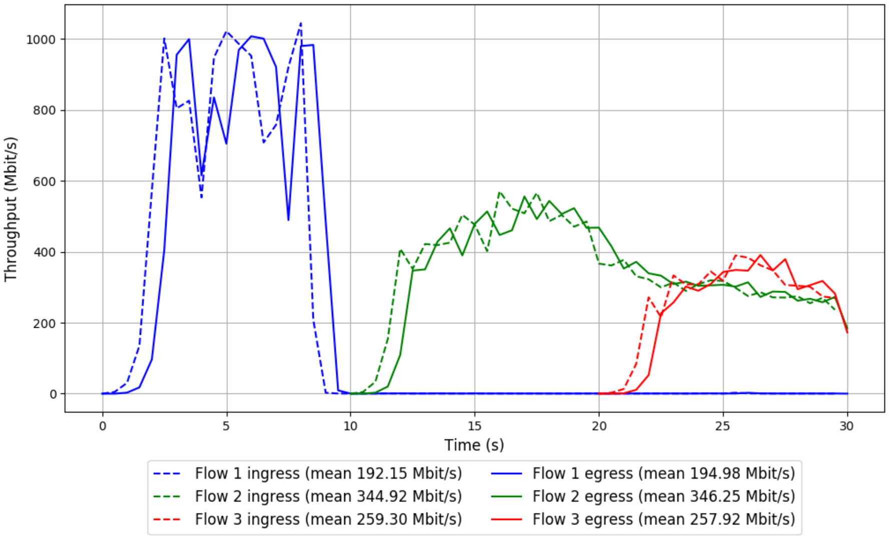
Run 4: Report of FillP — Data Link

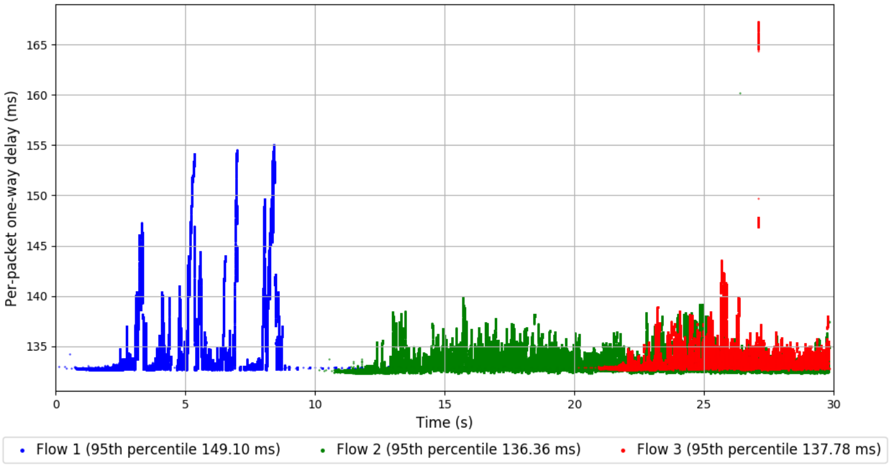




```
Run 5: Statistics of FillP

Start at: 2018-11-03 09:09:37
End at: 2018-11-03 09:10:07
Local clock offset: -0.178 ms
Remote clock offset: 0.336 ms

# Below is generated by plot.py at 2018-11-03 10:12:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 506.98 Mbit/s
95th percentile per-packet one-way delay: 142.526 ms
Loss rate: 0.95%
-- Flow 1:
Average throughput: 194.98 Mbit/s
95th percentile per-packet one-way delay: 149.096 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 346.25 Mbit/s
95th percentile per-packet one-way delay: 136.358 ms
Loss rate: 0.94%
-- Flow 3:
Average throughput: 257.92 Mbit/s
95th percentile per-packet one-way delay: 137.780 ms
Loss rate: 3.10%
```

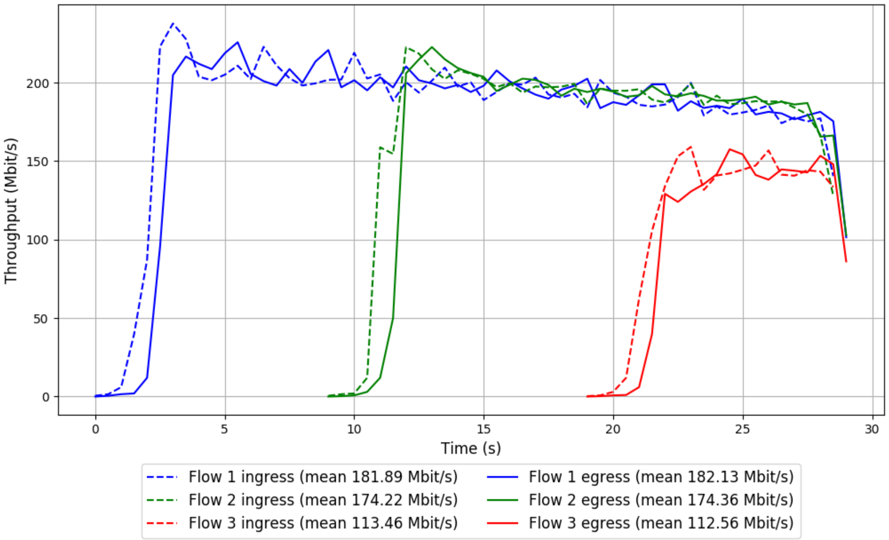
Run 5: Report of FillP — Data Link

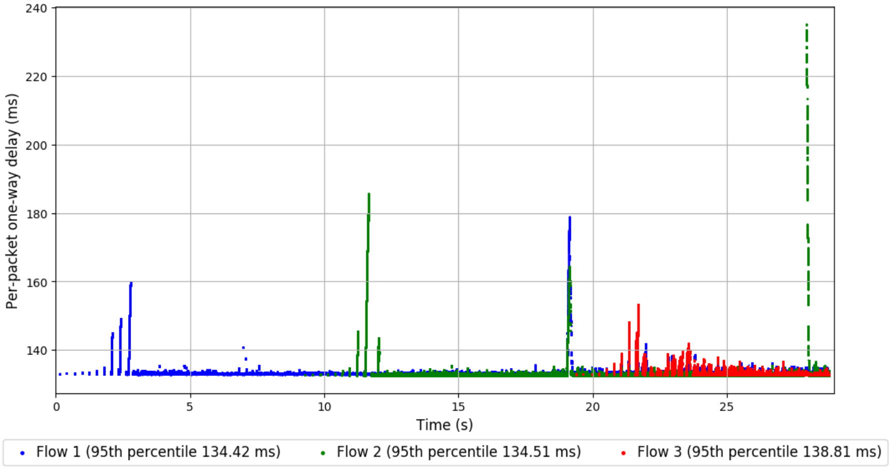




```
Run 1: Statistics of Indigo

Start at: 2018-11-03 06:48:29
End at: 2018-11-03 06:48:59
Local clock offset: -0.186 ms
Remote clock offset: -0.054 ms

# Below is generated by plot.py at 2018-11-03 10:13:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 337.78 Mbit/s
95th percentile per-packet one-way delay: 135.143 ms
Loss rate: 1.26%
-- Flow 1:
Average throughput: 182.13 Mbit/s
95th percentile per-packet one-way delay: 134.421 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 174.36 Mbit/s
95th percentile per-packet one-way delay: 134.506 ms
Loss rate: 1.27%
-- Flow 3:
Average throughput: 112.56 Mbit/s
95th percentile per-packet one-way delay: 138.812 ms
Loss rate: 3.53%
```

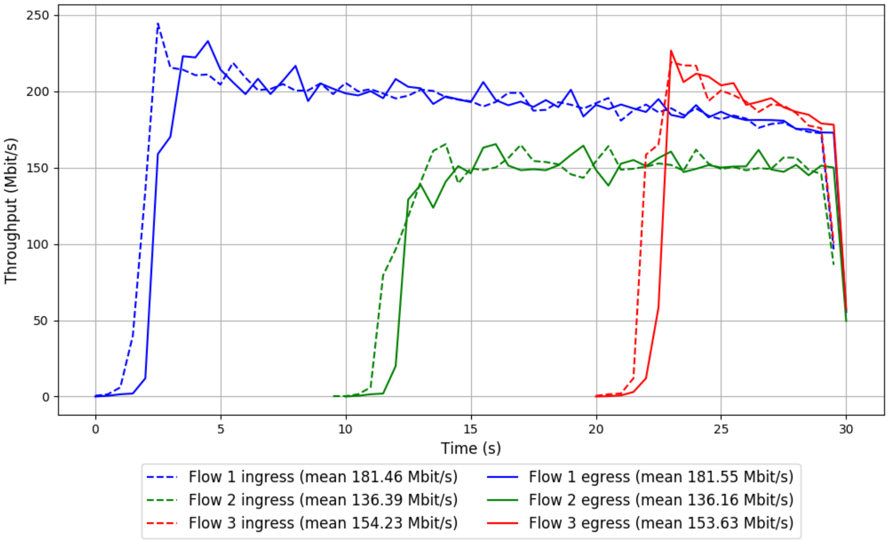
Run 1: Report of Indigo — Data Link

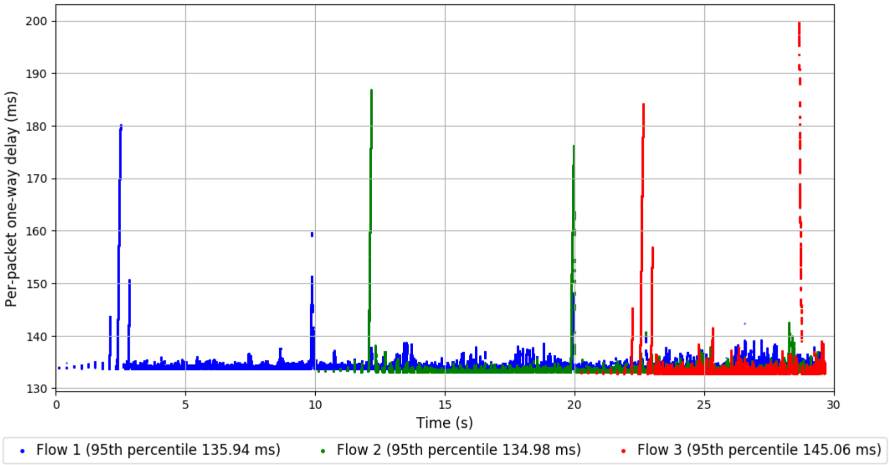




```
Run 2: Statistics of Indigo

Start at: 2018-11-03 07:22:07
End at: 2018-11-03 07:22:37
Local clock offset: 0.402 ms
Remote clock offset: -0.524 ms

# Below is generated by plot.py at 2018-11-03 10:13:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 320.59 Mbit/s
95th percentile per-packet one-way delay: 136.025 ms
Loss rate: 1.38%
-- Flow 1:
Average throughput: 181.55 Mbit/s
95th percentile per-packet one-way delay: 135.939 ms
Loss rate: 0.84%
-- Flow 2:
Average throughput: 136.16 Mbit/s
95th percentile per-packet one-way delay: 134.981 ms
Loss rate: 1.49%
-- Flow 3:
Average throughput: 153.63 Mbit/s
95th percentile per-packet one-way delay: 145.064 ms
Loss rate: 3.13%
```

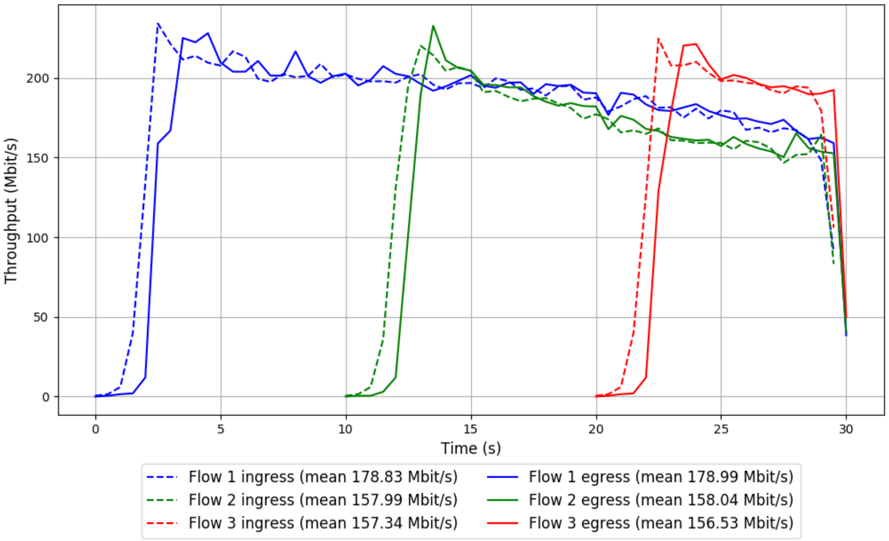
Run 2: Report of Indigo — Data Link

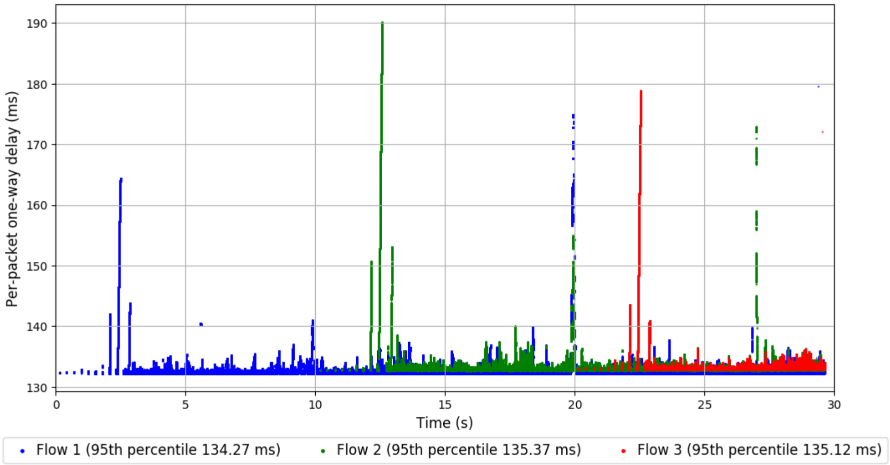




```
Run 3: Statistics of Indigo

Start at: 2018-11-03 07:56:08
End at: 2018-11-03 07:56:38
Local clock offset: -0.357 ms
Remote clock offset: -0.146 ms

# Below is generated by plot.py at 2018-11-03 10:15:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 333.55 Mbit/s
95th percentile per-packet one-way delay: 134.685 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 178.99 Mbit/s
95th percentile per-packet one-way delay: 134.266 ms
Loss rate: 0.80%
-- Flow 2:
Average throughput: 158.04 Mbit/s
95th percentile per-packet one-way delay: 135.371 ms
Loss rate: 1.33%
-- Flow 3:
Average throughput: 156.53 Mbit/s
95th percentile per-packet one-way delay: 135.125 ms
Loss rate: 3.24%
```

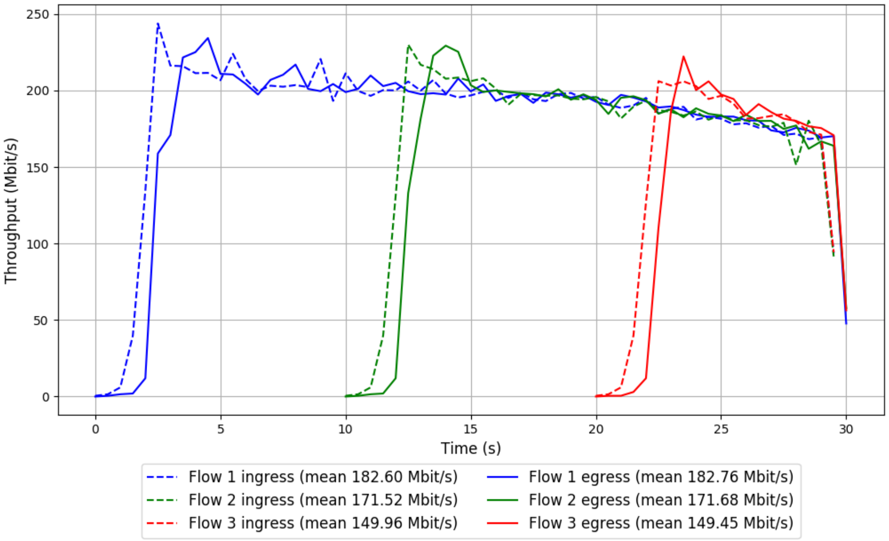
Run 3: Report of Indigo — Data Link

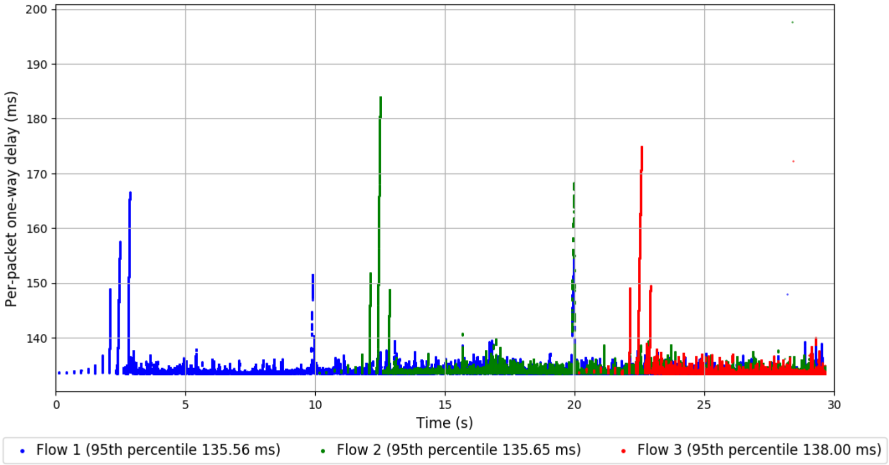




```
Run 4: Statistics of Indigo

Start at: 2018-11-03 08:29:45
End at: 2018-11-03 08:30:15
Local clock offset: 0.115 ms
Remote clock offset: -0.404 ms

# Below is generated by plot.py at 2018-11-03 10:16:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 344.19 Mbit/s
95th percentile per-packet one-way delay: 135.764 ms
Loss rate: 1.28%
-- Flow 1:
Average throughput: 182.76 Mbit/s
95th percentile per-packet one-way delay: 135.561 ms
Loss rate: 0.81%
-- Flow 2:
Average throughput: 171.68 Mbit/s
95th percentile per-packet one-way delay: 135.645 ms
Loss rate: 1.25%
-- Flow 3:
Average throughput: 149.45 Mbit/s
95th percentile per-packet one-way delay: 137.997 ms
Loss rate: 3.06%
```

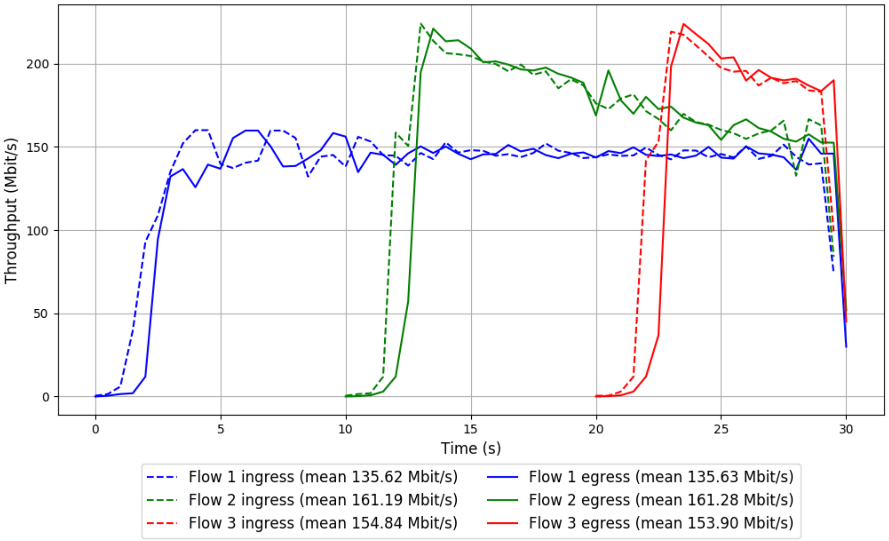
Run 4: Report of Indigo — Data Link

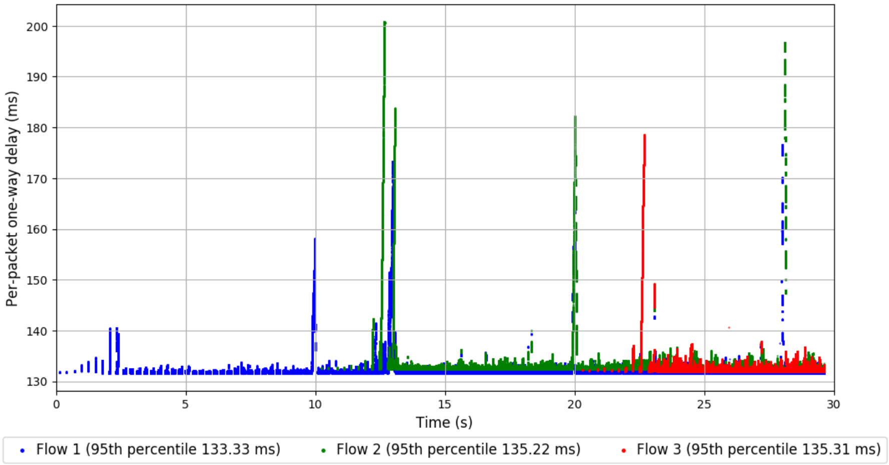




```
Run 5: Statistics of Indigo

Start at: 2018-11-03 09:02:24
End at: 2018-11-03 09:02:54
Local clock offset: -0.514 ms
Remote clock offset: -0.034 ms

# Below is generated by plot.py at 2018-11-03 10:16:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 290.35 Mbit/s
95th percentile per-packet one-way delay: 134.447 ms
Loss rate: 1.46%
-- Flow 1:
Average throughput: 135.63 Mbit/s
95th percentile per-packet one-way delay: 133.334 ms
Loss rate: 0.90%
-- Flow 2:
Average throughput: 161.28 Mbit/s
95th percentile per-packet one-way delay: 135.216 ms
Loss rate: 1.30%
-- Flow 3:
Average throughput: 153.90 Mbit/s
95th percentile per-packet one-way delay: 135.311 ms
Loss rate: 3.31%
```

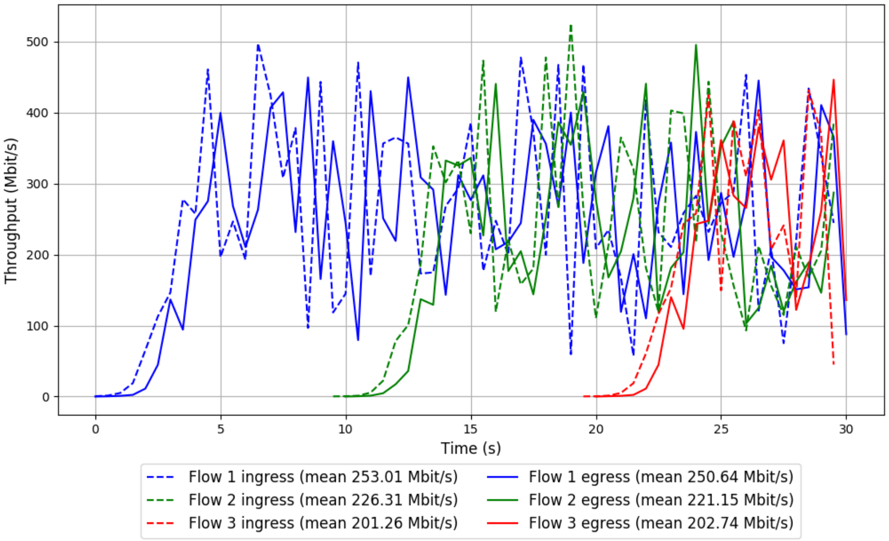
Run 5: Report of Indigo — Data Link

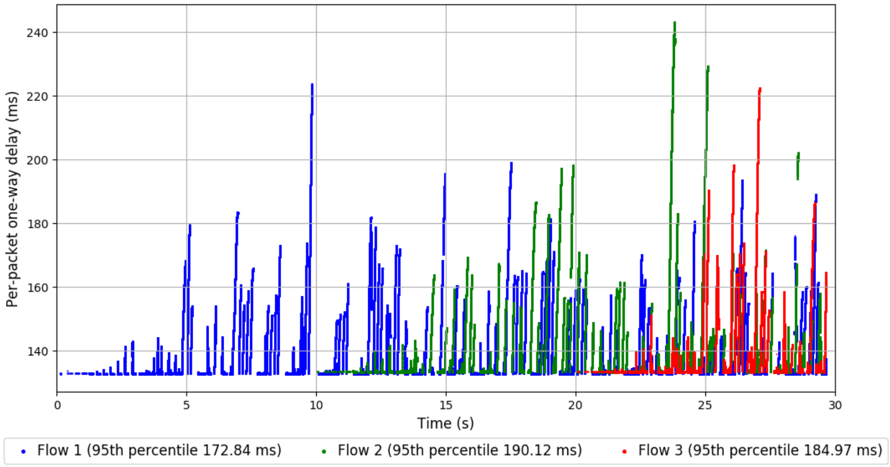




```
Run 1: Statistics of Indigo-96d2da3

Start at: 2018-11-03 06:59:34
End at: 2018-11-03 07:00:04
Local clock offset: 0.35 ms
Remote clock offset: -0.126 ms

# Below is generated by plot.py at 2018-11-03 10:17:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 462.19 Mbit/s
95th percentile per-packet one-way delay: 180.952 ms
Loss rate: 2.53%
-- Flow 1:
Average throughput: 250.64 Mbit/s
95th percentile per-packet one-way delay: 172.836 ms
Loss rate: 1.53%
-- Flow 2:
Average throughput: 221.15 Mbit/s
95th percentile per-packet one-way delay: 190.119 ms
Loss rate: 4.43%
-- Flow 3:
Average throughput: 202.74 Mbit/s
95th percentile per-packet one-way delay: 184.972 ms
Loss rate: 2.00%
```

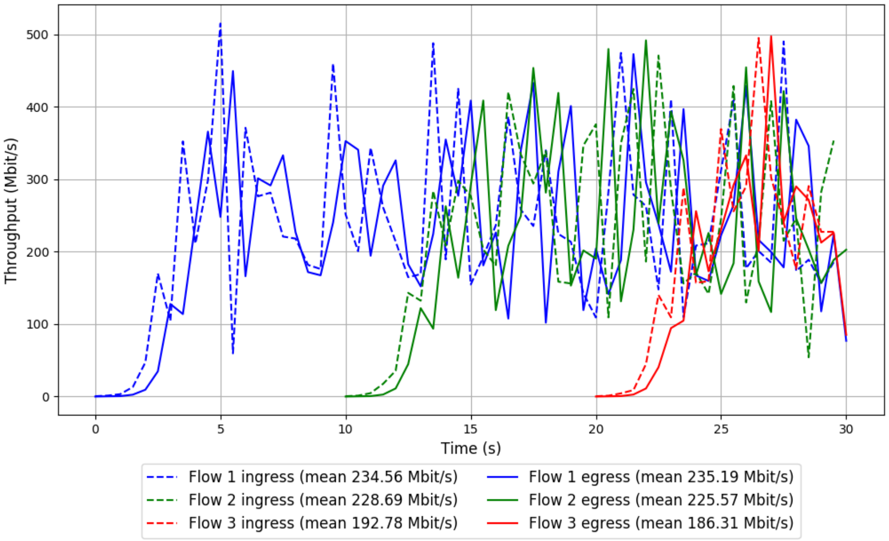
Run 1: Report of Indigo-96d2da3 — Data Link

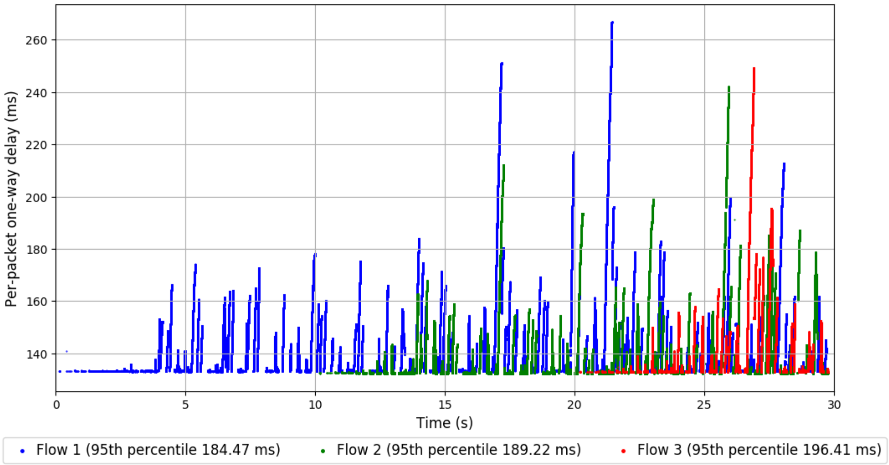




```
Run 2: Statistics of Indigo-96d2da3

Start at: 2018-11-03 07:34:00
End at: 2018-11-03 07:34:30
Local clock offset: -0.041 ms
Remote clock offset: -0.196 ms

# Below is generated by plot.py at 2018-11-03 10:21:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 443.94 Mbit/s
95th percentile per-packet one-way delay: 189.342 ms
Loss rate: 2.18%
-- Flow 1:
Average throughput: 235.19 Mbit/s
95th percentile per-packet one-way delay: 184.468 ms
Loss rate: 0.84%
-- Flow 2:
Average throughput: 225.57 Mbit/s
95th percentile per-packet one-way delay: 189.222 ms
Loss rate: 2.69%
-- Flow 3:
Average throughput: 186.31 Mbit/s
95th percentile per-packet one-way delay: 196.412 ms
Loss rate: 5.93%
```

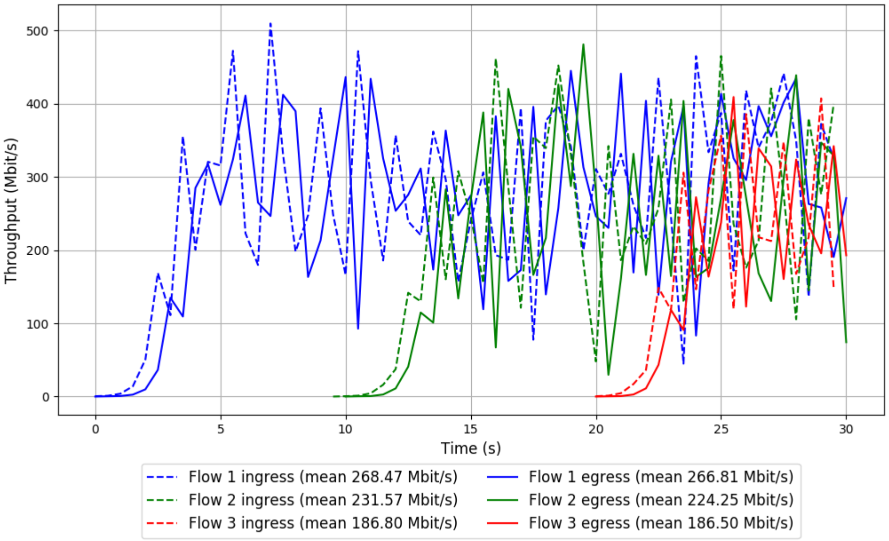
Run 2: Report of Indigo-96d2da3 — Data Link

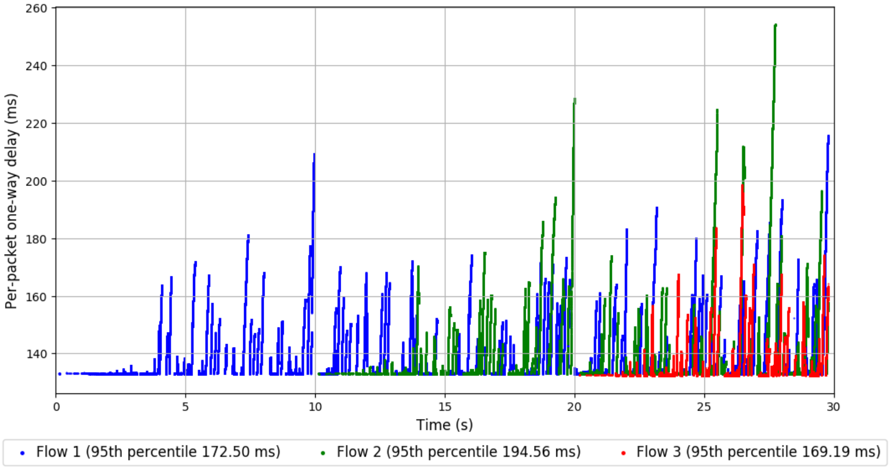




```
Run 3: Statistics of Indigo-96d2da3

Start at: 2018-11-03 08:07:56
End at: 2018-11-03 08:08:26
Local clock offset: -0.119 ms
Remote clock offset: -0.043 ms

# Below is generated by plot.py at 2018-11-03 10:22:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 475.75 Mbit/s
95th percentile per-packet one-way delay: 179.263 ms
Loss rate: 2.34%
-- Flow 1:
Average throughput: 266.81 Mbit/s
95th percentile per-packet one-way delay: 172.498 ms
Loss rate: 1.51%
-- Flow 2:
Average throughput: 224.25 Mbit/s
95th percentile per-packet one-way delay: 194.565 ms
Loss rate: 4.03%
-- Flow 3:
Average throughput: 186.50 Mbit/s
95th percentile per-packet one-way delay: 169.192 ms
Loss rate: 1.76%
```

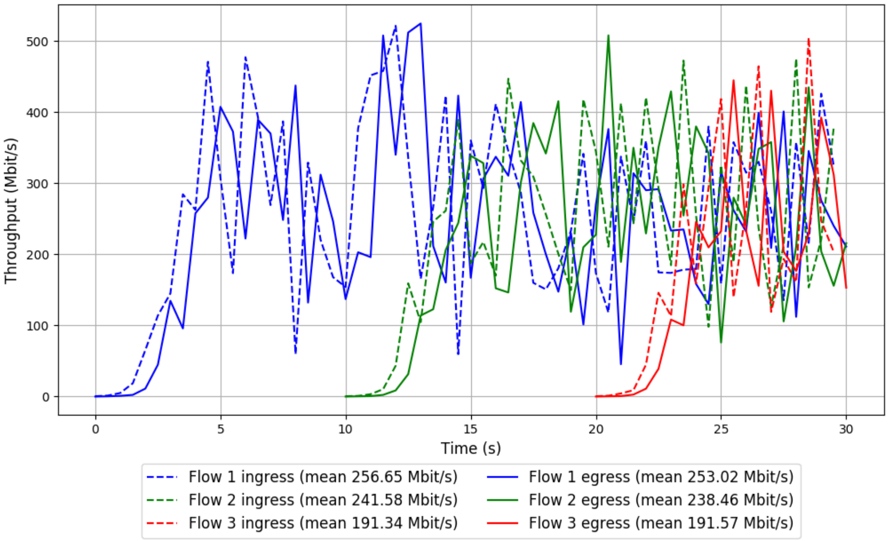
Run 3: Report of Indigo-96d2da3 — Data Link

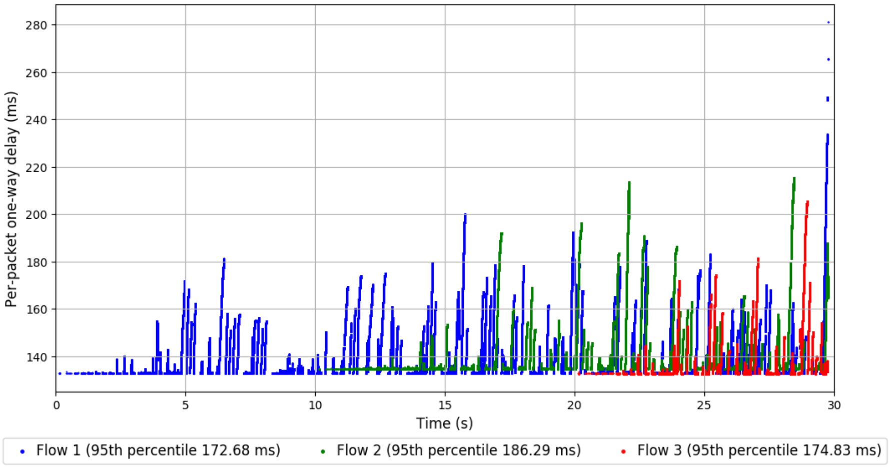




```
Run 4: Statistics of Indigo-96d2da3

Start at: 2018-11-03 08:40:58
End at: 2018-11-03 08:41:28
Local clock offset: -0.154 ms
Remote clock offset: -0.013 ms

# Below is generated by plot.py at 2018-11-03 10:22:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 472.94 Mbit/s
95th percentile per-packet one-way delay: 177.605 ms
Loss rate: 2.35%
-- Flow 1:
Average throughput: 253.02 Mbit/s
95th percentile per-packet one-way delay: 172.675 ms
Loss rate: 2.14%
-- Flow 2:
Average throughput: 238.46 Mbit/s
95th percentile per-packet one-way delay: 186.294 ms
Loss rate: 2.50%
-- Flow 3:
Average throughput: 191.57 Mbit/s
95th percentile per-packet one-way delay: 174.834 ms
Loss rate: 2.78%
```

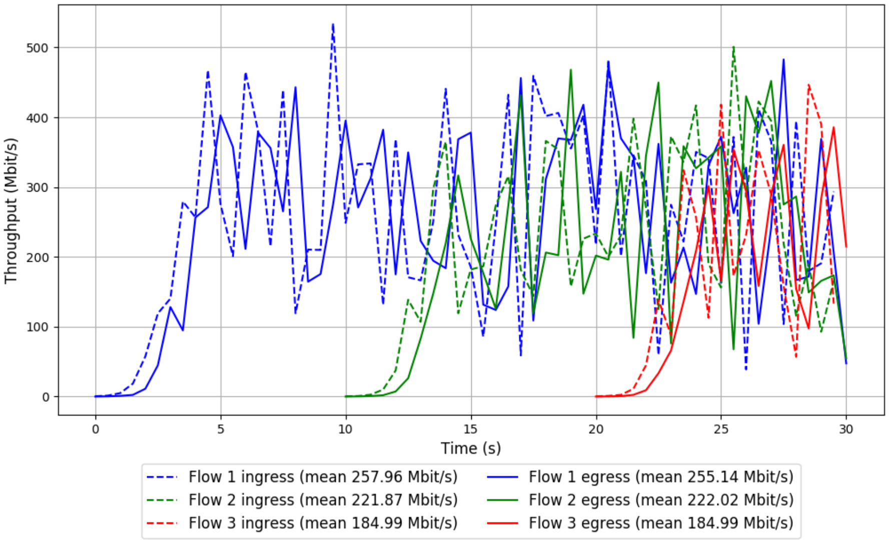
Run 4: Report of Indigo-96d2da3 — Data Link

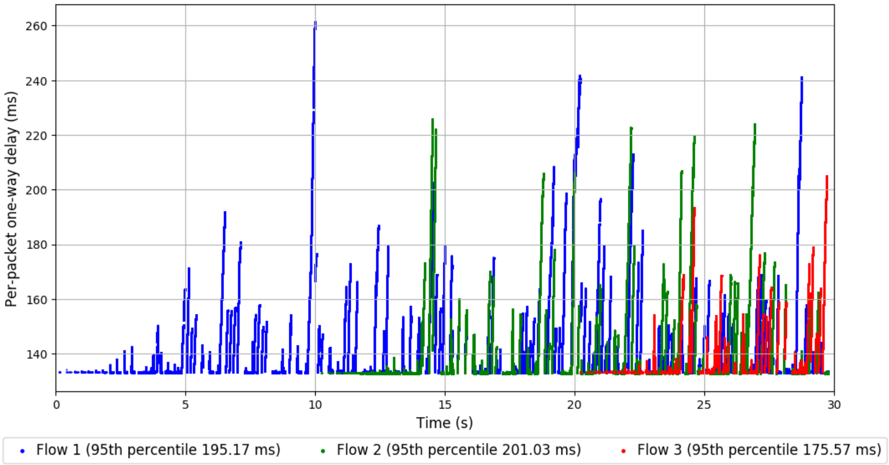




```
Run 5: Statistics of Indigo-96d2da3

Start at: 2018-11-03 09:13:50
End at: 2018-11-03 09:14:20
Local clock offset: -0.116 ms
Remote clock offset: -0.03 ms

# Below is generated by plot.py at 2018-11-03 10:22:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 460.82 Mbit/s
95th percentile per-packet one-way delay: 195.608 ms
Loss rate: 1.92%
-- Flow 1:
Average throughput: 255.14 Mbit/s
95th percentile per-packet one-way delay: 195.170 ms
Loss rate: 1.97%
-- Flow 2:
Average throughput: 222.02 Mbit/s
95th percentile per-packet one-way delay: 201.026 ms
Loss rate: 1.28%
-- Flow 3:
Average throughput: 184.99 Mbit/s
95th percentile per-packet one-way delay: 175.571 ms
Loss rate: 3.19%
```

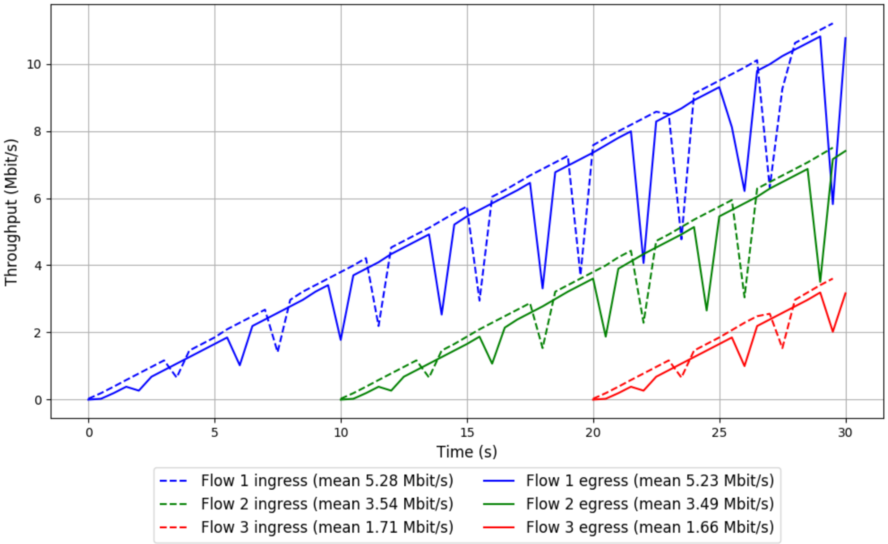
Run 5: Report of Indigo-96d2da3 — Data Link

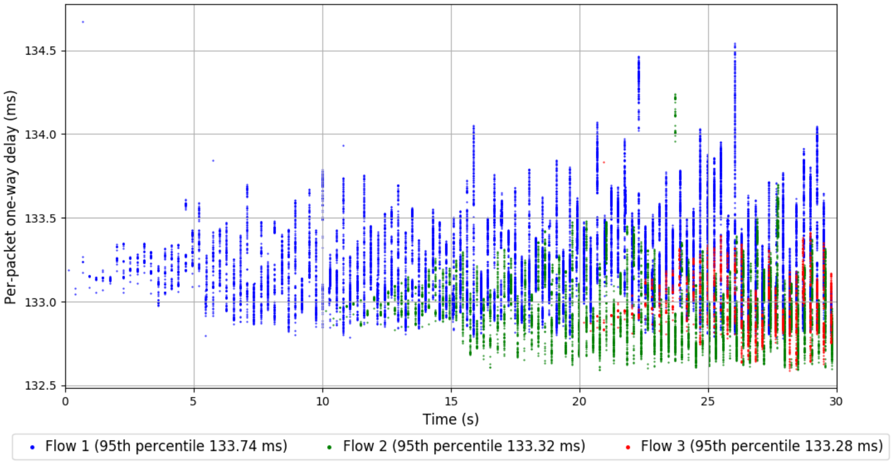




```
Run 1: Statistics of LEDBAT

Start at: 2018-11-03 06:34:04
End at: 2018-11-03 06:34:34
Local clock offset: -0.292 ms
Remote clock offset: 0.036 ms

# Below is generated by plot.py at 2018-11-03 10:22:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.08 Mbit/s
95th percentile per-packet one-way delay: 133.661 ms
Loss rate: 2.29%
-- Flow 1:
Average throughput: 5.23 Mbit/s
95th percentile per-packet one-way delay: 133.736 ms
Loss rate: 1.78%
-- Flow 2:
Average throughput: 3.49 Mbit/s
95th percentile per-packet one-way delay: 133.320 ms
Loss rate: 2.67%
-- Flow 3:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 133.276 ms
Loss rate: 5.40%
```

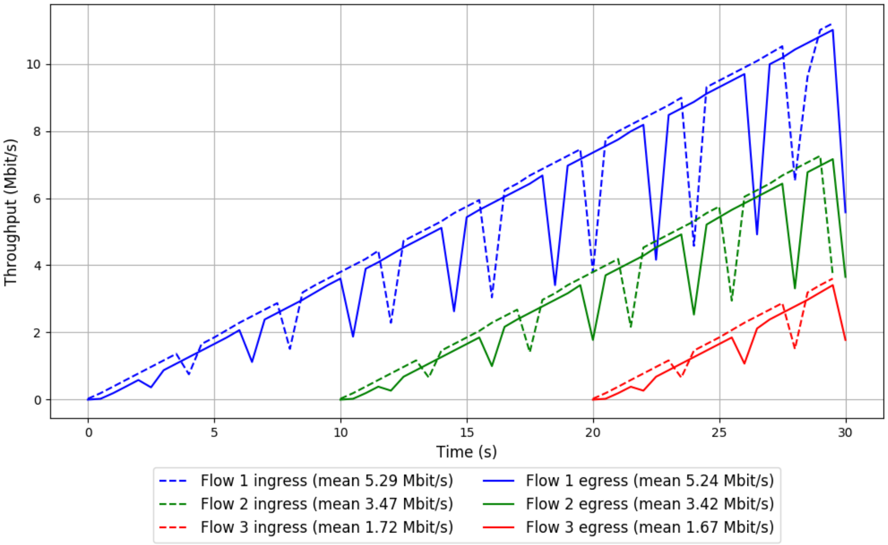
Run 1: Report of LEDBAT — Data Link

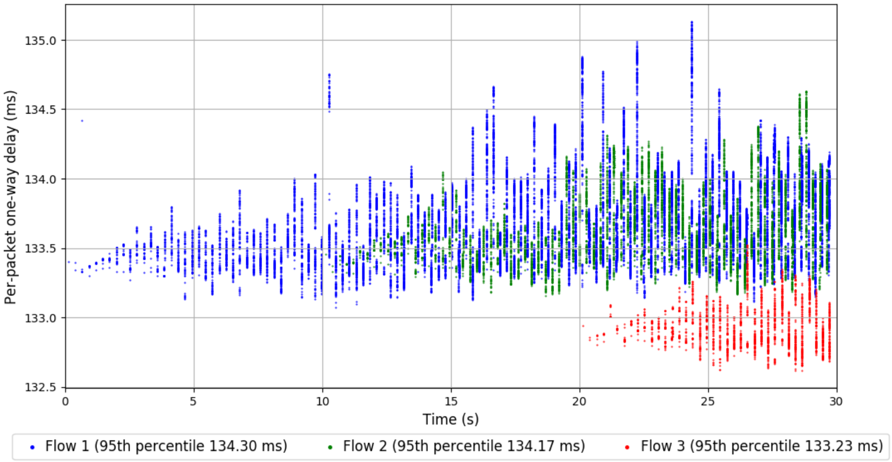




```
Run 2: Statistics of LEDBAT

Start at: 2018-11-03 07:07:41
End at: 2018-11-03 07:08:11
Local clock offset: 0.205 ms
Remote clock offset: -0.108 ms

# Below is generated by plot.py at 2018-11-03 10:22:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.03 Mbit/s
95th percentile per-packet one-way delay: 134.236 ms
Loss rate: 2.29%
-- Flow 1:
Average throughput: 5.24 Mbit/s
95th percentile per-packet one-way delay: 134.304 ms
Loss rate: 1.78%
-- Flow 2:
Average throughput: 3.42 Mbit/s
95th percentile per-packet one-way delay: 134.171 ms
Loss rate: 2.70%
-- Flow 3:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 133.233 ms
Loss rate: 5.40%
```

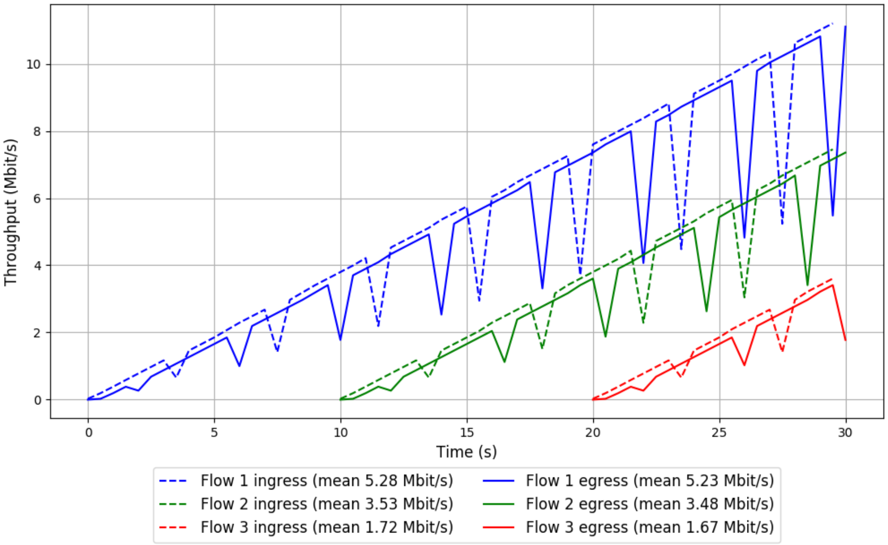
Run 2: Report of LEDBAT — Data Link

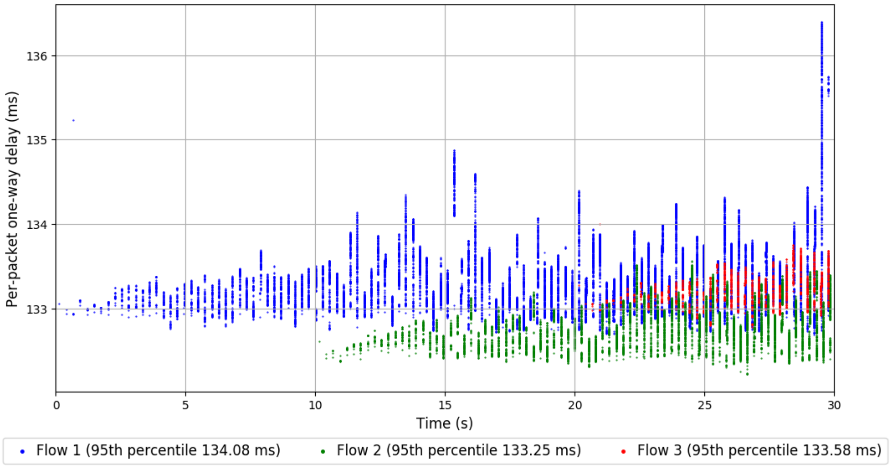




```
Run 3: Statistics of LEDBAT

Start at: 2018-11-03 07:42:00
End at: 2018-11-03 07:42:30
Local clock offset: -0.206 ms
Remote clock offset: -0.238 ms

# Below is generated by plot.py at 2018-11-03 10:22:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.07 Mbit/s
95th percentile per-packet one-way delay: 133.905 ms
Loss rate: 2.28%
-- Flow 1:
Average throughput: 5.23 Mbit/s
95th percentile per-packet one-way delay: 134.082 ms
Loss rate: 1.78%
-- Flow 2:
Average throughput: 3.48 Mbit/s
95th percentile per-packet one-way delay: 133.245 ms
Loss rate: 2.66%
-- Flow 3:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 133.583 ms
Loss rate: 5.39%
```

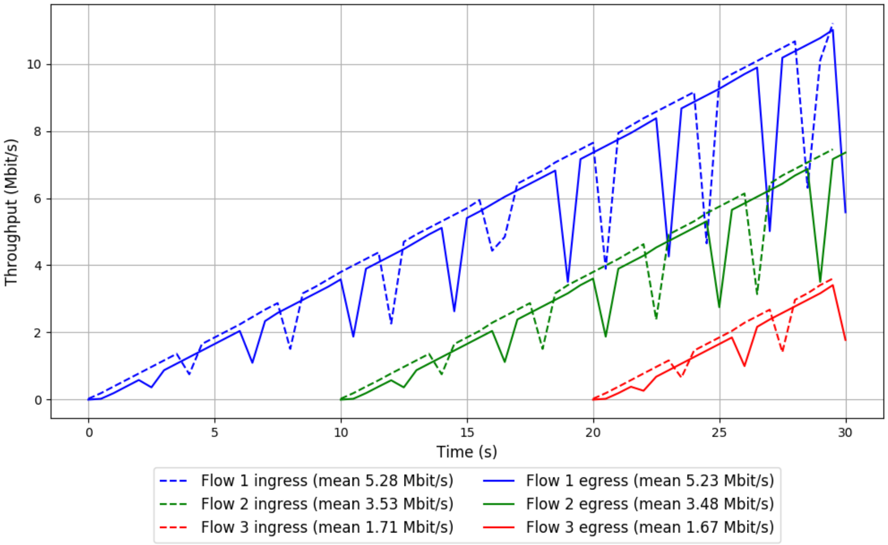
Run 3: Report of LEDBAT — Data Link

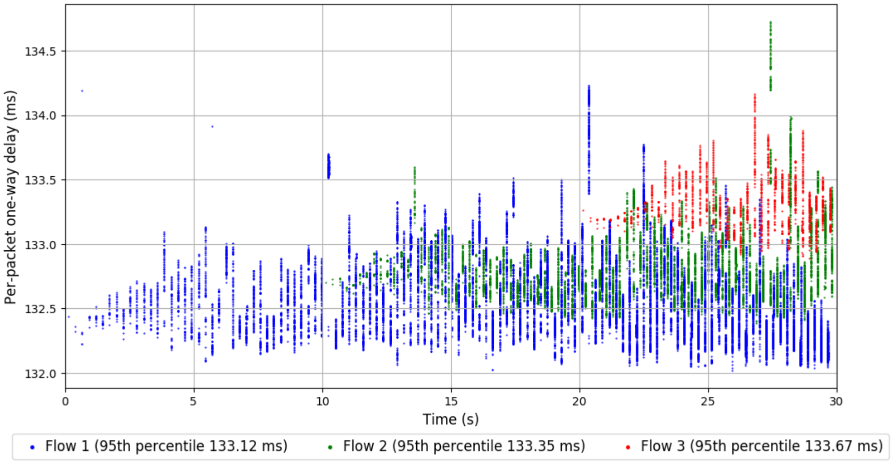




```
Run 4: Statistics of LEDBAT

Start at: 2018-11-03 08:16:00
End at: 2018-11-03 08:16:30
Local clock offset: -0.154 ms
Remote clock offset: -0.065 ms

# Below is generated by plot.py at 2018-11-03 10:22:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.05 Mbit/s
95th percentile per-packet one-way delay: 133.382 ms
Loss rate: 2.29%
-- Flow 1:
Average throughput: 5.23 Mbit/s
95th percentile per-packet one-way delay: 133.124 ms
Loss rate: 1.79%
-- Flow 2:
Average throughput: 3.48 Mbit/s
95th percentile per-packet one-way delay: 133.353 ms
Loss rate: 2.66%
-- Flow 3:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 133.674 ms
Loss rate: 5.40%
```

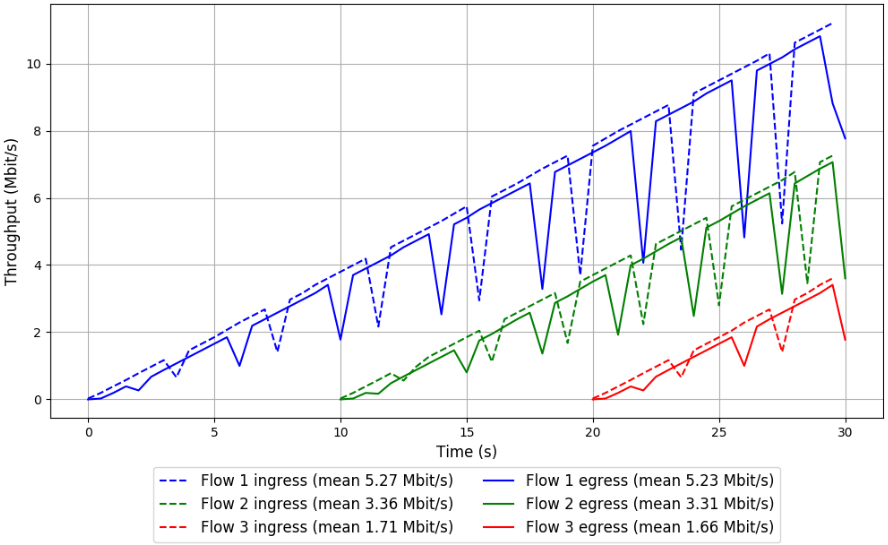
Run 4: Report of LEDBAT — Data Link

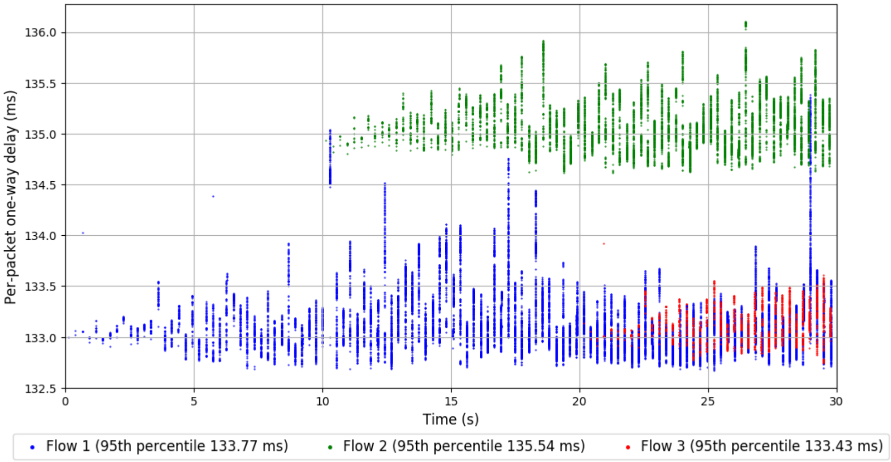




```
Run 5: Statistics of LEDBAT

Start at: 2018-11-03 08:49:01
End at: 2018-11-03 08:49:31
Local clock offset: 0.1 ms
Remote clock offset: 0.272 ms

# Below is generated by plot.py at 2018-11-03 10:22:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.95 Mbit/s
95th percentile per-packet one-way delay: 135.302 ms
Loss rate: 2.30%
-- Flow 1:
Average throughput: 5.23 Mbit/s
95th percentile per-packet one-way delay: 133.771 ms
Loss rate: 1.78%
-- Flow 2:
Average throughput: 3.31 Mbit/s
95th percentile per-packet one-way delay: 135.536 ms
Loss rate: 2.74%
-- Flow 3:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 133.425 ms
Loss rate: 5.41%
```

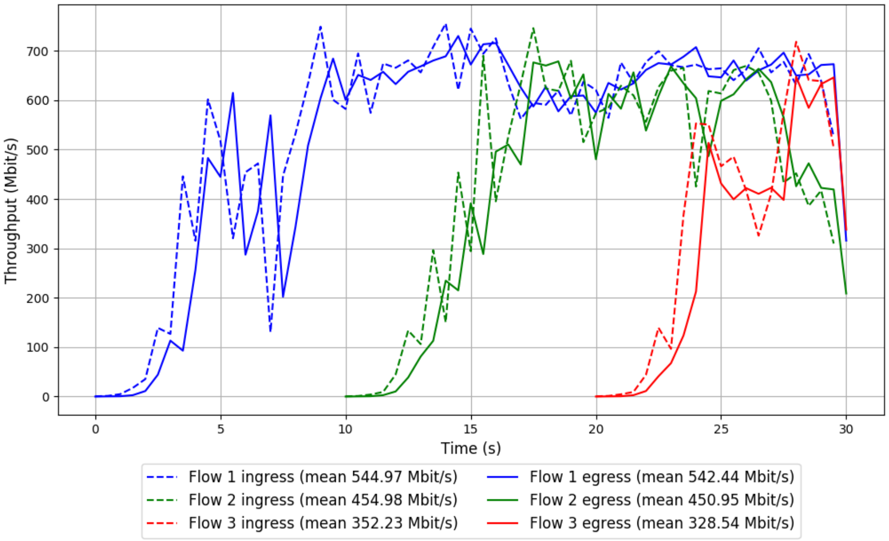
Run 5: Report of LEDBAT — Data Link

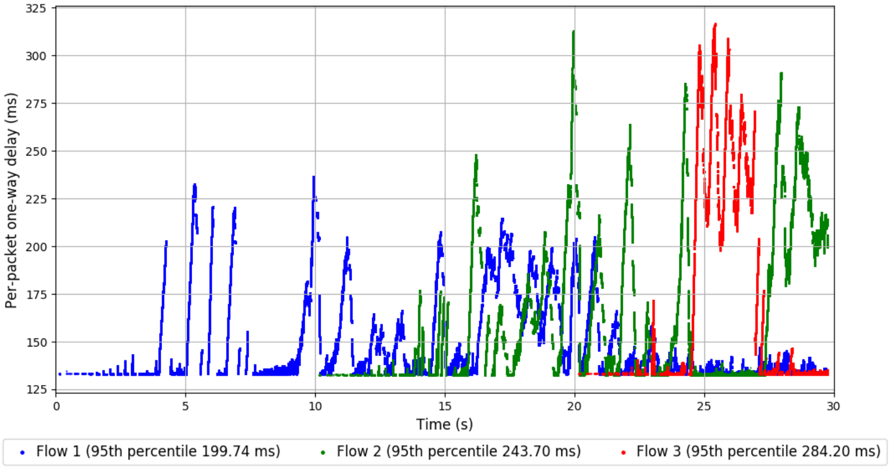




```
Run 1: Statistics of Indigo-Muses

Start at: 2018-11-03 06:35:25
End at: 2018-11-03 06:35:55
Local clock offset: -0.093 ms
Remote clock offset: 0.007 ms

# Below is generated by plot.py at 2018-11-03 10:34:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 947.24 Mbit/s
95th percentile per-packet one-way delay: 231.930 ms
Loss rate: 2.57%
-- Flow 1:
Average throughput: 542.44 Mbit/s
95th percentile per-packet one-way delay: 199.737 ms
Loss rate: 1.35%
-- Flow 2:
Average throughput: 450.95 Mbit/s
95th percentile per-packet one-way delay: 243.697 ms
Loss rate: 2.20%
-- Flow 3:
Average throughput: 328.54 Mbit/s
95th percentile per-packet one-way delay: 284.200 ms
Loss rate: 9.25%
```

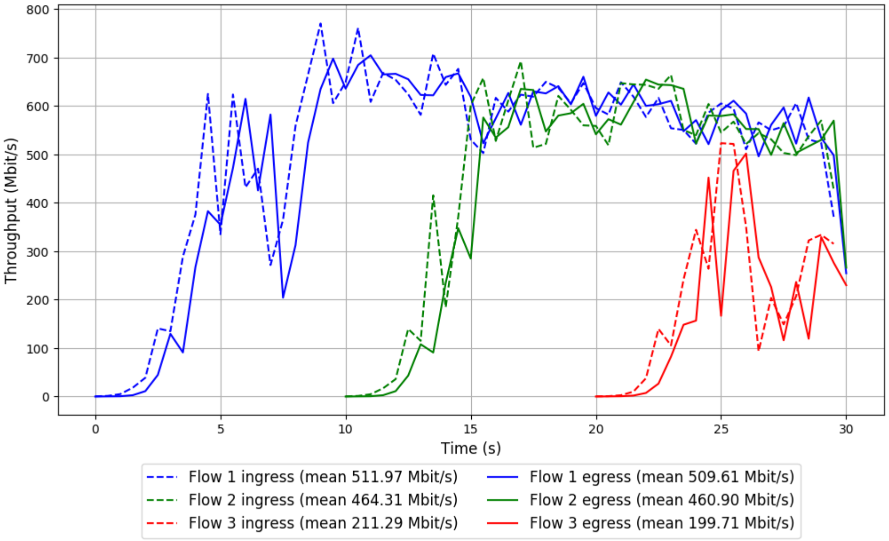
Run 1: Report of Indigo-Muses — Data Link

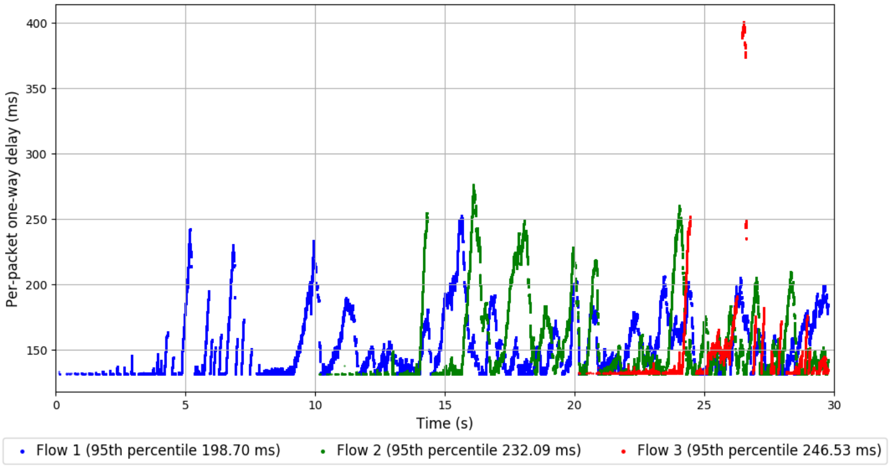




```
Run 2: Statistics of Indigo-Muses

Start at: 2018-11-03 07:09:02
End at: 2018-11-03 07:09:32
Local clock offset: -0.435 ms
Remote clock offset: 0.216 ms

# Below is generated by plot.py at 2018-11-03 10:34:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 879.22 Mbit/s
95th percentile per-packet one-way delay: 216.072 ms
Loss rate: 2.13%
-- Flow 1:
Average throughput: 509.61 Mbit/s
95th percentile per-packet one-way delay: 198.697 ms
Loss rate: 1.35%
-- Flow 2:
Average throughput: 460.90 Mbit/s
95th percentile per-packet one-way delay: 232.085 ms
Loss rate: 2.07%
-- Flow 3:
Average throughput: 199.71 Mbit/s
95th percentile per-packet one-way delay: 246.533 ms
Loss rate: 8.04%
```

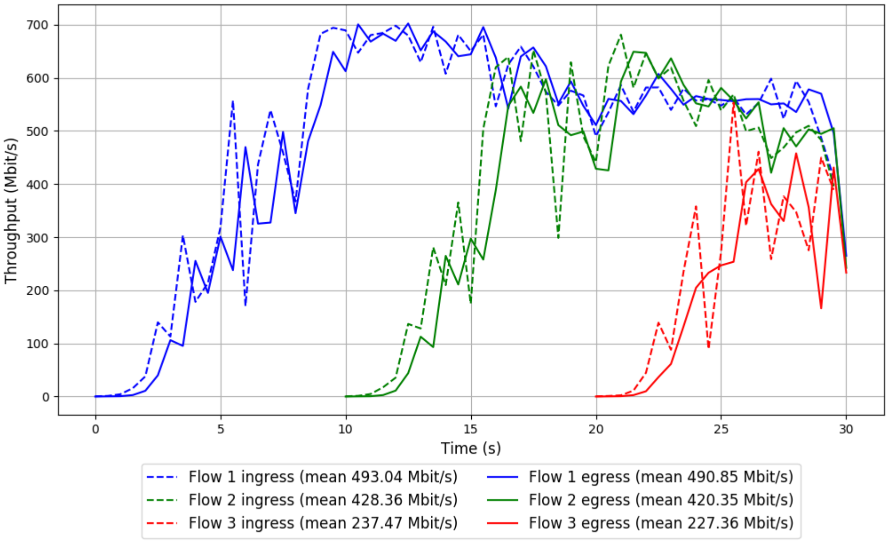
Run 2: Report of Indigo-Muses — Data Link

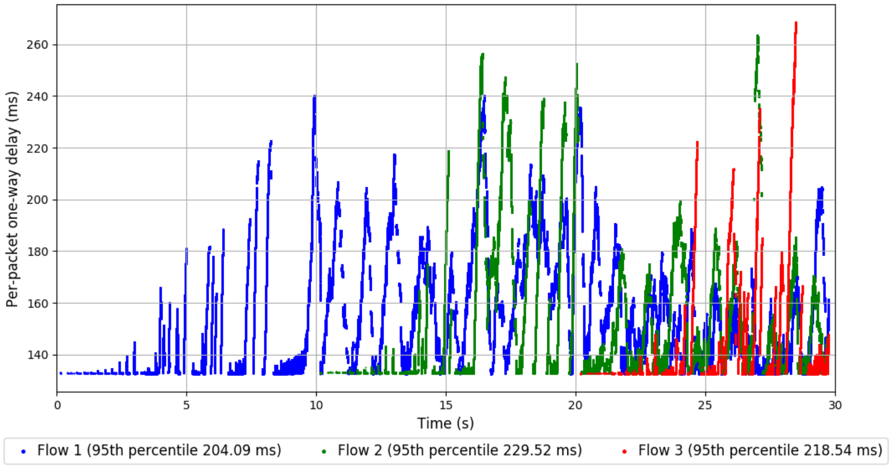




```
Run 3: Statistics of Indigo-Muses

Start at: 2018-11-03 07:43:21
End at: 2018-11-03 07:43:51
Local clock offset: -0.048 ms
Remote clock offset: 0.138 ms

# Below is generated by plot.py at 2018-11-03 10:34:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 842.37 Mbit/s
95th percentile per-packet one-way delay: 215.220 ms
Loss rate: 2.45%
-- Flow 1:
Average throughput: 490.85 Mbit/s
95th percentile per-packet one-way delay: 204.095 ms
Loss rate: 1.32%
-- Flow 2:
Average throughput: 420.35 Mbit/s
95th percentile per-packet one-way delay: 229.518 ms
Loss rate: 3.18%
-- Flow 3:
Average throughput: 227.36 Mbit/s
95th percentile per-packet one-way delay: 218.540 ms
Loss rate: 6.90%
```

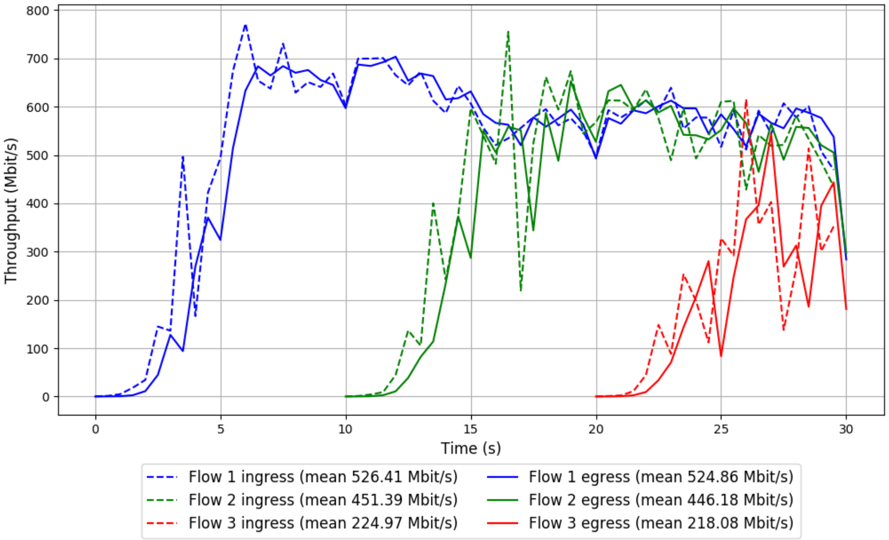
Run 3: Report of Indigo-Muses — Data Link

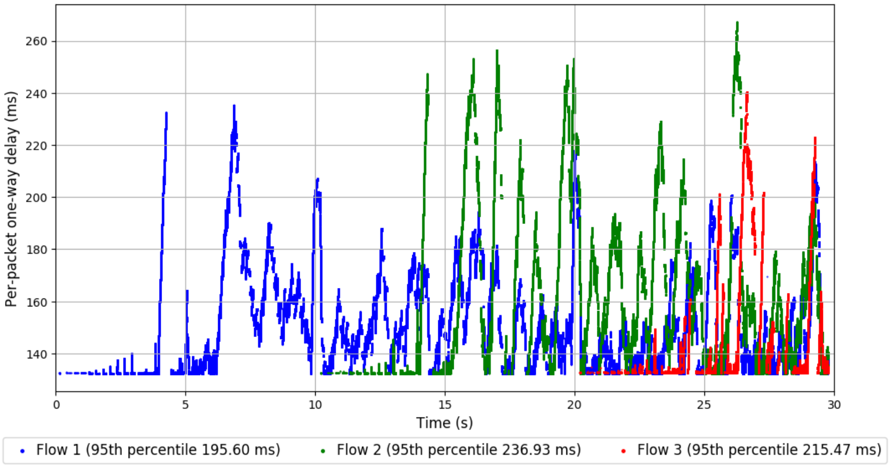




```
Run 4: Statistics of Indigo-Muses

Start at: 2018-11-03 08:17:21
End at: 2018-11-03 08:17:51
Local clock offset: -0.605 ms
Remote clock offset: -0.025 ms

# Below is generated by plot.py at 2018-11-03 10:35:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 889.78 Mbit/s
95th percentile per-packet one-way delay: 214.813 ms
Loss rate: 1.98%
-- Flow 1:
Average throughput: 524.86 Mbit/s
95th percentile per-packet one-way delay: 195.603 ms
Loss rate: 1.18%
-- Flow 2:
Average throughput: 446.18 Mbit/s
95th percentile per-packet one-way delay: 236.932 ms
Loss rate: 2.49%
-- Flow 3:
Average throughput: 218.08 Mbit/s
95th percentile per-packet one-way delay: 215.465 ms
Loss rate: 5.66%
```

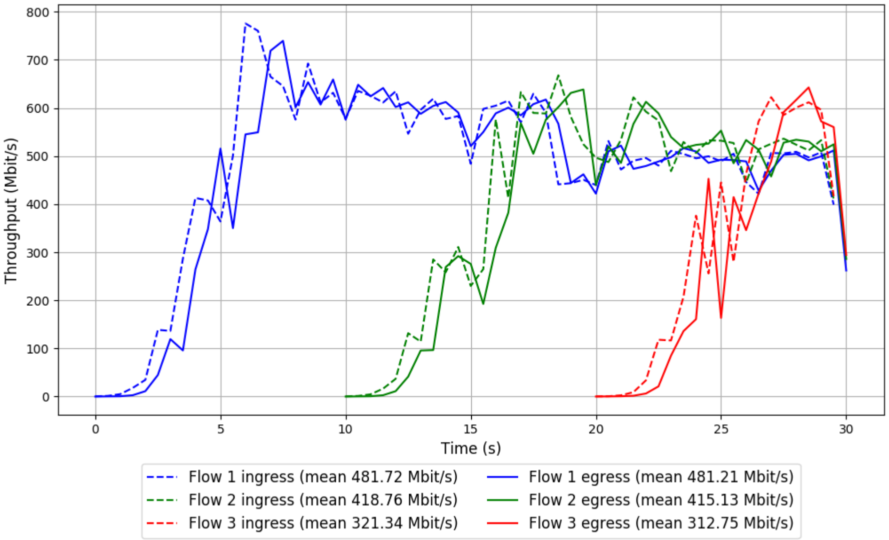
Run 4: Report of Indigo-Muses — Data Link

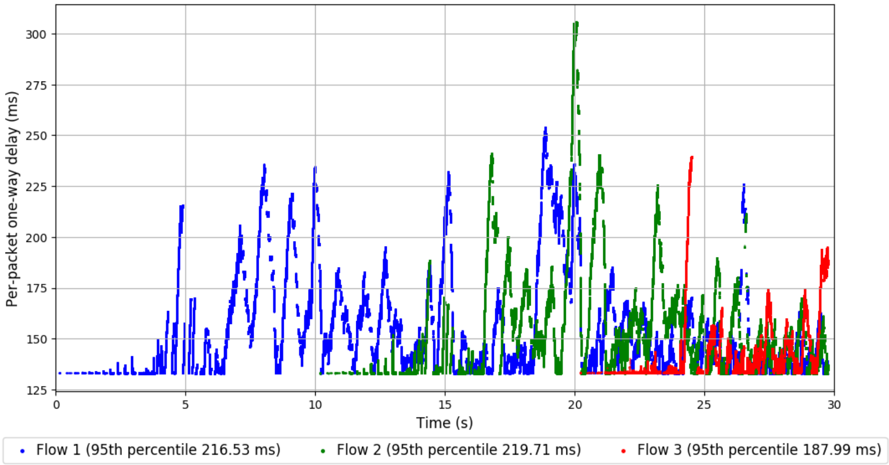




```
Run 5: Statistics of Indigo-Muses

Start at: 2018-11-03 08:50:21
End at: 2018-11-03 08:50:51
Local clock offset: 0.032 ms
Remote clock offset: -0.019 ms

# Below is generated by plot.py at 2018-11-03 10:37:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 856.52 Mbit/s
95th percentile per-packet one-way delay: 215.675 ms
Loss rate: 1.92%
-- Flow 1:
Average throughput: 481.21 Mbit/s
95th percentile per-packet one-way delay: 216.533 ms
Loss rate: 1.00%
-- Flow 2:
Average throughput: 415.13 Mbit/s
95th percentile per-packet one-way delay: 219.706 ms
Loss rate: 2.20%
-- Flow 3:
Average throughput: 312.75 Mbit/s
95th percentile per-packet one-way delay: 187.990 ms
Loss rate: 5.33%
```

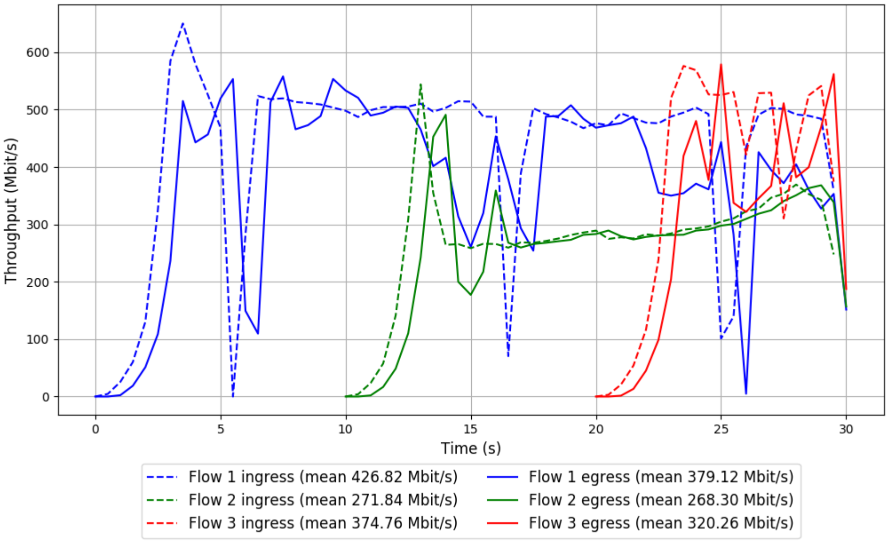
Run 5: Report of Indigo-Muses — Data Link

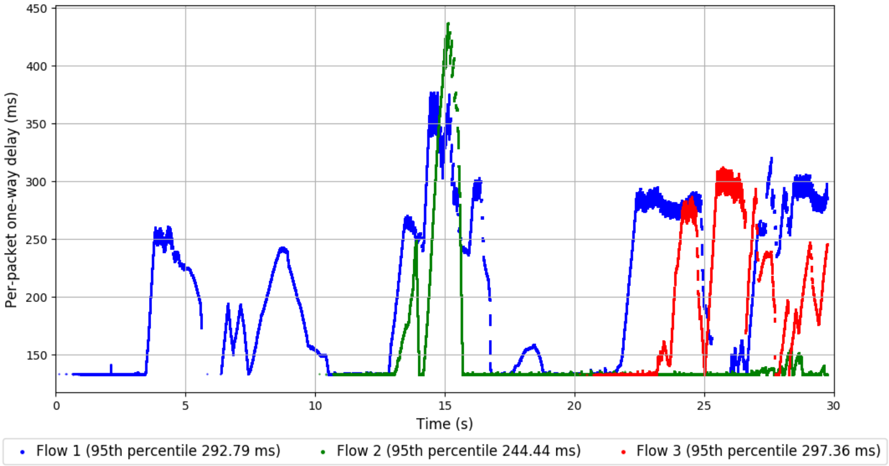




```
Run 1: Statistics of PCC-Allegro

Start at: 2018-11-03 06:42:29
End at: 2018-11-03 06:42:59
Local clock offset: 0.193 ms
Remote clock offset: -0.054 ms

# Below is generated by plot.py at 2018-11-03 10:49:34
# Datalink statistics
-- Total of 3 flows:
Average throughput: 659.67 Mbit/s
95th percentile per-packet one-way delay: 293.114 ms
Loss rate: 10.49%
-- Flow 1:
Average throughput: 379.12 Mbit/s
95th percentile per-packet one-way delay: 292.791 ms
Loss rate: 11.97%
-- Flow 2:
Average throughput: 268.30 Mbit/s
95th percentile per-packet one-way delay: 244.439 ms
Loss rate: 2.63%
-- Flow 3:
Average throughput: 320.26 Mbit/s
95th percentile per-packet one-way delay: 297.364 ms
Loss rate: 16.87%
```

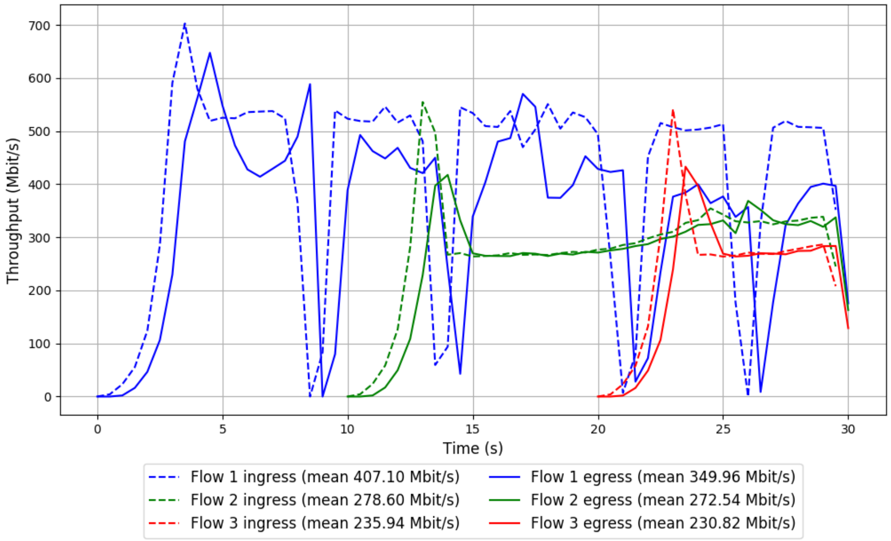
Run 1: Report of PCC-Allegro — Data Link

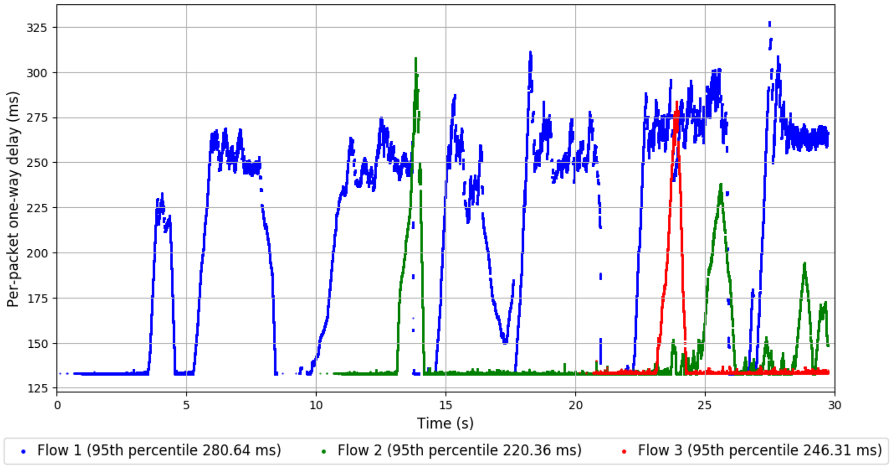




```
Run 2: Statistics of PCC-Allegro

Start at: 2018-11-03 07:16:11
End at: 2018-11-03 07:16:41
Local clock offset: 0.384 ms
Remote clock offset: -0.172 ms

# Below is generated by plot.py at 2018-11-03 10:49:34
# Datalink statistics
-- Total of 3 flows:
Average throughput: 604.97 Mbit/s
95th percentile per-packet one-way delay: 275.157 ms
Loss rate: 10.52%
-- Flow 1:
Average throughput: 349.96 Mbit/s
95th percentile per-packet one-way delay: 280.642 ms
Loss rate: 14.80%
-- Flow 2:
Average throughput: 272.54 Mbit/s
95th percentile per-packet one-way delay: 220.360 ms
Loss rate: 3.49%
-- Flow 3:
Average throughput: 230.82 Mbit/s
95th percentile per-packet one-way delay: 246.307 ms
Loss rate: 4.82%
```

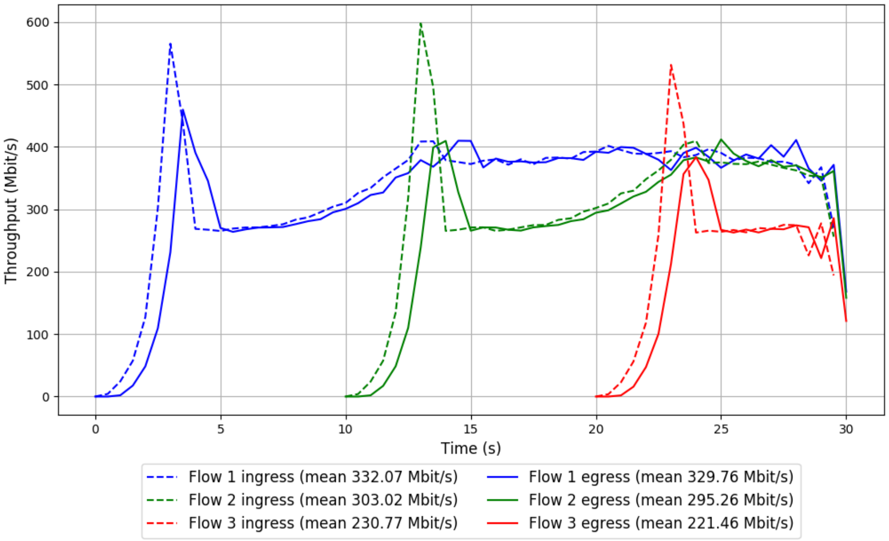
Run 2: Report of PCC-Allegro — Data Link

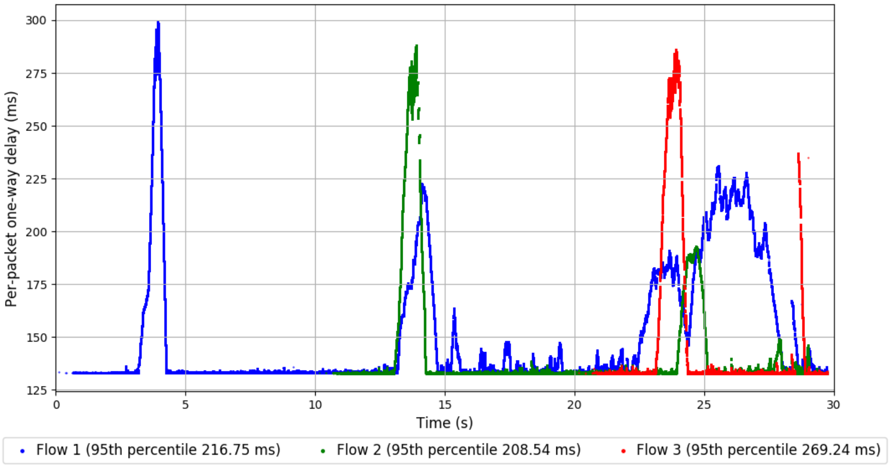




```
Run 3: Statistics of PCC-Allegro

Start at: 2018-11-03 07:50:14
End at: 2018-11-03 07:50:44
Local clock offset: -0.12 ms
Remote clock offset: -0.147 ms

# Below is generated by plot.py at 2018-11-03 10:49:34
# Datalink statistics
-- Total of 3 flows:
Average throughput: 596.63 Mbit/s
95th percentile per-packet one-way delay: 220.723 ms
Loss rate: 2.97%
-- Flow 1:
Average throughput: 329.76 Mbit/s
95th percentile per-packet one-way delay: 216.755 ms
Loss rate: 1.58%
-- Flow 2:
Average throughput: 295.26 Mbit/s
95th percentile per-packet one-way delay: 208.541 ms
Loss rate: 3.87%
-- Flow 3:
Average throughput: 221.46 Mbit/s
95th percentile per-packet one-way delay: 269.238 ms
Loss rate: 6.63%
```

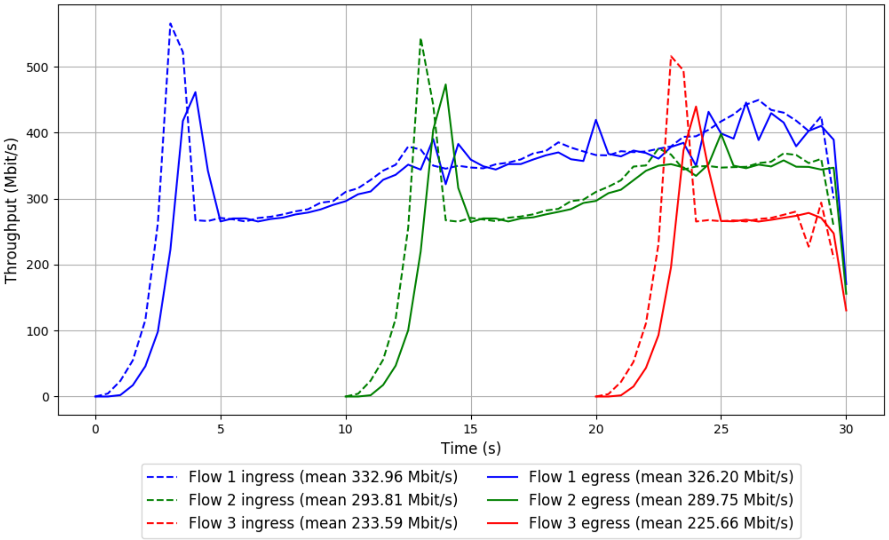
Run 3: Report of PCC-Allegro — Data Link

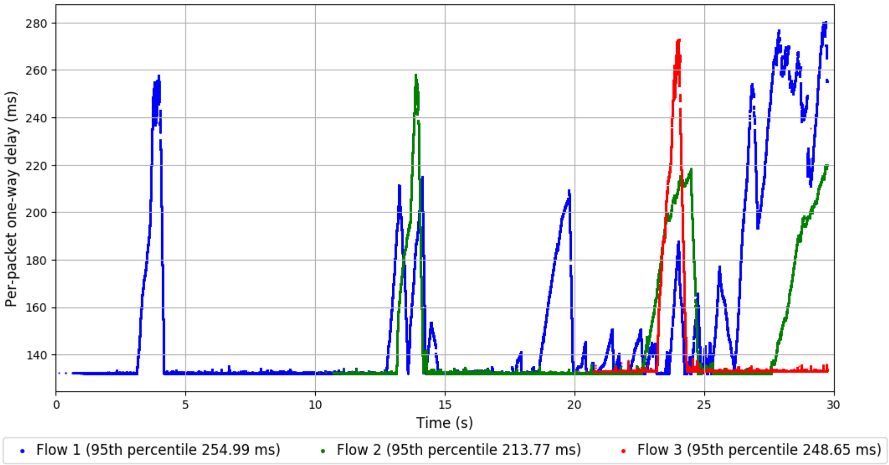




```
Run 4: Statistics of PCC-Allegro

Start at: 2018-11-03 08:23:59
End at: 2018-11-03 08:24:29
Local clock offset: -0.182 ms
Remote clock offset: -0.071 ms

# Below is generated by plot.py at 2018-11-03 10:56:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 590.76 Mbit/s
95th percentile per-packet one-way delay: 247.956 ms
Loss rate: 3.24%
-- Flow 1:
Average throughput: 326.20 Mbit/s
95th percentile per-packet one-way delay: 254.987 ms
Loss rate: 2.91%
-- Flow 2:
Average throughput: 289.75 Mbit/s
95th percentile per-packet one-way delay: 213.774 ms
Loss rate: 2.71%
-- Flow 3:
Average throughput: 225.66 Mbit/s
95th percentile per-packet one-way delay: 248.645 ms
Loss rate: 6.02%
```

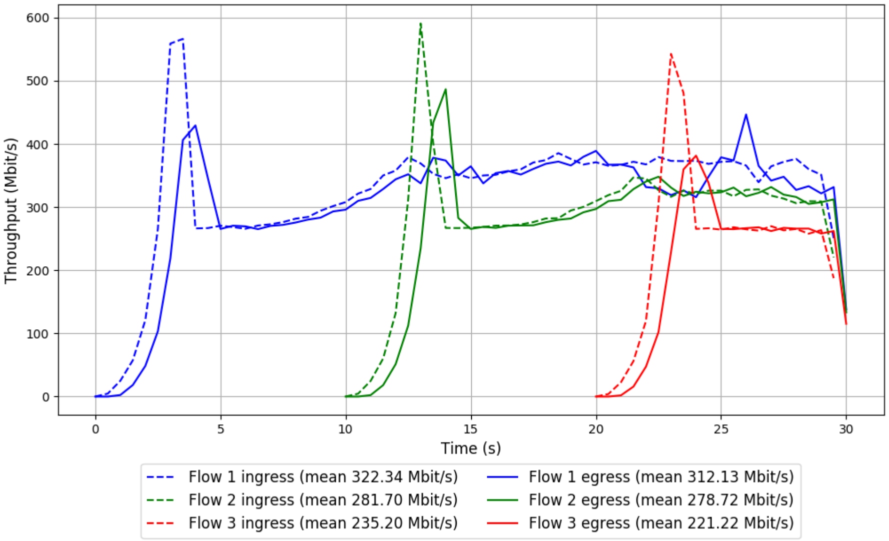
Run 4: Report of PCC-Allegro — Data Link

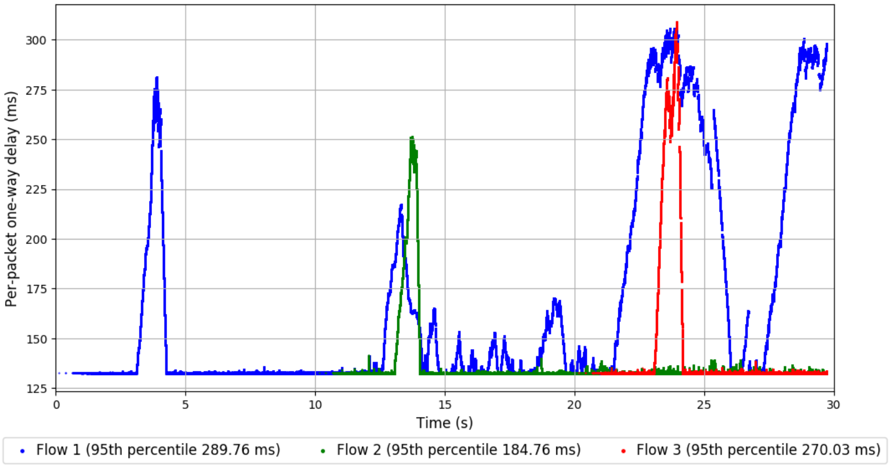




```
Run 5: Statistics of PCC-Allegro

Start at: 2018-11-03 08:56:51
End at: 2018-11-03 08:57:21
Local clock offset: -0.523 ms
Remote clock offset: 0.002 ms

# Below is generated by plot.py at 2018-11-03 10:56:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 568.09 Mbit/s
95th percentile per-packet one-way delay: 281.683 ms
Loss rate: 4.10%
-- Flow 1:
Average throughput: 312.13 Mbit/s
95th percentile per-packet one-way delay: 289.765 ms
Loss rate: 4.03%
-- Flow 2:
Average throughput: 278.72 Mbit/s
95th percentile per-packet one-way delay: 184.758 ms
Loss rate: 2.39%
-- Flow 3:
Average throughput: 221.22 Mbit/s
95th percentile per-packet one-way delay: 270.034 ms
Loss rate: 8.49%
```

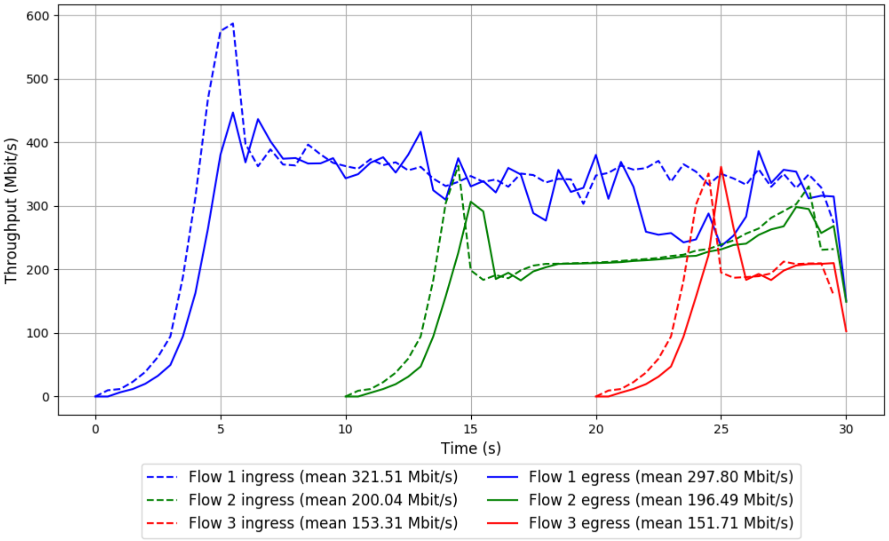
Run 5: Report of PCC-Allegro — Data Link

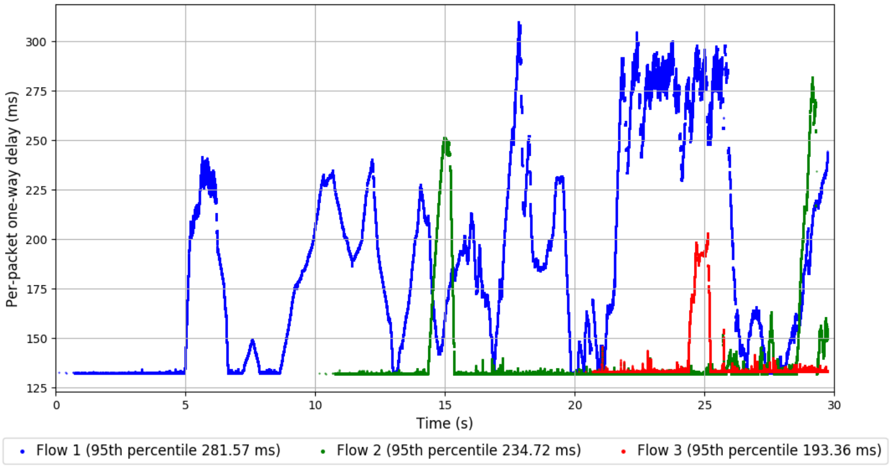




```
Run 1: Statistics of PCC-Expr

Start at: 2018-11-03 06:57:22
End at: 2018-11-03 06:57:52
Local clock offset: 0.012 ms
Remote clock offset: -0.098 ms

# Below is generated by plot.py at 2018-11-03 10:56:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 477.04 Mbit/s
95th percentile per-packet one-way delay: 274.167 ms
Loss rate: 6.40%
-- Flow 1:
Average throughput: 297.80 Mbit/s
95th percentile per-packet one-way delay: 281.572 ms
Loss rate: 8.20%
-- Flow 2:
Average throughput: 196.49 Mbit/s
95th percentile per-packet one-way delay: 234.716 ms
Loss rate: 3.08%
-- Flow 3:
Average throughput: 151.71 Mbit/s
95th percentile per-packet one-way delay: 193.362 ms
Loss rate: 3.72%
```

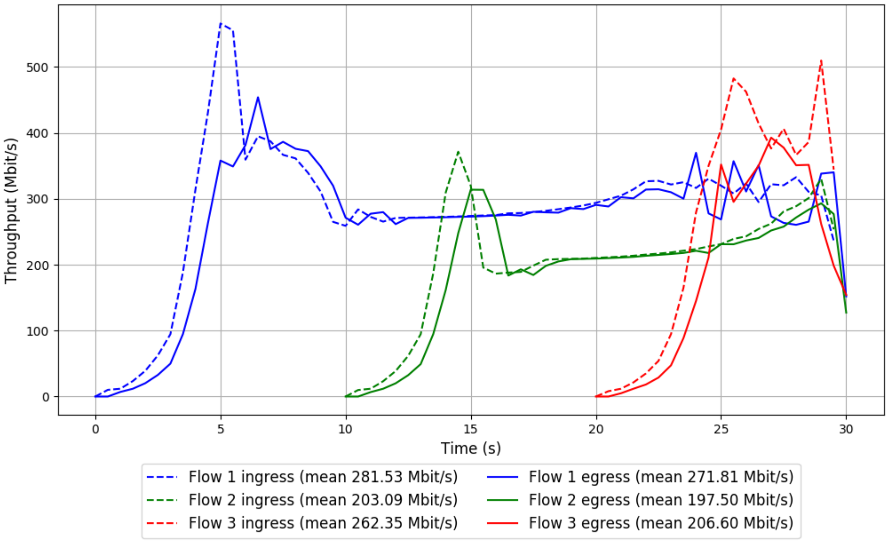
Run 1: Report of PCC-Expr — Data Link

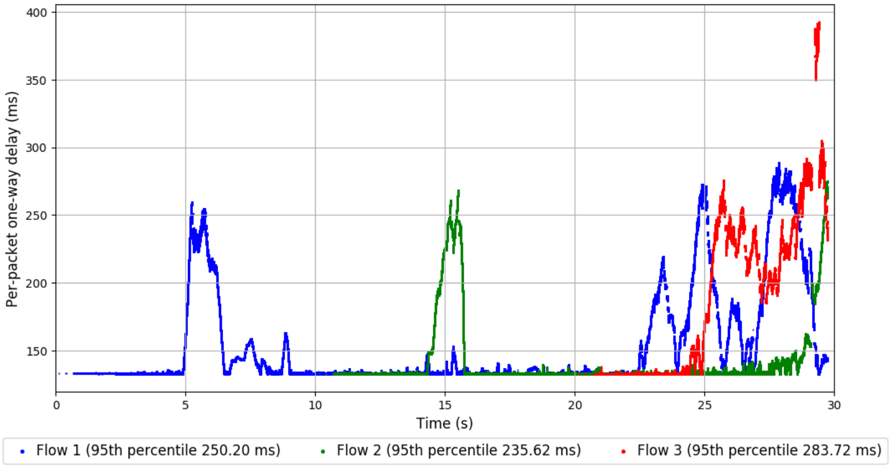




```
Run 2: Statistics of PCC-Expr

Start at: 2018-11-03 07:31:34
End at: 2018-11-03 07:32:04
Local clock offset: -0.311 ms
Remote clock offset: -0.217 ms

# Below is generated by plot.py at 2018-11-03 10:56:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 469.46 Mbit/s
95th percentile per-packet one-way delay: 254.601 ms
Loss rate: 7.53%
-- Flow 1:
Average throughput: 271.81 Mbit/s
95th percentile per-packet one-way delay: 250.203 ms
Loss rate: 4.32%
-- Flow 2:
Average throughput: 197.50 Mbit/s
95th percentile per-packet one-way delay: 235.620 ms
Loss rate: 4.06%
-- Flow 3:
Average throughput: 206.60 Mbit/s
95th percentile per-packet one-way delay: 283.721 ms
Loss rate: 23.38%
```

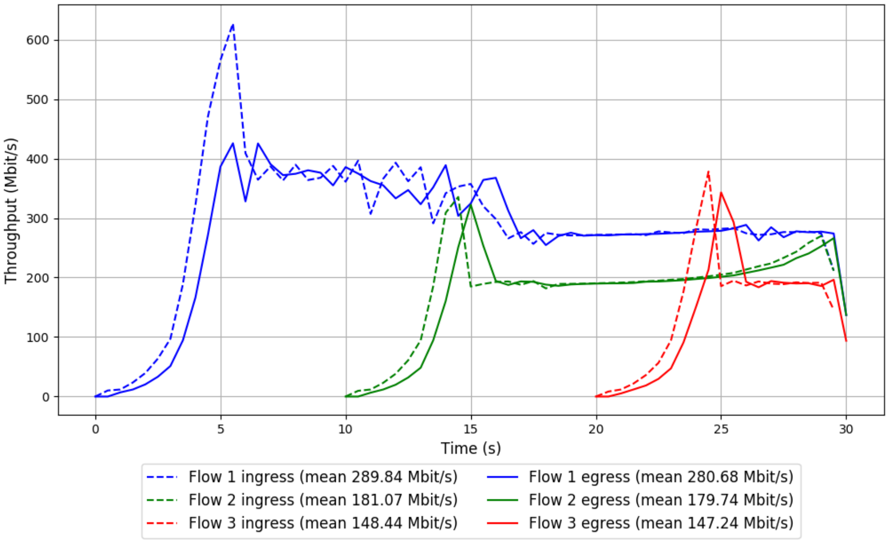
Run 2: Report of PCC-Expr — Data Link

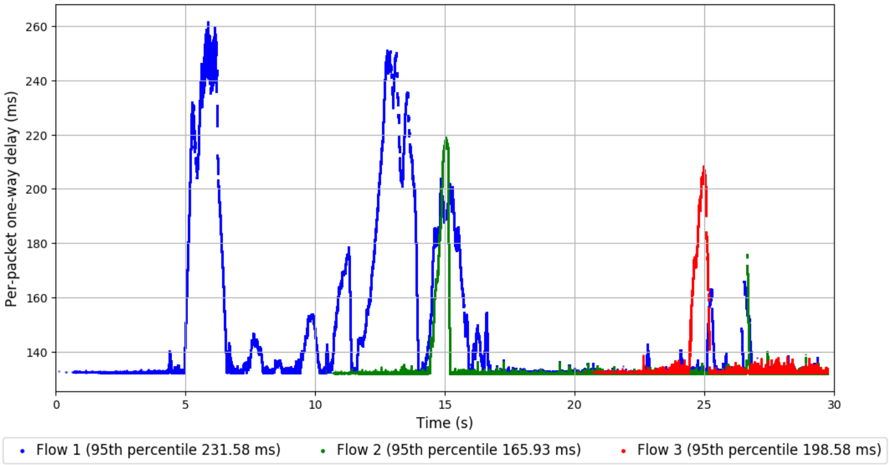




```
Run 3: Statistics of PCC-Expr

Start at: 2018-11-03 08:05:31
End at: 2018-11-03 08:06:01
Local clock offset: -0.161 ms
Remote clock offset: -0.062 ms

# Below is generated by plot.py at 2018-11-03 10:56:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 447.30 Mbit/s
95th percentile per-packet one-way delay: 215.638 ms
Loss rate: 3.45%
-- Flow 1:
Average throughput: 280.68 Mbit/s
95th percentile per-packet one-way delay: 231.582 ms
Loss rate: 4.02%
-- Flow 2:
Average throughput: 179.74 Mbit/s
95th percentile per-packet one-way delay: 165.925 ms
Loss rate: 2.06%
-- Flow 3:
Average throughput: 147.24 Mbit/s
95th percentile per-packet one-way delay: 198.576 ms
Loss rate: 3.50%
```

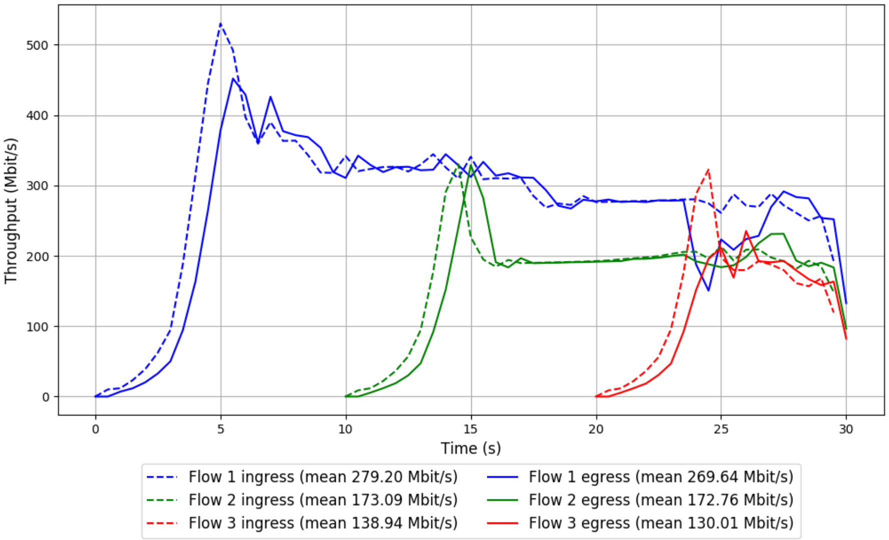
Run 3: Report of PCC-Expr — Data Link

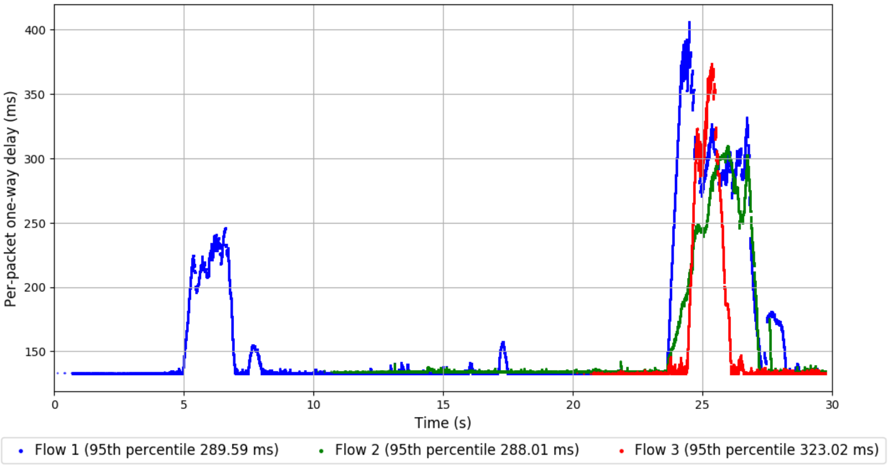




```
Run 4: Statistics of PCC-Expr

Start at: 2018-11-03 08:38:40
End at: 2018-11-03 08:39:11
Local clock offset: 0.094 ms
Remote clock offset: 0.353 ms

# Below is generated by plot.py at 2018-11-03 11:02:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 426.10 Mbit/s
95th percentile per-packet one-way delay: 293.810 ms
Loss rate: 4.06%
-- Flow 1:
Average throughput: 269.64 Mbit/s
95th percentile per-packet one-way delay: 289.592 ms
Loss rate: 4.29%
-- Flow 2:
Average throughput: 172.76 Mbit/s
95th percentile per-packet one-way delay: 288.009 ms
Loss rate: 1.55%
-- Flow 3:
Average throughput: 130.01 Mbit/s
95th percentile per-packet one-way delay: 323.018 ms
Loss rate: 8.96%
```

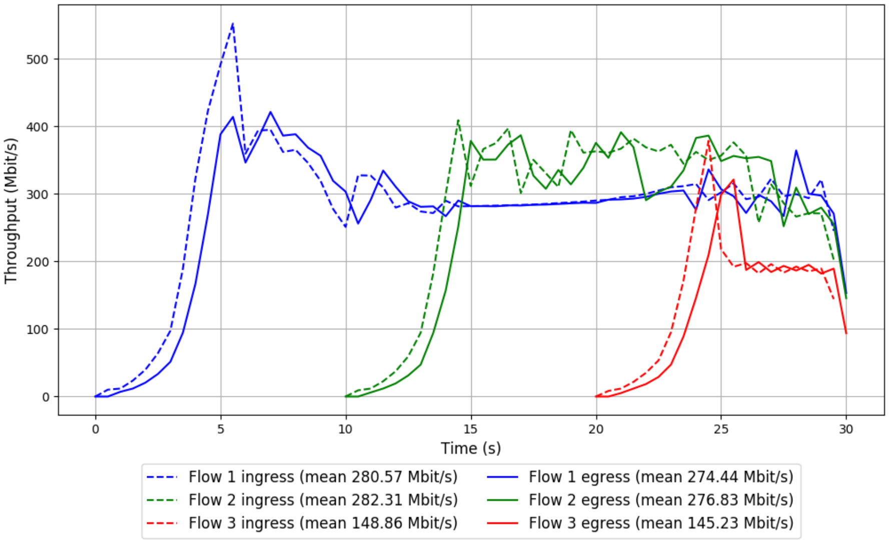
Run 4: Report of PCC-Expr — Data Link

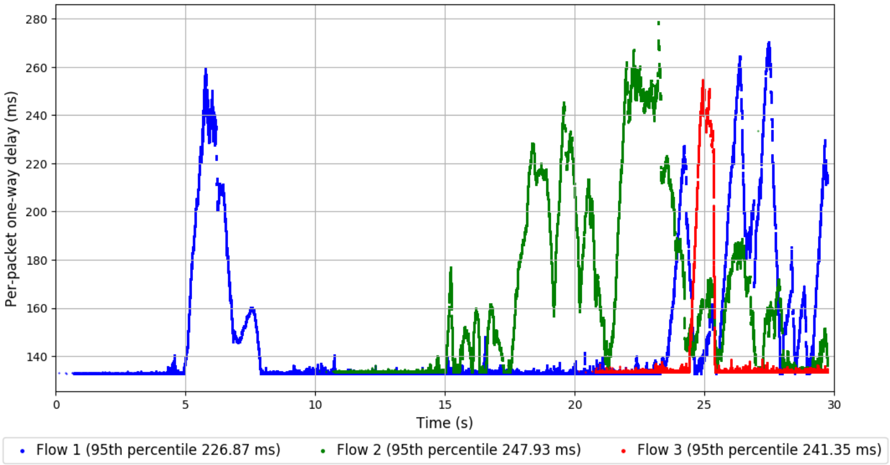




```
Run 5: Statistics of PCC-Expr

Start at: 2018-11-03 09:11:34
End at: 2018-11-03 09:12:04
Local clock offset: 0.335 ms
Remote clock offset: -0.009 ms

# Below is generated by plot.py at 2018-11-03 11:07:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 504.59 Mbit/s
95th percentile per-packet one-way delay: 240.865 ms
Loss rate: 3.32%
-- Flow 1:
Average throughput: 274.44 Mbit/s
95th percentile per-packet one-way delay: 226.867 ms
Loss rate: 3.06%
-- Flow 2:
Average throughput: 276.83 Mbit/s
95th percentile per-packet one-way delay: 247.929 ms
Loss rate: 3.26%
-- Flow 3:
Average throughput: 145.23 Mbit/s
95th percentile per-packet one-way delay: 241.353 ms
Loss rate: 5.08%
```

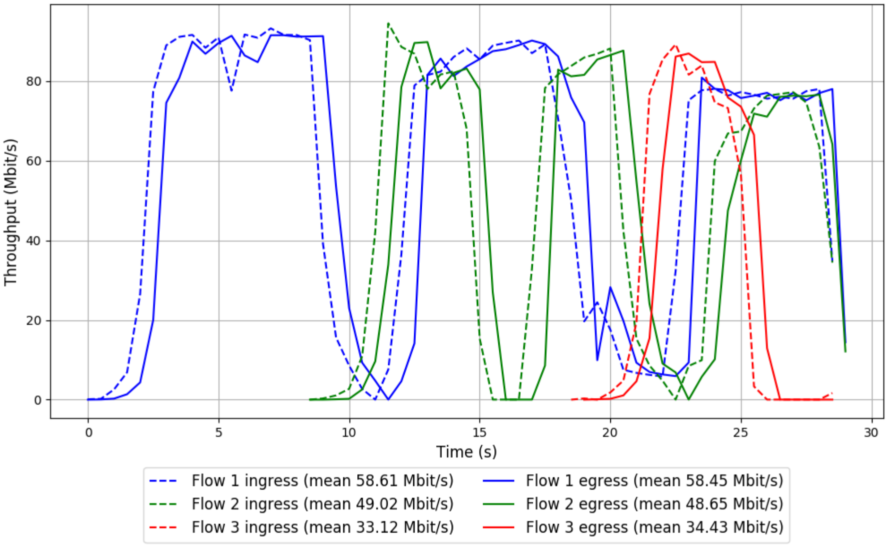
Run 5: Report of PCC-Expr — Data Link

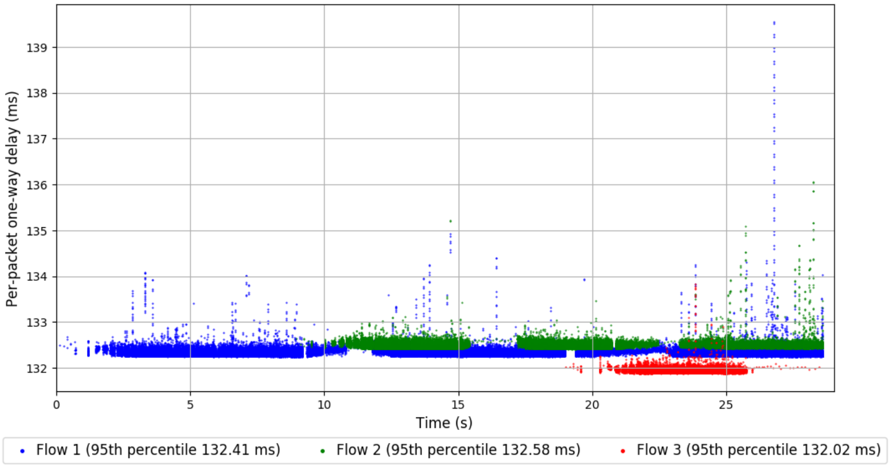




```
Run 1: Statistics of QUIC Cubic

Start at: 2018-11-03 06:47:02
End at: 2018-11-03 06:47:32
Local clock offset: -0.457 ms
Remote clock offset: -0.037 ms

# Below is generated by plot.py at 2018-11-03 11:07:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 103.41 Mbit/s
95th percentile per-packet one-way delay: 132.535 ms
Loss rate: 1.39%
-- Flow 1:
Average throughput: 58.45 Mbit/s
95th percentile per-packet one-way delay: 132.410 ms
Loss rate: 1.20%
-- Flow 2:
Average throughput: 48.65 Mbit/s
95th percentile per-packet one-way delay: 132.576 ms
Loss rate: 2.09%
-- Flow 3:
Average throughput: 34.43 Mbit/s
95th percentile per-packet one-way delay: 132.017 ms
Loss rate: 0.25%
```

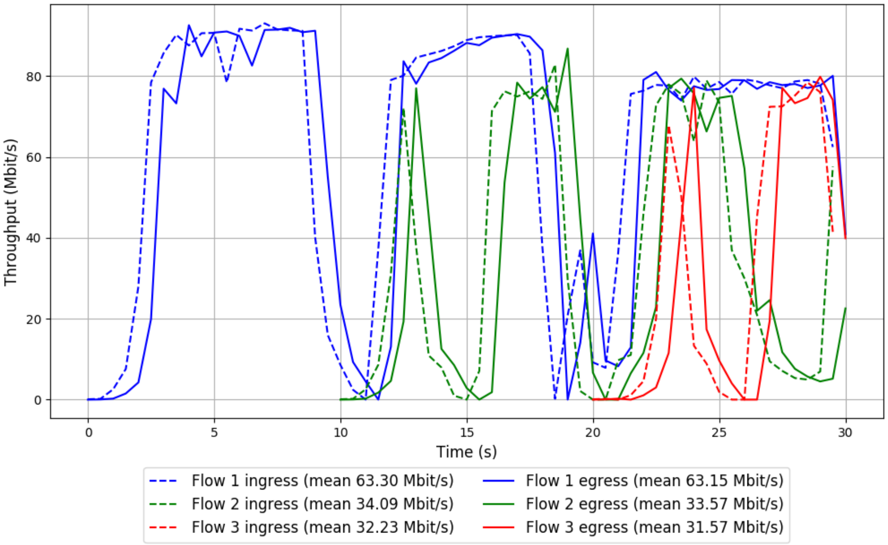
Run 1: Report of QUIC Cubic — Data Link

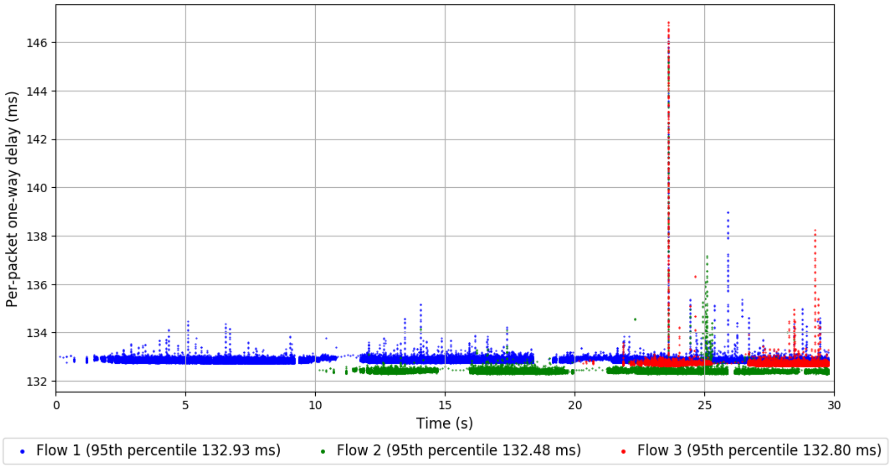




```
Run 2: Statistics of QUIC Cubic

Start at: 2018-11-03 07:20:40
End at: 2018-11-03 07:21:10
Local clock offset: -0.068 ms
Remote clock offset: -0.147 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 95.62 Mbit/s
95th percentile per-packet one-way delay: 132.915 ms
Loss rate: 1.80%
-- Flow 1:
Average throughput: 63.15 Mbit/s
95th percentile per-packet one-way delay: 132.932 ms
Loss rate: 1.12%
-- Flow 2:
Average throughput: 33.57 Mbit/s
95th percentile per-packet one-way delay: 132.478 ms
Loss rate: 2.84%
-- Flow 3:
Average throughput: 31.57 Mbit/s
95th percentile per-packet one-way delay: 132.803 ms
Loss rate: 3.65%
```

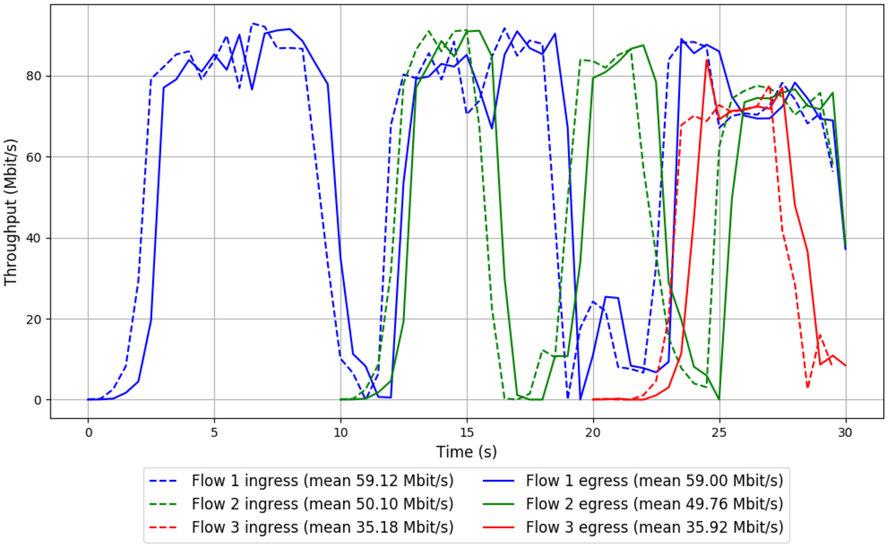
Run 2: Report of QUIC Cubic — Data Link

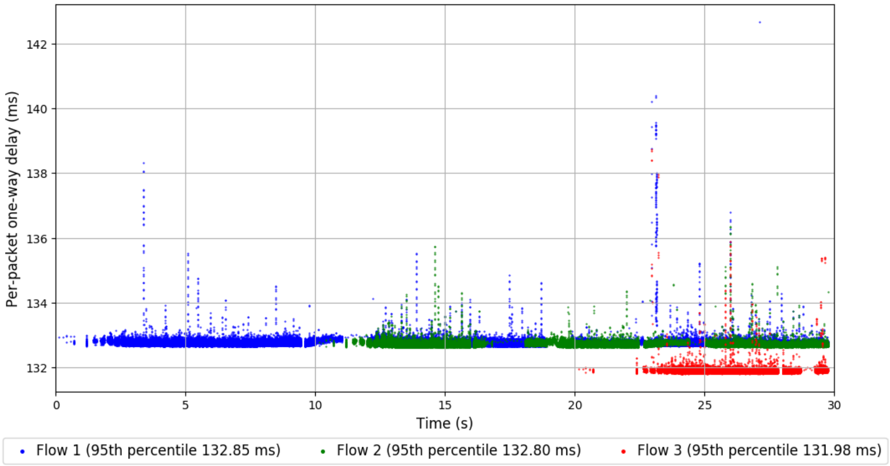




```
Run 3: Statistics of QUIC Cubic

Start at: 2018-11-03 07:54:38
End at: 2018-11-03 07:55:08
Local clock offset: -0.342 ms
Remote clock offset: -0.16 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 103.60 Mbit/s
95th percentile per-packet one-way delay: 132.833 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 59.00 Mbit/s
95th percentile per-packet one-way delay: 132.851 ms
Loss rate: 1.09%
-- Flow 2:
Average throughput: 49.76 Mbit/s
95th percentile per-packet one-way delay: 132.800 ms
Loss rate: 2.00%
-- Flow 3:
Average throughput: 35.92 Mbit/s
95th percentile per-packet one-way delay: 131.979 ms
Loss rate: 0.64%
```

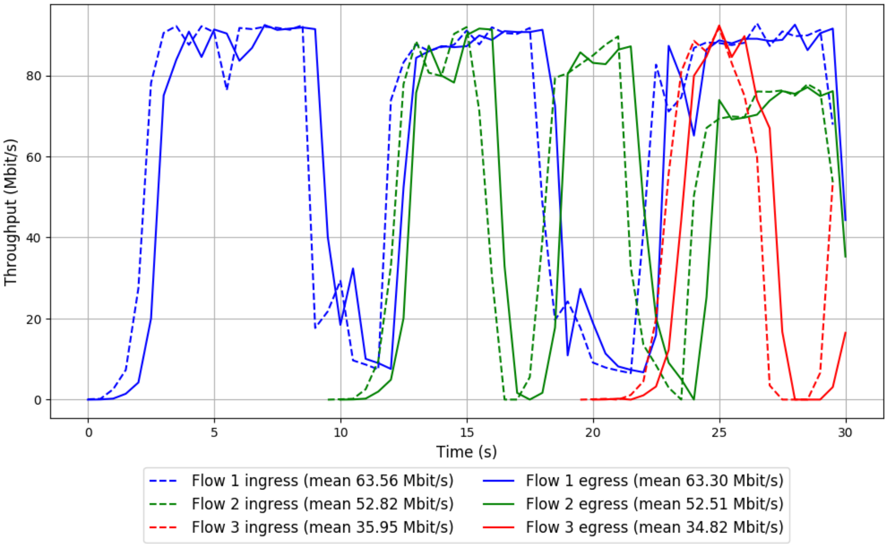
Run 3: Report of QUIC Cubic — Data Link

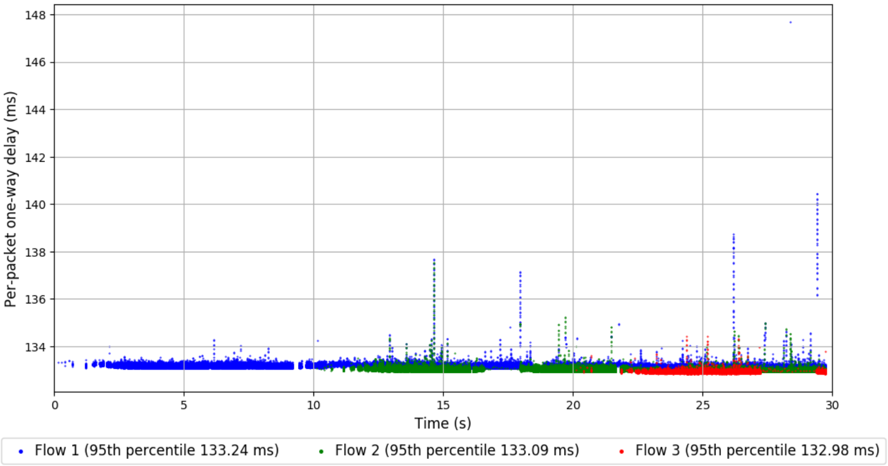




```
Run 4: Statistics of QUIC Cubic

Start at: 2018-11-03 08:28:18
End at: 2018-11-03 08:28:48
Local clock offset: -0.125 ms
Remote clock offset: -0.056 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 109.41 Mbit/s
95th percentile per-packet one-way delay: 133.220 ms
Loss rate: 1.96%
-- Flow 1:
Average throughput: 63.30 Mbit/s
95th percentile per-packet one-way delay: 133.243 ms
Loss rate: 1.28%
-- Flow 2:
Average throughput: 52.51 Mbit/s
95th percentile per-packet one-way delay: 133.091 ms
Loss rate: 1.91%
-- Flow 3:
Average throughput: 34.82 Mbit/s
95th percentile per-packet one-way delay: 132.977 ms
Loss rate: 5.74%
```

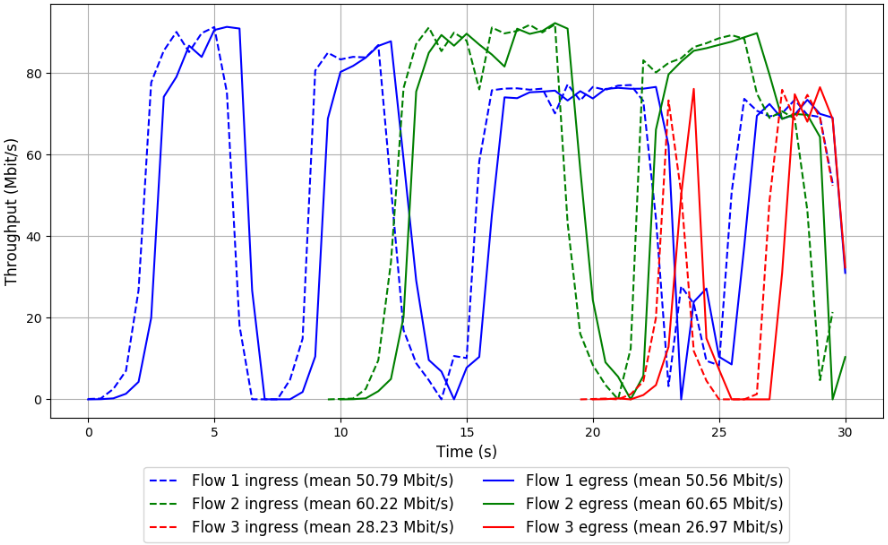
Run 4: Report of QUIC Cubic — Data Link

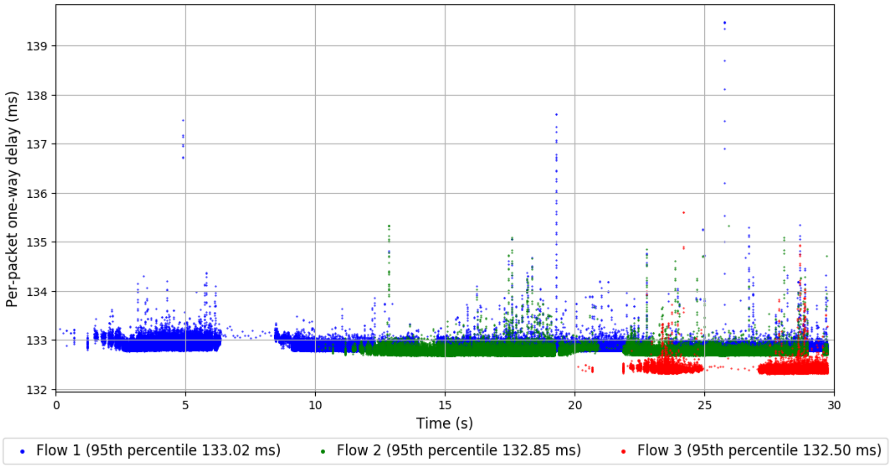




```
Run 5: Statistics of QUIC Cubic

Start at: 2018-11-03 09:00:57
End at: 2018-11-03 09:01:27
Local clock offset: -0.157 ms
Remote clock offset: -0.044 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 99.52 Mbit/s
95th percentile per-packet one-way delay: 132.978 ms
Loss rate: 1.60%
-- Flow 1:
Average throughput: 50.56 Mbit/s
95th percentile per-packet one-way delay: 133.020 ms
Loss rate: 1.34%
-- Flow 2:
Average throughput: 60.65 Mbit/s
95th percentile per-packet one-way delay: 132.854 ms
Loss rate: 0.66%
-- Flow 3:
Average throughput: 26.97 Mbit/s
95th percentile per-packet one-way delay: 132.504 ms
Loss rate: 7.04%
```

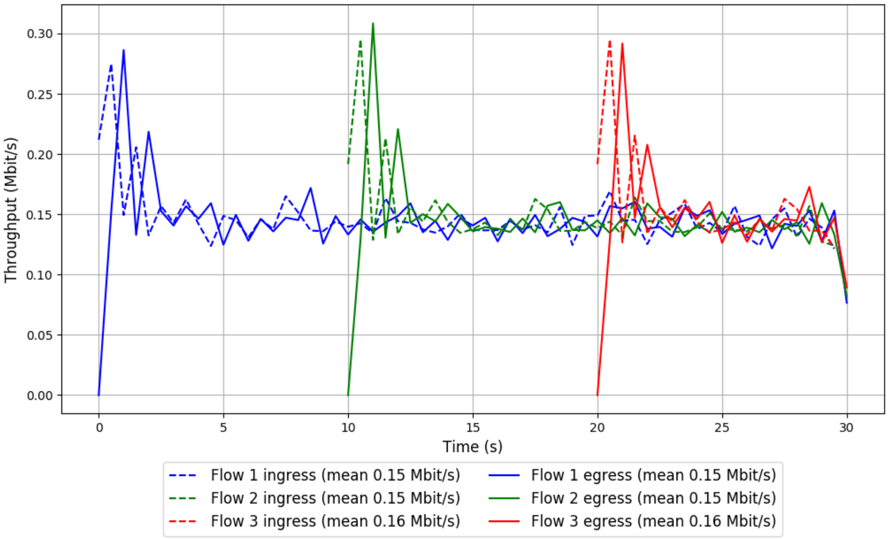
Run 5: Report of QUIC Cubic — Data Link

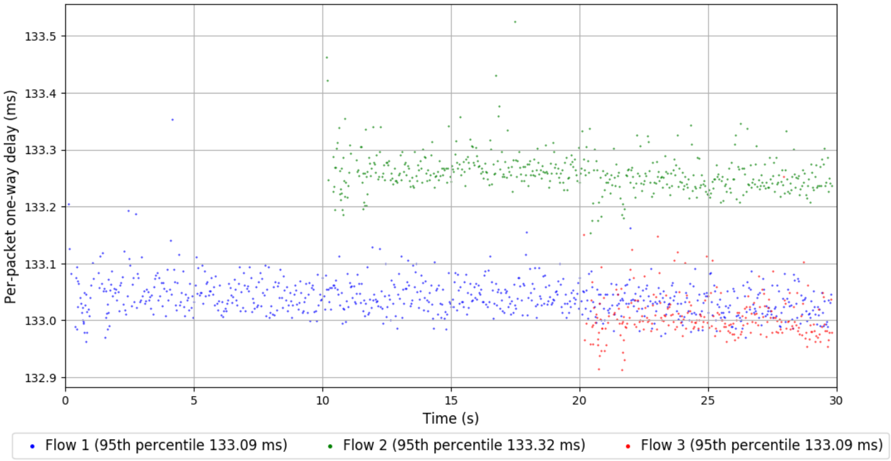




```
Run 1: Statistics of SCReAM

Start at: 2018-11-03 06:32:46
End at: 2018-11-03 06:33:16
Local clock offset: -0.103 ms
Remote clock offset: 0.064 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 133.286 ms
Loss rate: 1.20%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 133.092 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 133.317 ms
Loss rate: 1.21%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 133.086 ms
Loss rate: 2.12%
```

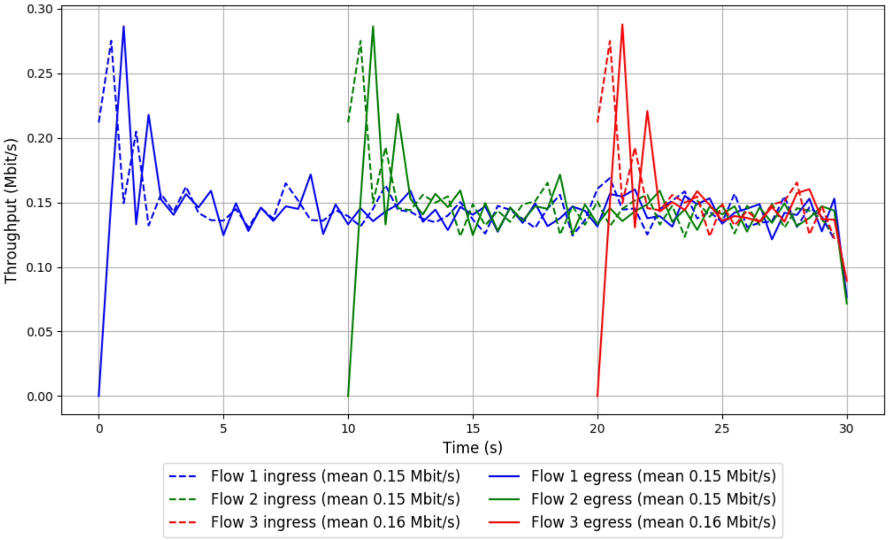
Run 1: Report of SCReAM — Data Link

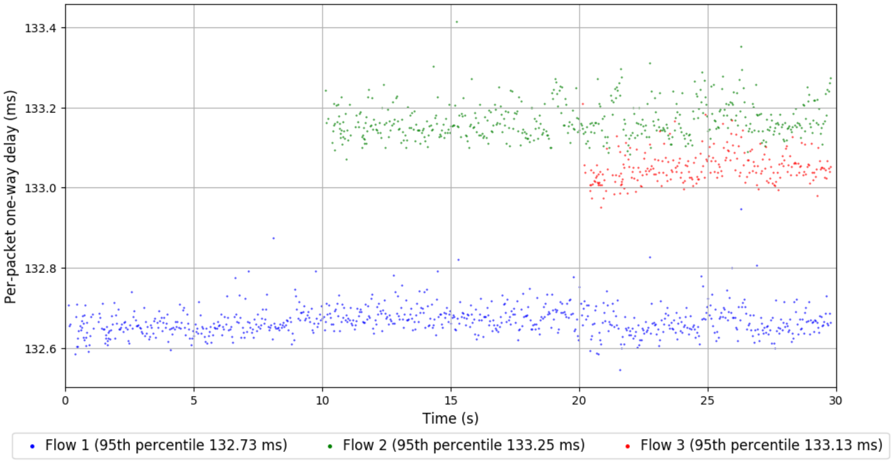




```
Run 2: Statistics of SCReAM

Start at: 2018-11-03 07:06:23
End at: 2018-11-03 07:06:53
Local clock offset: -0.306 ms
Remote clock offset: -0.502 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 133.214 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 132.729 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 133.252 ms
Loss rate: 1.39%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 133.127 ms
Loss rate: 2.45%
```

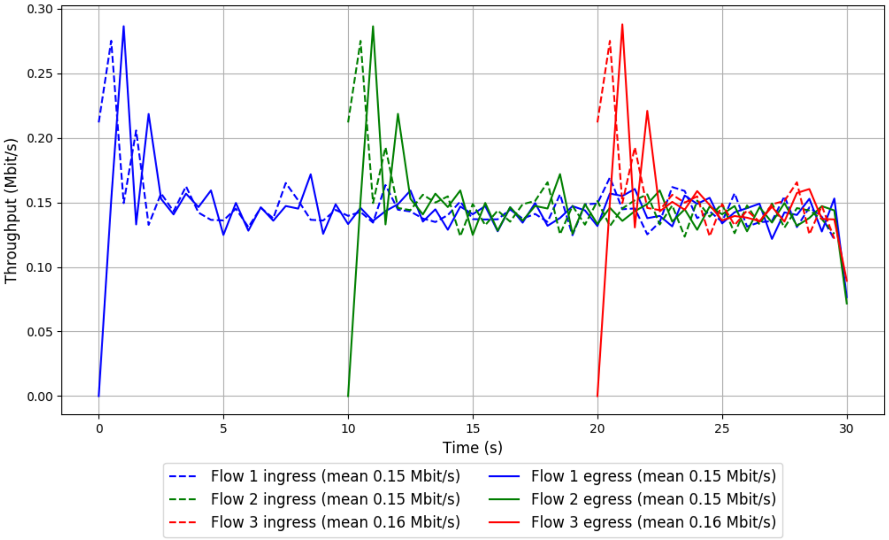
Run 2: Report of SCReAM — Data Link

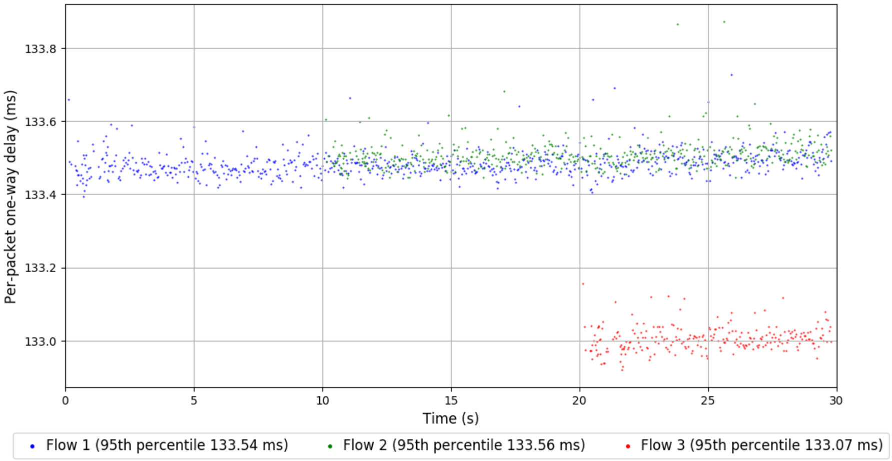




```
Run 3: Statistics of SCReAM

Start at: 2018-11-03 07:40:42
End at: 2018-11-03 07:41:12
Local clock offset: 0.38 ms
Remote clock offset: -0.194 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 133.546 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 133.540 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 133.563 ms
Loss rate: 1.39%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 133.066 ms
Loss rate: 2.45%
```

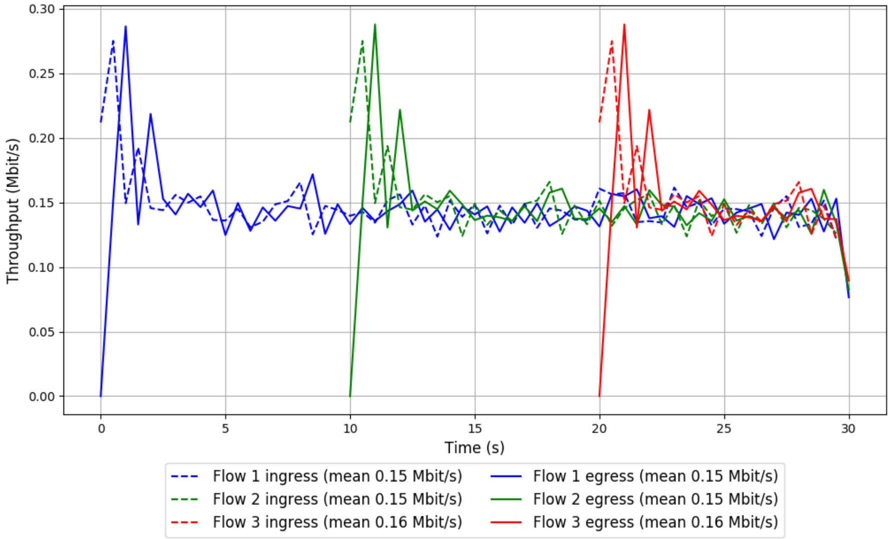
Run 3: Report of SCReAM — Data Link

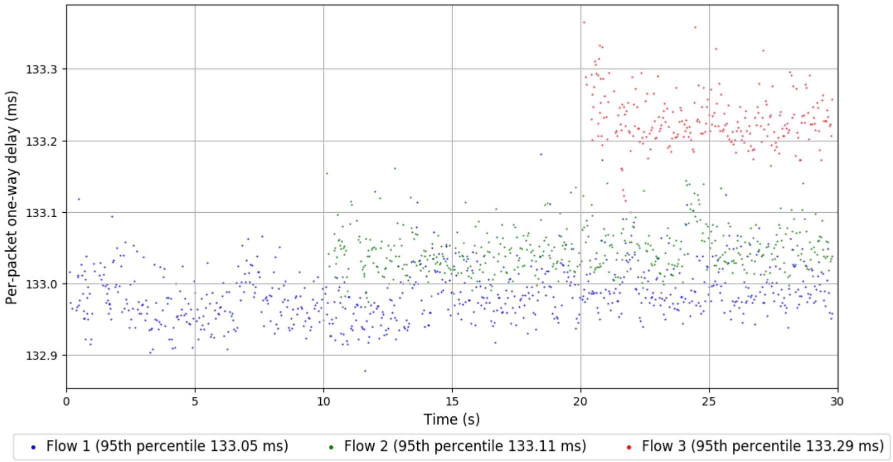




```
Run 4: Statistics of SCReAM

Start at: 2018-11-03 08:14:42
End at: 2018-11-03 08:15:12
Local clock offset: -0.196 ms
Remote clock offset: -0.007 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 133.241 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 133.050 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 133.110 ms
Loss rate: 1.39%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 133.293 ms
Loss rate: 2.45%
```

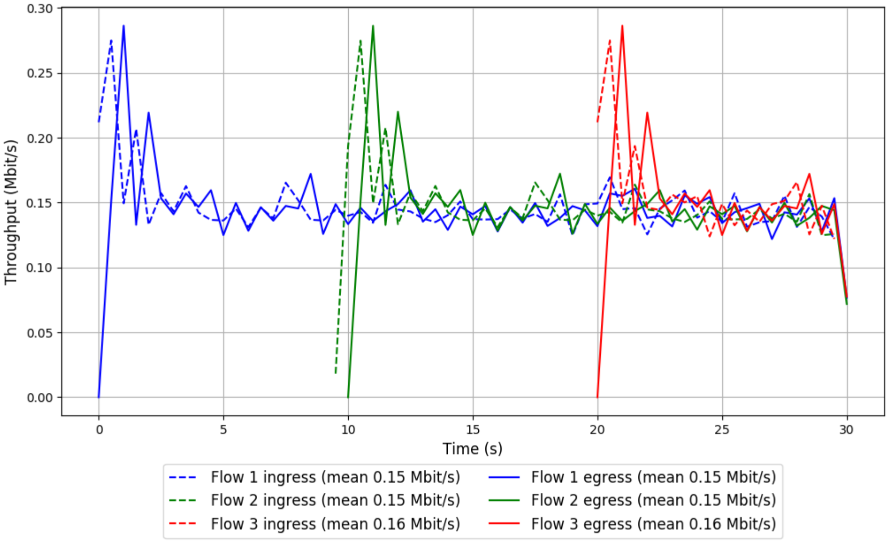
Run 4: Report of SCReAM — Data Link

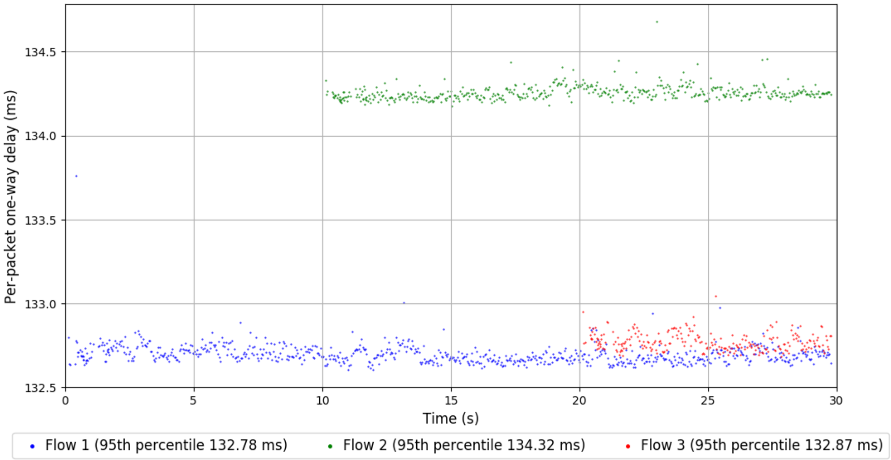




```
Run 5: Statistics of SCReAM

Start at: 2018-11-03 08:47:42
End at: 2018-11-03 08:48:12
Local clock offset: -0.359 ms
Remote clock offset: -0.004 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 134.293 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 132.775 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 134.323 ms
Loss rate: 1.39%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 132.867 ms
Loss rate: 2.45%
```

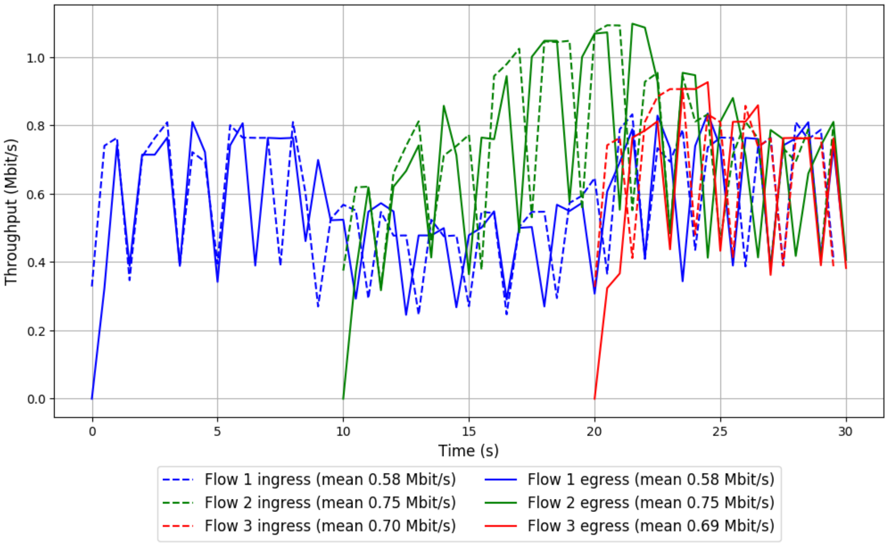
Run 5: Report of SCReAM — Data Link

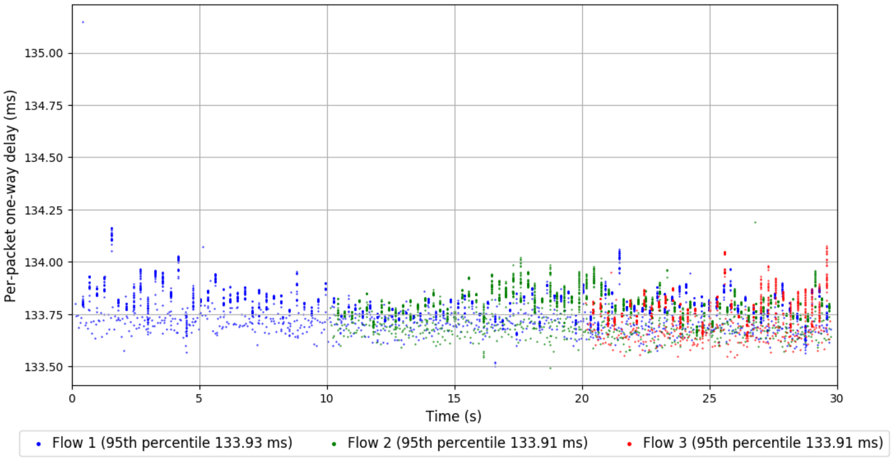




```
Run 1: Statistics of Sprout

Start at: 2018-11-03 06:52:26
End at: 2018-11-03 06:52:56
Local clock offset: 0.235 ms
Remote clock offset: -0.452 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 133.922 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 133.930 ms
Loss rate: 1.17%
-- Flow 2:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 133.913 ms
Loss rate: 1.36%
-- Flow 3:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 133.913 ms
Loss rate: 2.78%
```

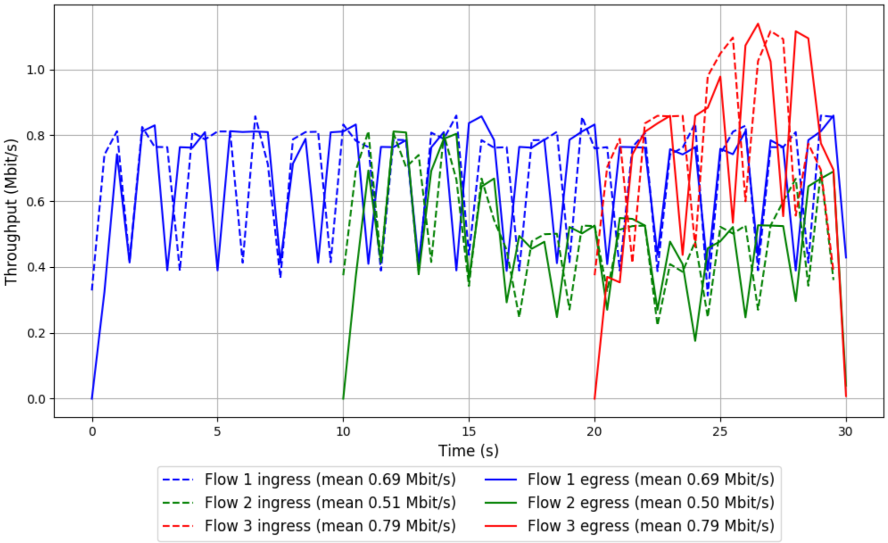
Run 1: Report of Sprout — Data Link

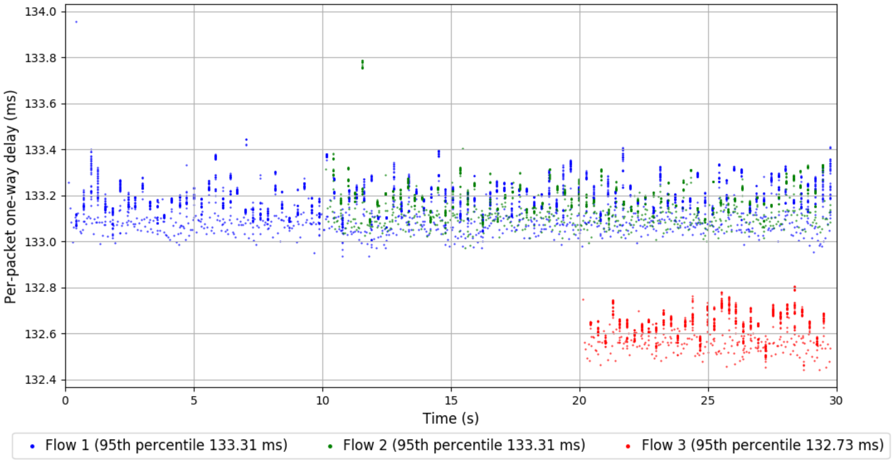




```
Run 2: Statistics of Sprout

Start at: 2018-11-03 07:26:09
End at: 2018-11-03 07:26:39
Local clock offset: -0.062 ms
Remote clock offset: -0.188 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 133.309 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 133.314 ms
Loss rate: 1.05%
-- Flow 2:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 133.311 ms
Loss rate: 1.62%
-- Flow 3:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 132.729 ms
Loss rate: 2.46%
```

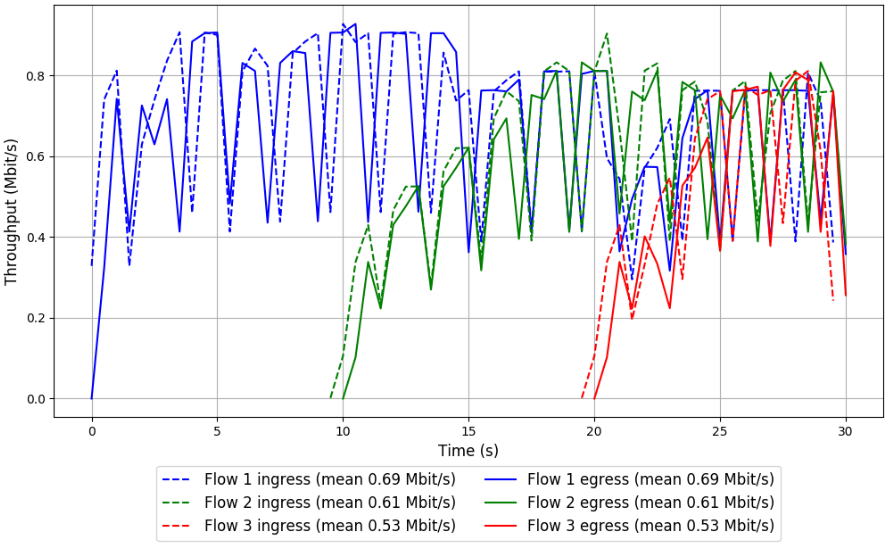
Run 2: Report of Sprout — Data Link

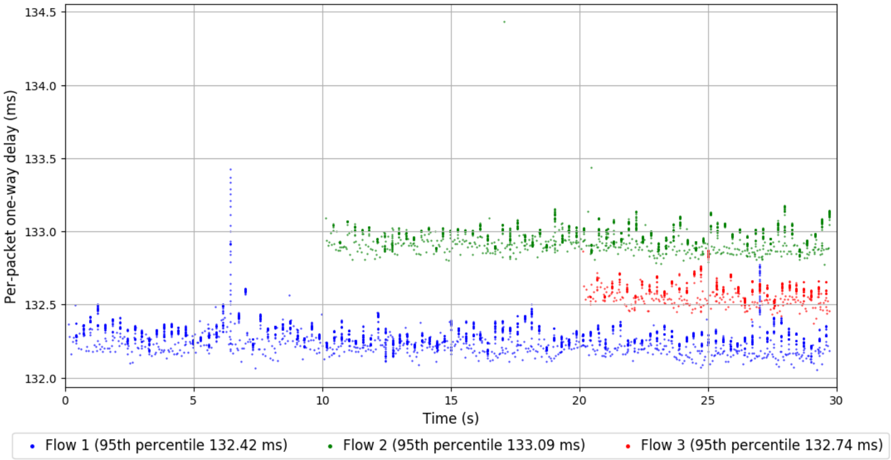




```
Run 3: Statistics of Sprout

Start at: 2018-11-03 08:00:26
End at: 2018-11-03 08:00:56
Local clock offset: -0.571 ms
Remote clock offset: -0.456 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 133.035 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 132.424 ms
Loss rate: 0.93%
-- Flow 2:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 133.089 ms
Loss rate: 1.58%
-- Flow 3:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 132.739 ms
Loss rate: 2.29%
```

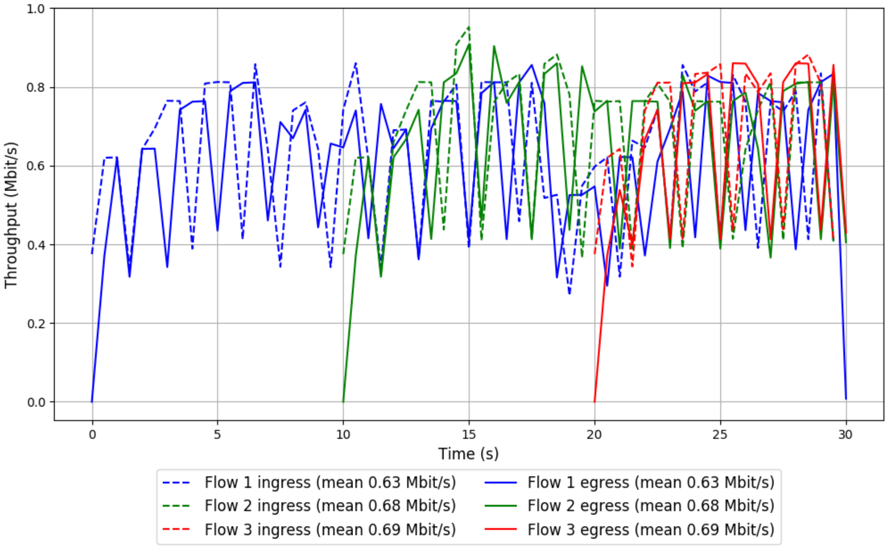
Run 3: Report of Sprout — Data Link

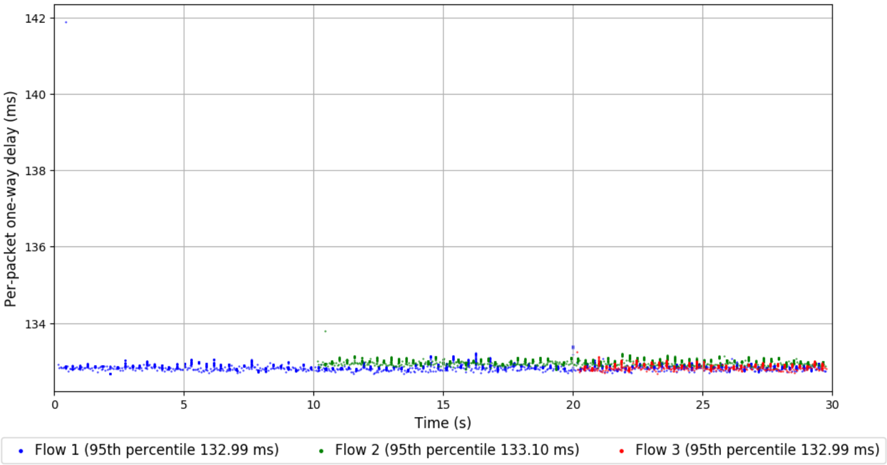




```
Run 4: Statistics of Sprout

Start at: 2018-11-03 08:33:38
End at: 2018-11-03 08:34:08
Local clock offset: -0.324 ms
Remote clock offset: -0.05 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 133.083 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 132.989 ms
Loss rate: 1.08%
-- Flow 2:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 133.104 ms
Loss rate: 1.50%
-- Flow 3:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 132.985 ms
Loss rate: 2.80%
```

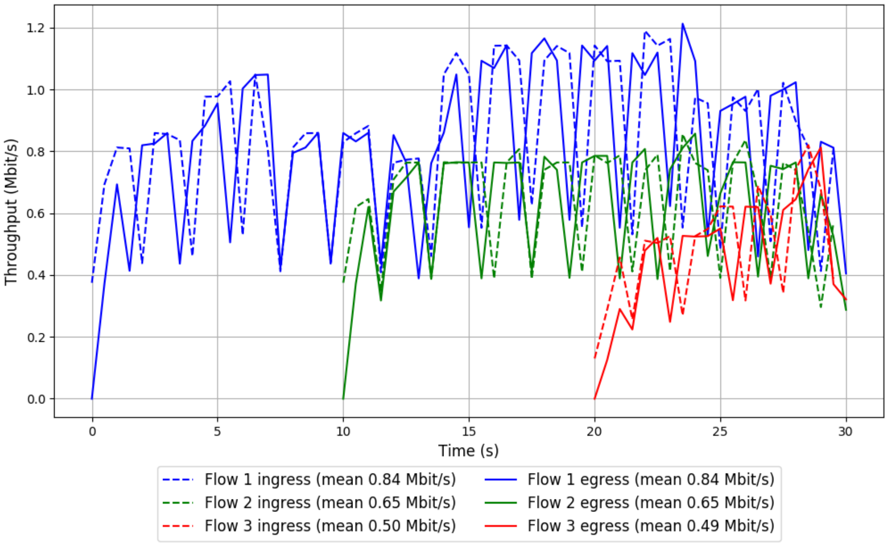
Run 4: Report of Sprout — Data Link

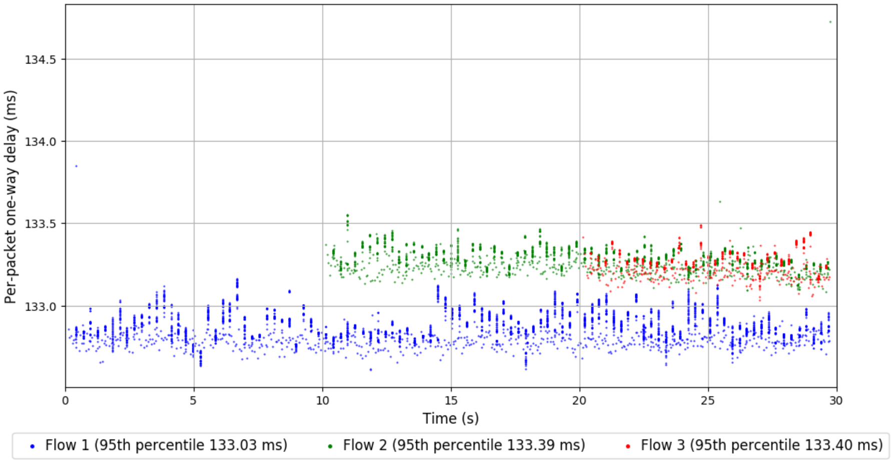




```
Run 5: Statistics of Sprout

Start at: 2018-11-03 09:06:23
End at: 2018-11-03 09:06:53
Local clock offset: 0.122 ms
Remote clock offset: -0.019 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 133.360 ms
Loss rate: 1.26%
-- Flow 1:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 133.034 ms
Loss rate: 0.81%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 133.386 ms
Loss rate: 1.11%
-- Flow 3:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 133.395 ms
Loss rate: 3.92%
```

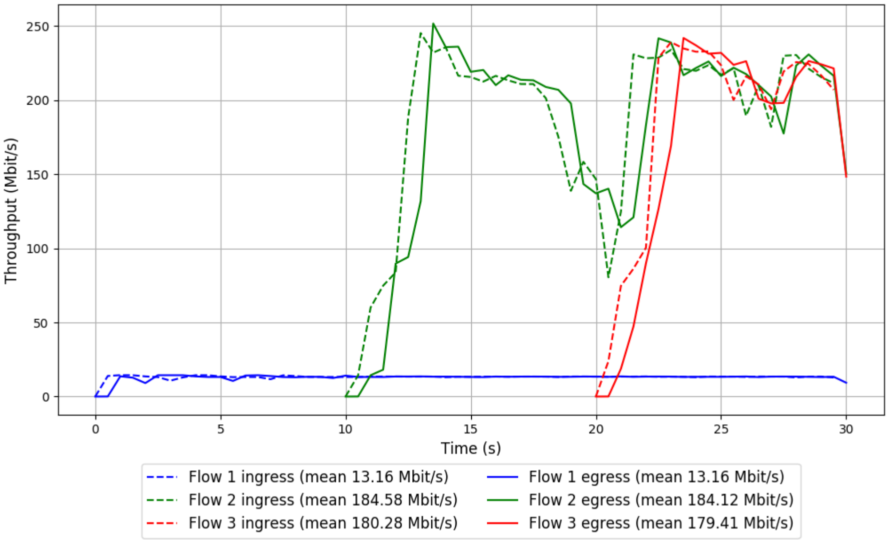
Run 5: Report of Sprout — Data Link

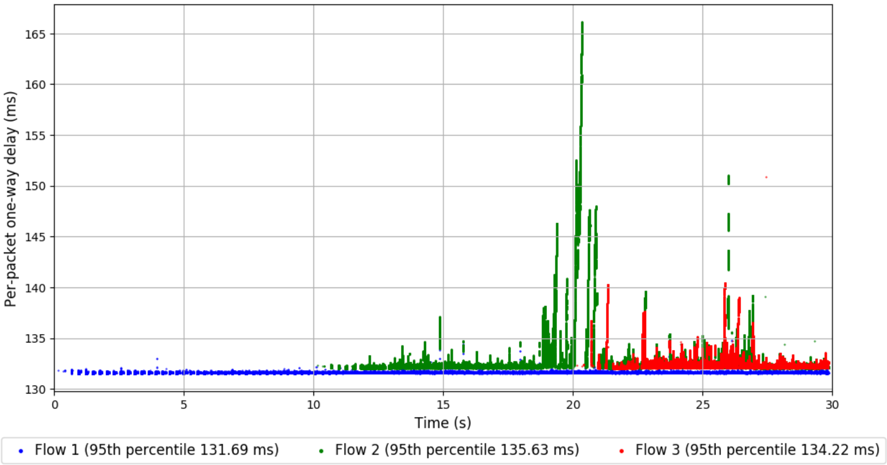




```
Run 1: Statistics of TaoVA-100x

Start at: 2018-11-03 06:38:21
End at: 2018-11-03 06:38:51
Local clock offset: -0.489 ms
Remote clock offset: 0.391 ms

# Below is generated by plot.py at 2018-11-03 11:07:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 193.75 Mbit/s
95th percentile per-packet one-way delay: 134.673 ms
Loss rate: 2.03%
-- Flow 1:
Average throughput: 13.16 Mbit/s
95th percentile per-packet one-way delay: 131.688 ms
Loss rate: 0.91%
-- Flow 2:
Average throughput: 184.12 Mbit/s
95th percentile per-packet one-way delay: 135.633 ms
Loss rate: 1.59%
-- Flow 3:
Average throughput: 179.41 Mbit/s
95th percentile per-packet one-way delay: 134.221 ms
Loss rate: 3.17%
```

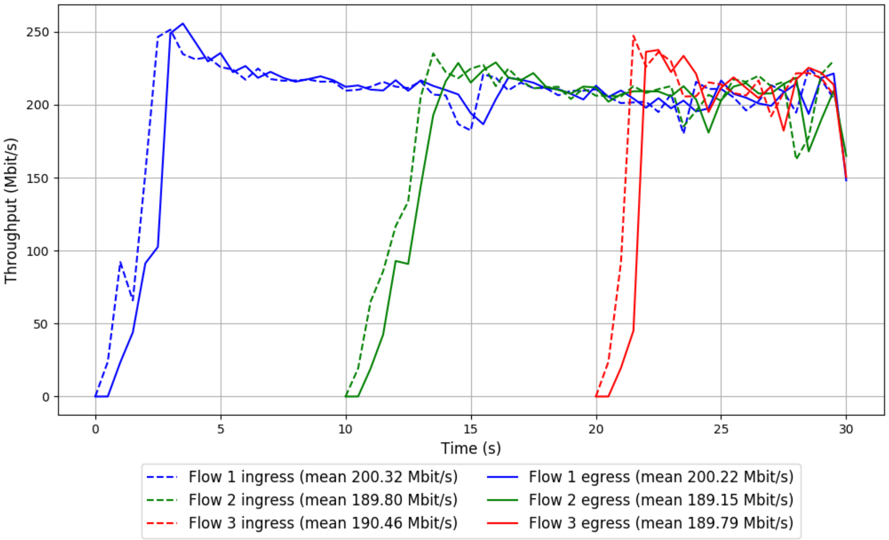
Run 1: Report of TaoVA-100x — Data Link

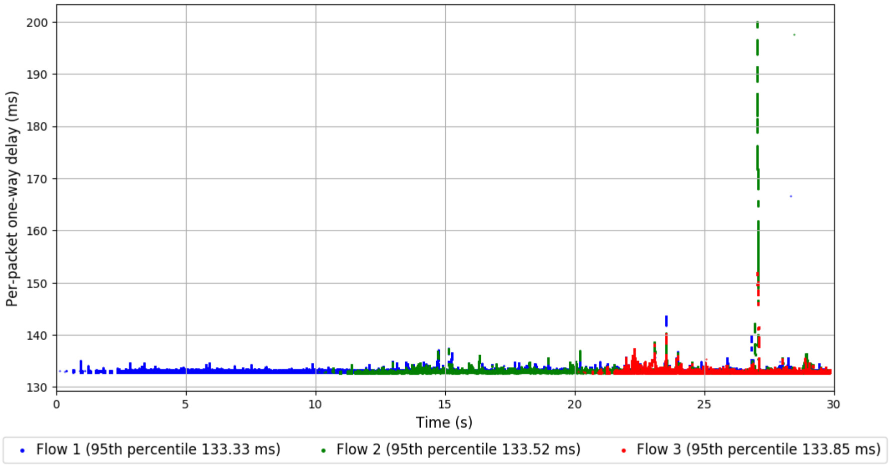




```
Run 2: Statistics of TaoVA-100x

Start at: 2018-11-03 07:11:27
End at: 2018-11-03 07:11:57
Local clock offset: 0.0 ms
Remote clock offset: -0.072 ms

# Below is generated by plot.py at 2018-11-03 11:11:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 387.58 Mbit/s
95th percentile per-packet one-way delay: 133.445 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 200.22 Mbit/s
95th percentile per-packet one-way delay: 133.330 ms
Loss rate: 0.94%
-- Flow 2:
Average throughput: 189.15 Mbit/s
95th percentile per-packet one-way delay: 133.516 ms
Loss rate: 1.67%
-- Flow 3:
Average throughput: 189.79 Mbit/s
95th percentile per-packet one-way delay: 133.847 ms
Loss rate: 3.02%
```

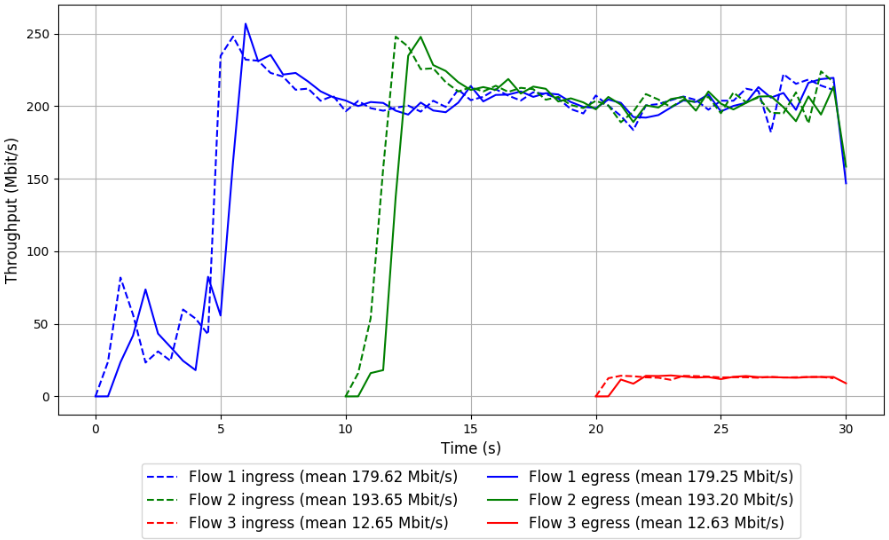
Run 2: Report of TaoVA-100x — Data Link

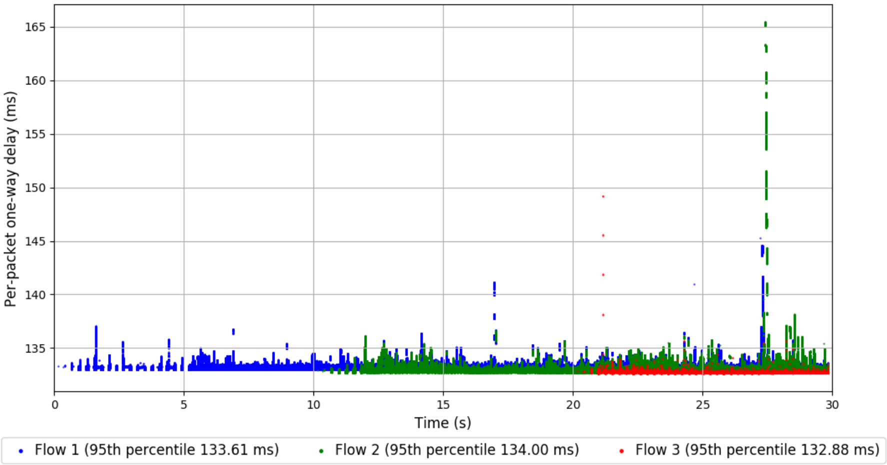




```
Run 3: Statistics of TaoVA-100x

Start at: 2018-11-03 07:45:40
End at: 2018-11-03 07:46:10
Local clock offset: -0.112 ms
Remote clock offset: -0.225 ms

# Below is generated by plot.py at 2018-11-03 11:11:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 311.47 Mbit/s
95th percentile per-packet one-way delay: 133.750 ms
Loss rate: 1.31%
-- Flow 1:
Average throughput: 179.25 Mbit/s
95th percentile per-packet one-way delay: 133.608 ms
Loss rate: 1.10%
-- Flow 2:
Average throughput: 193.20 Mbit/s
95th percentile per-packet one-way delay: 134.003 ms
Loss rate: 1.57%
-- Flow 3:
Average throughput: 12.63 Mbit/s
95th percentile per-packet one-way delay: 132.877 ms
Loss rate: 2.80%
```

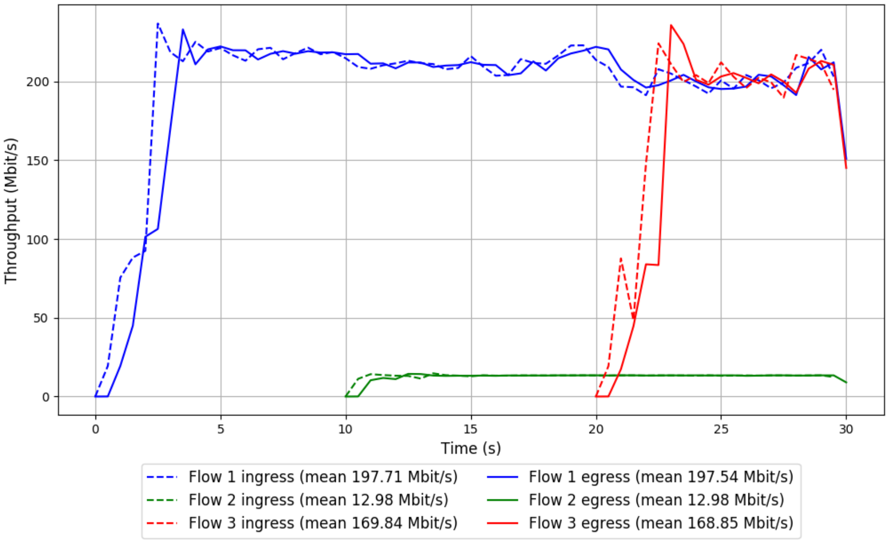
Run 3: Report of TaoVA-100x — Data Link

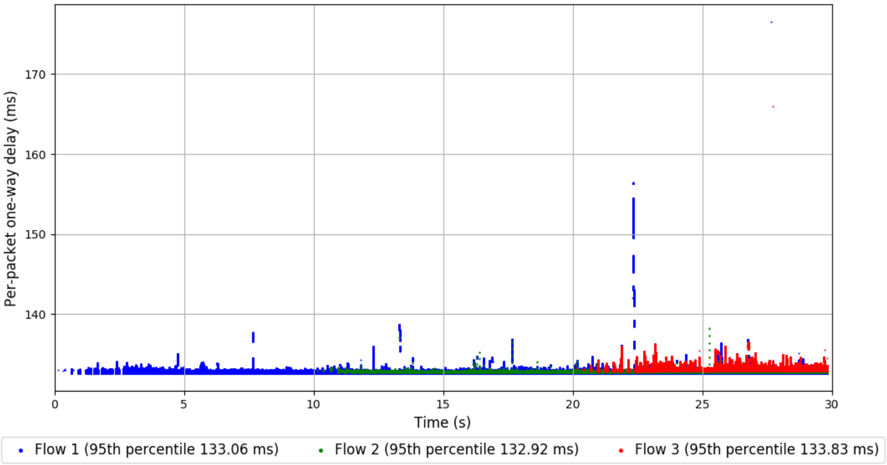




```
Run 4: Statistics of TaoVA-100x

Start at: 2018-11-03 08:19:45
End at: 2018-11-03 08:20:15
Local clock offset: -0.372 ms
Remote clock offset: -0.087 ms

# Below is generated by plot.py at 2018-11-03 11:11:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 261.17 Mbit/s
95th percentile per-packet one-way delay: 133.350 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 197.54 Mbit/s
95th percentile per-packet one-way delay: 133.064 ms
Loss rate: 0.98%
-- Flow 2:
Average throughput: 12.98 Mbit/s
95th percentile per-packet one-way delay: 132.920 ms
Loss rate: 1.36%
-- Flow 3:
Average throughput: 168.85 Mbit/s
95th percentile per-packet one-way delay: 133.828 ms
Loss rate: 3.23%
```

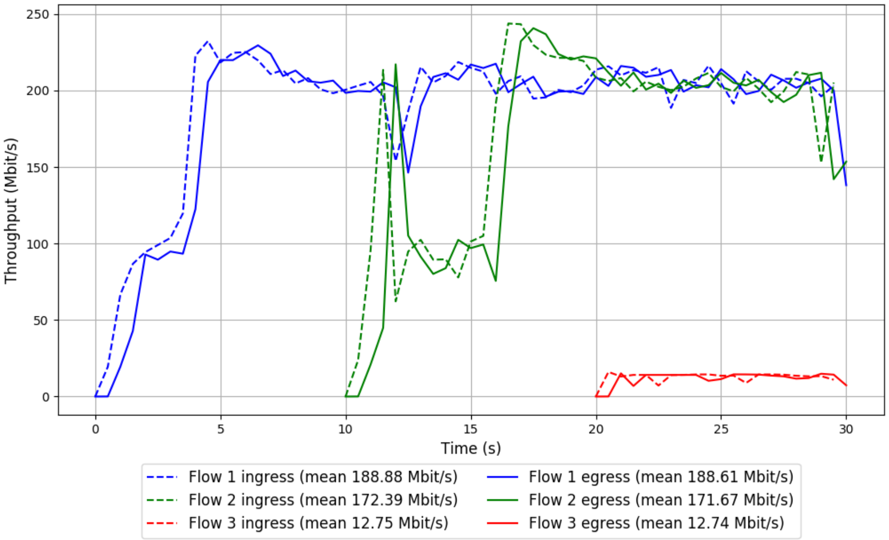
Run 4: Report of TaoVA-100x — Data Link

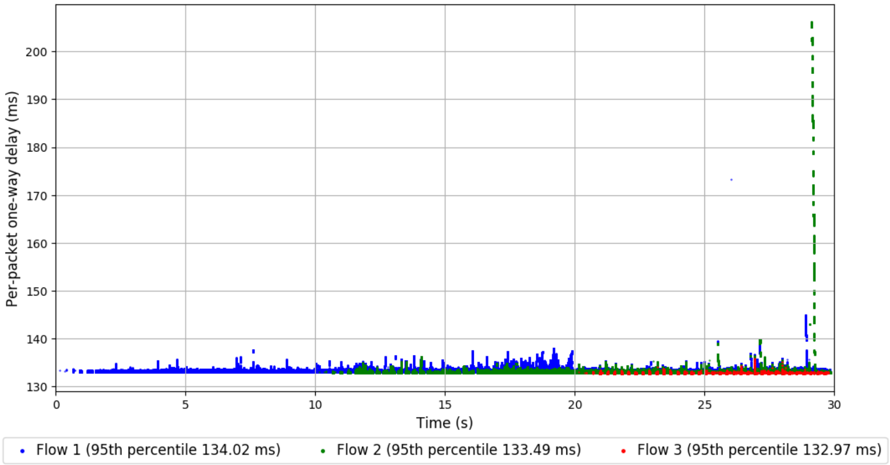




```
Run 5: Statistics of TaoVA-100x

Start at: 2018-11-03 08:52:34
End at: 2018-11-03 08:53:04
Local clock offset: -0.125 ms
Remote clock offset: -0.012 ms

# Below is generated by plot.py at 2018-11-03 11:11:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 306.57 Mbit/s
95th percentile per-packet one-way delay: 133.854 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 188.61 Mbit/s
95th percentile per-packet one-way delay: 134.016 ms
Loss rate: 1.04%
-- Flow 2:
Average throughput: 171.67 Mbit/s
95th percentile per-packet one-way delay: 133.491 ms
Loss rate: 1.73%
-- Flow 3:
Average throughput: 12.74 Mbit/s
95th percentile per-packet one-way delay: 132.967 ms
Loss rate: 2.85%
```

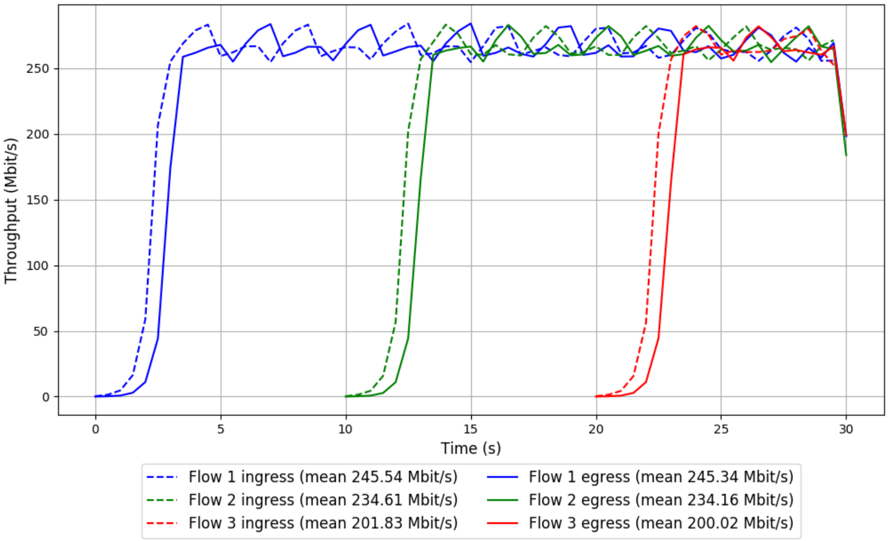
Run 5: Report of TaoVA-100x — Data Link

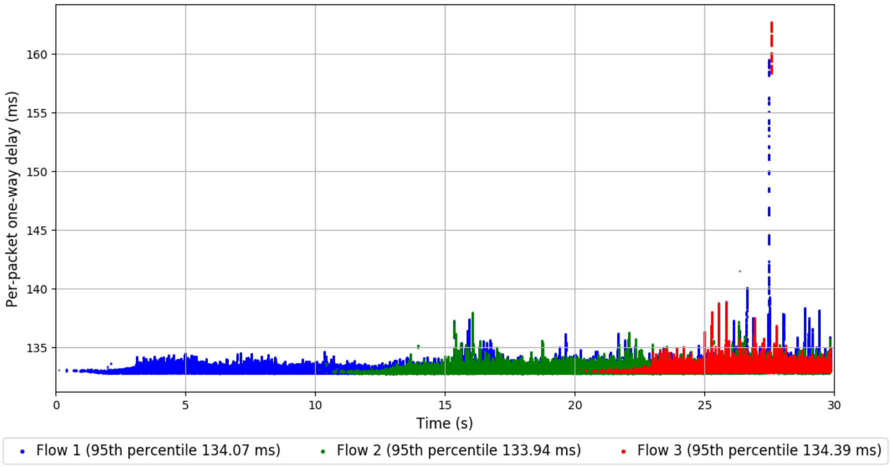




```
Run 1: Statistics of TCP Vegas

Start at: 2018-11-03 07:01:24
End at: 2018-11-03 07:01:54
Local clock offset: 0.007 ms
Remote clock offset: -0.109 ms

# Below is generated by plot.py at 2018-11-03 11:11:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 465.89 Mbit/s
95th percentile per-packet one-way delay: 134.068 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 245.34 Mbit/s
95th percentile per-packet one-way delay: 134.069 ms
Loss rate: 0.97%
-- Flow 2:
Average throughput: 234.16 Mbit/s
95th percentile per-packet one-way delay: 133.943 ms
Loss rate: 1.52%
-- Flow 3:
Average throughput: 200.02 Mbit/s
95th percentile per-packet one-way delay: 134.394 ms
Loss rate: 3.54%
```

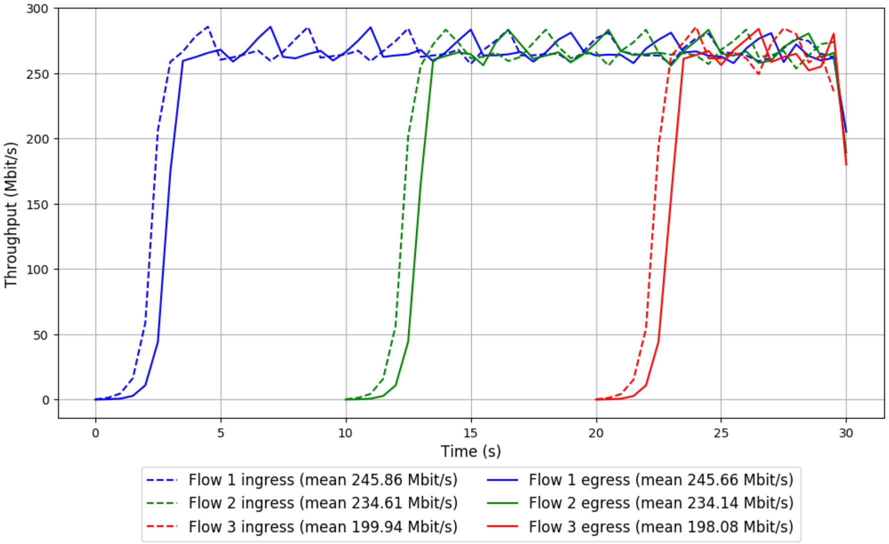
Run 1: Report of TCP Vegas — Data Link

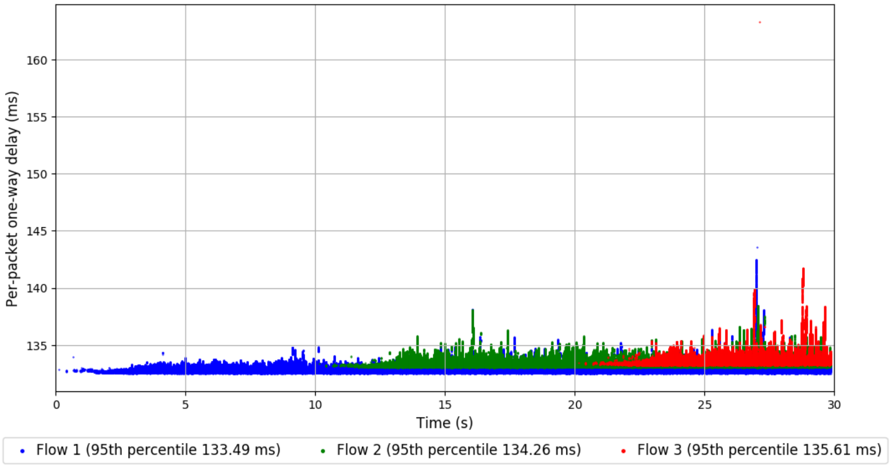




```
Run 2: Statistics of TCP Vegas

Start at: 2018-11-03 07:35:51
End at: 2018-11-03 07:36:21
Local clock offset: 0.114 ms
Remote clock offset: -0.191 ms

# Below is generated by plot.py at 2018-11-03 11:13:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 465.56 Mbit/s
95th percentile per-packet one-way delay: 134.177 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 245.66 Mbit/s
95th percentile per-packet one-way delay: 133.493 ms
Loss rate: 0.97%
-- Flow 2:
Average throughput: 234.14 Mbit/s
95th percentile per-packet one-way delay: 134.264 ms
Loss rate: 1.52%
-- Flow 3:
Average throughput: 198.08 Mbit/s
95th percentile per-packet one-way delay: 135.612 ms
Loss rate: 3.58%
```

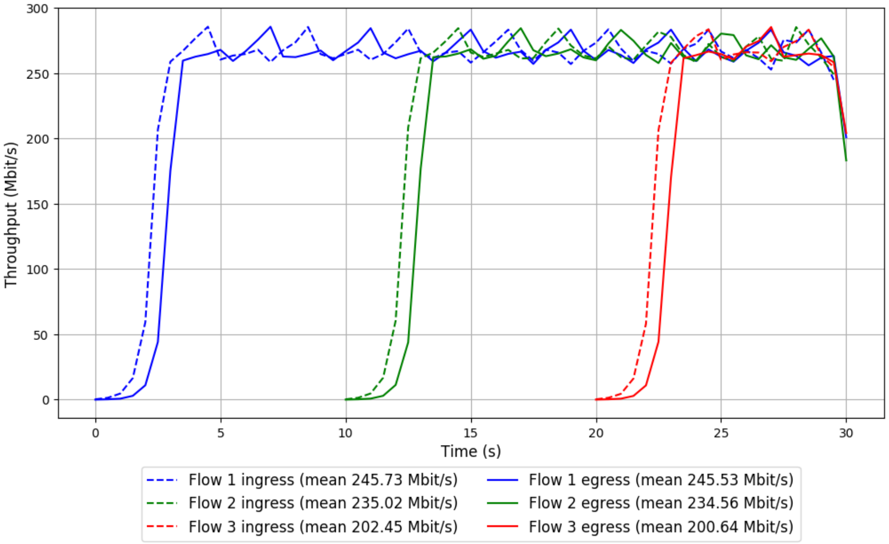
Run 2: Report of TCP Vegas — Data Link

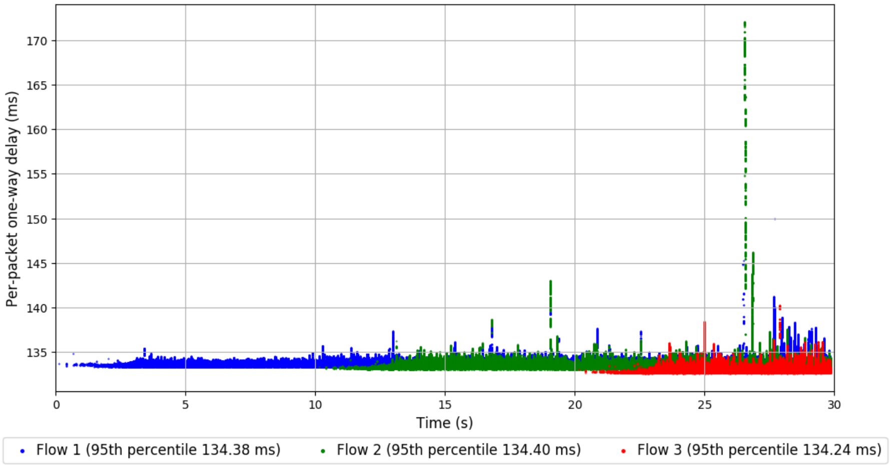




```
Run 3: Statistics of TCP Vegas

Start at: 2018-11-03 08:09:49
End at: 2018-11-03 08:10:19
Local clock offset: 0.114 ms
Remote clock offset: -0.054 ms

# Below is generated by plot.py at 2018-11-03 11:14:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 466.65 Mbit/s
95th percentile per-packet one-way delay: 134.373 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 245.53 Mbit/s
95th percentile per-packet one-way delay: 134.380 ms
Loss rate: 0.97%
-- Flow 2:
Average throughput: 234.56 Mbit/s
95th percentile per-packet one-way delay: 134.399 ms
Loss rate: 1.52%
-- Flow 3:
Average throughput: 200.64 Mbit/s
95th percentile per-packet one-way delay: 134.244 ms
Loss rate: 3.54%
```

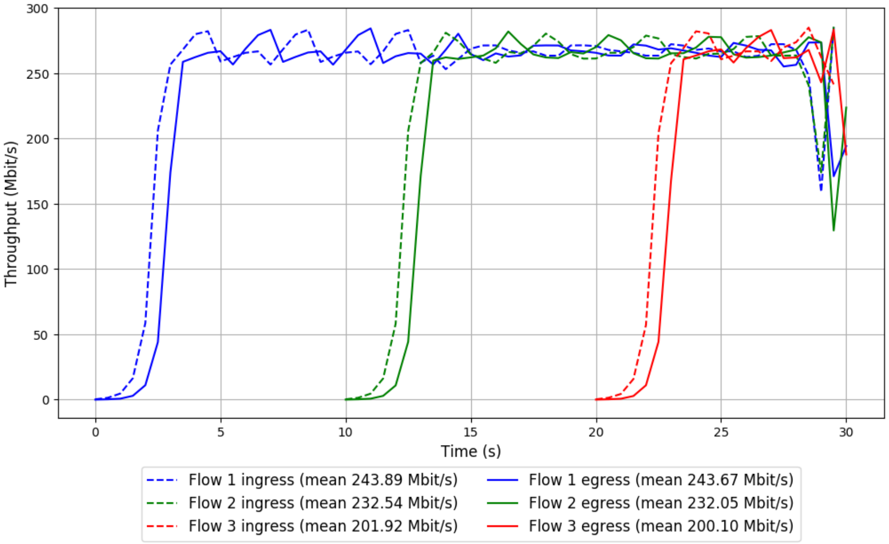
Run 3: Report of TCP Vegas — Data Link

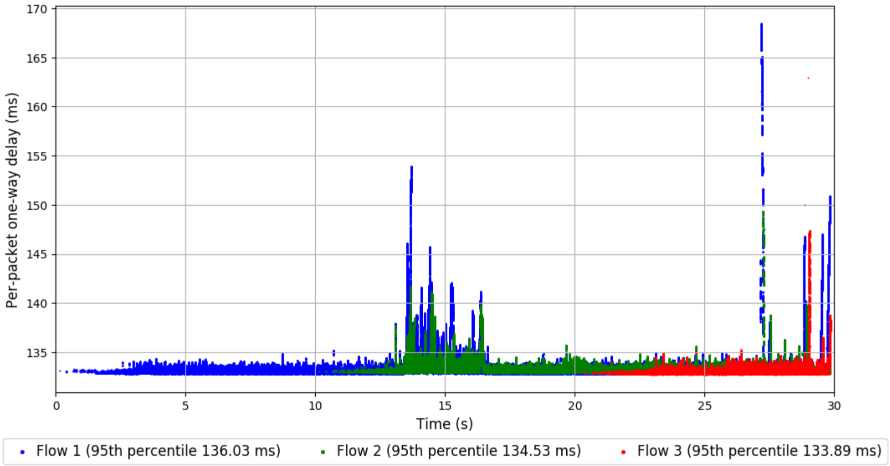




```
Run 4: Statistics of TCP Vegas

Start at: 2018-11-03 08:42:54
End at: 2018-11-03 08:43:24
Local clock offset: -0.139 ms
Remote clock offset: -0.022 ms

# Below is generated by plot.py at 2018-11-03 11:16:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 462.71 Mbit/s
95th percentile per-packet one-way delay: 134.991 ms
Loss rate: 1.53%
-- Flow 1:
Average throughput: 243.67 Mbit/s
95th percentile per-packet one-way delay: 136.025 ms
Loss rate: 0.98%
-- Flow 2:
Average throughput: 232.05 Mbit/s
95th percentile per-packet one-way delay: 134.533 ms
Loss rate: 1.54%
-- Flow 3:
Average throughput: 200.10 Mbit/s
95th percentile per-packet one-way delay: 133.893 ms
Loss rate: 3.53%
```

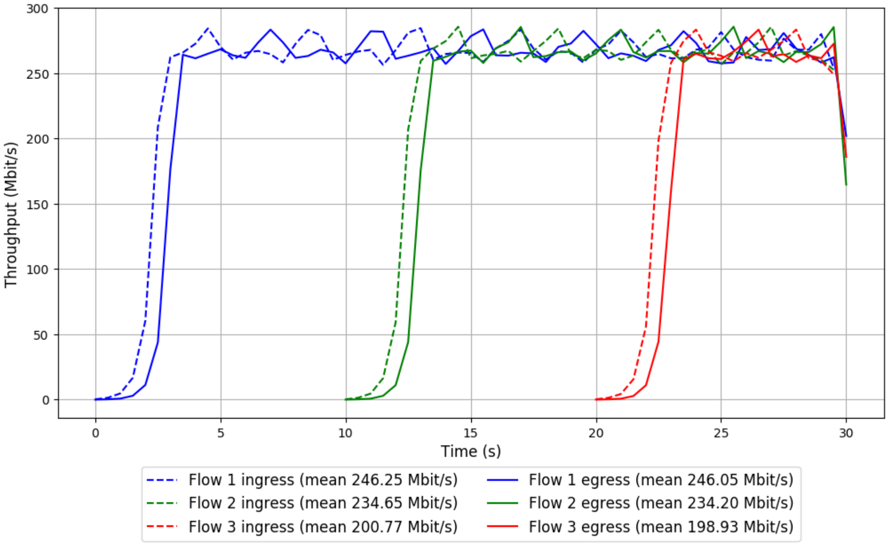
Run 4: Report of TCP Vegas — Data Link

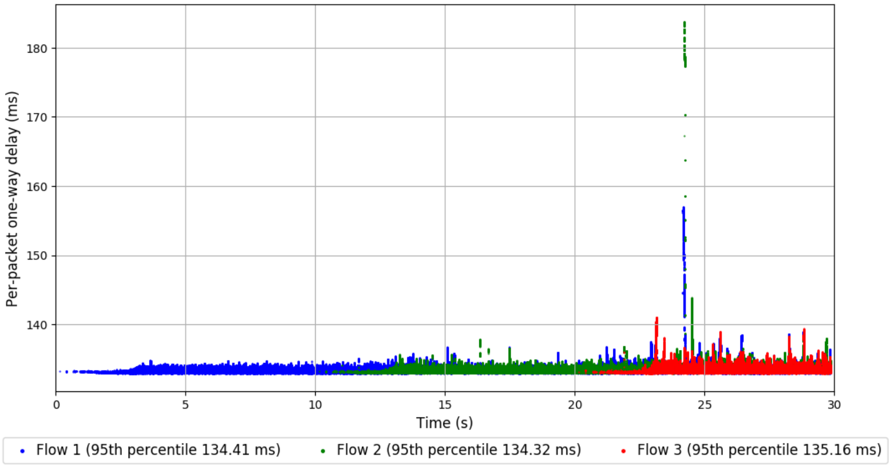




```
Run 5: Statistics of TCP Vegas

Start at: 2018-11-03 09:15:46
End at: 2018-11-03 09:16:16
Local clock offset: 0.051 ms
Remote clock offset: -0.034 ms

# Below is generated by plot.py at 2018-11-03 11:16:52
# Datalink statistics
-- Total of 3 flows:
Average throughput: 466.34 Mbit/s
95th percentile per-packet one-way delay: 134.508 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 246.05 Mbit/s
95th percentile per-packet one-way delay: 134.409 ms
Loss rate: 0.96%
-- Flow 2:
Average throughput: 234.20 Mbit/s
95th percentile per-packet one-way delay: 134.320 ms
Loss rate: 1.52%
-- Flow 3:
Average throughput: 198.93 Mbit/s
95th percentile per-packet one-way delay: 135.155 ms
Loss rate: 3.56%
```

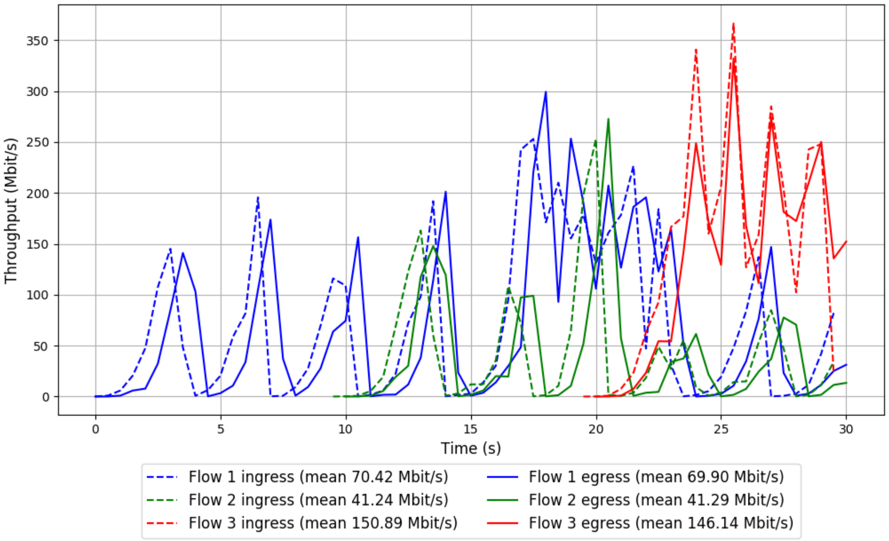
Run 5: Report of TCP Vegas — Data Link

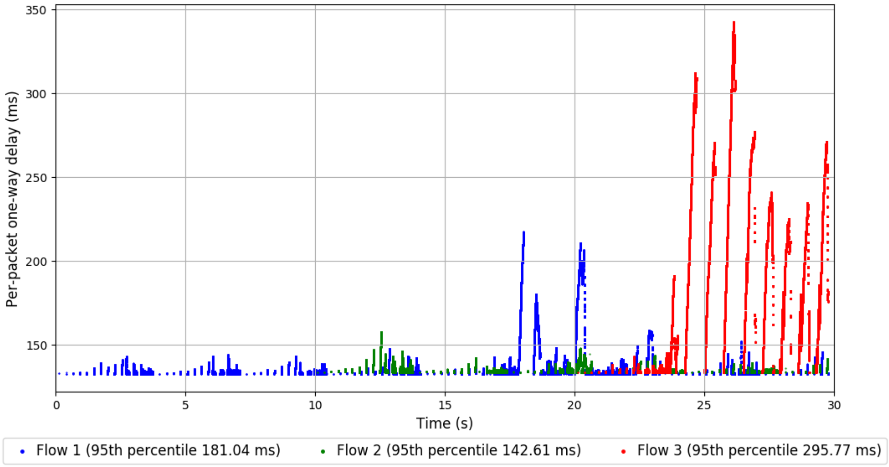




```
Run 1: Statistics of Verus

Start at: 2018-11-03 07:04:45
End at: 2018-11-03 07:05:15
Local clock offset: 0.381 ms
Remote clock offset: -0.114 ms

# Below is generated by plot.py at 2018-11-03 11:16:52
# Datalink statistics
-- Total of 3 flows:
Average throughput: 144.80 Mbit/s
95th percentile per-packet one-way delay: 259.424 ms
Loss rate: 2.98%
-- Flow 1:
Average throughput: 69.90 Mbit/s
95th percentile per-packet one-way delay: 181.040 ms
Loss rate: 1.61%
-- Flow 2:
Average throughput: 41.29 Mbit/s
95th percentile per-packet one-way delay: 142.609 ms
Loss rate: 1.26%
-- Flow 3:
Average throughput: 146.14 Mbit/s
95th percentile per-packet one-way delay: 295.772 ms
Loss rate: 5.87%
```

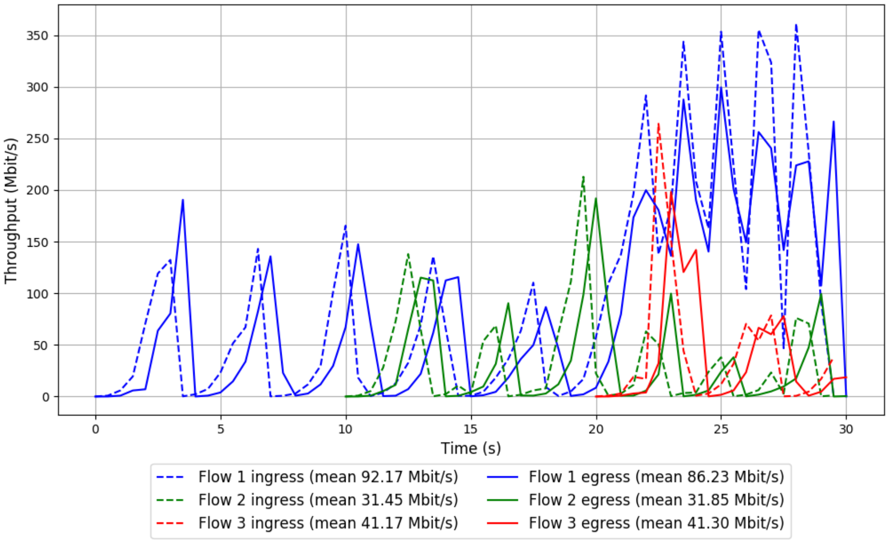
Run 1: Report of Verus — Data Link

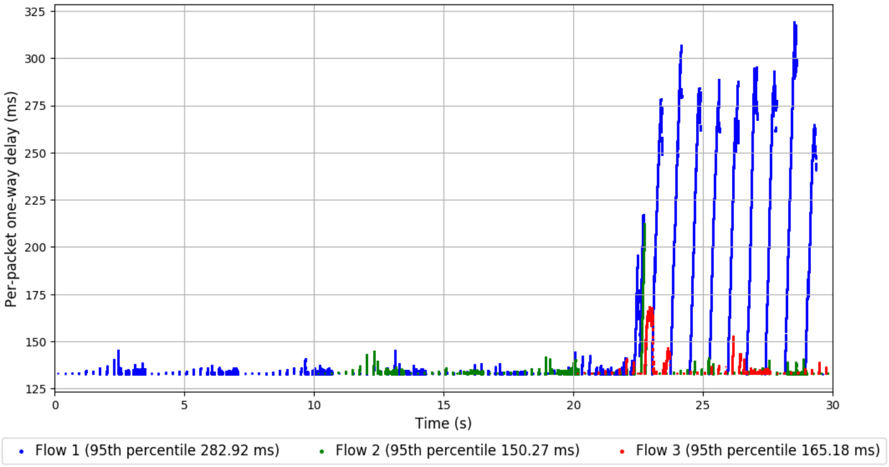




```
Run 2: Statistics of Verus

Start at: 2018-11-03 07:39:03
End at: 2018-11-03 07:39:33
Local clock offset: -0.045 ms
Remote clock offset: -0.215 ms

# Below is generated by plot.py at 2018-11-03 11:16:52
# Datalink statistics
-- Total of 3 flows:
Average throughput: 120.16 Mbit/s
95th percentile per-packet one-way delay: 279.190 ms
Loss rate: 5.56%
-- Flow 1:
Average throughput: 86.23 Mbit/s
95th percentile per-packet one-way delay: 282.919 ms
Loss rate: 7.28%
-- Flow 2:
Average throughput: 31.85 Mbit/s
95th percentile per-packet one-way delay: 150.267 ms
Loss rate: 0.07%
-- Flow 3:
Average throughput: 41.30 Mbit/s
95th percentile per-packet one-way delay: 165.176 ms
Loss rate: 2.41%
```

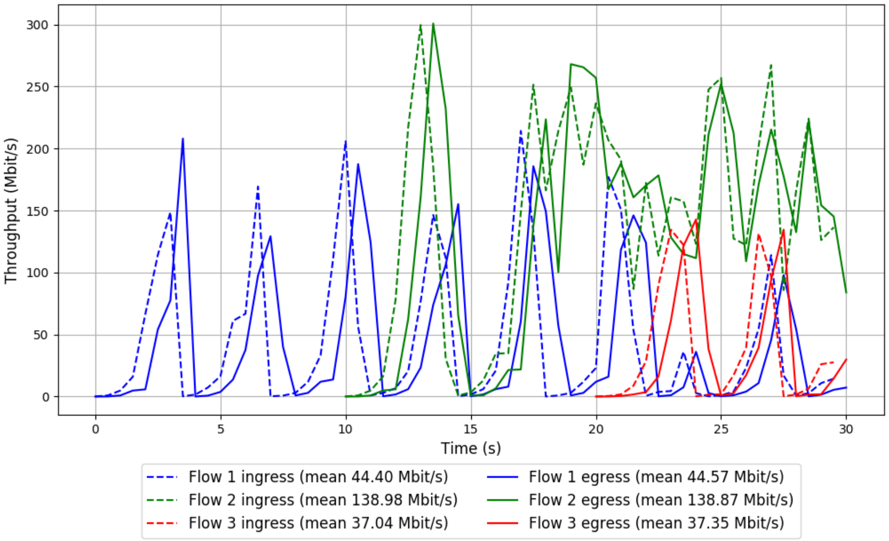
Run 2: Report of Verus — Data Link

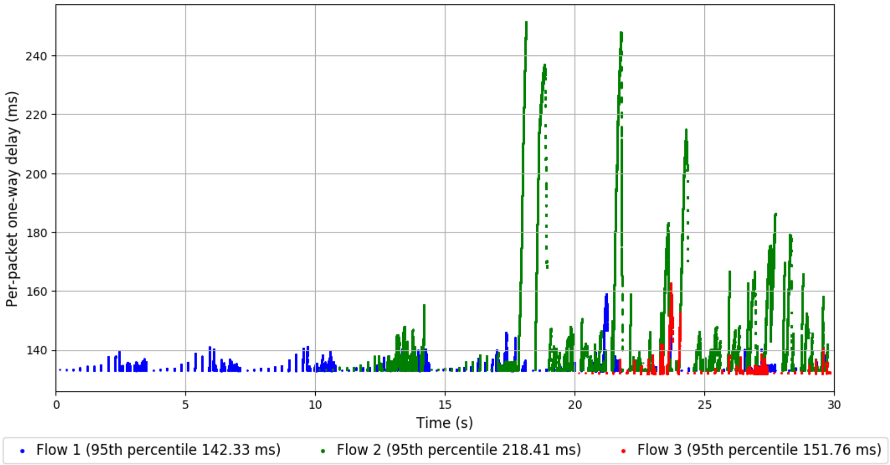




```
Run 3: Statistics of Verus

Start at: 2018-11-03 08:13:00
End at: 2018-11-03 08:13:30
Local clock offset: -0.202 ms
Remote clock offset: -0.064 ms

# Below is generated by plot.py at 2018-11-03 11:16:52
# Datalink statistics
-- Total of 3 flows:
Average throughput: 148.08 Mbit/s
95th percentile per-packet one-way delay: 202.197 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 44.57 Mbit/s
95th percentile per-packet one-way delay: 142.333 ms
Loss rate: 0.55%
-- Flow 2:
Average throughput: 138.87 Mbit/s
95th percentile per-packet one-way delay: 218.414 ms
Loss rate: 1.86%
-- Flow 3:
Average throughput: 37.35 Mbit/s
95th percentile per-packet one-way delay: 151.760 ms
Loss rate: 1.88%
```

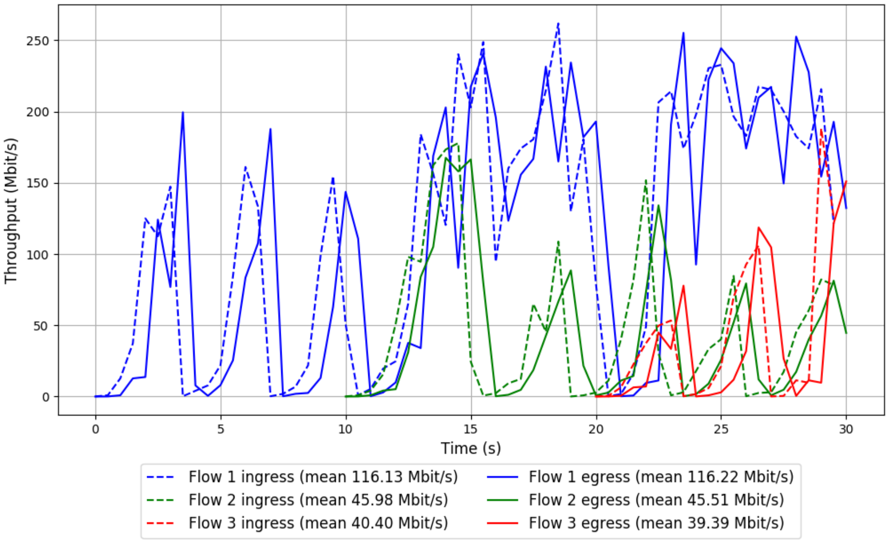
Run 3: Report of Verus — Data Link

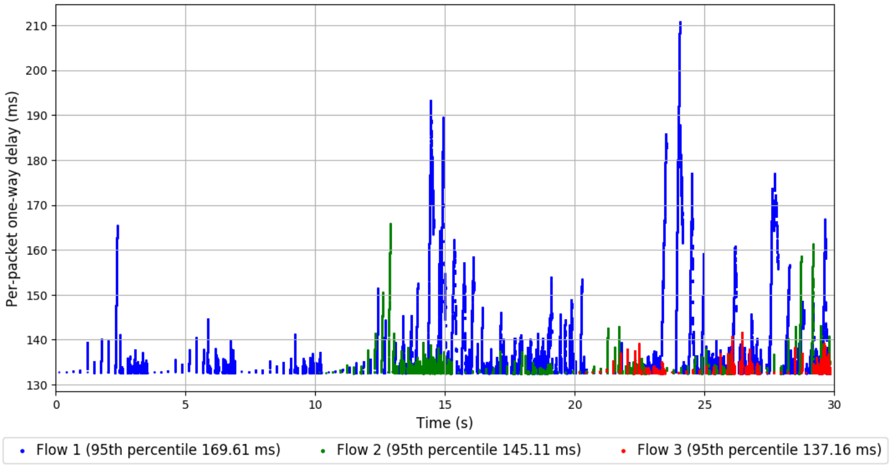




```
Run 4: Statistics of Verus

Start at: 2018-11-03 08:46:03
End at: 2018-11-03 08:46:33
Local clock offset: -0.4 ms
Remote clock offset: -0.047 ms

# Below is generated by plot.py at 2018-11-03 11:18:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 159.21 Mbit/s
95th percentile per-packet one-way delay: 165.495 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 116.22 Mbit/s
95th percentile per-packet one-way delay: 169.612 ms
Loss rate: 0.82%
-- Flow 2:
Average throughput: 45.51 Mbit/s
95th percentile per-packet one-way delay: 145.107 ms
Loss rate: 2.36%
-- Flow 3:
Average throughput: 39.39 Mbit/s
95th percentile per-packet one-way delay: 137.156 ms
Loss rate: 5.12%
```

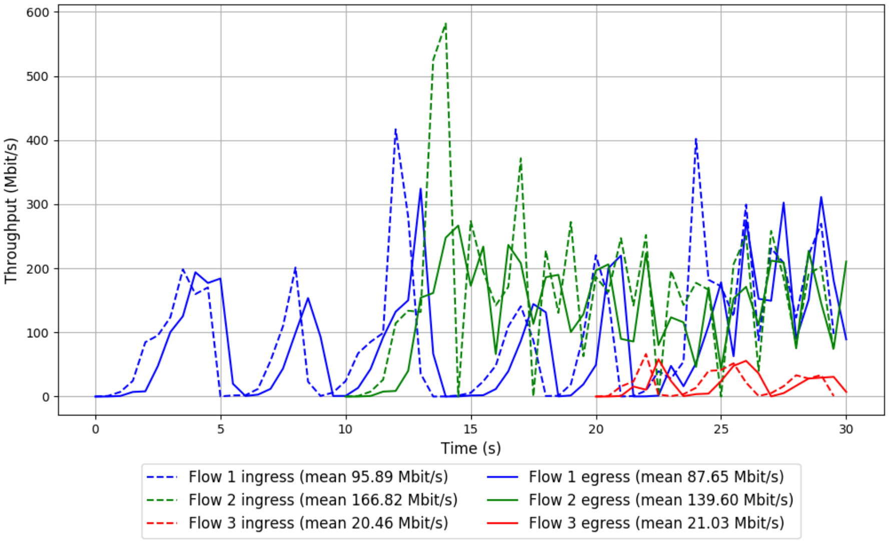
Run 4: Report of Verus — Data Link

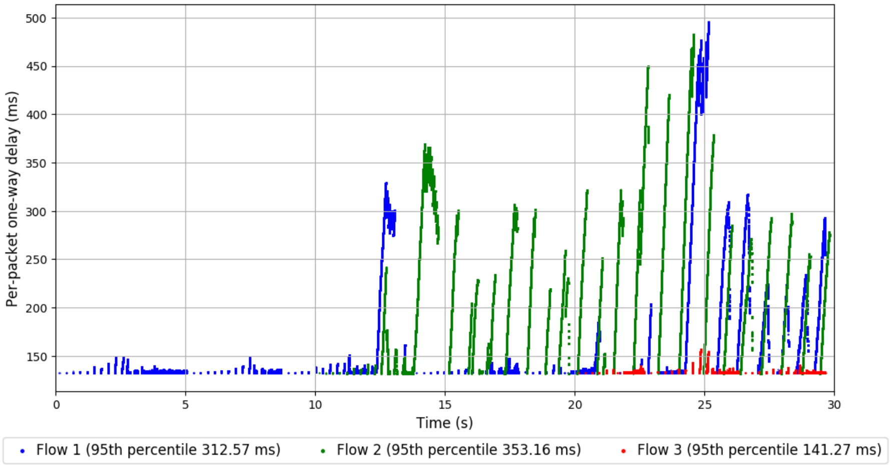




```
Run 5: Statistics of Verus

Start at: 2018-11-03 09:19:04
End at: 2018-11-03 09:19:34
Local clock offset: -0.155 ms
Remote clock offset: -0.031 ms

# Below is generated by plot.py at 2018-11-03 11:20:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 186.45 Mbit/s
95th percentile per-packet one-way delay: 344.774 ms
Loss rate: 12.66%
-- Flow 1:
Average throughput: 87.65 Mbit/s
95th percentile per-packet one-way delay: 312.573 ms
Loss rate: 9.96%
-- Flow 2:
Average throughput: 139.60 Mbit/s
95th percentile per-packet one-way delay: 353.163 ms
Loss rate: 15.81%
-- Flow 3:
Average throughput: 21.03 Mbit/s
95th percentile per-packet one-way delay: 141.270 ms
Loss rate: 0.01%
```

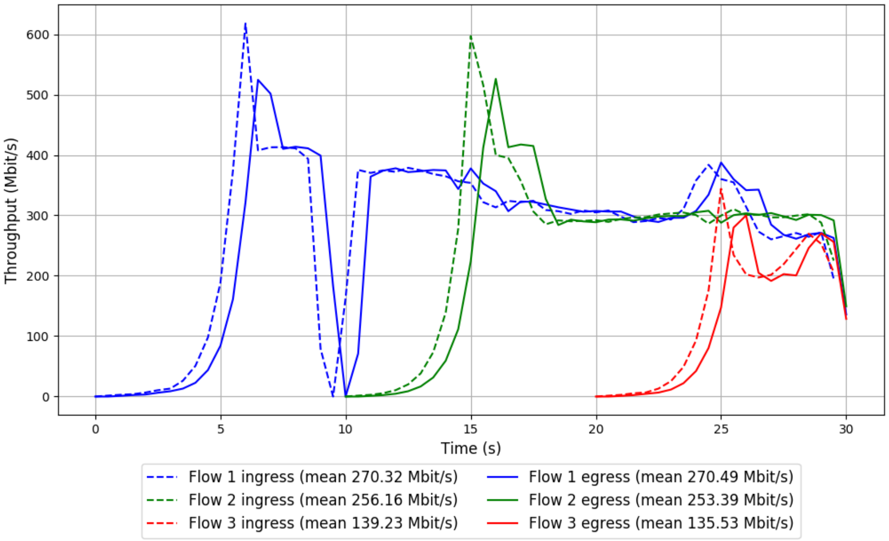
Run 5: Report of Verus — Data Link

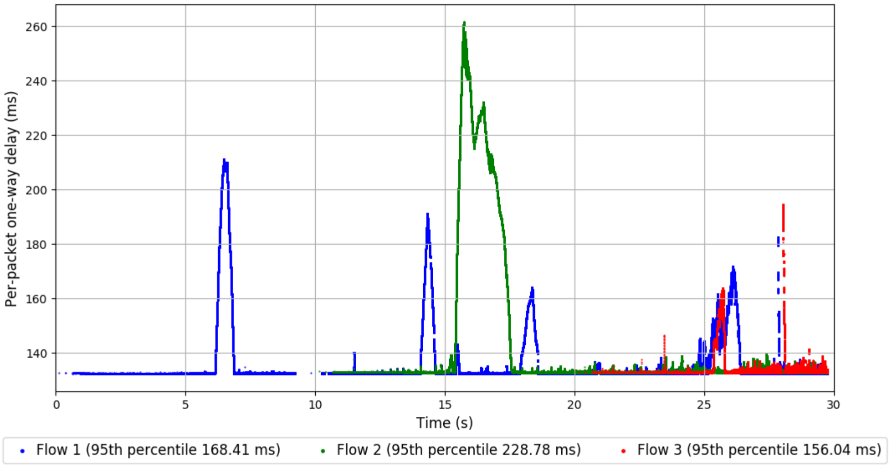




```
Run 1: Statistics of PCC-Vivace

Start at: 2018-11-03 06:44:54
End at: 2018-11-03 06:45:24
Local clock offset: 0.001 ms
Remote clock offset: -0.019 ms

# Below is generated by plot.py at 2018-11-03 11:21:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 482.10 Mbit/s
95th percentile per-packet one-way delay: 205.971 ms
Loss rate: 1.81%
-- Flow 1:
Average throughput: 270.49 Mbit/s
95th percentile per-packet one-way delay: 168.408 ms
Loss rate: 0.83%
-- Flow 2:
Average throughput: 253.39 Mbit/s
95th percentile per-packet one-way delay: 228.780 ms
Loss rate: 2.42%
-- Flow 3:
Average throughput: 135.53 Mbit/s
95th percentile per-packet one-way delay: 156.036 ms
Loss rate: 5.33%
```

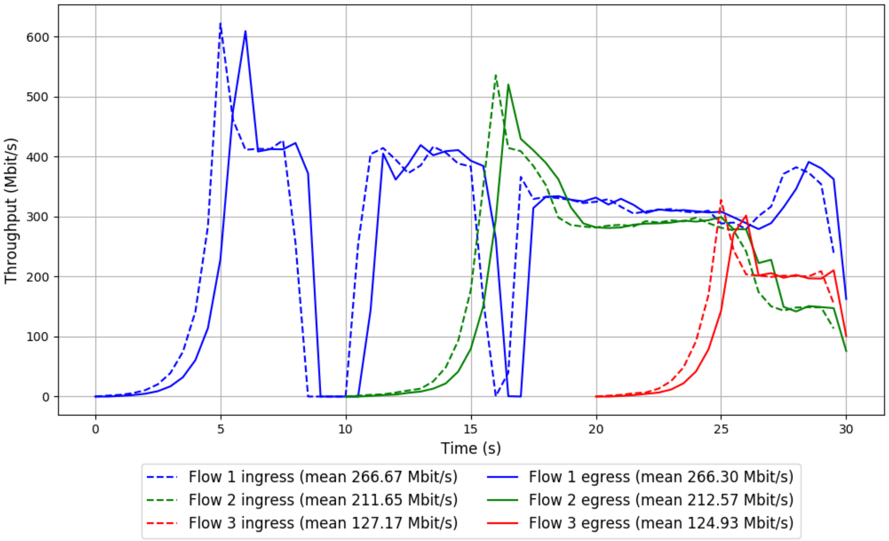
Run 1: Report of PCC-Vivace — Data Link

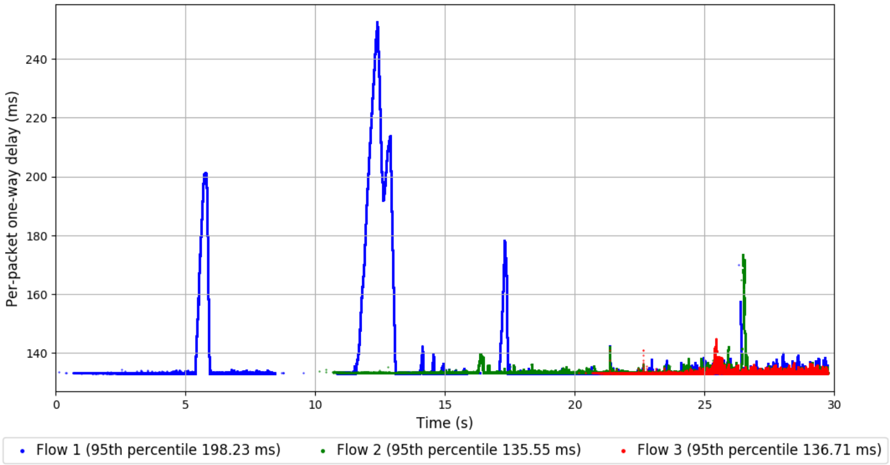




```
Run 2: Statistics of PCC-Vivace

Start at: 2018-11-03 07:18:33
End at: 2018-11-03 07:19:03
Local clock offset: -0.008 ms
Remote clock offset: -0.187 ms

# Below is generated by plot.py at 2018-11-03 11:21:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 447.52 Mbit/s
95th percentile per-packet one-way delay: 171.702 ms
Loss rate: 1.31%
-- Flow 1:
Average throughput: 266.30 Mbit/s
95th percentile per-packet one-way delay: 198.233 ms
Loss rate: 1.03%
-- Flow 2:
Average throughput: 212.57 Mbit/s
95th percentile per-packet one-way delay: 135.550 ms
Loss rate: 0.92%
-- Flow 3:
Average throughput: 124.93 Mbit/s
95th percentile per-packet one-way delay: 136.709 ms
Loss rate: 4.42%
```

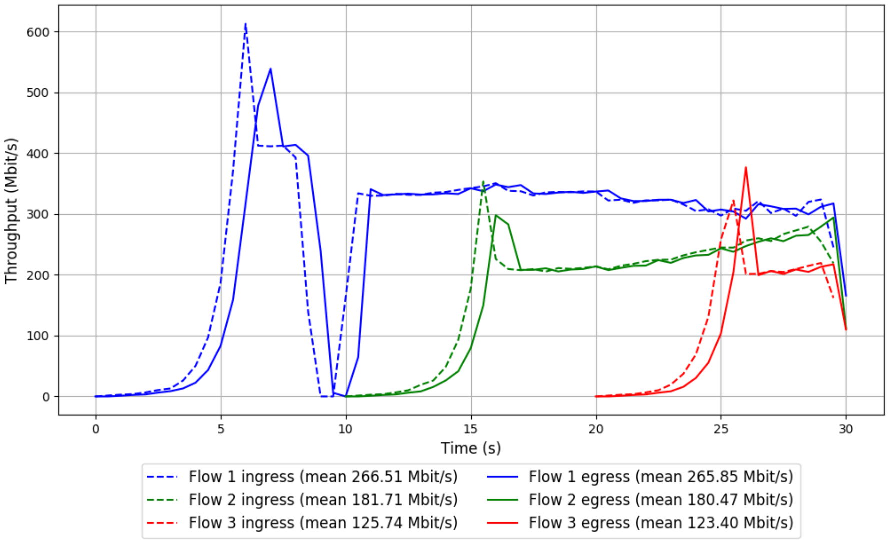
Run 2: Report of PCC-Vivace — Data Link

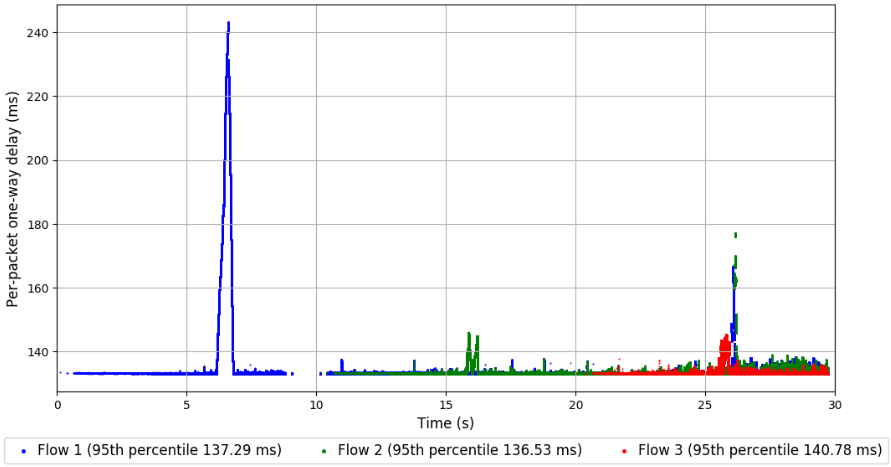




```
Run 3: Statistics of PCC-Vivace

Start at: 2018-11-03 07:52:27
End at: 2018-11-03 07:52:57
Local clock offset: 0.145 ms
Remote clock offset: -0.11 ms

# Below is generated by plot.py at 2018-11-03 11:21:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 425.28 Mbit/s
95th percentile per-packet one-way delay: 137.579 ms
Loss rate: 1.72%
-- Flow 1:
Average throughput: 265.85 Mbit/s
95th percentile per-packet one-way delay: 137.294 ms
Loss rate: 1.14%
-- Flow 2:
Average throughput: 180.47 Mbit/s
95th percentile per-packet one-way delay: 136.527 ms
Loss rate: 2.03%
-- Flow 3:
Average throughput: 123.40 Mbit/s
95th percentile per-packet one-way delay: 140.784 ms
Loss rate: 4.52%
```

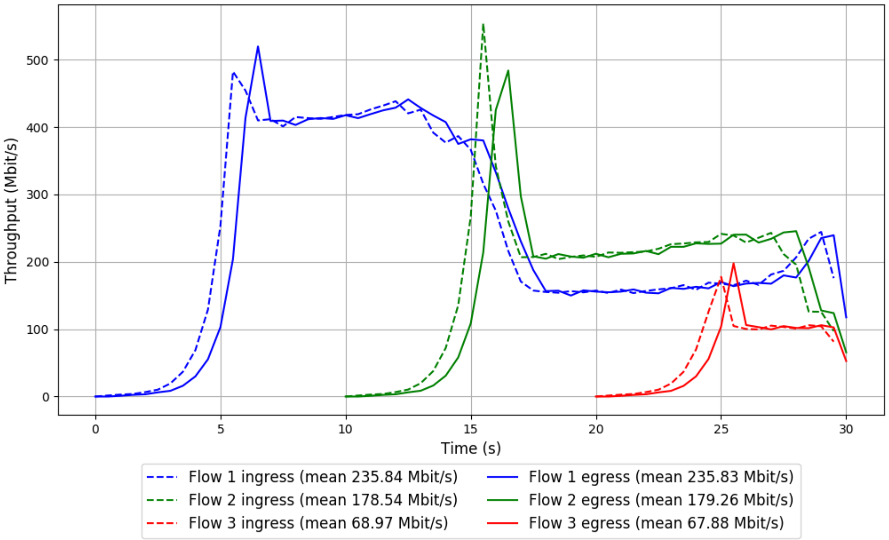
Run 3: Report of PCC-Vivace — Data Link

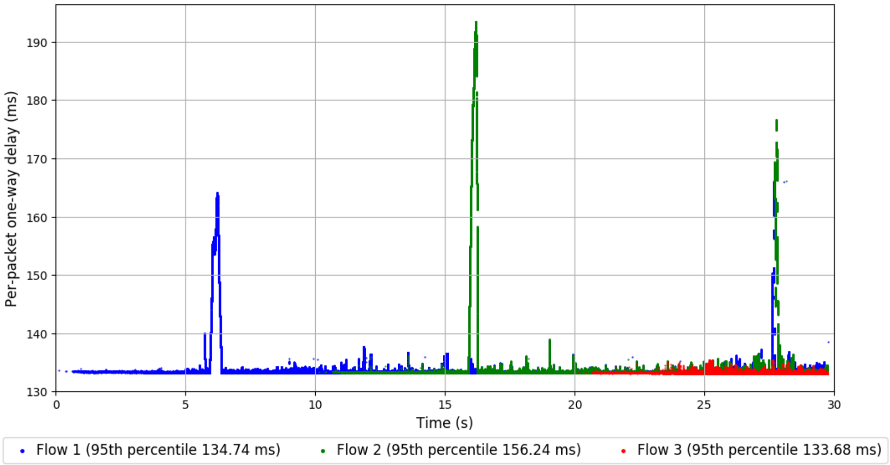




```
Run 4: Statistics of PCC-Vivace

Start at: 2018-11-03 08:26:23
End at: 2018-11-03 08:26:53
Local clock offset: 0.238 ms
Remote clock offset: -0.048 ms

# Below is generated by plot.py at 2018-11-03 11:21:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 376.48 Mbit/s
95th percentile per-packet one-way delay: 135.610 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 235.83 Mbit/s
95th percentile per-packet one-way delay: 134.741 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 179.26 Mbit/s
95th percentile per-packet one-way delay: 156.238 ms
Loss rate: 0.94%
-- Flow 3:
Average throughput: 67.88 Mbit/s
95th percentile per-packet one-way delay: 133.676 ms
Loss rate: 4.24%
```

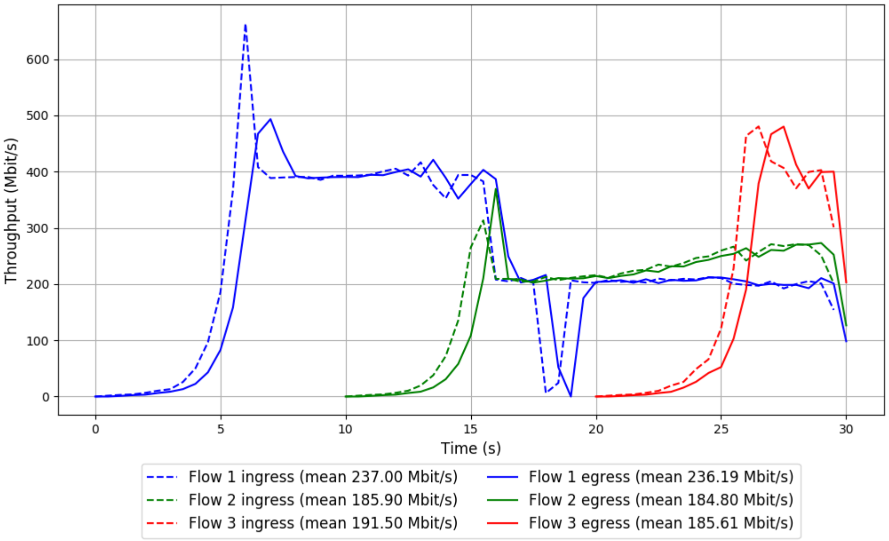
Run 4: Report of PCC-Vivace — Data Link

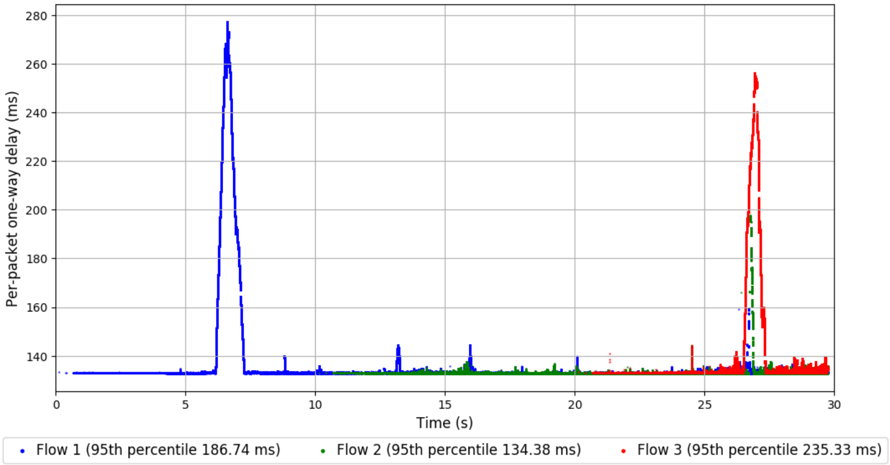




```
Run 5: Statistics of PCC-Vivace

Start at: 2018-11-03 08:58:59
End at: 2018-11-03 08:59:29
Local clock offset: -0.088 ms
Remote clock offset: 0.001 ms

# Below is generated by plot.py at 2018-11-03 11:22:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 418.65 Mbit/s
95th percentile per-packet one-way delay: 186.112 ms
Loss rate: 2.11%
-- Flow 1:
Average throughput: 236.19 Mbit/s
95th percentile per-packet one-way delay: 186.741 ms
Loss rate: 1.24%
-- Flow 2:
Average throughput: 184.80 Mbit/s
95th percentile per-packet one-way delay: 134.380 ms
Loss rate: 1.94%
-- Flow 3:
Average throughput: 185.61 Mbit/s
95th percentile per-packet one-way delay: 235.328 ms
Loss rate: 5.71%
```

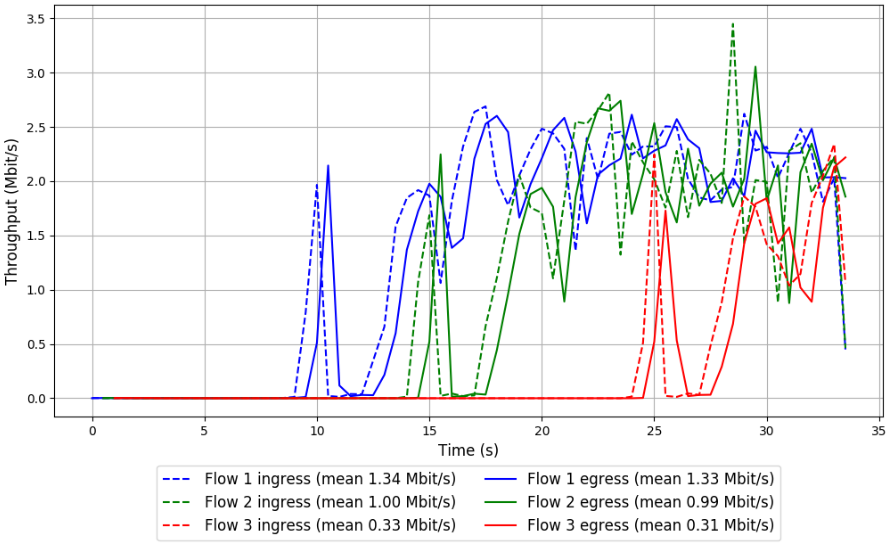
Run 5: Report of PCC-Vivace — Data Link

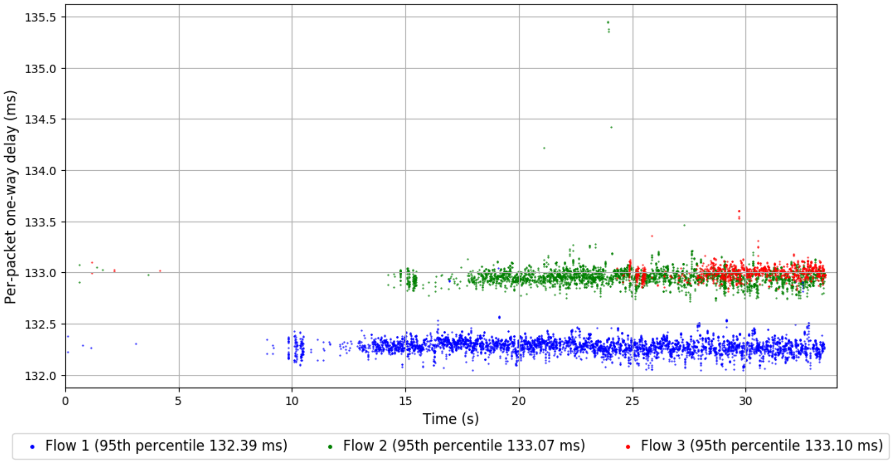




```
Run 1: Statistics of WebRTC media

Start at: 2018-11-03 07:03:25
End at: 2018-11-03 07:03:55
Local clock offset: -0.022 ms
Remote clock offset: -0.153 ms

# Below is generated by plot.py at 2018-11-03 11:22:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.60 Mbit/s
95th percentile per-packet one-way delay: 133.050 ms
Loss rate: 2.14%
-- Flow 1:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 132.389 ms
Loss rate: 1.01%
-- Flow 2:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 133.069 ms
Loss rate: 1.96%
-- Flow 3:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 133.102 ms
Loss rate: 7.39%
```

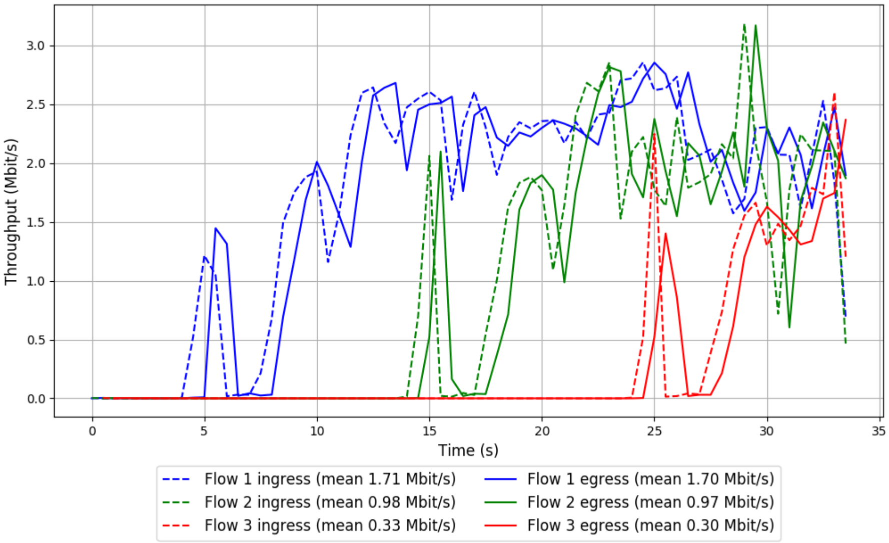
Run 1: Report of WebRTC media — Data Link

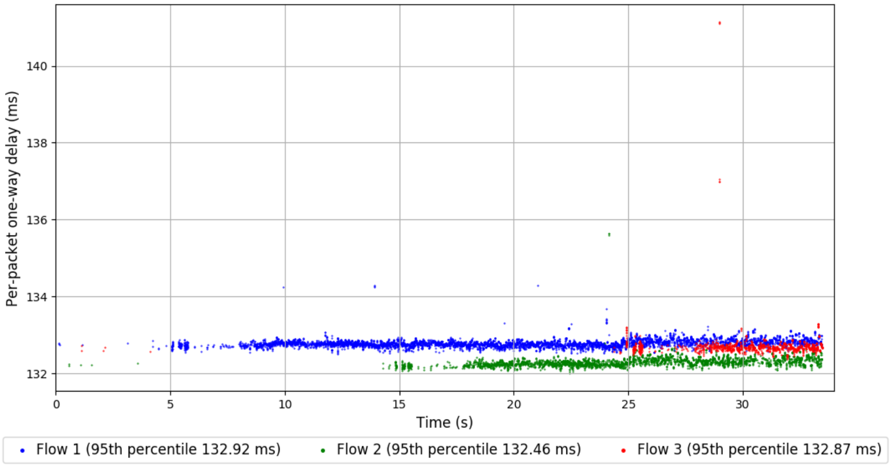




```
Run 2: Statistics of WebRTC media

Start at: 2018-11-03 07:37:44
End at: 2018-11-03 07:38:14
Local clock offset: -0.482 ms
Remote clock offset: -0.245 ms

# Below is generated by plot.py at 2018-11-03 11:22:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.95 Mbit/s
95th percentile per-packet one-way delay: 132.896 ms
Loss rate: 2.14%
-- Flow 1:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 132.924 ms
Loss rate: 1.00%
-- Flow 2:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 132.458 ms
Loss rate: 1.80%
-- Flow 3:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 132.870 ms
Loss rate: 9.25%
```

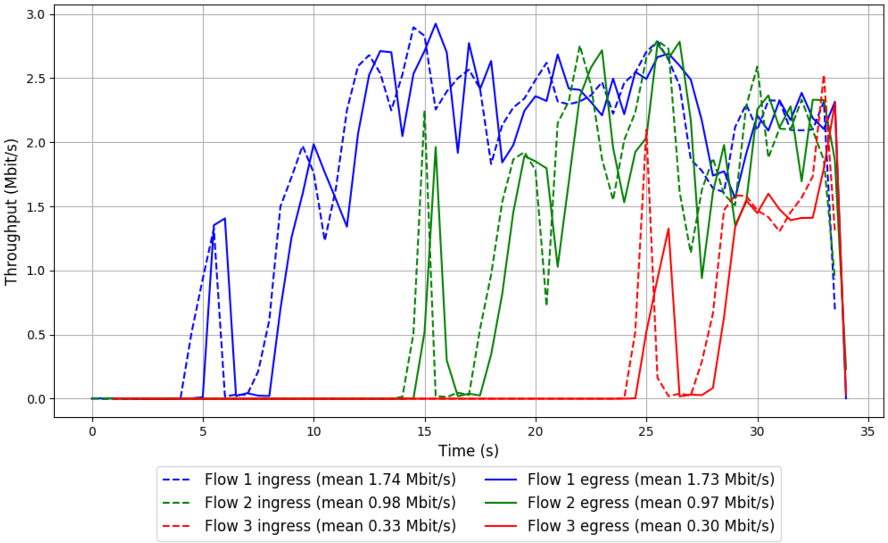
Run 2: Report of WebRTC media — Data Link

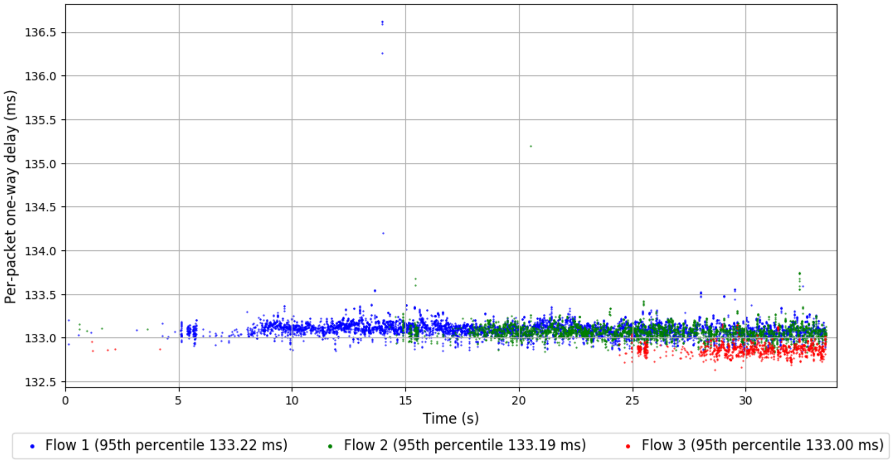




```
Run 3: Statistics of WebRTC media

Start at: 2018-11-03 08:11:41
End at: 2018-11-03 08:12:11
Local clock offset: -0.402 ms
Remote clock offset: -0.069 ms

# Below is generated by plot.py at 2018-11-03 11:22:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.98 Mbit/s
95th percentile per-packet one-way delay: 133.203 ms
Loss rate: 2.07%
-- Flow 1:
Average throughput: 1.73 Mbit/s
95th percentile per-packet one-way delay: 133.217 ms
Loss rate: 0.99%
-- Flow 2:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 133.193 ms
Loss rate: 1.79%
-- Flow 3:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 132.995 ms
Loss rate: 8.90%
```

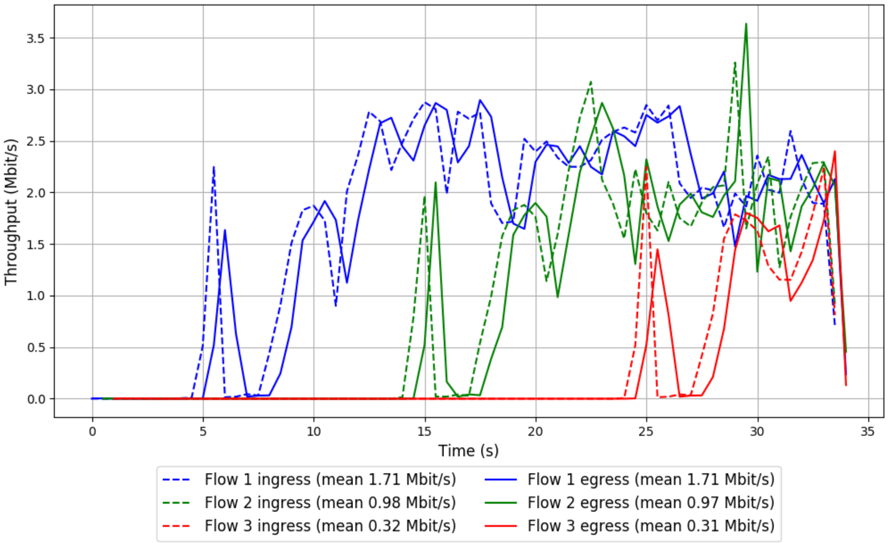
Run 3: Report of WebRTC media — Data Link

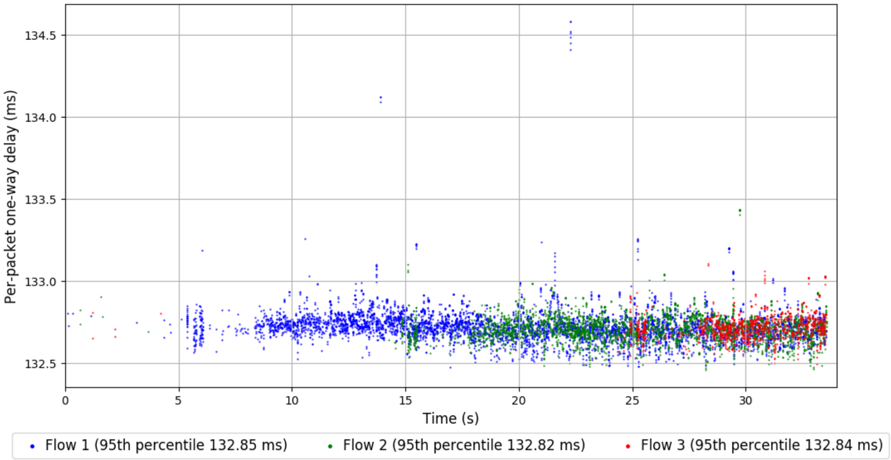




```
Run 4: Statistics of WebRTC media

Start at: 2018-11-03 08:44:44
End at: 2018-11-03 08:45:14
Local clock offset: -0.434 ms
Remote clock offset: -0.065 ms

# Below is generated by plot.py at 2018-11-03 11:22:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.96 Mbit/s
95th percentile per-packet one-way delay: 132.842 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 132.853 ms
Loss rate: 0.82%
-- Flow 2:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 132.824 ms
Loss rate: 1.76%
-- Flow 3:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 132.841 ms
Loss rate: 4.54%
```

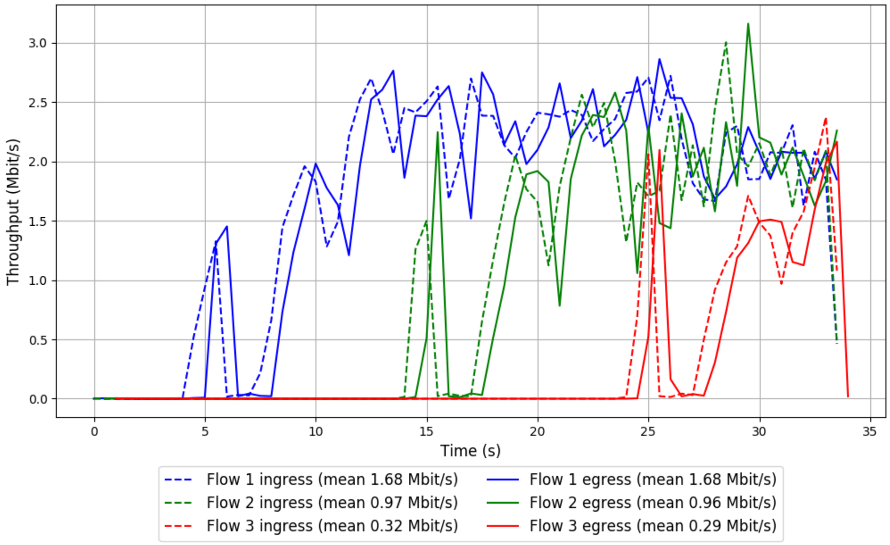
Run 4: Report of WebRTC media — Data Link



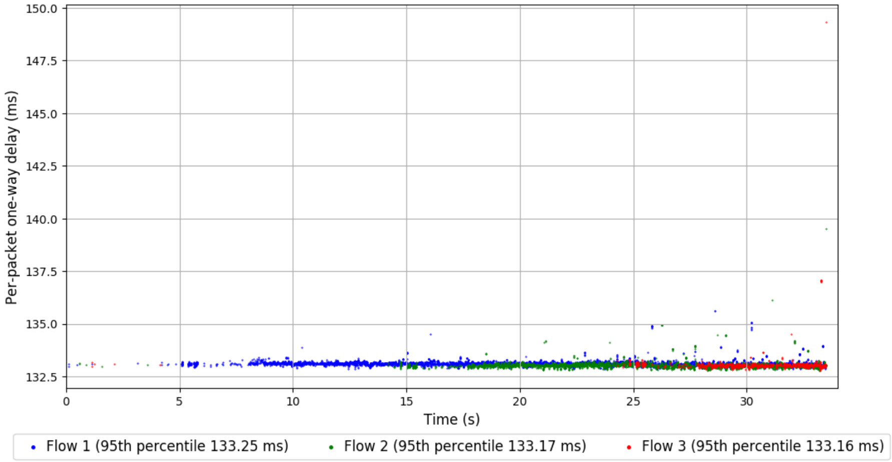


```
Run 5: Statistics of WebRTC media

Start at: 2018-11-03 09:17:44
End at: 2018-11-03 09:18:14
Local clock offset: -0.118 ms
Remote clock offset: -0.088 ms

# Below is generated by plot.py at 2018-11-03 11:22:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 133.226 ms
Loss rate: 1.82%
-- Flow 1:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 133.250 ms
Loss rate: 0.82%
-- Flow 2:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 133.169 ms
Loss rate: 1.53%
-- Flow 3:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 133.158 ms
Loss rate: 8.23%
```

Run 5: Report of WebRTC media — Data Link



Throughput (Mbit/s)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
5
10
15
20
25
30
35
Time (s)
Flow 1 ingress (mean 1.68 Mbit/s)
Flow 1 egress (mean 1.68 Mbit/s)
Flow 2 ingress (mean 0.97 Mbit/s)
Flow 2 egress (mean 0.96 Mbit/s)
Flow 3 ingress (mean 0.32 Mbit/s)
Flow 3 egress (mean 0.29 Mbit/s)



Per-packet one-way delay (ms)
132.5
135.0
137.5
140.0
142.5
145.0
147.5
150.0
0
5
10
15
20
25
30
Time (s)
Flow 1 (95th percentile 133.25 ms)
Flow 2 (95th percentile 133.17 ms)
Flow 3 (95th percentile 133.16 ms)