Pantheon Report

Generated at 2018-12-20 18:18:21 (UTC).

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

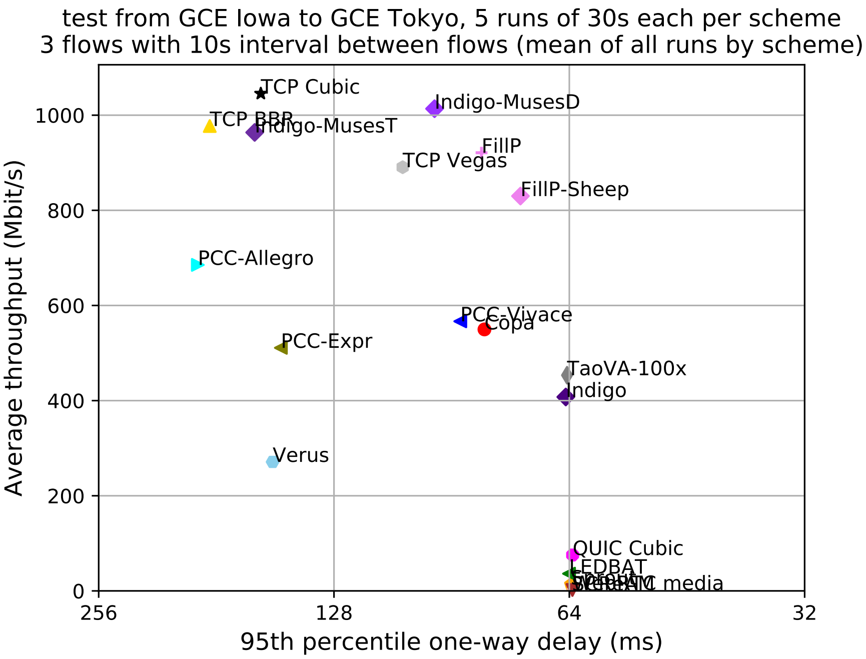
Repeated the test of 19 congestion control schemes 5 times.

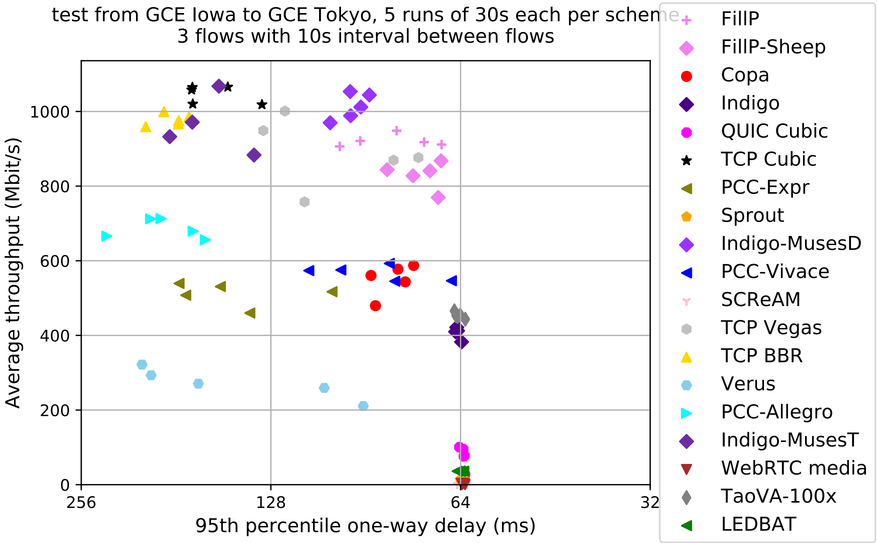
Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.

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

```
System info:
Linux 4.15.0-1025-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 @ c654af0b7d59d4ef4b914cfac404e1fc2e96dc68
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
third_party/muses-refactored @ 31f8f0ba8ef8b1da76c2bc0cd0a7850c33ff64fb
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
 M receiver/src/buffer.h
 M receiver/src/core.cpp
 M sender/src/buffer.h
 M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
 M src/ScreamClient
 M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
 M src/examples/cellsim.cc
 M src/examples/sproutbt2.cc
 M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
 M src/verus.hpp
 M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```


test from GCE Iowa to GCE Tokyo, 5 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
0
200
400
600
800
1000
256
128
64
32
TCP Cubic
Indigo-MusesD
TCP BBR
Indigo-MusesT
FillP
TCP Vegas
FillP-Sheep
PCC-Allegro
PCC-Vivace
Copa
PCC-Expr
TaoVA-100x
Indigo
Verus
QUIC Cubic
LEDBAT
Sprout
SCReAM
WebRTC media


test from GCE Iowa to GCE Tokyo, 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
256
128
64
32
FillP
FillP-Sheep
Copa
Indigo
QUIC Cubic
TCP Cubic
PCC-Expr
Sprout
Indigo-MusesD
PCC-Vivace
SCReAM
TCP Vegas
TCP BBR
Verus
PCC-Allegro
Indigo-MusesT
WebRTC media
TaoVA-100x
LEDBAT

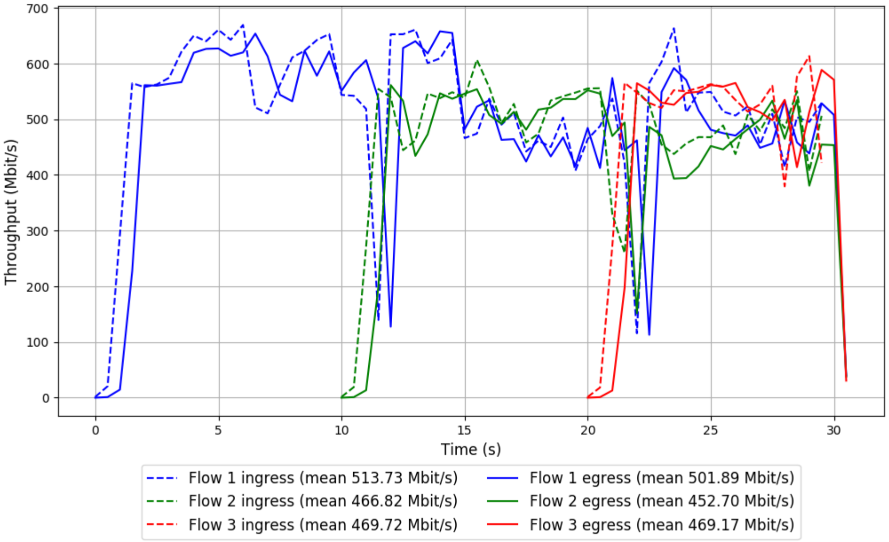
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	5	510.54	472.05	458.13	179.48	193.78	170.06	1.56	1.58	1.14
Copa	5	298.49	261.91	231.02	79.13	79.87	84.48	0.02	0.01	0.01
TCP Cubic	5	544.26	527.45	450.59	154.61	148.73	150.36	0.12	0.35	0.60
FillP	5	585.30	373.93	262.27	87.33	69.19	67.69	0.14	0.00	0.02
FillP-Sheep	5	535.42	323.57	241.25	77.32	66.75	67.01	0.03	0.00	0.05
Indigo	5	217.25	201.00	176.98	64.39	64.86	65.56	0.00	0.00	0.00
Indigo-MusesD	5	562.83	487.49	391.01	94.41	96.69	91.92	0.01	0.03	0.07
Indigo-MusesT	4	576.13	408.11	414.34	152.08	153.26	110.08	0.37	0.50	0.41
LEDBAT	5	23.37	15.55	7.71	64.07	63.94	63.78	0.00	0.01	0.00
PCC-Allegro	5	390.36	318.38	252.37	204.27	138.57	137.85	3.39	3.45	0.94
PCC-Expr	5	292.65	247.04	162.85	139.84	165.29	95.82	0.47	2.07	0.00
QUIC Cubic	5	39.83	40.71	26.20	63.32	63.32	63.26	0.00	0.00	0.00
SCReAM	5	0.22	0.22	0.22	63.32	63.33	63.44	0.00	0.00	0.00
Sprout	5	6.77	6.65	6.39	63.69	63.74	63.71	0.00	0.00	0.00
TaoVA-100x	5	231.61	223.82	218.64	64.26	64.12	65.42	0.00	0.00	0.00
TCP Vegas	5	492.64	414.02	367.29	103.98	90.25	91.72	0.03	0.01	0.01
Verus	5	169.82	109.52	87.76	159.82	103.50	97.48	1.94	0.08	0.10
PCC-Vivace	5	321.29	290.30	158.68	87.55	86.54	76.59	0.00	0.06	0.00
WebRTC media	5	0.87	0.85	0.25	63.33	63.40	63.49	0.00	0.00	0.00

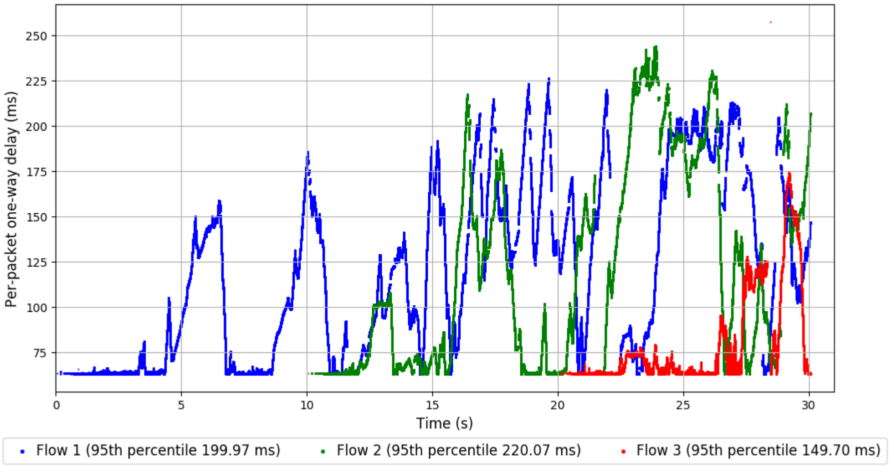
```
Run 1: Statistics of TCP BBR

Start at: 2018-12-20 12:49:31
End at: 2018-12-20 12:50:01
Local clock offset: -0.098 ms
Remote clock offset: 0.393 ms

# Below is generated by plot.py at 2018-12-20 16:04:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 959.33 Mbit/s
95th percentile per-packet one-way delay: 202.250 ms
Loss rate: 2.18%
-- Flow 1:
Average throughput: 501.89 Mbit/s
95th percentile per-packet one-way delay: 199.970 ms
Loss rate: 2.30%
-- Flow 2:
Average throughput: 452.70 Mbit/s
95th percentile per-packet one-way delay: 220.067 ms
Loss rate: 3.02%
-- Flow 3:
Average throughput: 469.17 Mbit/s
95th percentile per-packet one-way delay: 149.701 ms
Loss rate: 0.12%
```

Run 1: Report of TCP BBR — Data Link



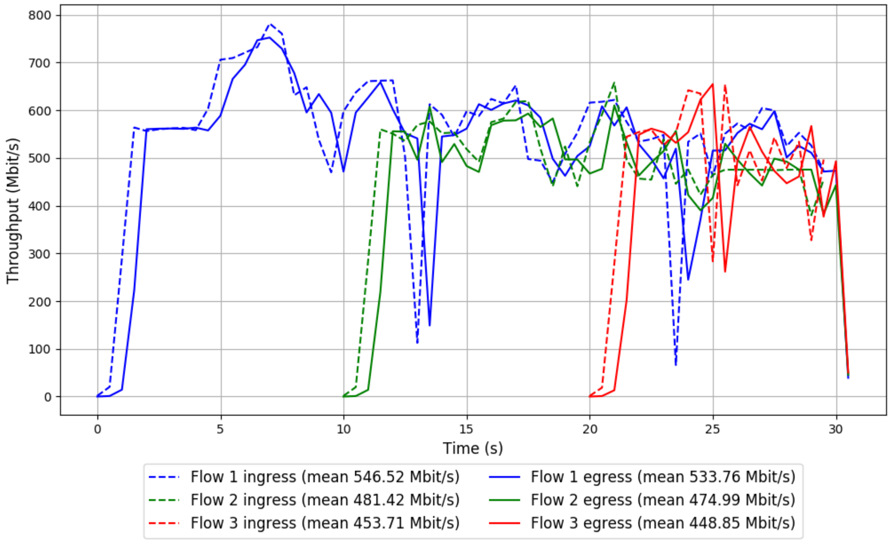


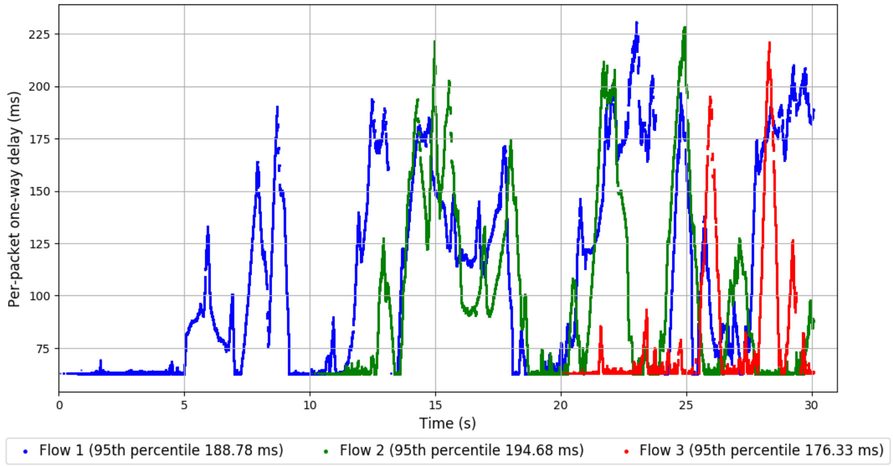
```
Run 2: Statistics of TCP BBR

Start at: 2018-12-20 13:23:02
End at: 2018-12-20 13:23:32
Local clock offset: -0.112 ms
Remote clock offset: -0.165 ms

# Below is generated by plot.py at 2018-12-20 16:05:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 999.42 Mbit/s
95th percentile per-packet one-way delay: 189.238 ms
Loss rate: 1.83%
-- Flow 1:
Average throughput: 533.76 Mbit/s
95th percentile per-packet one-way delay: 188.781 ms
Loss rate: 2.33%
-- Flow 2:
Average throughput: 474.99 Mbit/s
95th percentile per-packet one-way delay: 194.680 ms
Loss rate: 1.33%
-- Flow 3:
Average throughput: 448.85 Mbit/s
95th percentile per-packet one-way delay: 176.327 ms
Loss rate: 1.07%
```

Run 2: Report of TCP BBR — Data Link



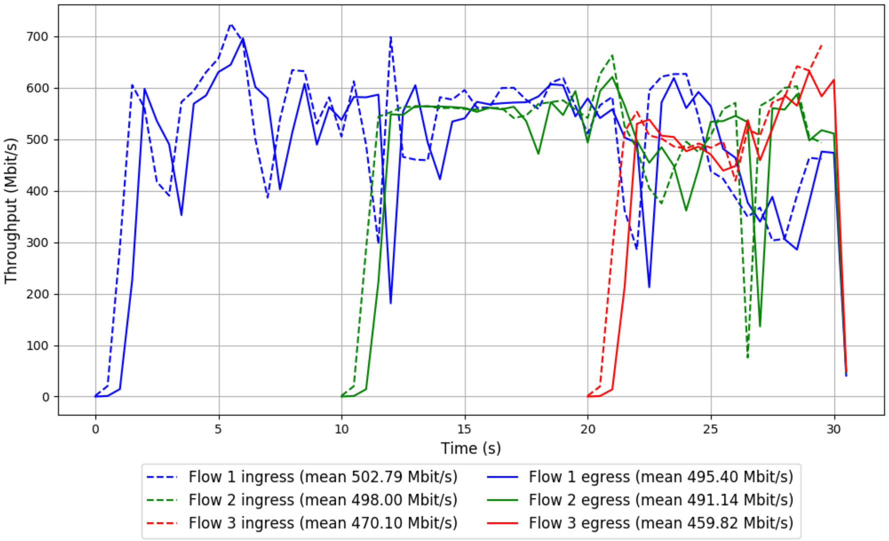


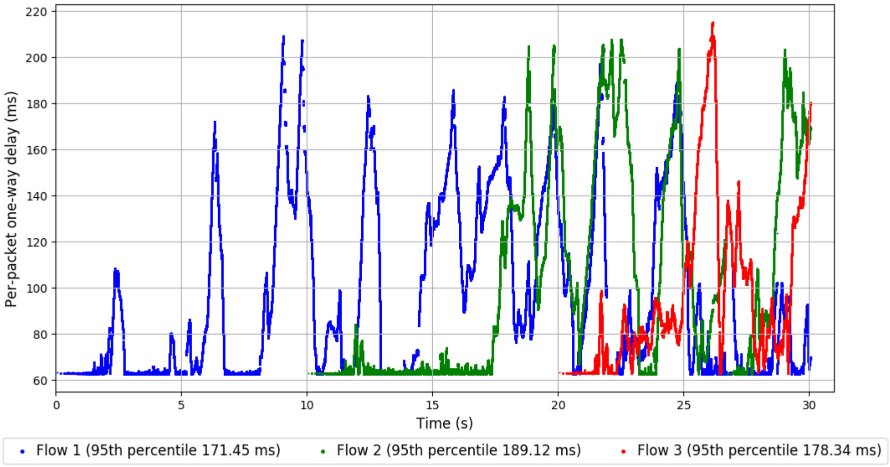
```
Run 3: Statistics of TCP BBR

Start at: 2018-12-20 13:56:58
End at: 2018-12-20 13:57:28
Local clock offset: 0.001 ms
Remote clock offset: -0.048 ms

# Below is generated by plot.py at 2018-12-20 16:05:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 975.58 Mbit/s
95th percentile per-packet one-way delay: 179.276 ms
Loss rate: 1.55%
-- Flow 1:
Average throughput: 495.40 Mbit/s
95th percentile per-packet one-way delay: 171.447 ms
Loss rate: 1.47%
-- Flow 2:
Average throughput: 491.14 Mbit/s
95th percentile per-packet one-way delay: 189.120 ms
Loss rate: 1.38%
-- Flow 3:
Average throughput: 459.82 Mbit/s
95th percentile per-packet one-way delay: 178.337 ms
Loss rate: 2.20%
```

Run 3: Report of TCP BBR — Data Link



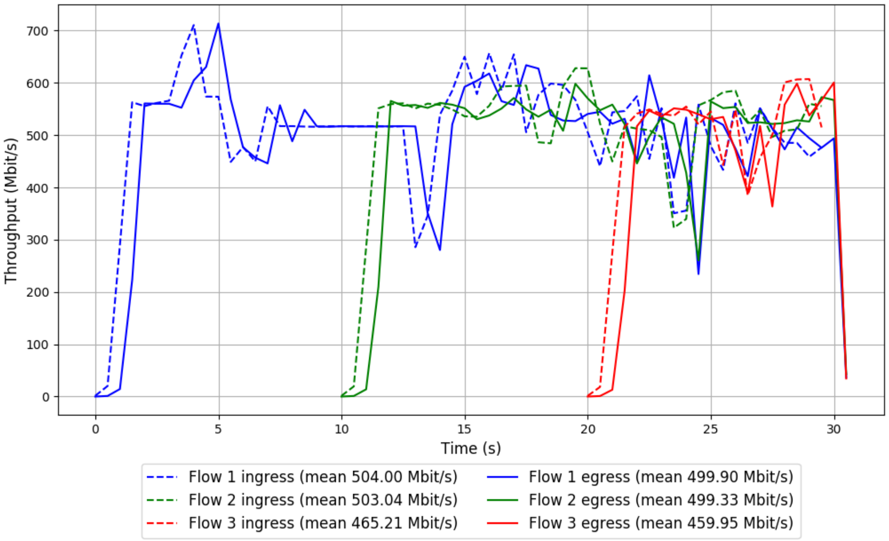


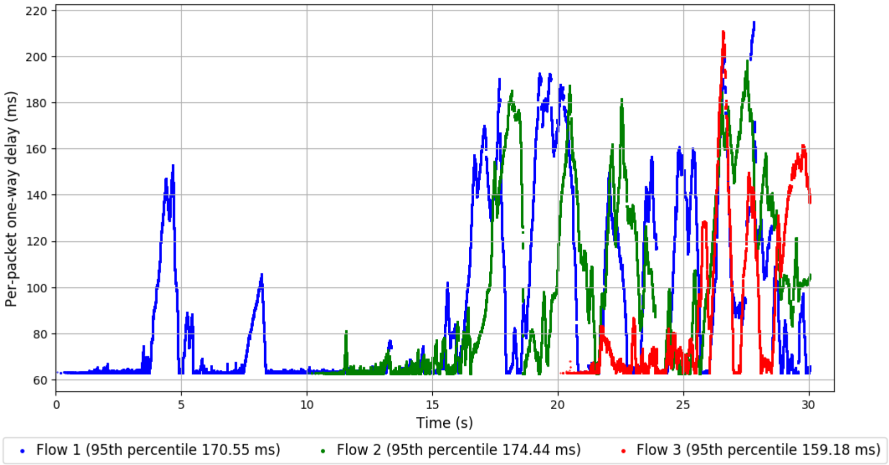
```
Run 4: Statistics of TCP BBR

Start at: 2018-12-20 14:30:37
End at: 2018-12-20 14:31:07
Local clock offset: -0.137 ms
Remote clock offset: -0.043 ms

# Below is generated by plot.py at 2018-12-20 16:05:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 985.21 Mbit/s
95th percentile per-packet one-way delay: 172.619 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 499.90 Mbit/s
95th percentile per-packet one-way delay: 170.548 ms
Loss rate: 0.81%
-- Flow 2:
Average throughput: 499.33 Mbit/s
95th percentile per-packet one-way delay: 174.442 ms
Loss rate: 0.73%
-- Flow 3:
Average throughput: 459.95 Mbit/s
95th percentile per-packet one-way delay: 159.182 ms
Loss rate: 1.12%
```

Run 4: Report of TCP BBR — Data Link



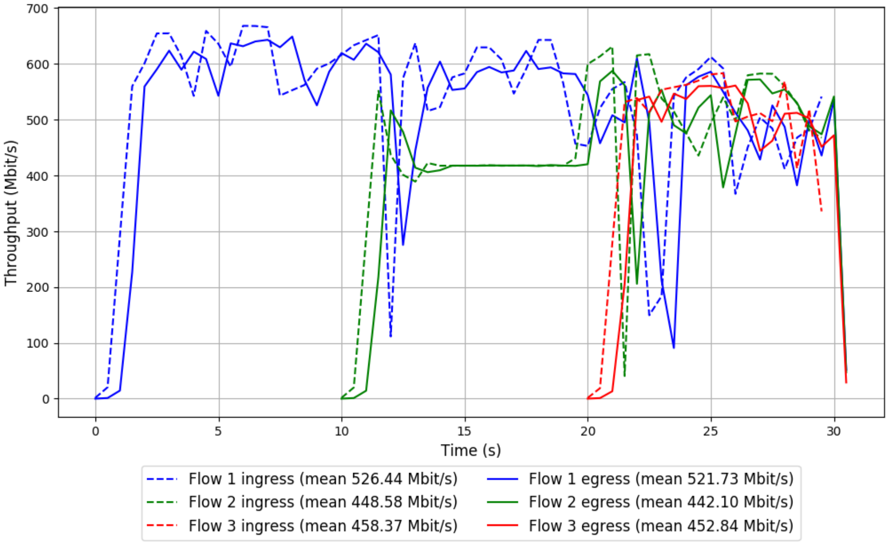


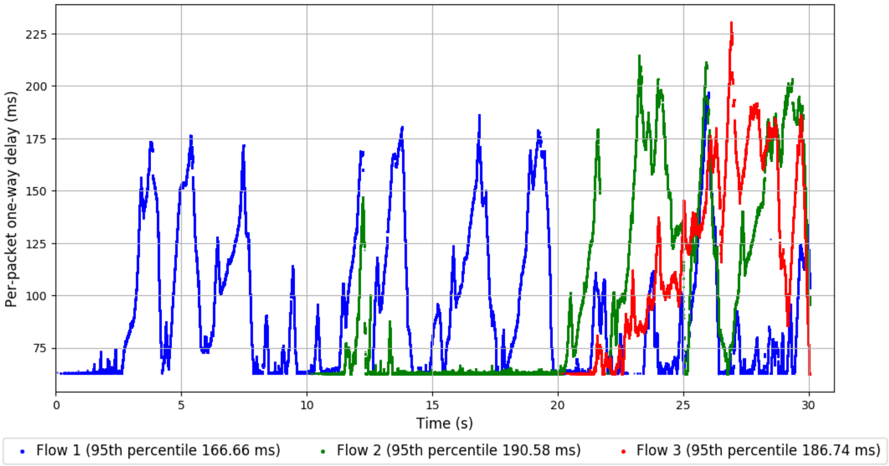
```
Run 5: Statistics of TCP BBR

Start at: 2018-12-20 15:04:21
End at: 2018-12-20 15:04:51
Local clock offset: 0.011 ms
Remote clock offset: -0.123 ms

# Below is generated by plot.py at 2018-12-20 16:05:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 966.77 Mbit/s
95th percentile per-packet one-way delay: 179.447 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 521.73 Mbit/s
95th percentile per-packet one-way delay: 166.661 ms
Loss rate: 0.89%
-- Flow 2:
Average throughput: 442.10 Mbit/s
95th percentile per-packet one-way delay: 190.576 ms
Loss rate: 1.44%
-- Flow 3:
Average throughput: 452.84 Mbit/s
95th percentile per-packet one-way delay: 186.737 ms
Loss rate: 1.21%
```

Run 5: Report of TCP BBR — Data Link



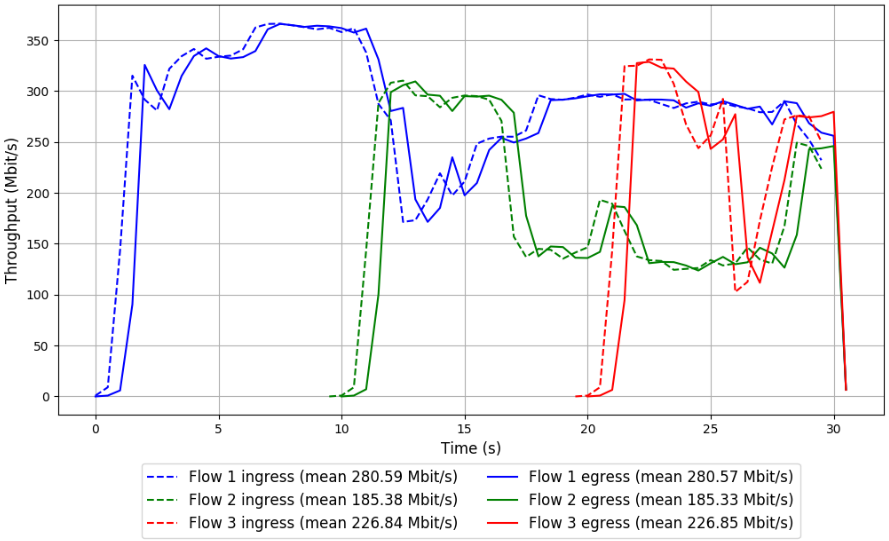


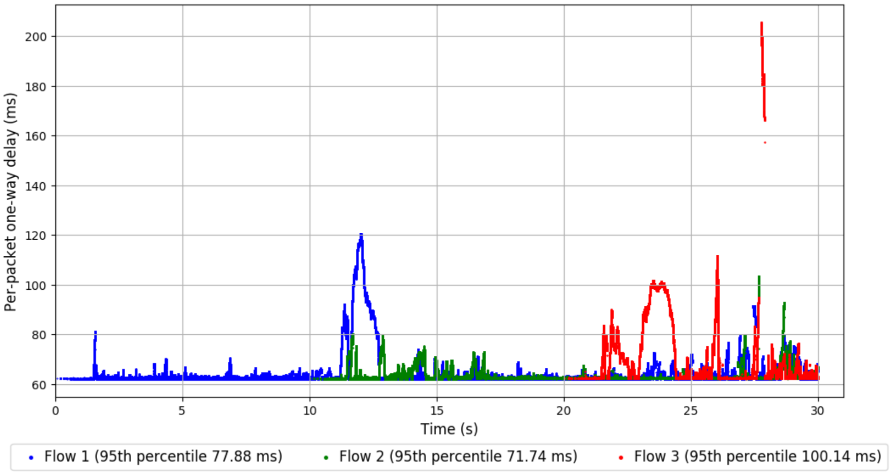
```
Run 1: Statistics of Copa

Start at: 2018-12-20 12:56:23
End at: 2018-12-20 12:56:53
Local clock offset: -0.072 ms
Remote clock offset: -0.857 ms

# Below is generated by plot.py at 2018-12-20 16:05:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 479.58 Mbit/s
95th percentile per-packet one-way delay: 87.339 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 280.57 Mbit/s
95th percentile per-packet one-way delay: 77.884 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 185.33 Mbit/s
95th percentile per-packet one-way delay: 71.742 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 226.85 Mbit/s
95th percentile per-packet one-way delay: 100.136 ms
Loss rate: 0.00%
```

Run 1: Report of Copa — Data Link



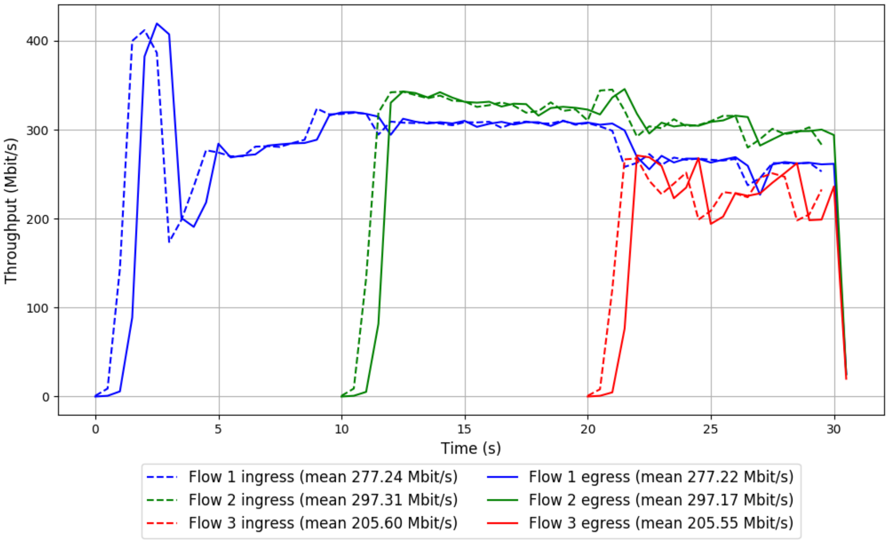


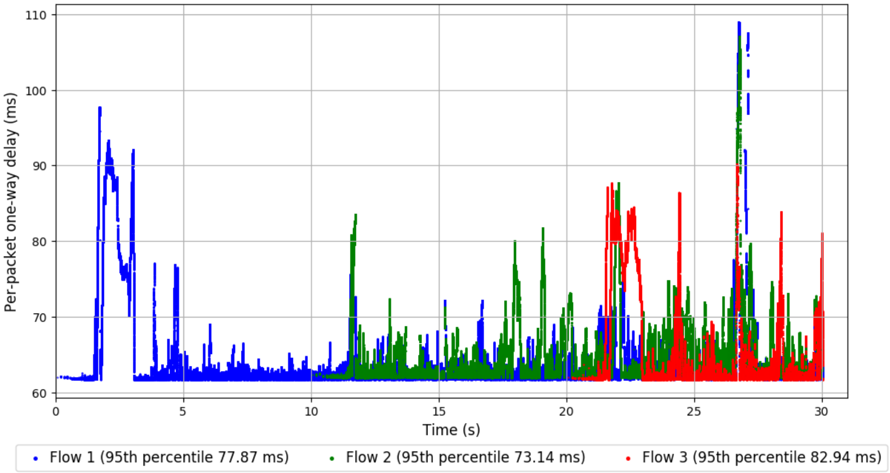
```
Run 2: Statistics of Copa

Start at: 2018-12-20 13:30:00
End at: 2018-12-20 13:30:30
Local clock offset: -0.024 ms
Remote clock offset: -1.03 ms

# Below is generated by plot.py at 2018-12-20 16:05:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 543.40 Mbit/s
95th percentile per-packet one-way delay: 78.336 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 277.22 Mbit/s
95th percentile per-packet one-way delay: 77.869 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 297.17 Mbit/s
95th percentile per-packet one-way delay: 73.142 ms
Loss rate: 0.04%
-- Flow 3:
Average throughput: 205.55 Mbit/s
95th percentile per-packet one-way delay: 82.943 ms
Loss rate: 0.03%
```

Run 2: Report of Copa — Data Link



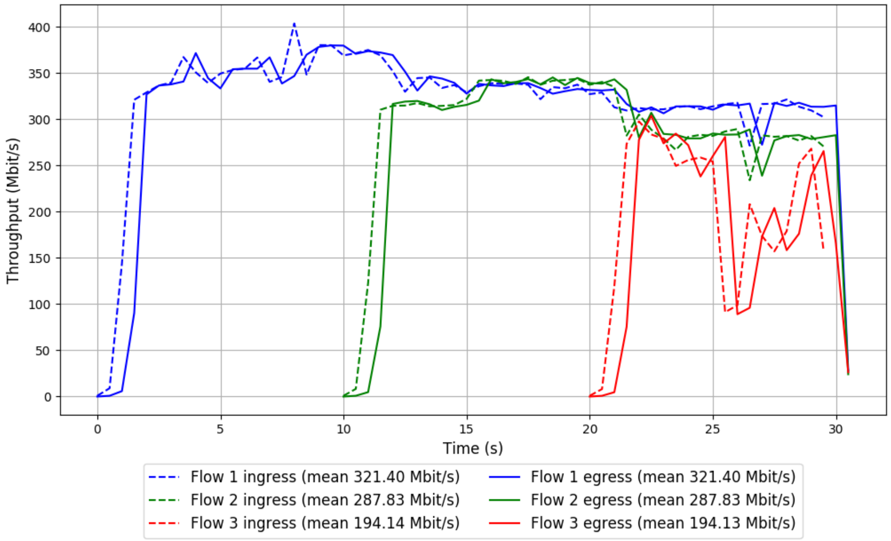


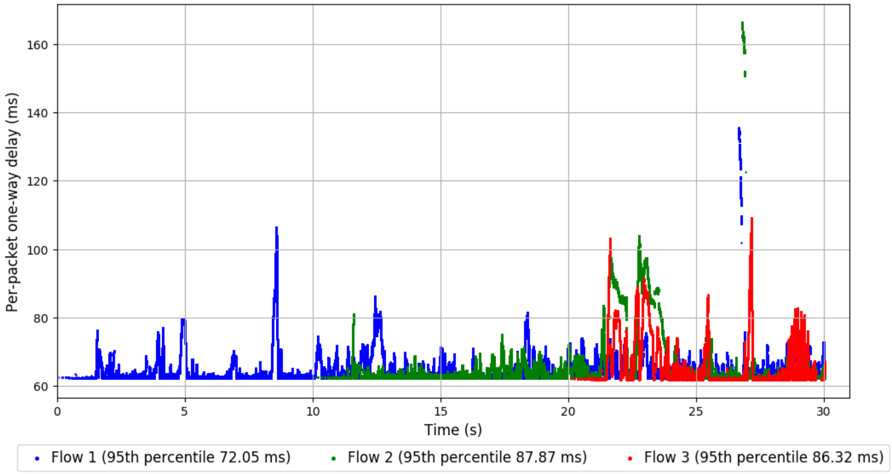
```
Run 3: Statistics of Copa

Start at: 2018-12-20 14:03:47
End at: 2018-12-20 14:04:17
Local clock offset: -0.029 ms
Remote clock offset: -0.703 ms

# Below is generated by plot.py at 2018-12-20 16:06:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 577.44 Mbit/s
95th percentile per-packet one-way delay: 80.453 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 321.40 Mbit/s
95th percentile per-packet one-way delay: 72.054 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 287.83 Mbit/s
95th percentile per-packet one-way delay: 87.873 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 194.13 Mbit/s
95th percentile per-packet one-way delay: 86.322 ms
Loss rate: 0.01%
```

Run 3: Report of Copa — Data Link



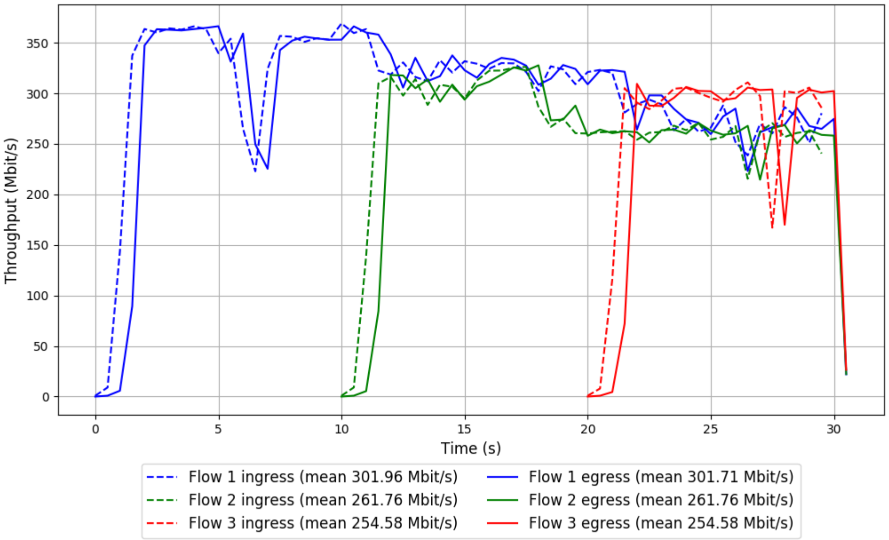


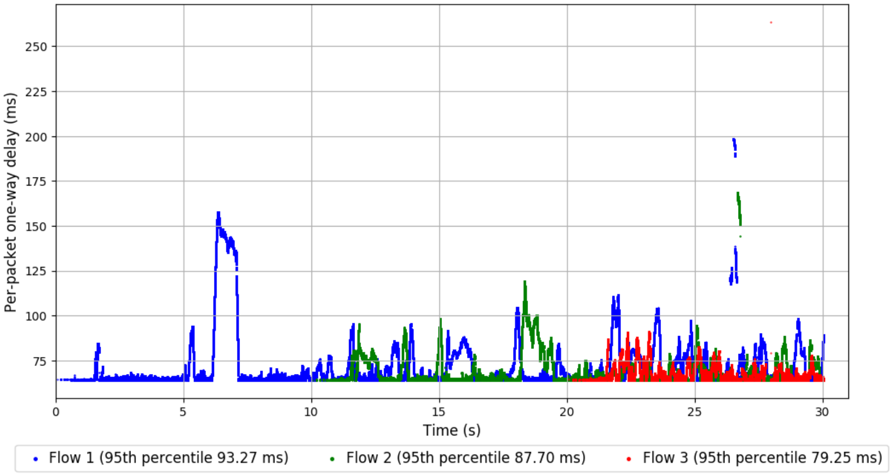
```
Run 4: Statistics of Copa

Start at: 2018-12-20 14:37:33
End at: 2018-12-20 14:38:03
Local clock offset: -0.057 ms
Remote clock offset: 1.269 ms

# Below is generated by plot.py at 2018-12-20 16:21:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 560.58 Mbit/s
95th percentile per-packet one-way delay: 88.777 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 301.71 Mbit/s
95th percentile per-packet one-way delay: 93.271 ms
Loss rate: 0.08%
-- Flow 2:
Average throughput: 261.76 Mbit/s
95th percentile per-packet one-way delay: 87.704 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 254.58 Mbit/s
95th percentile per-packet one-way delay: 79.246 ms
Loss rate: 0.00%
```

Run 4: Report of Copa — Data Link



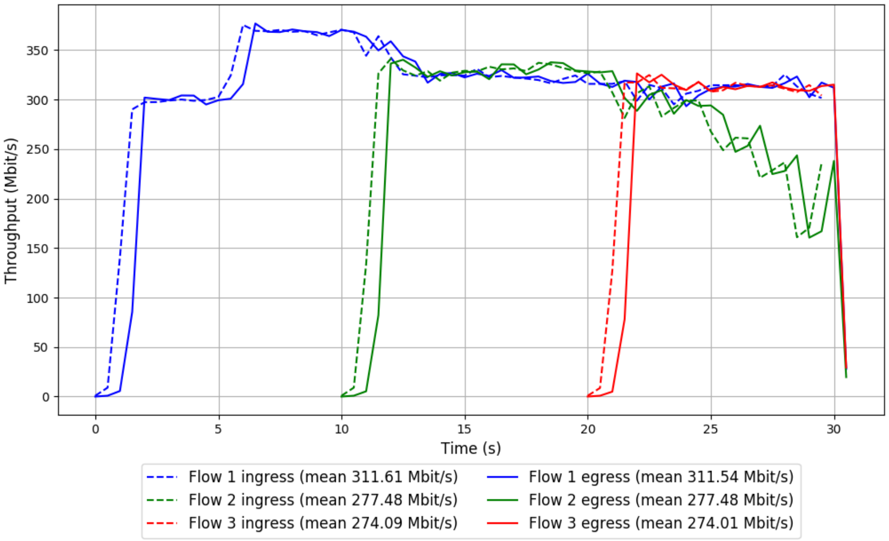


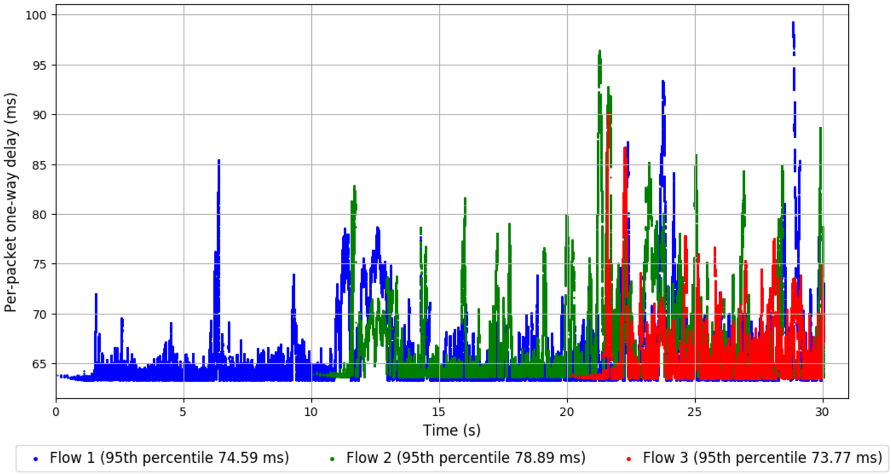
```
Run 5: Statistics of Copa

Start at: 2018-12-20 15:11:14
End at: 2018-12-20 15:11:44
Local clock offset: 0.0 ms
Remote clock offset: 0.671 ms

# Below is generated by plot.py at 2018-12-20 16:24:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 587.41 Mbit/s
95th percentile per-packet one-way delay: 75.968 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 311.54 Mbit/s
95th percentile per-packet one-way delay: 74.588 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 277.48 Mbit/s
95th percentile per-packet one-way delay: 78.885 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 274.01 Mbit/s
95th percentile per-packet one-way delay: 73.771 ms
Loss rate: 0.02%
```

Run 5: Report of Copa — Data Link



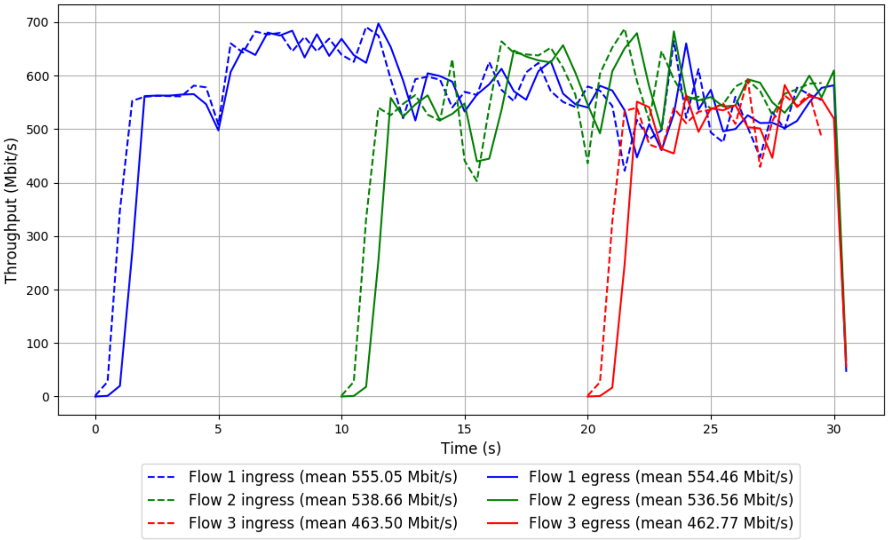


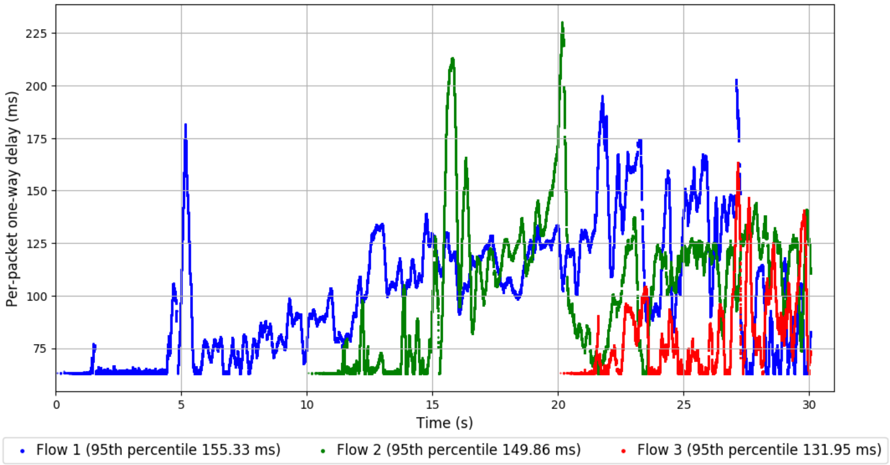
```
Run 1: Statistics of TCP Cubic

Start at: 2018-12-20 12:42:11
End at: 2018-12-20 12:42:41
Local clock offset: -0.1 ms
Remote clock offset: 0.012 ms

# Below is generated by plot.py at 2018-12-20 16:24:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1065.63 Mbit/s
95th percentile per-packet one-way delay: 149.833 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 554.46 Mbit/s
95th percentile per-packet one-way delay: 155.331 ms
Loss rate: 0.11%
-- Flow 2:
Average throughput: 536.56 Mbit/s
95th percentile per-packet one-way delay: 149.864 ms
Loss rate: 0.39%
-- Flow 3:
Average throughput: 462.77 Mbit/s
95th percentile per-packet one-way delay: 131.947 ms
Loss rate: 0.15%
```

Run 1: Report of TCP Cubic — Data Link



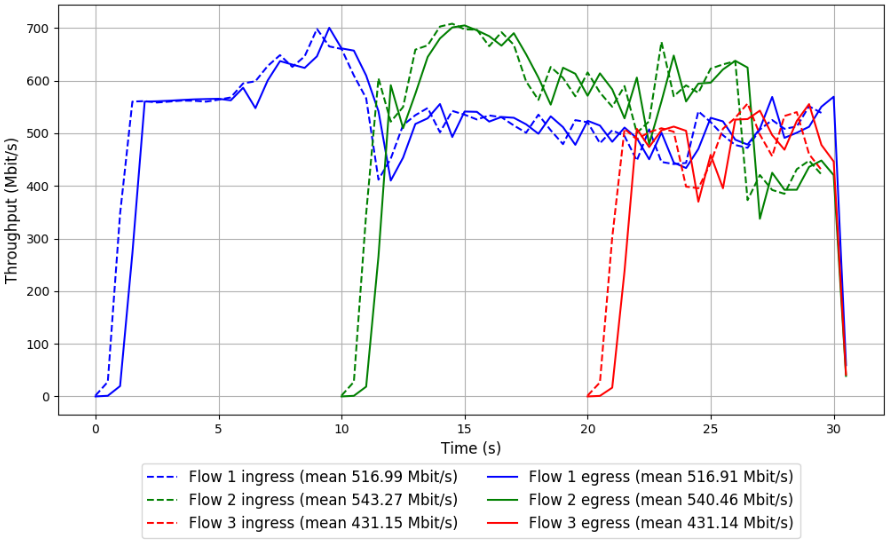


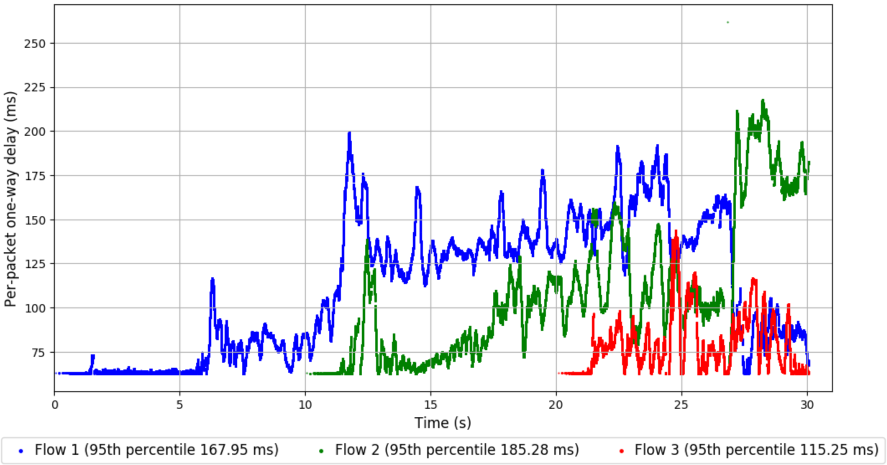
```
Run 2: Statistics of TCP Cubic

Start at: 2018-12-20 13:15:09
End at: 2018-12-20 13:15:39
Local clock offset: -0.074 ms
Remote clock offset: -0.053 ms

# Below is generated by plot.py at 2018-12-20 16:24:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1020.17 Mbit/s
95th percentile per-packet one-way delay: 170.303 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 516.91 Mbit/s
95th percentile per-packet one-way delay: 167.949 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 540.46 Mbit/s
95th percentile per-packet one-way delay: 185.282 ms
Loss rate: 0.51%
-- Flow 3:
Average throughput: 431.14 Mbit/s
95th percentile per-packet one-way delay: 115.251 ms
Loss rate: 0.00%
```

Run 2: Report of TCP Cubic — Data Link



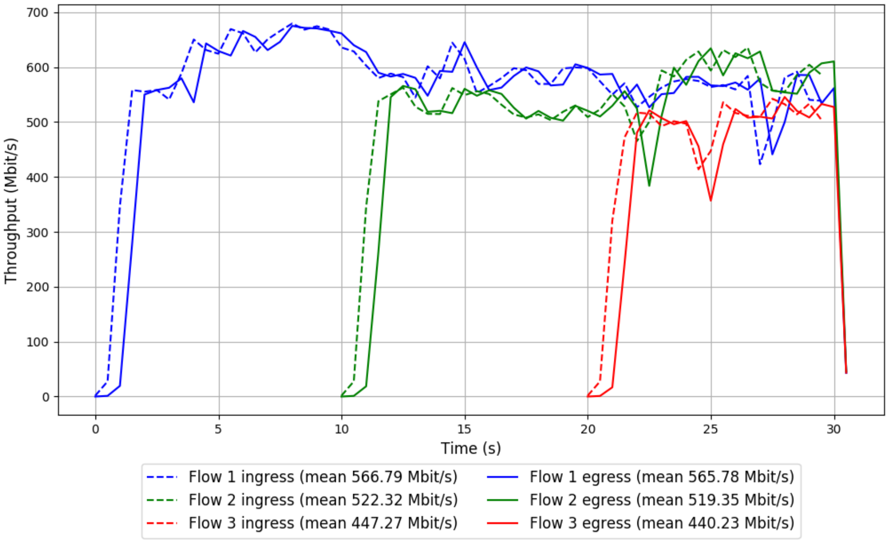


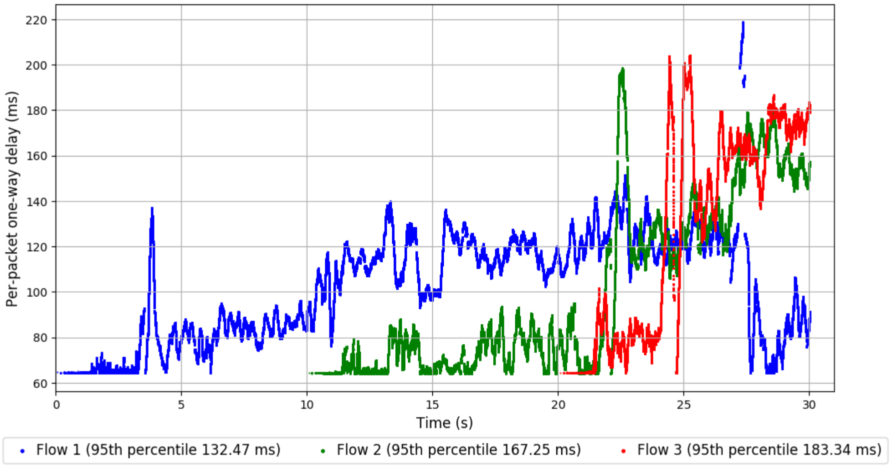
```
Run 3: Statistics of TCP Cubic

Start at: 2018-12-20 13:49:05
End at: 2018-12-20 13:49:35
Local clock offset: 0.002 ms
Remote clock offset: 1.513 ms

# Below is generated by plot.py at 2018-12-20 16:24:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1057.93 Mbit/s
95th percentile per-packet one-way delay: 171.036 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 565.78 Mbit/s
95th percentile per-packet one-way delay: 132.473 ms
Loss rate: 0.18%
-- Flow 2:
Average throughput: 519.35 Mbit/s
95th percentile per-packet one-way delay: 167.251 ms
Loss rate: 0.56%
-- Flow 3:
Average throughput: 440.23 Mbit/s
95th percentile per-packet one-way delay: 183.338 ms
Loss rate: 1.57%
```

Run 3: Report of TCP Cubic — Data Link



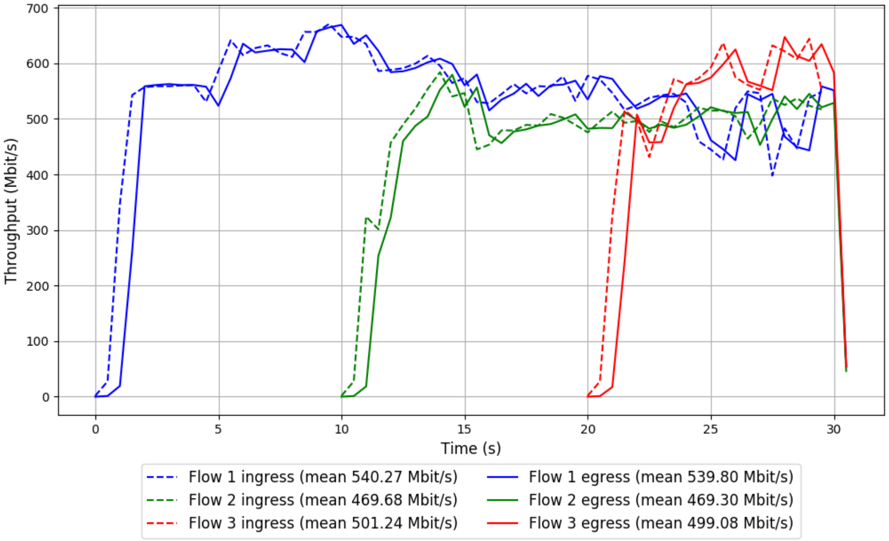


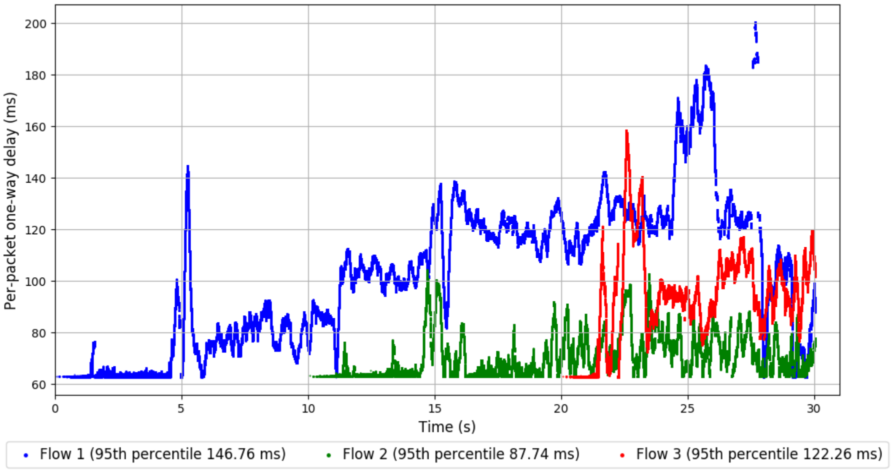
```
Run 4: Statistics of TCP Cubic

Start at: 2018-12-20 14:22:50
End at: 2018-12-20 14:23:20
Local clock offset: -0.112 ms
Remote clock offset: 0.034 ms

# Below is generated by plot.py at 2018-12-20 16:24:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1018.34 Mbit/s
95th percentile per-packet one-way delay: 132.255 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 539.80 Mbit/s
95th percentile per-packet one-way delay: 146.762 ms
Loss rate: 0.09%
-- Flow 2:
Average throughput: 469.30 Mbit/s
95th percentile per-packet one-way delay: 87.737 ms
Loss rate: 0.08%
-- Flow 3:
Average throughput: 499.08 Mbit/s
95th percentile per-packet one-way delay: 122.260 ms
Loss rate: 0.43%
```

Run 4: Report of TCP Cubic — Data Link



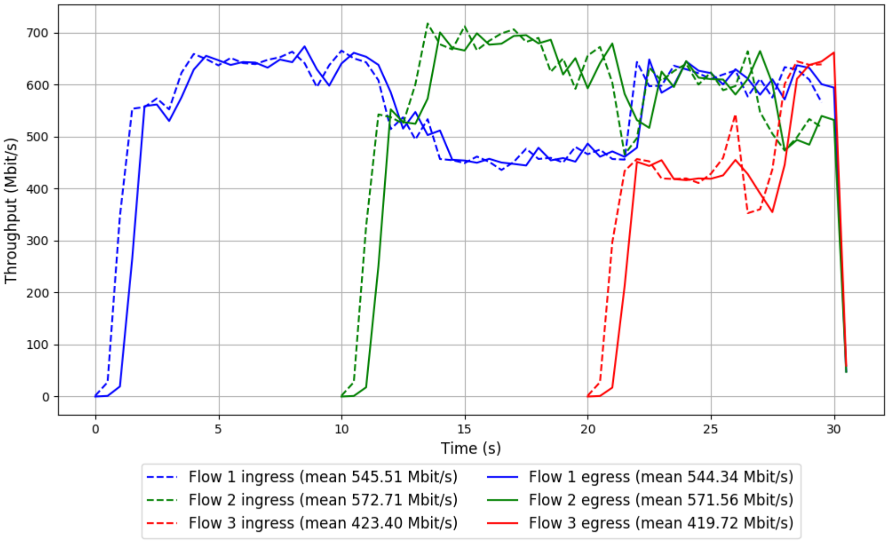


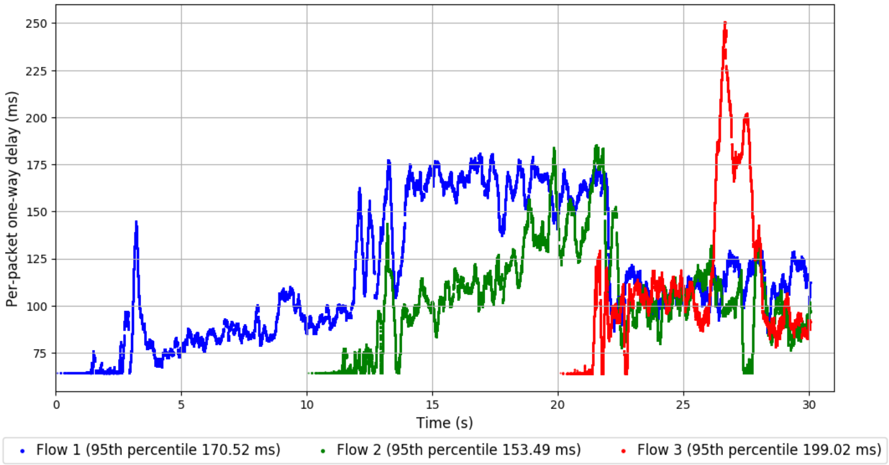
```
Run 5: Statistics of TCP Cubic

Start at: 2018-12-20 14:56:30
End at: 2018-12-20 14:57:00
Local clock offset: -0.039 ms
Remote clock offset: 1.281 ms

# Below is generated by plot.py at 2018-12-20 16:24:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1064.58 Mbit/s
95th percentile per-packet one-way delay: 170.539 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 544.34 Mbit/s
95th percentile per-packet one-way delay: 170.523 ms
Loss rate: 0.21%
-- Flow 2:
Average throughput: 571.56 Mbit/s
95th percentile per-packet one-way delay: 153.494 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 419.72 Mbit/s
95th percentile per-packet one-way delay: 199.016 ms
Loss rate: 0.87%
```

Run 5: Report of TCP Cubic — Data Link



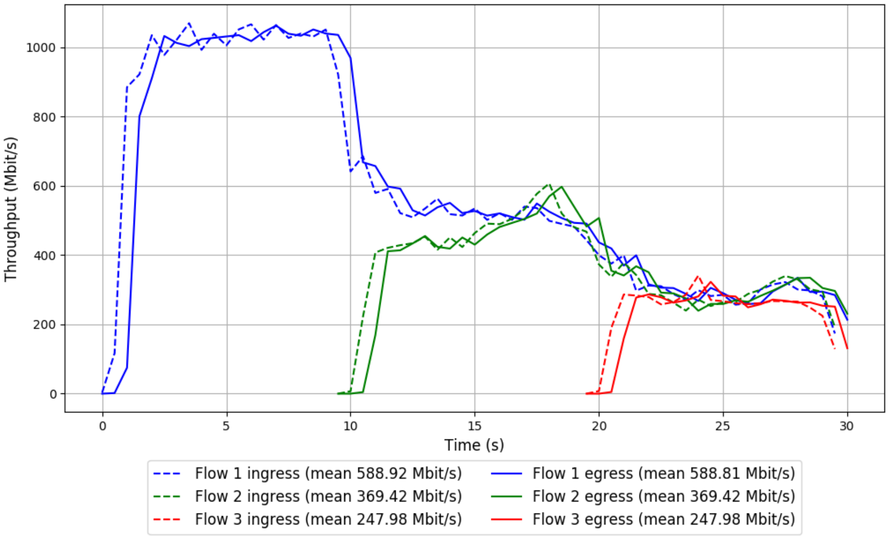


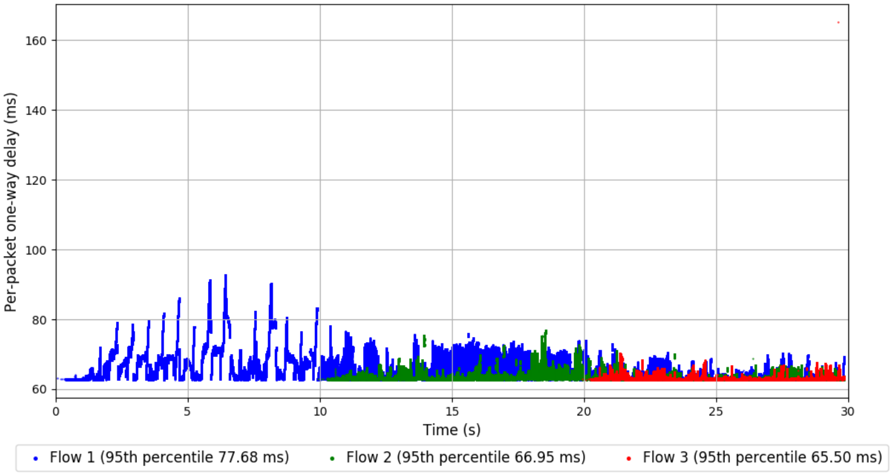
```
Run 1: Statistics of FillP

Start at: 2018-12-20 12:47:40
End at: 2018-12-20 12:48:10
Local clock offset: -0.09 ms
Remote clock offset: -0.315 ms

# Below is generated by plot.py at 2018-12-20 16:26:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 917.92 Mbit/s
95th percentile per-packet one-way delay: 73.113 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 588.81 Mbit/s
95th percentile per-packet one-way delay: 77.676 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 369.42 Mbit/s
95th percentile per-packet one-way delay: 66.951 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 247.98 Mbit/s
95th percentile per-packet one-way delay: 65.495 ms
Loss rate: 0.00%
```

Run 1: Report of FillP — Data Link



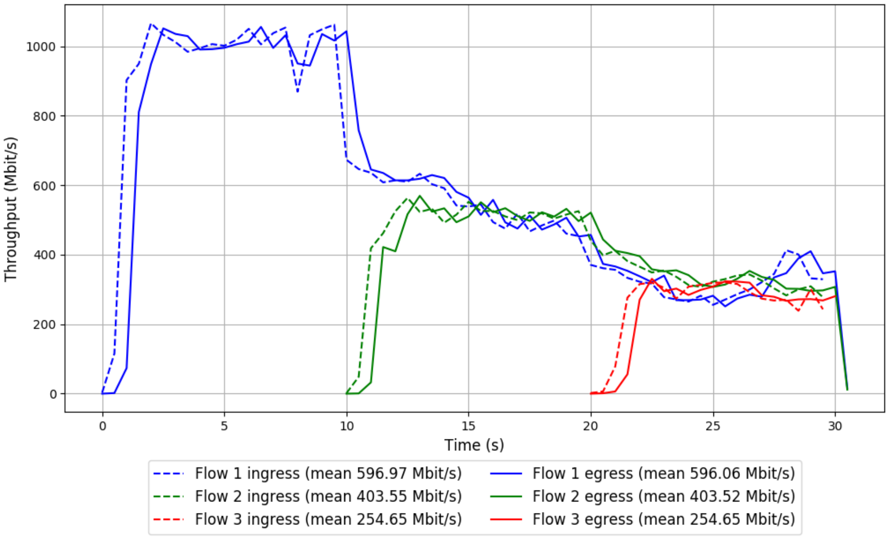


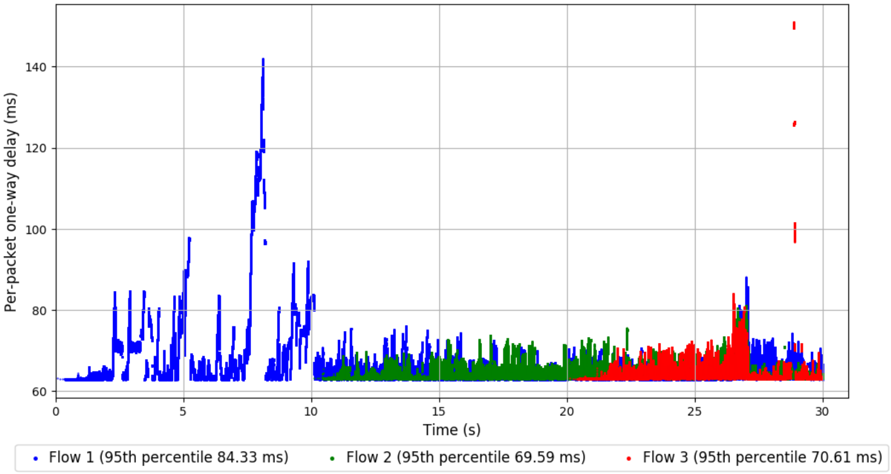
```
Run 2: Statistics of FillP

Start at: 2018-12-20 13:21:09
End at: 2018-12-20 13:21:39
Local clock offset: -0.078 ms
Remote clock offset: -0.031 ms

# Below is generated by plot.py at 2018-12-20 16:43:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 948.40 Mbit/s
95th percentile per-packet one-way delay: 80.838 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 596.06 Mbit/s
95th percentile per-packet one-way delay: 84.333 ms
Loss rate: 0.14%
-- Flow 2:
Average throughput: 403.52 Mbit/s
95th percentile per-packet one-way delay: 69.589 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 254.65 Mbit/s
95th percentile per-packet one-way delay: 70.612 ms
Loss rate: 0.00%
```

Run 2: Report of FillP — Data Link



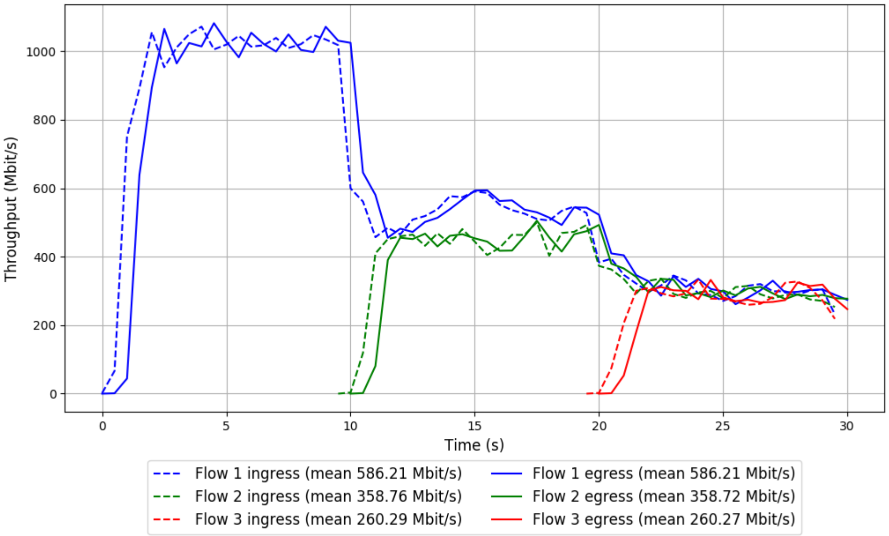


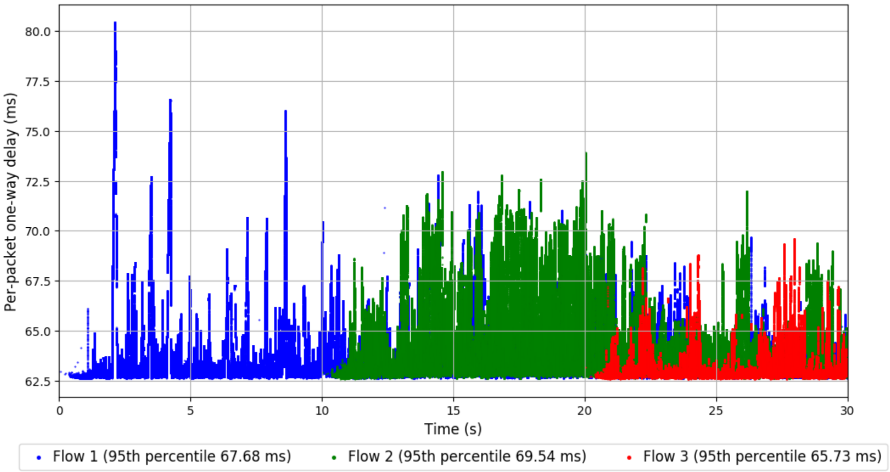
```
Run 3: Statistics of FillP

Start at: 2018-12-20 13:55:07
End at: 2018-12-20 13:55:37
Local clock offset: 0.005 ms
Remote clock offset: -0.117 ms

# Below is generated by plot.py at 2018-12-20 16:43:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 911.54 Mbit/s
95th percentile per-packet one-way delay: 68.601 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 586.21 Mbit/s
95th percentile per-packet one-way delay: 67.683 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 358.72 Mbit/s
95th percentile per-packet one-way delay: 69.538 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 260.27 Mbit/s
95th percentile per-packet one-way delay: 65.731 ms
Loss rate: 0.00%
```

Run 3: Report of FillP — Data Link



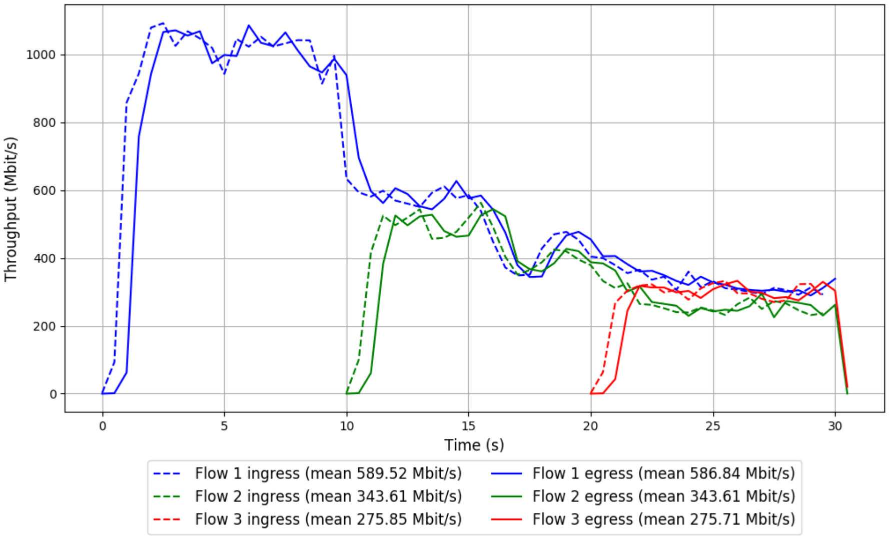


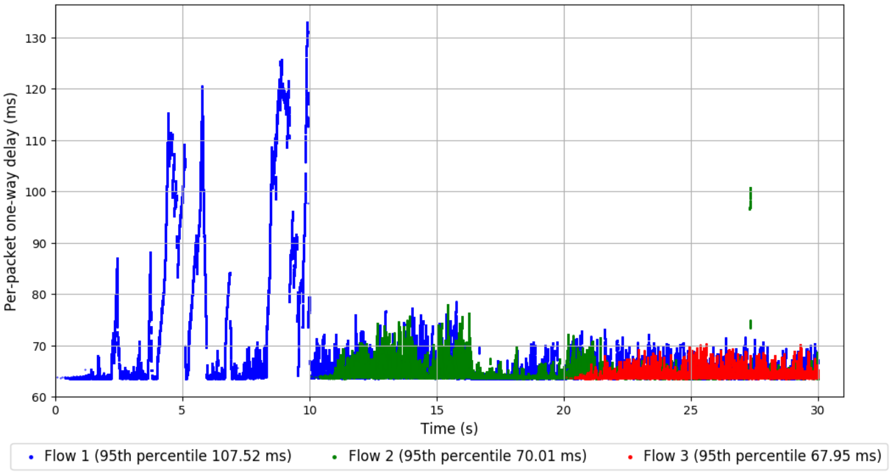
```
Run 4: Statistics of FillP

Start at: 2018-12-20 14:28:46
End at: 2018-12-20 14:29:16
Local clock offset: -0.109 ms
Remote clock offset: 0.669 ms

# Below is generated by plot.py at 2018-12-20 16:44:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 906.38 Mbit/s
95th percentile per-packet one-way delay: 99.528 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 586.84 Mbit/s
95th percentile per-packet one-way delay: 107.515 ms
Loss rate: 0.44%
-- Flow 2:
Average throughput: 343.61 Mbit/s
95th percentile per-packet one-way delay: 70.007 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 275.71 Mbit/s
95th percentile per-packet one-way delay: 67.952 ms
Loss rate: 0.05%
```

Run 4: Report of FillP — Data Link



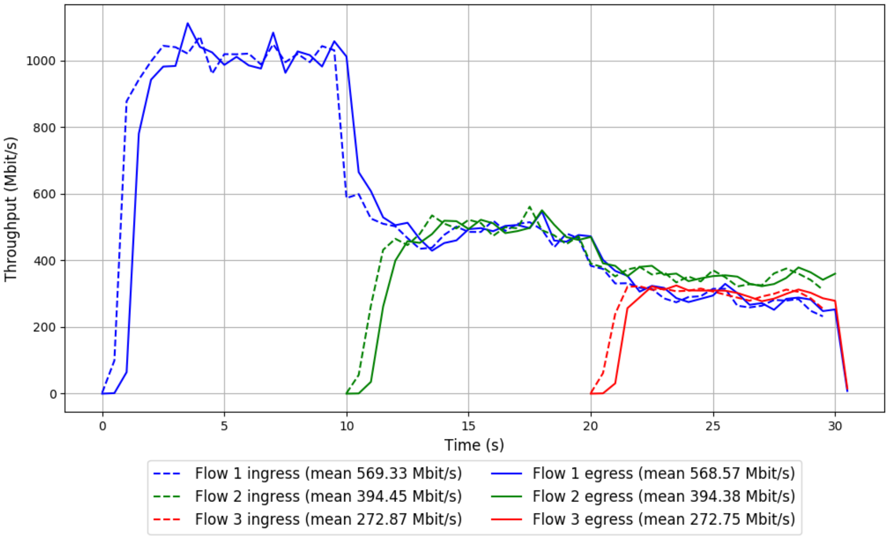


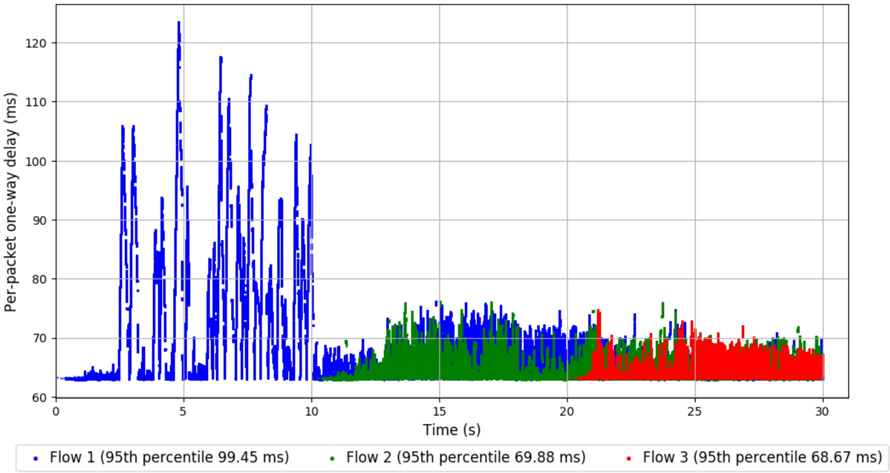
```
Run 5: Statistics of FillP

Start at: 2018-12-20 15:02:29
End at: 2018-12-20 15:02:59
Local clock offset: -0.003 ms
Remote clock offset: 0.277 ms

# Below is generated by plot.py at 2018-12-20 16:44:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 921.04 Mbit/s
95th percentile per-packet one-way delay: 92.342 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 568.57 Mbit/s
95th percentile per-packet one-way delay: 99.452 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 394.38 Mbit/s
95th percentile per-packet one-way delay: 69.877 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 272.75 Mbit/s
95th percentile per-packet one-way delay: 68.674 ms
Loss rate: 0.04%
```

Run 5: Report of FillP — Data Link



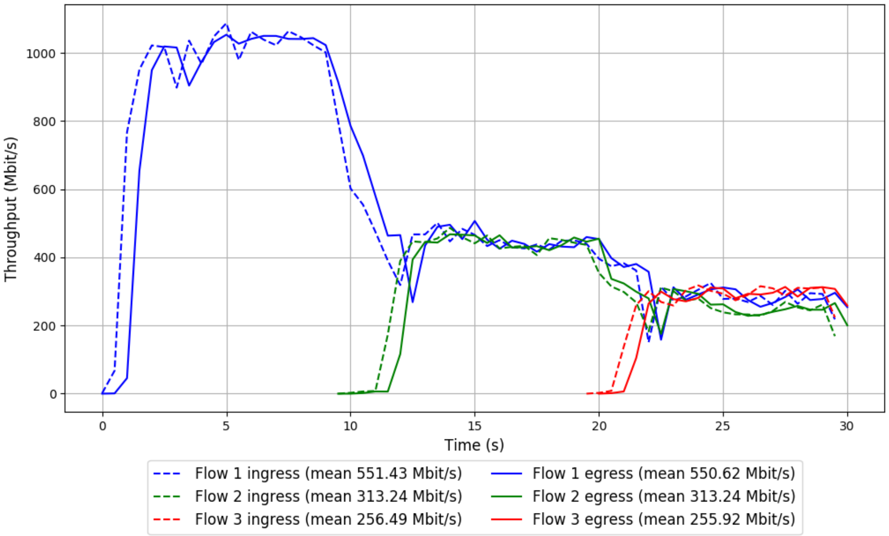


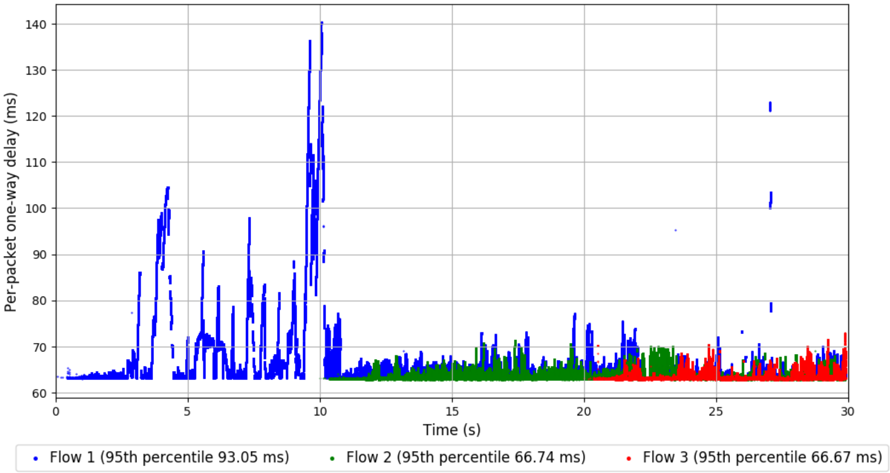
```
Run 1: Statistics of FillP-Sheep

Start at: 2018-12-20 12:59:37
End at: 2018-12-20 13:00:07
Local clock offset: -0.076 ms
Remote clock offset: -0.017 ms

# Below is generated by plot.py at 2018-12-20 16:44:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 844.06 Mbit/s
95th percentile per-packet one-way delay: 83.685 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 550.62 Mbit/s
95th percentile per-packet one-way delay: 93.046 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 313.24 Mbit/s
95th percentile per-packet one-way delay: 66.739 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 255.92 Mbit/s
95th percentile per-packet one-way delay: 66.675 ms
Loss rate: 0.22%
```

Run 1: Report of FillP-Sheep — Data Link



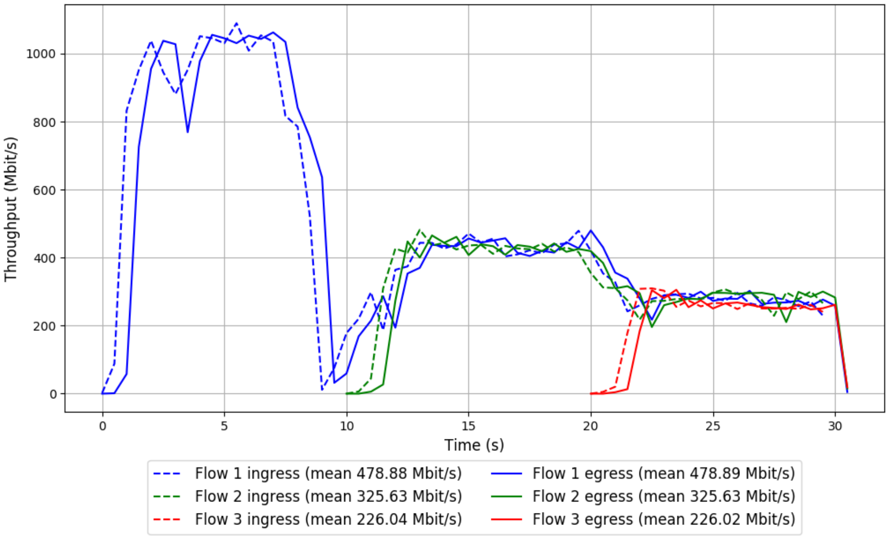


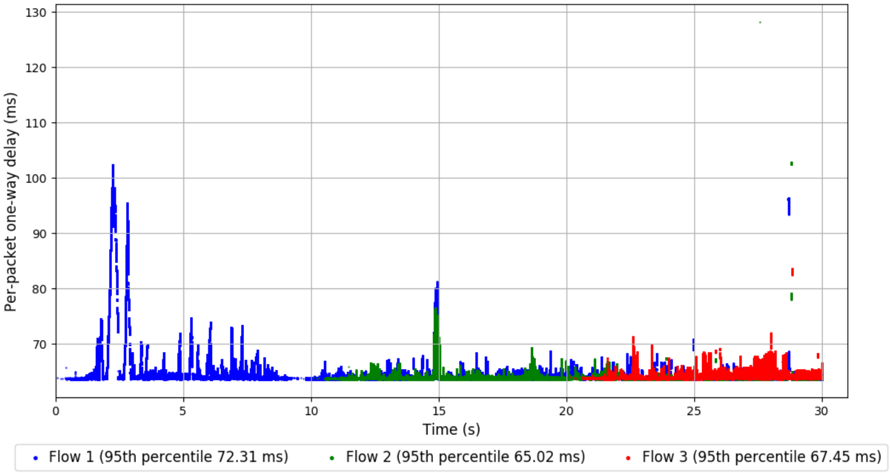
```
Run 2: Statistics of FillP-Sheep

Start at: 2018-12-20 13:33:21
End at: 2018-12-20 13:33:51
Local clock offset: -0.029 ms
Remote clock offset: 0.812 ms

# Below is generated by plot.py at 2018-12-20 16:44:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 769.56 Mbit/s
95th percentile per-packet one-way delay: 69.425 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 478.89 Mbit/s
95th percentile per-packet one-way delay: 72.312 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 325.63 Mbit/s
95th percentile per-packet one-way delay: 65.021 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 226.02 Mbit/s
95th percentile per-packet one-way delay: 67.452 ms
Loss rate: 0.00%
```

Run 2: Report of FillP-Sheep — Data Link



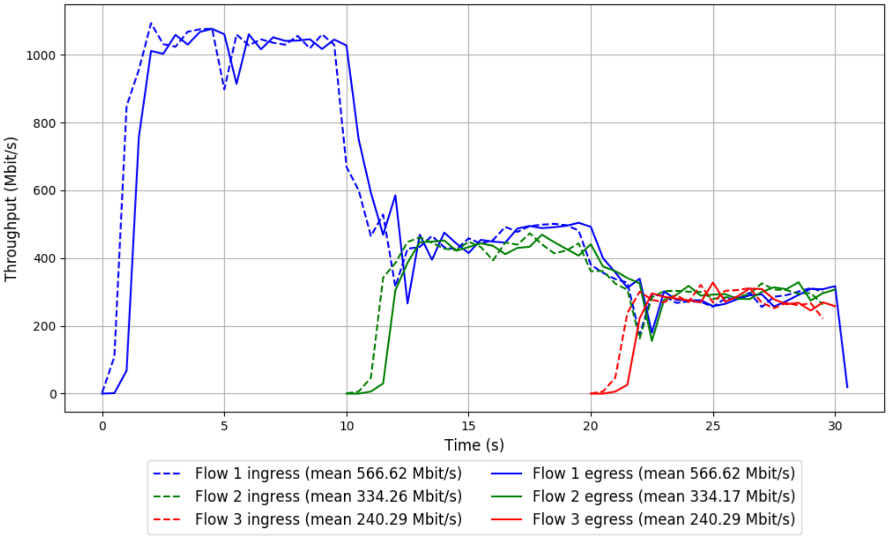


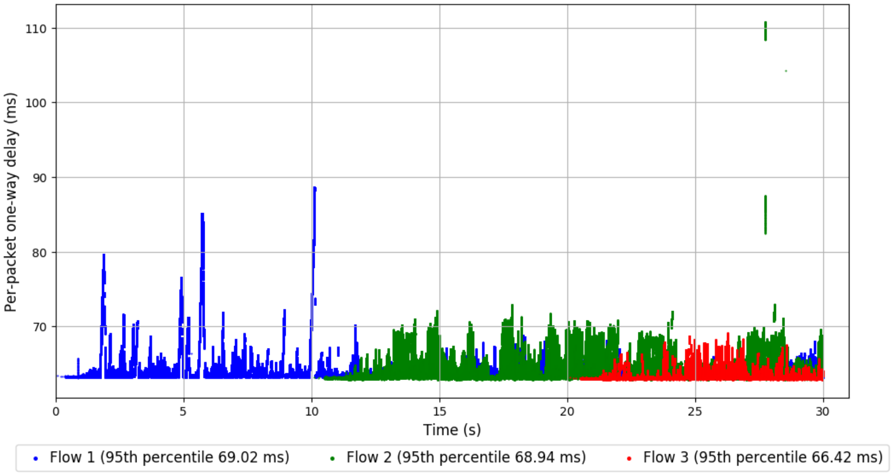
```
Run 3: Statistics of FillP-Sheep

Start at: 2018-12-20 14:07:11
End at: 2018-12-20 14:07:41
Local clock offset: -0.05 ms
Remote clock offset: 0.225 ms

# Below is generated by plot.py at 2018-12-20 16:44:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 867.75 Mbit/s
95th percentile per-packet one-way delay: 68.723 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 566.62 Mbit/s
95th percentile per-packet one-way delay: 69.024 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 334.17 Mbit/s
95th percentile per-packet one-way delay: 68.936 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 240.29 Mbit/s
95th percentile per-packet one-way delay: 66.421 ms
Loss rate: 0.00%
```

Run 3: Report of FillP-Sheep — Data Link



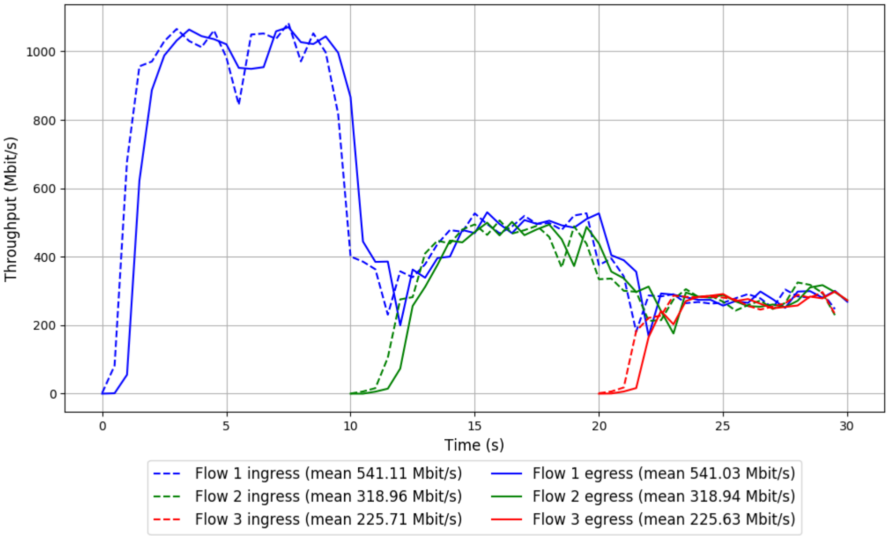


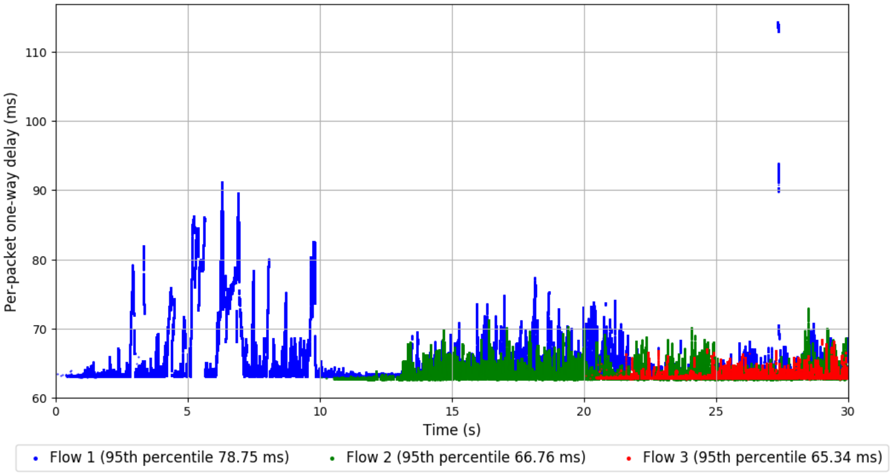
```
Run 4: Statistics of FillP-Sheep

Start at: 2018-12-20 14:40:58
End at: 2018-12-20 14:41:28
Local clock offset: -0.044 ms
Remote clock offset: 0.02 ms

# Below is generated by plot.py at 2018-12-20 16:44:54
# Datalink statistics
-- Total of 3 flows:
Average throughput: 827.59 Mbit/s
95th percentile per-packet one-way delay: 76.130 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 541.03 Mbit/s
95th percentile per-packet one-way delay: 78.755 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 318.94 Mbit/s
95th percentile per-packet one-way delay: 66.762 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 225.63 Mbit/s
95th percentile per-packet one-way delay: 65.338 ms
Loss rate: 0.04%
```

Run 4: Report of FillP-Sheep — Data Link



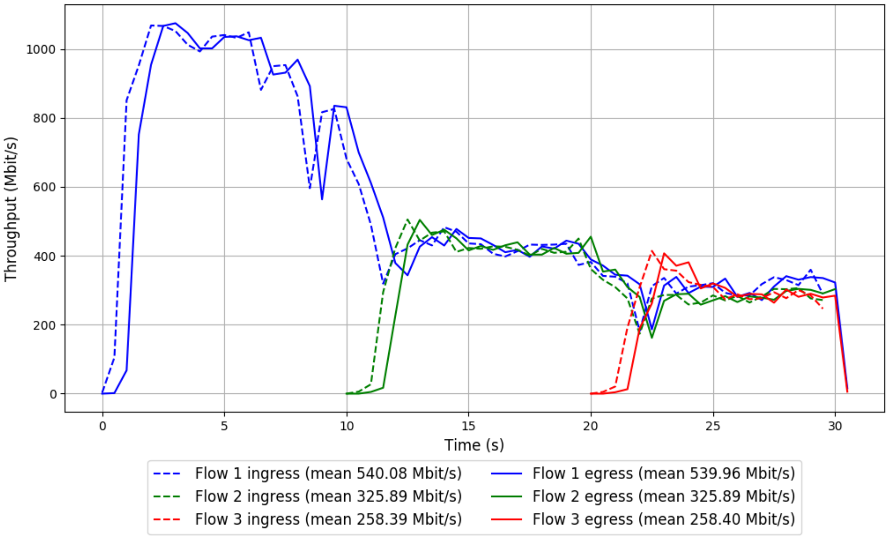


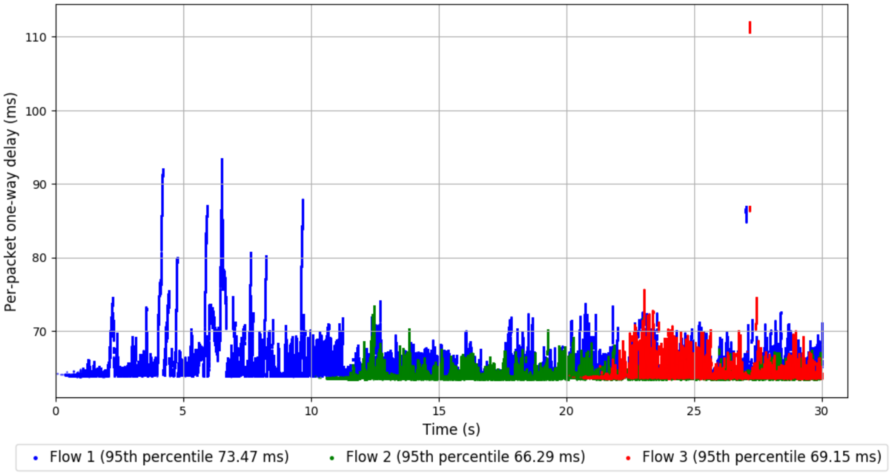
```
Run 5: Statistics of FillP-Sheep

Start at: 2018-12-20 15:14:42
End at: 2018-12-20 15:15:12
Local clock offset: -0.054 ms
Remote clock offset: 0.707 ms

# Below is generated by plot.py at 2018-12-20 17:00:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 841.03 Mbit/s
95th percentile per-packet one-way delay: 71.570 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 539.96 Mbit/s
95th percentile per-packet one-way delay: 73.473 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 325.89 Mbit/s
95th percentile per-packet one-way delay: 66.288 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 258.40 Mbit/s
95th percentile per-packet one-way delay: 69.154 ms
Loss rate: 0.00%
```

Run 5: Report of FillP-Sheep — Data Link



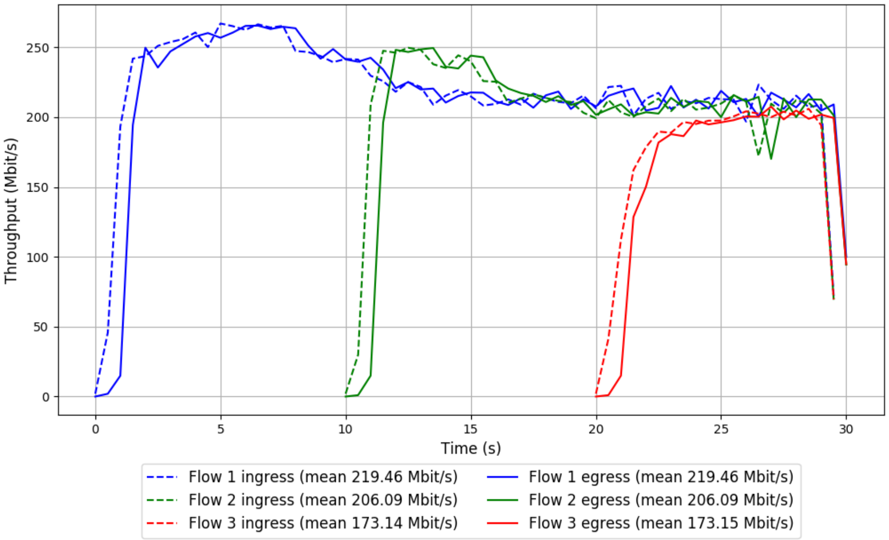


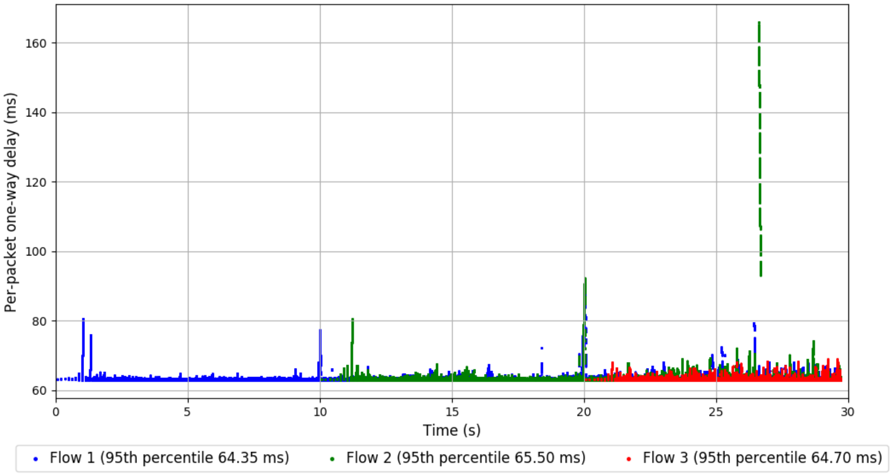
```
Run 1: Statistics of Indigo

Start at: 2018-12-20 12:54:30
End at: 2018-12-20 12:55:00
Local clock offset: -0.093 ms
Remote clock offset: 0.041 ms

# Below is generated by plot.py at 2018-12-20 17:00:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 412.30 Mbit/s
95th percentile per-packet one-way delay: 64.695 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 219.46 Mbit/s
95th percentile per-packet one-way delay: 64.353 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 206.09 Mbit/s
95th percentile per-packet one-way delay: 65.496 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 173.15 Mbit/s
95th percentile per-packet one-way delay: 64.696 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link



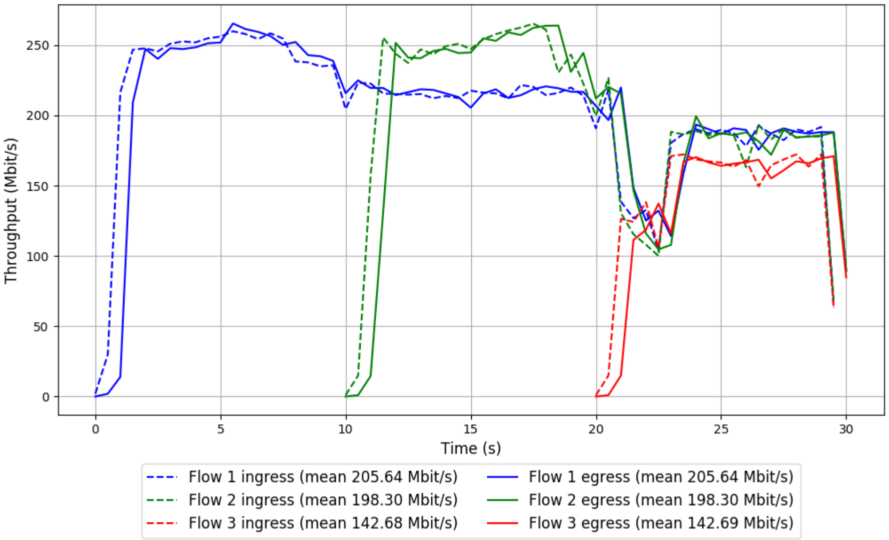


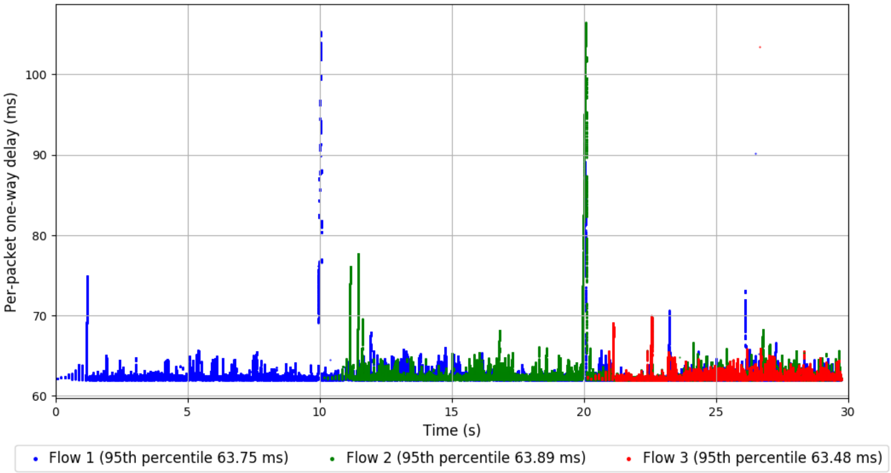
```
Run 2: Statistics of Indigo

Start at: 2018-12-20 13:28:11
End at: 2018-12-20 13:28:41
Local clock offset: -0.073 ms
Remote clock offset: -0.751 ms

# Below is generated by plot.py at 2018-12-20 17:00:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 382.53 Mbit/s
95th percentile per-packet one-way delay: 63.762 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 205.64 Mbit/s
95th percentile per-packet one-way delay: 63.747 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 198.30 Mbit/s
95th percentile per-packet one-way delay: 63.888 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 142.69 Mbit/s
95th percentile per-packet one-way delay: 63.477 ms
Loss rate: 0.00%
```

Run 2: Report of Indigo — Data Link



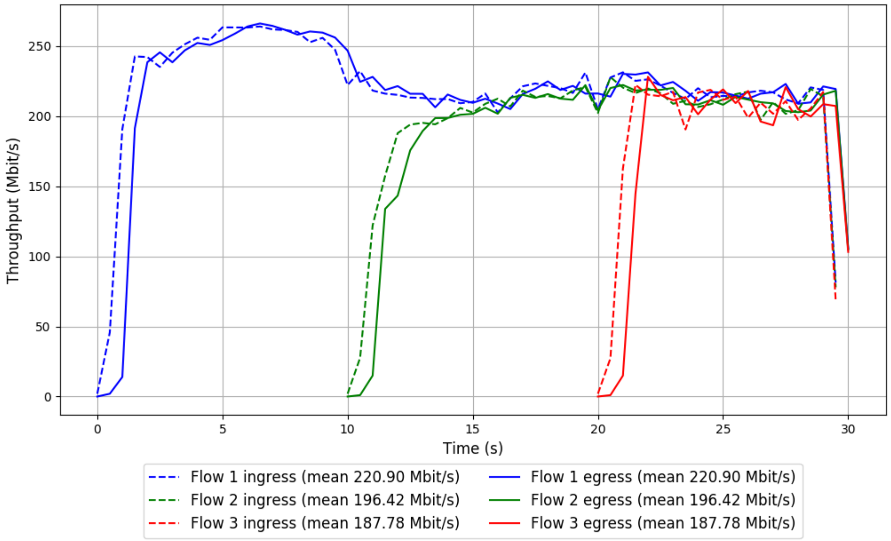


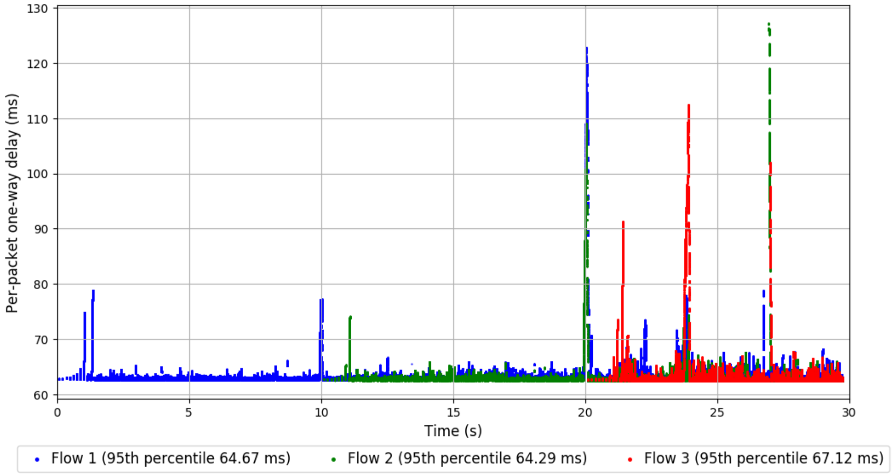
```
Run 3: Statistics of Indigo

Start at: 2018-12-20 14:01:55
End at: 2018-12-20 14:02:25
Local clock offset: 0.035 ms
Remote clock offset: -0.03 ms

# Below is generated by plot.py at 2018-12-20 17:00:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 411.90 Mbit/s
95th percentile per-packet one-way delay: 64.833 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 220.90 Mbit/s
95th percentile per-packet one-way delay: 64.667 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 196.42 Mbit/s
95th percentile per-packet one-way delay: 64.287 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 187.78 Mbit/s
95th percentile per-packet one-way delay: 67.119 ms
Loss rate: 0.00%
```

Run 3: Report of Indigo — Data Link



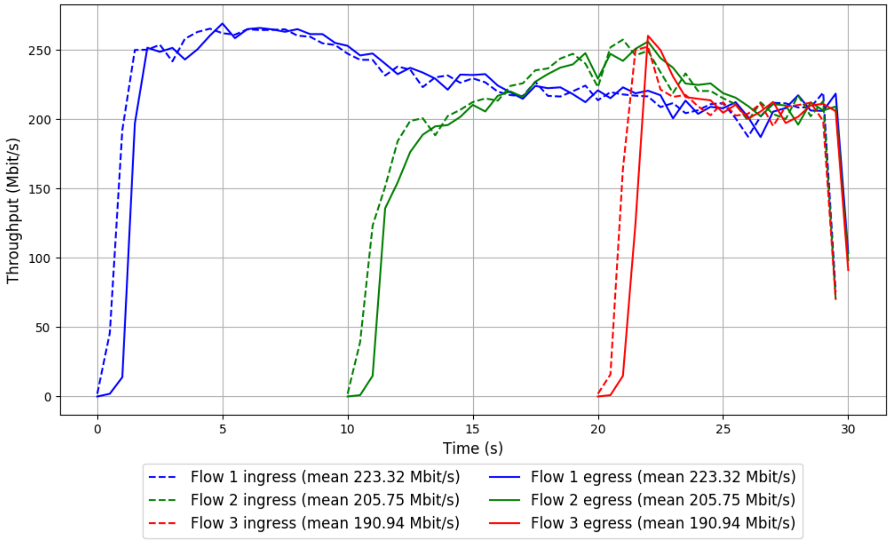


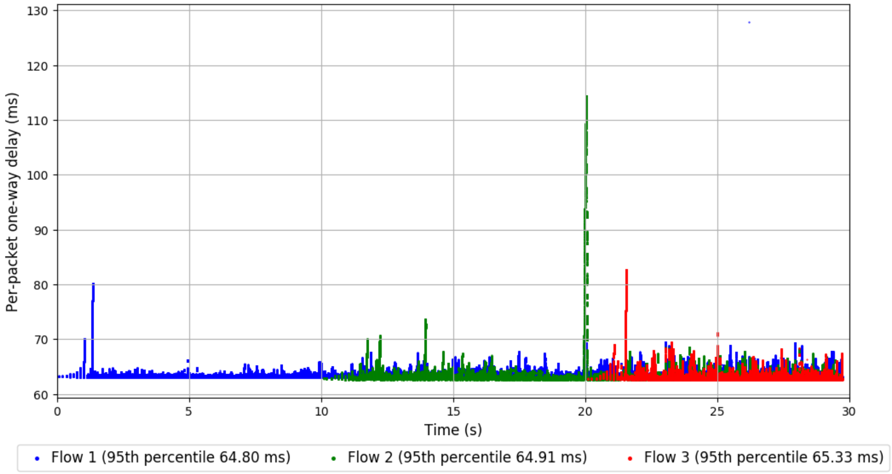
```
Run 4: Statistics of Indigo

Start at: 2018-12-20 14:35:40
End at: 2018-12-20 14:36:10
Local clock offset: -0.132 ms
Remote clock offset: -0.035 ms

# Below is generated by plot.py at 2018-12-20 17:00:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 421.48 Mbit/s
95th percentile per-packet one-way delay: 64.897 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 223.32 Mbit/s
95th percentile per-packet one-way delay: 64.795 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 205.75 Mbit/s
95th percentile per-packet one-way delay: 64.914 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 190.94 Mbit/s
95th percentile per-packet one-way delay: 65.325 ms
Loss rate: 0.00%
```

Run 4: Report of Indigo — Data Link



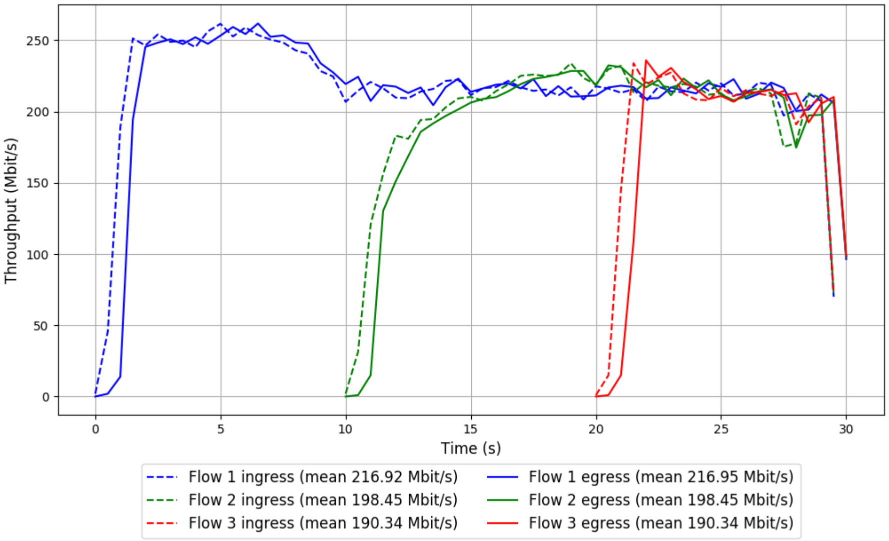


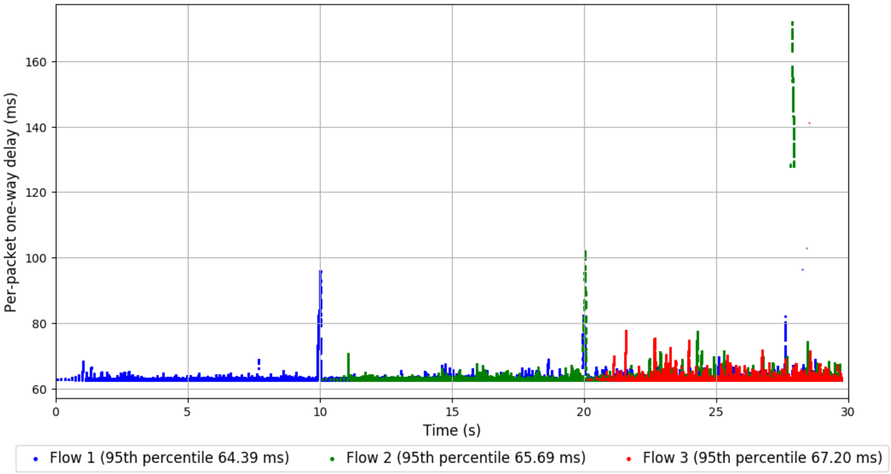
```
Run 5: Statistics of Indigo

Start at: 2018-12-20 15:09:22
End at: 2018-12-20 15:09:52
Local clock offset: -0.019 ms
Remote clock offset: -0.028 ms

# Below is generated by plot.py at 2018-12-20 17:00:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 409.81 Mbit/s
95th percentile per-packet one-way delay: 65.164 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 216.95 Mbit/s
95th percentile per-packet one-way delay: 64.395 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 198.45 Mbit/s
95th percentile per-packet one-way delay: 65.692 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 190.34 Mbit/s
95th percentile per-packet one-way delay: 67.200 ms
Loss rate: 0.00%
```

Run 5: Report of Indigo — Data Link



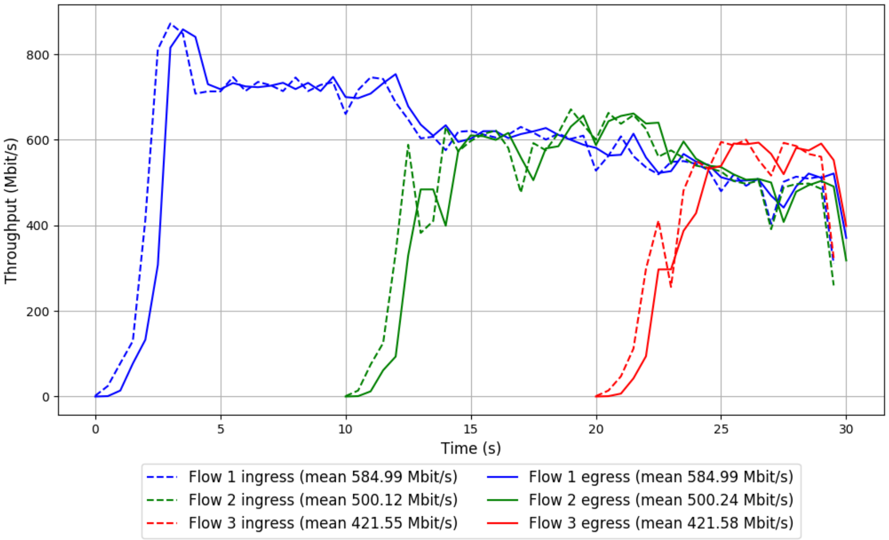


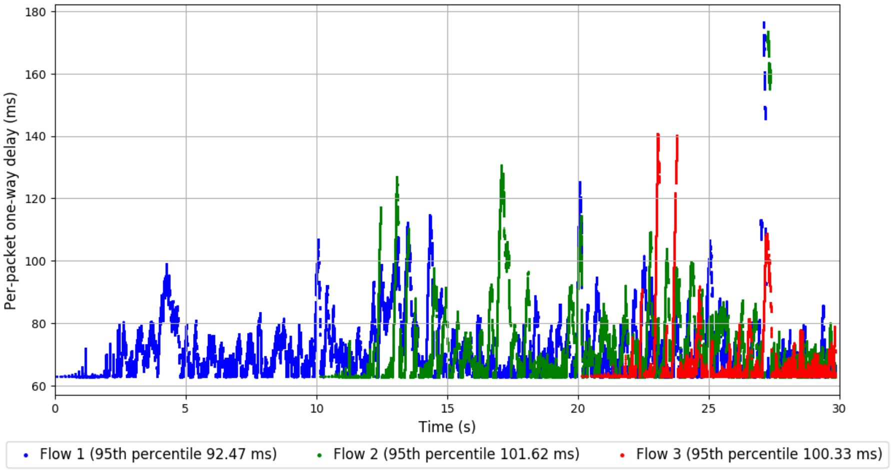
```
Run 1: Statistics of Indigo-MusesD

Start at: 2018-12-20 13:09:47
End at: 2018-12-20 13:10:17
Local clock offset: -0.096 ms
Remote clock offset: -0.015 ms

# Below is generated by plot.py at 2018-12-20 17:03:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1053.42 Mbit/s
95th percentile per-packet one-way delay: 95.787 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 584.99 Mbit/s
95th percentile per-packet one-way delay: 92.472 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 500.24 Mbit/s
95th percentile per-packet one-way delay: 101.620 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 421.58 Mbit/s
95th percentile per-packet one-way delay: 100.331 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo-MusesD — Data Link



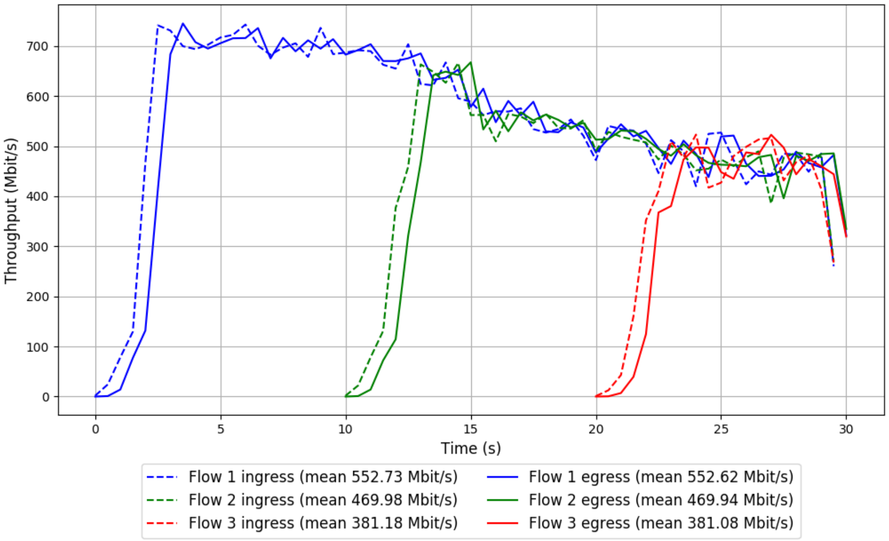


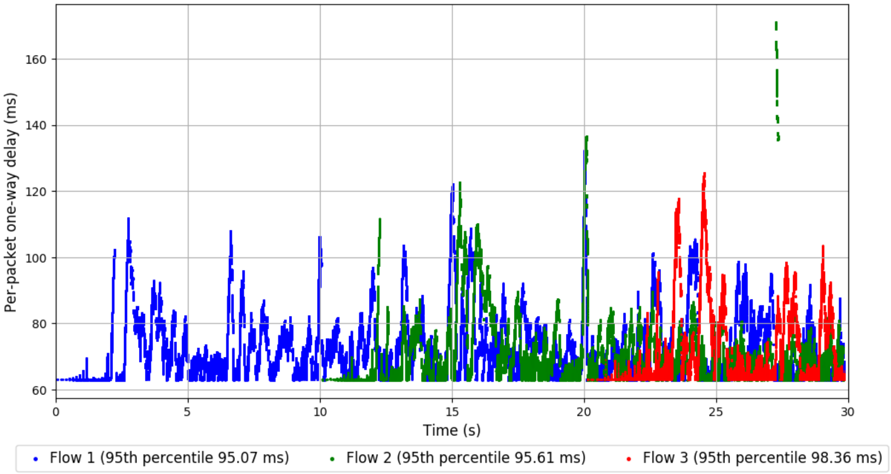
```
Run 2: Statistics of Indigo-MusesD

Start at: 2018-12-20 13:43:35
End at: 2018-12-20 13:44:05
Local clock offset: 0.019 ms
Remote clock offset: 0.145 ms

# Below is generated by plot.py at 2018-12-20 17:03:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 988.68 Mbit/s
95th percentile per-packet one-way delay: 95.647 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 552.62 Mbit/s
95th percentile per-packet one-way delay: 95.071 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 469.94 Mbit/s
95th percentile per-packet one-way delay: 95.605 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 381.08 Mbit/s
95th percentile per-packet one-way delay: 98.362 ms
Loss rate: 0.02%
```

Run 2: Report of Indigo-MusesD — Data Link



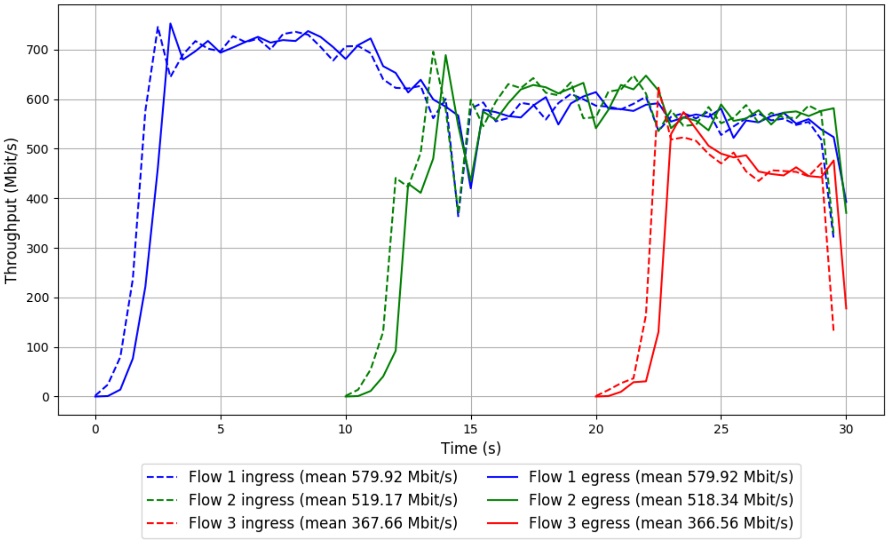


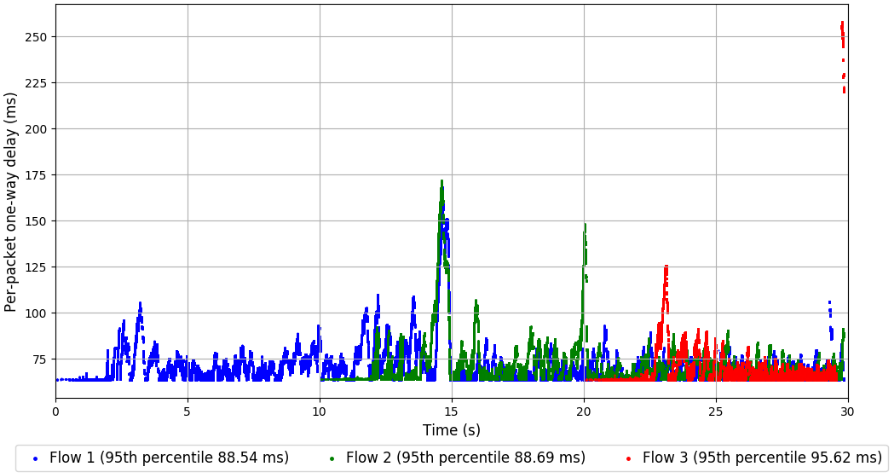
```
Run 3: Statistics of Indigo-MusesD

Start at: 2018-12-20 14:17:23
End at: 2018-12-20 14:17:53
Local clock offset: -0.092 ms
Remote clock offset: 0.683 ms

# Below is generated by plot.py at 2018-12-20 17:16:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1044.23 Mbit/s
95th percentile per-packet one-way delay: 89.312 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 579.92 Mbit/s
95th percentile per-packet one-way delay: 88.537 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 518.34 Mbit/s
95th percentile per-packet one-way delay: 88.691 ms
Loss rate: 0.16%
-- Flow 3:
Average throughput: 366.56 Mbit/s
95th percentile per-packet one-way delay: 95.618 ms
Loss rate: 0.14%
```

Run 3: Report of Indigo-MusesD — Data Link



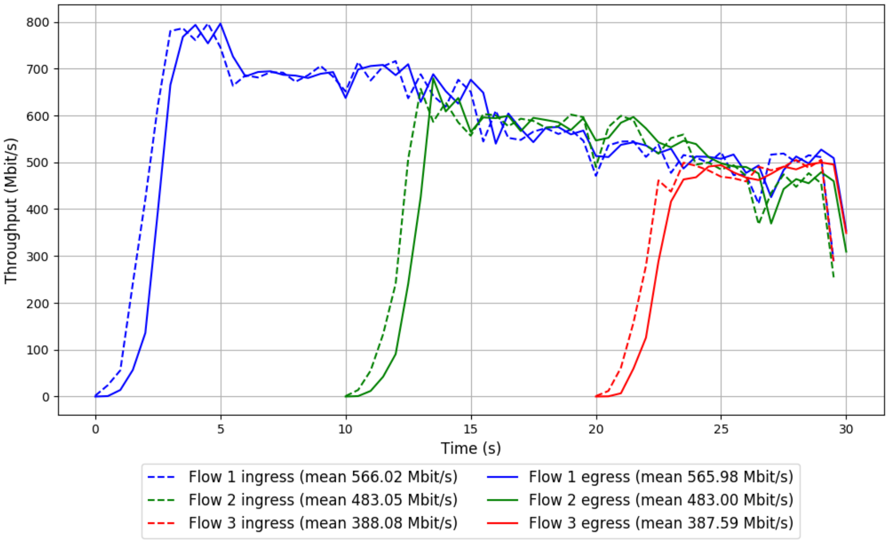


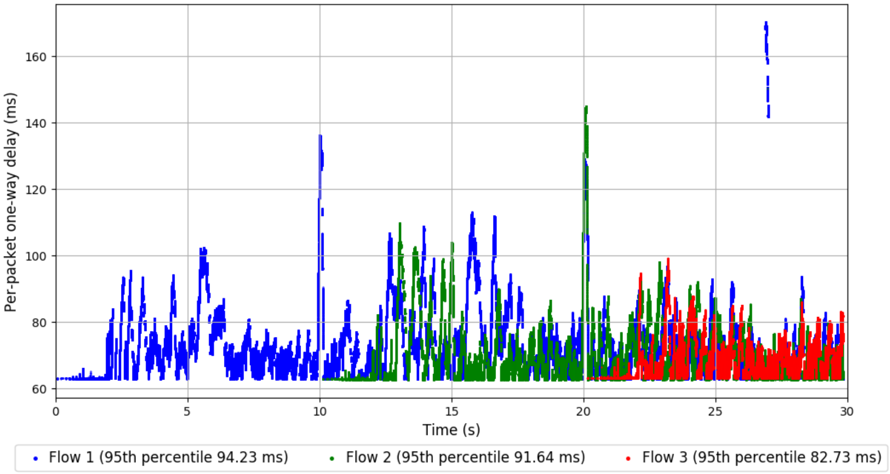
```
Run 4: Statistics of Indigo-MusesD

Start at: 2018-12-20 14:51:10
End at: 2018-12-20 14:51:40
Local clock offset: -0.04 ms
Remote clock offset: -0.015 ms

# Below is generated by plot.py at 2018-12-20 17:16:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1011.93 Mbit/s
95th percentile per-packet one-way delay: 92.137 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 565.98 Mbit/s
95th percentile per-packet one-way delay: 94.231 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 483.00 Mbit/s
95th percentile per-packet one-way delay: 91.638 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 387.59 Mbit/s
95th percentile per-packet one-way delay: 82.729 ms
Loss rate: 0.15%
```

Run 4: Report of Indigo-MusesD — Data Link



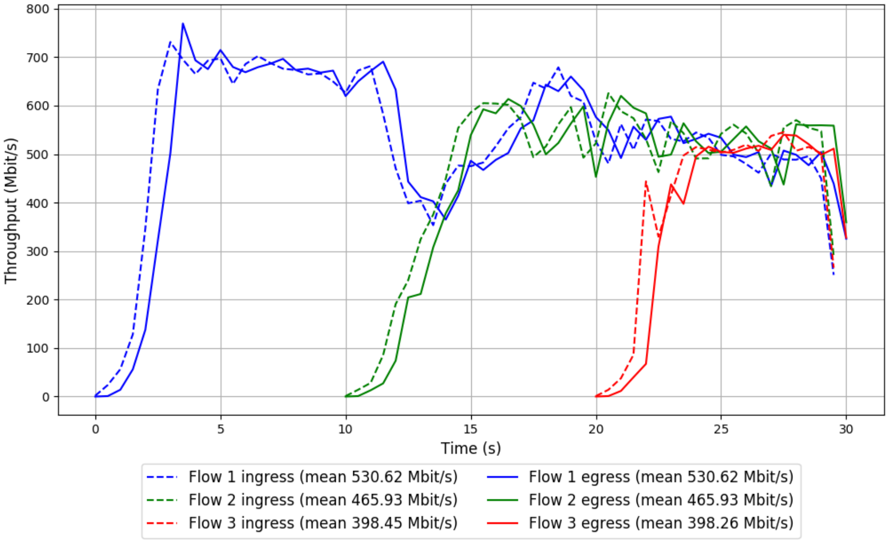


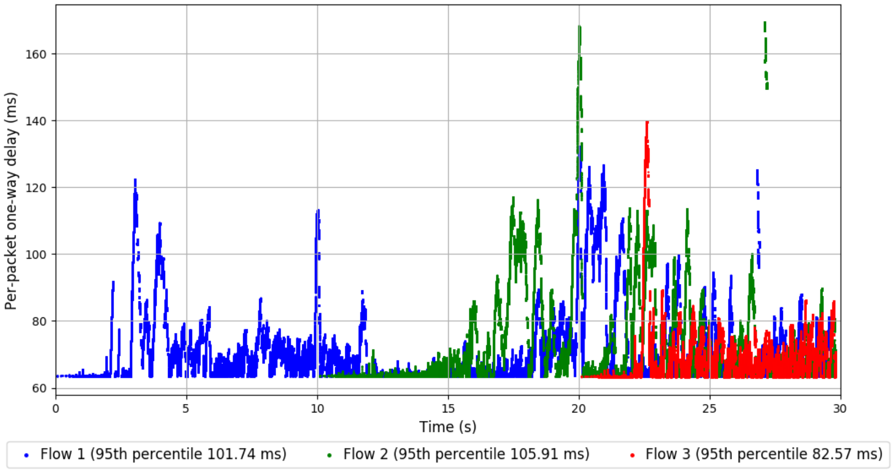
```
Run 5: Statistics of Indigo-MusesD

Start at: 2018-12-20 15:24:51
End at: 2018-12-20 15:25:21
Local clock offset: -0.047 ms
Remote clock offset: 0.493 ms

# Below is generated by plot.py at 2018-12-20 17:16:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 969.74 Mbit/s
95th percentile per-packet one-way delay: 103.075 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 530.62 Mbit/s
95th percentile per-packet one-way delay: 101.741 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 465.93 Mbit/s
95th percentile per-packet one-way delay: 105.908 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 398.26 Mbit/s
95th percentile per-packet one-way delay: 82.573 ms
Loss rate: 0.04%
```

Run 5: Report of Indigo-MusesD — Data Link

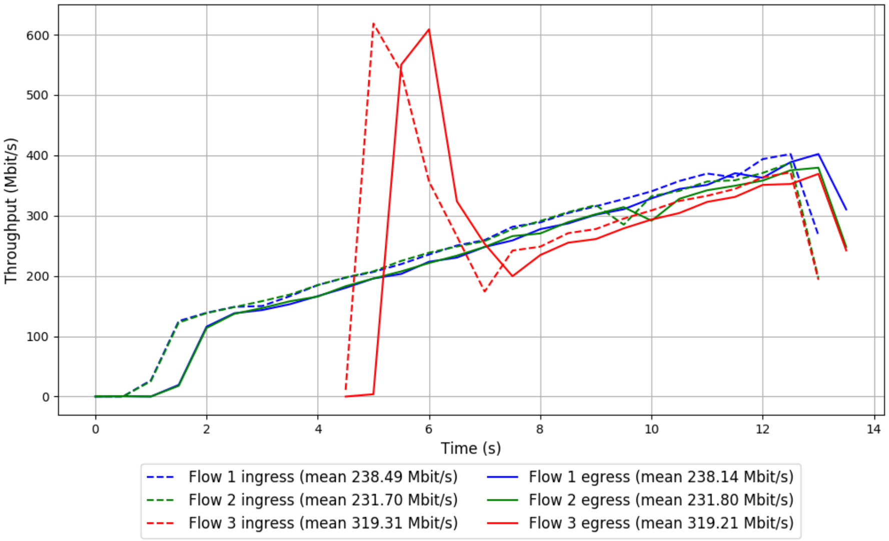


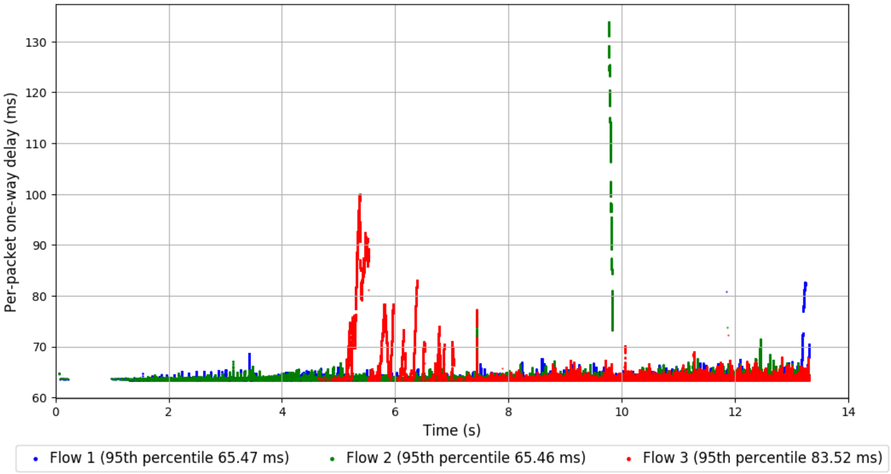


```
Run 1: Statistics of Indigo-MusesT

Start at: 2018-12-20 12:44:19
End at: 2018-12-20 12:44:49
Local clock offset: -0.065 ms
Remote clock offset: 0.556 ms
```

Run 1: Report of Indigo-MusesT — Data Link



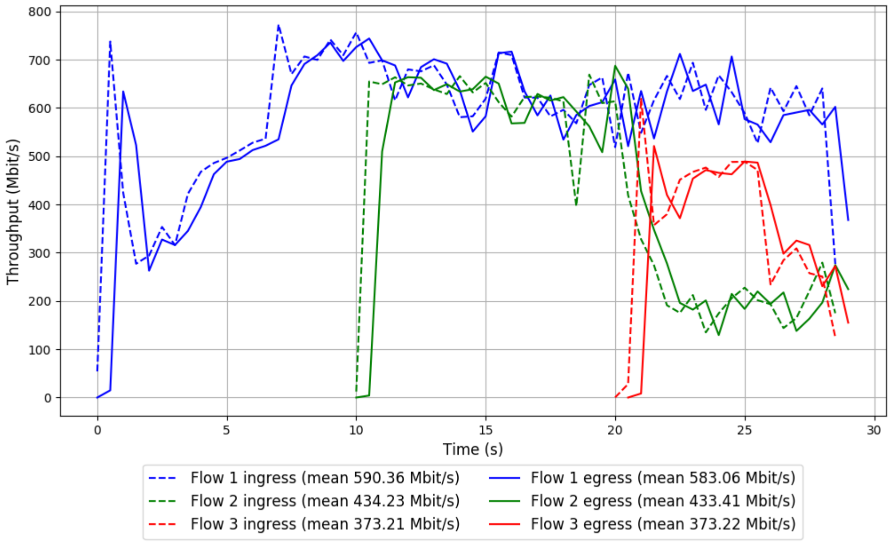


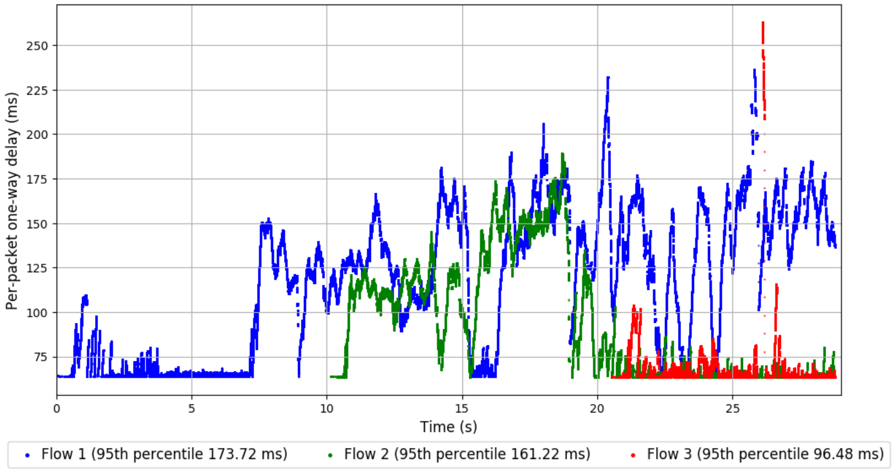
```
Run 2: Statistics of Indigo-MusesT

Start at: 2018-12-20 13:17:15
End at: 2018-12-20 13:17:45
Local clock offset: -0.068 ms
Remote clock offset: 0.775 ms

# Below is generated by plot.py at 2018-12-20 17:16:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 971.33 Mbit/s
95th percentile per-packet one-way delay: 170.607 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 583.06 Mbit/s
95th percentile per-packet one-way delay: 173.722 ms
Loss rate: 1.23%
-- Flow 2:
Average throughput: 433.41 Mbit/s
95th percentile per-packet one-way delay: 161.215 ms
Loss rate: 0.19%
-- Flow 3:
Average throughput: 373.22 Mbit/s
95th percentile per-packet one-way delay: 96.481 ms
Loss rate: 0.00%
```

Run 2: Report of Indigo-MusesT — Data Link



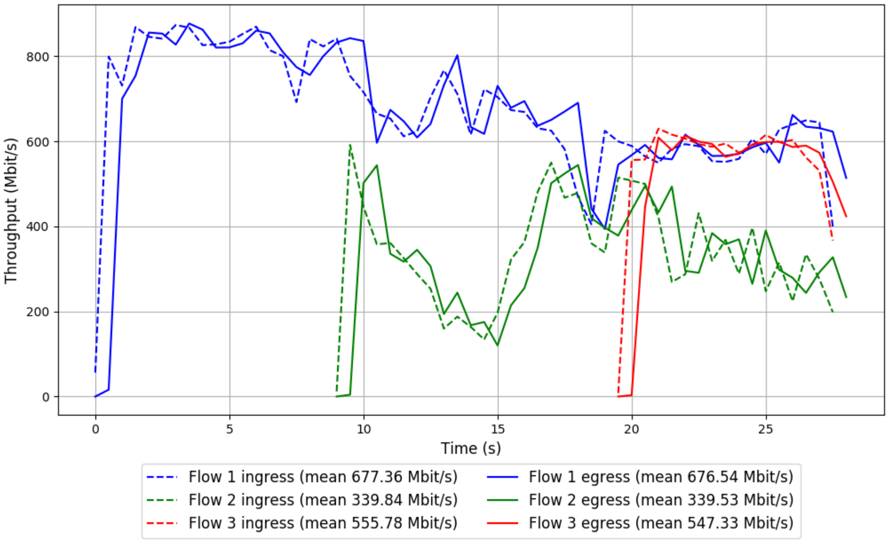


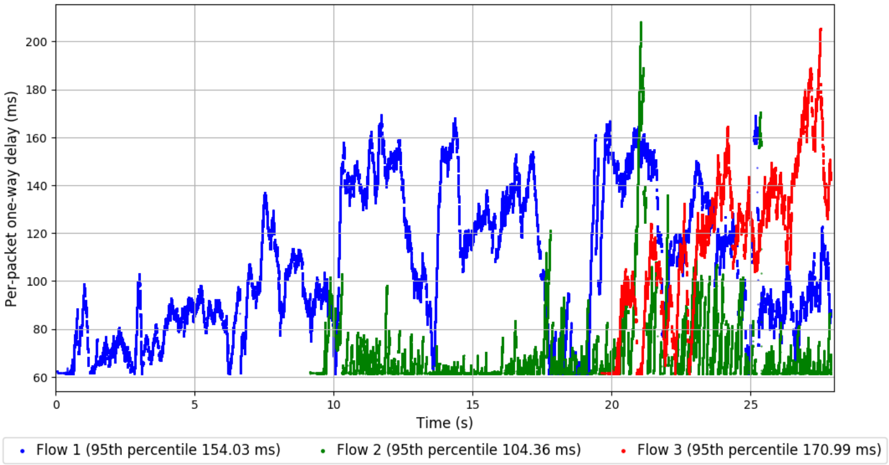
```
Run 3: Statistics of Indigo-MusesT

Start at: 2018-12-20 13:51:12
End at: 2018-12-20 13:51:42
Local clock offset: 0.01 ms
Remote clock offset: -1.314 ms

# Below is generated by plot.py at 2018-12-20 17:19:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1067.79 Mbit/s
95th percentile per-packet one-way delay: 154.768 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 676.54 Mbit/s
95th percentile per-packet one-way delay: 154.025 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 339.53 Mbit/s
95th percentile per-packet one-way delay: 104.360 ms
Loss rate: 0.10%
-- Flow 3:
Average throughput: 547.33 Mbit/s
95th percentile per-packet one-way delay: 170.985 ms
Loss rate: 1.53%
```

Run 3: Report of Indigo-MusesT — Data Link



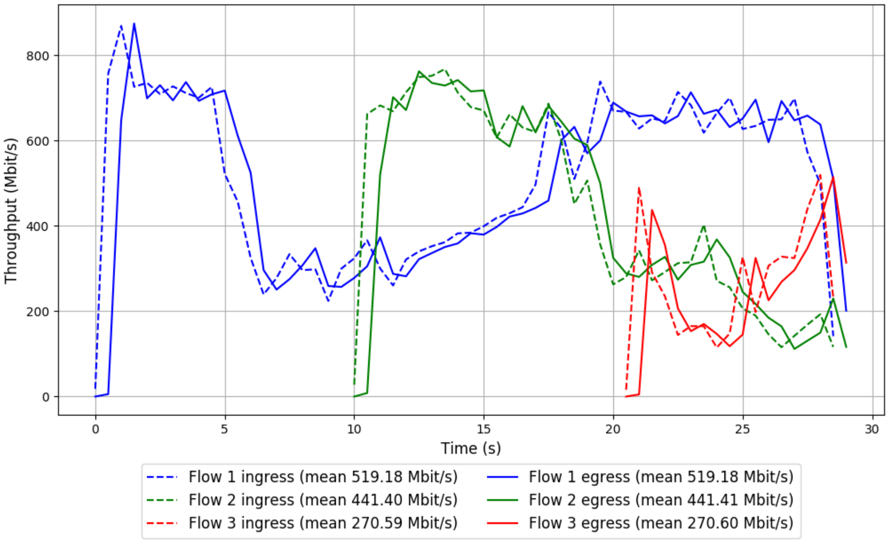


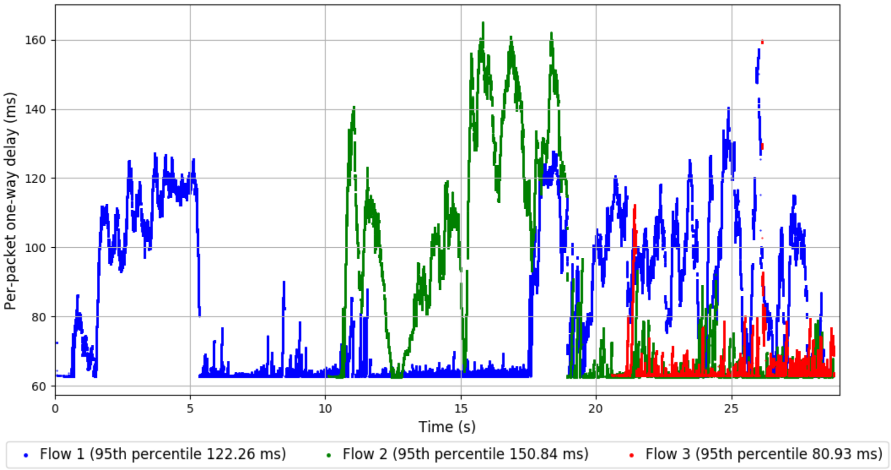
```
Run 4: Statistics of Indigo-MusesT

Start at: 2018-12-20 14:24:54
End at: 2018-12-20 14:25:24
Local clock offset: -0.083 ms
Remote clock offset: 0.031 ms

# Below is generated by plot.py at 2018-12-20 17:19:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 883.28 Mbit/s
95th percentile per-packet one-way delay: 136.146 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 519.18 Mbit/s
95th percentile per-packet one-way delay: 122.257 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 441.41 Mbit/s
95th percentile per-packet one-way delay: 150.839 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 270.60 Mbit/s
95th percentile per-packet one-way delay: 80.933 ms
Loss rate: 0.00%
```

Run 4: Report of Indigo-MusesT — Data Link



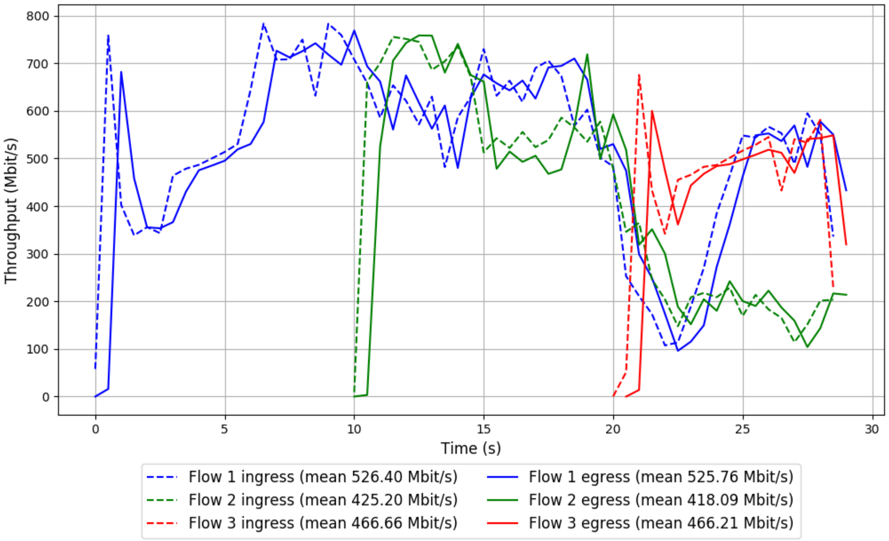


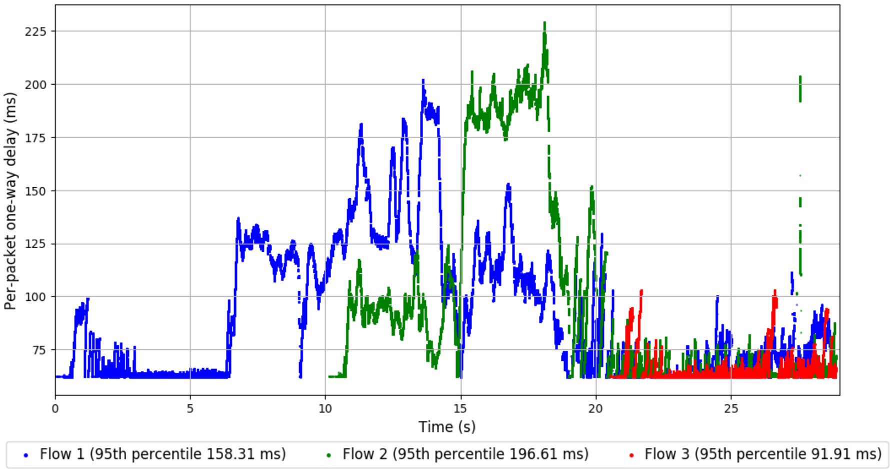
```
Run 5: Statistics of Indigo-MusesT

Start at: 2018-12-20 14:58:37
End at: 2018-12-20 14:59:07
Local clock offset: -0.041 ms
Remote clock offset: -0.637 ms

# Below is generated by plot.py at 2018-12-20 17:21:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 932.58 Mbit/s
95th percentile per-packet one-way delay: 185.246 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 525.76 Mbit/s
95th percentile per-packet one-way delay: 158.312 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 418.09 Mbit/s
95th percentile per-packet one-way delay: 196.609 ms
Loss rate: 1.71%
-- Flow 3:
Average throughput: 466.21 Mbit/s
95th percentile per-packet one-way delay: 91.906 ms
Loss rate: 0.09%
```

Run 5: Report of Indigo-MusesT — Data Link



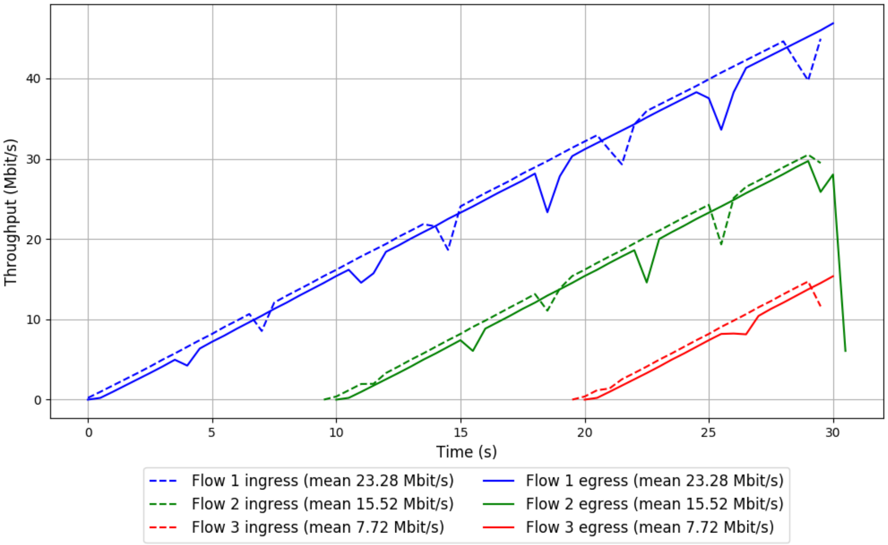


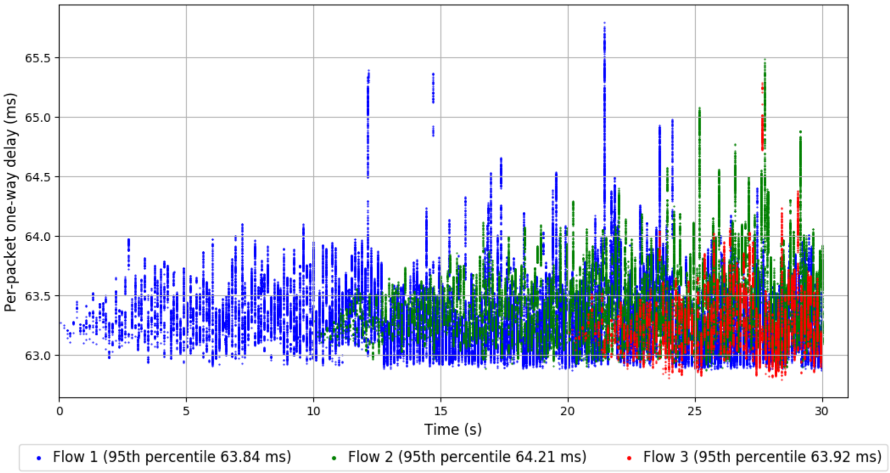
```
Run 1: Statistics of LEDBAT

Start at: 2018-12-20 12:58:21
End at: 2018-12-20 12:58:51
Local clock offset: -0.074 ms
Remote clock offset: -0.172 ms

# Below is generated by plot.py at 2018-12-20 17:21:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 36.14 Mbit/s
95th percentile per-packet one-way delay: 63.977 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 23.28 Mbit/s
95th percentile per-packet one-way delay: 63.839 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 15.52 Mbit/s
95th percentile per-packet one-way delay: 64.210 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 7.72 Mbit/s
95th percentile per-packet one-way delay: 63.924 ms
Loss rate: 0.00%
```

Run 1: Report of LEDBAT — Data Link



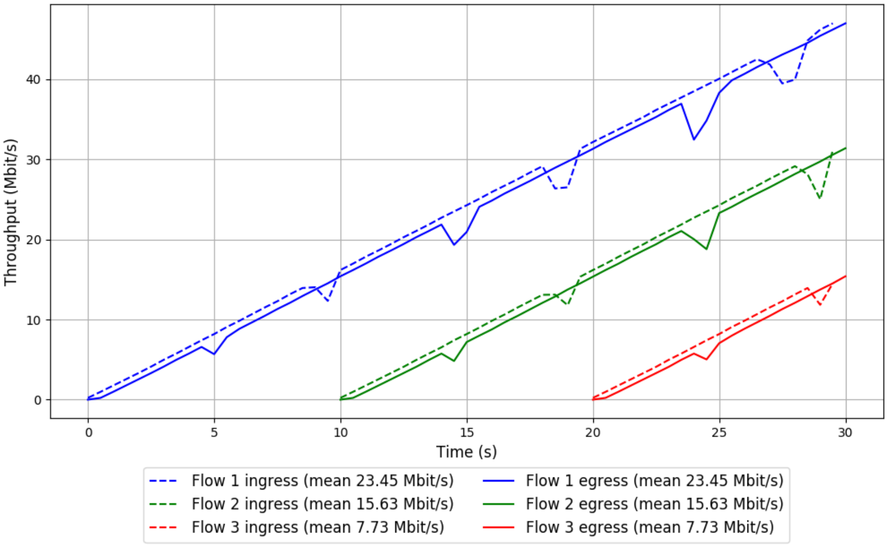


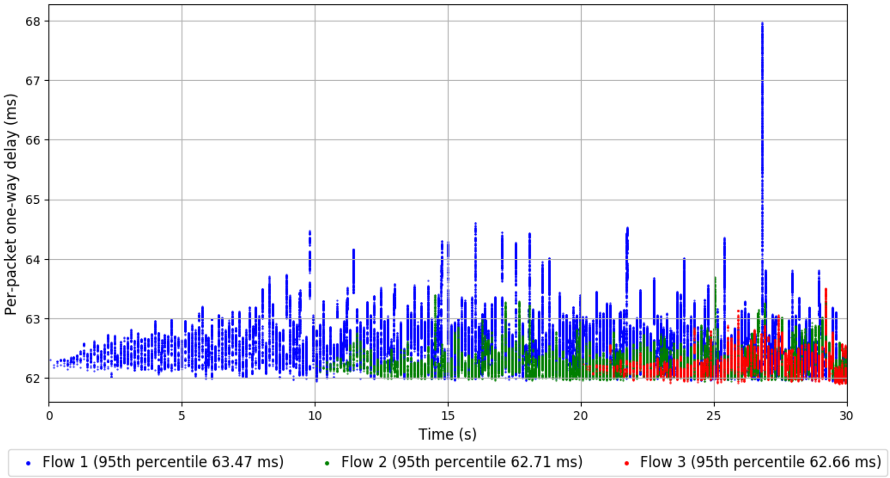
```
Run 2: Statistics of LEDBAT

Start at: 2018-12-20 13:32:05
End at: 2018-12-20 13:32:35
Local clock offset: -0.023 ms
Remote clock offset: -0.789 ms

# Below is generated by plot.py at 2018-12-20 17:21:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 36.39 Mbit/s
95th percentile per-packet one-way delay: 63.248 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 23.45 Mbit/s
95th percentile per-packet one-way delay: 63.469 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 15.63 Mbit/s
95th percentile per-packet one-way delay: 62.710 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 7.73 Mbit/s
95th percentile per-packet one-way delay: 62.665 ms
Loss rate: 0.00%
```

Run 2: Report of LEDBAT — Data Link



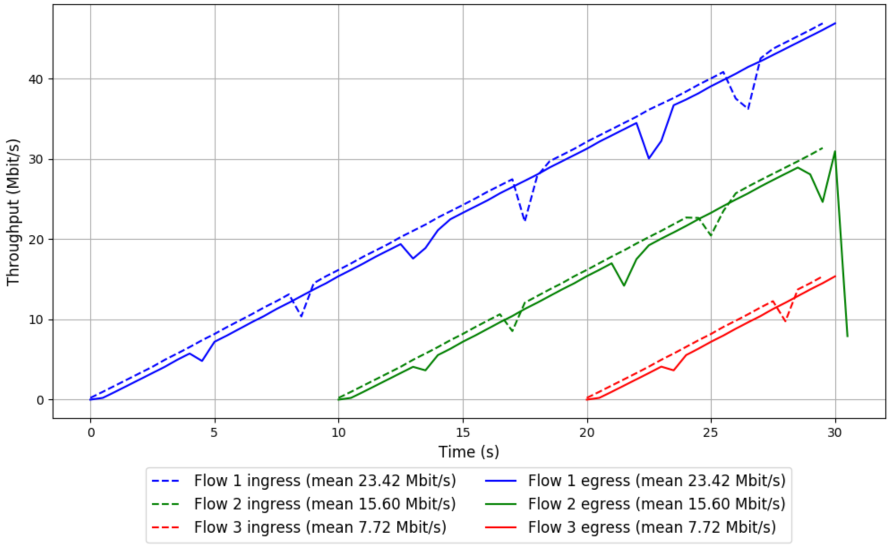


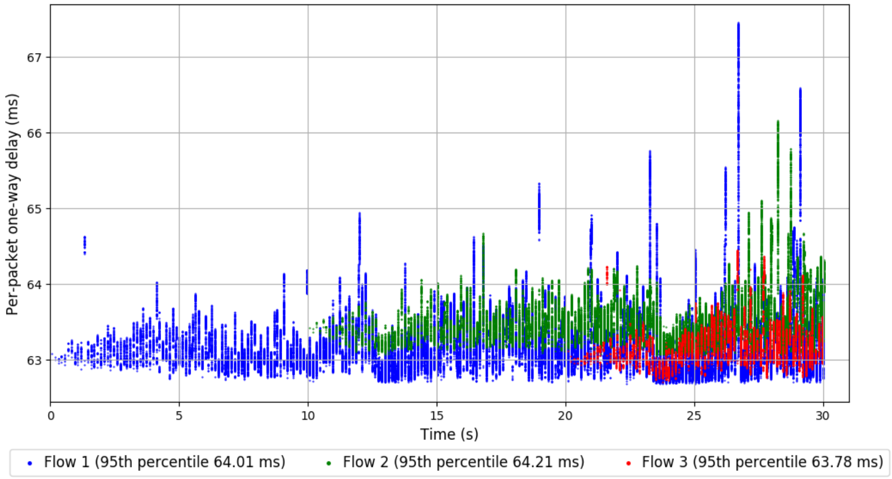
```
Run 3: Statistics of LEDBAT

Start at: 2018-12-20 14:05:55
End at: 2018-12-20 14:06:25
Local clock offset: -0.058 ms
Remote clock offset: -0.001 ms

# Below is generated by plot.py at 2018-12-20 17:21:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 36.33 Mbit/s
95th percentile per-packet one-way delay: 64.095 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 23.42 Mbit/s
95th percentile per-packet one-way delay: 64.007 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 15.60 Mbit/s
95th percentile per-packet one-way delay: 64.208 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 7.72 Mbit/s
95th percentile per-packet one-way delay: 63.776 ms
Loss rate: 0.00%
```

Run 3: Report of LEDBAT — Data Link



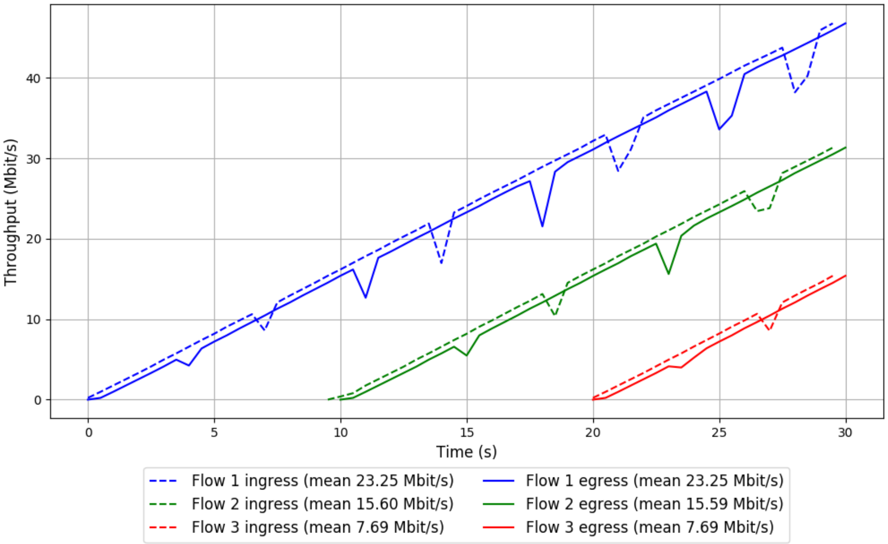


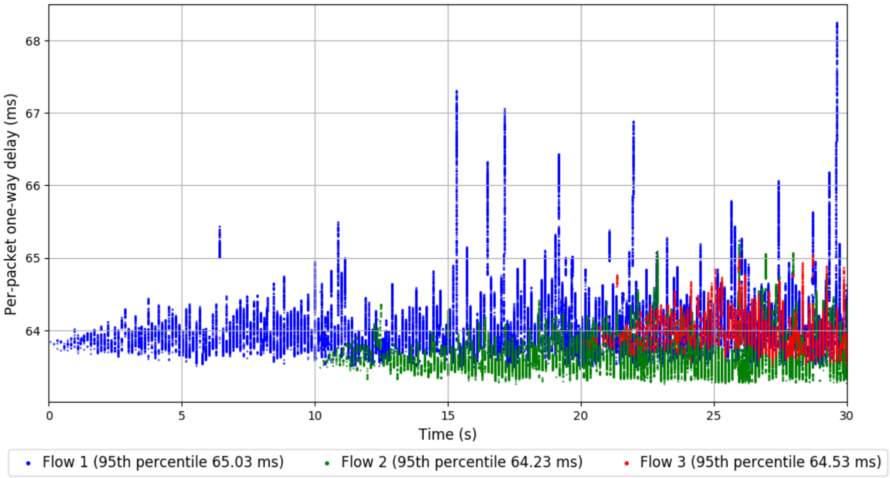
```
Run 4: Statistics of LEDBAT

Start at: 2018-12-20 14:39:41
End at: 2018-12-20 14:40:11
Local clock offset: -0.074 ms
Remote clock offset: 0.484 ms

# Below is generated by plot.py at 2018-12-20 17:21:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 36.18 Mbit/s
95th percentile per-packet one-way delay: 64.802 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 23.25 Mbit/s
95th percentile per-packet one-way delay: 65.025 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 15.59 Mbit/s
95th percentile per-packet one-way delay: 64.231 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 7.69 Mbit/s
95th percentile per-packet one-way delay: 64.527 ms
Loss rate: 0.00%
```

Run 4: Report of LEDBAT — Data Link



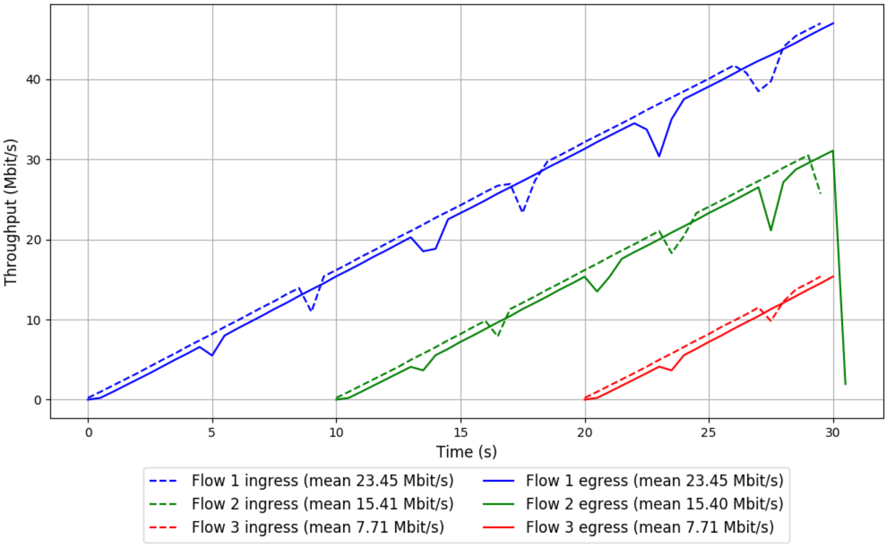


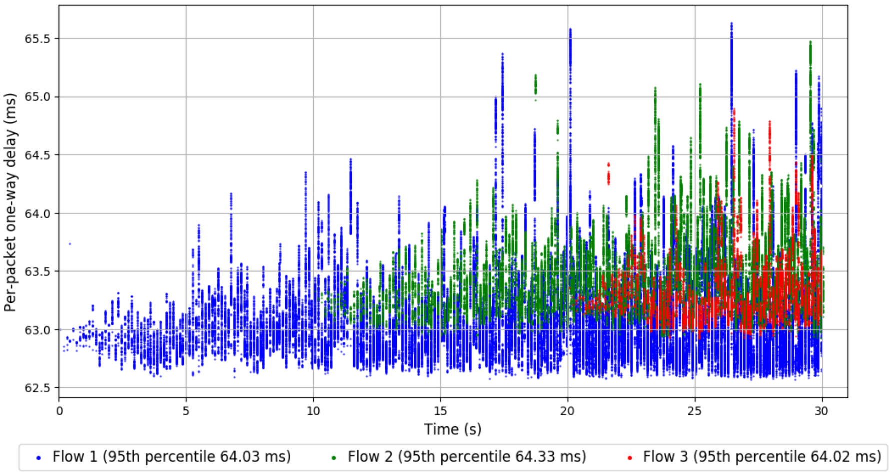
```
Run 5: Statistics of LEDBAT

Start at: 2018-12-20 15:13:25
End at: 2018-12-20 15:13:55
Local clock offset: 0.013 ms
Remote clock offset: -0.094 ms

# Below is generated by plot.py at 2018-12-20 17:21:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 36.20 Mbit/s
95th percentile per-packet one-way delay: 64.162 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 23.45 Mbit/s
95th percentile per-packet one-way delay: 64.033 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 15.40 Mbit/s
95th percentile per-packet one-way delay: 64.325 ms
Loss rate: 0.06%
-- Flow 3:
Average throughput: 7.71 Mbit/s
95th percentile per-packet one-way delay: 64.020 ms
Loss rate: 0.00%
```

Run 5: Report of LEDBAT — Data Link



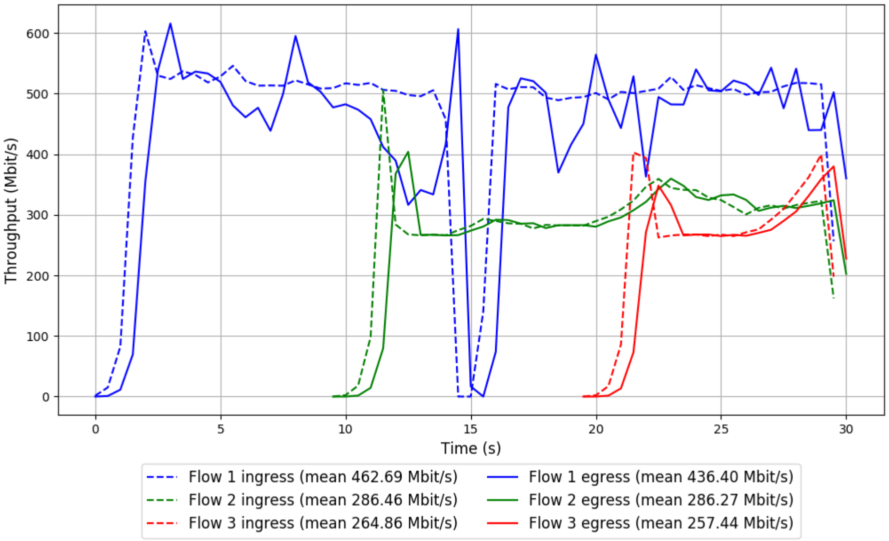


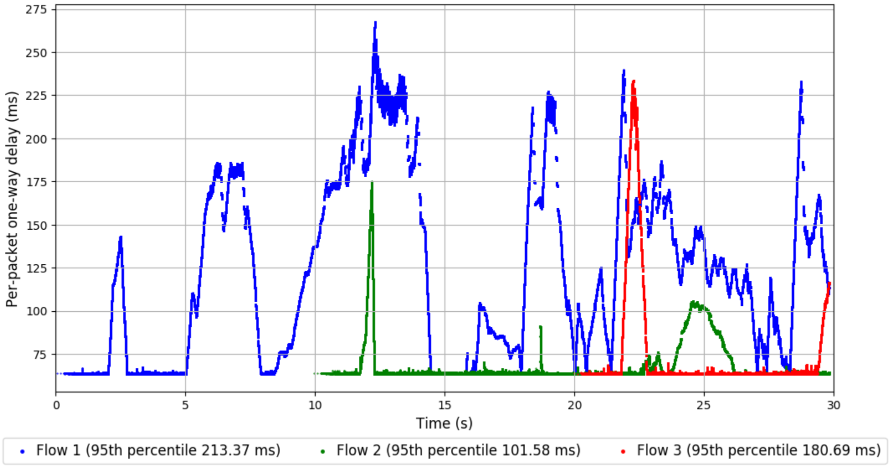
```
Run 1: Statistics of PCC-Allegro

Start at: 2018-12-20 13:05:50
End at: 2018-12-20 13:06:20
Local clock offset: -0.053 ms
Remote clock offset: 0.663 ms

# Below is generated by plot.py at 2018-12-20 17:35:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 712.37 Mbit/s
95th percentile per-packet one-way delay: 198.676 ms
Loss rate: 3.89%
-- Flow 1:
Average throughput: 436.40 Mbit/s
95th percentile per-packet one-way delay: 213.370 ms
Loss rate: 5.67%
-- Flow 2:
Average throughput: 286.27 Mbit/s
95th percentile per-packet one-way delay: 101.582 ms
Loss rate: 0.07%
-- Flow 3:
Average throughput: 257.44 Mbit/s
95th percentile per-packet one-way delay: 180.695 ms
Loss rate: 2.79%
```

Run 1: Report of PCC-Allegro — Data Link



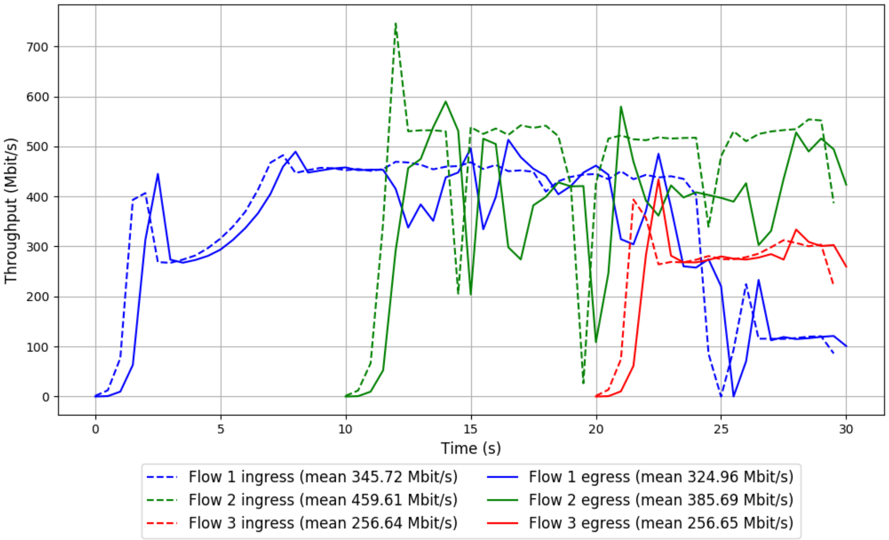


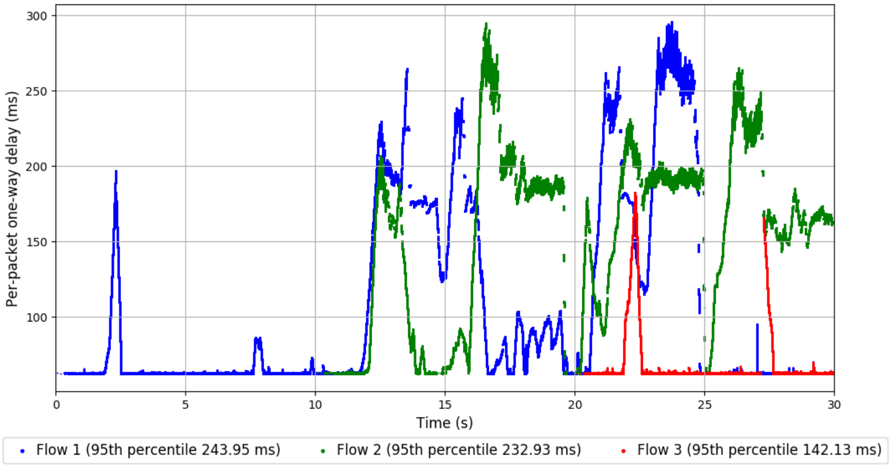
```
Run 2: Statistics of PCC-Allegro

Start at: 2018-12-20 13:39:33
End at: 2018-12-20 13:40:03
Local clock offset: 0.003 ms
Remote clock offset: -0.106 ms

# Below is generated by plot.py at 2018-12-20 17:41:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 665.96 Mbit/s
95th percentile per-packet one-way delay: 233.126 ms
Loss rate: 9.50%
-- Flow 1:
Average throughput: 324.96 Mbit/s
95th percentile per-packet one-way delay: 243.947 ms
Loss rate: 6.00%
-- Flow 2:
Average throughput: 385.69 Mbit/s
95th percentile per-packet one-way delay: 232.934 ms
Loss rate: 16.08%
-- Flow 3:
Average throughput: 256.65 Mbit/s
95th percentile per-packet one-way delay: 142.133 ms
Loss rate: 0.00%
```

Run 2: Report of PCC-Allegro — Data Link



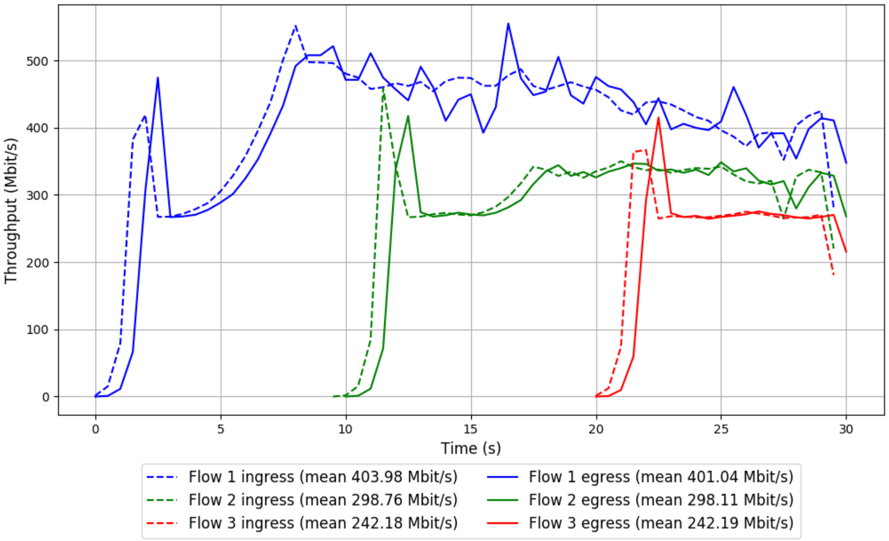


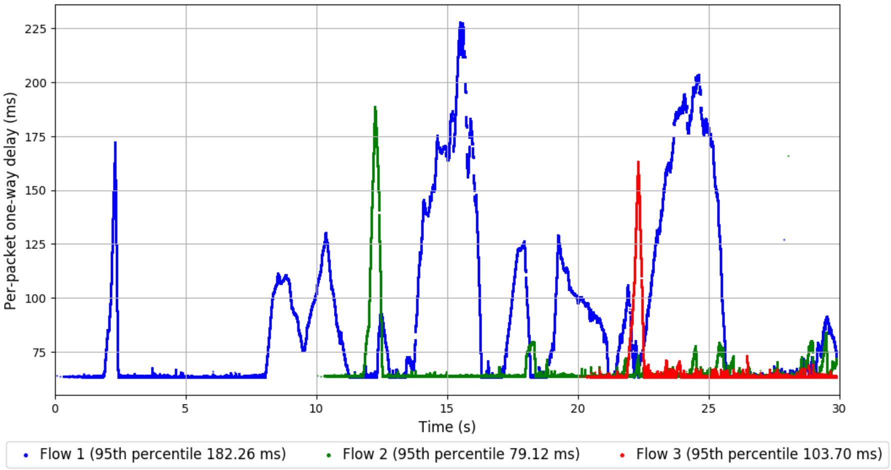
```
Run 3: Statistics of PCC-Allegro

Start at: 2018-12-20 14:13:27
End at: 2018-12-20 14:13:57
Local clock offset: -0.085 ms
Remote clock offset: 0.704 ms

# Below is generated by plot.py at 2018-12-20 17:41:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 679.19 Mbit/s
95th percentile per-packet one-way delay: 170.038 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 401.04 Mbit/s
95th percentile per-packet one-way delay: 182.263 ms
Loss rate: 0.73%
-- Flow 2:
Average throughput: 298.11 Mbit/s
95th percentile per-packet one-way delay: 79.123 ms
Loss rate: 0.22%
-- Flow 3:
Average throughput: 242.19 Mbit/s
95th percentile per-packet one-way delay: 103.702 ms
Loss rate: 0.00%
```

Run 3: Report of PCC-Allegro — Data Link



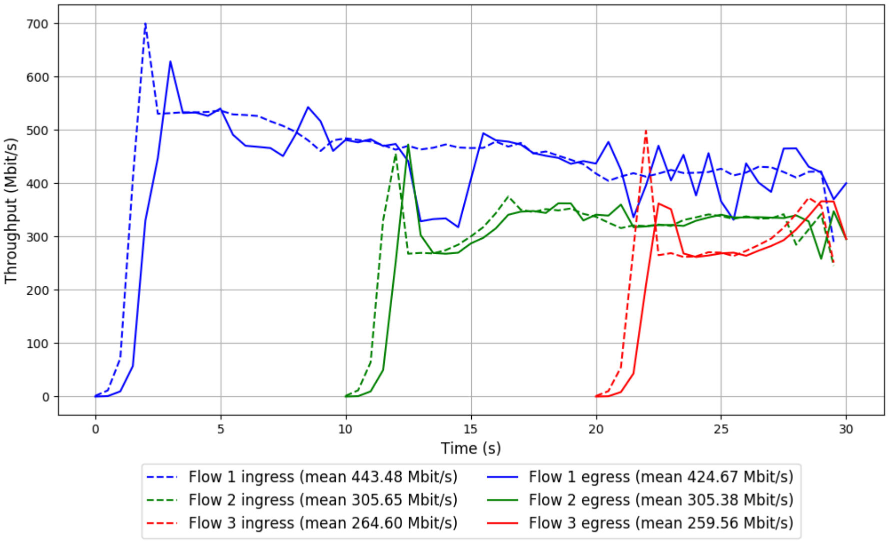


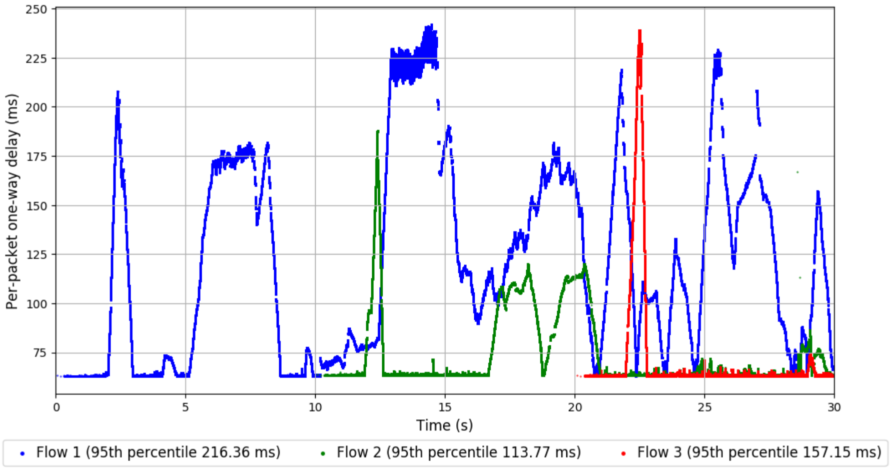
```
Run 4: Statistics of PCC-Allegro

Start at: 2018-12-20 14:47:13
End at: 2018-12-20 14:47:43
Local clock offset: -0.04 ms
Remote clock offset: 0.209 ms

# Below is generated by plot.py at 2018-12-20 17:42:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 712.94 Mbit/s
95th percentile per-packet one-way delay: 191.276 ms
Loss rate: 2.81%
-- Flow 1:
Average throughput: 424.67 Mbit/s
95th percentile per-packet one-way delay: 216.359 ms
Loss rate: 4.24%
-- Flow 2:
Average throughput: 305.38 Mbit/s
95th percentile per-packet one-way delay: 113.770 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 259.56 Mbit/s
95th percentile per-packet one-way delay: 157.152 ms
Loss rate: 1.90%
```

Run 4: Report of PCC-Allegro — Data Link



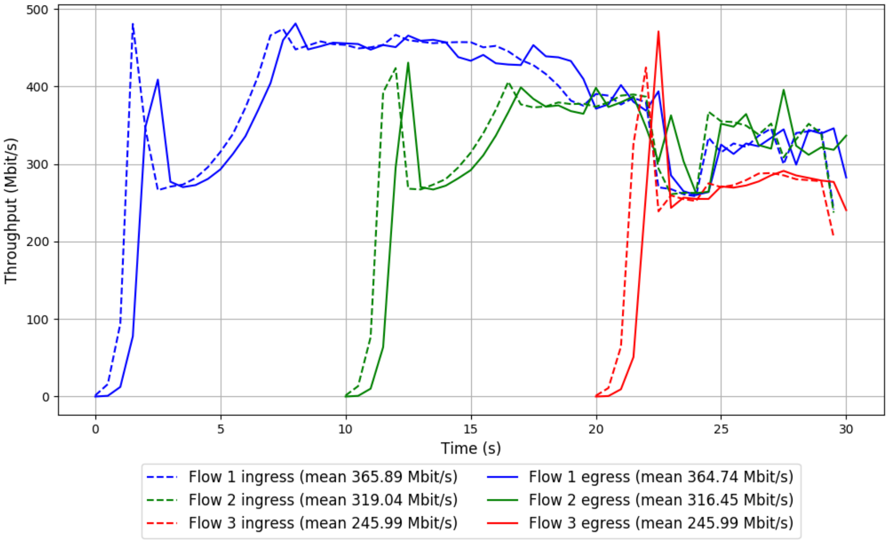


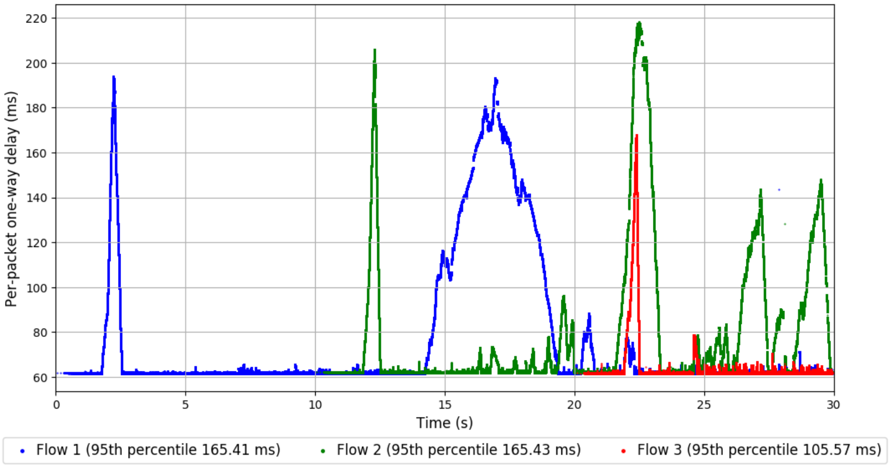
```
Run 5: Statistics of PCC-Allegro

Start at: 2018-12-20 15:20:58
End at: 2018-12-20 15:21:28
Local clock offset: -0.003 ms
Remote clock offset: -1.094 ms

# Below is generated by plot.py at 2018-12-20 17:42:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 656.08 Mbit/s
95th percentile per-packet one-way delay: 162.627 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 364.74 Mbit/s
95th percentile per-packet one-way delay: 165.410 ms
Loss rate: 0.31%
-- Flow 2:
Average throughput: 316.45 Mbit/s
95th percentile per-packet one-way delay: 165.429 ms
Loss rate: 0.81%
-- Flow 3:
Average throughput: 245.99 Mbit/s
95th percentile per-packet one-way delay: 105.570 ms
Loss rate: 0.00%
```

Run 5: Report of PCC-Allegro — Data Link



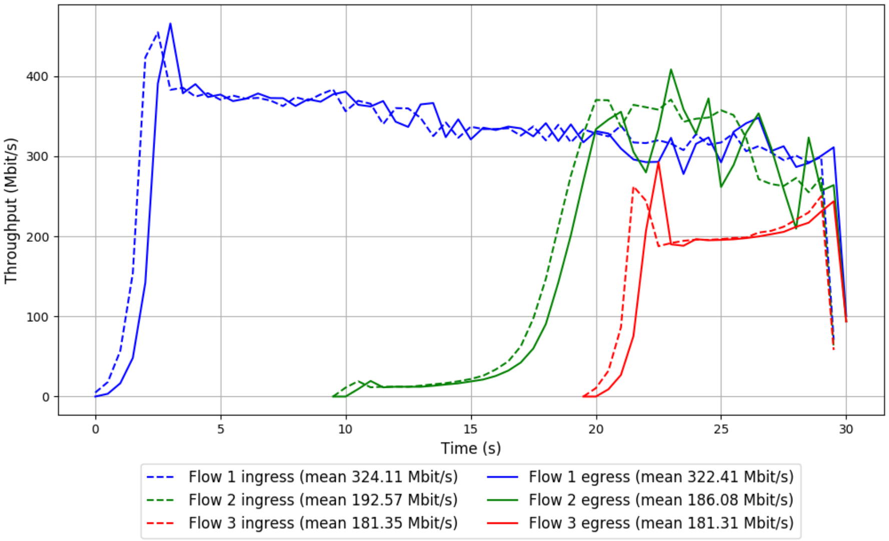


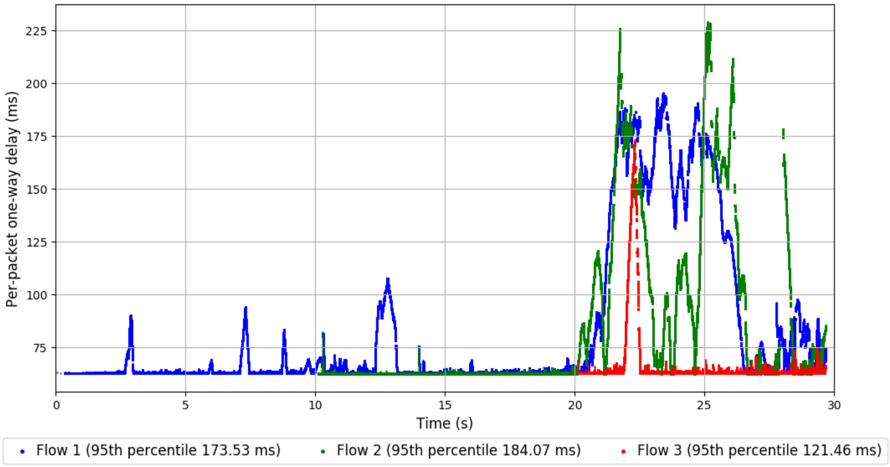
```
Run 1: Statistics of PCC-Expr

Start at: 2018-12-20 13:01:25
End at: 2018-12-20 13:01:55
Local clock offset: -0.08 ms
Remote clock offset: -0.209 ms

# Below is generated by plot.py at 2018-12-20 17:42:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 507.62 Mbit/s
95th percentile per-packet one-way delay: 174.762 ms
Loss rate: 1.17%
-- Flow 1:
Average throughput: 322.41 Mbit/s
95th percentile per-packet one-way delay: 173.529 ms
Loss rate: 0.52%
-- Flow 2:
Average throughput: 186.08 Mbit/s
95th percentile per-packet one-way delay: 184.066 ms
Loss rate: 3.36%
-- Flow 3:
Average throughput: 181.31 Mbit/s
95th percentile per-packet one-way delay: 121.457 ms
Loss rate: 0.02%
```

Run 1: Report of PCC-Expr — Data Link



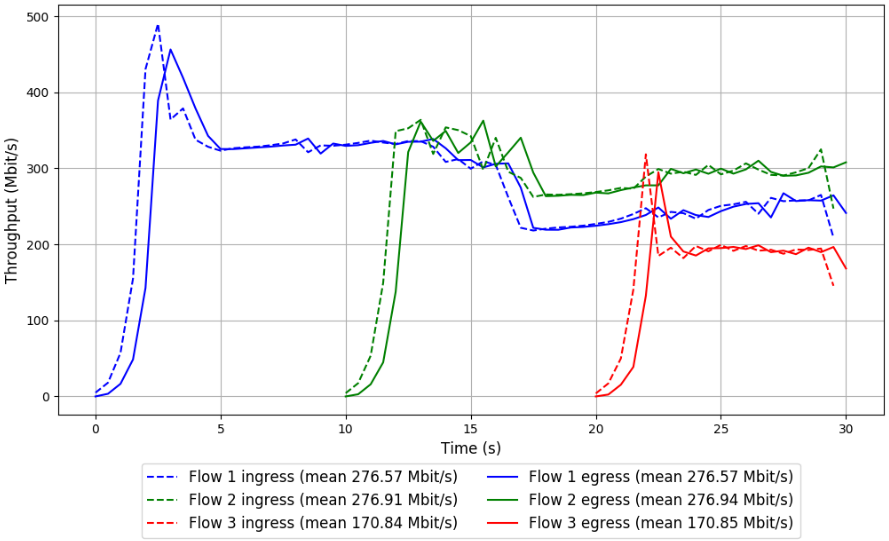


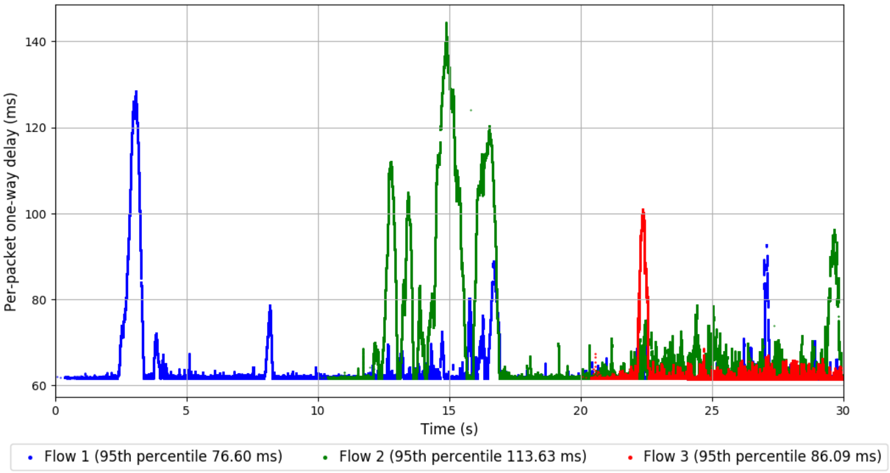
```
Run 2: Statistics of PCC-Expr

Start at: 2018-12-20 13:35:07
End at: 2018-12-20 13:35:37
Local clock offset: -0.007 ms
Remote clock offset: -1.063 ms

# Below is generated by plot.py at 2018-12-20 17:42:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 517.06 Mbit/s
95th percentile per-packet one-way delay: 102.396 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 276.57 Mbit/s
95th percentile per-packet one-way delay: 76.599 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 276.94 Mbit/s
95th percentile per-packet one-way delay: 113.628 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 170.85 Mbit/s
95th percentile per-packet one-way delay: 86.094 ms
Loss rate: 0.00%
```

Run 2: Report of PCC-Expr — Data Link



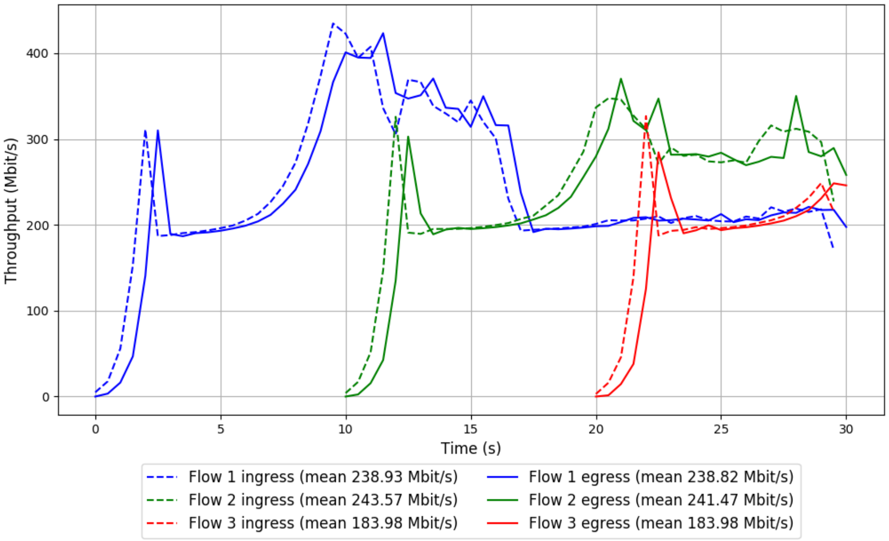


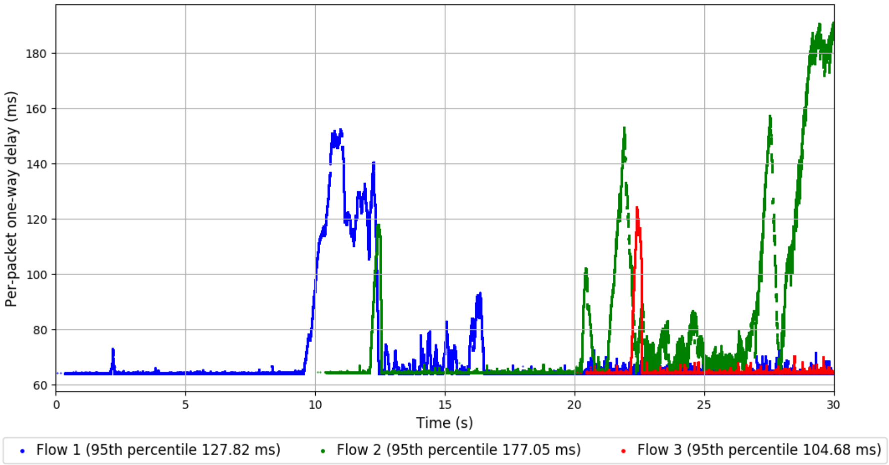
```
Run 3: Statistics of PCC-Expr

Start at: 2018-12-20 14:09:01
End at: 2018-12-20 14:09:31
Local clock offset: -0.067 ms
Remote clock offset: 1.293 ms

# Below is generated by plot.py at 2018-12-20 17:42:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 460.01 Mbit/s
95th percentile per-packet one-way delay: 138.252 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 238.82 Mbit/s
95th percentile per-packet one-way delay: 127.816 ms
Loss rate: 0.05%
-- Flow 2:
Average throughput: 241.47 Mbit/s
95th percentile per-packet one-way delay: 177.049 ms
Loss rate: 0.87%
-- Flow 3:
Average throughput: 183.98 Mbit/s
95th percentile per-packet one-way delay: 104.676 ms
Loss rate: 0.00%
```

Run 3: Report of PCC-Expr — Data Link



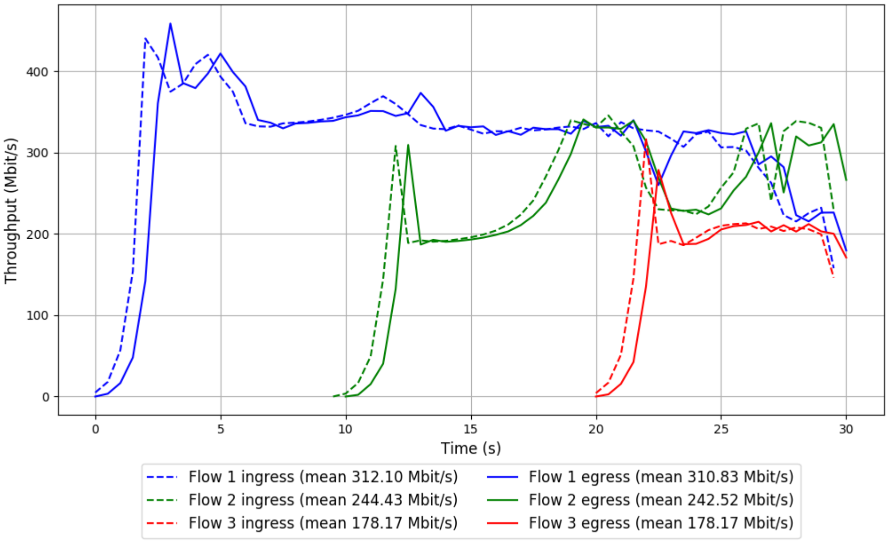


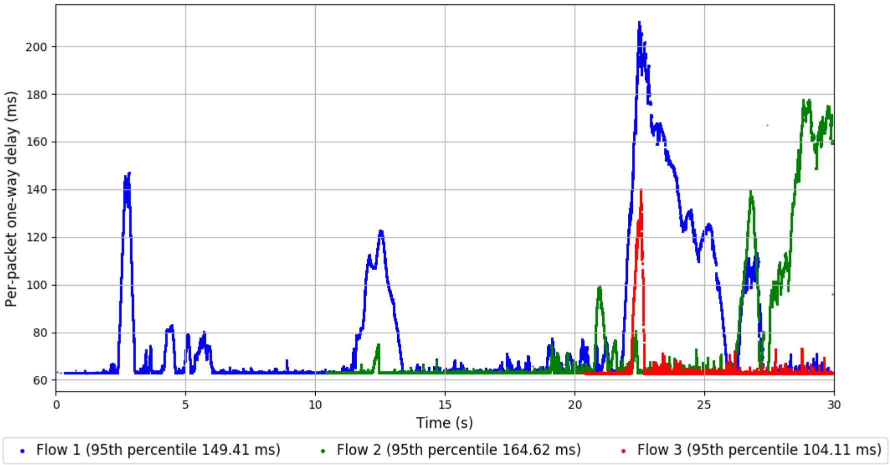
```
Run 4: Statistics of PCC-Expr

Start at: 2018-12-20 14:42:45
End at: 2018-12-20 14:43:15
Local clock offset: -0.068 ms
Remote clock offset: 0.047 ms

# Below is generated by plot.py at 2018-12-20 17:54:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 530.94 Mbit/s
95th percentile per-packet one-way delay: 153.972 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 310.83 Mbit/s
95th percentile per-packet one-way delay: 149.415 ms
Loss rate: 0.40%
-- Flow 2:
Average throughput: 242.52 Mbit/s
95th percentile per-packet one-way delay: 164.615 ms
Loss rate: 0.78%
-- Flow 3:
Average throughput: 178.17 Mbit/s
95th percentile per-packet one-way delay: 104.108 ms
Loss rate: 0.00%
```

Run 4: Report of PCC-Expr — Data Link



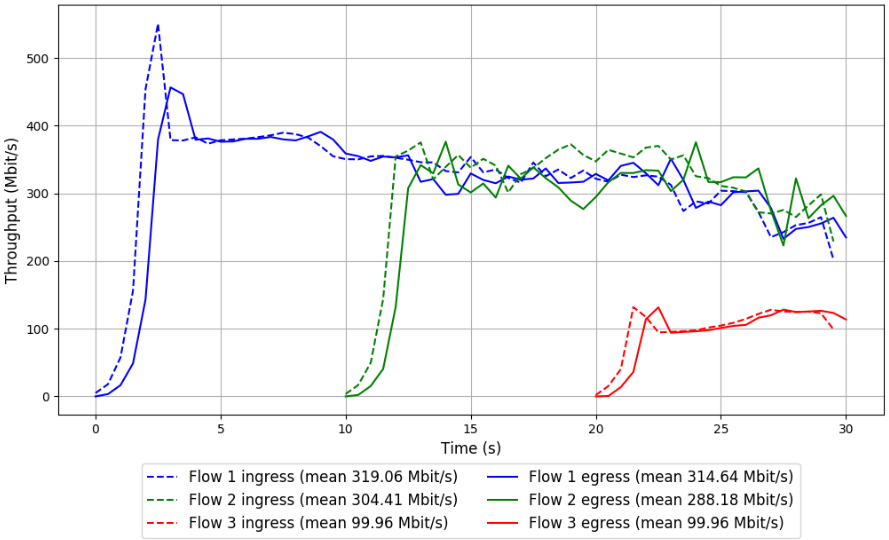


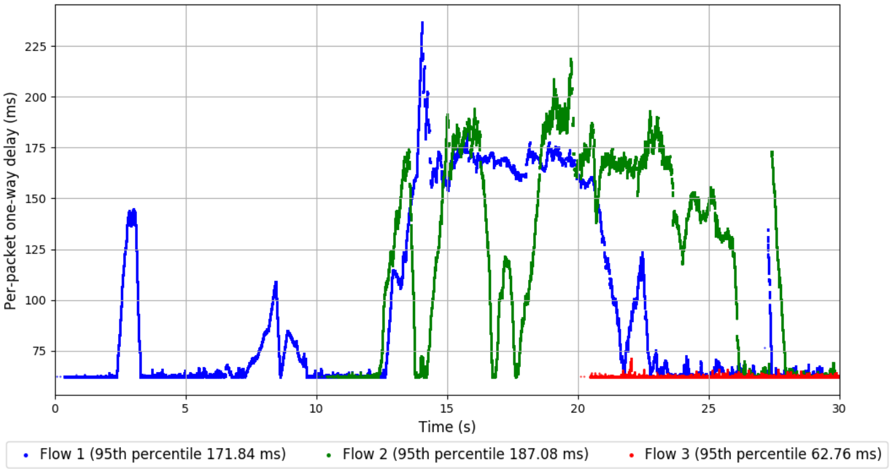
```
Run 5: Statistics of PCC-Expr

Start at: 2018-12-20 15:16:30
End at: 2018-12-20 15:17:00
Local clock offset: -0.043 ms
Remote clock offset: -0.695 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 539.13 Mbit/s
95th percentile per-packet one-way delay: 179.082 ms
Loss rate: 2.74%
-- Flow 1:
Average throughput: 314.64 Mbit/s
95th percentile per-packet one-way delay: 171.842 ms
Loss rate: 1.38%
-- Flow 2:
Average throughput: 288.18 Mbit/s
95th percentile per-packet one-way delay: 187.083 ms
Loss rate: 5.33%
-- Flow 3:
Average throughput: 99.96 Mbit/s
95th percentile per-packet one-way delay: 62.764 ms
Loss rate: 0.00%
```

Run 5: Report of PCC-Expr — Data Link



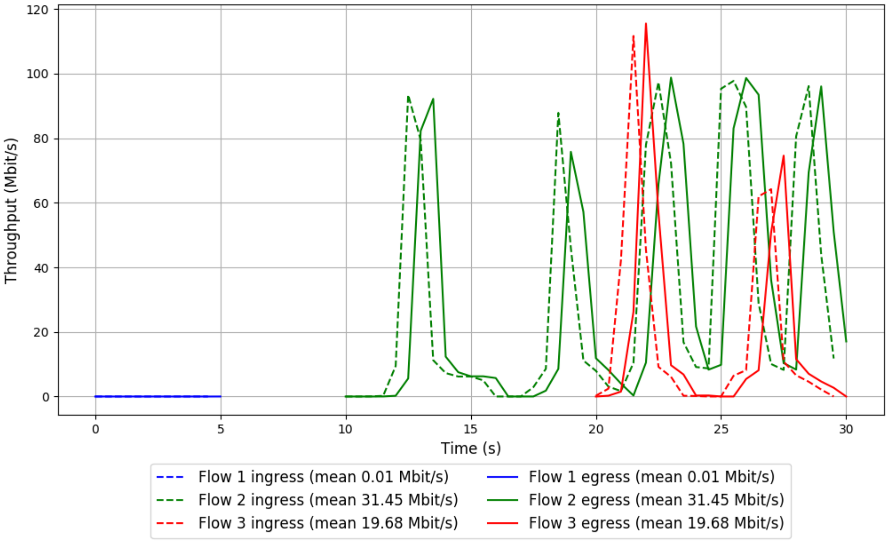


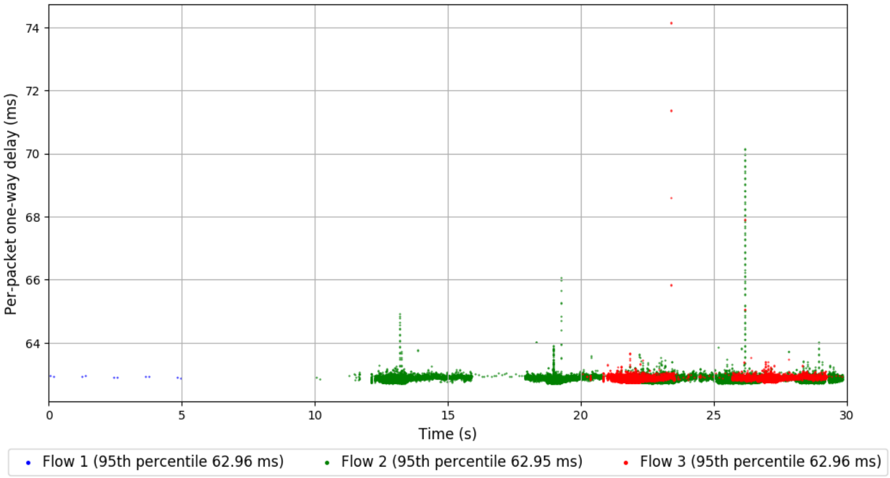
```
Run 1: Statistics of QUIC Cubic

Start at: 2018-12-20 13:11:53
End at: 2018-12-20 13:12:23
Local clock offset: -0.076 ms
Remote clock offset: -0.025 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 27.31 Mbit/s
95th percentile per-packet one-way delay: 62.950 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 62.957 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 31.45 Mbit/s
95th percentile per-packet one-way delay: 62.946 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 19.68 Mbit/s
95th percentile per-packet one-way delay: 62.960 ms
Loss rate: 0.00%
```

Run 1: Report of QUIC Cubic — Data Link



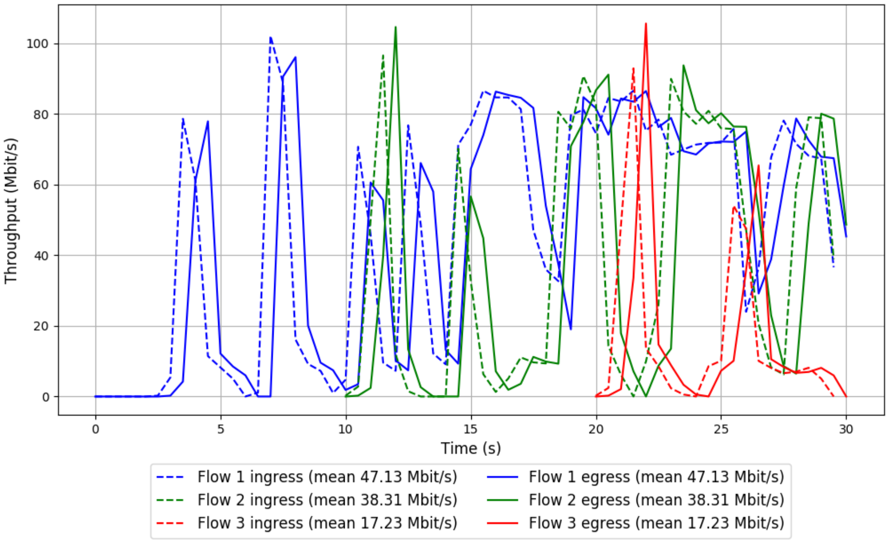


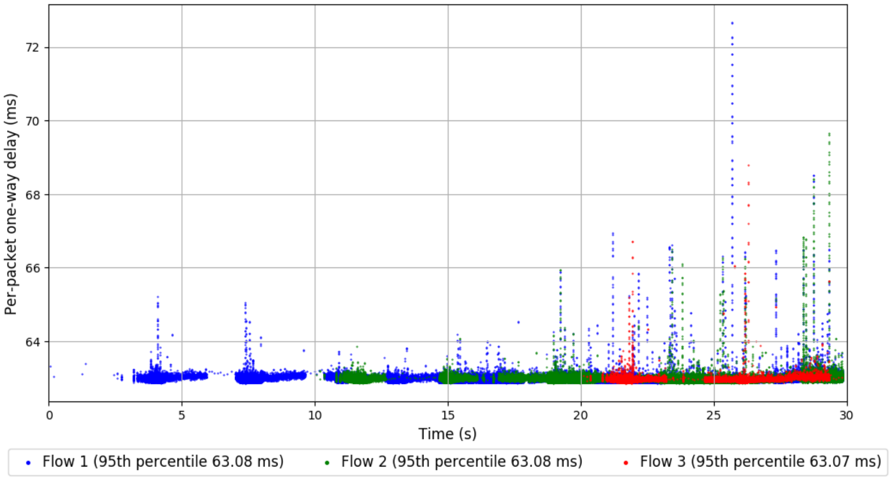
```
Run 2: Statistics of QUIC Cubic

Start at: 2018-12-20 13:45:44
End at: 2018-12-20 13:46:14
Local clock offset: -0.013 ms
Remote clock offset: 0.151 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 78.17 Mbit/s
95th percentile per-packet one-way delay: 63.081 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 47.13 Mbit/s
95th percentile per-packet one-way delay: 63.080 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 38.31 Mbit/s
95th percentile per-packet one-way delay: 63.083 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 17.23 Mbit/s
95th percentile per-packet one-way delay: 63.067 ms
Loss rate: 0.00%
```

Run 2: Report of QUIC Cubic — Data Link



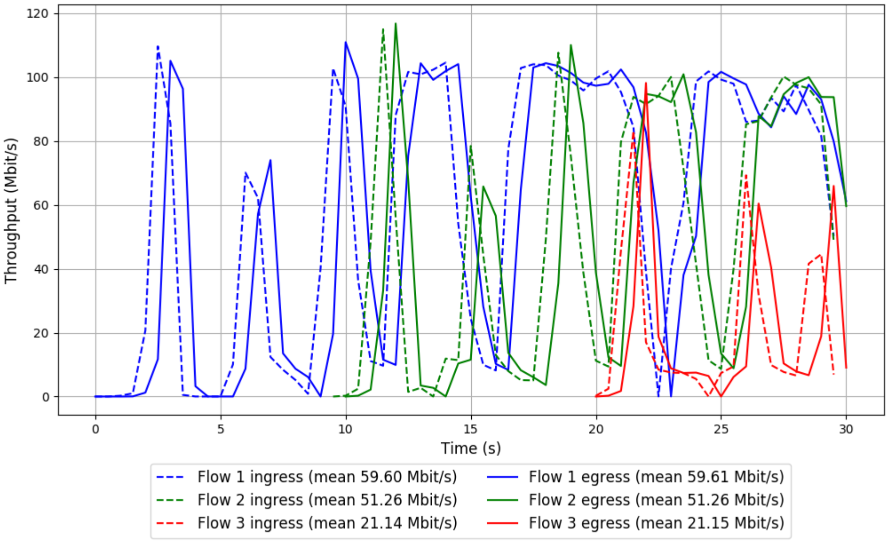


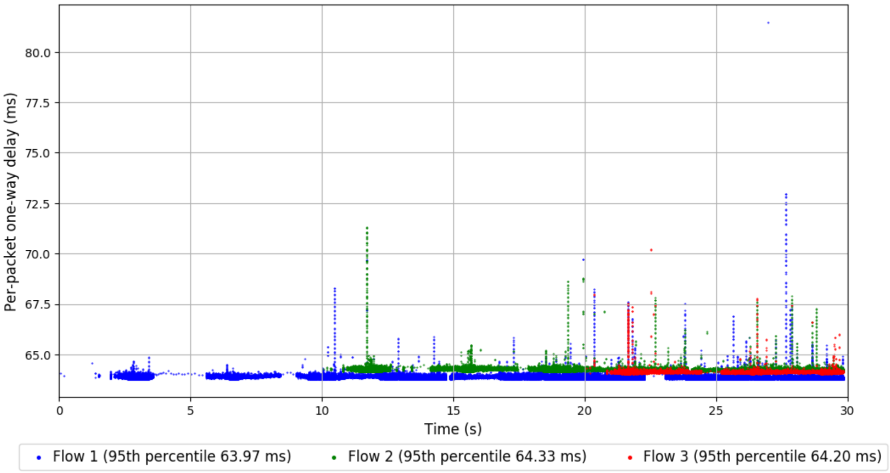
```
Run 3: Statistics of QUIC Cubic

Start at: 2018-12-20 14:19:37
End at: 2018-12-20 14:20:07
Local clock offset: -0.117 ms
Remote clock offset: 1.117 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 100.57 Mbit/s
95th percentile per-packet one-way delay: 64.280 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 59.61 Mbit/s
95th percentile per-packet one-way delay: 63.969 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 51.26 Mbit/s
95th percentile per-packet one-way delay: 64.327 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 21.15 Mbit/s
95th percentile per-packet one-way delay: 64.202 ms
Loss rate: 0.00%
```

Run 3: Report of QUIC Cubic — Data Link



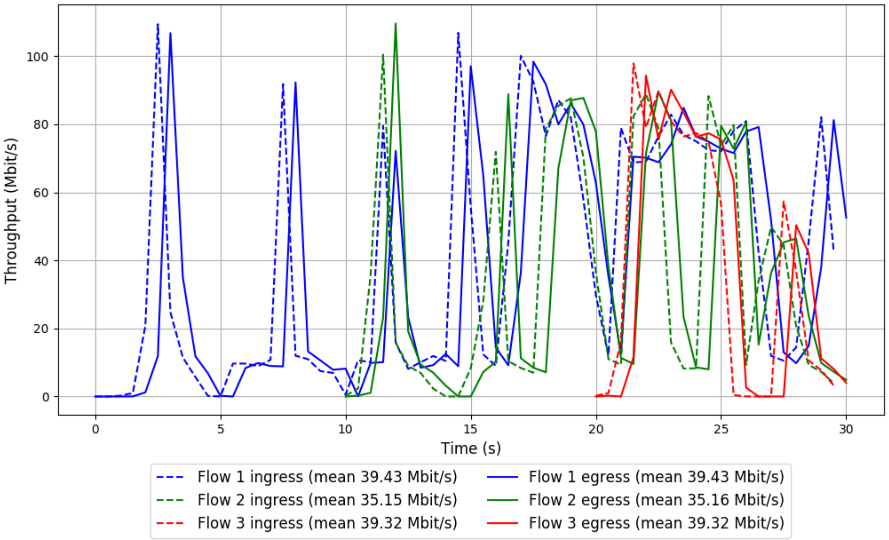


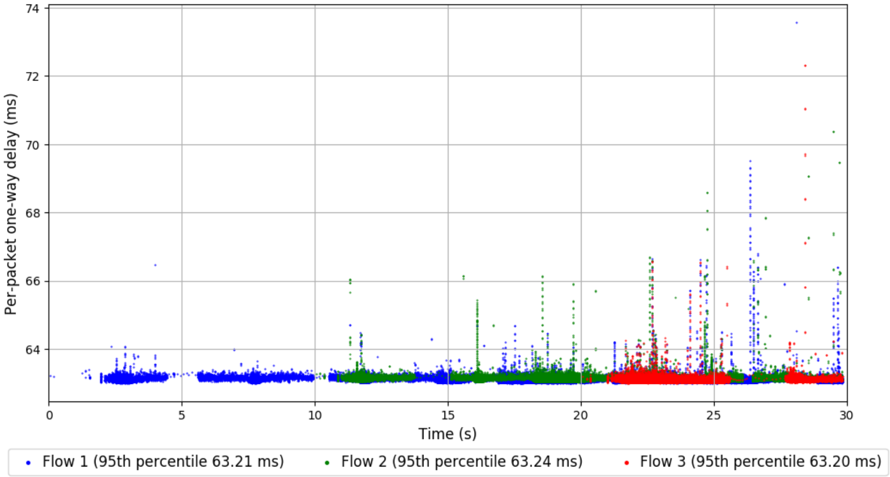
```
Run 4: Statistics of QUIC Cubic

Start at: 2018-12-20 14:53:15
End at: 2018-12-20 14:53:45
Local clock offset: -0.045 ms
Remote clock offset: 0.217 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 75.65 Mbit/s
95th percentile per-packet one-way delay: 63.219 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 39.43 Mbit/s
95th percentile per-packet one-way delay: 63.208 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 35.16 Mbit/s
95th percentile per-packet one-way delay: 63.238 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 39.32 Mbit/s
95th percentile per-packet one-way delay: 63.202 ms
Loss rate: 0.00%
```

Run 4: Report of QUIC Cubic — Data Link



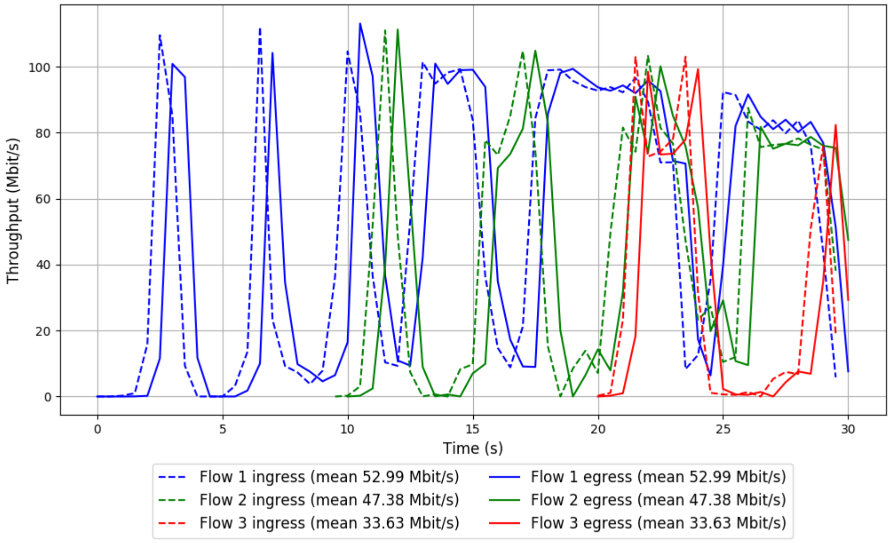


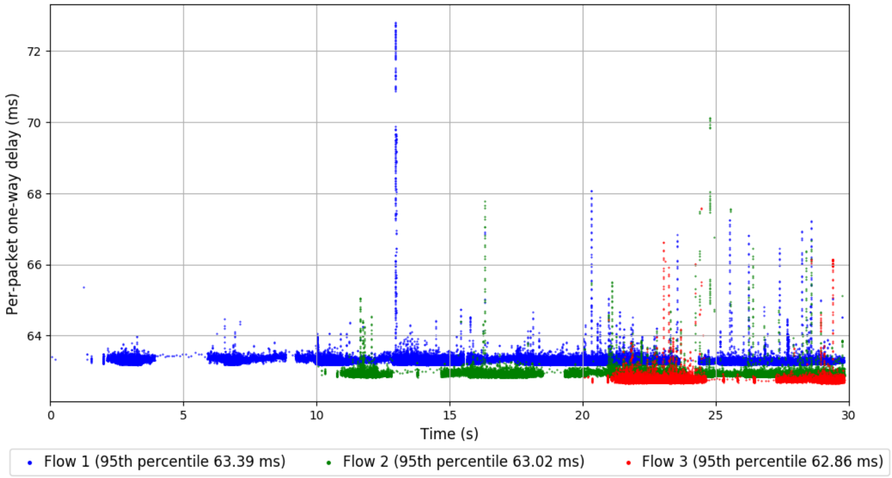
```
Run 5: Statistics of QUIC Cubic

Start at: 2018-12-20 15:26:56
End at: 2018-12-20 15:27:26
Local clock offset: -0.033 ms
Remote clock offset: 0.1 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 95.48 Mbit/s
95th percentile per-packet one-way delay: 63.362 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 52.99 Mbit/s
95th percentile per-packet one-way delay: 63.392 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 47.38 Mbit/s
95th percentile per-packet one-way delay: 63.016 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 33.63 Mbit/s
95th percentile per-packet one-way delay: 62.864 ms
Loss rate: 0.00%
```

Run 5: Report of QUIC Cubic — Data Link



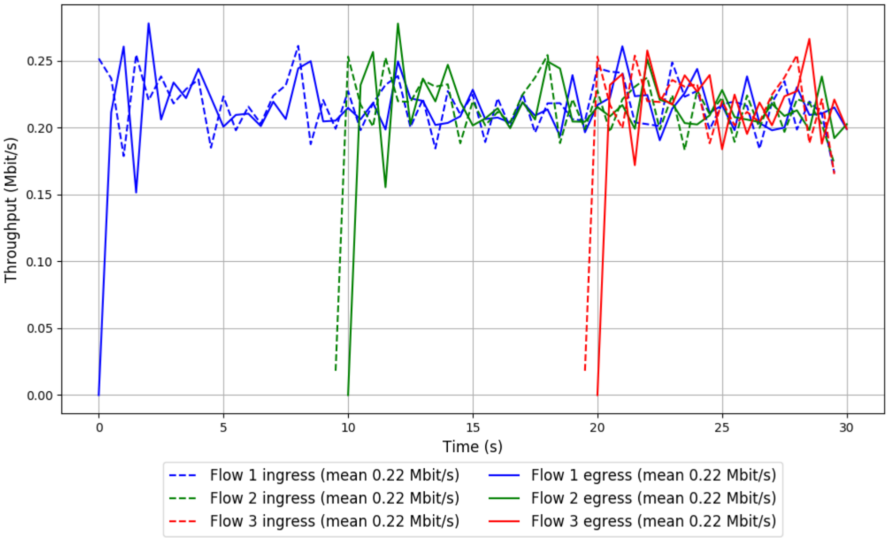


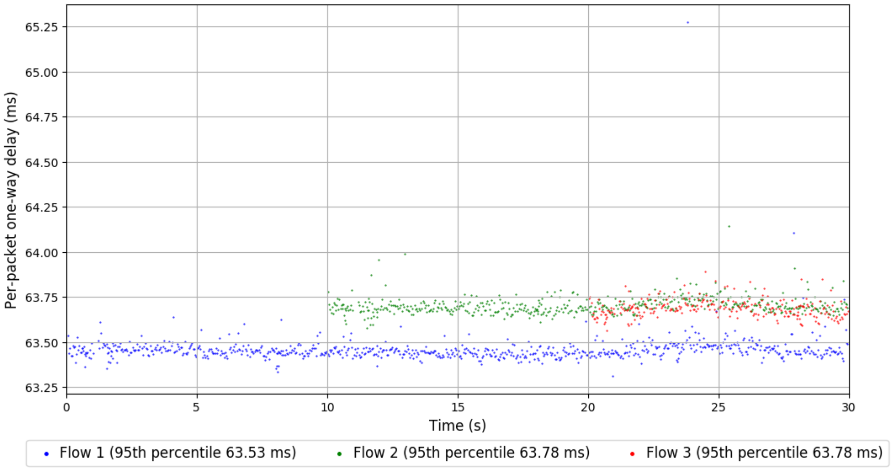
```
Run 1: Statistics of SCReAM

Start at: 2018-12-20 13:03:24
End at: 2018-12-20 13:03:54
Local clock offset: -0.036 ms
Remote clock offset: 0.459 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 63.752 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.530 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.779 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.782 ms
Loss rate: 0.00%
```

Run 1: Report of SCReAM — Data Link



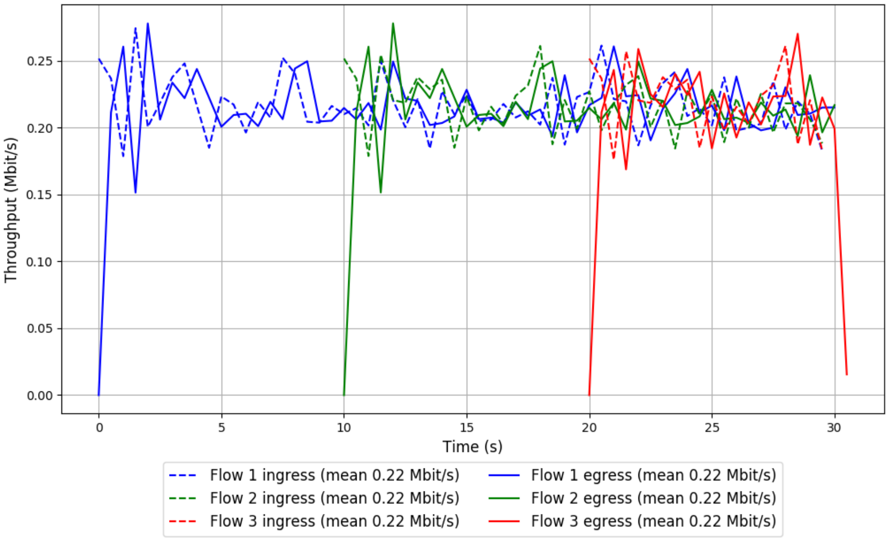


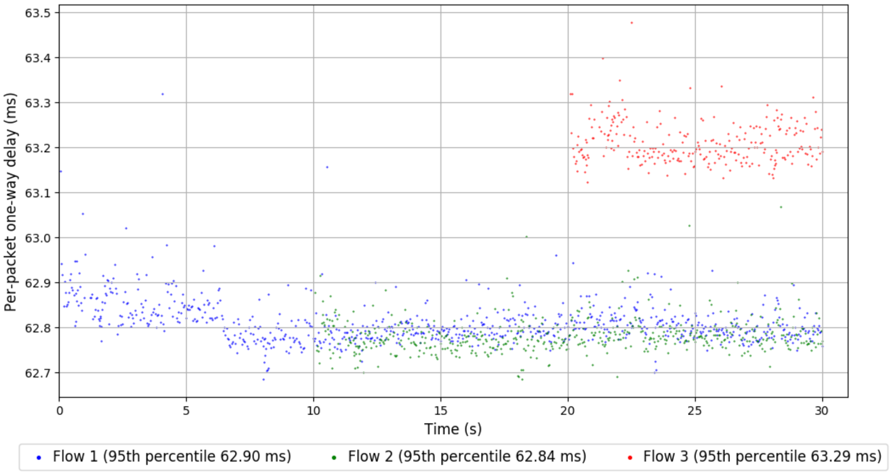
```
Run 2: Statistics of SCReAM

Start at: 2018-12-20 13:37:08
End at: 2018-12-20 13:37:38
Local clock offset: -0.03 ms
Remote clock offset: -0.151 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 63.231 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.898 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.844 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.286 ms
Loss rate: 0.00%
```

Run 2: Report of SCReAM — Data Link



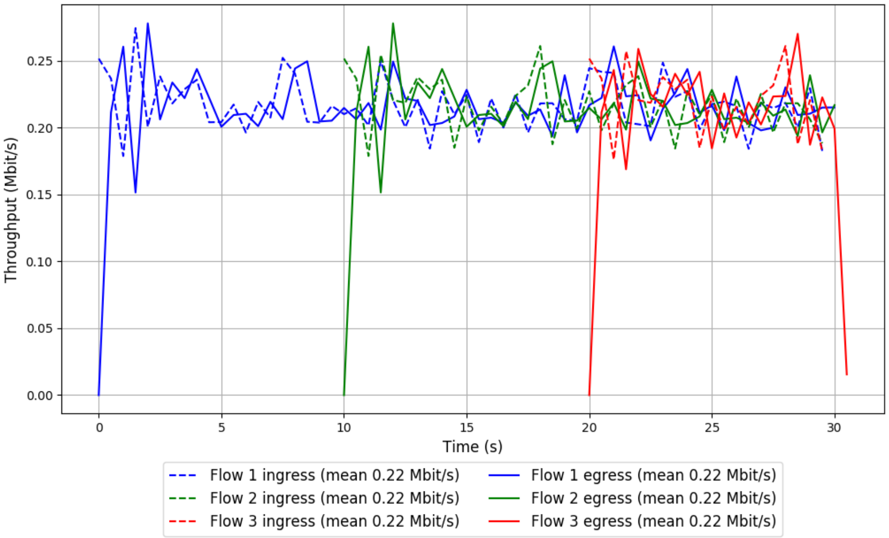


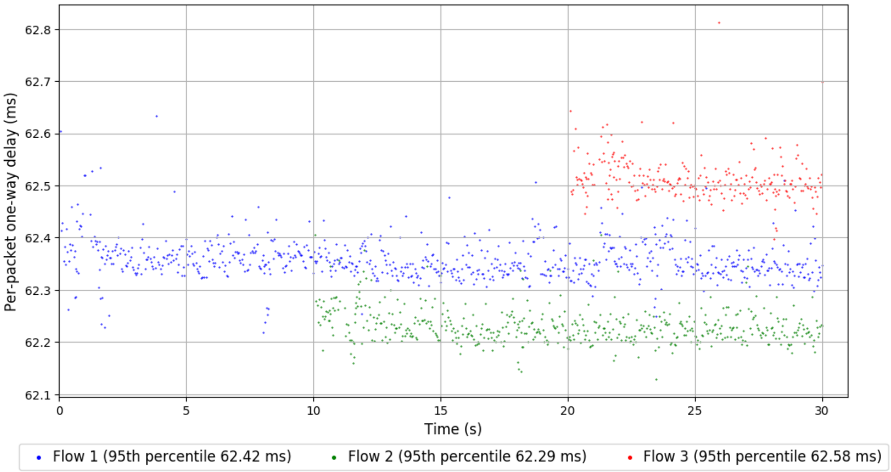
```
Run 3: Statistics of SCReAM

Start at: 2018-12-20 14:11:01
End at: 2018-12-20 14:11:31
Local clock offset: -0.086 ms
Remote clock offset: -0.556 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 62.522 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.422 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.286 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.581 ms
Loss rate: 0.00%
```

Run 3: Report of SCReAM — Data Link



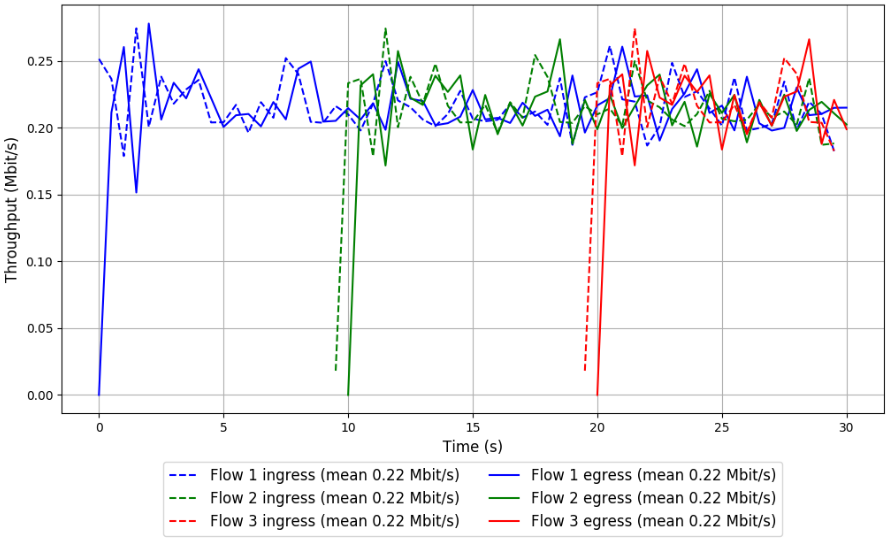


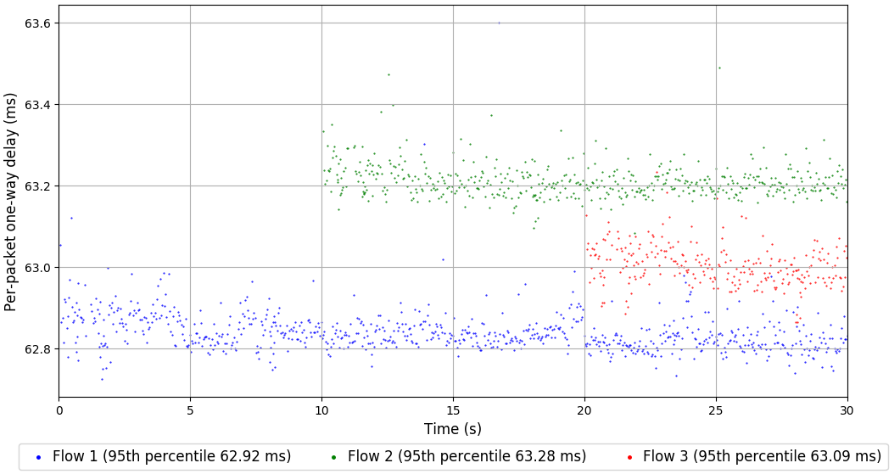
```
Run 4: Statistics of SCReAM

Start at: 2018-12-20 14:44:48
End at: 2018-12-20 14:45:18
Local clock offset: -0.025 ms
Remote clock offset: -0.039 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 63.245 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.918 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.280 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.087 ms
Loss rate: 0.00%
```

Run 4: Report of SCReAM — Data Link



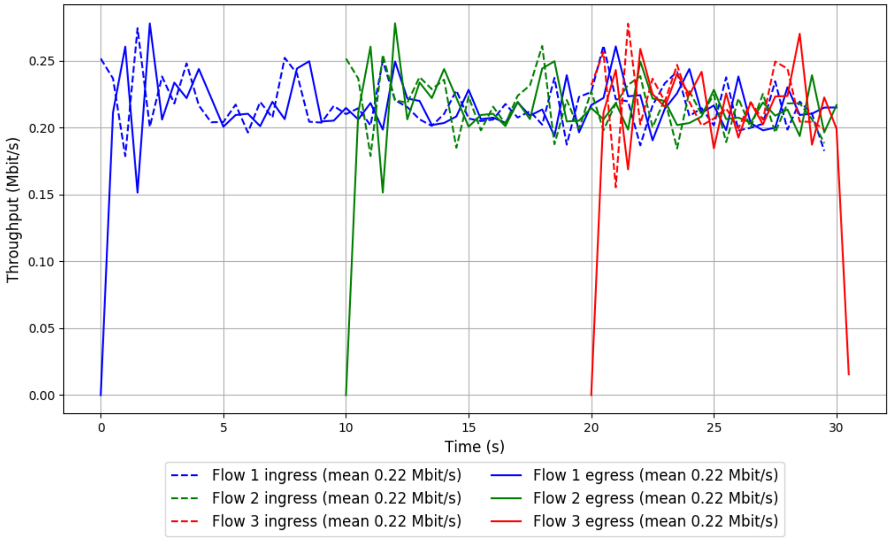


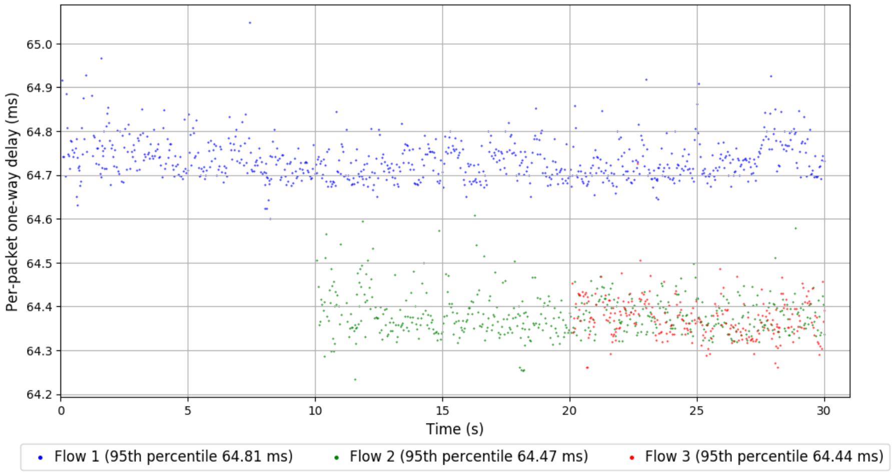
```
Run 5: Statistics of SCReAM

Start at: 2018-12-20 15:18:33
End at: 2018-12-20 15:19:03
Local clock offset: -0.03 ms
Remote clock offset: 1.384 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 64.793 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 64.808 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 64.468 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 64.443 ms
Loss rate: 0.00%
```

Run 5: Report of SCReAM — Data Link



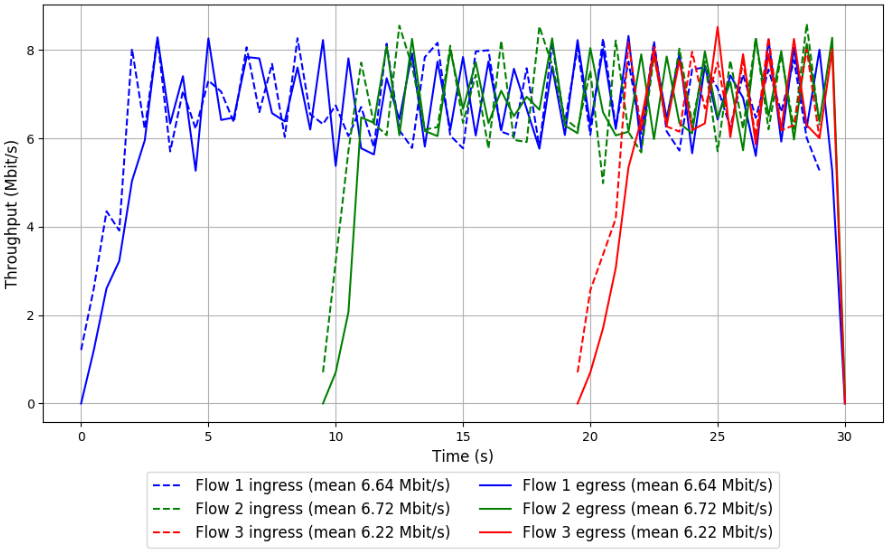


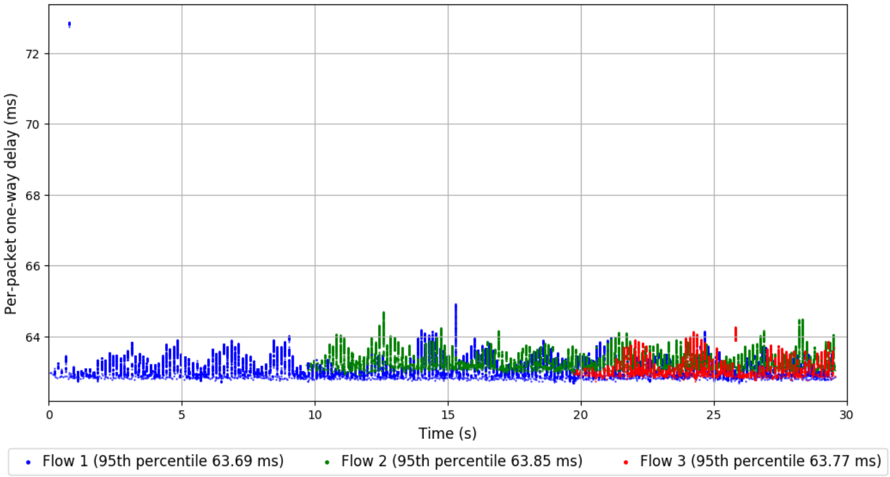
```
Run 1: Statistics of Sprout

Start at: 2018-12-20 12:51:38
End at: 2018-12-20 12:52:08
Local clock offset: -0.086 ms
Remote clock offset: -0.259 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.24 Mbit/s
95th percentile per-packet one-way delay: 63.772 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.64 Mbit/s
95th percentile per-packet one-way delay: 63.687 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 6.72 Mbit/s
95th percentile per-packet one-way delay: 63.854 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 6.22 Mbit/s
95th percentile per-packet one-way delay: 63.769 ms
Loss rate: 0.00%
```

Run 1: Report of Sprout — Data Link



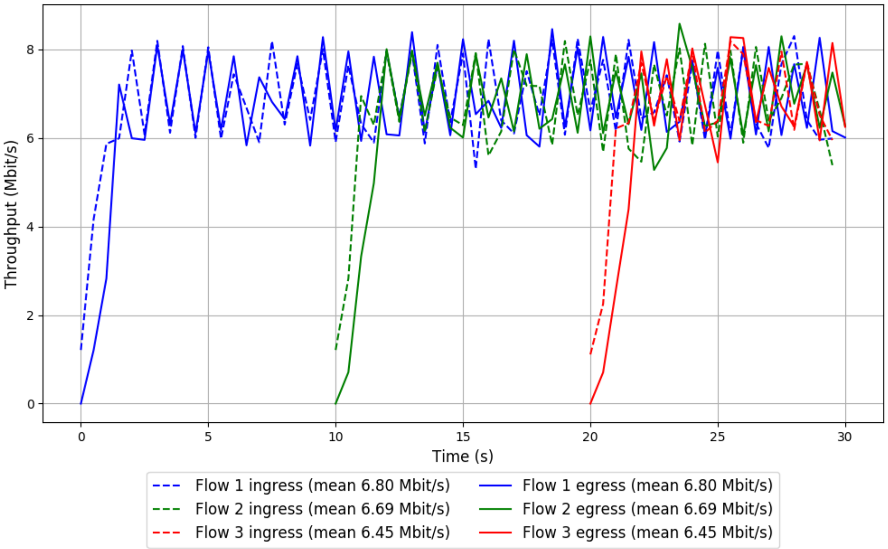


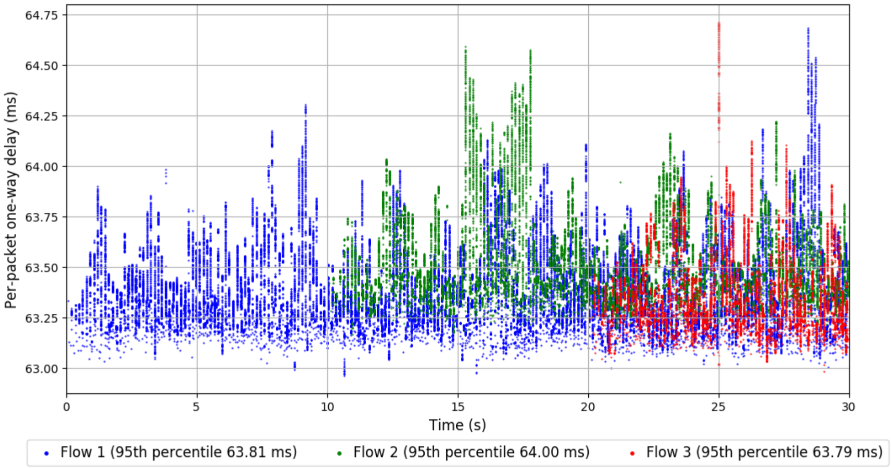
```
Run 2: Statistics of Sprout

Start at: 2018-12-20 13:25:13
End at: 2018-12-20 13:25:43
Local clock offset: -0.074 ms
Remote clock offset: 0.162 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.37 Mbit/s
95th percentile per-packet one-way delay: 63.889 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.80 Mbit/s
95th percentile per-packet one-way delay: 63.815 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 6.69 Mbit/s
95th percentile per-packet one-way delay: 64.003 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 6.45 Mbit/s
95th percentile per-packet one-way delay: 63.792 ms
Loss rate: 0.00%
```

Run 2: Report of Sprout — Data Link



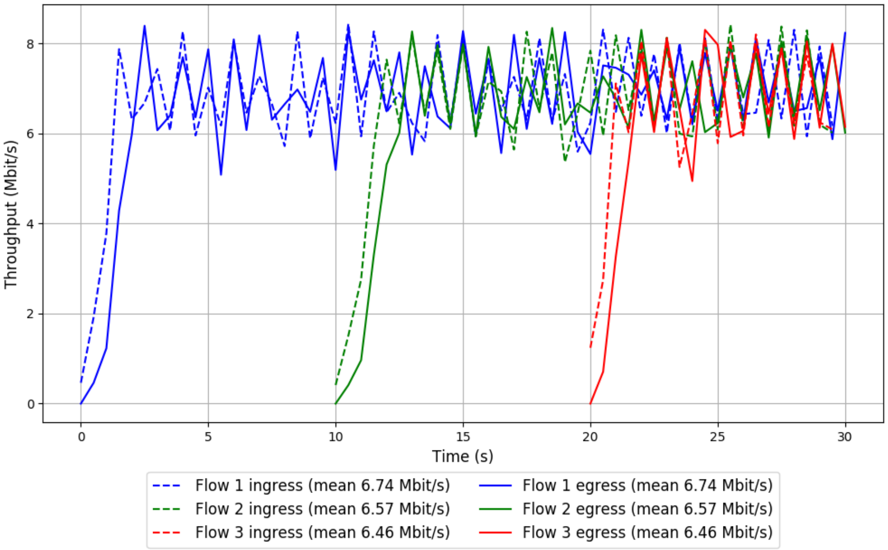


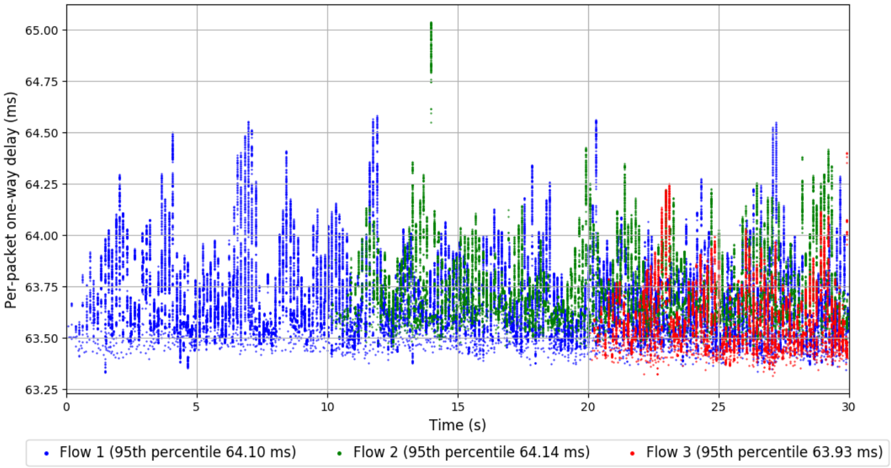
```
Run 3: Statistics of Sprout

Start at: 2018-12-20 13:59:07
End at: 2018-12-20 13:59:37
Local clock offset: 0.051 ms
Remote clock offset: 0.682 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.24 Mbit/s
95th percentile per-packet one-way delay: 64.097 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.74 Mbit/s
95th percentile per-packet one-way delay: 64.098 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 6.57 Mbit/s
95th percentile per-packet one-way delay: 64.135 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 6.46 Mbit/s
95th percentile per-packet one-way delay: 63.932 ms
Loss rate: 0.00%
```

Run 3: Report of Sprout — Data Link



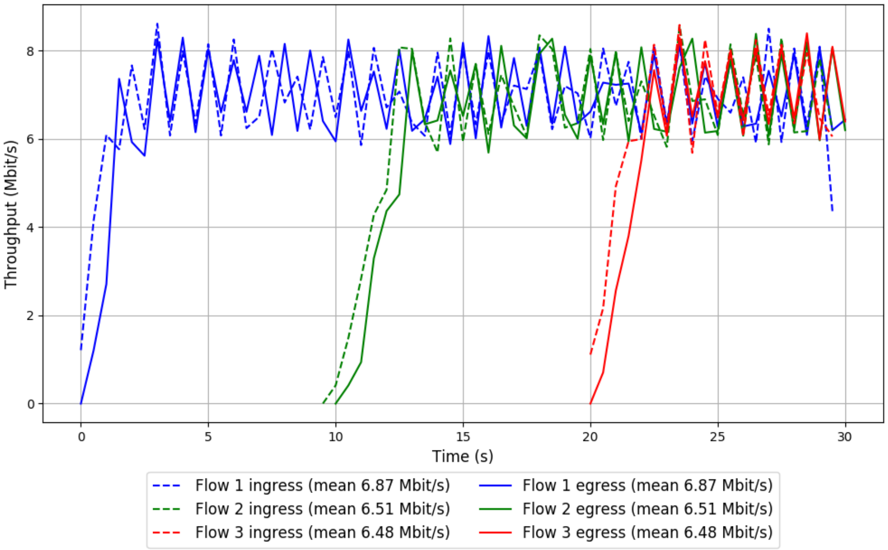


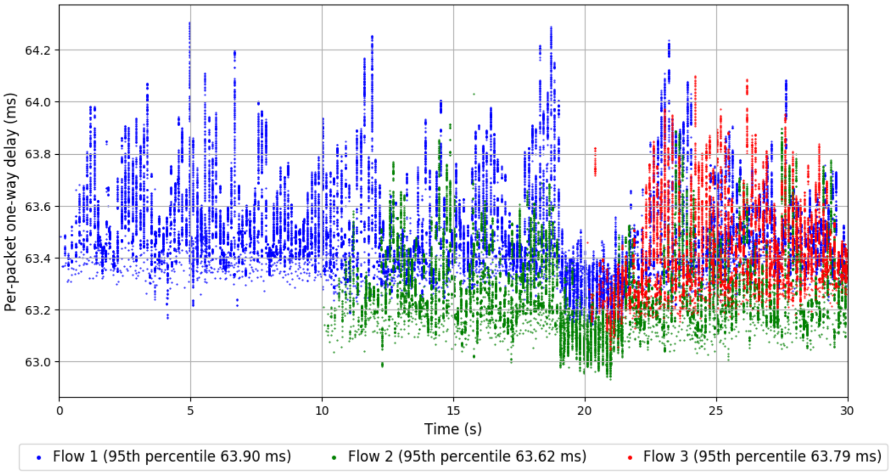
```
Run 4: Statistics of Sprout

Start at: 2018-12-20 14:32:45
End at: 2018-12-20 14:33:15
Local clock offset: -0.142 ms
Remote clock offset: 0.196 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.33 Mbit/s
95th percentile per-packet one-way delay: 63.832 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.87 Mbit/s
95th percentile per-packet one-way delay: 63.903 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 6.51 Mbit/s
95th percentile per-packet one-way delay: 63.618 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 6.48 Mbit/s
95th percentile per-packet one-way delay: 63.791 ms
Loss rate: 0.00%
```

Run 4: Report of Sprout — Data Link



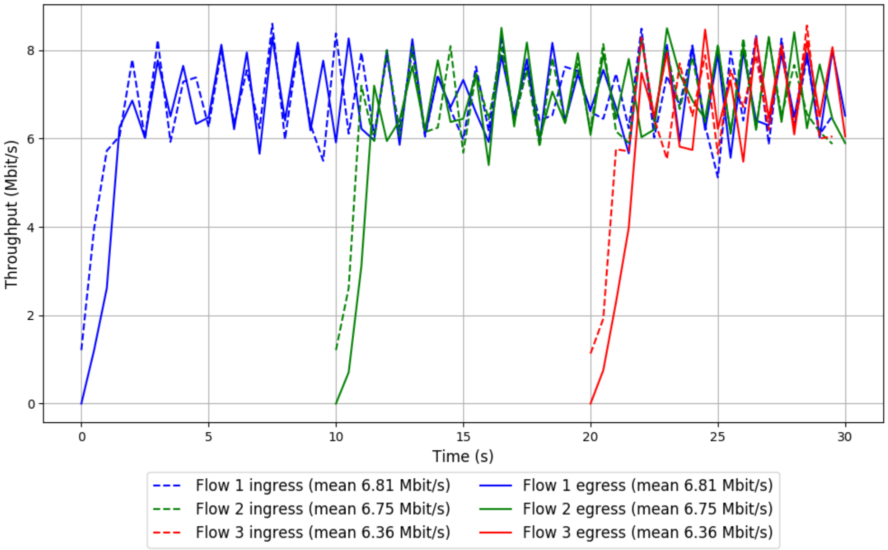


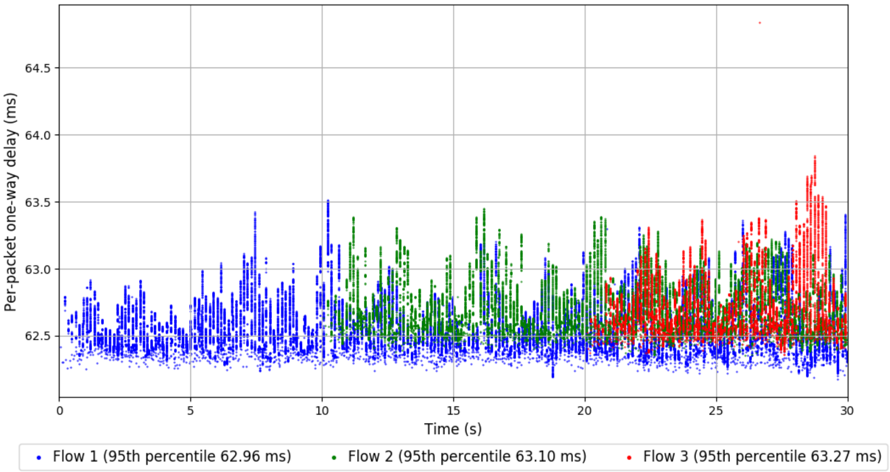
```
Run 5: Statistics of Sprout

Start at: 2018-12-20 15:06:29
End at: 2018-12-20 15:06:59
Local clock offset: -0.02 ms
Remote clock offset: -0.543 ms

# Below is generated by plot.py at 2018-12-20 17:55:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.41 Mbit/s
95th percentile per-packet one-way delay: 63.081 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.81 Mbit/s
95th percentile per-packet one-way delay: 62.962 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 6.75 Mbit/s
95th percentile per-packet one-way delay: 63.100 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 6.36 Mbit/s
95th percentile per-packet one-way delay: 63.274 ms
Loss rate: 0.00%
```

Run 5: Report of Sprout — Data Link



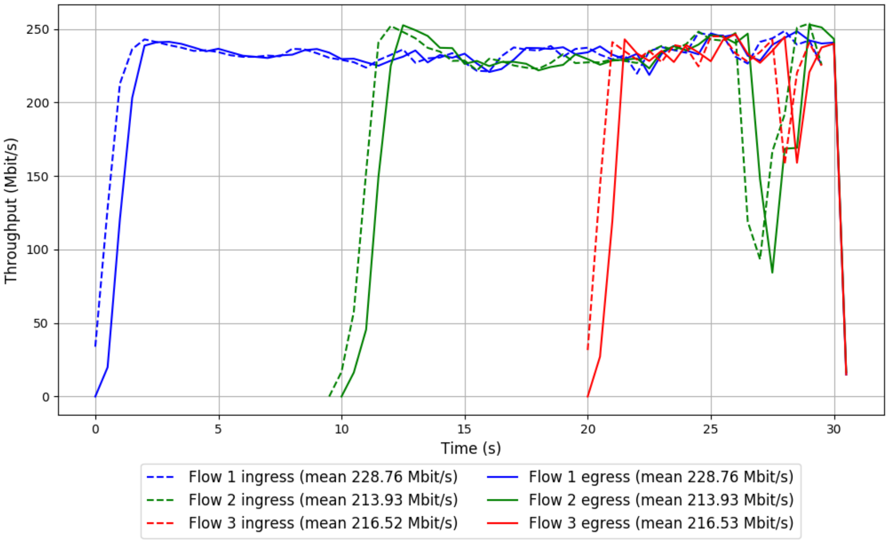


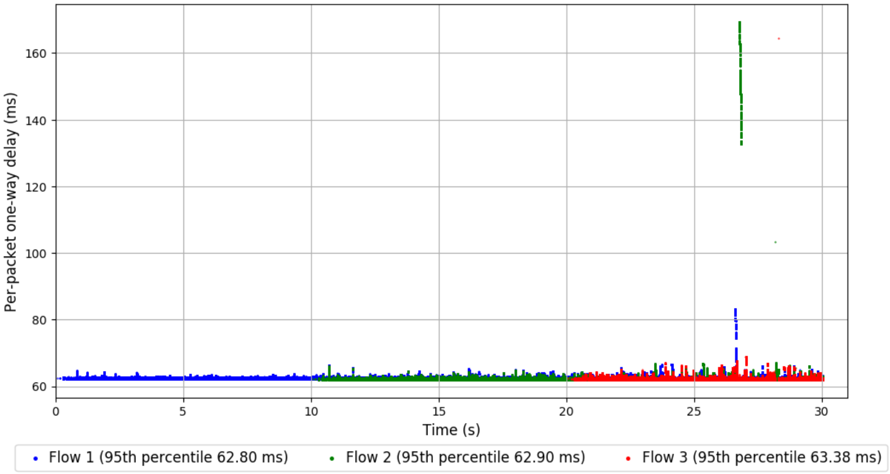
```
Run 1: Statistics of TaoVA-100x

Start at: 2018-12-20 13:07:51
End at: 2018-12-20 13:08:21
Local clock offset: -0.07 ms
Remote clock offset: -0.768 ms

# Below is generated by plot.py at 2018-12-20 17:57:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 443.30 Mbit/s
95th percentile per-packet one-way delay: 62.898 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 228.76 Mbit/s
95th percentile per-packet one-way delay: 62.805 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 213.93 Mbit/s
95th percentile per-packet one-way delay: 62.903 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 216.53 Mbit/s
95th percentile per-packet one-way delay: 63.383 ms
Loss rate: 0.00%
```

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



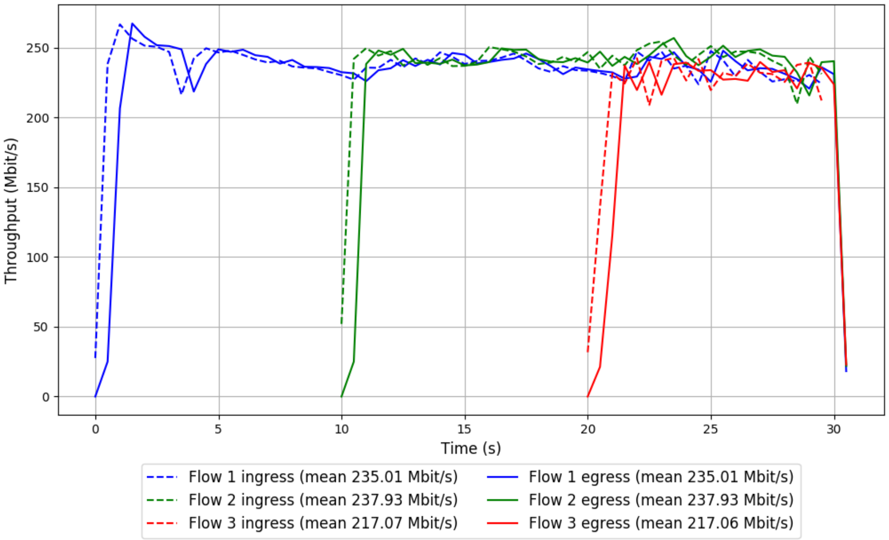


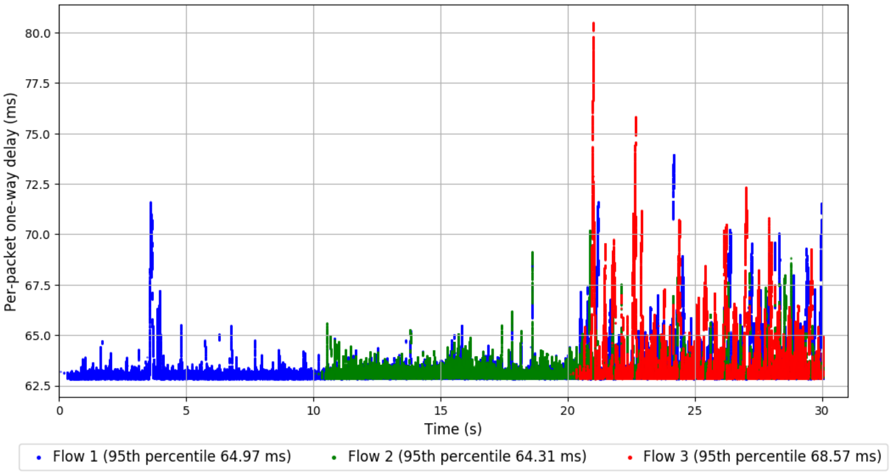
```
Run 2: Statistics of TaoVA-100x

Start at: 2018-12-20 13:41:33
End at: 2018-12-20 13:42:03
Local clock offset: -0.009 ms
Remote clock offset: 0.138 ms

# Below is generated by plot.py at 2018-12-20 17:58:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 465.62 Mbit/s
95th percentile per-packet one-way delay: 65.454 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 235.01 Mbit/s
95th percentile per-packet one-way delay: 64.968 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 237.93 Mbit/s
95th percentile per-packet one-way delay: 64.308 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 217.06 Mbit/s
95th percentile per-packet one-way delay: 68.566 ms
Loss rate: 0.01%
```

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



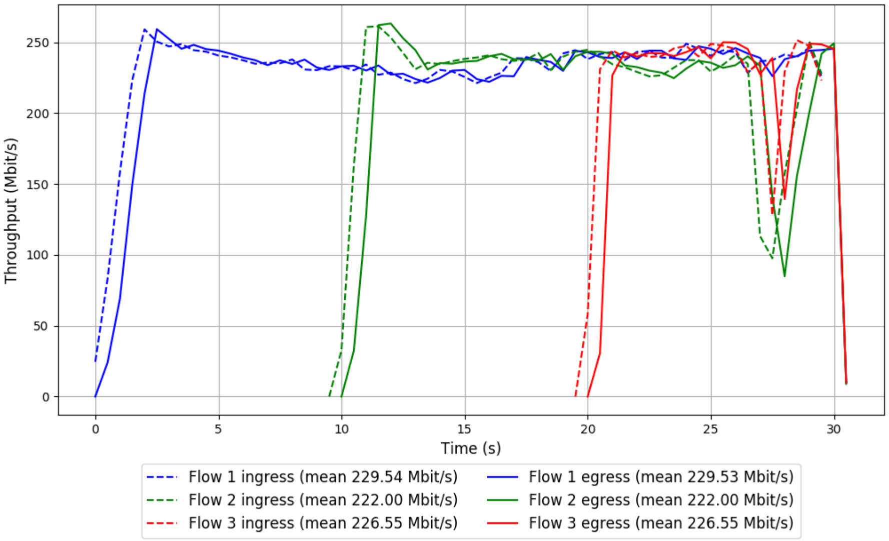


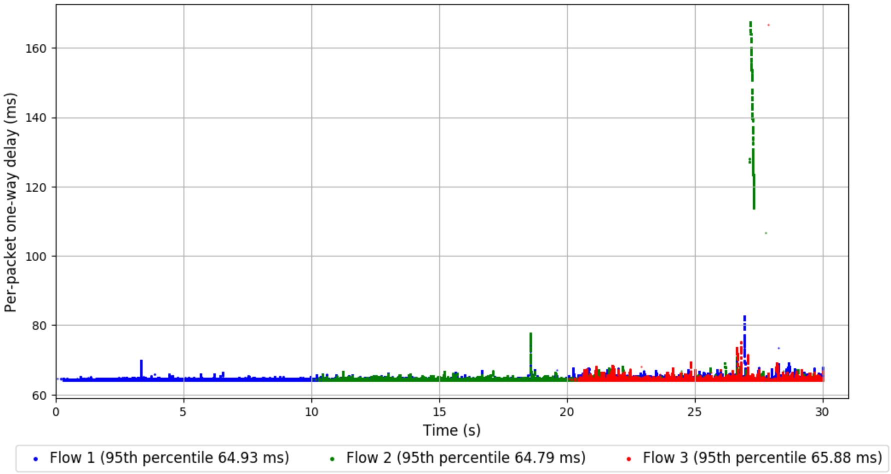
```
Run 3: Statistics of TaoVA-100x

Start at: 2018-12-20 14:15:27
End at: 2018-12-20 14:15:57
Local clock offset: -0.085 ms
Remote clock offset: 1.212 ms

# Below is generated by plot.py at 2018-12-20 17:58:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 452.87 Mbit/s
95th percentile per-packet one-way delay: 65.058 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 229.53 Mbit/s
95th percentile per-packet one-way delay: 64.926 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 222.00 Mbit/s
95th percentile per-packet one-way delay: 64.786 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 226.55 Mbit/s
95th percentile per-packet one-way delay: 65.879 ms
Loss rate: 0.00%
```

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



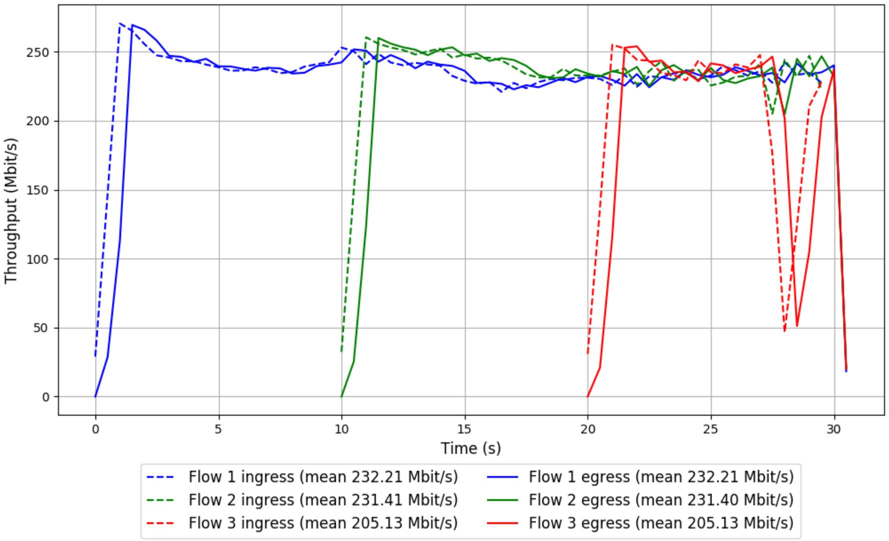


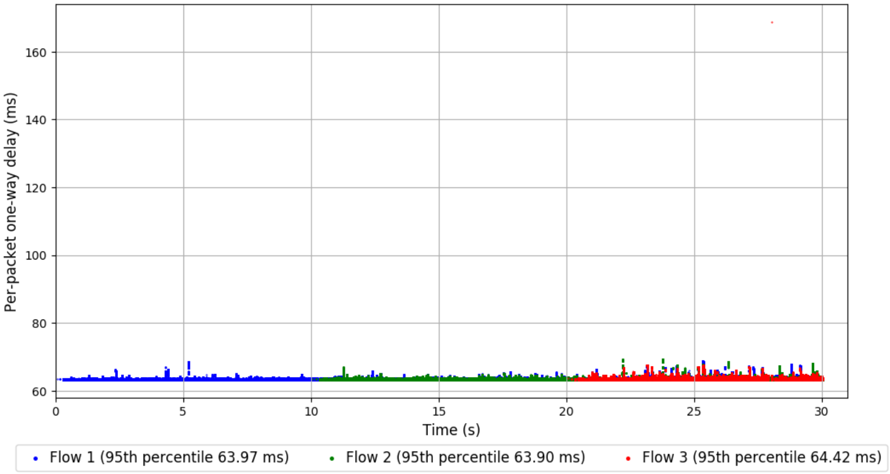
```
Run 4: Statistics of TaoVA-100x

Start at: 2018-12-20 14:49:14
End at: 2018-12-20 14:49:44
Local clock offset: -0.034 ms
Remote clock offset: 0.404 ms

# Below is generated by plot.py at 2018-12-20 17:58:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 454.49 Mbit/s
95th percentile per-packet one-way delay: 64.055 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 232.21 Mbit/s
95th percentile per-packet one-way delay: 63.973 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 231.40 Mbit/s
95th percentile per-packet one-way delay: 63.895 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 205.13 Mbit/s
95th percentile per-packet one-way delay: 64.420 ms
Loss rate: 0.00%
```

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



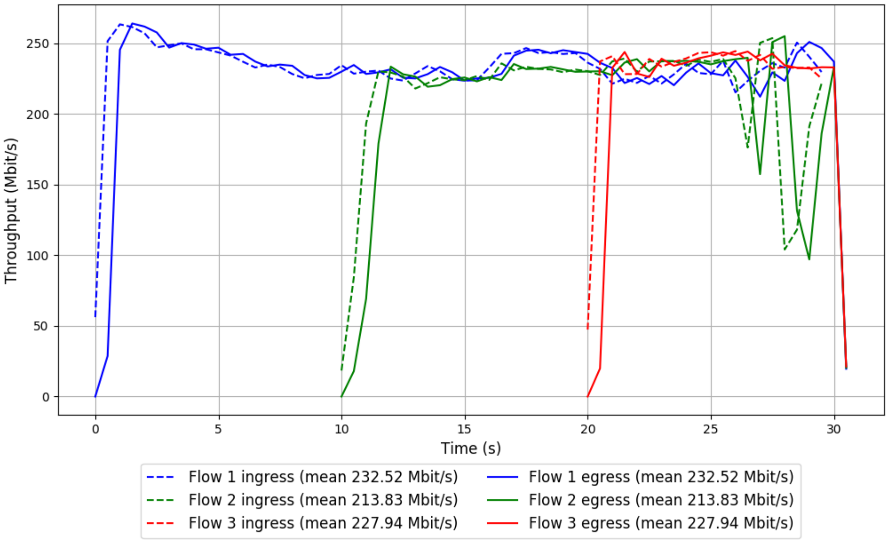


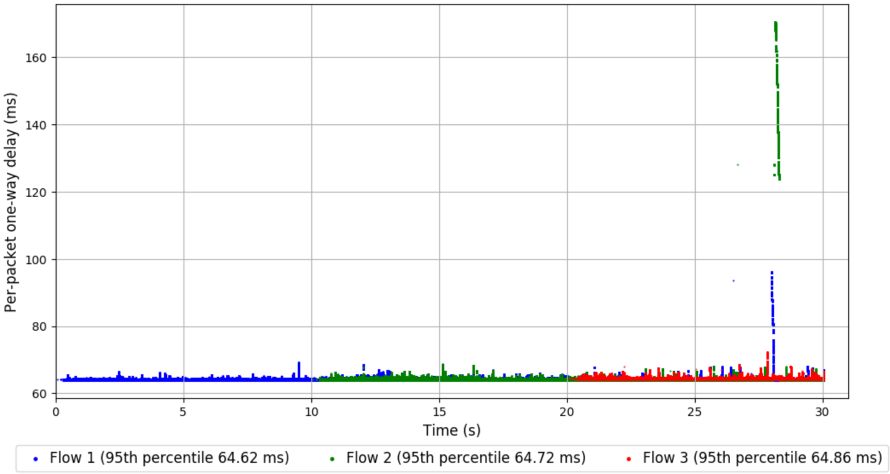
```
Run 5: Statistics of TaoVA-100x

Start at: 2018-12-20 15:22:55
End at: 2018-12-20 15:23:25
Local clock offset: -0.044 ms
Remote clock offset: 1.072 ms

# Below is generated by plot.py at 2018-12-20 17:58:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 450.67 Mbit/s
95th percentile per-packet one-way delay: 64.693 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 232.52 Mbit/s
95th percentile per-packet one-way delay: 64.618 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 213.83 Mbit/s
95th percentile per-packet one-way delay: 64.724 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 227.94 Mbit/s
95th percentile per-packet one-way delay: 64.865 ms
Loss rate: 0.00%
```

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



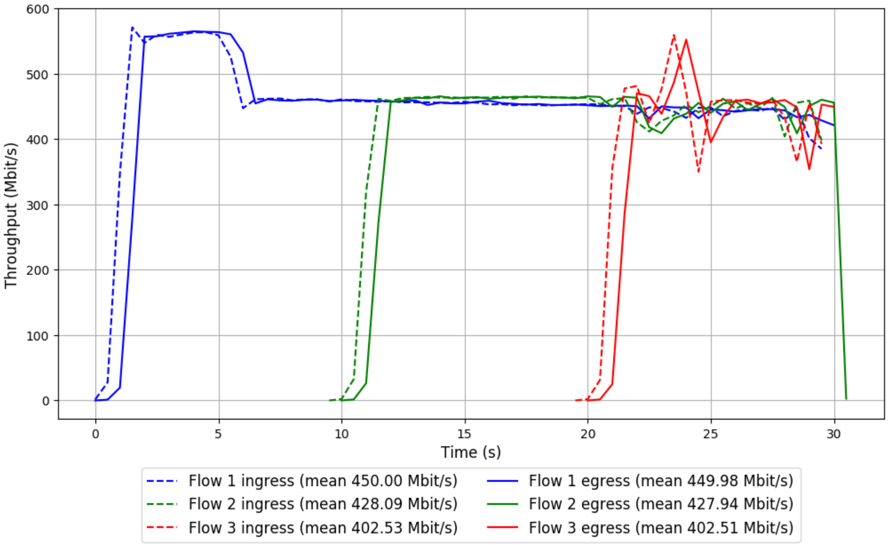


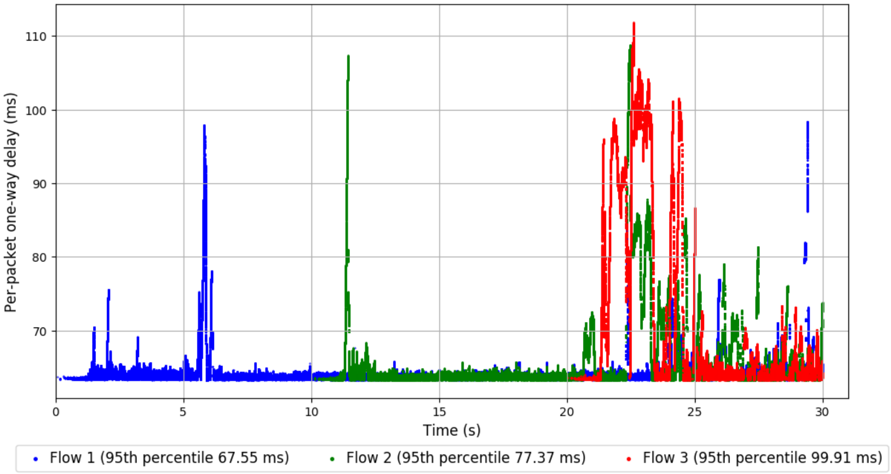
```
Run 1: Statistics of TCP Vegas

Start at: 2018-12-20 12:40:14
End at: 2018-12-20 12:40:44
Local clock offset: -0.06 ms
Remote clock offset: 0.426 ms

# Below is generated by plot.py at 2018-12-20 17:58:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 869.43 Mbit/s
95th percentile per-packet one-way delay: 81.749 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 449.98 Mbit/s
95th percentile per-packet one-way delay: 67.553 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 427.94 Mbit/s
95th percentile per-packet one-way delay: 77.369 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 402.51 Mbit/s
95th percentile per-packet one-way delay: 99.905 ms
Loss rate: 0.00%
```

Run 1: Report of TCP Vegas — Data Link



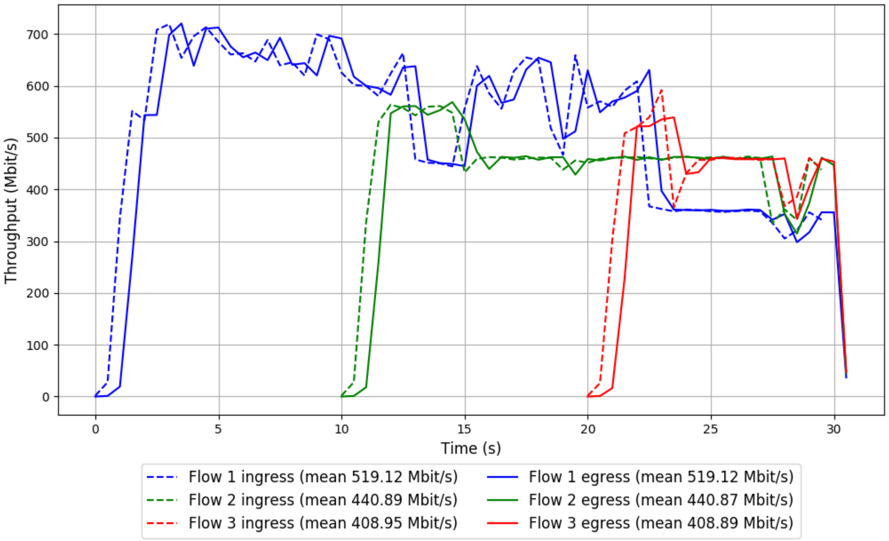


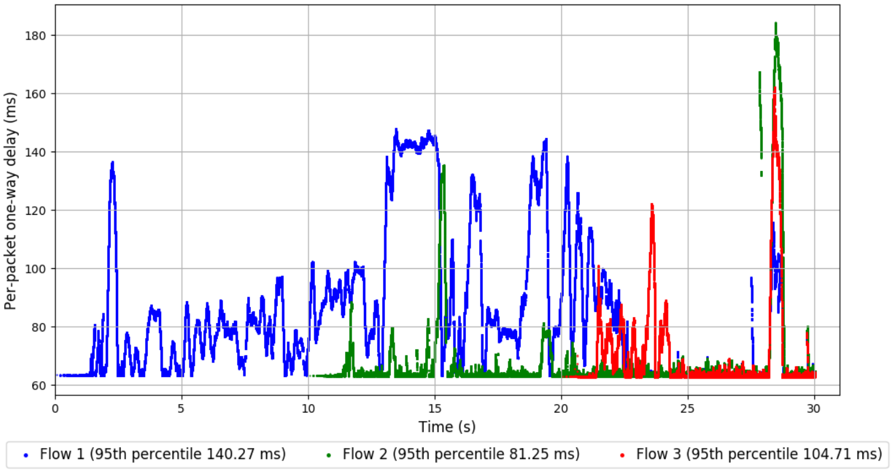
```
Run 2: Statistics of TCP Vegas

Start at: 2018-12-20 13:13:07
End at: 2018-12-20 13:13:37
Local clock offset: -0.082 ms
Remote clock offset: 0.013 ms

# Below is generated by plot.py at 2018-12-20 18:12:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 948.67 Mbit/s
95th percentile per-packet one-way delay: 131.608 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 519.12 Mbit/s
95th percentile per-packet one-way delay: 140.271 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 440.87 Mbit/s
95th percentile per-packet one-way delay: 81.248 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 408.89 Mbit/s
95th percentile per-packet one-way delay: 104.714 ms
Loss rate: 0.01%
```

Run 2: Report of TCP Vegas — Data Link



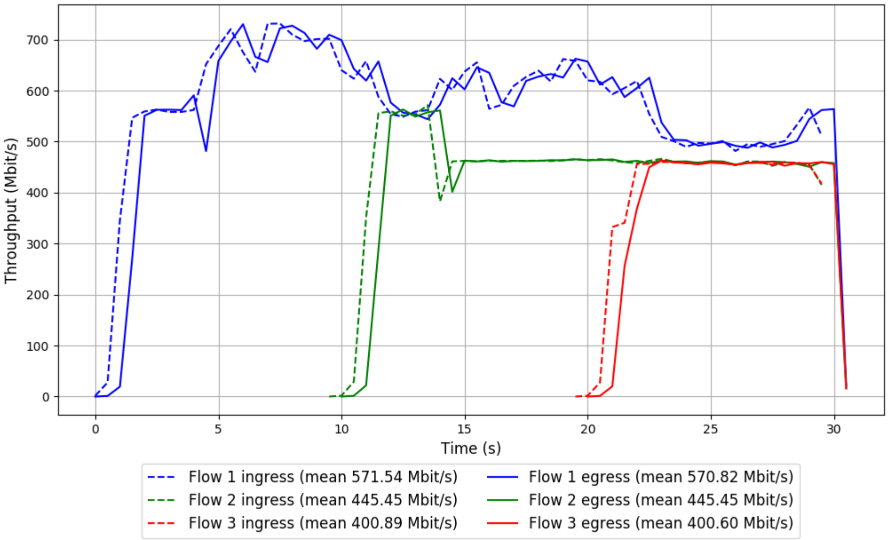


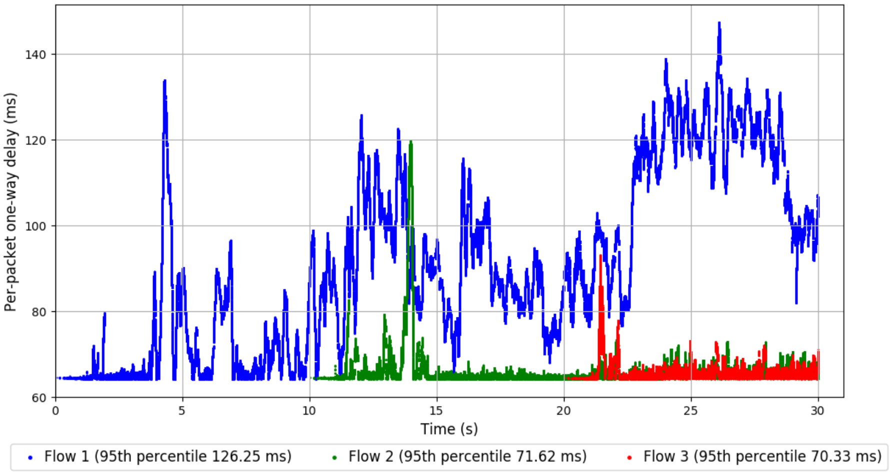
```
Run 3: Statistics of TCP Vegas

Start at: 2018-12-20 13:47:02
End at: 2018-12-20 13:47:32
Local clock offset: 0.002 ms
Remote clock offset: 1.556 ms

# Below is generated by plot.py at 2018-12-20 18:14:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1000.95 Mbit/s
95th percentile per-packet one-way delay: 121.600 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 570.82 Mbit/s
95th percentile per-packet one-way delay: 126.248 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 445.45 Mbit/s
95th percentile per-packet one-way delay: 71.623 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 400.60 Mbit/s
95th percentile per-packet one-way delay: 70.327 ms
Loss rate: 0.05%
```

Run 3: Report of TCP Vegas — Data Link



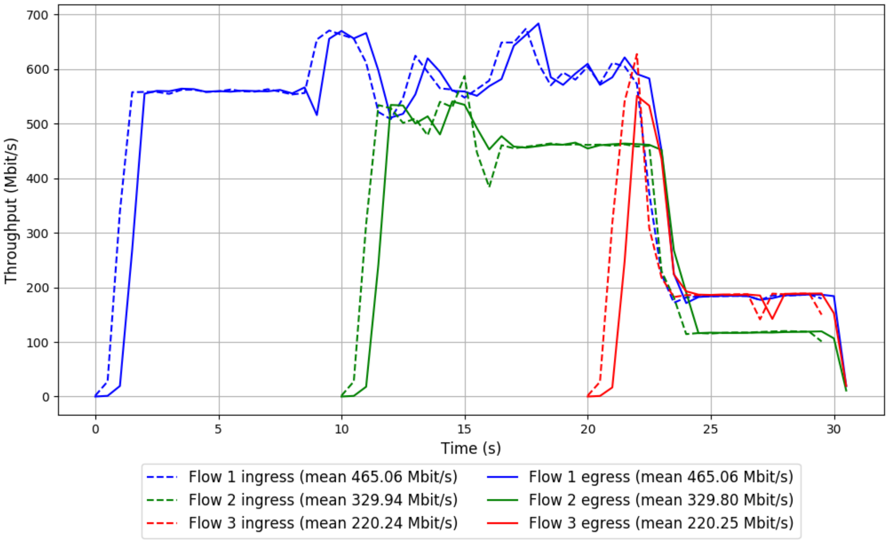


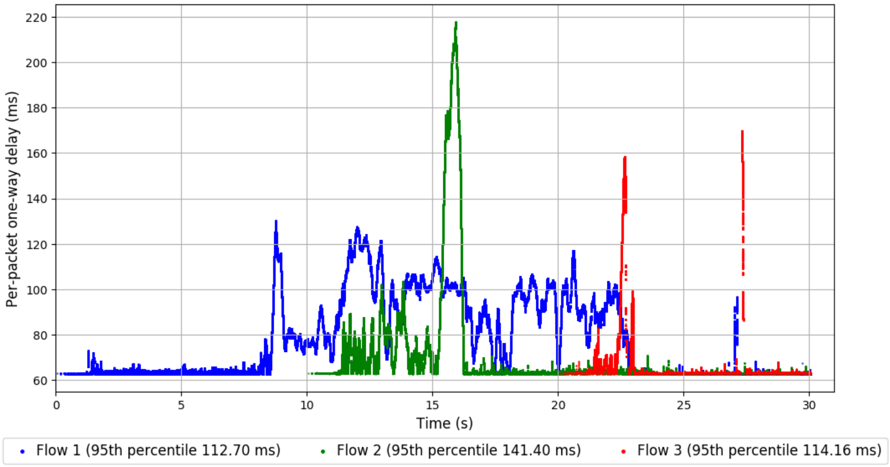
```
Run 4: Statistics of TCP Vegas

Start at: 2018-12-20 14:20:57
End at: 2018-12-20 14:21:27
Local clock offset: -0.103 ms
Remote clock offset: -0.234 ms

# Below is generated by plot.py at 2018-12-20 18:14:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 757.87 Mbit/s
95th percentile per-packet one-way delay: 113.166 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 465.06 Mbit/s
95th percentile per-packet one-way delay: 112.703 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 329.80 Mbit/s
95th percentile per-packet one-way delay: 141.404 ms
Loss rate: 0.04%
-- Flow 3:
Average throughput: 220.25 Mbit/s
95th percentile per-packet one-way delay: 114.158 ms
Loss rate: 0.00%
```

Run 4: Report of TCP Vegas — Data Link



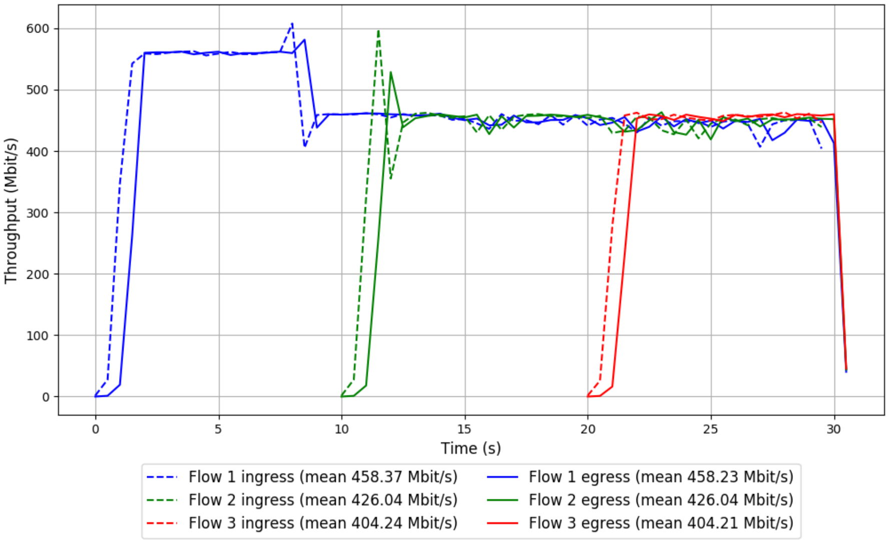


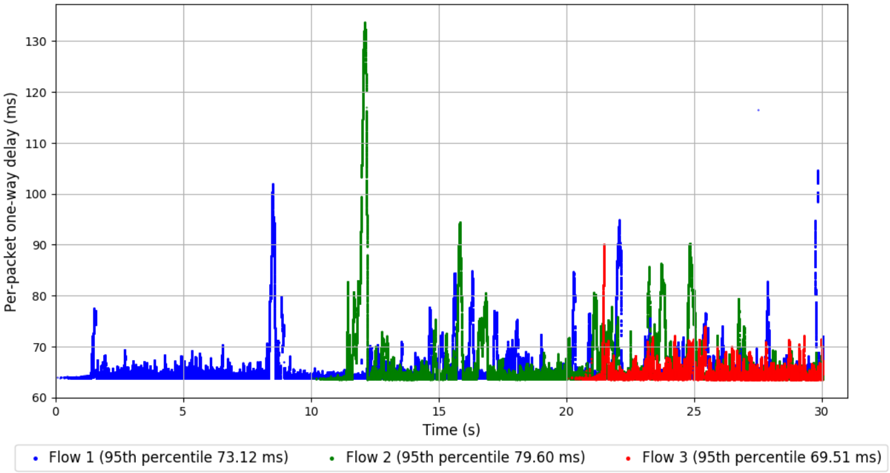
```
Run 5: Statistics of TCP Vegas

Start at: 2018-12-20 14:54:32
End at: 2018-12-20 14:55:02
Local clock offset: -0.044 ms
Remote clock offset: 0.677 ms

# Below is generated by plot.py at 2018-12-20 18:14:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 876.31 Mbit/s
95th percentile per-packet one-way delay: 74.661 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 458.23 Mbit/s
95th percentile per-packet one-way delay: 73.124 ms
Loss rate: 0.03%
-- Flow 2:
Average throughput: 426.04 Mbit/s
95th percentile per-packet one-way delay: 79.604 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 404.21 Mbit/s
95th percentile per-packet one-way delay: 69.508 ms
Loss rate: 0.00%
```

Run 5: Report of TCP Vegas — Data Link



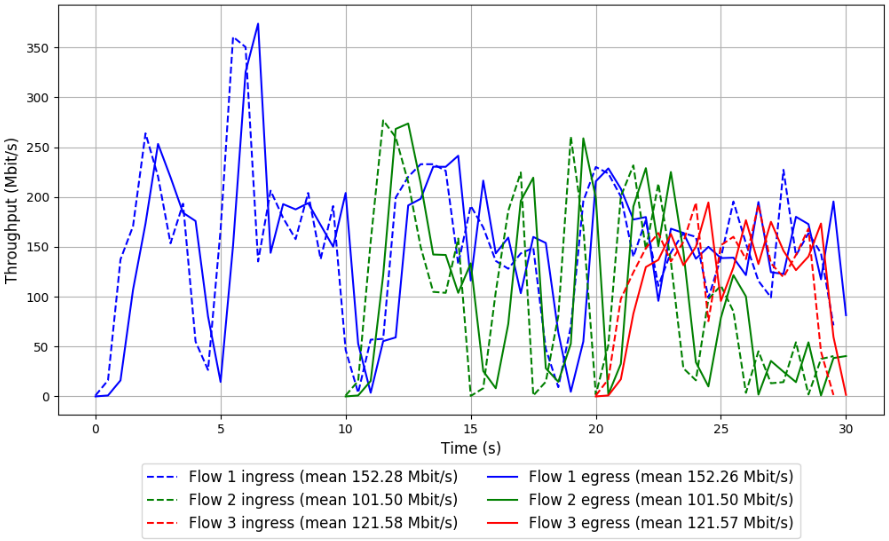


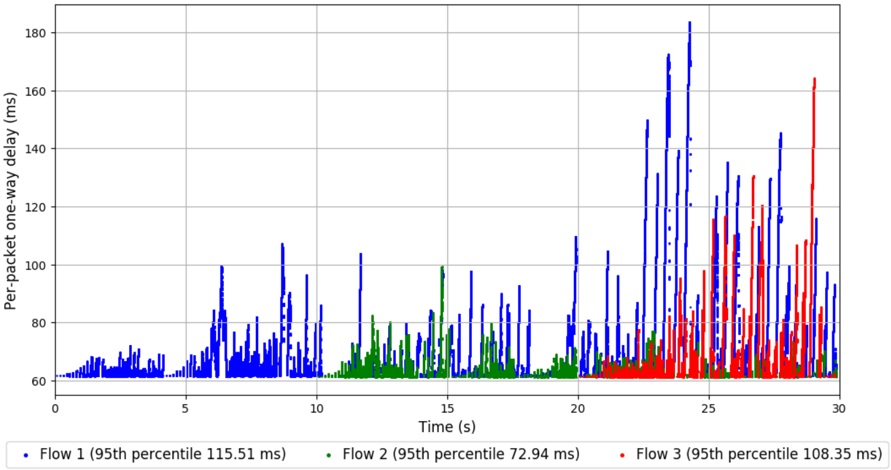
```
Run 1: Statistics of Verus

Start at: 2018-12-20 12:52:51
End at: 2018-12-20 12:53:21
Local clock offset: -0.076 ms
Remote clock offset: -1.582 ms

# Below is generated by plot.py at 2018-12-20 18:14:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 259.26 Mbit/s
95th percentile per-packet one-way delay: 105.321 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 152.26 Mbit/s
95th percentile per-packet one-way delay: 115.511 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 101.50 Mbit/s
95th percentile per-packet one-way delay: 72.943 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 121.57 Mbit/s
95th percentile per-packet one-way delay: 108.348 ms
Loss rate: 0.00%
```

Run 1: Report of Verus — Data Link



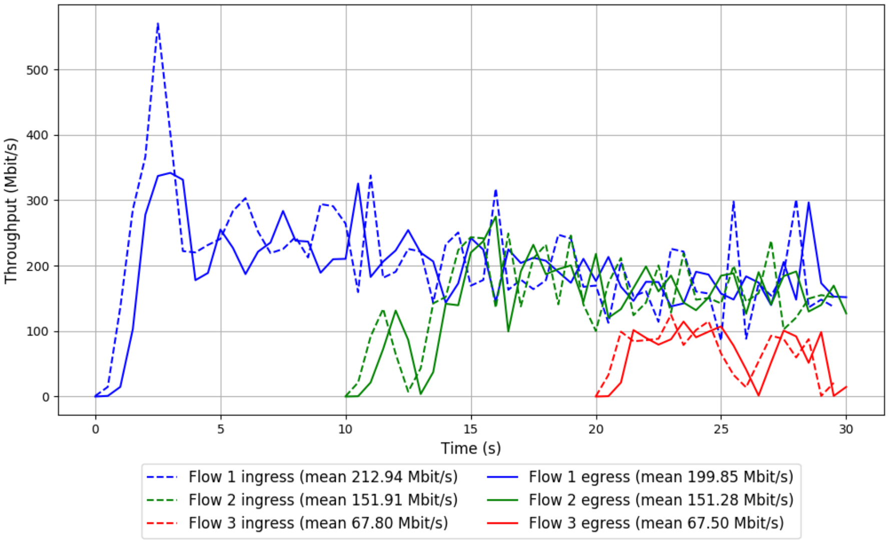


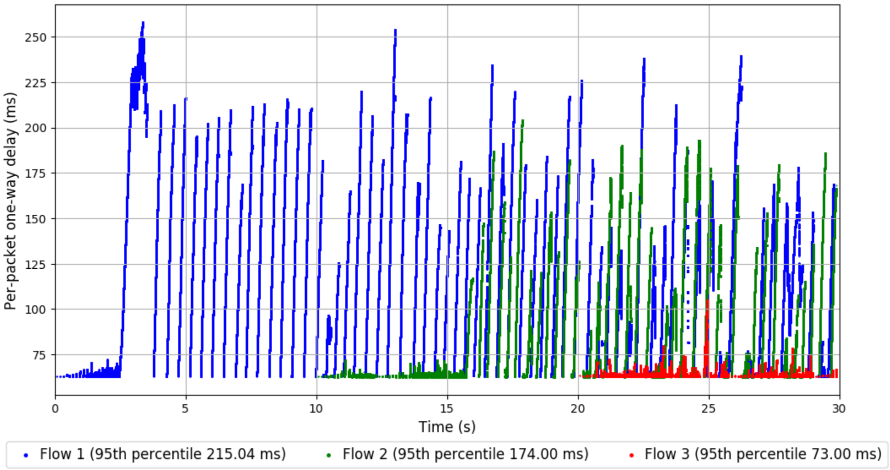
```
Run 2: Statistics of Verus

Start at: 2018-12-20 13:26:27
End at: 2018-12-20 13:26:57
Local clock offset: -0.077 ms
Remote clock offset: -0.096 ms

# Below is generated by plot.py at 2018-12-20 18:14:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 321.86 Mbit/s
95th percentile per-packet one-way delay: 204.998 ms
Loss rate: 3.85%
-- Flow 1:
Average throughput: 199.85 Mbit/s
95th percentile per-packet one-way delay: 215.036 ms
Loss rate: 5.85%
-- Flow 2:
Average throughput: 151.28 Mbit/s
95th percentile per-packet one-way delay: 173.999 ms
Loss rate: 0.41%
-- Flow 3:
Average throughput: 67.50 Mbit/s
95th percentile per-packet one-way delay: 73.004 ms
Loss rate: 0.46%
```

Run 2: Report of Verus — Data Link



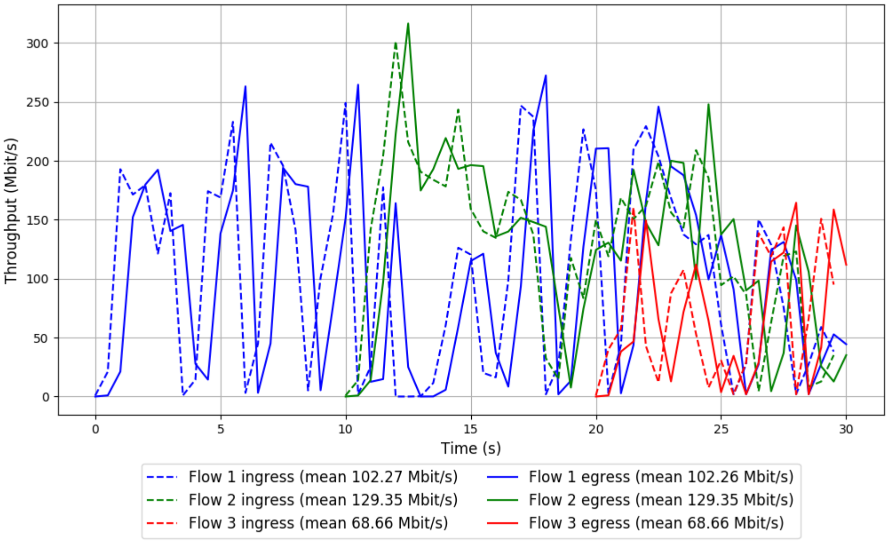


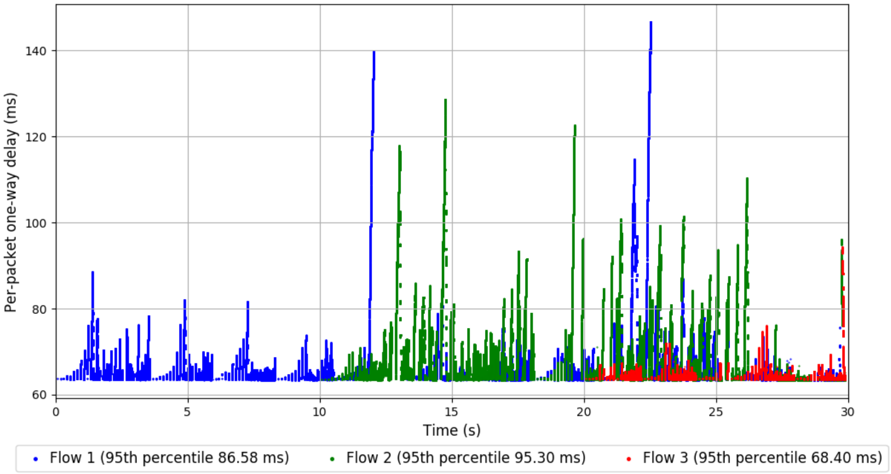
```
Run 3: Statistics of Verus

Start at: 2018-12-20 14:00:21
End at: 2018-12-20 14:00:51
Local clock offset: 0.049 ms
Remote clock offset: 0.697 ms

# Below is generated by plot.py at 2018-12-20 18:14:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 210.73 Mbit/s
95th percentile per-packet one-way delay: 91.301 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 102.26 Mbit/s
95th percentile per-packet one-way delay: 86.575 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 129.35 Mbit/s
95th percentile per-packet one-way delay: 95.302 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 68.66 Mbit/s
95th percentile per-packet one-way delay: 68.403 ms
Loss rate: 0.00%
```

Run 3: Report of Verus — Data Link



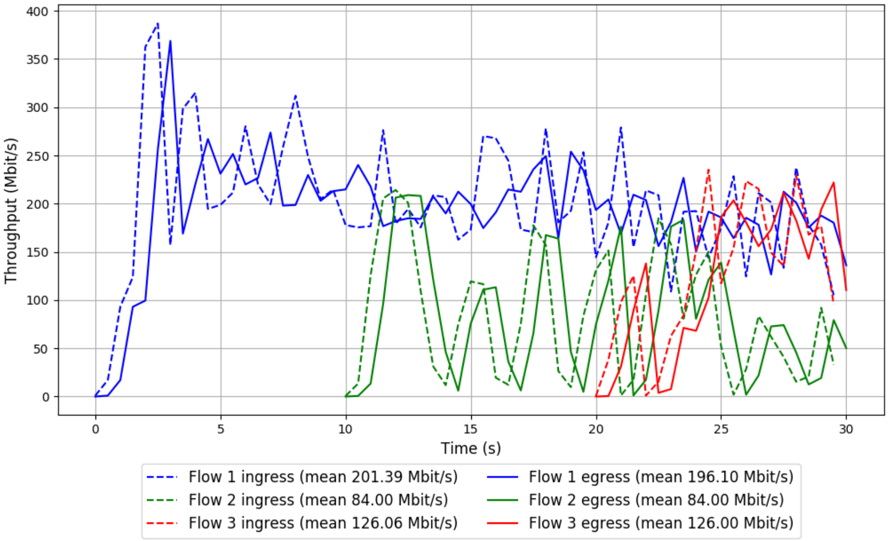


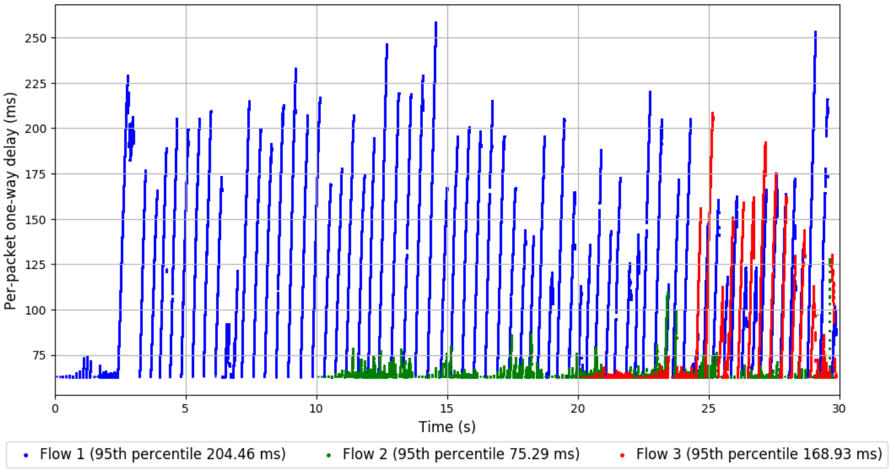
```
Run 4: Statistics of Verus

Start at: 2018-12-20 14:33:59
End at: 2018-12-20 14:34:29
Local clock offset: -0.114 ms
Remote clock offset: 0.001 ms

# Below is generated by plot.py at 2018-12-20 18:14:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 293.27 Mbit/s
95th percentile per-packet one-way delay: 198.327 ms
Loss rate: 1.74%
-- Flow 1:
Average throughput: 196.10 Mbit/s
95th percentile per-packet one-way delay: 204.458 ms
Loss rate: 2.57%
-- Flow 2:
Average throughput: 84.00 Mbit/s
95th percentile per-packet one-way delay: 75.288 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 126.00 Mbit/s
95th percentile per-packet one-way delay: 168.931 ms
Loss rate: 0.05%
```

Run 4: Report of Verus — Data Link



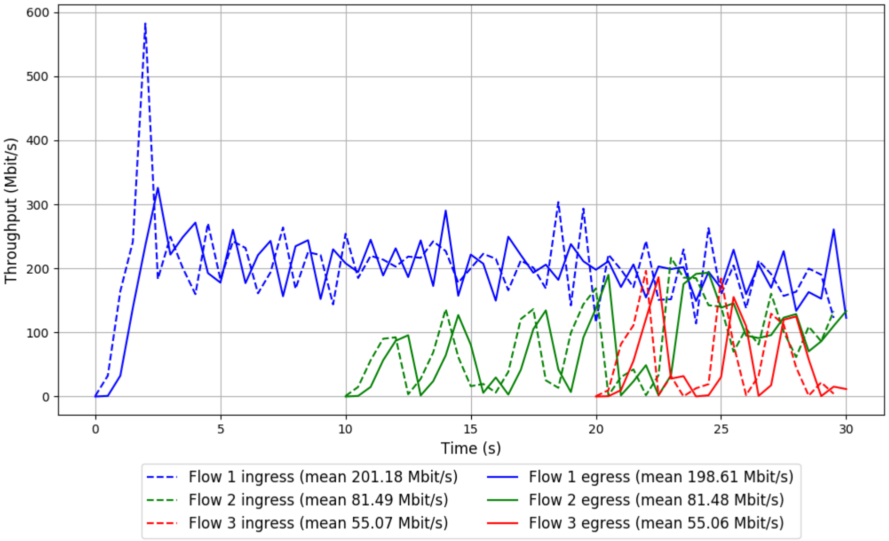


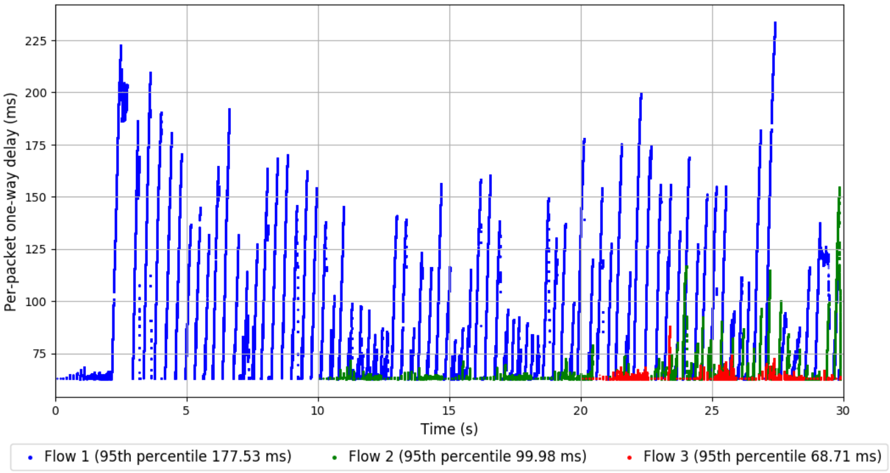
```
Run 5: Statistics of Verus

Start at: 2018-12-20 15:07:43
End at: 2018-12-20 15:08:13
Local clock offset: -0.015 ms
Remote clock offset: 0.079 ms

# Below is generated by plot.py at 2018-12-20 18:14:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 270.70 Mbit/s
95th percentile per-packet one-way delay: 166.855 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 198.61 Mbit/s
95th percentile per-packet one-way delay: 177.529 ms
Loss rate: 1.28%
-- Flow 2:
Average throughput: 81.48 Mbit/s
95th percentile per-packet one-way delay: 99.978 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 55.06 Mbit/s
95th percentile per-packet one-way delay: 68.710 ms
Loss rate: 0.00%
```

Run 5: Report of Verus — Data Link



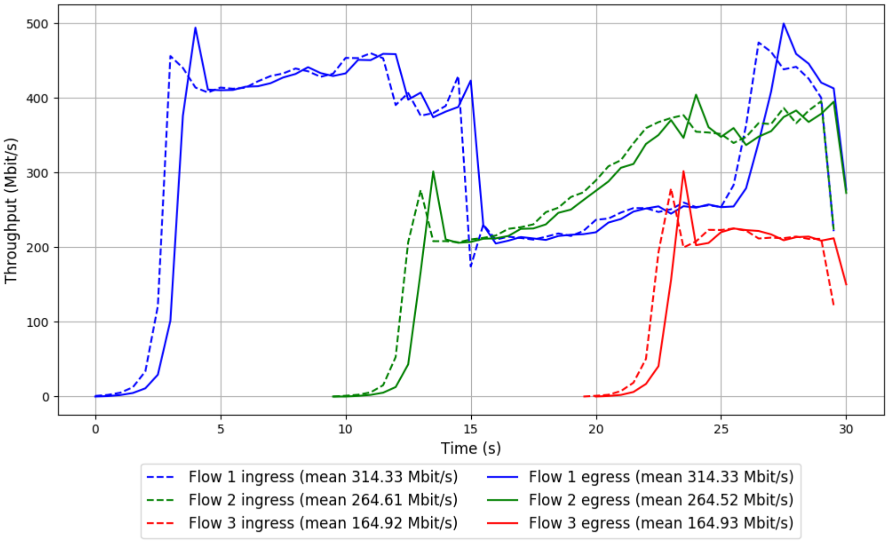


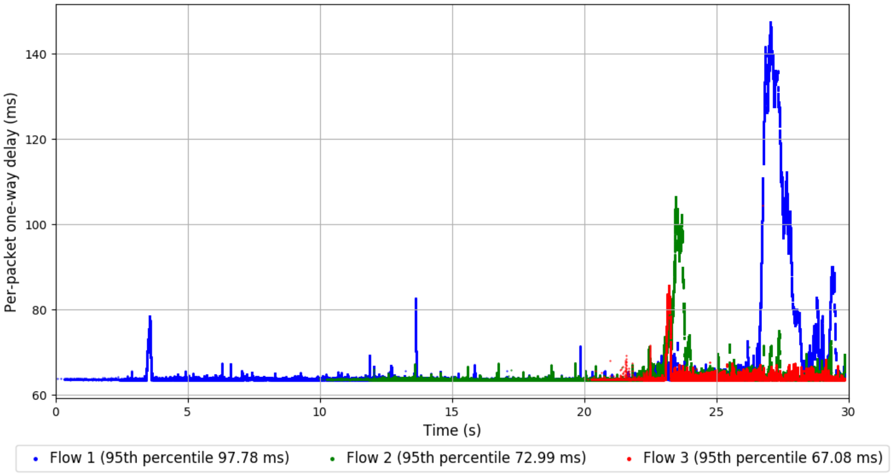
```
Run 1: Statistics of PCC-Vivace

Start at: 2018-12-20 12:45:49
End at: 2018-12-20 12:46:19
Local clock offset: -0.07 ms
Remote clock offset: 0.527 ms

# Below is generated by plot.py at 2018-12-20 18:16:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 545.20 Mbit/s
95th percentile per-packet one-way delay: 81.397 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 314.33 Mbit/s
95th percentile per-packet one-way delay: 97.778 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 264.52 Mbit/s
95th percentile per-packet one-way delay: 72.994 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 164.93 Mbit/s
95th percentile per-packet one-way delay: 67.082 ms
Loss rate: 0.00%
```

Run 1: Report of PCC-Vivace — Data Link



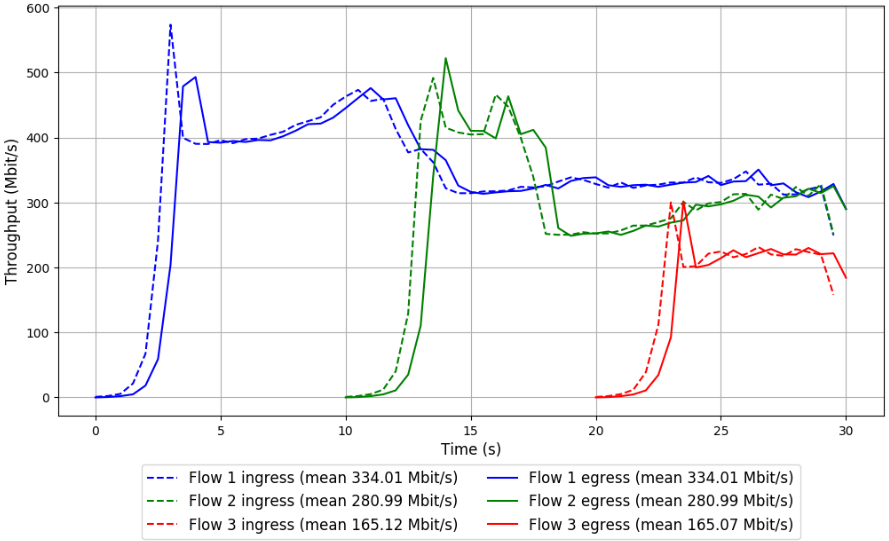


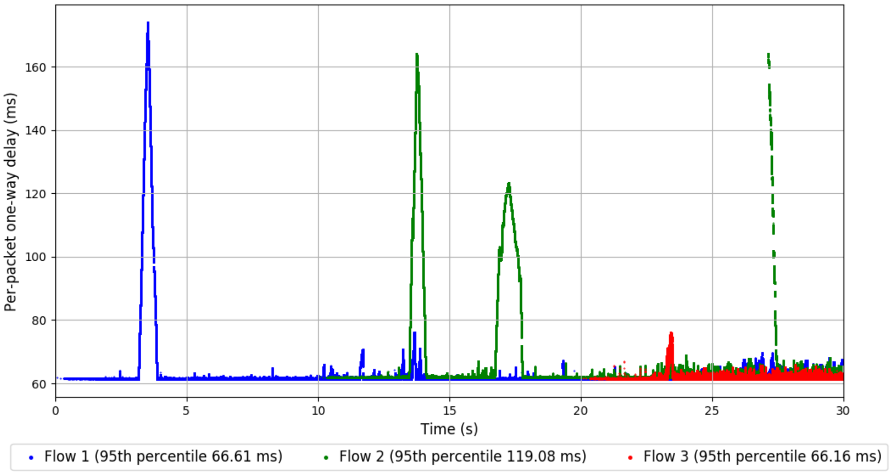
```
Run 2: Statistics of PCC-Vivace

Start at: 2018-12-20 13:19:16
End at: 2018-12-20 13:19:46
Local clock offset: -0.084 ms
Remote clock offset: -1.444 ms

# Below is generated by plot.py at 2018-12-20 18:17:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 575.30 Mbit/s
95th percentile per-packet one-way delay: 99.140 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 334.01 Mbit/s
95th percentile per-packet one-way delay: 66.605 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 280.99 Mbit/s
95th percentile per-packet one-way delay: 119.075 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 165.07 Mbit/s
95th percentile per-packet one-way delay: 66.163 ms
Loss rate: 0.02%
```

Run 2: Report of PCC-Vivace — Data Link



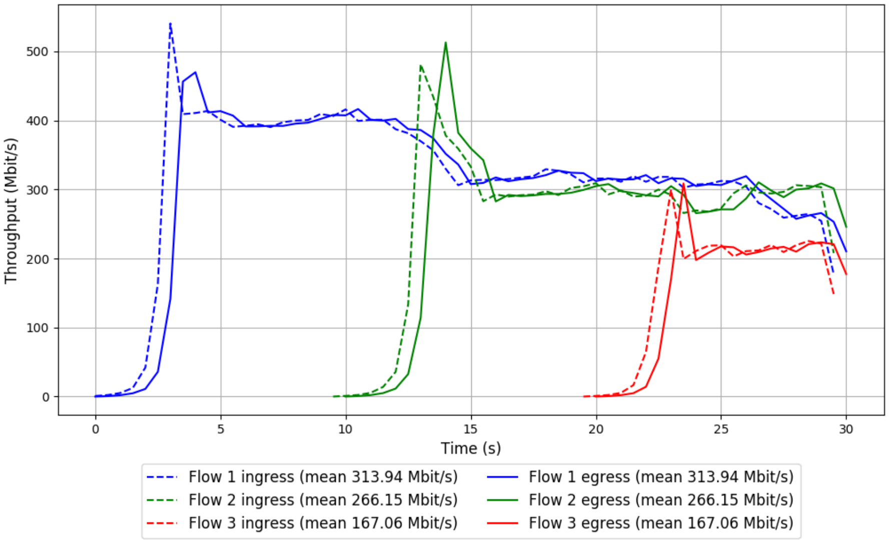


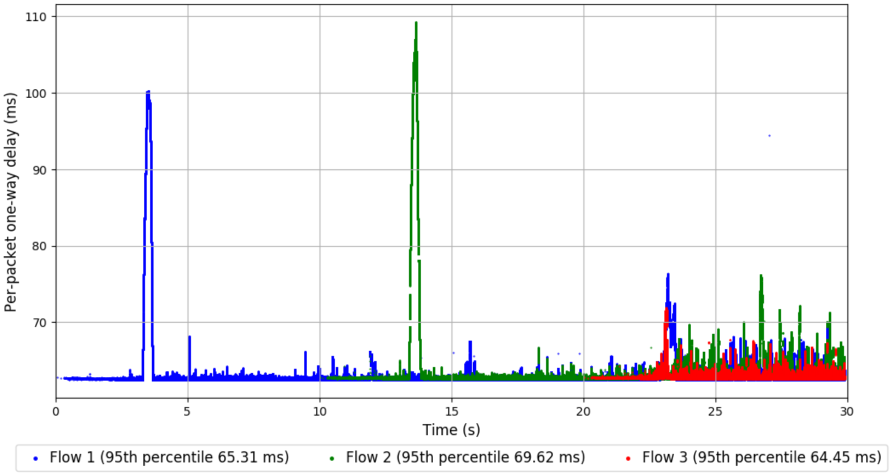
```
Run 3: Statistics of PCC-Vivace

Start at: 2018-12-20 13:53:16
End at: 2018-12-20 13:53:46
Local clock offset: 0.036 ms
Remote clock offset: -0.069 ms

# Below is generated by plot.py at 2018-12-20 18:17:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 546.43 Mbit/s
95th percentile per-packet one-way delay: 66.180 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 313.94 Mbit/s
95th percentile per-packet one-way delay: 65.306 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 266.15 Mbit/s
95th percentile per-packet one-way delay: 69.620 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 167.06 Mbit/s
95th percentile per-packet one-way delay: 64.452 ms
Loss rate: 0.00%
```

Run 3: Report of PCC-Vivace — Data Link



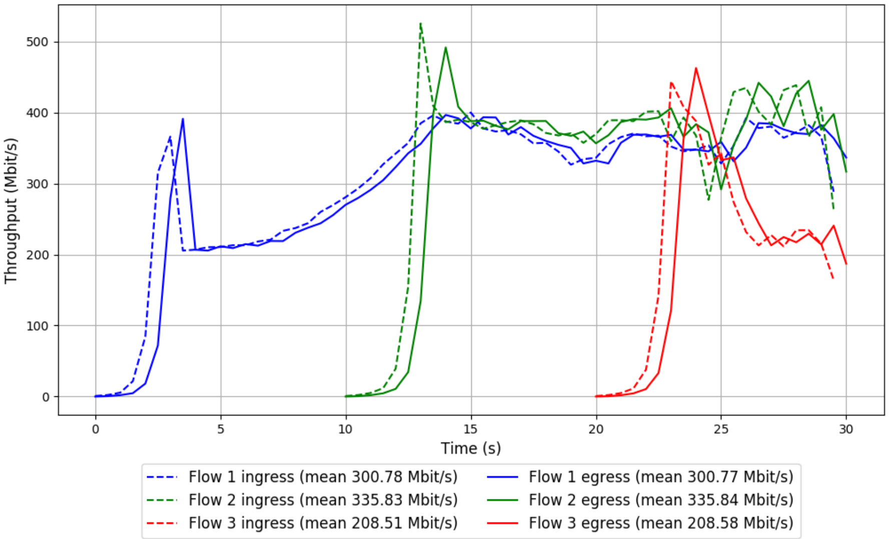


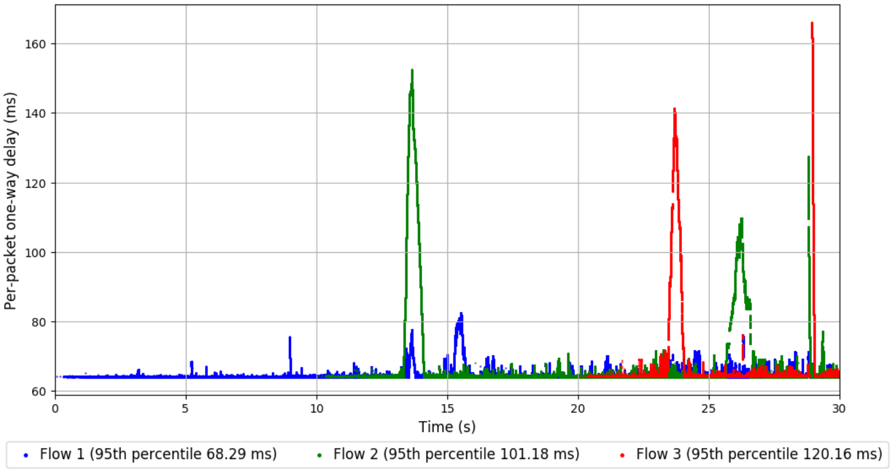
```
Run 4: Statistics of PCC-Vivace

Start at: 2018-12-20 14:26:51
End at: 2018-12-20 14:27:21
Local clock offset: -0.101 ms
Remote clock offset: 1.291 ms

# Below is generated by plot.py at 2018-12-20 18:18:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 592.87 Mbit/s
95th percentile per-packet one-way delay: 83.049 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 300.77 Mbit/s
95th percentile per-packet one-way delay: 68.288 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 335.84 Mbit/s
95th percentile per-packet one-way delay: 101.179 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 208.58 Mbit/s
95th percentile per-packet one-way delay: 120.159 ms
Loss rate: 0.00%
```

Run 4: Report of PCC-Vivace — Data Link



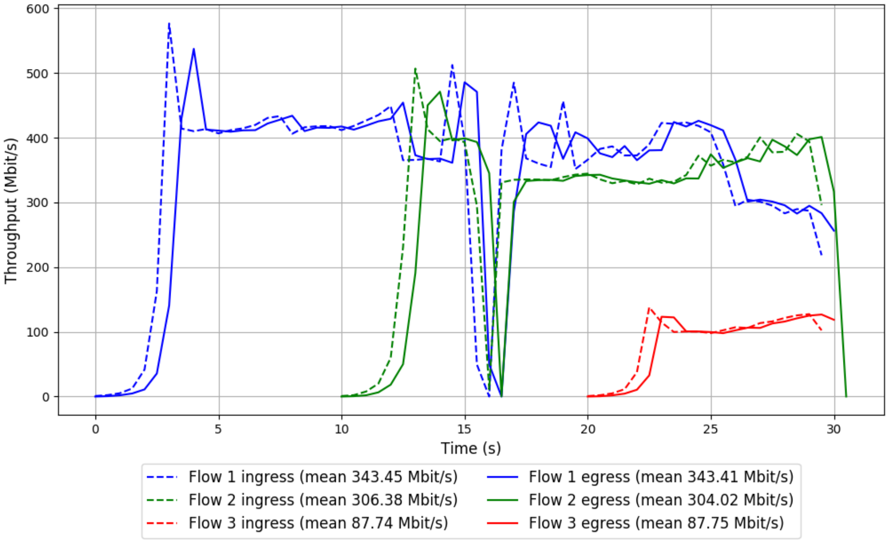


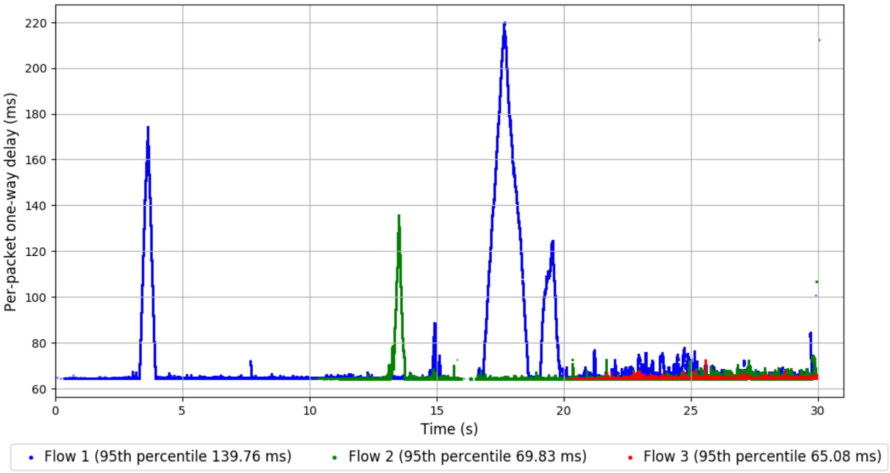
```
Run 5: Statistics of PCC-Vivace

Start at: 2018-12-20 15:00:35
End at: 2018-12-20 15:01:05
Local clock offset: -0.05 ms
Remote clock offset: 1.538 ms

# Below is generated by plot.py at 2018-12-20 18:18:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 573.60 Mbit/s
95th percentile per-packet one-way delay: 111.465 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 343.41 Mbit/s
95th percentile per-packet one-way delay: 139.758 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 304.02 Mbit/s
95th percentile per-packet one-way delay: 69.828 ms
Loss rate: 0.26%
-- Flow 3:
Average throughput: 87.75 Mbit/s
95th percentile per-packet one-way delay: 65.076 ms
Loss rate: 0.00%
```

Run 5: Report of PCC-Vivace — Data Link



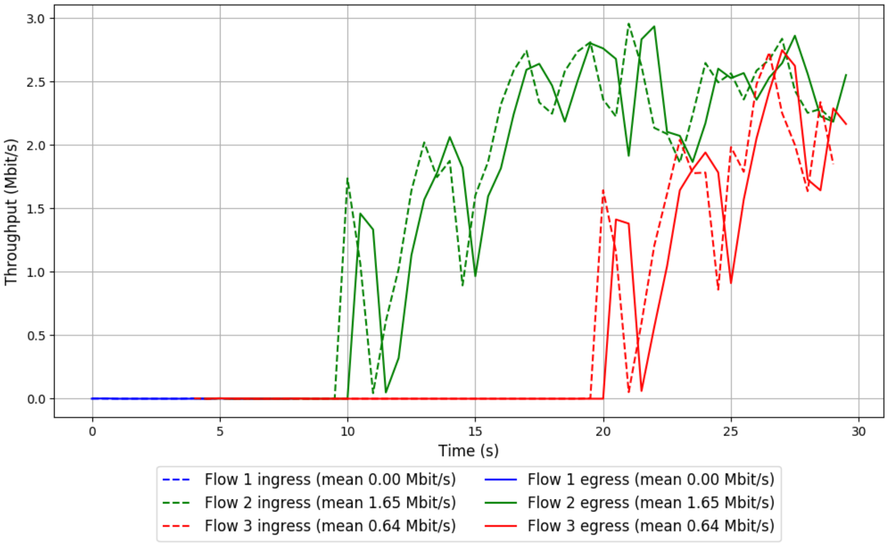


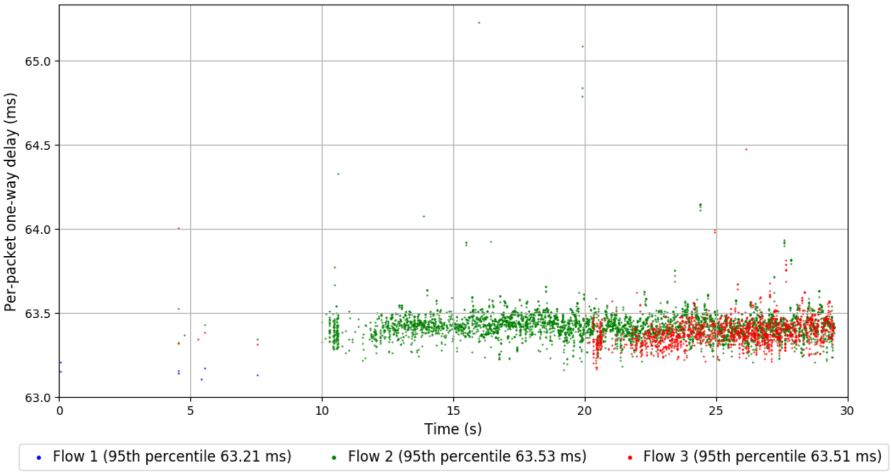
```
Run 1: Statistics of WebRTC media

Start at: 2018-12-20 13:04:37
End at: 2018-12-20 13:05:07
Local clock offset: -0.061 ms
Remote clock offset: 0.133 ms

# Below is generated by plot.py at 2018-12-20 18:18:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 63.523 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 63.206 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 63.528 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 63.508 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link



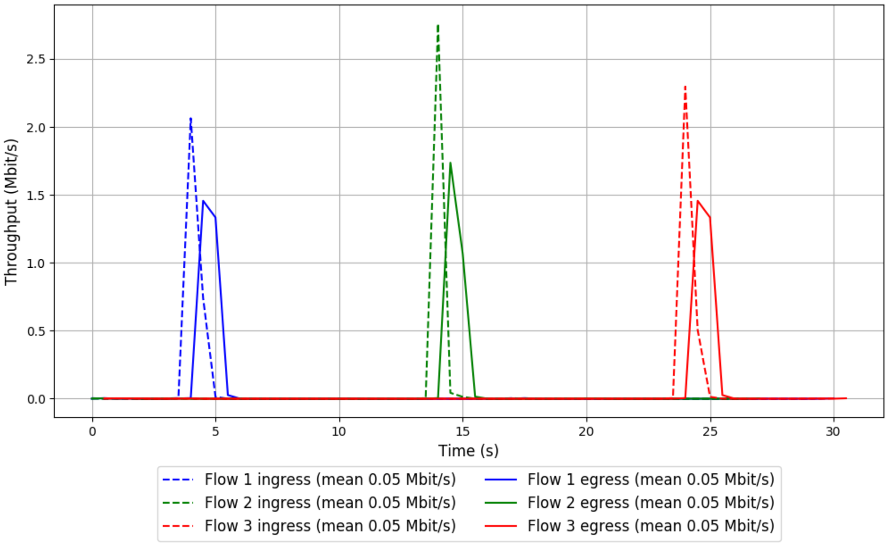


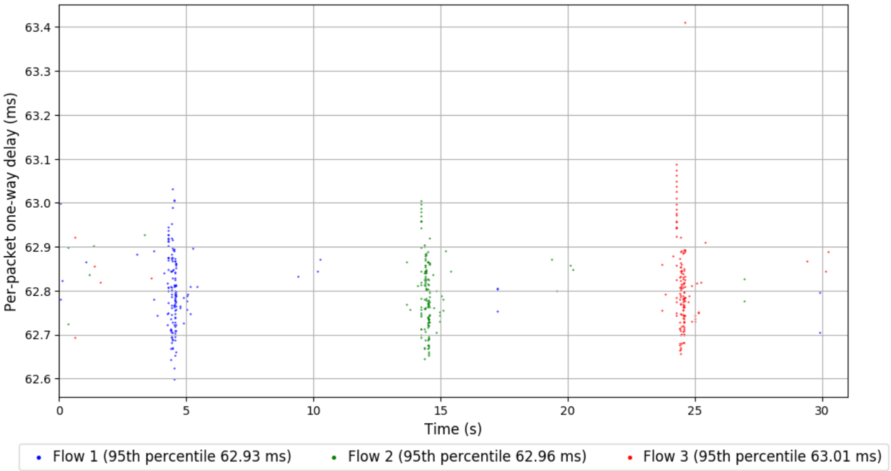
```
Run 2: Statistics of WebRTC media

Start at: 2018-12-20 13:38:21
End at: 2018-12-20 13:38:51
Local clock offset: 0.02 ms
Remote clock offset: -0.113 ms

# Below is generated by plot.py at 2018-12-20 18:18:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 62.959 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 62.928 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 62.958 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 63.011 ms
Loss rate: 0.00%
```

Run 2: Report of WebRTC media — Data Link



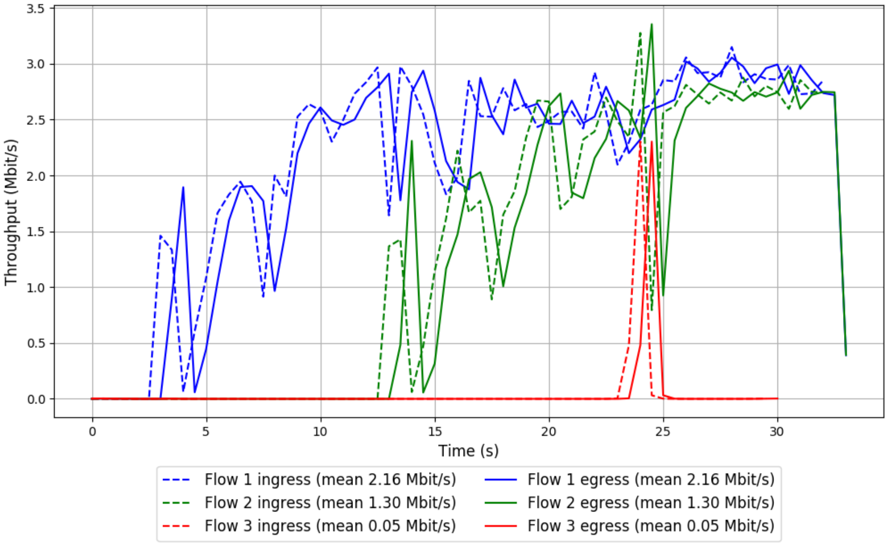


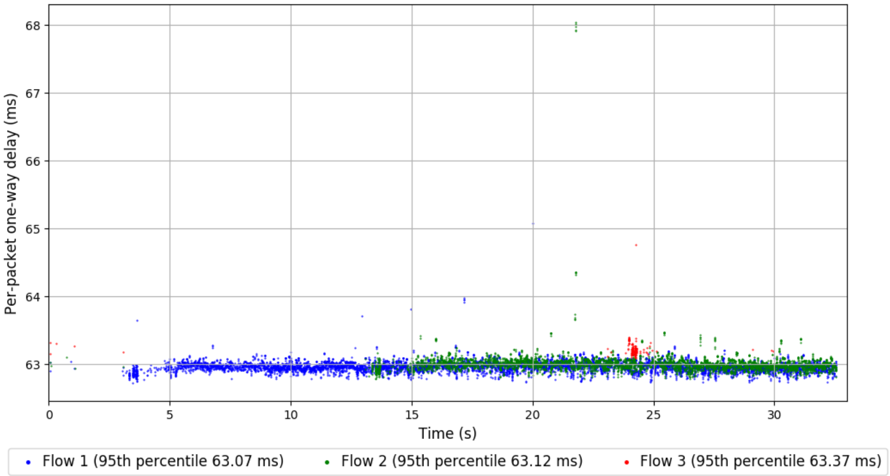
```
Run 3: Statistics of WebRTC media

Start at: 2018-12-20 14:12:14
End at: 2018-12-20 14:12:44
Local clock offset: -0.045 ms
Remote clock offset: 0.068 ms

# Below is generated by plot.py at 2018-12-20 18:18:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.50 Mbit/s
95th percentile per-packet one-way delay: 63.099 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 63.073 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 63.117 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 63.367 ms
Loss rate: 0.00%
```

Run 3: Report of WebRTC media — Data Link



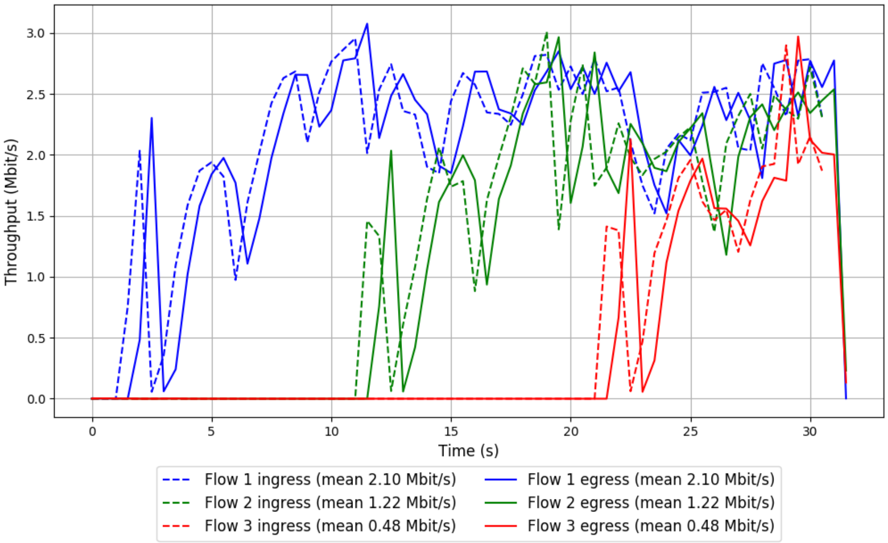


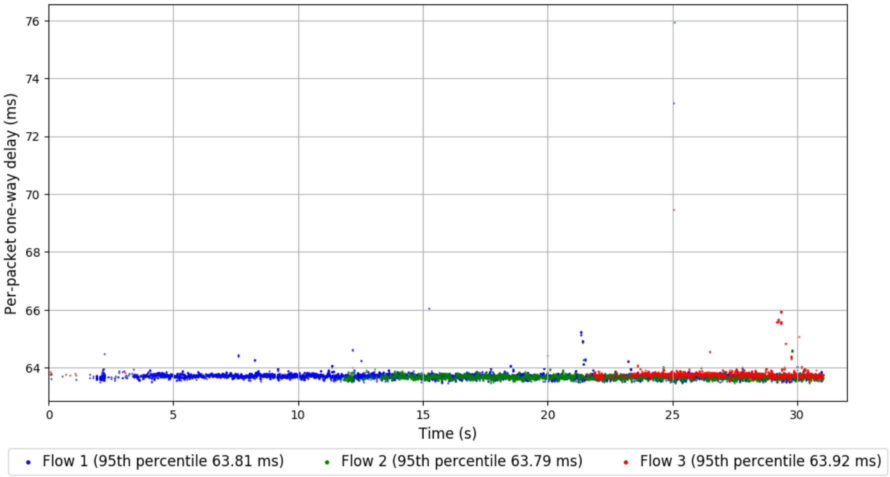
```
Run 4: Statistics of WebRTC media

Start at: 2018-12-20 14:46:00
End at: 2018-12-20 14:46:30
Local clock offset: -0.028 ms
Remote clock offset: 0.67 ms

# Below is generated by plot.py at 2018-12-20 18:18:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.81 Mbit/s
95th percentile per-packet one-way delay: 63.825 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.10 Mbit/s
95th percentile per-packet one-way delay: 63.812 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.22 Mbit/s
95th percentile per-packet one-way delay: 63.791 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 63.917 ms
Loss rate: 0.00%
```

Run 4: Report of WebRTC media — Data Link



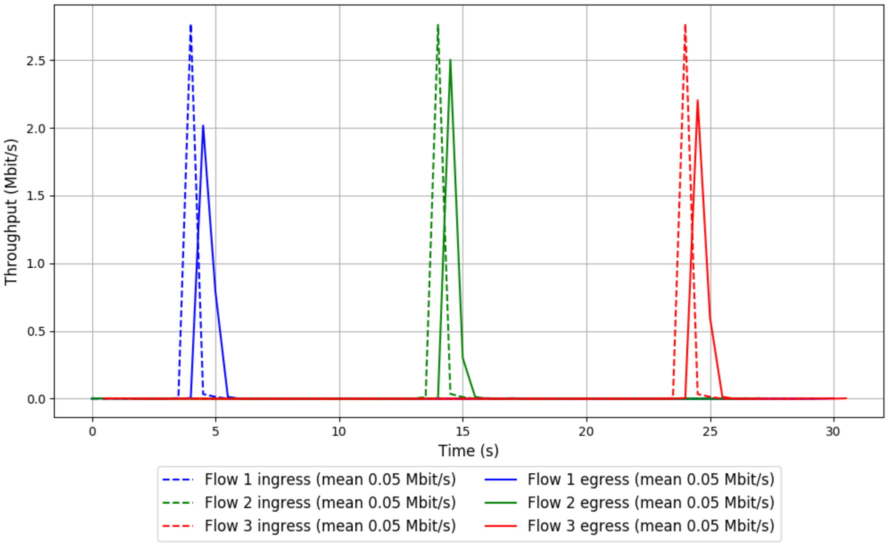


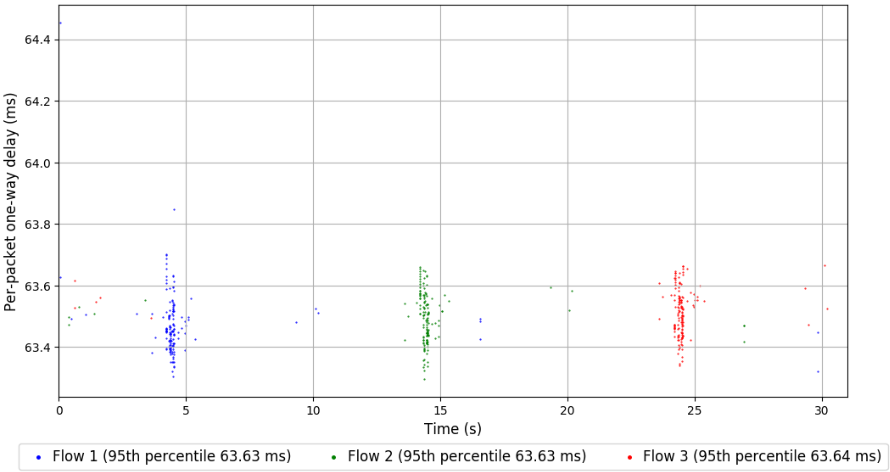
```
Run 5: Statistics of WebRTC media

Start at: 2018-12-20 15:19:46
End at: 2018-12-20 15:20:16
Local clock offset: -0.05 ms
Remote clock offset: 0.508 ms

# Below is generated by plot.py at 2018-12-20 18:18:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 63.637 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 63.629 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 63.631 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 63.641 ms
Loss rate: 0.00%
```

Run 5: Report of WebRTC media — Data Link


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


Per-packet one-way delay (ms)
63.4
63.6
63.8
64.0
64.2
64.4
0
5
10
15
20
25
30
Time (s)
Flow 1 (95th percentile 63.63 ms)
Flow 2 (95th percentile 63.63 ms)
Flow 3 (95th percentile 63.64 ms)