Pantheon Report

Generated at 2018-09-07 17:10:38 (UTC).

Data path: AWS India 2 on `ens5` (*local*) →Saudi Arabia on `enp2s0` (*remote*).

Repeated the test of 18 congestion control schemes 5 times.

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

NTP offsets were measured against `nets.org.sg` and have been applied to correct the timestamps in logs.
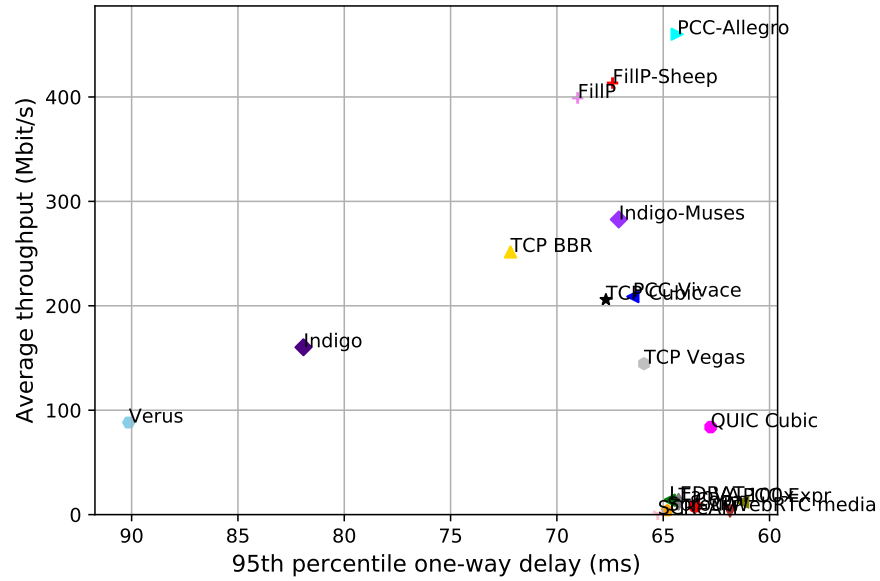
```
System info:
Linux 4.15.0-1020-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
net.ipv4.tcp_mem = 536870912 536870912 536870912

Git summary:
branch: muses @ e0a9b05ad97d268013b7cc9a9c95637b593a1b4c
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 7631aea3923a3598767c87765ae5103aca0678d3
third_party/pantheon-tunnel @ cbfce6db5ff5740dafe1771f813cd646339e1952
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
 M receiver/src/buffer.h
 M receiver/src/core.cpp
 M sender/src/buffer.h
 M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
 M src/ScreamClient
 M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
 M src/examples/cellsim.cc
 M src/examples/sproutbt2.cc
 M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
 M src/verus.hpp
```
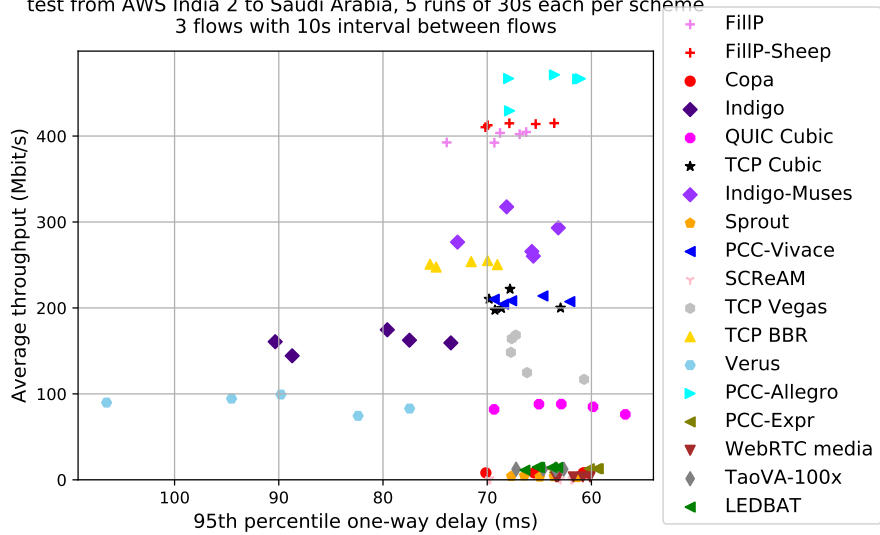
```
 M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from AWS India 2 to Saudi Arabia, 5 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)

test from AWS India 2 to Saudi Arabia, 5 runs of 30s each per scheme
3 flows with 10s interval between flows

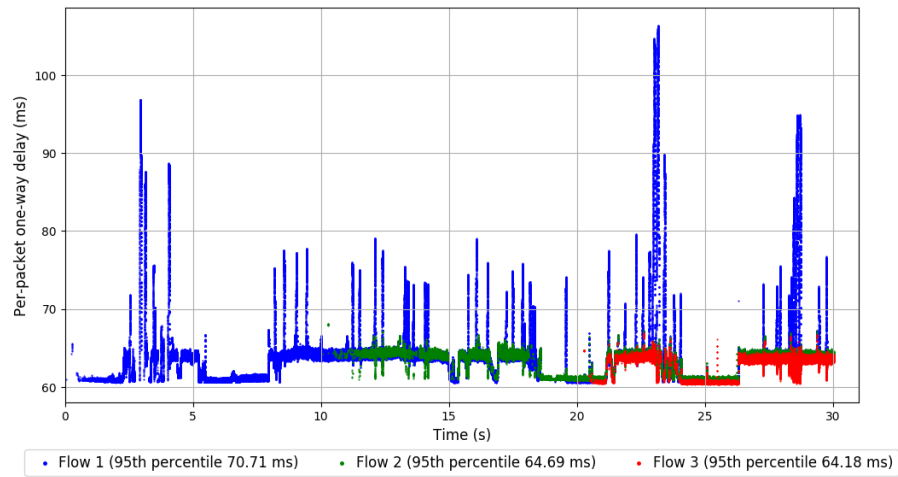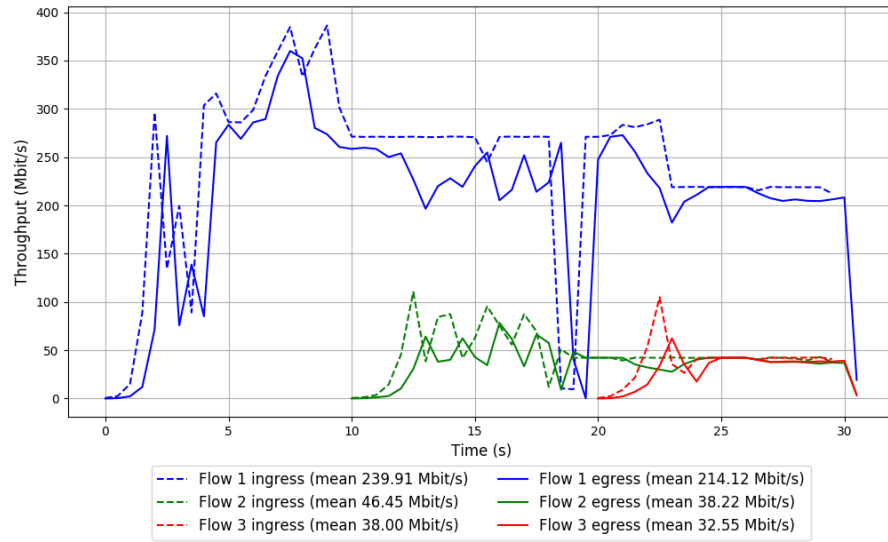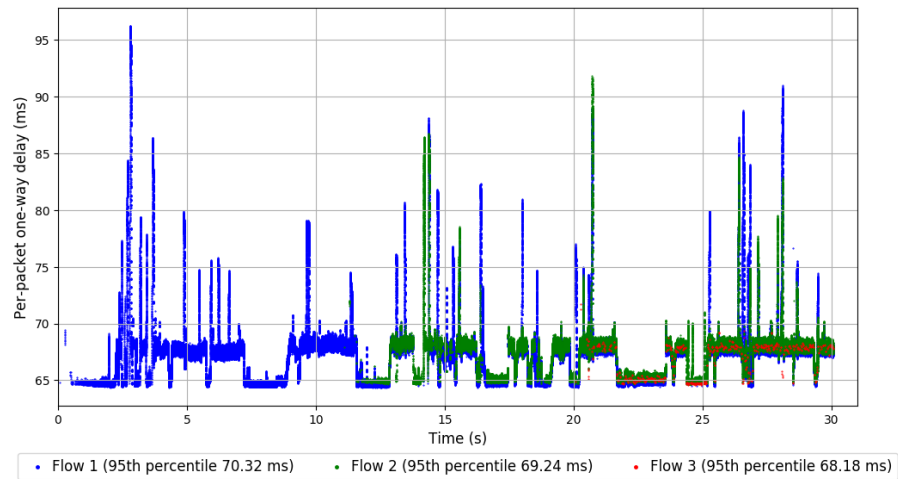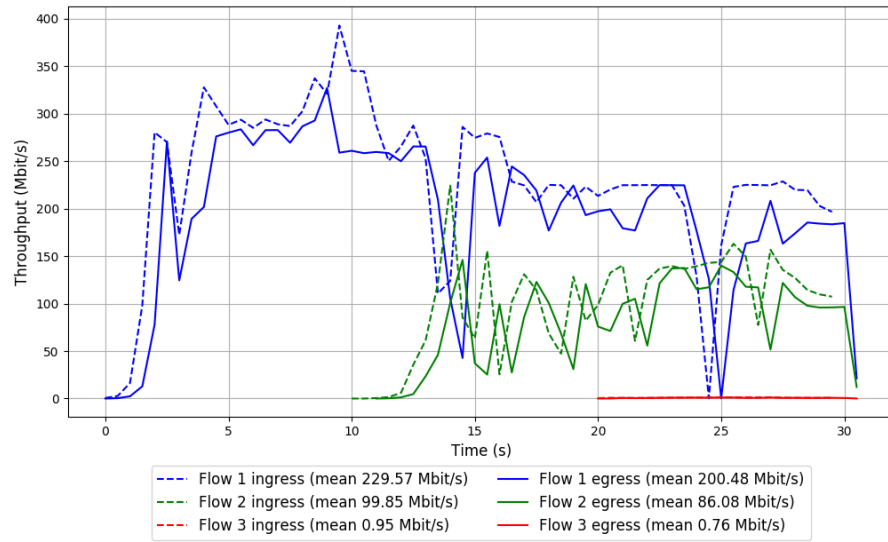| scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	5	206.91	56.14	26.12	73.31	68.71	66.98	11.13	17.15	16.82
Copa	5	0.00	9.91	4.55	64.04	63.72	62.59	98.56	63.16	71.43
TCP Cubic	5	123.52	87.68	71.95	68.36	65.50	66.69	1.39	1.33	1.47
FillP	5	295.24	150.96	10.09	70.81	66.53	65.77	16.39	17.13	17.75
FillP-Sheep	5	259.63	164.52	134.60	66.70	67.03	68.41	16.91	22.88	26.06
Indigo	5	75.96	91.81	73.34	75.48	87.47	84.52	12.78	22.03	40.55
LEDBAT	5	9.08	6.03	2.77	65.05	62.92	63.31	0.00	0.47	0.04
Indigo-Muses	5	236.43	48.96	42.60	67.65	65.88	66.65	10.30	15.65	14.18
PCC-Allegro	5	433.91	26.29	26.61	63.83	65.18	63.76	4.82	1.92	2.65
PCC-Expr	5	5.65	7.49	4.35	61.27	61.28	61.31	41.75	26.21	26.12
QUIC Cubic	5	52.51	35.99	22.87	61.26	63.38	63.57	0.01	0.01	0.00
SCReAM	5	0.22	0.22	0.22	64.74	64.69	64.54	0.00	0.00	0.00
Sprout	5	2.09	1.80	1.68	64.45	63.48	63.91	0.00	0.00	0.00
TaoVA-100x	5	7.32	4.16	6.97	67.69	61.29	61.22	33.14	38.98	88.76
TCP Vegas	5	81.82	60.75	66.87	65.68	65.69	67.80	1.71	2.03	3.27
Verus	5	60.17	30.57	28.42	86.97	80.99	83.41	48.94	32.61	51.57
PCC-Vivace	5	188.63	23.52	13.85	66.36	67.38	66.36	1.34	0.74	0.95
WebRTC media	5	1.83	1.16	0.41	61.12	61.72	62.41	0.00	0.00	0.00

```
Run 1: Statistics of TCP BBR

Start at: 2018-09-07 14:44:42
End at: 2018-09-07 14:45:12
Local clock offset: 0.371 ms
Remote clock offset: -35.774 ms


# Below is generated by plot.py at 2018-09-07 16:50:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 250.39 Mbit/s
95th percentile per-packet one-way delay: 69.027 ms
Loss rate: 11.67%
-- Flow 1:
Average throughput: 214.12 Mbit/s
95th percentile per-packet one-way delay: 70.707 ms
Loss rate: 10.75%
-- Flow 2:
Average throughput: 38.22 Mbit/s
95th percentile per-packet one-way delay: 64.688 ms
Loss rate: 17.72%
-- Flow 3:
Average throughput: 32.55 Mbit/s
95th percentile per-packet one-way delay: 64.178 ms
Loss rate: 14.34%
```
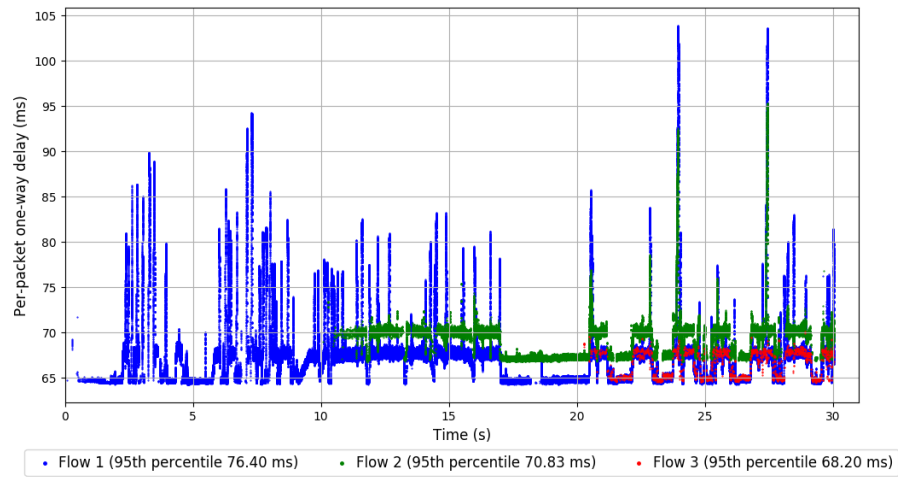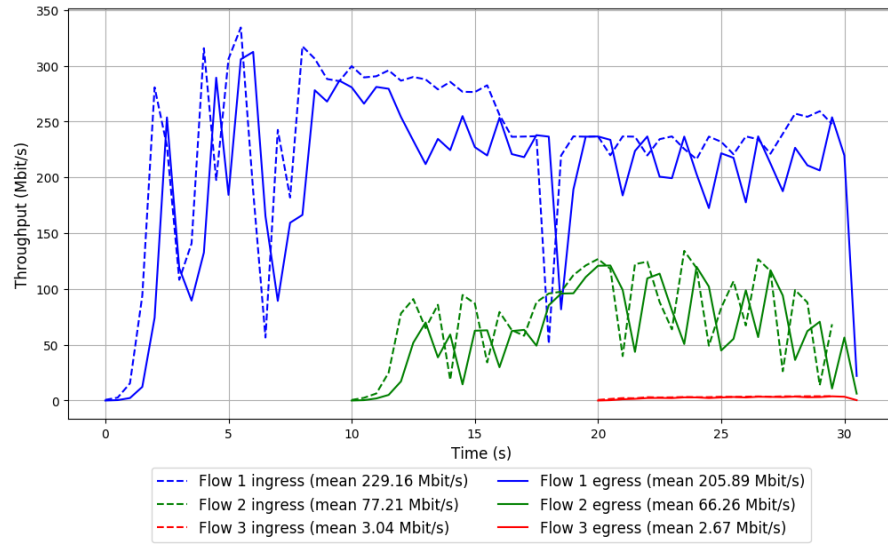
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2018-09-07 15:10:32
End at: 2018-09-07 15:11:02
Local clock offset: -0.135 ms
Remote clock offset: -29.883 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 255.13 Mbit/s
95th percentile per-packet one-way delay: 69.968 ms
Loss rate: 13.92%
-- Flow 1:
Average throughput: 200.48 Mbit/s
95th percentile per-packet one-way delay: 70.324 ms
Loss rate: 12.66%
-- Flow 2:
Average throughput: 86.08 Mbit/s
95th percentile per-packet one-way delay: 69.243 ms
Loss rate: 18.22%
-- Flow 3:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 68.181 ms
Loss rate: 19.74%
```

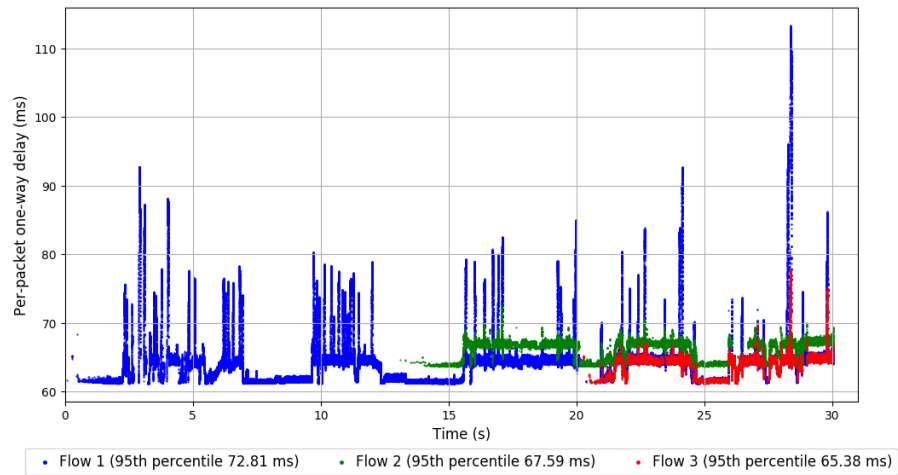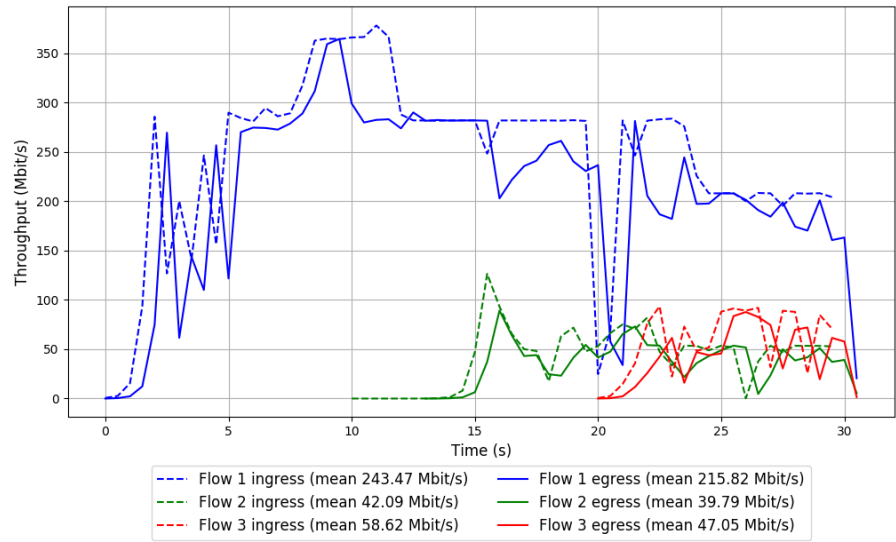Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2018-09-07 15:36:29
End at: 2018-09-07 15:36:59
Local clock offset: 0.249 ms
Remote clock offset: -30.166 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 250.90 Mbit/s
95th percentile per-packet one-way delay: 75.484 ms
Loss rate: 10.89%
-- Flow 1:
Average throughput: 205.89 Mbit/s
95th percentile per-packet one-way delay: 76.397 ms
Loss rate: 10.15%
-- Flow 2:
Average throughput: 66.26 Mbit/s
95th percentile per-packet one-way delay: 70.831 ms
Loss rate: 14.18%
-- Flow 3:
Average throughput: 2.67 Mbit/s
95th percentile per-packet one-way delay: 68.201 ms
Loss rate: 12.29%
```
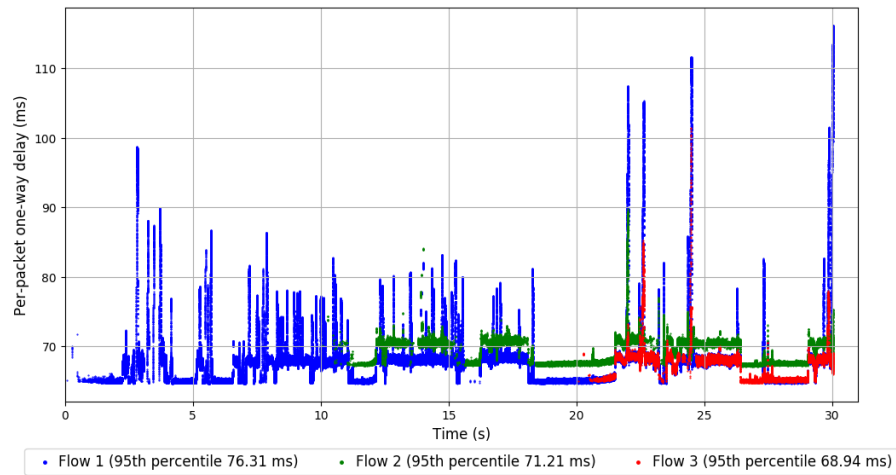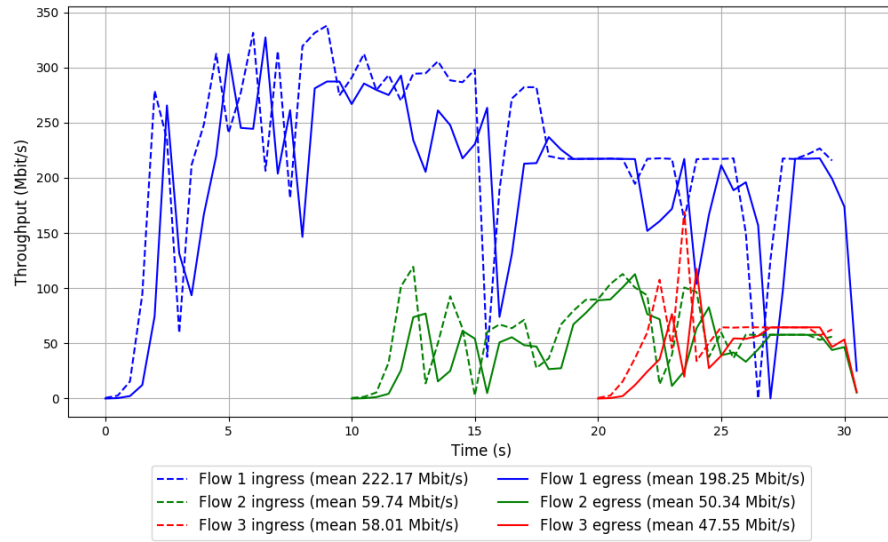
Run 3: Report of TCP BBR — Data Link

```
Run 4: Statistics of TCP BBR

Start at: 2018-09-07 16:02:45
End at: 2018-09-07 16:03:15
Local clock offset: 0.002 ms
Remote clock offset: -33.463 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 253.93 Mbit/s
95th percentile per-packet one-way delay: 71.534 ms
Loss rate: 12.73%
-- Flow 1:
Average throughput: 215.82 Mbit/s
95th percentile per-packet one-way delay: 72.815 ms
Loss rate: 11.35%
-- Flow 2:
Average throughput: 39.79 Mbit/s
95th percentile per-packet one-way delay: 67.590 ms
Loss rate: 19.85%
-- Flow 3:
Average throughput: 47.05 Mbit/s
95th percentile per-packet one-way delay: 65.383 ms
Loss rate: 19.74%
```
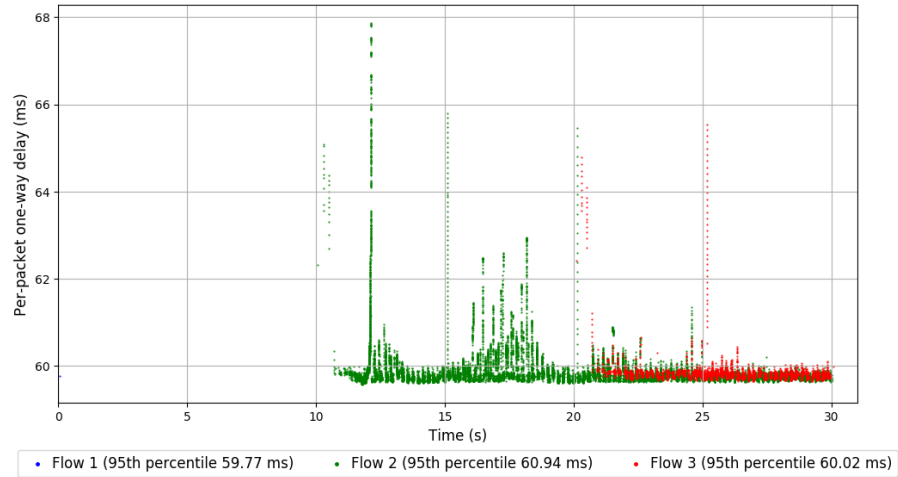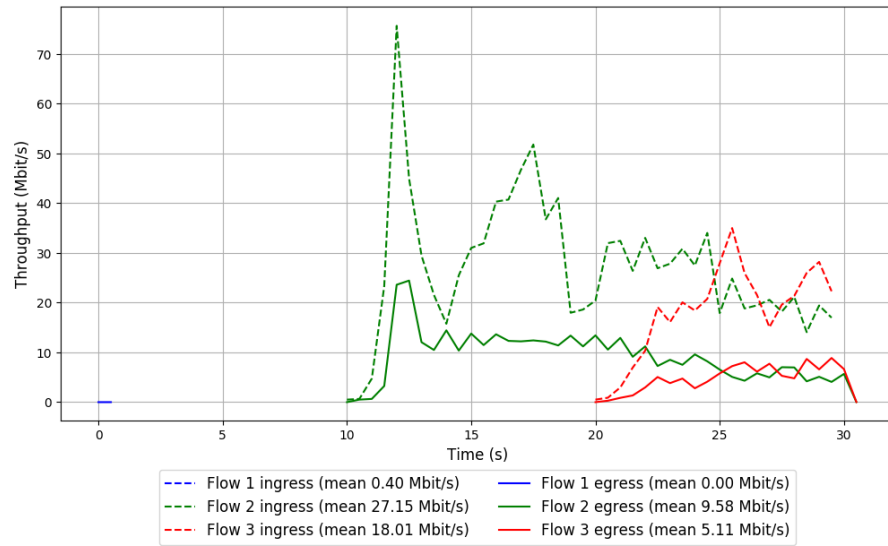
Run 4: Report of TCP BBR — Data Link

Flow 1 ingress (mean 243.47 Mbit/s) --- Flow 1 egress (mean 215.82 Mbit/s)
Flow 2 ingress (mean 42.09 Mbit/s) --- Flow 2 egress (mean 39.79 Mbit/s)
Flow 3 ingress (mean 58.62 Mbit/s) --- Flow 3 egress (mean 47.05 Mbit/s)

Flow 1 (95th percentile 72.81 ms)   Flow 2 (95th percentile 67.59 ms)   Flow 3 (95th percentile 65.38 ms)

12

```
Run 5: Statistics of TCP BBR

Start at: 2018-09-07 16:29:08
End at: 2018-09-07 16:29:38
Local clock offset: -0.066 ms
Remote clock offset: -29.526 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 247.59 Mbit/s
95th percentile per-packet one-way delay: 74.899 ms
Loss rate: 11.96%
-- Flow 1:
Average throughput: 198.25 Mbit/s
95th percentile per-packet one-way delay: 76.312 ms
Loss rate: 10.76%
-- Flow 2:
Average throughput: 50.34 Mbit/s
95th percentile per-packet one-way delay: 71.212 ms
Loss rate: 15.76%
-- Flow 3:
Average throughput: 47.55 Mbit/s
95th percentile per-packet one-way delay: 68.940 ms
Loss rate: 18.00%
```

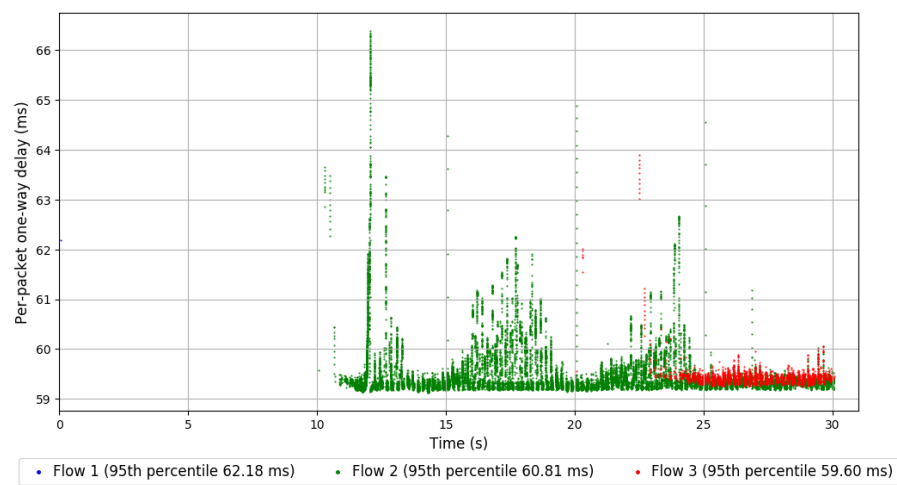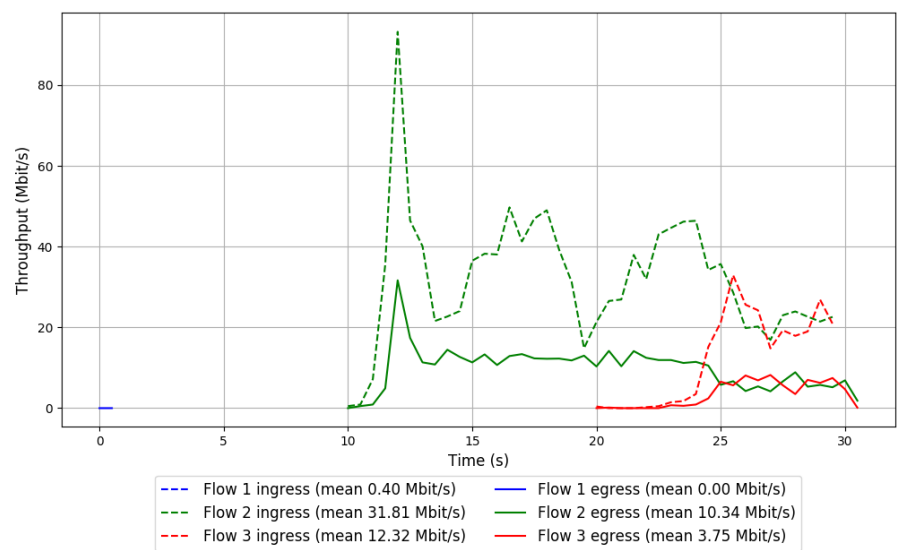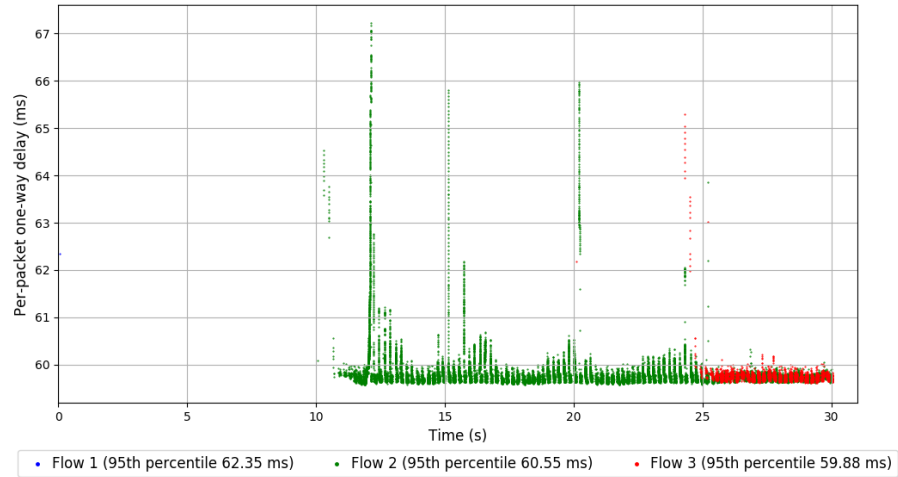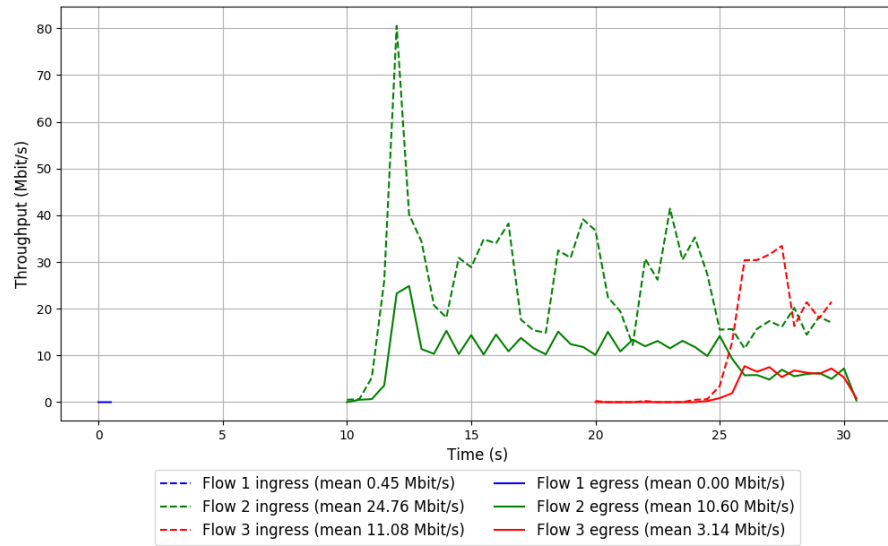Run 5: Report of TCP BBR — Data Link

```
Run 1: Statistics of Copa

Start at: 2018-09-07 14:50:36
End at: 2018-09-07 14:51:06
Local clock offset: -0.79 ms
Remote clock offset: -35.608 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.07 Mbit/s
95th percentile per-packet one-way delay: 60.782 ms
Loss rate: 66.44%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 59.775 ms
Loss rate: 98.80%
-- Flow 2:
Average throughput: 9.58 Mbit/s
95th percentile per-packet one-way delay: 60.944 ms
Loss rate: 64.70%
-- Flow 3:
Average throughput: 5.11 Mbit/s
95th percentile per-packet one-way delay: 60.023 ms
Loss rate: 71.66%
```

Run 1: Report of Copa — Data Link

Flow 1 ingress (mean 0.40 Mbit/s)   Flow 1 egress (mean 0.00 Mbit/s)
Flow 2 ingress (mean 27.15 Mbit/s)   Flow 2 egress (mean 9.58 Mbit/s)
Flow 3 ingress (mean 18.01 Mbit/s)   Flow 3 egress (mean 5.11 Mbit/s)

Flow 1 (95th percentile 59.77 ms)   Flow 2 (95th percentile 60.94 ms)   Flow 3 (95th percentile 60.02 ms)

```
Run 2: Statistics of Copa

Start at: 2018-09-07 15:16:27
End at: 2018-09-07 15:16:57
Local clock offset: 0.267 ms
Remote clock offset: -34.967 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.13 Mbit/s
95th percentile per-packet one-way delay: 60.666 ms
Loss rate: 67.84%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 62.179 ms
Loss rate: 98.80%
-- Flow 2:
Average throughput: 10.34 Mbit/s
95th percentile per-packet one-way delay: 60.810 ms
Loss rate: 67.51%
-- Flow 3:
Average throughput: 3.75 Mbit/s
95th percentile per-packet one-way delay: 59.596 ms
Loss rate: 69.56%
```
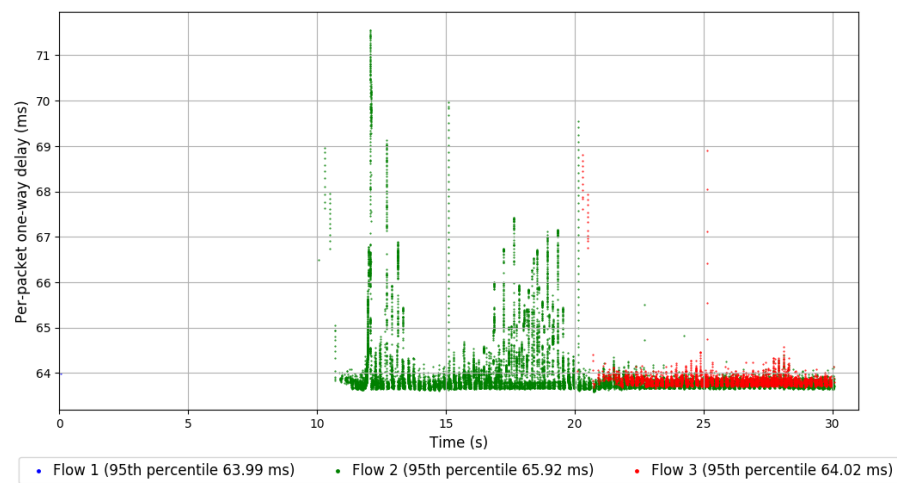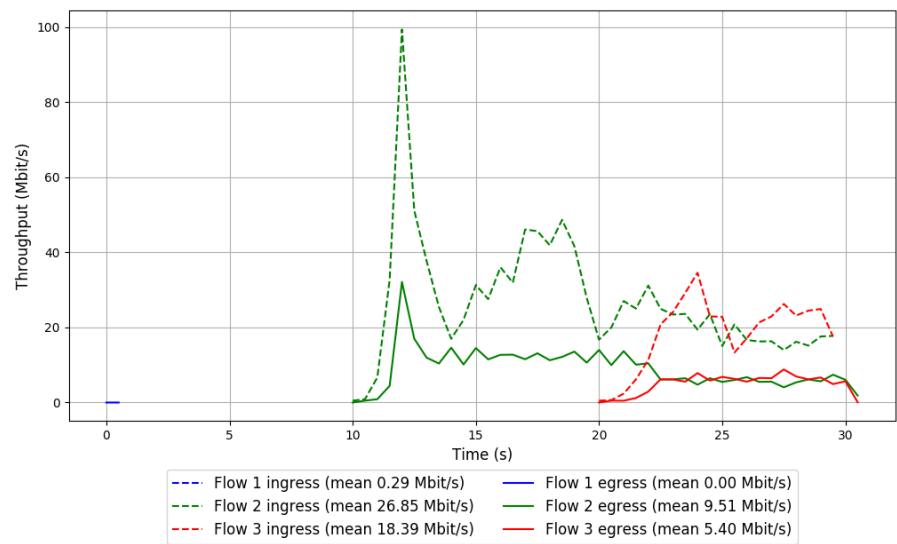
Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-09-07 15:42:23
End at: 2018-09-07 15:42:53
Local clock offset: 0.861 ms
Remote clock offset: -34.614 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.09 Mbit/s
95th percentile per-packet one-way delay: 60.444 ms
Loss rate: 59.84%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 62.346 ms
Loss rate: 98.95%
-- Flow 2:
Average throughput: 10.60 Mbit/s
95th percentile per-packet one-way delay: 60.552 ms
Loss rate: 57.19%
-- Flow 3:
Average throughput: 3.14 Mbit/s
95th percentile per-packet one-way delay: 59.884 ms
Loss rate: 71.67%
```
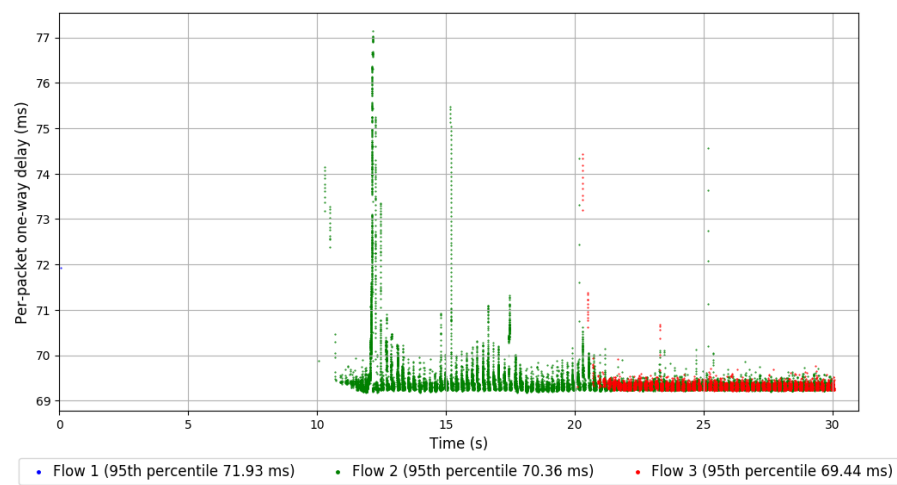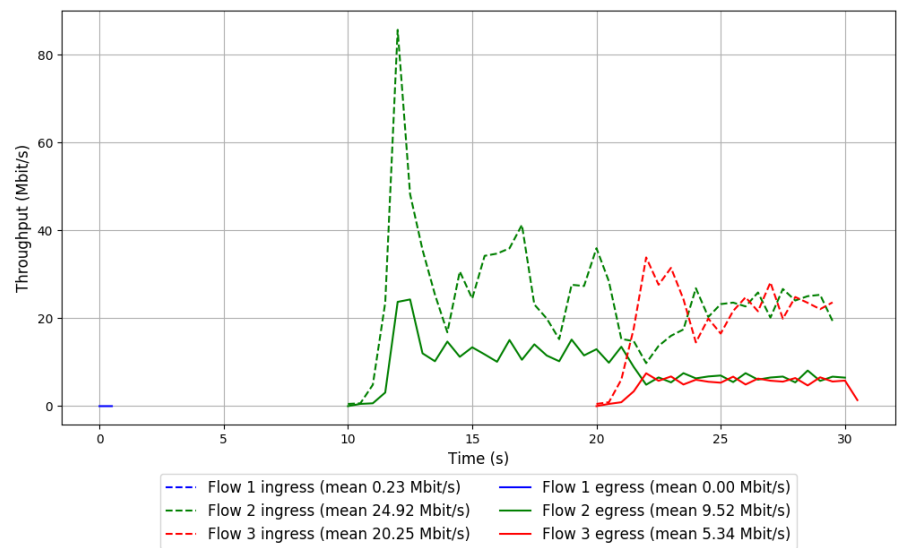
Run 3: Report of Copa — Data Link

```
Run 4: Statistics of Copa

Start at: 2018-09-07 16:08:39
End at: 2018-09-07 16:09:09
Local clock offset: 0.937 ms
Remote clock offset: -30.304 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.13 Mbit/s
95th percentile per-packet one-way delay: 65.506 ms
Loss rate: 66.13%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 63.992 ms
Loss rate: 98.33%
-- Flow 2:
Average throughput: 9.51 Mbit/s
95th percentile per-packet one-way delay: 65.921 ms
Loss rate: 64.59%
-- Flow 3:
Average throughput: 5.40 Mbit/s
95th percentile per-packet one-way delay: 64.022 ms
Loss rate: 70.63%
```
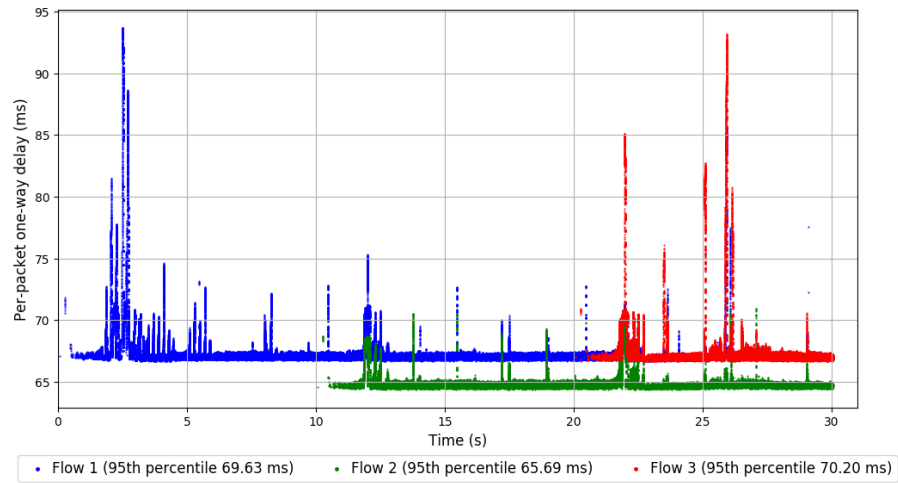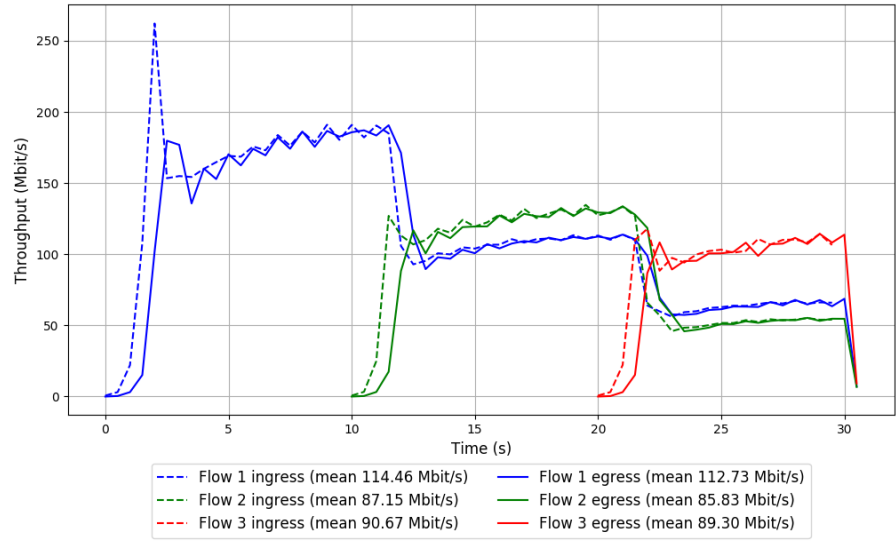
Run 4: Report of Copa — Data Link

```
Run 5: Statistics of Copa

Start at: 2018-09-07 16:40:42
End at: 2018-09-07 16:41:12
Local clock offset: -2.428 ms
Remote clock offset: -27.646 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.09 Mbit/s
95th percentile per-packet one-way delay: 70.129 ms
Loss rate: 65.24%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 71.932 ms
Loss rate: 97.92%
-- Flow 2:
Average throughput: 9.52 Mbit/s
95th percentile per-packet one-way delay: 70.360 ms
Loss rate: 61.81%
-- Flow 3:
Average throughput: 5.34 Mbit/s
95th percentile per-packet one-way delay: 69.444 ms
Loss rate: 73.64%
```
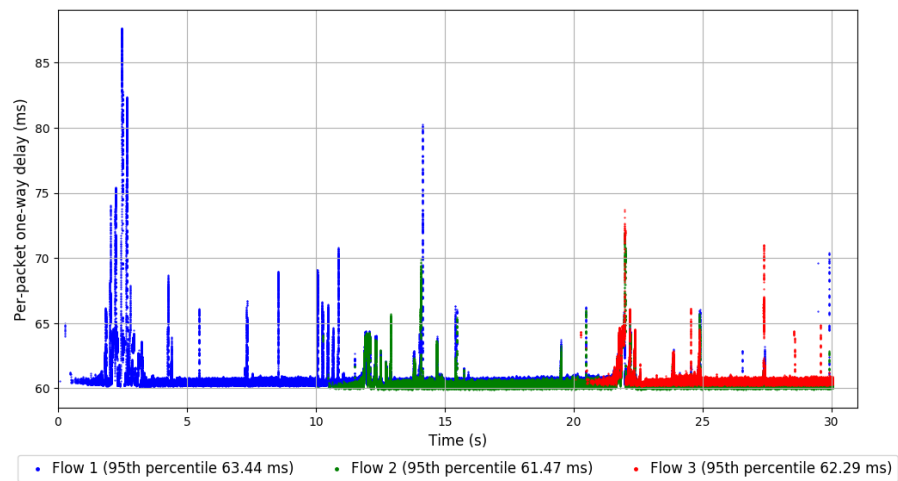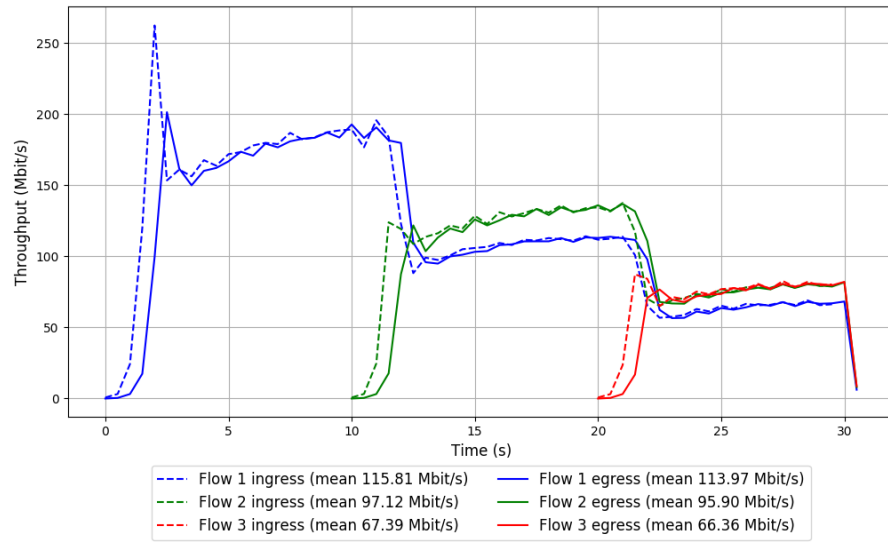
Run 5: Report of Copa — Data Link

```
Run 1: Statistics of TCP Cubic

Start at: 2018-09-07 14:51:54
End at: 2018-09-07 14:52:24
Local clock offset: -0.524 ms
Remote clock offset: -30.498 ms

# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 199.63 Mbit/s
95th percentile per-packet one-way delay: 68.628 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 112.73 Mbit/s
95th percentile per-packet one-way delay: 69.632 ms
Loss rate: 1.52%
-- Flow 2:
Average throughput: 85.83 Mbit/s
95th percentile per-packet one-way delay: 65.691 ms
Loss rate: 1.52%
-- Flow 3:
Average throughput: 89.30 Mbit/s
95th percentile per-packet one-way delay: 70.205 ms
Loss rate: 1.53%
```
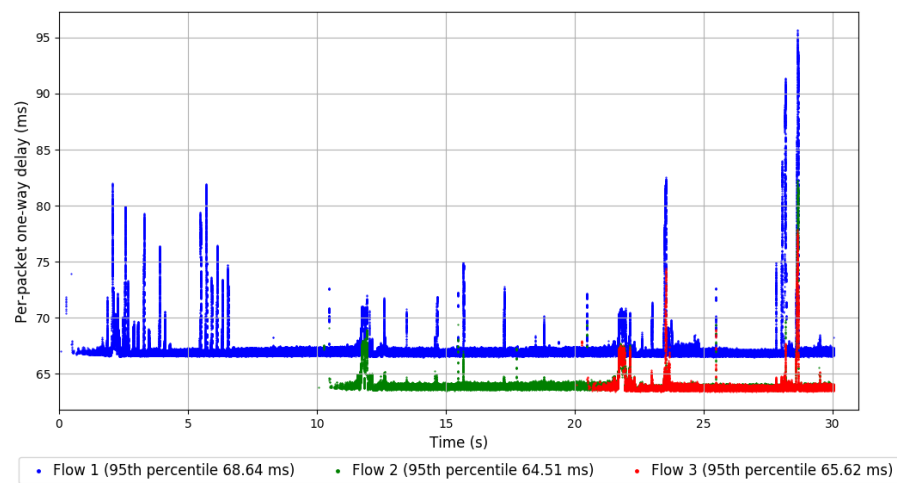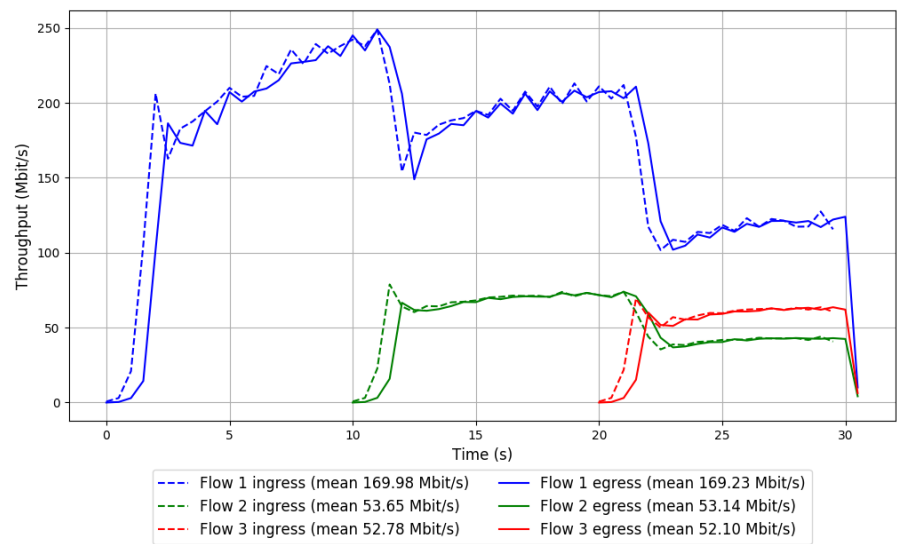
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-09-07 15:17:45
End at: 2018-09-07 15:18:15
Local clock offset: -0.342 ms
Remote clock offset: -34.68 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 200.00 Mbit/s
95th percentile per-packet one-way delay: 62.962 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 113.97 Mbit/s
95th percentile per-packet one-way delay: 63.443 ms
Loss rate: 1.58%
-- Flow 2:
Average throughput: 95.90 Mbit/s
95th percentile per-packet one-way delay: 61.472 ms
Loss rate: 1.25%
-- Flow 3:
Average throughput: 66.36 Mbit/s
95th percentile per-packet one-way delay: 62.290 ms
Loss rate: 1.53%
```
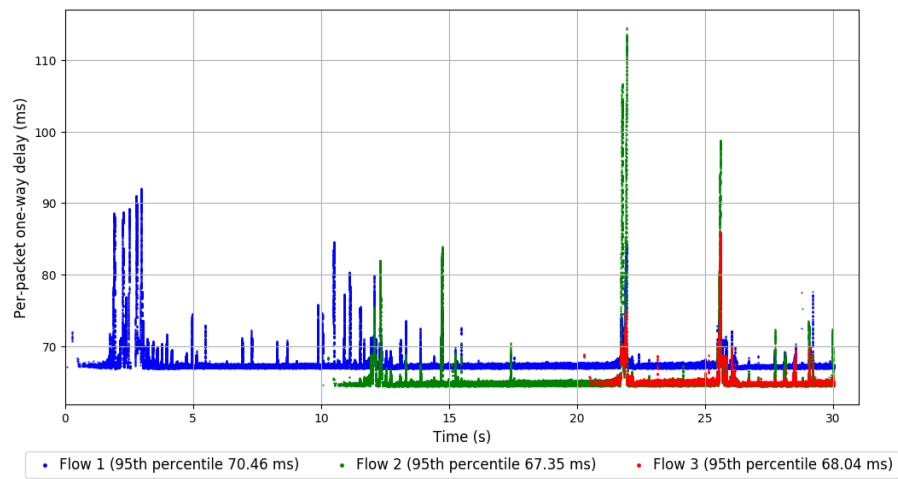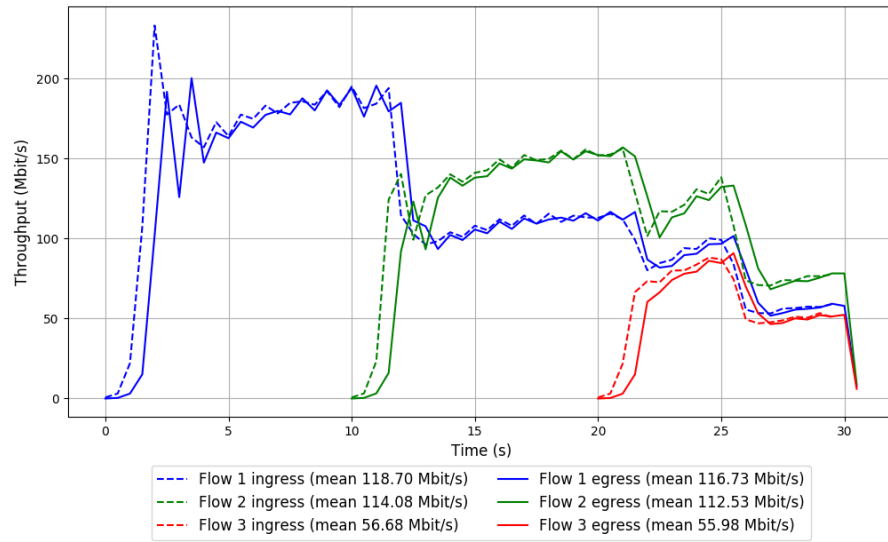
Run 2: Report of TCP Cubic — Data Link

- - - Flow 1 ingress (mean 115.81 Mbit/s) —— Flow 1 egress (mean 113.97 Mbit/s)
- - - Flow 2 ingress (mean 97.12 Mbit/s) —— Flow 2 egress (mean 95.90 Mbit/s)
- - - Flow 3 ingress (mean 67.39 Mbit/s) —— Flow 3 egress (mean 66.36 Mbit/s)

• Flow 1 (95th percentile 63.44 ms) • Flow 2 (95th percentile 61.47 ms) • Flow 3 (95th percentile 62.29 ms)

28

```
Run 3: Statistics of TCP Cubic

Start at: 2018-09-07 15:43:42
End at: 2018-09-07 15:44:12
Local clock offset: 0.885 ms
Remote clock offset: -30.342 ms


# Below is generated by plot.py at 2018-09-07 16:50:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 221.94 Mbit/s
95th percentile per-packet one-way delay: 67.809 ms
Loss rate: 0.59%
-- Flow 1:
Average throughput: 169.23 Mbit/s
95th percentile per-packet one-way delay: 68.636 ms
Loss rate: 0.44%
-- Flow 2:
Average throughput: 53.14 Mbit/s
95th percentile per-packet one-way delay: 64.510 ms
Loss rate: 0.96%
-- Flow 3:
Average throughput: 52.10 Mbit/s
95th percentile per-packet one-way delay: 65.621 ms
Loss rate: 1.29%
```
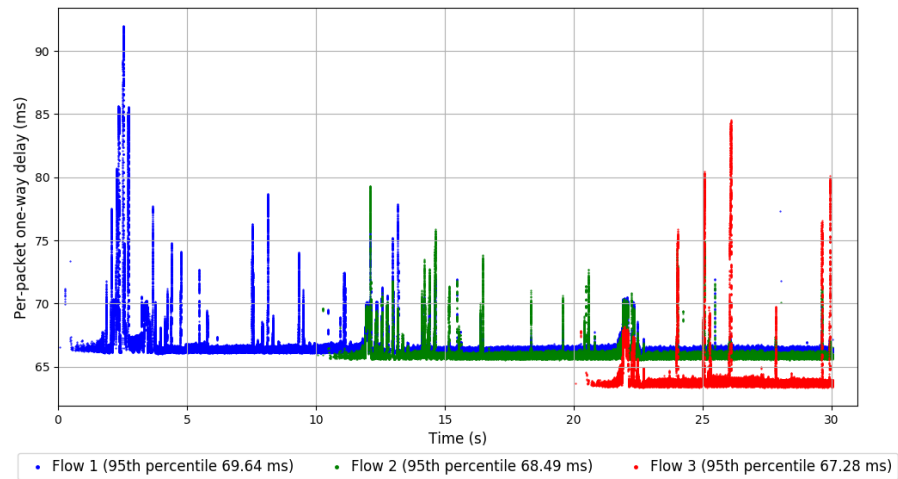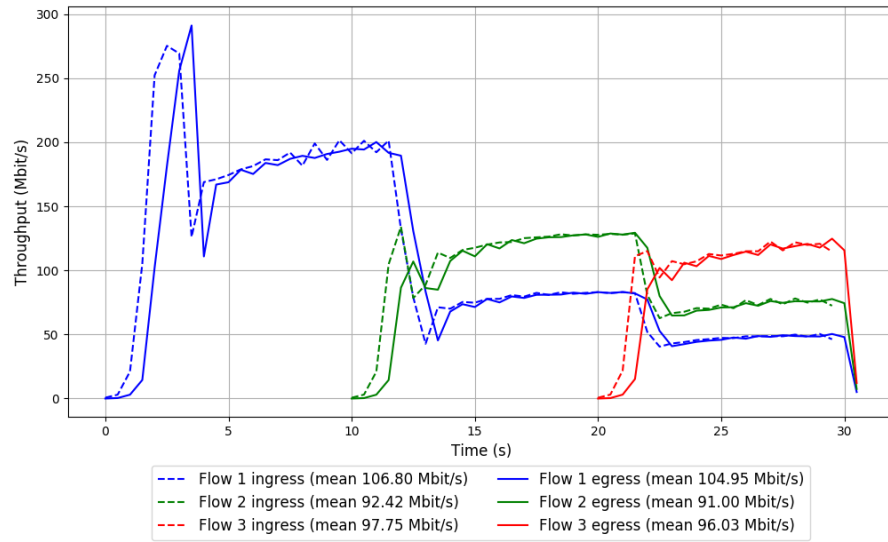
Run 3: Report of TCP Cubic — Data Link

```
Run 4: Statistics of TCP Cubic

Start at: 2018-09-07 16:09:58
End at: 2018-09-07 16:10:28
Local clock offset: 0.719 ms
Remote clock offset: -29.617 ms


# Below is generated by plot.py at 2018-09-07 16:52:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 210.32 Mbit/s
95th percentile per-packet one-way delay: 69.818 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 116.73 Mbit/s
95th percentile per-packet one-way delay: 70.463 ms
Loss rate: 1.67%
-- Flow 2:
Average throughput: 112.53 Mbit/s
95th percentile per-packet one-way delay: 67.350 ms
Loss rate: 1.36%
-- Flow 3:
Average throughput: 55.98 Mbit/s
95th percentile per-packet one-way delay: 68.044 ms
Loss rate: 1.23%
```

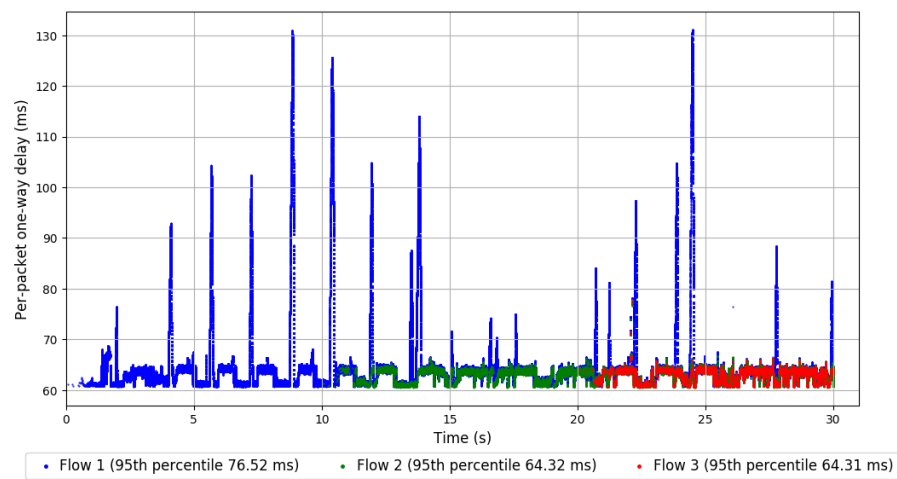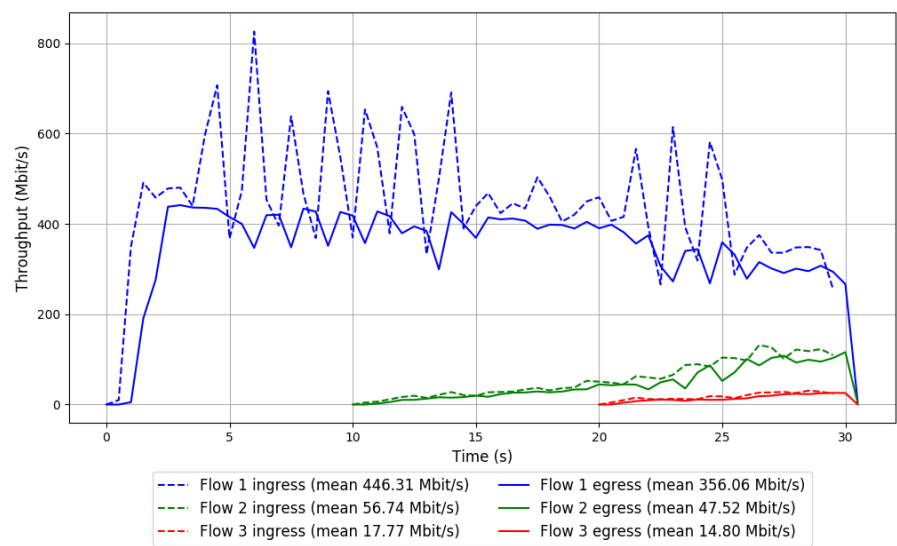Run 4: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 118.70 Mbit/s) --- Flow 1 egress (mean 116.73 Mbit/s)
Flow 2 ingress (mean 114.08 Mbit/s) --- Flow 2 egress (mean 112.53 Mbit/s)
Flow 3 ingress (mean 56.68 Mbit/s) --- Flow 3 egress (mean 55.98 Mbit/s)

Flow 1 (95th percentile 70.46 ms)   Flow 2 (95th percentile 67.35 ms)   Flow 3 (95th percentile 68.04 ms)

```
Run 5: Statistics of TCP Cubic

Start at: 2018-09-07 16:42:01
End at: 2018-09-07 16:42:31
Local clock offset: -2.205 ms
Remote clock offset: -33.202 ms


# Below is generated by plot.py at 2018-09-07 16:52:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 197.49 Mbit/s
95th percentile per-packet one-way delay: 69.258 ms
Loss rate: 1.68%
-- Flow 1:
Average throughput: 104.95 Mbit/s
95th percentile per-packet one-way delay: 69.643 ms
Loss rate: 1.74%
-- Flow 2:
Average throughput: 91.00 Mbit/s
95th percentile per-packet one-way delay: 68.491 ms
Loss rate: 1.54%
-- Flow 3:
Average throughput: 96.03 Mbit/s
95th percentile per-packet one-way delay: 67.277 ms
Loss rate: 1.76%
```

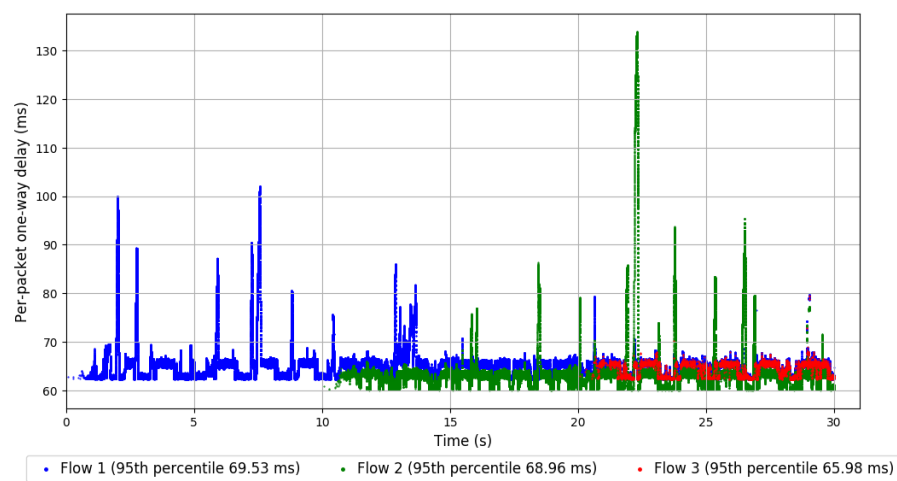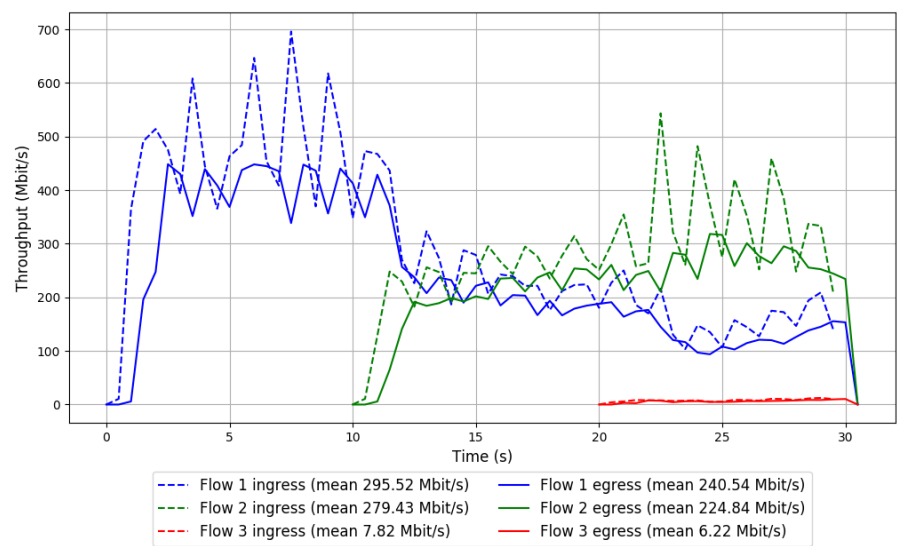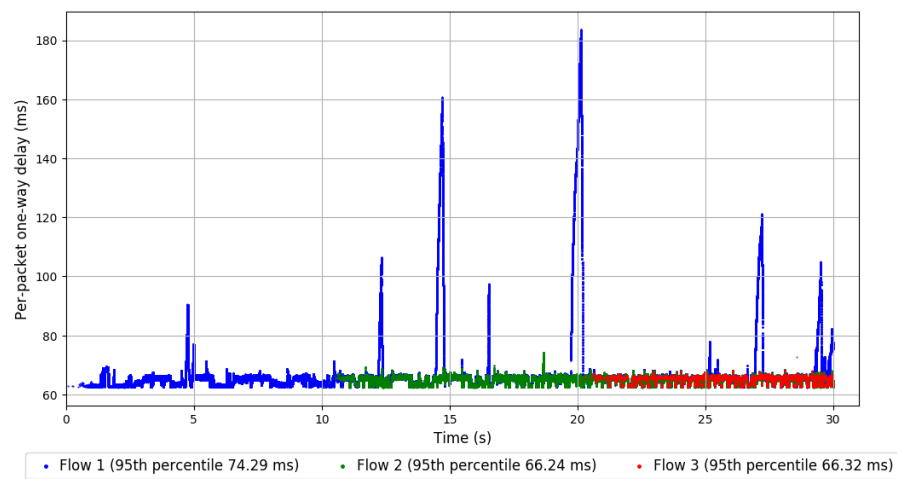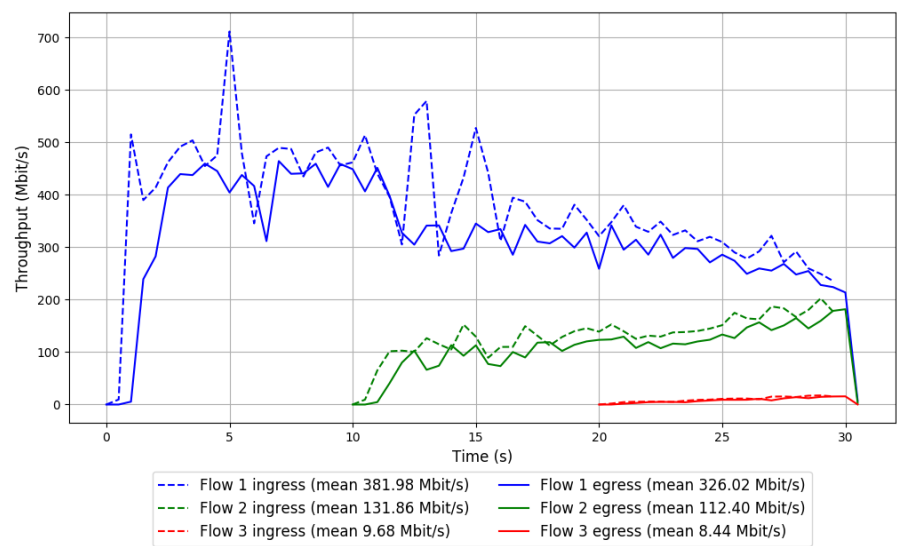Run 5: Report of TCP Cubic — Data Link

```
Run 1: Statistics of FillP

Start at: 2018-09-07 14:43:04
End at: 2018-09-07 14:43:34
Local clock offset: -0.313 ms
Remote clock offset: -33.852 ms

# Below is generated by plot.py at 2018-09-07 16:56:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 392.58 Mbit/s
95th percentile per-packet one-way delay: 73.886 ms
Loss rate: 19.87%
-- Flow 1:
Average throughput: 356.06 Mbit/s
95th percentile per-packet one-way delay: 76.517 ms
Loss rate: 20.22%
-- Flow 2:
Average throughput: 47.52 Mbit/s
95th percentile per-packet one-way delay: 64.317 ms
Loss rate: 16.25%
-- Flow 3:
Average throughput: 14.80 Mbit/s
95th percentile per-packet one-way delay: 64.306 ms
Loss rate: 16.72%
```
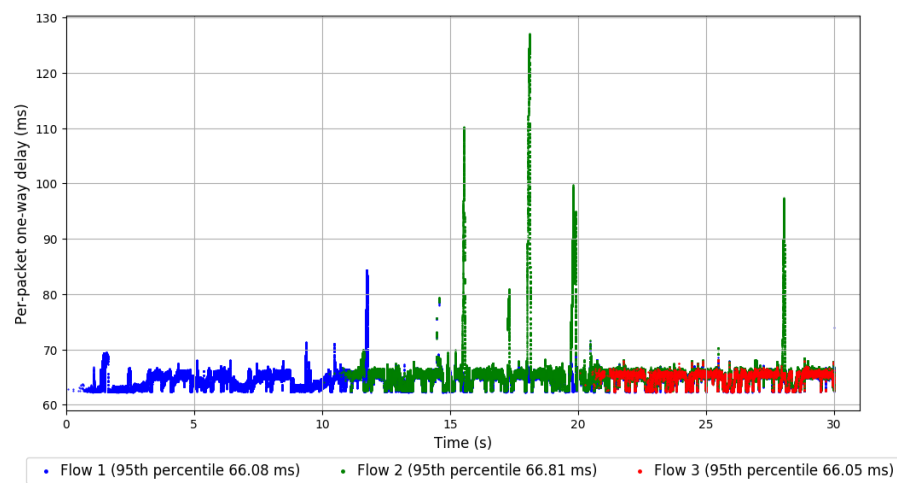
Run 1: Report of FillP — Data Link

```
Run 2: Statistics of FillP

Start at: 2018-09-07 15:08:56
End at: 2018-09-07 15:09:26
Local clock offset: -0.221 ms
Remote clock offset: -34.553 ms


# Below is generated by plot.py at 2018-09-07 16:56:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 392.28 Mbit/s
95th percentile per-packet one-way delay: 69.314 ms
Loss rate: 18.97%
-- Flow 1:
Average throughput: 240.54 Mbit/s
95th percentile per-packet one-way delay: 69.532 ms
Loss rate: 18.60%
-- Flow 2:
Average throughput: 224.84 Mbit/s
95th percentile per-packet one-way delay: 68.956 ms
Loss rate: 19.54%
-- Flow 3:
Average throughput: 6.22 Mbit/s
95th percentile per-packet one-way delay: 65.978 ms
Loss rate: 20.51%
```
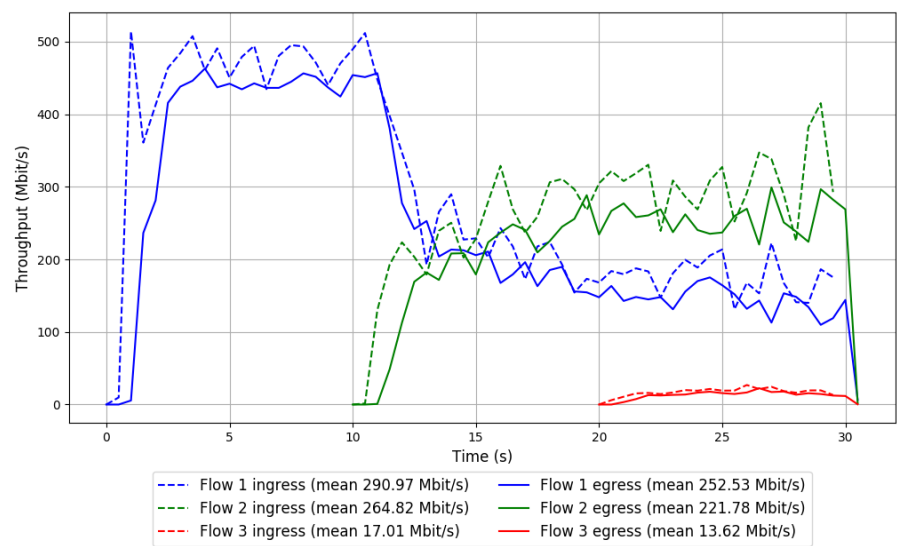
Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-09-07 15:34:52
End at: 2018-09-07 15:35:22
Local clock offset: 1.591 ms
Remote clock offset: -30.599 ms


# Below is generated by plot.py at 2018-09-07 16:56:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 403.62 Mbit/s
95th percentile per-packet one-way delay: 68.767 ms
Loss rate: 14.66%
-- Flow 1:
Average throughput: 326.02 Mbit/s
95th percentile per-packet one-way delay: 74.292 ms
Loss rate: 14.65%
-- Flow 2:
Average throughput: 112.40 Mbit/s
95th percentile per-packet one-way delay: 66.242 ms
Loss rate: 14.76%
-- Flow 3:
Average throughput: 8.44 Mbit/s
95th percentile per-packet one-way delay: 66.318 ms
Loss rate: 12.82%
```
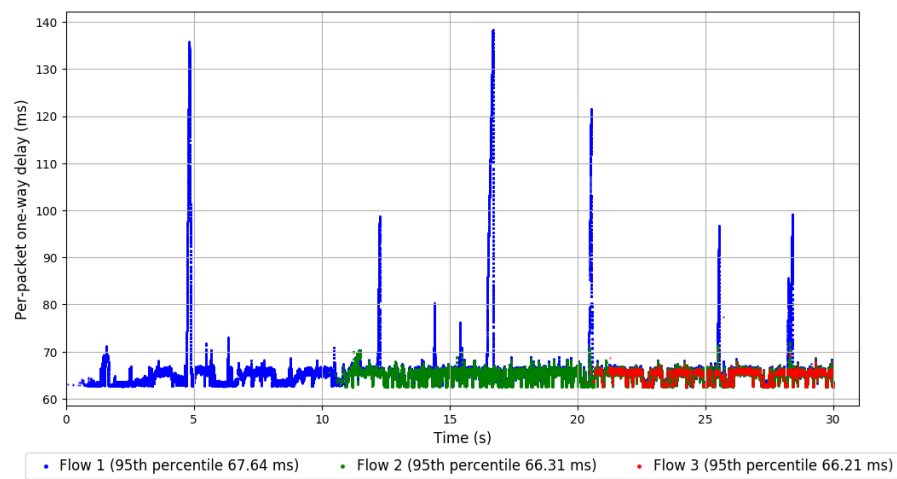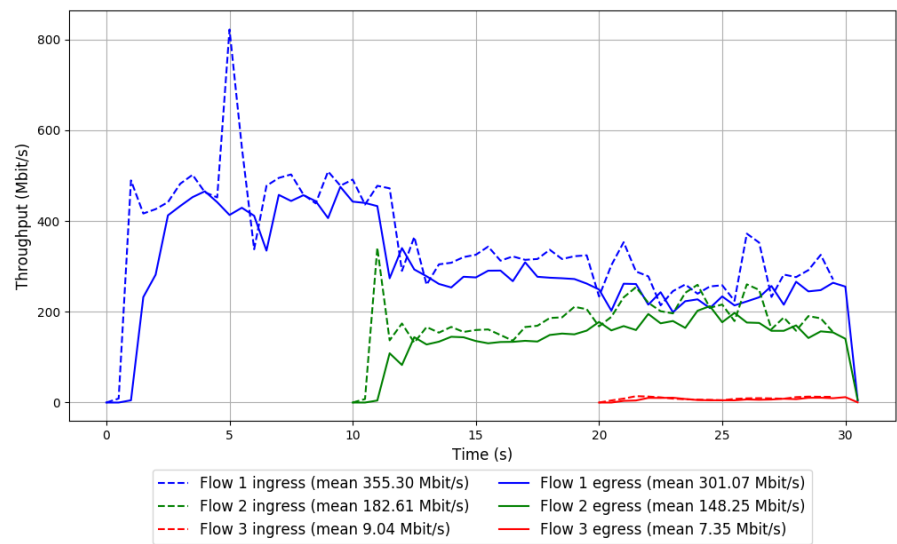
Run 3: Report of FillP — Data Link

```
Run 4: Statistics of FillP

Start at: 2018-09-07 16:01:08
End at: 2018-09-07 16:01:38
Local clock offset: 0.937 ms
Remote clock offset: -31.246 ms

# Below is generated by plot.py at 2018-09-07 16:56:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 404.69 Mbit/s
95th percentile per-packet one-way delay: 66.261 ms
Loss rate: 14.43%
-- Flow 1:
Average throughput: 252.53 Mbit/s
95th percentile per-packet one-way delay: 66.077 ms
Loss rate: 13.21%
-- Flow 2:
Average throughput: 221.78 Mbit/s
95th percentile per-packet one-way delay: 66.810 ms
Loss rate: 16.26%
-- Flow 3:
Average throughput: 13.62 Mbit/s
95th percentile per-packet one-way delay: 66.053 ms
Loss rate: 19.96%
```
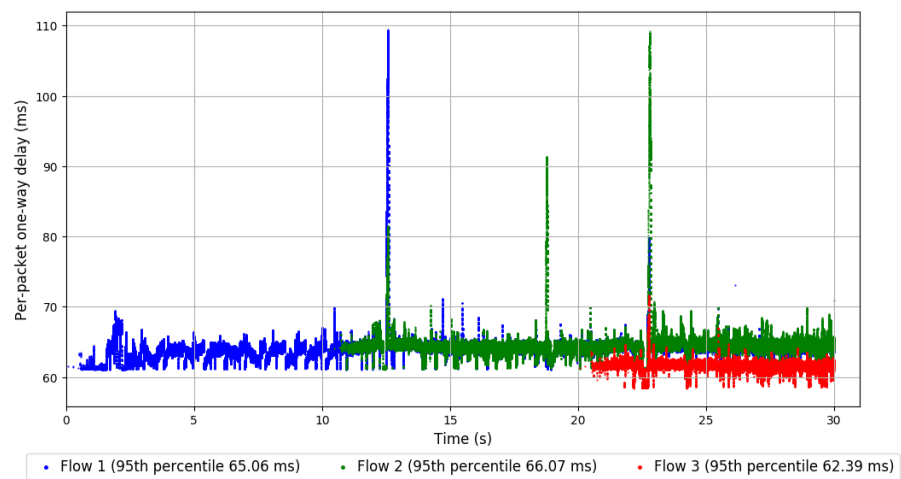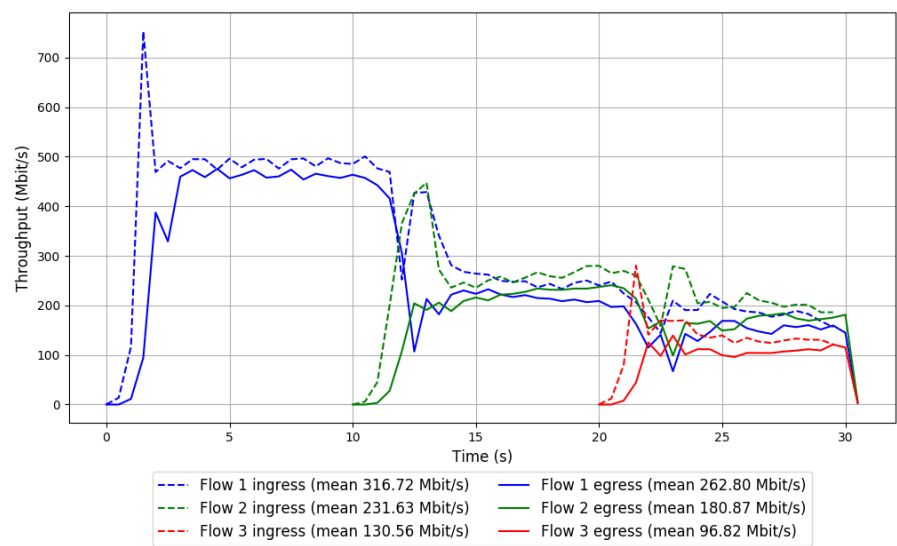
Run 4: Report of FillP — Data Link

Flow 1 ingress (mean 290.97 Mbit/s) ---- Flow 1 egress (mean 252.53 Mbit/s) ——
Flow 2 ingress (mean 264.82 Mbit/s) ---- Flow 2 egress (mean 221.78 Mbit/s) ——
Flow 3 ingress (mean 17.01 Mbit/s) ---- Flow 3 egress (mean 13.62 Mbit/s) ——

Flow 1 (95th percentile 66.08 ms)   Flow 2 (95th percentile 66.81 ms)   Flow 3 (95th percentile 66.05 ms)

42

```
Run 5: Statistics of FillP

Start at: 2018-09-07 16:27:31
End at: 2018-09-07 16:28:01
Local clock offset: 0.299 ms
Remote clock offset: -31.407 ms


# Below is generated by plot.py at 2018-09-07 16:56:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 402.15 Mbit/s
95th percentile per-packet one-way delay: 66.886 ms
Loss rate: 16.19%
-- Flow 1:
Average throughput: 301.07 Mbit/s
95th percentile per-packet one-way delay: 67.637 ms
Loss rate: 15.26%
-- Flow 2:
Average throughput: 148.25 Mbit/s
95th percentile per-packet one-way delay: 66.308 ms
Loss rate: 18.83%
-- Flow 3:
Average throughput: 7.35 Mbit/s
95th percentile per-packet one-way delay: 66.210 ms
Loss rate: 18.74%
```
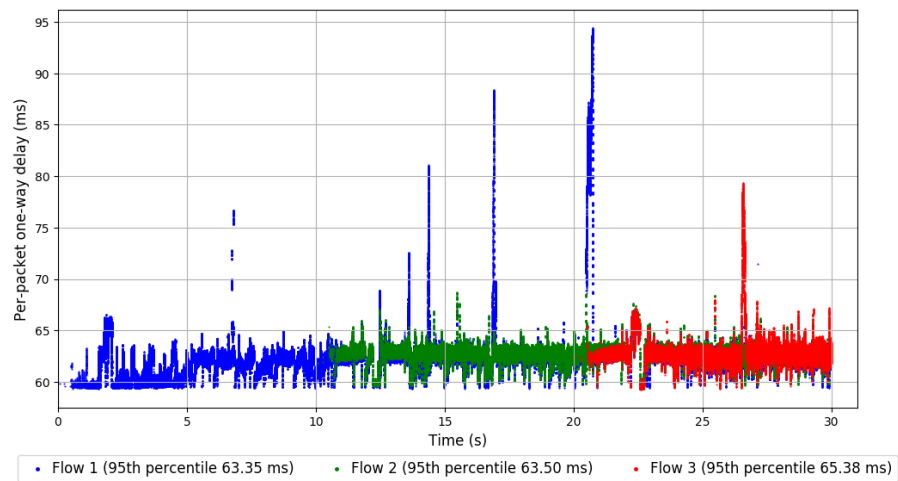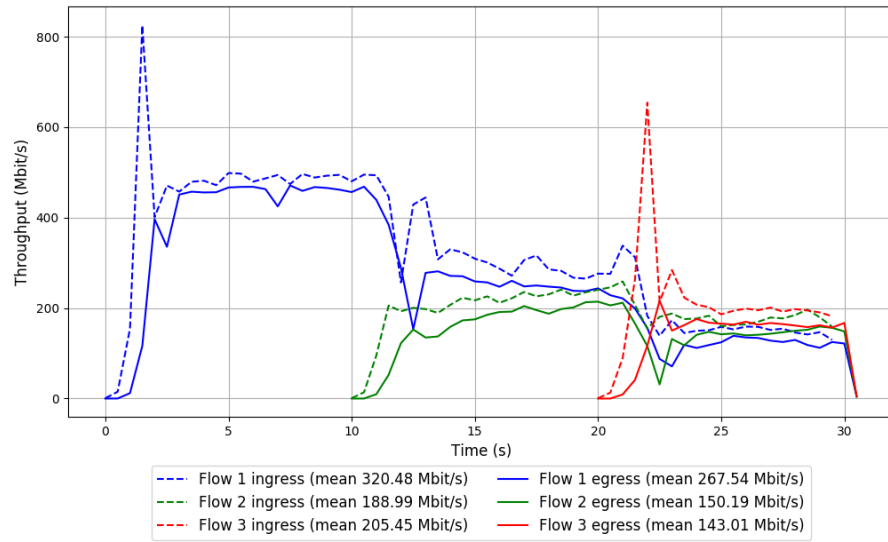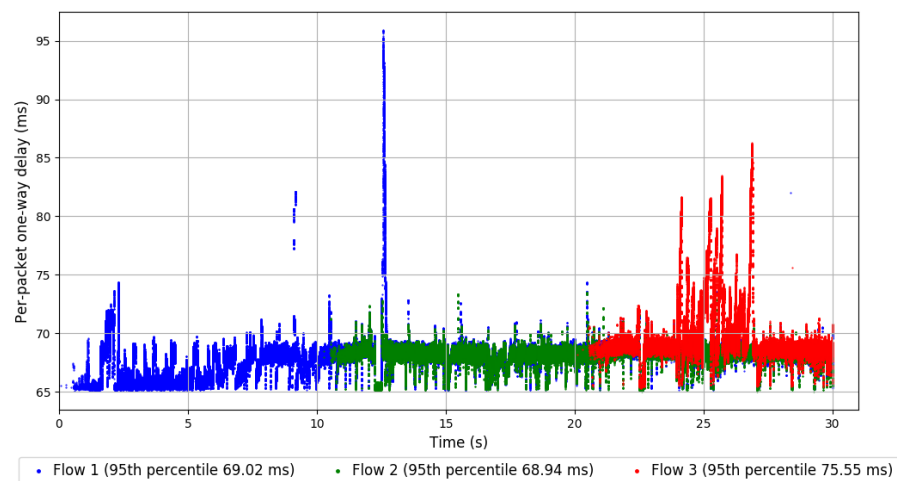
Run 5: Report of FillP — Data Link

44

```
Run 1: Statistics of FillP-Sheep

Start at: 2018-09-07 14:41:27
End at: 2018-09-07 14:41:57
Local clock offset: -0.589 ms
Remote clock offset: -36.022 ms

# Below is generated by plot.py at 2018-09-07 16:56:34
# Datalink statistics
-- Total of 3 flows:
Average throughput: 413.97 Mbit/s
95th percentile per-packet one-way delay: 65.345 ms
Loss rate: 19.46%
-- Flow 1:
Average throughput: 262.80 Mbit/s
95th percentile per-packet one-way delay: 65.057 ms
Loss rate: 17.02%
-- Flow 2:
Average throughput: 180.87 Mbit/s
95th percentile per-packet one-way delay: 66.070 ms
Loss rate: 22.69%
-- Flow 3:
Average throughput: 96.82 Mbit/s
95th percentile per-packet one-way delay: 62.392 ms
Loss rate: 25.85%
```

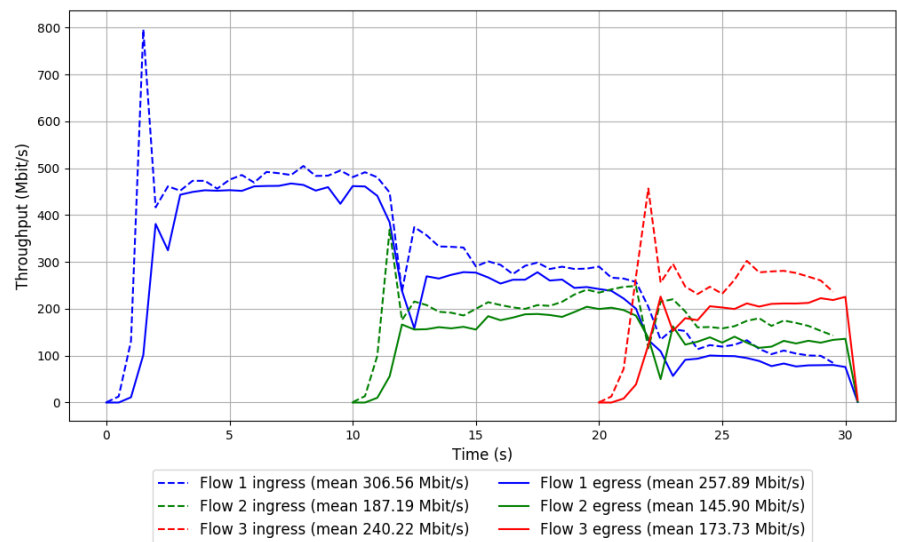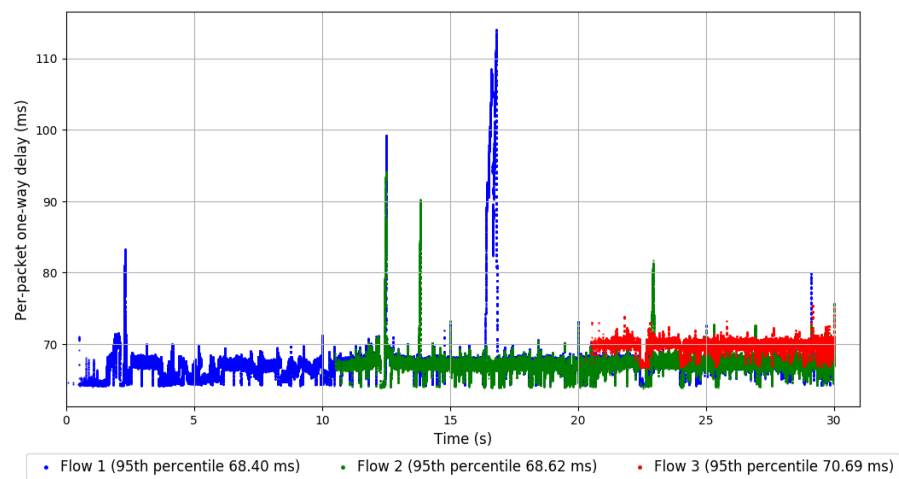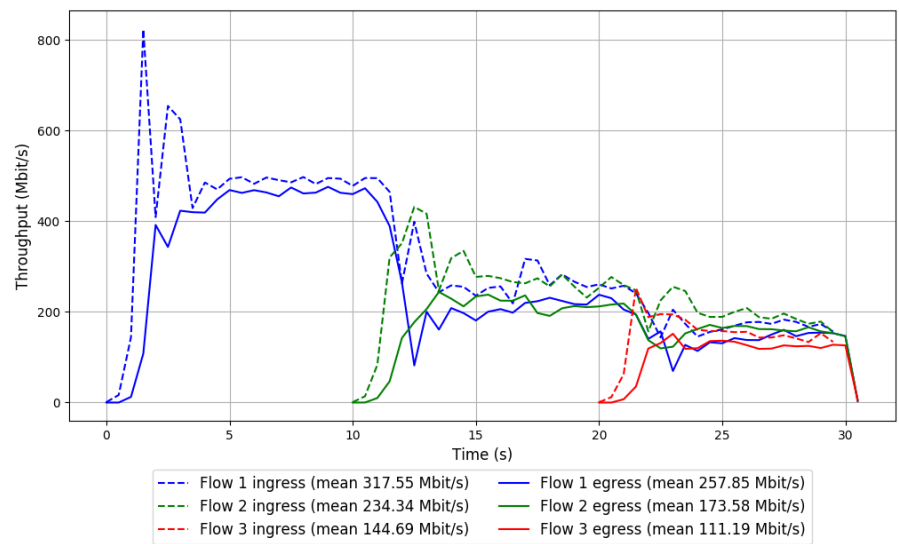Run 1: Report of FillP-Sheep — Data Link

```
Run 2: Statistics of FillP-Sheep

Start at: 2018-09-07 15:07:19
End at: 2018-09-07 15:07:49
Local clock offset: -0.117 ms
Remote clock offset: -34.797 ms


# Below is generated by plot.py at 2018-09-07 16:58:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 415.00 Mbit/s
95th percentile per-packet one-way delay: 63.570 ms
Loss rate: 19.33%
-- Flow 1:
Average throughput: 267.54 Mbit/s
95th percentile per-packet one-way delay: 63.351 ms
Loss rate: 16.51%
-- Flow 2:
Average throughput: 150.19 Mbit/s
95th percentile per-packet one-way delay: 63.504 ms
Loss rate: 20.53%
-- Flow 3:
Average throughput: 143.01 Mbit/s
95th percentile per-packet one-way delay: 65.379 ms
Loss rate: 30.39%
```

Run 2: Report of FillP-Sheep — Data Link

```
Run 3: Statistics of FillP-Sheep

Start at: 2018-09-07 15:33:15
End at: 2018-09-07 15:33:45
Local clock offset: -1.055 ms
Remote clock offset: -30.655 ms


# Below is generated by plot.py at 2018-09-07 16:58:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 412.56 Mbit/s
95th percentile per-packet one-way delay: 69.949 ms
Loss rate: 19.22%
-- Flow 1:
Average throughput: 257.89 Mbit/s
95th percentile per-packet one-way delay: 69.023 ms
Loss rate: 15.87%
-- Flow 2:
Average throughput: 145.90 Mbit/s
95th percentile per-packet one-way delay: 68.942 ms
Loss rate: 22.05%
-- Flow 3:
Average throughput: 173.73 Mbit/s
95th percentile per-packet one-way delay: 75.545 ms
Loss rate: 27.67%
```
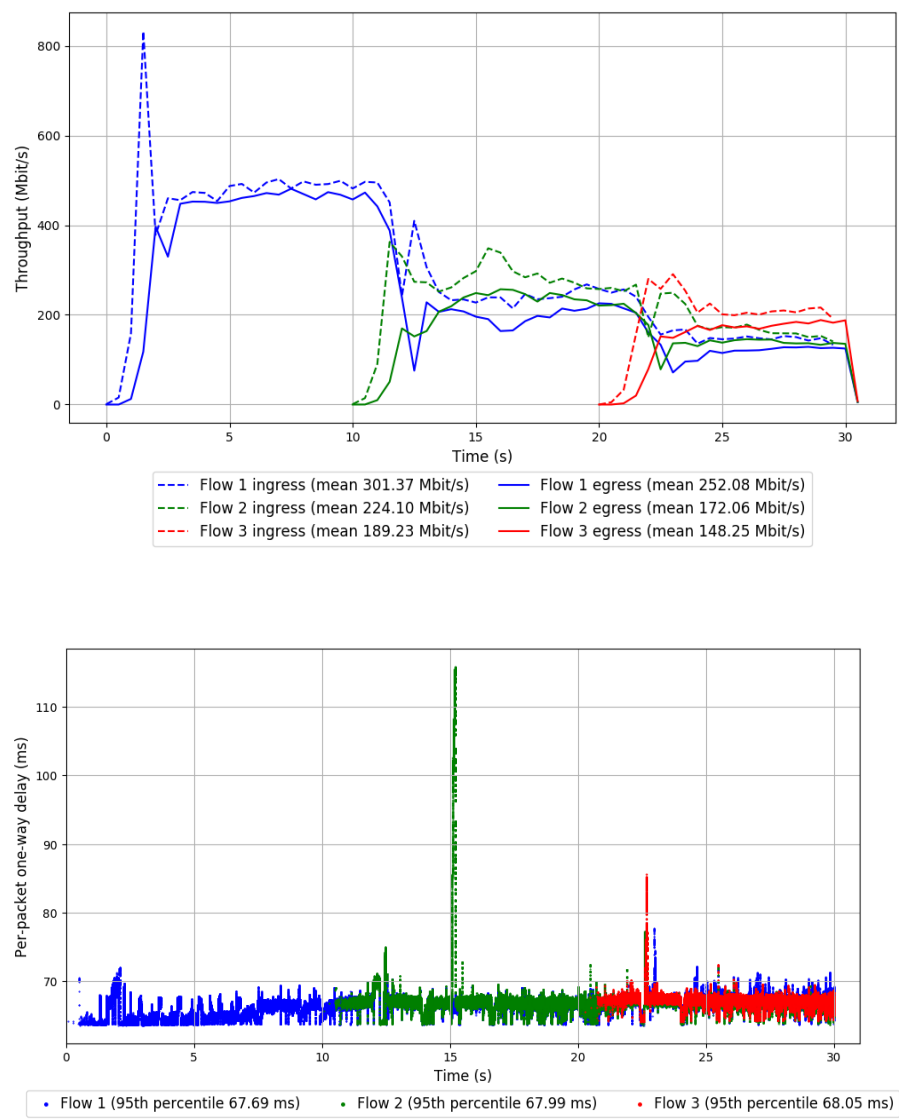
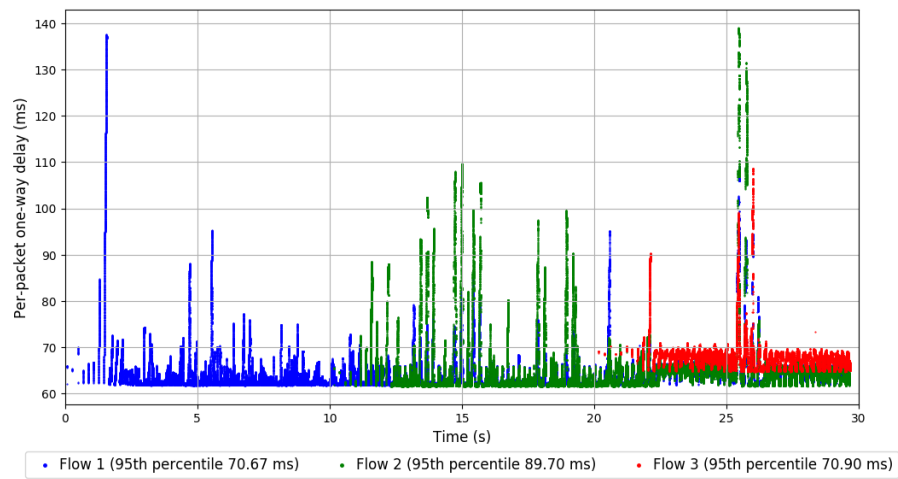Run 3: Report of FillP-Sheep — Data Link

```
Run 4: Statistics of FillP-Sheep

Start at: 2018-09-07 15:59:30
End at: 2018-09-07 16:00:00
Local clock offset: -0.358 ms
Remote clock offset: -31.116 ms


# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 410.31 Mbit/s
95th percentile per-packet one-way delay: 70.173 ms
Loss rate: 21.32%
-- Flow 1:
Average throughput: 257.85 Mbit/s
95th percentile per-packet one-way delay: 68.404 ms
Loss rate: 18.79%
-- Flow 2:
Average throughput: 173.58 Mbit/s
95th percentile per-packet one-way delay: 68.618 ms
Loss rate: 25.92%
-- Flow 3:
Average throughput: 111.19 Mbit/s
95th percentile per-packet one-way delay: 70.693 ms
Loss rate: 23.15%
```
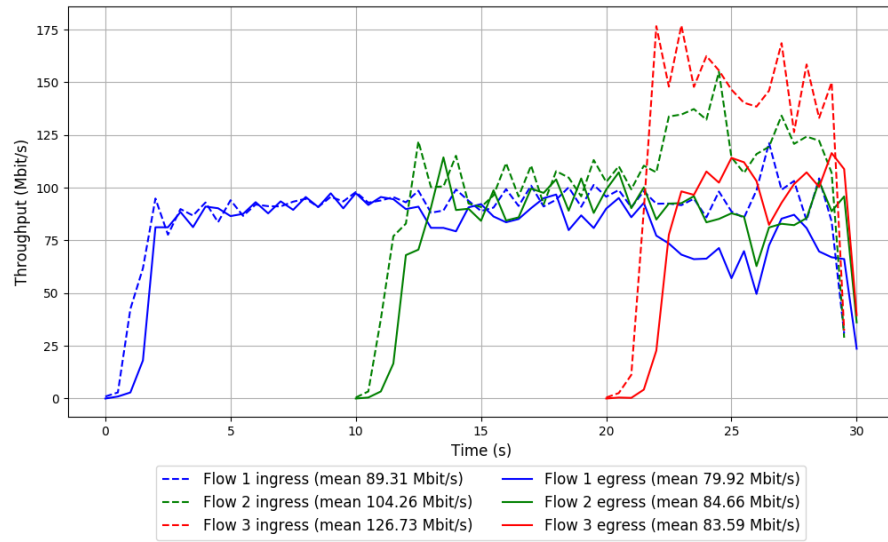
Run 4: Report of FillP-Sheep — Data Link

```
Run 5: Statistics of FillP-Sheep

Start at: 2018-09-07 16:25:53
End at: 2018-09-07 16:26:23
Local clock offset: 1.106 ms
Remote clock offset: -29.587 ms


# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 414.84 Mbit/s
95th percentile per-packet one-way delay: 67.876 ms
Loss rate: 19.19%
-- Flow 1:
Average throughput: 252.08 Mbit/s
95th percentile per-packet one-way delay: 67.685 ms
Loss rate: 16.35%
-- Flow 2:
Average throughput: 172.06 Mbit/s
95th percentile per-packet one-way delay: 67.993 ms
Loss rate: 23.22%
-- Flow 3:
Average throughput: 148.25 Mbit/s
95th percentile per-packet one-way delay: 68.046 ms
Loss rate: 23.24%
```

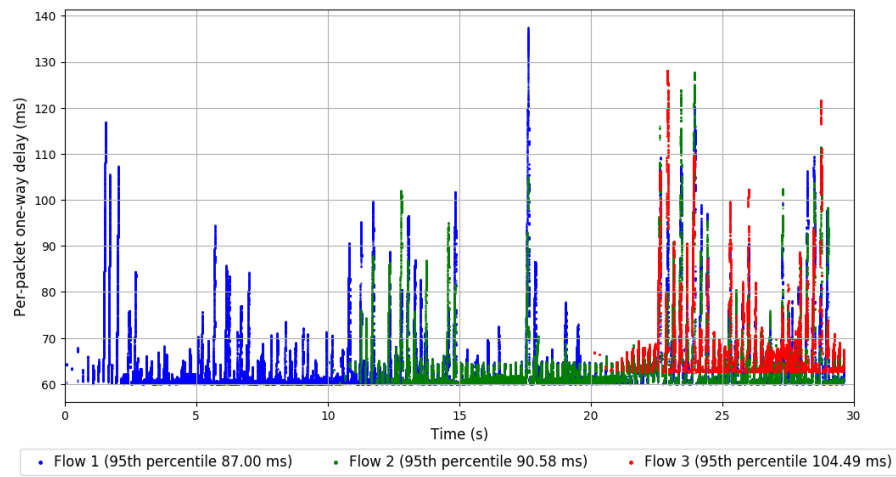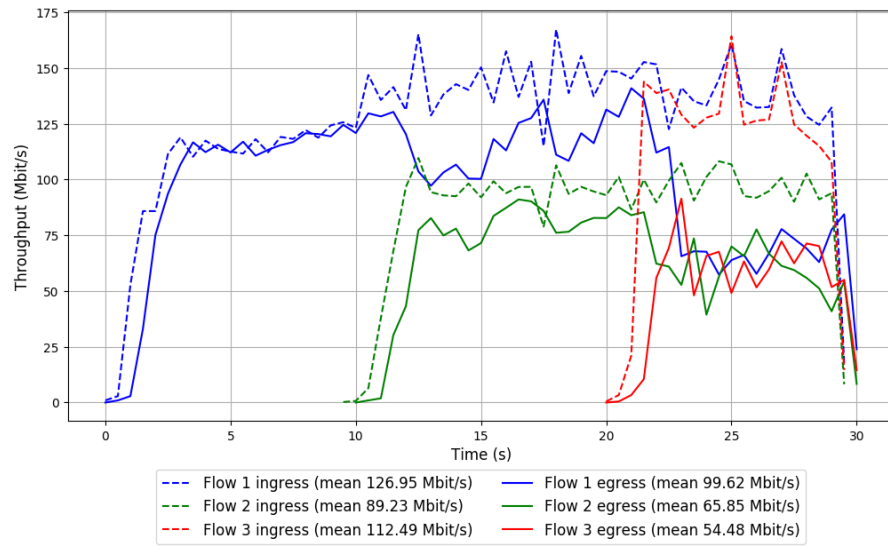Run 5: Report of FillP-Sheep — Data Link

```
Run 1: Statistics of Indigo

Start at: 2018-09-07 14:47:49
End at: 2018-09-07 14:48:19
Local clock offset: -1.486 ms
Remote clock offset: -33.871 ms


# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 162.47 Mbit/s
95th percentile per-packet one-way delay: 77.462 ms
Loss rate: 18.20%
-- Flow 1:
Average throughput: 79.92 Mbit/s
95th percentile per-packet one-way delay: 70.667 ms
Loss rate: 10.50%
-- Flow 2:
Average throughput: 84.66 Mbit/s
95th percentile per-packet one-way delay: 89.704 ms
Loss rate: 18.79%
-- Flow 3:
Average throughput: 83.59 Mbit/s
95th percentile per-packet one-way delay: 70.901 ms
Loss rate: 34.08%
```
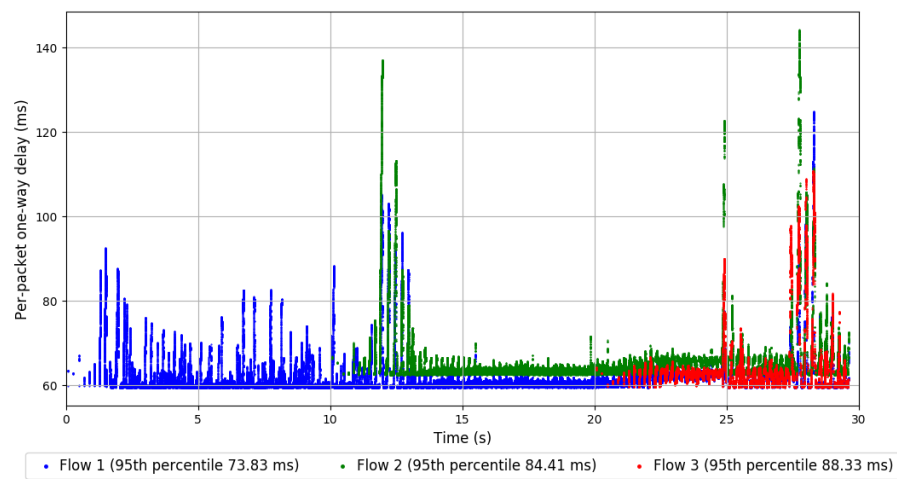
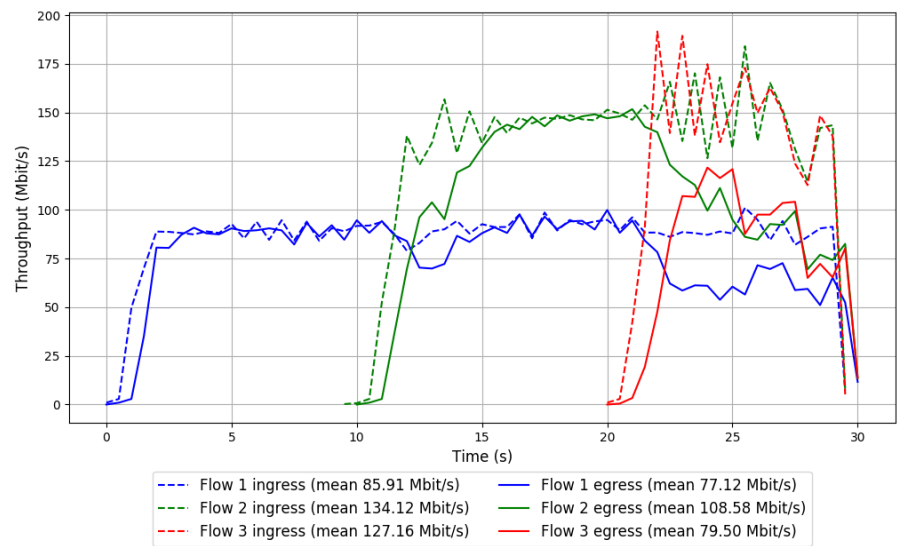Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2018-09-07 15:13:38
End at: 2018-09-07 15:14:08
Local clock offset: 1.263 ms
Remote clock offset: -32.639 ms


# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 160.70 Mbit/s
95th percentile per-packet one-way delay: 90.344 ms
Loss rate: 27.65%
-- Flow 1:
Average throughput: 99.62 Mbit/s
95th percentile per-packet one-way delay: 87.003 ms
Loss rate: 21.52%
-- Flow 2:
Average throughput: 65.85 Mbit/s
95th percentile per-packet one-way delay: 90.582 ms
Loss rate: 26.21%
-- Flow 3:
Average throughput: 54.48 Mbit/s
95th percentile per-packet one-way delay: 104.492 ms
Loss rate: 51.57%
```

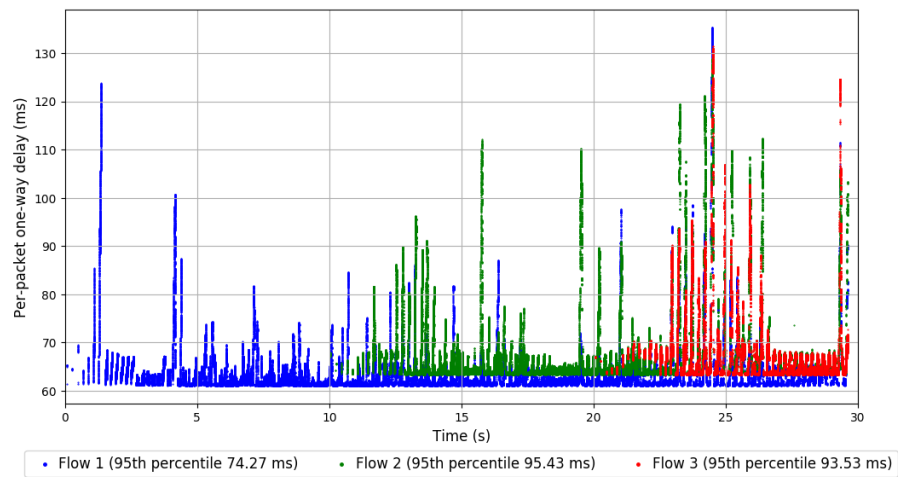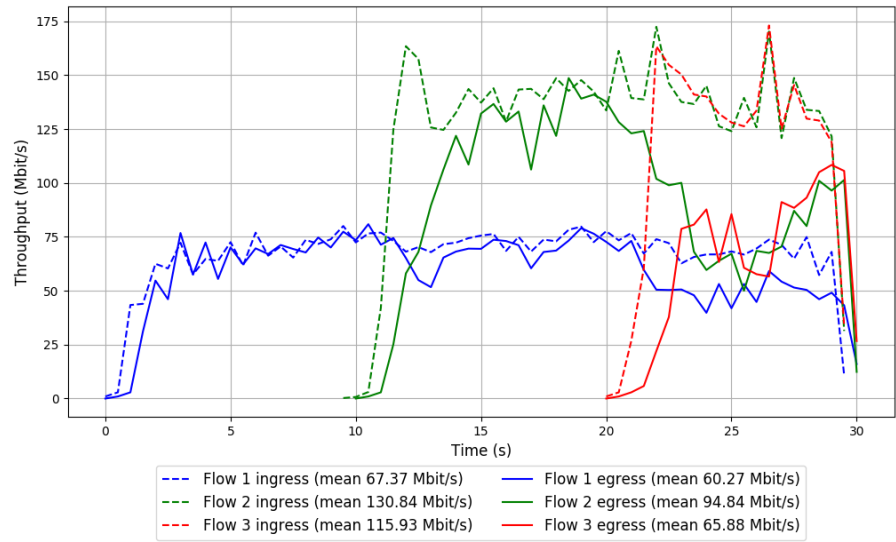Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2018-09-07 15:39:35
End at: 2018-09-07 15:40:05
Local clock offset: 0.248 ms
Remote clock offset: -35.059 ms

# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 174.57 Mbit/s
95th percentile per-packet one-way delay: 79.587 ms
Loss rate: 19.04%
-- Flow 1:
Average throughput: 77.12 Mbit/s
95th percentile per-packet one-way delay: 73.832 ms
Loss rate: 10.22%
-- Flow 2:
Average throughput: 108.58 Mbit/s
95th percentile per-packet one-way delay: 84.410 ms
Loss rate: 19.06%
-- Flow 3:
Average throughput: 79.50 Mbit/s
95th percentile per-packet one-way delay: 88.331 ms
Loss rate: 37.50%
```
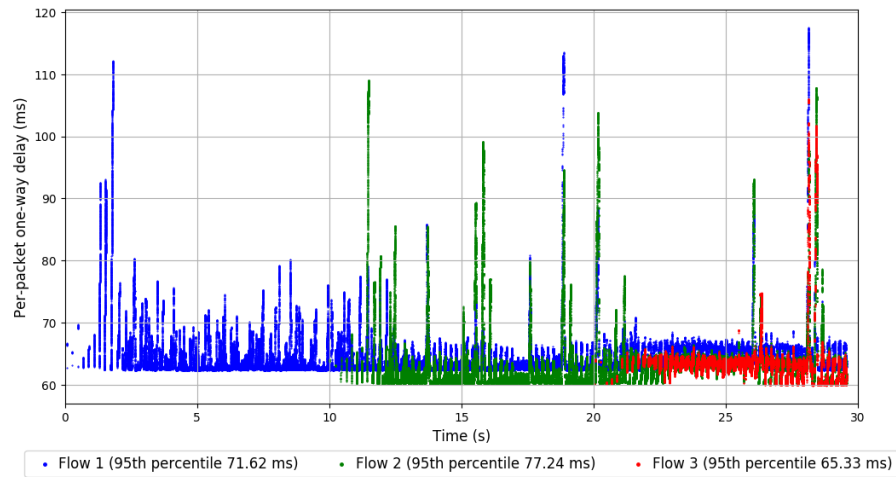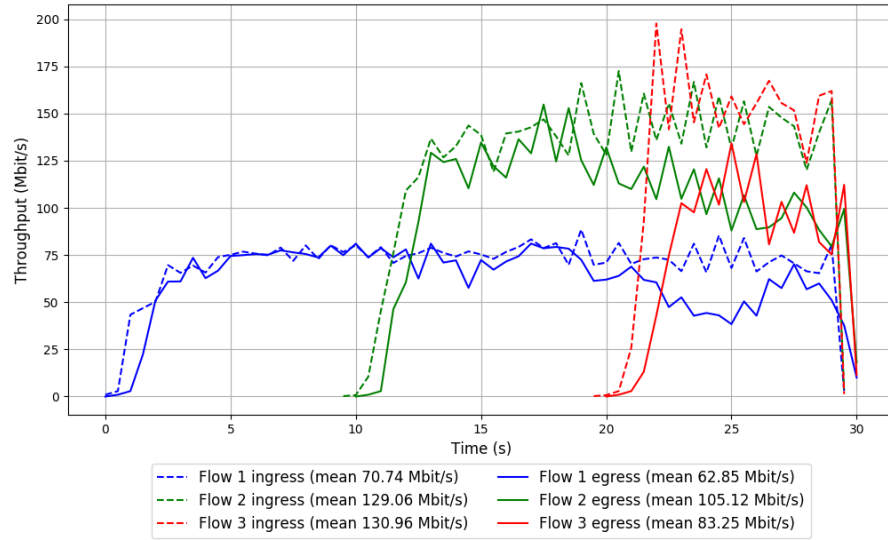
Run 3: Report of Indigo — Data Link

```
Run 4: Statistics of Indigo

Start at: 2018-09-07 16:05:53
End at: 2018-09-07 16:06:23
Local clock offset: 0.31 ms
Remote clock offset: -33.405 ms


# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 144.33 Mbit/s
95th percentile per-packet one-way delay: 88.714 ms
Loss rate: 24.60%
-- Flow 1:
Average throughput: 60.27 Mbit/s
95th percentile per-packet one-way delay: 74.271 ms
Loss rate: 10.48%
-- Flow 2:
Average throughput: 94.84 Mbit/s
95th percentile per-packet one-way delay: 95.426 ms
Loss rate: 27.53%
-- Flow 3:
Average throughput: 65.88 Mbit/s
95th percentile per-packet one-way delay: 93.528 ms
Loss rate: 43.19%
```
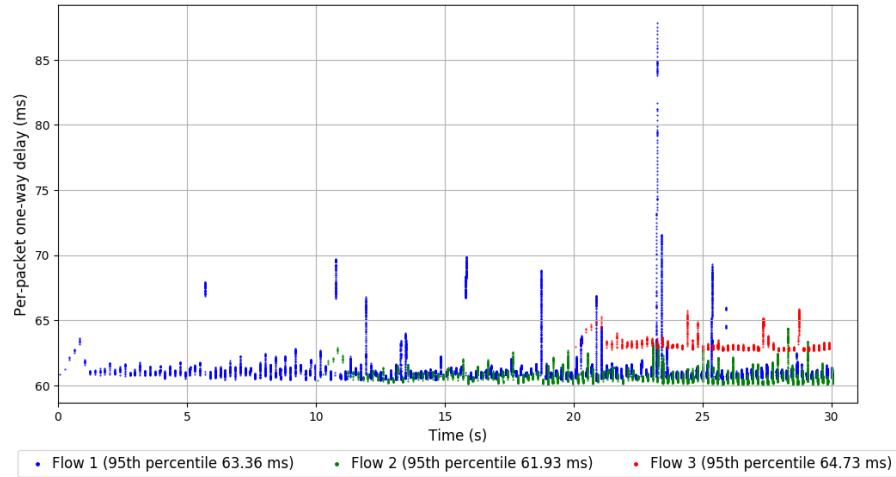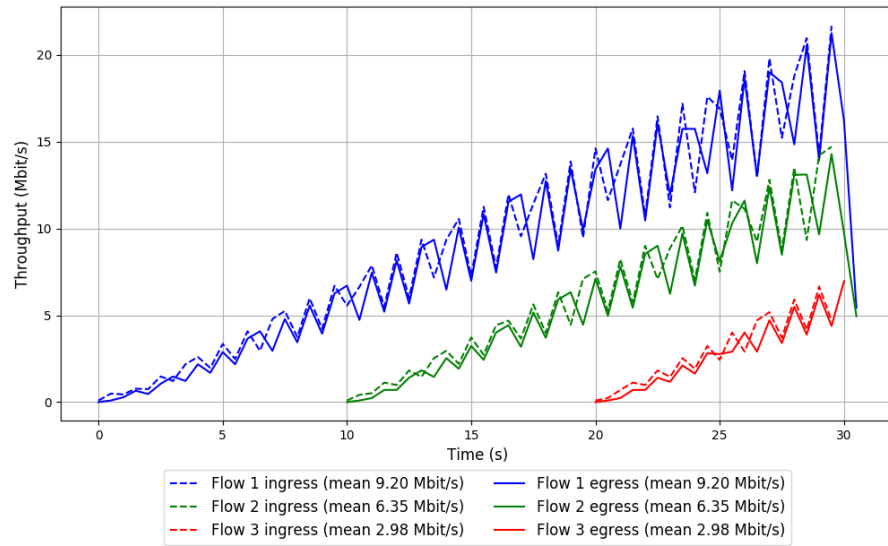
Run 4: Report of Indigo — Data Link

```
Run 5: Statistics of Indigo

Start at: 2018-09-07 16:37:54
End at: 2018-09-07 16:38:24
Local clock offset: -0.589 ms
Remote clock offset: -34.86 ms


# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 159.35 Mbit/s
95th percentile per-packet one-way delay: 73.488 ms
Loss rate: 19.74%
-- Flow 1:
Average throughput: 62.85 Mbit/s
95th percentile per-packet one-way delay: 71.621 ms
Loss rate: 11.18%
-- Flow 2:
Average throughput: 105.12 Mbit/s
95th percentile per-packet one-way delay: 77.243 ms
Loss rate: 18.57%
-- Flow 3:
Average throughput: 83.25 Mbit/s
95th percentile per-packet one-way delay: 65.335 ms
Loss rate: 36.43%
```

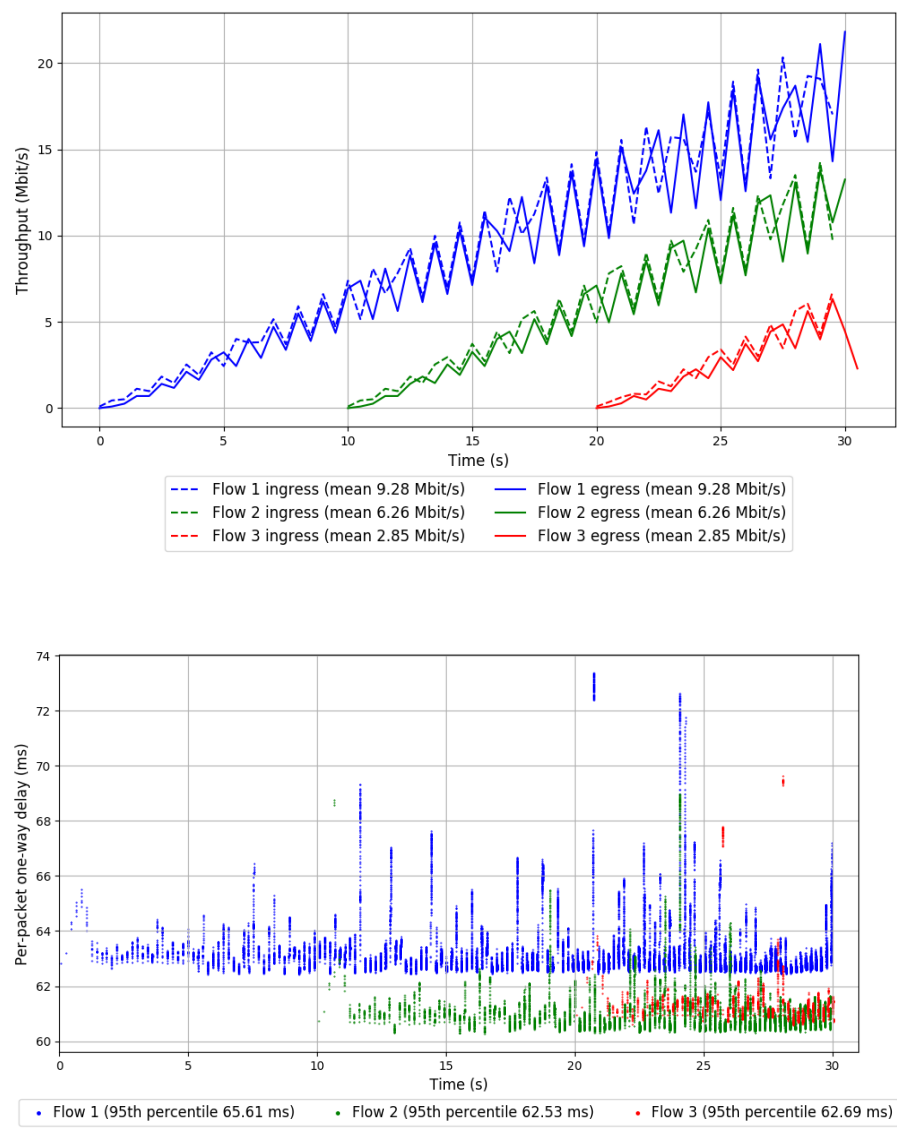Run 5: Report of Indigo — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2018-09-07 14:30:21
End at: 2018-09-07 14:30:51
Local clock offset: -0.857 ms
Remote clock offset: -35.035 ms


# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 14.40 Mbit/s
95th percentile per-packet one-way delay: 63.244 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.20 Mbit/s
95th percentile per-packet one-way delay: 63.356 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 6.35 Mbit/s
95th percentile per-packet one-way delay: 61.929 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.98 Mbit/s
95th percentile per-packet one-way delay: 64.731 ms
Loss rate: 0.00%
```
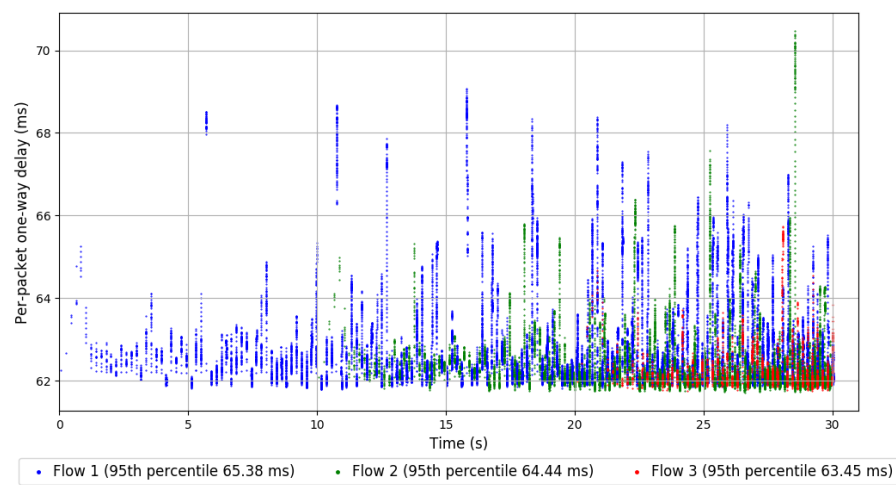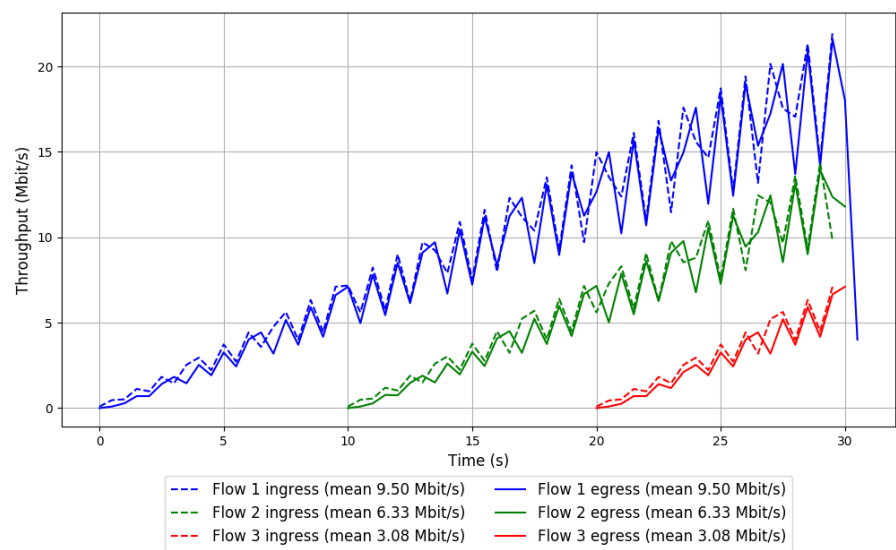
Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-09-07 14:56:15
End at: 2018-09-07 14:56:45
Local clock offset: -0.808 ms
Remote clock offset: -35.025 ms


# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 14.36 Mbit/s
95th percentile per-packet one-way delay: 64.980 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.28 Mbit/s
95th percentile per-packet one-way delay: 65.607 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 6.26 Mbit/s
95th percentile per-packet one-way delay: 62.529 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.85 Mbit/s
95th percentile per-packet one-way delay: 62.689 ms
Loss rate: 0.00%
```
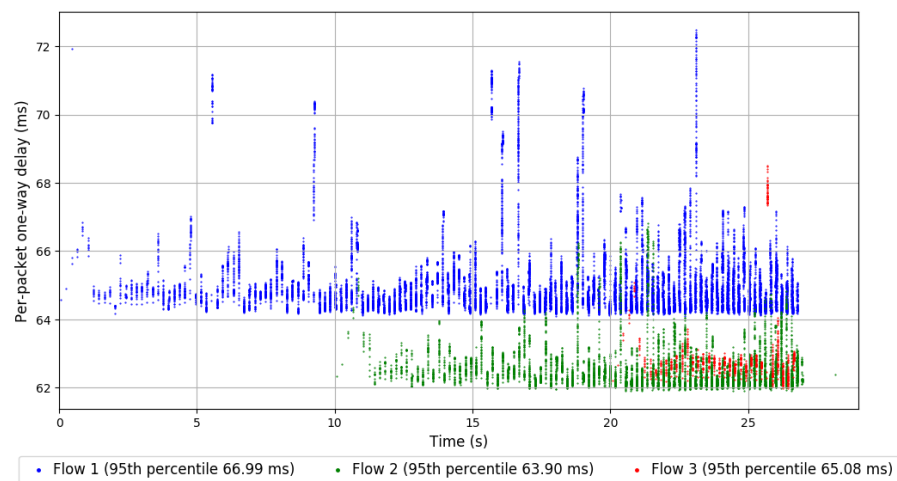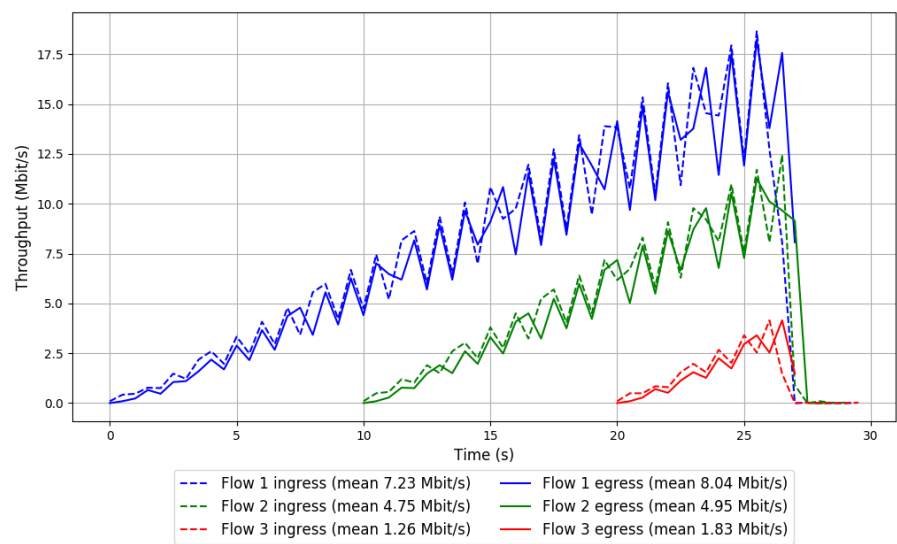
Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2018-09-07 15:22:09
End at: 2018-09-07 15:22:39
Local clock offset: 0.427 ms
Remote clock offset: -32.41 ms


# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 14.70 Mbit/s
95th percentile per-packet one-way delay: 65.205 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.50 Mbit/s
95th percentile per-packet one-way delay: 65.382 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 6.33 Mbit/s
95th percentile per-packet one-way delay: 64.438 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 3.08 Mbit/s
95th percentile per-packet one-way delay: 63.445 ms
Loss rate: 0.00%
```
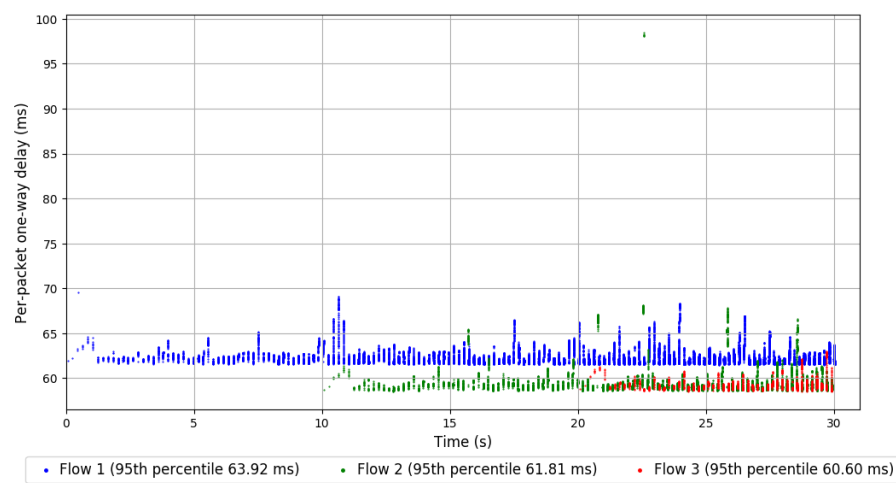
Run 3: Report of LEDBAT — Data Link

```
Run 4: Statistics of LEDBAT

Start at: 2018-09-07 15:48:04
End at: 2018-09-07 15:48:34
Local clock offset: 2.851 ms
Remote clock offset: -30.129 ms


# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 11.26 Mbit/s
95th percentile per-packet one-way delay: 66.387 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 8.04 Mbit/s
95th percentile per-packet one-way delay: 66.986 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 4.95 Mbit/s
95th percentile per-packet one-way delay: 63.902 ms
Loss rate: 2.34%
-- Flow 3:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 65.082 ms
Loss rate: 0.19%
```
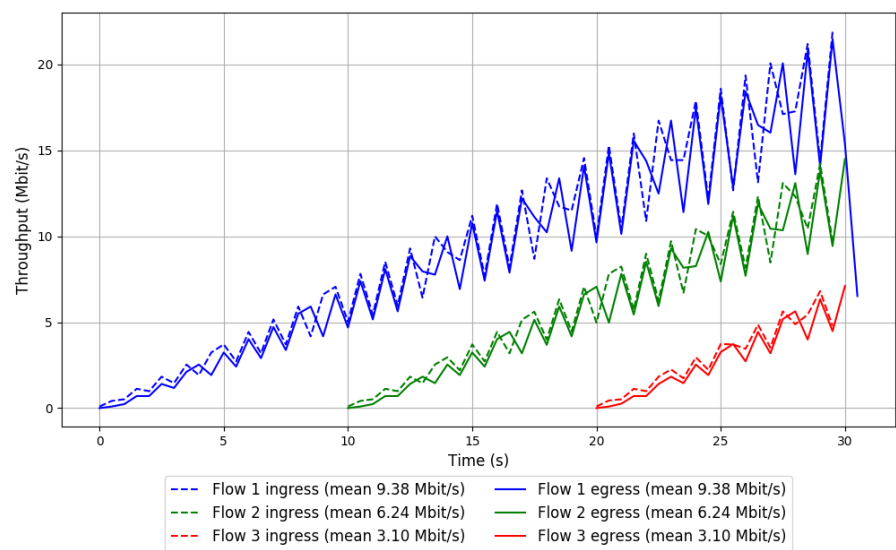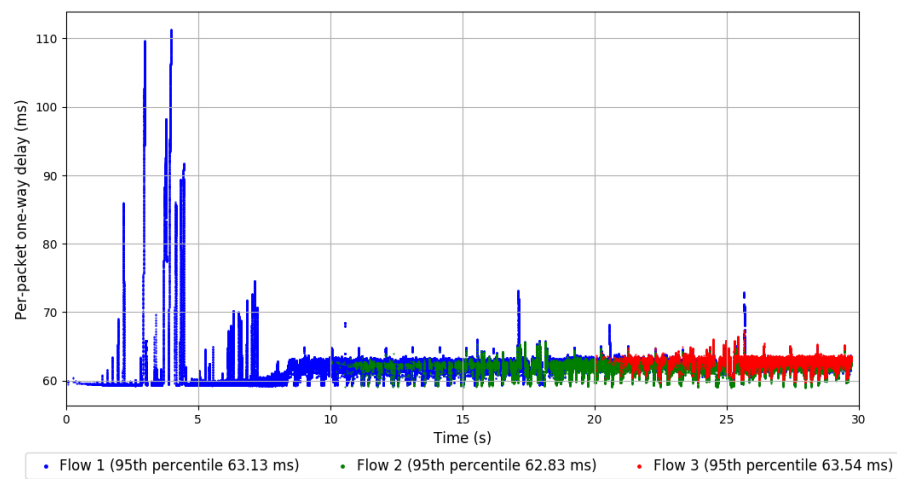
Run 4: Report of LEDBAT — Data Link

```
Run 5: Statistics of LEDBAT

Start at: 2018-09-07 16:14:20
End at: 2018-09-07 16:14:50
Local clock offset: 1.186 ms
Remote clock offset: -35.157 ms

# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 14.53 Mbit/s
95th percentile per-packet one-way delay: 63.783 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.38 Mbit/s
95th percentile per-packet one-way delay: 63.922 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 6.24 Mbit/s
95th percentile per-packet one-way delay: 61.810 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 3.10 Mbit/s
95th percentile per-packet one-way delay: 60.600 ms
Loss rate: 0.00%
```
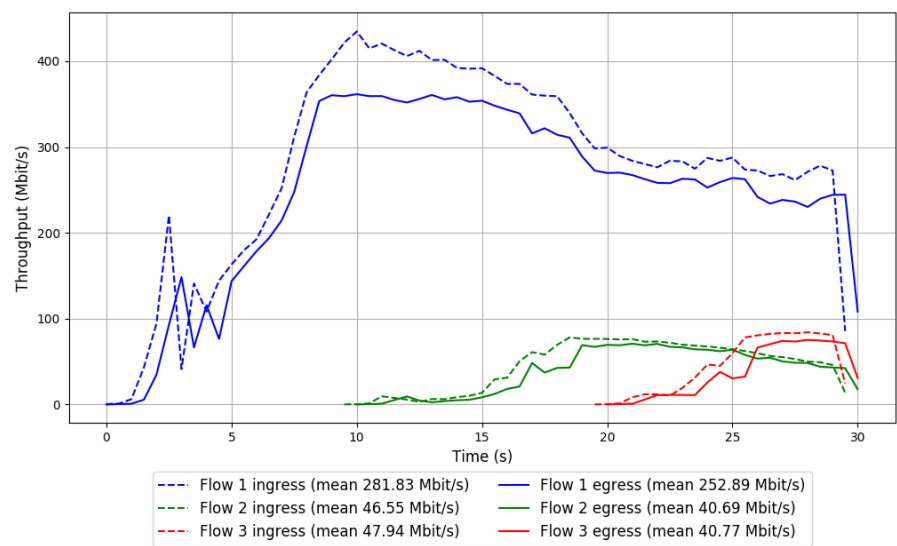
Run 5: Report of LEDBAT — Data Link

```
Run 1: Statistics of Indigo-Muses

Start at: 2018-09-07 14:53:22
End at: 2018-09-07 14:53:52
Local clock offset: -0.096 ms
Remote clock offset: -35.145 ms

# Below is generated by plot.py at 2018-09-07 17:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 293.20 Mbit/s
95th percentile per-packet one-way delay: 63.179 ms
Loss rate: 10.70%
-- Flow 1:
Average throughput: 252.89 Mbit/s
95th percentile per-packet one-way delay: 63.128 ms
Loss rate: 10.26%
-- Flow 2:
Average throughput: 40.69 Mbit/s
95th percentile per-packet one-way delay: 62.826 ms
Loss rate: 12.62%
-- Flow 3:
Average throughput: 40.77 Mbit/s
95th percentile per-packet one-way delay: 63.544 ms
Loss rate: 14.92%
```

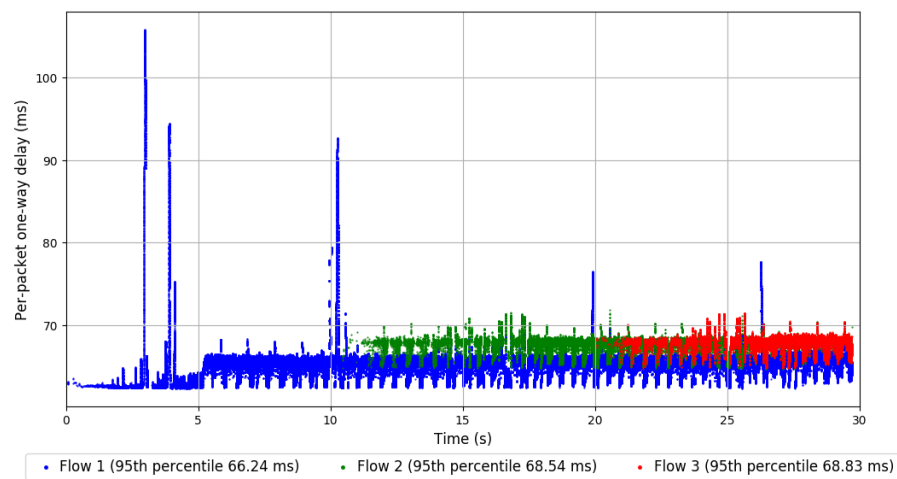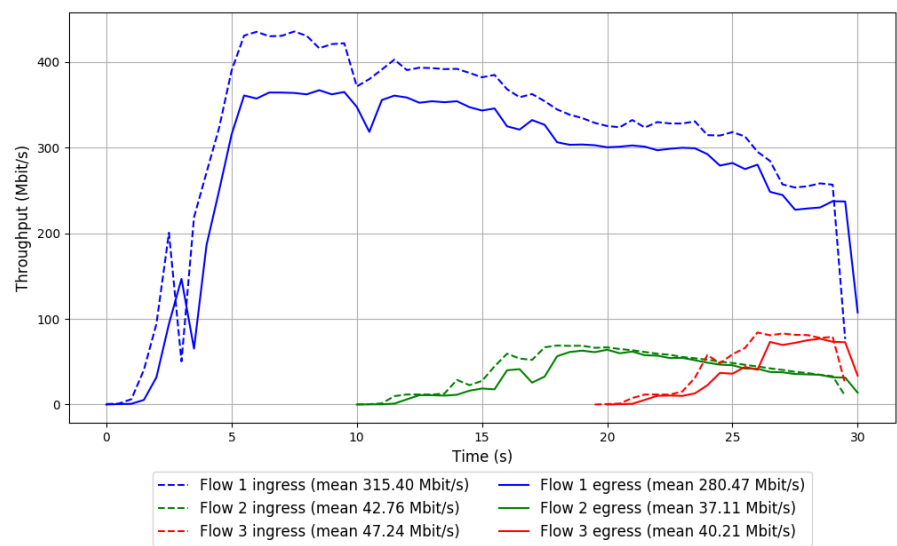Run 1: Report of Indigo-Muses — Data Link

```
Run 2: Statistics of Indigo-Muses

Start at: 2018-09-07 15:19:14
End at: 2018-09-07 15:19:45
Local clock offset: -0.286 ms
Remote clock offset: -32.287 ms


# Below is generated by plot.py at 2018-09-07 17:02:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 317.63 Mbit/s
95th percentile per-packet one-way delay: 68.135 ms
Loss rate: 11.40%
-- Flow 1:
Average throughput: 280.47 Mbit/s
95th percentile per-packet one-way delay: 66.243 ms
Loss rate: 11.07%
-- Flow 2:
Average throughput: 37.11 Mbit/s
95th percentile per-packet one-way delay: 68.543 ms
Loss rate: 13.24%
-- Flow 3:
Average throughput: 40.21 Mbit/s
95th percentile per-packet one-way delay: 68.826 ms
Loss rate: 14.88%
```
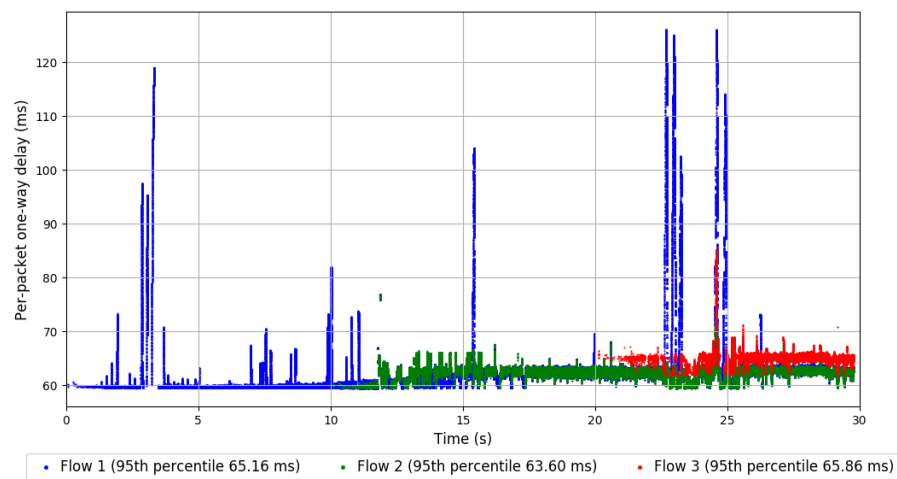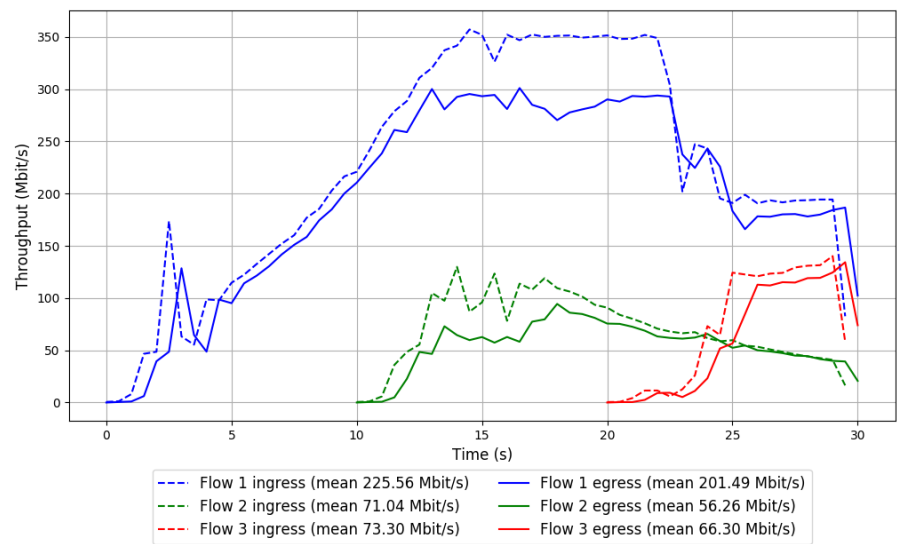
Run 2: Report of Indigo-Muses — Data Link

```
Run 3: Statistics of Indigo-Muses

Start at: 2018-09-07 15:45:12
End at: 2018-09-07 15:45:42
Local clock offset: 0.922 ms
Remote clock offset: -34.5 ms

# Below is generated by plot.py at 2018-09-07 17:02:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 260.28 Mbit/s
95th percentile per-packet one-way delay: 65.572 ms
Loss rate: 12.18%
-- Flow 1:
Average throughput: 201.49 Mbit/s
95th percentile per-packet one-way delay: 65.162 ms
Loss rate: 10.66%
-- Flow 2:
Average throughput: 56.26 Mbit/s
95th percentile per-packet one-way delay: 63.600 ms
Loss rate: 20.79%
-- Flow 3:
Average throughput: 66.30 Mbit/s
95th percentile per-packet one-way delay: 65.861 ms
Loss rate: 9.58%
```

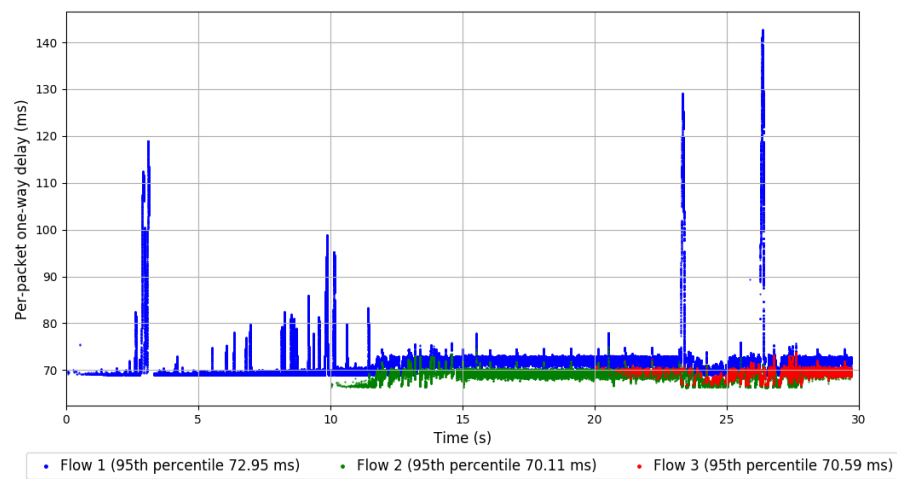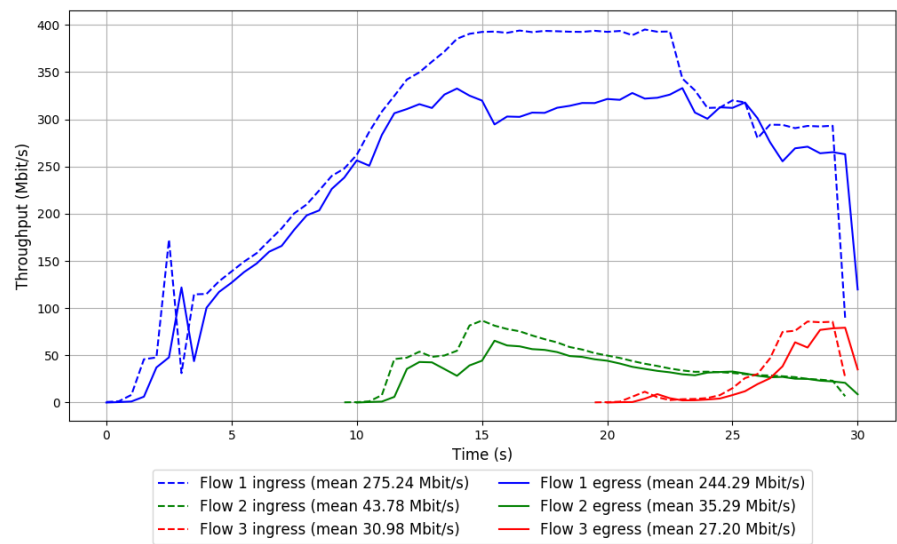Run 3: Report of Indigo-Muses — Data Link

```
Run 4: Statistics of Indigo-Muses

Start at: 2018-09-07 16:11:27
End at: 2018-09-07 16:11:57
Local clock offset: -0.121 ms
Remote clock offset: -28.417 ms

# Below is generated by plot.py at 2018-09-07 17:02:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 276.59 Mbit/s
95th percentile per-packet one-way delay: 72.848 ms
Loss rate: 12.03%
-- Flow 1:
Average throughput: 244.29 Mbit/s
95th percentile per-packet one-way delay: 72.948 ms
Loss rate: 11.24%
-- Flow 2:
Average throughput: 35.29 Mbit/s
95th percentile per-packet one-way delay: 70.111 ms
Loss rate: 19.38%
-- Flow 3:
Average throughput: 27.20 Mbit/s
95th percentile per-packet one-way delay: 70.589 ms
Loss rate: 12.24%
```

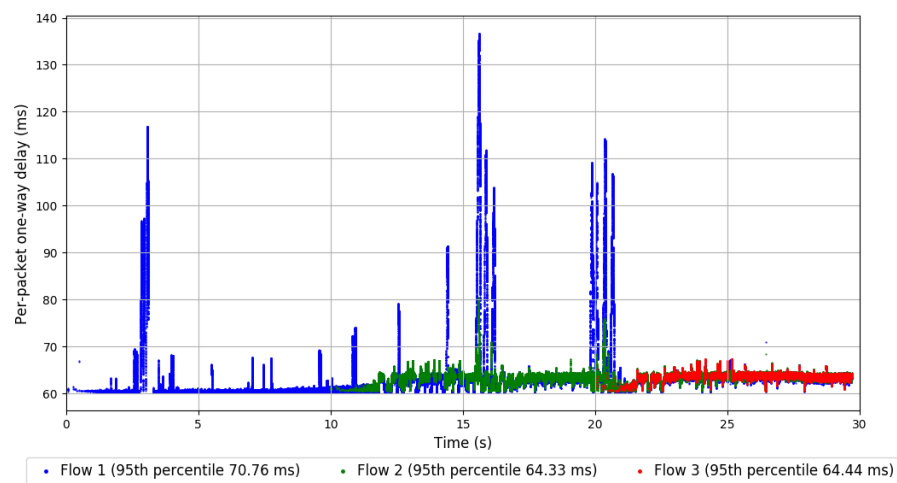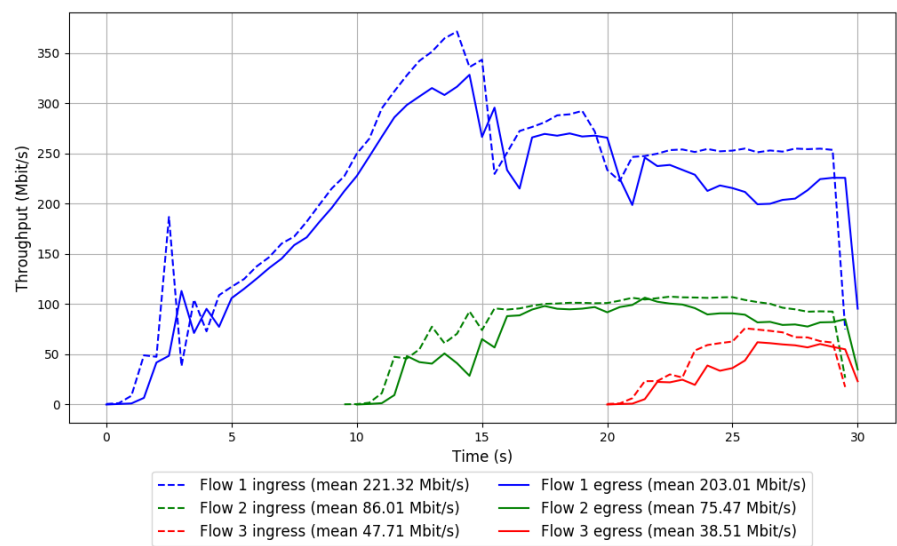Run 4: Report of Indigo-Muses — Data Link

```
Run 5: Statistics of Indigo-Muses

Start at: 2018-09-07 16:43:29
End at: 2018-09-07 16:43:59
Local clock offset: 0.052 ms
Remote clock offset: -33.997 ms


# Below is generated by plot.py at 2018-09-07 17:02:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 265.71 Mbit/s
95th percentile per-packet one-way delay: 65.715 ms
Loss rate: 9.62%
-- Flow 1:
Average throughput: 203.01 Mbit/s
95th percentile per-packet one-way delay: 70.760 ms
Loss rate: 8.26%
-- Flow 2:
Average throughput: 75.47 Mbit/s
95th percentile per-packet one-way delay: 64.334 ms
Loss rate: 12.23%
-- Flow 3:
Average throughput: 38.51 Mbit/s
95th percentile per-packet one-way delay: 64.438 ms
Loss rate: 19.26%
```

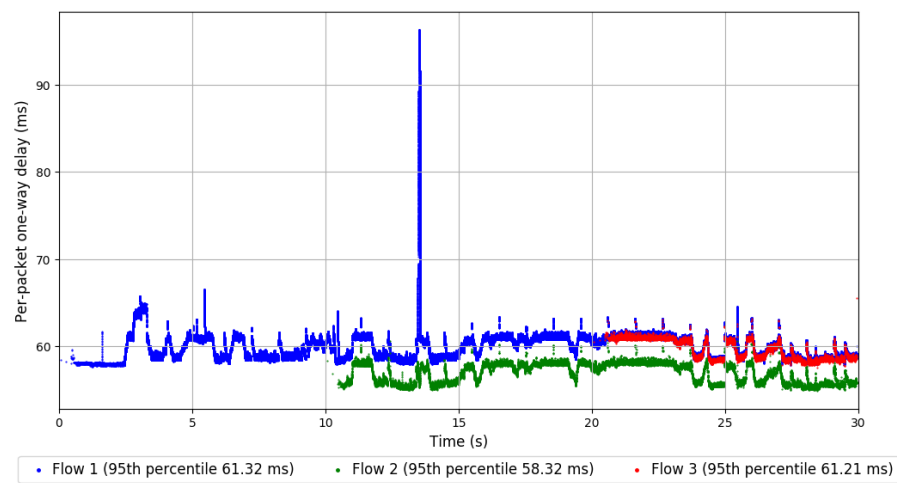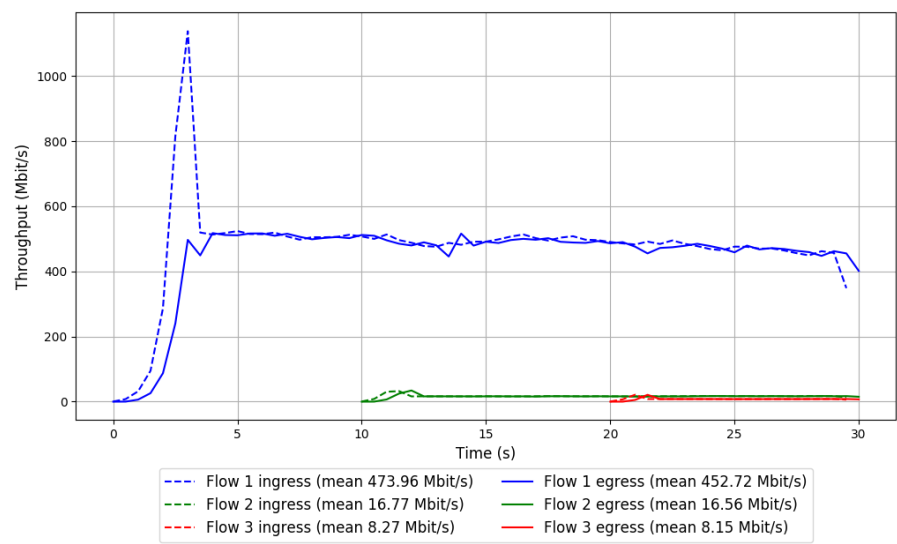Run 5: Report of Indigo-Muses — Data Link

Flow 1 ingress (mean 221.32 Mbit/s)   Flow 1 egress (mean 203.01 Mbit/s)
Flow 2 ingress (mean 86.01 Mbit/s)   Flow 2 egress (mean 75.47 Mbit/s)
Flow 3 ingress (mean 47.71 Mbit/s)   Flow 3 egress (mean 38.51 Mbit/s)

Flow 1 (95th percentile 70.76 ms)   Flow 2 (95th percentile 64.33 ms)   Flow 3 (95th percentile 64.44 ms)

```
Run 1: Statistics of PCC-Allegro

Start at: 2018-09-07 14:35:47
End at: 2018-09-07 14:36:17
Local clock offset: -0.388 ms
Remote clock offset: -39.849 ms


# Below is generated by plot.py at 2018-09-07 17:05:54
# Datalink statistics
-- Total of 3 flows:
Average throughput: 466.32 Mbit/s
95th percentile per-packet one-way delay: 61.311 ms
Loss rate: 4.39%
-- Flow 1:
Average throughput: 452.72 Mbit/s
95th percentile per-packet one-way delay: 61.319 ms
Loss rate: 4.49%
-- Flow 2:
Average throughput: 16.56 Mbit/s
95th percentile per-packet one-way delay: 58.318 ms
Loss rate: 1.25%
-- Flow 3:
Average throughput: 8.15 Mbit/s
95th percentile per-packet one-way delay: 61.212 ms
Loss rate: 1.33%
```
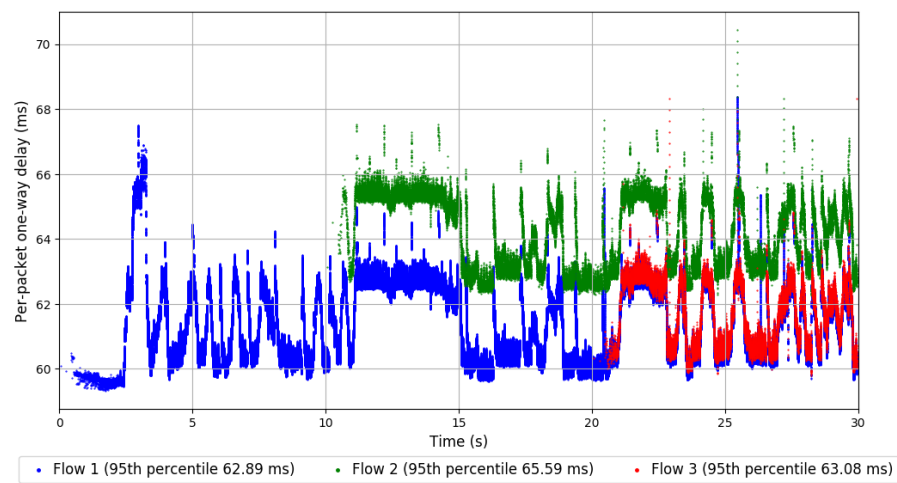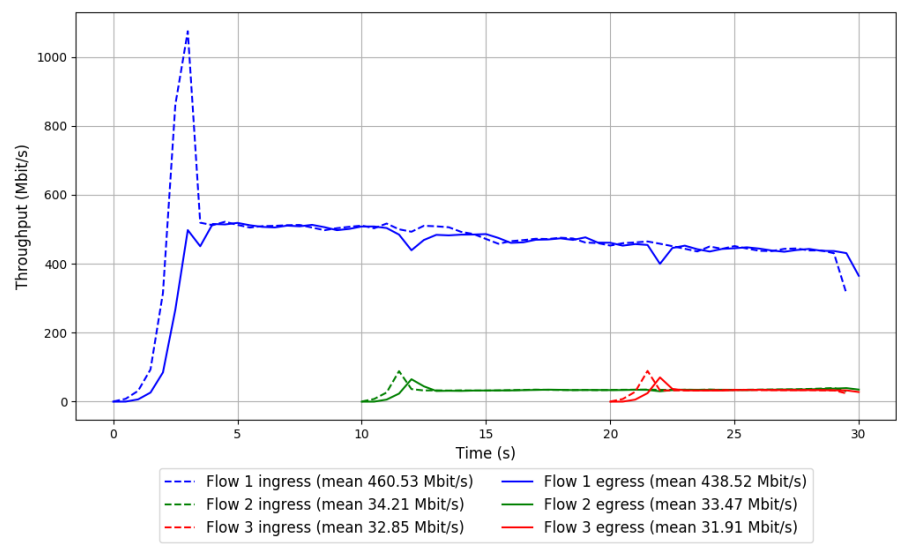
Run 1: Report of PCC-Allegro — Data Link

- - - Flow 1 ingress (mean 473.96 Mbit/s)   —— Flow 1 egress (mean 452.72 Mbit/s)
- - - Flow 2 ingress (mean 16.77 Mbit/s)   —— Flow 2 egress (mean 16.56 Mbit/s)
- - - Flow 3 ingress (mean 8.27 Mbit/s)   —— Flow 3 egress (mean 8.15 Mbit/s)

• Flow 1 (95th percentile 61.32 ms)   • Flow 2 (95th percentile 58.32 ms)   • Flow 3 (95th percentile 61.21 ms)

86

```
Run 2: Statistics of PCC-Allegro

Start at: 2018-09-07 15:01:39
End at: 2018-09-07 15:02:09
Local clock offset: -0.125 ms
Remote clock offset: -35.023 ms


# Below is generated by plot.py at 2018-09-07 17:07:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 471.18 Mbit/s
95th percentile per-packet one-way delay: 63.544 ms
Loss rate: 4.61%
-- Flow 1:
Average throughput: 438.52 Mbit/s
95th percentile per-packet one-way delay: 62.893 ms
Loss rate: 4.78%
-- Flow 2:
Average throughput: 33.47 Mbit/s
95th percentile per-packet one-way delay: 65.593 ms
Loss rate: 2.17%
-- Flow 3:
Average throughput: 31.91 Mbit/s
95th percentile per-packet one-way delay: 63.081 ms
Loss rate: 2.77%
```
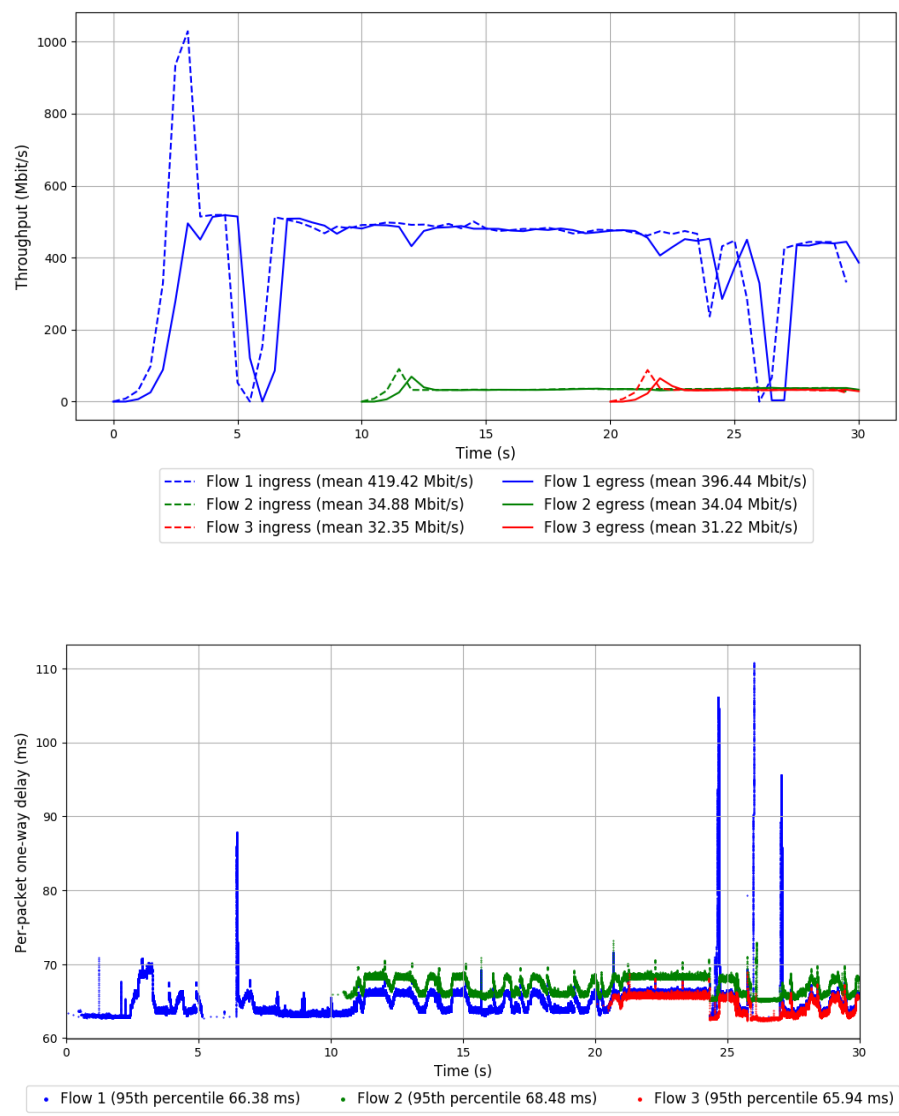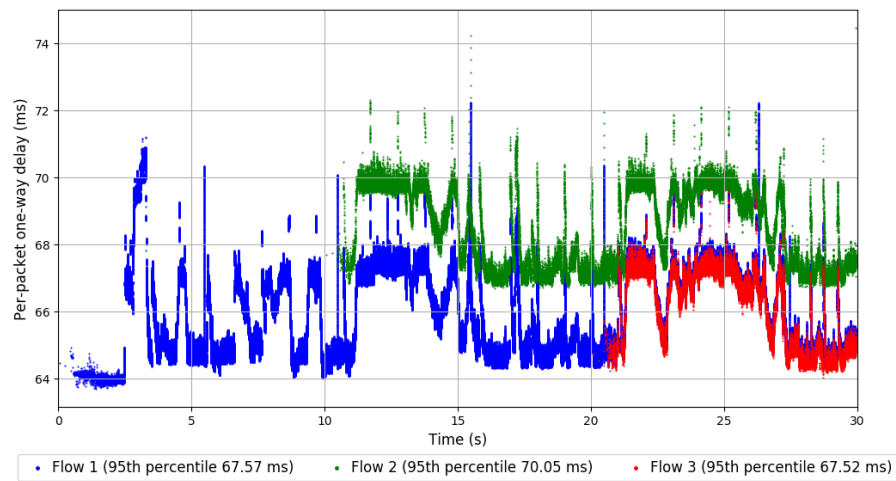
Run 2: Report of PCC-Allegro — Data Link

```
Run 3: Statistics of PCC-Allegro

Start at: 2018-09-07 15:27:33
End at: 2018-09-07 15:28:03
Local clock offset: 0.818 ms
Remote clock offset: -31.186 ms


# Below is generated by plot.py at 2018-09-07 17:07:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 429.35 Mbit/s
95th percentile per-packet one-way delay: 67.855 ms
Loss rate: 5.27%
-- Flow 1:
Average throughput: 396.44 Mbit/s
95th percentile per-packet one-way delay: 66.380 ms
Loss rate: 5.47%
-- Flow 2:
Average throughput: 34.04 Mbit/s
95th percentile per-packet one-way delay: 68.483 ms
Loss rate: 2.41%
-- Flow 3:
Average throughput: 31.22 Mbit/s
95th percentile per-packet one-way delay: 65.935 ms
Loss rate: 3.49%
```
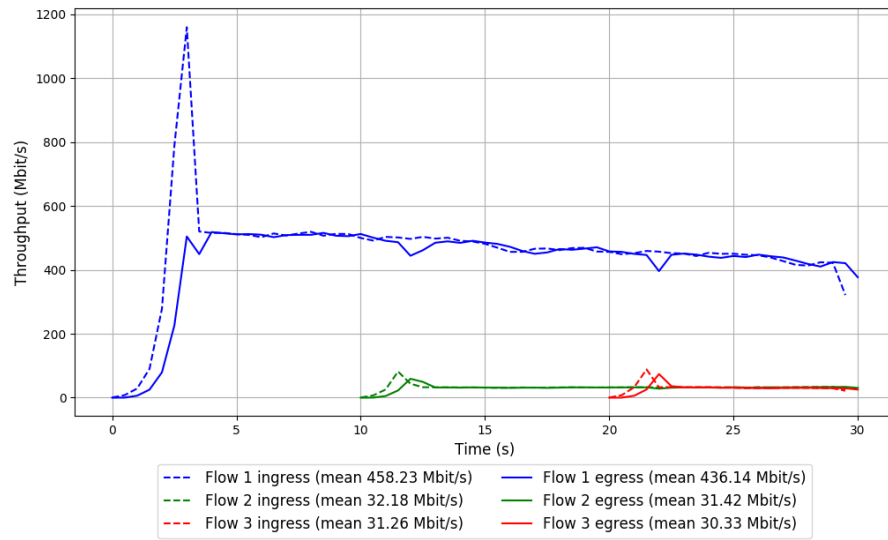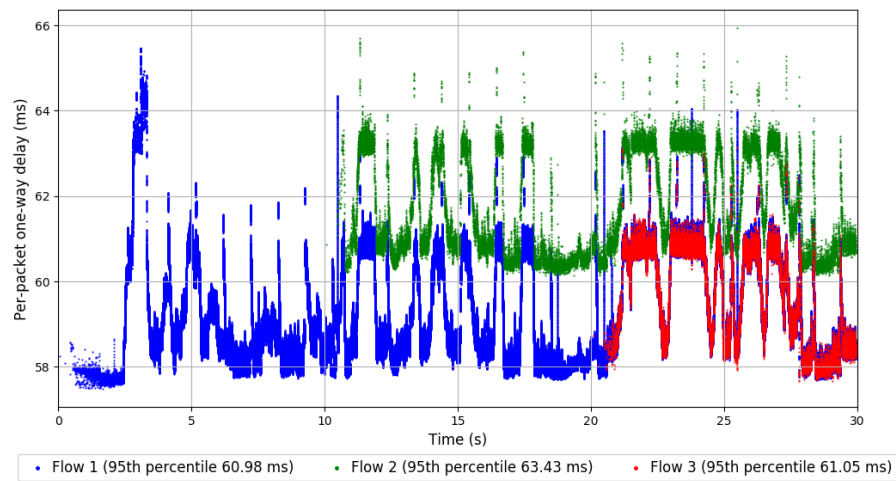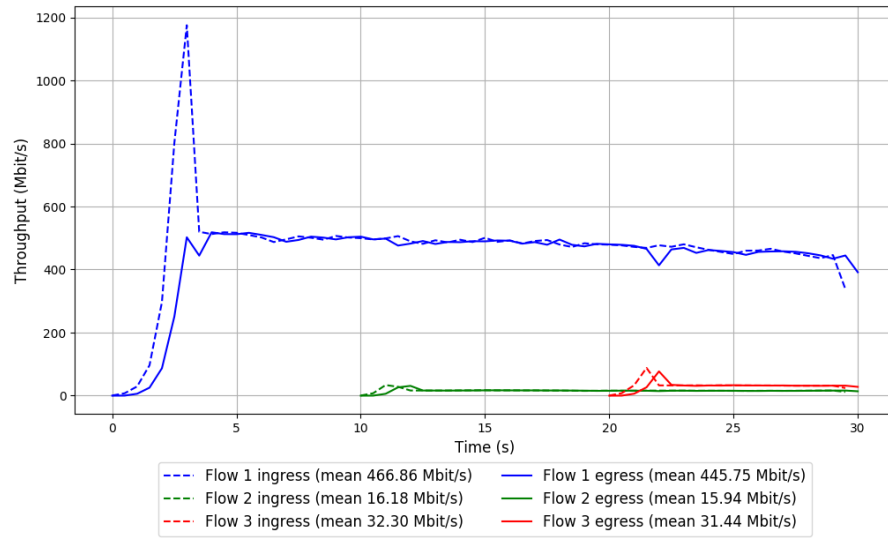
Run 3: Report of PCC-Allegro — Data Link

- - - Flow 1 ingress (mean 419.42 Mbit/s) ——— Flow 1 egress (mean 396.44 Mbit/s)
- - - Flow 2 ingress (mean 34.88 Mbit/s) ——— Flow 2 egress (mean 34.04 Mbit/s)
- - - Flow 3 ingress (mean 32.35 Mbit/s) ——— Flow 3 egress (mean 31.22 Mbit/s)

• Flow 1 (95th percentile 66.38 ms)   • Flow 2 (95th percentile 68.48 ms)   • Flow 3 (95th percentile 65.94 ms)

```
Run 4: Statistics of PCC-Allegro

Start at: 2018-09-07 15:53:27
End at: 2018-09-07 15:53:57
Local clock offset: 0.49 ms
Remote clock offset: -30.084 ms


# Below is generated by plot.py at 2018-09-07 17:08:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 466.92 Mbit/s
95th percentile per-packet one-way delay: 67.945 ms
Loss rate: 4.67%
-- Flow 1:
Average throughput: 436.14 Mbit/s
95th percentile per-packet one-way delay: 67.573 ms
Loss rate: 4.82%
-- Flow 2:
Average throughput: 31.42 Mbit/s
95th percentile per-packet one-way delay: 70.050 ms
Loss rate: 2.34%
-- Flow 3:
Average throughput: 30.33 Mbit/s
95th percentile per-packet one-way delay: 67.523 ms
Loss rate: 2.96%
```

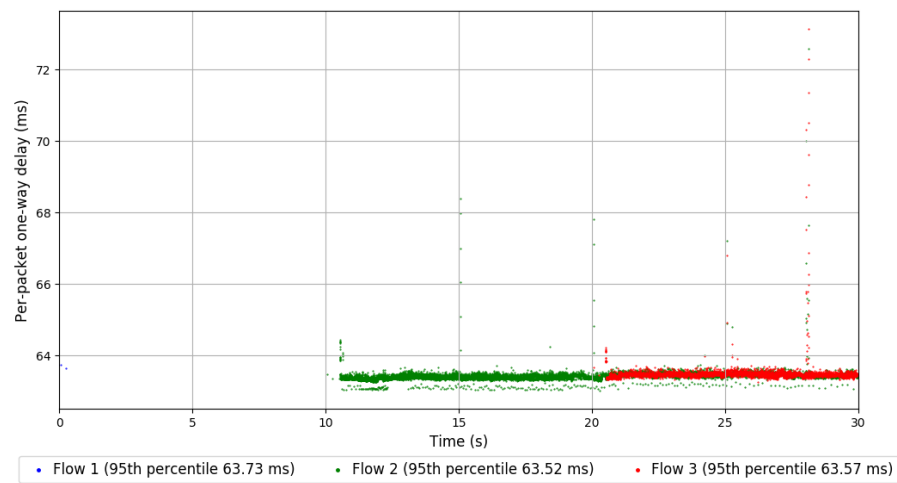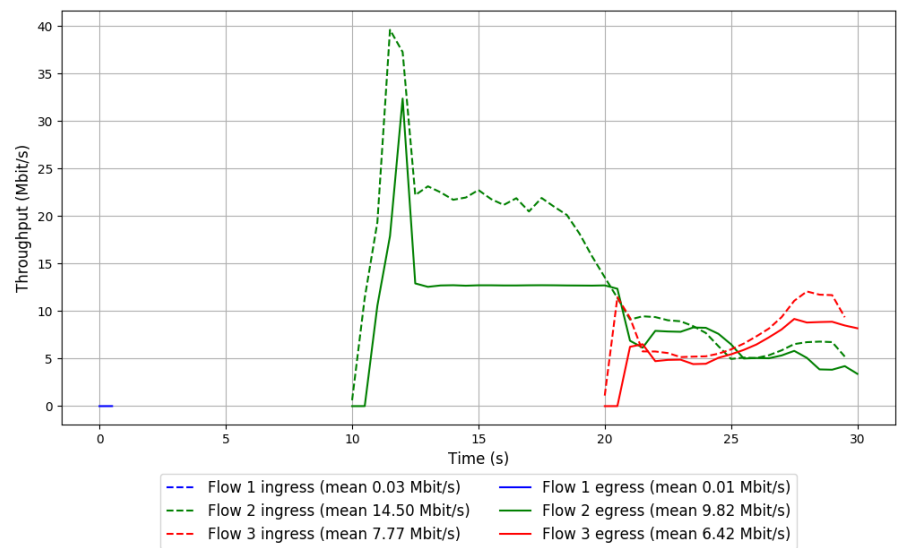Run 4: Report of PCC-Allegro — Data Link

```
Run 5: Statistics of PCC-Allegro

Start at: 2018-09-07 16:20:03
End at: 2018-09-07 16:20:33
Local clock offset: 2.52 ms
Remote clock offset: -34.523 ms

# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 466.71 Mbit/s
95th percentile per-packet one-way delay: 61.063 ms
Loss rate: 4.41%
-- Flow 1:
Average throughput: 445.75 Mbit/s
95th percentile per-packet one-way delay: 60.978 ms
Loss rate: 4.52%
-- Flow 2:
Average throughput: 15.94 Mbit/s
95th percentile per-packet one-way delay: 63.433 ms
Loss rate: 1.45%
-- Flow 3:
Average throughput: 31.44 Mbit/s
95th percentile per-packet one-way delay: 61.045 ms
Loss rate: 2.69%
```
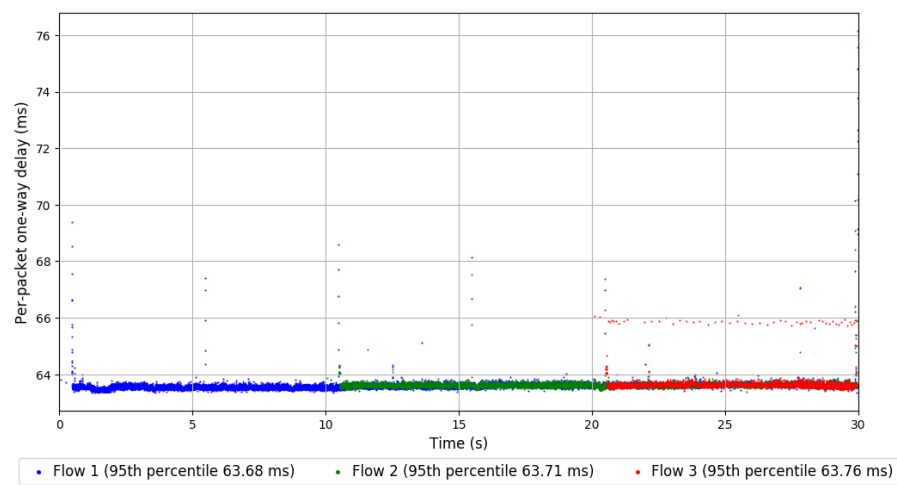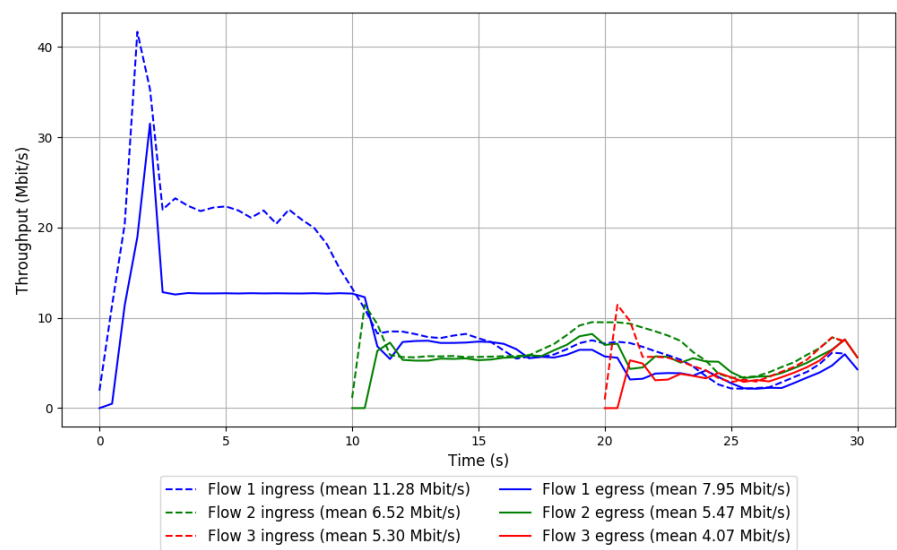
Run 5: Report of PCC-Allegro — Data Link

```
Run 1: Statistics of PCC-Expr

Start at: 2018-09-07 14:28:59
End at: 2018-09-07 14:29:29
Local clock offset: 1.554 ms
Remote clock offset: -29.878 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.65 Mbit/s
95th percentile per-packet one-way delay: 63.533 ms
Loss rate: 29.13%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 63.727 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 9.82 Mbit/s
95th percentile per-packet one-way delay: 63.522 ms
Loss rate: 32.26%
-- Flow 3:
Average throughput: 6.42 Mbit/s
95th percentile per-packet one-way delay: 63.566 ms
Loss rate: 17.37%
```
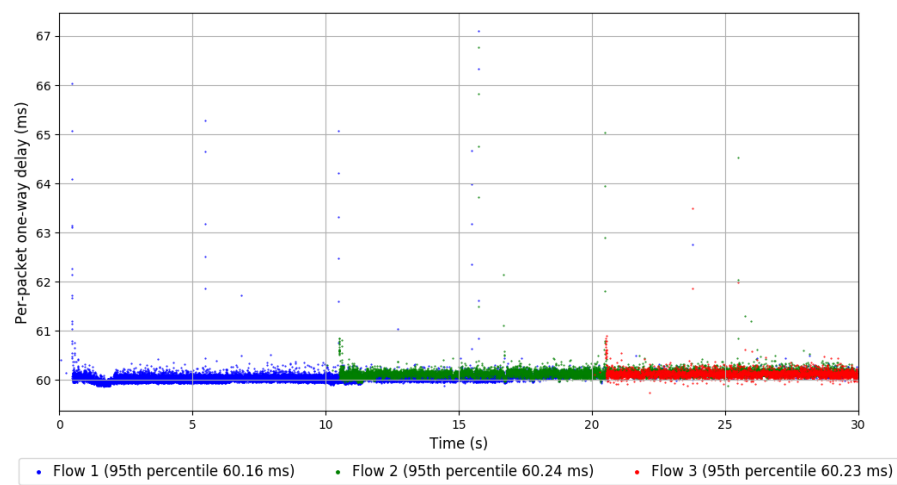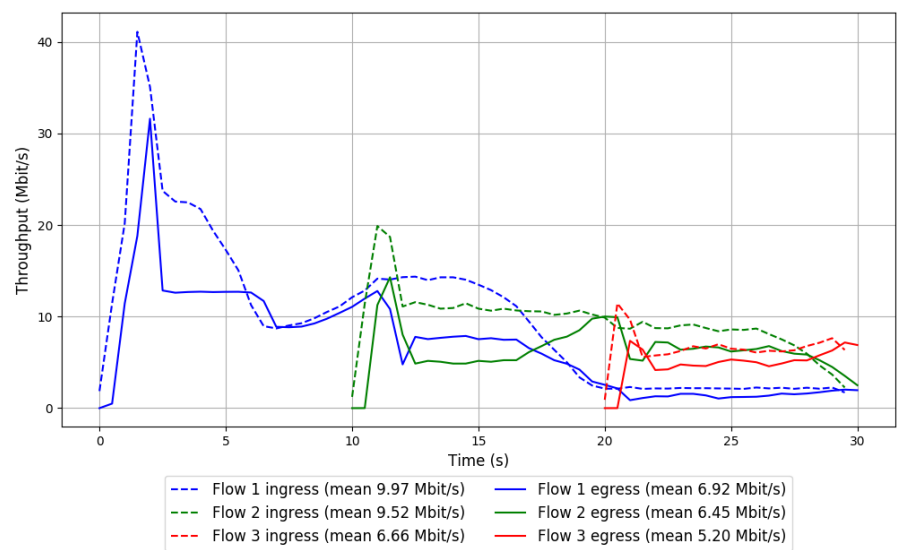
Run 1: Report of PCC-Expr — Data Link

```
Run 2: Statistics of PCC-Expr

Start at: 2018-09-07 14:54:56
End at: 2018-09-07 14:55:26
Local clock offset: -0.053 ms
Remote clock offset: -31.149 ms

# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.93 Mbit/s
95th percentile per-packet one-way delay: 63.699 ms
Loss rate: 25.55%
-- Flow 1:
Average throughput: 7.95 Mbit/s
95th percentile per-packet one-way delay: 63.681 ms
Loss rate: 29.53%
-- Flow 2:
Average throughput: 5.47 Mbit/s
95th percentile per-packet one-way delay: 63.711 ms
Loss rate: 16.11%
-- Flow 3:
Average throughput: 4.07 Mbit/s
95th percentile per-packet one-way delay: 63.762 ms
Loss rate: 23.28%
```
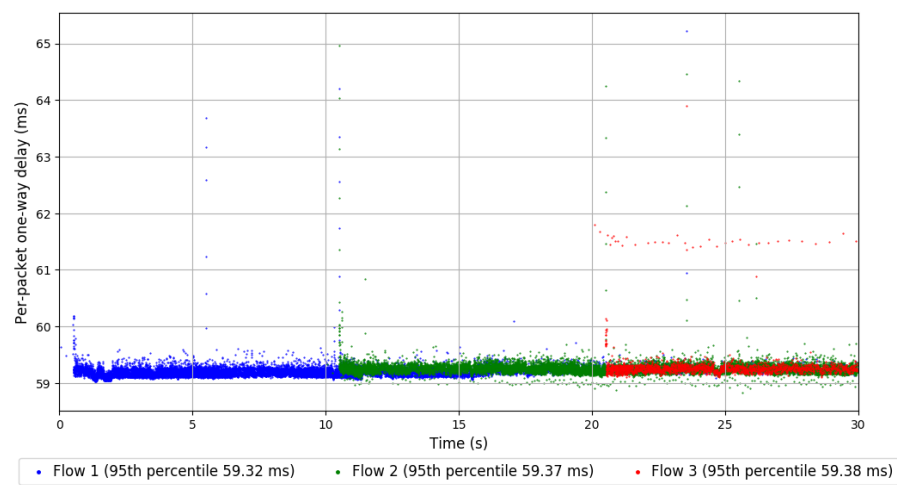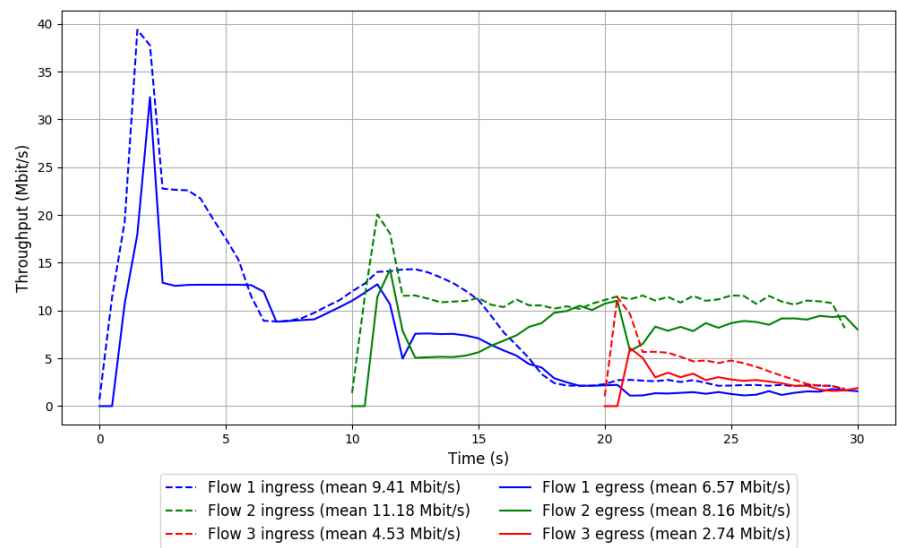
Run 2: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 11.28 Mbit/s)   Flow 1 egress (mean 7.95 Mbit/s)
Flow 2 ingress (mean 6.52 Mbit/s)   Flow 2 egress (mean 5.47 Mbit/s)
Flow 3 ingress (mean 5.30 Mbit/s)   Flow 3 egress (mean 4.07 Mbit/s)

Flow 1 (95th percentile 63.68 ms)   Flow 2 (95th percentile 63.71 ms)   Flow 3 (95th percentile 63.76 ms)
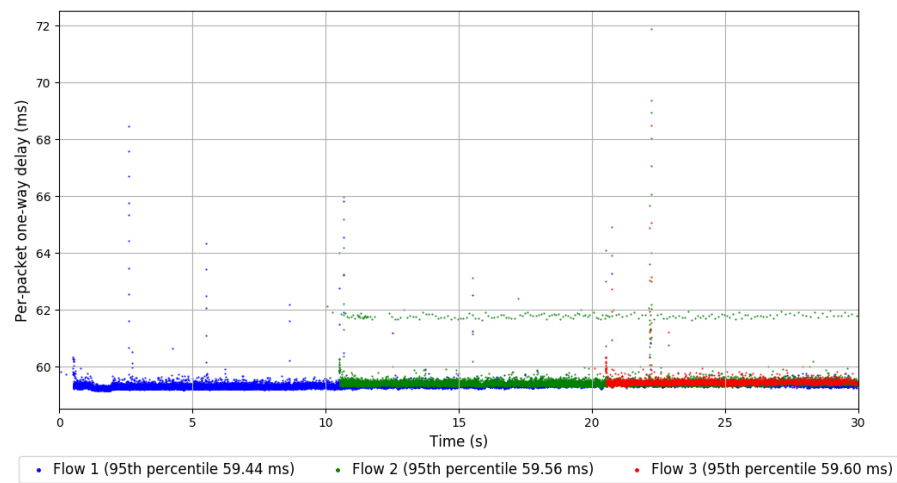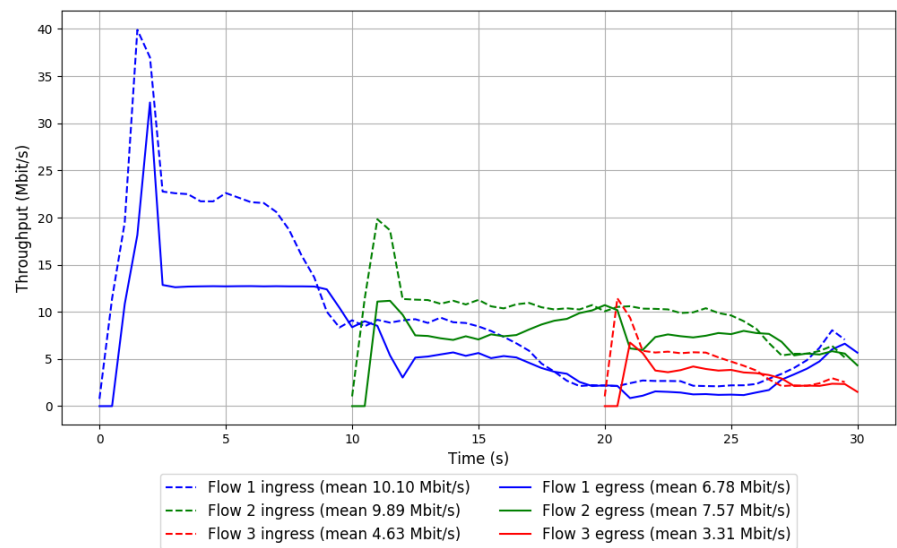
```
Run 3: Statistics of PCC-Expr

Start at: 2018-09-07 15:20:49
End at: 2018-09-07 15:21:19
Local clock offset: 0.193 ms
Remote clock offset: -34.579 ms

# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.93 Mbit/s
95th percentile per-packet one-way delay: 60.216 ms
Loss rate: 30.12%
-- Flow 1:
Average throughput: 6.92 Mbit/s
95th percentile per-packet one-way delay: 60.165 ms
Loss rate: 30.56%
-- Flow 2:
Average throughput: 6.45 Mbit/s
95th percentile per-packet one-way delay: 60.244 ms
Loss rate: 32.29%
-- Flow 3:
Average throughput: 5.20 Mbit/s
95th percentile per-packet one-way delay: 60.231 ms
Loss rate: 21.81%
```

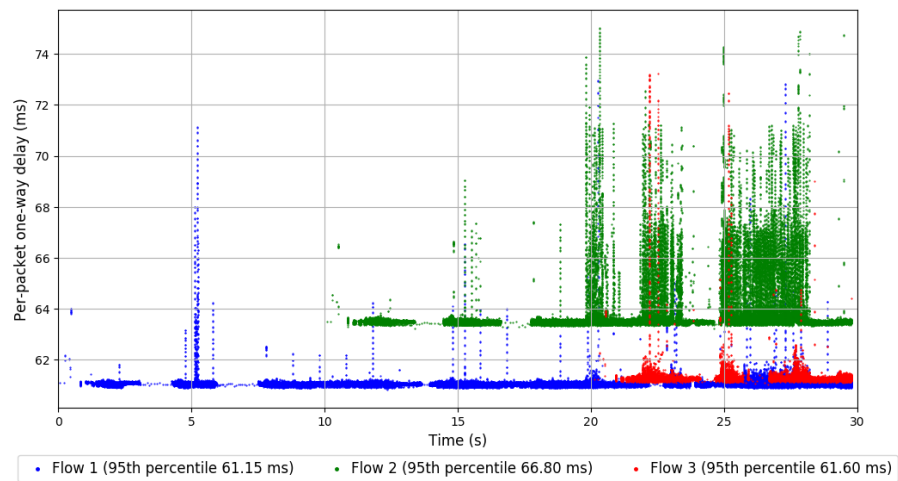# Run 3: Report of PCC-Expr — Data Link

```
Run 4: Statistics of PCC-Expr

Start at: 2018-09-07 15:46:44
End at: 2018-09-07 15:47:14
Local clock offset: 0.99 ms
Remote clock offset: -34.96 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.91 Mbit/s
95th percentile per-packet one-way delay: 59.350 ms
Loss rate: 29.60%
-- Flow 1:
Average throughput: 6.57 Mbit/s
95th percentile per-packet one-way delay: 59.317 ms
Loss rate: 30.10%
-- Flow 2:
Average throughput: 8.16 Mbit/s
95th percentile per-packet one-way delay: 59.367 ms
Loss rate: 26.96%
-- Flow 3:
Average throughput: 2.74 Mbit/s
95th percentile per-packet one-way delay: 59.382 ms
Loss rate: 39.60%
```
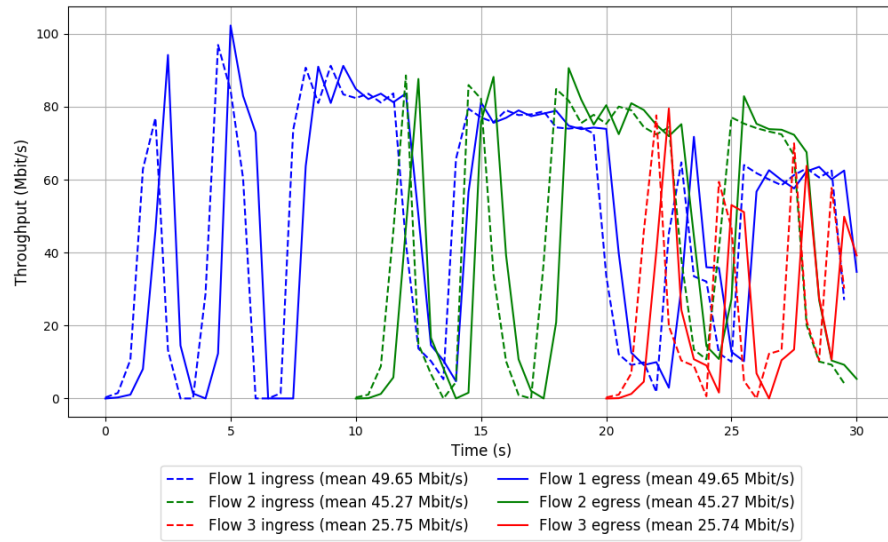
Run 4: Report of PCC-Expr — Data Link

```
Run 5: Statistics of PCC-Expr

Start at: 2018-09-07 16:13:00
End at: 2018-09-07 16:13:30
Local clock offset: 1.252 ms
Remote clock offset: -34.547 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.91 Mbit/s
95th percentile per-packet one-way delay: 59.519 ms
Loss rate: 29.08%
-- Flow 1:
Average throughput: 6.78 Mbit/s
95th percentile per-packet one-way delay: 59.439 ms
Loss rate: 32.83%
-- Flow 2:
Average throughput: 7.57 Mbit/s
95th percentile per-packet one-way delay: 59.562 ms
Loss rate: 23.43%
-- Flow 3:
Average throughput: 3.31 Mbit/s
95th percentile per-packet one-way delay: 59.599 ms
Loss rate: 28.53%
```
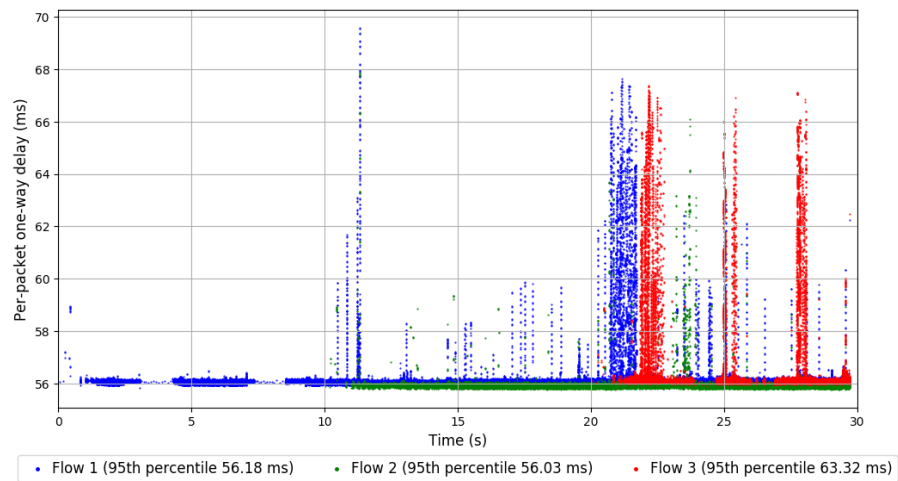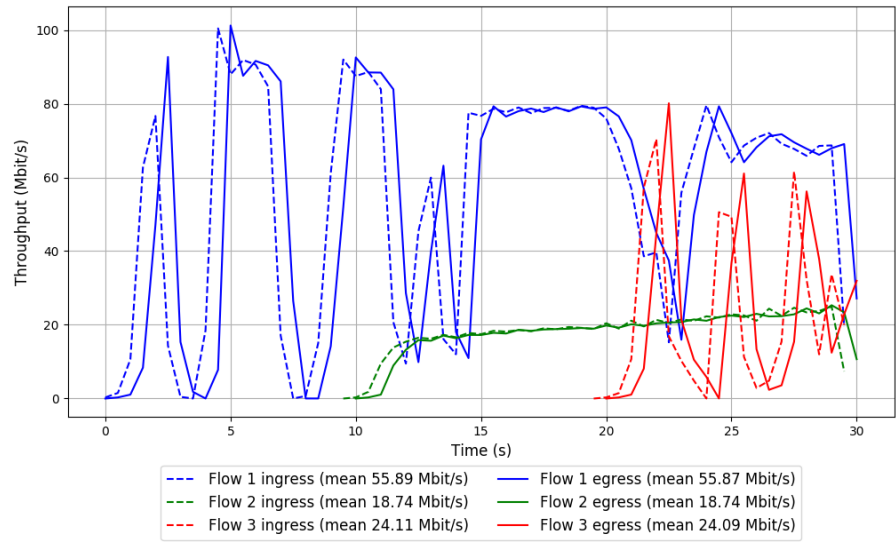
Run 5: Report of PCC-Expr — Data Link

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-09-07 14:37:21
End at: 2018-09-07 14:37:51
Local clock offset: 0.487 ms
Remote clock offset: -32.863 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 88.02 Mbit/s
95th percentile per-packet one-way delay: 65.034 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 49.65 Mbit/s
95th percentile per-packet one-way delay: 61.148 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 45.27 Mbit/s
95th percentile per-packet one-way delay: 66.803 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 25.74 Mbit/s
95th percentile per-packet one-way delay: 61.602 ms
Loss rate: 0.00%
```
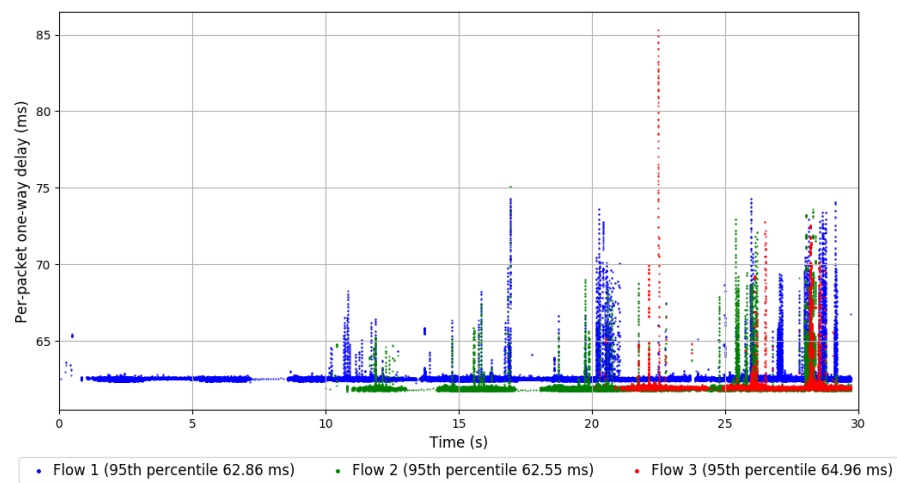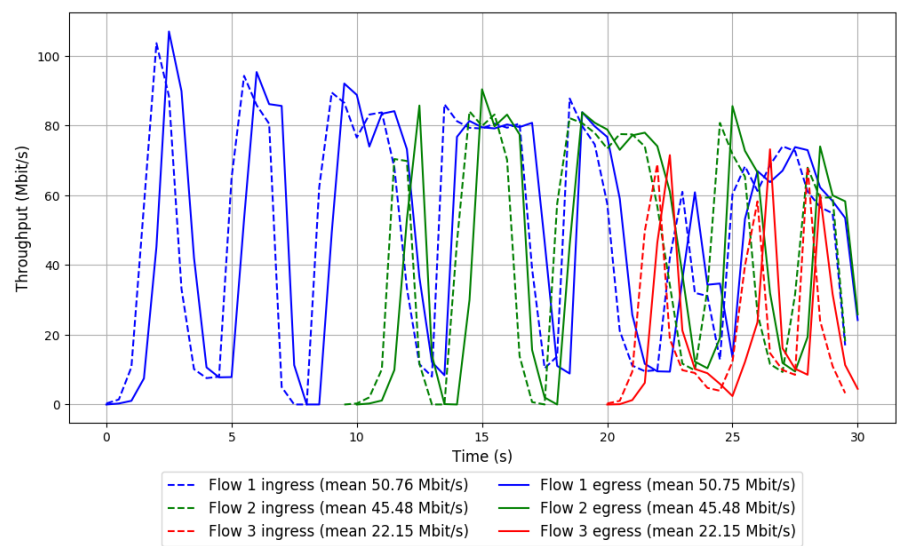
Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-09-07 15:03:14
End at: 2018-09-07 15:03:44
Local clock offset: -0.155 ms
Remote clock offset: -38.617 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 76.16 Mbit/s
95th percentile per-packet one-way delay: 56.746 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 55.87 Mbit/s
95th percentile per-packet one-way delay: 56.181 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 18.74 Mbit/s
95th percentile per-packet one-way delay: 56.032 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 24.09 Mbit/s
95th percentile per-packet one-way delay: 63.323 ms
Loss rate: 0.00%
```
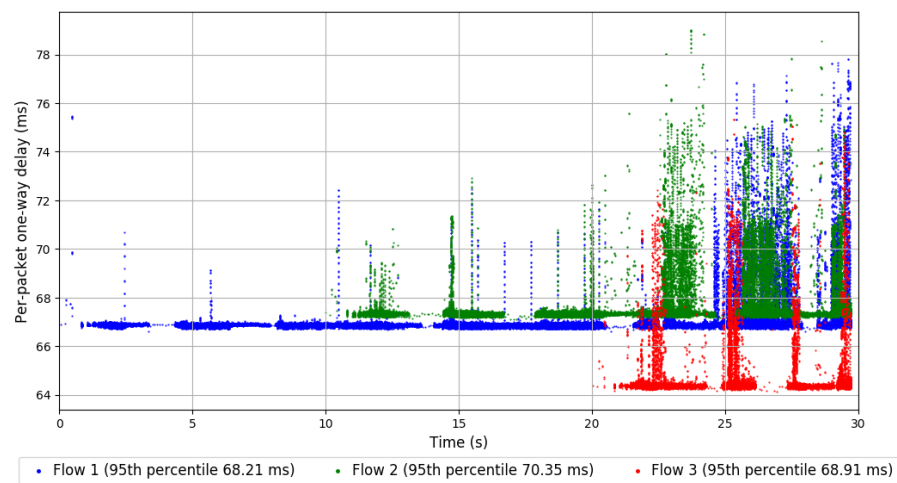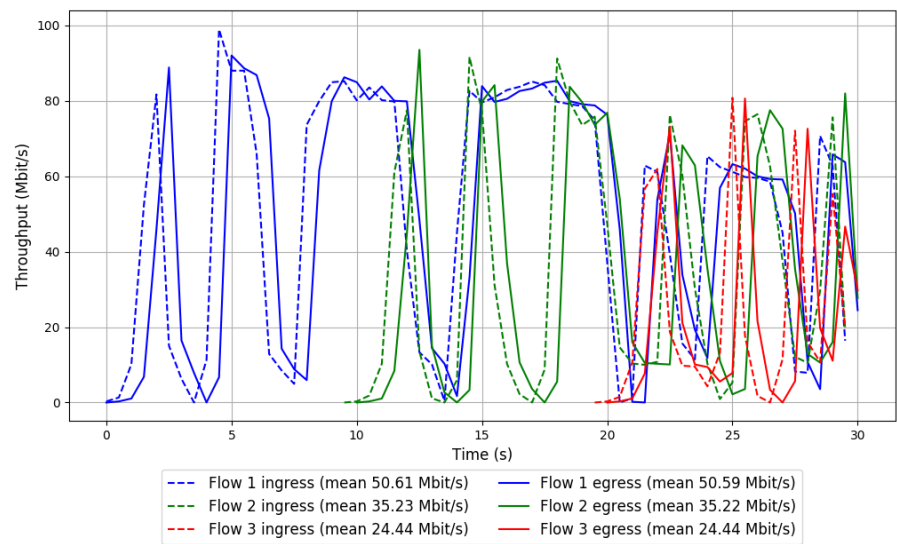
Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-09-07 15:29:07
End at: 2018-09-07 15:29:37
Local clock offset: 1.1 ms
Remote clock offset: -31.871 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 88.14 Mbit/s
95th percentile per-packet one-way delay: 62.885 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 50.75 Mbit/s
95th percentile per-packet one-way delay: 62.856 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 45.48 Mbit/s
95th percentile per-packet one-way delay: 62.546 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 22.15 Mbit/s
95th percentile per-packet one-way delay: 64.958 ms
Loss rate: 0.00%
```
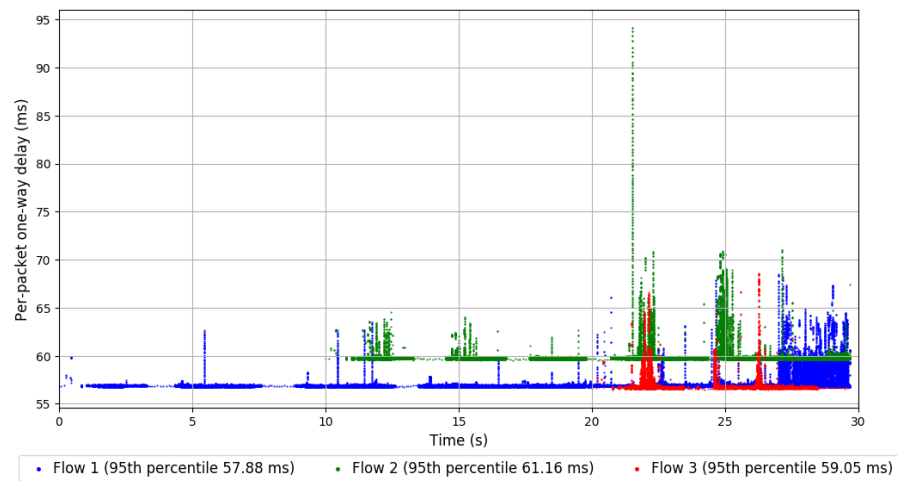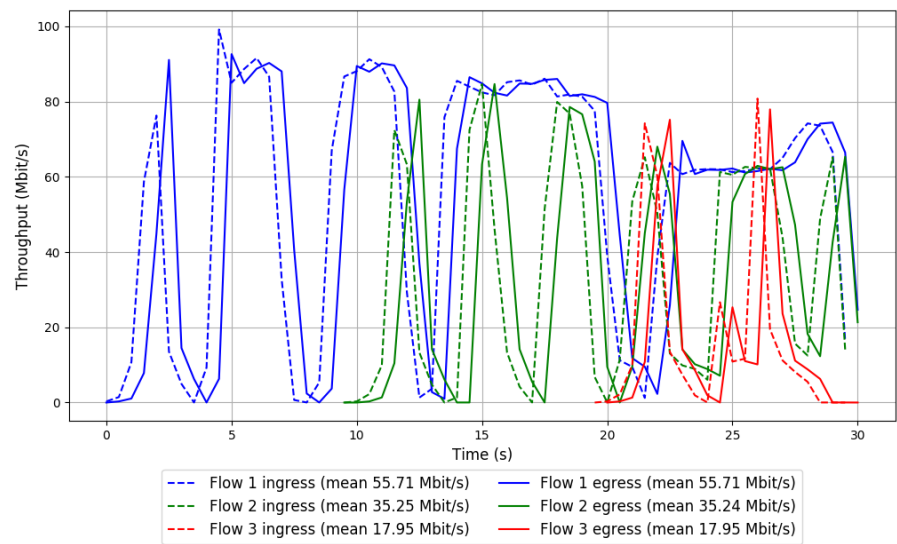
Run 3: Report of QUIC Cubic — Data Link

```
Run 4: Statistics of QUIC Cubic

Start at: 2018-09-07 15:55:02
End at: 2018-09-07 15:55:32
Local clock offset: 0.223 ms
Remote clock offset: -30.137 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 81.97 Mbit/s
95th percentile per-packet one-way delay: 69.340 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 50.59 Mbit/s
95th percentile per-packet one-way delay: 68.213 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 35.22 Mbit/s
95th percentile per-packet one-way delay: 70.348 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 24.44 Mbit/s
95th percentile per-packet one-way delay: 68.907 ms
Loss rate: 0.00%
```
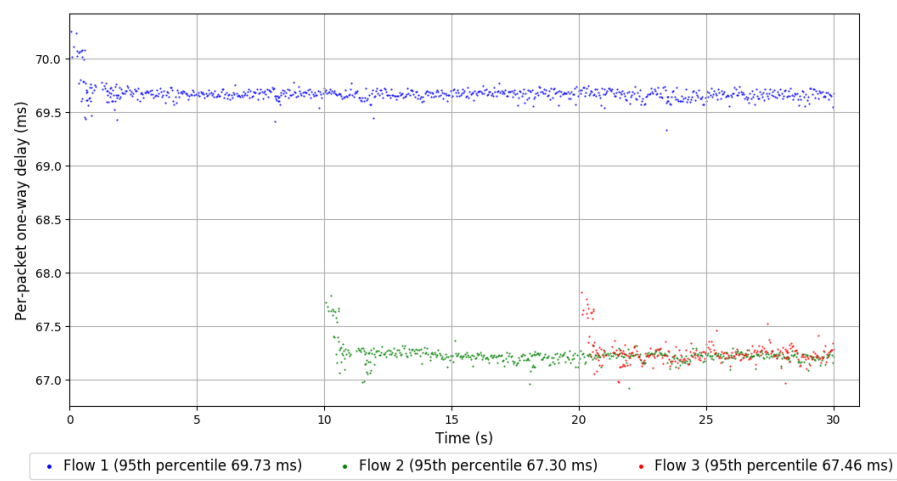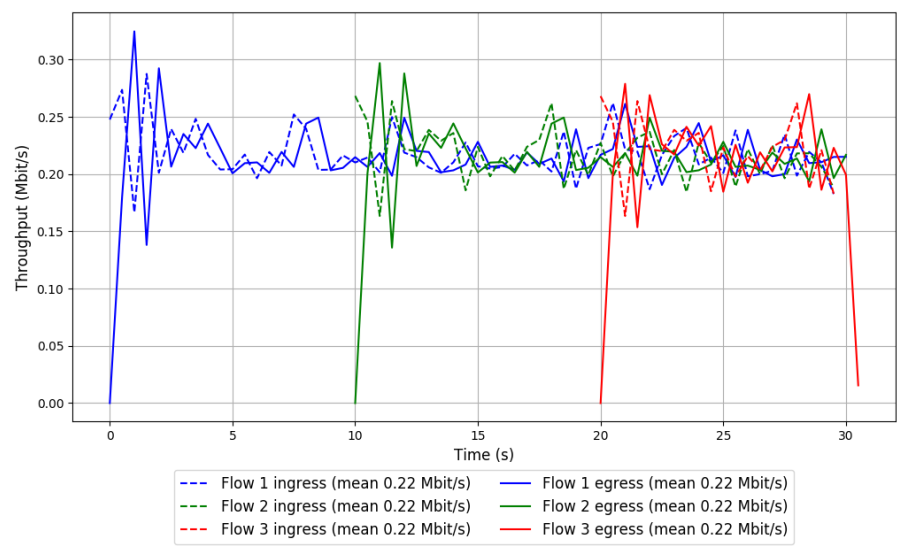
Run 4: Report of QUIC Cubic — Data Link

```
Run 5: Statistics of QUIC Cubic

Start at: 2018-09-07 16:21:38
End at: 2018-09-07 16:22:08
Local clock offset: 2.629 ms
Remote clock offset: -35.185 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 84.92 Mbit/s
95th percentile per-packet one-way delay: 59.846 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 55.71 Mbit/s
95th percentile per-packet one-way delay: 57.884 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 35.24 Mbit/s
95th percentile per-packet one-way delay: 61.155 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 17.95 Mbit/s
95th percentile per-packet one-way delay: 59.050 ms
Loss rate: 0.00%
```

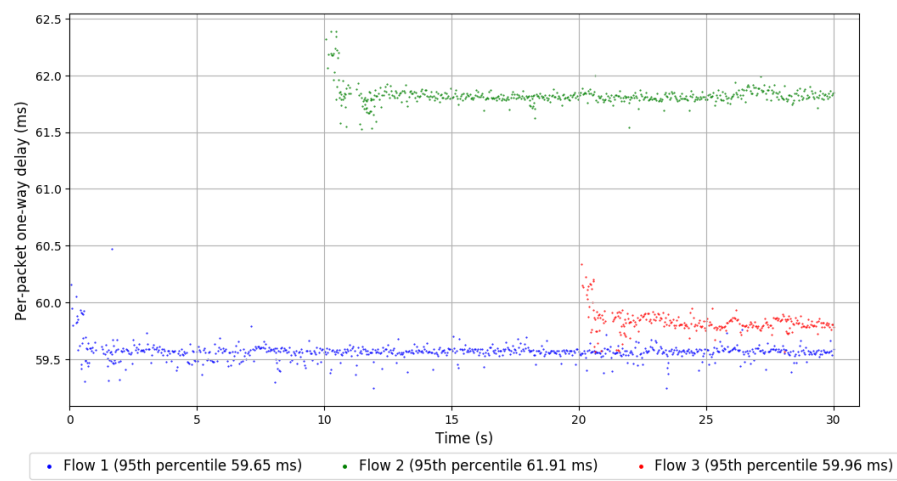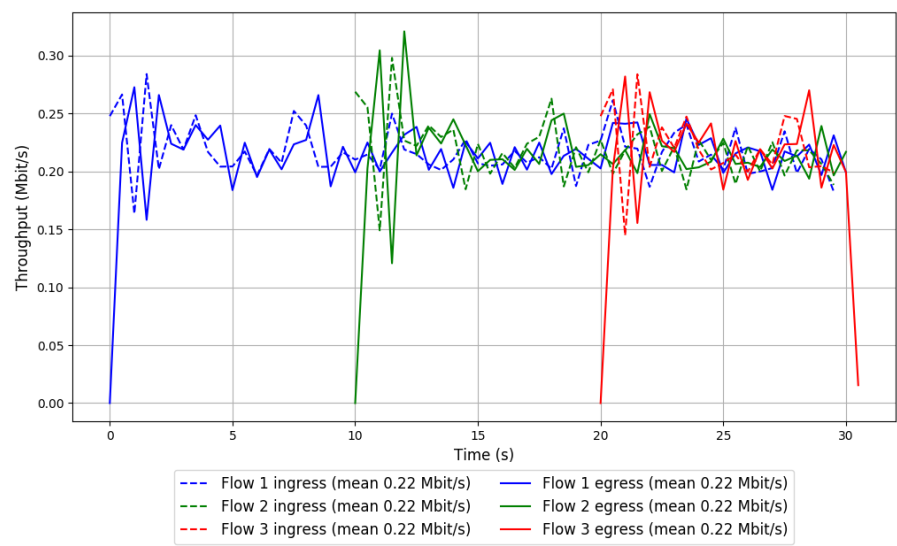Run 5: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2018-09-07 14:34:30
End at: 2018-09-07 14:35:00
Local clock offset: -1.727 ms
Remote clock offset: -29.173 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 69.715 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 69.731 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 67.301 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 67.458 ms
Loss rate: 0.00%
```
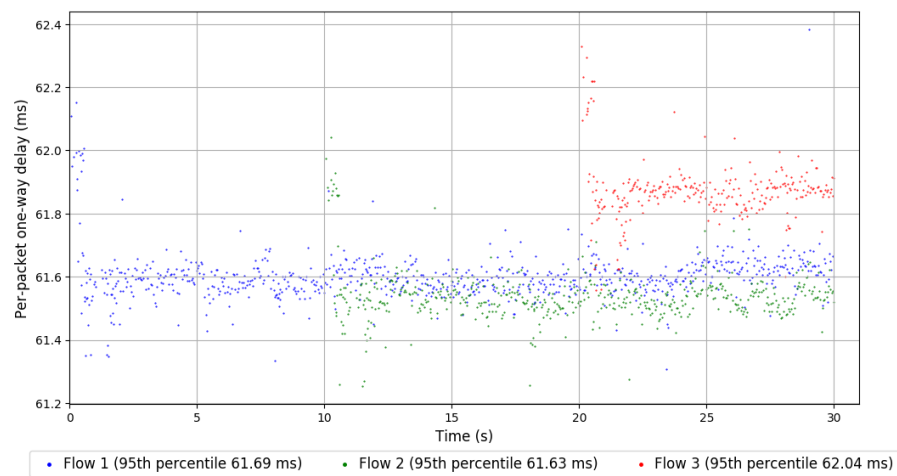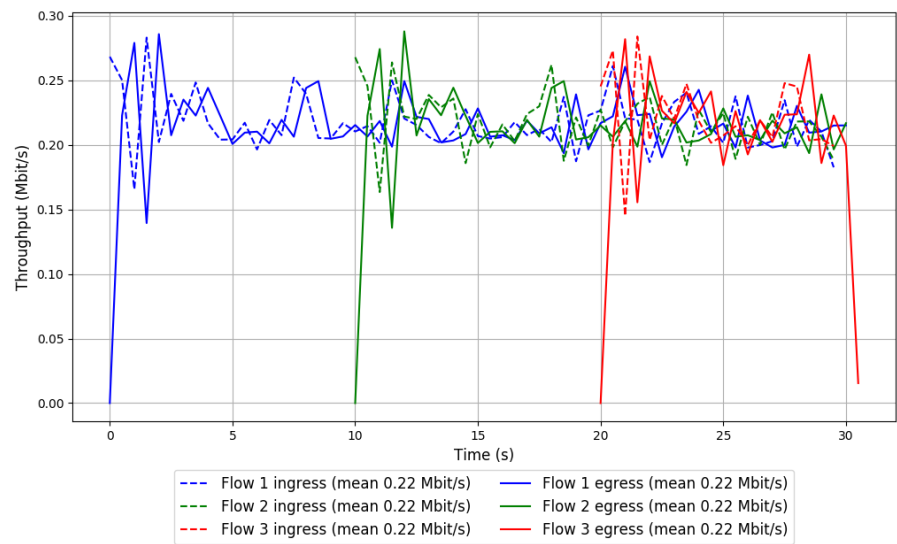
Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2018-09-07 15:00:22
End at: 2018-09-07 15:00:52
Local clock offset: -0.372 ms
Remote clock offset: -35.563 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 61.862 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 59.654 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 61.914 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 59.964 ms
Loss rate: 0.00%
```

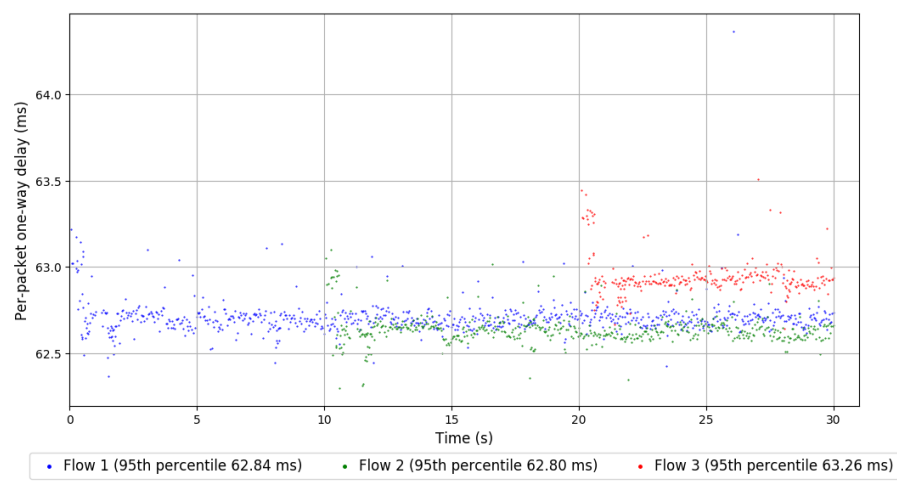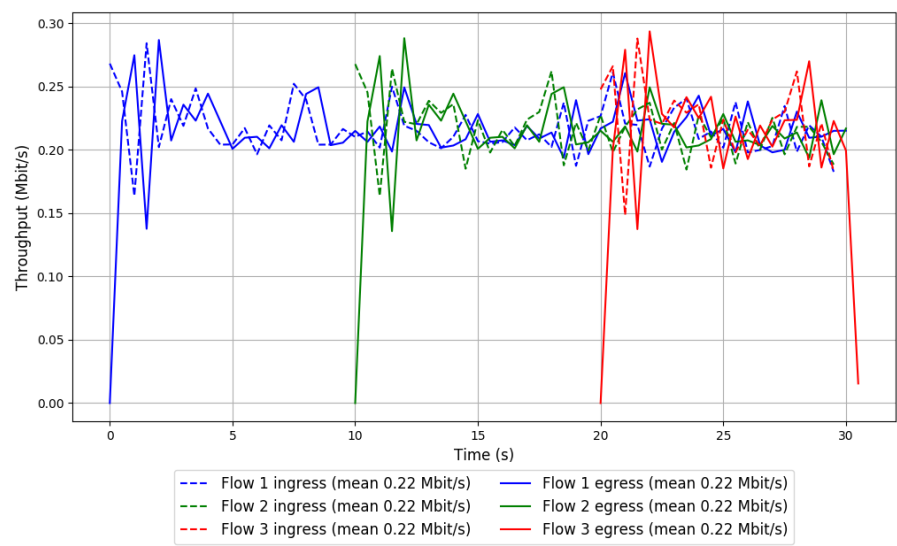# Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-09-07 15:26:17
End at: 2018-09-07 15:26:47
Local clock offset: -0.766 ms
Remote clock offset: -34.179 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 61.898 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 61.686 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 61.635 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.043 ms
Loss rate: 0.00%
```
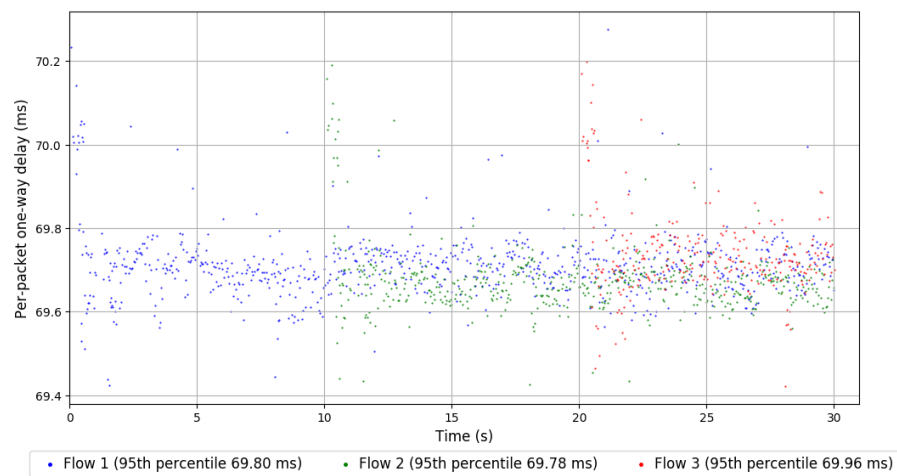
Run 3: Report of SCReAM — Data Link

```
Run 4: Statistics of SCReAM

Start at: 2018-09-07 15:52:10
End at: 2018-09-07 15:52:40
Local clock offset: 0.79 ms
Remote clock offset: -31.295 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 62.975 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.843 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 62.804 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 63.260 ms
Loss rate: 0.00%
```
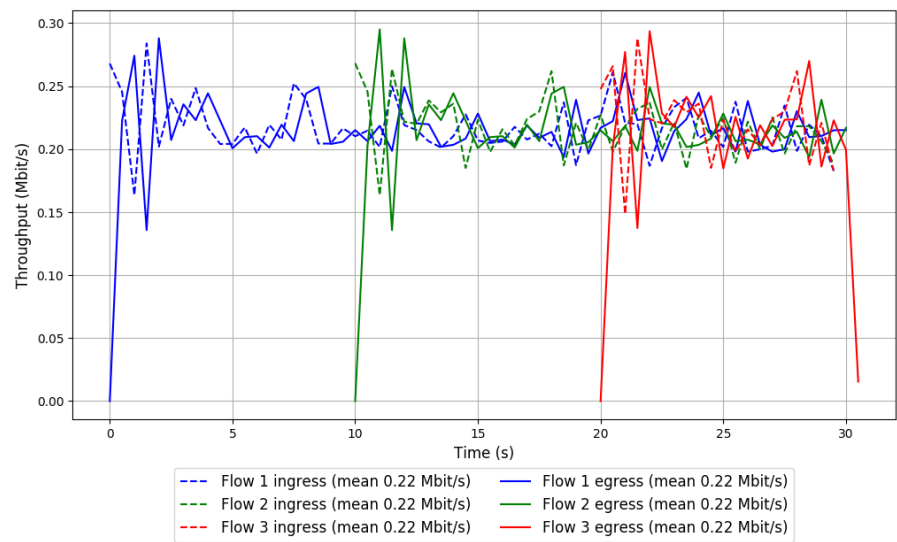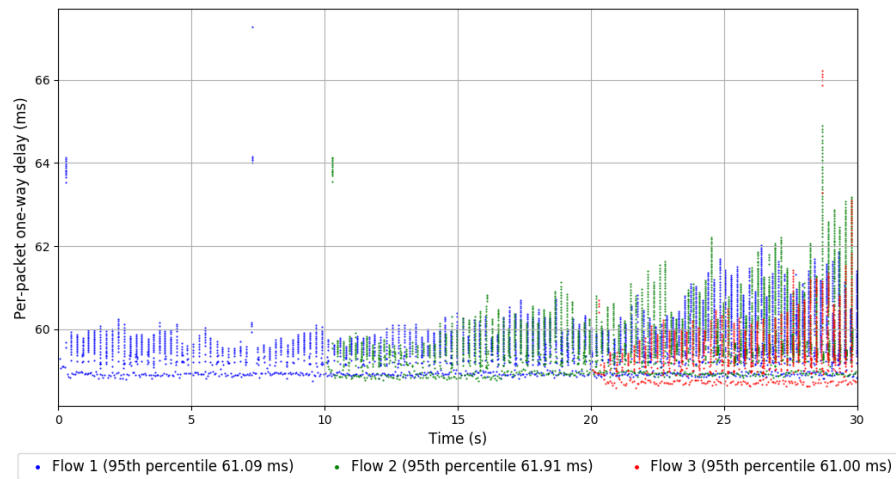
Run 4: Report of SCReAM — Data Link

```
Run 5: Statistics of SCReAM

Start at: 2018-09-07 16:18:26
End at: 2018-09-07 16:18:56
Local clock offset: -7.32 ms
Remote clock offset: -32.509 ms

# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 69.833 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 69.799 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 69.776 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 69.962 ms
Loss rate: 0.00%
```
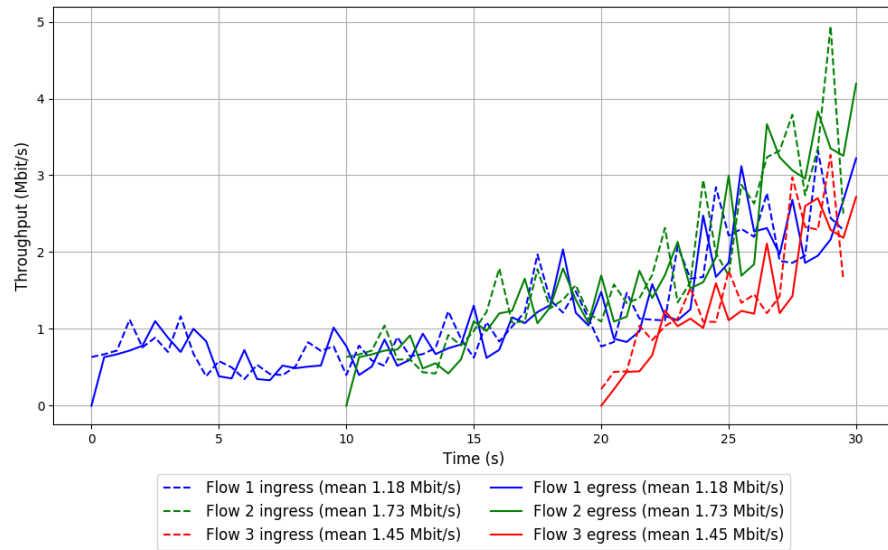
Run 5: Report of SCReAM — Data Link

```
Run 1: Statistics of Sprout

Start at: 2018-09-07 14:49:19
End at: 2018-09-07 14:49:49
Local clock offset: -0.389 ms
Remote clock offset: -35.927 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.81 Mbit/s
95th percentile per-packet one-way delay: 61.377 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 61.086 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.73 Mbit/s
95th percentile per-packet one-way delay: 61.915 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 60.996 ms
Loss rate: 0.00%
```
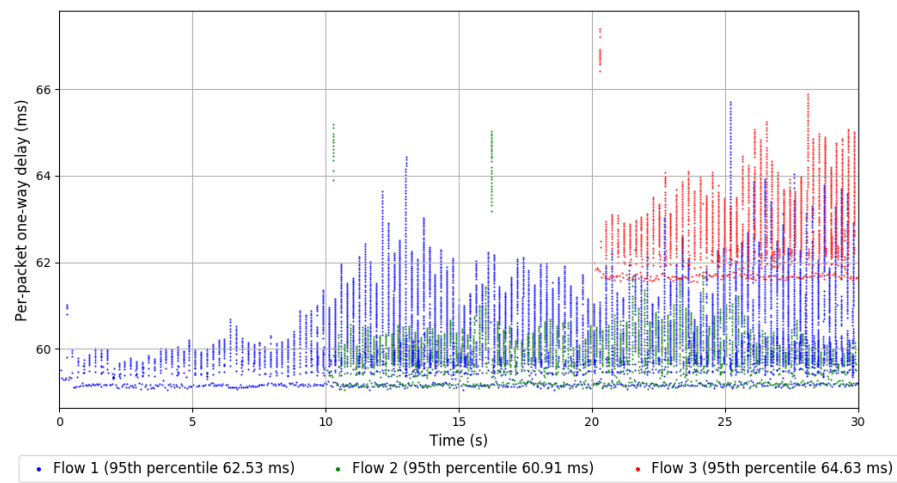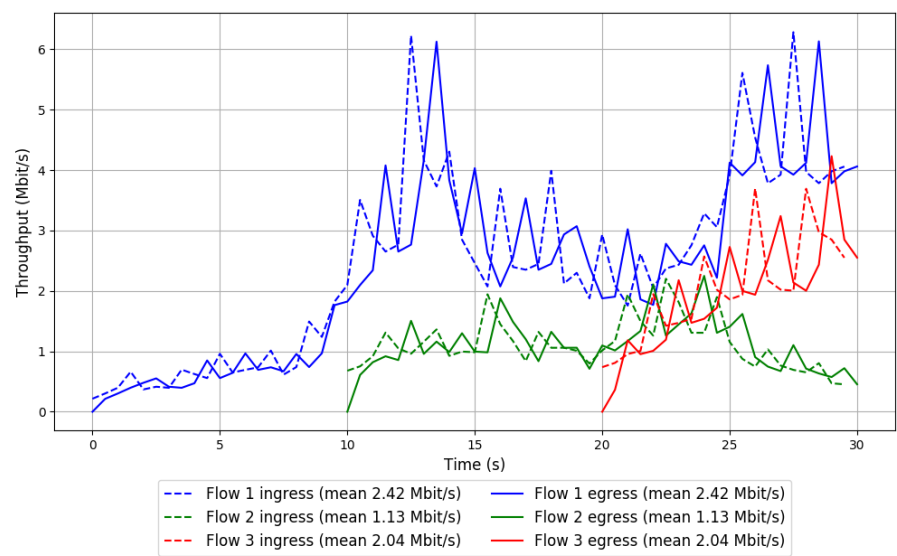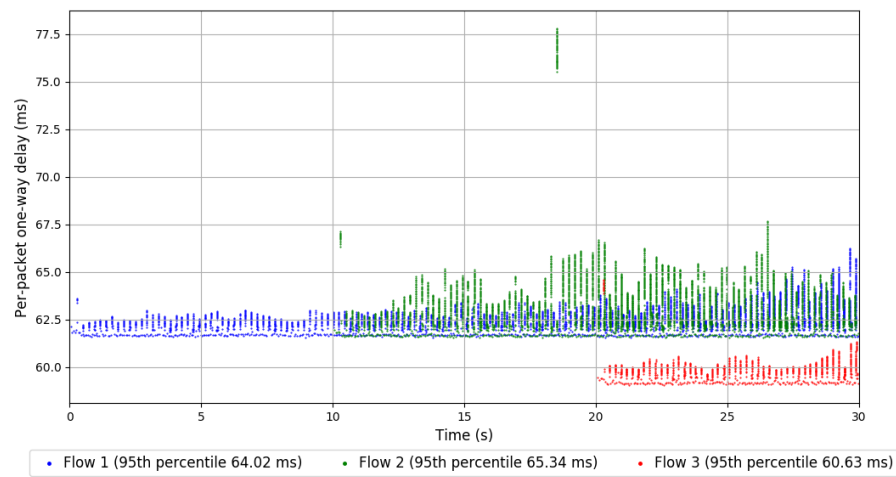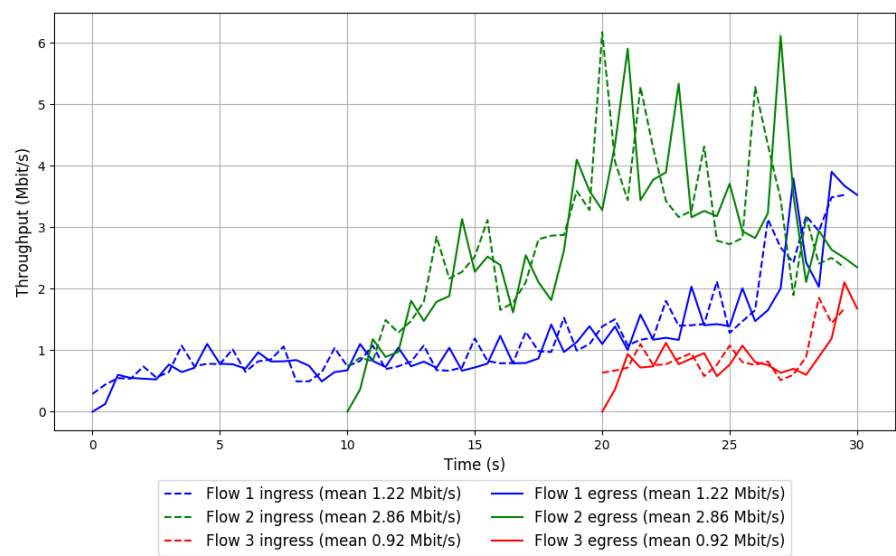
Run 1: Report of Sprout — Data Link

- - - Flow 1 ingress (mean 1.18 Mbit/s) ——— Flow 1 egress (mean 1.18 Mbit/s)
- - - Flow 2 ingress (mean 1.73 Mbit/s) ——— Flow 2 egress (mean 1.73 Mbit/s)
- - - Flow 3 ingress (mean 1.45 Mbit/s) ——— Flow 3 egress (mean 1.45 Mbit/s)

• Flow 1 (95th percentile 61.09 ms)   • Flow 2 (95th percentile 61.91 ms)   • Flow 3 (95th percentile 61.00 ms)

126

```
Run 2: Statistics of Sprout

Start at: 2018-09-07 15:15:09
End at: 2018-09-07 15:15:39
Local clock offset: -0.09 ms
Remote clock offset: -35.081 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.84 Mbit/s
95th percentile per-packet one-way delay: 63.596 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.42 Mbit/s
95th percentile per-packet one-way delay: 62.528 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 60.906 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 64.633 ms
Loss rate: 0.00%
```
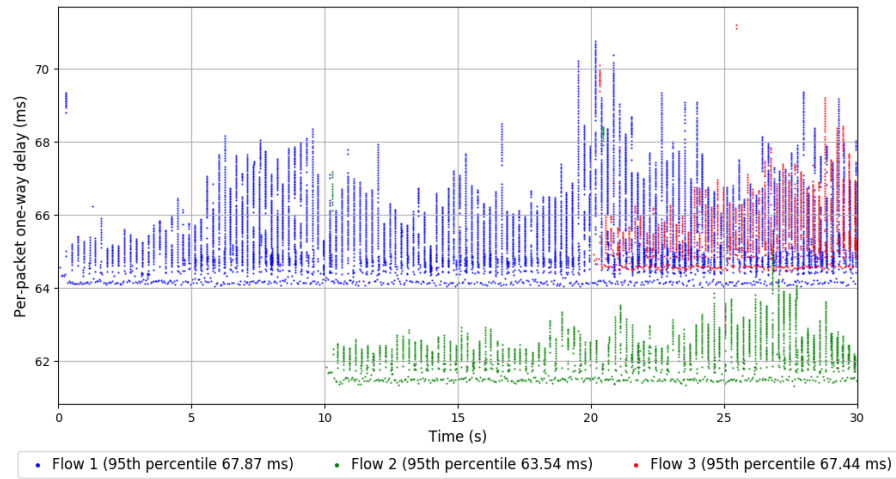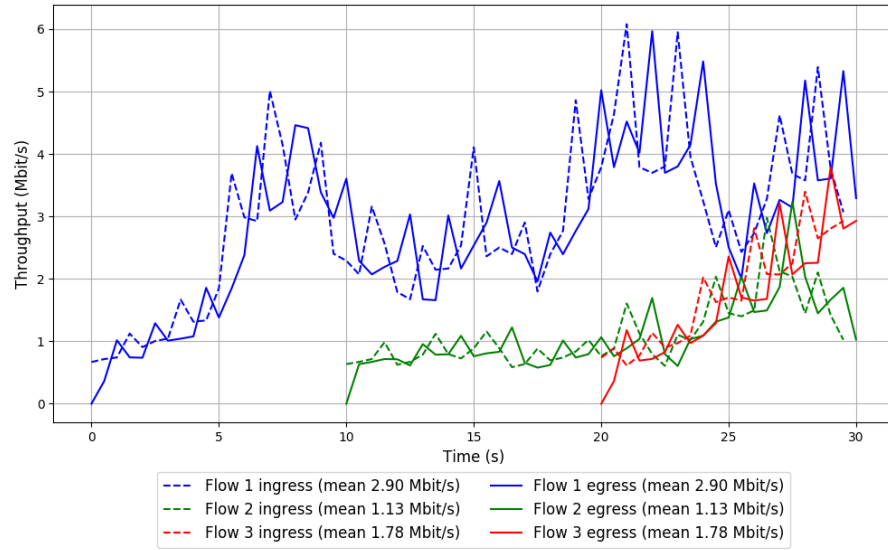
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-09-07 15:41:05
End at: 2018-09-07 15:41:35
Local clock offset: 0.848 ms
Remote clock offset: -34.939 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.42 Mbit/s
95th percentile per-packet one-way delay: 64.958 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.22 Mbit/s
95th percentile per-packet one-way delay: 64.018 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.86 Mbit/s
95th percentile per-packet one-way delay: 65.344 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 60.628 ms
Loss rate: 0.00%
```
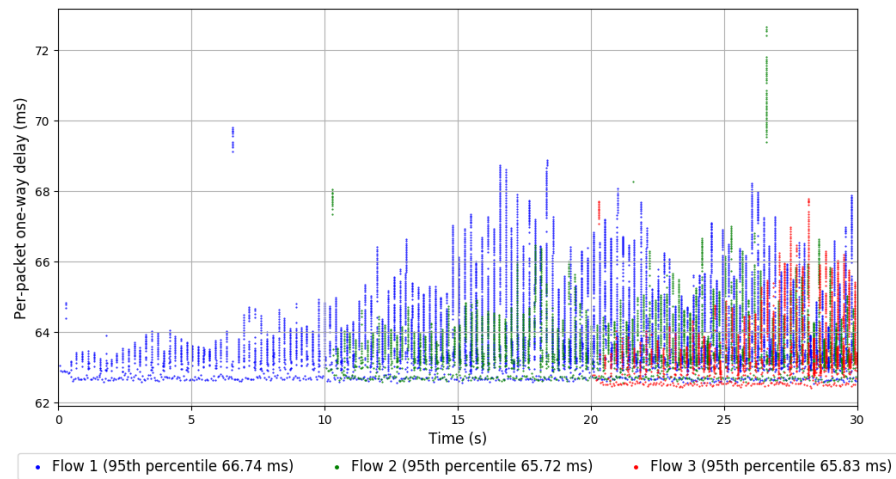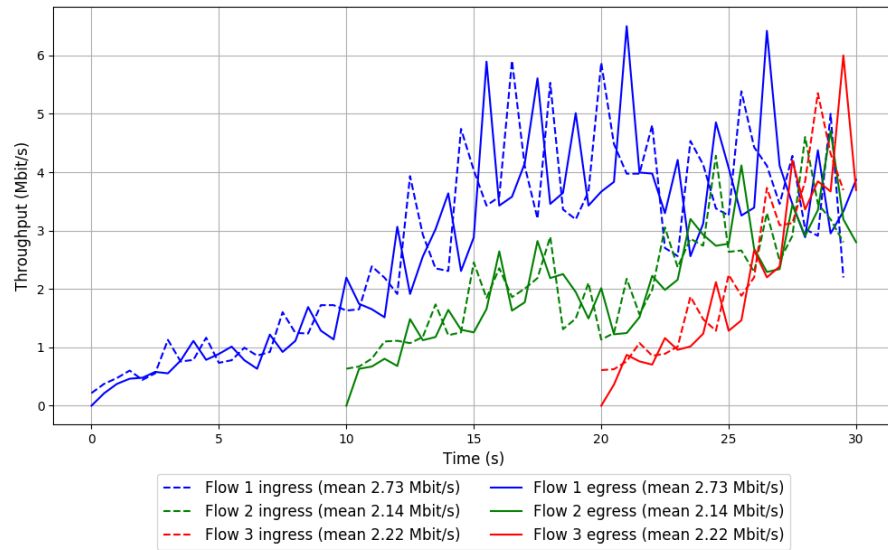
Run 3: Report of Sprout — Data Link

```
Run 4: Statistics of Sprout

Start at: 2018-09-07 16:07:21
End at: 2018-09-07 16:07:51
Local clock offset: 1.904 ms
Remote clock offset: -31.065 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.24 Mbit/s
95th percentile per-packet one-way delay: 67.680 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.90 Mbit/s
95th percentile per-packet one-way delay: 67.874 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 63.537 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 67.444 ms
Loss rate: 0.00%
```
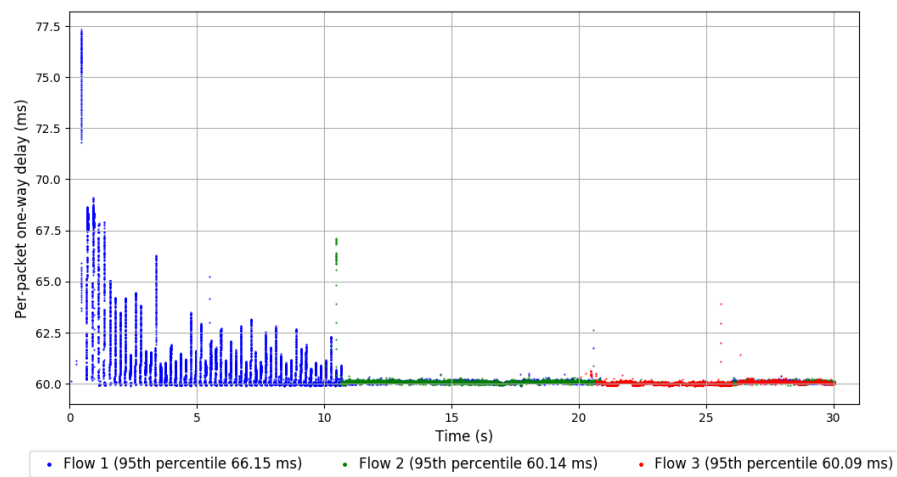
Run 4: Report of Sprout — Data Link

```
Run 5: Statistics of Sprout

Start at: 2018-09-07 16:39:24
End at: 2018-09-07 16:39:54
Local clock offset: -0.68 ms
Remote clock offset: -32.227 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.88 Mbit/s
95th percentile per-packet one-way delay: 66.438 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.73 Mbit/s
95th percentile per-packet one-way delay: 66.738 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.14 Mbit/s
95th percentile per-packet one-way delay: 65.717 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 65.833 ms
Loss rate: 0.00%
```
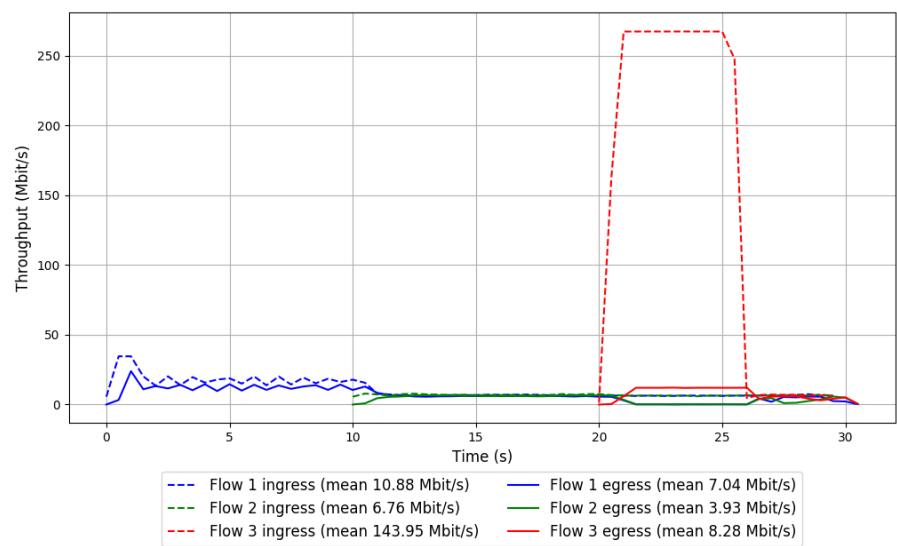
Run 5: Report of Sprout — Data Link

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

Start at: 2018-09-07 14:31:42
End at: 2018-09-07 14:32:12
Local clock offset: -0.65 ms
Remote clock offset: -35.453 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.40 Mbit/s
95th percentile per-packet one-way delay: 63.448 ms
Loss rate: 80.38%
-- Flow 1:
Average throughput: 7.04 Mbit/s
95th percentile per-packet one-way delay: 66.154 ms
Loss rate: 35.33%
-- Flow 2:
Average throughput: 3.93 Mbit/s
95th percentile per-packet one-way delay: 60.142 ms
Loss rate: 41.90%
-- Flow 3:
Average throughput: 8.28 Mbit/s
95th percentile per-packet one-way delay: 60.091 ms
Loss rate: 94.25%
```

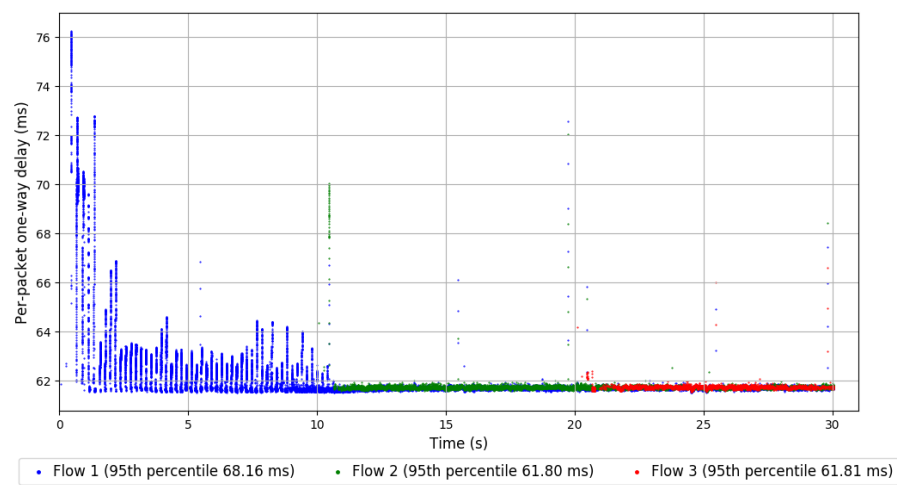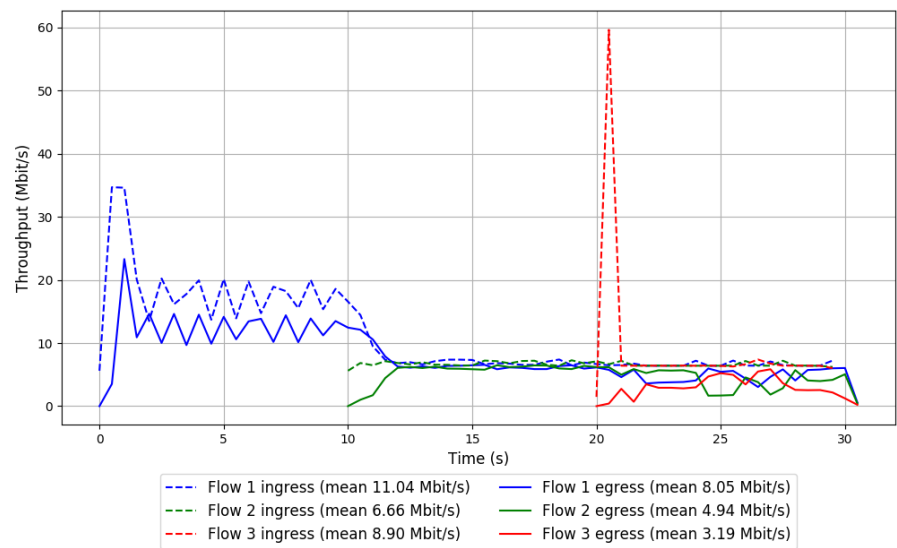Run 1: Report of TaoVA-100x — Data Link

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

Start at: 2018-09-07 14:57:35
End at: 2018-09-07 14:58:05
Local clock offset: -0.015 ms
Remote clock offset: -33.021 ms

# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.40 Mbit/s
95th percentile per-packet one-way delay: 64.620 ms
Loss rate: 32.73%
-- Flow 1:
Average throughput: 8.05 Mbit/s
95th percentile per-packet one-way delay: 68.161 ms
Loss rate: 27.07%
-- Flow 2:
Average throughput: 4.94 Mbit/s
95th percentile per-packet one-way delay: 61.804 ms
Loss rate: 25.80%
-- Flow 3:
Average throughput: 3.19 Mbit/s
95th percentile per-packet one-way delay: 61.810 ms
Loss rate: 64.22%
```

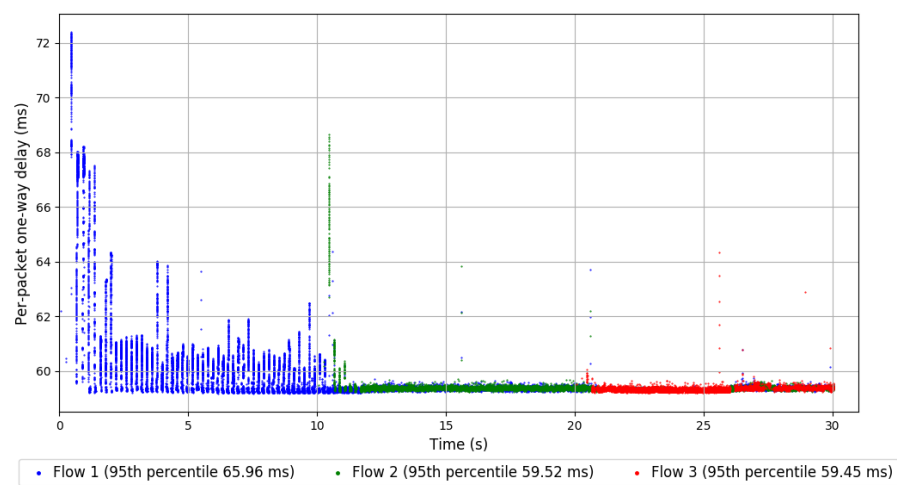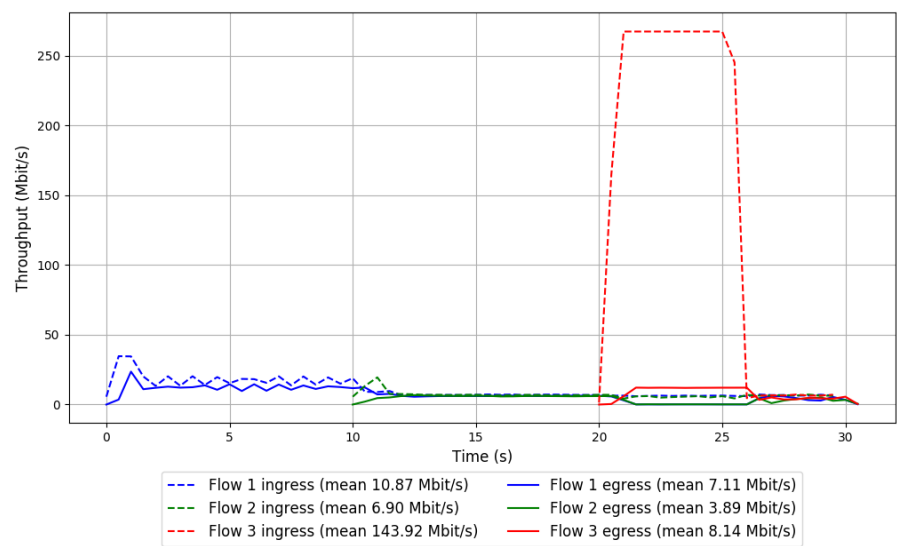Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2018-09-07 15:23:29
End at: 2018-09-07 15:23:59
Local clock offset: 0.671 ms
Remote clock offset: -34.961 ms

# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.40 Mbit/s
95th percentile per-packet one-way delay: 62.660 ms
Loss rate: 80.41%
-- Flow 1:
Average throughput: 7.11 Mbit/s
95th percentile per-packet one-way delay: 65.957 ms
Loss rate: 34.64%
-- Flow 2:
Average throughput: 3.89 Mbit/s
95th percentile per-packet one-way delay: 59.525 ms
Loss rate: 43.64%
-- Flow 3:
Average throughput: 8.14 Mbit/s
95th percentile per-packet one-way delay: 59.448 ms
Loss rate: 94.35%
```

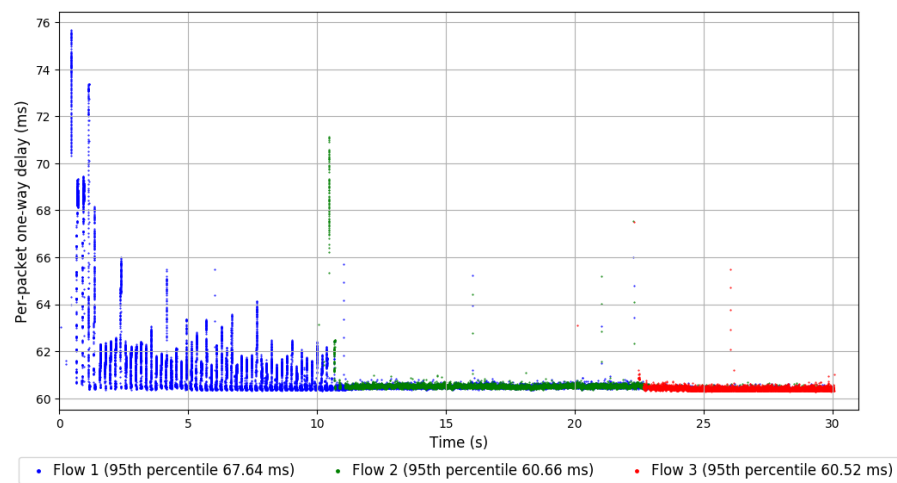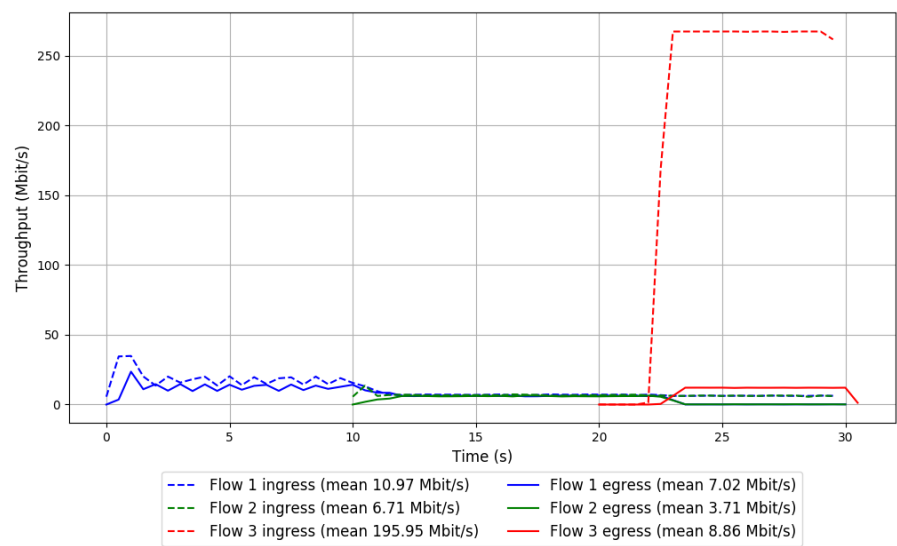Run 3: Report of TaoVA-100x — Data Link

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

Start at: 2018-09-07 15:49:24
End at: 2018-09-07 15:49:54
Local clock offset: -1.234 ms
Remote clock offset: -35.636 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.40 Mbit/s
95th percentile per-packet one-way delay: 63.452 ms
Loss rate: 84.61%
-- Flow 1:
Average throughput: 7.02 Mbit/s
95th percentile per-packet one-way delay: 67.643 ms
Loss rate: 36.20%
-- Flow 2:
Average throughput: 3.71 Mbit/s
95th percentile per-packet one-way delay: 60.660 ms
Loss rate: 44.95%
-- Flow 3:
Average throughput: 8.86 Mbit/s
95th percentile per-packet one-way delay: 60.517 ms
Loss rate: 95.48%
```

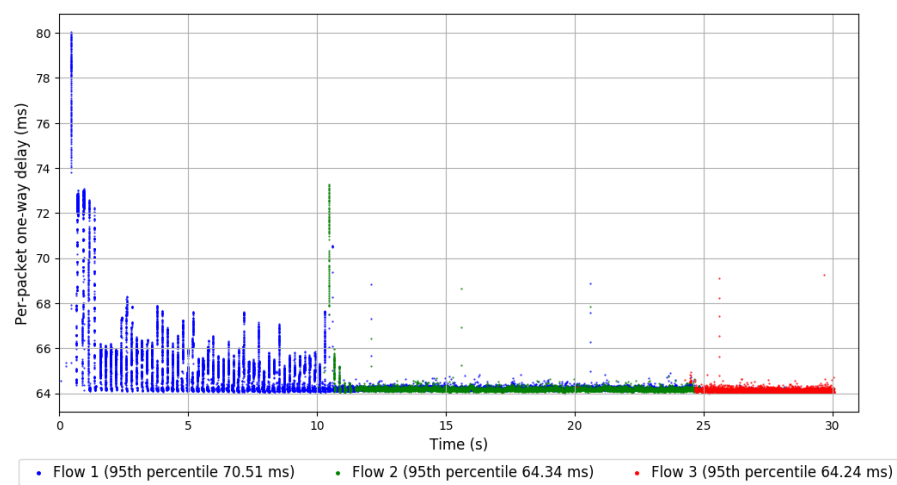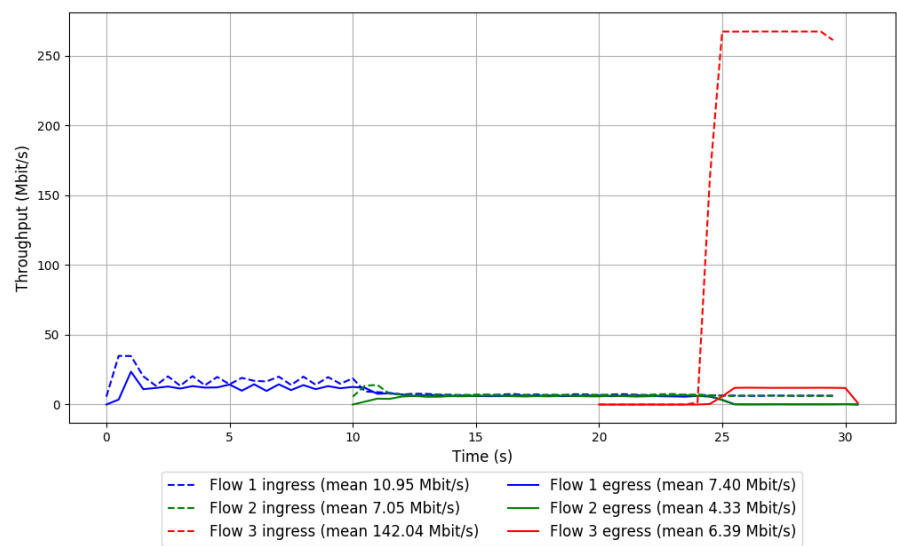Run 4: Report of TaoVA-100x — Data Link

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

Start at: 2018-09-07 16:15:40
End at: 2018-09-07 16:16:10
Local clock offset: 0.644 ms
Remote clock offset: -30.307 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.40 Mbit/s
95th percentile per-packet one-way delay: 67.224 ms
Loss rate: 80.27%
-- Flow 1:
Average throughput: 7.40 Mbit/s
95th percentile per-packet one-way delay: 70.513 ms
Loss rate: 32.46%
-- Flow 2:
Average throughput: 4.33 Mbit/s
95th percentile per-packet one-way delay: 64.343 ms
Loss rate: 38.60%
-- Flow 3:
Average throughput: 6.39 Mbit/s
95th percentile per-packet one-way delay: 64.236 ms
Loss rate: 95.50%
```

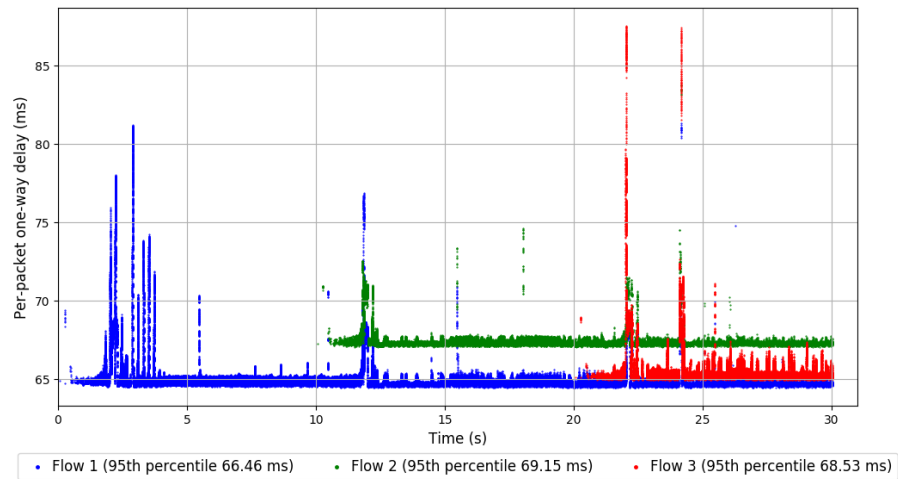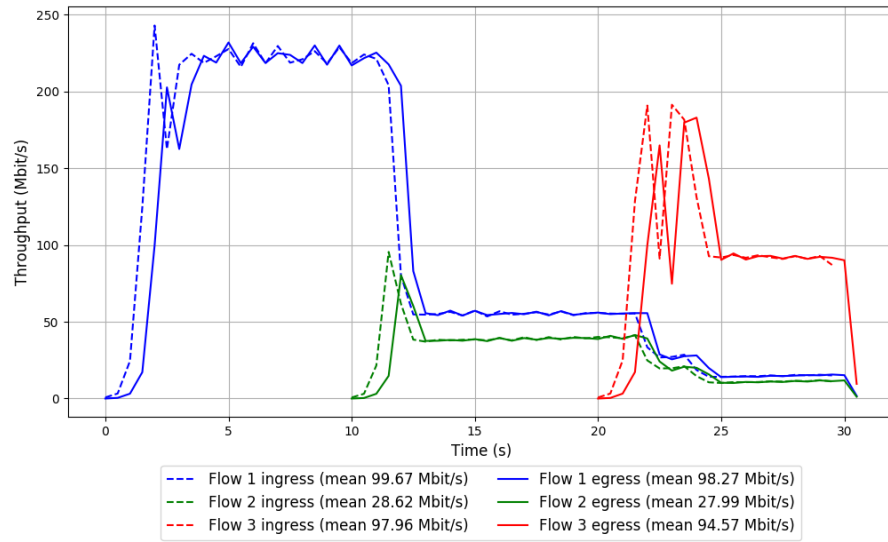Run 5: Report of TaoVA-100x — Data Link

```
Run 1: Statistics of TCP Vegas

Start at: 2018-09-07 14:33:03
End at: 2018-09-07 14:33:33
Local clock offset: -1.898 ms
Remote clock offset: -31.619 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 148.37 Mbit/s
95th percentile per-packet one-way delay: 67.726 ms
Loss rate: 1.95%
-- Flow 1:
Average throughput: 98.27 Mbit/s
95th percentile per-packet one-way delay: 66.459 ms
Loss rate: 1.41%
-- Flow 2:
Average throughput: 27.99 Mbit/s
95th percentile per-packet one-way delay: 69.152 ms
Loss rate: 2.20%
-- Flow 3:
Average throughput: 94.57 Mbit/s
95th percentile per-packet one-way delay: 68.533 ms
Loss rate: 3.46%
```

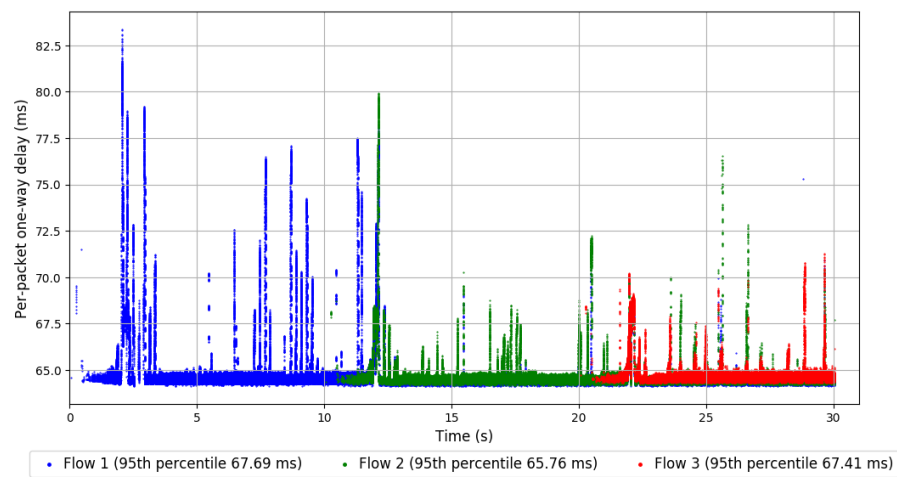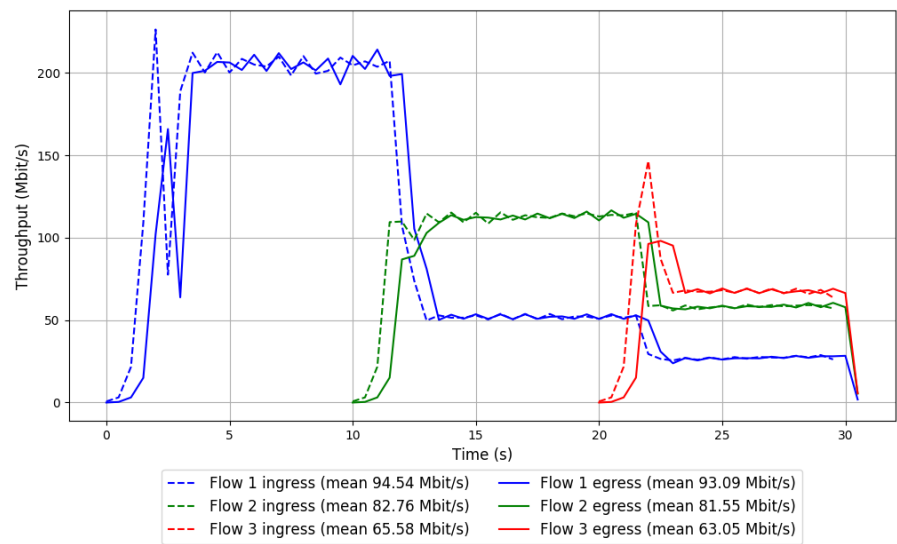Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-09-07 14:58:55
End at: 2018-09-07 14:59:25
Local clock offset: 1.9 ms
Remote clock offset: -30.656 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 168.42 Mbit/s
95th percentile per-packet one-way delay: 67.253 ms
Loss rate: 1.81%
-- Flow 1:
Average throughput: 93.09 Mbit/s
95th percentile per-packet one-way delay: 67.685 ms
Loss rate: 1.54%
-- Flow 2:
Average throughput: 81.55 Mbit/s
95th percentile per-packet one-way delay: 65.760 ms
Loss rate: 1.47%
-- Flow 3:
Average throughput: 63.05 Mbit/s
95th percentile per-packet one-way delay: 67.414 ms
Loss rate: 3.85%
```

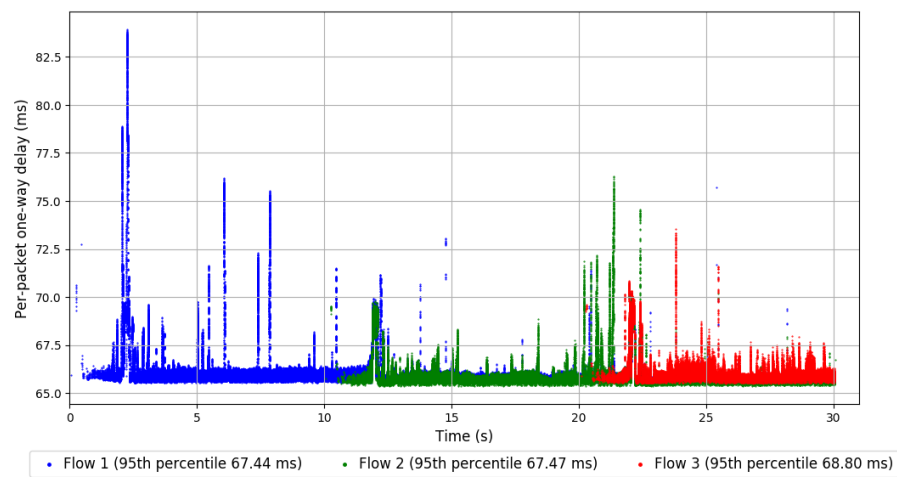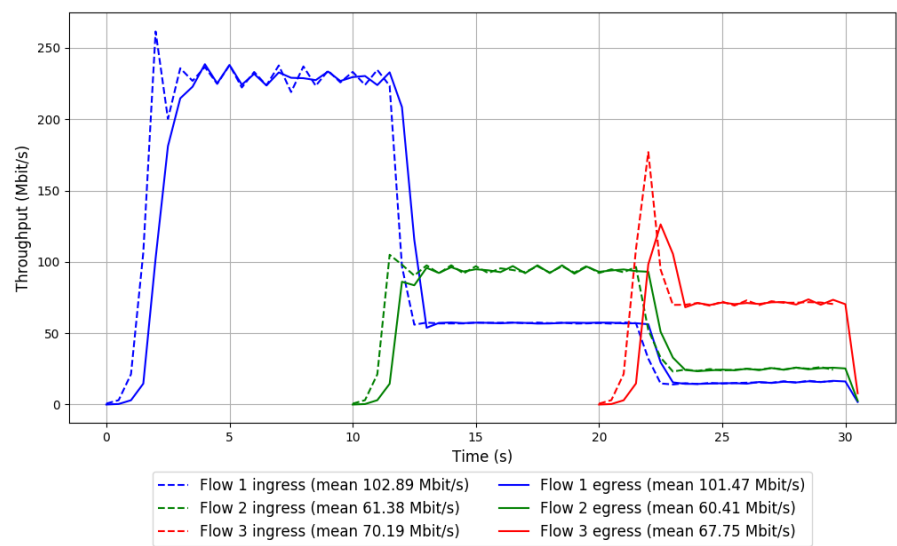Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-09-07 15:24:50
End at: 2018-09-07 15:25:20
Local clock offset: 0.263 ms
Remote clock offset: -31.441 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 164.22 Mbit/s
95th percentile per-packet one-way delay: 67.646 ms
Loss rate: 1.73%
-- Flow 1:
Average throughput: 101.47 Mbit/s
95th percentile per-packet one-way delay: 67.445 ms
Loss rate: 1.39%
-- Flow 2:
Average throughput: 60.41 Mbit/s
95th percentile per-packet one-way delay: 67.471 ms
Loss rate: 1.58%
-- Flow 3:
Average throughput: 67.75 Mbit/s
95th percentile per-packet one-way delay: 68.800 ms
Loss rate: 3.51%
```

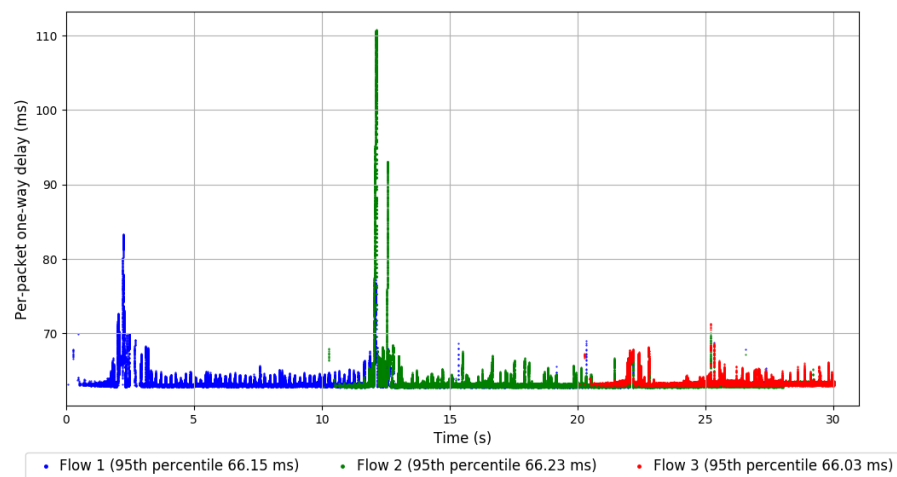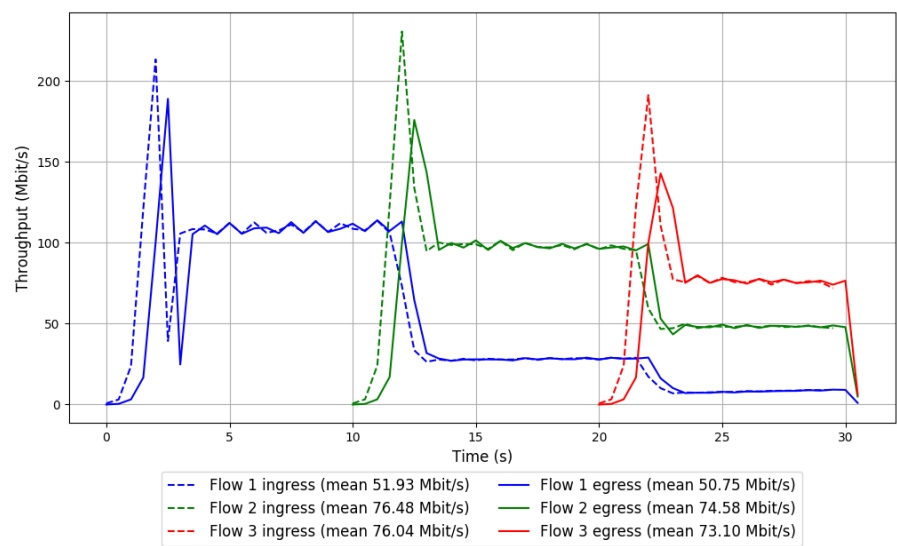Run 3: Report of TCP Vegas — Data Link

```
Run 4: Statistics of TCP Vegas

Start at: 2018-09-07 15:50:45
End at: 2018-09-07 15:51:15
Local clock offset: 0.345 ms
Remote clock offset: -31.331 ms


# Below is generated by plot.py at 2018-09-07 17:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 124.78 Mbit/s
95th percentile per-packet one-way delay: 66.177 ms
Loss rate: 2.66%
-- Flow 1:
Average throughput: 50.75 Mbit/s
95th percentile per-packet one-way delay: 66.152 ms
Loss rate: 2.26%
-- Flow 2:
Average throughput: 74.58 Mbit/s
95th percentile per-packet one-way delay: 66.234 ms
Loss rate: 2.48%
-- Flow 3:
Average throughput: 73.10 Mbit/s
95th percentile per-packet one-way delay: 66.033 ms
Loss rate: 3.86%
```

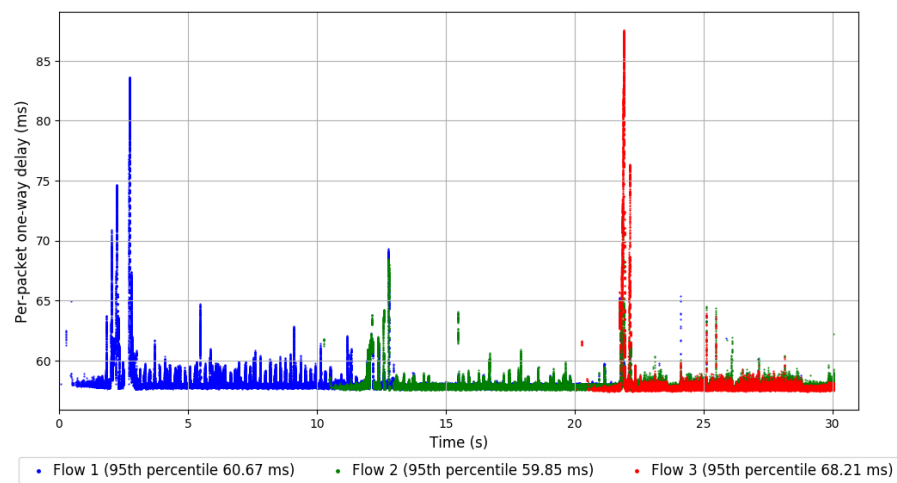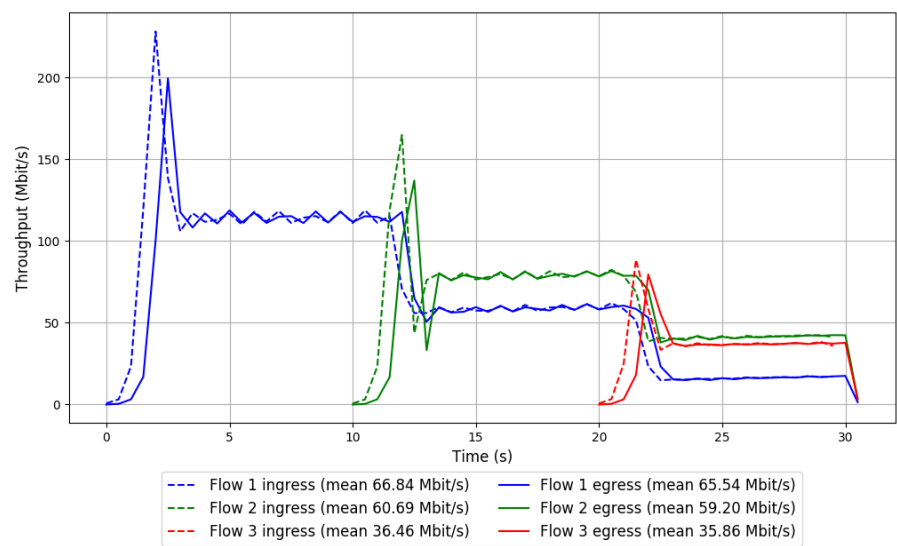# Run 4: Report of TCP Vegas — Data Link

```
Run 5: Statistics of TCP Vegas

Start at: 2018-09-07 16:17:01
End at: 2018-09-07 16:17:31
Local clock offset: 2.698 ms
Remote clock offset: -34.434 ms


# Below is generated by plot.py at 2018-09-07 17:08:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 116.89 Mbit/s
95th percentile per-packet one-way delay: 60.704 ms
Loss rate: 2.08%
-- Flow 1:
Average throughput: 65.54 Mbit/s
95th percentile per-packet one-way delay: 60.666 ms
Loss rate: 1.95%
-- Flow 2:
Average throughput: 59.20 Mbit/s
95th percentile per-packet one-way delay: 59.852 ms
Loss rate: 2.44%
-- Flow 3:
Average throughput: 35.86 Mbit/s
95th percentile per-packet one-way delay: 68.210 ms
Loss rate: 1.66%
```
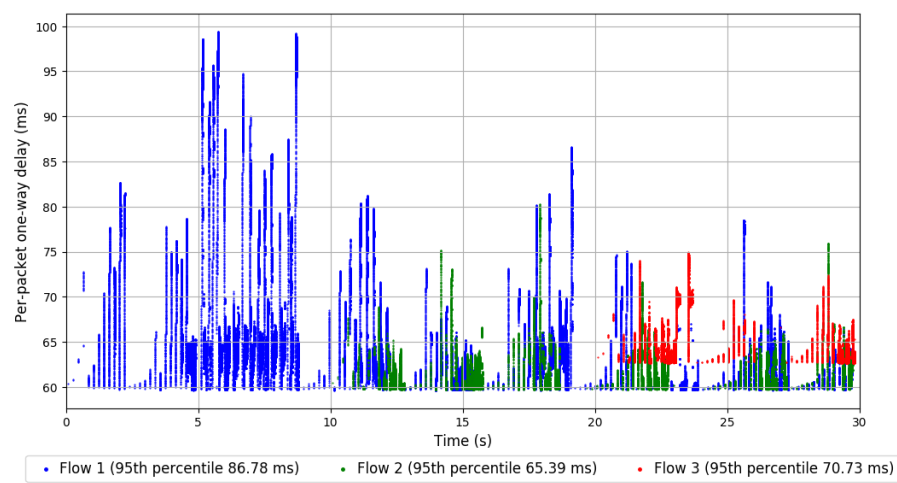
Run 5: Report of TCP Vegas — Data Link

- - - Flow 1 ingress (mean 66.84 Mbit/s) —— Flow 1 egress (mean 65.54 Mbit/s)
- - - Flow 2 ingress (mean 60.69 Mbit/s) —— Flow 2 egress (mean 59.20 Mbit/s)
- - - Flow 3 ingress (mean 36.46 Mbit/s) —— Flow 3 egress (mean 35.86 Mbit/s)

- Flow 1 (95th percentile 60.67 ms)   - Flow 2 (95th percentile 59.85 ms)   - Flow 3 (95th percentile 68.21 ms)
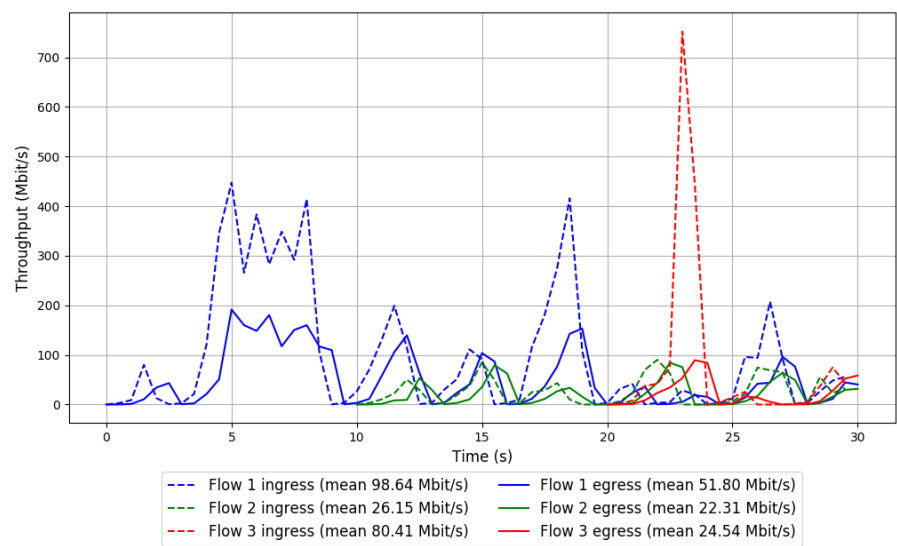
```
Run 1: Statistics of Verus

Start at: 2018-09-07 14:38:44
End at: 2018-09-07 14:39:14
Local clock offset: -0.284 ms
Remote clock offset: -34.963 ms

# Below is generated by plot.py at 2018-09-07 17:08:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 74.44 Mbit/s
95th percentile per-packet one-way delay: 82.389 ms
Loss rate: 47.56%
-- Flow 1:
Average throughput: 51.80 Mbit/s
95th percentile per-packet one-way delay: 86.778 ms
Loss rate: 47.48%
-- Flow 2:
Average throughput: 22.31 Mbit/s
95th percentile per-packet one-way delay: 65.390 ms
Loss rate: 14.65%
-- Flow 3:
Average throughput: 24.54 Mbit/s
95th percentile per-packet one-way delay: 70.731 ms
Loss rate: 69.48%
```
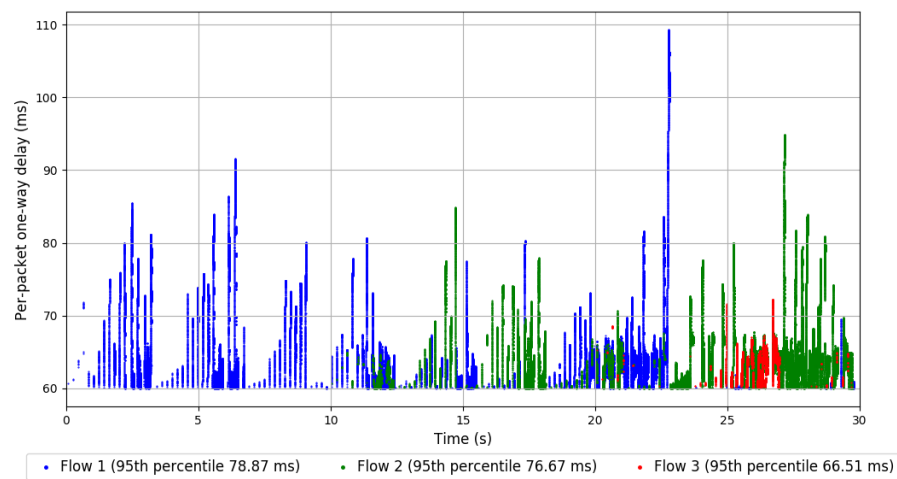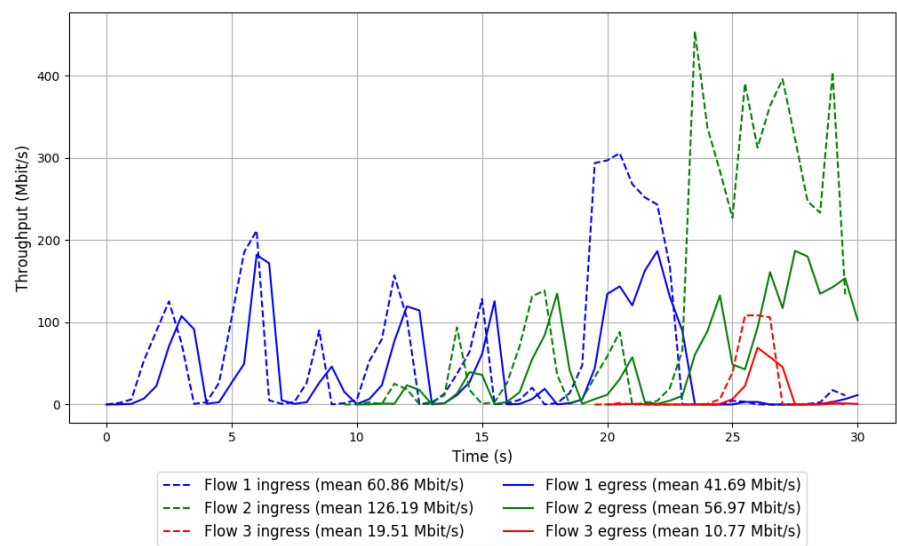
Run 1: Report of Verus — Data Link

Flow 1 ingress (mean 98.64 Mbit/s)   Flow 1 egress (mean 51.80 Mbit/s)
Flow 2 ingress (mean 26.15 Mbit/s)   Flow 2 egress (mean 22.31 Mbit/s)
Flow 3 ingress (mean 80.41 Mbit/s)   Flow 3 egress (mean 24.54 Mbit/s)

Flow 1 (95th percentile 86.78 ms)   Flow 2 (95th percentile 65.39 ms)   Flow 3 (95th percentile 70.73 ms)

```
Run 2: Statistics of Verus

Start at: 2018-09-07 15:04:36
End at: 2018-09-07 15:05:06
Local clock offset: -0.583 ms
Remote clock offset: -35.024 ms

# Below is generated by plot.py at 2018-09-07 17:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 82.92 Mbit/s
95th percentile per-packet one-way delay: 77.444 ms
Loss rate: 45.01%
-- Flow 1:
Average throughput: 41.69 Mbit/s
95th percentile per-packet one-way delay: 78.866 ms
Loss rate: 31.50%
-- Flow 2:
Average throughput: 56.97 Mbit/s
95th percentile per-packet one-way delay: 76.674 ms
Loss rate: 54.86%
-- Flow 3:
Average throughput: 10.77 Mbit/s
95th percentile per-packet one-way delay: 66.510 ms
Loss rate: 44.83%
```

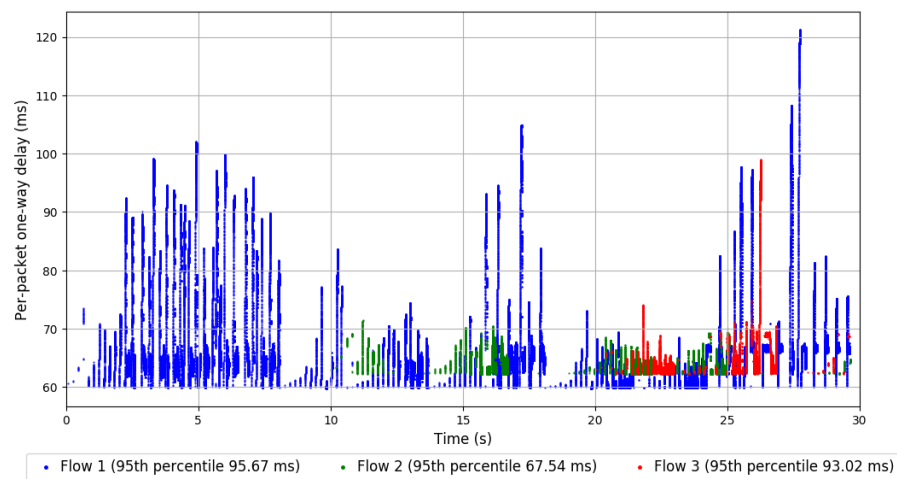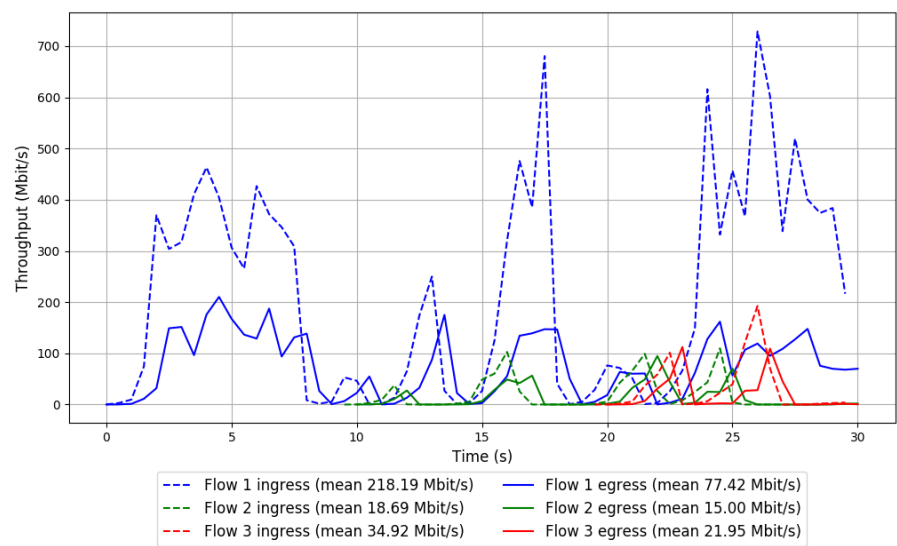## Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-09-07 15:30:30
End at: 2018-09-07 15:31:00
Local clock offset: 0.111 ms
Remote clock offset: -34.908 ms


# Below is generated by plot.py at 2018-09-07 17:09:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 94.48 Mbit/s
95th percentile per-packet one-way delay: 94.531 ms
Loss rate: 60.93%
-- Flow 1:
Average throughput: 77.42 Mbit/s
95th percentile per-packet one-way delay: 95.668 ms
Loss rate: 64.51%
-- Flow 2:
Average throughput: 15.00 Mbit/s
95th percentile per-packet one-way delay: 67.543 ms
Loss rate: 19.71%
-- Flow 3:
Average throughput: 21.95 Mbit/s
95th percentile per-packet one-way delay: 93.015 ms
Loss rate: 37.08%
```

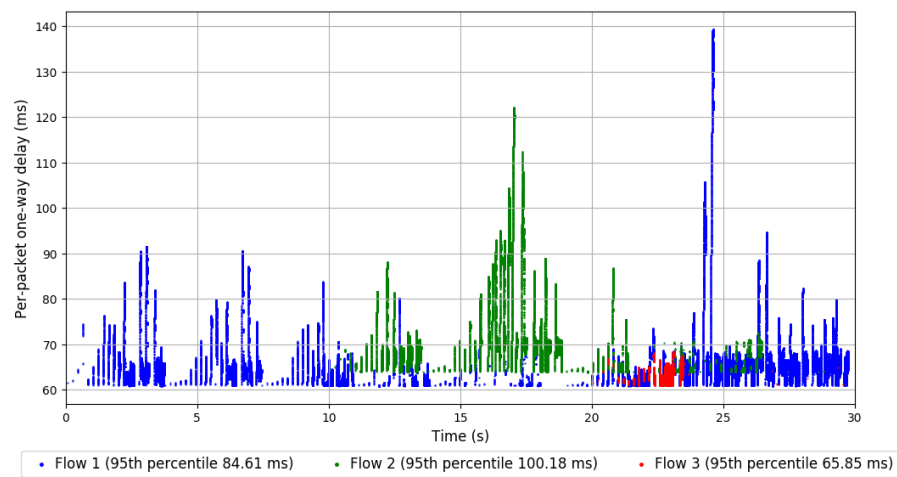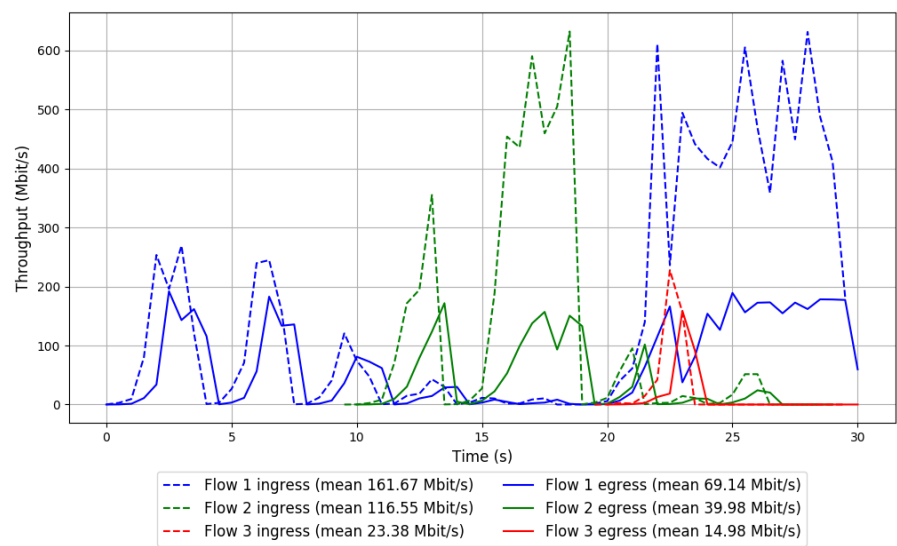Run 3: Report of Verus — Data Link

```
Run 4: Statistics of Verus

Start at: 2018-09-07 15:56:24
End at: 2018-09-07 15:56:54
Local clock offset: -0.35 ms
Remote clock offset: -34.165 ms


# Below is generated by plot.py at 2018-09-07 17:09:26
# Datalink statistics
-- Total of 3 flows:
Average throughput: 99.25 Mbit/s
95th percentile per-packet one-way delay: 89.797 ms
Loss rate: 59.27%
-- Flow 1:
Average throughput: 69.14 Mbit/s
95th percentile per-packet one-way delay: 84.613 ms
Loss rate: 57.22%
-- Flow 2:
Average throughput: 39.98 Mbit/s
95th percentile per-packet one-way delay: 100.178 ms
Loss rate: 66.05%
-- Flow 3:
Average throughput: 14.98 Mbit/s
95th percentile per-packet one-way delay: 65.853 ms
Loss rate: 35.94%
```

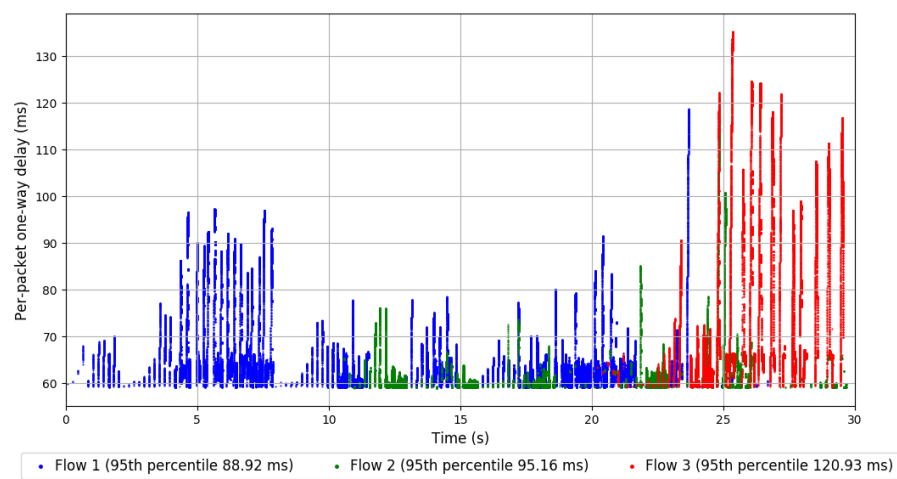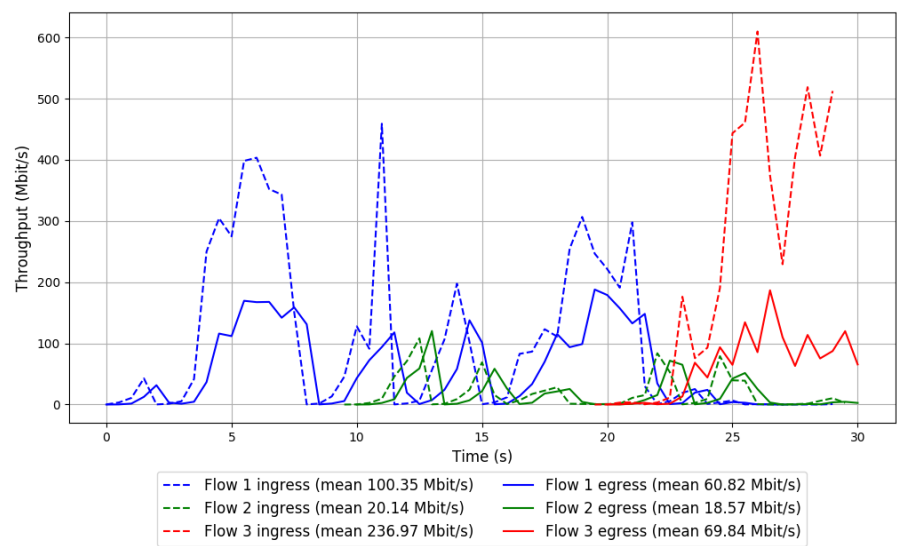Run 4: Report of Verus — Data Link

```
Run 5: Statistics of Verus

Start at: 2018-09-07 16:23:01
End at: 2018-09-07 16:23:31
Local clock offset: 0.848 ms
Remote clock offset: -34.62 ms

# Below is generated by plot.py at 2018-09-07 17:09:26
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.87 Mbit/s
95th percentile per-packet one-way delay: 106.522 ms
Loss rate: 52.18%
-- Flow 1:
Average throughput: 60.82 Mbit/s
95th percentile per-packet one-way delay: 88.921 ms
Loss rate: 44.00%
-- Flow 2:
Average throughput: 18.57 Mbit/s
95th percentile per-packet one-way delay: 95.164 ms
Loss rate: 7.80%
-- Flow 3:
Average throughput: 69.84 Mbit/s
95th percentile per-packet one-way delay: 120.927 ms
Loss rate: 70.50%
```

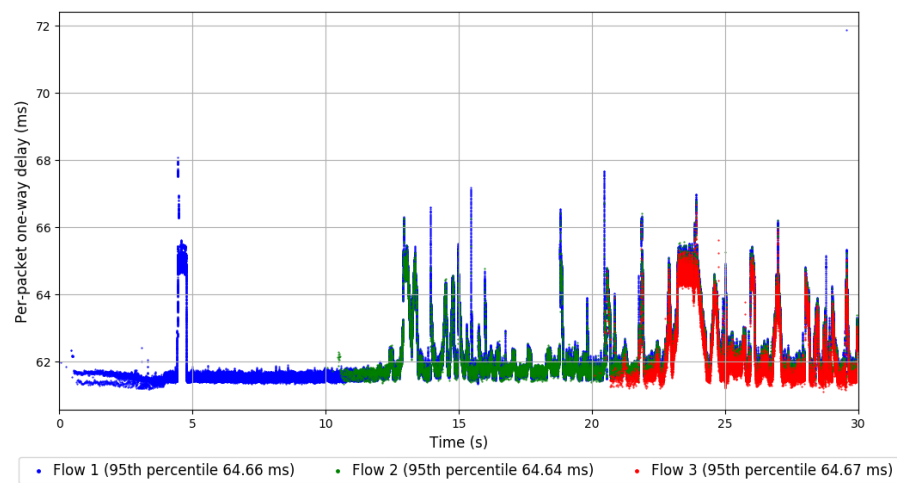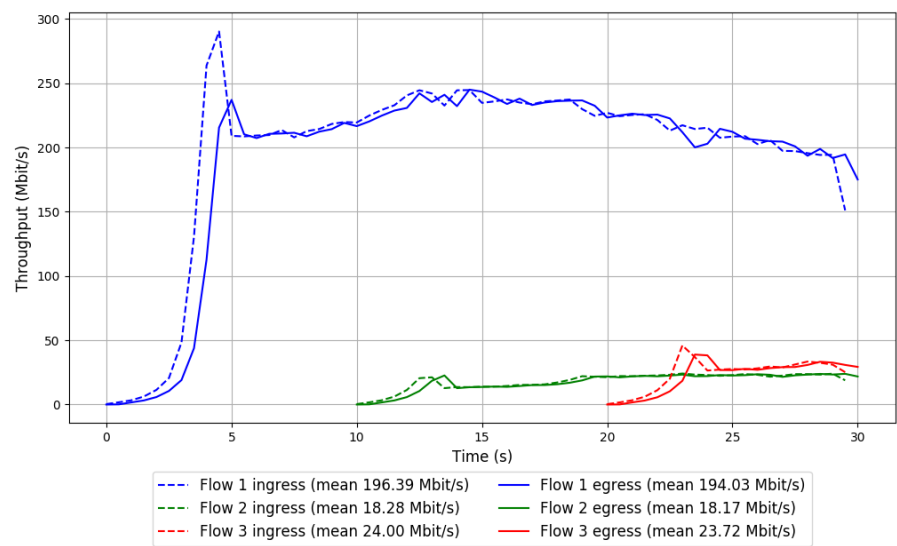Run 5: Report of Verus — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2018-09-07 14:46:16
End at: 2018-09-07 14:46:46
Local clock offset: -0.418 ms
Remote clock offset: -33.153 ms


# Below is generated by plot.py at 2018-09-07 17:10:26
# Datalink statistics
-- Total of 3 flows:
Average throughput: 213.95 Mbit/s
95th percentile per-packet one-way delay: 64.656 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 194.03 Mbit/s
95th percentile per-packet one-way delay: 64.656 ms
Loss rate: 1.20%
-- Flow 2:
Average throughput: 18.17 Mbit/s
95th percentile per-packet one-way delay: 64.642 ms
Loss rate: 0.56%
-- Flow 3:
Average throughput: 23.72 Mbit/s
95th percentile per-packet one-way delay: 64.667 ms
Loss rate: 1.19%
```

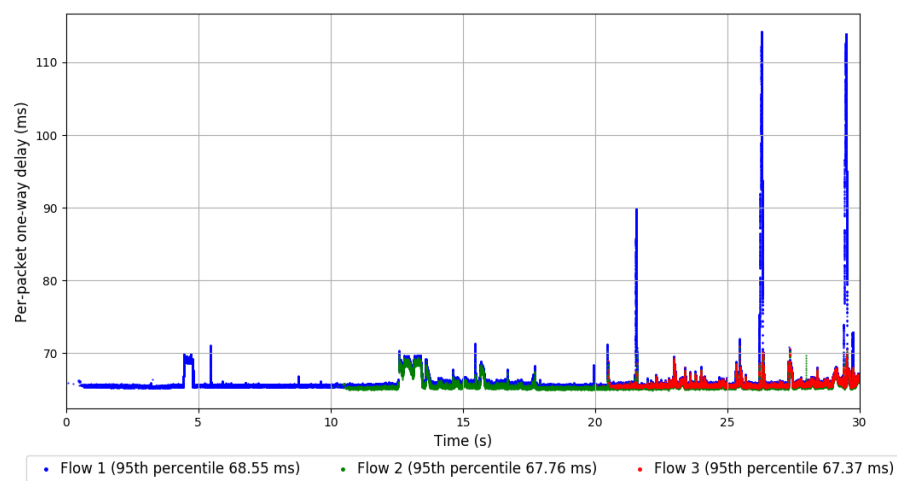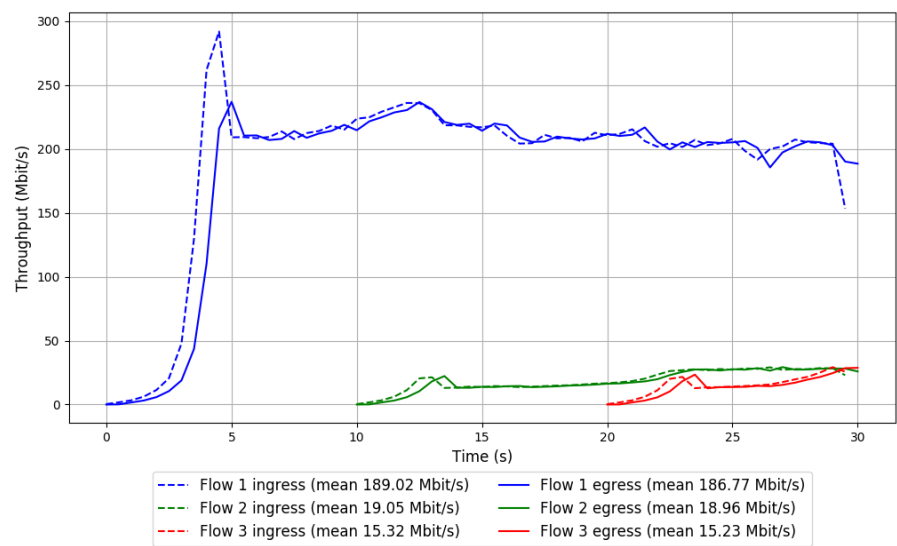Run 1: Report of PCC-Vivace — Data Link

```
Run 2: Statistics of PCC-Vivace

Start at: 2018-09-07 15:12:06
End at: 2018-09-07 15:12:36
Local clock offset: -2.427 ms
Remote clock offset: -31.462 ms


# Below is generated by plot.py at 2018-09-07 17:10:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 204.41 Mbit/s
95th percentile per-packet one-way delay: 68.428 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 186.77 Mbit/s
95th percentile per-packet one-way delay: 68.546 ms
Loss rate: 1.19%
-- Flow 2:
Average throughput: 18.96 Mbit/s
95th percentile per-packet one-way delay: 67.761 ms
Loss rate: 0.48%
-- Flow 3:
Average throughput: 15.23 Mbit/s
95th percentile per-packet one-way delay: 67.371 ms
Loss rate: 0.60%
```

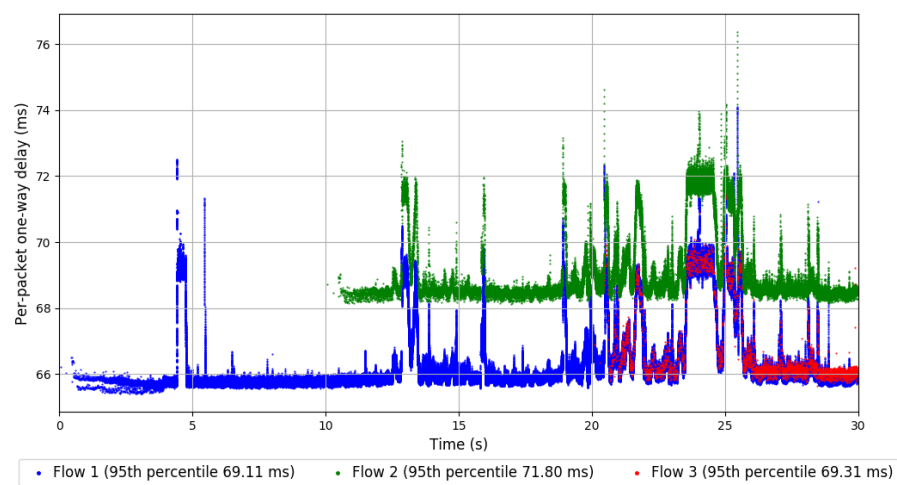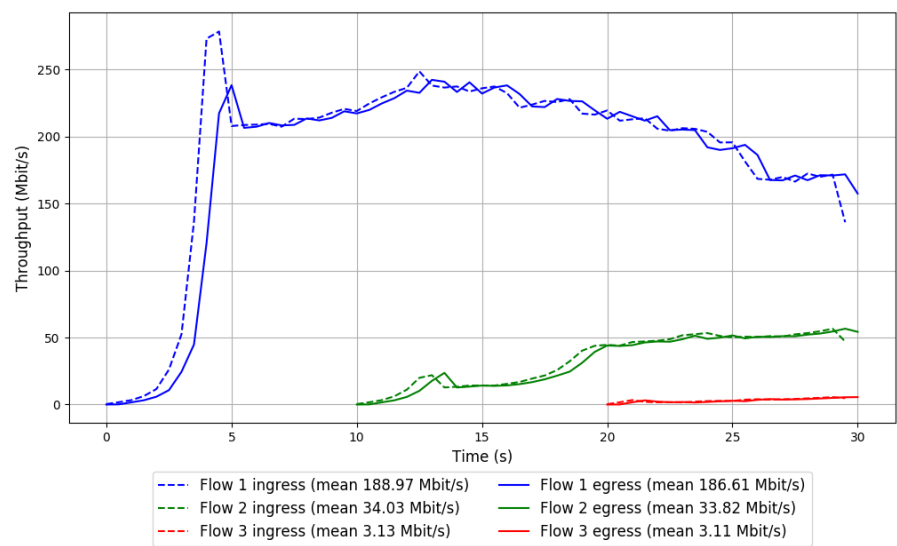Run 2: Report of PCC-Vivace — Data Link

```
Run 3: Statistics of PCC-Vivace

Start at: 2018-09-07 15:38:02
End at: 2018-09-07 15:38:32
Local clock offset: 0.747 ms
Remote clock offset: -28.207 ms


# Below is generated by plot.py at 2018-09-07 17:10:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 210.12 Mbit/s
95th percentile per-packet one-way delay: 69.330 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 186.61 Mbit/s
95th percentile per-packet one-way delay: 69.109 ms
Loss rate: 1.25%
-- Flow 2:
Average throughput: 33.82 Mbit/s
95th percentile per-packet one-way delay: 71.801 ms
Loss rate: 0.65%
-- Flow 3:
Average throughput: 3.11 Mbit/s
95th percentile per-packet one-way delay: 69.315 ms
Loss rate: 0.56%
```

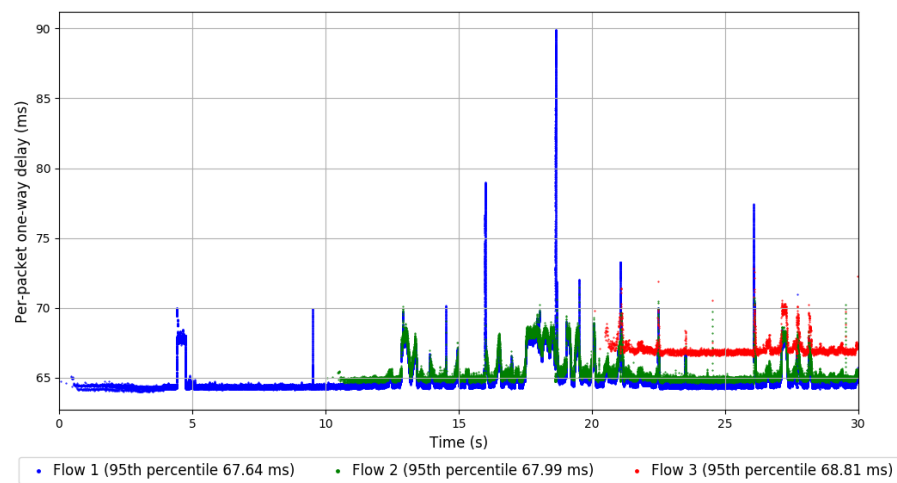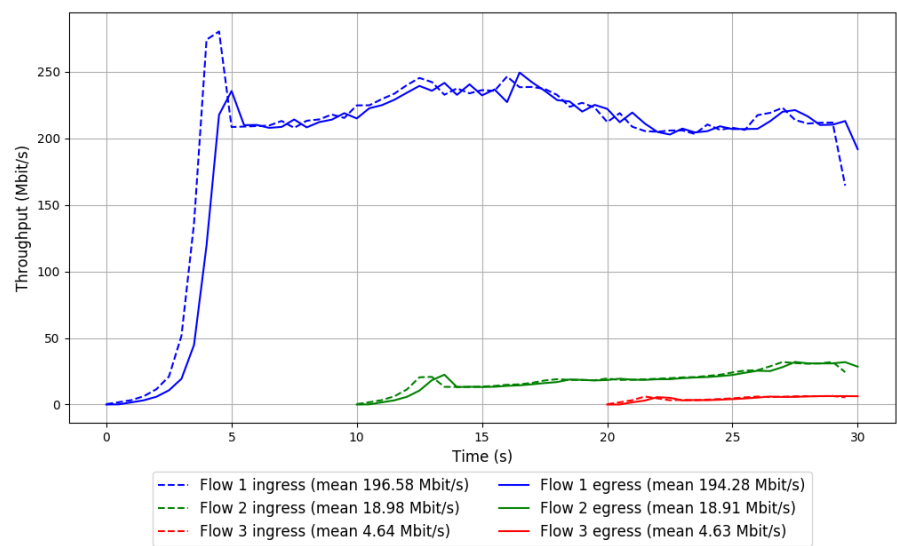Run 3: Report of PCC-Vivace — Data Link

```
Run 4: Statistics of PCC-Vivace

Start at: 2018-09-07 16:04:21
End at: 2018-09-07 16:04:51
Local clock offset: 1.219 ms
Remote clock offset: -29.248 ms


# Below is generated by plot.py at 2018-09-07 17:10:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 208.35 Mbit/s
95th percentile per-packet one-way delay: 67.656 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 194.28 Mbit/s
95th percentile per-packet one-way delay: 67.639 ms
Loss rate: 1.17%
-- Flow 2:
Average throughput: 18.91 Mbit/s
95th percentile per-packet one-way delay: 67.994 ms
Loss rate: 0.38%
-- Flow 3:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 68.810 ms
Loss rate: 0.21%
```

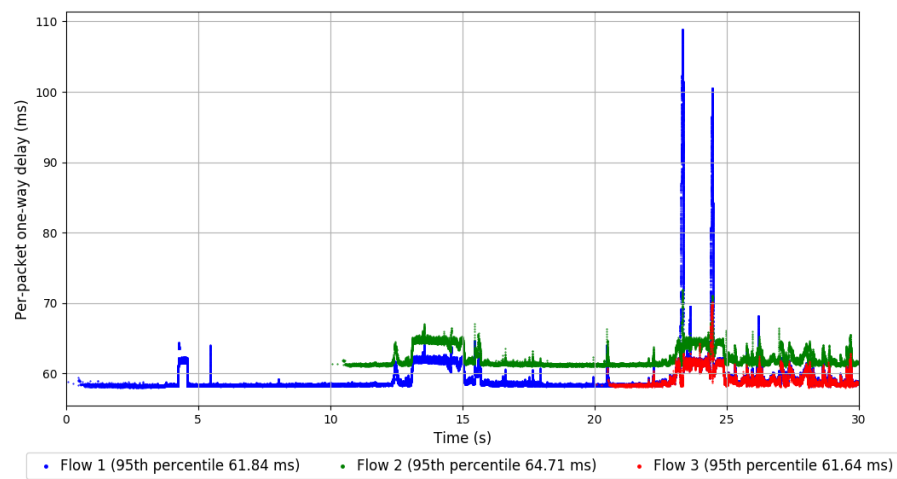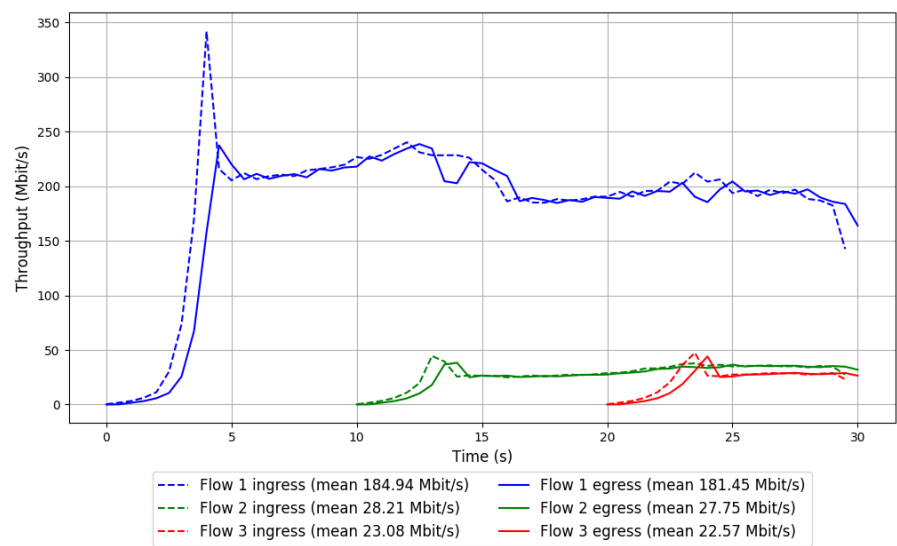Run 4: Report of PCC-Vivace — Data Link

```
Run 5: Statistics of PCC-Vivace

Start at: 2018-09-07 16:36:16
End at: 2018-09-07 16:36:46
Local clock offset: 0.989 ms
Remote clock offset: -35.129 ms


# Below is generated by plot.py at 2018-09-07 17:10:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 207.36 Mbit/s
95th percentile per-packet one-way delay: 62.075 ms
Loss rate: 1.88%
-- Flow 1:
Average throughput: 181.45 Mbit/s
95th percentile per-packet one-way delay: 61.840 ms
Loss rate: 1.89%
-- Flow 2:
Average throughput: 27.75 Mbit/s
95th percentile per-packet one-way delay: 64.708 ms
Loss rate: 1.65%
-- Flow 3:
Average throughput: 22.57 Mbit/s
95th percentile per-packet one-way delay: 61.642 ms
Loss rate: 2.19%
```

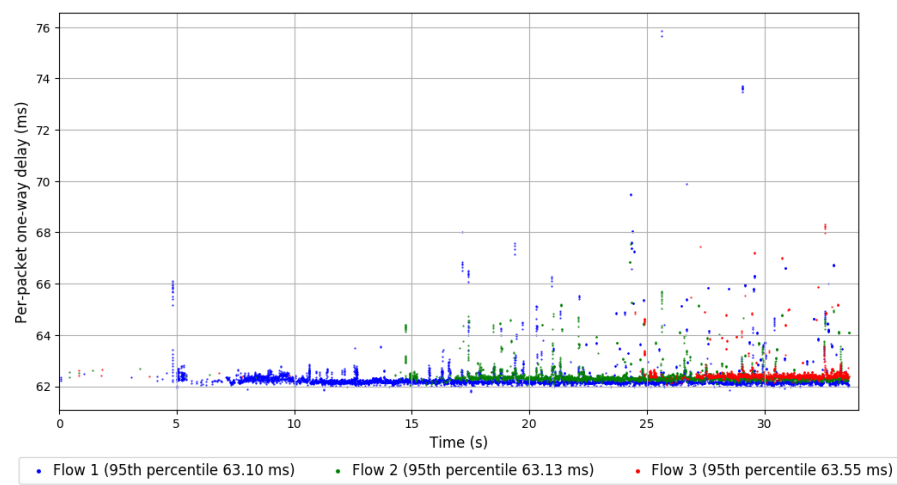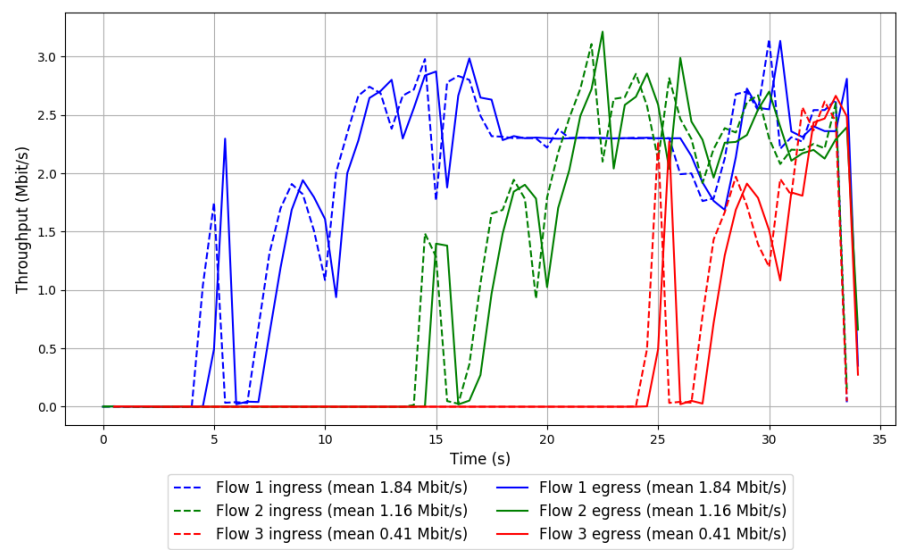Run 5: Report of PCC-Vivace — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2018-09-07 14:40:09
End at: 2018-09-07 14:40:39
Local clock offset: -0.431 ms
Remote clock offset: -32.68 ms


# Below is generated by plot.py at 2018-09-07 17:10:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.39 Mbit/s
95th percentile per-packet one-way delay: 63.206 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.84 Mbit/s
95th percentile per-packet one-way delay: 63.104 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 63.134 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 63.546 ms
Loss rate: 0.00%
```
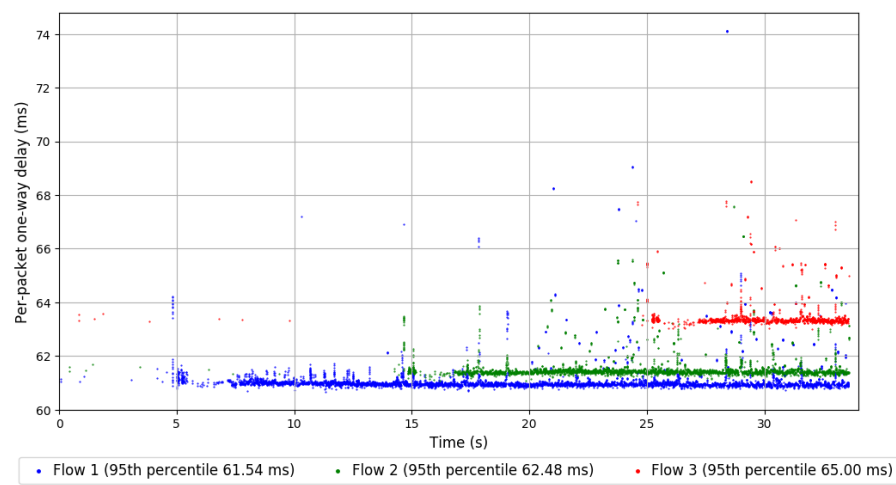
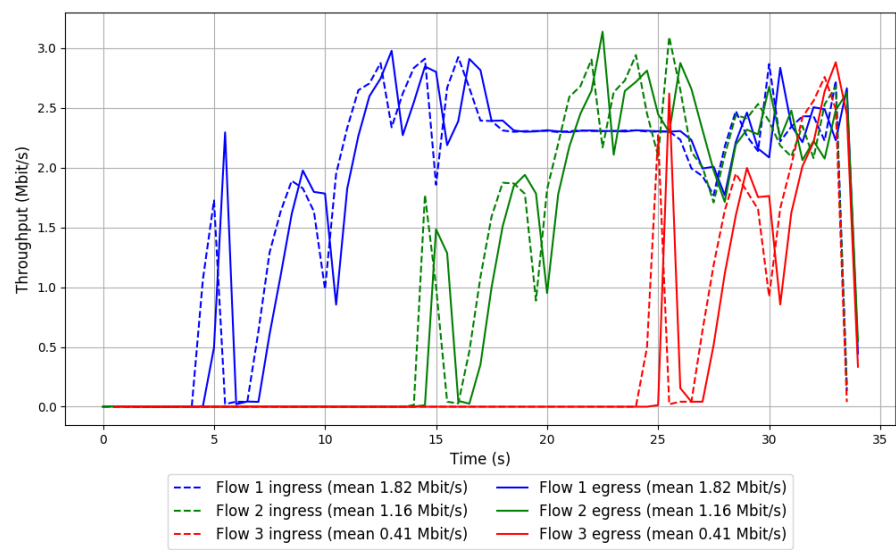Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-09-07 15:06:01
End at: 2018-09-07 15:06:31
Local clock offset: -0.448 ms
Remote clock offset: -33.911 ms


# Below is generated by plot.py at 2018-09-07 17:10:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 63.383 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 61.539 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 62.485 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 64.997 ms
Loss rate: 0.00%
```

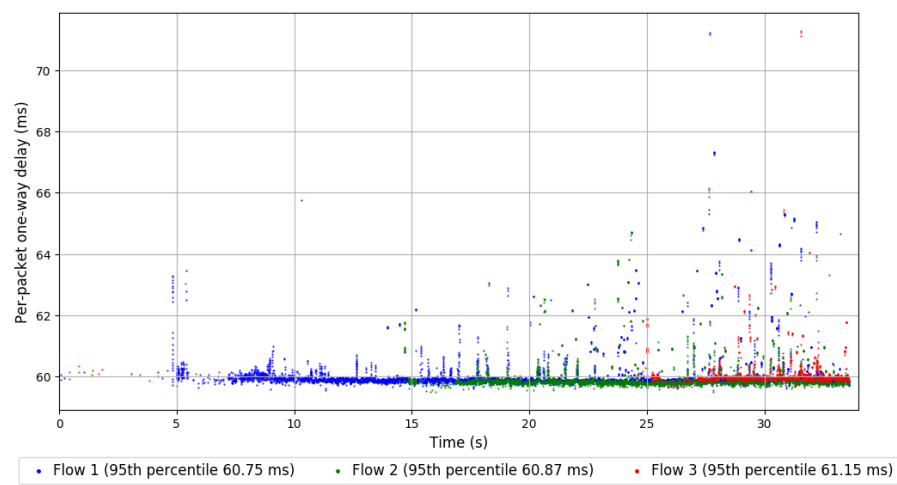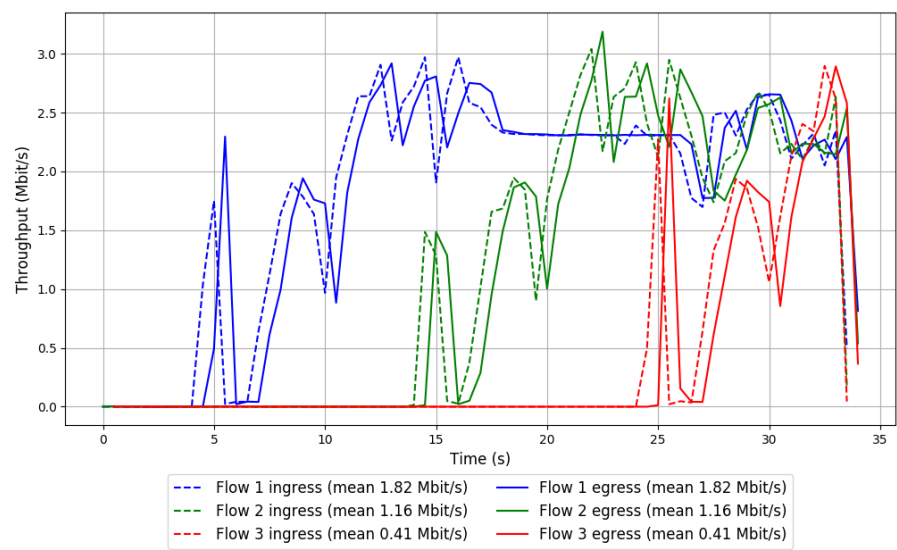Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-09-07 15:31:57
End at: 2018-09-07 15:32:27
Local clock offset: 0.024 ms
Remote clock offset: -35.034 ms

# Below is generated by plot.py at 2018-09-07 17:10:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 60.836 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 60.749 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 60.867 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 61.148 ms
Loss rate: 0.00%
```

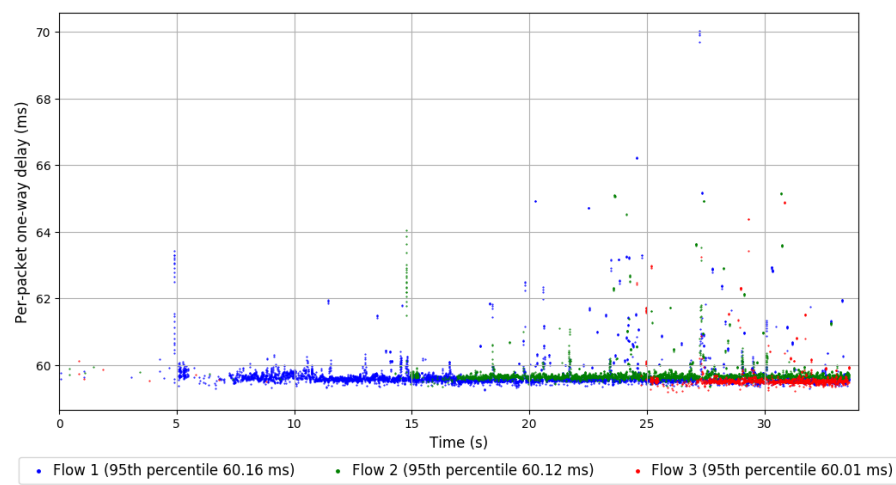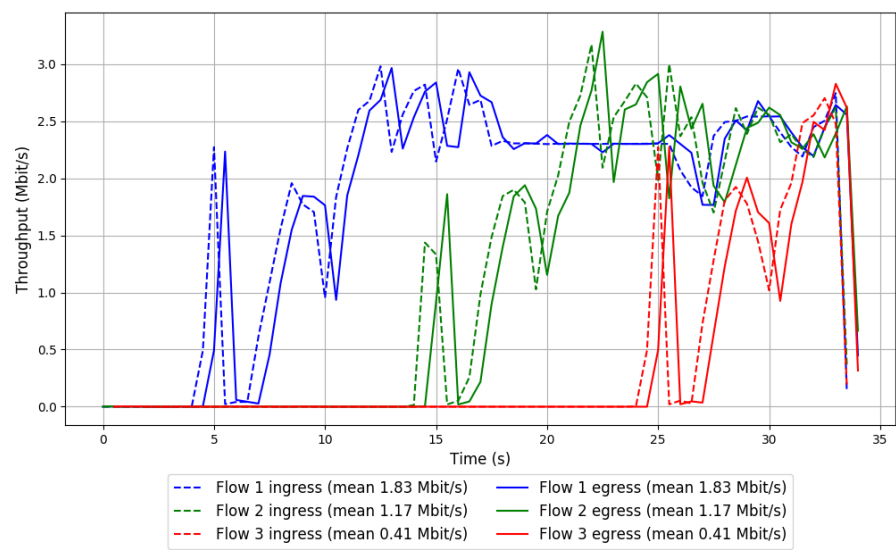Run 3: Report of WebRTC media — Data Link

```
Run 4: Statistics of WebRTC media

Start at: 2018-09-07 15:57:52
End at: 2018-09-07 15:58:22
Local clock offset: 2.474 ms
Remote clock offset: -32.802 ms


# Below is generated by plot.py at 2018-09-07 17:10:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.39 Mbit/s
95th percentile per-packet one-way delay: 60.131 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 60.162 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 60.115 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 60.005 ms
Loss rate: 0.00%
```

Run 4: Report of WebRTC media — Data Link

```
Run 5: Statistics of WebRTC media

Start at: 2018-09-07 16:24:35
End at: 2018-09-07 16:25:05
Local clock offset: 0.729 ms
Remote clock offset: -34.818 ms


# Below is generated by plot.py at 2018-09-07 17:10:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.36 Mbit/s
95th percentile per-packet one-way delay: 61.735 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 60.024 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 62.009 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 62.377 ms
Loss rate: 0.00%
```

Run 5: Report of WebRTC media — Data Link