Pantheon Report

Generated at 2018-12-20 03:43:52 (UTC).

Data path: AWS Brazil 2 on `ens5` (*local*) →Colombia on `p4p1` (*remote*).

Repeated the test of 19 congestion control schemes 5 times.

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

NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.
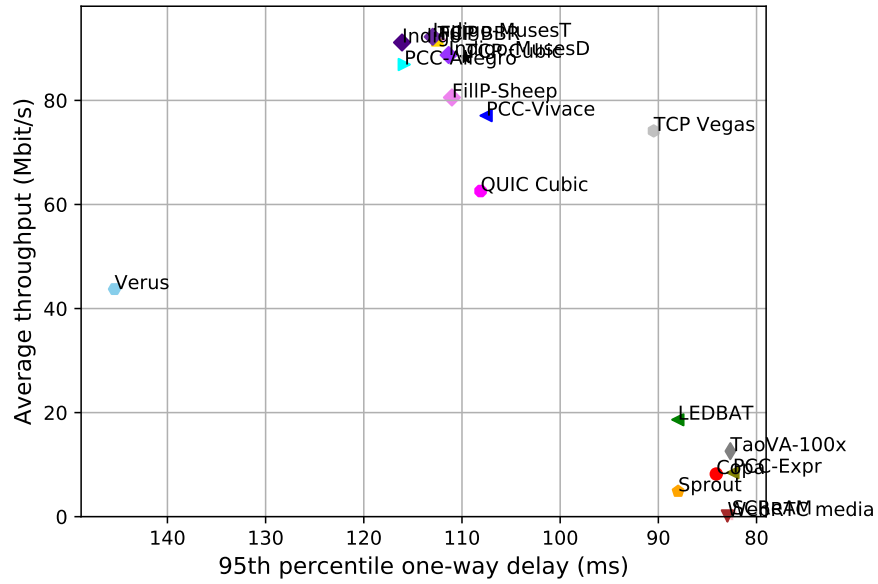
```
System info:
Linux 4.15.0-1029-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912

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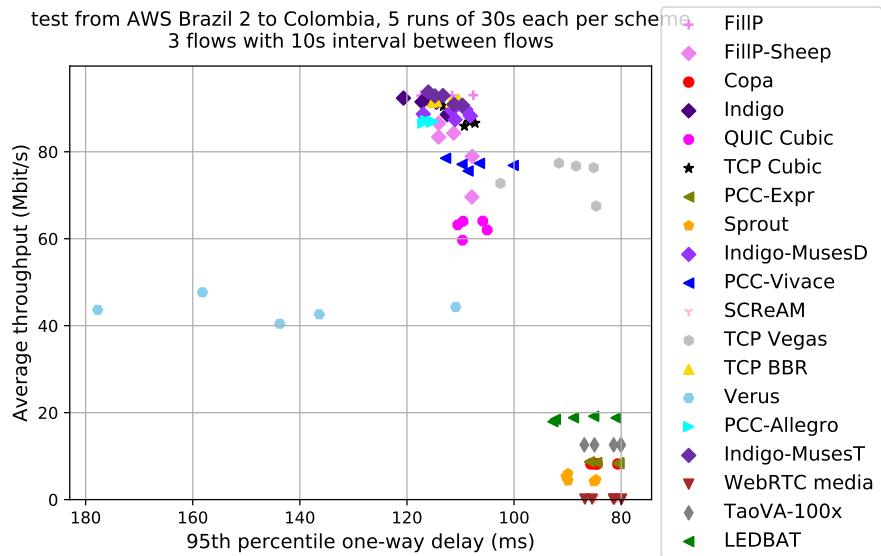
```
 M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

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

test from AWS Brazil 2 to Colombia, 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	55.51	38.57	31.32	112.23	112.17	112.53	12.74	19.98	27.07
Copa	5	0.00	10.34	3.99	83.74	84.29	83.03	98.31	75.84	71.65
TCP Cubic	5	64.86	23.57	22.99	108.80	110.24	109.07	0.89	0.23	0.27
FillP	5	54.95	42.63	25.21	110.50	110.62	111.00	15.81	26.14	24.11
FillP-Sheep	5	24.92	69.76	27.75	105.76	111.18	112.83	6.13	6.64	14.24
Indigo	5	64.78	26.11	28.73	115.84	115.45	115.20	9.47	32.82	63.22
Indigo-MusesD	5	70.00	20.62	15.48	112.14	108.66	108.92	3.24	1.11	2.15
Indigo-MusesT	5	63.88	29.68	28.70	112.53	113.00	112.72	7.64	14.51	17.39
LEDBAT	5	12.04	7.99	3.91	86.84	86.91	87.04	0.02	0.00	0.00
PCC-Allegro	5	77.87	9.49	8.23	115.56	115.77	117.10	2.88	4.57	5.07
PCC-Expr	5	0.01	9.43	6.62	82.93	82.40	82.42	85.71	59.74	30.93
QUIC Cubic	5	46.20	18.36	12.88	108.63	107.07	98.20	0.90	0.50	1.66
SCReAM	5	0.22	0.22	0.22	81.09	82.28	81.08	0.00	0.00	0.00
Sprout	5	2.78	2.36	1.63	88.12	87.76	86.59	0.01	0.00	0.00
TaoVA-100x	5	7.92	4.92	4.22	88.58	81.75	81.73	32.06	45.26	62.15
TCP Vegas	5	44.20	25.66	38.60	90.86	93.70	87.67	0.99	0.82	1.07
Verus	5	25.88	19.23	18.41	132.57	128.97	123.89	43.25	38.88	29.79
PCC-Vivace	5	65.44	13.71	7.65	107.55	105.05	107.03	0.26	0.48	0.32
WebRTC media	5	0.05	0.04	0.04	82.45	83.05	82.69	0.00	0.00	0.00

```
Run 1: Statistics of TCP BBR

Start at: 2018-12-20 01:48:18
End at: 2018-12-20 01:48:48
Local clock offset: -0.984 ms
Remote clock offset: 4.777 ms


# Below is generated by plot.py at 2018-12-20 03:36:26
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.41 Mbit/s
95th percentile per-packet one-way delay: 111.852 ms
Loss rate: 16.78%
-- Flow 1:
Average throughput: 56.25 Mbit/s
95th percentile per-packet one-way delay: 111.194 ms
Loss rate: 13.70%
-- Flow 2:
Average throughput: 39.57 Mbit/s
95th percentile per-packet one-way delay: 110.216 ms
Loss rate: 20.78%
-- Flow 3:
Average throughput: 26.54 Mbit/s
95th percentile per-packet one-way delay: 112.112 ms
Loss rate: 22.72%
```
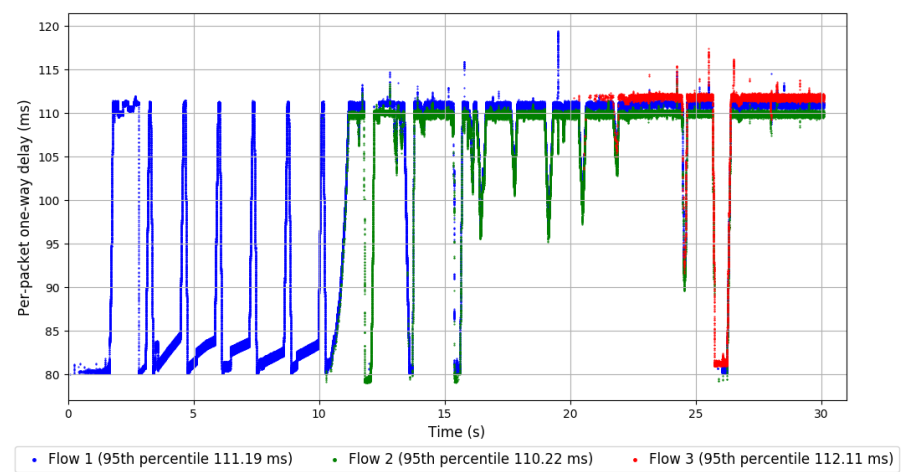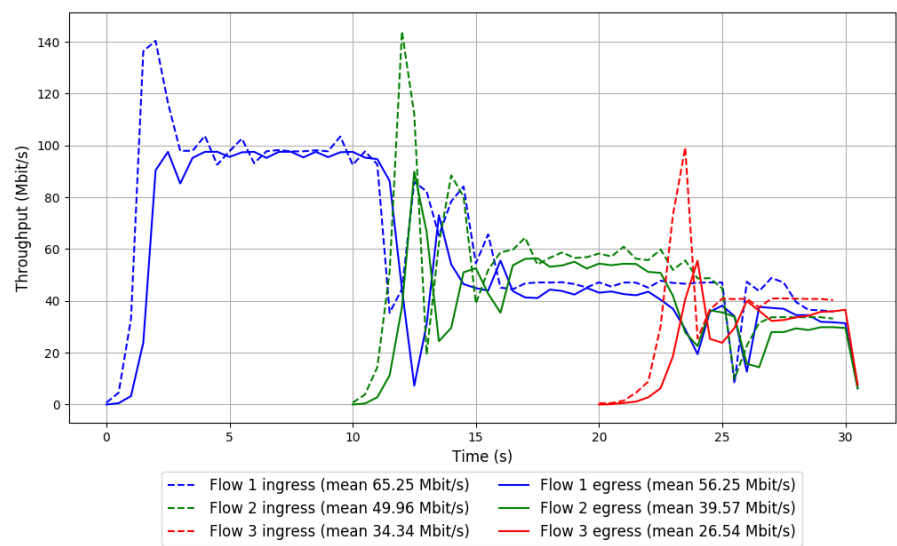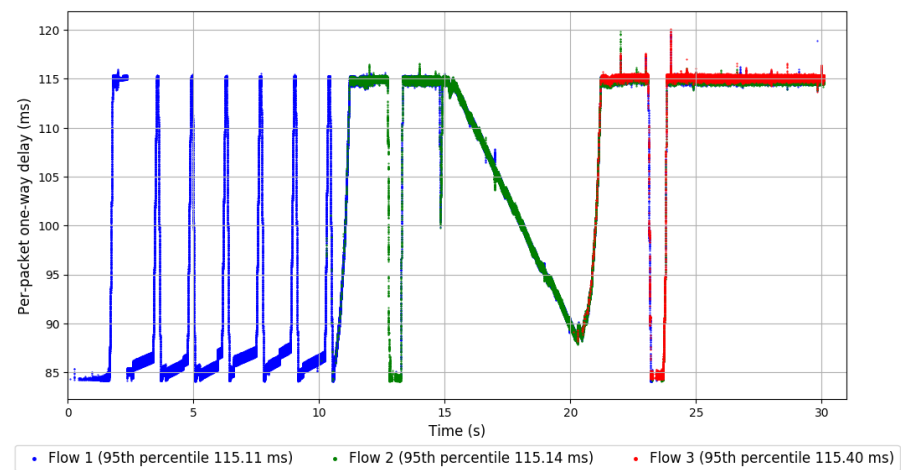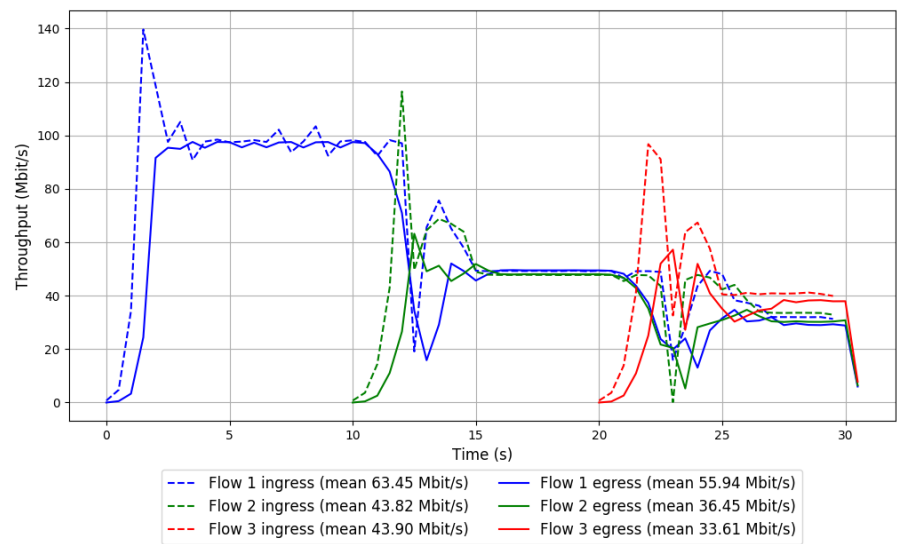
Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 65.25 Mbit/s) --- Flow 1 egress (mean 56.25 Mbit/s)
Flow 2 ingress (mean 49.96 Mbit/s) --- Flow 2 egress (mean 39.57 Mbit/s)
Flow 3 ingress (mean 34.34 Mbit/s) --- Flow 3 egress (mean 26.54 Mbit/s)

Flow 1 (95th percentile 111.19 ms)   Flow 2 (95th percentile 110.22 ms)   Flow 3 (95th percentile 112.11 ms)

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```
Run 2: Statistics of TCP BBR

Start at: 2018-12-20 02:12:21
End at: 2018-12-20 02:12:51
Local clock offset: -4.224 ms
Remote clock offset: 7.505 ms


# Below is generated by plot.py at 2018-12-20 03:36:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.42 Mbit/s
95th percentile per-packet one-way delay: 115.237 ms
Loss rate: 14.66%
-- Flow 1:
Average throughput: 55.94 Mbit/s
95th percentile per-packet one-way delay: 115.111 ms
Loss rate: 11.75%
-- Flow 2:
Average throughput: 36.45 Mbit/s
95th percentile per-packet one-way delay: 115.135 ms
Loss rate: 16.70%
-- Flow 3:
Average throughput: 33.61 Mbit/s
95th percentile per-packet one-way delay: 115.399 ms
Loss rate: 23.24%
```
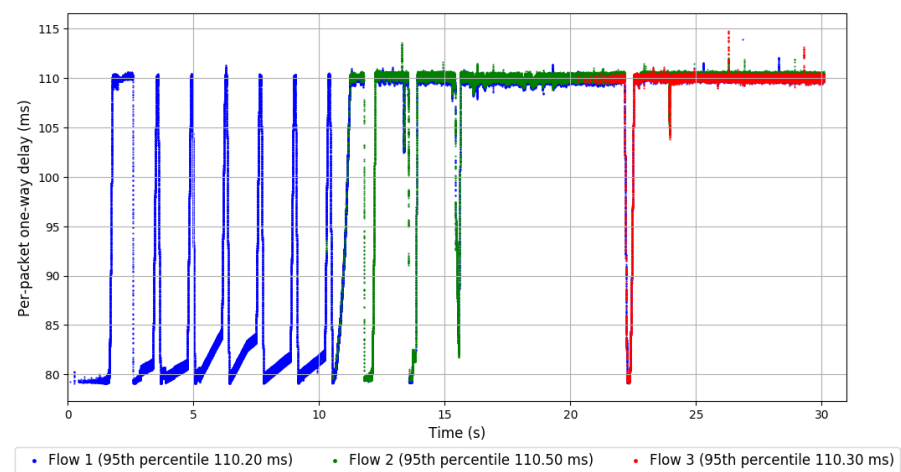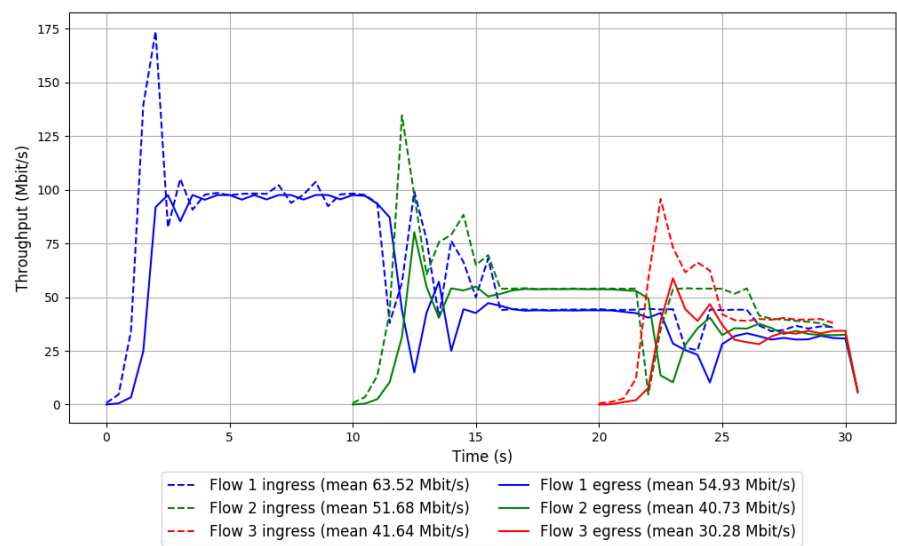
Run 2: Report of TCP BBR — Data Link

- - - Flow 1 ingress (mean 63.45 Mbit/s) —— Flow 1 egress (mean 55.94 Mbit/s)
- - - Flow 2 ingress (mean 43.82 Mbit/s) —— Flow 2 egress (mean 36.45 Mbit/s)
- - - Flow 3 ingress (mean 43.90 Mbit/s) —— Flow 3 egress (mean 33.61 Mbit/s)

• Flow 1 (95th percentile 115.11 ms)　　• Flow 2 (95th percentile 115.14 ms)　　• Flow 3 (95th percentile 115.40 ms)

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```
Run 3: Statistics of TCP BBR

Start at: 2018-12-20 02:36:22
End at: 2018-12-20 02:36:52
Local clock offset: -7.563 ms
Remote clock offset: -0.077 ms


# Below is generated by plot.py at 2018-12-20 03:36:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 92.13 Mbit/s
95th percentile per-packet one-way delay: 110.393 ms
Loss rate: 17.50%
-- Flow 1:
Average throughput: 54.93 Mbit/s
95th percentile per-packet one-way delay: 110.201 ms
Loss rate: 13.43%
-- Flow 2:
Average throughput: 40.73 Mbit/s
95th percentile per-packet one-way delay: 110.502 ms
Loss rate: 21.08%
-- Flow 3:
Average throughput: 30.28 Mbit/s
95th percentile per-packet one-way delay: 110.300 ms
Loss rate: 27.29%
```
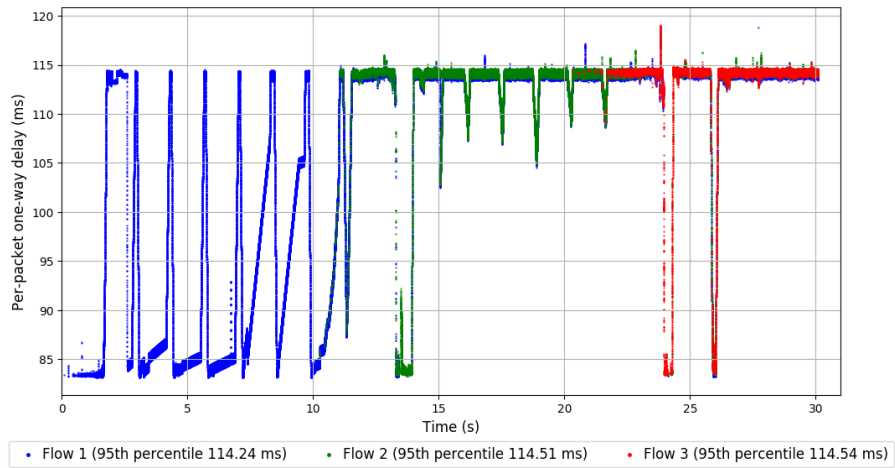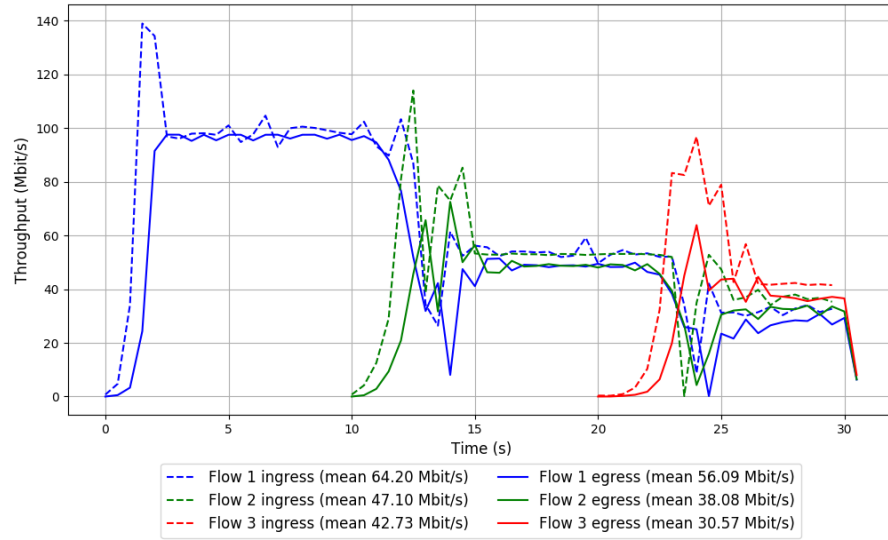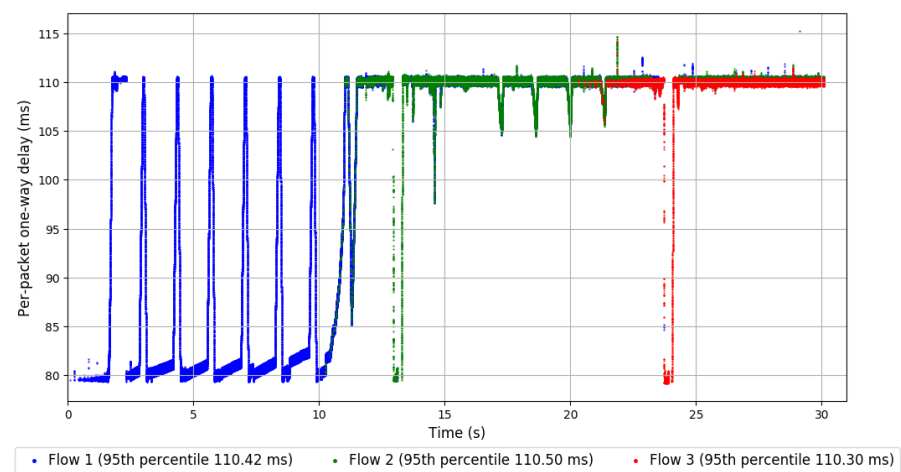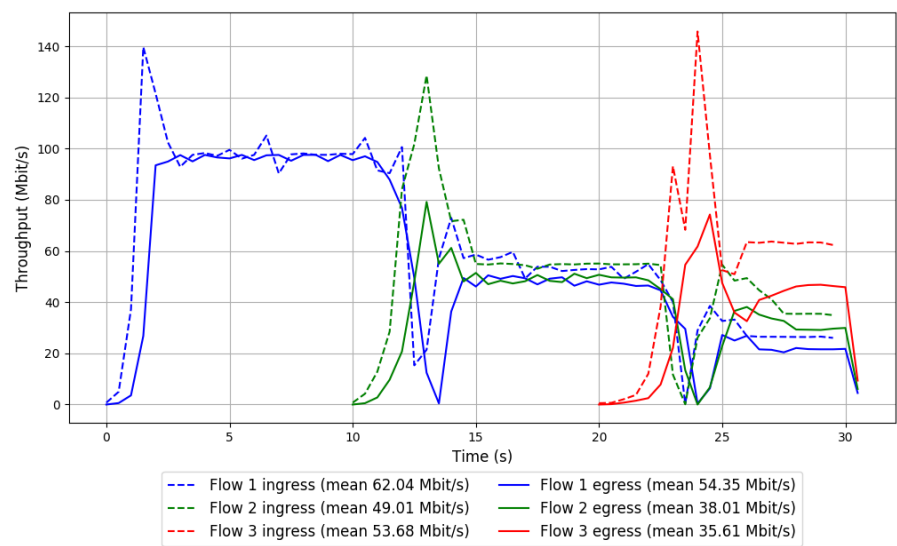
Run 3: Report of TCP BBR — Data Link

Flow 1 ingress (mean 63.52 Mbit/s)   Flow 1 egress (mean 54.93 Mbit/s)
Flow 2 ingress (mean 51.68 Mbit/s)   Flow 2 egress (mean 40.73 Mbit/s)
Flow 3 ingress (mean 41.64 Mbit/s)   Flow 3 egress (mean 30.28 Mbit/s)

Flow 1 (95th percentile 110.20 ms)   Flow 2 (95th percentile 110.50 ms)   Flow 3 (95th percentile 110.30 ms)

```
Run 4: Statistics of TCP BBR

Start at: 2018-12-20 03:00:26
End at: 2018-12-20 03:00:56
Local clock offset: -7.324 ms
Remote clock offset: 1.537 ms


# Below is generated by plot.py at 2018-12-20 03:36:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.63 Mbit/s
95th percentile per-packet one-way delay: 114.462 ms
Loss rate: 16.45%
-- Flow 1:
Average throughput: 56.09 Mbit/s
95th percentile per-packet one-way delay: 114.239 ms
Loss rate: 12.53%
-- Flow 2:
Average throughput: 38.08 Mbit/s
95th percentile per-packet one-way delay: 114.513 ms
Loss rate: 19.04%
-- Flow 3:
Average throughput: 30.57 Mbit/s
95th percentile per-packet one-way delay: 114.544 ms
Loss rate: 28.45%
```

Run 4: Report of TCP BBR — Data Link

```
Run 5: Statistics of TCP BBR

Start at: 2018-12-20 03:24:29
End at: 2018-12-20 03:24:59
Local clock offset: -6.919 ms
Remote clock offset: -4.897 ms


# Below is generated by plot.py at 2018-12-20 03:36:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.52 Mbit/s
95th percentile per-packet one-way delay: 110.454 ms
Loss rate: 18.59%
-- Flow 1:
Average throughput: 54.35 Mbit/s
95th percentile per-packet one-way delay: 110.423 ms
Loss rate: 12.30%
-- Flow 2:
Average throughput: 38.01 Mbit/s
95th percentile per-packet one-way delay: 110.502 ms
Loss rate: 22.32%
-- Flow 3:
Average throughput: 35.61 Mbit/s
95th percentile per-packet one-way delay: 110.300 ms
Loss rate: 33.66%
```
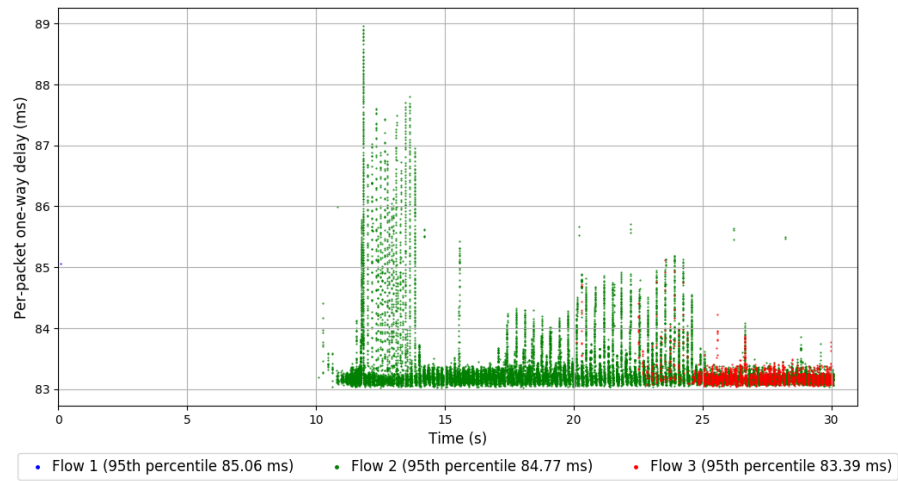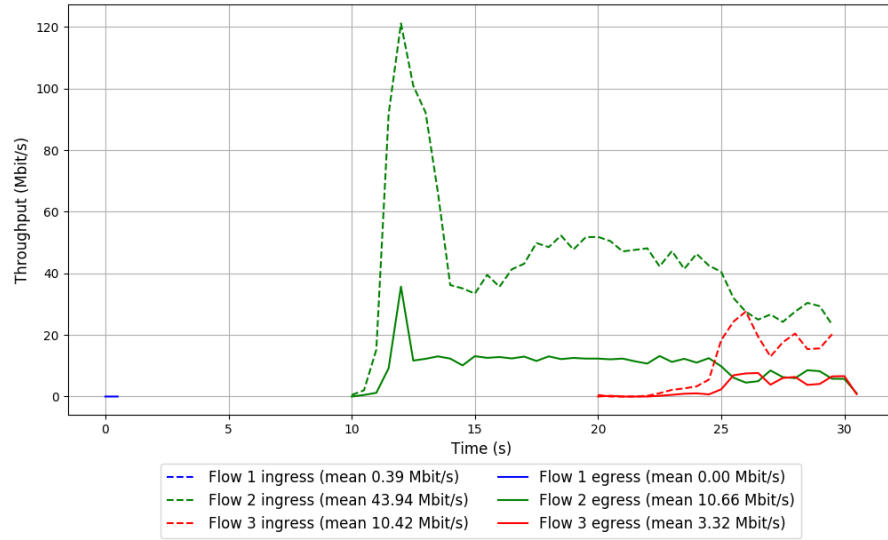
Run 5: Report of TCP BBR — Data Link

- - - Flow 1 ingress (mean 62.04 Mbit/s) ——— Flow 1 egress (mean 54.35 Mbit/s)
- - - Flow 2 ingress (mean 49.01 Mbit/s) ——— Flow 2 egress (mean 38.01 Mbit/s)
- - - Flow 3 ingress (mean 53.68 Mbit/s) ——— Flow 3 egress (mean 35.61 Mbit/s)

• Flow 1 (95th percentile 110.42 ms)   • Flow 2 (95th percentile 110.50 ms)   • Flow 3 (95th percentile 110.30 ms)

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```
Run 1: Statistics of Copa

Start at: 2018-12-20 01:40:47
End at: 2018-12-20 01:41:17
Local clock offset: -0.703 ms
Remote clock offset: 9.639 ms


# Below is generated by plot.py at 2018-12-20 03:36:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.20 Mbit/s
95th percentile per-packet one-way delay: 84.622 ms
Loss rate: 74.94%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 85.062 ms
Loss rate: 98.60%
-- Flow 2:
Average throughput: 10.66 Mbit/s
95th percentile per-packet one-way delay: 84.768 ms
Loss rate: 75.74%
-- Flow 3:
Average throughput: 3.32 Mbit/s
95th percentile per-packet one-way delay: 83.388 ms
Loss rate: 68.13%
```
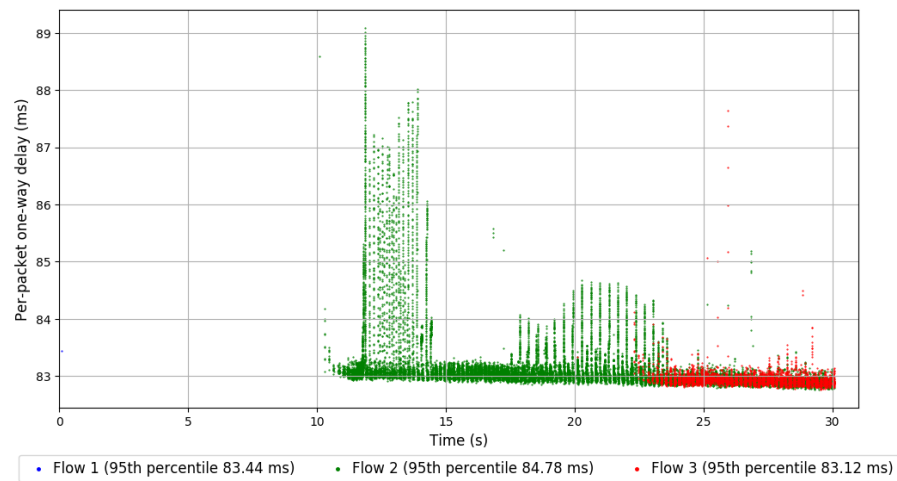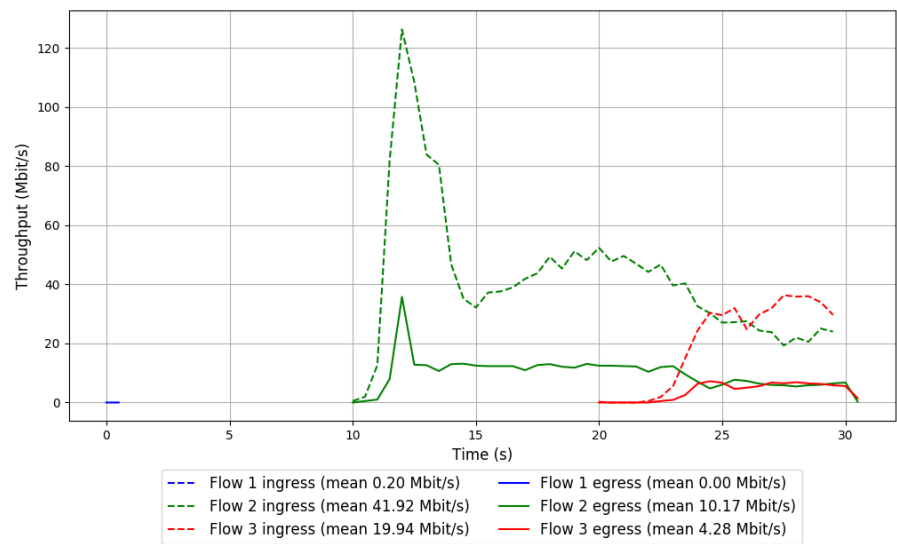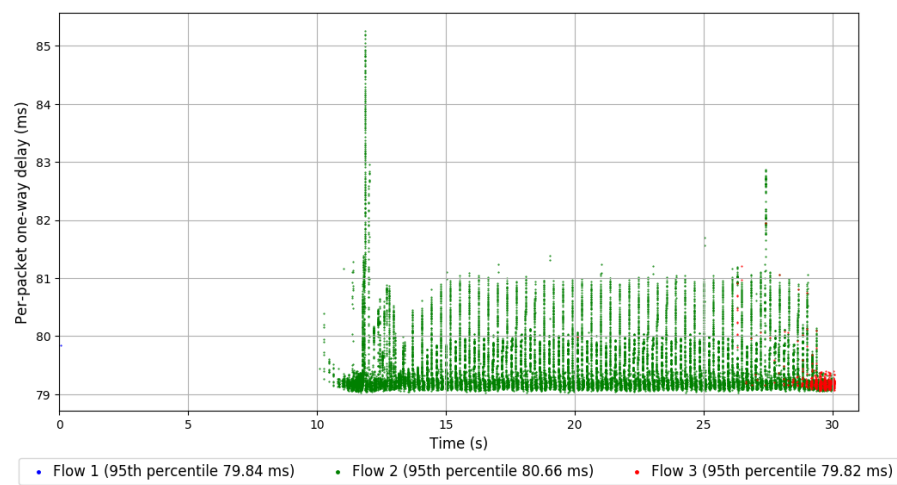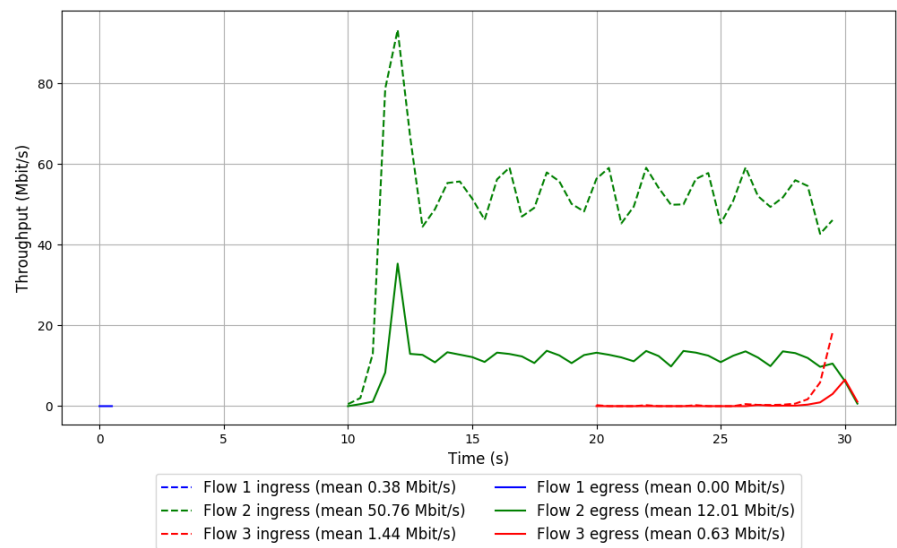
Run 1: Report of Copa — Data Link

- - - Flow 1 ingress (mean 0.39 Mbit/s) ——— Flow 1 egress (mean 0.00 Mbit/s)
- - - Flow 2 ingress (mean 43.94 Mbit/s) ——— Flow 2 egress (mean 10.66 Mbit/s)
- - - Flow 3 ingress (mean 10.42 Mbit/s) ——— Flow 3 egress (mean 3.32 Mbit/s)

• Flow 1 (95th percentile 85.06 ms)   • Flow 2 (95th percentile 84.77 ms)   • Flow 3 (95th percentile 83.39 ms)

```
Run 2: Statistics of Copa

Start at: 2018-12-20 02:04:50
End at: 2018-12-20 02:05:20
Local clock offset: -0.772 ms
Remote clock offset: 6.982 ms


# Below is generated by plot.py at 2018-12-20 03:36:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.19 Mbit/s
95th percentile per-packet one-way delay: 84.472 ms
Loss rate: 76.29%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 83.437 ms
Loss rate: 97.24%
-- Flow 2:
Average throughput: 10.17 Mbit/s
95th percentile per-packet one-way delay: 84.775 ms
Loss rate: 75.75%
-- Flow 3:
Average throughput: 4.28 Mbit/s
95th percentile per-packet one-way delay: 83.119 ms
Loss rate: 78.56%
```
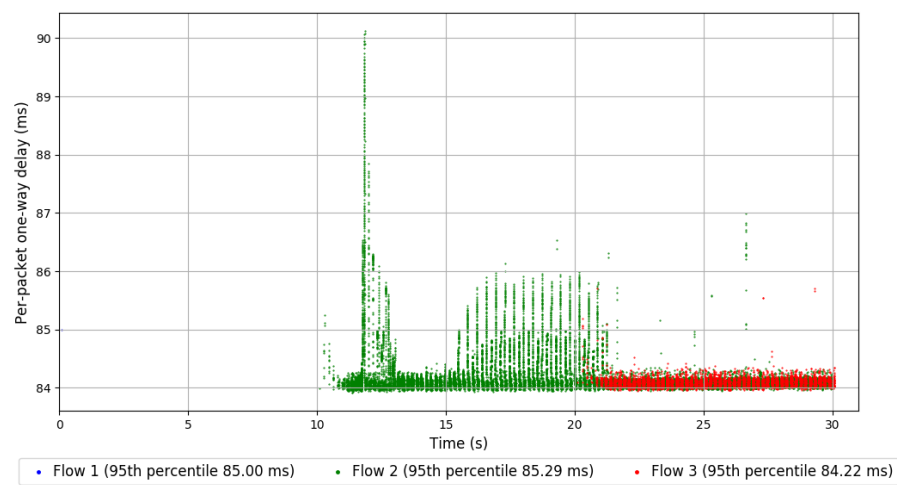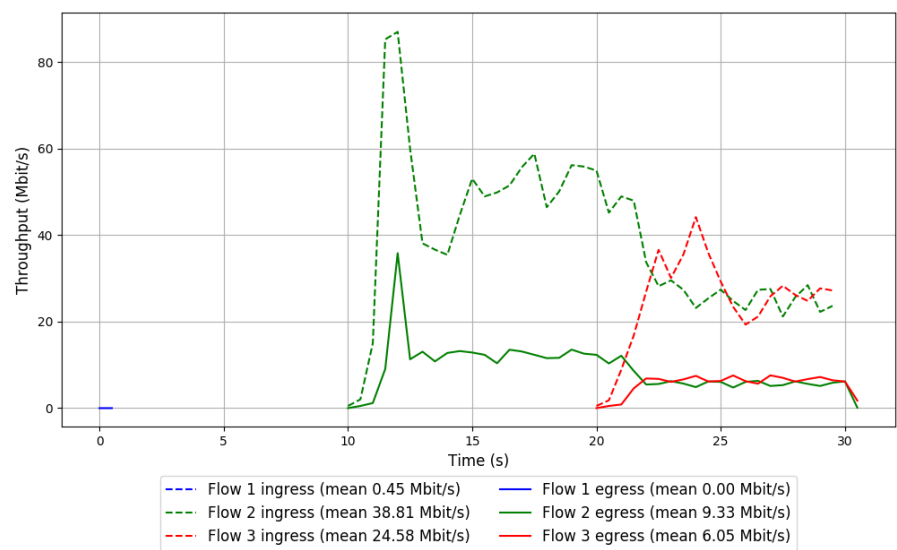
Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-12-20 02:28:52
End at: 2018-12-20 02:29:22
Local clock offset: -7.183 ms
Remote clock offset: 0.662 ms


# Below is generated by plot.py at 2018-12-20 03:36:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.20 Mbit/s
95th percentile per-packet one-way delay: 80.649 ms
Loss rate: 76.06%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 79.839 ms
Loss rate: 98.60%
-- Flow 2:
Average throughput: 12.01 Mbit/s
95th percentile per-packet one-way delay: 80.655 ms
Loss rate: 76.34%
-- Flow 3:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 79.819 ms
Loss rate: 56.04%
```

Run 3: Report of Copa — Data Link

```
Run 4: Statistics of Copa

Start at: 2018-12-20 02:52:56
End at: 2018-12-20 02:53:26
Local clock offset: -7.14 ms
Remote clock offset: 3.11 ms


# Below is generated by plot.py at 2018-12-20 03:36:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.20 Mbit/s
95th percentile per-packet one-way delay: 85.075 ms
Loss rate: 75.84%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 84.997 ms
Loss rate: 98.80%
-- Flow 2:
Average throughput: 9.33 Mbit/s
95th percentile per-packet one-way delay: 85.288 ms
Loss rate: 75.97%
-- Flow 3:
Average throughput: 6.05 Mbit/s
95th percentile per-packet one-way delay: 84.225 ms
Loss rate: 75.41%
```
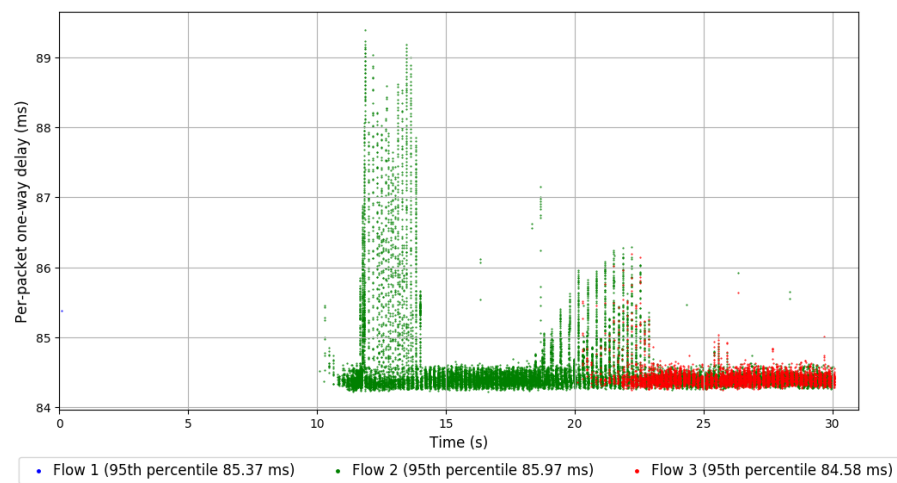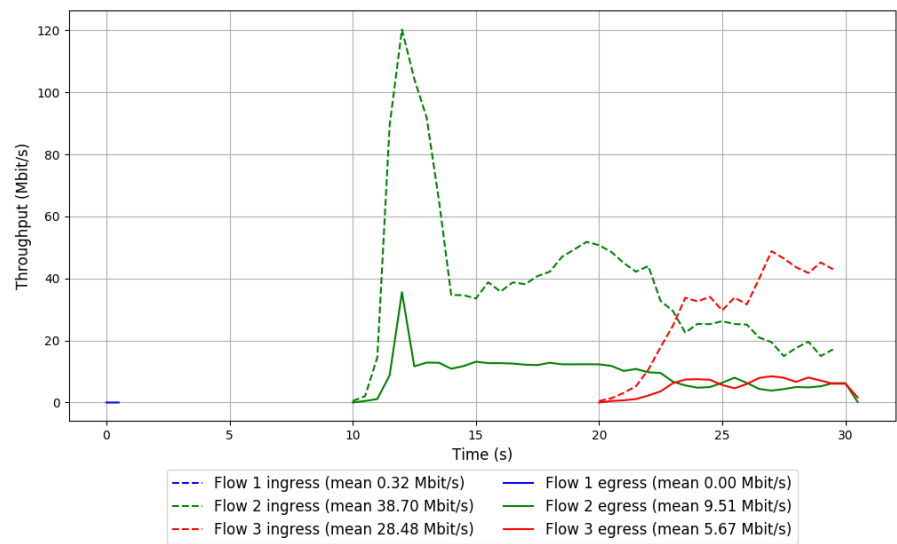
Run 4: Report of Copa — Data Link

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```
Run 5: Statistics of Copa

Start at: 2018-12-20 03:16:59
End at: 2018-12-20 03:17:29
Local clock offset: -6.91 ms
Remote clock offset: 0.965 ms


# Below is generated by plot.py at 2018-12-20 03:36:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.20 Mbit/s
95th percentile per-packet one-way delay: 85.681 ms
Loss rate: 76.68%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 85.374 ms
Loss rate: 98.33%
-- Flow 2:
Average throughput: 9.51 Mbit/s
95th percentile per-packet one-way delay: 85.965 ms
Loss rate: 75.42%
-- Flow 3:
Average throughput: 5.67 Mbit/s
95th percentile per-packet one-way delay: 84.584 ms
Loss rate: 80.10%
```
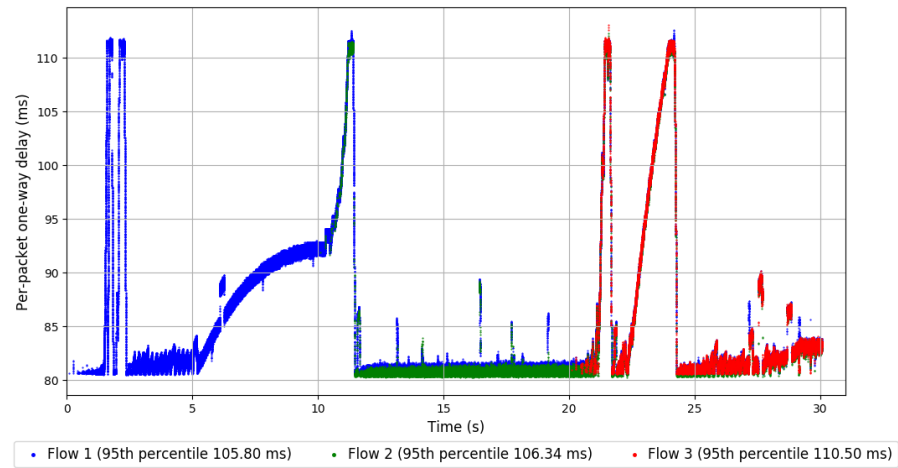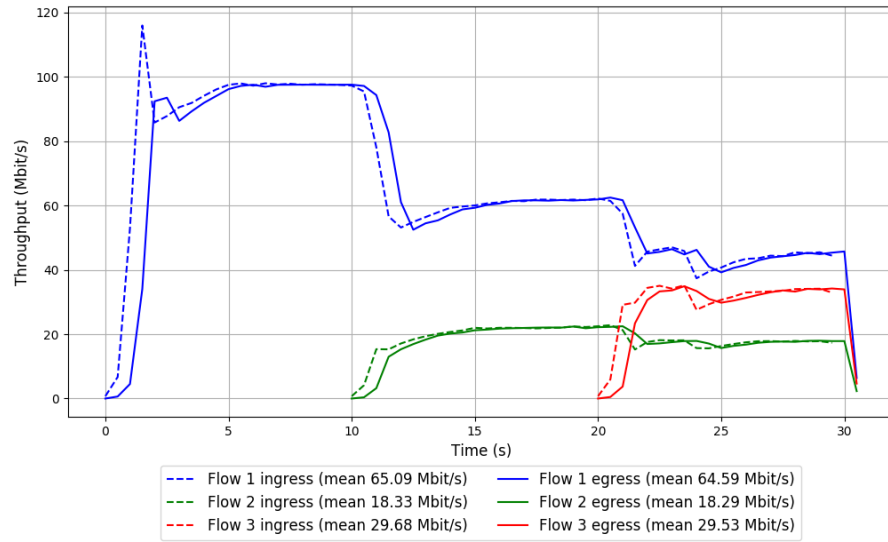
Run 5: Report of Copa — Data Link

- - - Flow 1 ingress (mean 0.32 Mbit/s) ——— Flow 1 egress (mean 0.00 Mbit/s)
- - - Flow 2 ingress (mean 38.70 Mbit/s) ——— Flow 2 egress (mean 9.51 Mbit/s)
- - - Flow 3 ingress (mean 28.48 Mbit/s) ——— Flow 3 egress (mean 5.67 Mbit/s)

• Flow 1 (95th percentile 85.37 ms)   • Flow 2 (95th percentile 85.97 ms)   • Flow 3 (95th percentile 84.58 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2018-12-20 01:38:17
End at: 2018-12-20 01:38:47
Local clock offset: -0.554 ms
Remote clock offset: 7.155 ms


# Below is generated by plot.py at 2018-12-20 03:36:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.58 Mbit/s
95th percentile per-packet one-way delay: 107.296 ms
Loss rate: 0.65%
-- Flow 1:
Average throughput: 64.59 Mbit/s
95th percentile per-packet one-way delay: 105.802 ms
Loss rate: 0.76%
-- Flow 2:
Average throughput: 18.29 Mbit/s
95th percentile per-packet one-way delay: 106.344 ms
Loss rate: 0.22%
-- Flow 3:
Average throughput: 29.53 Mbit/s
95th percentile per-packet one-way delay: 110.501 ms
Loss rate: 0.48%
```
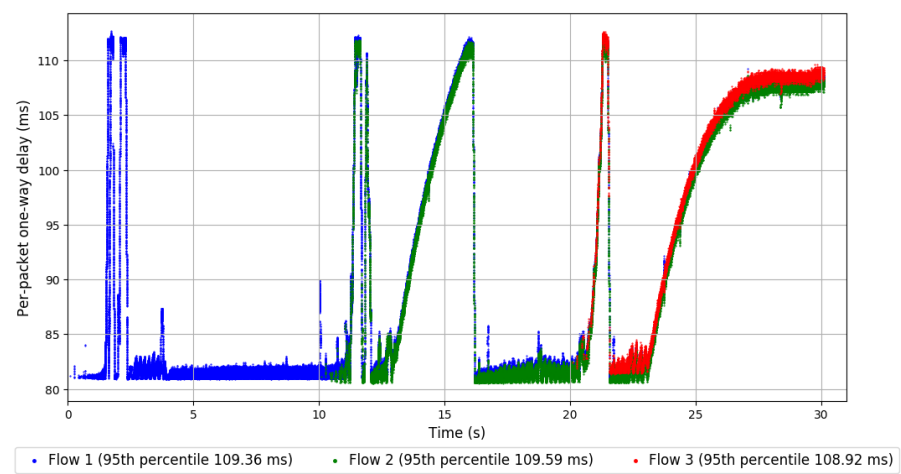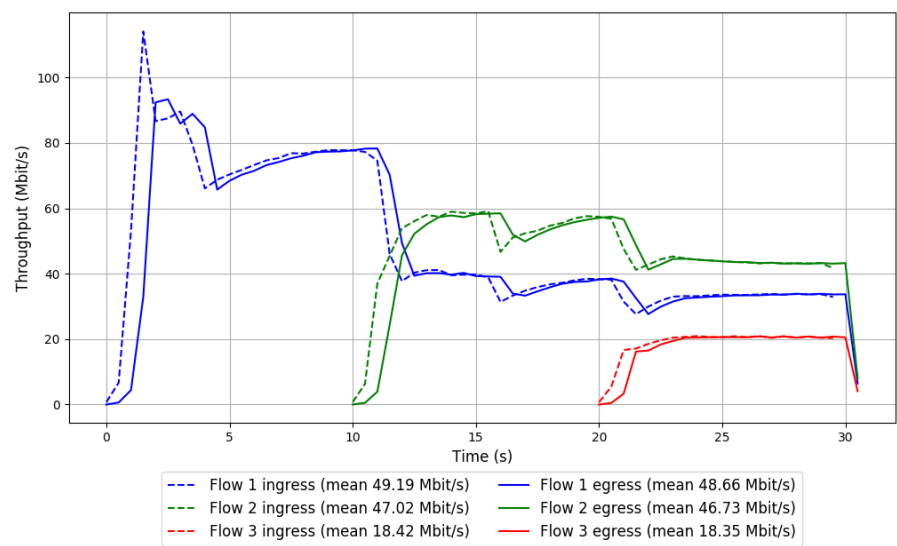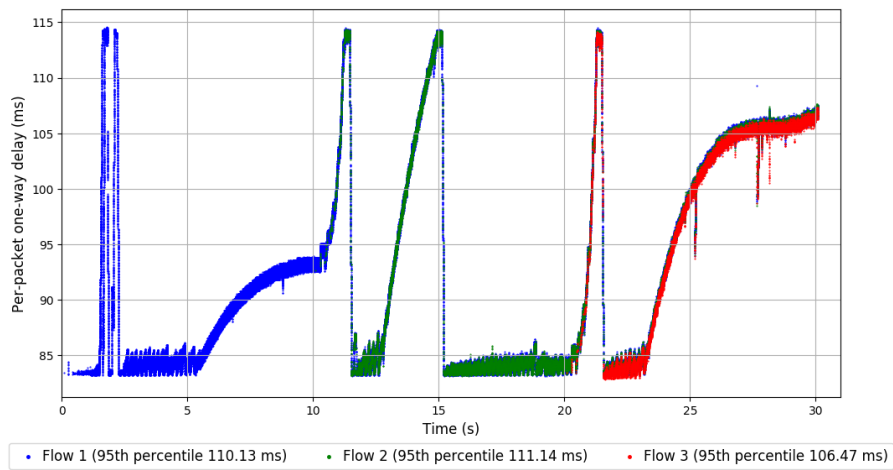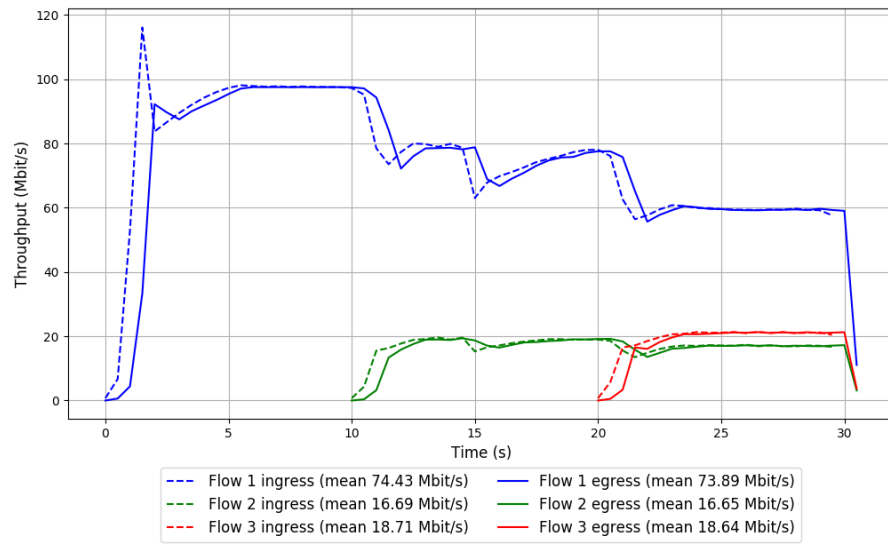
Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 65.09 Mbit/s) ---- Flow 1 egress (mean 64.59 Mbit/s)
Flow 2 ingress (mean 18.33 Mbit/s) ---- Flow 2 egress (mean 18.29 Mbit/s)
Flow 3 ingress (mean 29.68 Mbit/s) ---- Flow 3 egress (mean 29.53 Mbit/s)

Flow 1 (95th percentile 105.80 ms)   Flow 2 (95th percentile 106.34 ms)   Flow 3 (95th percentile 110.50 ms)

26

```
Run 2: Statistics of TCP Cubic

Start at: 2018-12-20 02:02:21
End at: 2018-12-20 02:02:51
Local clock offset: -0.831 ms
Remote clock offset: 4.546 ms


# Below is generated by plot.py at 2018-12-20 03:36:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 85.91 Mbit/s
95th percentile per-packet one-way delay: 109.273 ms
Loss rate: 0.75%
-- Flow 1:
Average throughput: 48.66 Mbit/s
95th percentile per-packet one-way delay: 109.365 ms
Loss rate: 1.00%
-- Flow 2:
Average throughput: 46.73 Mbit/s
95th percentile per-packet one-way delay: 109.593 ms
Loss rate: 0.48%
-- Flow 3:
Average throughput: 18.35 Mbit/s
95th percentile per-packet one-way delay: 108.918 ms
Loss rate: 0.10%
```
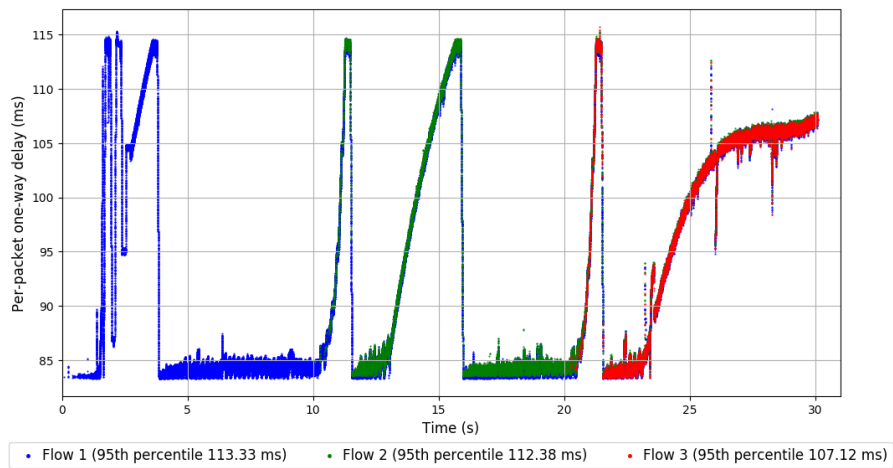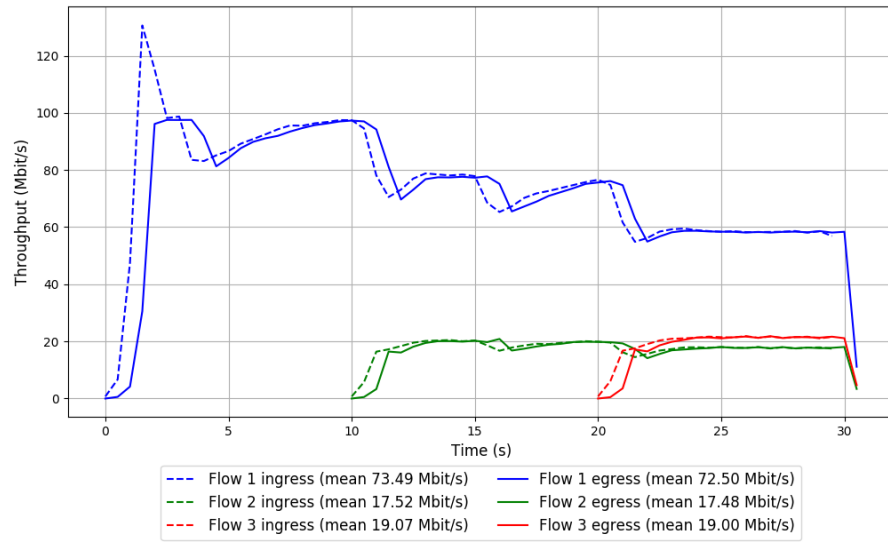
Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 49.19 Mbit/s) --- Flow 1 egress (mean 48.66 Mbit/s)
Flow 2 ingress (mean 47.02 Mbit/s) --- Flow 2 egress (mean 46.73 Mbit/s)
Flow 3 ingress (mean 18.42 Mbit/s) --- Flow 3 egress (mean 18.35 Mbit/s)

Flow 1 (95th percentile 109.36 ms) Flow 2 (95th percentile 109.59 ms) Flow 3 (95th percentile 108.92 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2018-12-20 02:26:23
End at: 2018-12-20 02:26:53
Local clock offset: -6.95 ms
Remote clock offset: 4.806 ms


# Below is generated by plot.py at 2018-12-20 03:36:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.18 Mbit/s
95th percentile per-packet one-way delay: 110.022 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 73.89 Mbit/s
95th percentile per-packet one-way delay: 110.127 ms
Loss rate: 0.66%
-- Flow 2:
Average throughput: 16.65 Mbit/s
95th percentile per-packet one-way delay: 111.137 ms
Loss rate: 0.18%
-- Flow 3:
Average throughput: 18.64 Mbit/s
95th percentile per-packet one-way delay: 106.471 ms
Loss rate: 0.12%
```
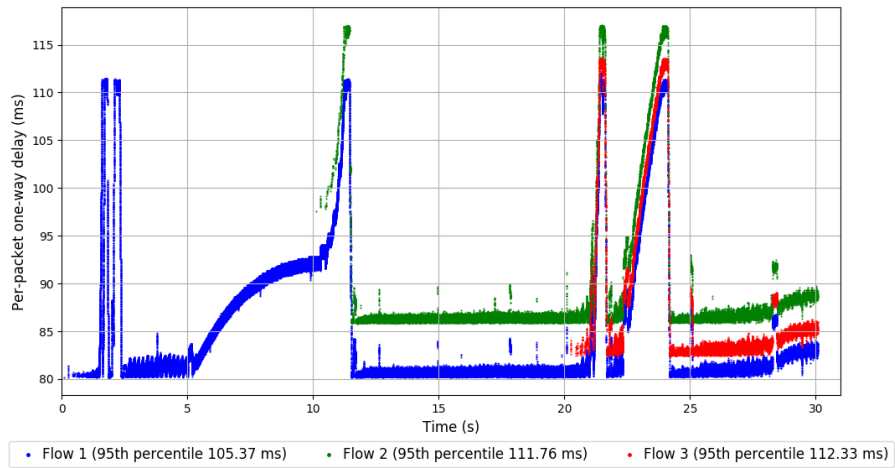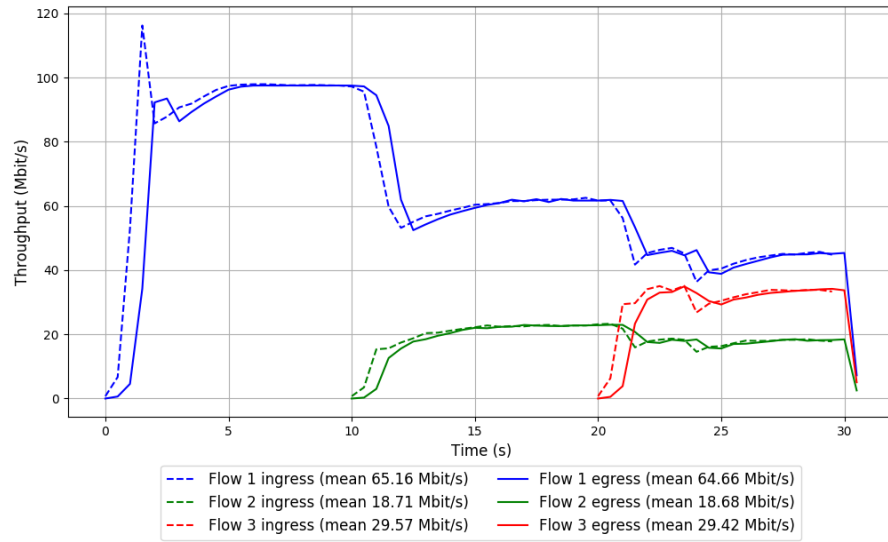
Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 74.43 Mbit/s) --- Flow 1 egress (mean 73.89 Mbit/s)
Flow 2 ingress (mean 16.69 Mbit/s) --- Flow 2 egress (mean 16.65 Mbit/s)
Flow 3 ingress (mean 18.71 Mbit/s) --- Flow 3 egress (mean 18.64 Mbit/s)

Flow 1 (95th percentile 110.13 ms) · Flow 2 (95th percentile 111.14 ms) · Flow 3 (95th percentile 106.47 ms)

```
Run 4: Statistics of TCP Cubic

Start at: 2018-12-20 02:50:26
End at: 2018-12-20 02:50:56
Local clock offset: -7.161 ms
Remote clock offset: 2.71 ms


# Below is generated by plot.py at 2018-12-20 03:37:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 90.48 Mbit/s
95th percentile per-packet one-way delay: 113.190 ms
Loss rate: 1.04%
-- Flow 1:
Average throughput: 72.50 Mbit/s
95th percentile per-packet one-way delay: 113.335 ms
Loss rate: 1.27%
-- Flow 2:
Average throughput: 17.48 Mbit/s
95th percentile per-packet one-way delay: 112.381 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 19.00 Mbit/s
95th percentile per-packet one-way delay: 107.116 ms
Loss rate: 0.13%
```
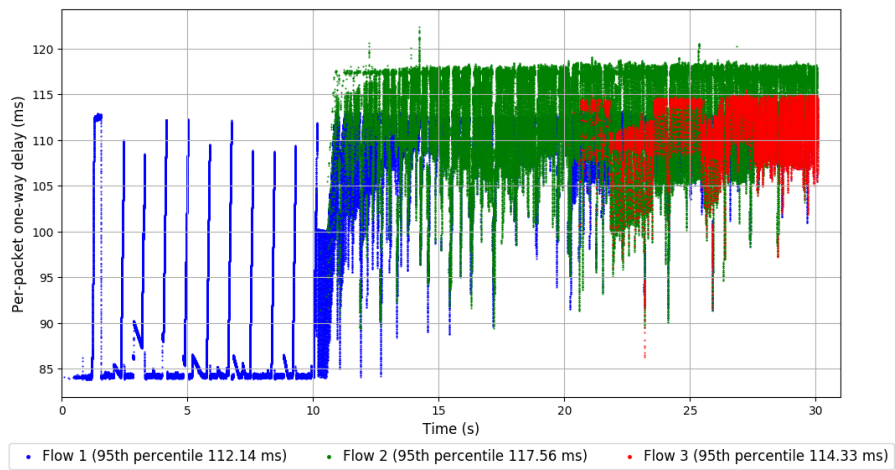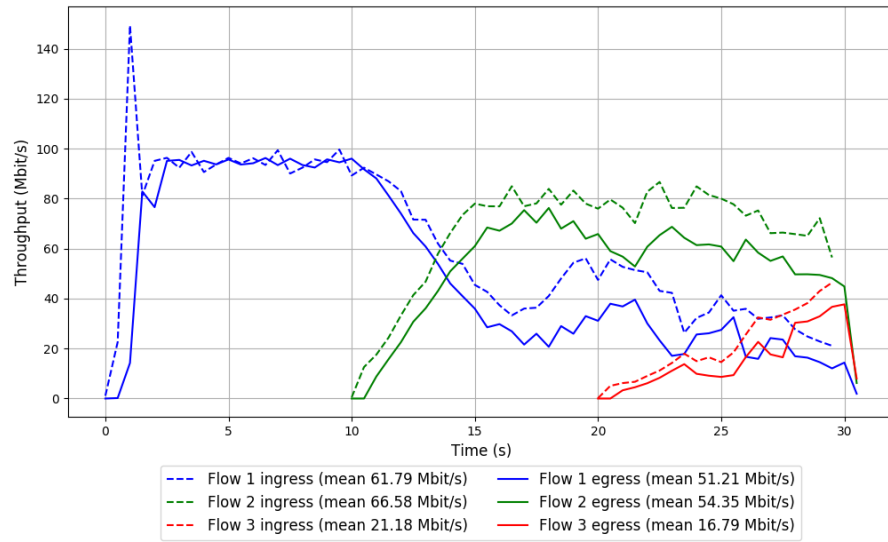
Run 4: Report of TCP Cubic — Data Link

- - - - Flow 1 ingress (mean 73.49 Mbit/s)   —— Flow 1 egress (mean 72.50 Mbit/s)
- - - - Flow 2 ingress (mean 17.52 Mbit/s)   —— Flow 2 egress (mean 17.48 Mbit/s)
- - - - Flow 3 ingress (mean 19.07 Mbit/s)   —— Flow 3 egress (mean 19.00 Mbit/s)

- Flow 1 (95th percentile 113.33 ms)   • Flow 2 (95th percentile 112.38 ms)   • Flow 3 (95th percentile 107.12 ms)

```
Run 5: Statistics of TCP Cubic

Start at: 2018-12-20 03:14:29
End at: 2018-12-20 03:14:59
Local clock offset: -6.964 ms
Remote clock offset: -2.816 ms


# Below is generated by plot.py at 2018-12-20 03:37:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.88 Mbit/s
95th percentile per-packet one-way delay: 108.325 ms
Loss rate: 0.65%
-- Flow 1:
Average throughput: 64.66 Mbit/s
95th percentile per-packet one-way delay: 105.368 ms
Loss rate: 0.76%
-- Flow 2:
Average throughput: 18.68 Mbit/s
95th percentile per-packet one-way delay: 111.758 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 29.42 Mbit/s
95th percentile per-packet one-way delay: 112.330 ms
Loss rate: 0.51%
```
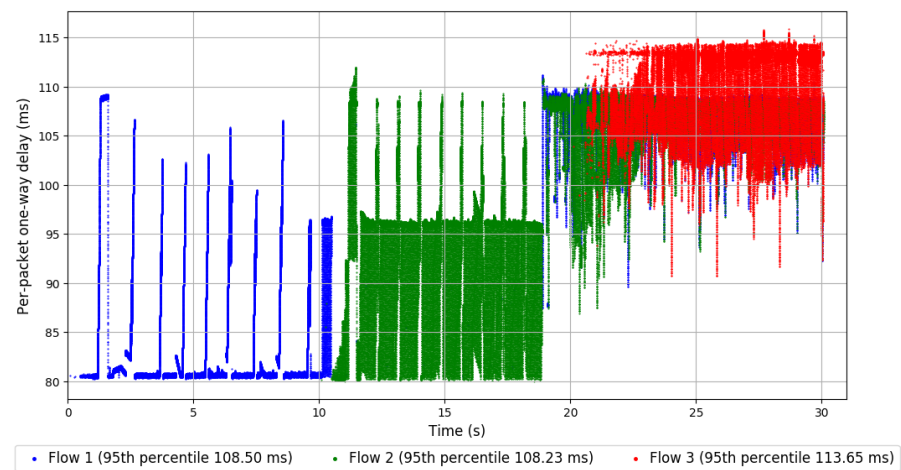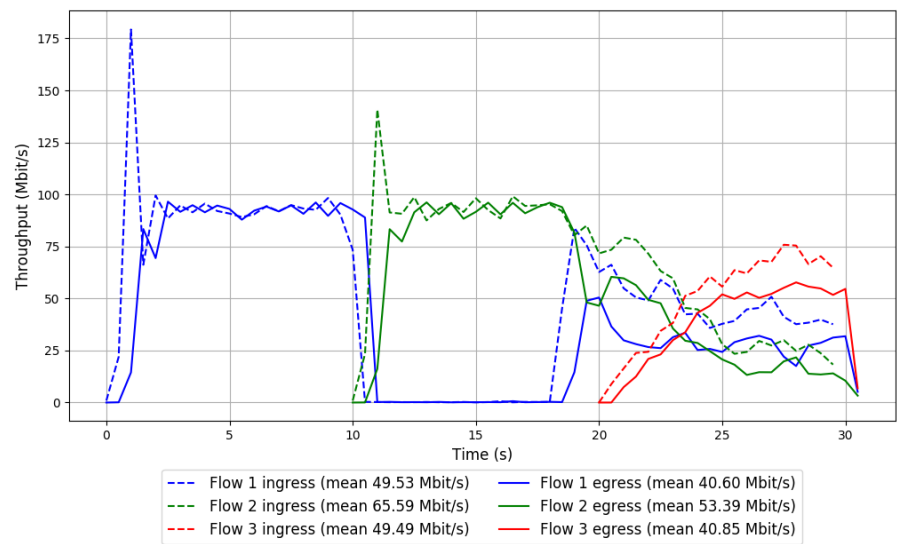
Run 5: Report of TCP Cubic — Data Link

```
Run 1: Statistics of FillP

Start at: 2018-12-20 01:54:38
End at: 2018-12-20 01:55:08
Local clock offset: -0.974 ms
Remote clock offset: 9.079 ms

# Below is generated by plot.py at 2018-12-20 03:37:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 92.93 Mbit/s
95th percentile per-packet one-way delay: 117.365 ms
Loss rate: 17.79%
-- Flow 1:
Average throughput: 51.21 Mbit/s
95th percentile per-packet one-way delay: 112.138 ms
Loss rate: 17.06%
-- Flow 2:
Average throughput: 54.35 Mbit/s
95th percentile per-packet one-way delay: 117.564 ms
Loss rate: 18.34%
-- Flow 3:
Average throughput: 16.79 Mbit/s
95th percentile per-packet one-way delay: 114.327 ms
Loss rate: 20.74%
```
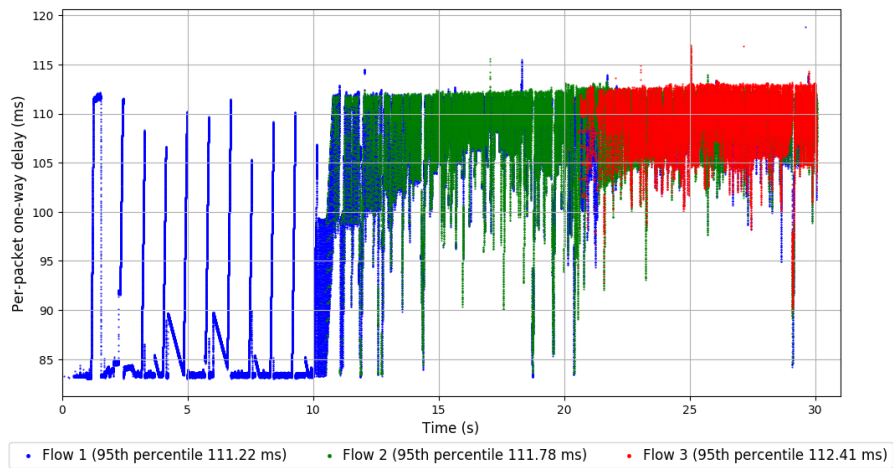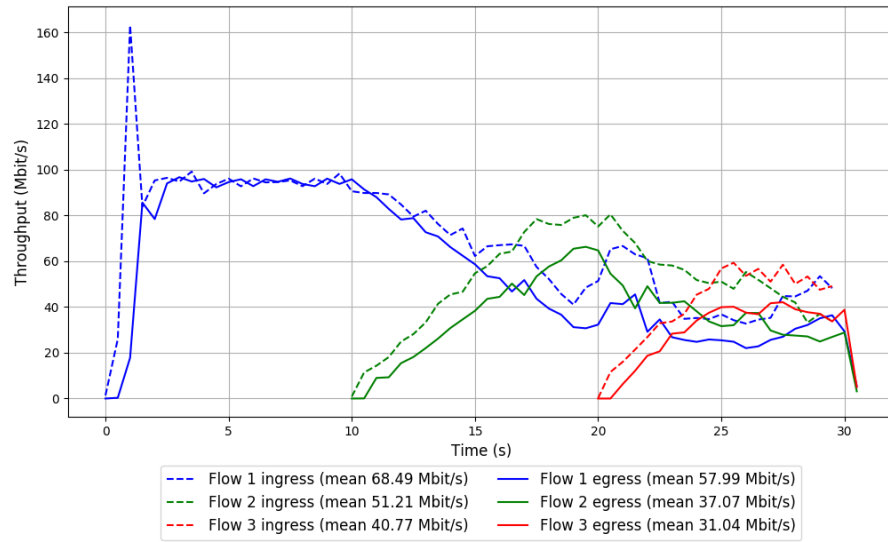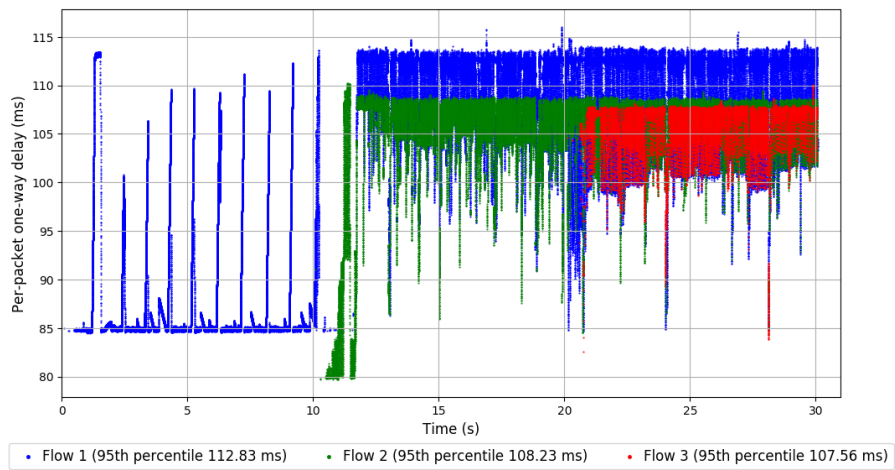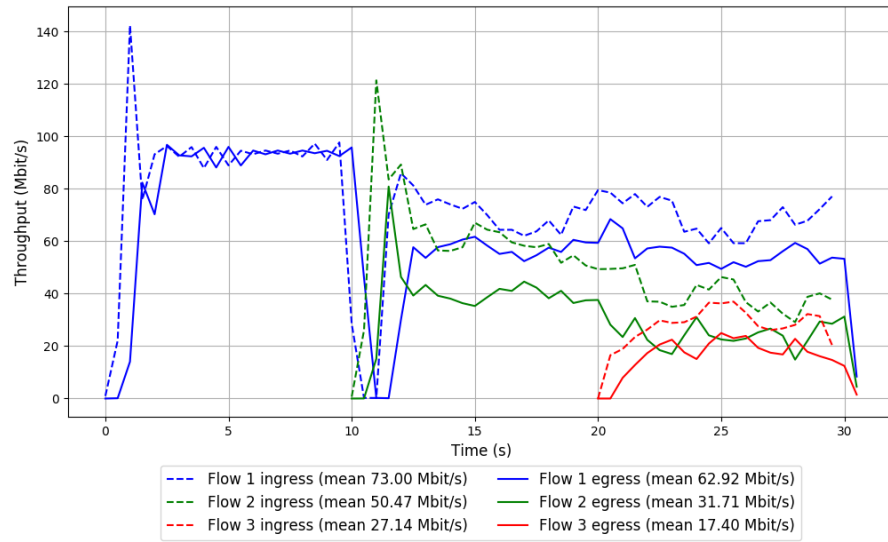
Run 1: Report of FillP — Data Link

```
Run 2: Statistics of FillP

Start at: 2018-12-20 02:18:41
End at: 2018-12-20 02:19:11
Local clock offset: -5.908 ms
Remote clock offset: 2.802 ms


# Below is generated by plot.py at 2018-12-20 03:37:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.69 Mbit/s
95th percentile per-packet one-way delay: 112.075 ms
Loss rate: 18.09%
-- Flow 1:
Average throughput: 40.60 Mbit/s
95th percentile per-packet one-way delay: 108.501 ms
Loss rate: 17.97%
-- Flow 2:
Average throughput: 53.39 Mbit/s
95th percentile per-packet one-way delay: 108.235 ms
Loss rate: 18.50%
-- Flow 3:
Average throughput: 40.85 Mbit/s
95th percentile per-packet one-way delay: 113.649 ms
Loss rate: 17.38%
```
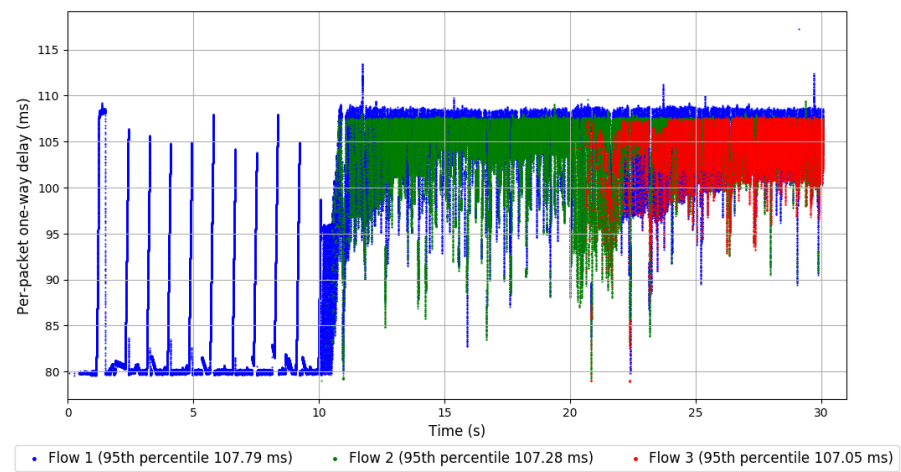
Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-12-20 02:42:44
End at: 2018-12-20 02:43:14
Local clock offset: -7.187 ms
Remote clock offset: 3.414 ms

# Below is generated by plot.py at 2018-12-20 03:37:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 92.92 Mbit/s
95th percentile per-packet one-way delay: 111.570 ms
Loss rate: 19.88%
-- Flow 1:
Average throughput: 57.99 Mbit/s
95th percentile per-packet one-way delay: 111.220 ms
Loss rate: 15.26%
-- Flow 2:
Average throughput: 37.07 Mbit/s
95th percentile per-packet one-way delay: 111.783 ms
Loss rate: 27.58%
-- Flow 3:
Average throughput: 31.04 Mbit/s
95th percentile per-packet one-way delay: 112.412 ms
Loss rate: 23.85%
```
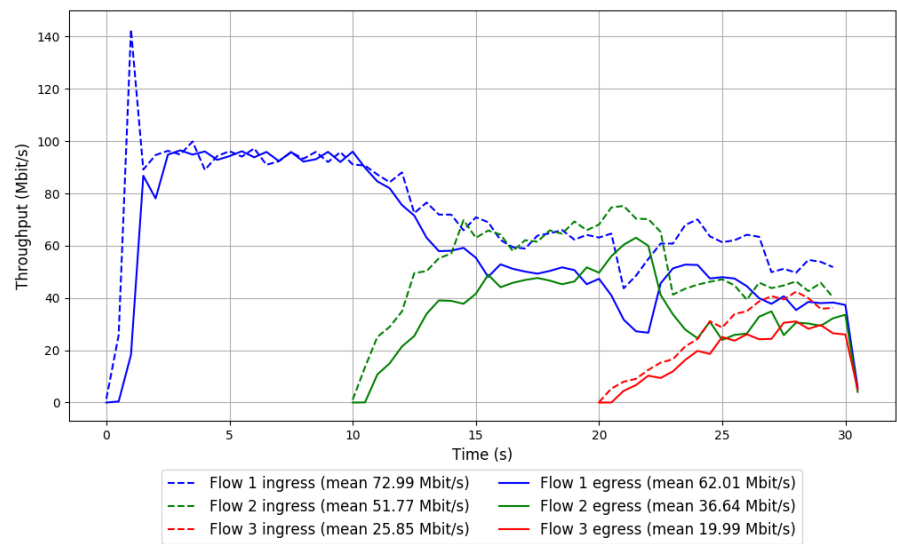
Run 3: Report of FillP — Data Link

```
Run 4: Statistics of FillP

Start at: 2018-12-20 03:06:46
End at: 2018-12-20 03:07:16
Local clock offset: -7.279 ms
Remote clock offset: -3.164 ms


# Below is generated by plot.py at 2018-12-20 03:37:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.79 Mbit/s
95th percentile per-packet one-way delay: 112.738 ms
Loss rate: 22.29%
-- Flow 1:
Average throughput: 62.92 Mbit/s
95th percentile per-packet one-way delay: 112.832 ms
Loss rate: 13.78%
-- Flow 2:
Average throughput: 31.71 Mbit/s
95th percentile per-packet one-way delay: 108.226 ms
Loss rate: 37.13%
-- Flow 3:
Average throughput: 17.40 Mbit/s
95th percentile per-packet one-way delay: 107.564 ms
Loss rate: 35.91%
```
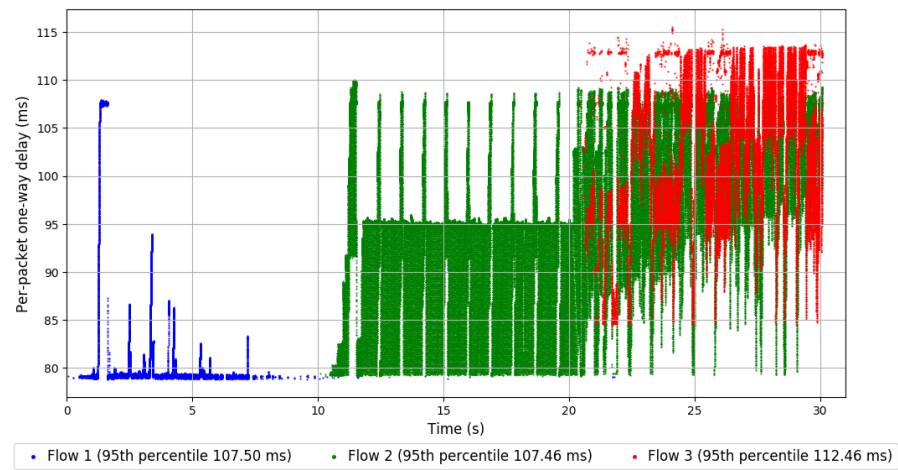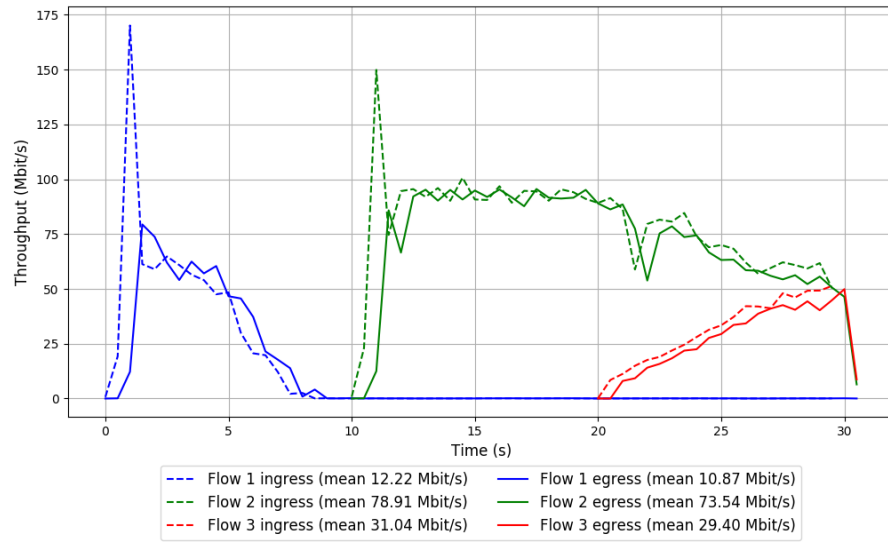
Run 4: Report of FillP — Data Link

Flow 1 ingress (mean 73.00 Mbit/s) --- Flow 1 egress (mean 62.92 Mbit/s) ——
Flow 2 ingress (mean 50.47 Mbit/s) --- Flow 2 egress (mean 31.71 Mbit/s) ——
Flow 3 ingress (mean 27.14 Mbit/s) --- Flow 3 egress (mean 17.40 Mbit/s) ——

Flow 1 (95th percentile 112.83 ms) • Flow 2 (95th percentile 108.23 ms) • Flow 3 (95th percentile 107.56 ms)

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```
Run 5: Statistics of FillP

Start at: 2018-12-20 03:30:48
End at: 2018-12-20 03:31:18
Local clock offset: -6.99 ms
Remote clock offset: -5.729 ms


# Below is generated by plot.py at 2018-12-20 03:38:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 93.00 Mbit/s
95th percentile per-packet one-way delay: 107.610 ms
Loss rate: 19.75%
-- Flow 1:
Average throughput: 62.01 Mbit/s
95th percentile per-packet one-way delay: 107.787 ms
Loss rate: 14.97%
-- Flow 2:
Average throughput: 36.64 Mbit/s
95th percentile per-packet one-way delay: 107.282 ms
Loss rate: 29.13%
-- Flow 3:
Average throughput: 19.99 Mbit/s
95th percentile per-packet one-way delay: 107.051 ms
Loss rate: 22.69%
```
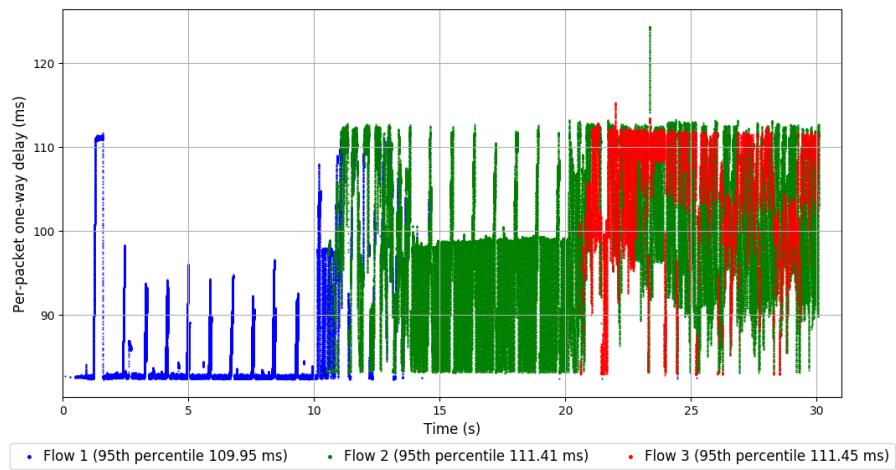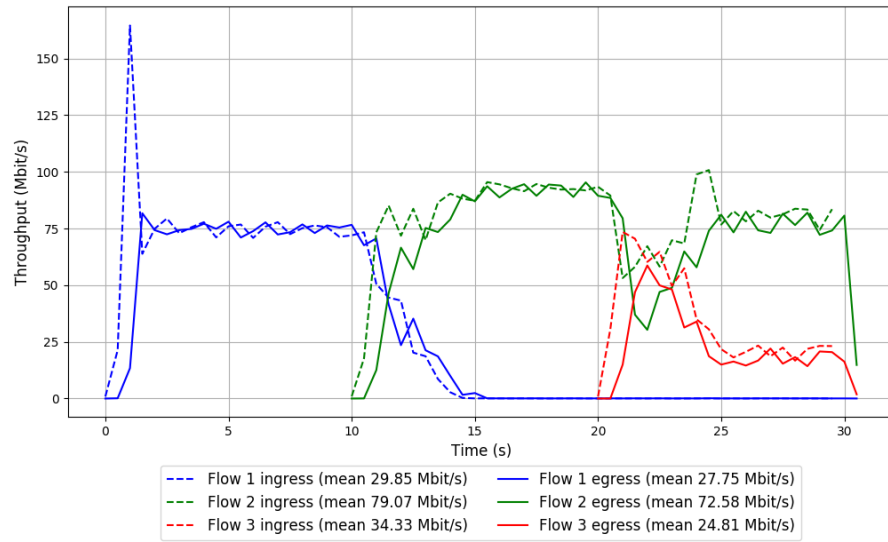
Run 5: Report of FillP — Data Link

Flow 1 ingress (mean 72.99 Mbit/s) --- Flow 1 egress (mean 62.01 Mbit/s)
Flow 2 ingress (mean 51.77 Mbit/s) --- Flow 2 egress (mean 36.64 Mbit/s)
Flow 3 ingress (mean 25.85 Mbit/s) --- Flow 3 egress (mean 19.99 Mbit/s)

Flow 1 (95th percentile 107.79 ms) • Flow 2 (95th percentile 107.28 ms) • Flow 3 (95th percentile 107.05 ms)

```
Run 1: Statistics of FillP-Sheep

Start at: 2018-12-20 01:43:16
End at: 2018-12-20 01:43:46
Local clock offset: -0.847 ms
Remote clock offset: 5.29 ms

# Below is generated by plot.py at 2018-12-20 03:38:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 69.62 Mbit/s
95th percentile per-packet one-way delay: 107.885 ms
Loss rate: 7.17%
-- Flow 1:
Average throughput: 10.87 Mbit/s
95th percentile per-packet one-way delay: 107.497 ms
Loss rate: 11.00%
-- Flow 2:
Average throughput: 73.54 Mbit/s
95th percentile per-packet one-way delay: 107.461 ms
Loss rate: 6.69%
-- Flow 3:
Average throughput: 29.40 Mbit/s
95th percentile per-packet one-way delay: 112.462 ms
Loss rate: 5.08%
```
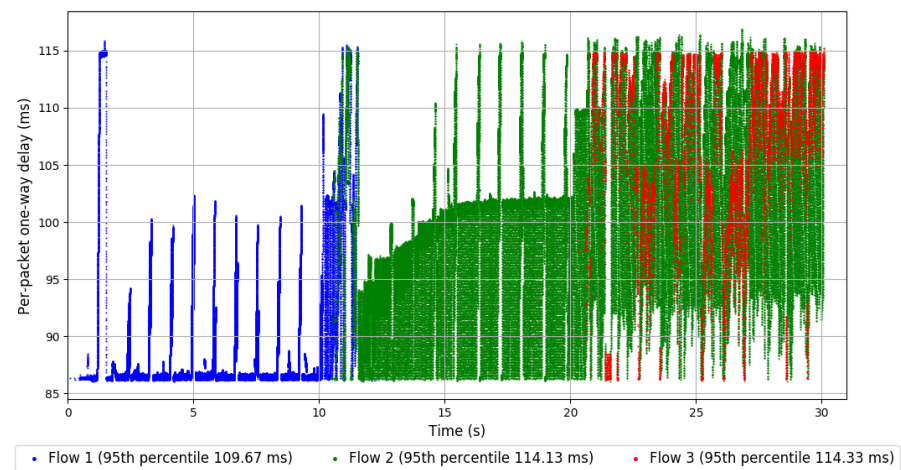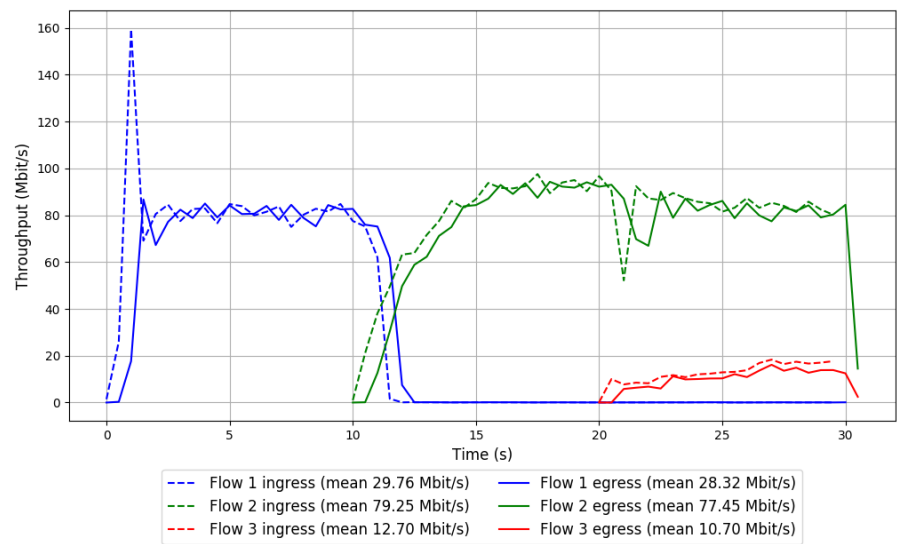
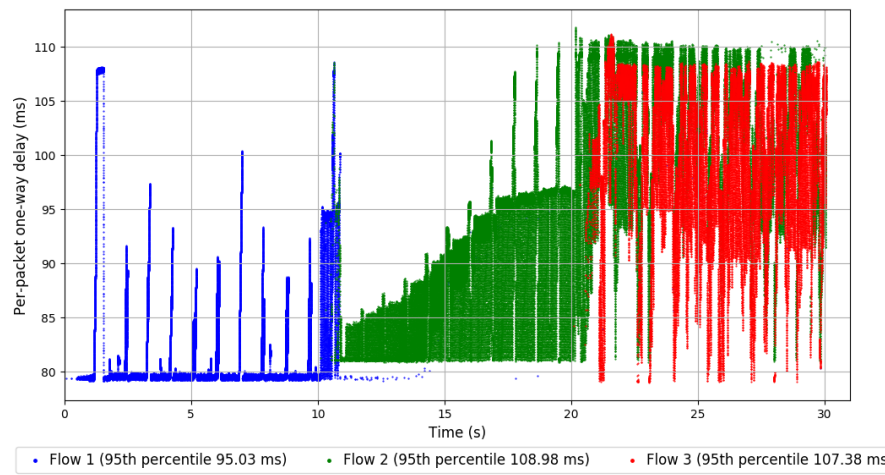Run 1: Report of FillP-Sheep — Data Link

```
Run 2: Statistics of FillP-Sheep

Start at: 2018-12-20 02:07:18
End at: 2018-12-20 02:07:48
Local clock offset: -2.03 ms
Remote clock offset: 6.497 ms


# Below is generated by plot.py at 2018-12-20 03:38:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 84.29 Mbit/s
95th percentile per-packet one-way delay: 111.271 ms
Loss rate: 10.09%
-- Flow 1:
Average throughput: 27.75 Mbit/s
95th percentile per-packet one-way delay: 109.952 ms
Loss rate: 6.97%
-- Flow 2:
Average throughput: 72.58 Mbit/s
95th percentile per-packet one-way delay: 111.412 ms
Loss rate: 8.07%
-- Flow 3:
Average throughput: 24.81 Mbit/s
95th percentile per-packet one-way delay: 111.450 ms
Loss rate: 27.62%
```

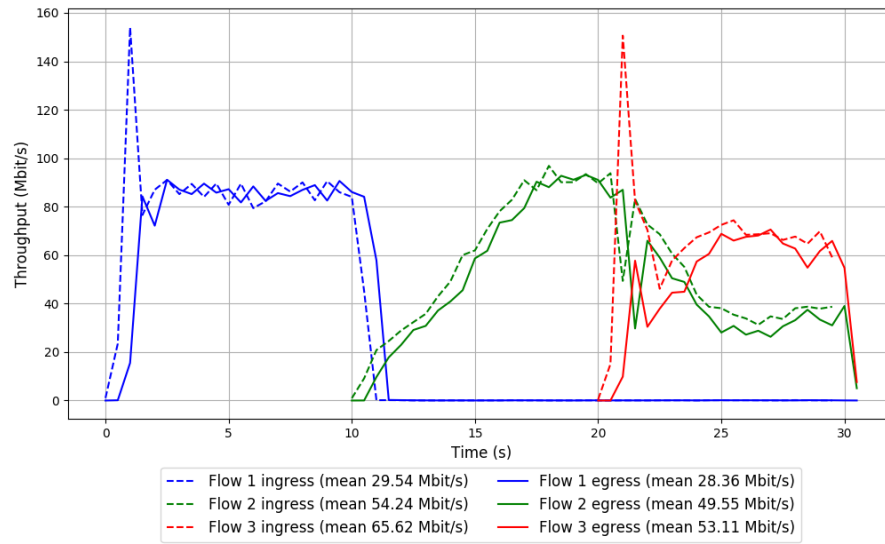Run 2: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 29.85 Mbit/s) --- Flow 1 egress (mean 27.75 Mbit/s)
Flow 2 ingress (mean 79.07 Mbit/s) --- Flow 2 egress (mean 72.58 Mbit/s)
Flow 3 ingress (mean 34.33 Mbit/s) --- Flow 3 egress (mean 24.81 Mbit/s)

Flow 1 (95th percentile 109.95 ms) Flow 2 (95th percentile 111.41 ms) Flow 3 (95th percentile 111.45 ms)

48

```
Run 3: Statistics of FillP-Sheep

Start at: 2018-12-20 02:31:20
End at: 2018-12-20 02:31:50
Local clock offset: -7.4 ms
Remote clock offset: 6.705 ms

# Below is generated by plot.py at 2018-12-20 03:38:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 83.38 Mbit/s
95th percentile per-packet one-way delay: 114.071 ms
Loss rate: 3.70%
-- Flow 1:
Average throughput: 28.32 Mbit/s
95th percentile per-packet one-way delay: 109.670 ms
Loss rate: 4.78%
-- Flow 2:
Average throughput: 77.45 Mbit/s
95th percentile per-packet one-way delay: 114.128 ms
Loss rate: 2.14%
-- Flow 3:
Average throughput: 10.70 Mbit/s
95th percentile per-packet one-way delay: 114.325 ms
Loss rate: 15.64%
```
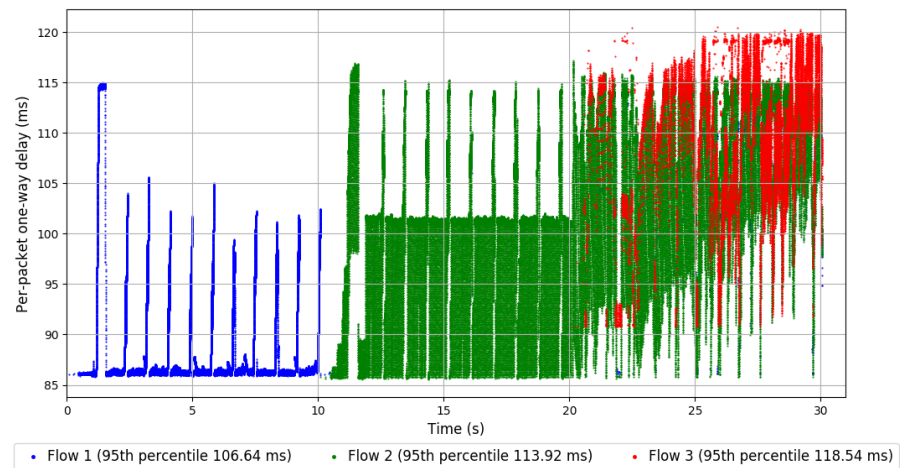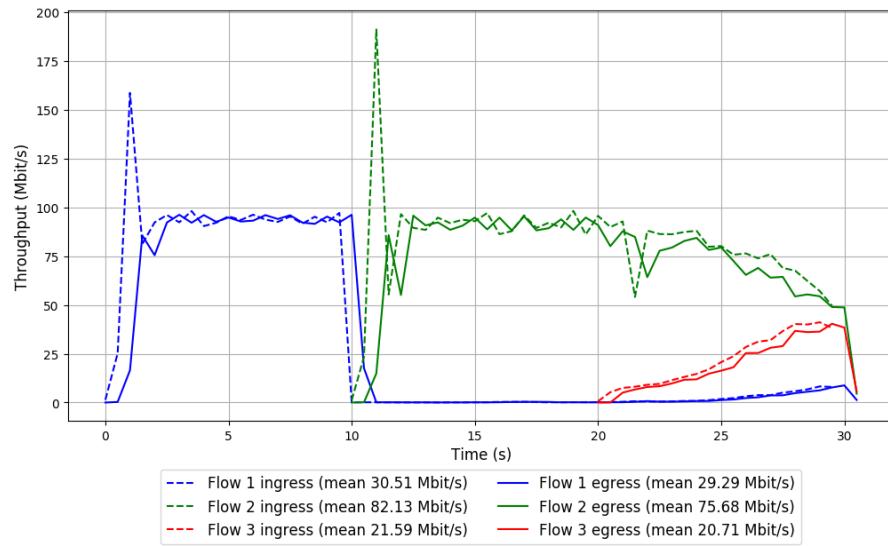
Run 3: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 29.76 Mbit/s) --- Flow 1 egress (mean 28.32 Mbit/s)
Flow 2 ingress (mean 79.25 Mbit/s) --- Flow 2 egress (mean 77.45 Mbit/s)
Flow 3 ingress (mean 12.70 Mbit/s) --- Flow 3 egress (mean 10.70 Mbit/s)

Flow 1 (95th percentile 109.67 ms)   Flow 2 (95th percentile 114.13 ms)   Flow 3 (95th percentile 114.33 ms)

50

```
Run 4: Statistics of FillP-Sheep

Start at: 2018-12-20 02:55:24
End at: 2018-12-20 02:55:54
Local clock offset: -7.159 ms
Remote clock offset: -1.999 ms


# Below is generated by plot.py at 2018-12-20 03:38:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 78.96 Mbit/s
95th percentile per-packet one-way delay: 107.818 ms
Loss rate: 9.56%
-- Flow 1:
Average throughput: 28.36 Mbit/s
95th percentile per-packet one-way delay: 95.029 ms
Loss rate: 3.94%
-- Flow 2:
Average throughput: 49.55 Mbit/s
95th percentile per-packet one-way delay: 108.982 ms
Loss rate: 8.52%
-- Flow 3:
Average throughput: 53.11 Mbit/s
95th percentile per-packet one-way delay: 107.376 ms
Loss rate: 18.91%
```
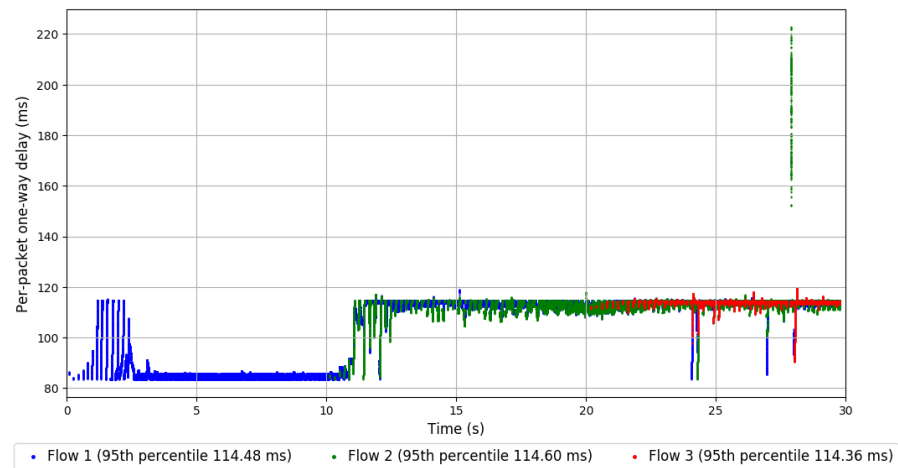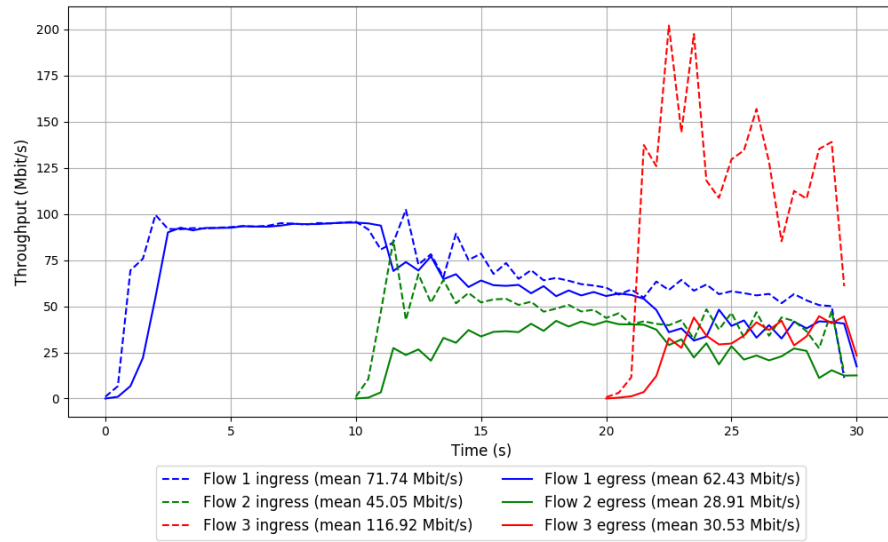
Run 4: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 29.54 Mbit/s) --- Flow 1 egress (mean 28.36 Mbit/s)
Flow 2 ingress (mean 54.24 Mbit/s) --- Flow 2 egress (mean 49.55 Mbit/s)
Flow 3 ingress (mean 65.62 Mbit/s) --- Flow 3 egress (mean 53.11 Mbit/s)

Flow 1 (95th percentile 95.03 ms) · Flow 2 (95th percentile 108.98 ms) · Flow 3 (95th percentile 107.38 ms)

```
Run 5: Statistics of FillP-Sheep

Start at: 2018-12-20 03:19:26
End at: 2018-12-20 03:19:56
Local clock offset: -6.992 ms
Remote clock offset: 1.844 ms

# Below is generated by plot.py at 2018-12-20 03:38:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.55 Mbit/s
95th percentile per-packet one-way delay: 114.080 ms
Loss rate: 6.23%
-- Flow 1:
Average throughput: 29.29 Mbit/s
95th percentile per-packet one-way delay: 106.645 ms
Loss rate: 3.97%
-- Flow 2:
Average throughput: 75.68 Mbit/s
95th percentile per-packet one-way delay: 113.923 ms
Loss rate: 7.80%
-- Flow 3:
Average throughput: 20.71 Mbit/s
95th percentile per-packet one-way delay: 118.543 ms
Loss rate: 3.94%
```
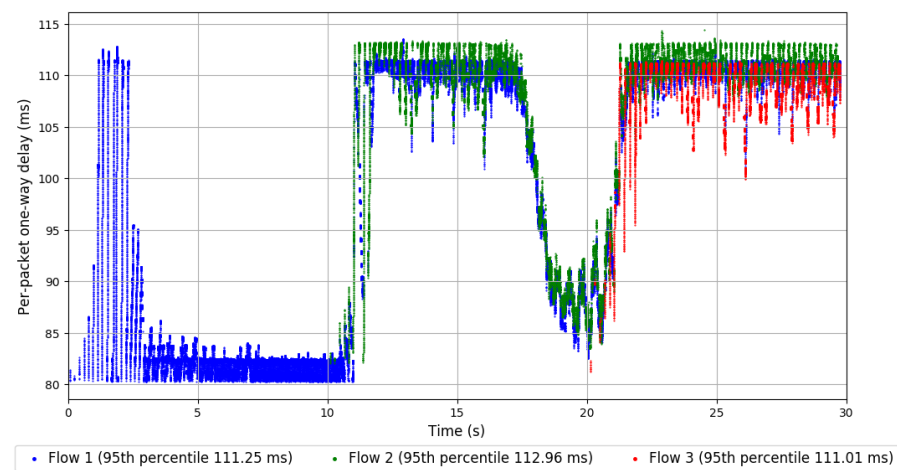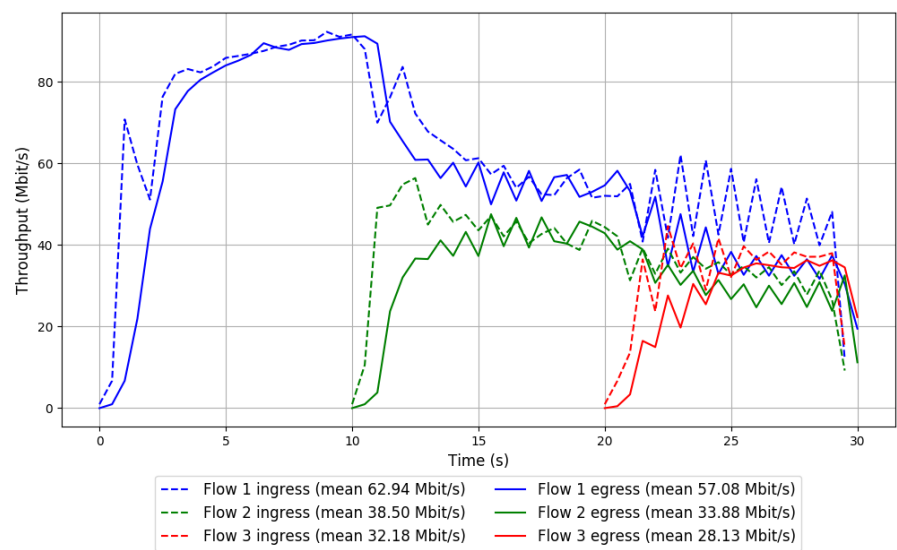
Run 5: Report of FillP-Sheep — Data Link

```
Run 1: Statistics of Indigo

Start at: 2018-12-20 01:55:56
End at: 2018-12-20 01:56:26
Local clock offset: -0.948 ms
Remote clock offset: 7.701 ms


# Below is generated by plot.py at 2018-12-20 03:38:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.41 Mbit/s
95th percentile per-packet one-way delay: 114.494 ms
Loss rate: 34.30%
-- Flow 1:
Average throughput: 62.43 Mbit/s
95th percentile per-packet one-way delay: 114.479 ms
Loss rate: 12.89%
-- Flow 2:
Average throughput: 28.91 Mbit/s
95th percentile per-packet one-way delay: 114.599 ms
Loss rate: 35.72%
-- Flow 3:
Average throughput: 30.53 Mbit/s
95th percentile per-packet one-way delay: 114.363 ms
Loss rate: 73.88%
```
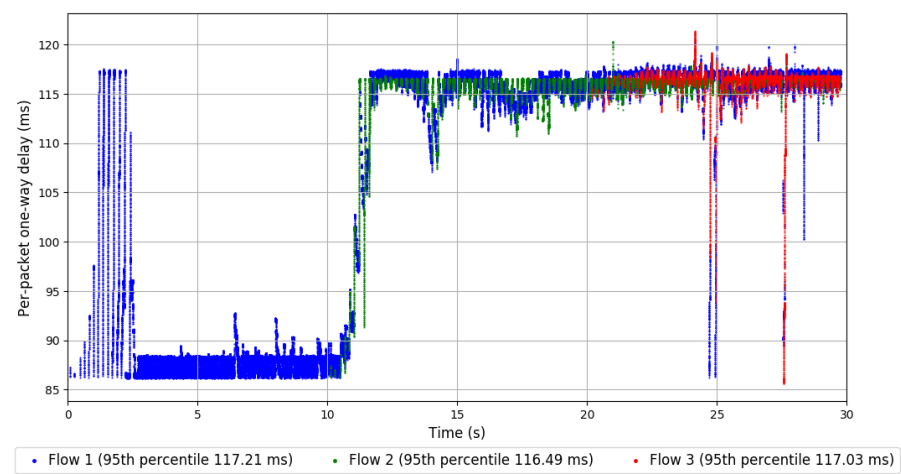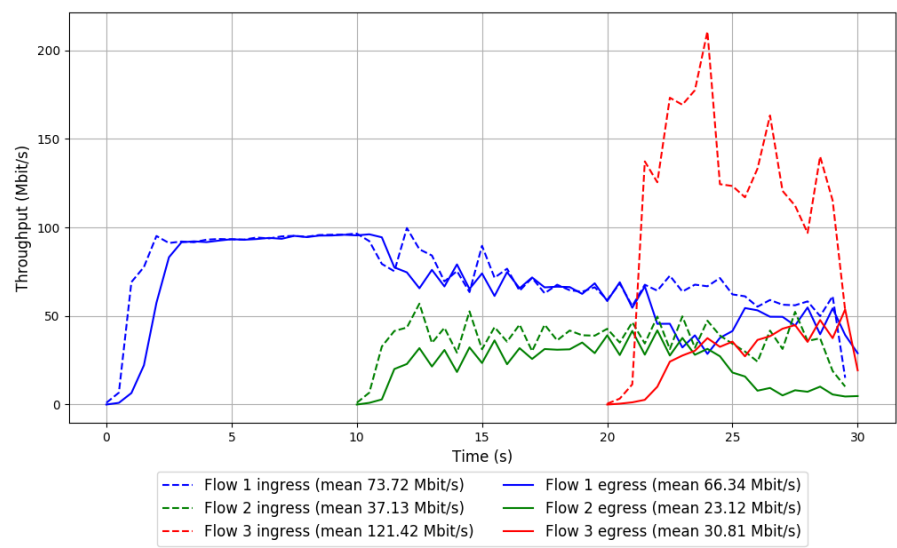
Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2018-12-20 02:19:58
End at: 2018-12-20 02:20:28
Local clock offset: -6.077 ms
Remote clock offset: 2.596 ms


# Below is generated by plot.py at 2018-12-20 03:38:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 88.55 Mbit/s
95th percentile per-packet one-way delay: 112.477 ms
Loss rate: 10.23%
-- Flow 1:
Average throughput: 57.08 Mbit/s
95th percentile per-packet one-way delay: 111.245 ms
Loss rate: 9.21%
-- Flow 2:
Average throughput: 33.88 Mbit/s
95th percentile per-packet one-way delay: 112.959 ms
Loss rate: 11.88%
-- Flow 3:
Average throughput: 28.13 Mbit/s
95th percentile per-packet one-way delay: 111.009 ms
Loss rate: 12.31%
```
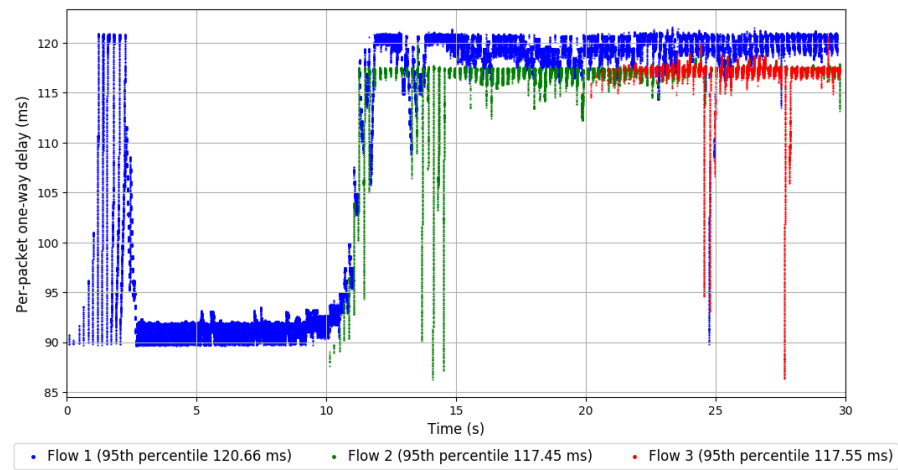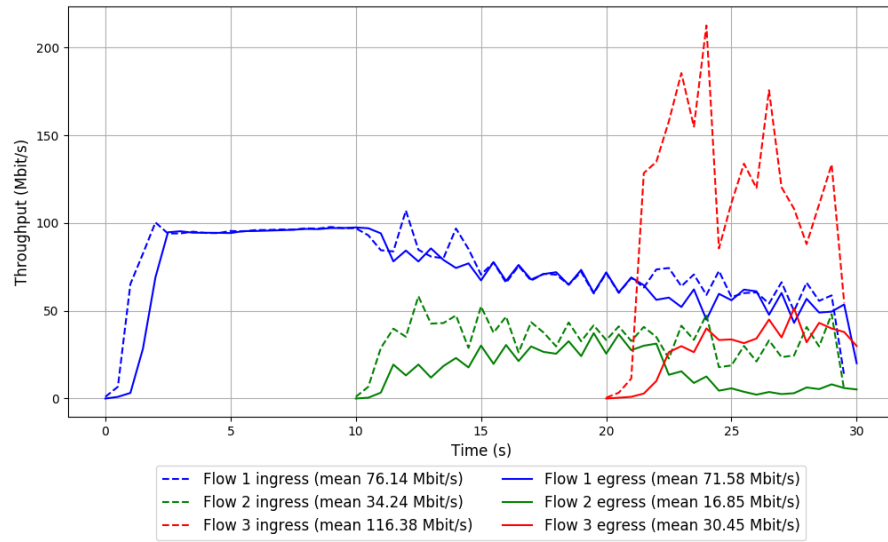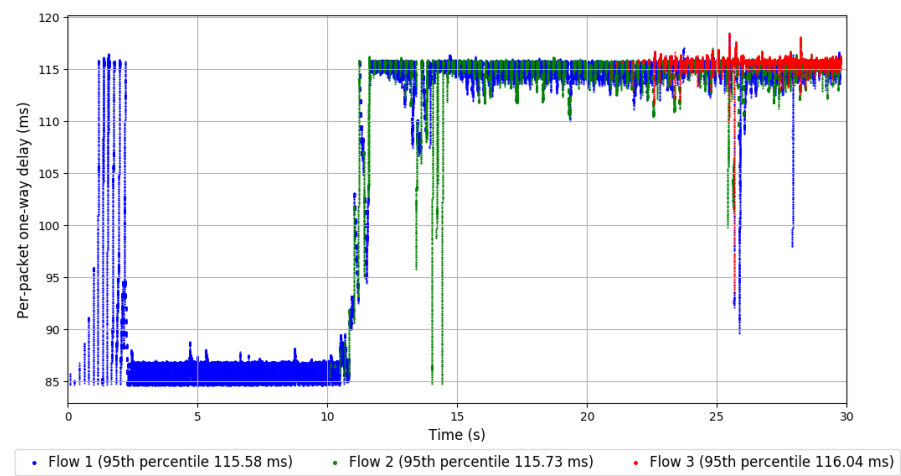
Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2018-12-20 02:44:01
End at: 2018-12-20 02:44:31
Local clock offset: -7.152 ms
Remote clock offset: 5.366 ms


# Below is generated by plot.py at 2018-12-20 03:39:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.48 Mbit/s
95th percentile per-packet one-way delay: 117.195 ms
Loss rate: 33.24%
-- Flow 1:
Average throughput: 66.34 Mbit/s
95th percentile per-packet one-way delay: 117.213 ms
Loss rate: 9.93%
-- Flow 2:
Average throughput: 23.12 Mbit/s
95th percentile per-packet one-way delay: 116.491 ms
Loss rate: 37.62%
-- Flow 3:
Average throughput: 30.81 Mbit/s
95th percentile per-packet one-way delay: 117.033 ms
Loss rate: 74.62%
```
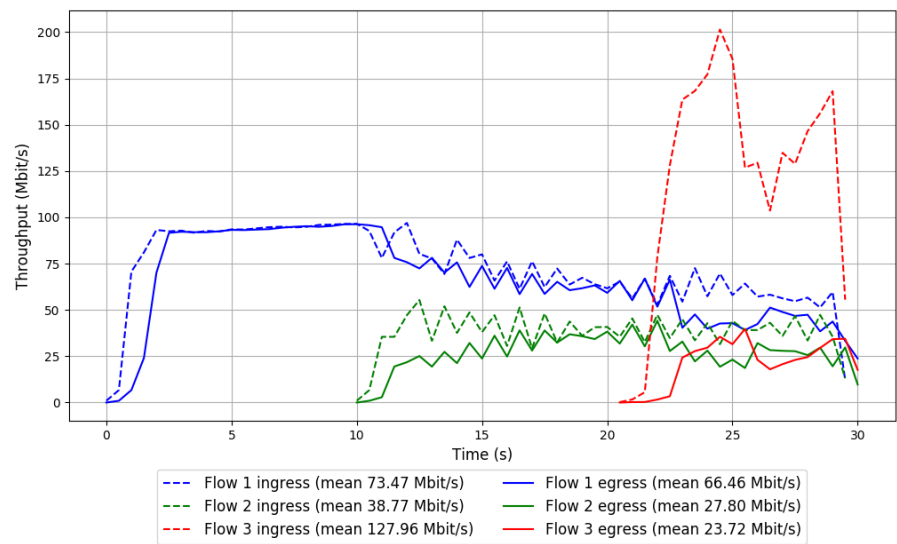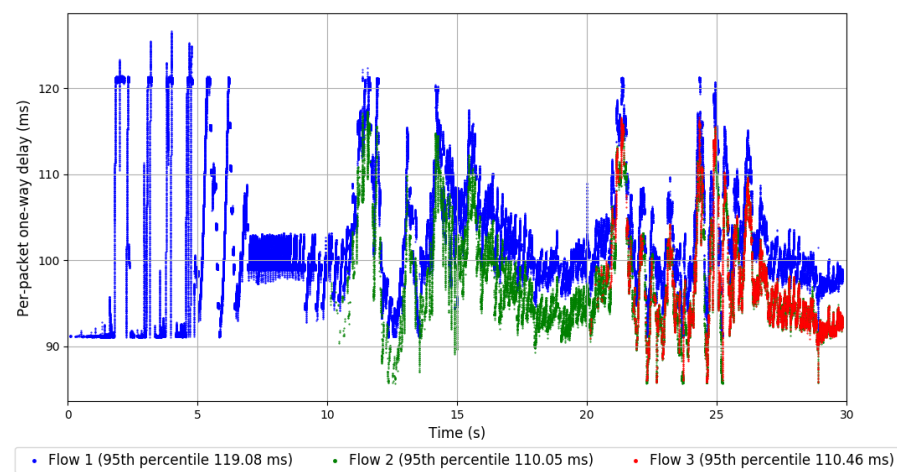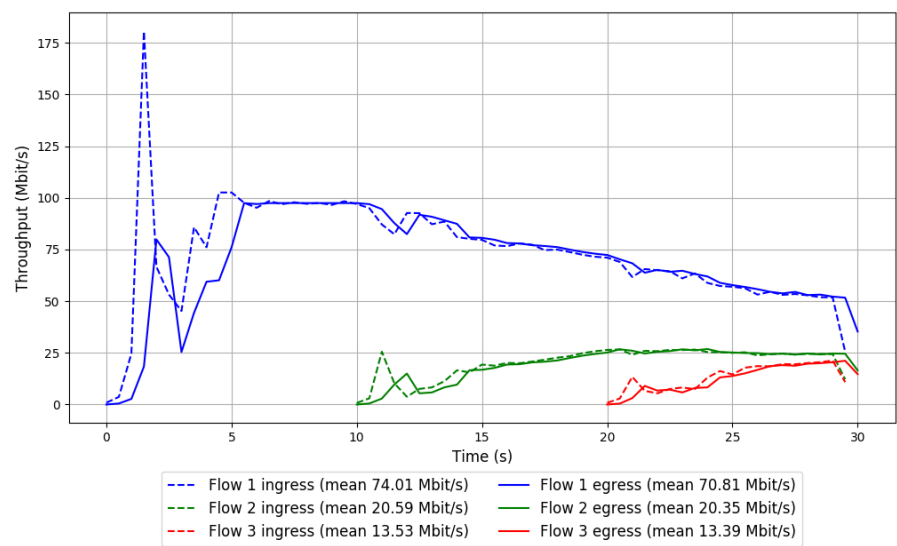
Run 3: Report of Indigo — Data Link

- - - Flow 1 ingress (mean 73.72 Mbit/s) —— Flow 1 egress (mean 66.34 Mbit/s)
- - - Flow 2 ingress (mean 37.13 Mbit/s) —— Flow 2 egress (mean 23.12 Mbit/s)
- - - Flow 3 ingress (mean 121.42 Mbit/s) —— Flow 3 egress (mean 30.81 Mbit/s)

• Flow 1 (95th percentile 117.21 ms)   • Flow 2 (95th percentile 116.49 ms)   • Flow 3 (95th percentile 117.03 ms)

60

```
Run 4: Statistics of Indigo

Start at: 2018-12-20 03:08:04
End at: 2018-12-20 03:08:34
Local clock offset: -7.267 ms
Remote clock offset: 1.619 ms


# Below is generated by plot.py at 2018-12-20 03:39:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 92.34 Mbit/s
95th percentile per-packet one-way delay: 120.648 ms
Loss rate: 32.11%
-- Flow 1:
Average throughput: 71.58 Mbit/s
95th percentile per-packet one-way delay: 120.660 ms
Loss rate: 5.88%
-- Flow 2:
Average throughput: 16.85 Mbit/s
95th percentile per-packet one-way delay: 117.452 ms
Loss rate: 50.70%
-- Flow 3:
Average throughput: 30.45 Mbit/s
95th percentile per-packet one-way delay: 117.545 ms
Loss rate: 73.83%
```

Run 4: Report of Indigo — Data Link

```
Run 5: Statistics of Indigo

Start at: 2018-12-20 03:32:06
End at: 2018-12-20 03:32:36
Local clock offset: -7.002 ms
Remote clock offset: -0.435 ms


# Below is generated by plot.py at 2018-12-20 03:39:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.87 Mbit/s
95th percentile per-packet one-way delay: 115.715 ms
Loss rate: 32.95%
-- Flow 1:
Average throughput: 66.46 Mbit/s
95th percentile per-packet one-way delay: 115.581 ms
Loss rate: 9.44%
-- Flow 2:
Average throughput: 27.80 Mbit/s
95th percentile per-packet one-way delay: 115.726 ms
Loss rate: 28.19%
-- Flow 3:
Average throughput: 23.72 Mbit/s
95th percentile per-packet one-way delay: 116.040 ms
Loss rate: 81.46%
```
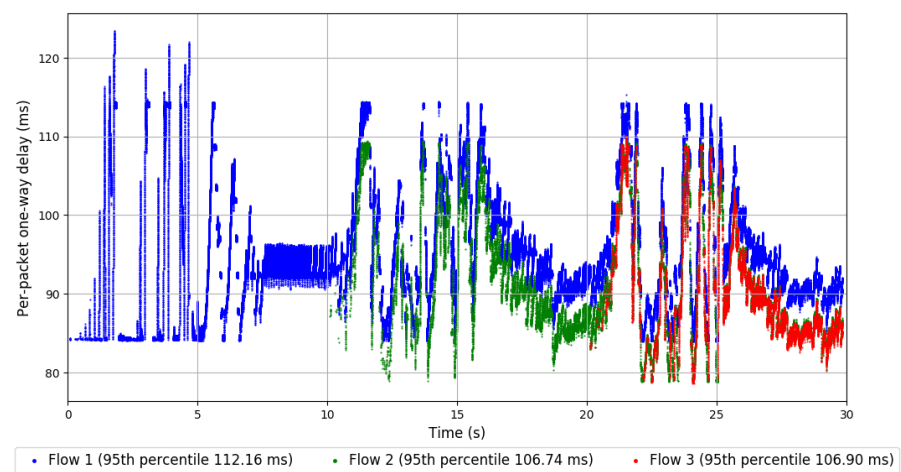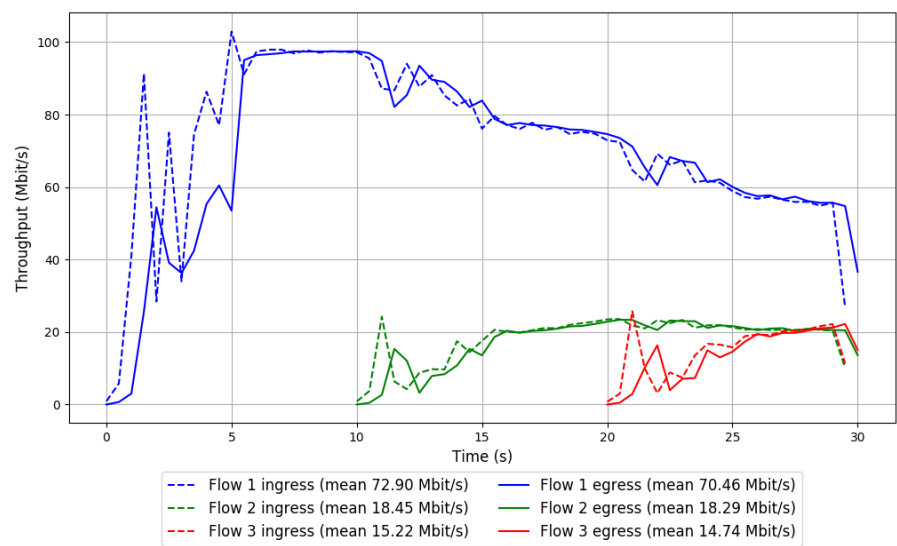
Run 5: Report of Indigo — Data Link

```
Run 1: Statistics of Indigo-MusesD

Start at: 2018-12-20 01:44:32
End at: 2018-12-20 01:45:02
Local clock offset: -0.903 ms
Remote clock offset: 11.511 ms


# Below is generated by plot.py at 2018-12-20 03:39:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 88.66 Mbit/s
95th percentile per-packet one-way delay: 116.951 ms
Loss rate: 3.70%
-- Flow 1:
Average throughput: 70.81 Mbit/s
95th percentile per-packet one-way delay: 119.085 ms
Loss rate: 4.33%
-- Flow 2:
Average throughput: 20.35 Mbit/s
95th percentile per-packet one-way delay: 110.050 ms
Loss rate: 1.17%
-- Flow 3:
Average throughput: 13.39 Mbit/s
95th percentile per-packet one-way delay: 110.457 ms
Loss rate: 1.05%
```
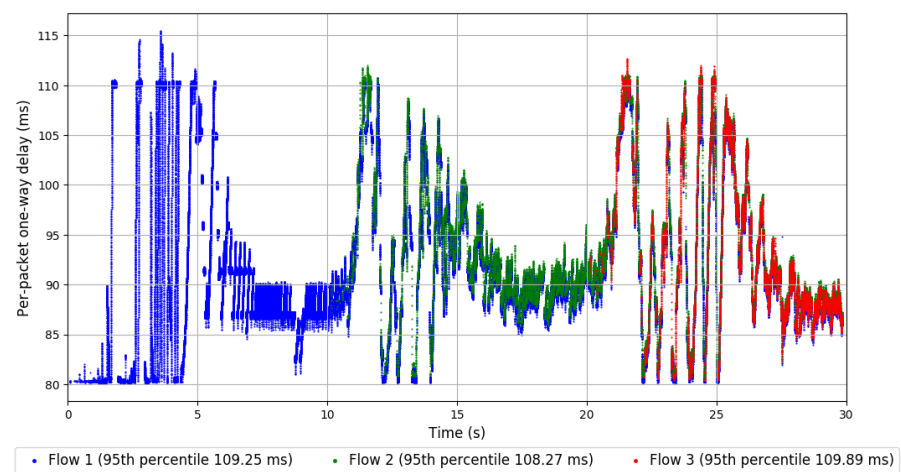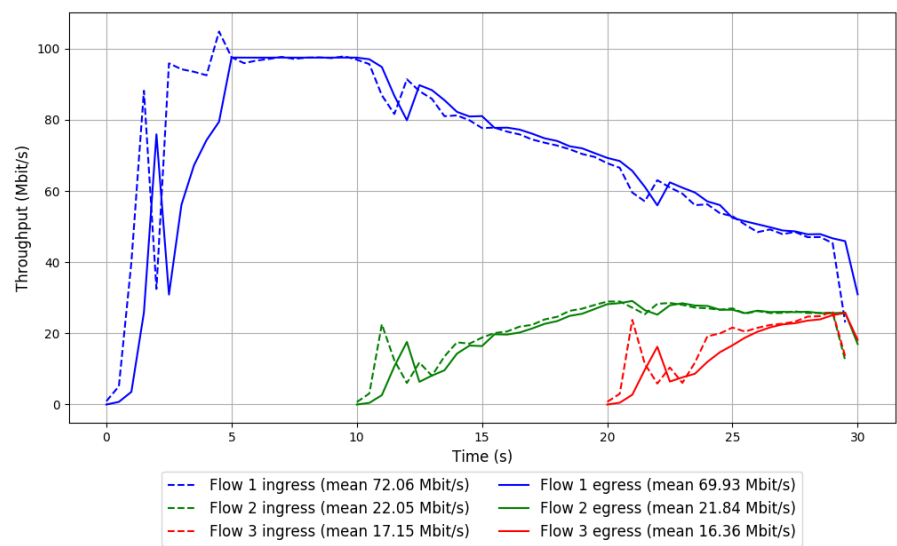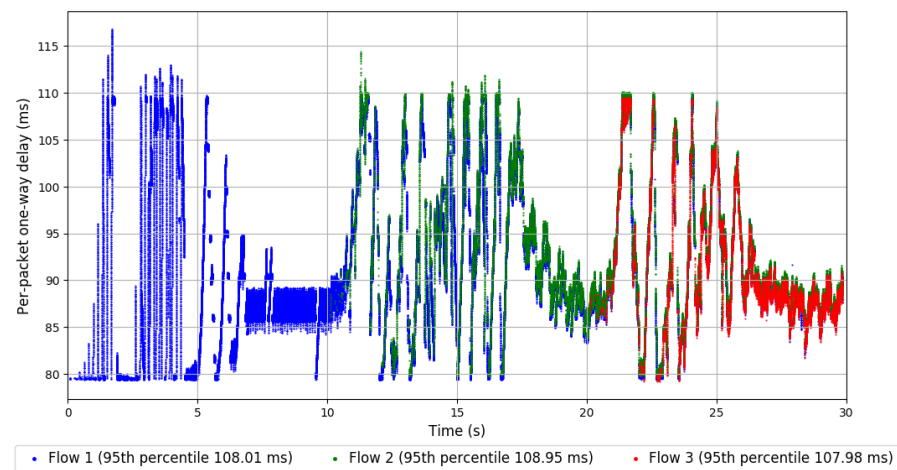
Run 1: Report of Indigo-MusesD — Data Link

- Flow 1 ingress (mean 74.01 Mbit/s) — Flow 1 egress (mean 70.81 Mbit/s)
- Flow 2 ingress (mean 20.59 Mbit/s) — Flow 2 egress (mean 20.35 Mbit/s)
- Flow 3 ingress (mean 13.53 Mbit/s) — Flow 3 egress (mean 13.39 Mbit/s)

- Flow 1 (95th percentile 119.08 ms)   • Flow 2 (95th percentile 110.05 ms)   • Flow 3 (95th percentile 110.46 ms)

```
Run 2: Statistics of Indigo-MusesD

Start at: 2018-12-20 02:08:34
End at: 2018-12-20 02:09:04
Local clock offset: -2.648 ms
Remote clock offset: 2.571 ms


# Below is generated by plot.py at 2018-12-20 03:39:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 87.40 Mbit/s
95th percentile per-packet one-way delay: 111.011 ms
Loss rate: 2.99%
-- Flow 1:
Average throughput: 70.46 Mbit/s
95th percentile per-packet one-way delay: 112.163 ms
Loss rate: 3.34%
-- Flow 2:
Average throughput: 18.29 Mbit/s
95th percentile per-packet one-way delay: 106.744 ms
Loss rate: 0.87%
-- Flow 3:
Average throughput: 14.74 Mbit/s
95th percentile per-packet one-way delay: 106.898 ms
Loss rate: 3.16%
```

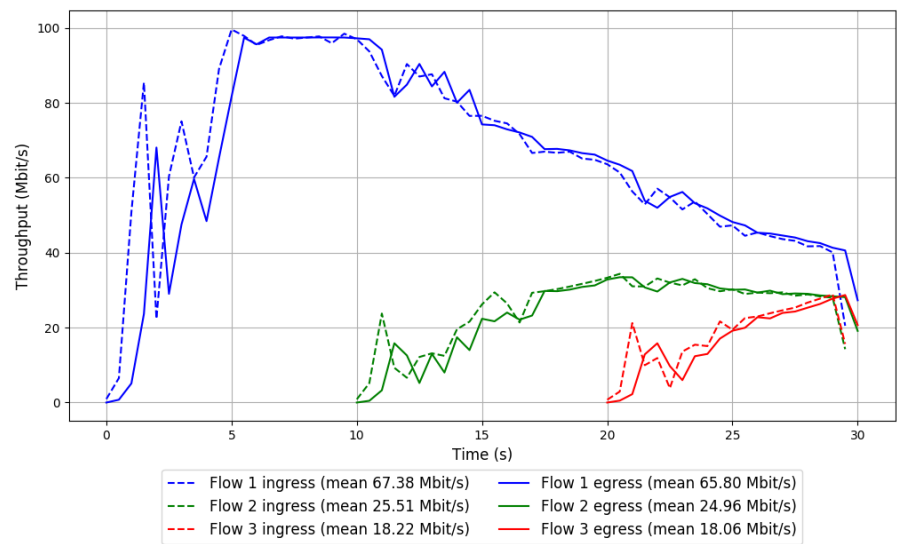Run 2: Report of Indigo-MusesD — Data Link

```
Run 3: Statistics of Indigo-MusesD

Start at: 2018-12-20 02:32:36
End at: 2018-12-20 02:33:06
Local clock offset: -7.497 ms
Remote clock offset: 1.341 ms


# Below is generated by plot.py at 2018-12-20 03:39:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.73 Mbit/s
95th percentile per-packet one-way delay: 109.024 ms
Loss rate: 2.73%
-- Flow 1:
Average throughput: 69.93 Mbit/s
95th percentile per-packet one-way delay: 109.249 ms
Loss rate: 2.93%
-- Flow 2:
Average throughput: 21.84 Mbit/s
95th percentile per-packet one-way delay: 108.269 ms
Loss rate: 0.97%
-- Flow 3:
Average throughput: 16.36 Mbit/s
95th percentile per-packet one-way delay: 109.894 ms
Loss rate: 4.62%
```
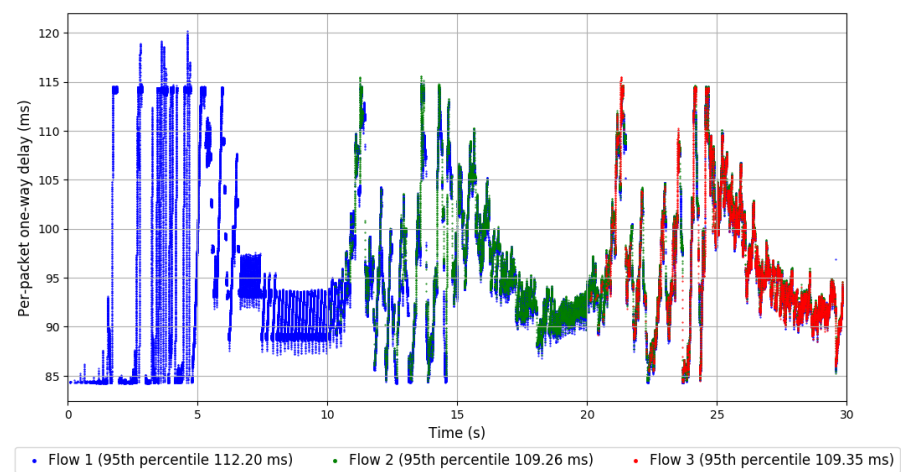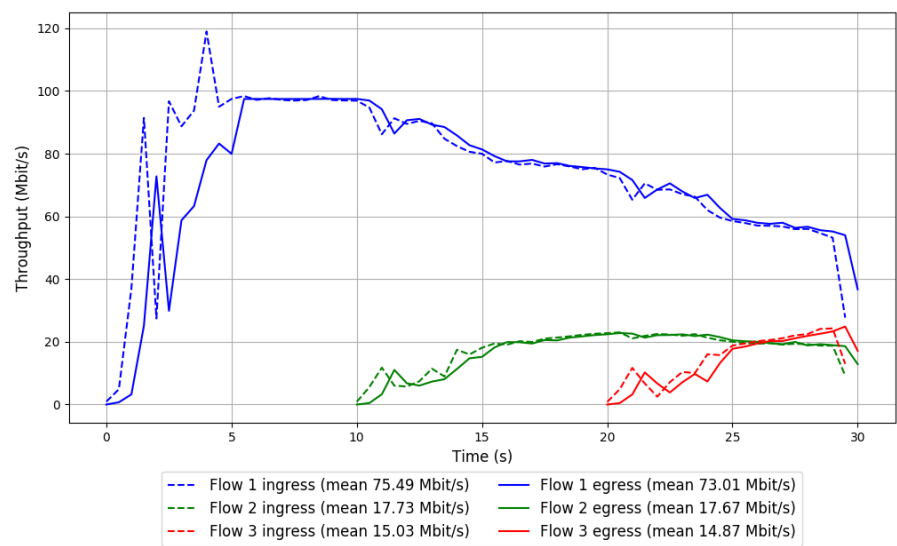
Run 3: Report of Indigo-MusesD — Data Link

Flow 1 ingress (mean 72.06 Mbit/s)   Flow 1 egress (mean 69.93 Mbit/s)
Flow 2 ingress (mean 22.05 Mbit/s)   Flow 2 egress (mean 21.84 Mbit/s)
Flow 3 ingress (mean 17.15 Mbit/s)   Flow 3 egress (mean 16.36 Mbit/s)

Flow 1 (95th percentile 109.25 ms)   Flow 2 (95th percentile 108.27 ms)   Flow 3 (95th percentile 109.89 ms)

```
Run 4: Statistics of Indigo-MusesD

Start at: 2018-12-20 02:56:40
End at: 2018-12-20 02:57:10
Local clock offset: -7.197 ms
Remote clock offset: -2.094 ms


# Below is generated by plot.py at 2018-12-20 03:39:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 88.24 Mbit/s
95th percentile per-packet one-way delay: 108.167 ms
Loss rate: 2.20%
-- Flow 1:
Average throughput: 65.80 Mbit/s
95th percentile per-packet one-way delay: 108.013 ms
Loss rate: 2.32%
-- Flow 2:
Average throughput: 24.96 Mbit/s
95th percentile per-packet one-way delay: 108.952 ms
Loss rate: 2.18%
-- Flow 3:
Average throughput: 18.06 Mbit/s
95th percentile per-packet one-way delay: 107.981 ms
Loss rate: 0.88%
```
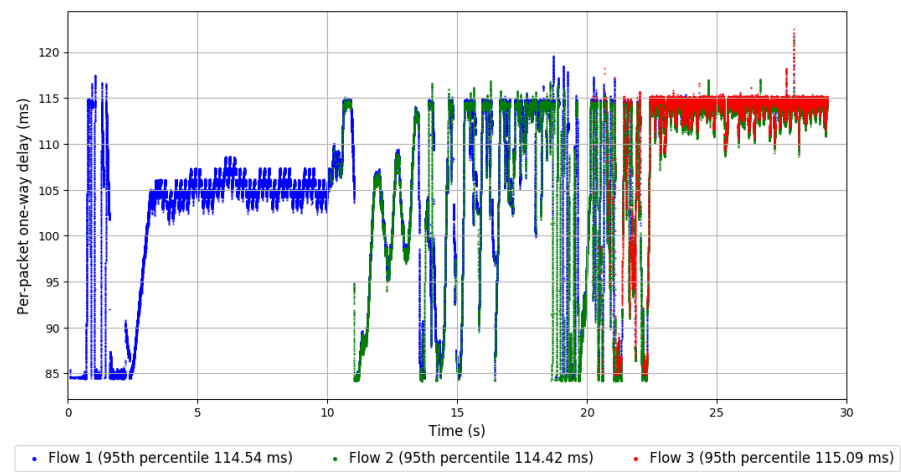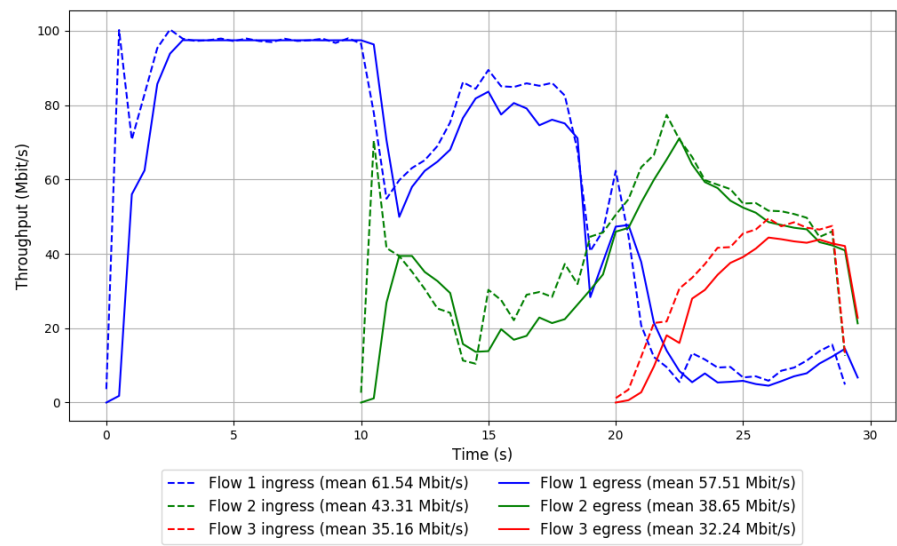
Run 4: Report of Indigo-MusesD — Data Link

```
Run 5: Statistics of Indigo-MusesD

Start at: 2018-12-20 03:20:43
End at: 2018-12-20 03:21:13
Local clock offset: -6.902 ms
Remote clock offset: 0.535 ms


# Below is generated by plot.py at 2018-12-20 03:40:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 89.58 Mbit/s
95th percentile per-packet one-way delay: 111.645 ms
Loss rate: 2.77%
-- Flow 1:
Average throughput: 73.01 Mbit/s
95th percentile per-packet one-way delay: 112.201 ms
Loss rate: 3.26%
-- Flow 2:
Average throughput: 17.67 Mbit/s
95th percentile per-packet one-way delay: 109.260 ms
Loss rate: 0.36%
-- Flow 3:
Average throughput: 14.87 Mbit/s
95th percentile per-packet one-way delay: 109.351 ms
Loss rate: 1.04%
```
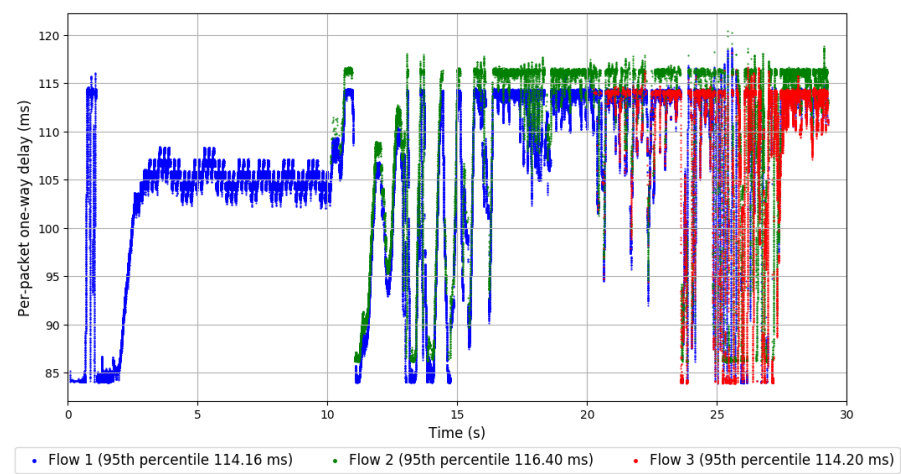
Run 5: Report of Indigo-MusesD — Data Link

```
Run 1: Statistics of Indigo-MusesT

Start at: 2018-12-20 01:50:54
End at: 2018-12-20 01:51:24
Local clock offset: -1.072 ms
Remote clock offset: 9.527 ms

# Below is generated by plot.py at 2018-12-20 03:40:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 92.86 Mbit/s
95th percentile per-packet one-way delay: 114.795 ms
Loss rate: 7.86%
-- Flow 1:
Average throughput: 57.51 Mbit/s
95th percentile per-packet one-way delay: 114.543 ms
Loss rate: 6.46%
-- Flow 2:
Average throughput: 38.65 Mbit/s
95th percentile per-packet one-way delay: 114.419 ms
Loss rate: 10.71%
-- Flow 3:
Average throughput: 32.24 Mbit/s
95th percentile per-packet one-way delay: 115.090 ms
Loss rate: 8.30%
```
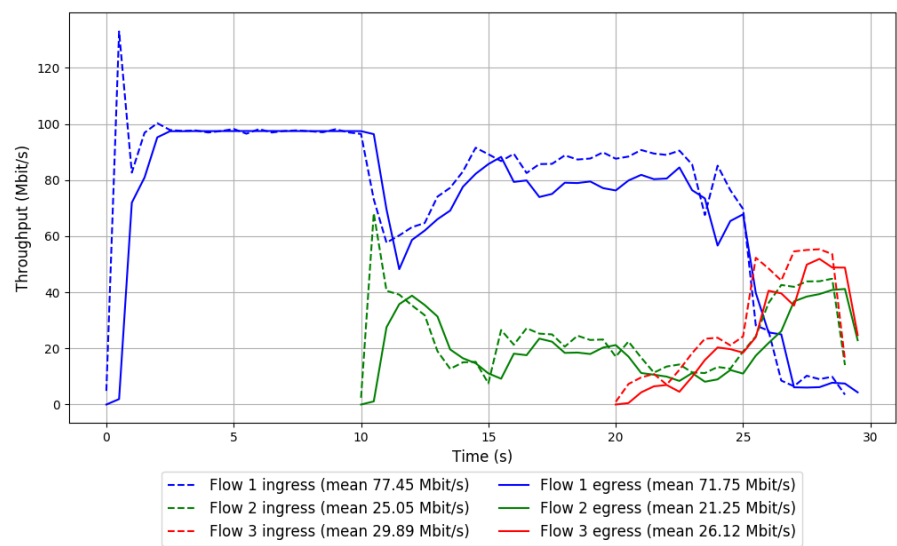
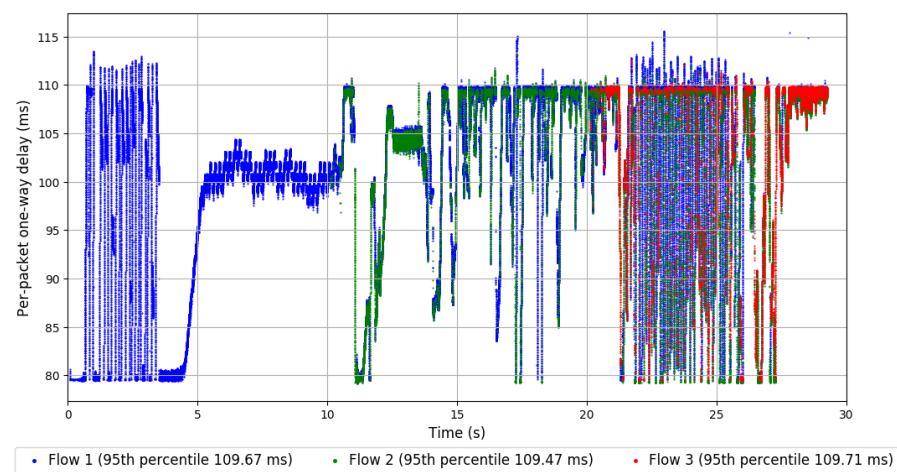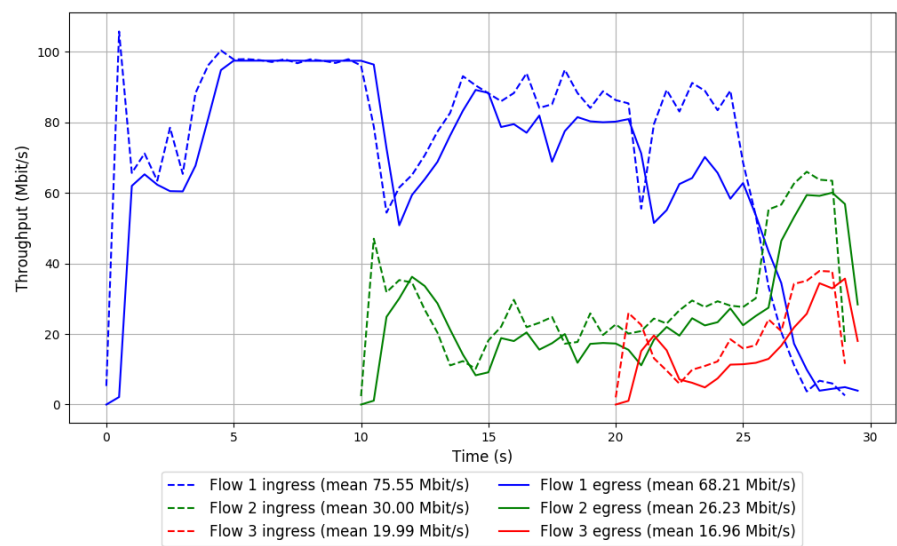## Run 1: Report of Indigo-MusesT — Data Link

```
Run 2: Statistics of Indigo-MusesT

Start at: 2018-12-20 02:14:57
End at: 2018-12-20 02:15:27
Local clock offset: -5.011 ms
Remote clock offset: 7.114 ms


# Below is generated by plot.py at 2018-12-20 03:40:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 93.74 Mbit/s
95th percentile per-packet one-way delay: 116.010 ms
Loss rate: 9.01%
-- Flow 1:
Average throughput: 71.75 Mbit/s
95th percentile per-packet one-way delay: 114.156 ms
Loss rate: 7.28%
-- Flow 2:
Average throughput: 21.25 Mbit/s
95th percentile per-packet one-way delay: 116.403 ms
Loss rate: 15.17%
-- Flow 3:
Average throughput: 26.12 Mbit/s
95th percentile per-packet one-way delay: 114.200 ms
Loss rate: 12.63%
```

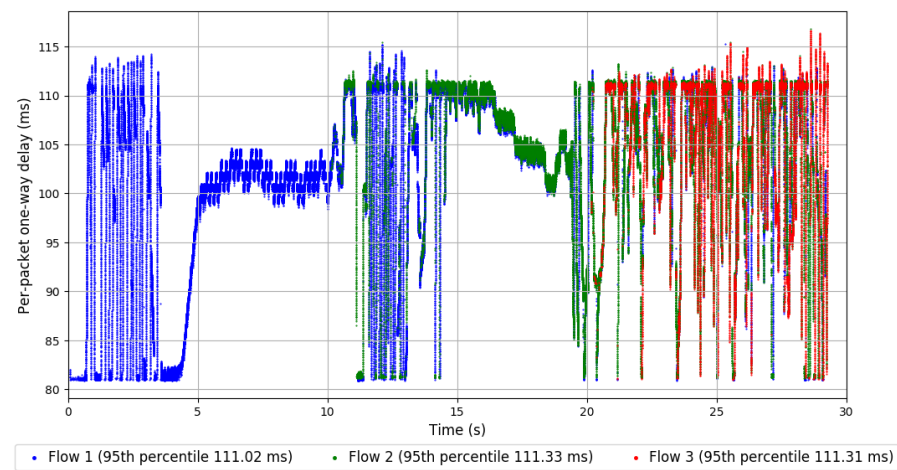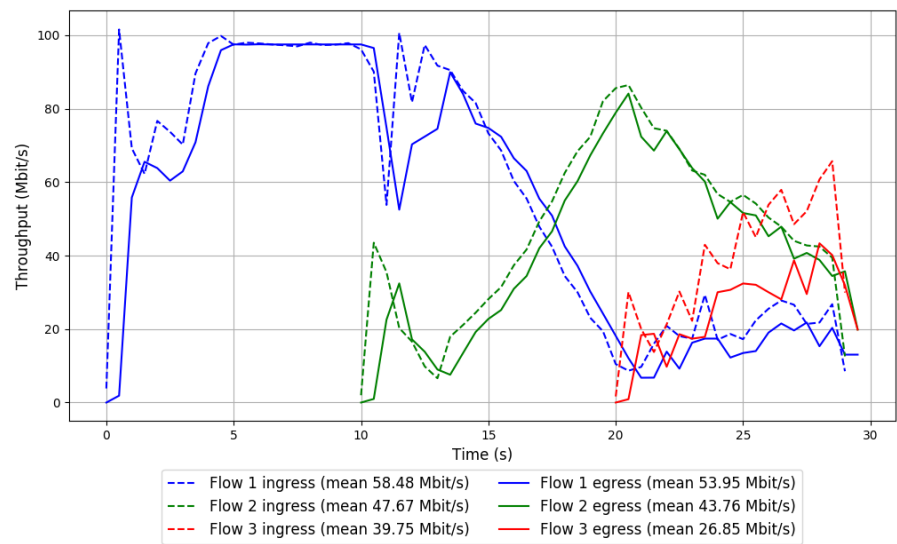# Run 2: Report of Indigo-MusesT — Data Link

Flow 1 ingress (mean 77.45 Mbit/s) --- Flow 1 egress (mean 71.75 Mbit/s)
Flow 2 ingress (mean 25.05 Mbit/s) --- Flow 2 egress (mean 21.25 Mbit/s)
Flow 3 ingress (mean 29.89 Mbit/s) --- Flow 3 egress (mean 26.12 Mbit/s)

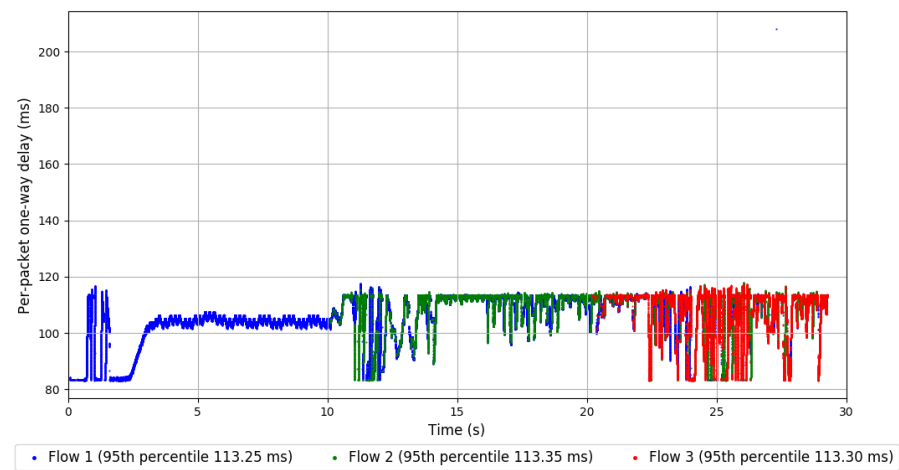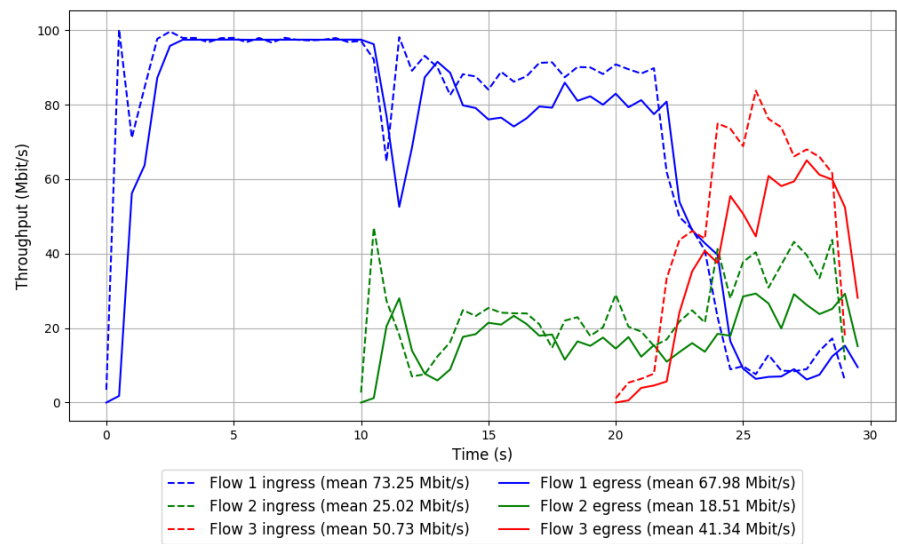Flow 1 (95th percentile 114.16 ms) · Flow 2 (95th percentile 116.40 ms) · Flow 3 (95th percentile 114.20 ms)

```
Run 3: Statistics of Indigo-MusesT

Start at: 2018-12-20 02:38:59
End at: 2018-12-20 02:39:29
Local clock offset: -7.363 ms
Remote clock offset: -0.283 ms


# Below is generated by plot.py at 2018-12-20 03:40:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 90.70 Mbit/s
95th percentile per-packet one-way delay: 109.650 ms
Loss rate: 10.53%
-- Flow 1:
Average throughput: 68.21 Mbit/s
95th percentile per-packet one-way delay: 109.670 ms
Loss rate: 9.62%
-- Flow 2:
Average throughput: 26.23 Mbit/s
95th percentile per-packet one-way delay: 109.473 ms
Loss rate: 12.54%
-- Flow 3:
Average throughput: 16.96 Mbit/s
95th percentile per-packet one-way delay: 109.713 ms
Loss rate: 15.15%
```
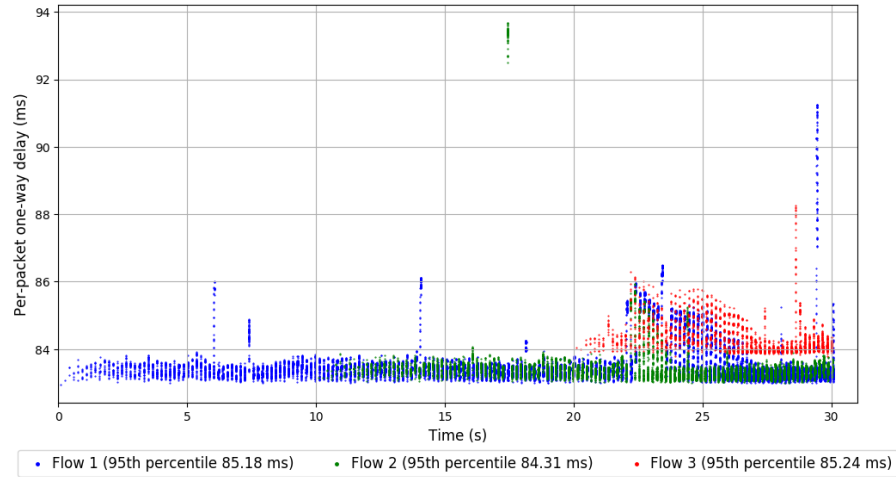
Run 3: Report of Indigo-MusesT — Data Link

Legend:
- - - - Flow 1 ingress (mean 75.55 Mbit/s) —— Flow 1 egress (mean 68.21 Mbit/s)
- - - - Flow 2 ingress (mean 30.00 Mbit/s) —— Flow 2 egress (mean 26.23 Mbit/s)
- - - - Flow 3 ingress (mean 19.99 Mbit/s) —— Flow 3 egress (mean 16.96 Mbit/s)

Legend:
- Flow 1 (95th percentile 109.67 ms)   - Flow 2 (95th percentile 109.47 ms)   - Flow 3 (95th percentile 109.71 ms)

```
Run 4: Statistics of Indigo-MusesT

Start at: 2018-12-20 03:03:01
End at: 2018-12-20 03:03:31
Local clock offset: -7.347 ms
Remote clock offset: -1.549 ms


# Below is generated by plot.py at 2018-12-20 03:40:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 90.87 Mbit/s
95th percentile per-packet one-way delay: 111.191 ms
Loss rate: 10.84%
-- Flow 1:
Average throughput: 53.95 Mbit/s
95th percentile per-packet one-way delay: 111.021 ms
Loss rate: 7.71%
-- Flow 2:
Average throughput: 43.76 Mbit/s
95th percentile per-packet one-way delay: 111.330 ms
Loss rate: 8.16%
-- Flow 3:
Average throughput: 26.85 Mbit/s
95th percentile per-packet one-way delay: 111.311 ms
Loss rate: 32.37%
```

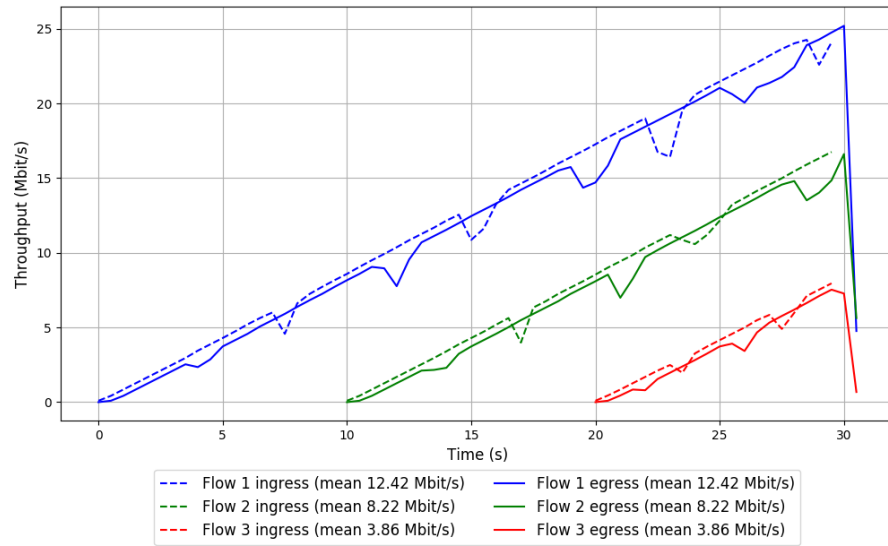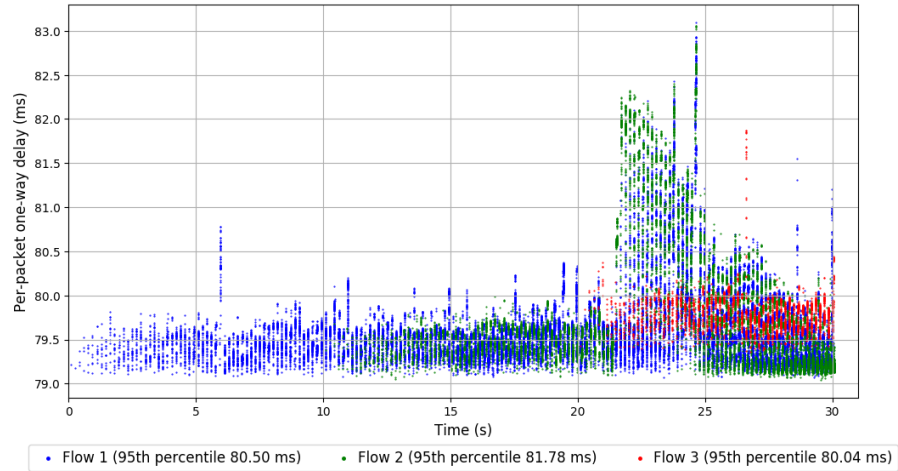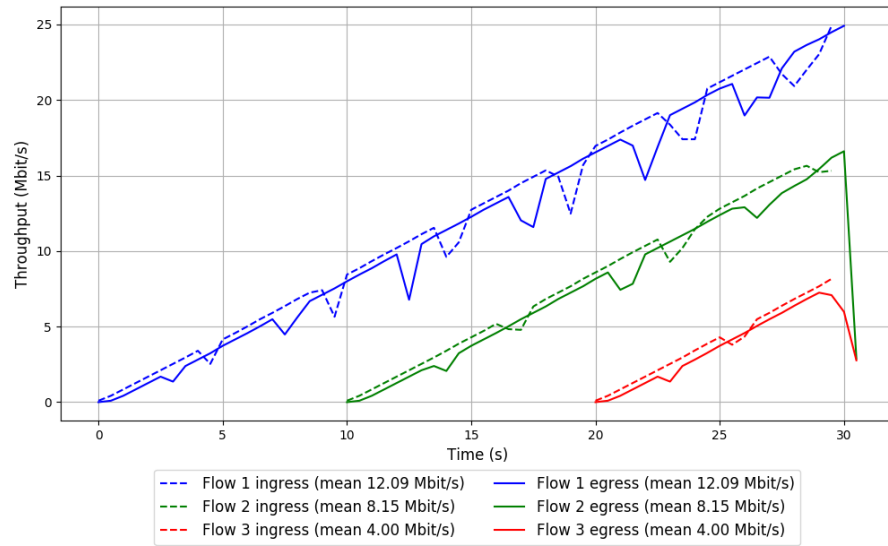# Run 4: Report of Indigo-MusesT — Data Link

Flow 1 ingress (mean 58.48 Mbit/s) --- Flow 1 egress (mean 53.95 Mbit/s)
Flow 2 ingress (mean 47.67 Mbit/s) --- Flow 2 egress (mean 43.76 Mbit/s)
Flow 3 ingress (mean 39.75 Mbit/s) --- Flow 3 egress (mean 26.85 Mbit/s)

Flow 1 (95th percentile 111.02 ms) · Flow 2 (95th percentile 111.33 ms) · Flow 3 (95th percentile 111.31 ms)

```
Run 5: Statistics of Indigo-MusesT

Start at: 2018-12-20 03:27:03
End at: 2018-12-20 03:27:33
Local clock offset: -7.005 ms
Remote clock offset: -1.299 ms


# Below is generated by plot.py at 2018-12-20 03:41:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 92.94 Mbit/s
95th percentile per-packet one-way delay: 113.274 ms
Loss rate: 11.75%
-- Flow 1:
Average throughput: 67.98 Mbit/s
95th percentile per-packet one-way delay: 113.246 ms
Loss rate: 7.11%
-- Flow 2:
Average throughput: 18.51 Mbit/s
95th percentile per-packet one-way delay: 113.352 ms
Loss rate: 25.97%
-- Flow 3:
Average throughput: 41.34 Mbit/s
95th percentile per-packet one-way delay: 113.303 ms
Loss rate: 18.51%
```

Run 5: Report of Indigo-MusesT — Data Link

Legend:
- Flow 1 ingress (mean 73.25 Mbit/s)
- Flow 1 egress (mean 67.98 Mbit/s)
- Flow 2 ingress (mean 25.02 Mbit/s)
- Flow 2 egress (mean 18.51 Mbit/s)
- Flow 3 ingress (mean 50.73 Mbit/s)
- Flow 3 egress (mean 41.34 Mbit/s)

Legend:
- Flow 1 (95th percentile 113.25 ms)
- Flow 2 (95th percentile 113.35 ms)
- Flow 3 (95th percentile 113.30 ms)

```
Run 1: Statistics of LEDBAT

Start at: 2018-12-20 01:37:03
End at: 2018-12-20 01:37:33
Local clock offset: -0.407 ms
Remote clock offset: 10.117 ms


# Below is generated by plot.py at 2018-12-20 03:41:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 19.16 Mbit/s
95th percentile per-packet one-way delay: 85.132 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 12.42 Mbit/s
95th percentile per-packet one-way delay: 85.183 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 8.22 Mbit/s
95th percentile per-packet one-way delay: 84.309 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 3.86 Mbit/s
95th percentile per-packet one-way delay: 85.236 ms
Loss rate: 0.00%
```
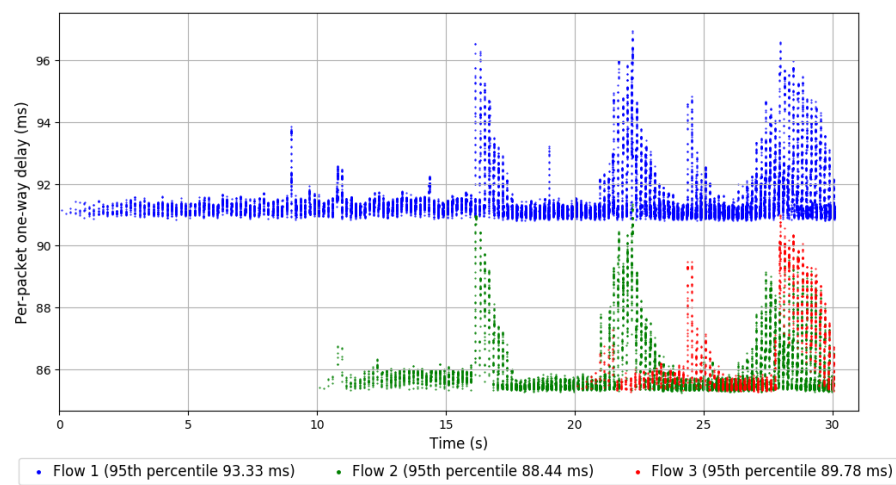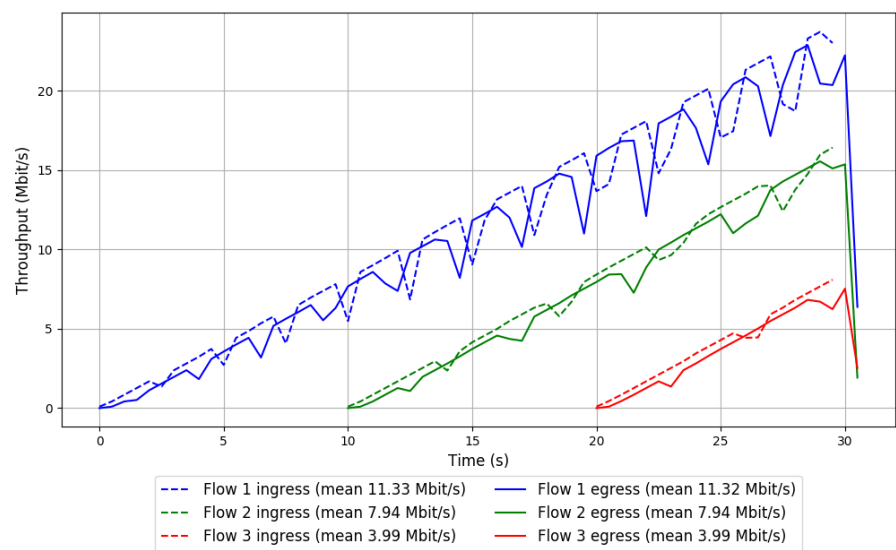
Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-12-20 02:01:07
End at: 2018-12-20 02:01:37
Local clock offset: -0.871 ms
Remote clock offset: 3.386 ms


# Below is generated by plot.py at 2018-12-20 03:41:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 18.80 Mbit/s
95th percentile per-packet one-way delay: 80.992 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 12.09 Mbit/s
95th percentile per-packet one-way delay: 80.504 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 8.15 Mbit/s
95th percentile per-packet one-way delay: 81.782 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 4.00 Mbit/s
95th percentile per-packet one-way delay: 80.038 ms
Loss rate: 0.00%
```
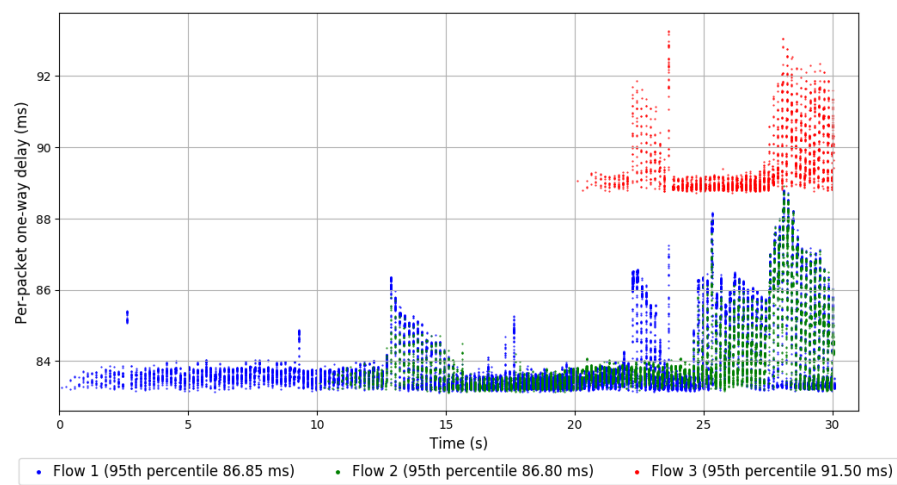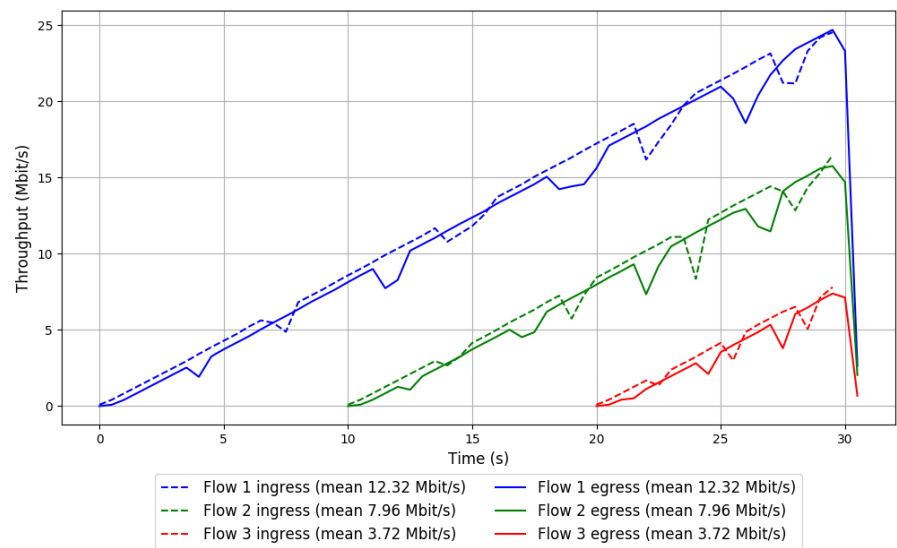
Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2018-12-20 02:25:08
End at: 2018-12-20 02:25:38
Local clock offset: -6.867 ms
Remote clock offset: 7.228 ms


# Below is generated by plot.py at 2018-12-20 03:41:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 17.92 Mbit/s
95th percentile per-packet one-way delay: 92.754 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 11.32 Mbit/s
95th percentile per-packet one-way delay: 93.334 ms
Loss rate: 0.09%
-- Flow 2:
Average throughput: 7.94 Mbit/s
95th percentile per-packet one-way delay: 88.444 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 3.99 Mbit/s
95th percentile per-packet one-way delay: 89.776 ms
Loss rate: 0.00%
```
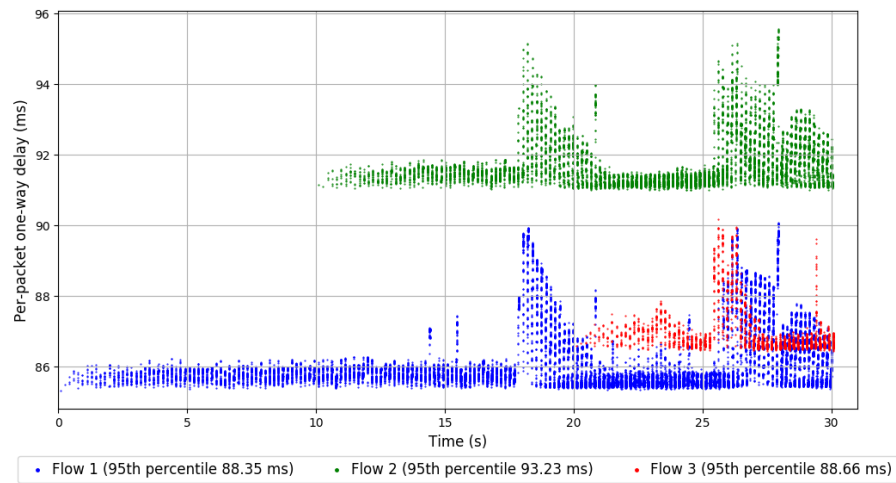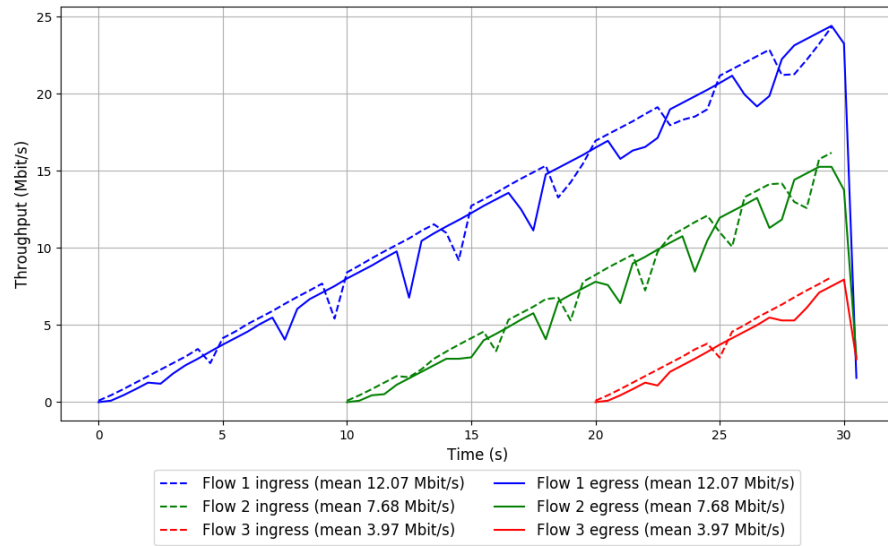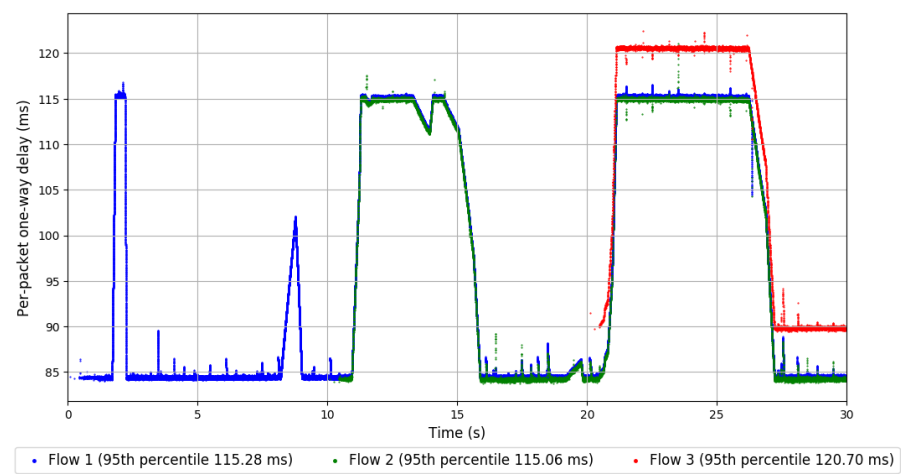
Run 3: Report of LEDBAT — Data Link

```
Run 4: Statistics of LEDBAT

Start at: 2018-12-20 02:49:12
End at: 2018-12-20 02:49:42
Local clock offset: -7.169 ms
Remote clock offset: 2.615 ms


# Below is generated by plot.py at 2018-12-20 03:41:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 18.84 Mbit/s
95th percentile per-packet one-way delay: 88.919 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 12.32 Mbit/s
95th percentile per-packet one-way delay: 86.849 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 7.96 Mbit/s
95th percentile per-packet one-way delay: 86.796 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 3.72 Mbit/s
95th percentile per-packet one-way delay: 91.495 ms
Loss rate: 0.00%
```
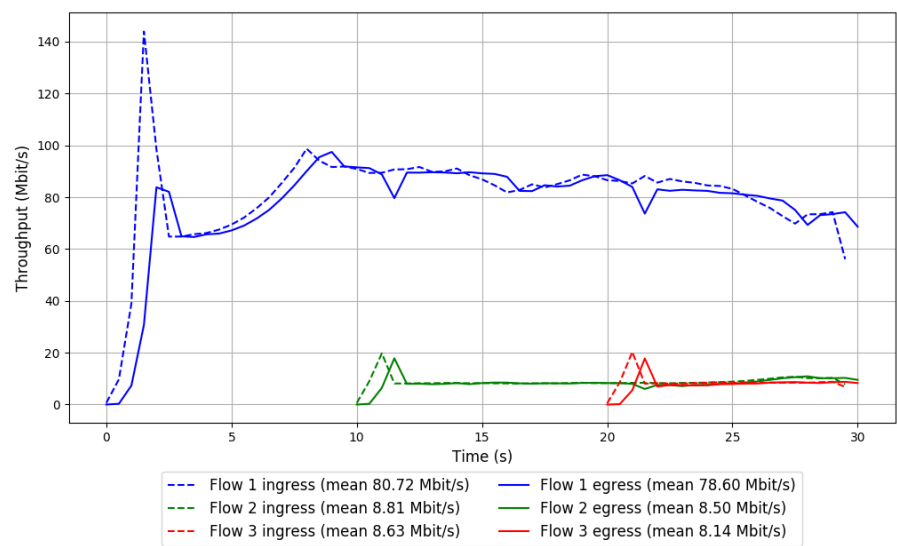
Run 4: Report of LEDBAT — Data Link

```
Run 5: Statistics of LEDBAT

Start at: 2018-12-20 03:13:15
End at: 2018-12-20 03:13:45
Local clock offset: -7.044 ms
Remote clock offset: 2.446 ms

# Below is generated by plot.py at 2018-12-20 03:41:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 18.47 Mbit/s
95th percentile per-packet one-way delay: 92.287 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 12.07 Mbit/s
95th percentile per-packet one-way delay: 88.354 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 7.68 Mbit/s
95th percentile per-packet one-way delay: 93.233 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 3.97 Mbit/s
95th percentile per-packet one-way delay: 88.656 ms
Loss rate: 0.00%
```

Run 5: Report of LEDBAT — Data Link

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```
Run 1: Statistics of PCC-Allegro

Start at: 2018-12-20 01:35:47
End at: 2018-12-20 01:36:17
Local clock offset: -0.17 ms
Remote clock offset: 11.324 ms


# Below is generated by plot.py at 2018-12-20 03:41:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.94 Mbit/s
95th percentile per-packet one-way delay: 115.303 ms
Loss rate: 2.78%
-- Flow 1:
Average throughput: 78.60 Mbit/s
95th percentile per-packet one-way delay: 115.279 ms
Loss rate: 2.62%
-- Flow 2:
Average throughput: 8.50 Mbit/s
95th percentile per-packet one-way delay: 115.055 ms
Loss rate: 3.48%
-- Flow 3:
Average throughput: 8.14 Mbit/s
95th percentile per-packet one-way delay: 120.699 ms
Loss rate: 5.73%
```
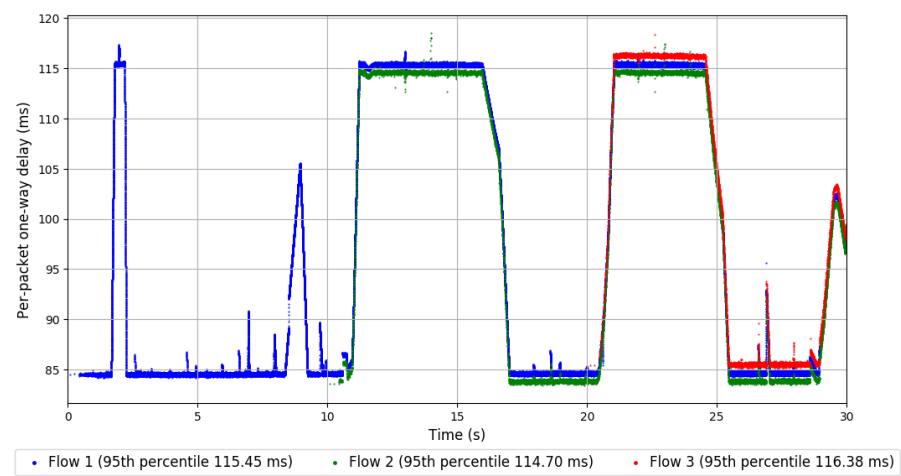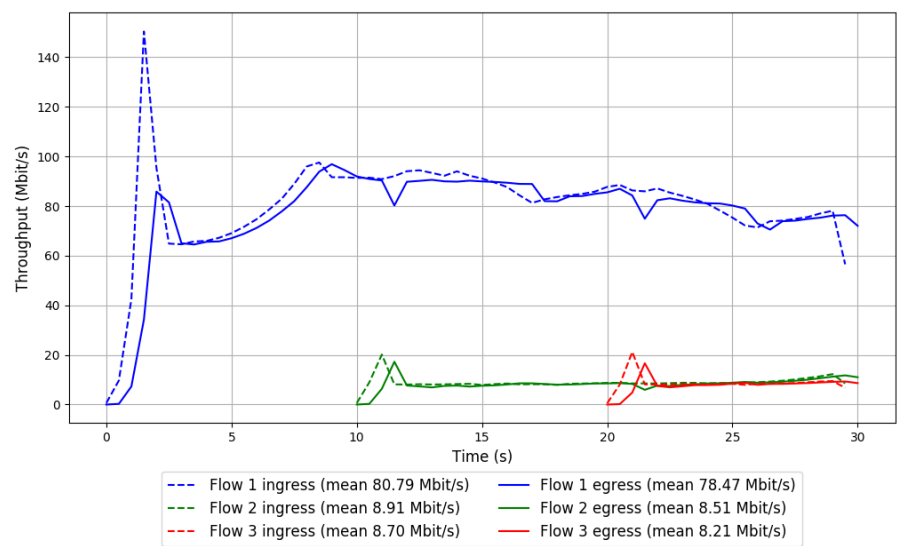
Run 1: Report of PCC-Allegro — Data Link

```
Run 2: Statistics of PCC-Allegro

Start at: 2018-12-20 01:59:51
End at: 2018-12-20 02:00:21
Local clock offset: -0.878 ms
Remote clock offset: 7.824 ms

# Below is generated by plot.py at 2018-12-20 03:41:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.84 Mbit/s
95th percentile per-packet one-way delay: 115.457 ms
Loss rate: 3.02%
-- Flow 1:
Average throughput: 78.47 Mbit/s
95th percentile per-packet one-way delay: 115.446 ms
Loss rate: 2.83%
-- Flow 2:
Average throughput: 8.51 Mbit/s
95th percentile per-packet one-way delay: 114.700 ms
Loss rate: 4.42%
-- Flow 3:
Average throughput: 8.21 Mbit/s
95th percentile per-packet one-way delay: 116.381 ms
Loss rate: 5.53%
```
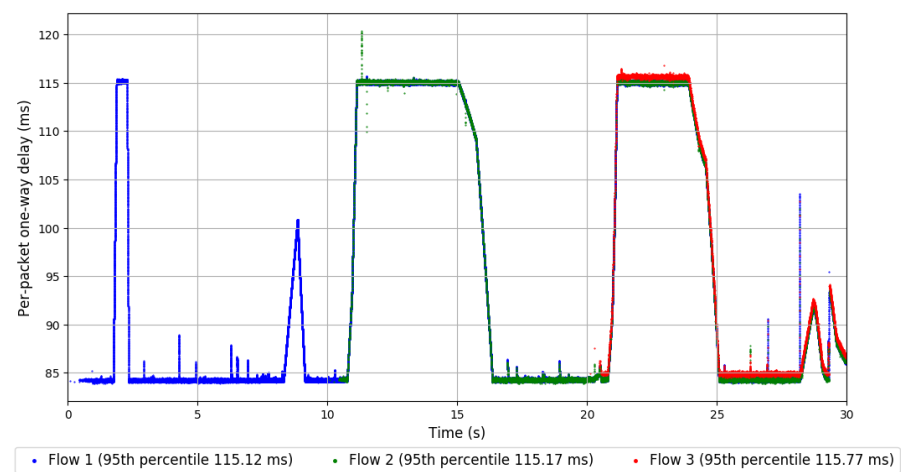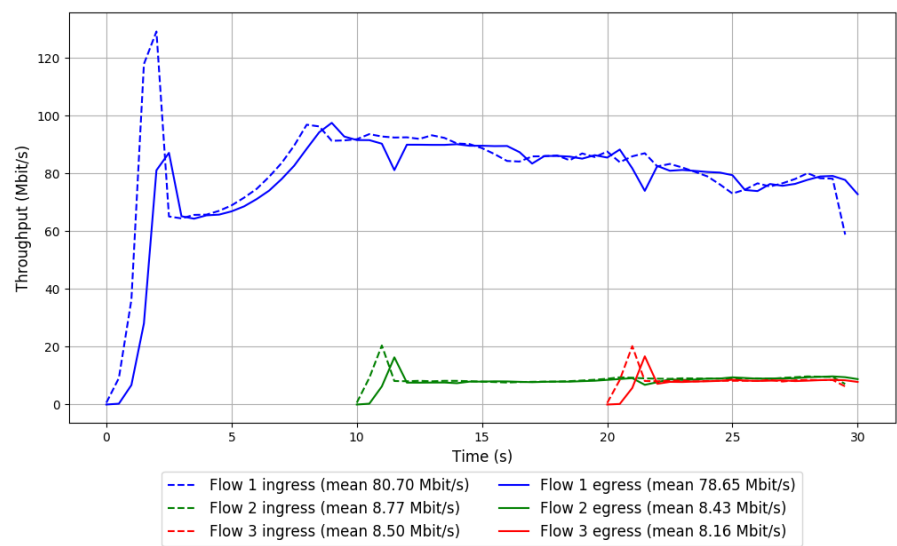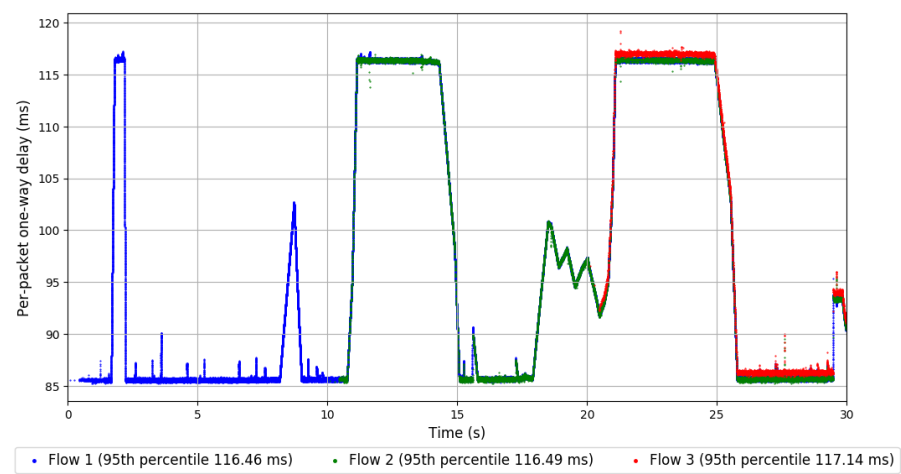
Run 2: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 80.79 Mbit/s)   Flow 1 egress (mean 78.47 Mbit/s)
Flow 2 ingress (mean 8.91 Mbit/s)   Flow 2 egress (mean 8.51 Mbit/s)
Flow 3 ingress (mean 8.70 Mbit/s)   Flow 3 egress (mean 8.21 Mbit/s)

Flow 1 (95th percentile 115.45 ms)   Flow 2 (95th percentile 114.70 ms)   Flow 3 (95th percentile 116.38 ms)

```
Run 3: Statistics of PCC-Allegro

Start at: 2018-12-20 02:23:52
End at: 2018-12-20 02:24:22
Local clock offset: -6.679 ms
Remote clock offset: 6.215 ms


# Below is generated by plot.py at 2018-12-20 03:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.94 Mbit/s
95th percentile per-packet one-way delay: 115.138 ms
Loss rate: 2.67%
-- Flow 1:
Average throughput: 78.65 Mbit/s
95th percentile per-packet one-way delay: 115.121 ms
Loss rate: 2.54%
-- Flow 2:
Average throughput: 8.43 Mbit/s
95th percentile per-packet one-way delay: 115.170 ms
Loss rate: 3.90%
-- Flow 3:
Average throughput: 8.16 Mbit/s
95th percentile per-packet one-way delay: 115.771 ms
Loss rate: 3.98%
```
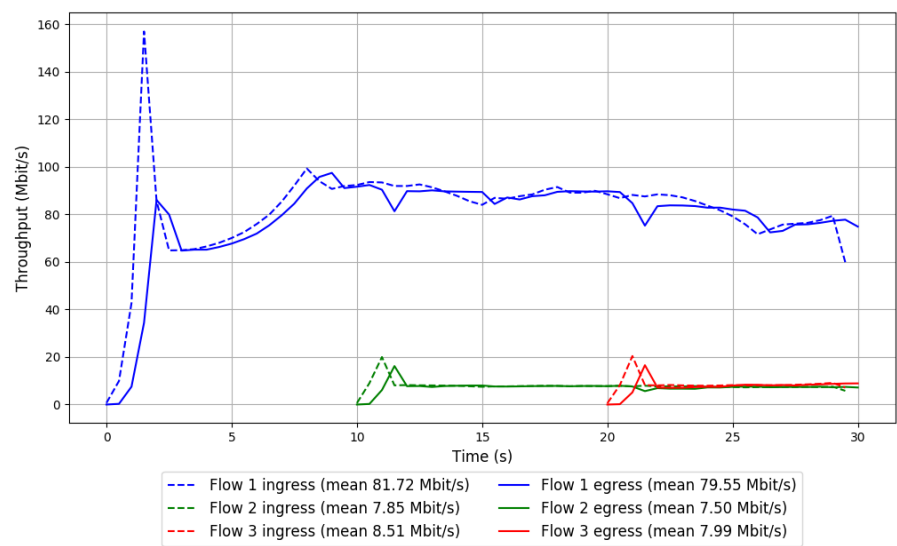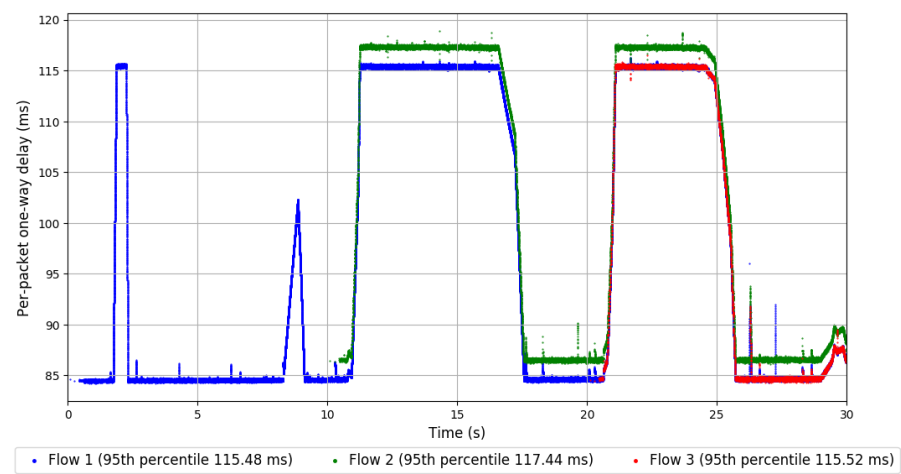
Run 3: Report of PCC-Allegro — Data Link

```
Run 4: Statistics of PCC-Allegro

Start at: 2018-12-20 02:47:56
End at: 2018-12-20 02:48:26
Local clock offset: -7.096 ms
Remote clock offset: 5.129 ms

# Below is generated by plot.py at 2018-12-20 03:41:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 87.18 Mbit/s
95th percentile per-packet one-way delay: 116.480 ms
Loss rate: 2.85%
-- Flow 1:
Average throughput: 79.55 Mbit/s
95th percentile per-packet one-way delay: 116.460 ms
Loss rate: 2.64%
-- Flow 2:
Average throughput: 7.50 Mbit/s
95th percentile per-packet one-way delay: 116.491 ms
Loss rate: 4.43%
-- Flow 3:
Average throughput: 7.99 Mbit/s
95th percentile per-packet one-way delay: 117.144 ms
Loss rate: 6.19%
```
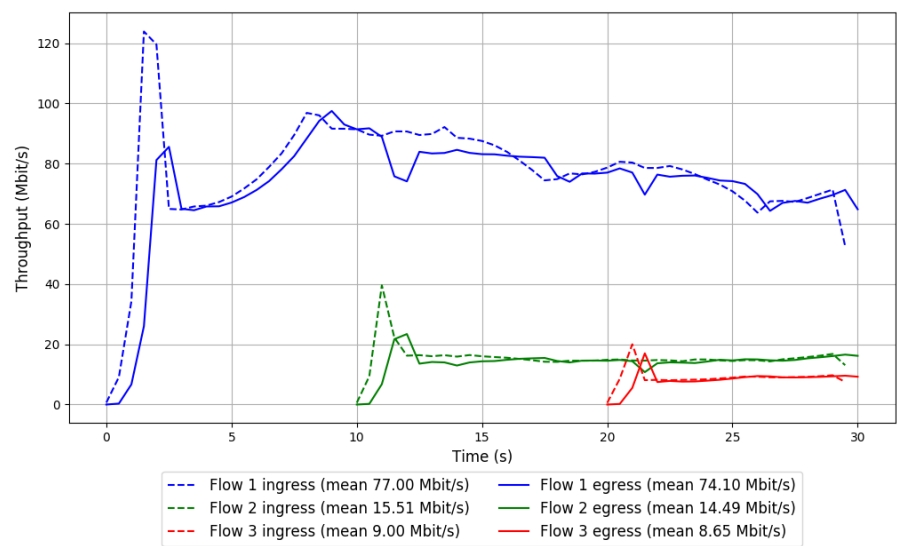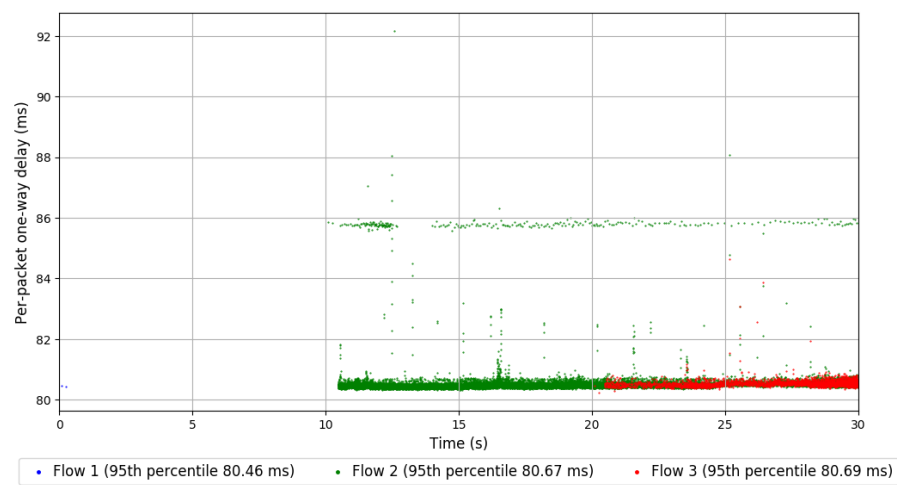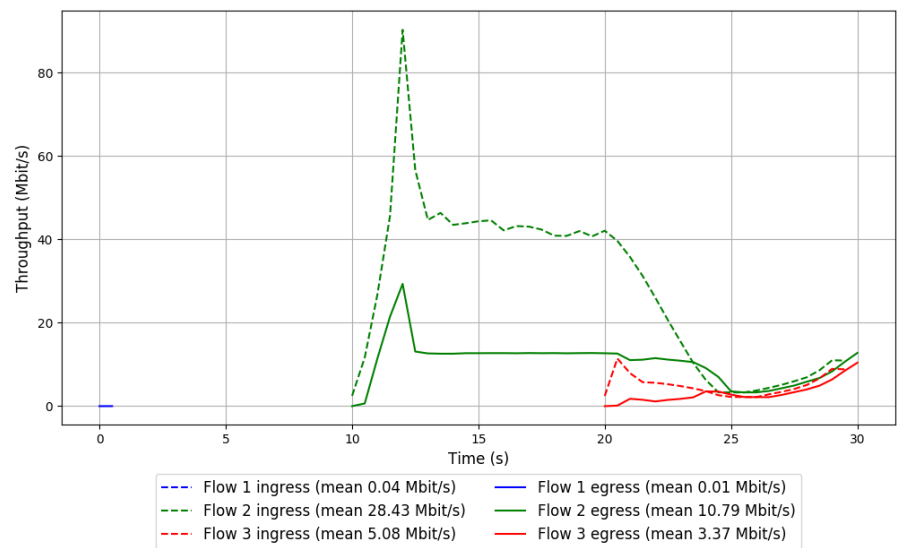
Run 4: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 81.72 Mbit/s)   Flow 1 egress (mean 79.55 Mbit/s)
Flow 2 ingress (mean 7.85 Mbit/s)   Flow 2 egress (mean 7.50 Mbit/s)
Flow 3 ingress (mean 8.51 Mbit/s)   Flow 3 egress (mean 7.99 Mbit/s)

Flow 1 (95th percentile 116.46 ms)   Flow 2 (95th percentile 116.49 ms)   Flow 3 (95th percentile 117.14 ms)

```
Run 5: Statistics of PCC-Allegro

Start at: 2018-12-20 03:11:59
End at: 2018-12-20 03:12:29
Local clock offset: -7.024 ms
Remote clock offset: 1.614 ms


# Below is generated by plot.py at 2018-12-20 03:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.59 Mbit/s
95th percentile per-packet one-way delay: 117.015 ms
Loss rate: 4.09%
-- Flow 1:
Average throughput: 74.10 Mbit/s
95th percentile per-packet one-way delay: 115.478 ms
Loss rate: 3.76%
-- Flow 2:
Average throughput: 14.49 Mbit/s
95th percentile per-packet one-way delay: 117.439 ms
Loss rate: 6.61%
-- Flow 3:
Average throughput: 8.65 Mbit/s
95th percentile per-packet one-way delay: 115.516 ms
Loss rate: 3.91%
```
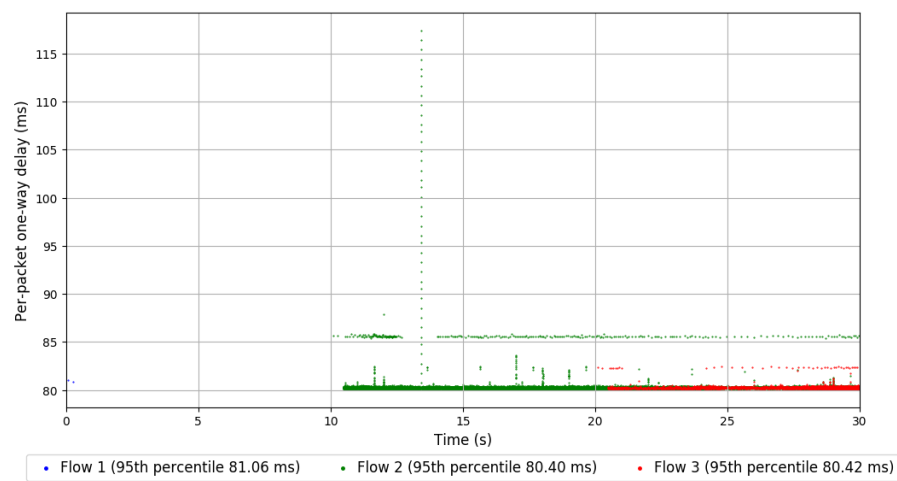
Run 5: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 77.00 Mbit/s) --- Flow 1 egress (mean 74.10 Mbit/s)
Flow 2 ingress (mean 15.51 Mbit/s) --- Flow 2 egress (mean 14.49 Mbit/s)
Flow 3 ingress (mean 9.00 Mbit/s) --- Flow 3 egress (mean 8.65 Mbit/s)

Flow 1 (95th percentile 115.48 ms)   Flow 2 (95th percentile 117.44 ms)   Flow 3 (95th percentile 115.52 ms)

```
Run 1: Statistics of PCC-Expr

Start at: 2018-12-20 01:53:25
End at: 2018-12-20 01:53:55
Local clock offset: -0.992 ms
Remote clock offset: 5.463 ms


# Below is generated by plot.py at 2018-12-20 03:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.29 Mbit/s
95th percentile per-packet one-way delay: 80.679 ms
Loss rate: 59.75%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 80.457 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 10.79 Mbit/s
95th percentile per-packet one-way delay: 80.673 ms
Loss rate: 62.07%
-- Flow 3:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 80.695 ms
Loss rate: 33.62%
```
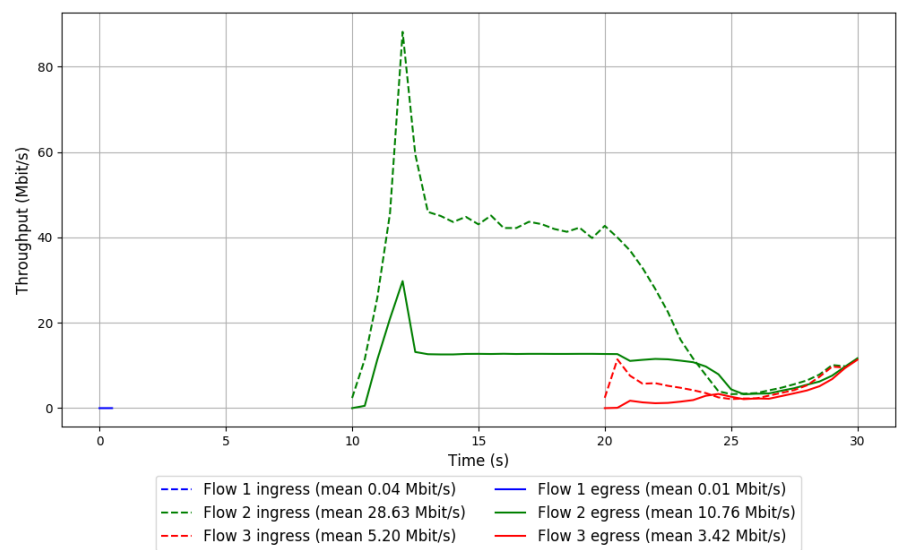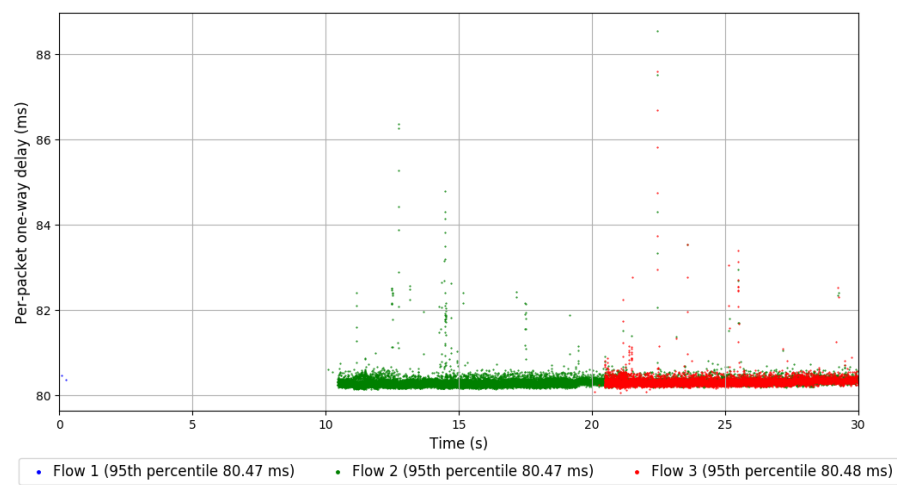
Run 1: Report of PCC-Expr — Data Link

```
Run 2: Statistics of PCC-Expr

Start at: 2018-12-20 02:17:28
End at: 2018-12-20 02:17:58
Local clock offset: -5.61 ms
Remote clock offset: 2.931 ms


# Below is generated by plot.py at 2018-12-20 03:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.28 Mbit/s
95th percentile per-packet one-way delay: 80.402 ms
Loss rate: 60.09%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 81.060 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 10.76 Mbit/s
95th percentile per-packet one-way delay: 80.398 ms
Loss rate: 62.43%
-- Flow 3:
Average throughput: 3.42 Mbit/s
95th percentile per-packet one-way delay: 80.417 ms
Loss rate: 34.18%
```
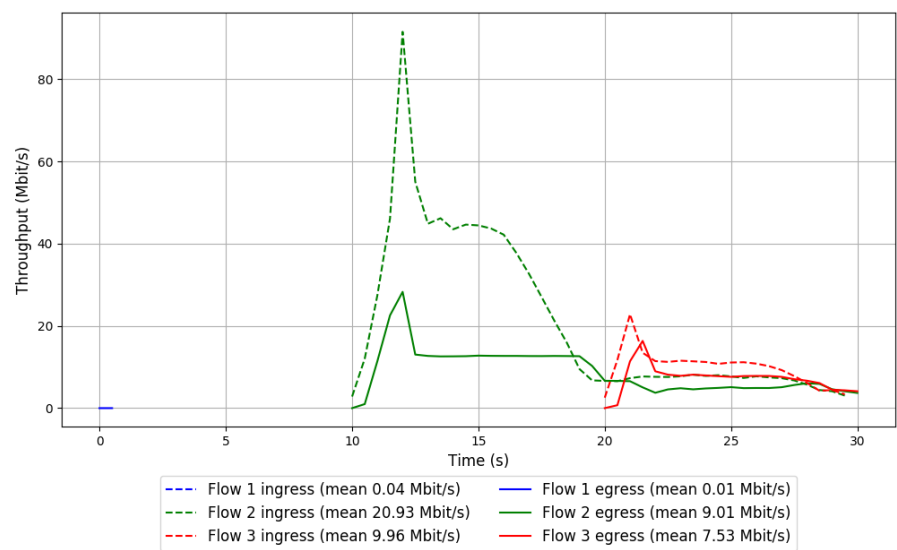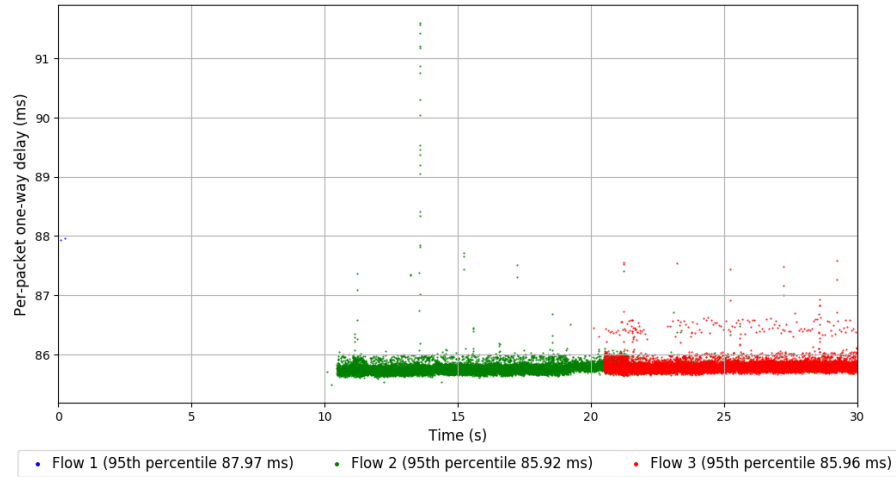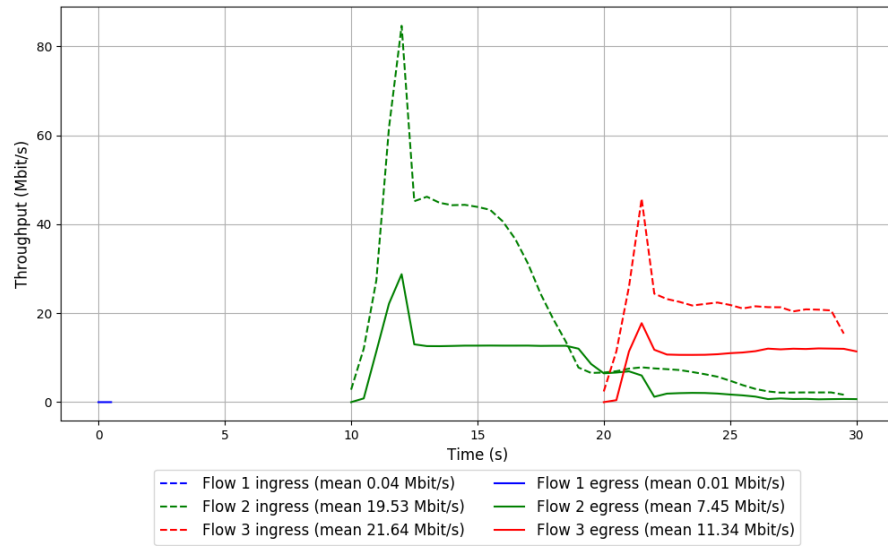
Run 2: Report of PCC-Expr — Data Link

Legend:
- Flow 1 ingress (mean 0.04 Mbit/s)
- Flow 1 egress (mean 0.01 Mbit/s)
- Flow 2 ingress (mean 28.63 Mbit/s)
- Flow 2 egress (mean 10.76 Mbit/s)
- Flow 3 ingress (mean 5.20 Mbit/s)
- Flow 3 egress (mean 3.42 Mbit/s)

Legend:
- Flow 1 (95th percentile 81.06 ms)
- Flow 2 (95th percentile 80.40 ms)
- Flow 3 (95th percentile 80.42 ms)

```
Run 3: Statistics of PCC-Expr

Start at: 2018-12-20 02:41:30
End at: 2018-12-20 02:42:00
Local clock offset: -7.229 ms
Remote clock offset: 0.44 ms


# Below is generated by plot.py at 2018-12-20 03:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.48 Mbit/s
95th percentile per-packet one-way delay: 80.476 ms
Loss rate: 50.71%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 80.467 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 9.01 Mbit/s
95th percentile per-packet one-way delay: 80.472 ms
Loss rate: 56.93%
-- Flow 3:
Average throughput: 7.53 Mbit/s
95th percentile per-packet one-way delay: 80.483 ms
Loss rate: 24.39%
```
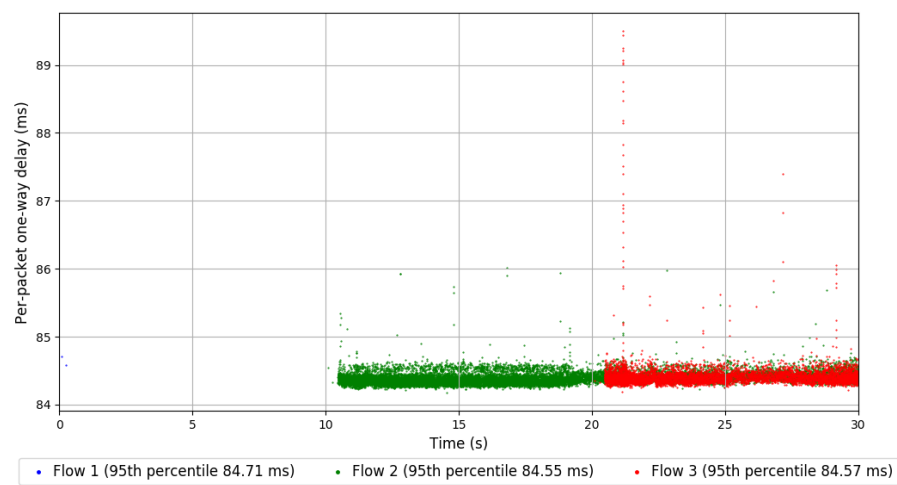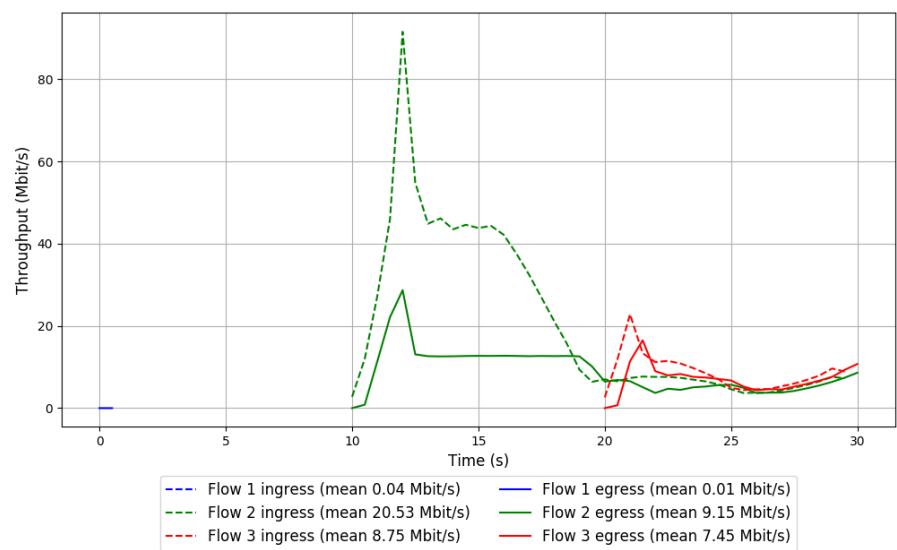
Run 3: Report of PCC-Expr — Data Link

```
Run 4: Statistics of PCC-Expr

Start at: 2018-12-20 03:05:32
End at: 2018-12-20 03:06:02
Local clock offset: -7.39 ms
Remote clock offset: 3.456 ms


# Below is generated by plot.py at 2018-12-20 03:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.70 Mbit/s
95th percentile per-packet one-way delay: 85.937 ms
Loss rate: 56.79%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 87.968 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 7.45 Mbit/s
95th percentile per-packet one-way delay: 85.920 ms
Loss rate: 61.85%
-- Flow 3:
Average throughput: 11.34 Mbit/s
95th percentile per-packet one-way delay: 85.958 ms
Loss rate: 47.61%
```
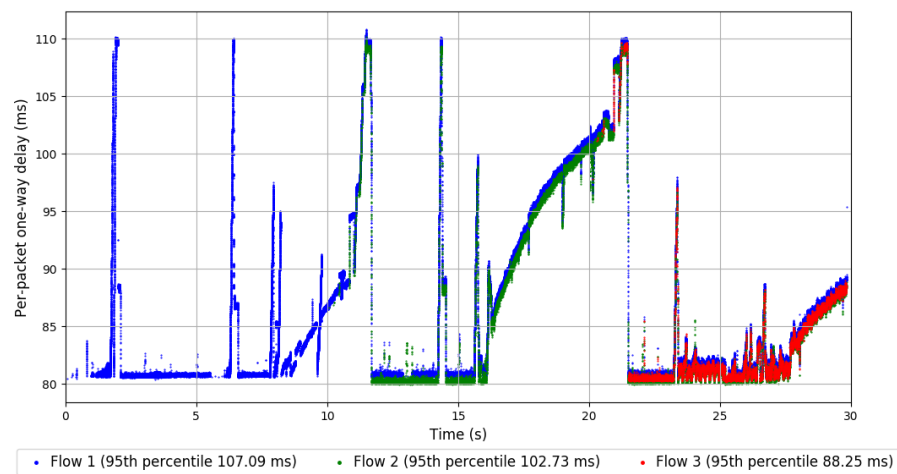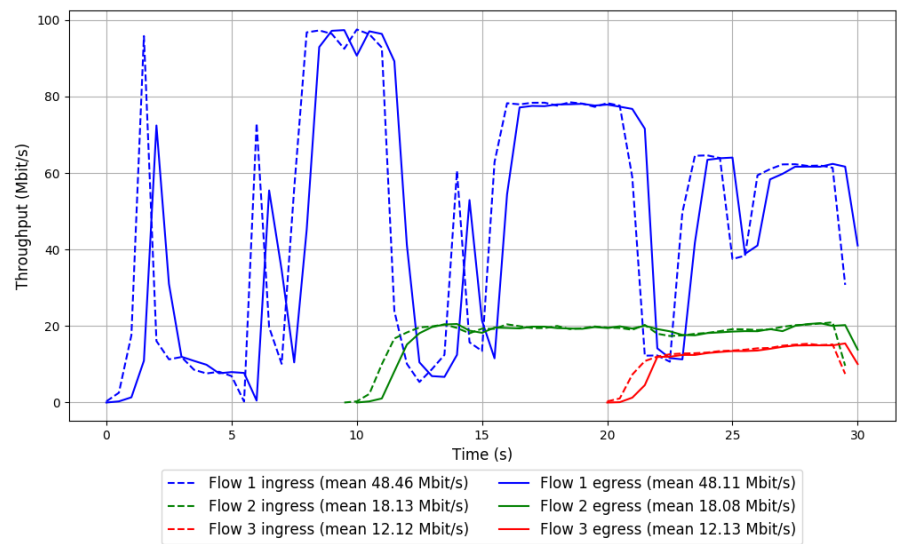
Run 4: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 0.04 Mbit/s)   Flow 1 egress (mean 0.01 Mbit/s)
Flow 2 ingress (mean 19.53 Mbit/s)   Flow 2 egress (mean 7.45 Mbit/s)
Flow 3 ingress (mean 21.64 Mbit/s)   Flow 3 egress (mean 11.34 Mbit/s)

Flow 1 (95th percentile 87.97 ms)   Flow 2 (95th percentile 85.92 ms)   Flow 3 (95th percentile 85.96 ms)

```
Run 5: Statistics of PCC-Expr

Start at: 2018-12-20 03:29:34
End at: 2018-12-20 03:30:04
Local clock offset: -7.032 ms
Remote clock offset: -0.355 ms

# Below is generated by plot.py at 2018-12-20 03:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.54 Mbit/s
95th percentile per-packet one-way delay: 84.553 ms
Loss rate: 48.36%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 84.708 ms
Loss rate: 85.71%
-- Flow 2:
Average throughput: 9.15 Mbit/s
95th percentile per-packet one-way delay: 84.547 ms
Loss rate: 55.44%
-- Flow 3:
Average throughput: 7.45 Mbit/s
95th percentile per-packet one-way delay: 84.569 ms
Loss rate: 14.87%
```
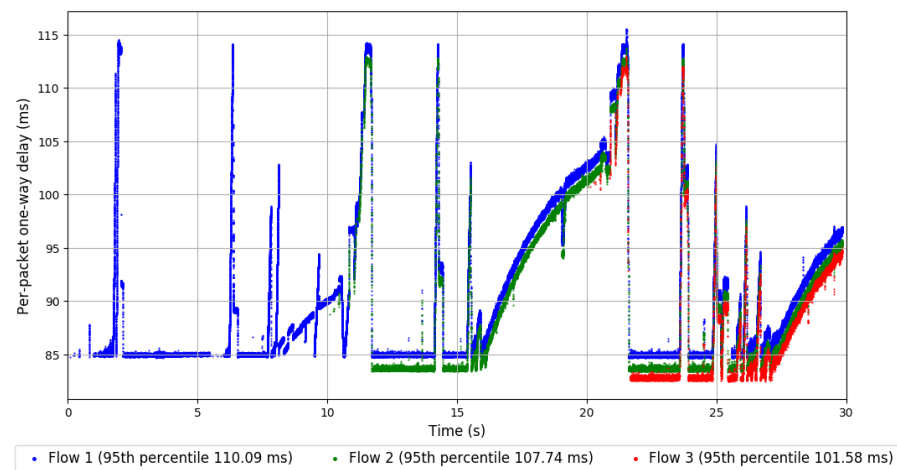
Run 5: Report of PCC-Expr — Data Link

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-12-20 01:45:49
End at: 2018-12-20 01:46:19
Local clock offset: -0.949 ms
Remote clock offset: 5.983 ms


# Below is generated by plot.py at 2018-12-20 03:42:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 64.06 Mbit/s
95th percentile per-packet one-way delay: 105.844 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 48.11 Mbit/s
95th percentile per-packet one-way delay: 107.086 ms
Loss rate: 0.68%
-- Flow 2:
Average throughput: 18.08 Mbit/s
95th percentile per-packet one-way delay: 102.730 ms
Loss rate: 0.26%
-- Flow 3:
Average throughput: 12.13 Mbit/s
95th percentile per-packet one-way delay: 88.247 ms
Loss rate: 0.03%
```
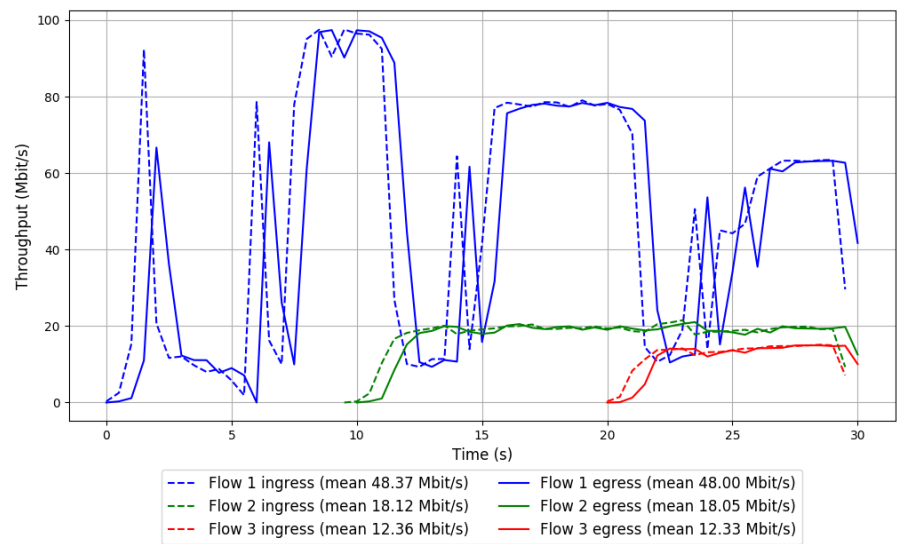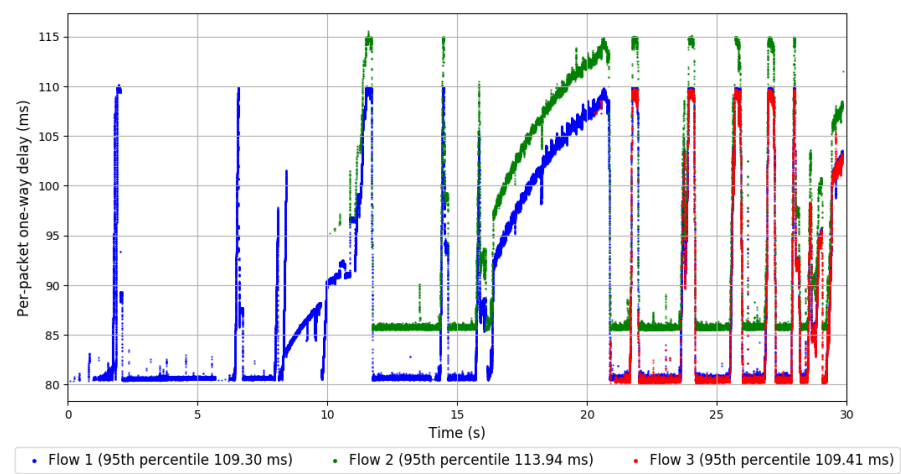
Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-12-20 02:09:52
End at: 2018-12-20 02:10:22
Local clock offset: -3.338 ms
Remote clock offset: 6.274 ms


# Below is generated by plot.py at 2018-12-20 03:42:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 64.02 Mbit/s
95th percentile per-packet one-way delay: 109.526 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 48.00 Mbit/s
95th percentile per-packet one-way delay: 110.090 ms
Loss rate: 0.73%
-- Flow 2:
Average throughput: 18.05 Mbit/s
95th percentile per-packet one-way delay: 107.743 ms
Loss rate: 0.34%
-- Flow 3:
Average throughput: 12.33 Mbit/s
95th percentile per-packet one-way delay: 101.579 ms
Loss rate: 0.31%
```
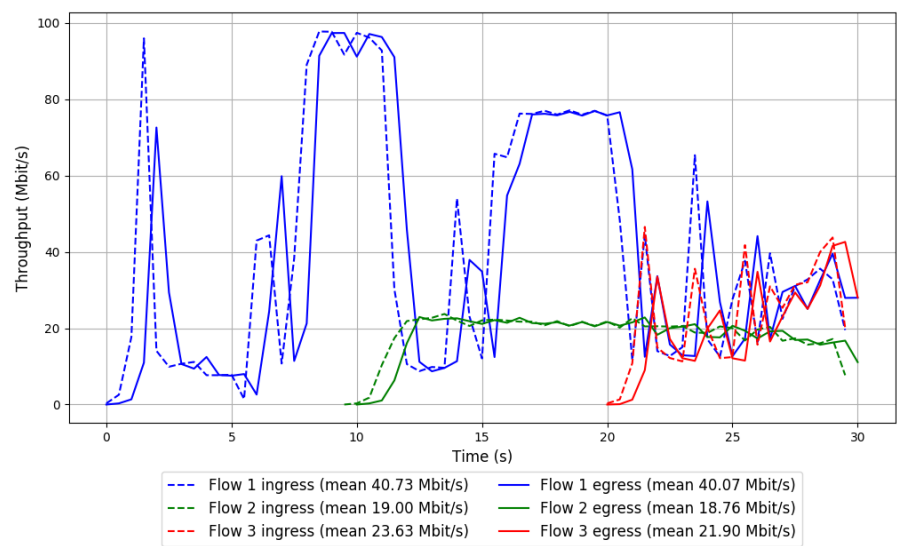
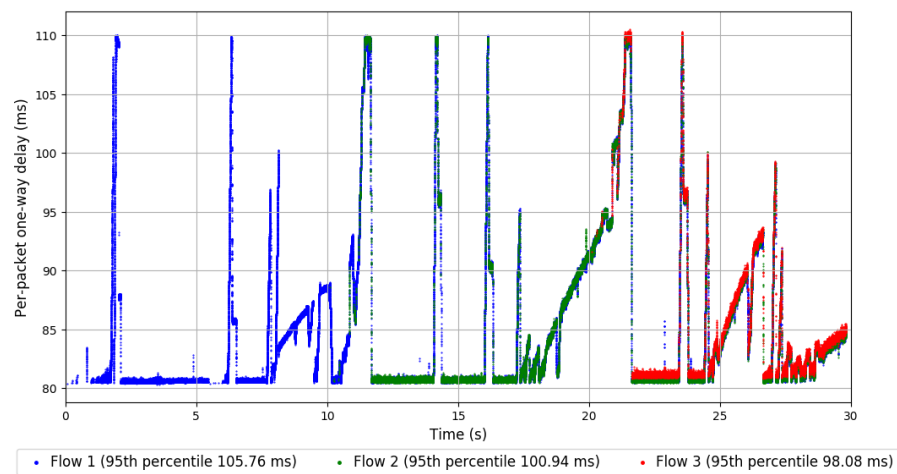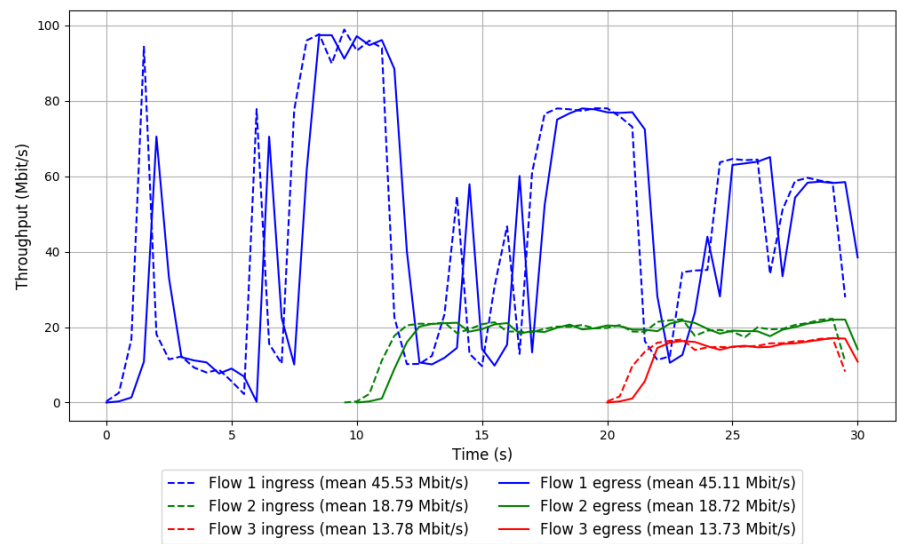Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 48.37 Mbit/s)   Flow 1 egress (mean 48.00 Mbit/s)
Flow 2 ingress (mean 18.12 Mbit/s)   Flow 2 egress (mean 18.05 Mbit/s)
Flow 3 ingress (mean 12.36 Mbit/s)   Flow 3 egress (mean 12.33 Mbit/s)

Flow 1 (95th percentile 110.09 ms)   Flow 2 (95th percentile 107.74 ms)   Flow 3 (95th percentile 101.58 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-12-20 02:33:54
End at: 2018-12-20 02:34:24
Local clock offset: -7.594 ms
Remote clock offset: 1.305 ms


# Below is generated by plot.py at 2018-12-20 03:42:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 59.66 Mbit/s
95th percentile per-packet one-way delay: 109.624 ms
Loss rate: 2.21%
-- Flow 1:
Average throughput: 40.07 Mbit/s
95th percentile per-packet one-way delay: 109.295 ms
Loss rate: 1.54%
-- Flow 2:
Average throughput: 18.76 Mbit/s
95th percentile per-packet one-way delay: 113.941 ms
Loss rate: 1.23%
-- Flow 3:
Average throughput: 21.90 Mbit/s
95th percentile per-packet one-way delay: 109.408 ms
Loss rate: 7.34%
```
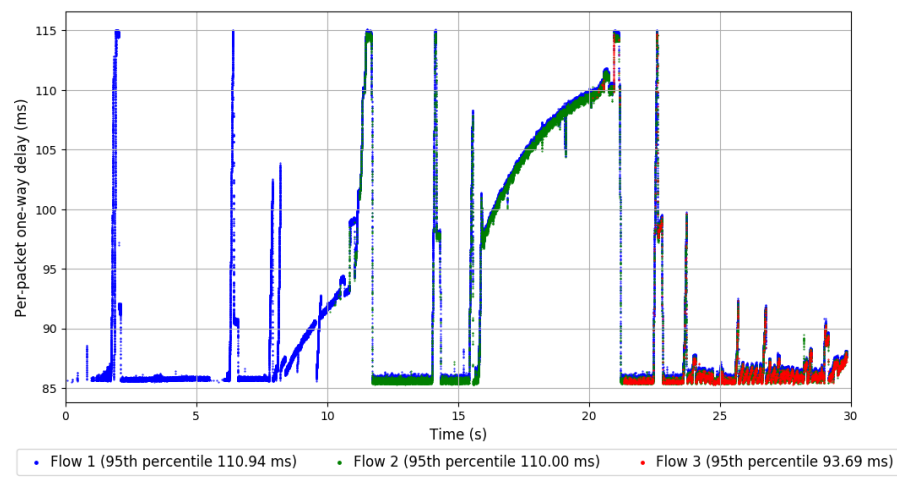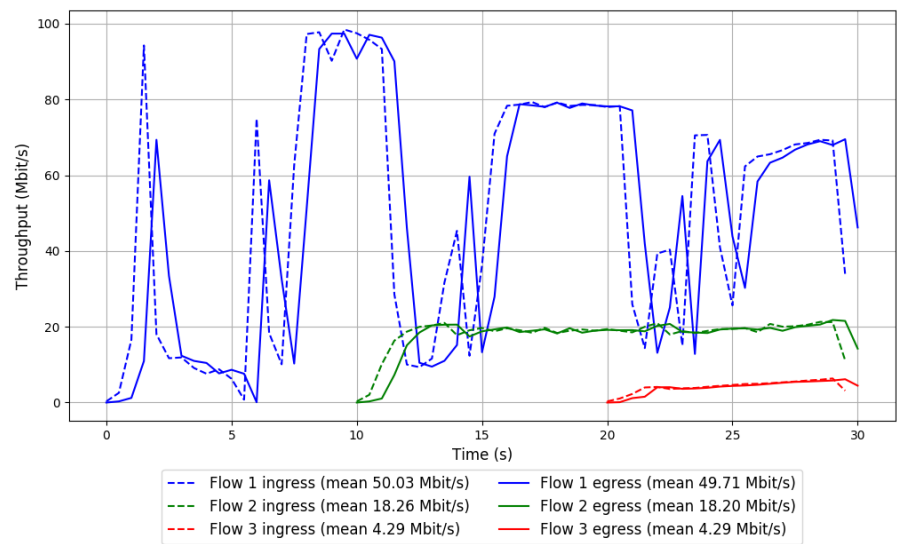
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 40.73 Mbit/s) --- Flow 1 egress (mean 40.07 Mbit/s)
Flow 2 ingress (mean 19.00 Mbit/s) --- Flow 2 egress (mean 18.76 Mbit/s)
Flow 3 ingress (mean 23.63 Mbit/s) --- Flow 3 egress (mean 21.90 Mbit/s)

Flow 1 (95th percentile 109.30 ms) · Flow 2 (95th percentile 113.94 ms) · Flow 3 (95th percentile 109.41 ms)

```
Run 4: Statistics of QUIC Cubic

Start at: 2018-12-20 02:57:58
End at: 2018-12-20 02:58:28
Local clock offset: -7.23 ms
Remote clock offset: -1.088 ms


# Below is generated by plot.py at 2018-12-20 03:42:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 62.01 Mbit/s
95th percentile per-packet one-way delay: 105.021 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 45.11 Mbit/s
95th percentile per-packet one-way delay: 105.757 ms
Loss rate: 0.92%
-- Flow 2:
Average throughput: 18.72 Mbit/s
95th percentile per-packet one-way delay: 100.941 ms
Loss rate: 0.38%
-- Flow 3:
Average throughput: 13.73 Mbit/s
95th percentile per-packet one-way delay: 98.075 ms
Loss rate: 0.46%
```
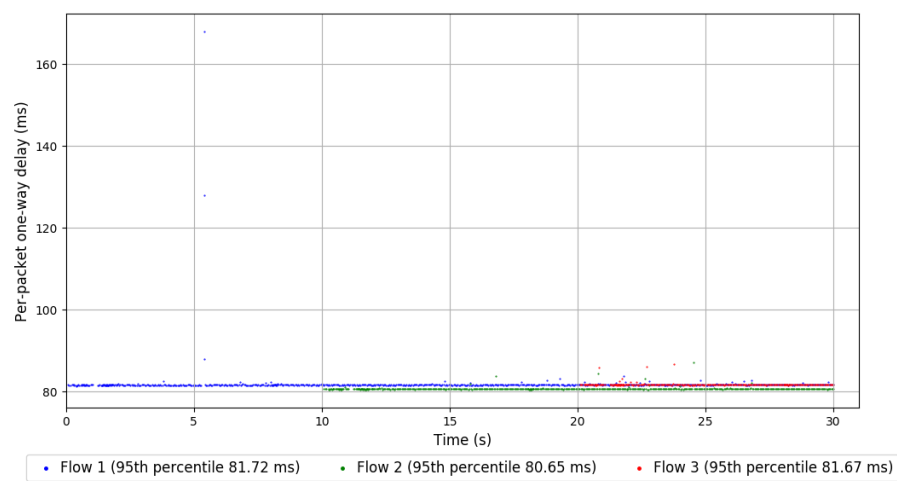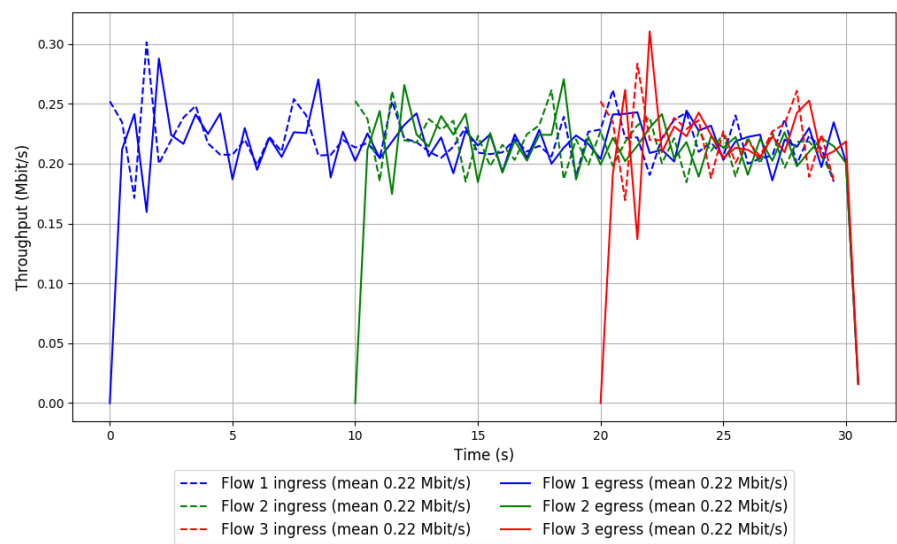
Run 4: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 45.53 Mbit/s) Flow 1 egress (mean 45.11 Mbit/s)
Flow 2 ingress (mean 18.79 Mbit/s) Flow 2 egress (mean 18.72 Mbit/s)
Flow 3 ingress (mean 13.78 Mbit/s) Flow 3 egress (mean 13.73 Mbit/s)

Flow 1 (95th percentile 105.76 ms)   Flow 2 (95th percentile 100.94 ms)   Flow 3 (95th percentile 98.08 ms)

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```
Run 5: Statistics of QUIC Cubic

Start at: 2018-12-20 03:22:00
End at: 2018-12-20 03:22:30
Local clock offset: -6.967 ms
Remote clock offset: 1.515 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 63.18 Mbit/s
95th percentile per-packet one-way delay: 110.511 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 49.71 Mbit/s
95th percentile per-packet one-way delay: 110.937 ms
Loss rate: 0.63%
-- Flow 2:
Average throughput: 18.20 Mbit/s
95th percentile per-packet one-way delay: 110.004 ms
Loss rate: 0.30%
-- Flow 3:
Average throughput: 4.29 Mbit/s
95th percentile per-packet one-way delay: 93.695 ms
Loss rate: 0.16%
```
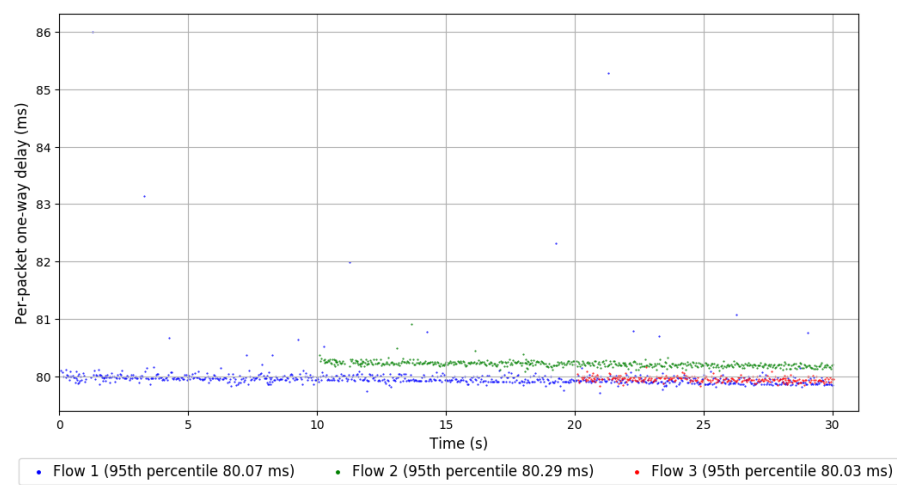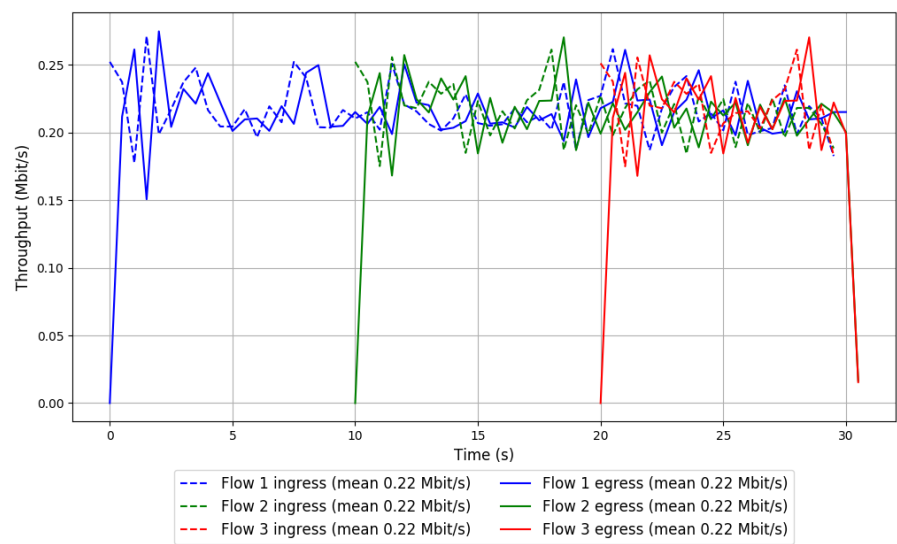
Run 5: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2018-12-20 01:47:06
End at: 2018-12-20 01:47:36
Local clock offset: -0.97 ms
Remote clock offset: 6.2 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 81.674 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 81.722 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.654 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 81.674 ms
Loss rate: 0.00%
```
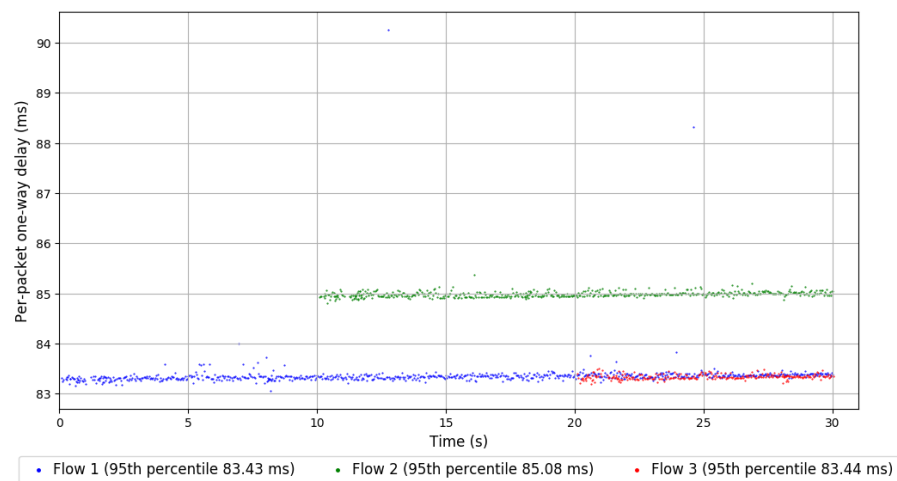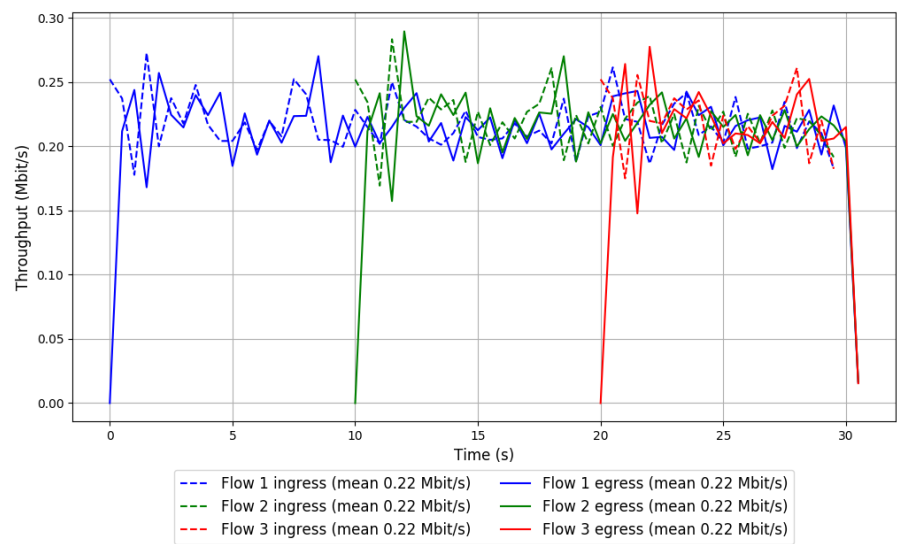
Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2018-12-20 02:11:08
End at: 2018-12-20 02:11:38
Local clock offset: -3.784 ms
Remote clock offset: 3.438 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 80.263 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.072 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.289 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.026 ms
Loss rate: 0.00%
```
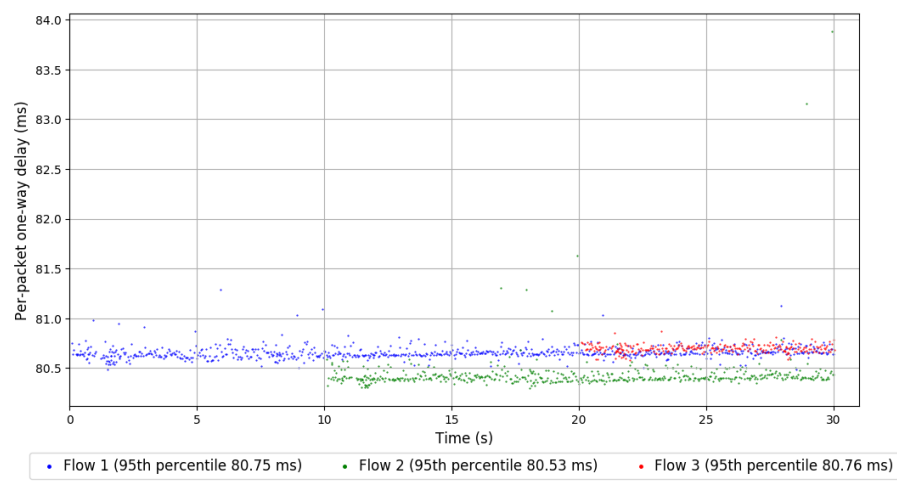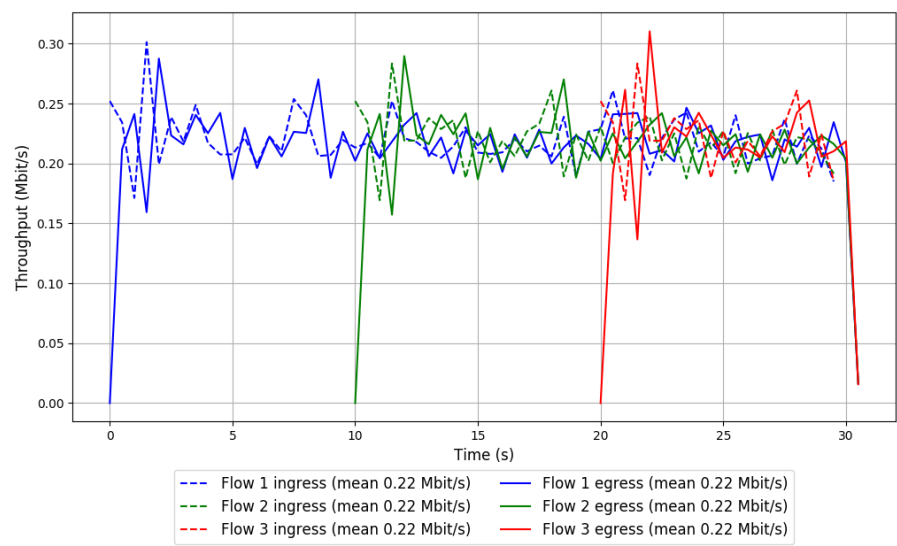
Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-12-20 02:35:10
End at: 2018-12-20 02:35:40
Local clock offset: -7.696 ms
Remote clock offset: 3.814 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 85.044 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 83.427 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 85.083 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 83.438 ms
Loss rate: 0.00%
```
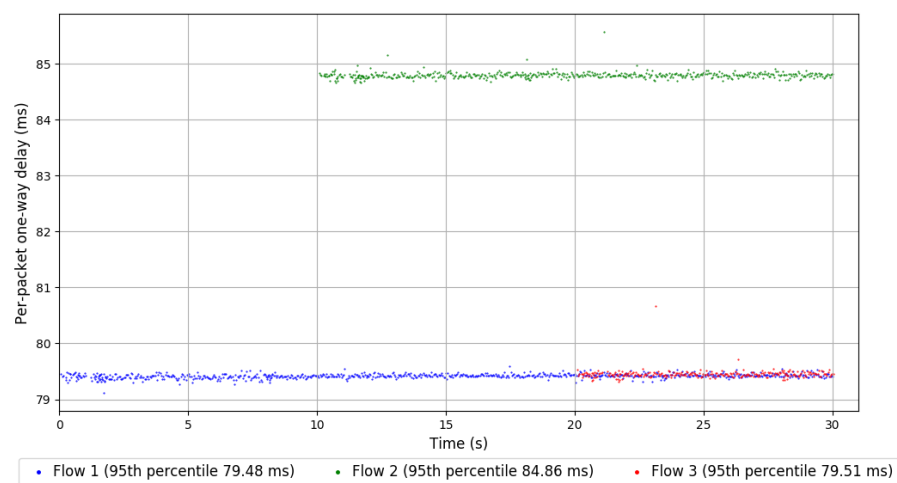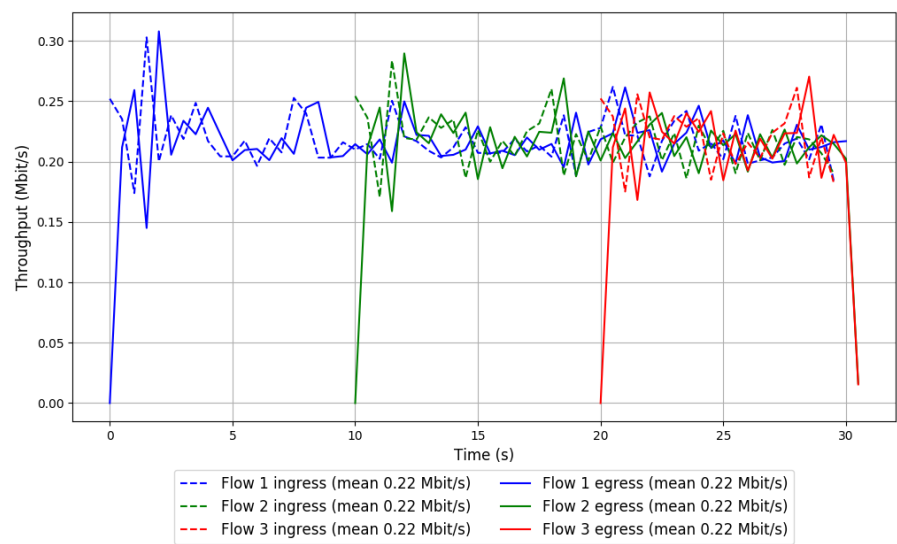
Run 3: Report of SCReAM — Data Link

```
Run 4: Statistics of SCReAM

Start at: 2018-12-20 02:59:14
End at: 2018-12-20 02:59:44
Local clock offset: -7.316 ms
Remote clock offset: -1.238 ms

# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 80.744 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.750 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.535 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 80.761 ms
Loss rate: 0.00%
```

Run 4: Report of SCReAM — Data Link

```
Run 5: Statistics of SCReAM

Start at: 2018-12-20 03:23:16
End at: 2018-12-20 03:23:46
Local clock offset: -6.924 ms
Remote clock offset: -4.888 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 84.832 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 79.483 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 84.862 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 79.514 ms
Loss rate: 0.00%
```
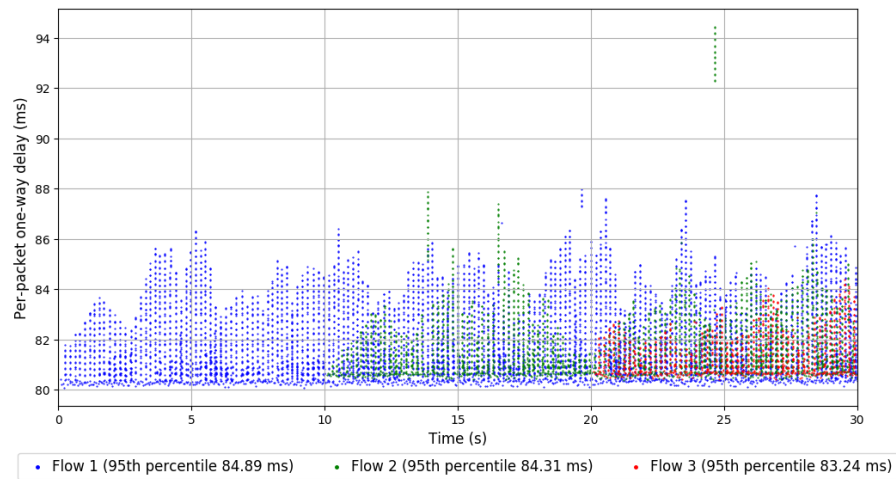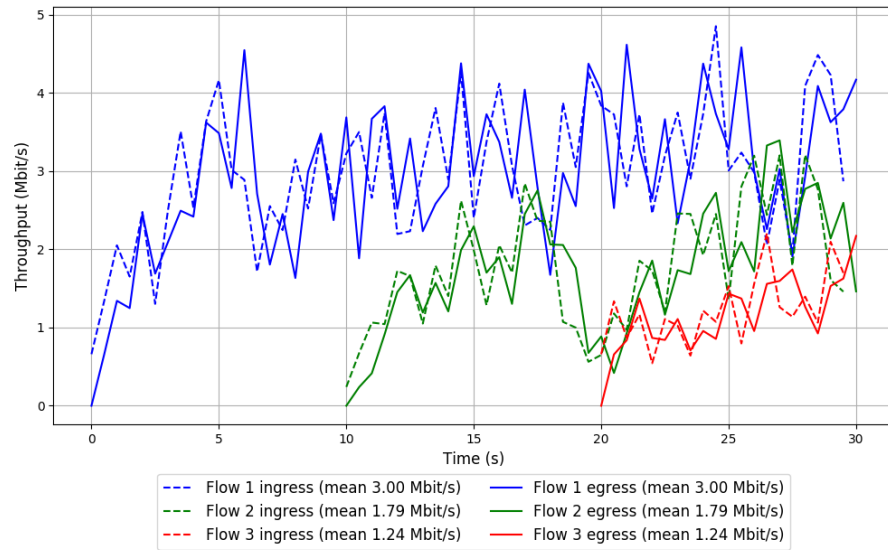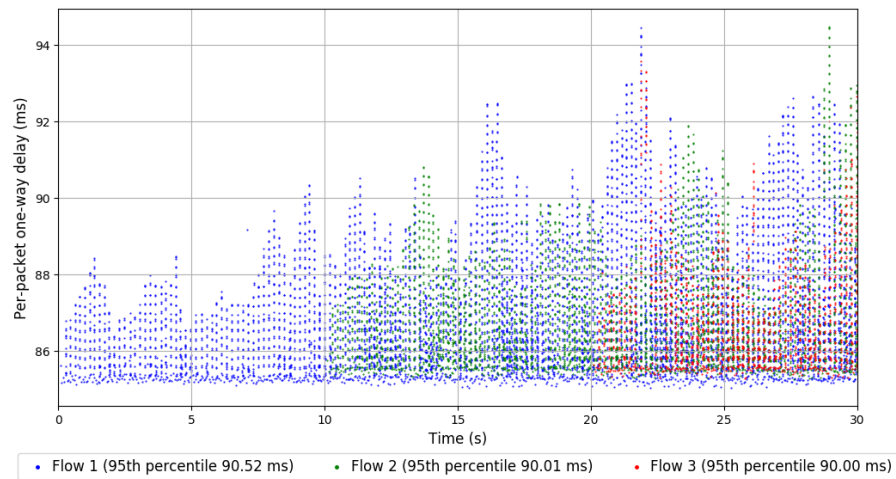
Run 5: Report of SCReAM — Data Link

```
Run 1: Statistics of Sprout

Start at: 2018-12-20 01:52:12
End at: 2018-12-20 01:52:42
Local clock offset: -1.014 ms
Remote clock offset: 5.565 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.59 Mbit/s
95th percentile per-packet one-way delay: 84.698 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 3.00 Mbit/s
95th percentile per-packet one-way delay: 84.892 ms
Loss rate: 0.03%
-- Flow 2:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 84.307 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 83.237 ms
Loss rate: 0.00%
```
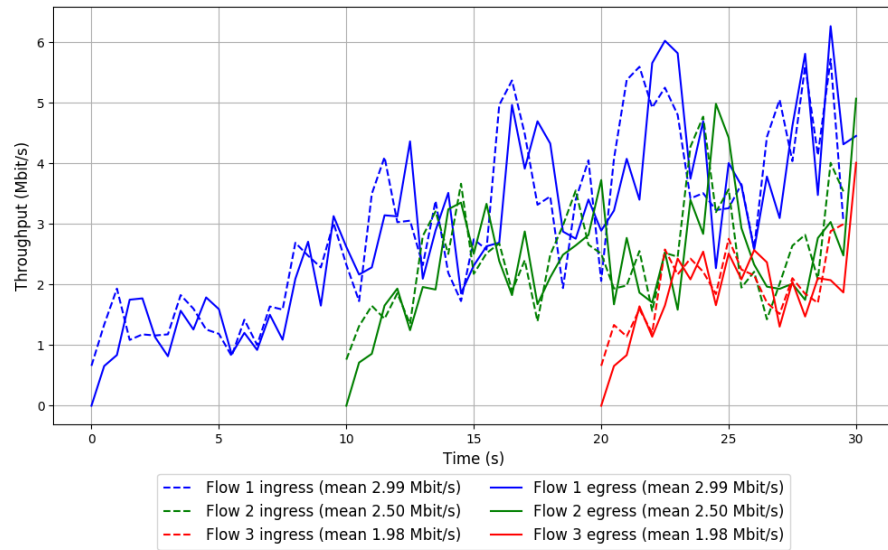
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-12-20 02:16:14
End at: 2018-12-20 02:16:44
Local clock offset: -5.432 ms
Remote clock offset: 8.116 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.30 Mbit/s
95th percentile per-packet one-way delay: 90.322 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.99 Mbit/s
95th percentile per-packet one-way delay: 90.517 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.50 Mbit/s
95th percentile per-packet one-way delay: 90.013 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.98 Mbit/s
95th percentile per-packet one-way delay: 90.005 ms
Loss rate: 0.00%
```
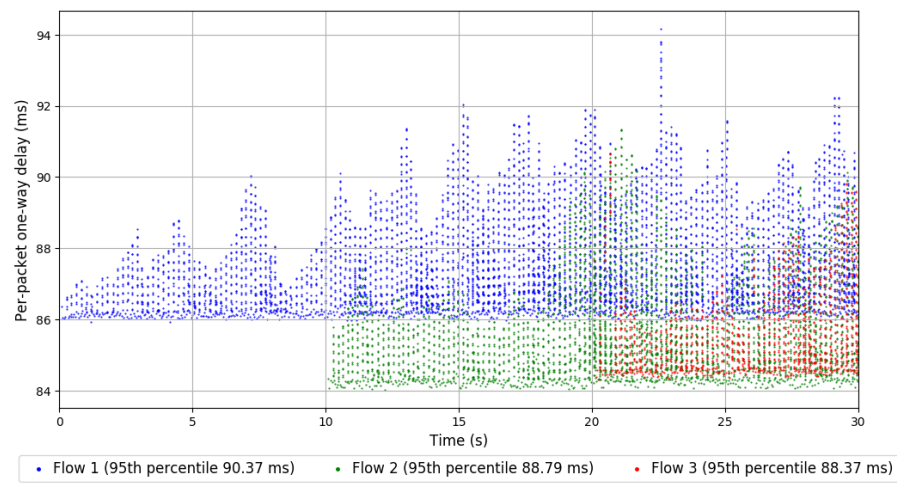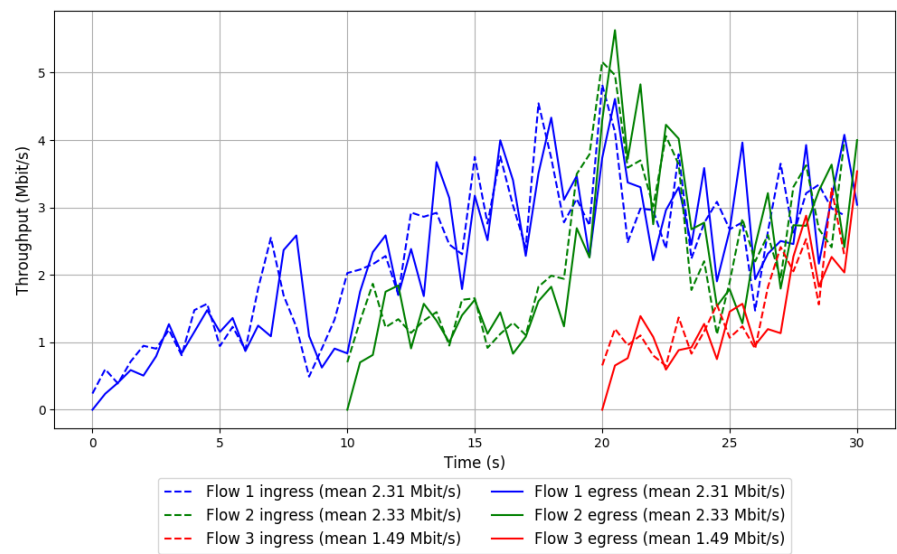
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-12-20 02:40:17
End at: 2018-12-20 02:40:47
Local clock offset: -7.329 ms
Remote clock offset: 4.596 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.35 Mbit/s
95th percentile per-packet one-way delay: 89.920 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 90.367 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 88.786 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.49 Mbit/s
95th percentile per-packet one-way delay: 88.371 ms
Loss rate: 0.00%
```
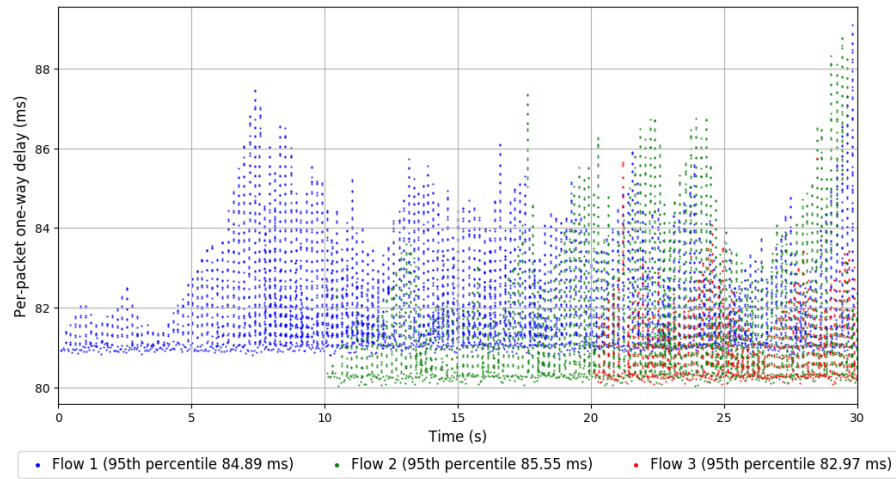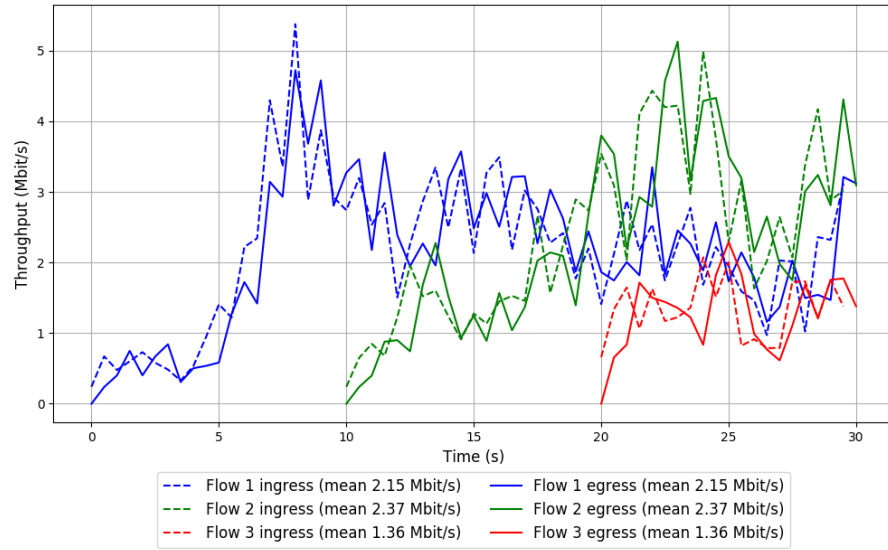
Run 3: Report of Sprout — Data Link

```
Run 4: Statistics of Sprout

Start at: 2018-12-20 03:04:19
End at: 2018-12-20 03:04:49
Local clock offset: -7.392 ms
Remote clock offset: -1.793 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.18 Mbit/s
95th percentile per-packet one-way delay: 85.066 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 84.892 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 85.554 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 82.965 ms
Loss rate: 0.00%
```
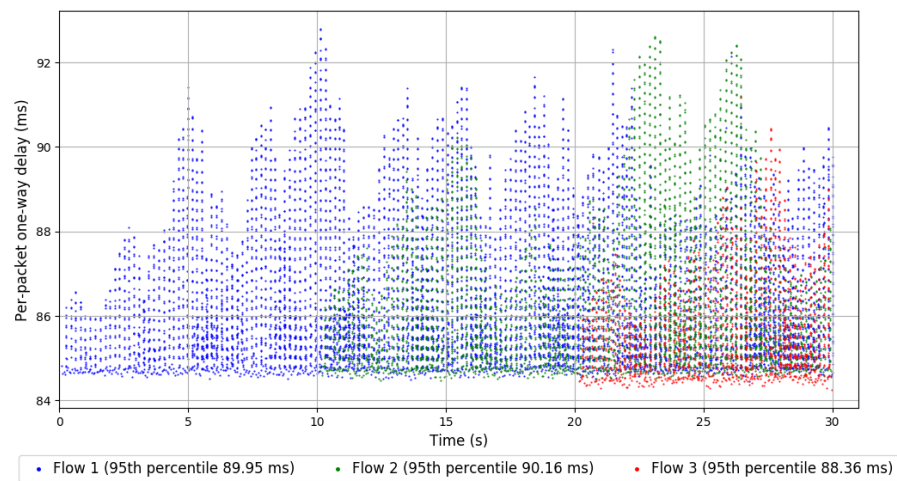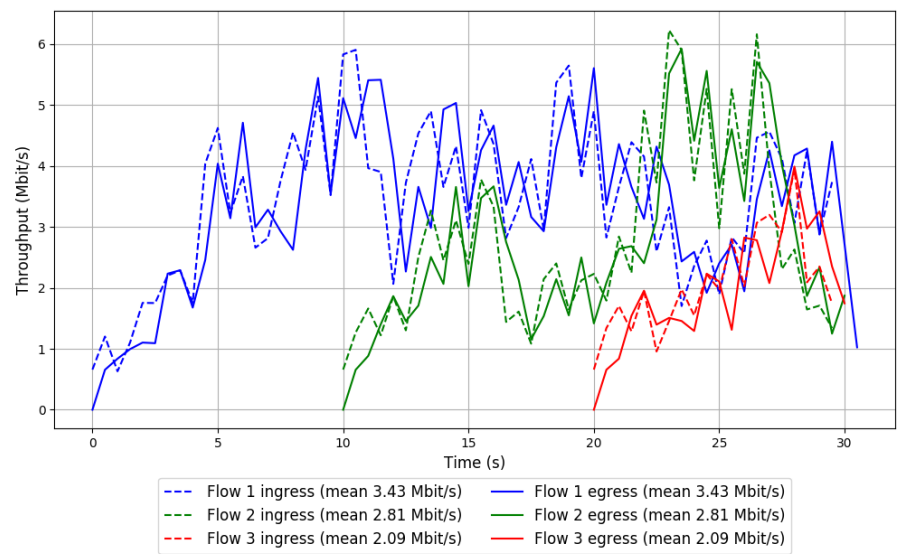
Run 4: Report of Sprout — Data Link

```
Run 5: Statistics of Sprout

Start at: 2018-12-20 03:28:21
End at: 2018-12-20 03:28:51
Local clock offset: -6.964 ms
Remote clock offset: -0.023 ms

# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.99 Mbit/s
95th percentile per-packet one-way delay: 89.927 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 3.43 Mbit/s
95th percentile per-packet one-way delay: 89.950 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.81 Mbit/s
95th percentile per-packet one-way delay: 90.159 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 88.358 ms
Loss rate: 0.00%
```

Run 5: Report of Sprout — Data Link

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

Start at: 2018-12-20 01:42:01
End at: 2018-12-20 01:42:31
Local clock offset: -0.798 ms
Remote clock offset: 6.592 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.59 Mbit/s
95th percentile per-packet one-way delay: 81.403 ms
Loss rate: 87.32%
-- Flow 1:
Average throughput: 7.18 Mbit/s
95th percentile per-packet one-way delay: 88.667 ms
Loss rate: 38.88%
-- Flow 2:
Average throughput: 3.73 Mbit/s
95th percentile per-packet one-way delay: 80.476 ms
Loss rate: 88.65%
-- Flow 3:
Average throughput: 8.90 Mbit/s
95th percentile per-packet one-way delay: 80.412 ms
Loss rate: 95.50%
```
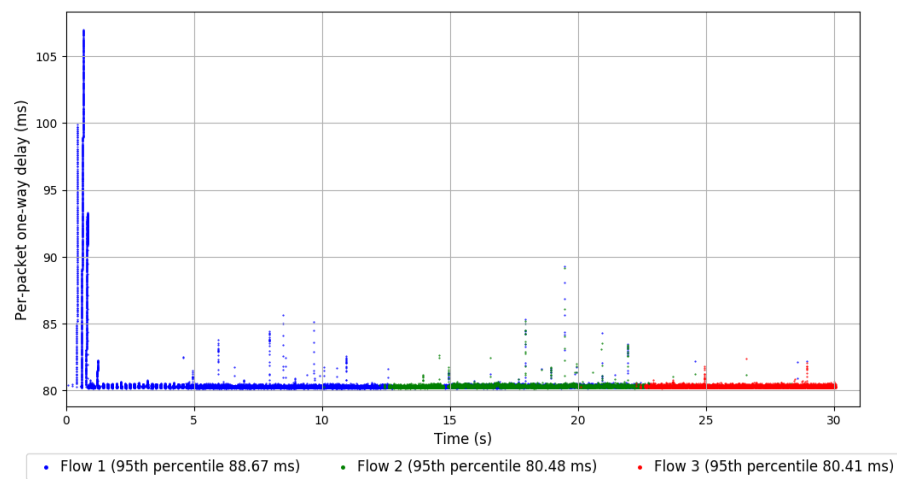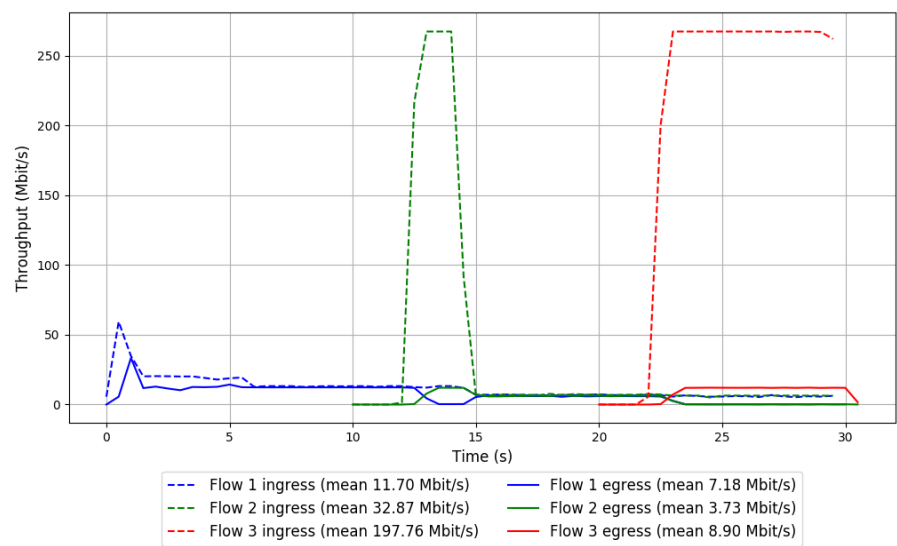
Run 1: Report of TaoVA-100x — Data Link

Legend:
- Flow 1 ingress (mean 11.70 Mbit/s)
- Flow 2 ingress (mean 32.87 Mbit/s)
- Flow 3 ingress (mean 197.76 Mbit/s)
- Flow 1 egress (mean 7.18 Mbit/s)
- Flow 2 egress (mean 3.73 Mbit/s)
- Flow 3 egress (mean 8.90 Mbit/s)

Legend:
- Flow 1 (95th percentile 88.67 ms)
- Flow 2 (95th percentile 80.48 ms)
- Flow 3 (95th percentile 80.41 ms)

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

Start at: 2018-12-20 02:06:04
End at: 2018-12-20 02:06:34
Local clock offset: -1.229 ms
Remote clock offset: 9.344 ms


# Below is generated by plot.py at 2018-12-20 03:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.59 Mbit/s
95th percentile per-packet one-way delay: 86.878 ms
Loss rate: 40.45%
-- Flow 1:
Average throughput: 8.36 Mbit/s
95th percentile per-packet one-way delay: 91.491 ms
Loss rate: 34.97%
-- Flow 2:
Average throughput: 4.67 Mbit/s
95th percentile per-packet one-way delay: 85.365 ms
Loss rate: 25.79%
-- Flow 3:
Average throughput: 3.38 Mbit/s
95th percentile per-packet one-way delay: 85.274 ms
Loss rate: 72.61%
```
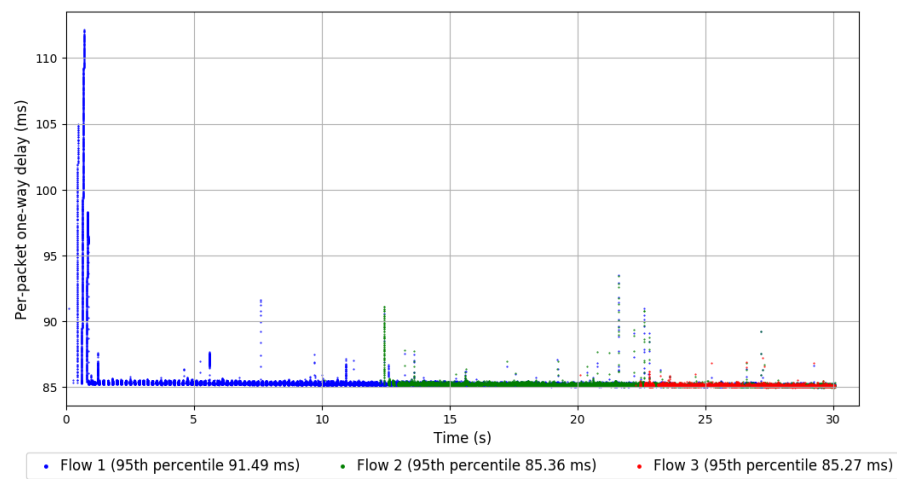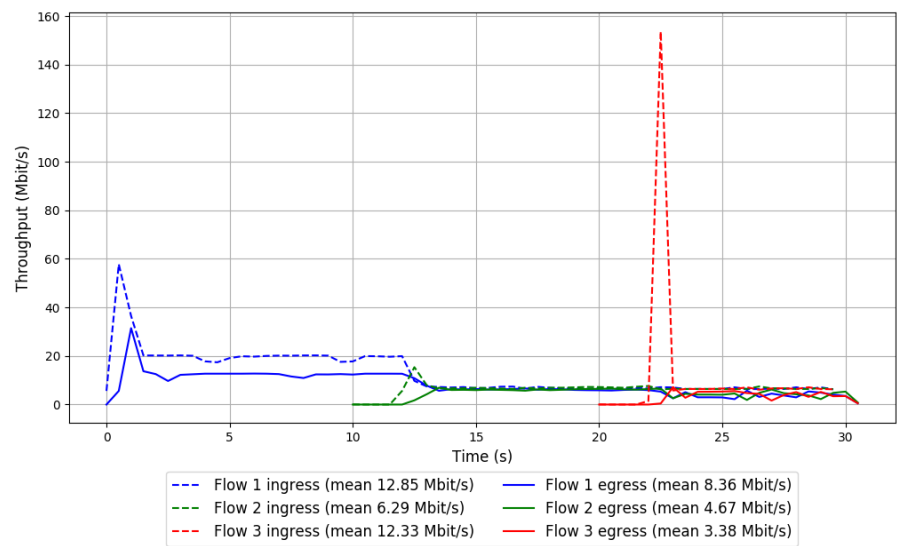
Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2018-12-20 02:30:06
End at: 2018-12-20 02:30:36
Local clock offset: -7.281 ms
Remote clock offset: 0.553 ms


# Below is generated by plot.py at 2018-12-20 03:42:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.59 Mbit/s
95th percentile per-packet one-way delay: 79.998 ms
Loss rate: 47.20%
-- Flow 1:
Average throughput: 7.77 Mbit/s
95th percentile per-packet one-way delay: 86.486 ms
Loss rate: 22.18%
-- Flow 2:
Average throughput: 5.31 Mbit/s
95th percentile per-packet one-way delay: 79.380 ms
Loss rate: 68.02%
-- Flow 3:
Average throughput: 3.88 Mbit/s
95th percentile per-packet one-way delay: 79.368 ms
Loss rate: 54.08%
```
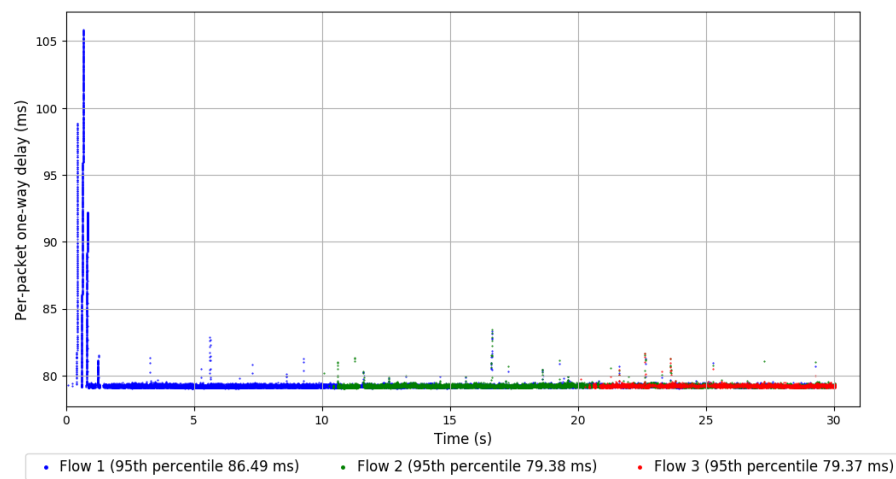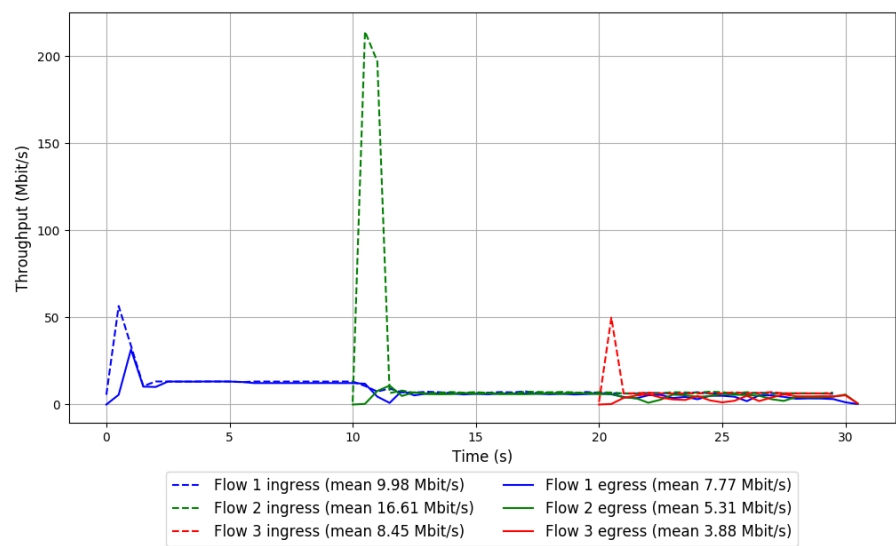
Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 9.98 Mbit/s)
Flow 2 ingress (mean 16.61 Mbit/s)
Flow 3 ingress (mean 8.45 Mbit/s)
Flow 1 egress (mean 7.77 Mbit/s)
Flow 2 egress (mean 5.31 Mbit/s)
Flow 3 egress (mean 3.88 Mbit/s)

Flow 1 (95th percentile 86.49 ms)
Flow 2 (95th percentile 79.38 ms)
Flow 3 (95th percentile 79.37 ms)

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

Start at: 2018-12-20 02:54:10
End at: 2018-12-20 02:54:40
Local clock offset: -7.134 ms
Remote clock offset: 3.065 ms

# Below is generated by plot.py at 2018-12-20 03:42:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.59 Mbit/s
95th percentile per-packet one-way delay: 84.986 ms
Loss rate: 29.90%
-- Flow 1:
Average throughput: 8.09 Mbit/s
95th percentile per-packet one-way delay: 90.780 ms
Loss rate: 32.73%
-- Flow 2:
Average throughput: 5.57 Mbit/s
95th percentile per-packet one-way delay: 84.318 ms
Loss rate: 19.87%
-- Flow 3:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 84.314 ms
Loss rate: 39.42%
```
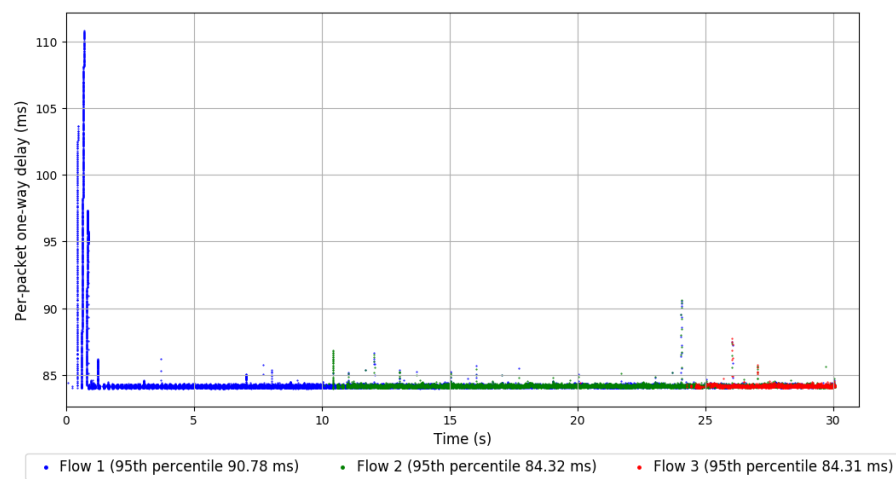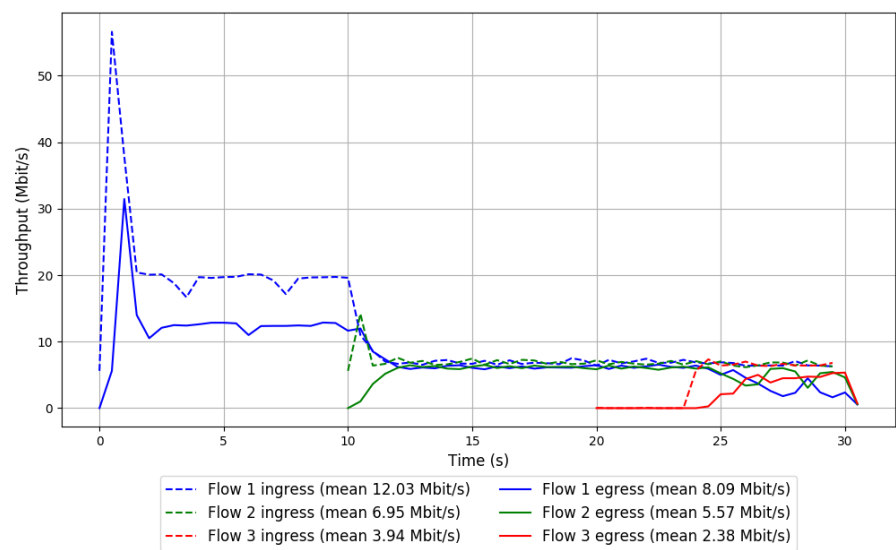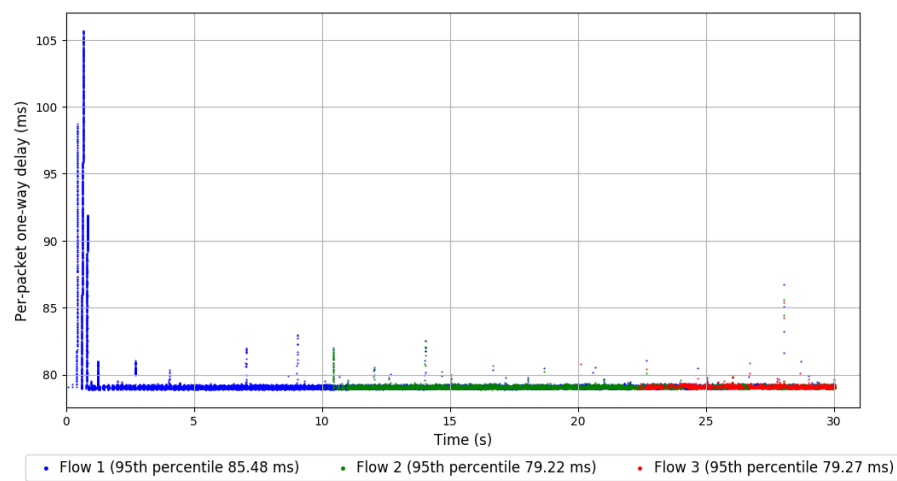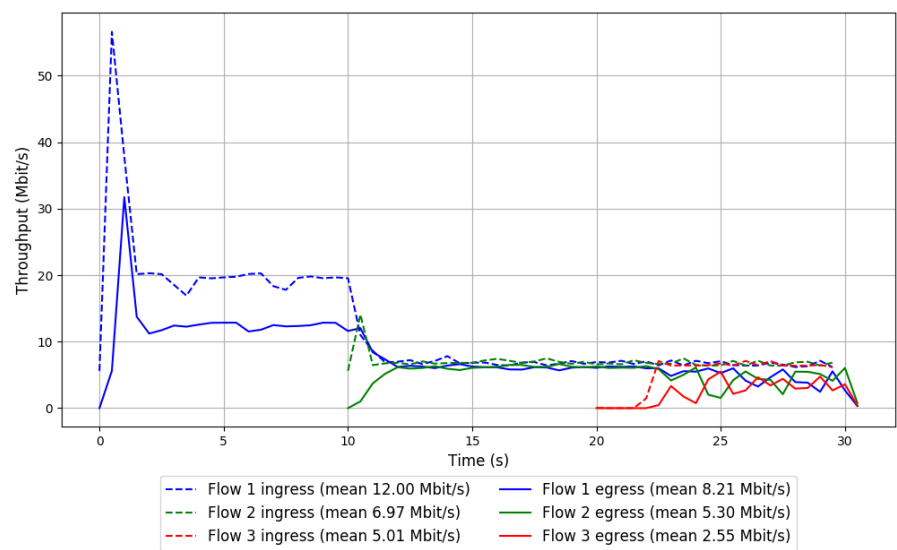
Run 4: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 12.03 Mbit/s)   Flow 1 egress (mean 8.09 Mbit/s)
Flow 2 ingress (mean 6.95 Mbit/s)   Flow 2 egress (mean 5.57 Mbit/s)
Flow 3 ingress (mean 3.94 Mbit/s)   Flow 3 egress (mean 2.38 Mbit/s)

Flow 1 (95th percentile 90.78 ms)   Flow 2 (95th percentile 84.32 ms)   Flow 3 (95th percentile 84.31 ms)

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

Start at: 2018-12-20 03:18:13
End at: 2018-12-20 03:18:43
Local clock offset: -6.965 ms
Remote clock offset: -4.554 ms


# Below is generated by plot.py at 2018-12-20 03:42:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.59 Mbit/s
95th percentile per-packet one-way delay: 80.089 ms
Loss rate: 31.23%
-- Flow 1:
Average throughput: 8.21 Mbit/s
95th percentile per-packet one-way delay: 85.485 ms
Loss rate: 31.55%
-- Flow 2:
Average throughput: 5.30 Mbit/s
95th percentile per-packet one-way delay: 79.222 ms
Loss rate: 23.97%
-- Flow 3:
Average throughput: 2.55 Mbit/s
95th percentile per-packet one-way delay: 79.265 ms
Loss rate: 49.16%
```
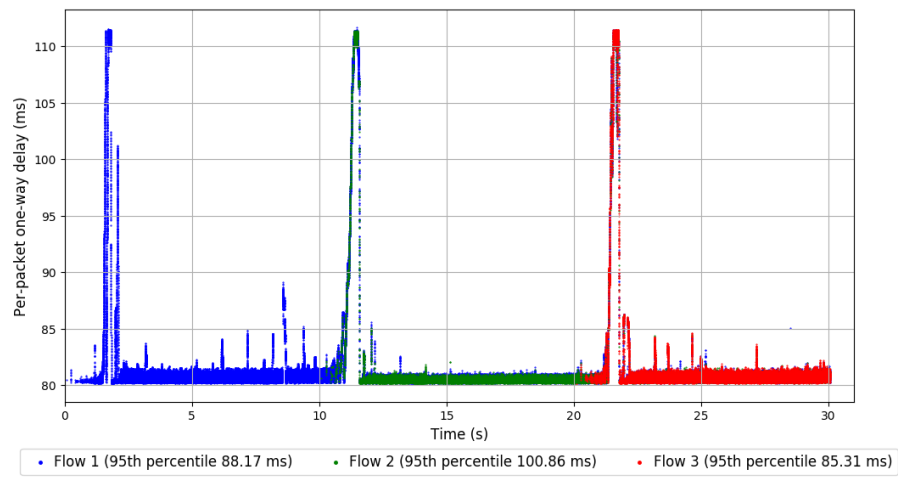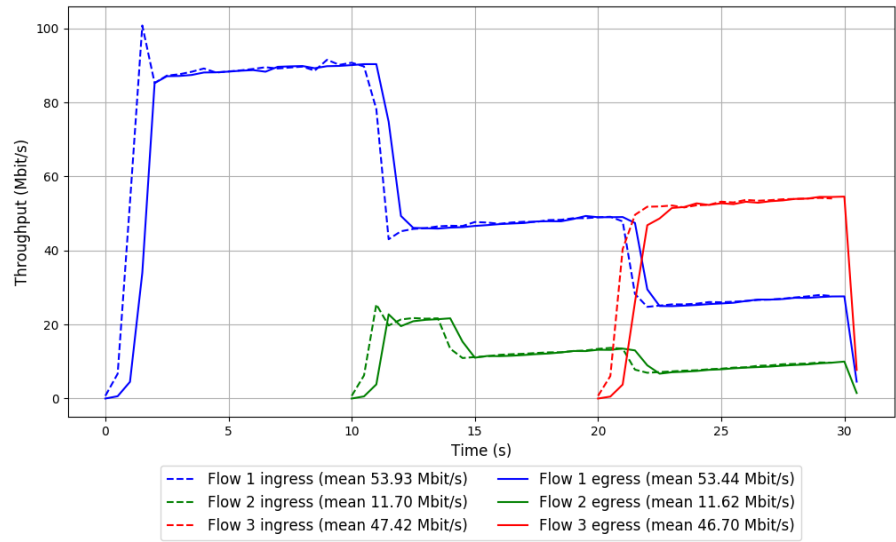
Run 5: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 12.00 Mbit/s) --- Flow 1 egress (mean 8.21 Mbit/s)
Flow 2 ingress (mean 6.97 Mbit/s) --- Flow 2 egress (mean 5.30 Mbit/s)
Flow 3 ingress (mean 5.01 Mbit/s) --- Flow 3 egress (mean 2.55 Mbit/s)

Flow 1 (95th percentile 85.48 ms)   Flow 2 (95th percentile 79.22 ms)   Flow 3 (95th percentile 79.27 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2018-12-20 01:57:15
End at: 2018-12-20 01:57:45
Local clock offset: -0.944 ms
Remote clock offset: 4.914 ms


# Below is generated by plot.py at 2018-12-20 03:42:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 76.71 Mbit/s
95th percentile per-packet one-way delay: 88.418 ms
Loss rate: 1.00%
-- Flow 1:
Average throughput: 53.44 Mbit/s
95th percentile per-packet one-way delay: 88.166 ms
Loss rate: 0.90%
-- Flow 2:
Average throughput: 11.62 Mbit/s
95th percentile per-packet one-way delay: 100.865 ms
Loss rate: 0.70%
-- Flow 3:
Average throughput: 46.70 Mbit/s
95th percentile per-packet one-way delay: 85.309 ms
Loss rate: 1.51%
```
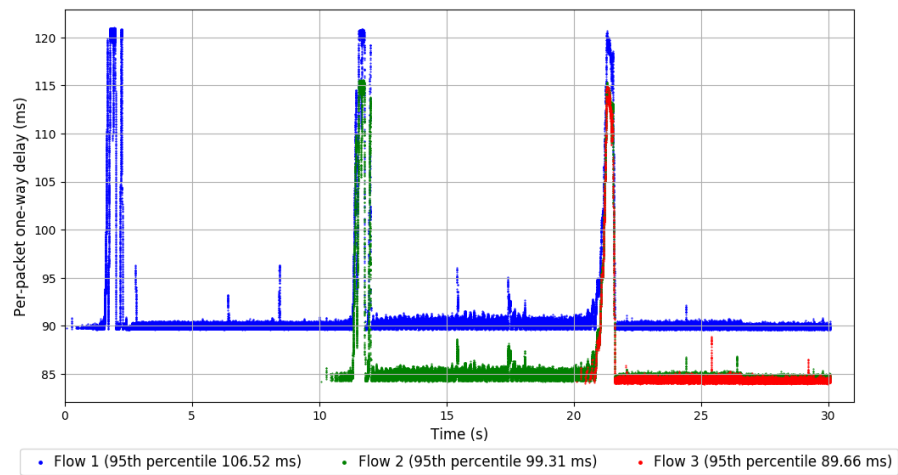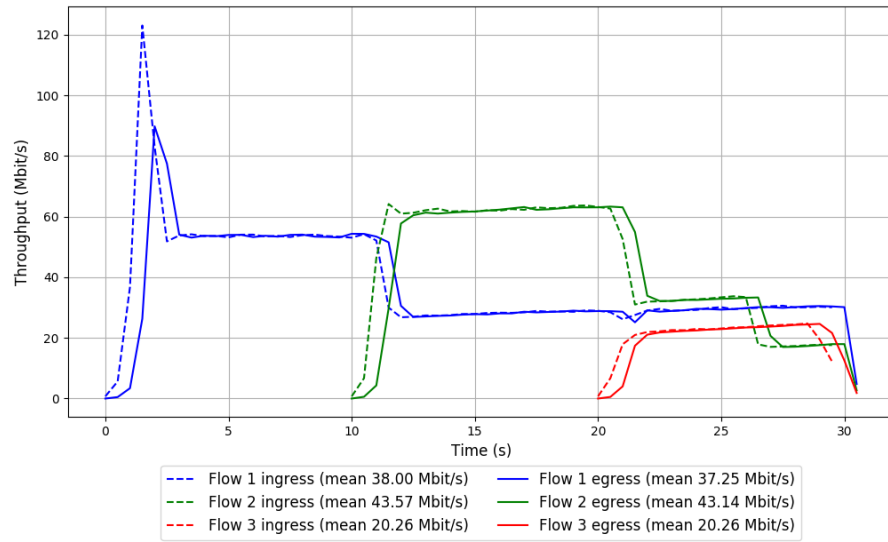
Run 1: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 53.93 Mbit/s) — Flow 1 egress (mean 53.44 Mbit/s)
Flow 2 ingress (mean 11.70 Mbit/s) — Flow 2 egress (mean 11.62 Mbit/s)
Flow 3 ingress (mean 47.42 Mbit/s) — Flow 3 egress (mean 46.70 Mbit/s)

Flow 1 (95th percentile 88.17 ms) • Flow 2 (95th percentile 100.86 ms) • Flow 3 (95th percentile 85.31 ms)

```
Run 2: Statistics of TCP Vegas

Start at: 2018-12-20 02:21:17
End at: 2018-12-20 02:21:47
Local clock offset: -6.308 ms
Remote clock offset: 6.437 ms


# Below is generated by plot.py at 2018-12-20 03:42:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 72.75 Mbit/s
95th percentile per-packet one-way delay: 102.548 ms
Loss rate: 1.41%
-- Flow 1:
Average throughput: 37.25 Mbit/s
95th percentile per-packet one-way delay: 106.522 ms
Loss rate: 1.99%
-- Flow 2:
Average throughput: 43.14 Mbit/s
95th percentile per-packet one-way delay: 99.309 ms
Loss rate: 0.99%
-- Flow 3:
Average throughput: 20.26 Mbit/s
95th percentile per-packet one-way delay: 89.655 ms
Loss rate: 0.01%
```

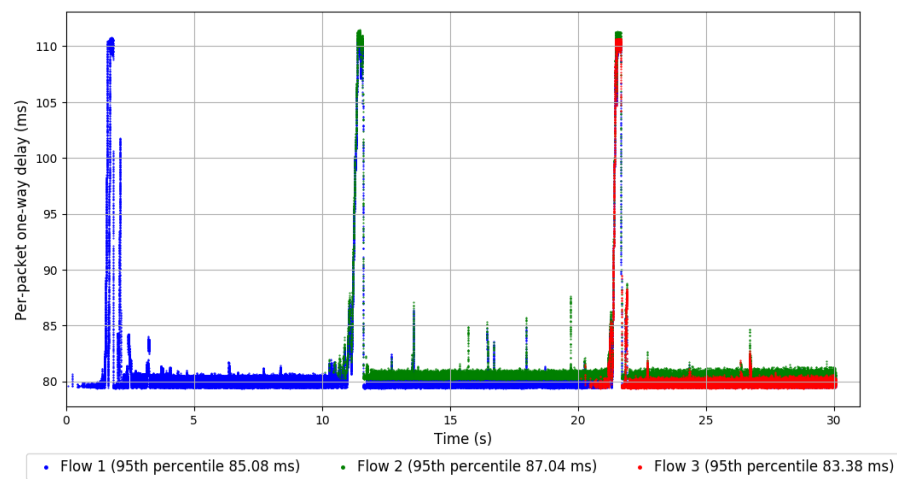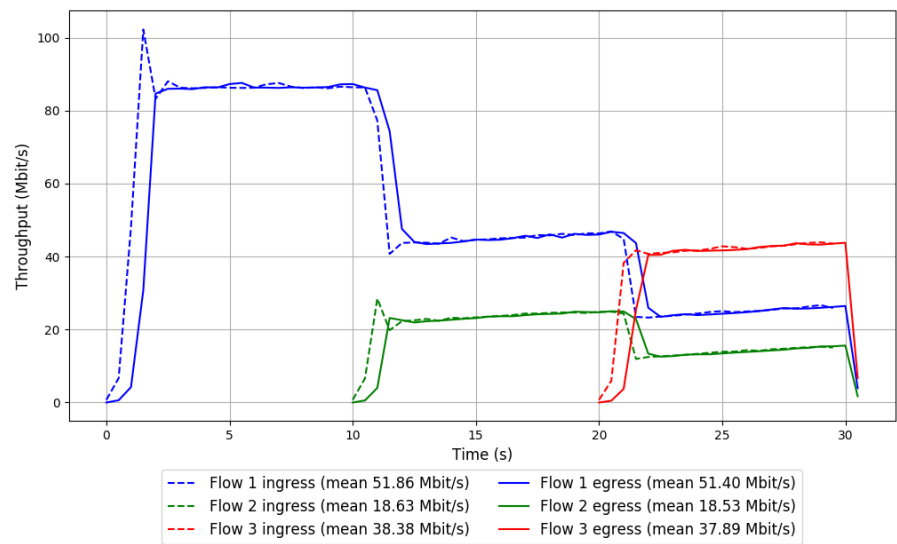Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-12-20 02:45:21
End at: 2018-12-20 02:45:51
Local clock offset: -7.126 ms
Remote clock offset: -0.919 ms


# Below is generated by plot.py at 2018-12-20 03:42:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 76.34 Mbit/s
95th percentile per-packet one-way delay: 85.138 ms
Loss rate: 0.88%
-- Flow 1:
Average throughput: 51.40 Mbit/s
95th percentile per-packet one-way delay: 85.080 ms
Loss rate: 0.87%
-- Flow 2:
Average throughput: 18.53 Mbit/s
95th percentile per-packet one-way delay: 87.036 ms
Loss rate: 0.52%
-- Flow 3:
Average throughput: 37.89 Mbit/s
95th percentile per-packet one-way delay: 83.383 ms
Loss rate: 1.28%
```
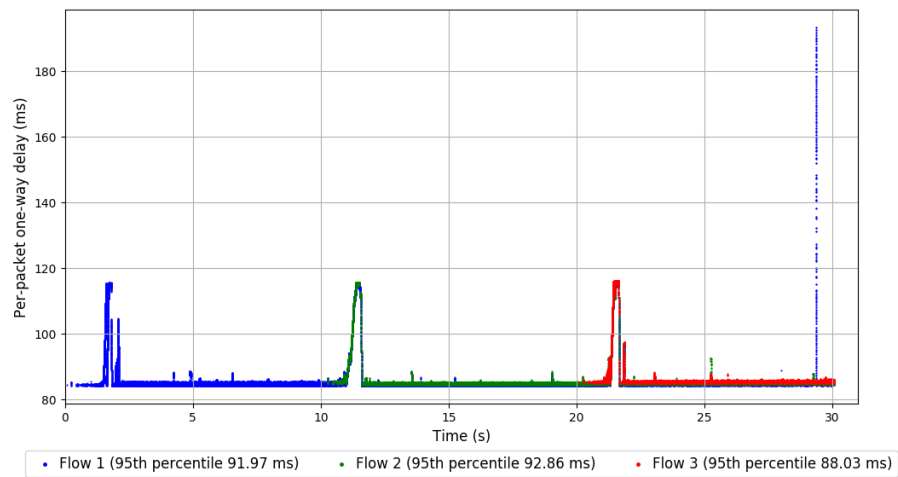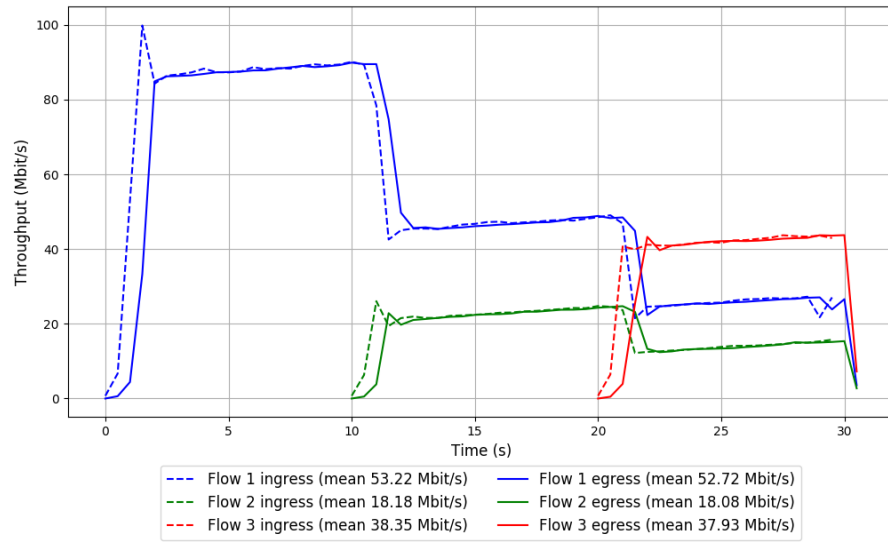
Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 51.86 Mbit/s) — — — Flow 1 egress (mean 51.40 Mbit/s)
Flow 2 ingress (mean 18.63 Mbit/s) — — — Flow 2 egress (mean 18.53 Mbit/s)
Flow 3 ingress (mean 38.38 Mbit/s) — — — Flow 3 egress (mean 37.89 Mbit/s)

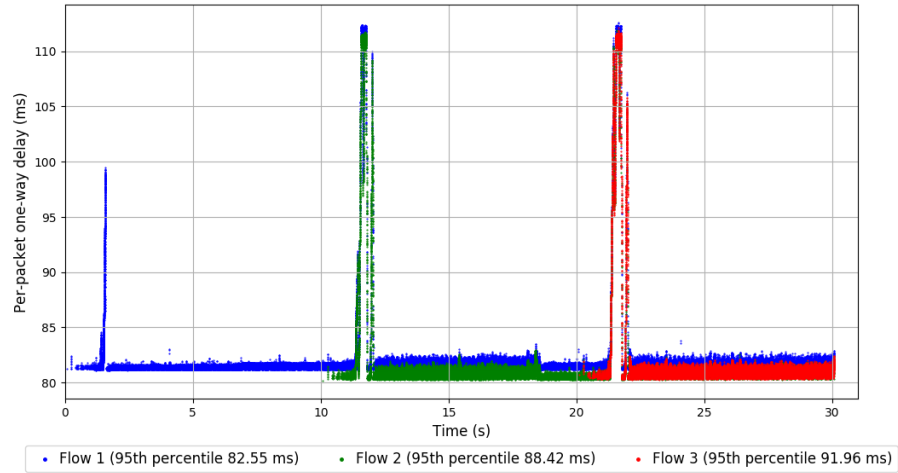Flow 1 (95th percentile 85.08 ms)　　Flow 2 (95th percentile 87.04 ms)　　Flow 3 (95th percentile 83.38 ms)

```
Run 4: Statistics of TCP Vegas

Start at: 2018-12-20 03:09:23
End at: 2018-12-20 03:09:53
Local clock offset: -7.134 ms
Remote clock offset: 1.737 ms


# Below is generated by plot.py at 2018-12-20 03:43:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 77.38 Mbit/s
95th percentile per-packet one-way delay: 91.616 ms
Loss rate: 0.90%
-- Flow 1:
Average throughput: 52.72 Mbit/s
95th percentile per-packet one-way delay: 91.971 ms
Loss rate: 0.94%
-- Flow 2:
Average throughput: 18.08 Mbit/s
95th percentile per-packet one-way delay: 92.856 ms
Loss rate: 0.54%
-- Flow 3:
Average throughput: 37.93 Mbit/s
95th percentile per-packet one-way delay: 88.031 ms
Loss rate: 1.09%
```

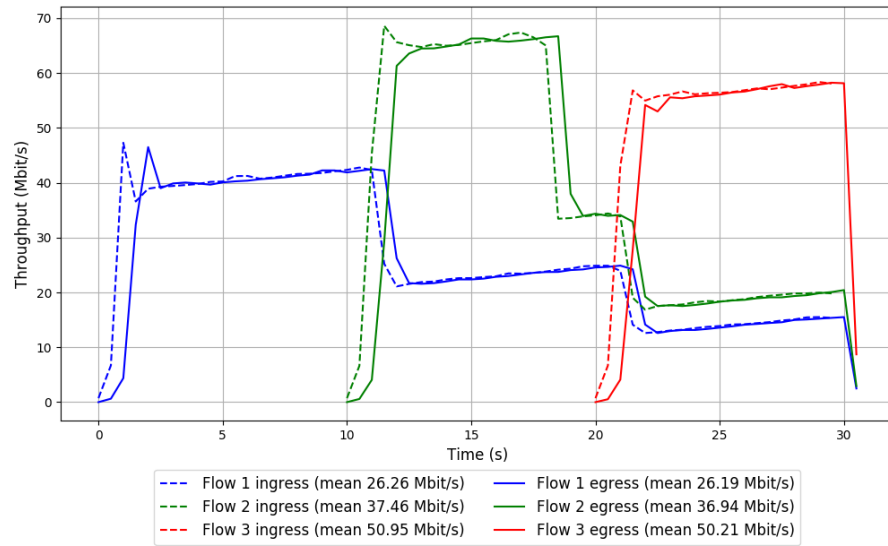Run 4: Report of TCP Vegas — Data Link

```
Run 5: Statistics of TCP Vegas

Start at: 2018-12-20 03:33:25
End at: 2018-12-20 03:33:55
Local clock offset: -7.031 ms
Remote clock offset: -4.657 ms


# Below is generated by plot.py at 2018-12-20 03:43:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 67.51 Mbit/s
95th percentile per-packet one-way delay: 84.667 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 26.19 Mbit/s
95th percentile per-packet one-way delay: 82.548 ms
Loss rate: 0.25%
-- Flow 2:
Average throughput: 36.94 Mbit/s
95th percentile per-packet one-way delay: 88.417 ms
Loss rate: 1.36%
-- Flow 3:
Average throughput: 50.21 Mbit/s
95th percentile per-packet one-way delay: 91.961 ms
Loss rate: 1.45%
```
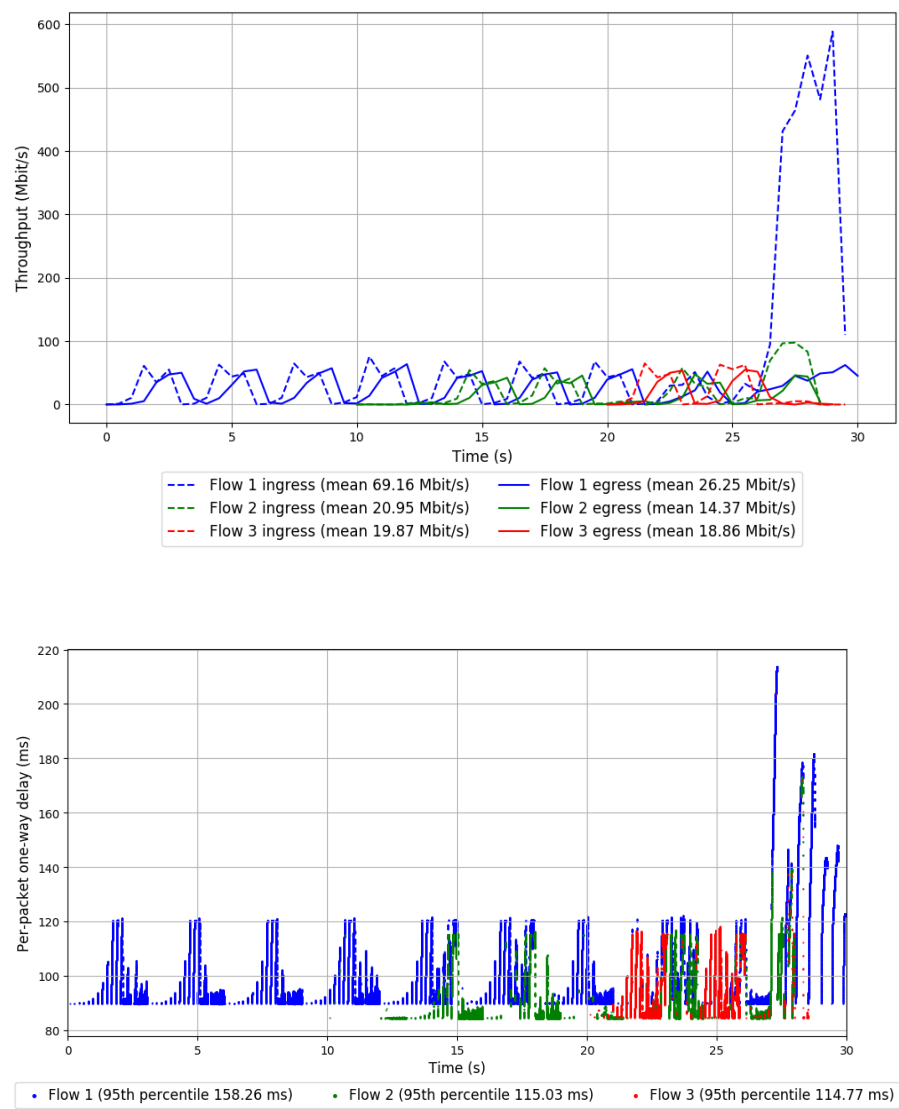
Run 5: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2018-12-20 01:49:37
End at: 2018-12-20 01:50:07
Local clock offset: -0.98 ms
Remote clock offset: 9.867 ms


# Below is generated by plot.py at 2018-12-20 03:43:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 40.44 Mbit/s
95th percentile per-packet one-way delay: 143.745 ms
Loss rate: 54.60%
-- Flow 1:
Average throughput: 26.25 Mbit/s
95th percentile per-packet one-way delay: 158.262 ms
Loss rate: 62.00%
-- Flow 2:
Average throughput: 14.37 Mbit/s
95th percentile per-packet one-way delay: 115.028 ms
Loss rate: 35.09%
-- Flow 3:
Average throughput: 18.86 Mbit/s
95th percentile per-packet one-way delay: 114.772 ms
Loss rate: 15.97%
```
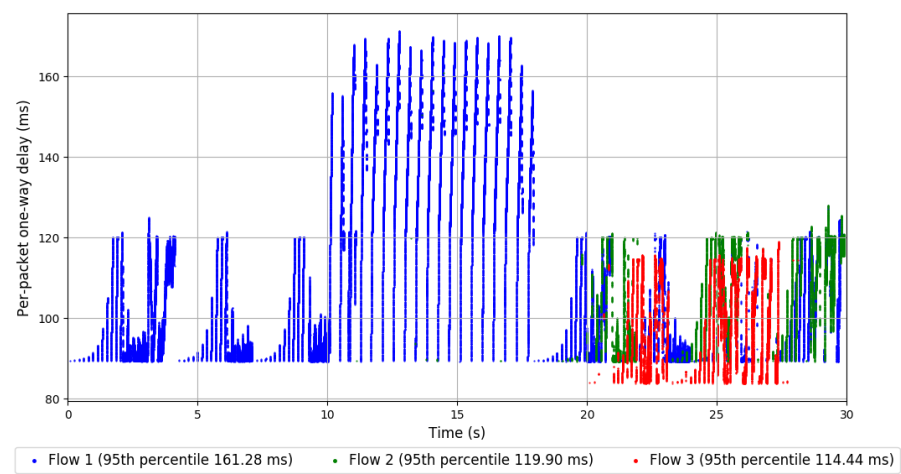
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2018-12-20 02:13:39
End at: 2018-12-20 02:14:09
Local clock offset: -4.647 ms
Remote clock offset: 7.196 ms


# Below is generated by plot.py at 2018-12-20 03:43:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 47.68 Mbit/s
95th percentile per-packet one-way delay: 158.189 ms
Loss rate: 69.92%
-- Flow 1:
Average throughput: 33.32 Mbit/s
95th percentile per-packet one-way delay: 161.280 ms
Loss rate: 76.18%
-- Flow 2:
Average throughput: 11.43 Mbit/s
95th percentile per-packet one-way delay: 119.899 ms
Loss rate: 28.69%
-- Flow 3:
Average throughput: 26.69 Mbit/s
95th percentile per-packet one-way delay: 114.438 ms
Loss rate: 16.33%
```
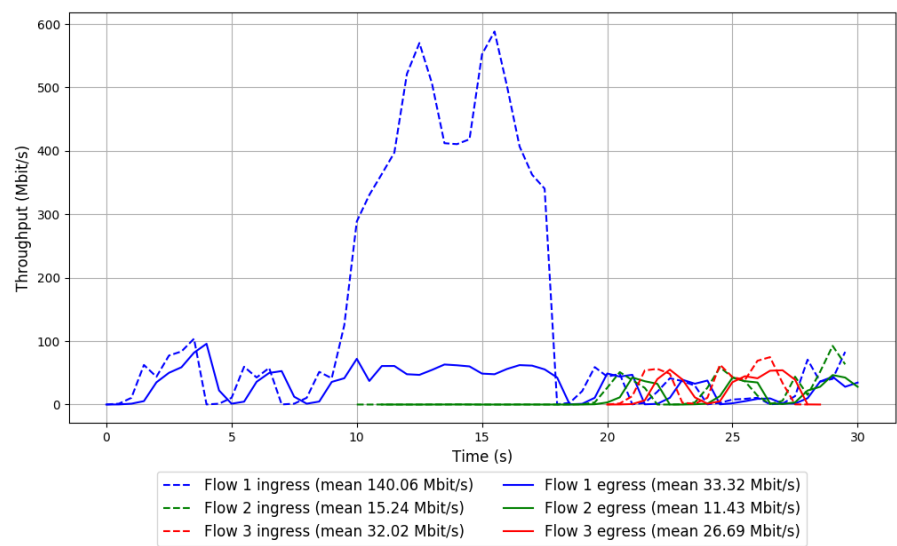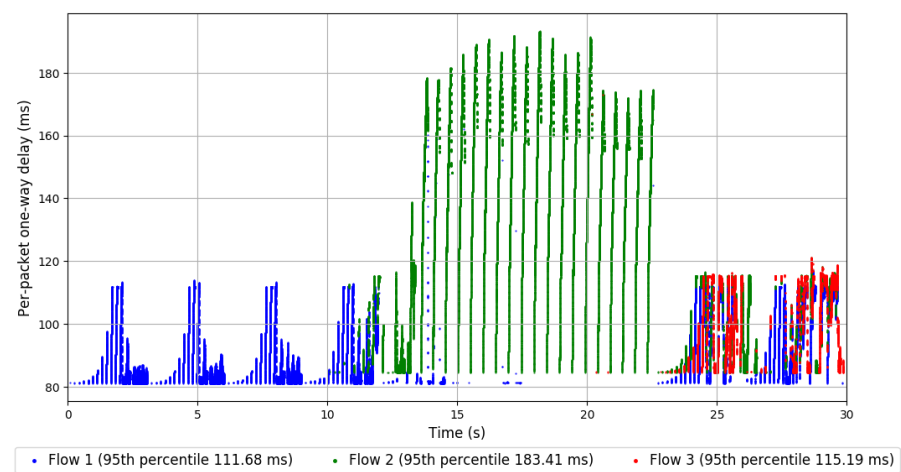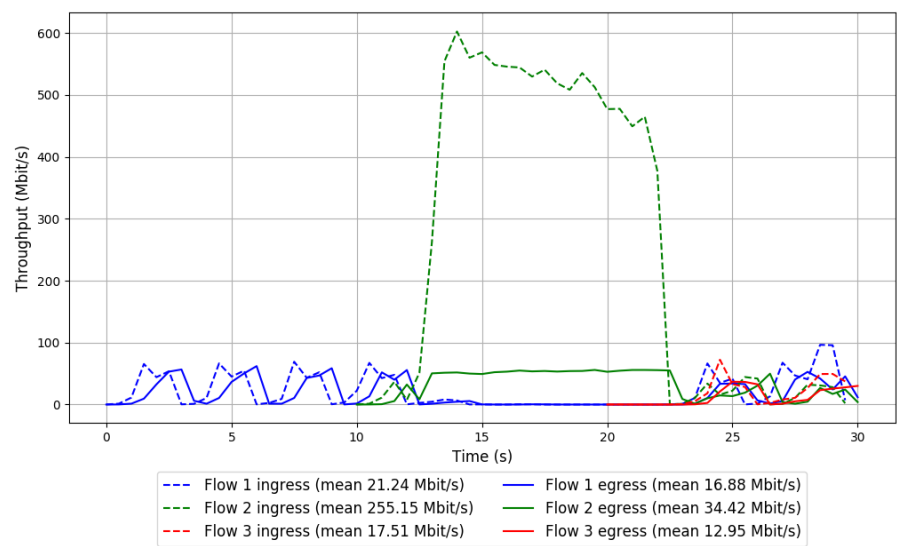
Run 2: Report of Verus — Data Link

- Flow 1 ingress (mean 140.06 Mbit/s)
- Flow 2 ingress (mean 15.24 Mbit/s)
- Flow 3 ingress (mean 32.02 Mbit/s)
- Flow 1 egress (mean 33.32 Mbit/s)
- Flow 2 egress (mean 11.43 Mbit/s)
- Flow 3 egress (mean 26.69 Mbit/s)

- Flow 1 (95th percentile 161.28 ms)
- Flow 2 (95th percentile 119.90 ms)
- Flow 3 (95th percentile 114.44 ms)

```
Run 3: Statistics of Verus

Start at: 2018-12-20 02:37:41
End at: 2018-12-20 02:38:11
Local clock offset: -7.533 ms
Remote clock offset: -0.279 ms

# Below is generated by plot.py at 2018-12-20 03:43:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 43.64 Mbit/s
95th percentile per-packet one-way delay: 177.755 ms
Loss rate: 77.52%
-- Flow 1:
Average throughput: 16.88 Mbit/s
95th percentile per-packet one-way delay: 111.676 ms
Loss rate: 20.52%
-- Flow 2:
Average throughput: 34.42 Mbit/s
95th percentile per-packet one-way delay: 183.412 ms
Loss rate: 86.50%
-- Flow 3:
Average throughput: 12.95 Mbit/s
95th percentile per-packet one-way delay: 115.186 ms
Loss rate: 26.72%
```
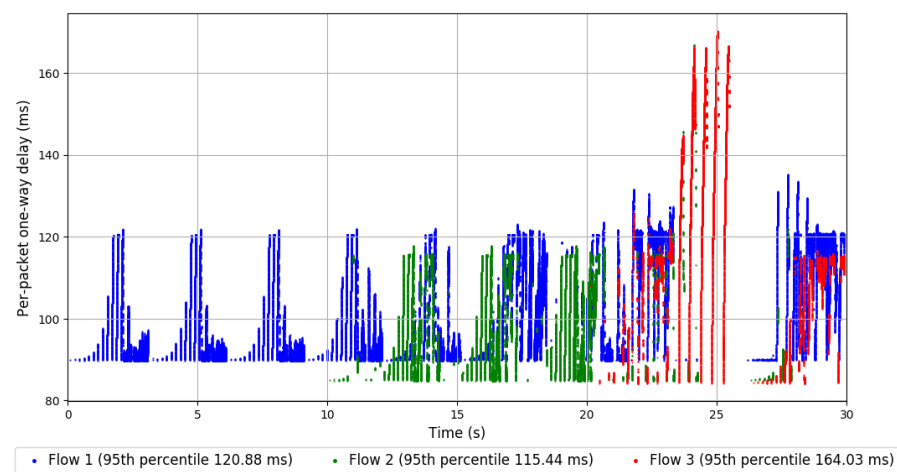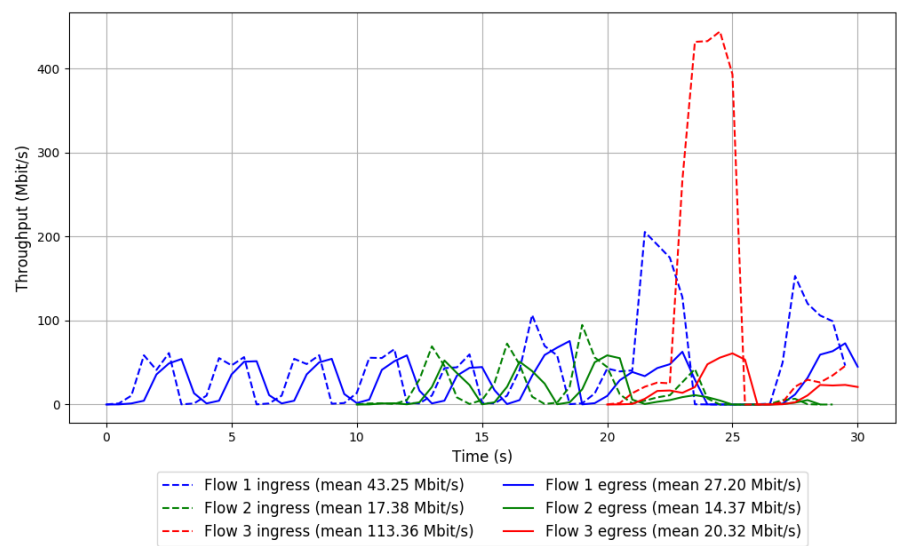
Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 21.24 Mbit/s)   Flow 1 egress (mean 16.88 Mbit/s)
Flow 2 ingress (mean 255.15 Mbit/s)   Flow 2 egress (mean 34.42 Mbit/s)
Flow 3 ingress (mean 17.51 Mbit/s)   Flow 3 egress (mean 12.95 Mbit/s)

Flow 1 (95th percentile 111.68 ms)   Flow 2 (95th percentile 183.41 ms)   Flow 3 (95th percentile 115.19 ms)

```
Run 4: Statistics of Verus

Start at: 2018-12-20 03:01:45
End at: 2018-12-20 03:02:15
Local clock offset: -7.3 ms
Remote clock offset: 2.474 ms


# Below is generated by plot.py at 2018-12-20 03:43:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 42.62 Mbit/s
95th percentile per-packet one-way delay: 136.376 ms
Loss rate: 53.49%
-- Flow 1:
Average throughput: 27.20 Mbit/s
95th percentile per-packet one-way delay: 120.883 ms
Loss rate: 37.06%
-- Flow 2:
Average throughput: 14.37 Mbit/s
95th percentile per-packet one-way delay: 115.443 ms
Loss rate: 22.11%
-- Flow 3:
Average throughput: 20.32 Mbit/s
95th percentile per-packet one-way delay: 164.029 ms
Loss rate: 82.06%
```
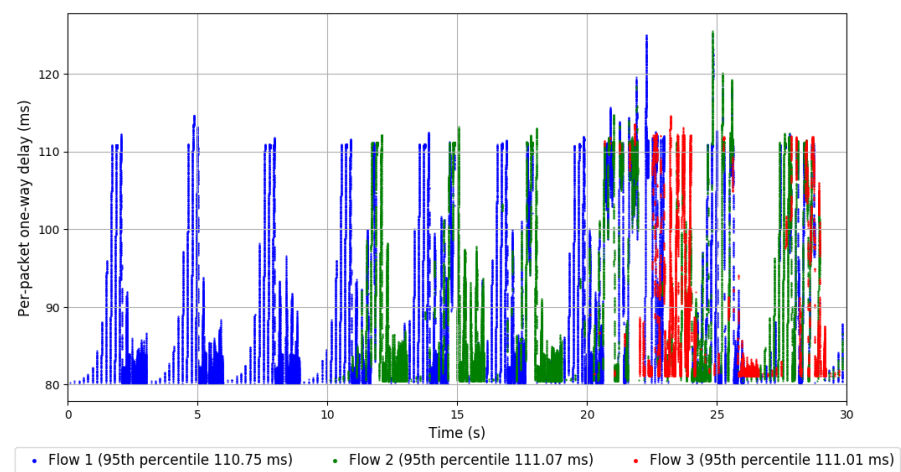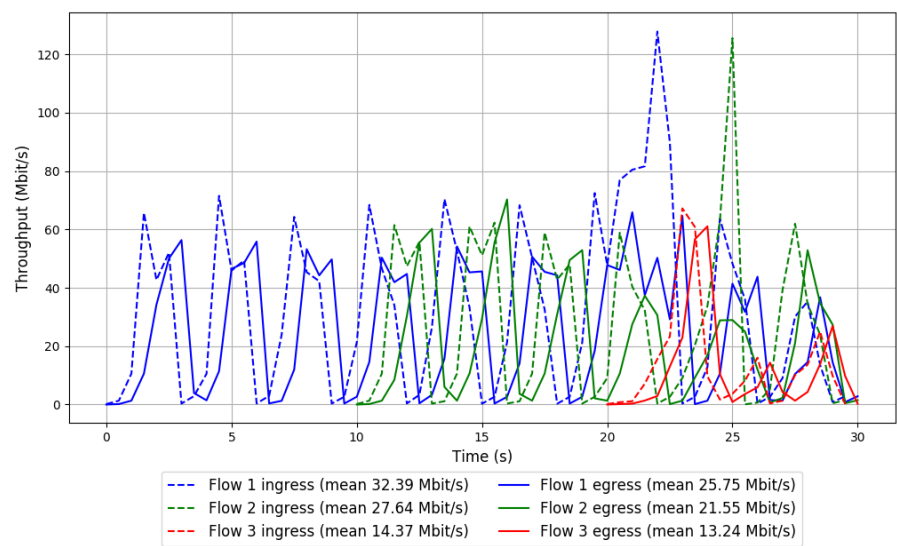
Run 4: Report of Verus — Data Link

```
Run 5: Statistics of Verus

Start at: 2018-12-20 03:25:48
End at: 2018-12-20 03:26:18
Local clock offset: -6.94 ms
Remote clock offset: -3.98 ms


# Below is generated by plot.py at 2018-12-20 03:43:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 44.31 Mbit/s
95th percentile per-packet one-way delay: 110.889 ms
Loss rate: 19.94%
-- Flow 1:
Average throughput: 25.75 Mbit/s
95th percentile per-packet one-way delay: 110.753 ms
Loss rate: 20.48%
-- Flow 2:
Average throughput: 21.55 Mbit/s
95th percentile per-packet one-way delay: 111.073 ms
Loss rate: 22.02%
-- Flow 3:
Average throughput: 13.24 Mbit/s
95th percentile per-packet one-way delay: 111.014 ms
Loss rate: 7.89%
```

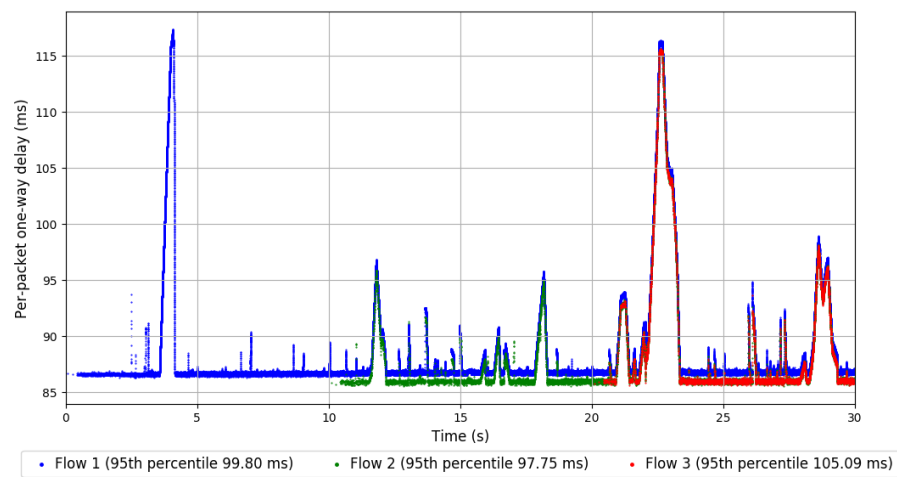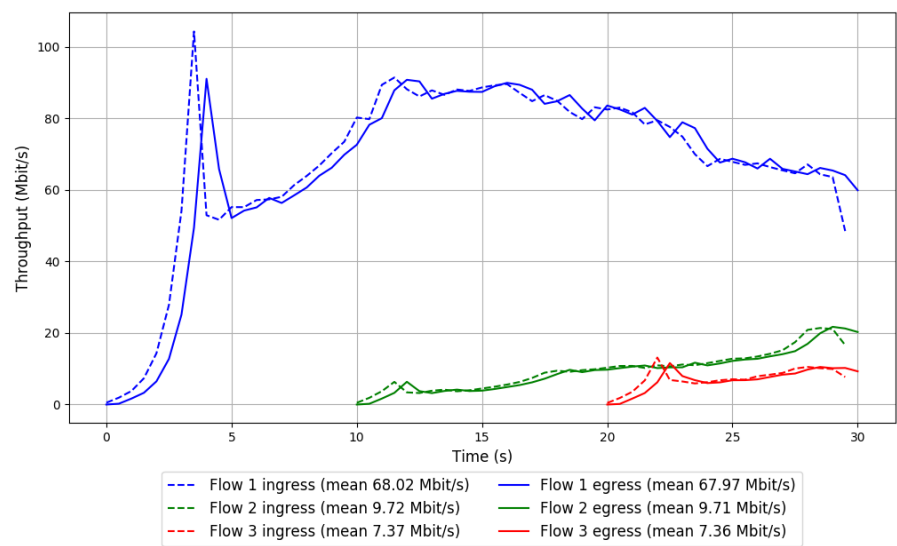# Run 5: Report of Verus — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2018-12-20 01:34:29
End at: 2018-12-20 01:34:59
Local clock offset: -0.182 ms
Remote clock offset: 12.842 ms


# Below is generated by plot.py at 2018-12-20 03:43:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 76.86 Mbit/s
95th percentile per-packet one-way delay: 100.160 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 67.97 Mbit/s
95th percentile per-packet one-way delay: 99.798 ms
Loss rate: 0.06%
-- Flow 2:
Average throughput: 9.71 Mbit/s
95th percentile per-packet one-way delay: 97.749 ms
Loss rate: 0.10%
-- Flow 3:
Average throughput: 7.36 Mbit/s
95th percentile per-packet one-way delay: 105.087 ms
Loss rate: 0.19%
```
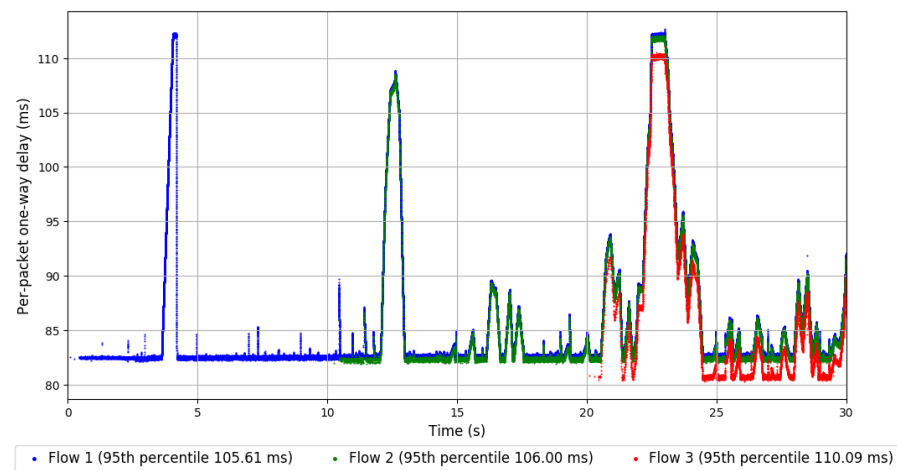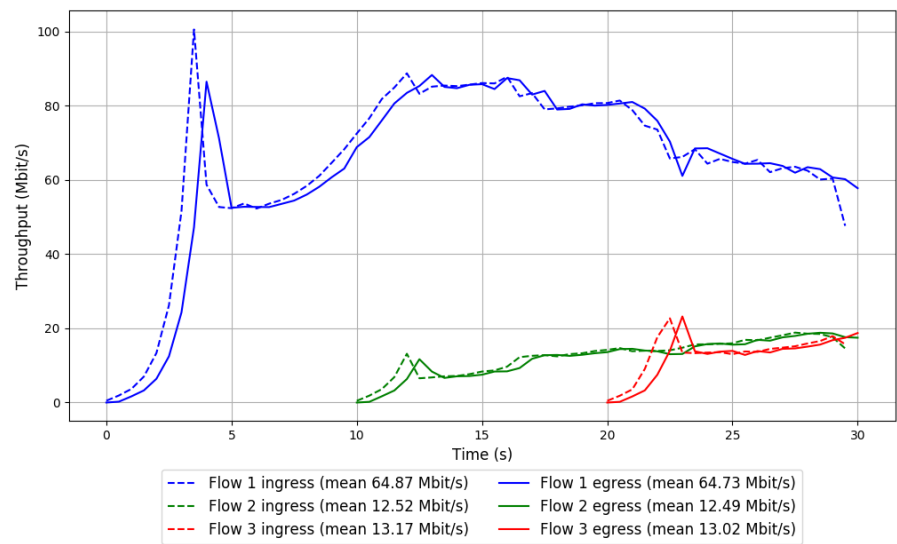
Run 1: Report of PCC-Vivace — Data Link

- - - Flow 1 ingress (mean 68.02 Mbit/s) —— Flow 1 egress (mean 67.97 Mbit/s)
- - - Flow 2 ingress (mean 9.72 Mbit/s) —— Flow 2 egress (mean 9.71 Mbit/s)
- - - Flow 3 ingress (mean 7.37 Mbit/s) —— Flow 3 egress (mean 7.36 Mbit/s)

- Flow 1 (95th percentile 99.80 ms)   • Flow 2 (95th percentile 97.75 ms)   • Flow 3 (95th percentile 105.09 ms)

```
Run 2: Statistics of PCC-Vivace

Start at: 2018-12-20 01:58:32
End at: 2018-12-20 01:59:02
Local clock offset: -0.91 ms
Remote clock offset: 4.806 ms


# Below is generated by plot.py at 2018-12-20 03:43:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 77.34 Mbit/s
95th percentile per-packet one-way delay: 106.462 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 64.73 Mbit/s
95th percentile per-packet one-way delay: 105.613 ms
Loss rate: 0.19%
-- Flow 2:
Average throughput: 12.49 Mbit/s
95th percentile per-packet one-way delay: 105.998 ms
Loss rate: 0.26%
-- Flow 3:
Average throughput: 13.02 Mbit/s
95th percentile per-packet one-way delay: 110.094 ms
Loss rate: 1.06%
```
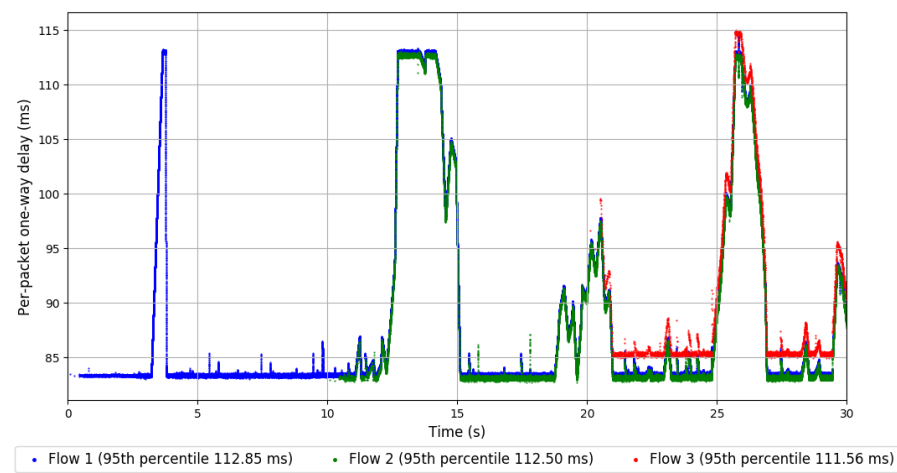
Run 2: Report of PCC-Vivace — Data Link

```
Run 3: Statistics of PCC-Vivace

Start at: 2018-12-20 02:22:34
End at: 2018-12-20 02:23:04
Local clock offset: -6.485 ms
Remote clock offset: 5.246 ms


# Below is generated by plot.py at 2018-12-20 03:43:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 78.51 Mbit/s
95th percentile per-packet one-way delay: 112.787 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 63.75 Mbit/s
95th percentile per-packet one-way delay: 112.854 ms
Loss rate: 0.43%
-- Flow 2:
Average throughput: 19.94 Mbit/s
95th percentile per-packet one-way delay: 112.500 ms
Loss rate: 0.76%
-- Flow 3:
Average throughput: 4.56 Mbit/s
95th percentile per-packet one-way delay: 111.558 ms
Loss rate: 0.18%
```
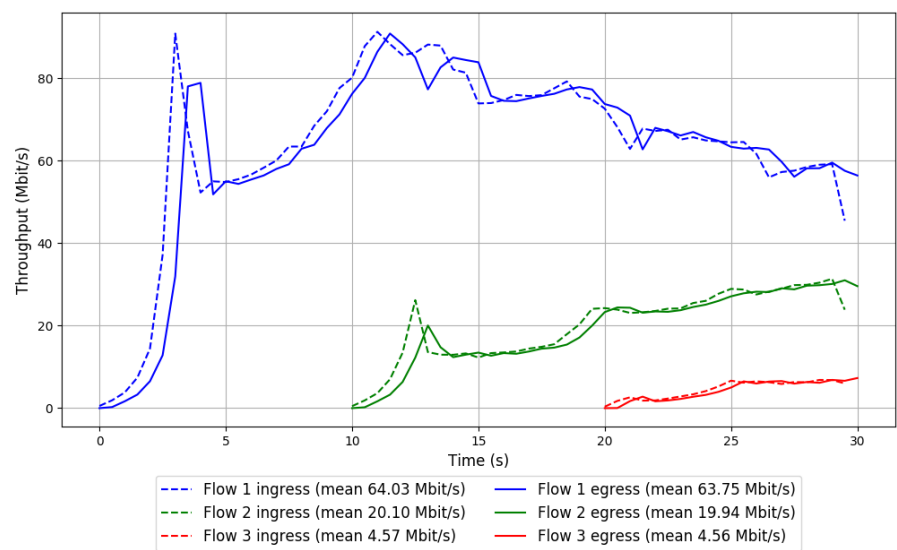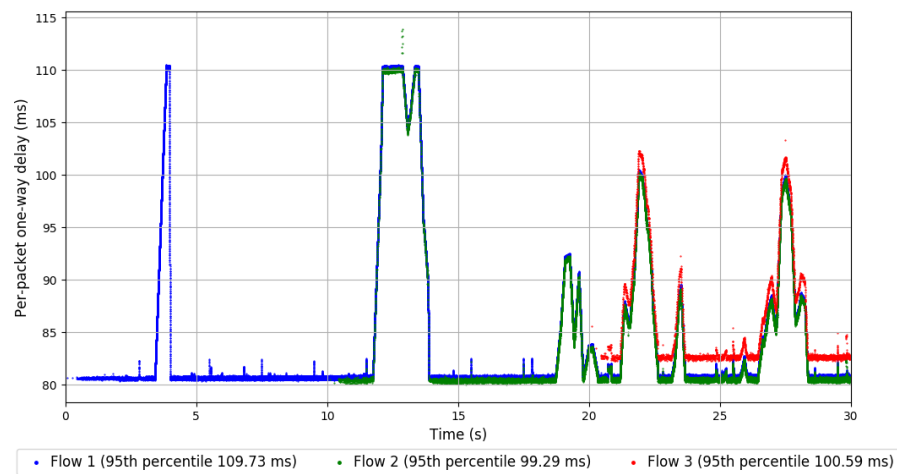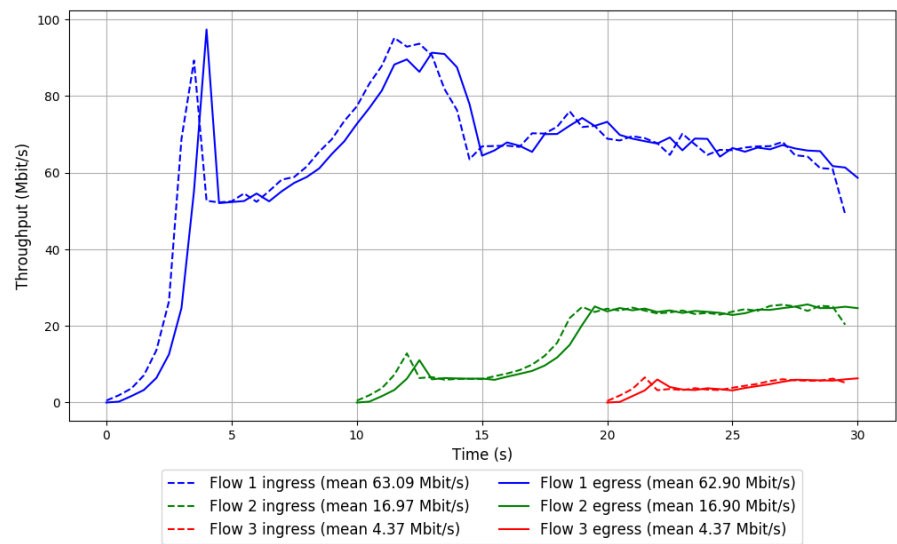
Run 3: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 64.03 Mbit/s) — Flow 1 egress (mean 63.75 Mbit/s)
Flow 2 ingress (mean 20.10 Mbit/s) — Flow 2 egress (mean 19.94 Mbit/s)
Flow 3 ingress (mean 4.57 Mbit/s) — Flow 3 egress (mean 4.56 Mbit/s)

Flow 1 (95th percentile 112.85 ms) • Flow 2 (95th percentile 112.50 ms) • Flow 3 (95th percentile 111.56 ms)

```
Run 4: Statistics of PCC-Vivace

Start at: 2018-12-20 02:46:38
End at: 2018-12-20 02:47:08
Local clock offset: -7.181 ms
Remote clock offset: -0.01 ms

# Below is generated by plot.py at 2018-12-20 03:43:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 75.58 Mbit/s
95th percentile per-packet one-way delay: 108.586 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 62.90 Mbit/s
95th percentile per-packet one-way delay: 109.730 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 16.90 Mbit/s
95th percentile per-packet one-way delay: 99.294 ms
Loss rate: 0.43%
-- Flow 3:
Average throughput: 4.37 Mbit/s
95th percentile per-packet one-way delay: 100.594 ms
Loss rate: 0.03%
```

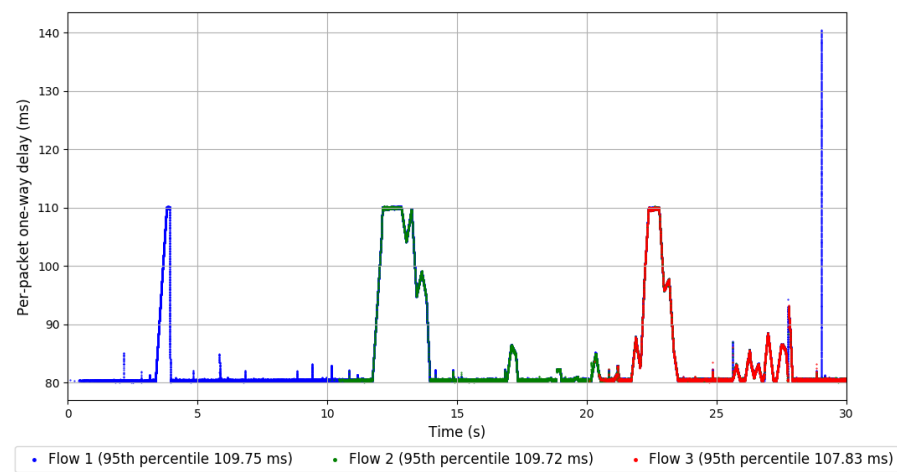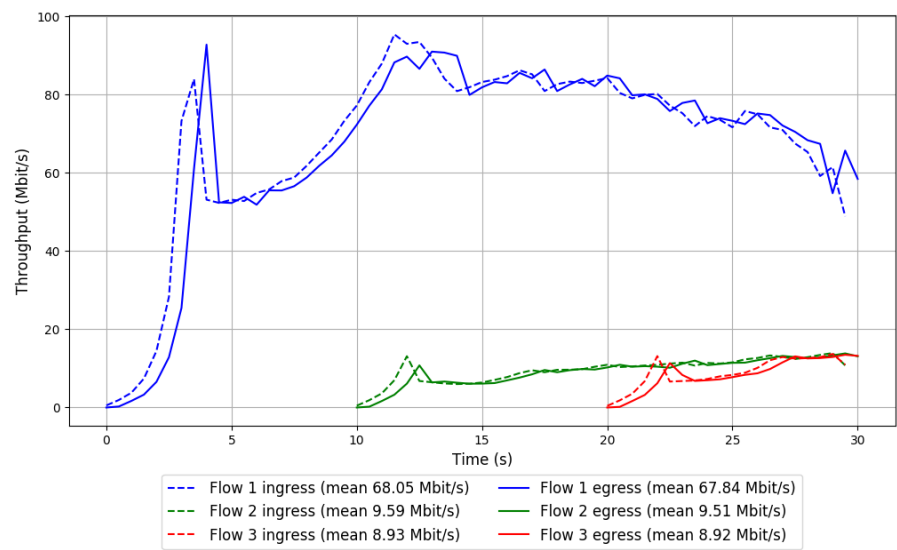Run 4: Report of PCC-Vivace — Data Link

```
Run 5: Statistics of PCC-Vivace

Start at: 2018-12-20 03:10:40
End at: 2018-12-20 03:11:10
Local clock offset: -7.068 ms
Remote clock offset: -2.418 ms


# Below is generated by plot.py at 2018-12-20 03:43:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 77.11 Mbit/s
95th percentile per-packet one-way delay: 109.729 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 67.84 Mbit/s
95th percentile per-packet one-way delay: 109.748 ms
Loss rate: 0.31%
-- Flow 2:
Average throughput: 9.51 Mbit/s
95th percentile per-packet one-way delay: 109.721 ms
Loss rate: 0.87%
-- Flow 3:
Average throughput: 8.92 Mbit/s
95th percentile per-packet one-way delay: 107.829 ms
Loss rate: 0.13%
```

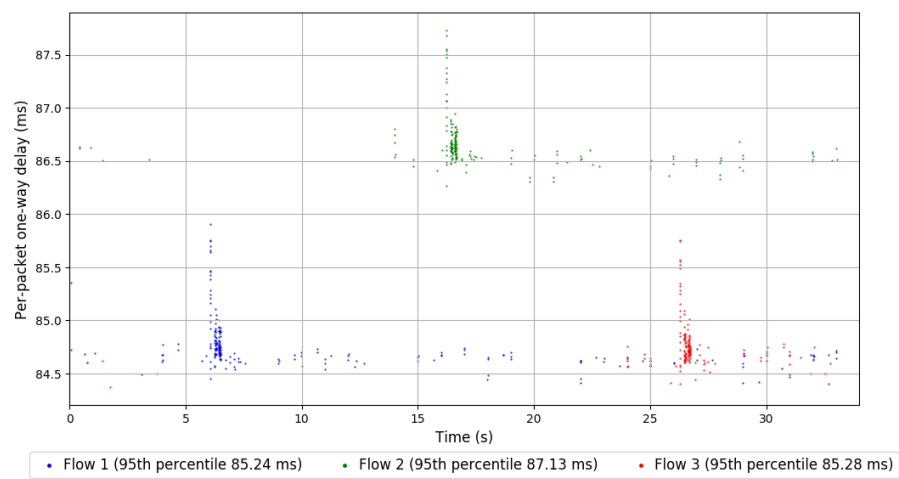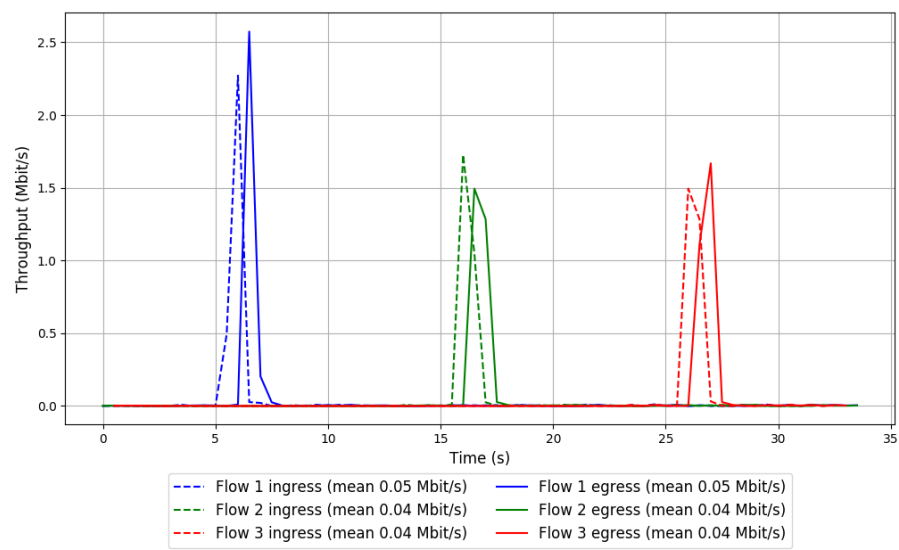Run 5: Report of PCC-Vivace — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2018-12-20 01:39:35
End at: 2018-12-20 01:40:05
Local clock offset: -0.625 ms
Remote clock offset: 11.047 ms


# Below is generated by plot.py at 2018-12-20 03:43:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 86.776 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 85.242 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 87.129 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 85.284 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-12-20 02:03:38
End at: 2018-12-20 02:04:08
Local clock offset: -0.797 ms
Remote clock offset: 3.167 ms


# Below is generated by plot.py at 2018-12-20 03:43:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 79.913 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 79.637 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 79.873 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 80.140 ms
Loss rate: 0.00%
```
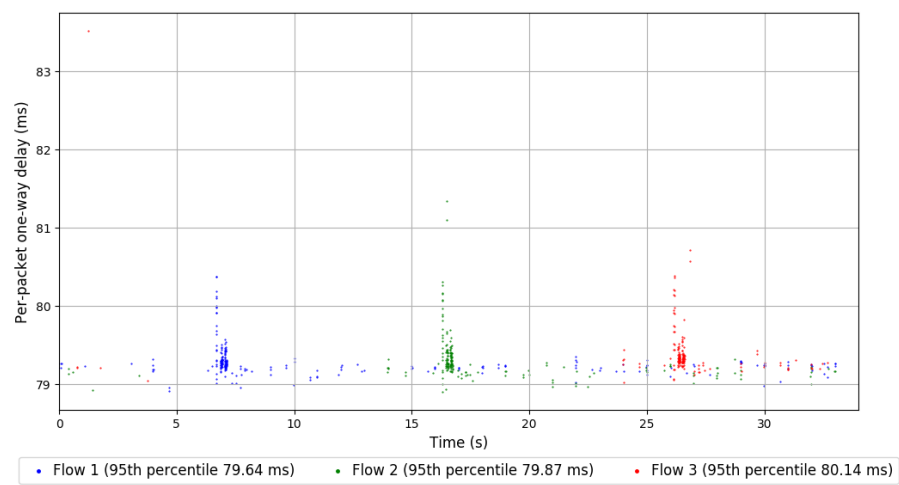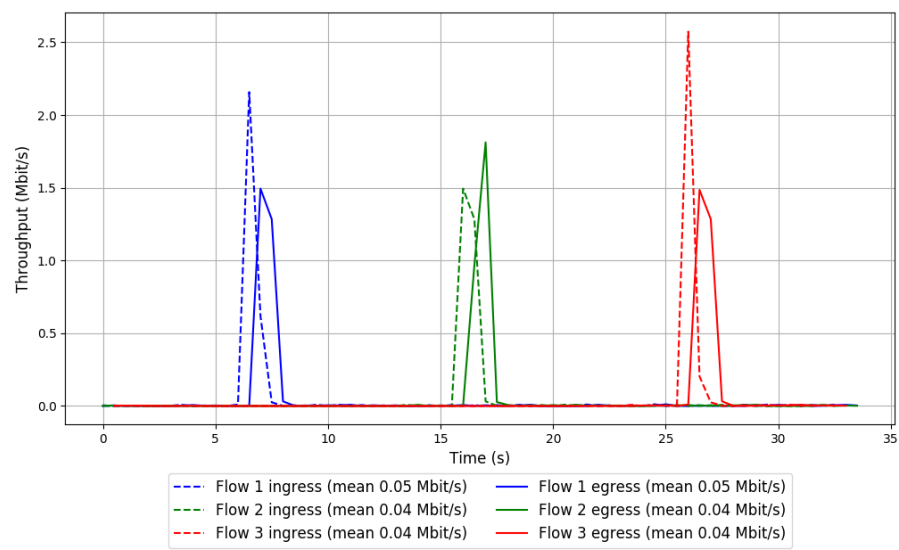
Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-12-20 02:27:40
End at: 2018-12-20 02:28:10
Local clock offset: -7.089 ms
Remote clock offset: 1.834 ms


# Below is generated by plot.py at 2018-12-20 03:43:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 81.298 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 80.976 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 81.052 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 81.574 ms
Loss rate: 0.00%
```
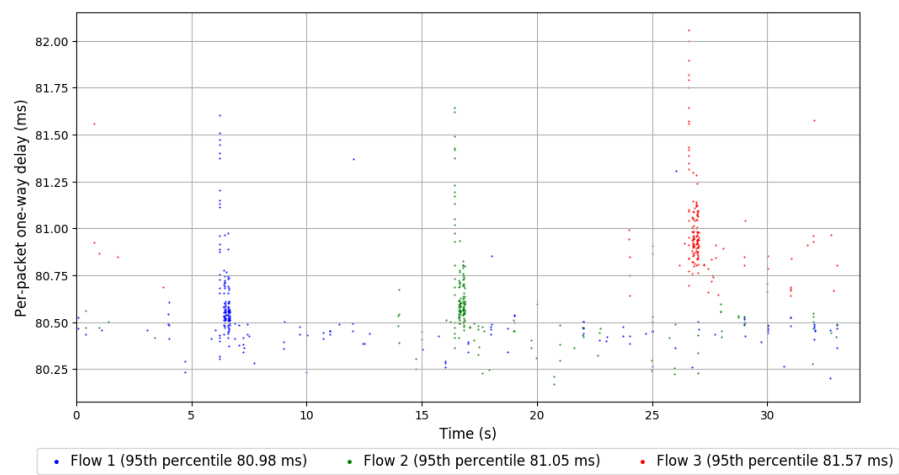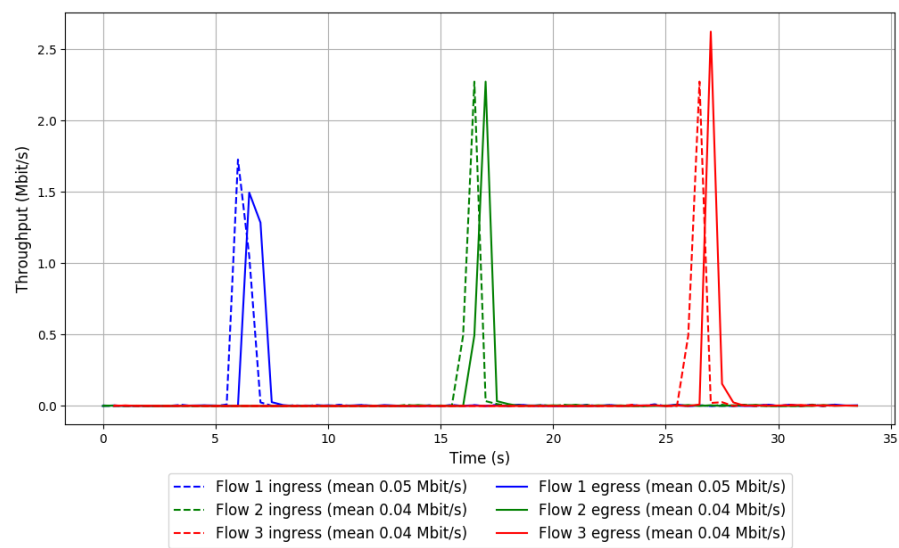
Run 3: Report of WebRTC media — Data Link

```
Run 4: Statistics of WebRTC media

Start at: 2018-12-20 02:51:44
End at: 2018-12-20 02:52:14
Local clock offset: -7.199 ms
Remote clock offset: 3.766 ms


# Below is generated by plot.py at 2018-12-20 03:43:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 85.415 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 85.413 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 85.489 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 85.327 ms
Loss rate: 0.00%
```
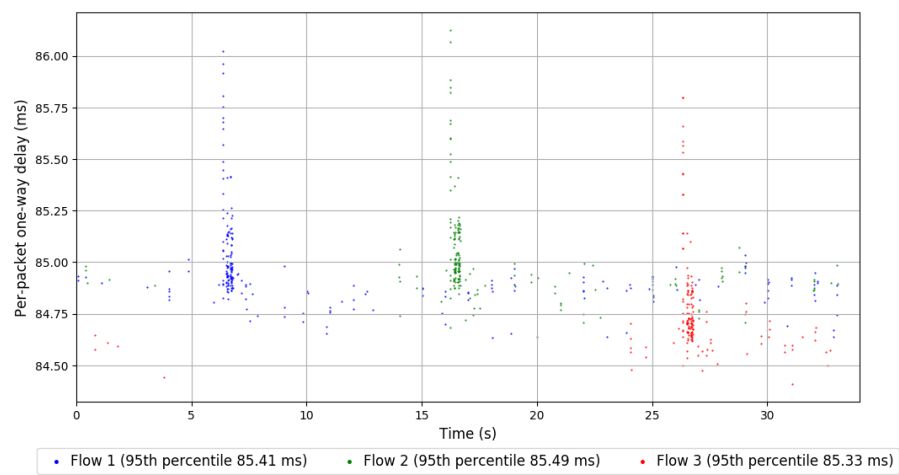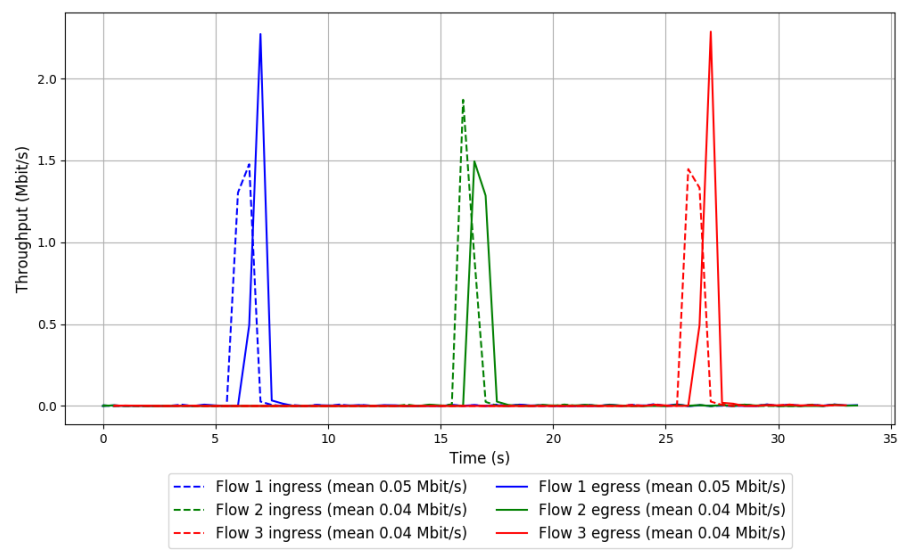
Run 4: Report of WebRTC media — Data Link

```
Run 5: Statistics of WebRTC media

Start at: 2018-12-20 03:15:47
End at: 2018-12-20 03:16:17
Local clock offset: -6.989 ms
Remote clock offset: -2.963 ms


# Below is generated by plot.py at 2018-12-20 03:43:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 81.437 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 81.002 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 81.721 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 81.121 ms
Loss rate: 0.00%
```

Run 5: Report of WebRTC media — Data Link