Pantheon Report

Generated at 2018-02-19 20:43:38 (UTC).

Data path: AWS India 1 Ethernet (*local*) →India ppp0 (*remote*).

Repeated the test of 17 congestion control schemes 3 times.

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

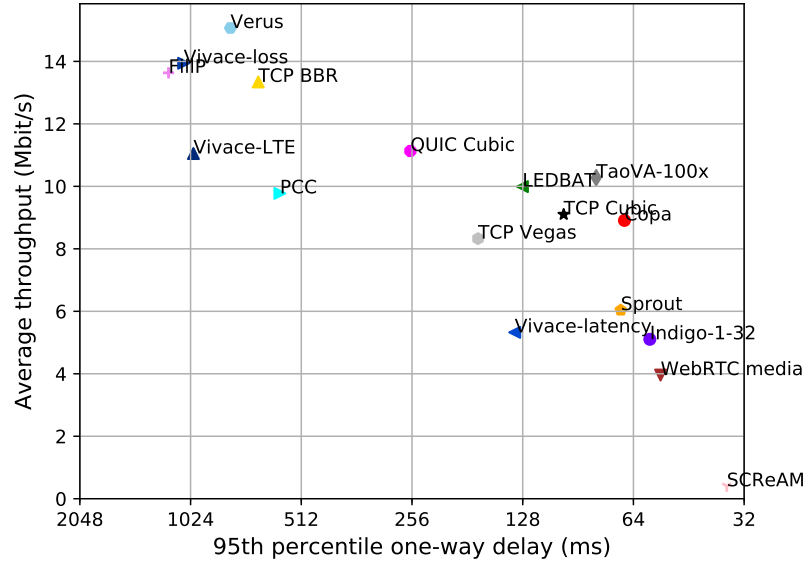Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

Tested BBR with qdisc of Fair Queuing (`fq`), and other schemes with the default Linux qdisc (`pfifo_fast`).

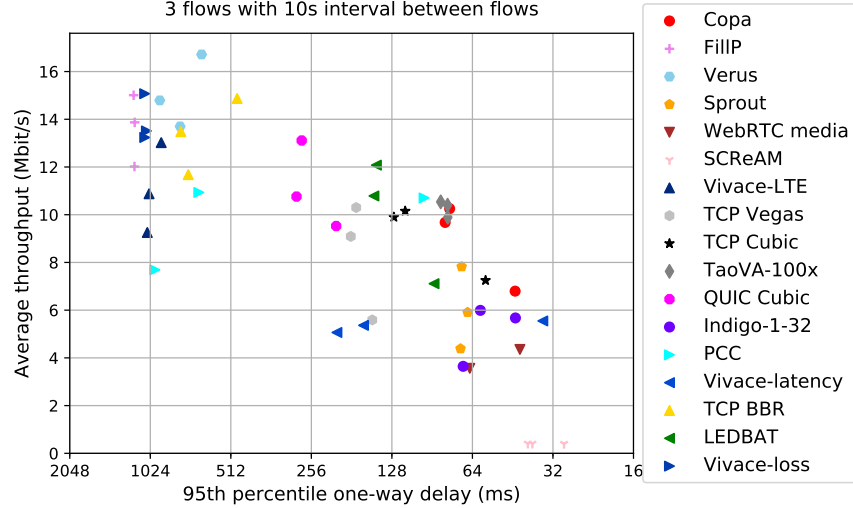NTP offsets were measured against `nets.org.sg` and have been applied to correct the timestamps in logs.

```
Git summary:
branch: master @ f12c42a2c63fdd9a862eefa0468859bf379b6623
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
 M datagrump/sender.cc
third_party/fillp @ 828bbf95fd4941149b5cec90f281d1c69ae1a5c6
third_party/genericCC @ 9249eea3238475c4d8cca1443d28df70bff6c4a2
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
 M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
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/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeeb30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
 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 @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

test from AWS India 1 Ethernet to India ppp0, 3 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)

test from AWS India 1 Ethernet to India ppp0, 3 runs of 30s each per scheme
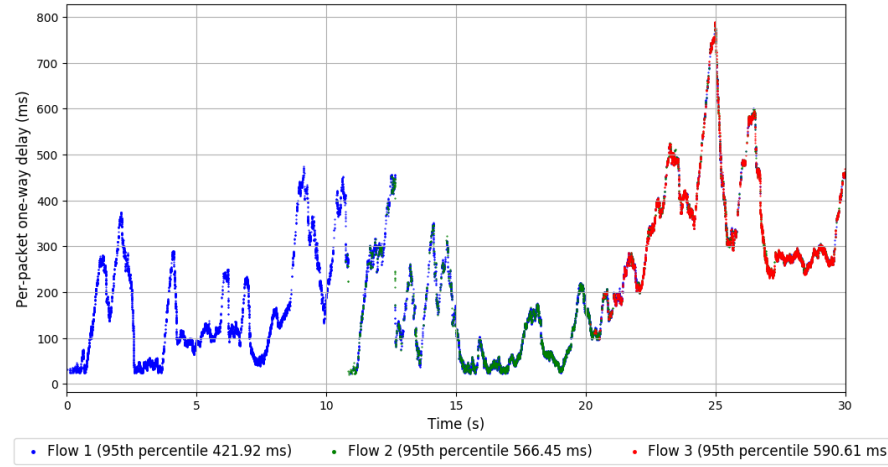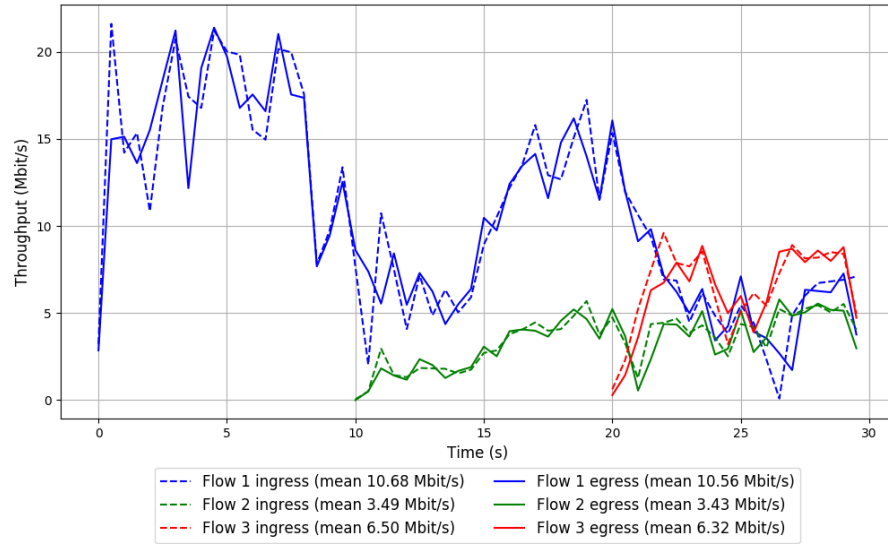3 flows with 10s interval between flows

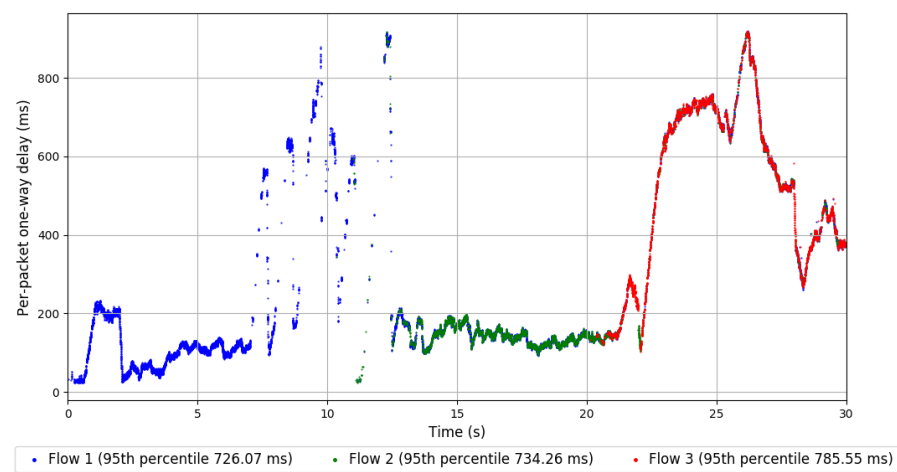| scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	8.61	4.21	5.98	582.98	694.55	745.64	1.62	2.72	5.04
TCP Cubic	3	6.60	2.91	1.71	100.16	90.44	71.25	1.11	1.67	1.74
LEDBAT	3	6.50	3.90	2.73	116.01	128.88	141.36	0.64	1.05	1.56
PCC	3	7.14	2.84	2.26	576.33	619.38	427.45	1.47	1.85	2.93
QUIC Cubic	3	7.13	4.58	3.15	230.34	257.09	293.90	1.07	2.60	3.48
SCReAM	3	0.21	0.19	0.21	35.75	36.88	35.75	0.20	0.49	0.60
WebRTC media	2	2.25	1.14	0.58	51.71	58.48	52.82	0.12	0.41	0.82
Sprout	3	3.38	2.80	2.43	72.39	66.96	70.81	0.36	0.68	2.07
TaoVA-100x	3	5.30	5.10	4.78	71.42	84.07	111.25	1.20	1.71	2.96
TCP Vegas	3	3.53	3.21	8.09	127.92	127.55	273.14	0.39	0.41	0.79
Verus	3	9.81	7.54	1.26	713.73	921.32	583.51	3.76	36.44	15.74
Copa	3	5.24	3.87	3.29	64.76	72.19	66.39	0.56	0.67	0.69
FillP	3	8.07	6.01	5.96	1225.47	1168.08	1175.34	81.74	93.45	96.44
Indigo-1-32	3	2.60	2.13	3.34	53.28	90.70	53.08	0.35	0.39	0.16
Vivace-latency	3	2.82	2.77	2.02	108.10	138.75	164.31	0.62	0.82	0.97
Vivace-loss	3	8.78	7.18	1.31	1073.41	1063.41	1058.01	39.48	30.85	24.71
Vivace-LTE	3	8.08	3.16	2.84	1005.37	1017.50	781.12	6.93	12.05	8.86

```
Run 1: Statistics of TCP BBR

Start at: 2018-02-19 19:58:01
End at: 2018-02-19 19:58:31
Local clock offset: -1.764 ms
Remote clock offset: -15.457 ms


# Below is generated by plot.py at 2018-02-19 20:42:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 14.87 Mbit/s
95th percentile per-packet one-way delay: 484.995 ms
Loss rate: 1.98%
-- Flow 1:
Average throughput: 10.56 Mbit/s
95th percentile per-packet one-way delay: 421.924 ms
Loss rate: 1.21%
-- Flow 2:
Average throughput: 3.43 Mbit/s
95th percentile per-packet one-way delay: 566.445 ms
Loss rate: 3.67%
-- Flow 3:
Average throughput: 6.32 Mbit/s
95th percentile per-packet one-way delay: 590.608 ms
Loss rate: 3.97%
```

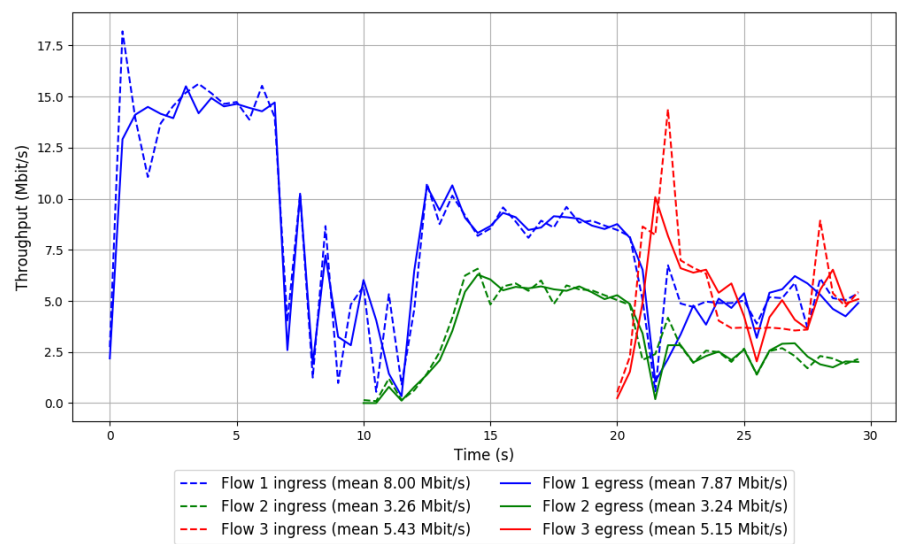Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2018-02-19 20:18:32
End at: 2018-02-19 20:19:02
Local clock offset: -2.301 ms
Remote clock offset: -20.402 ms


# Below is generated by plot.py at 2018-02-19 20:42:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 11.68 Mbit/s
95th percentile per-packet one-way delay: 738.504 ms
Loss rate: 2.58%
-- Flow 1:
Average throughput: 7.87 Mbit/s
95th percentile per-packet one-way delay: 726.065 ms
Loss rate: 1.73%
-- Flow 2:
Average throughput: 3.24 Mbit/s
95th percentile per-packet one-way delay: 734.256 ms
Loss rate: 2.43%
-- Flow 3:
Average throughput: 5.15 Mbit/s
95th percentile per-packet one-way delay: 785.550 ms
Loss rate: 6.51%
```
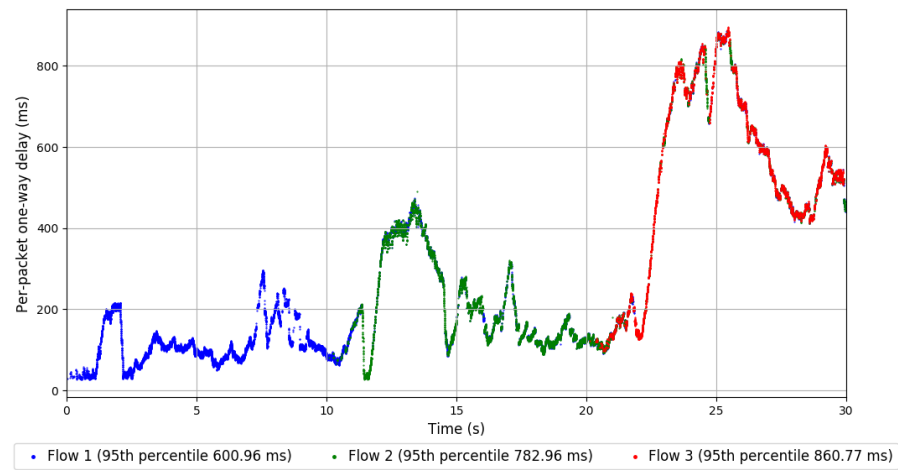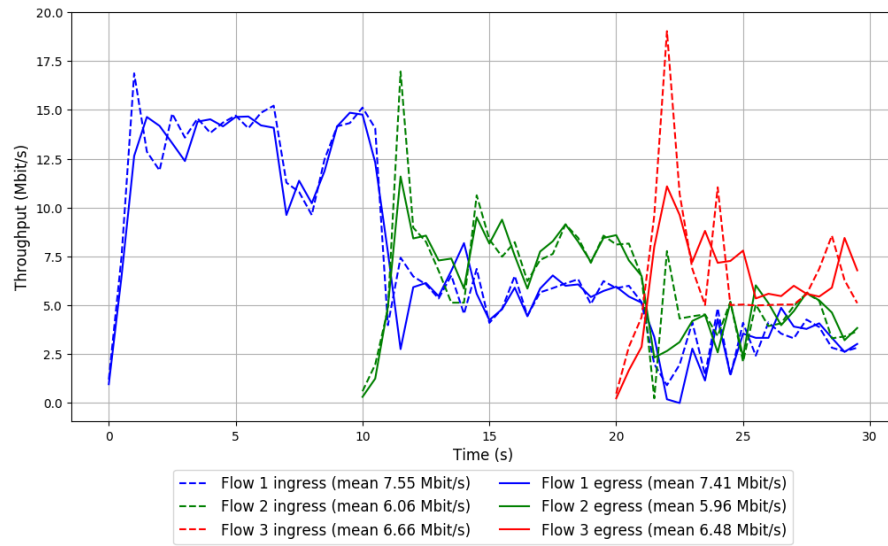
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2018-02-19 20:38:54
End at: 2018-02-19 20:39:24
Local clock offset: 2.289 ms
Remote clock offset: -20.317 ms


# Below is generated by plot.py at 2018-02-19 20:42:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.48 Mbit/s
95th percentile per-packet one-way delay: 787.316 ms
Loss rate: 2.40%
-- Flow 1:
Average throughput: 7.41 Mbit/s
95th percentile per-packet one-way delay: 600.964 ms
Loss rate: 1.91%
-- Flow 2:
Average throughput: 5.96 Mbit/s
95th percentile per-packet one-way delay: 782.961 ms
Loss rate: 2.07%
-- Flow 3:
Average throughput: 6.48 Mbit/s
95th percentile per-packet one-way delay: 860.773 ms
Loss rate: 4.65%
```

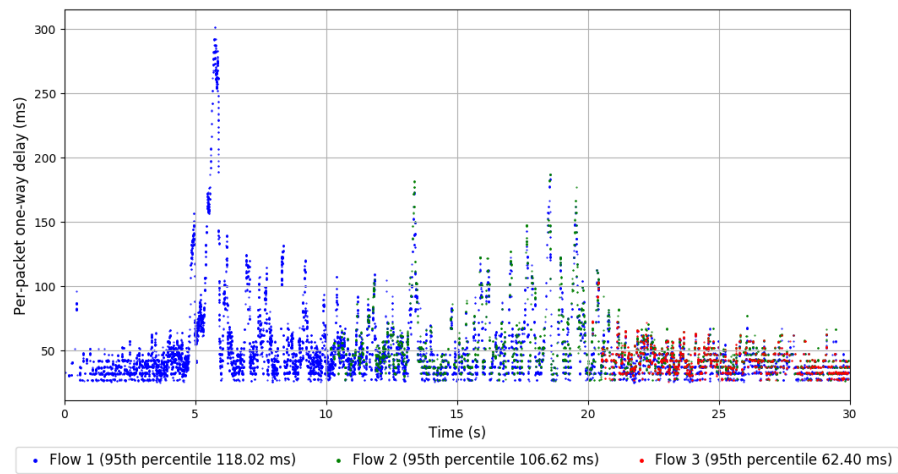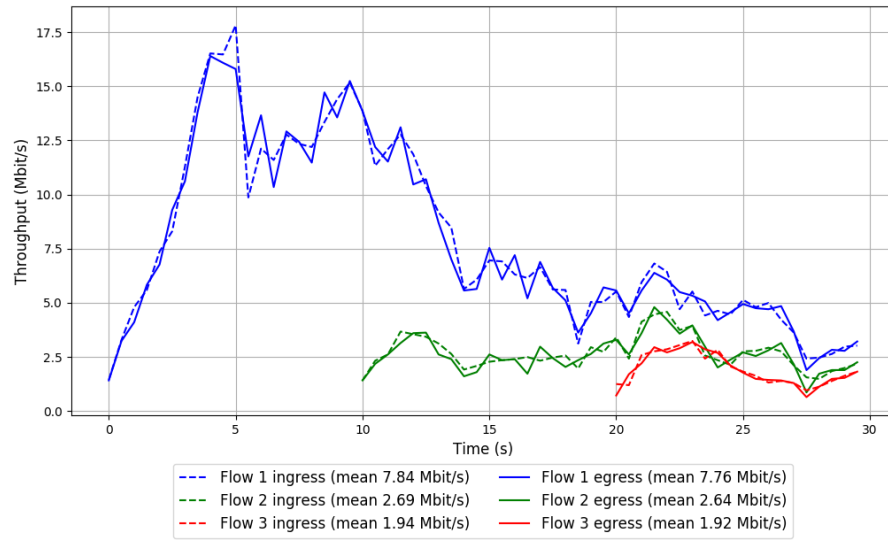Run 3: Report of TCP BBR — Data Link

```
Run 1: Statistics of TCP Cubic

Start at: 2018-02-19 19:40:00
End at: 2018-02-19 19:40:30
Local clock offset: -5.238 ms
Remote clock offset: -14.932 ms


# Below is generated by plot.py at 2018-02-19 20:42:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.15 Mbit/s
95th percentile per-packet one-way delay: 114.135 ms
Loss rate: 1.25%
-- Flow 1:
Average throughput: 7.76 Mbit/s
95th percentile per-packet one-way delay: 118.017 ms
Loss rate: 1.01%
-- Flow 2:
Average throughput: 2.64 Mbit/s
95th percentile per-packet one-way delay: 106.621 ms
Loss rate: 2.21%
-- Flow 3:
Average throughput: 1.92 Mbit/s
95th percentile per-packet one-way delay: 62.395 ms
Loss rate: 1.49%
```

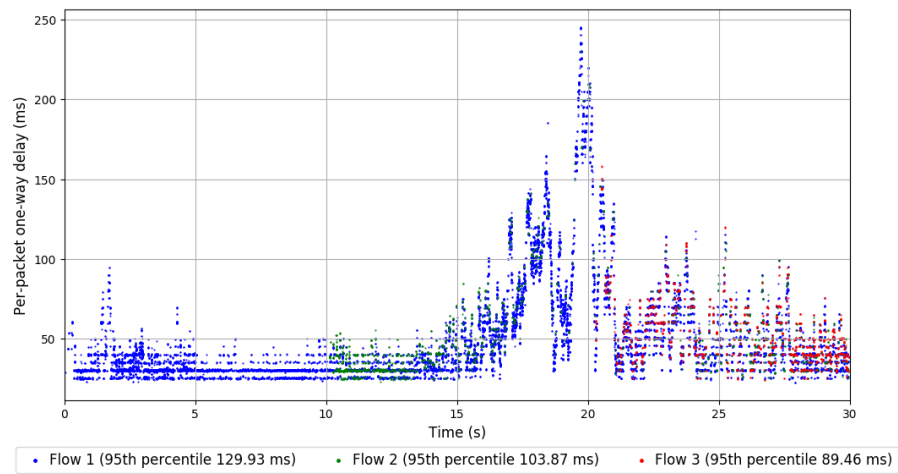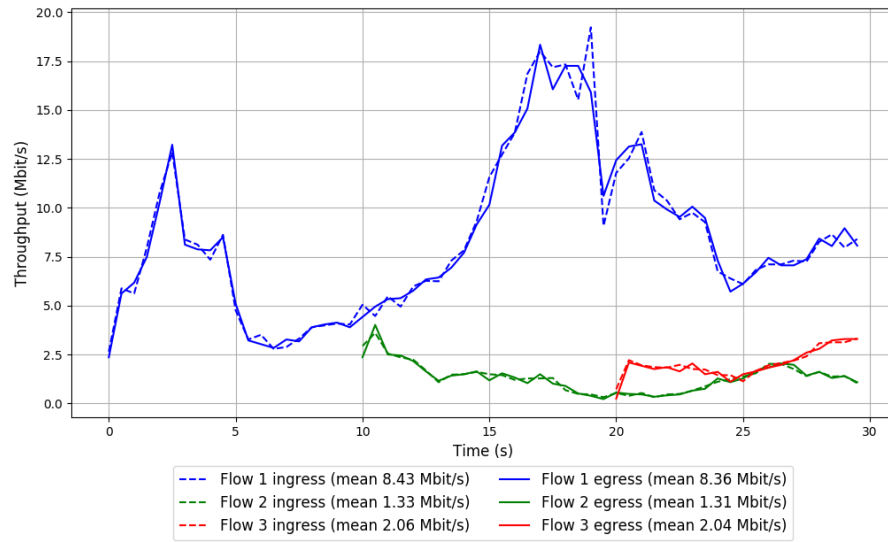Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-02-19 20:00:15
End at: 2018-02-19 20:00:45
Local clock offset: -1.742 ms
Remote clock offset: -17.003 ms


# Below is generated by plot.py at 2018-02-19 20:42:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.90 Mbit/s
95th percentile per-packet one-way delay: 125.861 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 8.36 Mbit/s
95th percentile per-packet one-way delay: 129.928 ms
Loss rate: 0.86%
-- Flow 2:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 103.867 ms
Loss rate: 1.04%
-- Flow 3:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 89.459 ms
Loss rate: 2.11%
```
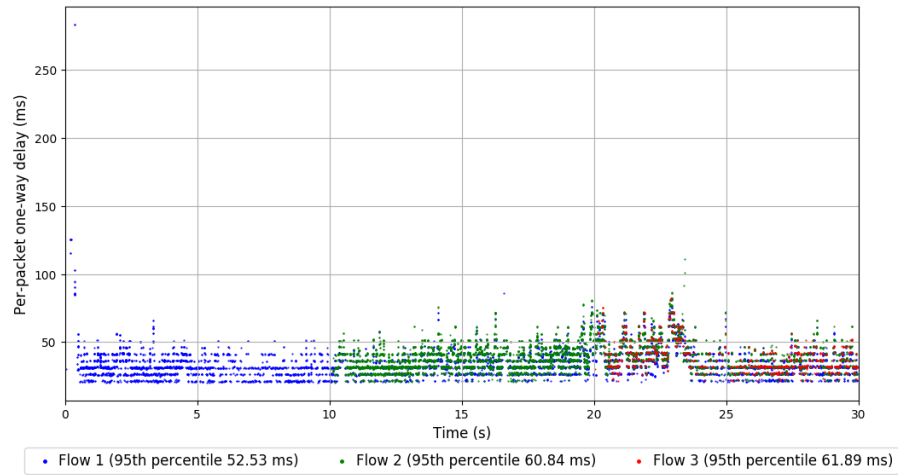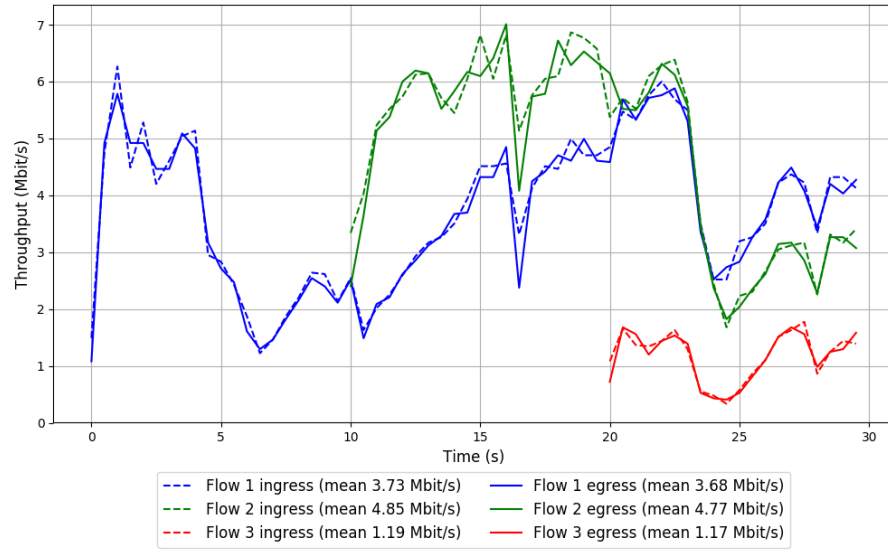
Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 8.43 Mbit/s)   Flow 1 egress (mean 8.36 Mbit/s)
Flow 2 ingress (mean 1.33 Mbit/s)   Flow 2 egress (mean 1.31 Mbit/s)
Flow 3 ingress (mean 2.06 Mbit/s)   Flow 3 egress (mean 2.04 Mbit/s)

Flow 1 (95th percentile 129.93 ms)   Flow 2 (95th percentile 103.87 ms)   Flow 3 (95th percentile 89.46 ms)

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```
Run 3: Statistics of TCP Cubic

Start at: 2018-02-19 20:20:46
End at: 2018-02-19 20:21:16
Local clock offset: 1.165 ms
Remote clock offset: -19.938 ms


# Below is generated by plot.py at 2018-02-19 20:42:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.25 Mbit/s
95th percentile per-packet one-way delay: 57.154 ms
Loss rate: 1.60%
-- Flow 1:
Average throughput: 3.68 Mbit/s
95th percentile per-packet one-way delay: 52.530 ms
Loss rate: 1.46%
-- Flow 2:
Average throughput: 4.77 Mbit/s
95th percentile per-packet one-way delay: 60.842 ms
Loss rate: 1.76%
-- Flow 3:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 61.890 ms
Loss rate: 1.63%
```

Run 3: Report of TCP Cubic — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2018-02-19 19:51:10
End at: 2018-02-19 19:51:40
Local clock offset: -0.678 ms
Remote clock offset: -15.237 ms

# Below is generated by plot.py at 2018-02-19 20:42:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.11 Mbit/s
95th percentile per-packet one-way delay: 89.068 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 2.50 Mbit/s
95th percentile per-packet one-way delay: 61.269 ms
Loss rate: 1.39%
-- Flow 2:
Average throughput: 4.84 Mbit/s
95th percentile per-packet one-way delay: 102.096 ms
Loss rate: 1.44%
-- Flow 3:
Average throughput: 4.21 Mbit/s
95th percentile per-packet one-way delay: 97.320 ms
Loss rate: 1.74%
```
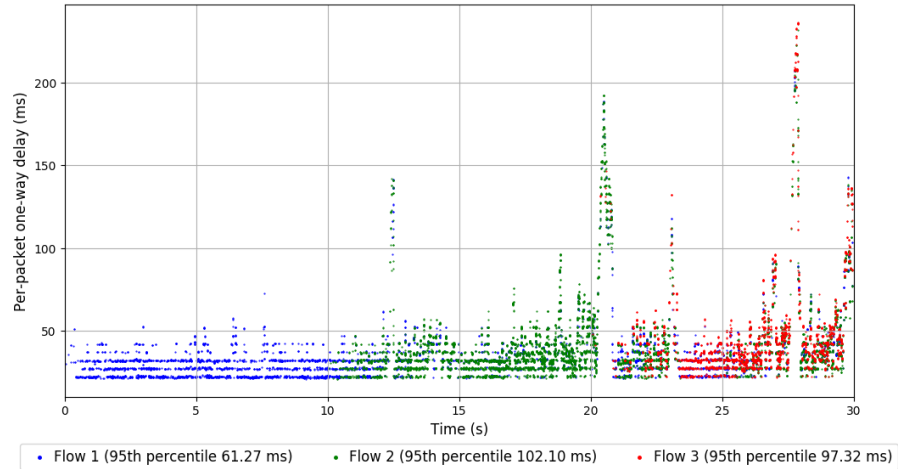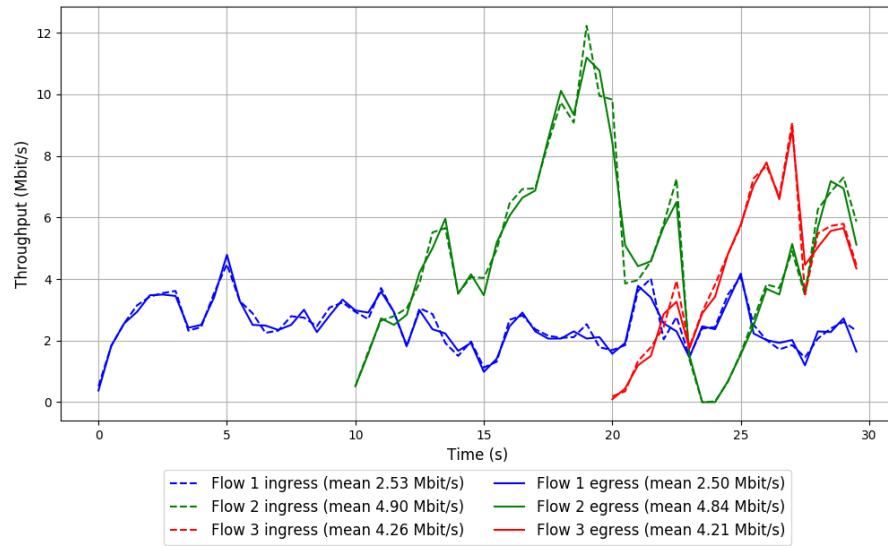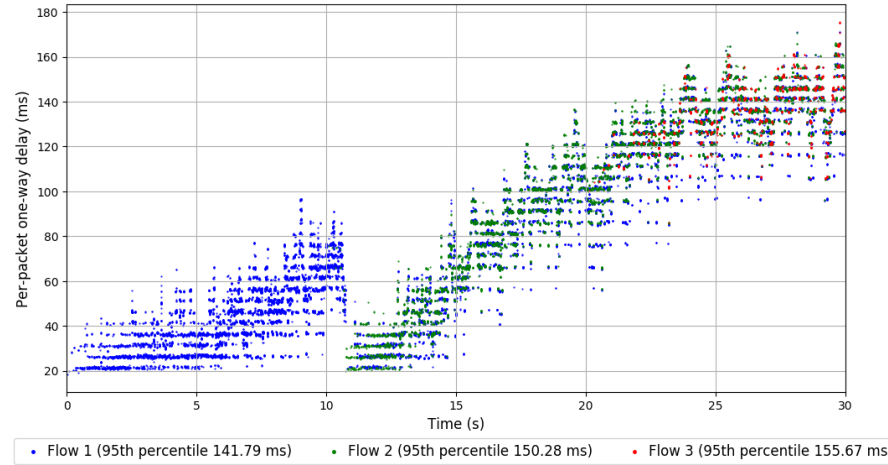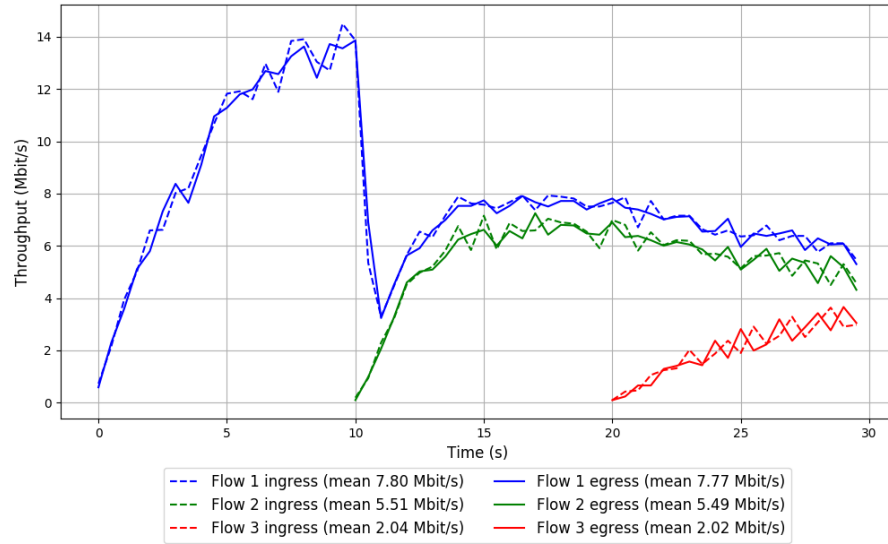
Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-02-19 20:11:41
End at: 2018-02-19 20:12:11
Local clock offset: 2.226 ms
Remote clock offset: -19.773 ms


# Below is generated by plot.py at 2018-02-19 20:42:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.08 Mbit/s
95th percentile per-packet one-way delay: 146.322 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 7.77 Mbit/s
95th percentile per-packet one-way delay: 141.790 ms
Loss rate: 0.45%
-- Flow 2:
Average throughput: 5.49 Mbit/s
95th percentile per-packet one-way delay: 150.282 ms
Loss rate: 0.61%
-- Flow 3:
Average throughput: 2.02 Mbit/s
95th percentile per-packet one-way delay: 155.674 ms
Loss rate: 1.34%
```
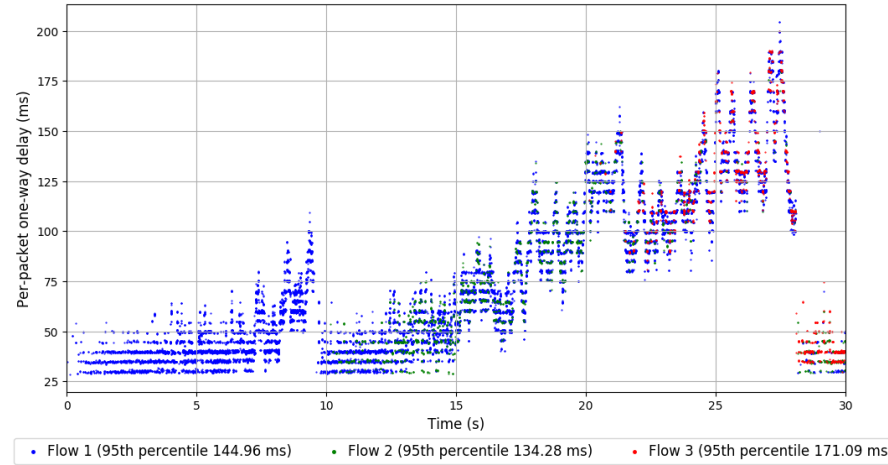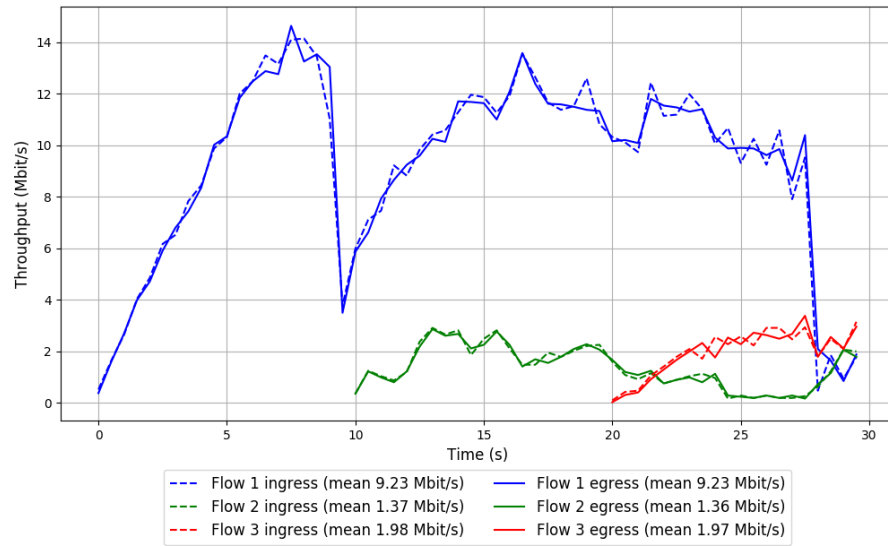
Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 7.80 Mbit/s) --- Flow 1 egress (mean 7.77 Mbit/s) ———
Flow 2 ingress (mean 5.51 Mbit/s) --- Flow 2 egress (mean 5.49 Mbit/s) ———
Flow 3 ingress (mean 2.04 Mbit/s) --- Flow 3 egress (mean 2.02 Mbit/s) ———

Flow 1 (95th percentile 141.79 ms) • Flow 2 (95th percentile 150.28 ms) • Flow 3 (95th percentile 155.67 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2018-02-19 20:32:01
End at: 2018-02-19 20:32:31
Local clock offset: -2.481 ms
Remote clock offset: -19.943 ms


# Below is generated by plot.py at 2018-02-19 20:42:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.79 Mbit/s
95th percentile per-packet one-way delay: 149.436 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 9.23 Mbit/s
95th percentile per-packet one-way delay: 144.960 ms
Loss rate: 0.09%
-- Flow 2:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 134.276 ms
Loss rate: 1.11%
-- Flow 3:
Average throughput: 1.97 Mbit/s
95th percentile per-packet one-way delay: 171.092 ms
Loss rate: 1.61%
```
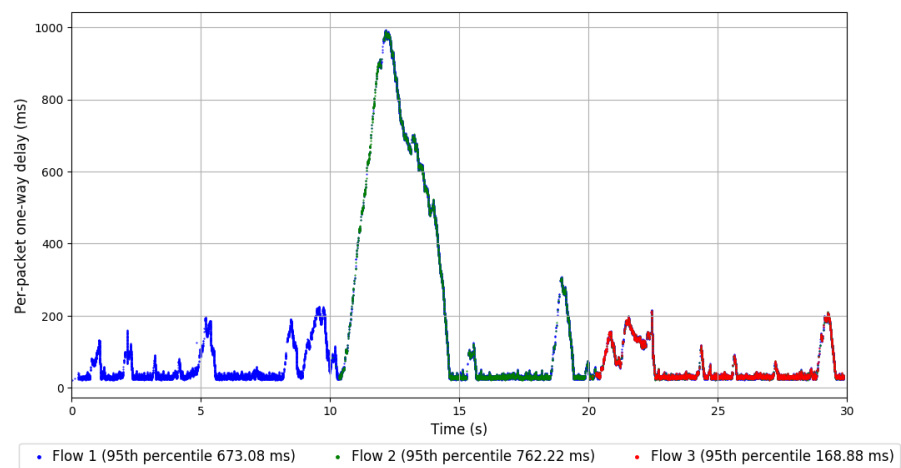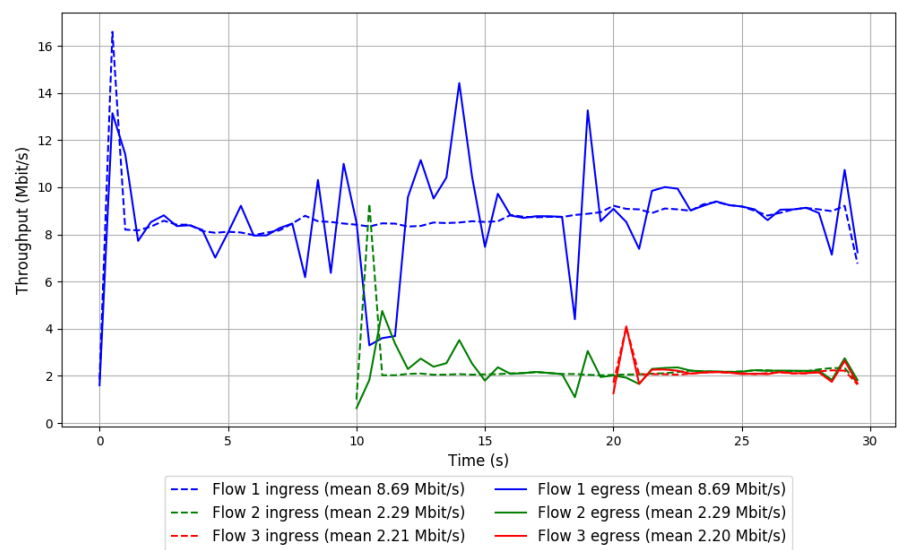
Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 9.23 Mbit/s) ------   Flow 1 egress (mean 9.23 Mbit/s) ──────
Flow 2 ingress (mean 1.37 Mbit/s) ------   Flow 2 egress (mean 1.36 Mbit/s) ──────
Flow 3 ingress (mean 1.98 Mbit/s) ------   Flow 3 egress (mean 1.97 Mbit/s) ──────

Flow 1 (95th percentile 144.96 ms)   Flow 2 (95th percentile 134.28 ms)   Flow 3 (95th percentile 171.09 ms)
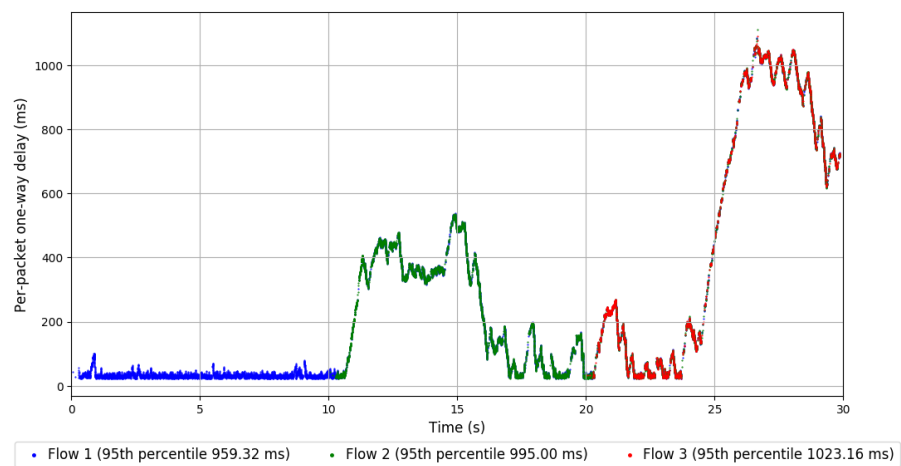
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```
Run 1: Statistics of PCC

Start at: 2018-02-19 19:43:22
End at: 2018-02-19 19:43:52
Local clock offset: -4.084 ms
Remote clock offset: -16.052 ms


# Below is generated by plot.py at 2018-02-19 20:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.93 Mbit/s
95th percentile per-packet one-way delay: 674.292 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 8.69 Mbit/s
95th percentile per-packet one-way delay: 673.080 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 762.218 ms
Loss rate: 0.22%
-- Flow 3:
Average throughput: 2.20 Mbit/s
95th percentile per-packet one-way delay: 168.883 ms
Loss rate: 0.72%
```
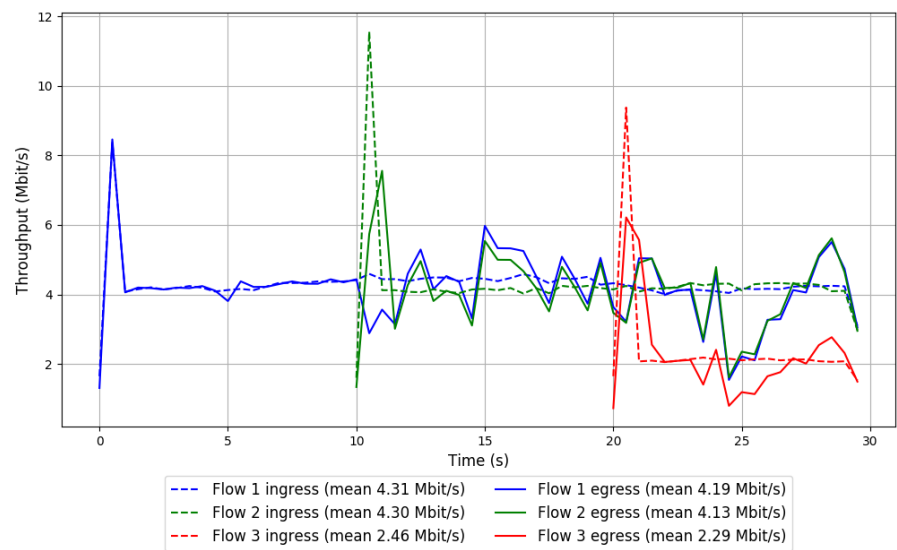
Run 1: Report of PCC — Data Link

```
Run 2: Statistics of PCC

Start at: 2018-02-19 20:03:37
End at: 2018-02-19 20:04:07
Local clock offset: -2.387 ms
Remote clock offset: -16.553 ms


# Below is generated by plot.py at 2018-02-19 20:42:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.69 Mbit/s
95th percentile per-packet one-way delay: 984.629 ms
Loss rate: 3.79%
-- Flow 1:
Average throughput: 4.19 Mbit/s
95th percentile per-packet one-way delay: 959.316 ms
Loss rate: 2.91%
-- Flow 2:
Average throughput: 4.13 Mbit/s
95th percentile per-packet one-way delay: 995.000 ms
Loss rate: 4.16%
-- Flow 3:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 1023.164 ms
Loss rate: 7.17%
```

Run 2: Report of PCC — Data Link

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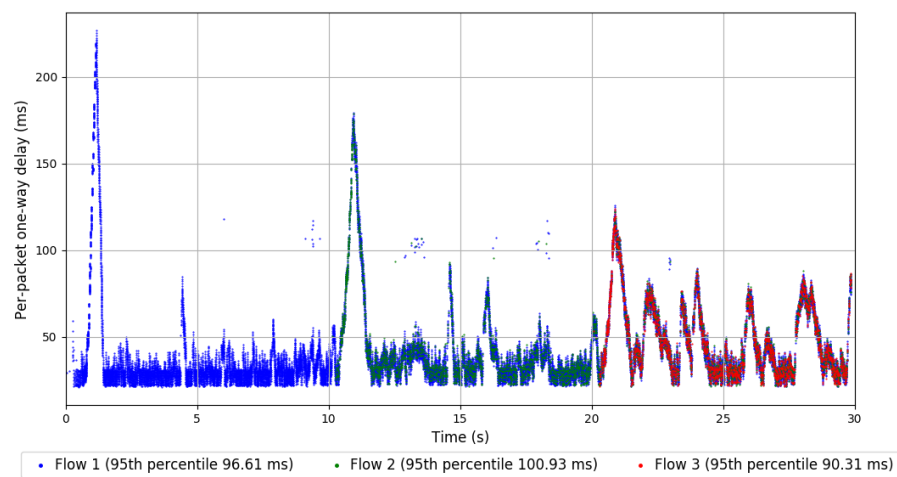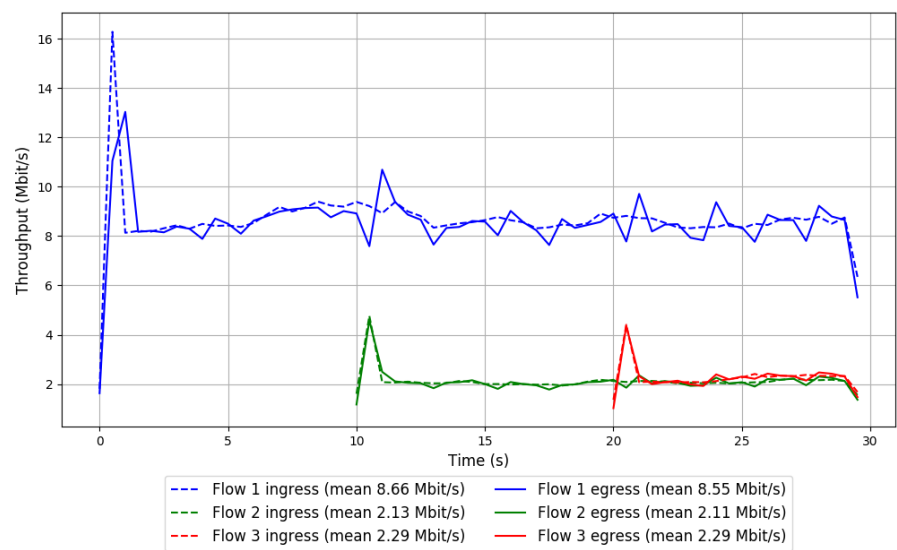Run 2: Report of PCC — Data Link

```
Run 3: Statistics of PCC

Start at: 2018-02-19 20:24:10
End at: 2018-02-19 20:24:40
Local clock offset: 1.975 ms
Remote clock offset: -19.913 ms

# Below is generated by plot.py at 2018-02-19 20:42:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.70 Mbit/s
95th percentile per-packet one-way delay: 97.005 ms
Loss rate: 1.30%
-- Flow 1:
Average throughput: 8.55 Mbit/s
95th percentile per-packet one-way delay: 96.608 ms
Loss rate: 1.36%
-- Flow 2:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 100.931 ms
Loss rate: 1.18%
-- Flow 3:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 90.310 ms
Loss rate: 0.89%
```
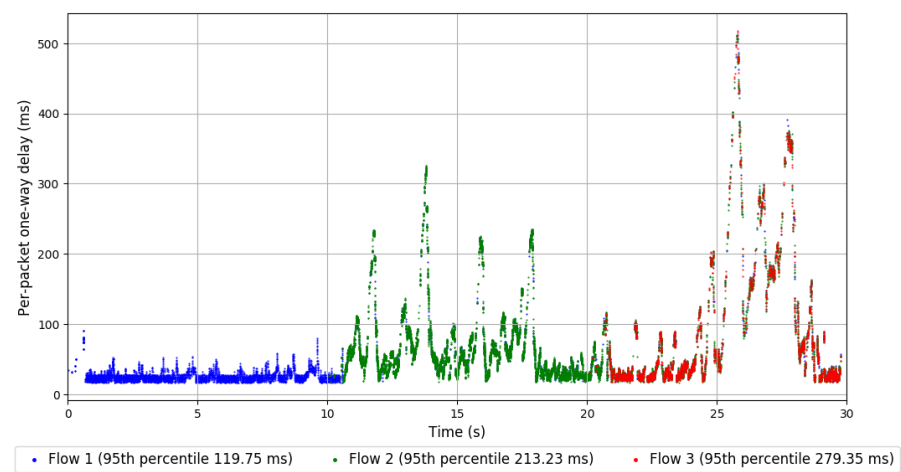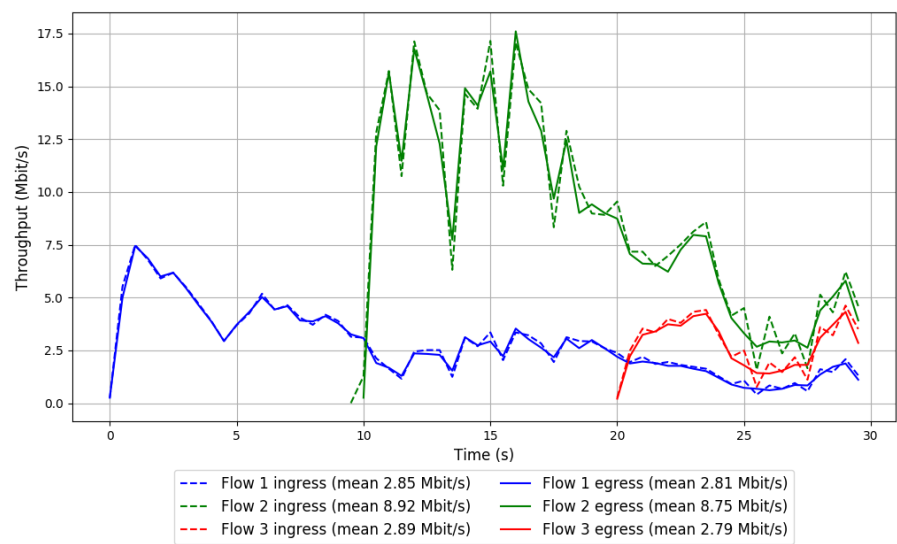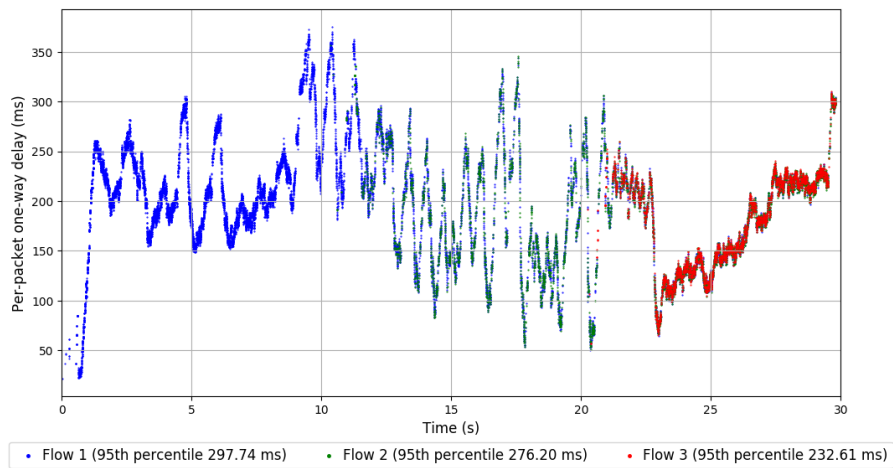
Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 8.66 Mbit/s)   Flow 1 egress (mean 8.55 Mbit/s)
Flow 2 ingress (mean 2.13 Mbit/s)   Flow 2 egress (mean 2.11 Mbit/s)
Flow 3 ingress (mean 2.29 Mbit/s)   Flow 3 egress (mean 2.29 Mbit/s)

• Flow 1 (95th percentile 96.61 ms)   • Flow 2 (95th percentile 100.93 ms)   • Flow 3 (95th percentile 90.31 ms)

27

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-02-19 19:46:43
End at: 2018-02-19 19:47:13
Local clock offset: -0.687 ms
Remote clock offset: -18.213 ms


# Below is generated by plot.py at 2018-02-19 20:42:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.53 Mbit/s
95th percentile per-packet one-way delay: 206.755 ms
Loss rate: 2.26%
-- Flow 1:
Average throughput: 2.81 Mbit/s
95th percentile per-packet one-way delay: 119.748 ms
Loss rate: 1.72%
-- Flow 2:
Average throughput: 8.75 Mbit/s
95th percentile per-packet one-way delay: 213.228 ms
Loss rate: 2.22%
-- Flow 3:
Average throughput: 2.79 Mbit/s
95th percentile per-packet one-way delay: 279.351 ms
Loss rate: 4.17%
```

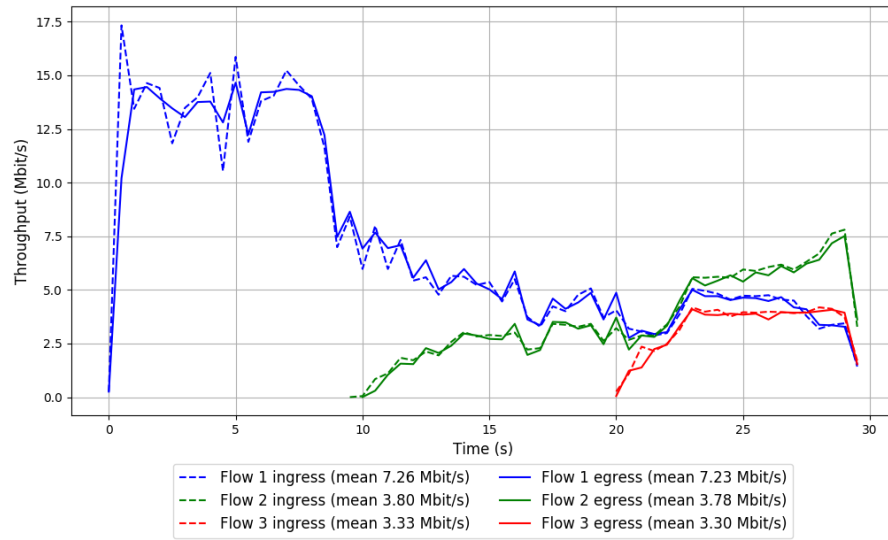Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-02-19 20:06:59
End at: 2018-02-19 20:07:29
Local clock offset: -1.449 ms
Remote clock offset: -18.53 ms


# Below is generated by plot.py at 2018-02-19 20:42:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.76 Mbit/s
95th percentile per-packet one-way delay: 290.889 ms
Loss rate: 1.21%
-- Flow 1:
Average throughput: 7.23 Mbit/s
95th percentile per-packet one-way delay: 297.744 ms
Loss rate: 0.51%
-- Flow 2:
Average throughput: 3.78 Mbit/s
95th percentile per-packet one-way delay: 276.199 ms
Loss rate: 2.48%
-- Flow 3:
Average throughput: 3.30 Mbit/s
95th percentile per-packet one-way delay: 232.606 ms
Loss rate: 2.89%
```
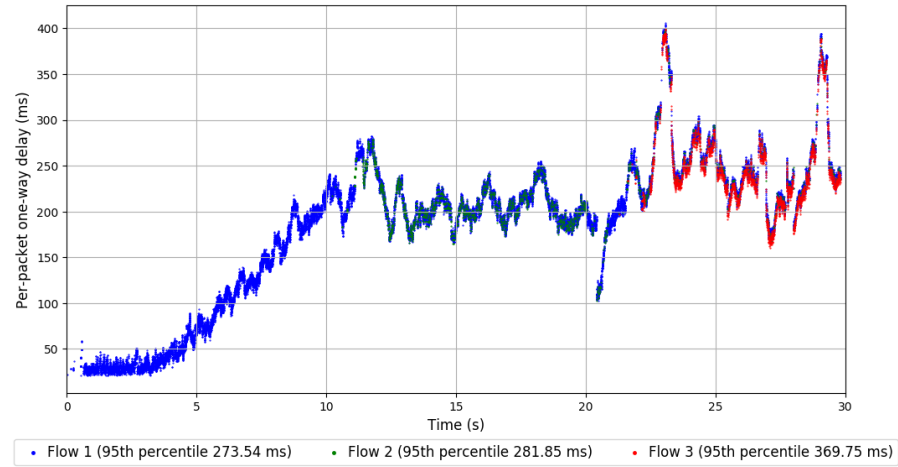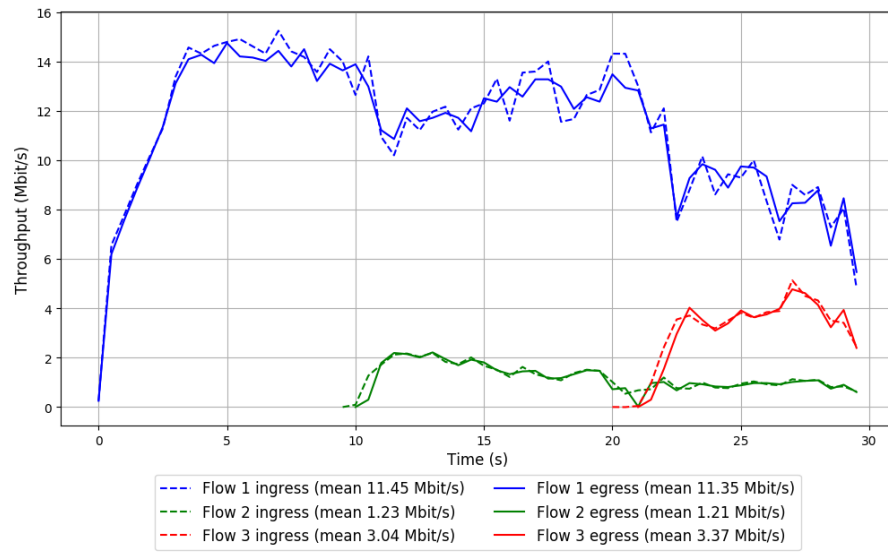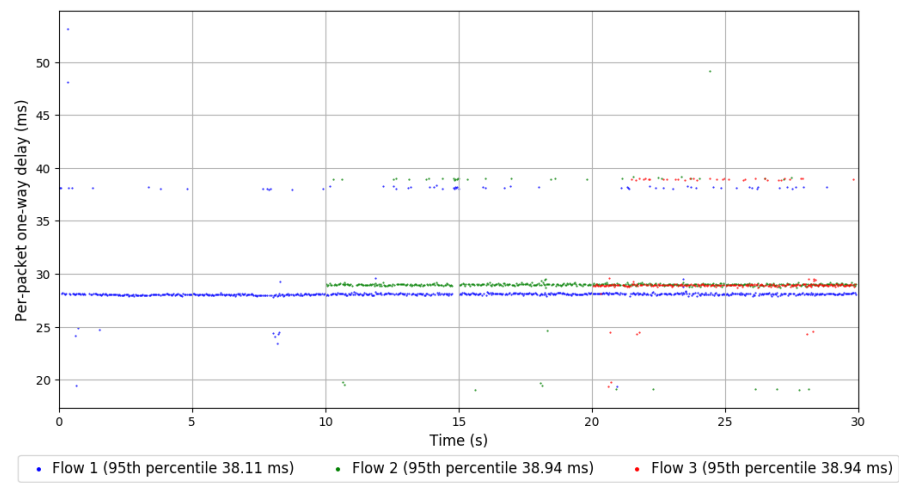
Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 7.26 Mbit/s)   Flow 1 egress (mean 7.23 Mbit/s)
Flow 2 ingress (mean 3.80 Mbit/s)   Flow 2 egress (mean 3.78 Mbit/s)
Flow 3 ingress (mean 3.33 Mbit/s)   Flow 3 egress (mean 3.30 Mbit/s)

Flow 1 (95th percentile 297.74 ms)   Flow 2 (95th percentile 276.20 ms)   Flow 3 (95th percentile 232.61 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-02-19 20:27:31
End at: 2018-02-19 20:28:01
Local clock offset: -0.364 ms
Remote clock offset: -21.503 ms


# Below is generated by plot.py at 2018-02-19 20:42:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.11 Mbit/s
95th percentile per-packet one-way delay: 278.246 ms
Loss rate: 1.28%
-- Flow 1:
Average throughput: 11.35 Mbit/s
95th percentile per-packet one-way delay: 273.539 ms
Loss rate: 0.97%
-- Flow 2:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 281.851 ms
Loss rate: 3.10%
-- Flow 3:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 369.751 ms
Loss rate: 3.37%
```

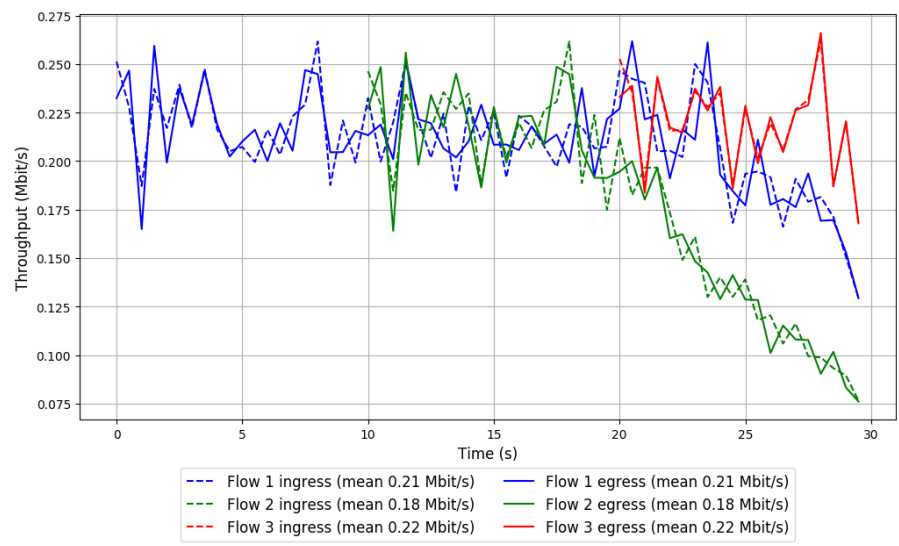# Run 3: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2018-02-19 19:44:29
End at: 2018-02-19 19:44:59
Local clock offset: -1.033 ms
Remote clock offset: -15.563 ms


# Below is generated by plot.py at 2018-02-19 20:42:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 38.205 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 38.110 ms
Loss rate: 0.22%
-- Flow 2:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 38.937 ms
Loss rate: 0.69%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 38.941 ms
Loss rate: 0.35%
```
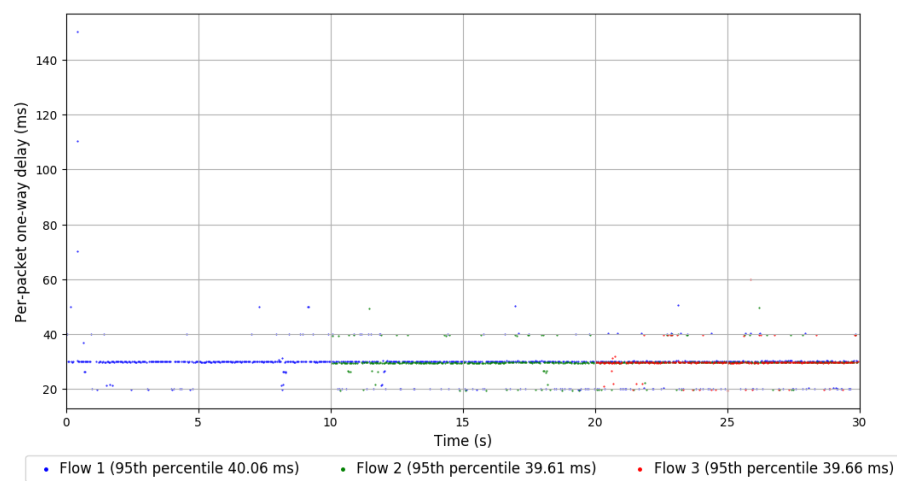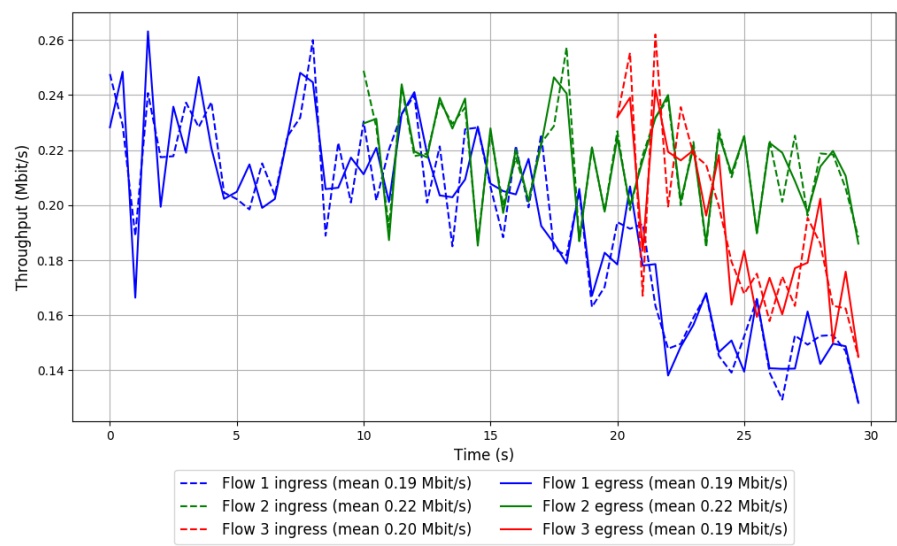
Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2018-02-19 20:04:44
End at: 2018-02-19 20:05:14
Local clock offset: -2.379 ms
Remote clock offset: -19.383 ms


# Below is generated by plot.py at 2018-02-19 20:42:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 39.718 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 40.056 ms
Loss rate: 0.24%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.611 ms
Loss rate: 0.19%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 39.656 ms
Loss rate: 0.47%
```
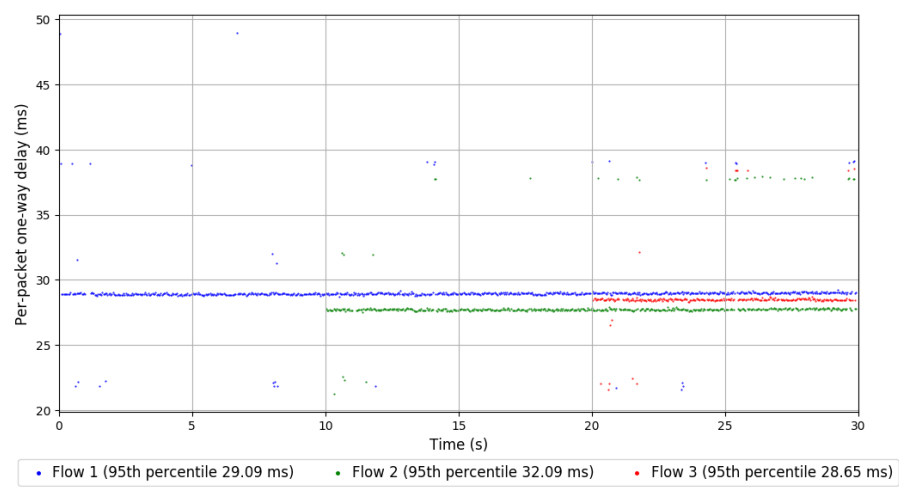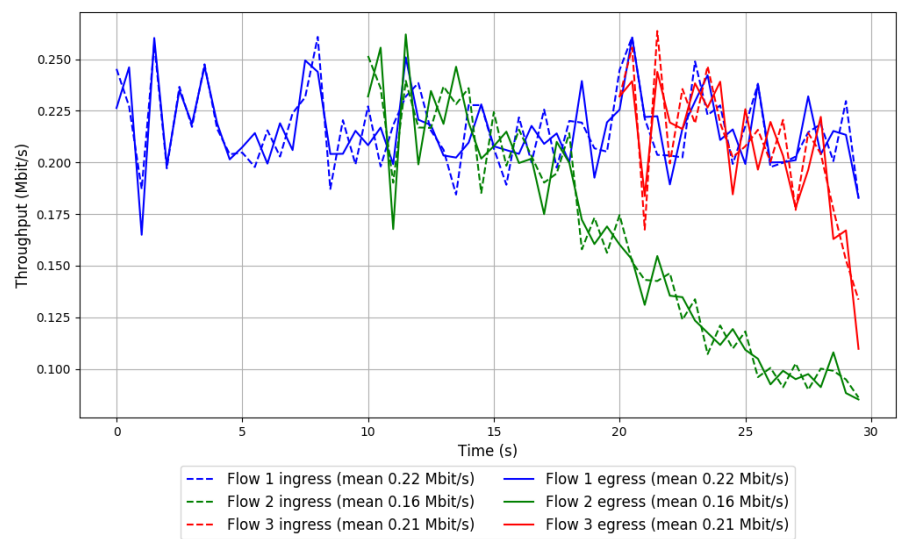
Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-02-19 20:25:18
End at: 2018-02-19 20:25:48
Local clock offset: 1.25 ms
Remote clock offset: -20.859 ms

# Below is generated by plot.py at 2018-02-19 20:42:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 29.086 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 29.087 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 32.093 ms
Loss rate: 0.58%
-- Flow 3:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 28.651 ms
Loss rate: 0.97%
```
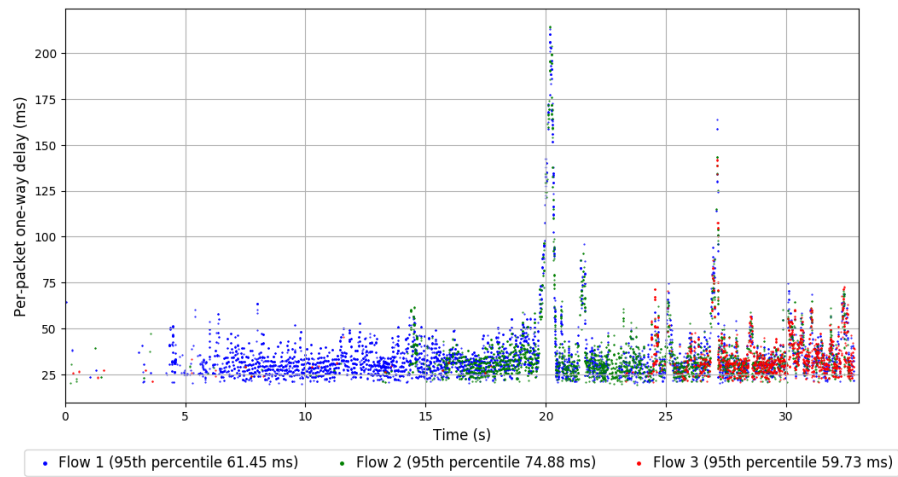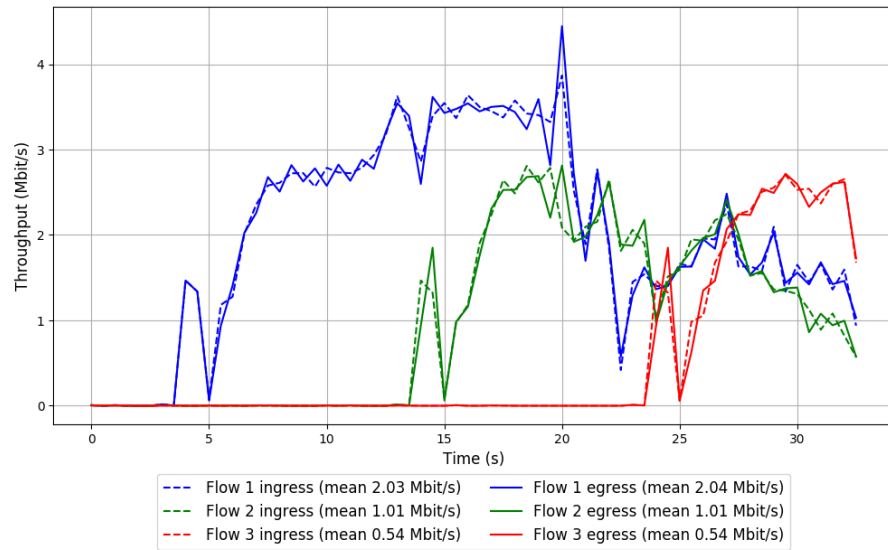
Run 3: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.22 Mbit/s)   Flow 1 egress (mean 0.22 Mbit/s)
Flow 2 ingress (mean 0.16 Mbit/s)   Flow 2 egress (mean 0.16 Mbit/s)
Flow 3 ingress (mean 0.21 Mbit/s)   Flow 3 egress (mean 0.21 Mbit/s)

Flow 1 (95th percentile 29.09 ms)   Flow 2 (95th percentile 32.09 ms)   Flow 3 (95th percentile 28.65 ms)

```
Run 1: Statistics of WebRTC media

Start at: 2018-02-19 19:45:35
End at: 2018-02-19 19:46:05
Local clock offset: -3.047 ms
Remote clock offset: -16.31 ms


# Below is generated by plot.py at 2018-02-19 20:42:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.56 Mbit/s
95th percentile per-packet one-way delay: 65.478 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 61.449 ms
Loss rate: 0.09%
-- Flow 2:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 74.879 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 59.733 ms
Loss rate: 0.55%
```

Run 1: Report of WebRTC media — Data Link
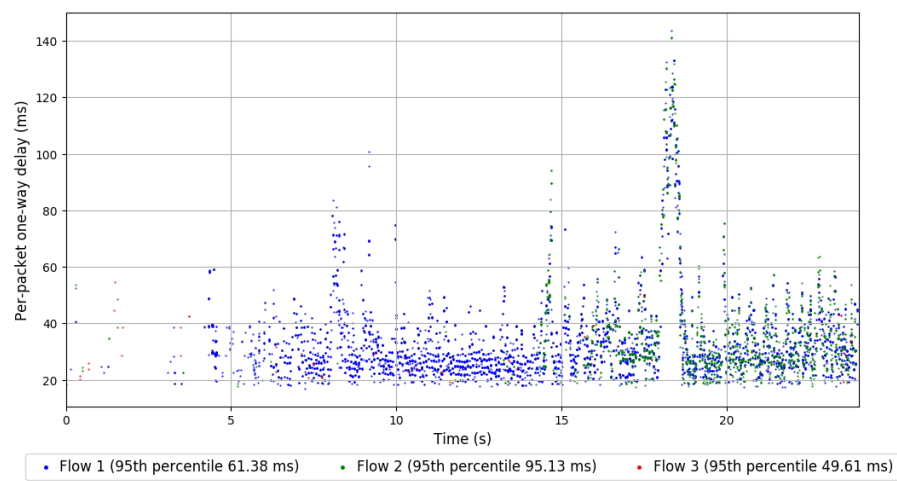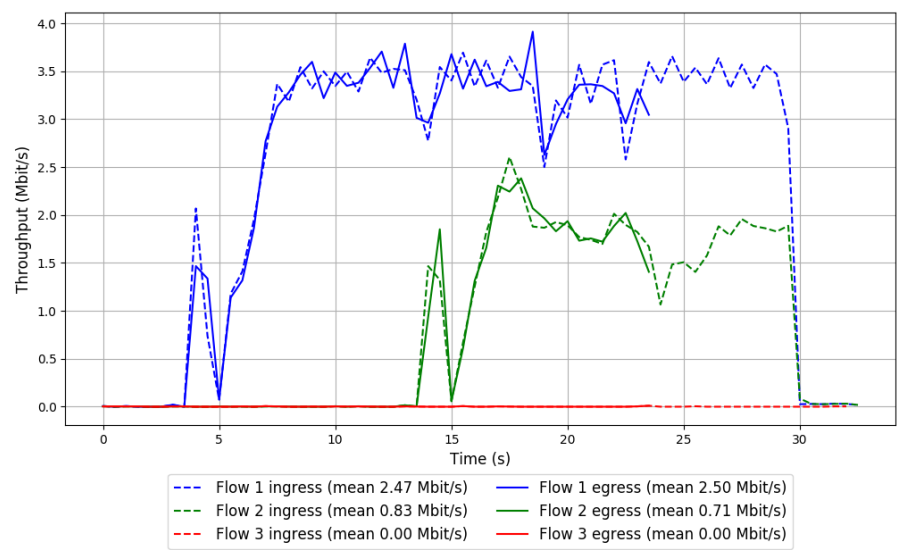
```
Run 2: Statistics of WebRTC media

Start at: 2018-02-19 20:05:51
End at: 2018-02-19 20:06:21
Local clock offset: 2.849 ms
Remote clock offset: -17.426 ms
```

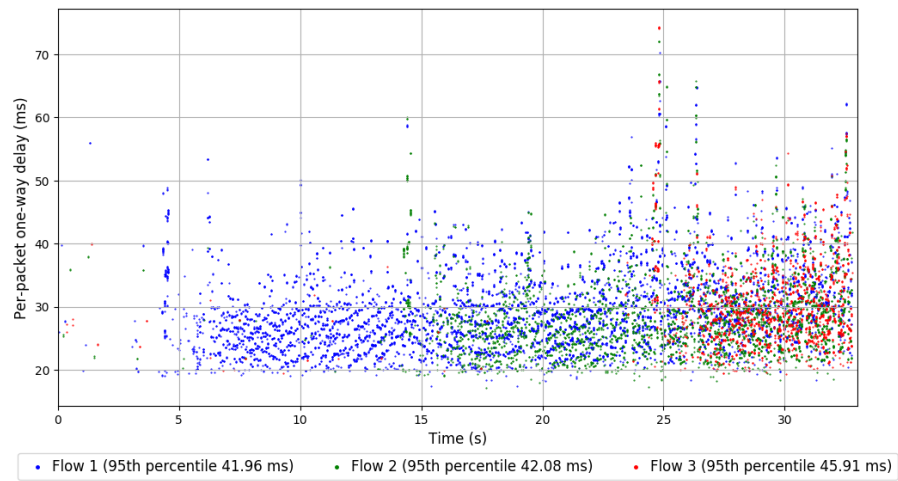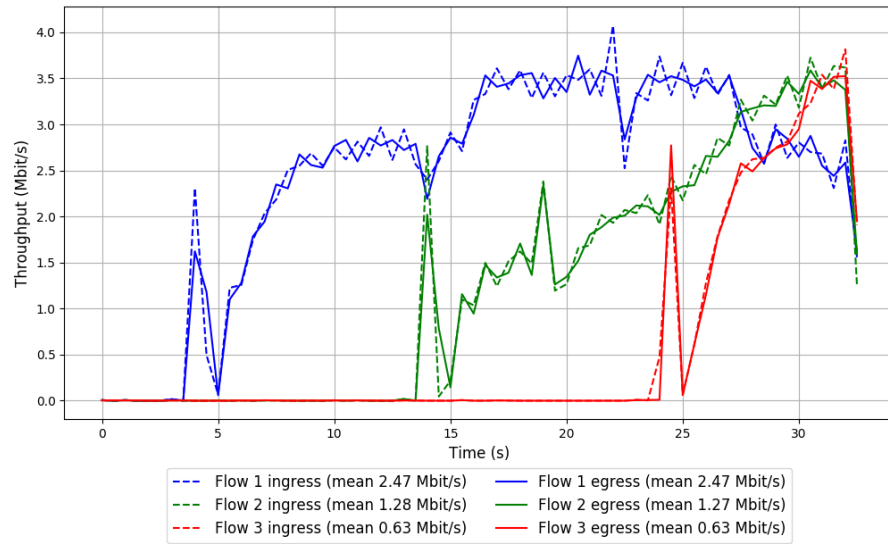Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-02-19 20:26:24
End at: 2018-02-19 20:26:54
Local clock offset: 2.86 ms
Remote clock offset: -21.516 ms

# Below is generated by plot.py at 2018-02-19 20:42:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.35 Mbit/s
95th percentile per-packet one-way delay: 42.524 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 2.47 Mbit/s
95th percentile per-packet one-way delay: 41.963 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 42.082 ms
Loss rate: 0.73%
-- Flow 3:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 45.910 ms
Loss rate: 1.08%
```
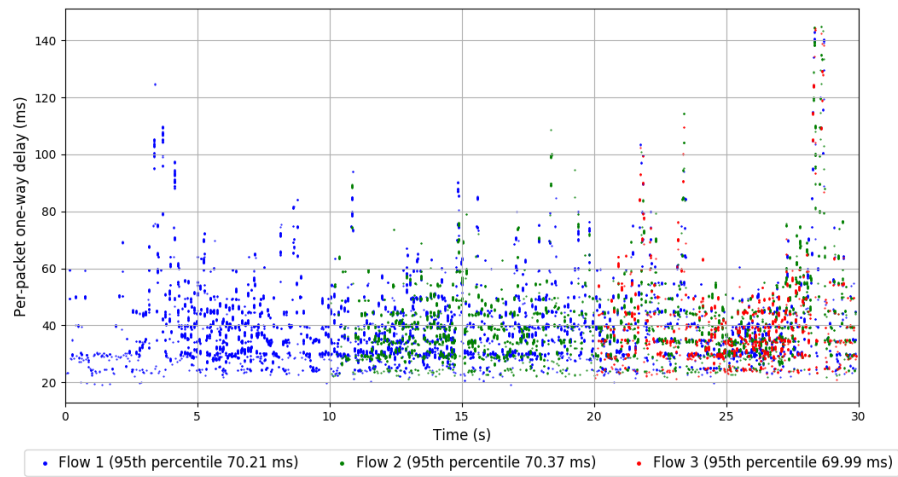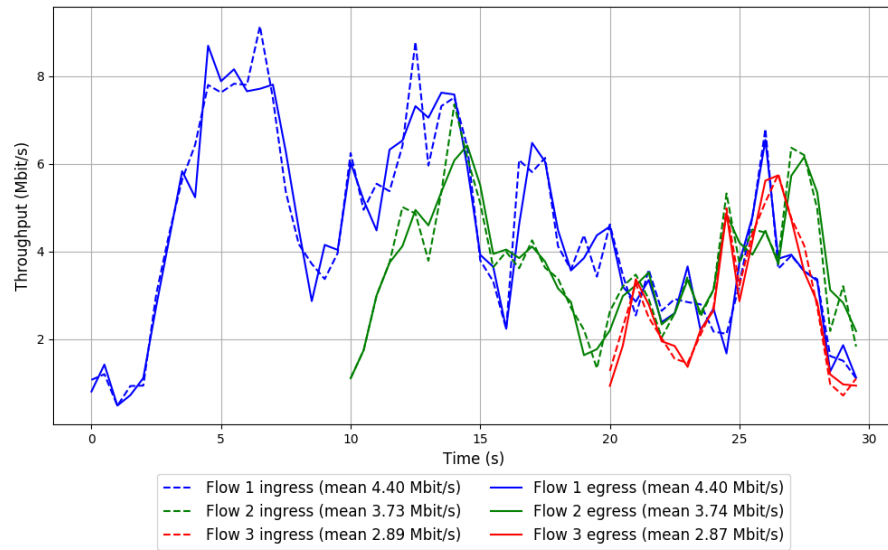
Run 3: Report of WebRTC media — Data Link

```
Run 1: Statistics of Sprout

Start at: 2018-02-19 19:59:08
End at: 2018-02-19 19:59:38
Local clock offset: -1.556 ms
Remote clock offset: -16.049 ms


# Below is generated by plot.py at 2018-02-19 20:42:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.82 Mbit/s
95th percentile per-packet one-way delay: 70.214 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 4.40 Mbit/s
95th percentile per-packet one-way delay: 70.209 ms
Loss rate: 0.05%
-- Flow 2:
Average throughput: 3.74 Mbit/s
95th percentile per-packet one-way delay: 70.367 ms
Loss rate: 0.18%
-- Flow 3:
Average throughput: 2.87 Mbit/s
95th percentile per-packet one-way delay: 69.989 ms
Loss rate: 1.01%
```
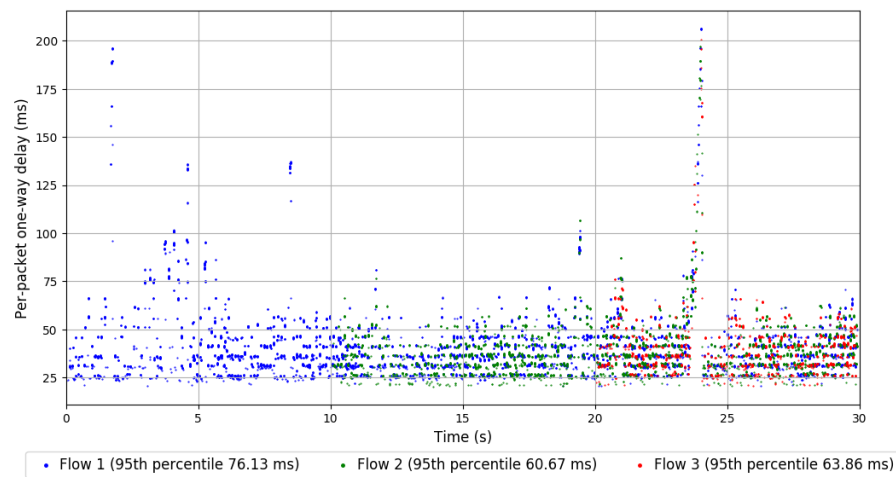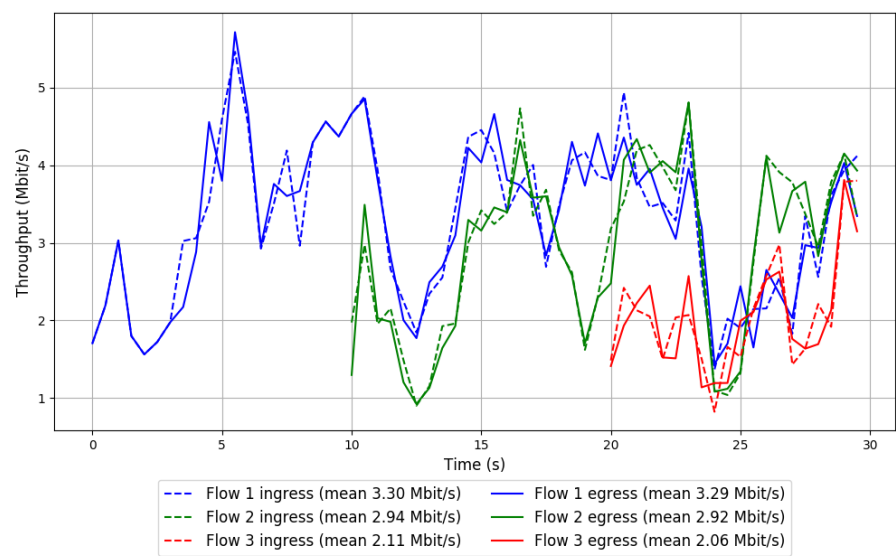
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-02-19 20:19:40
End at: 2018-02-19 20:20:10
Local clock offset: 0.747 ms
Remote clock offset: -19.5 ms


# Below is generated by plot.py at 2018-02-19 20:42:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.91 Mbit/s
95th percentile per-packet one-way delay: 66.715 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 3.29 Mbit/s
95th percentile per-packet one-way delay: 76.134 ms
Loss rate: 0.40%
-- Flow 2:
Average throughput: 2.92 Mbit/s
95th percentile per-packet one-way delay: 60.674 ms
Loss rate: 0.89%
-- Flow 3:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 63.856 ms
Loss rate: 2.68%
```
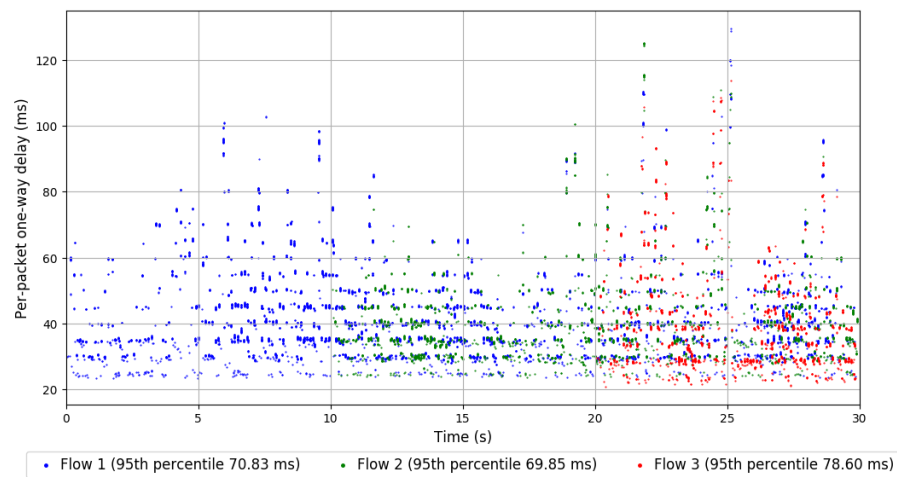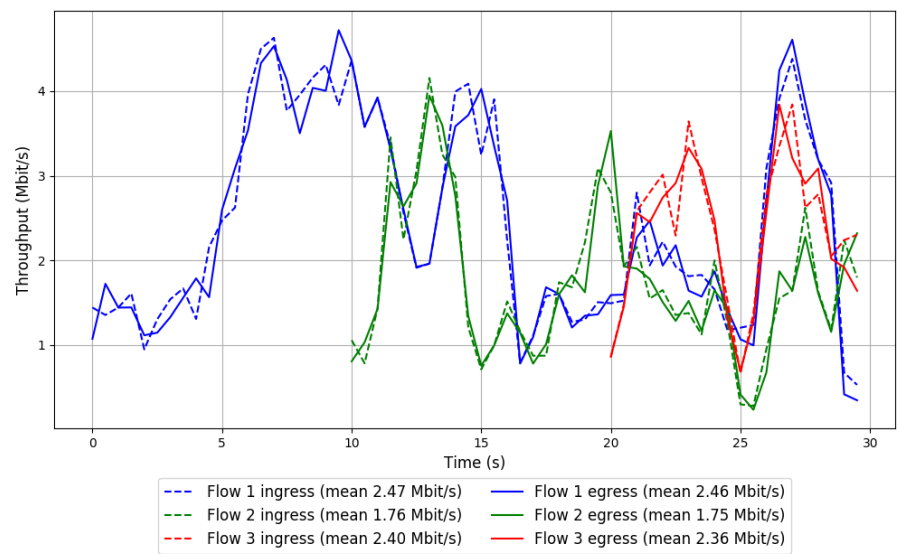
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-02-19 20:40:02
End at: 2018-02-19 20:40:32
Local clock offset: 2.625 ms
Remote clock offset: -21.646 ms


# Below is generated by plot.py at 2018-02-19 20:42:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.39 Mbit/s
95th percentile per-packet one-way delay: 70.900 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 70.832 ms
Loss rate: 0.62%
-- Flow 2:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 69.850 ms
Loss rate: 0.96%
-- Flow 3:
Average throughput: 2.36 Mbit/s
95th percentile per-packet one-way delay: 78.600 ms
Loss rate: 2.53%
```

Run 3: Report of Sprout — Data Link

Flow 1 ingress (mean 2.47 Mbit/s)   Flow 1 egress (mean 2.46 Mbit/s)
Flow 2 ingress (mean 1.76 Mbit/s)   Flow 2 egress (mean 1.75 Mbit/s)
Flow 3 ingress (mean 2.40 Mbit/s)   Flow 3 egress (mean 2.36 Mbit/s)

Flow 1 (95th percentile 70.83 ms)   Flow 2 (95th percentile 69.85 ms)   Flow 3 (95th percentile 78.60 ms)
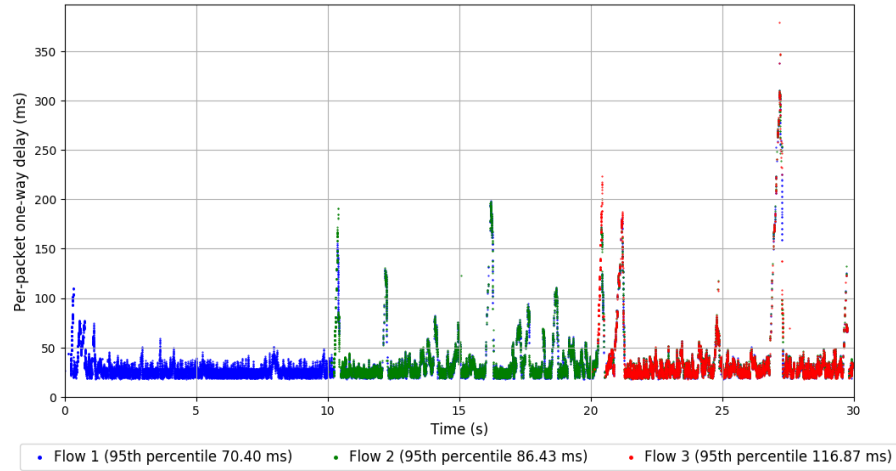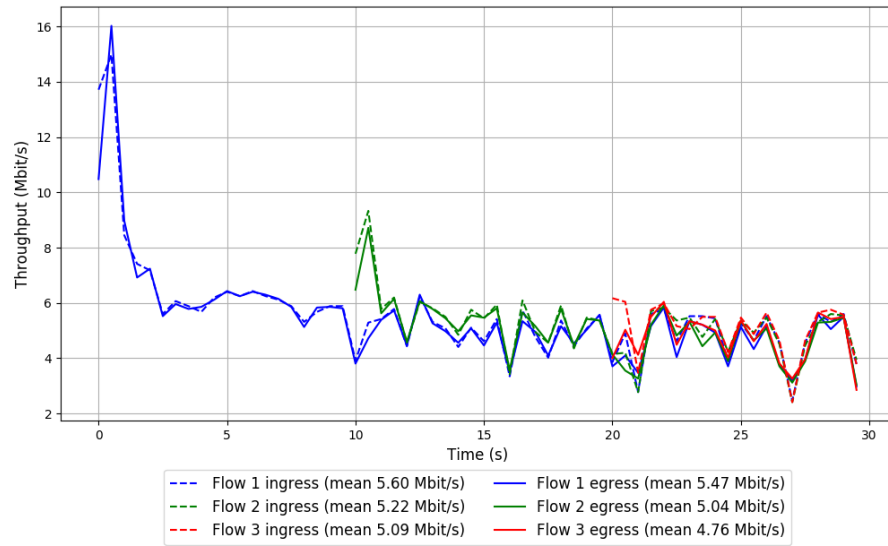
```
Run 1: Statistics of TaoVA-100x

Start at: 2018-02-19 19:48:57
End at: 2018-02-19 19:49:27
Local clock offset: -0.539 ms
Remote clock offset: -15.981 ms


# Below is generated by plot.py at 2018-02-19 20:42:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.40 Mbit/s
95th percentile per-packet one-way delay: 79.258 ms
Loss rate: 3.56%
-- Flow 1:
Average throughput: 5.47 Mbit/s
95th percentile per-packet one-way delay: 70.403 ms
Loss rate: 2.54%
-- Flow 2:
Average throughput: 5.04 Mbit/s
95th percentile per-packet one-way delay: 86.434 ms
Loss rate: 3.63%
-- Flow 3:
Average throughput: 4.76 Mbit/s
95th percentile per-packet one-way delay: 116.868 ms
Loss rate: 6.78%
```
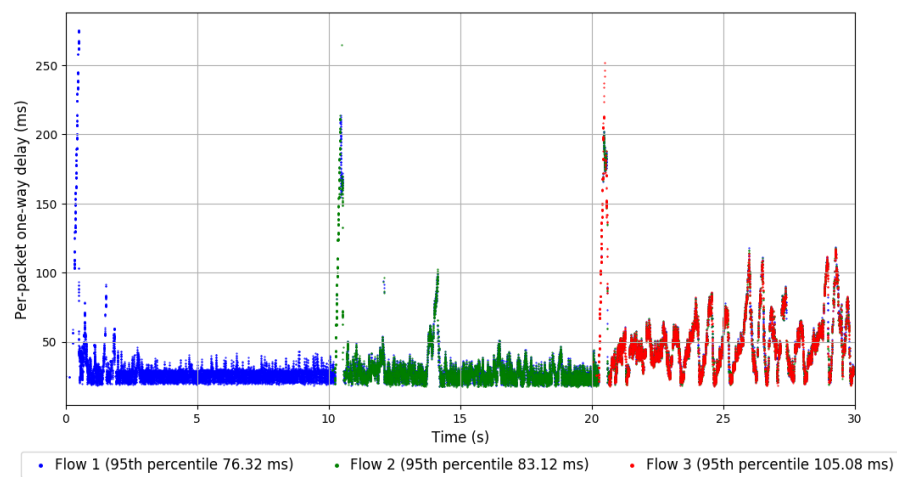
Run 1: Report of TaoVA-100x — Data Link

- Flow 1 ingress (mean 5.60 Mbit/s)
- Flow 1 egress (mean 5.47 Mbit/s)
- Flow 2 ingress (mean 5.22 Mbit/s)
- Flow 2 egress (mean 5.04 Mbit/s)
- Flow 3 ingress (mean 5.09 Mbit/s)
- Flow 3 egress (mean 4.76 Mbit/s)

- Flow 1 (95th percentile 70.40 ms)
- Flow 2 (95th percentile 86.43 ms)
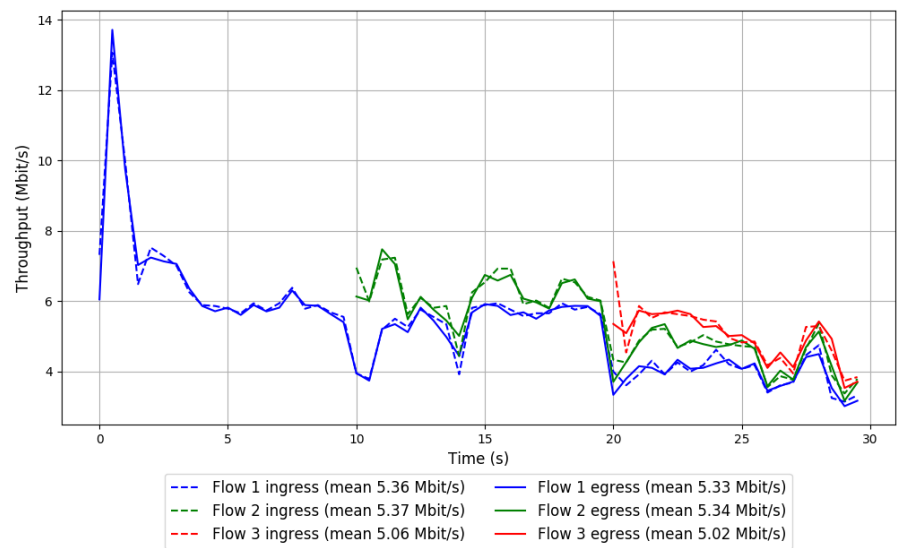- Flow 3 (95th percentile 116.87 ms)

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

Start at: 2018-02-19 20:09:16
End at: 2018-02-19 20:09:46
Local clock offset: 1.587 ms
Remote clock offset: -19.299 ms

# Below is generated by plot.py at 2018-02-19 20:42:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.54 Mbit/s
95th percentile per-packet one-way delay: 84.085 ms
Loss rate: 0.91%
-- Flow 1:
Average throughput: 5.33 Mbit/s
95th percentile per-packet one-way delay: 76.321 ms
Loss rate: 0.78%
-- Flow 2:
Average throughput: 5.34 Mbit/s
95th percentile per-packet one-way delay: 83.119 ms
Loss rate: 0.94%
-- Flow 3:
Average throughput: 5.02 Mbit/s
95th percentile per-packet one-way delay: 105.084 ms
Loss rate: 1.25%
```

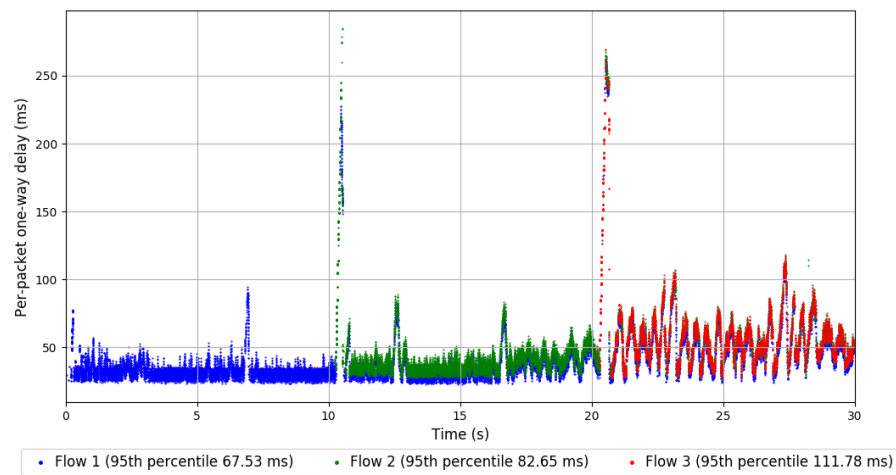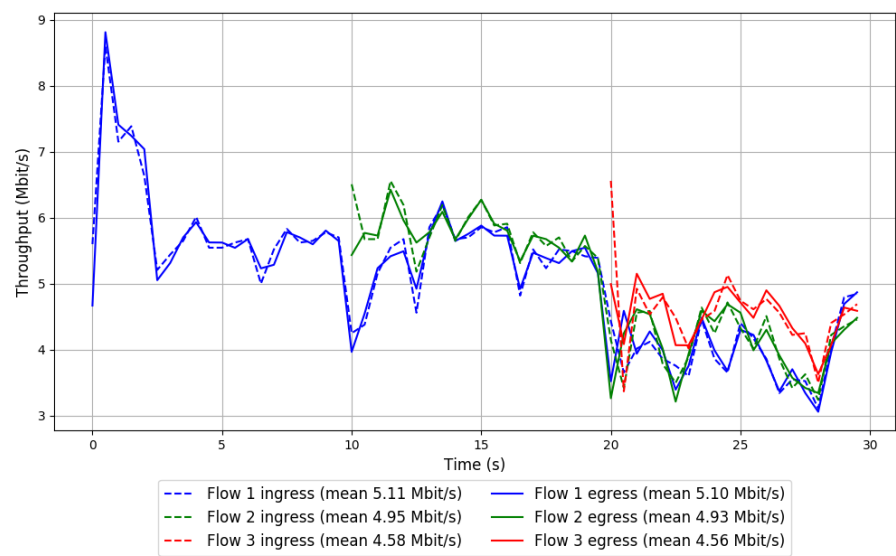Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2018-02-19 20:29:46
End at: 2018-02-19 20:30:16
Local clock offset: -1.065 ms
Remote clock offset: -20.477 ms

# Below is generated by plot.py at 2018-02-19 20:42:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.89 Mbit/s
95th percentile per-packet one-way delay: 79.106 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 5.10 Mbit/s
95th percentile per-packet one-way delay: 67.531 ms
Loss rate: 0.27%
-- Flow 2:
Average throughput: 4.93 Mbit/s
95th percentile per-packet one-way delay: 82.650 ms
Loss rate: 0.55%
-- Flow 3:
Average throughput: 4.56 Mbit/s
95th percentile per-packet one-way delay: 111.785 ms
Loss rate: 0.84%
```

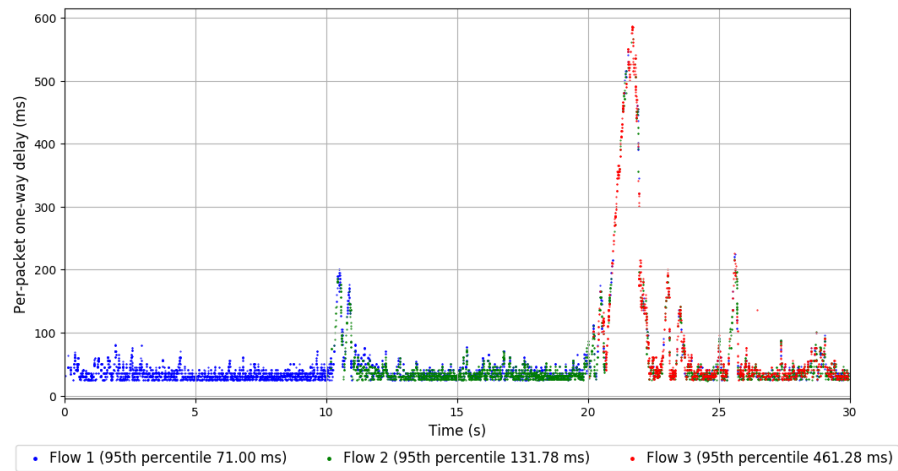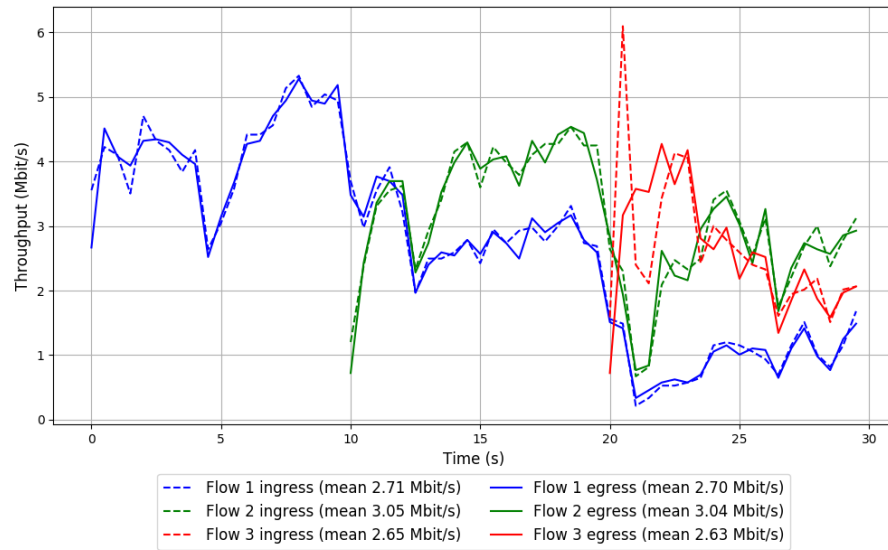# Run 3: Report of TaoVA-100x — Data Link

```
Run 1: Statistics of TCP Vegas

Start at: 2018-02-19 19:41:06
End at: 2018-02-19 19:41:36
Local clock offset: -4.997 ms
Remote clock offset: -16.395 ms


# Below is generated by plot.py at 2018-02-19 20:42:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.59 Mbit/s
95th percentile per-packet one-way delay: 151.557 ms
Loss rate: 0.62%
-- Flow 1:
Average throughput: 2.70 Mbit/s
95th percentile per-packet one-way delay: 71.002 ms
Loss rate: 0.38%
-- Flow 2:
Average throughput: 3.04 Mbit/s
95th percentile per-packet one-way delay: 131.785 ms
Loss rate: 0.49%
-- Flow 3:
Average throughput: 2.63 Mbit/s
95th percentile per-packet one-way delay: 461.282 ms
Loss rate: 1.64%
```

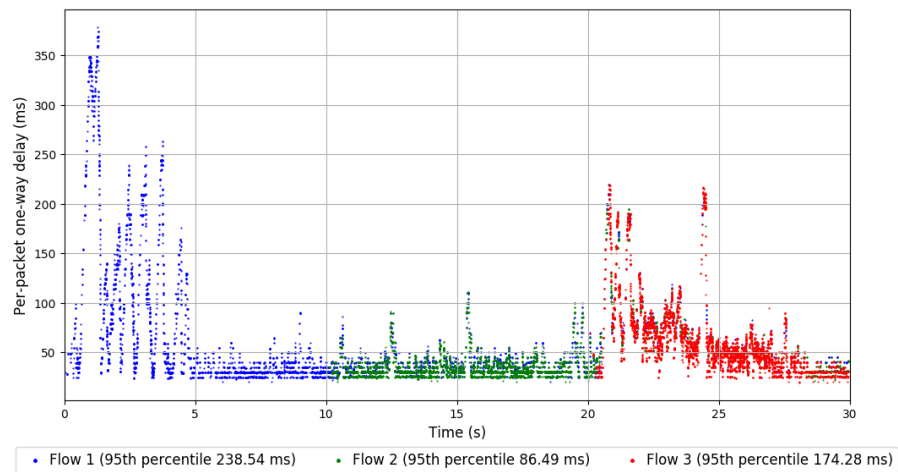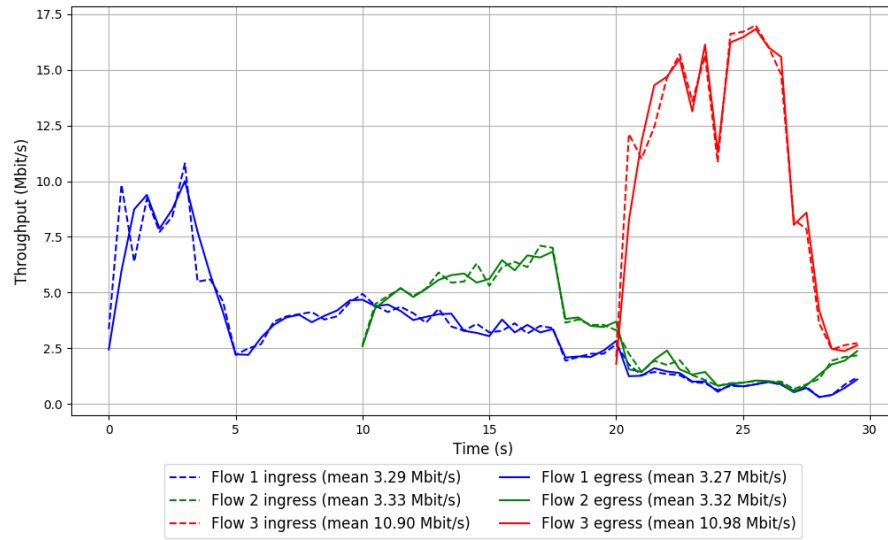Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-02-19 20:01:21
End at: 2018-02-19 20:01:51
Local clock offset: -0.064 ms
Remote clock offset: -16.377 ms


# Below is generated by plot.py at 2018-02-19 20:42:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.09 Mbit/s
95th percentile per-packet one-way delay: 182.338 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 3.27 Mbit/s
95th percentile per-packet one-way delay: 238.541 ms
Loss rate: 0.59%
-- Flow 2:
Average throughput: 3.32 Mbit/s
95th percentile per-packet one-way delay: 86.491 ms
Loss rate: 0.40%
-- Flow 3:
Average throughput: 10.98 Mbit/s
95th percentile per-packet one-way delay: 174.277 ms
Loss rate: 0.24%
```

Run 2: Report of TCP Vegas — Data Link

- - - Flow 1 ingress (mean 3.29 Mbit/s) —— Flow 1 egress (mean 3.27 Mbit/s)
- - - Flow 2 ingress (mean 3.33 Mbit/s) —— Flow 2 egress (mean 3.32 Mbit/s)
- - - Flow 3 ingress (mean 10.90 Mbit/s) —— Flow 3 egress (mean 10.98 Mbit/s)

• Flow 1 (95th percentile 238.54 ms)   • Flow 2 (95th percentile 86.49 ms)   • Flow 3 (95th percentile 174.28 ms)
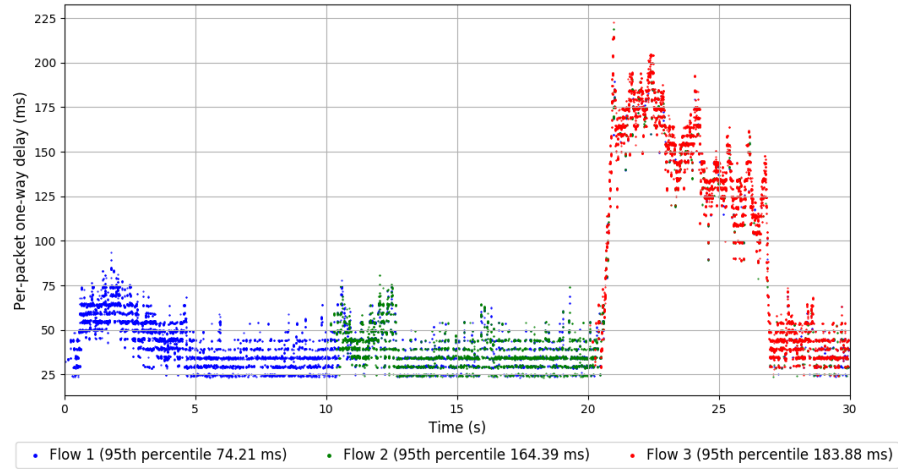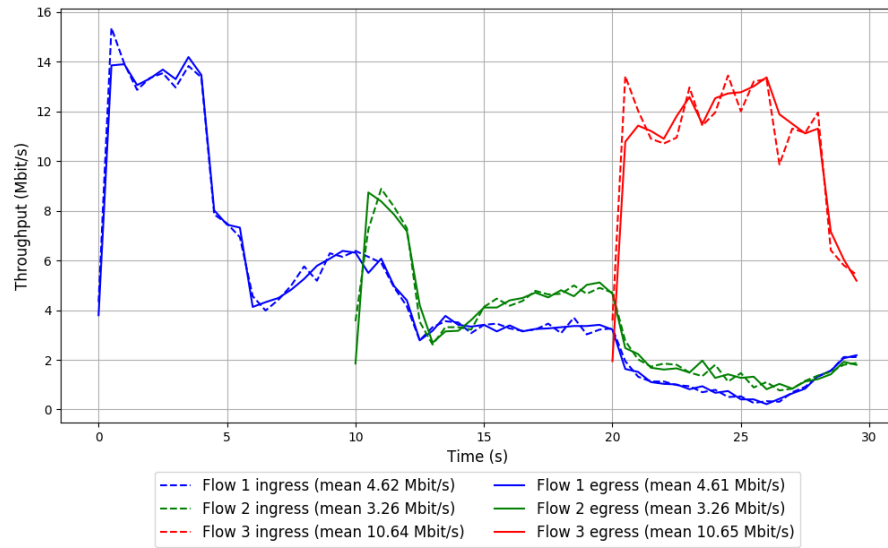
```
Run 3: Statistics of TCP Vegas

Start at: 2018-02-19 20:21:53
End at: 2018-02-19 20:22:23
Local clock offset: -1.409 ms
Remote clock offset: -20.421 ms


# Below is generated by plot.py at 2018-02-19 20:42:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.30 Mbit/s
95th percentile per-packet one-way delay: 174.052 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 4.61 Mbit/s
95th percentile per-packet one-way delay: 74.208 ms
Loss rate: 0.21%
-- Flow 2:
Average throughput: 3.26 Mbit/s
95th percentile per-packet one-way delay: 164.387 ms
Loss rate: 0.35%
-- Flow 3:
Average throughput: 10.65 Mbit/s
95th percentile per-packet one-way delay: 183.875 ms
Loss rate: 0.49%
```
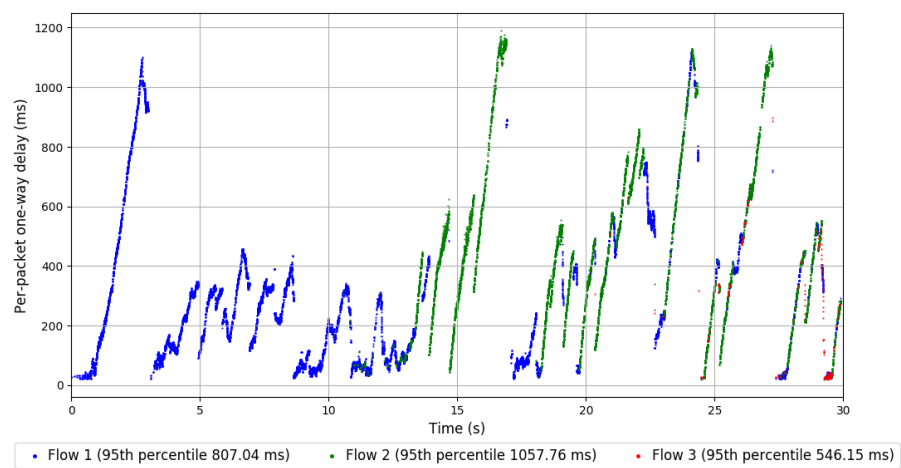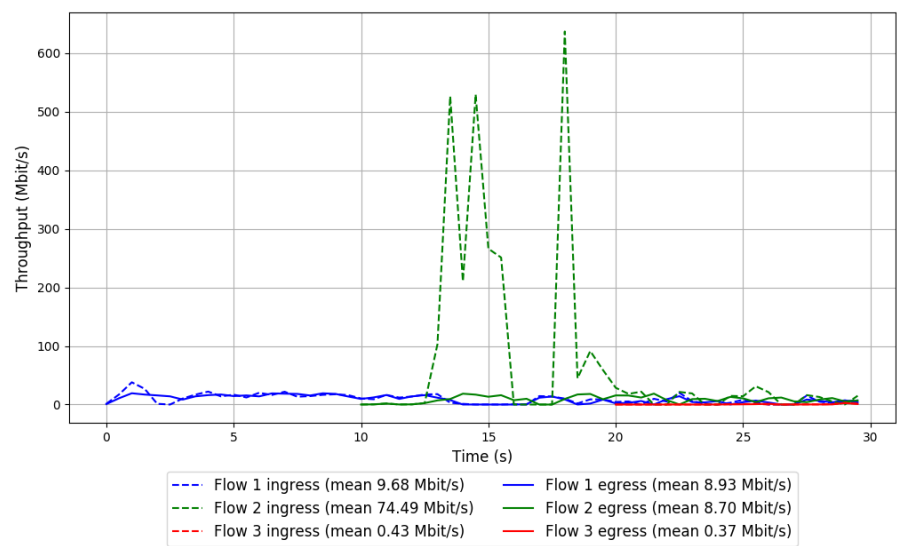
Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 4.62 Mbit/s) — — — Flow 1 egress (mean 4.61 Mbit/s)
Flow 2 ingress (mean 3.26 Mbit/s) — — — Flow 2 egress (mean 3.26 Mbit/s)
Flow 3 ingress (mean 10.64 Mbit/s) — — — Flow 3 egress (mean 10.65 Mbit/s)

Flow 1 (95th percentile 74.21 ms)   Flow 2 (95th percentile 164.39 ms)   Flow 3 (95th percentile 183.88 ms)

```
Run 1: Statistics of Verus

Start at: 2018-02-19 19:42:13
End at: 2018-02-19 19:42:43
Local clock offset: -1.191 ms
Remote clock offset: -16.427 ms


# Below is generated by plot.py at 2018-02-19 20:43:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 14.79 Mbit/s
95th percentile per-packet one-way delay: 943.759 ms
Loss rate: 75.08%
-- Flow 1:
Average throughput: 8.93 Mbit/s
95th percentile per-packet one-way delay: 807.040 ms
Loss rate: 7.19%
-- Flow 2:
Average throughput: 8.70 Mbit/s
95th percentile per-packet one-way delay: 1057.762 ms
Loss rate: 88.42%
-- Flow 3:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 546.148 ms
Loss rate: 17.40%
```

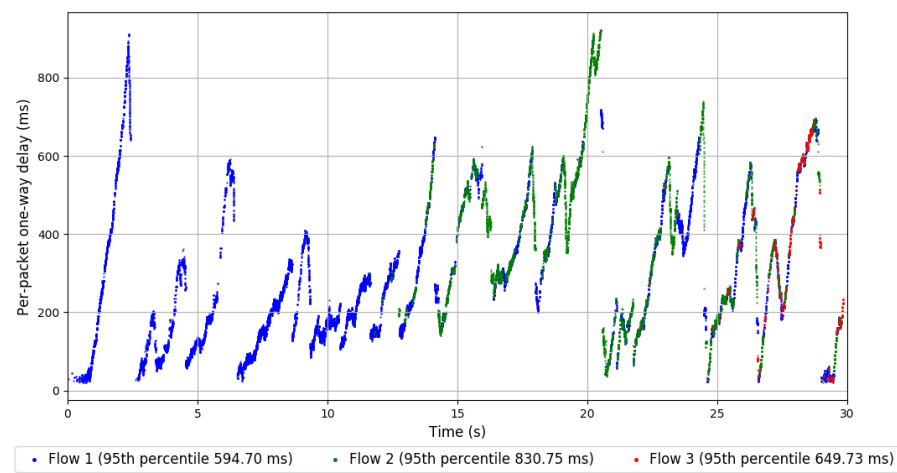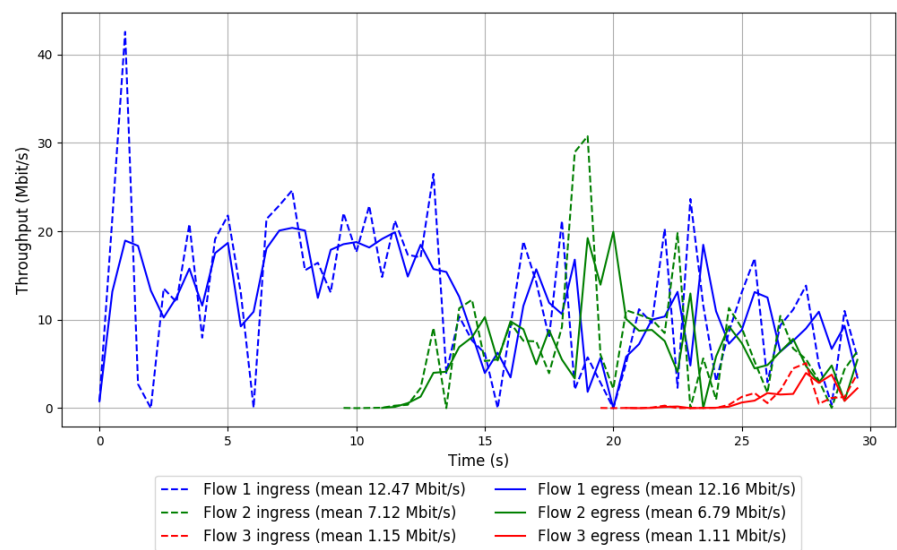Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2018-02-19 20:02:28
End at: 2018-02-19 20:02:58
Local clock offset: -0.785 ms
Remote clock offset: -17.055 ms

# Below is generated by plot.py at 2018-02-19 20:43:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 16.72 Mbit/s
95th percentile per-packet one-way delay: 658.412 ms
Loss rate: 5.11%
-- Flow 1:
Average throughput: 12.16 Mbit/s
95th percentile per-packet one-way delay: 594.695 ms
Loss rate: 2.80%
-- Flow 2:
Average throughput: 6.79 Mbit/s
95th percentile per-packet one-way delay: 830.748 ms
Loss rate: 10.84%
-- Flow 3:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 649.734 ms
Loss rate: 9.35%
```

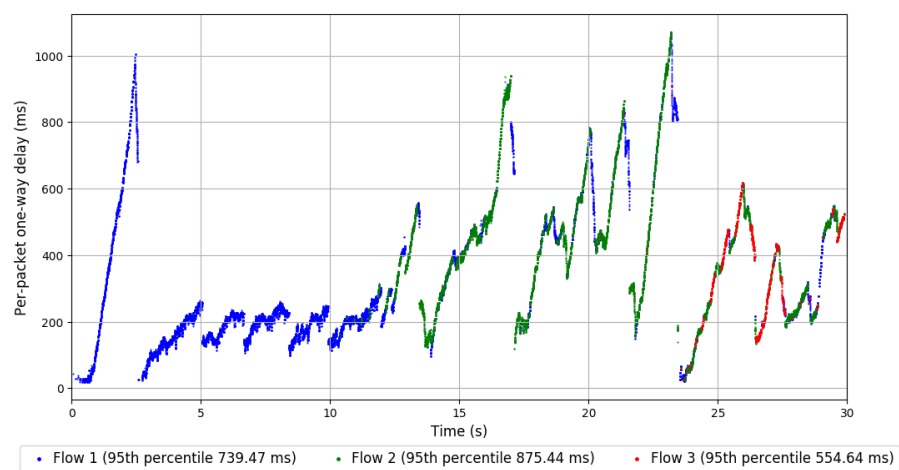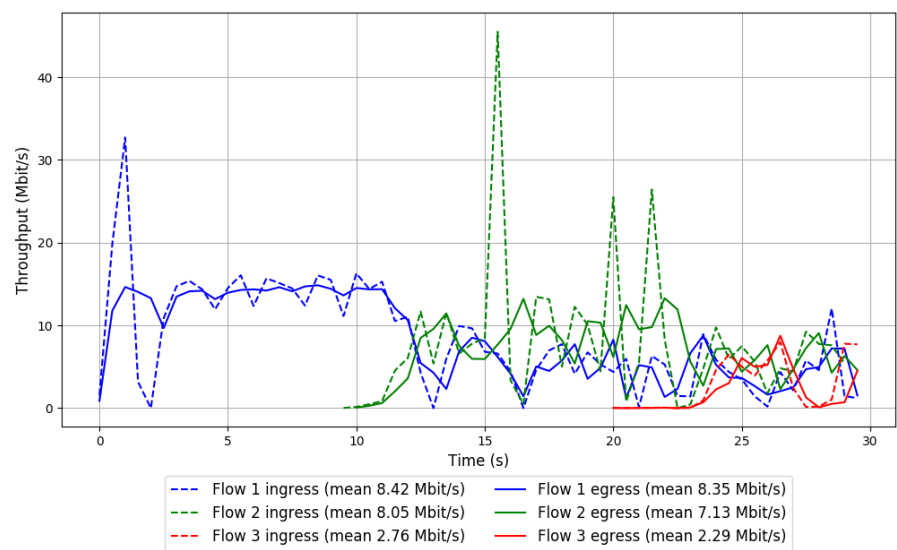Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-02-19 20:23:01
End at: 2018-02-19 20:23:31
Local clock offset: 1.946 ms
Remote clock offset: -22.167 ms


# Below is generated by plot.py at 2018-02-19 20:43:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.70 Mbit/s
95th percentile per-packet one-way delay: 791.981 ms
Loss rate: 5.65%
-- Flow 1:
Average throughput: 8.35 Mbit/s
95th percentile per-packet one-way delay: 739.468 ms
Loss rate: 1.28%
-- Flow 2:
Average throughput: 7.13 Mbit/s
95th percentile per-packet one-way delay: 875.436 ms
Loss rate: 10.05%
-- Flow 3:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 554.637 ms
Loss rate: 20.48%
```

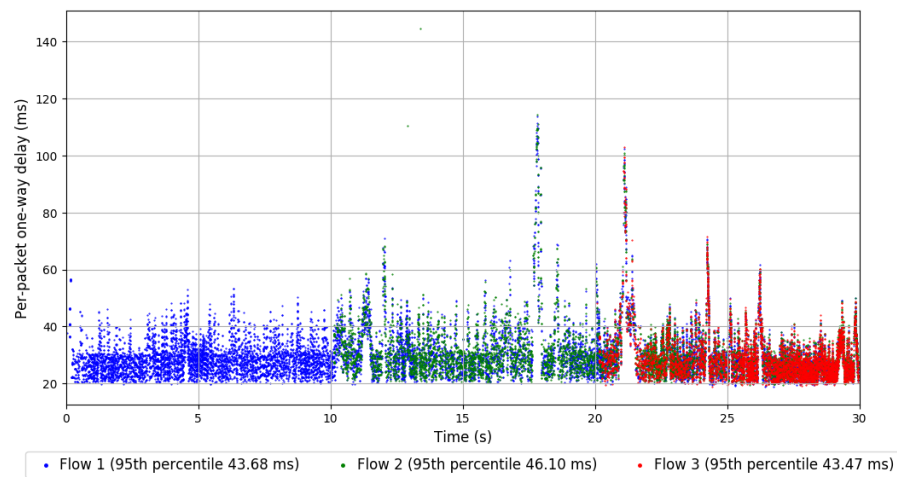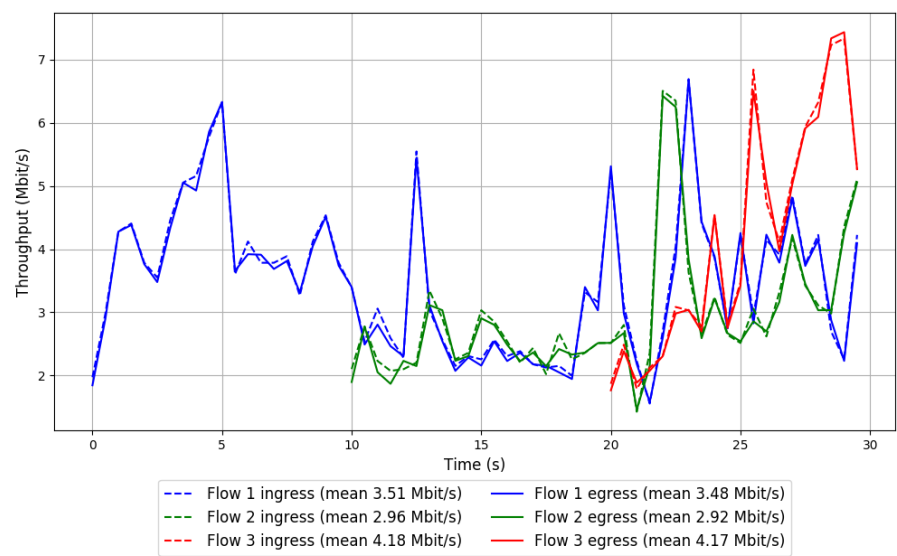# Run 3: Report of Verus — Data Link

```
Run 1: Statistics of Copa

Start at: 2018-02-19 19:52:17
End at: 2018-02-19 19:52:47
Local clock offset: -0.441 ms
Remote clock offset: -15.508 ms


# Below is generated by plot.py at 2018-02-19 20:43:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.80 Mbit/s
95th percentile per-packet one-way delay: 44.316 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 3.48 Mbit/s
95th percentile per-packet one-way delay: 43.677 ms
Loss rate: 1.14%
-- Flow 2:
Average throughput: 2.92 Mbit/s
95th percentile per-packet one-way delay: 46.099 ms
Loss rate: 1.41%
-- Flow 3:
Average throughput: 4.17 Mbit/s
95th percentile per-packet one-way delay: 43.467 ms
Loss rate: 0.87%
```
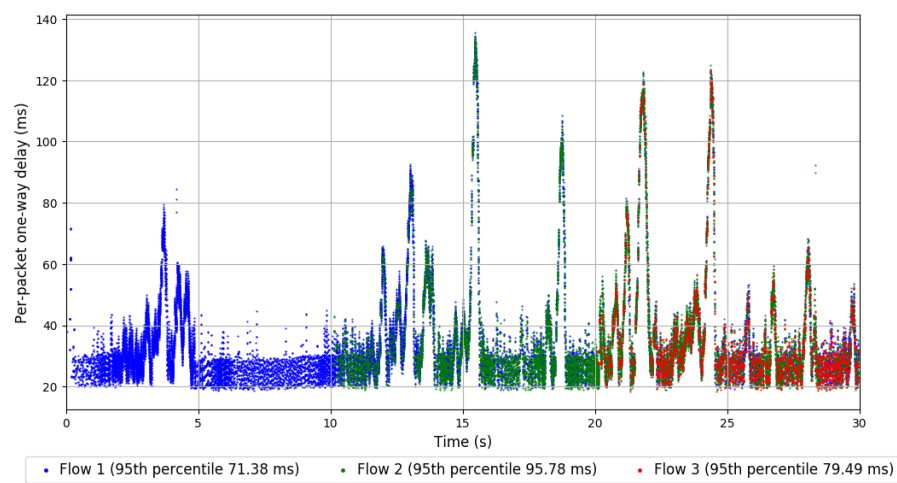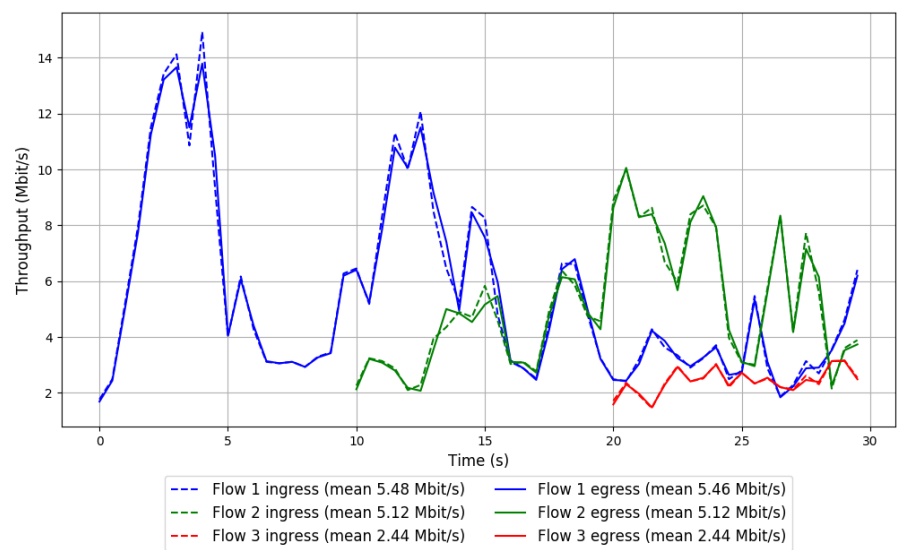
Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2018-02-19 20:12:49
End at: 2018-02-19 20:13:19
Local clock offset: 0.396 ms
Remote clock offset: -19.736 ms


# Below is generated by plot.py at 2018-02-19 20:43:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.68 Mbit/s
95th percentile per-packet one-way delay: 80.931 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 5.46 Mbit/s
95th percentile per-packet one-way delay: 71.375 ms
Loss rate: 0.35%
-- Flow 2:
Average throughput: 5.12 Mbit/s
95th percentile per-packet one-way delay: 95.776 ms
Loss rate: 0.27%
-- Flow 3:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 79.493 ms
Loss rate: 0.58%
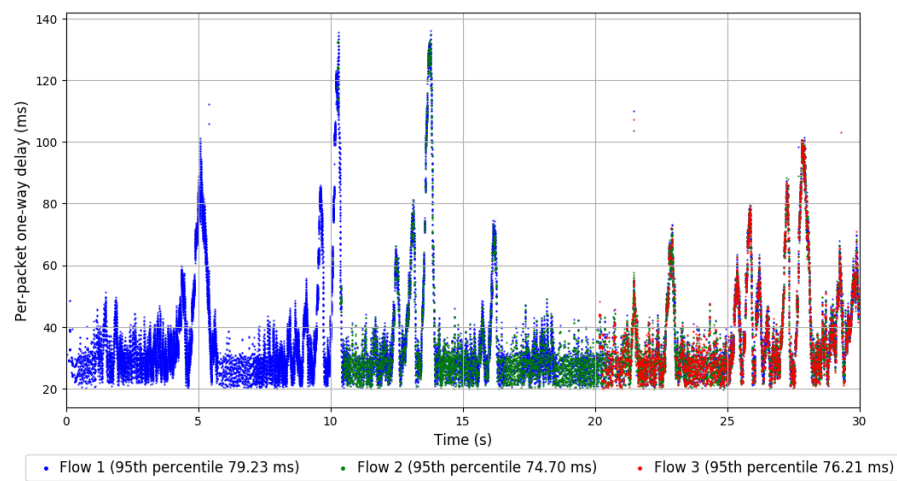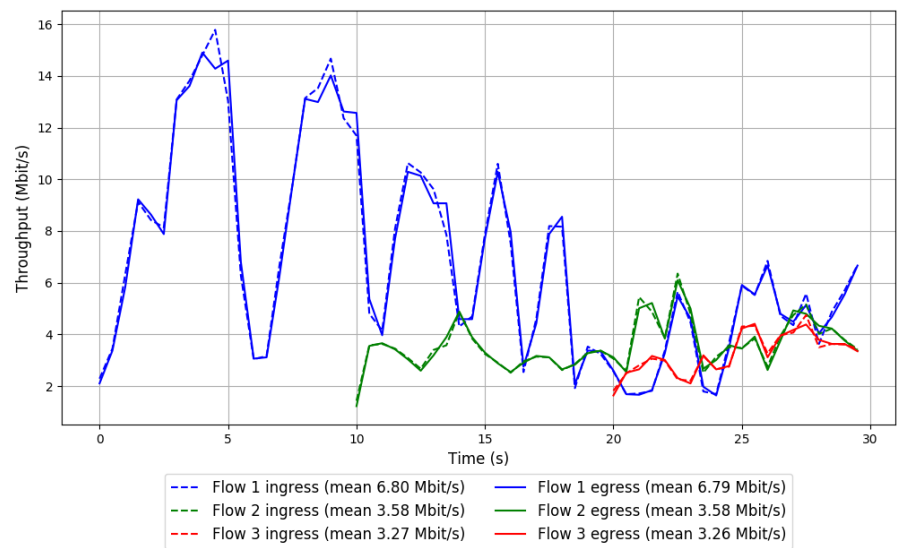```

Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-02-19 20:33:10
End at: 2018-02-19 20:33:40
Local clock offset: 1.485 ms
Remote clock offset: -21.327 ms


# Below is generated by plot.py at 2018-02-19 20:43:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.25 Mbit/s
95th percentile per-packet one-way delay: 77.857 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 6.79 Mbit/s
95th percentile per-packet one-way delay: 79.234 ms
Loss rate: 0.19%
-- Flow 2:
Average throughput: 3.58 Mbit/s
95th percentile per-packet one-way delay: 74.699 ms
Loss rate: 0.34%
-- Flow 3:
Average throughput: 3.26 Mbit/s
95th percentile per-packet one-way delay: 76.206 ms
Loss rate: 0.63%
```

Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 6.80 Mbit/s) Flow 1 egress (mean 6.79 Mbit/s)
Flow 2 ingress (mean 3.58 Mbit/s) Flow 2 egress (mean 3.58 Mbit/s)
Flow 3 ingress (mean 3.27 Mbit/s) Flow 3 egress (mean 3.26 Mbit/s)

Flow 1 (95th percentile 79.23 ms) Flow 2 (95th percentile 74.70 ms) Flow 3 (95th percentile 76.21 ms)
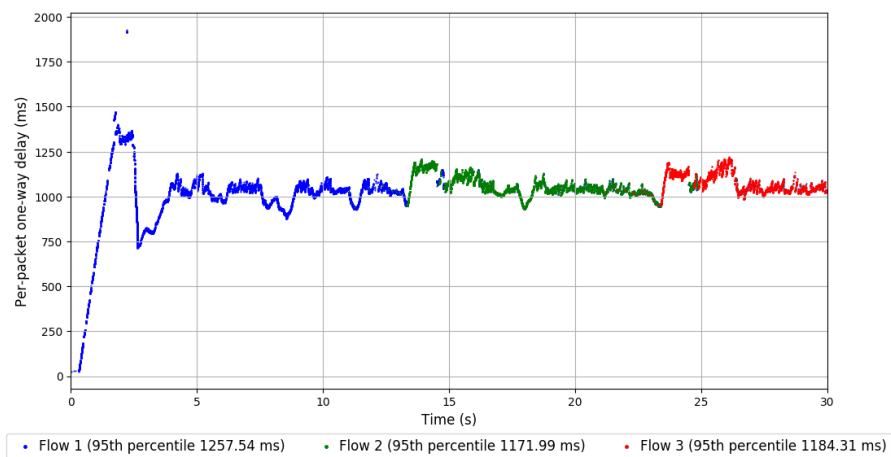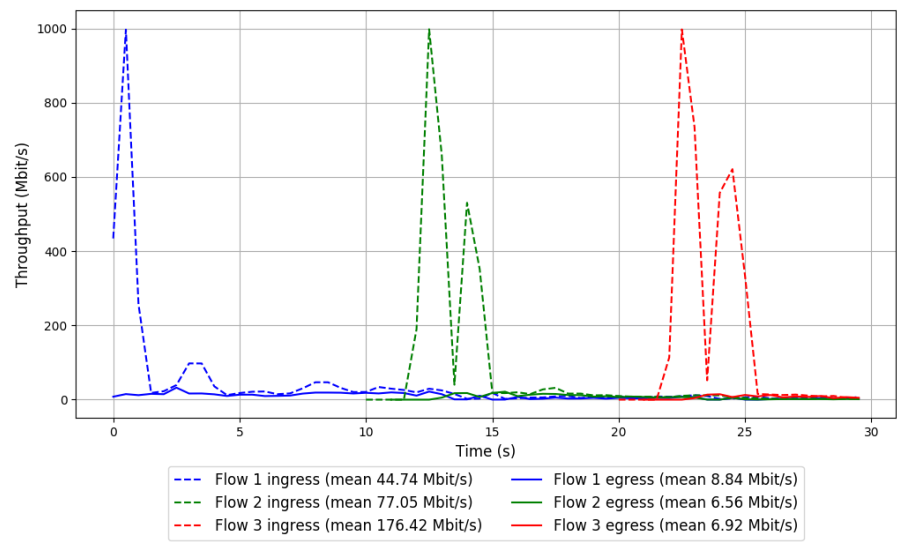
```
Run 1: Statistics of FillP

Start at: 2018-02-19 19:54:34
End at: 2018-02-19 19:55:04
Local clock offset: 0.121 ms
Remote clock offset: -15.862 ms

# Below is generated by plot.py at 2018-02-19 20:43:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 15.01 Mbit/s
95th percentile per-packet one-way delay: 1181.905 ms
Loss rate: 90.30%
-- Flow 1:
Average throughput: 8.84 Mbit/s
95th percentile per-packet one-way delay: 1257.542 ms
Loss rate: 80.27%
-- Flow 2:
Average throughput: 6.56 Mbit/s
95th percentile per-packet one-way delay: 1171.992 ms
Loss rate: 91.92%
-- Flow 3:
Average throughput: 6.92 Mbit/s
95th percentile per-packet one-way delay: 1184.312 ms
Loss rate: 96.54%
```

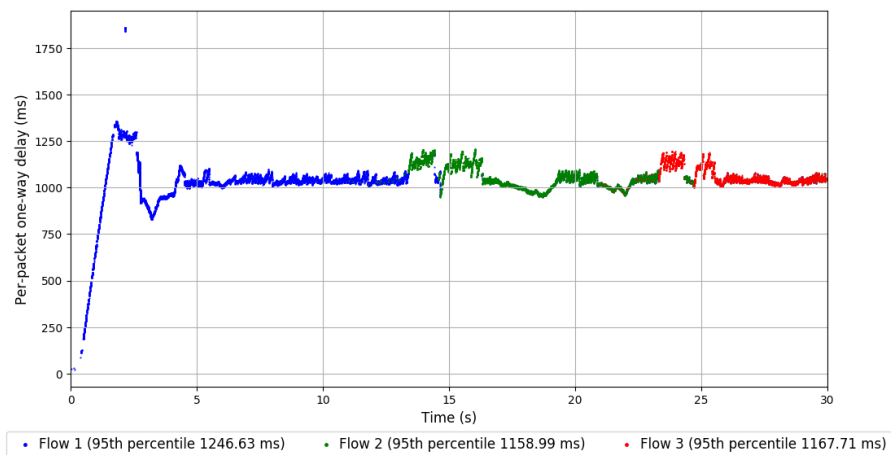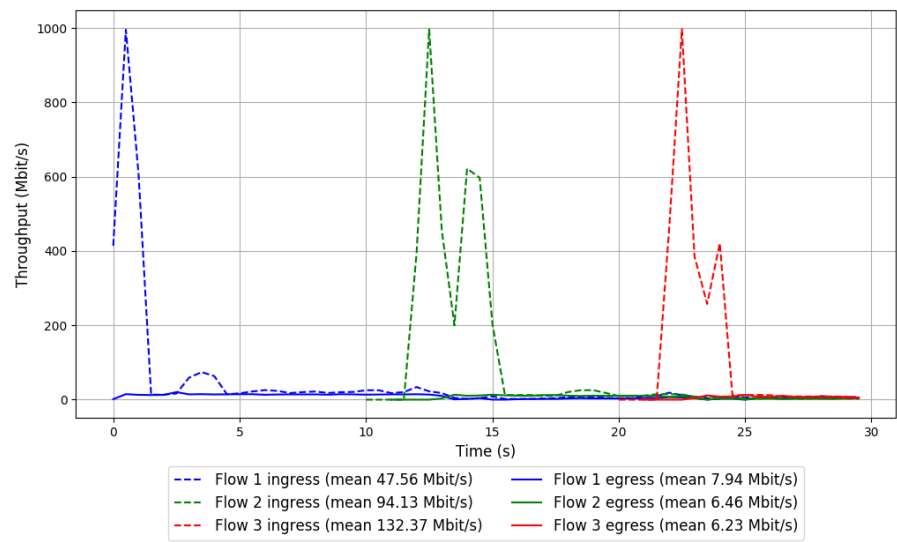Run 1: Report of FillP — Data Link

```
Run 2: Statistics of FillP

Start at: 2018-02-19 20:15:07
End at: 2018-02-19 20:15:37
Local clock offset: 1.702 ms
Remote clock offset: -20.162 ms


# Below is generated by plot.py at 2018-02-19 20:43:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.87 Mbit/s
95th percentile per-packet one-way delay: 1171.002 ms
Loss rate: 91.01%
-- Flow 1:
Average throughput: 7.94 Mbit/s
95th percentile per-packet one-way delay: 1246.634 ms
Loss rate: 83.32%
-- Flow 2:
Average throughput: 6.46 Mbit/s
95th percentile per-packet one-way delay: 1158.993 ms
Loss rate: 93.50%
-- Flow 3:
Average throughput: 6.23 Mbit/s
95th percentile per-packet one-way delay: 1167.710 ms
Loss rate: 95.78%
```
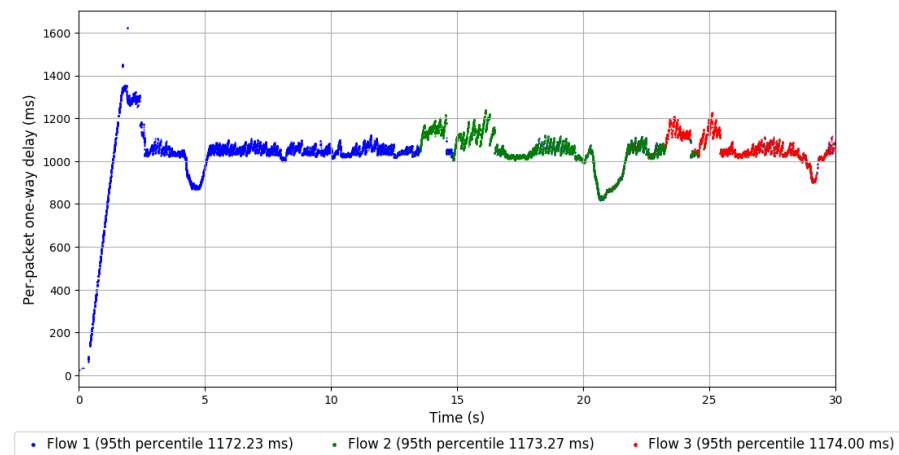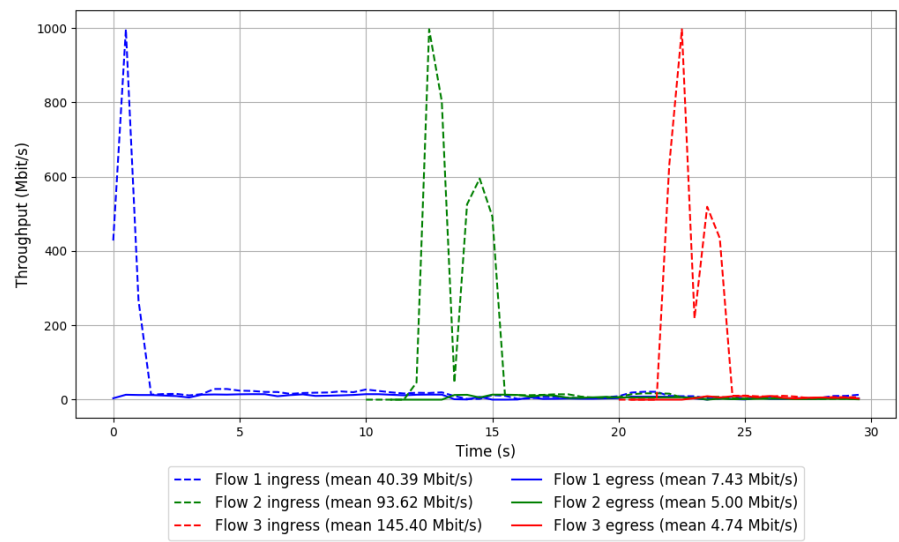
Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-02-19 20:35:29
End at: 2018-02-19 20:35:59
Local clock offset: 1.872 ms
Remote clock offset: -21.605 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.02 Mbit/s
95th percentile per-packet one-way delay: 1173.291 ms
Loss rate: 92.04%
-- Flow 1:
Average throughput: 7.43 Mbit/s
95th percentile per-packet one-way delay: 1172.229 ms
Loss rate: 81.63%
-- Flow 2:
Average throughput: 5.00 Mbit/s
95th percentile per-packet one-way delay: 1173.270 ms
Loss rate: 94.94%
-- Flow 3:
Average throughput: 4.74 Mbit/s
95th percentile per-packet one-way delay: 1173.999 ms
Loss rate: 97.01%
```

Run 3: Report of FillP — Data Link

Flow 1 ingress (mean 40.39 Mbit/s) — Flow 1 egress (mean 7.43 Mbit/s)
Flow 2 ingress (mean 93.62 Mbit/s) — Flow 2 egress (mean 5.00 Mbit/s)
Flow 3 ingress (mean 145.40 Mbit/s) — Flow 3 egress (mean 4.74 Mbit/s)

Flow 1 (95th percentile 1172.23 ms)   Flow 2 (95th percentile 1173.27 ms)   Flow 3 (95th percentile 1174.00 ms)
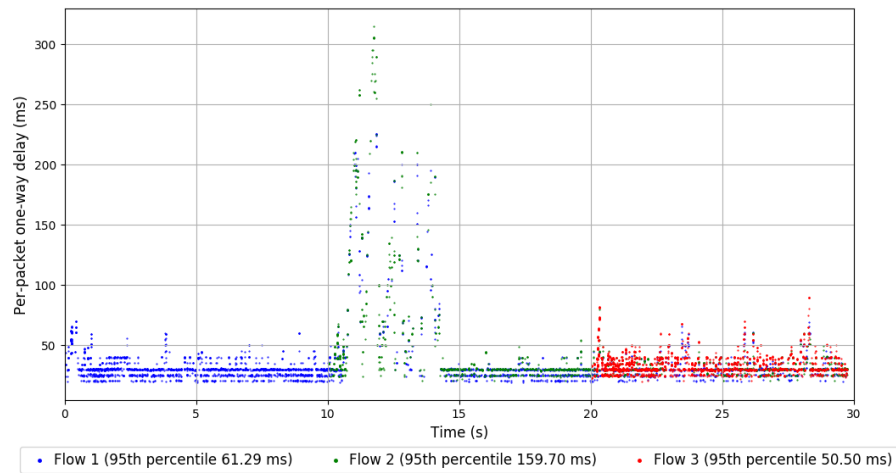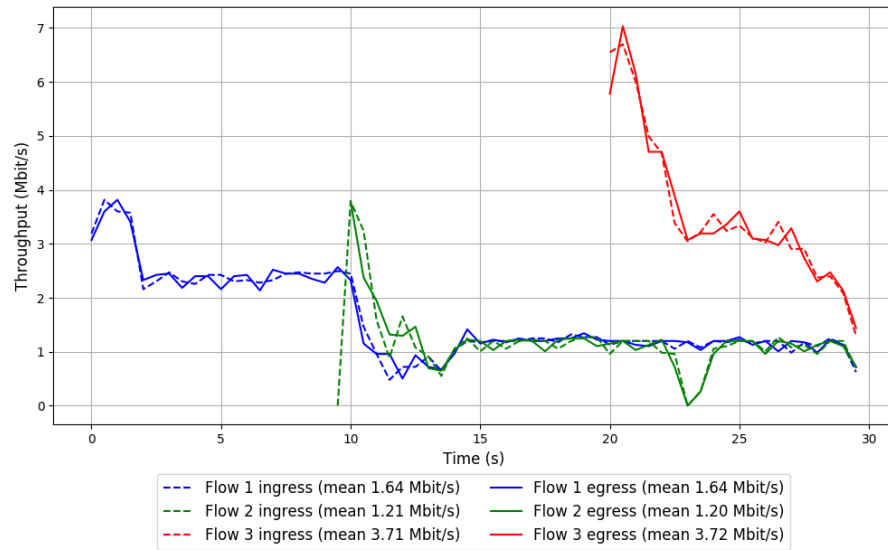
```
Run 1: Statistics of Indigo-1-32

Start at: 2018-02-19 19:47:51
End at: 2018-02-19 19:48:21
Local clock offset: -0.365 ms
Remote clock offset: -15.832 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.65 Mbit/s
95th percentile per-packet one-way delay: 69.305 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 1.64 Mbit/s
95th percentile per-packet one-way delay: 61.289 ms
Loss rate: 0.29%
-- Flow 2:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 159.704 ms
Loss rate: 0.71%
-- Flow 3:
Average throughput: 3.72 Mbit/s
95th percentile per-packet one-way delay: 50.499 ms
Loss rate: 0.03%
```
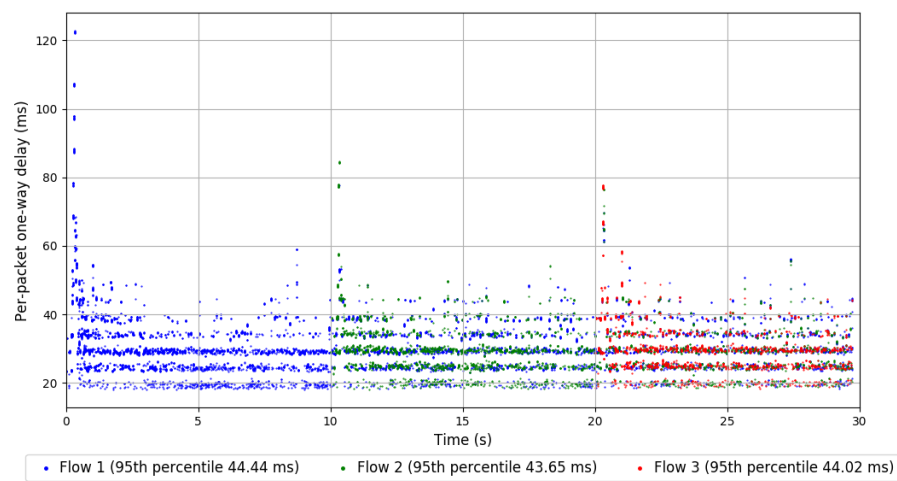
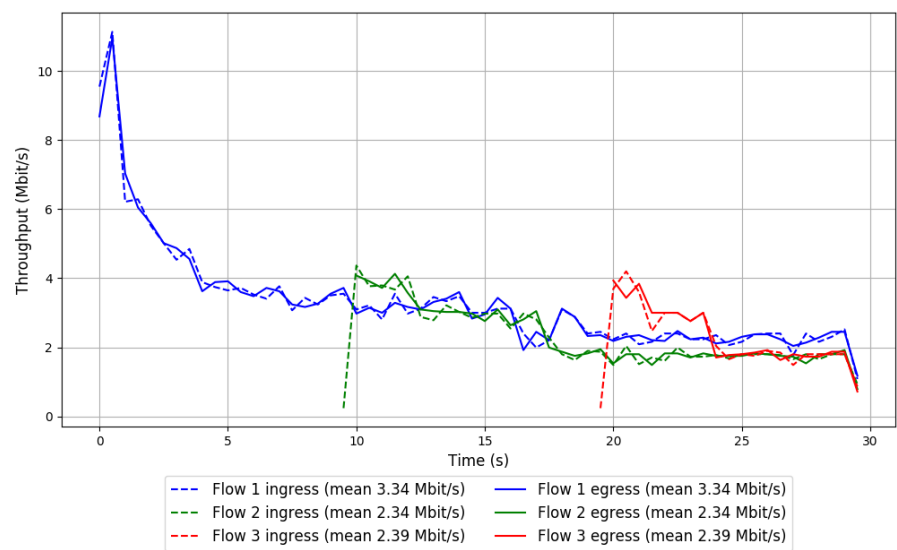Run 1: Report of Indigo-1-32 — Data Link

```
Run 2: Statistics of Indigo-1-32

Start at: 2018-02-19 20:08:07
End at: 2018-02-19 20:08:37
Local clock offset: 0.751 ms
Remote clock offset: -20.526 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.67 Mbit/s
95th percentile per-packet one-way delay: 44.202 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 3.34 Mbit/s
95th percentile per-packet one-way delay: 44.436 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 43.650 ms
Loss rate: 0.18%
-- Flow 3:
Average throughput: 2.39 Mbit/s
95th percentile per-packet one-way delay: 44.019 ms
Loss rate: 0.31%
```

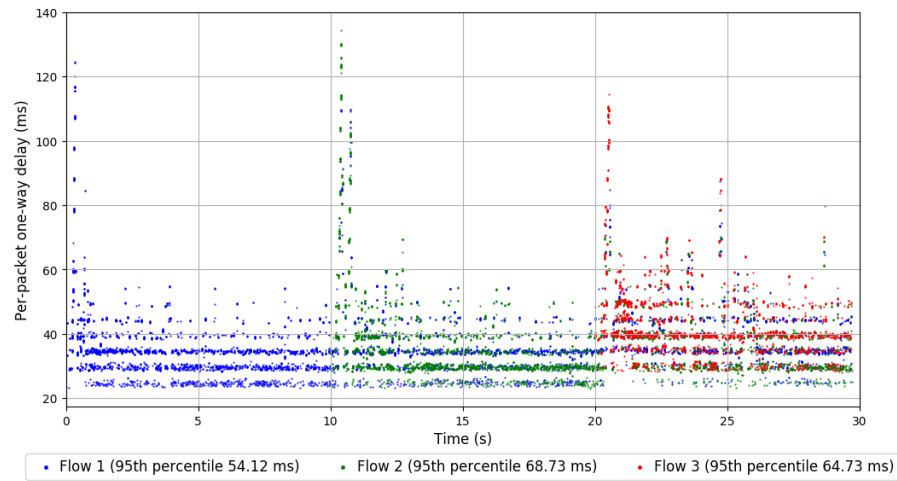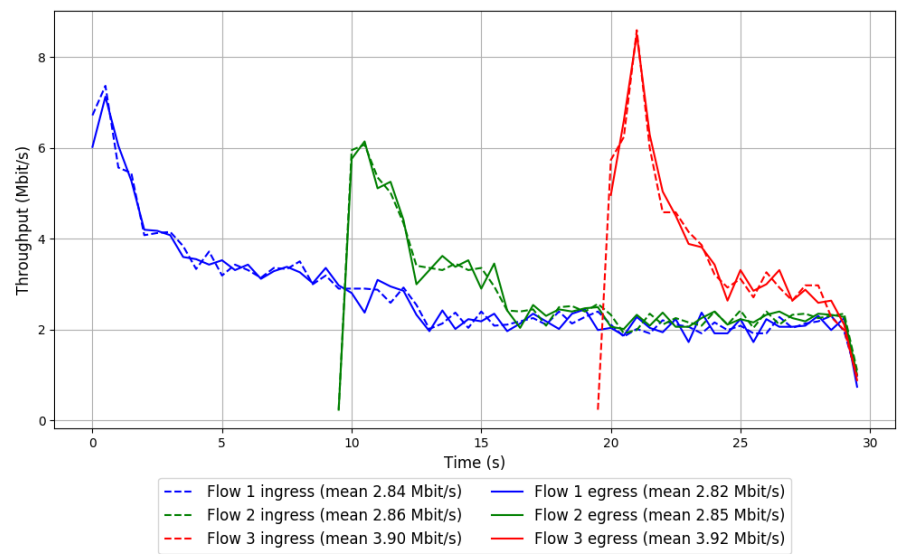Run 2: Report of Indigo-1-32 — Data Link

```
Run 3: Statistics of Indigo-1-32

Start at: 2018-02-19 20:28:39
End at: 2018-02-19 20:29:09
Local clock offset: -0.823 ms
Remote clock offset: -21.882 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.99 Mbit/s
95th percentile per-packet one-way delay: 59.767 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 2.82 Mbit/s
95th percentile per-packet one-way delay: 54.116 ms
Loss rate: 0.75%
-- Flow 2:
Average throughput: 2.85 Mbit/s
95th percentile per-packet one-way delay: 68.734 ms
Loss rate: 0.28%
-- Flow 3:
Average throughput: 3.92 Mbit/s
95th percentile per-packet one-way delay: 64.734 ms
Loss rate: 0.13%
```

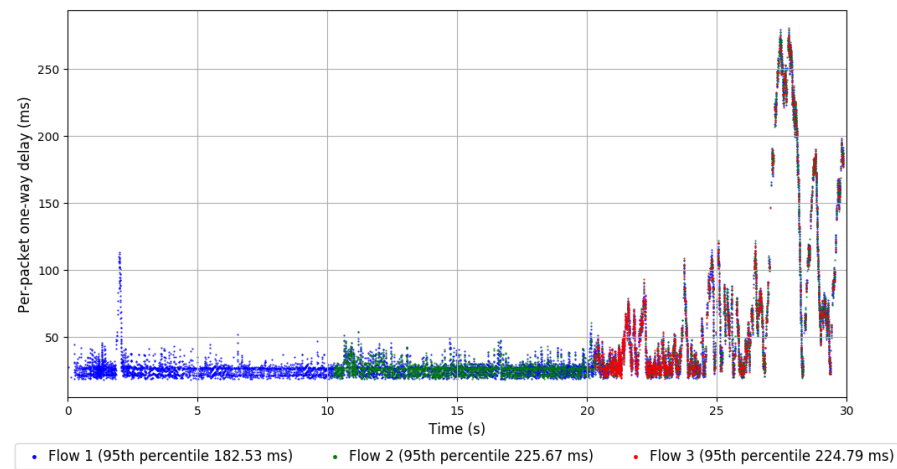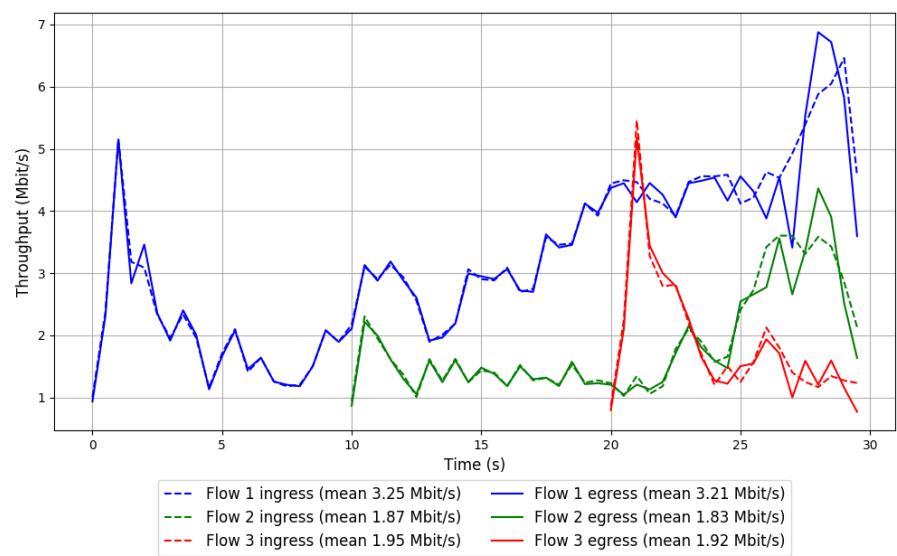Run 3: Report of Indigo-1-32 — Data Link

```
Run 1: Statistics of Vivace-latency

Start at: 2018-02-19 19:56:54
End at: 2018-02-19 19:57:24
Local clock offset: 1.054 ms
Remote clock offset: -16.298 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.06 Mbit/s
95th percentile per-packet one-way delay: 205.479 ms
Loss rate: 1.49%
-- Flow 1:
Average throughput: 3.21 Mbit/s
95th percentile per-packet one-way delay: 182.535 ms
Loss rate: 1.17%
-- Flow 2:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 225.670 ms
Loss rate: 2.15%
-- Flow 3:
Average throughput: 1.92 Mbit/s
95th percentile per-packet one-way delay: 224.791 ms
Loss rate: 1.87%
```

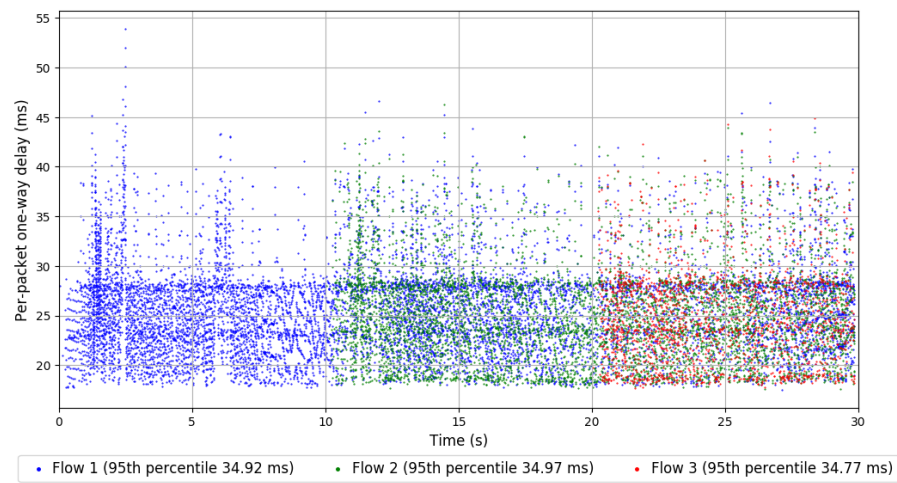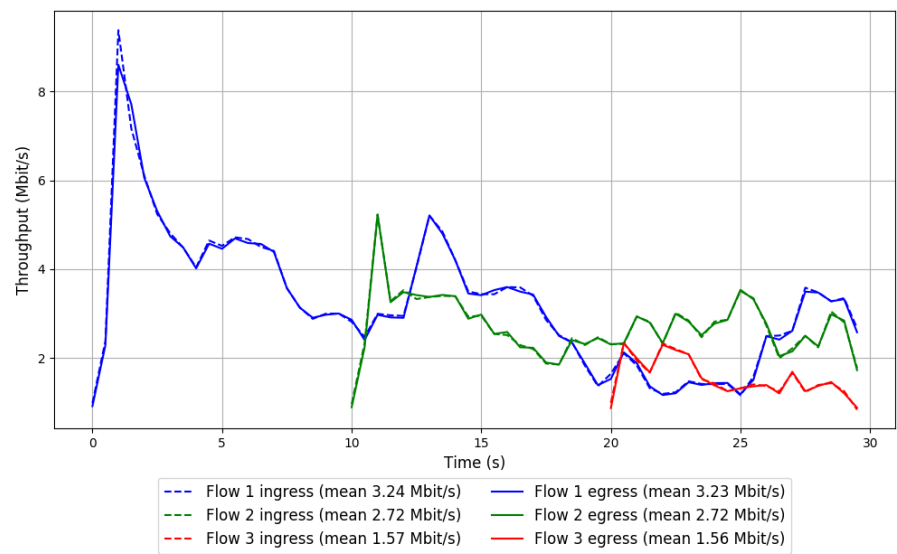Run 1: Report of Vivace-latency — Data Link

```
Run 2: Statistics of Vivace-latency

Start at: 2018-02-19 20:17:26
End at: 2018-02-19 20:17:56
Local clock offset: 1.369 ms
Remote clock offset: -21.43 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.55 Mbit/s
95th percentile per-packet one-way delay: 34.927 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 3.23 Mbit/s
95th percentile per-packet one-way delay: 34.925 ms
Loss rate: 0.59%
-- Flow 2:
Average throughput: 2.72 Mbit/s
95th percentile per-packet one-way delay: 34.969 ms
Loss rate: 0.15%
-- Flow 3:
Average throughput: 1.56 Mbit/s
95th percentile per-packet one-way delay: 34.774 ms
Loss rate: 0.53%
```

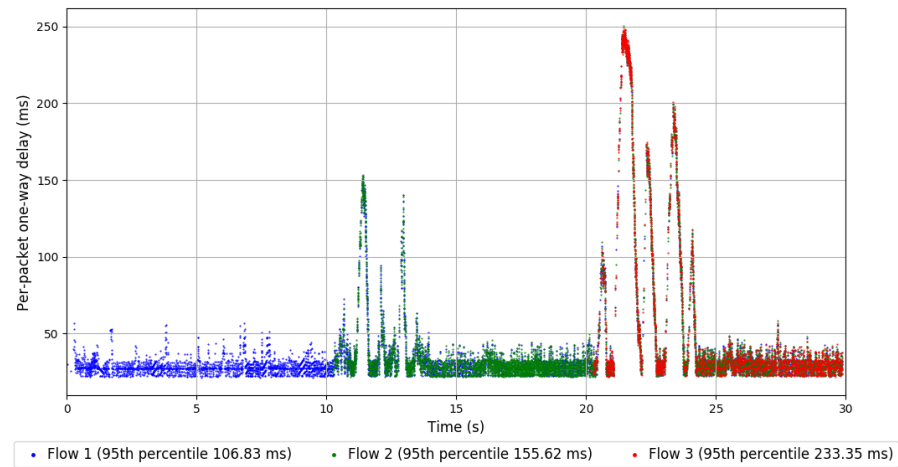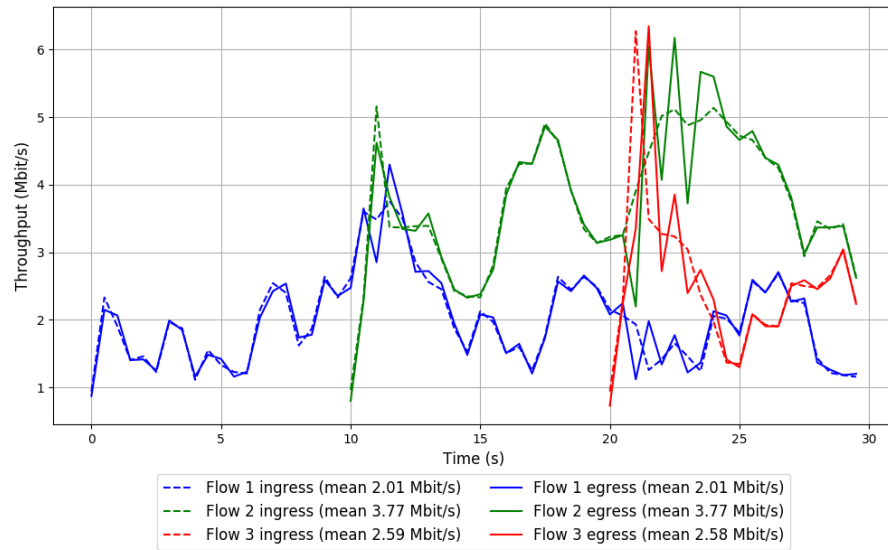Run 2: Report of Vivace-latency — Data Link

```
Run 3: Statistics of Vivace-latency

Start at: 2018-02-19 20:37:47
End at: 2018-02-19 20:38:17
Local clock offset: -0.484 ms
Remote clock offset: -22.234 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.36 Mbit/s
95th percentile per-packet one-way delay: 163.393 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 106.835 ms
Loss rate: 0.10%
-- Flow 2:
Average throughput: 3.77 Mbit/s
95th percentile per-packet one-way delay: 155.622 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 2.58 Mbit/s
95th percentile per-packet one-way delay: 233.355 ms
Loss rate: 0.51%
```

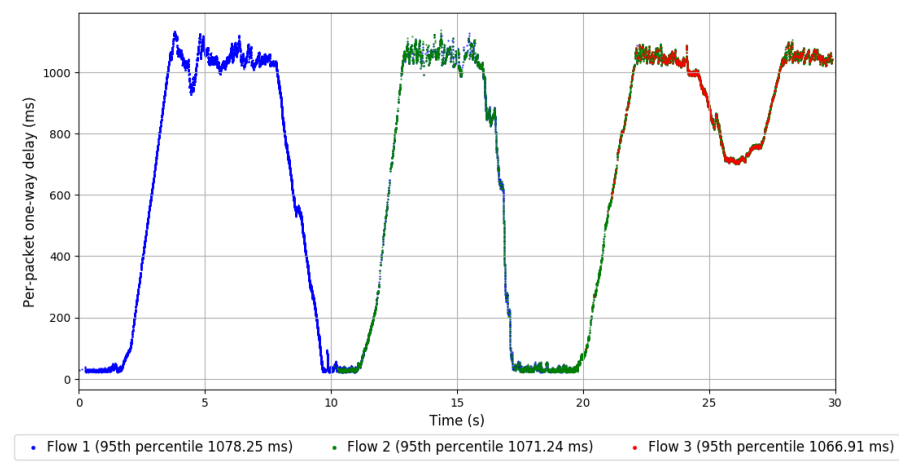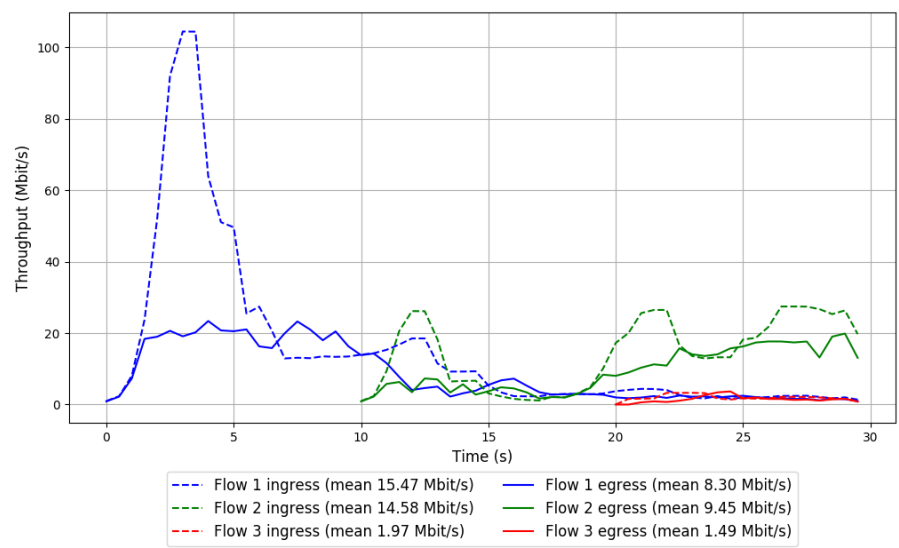# Run 3: Report of Vivace-latency — Data Link

```
Run 1: Statistics of Vivace-loss

Start at: 2018-02-19 19:53:26
End at: 2018-02-19 19:53:56
Local clock offset: -1.203 ms
Remote clock offset: -16.109 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 15.07 Mbit/s
95th percentile per-packet one-way delay: 1074.629 ms
Loss rate: 41.72%
-- Flow 1:
Average throughput: 8.30 Mbit/s
95th percentile per-packet one-way delay: 1078.251 ms
Loss rate: 46.43%
-- Flow 2:
Average throughput: 9.45 Mbit/s
95th percentile per-packet one-way delay: 1071.245 ms
Loss rate: 35.33%
-- Flow 3:
Average throughput: 1.49 Mbit/s
95th percentile per-packet one-way delay: 1066.914 ms
Loss rate: 25.14%
```

Run 1: Report of Vivace-loss — Data Link

Flow 1 ingress (mean 15.47 Mbit/s) Flow 1 egress (mean 8.30 Mbit/s)
Flow 2 ingress (mean 14.58 Mbit/s) Flow 2 egress (mean 9.45 Mbit/s)
Flow 3 ingress (mean 1.97 Mbit/s)   Flow 3 egress (mean 1.49 Mbit/s)

Flow 1 (95th percentile 1078.25 ms)   Flow 2 (95th percentile 1071.24 ms)   Flow 3 (95th percentile 1066.91 ms)
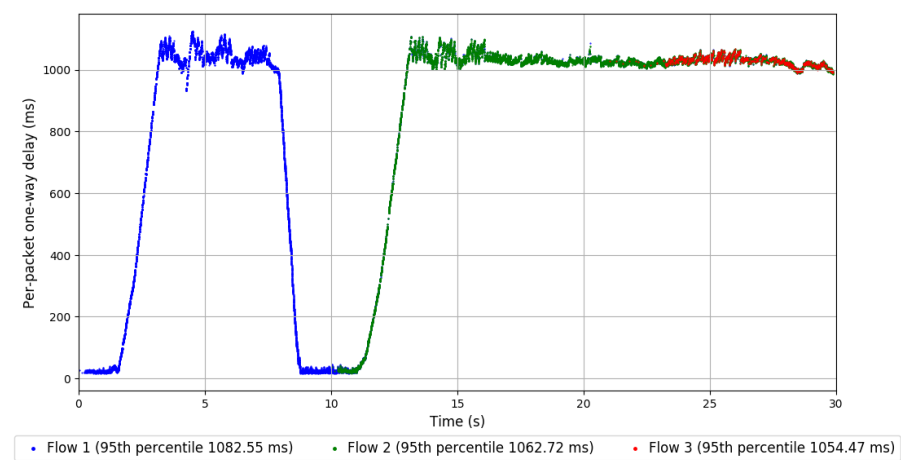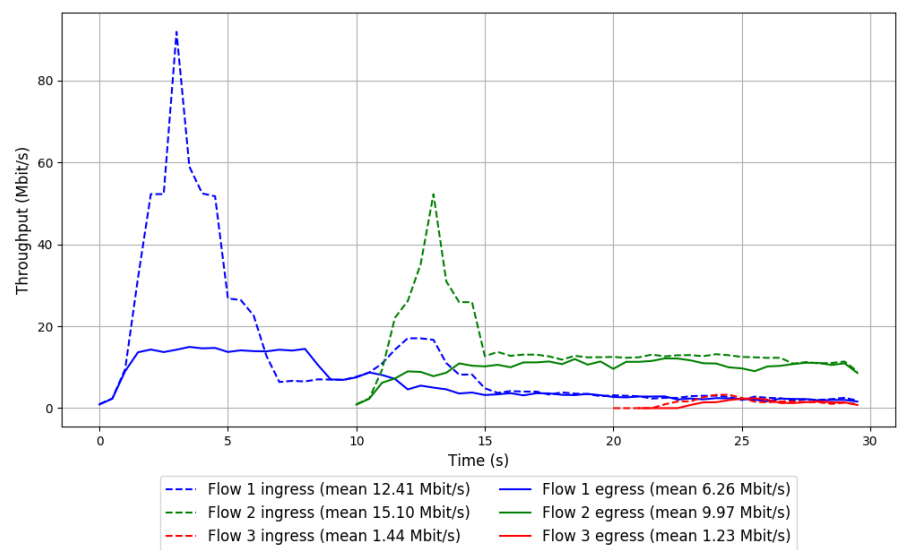
95

```
Run 2: Statistics of Vivace-loss

Start at: 2018-02-19 20:13:59
End at: 2018-02-19 20:14:29
Local clock offset: 2.451 ms
Remote clock offset: -20.682 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.24 Mbit/s
95th percentile per-packet one-way delay: 1073.914 ms
Loss rate: 42.32%
-- Flow 1:
Average throughput: 6.26 Mbit/s
95th percentile per-packet one-way delay: 1082.547 ms
Loss rate: 49.65%
-- Flow 2:
Average throughput: 9.97 Mbit/s
95th percentile per-packet one-way delay: 1062.716 ms
Loss rate: 34.13%
-- Flow 3:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 1054.471 ms
Loss rate: 23.94%
```

Run 2: Report of Vivace-loss — Data Link

```
Run 3: Statistics of Vivace-loss

Start at: 2018-02-19 20:34:20
End at: 2018-02-19 20:34:50
Local clock offset: 1.401 ms
Remote clock offset: -21.601 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.51 Mbit/s
95th percentile per-packet one-way delay: 1058.755 ms
Loss rate: 22.51%
-- Flow 1:
Average throughput: 11.78 Mbit/s
95th percentile per-packet one-way delay: 1059.420 ms
Loss rate: 22.36%
-- Flow 2:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 1056.264 ms
Loss rate: 23.09%
-- Flow 3:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 1052.658 ms
Loss rate: 25.05%
```
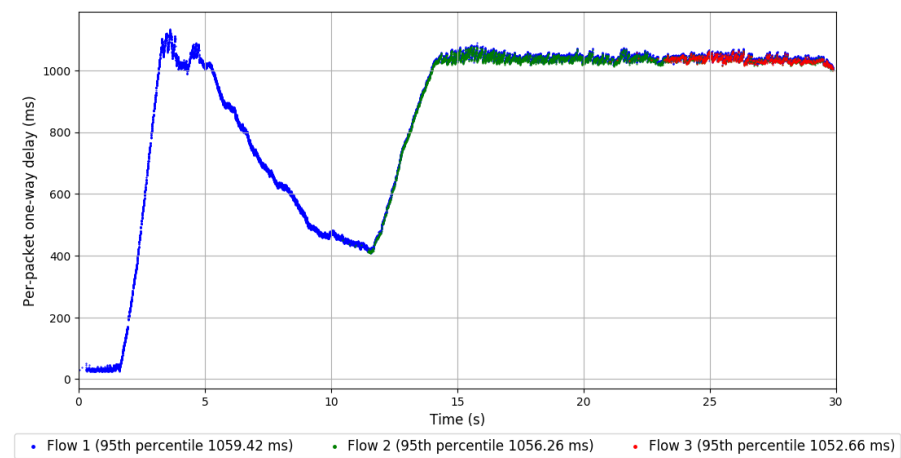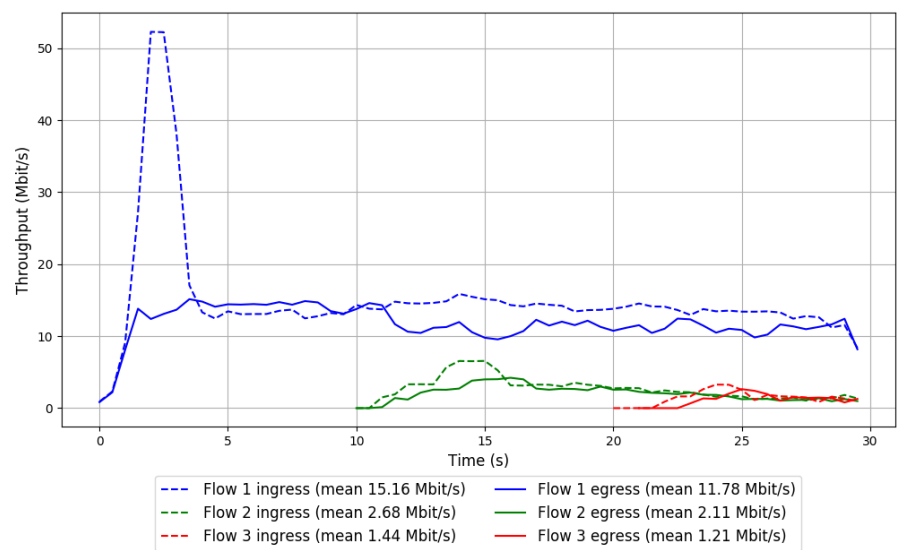
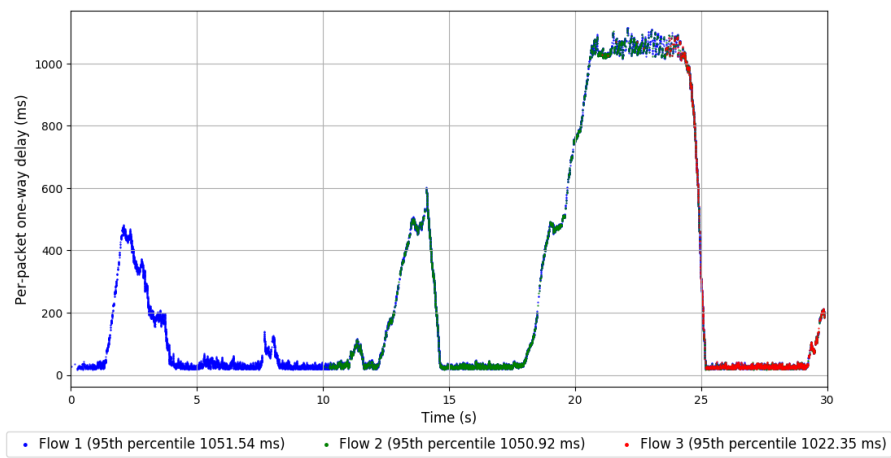Run 3: Report of Vivace-loss — Data Link

```
Run 1: Statistics of Vivace-LTE

Start at: 2018-02-19 19:55:45
End at: 2018-02-19 19:56:15
Local clock offset: 1.047 ms
Remote clock offset: -15.964 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.26 Mbit/s
95th percentile per-packet one-way delay: 1050.622 ms
Loss rate: 13.54%
-- Flow 1:
Average throughput: 7.27 Mbit/s
95th percentile per-packet one-way delay: 1051.537 ms
Loss rate: 13.26%
-- Flow 2:
Average throughput: 2.39 Mbit/s
95th percentile per-packet one-way delay: 1050.917 ms
Loss rate: 16.09%
-- Flow 3:
Average throughput: 1.35 Mbit/s
95th percentile per-packet one-way delay: 1022.350 ms
Loss rate: 7.78%
```
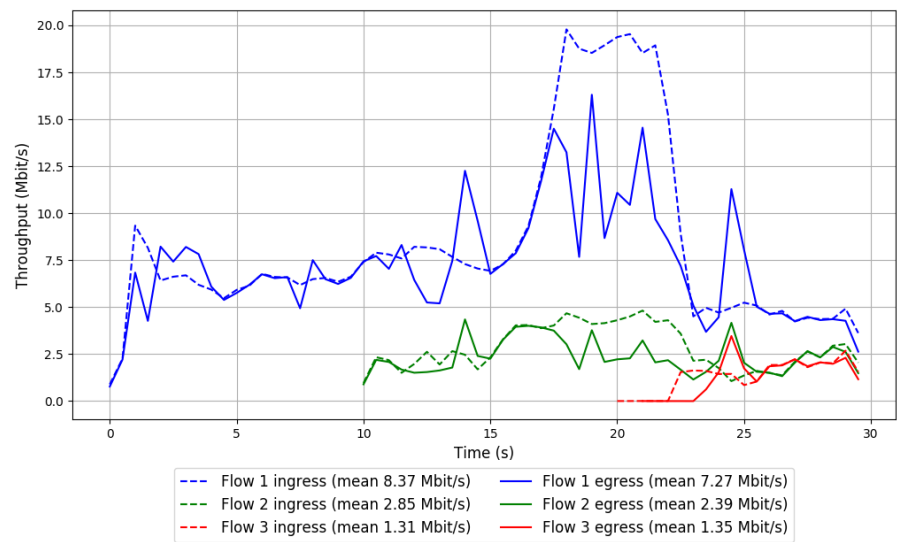
Run 1: Report of Vivace-LTE — Data Link

Flow 1 ingress (mean 8.37 Mbit/s) --- Flow 1 egress (mean 7.27 Mbit/s)
Flow 2 ingress (mean 2.85 Mbit/s) --- Flow 2 egress (mean 2.39 Mbit/s)
Flow 3 ingress (mean 1.31 Mbit/s) --- Flow 3 egress (mean 1.35 Mbit/s)

Flow 1 (95th percentile 1051.54 ms) --- Flow 2 (95th percentile 1050.92 ms) --- Flow 3 (95th percentile 1022.35 ms)
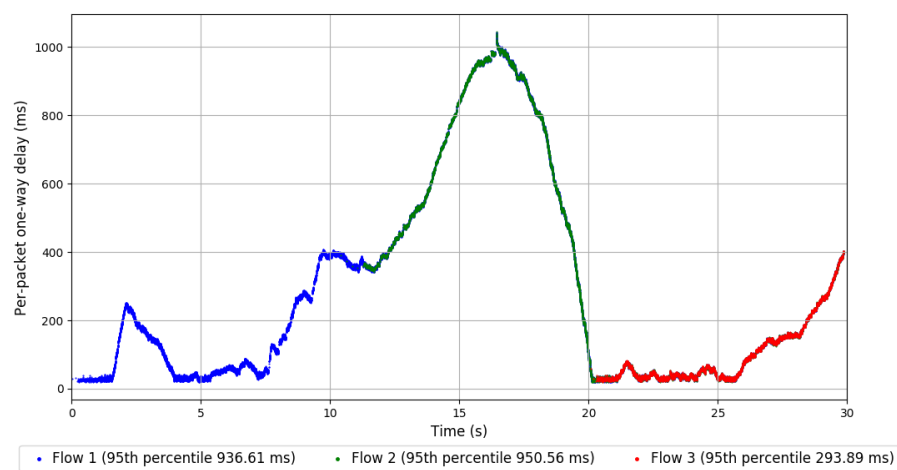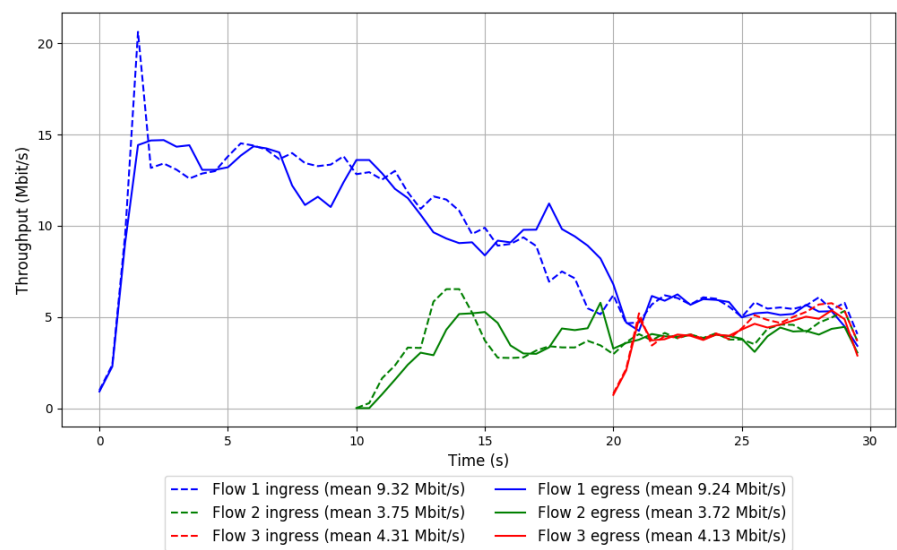
```
Run 2: Statistics of Vivace-LTE

Start at: 2018-02-19 20:16:17
End at: 2018-02-19 20:16:47
Local clock offset: 1.838 ms
Remote clock offset: -19.408 ms


# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.02 Mbit/s
95th percentile per-packet one-way delay: 932.127 ms
Loss rate: 1.74%
-- Flow 1:
Average throughput: 9.24 Mbit/s
95th percentile per-packet one-way delay: 936.613 ms
Loss rate: 0.95%
-- Flow 2:
Average throughput: 3.72 Mbit/s
95th percentile per-packet one-way delay: 950.564 ms
Loss rate: 2.91%
-- Flow 3:
Average throughput: 4.13 Mbit/s
95th percentile per-packet one-way delay: 293.893 ms
Loss rate: 4.85%
```

Run 2: Report of Vivace-LTE — Data Link

```
Run 3: Statistics of Vivace-LTE

Start at: 2018-02-19 20:36:39
End at: 2018-02-19 20:37:09
Local clock offset: 2.382 ms
Remote clock offset: -20.927 ms

# Below is generated by plot.py at 2018-02-19 20:43:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.88 Mbit/s
95th percentile per-packet one-way delay: 1034.720 ms
Loss rate: 9.59%
-- Flow 1:
Average throughput: 7.72 Mbit/s
95th percentile per-packet one-way delay: 1027.973 ms
Loss rate: 6.59%
-- Flow 2:
Average throughput: 3.36 Mbit/s
95th percentile per-packet one-way delay: 1051.029 ms
Loss rate: 17.16%
-- Flow 3:
Average throughput: 3.05 Mbit/s
95th percentile per-packet one-way delay: 1027.111 ms
Loss rate: 13.94%
```

Run 3: Report of Vivace-LTE — Data Link

- Flow 1 ingress (mean 8.25 Mbit/s)
- Flow 1 egress (mean 7.72 Mbit/s)
- Flow 2 ingress (mean 3.91 Mbit/s)
- Flow 2 egress (mean 3.36 Mbit/s)
- Flow 3 ingress (mean 3.52 Mbit/s)
- Flow 3 egress (mean 3.05 Mbit/s)

- Flow 1 (95th percentile 1027.97 ms)
- Flow 2 (95th percentile 1051.03 ms)
- Flow 3 (95th percentile 1027.11 ms)