Pantheon Report

Generated at 2018-02-27 10:33:51 (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.

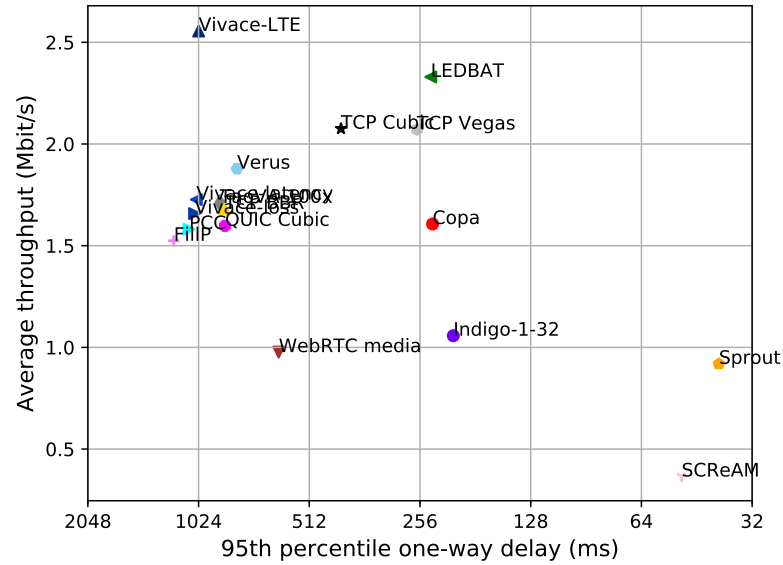Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

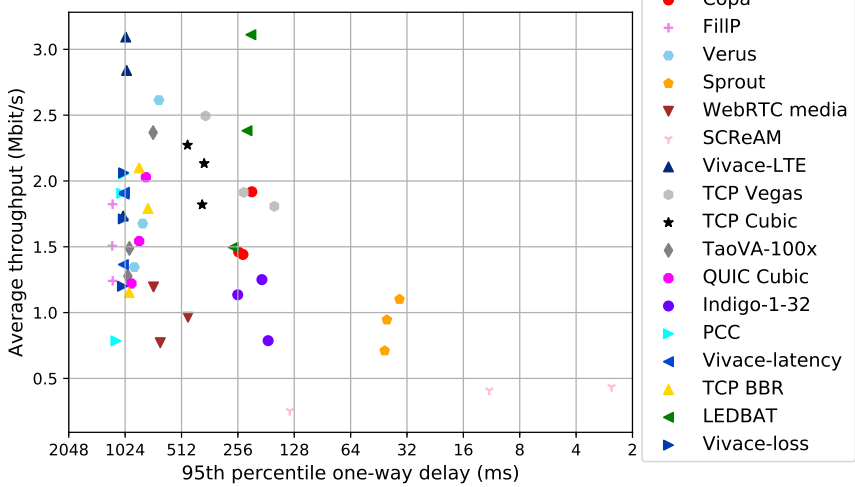NTP offsets were measured against `nets.org.sg` and have been applied to correct the timestamps in logs.

```
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
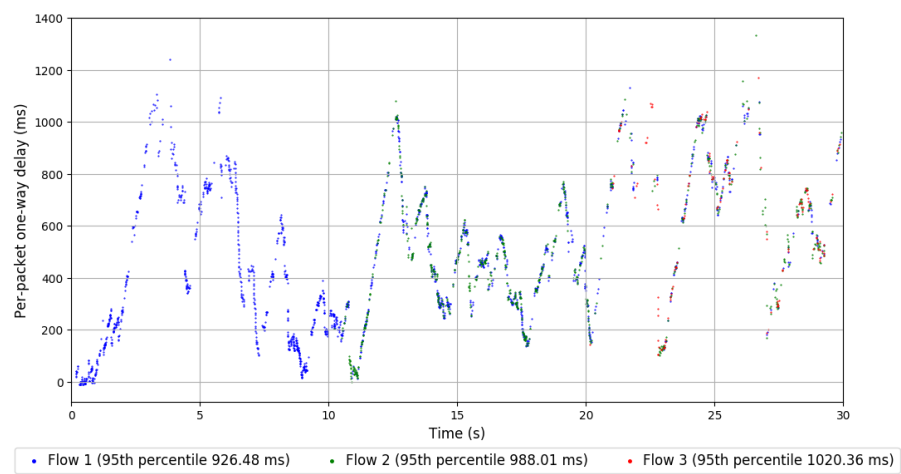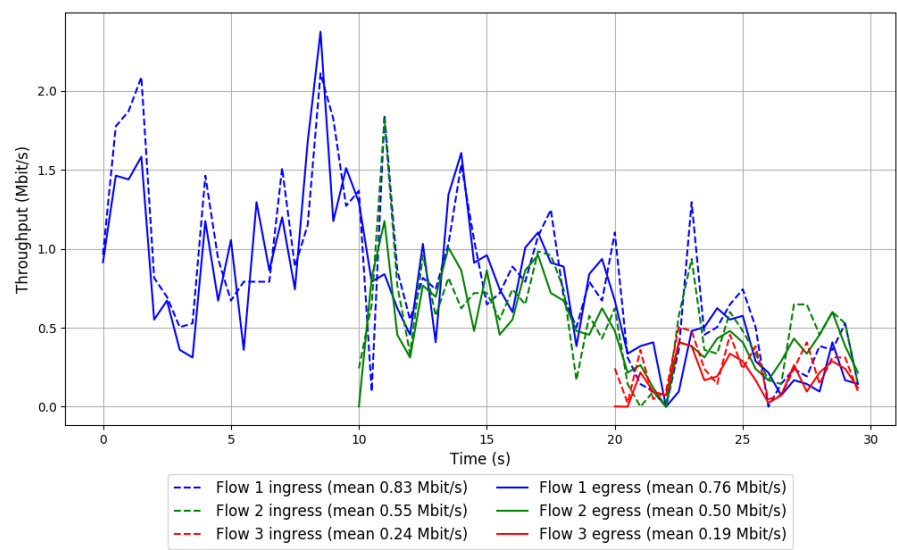3 flows with 10s interval between flows

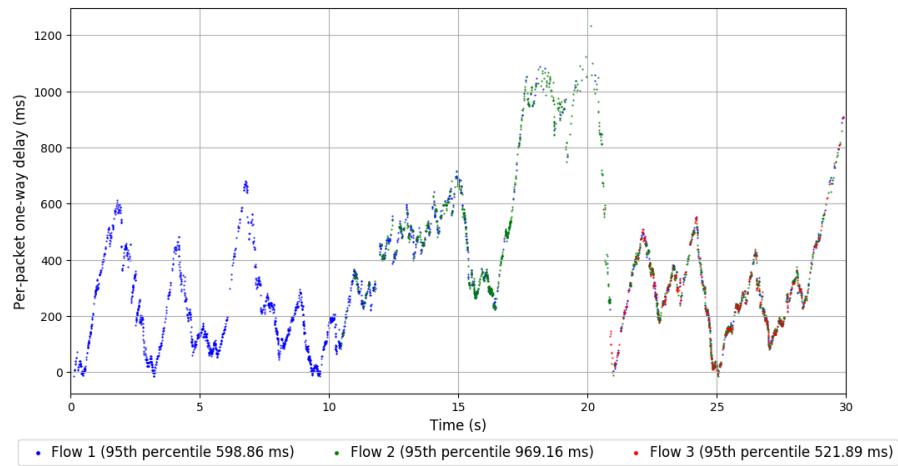| scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	1.00	0.84	0.42	790.35	954.44	668.08	4.83	9.68	11.42
TCP Cubic	3	1.16	1.03	0.78	400.86	419.60	447.42	1.05	1.61	3.58
LEDBAT	3	1.34	1.18	0.71	222.65	250.95	315.74	0.44	0.89	2.22
PCC	3	1.01	0.84	0.12	1065.33	1069.07	1106.71	61.54	71.50	82.05
QUIC Cubic	3	0.95	0.73	0.53	781.14	917.76	947.92	2.57	4.77	9.61
SCReAM	3	0.19	0.19	0.18	37.81	76.41	80.39	0.19	0.18	0.34
WebRTC media	3	0.42	0.40	0.16	606.32	601.74	586.86	1.23	0.97	1.47
Sprout	3	0.46	0.47	0.45	37.71	34.34	47.28	0.16	0.16	0.34
TaoVA-100x	3	1.08	0.75	0.43	815.55	926.45	973.74	6.29	17.19	34.89
TCP Vegas	3	1.07	0.85	1.36	275.73	177.01	319.46	0.53	0.61	1.06
Verus	3	1.49	0.49	0.24	803.48	780.43	857.99	3.14	4.64	4.27
Copa	3	0.99	0.55	0.77	217.51	298.04	233.45	0.35	0.29	1.09
FillP	3	0.99	0.60	0.59	1152.34	1199.91	1287.93	97.43	99.03	99.56
Indigo-1-32	3	0.59	0.38	0.65	231.36	214.38	323.91	0.29	0.54	1.00
Vivace-latency	3	1.04	0.82	0.49	1033.37	1042.76	1051.59	30.19	44.34	58.72
Vivace-loss	3	1.07	0.70	0.48	1045.90	1051.24	1058.38	42.45	52.50	66.21
Vivace-LTE	3	1.44	1.33	0.81	1012.10	1029.03	1044.50	17.95	28.13	46.67

```
Run 1: Statistics of TCP BBR

Start at: 2018-02-27 09:45:42
End at: 2018-02-27 09:46:12
Local clock offset: 0.093 ms
Remote clock offset: -69.248 ms


# Below is generated by plot.py at 2018-02-27 10:32:59
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 975.560 ms
Loss rate: 9.63%
-- Flow 1:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 926.478 ms
Loss rate: 8.33%
-- Flow 2:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 988.006 ms
Loss rate: 9.22%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 1020.362 ms
Loss rate: 24.74%
```
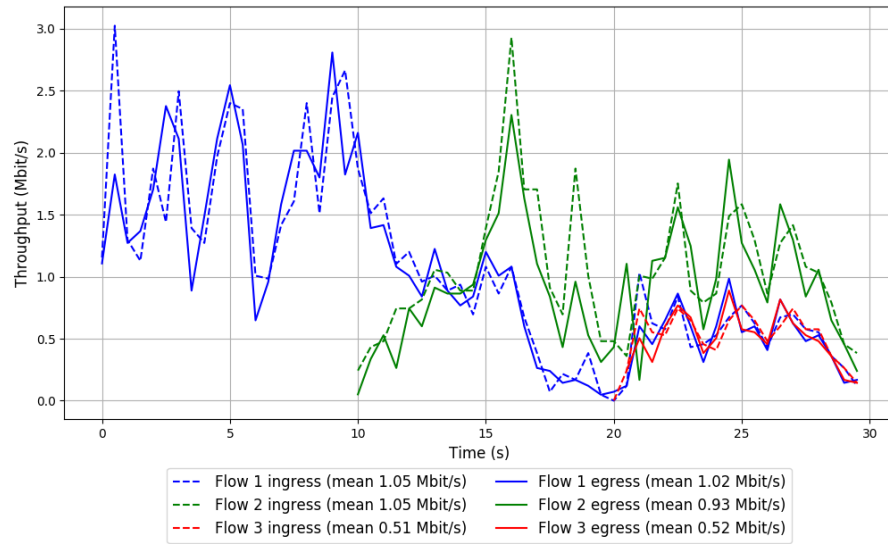
Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 0.83 Mbit/s)   Flow 1 egress (mean 0.76 Mbit/s)
Flow 2 ingress (mean 0.55 Mbit/s)   Flow 2 egress (mean 0.50 Mbit/s)
Flow 3 ingress (mean 0.24 Mbit/s)   Flow 3 egress (mean 0.19 Mbit/s)

Flow 1 (95th percentile 926.48 ms)   Flow 2 (95th percentile 988.01 ms)   Flow 3 (95th percentile 1020.36 ms)
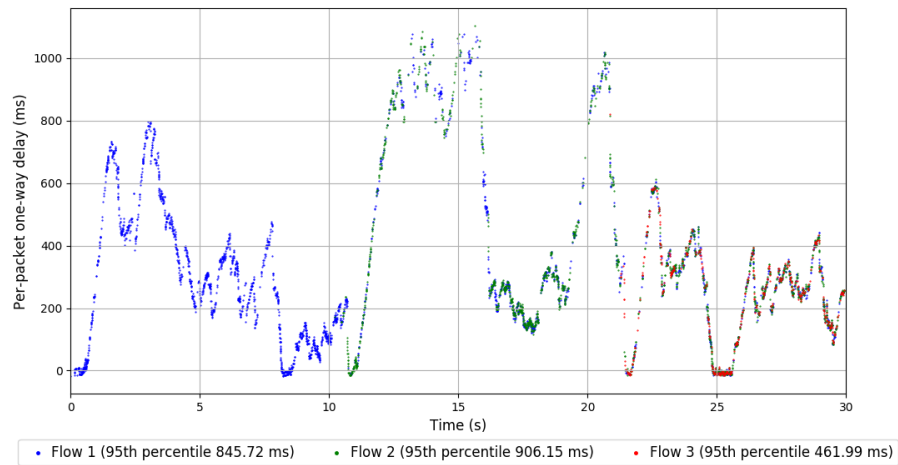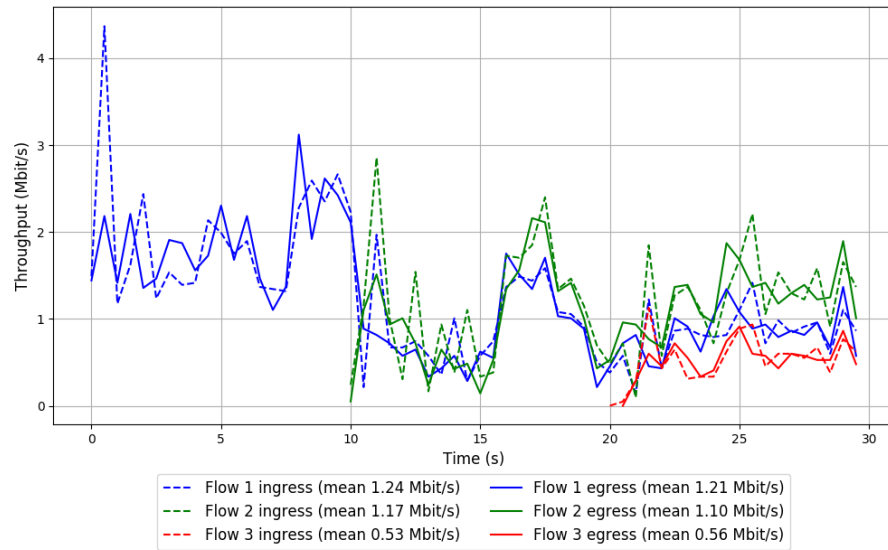
5

```
Run 2: Statistics of TCP BBR

Start at: 2018-02-27 10:05:46
End at: 2018-02-27 10:06:16
Local clock offset: -1.383 ms
Remote clock offset: -68.466 ms


# Below is generated by plot.py at 2018-02-27 10:33:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 773.632 ms
Loss rate: 6.81%
-- Flow 1:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 598.858 ms
Loss rate: 3.20%
-- Flow 2:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 969.156 ms
Loss rate: 12.57%
-- Flow 3:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 521.890 ms
Loss rate: 5.45%
```
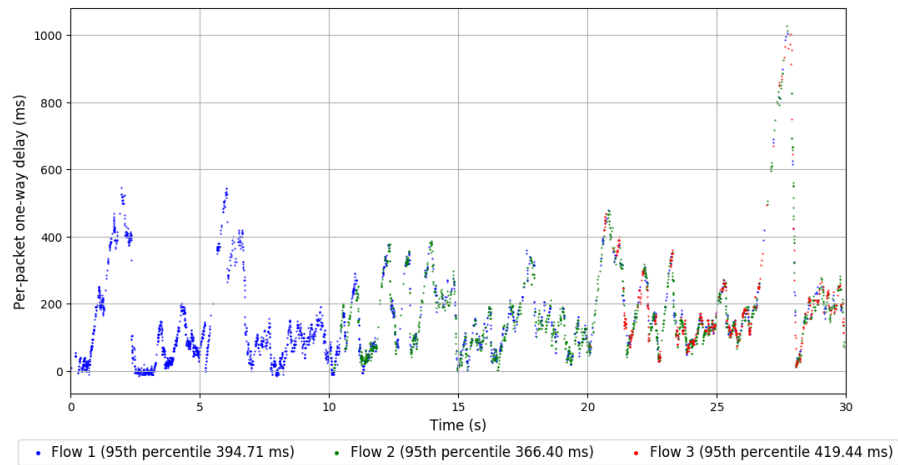
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2018-02-27 10:25:48
End at: 2018-02-27 10:26:18
Local clock offset: -0.096 ms
Remote clock offset: -60.813 ms


# Below is generated by plot.py at 2018-02-27 10:33:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.10 Mbit/s
95th percentile per-packet one-way delay: 861.857 ms
Loss rate: 4.57%
-- Flow 1:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 845.724 ms
Loss rate: 2.96%
-- Flow 2:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 906.151 ms
Loss rate: 7.24%
-- Flow 3:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 461.987 ms
Loss rate: 4.06%
```

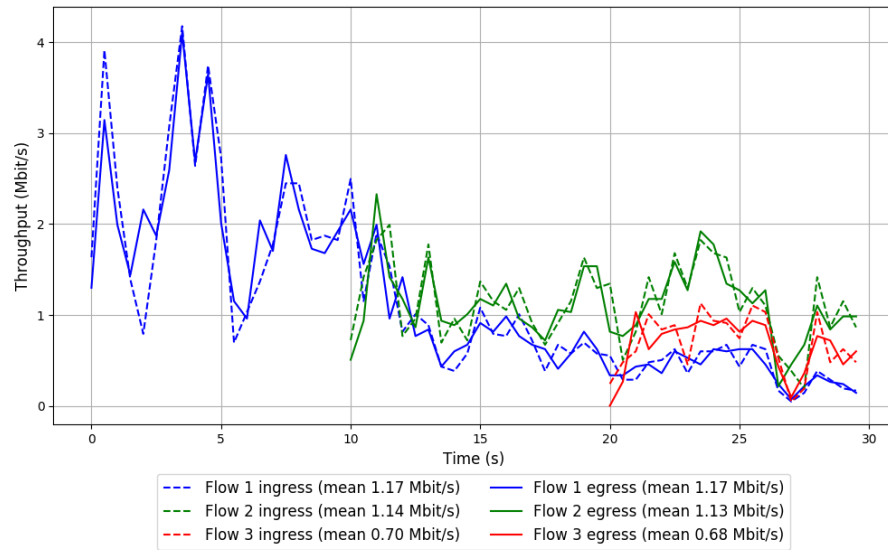Run 3: Report of TCP BBR — Data Link

```
Run 1: Statistics of TCP Cubic

Start at: 2018-02-27 09:40:07
End at: 2018-02-27 09:40:37
Local clock offset: -1.309 ms
Remote clock offset: -68.879 ms


# Below is generated by plot.py at 2018-02-27 10:33:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.13 Mbit/s
95th percentile per-packet one-way delay: 387.339 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 394.710 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 366.401 ms
Loss rate: 1.48%
-- Flow 3:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 419.442 ms
Loss rate: 3.49%
```

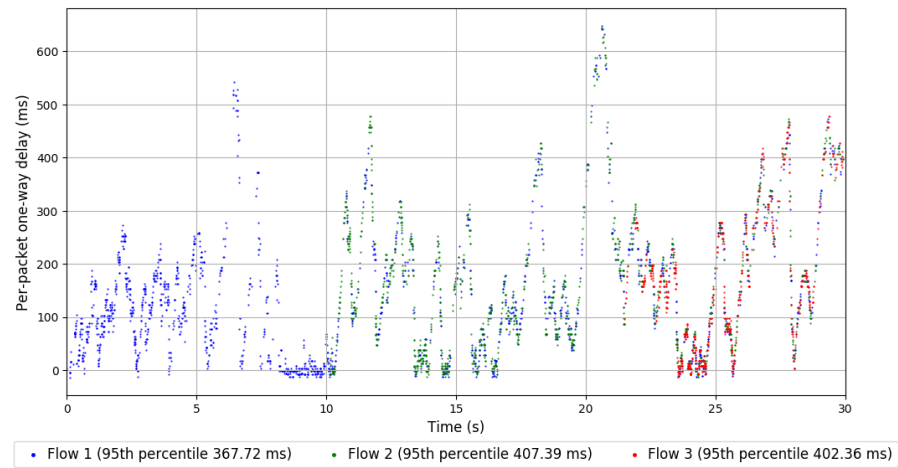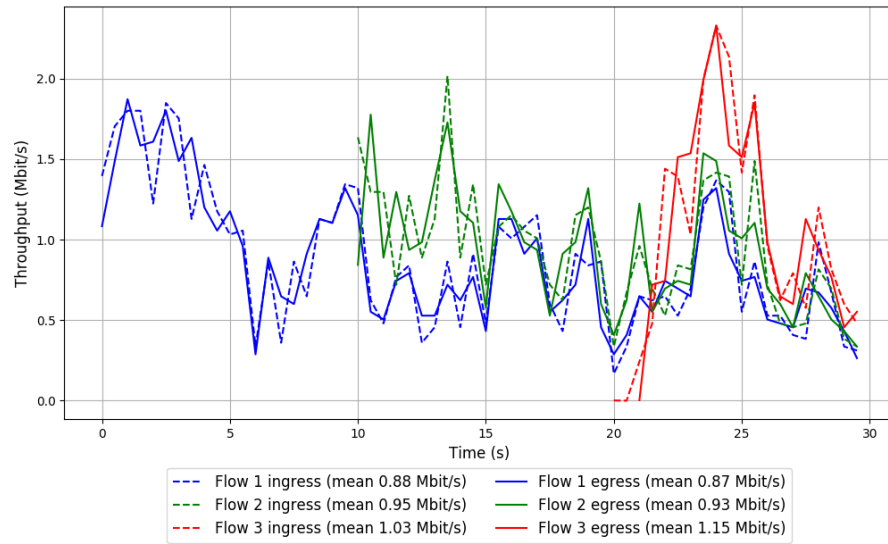Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-02-27 10:00:13
End at: 2018-02-27 10:00:43
Local clock offset: -1.91 ms
Remote clock offset: -68.556 ms


# Below is generated by plot.py at 2018-02-27 10:33:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 397.010 ms
Loss rate: 1.69%
-- Flow 1:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 367.724 ms
Loss rate: 1.41%
-- Flow 2:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 407.390 ms
Loss rate: 1.53%
-- Flow 3:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 402.364 ms
Loss rate: 2.71%
```

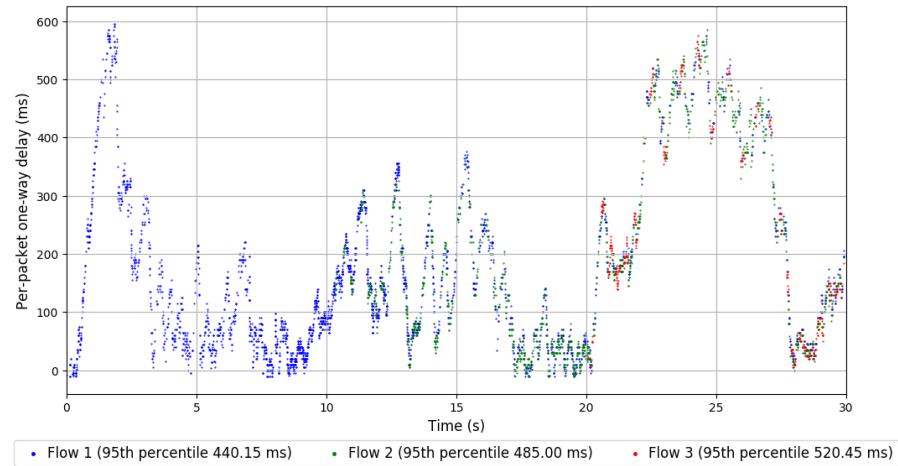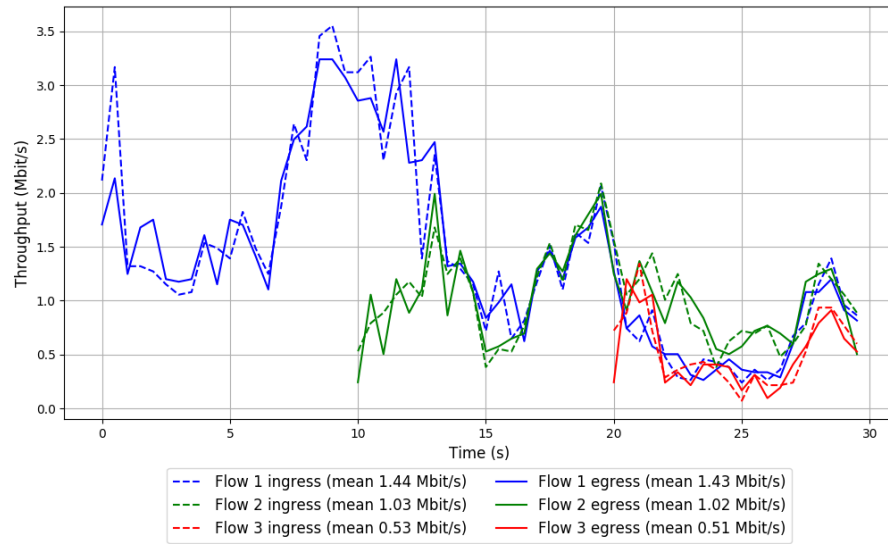Run 2: Report of TCP Cubic — Data Link

```
Run 3: Statistics of TCP Cubic

Start at: 2018-02-27 10:20:14
End at: 2018-02-27 10:20:44
Local clock offset: -2.557 ms
Remote clock offset: -59.605 ms


# Below is generated by plot.py at 2018-02-27 10:33:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 475.235 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 440.153 ms
Loss rate: 0.94%
-- Flow 2:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 485.000 ms
Loss rate: 1.81%
-- Flow 3:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 520.453 ms
Loss rate: 4.53%
```

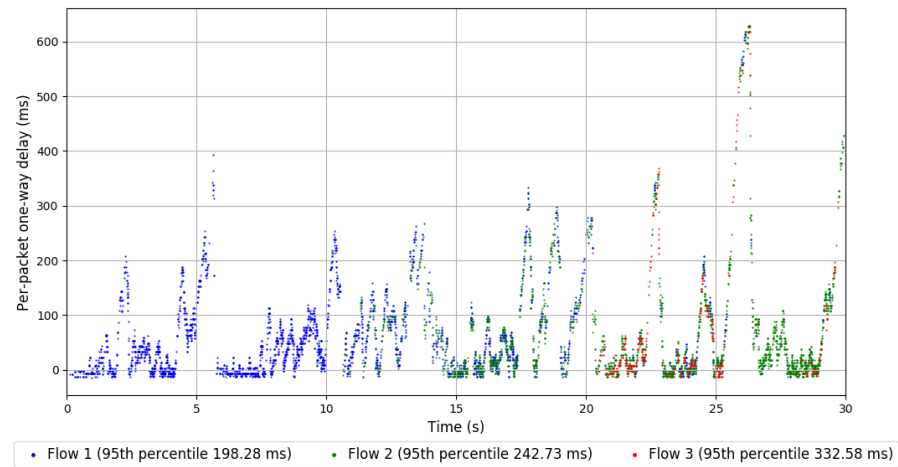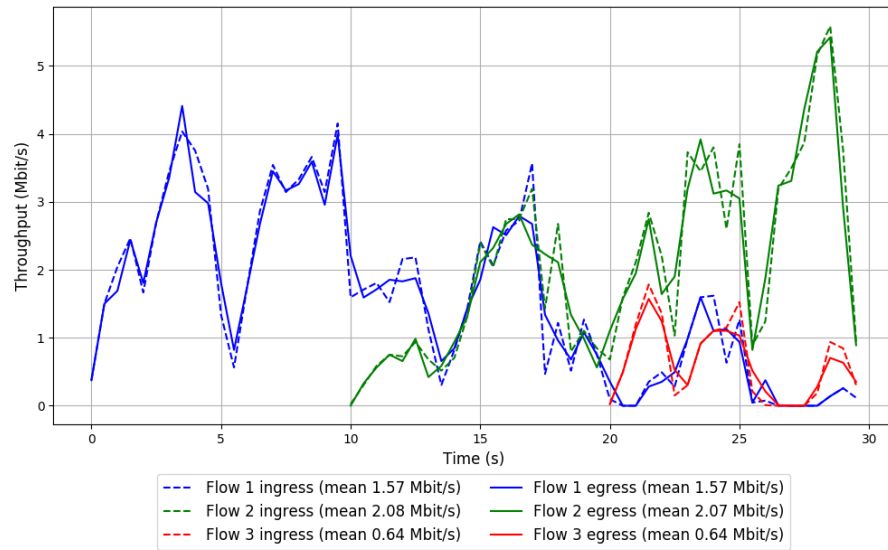# Run 3: Report of TCP Cubic — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2018-02-27 09:36:48
End at: 2018-02-27 09:37:18
Local clock offset: 0.454 ms
Remote clock offset: -68.821 ms

# Below is generated by plot.py at 2018-02-27 10:33:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.11 Mbit/s
95th percentile per-packet one-way delay: 218.187 ms
Loss rate: 0.92%
-- Flow 1:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 198.279 ms
Loss rate: 0.33%
-- Flow 2:
Average throughput: 2.07 Mbit/s
95th percentile per-packet one-way delay: 242.734 ms
Loss rate: 1.31%
-- Flow 3:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 332.583 ms
Loss rate: 2.82%
```

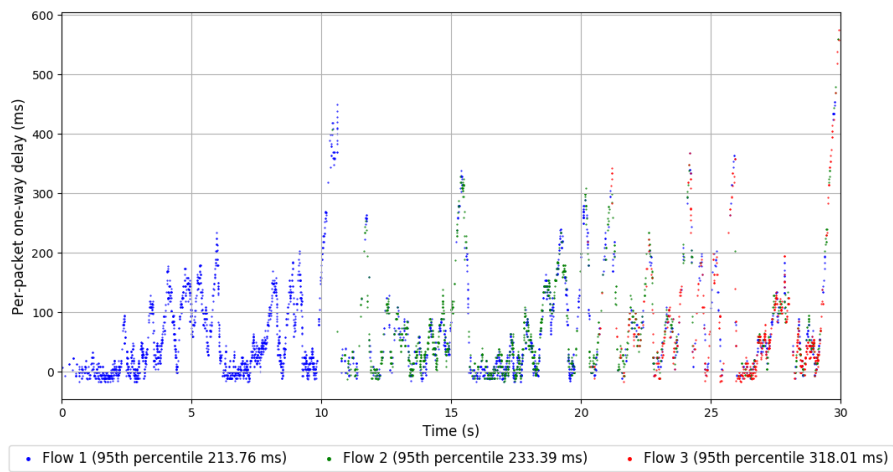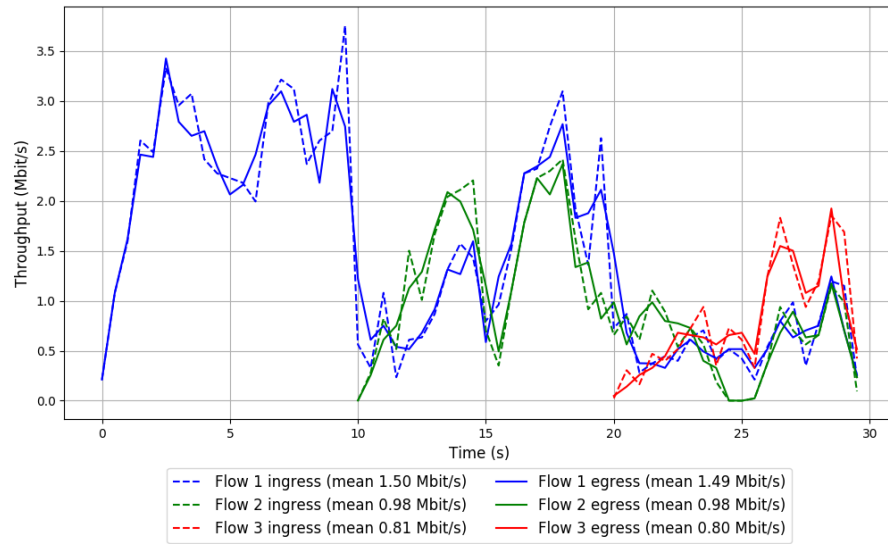Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-02-27 09:56:52
End at: 2018-02-27 09:57:22
Local clock offset: 1.173 ms
Remote clock offset: -68.568 ms


# Below is generated by plot.py at 2018-02-27 10:33:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 228.817 ms
Loss rate: 0.95%
-- Flow 1:
Average throughput: 1.49 Mbit/s
95th percentile per-packet one-way delay: 213.757 ms
Loss rate: 0.66%
-- Flow 2:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 233.392 ms
Loss rate: 0.55%
-- Flow 3:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 318.008 ms
Loss rate: 3.50%
```
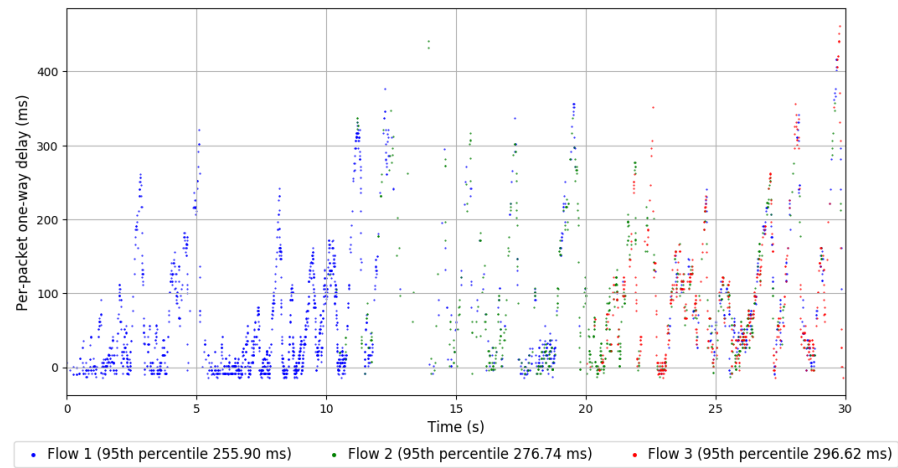
Run 2: Report of LEDBAT — Data Link

- - - - Flow 1 ingress (mean 1.50 Mbit/s) ──── Flow 1 egress (mean 1.49 Mbit/s)
- - - - Flow 2 ingress (mean 0.98 Mbit/s) ──── Flow 2 egress (mean 0.98 Mbit/s)
- - - - Flow 3 ingress (mean 0.81 Mbit/s) ──── Flow 3 egress (mean 0.80 Mbit/s)

• Flow 1 (95th percentile 213.76 ms)   • Flow 2 (95th percentile 233.39 ms)   • Flow 3 (95th percentile 318.01 ms)
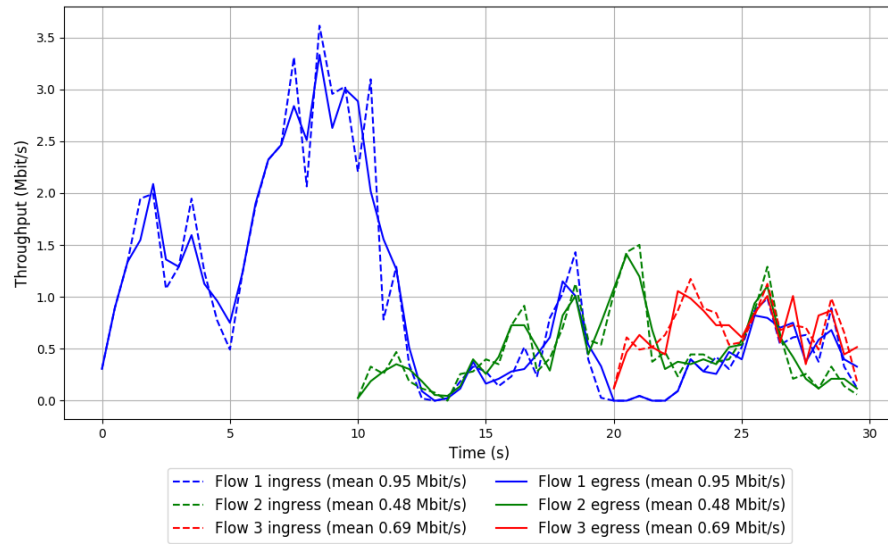
19

```
Run 3: Statistics of LEDBAT

Start at: 2018-02-27 10:16:54
End at: 2018-02-27 10:17:24
Local clock offset: 0.665 ms
Remote clock offset: -60.295 ms

# Below is generated by plot.py at 2018-02-27 10:33:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 271.175 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 255.902 ms
Loss rate: 0.34%
-- Flow 2:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 276.735 ms
Loss rate: 0.80%
-- Flow 3:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 296.620 ms
Loss rate: 0.34%
```
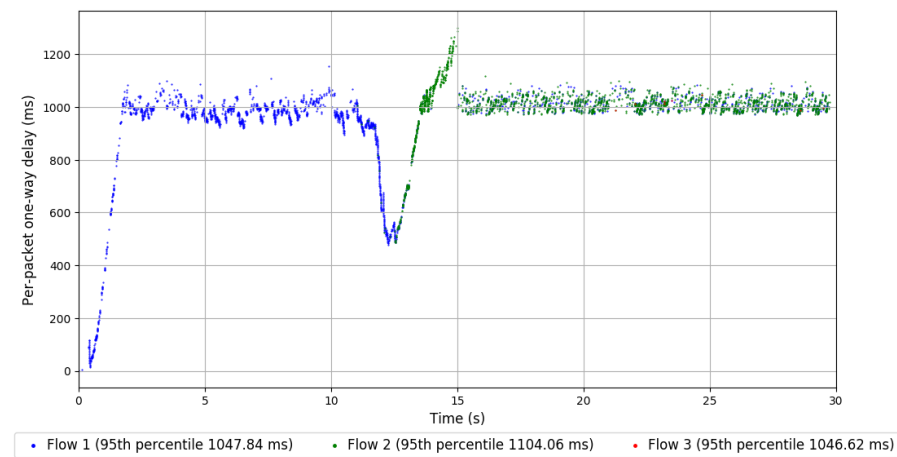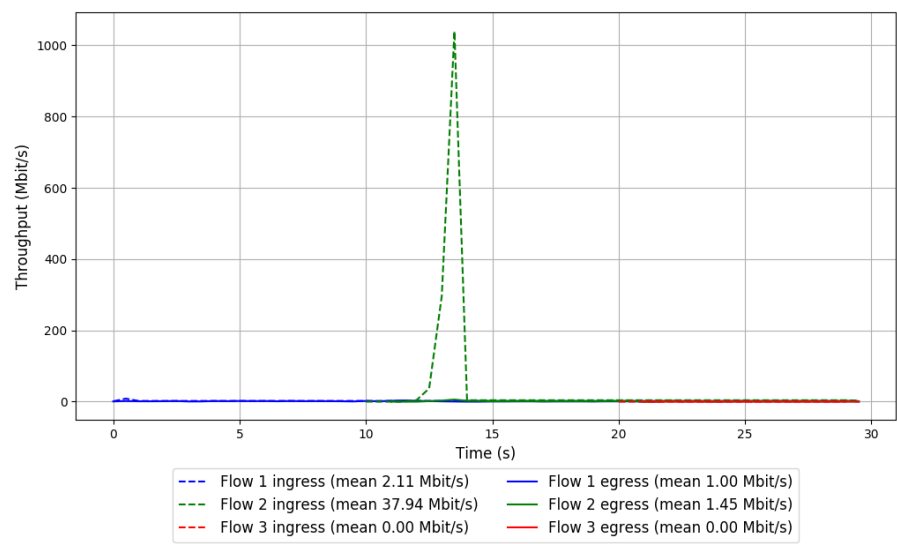
Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 0.95 Mbit/s)   Flow 1 egress (mean 0.95 Mbit/s)
Flow 2 ingress (mean 0.48 Mbit/s)   Flow 2 egress (mean 0.48 Mbit/s)
Flow 3 ingress (mean 0.69 Mbit/s)   Flow 3 egress (mean 0.69 Mbit/s)

Flow 1 (95th percentile 255.90 ms)   Flow 2 (95th percentile 276.74 ms)   Flow 3 (95th percentile 296.62 ms)

```
Run 1: Statistics of PCC

Start at: 2018-02-27 09:47:58
End at: 2018-02-27 09:48:28
Local clock offset: 0.525 ms
Remote clock offset: -77.514 ms

# Below is generated by plot.py at 2018-02-27 10:33:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 1067.163 ms
Loss rate: 93.06%
-- Flow 1:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 1047.836 ms
Loss rate: 53.10%
-- Flow 2:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 1104.057 ms
Loss rate: 96.41%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 1046.619 ms
Loss rate: 69.78%
```
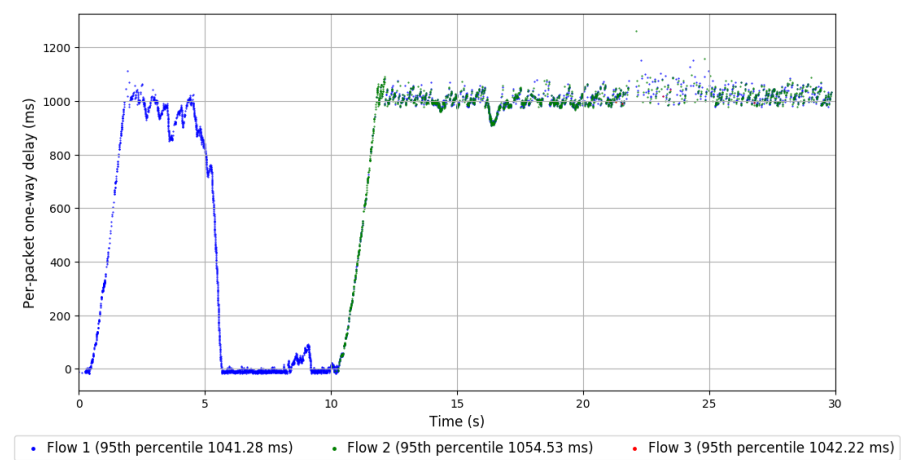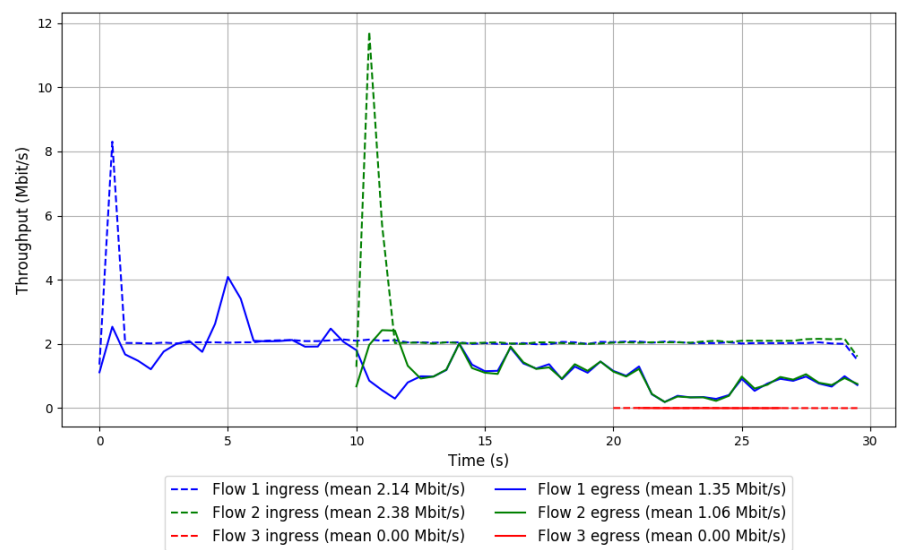
Run 1: Report of PCC — Data Link

- Flow 1 ingress (mean 2.11 Mbit/s)
- Flow 1 egress (mean 1.00 Mbit/s)
- Flow 2 ingress (mean 37.94 Mbit/s)
- Flow 2 egress (mean 1.45 Mbit/s)
- Flow 3 ingress (mean 0.00 Mbit/s)
- Flow 3 egress (mean 0.00 Mbit/s)

- Flow 1 (95th percentile 1047.84 ms)
- Flow 2 (95th percentile 1104.06 ms)
- Flow 3 (95th percentile 1046.62 ms)

```
Run 2: Statistics of PCC

Start at: 2018-02-27 10:08:01
End at: 2018-02-27 10:08:31
Local clock offset: -1.968 ms
Remote clock offset: -69.879 ms


# Below is generated by plot.py at 2018-02-27 10:33:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 1046.533 ms
Loss rate: 44.97%
-- Flow 1:
Average throughput: 1.35 Mbit/s
95th percentile per-packet one-way delay: 1041.275 ms
Loss rate: 37.27%
-- Flow 2:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 1054.533 ms
Loss rate: 55.38%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 1042.221 ms
Loss rate: 76.75%
```
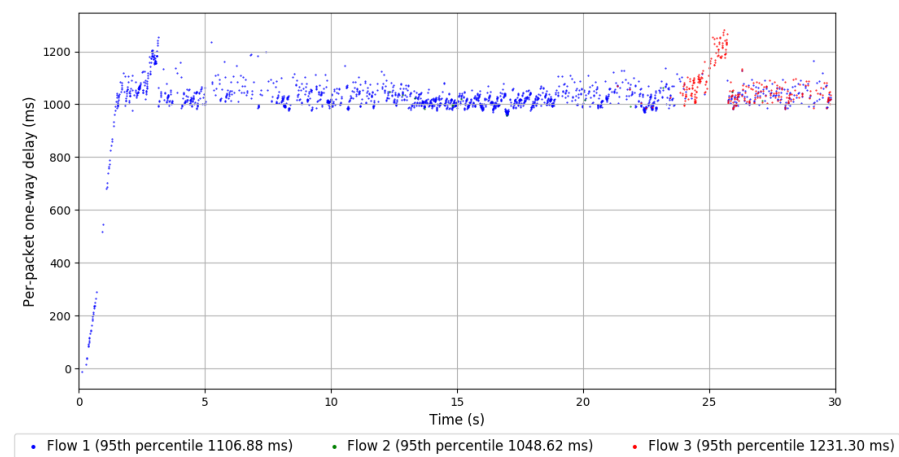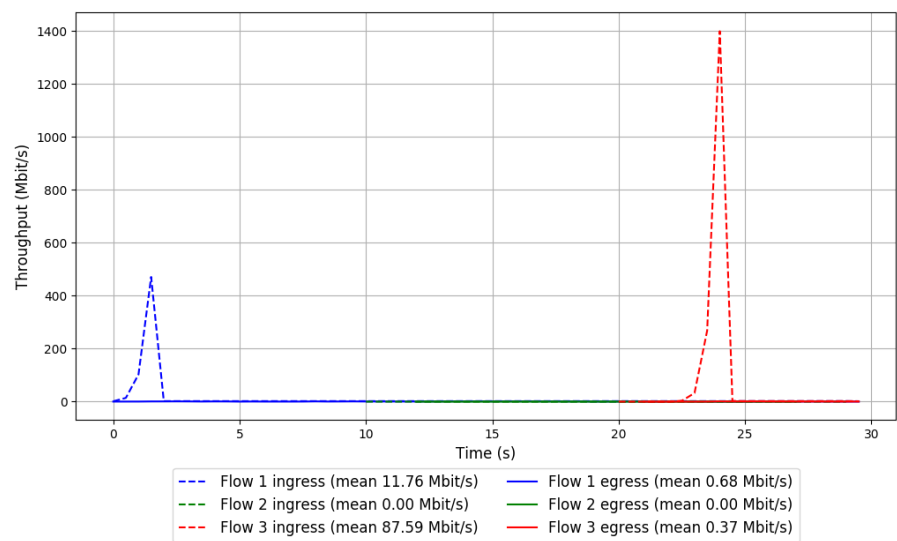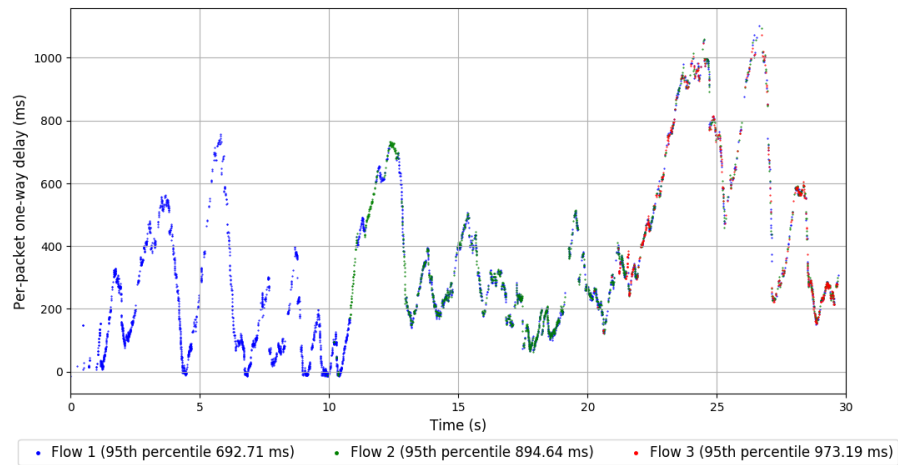
Run 2: Report of PCC — Data Link

Flow 1 ingress (mean 2.14 Mbit/s) --- Flow 1 egress (mean 1.35 Mbit/s)
Flow 2 ingress (mean 2.38 Mbit/s) --- Flow 2 egress (mean 1.06 Mbit/s)
Flow 3 ingress (mean 0.00 Mbit/s) --- Flow 3 egress (mean 0.00 Mbit/s)

Flow 1 (95th percentile 1041.28 ms) • Flow 2 (95th percentile 1054.53 ms) • Flow 3 (95th percentile 1042.22 ms)

```
Run 3: Statistics of PCC

Start at: 2018-02-27 10:28:03
End at: 2018-02-27 10:28:33
Local clock offset: -1.537 ms
Remote clock offset: -60.999 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 1146.621 ms
Loss rate: 98.07%
-- Flow 1:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 1106.884 ms
Loss rate: 94.25%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 1048.618 ms
Loss rate: 62.70%
-- Flow 3:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 1231.304 ms
Loss rate: 99.63%
```
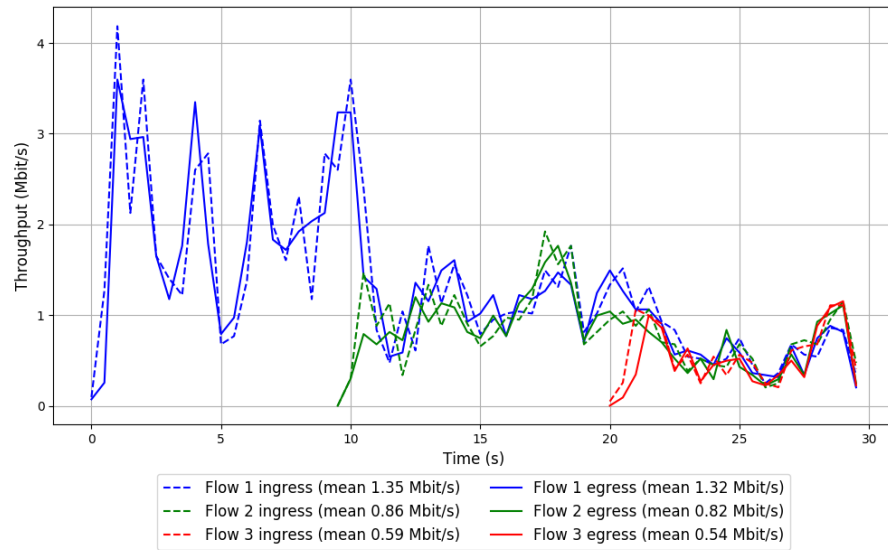
Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 11.76 Mbit/s) — — — Flow 1 egress (mean 0.68 Mbit/s)
Flow 2 ingress (mean 0.00 Mbit/s) — — — Flow 2 egress (mean 0.00 Mbit/s)
Flow 3 ingress (mean 87.59 Mbit/s) — — — Flow 3 egress (mean 0.37 Mbit/s)

• Flow 1 (95th percentile 1106.88 ms)   • Flow 2 (95th percentile 1048.62 ms)   • Flow 3 (95th percentile 1231.30 ms)
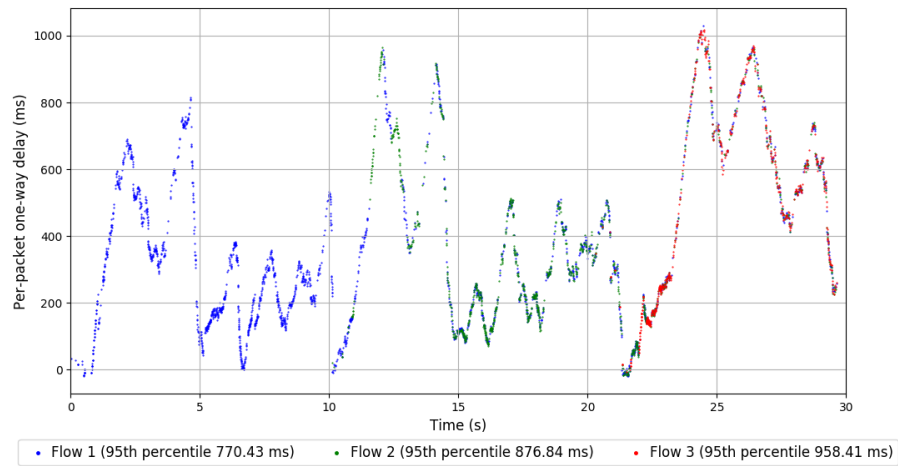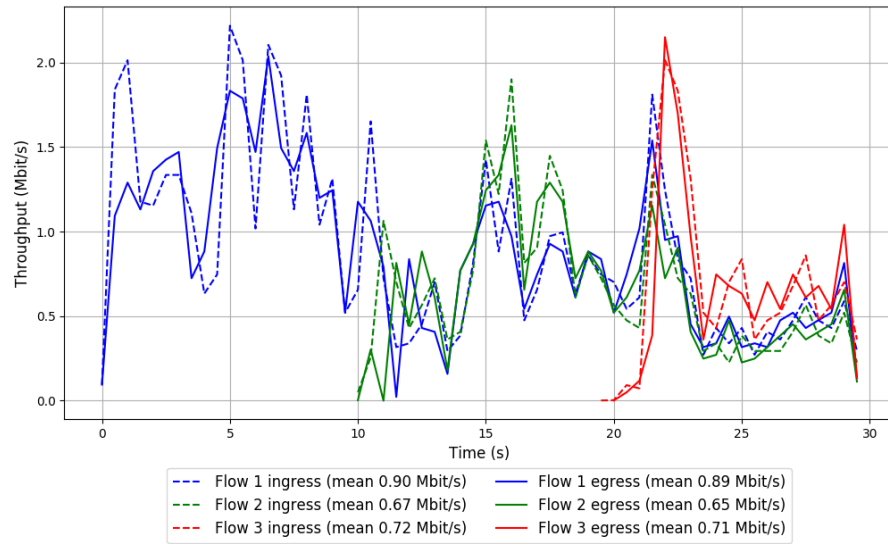
```
Run 1: Statistics of QUIC Cubic

Start at: 2018-02-27 09:35:41
End at: 2018-02-27 09:36:11
Local clock offset: -1.476 ms
Remote clock offset: -69.026 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.03 Mbit/s
95th percentile per-packet one-way delay: 793.200 ms
Loss rate: 3.88%
-- Flow 1:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 692.709 ms
Loss rate: 2.21%
-- Flow 2:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 894.643 ms
Loss rate: 5.06%
-- Flow 3:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 973.188 ms
Loss rate: 12.06%
```

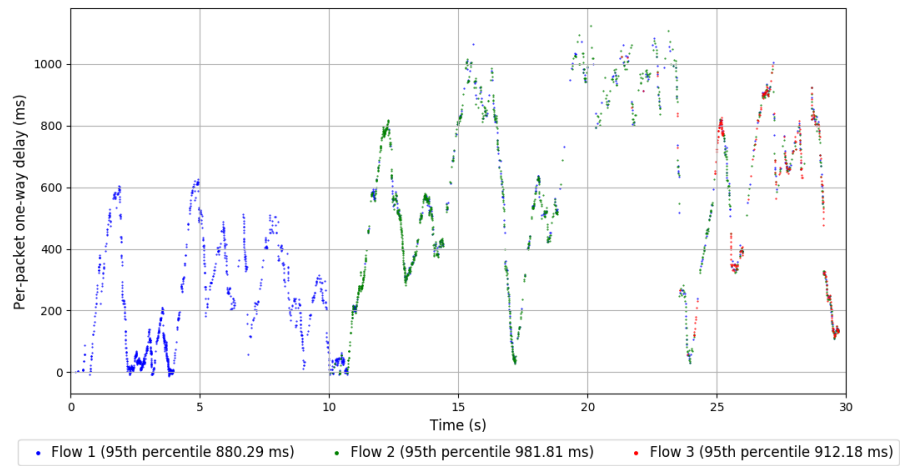Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-02-27 09:55:45
End at: 2018-02-27 09:56:15
Local clock offset: -1.772 ms
Remote clock offset: -75.643 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 861.851 ms
Loss rate: 2.98%
-- Flow 1:
Average throughput: 0.89 Mbit/s
95th percentile per-packet one-way delay: 770.427 ms
Loss rate: 2.19%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 876.836 ms
Loss rate: 3.17%
-- Flow 3:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 958.406 ms
Loss rate: 5.63%
```

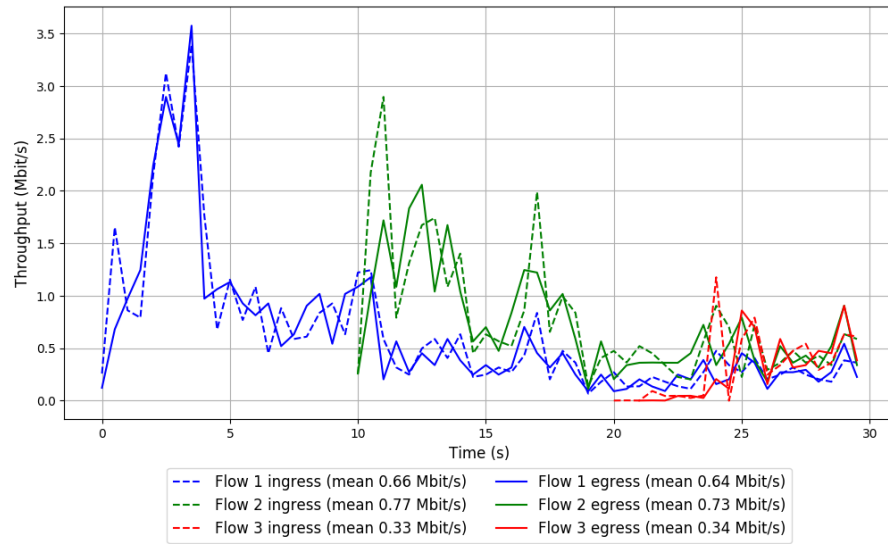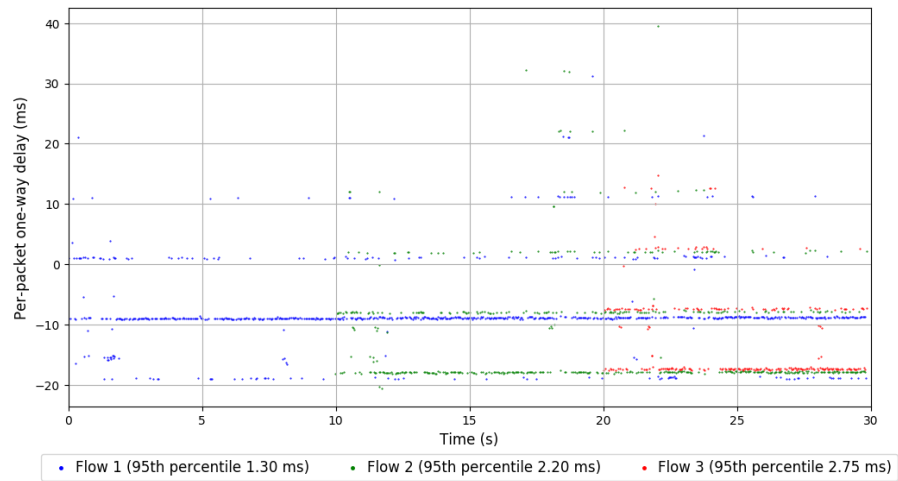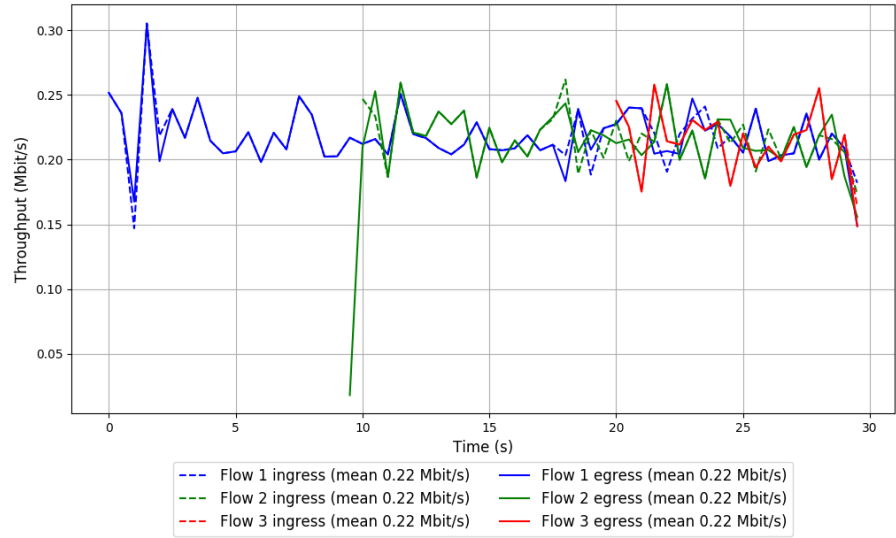# Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 0.90 Mbit/s) --- Flow 1 egress (mean 0.89 Mbit/s)
Flow 2 ingress (mean 0.67 Mbit/s) --- Flow 2 egress (mean 0.65 Mbit/s)
Flow 3 ingress (mean 0.72 Mbit/s) --- Flow 3 egress (mean 0.71 Mbit/s)

Flow 1 (95th percentile 770.43 ms) • Flow 2 (95th percentile 876.84 ms) • Flow 3 (95th percentile 958.41 ms)

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```
Run 3: Statistics of QUIC Cubic

Start at: 2018-02-27 10:15:48
End at: 2018-02-27 10:16:18
Local clock offset: -0.857 ms
Remote clock offset: -59.935 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.22 Mbit/s
95th percentile per-packet one-way delay: 947.817 ms
Loss rate: 5.07%
-- Flow 1:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 880.294 ms
Loss rate: 3.32%
-- Flow 2:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 981.808 ms
Loss rate: 6.07%
-- Flow 3:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 912.178 ms
Loss rate: 11.13%
```

Run 3: Report of QUIC Cubic — Data Link
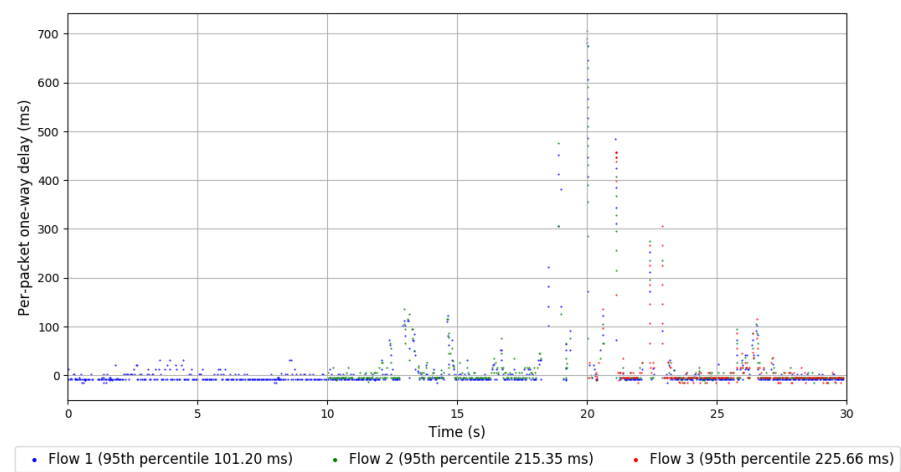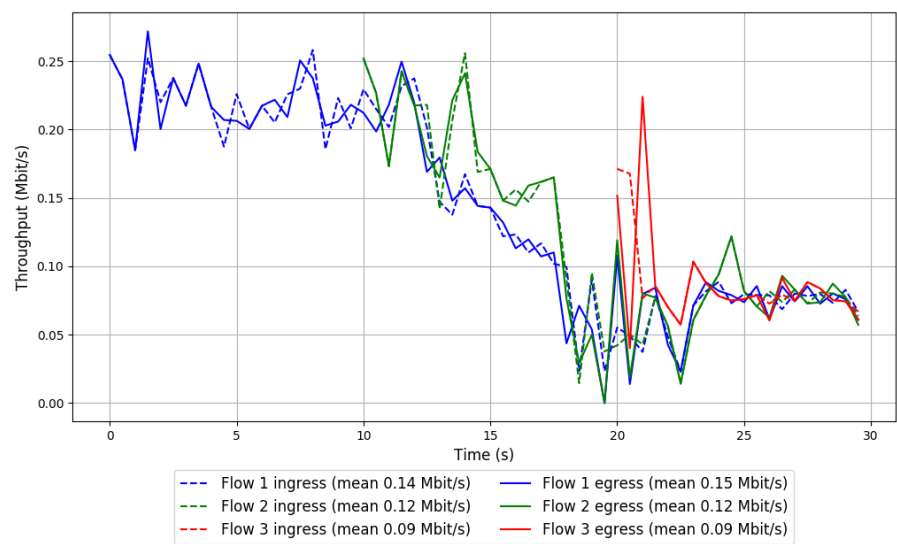

- - - Flow 1 ingress (mean 0.66 Mbit/s) —— Flow 1 egress (mean 0.64 Mbit/s)
- - - Flow 2 ingress (mean 0.77 Mbit/s) —— Flow 2 egress (mean 0.73 Mbit/s)
- - - Flow 3 ingress (mean 0.33 Mbit/s) —— Flow 3 egress (mean 0.34 Mbit/s)

- Flow 1 (95th percentile 880.29 ms)   · Flow 2 (95th percentile 981.81 ms)   · Flow 3 (95th percentile 912.18 ms)

```
Run 1: Statistics of SCReAM

Start at: 2018-02-27 09:34:34
End at: 2018-02-27 09:35:04
Local clock offset: 1.339 ms
Remote clock offset: -70.069 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 2.586 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.303 ms
Loss rate: 0.25%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 2.200 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 2.754 ms
Loss rate: 0.35%
```
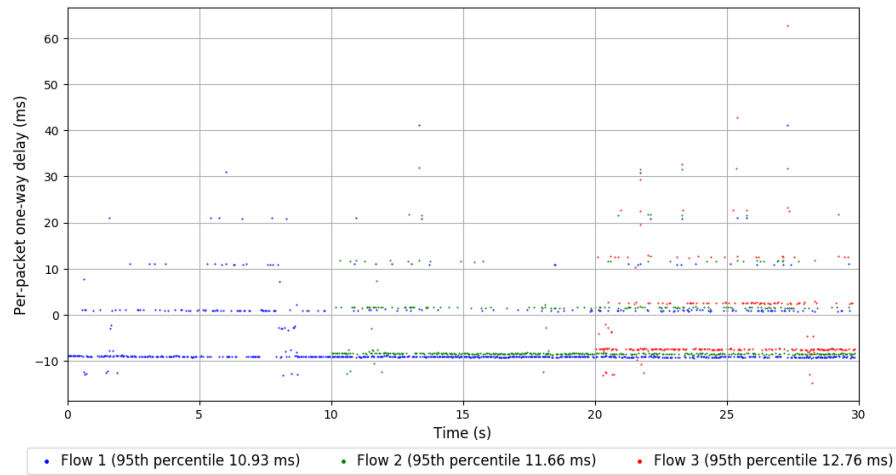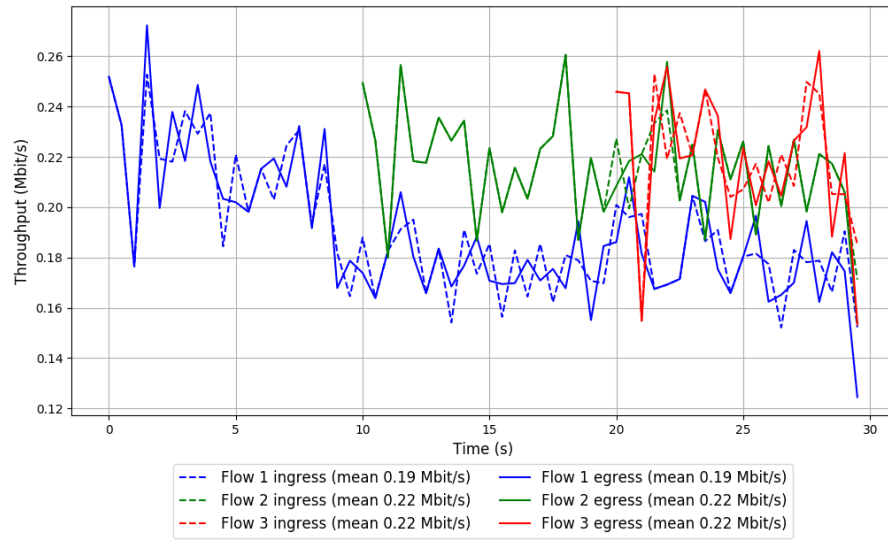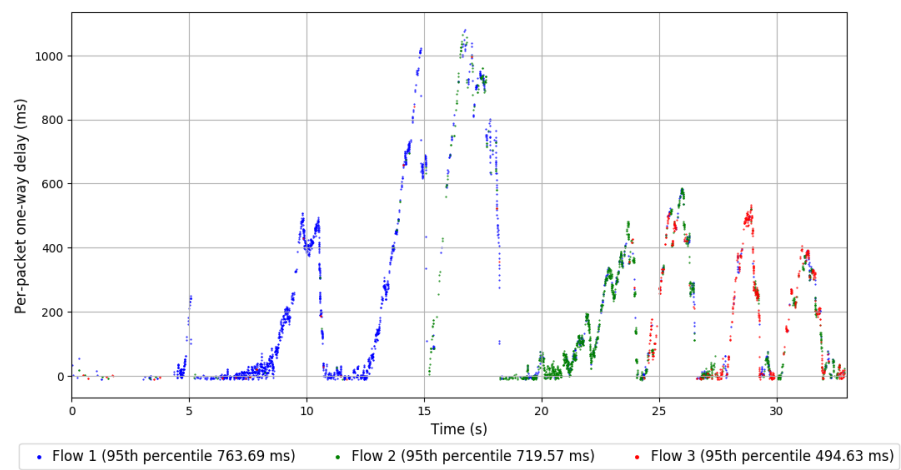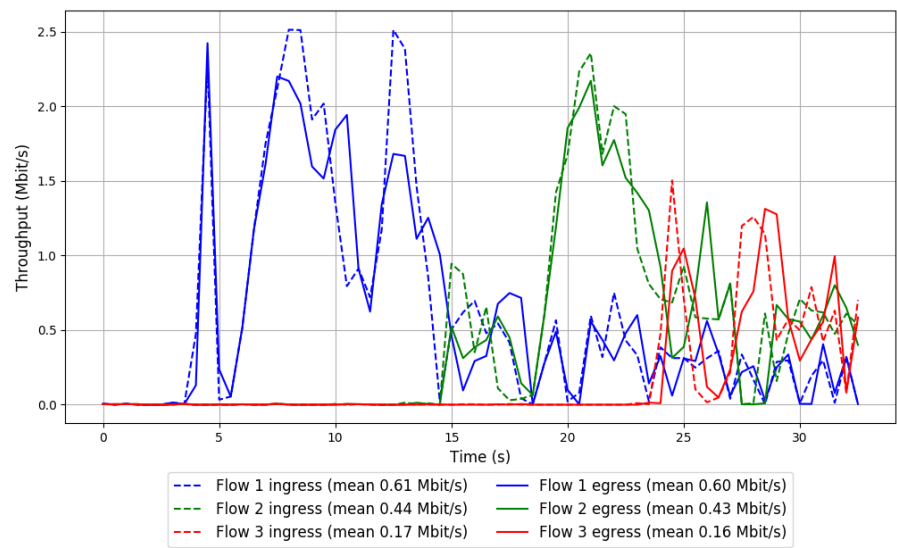
Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2018-02-27 09:54:39
End at: 2018-02-27 09:55:09
Local clock offset: 0.633 ms
Remote clock offset: -66.725 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 135.077 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 101.197 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 215.354 ms
Loss rate: 0.14%
-- Flow 3:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 225.655 ms
Loss rate: 0.32%
```

Run 2: Report of SCReAM — Data Link

- Flow 1 ingress (mean 0.14 Mbit/s) — Flow 1 egress (mean 0.15 Mbit/s)
- Flow 2 ingress (mean 0.12 Mbit/s) — Flow 2 egress (mean 0.12 Mbit/s)
- Flow 3 ingress (mean 0.09 Mbit/s) — Flow 3 egress (mean 0.09 Mbit/s)

- Flow 1 (95th percentile 101.20 ms) • Flow 2 (95th percentile 215.35 ms) • Flow 3 (95th percentile 225.66 ms)

```
Run 3: Statistics of SCReAM

Start at: 2018-02-27 10:14:42
End at: 2018-02-27 10:15:12
Local clock offset: -1.41 ms
Remote clock offset: -62.296 ms

# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 11.647 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 10.934 ms
Loss rate: 0.24%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 11.664 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 12.756 ms
Loss rate: 0.35%
```
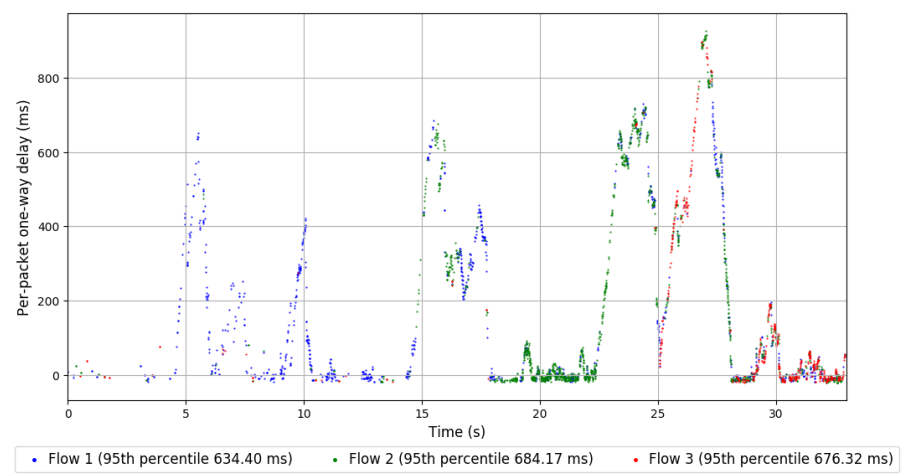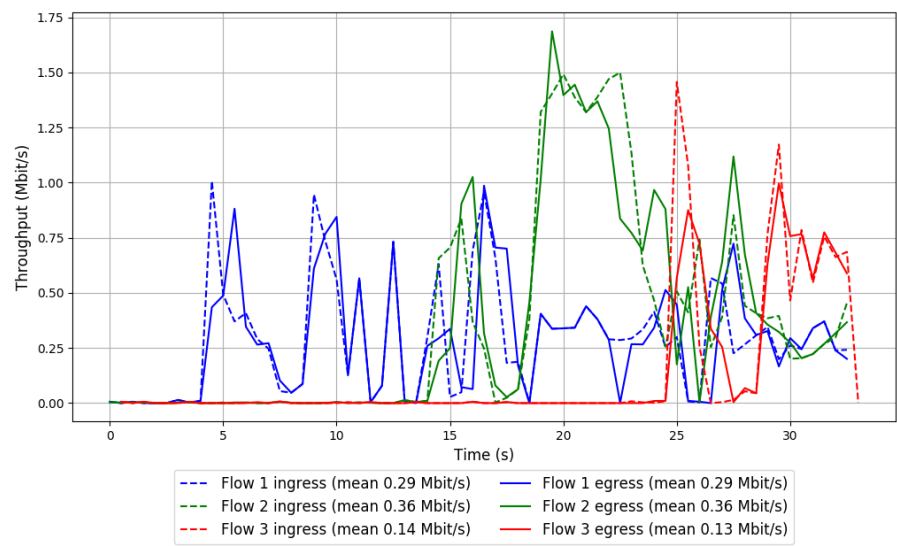
Run 3: Report of SCReAM — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2018-02-27 09:37:54
End at: 2018-02-27 09:38:24
Local clock offset: -1.881 ms
Remote clock offset: -67.355 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 722.316 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 763.694 ms
Loss rate: 1.41%
-- Flow 2:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 719.573 ms
Loss rate: 1.41%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 494.627 ms
Loss rate: 2.23%
```

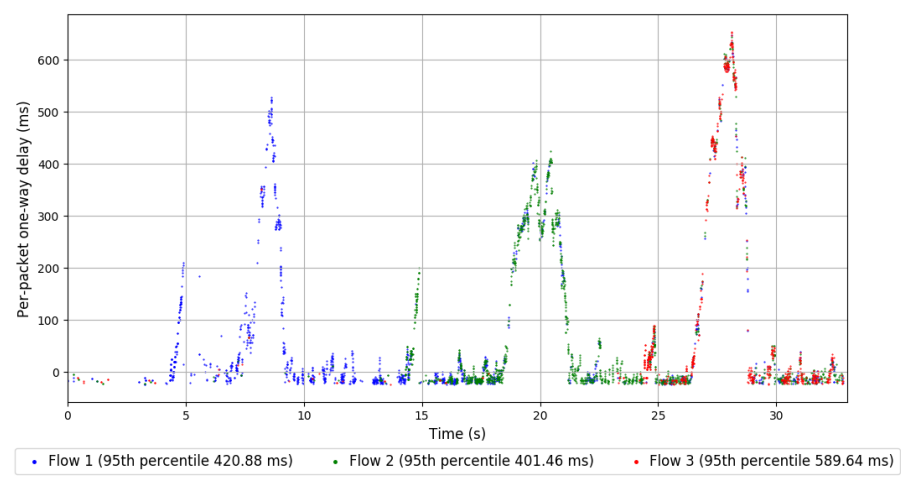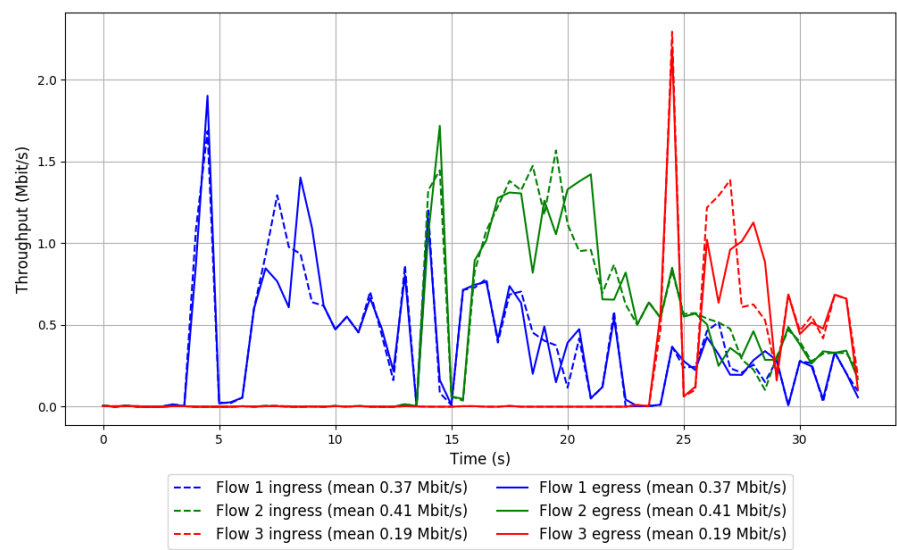Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-02-27 09:57:59
End at: 2018-02-27 09:58:29
Local clock offset: -2.028 ms
Remote clock offset: -73.851 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 664.713 ms
Loss rate: 1.27%
-- Flow 1:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 634.403 ms
Loss rate: 1.45%
-- Flow 2:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 684.174 ms
Loss rate: 1.14%
-- Flow 3:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 676.318 ms
Loss rate: 1.26%
```

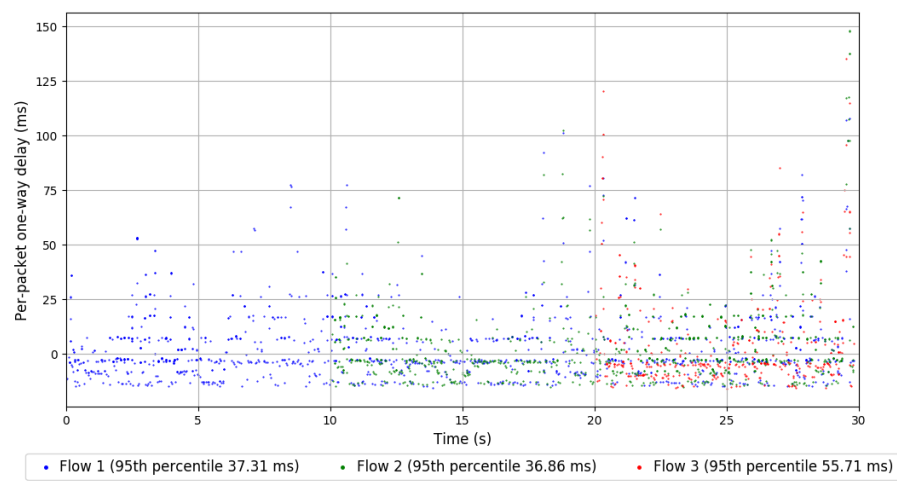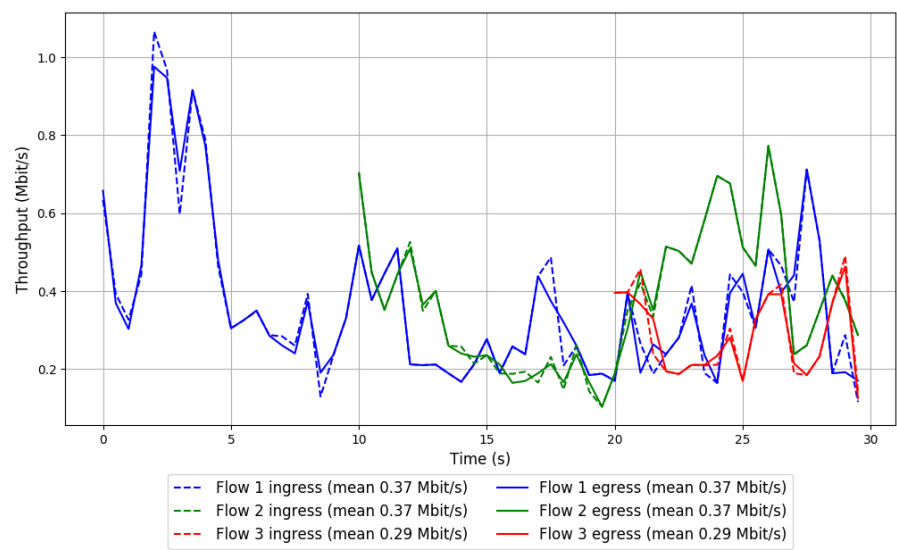Run 2: Report of WebRTC media — Data Link

Flow 1 ingress (mean 0.29 Mbit/s) Flow 1 egress (mean 0.29 Mbit/s)
Flow 2 ingress (mean 0.36 Mbit/s) Flow 2 egress (mean 0.36 Mbit/s)
Flow 3 ingress (mean 0.14 Mbit/s) Flow 3 egress (mean 0.13 Mbit/s)

Flow 1 (95th percentile 634.40 ms)   Flow 2 (95th percentile 684.17 ms)   Flow 3 (95th percentile 676.32 ms)

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```
Run 3: Statistics of WebRTC media

Start at: 2018-02-27 10:18:01
End at: 2018-02-27 10:18:31
Local clock offset: 1.168 ms
Remote clock offset: -67.112 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 472.974 ms
Loss rate: 0.65%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 420.876 ms
Loss rate: 0.83%
-- Flow 2:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 401.462 ms
Loss rate: 0.36%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 589.641 ms
Loss rate: 0.93%
```
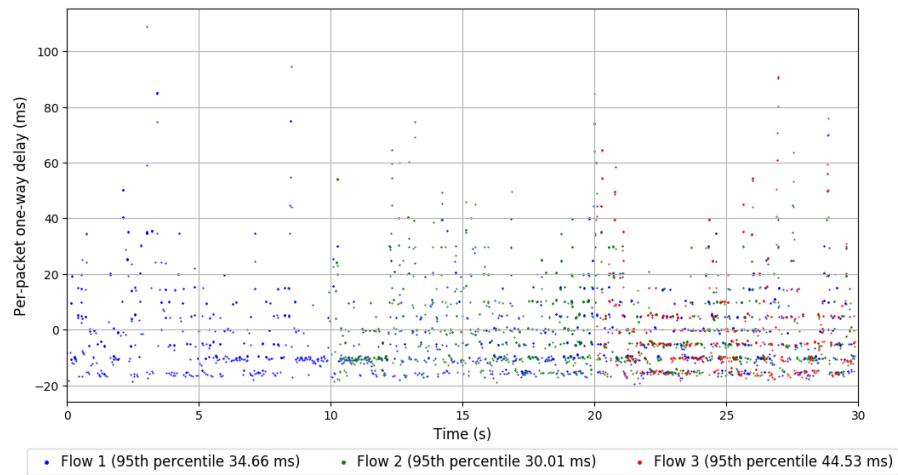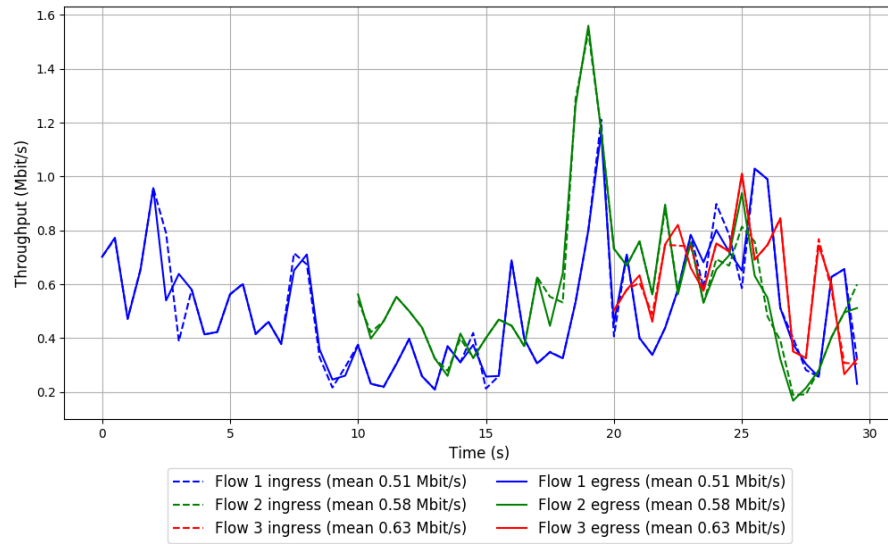
Run 3: Report of WebRTC media — Data Link

```
Run 1: Statistics of Sprout

Start at: 2018-02-27 09:42:20
End at: 2018-02-27 09:42:50
Local clock offset: -2.332 ms
Remote clock offset: -69.543 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 42.108 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 37.315 ms
Loss rate: 0.18%
-- Flow 2:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 36.860 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 55.711 ms
Loss rate: 0.80%
```
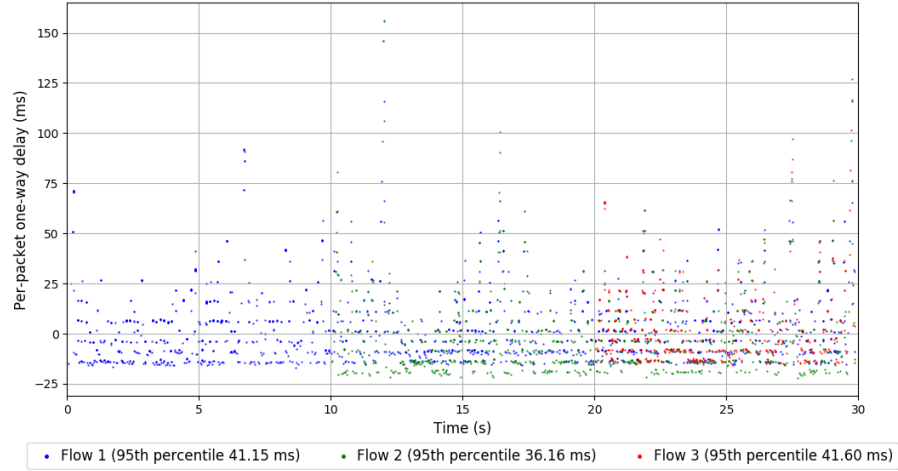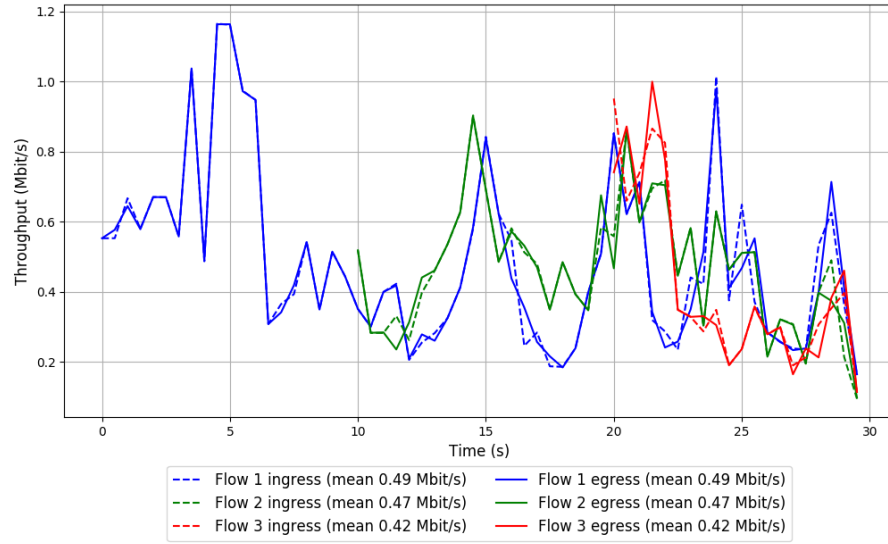
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-02-27 10:02:27
End at: 2018-02-27 10:02:57
Local clock offset: -1.568 ms
Remote clock offset: -70.786 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 35.084 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 34.662 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 30.007 ms
Loss rate: 0.38%
-- Flow 3:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 44.533 ms
Loss rate: 0.19%
```
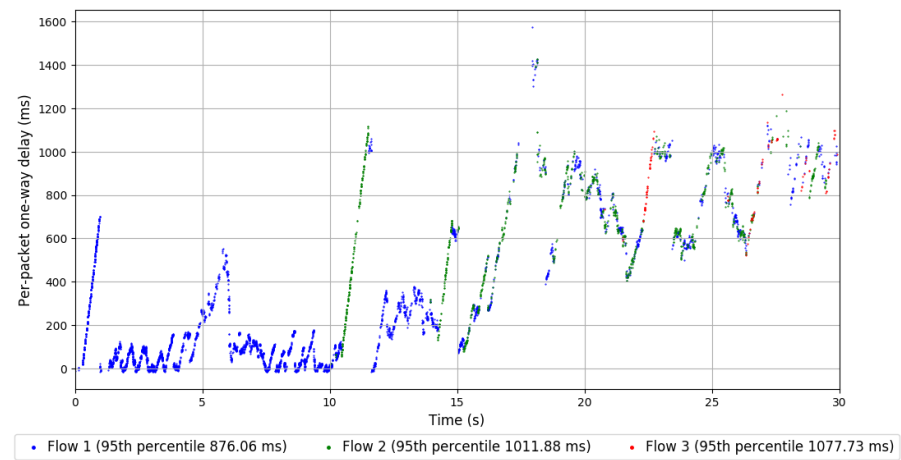
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-02-27 10:22:28
End at: 2018-02-27 10:22:58
Local clock offset: -3.009 ms
Remote clock offset: -63.116 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 40.983 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 41.151 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 36.157 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 41.598 ms
Loss rate: 0.02%
```
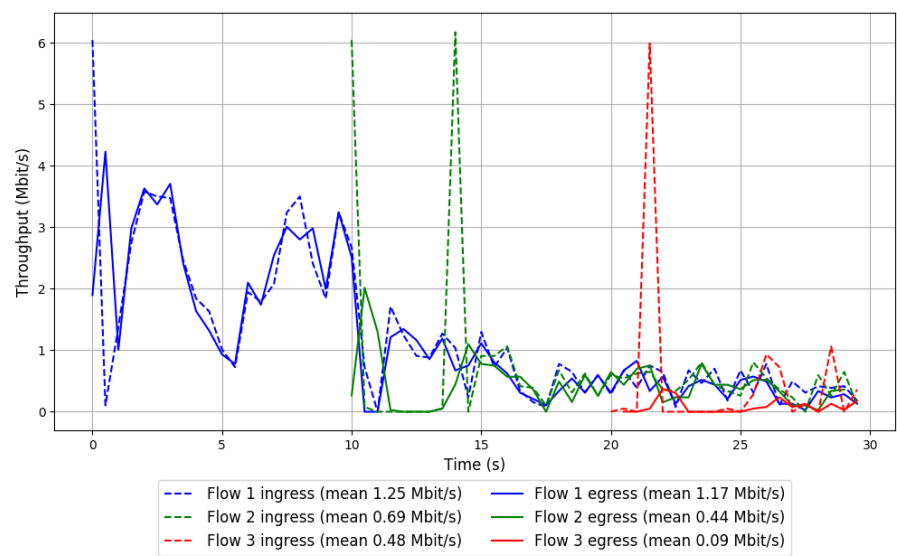
Run 3: Report of Sprout — Data Link

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

Start at: 2018-02-27 09:50:12
End at: 2018-02-27 09:50:42
Local clock offset: 0.159 ms
Remote clock offset: -67.831 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.49 Mbit/s
95th percentile per-packet one-way delay: 971.428 ms
Loss rate: 19.54%
-- Flow 1:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 876.058 ms
Loss rate: 5.23%
-- Flow 2:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 1011.875 ms
Loss rate: 36.27%
-- Flow 3:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 1077.730 ms
Loss rate: 82.96%
```

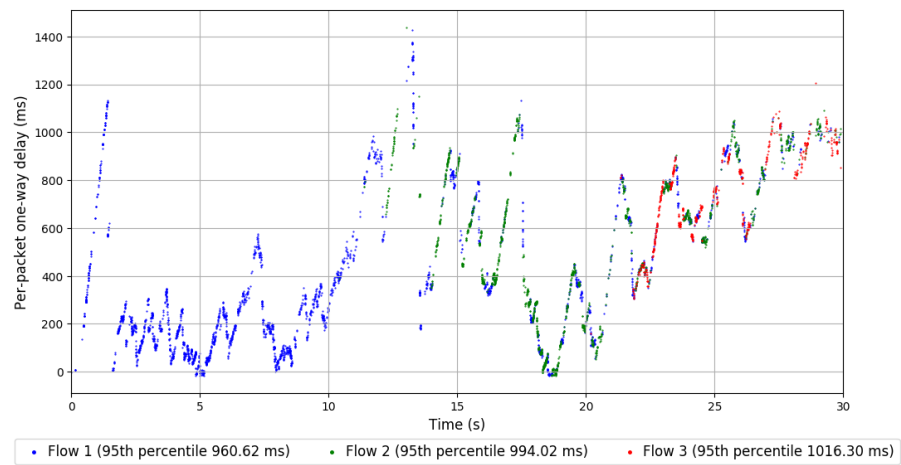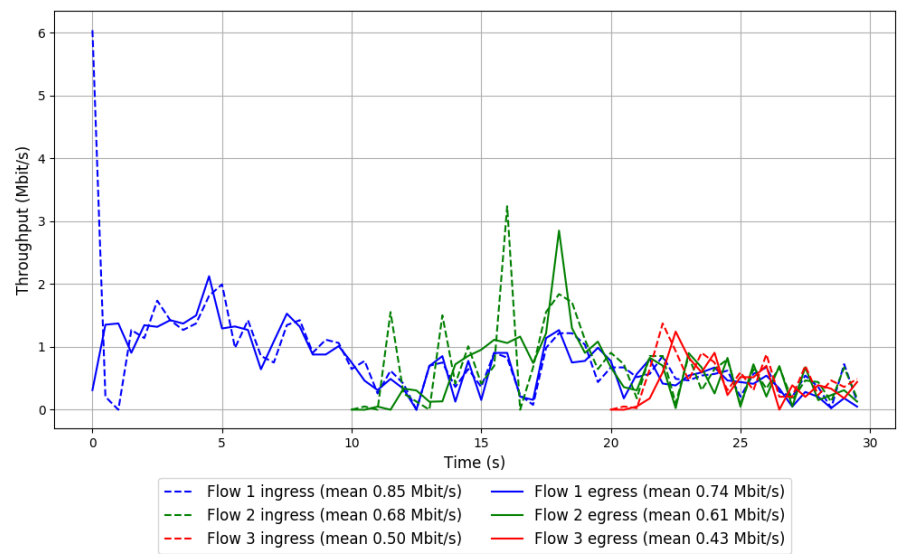## Run 1: Report of TaoVA-100x — Data Link

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

Start at: 2018-02-27 10:10:15
End at: 2018-02-27 10:10:45
Local clock offset: -1.54 ms
Remote clock offset: -68.032 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 990.595 ms
Loss rate: 12.40%
-- Flow 1:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 960.619 ms
Loss rate: 12.06%
-- Flow 2:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 994.022 ms
Loss rate: 11.64%
-- Flow 3:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 1016.303 ms
Loss rate: 16.16%
```

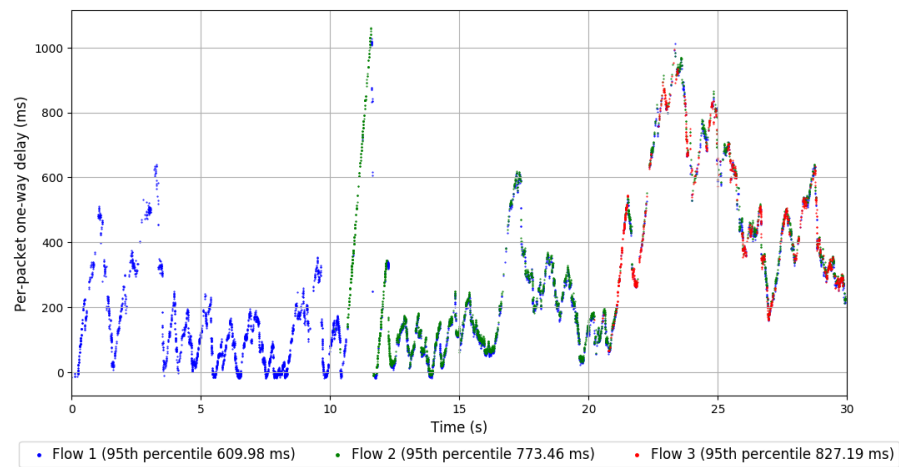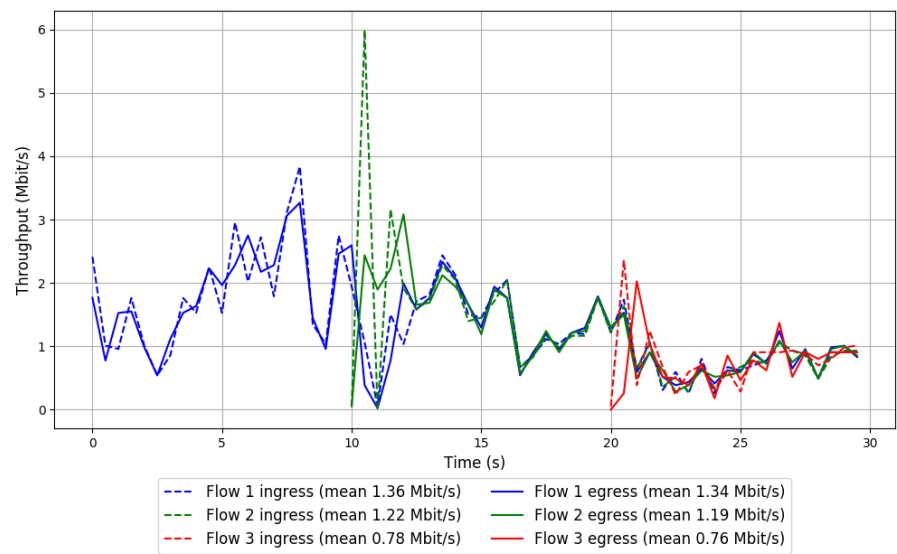Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2018-02-27 10:30:17
End at: 2018-02-27 10:30:47
Local clock offset: 1.433 ms
Remote clock offset: -59.902 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 725.732 ms
Loss rate: 2.70%
-- Flow 1:
Average throughput: 1.34 Mbit/s
95th percentile per-packet one-way delay: 609.977 ms
Loss rate: 1.58%
-- Flow 2:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 773.460 ms
Loss rate: 3.66%
-- Flow 3:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 827.194 ms
Loss rate: 5.55%
```
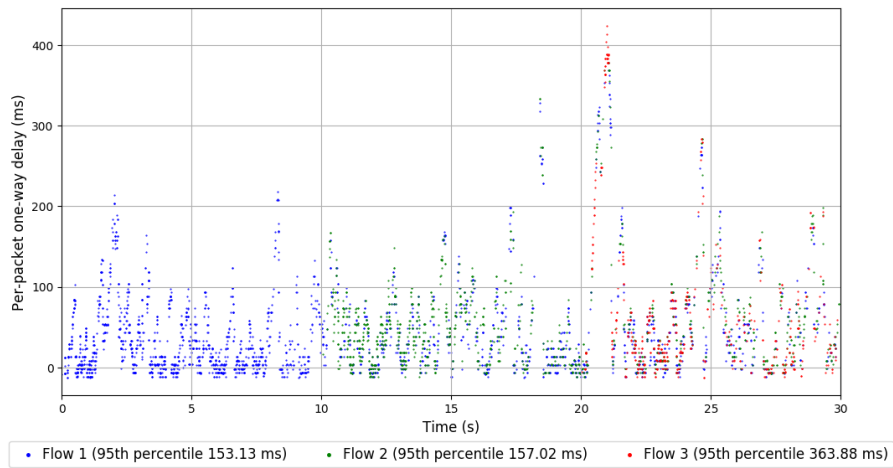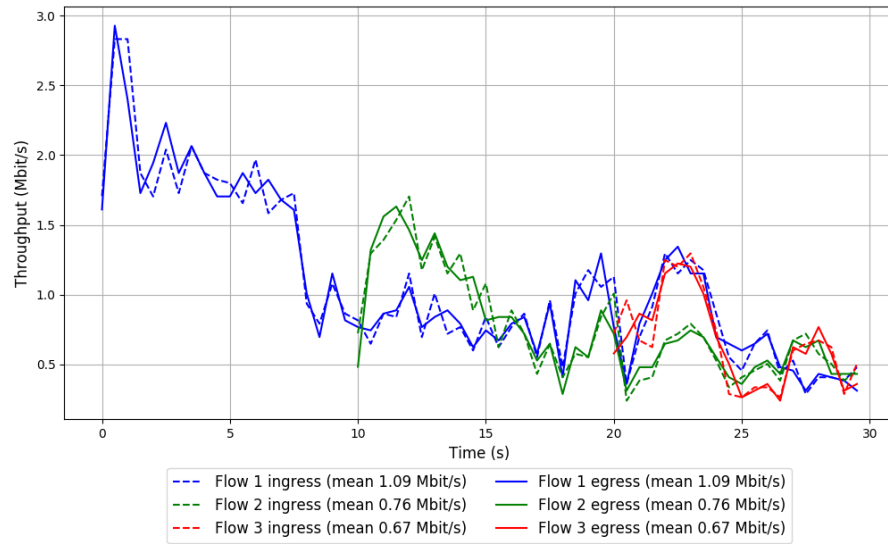
Run 3: Report of TaoVA-100x — Data Link

Legend:
- Flow 1 ingress (mean 1.36 Mbit/s)
- Flow 2 ingress (mean 1.22 Mbit/s)
- Flow 3 ingress (mean 0.78 Mbit/s)
- Flow 1 egress (mean 1.34 Mbit/s)
- Flow 2 egress (mean 1.19 Mbit/s)
- Flow 3 egress (mean 0.76 Mbit/s)

Legend:
- Flow 1 (95th percentile 609.98 ms)
- Flow 2 (95th percentile 773.46 ms)
- Flow 3 (95th percentile 827.19 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2018-02-27 09:43:26
End at: 2018-02-27 09:43:56
Local clock offset: 1.93 ms
Remote clock offset: -65.135 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.81 Mbit/s
95th percentile per-packet one-way delay: 163.556 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 153.135 ms
Loss rate: 0.37%
-- Flow 2:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 157.022 ms
Loss rate: 0.32%
-- Flow 3:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 363.879 ms
Loss rate: 1.62%
```

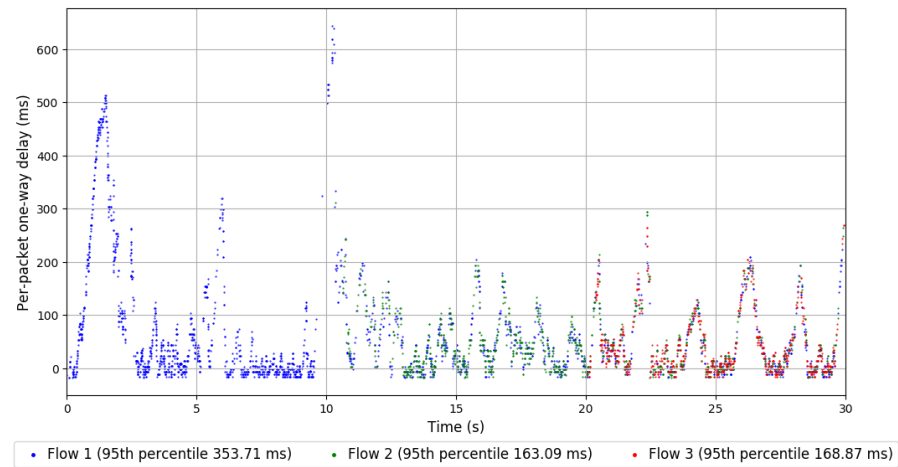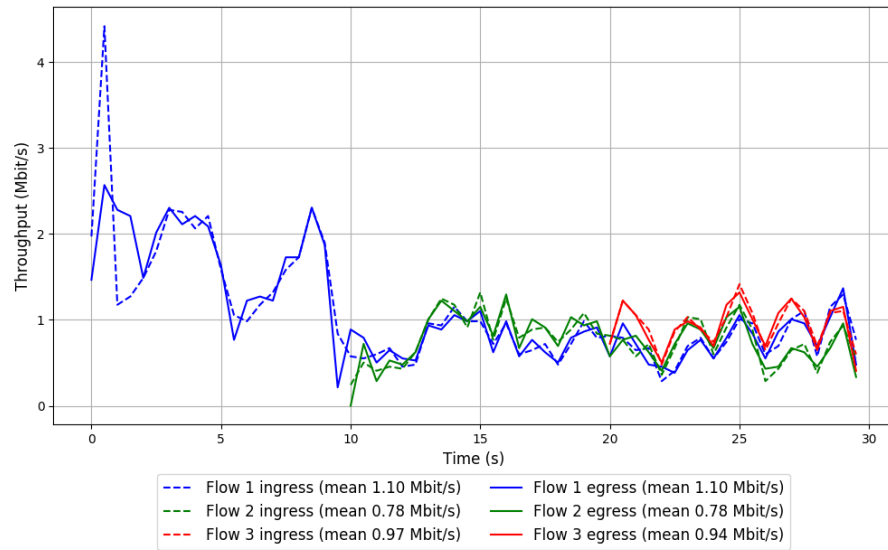Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-02-27 10:03:33
End at: 2018-02-27 10:04:03
Local clock offset: -1.218 ms
Remote clock offset: -72.767 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 238.273 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 353.715 ms
Loss rate: 0.80%
-- Flow 2:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 163.087 ms
Loss rate: 1.02%
-- Flow 3:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 168.874 ms
Loss rate: 1.27%
```

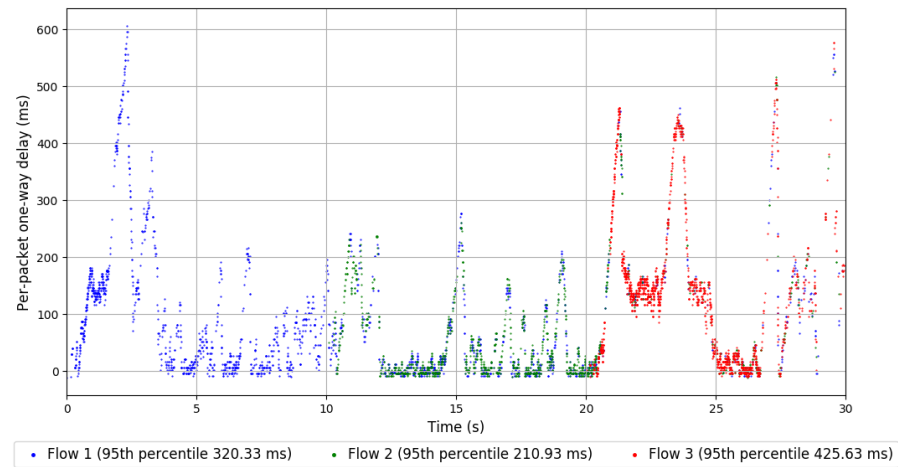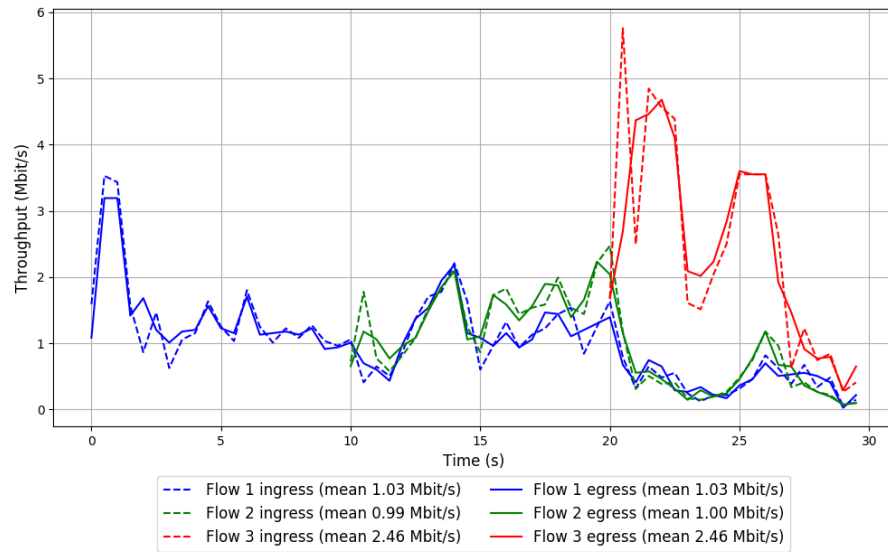Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-02-27 10:23:34
End at: 2018-02-27 10:24:04
Local clock offset: -0.383 ms
Remote clock offset: -62.038 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 380.895 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 320.330 ms
Loss rate: 0.43%
-- Flow 2:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 210.928 ms
Loss rate: 0.49%
-- Flow 3:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 425.632 ms
Loss rate: 0.30%
```

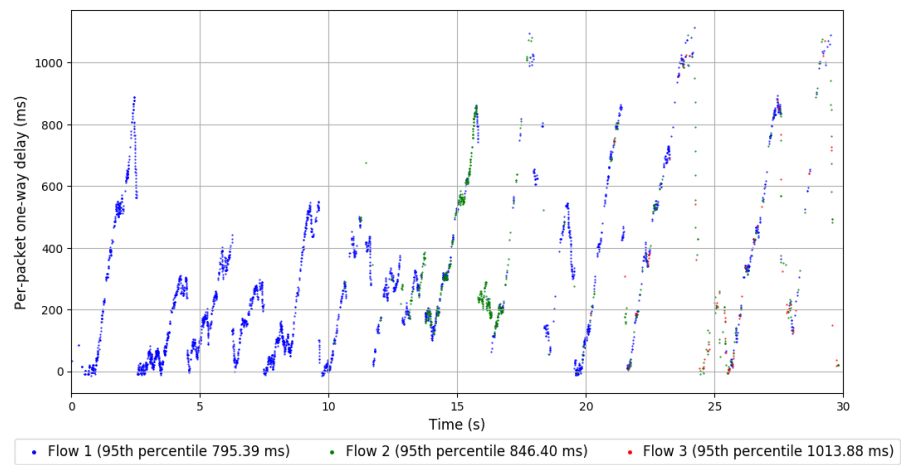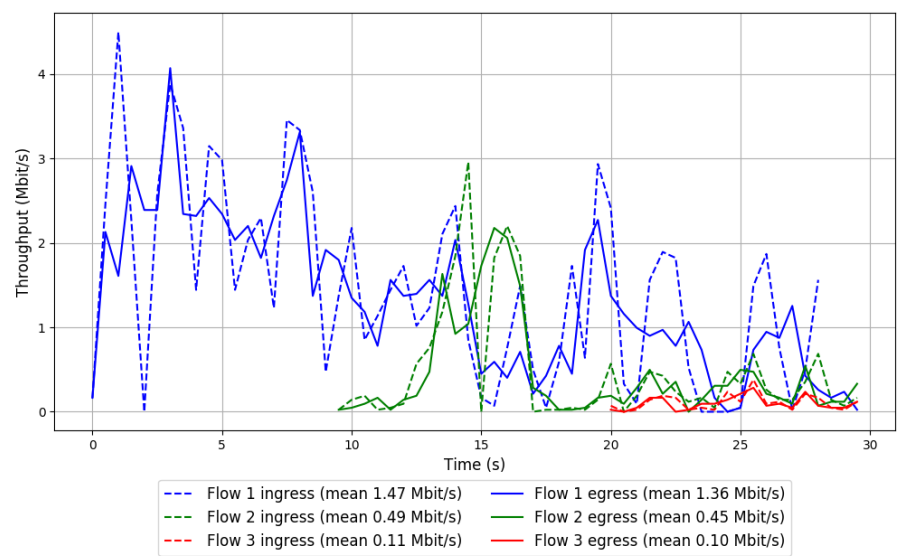Run 3: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2018-02-27 09:44:33
End at: 2018-02-27 09:45:03
Local clock offset: 0.113 ms
Remote clock offset: -67.684 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 825.025 ms
Loss rate: 5.49%
-- Flow 1:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 795.388 ms
Loss rate: 4.63%
-- Flow 2:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 846.402 ms
Loss rate: 8.55%
-- Flow 3:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 1013.877 ms
Loss rate: 10.64%
```

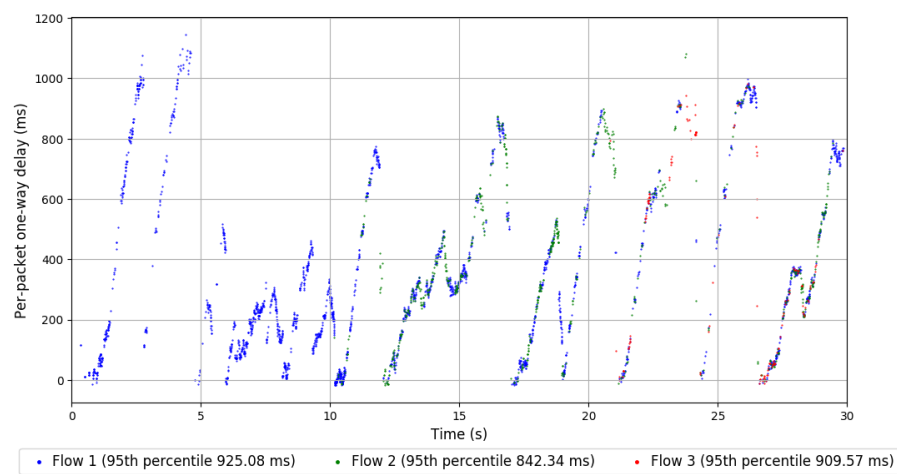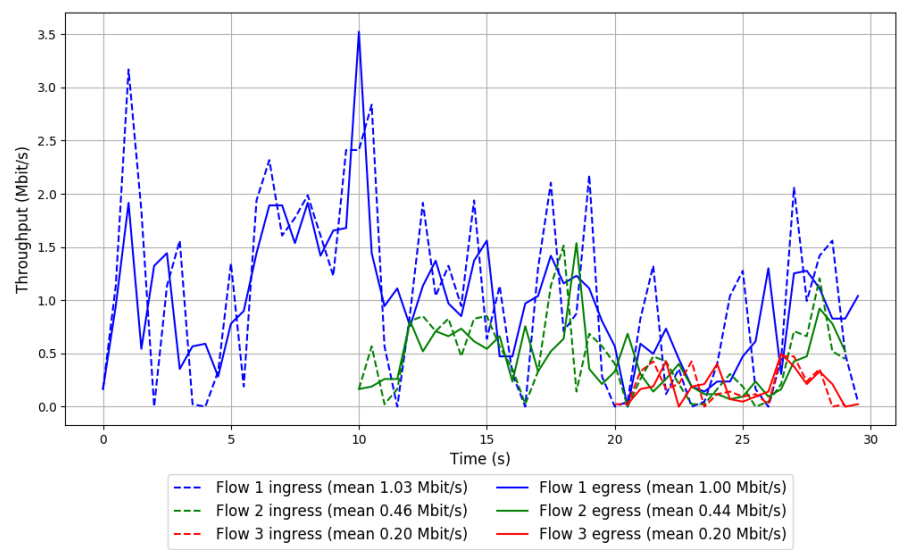Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2018-02-27 10:04:40
End at: 2018-02-27 10:05:10
Local clock offset: -0.832 ms
Remote clock offset: -70.374 ms


# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.35 Mbit/s
95th percentile per-packet one-way delay: 914.482 ms
Loss rate: 3.63%
-- Flow 1:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 925.084 ms
Loss rate: 3.48%
-- Flow 2:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 842.342 ms
Loss rate: 4.63%
-- Flow 3:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 909.567 ms
Loss rate: 1.29%
```
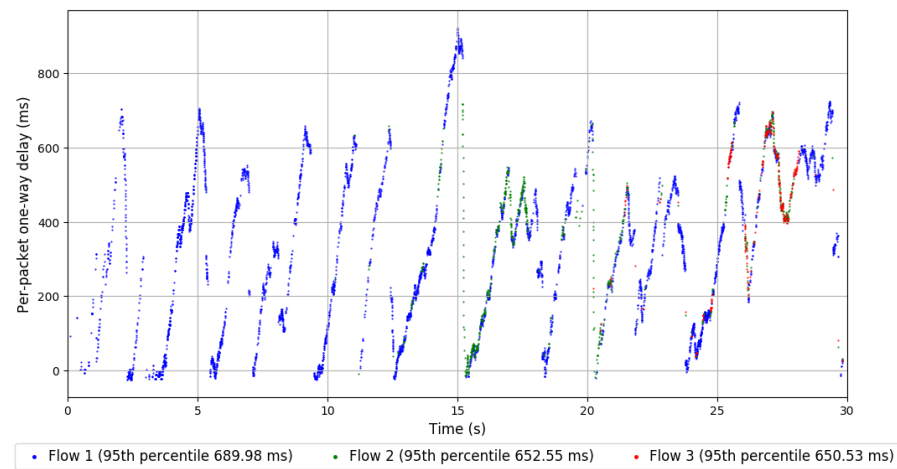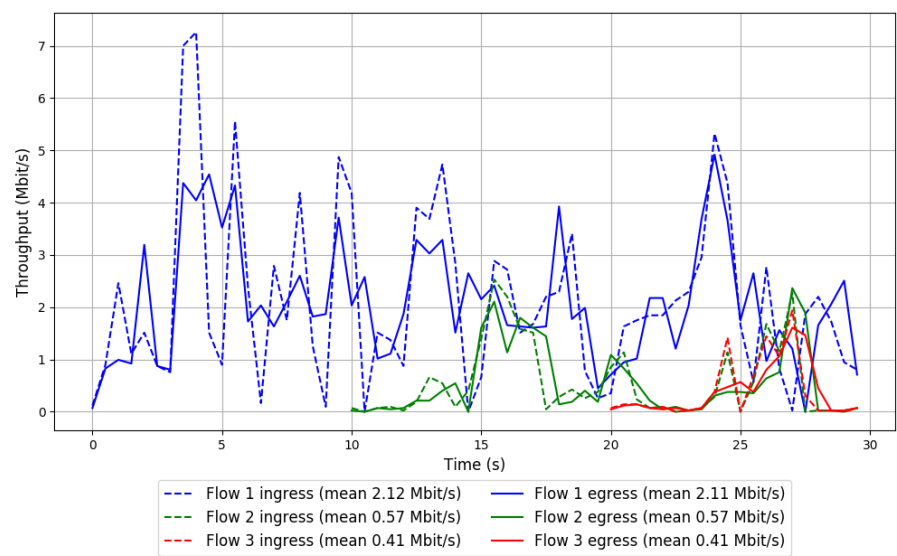
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-02-27 10:24:41
End at: 2018-02-27 10:25:11
Local clock offset: 0.626 ms
Remote clock offset: -68.429 ms

# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.61 Mbit/s
95th percentile per-packet one-way delay: 675.630 ms
Loss rate: 1.20%
-- Flow 1:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 689.976 ms
Loss rate: 1.30%
-- Flow 2:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 652.549 ms
Loss rate: 0.74%
-- Flow 3:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 650.533 ms
Loss rate: 0.89%
```
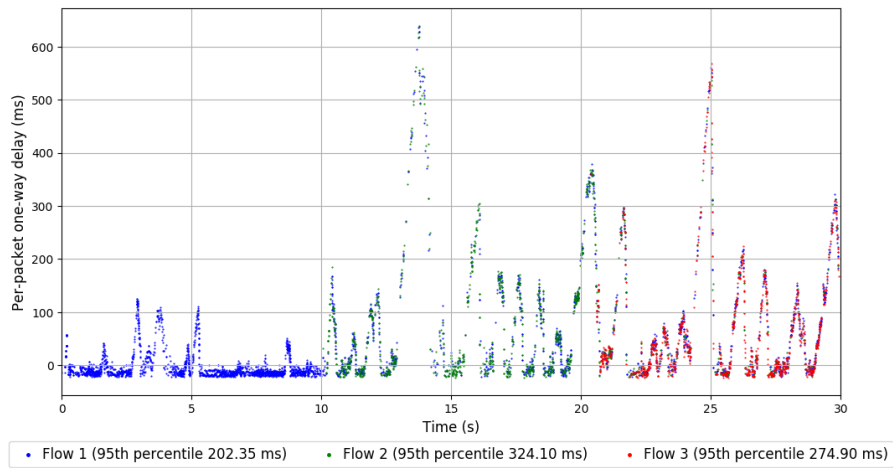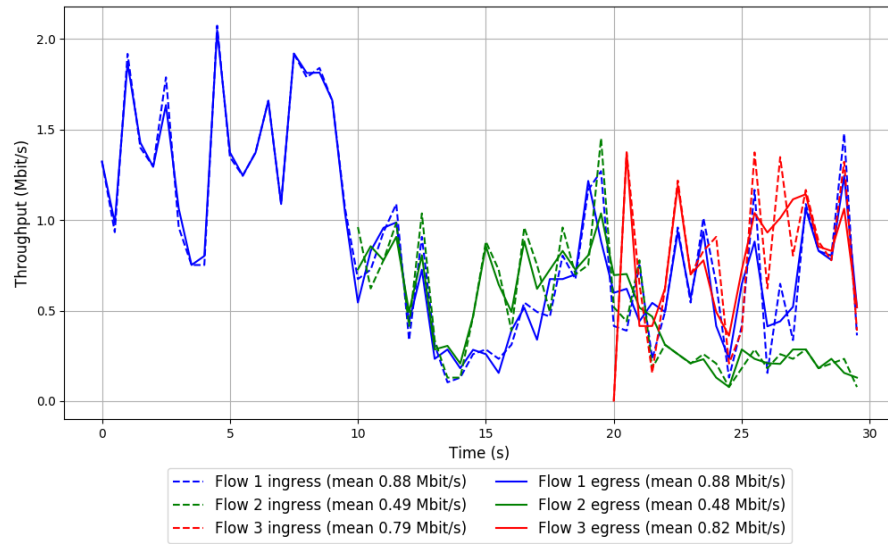
Run 3: Report of Verus — Data Link

```
Run 1: Statistics of Copa

Start at: 2018-02-27 09:51:19
End at: 2018-02-27 09:51:49
Local clock offset: 0.932 ms
Remote clock offset: -72.645 ms

# Below is generated by plot.py at 2018-02-27 10:33:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 253.617 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 202.355 ms
Loss rate: 0.35%
-- Flow 2:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 324.095 ms
Loss rate: 0.18%
-- Flow 3:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 274.901 ms
Loss rate: 1.01%
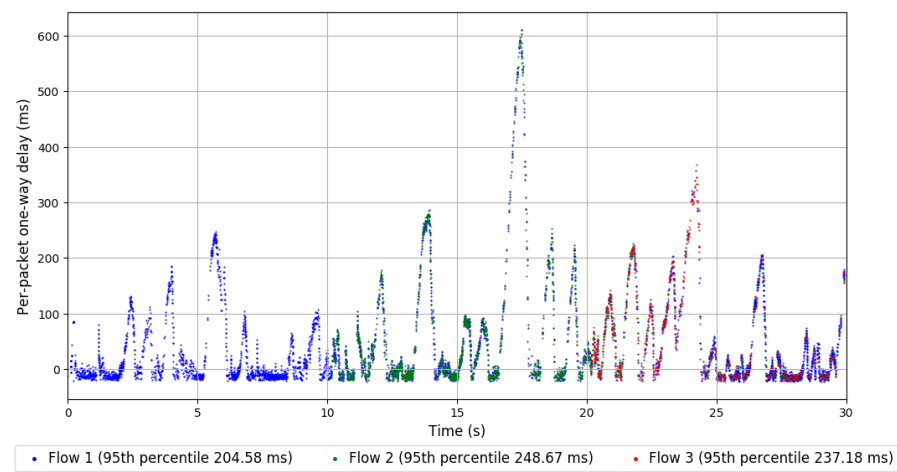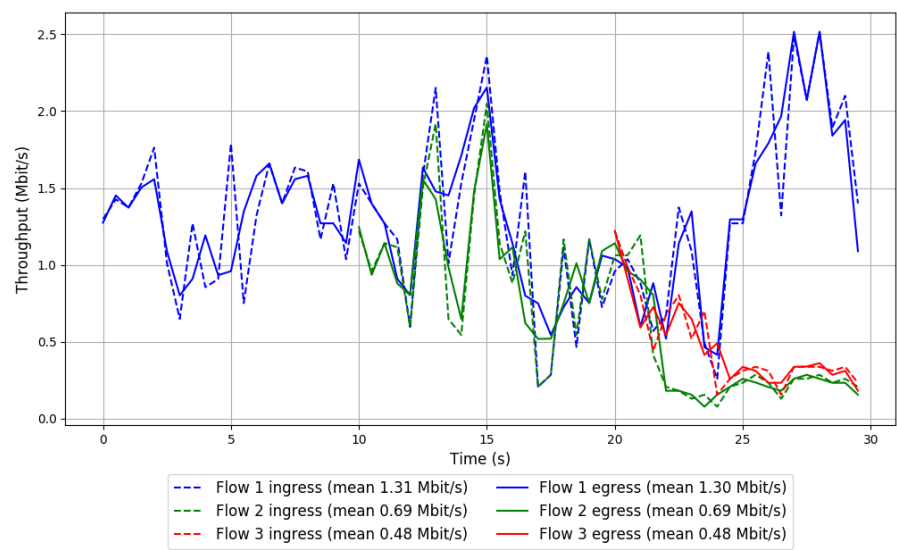```

Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2018-02-27 10:11:21
End at: 2018-02-27 10:11:51
Local clock offset: 0.028 ms
Remote clock offset: -68.608 ms

Below is generated by plot.py at 2018-02-27 10:33:31
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.92 Mbit/s
95th percentile per-packet one-way delay: 215.704 ms
Loss rate: 0.59%
-- Flow 1:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 204.576 ms
Loss rate: 0.64%
-- Flow 2:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 248.667 ms
Loss rate: 0.37%
-- Flow 3:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 237.175 ms
Loss rate: 0.88%
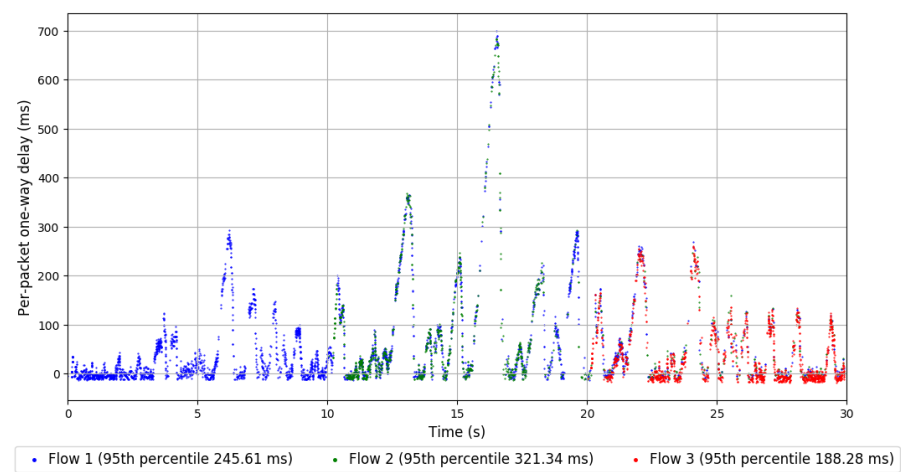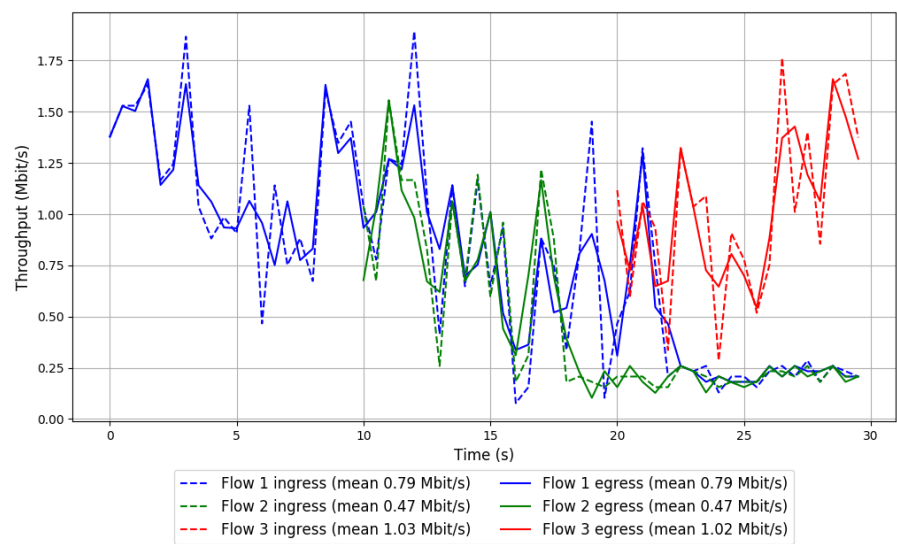```

Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-02-27 10:31:24
End at: 2018-02-27 10:31:54
Local clock offset: -0.738 ms
Remote clock offset: -59.181 ms


# Below is generated by plot.py at 2018-02-27 10:33:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 240.458 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 245.609 ms
Loss rate: 0.06%
-- Flow 2:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 321.344 ms
Loss rate: 0.32%
-- Flow 3:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 188.280 ms
Loss rate: 1.39%
```

Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 0.79 Mbit/s) Flow 1 egress (mean 0.79 Mbit/s)
Flow 2 ingress (mean 0.47 Mbit/s) Flow 2 egress (mean 0.47 Mbit/s)
Flow 3 ingress (mean 1.03 Mbit/s) Flow 3 egress (mean 1.02 Mbit/s)

Flow 1 (95th percentile 245.61 ms)   Flow 2 (95th percentile 321.34 ms)   Flow 3 (95th percentile 188.28 ms)
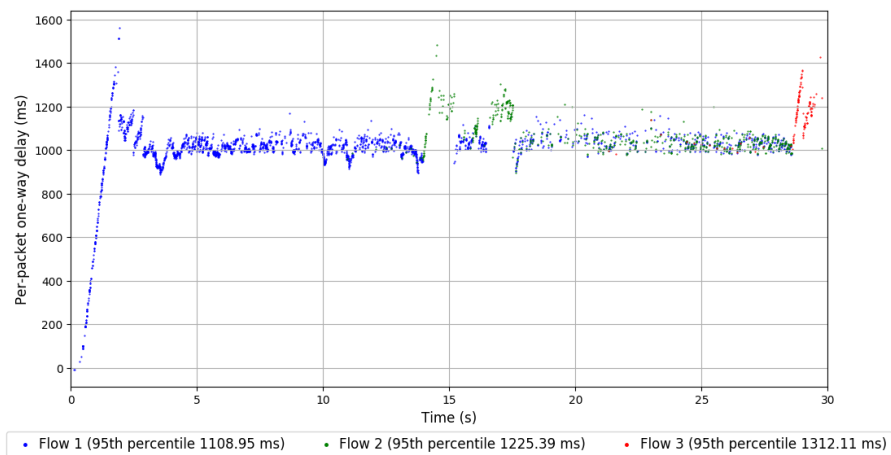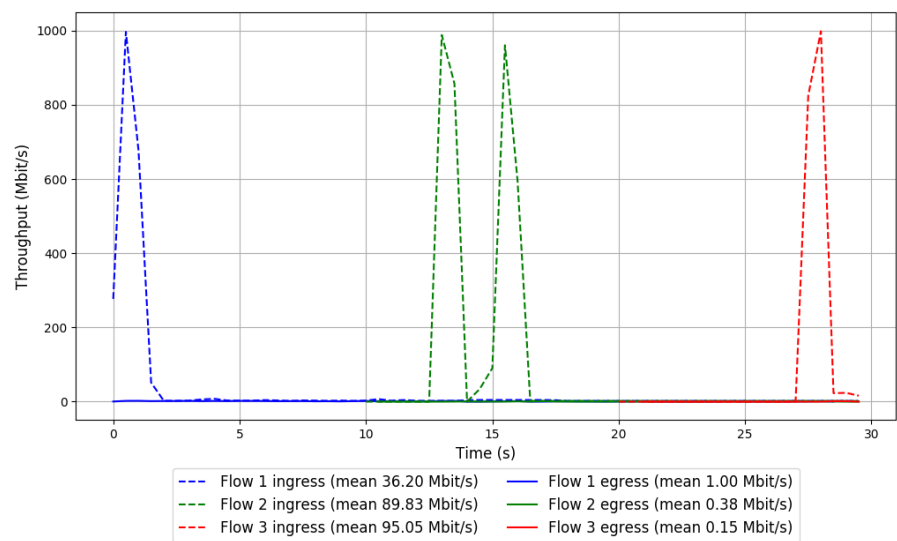
```
Run 1: Statistics of FillP

Start at: 2018-02-27 09:46:49
End at: 2018-02-27 09:47:19
Local clock offset: -0.594 ms
Remote clock offset: -68.372 ms

# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 1192.815 ms
Loss rate: 99.03%
-- Flow 1:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 1108.952 ms
Loss rate: 97.38%
-- Flow 2:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 1225.389 ms
Loss rate: 99.60%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 1312.111 ms
Loss rate: 99.86%
```

Run 1: Report of FillP — Data Link

Flow 1 ingress (mean 36.20 Mbit/s) — Flow 1 egress (mean 1.00 Mbit/s)
Flow 2 ingress (mean 89.83 Mbit/s) — Flow 2 egress (mean 0.38 Mbit/s)
Flow 3 ingress (mean 95.05 Mbit/s) — Flow 3 egress (mean 0.15 Mbit/s)

Flow 1 (95th percentile 1108.95 ms) • Flow 2 (95th percentile 1225.39 ms) • Flow 3 (95th percentile 1312.11 ms)
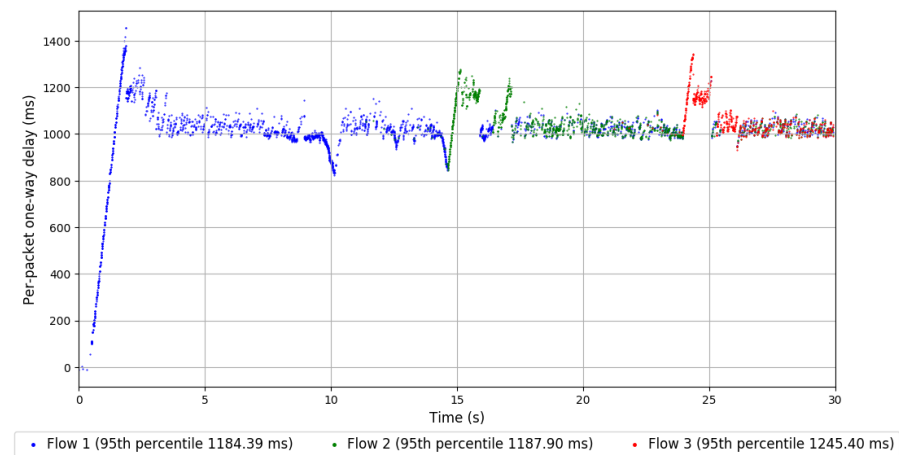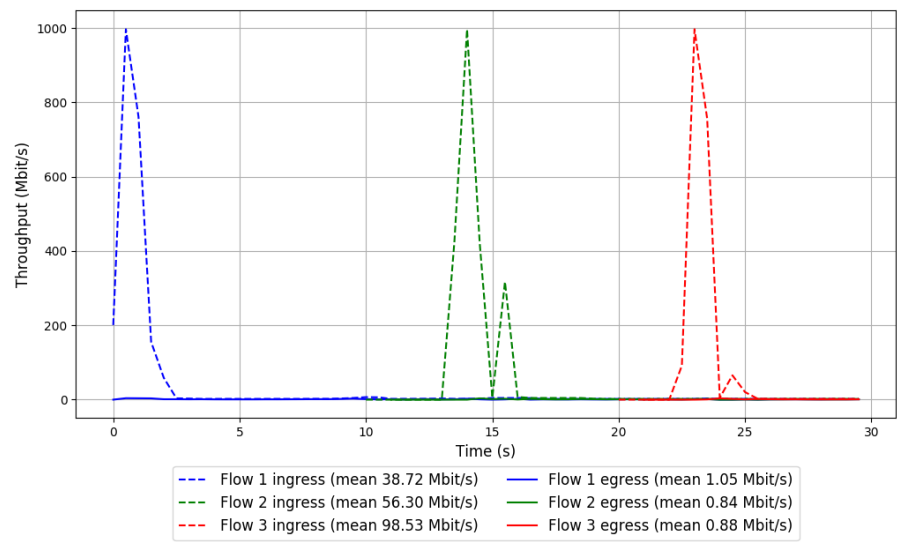
```
Run 2: Statistics of FillP

Start at: 2018-02-27 10:06:53
End at: 2018-02-27 10:07:23
Local clock offset: -2.661 ms
Remote clock offset: -69.064 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 1194.757 ms
Loss rate: 98.33%
-- Flow 1:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 1184.389 ms
Loss rate: 97.30%
-- Flow 2:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 1187.897 ms
Loss rate: 98.61%
-- Flow 3:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 1245.397 ms
Loss rate: 99.22%
```
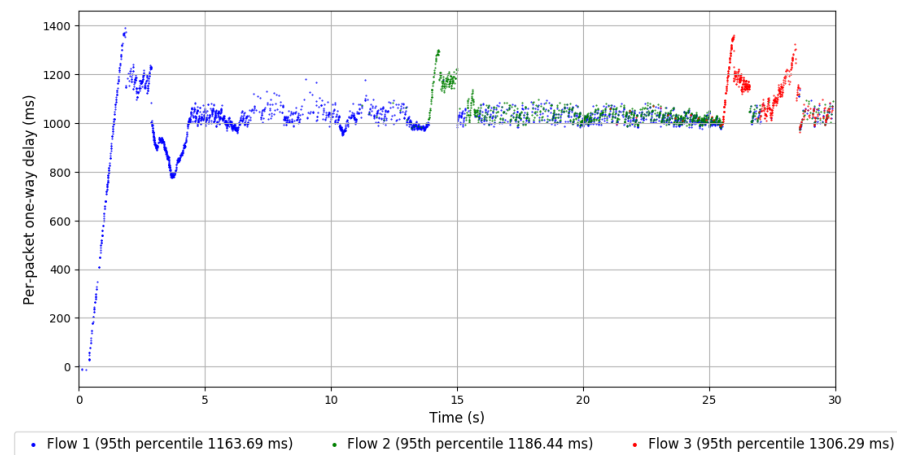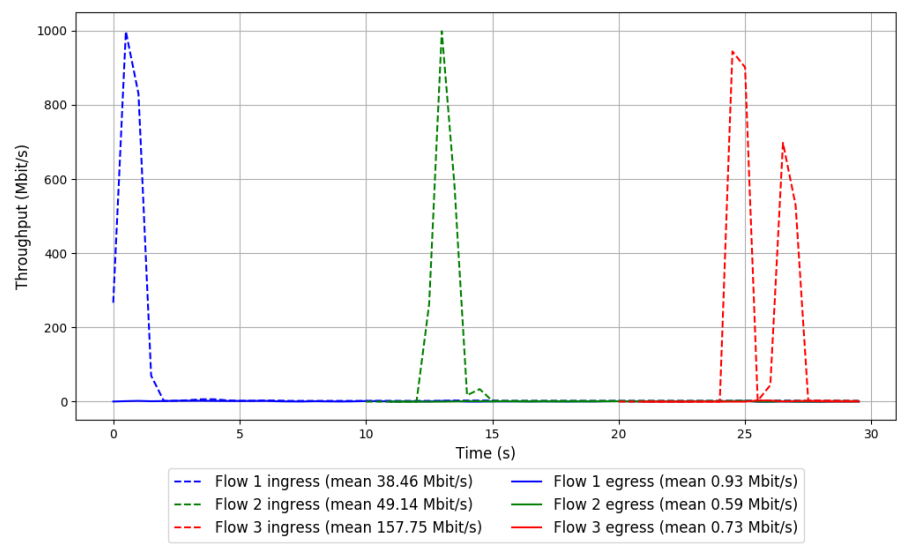
Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-02-27 10:26:54
End at: 2018-02-27 10:27:24
Local clock offset: -0.083 ms
Remote clock offset: -57.532 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 1199.922 ms
Loss rate: 98.78%
-- Flow 1:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 1163.692 ms
Loss rate: 97.60%
-- Flow 2:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1186.442 ms
Loss rate: 98.87%
-- Flow 3:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 1306.286 ms
Loss rate: 99.59%
```

Run 3: Report of FillP — Data Link

Flow 1 ingress (mean 38.46 Mbit/s) — Flow 1 egress (mean 0.93 Mbit/s)
Flow 2 ingress (mean 49.14 Mbit/s) — Flow 2 egress (mean 0.59 Mbit/s)
Flow 3 ingress (mean 157.75 Mbit/s) — Flow 3 egress (mean 0.73 Mbit/s)

Flow 1 (95th percentile 1163.69 ms)   Flow 2 (95th percentile 1186.44 ms)   Flow 3 (95th percentile 1306.29 ms)
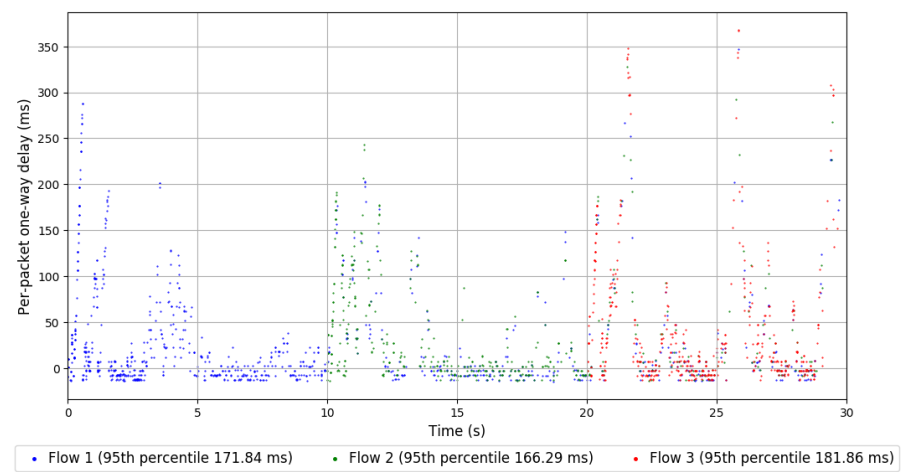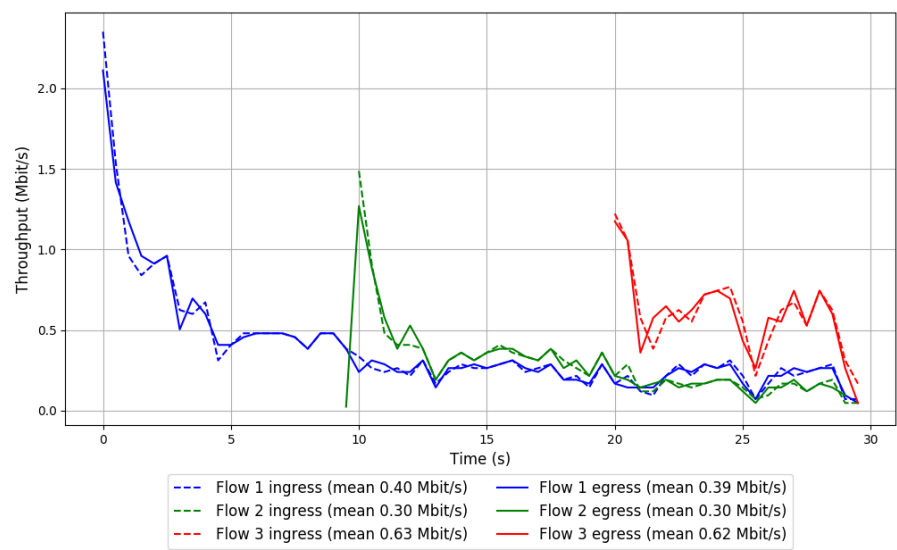
```
Run 1: Statistics of Indigo-1-32

Start at: 2018-02-27 09:39:00
End at: 2018-02-27 09:39:30
Local clock offset: 2.319 ms
Remote clock offset: -67.16 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 176.482 ms
Loss rate: 0.82%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 171.835 ms
Loss rate: 0.41%
-- Flow 2:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 166.288 ms
Loss rate: 0.83%
-- Flow 3:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 181.861 ms
Loss rate: 1.59%
```

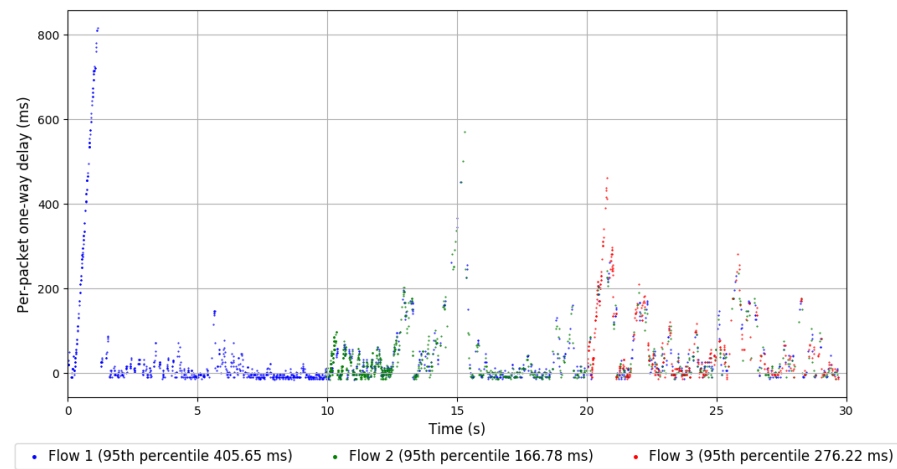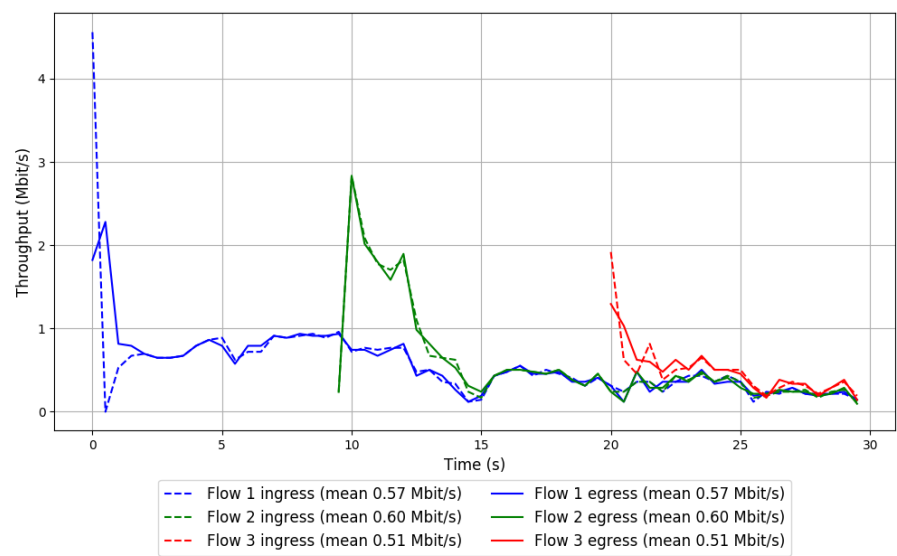Run 1: Report of Indigo-1-32 — Data Link

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

Start at: 2018-02-27 09:59:06
End at: 2018-02-27 09:59:36
Local clock offset: -1.969 ms
Remote clock offset: -68.654 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 256.463 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 405.648 ms
Loss rate: 0.35%
-- Flow 2:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 166.777 ms
Loss rate: 0.30%
-- Flow 3:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 276.216 ms
Loss rate: 0.97%
```

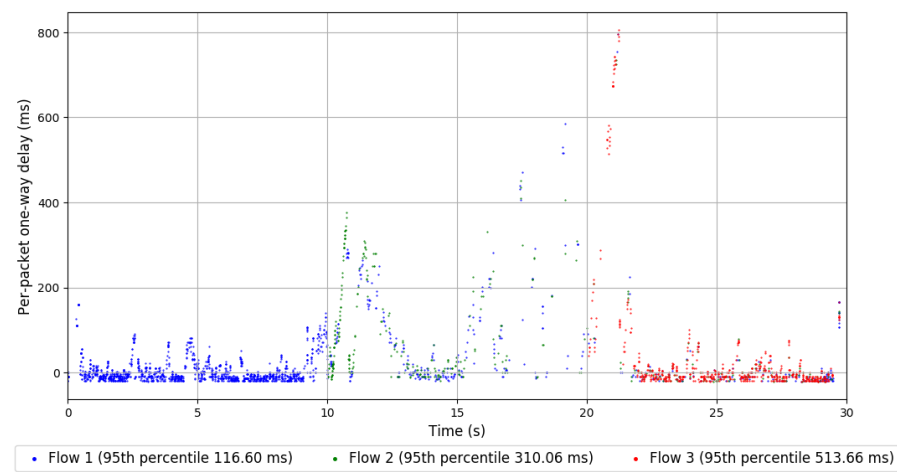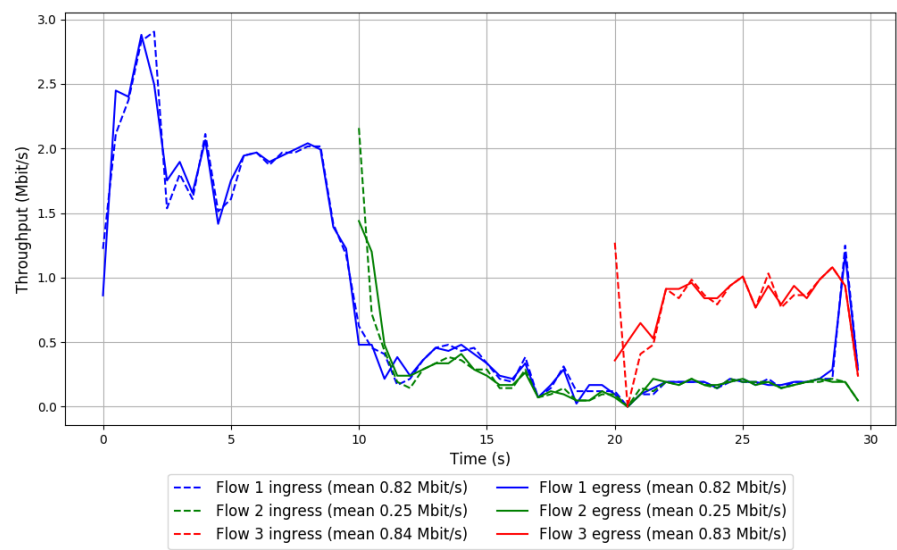# Run 2: Report of Indigo-1-32 — Data Link

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

Start at: 2018-02-27 10:19:08
End at: 2018-02-27 10:19:38
Local clock offset: -0.116 ms
Remote clock offset: -66.401 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 190.495 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 116.596 ms
Loss rate: 0.10%
-- Flow 2:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 310.065 ms
Loss rate: 0.49%
-- Flow 3:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 513.656 ms
Loss rate: 0.45%
```

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

Flow 1 ingress (mean 0.82 Mbit/s)   Flow 1 egress (mean 0.82 Mbit/s)
Flow 2 ingress (mean 0.25 Mbit/s)   Flow 2 egress (mean 0.25 Mbit/s)
Flow 3 ingress (mean 0.84 Mbit/s)   Flow 3 egress (mean 0.83 Mbit/s)

Flow 1 (95th percentile 116.60 ms)   Flow 2 (95th percentile 310.06 ms)   Flow 3 (95th percentile 513.66 ms)
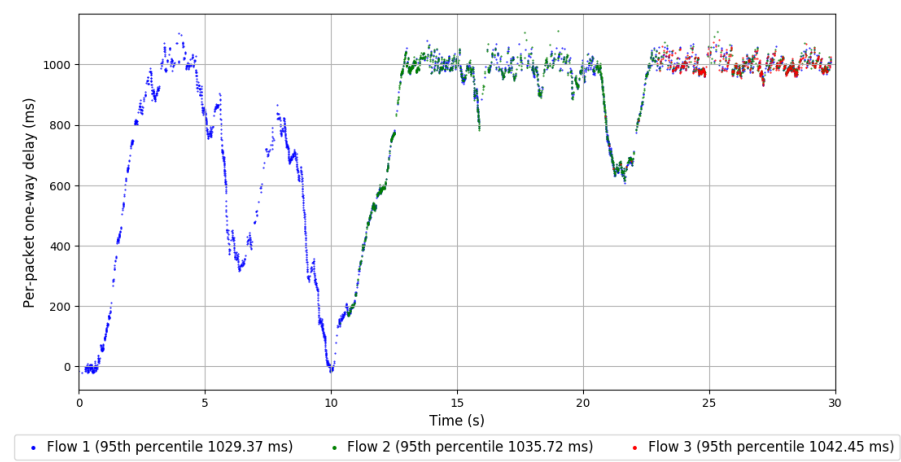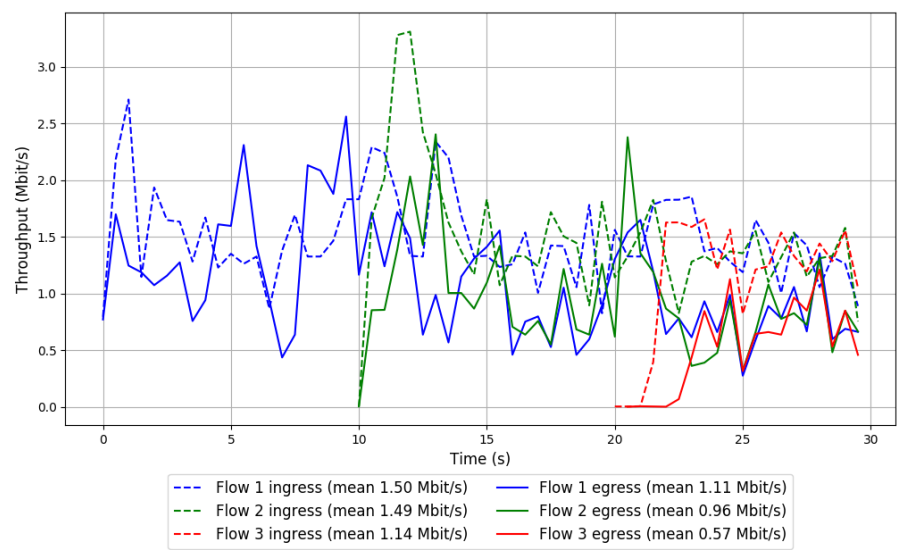
```
Run 1: Statistics of Vivace-latency

Start at: 2018-02-27 09:33:27
End at: 2018-02-27 09:33:57
Local clock offset: -1.896 ms
Remote clock offset: -76.852 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 1033.356 ms
Loss rate: 33.42%
-- Flow 1:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 1029.368 ms
Loss rate: 26.35%
-- Flow 2:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 1035.725 ms
Loss rate: 36.13%
-- Flow 3:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 1042.455 ms
Loss rate: 54.61%
```

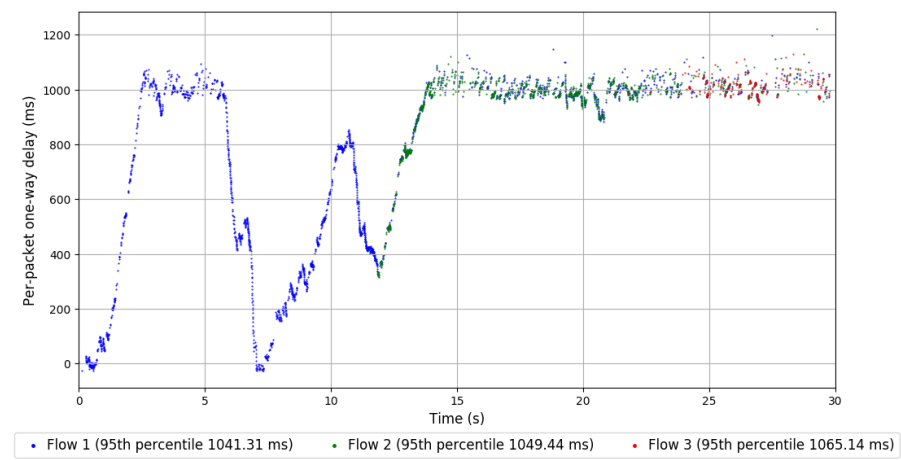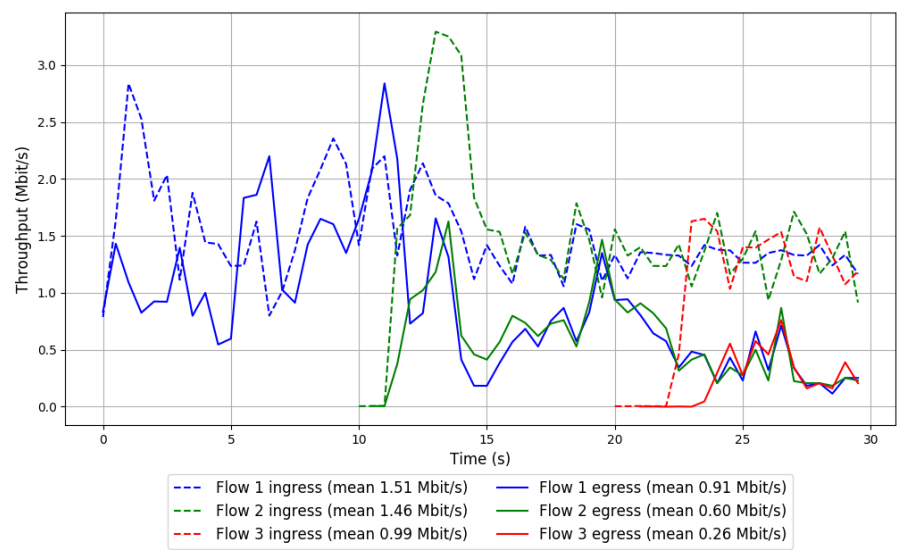Run 1: Report of Vivace-latency — Data Link

```
Run 2: Statistics of Vivace-latency

Start at: 2018-02-27 09:53:32
End at: 2018-02-27 09:54:02
Local clock offset: 0.65 ms
Remote clock offset: -79.766 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 1046.443 ms
Loss rate: 51.51%
-- Flow 1:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 1041.306 ms
Loss rate: 40.23%
-- Flow 2:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1049.445 ms
Loss rate: 60.41%
-- Flow 3:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 1065.140 ms
Loss rate: 77.26%
```

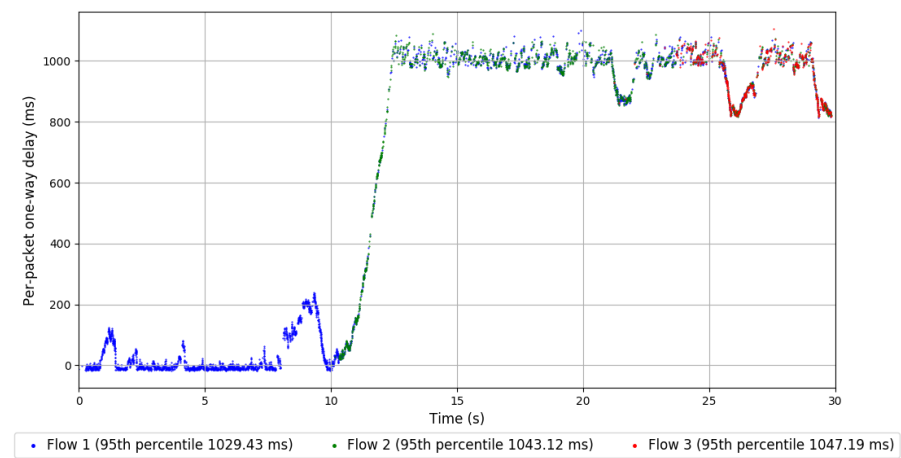Run 2: Report of Vivace-latency — Data Link

```
Run 3: Statistics of Vivace-latency

Start at: 2018-02-27 10:13:35
End at: 2018-02-27 10:14:05
Local clock offset: 0.637 ms
Remote clock offset: -64.314 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.90 Mbit/s
95th percentile per-packet one-way delay: 1036.529 ms
Loss rate: 30.78%
-- Flow 1:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 1029.435 ms
Loss rate: 23.98%
-- Flow 2:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 1043.116 ms
Loss rate: 36.48%
-- Flow 3:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 1047.188 ms
Loss rate: 44.30%
```
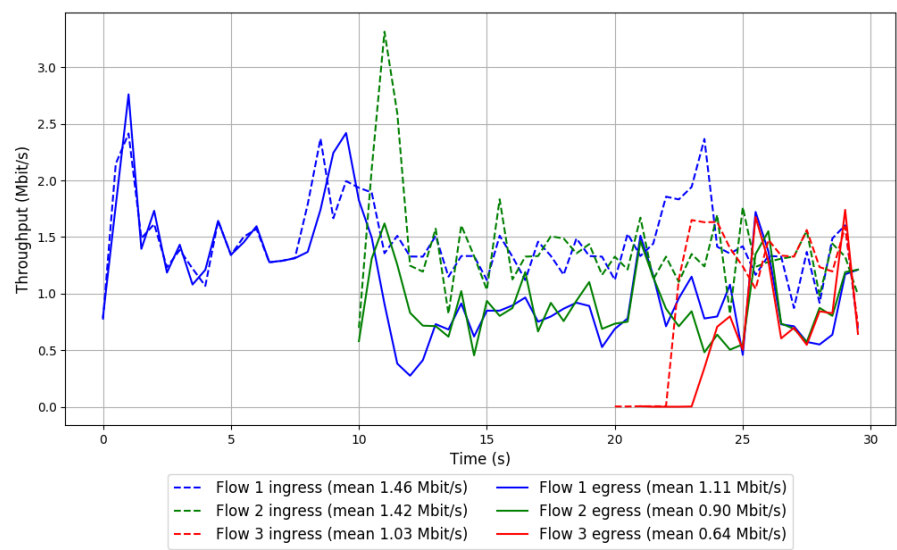
Run 3: Report of Vivace-latency — Data Link

```
Run 1: Statistics of Vivace-loss

Start at: 2018-02-27 09:32:19
End at: 2018-02-27 09:32:49
Local clock offset: 3.857 ms
Remote clock offset: -69.515 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 1058.729 ms
Loss rate: 59.43%
-- Flow 1:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 1055.640 ms
Loss rate: 53.22%
-- Flow 2:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 1059.220 ms
Loss rate: 65.30%
-- Flow 3:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 1062.600 ms
Loss rate: 75.12%
```

Run 1: Report of Vivace-loss — Data Link

Flow 1 ingress (mean 1.72 Mbit/s) --- Flow 1 egress (mean 0.81 Mbit/s)
Flow 2 ingress (mean 1.32 Mbit/s) --- Flow 2 egress (mean 0.49 Mbit/s)
Flow 3 ingress (mean 1.08 Mbit/s) --- Flow 3 egress (mean 0.30 Mbit/s)

Flow 1 (95th percentile 1055.64 ms) • Flow 2 (95th percentile 1059.22 ms) • Flow 3 (95th percentile 1062.60 ms)
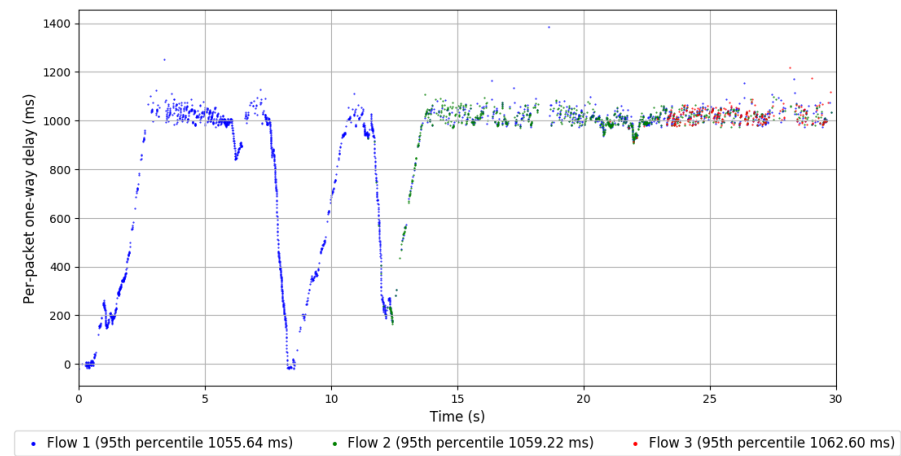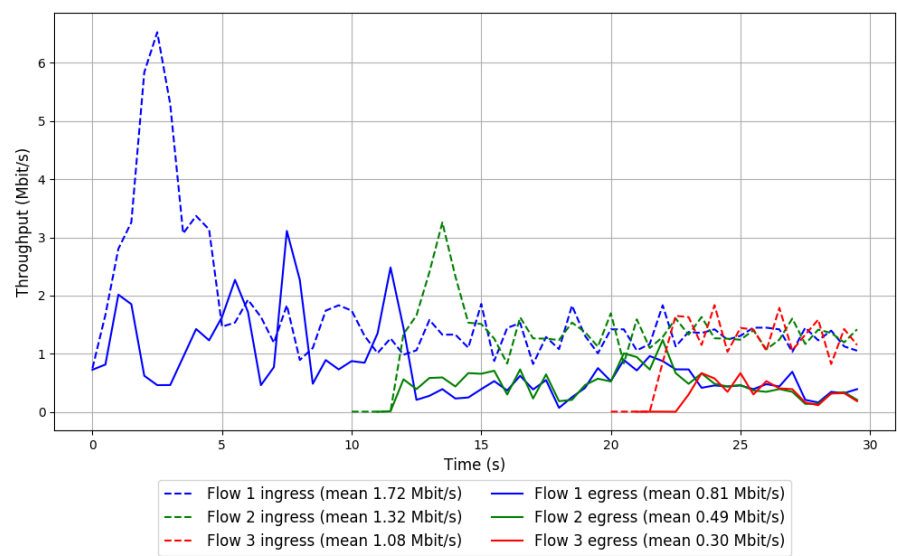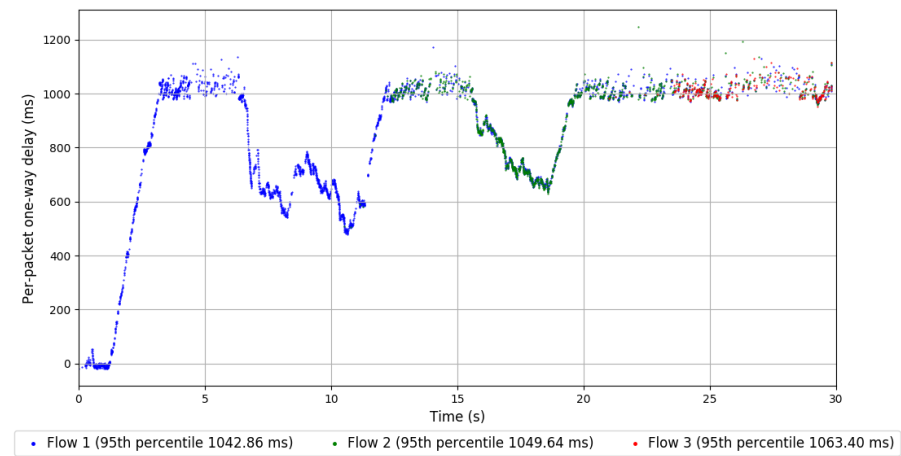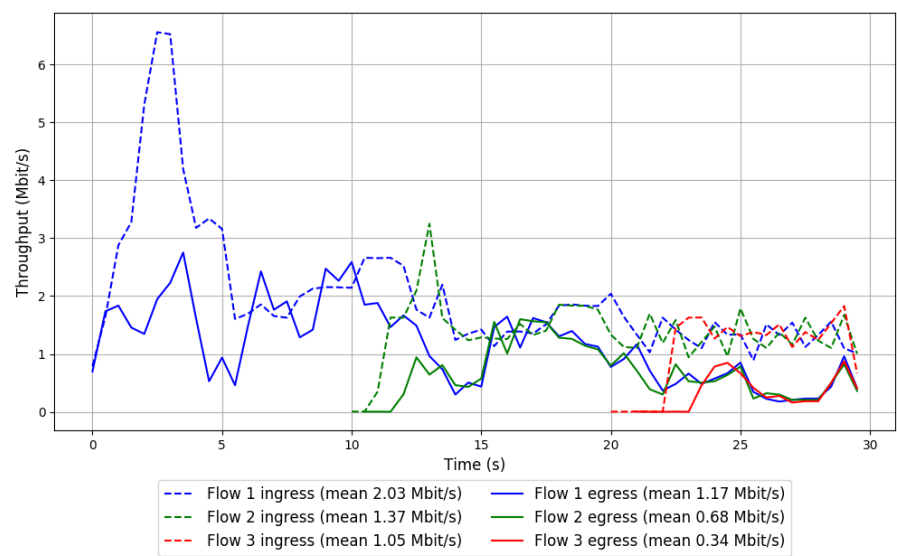
```
Run 2: Statistics of Vivace-loss

Start at: 2018-02-27 09:52:25
End at: 2018-02-27 09:52:55
Local clock offset: -2.132 ms
Remote clock offset: -75.71 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 1047.500 ms
Loss rate: 48.01%
-- Flow 1:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 1042.857 ms
Loss rate: 42.45%
-- Flow 2:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 1049.643 ms
Loss rate: 51.59%
-- Flow 3:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 1063.397 ms
Loss rate: 71.02%
```

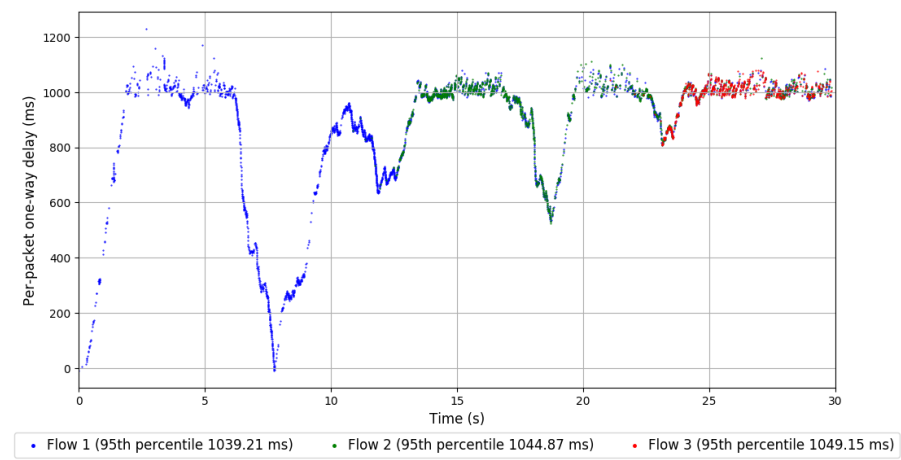Run 2: Report of Vivace-loss — Data Link

```
Run 3: Statistics of Vivace-loss

Start at: 2018-02-27 10:12:28
End at: 2018-02-27 10:12:58
Local clock offset: -1.942 ms
Remote clock offset: -64.961 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 1043.024 ms
Loss rate: 37.54%
-- Flow 1:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 1039.207 ms
Loss rate: 31.69%
-- Flow 2:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 1044.871 ms
Loss rate: 40.61%
-- Flow 3:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 1049.154 ms
Loss rate: 52.48%
```

Run 3: Report of Vivace-loss — Data Link

Flow 1 ingress (mean 1.80 Mbit/s)   Flow 1 egress (mean 1.23 Mbit/s)
Flow 2 ingress (mean 1.50 Mbit/s)   Flow 2 egress (mean 0.93 Mbit/s)
Flow 3 ingress (mean 1.52 Mbit/s)   Flow 3 egress (mean 0.81 Mbit/s)

Flow 1 (95th percentile 1039.21 ms)   Flow 2 (95th percentile 1044.87 ms)   Flow 3 (95th percentile 1049.15 ms)
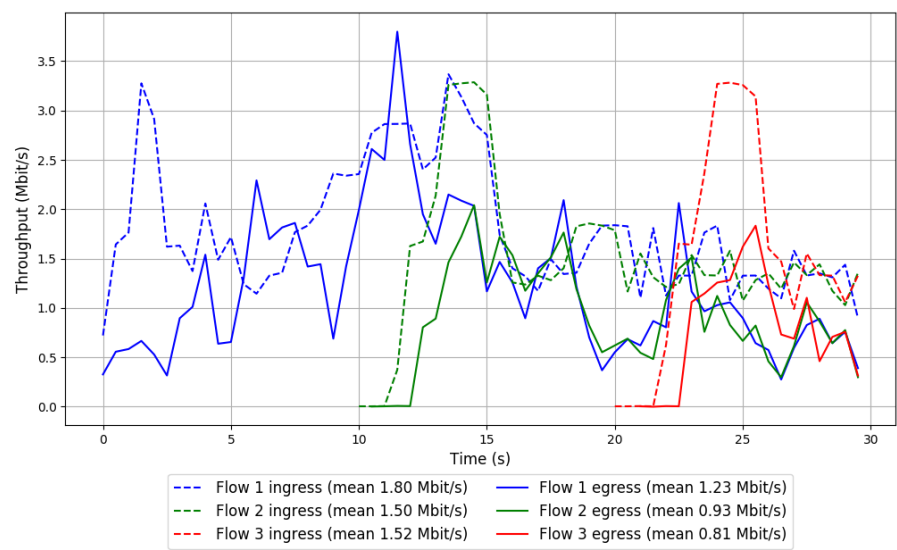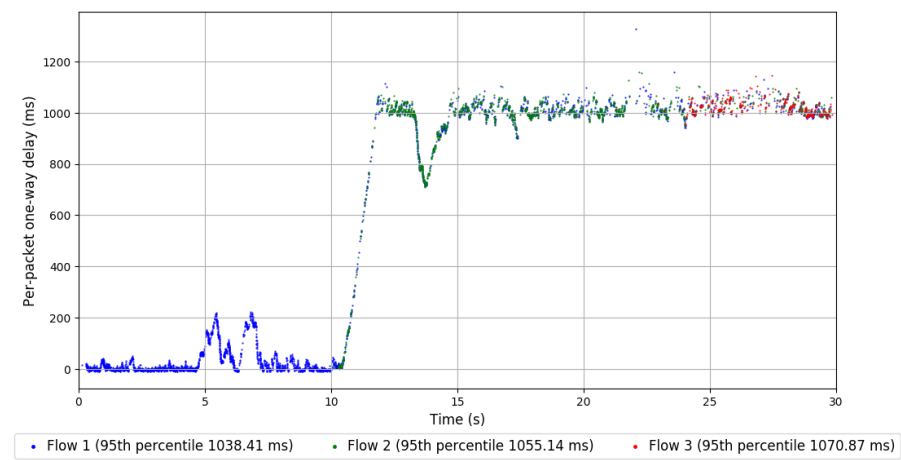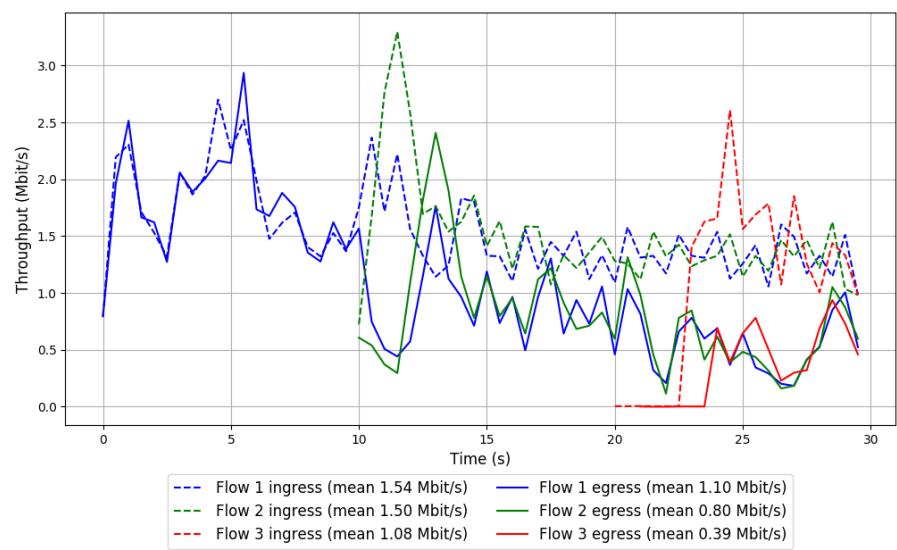
```
Run 1: Statistics of Vivace-LTE

Start at: 2018-02-27 09:41:14
End at: 2018-02-27 09:41:44
Local clock offset: -1.553 ms
Remote clock offset: -64.632 ms

# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.73 Mbit/s
95th percentile per-packet one-way delay: 1048.287 ms
Loss rate: 40.23%
-- Flow 1:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 1038.413 ms
Loss rate: 29.28%
-- Flow 2:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 1055.137 ms
Loss rate: 47.04%
-- Flow 3:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 1070.869 ms
Loss rate: 68.59%
```

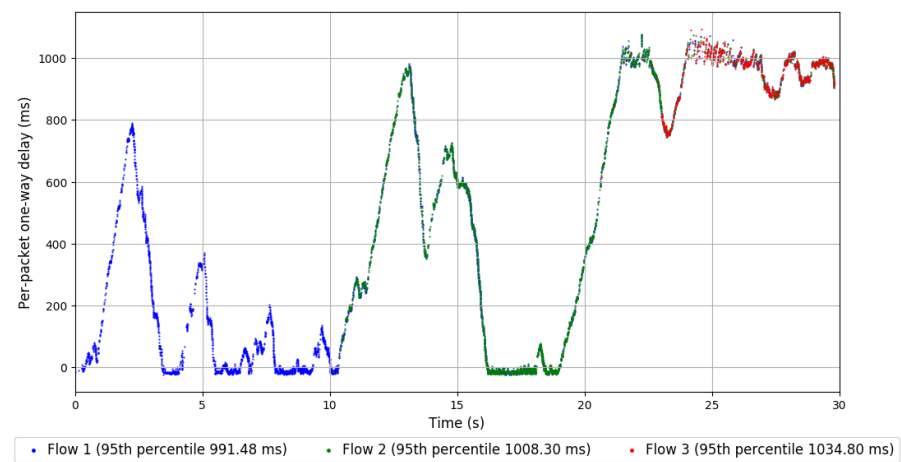Run 1: Report of Vivace-LTE — Data Link

```
Run 2: Statistics of Vivace-LTE

Start at: 2018-02-27 10:01:20
End at: 2018-02-27 10:01:50
Local clock offset: -1.369 ms
Remote clock offset: -75.139 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.84 Mbit/s
95th percentile per-packet one-way delay: 1006.079 ms
Loss rate: 15.48%
-- Flow 1:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 991.477 ms
Loss rate: 9.61%
-- Flow 2:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 1008.296 ms
Loss rate: 15.52%
-- Flow 3:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 1034.804 ms
Loss rate: 37.72%
```

Run 2: Report of Vivace-LTE — Data Link

Flow 1 ingress (mean 1.64 Mbit/s) — — — Flow 1 egress (mean 1.48 Mbit/s) ———
Flow 2 ingress (mean 1.94 Mbit/s) — — — Flow 2 egress (mean 1.65 Mbit/s) ———
Flow 3 ingress (mean 1.30 Mbit/s) — — — Flow 3 egress (mean 0.87 Mbit/s) ———

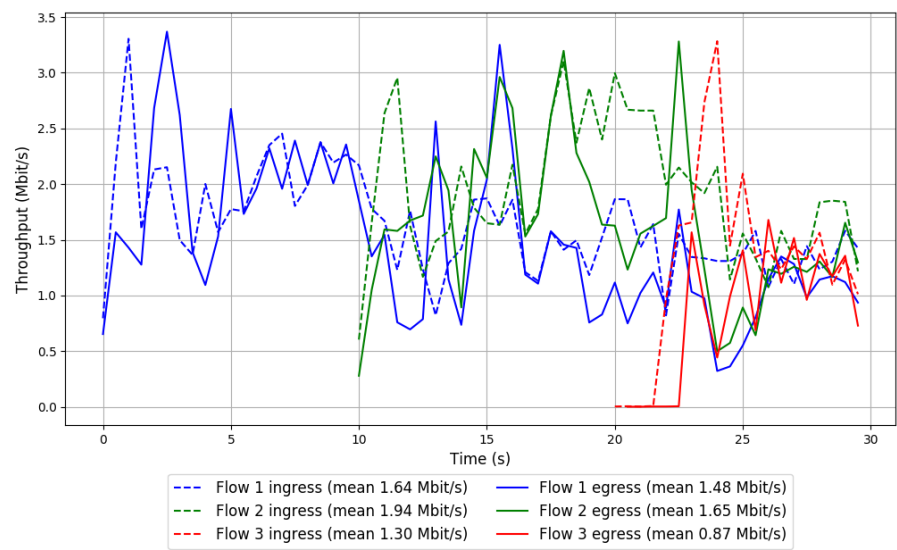• Flow 1 (95th percentile 991.48 ms)   • Flow 2 (95th percentile 1008.30 ms)   • Flow 3 (95th percentile 1034.80 ms)

```
Run 3: Statistics of Vivace-LTE

Start at: 2018-02-27 10:21:21
End at: 2018-02-27 10:21:51
Local clock offset: -1.473 ms
Remote clock offset: -68.222 ms


# Below is generated by plot.py at 2018-02-27 10:33:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.09 Mbit/s
95th percentile per-packet one-way delay: 1015.962 ms
Loss rate: 19.81%
-- Flow 1:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 1006.422 ms
Loss rate: 14.97%
-- Flow 2:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 1023.655 ms
Loss rate: 21.82%
-- Flow 3:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 1027.823 ms
Loss rate: 33.70%
```

Run 3: Report of Vivace-LTE — Data Link

- Flow 1 ingress (mean 2.04 Mbit/s)
- Flow 1 egress (mean 1.74 Mbit/s)
- Flow 2 ingress (mean 1.94 Mbit/s)
- Flow 2 egress (mean 1.54 Mbit/s)
- Flow 3 ingress (mean 1.59 Mbit/s)
- Flow 3 egress (mean 1.18 Mbit/s)

- Flow 1 (95th percentile 1006.42 ms)
- Flow 2 (95th percentile 1023.65 ms)
- Flow 3 (95th percentile 1027.82 ms)