Pantheon Report

Generated at 2018-02-19 21:04:08 (UTC).

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

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.

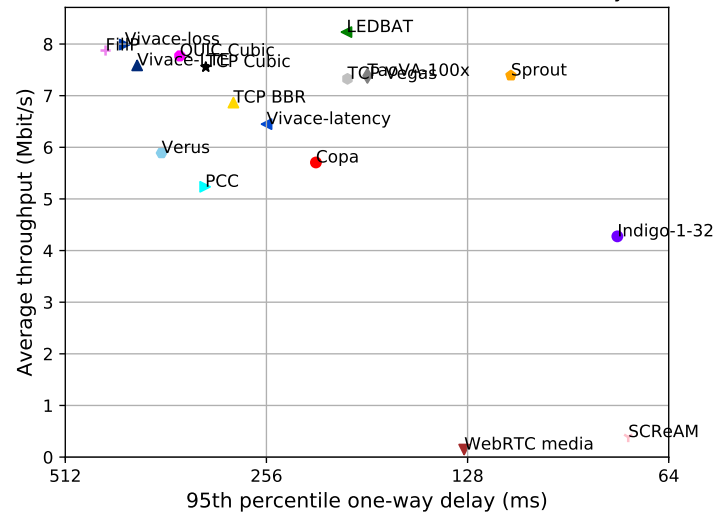Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

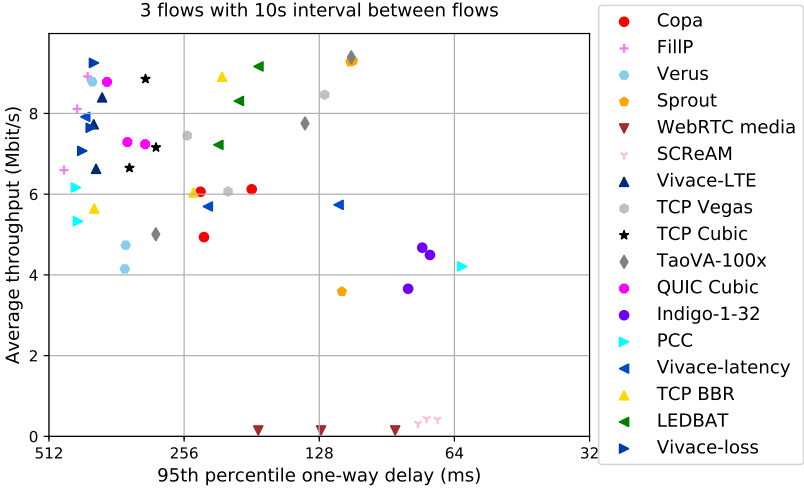NTP offsets were measured against `time.stanford.edu` and have been applied to correct the timestamps in logs.

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

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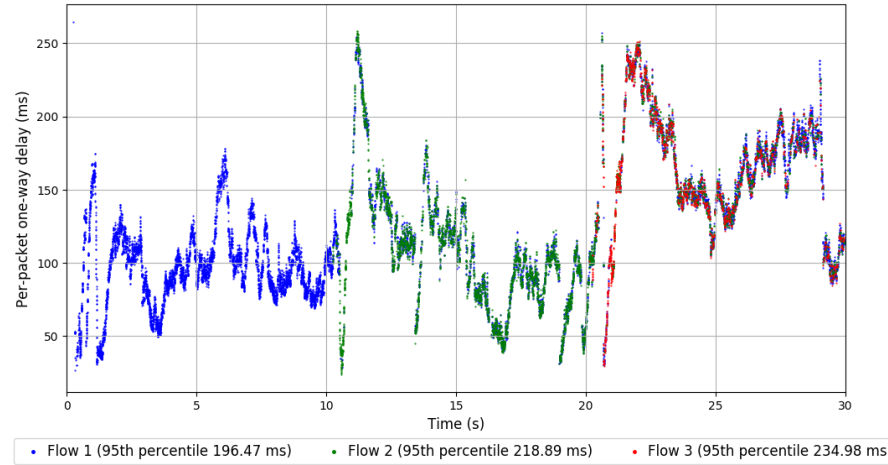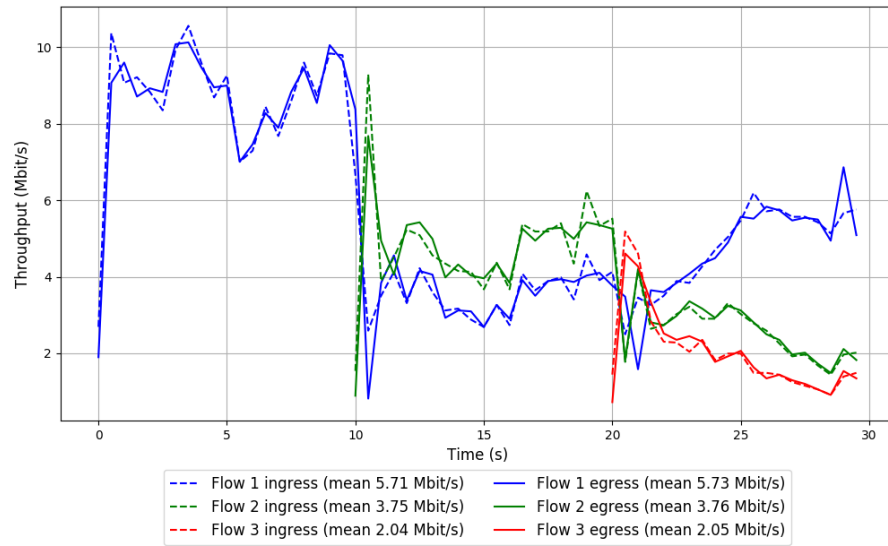3 flows with 10s interval between flows

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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	3.92	2.94	3.05	244.80	283.03	316.10	1.14	2.54	5.11
TCP Cubic	3	5.48	2.02	2.31	316.03	307.19	303.03	1.33	2.09	4.84
LEDBAT	3	5.46	3.31	1.81	186.90	202.11	204.90	0.15	0.75	2.32
PCC	3	3.07	2.40	1.74	308.81	317.90	351.22	8.99	13.29	31.96
QUIC Cubic	3	6.27	1.54	1.48	343.73	357.55	332.86	2.54	4.47	6.76
SCReAM	3	0.18	0.21	0.22	74.85	71.18	73.08	0.19	0.38	0.60
WebRTC media	3	0.05	0.05	0.05	116.35	128.21	115.78	2.76	0.03	0.07
Sprout	3	4.23	3.40	2.79	106.75	111.68	117.01	1.14	1.20	1.94
TaoVA-100x	3	4.06	3.45	3.13	180.56	178.67	181.33	1.11	1.58	3.77
TCP Vegas	3	4.20	2.07	5.30	201.55	146.28	95.98	0.09	0.29	0.33
Verus	3	3.96	2.29	1.62	358.95	385.60	369.28	22.90	37.14	25.02
Copa	3	3.07	2.89	2.21	161.95	228.25	195.42	0.38	1.28	1.88
FillP	3	5.82	2.02	2.37	440.98	450.39	473.64	63.01	93.07	96.38
Indigo-1-32	3	2.10	2.02	2.51	76.59	77.46	72.34	0.41	0.57	0.49
Vivace-latency	3	4.26	2.37	1.93	238.42	264.25	280.78	5.45	8.04	9.87
Vivace-loss	3	5.77	2.70	1.40	417.01	417.82	394.54	28.26	20.01	19.67
Vivace-LTE	3	5.31	2.15	2.69	397.00	405.37	404.71	7.85	10.38	10.78

```
Run 1: Statistics of TCP BBR

Start at: 2018-02-19 19:01:20
End at: 2018-02-19 19:01:50
Local clock offset: 1.377 ms
Remote clock offset: -6.669 ms


# Below is generated by plot.py at 2018-02-19 21:03:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.91 Mbit/s
95th percentile per-packet one-way delay: 210.736 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 5.73 Mbit/s
95th percentile per-packet one-way delay: 196.465 ms
Loss rate: 0.51%
-- Flow 2:
Average throughput: 3.76 Mbit/s
95th percentile per-packet one-way delay: 218.891 ms
Loss rate: 0.42%
-- Flow 3:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 234.984 ms
Loss rate: 1.07%
```

Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2018-02-19 19:25:07
End at: 2018-02-19 19:25:37
Local clock offset: -0.247 ms
Remote clock offset: -6.839 ms


# Below is generated by plot.py at 2018-02-19 21:03:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.64 Mbit/s
95th percentile per-packet one-way delay: 405.785 ms
Loss rate: 5.69%
-- Flow 1:
Average throughput: 2.90 Mbit/s
95th percentile per-packet one-way delay: 343.218 ms
Loss rate: 2.37%
-- Flow 2:
Average throughput: 2.54 Mbit/s
95th percentile per-packet one-way delay: 401.063 ms
Loss rate: 6.31%
-- Flow 3:
Average throughput: 3.25 Mbit/s
95th percentile per-packet one-way delay: 428.138 ms
Loss rate: 12.84%
```
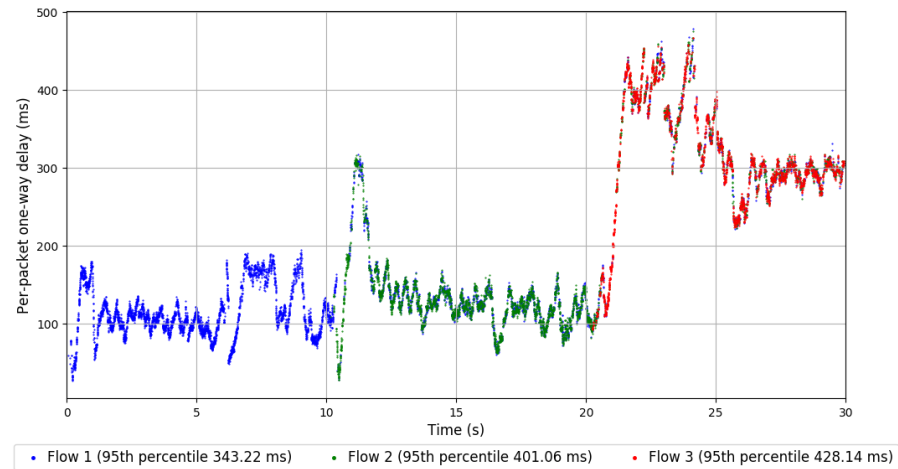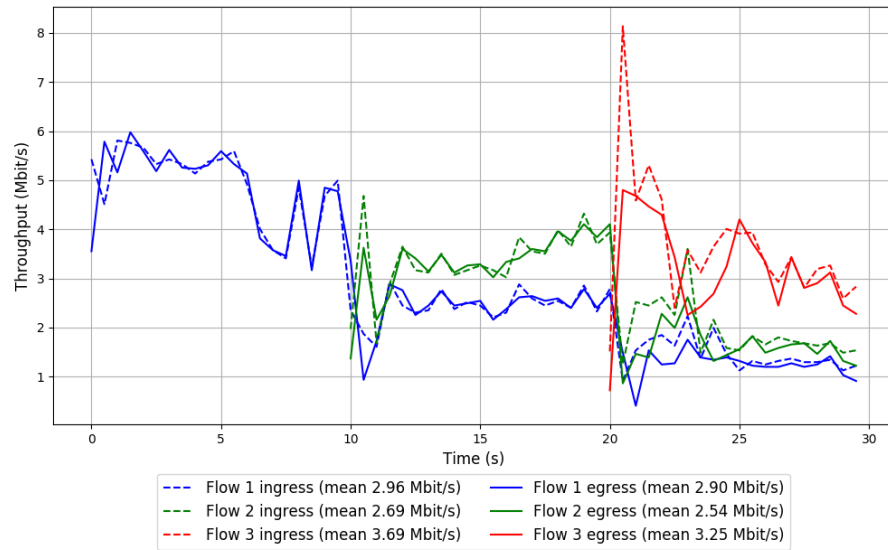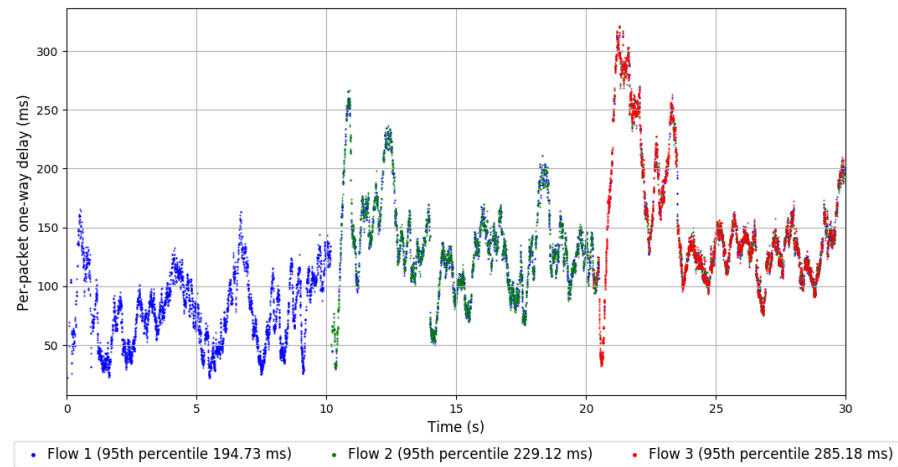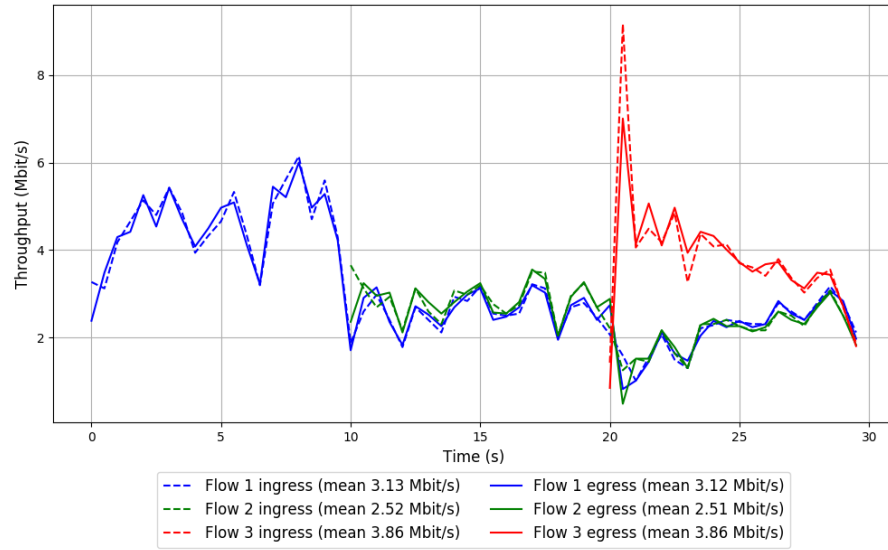
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2018-02-19 19:48:54
End at: 2018-02-19 19:49:24
Local clock offset: 0.277 ms
Remote clock offset: -7.118 ms


# Below is generated by plot.py at 2018-02-19 21:03:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.04 Mbit/s
95th percentile per-packet one-way delay: 244.027 ms
Loss rate: 0.82%
-- Flow 1:
Average throughput: 3.12 Mbit/s
95th percentile per-packet one-way delay: 194.728 ms
Loss rate: 0.55%
-- Flow 2:
Average throughput: 2.51 Mbit/s
95th percentile per-packet one-way delay: 229.124 ms
Loss rate: 0.88%
-- Flow 3:
Average throughput: 3.86 Mbit/s
95th percentile per-packet one-way delay: 285.181 ms
Loss rate: 1.41%
```
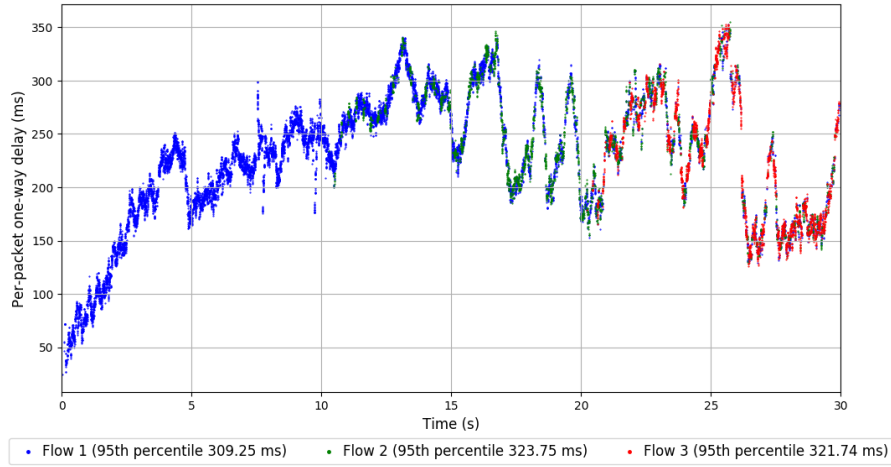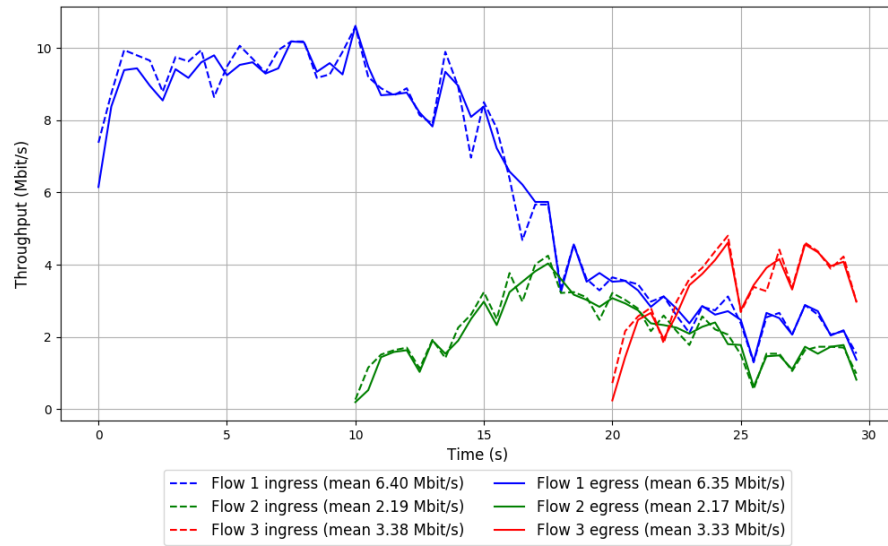
Run 3: Report of TCP BBR — Data Link

```
Run 1: Statistics of TCP Cubic

Start at: 2018-02-19 18:57:24
End at: 2018-02-19 18:57:54
Local clock offset: 1.882 ms
Remote clock offset: -6.874 ms


# Below is generated by plot.py at 2018-02-19 21:03:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.85 Mbit/s
95th percentile per-packet one-way delay: 312.066 ms
Loss rate: 1.35%
-- Flow 1:
Average throughput: 6.35 Mbit/s
95th percentile per-packet one-way delay: 309.253 ms
Loss rate: 0.86%
-- Flow 2:
Average throughput: 2.17 Mbit/s
95th percentile per-packet one-way delay: 323.751 ms
Loss rate: 2.07%
-- Flow 3:
Average throughput: 3.33 Mbit/s
95th percentile per-packet one-way delay: 321.743 ms
Loss rate: 3.23%
```

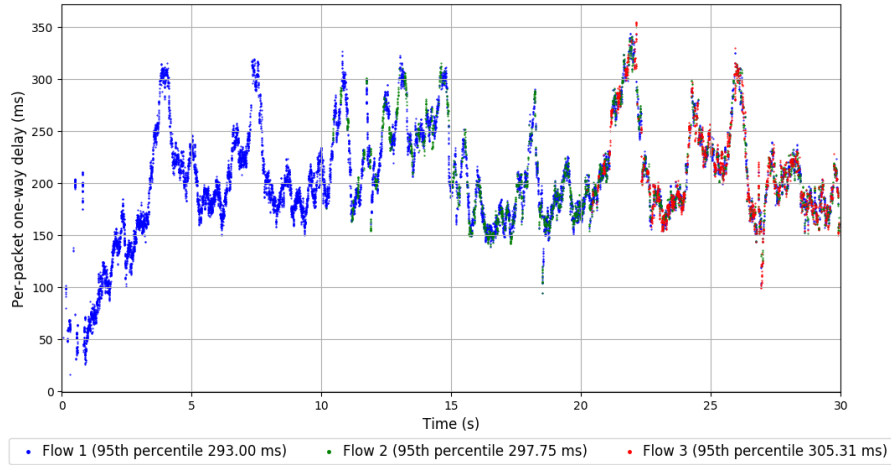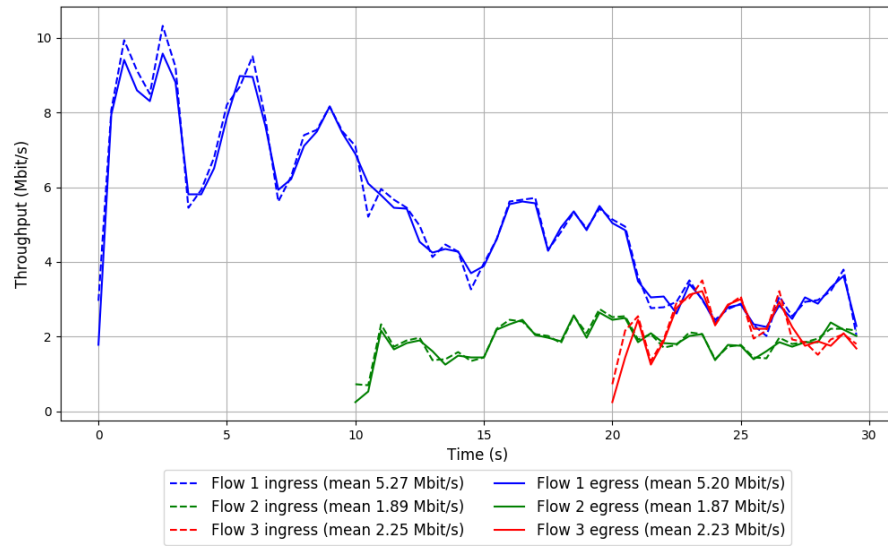Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-02-19 19:21:10
End at: 2018-02-19 19:21:40
Local clock offset: -0.077 ms
Remote clock offset: -6.763 ms


# Below is generated by plot.py at 2018-02-19 21:03:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.16 Mbit/s
95th percentile per-packet one-way delay: 295.697 ms
Loss rate: 1.75%
-- Flow 1:
Average throughput: 5.20 Mbit/s
95th percentile per-packet one-way delay: 292.998 ms
Loss rate: 1.47%
-- Flow 2:
Average throughput: 1.87 Mbit/s
95th percentile per-packet one-way delay: 297.752 ms
Loss rate: 2.01%
-- Flow 3:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 305.313 ms
Loss rate: 3.27%
```

Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 5.27 Mbit/s)   Flow 1 egress (mean 5.20 Mbit/s)
Flow 2 ingress (mean 1.89 Mbit/s)   Flow 2 egress (mean 1.87 Mbit/s)
Flow 3 ingress (mean 2.25 Mbit/s)   Flow 3 egress (mean 2.23 Mbit/s)

Flow 1 (95th percentile 293.00 ms)   Flow 2 (95th percentile 297.75 ms)   Flow 3 (95th percentile 305.31 ms)
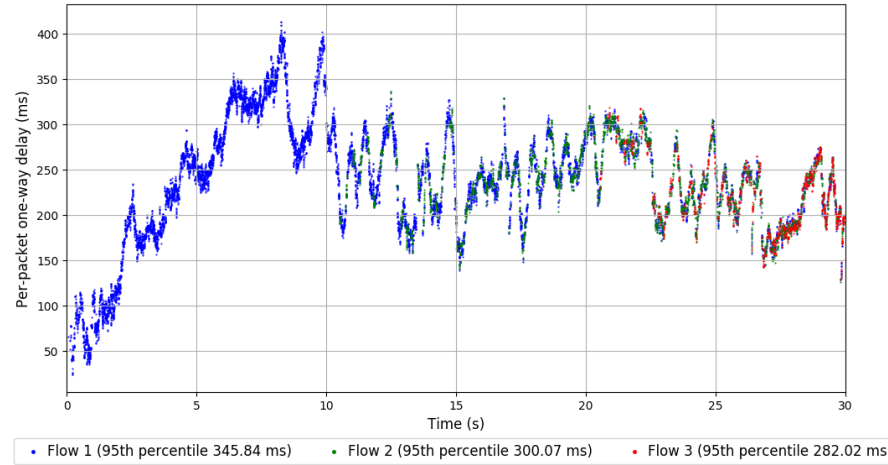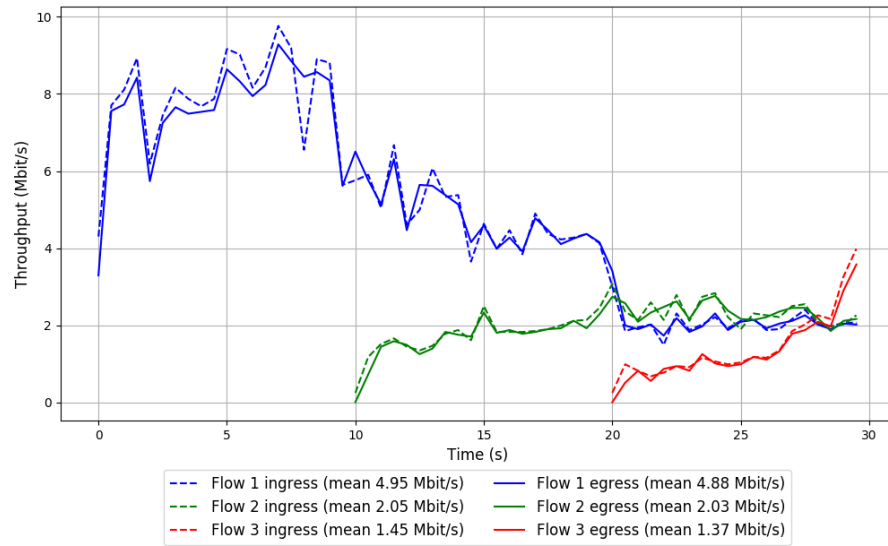
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```
Run 3: Statistics of TCP Cubic

Start at: 2018-02-19 19:44:56
End at: 2018-02-19 19:45:26
Local clock offset: 0.334 ms
Remote clock offset: -7.095 ms


# Below is generated by plot.py at 2018-02-19 21:03:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.65 Mbit/s
95th percentile per-packet one-way delay: 338.774 ms
Loss rate: 2.20%
-- Flow 1:
Average throughput: 4.88 Mbit/s
95th percentile per-packet one-way delay: 345.836 ms
Loss rate: 1.65%
-- Flow 2:
Average throughput: 2.03 Mbit/s
95th percentile per-packet one-way delay: 300.073 ms
Loss rate: 2.18%
-- Flow 3:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 282.021 ms
Loss rate: 8.01%
```

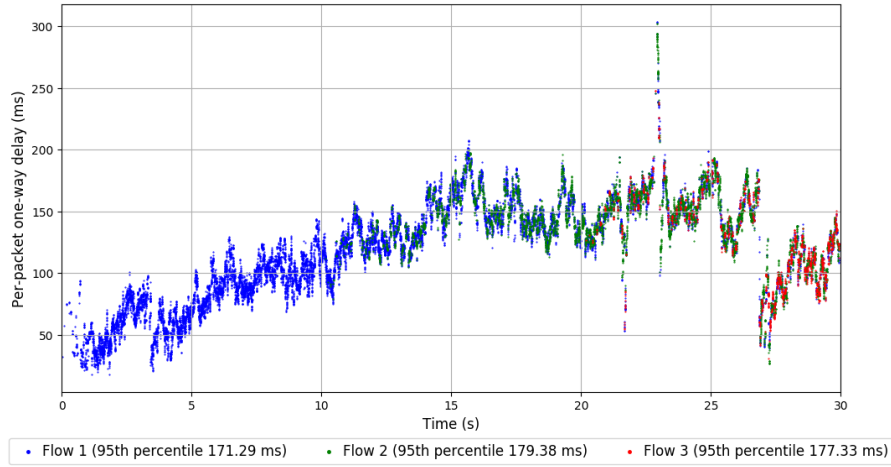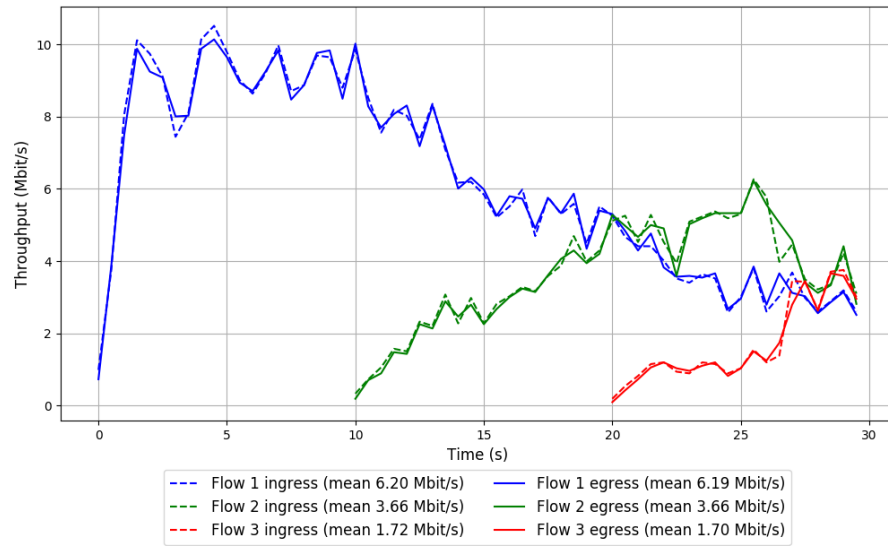Run 3: Report of TCP Cubic — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2018-02-19 18:46:49
End at: 2018-02-19 18:47:19
Local clock offset: 1.891 ms
Remote clock offset: -7.495 ms

# Below is generated by plot.py at 2018-02-19 21:03:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.16 Mbit/s
95th percentile per-packet one-way delay: 174.840 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 6.19 Mbit/s
95th percentile per-packet one-way delay: 171.290 ms
Loss rate: 0.23%
-- Flow 2:
Average throughput: 3.66 Mbit/s
95th percentile per-packet one-way delay: 179.375 ms
Loss rate: 0.69%
-- Flow 3:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 177.333 ms
Loss rate: 2.68%
```

Run 1: Report of LEDBAT — Data Link

Flow 1 ingress (mean 6.20 Mbit/s) — — —   Flow 1 egress (mean 6.19 Mbit/s) ———
Flow 2 ingress (mean 3.66 Mbit/s) — — —   Flow 2 egress (mean 3.66 Mbit/s) ———
Flow 3 ingress (mean 1.72 Mbit/s) — — —   Flow 3 egress (mean 1.70 Mbit/s) ———

• Flow 1 (95th percentile 171.29 ms)   • Flow 2 (95th percentile 179.38 ms)   • Flow 3 (95th percentile 177.33 ms)
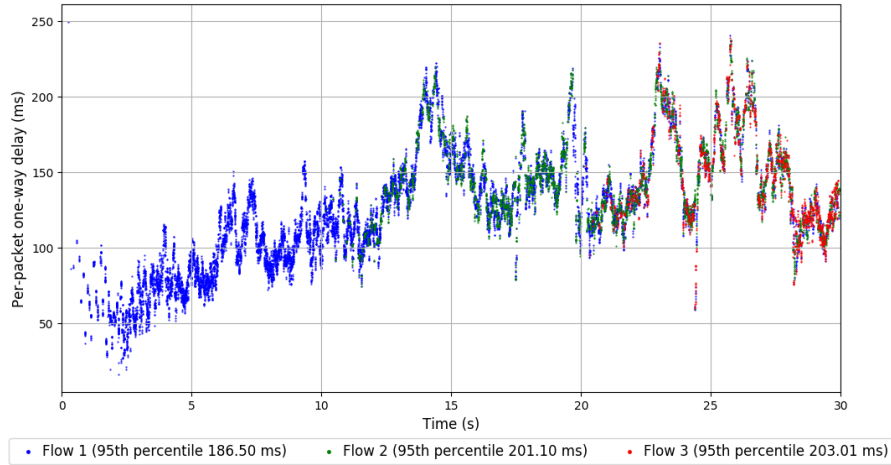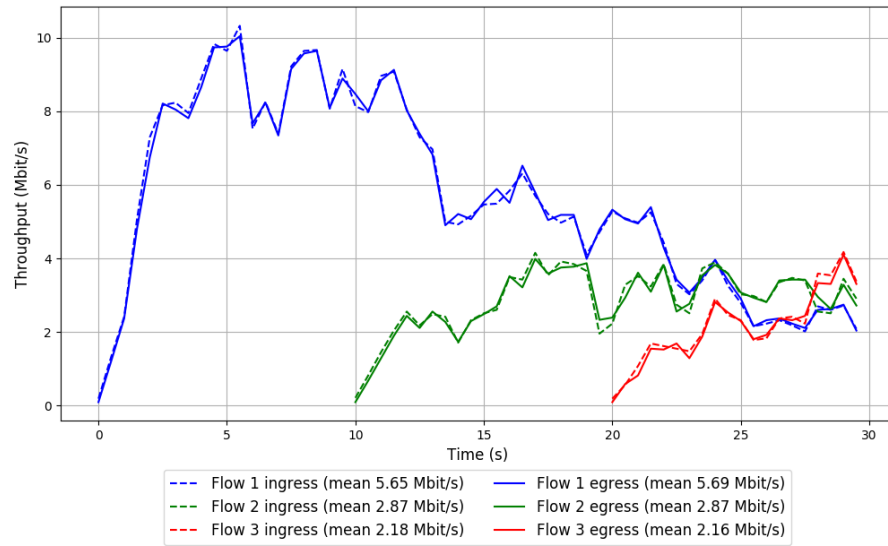
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```
Run 2: Statistics of LEDBAT

Start at: 2018-02-19 19:10:35
End at: 2018-02-19 19:11:05
Local clock offset: 0.437 ms
Remote clock offset: -6.486 ms

# Below is generated by plot.py at 2018-02-19 21:03:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.31 Mbit/s
95th percentile per-packet one-way delay: 193.310 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 5.69 Mbit/s
95th percentile per-packet one-way delay: 186.503 ms
Loss rate: 0.20%
-- Flow 2:
Average throughput: 2.87 Mbit/s
95th percentile per-packet one-way delay: 201.099 ms
Loss rate: 0.84%
-- Flow 3:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 203.013 ms
Loss rate: 2.61%
```

Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 5.65 Mbit/s) — — —   Flow 1 egress (mean 5.69 Mbit/s) ———
Flow 2 ingress (mean 2.87 Mbit/s) — — —   Flow 2 egress (mean 2.87 Mbit/s) ———
Flow 3 ingress (mean 2.18 Mbit/s) — — —   Flow 3 egress (mean 2.16 Mbit/s) ———

Flow 1 (95th percentile 186.50 ms)   Flow 2 (95th percentile 201.10 ms)   Flow 3 (95th percentile 203.01 ms)
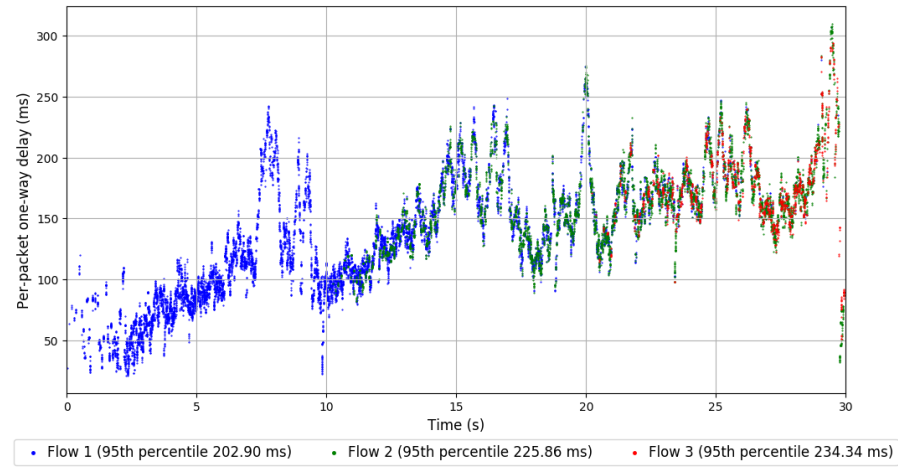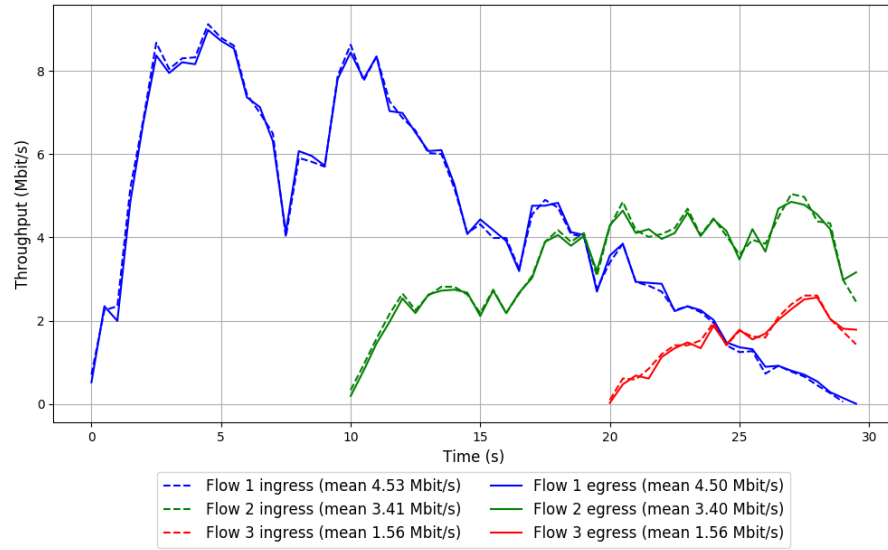
```
Run 3: Statistics of LEDBAT

Start at: 2018-02-19 19:34:21
End at: 2018-02-19 19:34:51
Local clock offset: -0.256 ms
Remote clock offset: -7.019 ms


# Below is generated by plot.py at 2018-02-19 21:03:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.22 Mbit/s
95th percentile per-packet one-way delay: 214.746 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 4.50 Mbit/s
95th percentile per-packet one-way delay: 202.895 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 3.40 Mbit/s
95th percentile per-packet one-way delay: 225.861 ms
Loss rate: 0.71%
-- Flow 3:
Average throughput: 1.56 Mbit/s
95th percentile per-packet one-way delay: 234.341 ms
Loss rate: 1.67%
```
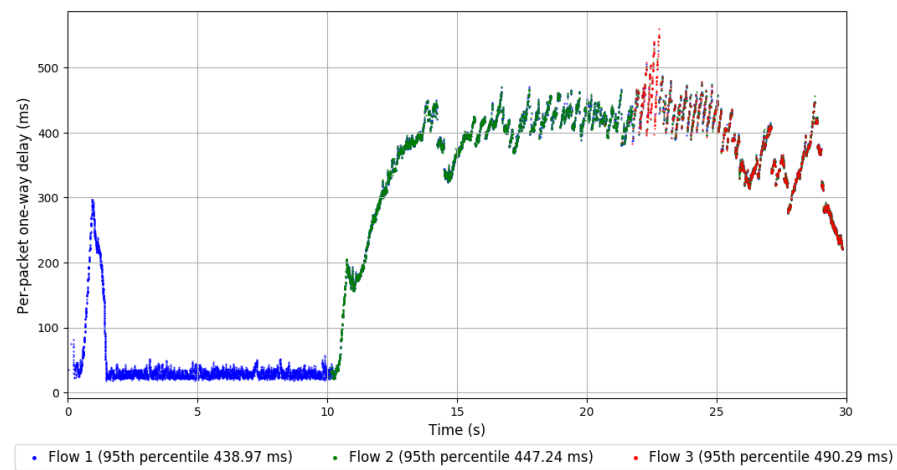
Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 4.53 Mbit/s) --- Flow 1 egress (mean 4.50 Mbit/s)
Flow 2 ingress (mean 3.41 Mbit/s) --- Flow 2 egress (mean 3.40 Mbit/s)
Flow 3 ingress (mean 1.56 Mbit/s) --- Flow 3 egress (mean 1.56 Mbit/s)

• Flow 1 (95th percentile 202.90 ms)   • Flow 2 (95th percentile 225.86 ms)   • Flow 3 (95th percentile 234.34 ms)
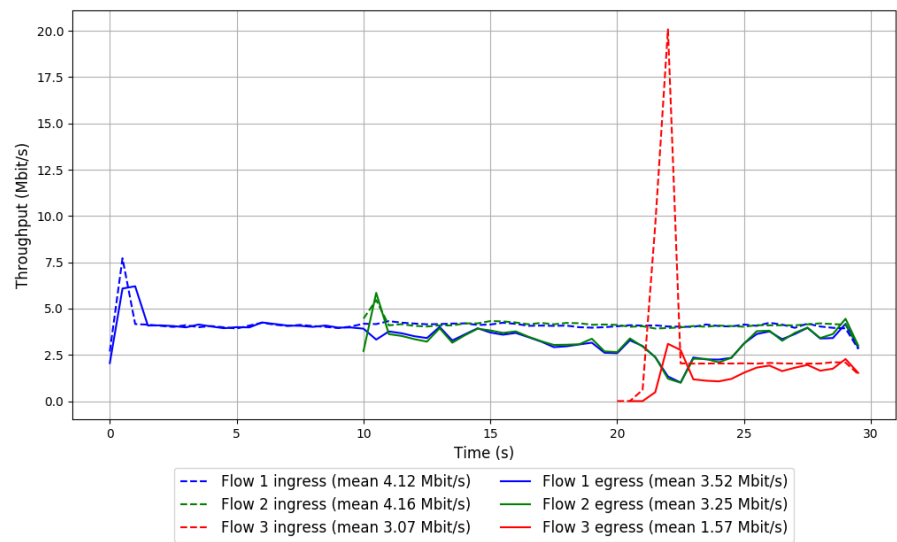
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```
Run 1: Statistics of PCC

Start at: 2018-02-19 18:40:13
End at: 2018-02-19 18:40:43
Local clock offset: 1.916 ms
Remote clock offset: -8.302 ms


# Below is generated by plot.py at 2018-02-19 21:03:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.17 Mbit/s
95th percentile per-packet one-way delay: 445.818 ms
Loss rate: 22.10%
-- Flow 1:
Average throughput: 3.52 Mbit/s
95th percentile per-packet one-way delay: 438.966 ms
Loss rate: 14.70%
-- Flow 2:
Average throughput: 3.25 Mbit/s
95th percentile per-packet one-way delay: 447.241 ms
Loss rate: 22.10%
-- Flow 3:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 490.288 ms
Loss rate: 52.35%
```
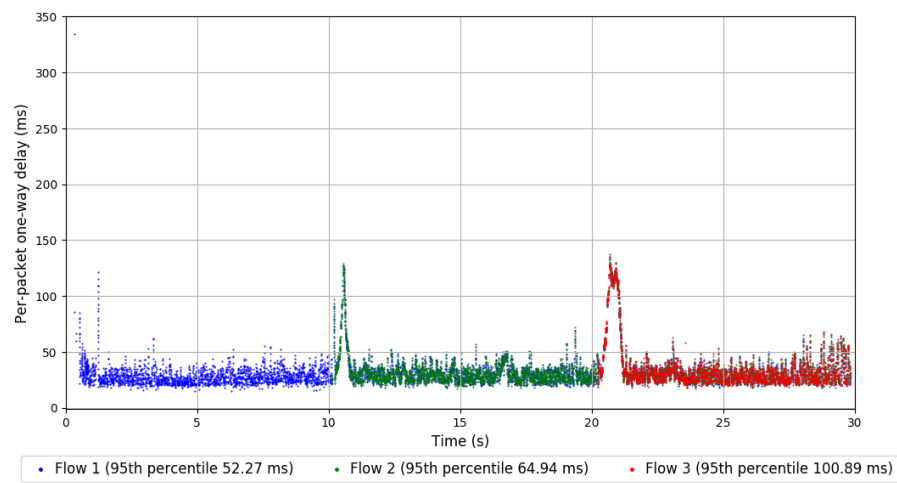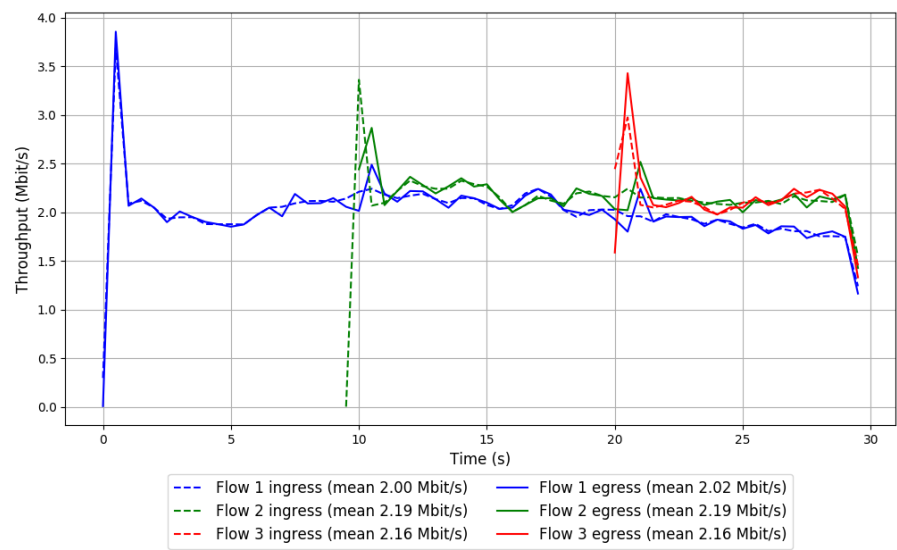
Run 1: Report of PCC — Data Link

Flow 1 ingress (mean 4.12 Mbit/s)   Flow 1 egress (mean 3.52 Mbit/s)
Flow 2 ingress (mean 4.16 Mbit/s)   Flow 2 egress (mean 3.25 Mbit/s)
Flow 3 ingress (mean 3.07 Mbit/s)   Flow 3 egress (mean 1.57 Mbit/s)

Flow 1 (95th percentile 438.97 ms)   Flow 2 (95th percentile 447.24 ms)   Flow 3 (95th percentile 490.29 ms)

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```
Run 2: Statistics of PCC

Start at: 2018-02-19 19:03:59
End at: 2018-02-19 19:04:29
Local clock offset: 1.067 ms
Remote clock offset: -6.631 ms


# Below is generated by plot.py at 2018-02-19 21:03:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.21 Mbit/s
95th percentile per-packet one-way delay: 61.478 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 2.02 Mbit/s
95th percentile per-packet one-way delay: 52.266 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 2.19 Mbit/s
95th percentile per-packet one-way delay: 64.940 ms
Loss rate: 0.25%
-- Flow 3:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 100.888 ms
Loss rate: 0.46%
```
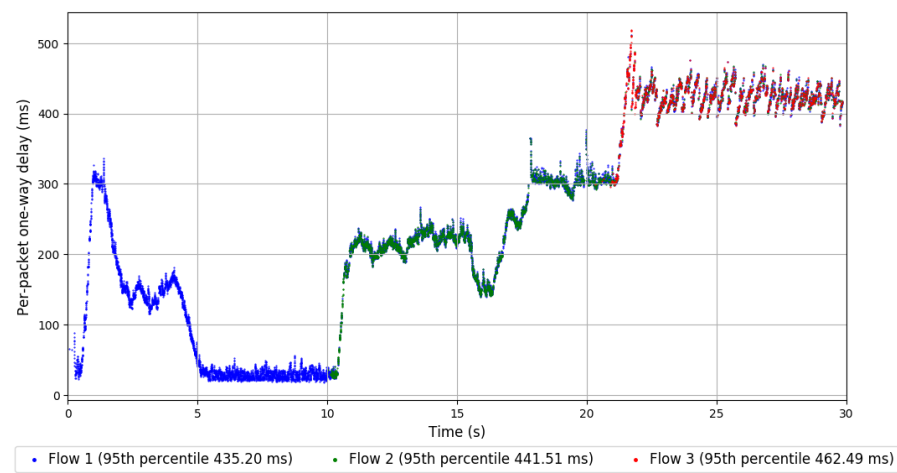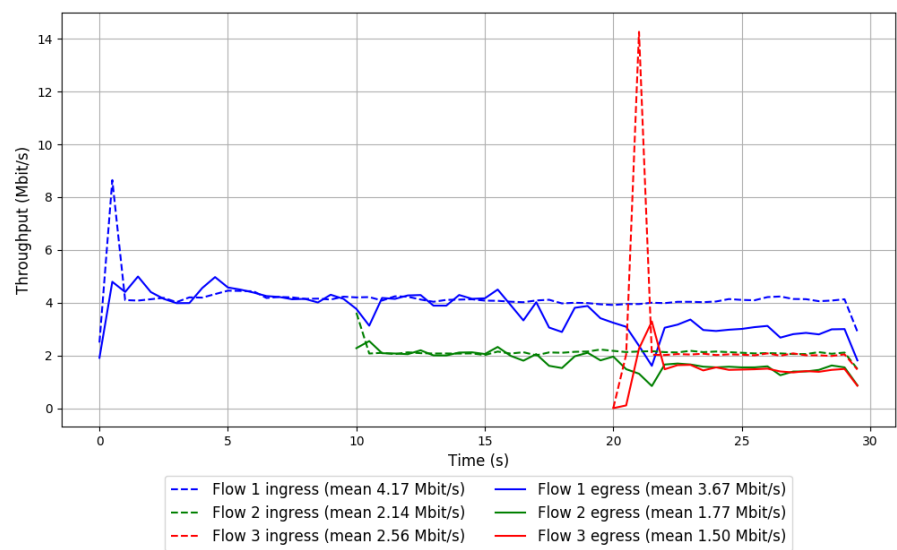
Run 2: Report of PCC — Data Link

Flow 1 ingress (mean 2.00 Mbit/s)   Flow 1 egress (mean 2.02 Mbit/s)
Flow 2 ingress (mean 2.19 Mbit/s)   Flow 2 egress (mean 2.19 Mbit/s)
Flow 3 ingress (mean 2.16 Mbit/s)   Flow 3 egress (mean 2.16 Mbit/s)

Flow 1 (95th percentile 52.27 ms)   Flow 2 (95th percentile 64.94 ms)   Flow 3 (95th percentile 100.89 ms)

```
Run 3: Statistics of PCC

Start at: 2018-02-19 19:27:46
End at: 2018-02-19 19:28:16
Local clock offset: -0.409 ms
Remote clock offset: -6.971 ms


# Below is generated by plot.py at 2018-02-19 21:03:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.33 Mbit/s
95th percentile per-packet one-way delay: 441.208 ms
Loss rate: 17.38%
-- Flow 1:
Average throughput: 3.67 Mbit/s
95th percentile per-packet one-way delay: 435.198 ms
Loss rate: 12.15%
-- Flow 2:
Average throughput: 1.77 Mbit/s
95th percentile per-packet one-way delay: 441.508 ms
Loss rate: 17.53%
-- Flow 3:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 462.488 ms
Loss rate: 43.06%
```
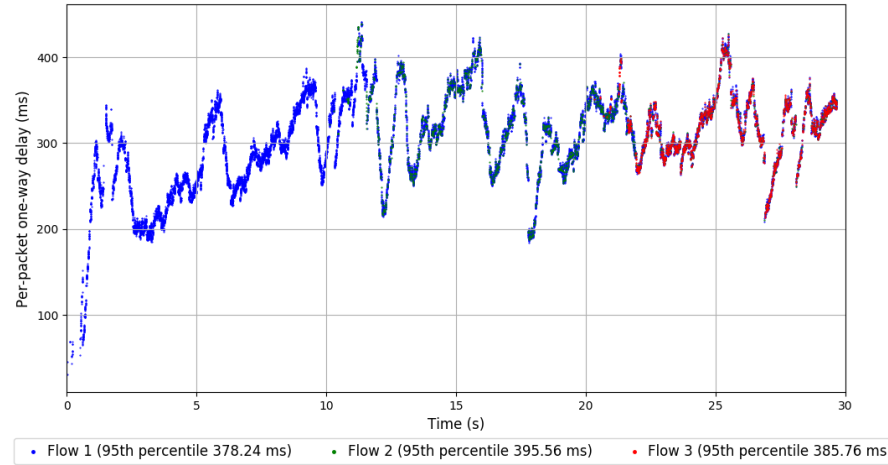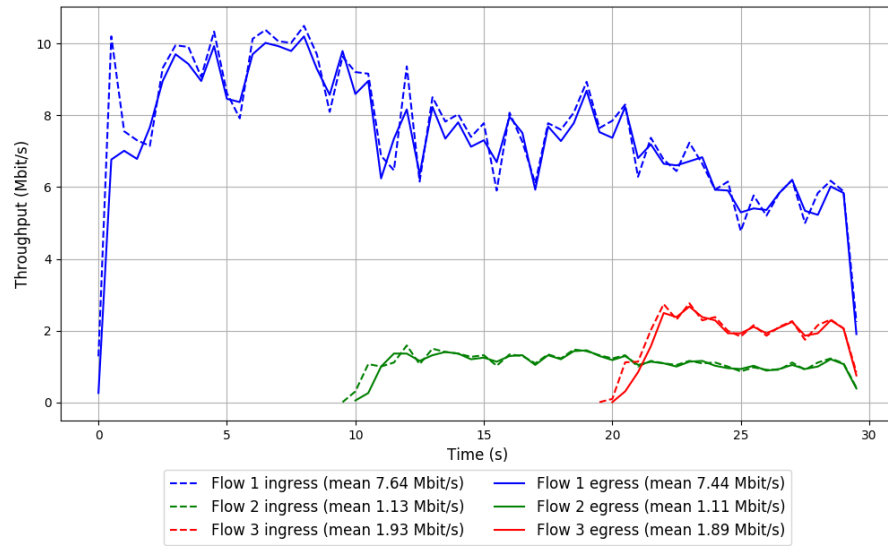
Run 3: Report of PCC — Data Link

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-02-19 18:42:51
End at: 2018-02-19 18:43:21
Local clock offset: 1.913 ms
Remote clock offset: -8.058 ms


# Below is generated by plot.py at 2018-02-19 21:03:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.78 Mbit/s
95th percentile per-packet one-way delay: 380.151 ms
Loss rate: 3.01%
-- Flow 1:
Average throughput: 7.44 Mbit/s
95th percentile per-packet one-way delay: 378.237 ms
Loss rate: 2.73%
-- Flow 2:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 395.564 ms
Loss rate: 3.56%
-- Flow 3:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 385.762 ms
Loss rate: 5.64%
```
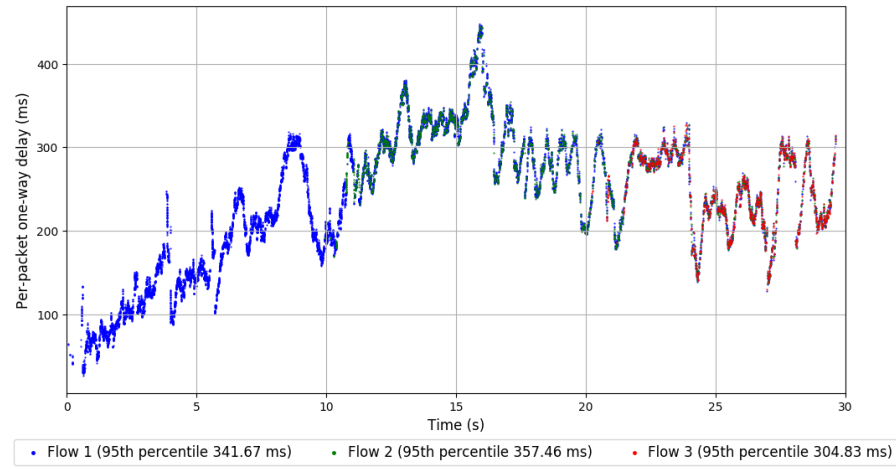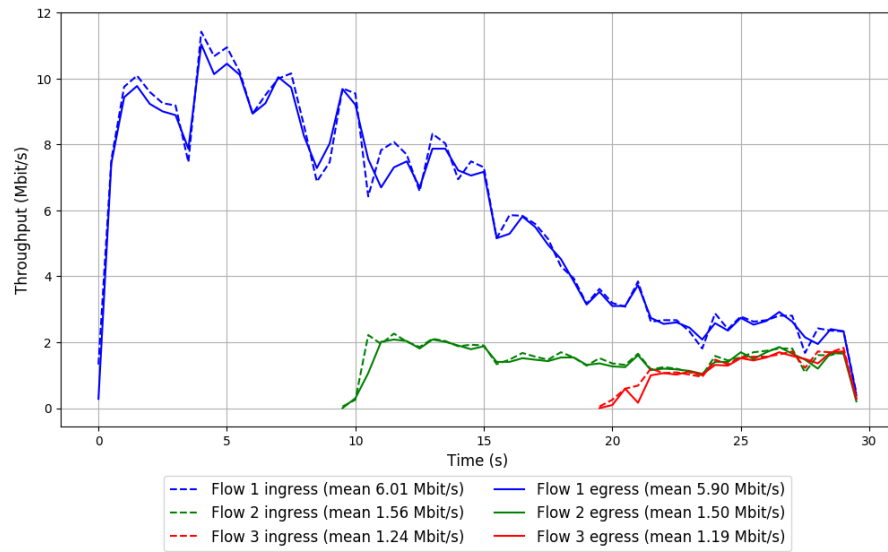
Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 7.64 Mbit/s) — Flow 1 egress (mean 7.44 Mbit/s)
Flow 2 ingress (mean 1.13 Mbit/s) — Flow 2 egress (mean 1.11 Mbit/s)
Flow 3 ingress (mean 1.93 Mbit/s) — Flow 3 egress (mean 1.89 Mbit/s)

Flow 1 (95th percentile 378.24 ms) · Flow 2 (95th percentile 395.56 ms) · Flow 3 (95th percentile 385.76 ms)

29

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-02-19 19:06:37
End at: 2018-02-19 19:07:07
Local clock offset: 0.774 ms
Remote clock offset: -6.527 ms


# Below is generated by plot.py at 2018-02-19 21:03:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.29 Mbit/s
95th percentile per-packet one-way delay: 342.472 ms
Loss rate: 2.58%
-- Flow 1:
Average throughput: 5.90 Mbit/s
95th percentile per-packet one-way delay: 341.668 ms
Loss rate: 2.02%
-- Flow 2:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 357.462 ms
Loss rate: 4.46%
-- Flow 3:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 304.828 ms
Loss rate: 5.94%
```
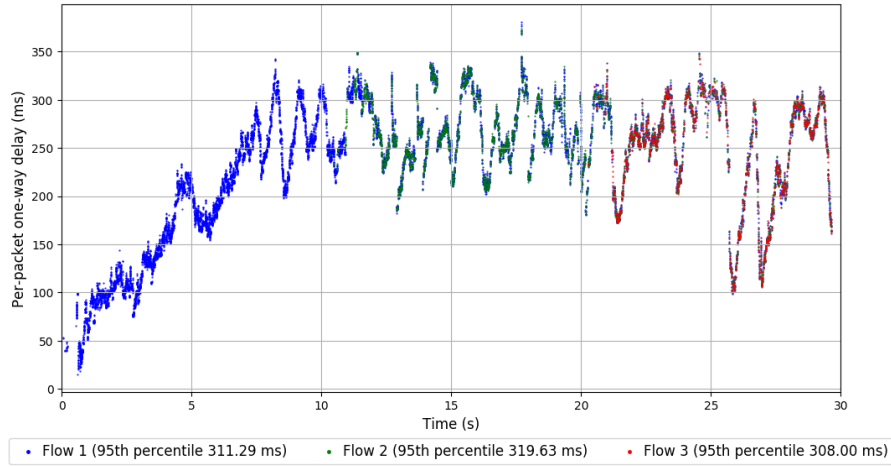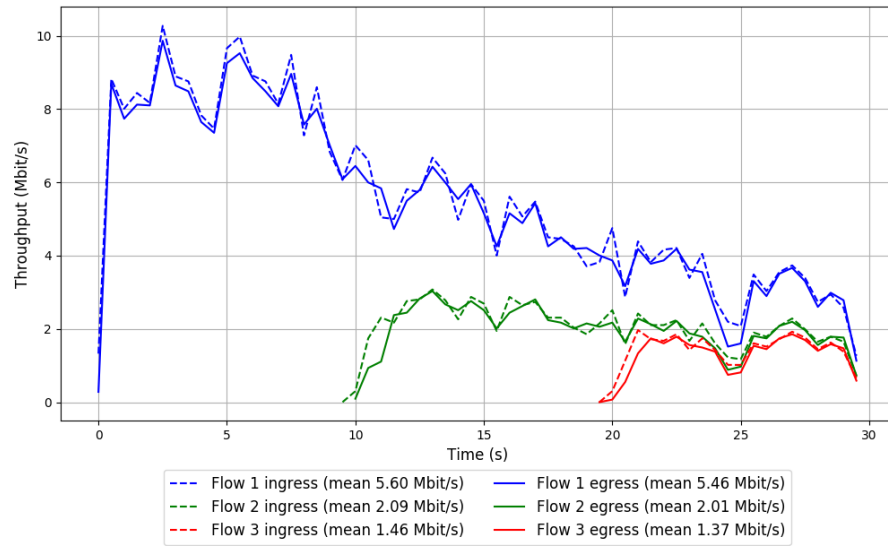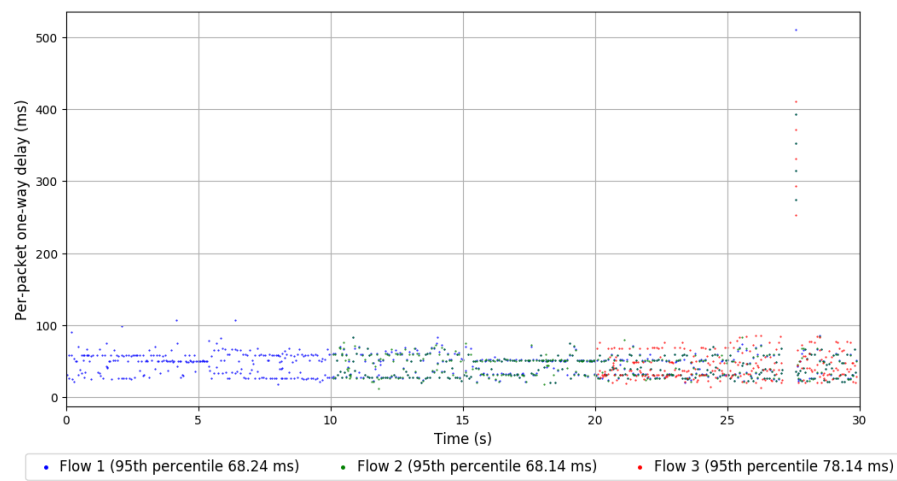
Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 6.01 Mbit/s)	Flow 1 egress (mean 5.90 Mbit/s)
Flow 2 ingress (mean 1.56 Mbit/s)	Flow 2 egress (mean 1.50 Mbit/s)
Flow 3 ingress (mean 1.24 Mbit/s)	Flow 3 egress (mean 1.19 Mbit/s)

Flow 1 (95th percentile 341.67 ms)　　Flow 2 (95th percentile 357.46 ms)　　Flow 3 (95th percentile 304.83 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-02-19 19:30:24
End at: 2018-02-19 19:30:54
Local clock offset: -0.48 ms
Remote clock offset: -7.029 ms


# Below is generated by plot.py at 2018-02-19 21:03:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.24 Mbit/s
95th percentile per-packet one-way delay: 312.639 ms
Loss rate: 3.71%
-- Flow 1:
Average throughput: 5.46 Mbit/s
95th percentile per-packet one-way delay: 311.291 ms
Loss rate: 2.86%
-- Flow 2:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 319.627 ms
Loss rate: 5.38%
-- Flow 3:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 307.996 ms
Loss rate: 8.69%
```
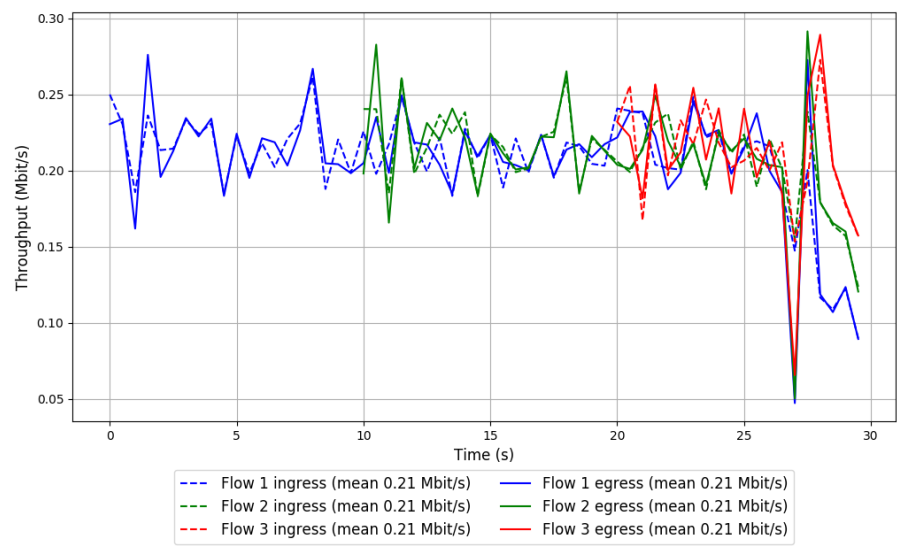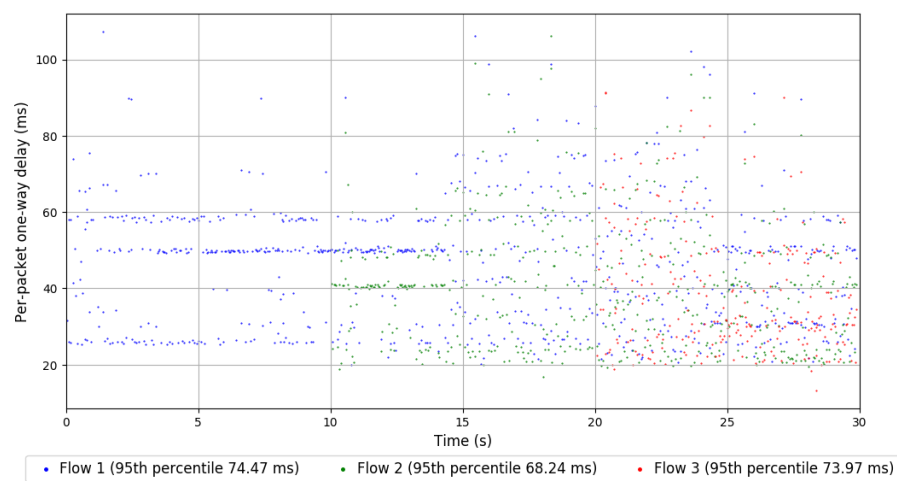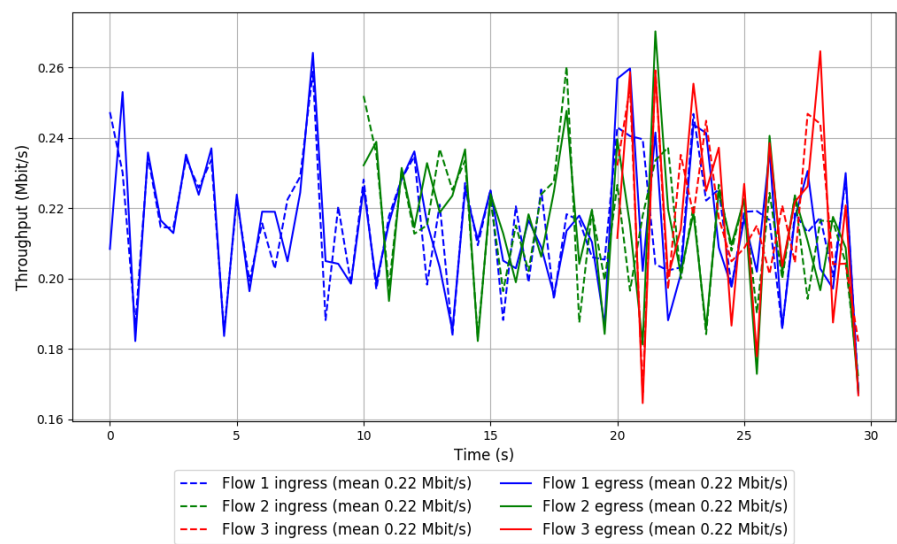
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 5.60 Mbit/s) --- Flow 1 egress (mean 5.46 Mbit/s) ---
Flow 2 ingress (mean 2.09 Mbit/s) --- Flow 2 egress (mean 2.01 Mbit/s) ---
Flow 3 ingress (mean 1.46 Mbit/s) --- Flow 3 egress (mean 1.37 Mbit/s) ---

Flow 1 (95th percentile 311.29 ms)   Flow 2 (95th percentile 319.63 ms)   Flow 3 (95th percentile 308.00 ms)

33

```
Run 1: Statistics of SCReAM

Start at: 2018-02-19 18:41:32
End at: 2018-02-19 18:42:02
Local clock offset: 1.923 ms
Remote clock offset: -8.167 ms


# Below is generated by plot.py at 2018-02-19 21:03:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 69.801 ms
Loss rate: 0.62%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 68.238 ms
Loss rate: 0.35%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 68.137 ms
Loss rate: 0.80%
-- Flow 3:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 78.138 ms
Loss rate: 1.09%
```
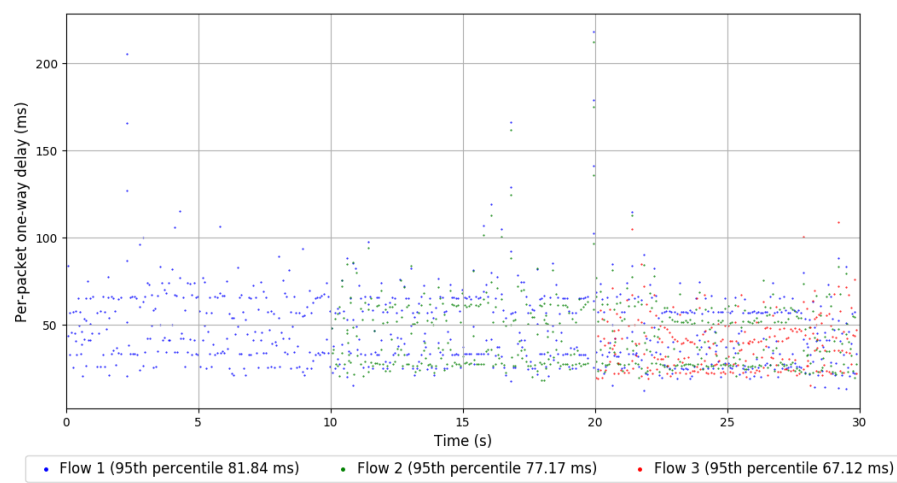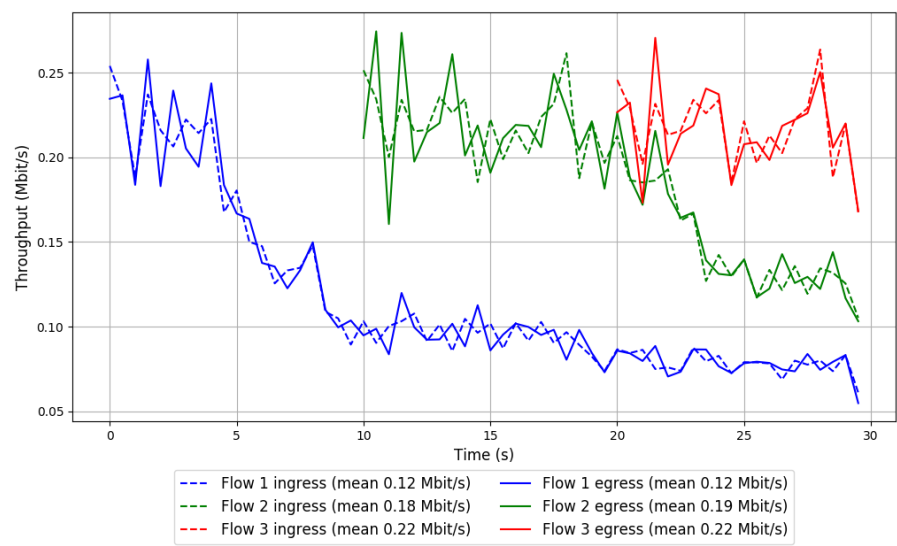
Run 1: Report of SCReAM — Data Link

Throughput (Mbit/s) vs Time (s)

- - - Flow 1 ingress (mean 0.21 Mbit/s)   —— Flow 1 egress (mean 0.21 Mbit/s)
- - - Flow 2 ingress (mean 0.21 Mbit/s)   —— Flow 2 egress (mean 0.21 Mbit/s)
- - - Flow 3 ingress (mean 0.21 Mbit/s)   —— Flow 3 egress (mean 0.21 Mbit/s)

Per-packet one-way delay (ms) vs Time (s)

• Flow 1 (95th percentile 68.24 ms)   • Flow 2 (95th percentile 68.14 ms)   • Flow 3 (95th percentile 78.14 ms)

```
Run 2: Statistics of SCReAM

Start at: 2018-02-19 19:05:18
End at: 2018-02-19 19:05:48
Local clock offset: 0.887 ms
Remote clock offset: -6.605 ms

# Below is generated by plot.py at 2018-02-19 21:03:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 73.805 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 74.470 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 68.238 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 73.971 ms
Loss rate: 0.35%
```
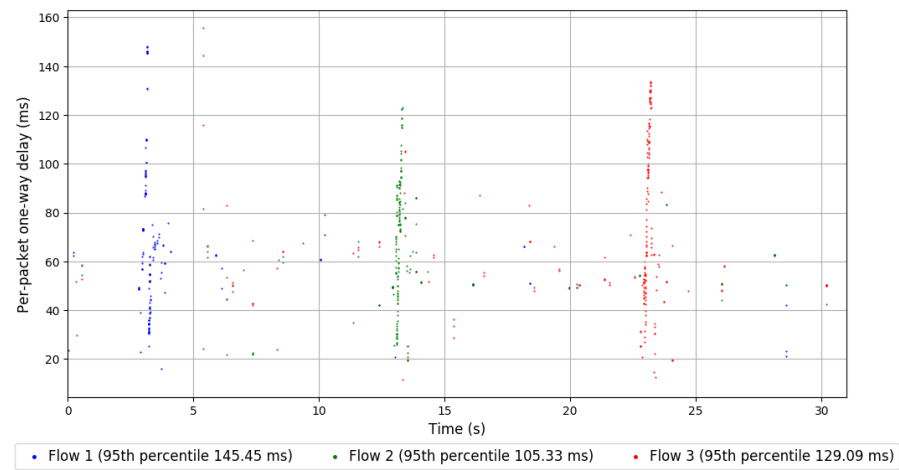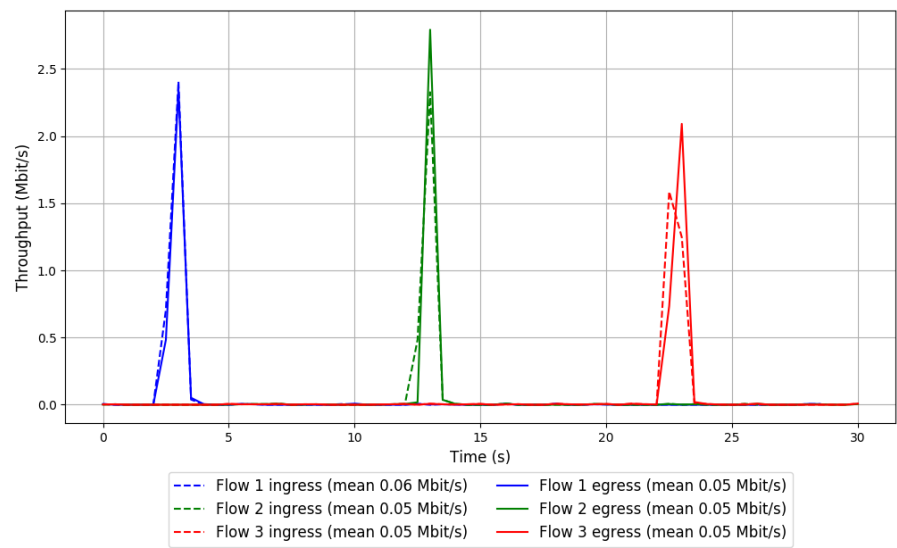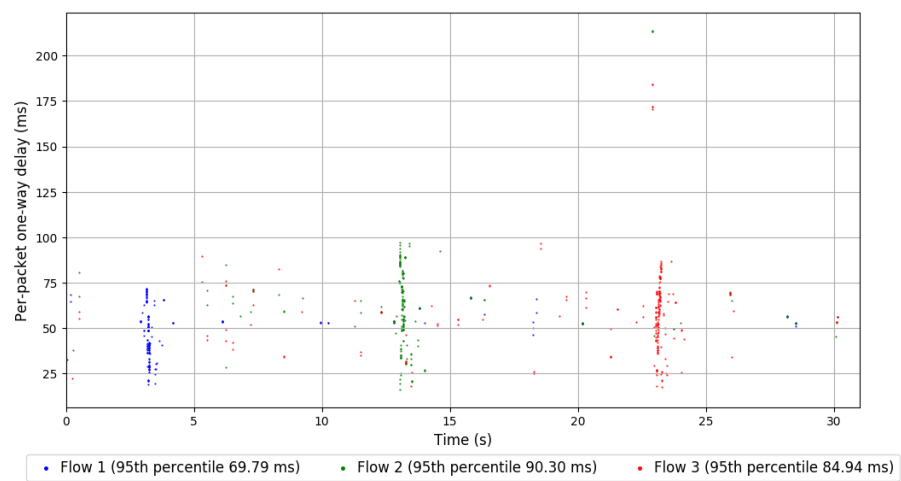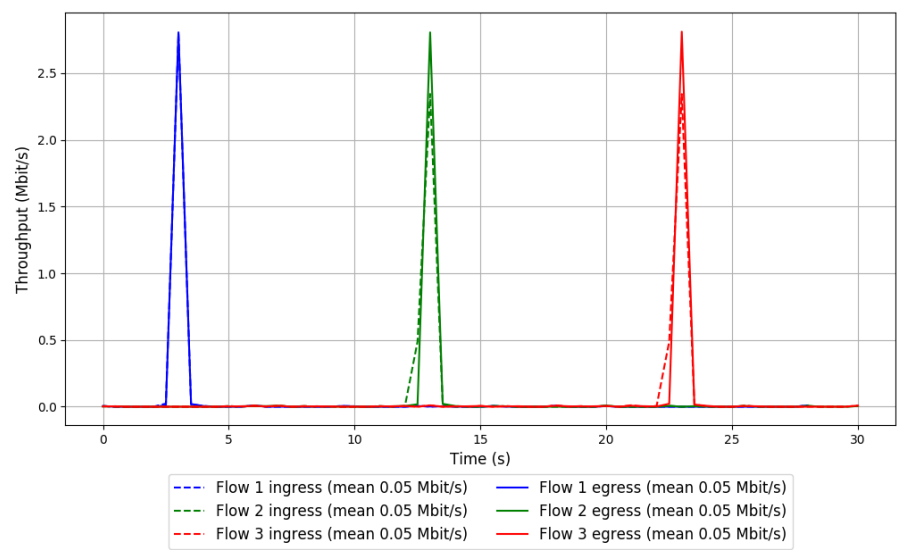
Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-02-19 19:29:05
End at: 2018-02-19 19:29:35
Local clock offset: -0.452 ms
Remote clock offset: -7.002 ms

# Below is generated by plot.py at 2018-02-19 21:03:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 77.165 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 81.845 ms
Loss rate: 0.09%
-- Flow 2:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 77.165 ms
Loss rate: 0.15%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 67.123 ms
Loss rate: 0.35%
```

Run 3: Report of SCReAM — Data Link

Throughput (Mbit/s) vs Time (s)

- Flow 1 ingress (mean 0.12 Mbit/s)
- Flow 1 egress (mean 0.12 Mbit/s)
- Flow 2 ingress (mean 0.18 Mbit/s)
- Flow 2 egress (mean 0.19 Mbit/s)
- Flow 3 ingress (mean 0.22 Mbit/s)
- Flow 3 egress (mean 0.22 Mbit/s)

Per-packet one-way delay (ms) vs Time (s)

- Flow 1 (95th percentile 81.84 ms)
- Flow 2 (95th percentile 77.17 ms)
- Flow 3 (95th percentile 67.12 ms)

```
Run 1: Statistics of WebRTC media

Start at: 2018-02-19 19:00:02
End at: 2018-02-19 19:00:32
Local clock offset: 1.546 ms
Remote clock offset: -6.671 ms


# Below is generated by plot.py at 2018-02-19 21:03:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 126.828 ms
Loss rate: 2.90%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 145.452 ms
Loss rate: 8.22%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 105.327 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 129.091 ms
Loss rate: 0.00%
```
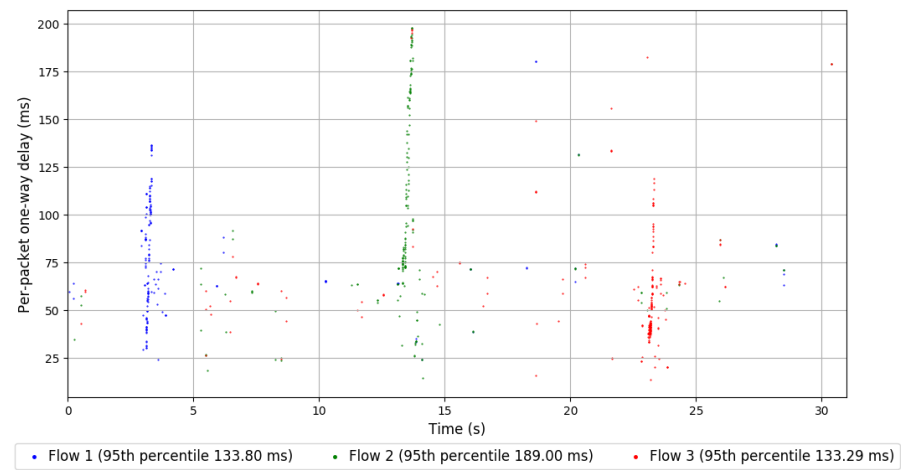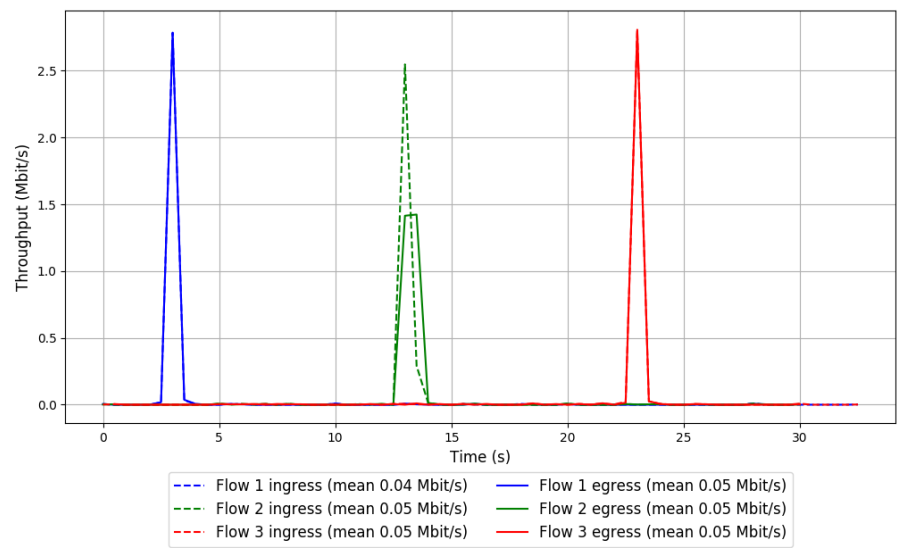
Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-02-19 19:23:49
End at: 2018-02-19 19:24:19
Local clock offset: -0.203 ms
Remote clock offset: -6.881 ms


# Below is generated by plot.py at 2018-02-19 21:03:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 86.709 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 69.793 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 90.295 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 84.944 ms
Loss rate: 0.00%
```
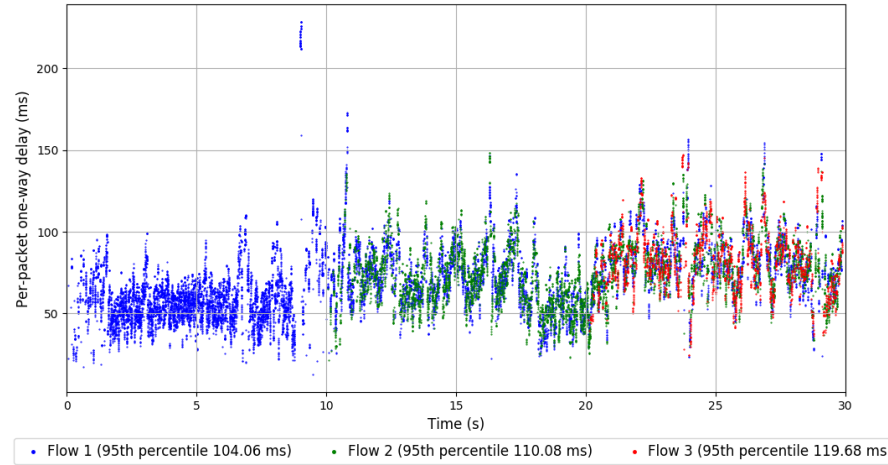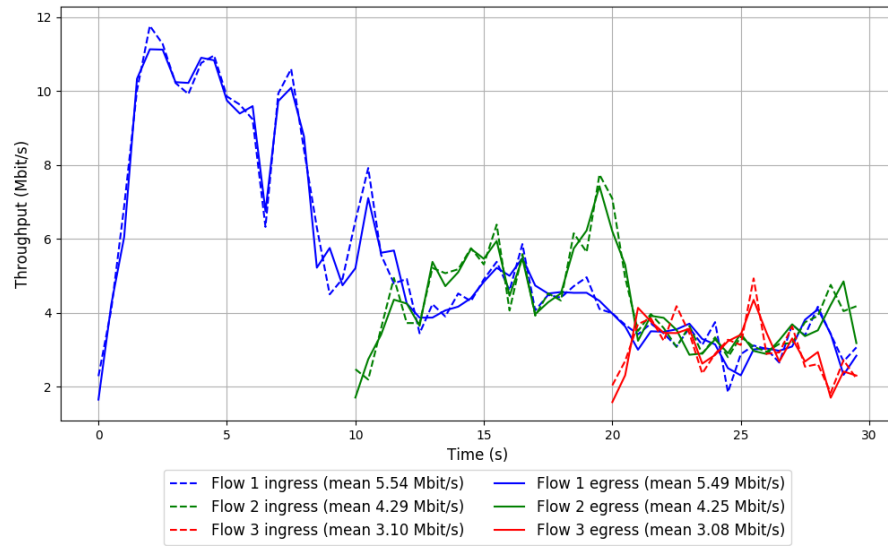
Run 2: Report of WebRTC media — Data Link

Flow 1 ingress (mean 0.05 Mbit/s)   Flow 1 egress (mean 0.05 Mbit/s)
Flow 2 ingress (mean 0.05 Mbit/s)   Flow 2 egress (mean 0.05 Mbit/s)
Flow 3 ingress (mean 0.05 Mbit/s)   Flow 3 egress (mean 0.05 Mbit/s)

Flow 1 (95th percentile 69.79 ms)   Flow 2 (95th percentile 90.30 ms)   Flow 3 (95th percentile 84.94 ms)

```
Run 3: Statistics of WebRTC media

Start at: 2018-02-19 19:47:35
End at: 2018-02-19 19:48:05
Local clock offset: 0.32 ms
Remote clock offset: -7.118 ms


# Below is generated by plot.py at 2018-02-19 21:03:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 175.011 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 133.796 ms
Loss rate: 0.05%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 189.002 ms
Loss rate: 0.10%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 133.292 ms
Loss rate: 0.22%
```

Run 3: Report of WebRTC media — Data Link

```
Run 1: Statistics of Sprout

Start at: 2018-02-19 18:56:04
End at: 2018-02-19 18:56:34
Local clock offset: 1.887 ms
Remote clock offset: -6.832 ms


# Below is generated by plot.py at 2018-02-19 21:03:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.31 Mbit/s
95th percentile per-packet one-way delay: 107.628 ms
Loss rate: 1.36%
-- Flow 1:
Average throughput: 5.49 Mbit/s
95th percentile per-packet one-way delay: 104.059 ms
Loss rate: 1.21%
-- Flow 2:
Average throughput: 4.25 Mbit/s
95th percentile per-packet one-way delay: 110.082 ms
Loss rate: 1.63%
-- Flow 3:
Average throughput: 3.08 Mbit/s
95th percentile per-packet one-way delay: 119.677 ms
Loss rate: 1.43%
```
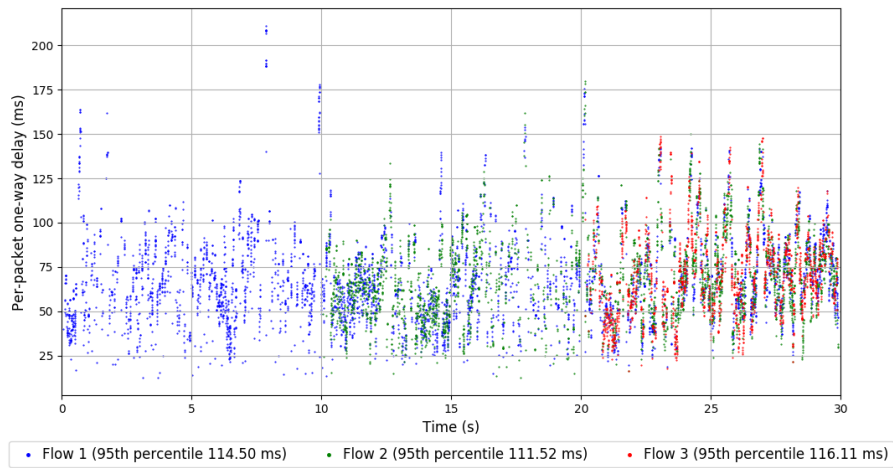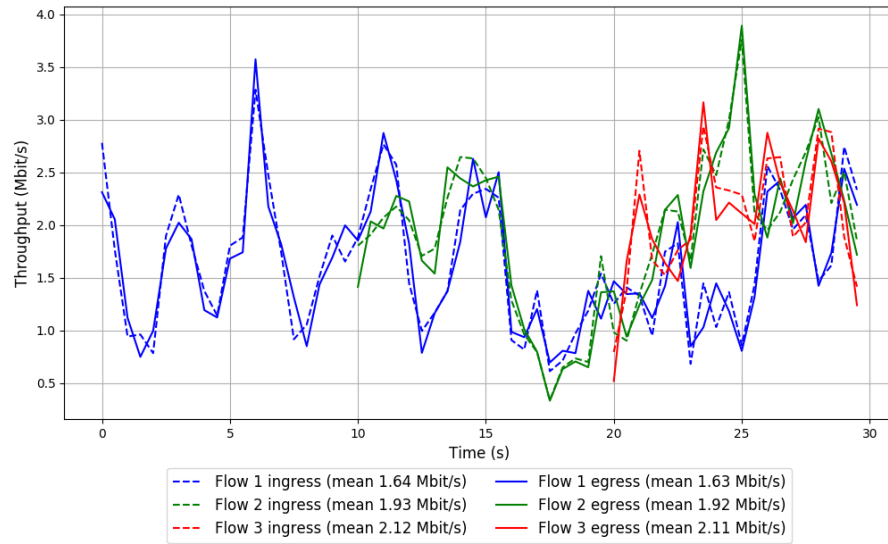
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-02-19 19:19:51
End at: 2018-02-19 19:20:21
Local clock offset: -0.018 ms
Remote clock offset: -6.638 ms


# Below is generated by plot.py at 2018-02-19 21:03:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.28 Mbit/s
95th percentile per-packet one-way delay: 109.144 ms
Loss rate: 1.40%
-- Flow 1:
Average throughput: 5.56 Mbit/s
95th percentile per-packet one-way delay: 101.694 ms
Loss rate: 1.15%
-- Flow 2:
Average throughput: 4.04 Mbit/s
95th percentile per-packet one-way delay: 113.420 ms
Loss rate: 1.44%
-- Flow 3:
Average throughput: 3.17 Mbit/s
95th percentile per-packet one-way delay: 115.247 ms
Loss rate: 2.65%
```
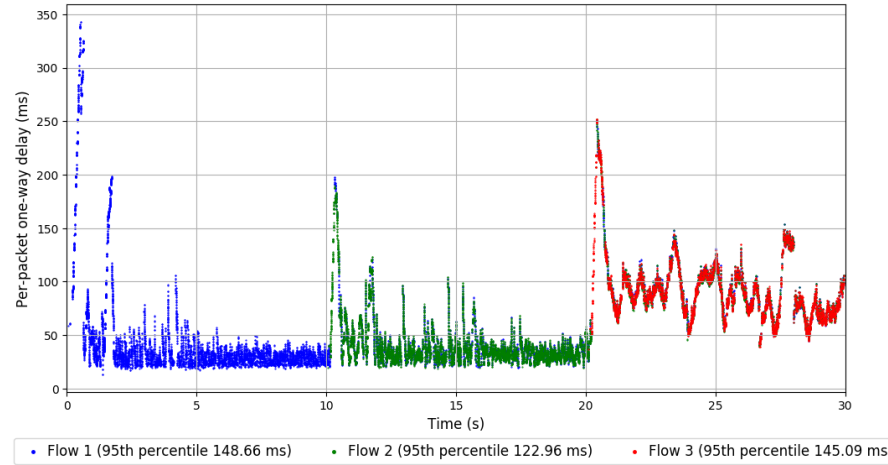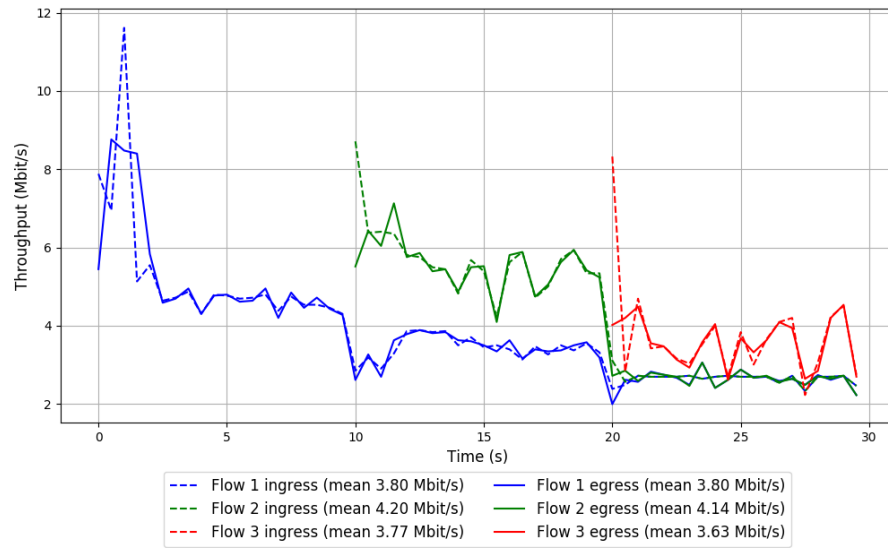
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-02-19 19:43:37
End at: 2018-02-19 19:44:07
Local clock offset: 0.298 ms
Remote clock offset: -7.099 ms


# Below is generated by plot.py at 2018-02-19 21:03:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.59 Mbit/s
95th percentile per-packet one-way delay: 113.970 ms
Loss rate: 1.00%
-- Flow 1:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 114.496 ms
Loss rate: 1.05%
-- Flow 2:
Average throughput: 1.92 Mbit/s
95th percentile per-packet one-way delay: 111.524 ms
Loss rate: 0.53%
-- Flow 3:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 116.113 ms
Loss rate: 1.75%
```

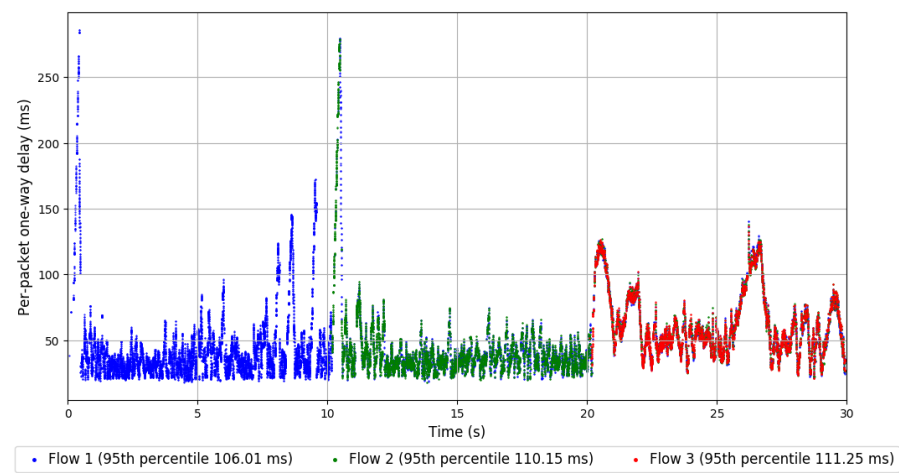Run 3: Report of Sprout — Data Link

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

Start at: 2018-02-19 18:50:47
End at: 2018-02-19 18:51:17
Local clock offset: 1.775 ms
Remote clock offset: -7.171 ms

# Below is generated by plot.py at 2018-02-19 21:03:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.75 Mbit/s
95th percentile per-packet one-way delay: 137.693 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 3.80 Mbit/s
95th percentile per-packet one-way delay: 148.664 ms
Loss rate: 0.34%
-- Flow 2:
Average throughput: 4.14 Mbit/s
95th percentile per-packet one-way delay: 122.957 ms
Loss rate: 1.83%
-- Flow 3:
Average throughput: 3.63 Mbit/s
95th percentile per-packet one-way delay: 145.092 ms
Loss rate: 4.14%
```

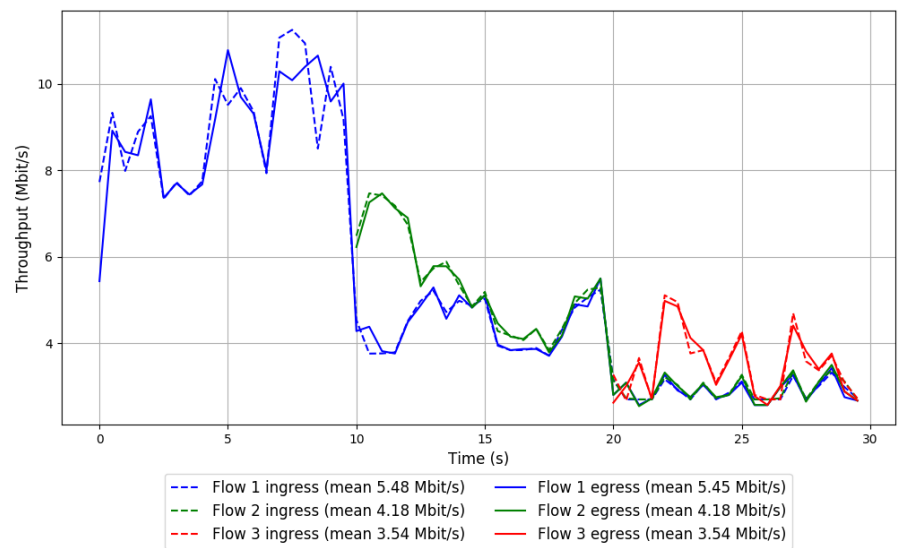Run 1: Report of TaoVA-100x — Data Link

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

Start at: 2018-02-19 19:14:34
End at: 2018-02-19 19:15:04
Local clock offset: 0.23 ms
Remote clock offset: -6.321 ms


# Below is generated by plot.py at 2018-02-19 21:03:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.39 Mbit/s
95th percentile per-packet one-way delay: 108.625 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 5.45 Mbit/s
95th percentile per-packet one-way delay: 106.012 ms
Loss rate: 0.75%
-- Flow 2:
Average throughput: 4.18 Mbit/s
95th percentile per-packet one-way delay: 110.146 ms
Loss rate: 0.28%
-- Flow 3:
Average throughput: 3.54 Mbit/s
95th percentile per-packet one-way delay: 111.253 ms
Loss rate: 0.73%
```
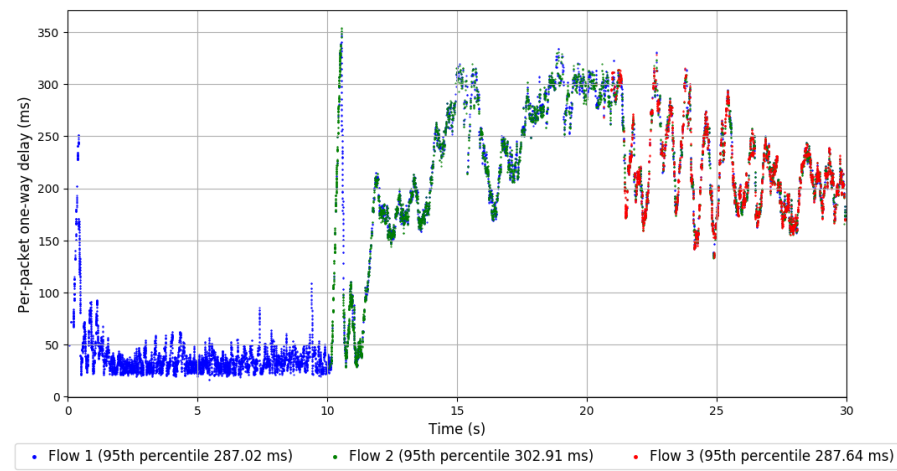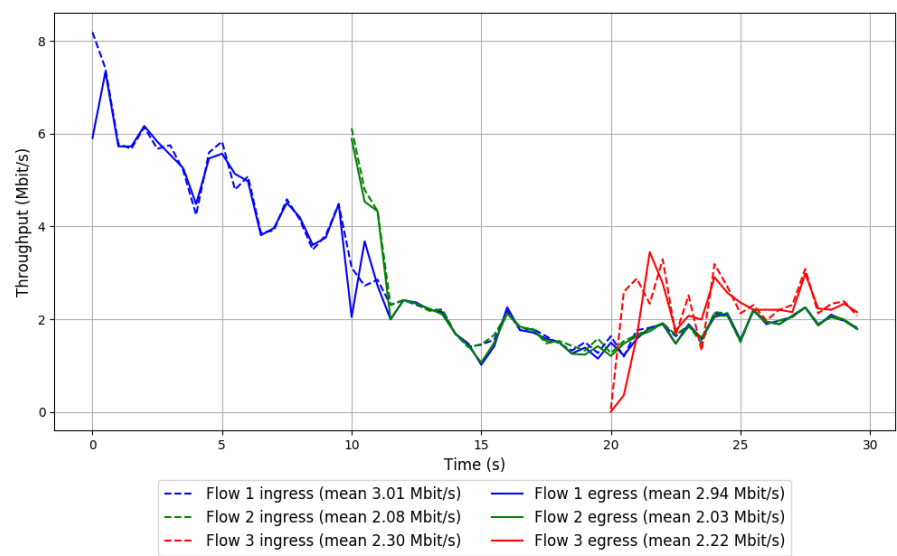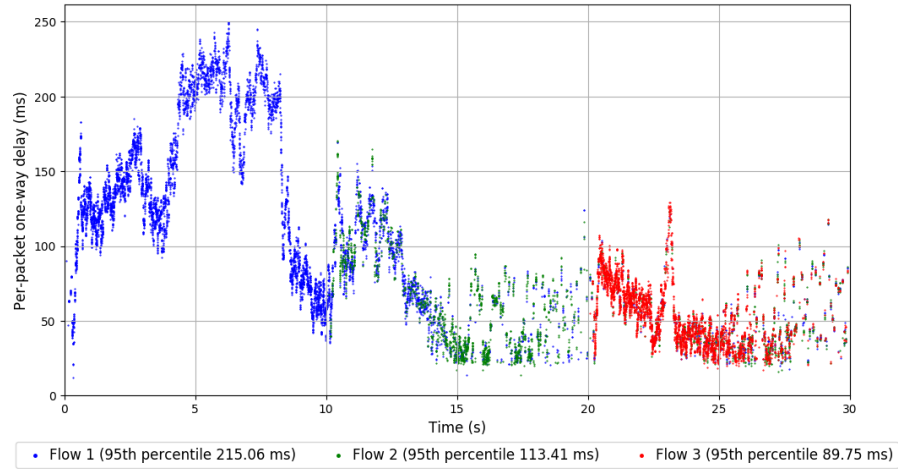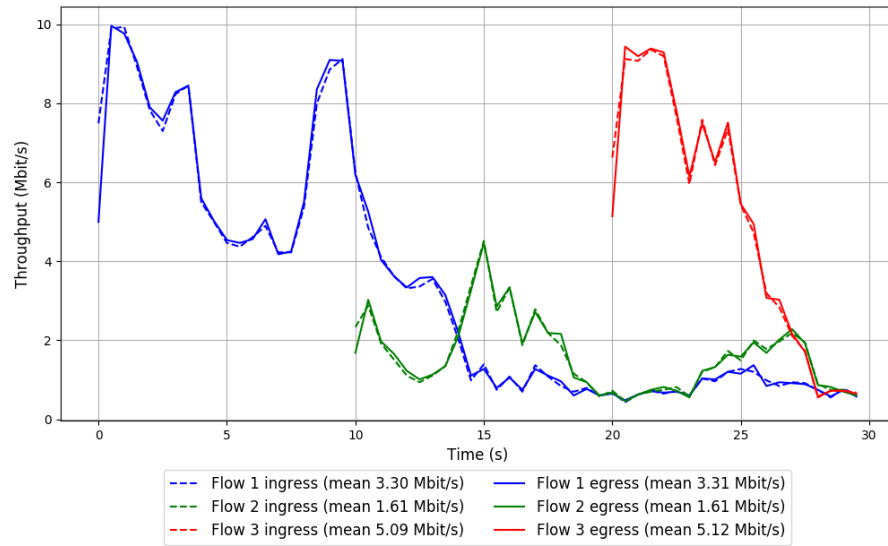
Run 2: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 5.48 Mbit/s) --- Flow 1 egress (mean 5.45 Mbit/s)
Flow 2 ingress (mean 4.18 Mbit/s) --- Flow 2 egress (mean 4.18 Mbit/s)
Flow 3 ingress (mean 3.54 Mbit/s) --- Flow 3 egress (mean 3.54 Mbit/s)

Flow 1 (95th percentile 106.01 ms) ・ Flow 2 (95th percentile 110.15 ms) ・ Flow 3 (95th percentile 111.25 ms)

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

Start at: 2018-02-19 19:38:21
End at: 2018-02-19 19:38:51
Local clock offset: 0.063 ms
Remote clock offset: -7.008 ms


# Below is generated by plot.py at 2018-02-19 21:03:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.01 Mbit/s
95th percentile per-packet one-way delay: 295.979 ms
Loss rate: 2.97%
-- Flow 1:
Average throughput: 2.94 Mbit/s
95th percentile per-packet one-way delay: 287.019 ms
Loss rate: 2.25%
-- Flow 2:
Average throughput: 2.03 Mbit/s
95th percentile per-packet one-way delay: 302.908 ms
Loss rate: 2.62%
-- Flow 3:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 287.642 ms
Loss rate: 6.45%
```

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

Flow 1 ingress (mean 3.01 Mbit/s)   Flow 1 egress (mean 2.94 Mbit/s)
Flow 2 ingress (mean 2.08 Mbit/s)   Flow 2 egress (mean 2.03 Mbit/s)
Flow 3 ingress (mean 2.30 Mbit/s)   Flow 3 egress (mean 2.22 Mbit/s)

• Flow 1 (95th percentile 287.02 ms)   • Flow 2 (95th percentile 302.91 ms)   • Flow 3 (95th percentile 287.64 ms)
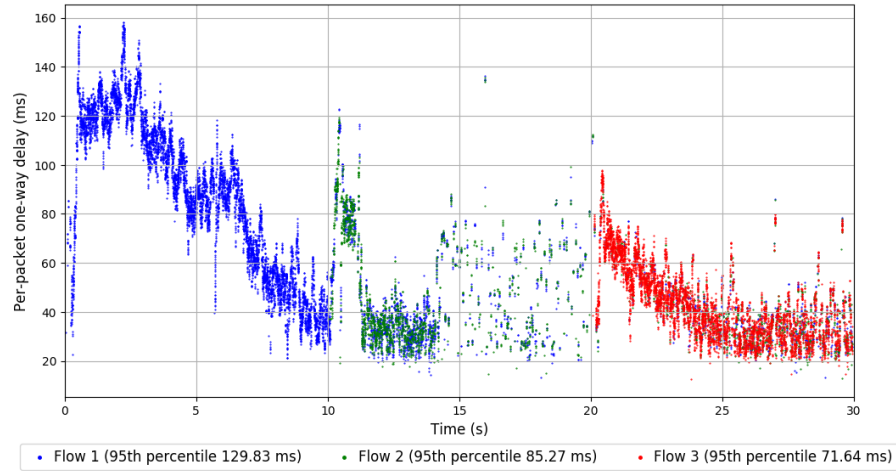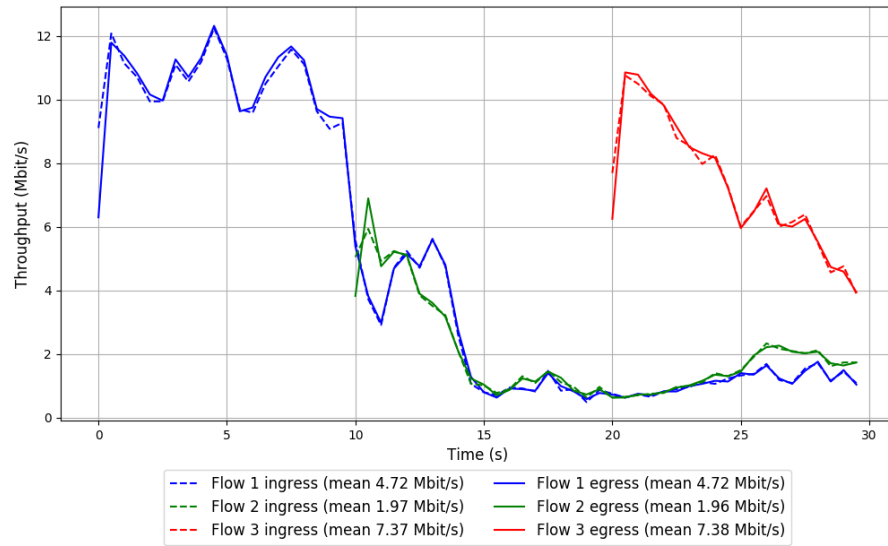
57

```
Run 1: Statistics of TCP Vegas

Start at: 2018-02-19 18:45:30
End at: 2018-02-19 18:46:00
Local clock offset: 1.888 ms
Remote clock offset: -7.725 ms


# Below is generated by plot.py at 2018-02-19 21:03:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.06 Mbit/s
95th percentile per-packet one-way delay: 204.322 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 3.31 Mbit/s
95th percentile per-packet one-way delay: 215.064 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 113.406 ms
Loss rate: 0.19%
-- Flow 3:
Average throughput: 5.12 Mbit/s
95th percentile per-packet one-way delay: 89.747 ms
Loss rate: 0.12%
```
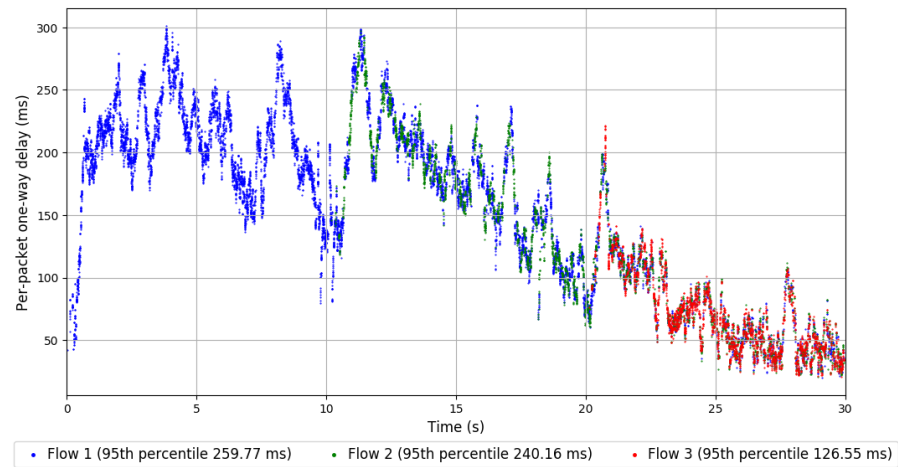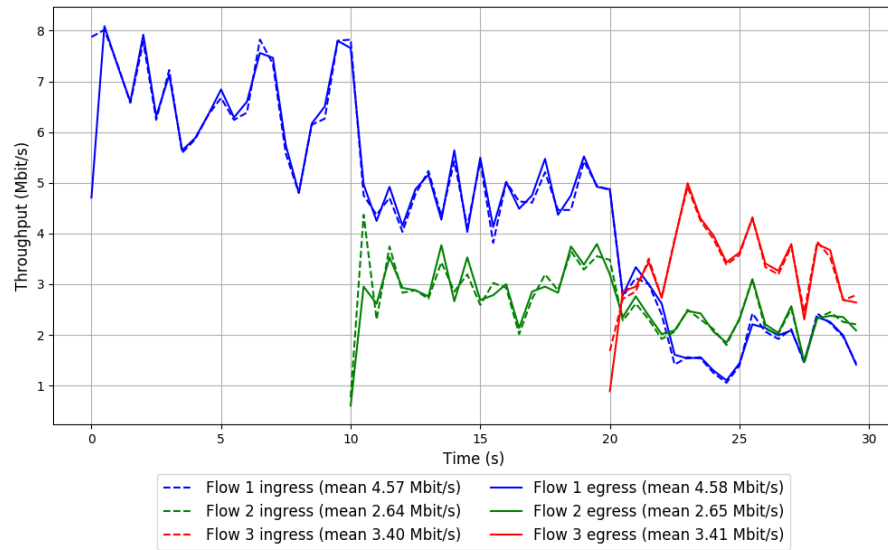
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-02-19 19:09:16
End at: 2018-02-19 19:09:46
Local clock offset: 0.46 ms
Remote clock offset: -6.413 ms


# Below is generated by plot.py at 2018-02-19 21:03:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.46 Mbit/s
95th percentile per-packet one-way delay: 124.502 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 4.72 Mbit/s
95th percentile per-packet one-way delay: 129.830 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 1.96 Mbit/s
95th percentile per-packet one-way delay: 85.270 ms
Loss rate: 0.43%
-- Flow 3:
Average throughput: 7.38 Mbit/s
95th percentile per-packet one-way delay: 71.643 ms
Loss rate: 0.30%
```
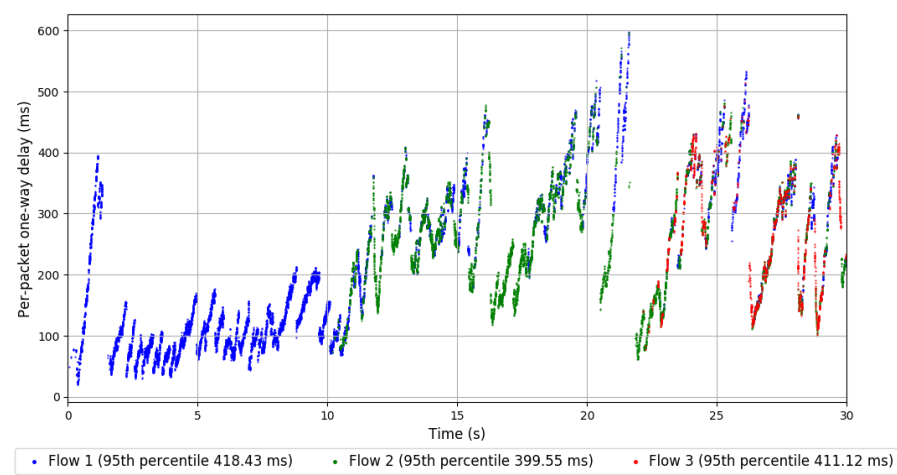
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-02-19 19:33:02
End at: 2018-02-19 19:33:32
Local clock offset: -0.402 ms
Remote clock offset: -7.044 ms


# Below is generated by plot.py at 2018-02-19 21:03:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.45 Mbit/s
95th percentile per-packet one-way delay: 252.013 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 4.58 Mbit/s
95th percentile per-packet one-way delay: 259.769 ms
Loss rate: 0.08%
-- Flow 2:
Average throughput: 2.65 Mbit/s
95th percentile per-packet one-way delay: 240.162 ms
Loss rate: 0.25%
-- Flow 3:
Average throughput: 3.41 Mbit/s
95th percentile per-packet one-way delay: 126.549 ms
Loss rate: 0.57%
```

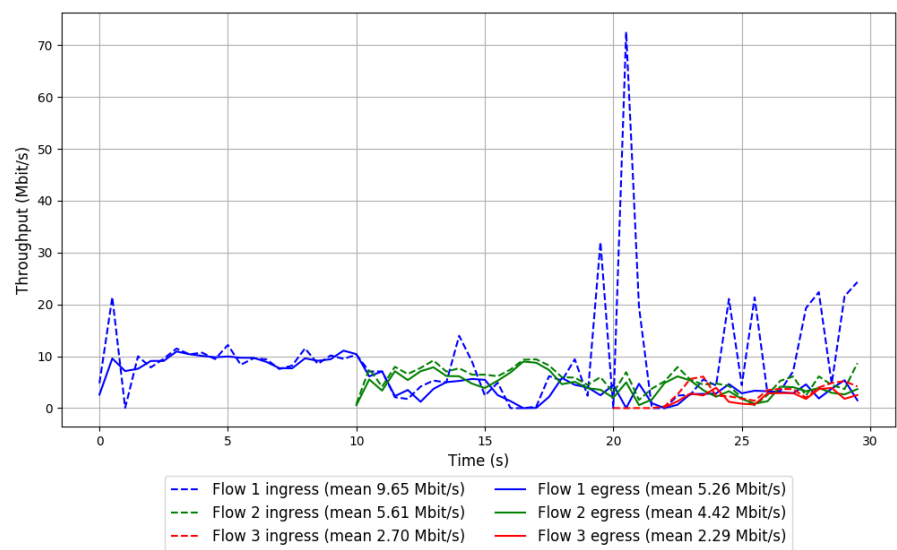Run 3: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2018-02-19 19:02:40
End at: 2018-02-19 19:03:10
Local clock offset: 1.21 ms
Remote clock offset: -6.707 ms


# Below is generated by plot.py at 2018-02-19 21:03:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.78 Mbit/s
95th percentile per-packet one-way delay: 409.764 ms
Loss rate: 38.65%
-- Flow 1:
Average throughput: 5.26 Mbit/s
95th percentile per-packet one-way delay: 418.426 ms
Loss rate: 45.71%
-- Flow 2:
Average throughput: 4.42 Mbit/s
95th percentile per-packet one-way delay: 399.547 ms
Loss rate: 21.65%
-- Flow 3:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 411.117 ms
Loss rate: 33.51%
```
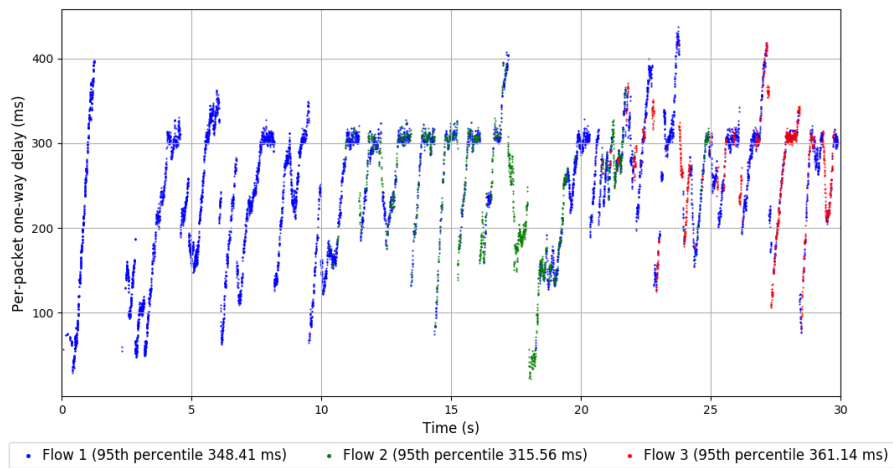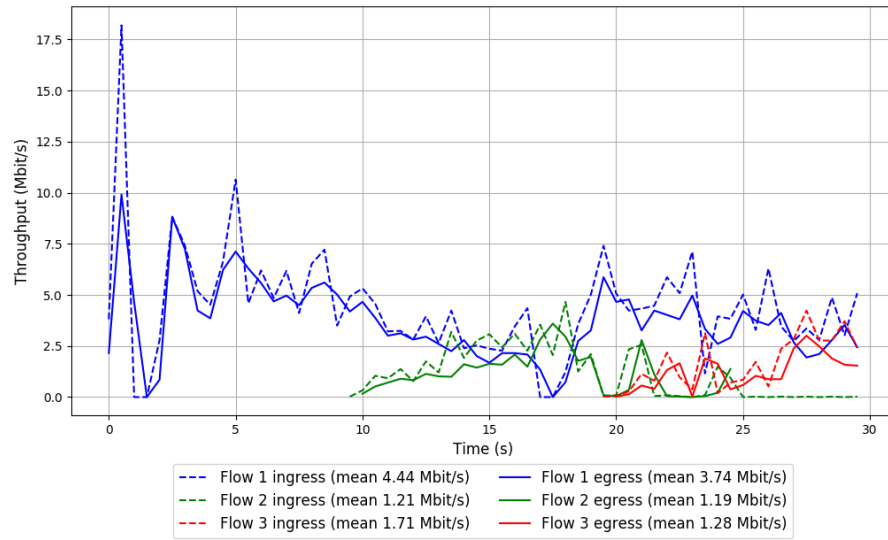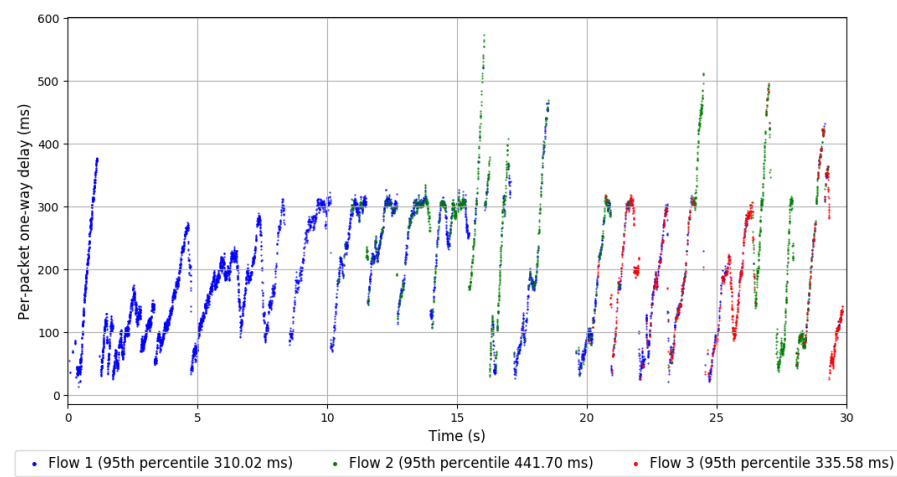
Run 1: Report of Verus — Data Link

Flow 1 ingress (mean 9.65 Mbit/s)   Flow 1 egress (mean 5.26 Mbit/s)
Flow 2 ingress (mean 5.61 Mbit/s)   Flow 2 egress (mean 4.42 Mbit/s)
Flow 3 ingress (mean 2.70 Mbit/s)   Flow 3 egress (mean 2.29 Mbit/s)

Flow 1 (95th percentile 418.43 ms)   Flow 2 (95th percentile 399.55 ms)   Flow 3 (95th percentile 411.12 ms)

```
Run 2: Statistics of Verus

Start at: 2018-02-19 19:26:26
End at: 2018-02-19 19:26:56
Local clock offset: -0.264 ms
Remote clock offset: -6.868 ms


# Below is generated by plot.py at 2018-02-19 21:03:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.74 Mbit/s
95th percentile per-packet one-way delay: 345.476 ms
Loss rate: 18.66%
-- Flow 1:
Average throughput: 3.74 Mbit/s
95th percentile per-packet one-way delay: 348.411 ms
Loss rate: 16.08%
-- Flow 2:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 315.560 ms
Loss rate: 25.94%
-- Flow 3:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 361.145 ms
Loss rate: 28.56%
```
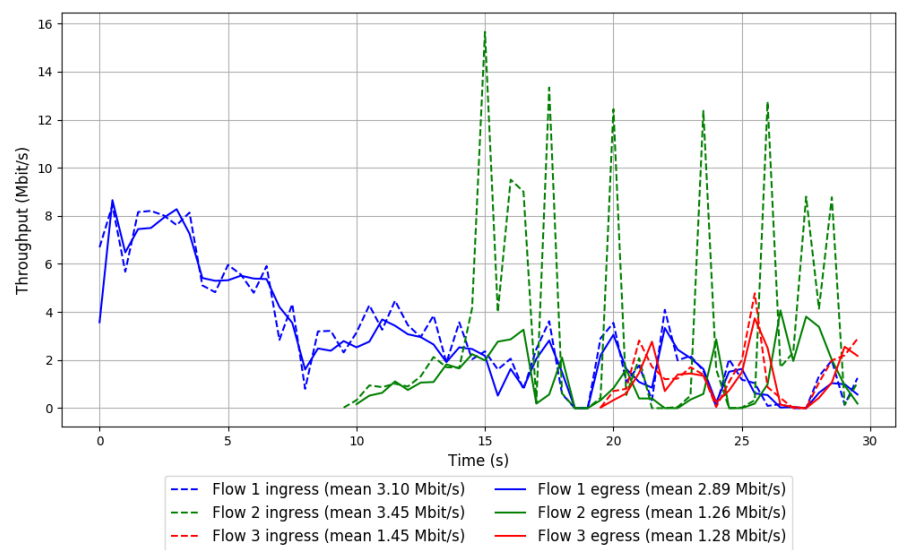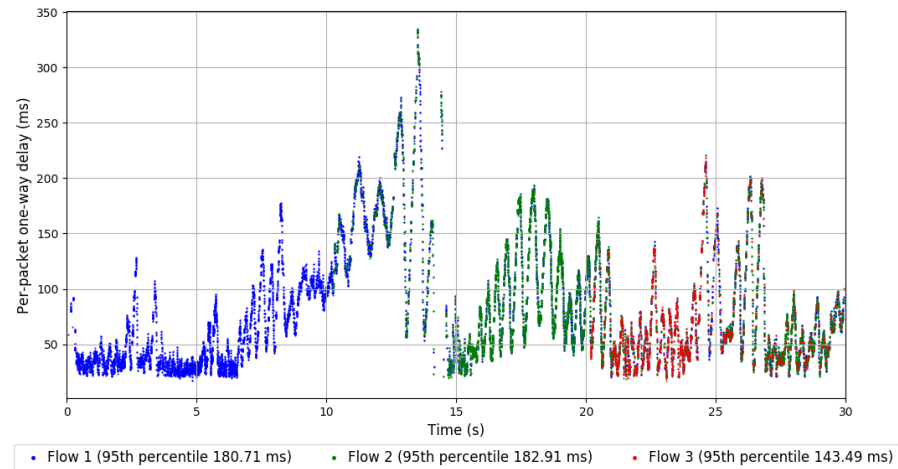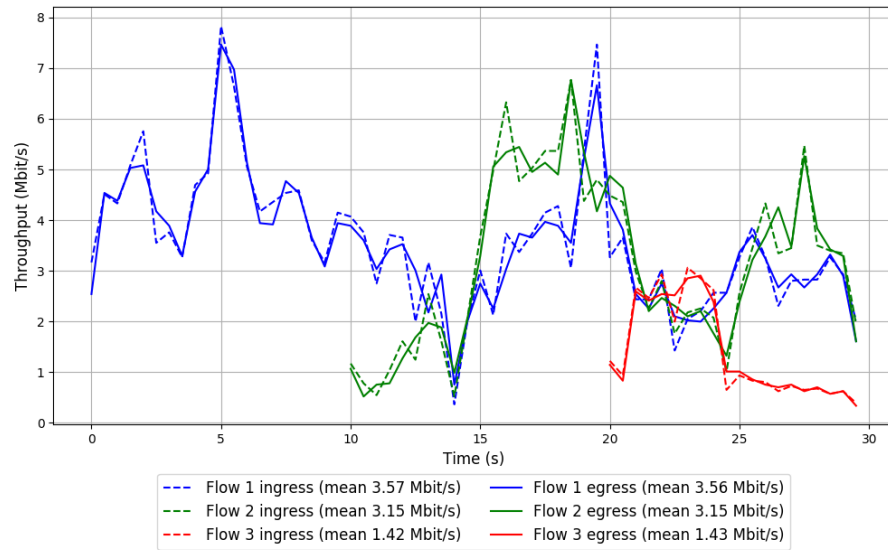
Run 2: Report of Verus — Data Link

Flow 1 ingress (mean 4.44 Mbit/s) Flow 1 egress (mean 3.74 Mbit/s)
Flow 2 ingress (mean 1.21 Mbit/s) Flow 2 egress (mean 1.19 Mbit/s)
Flow 3 ingress (mean 1.71 Mbit/s) Flow 3 egress (mean 1.28 Mbit/s)

Flow 1 (95th percentile 348.41 ms)   Flow 2 (95th percentile 315.56 ms)   Flow 3 (95th percentile 361.14 ms)

```
Run 3: Statistics of Verus

Start at: 2018-02-19 19:50:13
End at: 2018-02-19 19:50:43
Local clock offset: 0.379 ms
Remote clock offset: -7.03 ms


# Below is generated by plot.py at 2018-02-19 21:03:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 347.040 ms
Loss rate: 29.69%
-- Flow 1:
Average throughput: 2.89 Mbit/s
95th percentile per-packet one-way delay: 310.024 ms
Loss rate: 6.92%
-- Flow 2:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 441.701 ms
Loss rate: 63.83%
-- Flow 3:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 335.583 ms
Loss rate: 12.98%
```
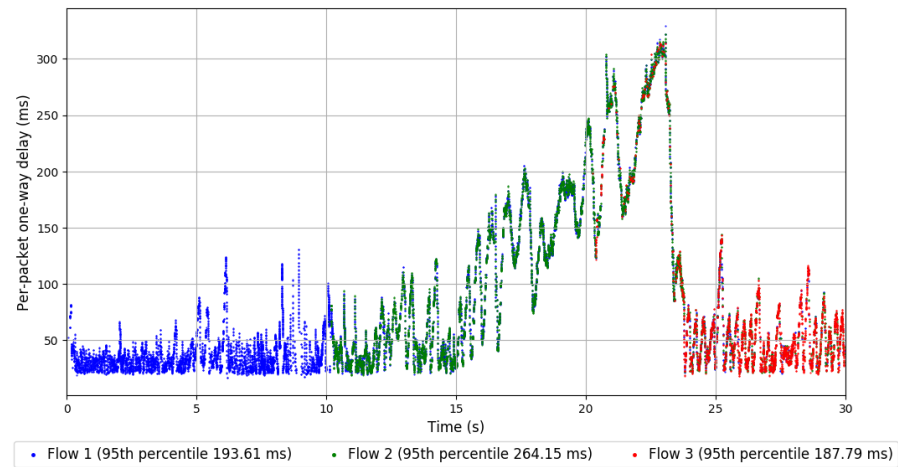
Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 3.10 Mbit/s)   Flow 1 egress (mean 2.89 Mbit/s)
Flow 2 ingress (mean 3.45 Mbit/s)   Flow 2 egress (mean 1.26 Mbit/s)
Flow 3 ingress (mean 1.45 Mbit/s)   Flow 3 egress (mean 1.28 Mbit/s)

Flow 1 (95th percentile 310.02 ms)   Flow 2 (95th percentile 441.70 ms)   Flow 3 (95th percentile 335.58 ms)
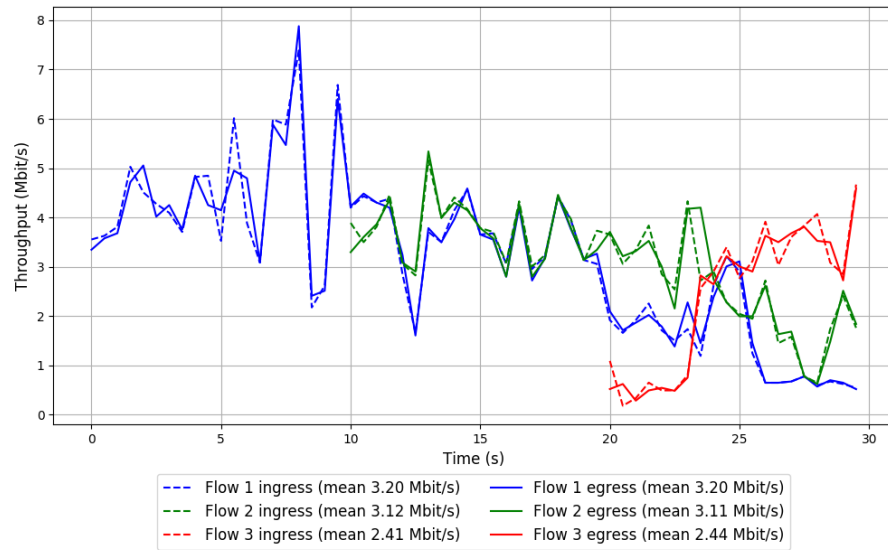
69

```
Run 1: Statistics of Copa

Start at: 2018-02-19 18:54:45
End at: 2018-02-19 18:55:15
Local clock offset: 1.809 ms
Remote clock offset: -6.986 ms


# Below is generated by plot.py at 2018-02-19 21:03:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.12 Mbit/s
95th percentile per-packet one-way delay: 181.000 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 3.56 Mbit/s
95th percentile per-packet one-way delay: 180.708 ms
Loss rate: 0.52%
-- Flow 2:
Average throughput: 3.15 Mbit/s
95th percentile per-packet one-way delay: 182.909 ms
Loss rate: 0.57%
-- Flow 3:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 143.491 ms
Loss rate: 0.37%
```
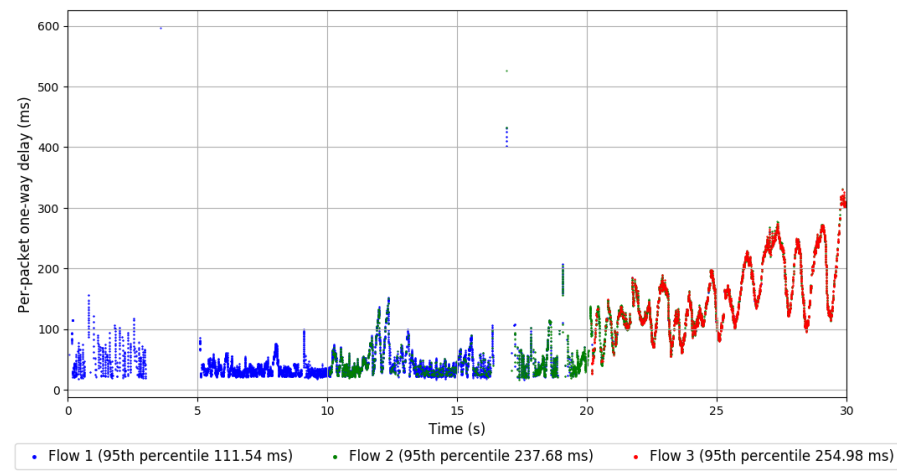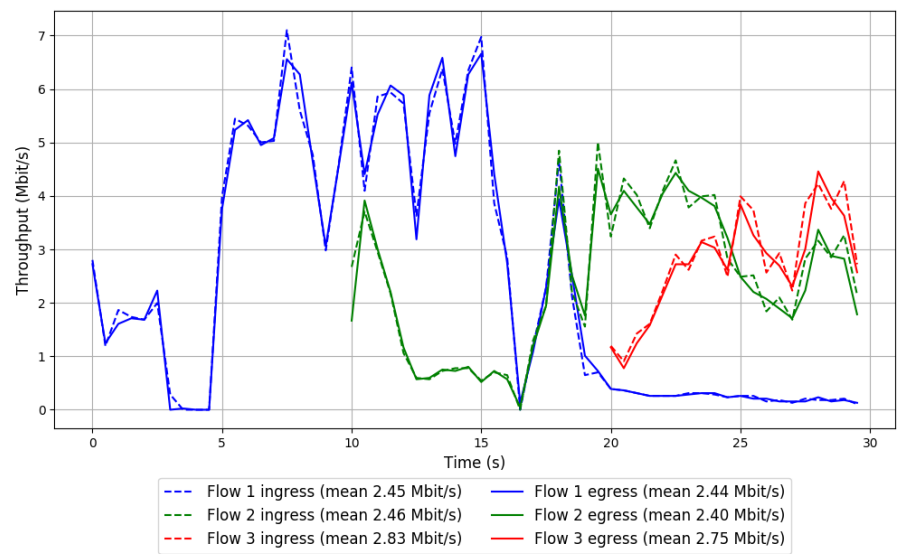
Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2018-02-19 19:18:32
End at: 2018-02-19 19:19:02
Local clock offset: 0.024 ms
Remote clock offset: -6.514 ms


# Below is generated by plot.py at 2018-02-19 21:03:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.06 Mbit/s
95th percentile per-packet one-way delay: 235.346 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 3.20 Mbit/s
95th percentile per-packet one-way delay: 193.609 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 3.11 Mbit/s
95th percentile per-packet one-way delay: 264.153 ms
Loss rate: 0.60%
-- Flow 3:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 187.789 ms
Loss rate: 1.26%
```
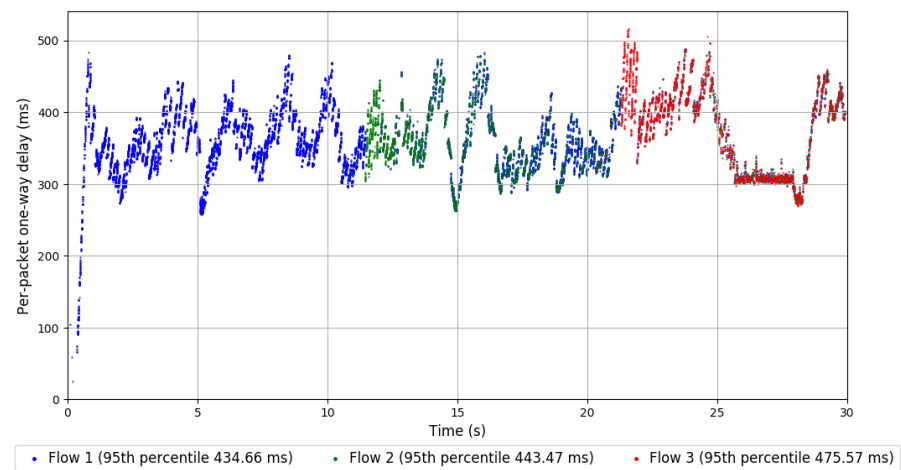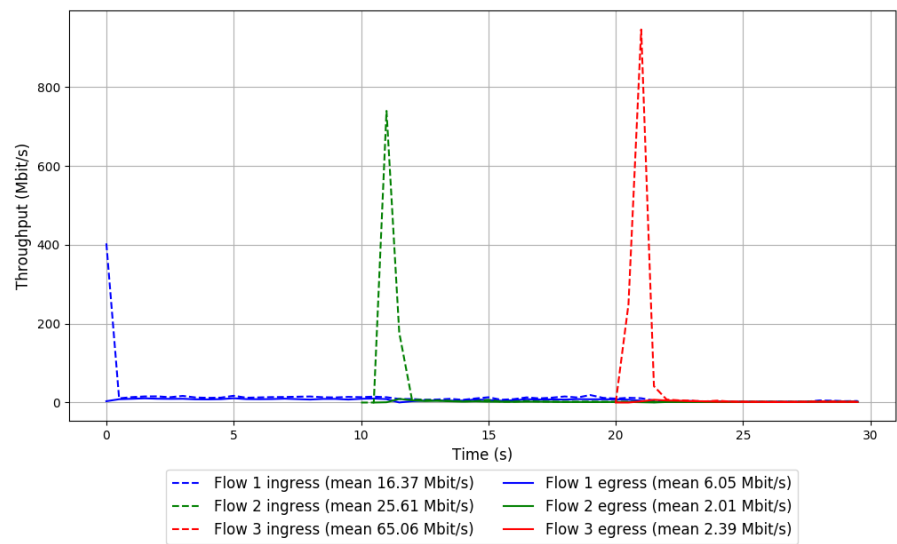
Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-02-19 19:42:18
End at: 2018-02-19 19:42:48
Local clock offset: 0.222 ms
Remote clock offset: -7.083 ms

# Below is generated by plot.py at 2018-02-19 21:03:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.94 Mbit/s
95th percentile per-packet one-way delay: 231.215 ms
Loss rate: 1.84%
-- Flow 1:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 111.542 ms
Loss rate: 0.46%
-- Flow 2:
Average throughput: 2.40 Mbit/s
95th percentile per-packet one-way delay: 237.684 ms
Loss rate: 2.67%
-- Flow 3:
Average throughput: 2.75 Mbit/s
95th percentile per-packet one-way delay: 254.982 ms
Loss rate: 4.01%
```
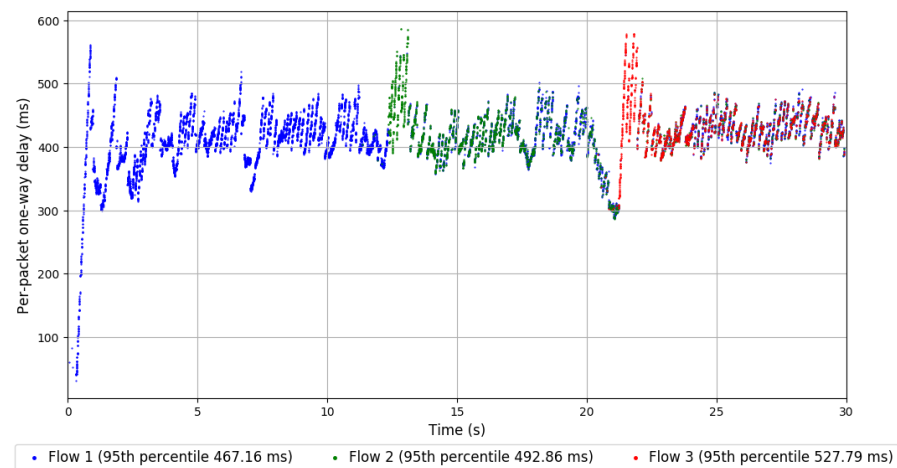
Run 3: Report of Copa — Data Link

```
Run 1: Statistics of FillP

Start at: 2018-02-19 18:48:08
End at: 2018-02-19 18:48:38
Local clock offset: 1.889 ms
Remote clock offset: -7.409 ms


# Below is generated by plot.py at 2018-02-19 21:04:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.11 Mbit/s
95th percentile per-packet one-way delay: 443.119 ms
Loss rate: 85.28%
-- Flow 1:
Average throughput: 6.05 Mbit/s
95th percentile per-packet one-way delay: 434.657 ms
Loss rate: 63.20%
-- Flow 2:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 443.473 ms
Loss rate: 92.41%
-- Flow 3:
Average throughput: 2.39 Mbit/s
95th percentile per-packet one-way delay: 475.568 ms
Loss rate: 96.45%
```

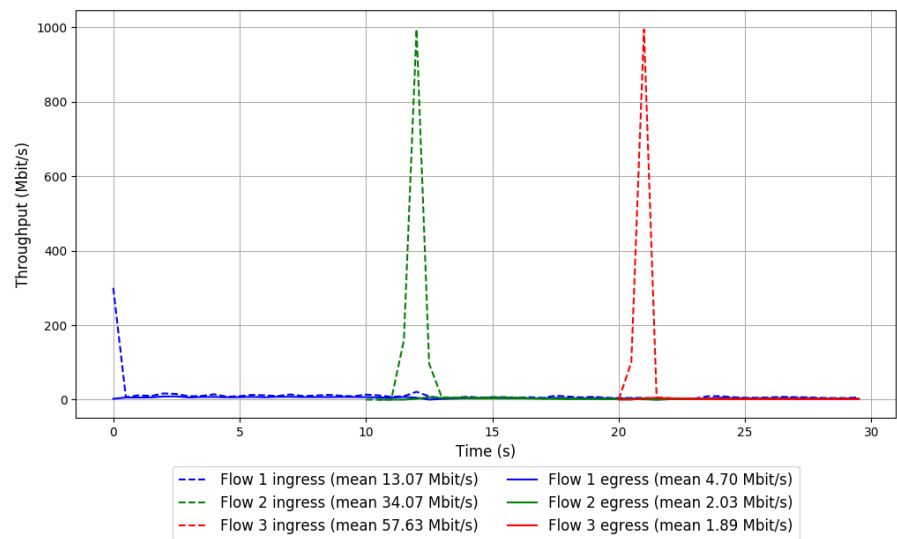# Run 1: Report of FillP — Data Link

```
Run 2: Statistics of FillP

Start at: 2018-02-19 19:11:55
End at: 2018-02-19 19:12:25
Local clock offset: 0.393 ms
Remote clock offset: -6.447 ms


# Below is generated by plot.py at 2018-02-19 21:04:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.60 Mbit/s
95th percentile per-packet one-way delay: 474.010 ms
Loss rate: 87.98%
-- Flow 1:
Average throughput: 4.70 Mbit/s
95th percentile per-packet one-way delay: 467.163 ms
Loss rate: 64.16%
-- Flow 2:
Average throughput: 2.03 Mbit/s
95th percentile per-packet one-way delay: 492.859 ms
Loss rate: 94.26%
-- Flow 3:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 527.792 ms
Loss rate: 96.87%
```

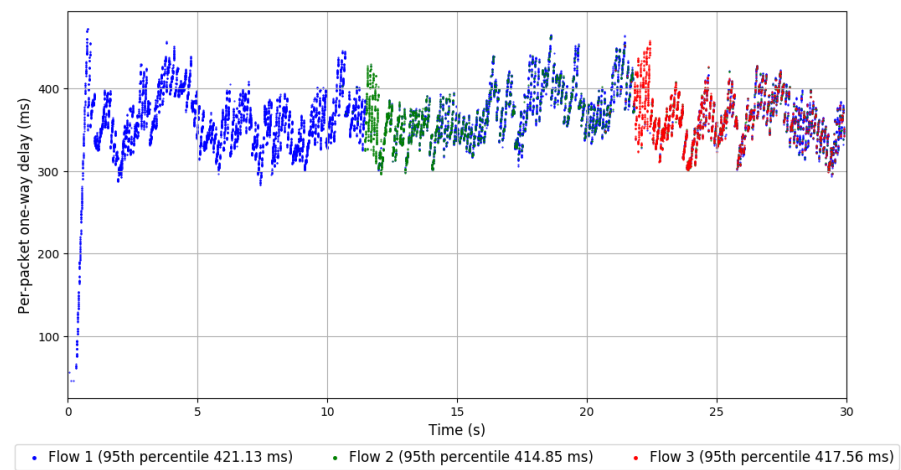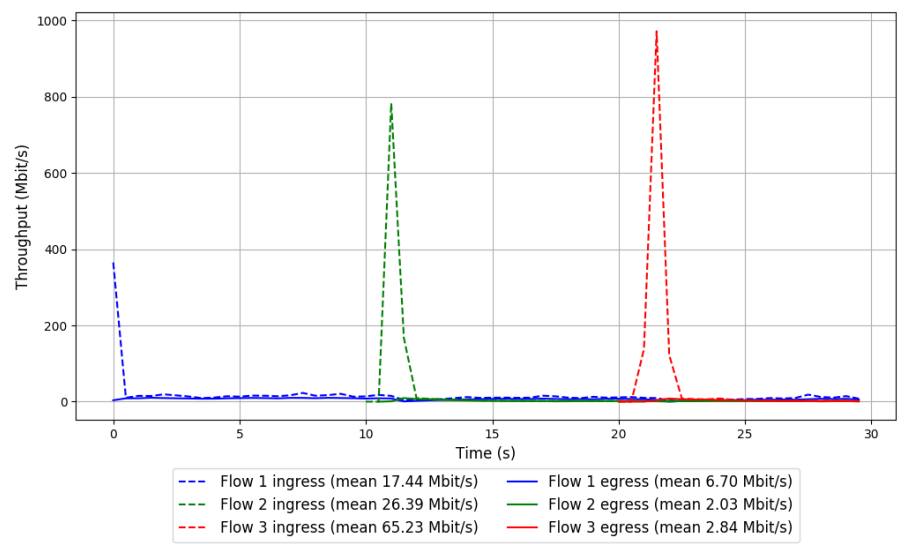Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-02-19 19:35:41
End at: 2018-02-19 19:36:11
Local clock offset: -0.126 ms
Remote clock offset: -7.016 ms

# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.91 Mbit/s
95th percentile per-packet one-way delay: 419.793 ms
Loss rate: 84.27%
-- Flow 1:
Average throughput: 6.70 Mbit/s
95th percentile per-packet one-way delay: 421.134 ms
Loss rate: 61.68%
-- Flow 2:
Average throughput: 2.03 Mbit/s
95th percentile per-packet one-way delay: 414.846 ms
Loss rate: 92.54%
-- Flow 3:
Average throughput: 2.84 Mbit/s
95th percentile per-packet one-way delay: 417.555 ms
Loss rate: 95.82%
```
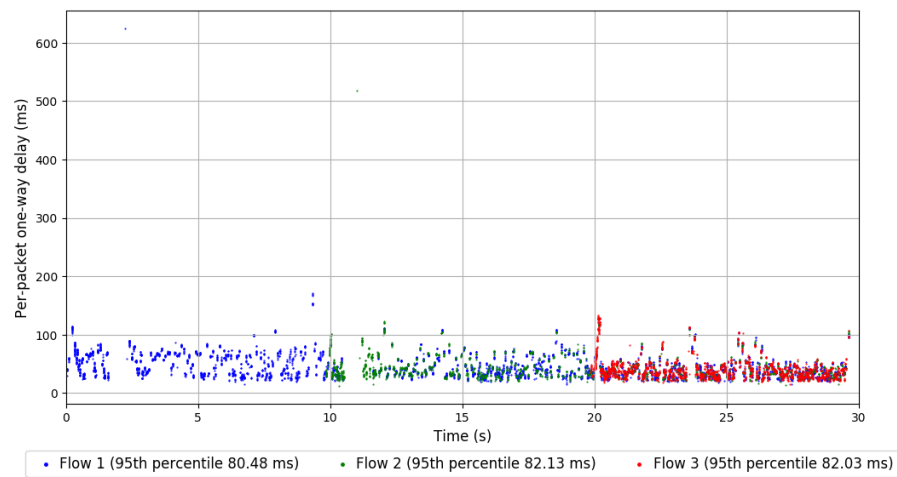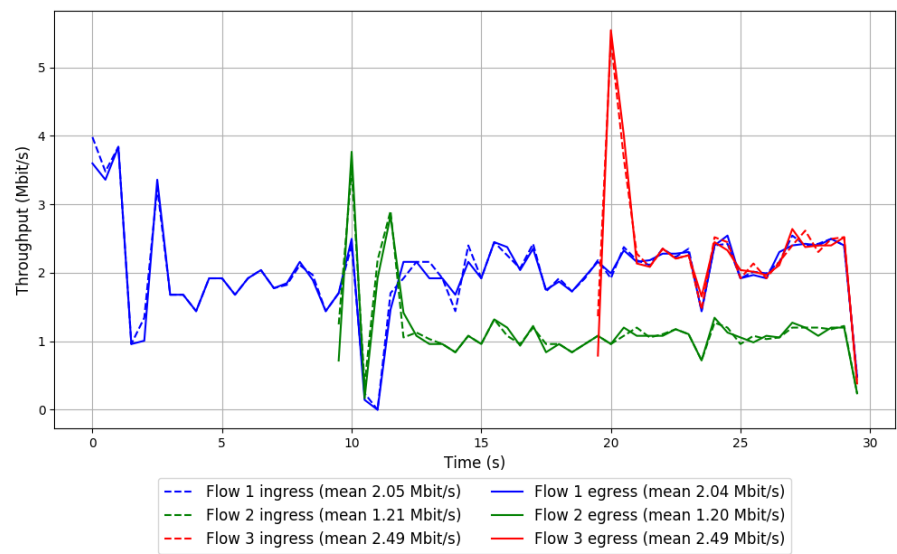
Run 3: Report of FillP — Data Link

Flow 1 ingress (mean 17.44 Mbit/s)   Flow 1 egress (mean 6.70 Mbit/s)
Flow 2 ingress (mean 26.39 Mbit/s)   Flow 2 egress (mean 2.03 Mbit/s)
Flow 3 ingress (mean 65.23 Mbit/s)   Flow 3 egress (mean 2.84 Mbit/s)

Flow 1 (95th percentile 421.13 ms)   Flow 2 (95th percentile 414.85 ms)   Flow 3 (95th percentile 417.56 ms)

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

Start at: 2018-02-19 18:52:07
End at: 2018-02-19 18:52:37
Local clock offset: 1.875 ms
Remote clock offset: -7.052 ms


# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.66 Mbit/s
95th percentile per-packet one-way delay: 81.158 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 80.479 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 82.130 ms
Loss rate: 1.15%
-- Flow 3:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 82.026 ms
Loss rate: 0.49%
```

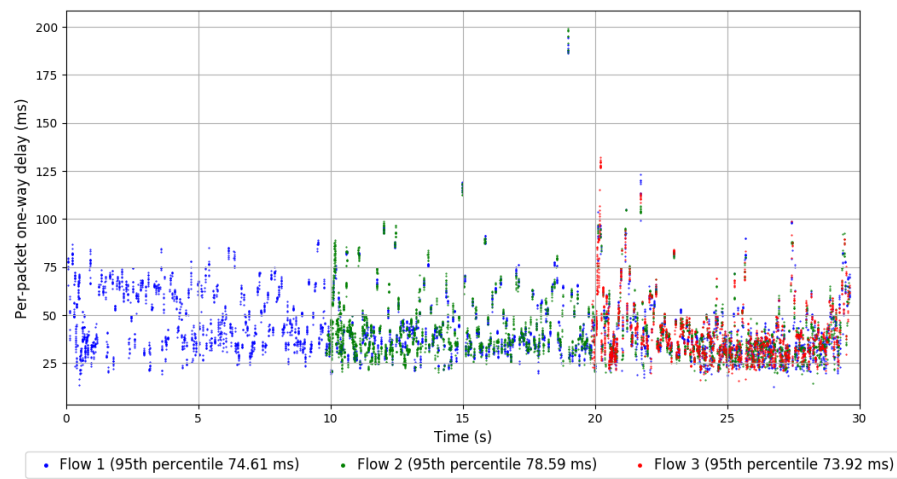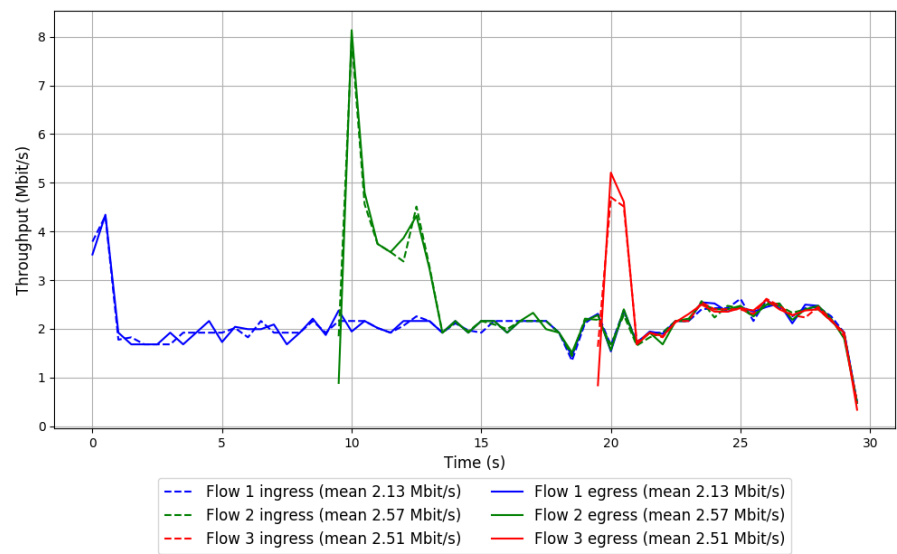Run 1: Report of Indigo-1-32 — Data Link

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

Start at: 2018-02-19 19:15:53
End at: 2018-02-19 19:16:23
Local clock offset: 0.067 ms
Remote clock offset: -6.365 ms


# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.67 Mbit/s
95th percentile per-packet one-way delay: 75.477 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 2.13 Mbit/s
95th percentile per-packet one-way delay: 74.615 ms
Loss rate: 0.19%
-- Flow 2:
Average throughput: 2.57 Mbit/s
95th percentile per-packet one-way delay: 78.593 ms
Loss rate: 0.28%
-- Flow 3:
Average throughput: 2.51 Mbit/s
95th percentile per-packet one-way delay: 73.917 ms
Loss rate: 0.49%
```

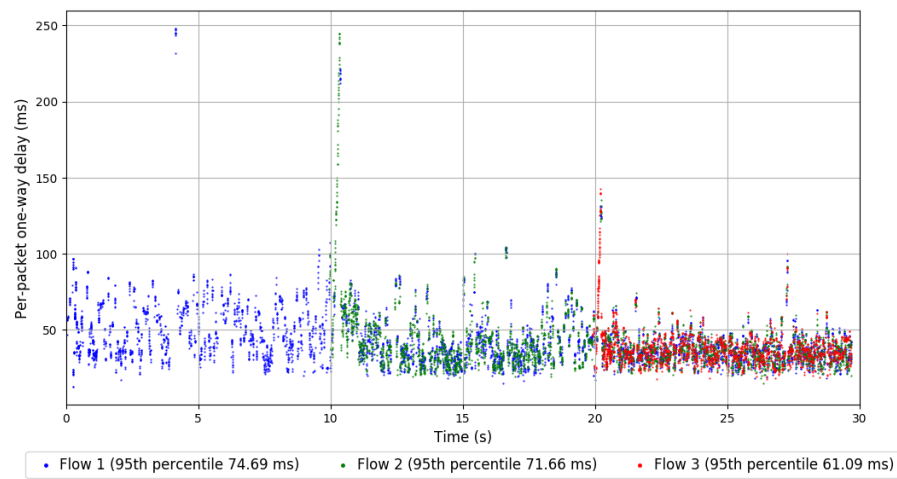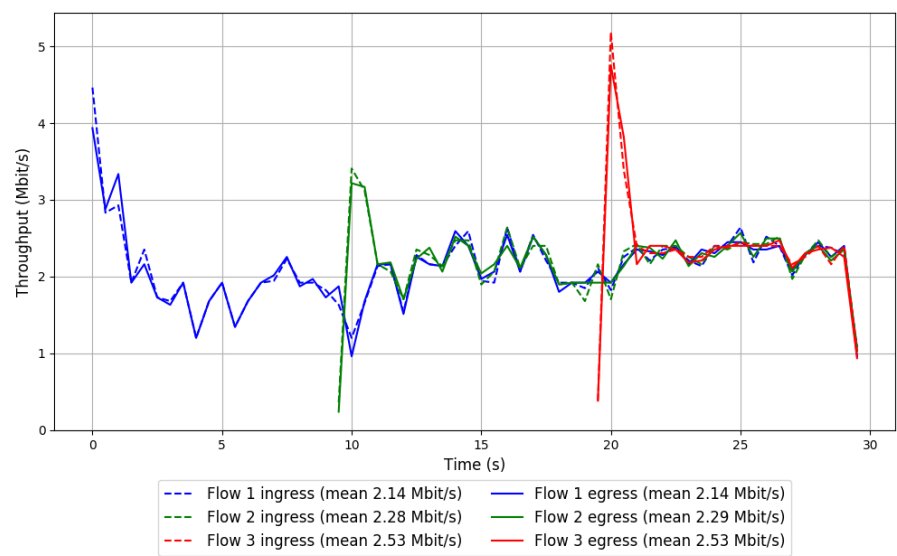Run 2: Report of Indigo-1-32 — Data Link

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

Start at: 2018-02-19 19:39:40
End at: 2018-02-19 19:40:10
Local clock offset: 0.128 ms
Remote clock offset: -6.973 ms


# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.49 Mbit/s
95th percentile per-packet one-way delay: 72.554 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 2.14 Mbit/s
95th percentile per-packet one-way delay: 74.685 ms
Loss rate: 0.26%
-- Flow 2:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 71.656 ms
Loss rate: 0.29%
-- Flow 3:
Average throughput: 2.53 Mbit/s
95th percentile per-packet one-way delay: 61.086 ms
Loss rate: 0.48%
```

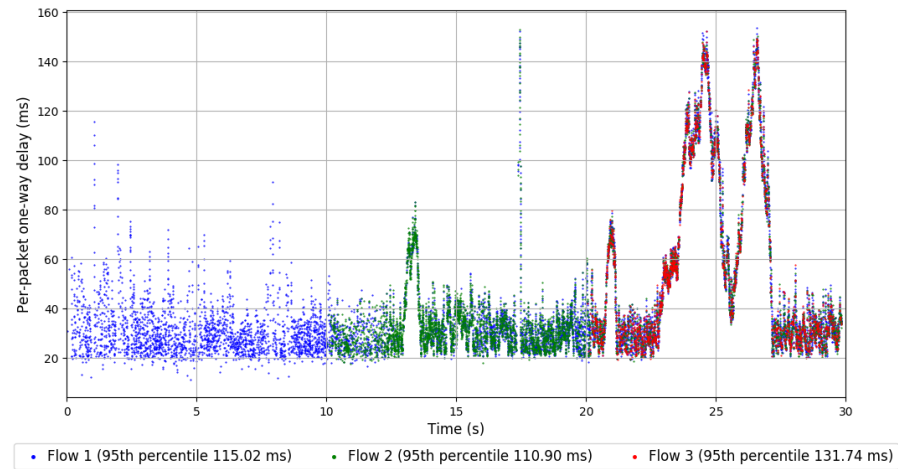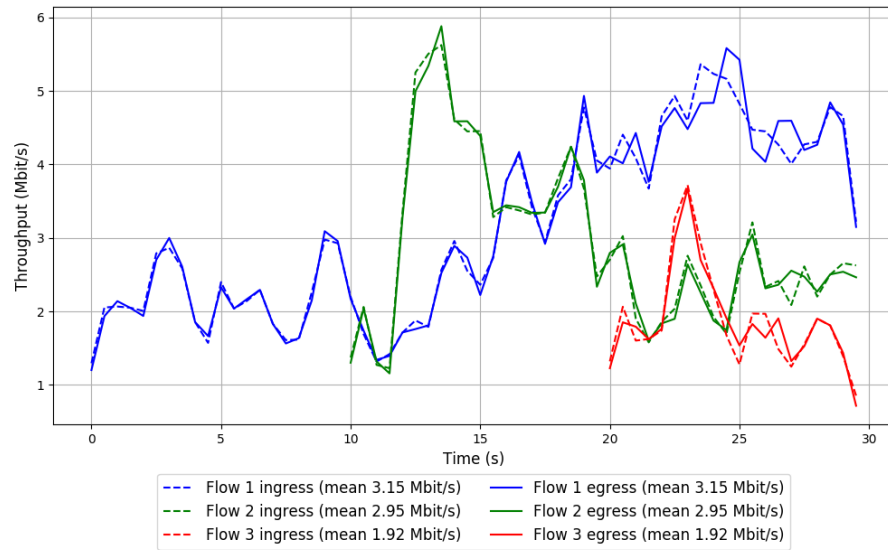Run 3: Report of Indigo-1-32 — Data Link

```
Run 1: Statistics of Vivace-latency

Start at: 2018-02-19 18:49:28
End at: 2018-02-19 18:49:58
Local clock offset: 1.874 ms
Remote clock offset: -7.248 ms

# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.74 Mbit/s
95th percentile per-packet one-way delay: 115.925 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 3.15 Mbit/s
95th percentile per-packet one-way delay: 115.015 ms
Loss rate: 0.25%
-- Flow 2:
Average throughput: 2.95 Mbit/s
95th percentile per-packet one-way delay: 110.902 ms
Loss rate: 0.36%
-- Flow 3:
Average throughput: 1.92 Mbit/s
95th percentile per-packet one-way delay: 131.743 ms
Loss rate: 0.56%
```

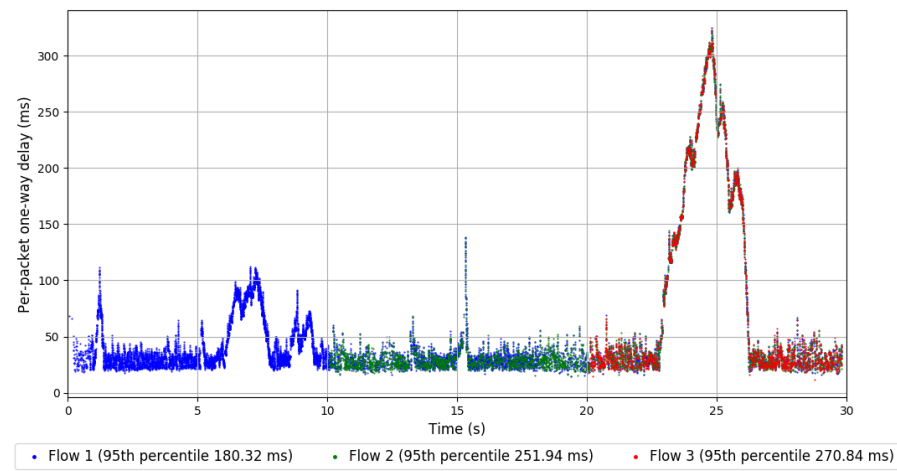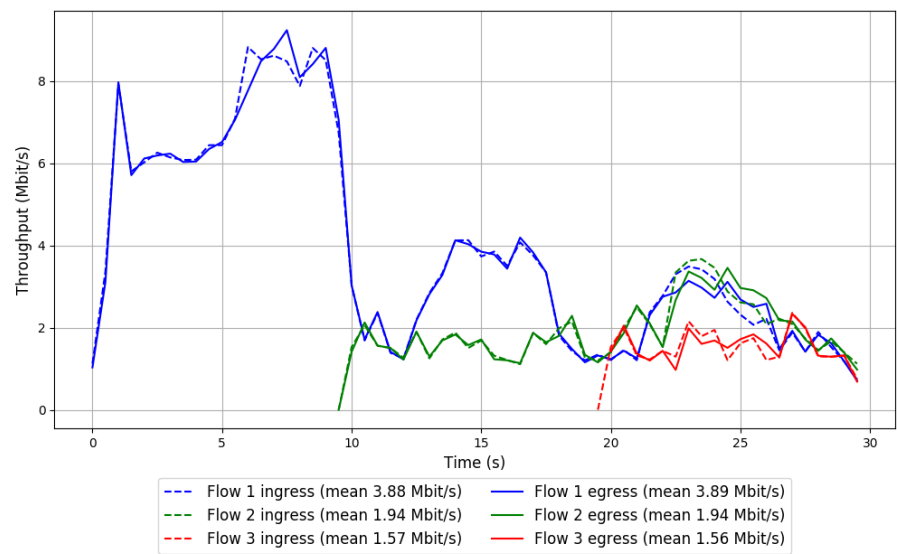Run 1: Report of Vivace-latency — Data Link

```
Run 2: Statistics of Vivace-latency

Start at: 2018-02-19 19:13:15
End at: 2018-02-19 19:13:45
Local clock offset: 0.294 ms
Remote clock offset: -6.347 ms


# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.69 Mbit/s
95th percentile per-packet one-way delay: 226.704 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 3.89 Mbit/s
95th percentile per-packet one-way delay: 180.320 ms
Loss rate: 0.05%
-- Flow 2:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 251.935 ms
Loss rate: 0.27%
-- Flow 3:
Average throughput: 1.56 Mbit/s
95th percentile per-packet one-way delay: 270.838 ms
Loss rate: 0.53%
```

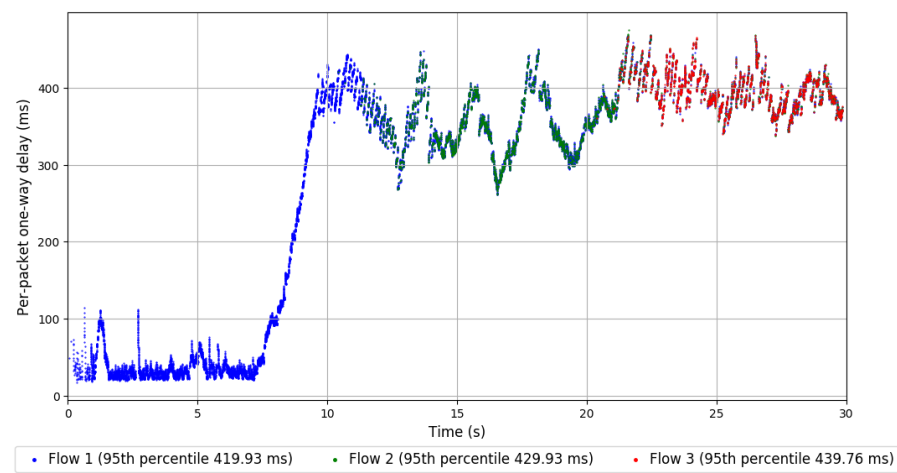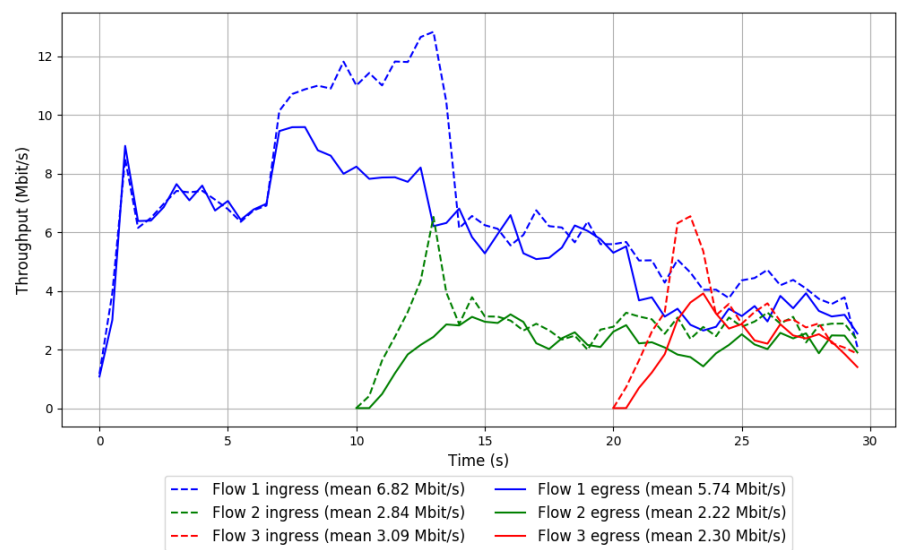Run 2: Report of Vivace-latency — Data Link

```
Run 3: Statistics of Vivace-latency

Start at: 2018-02-19 19:37:01
End at: 2018-02-19 19:37:31
Local clock offset: -0.121 ms
Remote clock offset: -7.092 ms


# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.92 Mbit/s
95th percentile per-packet one-way delay: 425.088 ms
Loss rate: 18.80%
-- Flow 1:
Average throughput: 5.74 Mbit/s
95th percentile per-packet one-way delay: 419.932 ms
Loss rate: 16.05%
-- Flow 2:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 429.926 ms
Loss rate: 23.49%
-- Flow 3:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 439.764 ms
Loss rate: 28.51%
```

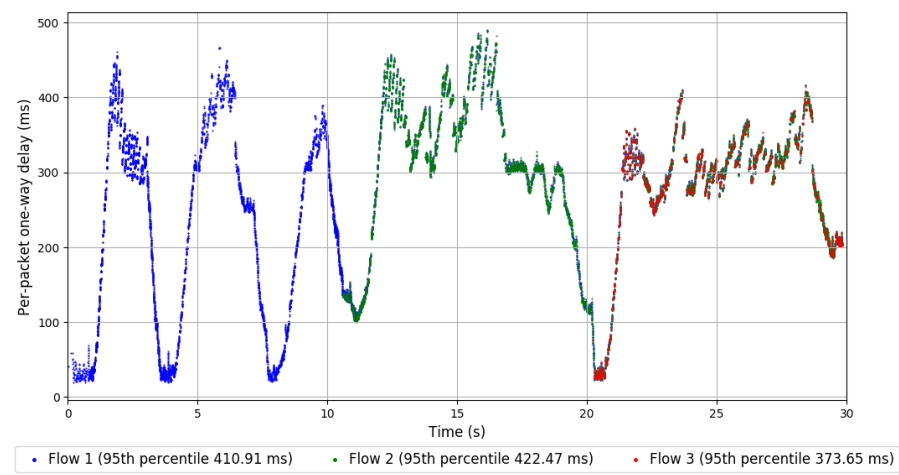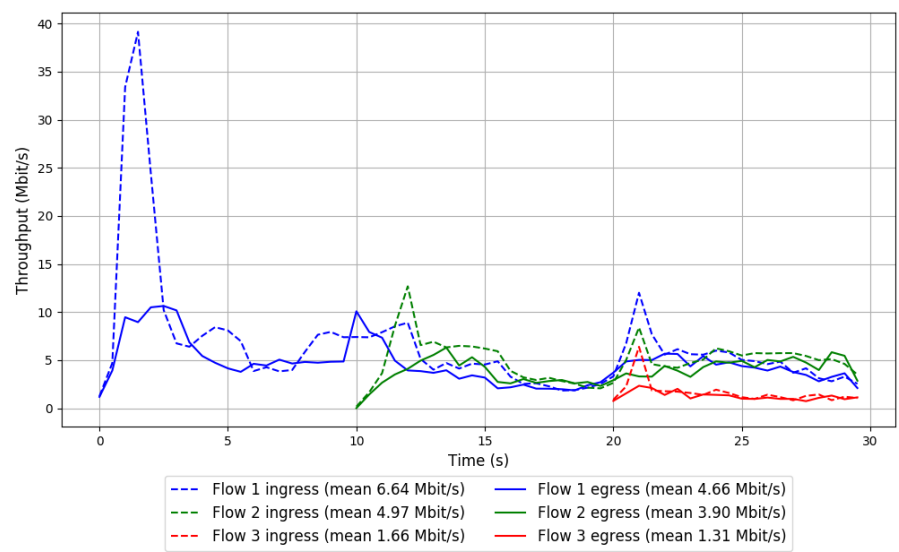Run 3: Report of Vivace-latency — Data Link

```
Run 1: Statistics of Vivace-loss

Start at: 2018-02-19 18:44:11
End at: 2018-02-19 18:44:41
Local clock offset: 1.809 ms
Remote clock offset: -7.822 ms


# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.65 Mbit/s
95th percentile per-packet one-way delay: 413.293 ms
Loss rate: 27.27%
-- Flow 1:
Average throughput: 4.66 Mbit/s
95th percentile per-packet one-way delay: 410.910 ms
Loss rate: 30.00%
-- Flow 2:
Average throughput: 3.90 Mbit/s
95th percentile per-packet one-way delay: 422.470 ms
Loss rate: 22.66%
-- Flow 3:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 373.648 ms
Loss rate: 21.93%
```

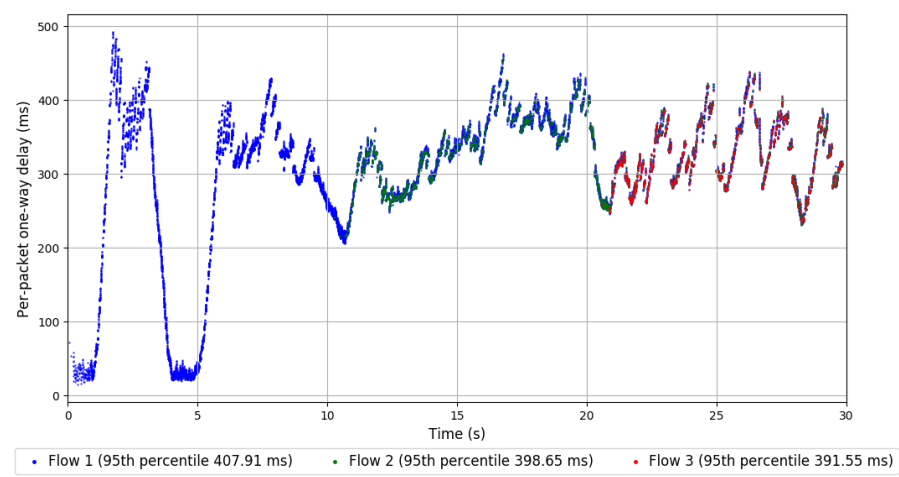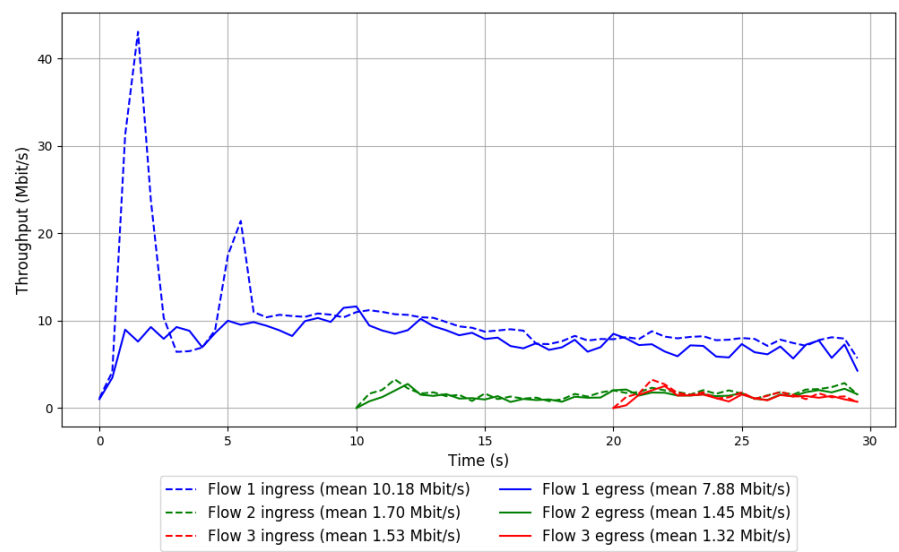Run 1: Report of Vivace-loss — Data Link

```
Run 2: Statistics of Vivace-loss

Start at: 2018-02-19 19:07:56
End at: 2018-02-19 19:08:26
Local clock offset: 0.569 ms
Remote clock offset: -6.538 ms


# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.25 Mbit/s
95th percentile per-packet one-way delay: 406.460 ms
Loss rate: 21.90%
-- Flow 1:
Average throughput: 7.88 Mbit/s
95th percentile per-packet one-way delay: 407.914 ms
Loss rate: 22.84%
-- Flow 2:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 398.653 ms
Loss rate: 15.74%
-- Flow 3:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 391.552 ms
Loss rate: 16.75%
```

Run 2: Report of Vivace-loss — Data Link

```
Run 3: Statistics of Vivace-loss

Start at: 2018-02-19 19:31:43
End at: 2018-02-19 19:32:13
Local clock offset: -0.448 ms
Remote clock offset: -7.05 ms

# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.07 Mbit/s
95th percentile per-packet one-way delay: 431.587 ms
Loss rate: 28.80%
-- Flow 1:
Average throughput: 4.76 Mbit/s
95th percentile per-packet one-way delay: 432.205 ms
Loss rate: 31.93%
-- Flow 2:
Average throughput: 2.76 Mbit/s
95th percentile per-packet one-way delay: 432.350 ms
Loss rate: 21.63%
-- Flow 3:
Average throughput: 1.58 Mbit/s
95th percentile per-packet one-way delay: 418.429 ms
Loss rate: 20.33%
```
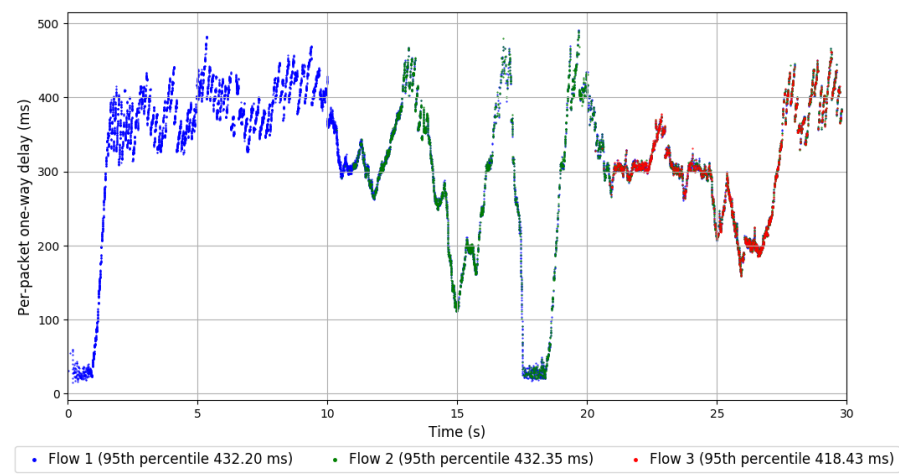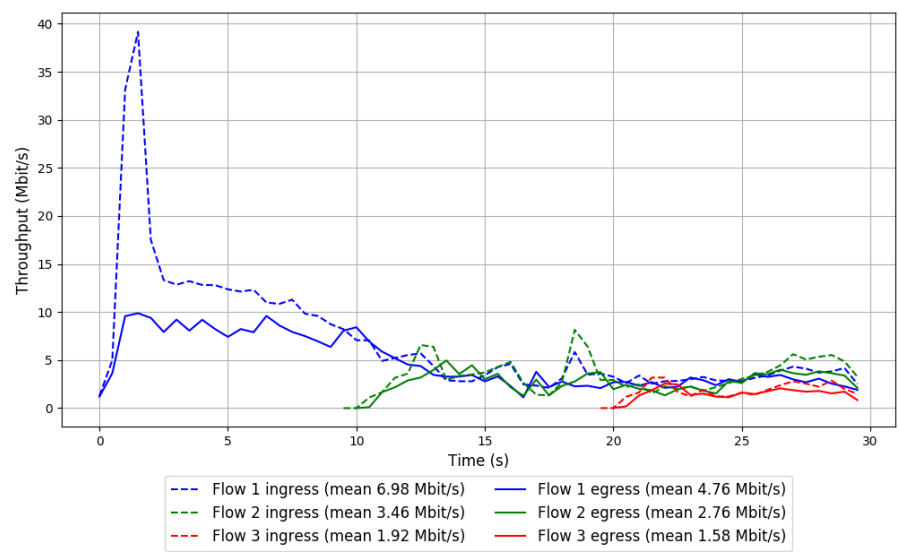
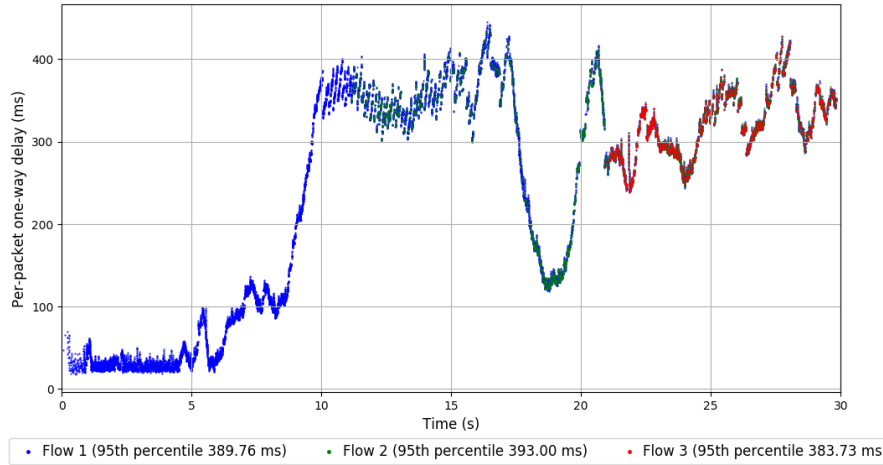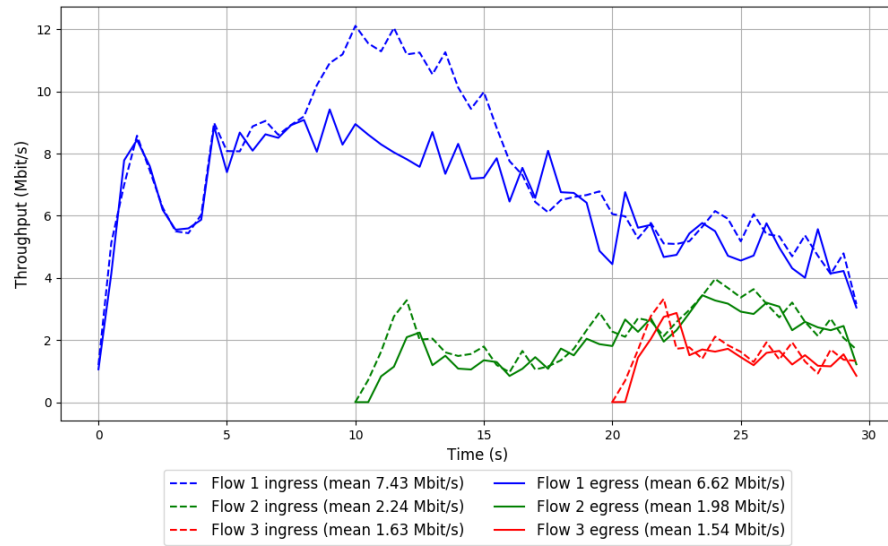Run 3: Report of Vivace-loss — Data Link

```
Run 1: Statistics of Vivace-LTE

Start at: 2018-02-19 18:53:26
End at: 2018-02-19 18:53:56
Local clock offset: 1.889 ms
Remote clock offset: -6.974 ms


# Below is generated by plot.py at 2018-02-19 21:04:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.40 Mbit/s
95th percentile per-packet one-way delay: 389.839 ms
Loss rate: 11.36%
-- Flow 1:
Average throughput: 6.62 Mbit/s
95th percentile per-packet one-way delay: 389.760 ms
Loss rate: 11.12%
-- Flow 2:
Average throughput: 1.98 Mbit/s
95th percentile per-packet one-way delay: 393.003 ms
Loss rate: 13.20%
-- Flow 3:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 383.727 ms
Loss rate: 9.66%
```

Run 1: Report of Vivace-LTE — Data Link

Flow 1 ingress (mean 7.43 Mbit/s) ---- Flow 1 egress (mean 6.62 Mbit/s) ——
Flow 2 ingress (mean 2.24 Mbit/s) ---- Flow 2 egress (mean 1.98 Mbit/s) ——
Flow 3 ingress (mean 1.63 Mbit/s) ---- Flow 3 egress (mean 1.54 Mbit/s) ——

• Flow 1 (95th percentile 389.76 ms) • Flow 2 (95th percentile 393.00 ms) • Flow 3 (95th percentile 383.73 ms)
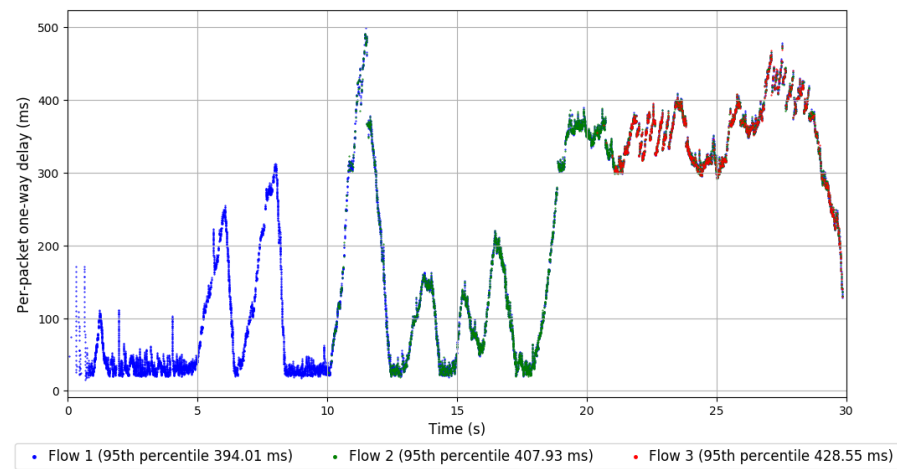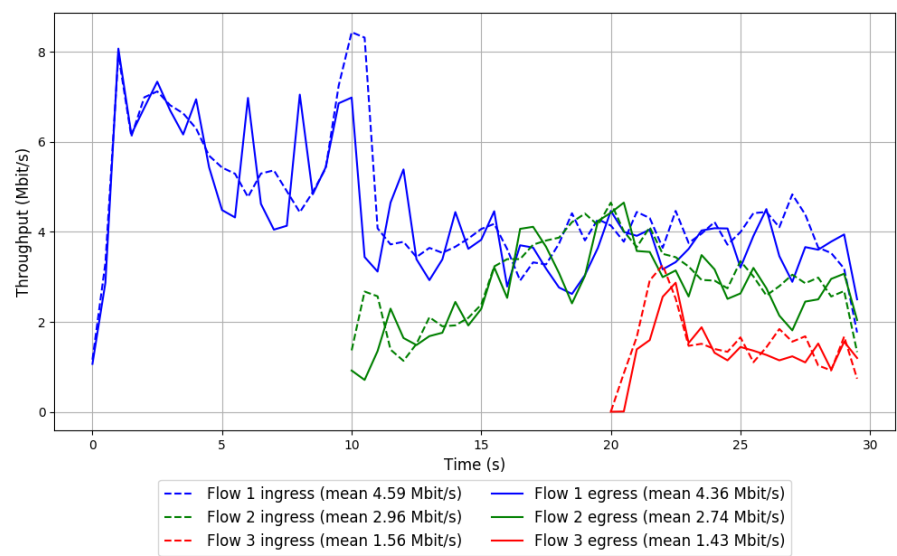
```
Run 2: Statistics of Vivace-LTE

Start at: 2018-02-19 19:17:12
End at: 2018-02-19 19:17:42
Local clock offset: -0.01 ms
Remote clock offset: -6.488 ms


# Below is generated by plot.py at 2018-02-19 21:04:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.63 Mbit/s
95th percentile per-packet one-way delay: 402.164 ms
Loss rate: 6.43%
-- Flow 1:
Average throughput: 4.36 Mbit/s
95th percentile per-packet one-way delay: 394.015 ms
Loss rate: 5.27%
-- Flow 2:
Average throughput: 2.74 Mbit/s
95th percentile per-packet one-way delay: 407.926 ms
Loss rate: 7.80%
-- Flow 3:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 428.548 ms
Loss rate: 11.53%
```

Run 2: Report of Vivace-LTE — Data Link

```
Run 3: Statistics of Vivace-LTE

Start at: 2018-02-19 19:40:59
End at: 2018-02-19 19:41:29
Local clock offset: 0.18 ms
Remote clock offset: -7.081 ms


# Below is generated by plot.py at 2018-02-19 21:04:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.73 Mbit/s
95th percentile per-packet one-way delay: 406.959 ms
Loss rate: 8.49%
-- Flow 1:
Average throughput: 4.95 Mbit/s
95th percentile per-packet one-way delay: 407.229 ms
Loss rate: 7.17%
-- Flow 2:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 415.185 ms
Loss rate: 10.14%
-- Flow 3:
Average throughput: 5.10 Mbit/s
95th percentile per-packet one-way delay: 401.843 ms
Loss rate: 11.14%
```

Run 3: Report of Vivace-LTE — Data Link

Flow 1 ingress (mean 5.32 Mbit/s) Flow 1 egress (mean 4.95 Mbit/s)
Flow 2 ingress (mean 1.85 Mbit/s) Flow 2 egress (mean 1.72 Mbit/s)
Flow 3 ingress (mean 5.70 Mbit/s) Flow 3 egress (mean 5.10 Mbit/s)

Flow 1 (95th percentile 407.23 ms)   Flow 2 (95th percentile 415.19 ms)   Flow 3 (95th percentile 401.84 ms)