Pantheon Report

Generated at 2018-03-27 00:25:42 (UTC).

Data path: Colombia ppp0 (*remote*) →AWS Brazil 2 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.

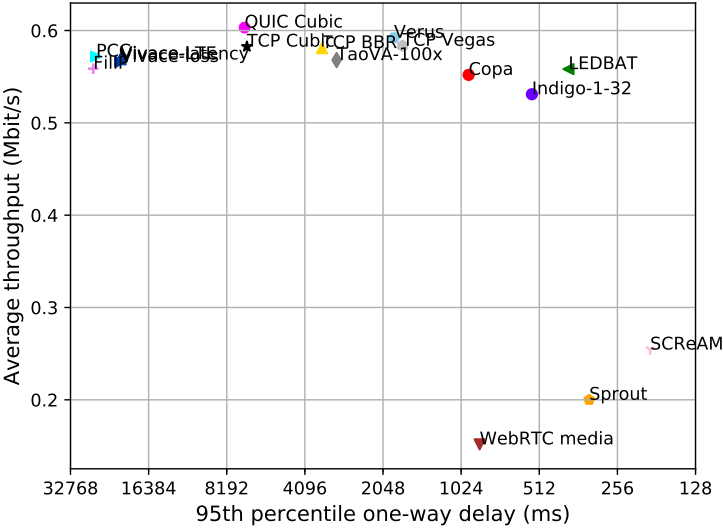Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

```
Git summary:
branch: master @ 503f51fe03f703a4c0a826a0792a4fead3e7d1b0
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 @ f271183af822eee5d0031620f4bebf38aedc5581
```
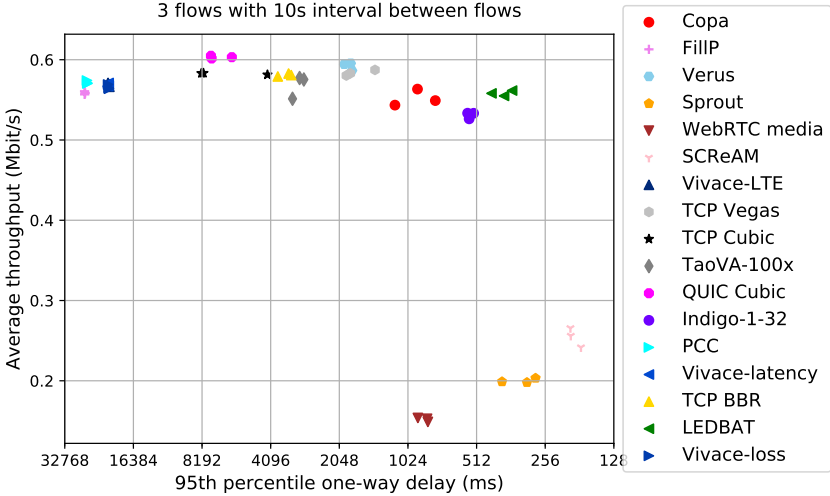
test from Colombia ppp0 to AWS Brazil 2 Ethernet, 3 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)

test from Colombia ppp0 to AWS Brazil 2 Ethernet, 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	0.38	0.29	0.04	3513.48	3532.91	3121.72	2.44	5.71	36.31
TCP Cubic	3	0.56	0.05	0.00	6862.05	5455.75	6818.41	22.62	48.57	78.68
LEDBAT	3	0.26	0.33	0.27	341.96	399.42	418.52	0.16	0.99	6.93
PCC	3	0.57	0.00	N/A	26111.77	N/A	N/A	98.53	N/A	N/A
QUIC Cubic	3	0.57	0.06	0.00	6971.43	6973.32	7081.16	25.83	34.40	27.78
SCReAM	3	0.08	0.16	0.19	168.42	182.03	237.51	0.83	0.90	2.22
WebRTC media	3	0.05	0.05	0.05	895.52	849.09	850.11	0.02	0.00	0.27
Sprout	3	0.10	0.10	0.11	532.84	225.27	282.72	1.56	1.63	3.54
TaoVA-100x	3	0.35	0.25	0.22	2509.06	3047.60	3350.46	4.28	17.90	22.96
TCP Vegas	3	0.41	0.22	0.15	1719.51	1729.14	1697.00	3.22	6.26	20.13
Verus	3	0.58	0.01	0.01	1861.14	1787.28	1817.21	5.61	7.33	12.42
Copa	3	0.34	0.20	0.25	910.31	973.70	946.21	4.54	8.71	15.03
FillP	3	0.56	0.00	N/A	26774.18	N/A	N/A	99.00	N/A	N/A
Indigo-1-32	3	0.27	0.28	0.25	511.16	470.33	651.37	1.18	2.39	4.82
Vivace-latency	3	0.57	0.00	N/A	21107.39	N/A	N/A	71.26	N/A	N/A
Vivace-loss	3	0.56	0.00	N/A	21051.72	N/A	N/A	89.09	N/A	N/A
Vivace-LTE	3	0.57	0.00	N/A	21019.06	N/A	N/A	71.05	N/A	N/A

```
Run 1: Statistics of TCP BBR

Start at: 2018-03-26 22:28:02
End at: 2018-03-26 22:28:32
Local clock offset: -2.444 ms
Remote clock offset: 7.735 ms


# Below is generated by plot.py at 2018-03-27 00:25:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 3418.286 ms
Loss rate: 4.14%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 3406.981 ms
Loss rate: 1.98%
-- Flow 2:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 3439.735 ms
Loss rate: 5.80%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 3269.139 ms
Loss rate: 39.58%
```
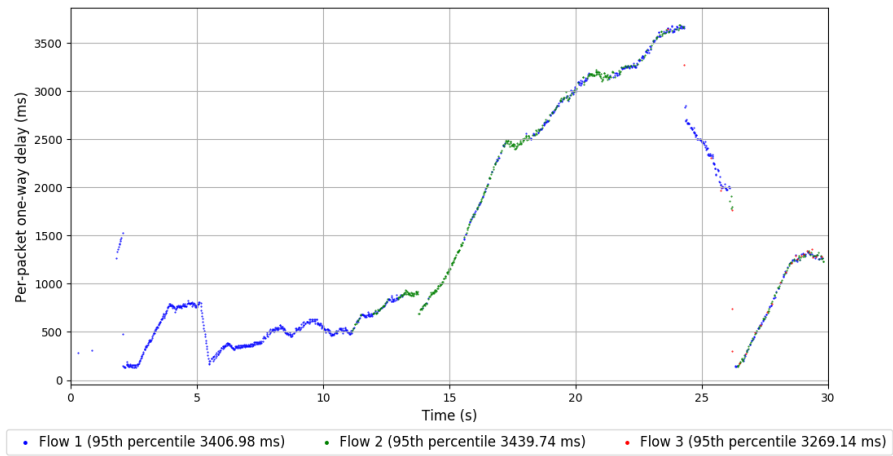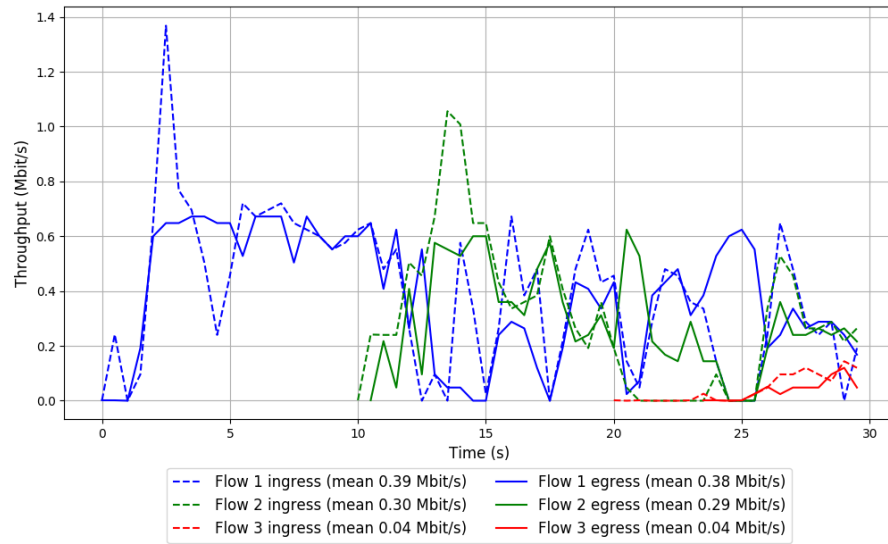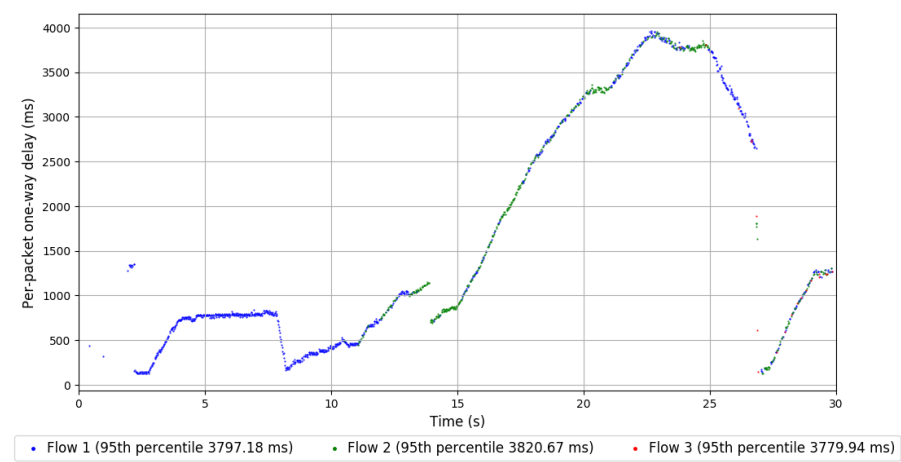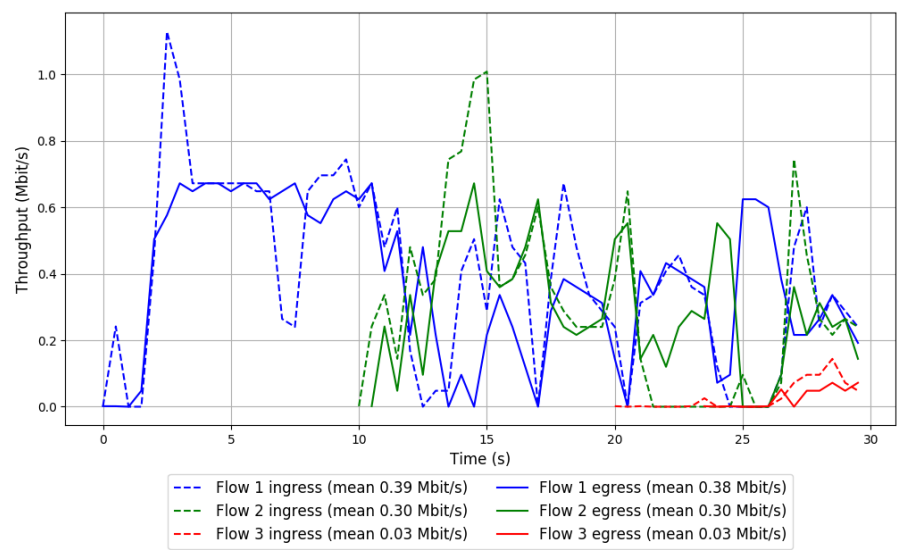
Run 1: Report of TCP BBR — Data Link

- - - Flow 1 ingress (mean 0.39 Mbit/s) —— Flow 1 egress (mean 0.38 Mbit/s)
- - - Flow 2 ingress (mean 0.30 Mbit/s) —— Flow 2 egress (mean 0.29 Mbit/s)
- - - Flow 3 ingress (mean 0.04 Mbit/s) —— Flow 3 egress (mean 0.04 Mbit/s)

• Flow 1 (95th percentile 3406.98 ms)   • Flow 2 (95th percentile 3439.74 ms)   • Flow 3 (95th percentile 3269.14 ms)

```
Run 2: Statistics of TCP BBR

Start at: 2018-03-26 22:50:48
End at: 2018-03-26 22:51:18
Local clock offset: -2.654 ms
Remote clock offset: 8.379 ms


# Below is generated by plot.py at 2018-03-27 00:25:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 3810.833 ms
Loss rate: 4.89%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 3797.179 ms
Loss rate: 3.43%
-- Flow 2:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 3820.667 ms
Loss rate: 5.94%
-- Flow 3:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 3779.940 ms
Loss rate: 41.04%
```
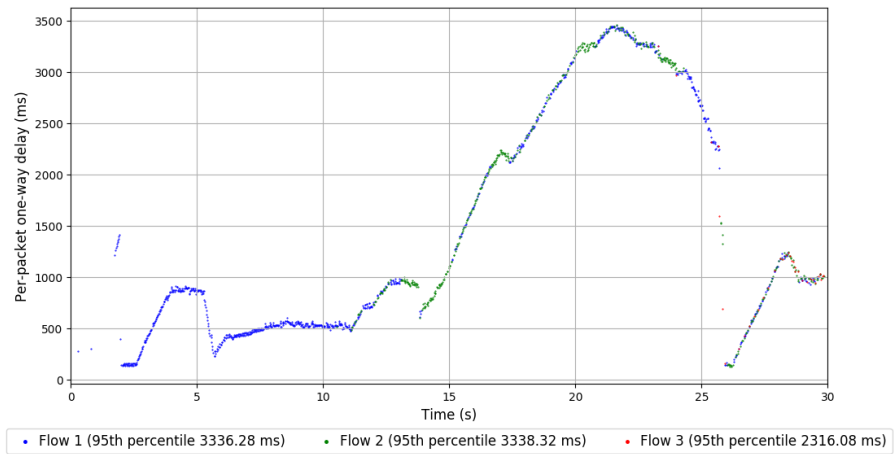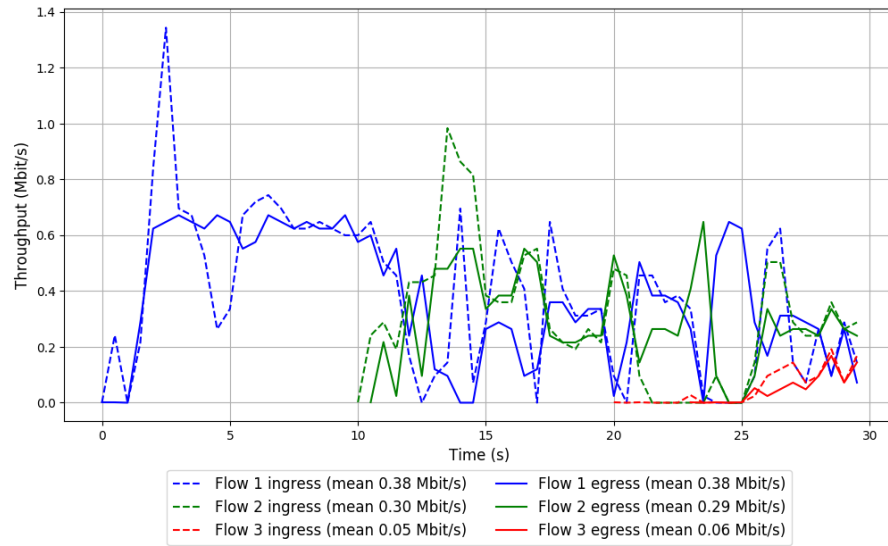
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2018-03-26 23:13:33
End at: 2018-03-26 23:14:03
Local clock offset: -4.669 ms
Remote clock offset: 2.886 ms


# Below is generated by plot.py at 2018-03-27 00:25:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 3328.314 ms
Loss rate: 3.83%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 3336.280 ms
Loss rate: 1.90%
-- Flow 2:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 3338.319 ms
Loss rate: 5.40%
-- Flow 3:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 2316.079 ms
Loss rate: 28.32%
```
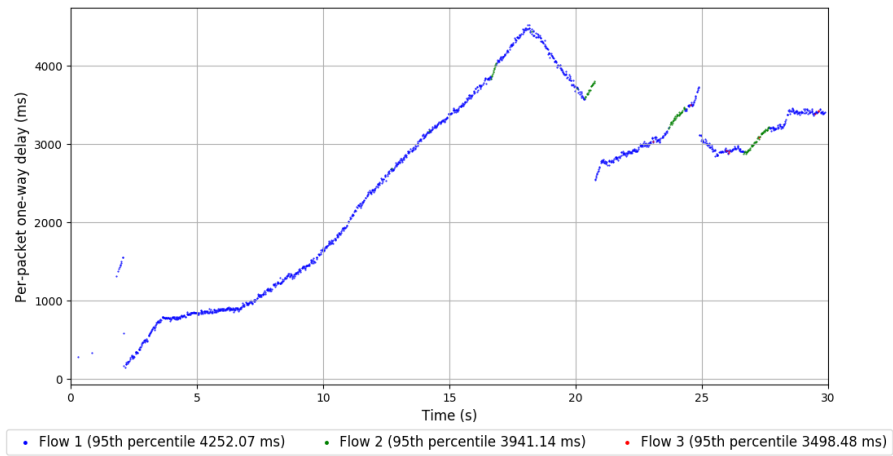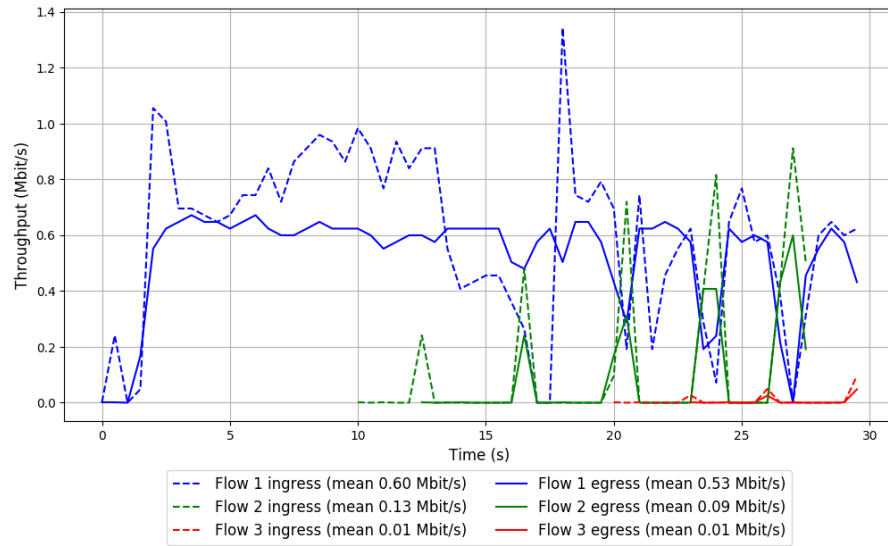
Run 3: Report of TCP BBR — Data Link

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```
Run 1: Statistics of TCP Cubic

Start at: 2018-03-26 22:12:51
End at: 2018-03-26 22:13:21
Local clock offset: -3.076 ms
Remote clock offset: 2.32 ms


# Below is generated by plot.py at 2018-03-27 00:25:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 4231.369 ms
Loss rate: 15.06%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 4252.068 ms
Loss rate: 11.63%
-- Flow 2:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 3941.138 ms
Loss rate: 40.04%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 3498.478 ms
Loss rate: 54.29%
```
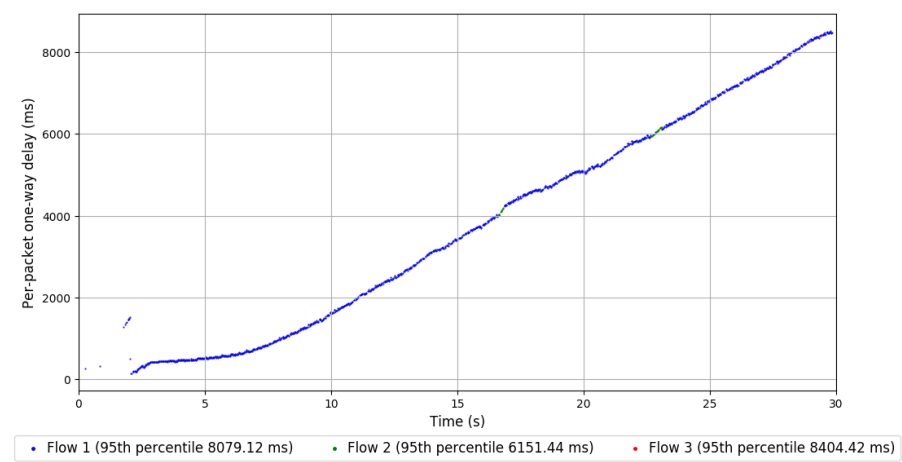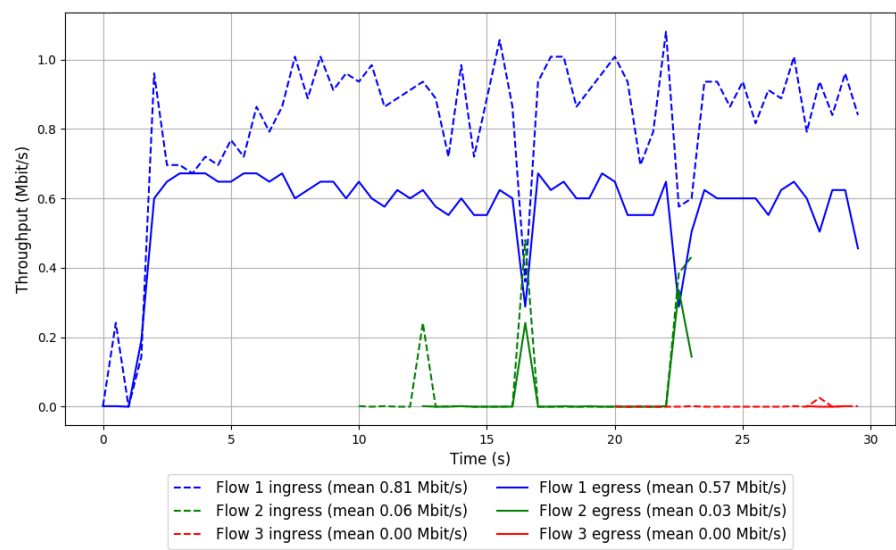
Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 0.60 Mbit/s) --- Flow 1 egress (mean 0.53 Mbit/s) —
Flow 2 ingress (mean 0.13 Mbit/s) --- Flow 2 egress (mean 0.09 Mbit/s) —
Flow 3 ingress (mean 0.01 Mbit/s) --- Flow 3 egress (mean 0.01 Mbit/s) —

Flow 1 (95th percentile 4252.07 ms)   Flow 2 (95th percentile 3941.14 ms)   Flow 3 (95th percentile 3498.48 ms)

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```
Run 2: Statistics of TCP Cubic

Start at: 2018-03-26 22:35:35
End at: 2018-03-26 22:36:05
Local clock offset: -2.562 ms
Remote clock offset: 3.113 ms


# Below is generated by plot.py at 2018-03-27 00:25:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 8078.385 ms
Loss rate: 31.31%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 8079.124 ms
Loss rate: 30.59%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 6151.436 ms
Loss rate: 52.83%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8404.415 ms
Loss rate: 91.06%
```
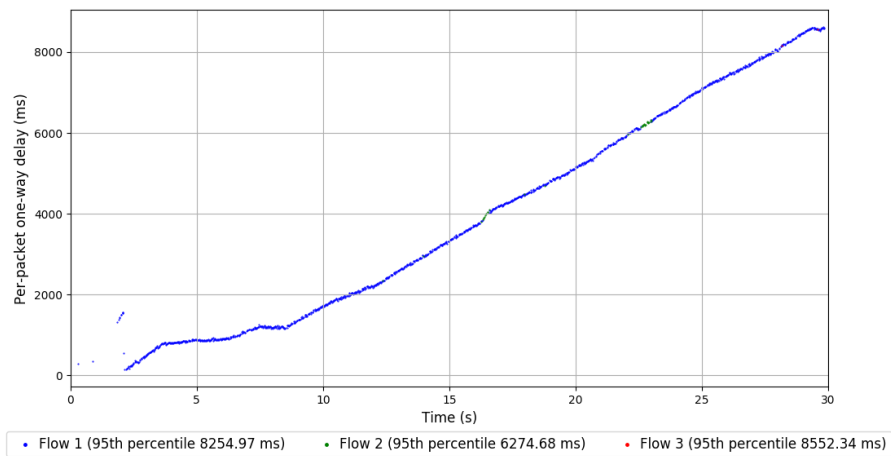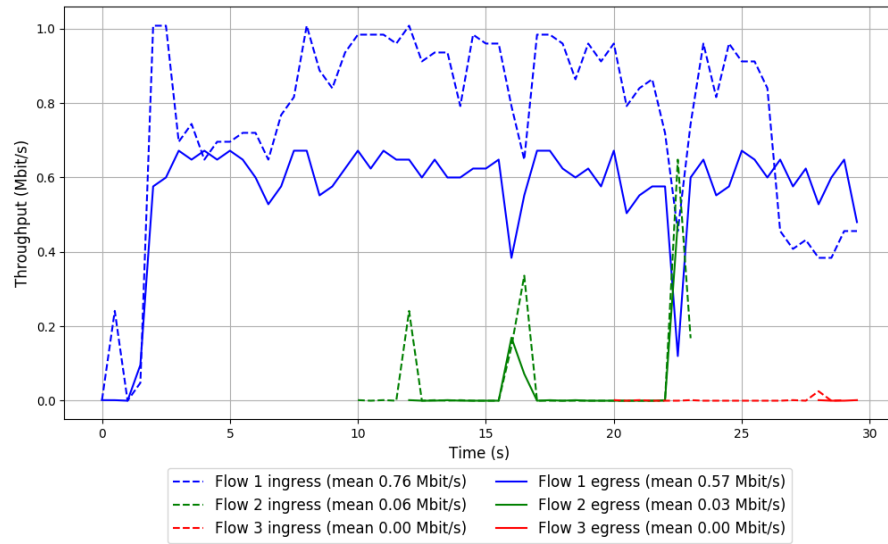
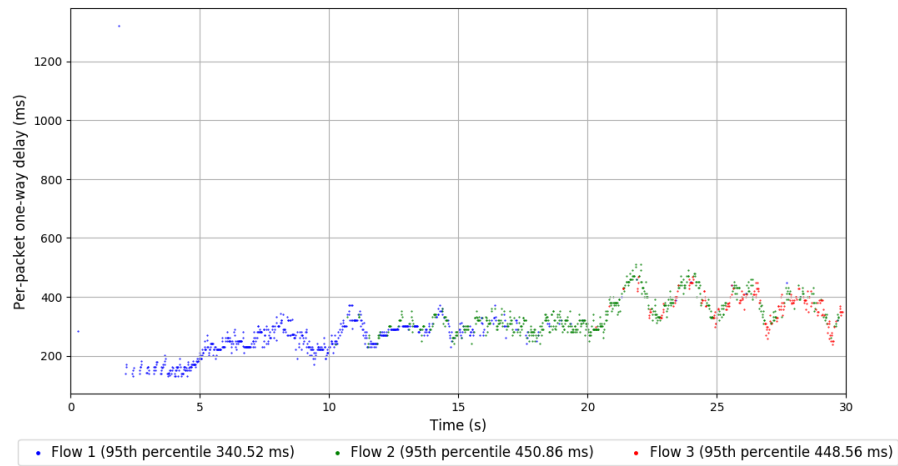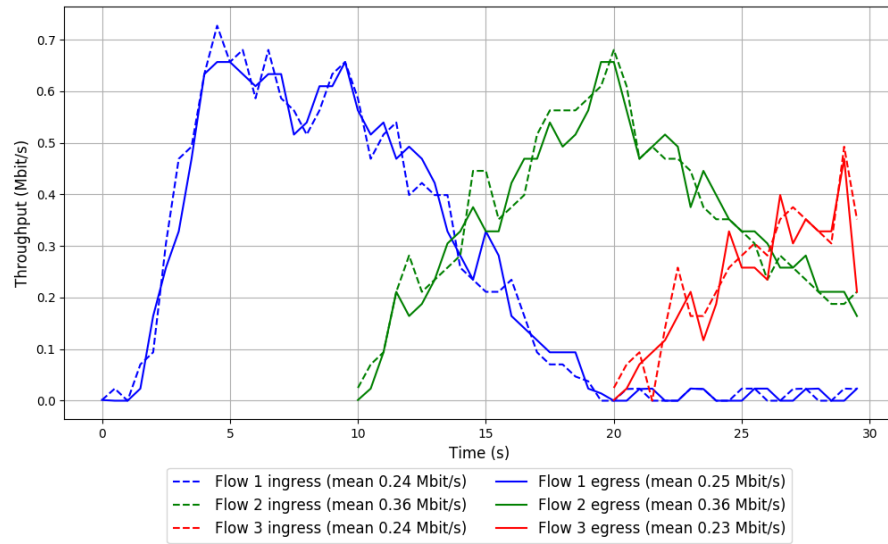Run 2: Report of TCP Cubic — Data Link

- - - Flow 1 ingress (mean 0.81 Mbit/s) ———— Flow 1 egress (mean 0.57 Mbit/s)
- - - Flow 2 ingress (mean 0.06 Mbit/s) ———— Flow 2 egress (mean 0.03 Mbit/s)
- - - Flow 3 ingress (mean 0.00 Mbit/s) ———— Flow 3 egress (mean 0.00 Mbit/s)

• Flow 1 (95th percentile 8079.12 ms)   • Flow 2 (95th percentile 6151.44 ms)   • Flow 3 (95th percentile 8404.42 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2018-03-26 22:58:22
End at: 2018-03-26 22:58:52
Local clock offset: -2.637 ms
Remote clock offset: 3.149 ms


# Below is generated by plot.py at 2018-03-27 00:25:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 8244.987 ms
Loss rate: 26.59%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 8254.966 ms
Loss rate: 25.65%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 6274.681 ms
Loss rate: 52.83%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8552.341 ms
Loss rate: 90.68%
```
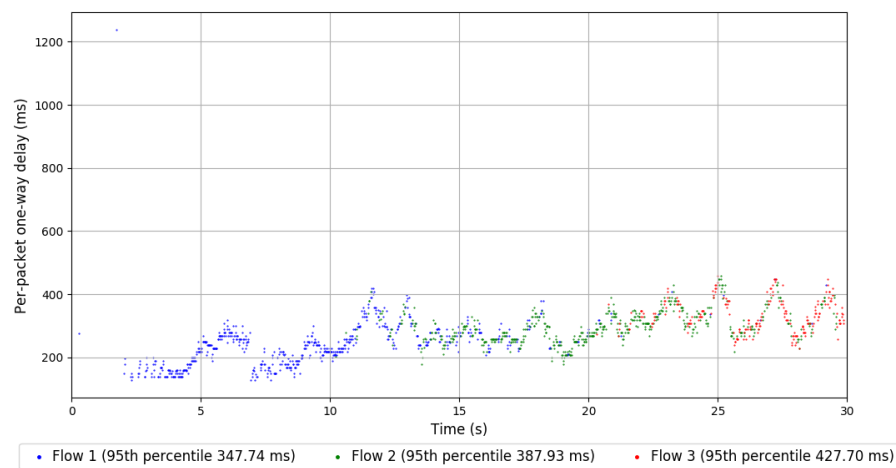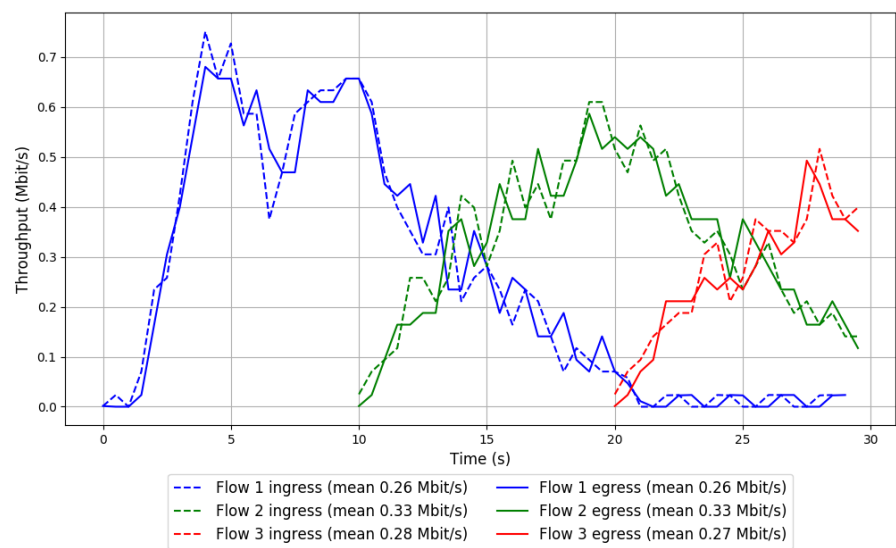
Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 0.76 Mbit/s) — — — Flow 1 egress (mean 0.57 Mbit/s) ——
Flow 2 ingress (mean 0.06 Mbit/s) — — — Flow 2 egress (mean 0.03 Mbit/s) ——
Flow 3 ingress (mean 0.00 Mbit/s) — — — Flow 3 egress (mean 0.00 Mbit/s) ——

• Flow 1 (95th percentile 8254.97 ms)   • Flow 2 (95th percentile 6274.68 ms)   • Flow 3 (95th percentile 8552.34 ms)
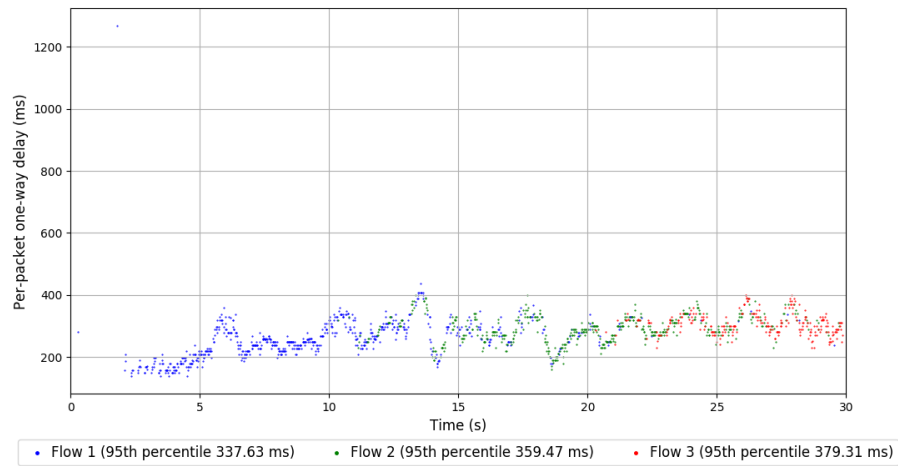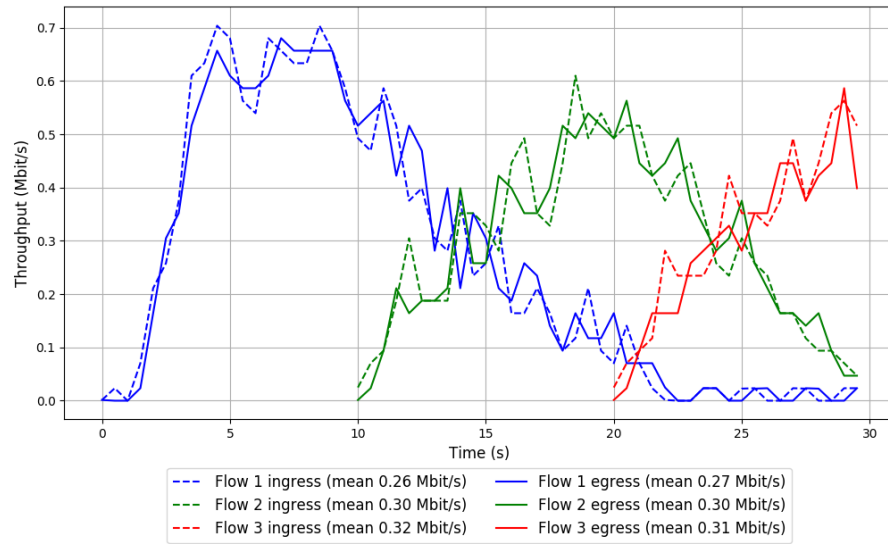
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```
Run 1: Statistics of LEDBAT

Start at: 2018-03-26 22:17:56
End at: 2018-03-26 22:18:26
Local clock offset: -2.769 ms
Remote clock offset: 7.109 ms


# Below is generated by plot.py at 2018-03-27 00:25:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 440.608 ms
Loss rate: 1.74%
-- Flow 1:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 340.519 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 450.863 ms
Loss rate: 1.48%
-- Flow 3:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 448.562 ms
Loss rate: 7.32%
```
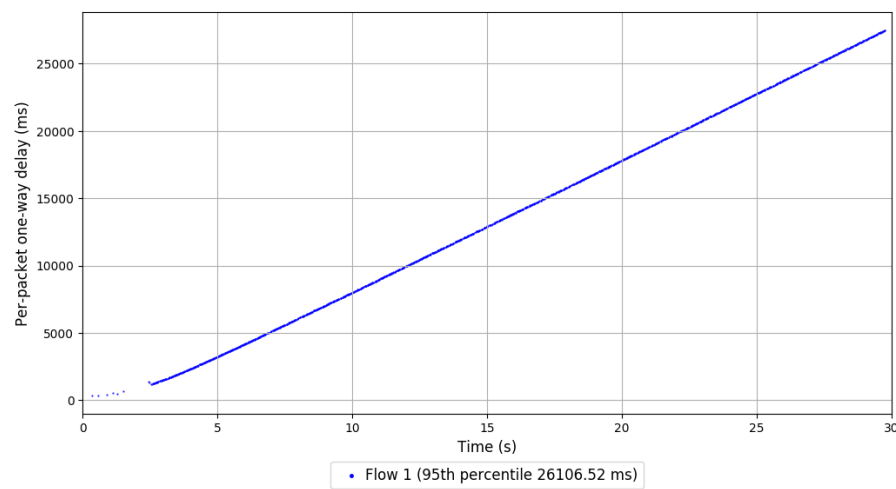
Run 1: Report of LEDBAT — Data Link

Flow 1 ingress (mean 0.24 Mbit/s)   Flow 1 egress (mean 0.25 Mbit/s)
Flow 2 ingress (mean 0.36 Mbit/s)   Flow 2 egress (mean 0.36 Mbit/s)
Flow 3 ingress (mean 0.24 Mbit/s)   Flow 3 egress (mean 0.23 Mbit/s)

Flow 1 (95th percentile 340.52 ms)   Flow 2 (95th percentile 450.86 ms)   Flow 3 (95th percentile 448.56 ms)

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```
Run 2: Statistics of LEDBAT

Start at: 2018-03-26 22:40:42
End at: 2018-03-26 22:41:12
Local clock offset: -2.635 ms
Remote clock offset: 8.143 ms


# Below is generated by plot.py at 2018-03-27 00:25:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 388.005 ms
Loss rate: 1.55%
-- Flow 1:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 347.740 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 387.927 ms
Loss rate: 1.08%
-- Flow 3:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 427.696 ms
Loss rate: 6.44%
```
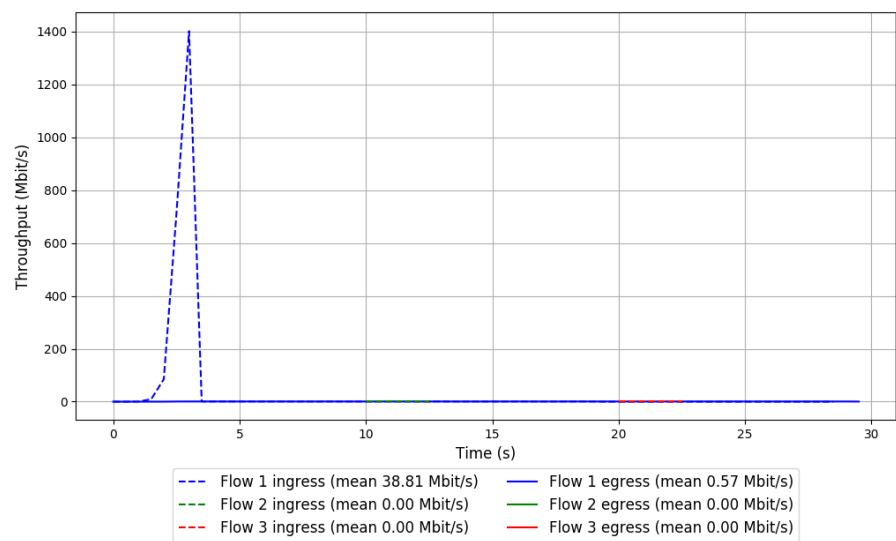
Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2018-03-26 23:03:26
End at: 2018-03-26 23:03:56
Local clock offset: -2.594 ms
Remote clock offset: 2.965 ms


# Below is generated by plot.py at 2018-03-27 00:25:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 357.704 ms
Loss rate: 1.53%
-- Flow 1:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 337.633 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 359.474 ms
Loss rate: 0.40%
-- Flow 3:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 379.313 ms
Loss rate: 7.04%
```
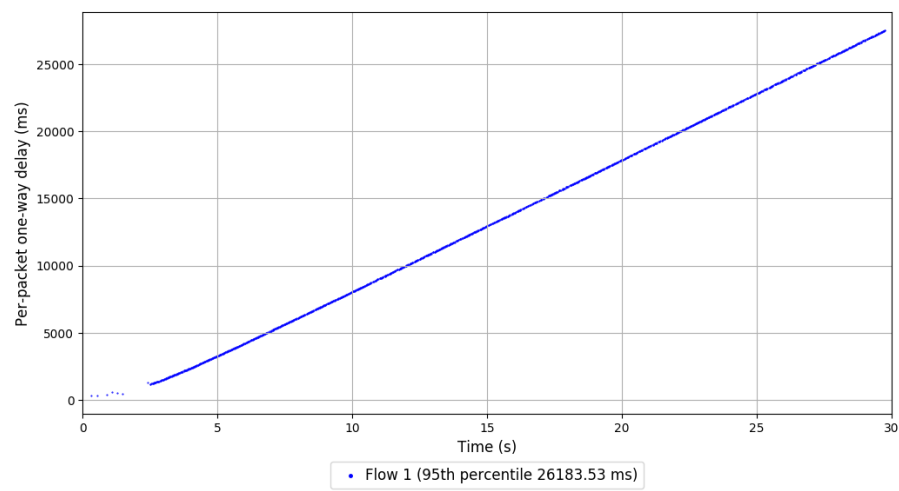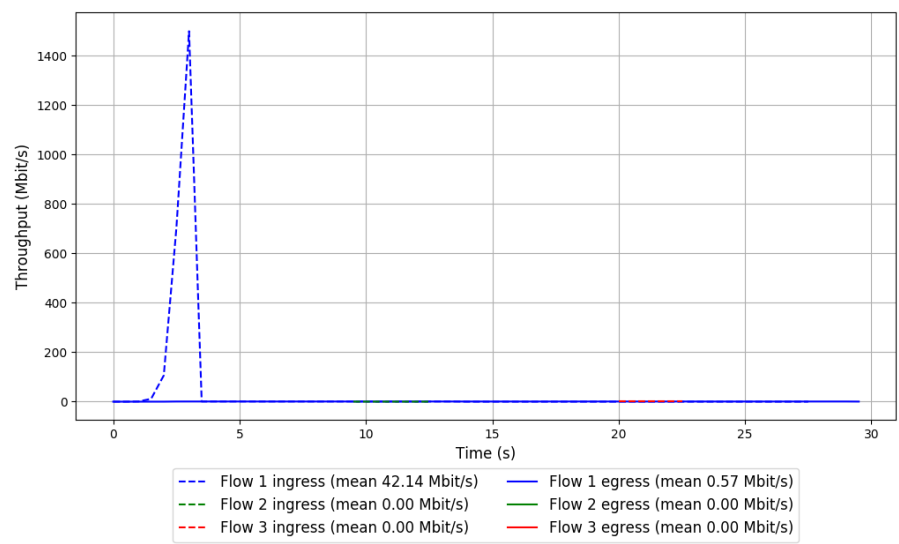
Run 3: Report of LEDBAT — Data Link

```
Run 1: Statistics of PCC

Start at: 2018-03-26 22:24:13
End at: 2018-03-26 22:24:43
Local clock offset: -2.549 ms
Remote clock offset: 7.553 ms


# Below is generated by plot.py at 2018-03-27 00:25:26
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26106.516 ms
Loss rate: 98.49%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26106.516 ms
Loss rate: 98.49%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
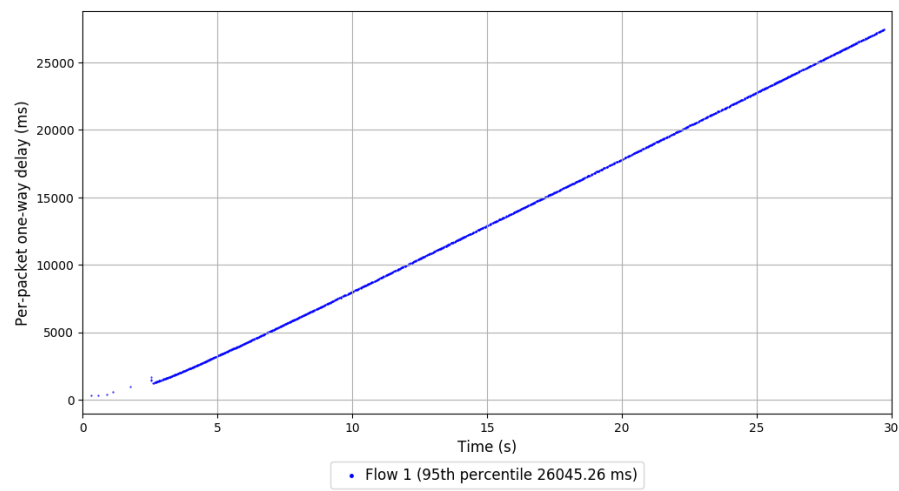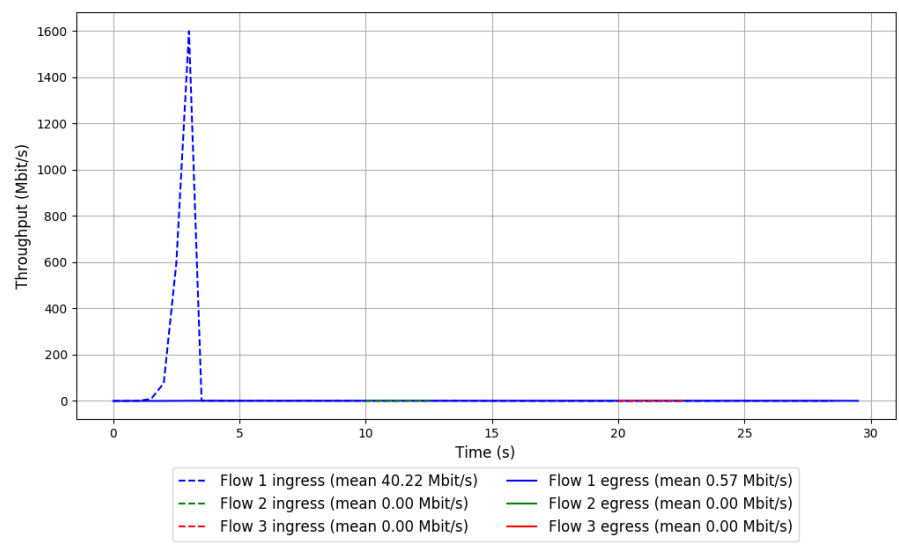
Run 1: Report of PCC — Data Link

```
Run 2: Statistics of PCC

Start at: 2018-03-26 22:47:00
End at: 2018-03-26 22:47:30
Local clock offset: -2.656 ms
Remote clock offset: 8.281 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26183.533 ms
Loss rate: 98.55%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26183.533 ms
Loss rate: 98.55%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

Run 2: Report of PCC — Data Link

```
Run 3: Statistics of PCC

Start at: 2018-03-26 23:09:44
End at: 2018-03-26 23:10:14
Local clock offset: -4.061 ms
Remote clock offset: 7.718 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26045.257 ms
Loss rate: 98.54%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26045.257 ms
Loss rate: 98.54%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
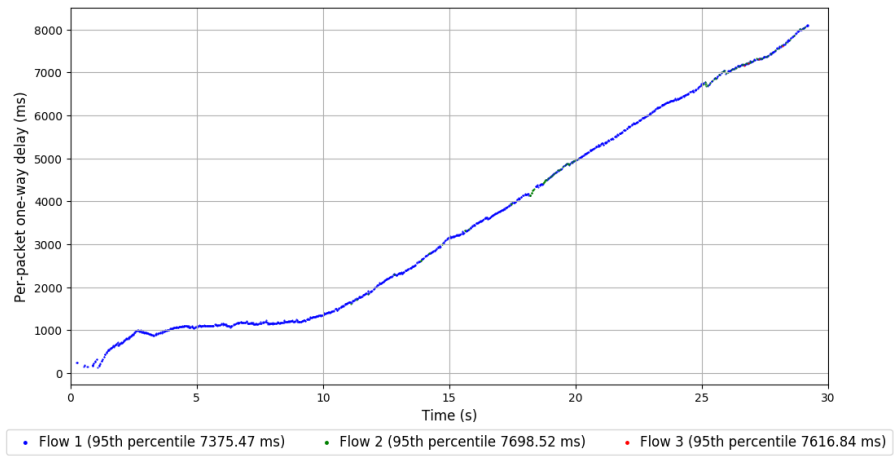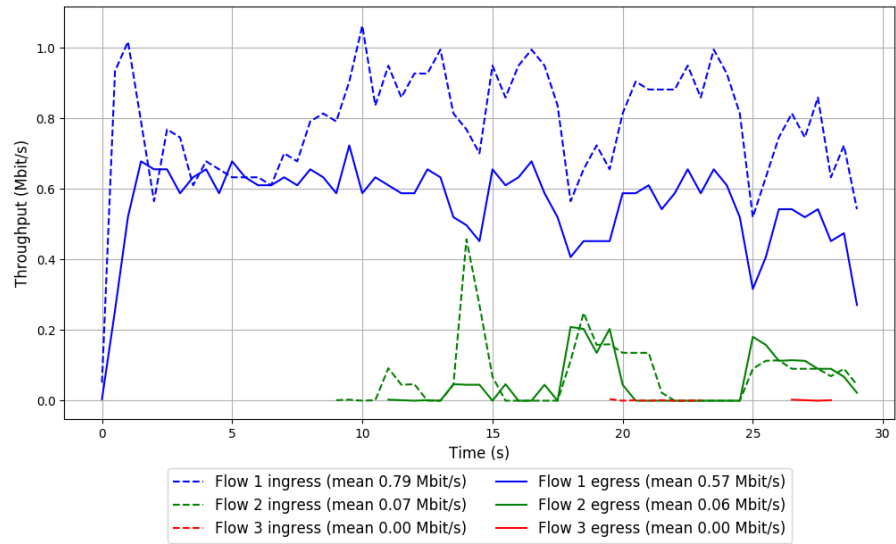
Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 40.22 Mbit/s) — — —   Flow 1 egress (mean 0.57 Mbit/s)
Flow 2 ingress (mean 0.00 Mbit/s) — — —   Flow 2 egress (mean 0.00 Mbit/s)
Flow 3 ingress (mean 0.00 Mbit/s) — — —   Flow 3 egress (mean 0.00 Mbit/s)

Flow 1 (95th percentile 26045.26 ms)

27

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-03-26 22:21:42
End at: 2018-03-26 22:22:12
Local clock offset: -2.677 ms
Remote clock offset: 2.517 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 7433.761 ms
Loss rate: 29.00%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 7375.468 ms
Loss rate: 28.78%
-- Flow 2:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 7698.519 ms
Loss rate: 32.45%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 7616.835 ms
Loss rate: 33.33%
```
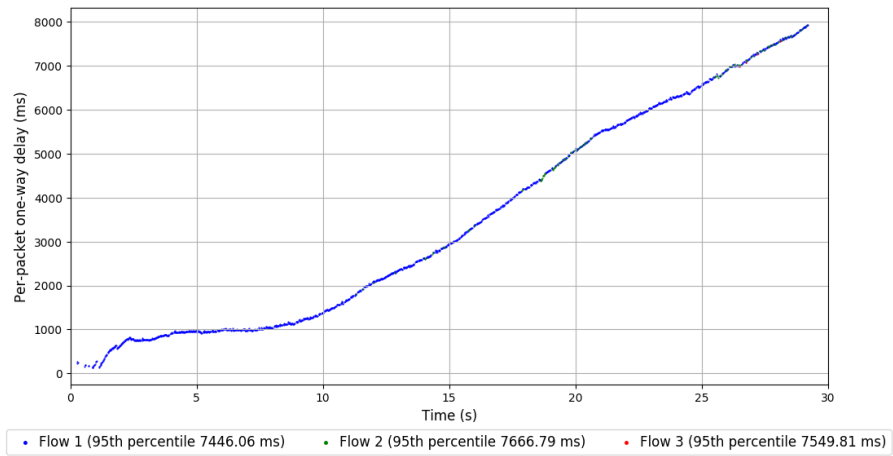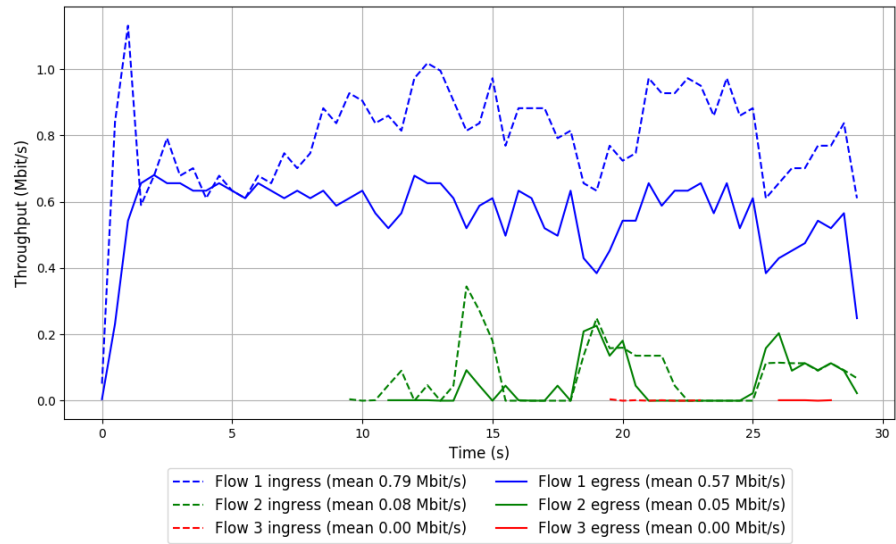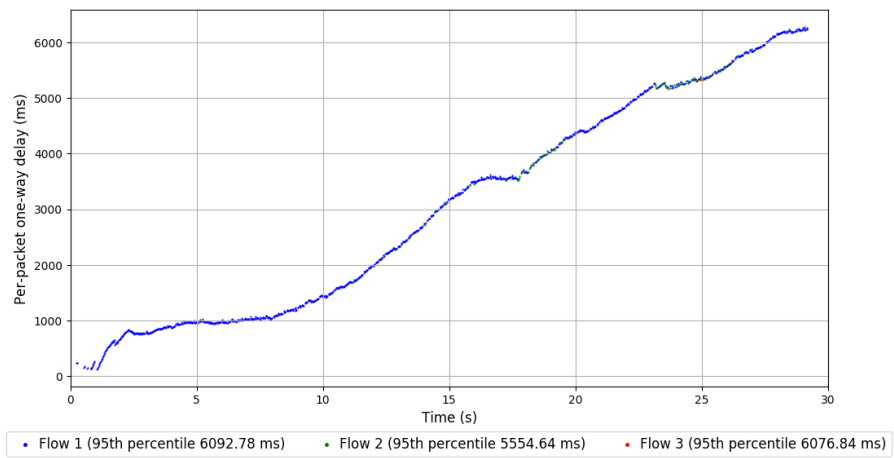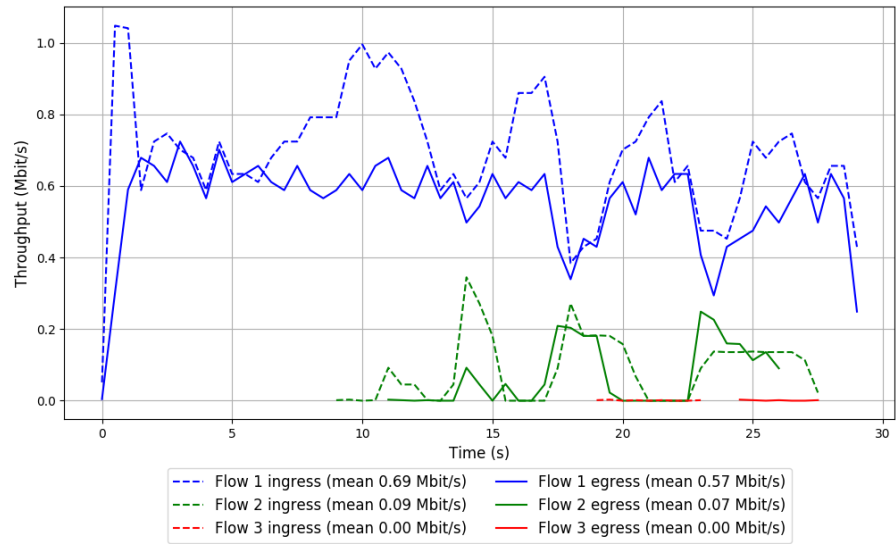
Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 0.79 Mbit/s)   Flow 1 egress (mean 0.57 Mbit/s)
Flow 2 ingress (mean 0.07 Mbit/s)   Flow 2 egress (mean 0.06 Mbit/s)
Flow 3 ingress (mean 0.00 Mbit/s)   Flow 3 egress (mean 0.00 Mbit/s)

Flow 1 (95th percentile 7375.47 ms)   Flow 2 (95th percentile 7698.52 ms)   Flow 3 (95th percentile 7616.84 ms)

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```
Run 2: Statistics of QUIC Cubic

Start at: 2018-03-26 22:44:29
End at: 2018-03-26 22:44:59
Local clock offset: -2.676 ms
Remote clock offset: 8.209 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 7487.600 ms
Loss rate: 29.49%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 7446.056 ms
Loss rate: 29.10%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 7666.794 ms
Loss rate: 35.48%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 7549.806 ms
Loss rate: 33.33%
```

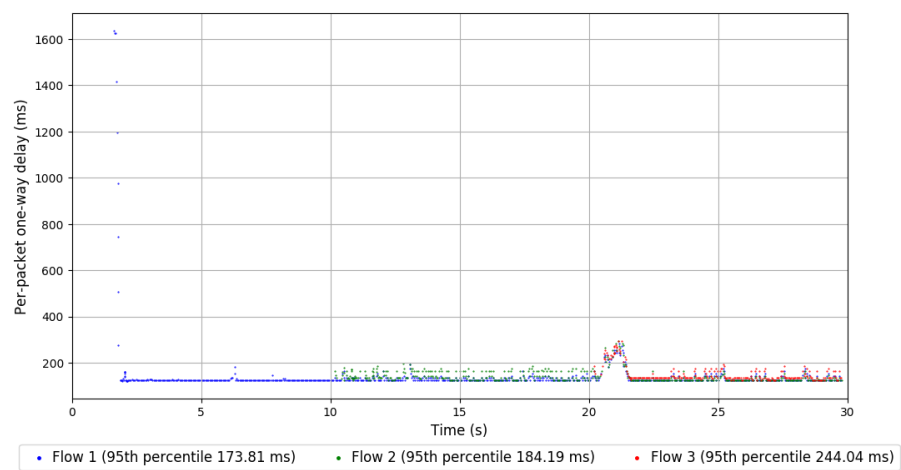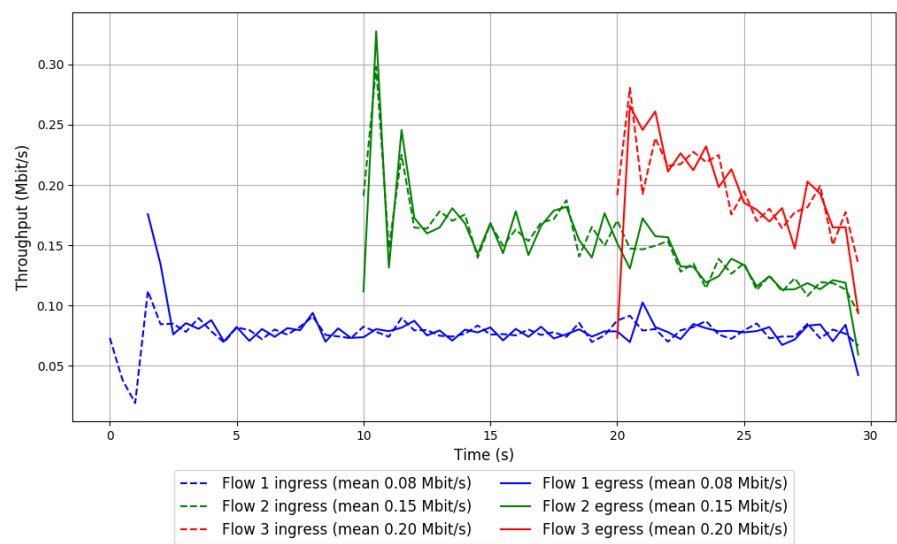# Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 0.79 Mbit/s) --- Flow 1 egress (mean 0.57 Mbit/s)
Flow 2 ingress (mean 0.08 Mbit/s) --- Flow 2 egress (mean 0.05 Mbit/s)
Flow 3 ingress (mean 0.00 Mbit/s) --- Flow 3 egress (mean 0.00 Mbit/s)

- Flow 1 (95th percentile 7446.06 ms)   • Flow 2 (95th percentile 7666.79 ms)   • Flow 3 (95th percentile 7549.81 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-03-26 23:07:12
End at: 2018-03-26 23:07:42
Local clock offset: -3.529 ms
Remote clock offset: 7.79 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 6063.454 ms
Loss rate: 20.80%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 6092.780 ms
Loss rate: 19.62%
-- Flow 2:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 5554.644 ms
Loss rate: 35.27%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 6076.838 ms
Loss rate: 16.67%
```
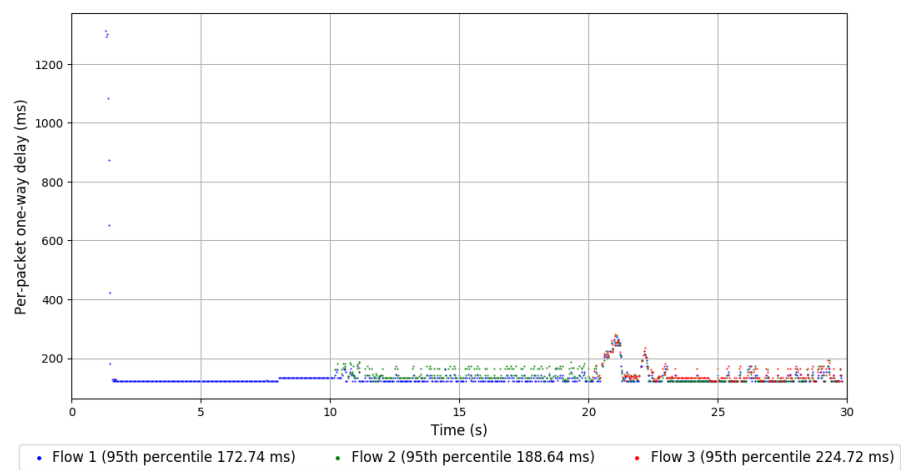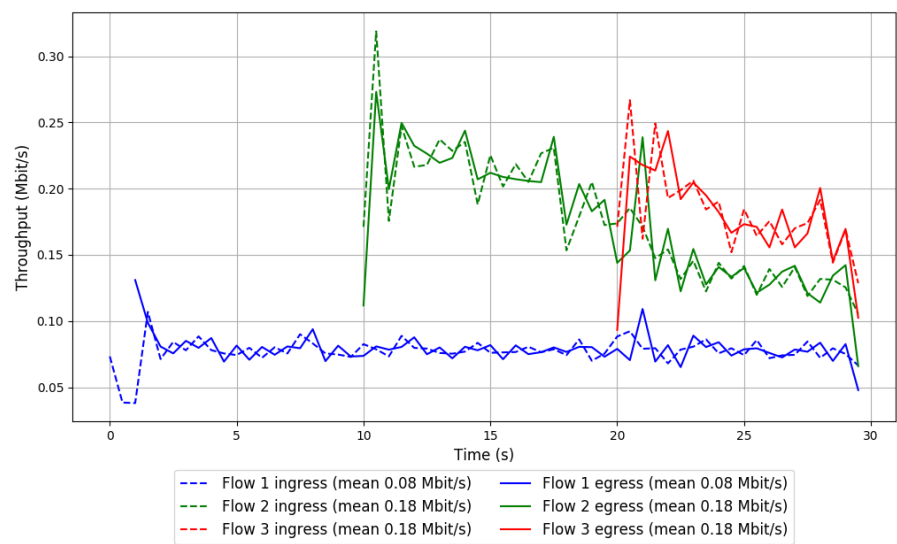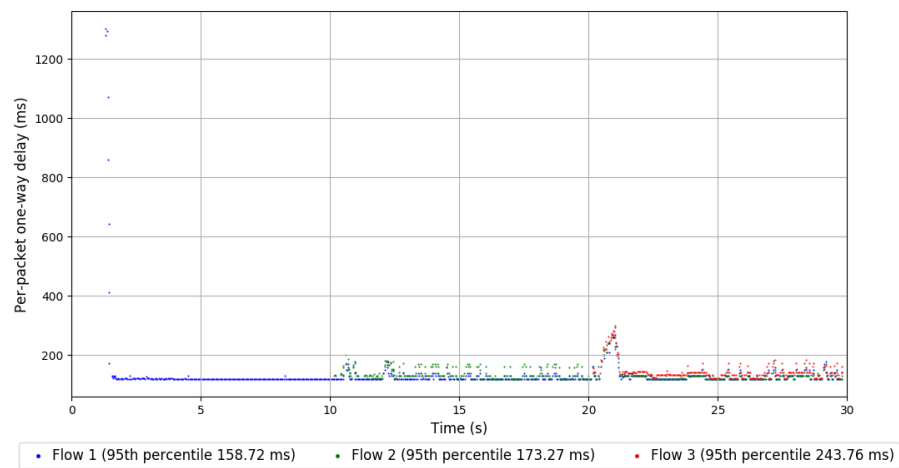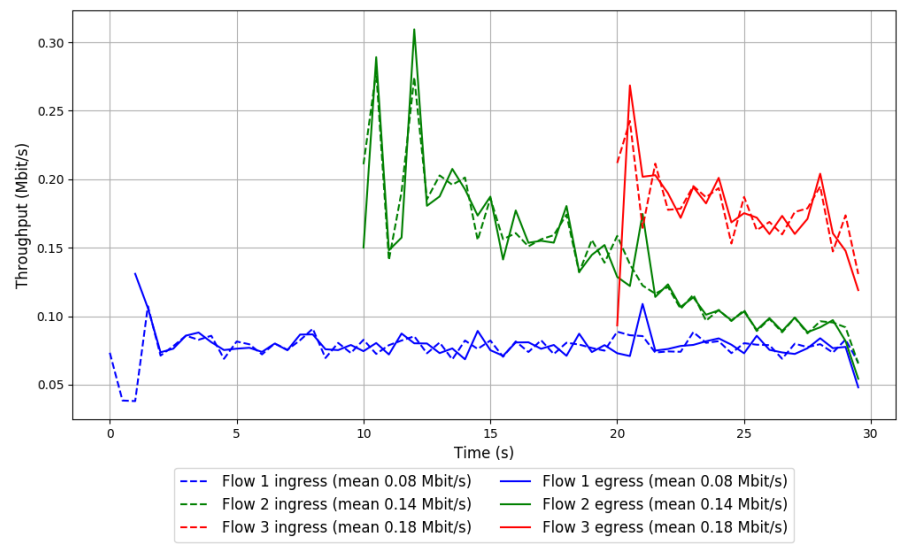
Run 3: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2018-03-26 22:09:05
End at: 2018-03-26 22:09:35
Local clock offset: -3.48 ms
Remote clock offset: 2.182 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 197.714 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 173.805 ms
Loss rate: 0.92%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 184.192 ms
Loss rate: 0.97%
-- Flow 3:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 244.044 ms
Loss rate: 2.40%
```

Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2018-03-26 22:31:49
End at: 2018-03-26 22:32:19
Local clock offset: -2.492 ms
Remote clock offset: 2.951 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 198.479 ms
Loss rate: 1.17%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 172.736 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 188.639 ms
Loss rate: 0.94%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 224.720 ms
Loss rate: 2.10%
```

Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-03-26 22:54:35
End at: 2018-03-26 22:55:05
Local clock offset: -2.727 ms
Remote clock offset: 3.421 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 178.418 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 158.725 ms
Loss rate: 0.78%
-- Flow 2:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 173.268 ms
Loss rate: 0.79%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 243.757 ms
Loss rate: 2.15%
```
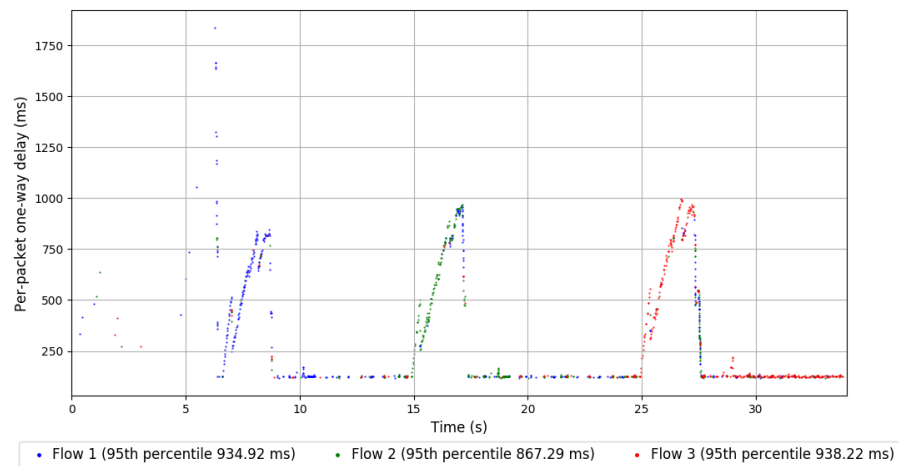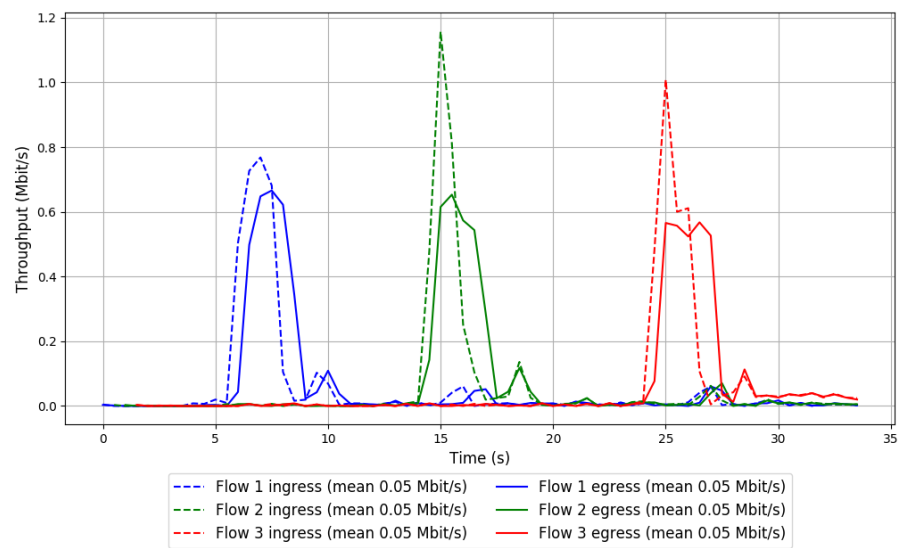
Run 3: Report of SCReAM — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2018-03-26 22:29:18
End at: 2018-03-26 22:29:48
Local clock offset: -2.422 ms
Remote clock offset: 2.841 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 926.320 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 934.919 ms
Loss rate: 0.05%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 867.288 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 938.215 ms
Loss rate: 0.35%
```
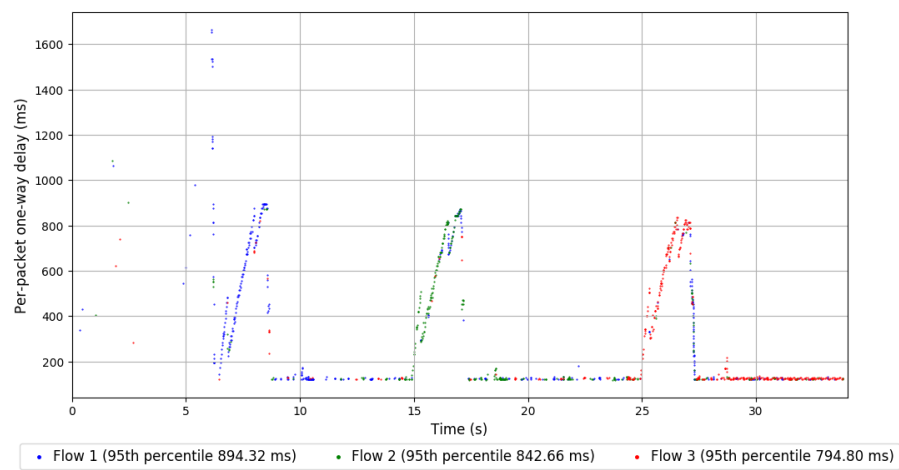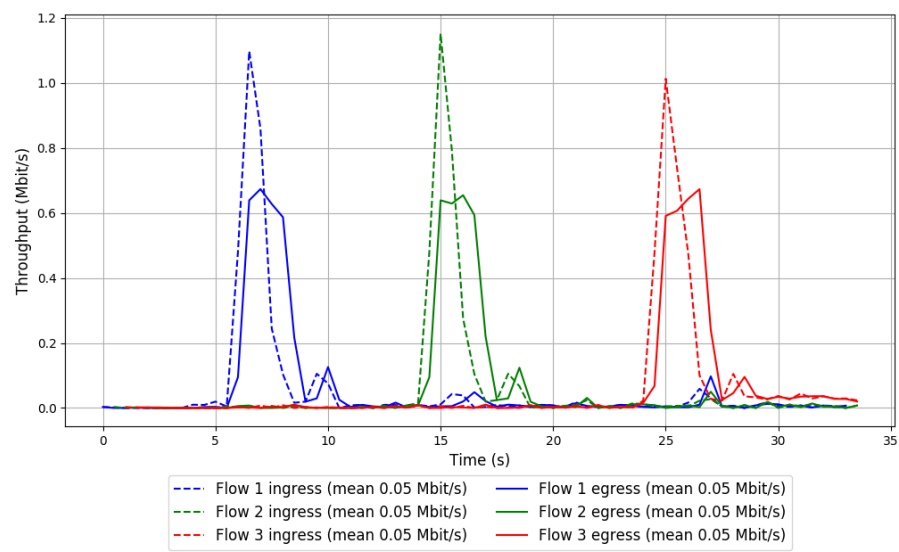
Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-03-26 22:52:04
End at: 2018-03-26 22:52:34
Local clock offset: -2.749 ms
Remote clock offset: 3.496 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 843.992 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 894.324 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 842.662 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 794.801 ms
Loss rate: 0.38%
```
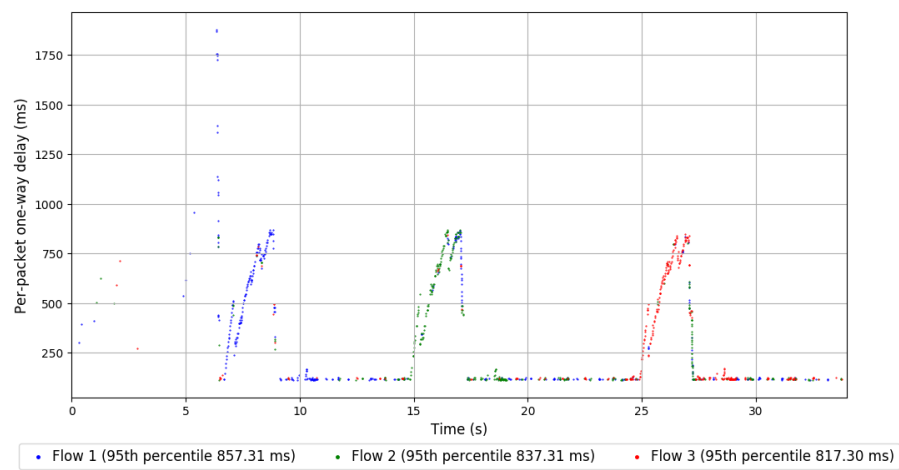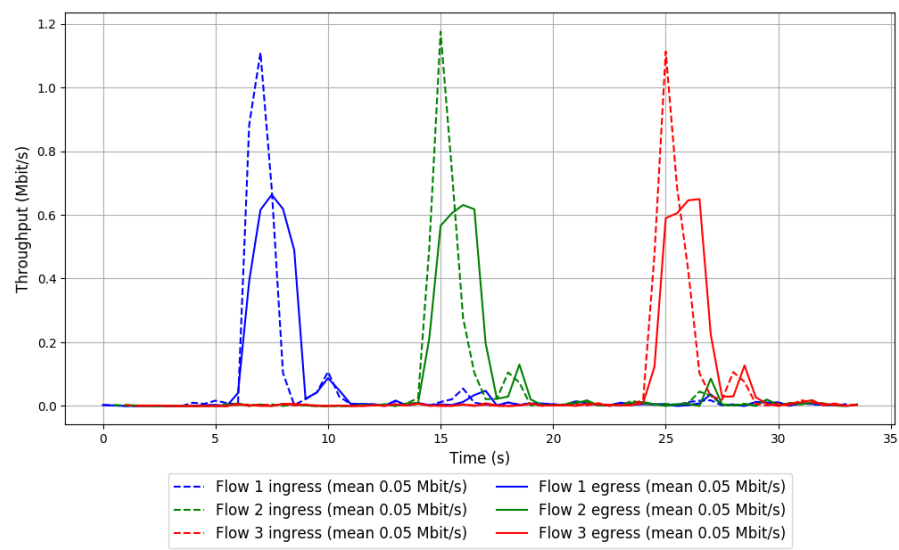
Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-03-26 23:14:48
End at: 2018-03-26 23:15:18
Local clock offset: -4.791 ms
Remote clock offset: 7.8 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 837.312 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 857.311 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 837.312 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 817.299 ms
Loss rate: 0.08%
```
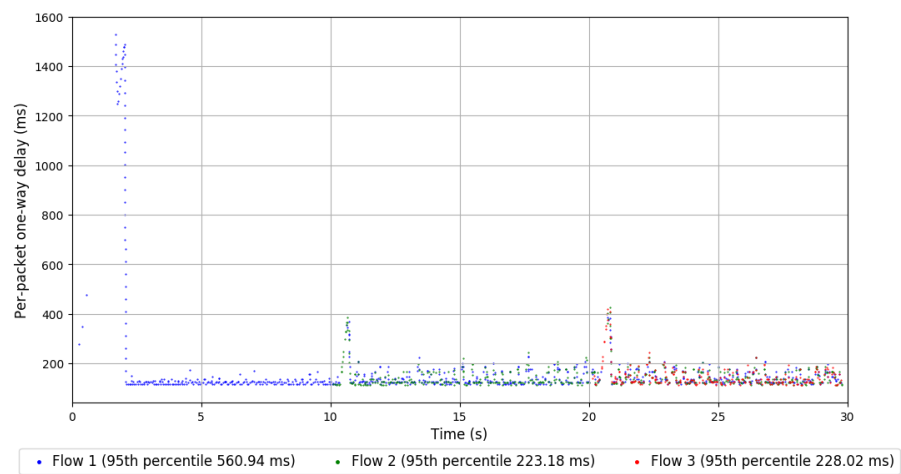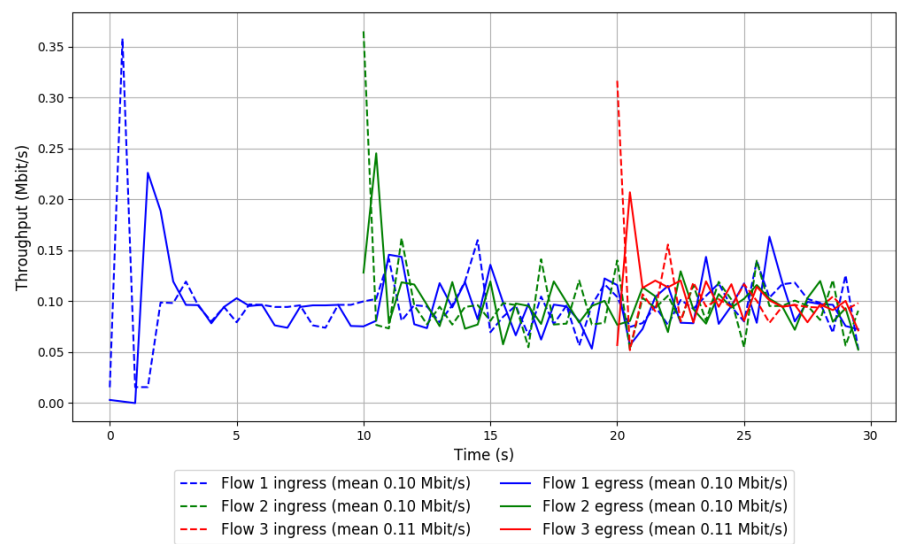
Run 3: Report of WebRTC media — Data Link

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```
Run 1: Statistics of Sprout

Start at: 2018-03-26 22:10:20
End at: 2018-03-26 22:10:50
Local clock offset: -3.363 ms
Remote clock offset: 7.178 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 307.833 ms
Loss rate: 2.57%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 560.940 ms
Loss rate: 1.87%
-- Flow 2:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 223.182 ms
Loss rate: 2.15%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 228.018 ms
Loss rate: 5.18%
```

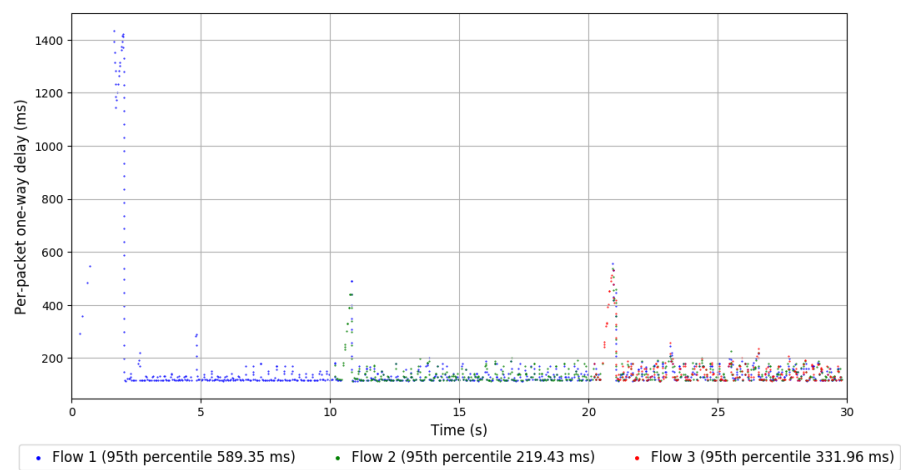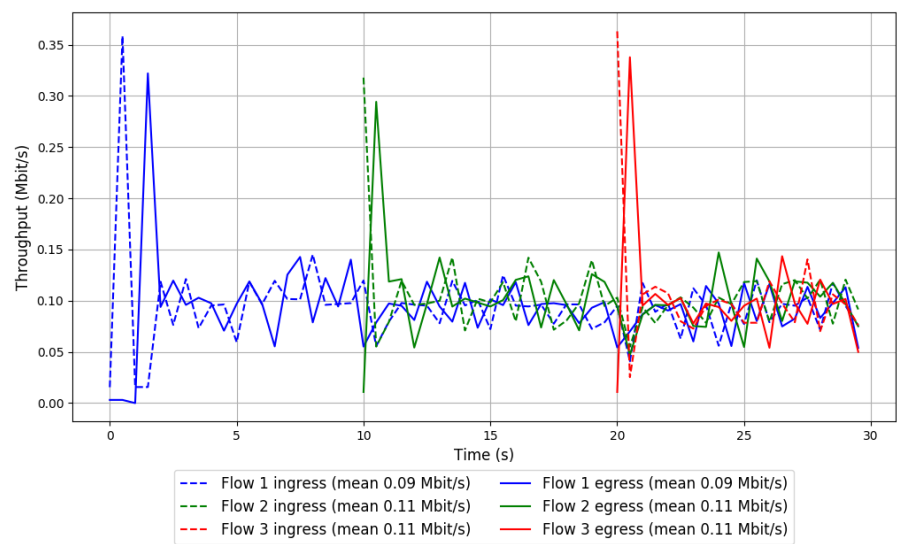Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-03-26 22:33:04
End at: 2018-03-26 22:33:34
Local clock offset: -2.508 ms
Remote clock offset: 8.054 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 395.989 ms
Loss rate: 1.77%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 589.353 ms
Loss rate: 1.38%
-- Flow 2:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 219.427 ms
Loss rate: 1.64%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 331.961 ms
Loss rate: 3.10%
```
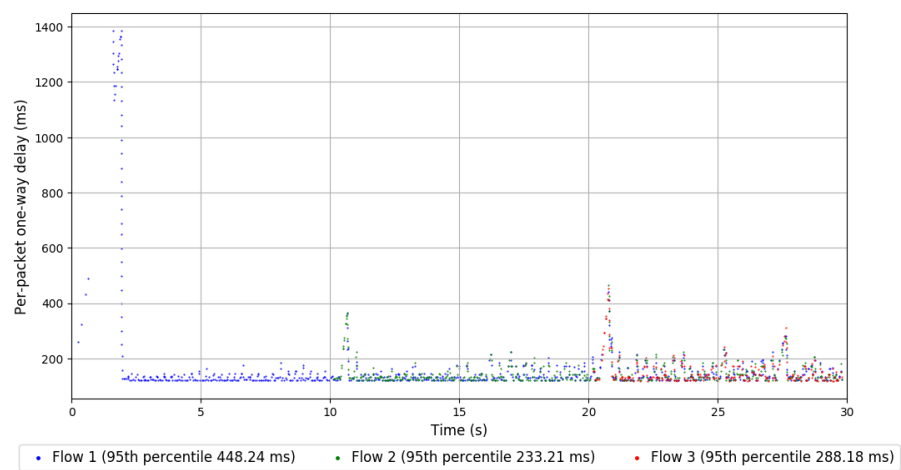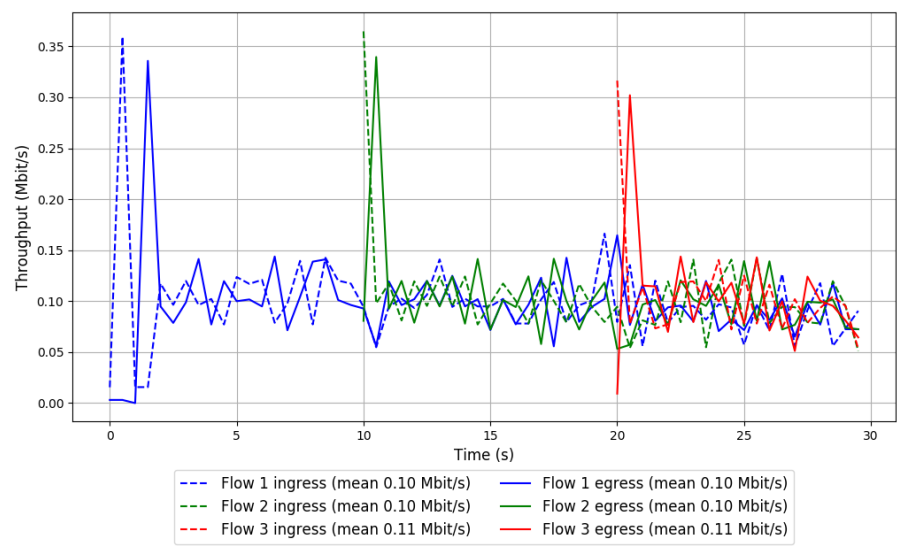
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-03-26 22:55:50
End at: 2018-03-26 22:56:20
Local clock offset: -2.648 ms
Remote clock offset: 3.372 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 282.294 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 448.238 ms
Loss rate: 1.43%
-- Flow 2:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 233.207 ms
Loss rate: 1.11%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 288.176 ms
Loss rate: 2.35%
```

Run 3: Report of Sprout — Data Link

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

Start at: 2018-03-26 22:26:46
End at: 2018-03-26 22:27:16
Local clock offset: -2.471 ms
Remote clock offset: 7.733 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 3058.402 ms
Loss rate: 17.87%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 2257.247 ms
Loss rate: 3.99%
-- Flow 2:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 3126.621 ms
Loss rate: 36.44%
-- Flow 3:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 3138.177 ms
Loss rate: 24.41%
```
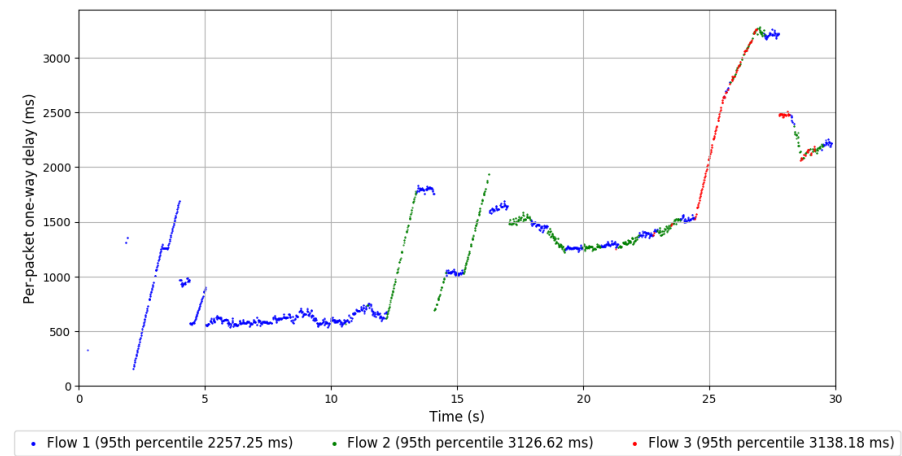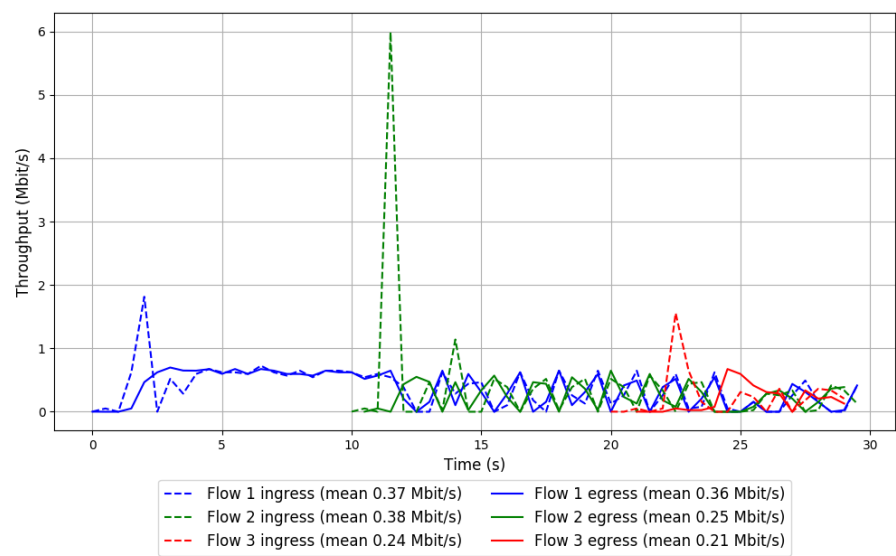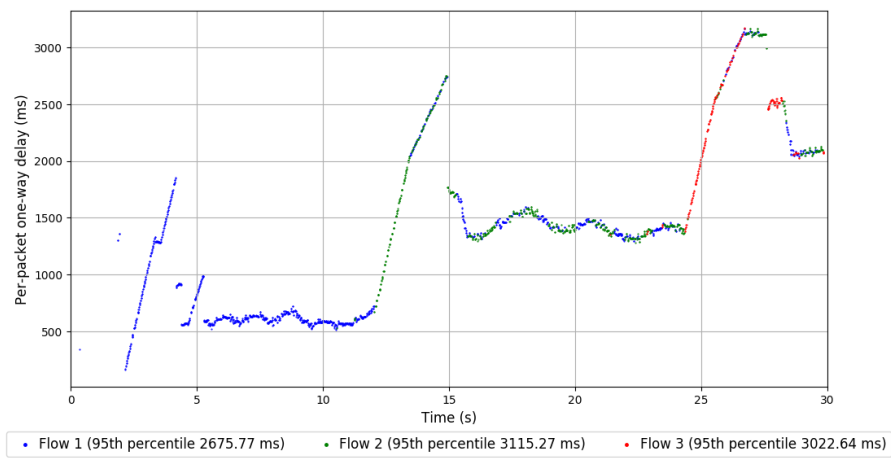
Run 1: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 0.37 Mbit/s)   Flow 1 egress (mean 0.36 Mbit/s)
Flow 2 ingress (mean 0.38 Mbit/s)   Flow 2 egress (mean 0.25 Mbit/s)
Flow 3 ingress (mean 0.24 Mbit/s)   Flow 3 egress (mean 0.21 Mbit/s)

Flow 1 (95th percentile 2257.25 ms)   Flow 2 (95th percentile 3126.62 ms)   Flow 3 (95th percentile 3138.18 ms)

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

Start at: 2018-03-26 22:49:32
End at: 2018-03-26 22:50:02
Local clock offset: -2.744 ms
Remote clock offset: 3.335 ms

# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 2929.755 ms
Loss rate: 7.95%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 2675.767 ms
Loss rate: 4.46%
-- Flow 2:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 3115.273 ms
Loss rate: 8.25%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 3022.641 ms
Loss rate: 24.59%
```
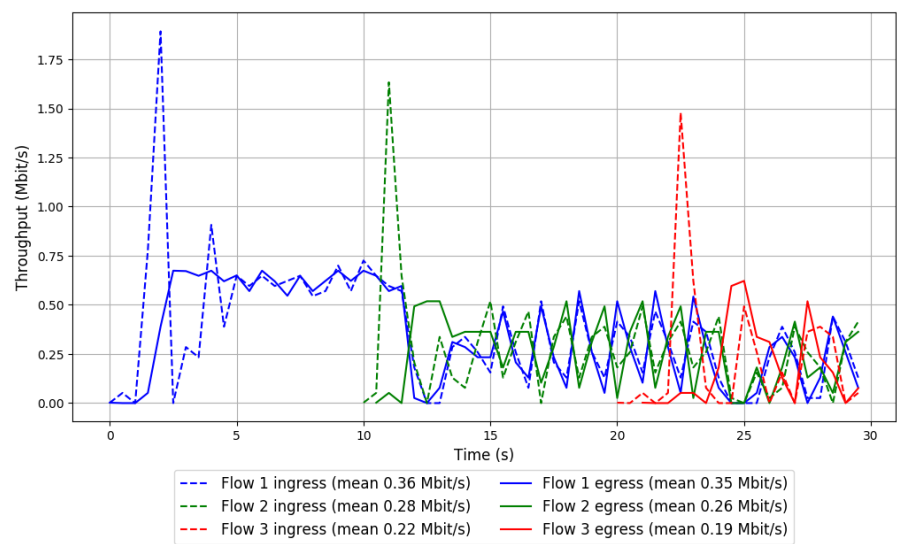
Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2018-03-26 23:12:17
End at: 2018-03-26 23:12:47
Local clock offset: -4.458 ms
Remote clock offset: 7.86 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 3285.351 ms
Loss rate: 7.72%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 2594.156 ms
Loss rate: 4.40%
-- Flow 2:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 2900.903 ms
Loss rate: 9.00%
-- Flow 3:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 3890.571 ms
Loss rate: 19.87%
```
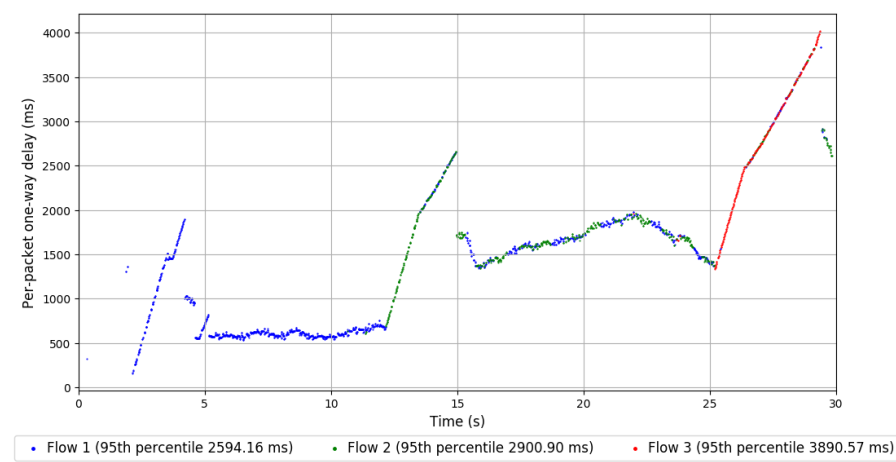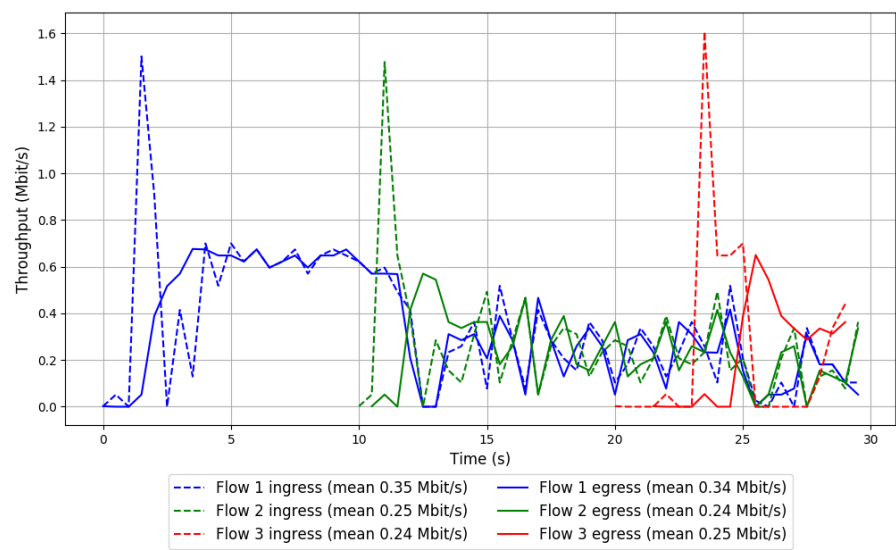
Run 3: Report of TaoVA-100x — Data Link

```
Run 1: Statistics of TCP Vegas

Start at: 2018-03-26 22:20:27
End at: 2018-03-26 22:20:57
Local clock offset: -2.65 ms
Remote clock offset: 2.48 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1832.912 ms
Loss rate: 5.77%
-- Flow 1:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 1813.003 ms
Loss rate: 3.08%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1843.064 ms
Loss rate: 6.76%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 1833.024 ms
Loss rate: 20.34%
```
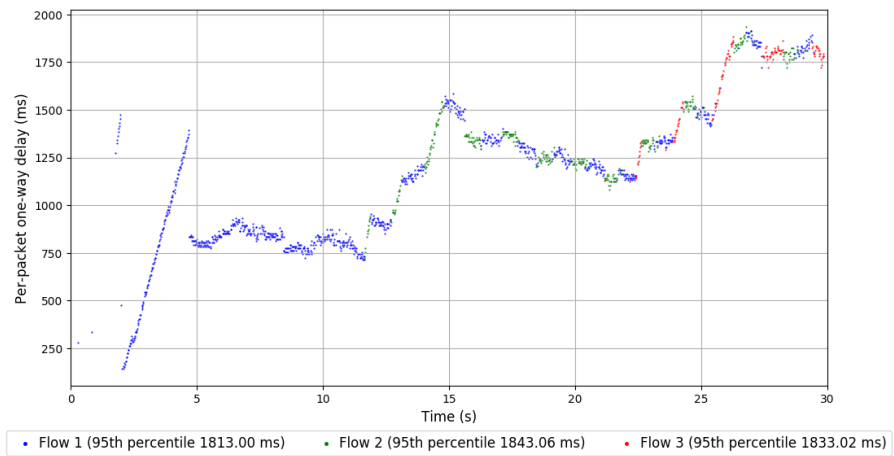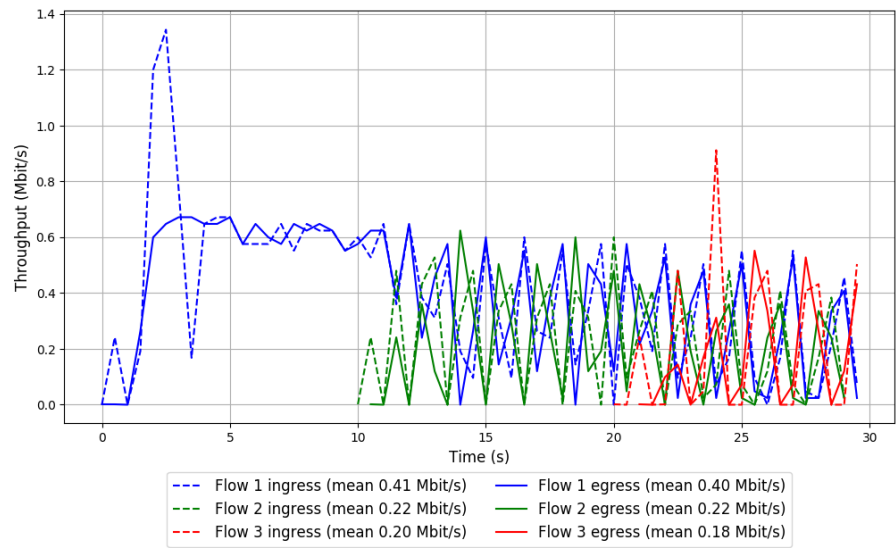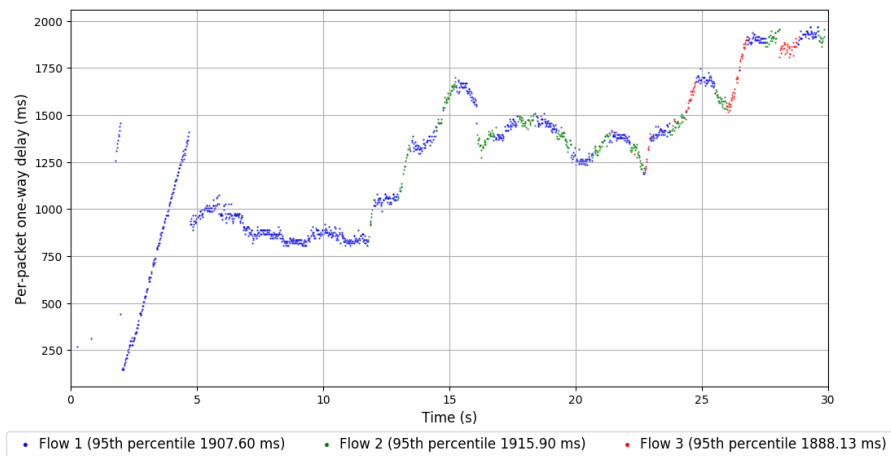
Run 1: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 0.41 Mbit/s)   Flow 1 egress (mean 0.40 Mbit/s)
Flow 2 ingress (mean 0.22 Mbit/s)   Flow 2 egress (mean 0.22 Mbit/s)
Flow 3 ingress (mean 0.20 Mbit/s)   Flow 3 egress (mean 0.18 Mbit/s)

Flow 1 (95th percentile 1813.00 ms)   Flow 2 (95th percentile 1843.06 ms)   Flow 3 (95th percentile 1833.02 ms)

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```
Run 2: Statistics of TCP Vegas

Start at: 2018-03-26 22:43:13
End at: 2018-03-26 22:43:43
Local clock offset: -2.657 ms
Remote clock offset: 3.313 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1907.577 ms
Loss rate: 6.04%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 1907.599 ms
Loss rate: 3.64%
-- Flow 2:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 1915.904 ms
Loss rate: 6.43%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 1888.128 ms
Loss rate: 23.66%
```
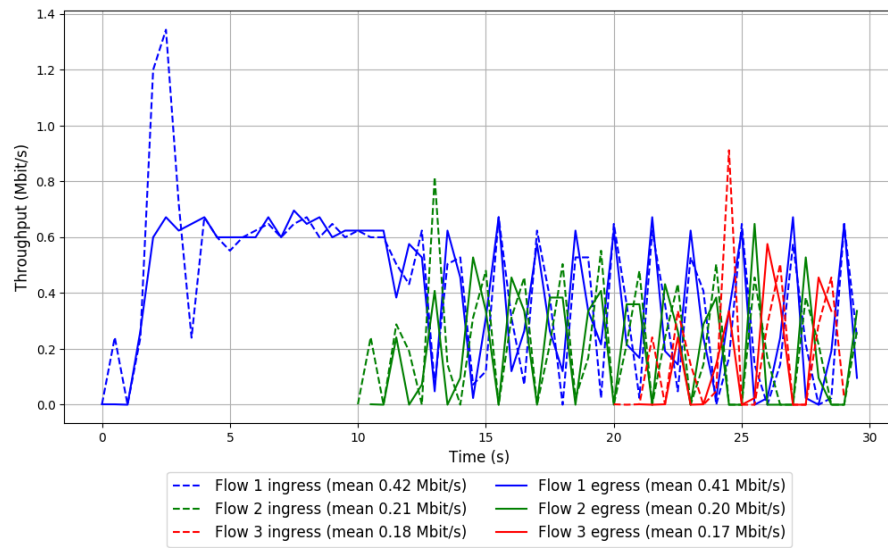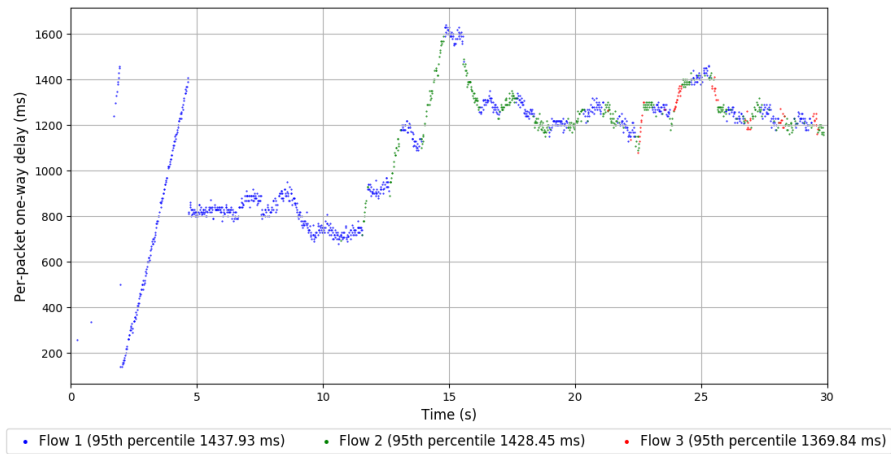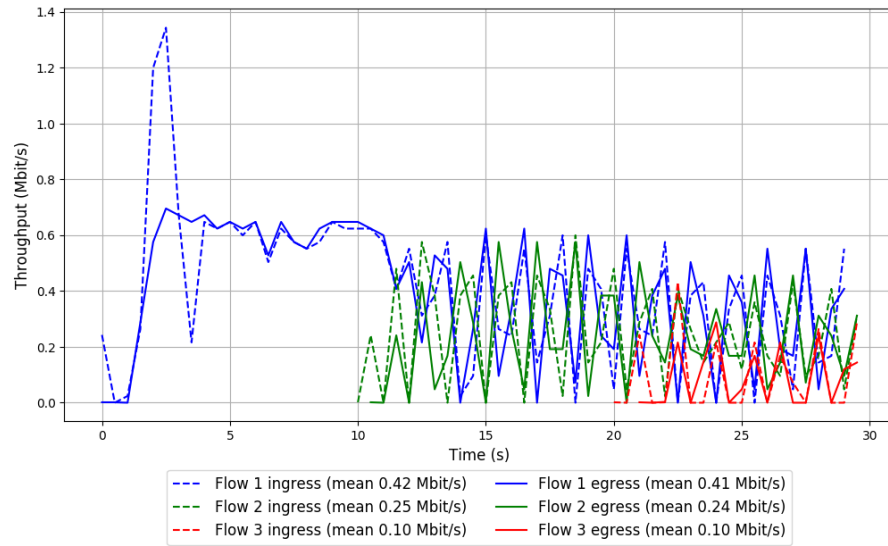
Run 2: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 0.42 Mbit/s) Flow 1 egress (mean 0.41 Mbit/s)
Flow 2 ingress (mean 0.21 Mbit/s) Flow 2 egress (mean 0.20 Mbit/s)
Flow 3 ingress (mean 0.18 Mbit/s) Flow 3 egress (mean 0.17 Mbit/s)

Flow 1 (95th percentile 1907.60 ms) Flow 2 (95th percentile 1915.90 ms) Flow 3 (95th percentile 1888.13 ms)

61

```
Run 3: Statistics of TCP Vegas

Start at: 2018-03-26 23:05:57
End at: 2018-03-26 23:06:27
Local clock offset: -3.27 ms
Remote clock offset: 7.912 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1428.266 ms
Loss rate: 4.36%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 1437.931 ms
Loss rate: 2.94%
-- Flow 2:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 1428.447 ms
Loss rate: 5.58%
-- Flow 3:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 1369.842 ms
Loss rate: 16.40%
```
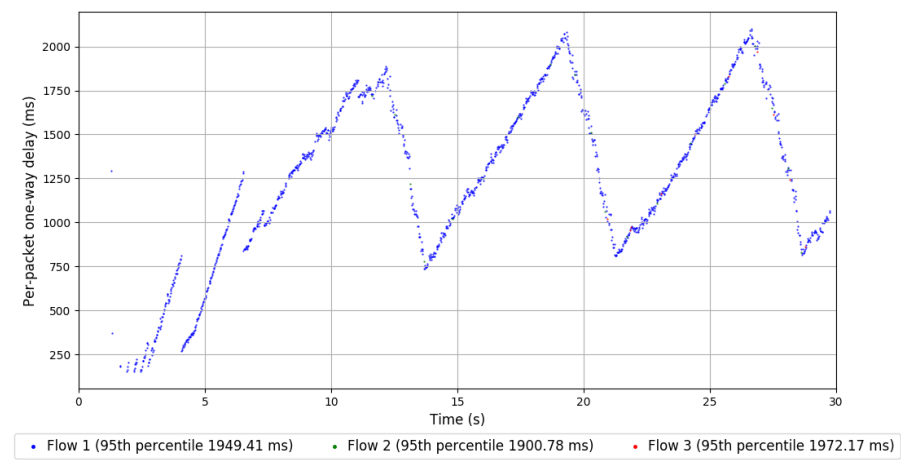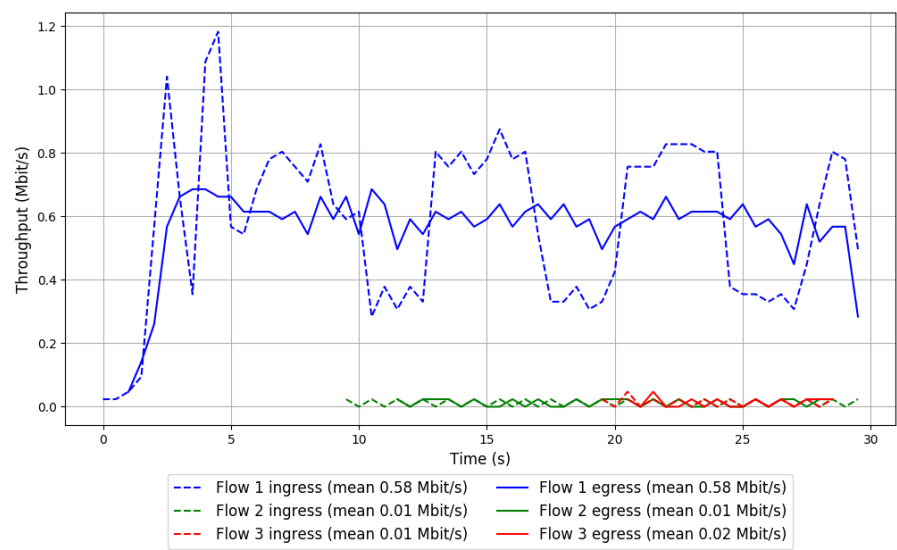
Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 0.42 Mbit/s)   Flow 1 egress (mean 0.41 Mbit/s)
Flow 2 ingress (mean 0.25 Mbit/s)   Flow 2 egress (mean 0.24 Mbit/s)
Flow 3 ingress (mean 0.10 Mbit/s)   Flow 3 egress (mean 0.10 Mbit/s)

Flow 1 (95th percentile 1437.93 ms)   Flow 2 (95th percentile 1428.45 ms)   Flow 3 (95th percentile 1369.84 ms)

63

```
Run 1: Statistics of Verus

Start at: 2018-03-26 22:25:31
End at: 2018-03-26 22:26:01
Local clock offset: -2.504 ms
Remote clock offset: 2.678 ms

# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1949.472 ms
Loss rate: 5.11%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1949.412 ms
Loss rate: 5.02%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1900.783 ms
Loss rate: 9.52%
-- Flow 3:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1972.172 ms
Loss rate: 9.09%
```
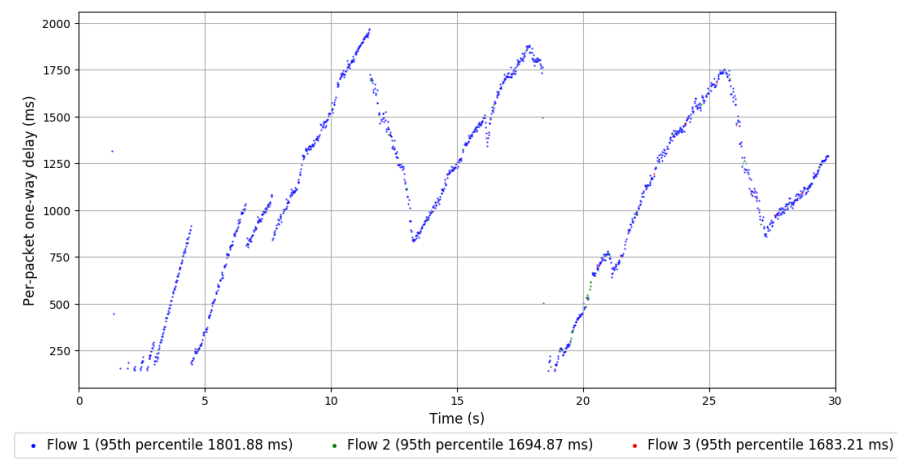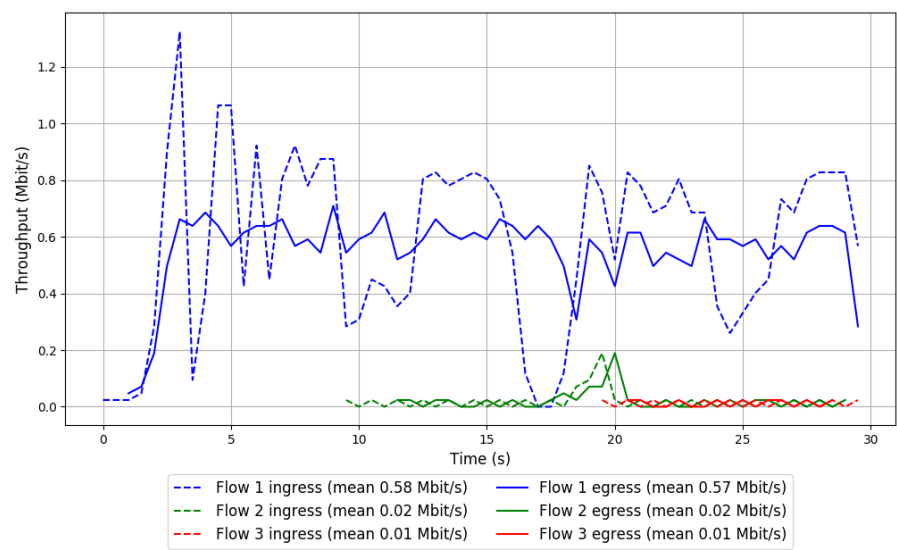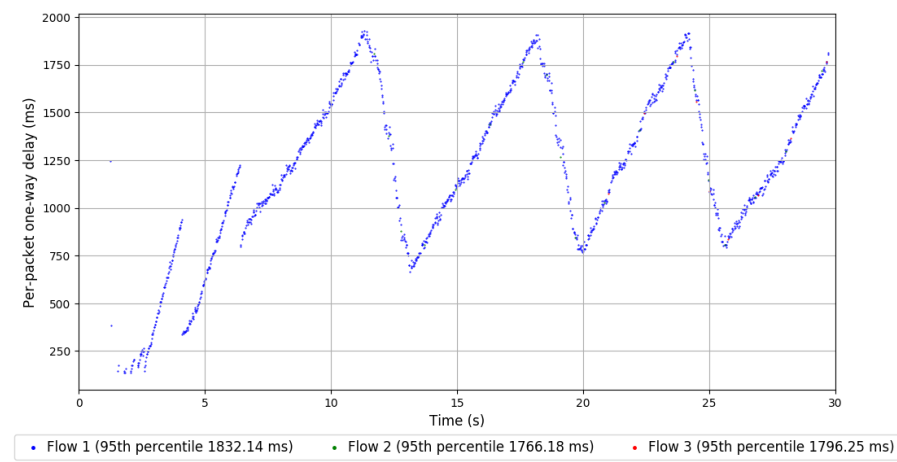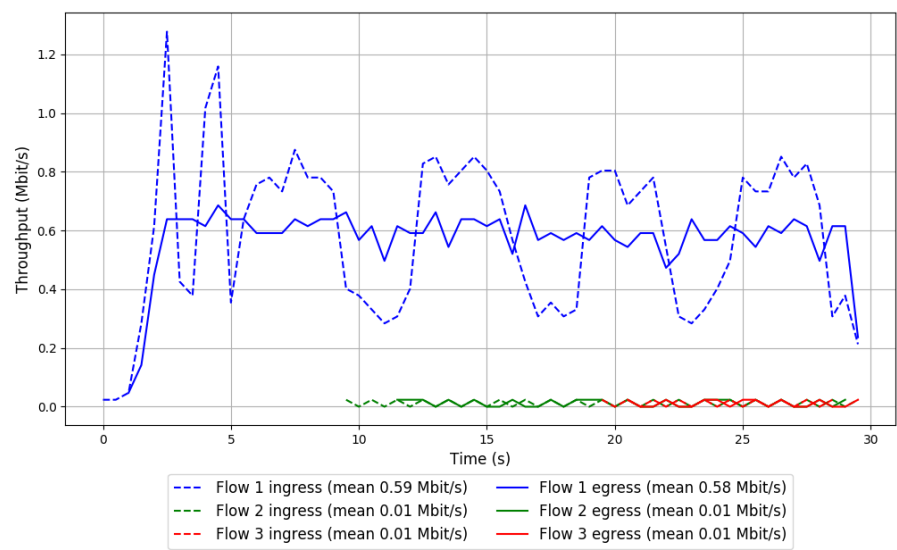
Run 1: Report of Verus — Data Link

Flow 1 ingress (mean 0.58 Mbit/s) ---- Flow 1 egress (mean 0.58 Mbit/s) ——
Flow 2 ingress (mean 0.01 Mbit/s) ---- Flow 2 egress (mean 0.01 Mbit/s) ——
Flow 3 ingress (mean 0.01 Mbit/s) ---- Flow 3 egress (mean 0.02 Mbit/s) ——

• Flow 1 (95th percentile 1949.41 ms)   • Flow 2 (95th percentile 1900.78 ms)   • Flow 3 (95th percentile 1972.17 ms)

65

```
Run 2: Statistics of Verus

Start at: 2018-03-26 22:48:17
End at: 2018-03-26 22:48:47
Local clock offset: -2.659 ms
Remote clock offset: 8.308 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1801.727 ms
Loss rate: 6.94%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 1801.878 ms
Loss rate: 6.95%
-- Flow 2:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1694.872 ms
Loss rate: 2.94%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1683.213 ms
Loss rate: 18.18%
```

Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-03-26 23:11:01
End at: 2018-03-26 23:11:31
Local clock offset: -4.378 ms
Remote clock offset: 7.768 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1825.325 ms
Loss rate: 4.97%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1832.139 ms
Loss rate: 4.87%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1766.178 ms
Loss rate: 9.52%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1796.253 ms
Loss rate: 10.00%
```
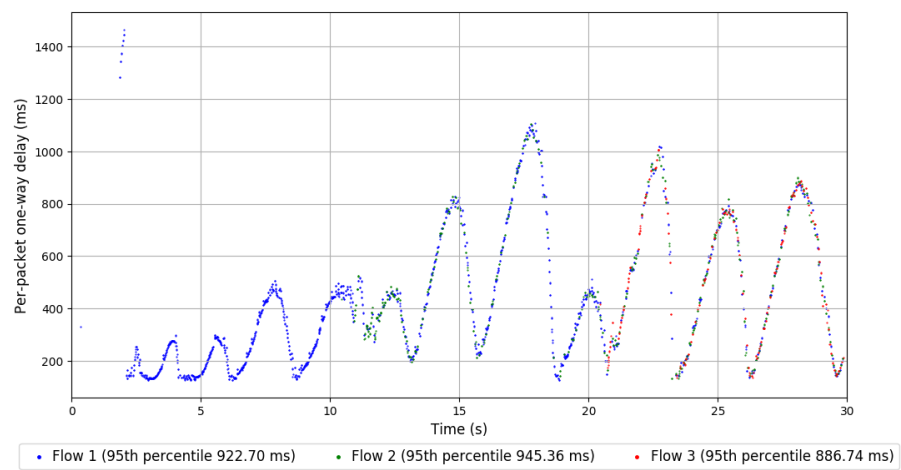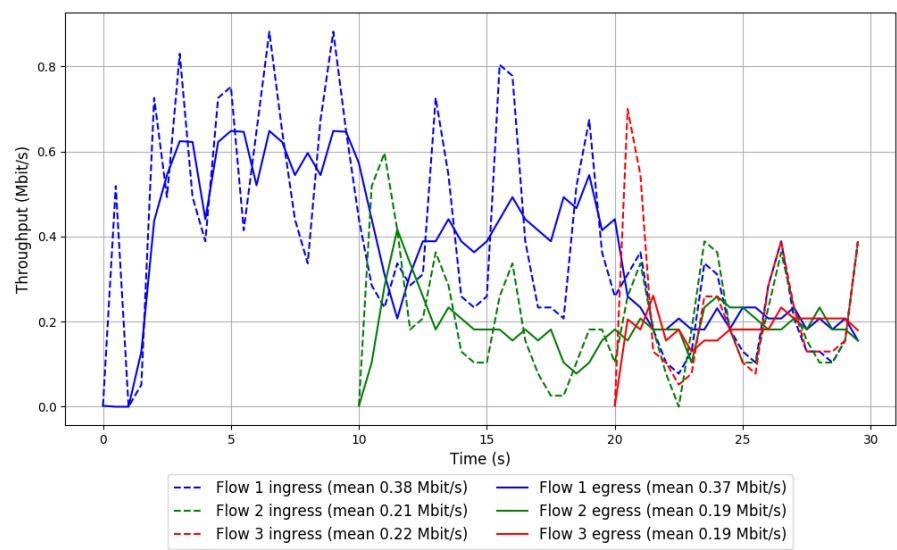
Run 3: Report of Verus — Data Link

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```
Run 1: Statistics of Copa

Start at: 2018-03-26 22:30:33
End at: 2018-03-26 22:31:03
Local clock offset: -2.425 ms
Remote clock offset: 7.87 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 929.857 ms
Loss rate: 6.43%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 922.696 ms
Loss rate: 3.62%
-- Flow 2:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 945.362 ms
Loss rate: 8.78%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 886.737 ms
Loss rate: 16.80%
```
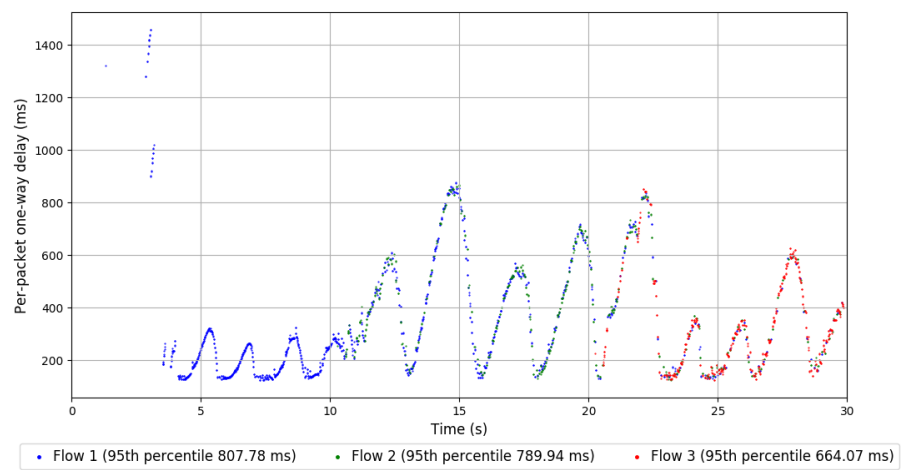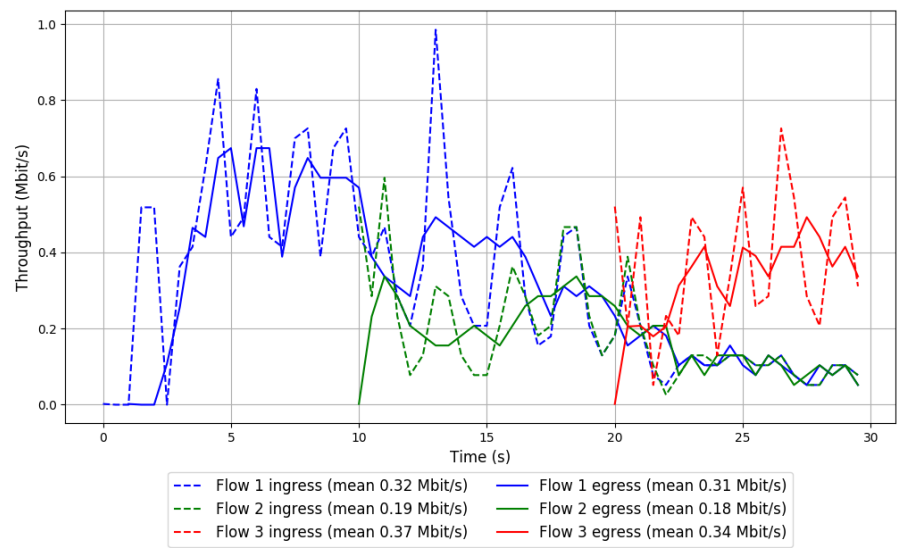
Run 1: Report of Copa — Data Link

- Flow 1 ingress (mean 0.38 Mbit/s)
- Flow 1 egress (mean 0.37 Mbit/s)
- Flow 2 ingress (mean 0.21 Mbit/s)
- Flow 2 egress (mean 0.19 Mbit/s)
- Flow 3 ingress (mean 0.22 Mbit/s)
- Flow 3 egress (mean 0.19 Mbit/s)

- Flow 1 (95th percentile 922.70 ms)
- Flow 2 (95th percentile 945.36 ms)
- Flow 3 (95th percentile 886.74 ms)

```
Run 2: Statistics of Copa

Start at: 2018-03-26 22:53:19
End at: 2018-03-26 22:53:49
Local clock offset: -2.668 ms
Remote clock offset: 8.489 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 776.716 ms
Loss rate: 7.44%
-- Flow 1:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 807.777 ms
Loss rate: 5.63%
-- Flow 2:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 789.943 ms
Loss rate: 8.13%
-- Flow 3:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 664.065 ms
Loss rate: 11.40%
```
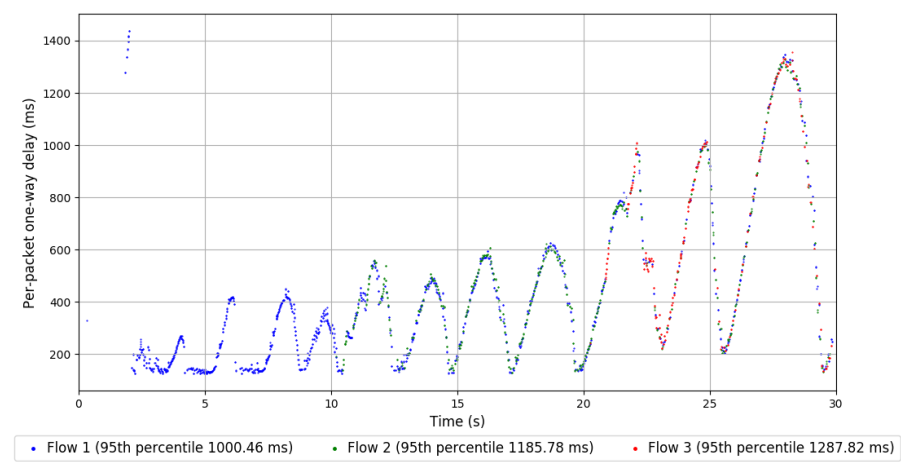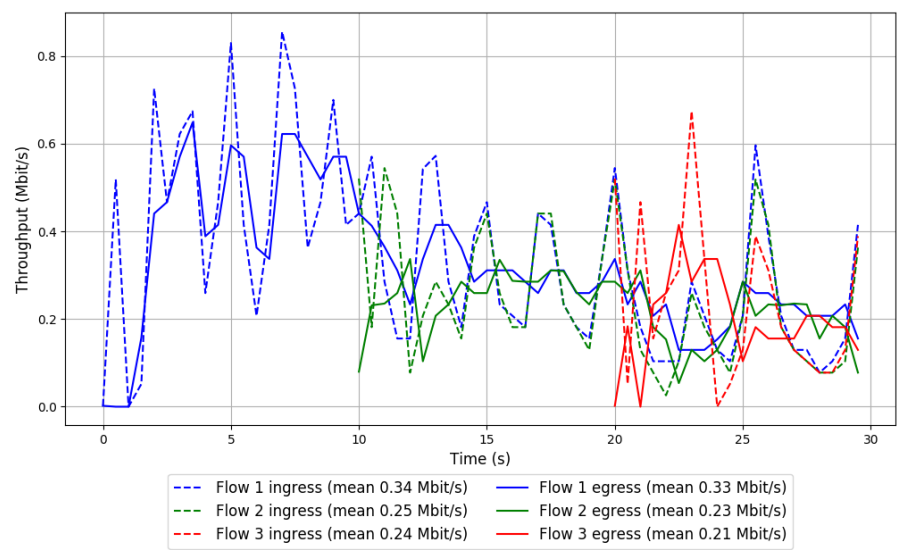
Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-03-26 23:16:04
End at: 2018-03-26 23:16:34
Local clock offset: -5.046 ms
Remote clock offset: 7.728 ms


# Below is generated by plot.py at 2018-03-27 00:25:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 1167.743 ms
Loss rate: 7.47%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 1000.457 ms
Loss rate: 4.38%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 1185.783 ms
Loss rate: 9.23%
-- Flow 3:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 1287.820 ms
Loss rate: 16.89%
```
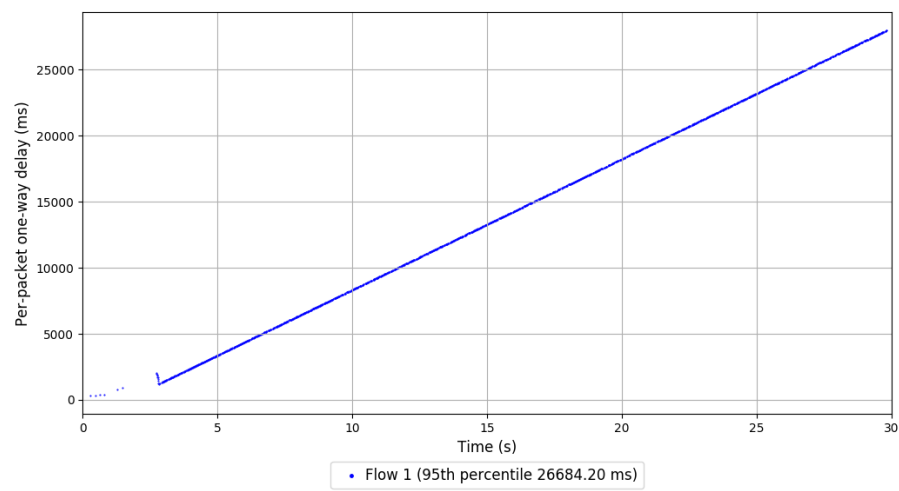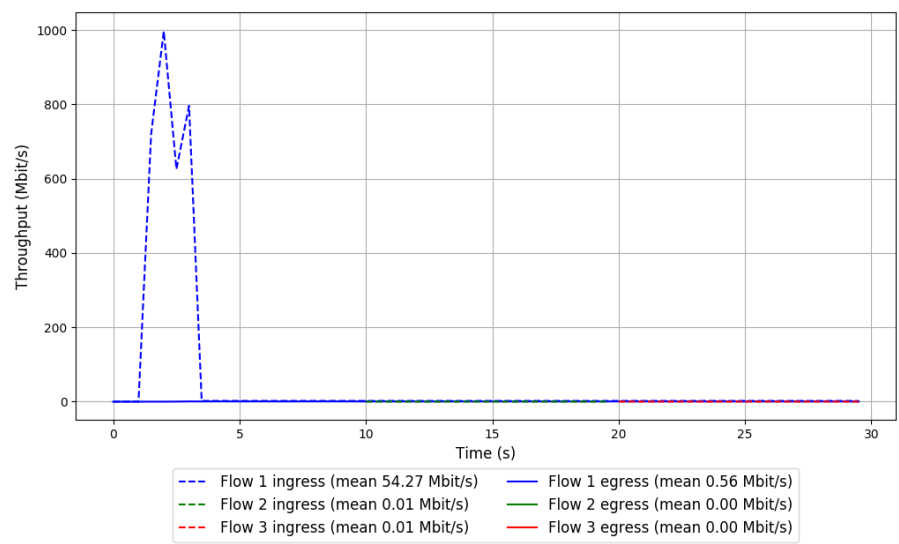
Run 3: Report of Copa — Data Link

```
Run 1: Statistics of FillP

Start at: 2018-03-26 22:14:07
End at: 2018-03-26 22:14:37
Local clock offset: -3.052 ms
Remote clock offset: 2.2 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 26684.204 ms
Loss rate: 98.99%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 26684.204 ms
Loss rate: 98.99%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
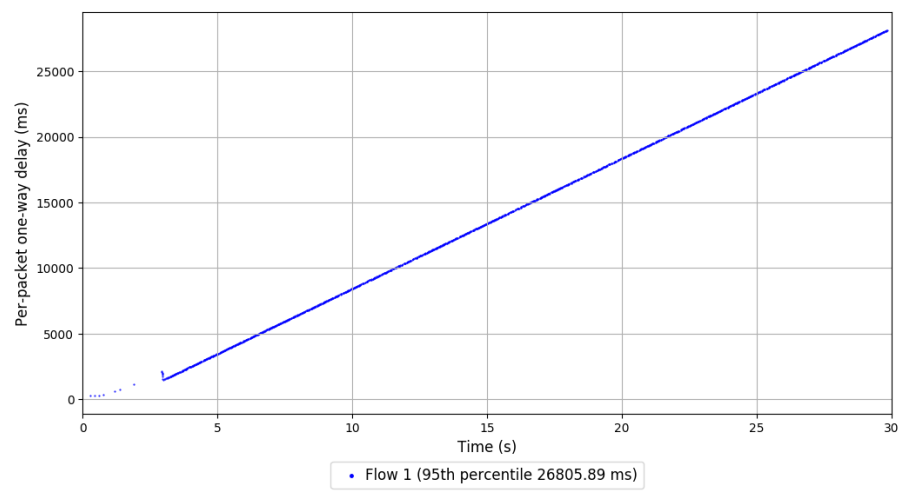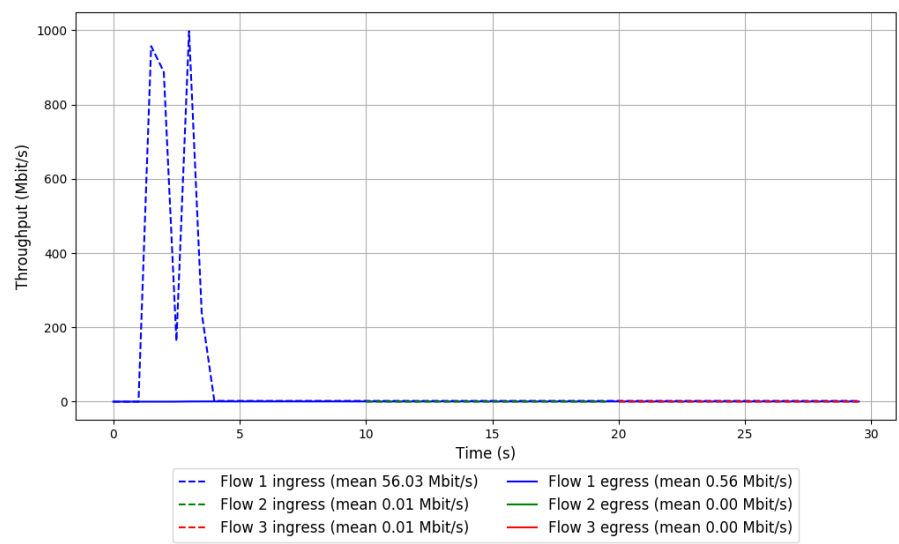
Run 1: Report of FillP — Data Link

Flow 1 ingress (mean 54.27 Mbit/s) — — — Flow 1 egress (mean 0.56 Mbit/s)
Flow 2 ingress (mean 0.01 Mbit/s) — — — Flow 2 egress (mean 0.00 Mbit/s)
Flow 3 ingress (mean 0.01 Mbit/s) — — — Flow 3 egress (mean 0.00 Mbit/s)

Flow 1 (95th percentile 26684.20 ms)

```
Run 2: Statistics of FillP

Start at: 2018-03-26 22:36:53
End at: 2018-03-26 22:37:23
Local clock offset: -2.595 ms
Remote clock offset: 8.13 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 26805.889 ms
Loss rate: 99.02%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 26805.889 ms
Loss rate: 99.02%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
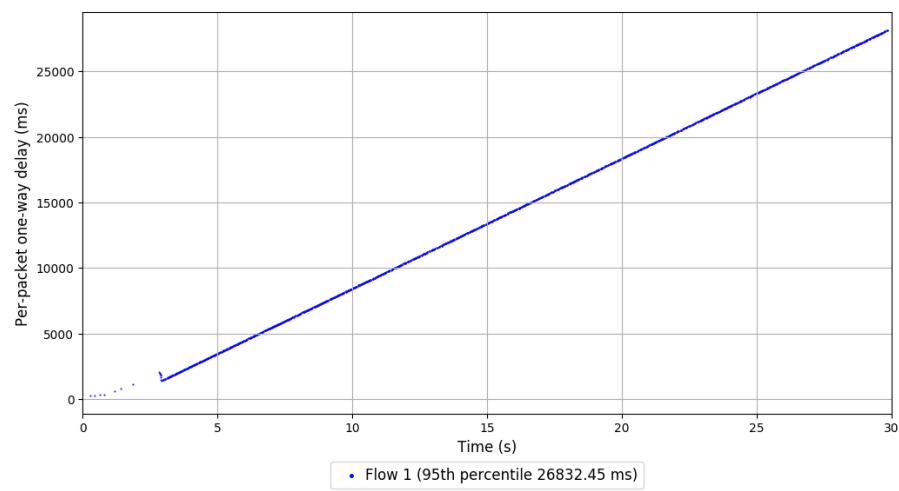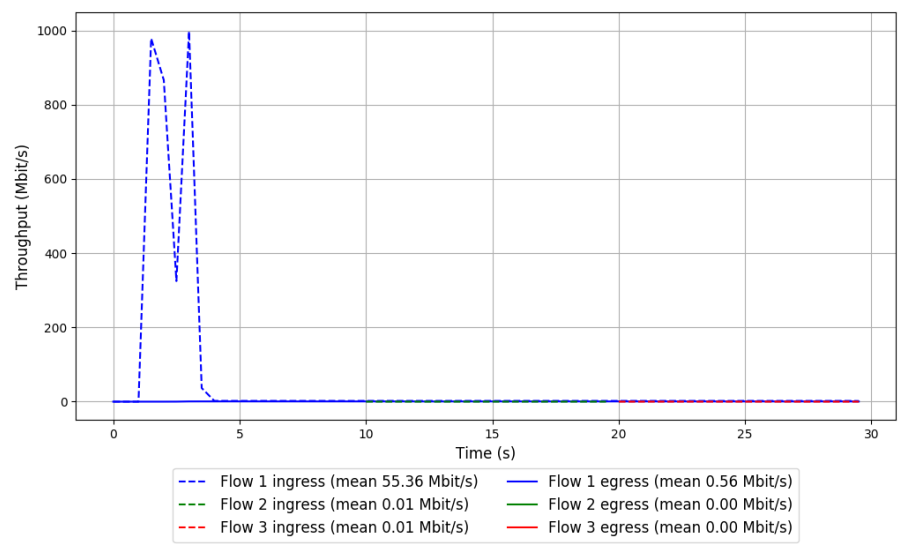
Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-03-26 22:59:37
End at: 2018-03-26 23:00:07
Local clock offset: -2.606 ms
Remote clock offset: 8.113 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 26832.449 ms
Loss rate: 99.00%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 26832.449 ms
Loss rate: 99.00%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
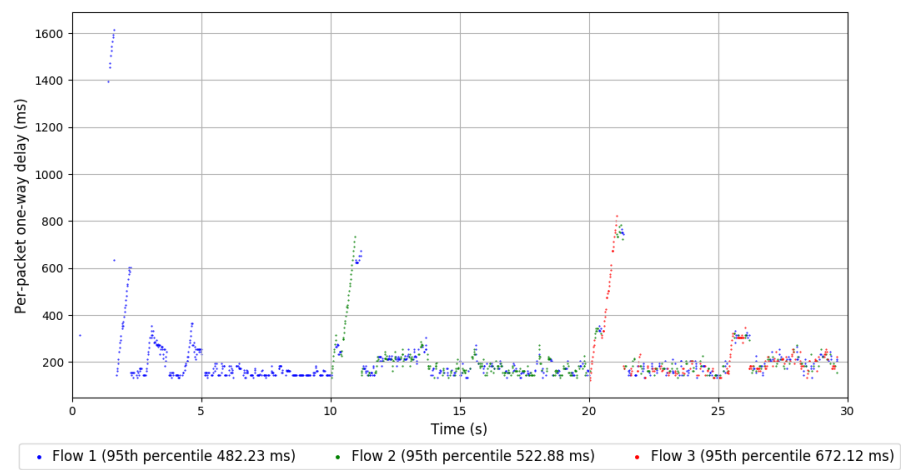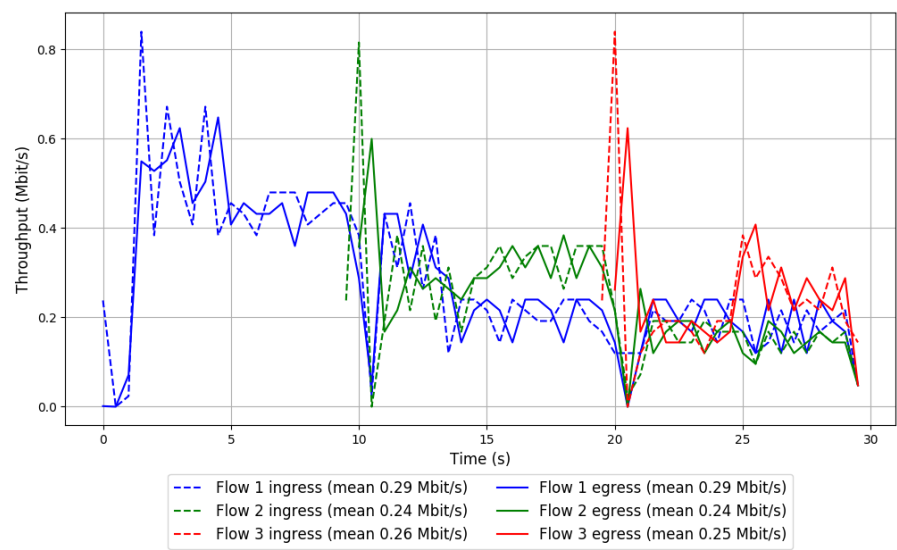
Run 3: Report of FillP — Data Link

Flow 1 ingress (mean 55.36 Mbit/s)   Flow 1 egress (mean 0.56 Mbit/s)
Flow 2 ingress (mean 0.01 Mbit/s)   Flow 2 egress (mean 0.00 Mbit/s)
Flow 3 ingress (mean 0.01 Mbit/s)   Flow 3 egress (mean 0.00 Mbit/s)

Flow 1 (95th percentile 26832.45 ms)

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

Start at: 2018-03-26 22:16:40
End at: 2018-03-26 22:17:10
Local clock offset: -2.831 ms
Remote clock offset: 2.211 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 551.910 ms
Loss rate: 1.91%
-- Flow 1:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 482.227 ms
Loss rate: 1.27%
-- Flow 2:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 522.877 ms
Loss rate: 1.79%
-- Flow 3:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 672.123 ms
Loss rate: 4.29%
```
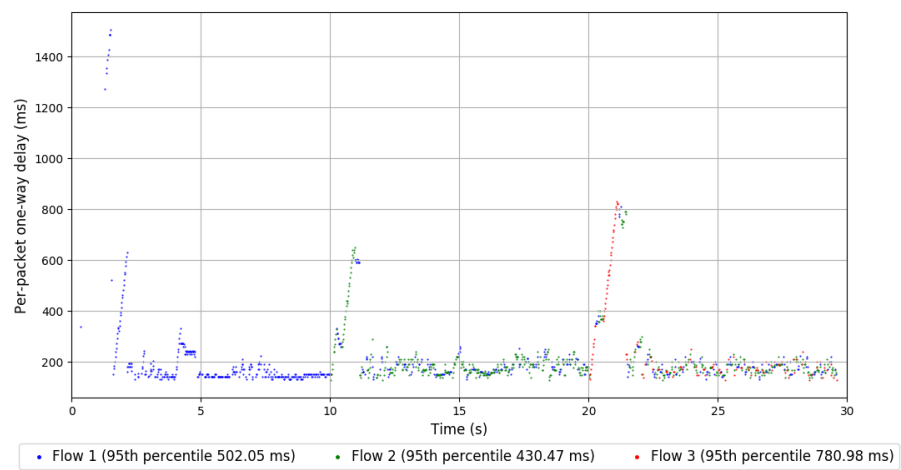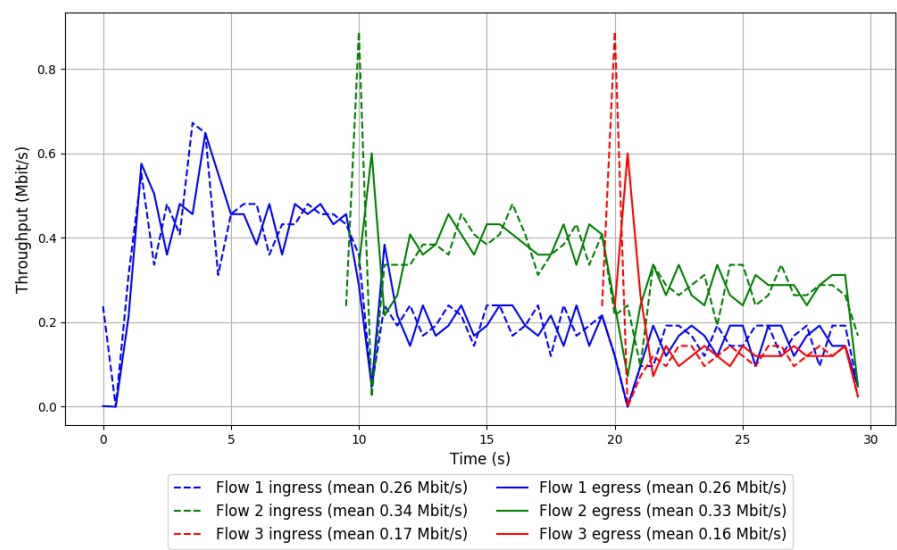
Run 1: Report of Indigo-1-32 — Data Link

Flow 1 ingress (mean 0.29 Mbit/s) — Flow 1 egress (mean 0.29 Mbit/s)
Flow 2 ingress (mean 0.24 Mbit/s) — Flow 2 egress (mean 0.24 Mbit/s)
Flow 3 ingress (mean 0.26 Mbit/s) — Flow 3 egress (mean 0.25 Mbit/s)

Flow 1 (95th percentile 482.23 ms)   Flow 2 (95th percentile 522.88 ms)   Flow 3 (95th percentile 672.12 ms)

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

Start at: 2018-03-26 22:39:26
End at: 2018-03-26 22:39:56
Local clock offset: -2.612 ms
Remote clock offset: 3.288 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 560.647 ms
Loss rate: 2.11%
-- Flow 1:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 502.050 ms
Loss rate: 1.10%
-- Flow 2:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 430.474 ms
Loss rate: 2.70%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 780.983 ms
Loss rate: 4.48%
```
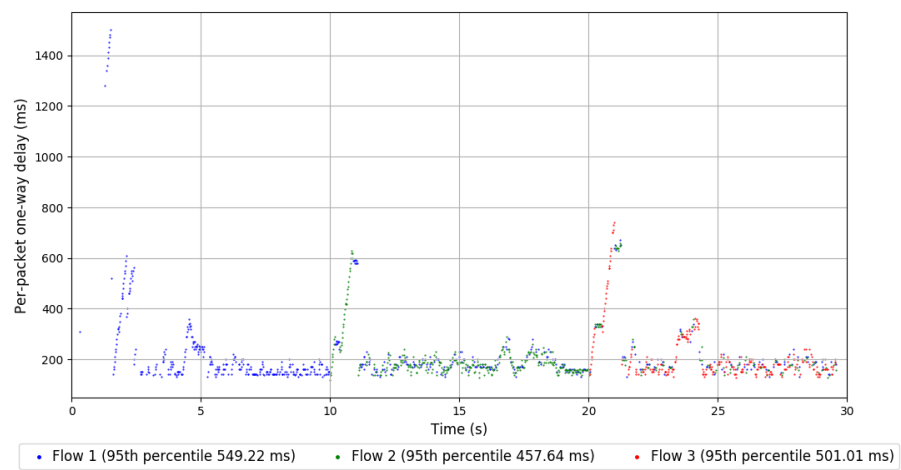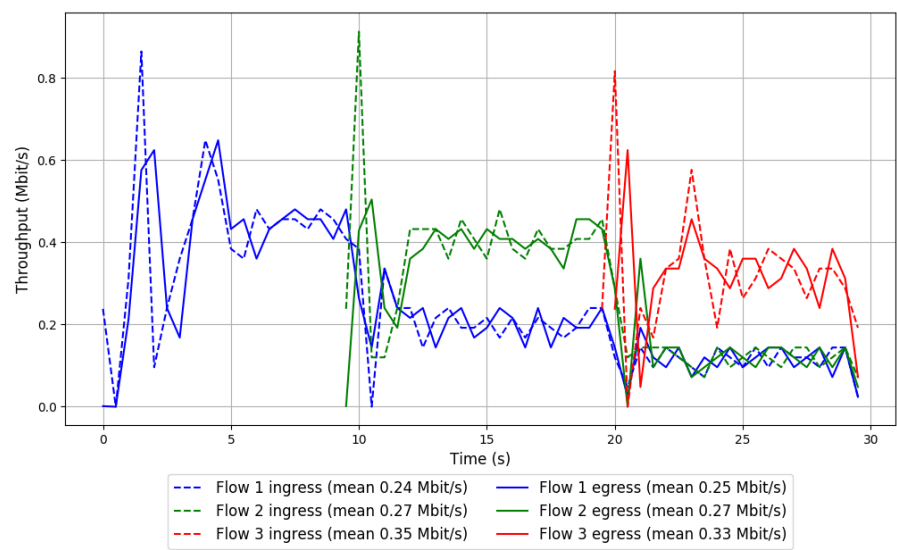
Run 2: Report of Indigo-1-32 — Data Link

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

Start at: 2018-03-26 23:02:11
End at: 2018-03-26 23:02:41
Local clock offset: -2.614 ms
Remote clock offset: 7.933 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 527.511 ms
Loss rate: 2.62%
-- Flow 1:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 549.217 ms
Loss rate: 1.16%
-- Flow 2:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 457.643 ms
Loss rate: 2.67%
-- Flow 3:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 501.006 ms
Loss rate: 5.70%
```
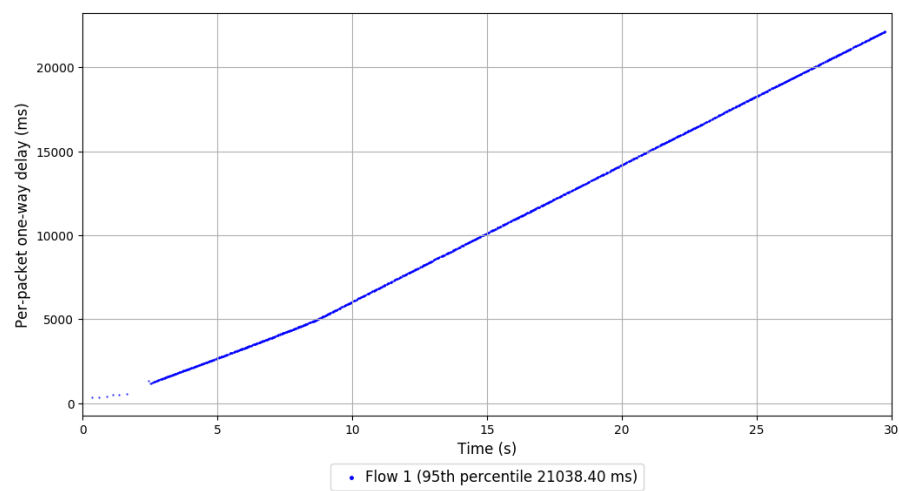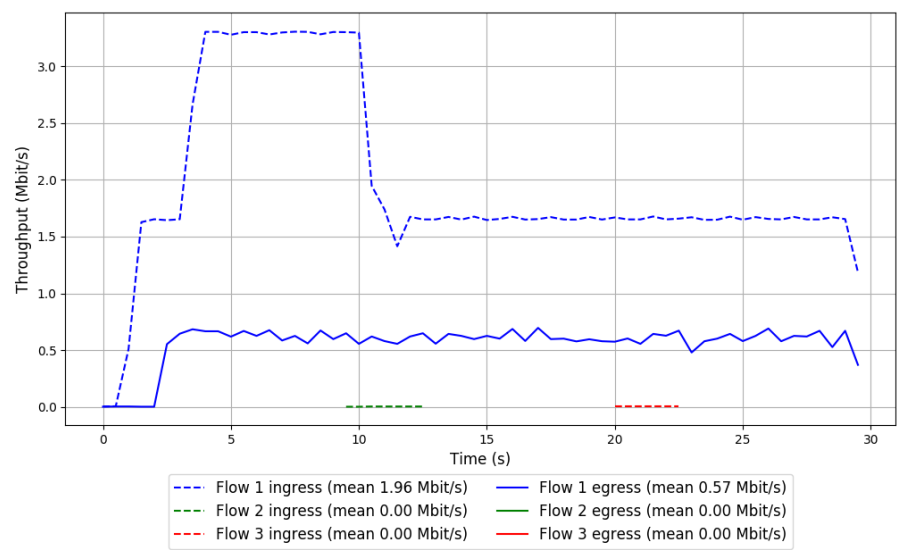
Run 3: Report of Indigo-1-32 — Data Link

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```
Run 1: Statistics of Vivace-latency

Start at: 2018-03-26 22:22:58
End at: 2018-03-26 22:23:28
Local clock offset: -2.638 ms
Remote clock offset: 2.562 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21038.400 ms
Loss rate: 71.30%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21038.400 ms
Loss rate: 71.29%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
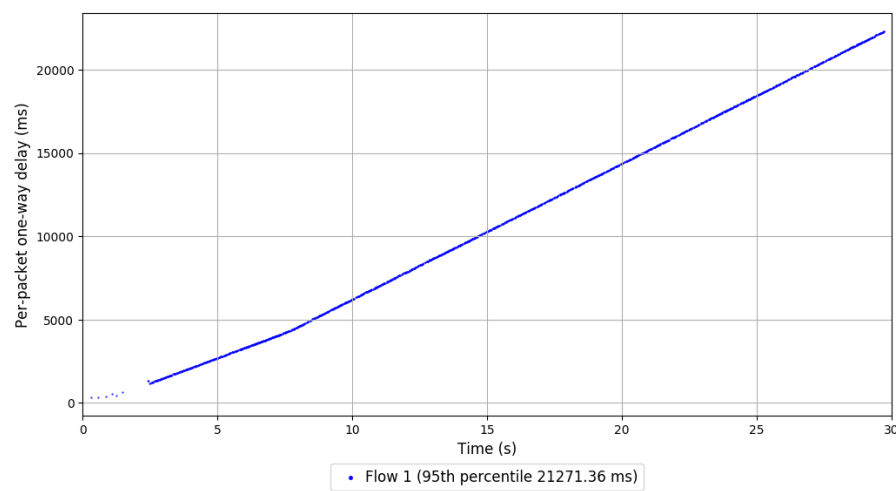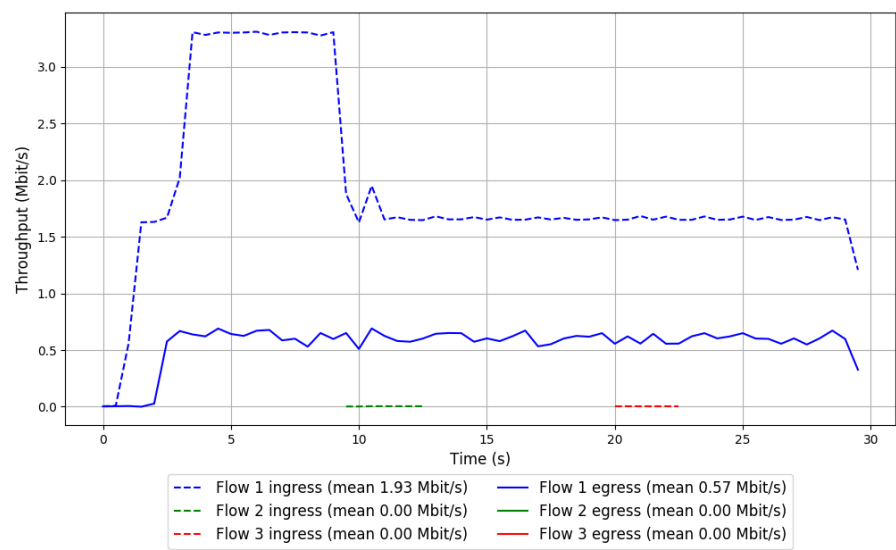
Run 1: Report of Vivace-latency — Data Link

```
Run 2: Statistics of Vivace-latency

Start at: 2018-03-26 22:45:44
End at: 2018-03-26 22:46:14
Local clock offset: -2.635 ms
Remote clock offset: 8.192 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21271.361 ms
Loss rate: 71.05%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21271.361 ms
Loss rate: 71.04%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

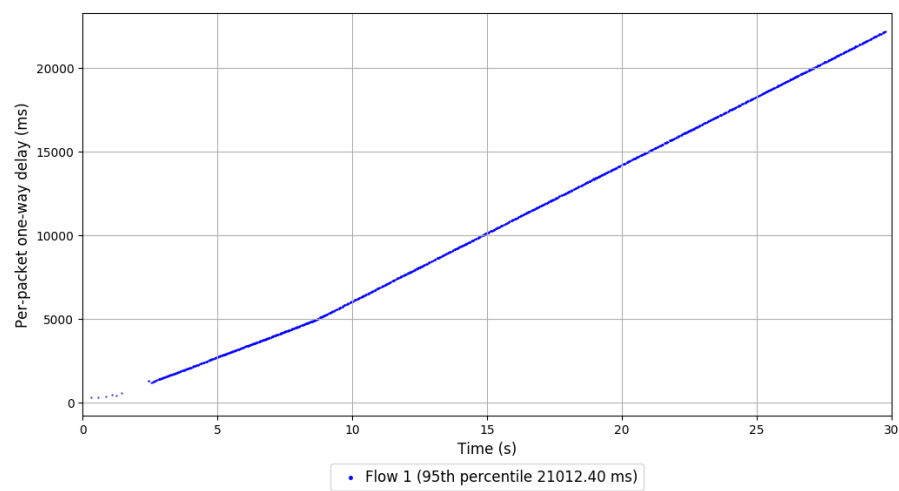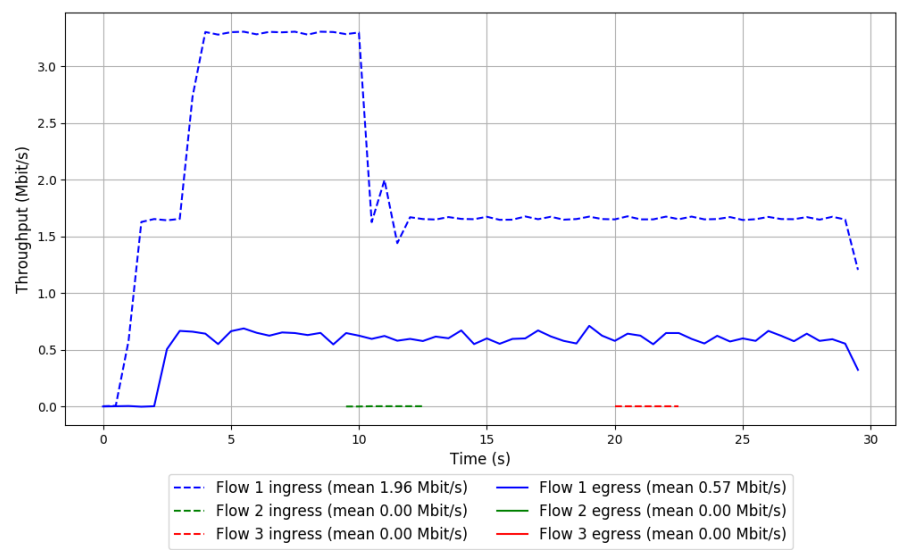Run 2: Report of Vivace-latency — Data Link

```
Run 3: Statistics of Vivace-latency

Start at: 2018-03-26 23:08:28
End at: 2018-03-26 23:08:58
Local clock offset: -3.884 ms
Remote clock offset: 7.806 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21012.404 ms
Loss rate: 71.46%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21012.404 ms
Loss rate: 71.44%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

Run 3: Report of Vivace-latency — Data Link

Flow 1 ingress (mean 1.96 Mbit/s) · · · Flow 1 egress (mean 0.57 Mbit/s)
Flow 2 ingress (mean 0.00 Mbit/s) — — Flow 2 egress (mean 0.00 Mbit/s)
Flow 3 ingress (mean 0.00 Mbit/s) — — Flow 3 egress (mean 0.00 Mbit/s)
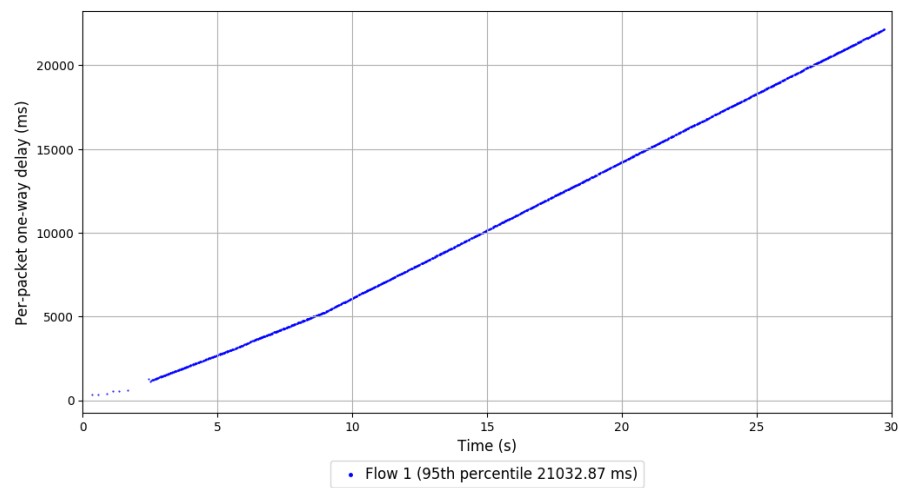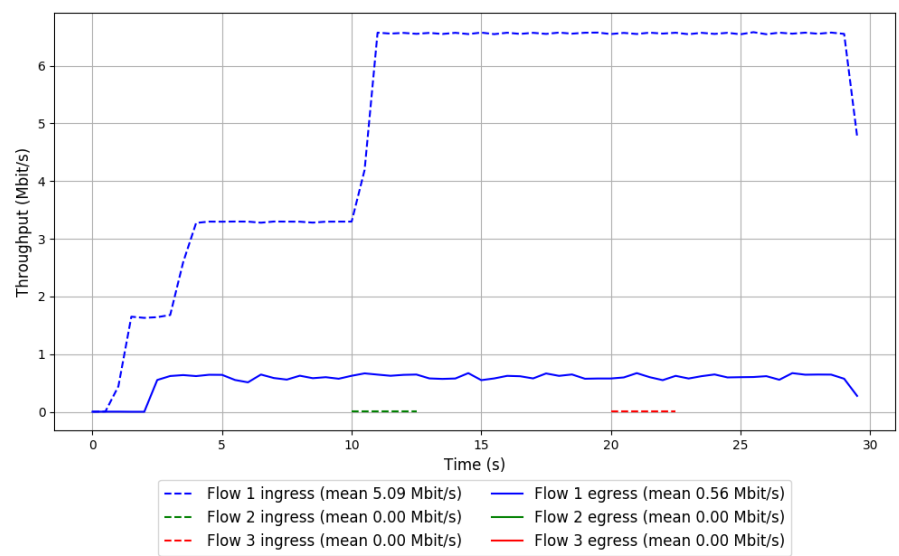

· Flow 1 (95th percentile 21012.40 ms)

```
Run 1: Statistics of Vivace-loss

Start at: 2018-03-26 22:15:25
End at: 2018-03-26 22:15:55
Local clock offset: -2.949 ms
Remote clock offset: 2.264 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 21032.869 ms
Loss rate: 89.10%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 21032.869 ms
Loss rate: 89.09%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
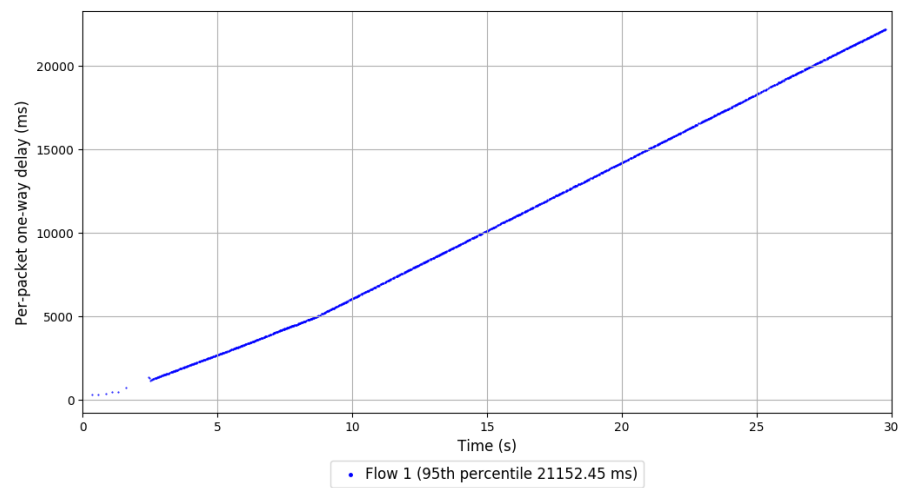
Run 1: Report of Vivace-loss — Data Link

```
Run 2: Statistics of Vivace-loss

Start at: 2018-03-26 22:38:10
End at: 2018-03-26 22:38:40
Local clock offset: -2.434 ms
Remote clock offset: 8.119 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21152.451 ms
Loss rate: 89.08%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21152.451 ms
Loss rate: 89.08%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
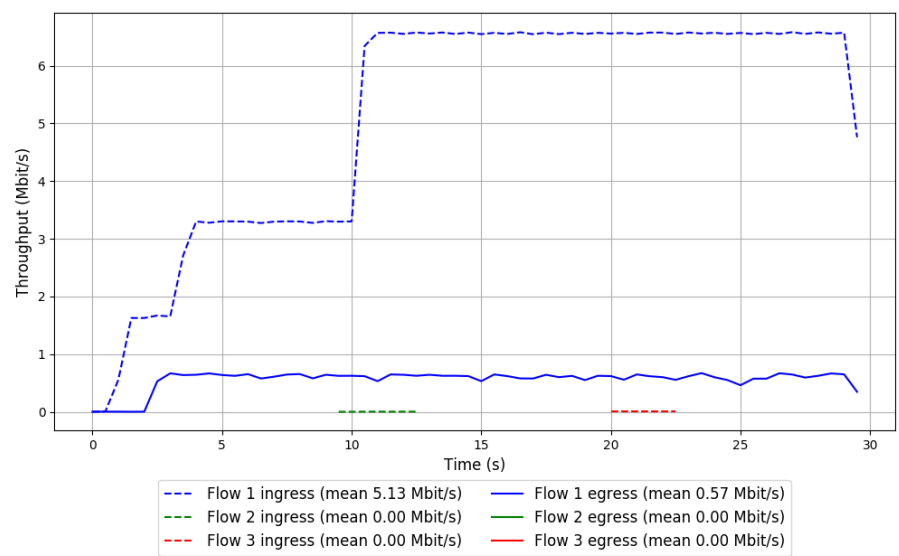
Run 2: Report of Vivace-loss — Data Link

```
Run 3: Statistics of Vivace-loss

Start at: 2018-03-26 23:00:55
End at: 2018-03-26 23:01:25
Local clock offset: -2.609 ms
Remote clock offset: 3.018 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20969.844 ms
Loss rate: 89.10%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20969.844 ms
Loss rate: 89.10%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
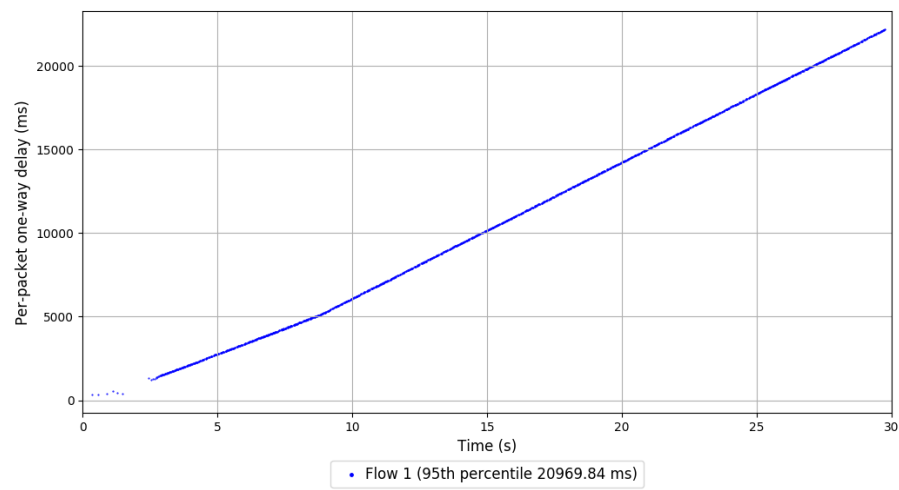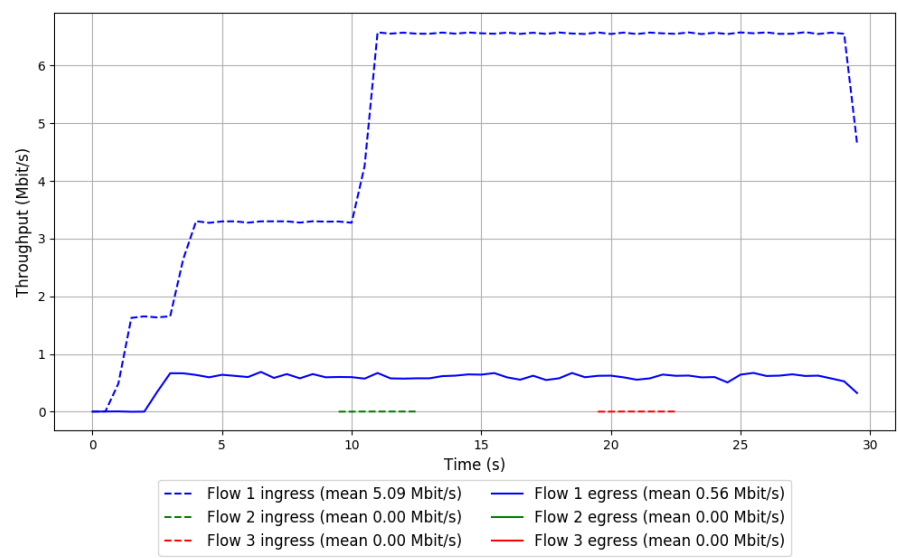
Run 3: Report of Vivace-loss — Data Link

```
Run 1: Statistics of Vivace-LTE

Start at: 2018-03-26 22:19:11
End at: 2018-03-26 22:19:41
Local clock offset: -2.704 ms
Remote clock offset: 7.306 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21011.900 ms
Loss rate: 71.33%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21011.900 ms
Loss rate: 71.32%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
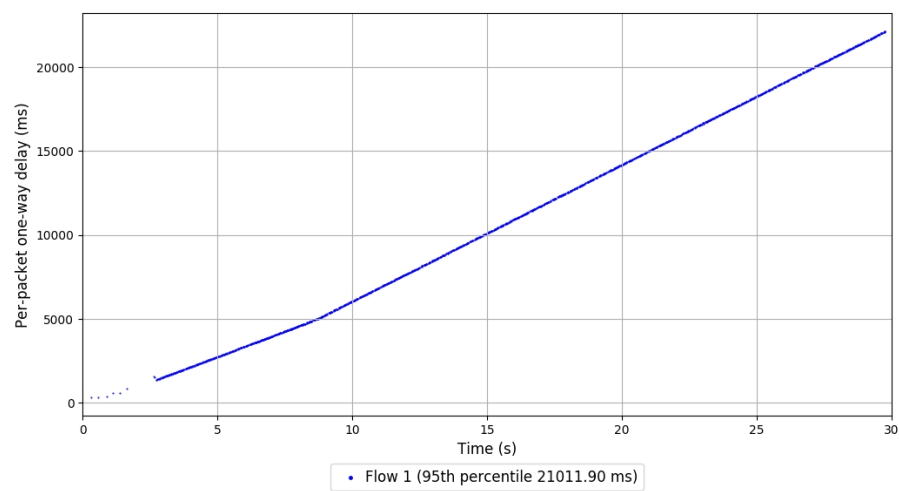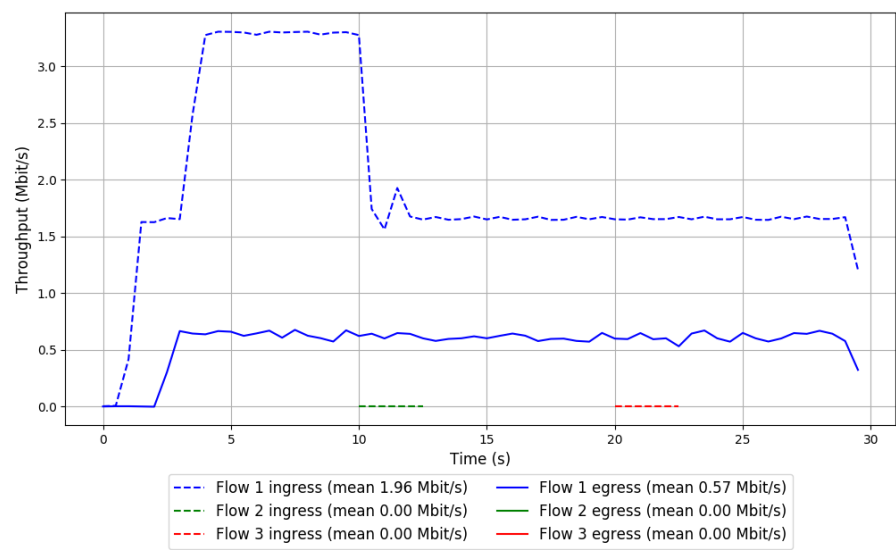
Run 1: Report of Vivace-LTE — Data Link

```
Run 2: Statistics of Vivace-LTE

Start at: 2018-03-26 22:41:57
End at: 2018-03-26 22:42:27
Local clock offset: -2.709 ms
Remote clock offset: 3.255 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 20879.563 ms
Loss rate: 71.07%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 20879.563 ms
Loss rate: 71.05%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
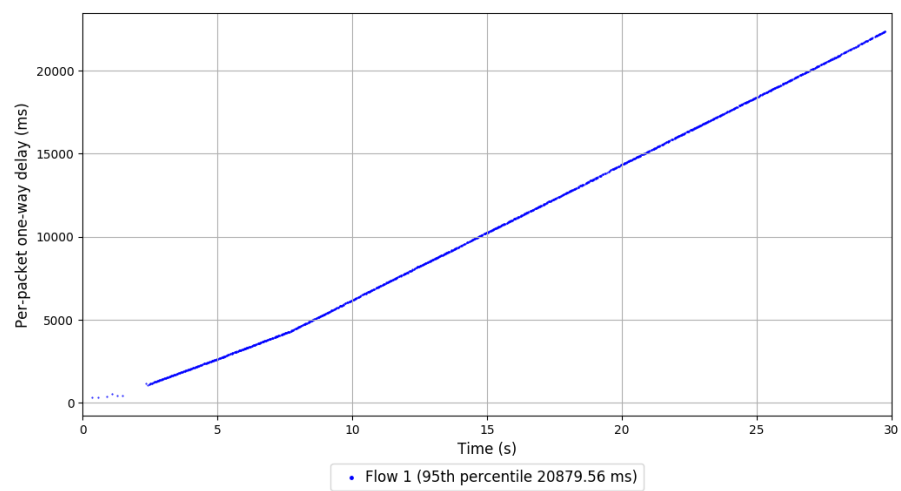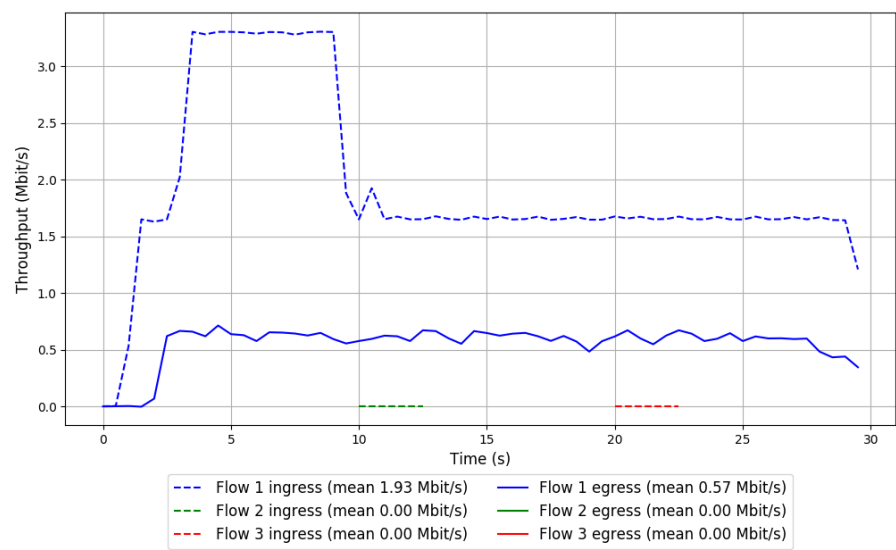
Run 2: Report of Vivace-LTE — Data Link

```
Run 3: Statistics of Vivace-LTE

Start at: 2018-03-26 23:04:41
End at: 2018-03-26 23:05:11
Local clock offset: -2.924 ms
Remote clock offset: 7.953 ms


# Below is generated by plot.py at 2018-03-27 00:25:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21165.707 ms
Loss rate: 70.80%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21165.707 ms
Loss rate: 70.79%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

Run 3: Report of Vivace-LTE — Data Link