# Pantheon Report

Generated at 2018-04-10 08:41:45 (UTC).

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

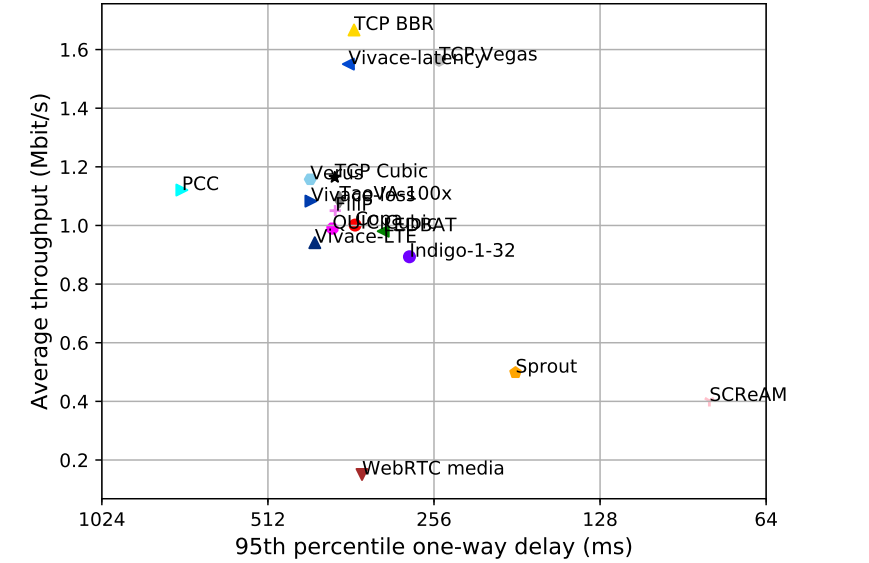Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

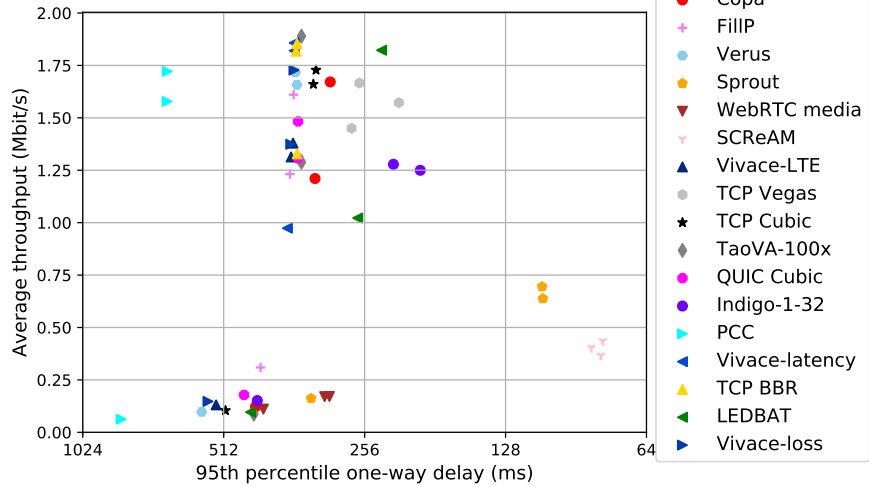NTP offsets were measured against `nets.org.sg` and have been applied to correct the timestamps in logs.

```
Git summary:
branch: master @ eb420b5be9bafccd22cf68b99ff5a2000462fc59
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
 M datagrump/sender.cc
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44
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 India ppp0 to AWS India 1 Ethernet, 3 runs of 30s each per scheme
### 3 flows with 10s interval between flows (mean of all runs by scheme)



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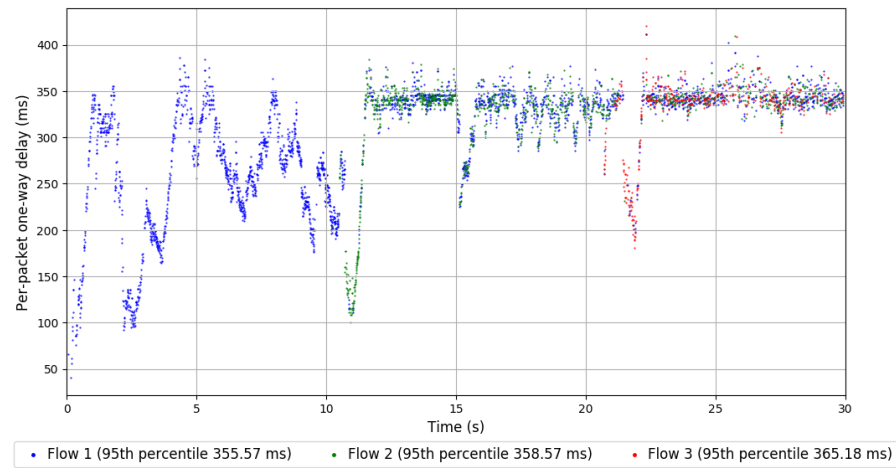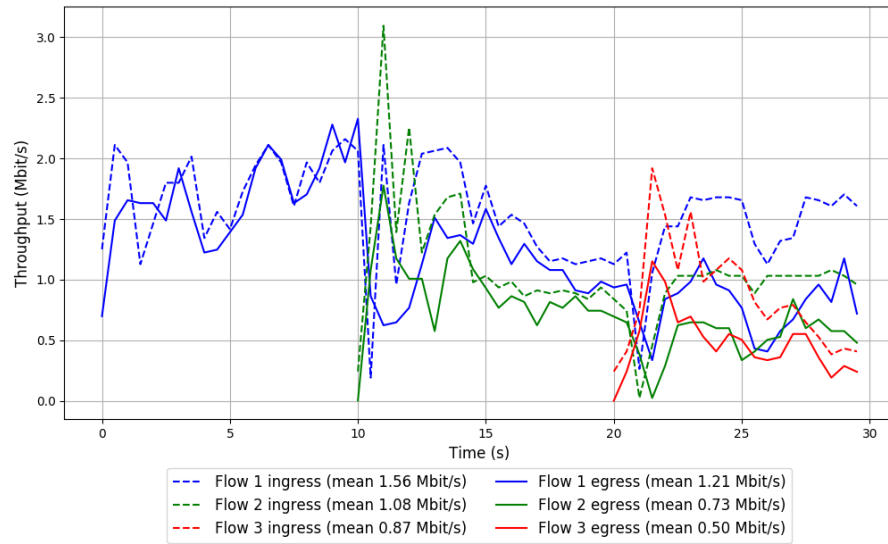### 3 flows with 10s interval between flows



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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 | 1.02 | 0.76 | 0.46 | 354.46 | 360.12 | 360.66 | 18.88 | 30.47 | 35.75 |
| TCP Cubic | 3 | 0.74 | 0.49 | 0.31 | 369.05 | 407.01 | 408.79 | 10.27 | 13.68 | 21.36 |
| LEDBAT | 3 | 0.52 | 0.46 | 0.49 | 317.63 | 312.78 | 314.32 | 6.31 | 6.86 | 10.54 |
| PCC | 3 | 0.63 | 0.50 | 0.79 | 549.04 | 687.28 | 778.83 | 81.24 | 86.17 | 91.30 |
| QUIC Cubic | 3 | 0.55 | 0.47 | 0.40 | 397.05 | 385.35 | 394.01 | 24.06 | 25.43 | 40.18 |
| SCReAM | 3 | 0.20 | 0.19 | 0.22 | 75.63 | 86.13 | 82.09 | 0.23 | 0.24 | 0.55 |
| WebRTC media | 3 | 0.06 | 0.05 | 0.05 | 329.46 | 352.86 | 354.34 | 16.41 | 19.00 | 13.91 |
| Sprout | 3 | 0.25 | 0.25 | 0.27 | 181.59 | 181.88 | 182.10 | 4.27 | 5.00 | 6.97 |
| TaoVA-100x | 3 | 0.74 | 0.39 | 0.35 | 377.82 | 384.51 | 385.69 | 41.03 | 62.06 | 69.90 |
| TCP Vegas | 3 | 0.84 | 0.68 | 0.81 | 274.04 | 215.79 | 208.95 | 1.84 | 0.70 | 1.35 |
| Verus | 3 | 1.07 | 0.10 | 0.07 | 419.51 | 438.28 | 458.43 | 34.89 | 42.69 | 61.09 |
| Copa | 3 | 0.61 | 0.39 | 0.42 | 346.26 | 361.93 | 351.46 | 22.90 | 30.66 | 33.40 |
| FillP | 3 | 0.57 | 0.58 | 0.50 | 384.71 | 386.06 | 387.64 | 75.20 | 82.82 | 82.43 |
| Indigo-1-32 | 3 | 0.39 | 0.43 | 0.68 | 271.42 | 291.29 | 290.25 | 9.76 | 16.49 | 26.18 |
| Vivace-latency | 3 | 0.86 | 0.79 | 0.52 | 362.73 | 368.06 | 368.12 | 36.63 | 45.34 | 50.61 |
| Vivace-loss | 3 | 0.66 | 0.50 | 0.49 | 426.46 | 365.75 | 372.92 | 54.32 | 47.87 | 63.88 |
| Vivace-LTE | 3 | 0.56 | 0.42 | 0.35 | 412.16 | 355.46 | 443.45 | 57.92 | 66.36 | 71.68 |

```
Run 1: Statistics of TCP BBR

Start at: 2018-04-10 06:45:47
End at: 2018-04-10 06:46:17
Local clock offset: -5.147 ms
Remote clock offset: -2.335 ms


# Below is generated by plot.py at 2018-04-10 08:41:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 357.014 ms
Loss rate: 27.95%
-- Flow 1:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 355.572 ms
Loss rate: 22.48%
-- Flow 2:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 358.570 ms
Loss rate: 33.05%
-- Flow 3:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 365.183 ms
Loss rate: 44.78%
```
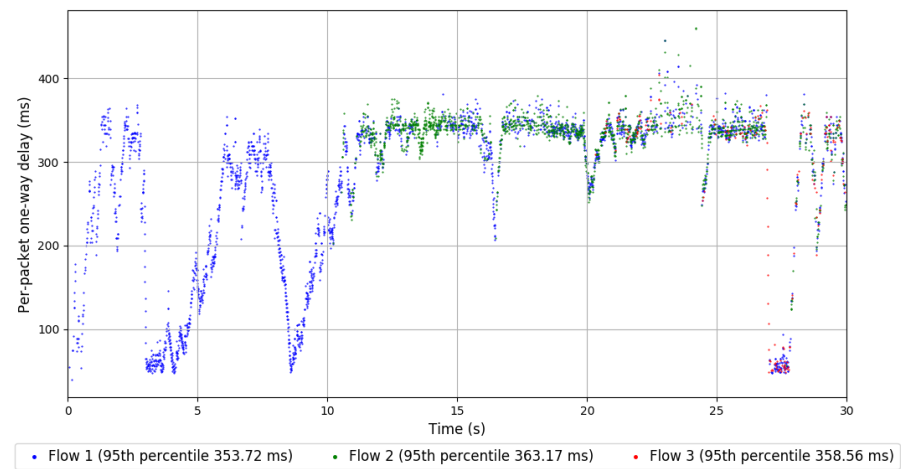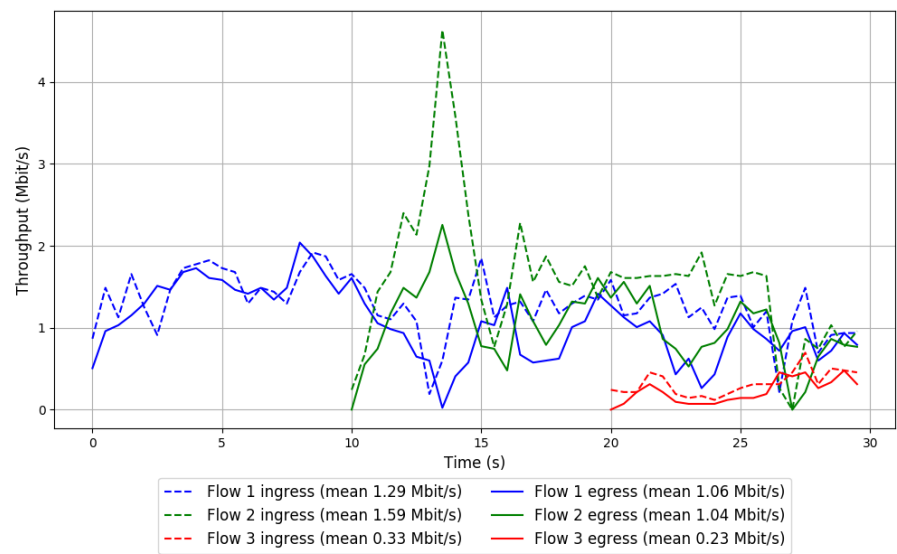
# Run 1: Report of TCP BBR — Data Link



- - - Flow 1 ingress (mean 1.56 Mbit/s) —— Flow 1 egress (mean 1.21 Mbit/s)
- - - Flow 2 ingress (mean 1.08 Mbit/s) —— Flow 2 egress (mean 0.73 Mbit/s)
- - - Flow 3 ingress (mean 0.87 Mbit/s) —— Flow 3 egress (mean 0.50 Mbit/s)



- Flow 1 (95th percentile 355.57 ms)   • Flow 2 (95th percentile 358.57 ms)   • Flow 3 (95th percentile 365.18 ms)

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```
Run 2: Statistics of TCP BBR

Start at: 2018-04-10 07:05:31
End at: 2018-04-10 07:06:01
Local clock offset: 0.197 ms
Remote clock offset: 0.196 ms


# Below is generated by plot.py at 2018-04-10 08:41:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 358.614 ms
Loss rate: 26.21%
-- Flow 1:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 353.721 ms
Loss rate: 18.46%
-- Flow 2:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 363.171 ms
Loss rate: 35.18%
-- Flow 3:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 358.558 ms
Loss rate: 31.21%
```
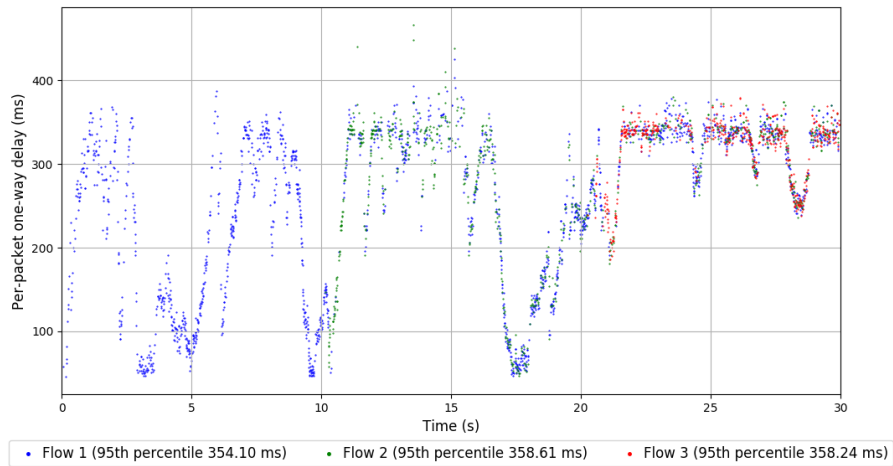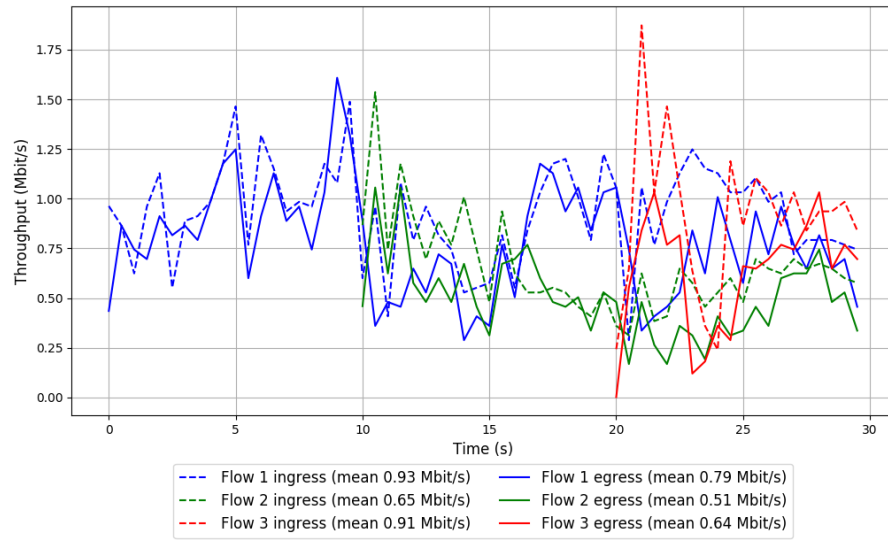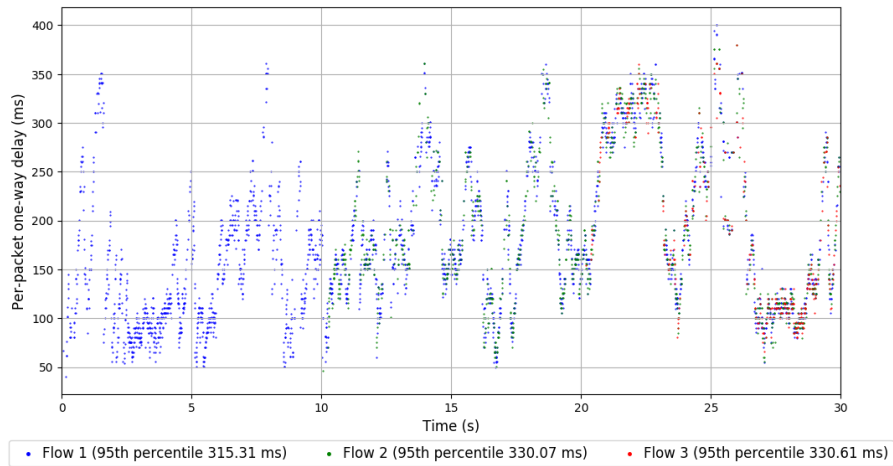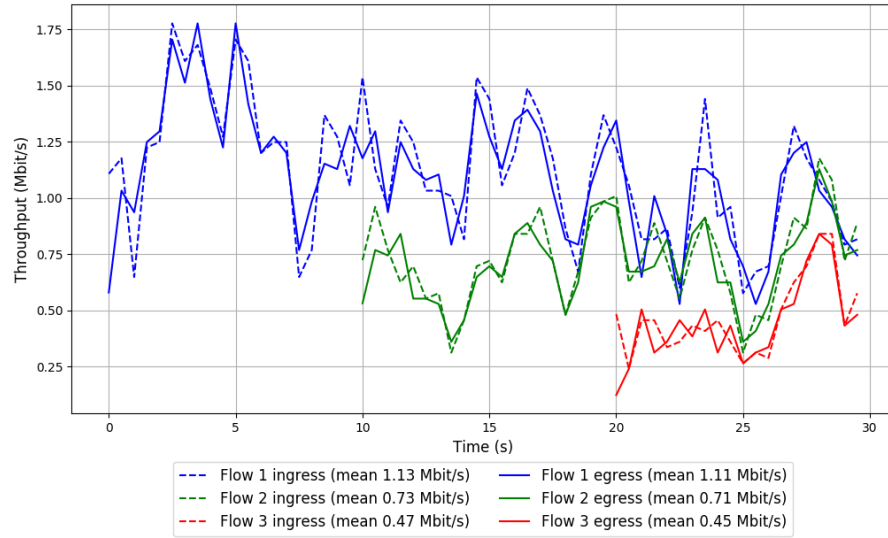
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2018-04-10 07:25:15
End at: 2018-04-10 07:25:45
Local clock offset: 0.315 ms
Remote clock offset: 2.929 ms


# Below is generated by plot.py at 2018-04-10 08:41:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 356.616 ms
Loss rate: 20.48%
-- Flow 1:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 354.101 ms
Loss rate: 15.70%
-- Flow 2:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 358.610 ms
Loss rate: 23.18%
-- Flow 3:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 358.239 ms
Loss rate: 31.26%
```

# Run 3: Report of TCP BBR — Data Link





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```
Run 1: Statistics of TCP Cubic

Start at: 2018-04-10 06:58:57
End at: 2018-04-10 06:59:27
Local clock offset: -0.672 ms
Remote clock offset: -0.285 ms


# Below is generated by plot.py at 2018-04-10 08:41:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.73 Mbit/s
95th percentile per-packet one-way delay: 325.169 ms
Loss rate: 2.62%
-- Flow 1:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 315.313 ms
Loss rate: 2.10%
-- Flow 2:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 330.073 ms
Loss rate: 2.87%
-- Flow 3:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 330.607 ms
Loss rate: 5.64%
```
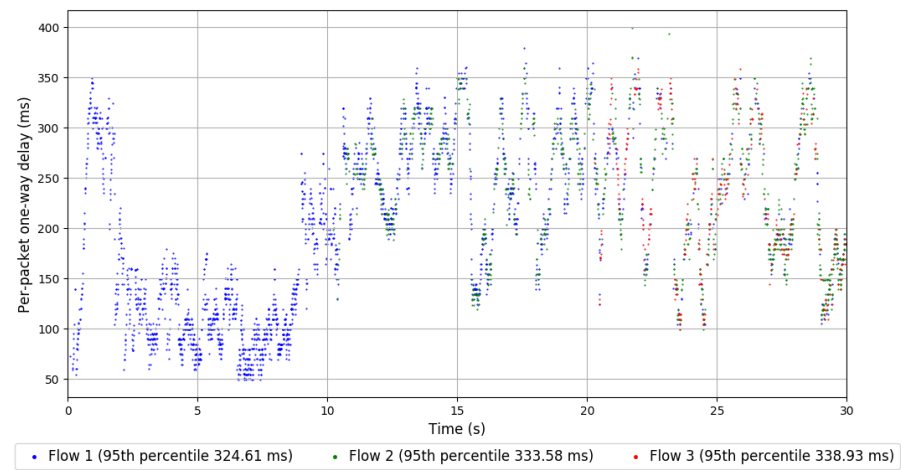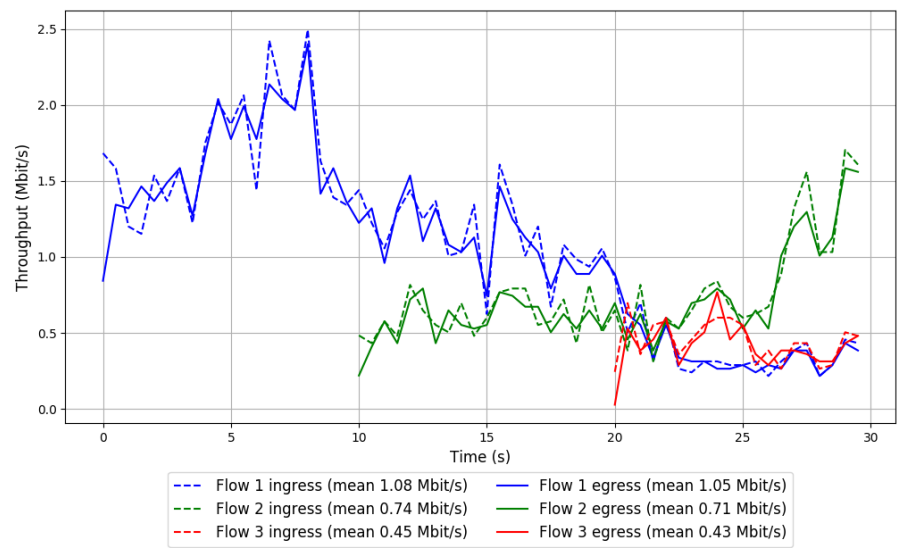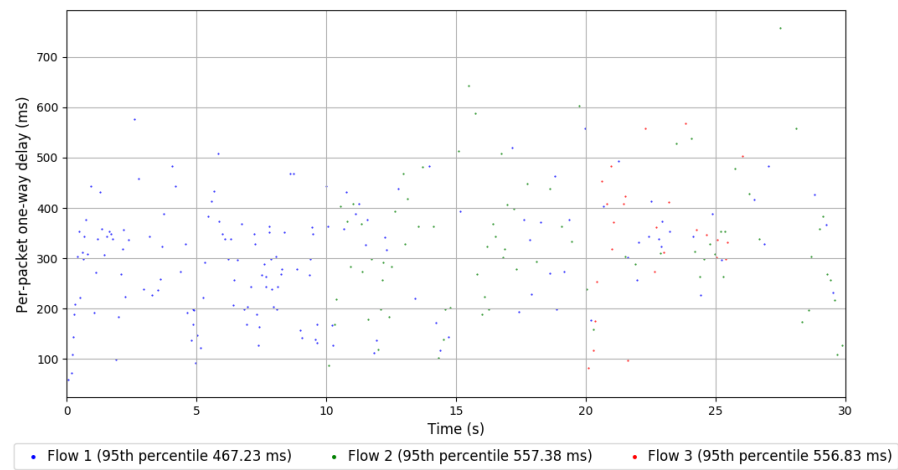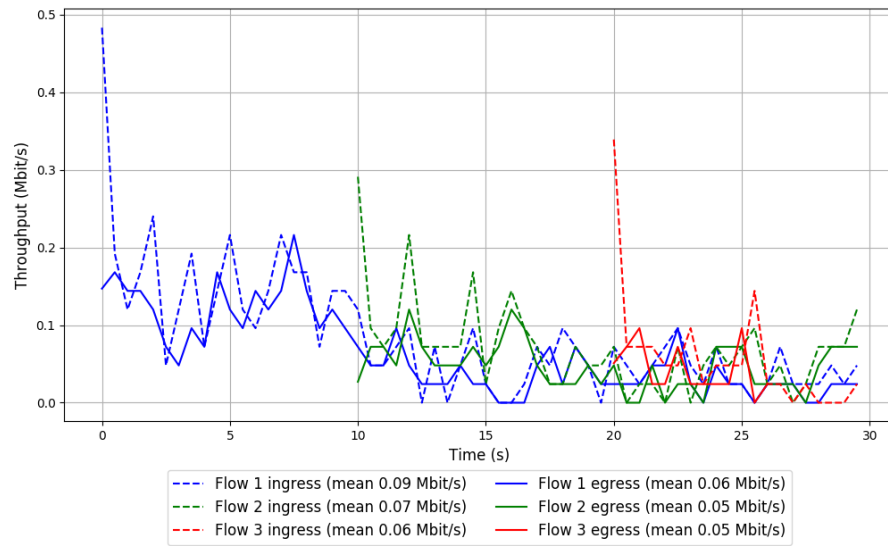
Run 1: Report of TCP Cubic — Data Link



Flow 1 ingress (mean 1.13 Mbit/s) — Flow 1 egress (mean 1.11 Mbit/s)
Flow 2 ingress (mean 0.73 Mbit/s) — Flow 2 egress (mean 0.71 Mbit/s)
Flow 3 ingress (mean 0.47 Mbit/s) — Flow 3 egress (mean 0.45 Mbit/s)



Flow 1 (95th percentile 315.31 ms)    Flow 2 (95th percentile 330.07 ms)    Flow 3 (95th percentile 330.61 ms)

```
Run 2: Statistics of TCP Cubic

Start at: 2018-04-10 07:18:40
End at: 2018-04-10 07:19:10
Local clock offset: 0.904 ms
Remote clock offset: 1.314 ms


# Below is generated by plot.py at 2018-04-10 08:41:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 329.424 ms
Loss rate: 3.55%
-- Flow 1:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 324.614 ms
Loss rate: 2.79%
-- Flow 2:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 333.583 ms
Loss rate: 4.31%
-- Flow 3:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 338.926 ms
Loss rate: 6.48%
```
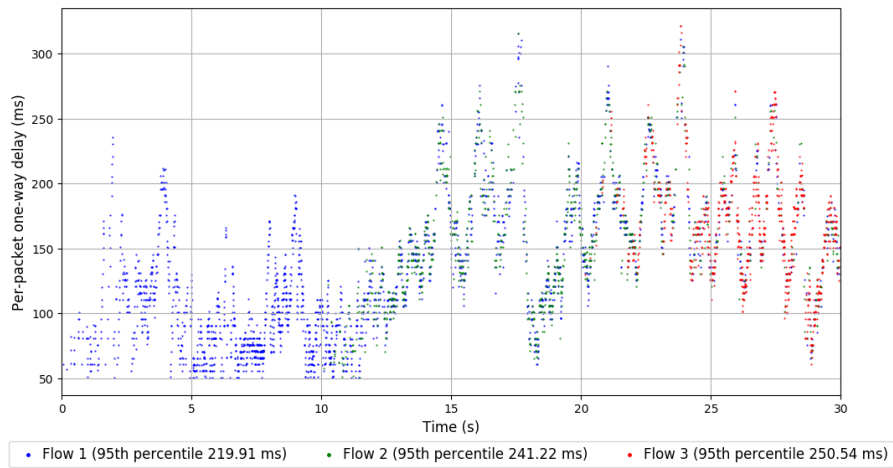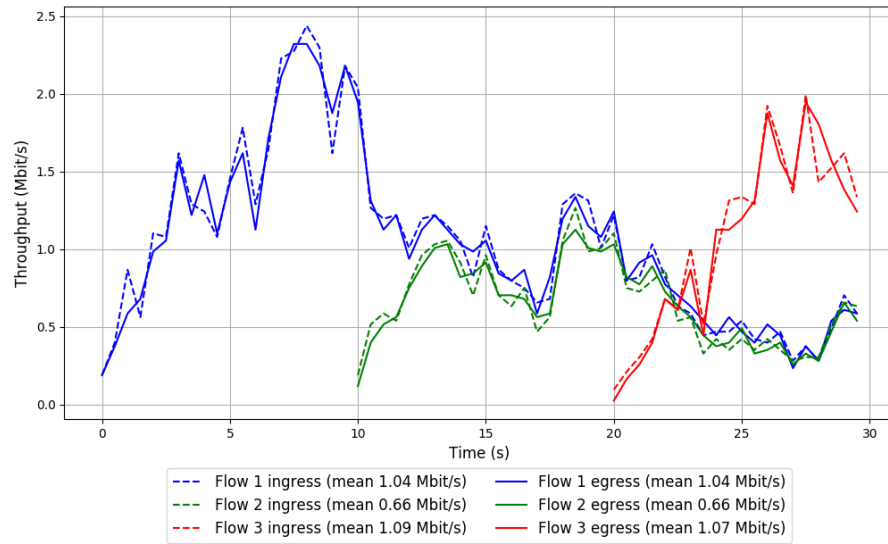
# Run 2: Report of TCP Cubic — Data Link



Flow 1 ingress (mean 1.08 Mbit/s)    Flow 1 egress (mean 1.05 Mbit/s)
Flow 2 ingress (mean 0.74 Mbit/s)    Flow 2 egress (mean 0.71 Mbit/s)
Flow 3 ingress (mean 0.45 Mbit/s)    Flow 3 egress (mean 0.43 Mbit/s)



Flow 1 (95th percentile 324.61 ms)    Flow 2 (95th percentile 333.58 ms)    Flow 3 (95th percentile 338.93 ms)

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```
Run 3: Statistics of TCP Cubic

Start at: 2018-04-10 07:38:30
End at: 2018-04-10 07:39:00
Local clock offset: -0.622 ms
Remote clock offset: -1.233 ms


# Below is generated by plot.py at 2018-04-10 08:41:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 507.476 ms
Loss rate: 31.72%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 467.233 ms
Loss rate: 25.93%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 557.376 ms
Loss rate: 33.86%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 556.830 ms
Loss rate: 51.95%
```

Run 3: Report of TCP Cubic — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2018-04-10 06:55:39
End at: 2018-04-10 06:56:09
Local clock offset: -1.482 ms
Remote clock offset: -0.618 ms

# Below is generated by plot.py at 2018-04-10 08:41:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 235.564 ms
Loss rate: 1.40%
-- Flow 1:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 219.909 ms
Loss rate: 0.98%
-- Flow 2:
Average throughput: 0.66 Mbit/s
95th percentile per-packet one-way delay: 241.221 ms
Loss rate: 1.33%
-- Flow 3:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 250.540 ms
Loss rate: 2.71%
```
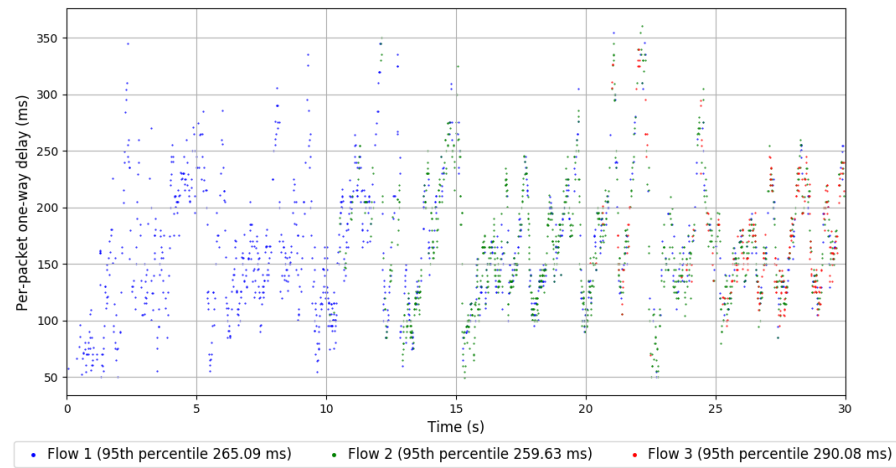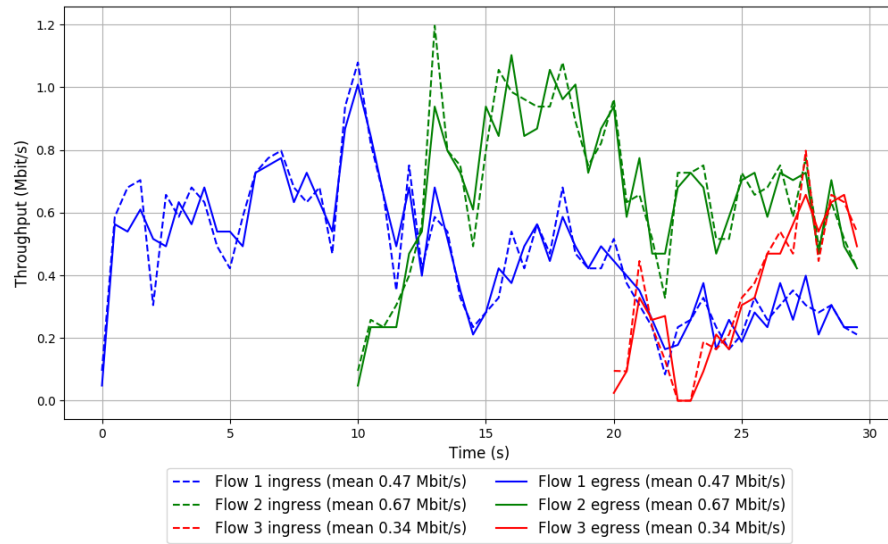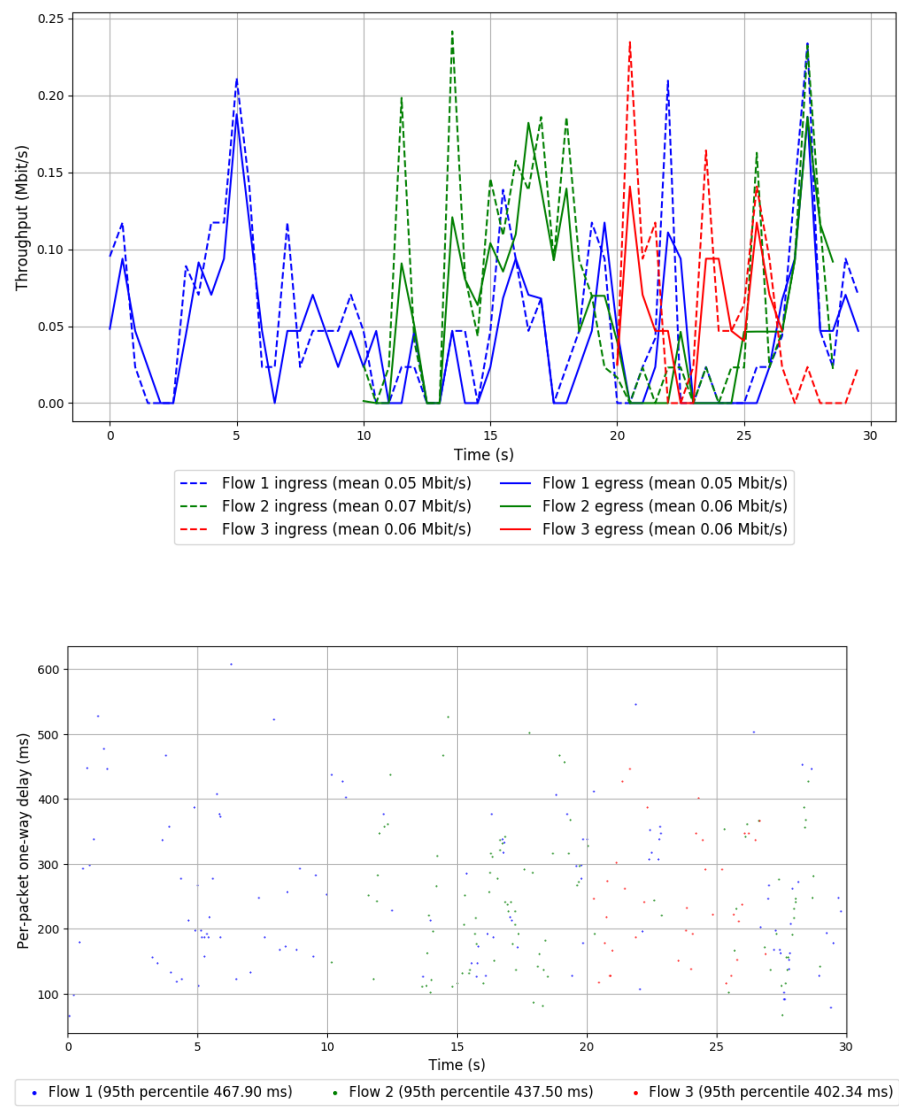
Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-04-10 07:15:23
End at: 2018-04-10 07:15:53
Local clock offset: 1.148 ms
Remote clock offset: 1.785 ms


# Below is generated by plot.py at 2018-04-10 08:41:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 264.966 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 265.092 ms
Loss rate: 0.59%
-- Flow 2:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 259.627 ms
Loss rate: 0.70%
-- Flow 3:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 290.078 ms
Loss rate: 3.79%
```
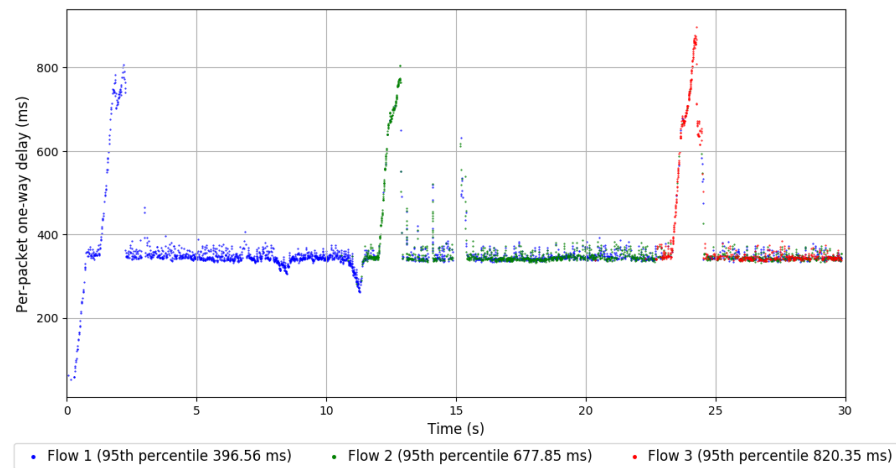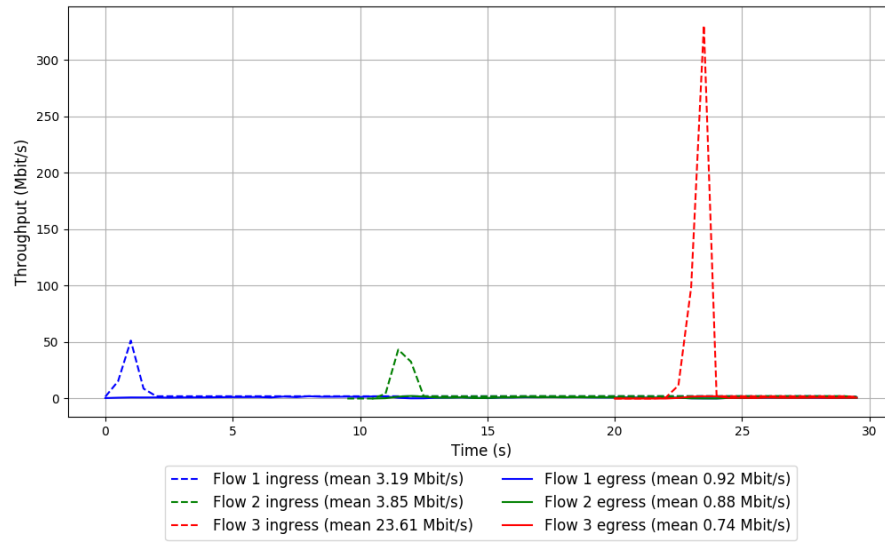
Run 2: Report of LEDBAT — Data Link



Flow 1 ingress (mean 0.47 Mbit/s) --- Flow 1 egress (mean 0.47 Mbit/s)
Flow 2 ingress (mean 0.67 Mbit/s) --- Flow 2 egress (mean 0.67 Mbit/s)
Flow 3 ingress (mean 0.34 Mbit/s) --- Flow 3 egress (mean 0.34 Mbit/s)



Flow 1 (95th percentile 265.09 ms) • Flow 2 (95th percentile 259.63 ms) • Flow 3 (95th percentile 290.08 ms)

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```
Run 3: Statistics of LEDBAT

Start at: 2018-04-10 07:35:10
End at: 2018-04-10 07:35:40
Local clock offset: -0.459 ms
Remote clock offset: -0.593 ms


# Below is generated by plot.py at 2018-04-10 08:41:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 448.894 ms
Loss rate: 19.05%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 467.899 ms
Loss rate: 17.37%
-- Flow 2:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 437.495 ms
Loss rate: 18.54%
-- Flow 3:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 402.344 ms
Loss rate: 25.11%
```
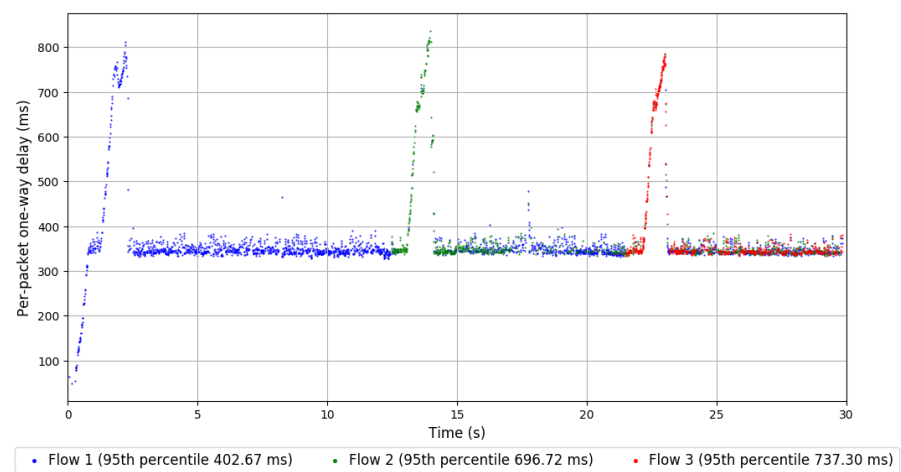
# Run 3: Report of LEDBAT — Data Link

```
Run 1: Statistics of PCC

Start at: 2018-04-10 06:57:50
End at: 2018-04-10 06:58:20
Local clock offset: -7.181 ms
Remote clock offset: -7.575 ms


# Below is generated by plot.py at 2018-04-10 08:41:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 675.632 ms
Loss rate: 87.31%
-- Flow 1:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 396.561 ms
Loss rate: 71.22%
-- Flow 2:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 677.850 ms
Loss rate: 77.89%
-- Flow 3:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 820.348 ms
Loss rate: 97.00%
```
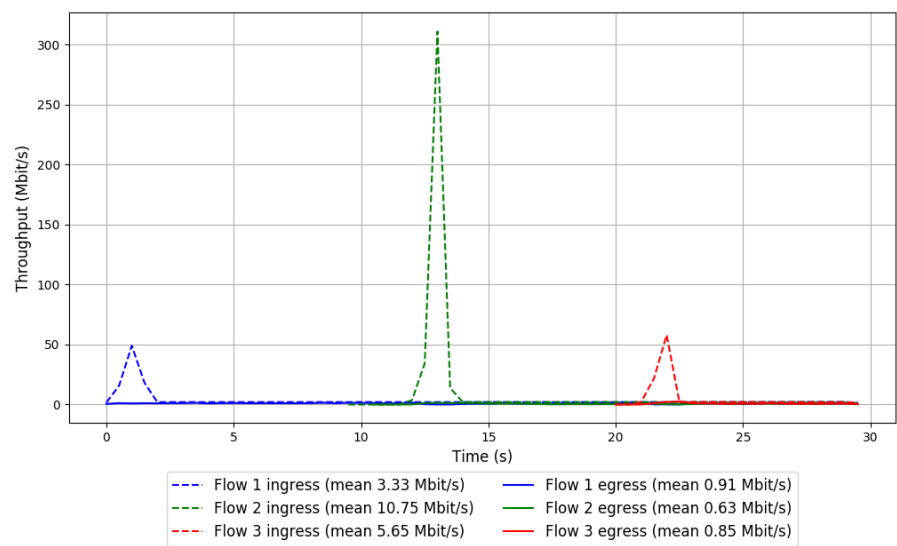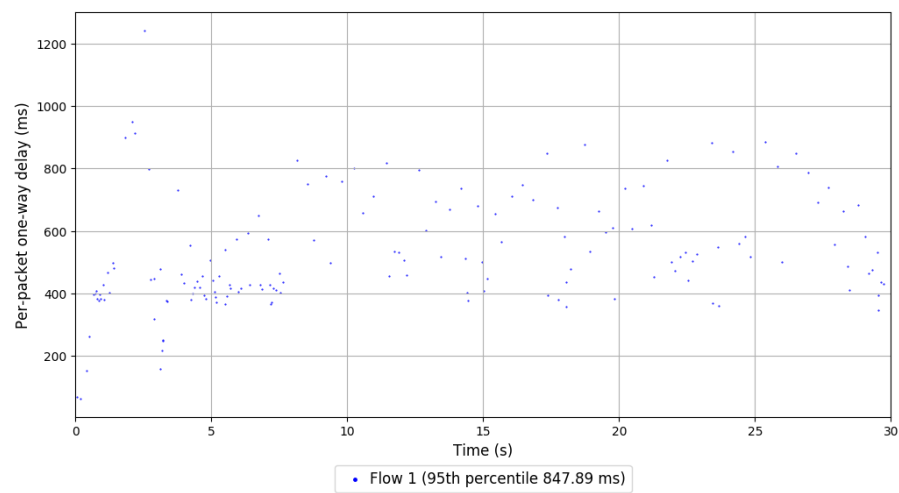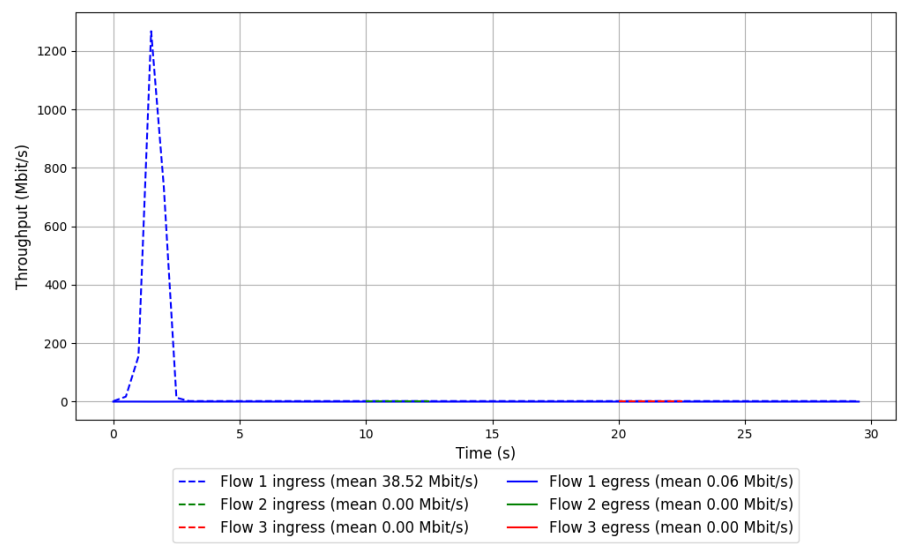
# Run 1: Report of PCC — Data Link



- - - Flow 1 ingress (mean 3.19 Mbit/s) —— Flow 1 egress (mean 0.92 Mbit/s)
- - - Flow 2 ingress (mean 3.85 Mbit/s) —— Flow 2 egress (mean 0.88 Mbit/s)
- - - Flow 3 ingress (mean 23.61 Mbit/s) —— Flow 3 egress (mean 0.74 Mbit/s)



- Flow 1 (95th percentile 396.56 ms)  • Flow 2 (95th percentile 677.85 ms)  • Flow 3 (95th percentile 820.35 ms)

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```
Run 2: Statistics of PCC

Start at: 2018-04-10 07:17:34
End at: 2018-04-10 07:18:04
Local clock offset: 1.708 ms
Remote clock offset: 2.081 ms


# Below is generated by plot.py at 2018-04-10 08:41:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.58 Mbit/s
95th percentile per-packet one-way delay: 676.128 ms
Loss rate: 87.25%
-- Flow 1:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 402.671 ms
Loss rate: 72.66%
-- Flow 2:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 696.715 ms
Loss rate: 94.46%
-- Flow 3:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 737.305 ms
Loss rate: 85.59%
```

Run 2: Report of PCC — Data Link

```
Run 3: Statistics of PCC

Start at: 2018-04-10 07:37:22
End at: 2018-04-10 07:37:52
Local clock offset: -0.632 ms
Remote clock offset: -1.201 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 847.890 ms
Loss rate: 99.84%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 847.890 ms
Loss rate: 99.84%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
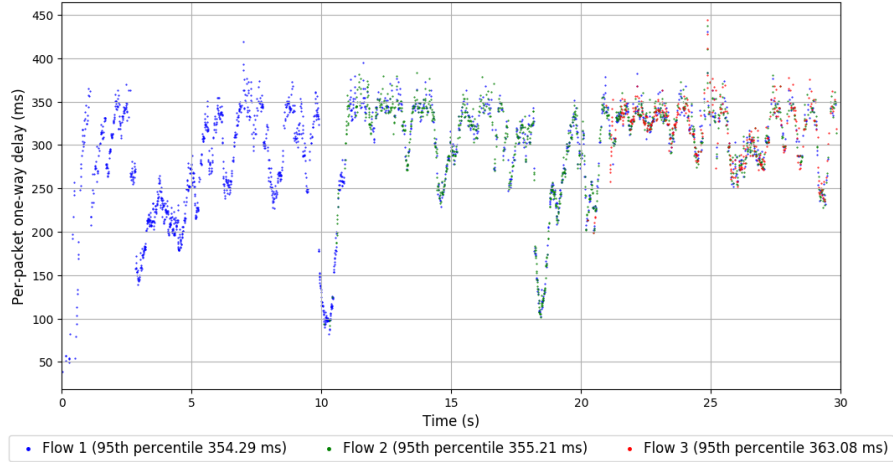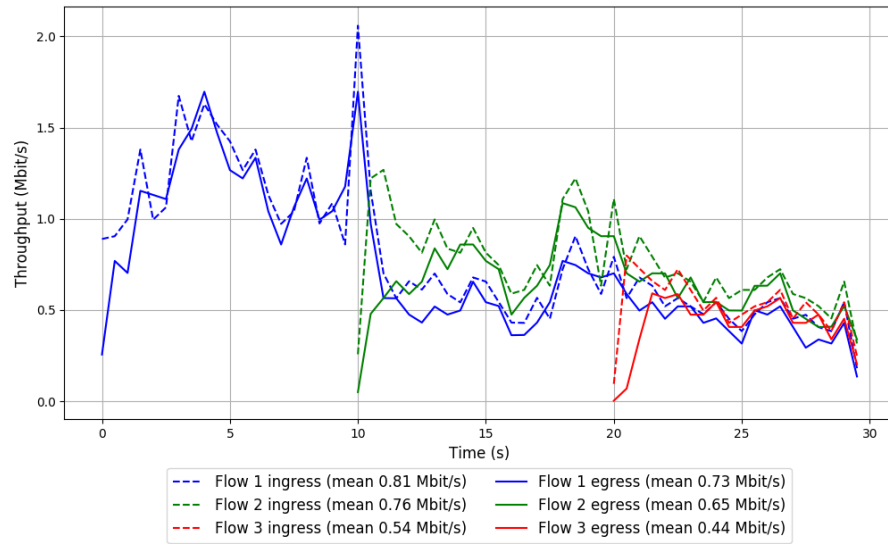
Run 3: Report of PCC — Data Link



Flow 1 ingress (mean 38.52 Mbit/s)    Flow 1 egress (mean 0.06 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 847.89 ms)

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-04-10 06:42:21
End at: 2018-04-10 06:42:51
Local clock offset: -4.521 ms
Remote clock offset: -2.645 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 463.142 ms
Loss rate: 54.56%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 481.440 ms
Loss rate: 52.84%
-- Flow 2:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 447.214 ms
Loss rate: 47.52%
-- Flow 3:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 462.633 ms
Loss rate: 84.49%
```
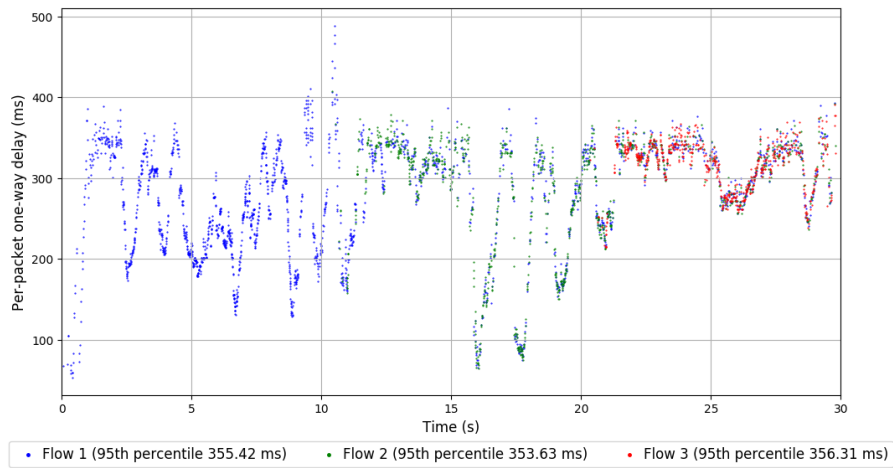
Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-04-10 07:02:14
End at: 2018-04-10 07:02:44
Local clock offset: 0.081 ms
Remote clock offset: 0.165 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 355.284 ms
Loss rate: 12.65%
-- Flow 1:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 354.291 ms
Loss rate: 9.63%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 355.214 ms
Loss rate: 14.81%
-- Flow 3:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 363.083 ms
Loss rate: 20.31%
```
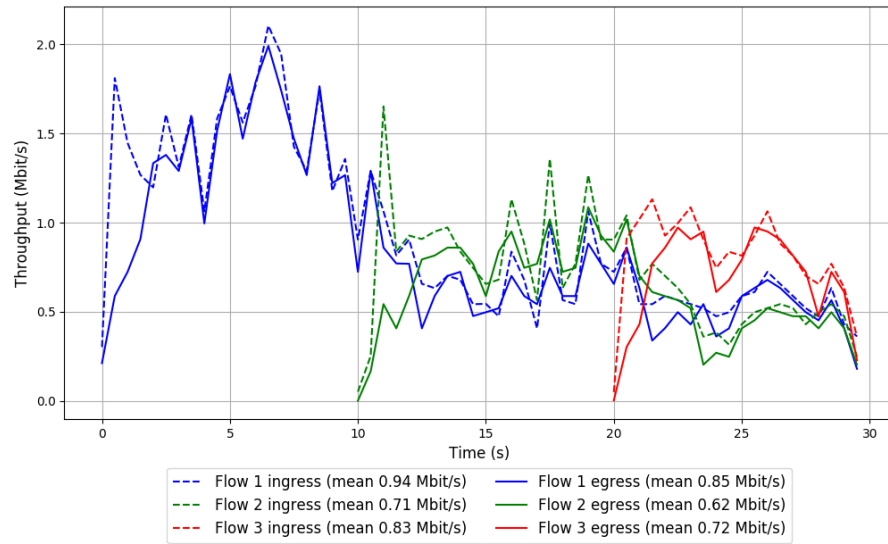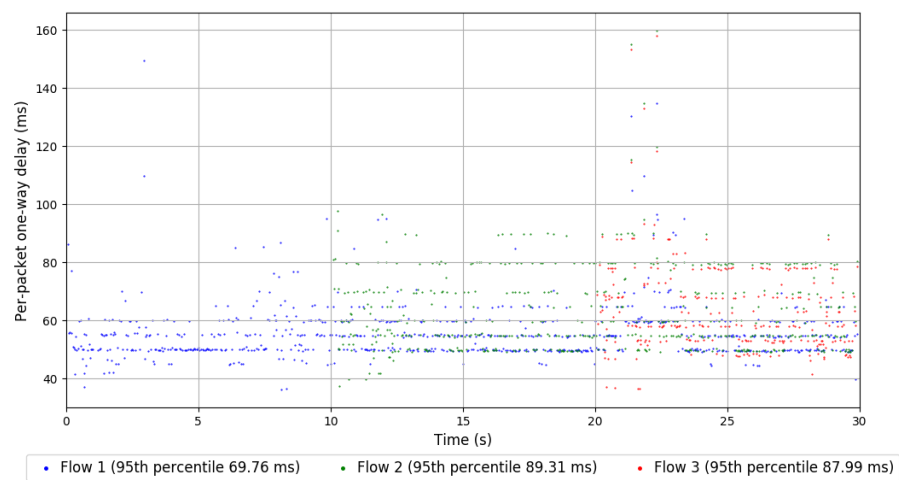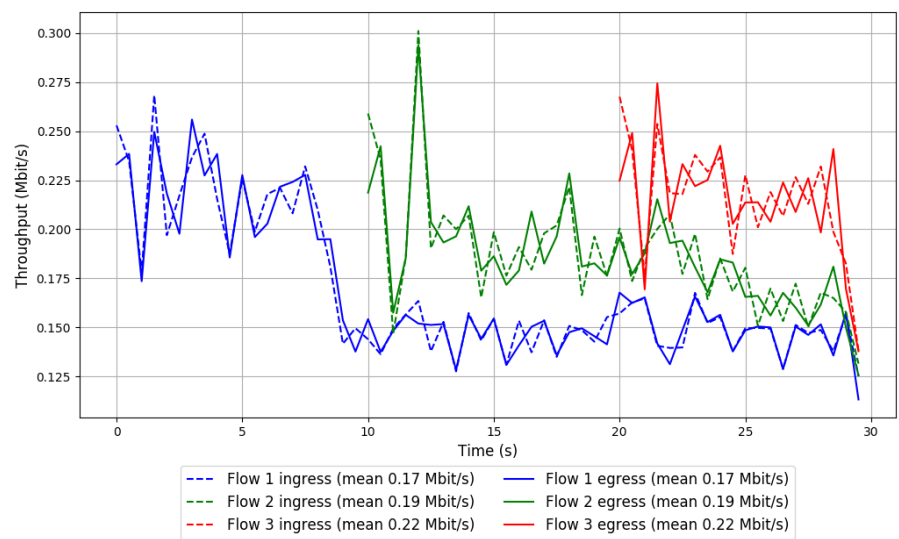
Run 2: Report of QUIC Cubic — Data Link



Flow 1 ingress (mean 0.81 Mbit/s)      Flow 1 egress (mean 0.73 Mbit/s)
Flow 2 ingress (mean 0.76 Mbit/s)      Flow 2 egress (mean 0.65 Mbit/s)
Flow 3 ingress (mean 0.54 Mbit/s)      Flow 3 egress (mean 0.44 Mbit/s)



Flow 1 (95th percentile 354.29 ms)   •   Flow 2 (95th percentile 355.21 ms)   •   Flow 3 (95th percentile 363.08 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-04-10 07:21:58
End at: 2018-04-10 07:22:28
Local clock offset: 1.612 ms
Remote clock offset: 3.015 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 355.096 ms
Loss rate: 11.89%
-- Flow 1:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 355.421 ms
Loss rate: 9.72%
-- Flow 2:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 353.628 ms
Loss rate: 13.96%
-- Flow 3:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 356.306 ms
Loss rate: 15.74%
```
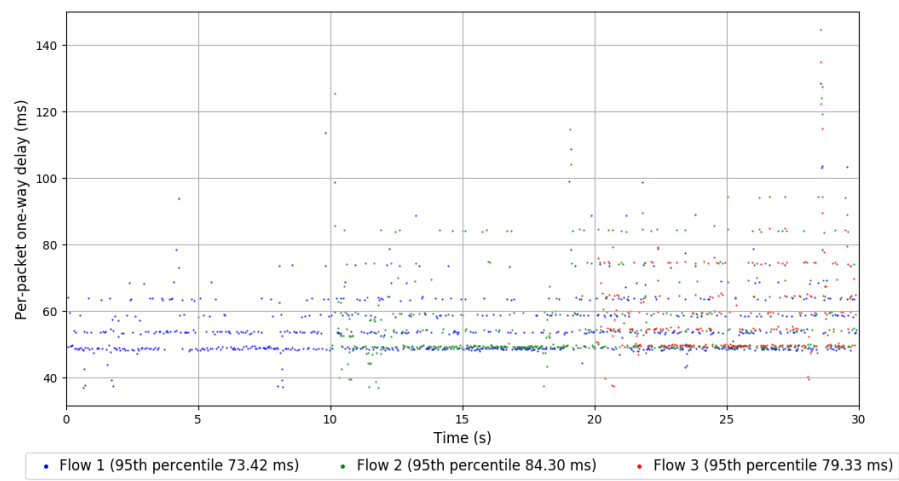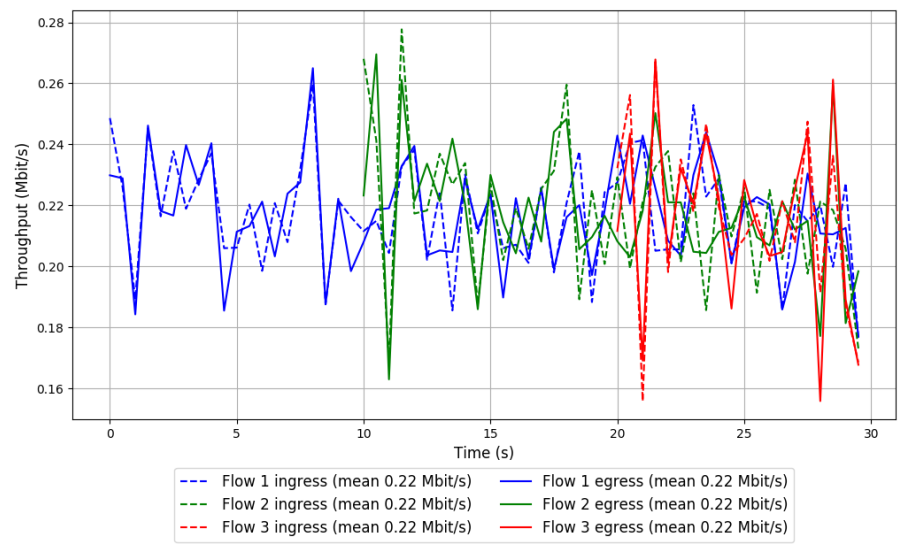
Run 3: Report of QUIC Cubic — Data Link



Flow 1 ingress (mean 0.94 Mbit/s)    Flow 1 egress (mean 0.85 Mbit/s)
Flow 2 ingress (mean 0.71 Mbit/s)    Flow 2 egress (mean 0.62 Mbit/s)
Flow 3 ingress (mean 0.83 Mbit/s)    Flow 3 egress (mean 0.72 Mbit/s)



Flow 1 (95th percentile 355.42 ms)    Flow 2 (95th percentile 353.63 ms)    Flow 3 (95th percentile 356.31 ms)

```
Run 1: Statistics of SCReAM

Start at: 2018-04-10 06:47:59
End at: 2018-04-10 06:48:29
Local clock offset: -5.274 ms
Remote clock offset: -1.569 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 80.109 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 69.760 ms
Loss rate: 0.23%
-- Flow 2:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 89.313 ms
Loss rate: 0.37%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 87.993 ms
Loss rate: 0.62%
```
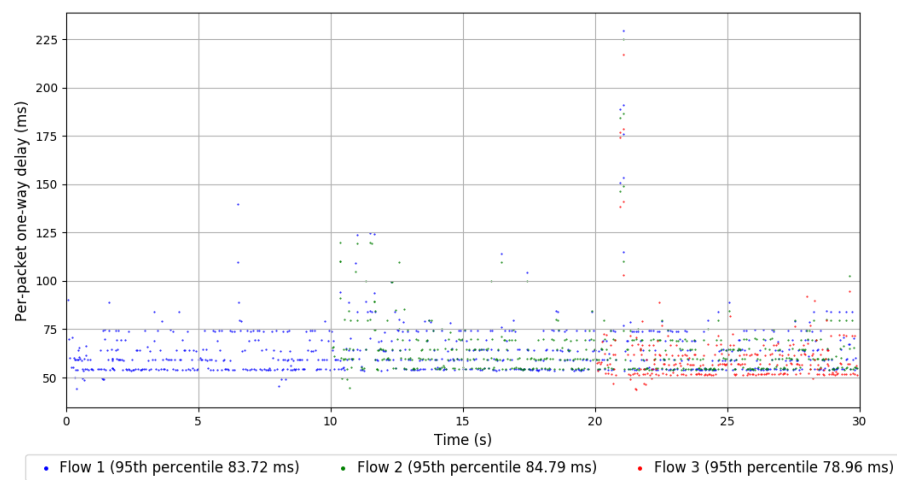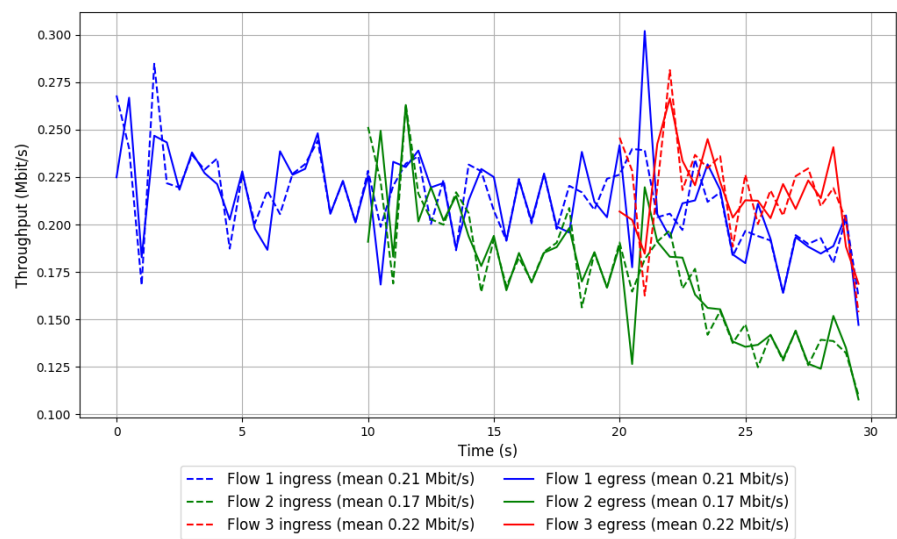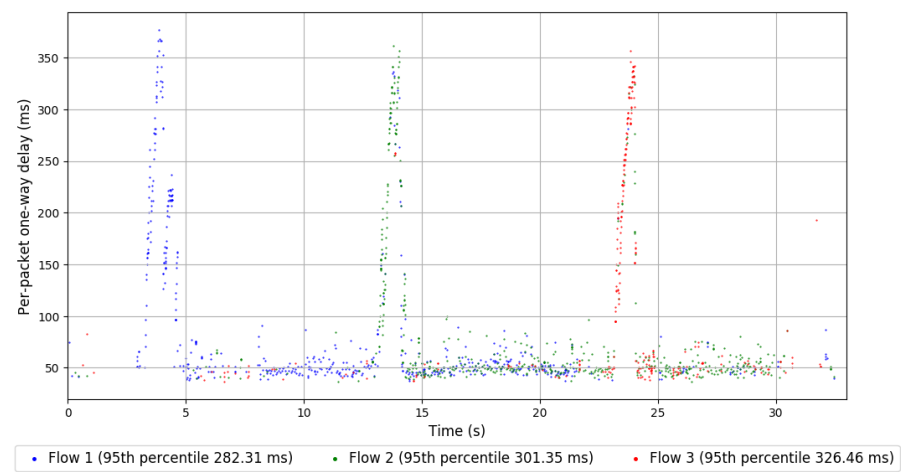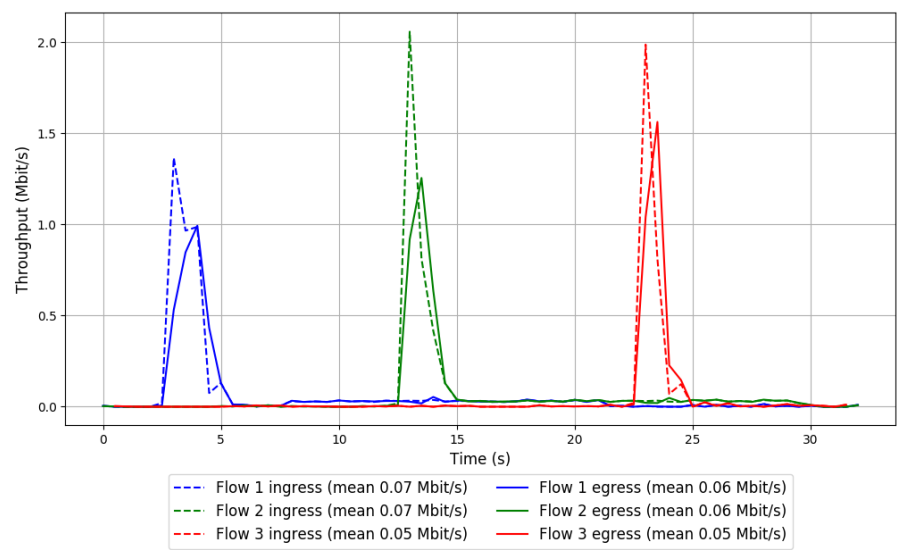
Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2018-04-10 07:07:43
End at: 2018-04-10 07:08:13
Local clock offset: 1.445 ms
Remote clock offset: 1.02 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 79.332 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 73.417 ms
Loss rate: 0.24%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 84.298 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 79.332 ms
Loss rate: 0.69%
```

Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-04-10 07:27:27
End at: 2018-04-10 07:27:57
Local clock offset: 0.713 ms
Remote clock offset: 1.383 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 83.904 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 83.725 ms
Loss rate: 0.23%
-- Flow 2:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 84.788 ms
Loss rate: 0.16%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 78.960 ms
Loss rate: 0.33%
```
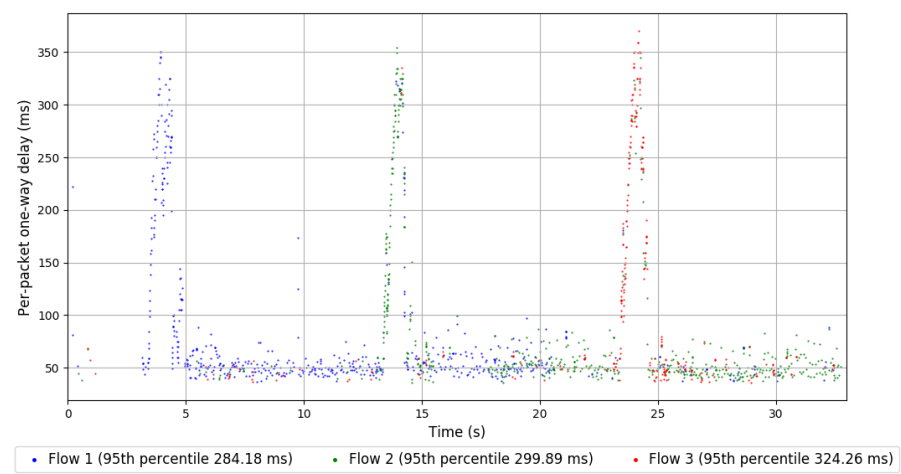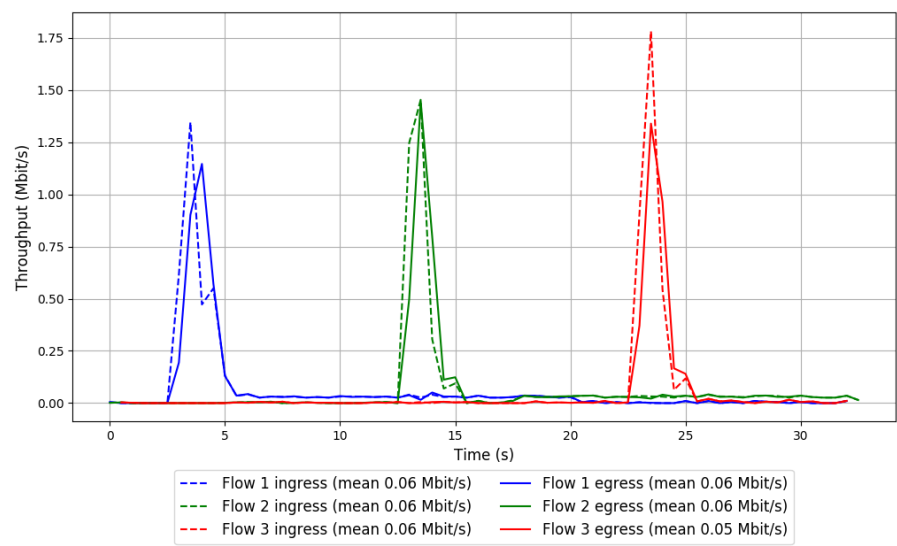
Run 3: Report of SCReAM — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2018-04-10 06:56:45
End at: 2018-04-10 06:57:15
Local clock offset: -0.453 ms
Remote clock offset: -0.418 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 311.670 ms
Loss rate: 9.15%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 282.305 ms
Loss rate: 13.42%
-- Flow 2:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 301.347 ms
Loss rate: 10.90%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 326.465 ms
Loss rate: 0.75%
```

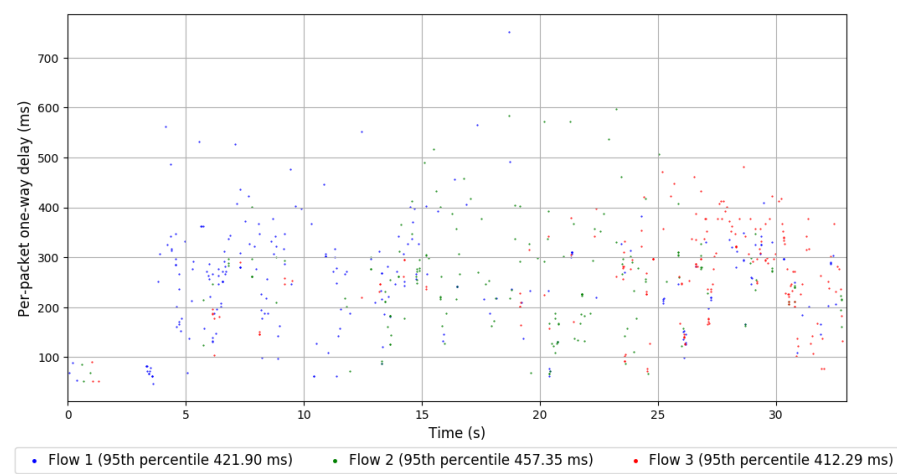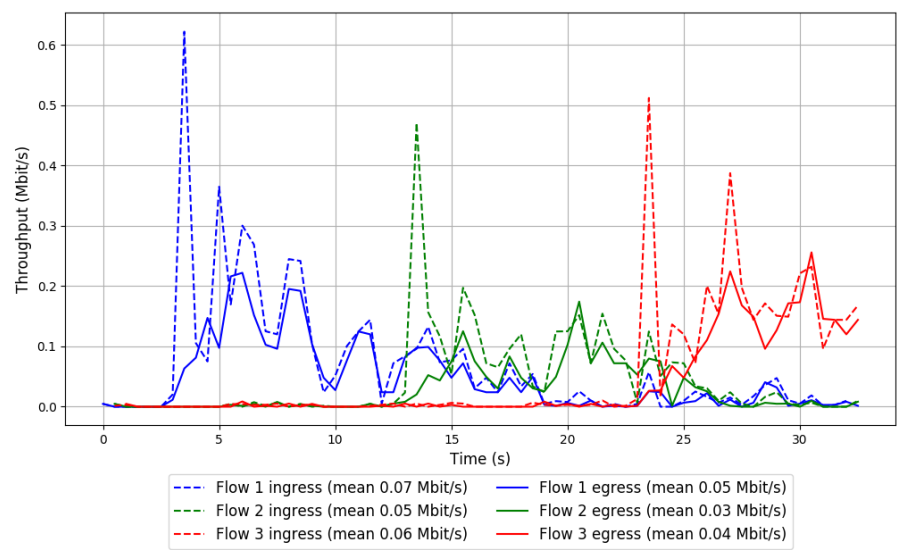Run 1: Report of WebRTC media — Data Link



Flow 1 ingress (mean 0.07 Mbit/s) ---- Flow 1 egress (mean 0.06 Mbit/s)
Flow 2 ingress (mean 0.07 Mbit/s) ---- Flow 2 egress (mean 0.06 Mbit/s)
Flow 3 ingress (mean 0.05 Mbit/s) ---- Flow 3 egress (mean 0.05 Mbit/s)



Flow 1 (95th percentile 282.31 ms)   Flow 2 (95th percentile 301.35 ms)   Flow 3 (95th percentile 326.46 ms)

```
Run 2: Statistics of WebRTC media

Start at: 2018-04-10 07:16:29
End at: 2018-04-10 07:16:59
Local clock offset: 1.342 ms
Remote clock offset: 1.901 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 304.364 ms
Loss rate: 6.70%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 284.178 ms
Loss rate: 4.07%
-- Flow 2:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 299.889 ms
Loss rate: 4.73%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 324.259 ms
Loss rate: 11.97%
```

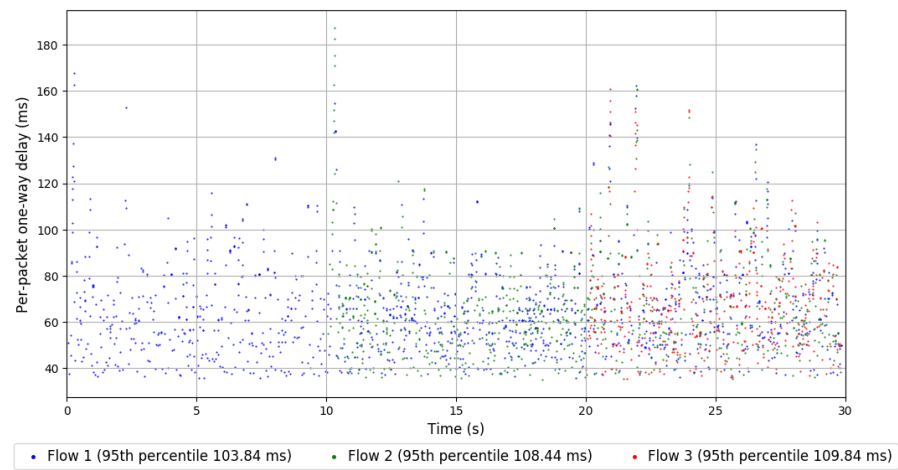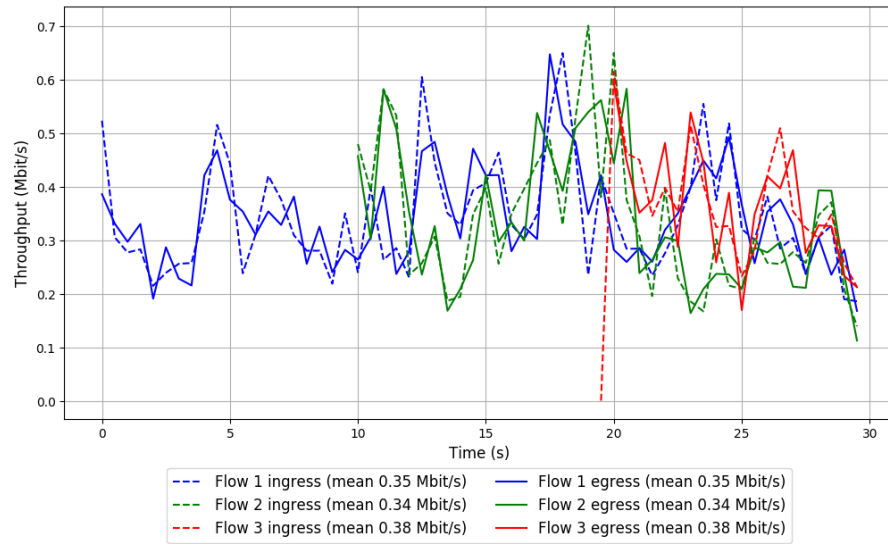Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-04-10 07:36:16
End at: 2018-04-10 07:36:46
Local clock offset: -0.613 ms
Remote clock offset: -0.284 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 421.100 ms
Loss rate: 33.44%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 421.899 ms
Loss rate: 31.75%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 457.353 ms
Loss rate: 41.37%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 412.287 ms
Loss rate: 29.01%
```
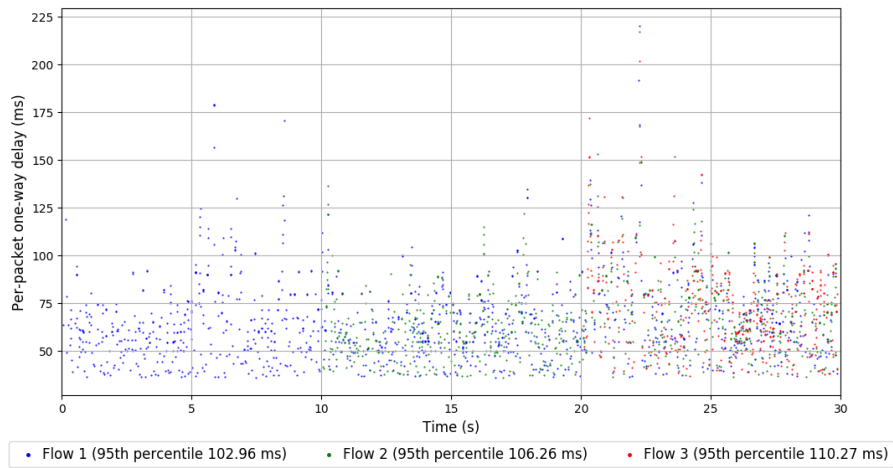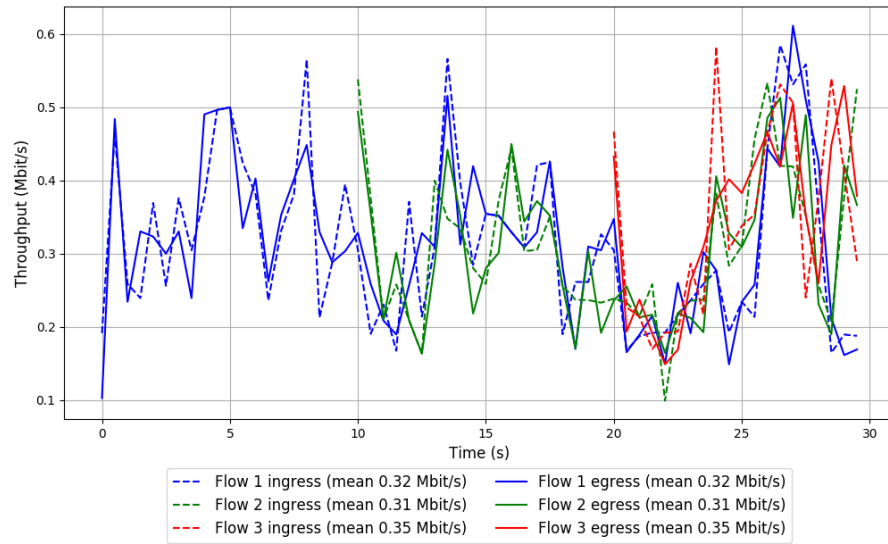
Run 3: Report of WebRTC media — Data Link



Flow 1 ingress (mean 0.07 Mbit/s)    Flow 1 egress (mean 0.05 Mbit/s)
Flow 2 ingress (mean 0.05 Mbit/s)    Flow 2 egress (mean 0.03 Mbit/s)
Flow 3 ingress (mean 0.06 Mbit/s)    Flow 3 egress (mean 0.04 Mbit/s)



Flow 1 (95th percentile 421.90 ms)    Flow 2 (95th percentile 457.35 ms)    Flow 3 (95th percentile 412.29 ms)

```
Run 1: Statistics of Sprout

Start at: 2018-04-10 06:49:04
End at: 2018-04-10 06:49:34
Local clock offset: -3.38 ms
Remote clock offset: -0.916 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 106.955 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 103.839 ms
Loss rate: 0.20%
-- Flow 2:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 108.443 ms
Loss rate: 0.49%
-- Flow 3:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 109.845 ms
Loss rate: 1.22%
```
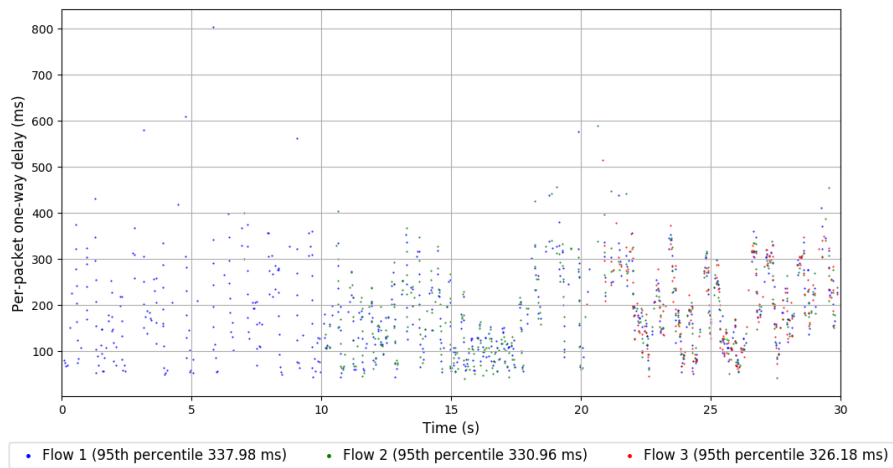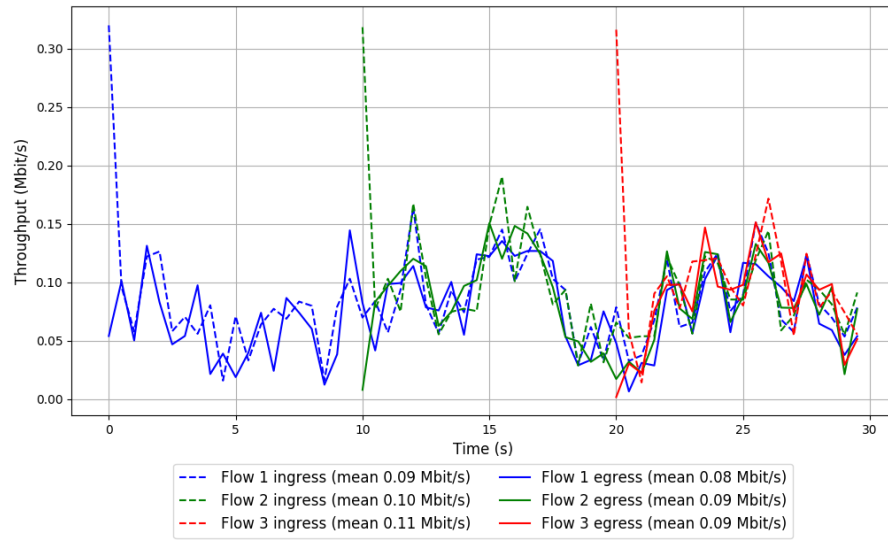
Run 1: Report of Sprout — Data Link





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```
Run 2: Statistics of Sprout

Start at: 2018-04-10 07:08:48
End at: 2018-04-10 07:09:18
Local clock offset: 1.326 ms
Remote clock offset: 1.582 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 106.528 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 102.958 ms
Loss rate: 0.36%
-- Flow 2:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 106.256 ms
Loss rate: 1.46%
-- Flow 3:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 110.269 ms
Loss rate: 0.32%
```
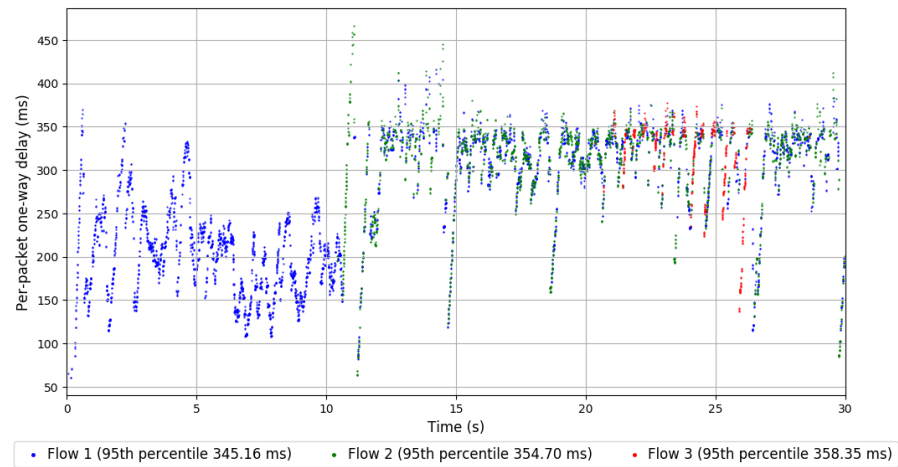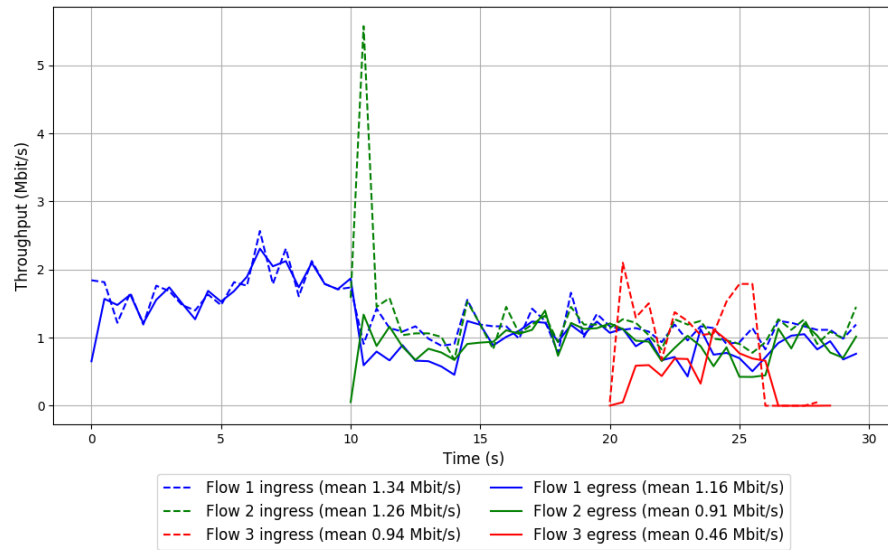
Run 2: Report of Sprout — Data Link





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```
Run 3: Statistics of Sprout

Start at: 2018-04-10 07:28:32
End at: 2018-04-10 07:29:02
Local clock offset: 0.036 ms
Remote clock offset: 1.079 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 333.070 ms
Loss rate: 13.85%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 337.975 ms
Loss rate: 12.25%
-- Flow 2:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 330.956 ms
Loss rate: 13.05%
-- Flow 3:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 326.181 ms
Loss rate: 19.36%
```
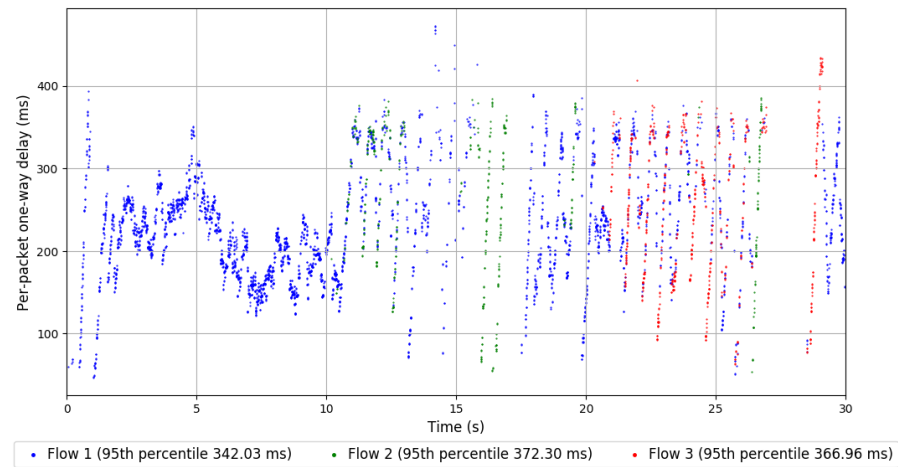
Run 3: Report of Sprout — Data Link

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

Start at: 2018-04-10 07:01:08
End at: 2018-04-10 07:01:38
Local clock offset: 0.519 ms
Remote clock offset: 0.186 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 349.303 ms
Loss rate: 22.59%
-- Flow 1:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 345.163 ms
Loss rate: 13.50%
-- Flow 2:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 354.702 ms
Loss rate: 28.31%
-- Flow 3:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 358.353 ms
Loss rate: 51.03%
```
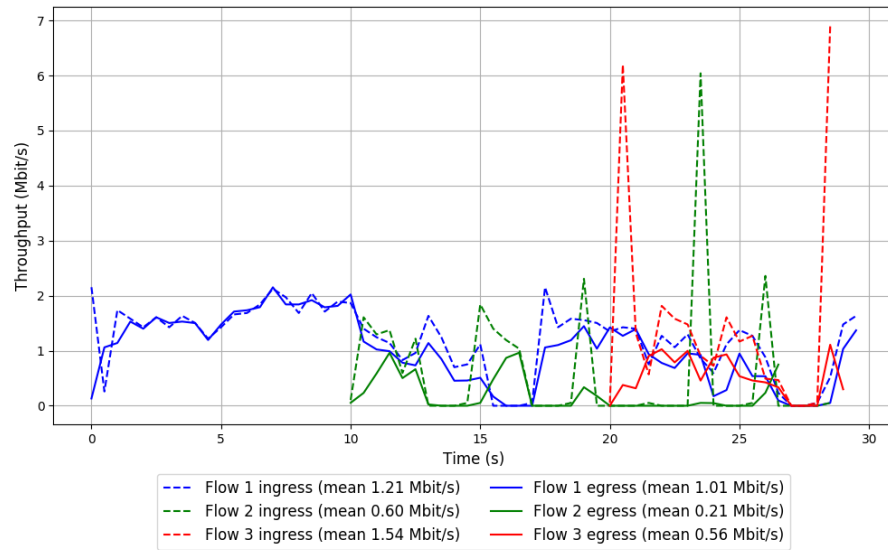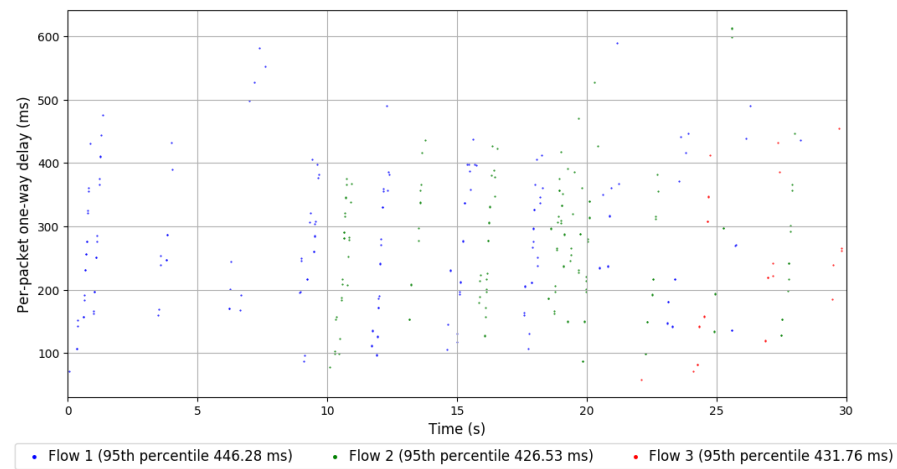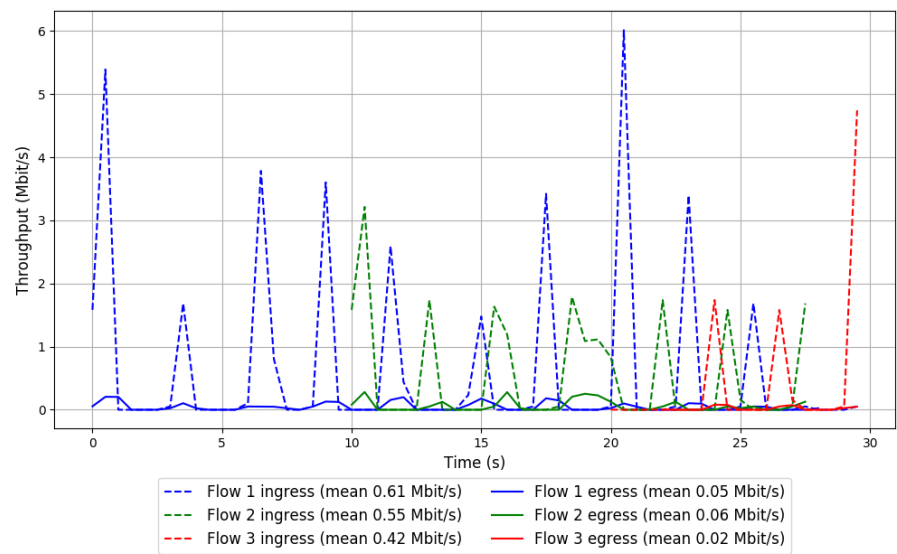
Run 1: Report of TaoVA-100x — Data Link

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

Start at: 2018-04-10 07:20:52
End at: 2018-04-10 07:21:22
Local clock offset: 0.975 ms
Remote clock offset: 1.735 ms

# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 349.216 ms
Loss rate: 36.63%
-- Flow 1:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 342.027 ms
Loss rate: 16.75%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 372.304 ms
Loss rate: 69.13%
-- Flow 3:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 366.963 ms
Loss rate: 63.01%
```
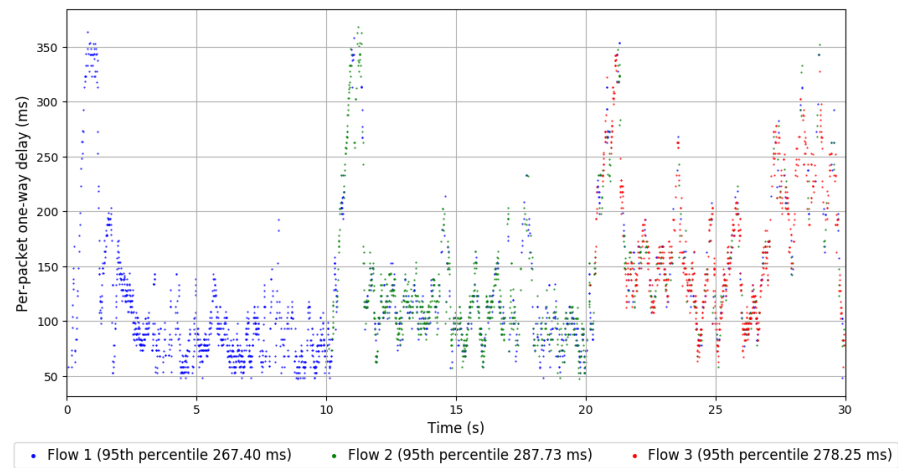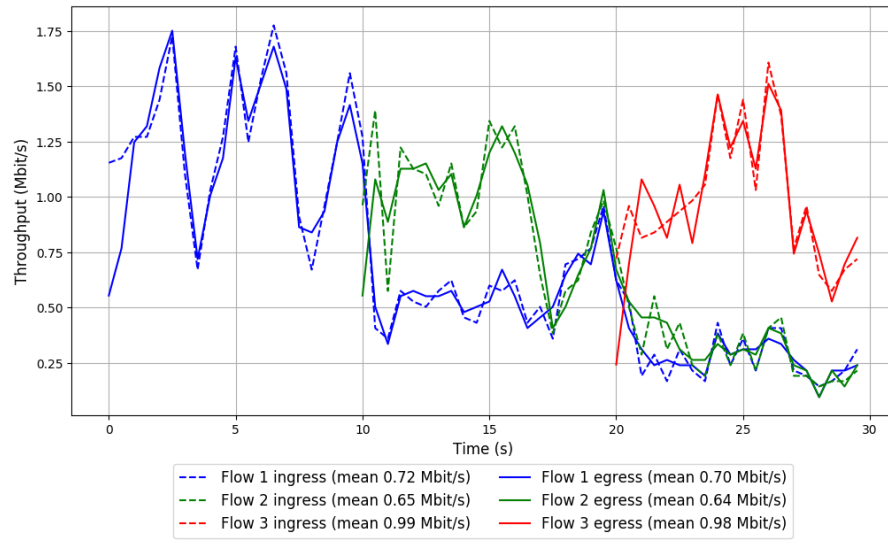
Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2018-04-10 07:40:42
End at: 2018-04-10 07:41:12
Local clock offset: -0.335 ms
Remote clock offset: -2.305 ms

# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 441.408 ms
Loss rate: 91.97%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 446.277 ms
Loss rate: 92.85%
-- Flow 2:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 426.526 ms
Loss rate: 88.74%
-- Flow 3:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 431.756 ms
Loss rate: 95.66%
```

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

```
Run 1: Statistics of TCP Vegas

Start at: 2018-04-10 06:46:53
End at: 2018-04-10 06:47:23
Local clock offset: -5.667 ms
Remote clock offset: -1.509 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 272.980 ms
Loss rate: 1.95%
-- Flow 1:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 267.403 ms
Loss rate: 2.51%
-- Flow 2:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 287.725 ms
Loss rate: 1.12%
-- Flow 3:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 278.247 ms
Loss rate: 1.83%
```
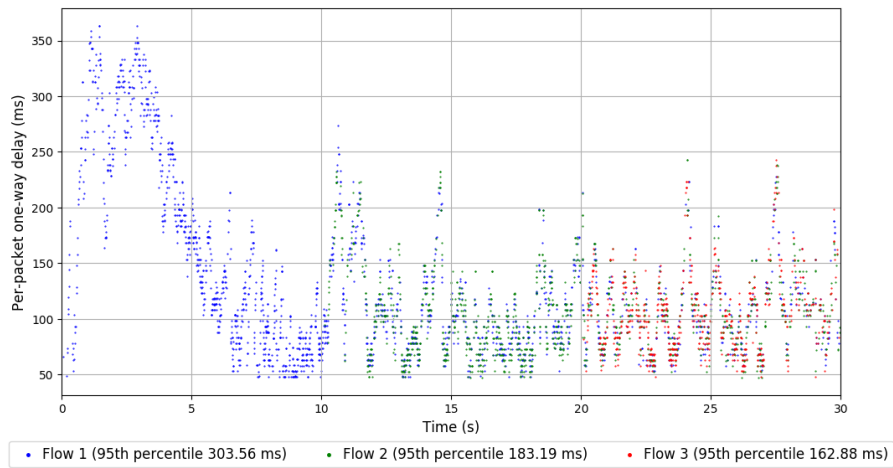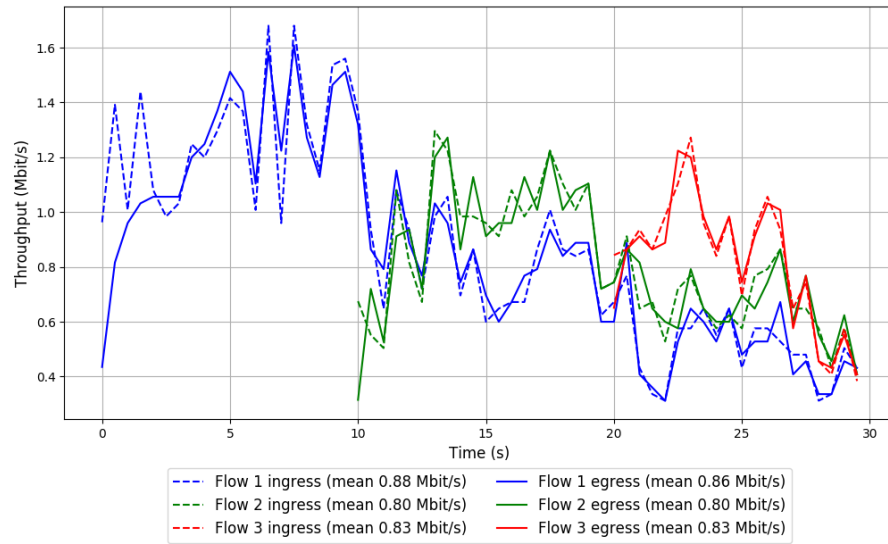
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-04-10 07:06:37
End at: 2018-04-10 07:07:07
Local clock offset: 0.563 ms
Remote clock offset: 0.728 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 262.770 ms
Loss rate: 1.43%
-- Flow 1:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 303.562 ms
Loss rate: 2.20%
-- Flow 2:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 183.195 ms
Loss rate: 0.37%
-- Flow 3:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 162.884 ms
Loss rate: 1.02%
```
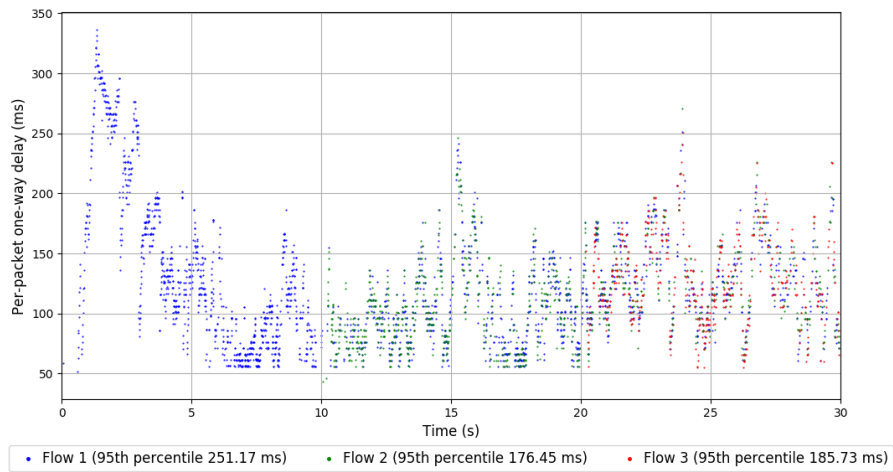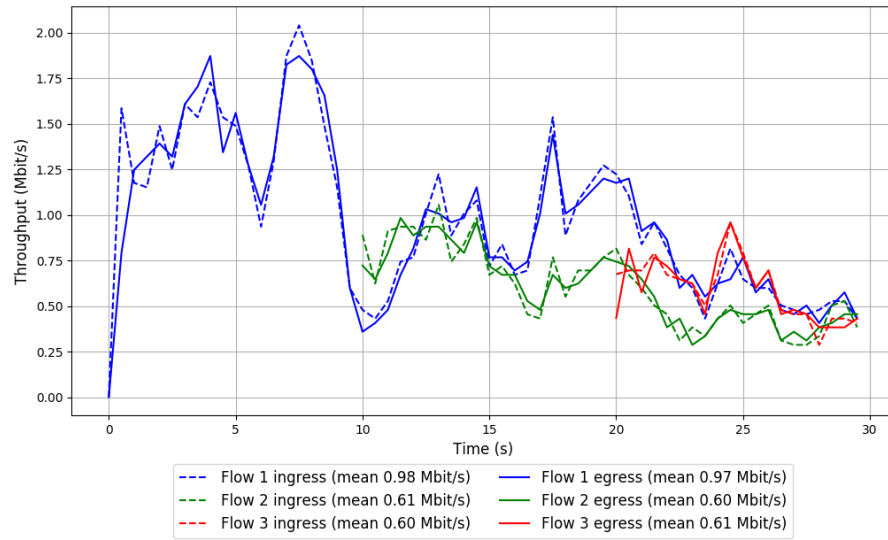
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-04-10 07:26:21
End at: 2018-04-10 07:26:51
Local clock offset: 0.746 ms
Remote clock offset: 1.141 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 216.288 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 251.167 ms
Loss rate: 0.82%
-- Flow 2:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 176.454 ms
Loss rate: 0.60%
-- Flow 3:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 185.729 ms
Loss rate: 1.20%
```

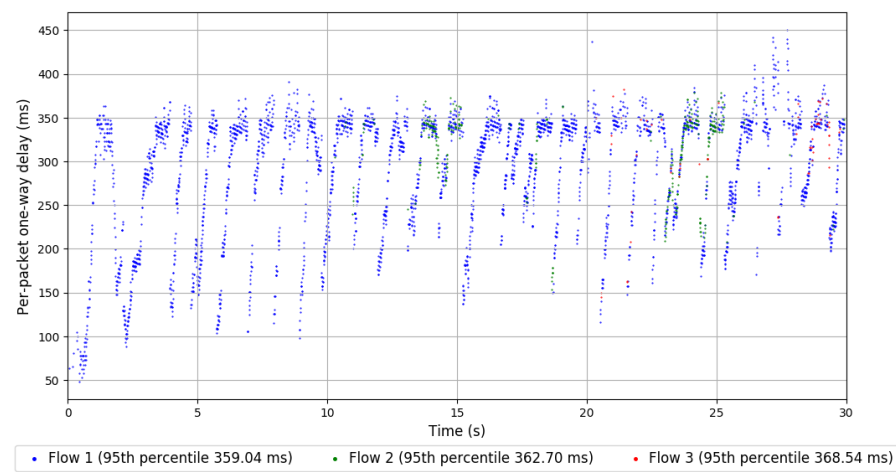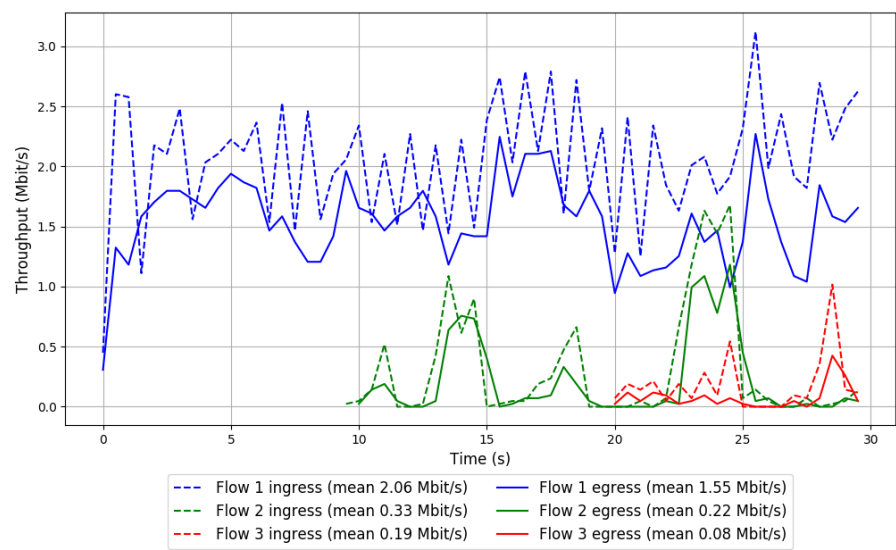Run 3: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2018-04-10 06:53:28
End at: 2018-04-10 06:53:58
Local clock offset: -1.565 ms
Remote clock offset: -1.297 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 359.791 ms
Loss rate: 26.73%
-- Flow 1:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 359.038 ms
Loss rate: 25.25%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 362.696 ms
Loss rate: 32.16%
-- Flow 3:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 368.539 ms
Loss rate: 57.79%
```
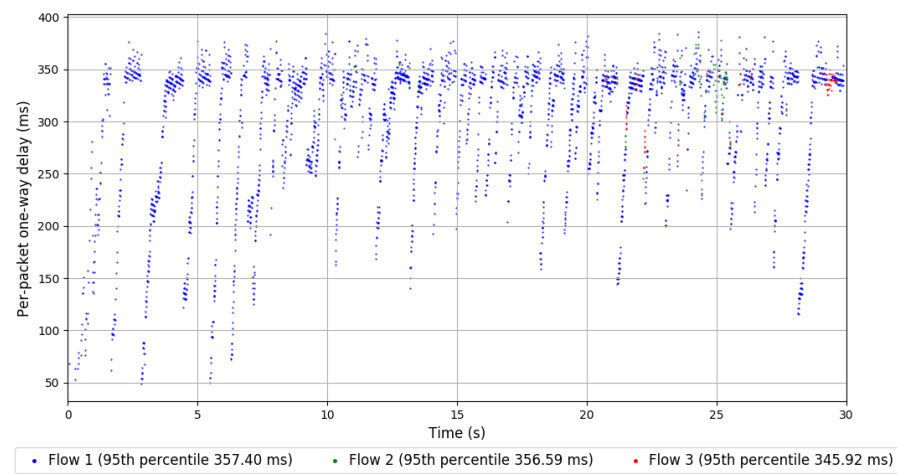
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2018-04-10 07:13:12
End at: 2018-04-10 07:13:42
Local clock offset: 1.107 ms
Remote clock offset: 1.605 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 357.043 ms
Loss rate: 29.69%
-- Flow 1:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 357.405 ms
Loss rate: 28.79%
-- Flow 2:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 356.593 ms
Loss rate: 46.89%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 345.920 ms
Loss rate: 43.05%
```
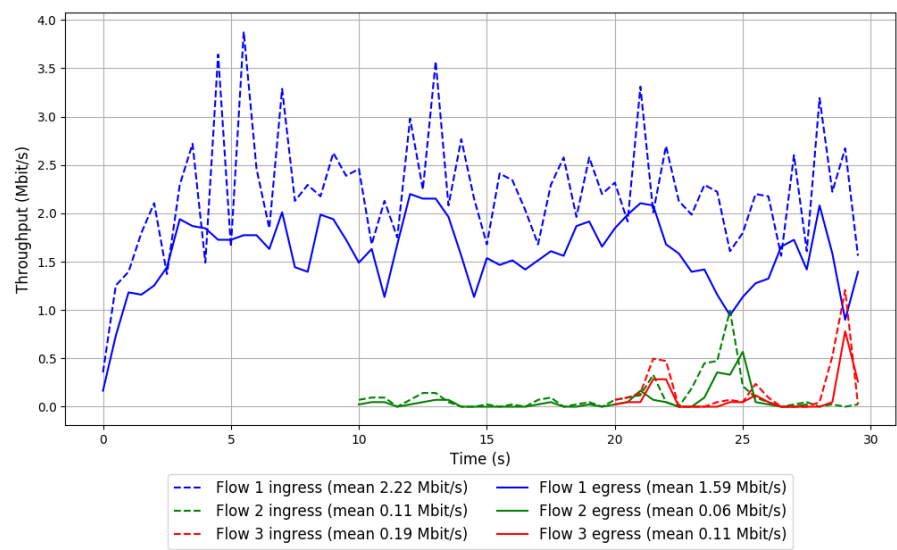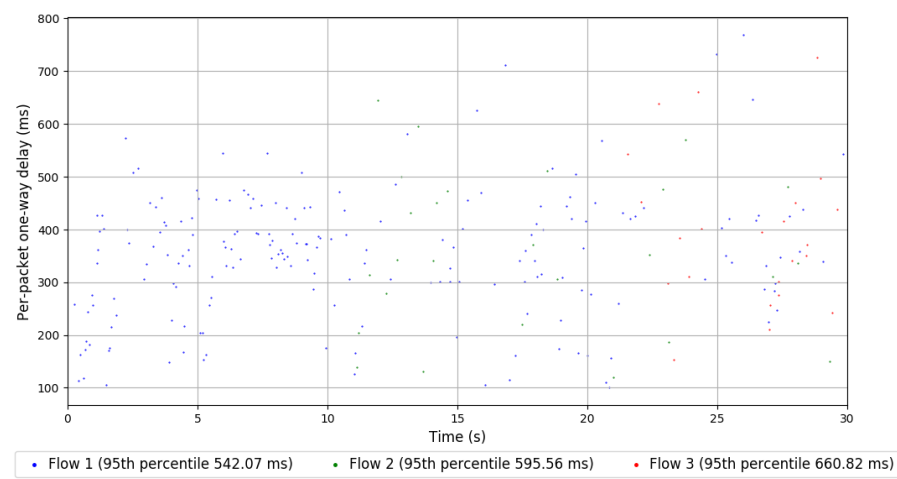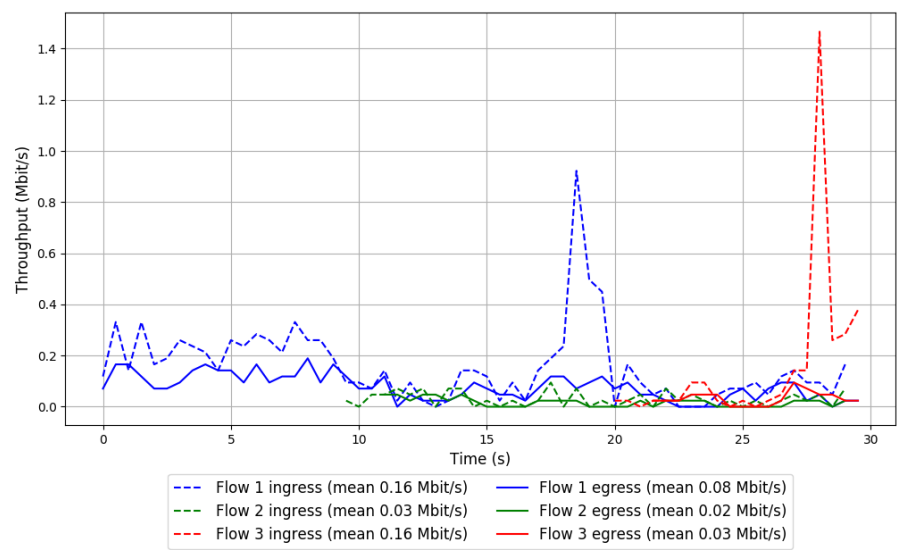
Run 2: Report of Verus — Data Link



Flow 1 ingress (mean 2.22 Mbit/s)
Flow 1 egress (mean 1.59 Mbit/s)
Flow 2 ingress (mean 0.11 Mbit/s)
Flow 2 egress (mean 0.06 Mbit/s)
Flow 3 ingress (mean 0.19 Mbit/s)
Flow 3 egress (mean 0.11 Mbit/s)



Flow 1 (95th percentile 357.40 ms)
Flow 2 (95th percentile 356.59 ms)
Flow 3 (95th percentile 345.92 ms)

```
Run 3: Statistics of Verus

Start at: 2018-04-10 07:32:59
End at: 2018-04-10 07:33:29
Local clock offset: 0.346 ms
Remote clock offset: -1.221 ms


# Below is generated by plot.py at 2018-04-10 08:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 570.507 ms
Loss rate: 57.71%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 542.074 ms
Loss rate: 50.63%
-- Flow 2:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 595.558 ms
Loss rate: 49.02%
-- Flow 3:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 660.817 ms
Loss rate: 82.44%
```

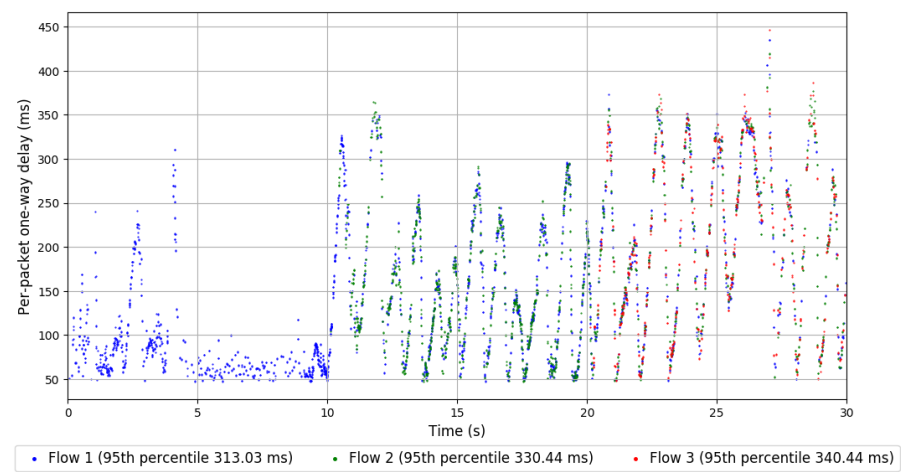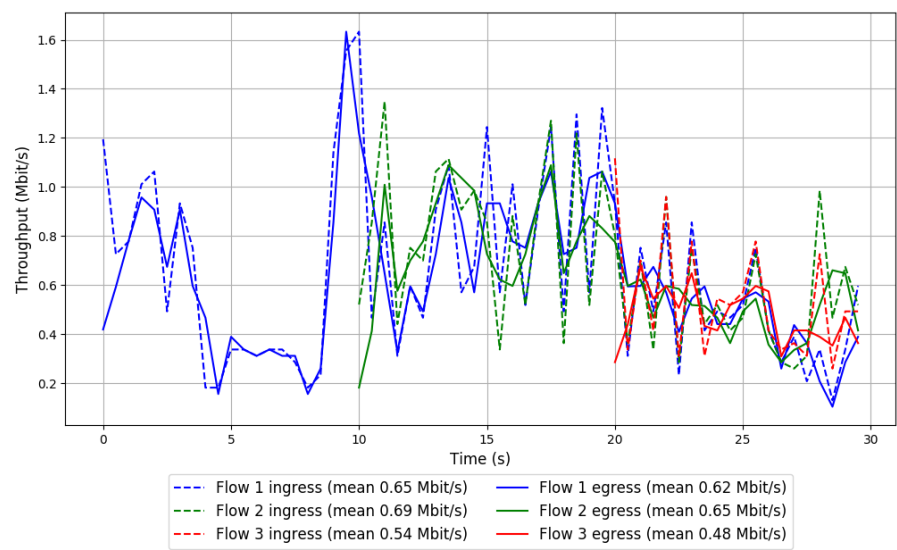Run 3: Report of Verus — Data Link

```
Run 1: Statistics of Copa

Start at: 2018-04-10 06:50:10
End at: 2018-04-10 06:50:40
Local clock offset: -2.714 ms
Remote clock offset: -2.085 ms


# Below is generated by plot.py at 2018-04-10 08:41:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 326.700 ms
Loss rate: 5.93%
-- Flow 1:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 313.034 ms
Loss rate: 4.23%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 330.442 ms
Loss rate: 6.11%
-- Flow 3:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 340.441 ms
Loss rate: 11.65%
```
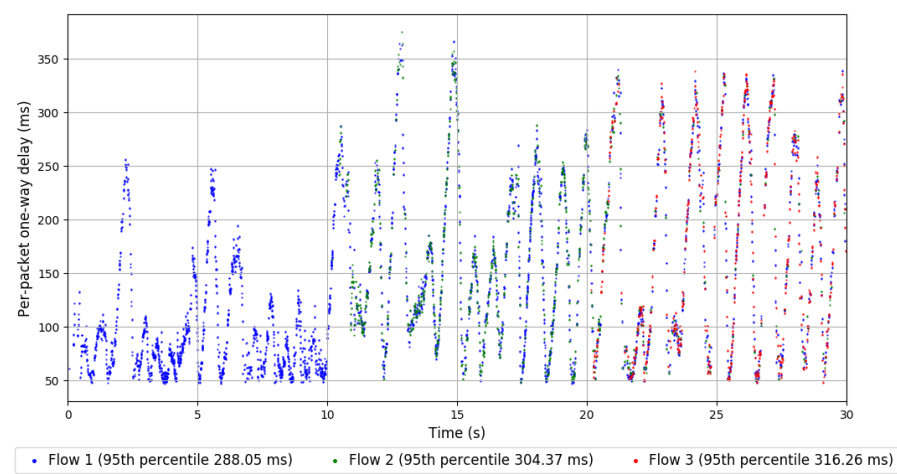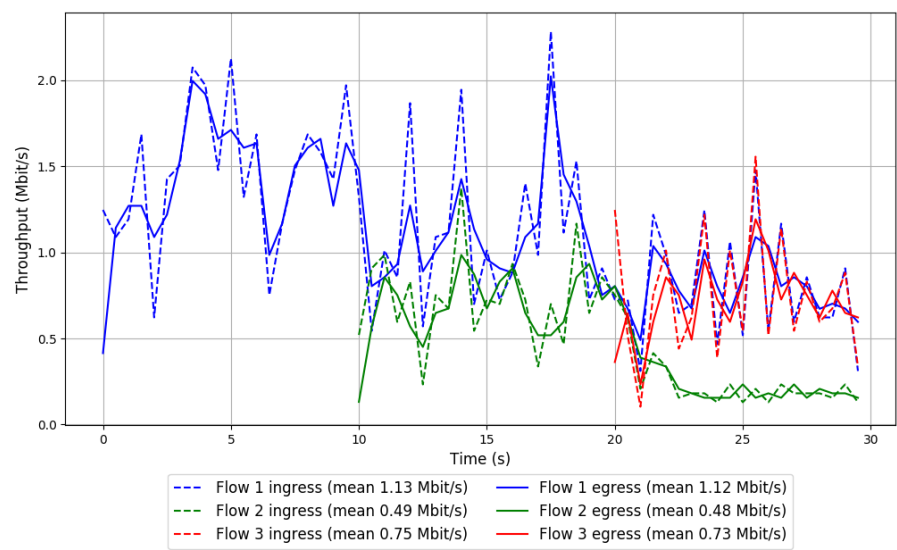
Run 1: Report of Copa — Data Link



Flow 1 ingress (mean 0.65 Mbit/s) — — — Flow 1 egress (mean 0.62 Mbit/s)
Flow 2 ingress (mean 0.69 Mbit/s) — — — Flow 2 egress (mean 0.65 Mbit/s)
Flow 3 ingress (mean 0.54 Mbit/s) — — — Flow 3 egress (mean 0.48 Mbit/s)



Flow 1 (95th percentile 313.03 ms)   •   Flow 2 (95th percentile 330.44 ms)   •   Flow 3 (95th percentile 340.44 ms)

```
Run 2: Statistics of Copa

Start at: 2018-04-10 07:09:54
End at: 2018-04-10 07:10:24
Local clock offset: 0.948 ms
Remote clock offset: 0.795 ms

# Below is generated by plot.py at 2018-04-10 08:41:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 303.156 ms
Loss rate: 2.39%
-- Flow 1:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 288.053 ms
Loss rate: 1.57%
-- Flow 2:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 304.368 ms
Loss rate: 3.70%
-- Flow 3:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 316.258 ms
Loss rate: 4.37%
```
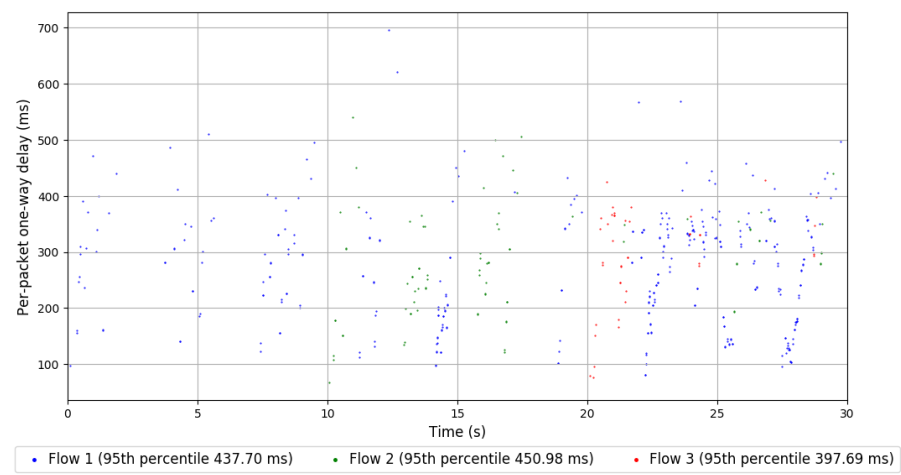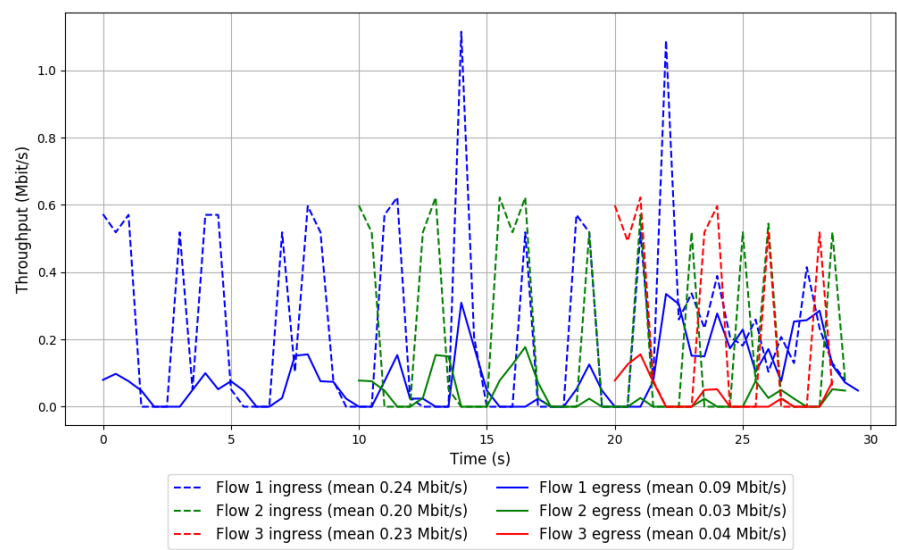
# Run 2: Report of Copa — Data Link



Flow 1 ingress (mean 1.13 Mbit/s) --- Flow 1 egress (mean 1.12 Mbit/s)
Flow 2 ingress (mean 0.49 Mbit/s) --- Flow 2 egress (mean 0.48 Mbit/s)
Flow 3 ingress (mean 0.75 Mbit/s) --- Flow 3 egress (mean 0.73 Mbit/s)



Flow 1 (95th percentile 288.05 ms)   Flow 2 (95th percentile 304.37 ms)   Flow 3 (95th percentile 316.26 ms)

```
Run 3: Statistics of Copa

Start at: 2018-04-10 07:29:38
End at: 2018-04-10 07:30:08
Local clock offset: 0.727 ms
Remote clock offset: 0.783 ms


# Below is generated by plot.py at 2018-04-10 08:41:35
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 437.700 ms
Loss rate: 71.80%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 437.700 ms
Loss rate: 62.90%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 450.983 ms
Loss rate: 82.16%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 397.685 ms
Loss rate: 84.17%
```
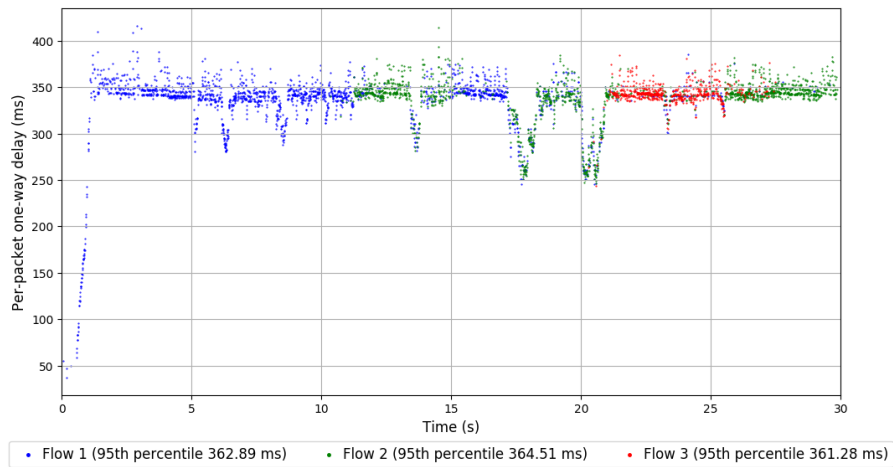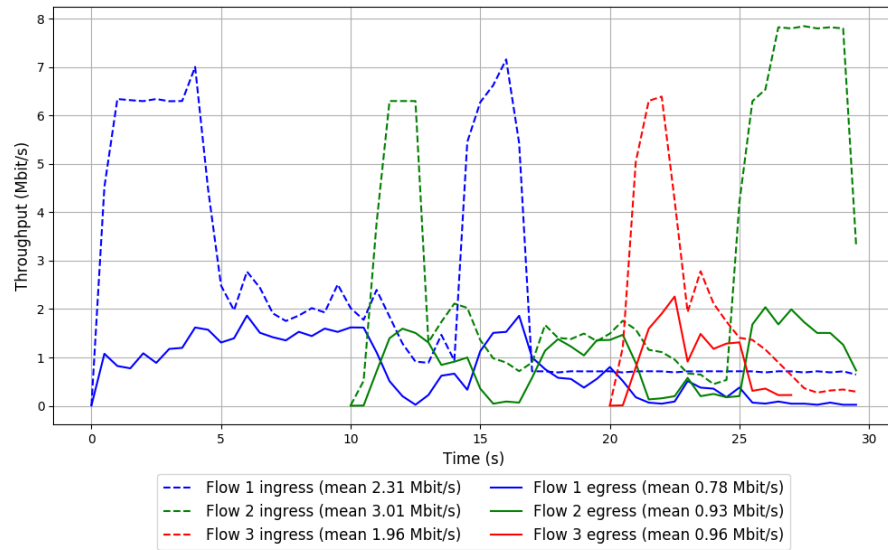
Run 3: Report of Copa — Data Link

```
Run 1: Statistics of FillP

Start at: 2018-04-10 06:52:21
End at: 2018-04-10 06:52:51
Local clock offset: -2.756 ms
Remote clock offset: -1.37 ms


# Below is generated by plot.py at 2018-04-10 08:41:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 363.016 ms
Loss rate: 67.71%
-- Flow 1:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 362.888 ms
Loss rate: 66.87%
-- Flow 2:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 364.511 ms
Loss rate: 69.79%
-- Flow 3:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 361.280 ms
Loss rate: 64.30%
```
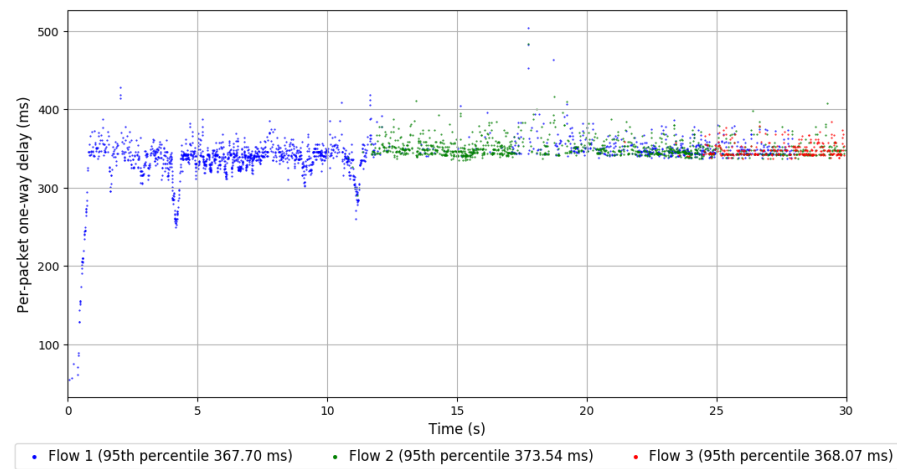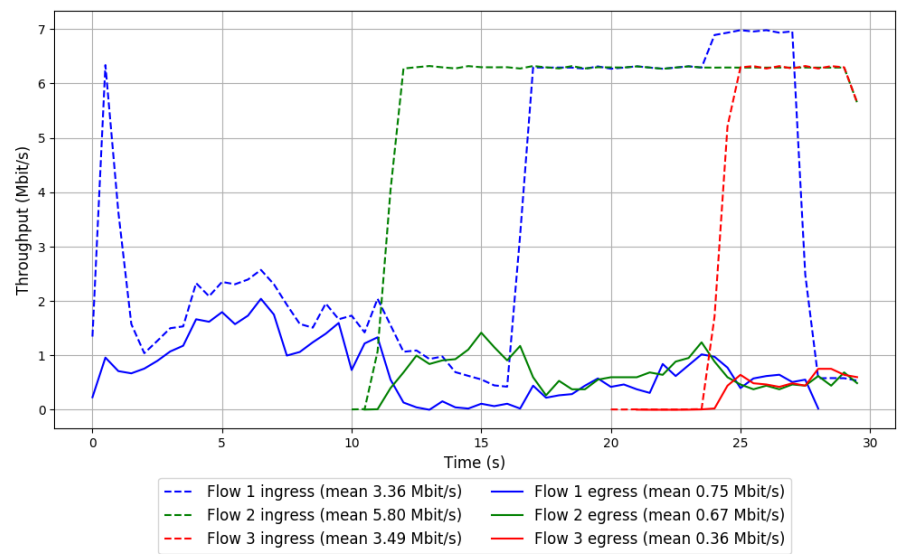
Run 1: Report of FillP — Data Link

```
Run 2: Statistics of FillP

Start at: 2018-04-10 07:12:05
End at: 2018-04-10 07:12:35
Local clock offset: 1.196 ms
Remote clock offset: 1.337 ms


# Below is generated by plot.py at 2018-04-10 08:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 369.709 ms
Loss rate: 85.35%
-- Flow 1:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 367.696 ms
Loss rate: 79.32%
-- Flow 2:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 373.541 ms
Loss rate: 88.87%
-- Flow 3:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 368.068 ms
Loss rate: 91.10%
```
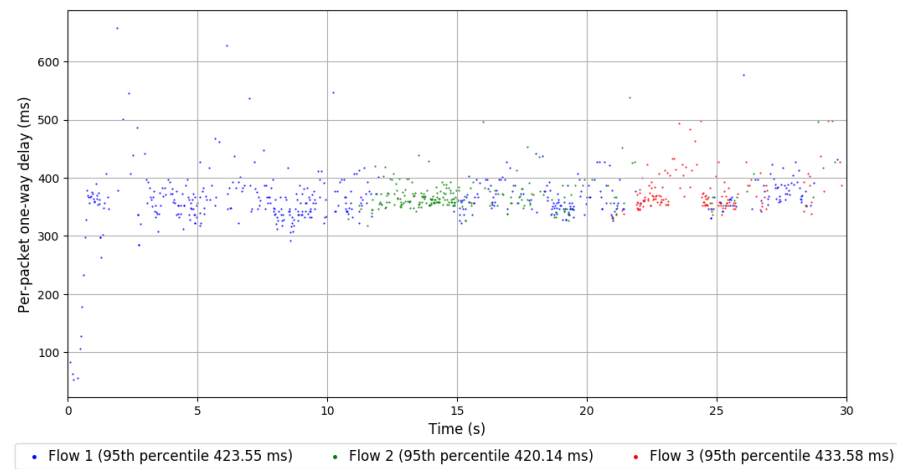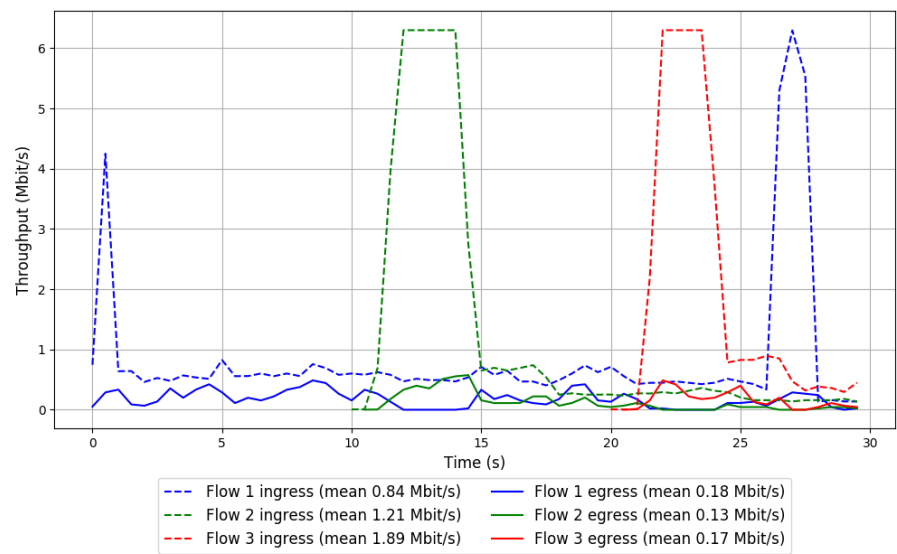
Run 2: Report of FillP — Data Link

```
Run 3: Statistics of FillP

Start at: 2018-04-10 07:31:53
End at: 2018-04-10 07:32:23
Local clock offset: -0.548 ms
Remote clock offset: 0.483 ms


# Below is generated by plot.py at 2018-04-10 08:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 427.125 ms
Loss rate: 86.53%
-- Flow 1:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 423.551 ms
Loss rate: 79.41%
-- Flow 2:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 420.139 ms
Loss rate: 89.80%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 433.583 ms
Loss rate: 91.90%
```

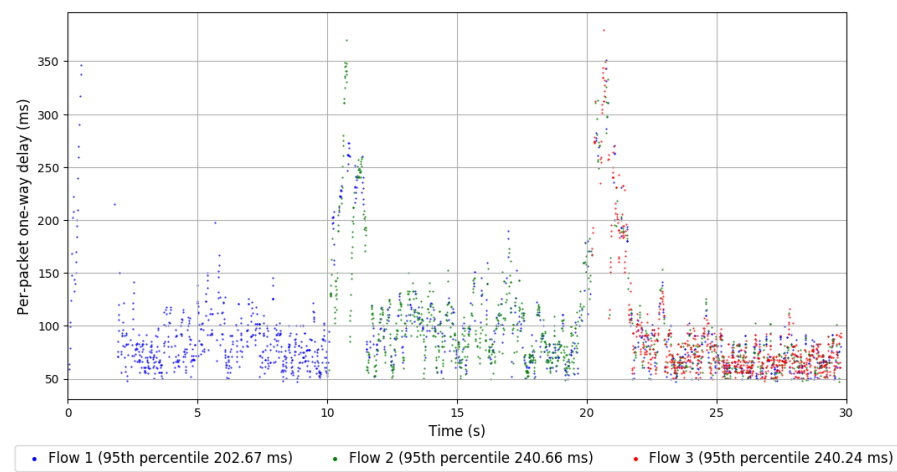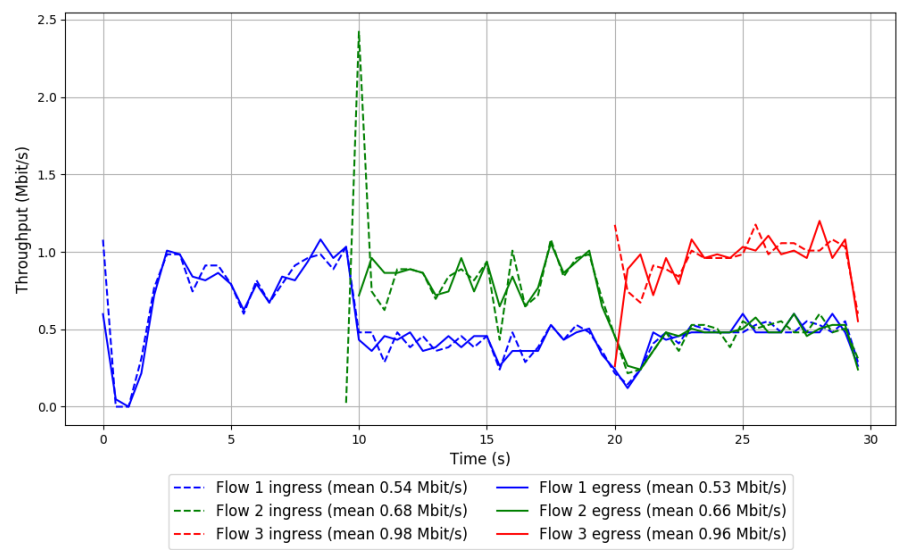Run 3: Report of FillP — Data Link

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

Start at: 2018-04-10 06:51:16
End at: 2018-04-10 06:51:46
Local clock offset: -2.215 ms
Remote clock offset: -1.776 ms


# Below is generated by plot.py at 2018-04-10 08:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 222.179 ms
Loss rate: 3.09%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 202.666 ms
Loss rate: 1.64%
-- Flow 2:
Average throughput: 0.66 Mbit/s
95th percentile per-packet one-way delay: 240.664 ms
Loss rate: 4.70%
-- Flow 3:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 240.236 ms
Loss rate: 3.27%
```

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

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

Start at: 2018-04-10 07:11:00
End at: 2018-04-10 07:11:30
Local clock offset: 1.165 ms
Remote clock offset: 1.218 ms


# Below is generated by plot.py at 2018-04-10 08:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 194.717 ms
Loss rate: 1.78%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 191.947 ms
Loss rate: 1.36%
-- Flow 2:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 189.290 ms
Loss rate: 2.37%
-- Flow 3:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 202.256 ms
Loss rate: 1.82%
```
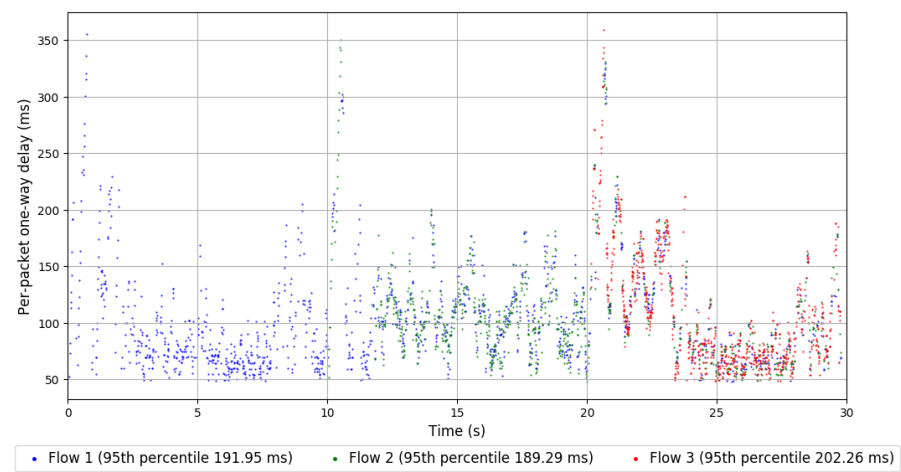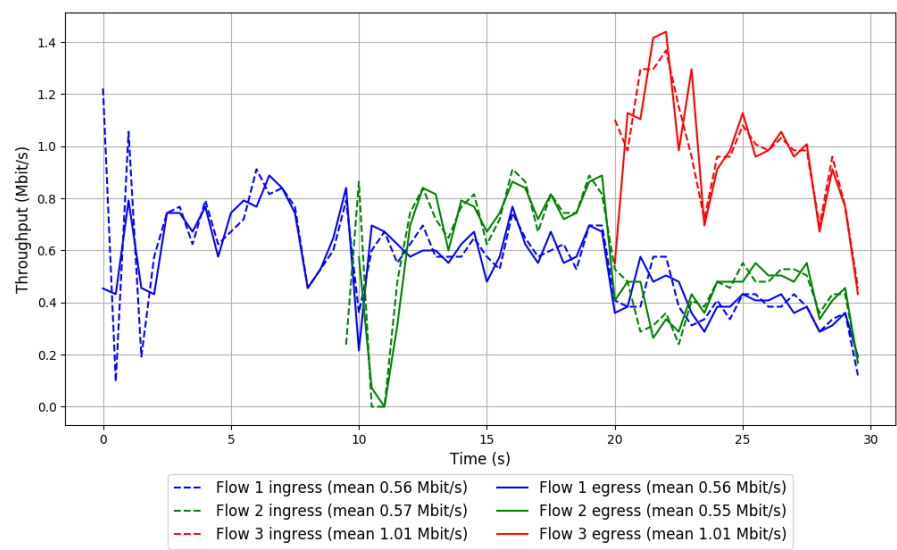
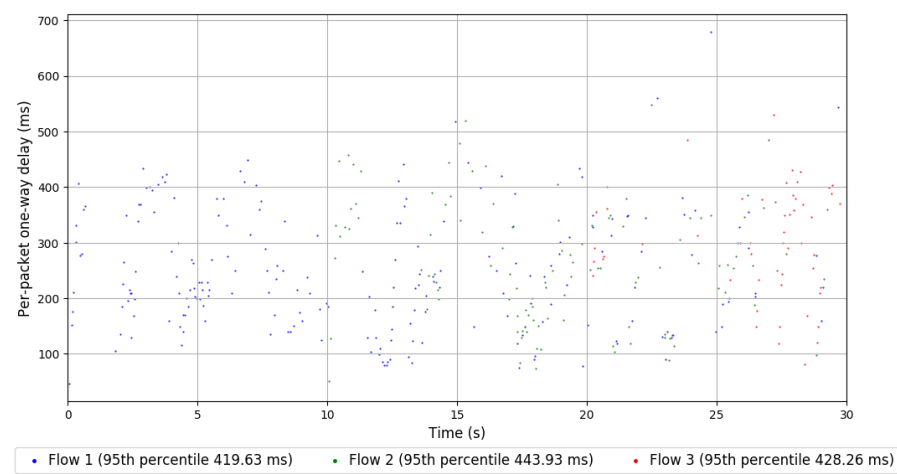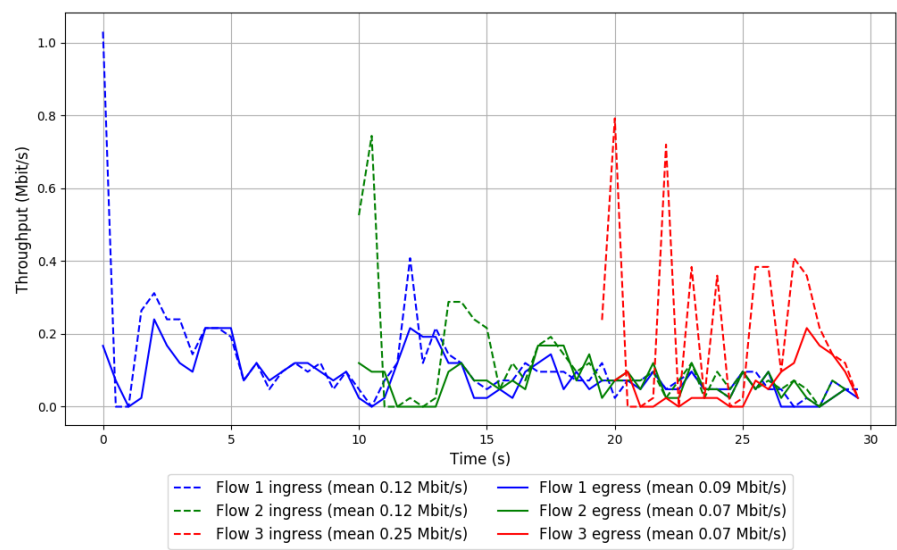Run 2: Report of Indigo-1-32 — Data Link

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

Start at: 2018-04-10 07:30:47
End at: 2018-04-10 07:31:17
Local clock offset: 0.481 ms
Remote clock offset: -0.967 ms


# Below is generated by plot.py at 2018-04-10 08:41:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 433.980 ms
Loss rate: 44.51%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 419.635 ms
Loss rate: 26.29%
-- Flow 2:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 443.930 ms
Loss rate: 42.39%
-- Flow 3:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 428.261 ms
Loss rate: 73.46%
```

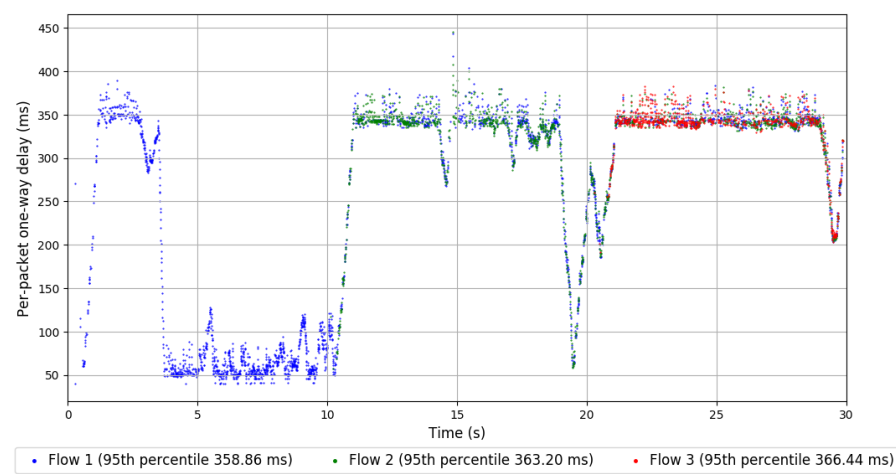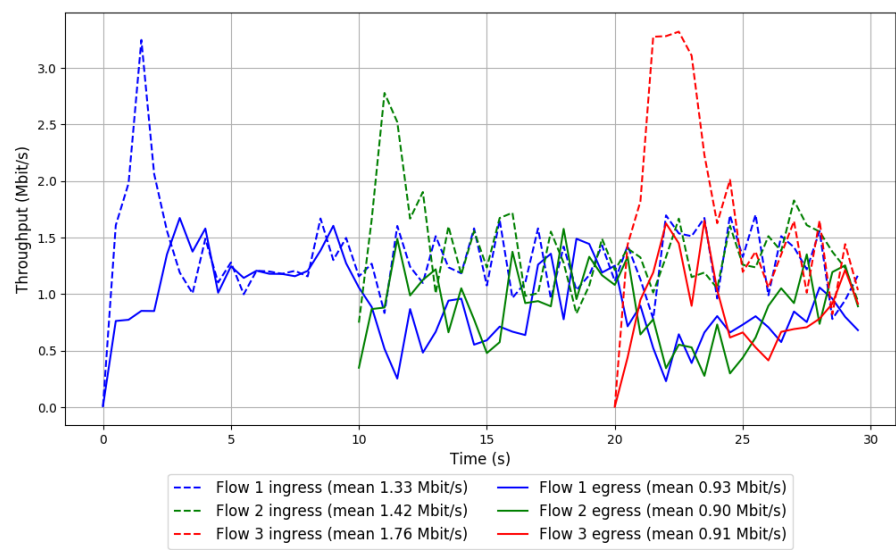Run 3: Report of Indigo-1-32 — Data Link

```
Run 1: Statistics of Vivace-latency

Start at: 2018-04-10 06:44:39
End at: 2018-04-10 06:45:09
Local clock offset: -5.302 ms
Remote clock offset: -2.622 ms


# Below is generated by plot.py at 2018-04-10 08:41:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 361.814 ms
Loss rate: 36.74%
-- Flow 1:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 358.856 ms
Loss rate: 30.79%
-- Flow 2:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 363.197 ms
Loss rate: 36.92%
-- Flow 3:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 366.437 ms
Loss rate: 50.01%
```

Run 1: Report of Vivace-latency — Data Link

```
Run 2: Statistics of Vivace-latency

Start at: 2018-04-10 07:04:25
End at: 2018-04-10 07:04:56
Local clock offset: 0.849 ms
Remote clock offset: 0.391 ms


# Below is generated by plot.py at 2018-04-10 08:41:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 361.847 ms
Loss rate: 32.84%
-- Flow 1:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 357.513 ms
Loss rate: 26.59%
-- Flow 2:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 362.912 ms
Loss rate: 34.19%
-- Flow 3:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 369.801 ms
Loss rate: 51.22%
```
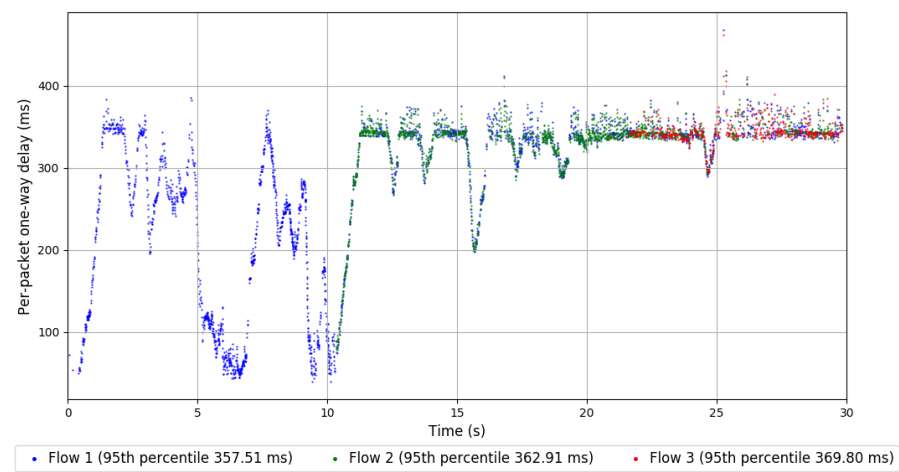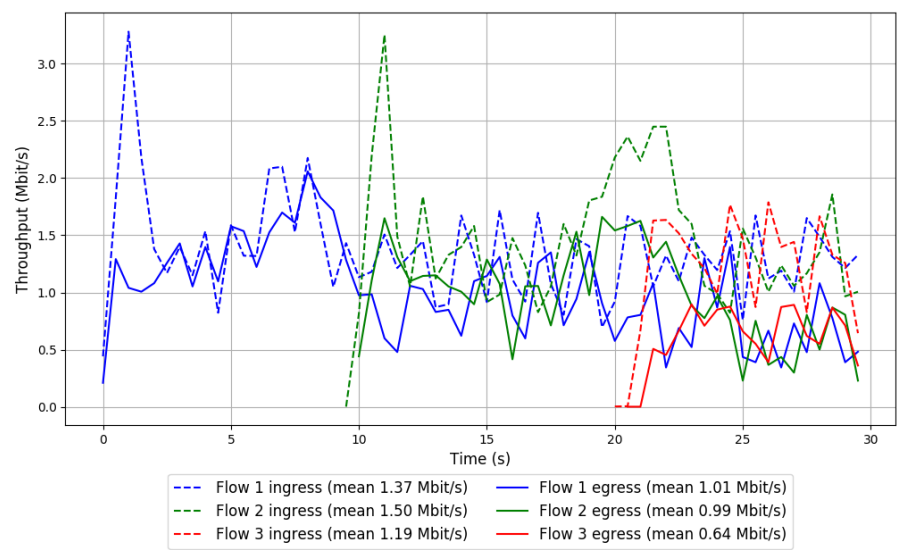
Run 2: Report of Vivace-latency — Data Link

```
Run 3: Statistics of Vivace-latency

Start at: 2018-04-10 07:24:09
End at: 2018-04-10 07:24:39
Local clock offset: 1.257 ms
Remote clock offset: 1.709 ms


# Below is generated by plot.py at 2018-04-10 08:41:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 374.293 ms
Loss rate: 57.57%
-- Flow 1:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 371.827 ms
Loss rate: 52.52%
-- Flow 2:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 378.062 ms
Loss rate: 64.91%
-- Flow 3:
Average throughput: 0.00 Mbit/s
```
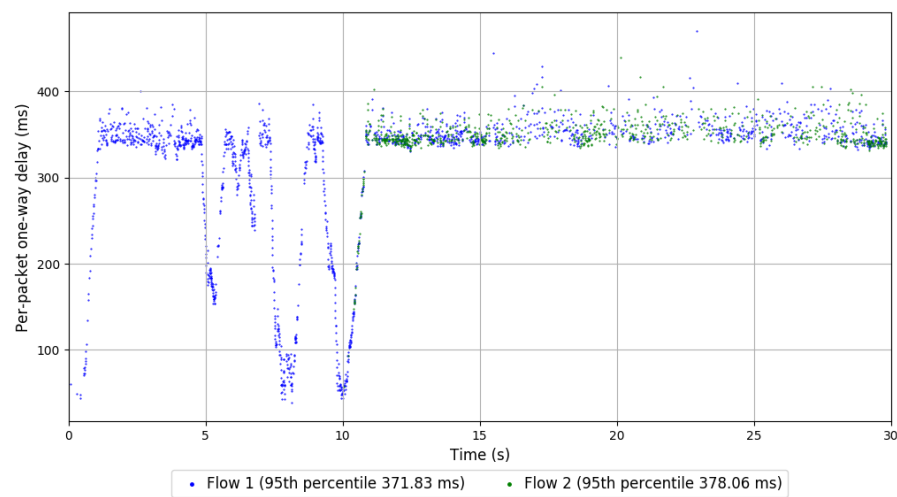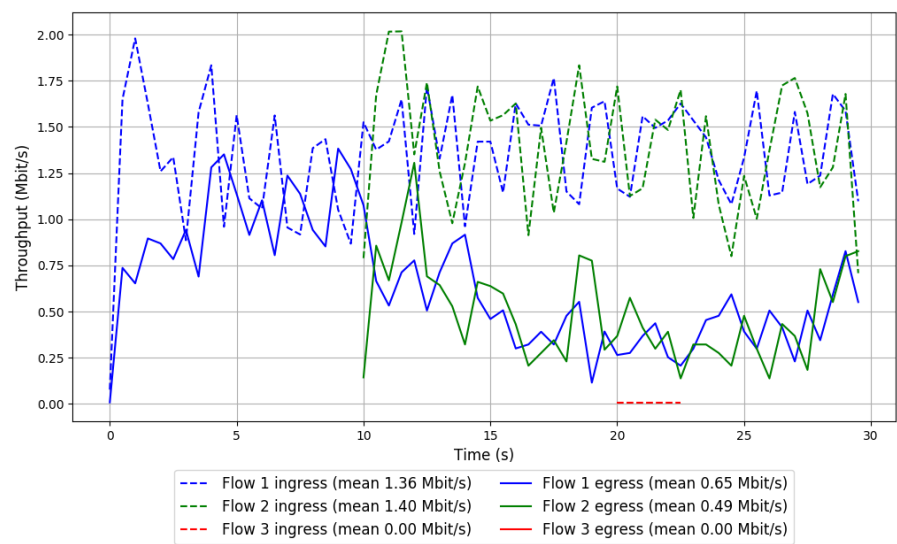
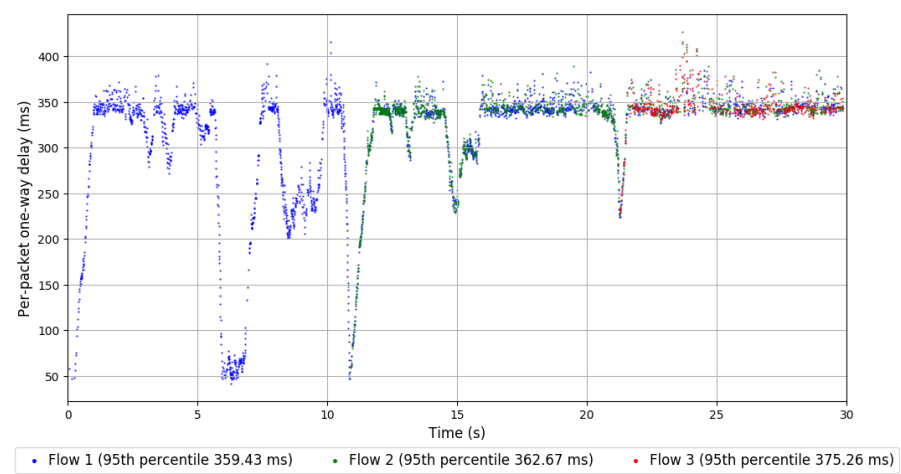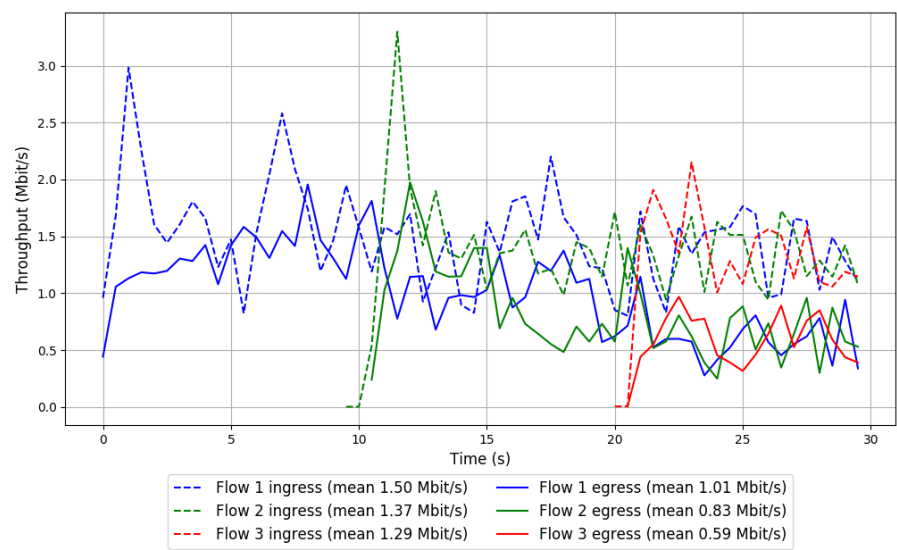Run 3: Report of Vivace-latency — Data Link



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```
Run 1: Statistics of Vivace-loss

Start at: 2018-04-10 06:54:33
End at: 2018-04-10 06:55:03
Local clock offset: -1.128 ms
Remote clock offset: -0.741 ms


# Below is generated by plot.py at 2018-04-10 08:41:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.73 Mbit/s
95th percentile per-packet one-way delay: 362.359 ms
Loss rate: 39.26%
-- Flow 1:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 359.430 ms
Loss rate: 32.91%
-- Flow 2:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 362.673 ms
Loss rate: 41.63%
-- Flow 3:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 375.257 ms
Loss rate: 56.62%
```

Run 1: Report of Vivace-loss — Data Link





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```
Run 2: Statistics of Vivace-loss

Start at: 2018-04-10 07:14:17
End at: 2018-04-10 07:14:47
Local clock offset: 1.256 ms
Remote clock offset: 0.955 ms


# Below is generated by plot.py at 2018-04-10 08:41:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 368.130 ms
Loss rate: 50.24%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 366.840 ms
Loss rate: 41.38%
-- Flow 2:
Average throughput: 0.66 Mbit/s
95th percentile per-packet one-way delay: 368.835 ms
Loss rate: 54.11%
-- Flow 3:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 370.587 ms
Loss rate: 71.14%
```
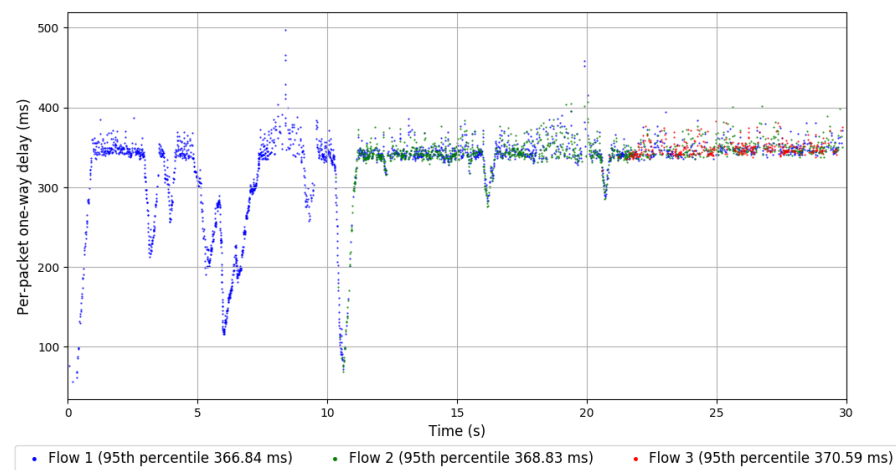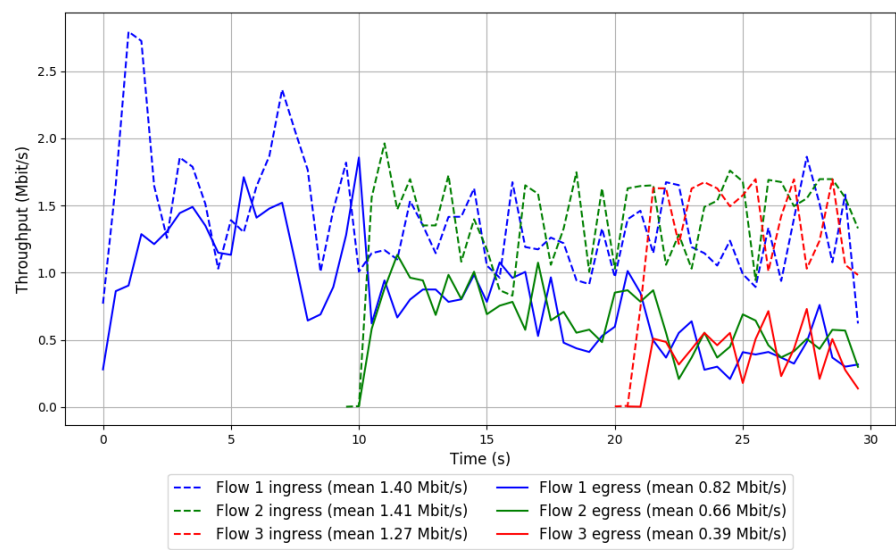
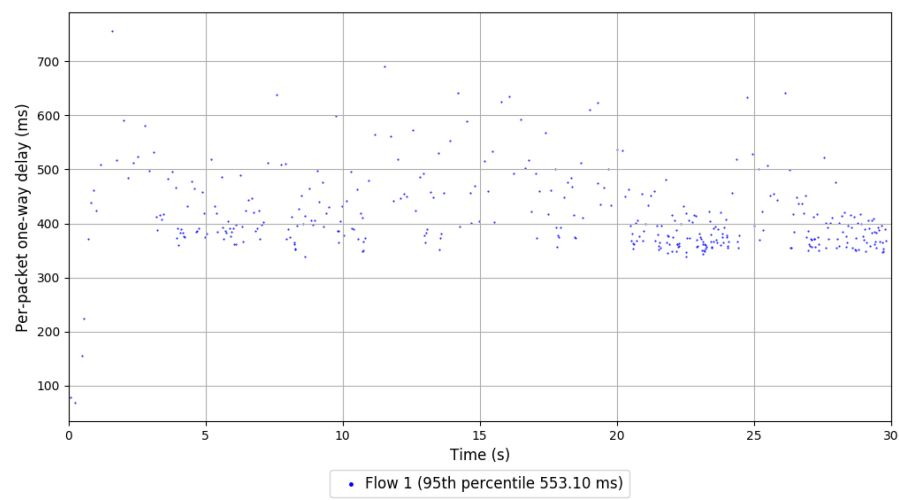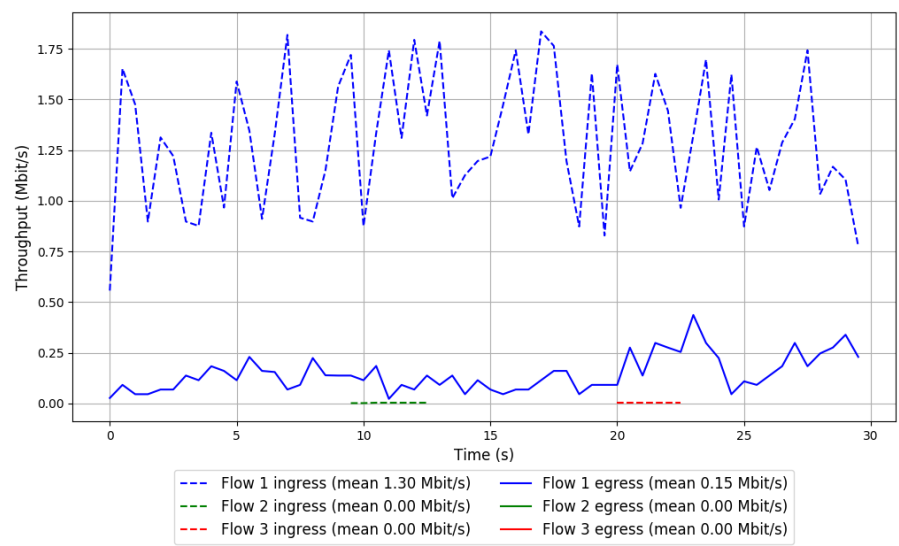Run 2: Report of Vivace-loss — Data Link

```
Run 3: Statistics of Vivace-loss

Start at: 2018-04-10 07:34:04
End at: 2018-04-10 07:34:34
Local clock offset: -0.685 ms
Remote clock offset: -0.645 ms


# Below is generated by plot.py at 2018-04-10 08:41:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 553.099 ms
Loss rate: 88.67%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 553.099 ms
Loss rate: 88.66%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

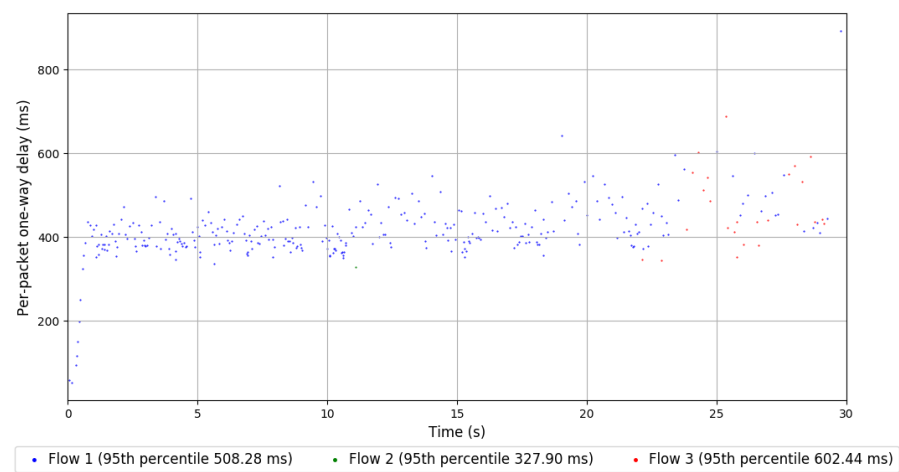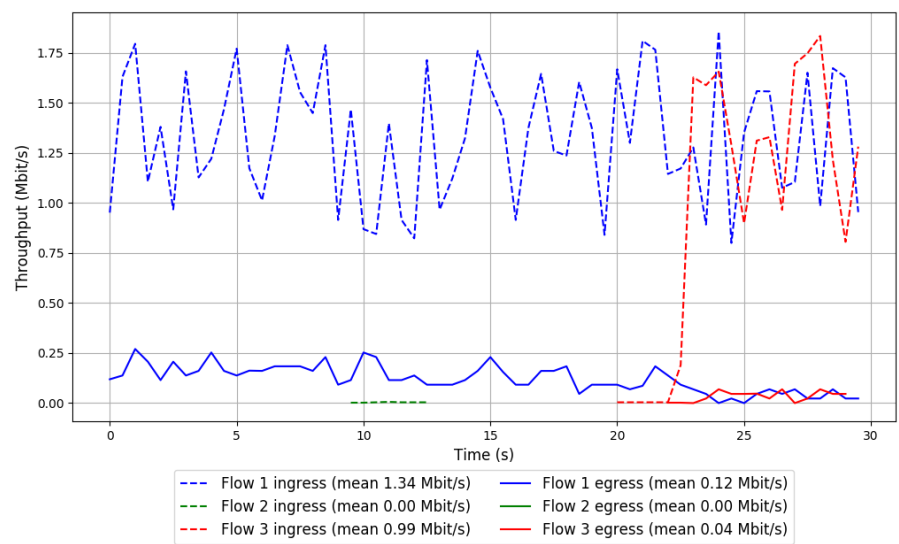Run 3: Report of Vivace-loss — Data Link

```
Run 1: Statistics of Vivace-LTE

Start at: 2018-04-10 06:43:26
End at: 2018-04-10 06:43:56
Local clock offset: -5.102 ms
Remote clock offset: -1.821 ms


# Below is generated by plot.py at 2018-04-10 08:41:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 531.539 ms
Loss rate: 92.15%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 508.284 ms
Loss rate: 90.88%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 327.897 ms
Loss rate: 92.31%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 602.444 ms
Loss rate: 97.37%
```

Run 1: Report of Vivace-LTE — Data Link

```
Run 2: Statistics of Vivace-LTE

Start at: 2018-04-10 07:03:20
End at: 2018-04-10 07:03:50
Local clock offset: 0.676 ms
Remote clock offset: 1.345 ms


# Below is generated by plot.py at 2018-04-10 08:41:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 364.013 ms
Loss rate: 48.21%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 362.037 ms
Loss rate: 40.57%
-- Flow 2:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 369.683 ms
Loss rate: 54.96%
-- Flow 3:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 362.453 ms
Loss rate: 59.96%
```

Run 2: Report of Vivace-LTE — Data Link



Flow 1 ingress (mean 1.38 Mbit/s) --- Flow 1 egress (mean 0.82 Mbit/s)
Flow 2 ingress (mean 1.36 Mbit/s) --- Flow 2 egress (mean 0.62 Mbit/s)
Flow 3 ingress (mean 1.15 Mbit/s) --- Flow 3 egress (mean 0.49 Mbit/s)



Flow 1 (95th percentile 362.04 ms)   Flow 2 (95th percentile 369.68 ms)   Flow 3 (95th percentile 362.45 ms)

```
Run 3: Statistics of Vivace-LTE

Start at: 2018-04-10 07:23:03
End at: 2018-04-10 07:23:33
Local clock offset: 0.56 ms
Remote clock offset: 1.804 ms

# Below is generated by plot.py at 2018-04-10 08:41:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 367.518 ms
Loss rate: 47.71%
-- Flow 1:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 366.166 ms
Loss rate: 42.32%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 368.795 ms
Loss rate: 51.81%
-- Flow 3:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 365.462 ms
Loss rate: 57.72%
```
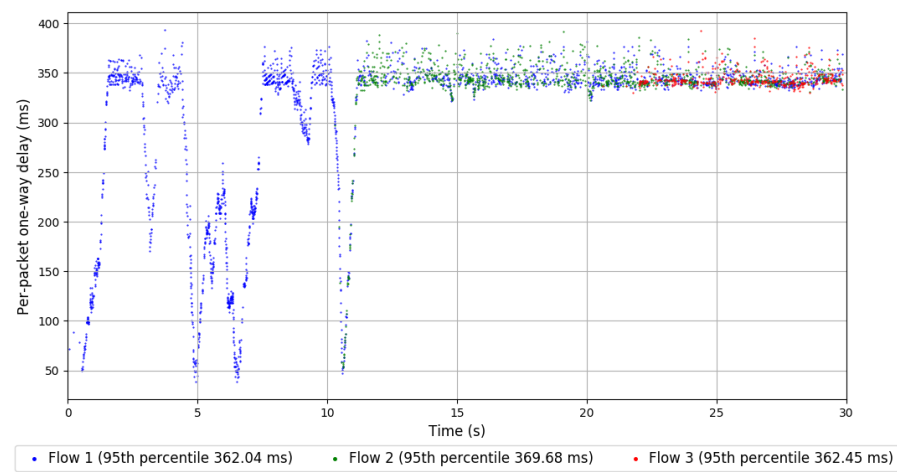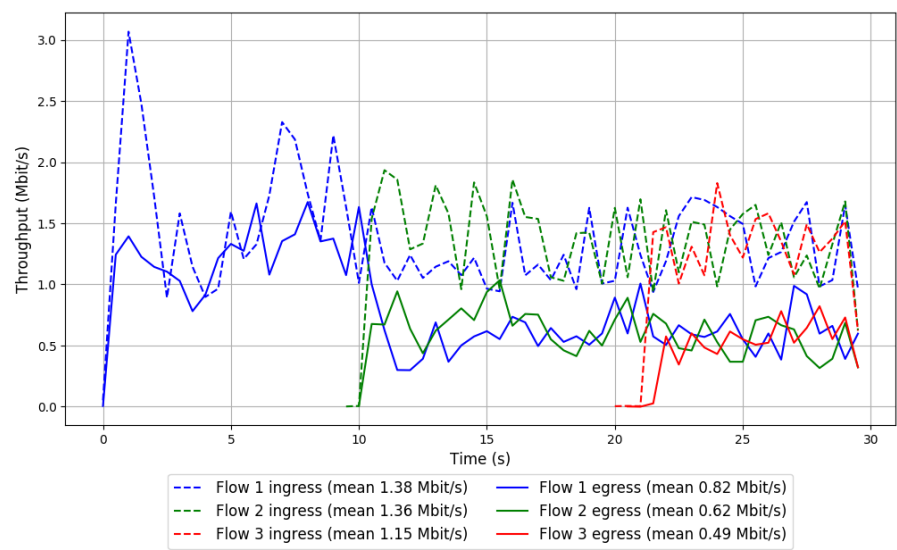
# Run 3: Report of Vivace-LTE — Data Link



Flow 1 ingress (mean 1.29 Mbit/s)    Flow 1 egress (mean 0.75 Mbit/s)
Flow 2 ingress (mean 1.32 Mbit/s)    Flow 2 egress (mean 0.65 Mbit/s)
Flow 3 ingress (mean 1.02 Mbit/s)    Flow 3 egress (mean 0.51 Mbit/s)



Flow 1 (95th percentile 366.17 ms)    Flow 2 (95th percentile 368.80 ms)    Flow 3 (95th percentile 365.46 ms)