

Pantheon Report

Generated at 2018-06-06 02:23:47 (UTC).

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

Repeated the test of 16 congestion control schemes 3 times.

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

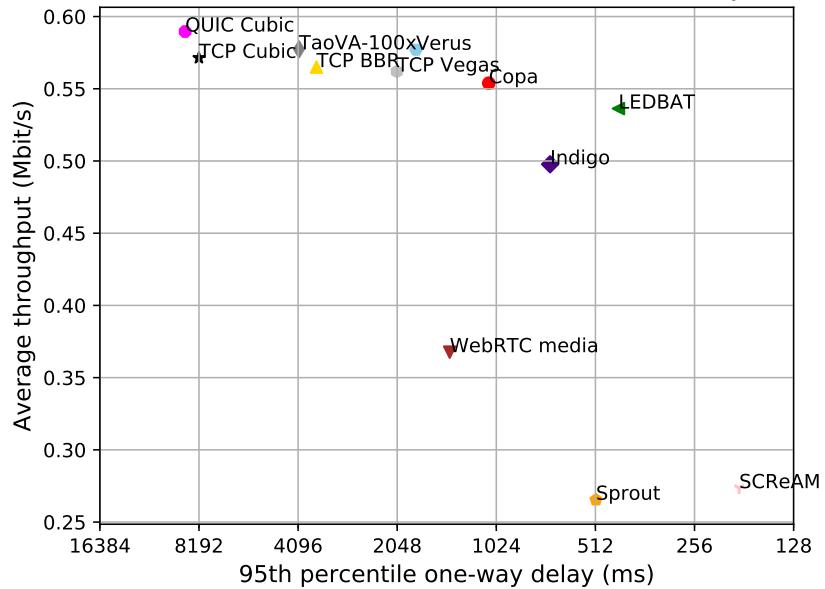
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

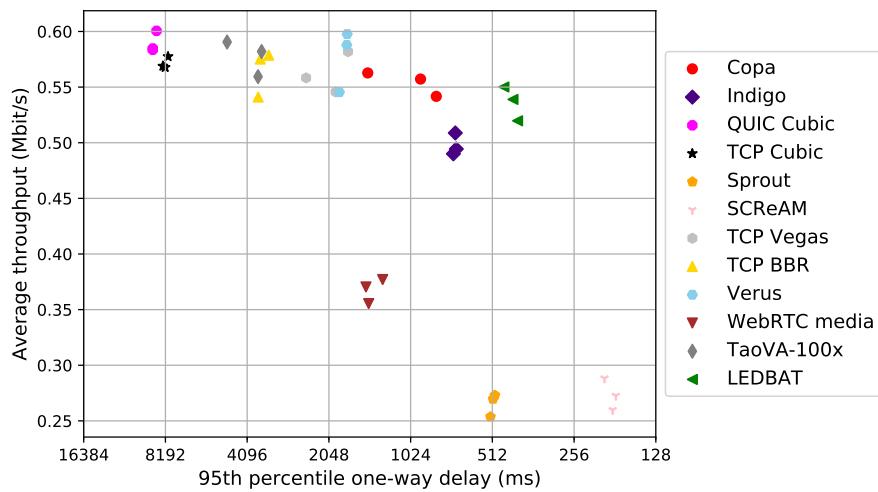
Git summary:

```
branch: master @ 227fdf9a3757f17b88537cceed5743a33037a3d2
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/genericCC @ c7966e494a929986eaa5a9c169a7f381fe1bbbe5
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ 6f038ed31259d366f9840f65b82cbe8f464b1b39
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/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
  M src/ScreamClient
  M src/ScreamServer
third_party/sprout @ c838669682f0c19f6baf92afc9a596a406d48c1f
  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 @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from Colombia ppp0 to AWS Brazil 2, 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, 3 runs of 30s each per scheme
 3 flows with 10s interval between flows



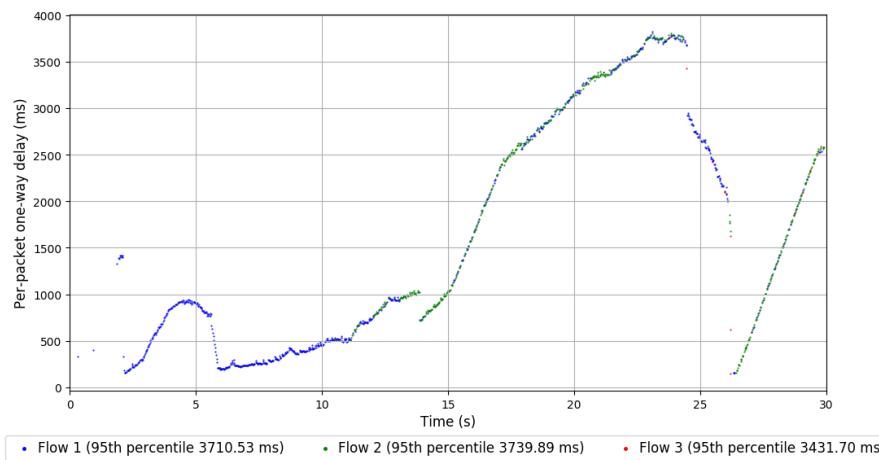
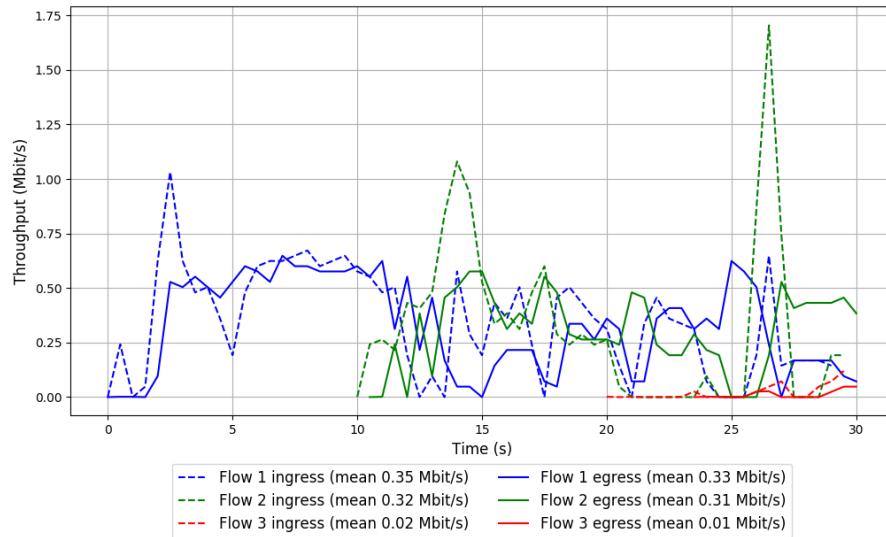
| scheme | # runs | mean avg tput (Mbit/s) | | | mean 95th-%ile delay (ms) | | | mean loss rate (%) | | |
|--------------|--------|------------------------|--------|--------|---------------------------|---------|---------|--------------------|--------|--------|
| | | flow 1 | flow 2 | flow 3 | flow 1 | flow 2 | flow 3 | flow 1 | flow 2 | flow 3 |
| TCP BBR | 3 | 0.36 | 0.32 | 0.02 | 3543.47 | 3634.75 | 3346.67 | 2.87 | 4.74 | 50.52 |
| Copa | | 0.33 | 0.27 | 0.15 | 1038.20 | 1085.90 | 1129.15 | 3.18 | 6.25 | 11.37 |
| TCP Cubic | | 0.56 | 0.03 | 0.00 | 8197.35 | 6193.13 | 8539.00 | 30.99 | 52.86 | 90.93 |
| FillP | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Indigo | | 0.32 | 0.18 | 0.19 | 546.86 | 696.90 | 893.37 | 0.56 | 2.48 | 2.13 |
| LEDBAT | | 0.23 | 0.38 | 0.21 | 349.20 | 445.95 | 462.37 | 0.00 | 1.21 | 6.77 |
| PCC-Allegro | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| PCC-Expr | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| QUIC Cubic | | 0.59 | 0.00 | 0.00 | 9008.44 | 5965.99 | 9411.95 | 32.87 | 0.00 | 66.67 |
| SCReAM | | 0.08 | 0.19 | 0.18 | 174.09 | 183.95 | 200.68 | 0.70 | 0.94 | 1.90 |
| Sprout | | 0.13 | 0.13 | 0.14 | 581.77 | 431.03 | 466.98 | 0.79 | 1.07 | 1.67 |
| TaoVA-100x | | 0.35 | 0.27 | 0.23 | 3254.06 | 3969.86 | 4186.96 | 4.15 | 11.54 | 23.75 |
| TCP Vegas | | 0.38 | 0.22 | 0.19 | 2083.07 | 1895.99 | 1866.55 | 3.21 | 6.30 | 20.99 |
| Verus | | 0.57 | 0.01 | 0.01 | 1795.27 | 1776.12 | 1742.64 | 4.00 | 8.01 | 18.48 |
| PCC-Vivace | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| WebRTC media | | 0.17 | 0.12 | 0.08 | 1402.60 | 1463.13 | 1317.48 | 0.26 | 0.48 | 1.14 |

Run 1: Statistics of TCP BBR

```
Start at: 2018-06-06 01:42:51
End at: 2018-06-06 01:43:21
Local clock offset: -2.735 ms
Remote clock offset: 3.307 ms

# Below is generated by plot.py at 2018-06-06 02:23:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 3729.091 ms
Loss rate: 4.38%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 3710.532 ms
Loss rate: 3.42%
-- Flow 2:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 3739.895 ms
Loss rate: 4.16%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 3431.701 ms
Loss rate: 57.58%
```

Run 1: Report of TCP BBR — Data Link

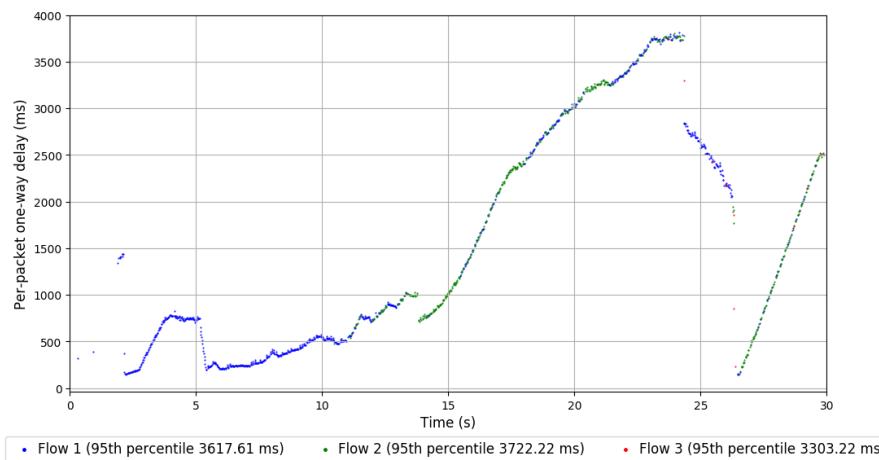
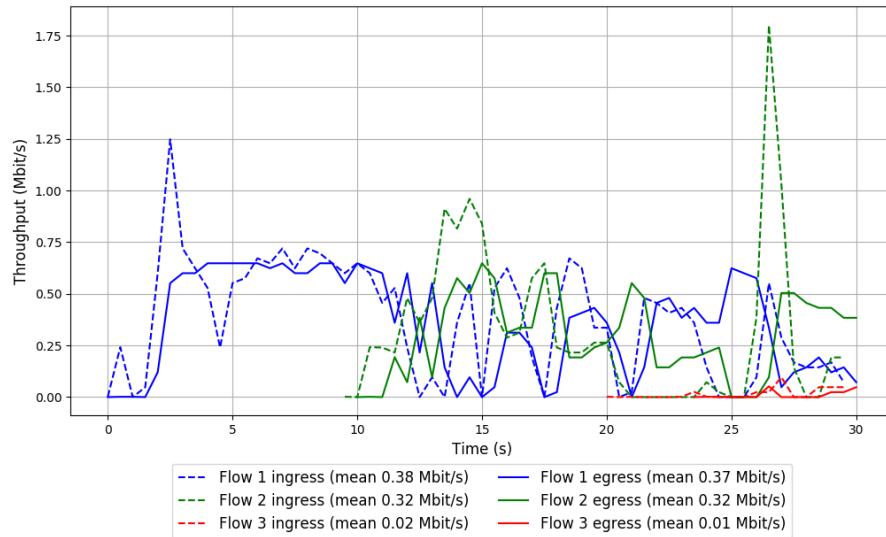


Run 2: Statistics of TCP BBR

```
Start at: 2018-06-06 02:02:03
End at: 2018-06-06 02:02:33
Local clock offset: -1.954 ms
Remote clock offset: 10.285 ms

# Below is generated by plot.py at 2018-06-06 02:23:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 3664.320 ms
Loss rate: 4.39%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 3617.613 ms
Loss rate: 3.33%
-- Flow 2:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 3722.222 ms
Loss rate: 5.03%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 3303.225 ms
Loss rate: 52.36%
```

Run 2: Report of TCP BBR — Data Link

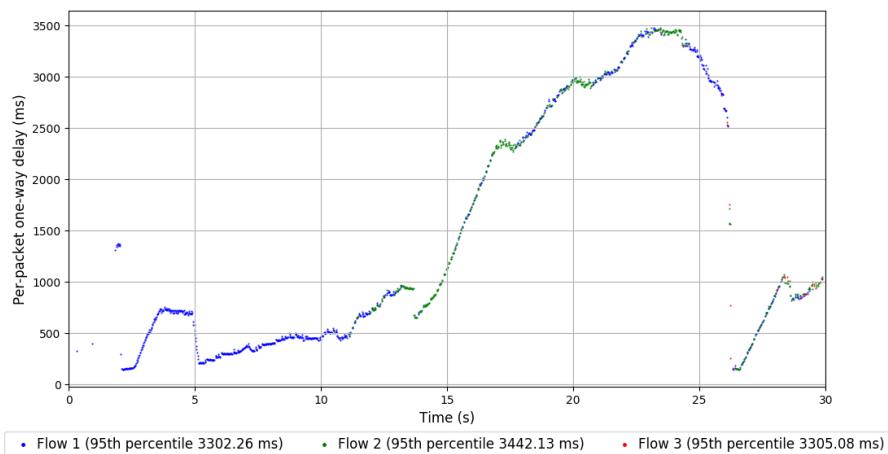
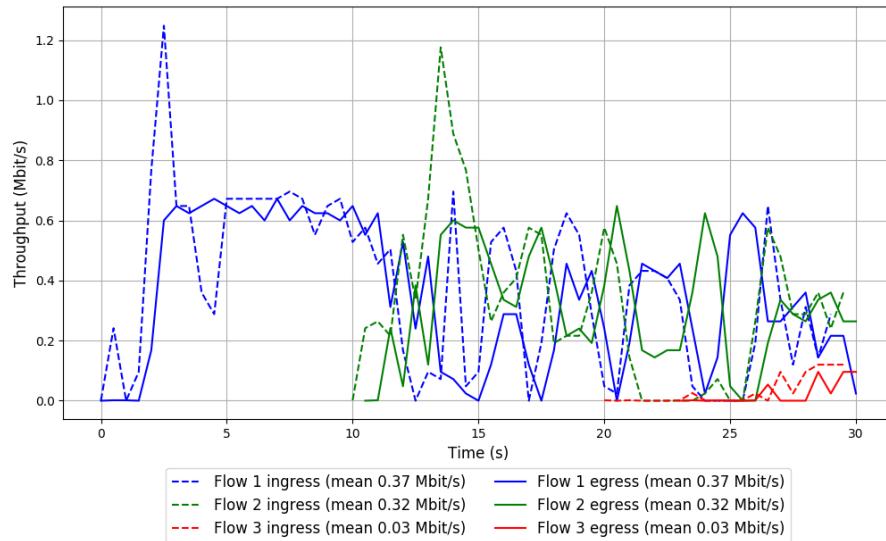


Run 3: Statistics of TCP BBR

```
Start at: 2018-06-06 02:21:15
End at: 2018-06-06 02:21:45
Local clock offset: -6.031 ms
Remote clock offset: 8.465 ms

# Below is generated by plot.py at 2018-06-06 02:23:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 3412.076 ms
Loss rate: 3.72%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 3302.257 ms
Loss rate: 1.86%
-- Flow 2:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 3442.130 ms
Loss rate: 5.03%
-- Flow 3:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 3305.080 ms
Loss rate: 41.62%
```

Run 3: Report of TCP BBR — Data Link

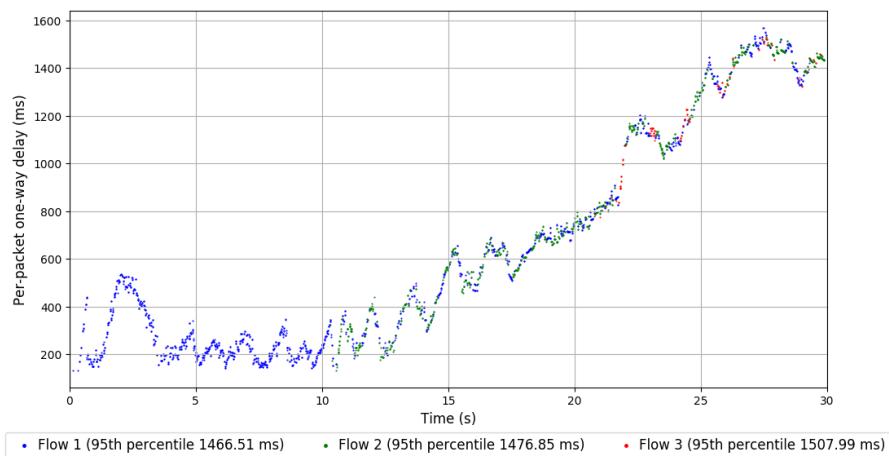
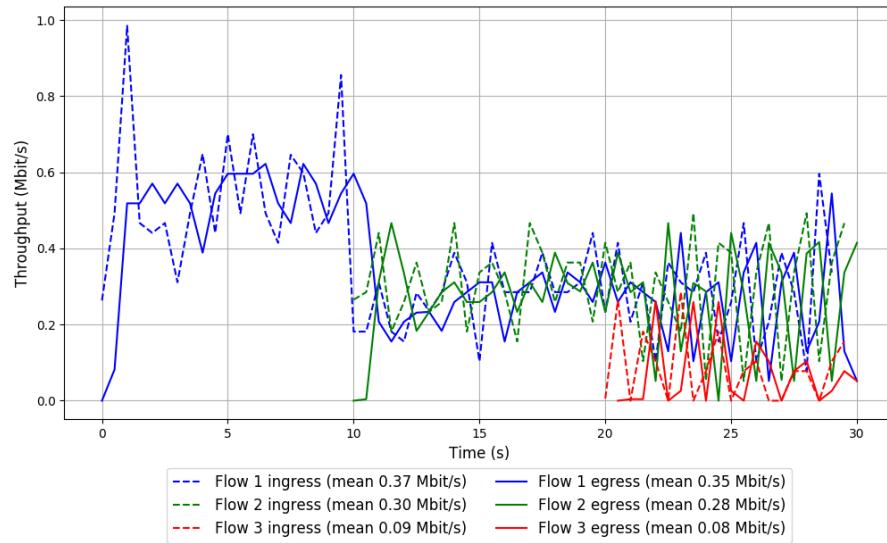


Run 1: Statistics of Copa

```
Start at: 2018-06-06 01:39:15
End at: 2018-06-06 01:39:45
Local clock offset: -1.843 ms
Remote clock offset: 4.597 ms

# Below is generated by plot.py at 2018-06-06 02:23:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 1472.942 ms
Loss rate: 6.24%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 1466.507 ms
Loss rate: 4.37%
-- Flow 2:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 1476.853 ms
Loss rate: 8.36%
-- Flow 3:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 1507.987 ms
Loss rate: 15.29%
```

Run 1: Report of Copa — Data Link

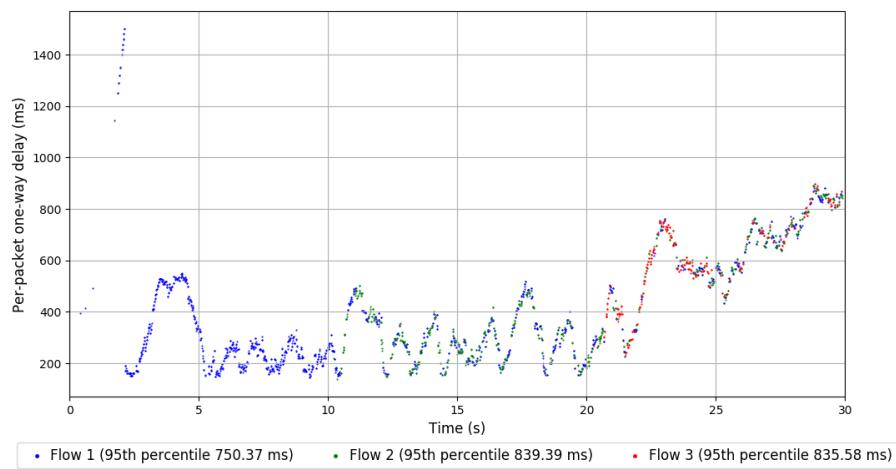
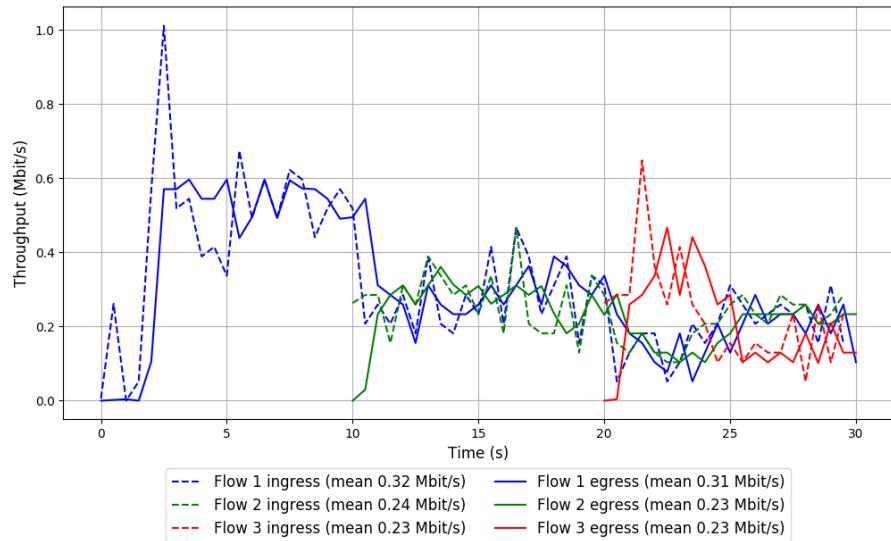


Run 2: Statistics of Copa

```
Start at: 2018-06-06 01:58:27
End at: 2018-06-06 01:58:57
Local clock offset: -1.97 ms
Remote clock offset: 5.215 ms

# Below is generated by plot.py at 2018-06-06 02:23:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 823.750 ms
Loss rate: 3.82%
-- Flow 1:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 750.371 ms
Loss rate: 2.46%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 839.386 ms
Loss rate: 4.84%
-- Flow 3:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 835.584 ms
Loss rate: 7.26%
```

Run 2: Report of Copa — Data Link

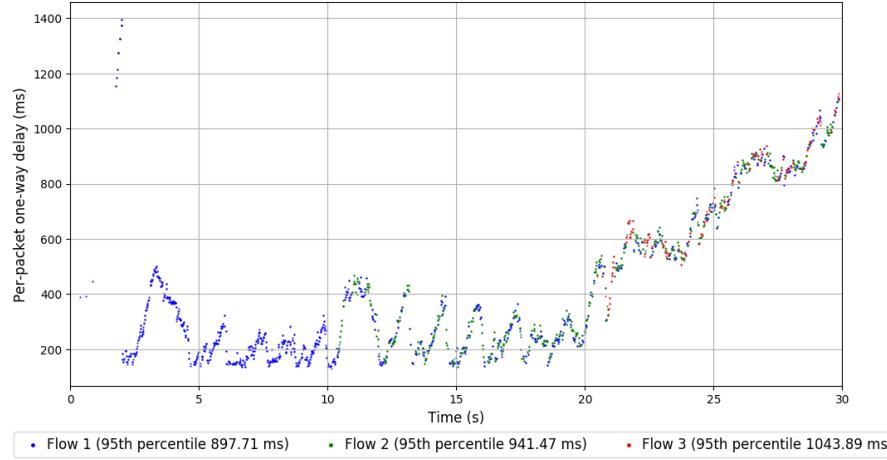
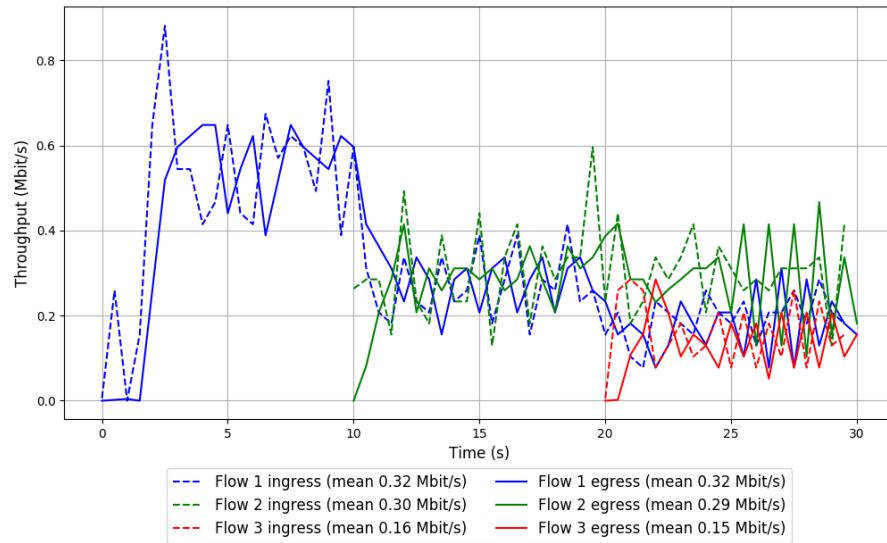


Run 3: Statistics of Copa

```
Start at: 2018-06-06 02:17:39
End at: 2018-06-06 02:18:09
Local clock offset: -6.273 ms
Remote clock offset: 10.855 ms

# Below is generated by plot.py at 2018-06-06 02:23:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 941.467 ms
Loss rate: 4.52%
-- Flow 1:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 897.714 ms
Loss rate: 2.71%
-- Flow 2:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 941.467 ms
Loss rate: 5.55%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 1043.886 ms
Loss rate: 11.55%
```

Run 3: Report of Copa — Data Link

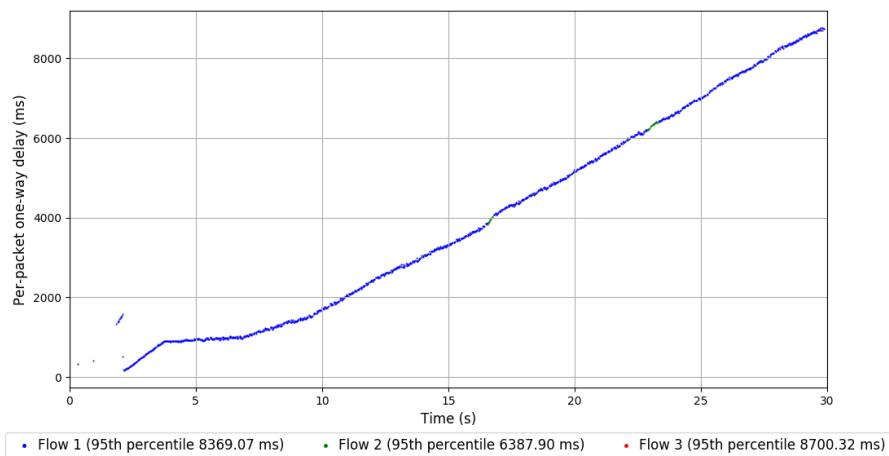
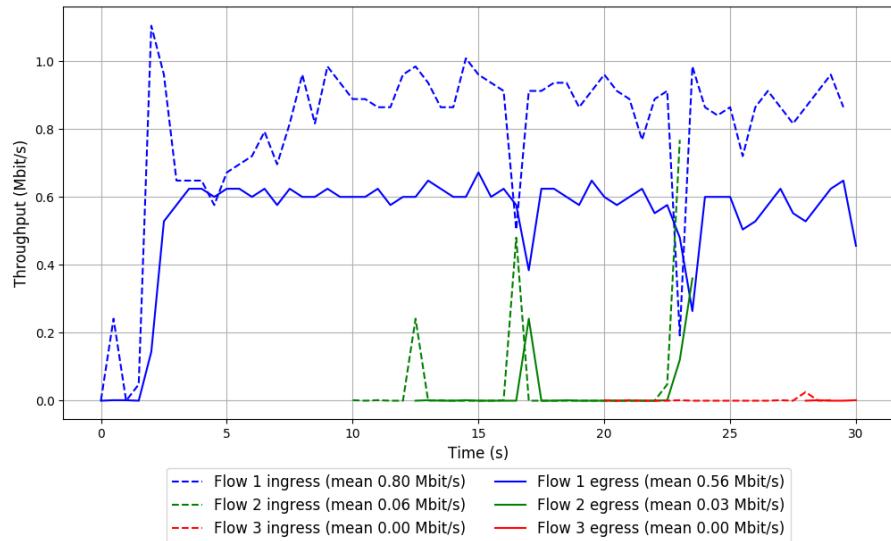


```
Run 1: Statistics of TCP Cubic
```

```
Start at: 2018-06-06 01:44:03
End at: 2018-06-06 01:44:33
Local clock offset: -1.935 ms
Remote clock offset: 8.627 ms

# Below is generated by plot.py at 2018-06-06 02:23:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 8369.070 ms
Loss rate: 31.81%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 8369.070 ms
Loss rate: 31.08%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 6387.905 ms
Loss rate: 52.87%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8700.320 ms
Loss rate: 90.68%
```

Run 1: Report of TCP Cubic — Data Link

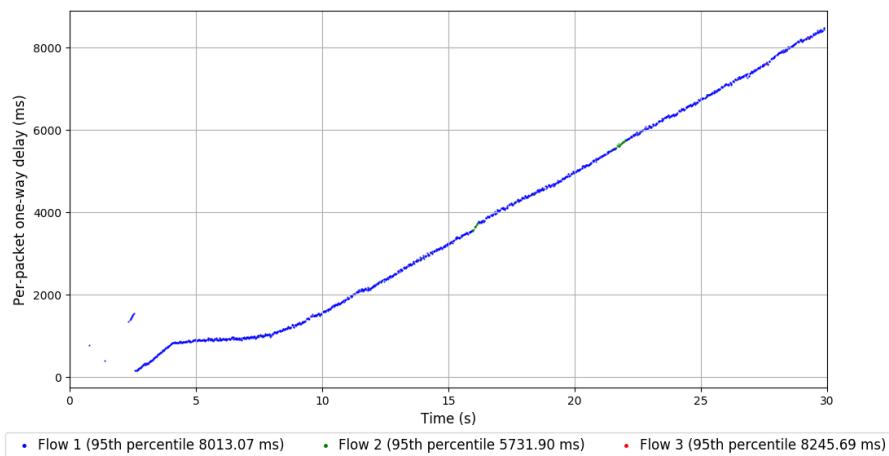
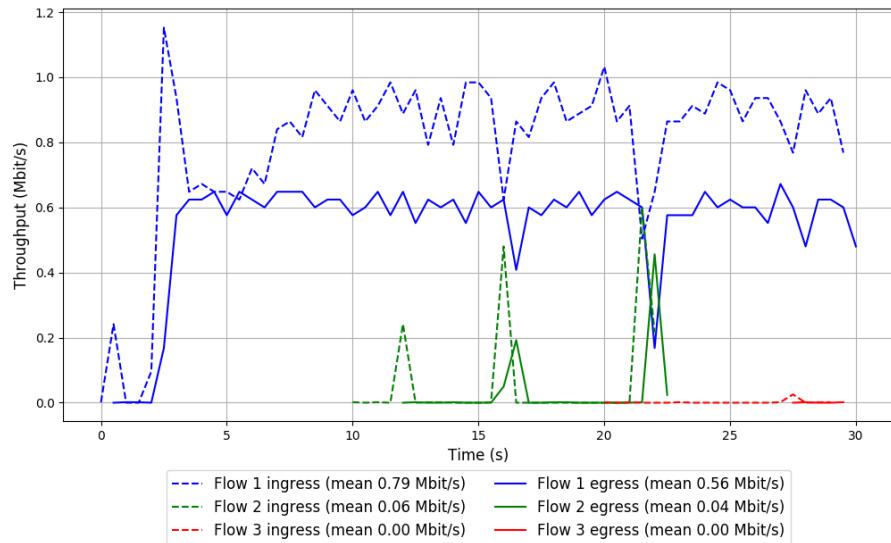


Run 2: Statistics of TCP Cubic

```
Start at: 2018-06-06 02:03:15
End at: 2018-06-06 02:03:45
Local clock offset: -1.179 ms
Remote clock offset: 10.281 ms

# Below is generated by plot.py at 2018-06-06 02:23:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 8013.066 ms
Loss rate: 31.57%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 8013.066 ms
Loss rate: 30.84%
-- Flow 2:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 5731.899 ms
Loss rate: 52.83%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8245.687 ms
Loss rate: 91.06%
```

Run 2: Report of TCP Cubic — Data Link

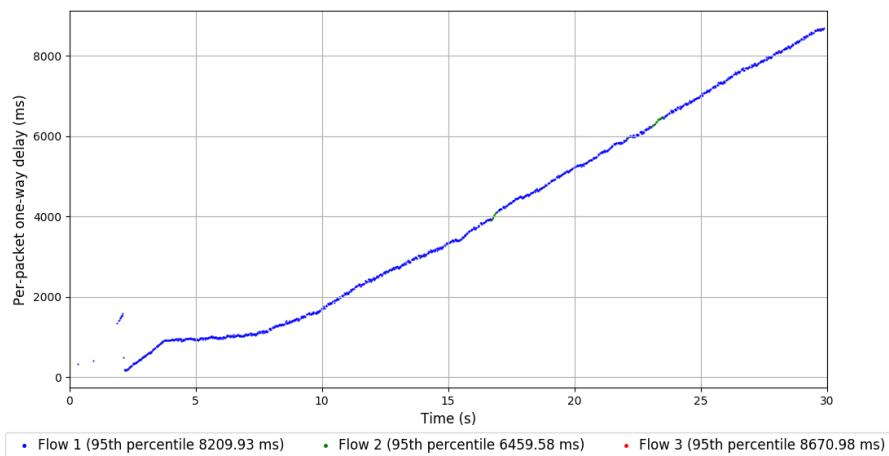
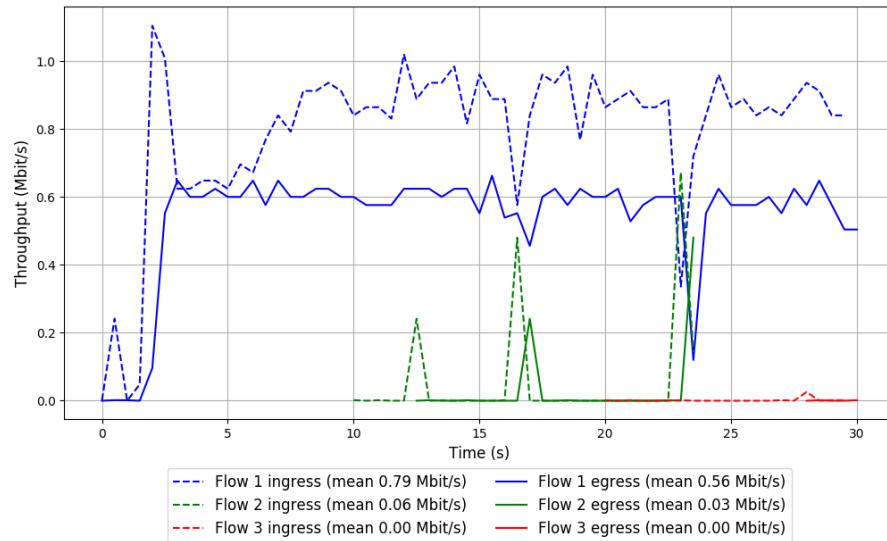


Run 3: Statistics of TCP Cubic

```
Start at: 2018-06-06 02:22:26
End at: 2018-06-06 02:22:56
Local clock offset: -6.945 ms
Remote clock offset: 7.618 ms

# Below is generated by plot.py at 2018-06-06 02:23:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 8209.699 ms
Loss rate: 31.79%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 8209.929 ms
Loss rate: 31.06%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 6459.579 ms
Loss rate: 52.87%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8670.984 ms
Loss rate: 91.06%
```

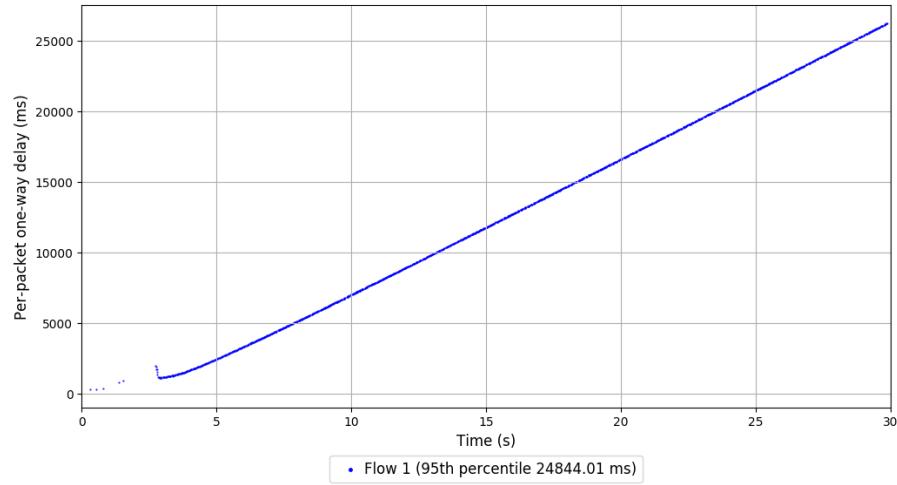
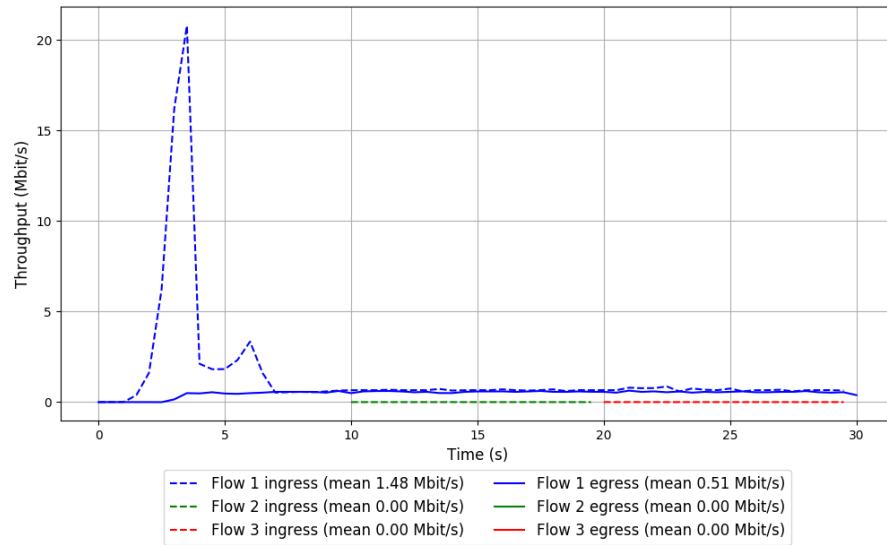
Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2018-06-06 01:29:36
End at: 2018-06-06 01:30:06
Local clock offset: -0.957 ms
Remote clock offset: 9.334 ms

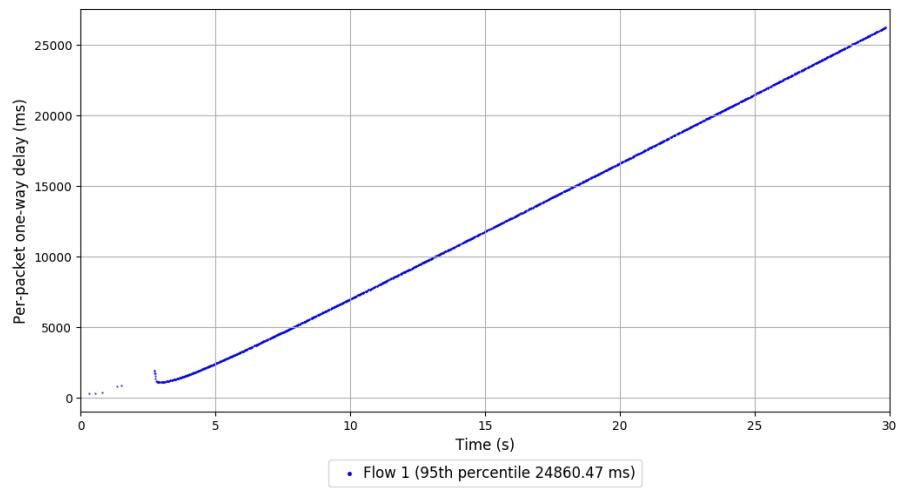
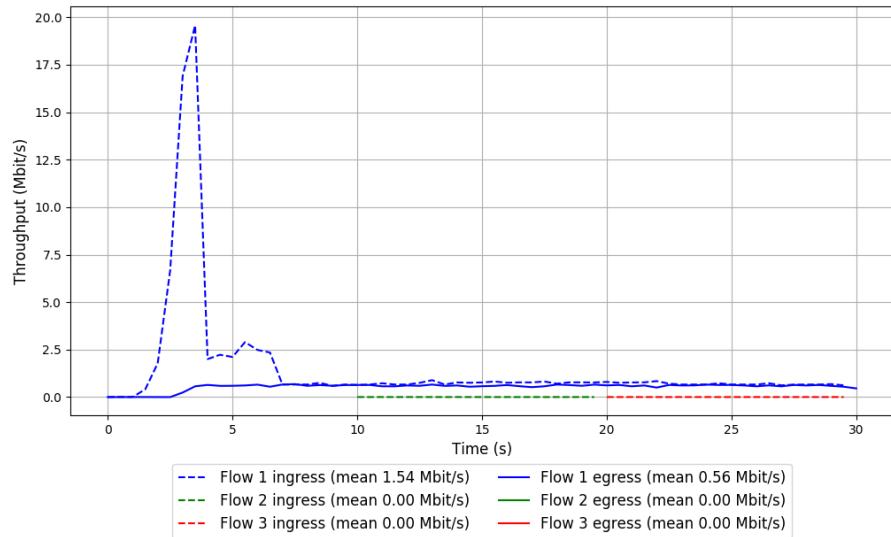
Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2018-06-06 01:48:50
End at: 2018-06-06 01:49:20
Local clock offset: -2.739 ms
Remote clock offset: 9.486 ms

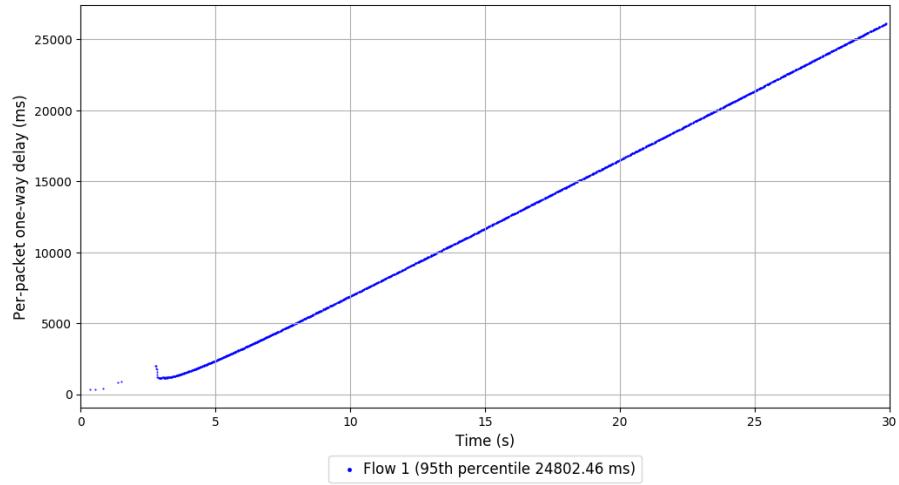
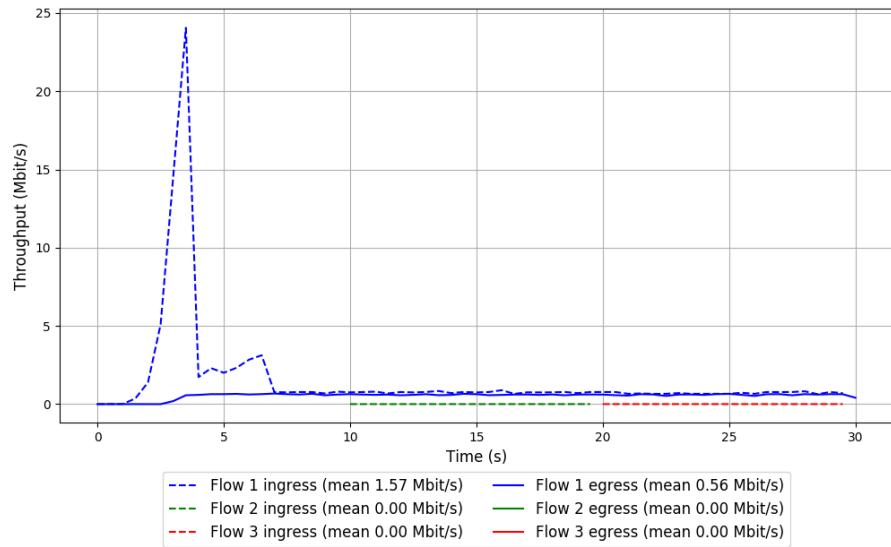
Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-06-06 02:08:02
End at: 2018-06-06 02:08:32
Local clock offset: -3.103 ms
Remote clock offset: 6.485 ms

Run 3: Report of FillP — Data Link

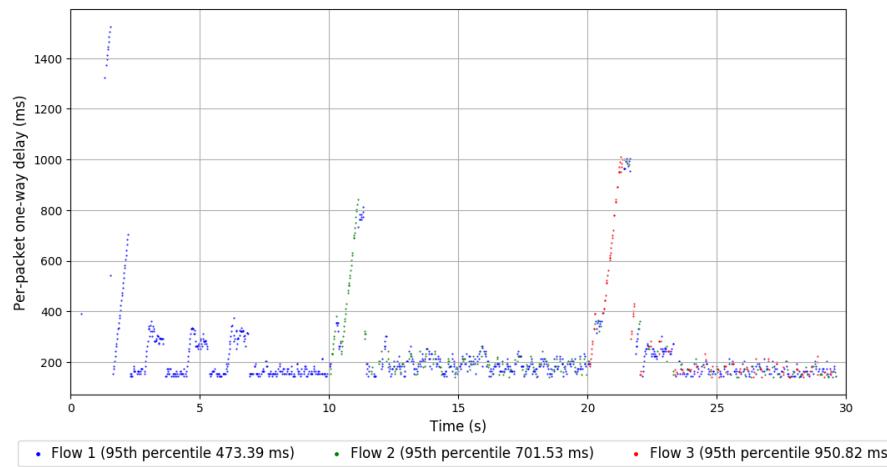
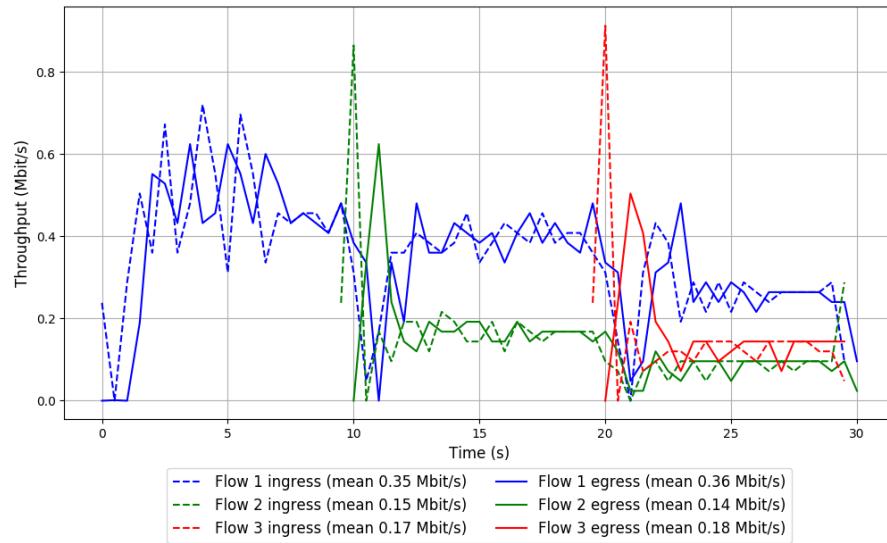


Run 1: Statistics of Indigo

```
Start at: 2018-06-06 01:40:27
End at: 2018-06-06 01:40:57
Local clock offset: -1.882 ms
Remote clock offset: 8.29 ms

# Below is generated by plot.py at 2018-06-06 02:23:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 700.990 ms
Loss rate: 1.67%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 473.389 ms
Loss rate: 0.69%
-- Flow 2:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 701.534 ms
Loss rate: 4.90%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 950.824 ms
Loss rate: 2.14%
```

Run 1: Report of Indigo — Data Link

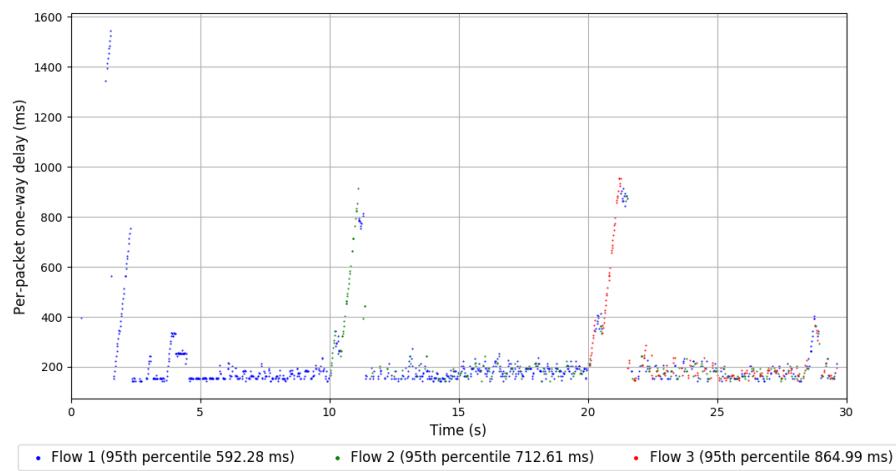
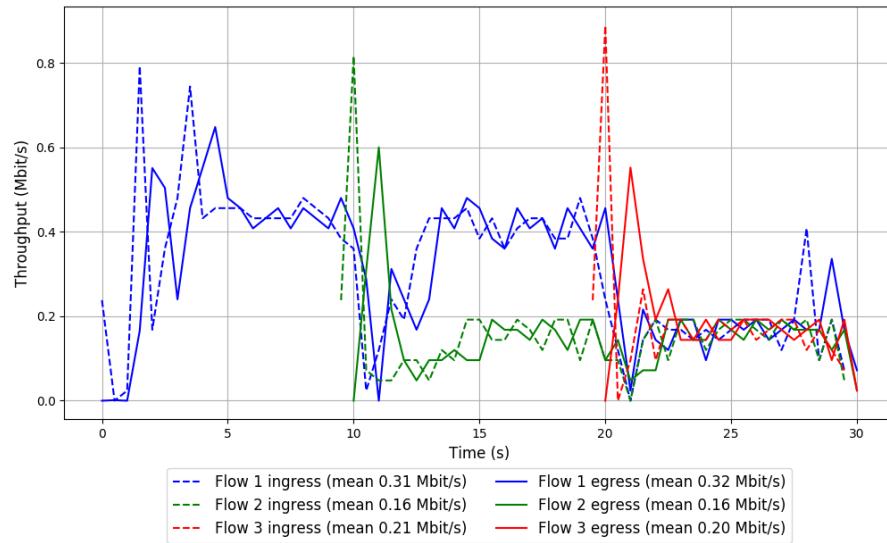


Run 2: Statistics of Indigo

```
Start at: 2018-06-06 01:59:39
End at: 2018-06-06 02:00:09
Local clock offset: -1.198 ms
Remote clock offset: 9.266 ms

# Below is generated by plot.py at 2018-06-06 02:23:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 712.611 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 592.279 ms
Loss rate: 0.39%
-- Flow 2:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 712.611 ms
Loss rate: 1.50%
-- Flow 3:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 864.989 ms
Loss rate: 1.81%
```

Run 2: Report of Indigo — Data Link

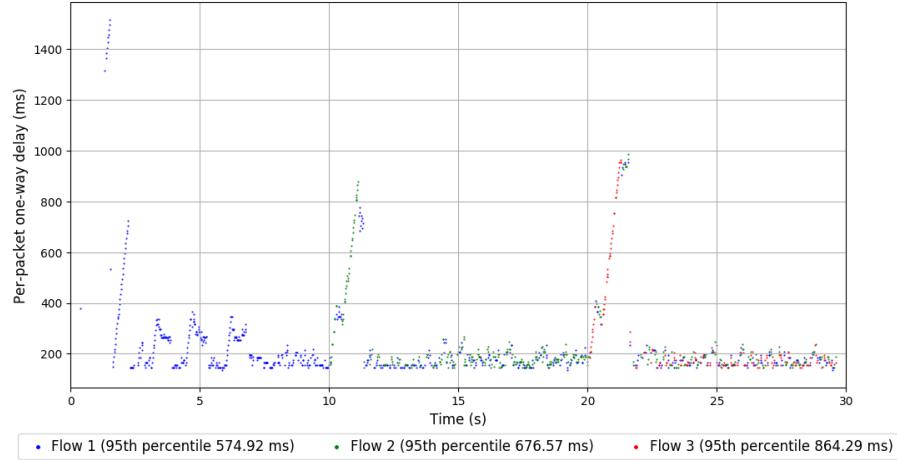
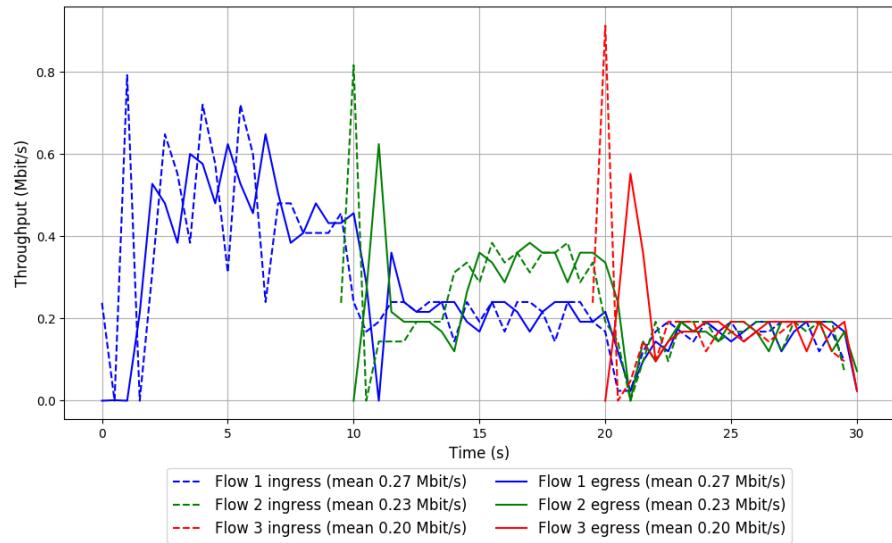


Run 3: Statistics of Indigo

```
Start at: 2018-06-06 02:18:51
End at: 2018-06-06 02:19:21
Local clock offset: -6.467 ms
Remote clock offset: 11.254 ms

# Below is generated by plot.py at 2018-06-06 02:23:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 695.131 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 574.923 ms
Loss rate: 0.60%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 676.567 ms
Loss rate: 1.04%
-- Flow 3:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 864.290 ms
Loss rate: 2.43%
```

Run 3: Report of Indigo — Data Link

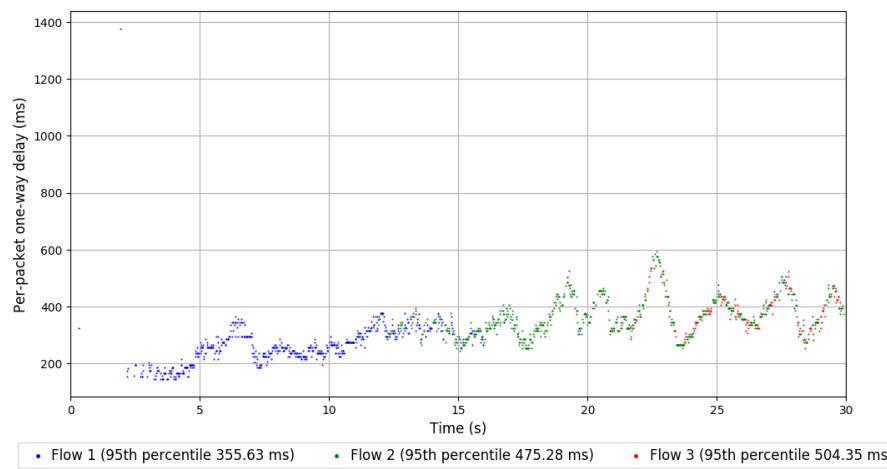
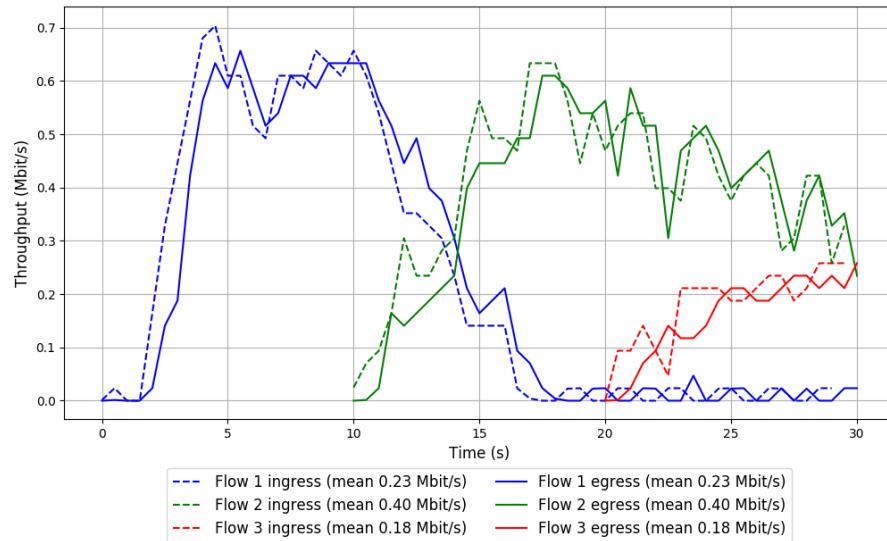


```
Run 1: Statistics of LEDBAT

Start at: 2018-06-06 01:26:00
End at: 2018-06-06 01:26:30
Local clock offset: -1.787 ms
Remote clock offset: 9.8 ms

# Below is generated by plot.py at 2018-06-06 02:23:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 464.303 ms
Loss rate: 1.70%
-- Flow 1:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 355.635 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 475.280 ms
Loss rate: 1.91%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 504.349 ms
Loss rate: 7.28%
```

Run 1: Report of LEDBAT — Data Link

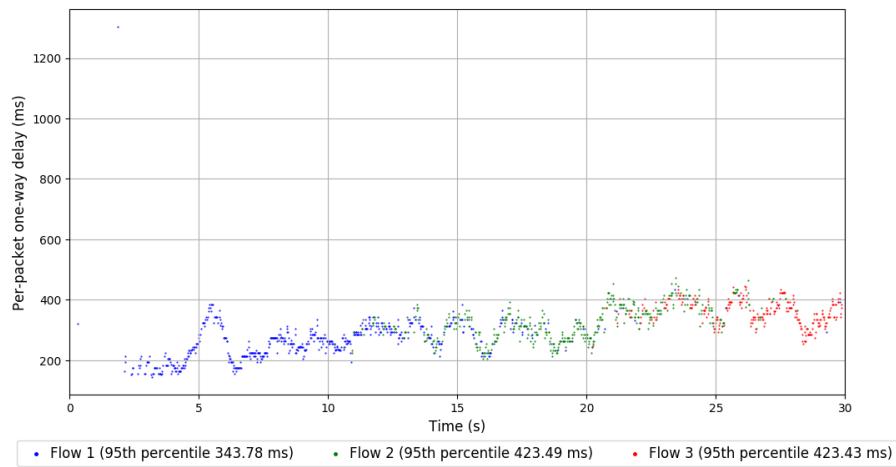
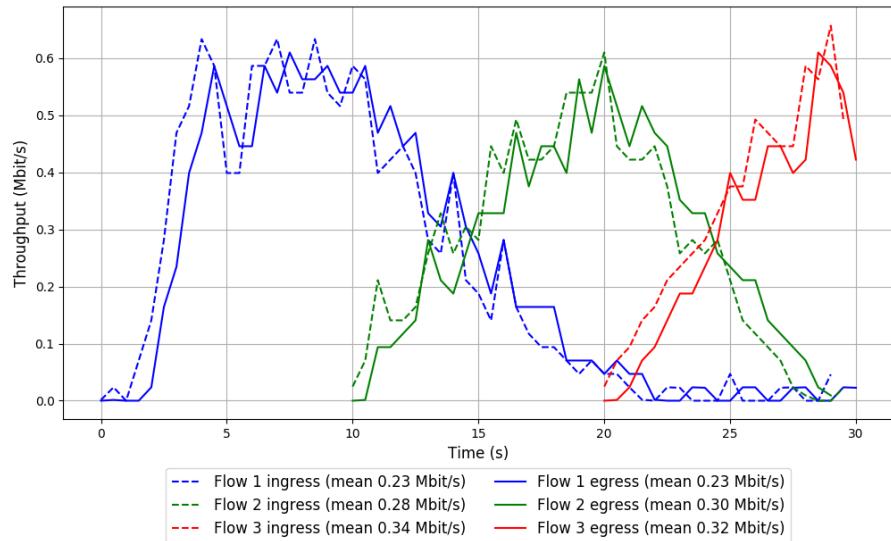


Run 2: Statistics of LEDBAT

```
Start at: 2018-06-06 01:45:15
End at: 2018-06-06 01:45:45
Local clock offset: -2.011 ms
Remote clock offset: 9.996 ms

# Below is generated by plot.py at 2018-06-06 02:23:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 413.461 ms
Loss rate: 1.72%
-- Flow 1:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 343.777 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 423.487 ms
Loss rate: 0.21%
-- Flow 3:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 423.433 ms
Loss rate: 7.69%
```

Run 2: Report of LEDBAT — Data Link

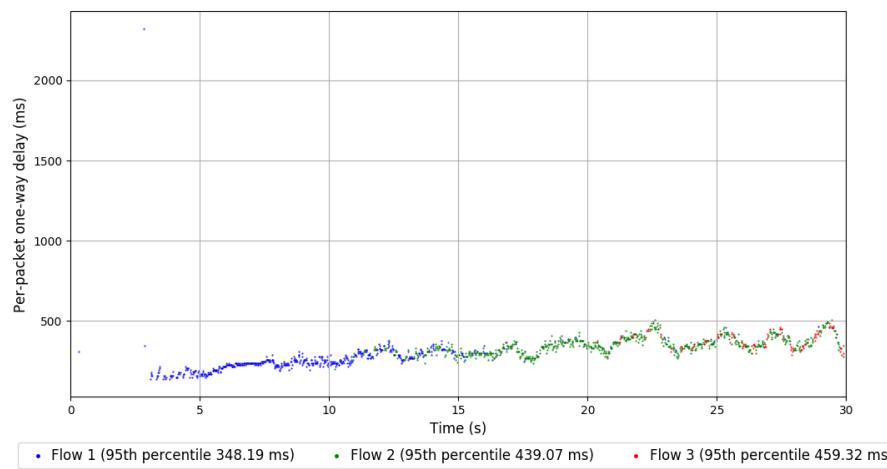
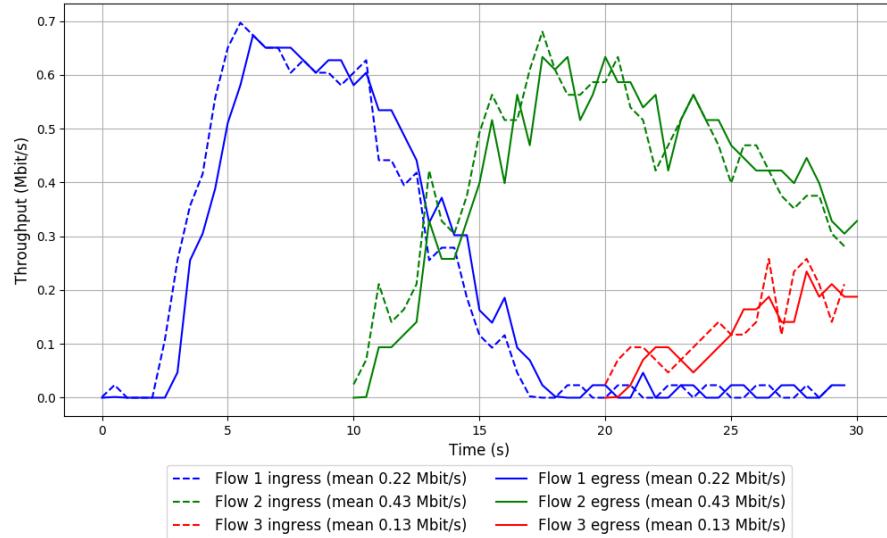


Run 3: Statistics of LEDBAT

```
Start at: 2018-06-06 02:04:26
End at: 2018-06-06 02:04:56
Local clock offset: -1.416 ms
Remote clock offset: 9.935 ms

# Below is generated by plot.py at 2018-06-06 02:23:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 429.956 ms
Loss rate: 1.24%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 348.190 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 439.072 ms
Loss rate: 1.52%
-- Flow 3:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 459.316 ms
Loss rate: 5.35%
```

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

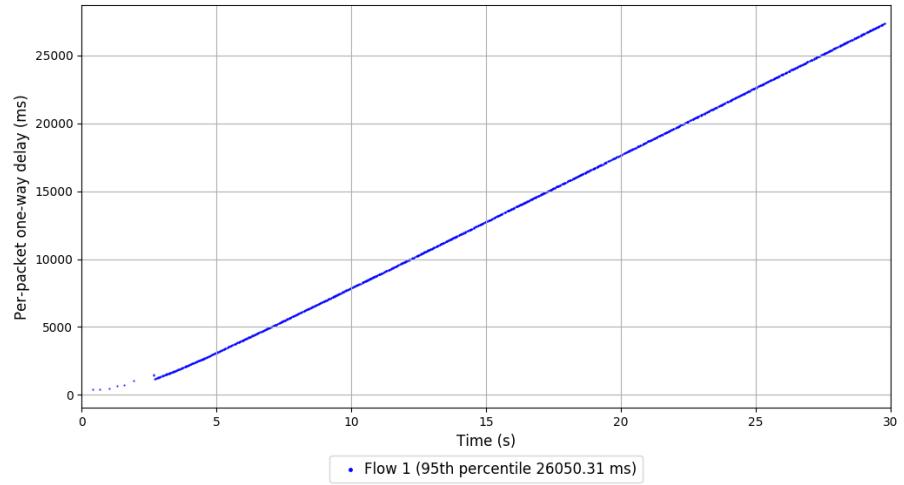
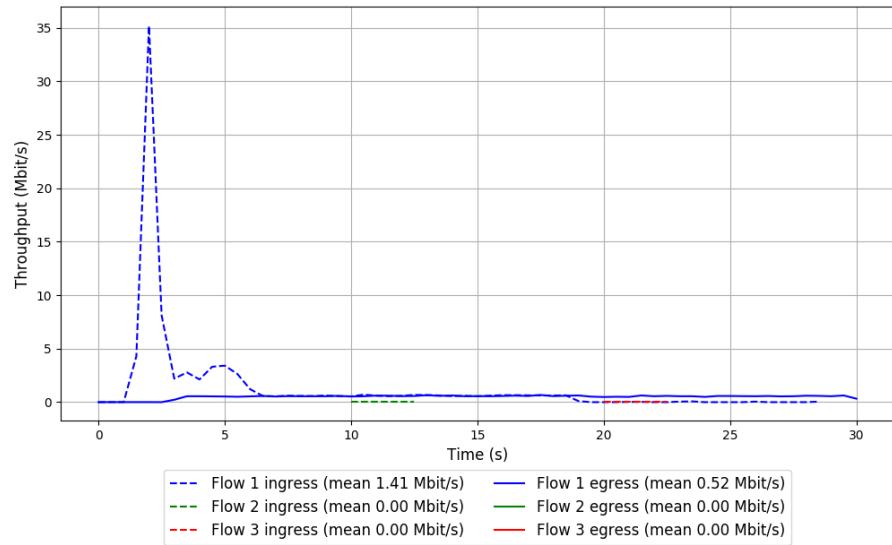
Start at: 2018-06-06 01:38:02

End at: 2018-06-06 01:38:32

Local clock offset: -2.596 ms

Remote clock offset: 4.62 ms

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

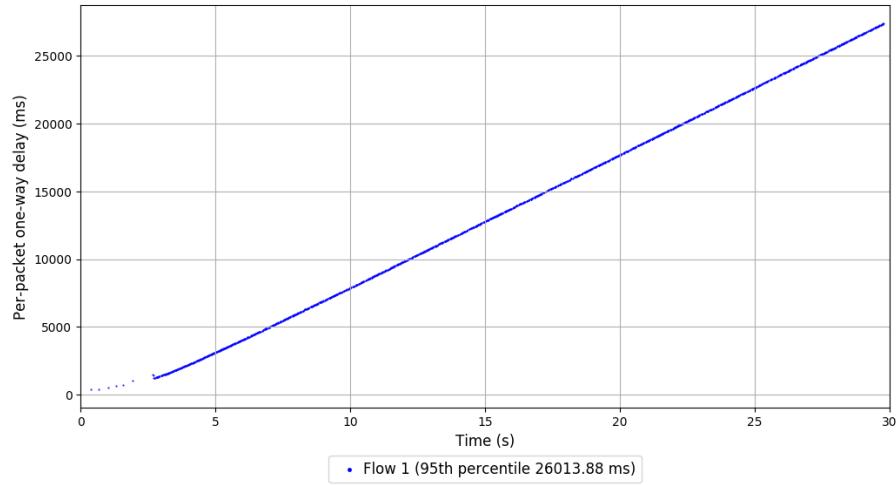
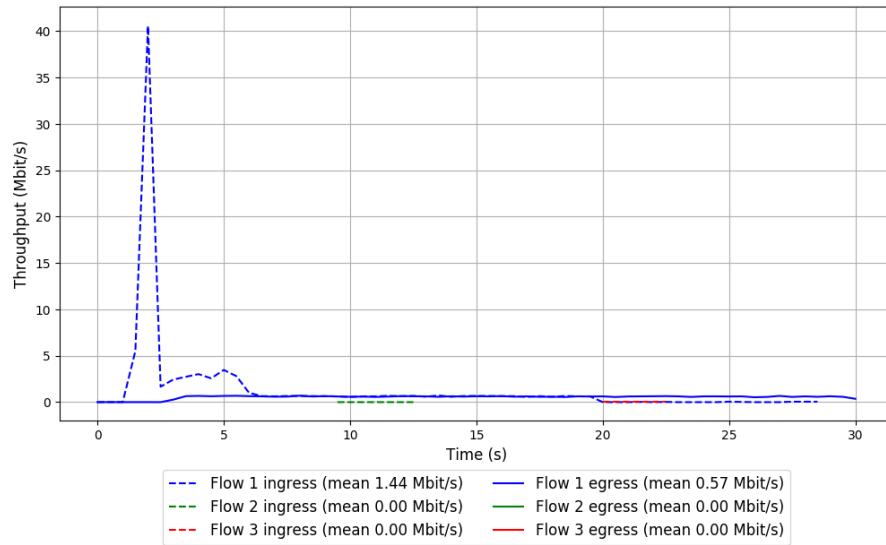
Start at: 2018-06-06 01:57:15

End at: 2018-06-06 01:57:45

Local clock offset: -1.218 ms

Remote clock offset: 6.172 ms

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

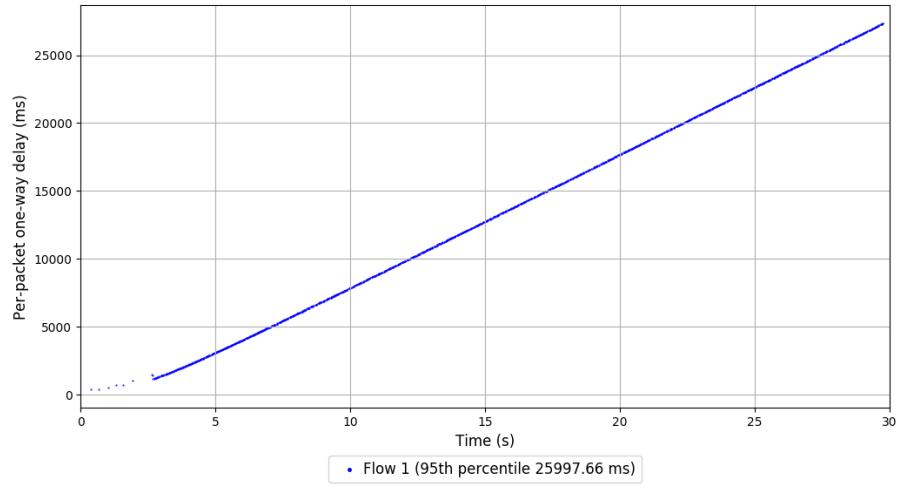
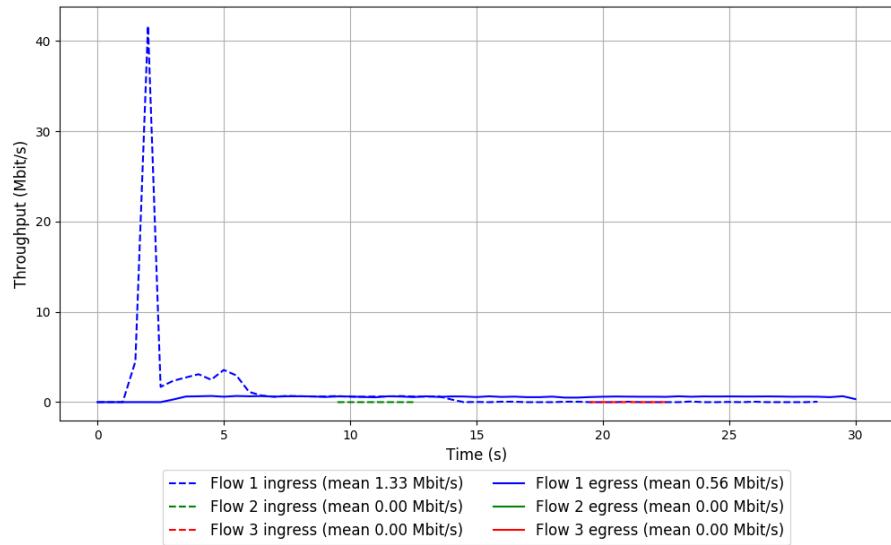
Start at: 2018-06-06 02:16:27

End at: 2018-06-06 02:16:57

Local clock offset: -6.095 ms

Remote clock offset: 10.554 ms

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

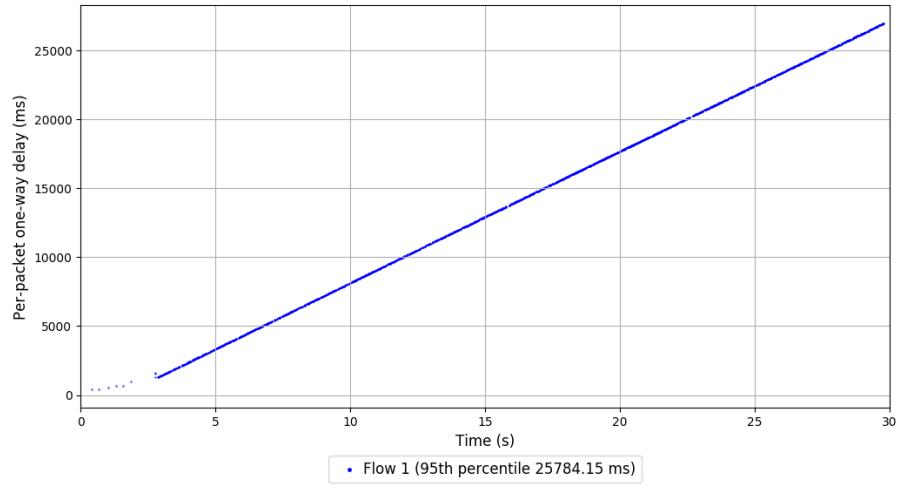
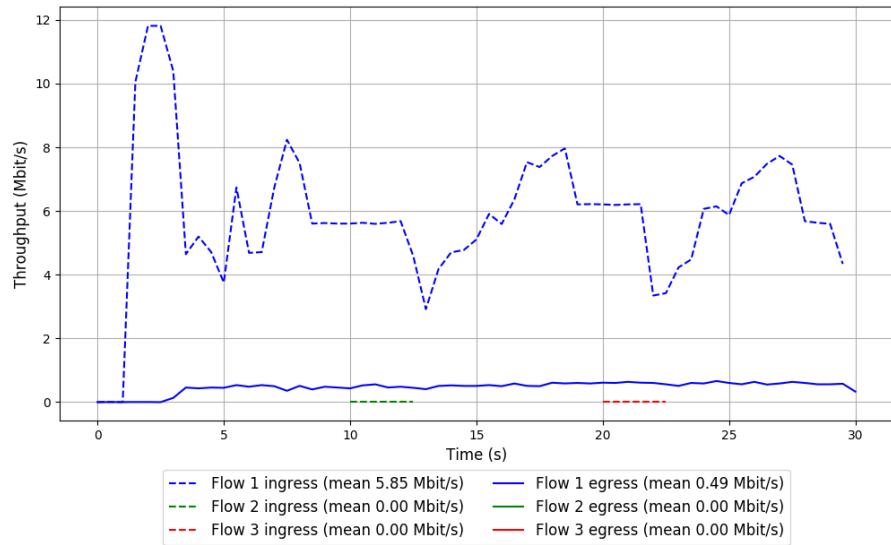
Start at: 2018-06-06 01:35:38

End at: 2018-06-06 01:36:08

Local clock offset: -0.94 ms

Remote clock offset: 4.838 ms

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

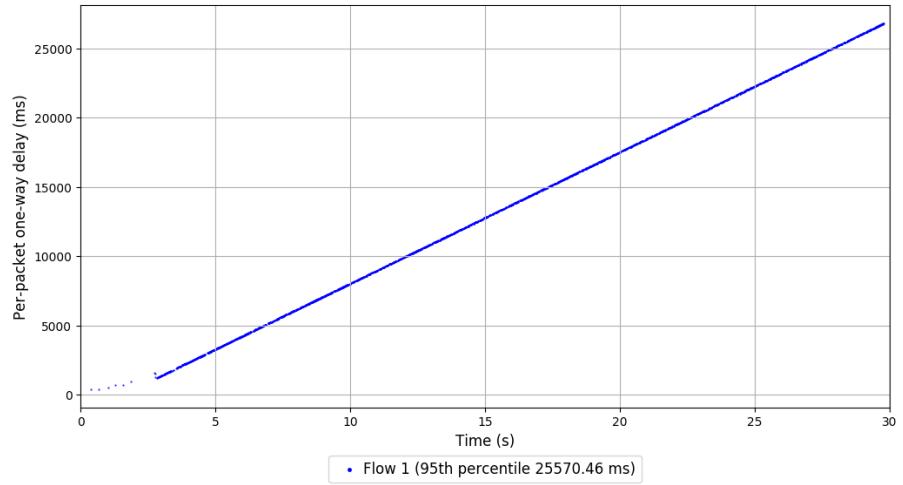
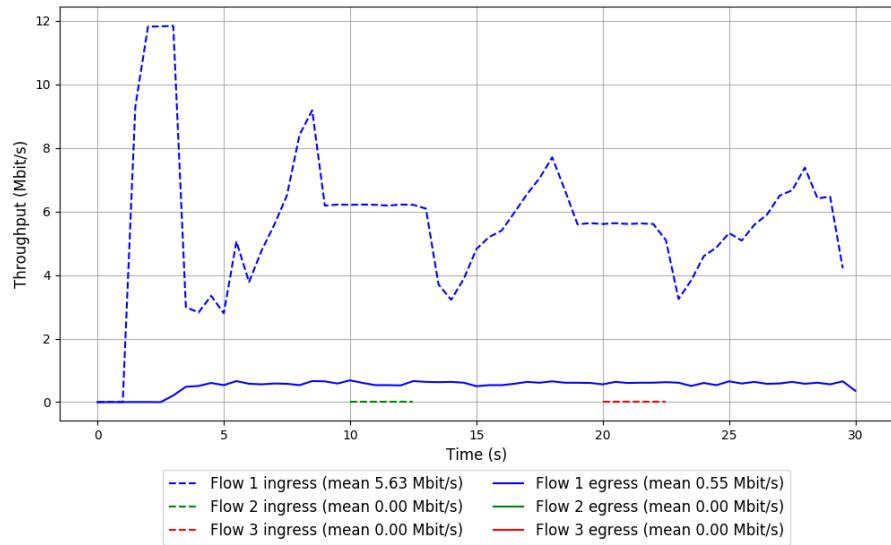
Start at: 2018-06-06 01:54:49

End at: 2018-06-06 01:55:19

Local clock offset: -1.988 ms

Remote clock offset: 4.891 ms

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

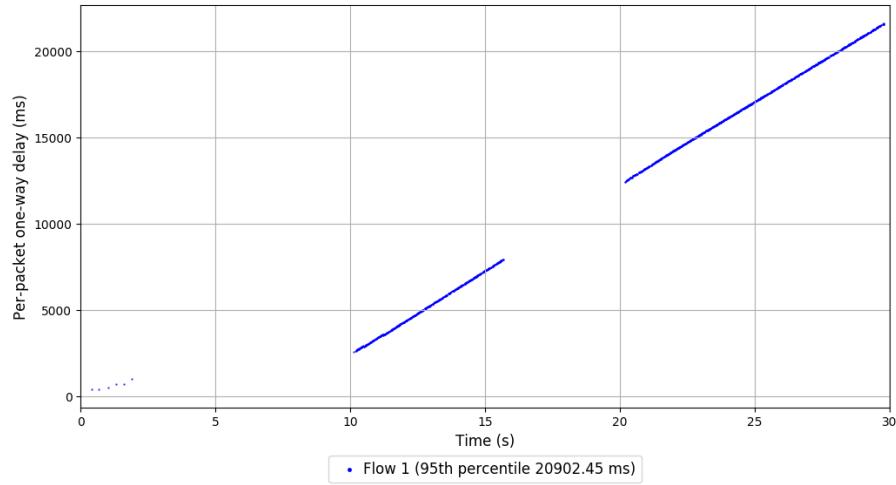
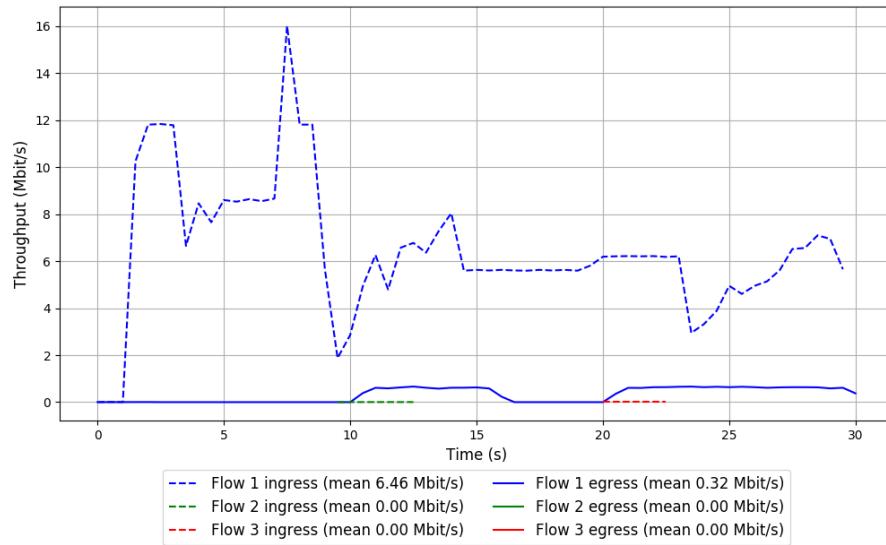
Start at: 2018-06-06 02:14:00

End at: 2018-06-06 02:14:30

Local clock offset: -5.576 ms

Remote clock offset: 7.023 ms

Run 3: Report of PCC-Expr — Data Link

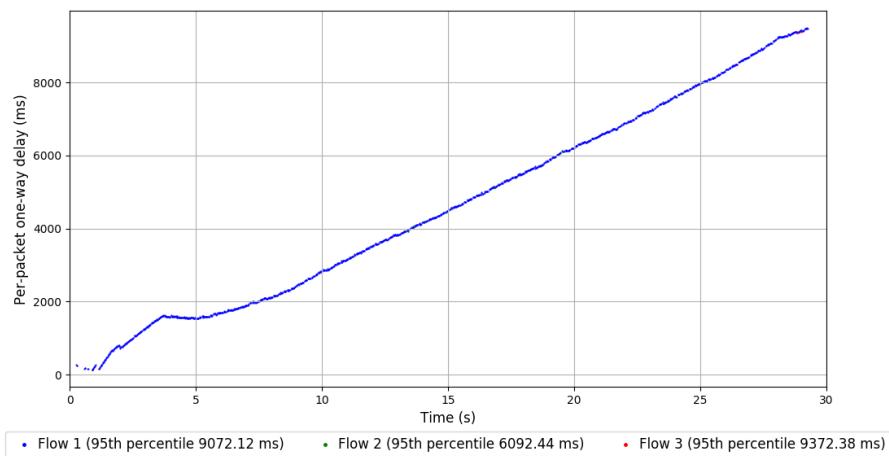
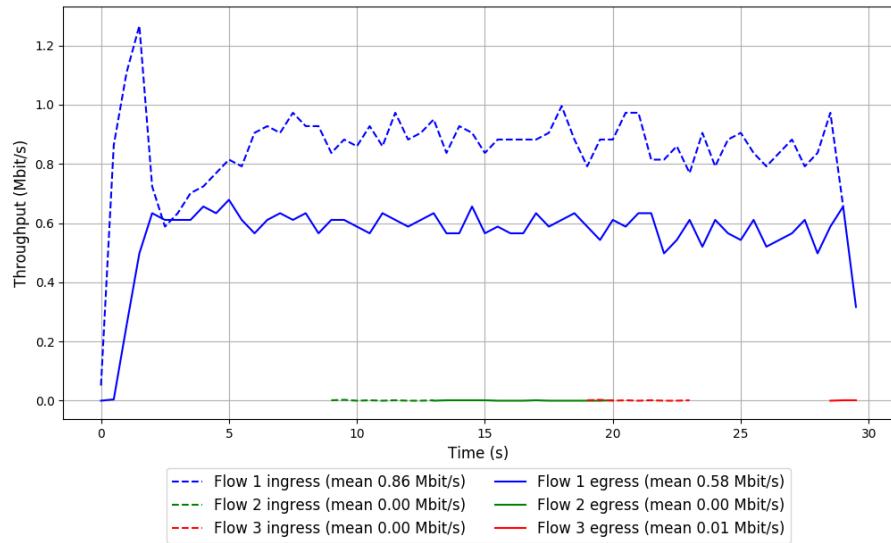


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2018-06-06 01:33:14
End at: 2018-06-06 01:38:44
Local clock offset: -2.409 ms
Remote clock offset: 9.92 ms

# Below is generated by plot.py at 2018-06-06 02:23:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 9121.661 ms
Loss rate: 32.85%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 9072.123 ms
Loss rate: 32.85%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 6092.442 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 9372.381 ms
Loss rate: 66.67%
```

Run 1: Report of QUIC Cubic — Data Link

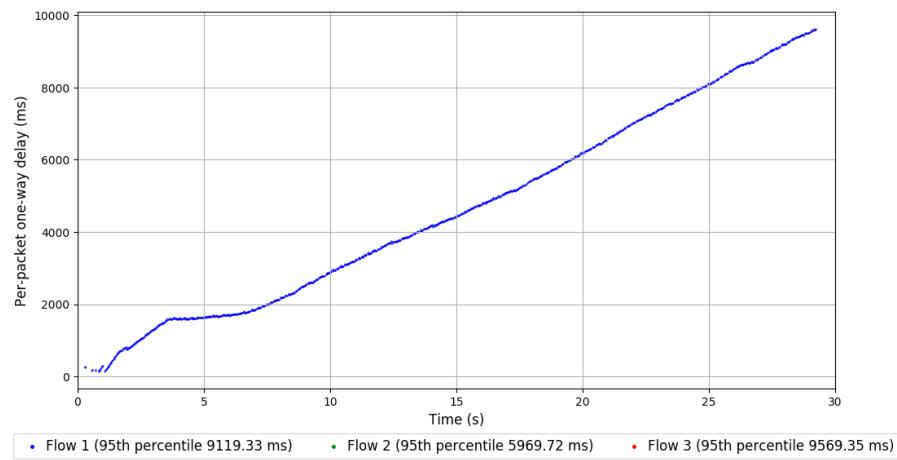
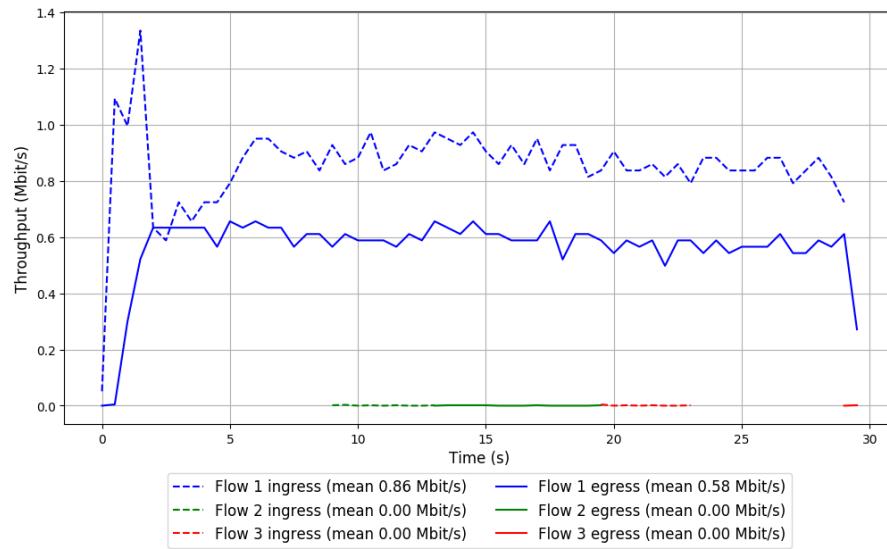


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-06-06 01:52:25
End at: 2018-06-06 01:52:55
Local clock offset: -1.983 ms
Remote clock offset: 4.779 ms

# Below is generated by plot.py at 2018-06-06 02:23:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 9119.327 ms
Loss rate: 32.91%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 9119.327 ms
Loss rate: 32.91%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 5969.723 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 9569.353 ms
Loss rate: 83.33%
```

Run 2: Report of QUIC Cubic — Data Link

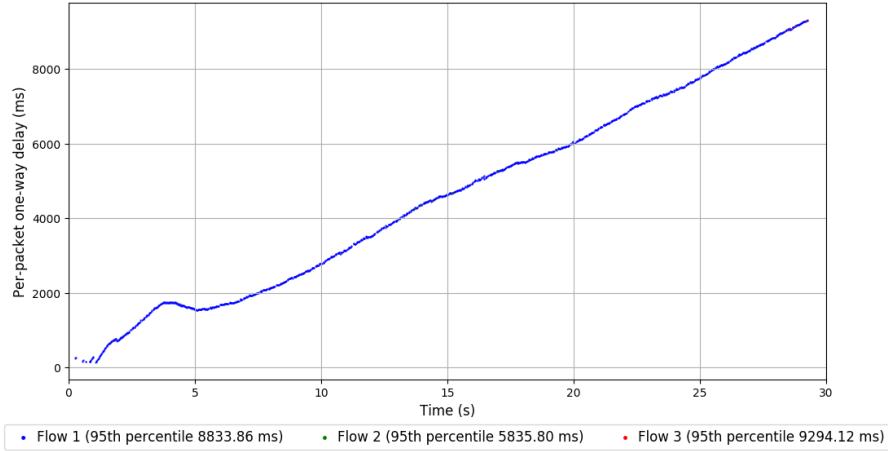
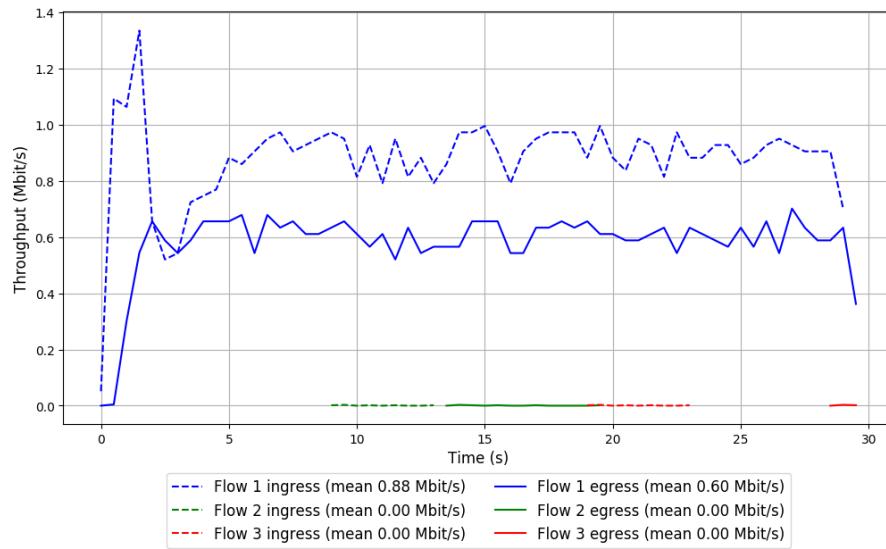


Run 3: Statistics of QUIC Cubic

```
Start at: 2018-06-06 02:11:37
End at: 2018-06-06 02:12:07
Local clock offset: -5.041 ms
Remote clock offset: 7.058 ms

# Below is generated by plot.py at 2018-06-06 02:23:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 8833.978 ms
Loss rate: 32.84%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 8833.862 ms
Loss rate: 32.85%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 5835.801 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 9294.117 ms
Loss rate: 50.00%
```

Run 3: Report of QUIC Cubic — Data Link

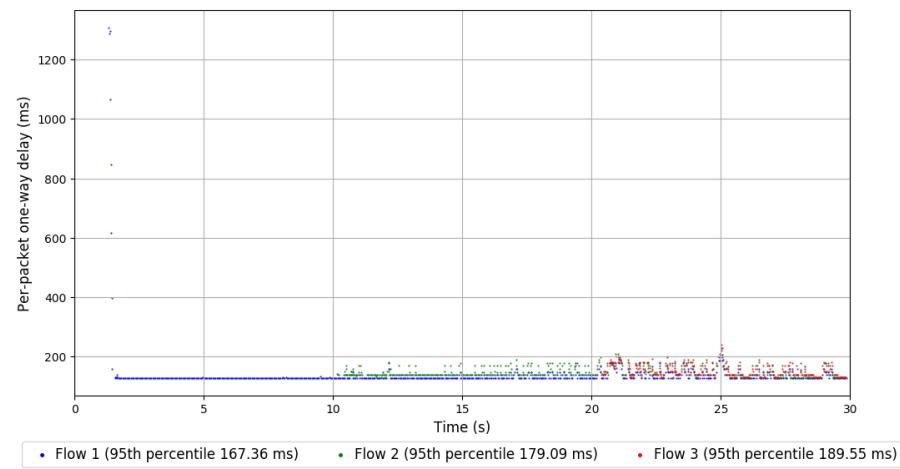
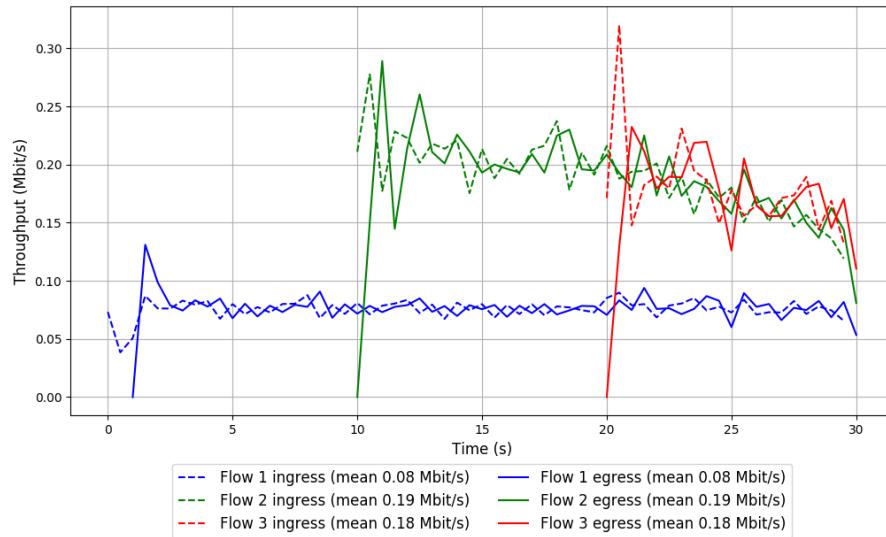


```
Run 1: Statistics of SCReAM

Start at: 2018-06-06 01:32:02
End at: 2018-06-06 01:32:32
Local clock offset: -1.73 ms
Remote clock offset: 10.154 ms

# Below is generated by plot.py at 2018-06-06 02:23:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 179.631 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 167.357 ms
Loss rate: 0.66%
-- Flow 2:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 179.090 ms
Loss rate: 0.88%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 189.548 ms
Loss rate: 1.98%
```

Run 1: Report of SCReAM — Data Link

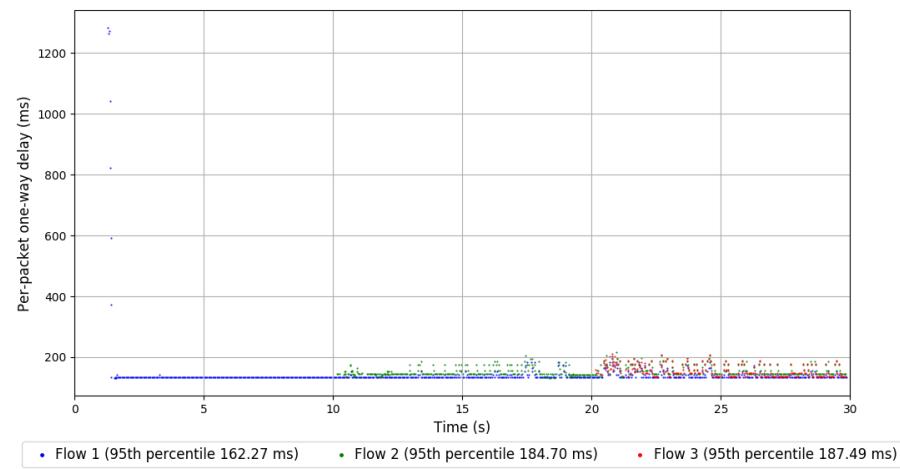
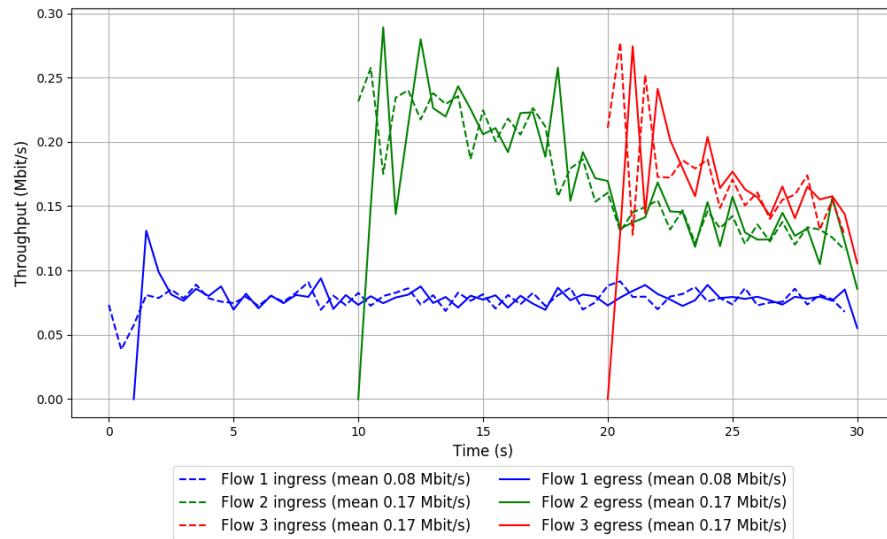


Run 2: Statistics of SCReAM

```
Start at: 2018-06-06 01:51:14
End at: 2018-06-06 01:51:44
Local clock offset: -2.754 ms
Remote clock offset: 4.646 ms

# Below is generated by plot.py at 2018-06-06 02:23:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 184.590 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 162.270 ms
Loss rate: 0.66%
-- Flow 2:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 184.703 ms
Loss rate: 0.96%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 187.486 ms
Loss rate: 1.97%
```

Run 2: Report of SCReAM — Data Link

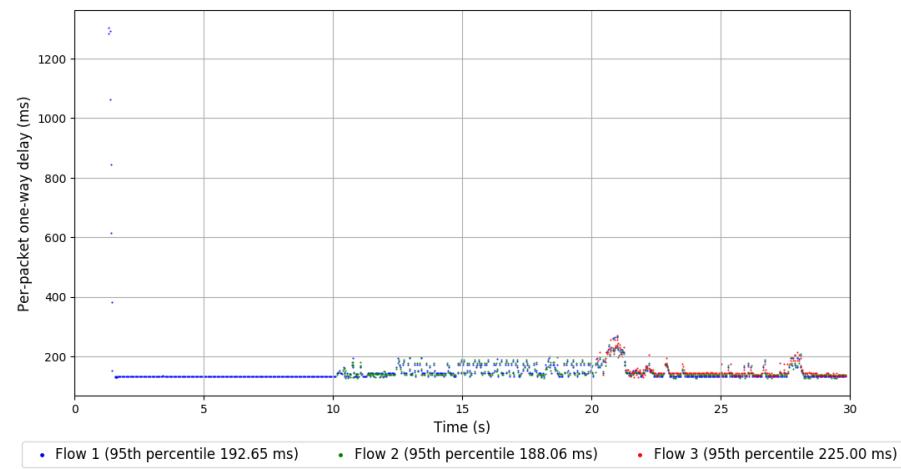
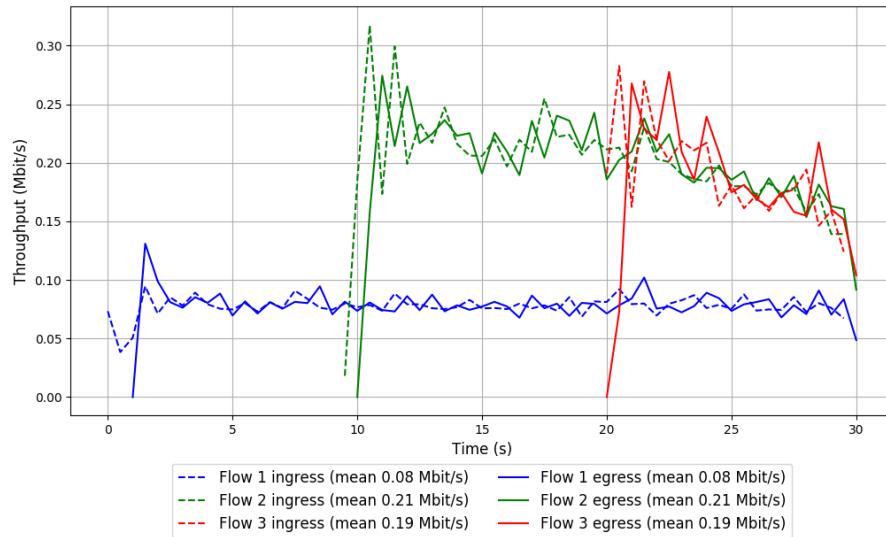


Run 3: Statistics of SCReAM

```
Start at: 2018-06-06 02:10:25
End at: 2018-06-06 02:10:55
Local clock offset: -3.958 ms
Remote clock offset: 10.913 ms

# Below is generated by plot.py at 2018-06-06 02:23:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 197.865 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 192.648 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 188.058 ms
Loss rate: 0.97%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 225.002 ms
Loss rate: 1.75%
```

Run 3: Report of SCReAM — Data Link

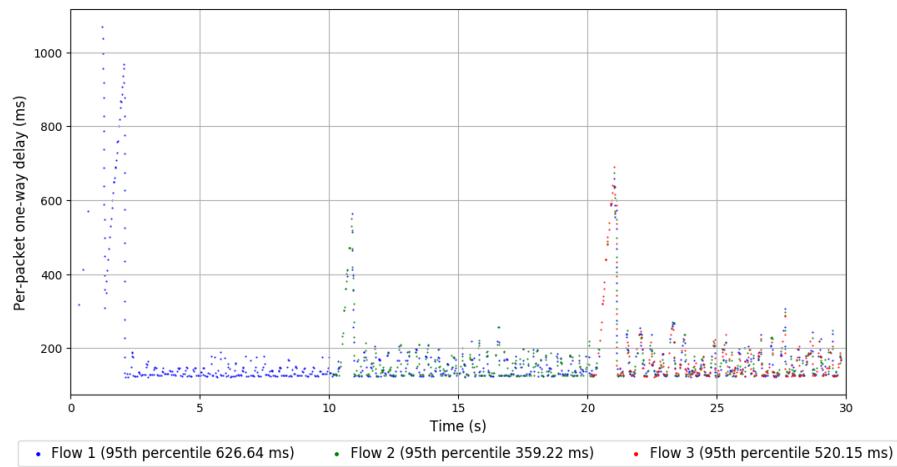
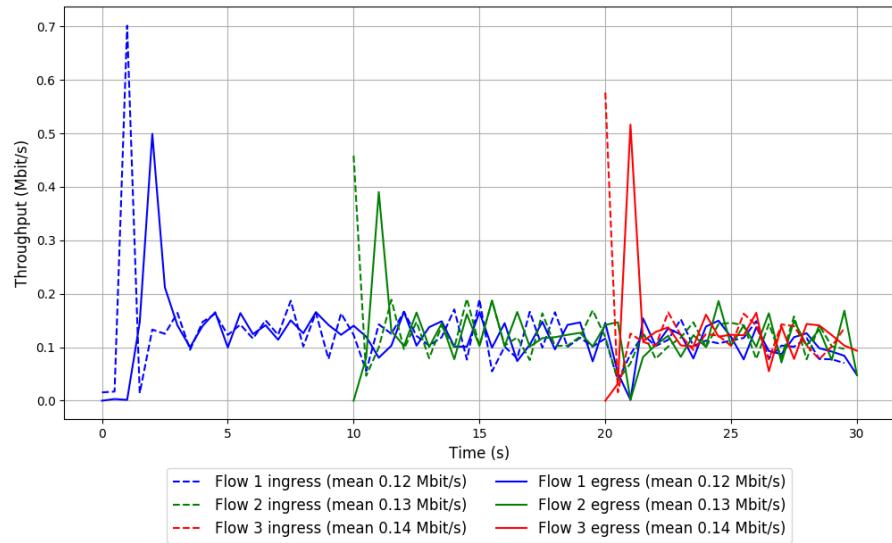


Run 1: Statistics of Sprout

```
Start at: 2018-06-06 01:41:39
End at: 2018-06-06 01:42:09
Local clock offset: -2.669 ms
Remote clock offset: 9.394 ms

# Below is generated by plot.py at 2018-06-06 02:23:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 520.153 ms
Loss rate: 0.97%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 626.639 ms
Loss rate: 0.65%
-- Flow 2:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 359.219 ms
Loss rate: 1.05%
-- Flow 3:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 520.153 ms
Loss rate: 1.67%
```

Run 1: Report of Sprout — Data Link

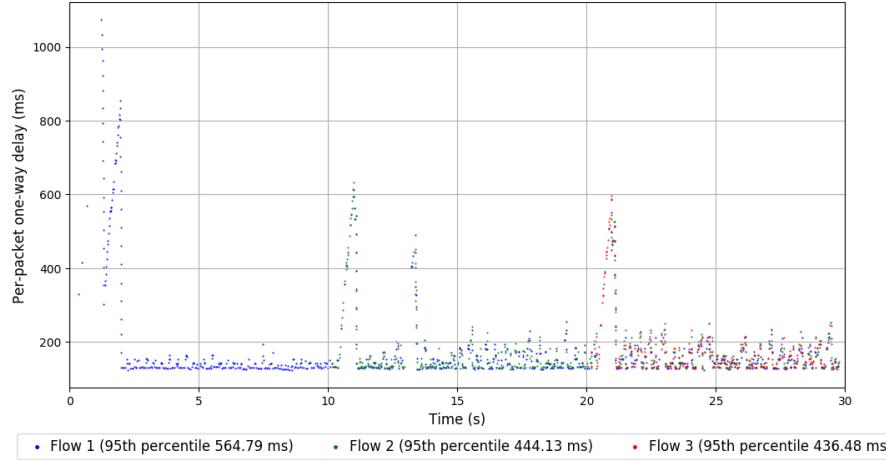
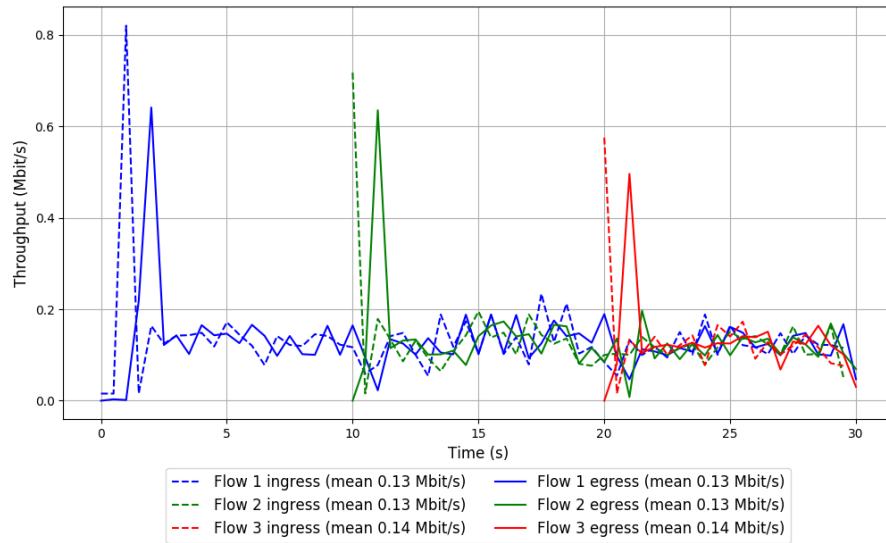


Run 2: Statistics of Sprout

```
Start at: 2018-06-06 02:00:51
End at: 2018-06-06 02:01:21
Local clock offset: -1.955 ms
Remote clock offset: 11.315 ms

# Below is generated by plot.py at 2018-06-06 02:23:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 509.155 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 564.787 ms
Loss rate: 1.16%
-- Flow 2:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 444.131 ms
Loss rate: 0.91%
-- Flow 3:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 436.480 ms
Loss rate: 1.78%
```

Run 2: Report of Sprout — Data Link

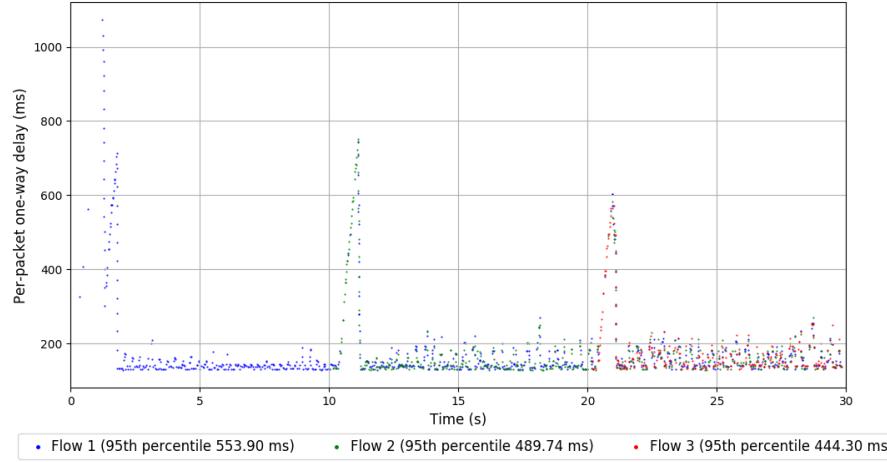
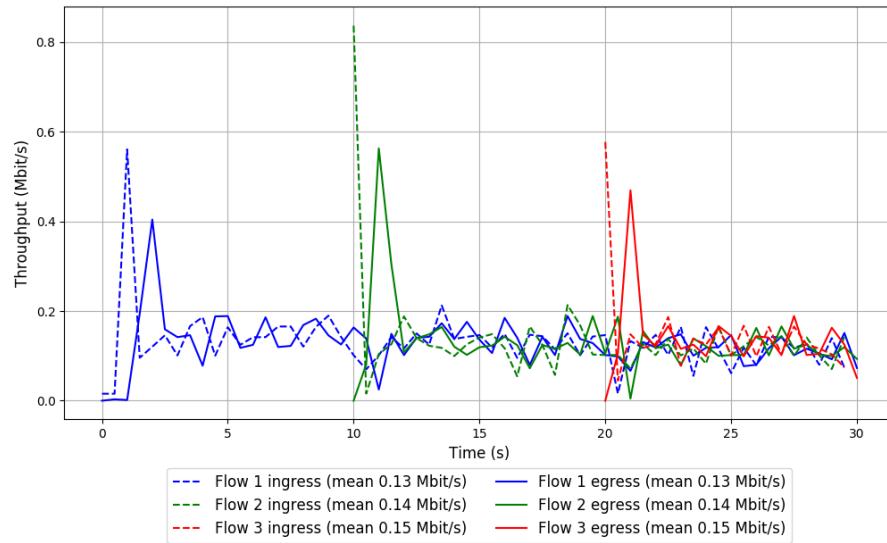


Run 3: Statistics of Sprout

```
Start at: 2018-06-06 02:20:03
End at: 2018-06-06 02:20:33
Local clock offset: -6.687 ms
Remote clock offset: 7.744 ms

# Below is generated by plot.py at 2018-06-06 02:23:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 500.956 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 553.896 ms
Loss rate: 0.57%
-- Flow 2:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 489.743 ms
Loss rate: 1.26%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 444.298 ms
Loss rate: 1.55%
```

Run 3: Report of Sprout — Data Link

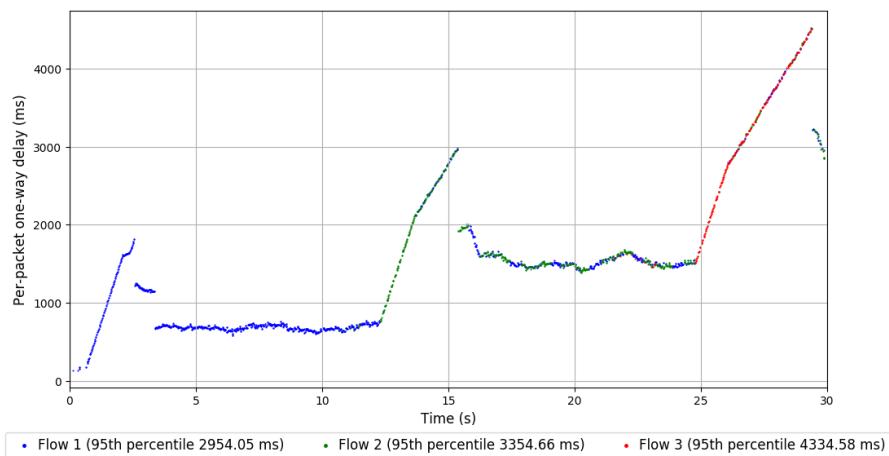
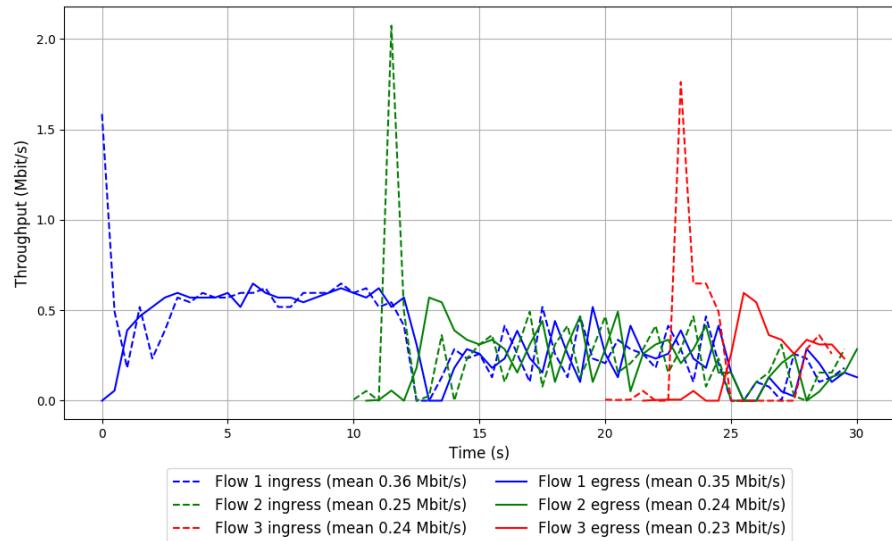


Run 1: Statistics of TaoVA-100x

```
Start at: 2018-06-06 01:30:47
End at: 2018-06-06 01:31:17
Local clock offset: -1.747 ms
Remote clock offset: 4.193 ms

# Below is generated by plot.py at 2018-06-06 02:23:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 3734.552 ms
Loss rate: 7.49%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 2954.046 ms
Loss rate: 4.22%
-- Flow 2:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 3354.661 ms
Loss rate: 8.85%
-- Flow 3:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 4334.579 ms
Loss rate: 20.03%
```

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

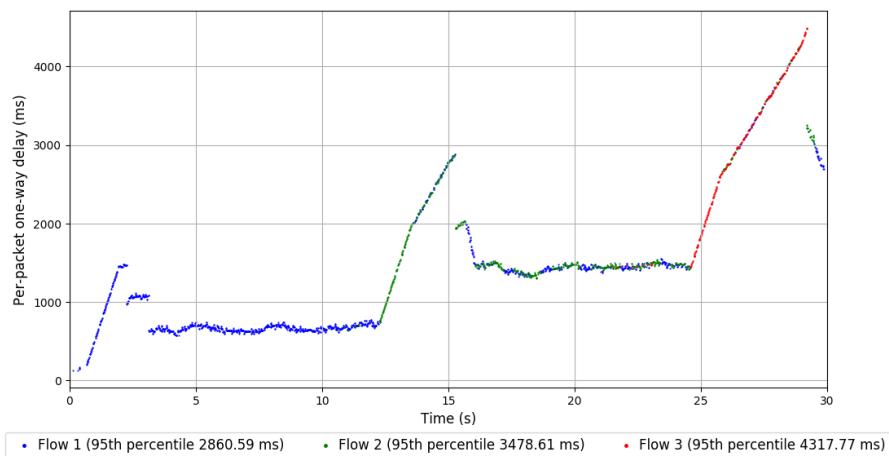
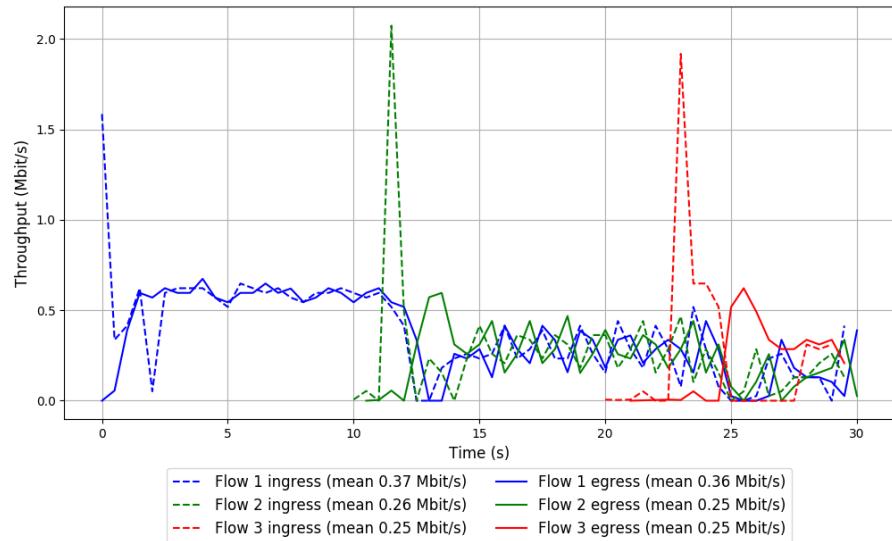


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-06-06 01:50:01
End at: 2018-06-06 01:50:32
Local clock offset: -2.809 ms
Remote clock offset: 8.543 ms

# Below is generated by plot.py at 2018-06-06 02:23:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 3623.683 ms
Loss rate: 7.29%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 2860.591 ms
Loss rate: 4.06%
-- Flow 2:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 3478.612 ms
Loss rate: 8.83%
-- Flow 3:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 4317.765 ms
Loss rate: 19.27%
```

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

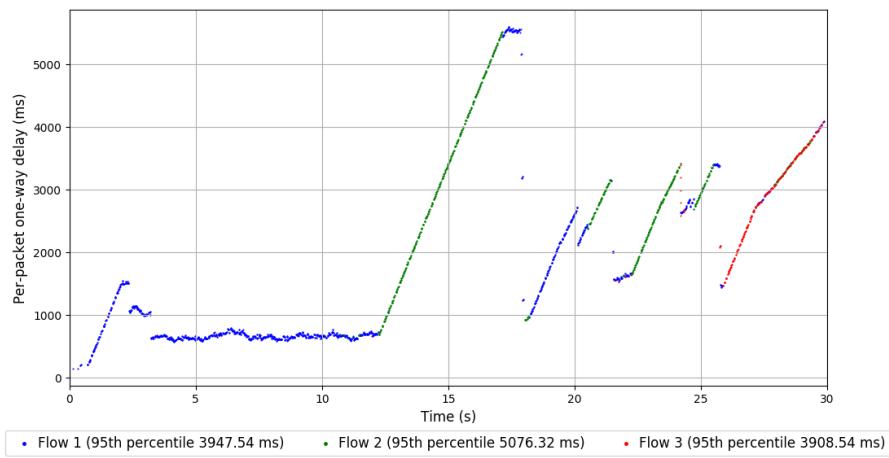
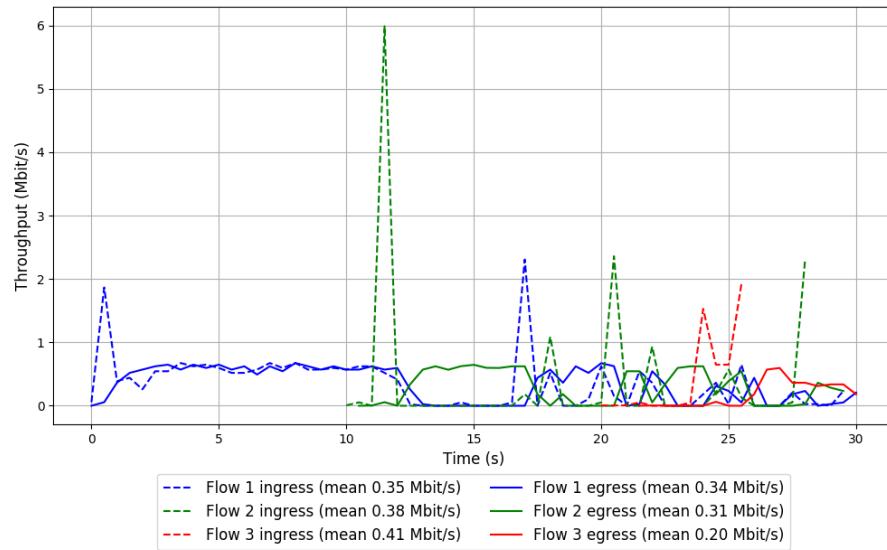


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-06-06 02:09:13
End at: 2018-06-06 02:09:43
Local clock offset: -5.086 ms
Remote clock offset: 6.633 ms

# Below is generated by plot.py at 2018-06-06 02:23:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 4854.830 ms
Loss rate: 12.01%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 3947.539 ms
Loss rate: 4.17%
-- Flow 2:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 5076.321 ms
Loss rate: 16.94%
-- Flow 3:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 3908.544 ms
Loss rate: 31.96%
```

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

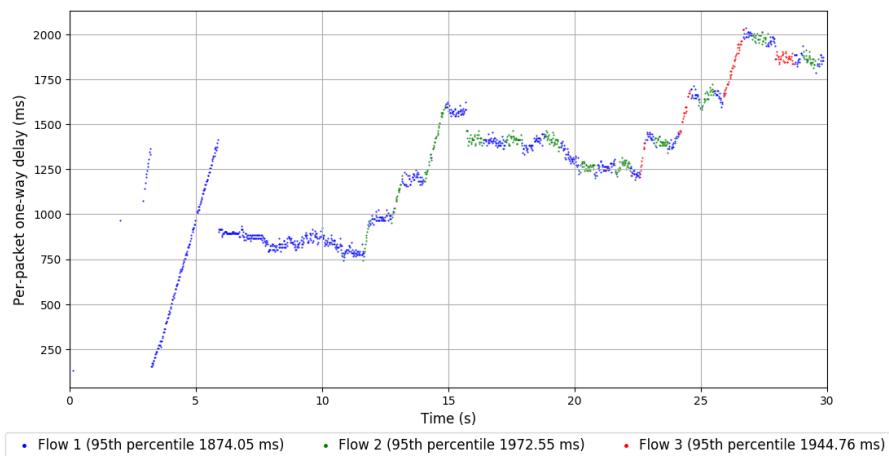
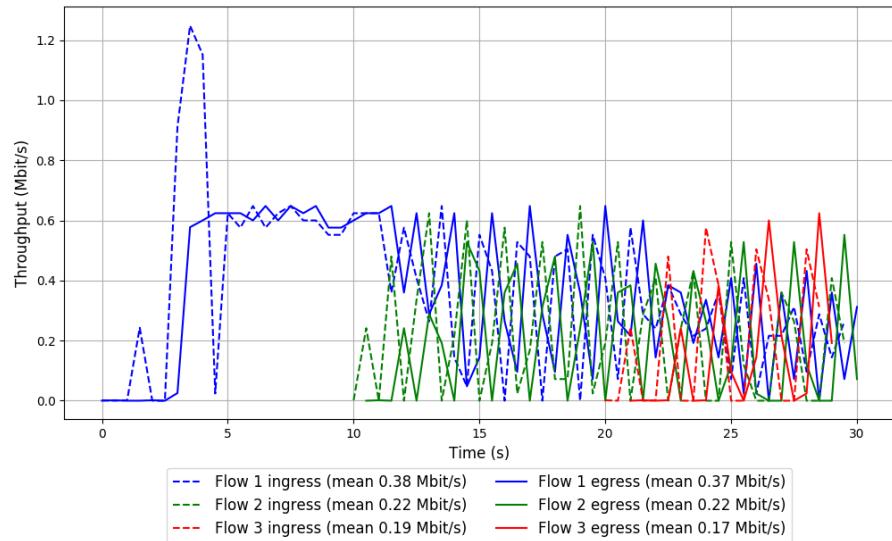


Run 1: Statistics of TCP Vegas

```
Start at: 2018-06-06 01:36:50
End at: 2018-06-06 01:37:20
Local clock offset: -1.01 ms
Remote clock offset: 8.769 ms

# Below is generated by plot.py at 2018-06-06 02:23:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 1933.979 ms
Loss rate: 6.37%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 1874.048 ms
Loss rate: 3.51%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1972.551 ms
Loss rate: 6.85%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 1944.764 ms
Loss rate: 24.42%
```

Run 1: Report of TCP Vegas — Data Link

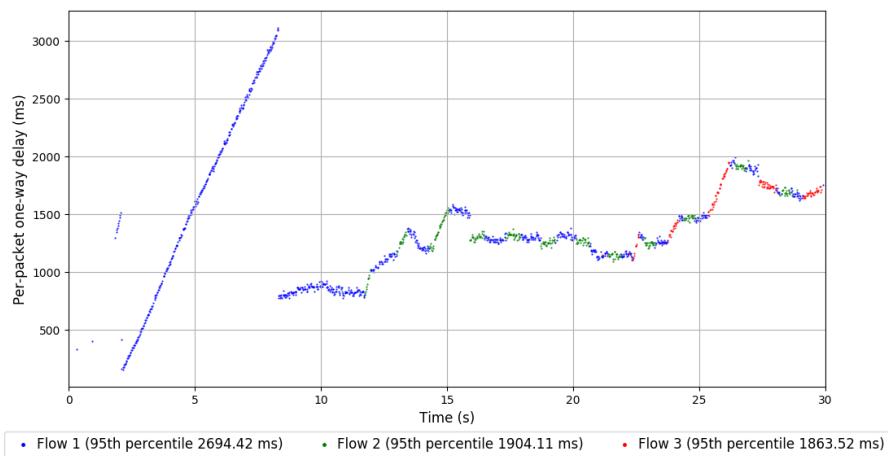
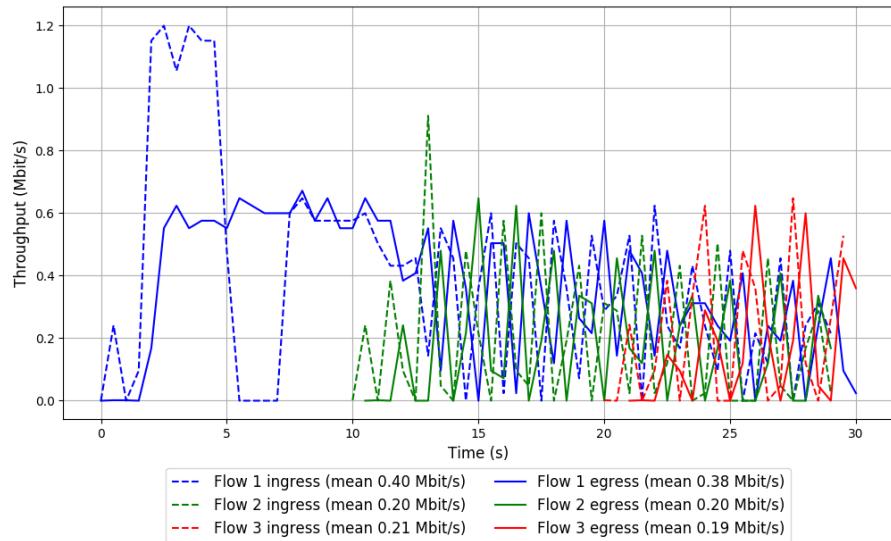


Run 2: Statistics of TCP Vegas

```
Start at: 2018-06-06 01:56:03
End at: 2018-06-06 01:56:33
Local clock offset: -2.731 ms
Remote clock offset: 4.935 ms

# Below is generated by plot.py at 2018-06-06 02:23:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 2484.817 ms
Loss rate: 5.76%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 2694.423 ms
Loss rate: 3.19%
-- Flow 2:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 1904.110 ms
Loss rate: 6.35%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 1863.517 ms
Loss rate: 19.16%
```

Run 2: Report of TCP Vegas — Data Link

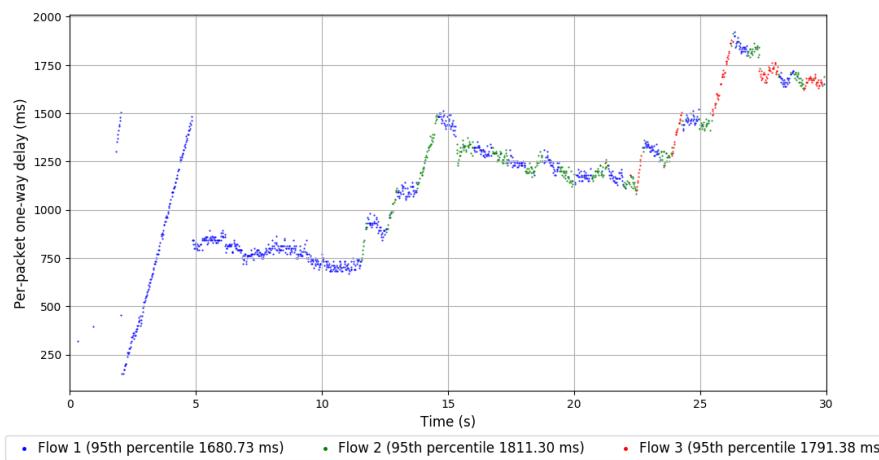
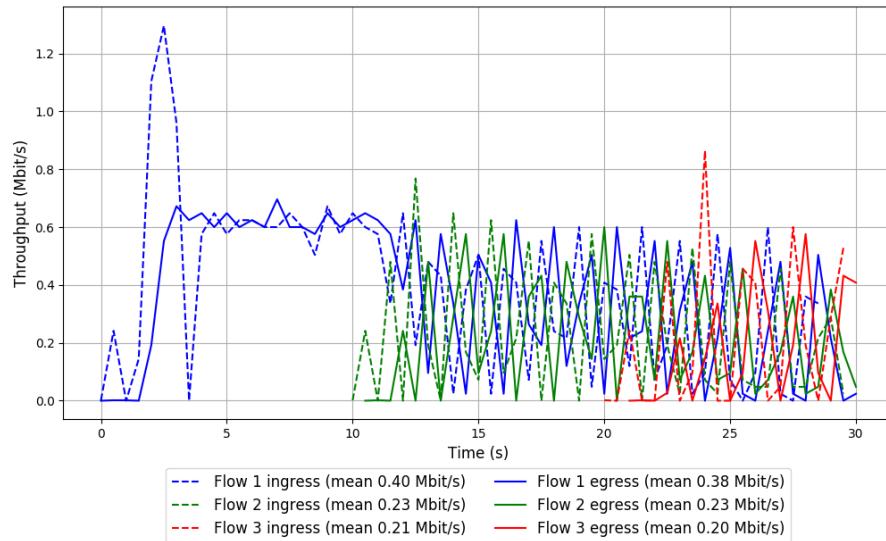


Run 3: Statistics of TCP Vegas

```
Start at: 2018-06-06 02:15:15
End at: 2018-06-06 02:15:45
Local clock offset: -6.624 ms
Remote clock offset: 10.224 ms

# Below is generated by plot.py at 2018-06-06 02:23:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1741.349 ms
Loss rate: 5.54%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 1680.731 ms
Loss rate: 2.93%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 1811.296 ms
Loss rate: 5.70%
-- Flow 3:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 1791.382 ms
Loss rate: 19.40%
```

Run 3: Report of TCP Vegas — Data Link

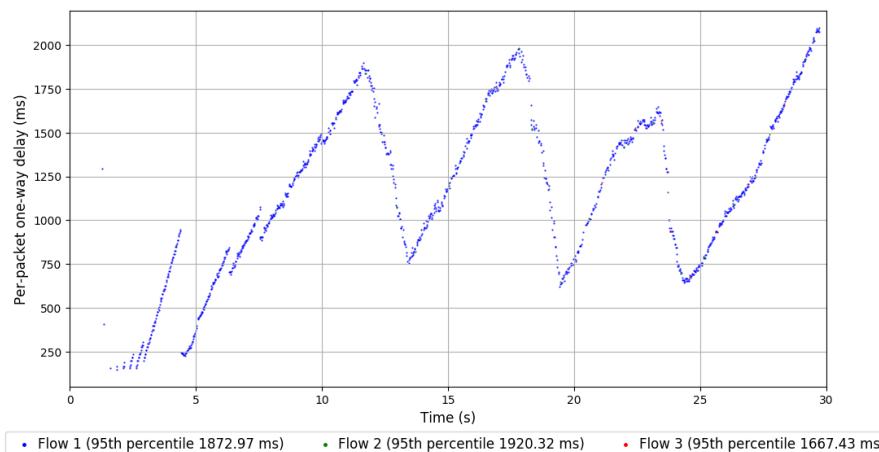
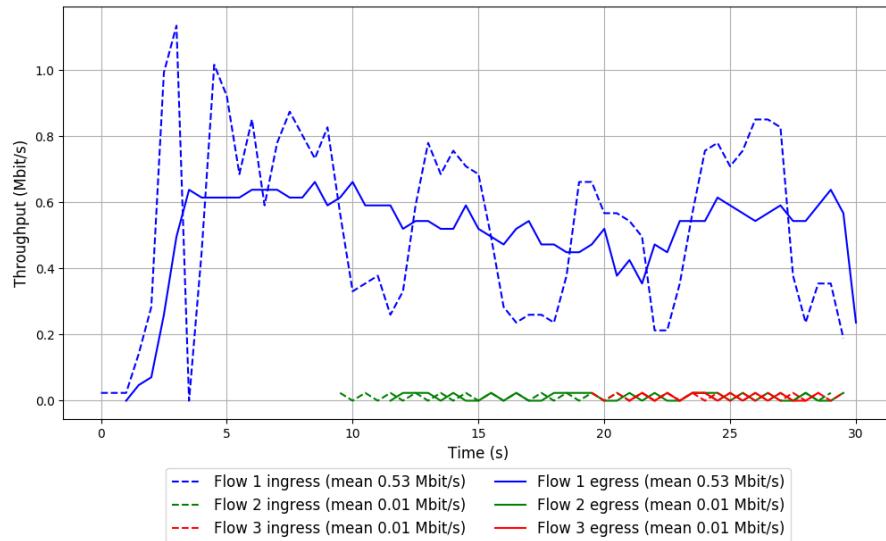


Run 1: Statistics of Verus

```
Start at: 2018-06-06 01:34:26
End at: 2018-06-06 01:34:56
Local clock offset: -1.653 ms
Remote clock offset: 3.765 ms

# Below is generated by plot.py at 2018-06-06 02:23:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 1872.966 ms
Loss rate: 4.31%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 1872.966 ms
Loss rate: 4.04%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1920.323 ms
Loss rate: 9.52%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1667.429 ms
Loss rate: 27.27%
```

Run 1: Report of Verus — Data Link

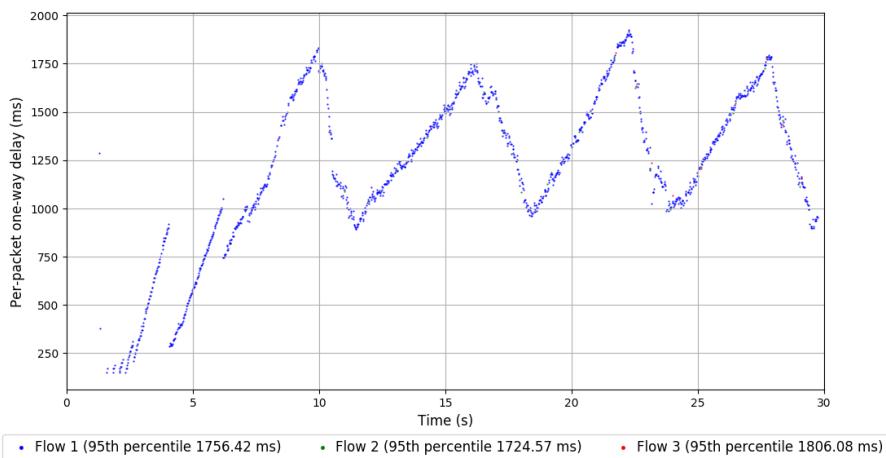
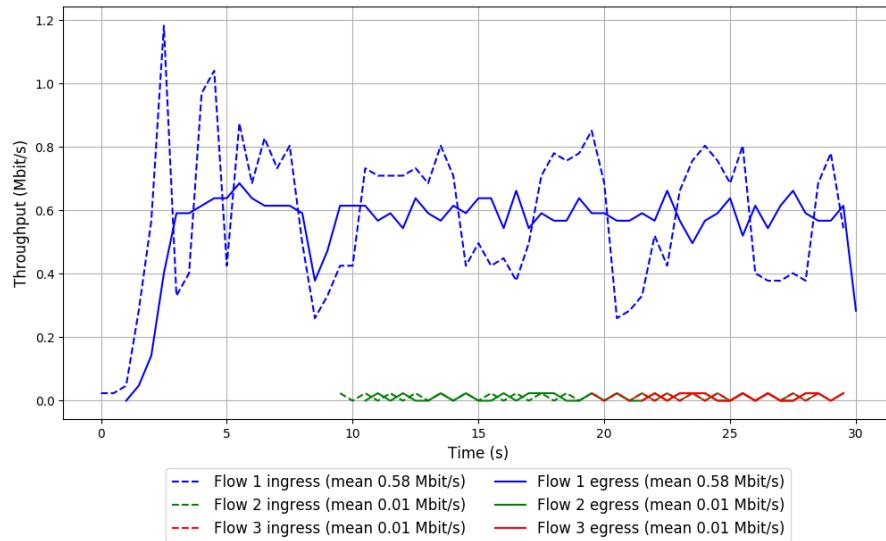


Run 2: Statistics of Verus

```
Start at: 2018-06-06 01:53:38
End at: 2018-06-06 01:54:08
Local clock offset: -1.981 ms
Remote clock offset: 10.928 ms

# Below is generated by plot.py at 2018-06-06 02:23:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1759.767 ms
Loss rate: 4.78%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1756.421 ms
Loss rate: 4.74%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1724.573 ms
Loss rate: 5.00%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1806.082 ms
Loss rate: 10.00%
```

Run 2: Report of Verus — Data Link

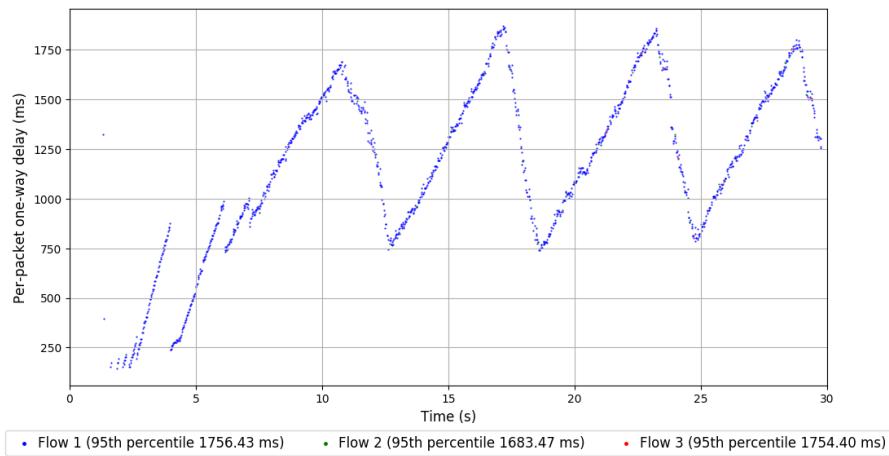
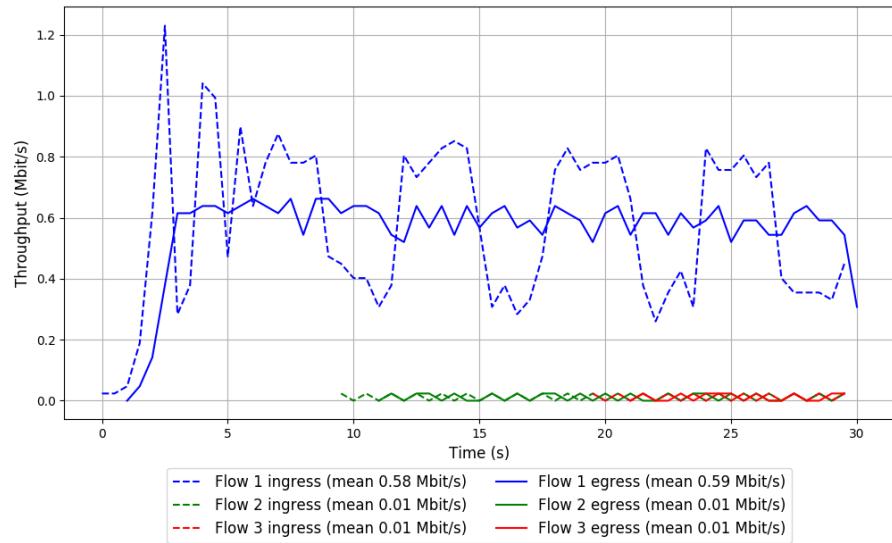


Run 3: Statistics of Verus

```
Start at: 2018-06-06 02:12:49
End at: 2018-06-06 02:13:19
Local clock offset: -6.143 ms
Remote clock offset: 10.449 ms

# Below is generated by plot.py at 2018-06-06 02:23:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1754.071 ms
Loss rate: 3.43%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1756.426 ms
Loss rate: 3.23%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1683.471 ms
Loss rate: 9.52%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1754.398 ms
Loss rate: 18.18%
```

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

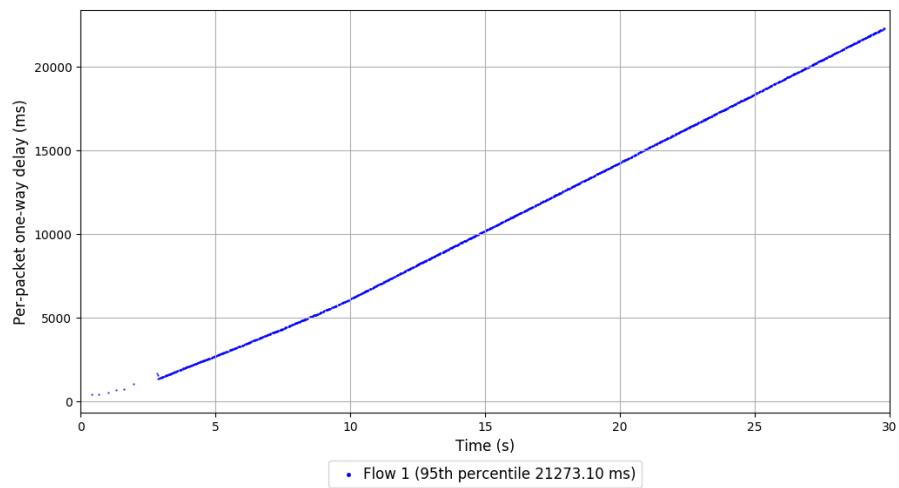
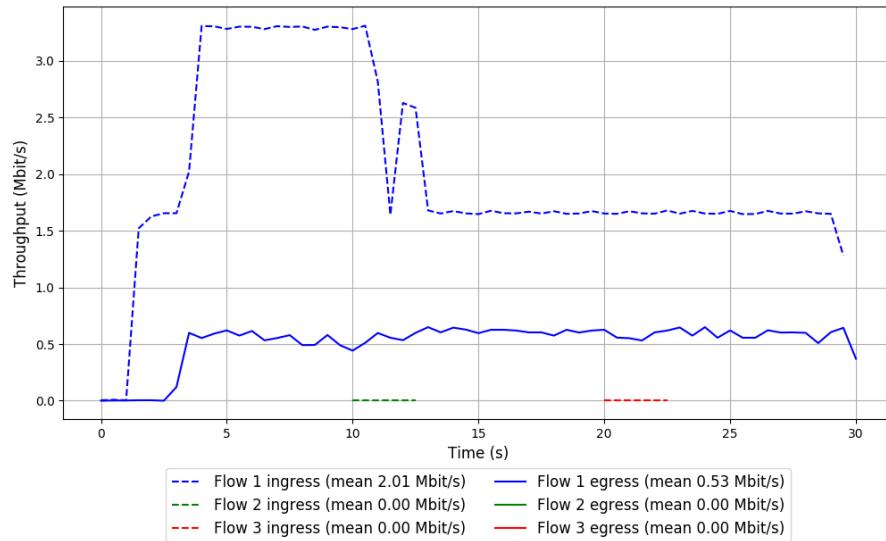
Start at: 2018-06-06 01:27:12

End at: 2018-06-06 01:27:42

Local clock offset: -0.988 ms

Remote clock offset: 4.669 ms

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

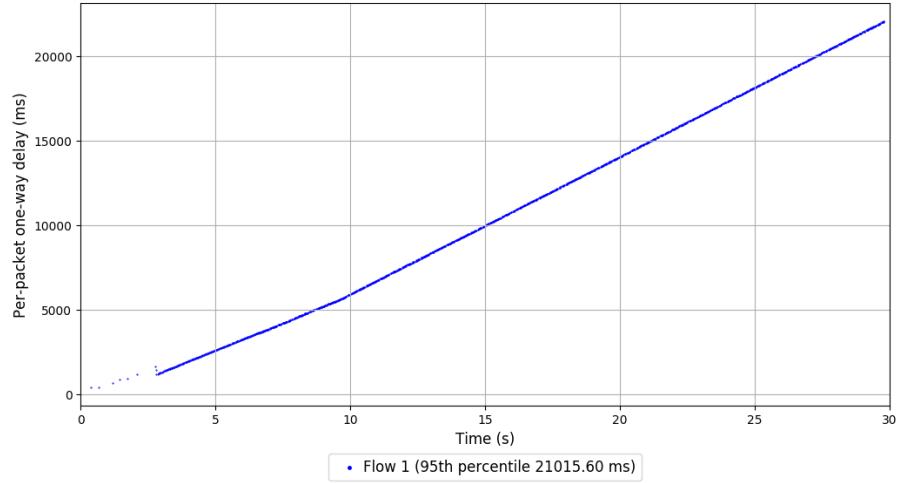
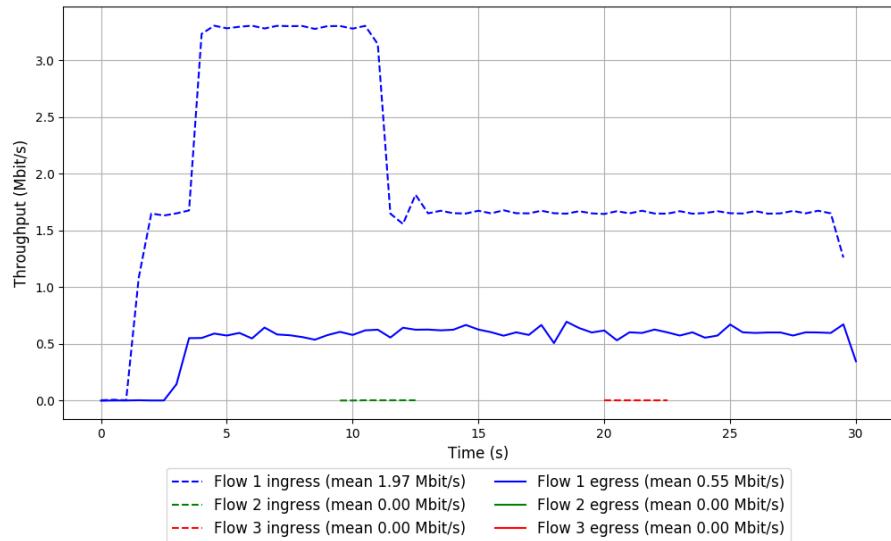
Start at: 2018-06-06 01:46:27

End at: 2018-06-06 01:46:57

Local clock offset: -1.957 ms

Remote clock offset: 5.115 ms

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

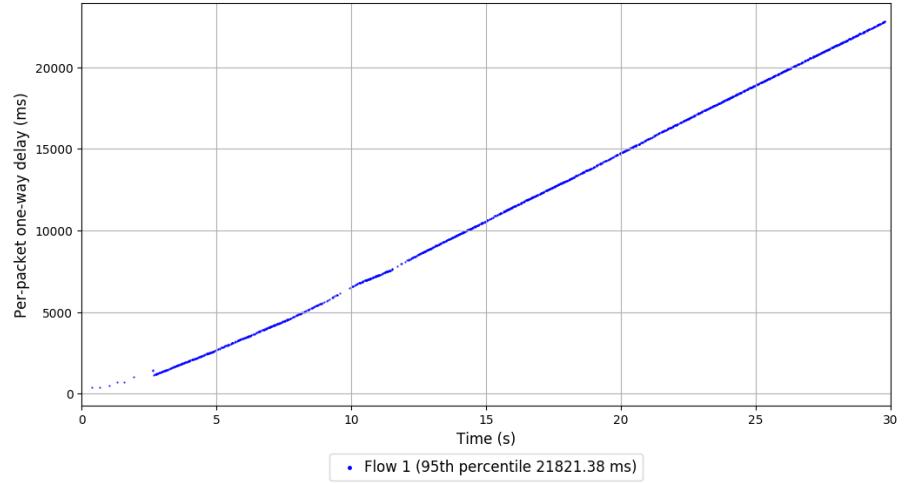
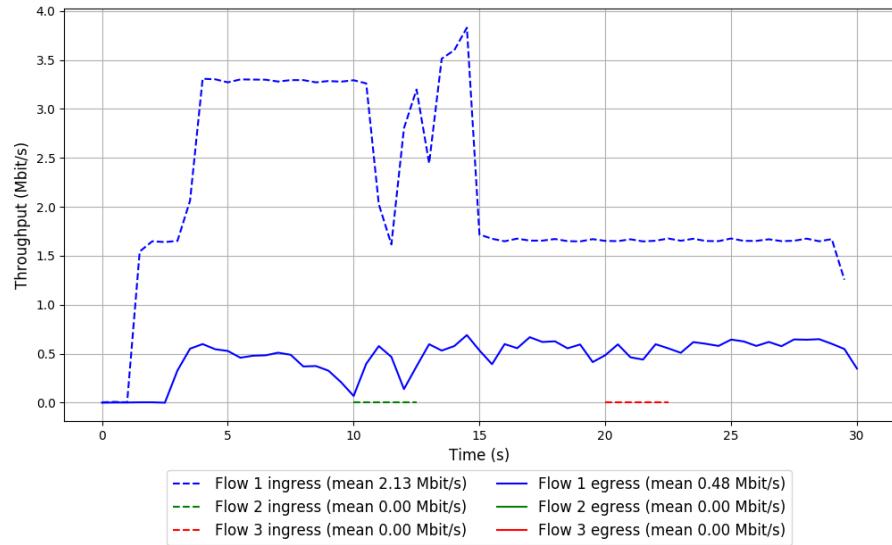
Start at: 2018-06-06 02:05:38

End at: 2018-06-06 02:06:08

Local clock offset: -2.065 ms

Remote clock offset: 6.887 ms

Run 3: Report of PCC-Vivace — Data Link

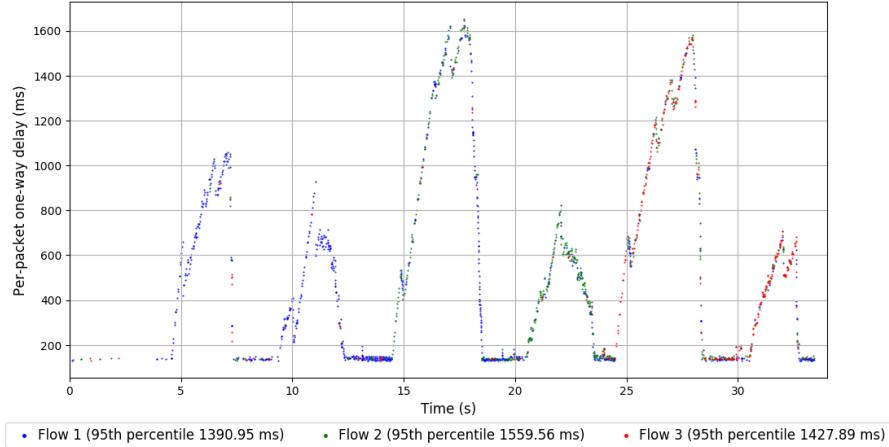
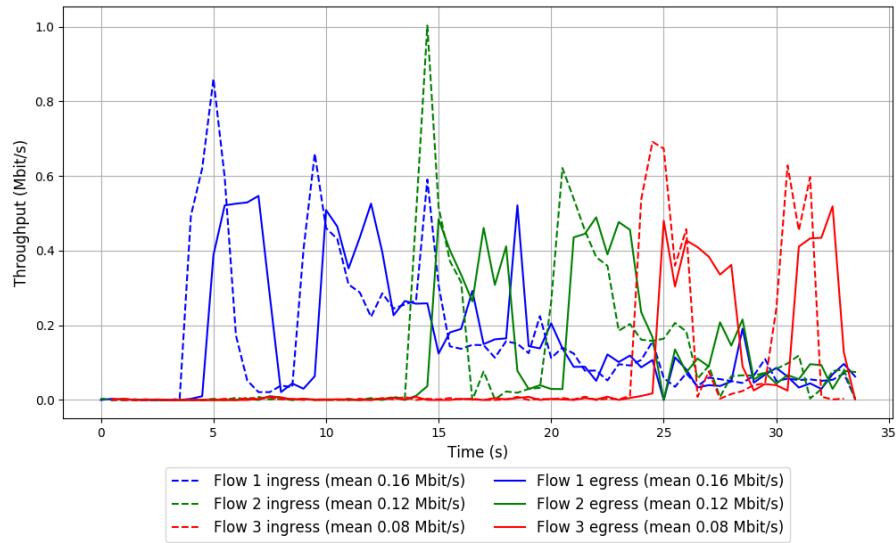


```
Run 1: Statistics of WebRTC media

Start at: 2018-06-06 01:28:24
End at: 2018-06-06 01:28:54
Local clock offset: -1.735 ms
Remote clock offset: 4.397 ms

# Below is generated by plot.py at 2018-06-06 02:23:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 1461.754 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 1390.955 ms
Loss rate: 0.29%
-- Flow 2:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 1559.561 ms
Loss rate: 0.47%
-- Flow 3:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 1427.893 ms
Loss rate: 0.04%
```

Run 1: Report of WebRTC media — Data Link

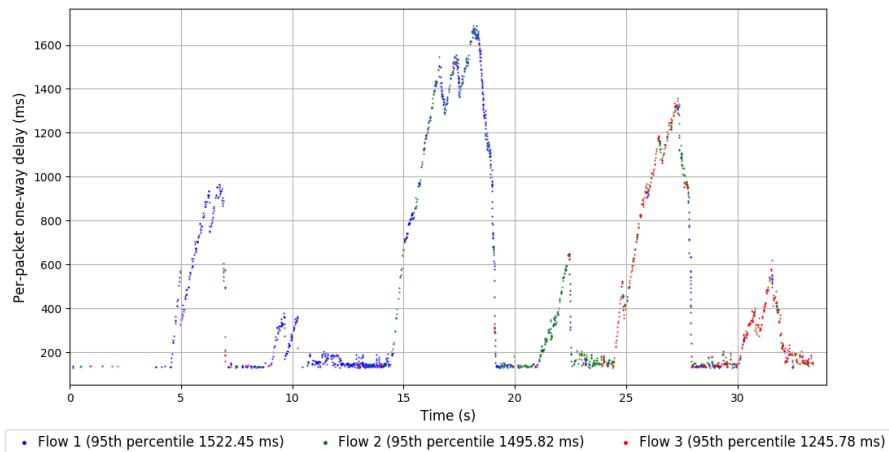
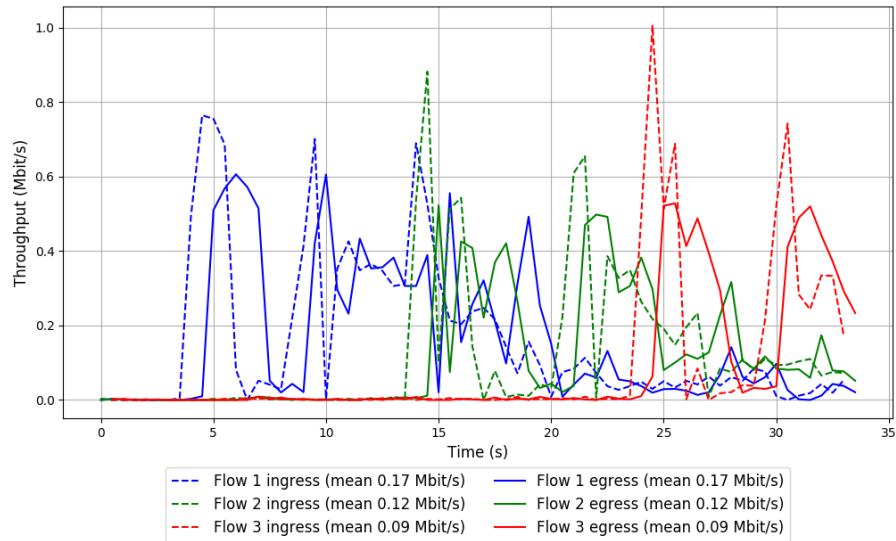


```
Run 2: Statistics of WebRTC media

Start at: 2018-06-06 01:47:38
End at: 2018-06-06 01:48:08
Local clock offset: -1.991 ms
Remote clock offset: 5.32 ms

# Below is generated by plot.py at 2018-06-06 02:23:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 1495.737 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 1522.449 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 1495.822 ms
Loss rate: 0.57%
-- Flow 3:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 1245.780 ms
Loss rate: 1.09%
```

Run 2: Report of WebRTC media — Data Link



```
Run 3: Statistics of WebRTC media
```

```
Start at: 2018-06-06 02:06:50
End at: 2018-06-06 02:07:20
Local clock offset: -3.407 ms
Remote clock offset: 10.081 ms

# Below is generated by plot.py at 2018-06-06 02:23:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 1298.476 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 1294.406 ms
Loss rate: 0.20%
-- Flow 2:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 1333.996 ms
Loss rate: 0.39%
-- Flow 3:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 1278.757 ms
Loss rate: 2.28%
```

Run 3: Report of WebRTC media — Data Link

