

## Pantheon Report

Generated at 2018-07-17 08:51:02 (UTC).

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

Repeated the test of 17 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

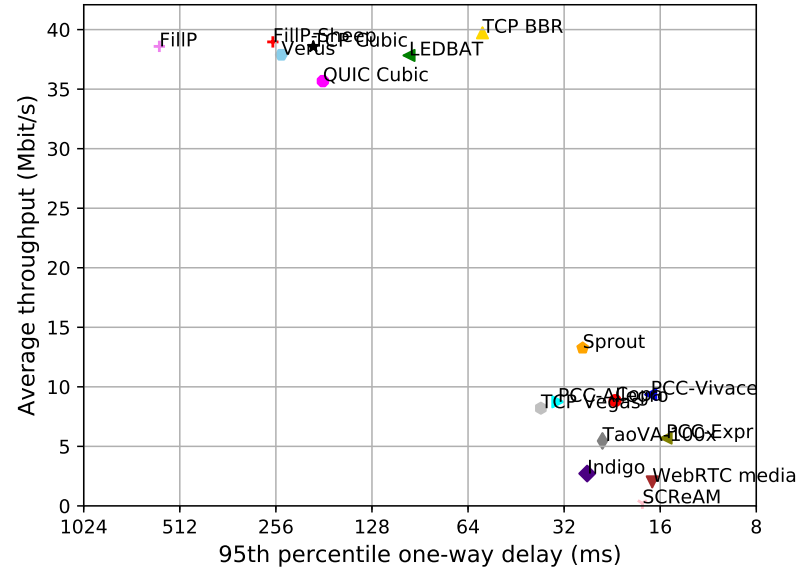
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

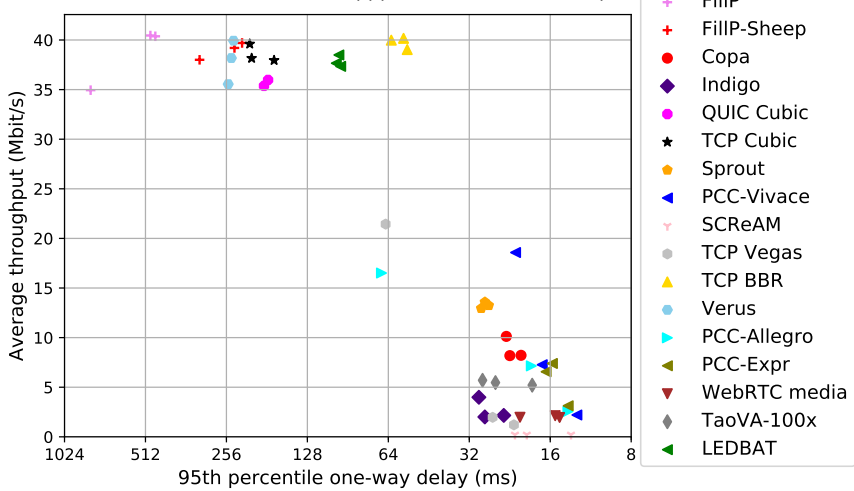
Git summary:

```
branch: master @ f7befc2d8410f41949e0ad8143a9aab40bab7edb
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
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-quick @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webRTC @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from AWS California 1 to Stanford ppp0, 3 runs of 30s each per scheme  
(mean of all runs by scheme)



test from AWS California 1 to Stanford ppp0, 3 runs of 30s each per scheme



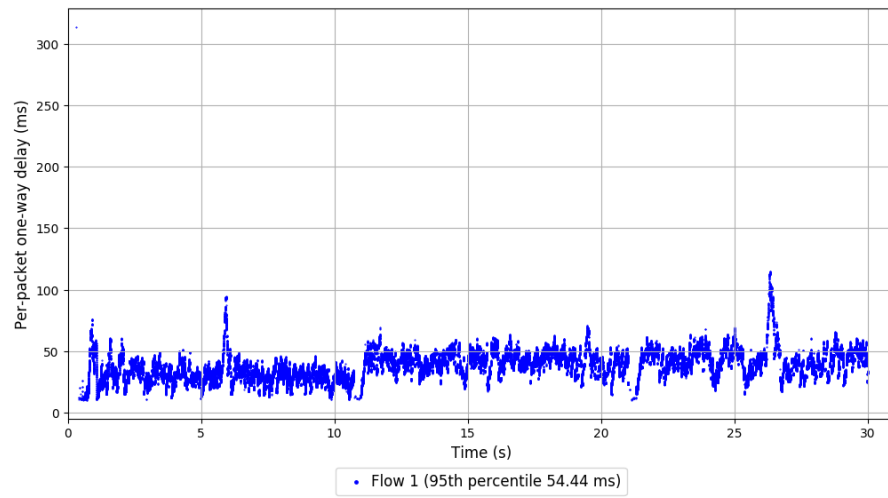
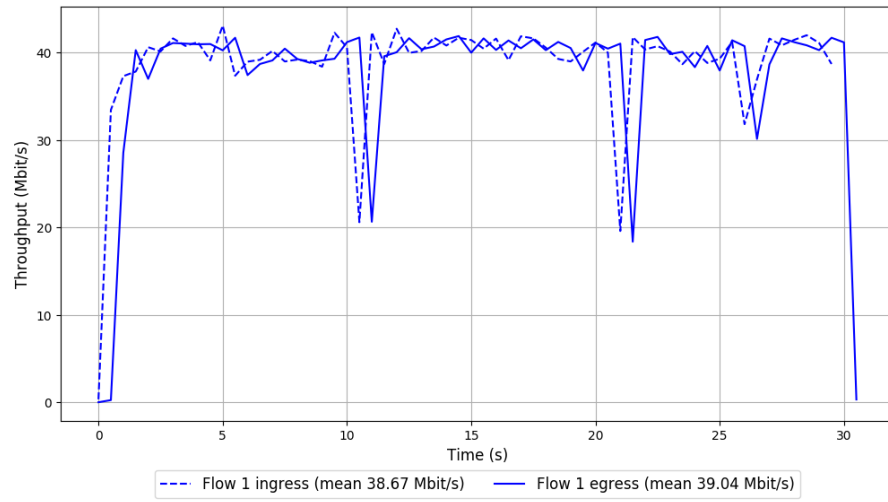
| scheme       | # runs | mean avg tput (Mbit/s)<br>flow 1 | mean 95th-%ile delay (ms)<br>flow 1 | mean loss rate (%)<br>flow 1 |
|--------------|--------|----------------------------------|-------------------------------------|------------------------------|
| TCP BBR      | 3      | 39.73                            | 57.67                               | 0.11                         |
| Copa         | 3      | 8.84                             | 22.15                               | 0.06                         |
| TCP Cubic    | 3      | 38.57                            | 195.39                              | 0.38                         |
| FillP        | 3      | 38.59                            | 593.42                              | 26.64                        |
| FillP-Sheep  | 3      | 38.97                            | 261.66                              | 2.43                         |
| Indigo       | 3      | 2.72                             | 27.10                               | 0.03                         |
| LEDBAT       | 3      | 37.83                            | 97.99                               | 0.33                         |
| PCC-Allegro  | 3      | 8.74                             | 33.47                               | 0.03                         |
| PCC-Expr     | 3      | 5.69                             | 15.34                               | 0.06                         |
| QUIC Cubic   | 2      | 35.67                            | 182.40                              | 0.58                         |
| SCReAM       | 3      | 0.22                             | 18.20                               | 0.04                         |
| Sprout       | 3      | 13.26                            | 27.99                               | 0.04                         |
| TaoVA-100x   | 3      | 5.46                             | 24.27                               | 0.02                         |
| TCP Vegas    | 3      | 8.21                             | 37.84                               | 0.06                         |
| Verus        | 3      | 37.89                            | 246.10                              | 1.20                         |
| PCC-Vivace   | 3      | 9.35                             | 17.14                               | 0.02                         |
| WebRTC media | 3      | 2.02                             | 16.94                               | 0.02                         |

Run 1: Statistics of TCP BBR

Start at: 2018-07-17 07:46:25  
End at: 2018-07-17 07:46:55  
Local clock offset: -12.367 ms  
Remote clock offset: 0.782 ms

# Below is generated by plot.py at 2018-07-17 08:49:23  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 39.04 Mbit/s  
95th percentile per-packet one-way delay: 54.437 ms  
Loss rate: 0.05%  
-- Flow 1:  
Average throughput: 39.04 Mbit/s  
95th percentile per-packet one-way delay: 54.437 ms  
Loss rate: 0.05%

# Run 1: Report of TCP BBR — Data Link

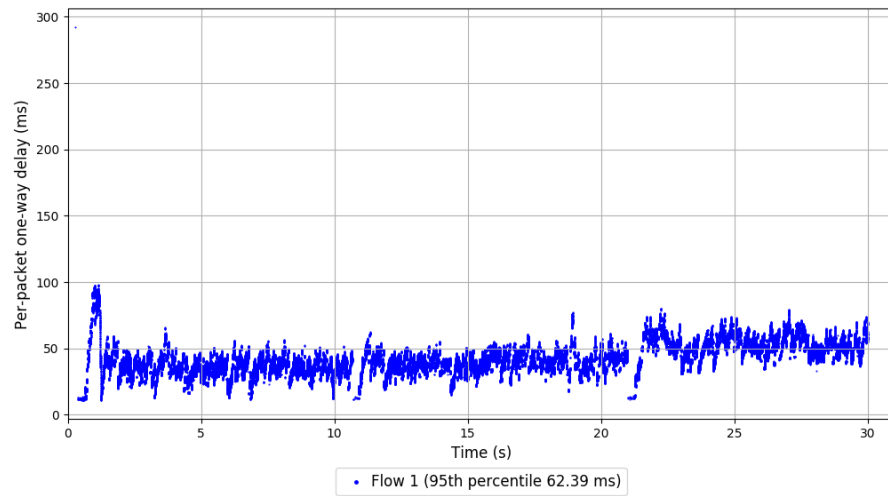
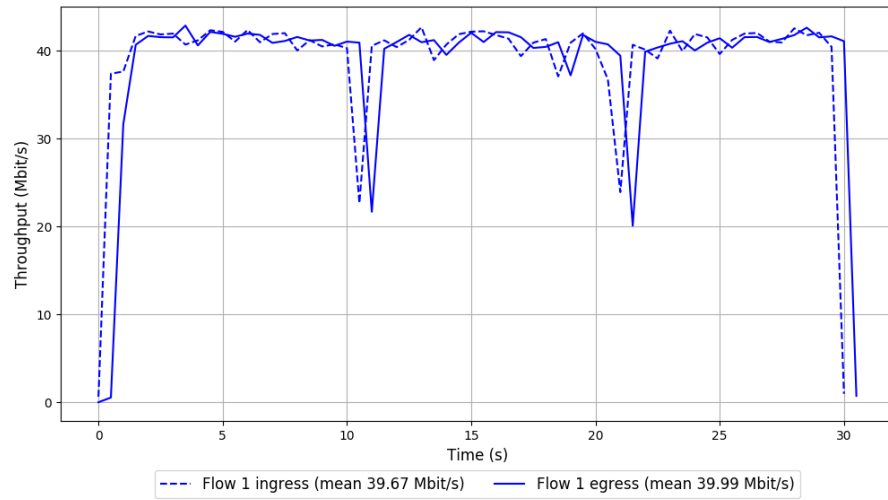


Run 2: Statistics of TCP BBR

Start at: 2018-07-17 08:08:50  
End at: 2018-07-17 08:09:20  
Local clock offset: -25.998 ms  
Remote clock offset: 0.694 ms

# Below is generated by plot.py at 2018-07-17 08:49:24  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 39.99 Mbit/s  
95th percentile per-packet one-way delay: 62.394 ms  
Loss rate: 0.18%  
-- Flow 1:  
Average throughput: 39.99 Mbit/s  
95th percentile per-packet one-way delay: 62.394 ms  
Loss rate: 0.18%

## Run 2: Report of TCP BBR — Data Link



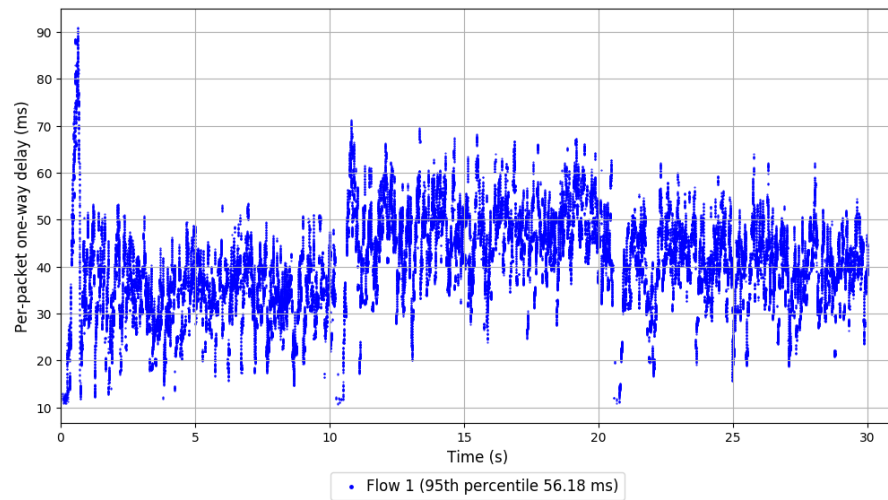
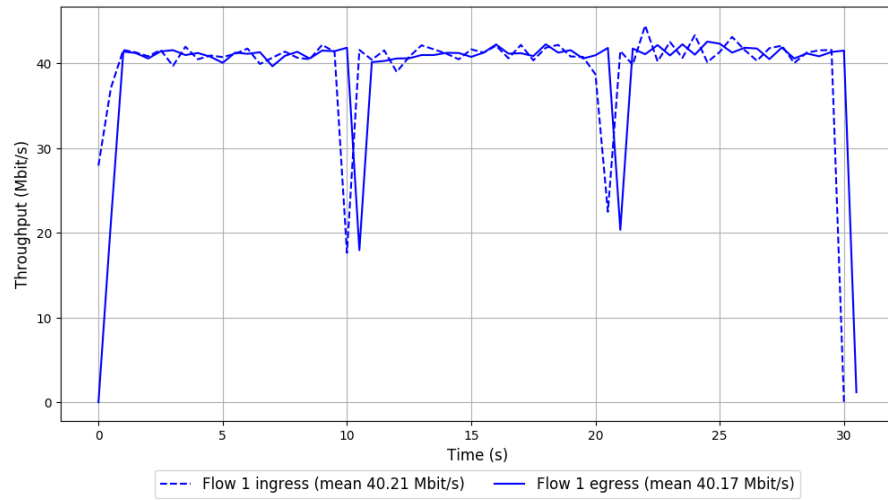
Run 3: Statistics of TCP BBR

Start at: 2018-07-17 08:31:05  
End at: 2018-07-17 08:31:35  
Local clock offset: -12.721 ms  
Remote clock offset: 0.577 ms

# Below is generated by plot.py at 2018-07-17 08:49:25  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 40.17 Mbit/s  
95th percentile per-packet one-way delay: 56.182 ms  
Loss rate: 0.11%  
-- Flow 1:  
Average throughput: 40.17 Mbit/s  
95th percentile per-packet one-way delay: 56.182 ms  
Loss rate: 0.11%



### Run 3: Report of TCP BBR — Data Link

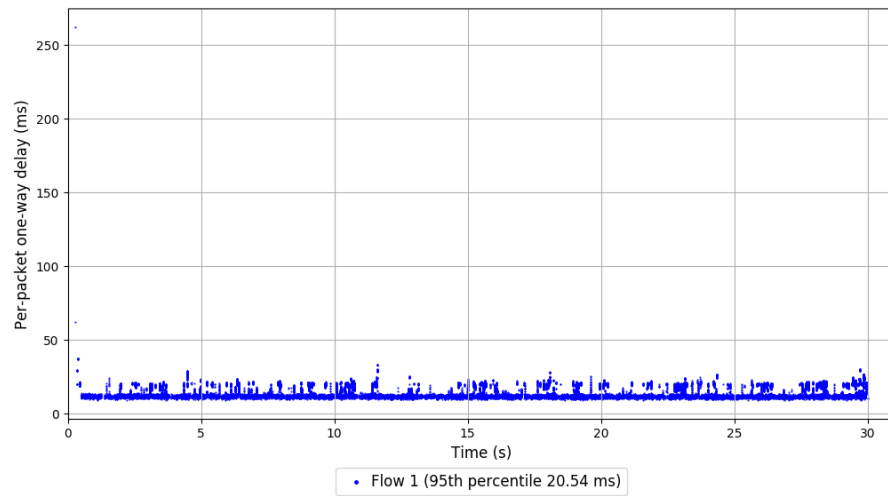
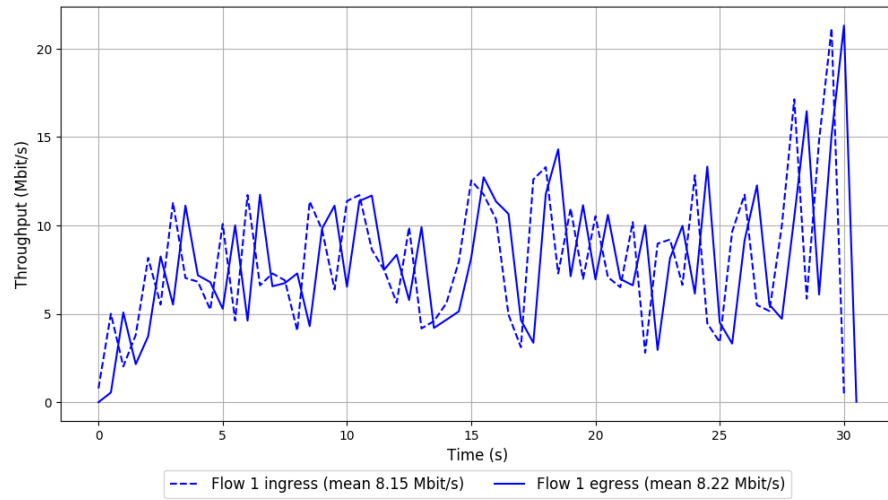


Run 1: Statistics of Copa

Start at: 2018-07-17 07:57:04  
End at: 2018-07-17 07:57:34  
Local clock offset: -18.632 ms  
Remote clock offset: 0.642 ms

# Below is generated by plot.py at 2018-07-17 08:49:25  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 8.22 Mbit/s  
95th percentile per-packet one-way delay: 20.544 ms  
Loss rate: 0.09%  
-- Flow 1:  
Average throughput: 8.22 Mbit/s  
95th percentile per-packet one-way delay: 20.544 ms  
Loss rate: 0.09%

## Run 1: Report of Copa — Data Link

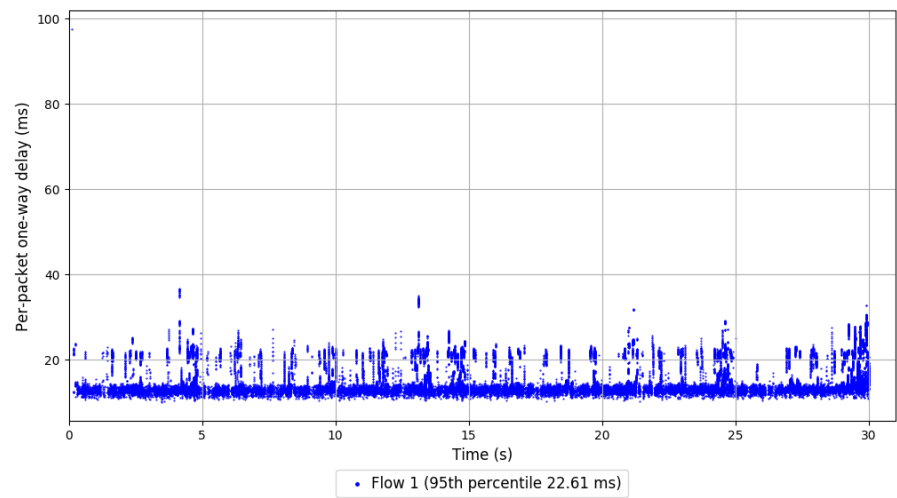
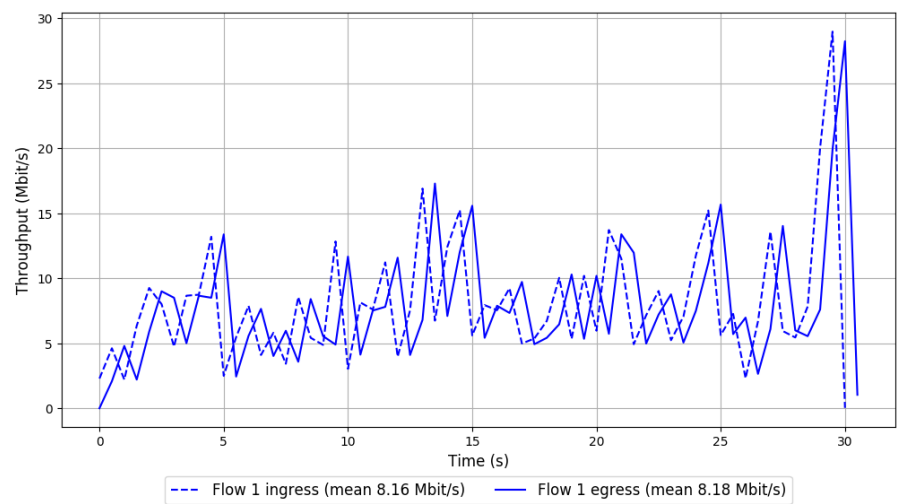


Run 2: Statistics of Copa

Start at: 2018-07-17 08:19:19  
End at: 2018-07-17 08:19:49  
Local clock offset: -14.326 ms  
Remote clock offset: 0.658 ms

# Below is generated by plot.py at 2018-07-17 08:49:25  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 8.18 Mbit/s  
95th percentile per-packet one-way delay: 22.611 ms  
Loss rate: 0.02%  
-- Flow 1:  
Average throughput: 8.18 Mbit/s  
95th percentile per-packet one-way delay: 22.611 ms  
Loss rate: 0.02%

Run 2: Report of Copa — Data Link

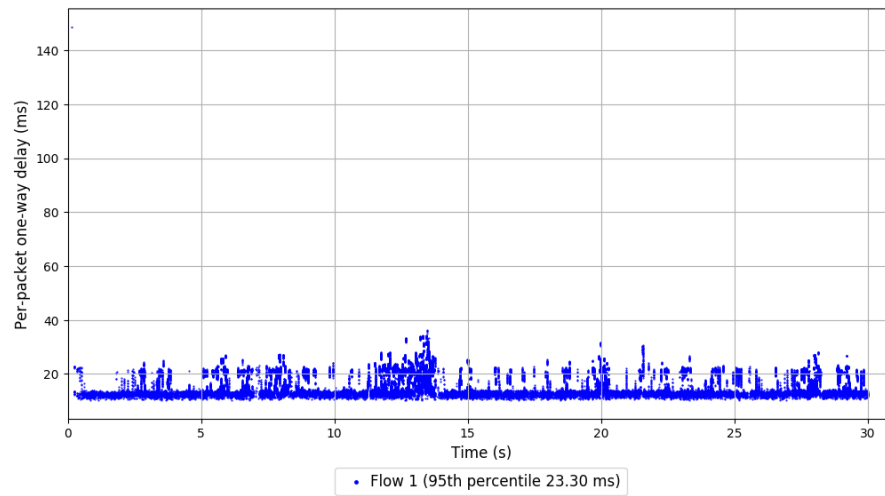
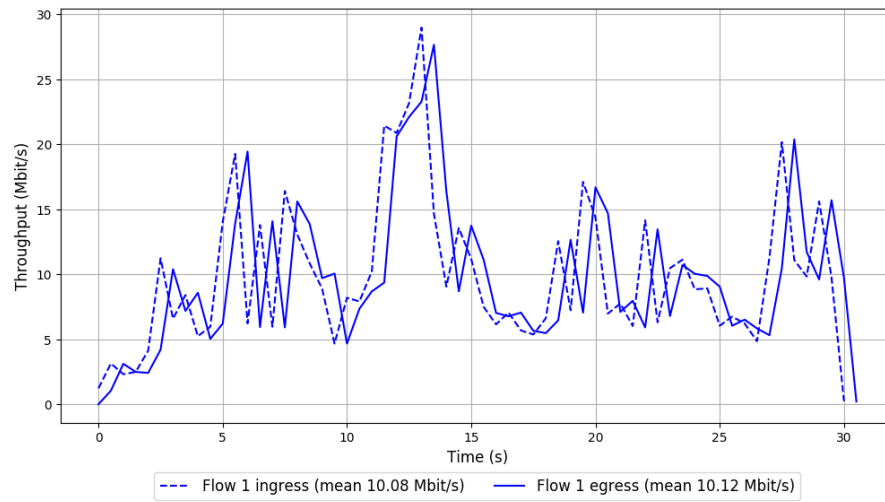


Run 3: Statistics of Copa

Start at: 2018-07-17 08:41:30  
End at: 2018-07-17 08:42:00  
Local clock offset: -13.373 ms  
Remote clock offset: 0.525 ms

# Below is generated by plot.py at 2018-07-17 08:49:25  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 10.12 Mbit/s  
95th percentile per-packet one-way delay: 23.302 ms  
Loss rate: 0.06%  
-- Flow 1:  
Average throughput: 10.12 Mbit/s  
95th percentile per-packet one-way delay: 23.302 ms  
Loss rate: 0.06%

### Run 3: Report of Copa — Data Link



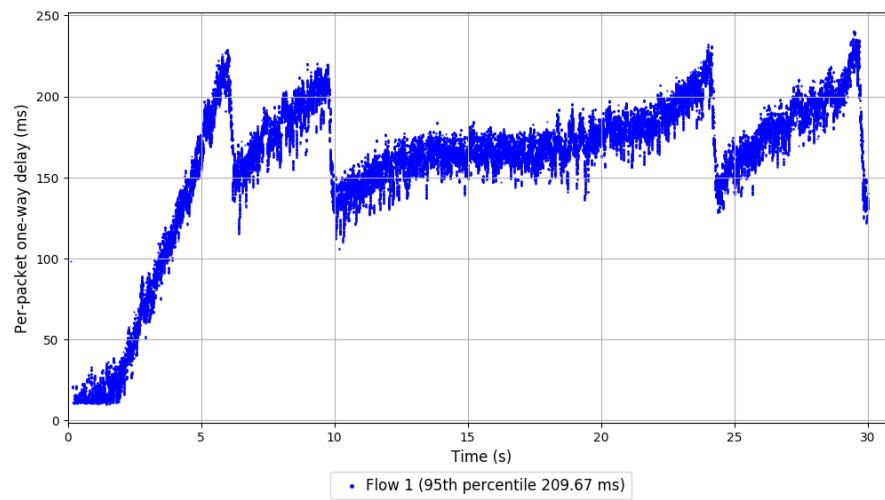
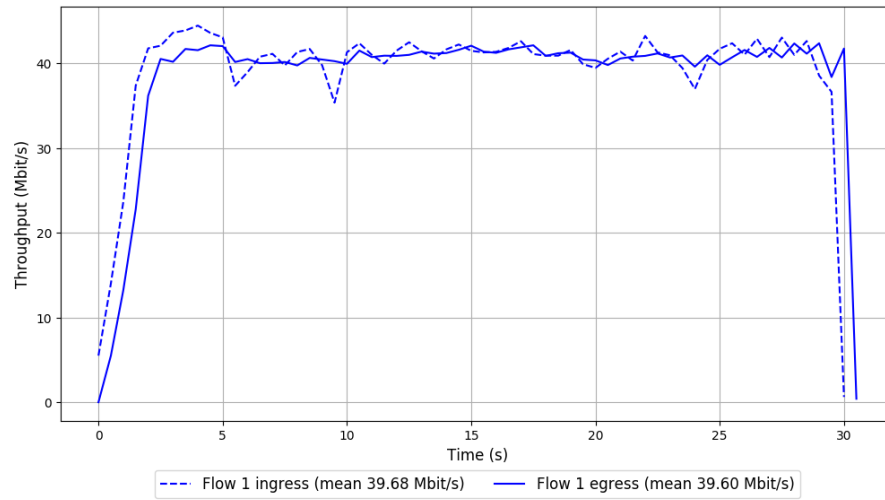
Run 1: Statistics of TCP Cubic

Start at: 2018-07-17 07:58:22  
End at: 2018-07-17 07:58:52  
Local clock offset: -19.408 ms  
Remote clock offset: 0.587 ms

# Below is generated by plot.py at 2018-07-17 08:49:25  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 39.60 Mbit/s  
95th percentile per-packet one-way delay: 209.670 ms  
Loss rate: 0.51%  
-- Flow 1:  
Average throughput: 39.60 Mbit/s  
95th percentile per-packet one-way delay: 209.670 ms  
Loss rate: 0.51%



### Run 1: Report of TCP Cubic — Data Link

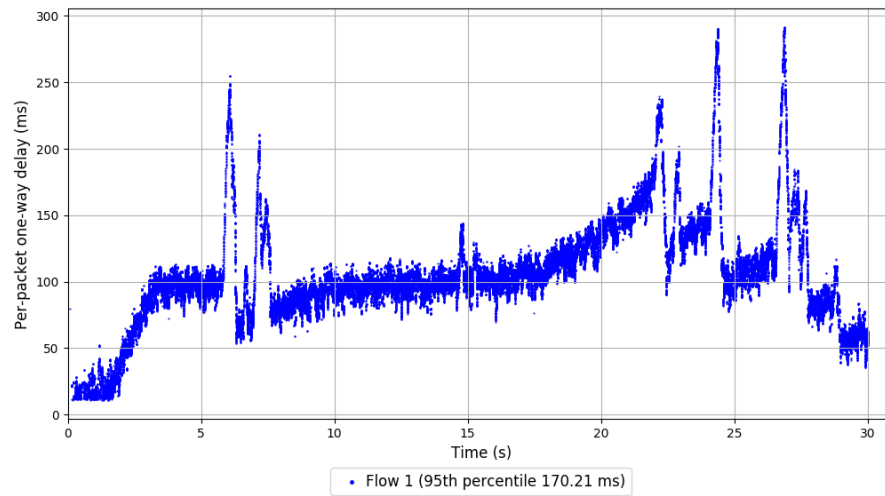
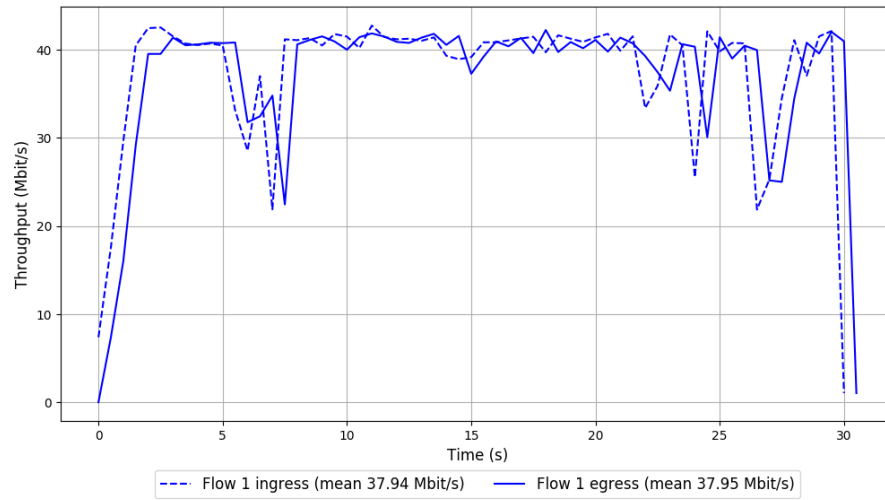


Run 2: Statistics of TCP Cubic

Start at: 2018-07-17 08:20:37  
End at: 2018-07-17 08:21:07  
Local clock offset: -13.722 ms  
Remote clock offset: 0.627 ms

# Below is generated by plot.py at 2018-07-17 08:49:25  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 37.95 Mbit/s  
95th percentile per-packet one-way delay: 170.210 ms  
Loss rate: 0.24%  
-- Flow 1:  
Average throughput: 37.95 Mbit/s  
95th percentile per-packet one-way delay: 170.210 ms  
Loss rate: 0.24%

## Run 2: Report of TCP Cubic — Data Link

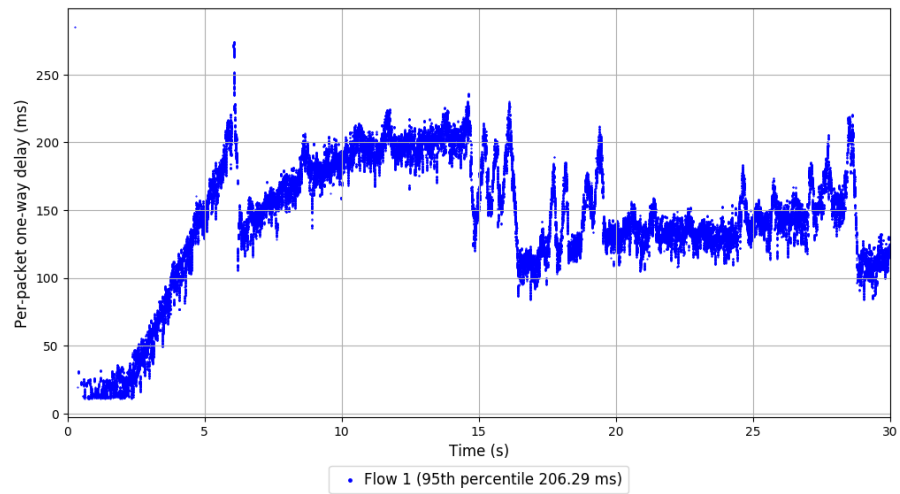
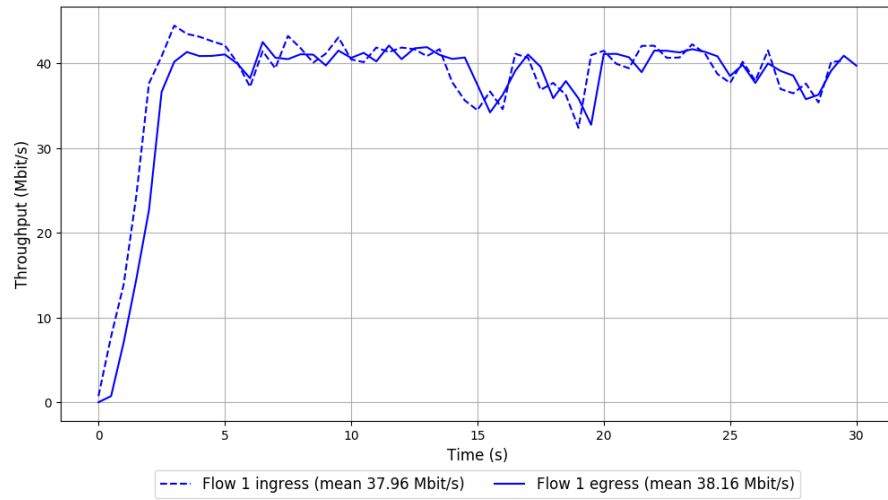


Run 3: Statistics of TCP Cubic

Start at: 2018-07-17 08:42:53  
End at: 2018-07-17 08:43:23  
Local clock offset: -13.027 ms  
Remote clock offset: 0.58 ms

# Below is generated by plot.py at 2018-07-17 08:49:38  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 38.16 Mbit/s  
95th percentile per-packet one-way delay: 206.287 ms  
Loss rate: 0.39%  
-- Flow 1:  
Average throughput: 38.16 Mbit/s  
95th percentile per-packet one-way delay: 206.287 ms  
Loss rate: 0.39%

### Run 3: Report of TCP Cubic — Data Link

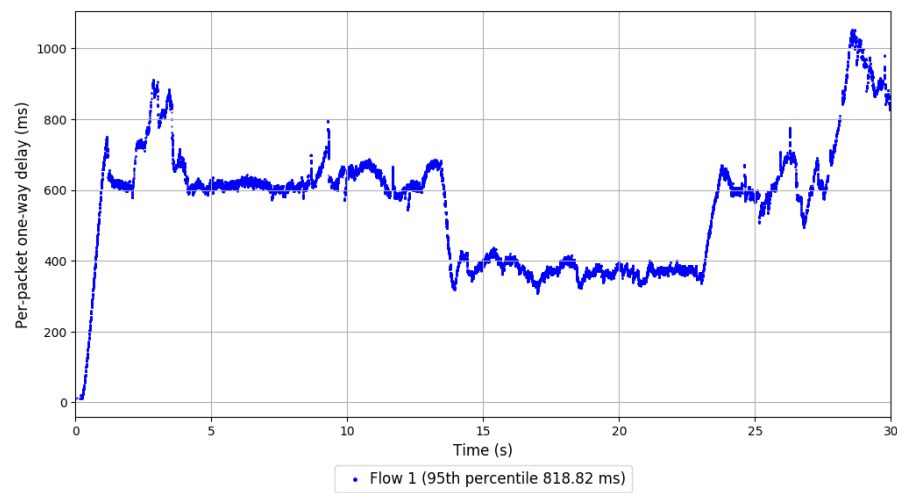
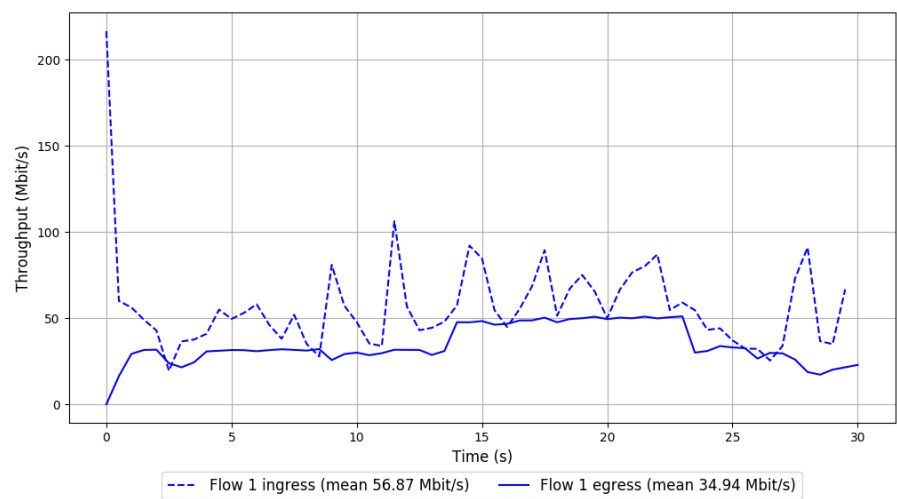


Run 1: Statistics of FillP

Start at: 2018-07-17 07:59:41  
End at: 2018-07-17 08:00:11  
Local clock offset: -20.227 ms  
Remote clock offset: 0.655 ms

# Below is generated by plot.py at 2018-07-17 08:49:46  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 34.94 Mbit/s  
95th percentile per-packet one-way delay: 818.820 ms  
Loss rate: 38.57%  
-- Flow 1:  
Average throughput: 34.94 Mbit/s  
95th percentile per-packet one-way delay: 818.820 ms  
Loss rate: 38.57%

Run 1: Report of FillP — Data Link



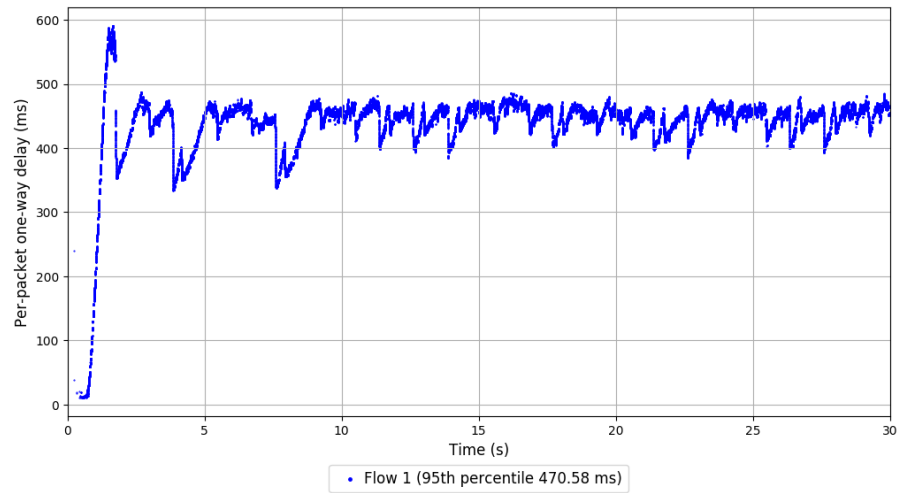
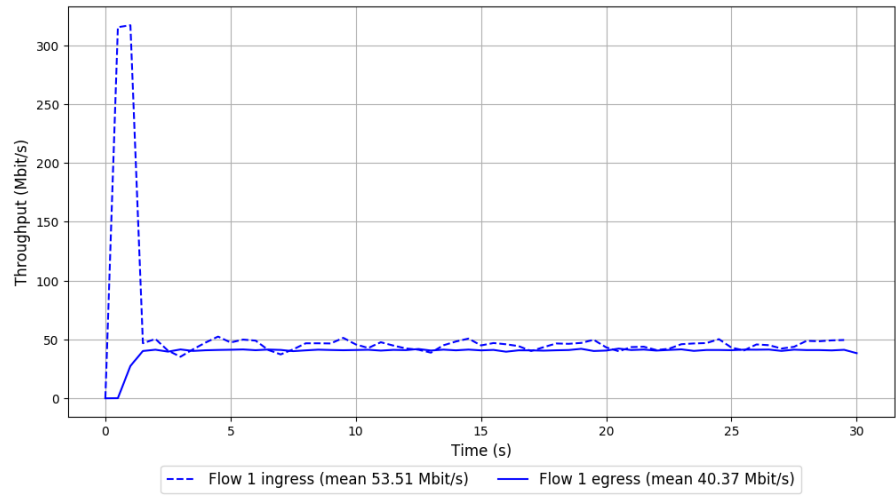
Run 2: Statistics of FillP

Start at: 2018-07-17 08:21:56  
End at: 2018-07-17 08:22:26  
Local clock offset: -13.309 ms  
Remote clock offset: 0.692 ms

# Below is generated by plot.py at 2018-07-17 08:49:54  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 40.37 Mbit/s  
95th percentile per-packet one-way delay: 470.580 ms  
Loss rate: 25.15%  
-- Flow 1:  
Average throughput: 40.37 Mbit/s  
95th percentile per-packet one-way delay: 470.580 ms  
Loss rate: 25.15%



## Run 2: Report of FillP — Data Link

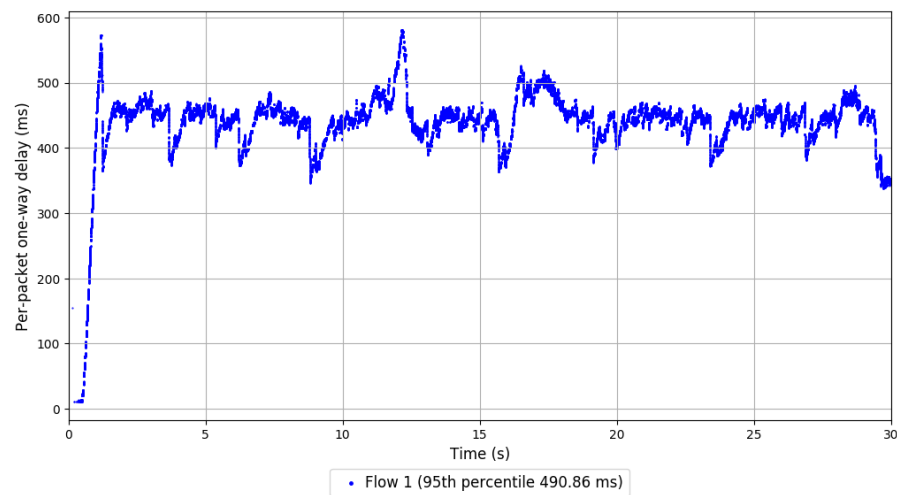
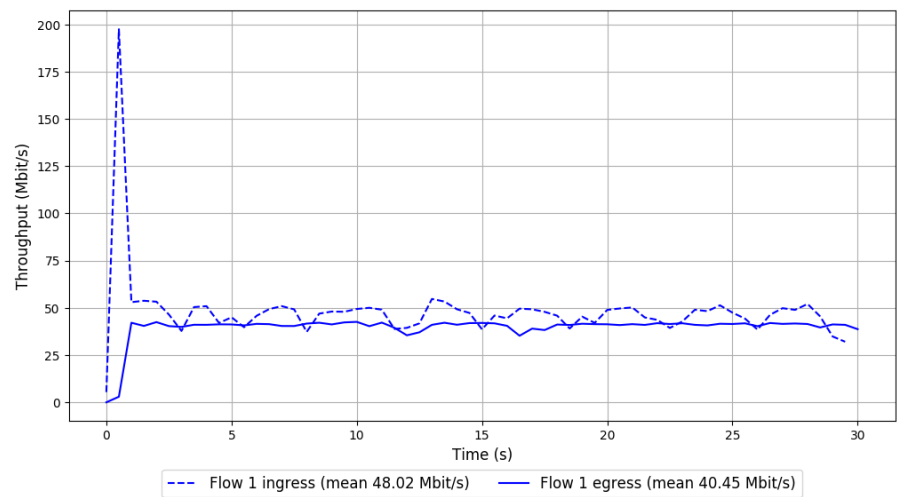


Run 3: Statistics of FillP

Start at: 2018-07-17 08:44:11  
End at: 2018-07-17 08:44:41  
Local clock offset: -12.701 ms  
Remote clock offset: 0.544 ms

# Below is generated by plot.py at 2018-07-17 08:50:09  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 40.45 Mbit/s  
95th percentile per-packet one-way delay: 490.858 ms  
Loss rate: 16.19%  
-- Flow 1:  
Average throughput: 40.45 Mbit/s  
95th percentile per-packet one-way delay: 490.858 ms  
Loss rate: 16.19%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2018-07-17 08:02:17

End at: 2018-07-17 08:02:47

Local clock offset: -21.86 ms

Remote clock offset: 0.662 ms

# Below is generated by plot.py at 2018-07-17 08:50:09

# Datalink statistics

-- Total of 1 flow:

Average throughput: 39.70 Mbit/s

95th percentile per-packet one-way delay: 223.878 ms

Loss rate: 2.83%

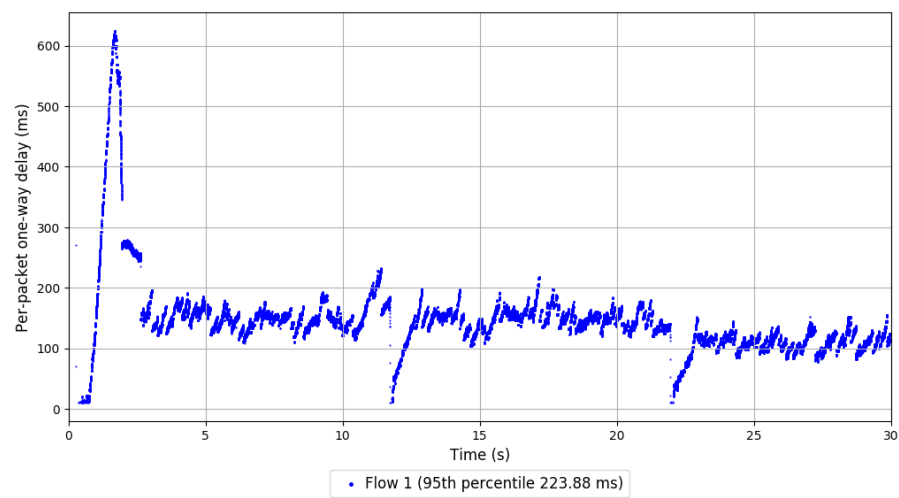
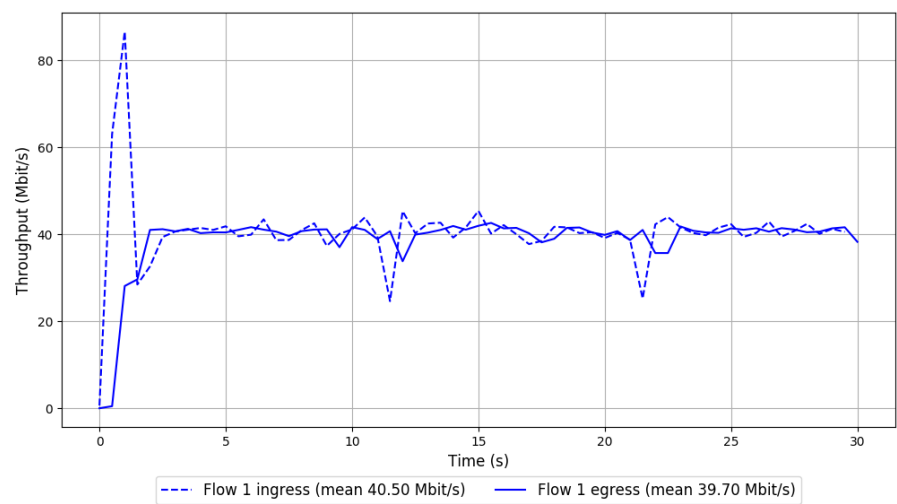
-- Flow 1:

Average throughput: 39.70 Mbit/s

95th percentile per-packet one-way delay: 223.878 ms

Loss rate: 2.83%

Run 1: Report of FillP-Sheep — Data Link

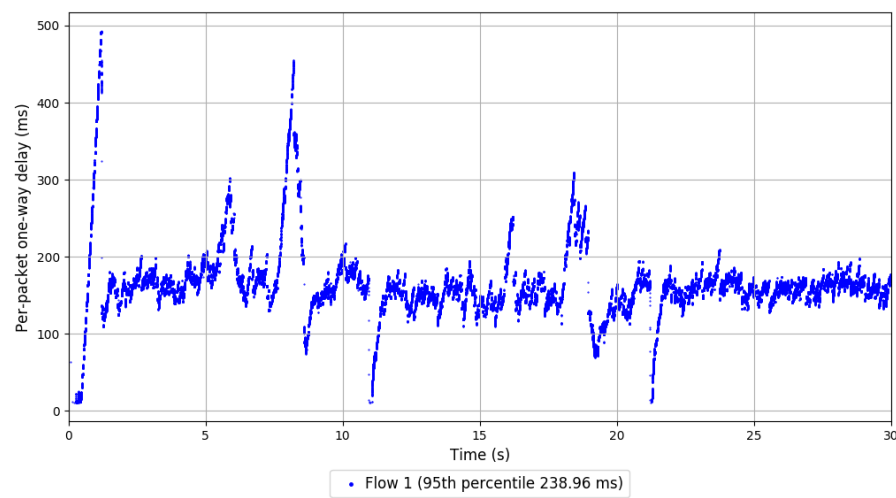
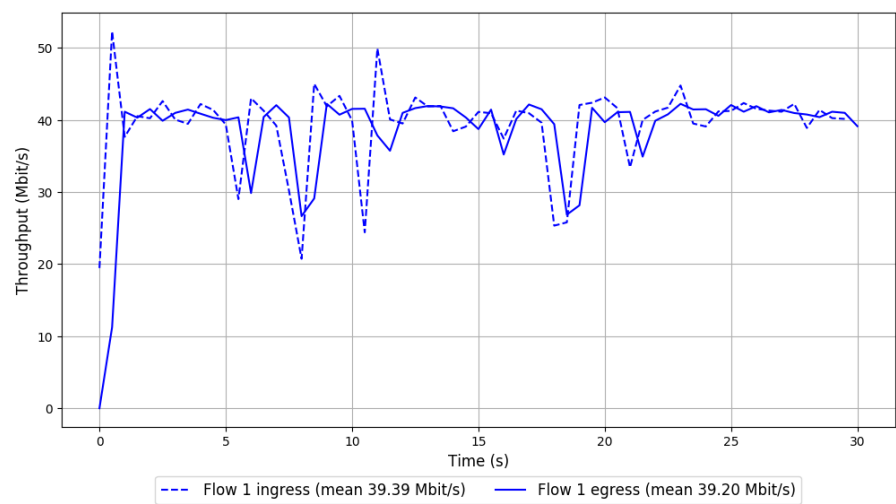


Run 2: Statistics of FillP-Sheep

Start at: 2018-07-17 08:24:32  
End at: 2018-07-17 08:25:02  
Local clock offset: -12.717 ms  
Remote clock offset: 0.586 ms

# Below is generated by plot.py at 2018-07-17 08:50:09  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 39.20 Mbit/s  
95th percentile per-packet one-way delay: 238.962 ms  
Loss rate: 0.69%  
-- Flow 1:  
Average throughput: 39.20 Mbit/s  
95th percentile per-packet one-way delay: 238.962 ms  
Loss rate: 0.69%

Run 2: Report of FillP-Sheep — Data Link



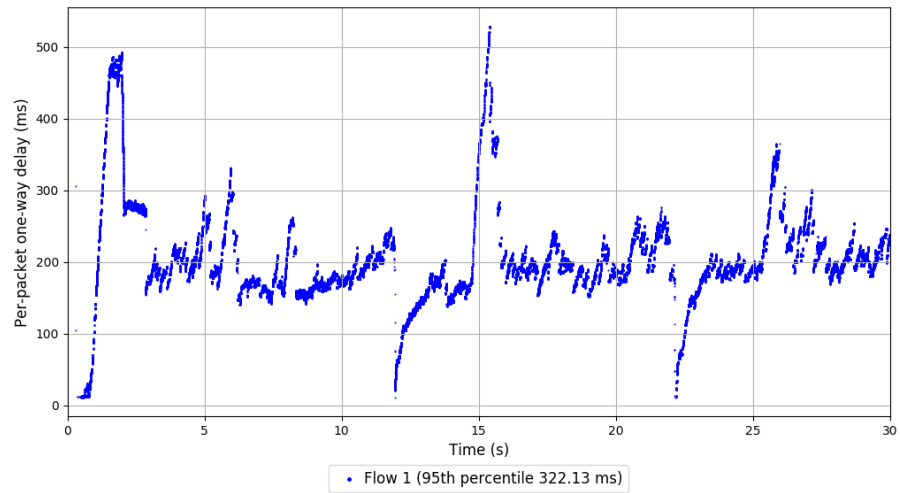
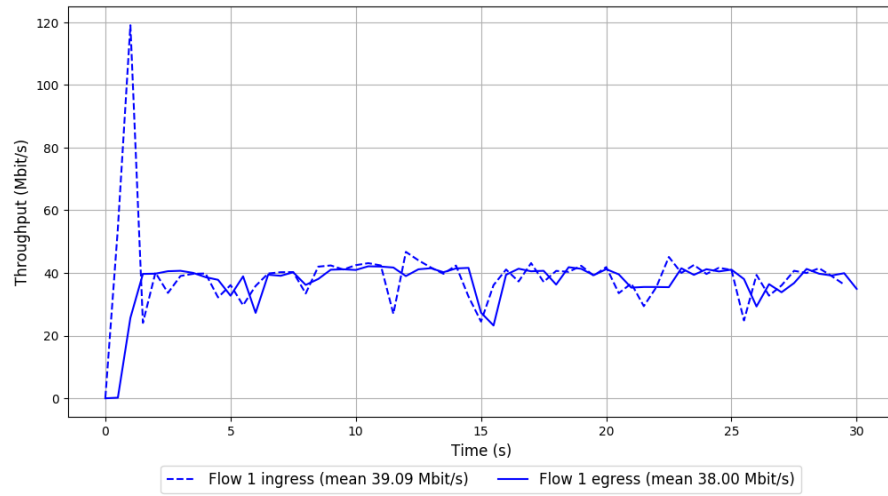
Run 3: Statistics of FillP-Sheep

Start at: 2018-07-17 08:46:48  
End at: 2018-07-17 08:47:18  
Local clock offset: -12.379 ms  
Remote clock offset: 0.513 ms

# Below is generated by plot.py at 2018-07-17 08:50:09  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 38.00 Mbit/s  
95th percentile per-packet one-way delay: 322.134 ms  
Loss rate: 3.76%  
-- Flow 1:  
Average throughput: 38.00 Mbit/s  
95th percentile per-packet one-way delay: 322.134 ms  
Loss rate: 3.76%



### Run 3: Report of FillP-Sheep — Data Link

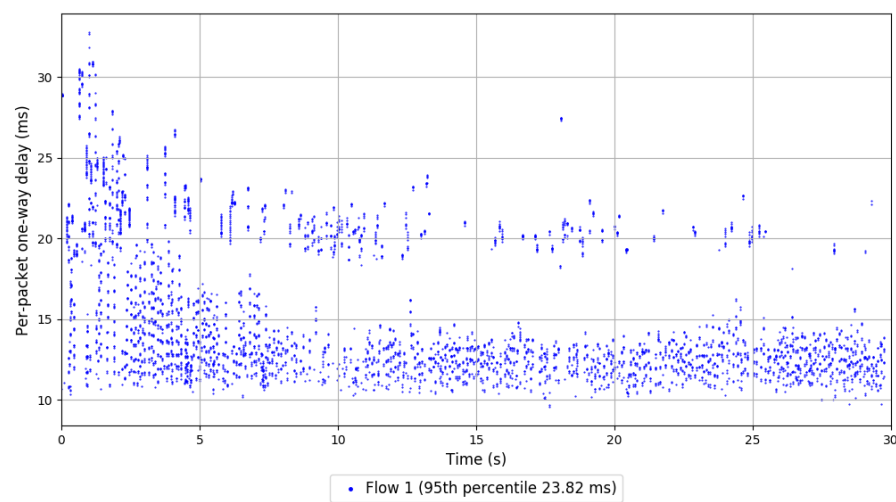
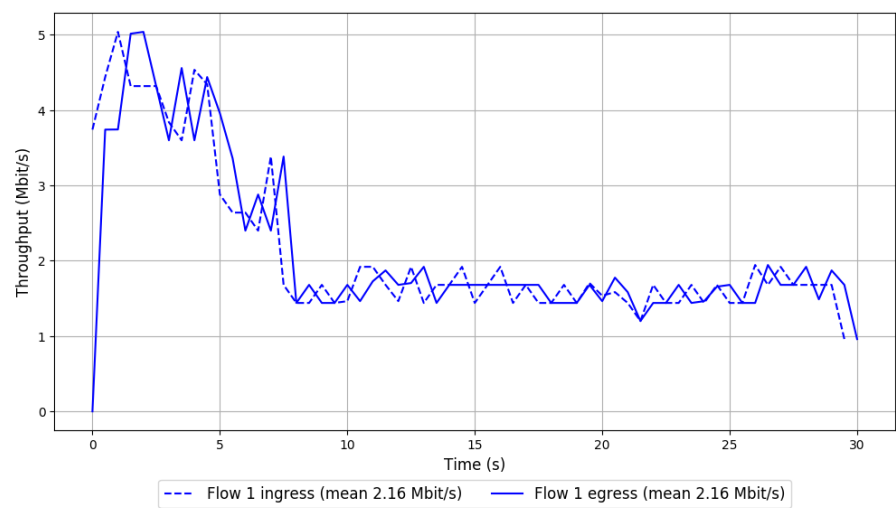


```
Run 1: Statistics of Indigo

Start at: 2018-07-17 07:51:53
End at: 2018-07-17 07:52:23
Local clock offset: -15.488 ms
Remote clock offset: 0.692 ms

# Below is generated by plot.py at 2018-07-17 08:50:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 23.818 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 23.818 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link

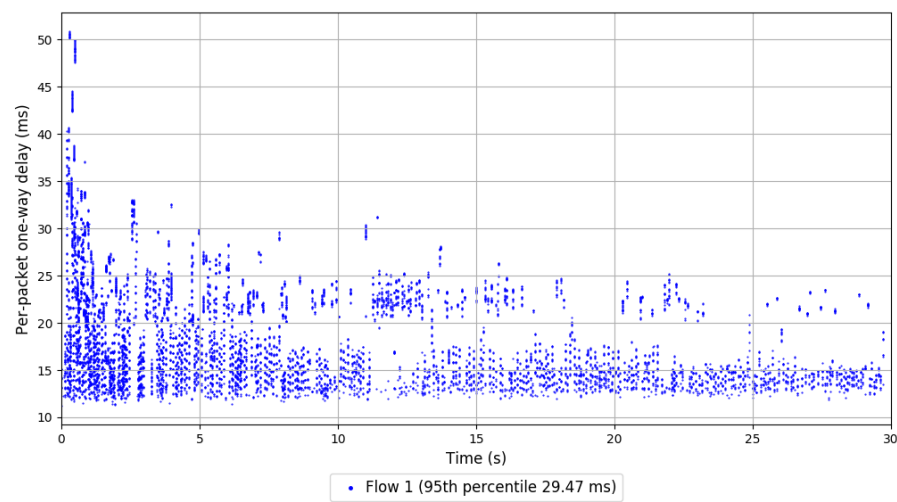
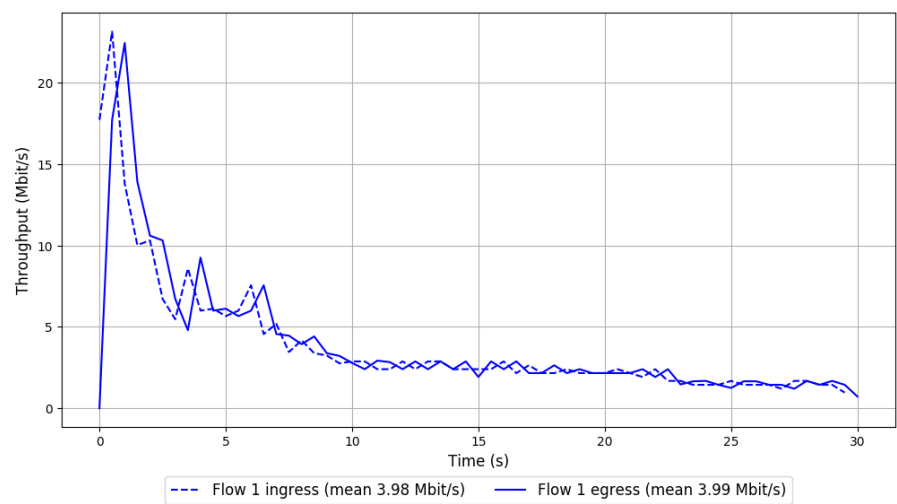


Run 2: Statistics of Indigo

Start at: 2018-07-17 08:14:07  
End at: 2018-07-17 08:14:37  
Local clock offset: -18.396 ms  
Remote clock offset: 0.647 ms

# Below is generated by plot.py at 2018-07-17 08:50:09  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 3.99 Mbit/s  
95th percentile per-packet one-way delay: 29.473 ms  
Loss rate: 0.10%  
-- Flow 1:  
Average throughput: 3.99 Mbit/s  
95th percentile per-packet one-way delay: 29.473 ms  
Loss rate: 0.10%

Run 2: Report of Indigo — Data Link

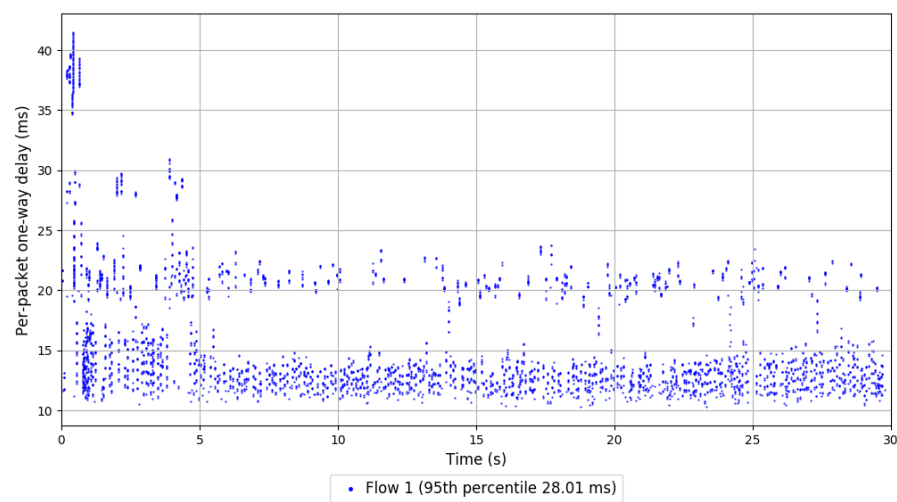
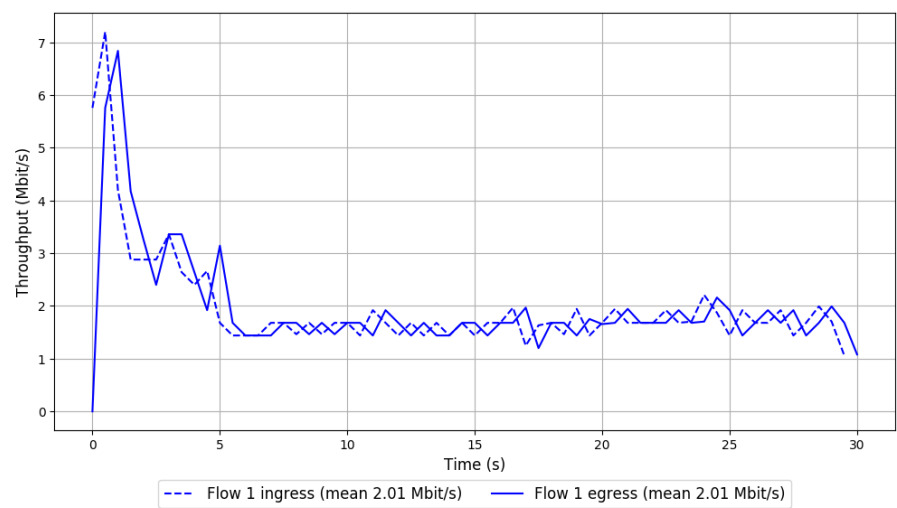


Run 3: Statistics of Indigo

Start at: 2018-07-17 08:36:17  
End at: 2018-07-17 08:36:47  
Local clock offset: -13.525 ms  
Remote clock offset: 0.503 ms

# Below is generated by plot.py at 2018-07-17 08:50:09  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.01 Mbit/s  
95th percentile per-packet one-way delay: 28.010 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 2.01 Mbit/s  
95th percentile per-packet one-way delay: 28.010 ms  
Loss rate: 0.00%

Run 3: Report of Indigo — Data Link



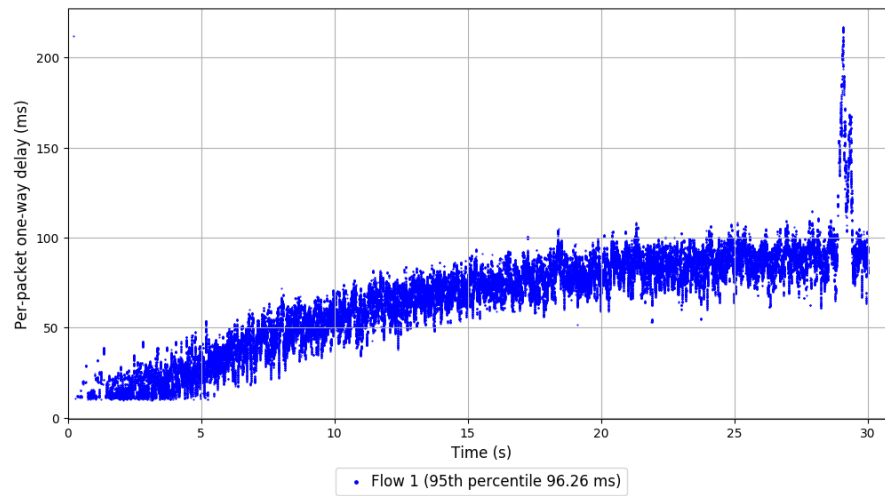
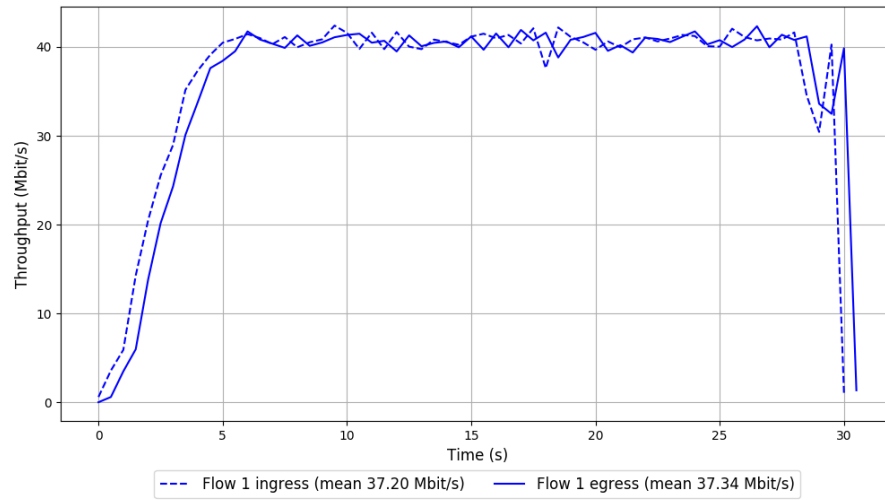
Run 1: Statistics of LEDBAT

Start at: 2018-07-17 08:03:36  
End at: 2018-07-17 08:04:06  
Local clock offset: -22.634 ms  
Remote clock offset: 0.642 ms

# Below is generated by plot.py at 2018-07-17 08:50:09  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 37.34 Mbit/s  
95th percentile per-packet one-way delay: 96.264 ms  
Loss rate: 0.31%  
-- Flow 1:  
Average throughput: 37.34 Mbit/s  
95th percentile per-packet one-way delay: 96.264 ms  
Loss rate: 0.31%



# Run 1: Report of LEDBAT — Data Link

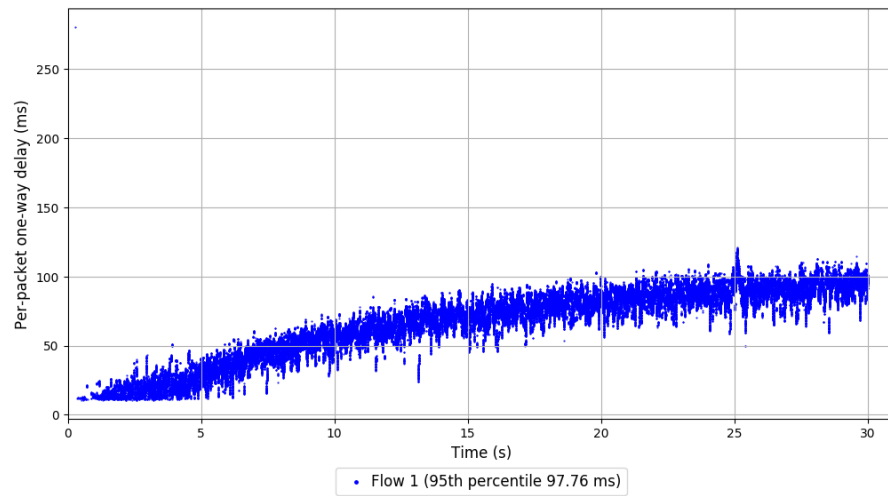
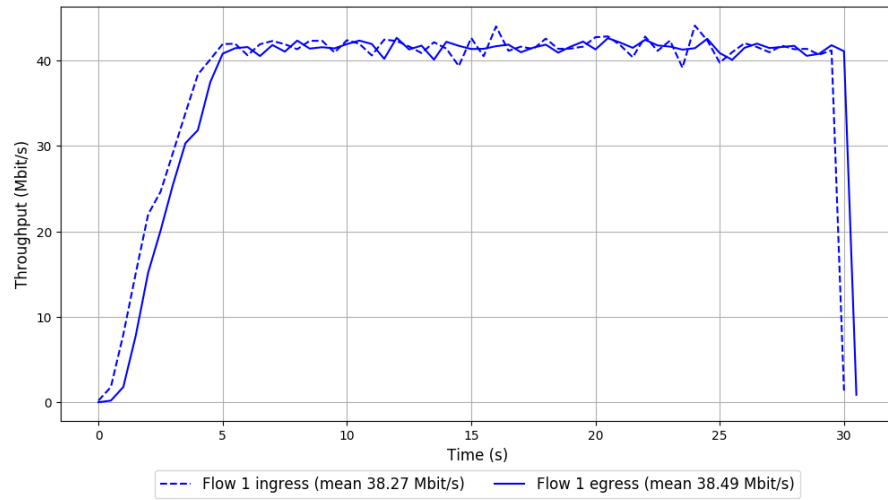


Run 2: Statistics of LEDBAT

Start at: 2018-07-17 08:25:51  
End at: 2018-07-17 08:26:21  
Local clock offset: -12.616 ms  
Remote clock offset: 0.613 ms

# Below is generated by plot.py at 2018-07-17 08:50:15  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 38.49 Mbit/s  
95th percentile per-packet one-way delay: 97.763 ms  
Loss rate: 0.35%  
-- Flow 1:  
Average throughput: 38.49 Mbit/s  
95th percentile per-packet one-way delay: 97.763 ms  
Loss rate: 0.35%

## Run 2: Report of LEDBAT — Data Link

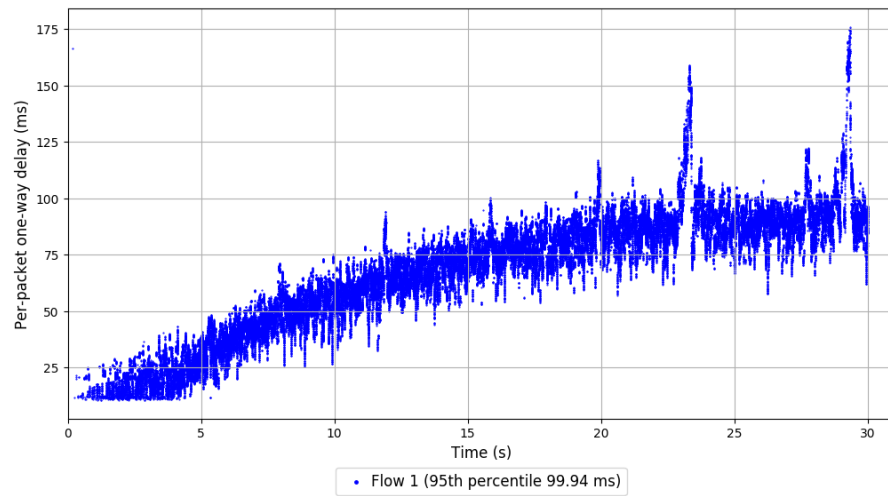
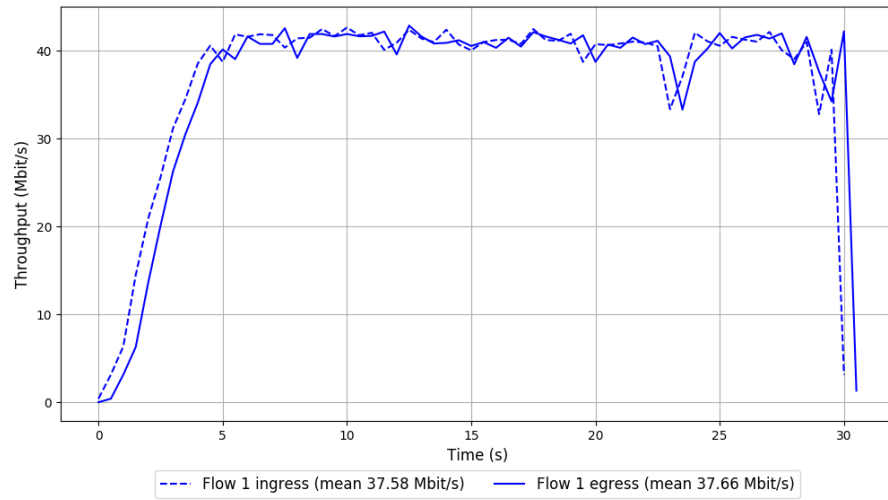


Run 3: Statistics of LEDBAT

Start at: 2018-07-17 08:48:06  
End at: 2018-07-17 08:48:36  
Local clock offset: -12.329 ms  
Remote clock offset: 0.474 ms

# Below is generated by plot.py at 2018-07-17 08:50:27  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 37.66 Mbit/s  
95th percentile per-packet one-way delay: 99.936 ms  
Loss rate: 0.34%  
-- Flow 1:  
Average throughput: 37.66 Mbit/s  
95th percentile per-packet one-way delay: 99.936 ms  
Loss rate: 0.34%

### Run 3: Report of LEDBAT — Data Link

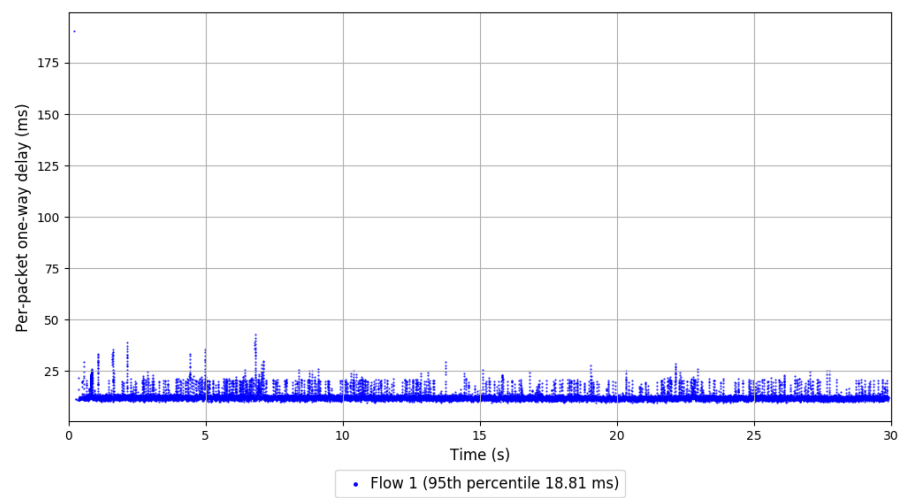
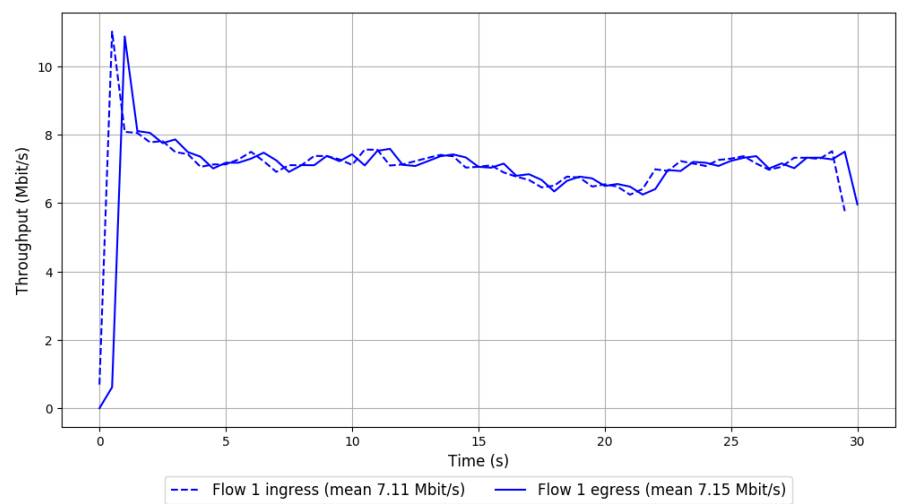


Run 1: Statistics of PCC-Allegro

Start at: 2018-07-17 07:45:07  
End at: 2018-07-17 07:45:37  
Local clock offset: -11.634 ms  
Remote clock offset: 0.915 ms

# Below is generated by plot.py at 2018-07-17 08:50:27  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 7.15 Mbit/s  
95th percentile per-packet one-way delay: 18.810 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 7.15 Mbit/s  
95th percentile per-packet one-way delay: 18.810 ms  
Loss rate: 0.00%

Run 1: Report of PCC-Allegro — Data Link



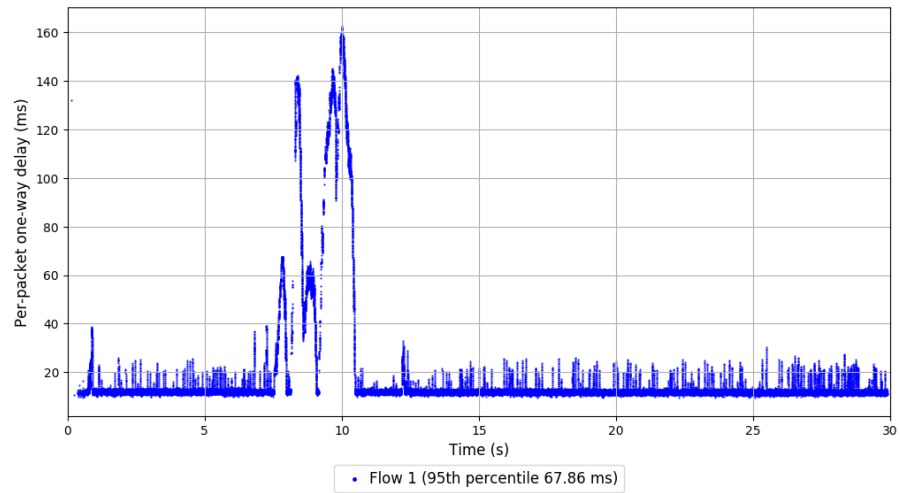
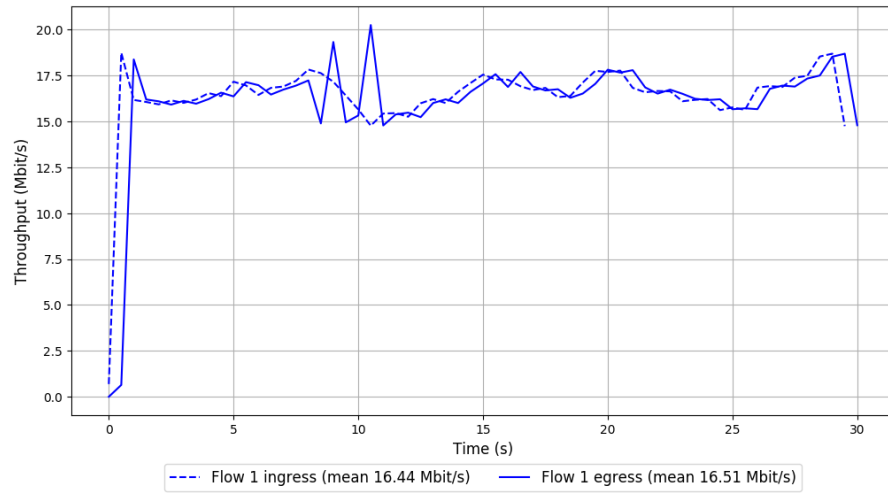
Run 2: Statistics of PCC-Allegro

Start at: 2018-07-17 08:07:32  
End at: 2018-07-17 08:08:02  
Local clock offset: -25.194 ms  
Remote clock offset: 0.613 ms

# Below is generated by plot.py at 2018-07-17 08:50:27  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 16.51 Mbit/s  
95th percentile per-packet one-way delay: 67.861 ms  
Loss rate: 0.04%  
-- Flow 1:  
Average throughput: 16.51 Mbit/s  
95th percentile per-packet one-way delay: 67.861 ms  
Loss rate: 0.04%



## Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2018-07-17 08:29:48

End at: 2018-07-17 08:30:18

Local clock offset: -12.63 ms

Remote clock offset: 0.568 ms

# Below is generated by plot.py at 2018-07-17 08:50:27

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.56 Mbit/s

95th percentile per-packet one-way delay: 13.747 ms

Loss rate: 0.05%

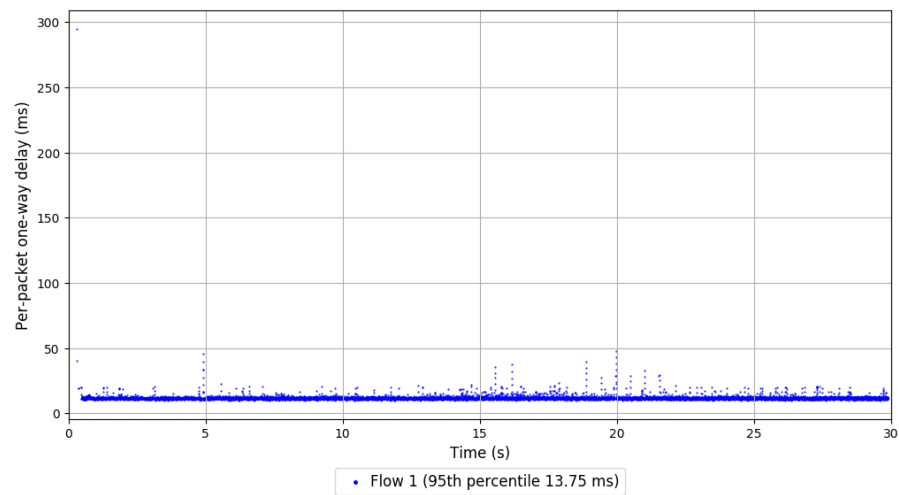
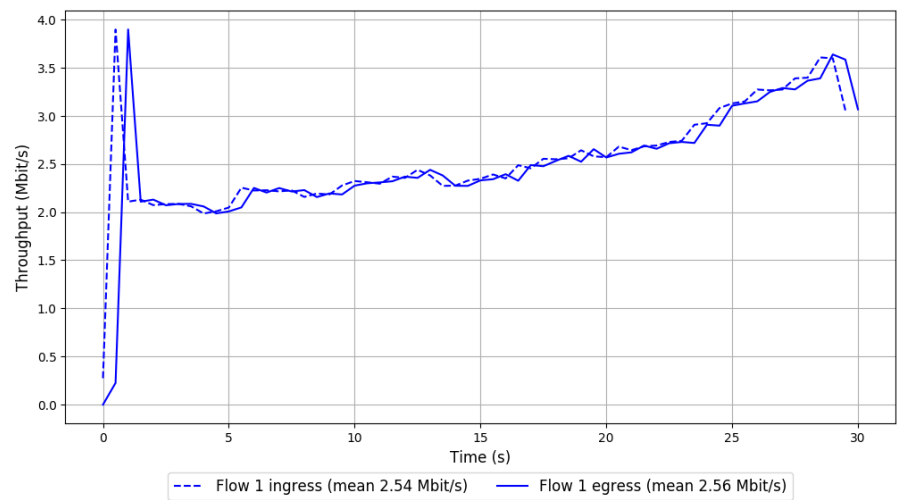
-- Flow 1:

Average throughput: 2.56 Mbit/s

95th percentile per-packet one-way delay: 13.747 ms

Loss rate: 0.05%

Run 3: Report of PCC-Allegro — Data Link

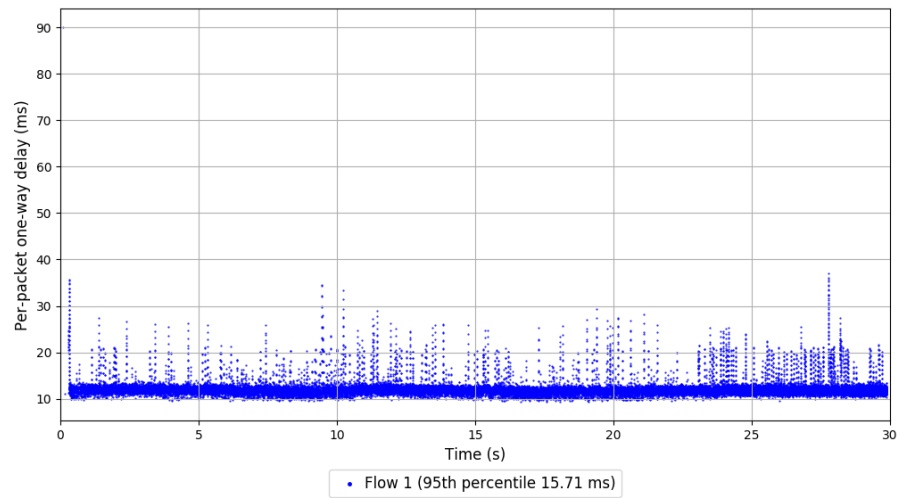
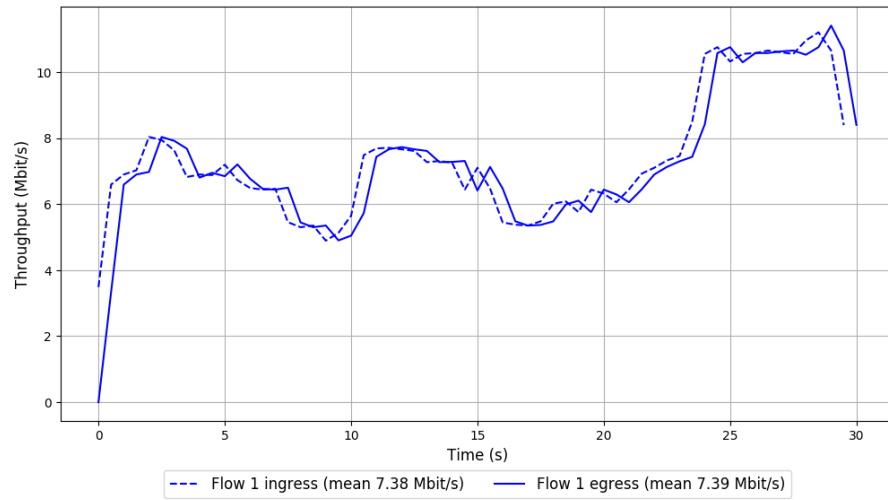


Run 1: Statistics of PCC-Expr

Start at: 2018-07-17 08:00:59  
End at: 2018-07-17 08:01:29  
Local clock offset: -21.094 ms  
Remote clock offset: 0.68 ms

# Below is generated by plot.py at 2018-07-17 08:50:27  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 7.39 Mbit/s  
95th percentile per-packet one-way delay: 15.710 ms  
Loss rate: 0.06%  
-- Flow 1:  
Average throughput: 7.39 Mbit/s  
95th percentile per-packet one-way delay: 15.710 ms  
Loss rate: 0.06%

# Run 1: Report of PCC-Expr — Data Link

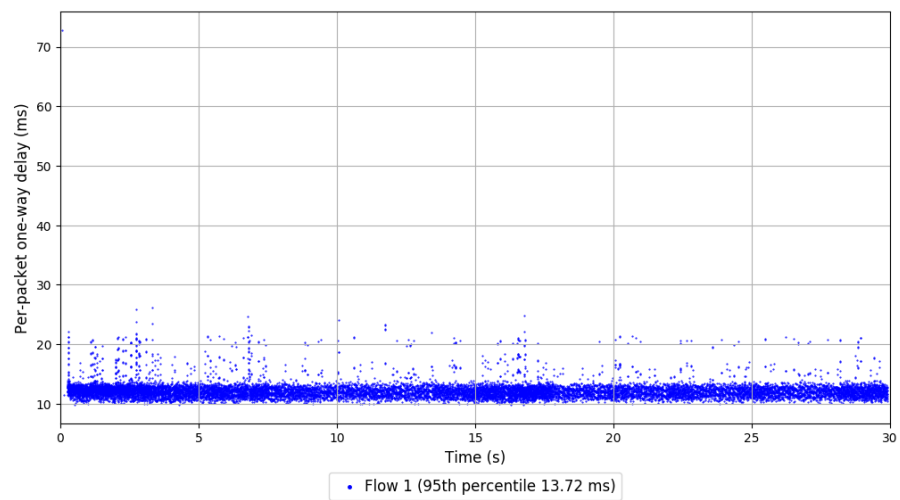
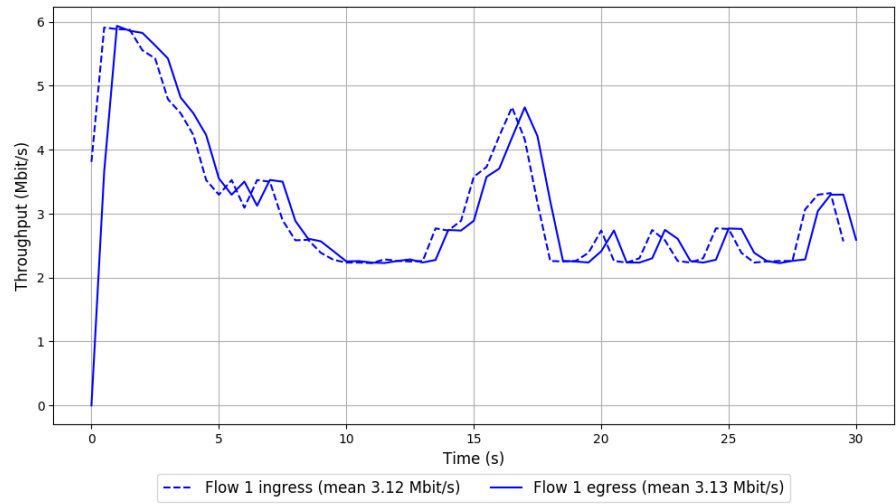


Run 2: Statistics of PCC-Expr

Start at: 2018-07-17 08:23:15  
End at: 2018-07-17 08:23:45  
Local clock offset: -12.913 ms  
Remote clock offset: 0.586 ms

# Below is generated by plot.py at 2018-07-17 08:50:27  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 3.13 Mbit/s  
95th percentile per-packet one-way delay: 13.724 ms  
Loss rate: 0.04%  
-- Flow 1:  
Average throughput: 3.13 Mbit/s  
95th percentile per-packet one-way delay: 13.724 ms  
Loss rate: 0.04%

## Run 2: Report of PCC-Expr — Data Link



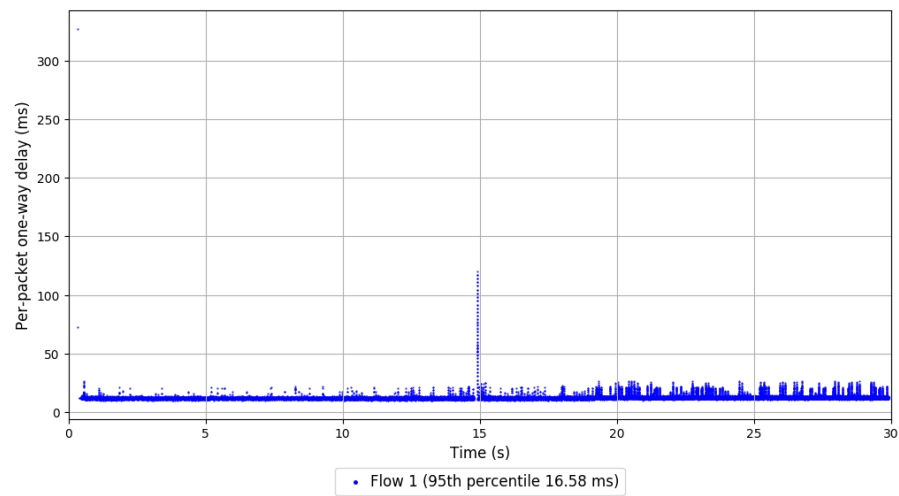
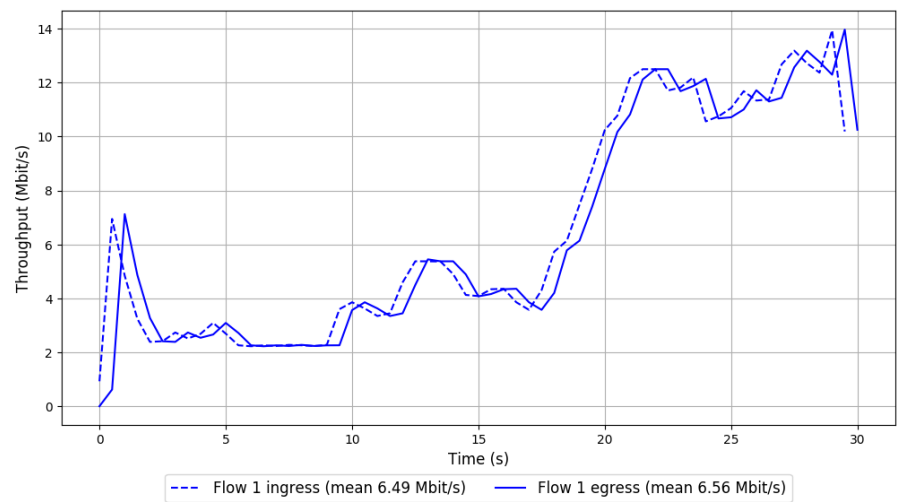
Run 3: Statistics of PCC-Expr

Start at: 2018-07-17 08:45:30  
End at: 2018-07-17 08:46:00  
Local clock offset: -12.539 ms  
Remote clock offset: 0.477 ms

# Below is generated by plot.py at 2018-07-17 08:50:27  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 6.56 Mbit/s  
95th percentile per-packet one-way delay: 16.580 ms  
Loss rate: 0.08%  
-- Flow 1:  
Average throughput: 6.56 Mbit/s  
95th percentile per-packet one-way delay: 16.580 ms  
Loss rate: 0.08%



Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

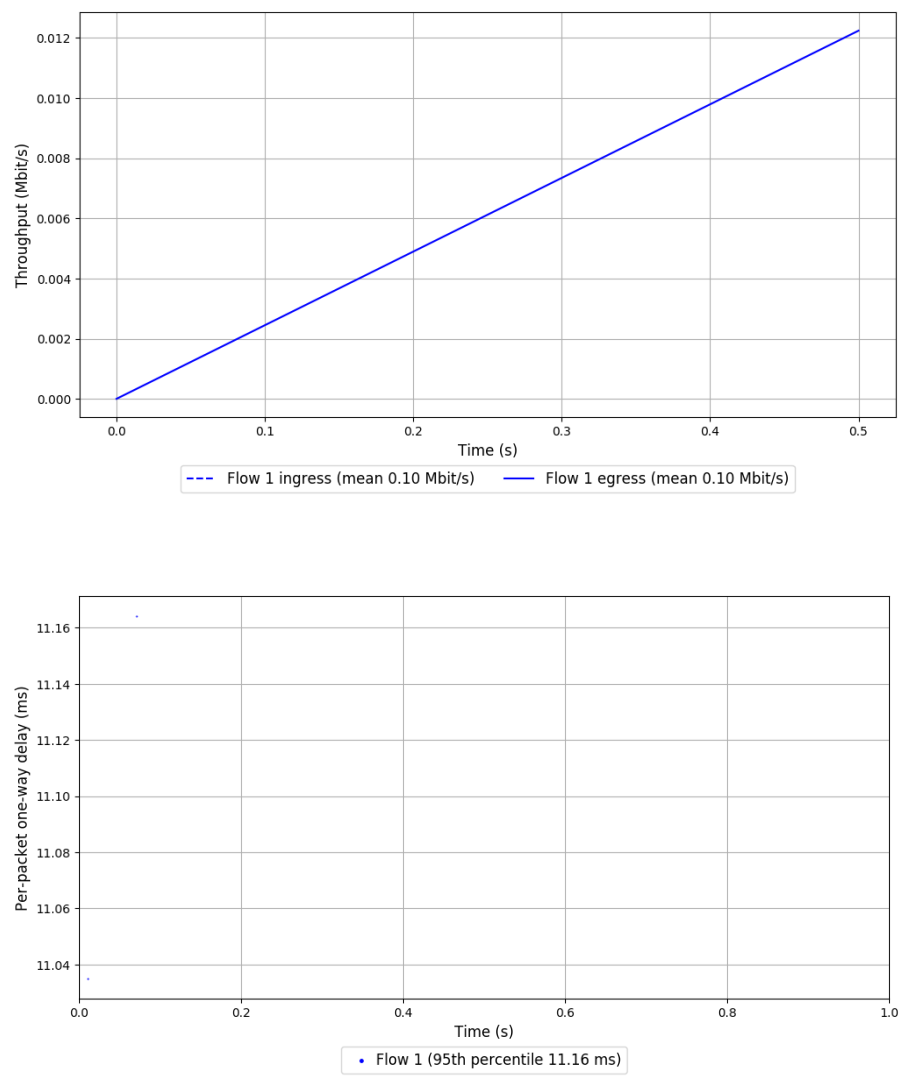
Start at: 2018-07-17 07:53:11

End at: 2018-07-17 07:53:41

Local clock offset: -16.224 ms

Remote clock offset: 0.639 ms

Run 1: Report of QUIC Cubic — Data Link

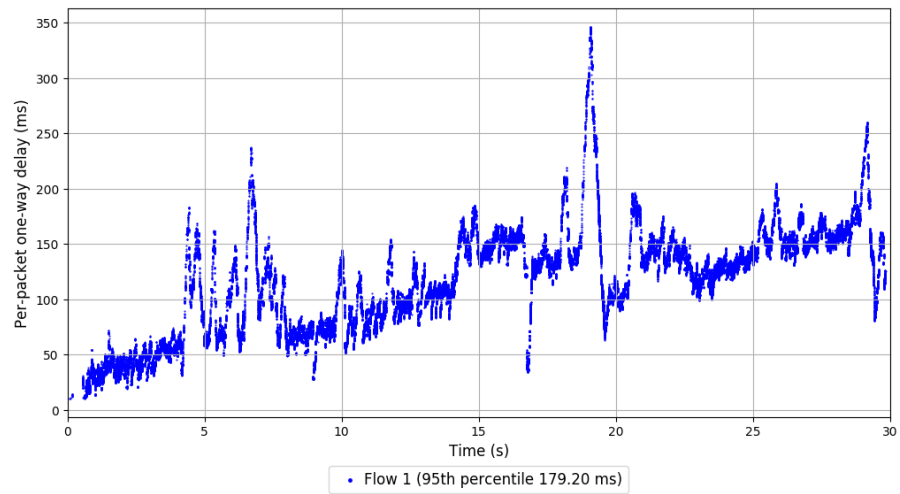
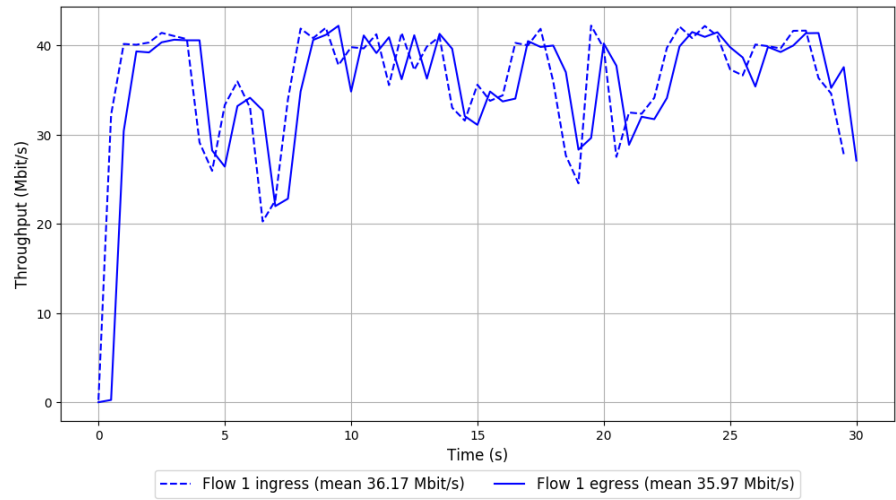


Run 2: Statistics of QUIC Cubic

Start at: 2018-07-17 08:15:24  
End at: 2018-07-17 08:15:55  
Local clock offset: -17.097 ms  
Remote clock offset: 0.579 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 35.97 Mbit/s  
95th percentile per-packet one-way delay: 179.200 ms  
Loss rate: 0.56%  
-- Flow 1:  
Average throughput: 35.97 Mbit/s  
95th percentile per-packet one-way delay: 179.200 ms  
Loss rate: 0.56%

## Run 2: Report of QUIC Cubic — Data Link

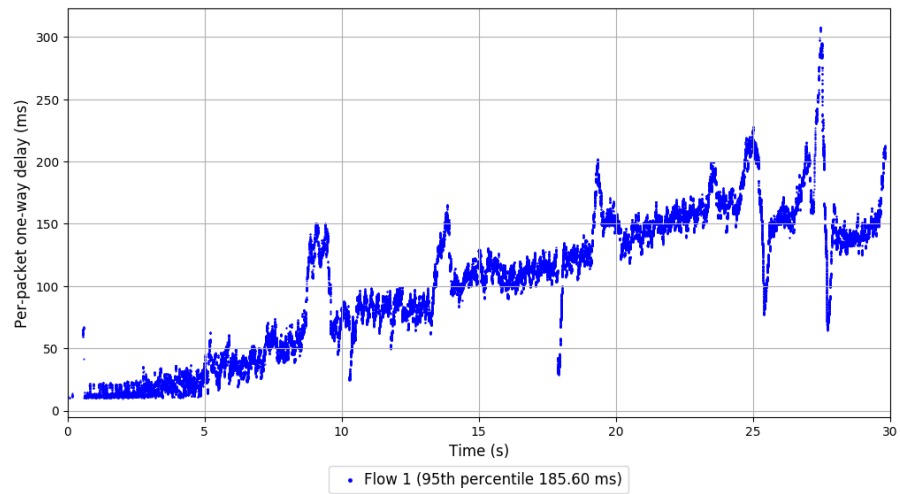
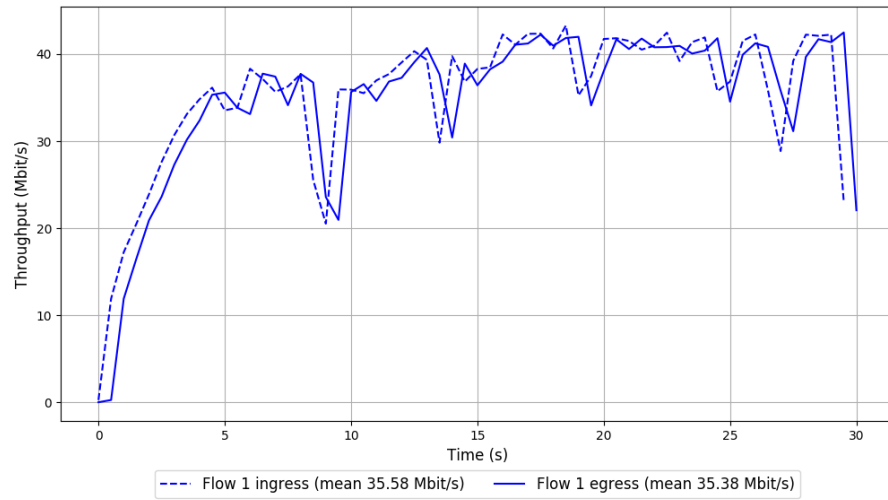


Run 3: Statistics of QUIC Cubic

Start at: 2018-07-17 08:37:35  
End at: 2018-07-17 08:38:05  
Local clock offset: -13.783 ms  
Remote clock offset: 0.597 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 35.38 Mbit/s  
95th percentile per-packet one-way delay: 185.596 ms  
Loss rate: 0.61%  
-- Flow 1:  
Average throughput: 35.38 Mbit/s  
95th percentile per-packet one-way delay: 185.596 ms  
Loss rate: 0.61%

### Run 3: Report of QUIC Cubic — Data Link



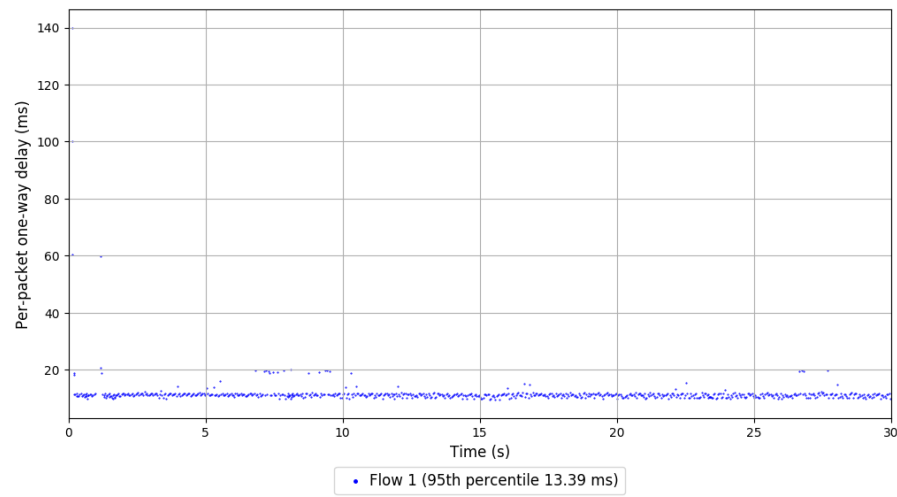
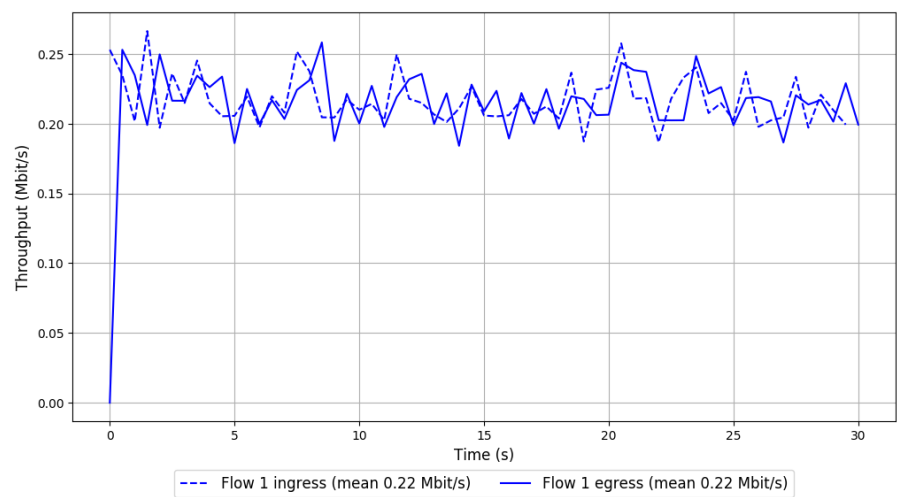
Run 1: Statistics of SCReAM

Start at: 2018-07-17 07:49:02  
End at: 2018-07-17 07:49:32  
Local clock offset: -13.651 ms  
Remote clock offset: 0.781 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 13.394 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 13.394 ms  
Loss rate: 0.00%



Run 1: Report of SReAM — Data Link

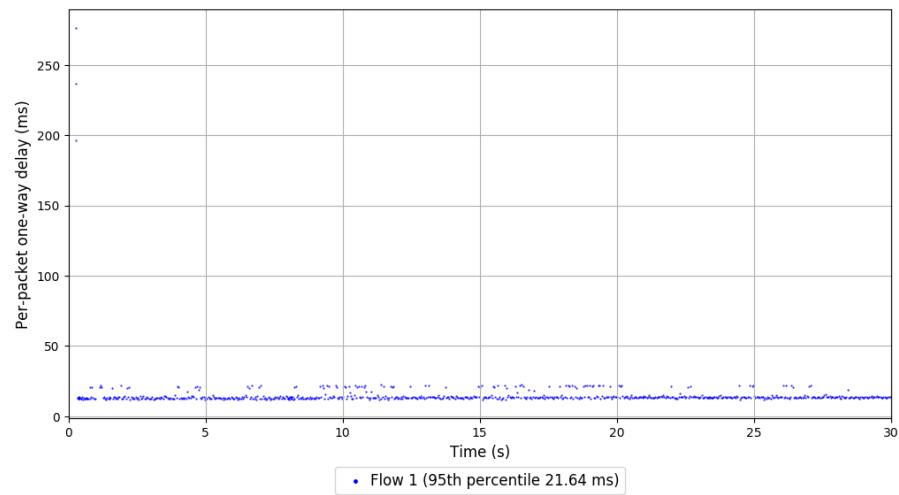
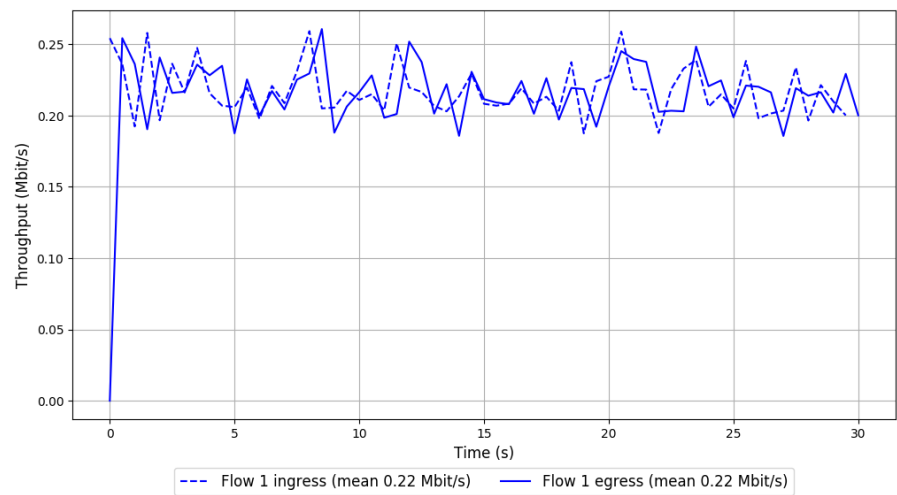


Run 2: Statistics of SCReAM

Start at: 2018-07-17 08:11:27  
End at: 2018-07-17 08:11:57  
Local clock offset: -22.493 ms  
Remote clock offset: 0.637 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 21.640 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 21.640 ms  
Loss rate: 0.00%

Run 2: Report of SReAM — Data Link

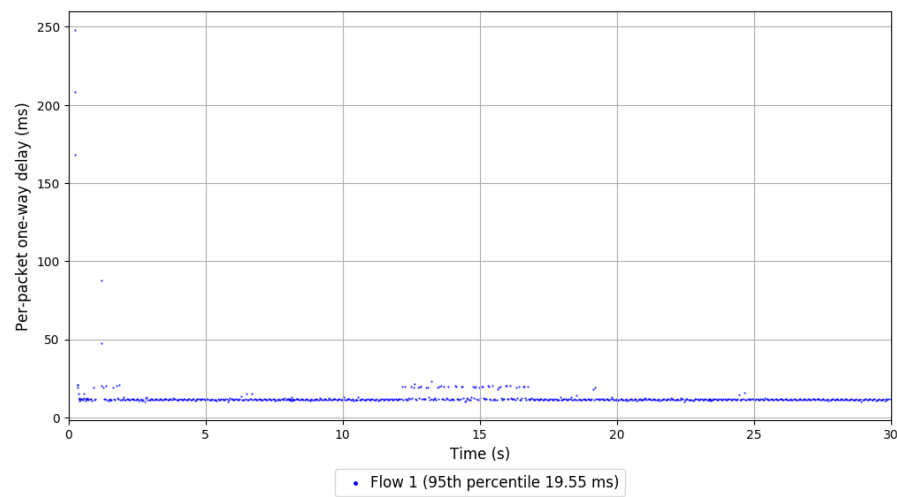
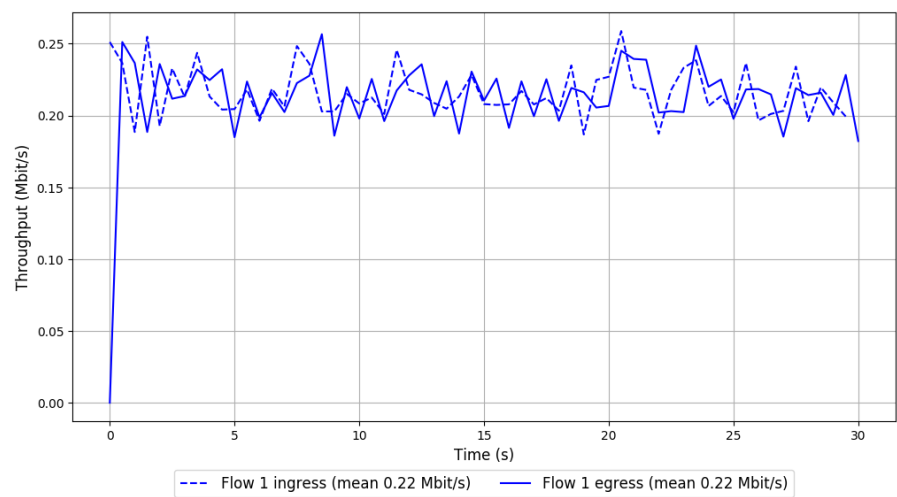


Run 3: Statistics of SCReAM

Start at: 2018-07-17 08:33:42  
End at: 2018-07-17 08:34:12  
Local clock offset: -13.093 ms  
Remote clock offset: 0.568 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 19.553 ms  
Loss rate: 0.13%  
-- Flow 1:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 19.553 ms  
Loss rate: 0.13%

Run 3: Report of SReAM — Data Link

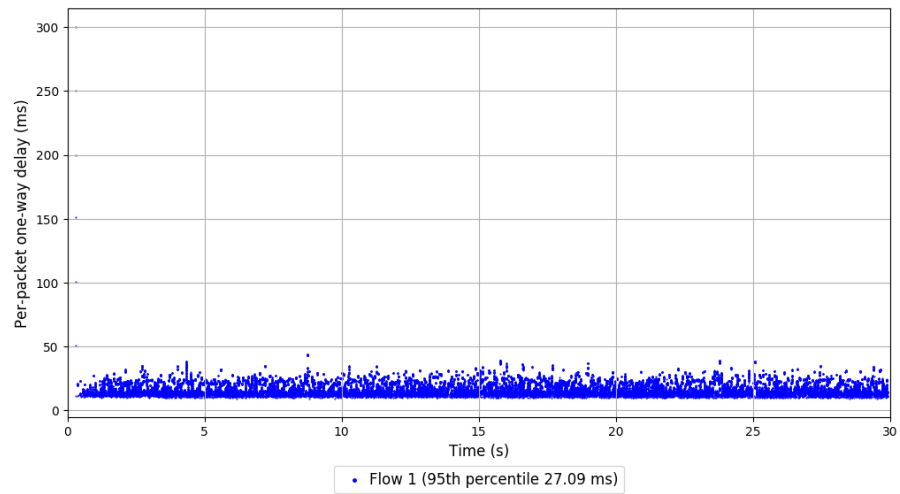
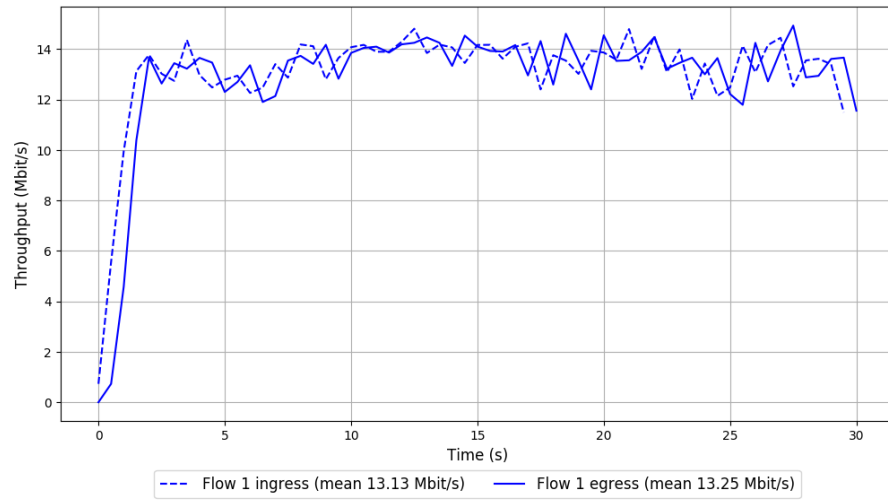


Run 1: Statistics of Sprout

Start at: 2018-07-17 07:55:46  
End at: 2018-07-17 07:56:16  
Local clock offset: -17.876 ms  
Remote clock offset: 0.65 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 13.25 Mbit/s  
95th percentile per-packet one-way delay: 27.094 ms  
Loss rate: 0.08%  
-- Flow 1:  
Average throughput: 13.25 Mbit/s  
95th percentile per-packet one-way delay: 27.094 ms  
Loss rate: 0.08%

# Run 1: Report of Sprout — Data Link



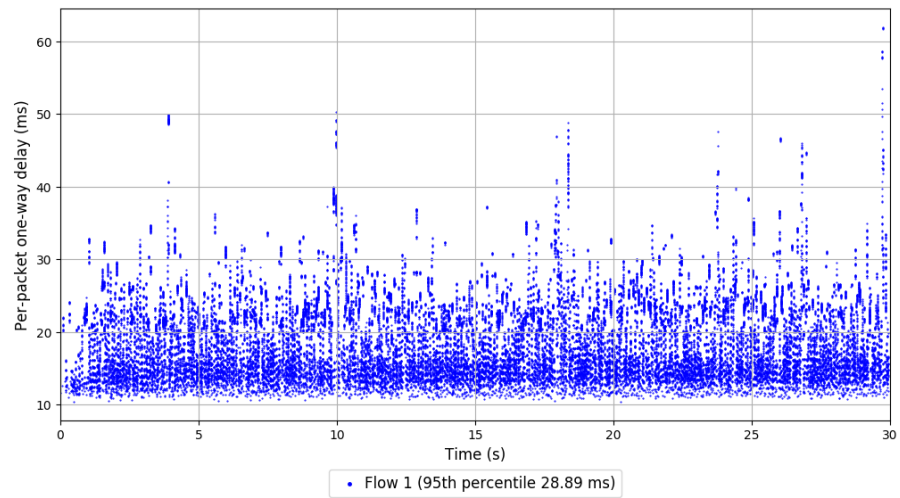
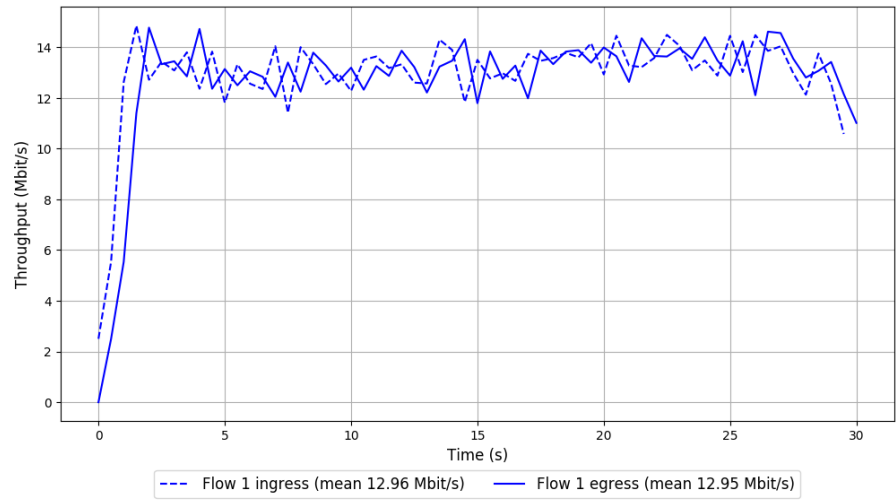
Run 2: Statistics of Sprout

Start at: 2018-07-17 08:18:01  
End at: 2018-07-17 08:18:31  
Local clock offset: -15.077 ms  
Remote clock offset: 0.614 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 12.95 Mbit/s  
95th percentile per-packet one-way delay: 28.894 ms  
Loss rate: 0.04%  
-- Flow 1:  
Average throughput: 12.95 Mbit/s  
95th percentile per-packet one-way delay: 28.894 ms  
Loss rate: 0.04%



## Run 2: Report of Sprout — Data Link

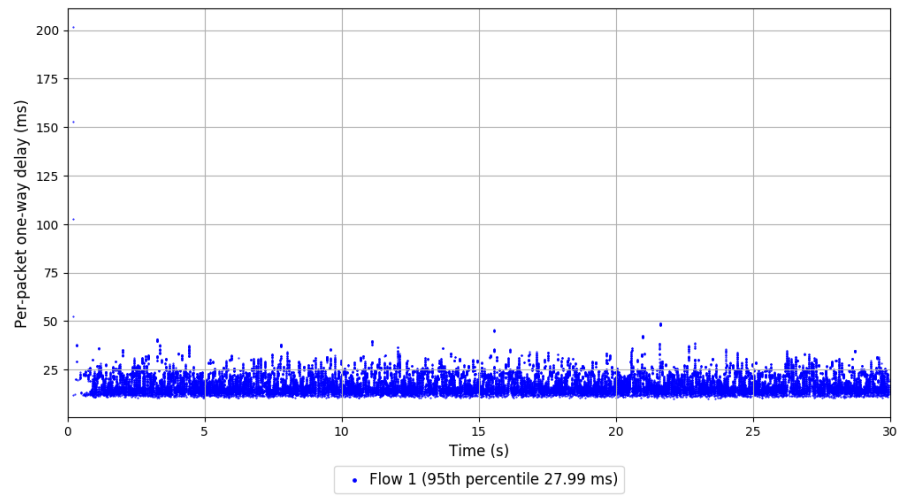
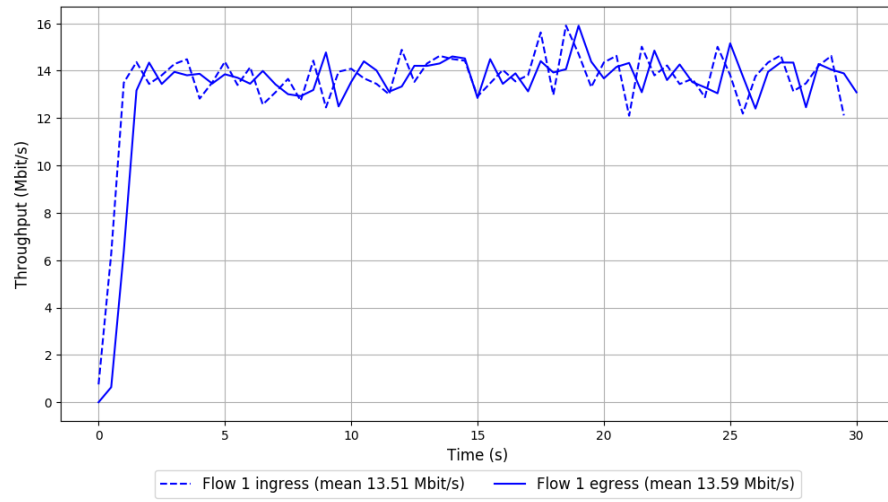


Run 3: Statistics of Sprout

Start at: 2018-07-17 08:40:12  
End at: 2018-07-17 08:40:42  
Local clock offset: -13.905 ms  
Remote clock offset: 0.57 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 13.59 Mbit/s  
95th percentile per-packet one-way delay: 27.993 ms  
Loss rate: 0.01%  
-- Flow 1:  
Average throughput: 13.59 Mbit/s  
95th percentile per-packet one-way delay: 27.993 ms  
Loss rate: 0.01%

### Run 3: Report of Sprout — Data Link

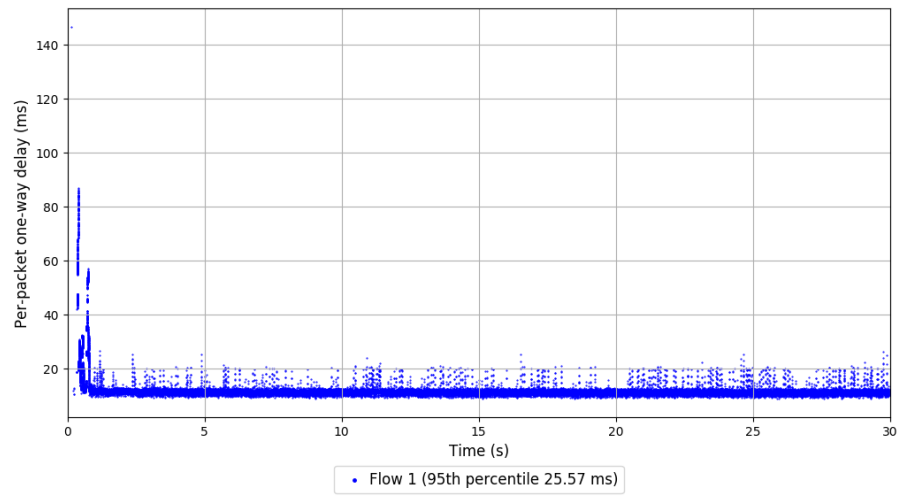
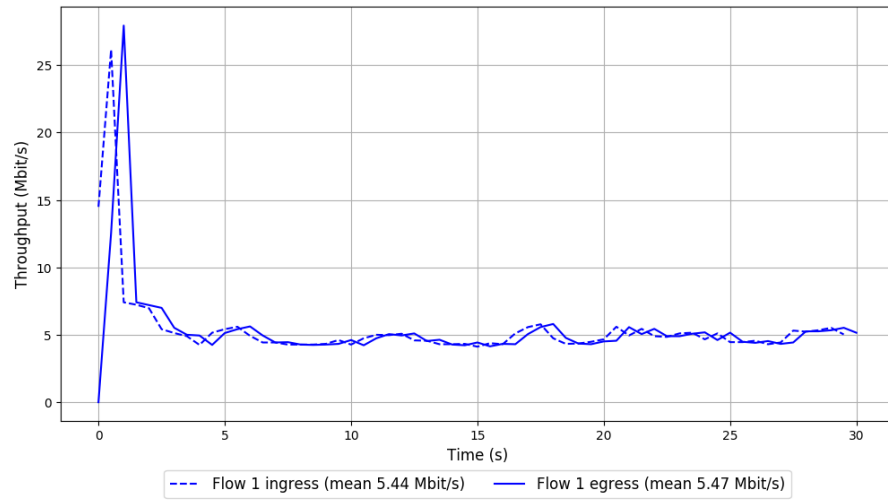


Run 1: Statistics of TaoVA-100x

Start at: 2018-07-17 07:50:20  
End at: 2018-07-17 07:50:50  
Local clock offset: -14.422 ms  
Remote clock offset: 0.719 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 5.47 Mbit/s  
95th percentile per-packet one-way delay: 25.573 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 5.47 Mbit/s  
95th percentile per-packet one-way delay: 25.573 ms  
Loss rate: 0.00%

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

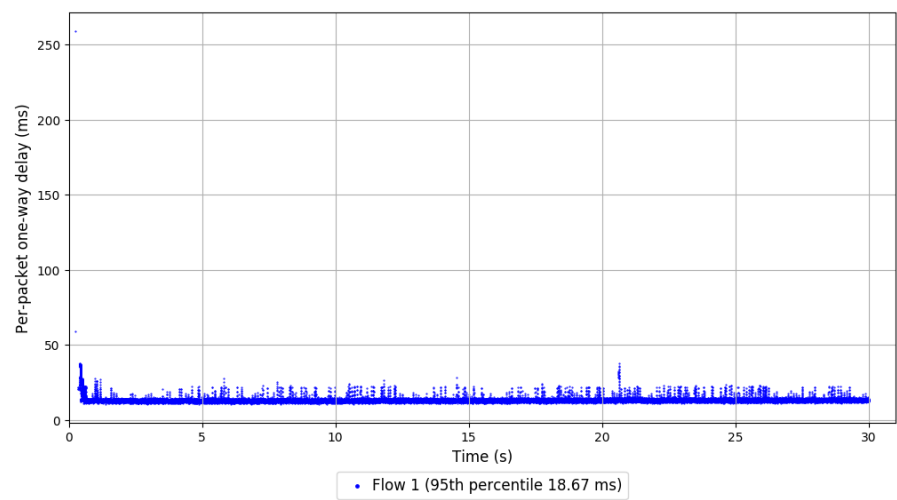
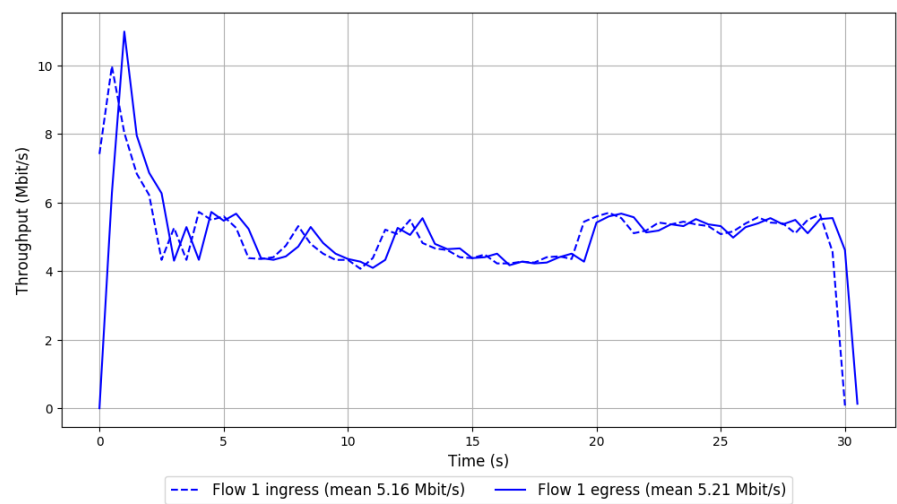


Run 2: Statistics of TaoVA-100x

Start at: 2018-07-17 08:12:49  
End at: 2018-07-17 08:13:19  
Local clock offset: -20.158 ms  
Remote clock offset: 0.618 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 5.21 Mbit/s  
95th percentile per-packet one-way delay: 18.668 ms  
Loss rate: 0.03%  
-- Flow 1:  
Average throughput: 5.21 Mbit/s  
95th percentile per-packet one-way delay: 18.668 ms  
Loss rate: 0.03%

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



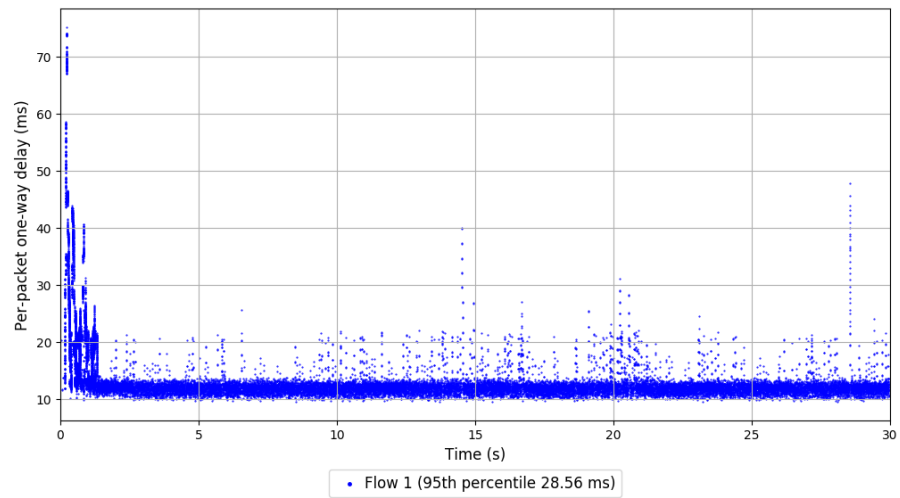
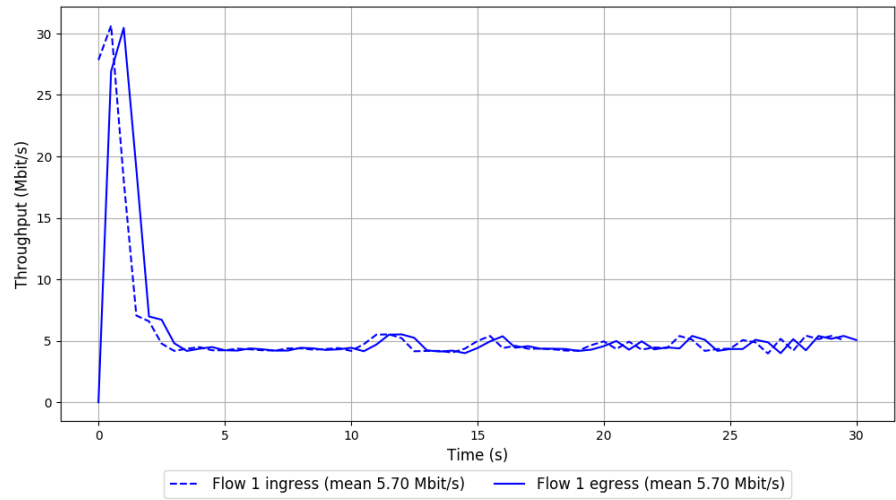
Run 3: Statistics of TaoVA-100x

Start at: 2018-07-17 08:34:59  
End at: 2018-07-17 08:35:29  
Local clock offset: -13.283 ms  
Remote clock offset: 0.566 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 5.70 Mbit/s  
95th percentile per-packet one-way delay: 28.564 ms  
Loss rate: 0.04%  
-- Flow 1:  
Average throughput: 5.70 Mbit/s  
95th percentile per-packet one-way delay: 28.564 ms  
Loss rate: 0.04%



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

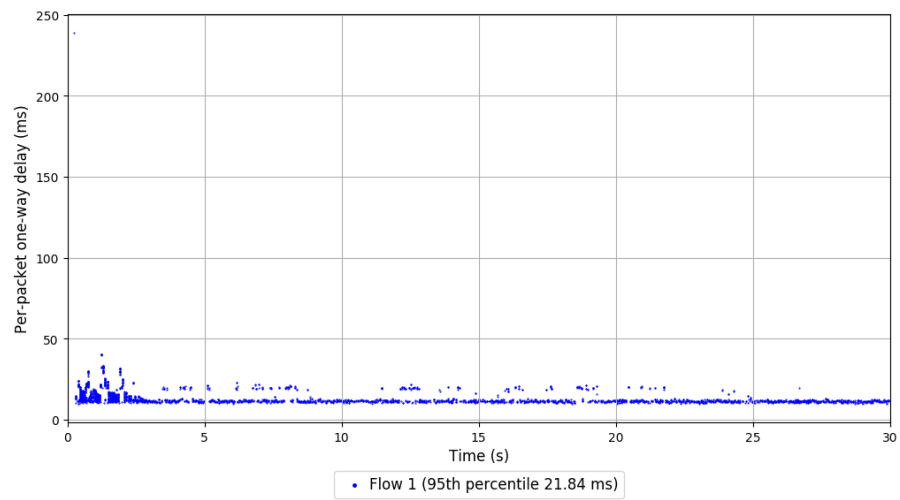
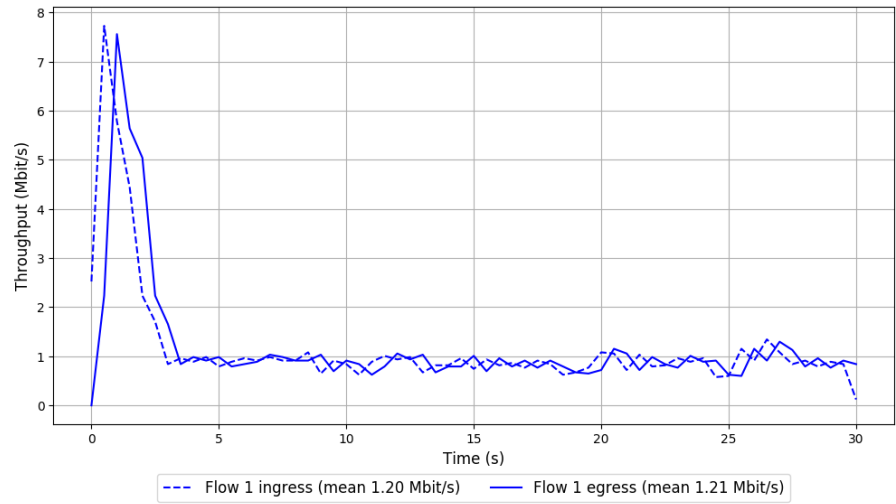


Run 1: Statistics of TCP Vegas

Start at: 2018-07-17 07:54:28  
End at: 2018-07-17 07:54:58  
Local clock offset: -16.988 ms  
Remote clock offset: 0.729 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.21 Mbit/s  
95th percentile per-packet one-way delay: 21.837 ms  
Loss rate: 0.17%  
-- Flow 1:  
Average throughput: 1.21 Mbit/s  
95th percentile per-packet one-way delay: 21.837 ms  
Loss rate: 0.17%

### Run 1: Report of TCP Vegas — Data Link

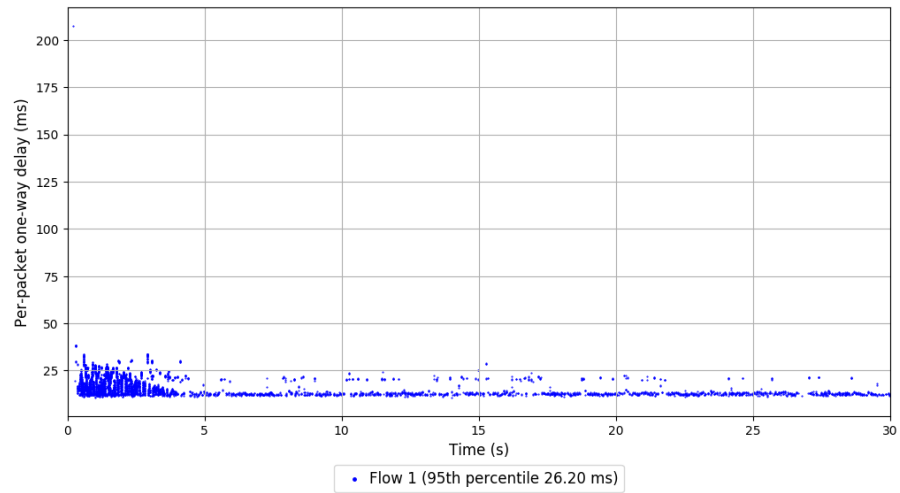
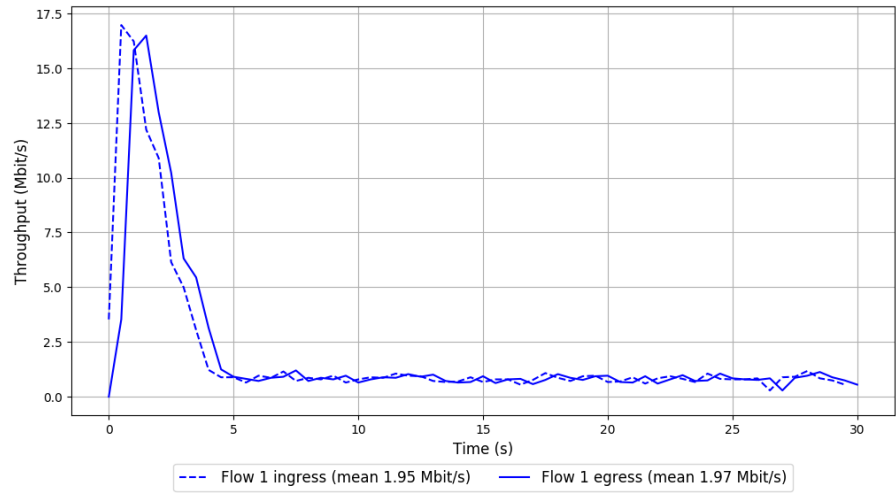


Run 2: Statistics of TCP Vegas

Start at: 2018-07-17 08:16:43  
End at: 2018-07-17 08:17:13  
Local clock offset: -15.946 ms  
Remote clock offset: 0.636 ms

# Below is generated by plot.py at 2018-07-17 08:50:48  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.97 Mbit/s  
95th percentile per-packet one-way delay: 26.202 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 1.97 Mbit/s  
95th percentile per-packet one-way delay: 26.202 ms  
Loss rate: 0.00%

## Run 2: Report of TCP Vegas — Data Link

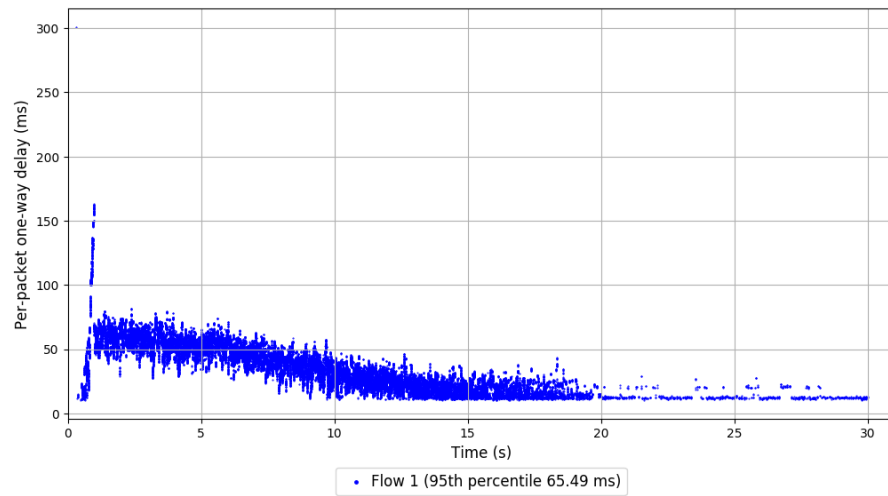
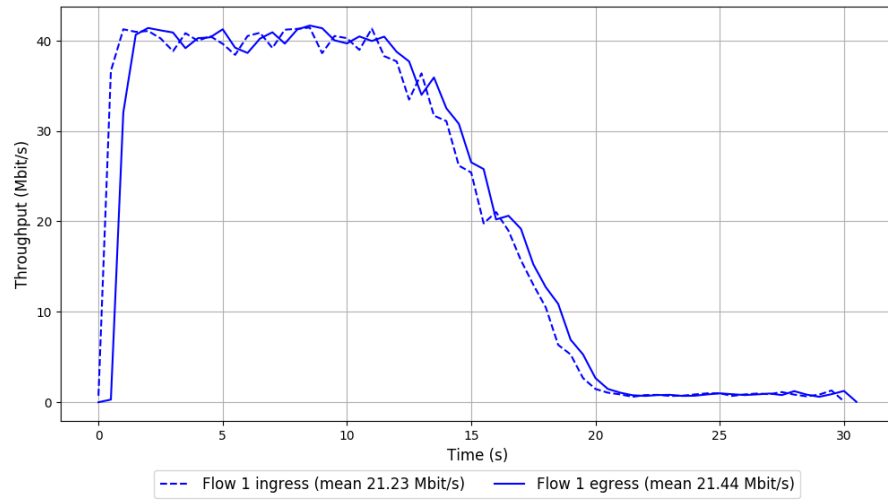


Run 3: Statistics of TCP Vegas

Start at: 2018-07-17 08:38:53  
End at: 2018-07-17 08:39:24  
Local clock offset: -14.093 ms  
Remote clock offset: 0.523 ms

# Below is generated by plot.py at 2018-07-17 08:50:52  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 21.44 Mbit/s  
95th percentile per-packet one-way delay: 65.494 ms  
Loss rate: 0.01%  
-- Flow 1:  
Average throughput: 21.44 Mbit/s  
95th percentile per-packet one-way delay: 65.494 ms  
Loss rate: 0.01%

### Run 3: Report of TCP Vegas — Data Link



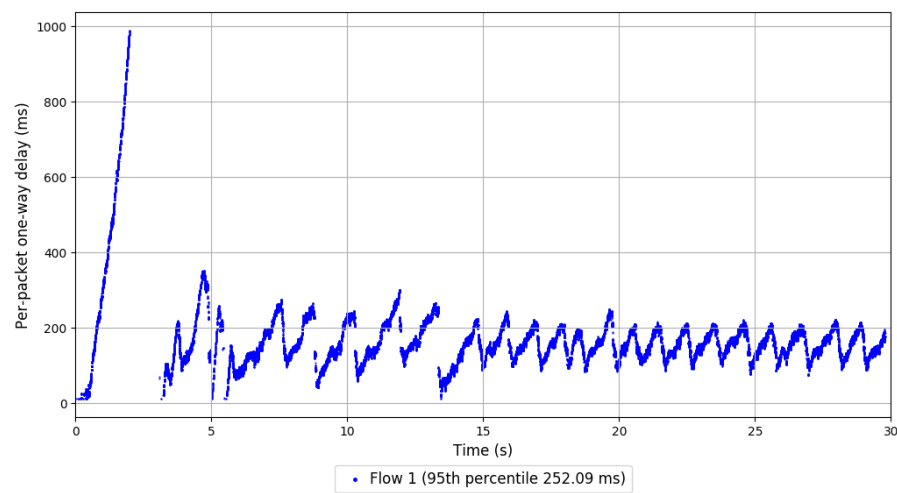
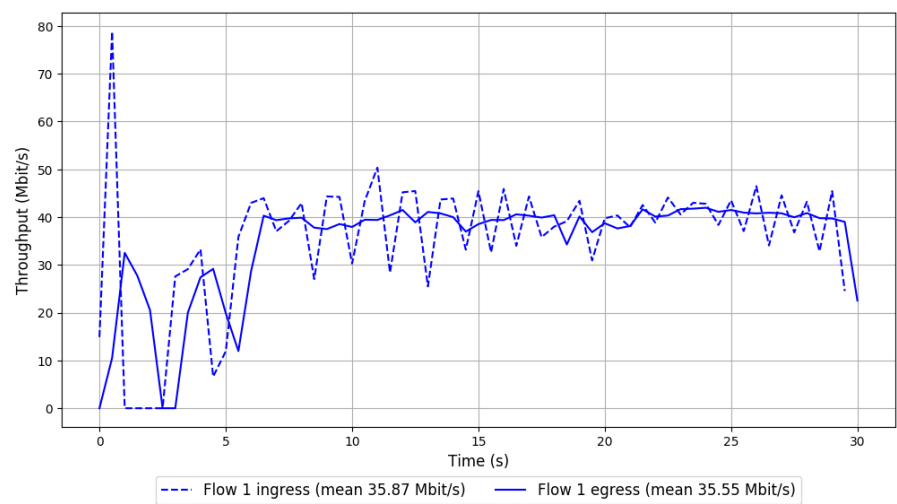
Run 1: Statistics of Verus

Start at: 2018-07-17 07:42:30  
End at: 2018-07-17 07:43:00  
Local clock offset: -10.149 ms  
Remote clock offset: 0.867 ms

# Below is generated by plot.py at 2018-07-17 08:50:59  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 35.55 Mbit/s  
95th percentile per-packet one-way delay: 252.093 ms  
Loss rate: 0.84%  
-- Flow 1:  
Average throughput: 35.55 Mbit/s  
95th percentile per-packet one-way delay: 252.093 ms  
Loss rate: 0.84%



Run 1: Report of Verus — Data Link

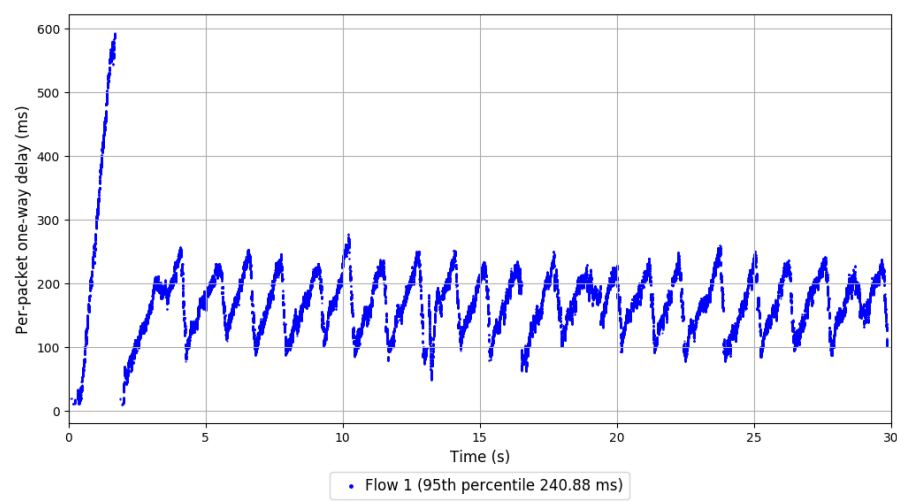
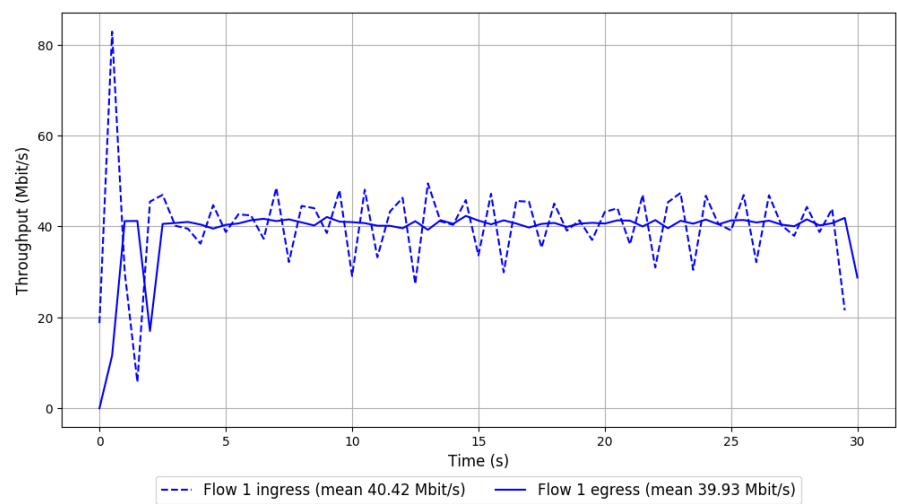


Run 2: Statistics of Verus

Start at: 2018-07-17 08:04:55  
End at: 2018-07-17 08:05:25  
Local clock offset: -23.583 ms  
Remote clock offset: 0.623 ms

# Below is generated by plot.py at 2018-07-17 08:51:00  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 39.93 Mbit/s  
95th percentile per-packet one-way delay: 240.882 ms  
Loss rate: 1.28%  
-- Flow 1:  
Average throughput: 39.93 Mbit/s  
95th percentile per-packet one-way delay: 240.882 ms  
Loss rate: 1.28%

Run 2: Report of Verus — Data Link

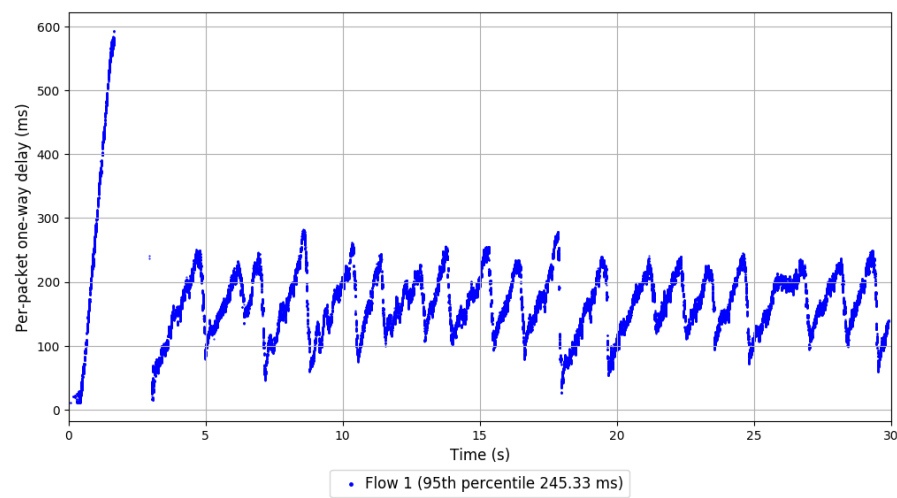
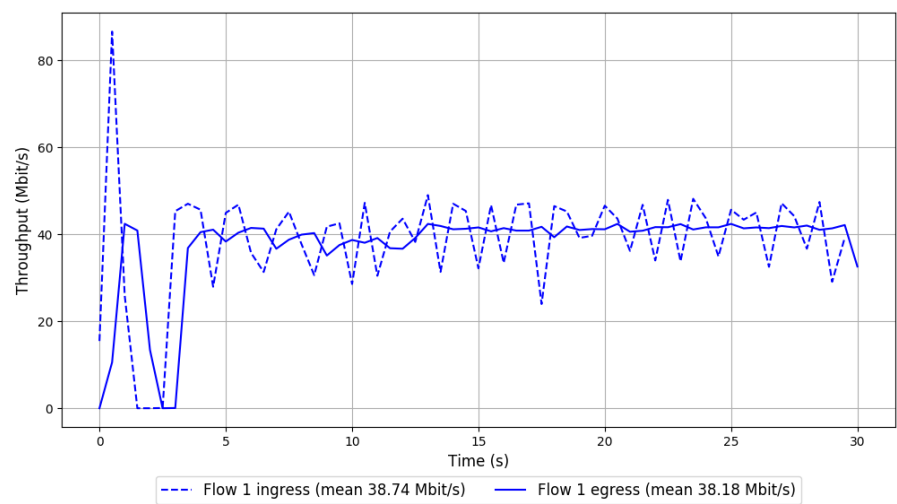


Run 3: Statistics of Verus

Start at: 2018-07-17 08:27:10  
End at: 2018-07-17 08:27:40  
Local clock offset: -12.556 ms  
Remote clock offset: 0.522 ms

# Below is generated by plot.py at 2018-07-17 08:51:00  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 38.18 Mbit/s  
95th percentile per-packet one-way delay: 245.332 ms  
Loss rate: 1.48%  
-- Flow 1:  
Average throughput: 38.18 Mbit/s  
95th percentile per-packet one-way delay: 245.332 ms  
Loss rate: 1.48%

Run 3: Report of Verus — Data Link

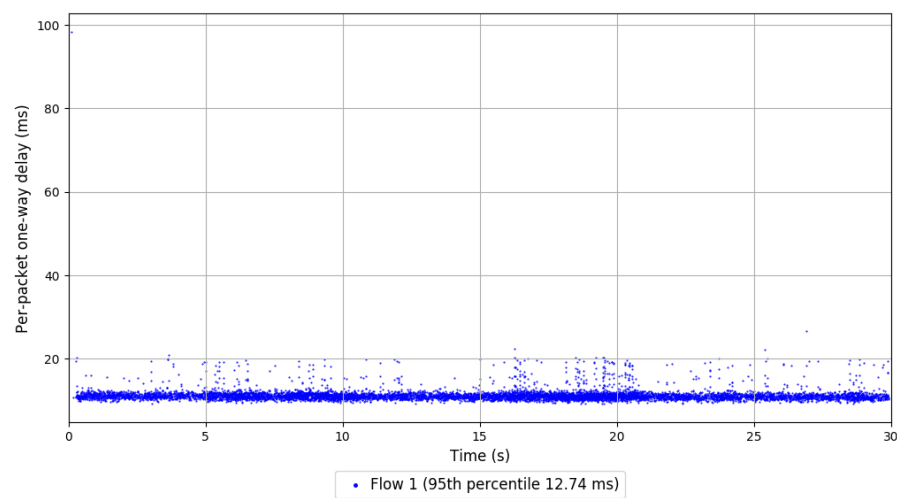
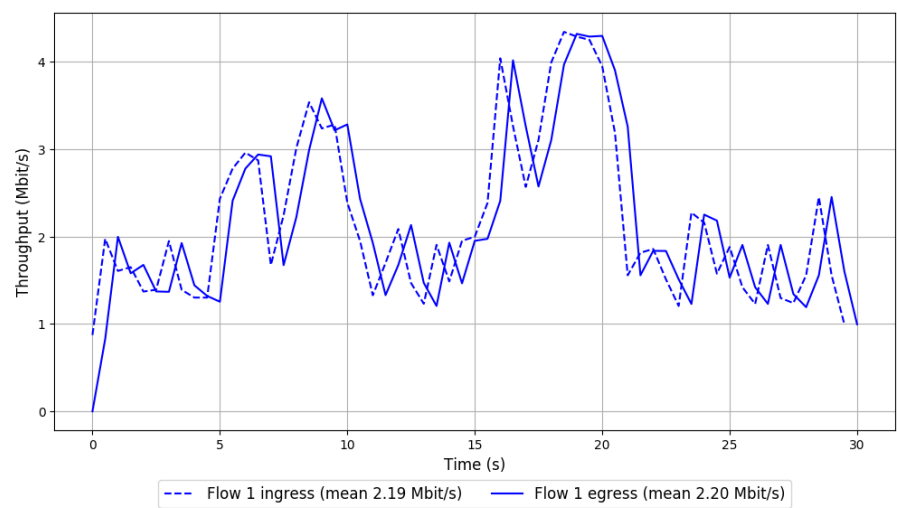


Run 1: Statistics of PCC-Vivace

Start at: 2018-07-17 07:43:49  
End at: 2018-07-17 07:44:19  
Local clock offset: -10.783 ms  
Remote clock offset: 0.863 ms

# Below is generated by plot.py at 2018-07-17 08:51:00  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.20 Mbit/s  
95th percentile per-packet one-way delay: 12.739 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 2.20 Mbit/s  
95th percentile per-packet one-way delay: 12.739 ms  
Loss rate: 0.00%

Run 1: Report of PCC-Vivace — Data Link



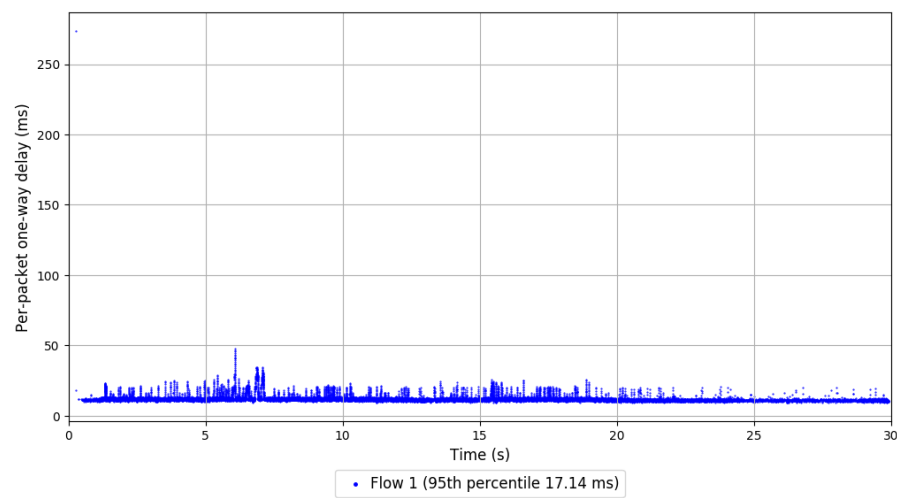
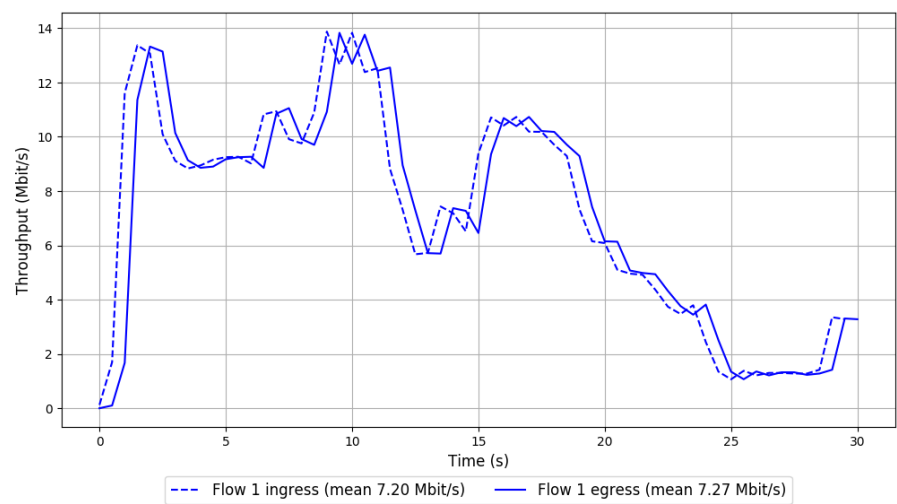
Run 2: Statistics of PCC-Vivace

Start at: 2018-07-17 08:06:14  
End at: 2018-07-17 08:06:44  
Local clock offset: -24.377 ms  
Remote clock offset: 0.696 ms

# Below is generated by plot.py at 2018-07-17 08:51:00  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 7.27 Mbit/s  
95th percentile per-packet one-way delay: 17.140 ms  
Loss rate: 0.02%  
-- Flow 1:  
Average throughput: 7.27 Mbit/s  
95th percentile per-packet one-way delay: 17.140 ms  
Loss rate: 0.02%



Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2018-07-17 08:28:29

End at: 2018-07-17 08:28:59

Local clock offset: -12.57 ms

Remote clock offset: 0.501 ms

# Below is generated by plot.py at 2018-07-17 08:51:00

# Datalink statistics

-- Total of 1 flow:

Average throughput: 18.58 Mbit/s

95th percentile per-packet one-way delay: 21.536 ms

Loss rate: 0.04%

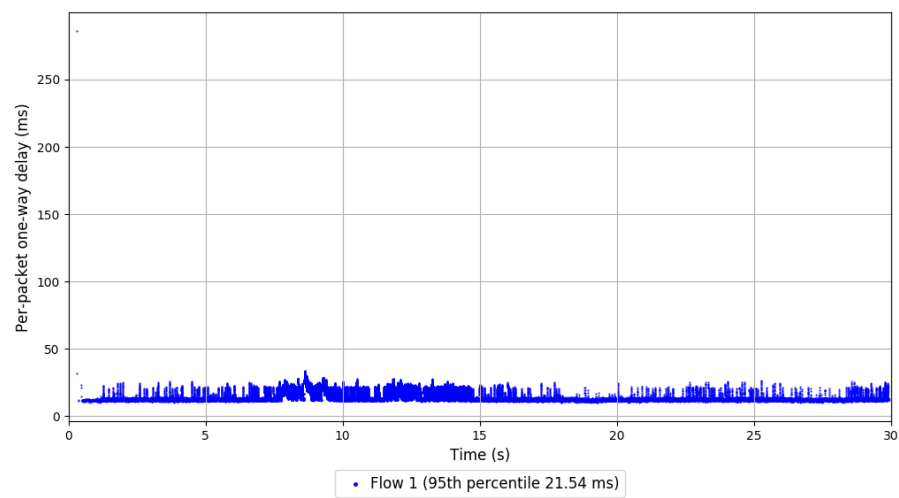
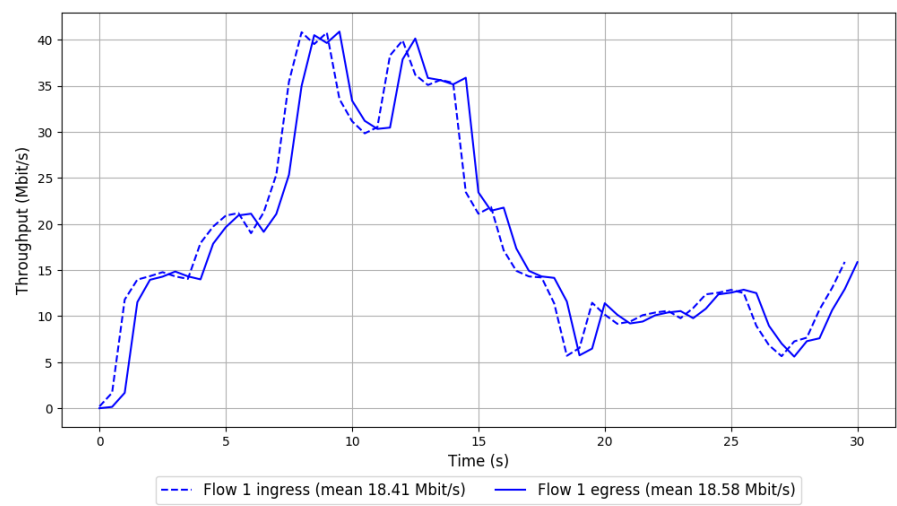
-- Flow 1:

Average throughput: 18.58 Mbit/s

95th percentile per-packet one-way delay: 21.536 ms

Loss rate: 0.04%

Run 3: Report of PCC-Vivace — Data Link

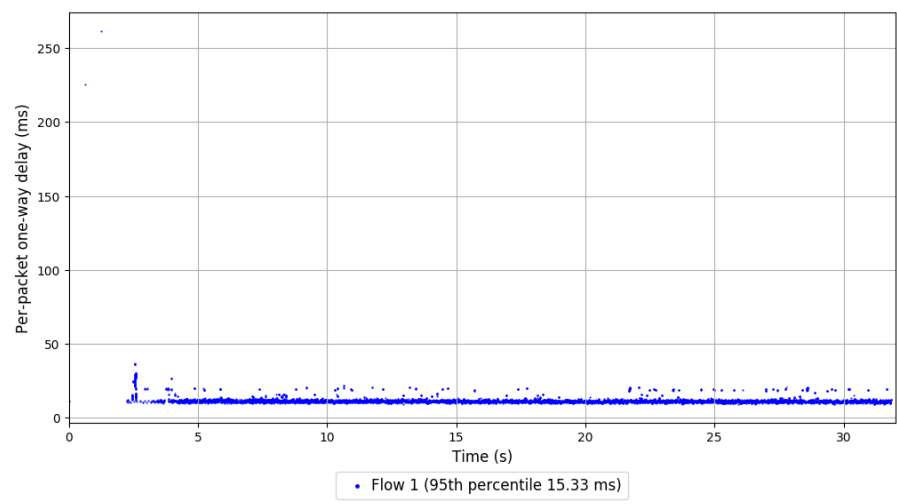
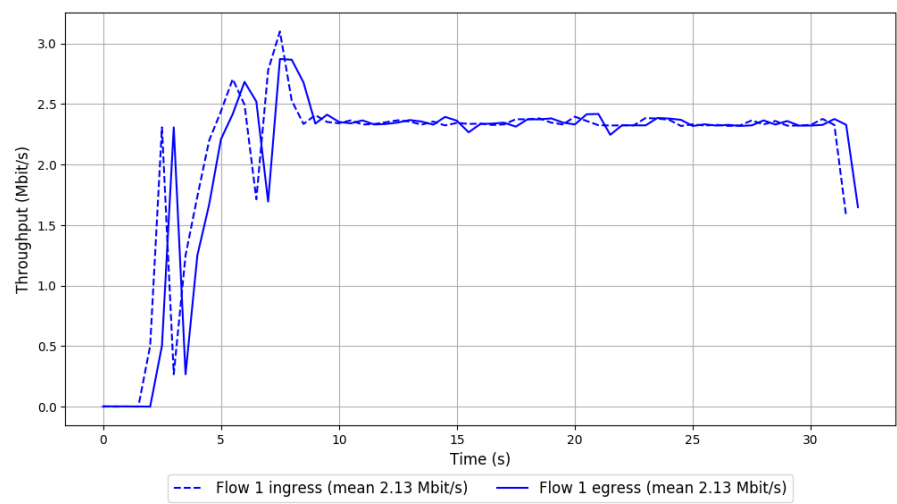


Run 1: Statistics of WebRTC media

Start at: 2018-07-17 07:47:45  
End at: 2018-07-17 07:48:15  
Local clock offset: -13.034 ms  
Remote clock offset: 0.799 ms

# Below is generated by plot.py at 2018-07-17 08:51:00  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.13 Mbit/s  
95th percentile per-packet one-way delay: 15.333 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 2.13 Mbit/s  
95th percentile per-packet one-way delay: 15.333 ms  
Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link

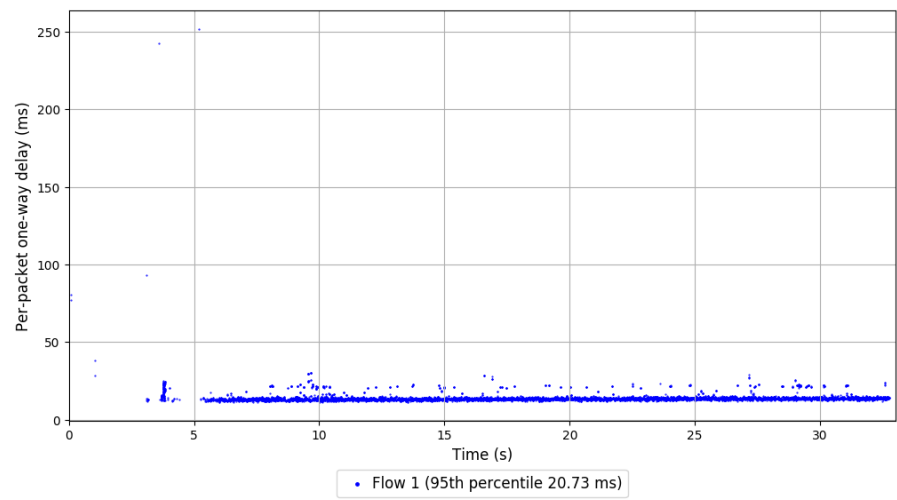
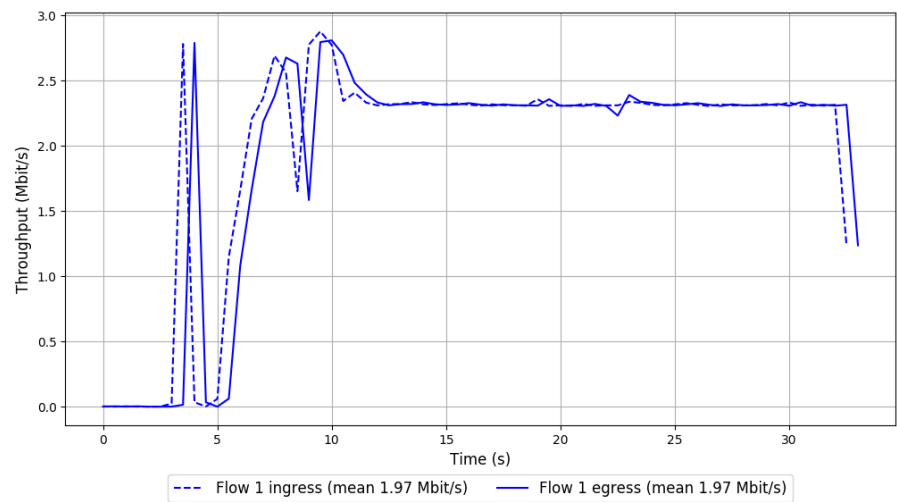


Run 2: Statistics of WebRTC media

Start at: 2018-07-17 08:10:09  
End at: 2018-07-17 08:10:39  
Local clock offset: -24.803 ms  
Remote clock offset: 0.612 ms

# Below is generated by plot.py at 2018-07-17 08:51:00  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.97 Mbit/s  
95th percentile per-packet one-way delay: 20.730 ms  
Loss rate: 0.06%  
-- Flow 1:  
Average throughput: 1.97 Mbit/s  
95th percentile per-packet one-way delay: 20.730 ms  
Loss rate: 0.06%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-07-17 08:32:24  
End at: 2018-07-17 08:32:54  
Local clock offset: -12.885 ms  
Remote clock offset: 0.567 ms

# Below is generated by plot.py at 2018-07-17 08:51:00  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.95 Mbit/s  
95th percentile per-packet one-way delay: 14.770 ms  
Loss rate: 0.01%  
-- Flow 1:  
Average throughput: 1.95 Mbit/s  
95th percentile per-packet one-way delay: 14.770 ms  
Loss rate: 0.01%



Run 3: Report of WebRTC media — Data Link

