

**Pantheon Summary** (Generated at Tue, 20 Jun 2017 07:19:52 +0000 with  
pantheon version f1f579919e2382b18c1fb18b676e821e7efc0b62)

Repeated the test of 15 congestion control schemes once.

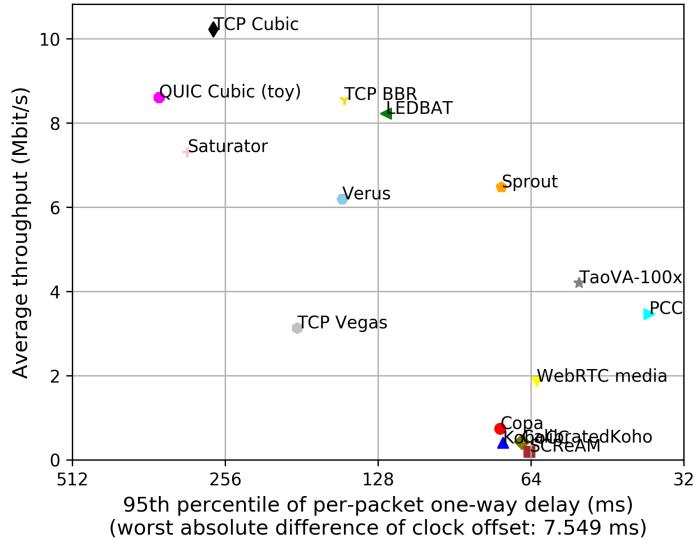
Each test lasted for 30 seconds running 1 flow.

Data path **from** Stanford ppp0 **to** AWS California 1 Ethernet.

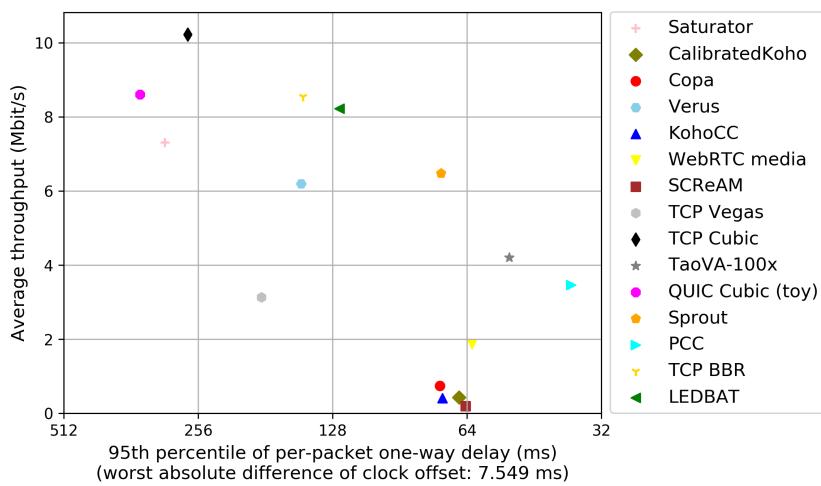
NTP offset measured against time.stanford.edu.

```
git branch: master @ f1f579919e2382b18c1fb18b676e821e7efc0b62
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
M datagrump/sender.cc
third_party/genericCC @ dae96123232f1bcb37725348fa2378691ce26725
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-stimuli @ fc73a85ca16c34366d1888dc8a0d0d88d4ebf2a7
third_party/pantheon-tunnel @ 4893799ab83a43fa2d3236507d168f461e1243ed
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeeb30b267cde681
third_party/sprout @ 6f2efef6e088d91066a9f023df375eee2665089ce
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/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

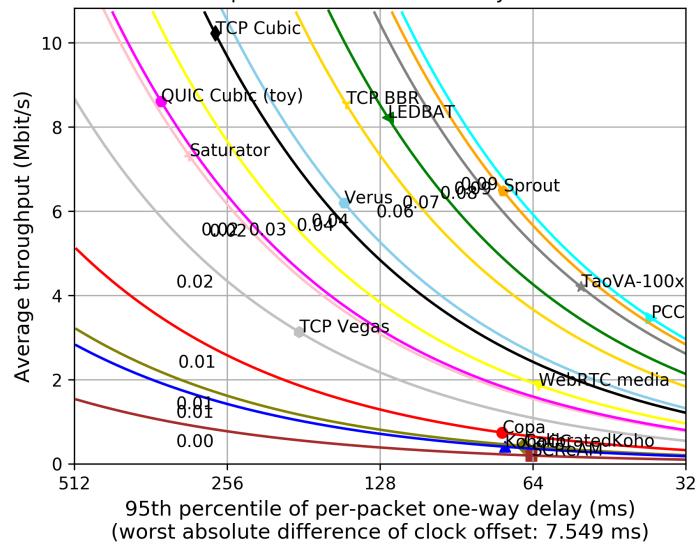
test from Stanford ppp0 to AWS California 1 Ethernet, 1 run of 30s each per scheme  
mean of all runs by scheme



test from Stanford ppp0 to AWS California 1 Ethernet, 1 run of 30s each per scheme



test from Stanford ppp0 to AWS California 1 Ethernet, 1 run of 30s each per scheme  
mean power scores of all runs by scheme

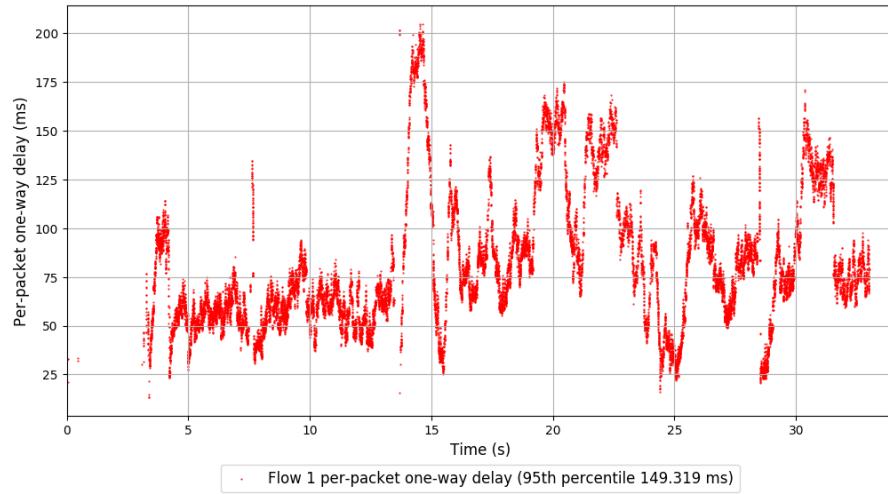
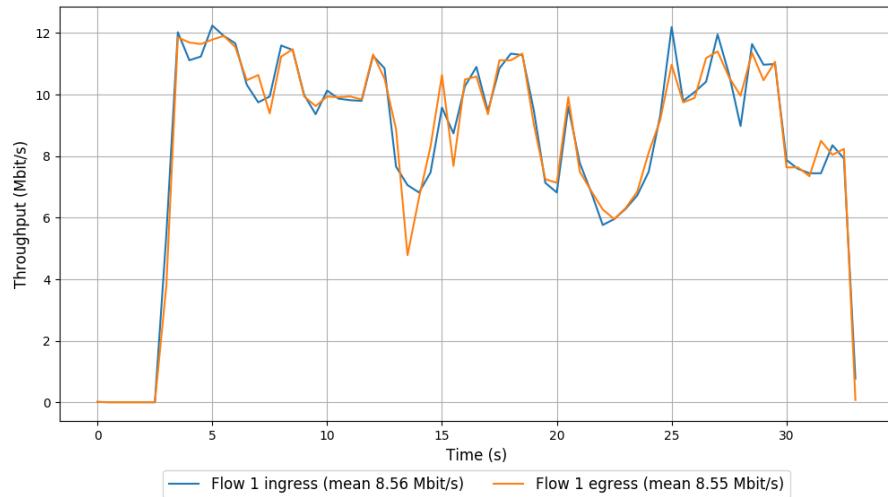


Run 1: Statistics of TCP BBR

```
Start at: Tue, 20 Jun 2017 07:01:27 +0000
End at: Tue, 20 Jun 2017 07:01:57 +0000
Local clock offset: 4.666 ms
Remote clock offset: -2.675 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:39 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.55 Mbit/s
95th percentile per-packet one-way delay: 149.319 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 8.55 Mbit/s
95th percentile per-packet one-way delay: 149.319 ms
Loss rate: 0.29%
```

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



```
Run 1: Statistics of CalibratedKoho
```

```
Start at: Tue, 20 Jun 2017 07:11:58 +0000
```

```
End at: Tue, 20 Jun 2017 07:12:28 +0000
```

```
Local clock offset: 4.808 ms
```

```
Remote clock offset: -2.64 ms
```

```
# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:39 +0000
```

```
# Datalink statistics
```

```
-- Total of 1 flow:
```

```
Average throughput: 0.42 Mbit/s
```

```
95th percentile per-packet one-way delay: 66.755 ms
```

```
Loss rate: 0.52%
```

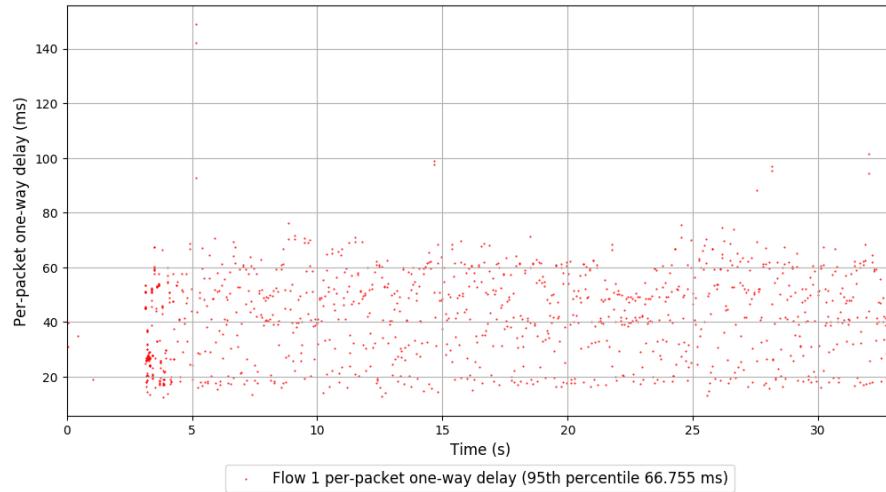
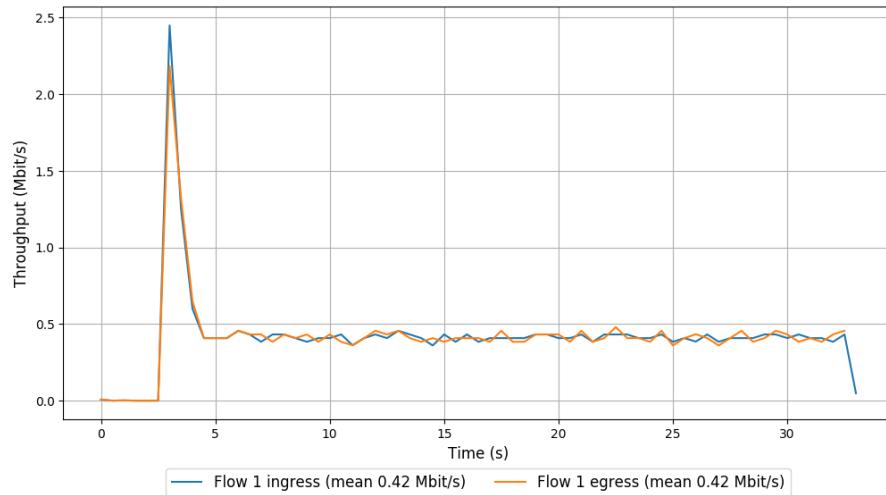
```
-- Flow 1:
```

```
Average throughput: 0.42 Mbit/s
```

```
95th percentile per-packet one-way delay: 66.755 ms
```

```
Loss rate: 0.52%
```

## Run 1: Report of CalibratedKoho — Data Link

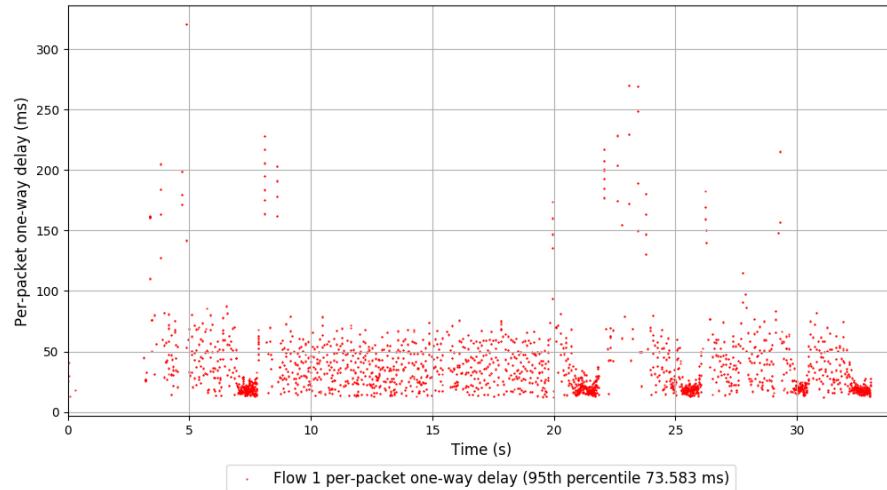
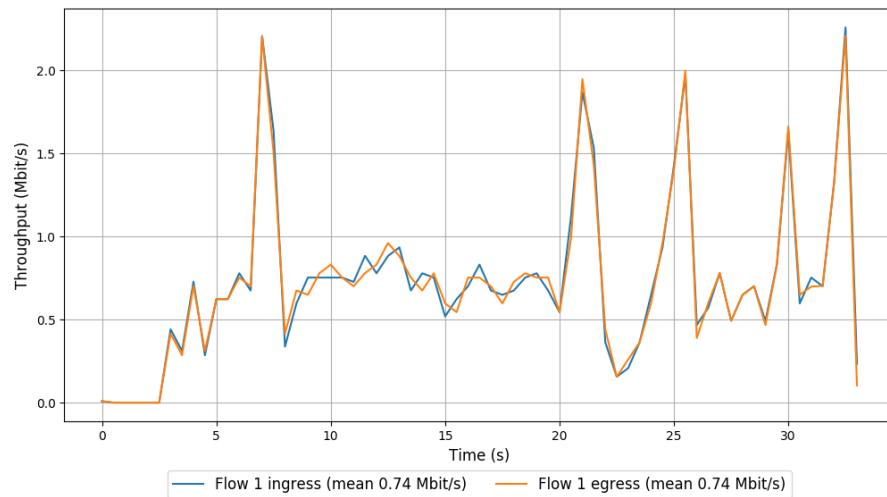


Run 1: Statistics of Copa

```
Start at: Tue, 20 Jun 2017 07:13:08 +0000
End at: Tue, 20 Jun 2017 07:13:38 +0000
Local clock offset: 4.925 ms
Remote clock offset: -2.616 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:39 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 73.583 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 73.583 ms
Loss rate: 0.58%
```

## Run 1: Report of Copa — Data Link



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

```
Start at: Tue, 20 Jun 2017 07:09:38 +0000
```

```
End at: Tue, 20 Jun 2017 07:10:08 +0000
```

```
Local clock offset: 4.789 ms
```

```
Remote clock offset: -2.715 ms
```

```
# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:40 +0000
```

```
# Datalink statistics
```

```
-- Total of 1 flow:
```

```
Average throughput: 10.22 Mbit/s
```

```
95th percentile per-packet one-way delay: 270.493 ms
```

```
Loss rate: 1.02%
```

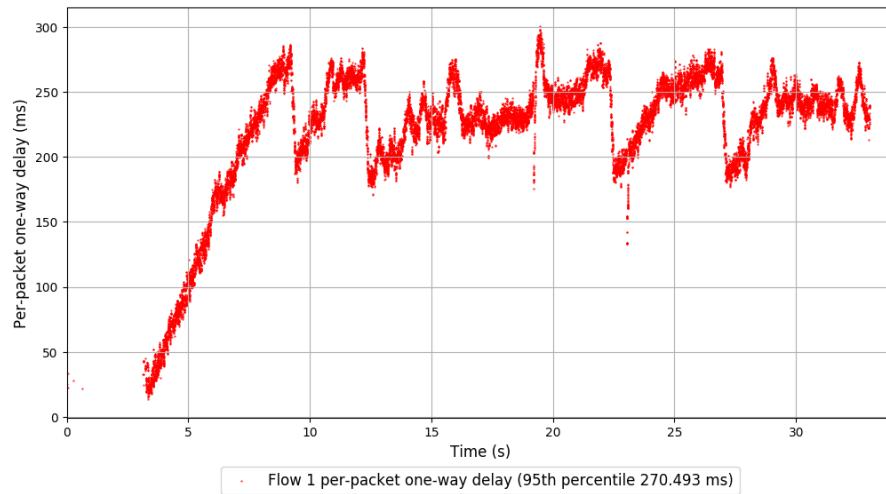
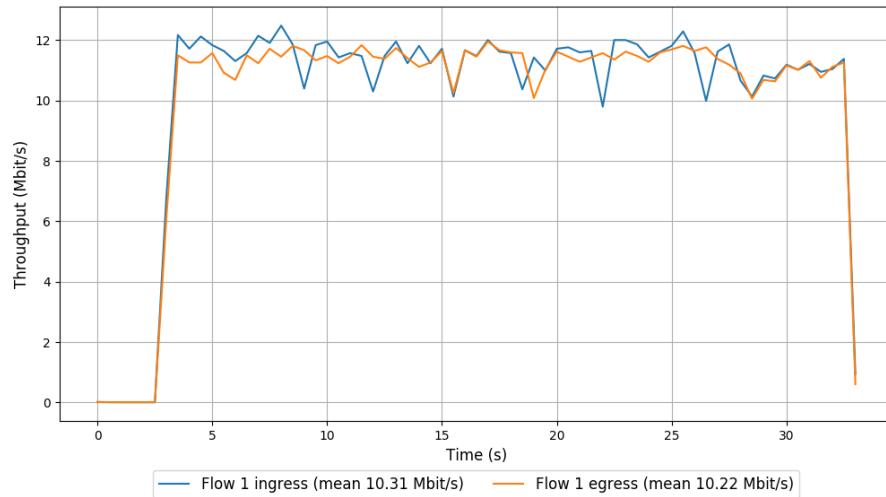
```
-- Flow 1:
```

```
Average throughput: 10.22 Mbit/s
```

```
95th percentile per-packet one-way delay: 270.493 ms
```

```
Loss rate: 1.02%
```

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



```
Run 1: Statistics of KohoCC
```

```
Start at: Tue, 20 Jun 2017 07:10:48 +0000
```

```
End at: Tue, 20 Jun 2017 07:11:18 +0000
```

```
Local clock offset: 4.864 ms
```

```
Remote clock offset: -2.616 ms
```

```
# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:40 +0000
```

```
# Datalink statistics
```

```
-- Total of 1 flow:
```

```
Average throughput: 0.40 Mbit/s
```

```
95th percentile per-packet one-way delay: 72.637 ms
```

```
Loss rate: 0.54%
```

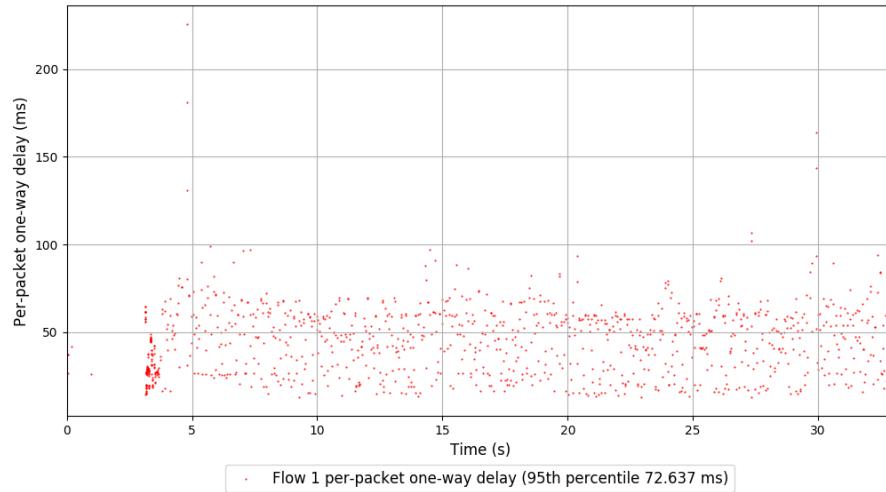
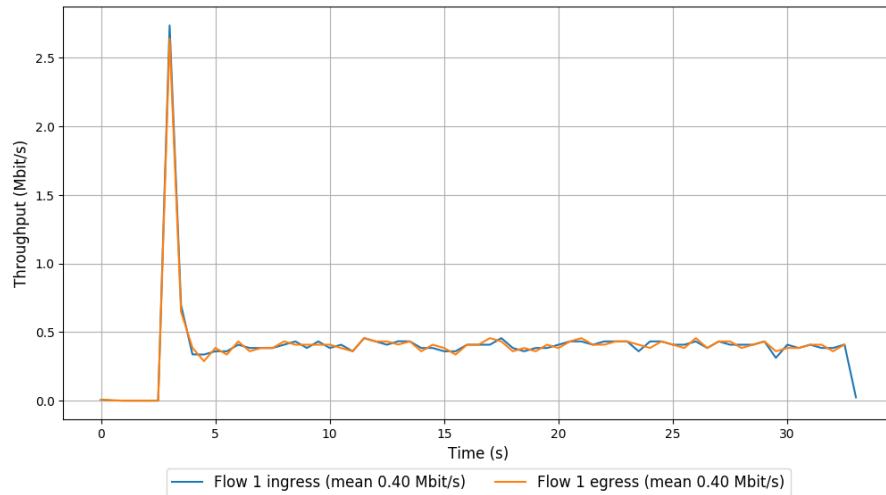
```
-- Flow 1:
```

```
Average throughput: 0.40 Mbit/s
```

```
95th percentile per-packet one-way delay: 72.637 ms
```

```
Loss rate: 0.54%
```

## Run 1: Report of KohoCC — Data Link

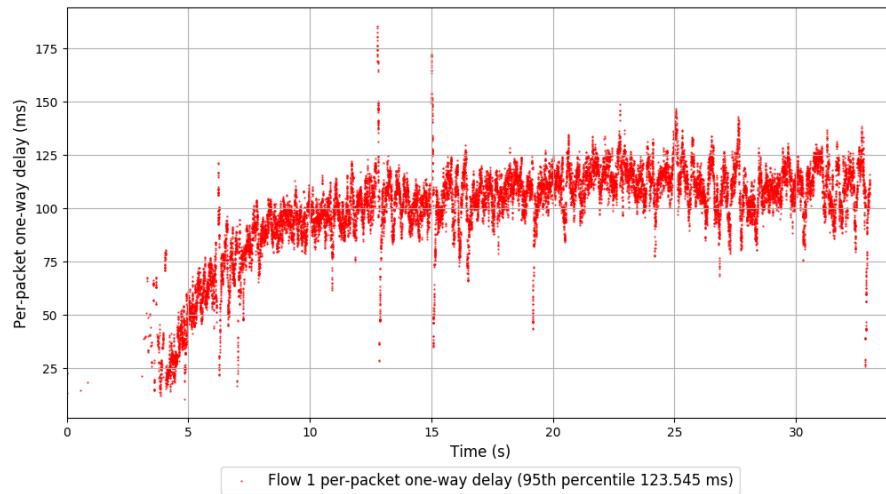
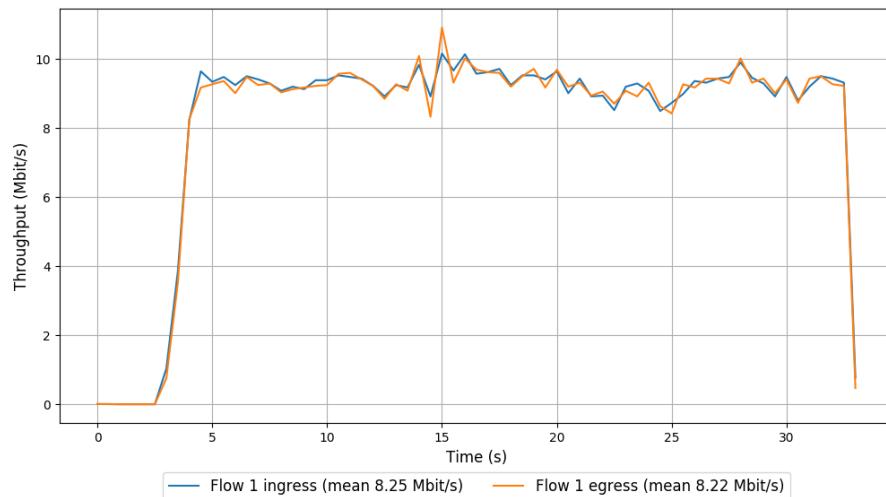


```
Run 1: Statistics of LEDBAT
```

```
Start at: Tue, 20 Jun 2017 07:14:18 +0000
End at: Tue, 20 Jun 2017 07:14:48 +0000
Local clock offset: 4.884 ms
Remote clock offset: -2.603 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:42 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.22 Mbit/s
95th percentile per-packet one-way delay: 123.545 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 8.22 Mbit/s
95th percentile per-packet one-way delay: 123.545 ms
Loss rate: 0.44%
```

## Run 1: Report of LEDBAT — Data Link

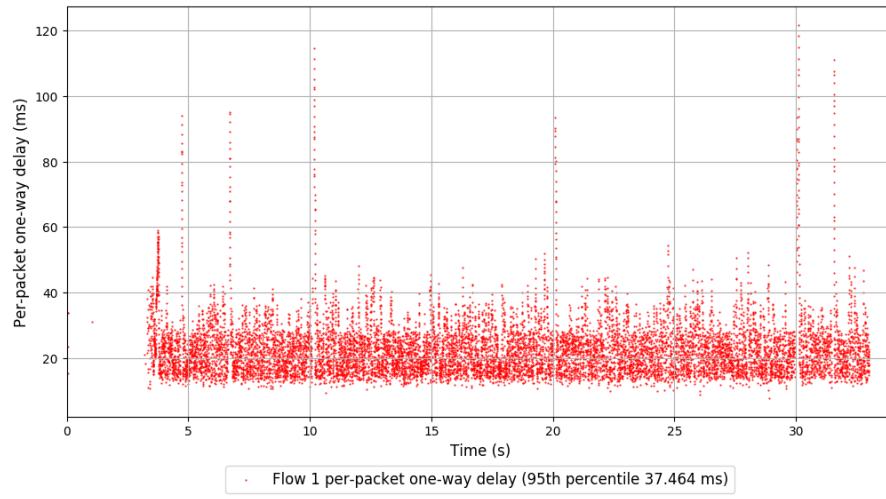
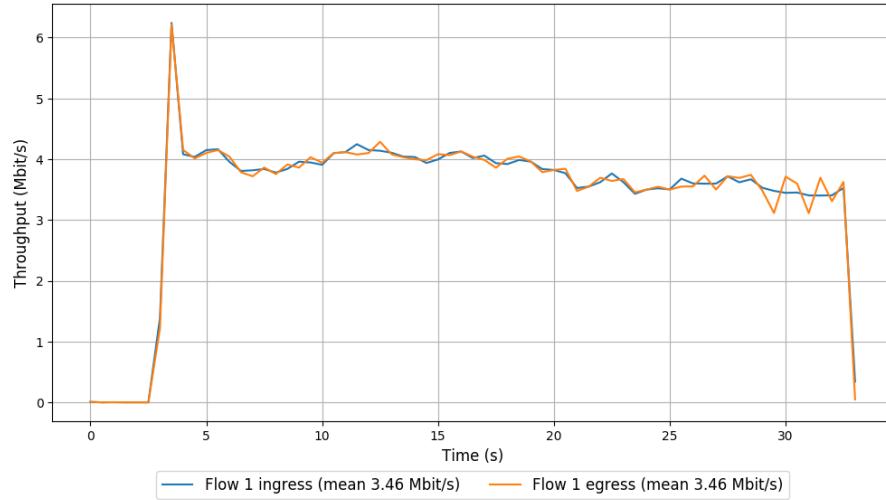


Run 1: Statistics of PCC

```
Start at: Tue, 20 Jun 2017 07:07:18 +0000
End at: Tue, 20 Jun 2017 07:07:48 +0000
Local clock offset: 4.838 ms
Remote clock offset: -2.711 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:42 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.46 Mbit/s
95th percentile per-packet one-way delay: 37.464 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 3.46 Mbit/s
95th percentile per-packet one-way delay: 37.464 ms
Loss rate: 0.19%
```

## Run 1: Report of PCC — Data Link

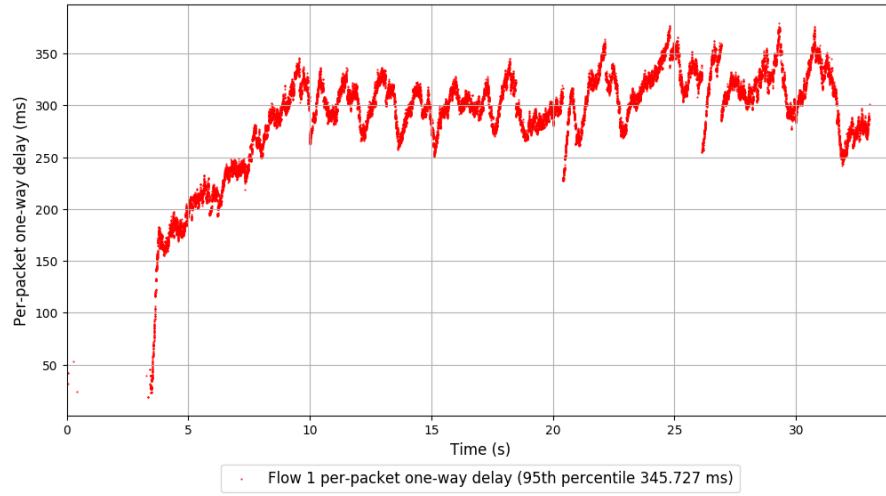
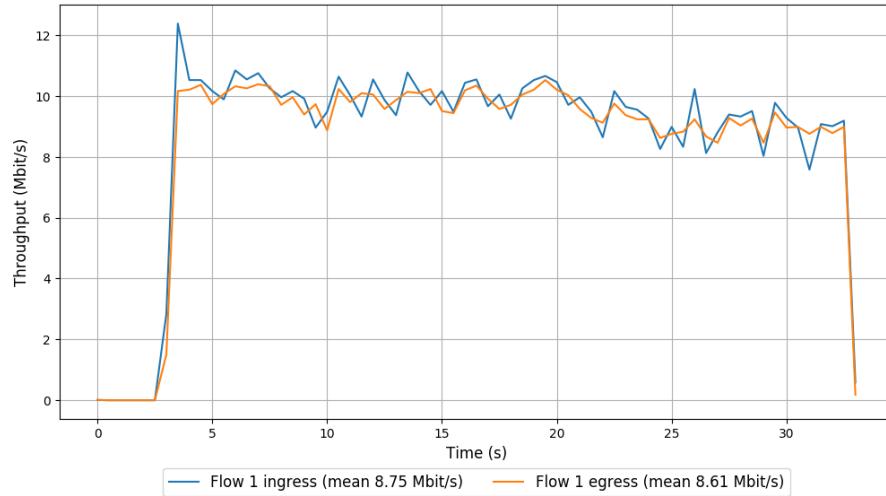


```
Run 1: Statistics of QUIC Cubic (toy)

Start at: Tue, 20 Jun 2017 07:17:49 +0000
End at: Tue, 20 Jun 2017 07:18:19 +0000
Local clock offset: 4.76 ms
Remote clock offset: -2.498 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:43 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.61 Mbit/s
95th percentile per-packet one-way delay: 345.727 ms
Loss rate: 1.72%
-- Flow 1:
Average throughput: 8.61 Mbit/s
95th percentile per-packet one-way delay: 345.727 ms
Loss rate: 1.72%
```

## Run 1: Report of QUIC Cubic (toy) — Data Link



```
Run 1: Statistics of Saturator
```

```
Start at: Tue, 20 Jun 2017 07:15:28 +0000
```

```
End at: Tue, 20 Jun 2017 07:15:58 +0000
```

```
Local clock offset: 4.73 ms
```

```
Remote clock offset: -2.497 ms
```

```
# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:44 +0000
```

```
# Datalink statistics
```

```
-- Total of 1 flow:
```

```
Average throughput: 7.31 Mbit/s
```

```
95th percentile per-packet one-way delay: 303.848 ms
```

```
Loss rate: 2.60%
```

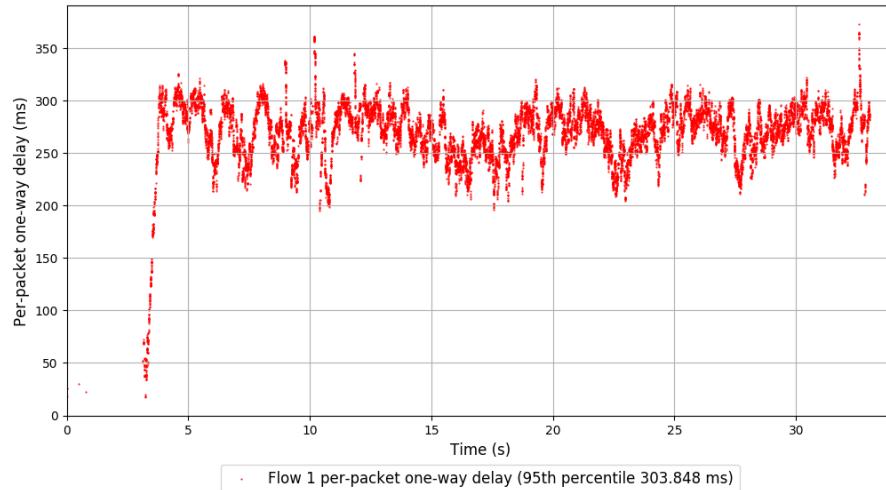
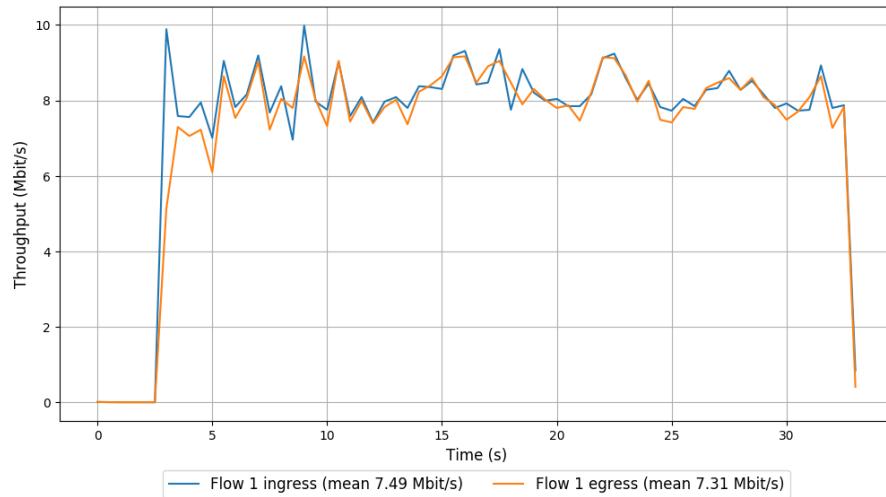
```
-- Flow 1:
```

```
Average throughput: 7.31 Mbit/s
```

```
95th percentile per-packet one-way delay: 303.848 ms
```

```
Loss rate: 2.60%
```

### Run 1: Report of Saturator — Data Link

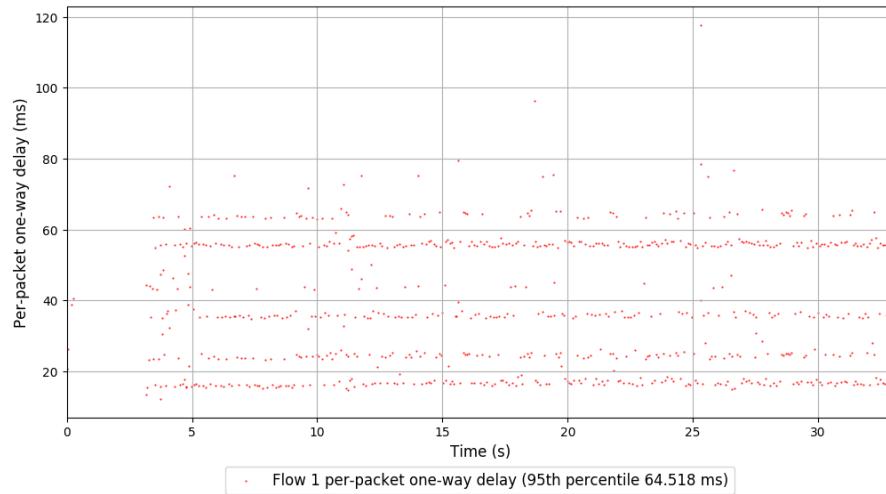
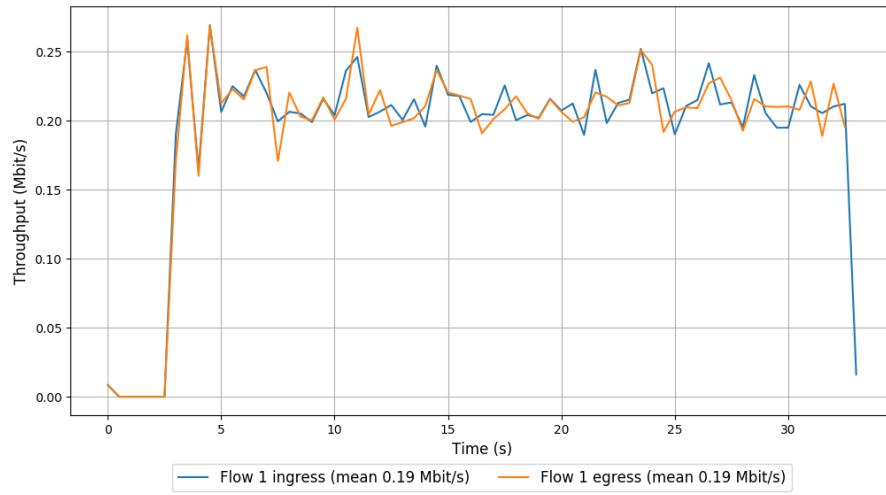


```
Run 1: Statistics of SCReAM
```

```
Start at: Tue, 20 Jun 2017 07:16:39 +0000
End at: Tue, 20 Jun 2017 07:17:09 +0000
Local clock offset: 4.715 ms
Remote clock offset: -2.534 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:45 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 64.518 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 64.518 ms
Loss rate: 0.26%
```

## Run 1: Report of SCReAM — Data Link

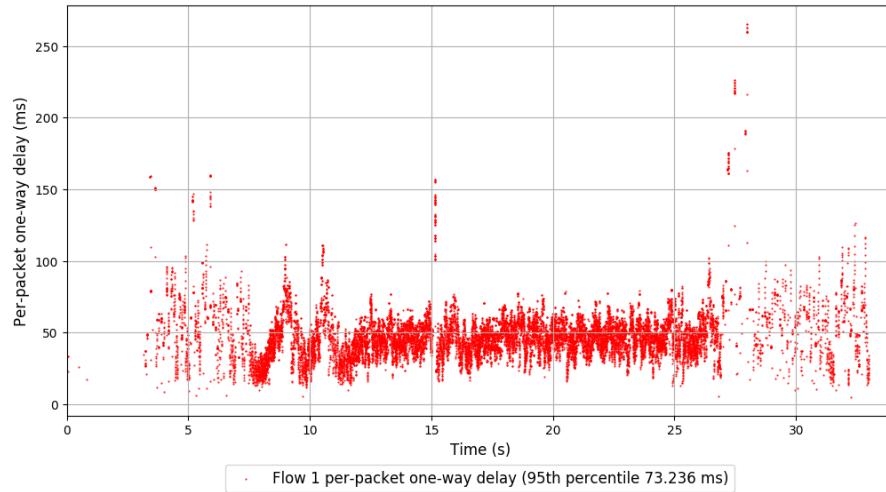
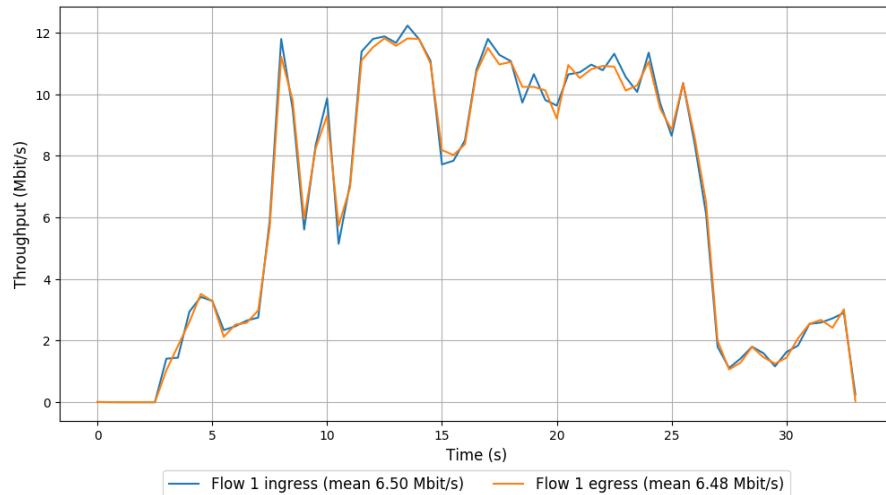


Run 1: Statistics of Sprout

```
Start at: Tue, 20 Jun 2017 07:02:37 +0000
End at: Tue, 20 Jun 2017 07:03:07 +0000
Local clock offset: 4.654 ms
Remote clock offset: -2.682 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:46 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.48 Mbit/s
95th percentile per-packet one-way delay: 73.236 ms
Loss rate: 0.59%
-- Flow 1:
Average throughput: 6.48 Mbit/s
95th percentile per-packet one-way delay: 73.236 ms
Loss rate: 0.59%
```

## Run 1: Report of Sprout — Data Link

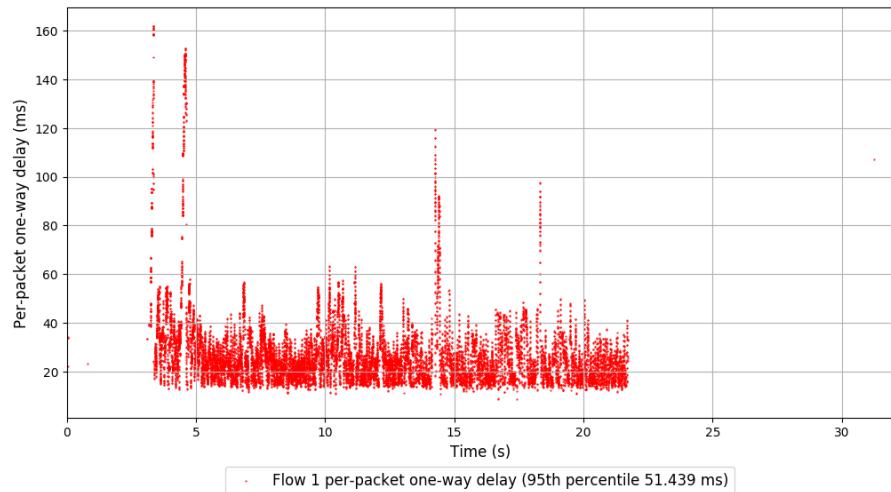
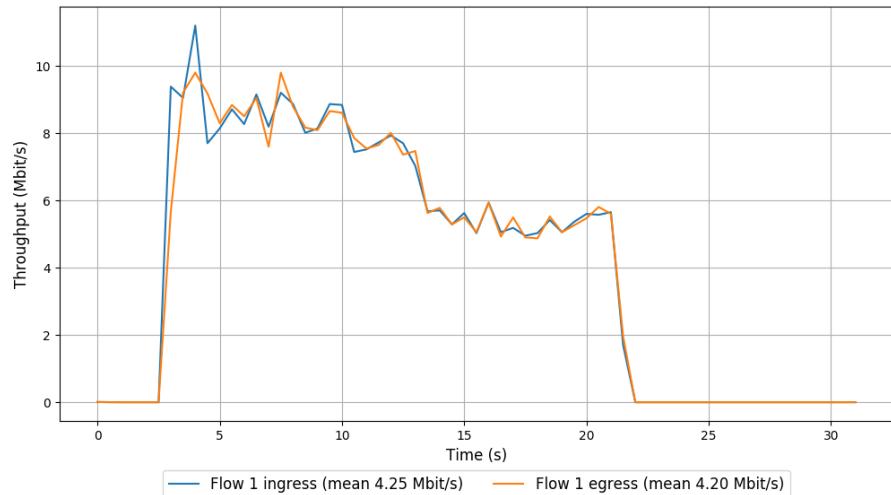


Run 1: Statistics of TaoVA-100x

```
Start at: Tue, 20 Jun 2017 07:06:07 +0000
End at: Tue, 20 Jun 2017 07:06:37 +0000
Local clock offset: 4.704 ms
Remote clock offset: -2.722 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:48 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.20 Mbit/s
95th percentile per-packet one-way delay: 51.439 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 4.20 Mbit/s
95th percentile per-packet one-way delay: 51.439 ms
Loss rate: 1.03%
```

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

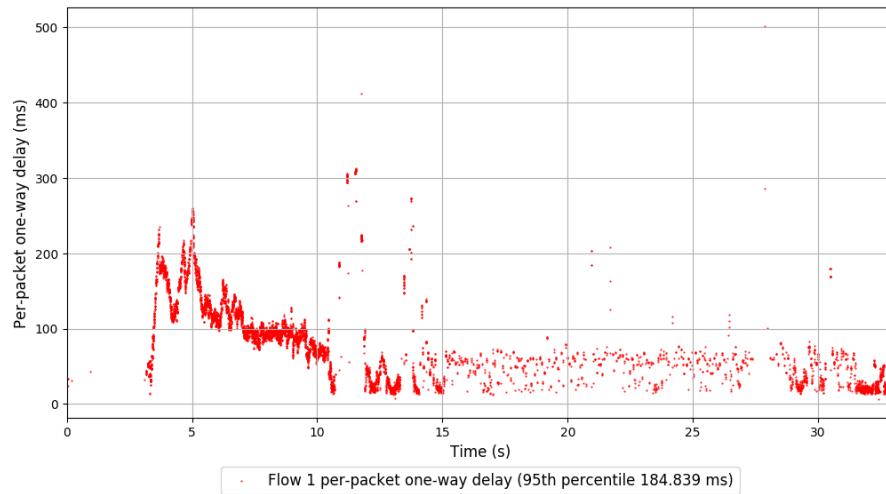
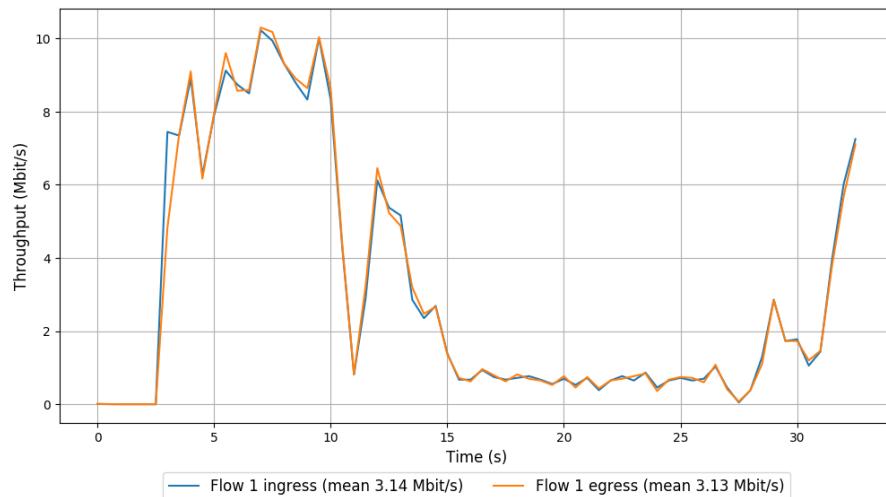


Run 1: Statistics of TCP Vegas

```
Start at: Tue, 20 Jun 2017 07:03:47 +0000
End at: Tue, 20 Jun 2017 07:04:17 +0000
Local clock offset: 4.695 ms
Remote clock offset: -2.683 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:48 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.13 Mbit/s
95th percentile per-packet one-way delay: 184.839 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 3.13 Mbit/s
95th percentile per-packet one-way delay: 184.839 ms
Loss rate: 0.44%
```

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

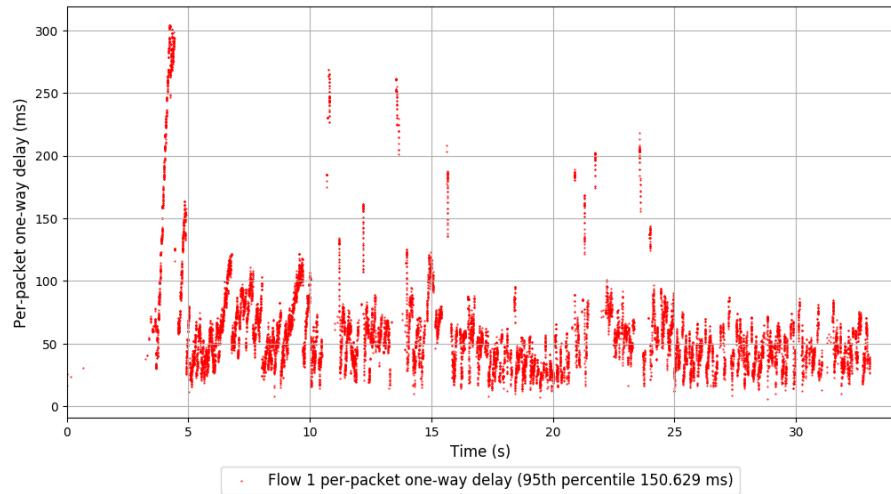
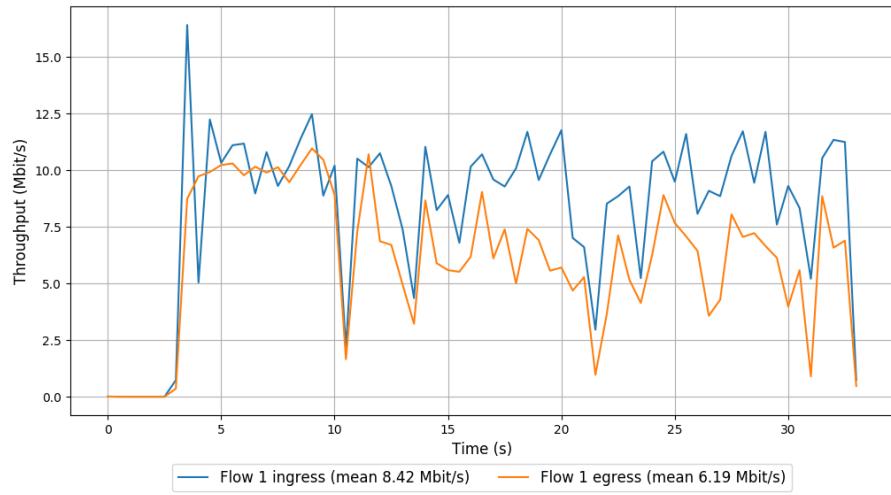


Run 1: Statistics of Verus

```
Start at: Tue, 20 Jun 2017 07:04:57 +0000
End at: Tue, 20 Jun 2017 07:05:27 +0000
Local clock offset: 4.69 ms
Remote clock offset: -2.711 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:49 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.19 Mbit/s
95th percentile per-packet one-way delay: 150.629 ms
Loss rate: 26.52%
-- Flow 1:
Average throughput: 6.19 Mbit/s
95th percentile per-packet one-way delay: 150.629 ms
Loss rate: 26.52%
```

## Run 1: Report of Verus — Data Link



```
Run 1: Statistics of WebRTC media

Start at: Tue, 20 Jun 2017 07:08:28 +0000
End at: Tue, 20 Jun 2017 07:08:58 +0000
Local clock offset: 4.782 ms
Remote clock offset: -2.704 ms

# Below is generated by plot.py at Tue, 20 Jun 2017 07:19:49 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.87 Mbit/s
95th percentile per-packet one-way delay: 62.376 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 1.87 Mbit/s
95th percentile per-packet one-way delay: 62.376 ms
Loss rate: 0.38%
```

### Run 1: Report of WebRTC media — Data Link

