

Pantheon Summary (Generated at Wed, 14 Jun 2017 18:01:39 +0000 with
pantheon version 0502c2c57571426cde66b34b88203c82b91e4e5c)

Repeated the test of 15 congestion control schemes once.

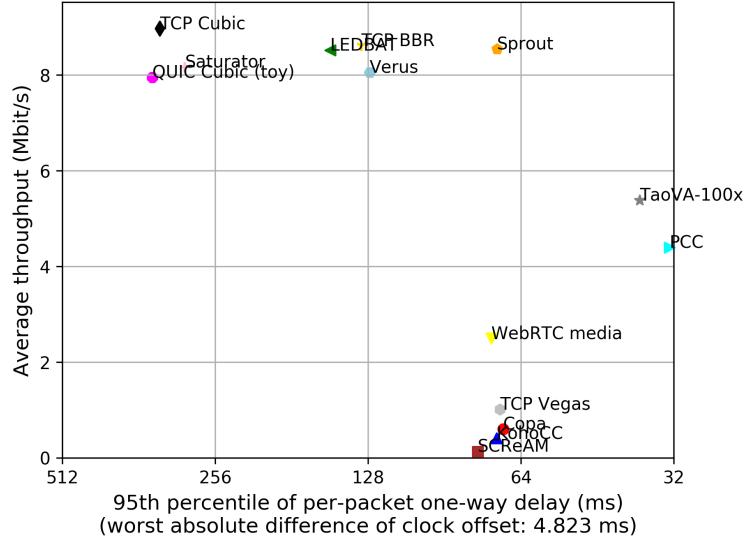
Each test lasted for 30 seconds running 1 flow.

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

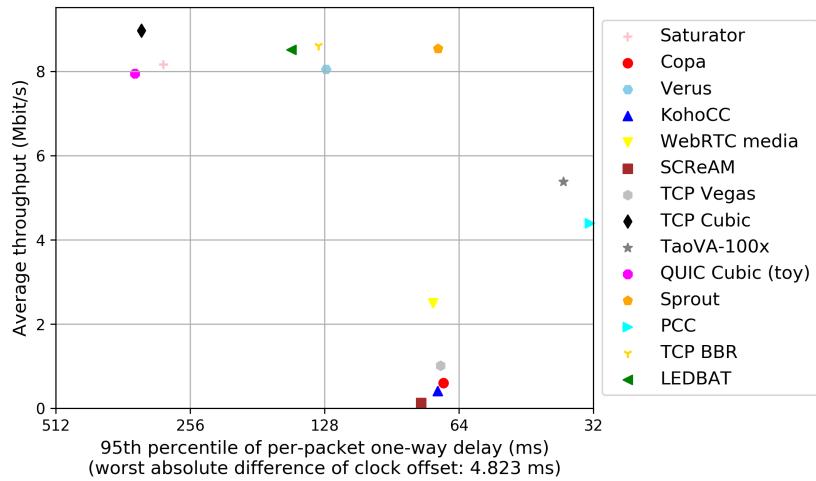
NTP offset measured against time.stanford.edu.

```
git branch: master @ 0502c2c57571426cde66b34b88203c82b91e4e5c
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
```

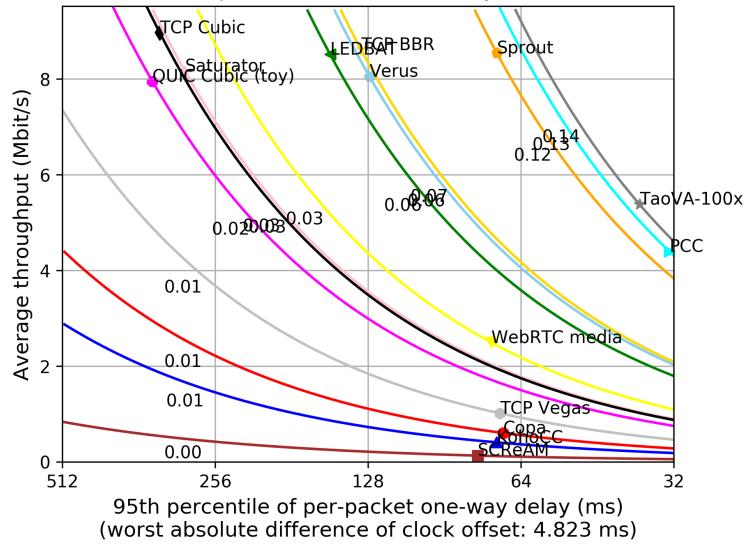
test from Stanford ppp0 to AWS California 1 Ethernet, run 1 of 30s each per scheme
mean of all runs by scheme



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



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

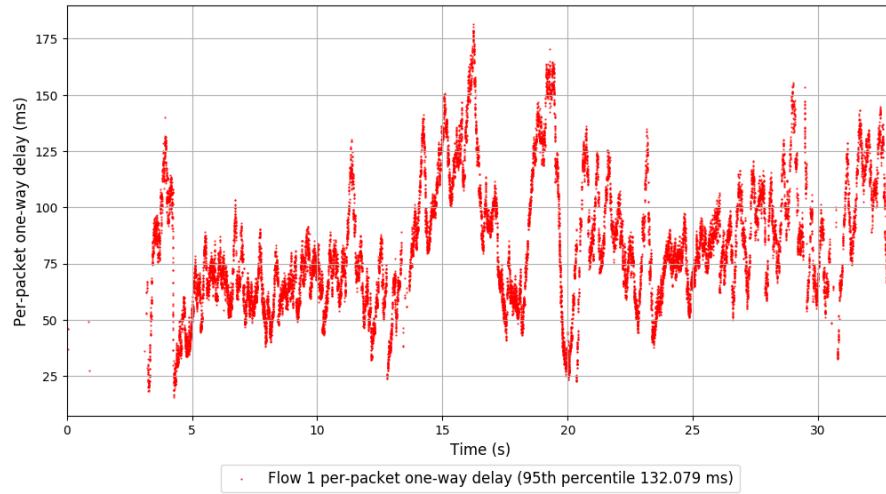
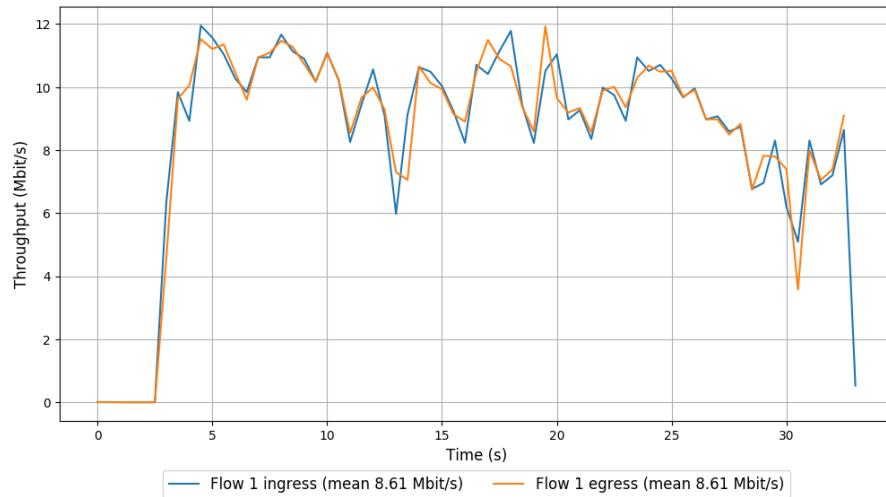


Run 1: Statistics of TCP BBR

```
Start at: Wed, 14 Jun 2017 17:54:07 +0000
End at: Wed, 14 Jun 2017 17:54:37 +0000
Local clock offset: 2.228 ms
Remote clock offset: -1.871 ms

# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:25 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.61 Mbit/s
95th percentile per-packet one-way delay: 132.079 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 8.61 Mbit/s
95th percentile per-packet one-way delay: 132.079 ms
Loss rate: 0.28%
```

Run 1: Report of TCP BBR — Data Link



Run 1: Statistics of CalibratedKoho

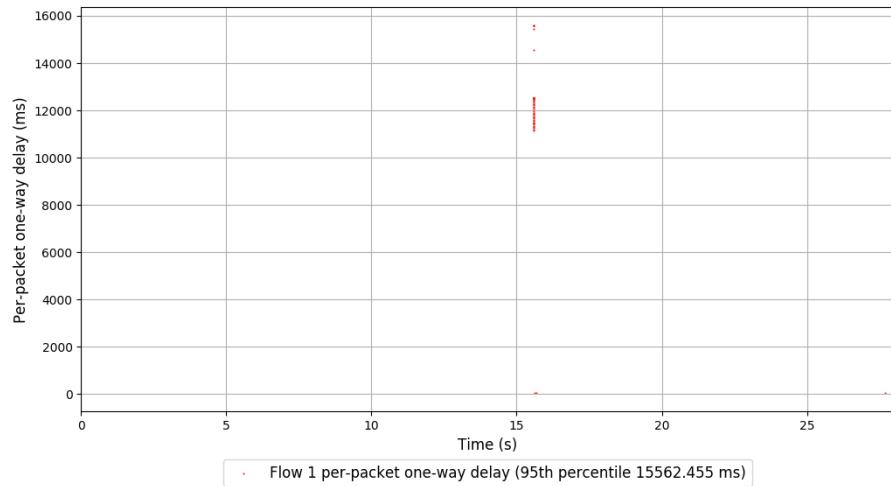
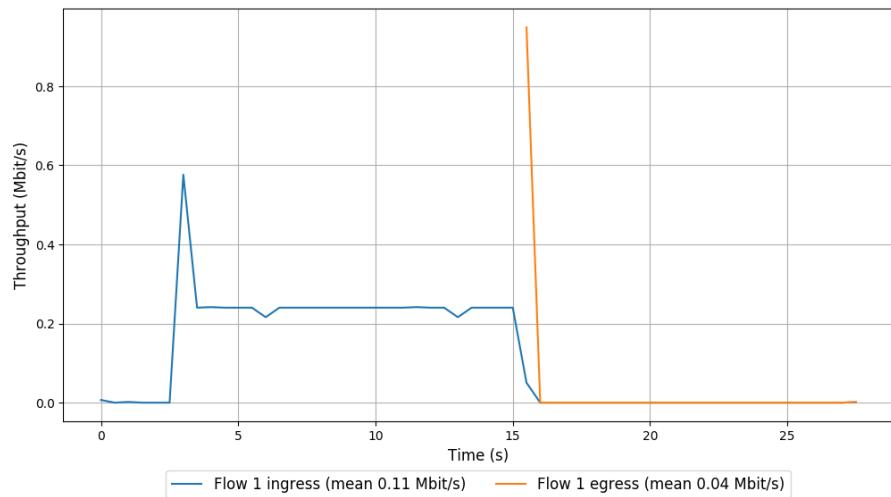
Start at: Wed, 14 Jun 2017 17:43:34 +0000

End at: Wed, 14 Jun 2017 17:44:04 +0000

Local clock offset: 2.804 ms

Remote clock offset: -2.023 ms

Run 1: Report of CalibratedKoho — Data Link

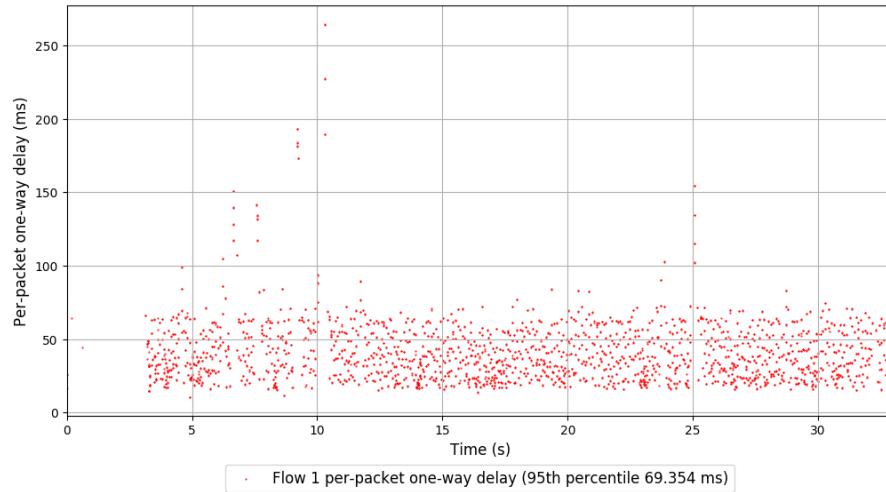
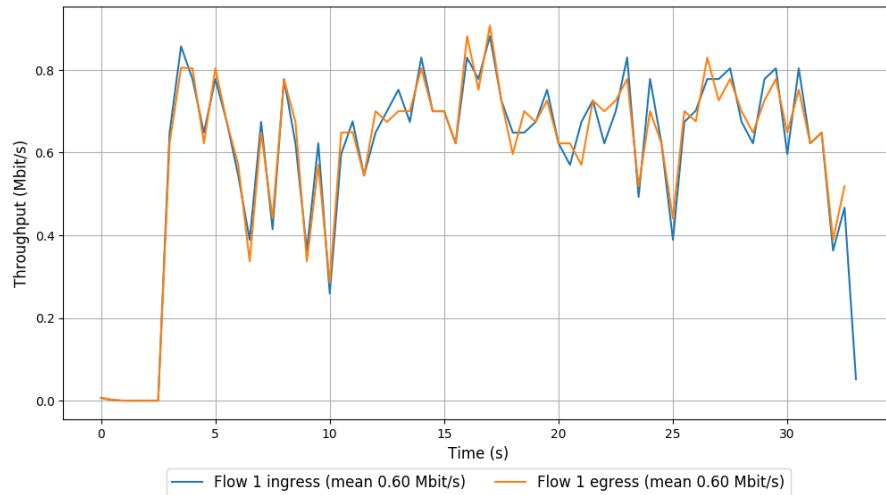


Run 1: Statistics of Copa

```
Start at: Wed, 14 Jun 2017 17:56:27 +0000
End at: Wed, 14 Jun 2017 17:56:57 +0000
Local clock offset: 2.539 ms
Remote clock offset: -1.942 ms

# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:25 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 69.354 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 69.354 ms
Loss rate: 0.20%
```

Run 1: Report of Copa — Data Link



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

```
Start at: Wed, 14 Jun 2017 17:45:54 +0000
```

```
End at: Wed, 14 Jun 2017 17:46:24 +0000
```

```
Local clock offset: 2.563 ms
```

```
Remote clock offset: -1.977 ms
```

```
# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:27 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 8.97 Mbit/s
```

```
95th percentile per-packet one-way delay: 329.339 ms
```

```
Loss rate: 1.08%
```

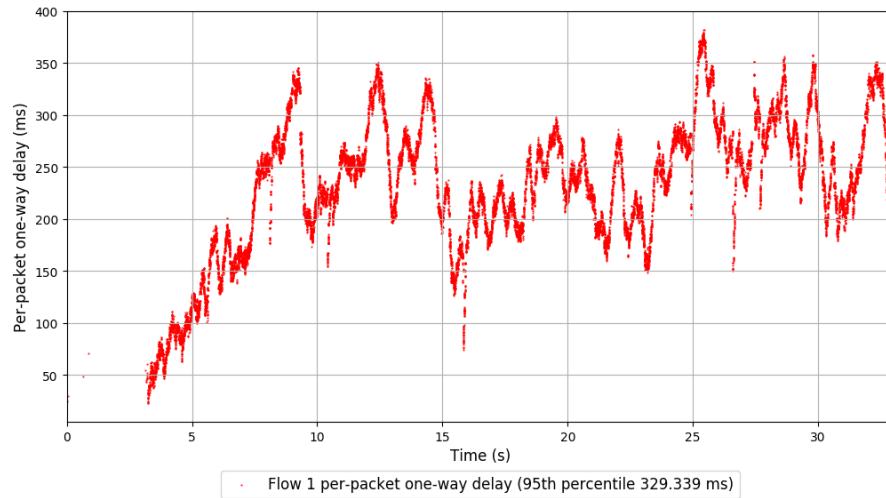
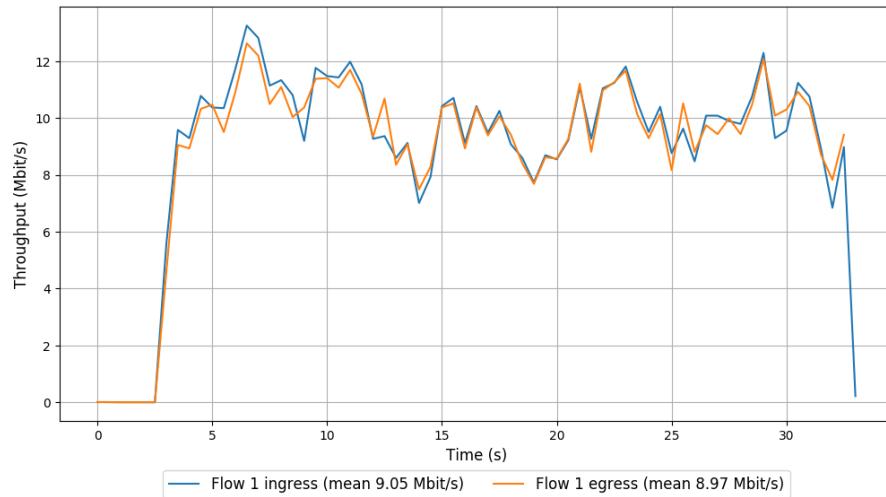
```
-- Flow 1:
```

```
Average throughput: 8.97 Mbit/s
```

```
95th percentile per-packet one-way delay: 329.339 ms
```

```
Loss rate: 1.08%
```

Run 1: Report of TCP Cubic — Data Link



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

```
Start at: Wed, 14 Jun 2017 17:57:37 +0000
```

```
End at: Wed, 14 Jun 2017 17:58:07 +0000
```

```
Local clock offset: 2.546 ms
```

```
Remote clock offset: -1.898 ms
```

```
# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:27 +0000
```

```
# Datalink statistics
```

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

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

```
95th percentile per-packet one-way delay: 71.489 ms
```

```
Loss rate: 0.72%
```

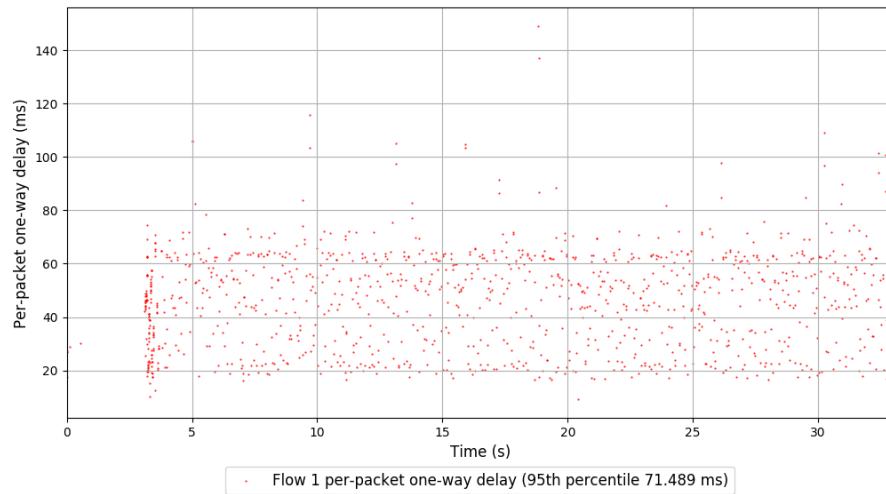
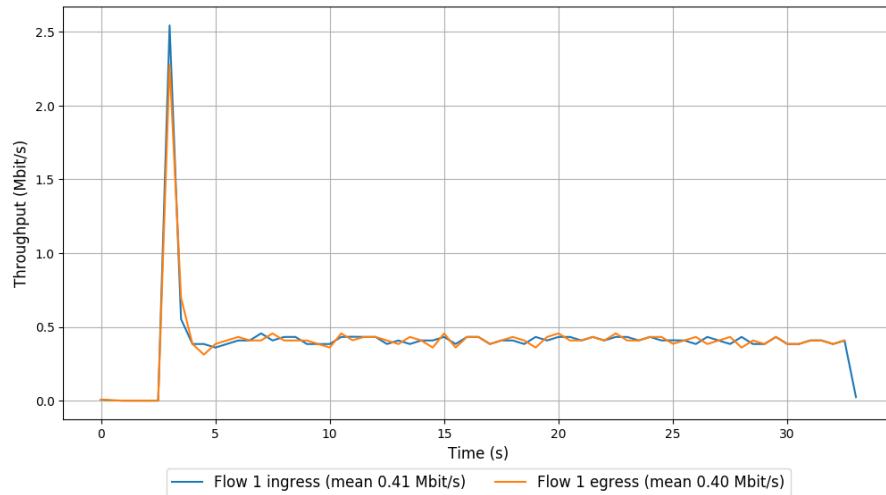
```
-- Flow 1:
```

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

```
95th percentile per-packet one-way delay: 71.489 ms
```

```
Loss rate: 0.72%
```

Run 1: Report of KohoCC — Data Link

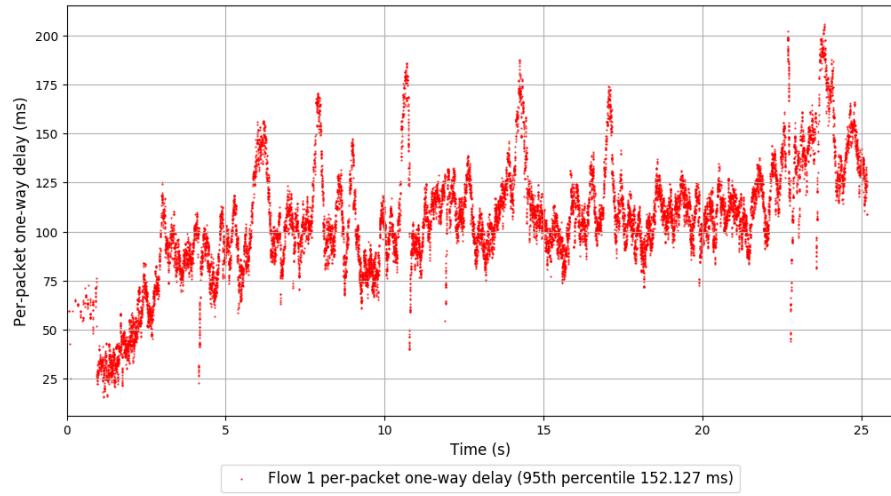
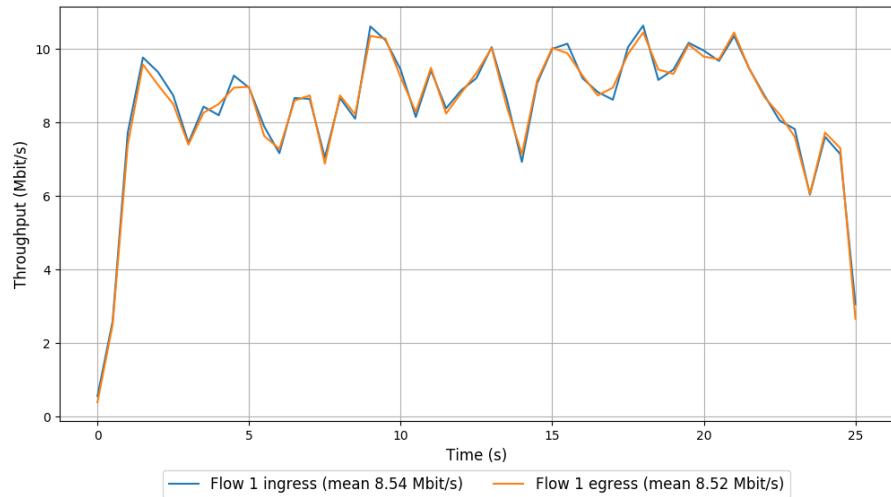


```
Run 1: Statistics of LEDBAT
```

```
Start at: Wed, 14 Jun 2017 17:48:14 +0000
End at: Wed, 14 Jun 2017 17:48:44 +0000
Local clock offset: 2.328 ms
Remote clock offset: -1.987 ms

# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:27 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.52 Mbit/s
95th percentile per-packet one-way delay: 152.127 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 8.52 Mbit/s
95th percentile per-packet one-way delay: 152.127 ms
Loss rate: 0.53%
```

Run 1: Report of LEDBAT — Data Link



```
Run 1: Statistics of PCC
```

```
Start at: Wed, 14 Jun 2017 17:58:47 +0000
```

```
End at: Wed, 14 Jun 2017 17:59:17 +0000
```

```
Local clock offset: 2.753 ms
```

```
Remote clock offset: -1.943 ms
```

```
# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:29 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 4.39 Mbit/s
```

```
95th percentile per-packet one-way delay: 32.616 ms
```

```
Loss rate: 0.17%
```

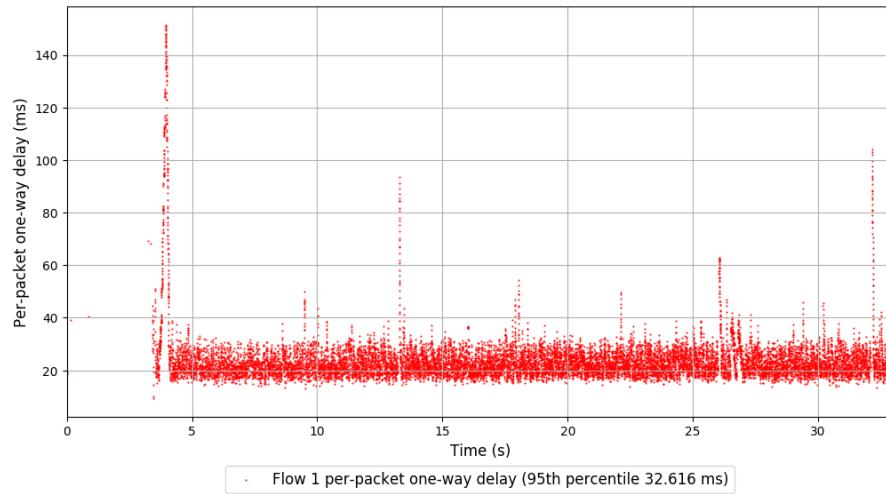
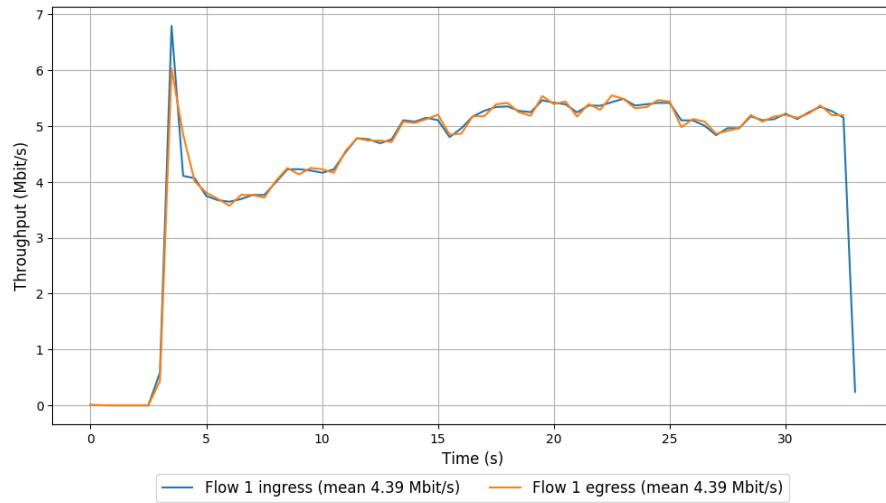
```
-- Flow 1:
```

```
Average throughput: 4.39 Mbit/s
```

```
95th percentile per-packet one-way delay: 32.616 ms
```

```
Loss rate: 0.17%
```

Run 1: Report of PCC — Data Link



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

```
Start at: Wed, 14 Jun 2017 17:47:04 +0000
```

```
End at: Wed, 14 Jun 2017 17:47:34 +0000
```

```
Local clock offset: 2.559 ms
```

```
Remote clock offset: -1.997 ms
```

```
# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:30 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 7.95 Mbit/s
```

```
95th percentile per-packet one-way delay: 340.380 ms
```

```
Loss rate: 2.29%
```

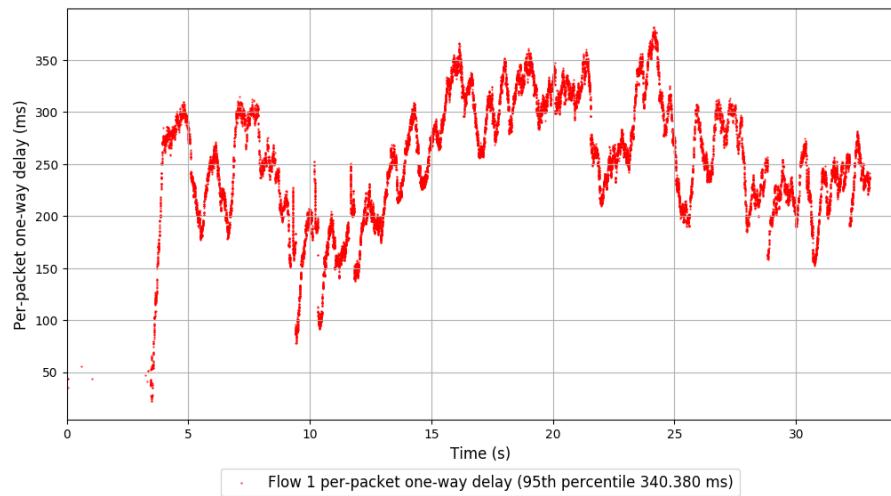
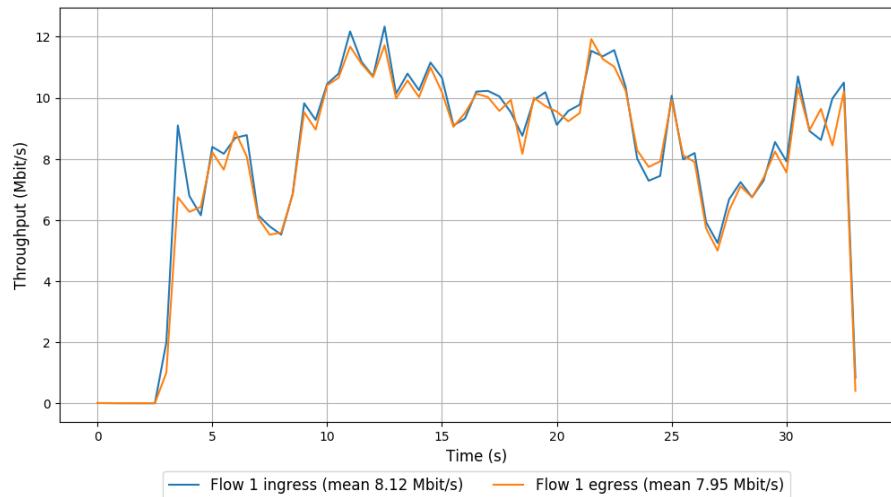
```
-- Flow 1:
```

```
Average throughput: 7.95 Mbit/s
```

```
95th percentile per-packet one-way delay: 340.380 ms
```

```
Loss rate: 2.29%
```

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



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

```
Start at: Wed, 14 Jun 2017 17:49:25 +0000
```

```
End at: Wed, 14 Jun 2017 17:49:55 +0000
```

```
Local clock offset: 2.34 ms
```

```
Remote clock offset: -1.897 ms
```

```
# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:31 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 8.16 Mbit/s
```

```
95th percentile per-packet one-way delay: 293.703 ms
```

```
Loss rate: 1.45%
```

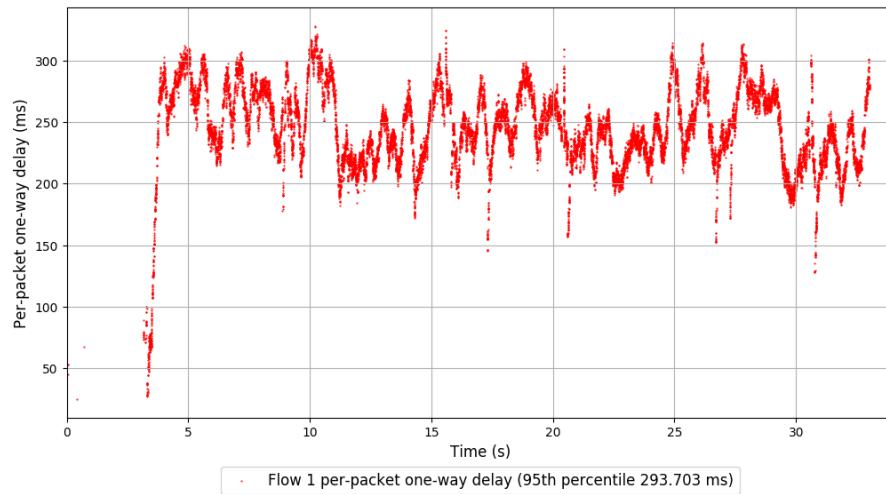
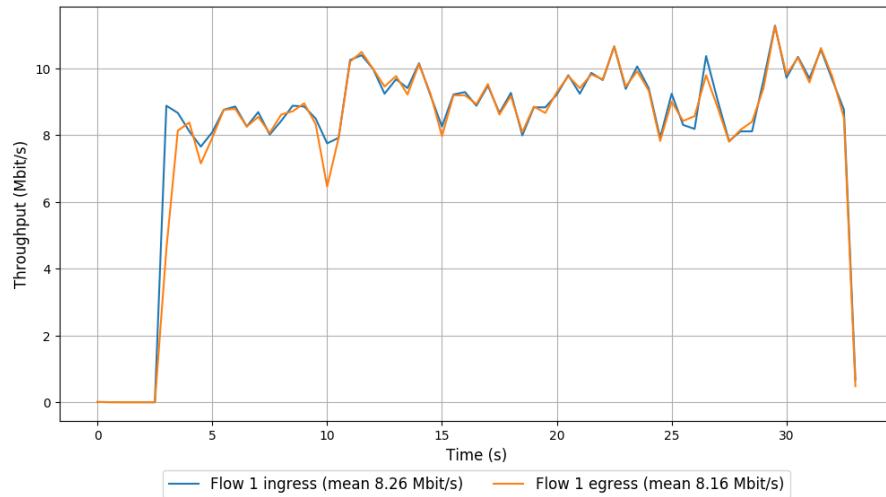
```
-- Flow 1:
```

```
Average throughput: 8.16 Mbit/s
```

```
95th percentile per-packet one-way delay: 293.703 ms
```

```
Loss rate: 1.45%
```

Run 1: Report of Saturator — Data Link



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

```
Start at: Wed, 14 Jun 2017 17:59:58 +0000
```

```
End at: Wed, 14 Jun 2017 18:00:28 +0000
```

```
Local clock offset: 2.819 ms
```

```
Remote clock offset: -2.004 ms
```

```
# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:31 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 0.13 Mbit/s
```

```
95th percentile per-packet one-way delay: 77.915 ms
```

```
Loss rate: 0.07%
```

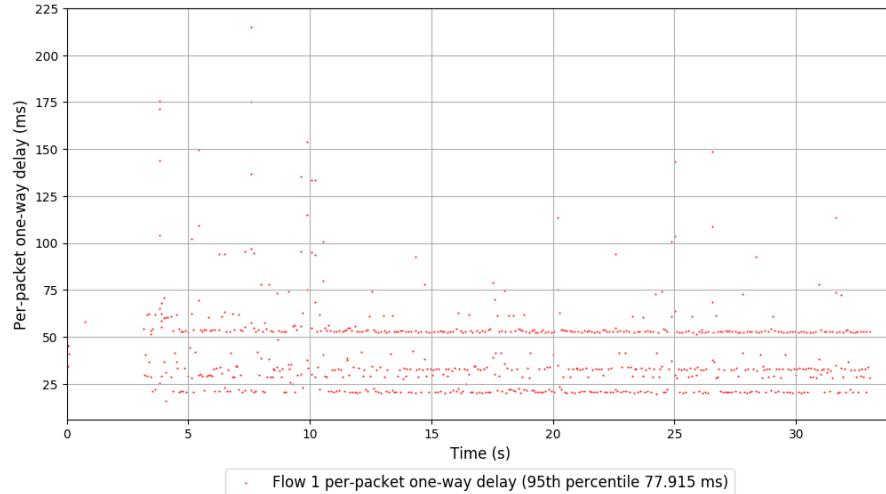
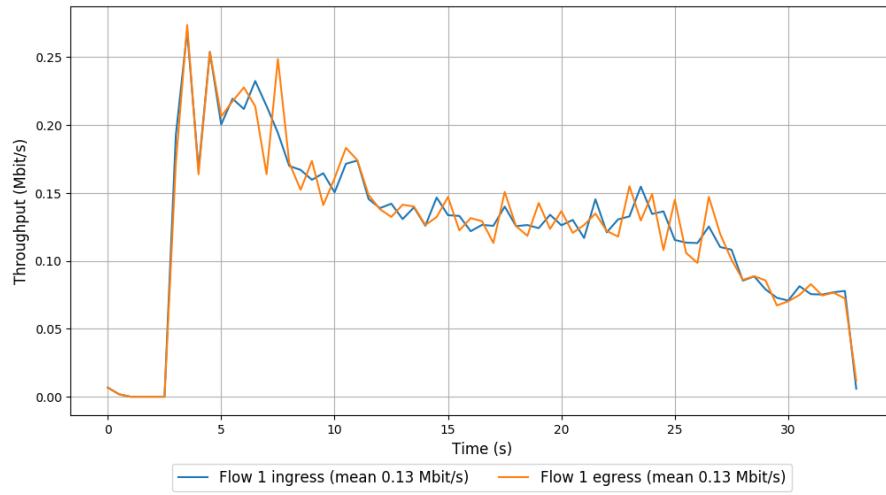
```
-- Flow 1:
```

```
Average throughput: 0.13 Mbit/s
```

```
95th percentile per-packet one-way delay: 77.915 ms
```

```
Loss rate: 0.07%
```

Run 1: Report of SCReAM — Data Link



```
Run 1: Statistics of Sprout
```

```
Start at: Wed, 14 Jun 2017 17:50:35 +0000
```

```
End at: Wed, 14 Jun 2017 17:51:05 +0000
```

```
Local clock offset: 2.147 ms
```

```
Remote clock offset: -1.972 ms
```

```
# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:32 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 8.54 Mbit/s
```

```
95th percentile per-packet one-way delay: 71.369 ms
```

```
Loss rate: 0.34%
```

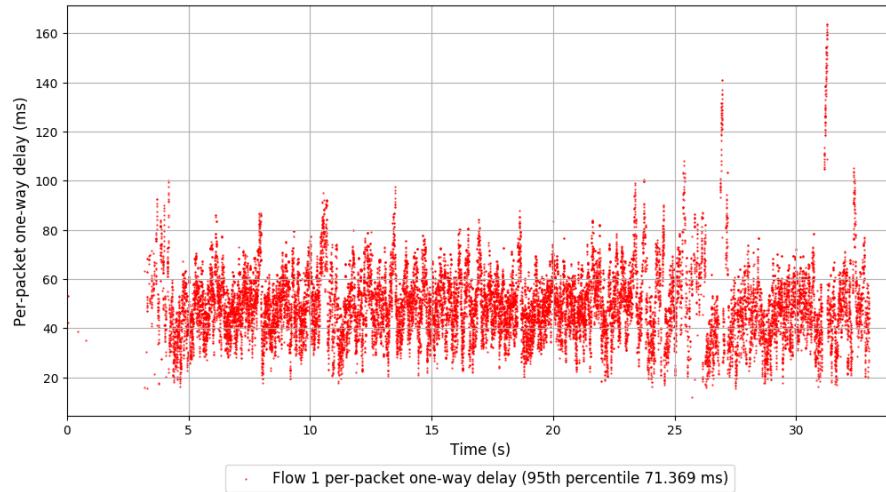
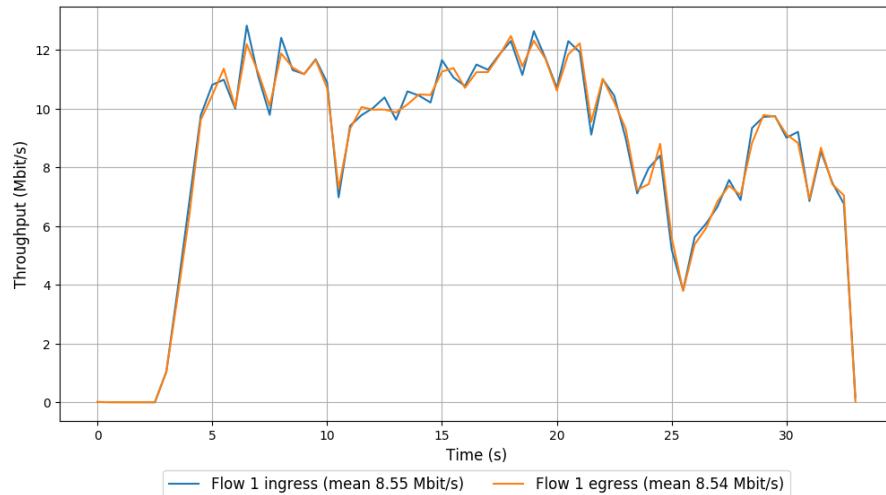
```
-- Flow 1:
```

```
Average throughput: 8.54 Mbit/s
```

```
95th percentile per-packet one-way delay: 71.369 ms
```

```
Loss rate: 0.34%
```

Run 1: Report of Sprout — Data Link



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

```
Start at: Wed, 14 Jun 2017 17:55:17 +0000
```

```
End at: Wed, 14 Jun 2017 17:55:47 +0000
```

```
Local clock offset: 2.422 ms
```

```
Remote clock offset: -1.874 ms
```

```
# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:34 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 5.38 Mbit/s
```

```
95th percentile per-packet one-way delay: 37.394 ms
```

```
Loss rate: 0.17%
```

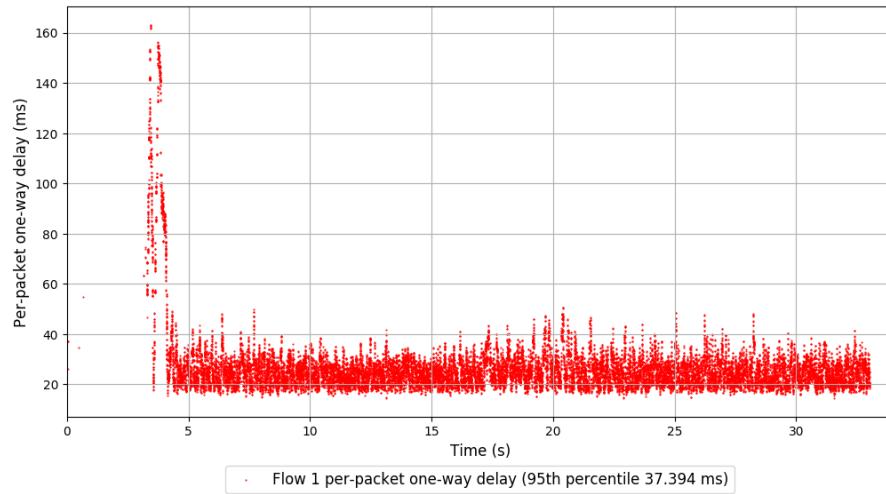
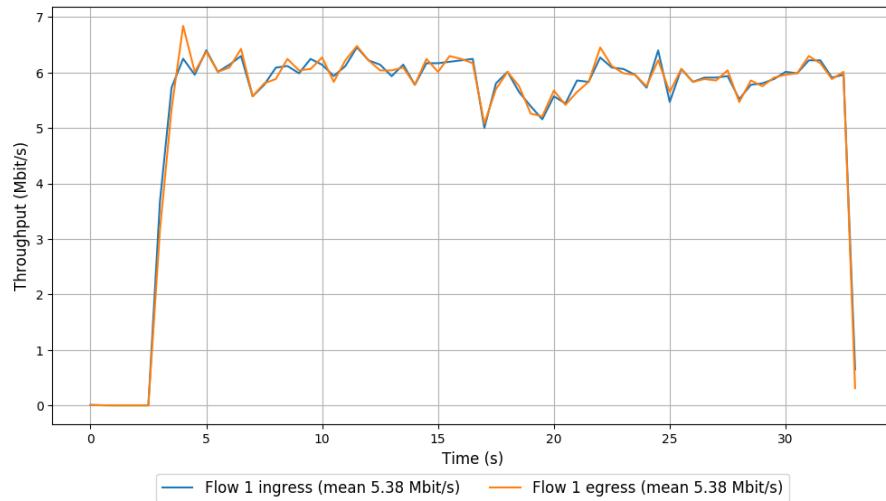
```
-- Flow 1:
```

```
Average throughput: 5.38 Mbit/s
```

```
95th percentile per-packet one-way delay: 37.394 ms
```

```
Loss rate: 0.17%
```

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

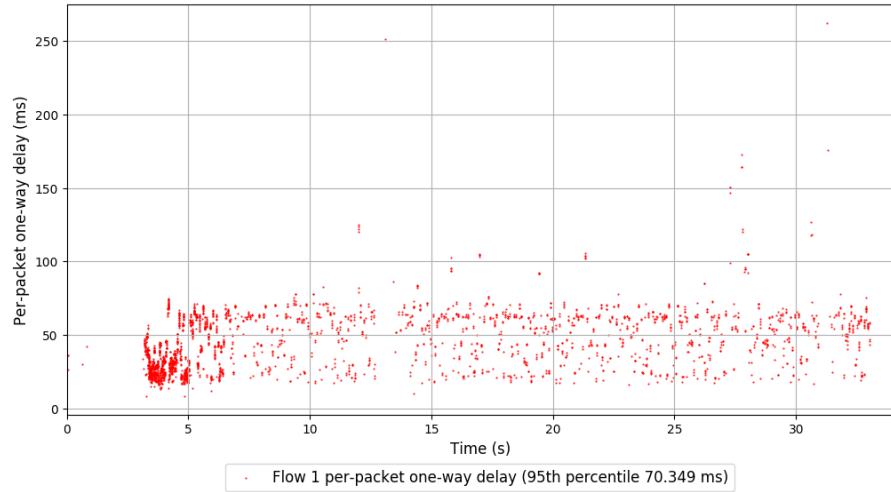
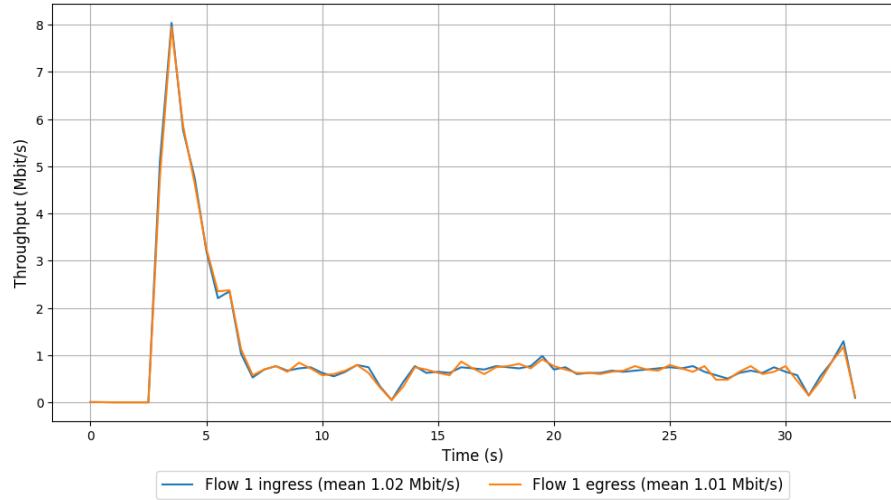


Run 1: Statistics of TCP Vegas

```
Start at: Wed, 14 Jun 2017 17:44:44 +0000
End at: Wed, 14 Jun 2017 17:45:14 +0000
Local clock offset: 2.664 ms
Remote clock offset: -2.019 ms

# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:34 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 70.349 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 70.349 ms
Loss rate: 0.68%
```

Run 1: Report of TCP Vegas — Data Link



```
Run 1: Statistics of Verus
```

```
Start at: Wed, 14 Jun 2017 17:52:56 +0000
```

```
End at: Wed, 14 Jun 2017 17:53:26 +0000
```

```
Local clock offset: 2.152 ms
```

```
Remote clock offset: -1.849 ms
```

```
# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:35 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 8.05 Mbit/s
```

```
95th percentile per-packet one-way delay: 127.202 ms
```

```
Loss rate: 13.05%
```

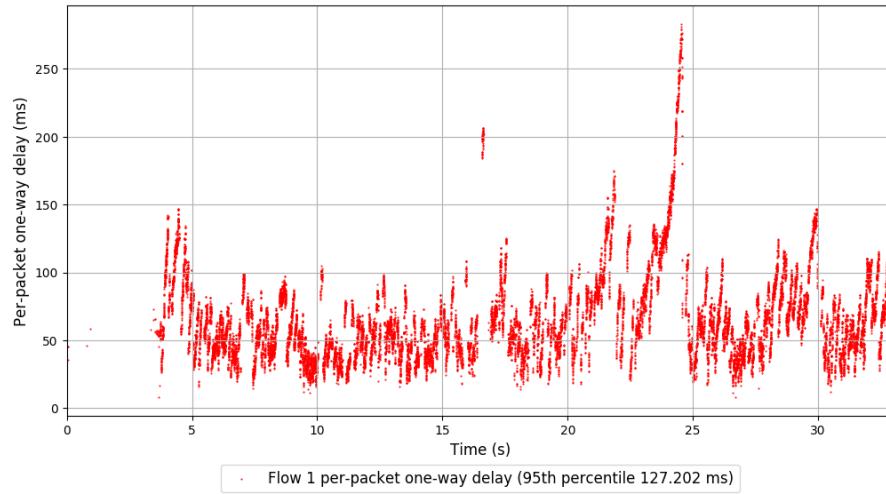
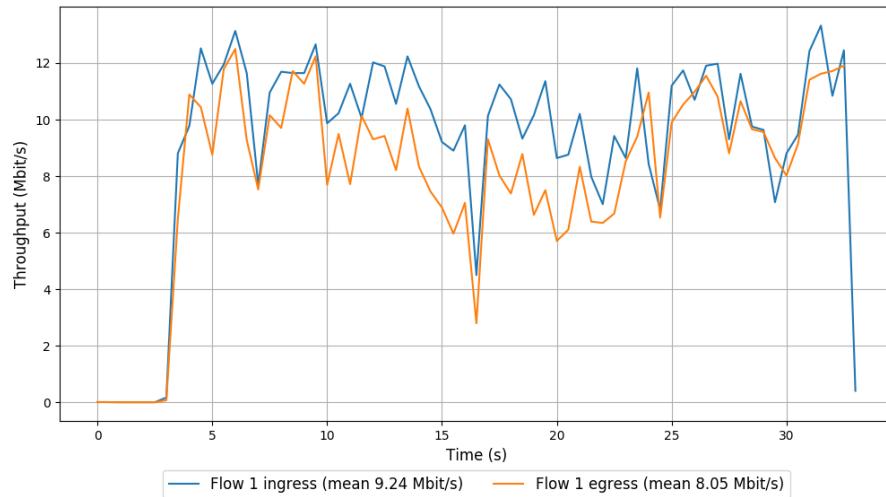
```
-- Flow 1:
```

```
Average throughput: 8.05 Mbit/s
```

```
95th percentile per-packet one-way delay: 127.202 ms
```

```
Loss rate: 13.05%
```

Run 1: Report of Verus — Data Link



```
Run 1: Statistics of WebRTC media

Start at: Wed, 14 Jun 2017 17:51:46 +0000
End at: Wed, 14 Jun 2017 17:52:16 +0000
Local clock offset: 2.062 ms
Remote clock offset: -1.913 ms

# Below is generated by plot.py at Wed, 14 Jun 2017 18:01:36 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 73.199 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 73.199 ms
Loss rate: 0.36%
```

Run 1: Report of WebRTC media — Data Link

