

**Pantheon Summary** (Generated at Wed, 05 Jul 2017 23:54:17 +0000 with  
pantheon version 767a95bcc95d67bd77e69c0f8bc9320c1ad3146b)

Repeated the test of 15 congestion control schemes once.

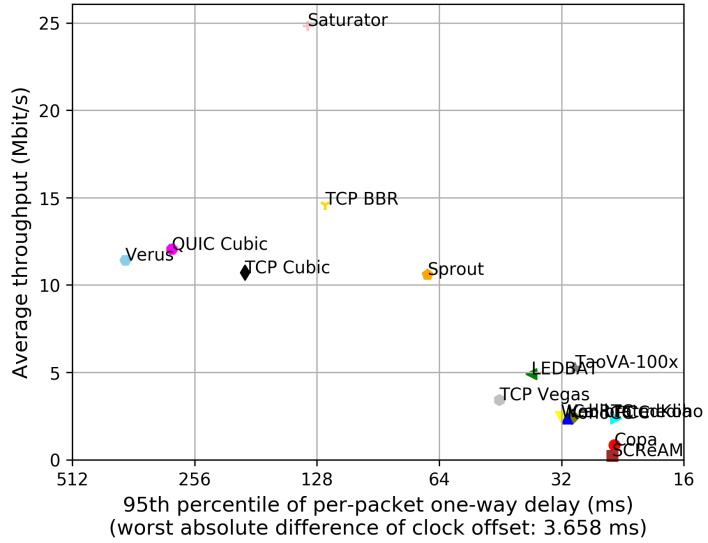
Each test lasted for 30 seconds running 1 flow.

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

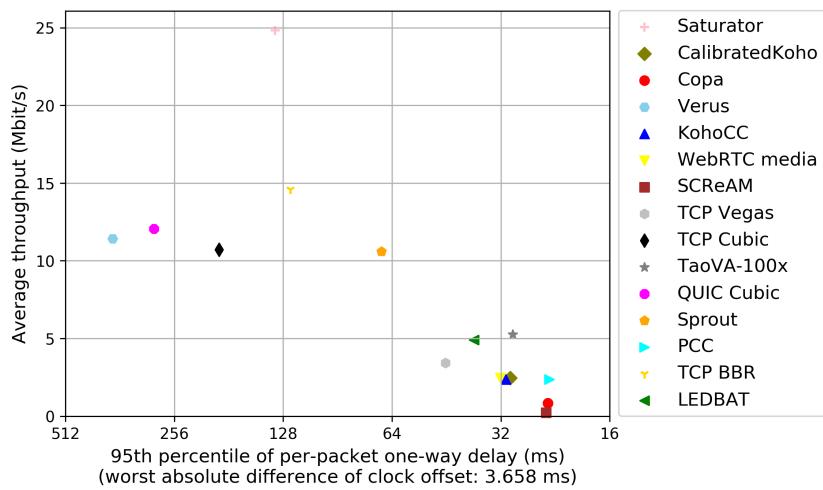
NTP offset measured against time.stanford.edu.

```
git branch: master @ 767a95bcc95d67bd77e69c0f8bc9320c1ad3146b
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 @ c792f8e8e0704b1646a0e024766675d8e9a835f1
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
```

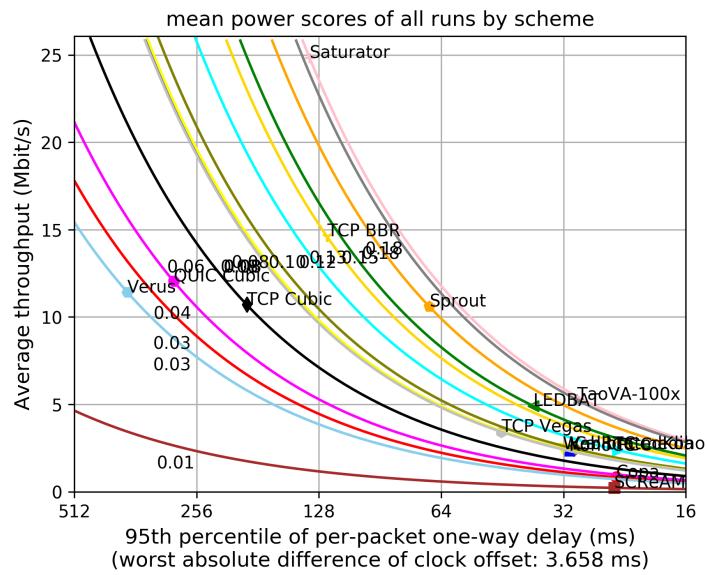
test from AWS California 1 Ethernet to Stanford ppp0, 1 run of 30s each per scheme  
(mean of all runs by scheme)



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



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

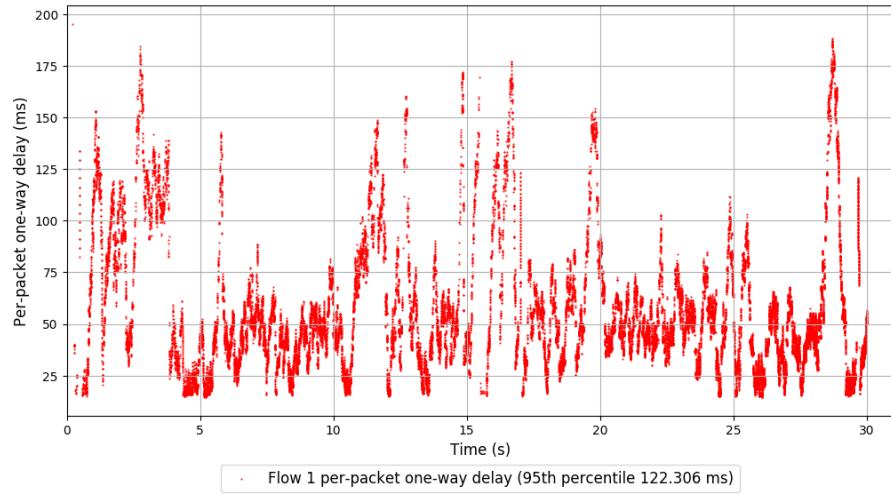
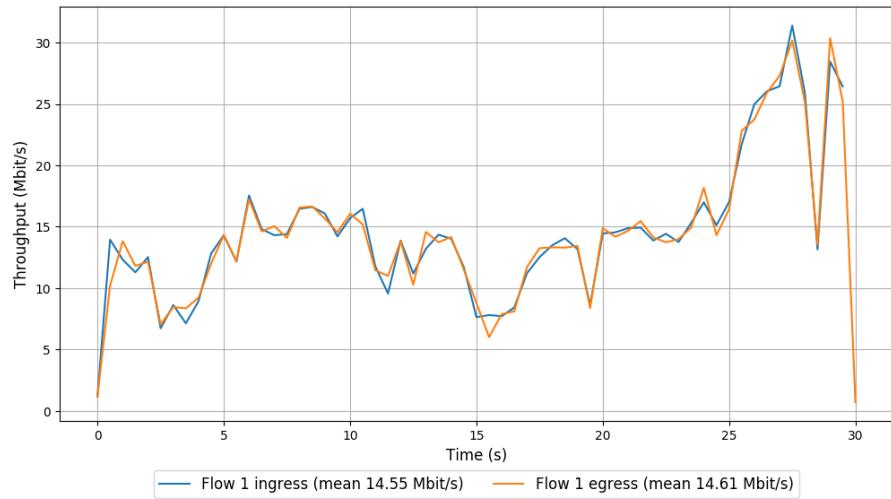


```
Run 1: Statistics of TCP BBR
```

```
Start at: Wed, 05 Jul 2017 23:35:29 +0000
End at: Wed, 05 Jul 2017 23:35:59 +0000
Local clock offset: 0.641 ms
Remote clock offset: -2.963 ms

# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:02 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 14.61 Mbit/s
95th percentile per-packet one-way delay: 122.306 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 14.61 Mbit/s
95th percentile per-packet one-way delay: 122.306 ms
Loss rate: 0.21%
```

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



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

```
Start at: Wed, 05 Jul 2017 23:29:38 +0000
```

```
End at: Wed, 05 Jul 2017 23:30:08 +0000
```

```
Local clock offset: 0.568 ms
```

```
Remote clock offset: -2.958 ms
```

```
# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:02 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 2.46 Mbit/s
```

```
95th percentile per-packet one-way delay: 30.148 ms
```

```
Loss rate: 0.00%
```

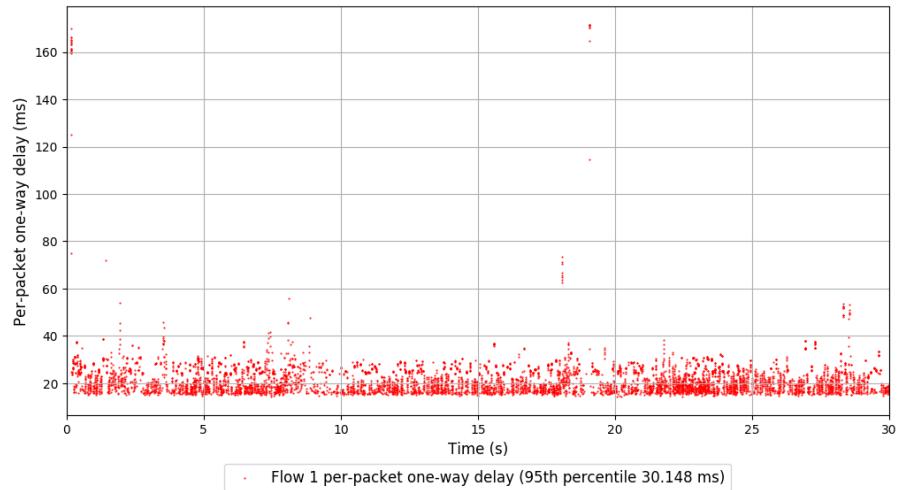
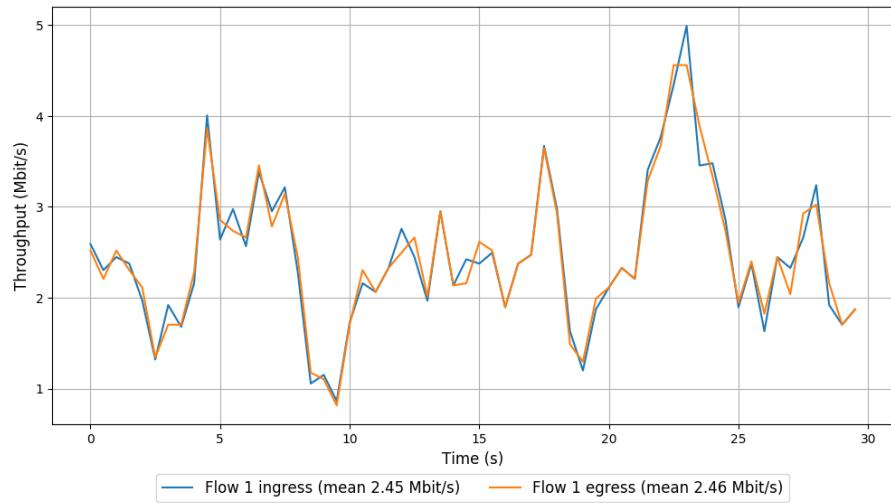
```
-- Flow 1:
```

```
Average throughput: 2.46 Mbit/s
```

```
95th percentile per-packet one-way delay: 30.148 ms
```

```
Loss rate: 0.00%
```

## Run 1: Report of CalibratedKoho — Data Link

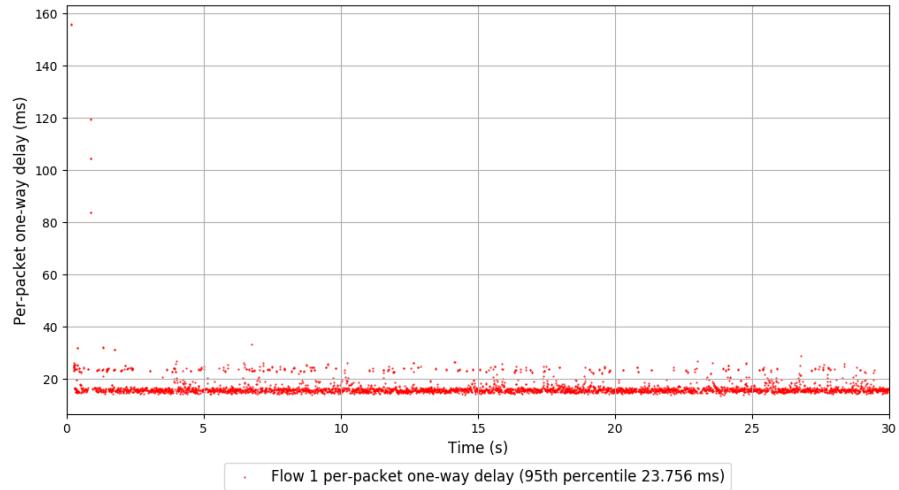
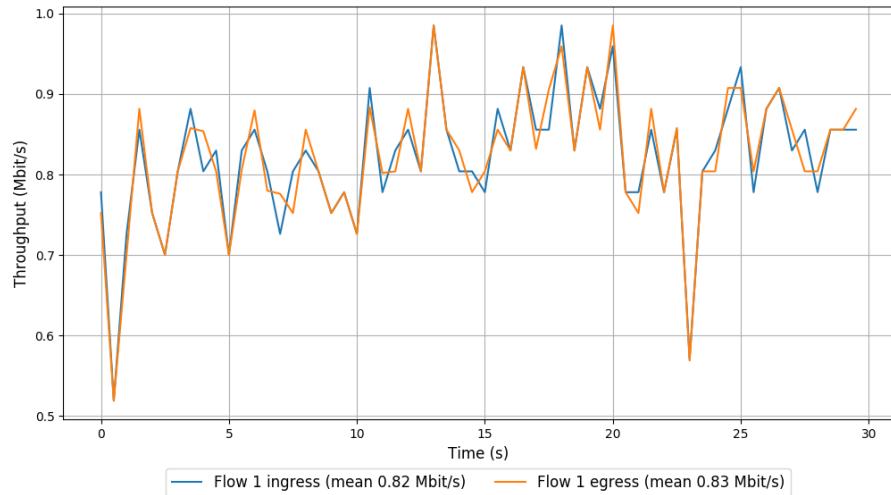


Run 1: Statistics of Copa

```
Start at: Wed, 05 Jul 2017 23:24:57 +0000
End at: Wed, 05 Jul 2017 23:25:27 +0000
Local clock offset: 0.532 ms
Remote clock offset: -2.928 ms

# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:02 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 23.756 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 23.756 ms
Loss rate: 0.00%
```

## Run 1: Report of Copa — Data Link



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

```
Start at: Wed, 05 Jul 2017 23:30:48 +0000
```

```
End at: Wed, 05 Jul 2017 23:31:18 +0000
```

```
Local clock offset: 0.543 ms
```

```
Remote clock offset: -2.93 ms
```

```
# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:03 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 10.71 Mbit/s
```

```
95th percentile per-packet one-way delay: 192.812 ms
```

```
Loss rate: 0.36%
```

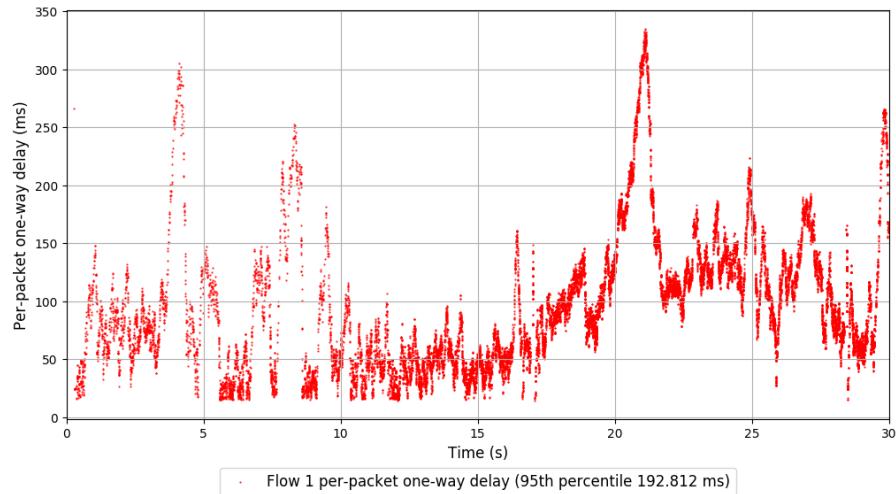
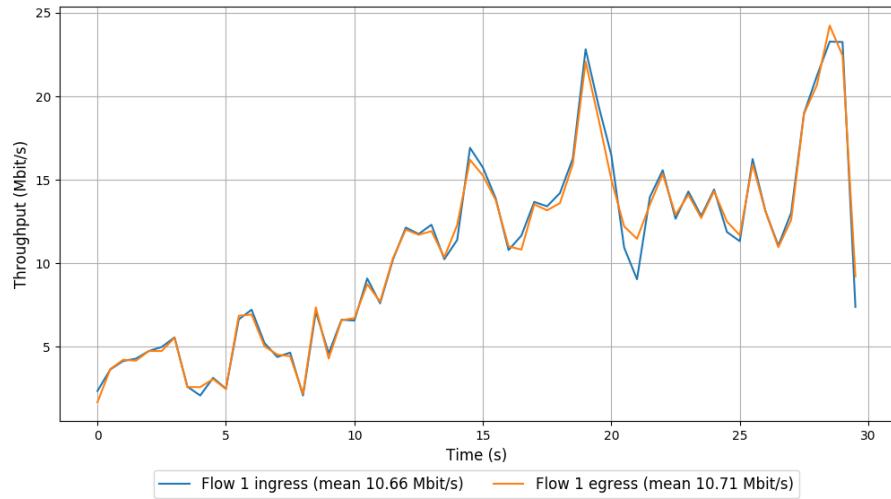
```
-- Flow 1:
```

```
Average throughput: 10.71 Mbit/s
```

```
95th percentile per-packet one-way delay: 192.812 ms
```

```
Loss rate: 0.36%
```

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



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

```
Start at: Wed, 05 Jul 2017 23:22:37 +0000
```

```
End at: Wed, 05 Jul 2017 23:23:07 +0000
```

```
Local clock offset: 0.648 ms
```

```
Remote clock offset: -2.805 ms
```

```
# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:03 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 2.37 Mbit/s
```

```
95th percentile per-packet one-way delay: 31.054 ms
```

```
Loss rate: 0.00%
```

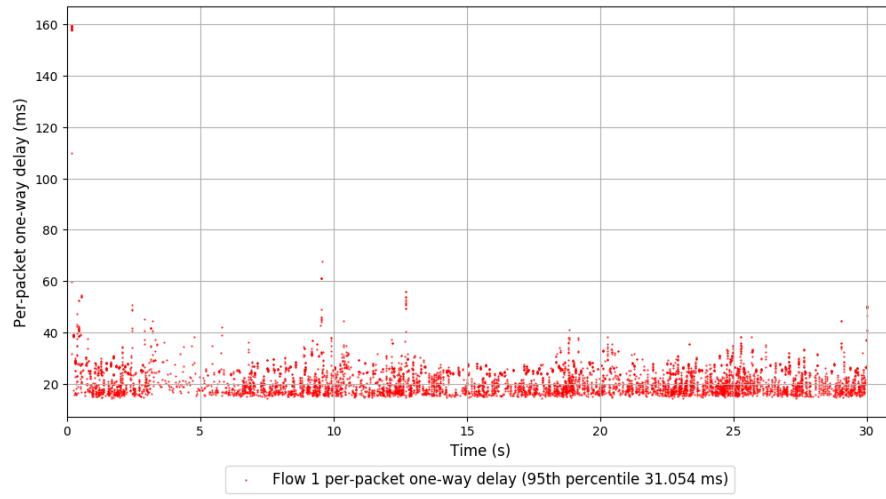
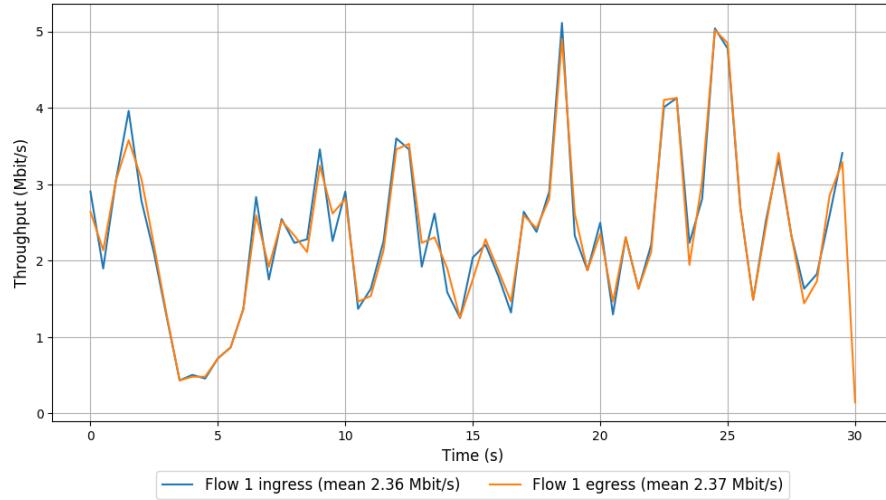
```
-- Flow 1:
```

```
Average throughput: 2.37 Mbit/s
```

```
95th percentile per-packet one-way delay: 31.054 ms
```

```
Loss rate: 0.00%
```

## Run 1: Report of KohoCC — Data Link

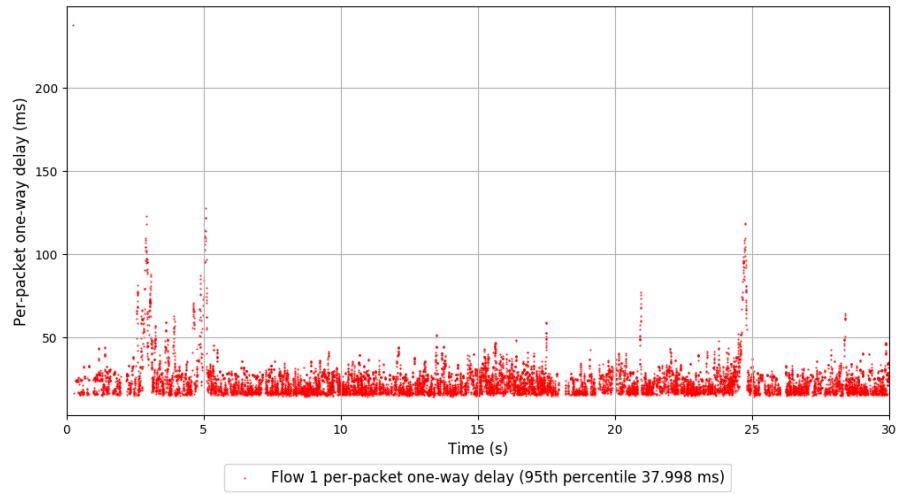
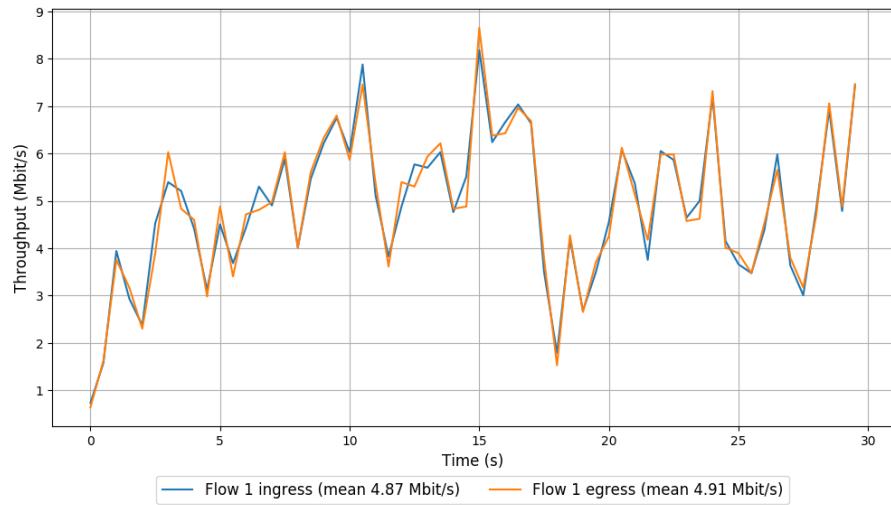


```
Run 1: Statistics of LEDBAT
```

```
Start at: Wed, 05 Jul 2017 23:19:07 +0000
End at: Wed, 05 Jul 2017 23:19:37 +0000
Local clock offset: 0.504 ms
Remote clock offset: -3.018 ms

# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:04 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.91 Mbit/s
95th percentile per-packet one-way delay: 37.998 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 4.91 Mbit/s
95th percentile per-packet one-way delay: 37.998 ms
Loss rate: 0.01%
```

## Run 1: Report of LEDBAT — Data Link

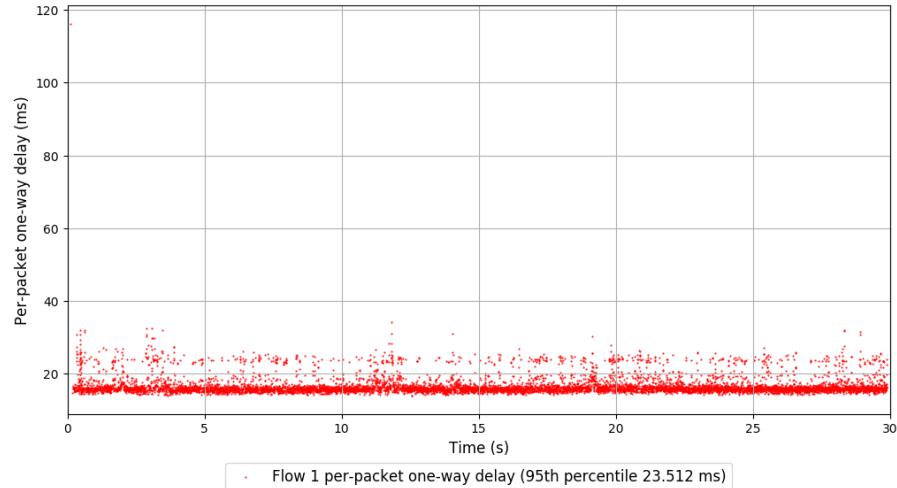
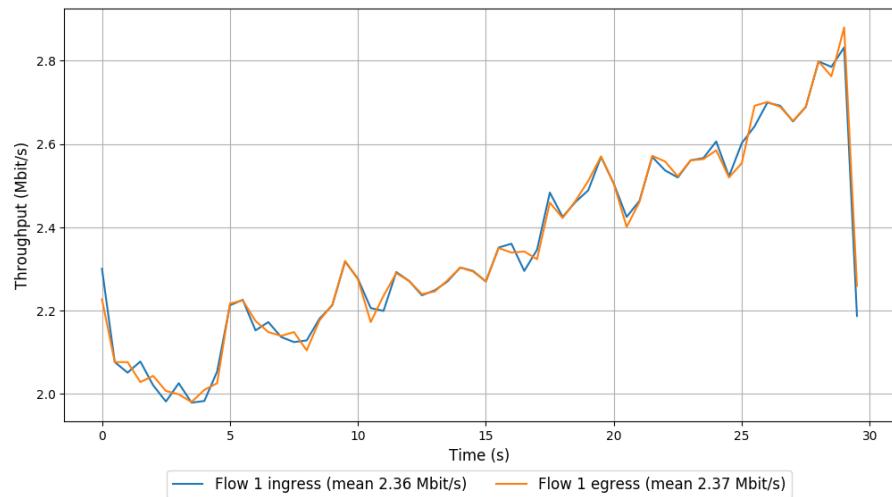


```
Run 1: Statistics of PCC
```

```
Start at: Wed, 05 Jul 2017 23:26:06 +0000
End at: Wed, 05 Jul 2017 23:26:36 +0000
Local clock offset: 0.569 ms
Remote clock offset: -2.947 ms

# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:05 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 23.512 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 23.512 ms
Loss rate: 0.00%
```

## Run 1: Report of PCC — Data Link

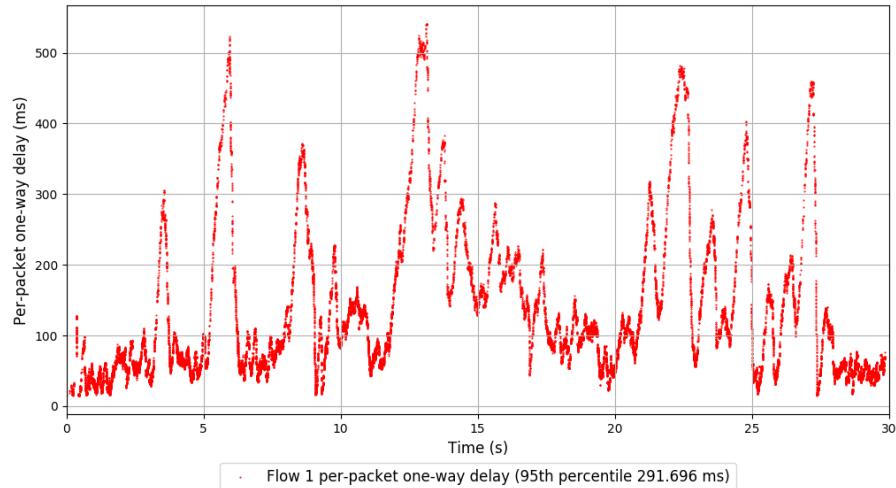
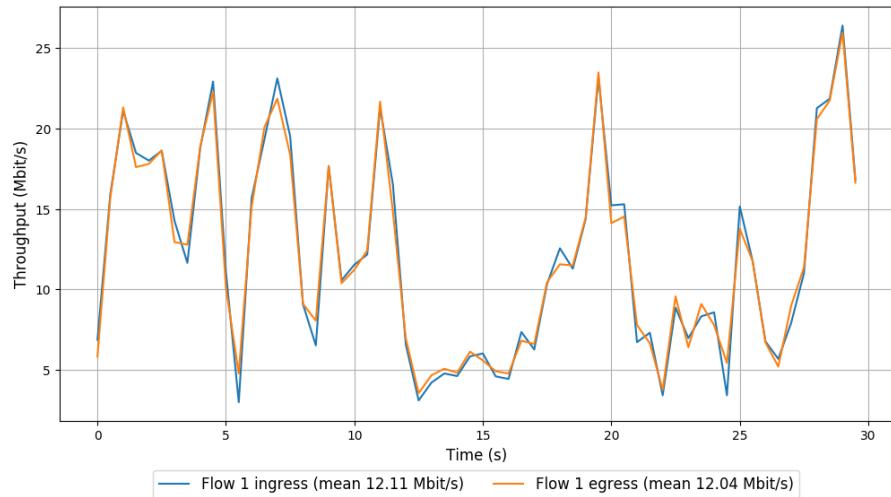


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: Wed, 05 Jul 2017 23:33:08 +0000
End at: Wed, 05 Jul 2017 23:33:38 +0000
Local clock offset: 0.67 ms
Remote clock offset: -2.894 ms

# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:07 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.04 Mbit/s
95th percentile per-packet one-way delay: 291.696 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 12.04 Mbit/s
95th percentile per-packet one-way delay: 291.696 ms
Loss rate: 0.47%
```

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



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

```
Start at: Wed, 05 Jul 2017 23:27:17 +0000
```

```
End at: Wed, 05 Jul 2017 23:27:47 +0000
```

```
Local clock offset: 0.549 ms
```

```
Remote clock offset: -2.969 ms
```

```
# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:10 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 24.83 Mbit/s
```

```
95th percentile per-packet one-way delay: 134.949 ms
```

```
Loss rate: 0.38%
```

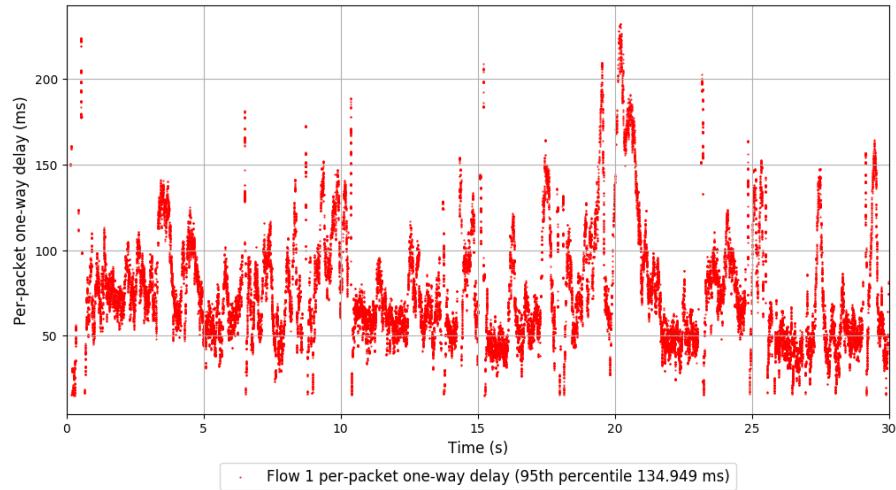
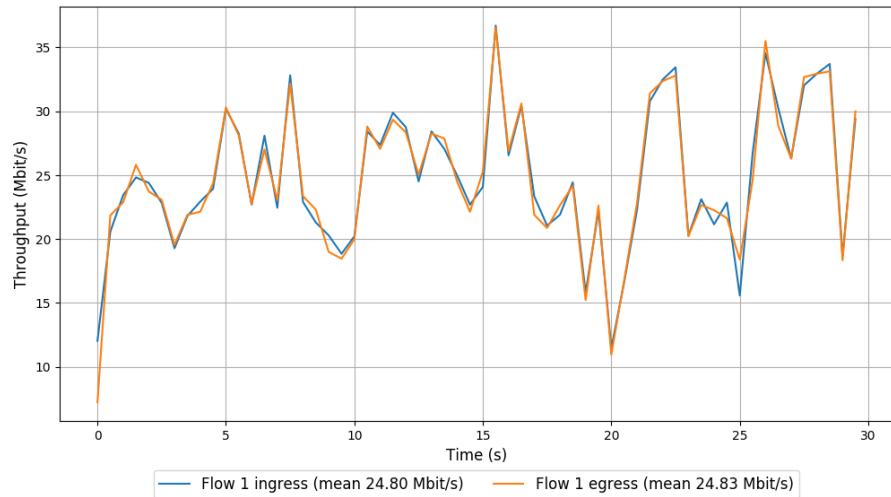
```
-- Flow 1:
```

```
Average throughput: 24.83 Mbit/s
```

```
95th percentile per-packet one-way delay: 134.949 ms
```

```
Loss rate: 0.38%
```

## Run 1: Report of Saturator — Data Link



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

```
Start at: Wed, 05 Jul 2017 23:20:17 +0000
```

```
End at: Wed, 05 Jul 2017 23:20:47 +0000
```

```
Local clock offset: 0.604 ms
```

```
Remote clock offset: -2.908 ms
```

```
# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:10 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 0.22 Mbit/s
```

```
95th percentile per-packet one-way delay: 24.023 ms
```

```
Loss rate: 0.00%
```

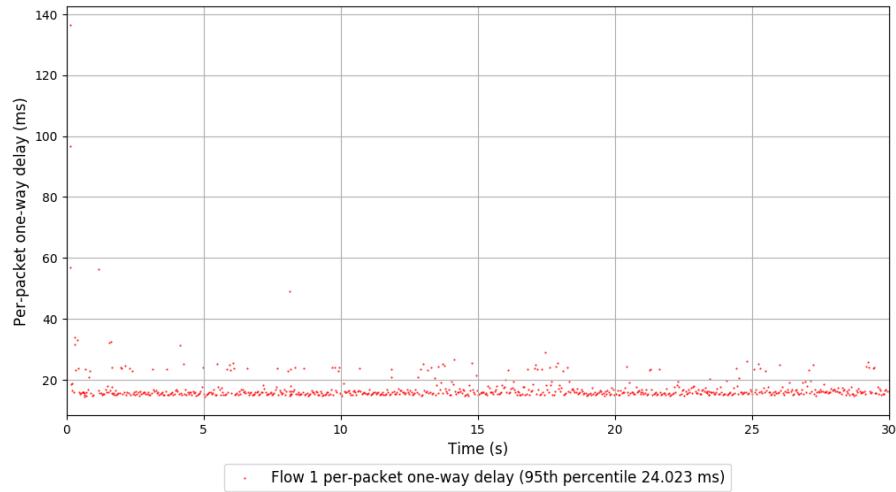
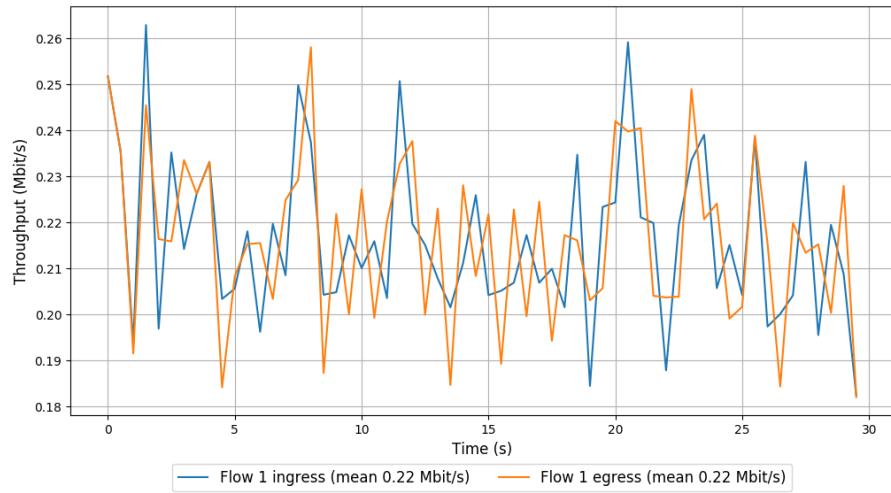
```
-- Flow 1:
```

```
Average throughput: 0.22 Mbit/s
```

```
95th percentile per-packet one-way delay: 24.023 ms
```

```
Loss rate: 0.00%
```

## Run 1: Report of SCReAM — Data Link

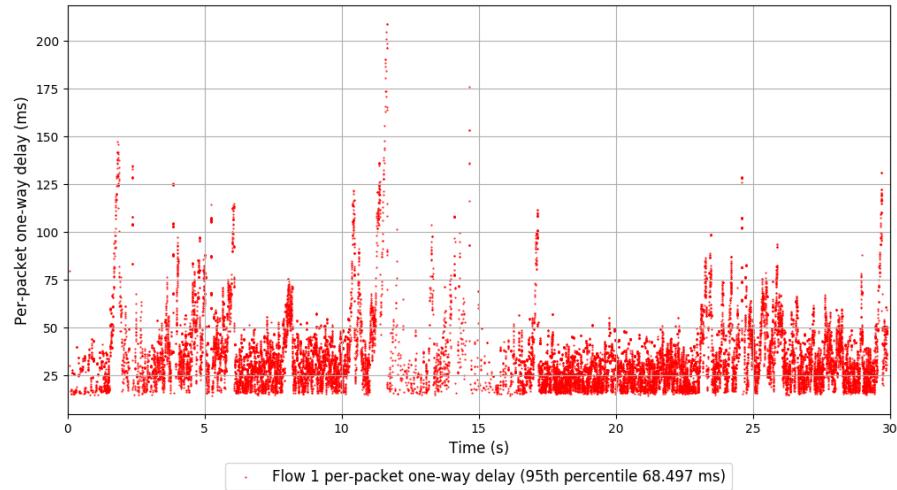
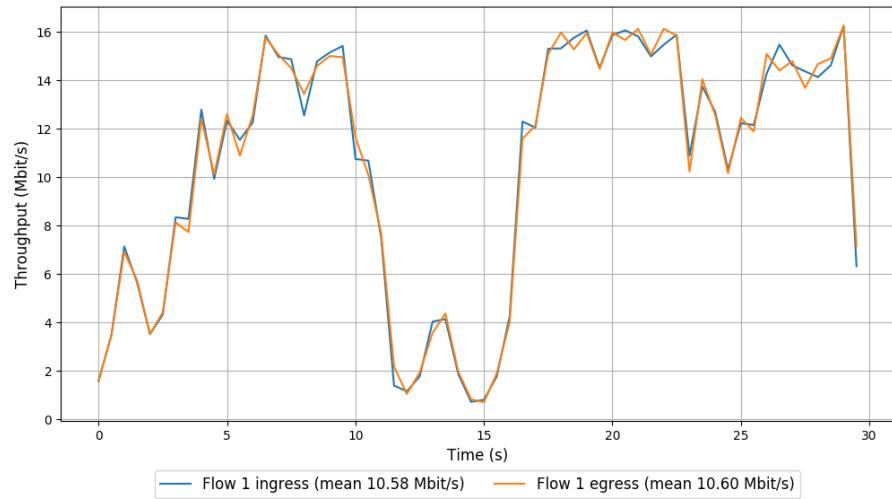


```
Run 1: Statistics of Sprout
```

```
Start at: Wed, 05 Jul 2017 23:31:58 +0000
End at: Wed, 05 Jul 2017 23:32:28 +0000
Local clock offset: 0.612 ms
Remote clock offset: -2.984 ms

# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:10 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.60 Mbit/s
95th percentile per-packet one-way delay: 68.497 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 10.60 Mbit/s
95th percentile per-packet one-way delay: 68.497 ms
Loss rate: 0.02%
```

## Run 1: Report of Sprout — Data Link



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

```
Start at: Wed, 05 Jul 2017 23:21:27 +0000
```

```
End at: Wed, 05 Jul 2017 23:21:57 +0000
```

```
Local clock offset: 0.636 ms
```

```
Remote clock offset: -2.893 ms
```

```
# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:12 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 5.26 Mbit/s
```

```
95th percentile per-packet one-way delay: 29.677 ms
```

```
Loss rate: 0.00%
```

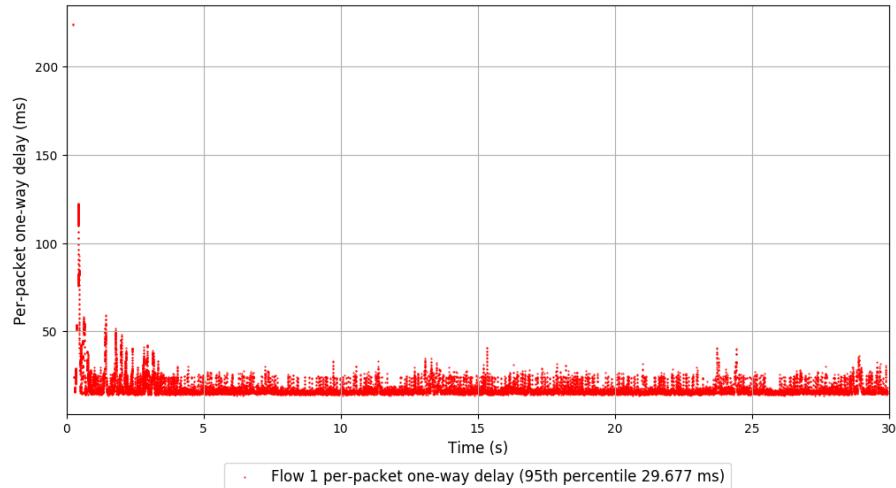
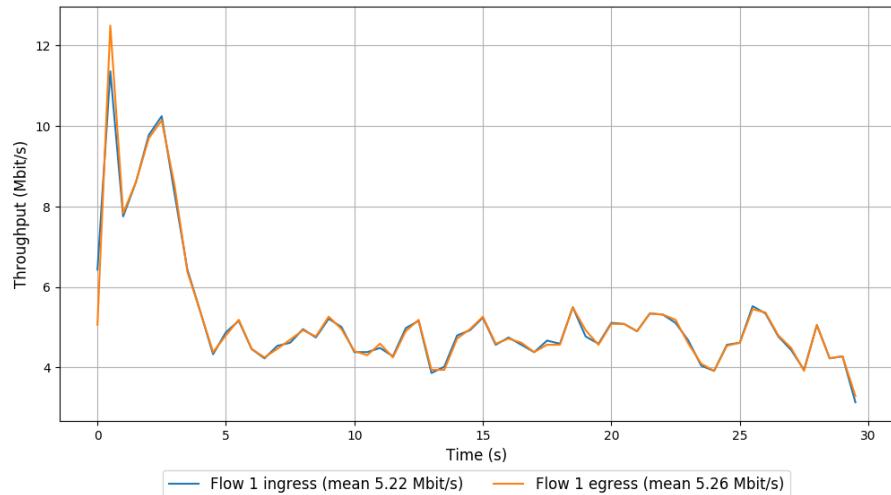
```
-- Flow 1:
```

```
Average throughput: 5.26 Mbit/s
```

```
95th percentile per-packet one-way delay: 29.677 ms
```

```
Loss rate: 0.00%
```

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



```
Run 1: Statistics of TCP Vegas
```

```
Start at: Wed, 05 Jul 2017 23:23:46 +0000
```

```
End at: Wed, 05 Jul 2017 23:24:16 +0000
```

```
Local clock offset: 0.628 ms
```

```
Remote clock offset: -2.837 ms
```

```
# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:12 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 3.42 Mbit/s
```

```
95th percentile per-packet one-way delay: 45.504 ms
```

```
Loss rate: 0.00%
```

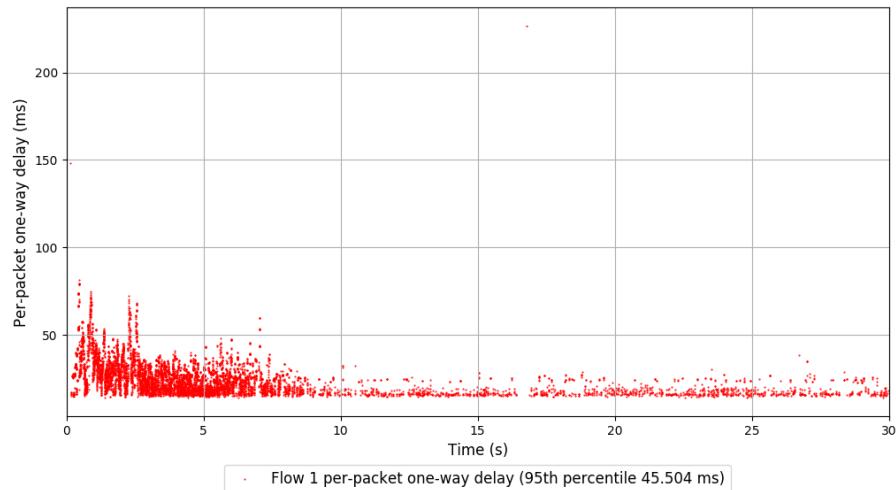
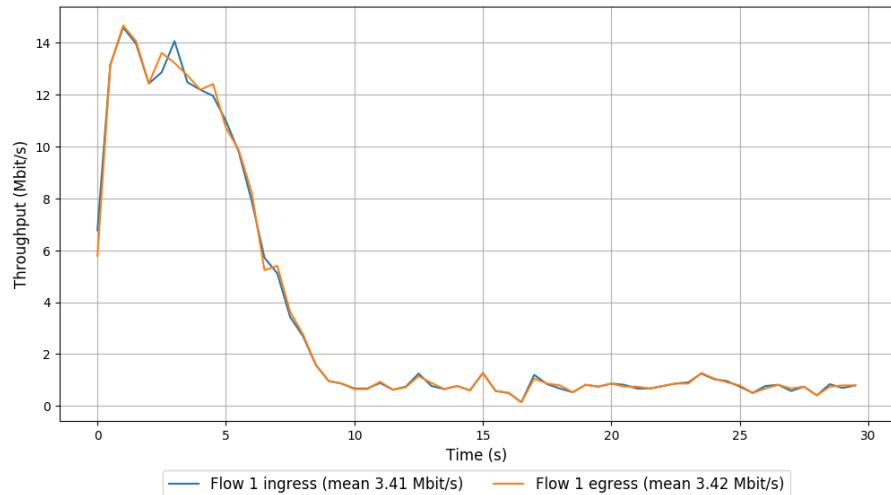
```
-- Flow 1:
```

```
Average throughput: 3.42 Mbit/s
```

```
95th percentile per-packet one-way delay: 45.504 ms
```

```
Loss rate: 0.00%
```

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

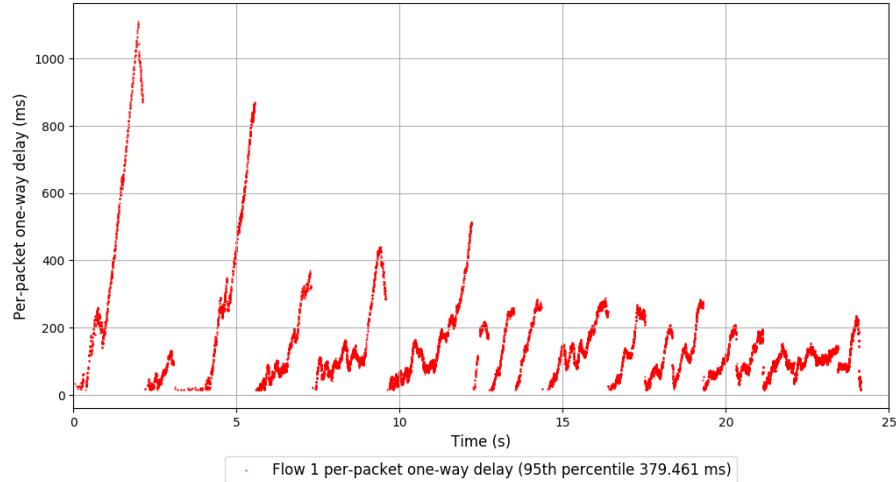
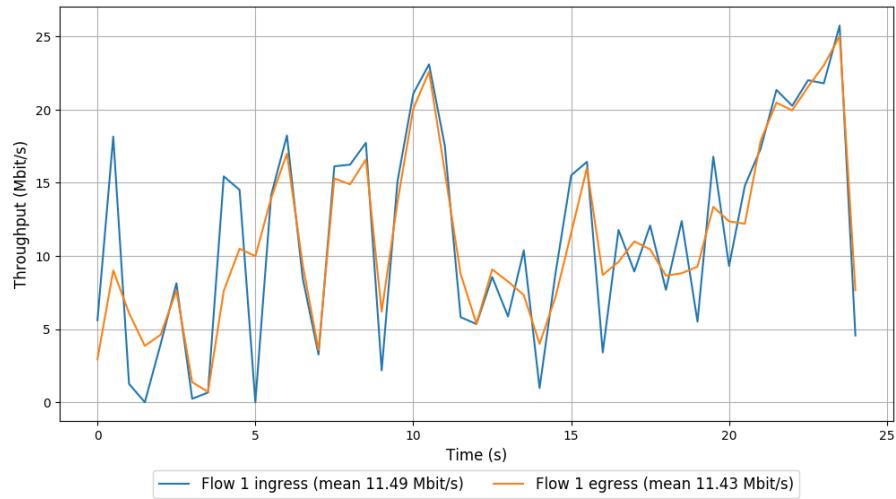


```
Run 1: Statistics of Verus
```

```
Start at: Wed, 05 Jul 2017 23:28:28 +0000
End at: Wed, 05 Jul 2017 23:28:58 +0000
Local clock offset: 0.555 ms
Remote clock offset: -2.961 ms

# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:14 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.43 Mbit/s
95th percentile per-packet one-way delay: 379.461 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 11.43 Mbit/s
95th percentile per-packet one-way delay: 379.461 ms
Loss rate: 0.67%
```

## Run 1: Report of Verus — Data Link



```
Run 1: Statistics of WebRTC media

Start at: Wed, 05 Jul 2017 23:34:19 +0000
End at: Wed, 05 Jul 2017 23:34:49 +0000
Local clock offset: 0.68 ms
Remote clock offset: -2.978 ms

# Below is generated by plot.py at Wed, 05 Jul 2017 23:54:14 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 32.154 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 32.154 ms
Loss rate: 0.00%
```

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

