

Pantheon Summary (Generated at Sun, 11 Jun 2017 01:20:21 +0000 with
pantheon version e44e21ab50520045378f626dc5b5e21d0473d7b8)

Repeated the test of 15 congestion control schemes once.

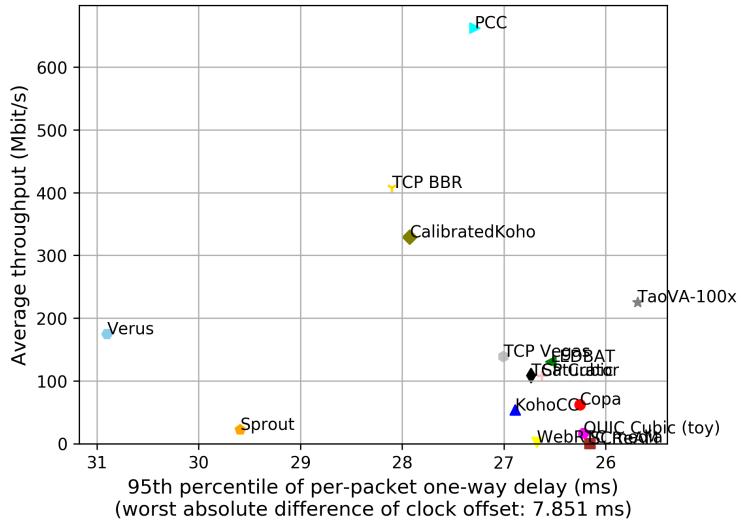
Each test lasted for 30 seconds running 1 flow.

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

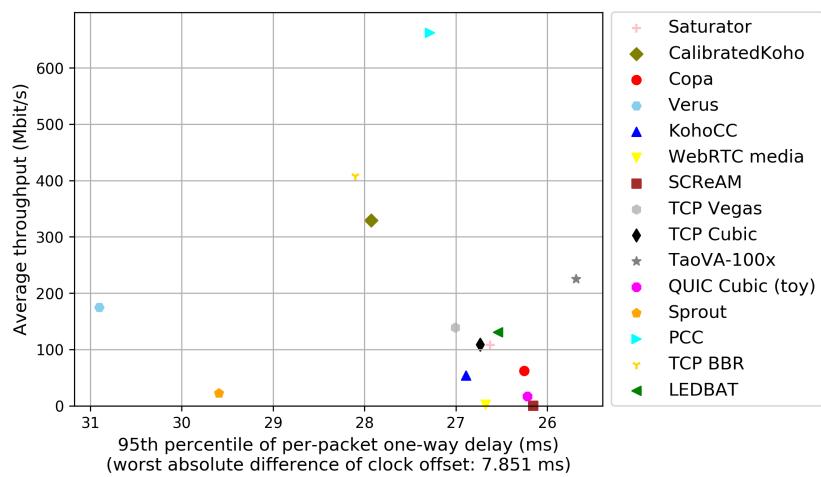
NTP offset measured against time.stanford.edu.

```
git branch: master @ e44e21ab50520045378f626dc5b5e21d0473d7b8
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
```

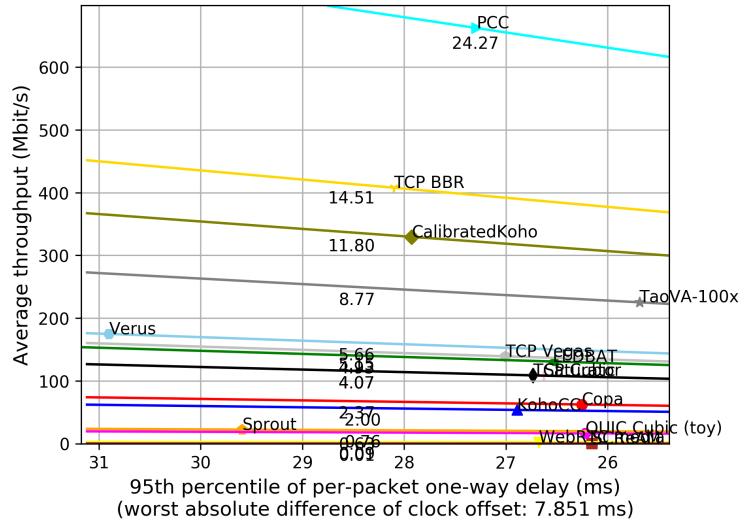
test from AWS California 1 Ethernet to Stanford Ethernet, run 1 of 30s each per scheme
mean of all runs by scheme



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



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

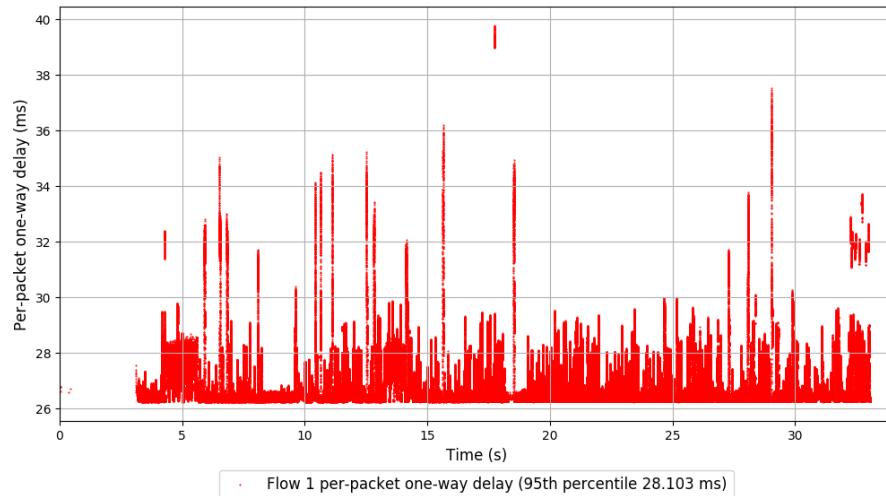
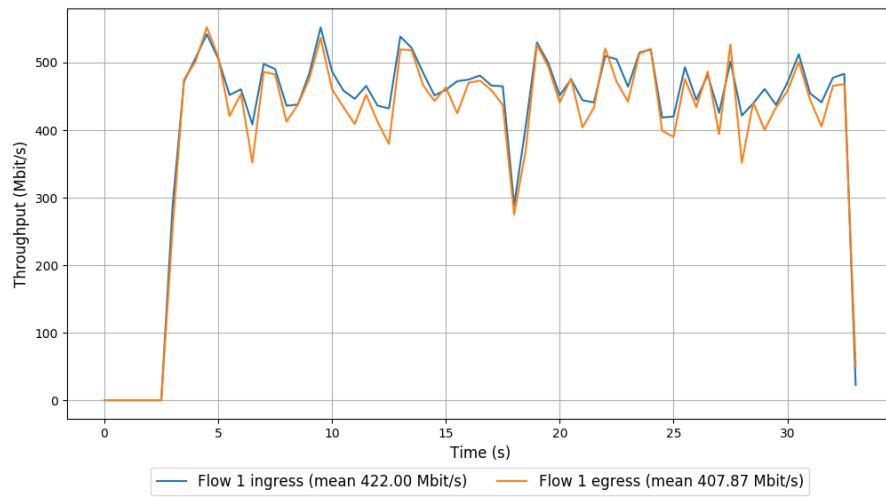


Run 1: Statistics of TCP BBR

```
Start at: Sun, 11 Jun 2017 00:40:12 +0000
End at: Sun, 11 Jun 2017 00:40:42 +0000
Local clock offset: 5.84 ms
Remote clock offset: -1.741 ms

# Below is generated by plot.py at Sun, 11 Jun 2017 01:18:02 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 407.87 Mbit/s
95th percentile per-packet one-way delay: 28.103 ms
Loss rate: 3.38%
-- Flow 1:
Average throughput: 407.87 Mbit/s
95th percentile per-packet one-way delay: 28.103 ms
Loss rate: 3.38%
```

Run 1: Report of TCP BBR — Data Link



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

```
Start at: Sun, 11 Jun 2017 00:41:53 +0000
```

```
End at: Sun, 11 Jun 2017 00:42:23 +0000
```

```
Local clock offset: 5.821 ms
```

```
Remote clock offset: -1.757 ms
```

```
# Below is generated by plot.py at Sun, 11 Jun 2017 01:18:02 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 329.57 Mbit/s
```

```
95th percentile per-packet one-way delay: 27.927 ms
```

```
Loss rate: 1.30%
```

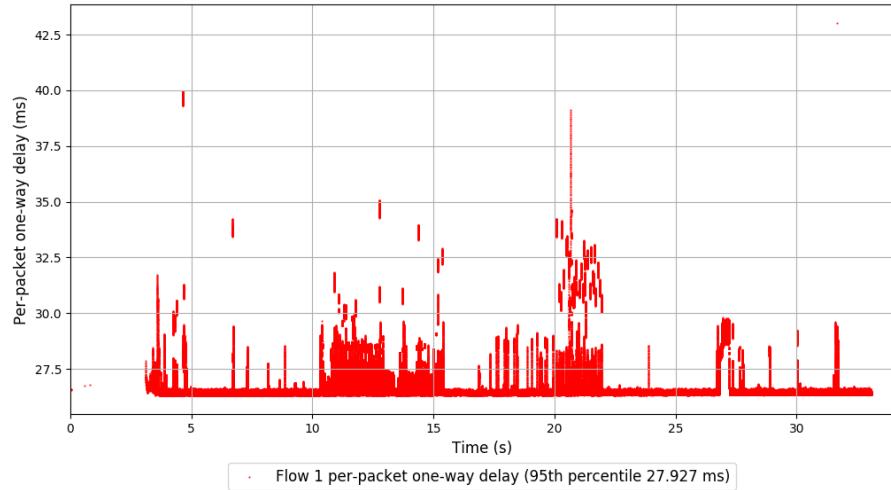
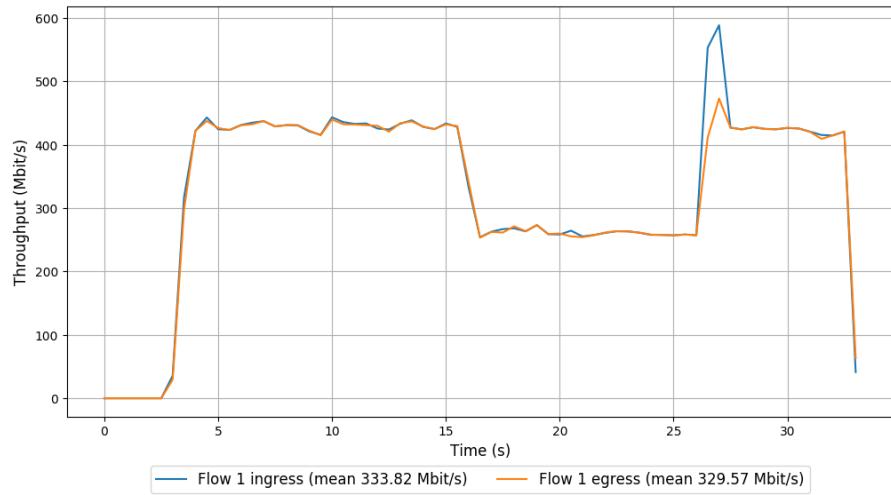
```
-- Flow 1:
```

```
Average throughput: 329.57 Mbit/s
```

```
95th percentile per-packet one-way delay: 27.927 ms
```

```
Loss rate: 1.30%
```

Run 1: Report of CalibratedKoho — Data Link

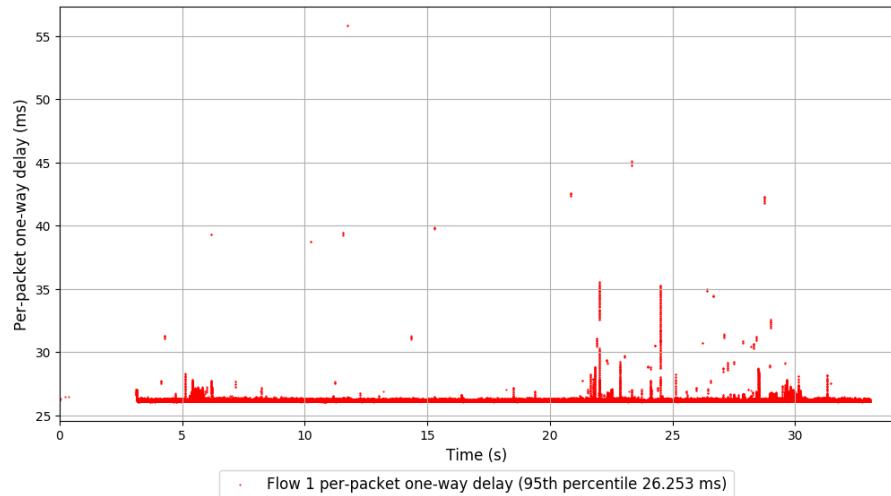
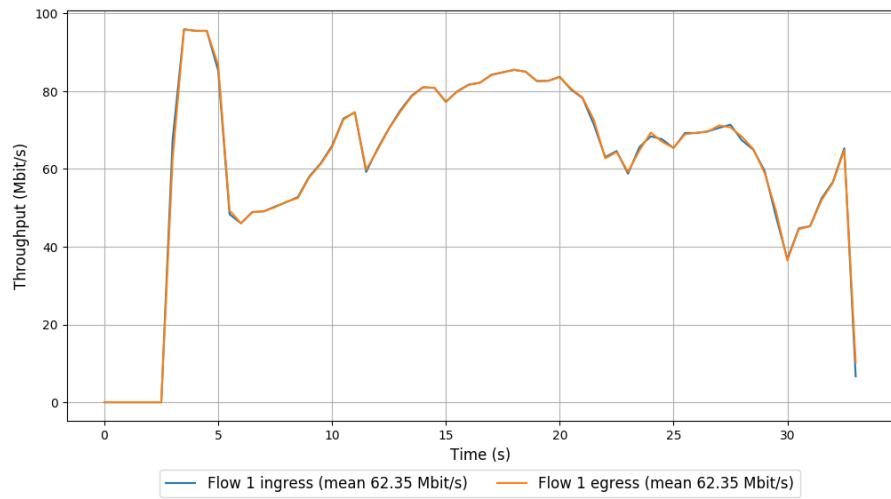


Run 1: Statistics of Copa

```
Start at: Sun, 11 Jun 2017 00:36:12 +0000
End at: Sun, 11 Jun 2017 00:36:42 +0000
Local clock offset: 5.723 ms
Remote clock offset: -1.763 ms

# Below is generated by plot.py at Sun, 11 Jun 2017 01:18:08 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 62.35 Mbit/s
95th percentile per-packet one-way delay: 26.253 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 62.35 Mbit/s
95th percentile per-packet one-way delay: 26.253 ms
Loss rate: 0.00%
```

Run 1: Report of Copa — Data Link



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

```
Start at: Sun, 11 Jun 2017 00:29:38 +0000
```

```
End at: Sun, 11 Jun 2017 00:30:08 +0000
```

```
Local clock offset: 5.212 ms
```

```
Remote clock offset: -1.869 ms
```

```
# Below is generated by plot.py at Sun, 11 Jun 2017 01:18:20 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 108.79 Mbit/s
```

```
95th percentile per-packet one-way delay: 26.736 ms
```

```
Loss rate: 0.16%
```

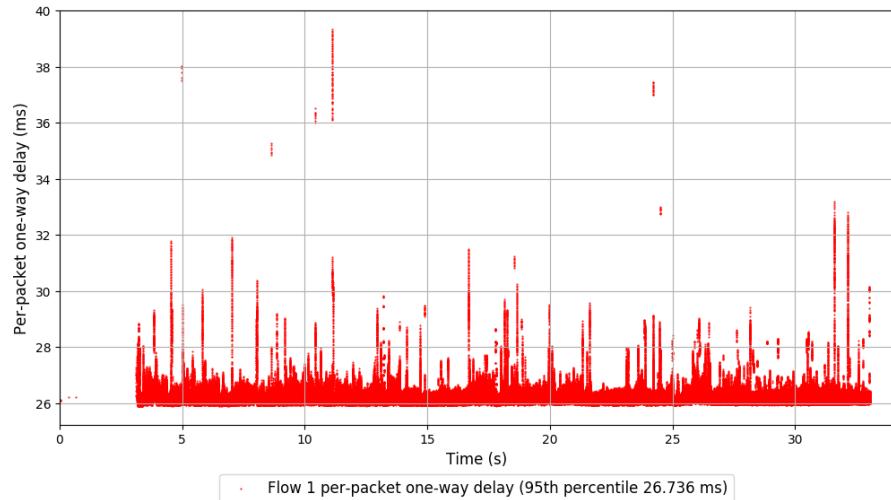
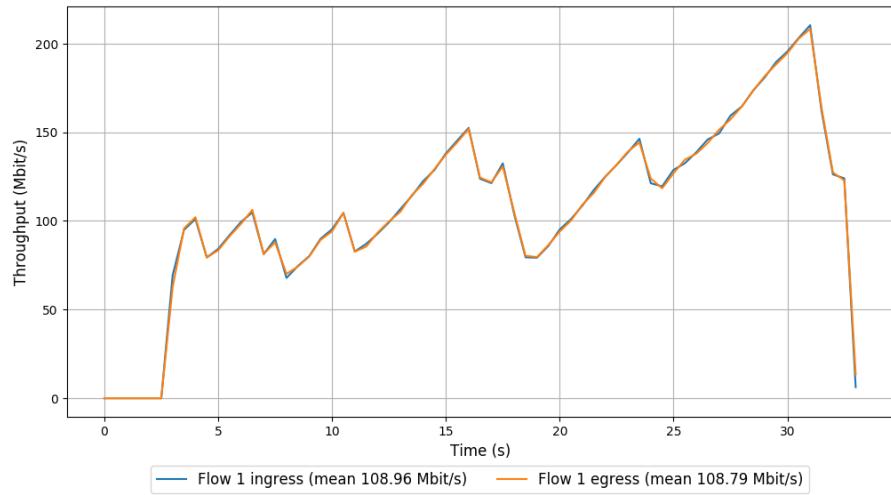
```
-- Flow 1:
```

```
Average throughput: 108.79 Mbit/s
```

```
95th percentile per-packet one-way delay: 26.736 ms
```

```
Loss rate: 0.16%
```

Run 1: Report of TCP Cubic — Data Link



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

```
Start at: Sun, 11 Jun 2017 00:34:54 +0000
```

```
End at: Sun, 11 Jun 2017 00:35:24 +0000
```

```
Local clock offset: 5.696 ms
```

```
Remote clock offset: -1.691 ms
```

```
# Below is generated by plot.py at Sun, 11 Jun 2017 01:18:20 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 53.65 Mbit/s
```

```
95th percentile per-packet one-way delay: 26.891 ms
```

```
Loss rate: 0.00%
```

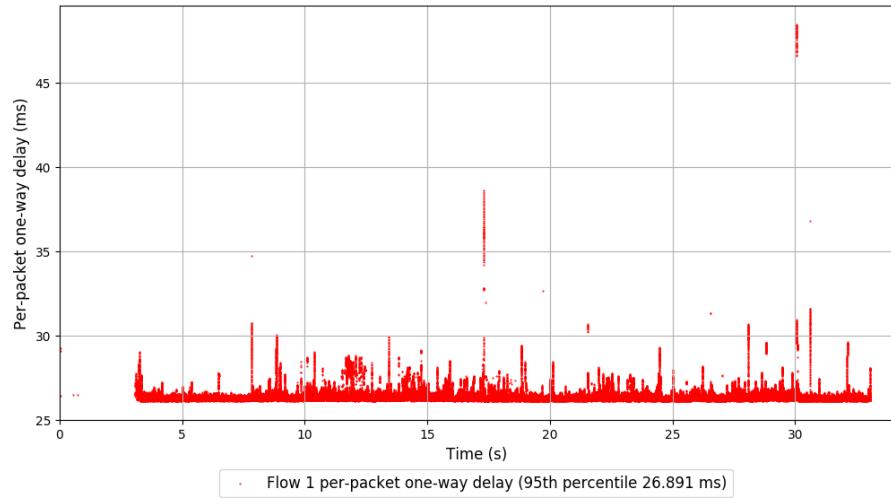
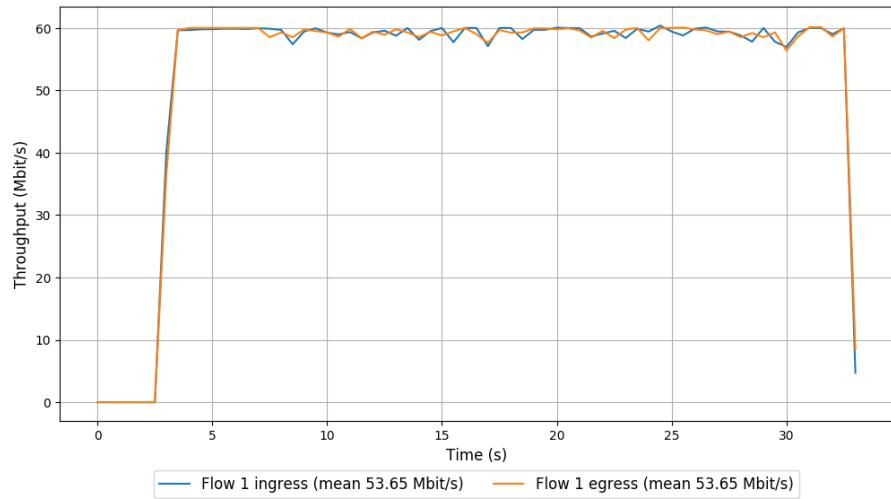
```
-- Flow 1:
```

```
Average throughput: 53.65 Mbit/s
```

```
95th percentile per-packet one-way delay: 26.891 ms
```

```
Loss rate: 0.00%
```

Run 1: Report of KohoCC — Data Link

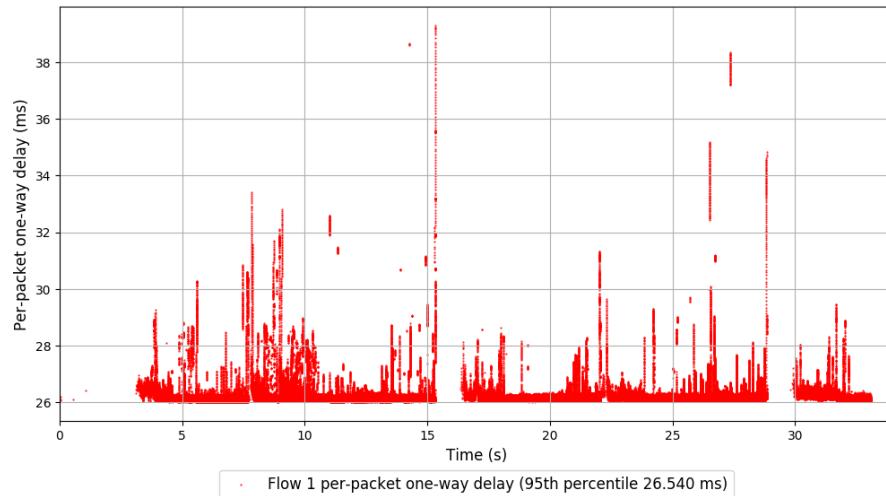
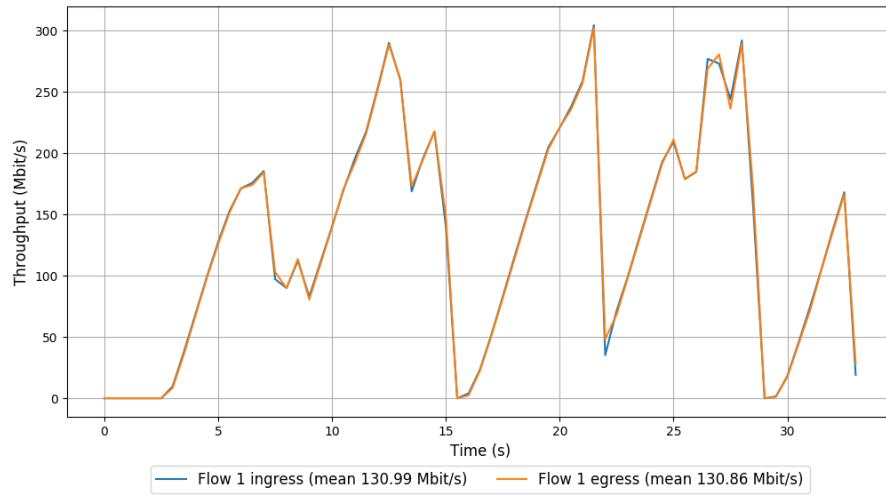


```
Run 1: Statistics of LEDBAT
```

```
Start at: Sun, 11 Jun 2017 00:30:59 +0000
End at: Sun, 11 Jun 2017 00:31:29 +0000
Local clock offset: 5.328 ms
Remote clock offset: -1.878 ms

# Below is generated by plot.py at Sun, 11 Jun 2017 01:18:33 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 130.86 Mbit/s
95th percentile per-packet one-way delay: 26.540 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 130.86 Mbit/s
95th percentile per-packet one-way delay: 26.540 ms
Loss rate: 0.12%
```

Run 1: Report of LEDBAT — Data Link

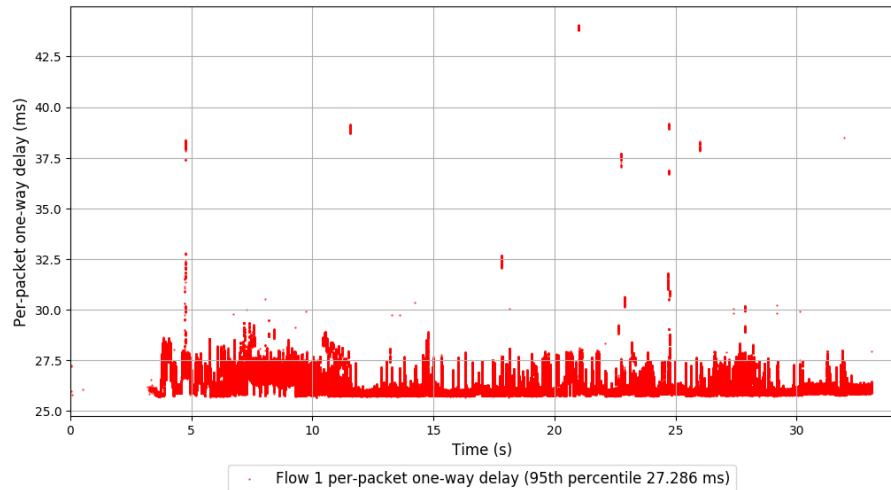
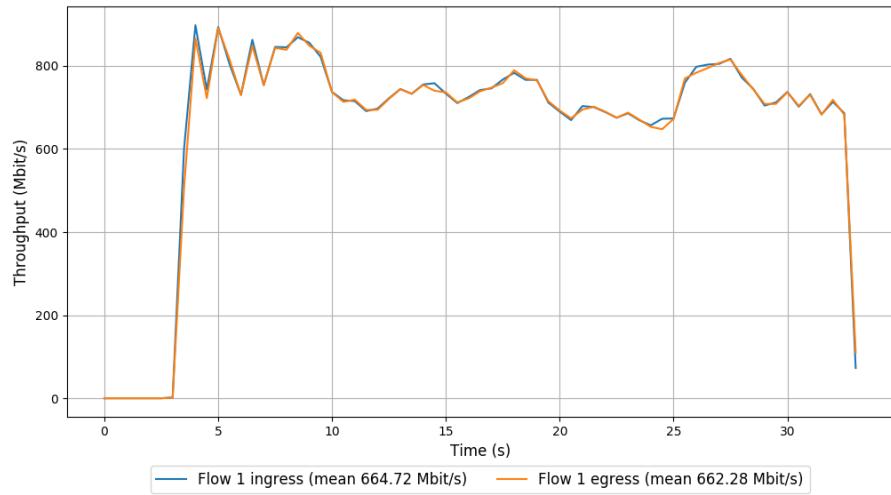


```
Run 1: Statistics of PCC
```

```
Start at: Sun, 11 Jun 2017 00:27:57 +0000
End at: Sun, 11 Jun 2017 00:28:27 +0000
Local clock offset: 4.963 ms
Remote clock offset: -1.881 ms

# Below is generated by plot.py at Sun, 11 Jun 2017 01:19:58 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 662.28 Mbit/s
95th percentile per-packet one-way delay: 27.286 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 662.28 Mbit/s
95th percentile per-packet one-way delay: 27.286 ms
Loss rate: 0.37%
```

Run 1: Report of PCC — Data Link



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

```
Start at: Sun, 11 Jun 2017 00:33:38 +0000
```

```
End at: Sun, 11 Jun 2017 00:34:08 +0000
```

```
Local clock offset: 5.605 ms
```

```
Remote clock offset: -1.758 ms
```

```
# Below is generated by plot.py at Sun, 11 Jun 2017 01:19:58 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 16.47 Mbit/s
```

```
95th percentile per-packet one-way delay: 26.219 ms
```

```
Loss rate: 0.00%
```

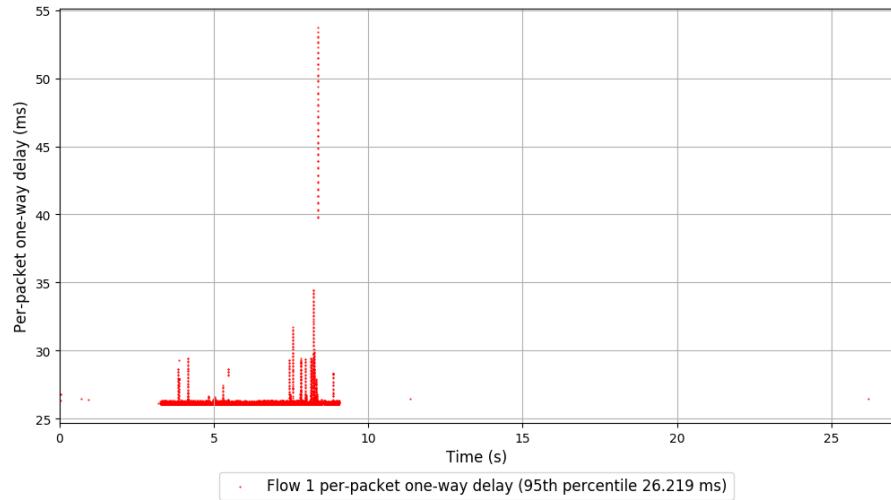
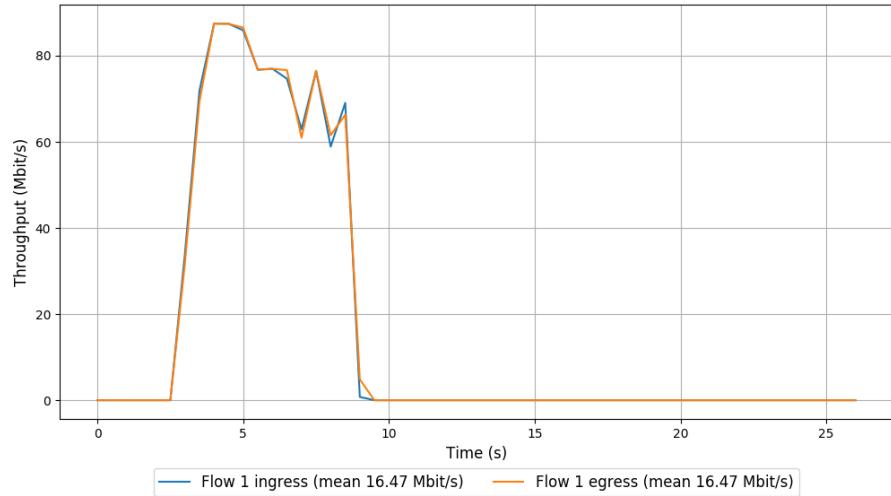
```
-- Flow 1:
```

```
Average throughput: 16.47 Mbit/s
```

```
95th percentile per-packet one-way delay: 26.219 ms
```

```
Loss rate: 0.00%
```

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



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

```
Start at: Sun, 11 Jun 2017 00:37:33 +0000
```

```
End at: Sun, 11 Jun 2017 00:38:03 +0000
```

```
Local clock offset: 5.798 ms
```

```
Remote clock offset: -1.619 ms
```

```
# Below is generated by plot.py at Sun, 11 Jun 2017 01:19:58 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 108.36 Mbit/s
```

```
95th percentile per-packet one-way delay: 26.628 ms
```

```
Loss rate: 0.03%
```

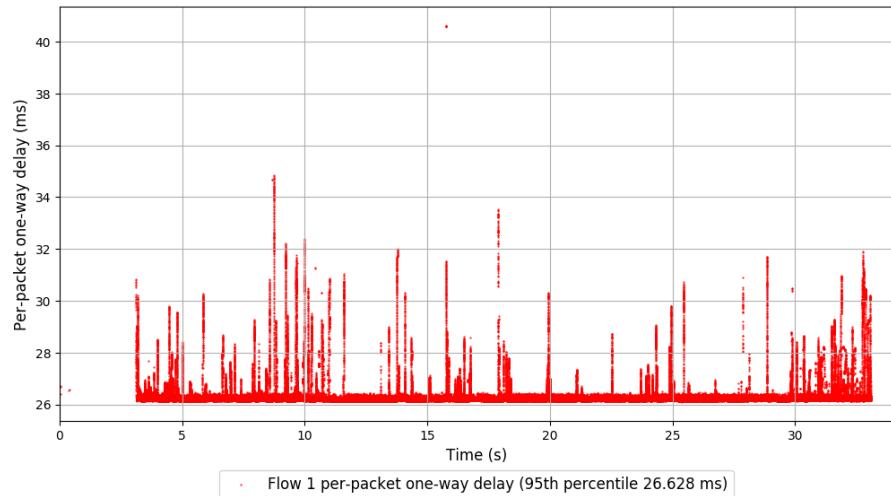
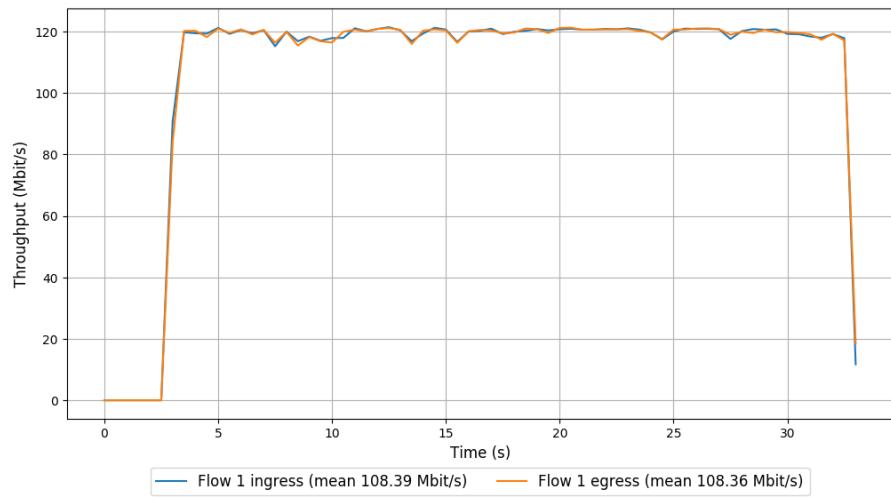
```
-- Flow 1:
```

```
Average throughput: 108.36 Mbit/s
```

```
95th percentile per-packet one-way delay: 26.628 ms
```

```
Loss rate: 0.03%
```

Run 1: Report of Saturator — Data Link

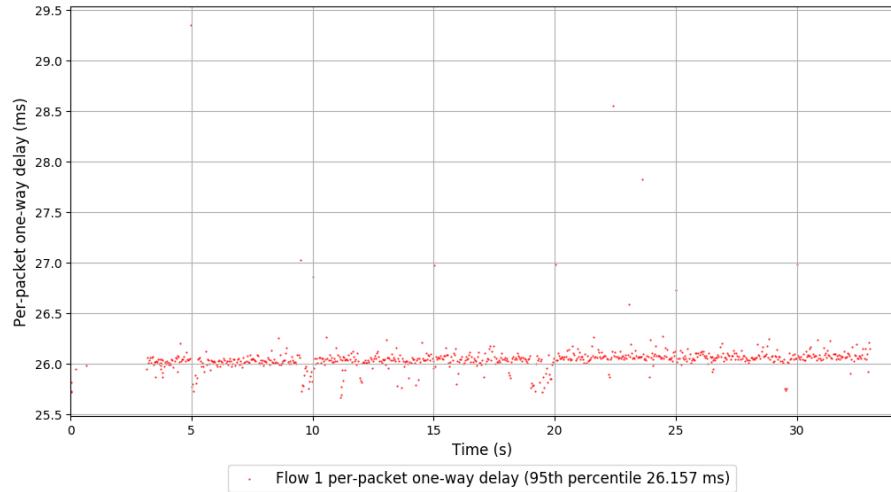
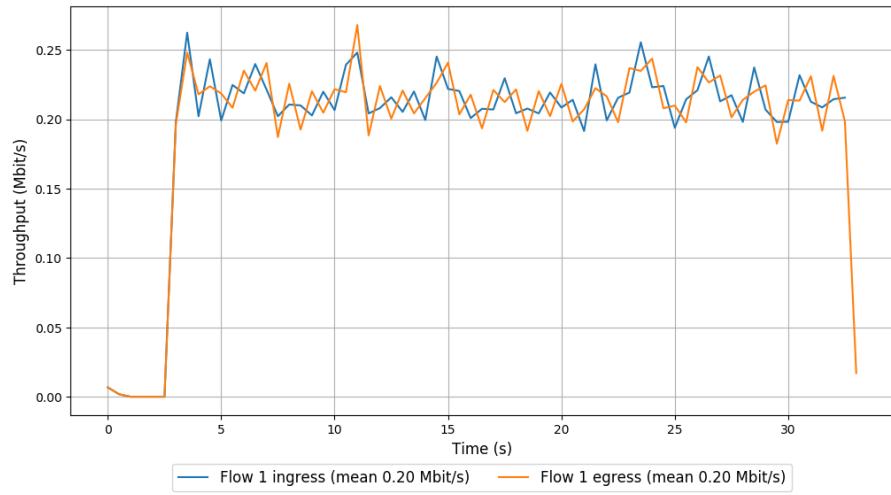


```
Run 1: Statistics of SCReAM
```

```
Start at: Sun, 11 Jun 2017 00:26:42 +0000
End at: Sun, 11 Jun 2017 00:27:12 +0000
Local clock offset: 4.856 ms
Remote clock offset: -1.976 ms

# Below is generated by plot.py at Sun, 11 Jun 2017 01:19:58 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 26.157 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 26.157 ms
Loss rate: 0.00%
```

Run 1: Report of SCReAM — Data Link

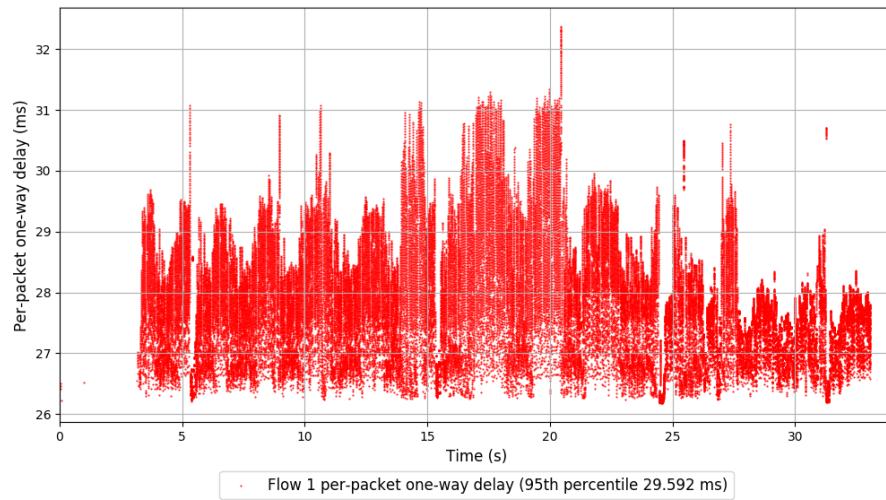
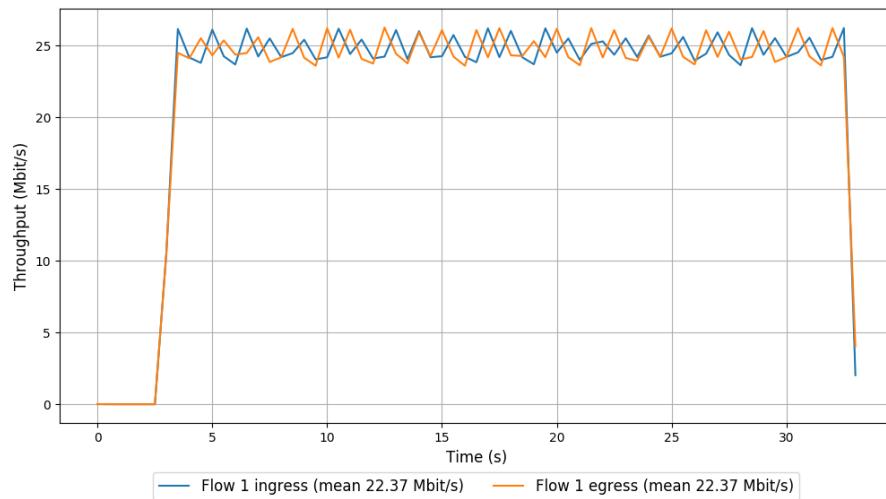


Run 1: Statistics of Sprout

```
Start at: Sun, 11 Jun 2017 00:38:56 +0000
End at: Sun, 11 Jun 2017 00:39:26 +0000
Local clock offset: 5.83 ms
Remote clock offset: -1.691 ms

# Below is generated by plot.py at Sun, 11 Jun 2017 01:19:58 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 22.37 Mbit/s
95th percentile per-packet one-way delay: 29.592 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 22.37 Mbit/s
95th percentile per-packet one-way delay: 29.592 ms
Loss rate: 0.00%
```

Run 1: Report of Sprout — Data Link



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

```
Start at: Sun, 11 Jun 2017 00:25:03 +0000
```

```
End at: Sun, 11 Jun 2017 00:25:33 +0000
```

```
Local clock offset: 4.67 ms
```

```
Remote clock offset: -2.009 ms
```

```
# Below is generated by plot.py at Sun, 11 Jun 2017 01:19:58 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 225.22 Mbit/s
```

```
95th percentile per-packet one-way delay: 25.688 ms
```

```
Loss rate: 0.04%
```

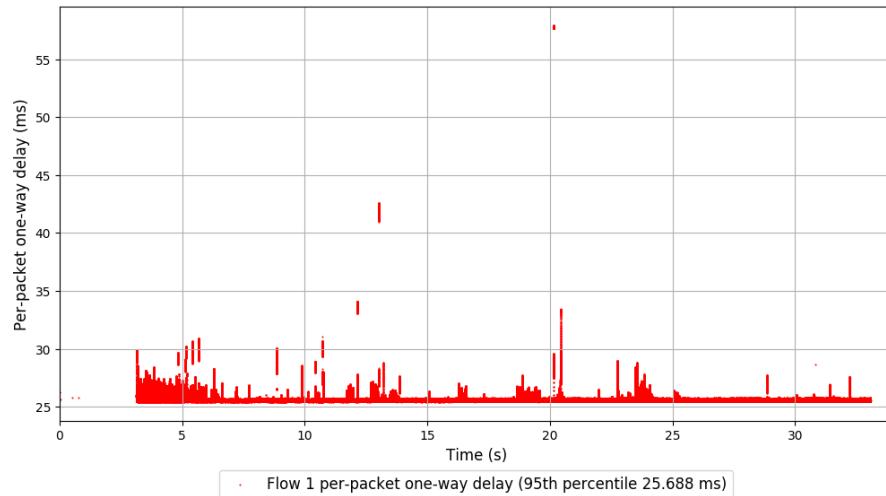
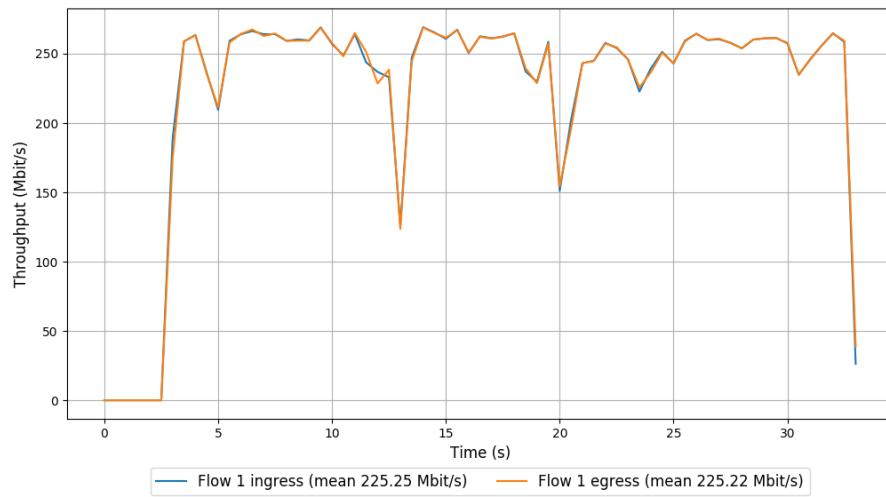
```
-- Flow 1:
```

```
Average throughput: 225.22 Mbit/s
```

```
95th percentile per-packet one-way delay: 25.688 ms
```

```
Loss rate: 0.04%
```

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

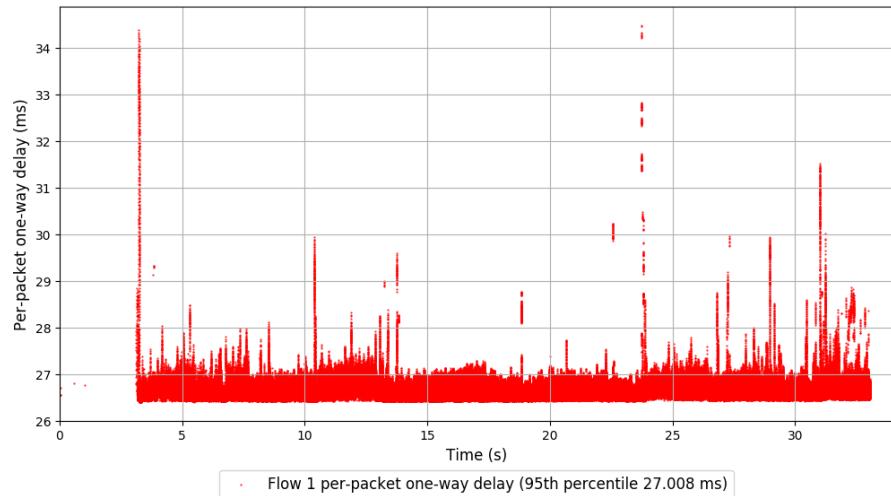
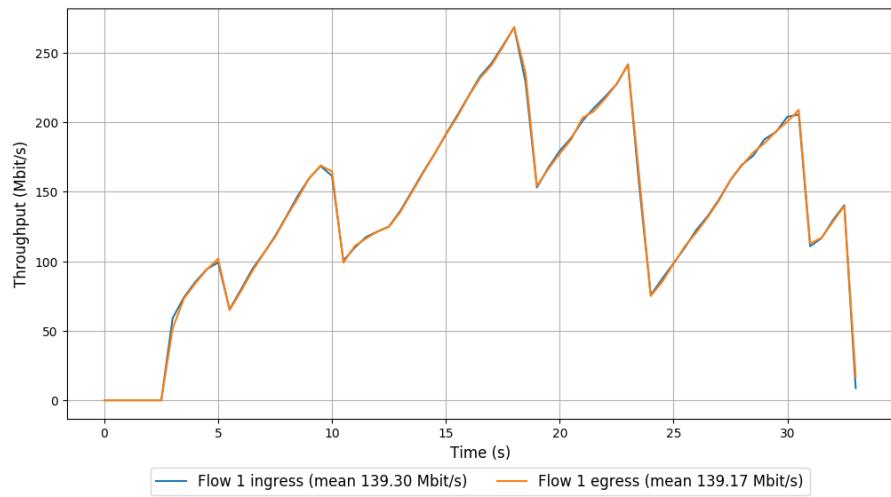


Run 1: Statistics of TCP Vegas

```
Start at: Sun, 11 Jun 2017 00:43:33 +0000
End at: Sun, 11 Jun 2017 00:44:03 +0000
Local clock offset: 5.979 ms
Remote clock offset: -1.68 ms

# Below is generated by plot.py at Sun, 11 Jun 2017 01:20:11 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 139.17 Mbit/s
95th percentile per-packet one-way delay: 27.008 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 139.17 Mbit/s
95th percentile per-packet one-way delay: 27.008 ms
Loss rate: 0.09%
```

Run 1: Report of TCP Vegas — Data Link

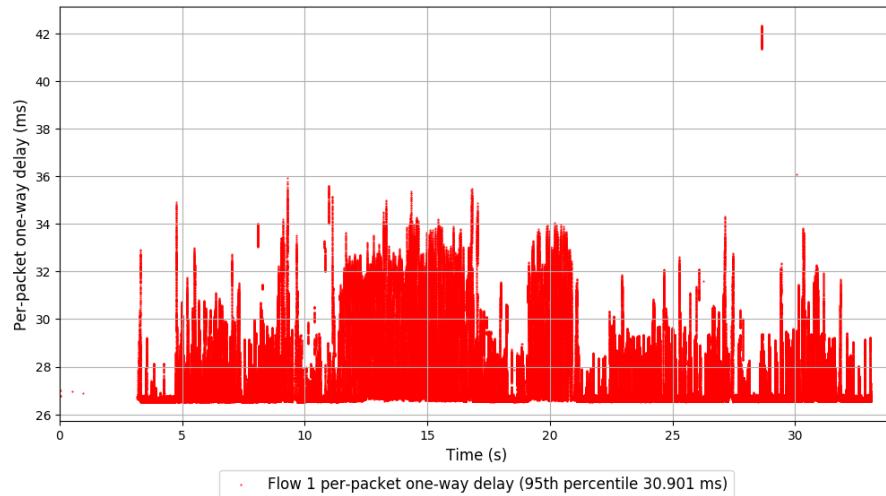
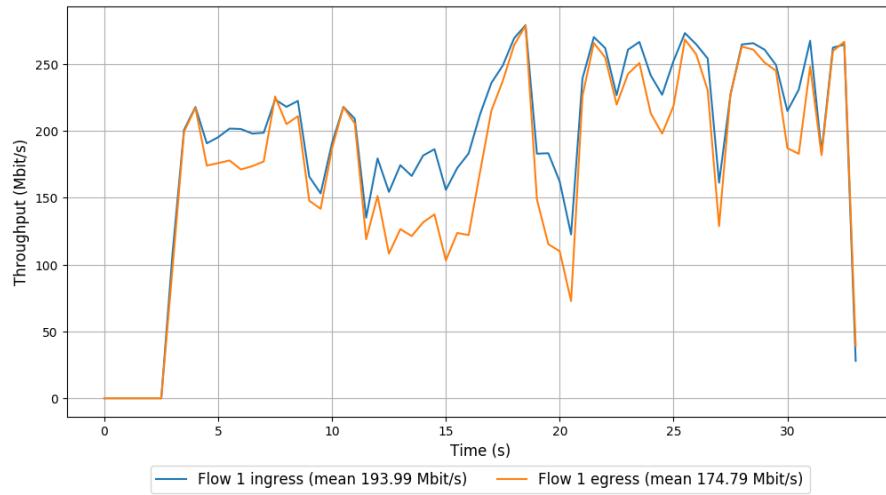


```
Run 1: Statistics of Verus
```

```
Start at: Sun, 11 Jun 2017 00:44:55 +0000
End at: Sun, 11 Jun 2017 00:45:25 +0000
Local clock offset: 6.048 ms
Remote clock offset: -1.803 ms

# Below is generated by plot.py at Sun, 11 Jun 2017 01:20:18 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 174.79 Mbit/s
95th percentile per-packet one-way delay: 30.901 ms
Loss rate: 9.90%
-- Flow 1:
Average throughput: 174.79 Mbit/s
95th percentile per-packet one-way delay: 30.901 ms
Loss rate: 9.90%
```

Run 1: Report of Verus — Data Link



```
Run 1: Statistics of WebRTC media

Start at: Sun, 11 Jun 2017 00:32:23 +0000
End at: Sun, 11 Jun 2017 00:32:53 +0000
Local clock offset: 5.628 ms
Remote clock offset: -1.78 ms

# Below is generated by plot.py at Sun, 11 Jun 2017 01:20:18 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 26.677 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 26.677 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link

