

**Pantheon Summary** (Generated at Tue, 11 Jul 2017 04:45:07 +0000 with  
pantheon version c3610718e2bbac84102e8ac47b889a75d4392d79)

Repeated the test of 15 congestion control schemes once.

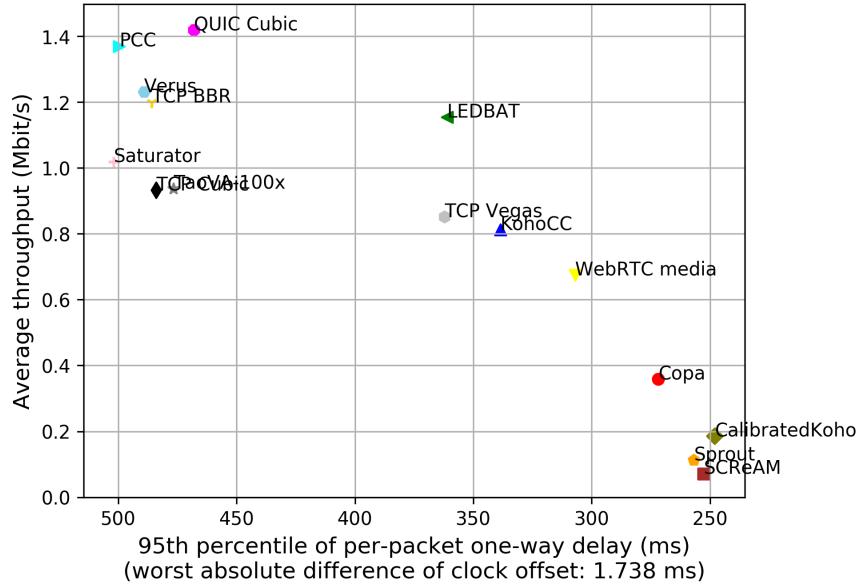
Each test lasted for 30 seconds running 1 flow.

Data path **from** China ppp0 **to** AWS Korea Ethernet.

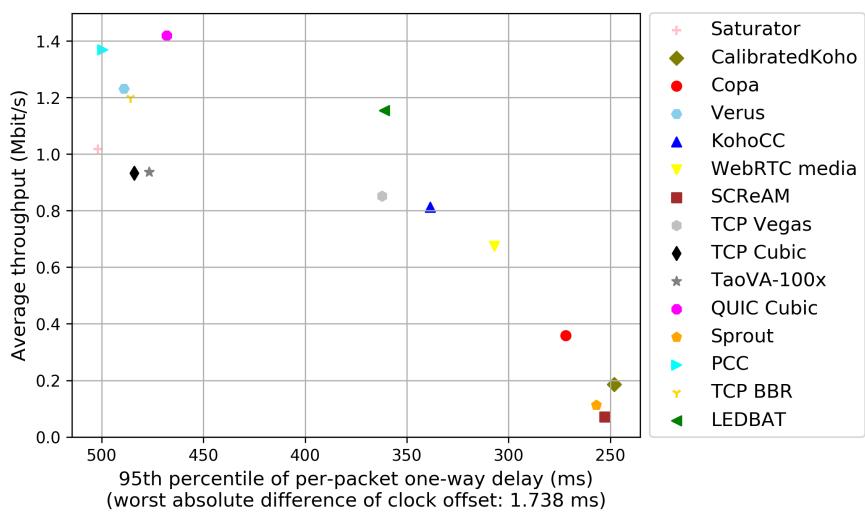
NTP offset measured against ntp.nict.jp.

```
git branch: master @ c3610718e2bbac84102e8ac47b889a75d4392d79
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 China ppp0 to AWS Korea Ethernet, 1 run of 30s each per scheme  
(mean of all runs by scheme)



test from China ppp0 to AWS Korea Ethernet, 1 run of 30s each per scheme



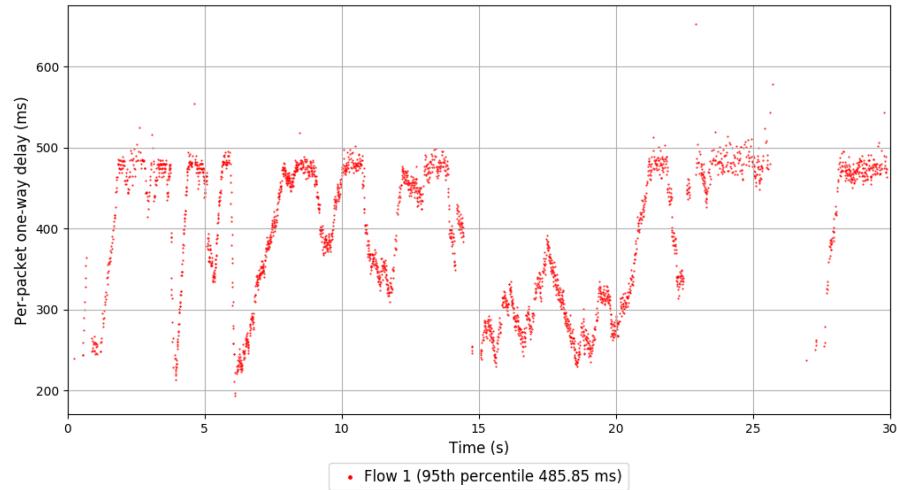
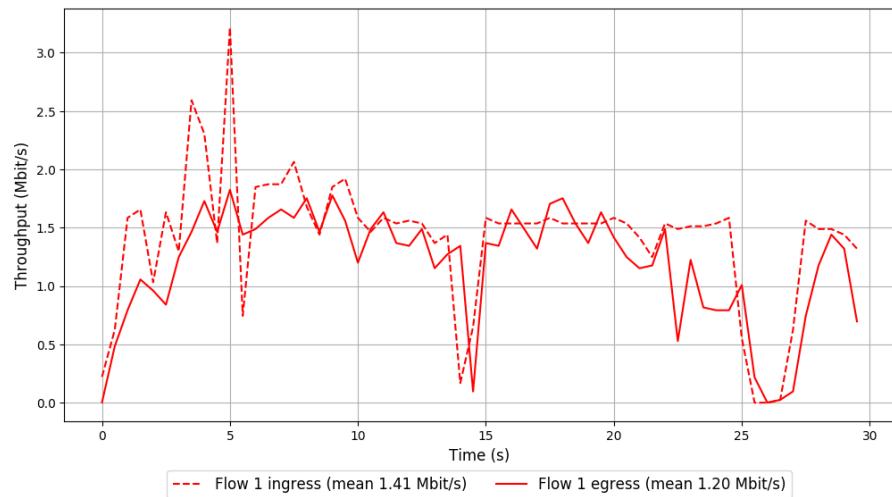
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	1	1.20	485.85	16.00
CalibratedKoho	1	0.19	248.03	1.71
Copa	1	0.36	271.86	0.61
TCP Cubic	1	0.93	484.02	7.20
KohoCC	1	0.81	338.62	1.76
LEDBAT	1	1.15	361.17	1.52
PCC	1	1.37	499.51	83.31
QUIC Cubic	1	1.42	468.00	3.81
Saturator	1	1.02	501.91	49.80
SCReAM	1	0.07	252.83	0.91
Sprout	1	0.11	256.88	1.03
TaoVA-100x	1	0.94	476.66	18.16
TCP Vegas	1	0.85	362.28	2.23
Verus	1	1.23	489.09	34.12
WebRTC media	1	0.68	306.98	1.73

Run 1: Statistics of TCP BBR

```
Start at: Tue, 11 Jul 2017 04:35:48 +0000
End at: Tue, 11 Jul 2017 04:36:19 +0000
Local clock offset: 1.302 ms
Remote clock offset: -0.113 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:44:58 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 485.851 ms
Loss rate: 16.00%
-- Flow 1:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 485.851 ms
Loss rate: 16.00%
```

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

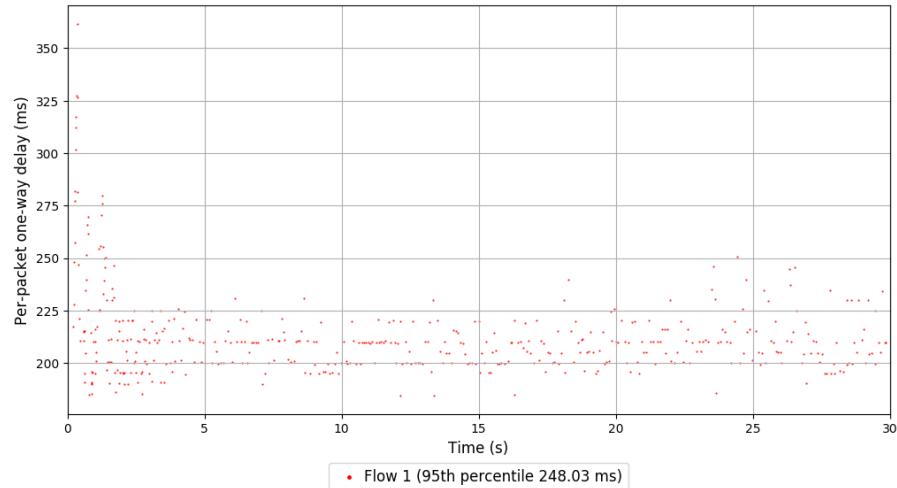
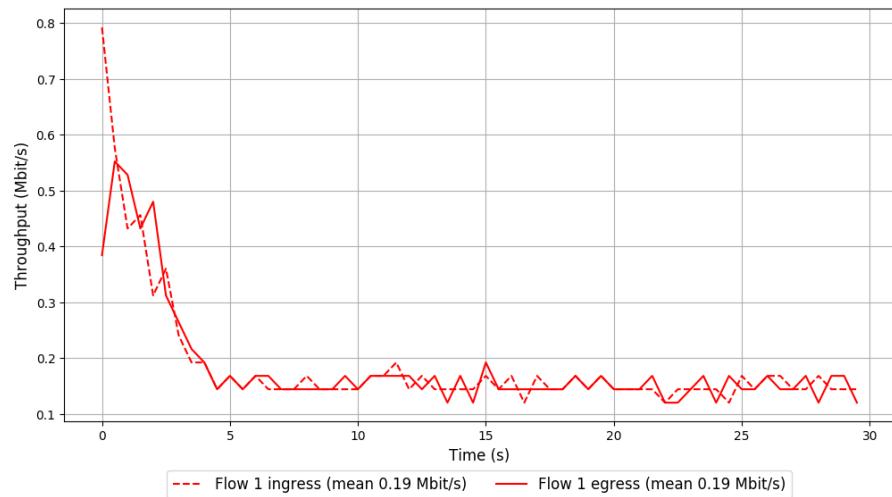


```
Run 1: Statistics of CalibratedKoho

Start at: Tue, 11 Jul 2017 04:28:46 +0000
End at: Tue, 11 Jul 2017 04:29:16 +0000
Local clock offset: 0.272 ms
Remote clock offset: -0.183 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:44:58 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 248.029 ms
Loss rate: 1.71%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 248.029 ms
Loss rate: 1.71%
```

## Run 1: Report of CalibratedKoho — Data Link

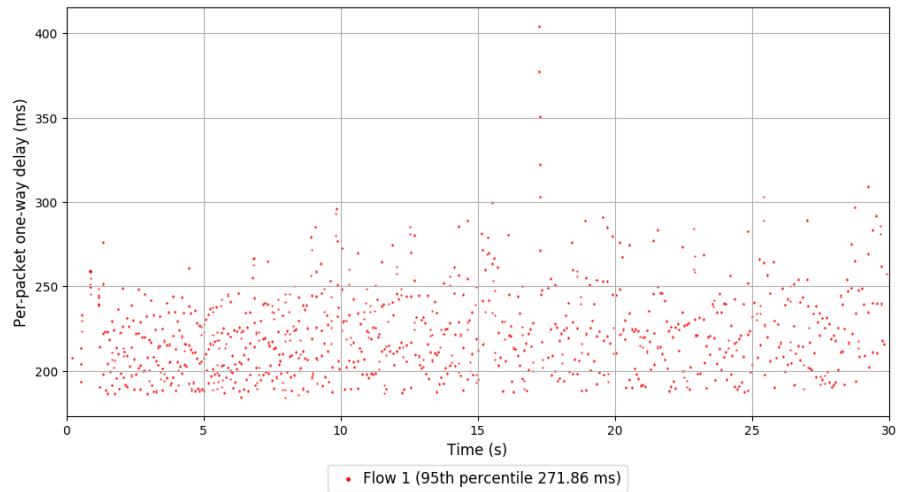
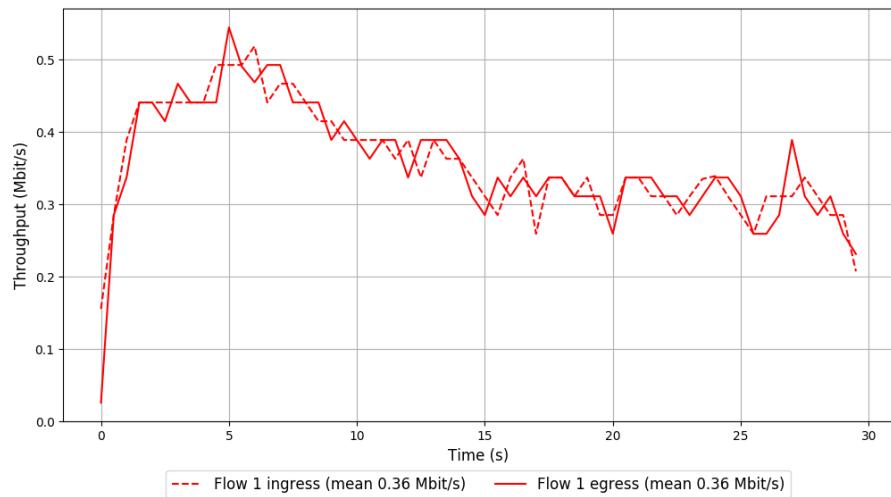


Run 1: Statistics of Copa

```
Start at: Tue, 11 Jul 2017 04:41:41 +0000
End at: Tue, 11 Jul 2017 04:42:11 +0000
Local clock offset: 1.668 ms
Remote clock offset: 0.002 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:44:58 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 271.860 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 271.860 ms
Loss rate: 0.61%
```

## Run 1: Report of Copa — Data Link

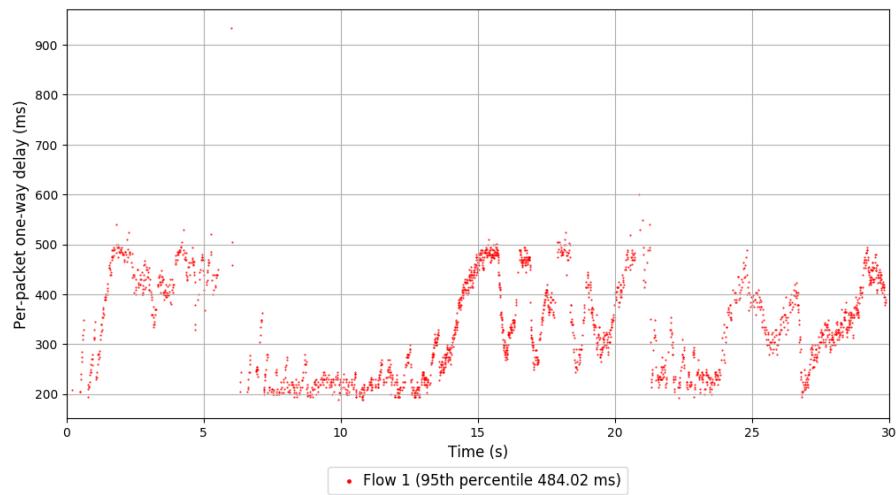
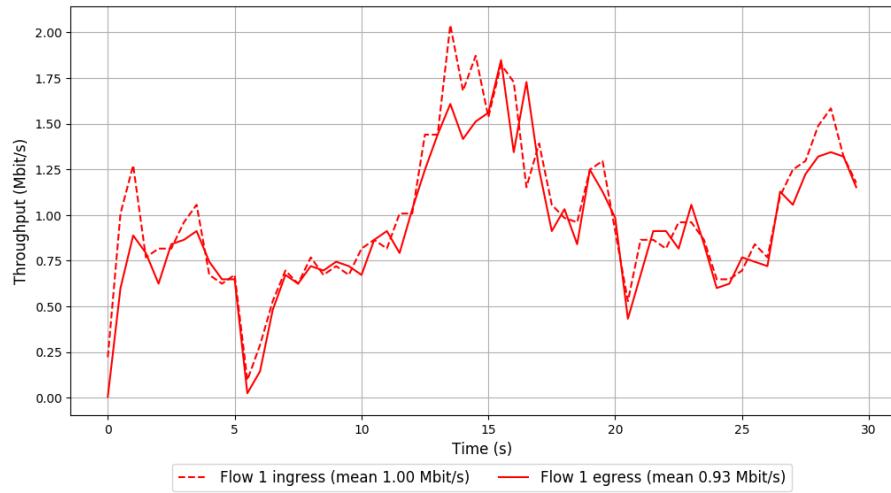


Run 1: Statistics of TCP Cubic

```
Start at: Tue, 11 Jul 2017 04:40:30 +0000
End at: Tue, 11 Jul 2017 04:41:00 +0000
Local clock offset: 0.262 ms
Remote clock offset: -0.063 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:00 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 484.022 ms
Loss rate: 7.20%
-- Flow 1:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 484.022 ms
Loss rate: 7.20%
```

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



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

```
Start at: Tue, 11 Jul 2017 04:36:59 +0000
```

```
End at: Tue, 11 Jul 2017 04:37:29 +0000
```

```
Local clock offset: 0.232 ms
```

```
Remote clock offset: -0.048 ms
```

```
# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:00 +0000
```

```
# Datalink statistics
```

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

```
Average throughput: 0.81 Mbit/s
```

```
95th percentile per-packet one-way delay: 338.625 ms
```

```
Loss rate: 1.76%
```

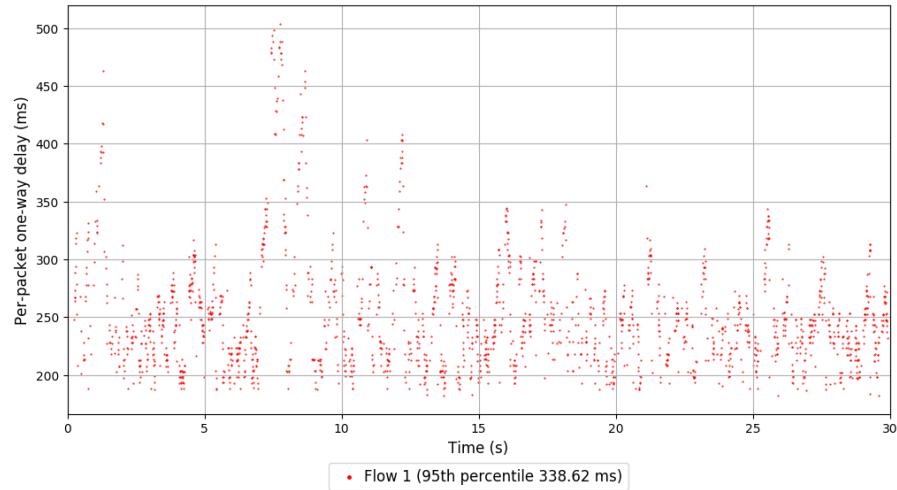
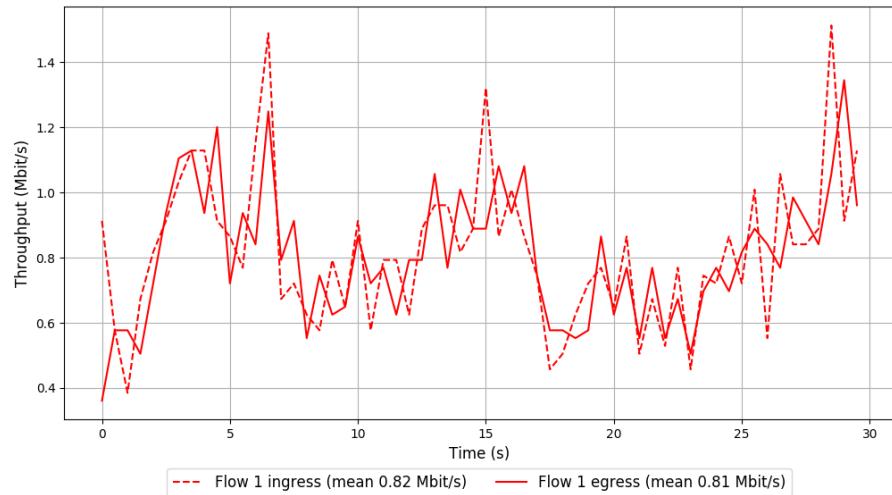
```
-- Flow 1:
```

```
Average throughput: 0.81 Mbit/s
```

```
95th percentile per-packet one-way delay: 338.625 ms
```

```
Loss rate: 1.76%
```

## Run 1: Report of KohoCC — Data Link

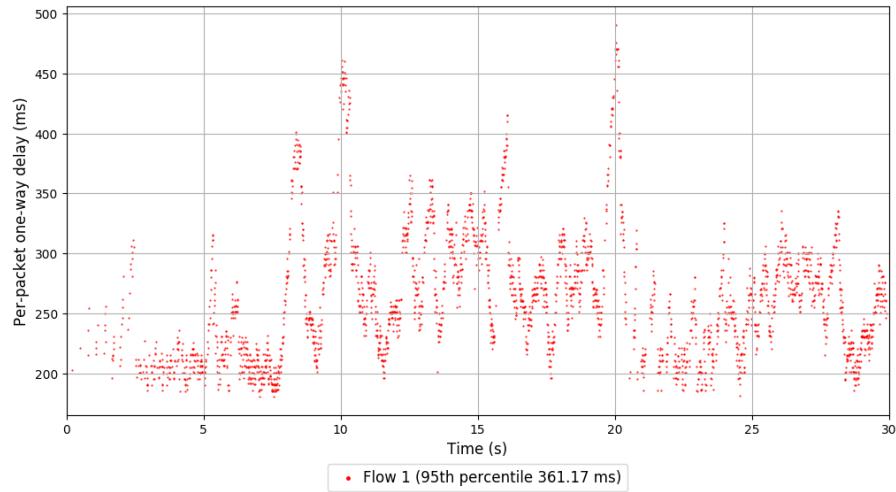
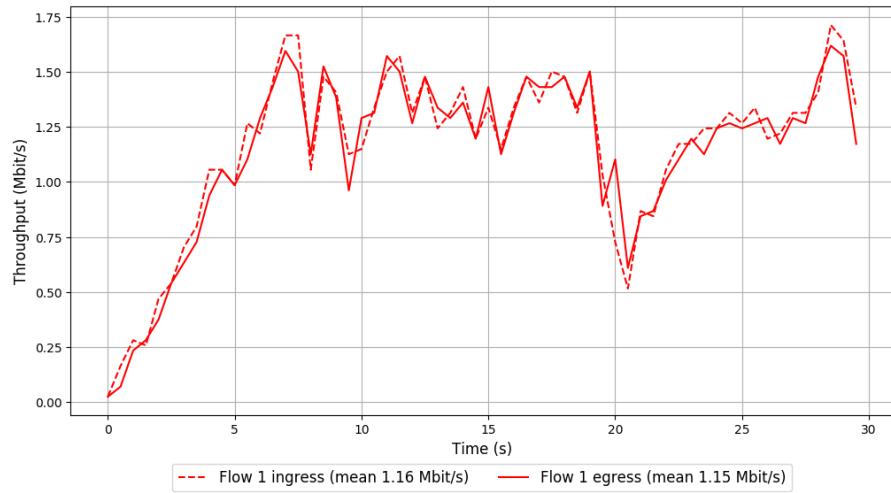


```
Run 1: Statistics of LEDBAT
```

```
Start at: Tue, 11 Jul 2017 04:39:20 +0000
End at: Tue, 11 Jul 2017 04:39:50 +0000
Local clock offset: 1.139 ms
Remote clock offset: 0.009 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:00 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 361.167 ms
Loss rate: 1.52%
-- Flow 1:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 361.167 ms
Loss rate: 1.52%
```

## Run 1: Report of LEDBAT — Data Link

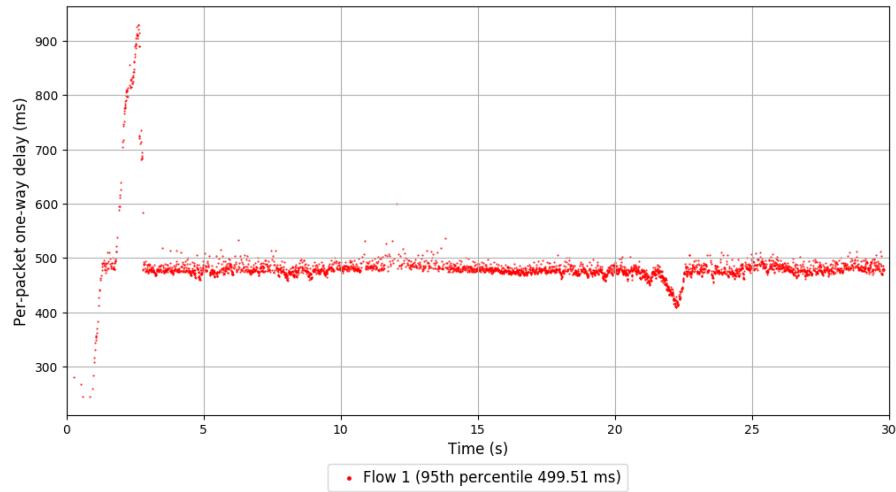
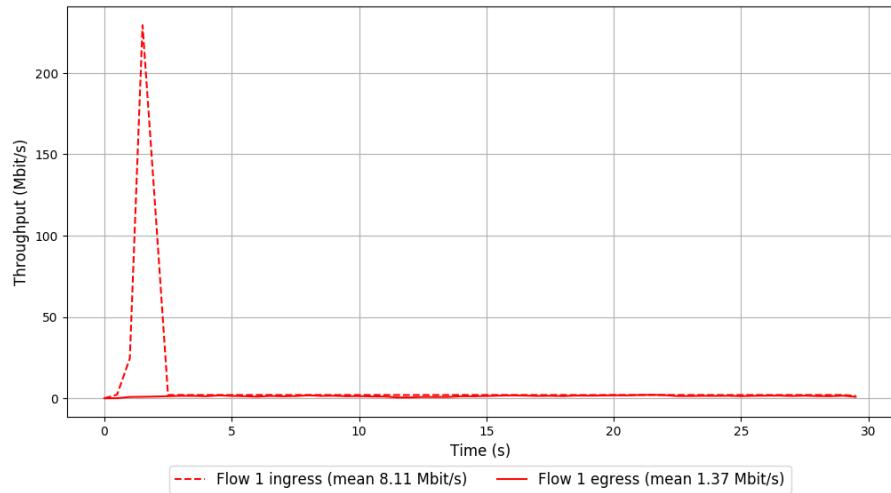


```
Run 1: Statistics of PCC
```

```
Start at: Tue, 11 Jul 2017 04:29:56 +0000
End at: Tue, 11 Jul 2017 04:30:26 +0000
Local clock offset: 1.351 ms
Remote clock offset: -0.173 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:01 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 499.509 ms
Loss rate: 83.31%
-- Flow 1:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 499.509 ms
Loss rate: 83.31%
```

### Run 1: Report of PCC — Data Link

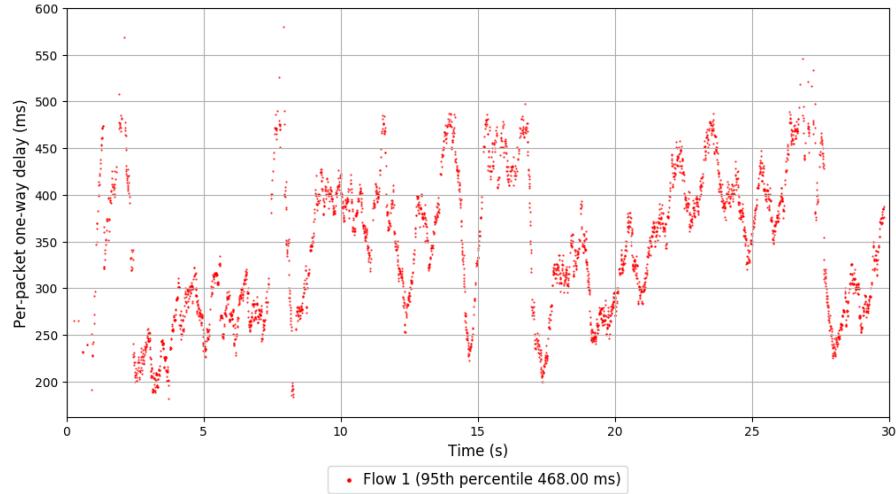
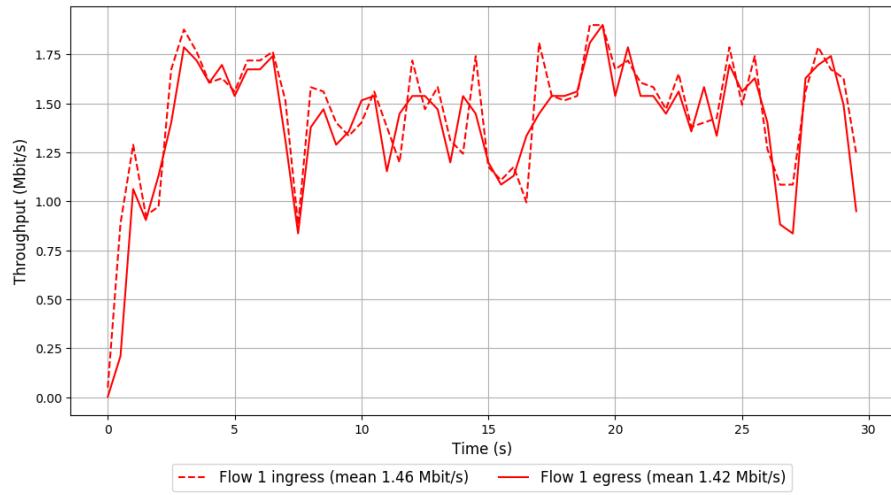


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: Tue, 11 Jul 2017 04:34:38 +0000
End at: Tue, 11 Jul 2017 04:35:08 +0000
Local clock offset: 0.818 ms
Remote clock offset: -0.116 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:02 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 468.001 ms
Loss rate: 3.81%
-- Flow 1:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 468.001 ms
Loss rate: 3.81%
```

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

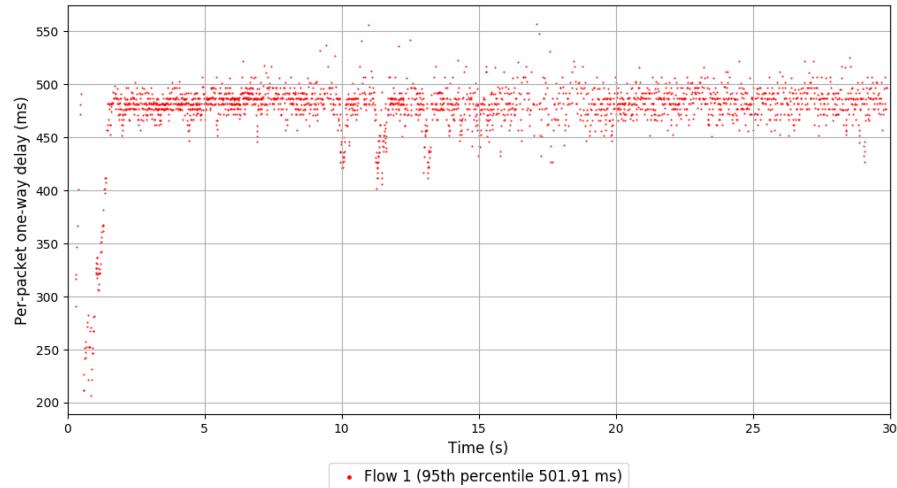
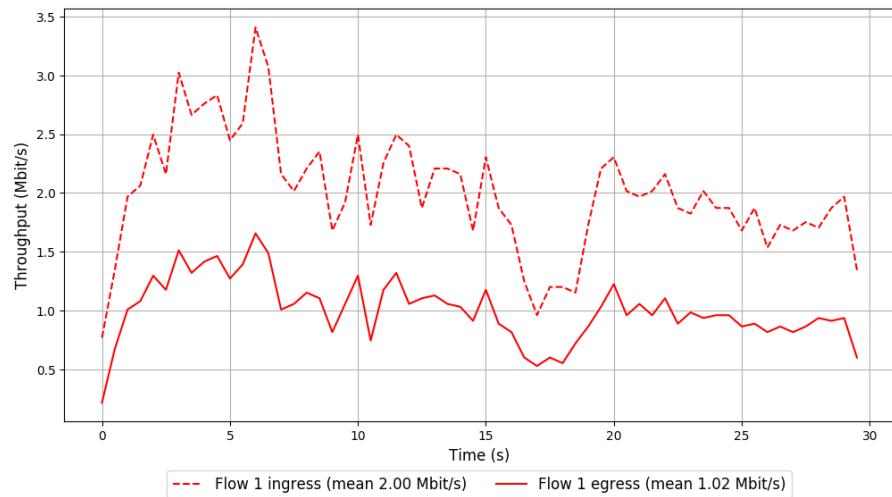


Run 1: Statistics of Saturator

```
Start at: Tue, 11 Jul 2017 04:38:10 +0000
End at: Tue, 11 Jul 2017 04:38:40 +0000
Local clock offset: 0.22 ms
Remote clock offset: -0.008 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:03 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 501.911 ms
Loss rate: 49.80%
-- Flow 1:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 501.911 ms
Loss rate: 49.80%
```

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

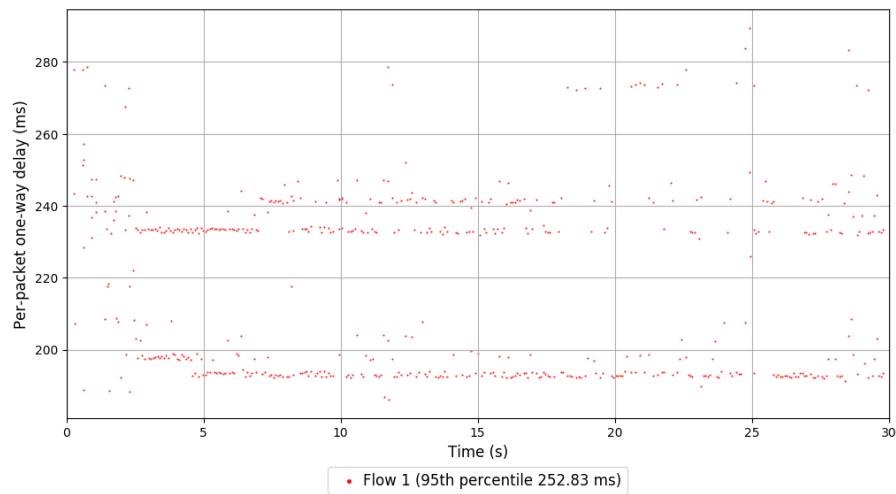
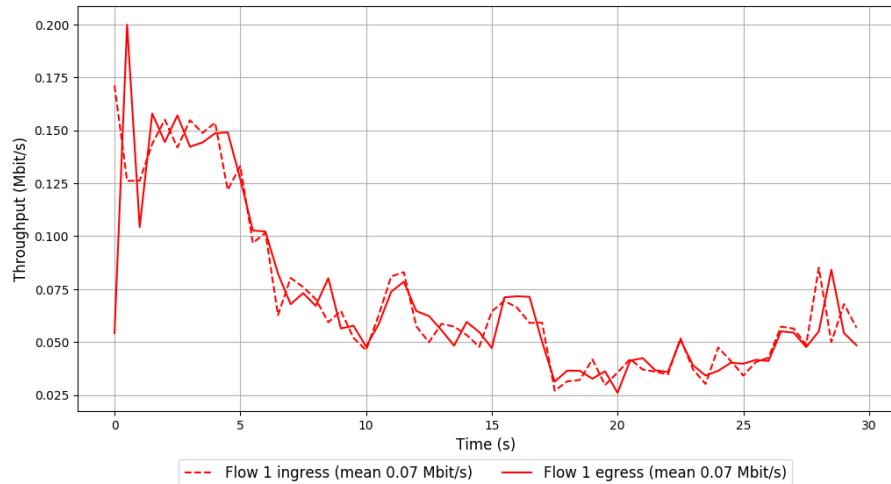


```
Run 1: Statistics of SCReAM
```

```
Start at: Tue, 11 Jul 2017 04:27:36 +0000
End at: Tue, 11 Jul 2017 04:28:06 +0000
Local clock offset: -0.55 ms
Remote clock offset: -0.137 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:03 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 252.826 ms
Loss rate: 0.91%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 252.826 ms
Loss rate: 0.91%
```

## Run 1: Report of SCReAM — Data Link

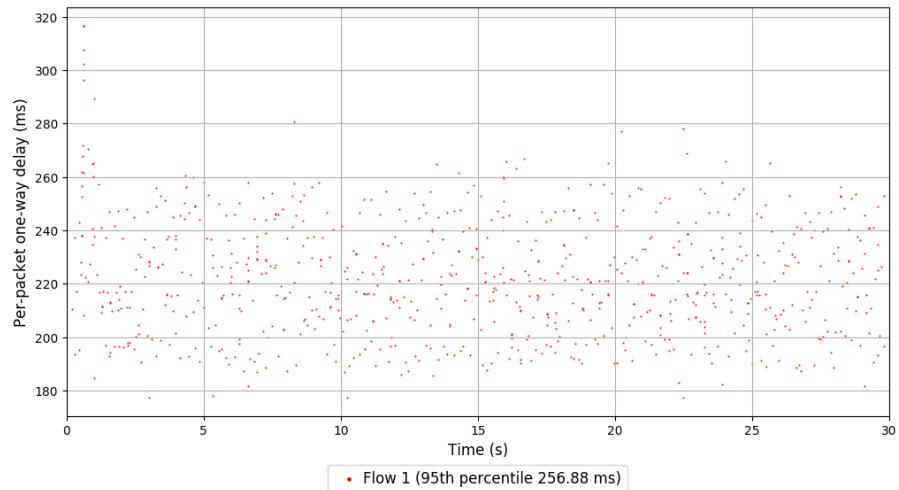
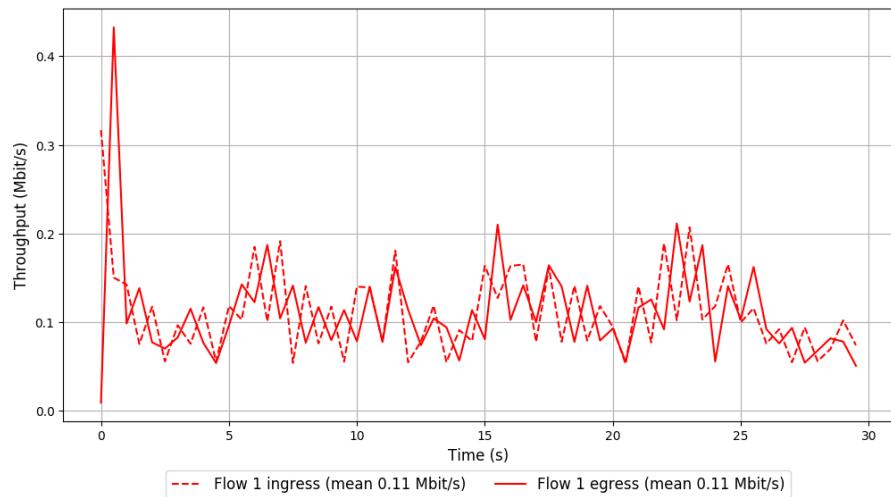


Run 1: Statistics of Sprout

```
Start at: Tue, 11 Jul 2017 04:32:18 +0000
End at: Tue, 11 Jul 2017 04:32:48 +0000
Local clock offset: -0.357 ms
Remote clock offset: -0.137 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:03 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 256.876 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 256.876 ms
Loss rate: 1.03%
```

## Run 1: Report of Sprout — Data Link

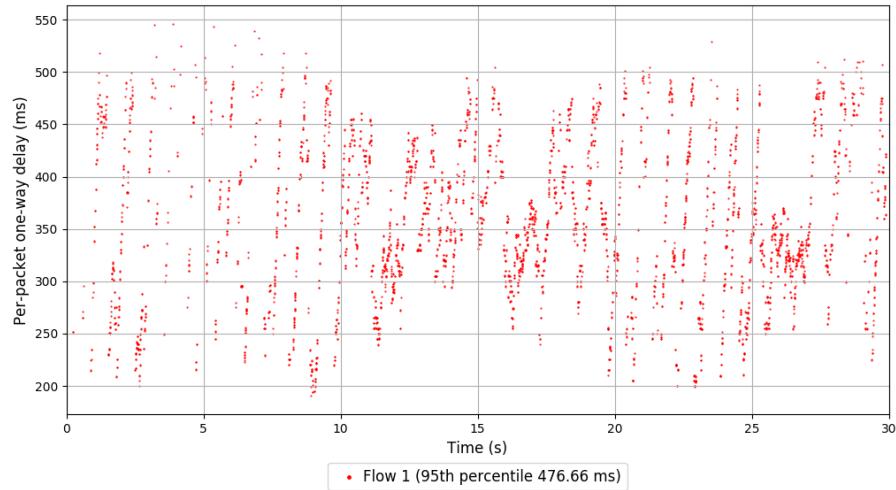
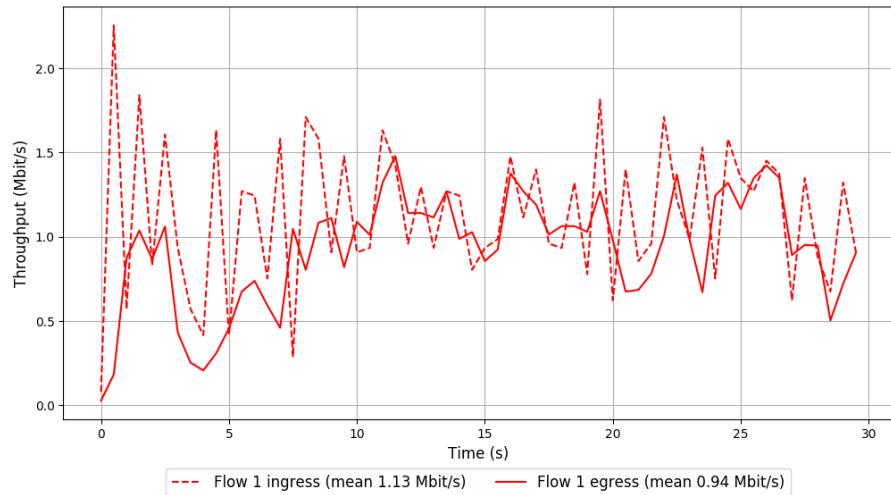


Run 1: Statistics of TaoVA-100x

```
Start at: Tue, 11 Jul 2017 04:42:51 +0000
End at: Tue, 11 Jul 2017 04:43:21 +0000
Local clock offset: 1.67 ms
Remote clock offset: -0.068 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:04 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 476.660 ms
Loss rate: 18.16%
-- Flow 1:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 476.660 ms
Loss rate: 18.16%
```

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

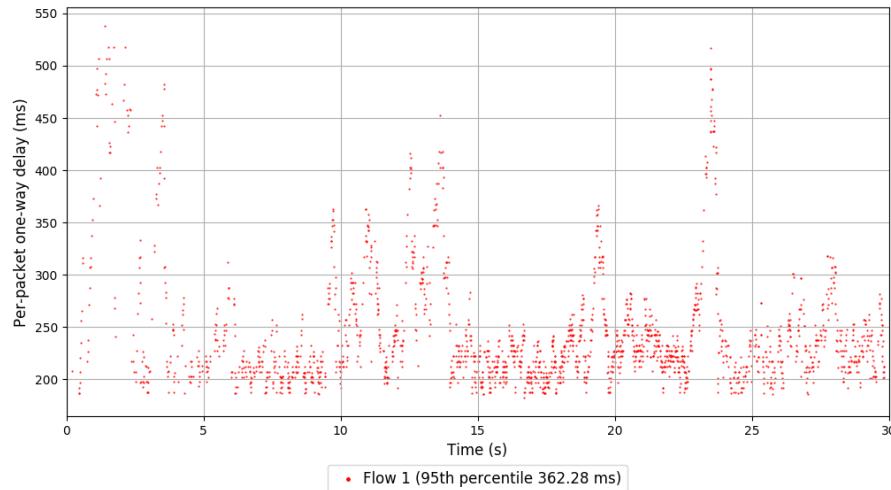
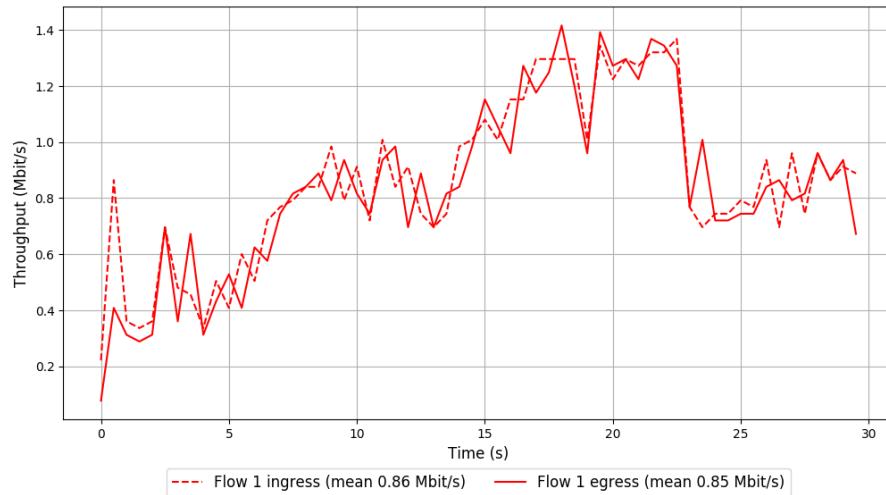


Run 1: Statistics of TCP Vegas

```
Start at: Tue, 11 Jul 2017 04:44:01 +0000
End at: Tue, 11 Jul 2017 04:44:31 +0000
Local clock offset: 0.08 ms
Remote clock offset: -0.102 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:05 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 362.278 ms
Loss rate: 2.23%
-- Flow 1:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 362.278 ms
Loss rate: 2.23%
```

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

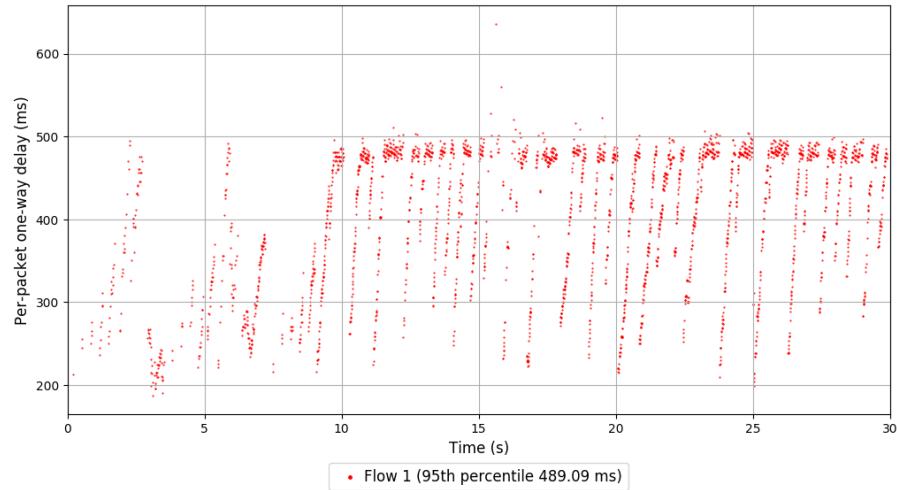
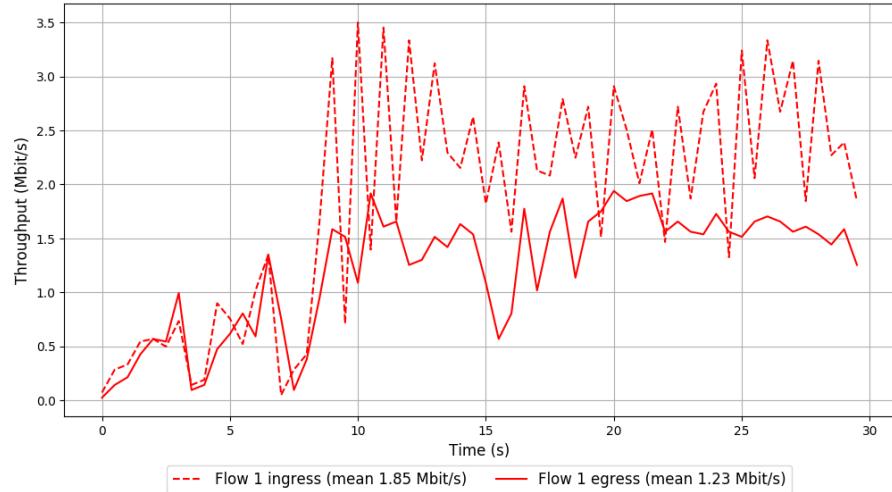


```
Run 1: Statistics of Verus
```

```
Start at: Tue, 11 Jul 2017 04:31:07 +0000
End at: Tue, 11 Jul 2017 04:31:37 +0000
Local clock offset: 0.237 ms
Remote clock offset: -0.193 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:05 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 489.091 ms
Loss rate: 34.12%
-- Flow 1:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 489.091 ms
Loss rate: 34.12%
```

## Run 1: Report of Verus — Data Link



```
Run 1: Statistics of WebRTC media

Start at: Tue, 11 Jul 2017 04:33:28 +0000
End at: Tue, 11 Jul 2017 04:33:58 +0000
Local clock offset: 1.338 ms
Remote clock offset: -0.137 ms

# Below is generated by plot.py at Tue, 11 Jul 2017 04:45:06 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 306.983 ms
Loss rate: 1.73%
-- Flow 1:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 306.983 ms
Loss rate: 1.73%
```

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

