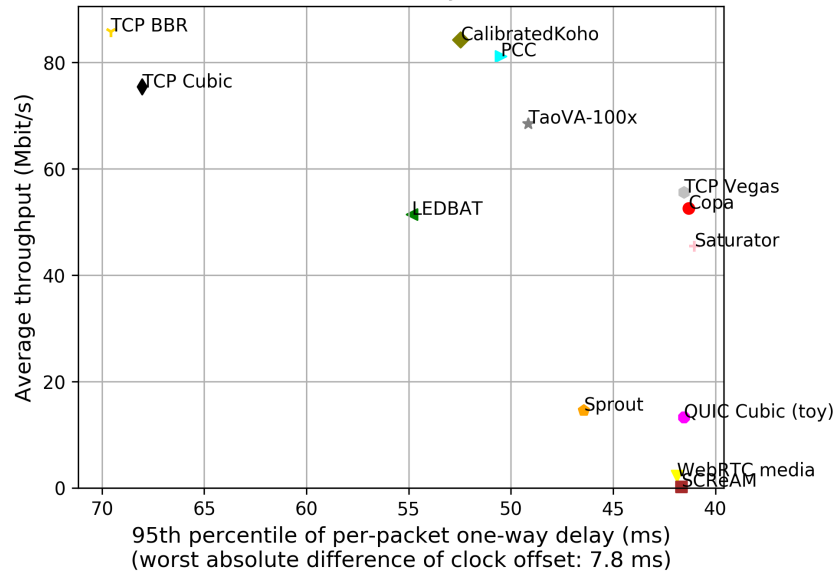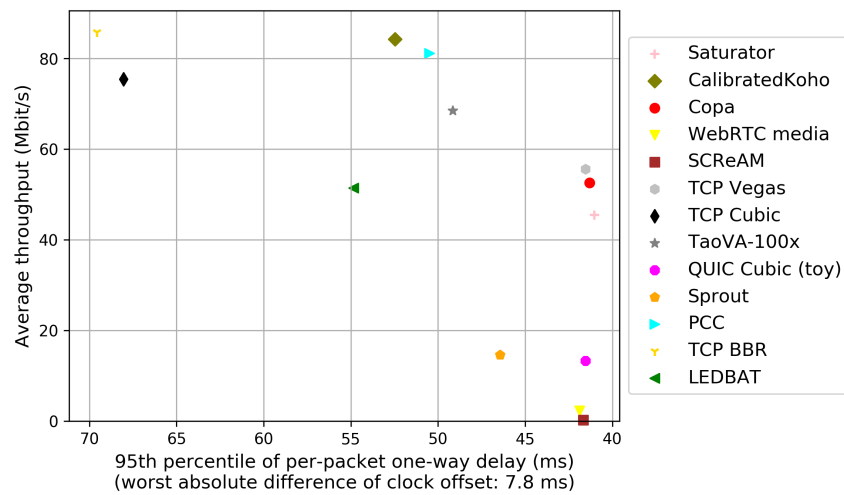**Pantheon Summary** (Generated at Sun, 11 Jun 2017 02:54:28 +0000 with pantheon version `e44e21ab50520045378f626dc5b5e21d0473d7b8`)

Repeated the test of 15 congestion control schemes once.

Each test lasted for 30 seconds running 1 flow.

Data path **from** AWS India 1 Ethernet **to** India Ethernet.

NTP offset measured against nets.org.sg.

```
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 @ 6f2efe6e088d91066a9f023df375eee2665089ce
 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
```
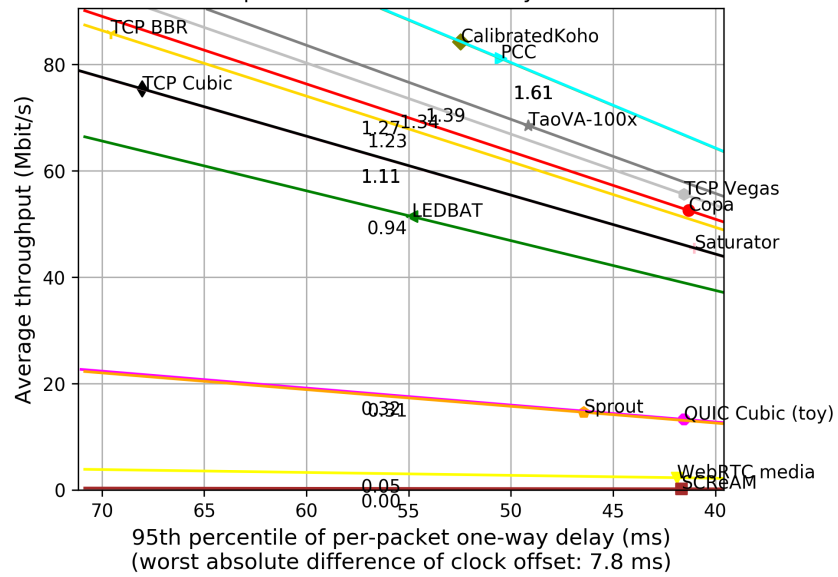
test from AWS India 1 Ethernet to India Ethernet, run 1 of 30s each per scheme
mean of all runs by scheme

TCP BBR

CalibratedKoho

PCC

TCP Cubic

TaoVA-100x

TCP Vegas
Copa

Saturator

LEDBAT

Sprout

QUIC Cubic (toy)

WebRTC media
SCReAM

Average throughput (Mbit/s)

95th percentile of per-packet one-way delay (ms)
(worst absolute difference of clock offset: 7.8 ms)

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

Average throughput (Mbit/s)

95th percentile of per-packet one-way delay (ms)
(worst absolute difference of clock offset: 7.8 ms)

Legend:
- Saturator
- CalibratedKoho
- Copa
- WebRTC media
- SCReAM
- TCP Vegas
- TCP Cubic
- TaoVA-100x
- QUIC Cubic (toy)
- Sprout
- PCC
- TCP BBR
- LEDBAT

test from AWS India 1 Ethernet to India 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 02:21:28 +0000
End at: Sun, 11 Jun 2017 02:21:58 +0000
Local clock offset: 1.867 ms
Remote clock offset: -3.927 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:53:50 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 85.85 Mbit/s
95th percentile per-packet one-way delay: 69.576 ms
Loss rate: 1.50%
-- Flow 1:
Average throughput: 85.85 Mbit/s
95th percentile per-packet one-way delay: 69.576 ms
Loss rate: 1.50%
```
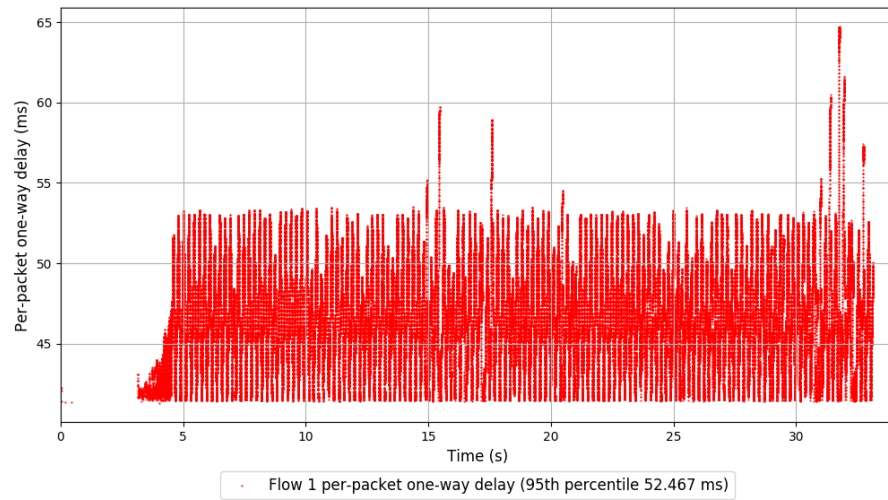
Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 87.15 Mbit/s) — Flow 1 egress (mean 85.85 Mbit/s)

· Flow 1 per-packet one-way delay (95th percentile 69.576 ms)

5

```
Run 1: Statistics of CalibratedKoho

Start at: Sun, 11 Jun 2017 02:16:34 +0000
End at: Sun, 11 Jun 2017 02:17:04 +0000
Local clock offset: 3.723 ms
Remote clock offset: -2.916 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:53:50 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 84.27 Mbit/s
95th percentile per-packet one-way delay: 52.467 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 84.27 Mbit/s
95th percentile per-packet one-way delay: 52.467 ms
Loss rate: 0.01%
```
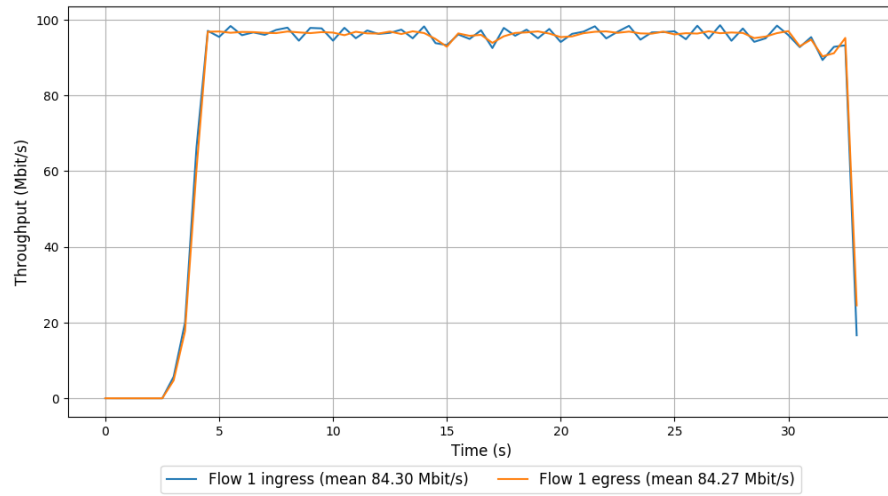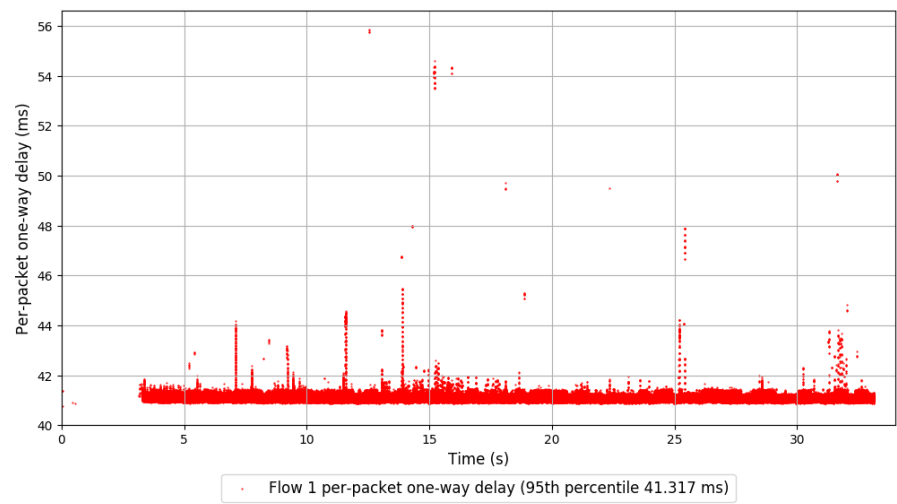
Run 1: Report of CalibratedKoho — Data Link

Flow 1 ingress (mean 84.30 Mbit/s) — Flow 1 egress (mean 84.27 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 52.467 ms)

```
Run 1: Statistics of Copa

Start at: Sun, 11 Jun 2017 02:17:51 +0000
End at: Sun, 11 Jun 2017 02:18:21 +0000
Local clock offset: 3.329 ms
Remote clock offset: -3.607 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:00 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 52.56 Mbit/s
95th percentile per-packet one-way delay: 41.317 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 52.56 Mbit/s
95th percentile per-packet one-way delay: 41.317 ms
Loss rate: 0.00%
```
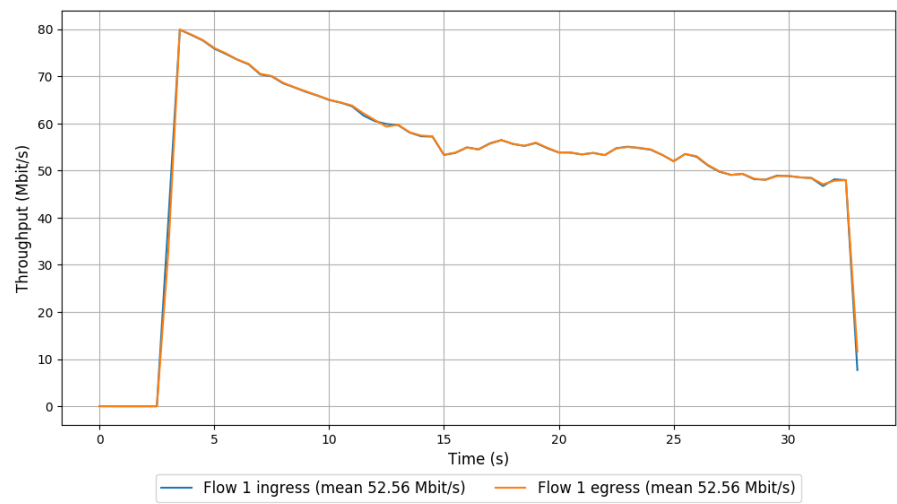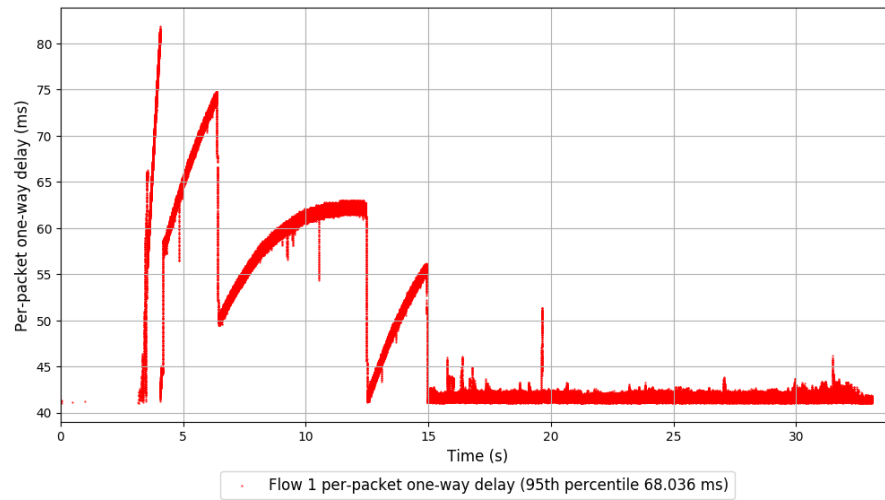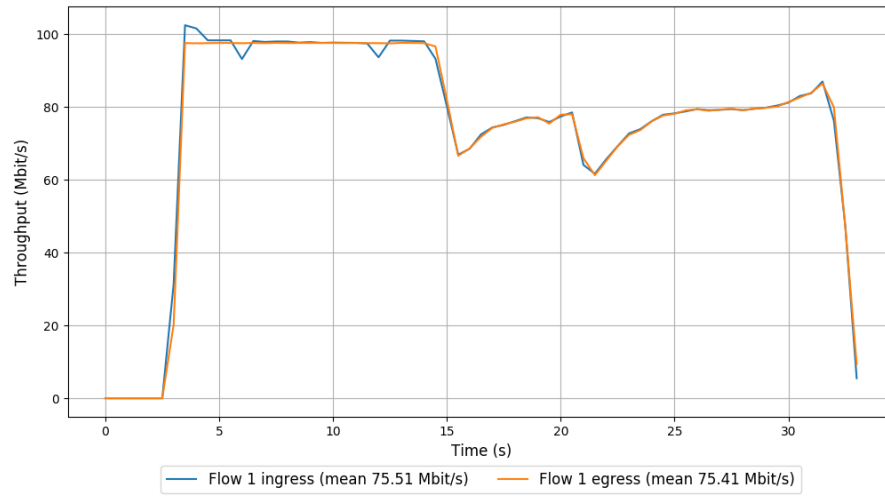
Run 1: Report of Copa — Data Link

Flow 1 ingress (mean 52.56 Mbit/s) —— Flow 1 egress (mean 52.56 Mbit/s)

· Flow 1 per-packet one-way delay (95th percentile 41.317 ms)

```
Run 1: Statistics of TCP Cubic

Start at: Sun, 11 Jun 2017 02:14:03 +0000
End at: Sun, 11 Jun 2017 02:14:33 +0000
Local clock offset: 3.7 ms
Remote clock offset: -4.1 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:00 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 75.41 Mbit/s
95th percentile per-packet one-way delay: 68.036 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 75.41 Mbit/s
95th percentile per-packet one-way delay: 68.036 ms
Loss rate: 0.17%
```

Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 75.51 Mbit/s)   Flow 1 egress (mean 75.41 Mbit/s)

· Flow 1 per-packet one-way delay (95th percentile 68.036 ms)
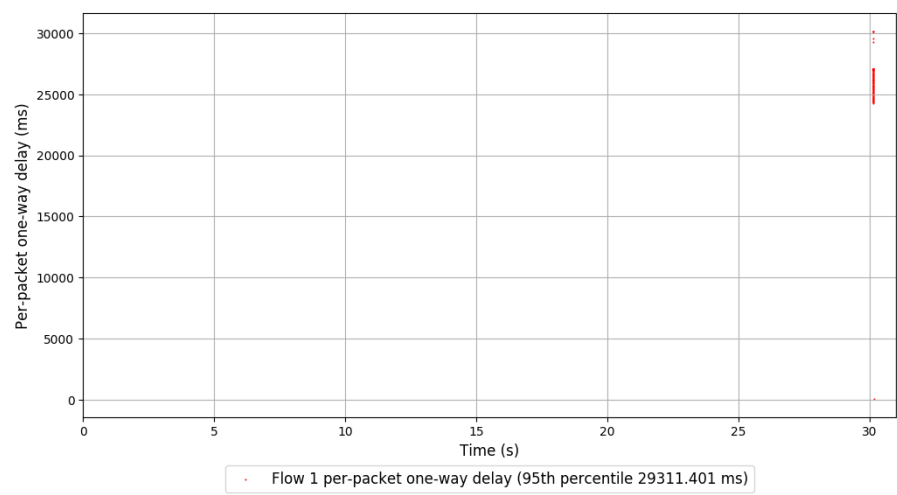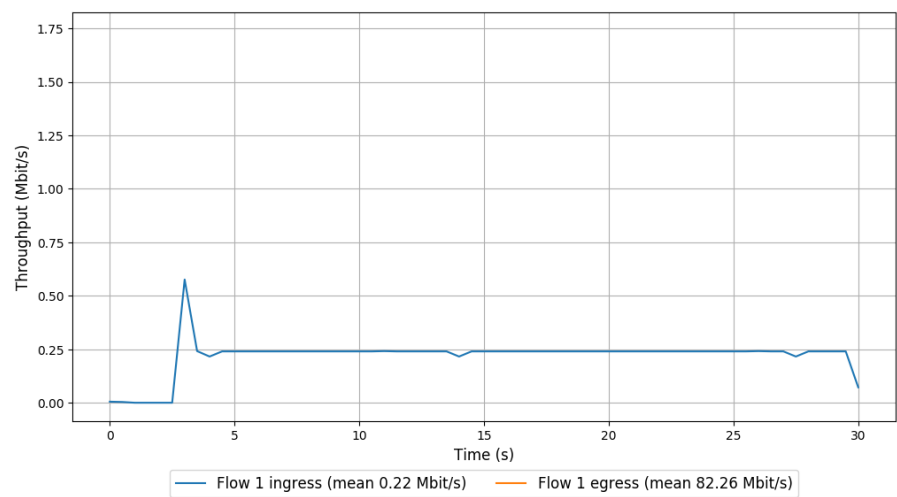
```
Run 1: Statistics of KohoCC

Start at: Sun, 11 Jun 2017 02:26:26 +0000
End at: Sun, 11 Jun 2017 02:26:56 +0000
Local clock offset: 3.521 ms
Remote clock offset: -2.767 ms
```

Run 1: Report of KohoCC — Data Link

```
Run 1: Statistics of LEDBAT

Start at: Sun, 11 Jun 2017 02:22:46 +0000
End at: Sun, 11 Jun 2017 02:23:16 +0000
Local clock offset: 3.951 ms
Remote clock offset: -3.819 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:05 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 51.39 Mbit/s
95th percentile per-packet one-way delay: 54.841 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 51.39 Mbit/s
95th percentile per-packet one-way delay: 54.841 ms
Loss rate: 0.00%
```
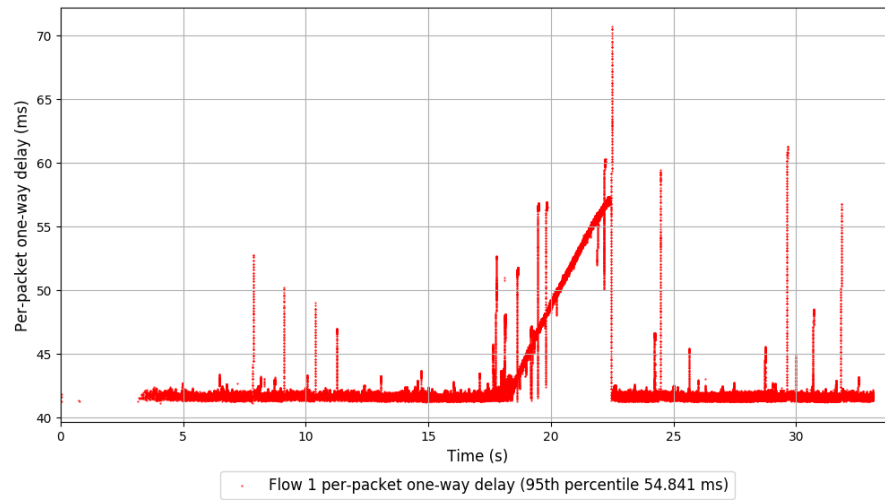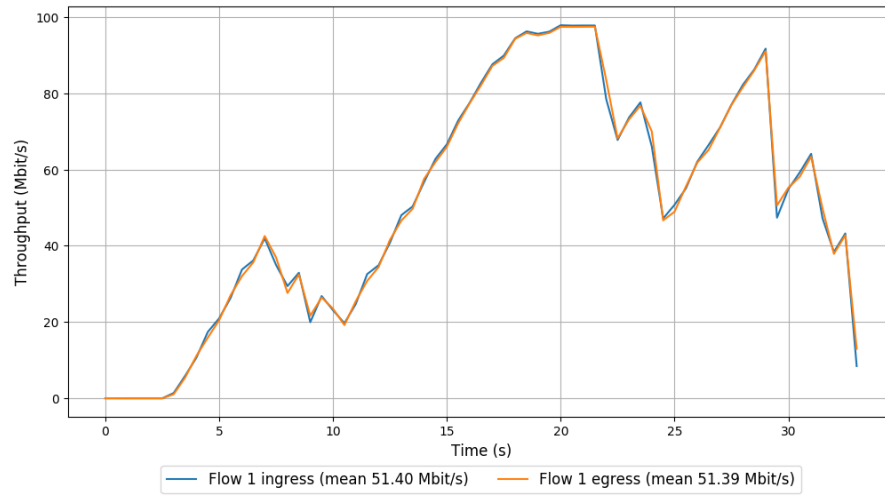
Run 1: Report of LEDBAT — Data Link

```
Run 1: Statistics of PCC

Start at: Sun, 11 Jun 2017 02:24:00 +0000
End at: Sun, 11 Jun 2017 02:24:30 +0000
Local clock offset: 2.379 ms
Remote clock offset: -3.359 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:09 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 81.17 Mbit/s
95th percentile per-packet one-way delay: 50.506 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 81.17 Mbit/s
95th percentile per-packet one-way delay: 50.506 ms
Loss rate: 0.45%
```
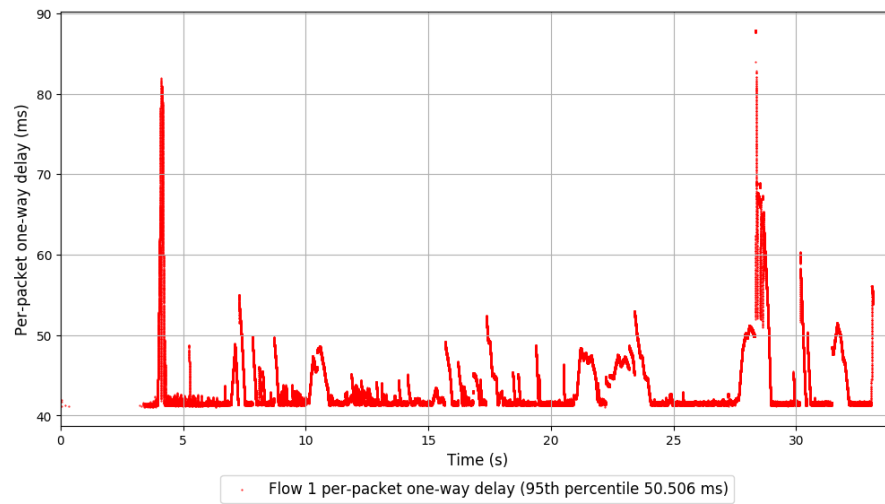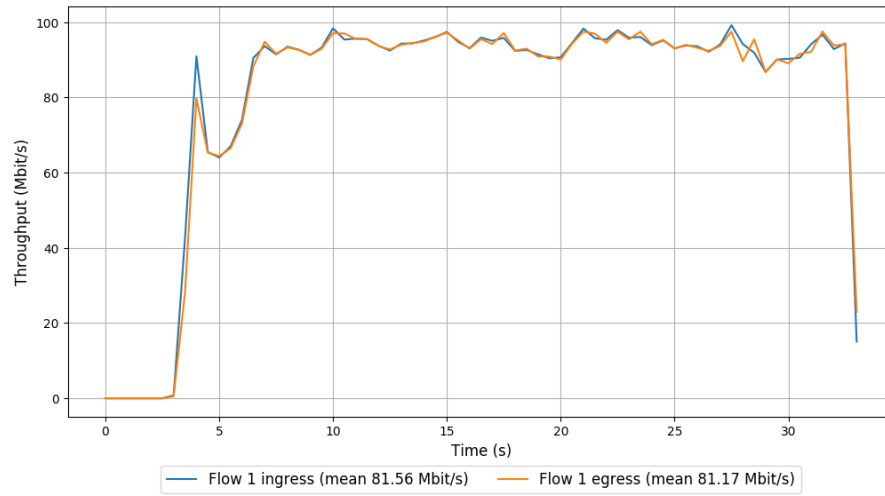
Run 1: Report of PCC — Data Link

Flow 1 ingress (mean 81.56 Mbit/s) ——— Flow 1 egress (mean 81.17 Mbit/s)

· Flow 1 per-packet one-way delay (95th percentile 50.506 ms)

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

Start at: Sun, 11 Jun 2017 02:25:14 +0000
End at: Sun, 11 Jun 2017 02:25:44 +0000
Local clock offset: 3.531 ms
Remote clock offset: -2.893 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:09 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.25 Mbit/s
95th percentile per-packet one-way delay: 41.546 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 13.25 Mbit/s
95th percentile per-packet one-way delay: 41.546 ms
Loss rate: 0.01%
```
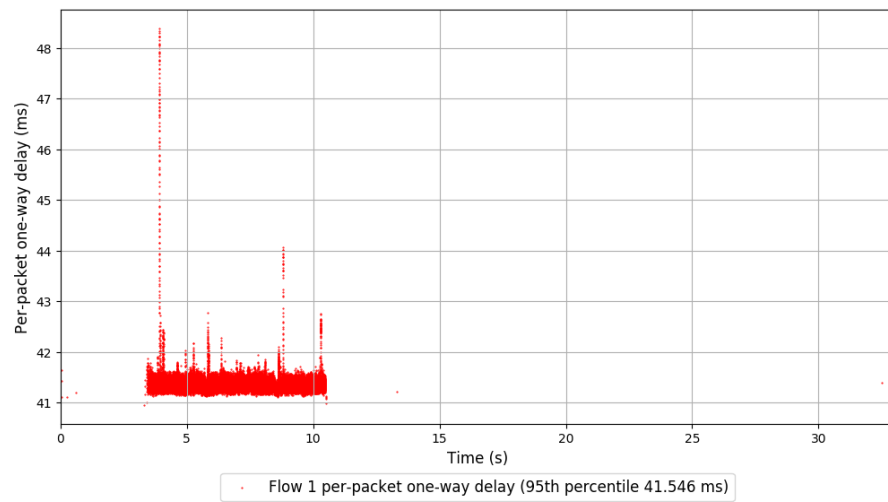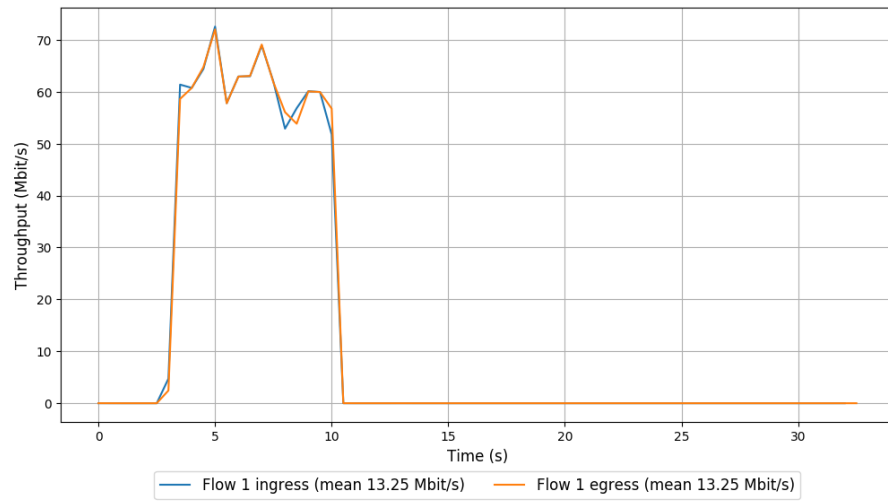
Run 1: Report of QUIC Cubic (toy) — Data Link

Flow 1 ingress (mean 13.25 Mbit/s) —— Flow 1 egress (mean 13.25 Mbit/s)

· Flow 1 per-packet one-way delay (95th percentile 41.546 ms)

```
Run 1: Statistics of Saturator

Start at: Sun, 11 Jun 2017 02:28:45 +0000
End at: Sun, 11 Jun 2017 02:29:15 +0000
Local clock offset: 0.102 ms
Remote clock offset: -3.327 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:13 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 45.45 Mbit/s
95th percentile per-packet one-way delay: 41.031 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 45.45 Mbit/s
95th percentile per-packet one-way delay: 41.031 ms
Loss rate: 0.00%
```
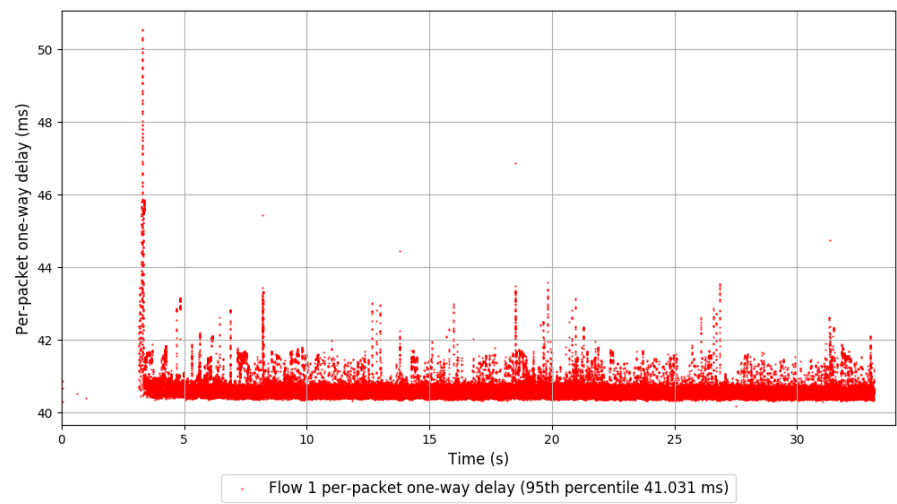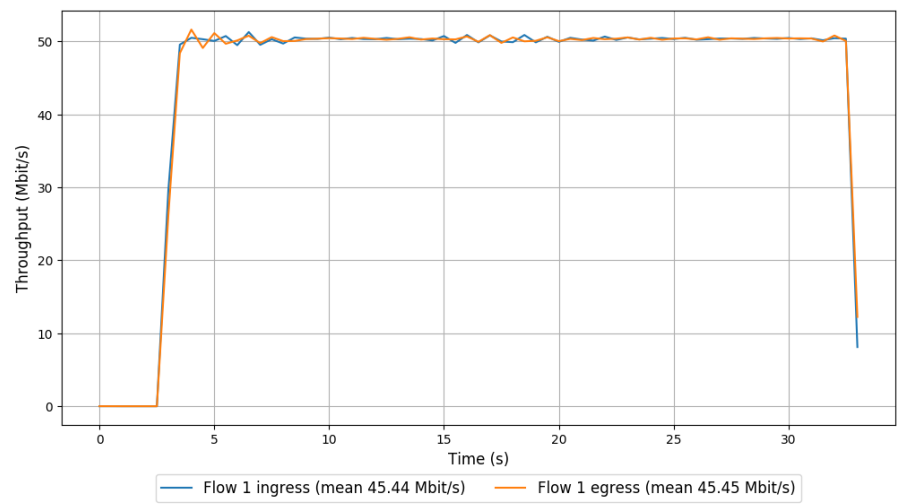
Run 1: Report of Saturator — Data Link

Flow 1 ingress (mean 45.44 Mbit/s) — Flow 1 egress (mean 45.45 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 41.031 ms)

```
Run 1: Statistics of SCReAM

Start at: Sun, 11 Jun 2017 02:20:19 +0000
End at: Sun, 11 Jun 2017 02:20:49 +0000
Local clock offset: 3.33 ms
Remote clock offset: -3.474 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:13 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 41.668 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 41.668 ms
Loss rate: 0.00%
```
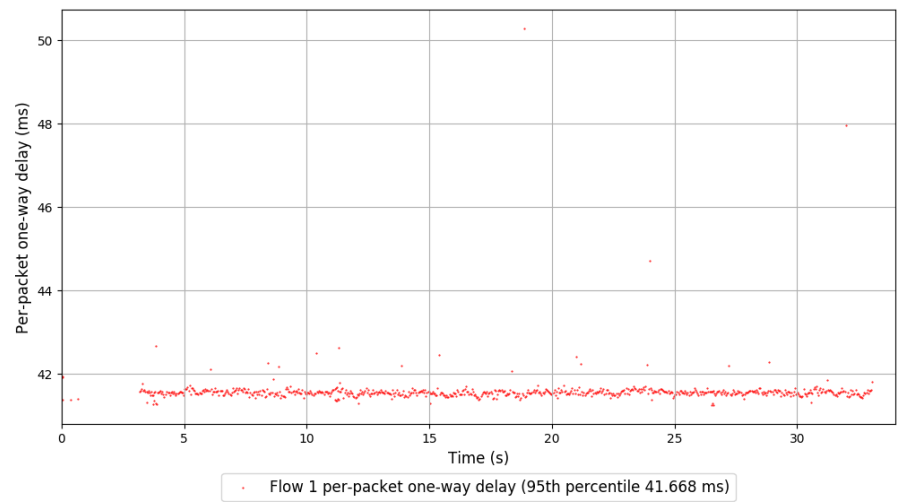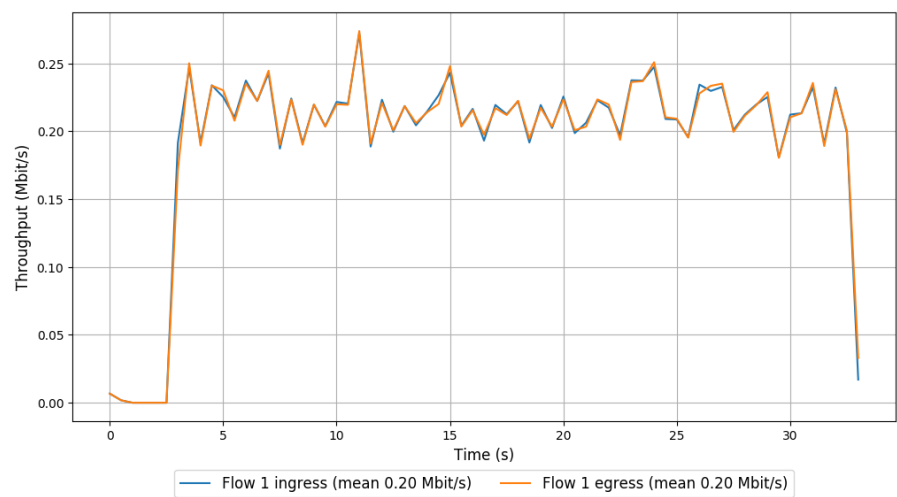
Run 1: Report of SCReAM — Data Link

```
Run 1: Statistics of Sprout

Start at: Sun, 11 Jun 2017 02:12:53 +0000
End at: Sun, 11 Jun 2017 02:13:23 +0000
Local clock offset: 0.911 ms
Remote clock offset: -5.202 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:13 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 14.58 Mbit/s
95th percentile per-packet one-way delay: 46.436 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 14.58 Mbit/s
95th percentile per-packet one-way delay: 46.436 ms
Loss rate: 0.01%
```
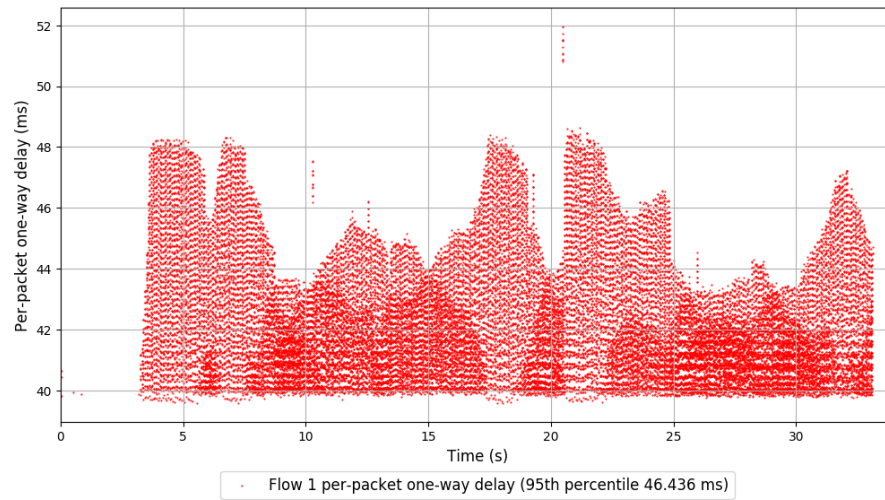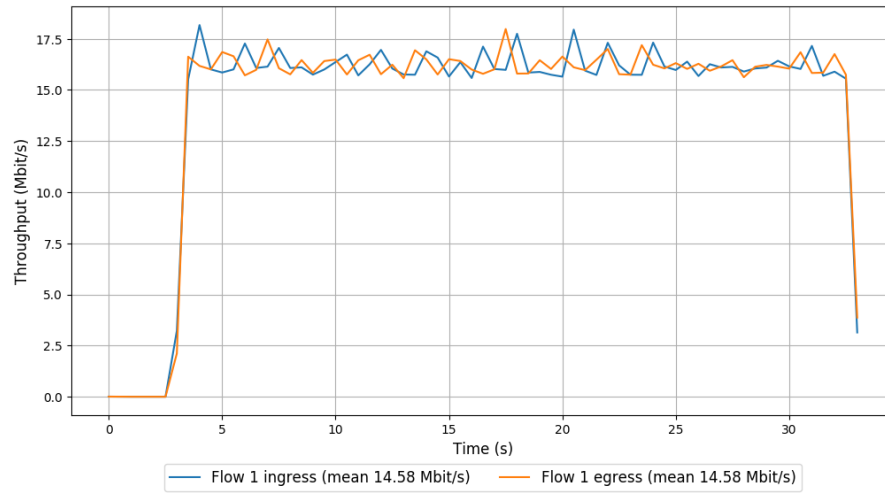
Run 1: Report of Sprout — Data Link

Flow 1 ingress (mean 14.58 Mbit/s)   Flow 1 egress (mean 14.58 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 46.436 ms)

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

Start at: Sun, 11 Jun 2017 02:15:18 +0000
End at: Sun, 11 Jun 2017 02:15:48 +0000
Local clock offset: 3.104 ms
Remote clock offset: -4.631 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:25 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 68.49 Mbit/s
95th percentile per-packet one-way delay: 49.156 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 68.49 Mbit/s
95th percentile per-packet one-way delay: 49.156 ms
Loss rate: 0.00%
```
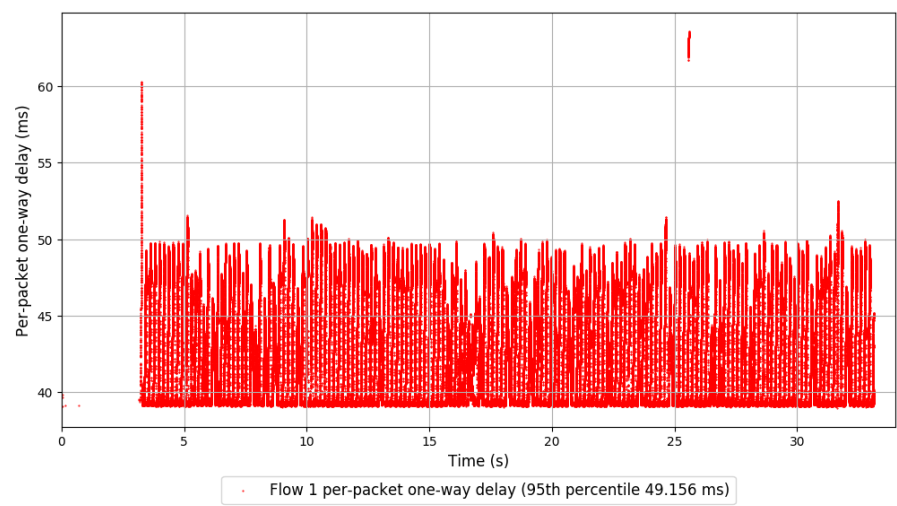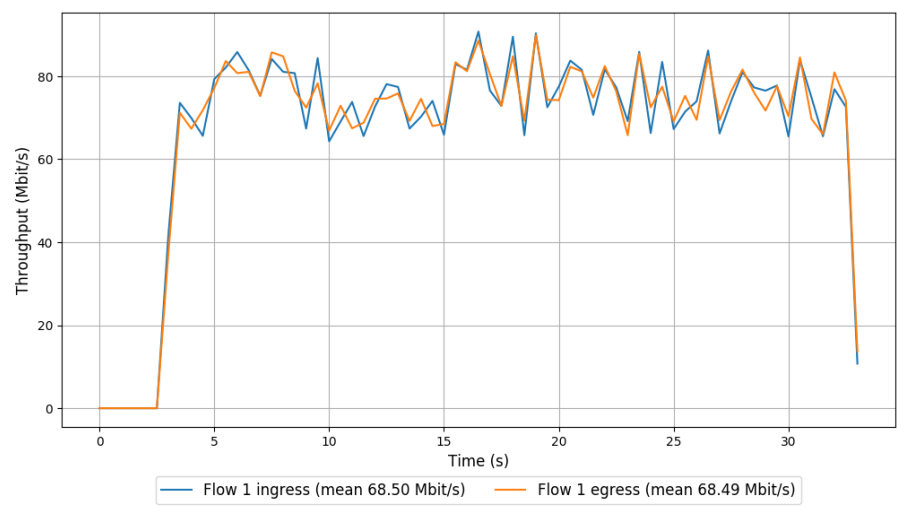
Run 1: Report of TaoVA-100x — Data Link

```
Run 1: Statistics of TCP Vegas

Start at: Sun, 11 Jun 2017 02:29:56 +0000
End at: Sun, 11 Jun 2017 02:30:26 +0000
Local clock offset: 3.761 ms
Remote clock offset: -2.683 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:25 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 55.58 Mbit/s
95th percentile per-packet one-way delay: 41.551 ms
Loss rate: 0.85%
-- Flow 1:
Average throughput: 55.58 Mbit/s
95th percentile per-packet one-way delay: 41.551 ms
Loss rate: 0.85%
```
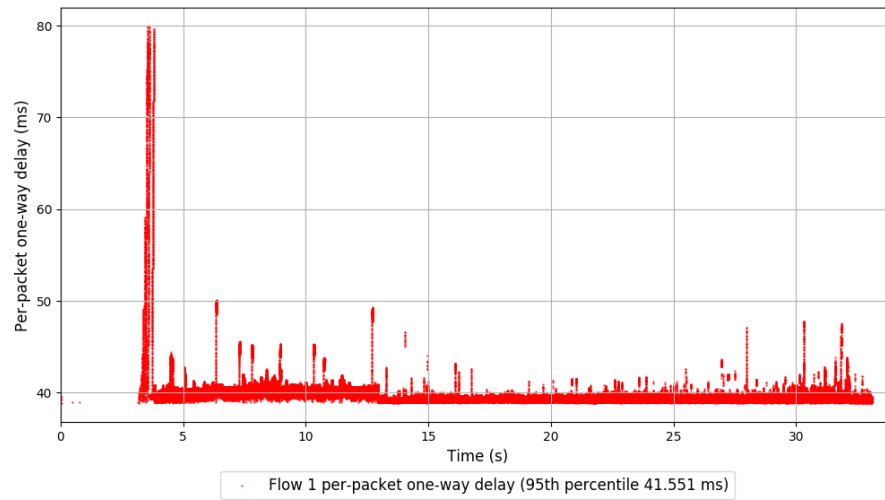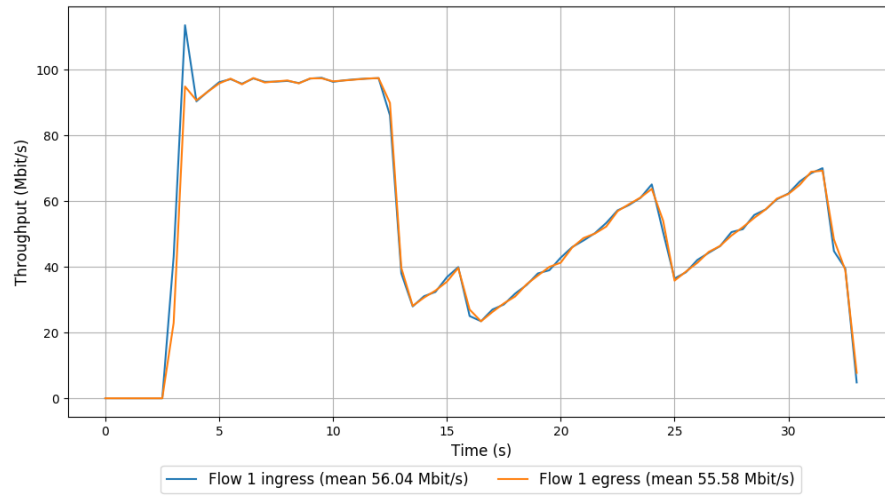
Run 1: Report of TCP Vegas — Data Link
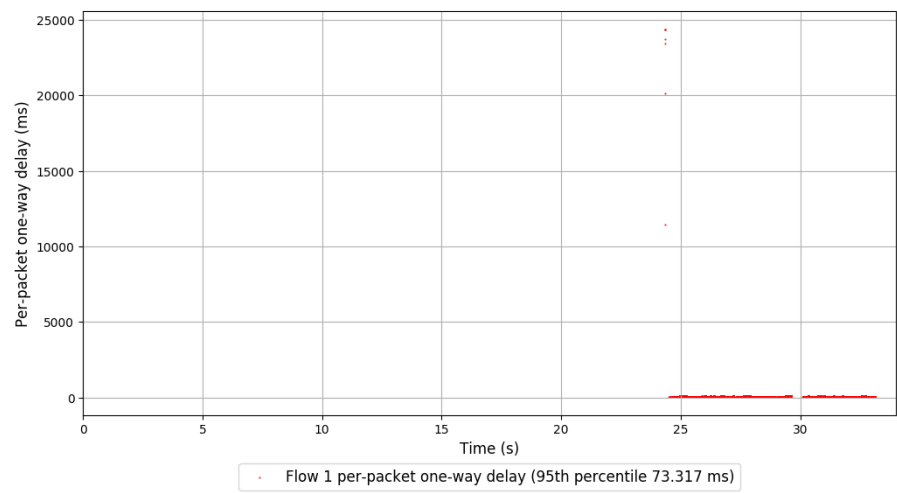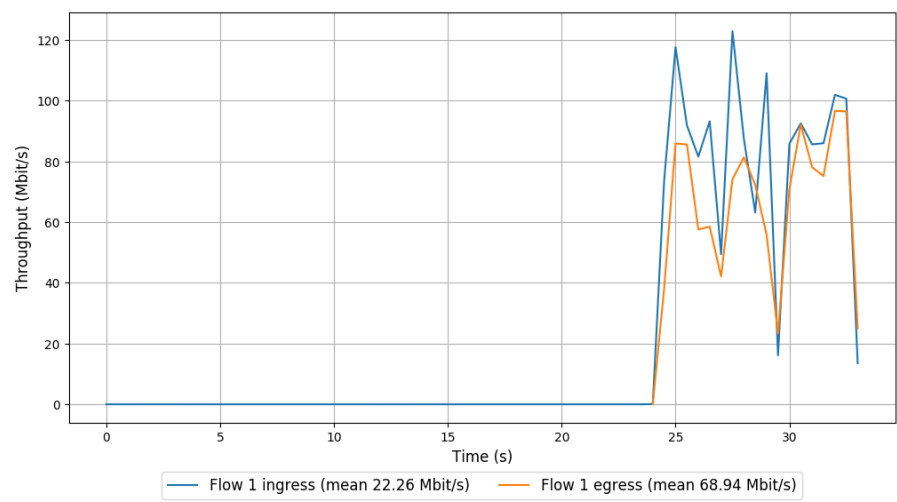
```
Run 1: Statistics of Verus

Start at: Sun, 11 Jun 2017 02:19:06 +0000
End at: Sun, 11 Jun 2017 02:19:36 +0000
Local clock offset: 2.983 ms
Remote clock offset: -3.897 ms
```

Run 1: Report of Verus — Data Link

```
Run 1: Statistics of WebRTC media

Start at: Sun, 11 Jun 2017 02:27:35 +0000
End at: Sun, 11 Jun 2017 02:28:05 +0000
Local clock offset: 3.175 ms
Remote clock offset: -2.328 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 02:54:25 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.28 Mbit/s
95th percentile per-packet one-way delay: 41.882 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.28 Mbit/s
95th percentile per-packet one-way delay: 41.882 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link

Flow 1 ingress (mean 2.28 Mbit/s) —— Flow 1 egress (mean 2.28 Mbit/s)

· Flow 1 per-packet one-way delay (95th percentile 41.882 ms)