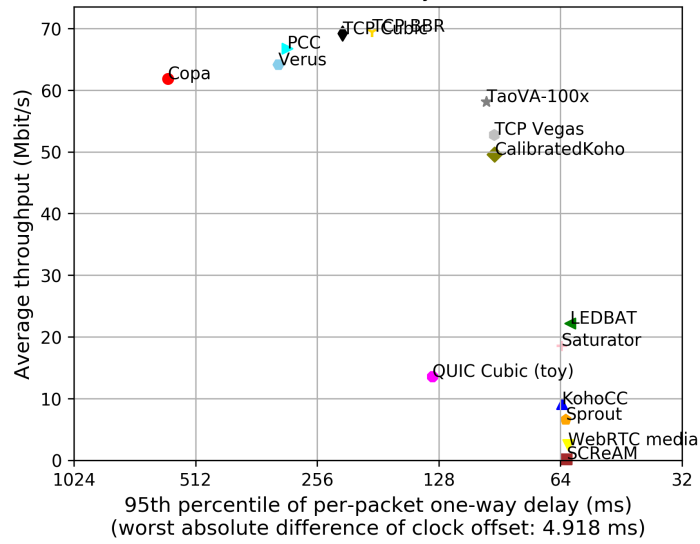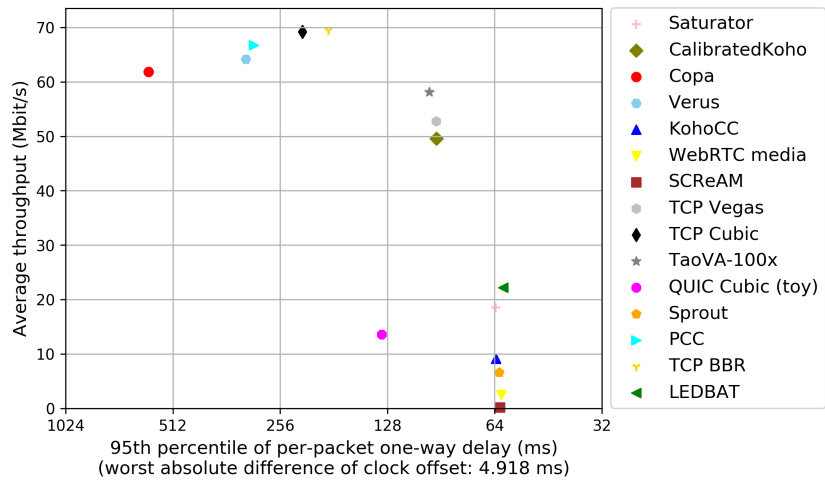**Pantheon Summary** (Generated at Sun, 11 Jun 2017 01:08:21 +0000 with pantheon version `e44e21ab50520045378f626dc5b5e21d0473d7b8`)

Repeated the test of 15 congestion control schemes once.

Each test lasted for 30 seconds running 1 flow.

Data path **from** AWS Brazil 2 Ethernet **to** Colombia Ethernet.

NTP offset measured against gps.ntp.br.

```
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
```
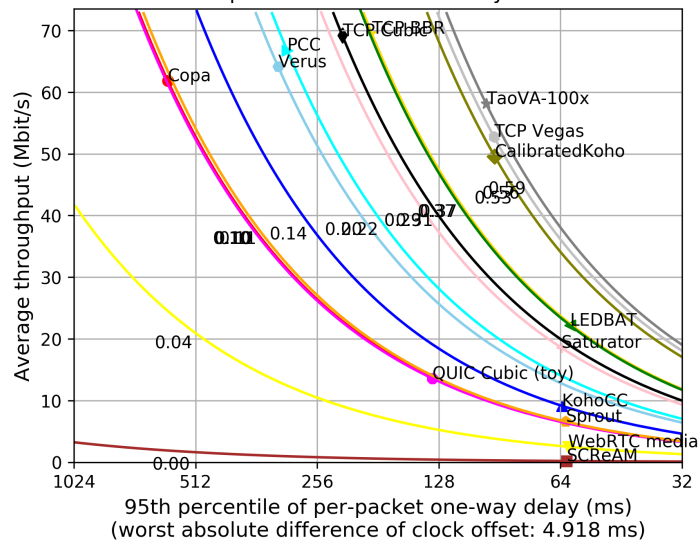
1

test from AWS Brazil 2 Ethernet to Colombia Ethernet, run 1 of 30s each per scheme
mean of all runs by scheme

test from AWS Brazil 2 Ethernet to Colombia Ethernet, run 1 of 30s each per scheme

test from AWS Brazil 2 Ethernet to Colombia 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 00:36:48 +0000
End at: Sun, 11 Jun 2017 00:37:18 +0000
Local clock offset: 2.435 ms
Remote clock offset: -1.071 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:32 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 69.47 Mbit/s
95th percentile per-packet one-way delay: 187.497 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 69.47 Mbit/s
95th percentile per-packet one-way delay: 187.497 ms
Loss rate: 0.17%
```
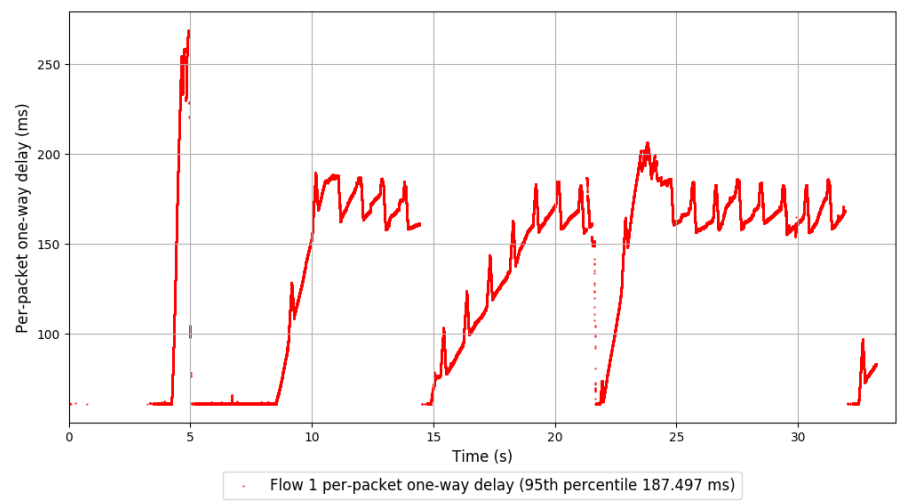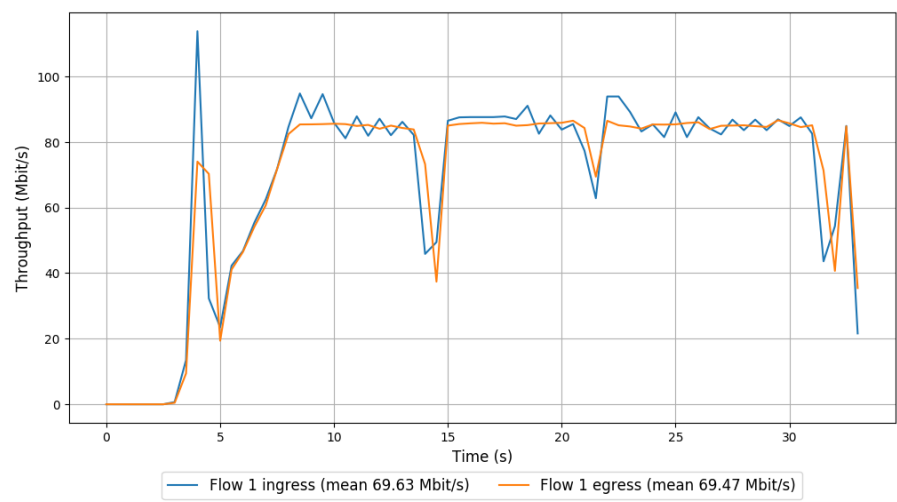
Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 69.63 Mbit/s)   Flow 1 egress (mean 69.47 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 187.497 ms)

```
Run 1: Statistics of CalibratedKoho

Start at: Sun, 11 Jun 2017 00:25:04 +0000
End at: Sun, 11 Jun 2017 00:25:34 +0000
Local clock offset: 3.427 ms
Remote clock offset: -1.286 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:32 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 49.60 Mbit/s
95th percentile per-packet one-way delay: 93.122 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 49.60 Mbit/s
95th percentile per-packet one-way delay: 93.122 ms
Loss rate: 0.21%
```
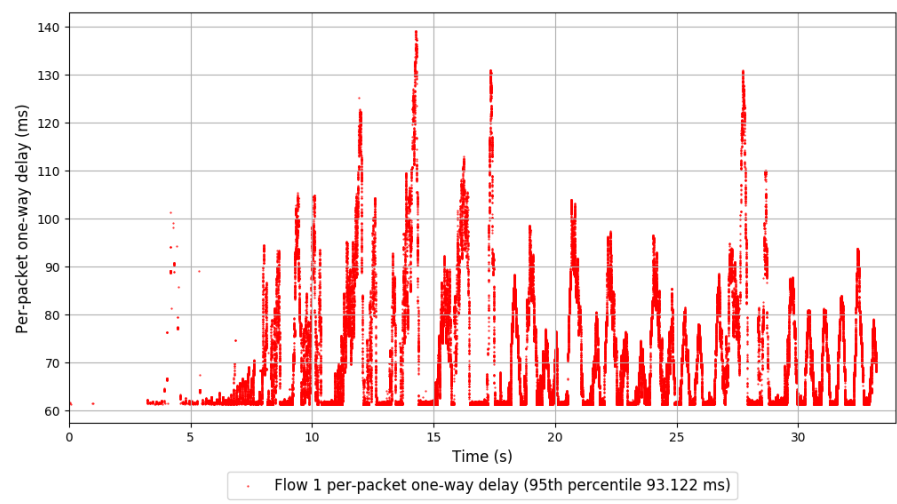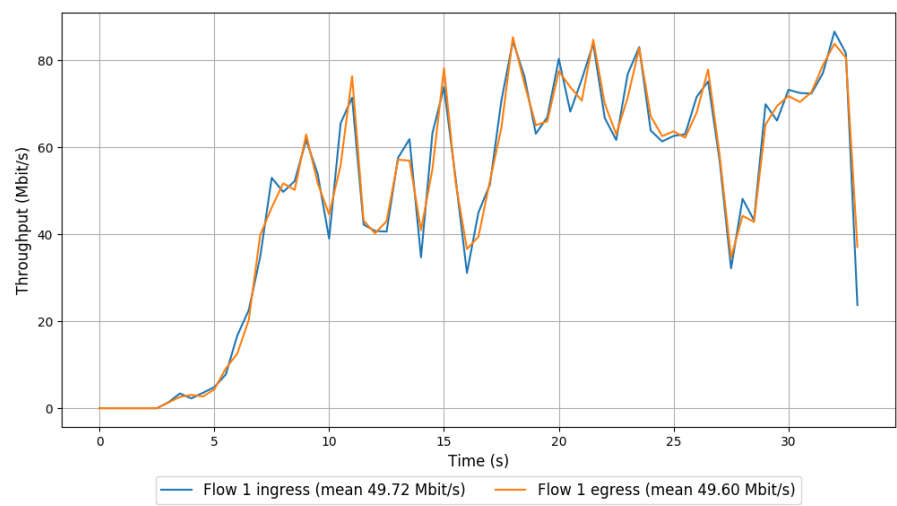
Run 1: Report of CalibratedKoho — Data Link

Flow 1 ingress (mean 49.72 Mbit/s)   Flow 1 egress (mean 49.60 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 93.122 ms)

```
Run 1: Statistics of Copa

Start at: Sun, 11 Jun 2017 00:38:11 +0000
End at: Sun, 11 Jun 2017 00:38:41 +0000
Local clock offset: 2.101 ms
Remote clock offset: -1.037 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:46 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 61.83 Mbit/s
95th percentile per-packet one-way delay: 599.645 ms
Loss rate: 0.90%
-- Flow 1:
Average throughput: 61.83 Mbit/s
95th percentile per-packet one-way delay: 599.645 ms
Loss rate: 0.90%
```
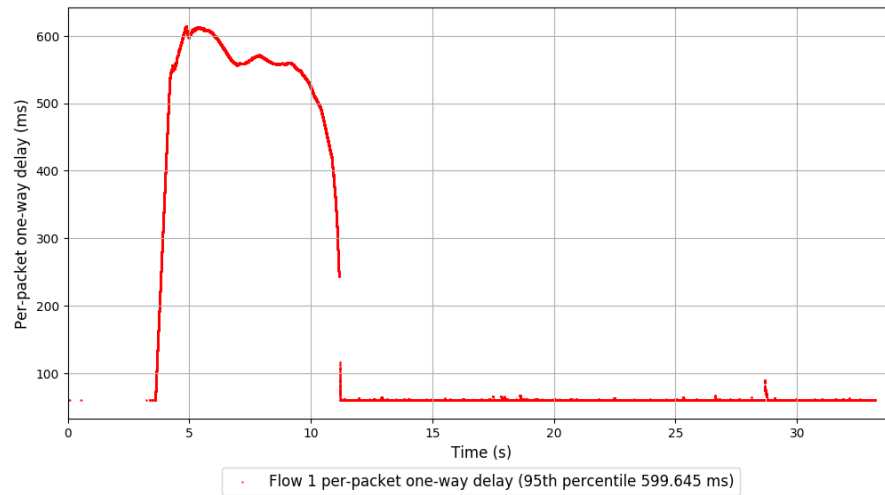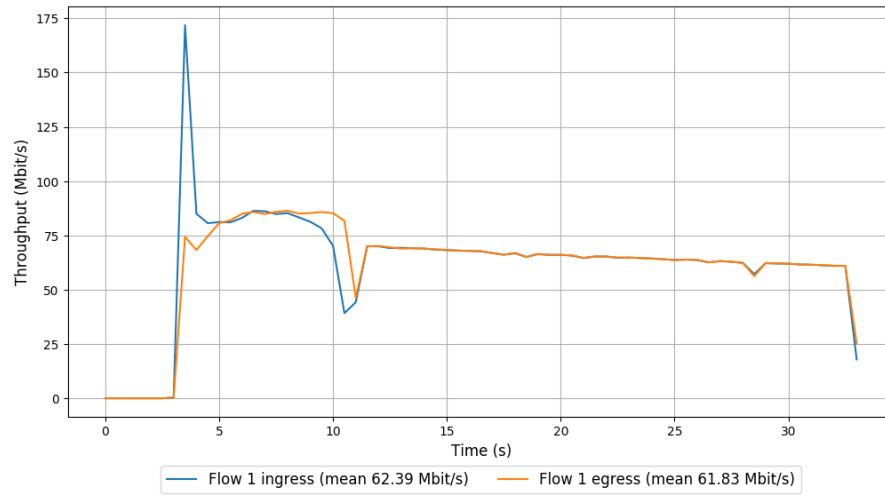
Run 1: Report of Copa — Data Link

Flow 1 ingress (mean 62.39 Mbit/s) ── Flow 1 egress (mean 61.83 Mbit/s)

· Flow 1 per-packet one-way delay (95th percentile 599.645 ms)

9

```
Run 1: Statistics of TCP Cubic

Start at: Sun, 11 Jun 2017 00:43:22 +0000
End at: Sun, 11 Jun 2017 00:43:52 +0000
Local clock offset: 1.126 ms
Remote clock offset: -1.294 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:46 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 69.19 Mbit/s
95th percentile per-packet one-way delay: 221.833 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 69.19 Mbit/s
95th percentile per-packet one-way delay: 221.833 ms
Loss rate: 0.06%
```
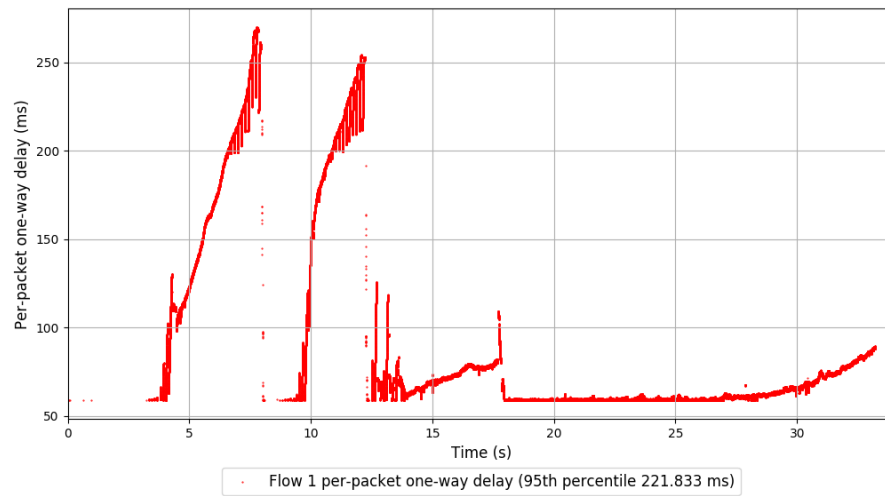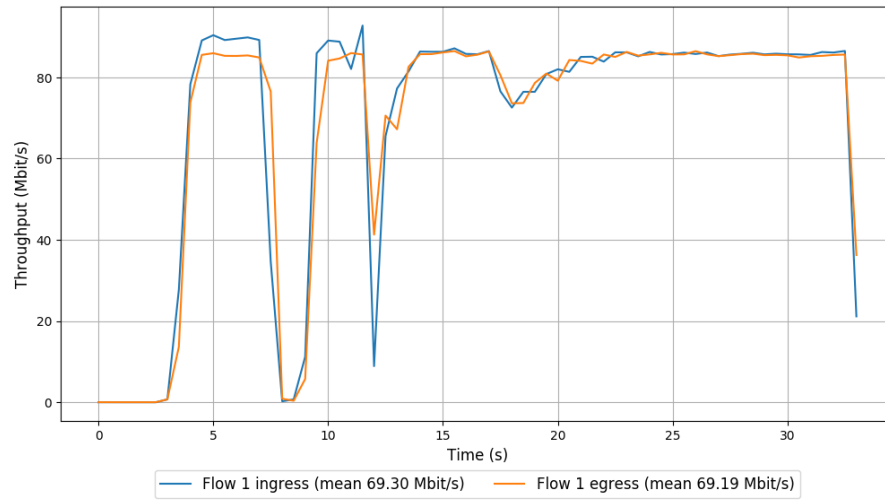
Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 69.30 Mbit/s) — Flow 1 egress (mean 69.19 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 221.833 ms)

```
Run 1: Statistics of KohoCC

Start at: Sun, 11 Jun 2017 00:27:46 +0000
End at: Sun, 11 Jun 2017 00:28:16 +0000
Local clock offset: 3.416 ms
Remote clock offset: -0.937 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:46 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.13 Mbit/s
95th percentile per-packet one-way delay: 63.470 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.13 Mbit/s
95th percentile per-packet one-way delay: 63.470 ms
Loss rate: 0.00%
```
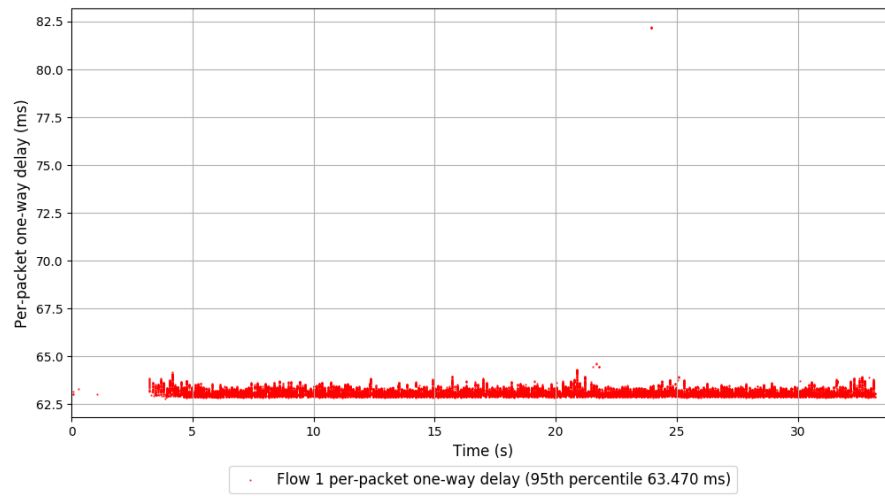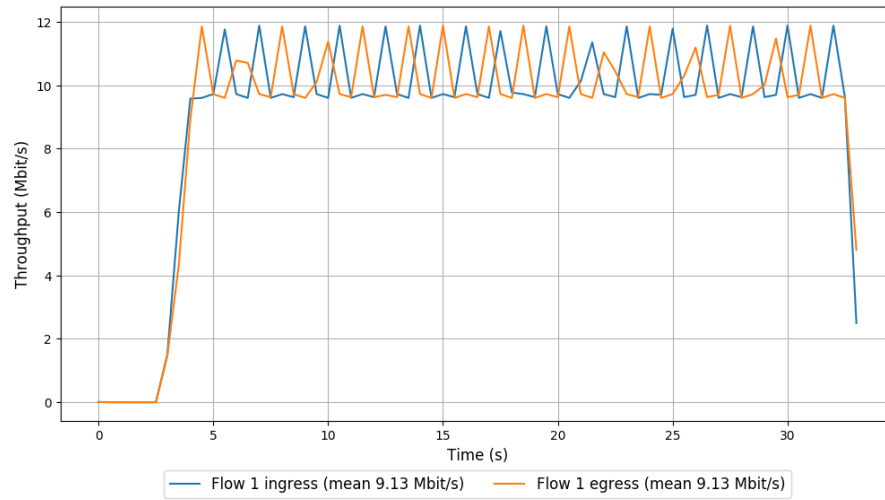
Run 1: Report of KohoCC — Data Link

```
Run 1: Statistics of LEDBAT

Start at: Sun, 11 Jun 2017 00:39:33 +0000
End at: Sun, 11 Jun 2017 00:40:03 +0000
Local clock offset: 1.81 ms
Remote clock offset: -1.692 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:49 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 22.18 Mbit/s
95th percentile per-packet one-way delay: 60.568 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 22.18 Mbit/s
95th percentile per-packet one-way delay: 60.568 ms
Loss rate: 0.01%
```
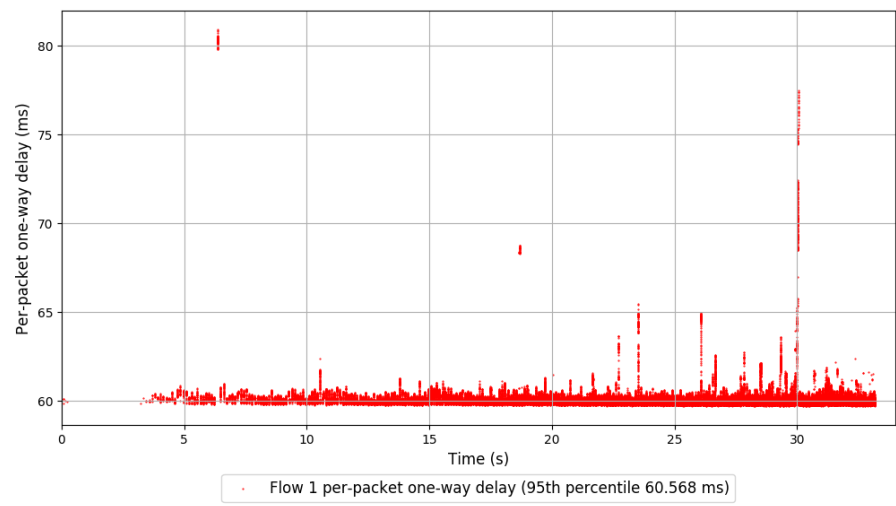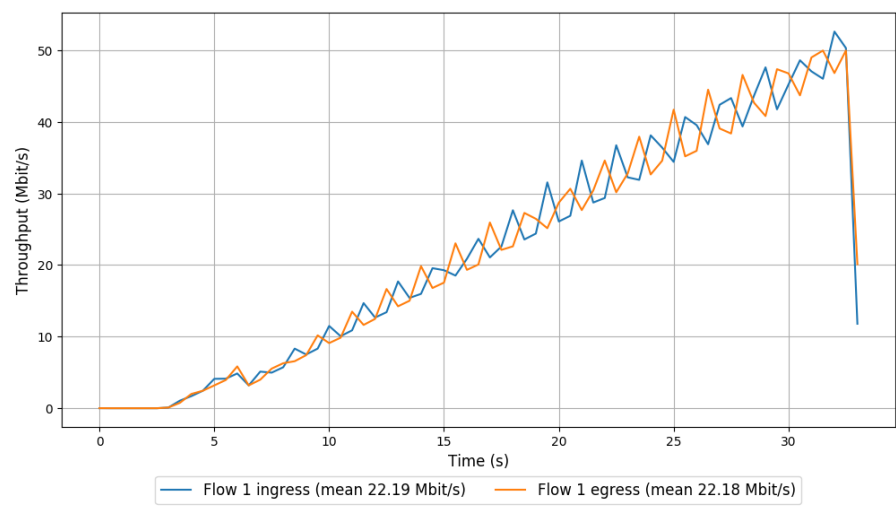
Run 1: Report of LEDBAT — Data Link

Flow 1 ingress (mean 22.19 Mbit/s)   Flow 1 egress (mean 22.18 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 60.568 ms)

```
Run 1: Statistics of PCC

Start at: Sun, 11 Jun 2017 00:29:02 +0000
End at: Sun, 11 Jun 2017 00:29:32 +0000
Local clock offset: 3.313 ms
Remote clock offset: -1.254 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:59 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 66.76 Mbit/s
95th percentile per-packet one-way delay: 303.661 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 66.76 Mbit/s
95th percentile per-packet one-way delay: 303.661 ms
Loss rate: 0.17%
```
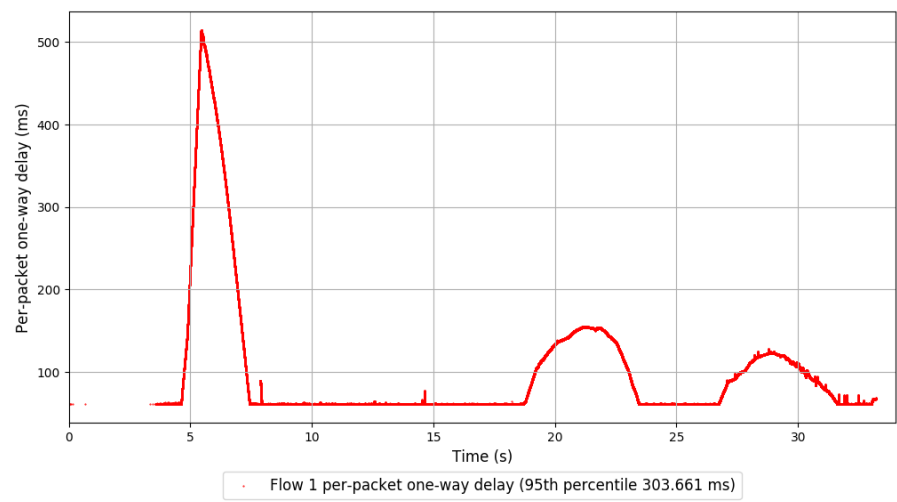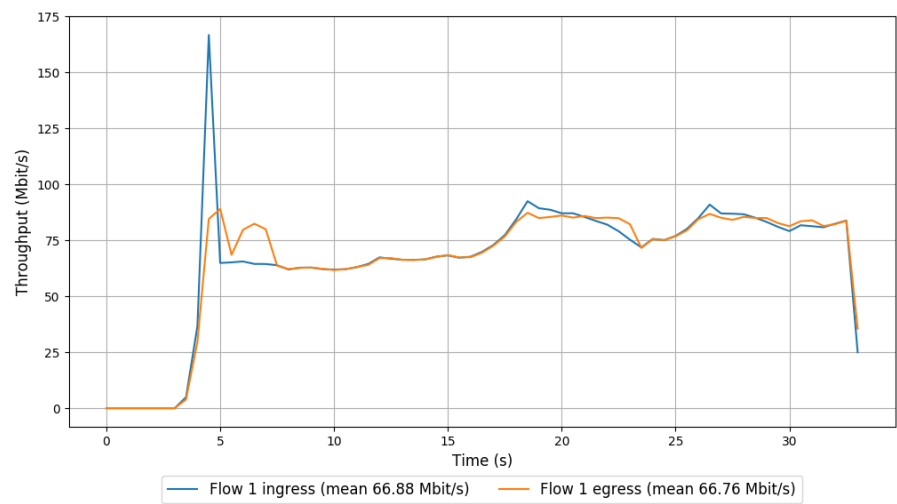
Run 1: Report of PCC — Data Link

Flow 1 ingress (mean 66.88 Mbit/s) —— Flow 1 egress (mean 66.76 Mbit/s)

· Flow 1 per-packet one-way delay (95th percentile 303.661 ms)

17

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

Start at: Sun, 11 Jun 2017 00:42:06 +0000
End at: Sun, 11 Jun 2017 00:42:36 +0000
Local clock offset: 1.381 ms
Remote clock offset: -1.459 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:59 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.58 Mbit/s
95th percentile per-packet one-way delay: 132.830 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 13.58 Mbit/s
95th percentile per-packet one-way delay: 132.830 ms
Loss rate: 0.00%
```
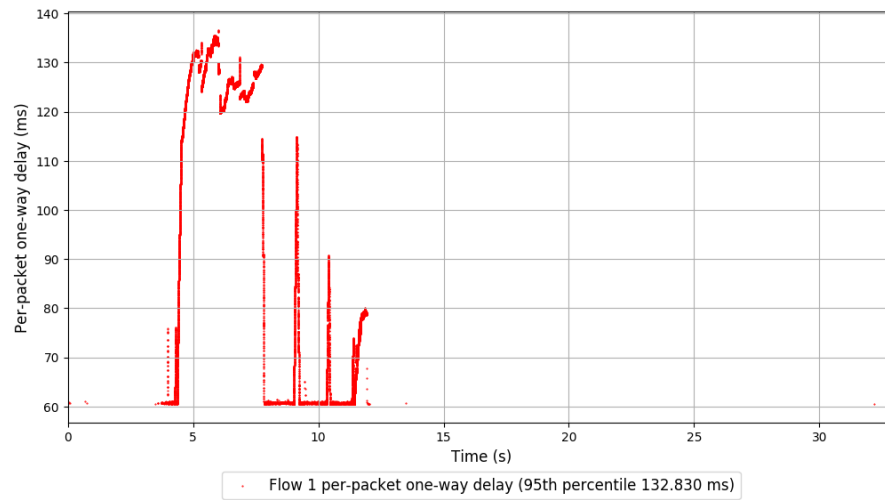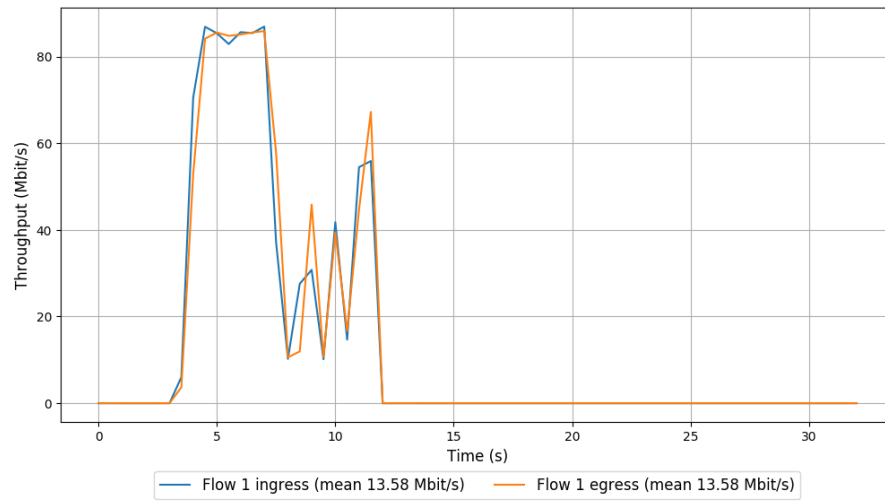
Run 1: Report of QUIC Cubic (toy) — Data Link

```
Run 1: Statistics of Saturator

Start at: Sun, 11 Jun 2017 00:30:20 +0000
End at: Sun, 11 Jun 2017 00:30:50 +0000
Local clock offset: 3.352 ms
Remote clock offset: -1.566 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:59 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 18.56 Mbit/s
95th percentile per-packet one-way delay: 63.672 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 18.56 Mbit/s
95th percentile per-packet one-way delay: 63.672 ms
Loss rate: 0.01%
```
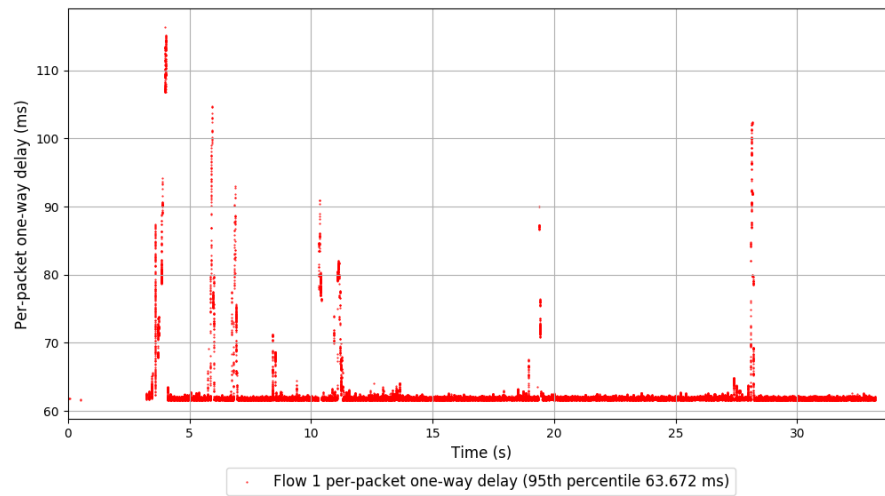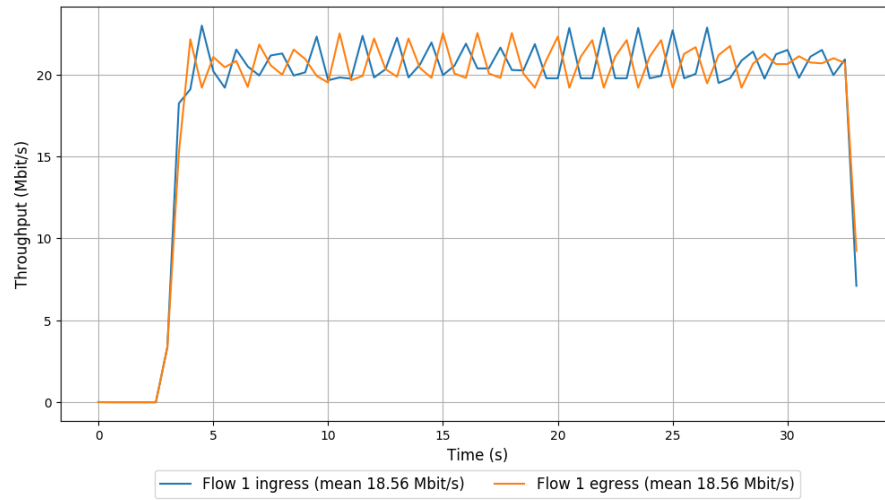
Run 1: Report of Saturator — Data Link

Flow 1 ingress (mean 18.56 Mbit/s)   Flow 1 egress (mean 18.56 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 63.672 ms)

```
Run 1: Statistics of SCReAM

Start at: Sun, 11 Jun 2017 00:31:37 +0000
End at: Sun, 11 Jun 2017 00:32:07 +0000
Local clock offset: 3.255 ms
Remote clock offset: -1.6 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:59 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 61.837 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 61.837 ms
Loss rate: 0.27%
```
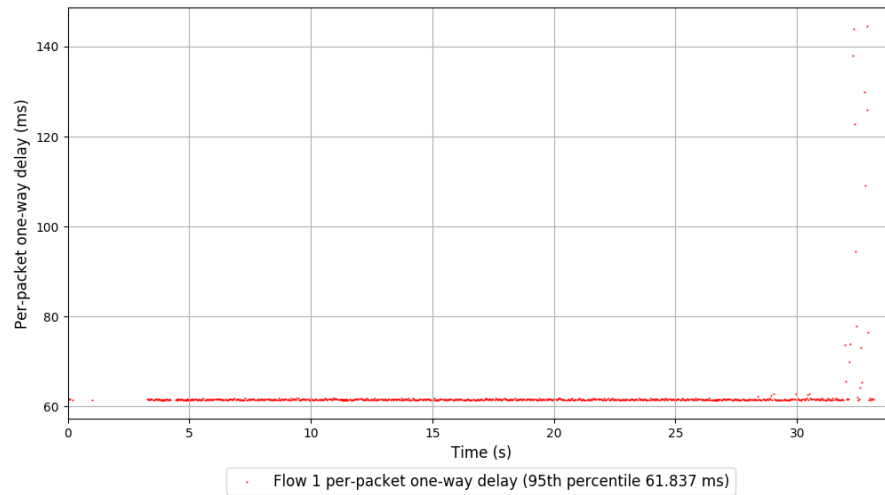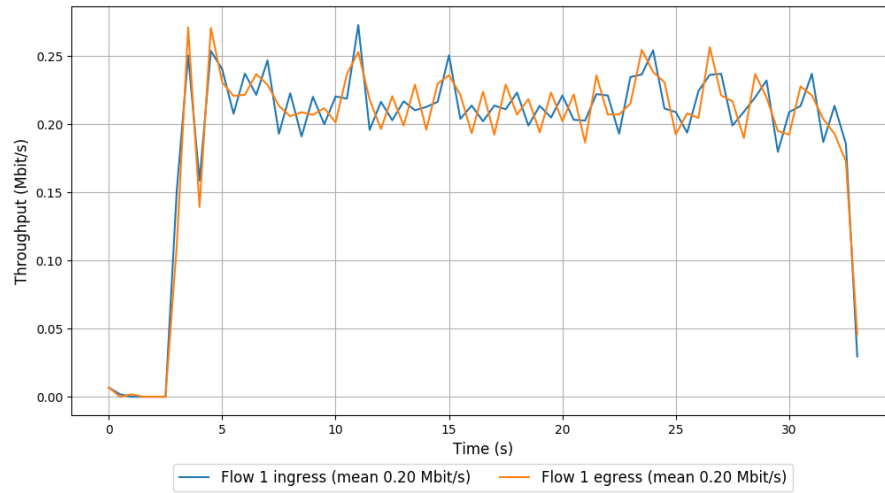
Run 1: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.20 Mbit/s) — Flow 1 egress (mean 0.20 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 61.837 ms)

```
Run 1: Statistics of Sprout

Start at: Sun, 11 Jun 2017 00:35:33 +0000
End at: Sun, 11 Jun 2017 00:36:03 +0000
Local clock offset: 2.862 ms
Remote clock offset: -1.33 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:07:59 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.57 Mbit/s
95th percentile per-packet one-way delay: 62.129 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.57 Mbit/s
95th percentile per-packet one-way delay: 62.129 ms
Loss rate: 0.00%
```
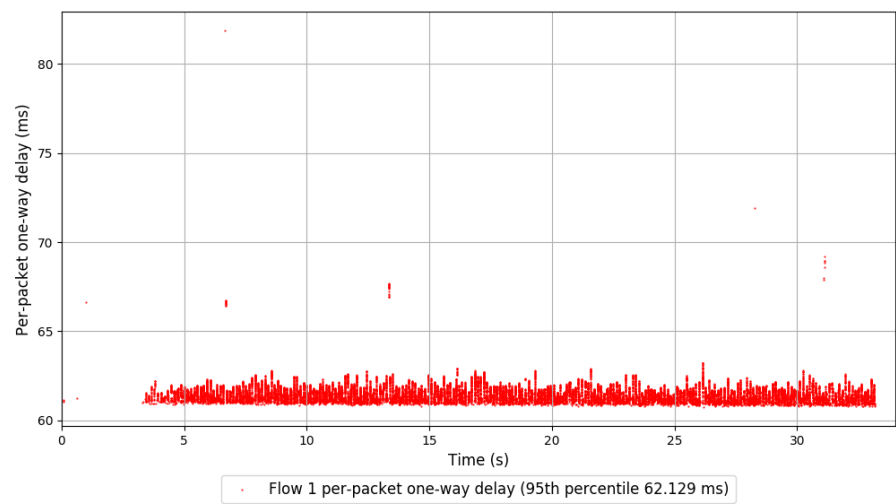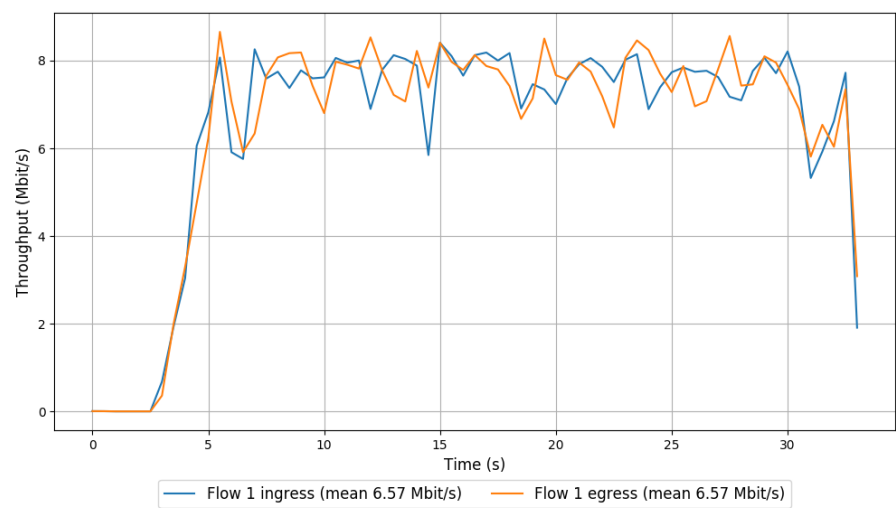
Run 1: Report of Sprout — Data Link

Flow 1 ingress (mean 6.57 Mbit/s) ———— Flow 1 egress (mean 6.57 Mbit/s)

· Flow 1 per-packet one-way delay (95th percentile 62.129 ms)

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

Start at: Sun, 11 Jun 2017 00:26:24 +0000
End at: Sun, 11 Jun 2017 00:26:54 +0000
Local clock offset: 3.449 ms
Remote clock offset: -1.257 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:08:16 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 58.11 Mbit/s
95th percentile per-packet one-way delay: 97.722 ms
Loss rate: 2.34%
-- Flow 1:
Average throughput: 58.11 Mbit/s
95th percentile per-packet one-way delay: 97.722 ms
Loss rate: 2.34%
```
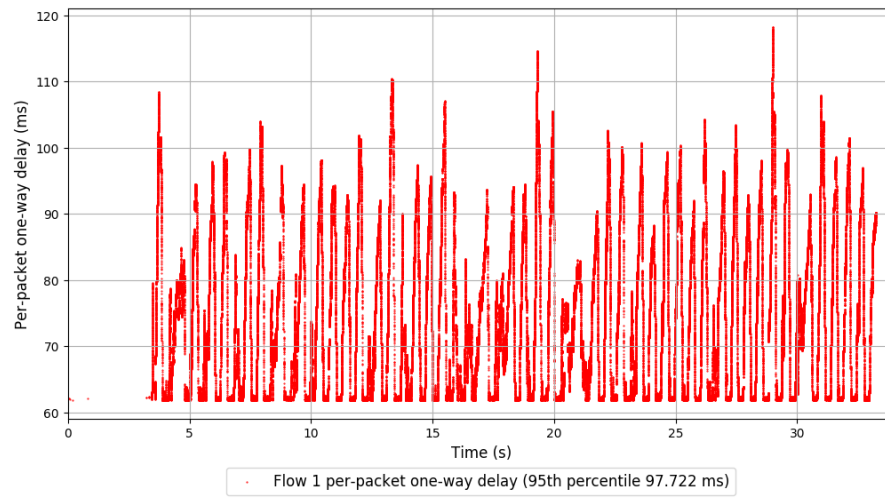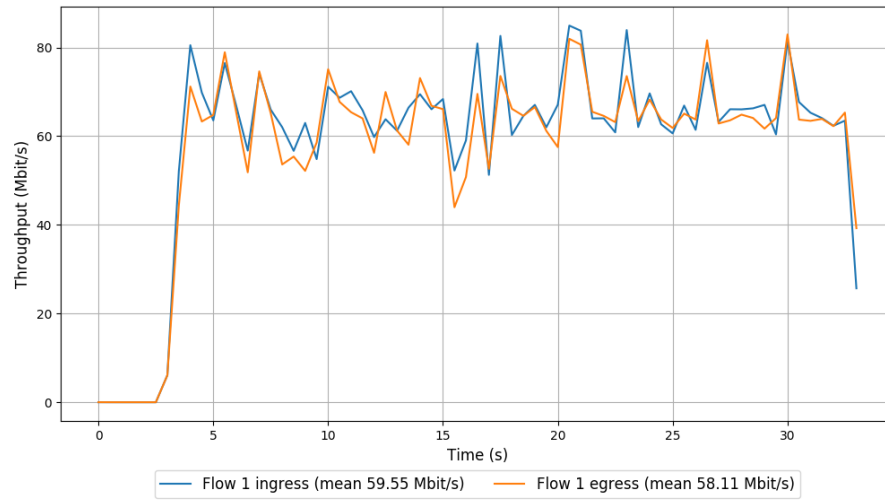
Run 1: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 59.55 Mbit/s) Flow 1 egress (mean 58.11 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 97.722 ms)

27

```
Run 1: Statistics of TCP Vegas

Start at: Sun, 11 Jun 2017 00:34:14 +0000
End at: Sun, 11 Jun 2017 00:34:44 +0000
Local clock offset: 3.263 ms
Remote clock offset: -1.348 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:08:16 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 52.78 Mbit/s
95th percentile per-packet one-way delay: 93.503 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 52.78 Mbit/s
95th percentile per-packet one-way delay: 93.503 ms
Loss rate: 0.11%
```
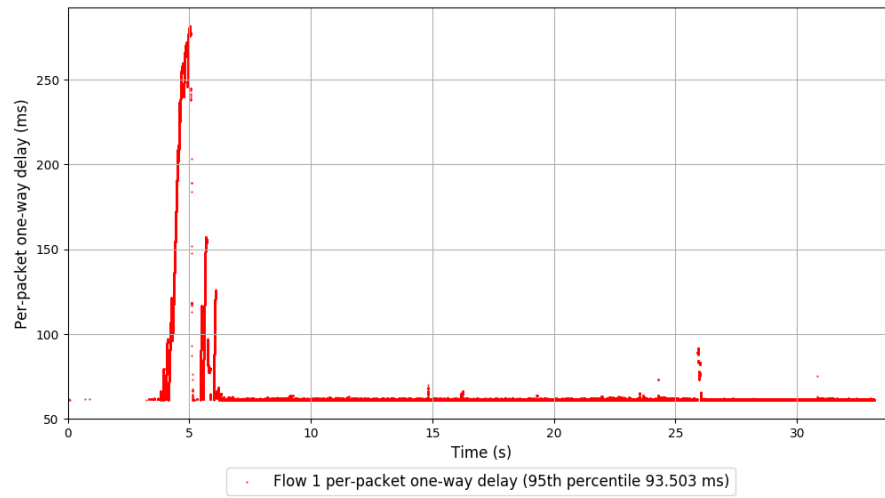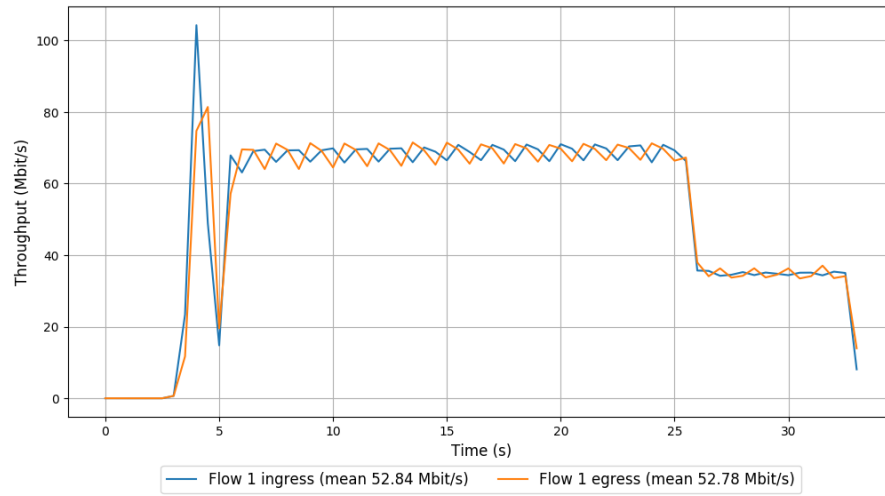
Run 1: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 52.84 Mbit/s)   Flow 1 egress (mean 52.78 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 93.503 ms)

```
Run 1: Statistics of Verus

Start at: Sun, 11 Jun 2017 00:32:52 +0000
End at: Sun, 11 Jun 2017 00:33:22 +0000
Local clock offset: 3.317 ms
Remote clock offset: -1.437 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:08:18 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 64.15 Mbit/s
95th percentile per-packet one-way delay: 319.931 ms
Loss rate: 1.27%
-- Flow 1:
Average throughput: 64.15 Mbit/s
95th percentile per-packet one-way delay: 319.931 ms
Loss rate: 1.27%
```
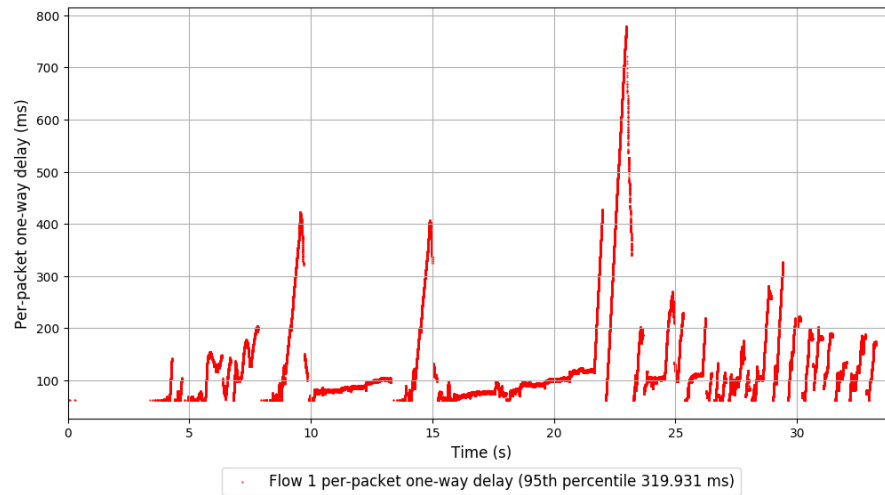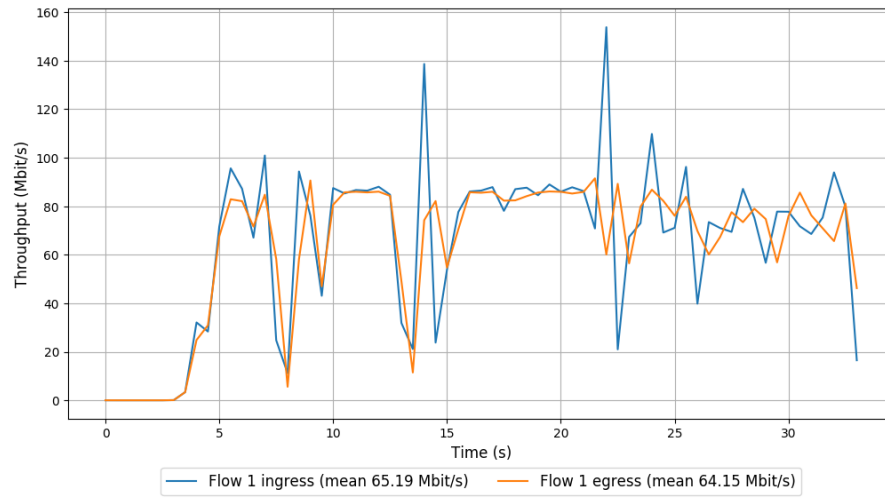
Run 1: Report of Verus — Data Link

Flow 1 ingress (mean 65.19 Mbit/s) —— Flow 1 egress (mean 64.15 Mbit/s)

· Flow 1 per-packet one-way delay (95th percentile 319.931 ms)

```
Run 1: Statistics of WebRTC media

Start at: Sun, 11 Jun 2017 00:40:50 +0000
End at: Sun, 11 Jun 2017 00:41:20 +0000
Local clock offset: 1.586 ms
Remote clock offset: -1.34 ms


# Below is generated by plot.py at Sun, 11 Jun 2017 01:08:18 +0000
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.51 Mbit/s
95th percentile per-packet one-way delay: 61.304 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 2.51 Mbit/s
95th percentile per-packet one-way delay: 61.304 ms
Loss rate: 0.01%
```

Run 1: Report of WebRTC media — Data Link

Flow 1 ingress (mean 2.50 Mbit/s) — Flow 1 egress (mean 2.51 Mbit/s)

Flow 1 per-packet one-way delay (95th percentile 61.304 ms)