Pantheon Report

Generated at 2025-04-17 18:17:47 (UTC).

Tested in mahimahi: `mm-delay 5 mm-link 50mbps.trace 50mbps.trace --uplink-queue=droptail --downlink-queue=droptail --uplink-queue-args=packets=500 --downlink-queue-args=packets=500`
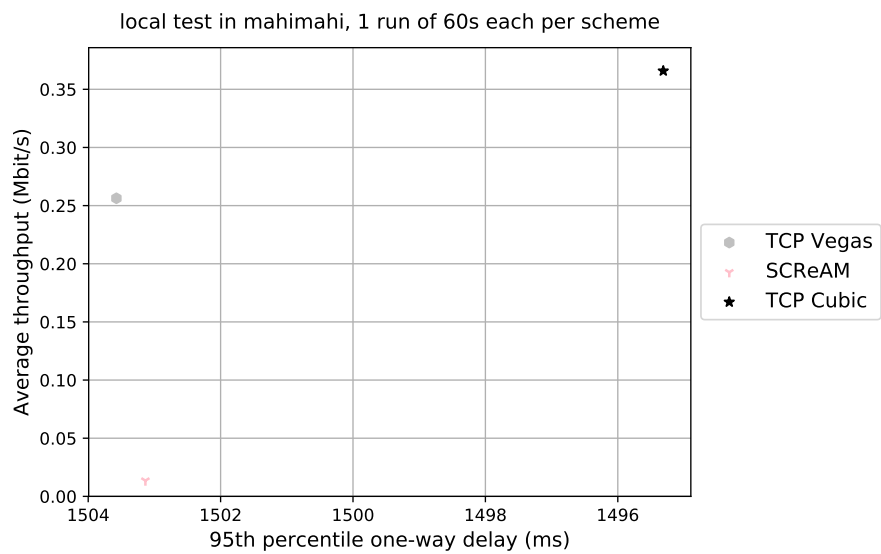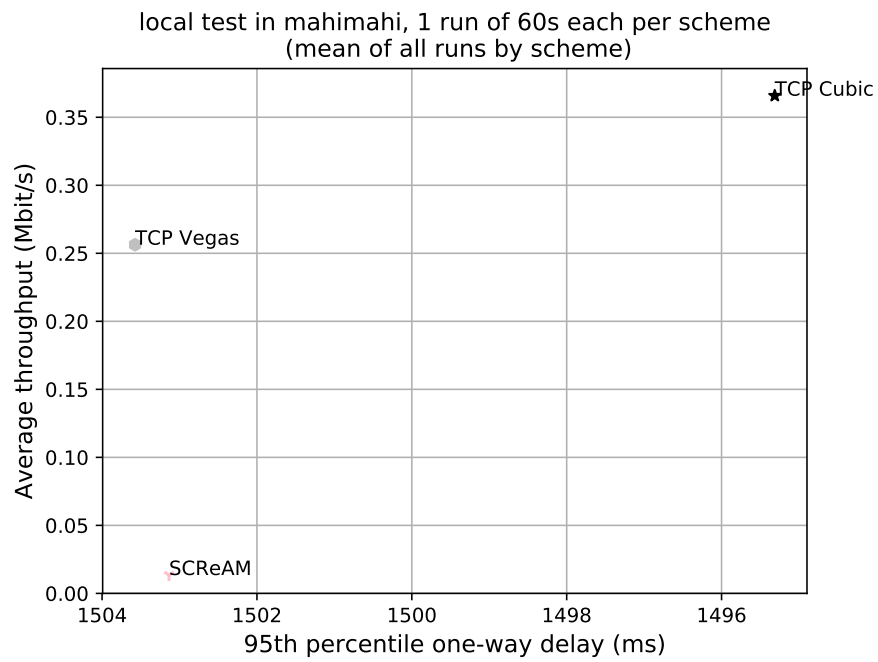
Repeated the test of 3 congestion control schemes once.

Each test lasted for 60 seconds running 1 flow.

```
System info:
Linux 6.8.0-57-generic
net.core.default_qdisc = fq
net.core.rmem_default = 212992
net.core.rmem_max = 212992
net.core.wmem_default = 212992
net.core.wmem_max = 212992
net.ipv4.tcp_rmem = 4096 131072 6291456
net.ipv4.tcp_wmem = 4096 16384 4194304

Git summary:
branch: master @ 23e738ce5acae1d36e321886cd613b0b9401ac11
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 463d89b09699a57bfdfbae351646df6a60040b90
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
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/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
 M src/ScreamClient
 M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

local test in mahimahi, 1 run of 60s each per scheme
(mean of all runs by scheme)

TCP Cubic

TCP Vegas

SCReAM

Average throughput (Mbit/s)

95th percentile one-way delay (ms)

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Average throughput (Mbit/s)

95th percentile one-way delay (ms)

- ● TCP Vegas
- Y SCReAM
- ★ TCP Cubic

scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP Cubic	1	0.37	1495.31	8.47
SCReAM	1	0.01	1503.14	0.00
TCP Vegas	1	0.26	1503.57	0.32

```
Run 1: Statistics of TCP Cubic

Start at: 2025-04-17 18:14:02
End at: 2025-04-17 18:15:03

# Below is generated by plot.py at 2025-04-17 18:17:47
# Datalink statistics
-- Total of 1 flow:
Average capacity: 34.11 Mbit/s
Average throughput: 0.37 Mbit/s (1.1% utilization)
95th percentile per-packet one-way delay: 1495.313 ms
Loss rate: 8.47%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 1495.313 ms
Loss rate: 8.47%
```
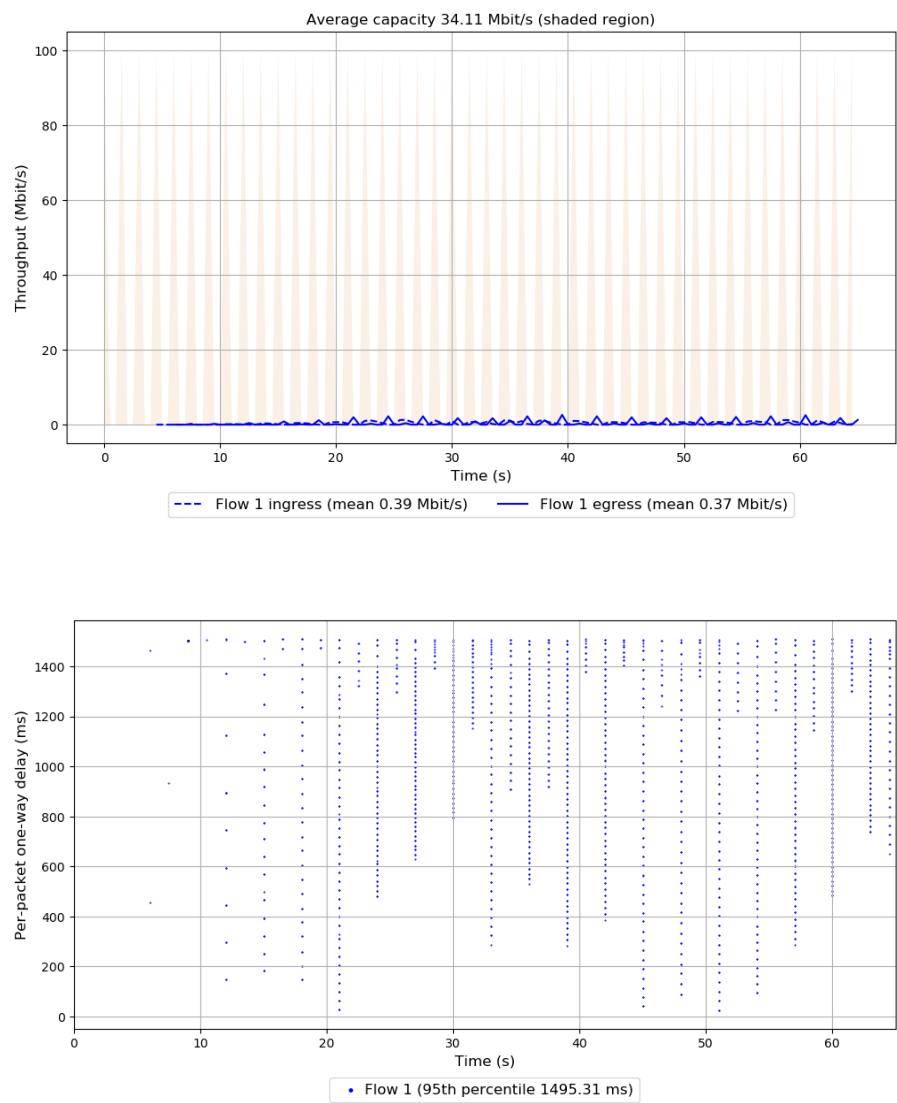
Run 1: Report of TCP Cubic — Data Link

Average capacity 34.11 Mbit/s (shaded region)

- - - - Flow 1 ingress (mean 0.39 Mbit/s) ——— Flow 1 egress (mean 0.37 Mbit/s)

• Flow 1 (95th percentile 1495.31 ms)

5

```
Run 1: Statistics of SCReAM

Start at: 2025-04-17 18:16:16
End at: 2025-04-17 18:17:16

# Below is generated by plot.py at 2025-04-17 18:17:47
# Datalink statistics
-- Total of 1 flow:
Average capacity: 34.11 Mbit/s
Average throughput: 0.01 Mbit/s (0.0% utilization)
95th percentile per-packet one-way delay: 1503.136 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1503.136 ms
Loss rate: 0.00%
```
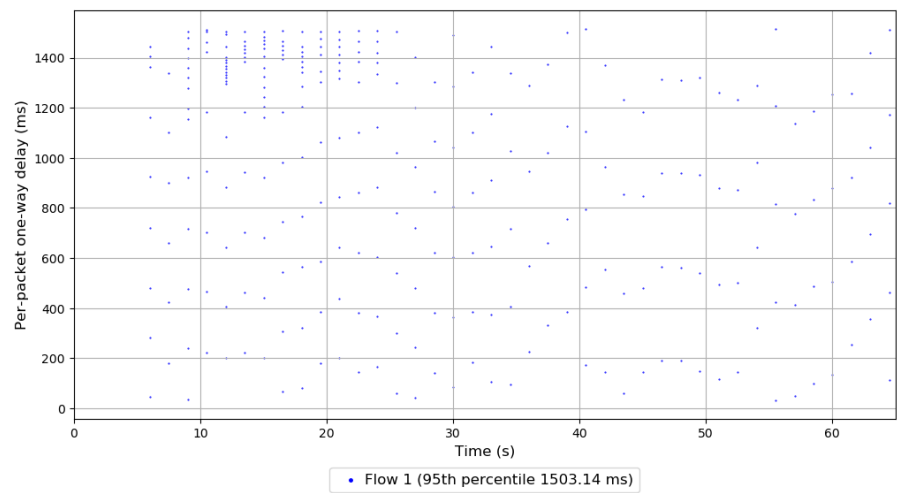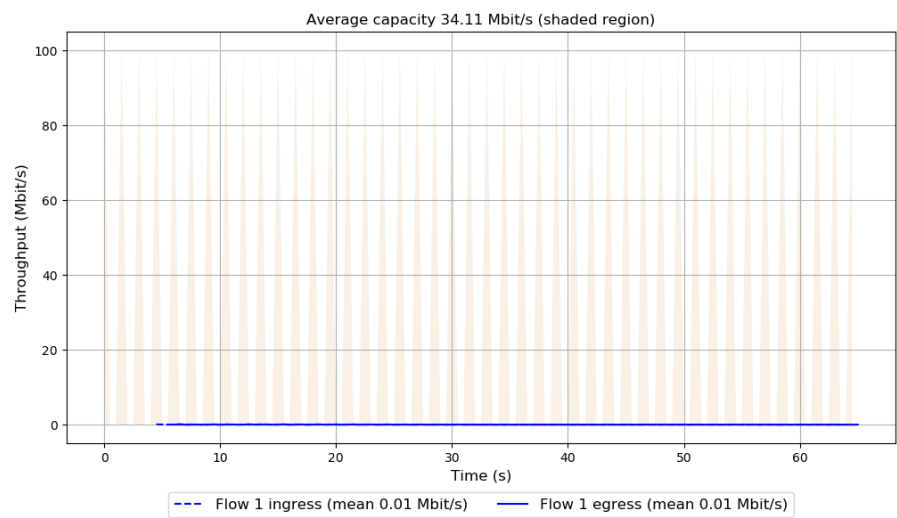
Run 1: Report of SCReAM — Data Link

Average capacity 34.11 Mbit/s (shaded region)

Flow 1 ingress (mean 0.01 Mbit/s) --- Flow 1 egress (mean 0.01 Mbit/s)

• Flow 1 (95th percentile 1503.14 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2025-04-17 18:15:09
End at: 2025-04-17 18:16:09

# Below is generated by plot.py at 2025-04-17 18:17:47
# Datalink statistics
-- Total of 1 flow:
Average capacity: 34.11 Mbit/s
Average throughput: 0.26 Mbit/s (0.8% utilization)
95th percentile per-packet one-way delay: 1503.574 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 1503.574 ms
Loss rate: 0.32%
```

Run 1: Report of TCP Vegas — Data Link

Average capacity 34.11 Mbit/s (shaded region)

- - - - Flow 1 ingress (mean 0.25 Mbit/s) ——— Flow 1 egress (mean 0.26 Mbit/s)

• Flow 1 (95th percentile 1503.57 ms)