Pantheon Report

Generated at 2019-10-21 21:05:30 (UTC).

Tested in mahimahi: `mm-delay 28 mm-loss uplink 0.0477 mm-link 10mbps.trace 10mbps.trace --uplink-queue=droptail --uplink-queue-args=packets=14`

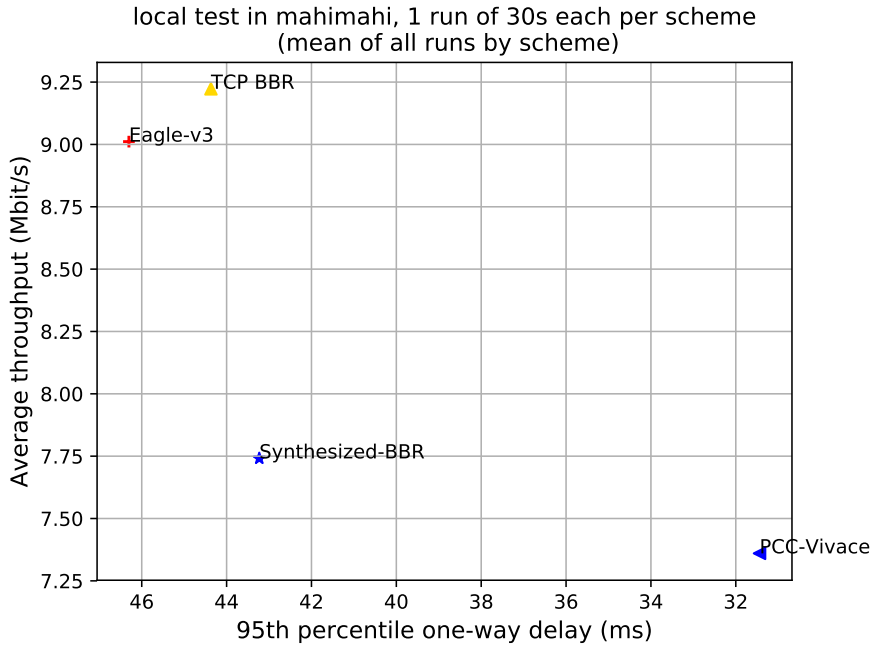
Repeated the test of 5 congestion control schemes once.

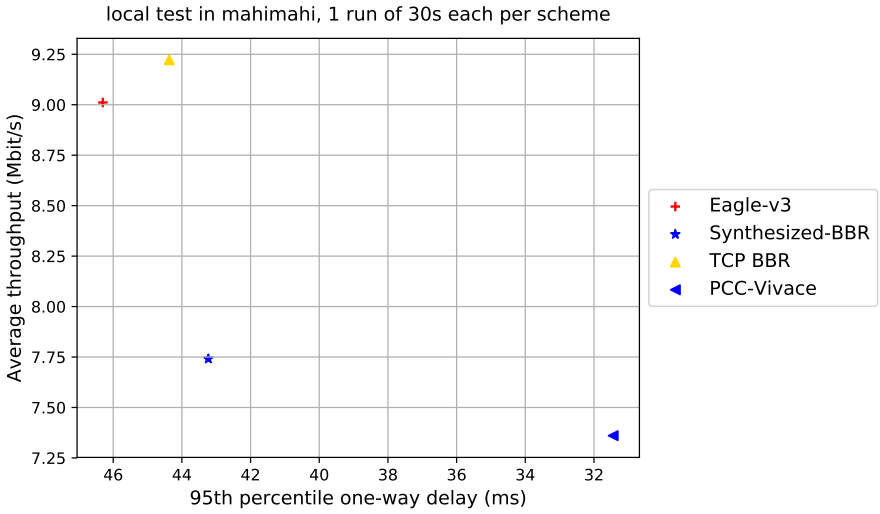
Each test lasted for 30 seconds running 1 flow.

```
System info:
Linux 4.15.0-65-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 87380 6291456
net.ipv4.tcp_wmem = 4096 16384 4194304
```

```
Git summary:
branch: master @ b54fc866b3140559c1fa1782d26fa636f7a43a8d
third_party/aurora @ f3e943d61015b39960854ba6391797e0c7984d74
third_party/aurora-model @ e292c316c23fb837255c4e142e40590d154bbe95
third_party/eagle-v1 @ c68d985e042be5c30704c0aee48c363861951a95
third_party/eagle-v2 @ c8a1737b3c84d7d49eada5b8785045d272a70120
third_party/eagle-v3 @ a63fea7809d9b57a6dbfc95c54181b54157c2b45
 M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/datagram_pb2.cpython-36.
 M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/helpers.cpython-36.pyc
 M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/mahimahi.cpython-36.pyc
 M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/project_root.cpython-36.
 M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/receiver.cpython-36.pyc
 M sender-receiver/sender-receiver/sender_receiver/envs/model-xentropy/model-xentropy.pt
 M sender-receiver/sender-receiver/sender_receiver/logs.txt
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
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
 M src/examples/cellsim.cc
 M src/examples/sproutbt2.cc
 M src/network/sproutconn.cc
third_party/synthesizedBBR @ a63fea7809d9b57a6dbfc95c54181b54157c2b45
 M sender-receiver/sender-receiver/sender_receiver/__pycache__/__init__.cpython-36.pyc
 M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/__init__.cpython-36.pyc
 M sender-receiver/sender-receiver/sender_receiver/envs/__pycache__/sender_receiver_env.cpyt
 M sender-receiver/sender-receiver/sender_receiver/envs/model-xentropy/model-xentropy.pt
 M sender-receiver/sender-receiver/sender_receiver/envs/sender_receiver_env.py
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
 M src/verus.hpp
 M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```


local test in mahimahi, 1 run of 30s each per scheme
(mean of all runs by scheme)
TCP BBR
Eagle-v3
Synthesized-BBR
PCC-Vivace
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
9.25
9.00
8.75
8.50
8.25
8.00
7.75
7.50
7.25
46
44
42
40
38
36
34
32

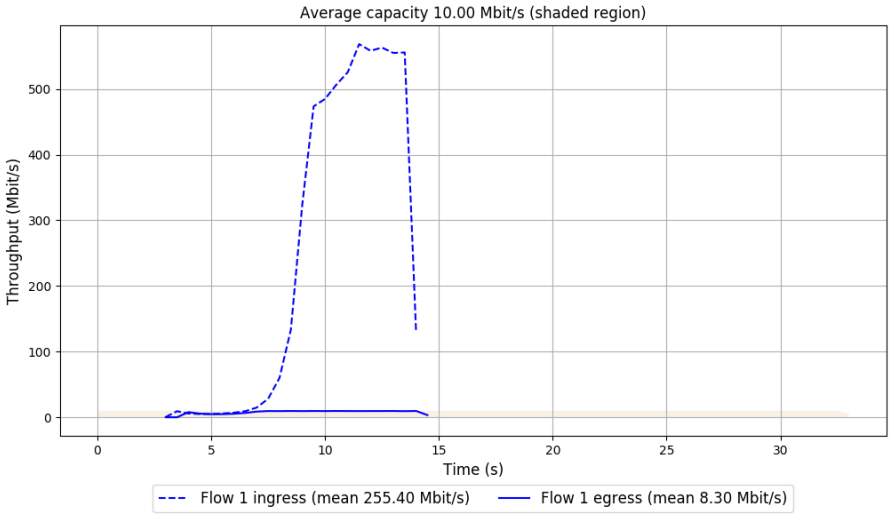

local test in mahimahi, 1 run of 30s each per scheme
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
Eagle-v3
Synthesized-BBR
TCP BBR
PCC-Vivace
9.25
9.00
8.75
8.50
8.25
8.00
7.75
7.50
7.25
46
44
42
40
38
36
34
32

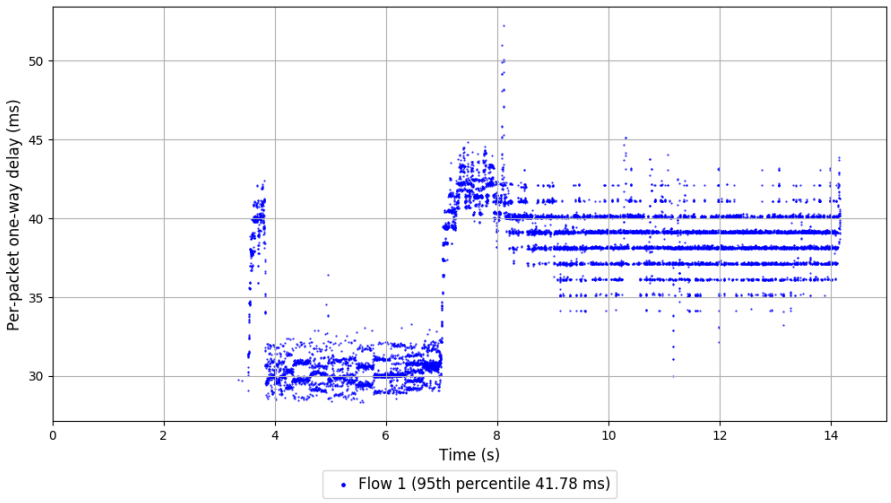
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
Aurora	0	N/A	N/A	N/A
TCP BBR	1	9.22	44.37	6.72
Eagle-v3	1	9.01	46.30	11.76
Synthesized-BBR	1	7.74	43.23	5.90
PCC-Vivace	1	7.36	31.44	4.92

```
Run 1: Statistics of Aurora

Start at: 2019-10-21 21:04:03
End at: 2019-10-21 21:04:33
```

Run 1: Report of Aurora — Data Link



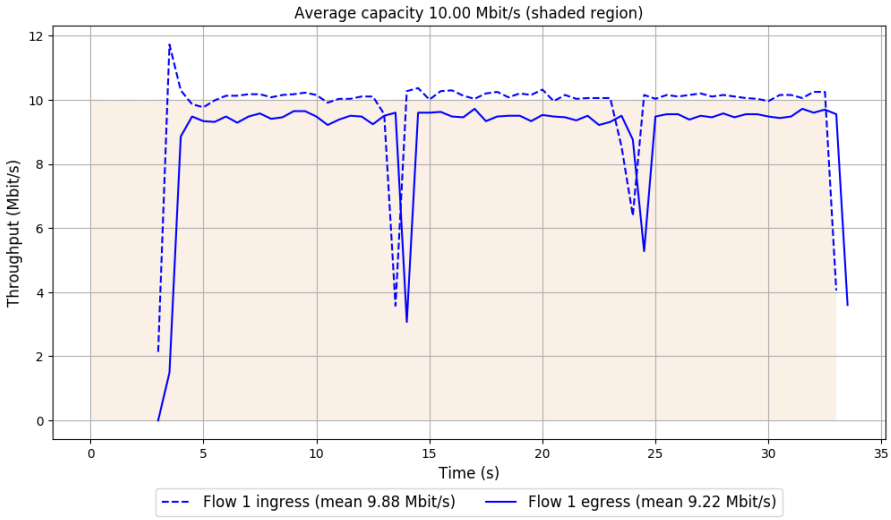


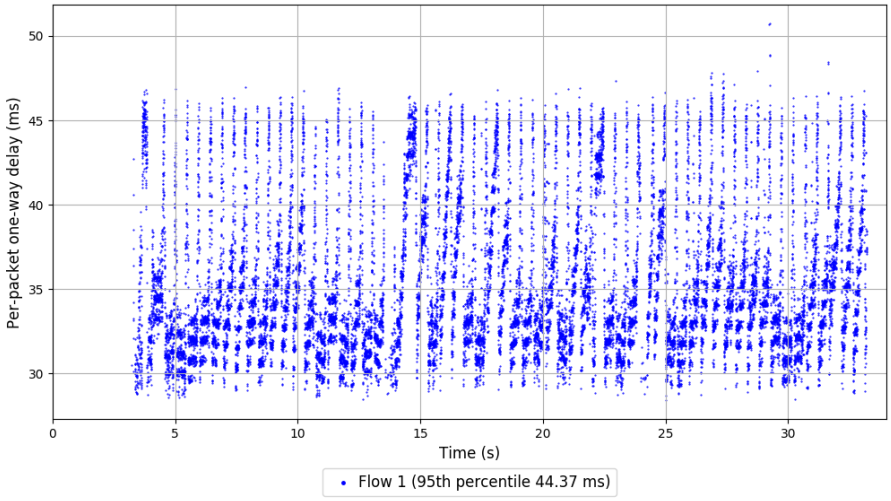
```
Run 1: Statistics of TCP BBR

Start at: 2019-10-21 21:02:19
End at: 2019-10-21 21:02:49

# Below is generated by plot.py at 2019-10-21 21:05:29
# Datalink statistics
-- Total of 1 flow:
Average capacity: 10.00 Mbit/s
Average throughput: 9.22 Mbit/s (92.2% utilization)
95th percentile per-packet one-way delay: 44.369 ms
Loss rate: 6.72%
-- Flow 1:
Average throughput: 9.22 Mbit/s
95th percentile per-packet one-way delay: 44.369 ms
Loss rate: 6.72%
```

Run 1: Report of TCP BBR — Data Link



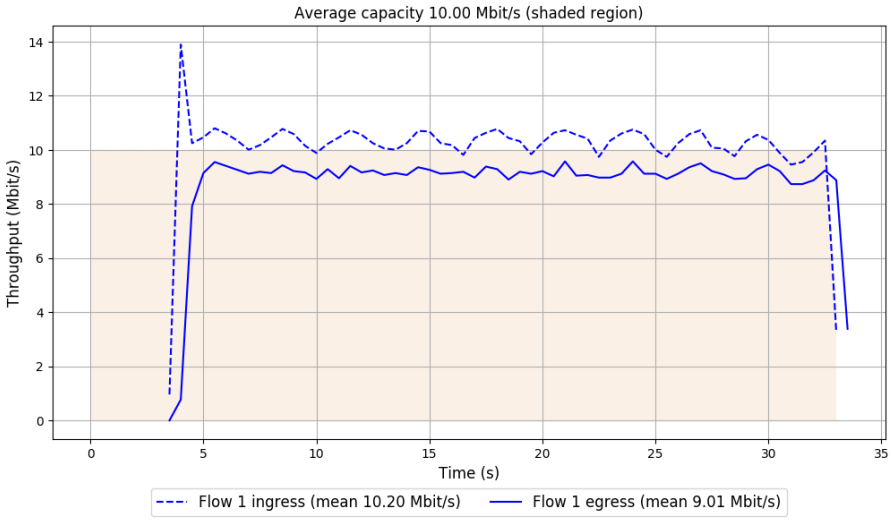


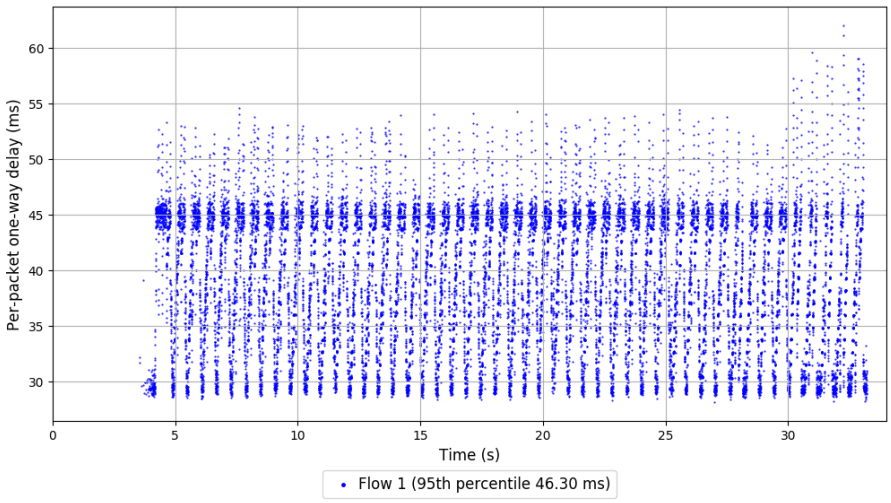
```
Run 1: Statistics of Eagle-v3

Start at: 2019-10-21 21:01:44
End at: 2019-10-21 21:02:14

# Below is generated by plot.py at 2019-10-21 21:05:29
# Datalink statistics
-- Total of 1 flow:
Average capacity: 10.00 Mbit/s
Average throughput: 9.01 Mbit/s (90.1% utilization)
95th percentile per-packet one-way delay: 46.302 ms
Loss rate: 11.76%
-- Flow 1:
Average throughput: 9.01 Mbit/s
95th percentile per-packet one-way delay: 46.302 ms
Loss rate: 11.76%
```

Run 1: Report of Eagle-v3 — Data Link



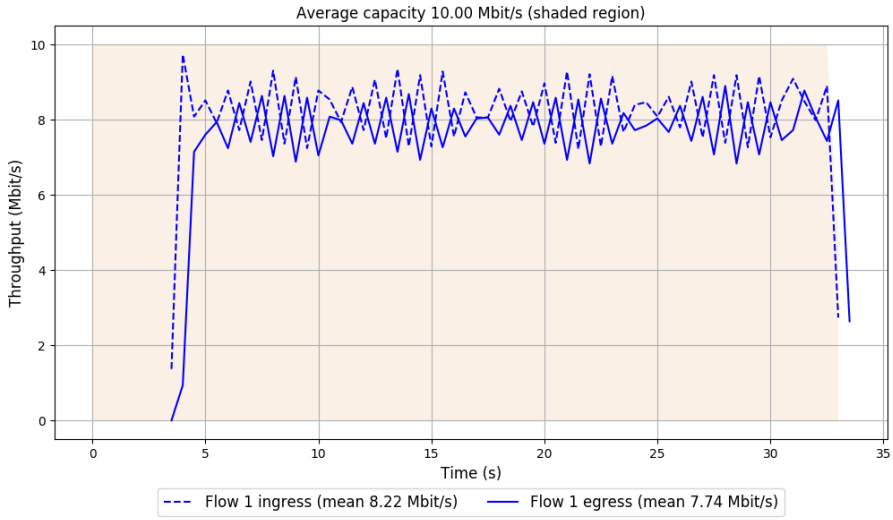


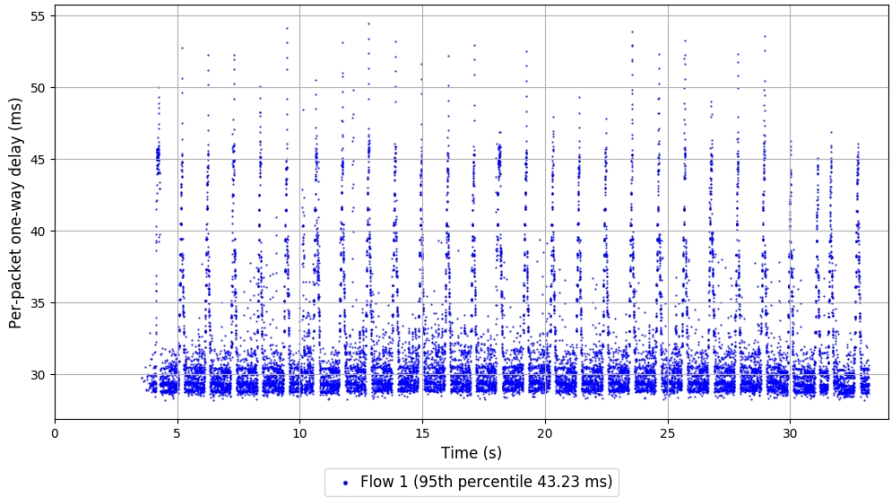
```
Run 1: Statistics of Synthesized-BBR

Start at: 2019-10-21 21:02:54
End at: 2019-10-21 21:03:24

# Below is generated by plot.py at 2019-10-21 21:05:29
# Datalink statistics
-- Total of 1 flow:
Average capacity: 10.00 Mbit/s
Average throughput: 7.74 Mbit/s (77.4% utilization)
95th percentile per-packet one-way delay: 43.230 ms
Loss rate: 5.90%
-- Flow 1:
Average throughput: 7.74 Mbit/s
95th percentile per-packet one-way delay: 43.230 ms
Loss rate: 5.90%
```

Run 1: Report of Synthesized-BBR — Data Link





```
Run 1: Statistics of PCC-Vivace

Start at: 2019-10-21 21:03:28
End at: 2019-10-21 21:03:58

# Below is generated by plot.py at 2019-10-21 21:05:29
# Datalink statistics
-- Total of 1 flow:
Average capacity: 10.00 Mbit/s
Average throughput: 7.36 Mbit/s (73.6% utilization)
95th percentile per-packet one-way delay: 31.441 ms
Loss rate: 4.92%
-- Flow 1:
Average throughput: 7.36 Mbit/s
95th percentile per-packet one-way delay: 31.441 ms
Loss rate: 4.92%
```

Run 1: Report of PCC-Vivace — Data Link