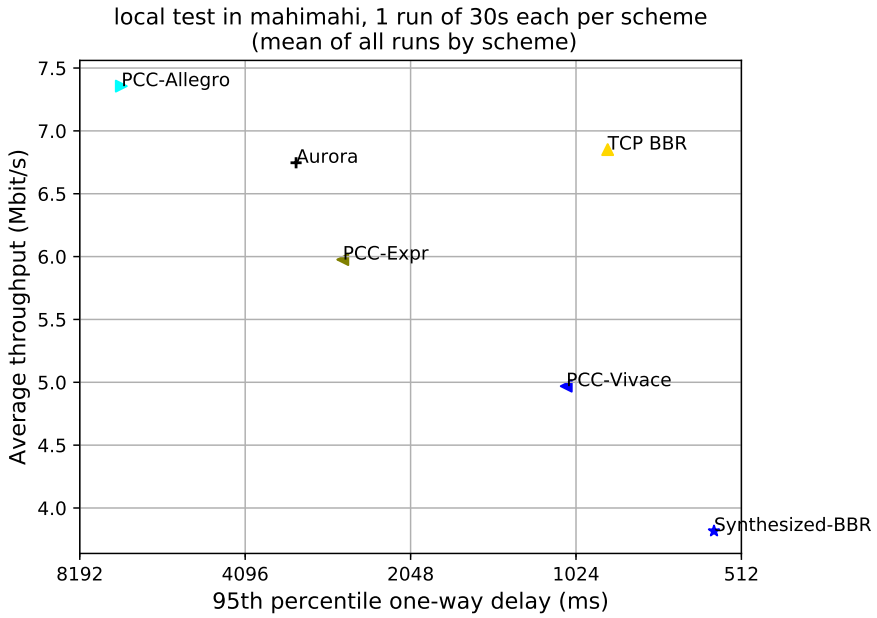
Pantheon Report

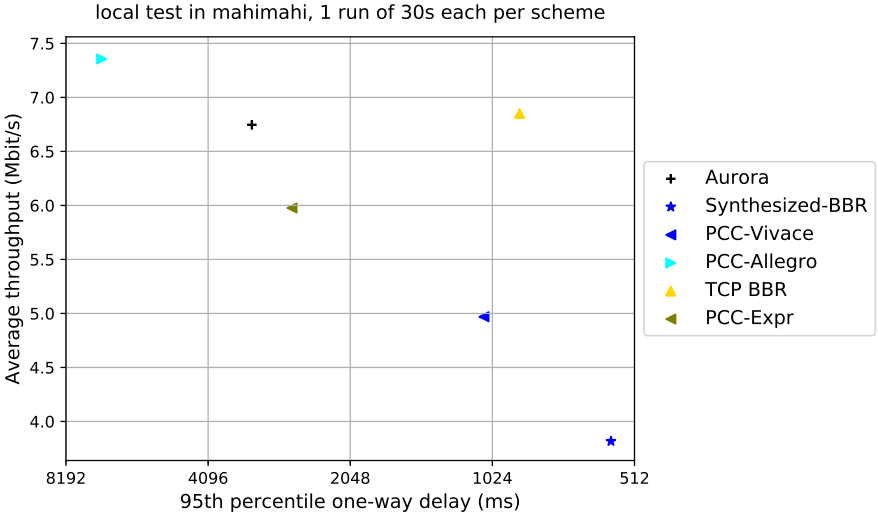
Generated at 2019-10-08 22:27:41 (UTC).
Tested in mahimahi: `mm-delay 100 mm-link Verizon-LTE-short.up Verizon-LTE-short.down`
Repeated the test of 6 congestion control schemes once.
Each test lasted for 30 seconds running 1 flow.

```
System info:
Linux 4.15.0-58-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 @ 0cba88cb273a03b4ddd6a06737eefd2f827d734d
third_party/aurora @ f3e943d61015b39960854ba6391797e0c7984d74
third_party/aurora-model @ e292c316c23fb837255c4e142e40590d154bbe95
third_party/eagle-v1 @ c68d985e042be5c30704c0aee48c363861951a95
third_party/eagle-v2 @ c8a1737b3c84d7d49eada5b8785045d272a70120
third_party/eagle-v3 @ 27045f2c9e7b63716dab4980f0a45a660dff3d51
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 @ 27045f2c9e7b63716dab4980f0a45a660dff3d51
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)
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
PCC-Allegro
Aurora
TCP BBR
PCC-Expr
PCC-Vivace
Synthesized-BBR
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
8192
4096
2048
1024
512


local test in mahimahi, 1 run of 30s each per scheme
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
Aurora
Synthesized-BBR
PCC-Vivace
PCC-Allegro
TCP BBR
PCC-Expr
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
8192
4096
2048
1024
512

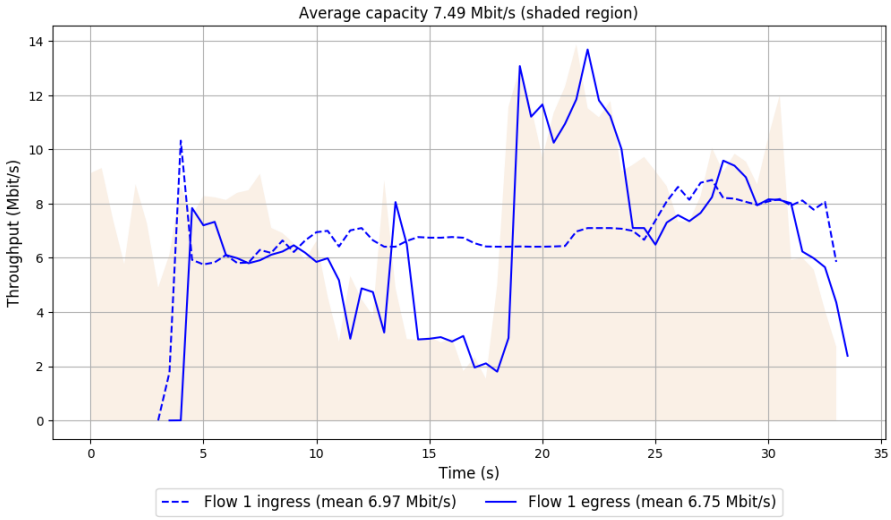
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
Aurora	1	6.75	3309.30	3.56
TCP BBR	1	6.85	896.80	2.00
PCC-Allegro	1	7.36	6882.51	15.43
PCC-Expr	1	5.98	2721.36	6.51
Synthesized-BBR	1	3.82	574.29	4.54
PCC-Vivace	1	4.97	1066.94	10.06

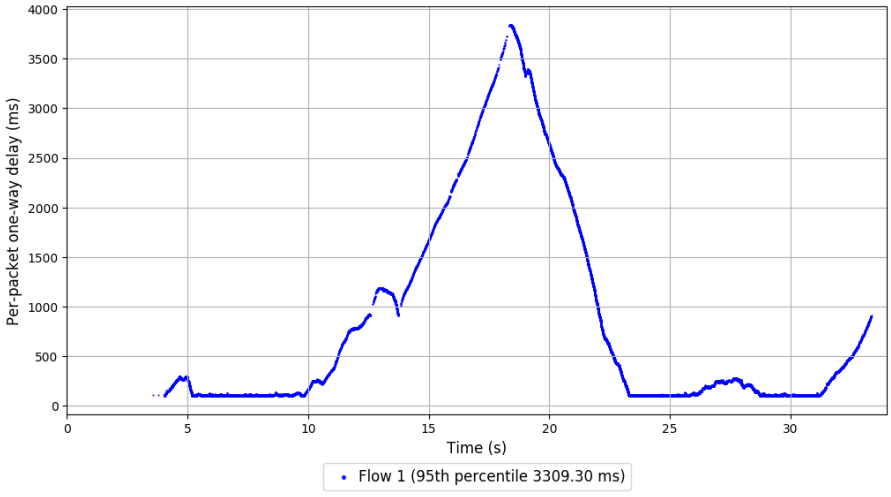
```
Run 1: Statistics of Aurora

Start at: 2019-10-08 22:25:00
End at: 2019-10-08 22:25:30

# Below is generated by plot.py at 2019-10-08 22:27:38
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.49 Mbit/s
Average throughput: 6.75 Mbit/s (90.1% utilization)
95th percentile per-packet one-way delay: 3309.296 ms
Loss rate: 3.56%
-- Flow 1:
Average throughput: 6.75 Mbit/s
95th percentile per-packet one-way delay: 3309.296 ms
Loss rate: 3.56%
```

Run 1: Report of Aurora — Data Link



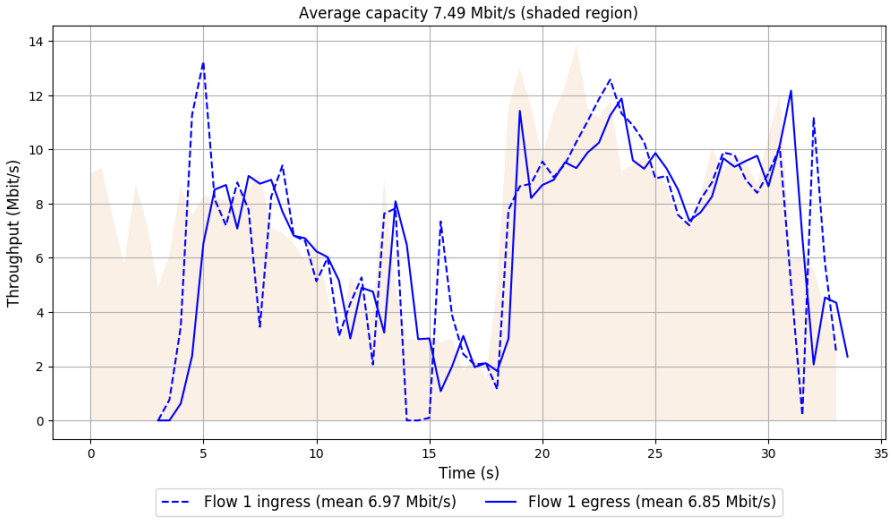


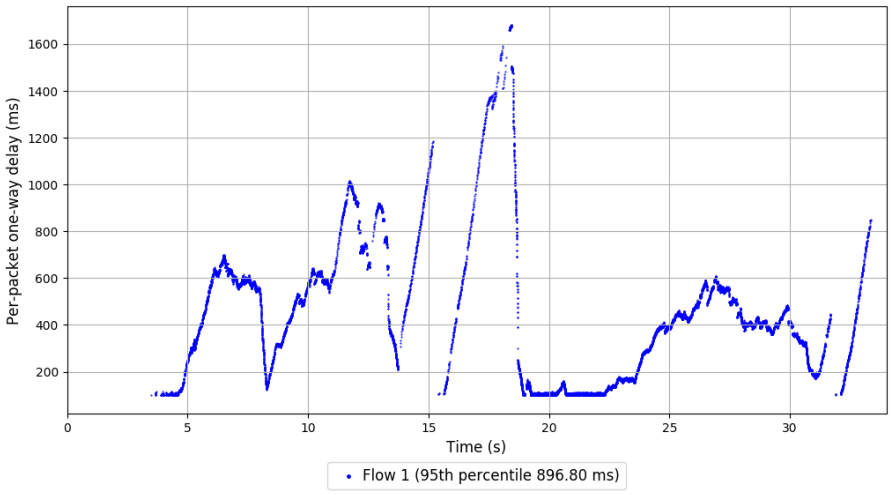
```
Run 1: Statistics of TCP BBR

Start at: 2019-10-08 22:23:17
End at: 2019-10-08 22:23:47

# Below is generated by plot.py at 2019-10-08 22:27:38
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.49 Mbit/s
Average throughput: 6.85 Mbit/s (91.5% utilization)
95th percentile per-packet one-way delay: 896.805 ms
Loss rate: 2.00%
-- Flow 1:
Average throughput: 6.85 Mbit/s
95th percentile per-packet one-way delay: 896.805 ms
Loss rate: 2.00%
```

Run 1: Report of TCP BBR — Data Link



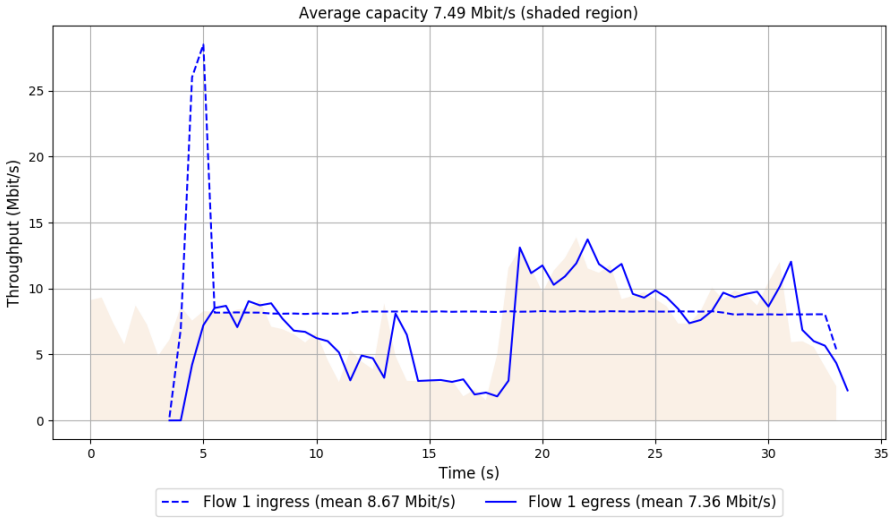


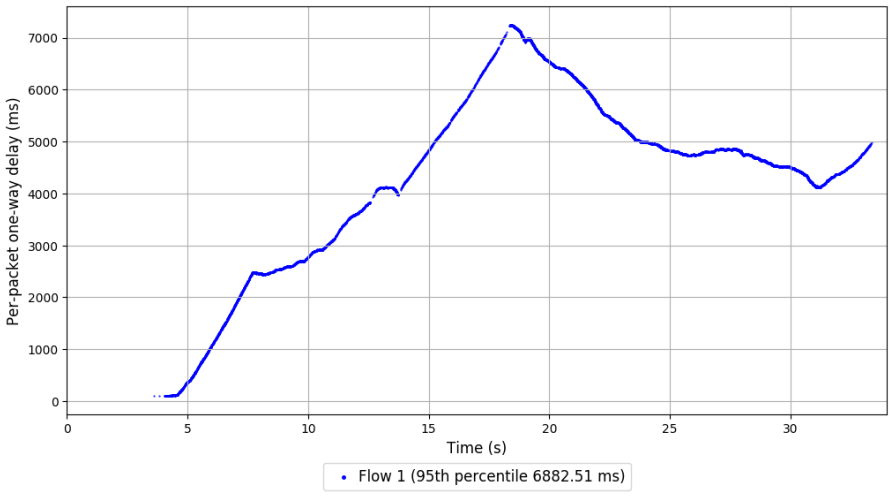
```
Run 1: Statistics of PCC-Allegro

Start at: 2019-10-08 22:24:26
End at: 2019-10-08 22:24:56

# Below is generated by plot.py at 2019-10-08 22:27:38
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.49 Mbit/s
Average throughput: 7.36 Mbit/s (98.2% utilization)
95th percentile per-packet one-way delay: 6882.512 ms
Loss rate: 15.43%
-- Flow 1:
Average throughput: 7.36 Mbit/s
95th percentile per-packet one-way delay: 6882.512 ms
Loss rate: 15.43%
```

Run 1: Report of PCC-Allegro — Data Link



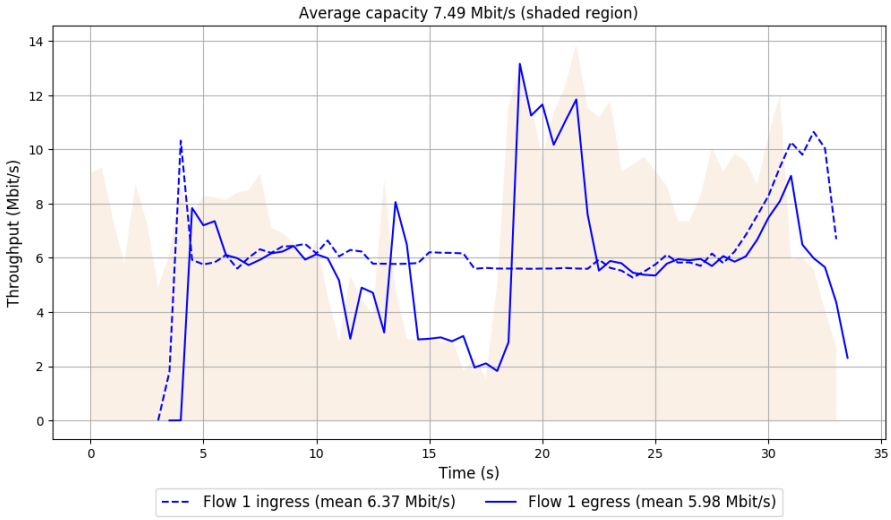


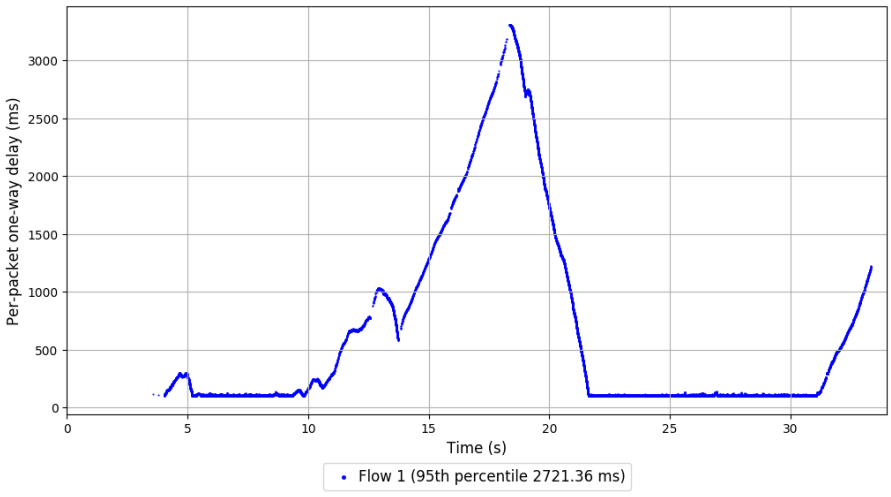
```
Run 1: Statistics of PCC-Expr

Start at: 2019-10-08 22:23:51
End at: 2019-10-08 22:24:21

# Below is generated by plot.py at 2019-10-08 22:27:38
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.49 Mbit/s
Average throughput: 5.98 Mbit/s (79.8% utilization)
95th percentile per-packet one-way delay: 2721.358 ms
Loss rate: 6.51%
-- Flow 1:
Average throughput: 5.98 Mbit/s
95th percentile per-packet one-way delay: 2721.358 ms
Loss rate: 6.51%
```

Run 1: Report of PCC-Expr — Data Link



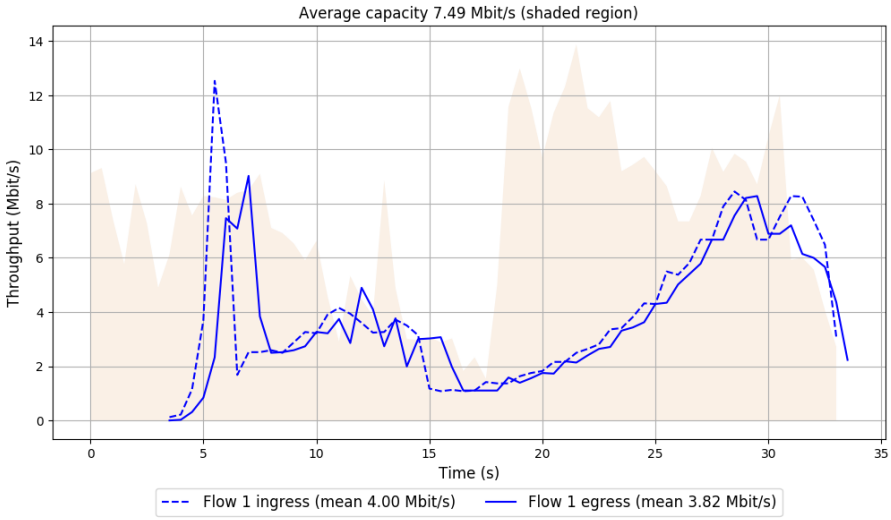


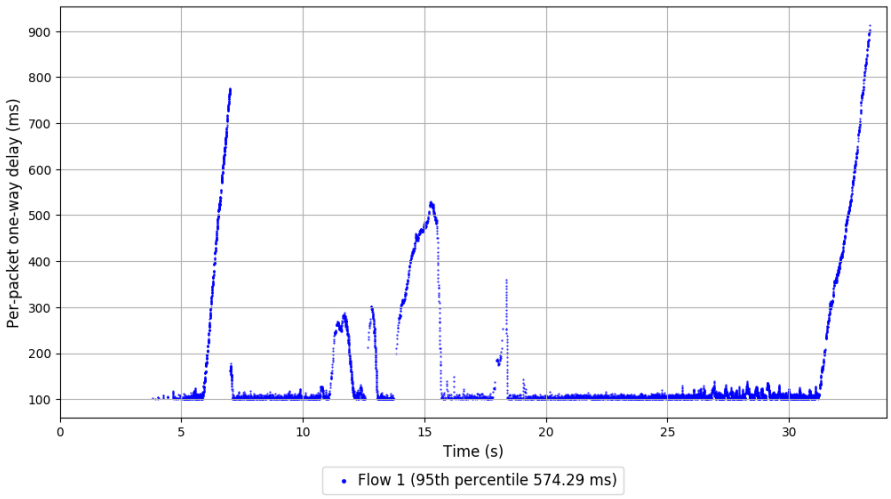
```
Run 1: Statistics of Synthesized-BBR

Start at: 2019-10-08 22:26:08
End at: 2019-10-08 22:26:38

# Below is generated by plot.py at 2019-10-08 22:27:39
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.49 Mbit/s
Average throughput: 3.82 Mbit/s (51.0% utilization)
95th percentile per-packet one-way delay: 574.290 ms
Loss rate: 4.54%
-- Flow 1:
Average throughput: 3.82 Mbit/s
95th percentile per-packet one-way delay: 574.290 ms
Loss rate: 4.54%
```

Run 1: Report of Synthesized-BBR — Data Link





```
Run 1: Statistics of PCC-Vivace

Start at: 2019-10-08 22:25:34
End at: 2019-10-08 22:26:04

# Below is generated by plot.py at 2019-10-08 22:27:40
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.49 Mbit/s
Average throughput: 4.97 Mbit/s (66.4% utilization)
95th percentile per-packet one-way delay: 1066.942 ms
Loss rate: 10.06%
-- Flow 1:
Average throughput: 4.97 Mbit/s
95th percentile per-packet one-way delay: 1066.942 ms
Loss rate: 10.06%
```

Run 1: Report of PCC-Vivace — Data Link