Pantheon Report

Generated at 2022-03-11 08:41:00 (UTC).
Tested in mahimahi: `mm-delay 100 mm-link 12Mbps_trace 12Mbps_trace`
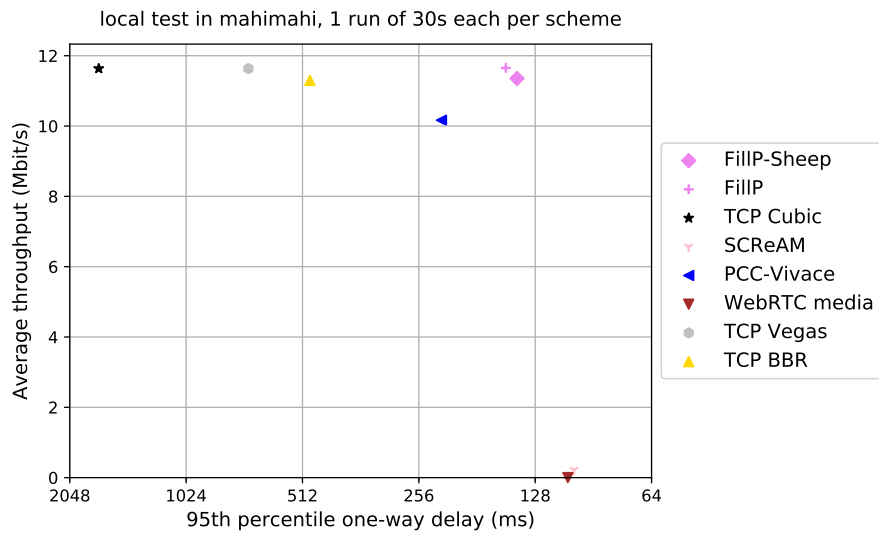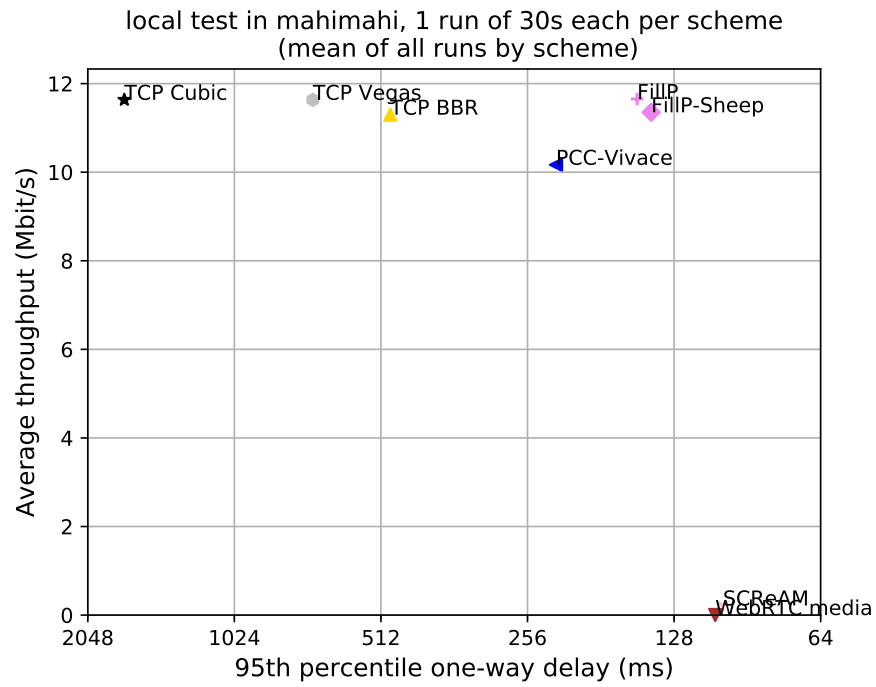Repeated the test of 9 congestion control schemes once.
Each test lasted for 30 seconds running 1 flow.

```
System info:
Linux 4.15.0-159-generic
net.core.default_qdisc = fq_codel
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 @ ab1f63ce696d5eba89174b9c502dc4faac695d8c
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
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
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)

local test in mahimahi, 1 run of 30s each per scheme

scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	1	11.30	489.89	0.86
TCP Cubic	1	11.63	1723.26	4.19
FillP	1	11.65	152.44	0.39
FillP-Sheep	1	11.35	142.64	0.31
QUIC Cubic	0	N/A	N/A	N/A
SCReAM	1	0.22	101.59	0.26
TCP Vegas	1	11.63	706.61	2.26
PCC-Vivace	1	10.17	223.78	0.41
WebRTC media	1	0.00	105.38	0.00

```
Run 1: Statistics of TCP BBR

Start at: 2022-03-11 08:36:57
End at: 2022-03-11 08:37:27

# Below is generated by plot.py at 2022-03-11 08:40:56
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 11.30 Mbit/s (94.1% utilization)
95th percentile per-packet one-way delay: 489.894 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 11.30 Mbit/s
95th percentile per-packet one-way delay: 489.894 ms
Loss rate: 0.86%
```
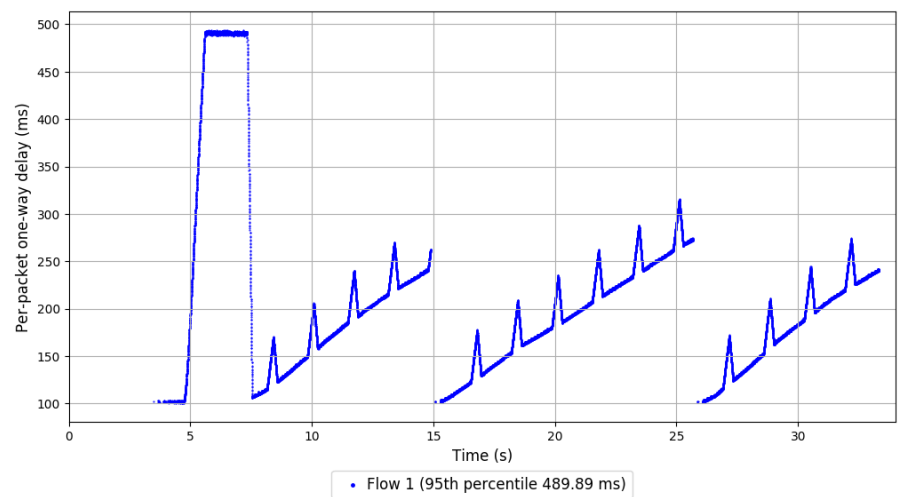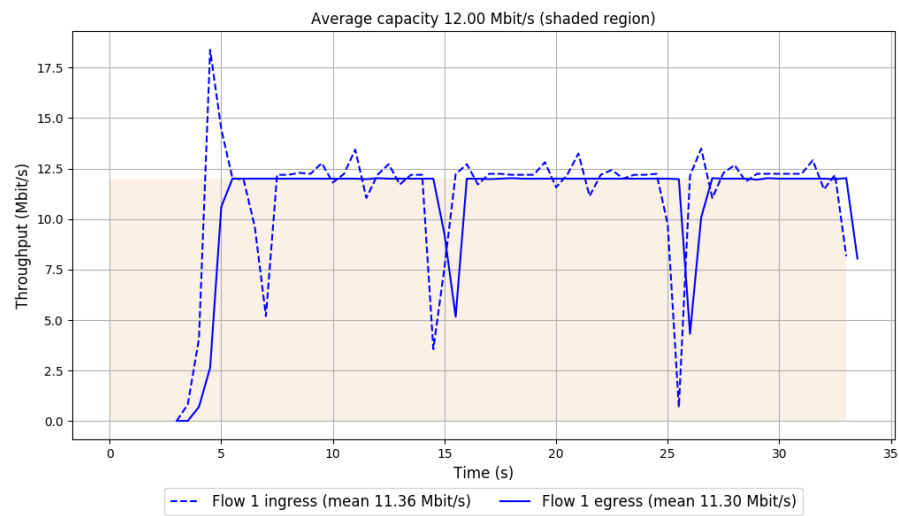
Run 1: Report of TCP BBR — Data Link

Average capacity 12.00 Mbit/s (shaded region)

Flow 1 ingress (mean 11.36 Mbit/s) — Flow 1 egress (mean 11.30 Mbit/s)

Flow 1 (95th percentile 489.89 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2022-03-11 08:35:13
End at: 2022-03-11 08:35:43

# Below is generated by plot.py at 2022-03-11 08:40:56
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 11.63 Mbit/s (96.9% utilization)
95th percentile per-packet one-way delay: 1723.261 ms
Loss rate: 4.19%
-- Flow 1:
Average throughput: 11.63 Mbit/s
95th percentile per-packet one-way delay: 1723.261 ms
Loss rate: 4.19%
```
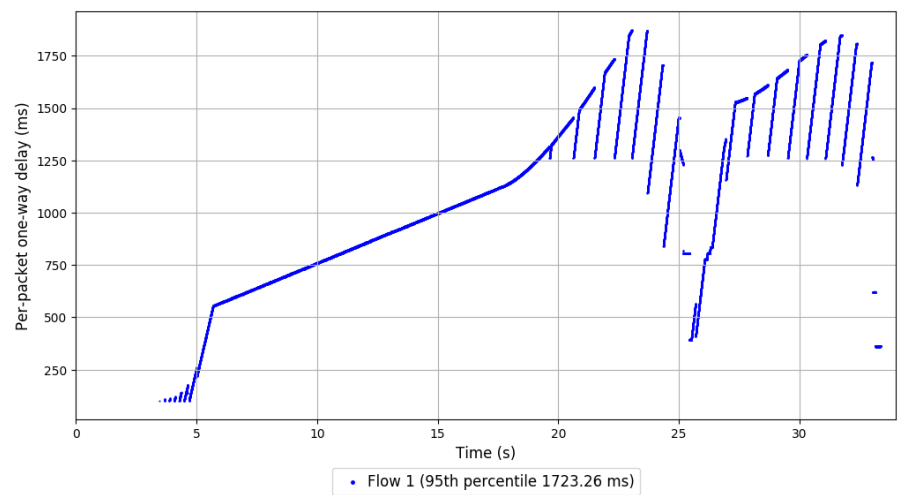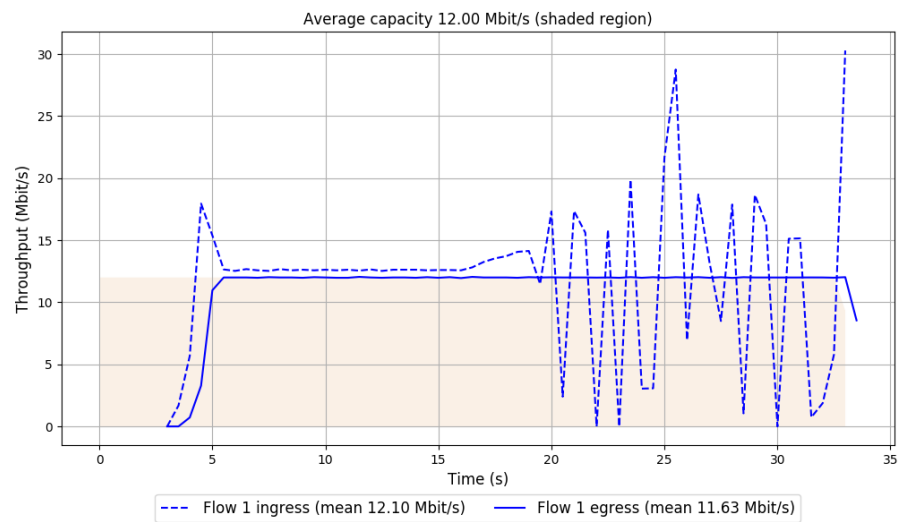
Run 1: Report of TCP Cubic — Data Link

Average capacity 12.00 Mbit/s (shaded region)

Flow 1 ingress (mean 12.10 Mbit/s)   Flow 1 egress (mean 11.63 Mbit/s)

Flow 1 (95th percentile 1723.26 ms)

```
Run 1: Statistics of FillP

Start at: 2022-03-11 08:34:38
End at: 2022-03-11 08:35:08

# Below is generated by plot.py at 2022-03-11 08:40:58
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 11.65 Mbit/s (97.1% utilization)
95th percentile per-packet one-way delay: 152.438 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 11.65 Mbit/s
95th percentile per-packet one-way delay: 152.438 ms
Loss rate: 0.39%
```
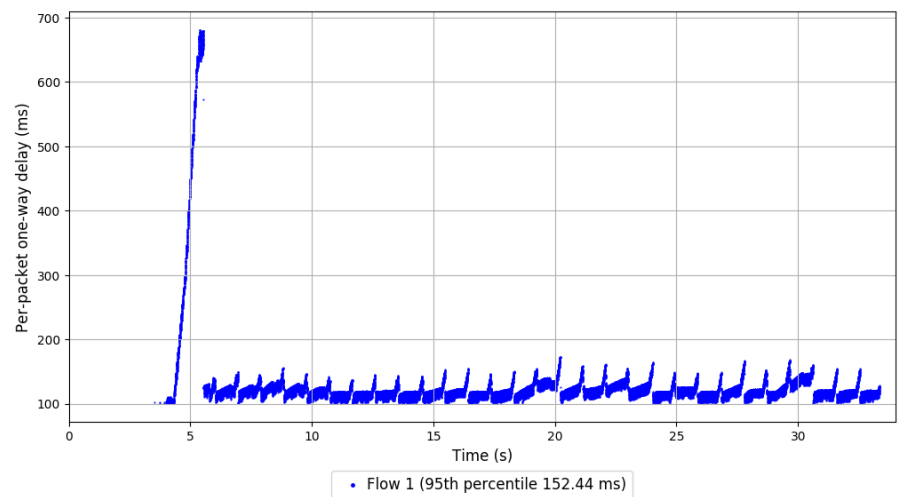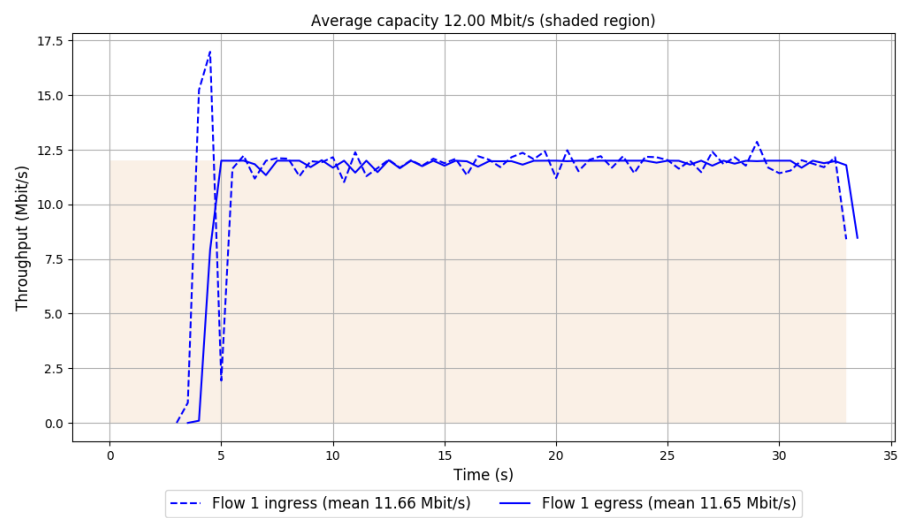
Run 1: Report of FillP — Data Link

Average capacity 12.00 Mbit/s (shaded region)

Flow 1 ingress (mean 11.66 Mbit/s) — Flow 1 egress (mean 11.65 Mbit/s)

Flow 1 (95th percentile 152.44 ms)

```
Run 1: Statistics of FillP-Sheep

Start at: 2022-03-11 08:34:03
End at: 2022-03-11 08:34:33


# Below is generated by plot.py at 2022-03-11 08:40:58
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 11.35 Mbit/s (94.6% utilization)
95th percentile per-packet one-way delay: 142.640 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 11.35 Mbit/s
95th percentile per-packet one-way delay: 142.640 ms
Loss rate: 0.31%
```
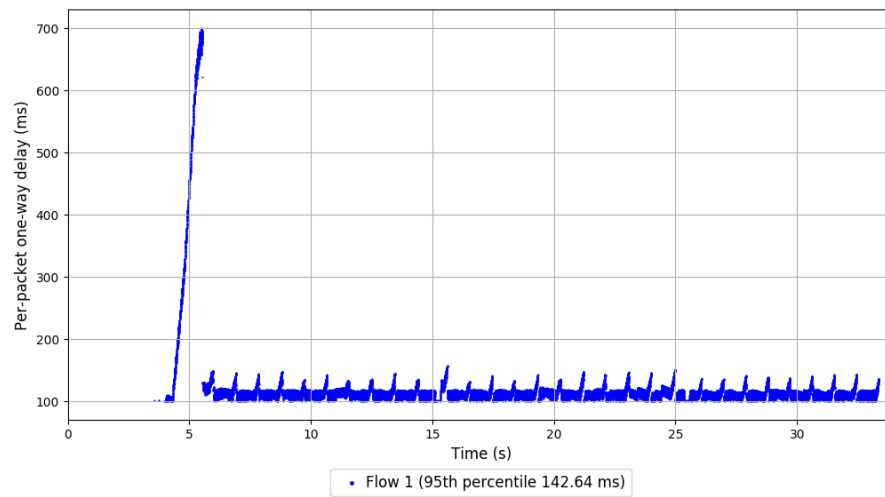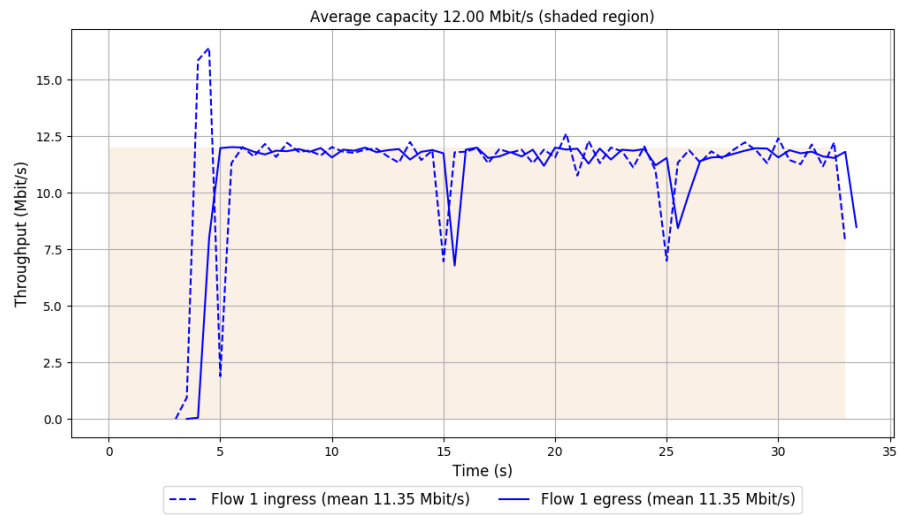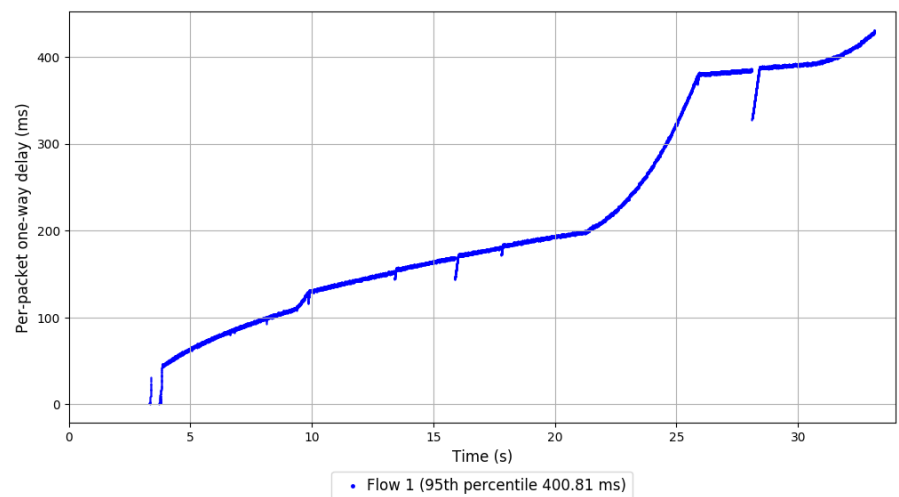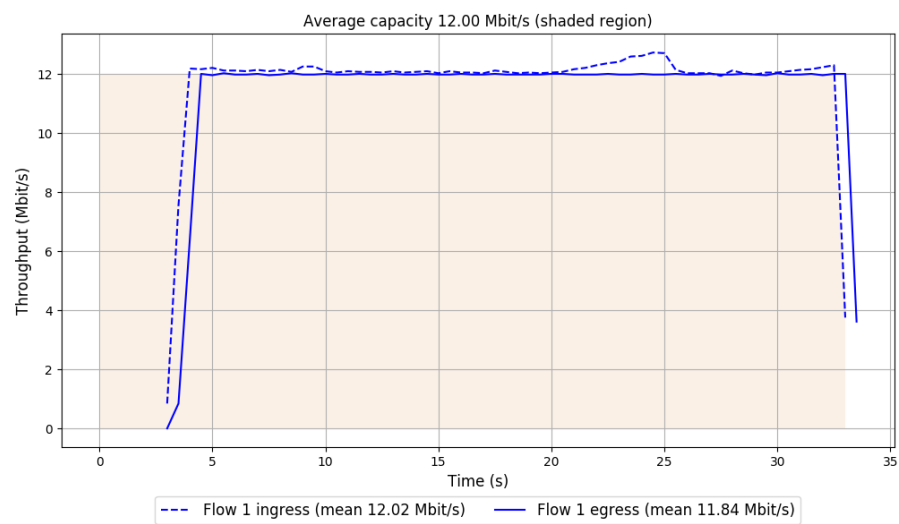
Run 1: Report of FillP-Sheep — Data Link

Average capacity 12.00 Mbit/s (shaded region)

```
Run 1: Statistics of QUIC Cubic

Start at: 2022-03-11 08:38:06
End at: 2022-03-11 08:38:36
```

Run 1: Report of QUIC Cubic — Data Link

Average capacity 12.00 Mbit/s (shaded region)

- - - Flow 1 ingress (mean 12.02 Mbit/s) —— Flow 1 egress (mean 11.84 Mbit/s)

• Flow 1 (95th percentile 400.81 ms)

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```
Run 1: Statistics of SCReAM

Start at: 2022-03-11 08:35:47
End at: 2022-03-11 08:36:18

# Below is generated by plot.py at 2022-03-11 08:40:58
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 0.22 Mbit/s (1.8% utilization)
95th percentile per-packet one-way delay: 101.594 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 101.594 ms
Loss rate: 0.26%
```
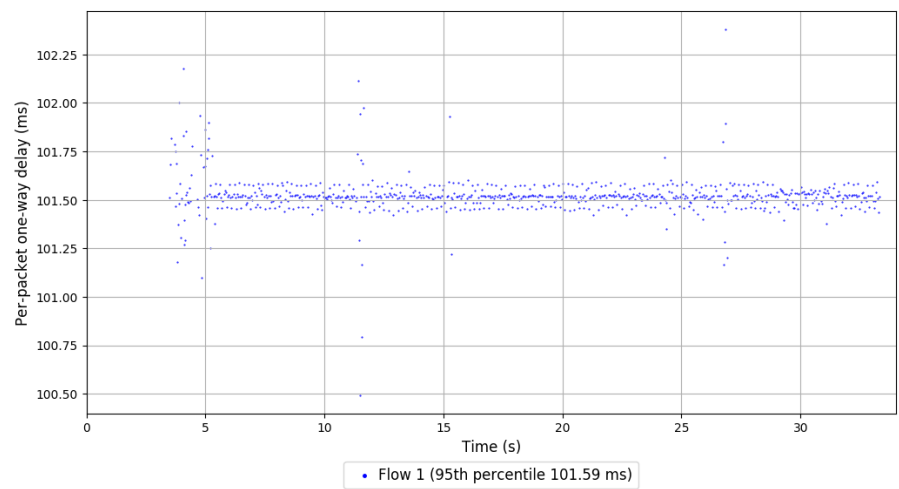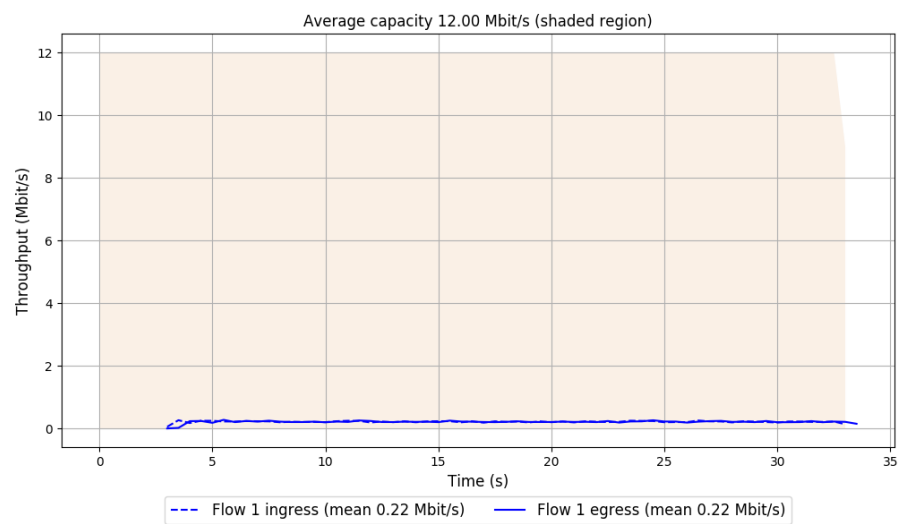
Run 1: Report of SCReAM — Data Link

Average capacity 12.00 Mbit/s (shaded region)

Flow 1 ingress (mean 0.22 Mbit/s) — Flow 1 egress (mean 0.22 Mbit/s)

• Flow 1 (95th percentile 101.59 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2022-03-11 08:37:31
End at: 2022-03-11 08:38:01

# Below is generated by plot.py at 2022-03-11 08:40:58
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 11.63 Mbit/s (96.9% utilization)
95th percentile per-packet one-way delay: 706.605 ms
Loss rate: 2.26%
-- Flow 1:
Average throughput: 11.63 Mbit/s
95th percentile per-packet one-way delay: 706.605 ms
Loss rate: 2.26%
```
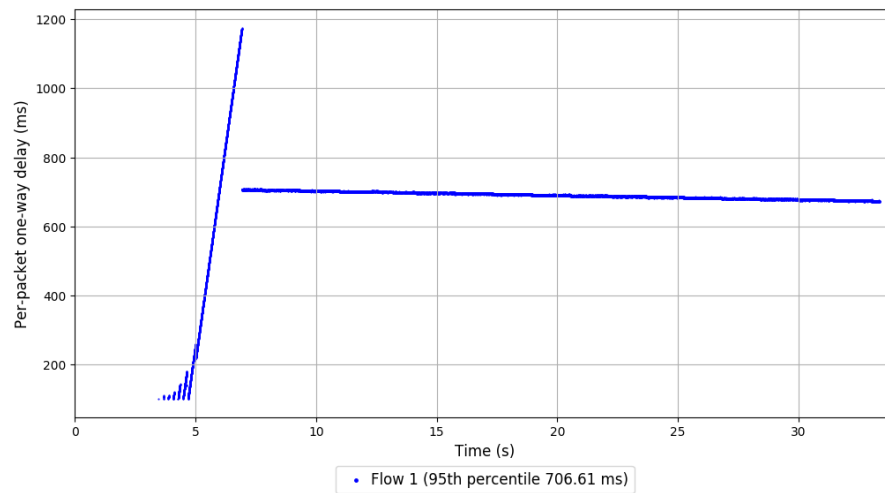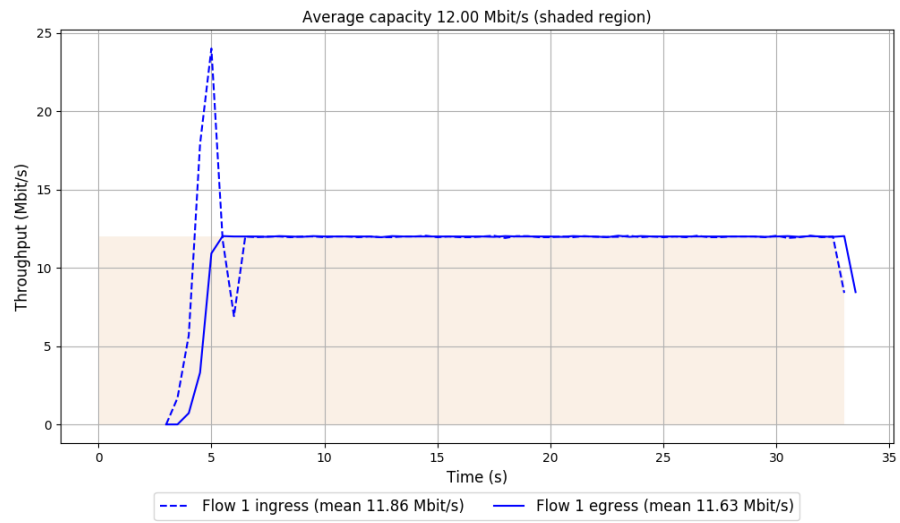
Run 1: Report of TCP Vegas — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2022-03-11 08:36:22
End at: 2022-03-11 08:36:52

# Below is generated by plot.py at 2022-03-11 08:40:58
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 10.17 Mbit/s (84.7% utilization)
95th percentile per-packet one-way delay: 223.785 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 10.17 Mbit/s
95th percentile per-packet one-way delay: 223.785 ms
Loss rate: 0.41%
```
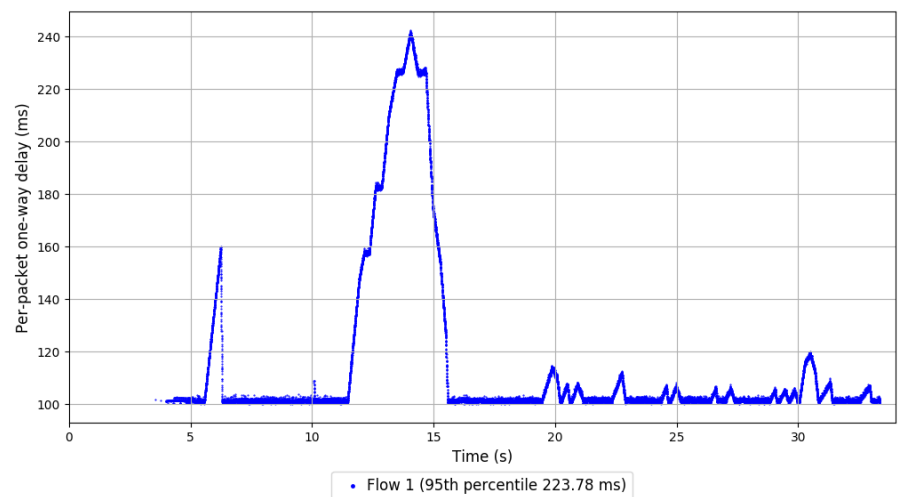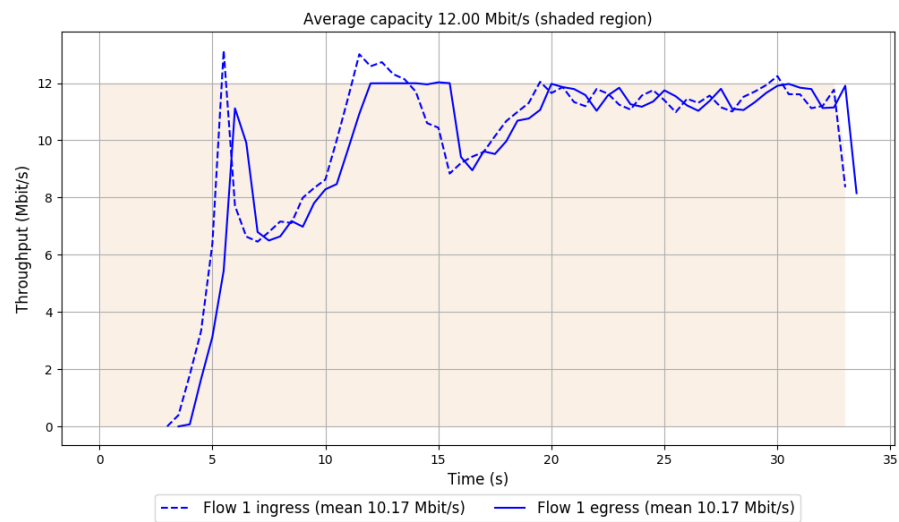
Run 1: Report of PCC-Vivace — Data Link

Average capacity 12.00 Mbit/s (shaded region)

Flow 1 ingress (mean 10.17 Mbit/s)   Flow 1 egress (mean 10.17 Mbit/s)

Flow 1 (95th percentile 223.78 ms)

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```
Run 1: Statistics of WebRTC media

Start at: 2022-03-11 08:38:41
End at: 2022-03-11 08:39:11


# Below is generated by plot.py at 2022-03-11 08:40:58
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 0.00 Mbit/s (0.0% utilization)
95th percentile per-packet one-way delay: 105.383 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 105.383 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link

Average capacity 12.00 Mbit/s (shaded region)

Flow 1 ingress (mean 0.00 Mbit/s)   Flow 1 egress (mean 0.00 Mbit/s)

Flow 1 (95th percentile 105.38 ms)