

Pantheon Report

Generated at 2022-03-11 08:27:02 (UTC).

Tested in mahimahi: `mm-delay 100 mm-link 12Mbps_trace 12Mbps_trace`

Repeated the test of 15 congestion control schemes once.

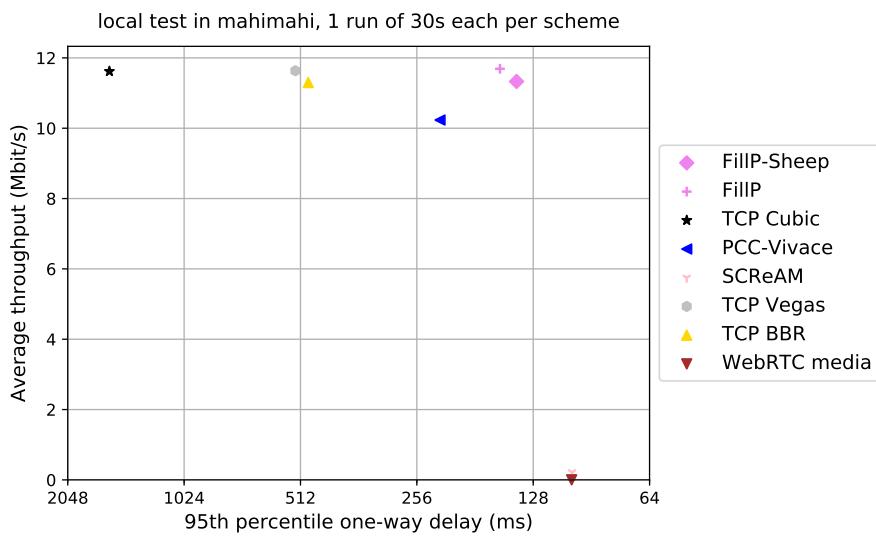
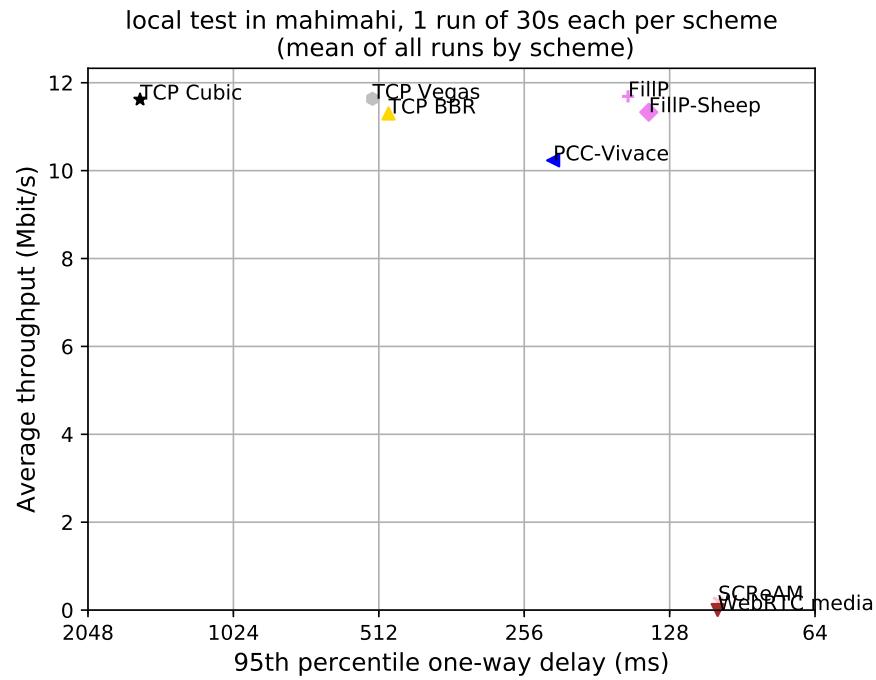
Each test lasted for 30 seconds running 1 flow.

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 @ 91d3720ce53d6a6ec9421e298670a59fd3368570
third_party/fillp @ d6da1459332fceef56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 463d89b09699a57bfdfbae351646df6a60040b90
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ f866d3f58d27af942717625ee3a354cc2e802bd
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
```



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	488.83	0.96
TCP Cubic	1	11.62	1597.92	2.87
FillP	1	11.69	156.06	0.45
FillP-Sheep	1	11.33	141.36	0.48
LEDBAT	0	N/A	N/A	N/A
PCC-Allegro	0	N/A	N/A	N/A
PCC-Expr	0	N/A	N/A	N/A
QUIC Cubic	0	N/A	N/A	N/A
SCReAM	1	0.22	101.59	0.26
Sprout	0	N/A	N/A	N/A
TaoVA-100x	0	N/A	N/A	N/A
TCP Vegas	1	11.63	527.84	1.64
Verus	0	N/A	N/A	N/A
PCC-Vivace	1	10.23	223.03	0.37
WebRTC media	1	0.00	101.82	0.00

Run 1: Statistics of TCP BBR

Start at: 2022-03-11 08:19:23

End at: 2022-03-11 08:19:53

Below is generated by plot.py at 2022-03-11 08:26:58

Datalink statistics

-- Total of 1 flow:

Average capacity: 12.00 Mbit/s

Average throughput: 11.30 Mbit/s (94.2% utilization)

95th percentile per-packet one-way delay: 488.835 ms

Loss rate: 0.96%

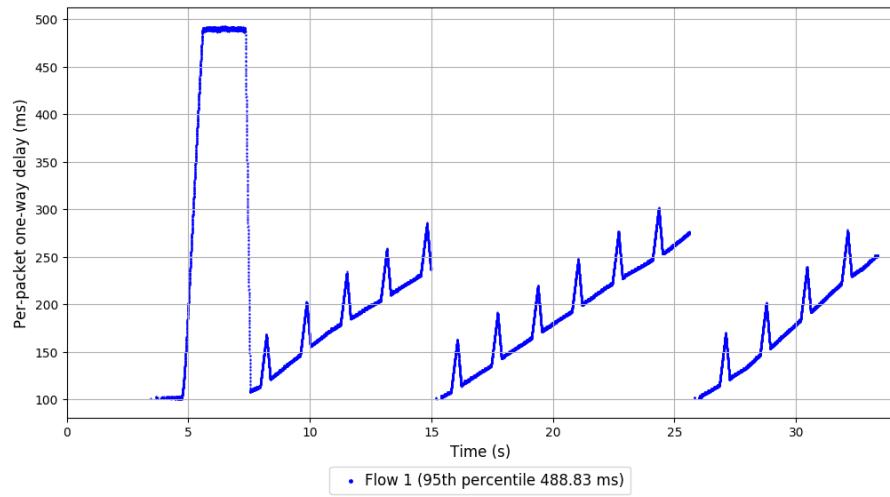
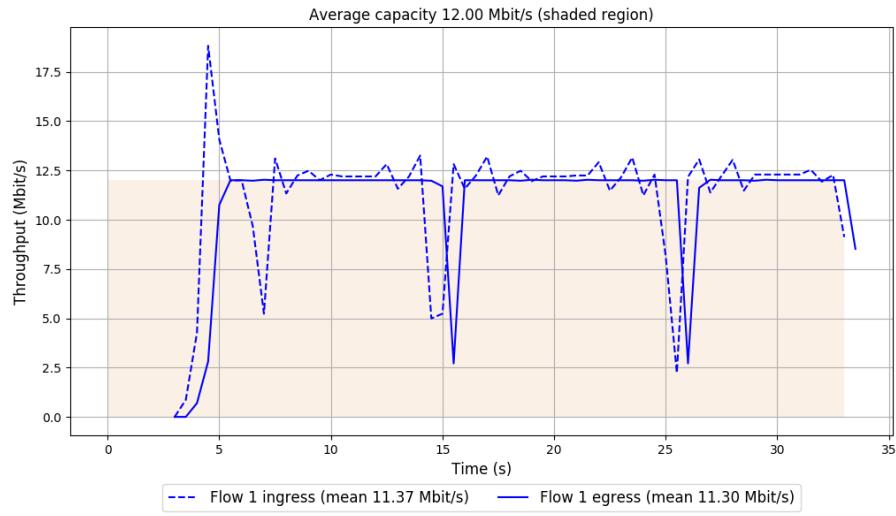
-- Flow 1:

Average throughput: 11.30 Mbit/s

95th percentile per-packet one-way delay: 488.835 ms

Loss rate: 0.96%

Run 1: Report of TCP BBR — Data Link

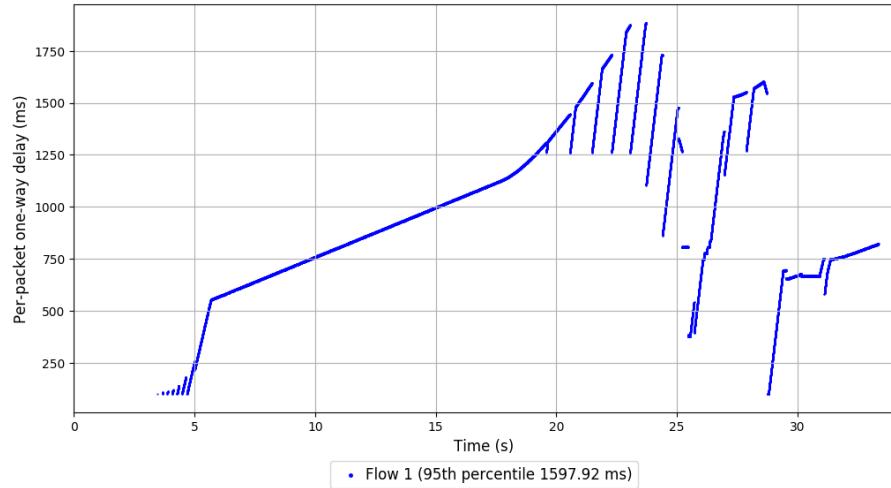
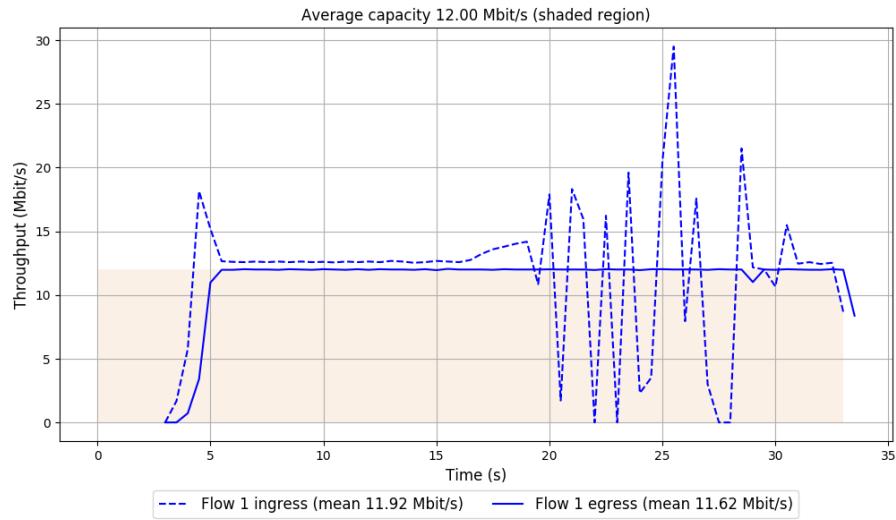


```
Run 1: Statistics of TCP Cubic

Start at: 2022-03-11 08:16:29
End at: 2022-03-11 08:16:59

# Below is generated by plot.py at 2022-03-11 08:26:59
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 11.62 Mbit/s (96.8% utilization)
95th percentile per-packet one-way delay: 1597.918 ms
Loss rate: 2.87%
-- Flow 1:
Average throughput: 11.62 Mbit/s
95th percentile per-packet one-way delay: 1597.918 ms
Loss rate: 2.87%
```

Run 1: Report of TCP Cubic — Data Link

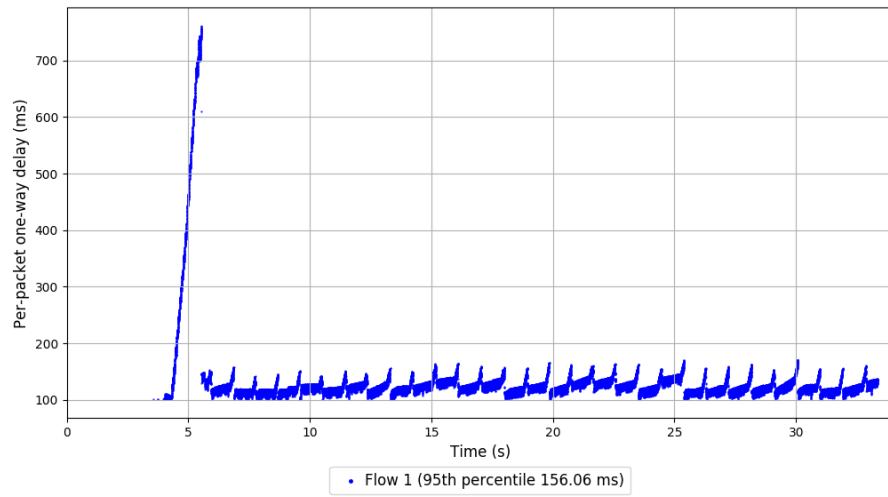
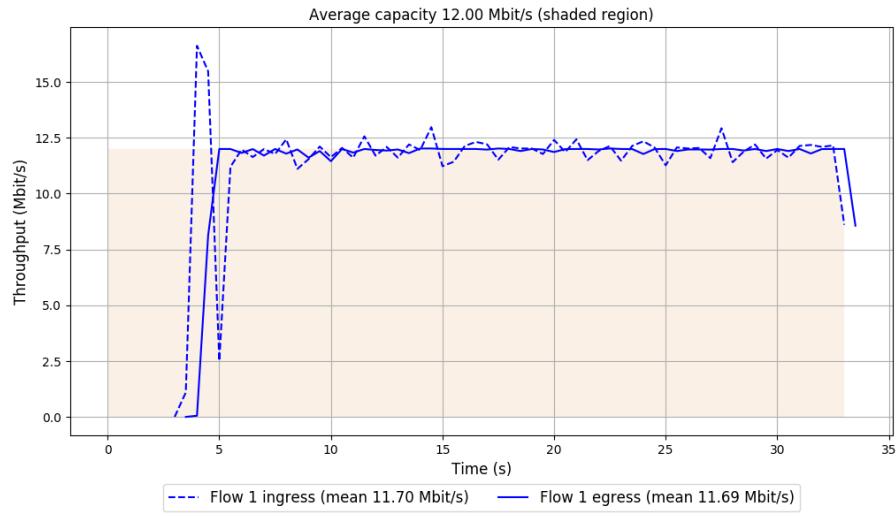


```
Run 1: Statistics of FillP

Start at: 2022-03-11 08:15:20
End at: 2022-03-11 08:15:50

# Below is generated by plot.py at 2022-03-11 08:27:00
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 11.69 Mbit/s (97.4% utilization)
95th percentile per-packet one-way delay: 156.063 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 11.69 Mbit/s
95th percentile per-packet one-way delay: 156.063 ms
Loss rate: 0.45%
```

Run 1: Report of FillP — Data Link

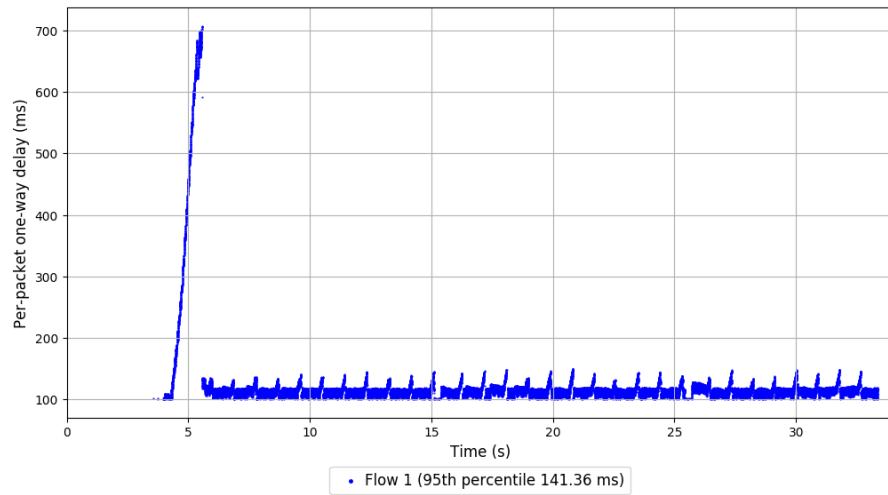
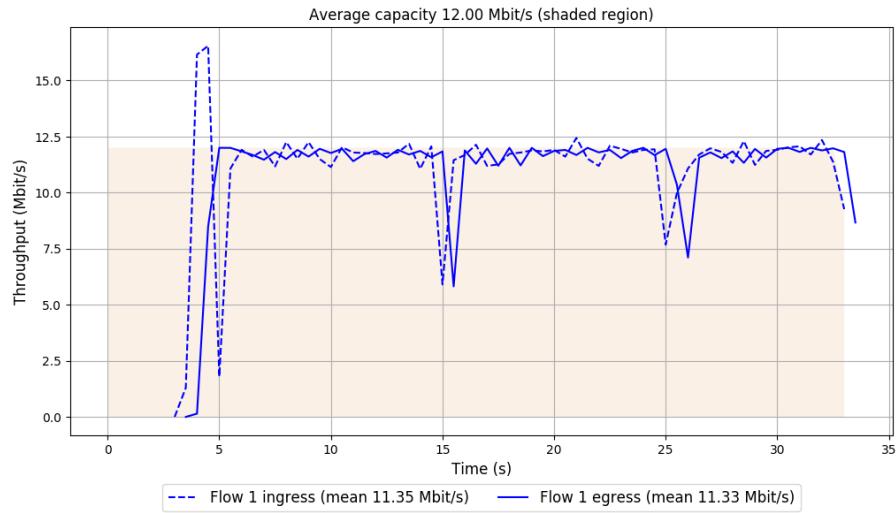


```
Run 1: Statistics of FillP-Sheep

Start at: 2022-03-11 08:14:45
End at: 2022-03-11 08:15:15

# Below is generated by plot.py at 2022-03-11 08:27:00
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 11.33 Mbit/s (94.4% utilization)
95th percentile per-packet one-way delay: 141.359 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 11.33 Mbit/s
95th percentile per-packet one-way delay: 141.359 ms
Loss rate: 0.48%
```

Run 1: Report of FillP-Sheep — Data Link

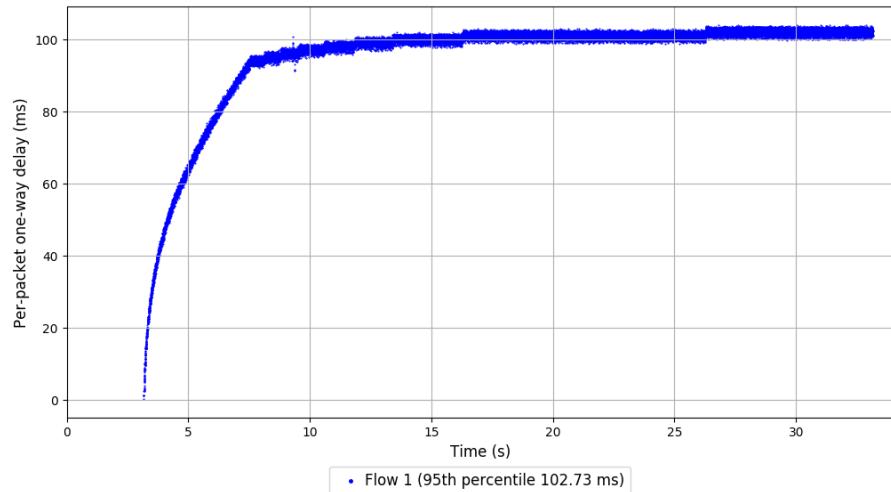
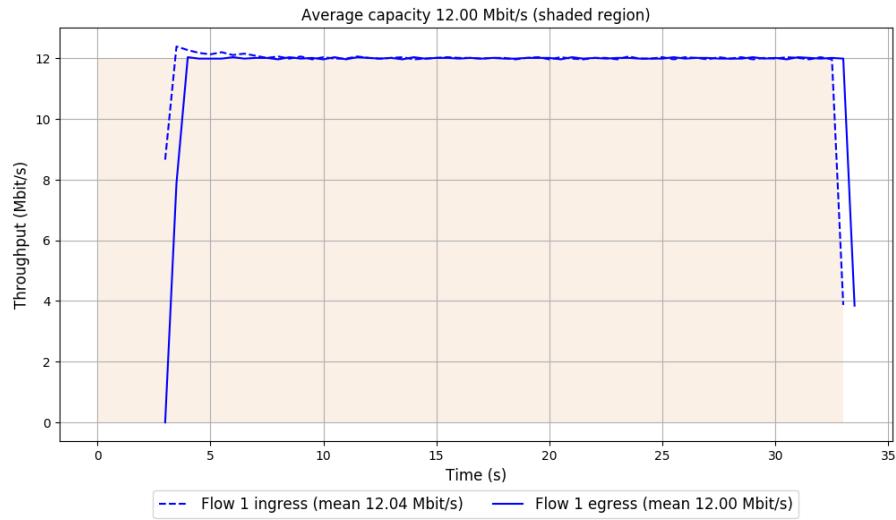


Run 1: Statistics of LEDBAT

Start at: 2022-03-11 08:22:49

End at: 2022-03-11 08:23:19

Run 1: Report of LEDBAT — Data Link

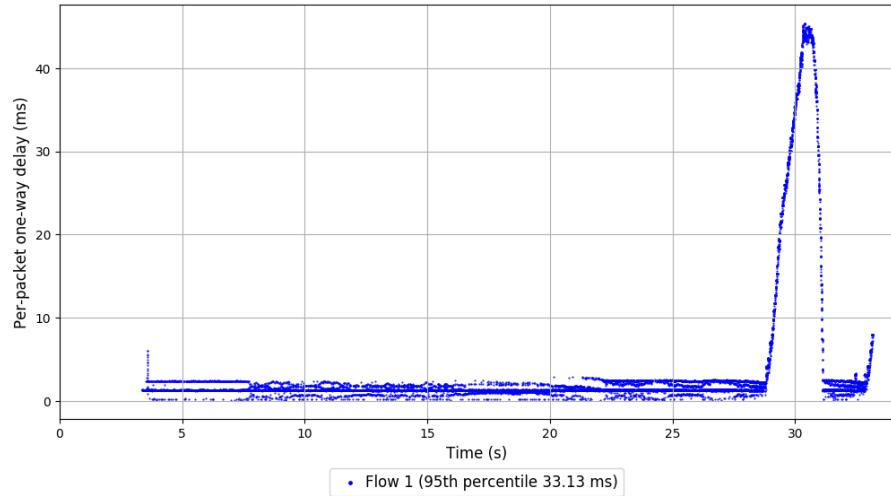
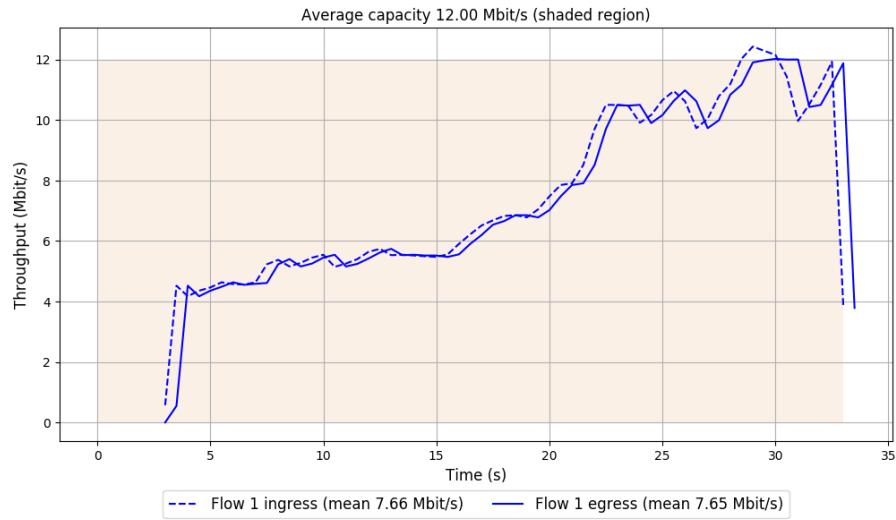


Run 1: Statistics of PCC-Allegro

Start at: 2022-03-11 08:20:32

End at: 2022-03-11 08:21:02

Run 1: Report of PCC-Allegro — Data Link

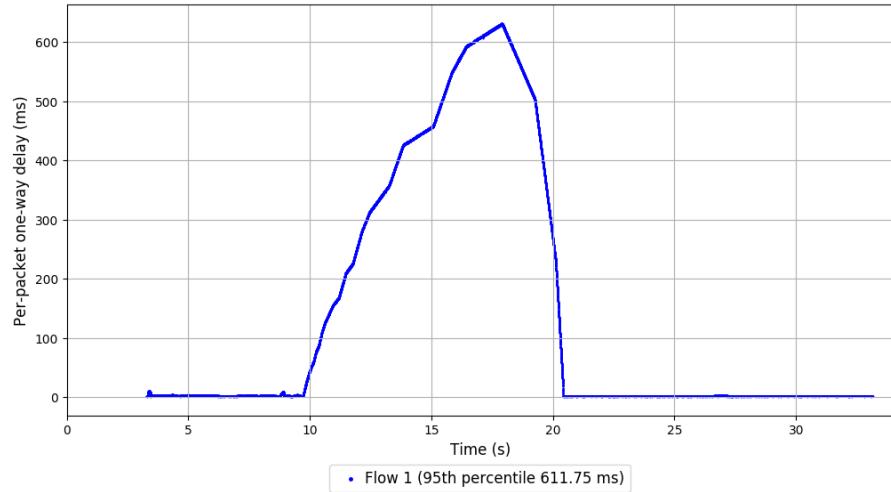
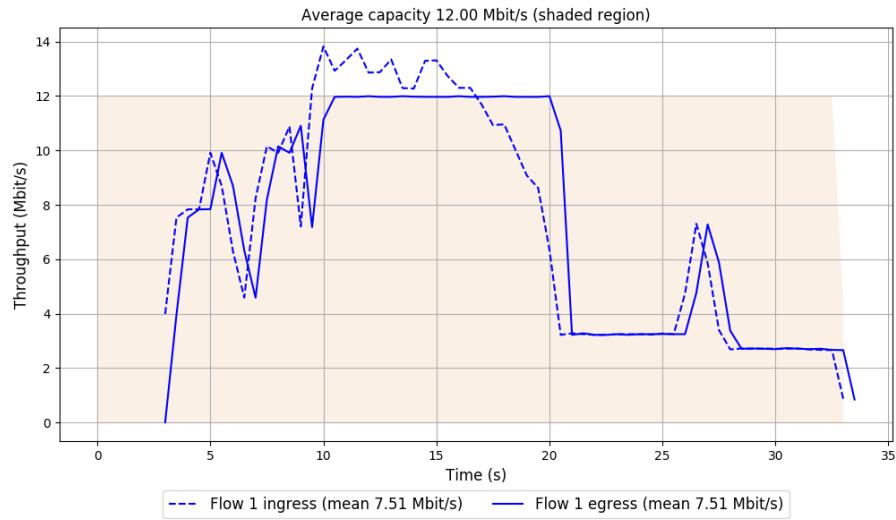


Run 1: Statistics of PCC-Expr

Start at: 2022-03-11 08:21:06

End at: 2022-03-11 08:21:36

Run 1: Report of PCC-Expr — Data Link

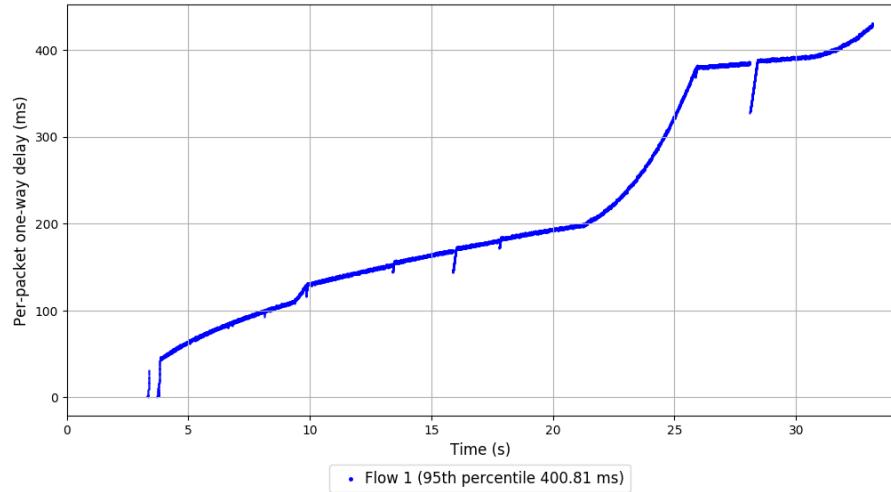
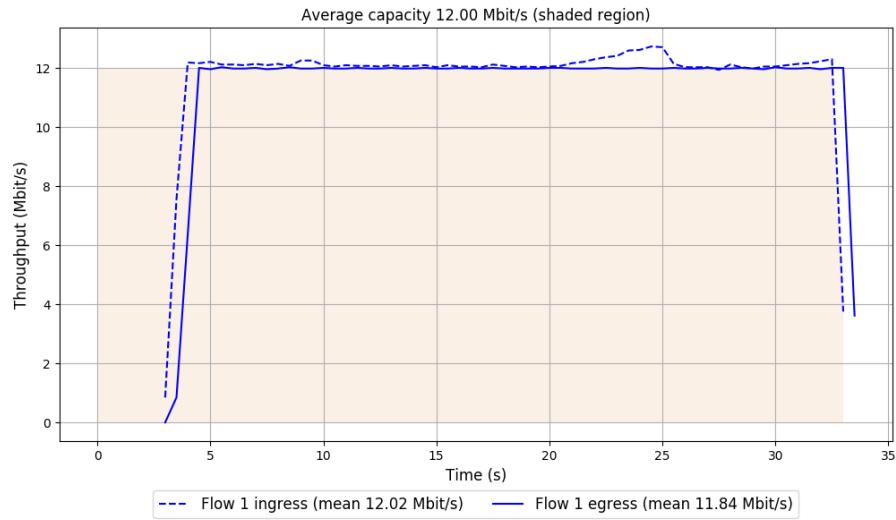


Run 1: Statistics of QUIC Cubic

Start at: 2022-03-11 08:19:58

End at: 2022-03-11 08:20:28

Run 1: Report of QUIC Cubic — Data Link

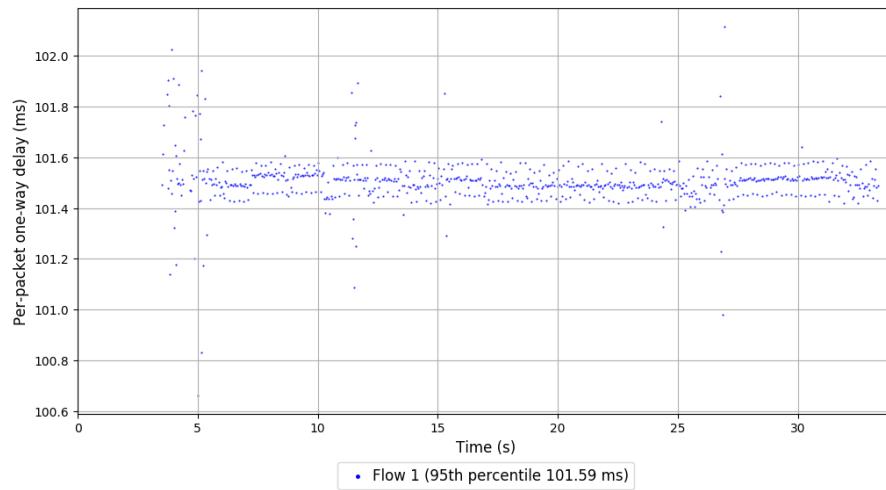
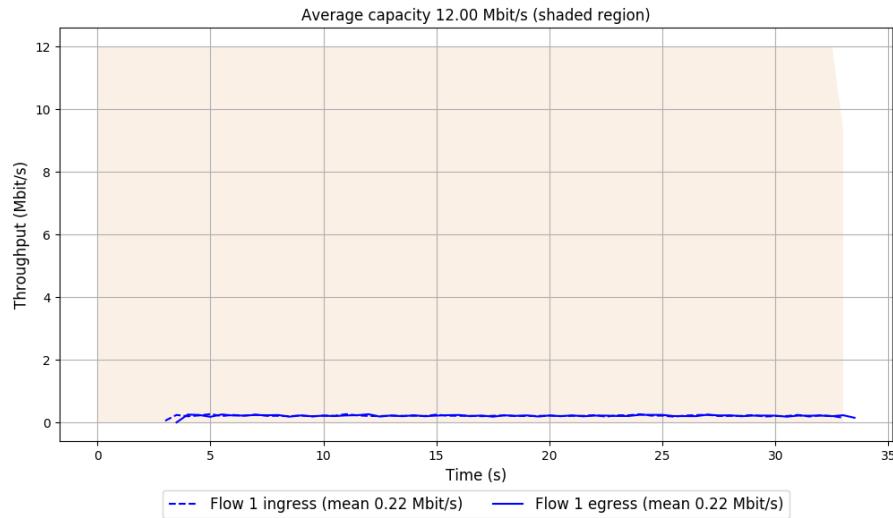


```
Run 1: Statistics of SCReAM

Start at: 2022-03-11 08:18:14
End at: 2022-03-11 08:18:44

# Below is generated by plot.py at 2022-03-11 08:27:00
# 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: 101.586 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 101.586 ms
Loss rate: 0.26%
```

Run 1: Report of SCReAM — Data Link

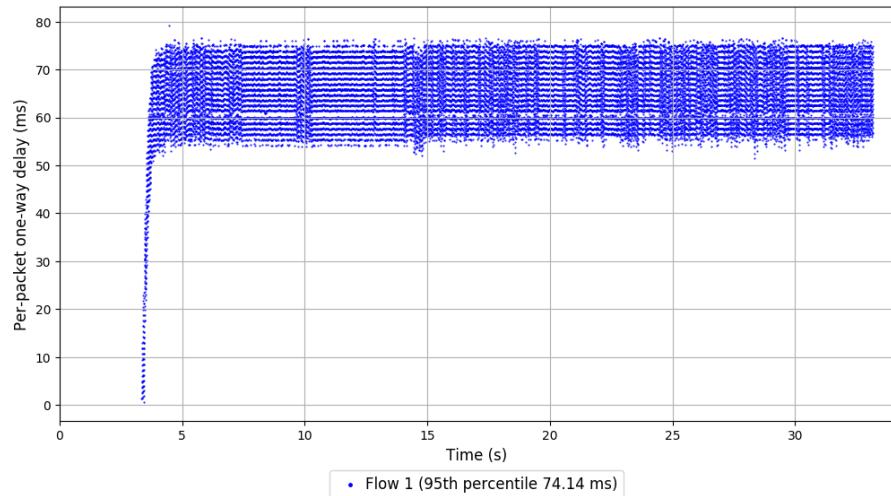
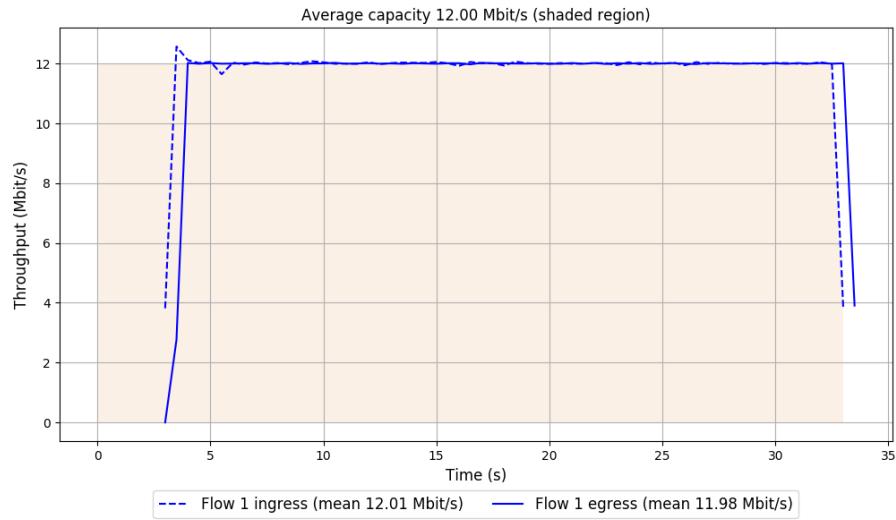


Run 1: Statistics of Sprout

Start at: 2022-03-11 08:17:04

End at: 2022-03-11 08:17:34

Run 1: Report of Sprout — Data Link

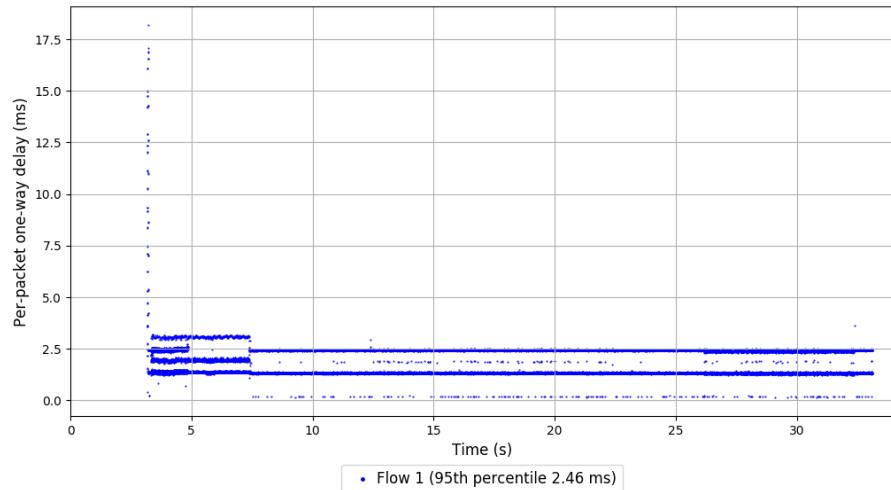
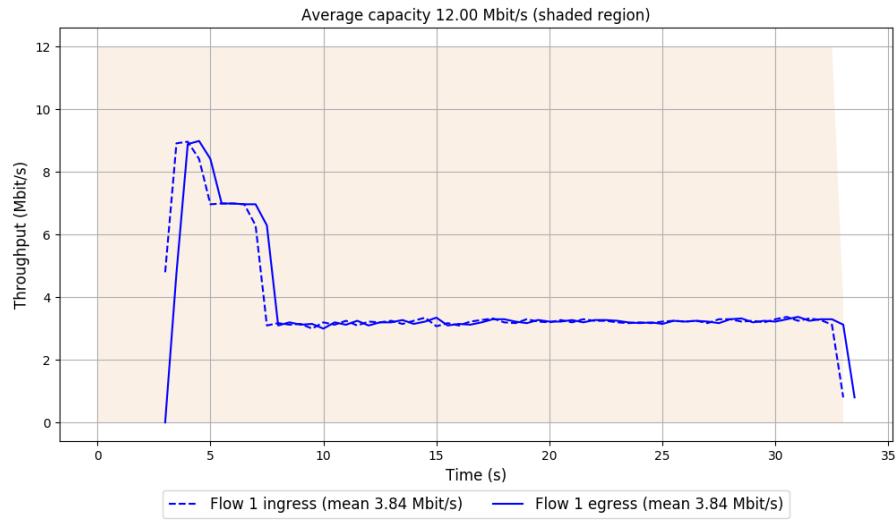


Run 1: Statistics of TaoVA-100x

Start at: 2022-03-11 08:22:15

End at: 2022-03-11 08:22:45

Run 1: Report of TaoVA-100x — Data Link



```
Run 1: Statistics of TCP Vegas
```

```
Start at: 2022-03-11 08:18:48
```

```
End at: 2022-03-11 08:19:18
```

```
# Below is generated by plot.py at 2022-03-11 08:27:00
```

```
# 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: 527.839 ms
```

```
Loss rate: 1.64%
```

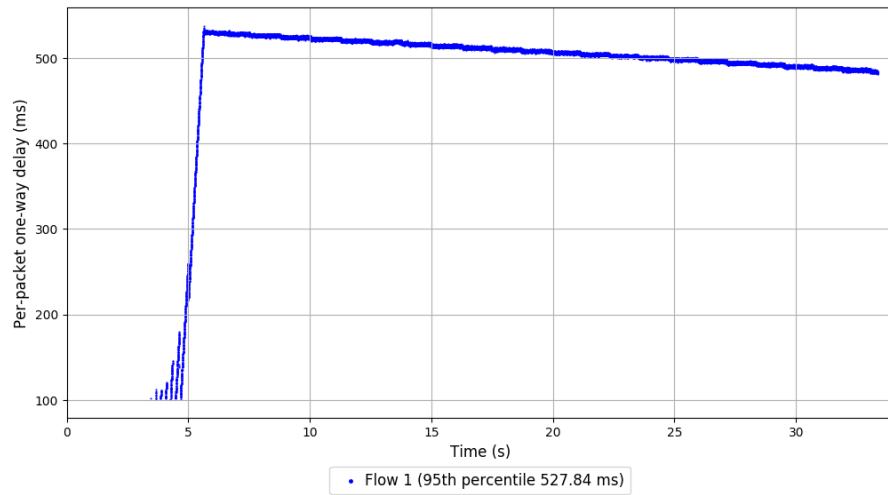
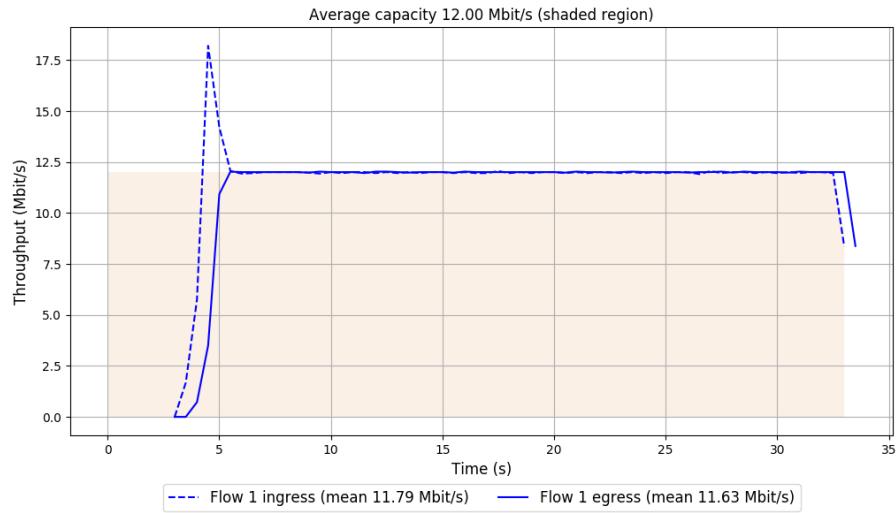
```
-- Flow 1:
```

```
Average throughput: 11.63 Mbit/s
```

```
95th percentile per-packet one-way delay: 527.839 ms
```

```
Loss rate: 1.64%
```

Run 1: Report of TCP Vegas — Data Link

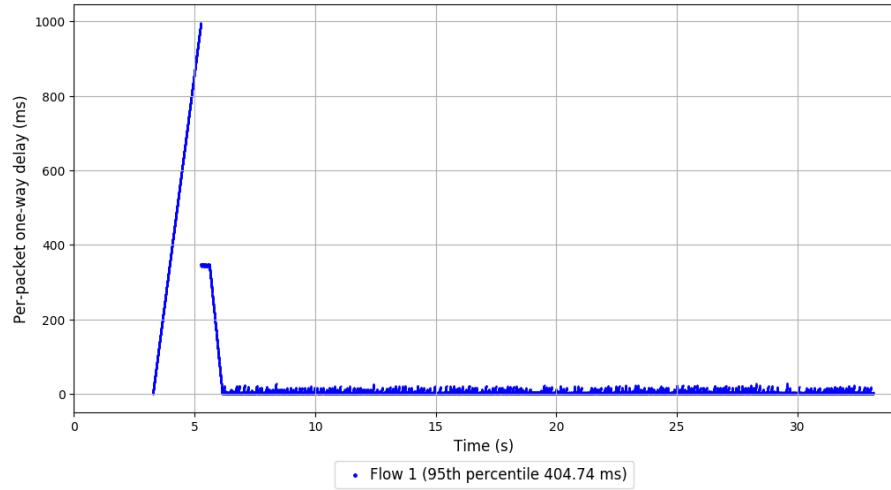
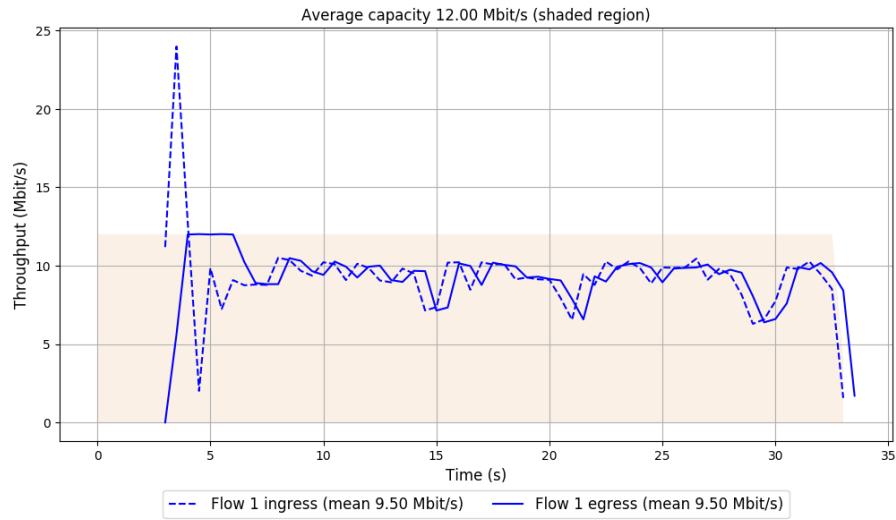


Run 1: Statistics of Verus

Start at: 2022-03-11 08:15:55

End at: 2022-03-11 08:16:25

Run 1: Report of Verus — Data Link

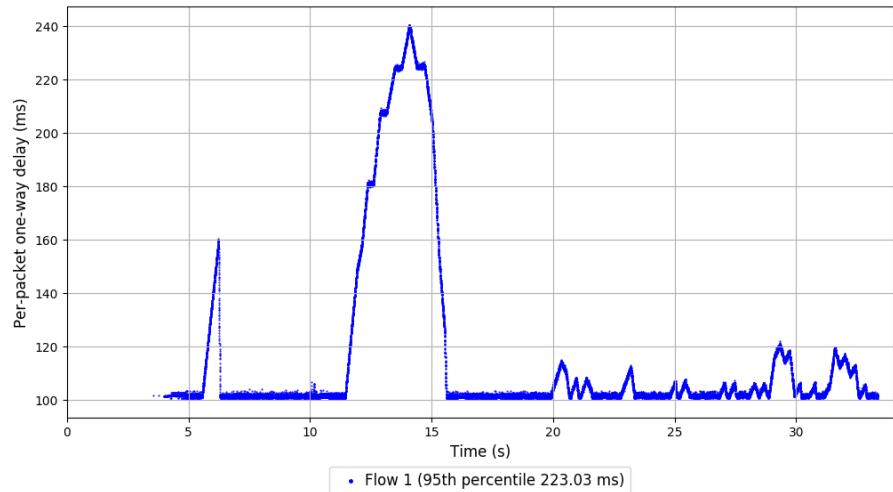
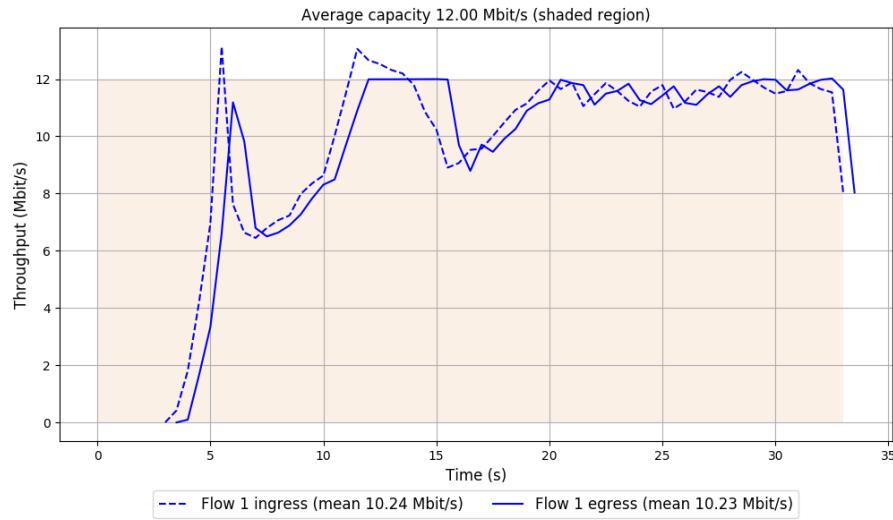


```
Run 1: Statistics of PCC-Vivace

Start at: 2022-03-11 08:17:39
End at: 2022-03-11 08:18:09

# Below is generated by plot.py at 2022-03-11 08:27:00
# Datalink statistics
-- Total of 1 flow:
Average capacity: 12.00 Mbit/s
Average throughput: 10.23 Mbit/s (85.3% utilization)
95th percentile per-packet one-way delay: 223.029 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 10.23 Mbit/s
95th percentile per-packet one-way delay: 223.029 ms
Loss rate: 0.37%
```

Run 1: Report of PCC-Vivace — Data Link



```
Run 1: Statistics of WebRTC media

Start at: 2022-03-11 08:21:40
End at: 2022-03-11 08:22:10

# Below is generated by plot.py at 2022-03-11 08:27:00
# 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: 101.817 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 101.817 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link

