

# Pantheon Report

Generated at 2022-04-05 22:03:10 (UTC).  
Tested in mahimahi: mm-link wired48 wired6  
Repeated the test of 14 congestion control schemes once.  
Each test lasted for 30 seconds running 1 flow.

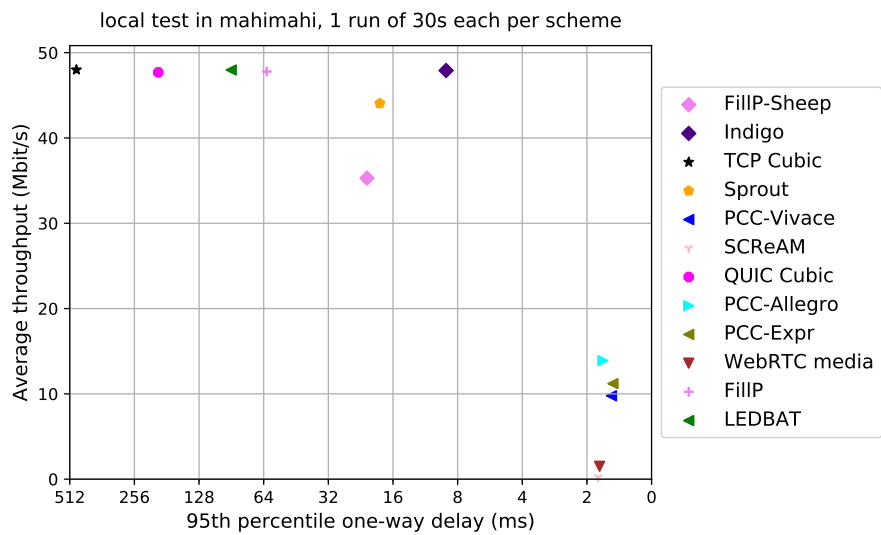
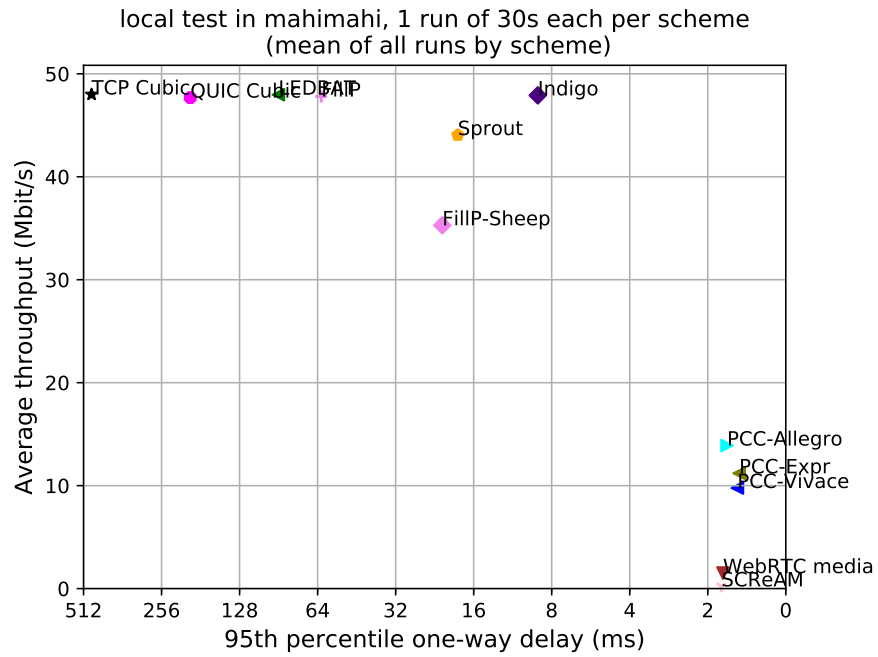
## System info:

Linux 5.13.0-39-generic  
net.core.default\_qdisc = fq\_codel  
net.core.rmem\_default = 212992  
net.core.rmem\_max = 50000000  
net.core.wmem\_default = 212992  
net.core.wmem\_max = 1048576  
net.ipv4.tcp\_rmem = 4096 131072 6291456  
net.ipv4.tcp\_wmem = 4096 16384 4194304

## Git summary:

branch: master @ 932ea819529bc7318f767ee187f6f0482584470f  
third\_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519  
third\_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9  
third\_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4  
M makefile  
M python-wrapper.cc  
third\_party/indigo @ 463d89b09699a57bfdfbae351646df6a60040b90  
third\_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf  
third\_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd  
M configure.ac  
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-quick @ 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/verus @ d4b447ea74c6c60a261149af2629562939f9a494  
M src/verus.hpp  
M src/verus\_server.cpp  
M tools/plot.py

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	0	N/A	N/A	N/A
TCP Cubic	1	47.99	476.68	1.33
FillP	1	47.79	61.96	0.19
FillP-Sheep	1	35.29	21.14	0.03
Indigo	1	47.91	9.05	0.02
LEDBAT	1	47.97	90.69	0.30
PCC-Allegro	1	13.89	1.50	0.01
PCC-Expr	1	11.20	1.20	0.00
QUIC Cubic	1	47.69	198.25	0.70
SCReAM	1	0.22	1.65	0.00
Sprout	1	44.05	18.43	0.02
TCP Vegas	0	N/A	N/A	N/A
PCC-Vivace	1	9.77	1.24	0.00
WebRTC media	1	1.50	1.61	0.00

Run 1: Statistics of TCP BBR

Start at: 2022-04-05 21:52:22

End at: 2022-04-05 21:52:52

Run 1: Report of TCP BBR — Data Link

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Run 1: Statistics of TCP Cubic

Start at: 2022-04-05 21:49:31

End at: 2022-04-05 21:50:01

# Below is generated by plot.py at 2022-04-05 22:03:07

# Datalink statistics

-- Total of 1 flow:

Average capacity: 48.00 Mbit/s

Average throughput: 47.99 Mbit/s (100.0% utilization)

95th percentile per-packet one-way delay: 476.683 ms

Loss rate: 1.33%

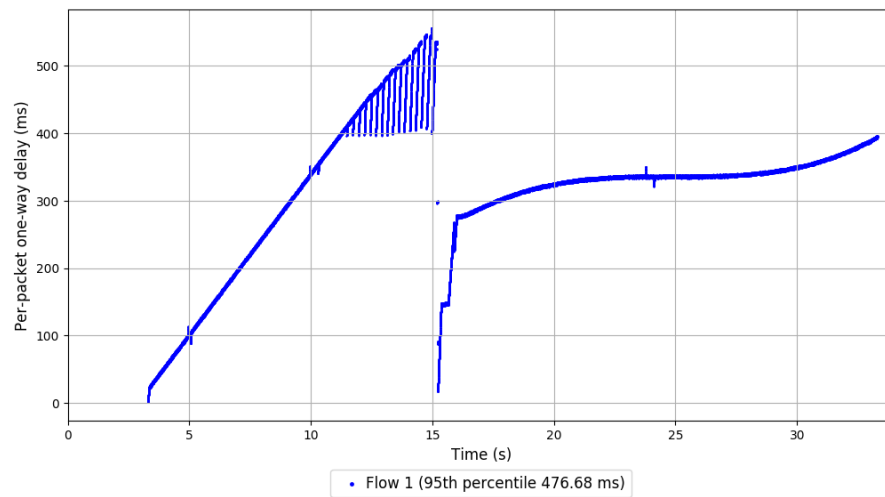
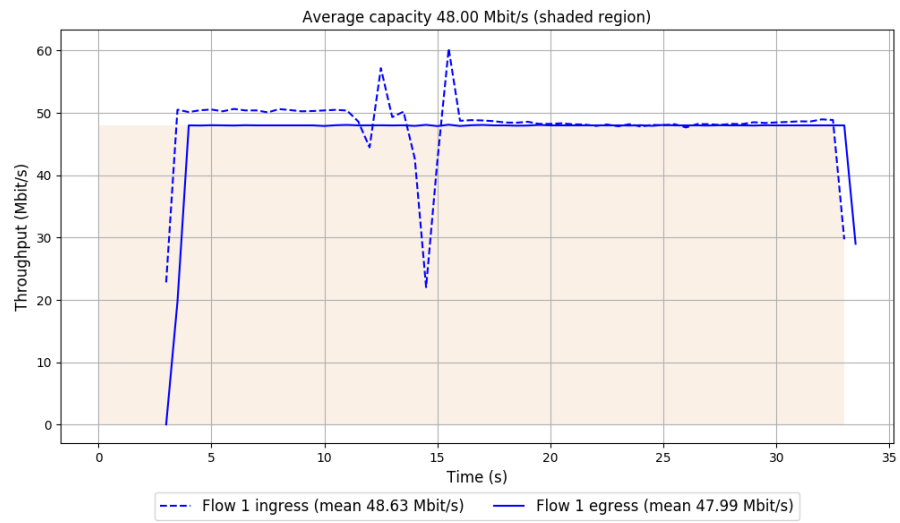
-- Flow 1:

Average throughput: 47.99 Mbit/s

95th percentile per-packet one-way delay: 476.683 ms

Loss rate: 1.33%

## Run 1: Report of TCP Cubic — Data Link





Run 1: Statistics of FillP

Start at: 2022-04-05 21:48:56

End at: 2022-04-05 21:49:26

# Below is generated by plot.py at 2022-04-05 22:03:08

# Datalink statistics

-- Total of 1 flow:

Average capacity: 48.00 Mbit/s

Average throughput: 47.79 Mbit/s (99.6% utilization)

95th percentile per-packet one-way delay: 61.958 ms

Loss rate: 0.19%

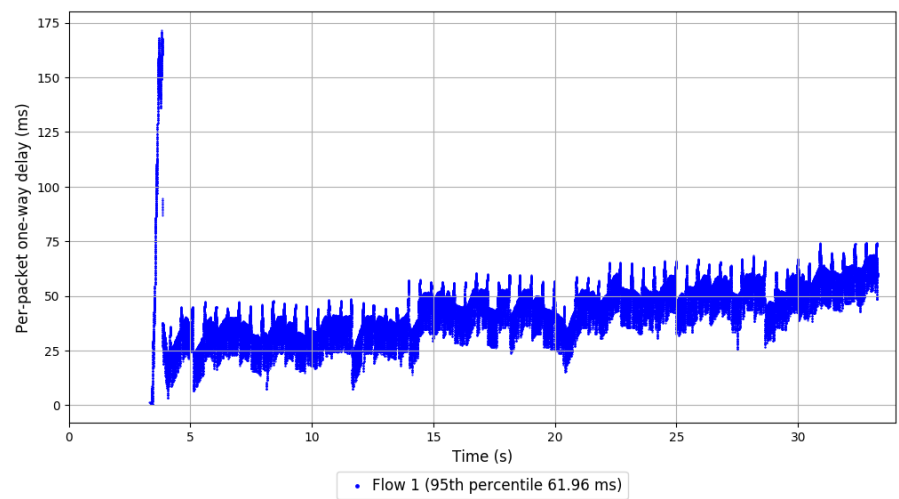
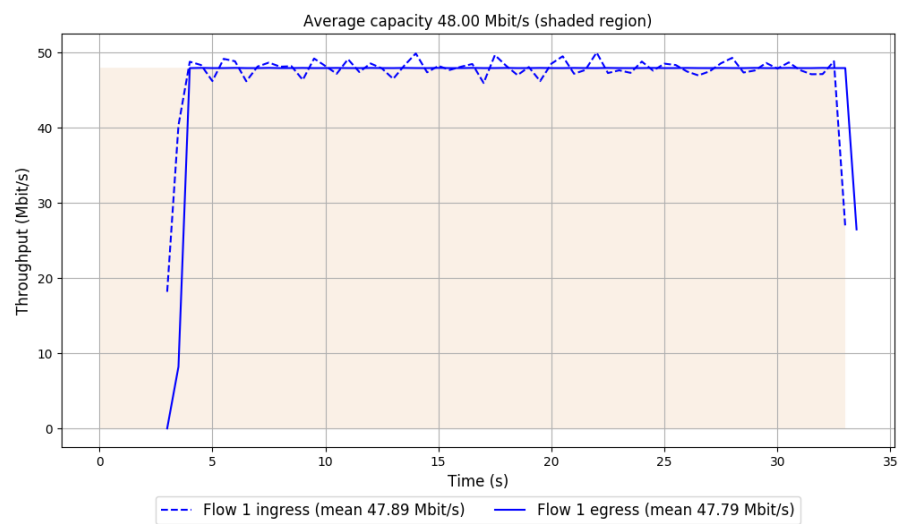
-- Flow 1:

Average throughput: 47.79 Mbit/s

95th percentile per-packet one-way delay: 61.958 ms

Loss rate: 0.19%

Run 1: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2022-04-05 21:48:21

End at: 2022-04-05 21:48:51

# Below is generated by plot.py at 2022-04-05 22:03:08

# Datalink statistics

-- Total of 1 flow:

Average capacity: 48.00 Mbit/s

Average throughput: 35.29 Mbit/s (73.5% utilization)

95th percentile per-packet one-way delay: 21.145 ms

Loss rate: 0.03%

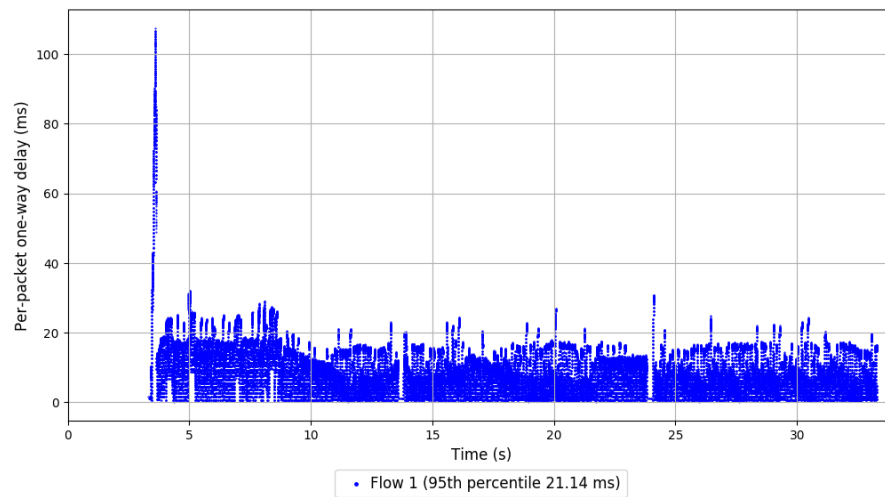
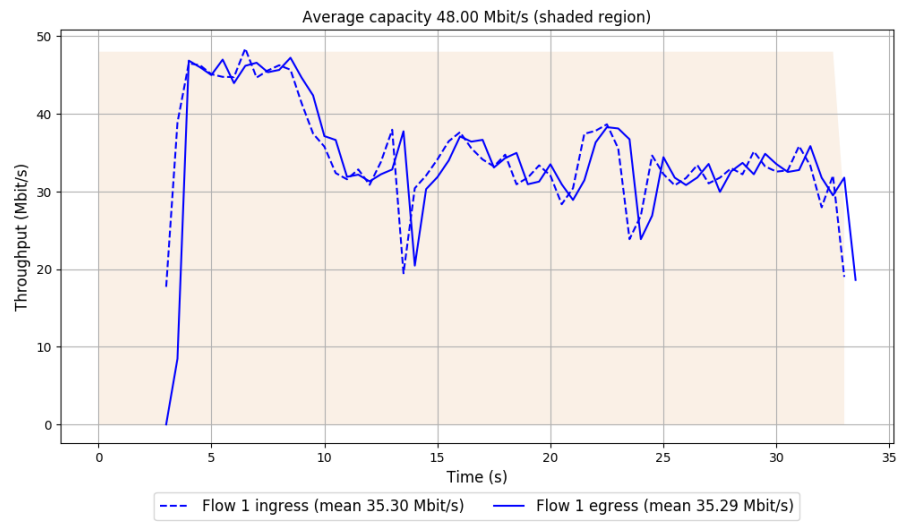
-- Flow 1:

Average throughput: 35.29 Mbit/s

95th percentile per-packet one-way delay: 21.145 ms

Loss rate: 0.03%

## Run 1: Report of FillP-Sheep — Data Link

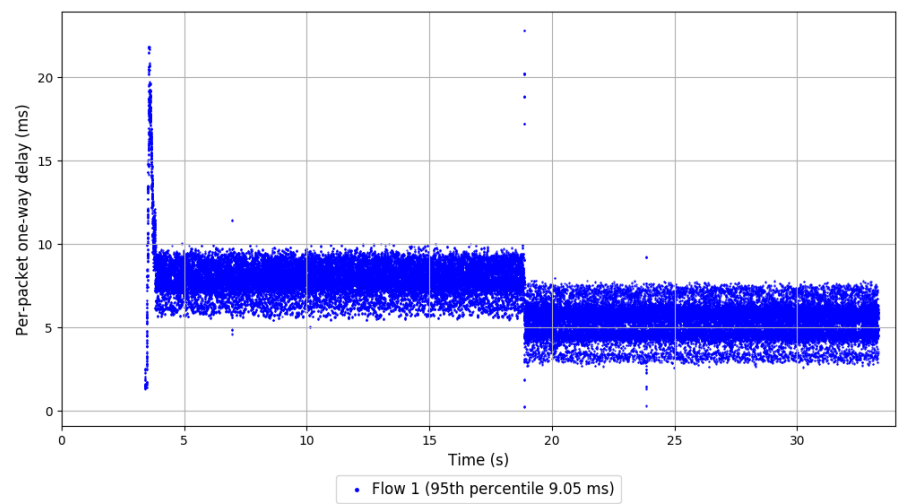
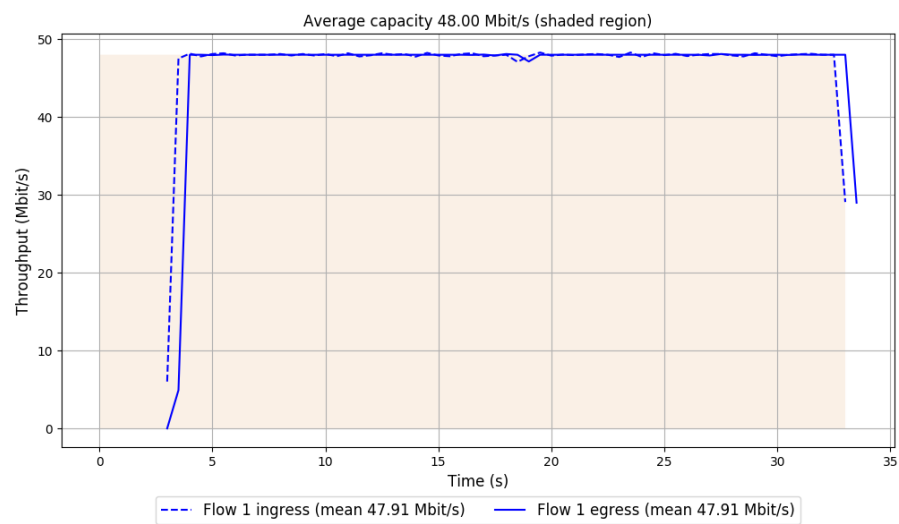


```
Run 1: Statistics of Indigo

Start at: 2022-04-05 21:54:05
End at: 2022-04-05 21:54:35

# Below is generated by plot.py at 2022-04-05 22:03:08
# Datalink statistics
-- Total of 1 flow:
Average capacity: 48.00 Mbit/s
Average throughput: 47.91 Mbit/s (99.8% utilization)
95th percentile per-packet one-way delay: 9.053 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 47.91 Mbit/s
95th percentile per-packet one-way delay: 9.053 ms
Loss rate: 0.02%
```

Run 1: Report of Indigo — Data Link

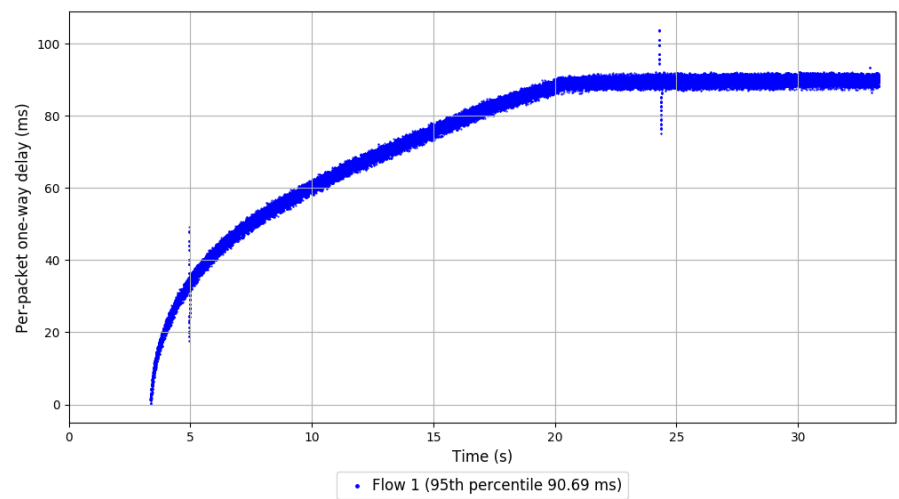
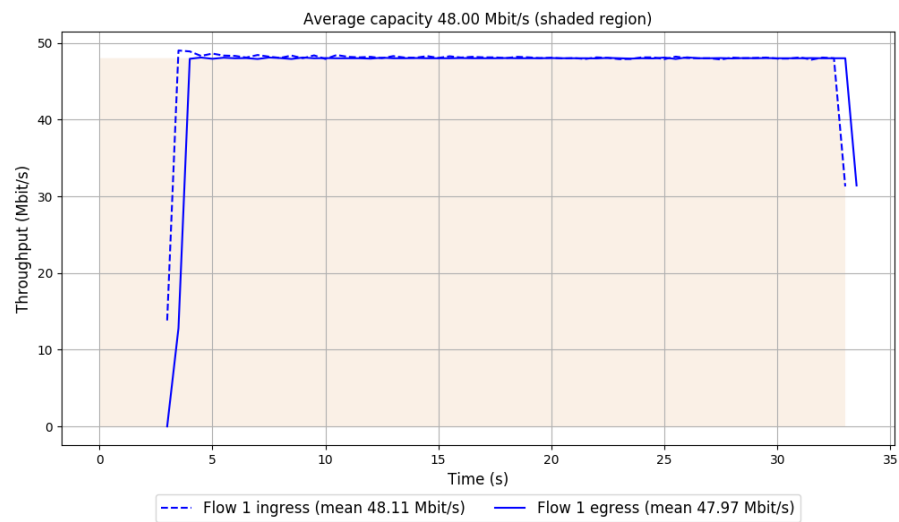


```
Run 1: Statistics of LEDBAT

Start at: 2022-04-05 21:55:14
End at: 2022-04-05 21:55:44

# Below is generated by plot.py at 2022-04-05 22:03:08
# Datalink statistics
-- Total of 1 flow:
Average capacity: 48.00 Mbit/s
Average throughput: 47.97 Mbit/s (99.9% utilization)
95th percentile per-packet one-way delay: 90.692 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 47.97 Mbit/s
95th percentile per-packet one-way delay: 90.692 ms
Loss rate: 0.30%
```

Run 1: Report of LEDBAT — Data Link





Run 1: Statistics of PCC-Allegro

Start at: 2022-04-05 21:53:31

End at: 2022-04-05 21:54:01

# Below is generated by plot.py at 2022-04-05 22:03:08

# Datalink statistics

-- Total of 1 flow:

Average capacity: 48.00 Mbit/s

Average throughput: 13.89 Mbit/s (28.9% utilization)

95th percentile per-packet one-way delay: 1.505 ms

Loss rate: 0.01%

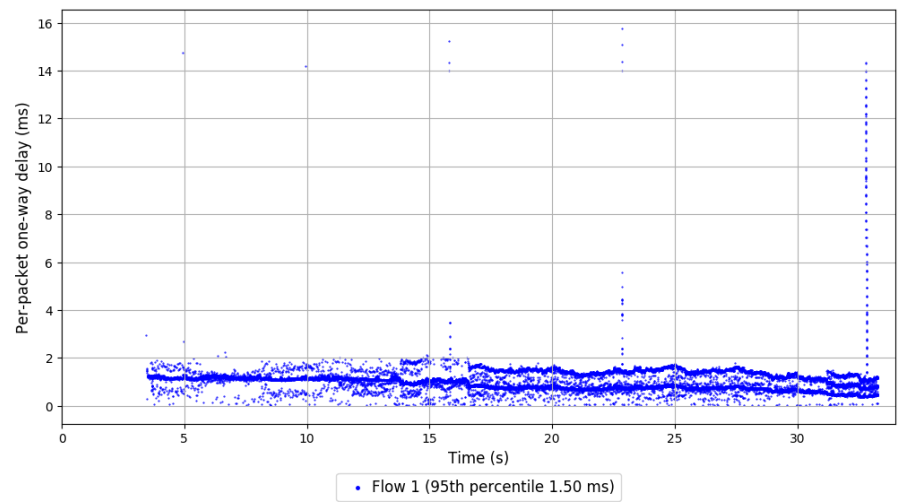
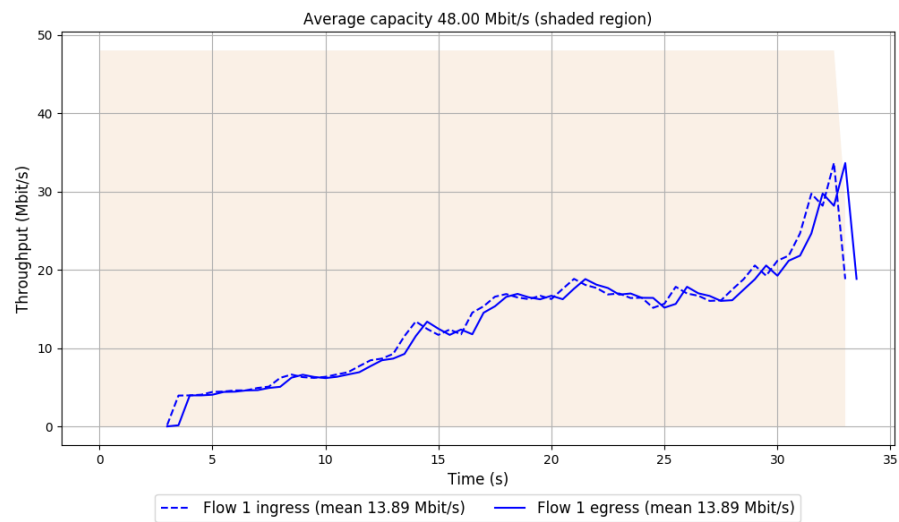
-- Flow 1:

Average throughput: 13.89 Mbit/s

95th percentile per-packet one-way delay: 1.505 ms

Loss rate: 0.01%

Run 1: Report of PCC-Allegro — Data Link

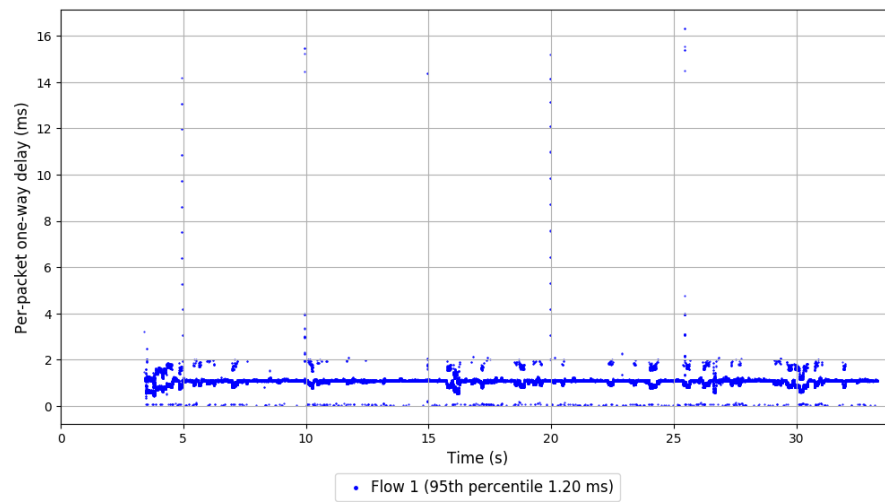
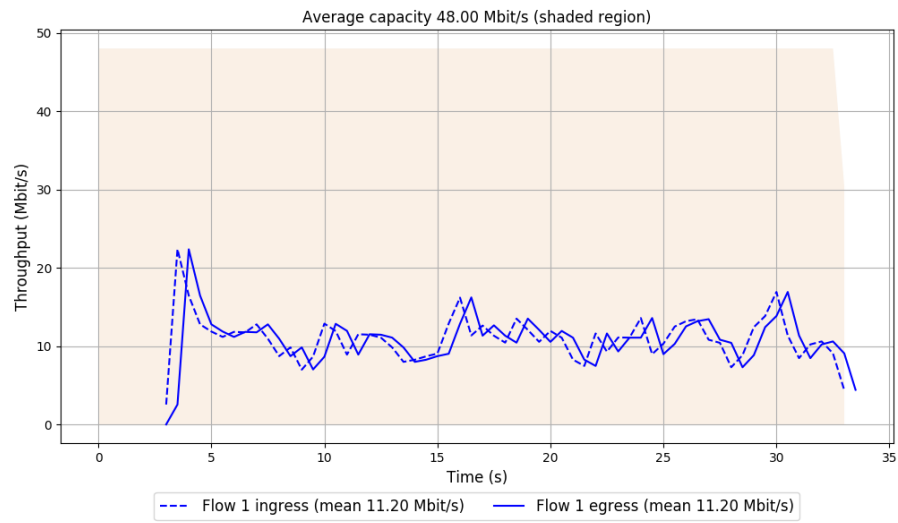


```
Run 1: Statistics of PCC-Expr

Start at: 2022-04-05 21:55:49
End at: 2022-04-05 21:56:20

# Below is generated by plot.py at 2022-04-05 22:03:08
# Datalink statistics
-- Total of 1 flow:
Average capacity: 48.00 Mbit/s
Average throughput: 11.20 Mbit/s (23.3% utilization)
95th percentile per-packet one-way delay: 1.196 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 11.20 Mbit/s
95th percentile per-packet one-way delay: 1.196 ms
Loss rate: 0.00%
```

## Run 1: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2022-04-05 21:52:55

End at: 2022-04-05 21:53:25

# Below is generated by plot.py at 2022-04-05 22:03:08

# Datalink statistics

-- Total of 1 flow:

Average capacity: 48.00 Mbit/s

Average throughput: 47.69 Mbit/s (99.3% utilization)

95th percentile per-packet one-way delay: 198.252 ms

Loss rate: 0.70%

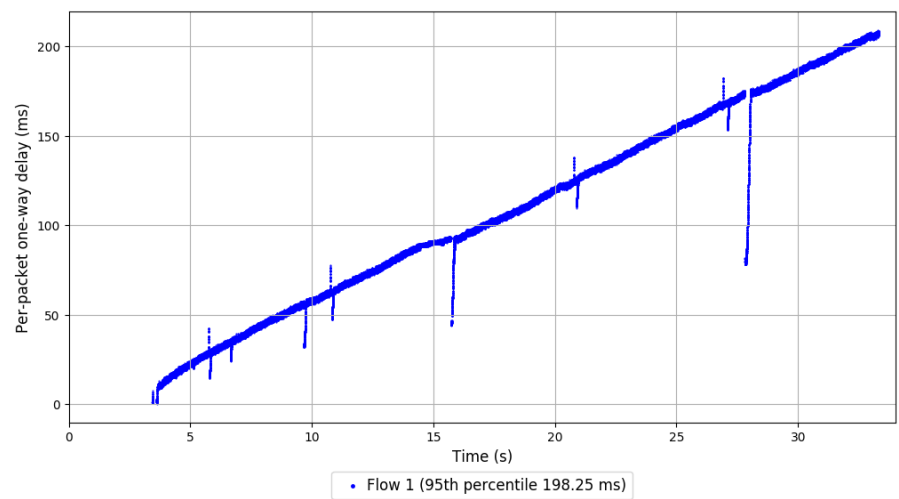
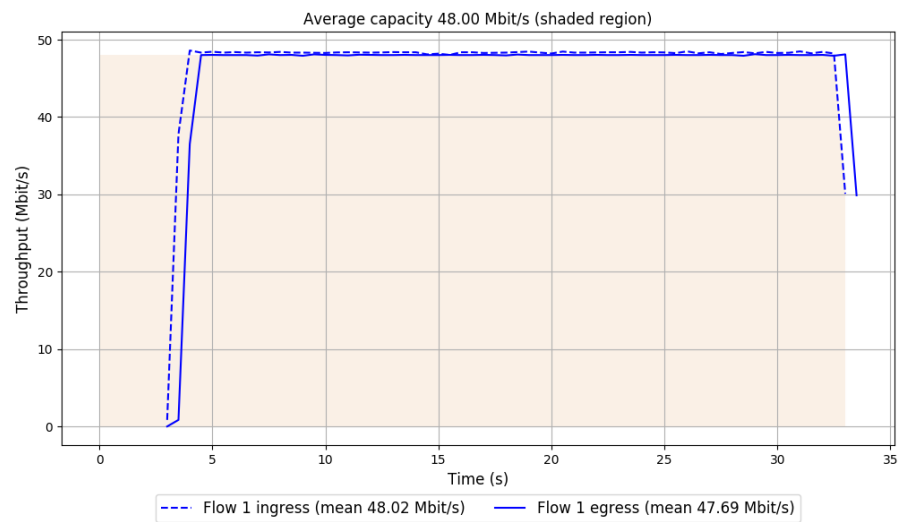
-- Flow 1:

Average throughput: 47.69 Mbit/s

95th percentile per-packet one-way delay: 198.252 ms

Loss rate: 0.70%

Run 1: Report of QUIC Cubic — Data Link

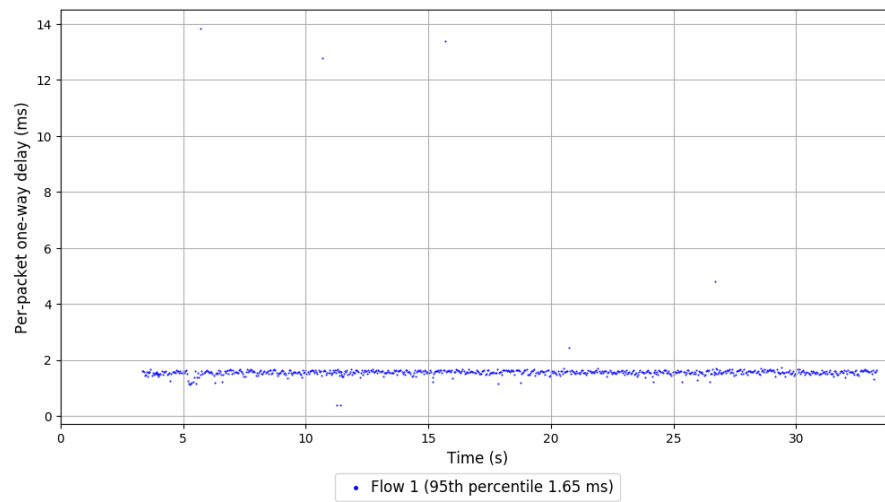
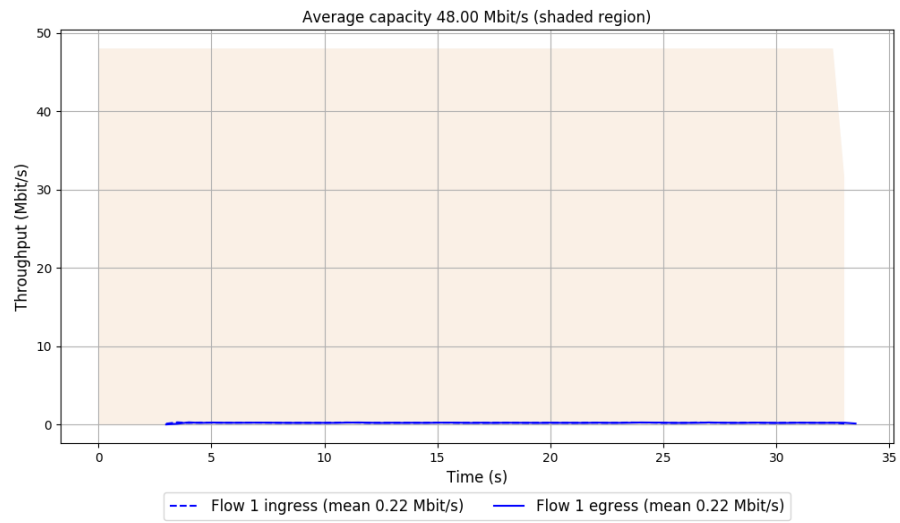


```
Run 1: Statistics of SCReAM

Start at: 2022-04-05 21:51:15
End at: 2022-04-05 21:51:45

# Below is generated by plot.py at 2022-04-05 22:03:08
# Datalink statistics
-- Total of 1 flow:
Average capacity: 48.00 Mbit/s
Average throughput: 0.22 Mbit/s (0.5% utilization)
95th percentile per-packet one-way delay: 1.651 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.651 ms
Loss rate: 0.00%
```

## Run 1: Report of SReAM — Data Link





Run 1: Statistics of Sprout

Start at: 2022-04-05 21:50:06

End at: 2022-04-05 21:50:36

# Below is generated by plot.py at 2022-04-05 22:03:08

# Datalink statistics

-- Total of 1 flow:

Average capacity: 48.00 Mbit/s

Average throughput: 44.05 Mbit/s (91.8% utilization)

95th percentile per-packet one-way delay: 18.428 ms

Loss rate: 0.02%

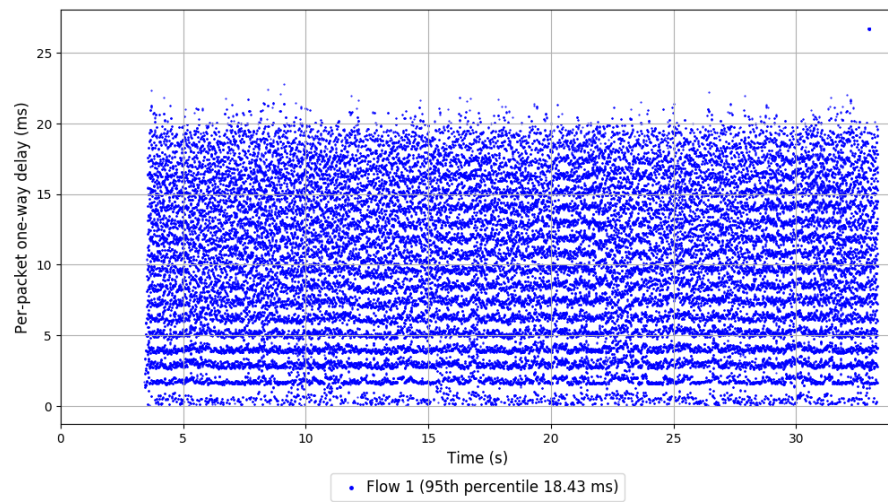
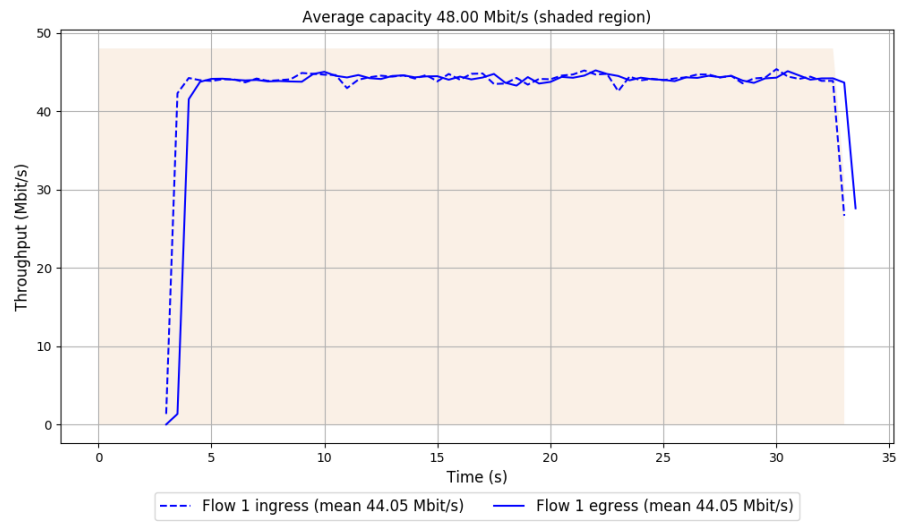
-- Flow 1:

Average throughput: 44.05 Mbit/s

95th percentile per-packet one-way delay: 18.428 ms

Loss rate: 0.02%

## Run 1: Report of Sprout — Data Link



Run 1: Statistics of TCP Vegas

Start at: 2022-04-05 21:51:48

End at: 2022-04-05 21:52:18

Run 1: Report of TCP Vegas — Data Link

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Run 1: Statistics of PCC-Vivace

Start at: 2022-04-05 21:50:40

End at: 2022-04-05 21:51:10

# Below is generated by plot.py at 2022-04-05 22:03:08

# Datalink statistics

-- Total of 1 flow:

Average capacity: 48.00 Mbit/s

Average throughput: 9.77 Mbit/s (20.4% utilization)

95th percentile per-packet one-way delay: 1.241 ms

Loss rate: 0.00%

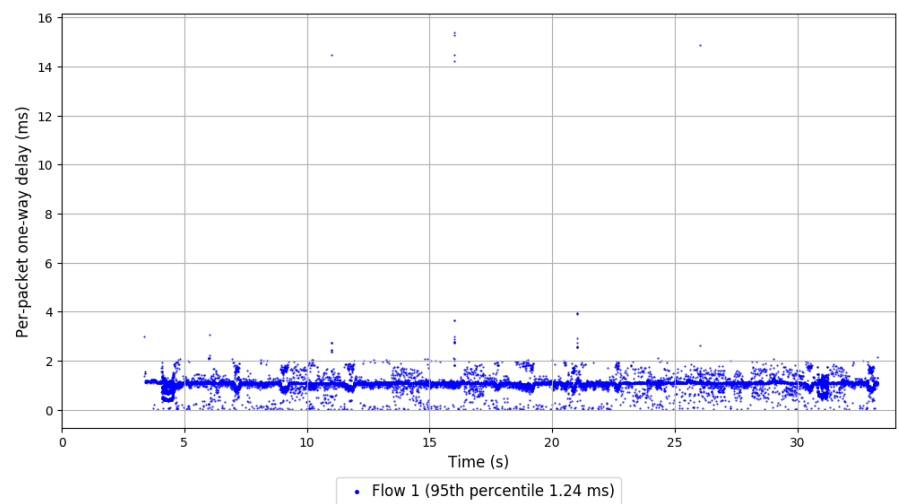
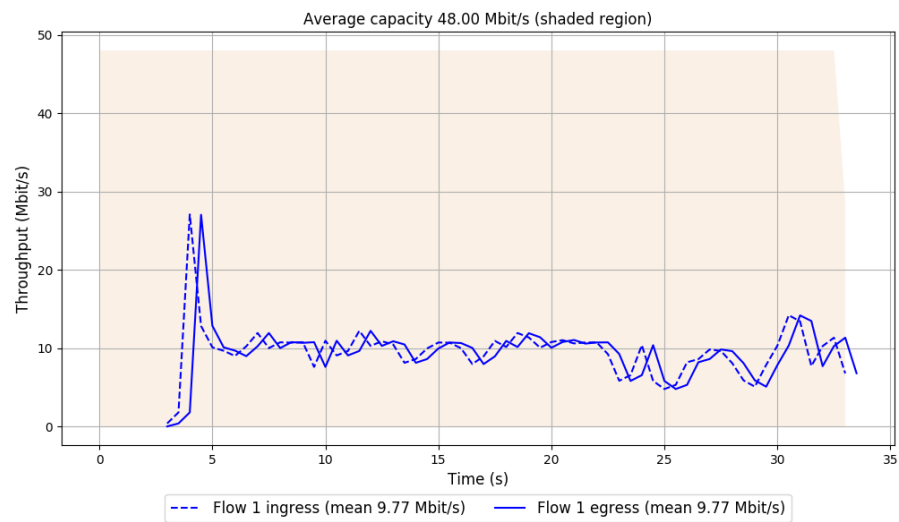
-- Flow 1:

Average throughput: 9.77 Mbit/s

95th percentile per-packet one-way delay: 1.241 ms

Loss rate: 0.00%

Run 1: Report of PCC-Vivace — Data Link



```
Run 1: Statistics of WebRTC media

Start at: 2022-04-05 21:54:40
End at: 2022-04-05 21:55:10

# Below is generated by plot.py at 2022-04-05 22:03:08
# Datalink statistics
-- Total of 1 flow:
Average capacity: 48.00 Mbit/s
Average throughput: 1.50 Mbit/s (3.1% utilization)
95th percentile per-packet one-way delay: 1.610 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 1.610 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link

