

Pantheon Report

Generated at 2019-07-02 04:36:38 (UTC).

Tested in mahimahi: mm-delay 80 mm-loss uplink 0.0006 mm-link 77.72mbps.trace
77.72mbps.trace

Repeated the test of 19 congestion control schemes twice.

Each test lasted for 30 seconds running 1 flow.

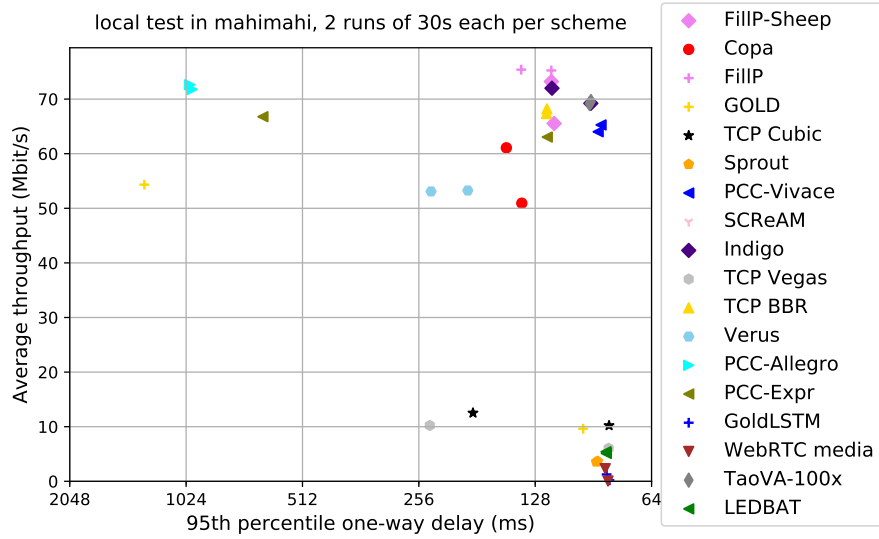
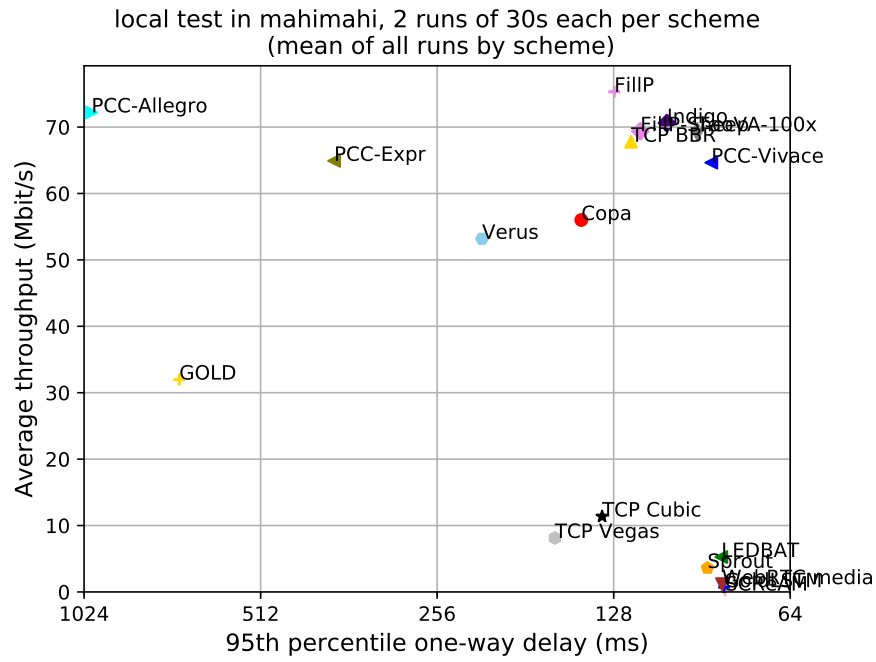
System info:

Linux 4.15.0-54-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 @ e766500a9a1a79589f5b21915d7321f2d3cff01a
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/gold @ e47bed6d7495aa223eec8de2c7a43035967074ef
M environment/__pycache__/datagram_pb2.cpython-36.opt-1.pyc
M environment/__pycache__/datagram_pb2.cpython-36.pyc
M environment/__pycache__/environment.cpython-36.opt-1.pyc
M environment/__pycache__/helpers.cpython-36.opt-1.pyc
M environment/__pycache__/helpers.cpython-36.pyc
M environment/__pycache__/mahimahi.cpython-36.opt-1.pyc
M environment/__pycache__/project_root.cpython-36.opt-1.pyc
M environment/__pycache__/project_root.cpython-36.pyc
M environment/__pycache__/receiver.cpython-36.opt-1.pyc
M environment/__pycache__/receiver.cpython-36.pyc
M environment/logs.txt
M model
third_party/goldLSTM @ 0fa59ba3f5a72353b47cd4411e923035b1f98c7a
M sender-receiver/sender_receiver/envs/DeepRL/deep_rl/agent/A2C_agent.py
M sender-receiver/sender_receiver/envs/sender_receiver_env.py
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
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-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 tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```



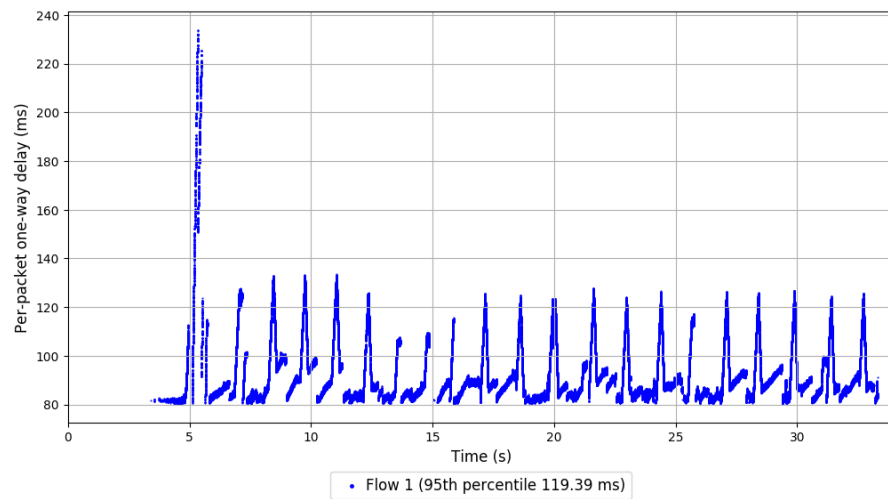
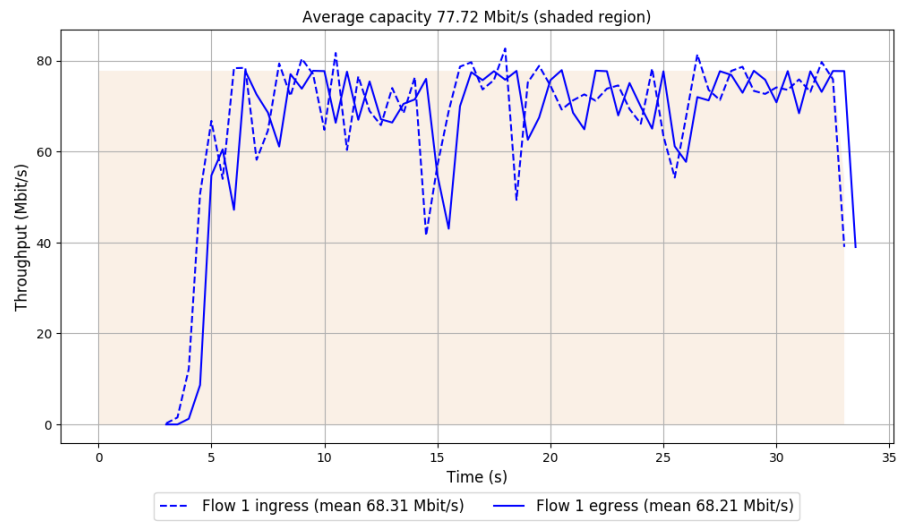
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	2	67.78	119.54	0.42
Copa	2	56.00	145.33	0.42
TCP Cubic	2	11.37	133.95	0.17
FillP	2	75.31	127.70	0.42
FillP-Sheep	2	69.38	115.30	0.39
GOLD	2	31.98	704.66	5.37
GoldLSTM	2	0.72	82.96	0.29
Indigo	2	70.60	103.87	0.34
LEDBAT	2	5.26	83.89	0.62
PCC-Allegro	2	72.20	994.82	0.34
PCC-Expr	2	64.91	383.66	1.45
QUIC Cubic	0	N/A	N/A	N/A
SCReAM	2	0.21	82.66	0.31
Sprout	2	3.62	88.59	0.39
TaoVA-100x	2	69.38	92.22	0.44
TCP Vegas	2	8.13	161.25	0.17
Verus	2	53.17	214.66	0.74
PCC-Vivace	2	64.64	87.24	0.36
WebRTC media	2	1.17	83.65	0.26

```
Run 1: Statistics of TCP BBR

Start at: 2019-07-02 03:55:22
End at: 2019-07-02 03:55:52

# Below is generated by plot.py at 2019-07-02 04:32:50
# Datalink statistics
-- Total of 1 flow:
Average capacity: 77.72 Mbit/s
Average throughput: 68.21 Mbit/s (87.8% utilization)
95th percentile per-packet one-way delay: 119.391 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 68.21 Mbit/s
95th percentile per-packet one-way delay: 119.391 ms
Loss rate: 0.39%
```

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2019-07-02 04:07:15

End at: 2019-07-02 04:07:45

Below is generated by plot.py at 2019-07-02 04:32:50

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 67.36 Mbit/s (86.7% utilization)

95th percentile per-packet one-way delay: 119.682 ms

Loss rate: 0.44%

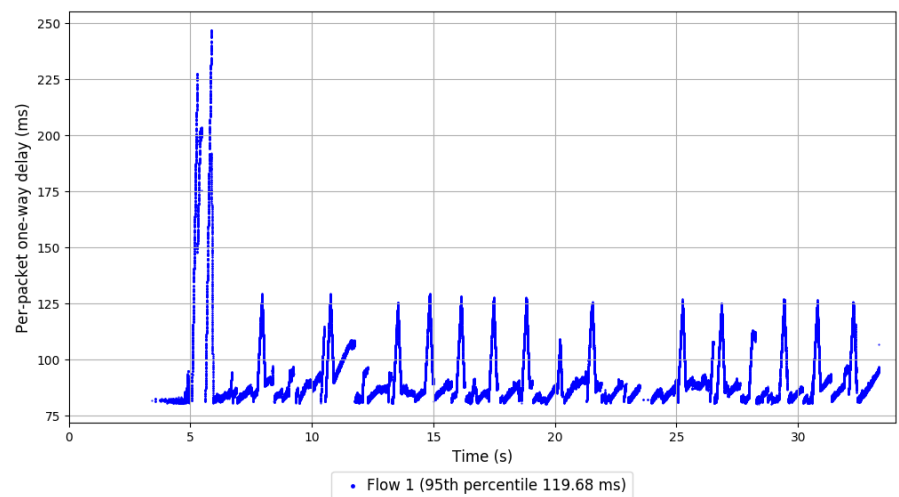
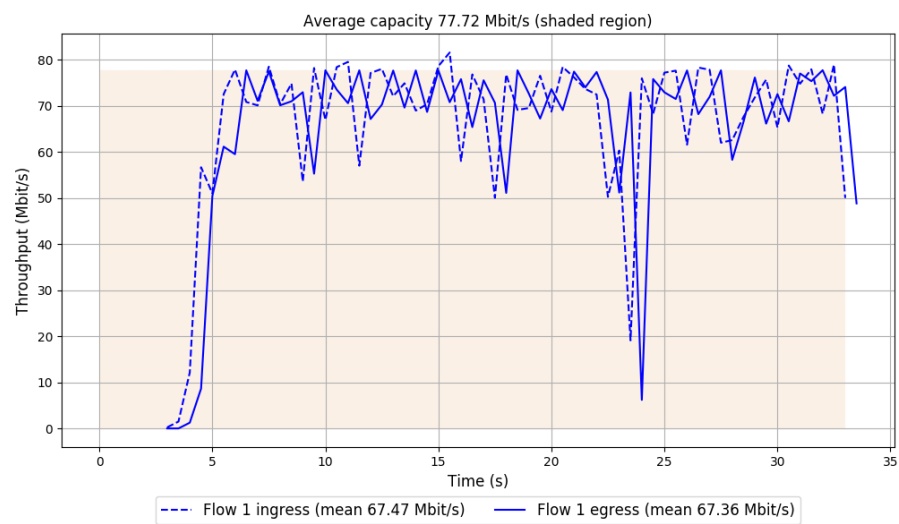
-- Flow 1:

Average throughput: 67.36 Mbit/s

95th percentile per-packet one-way delay: 119.682 ms

Loss rate: 0.44%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

Start at: 2019-07-02 03:50:22

End at: 2019-07-02 03:50:52

Below is generated by plot.py at 2019-07-02 04:33:06

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 50.93 Mbit/s (65.5% utilization)

95th percentile per-packet one-way delay: 138.648 ms

Loss rate: 0.44%

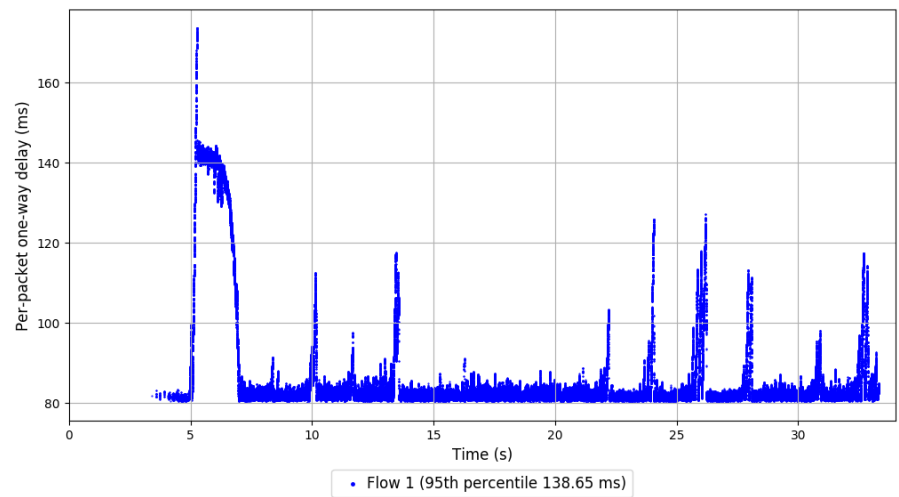
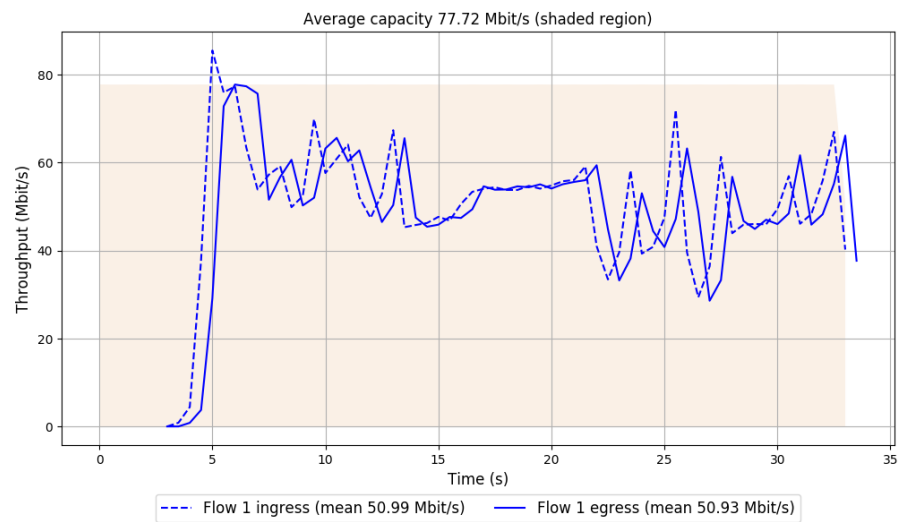
-- Flow 1:

Average throughput: 50.93 Mbit/s

95th percentile per-packet one-way delay: 138.648 ms

Loss rate: 0.44%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2019-07-02 04:02:12

End at: 2019-07-02 04:02:42

Below is generated by plot.py at 2019-07-02 04:33:12

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 61.08 Mbit/s (78.6% utilization)

95th percentile per-packet one-way delay: 152.005 ms

Loss rate: 0.40%

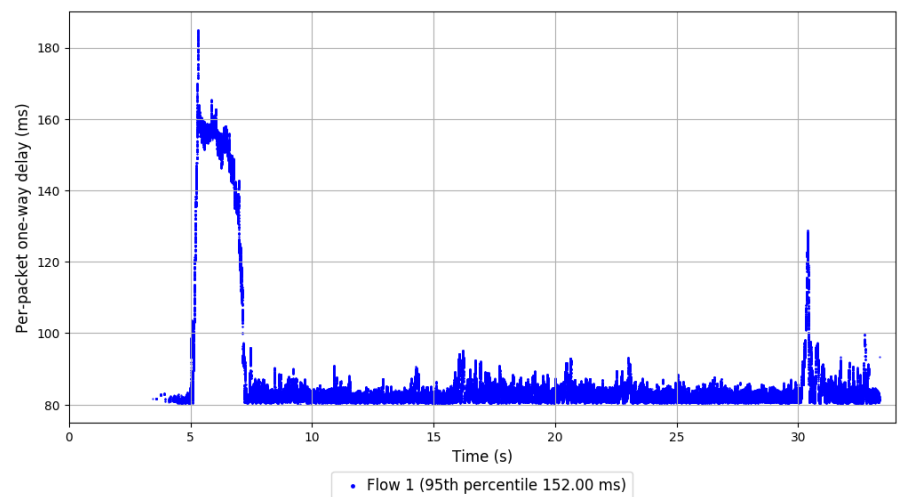
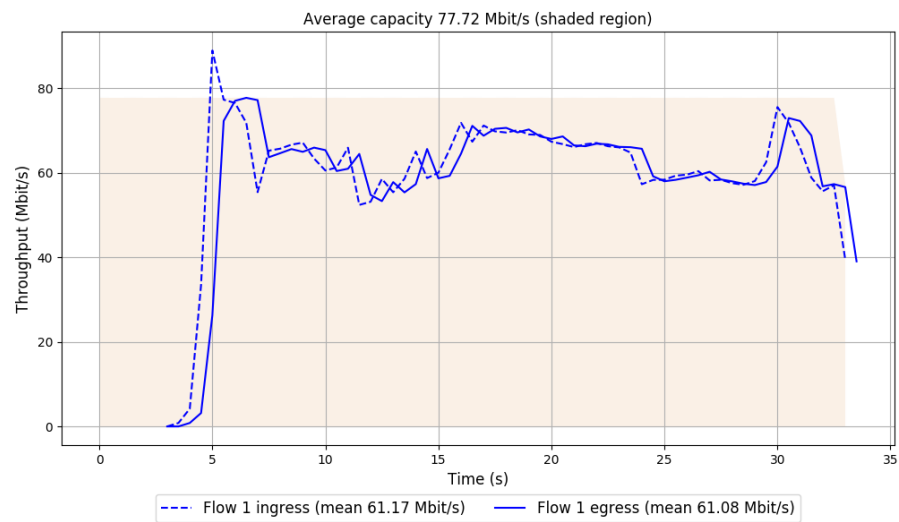
-- Flow 1:

Average throughput: 61.08 Mbit/s

95th percentile per-packet one-way delay: 152.005 ms

Loss rate: 0.40%

Run 2: Report of Copa — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2019-07-02 03:52:55

End at: 2019-07-02 03:53:25

Below is generated by plot.py at 2019-07-02 04:33:12

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 10.21 Mbit/s (13.1% utilization)

95th percentile per-packet one-way delay: 82.444 ms

Loss rate: 0.17%

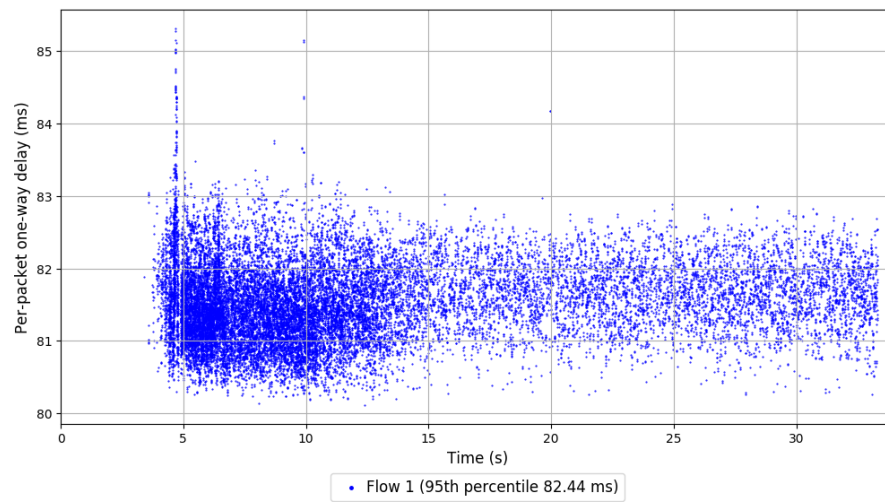
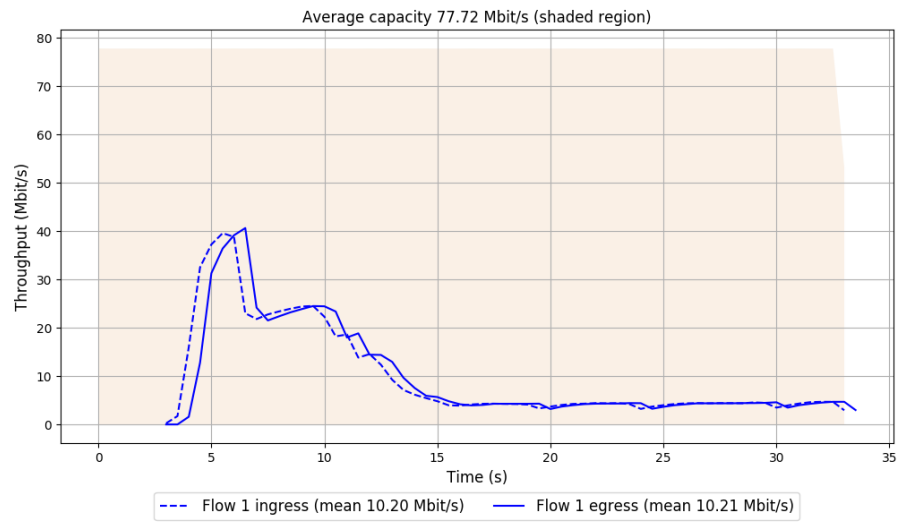
-- Flow 1:

Average throughput: 10.21 Mbit/s

95th percentile per-packet one-way delay: 82.444 ms

Loss rate: 0.17%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2019-07-02 04:04:48

End at: 2019-07-02 04:05:18

Below is generated by plot.py at 2019-07-02 04:33:12

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 12.52 Mbit/s (16.1% utilization)

95th percentile per-packet one-way delay: 185.453 ms

Loss rate: 0.17%

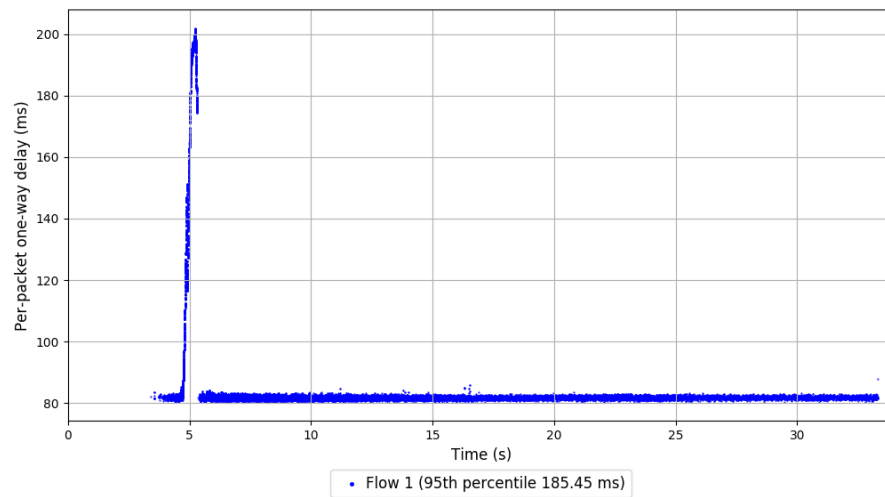
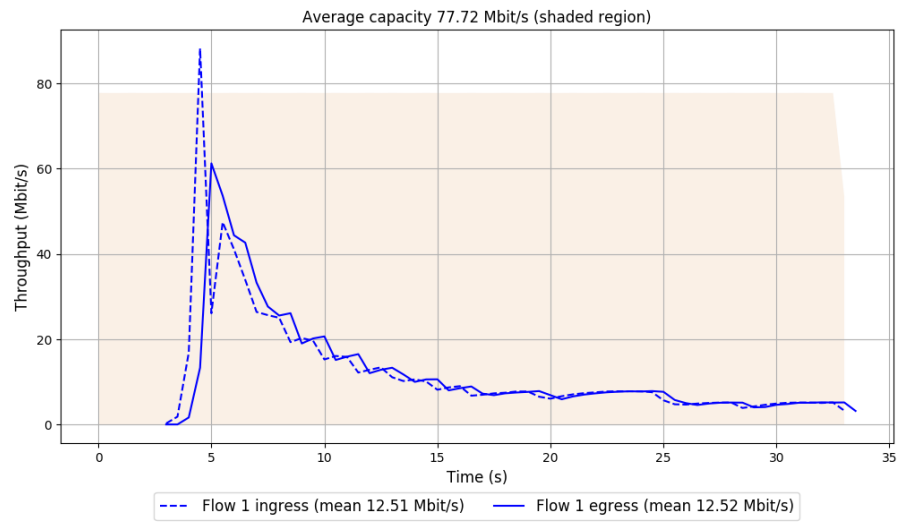
-- Flow 1:

Average throughput: 12.52 Mbit/s

95th percentile per-packet one-way delay: 185.453 ms

Loss rate: 0.17%

Run 2: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2019-07-02 03:57:17

End at: 2019-07-02 03:57:47

Below is generated by plot.py at 2019-07-02 04:33:49

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 75.39 Mbit/s (97.0% utilization)

95th percentile per-packet one-way delay: 139.122 ms

Loss rate: 0.47%

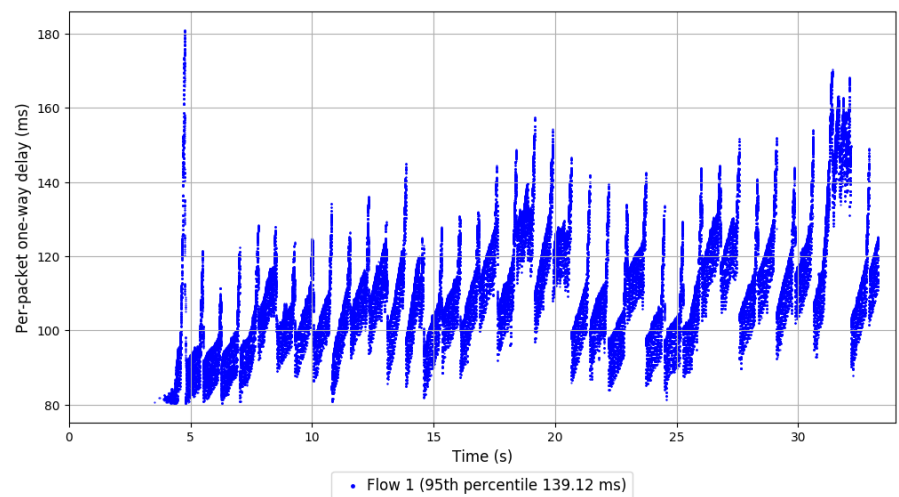
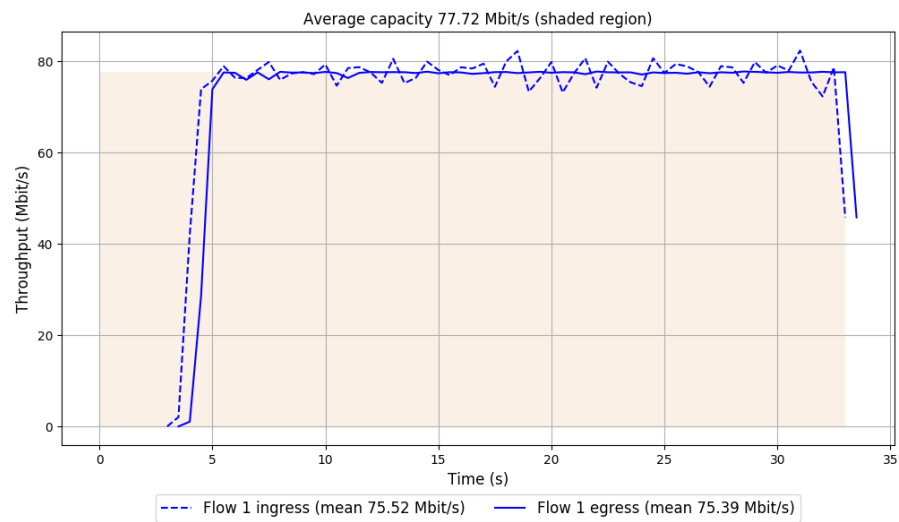
-- Flow 1:

Average throughput: 75.39 Mbit/s

95th percentile per-packet one-way delay: 139.122 ms

Loss rate: 0.47%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2019-07-02 04:09:10

End at: 2019-07-02 04:09:40

Below is generated by plot.py at 2019-07-02 04:33:49

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 75.24 Mbit/s (96.8% utilization)

95th percentile per-packet one-way delay: 116.281 ms

Loss rate: 0.38%

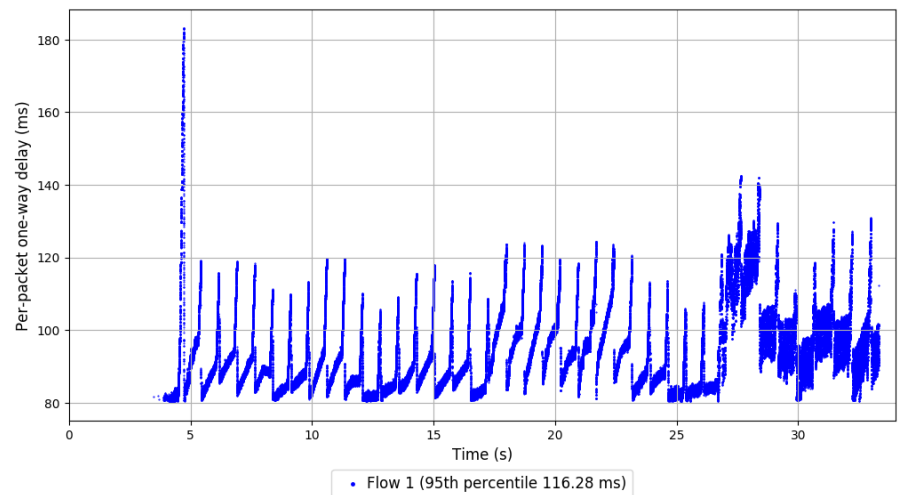
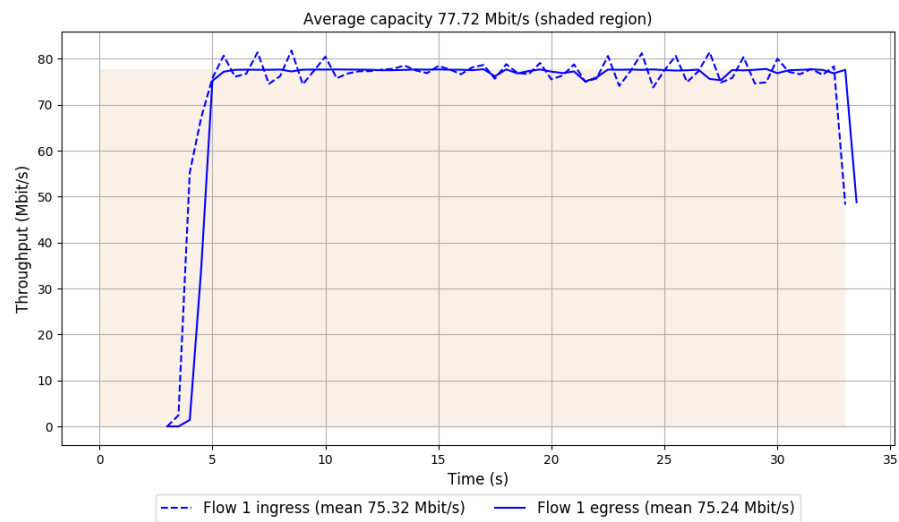
-- Flow 1:

Average throughput: 75.24 Mbit/s

95th percentile per-packet one-way delay: 116.281 ms

Loss rate: 0.38%

Run 2: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2019-07-02 03:49:44

End at: 2019-07-02 03:50:14

Below is generated by plot.py at 2019-07-02 04:33:50

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 73.21 Mbit/s (94.2% utilization)

95th percentile per-packet one-way delay: 116.269 ms

Loss rate: 0.38%

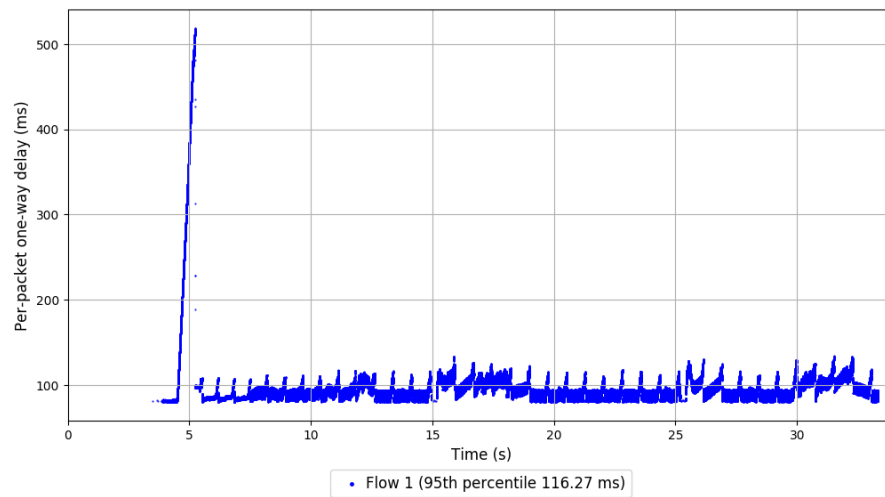
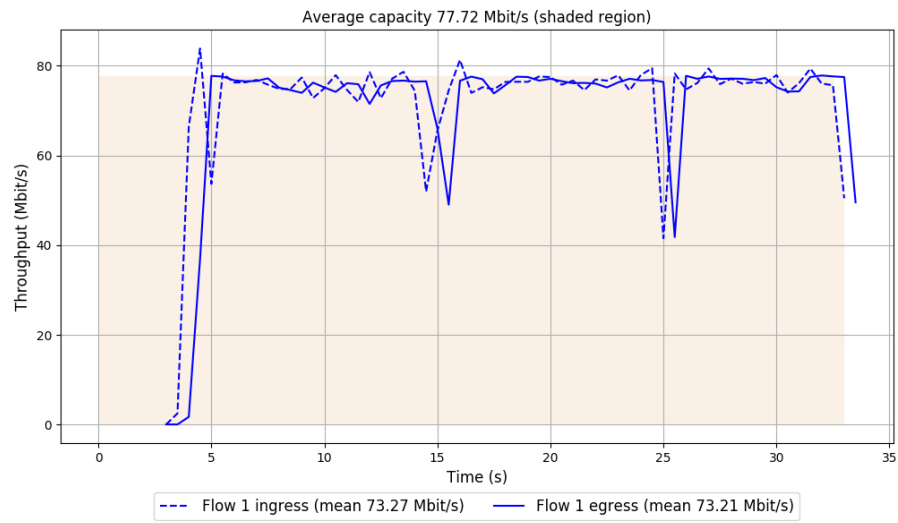
-- Flow 1:

Average throughput: 73.21 Mbit/s

95th percentile per-packet one-way delay: 116.269 ms

Loss rate: 0.38%

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2019-07-02 04:01:34

End at: 2019-07-02 04:02:05

Below is generated by plot.py at 2019-07-02 04:33:51

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 65.54 Mbit/s (84.3% utilization)

95th percentile per-packet one-way delay: 114.337 ms

Loss rate: 0.40%

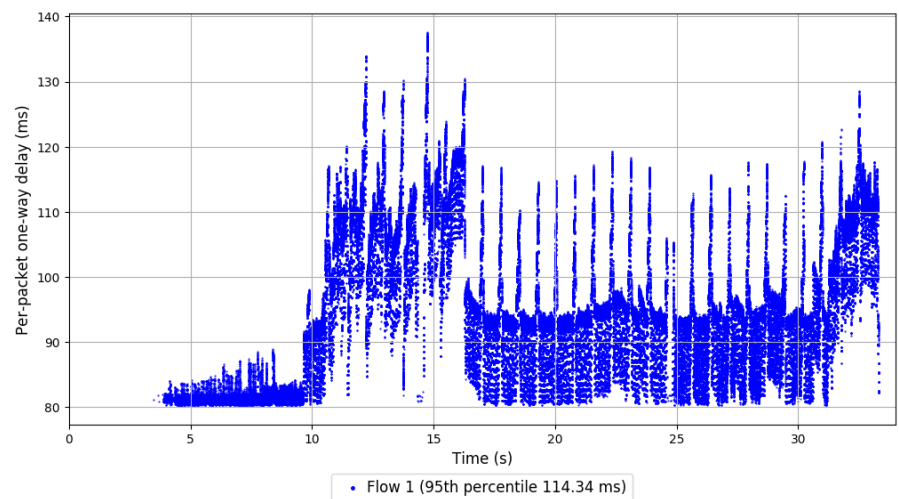
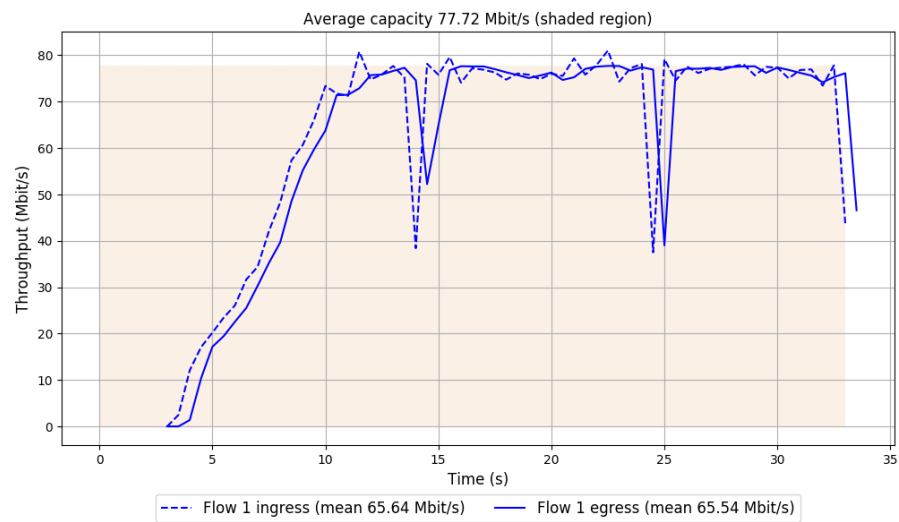
-- Flow 1:

Average throughput: 65.54 Mbit/s

95th percentile per-packet one-way delay: 114.337 ms

Loss rate: 0.40%

Run 2: Report of FillP-Sheep — Data Link



Run 1: Statistics of GOLD

Start at: 2019-07-02 03:52:19

End at: 2019-07-02 03:52:49

Below is generated by plot.py at 2019-07-02 04:34:01

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 9.63 Mbit/s (12.4% utilization)

95th percentile per-packet one-way delay: 96.195 ms

Loss rate: 1.83%

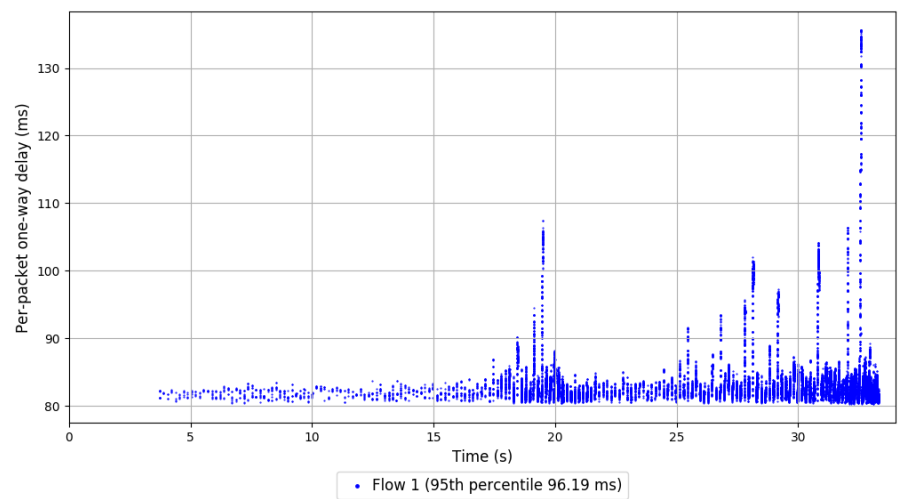
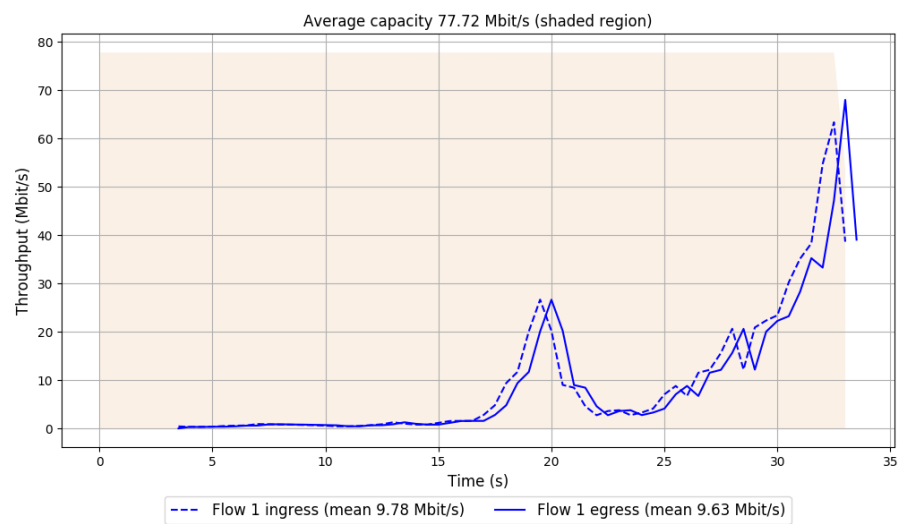
-- Flow 1:

Average throughput: 9.63 Mbit/s

95th percentile per-packet one-way delay: 96.195 ms

Loss rate: 1.83%

Run 1: Report of GOLD — Data Link



Run 2: Statistics of GOLD

Start at: 2019-07-02 04:04:10

End at: 2019-07-02 04:04:40

Below is generated by plot.py at 2019-07-02 04:34:15

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 54.33 Mbit/s (69.9% utilization)

95th percentile per-packet one-way delay: 1313.118 ms

Loss rate: 8.91%

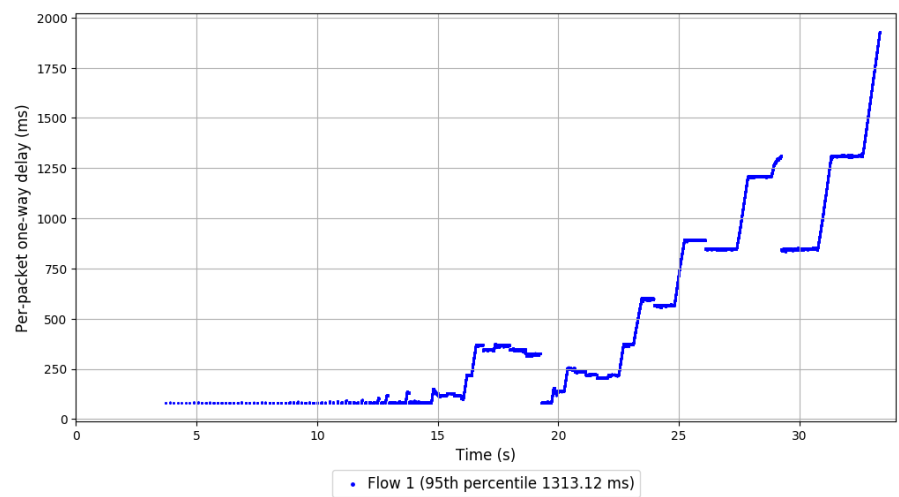
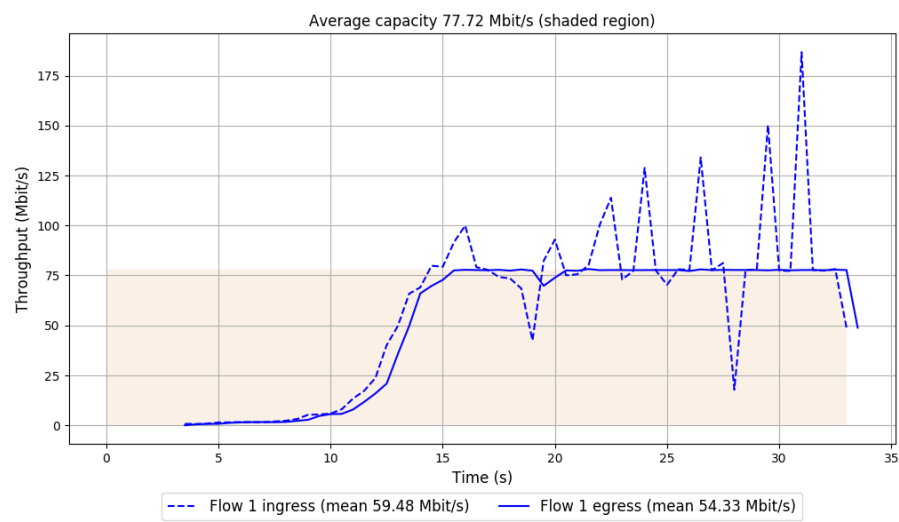
-- Flow 1:

Average throughput: 54.33 Mbit/s

95th percentile per-packet one-way delay: 1313.118 ms

Loss rate: 8.91%

Run 2: Report of GOLD — Data Link

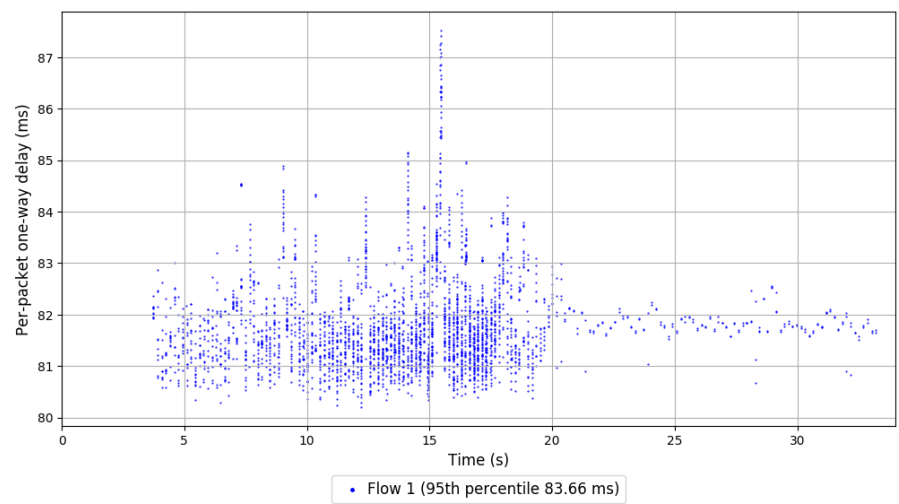
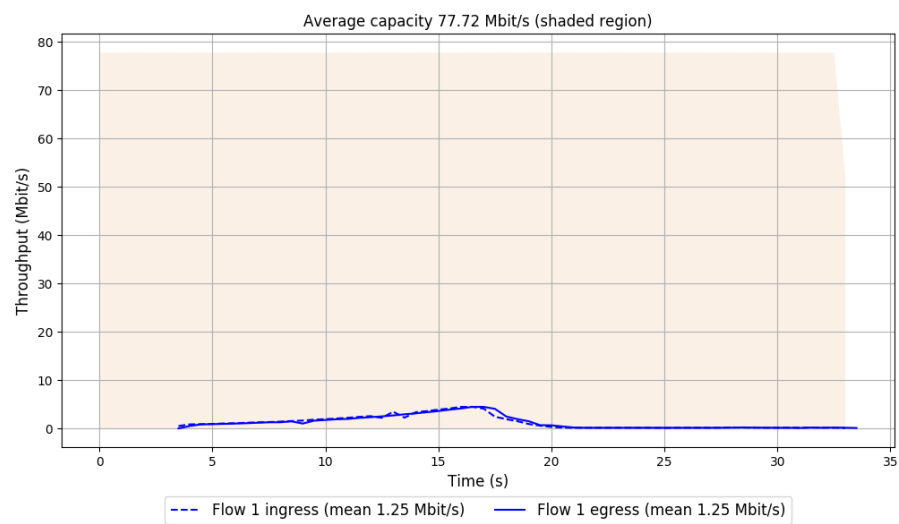


```
Run 1: Statistics of GoldLSTM

Start at: 2019-07-02 03:56:01
End at: 2019-07-02 03:56:31

# Below is generated by plot.py at 2019-07-02 04:34:15
# Datalink statistics
-- Total of 1 flow:
Average capacity: 77.72 Mbit/s
Average throughput: 1.25 Mbit/s (1.6% utilization)
95th percentile per-packet one-way delay: 83.659 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 83.659 ms
Loss rate: 0.13%
```

Run 1: Report of GoldLSTM — Data Link



Run 2: Statistics of GoldLSTM

Start at: 2019-07-02 04:07:53

End at: 2019-07-02 04:08:23

Below is generated by plot.py at 2019-07-02 04:34:15

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 0.19 Mbit/s (0.2% utilization)

95th percentile per-packet one-way delay: 82.252 ms

Loss rate: 0.44%

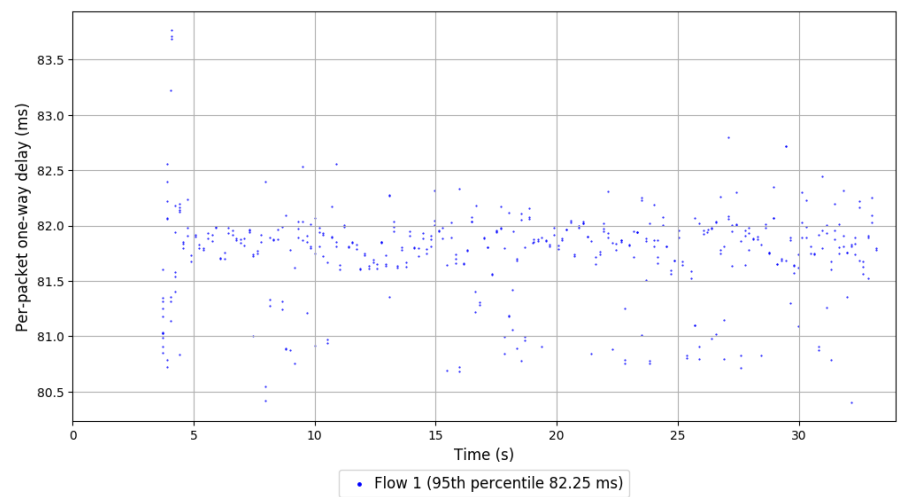
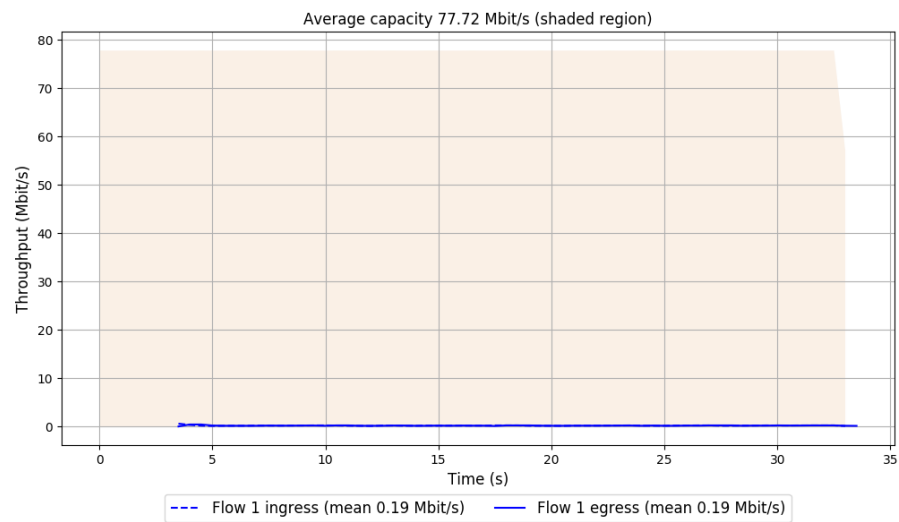
-- Flow 1:

Average throughput: 0.19 Mbit/s

95th percentile per-packet one-way delay: 82.252 ms

Loss rate: 0.44%

Run 2: Report of GoldLSTM — Data Link

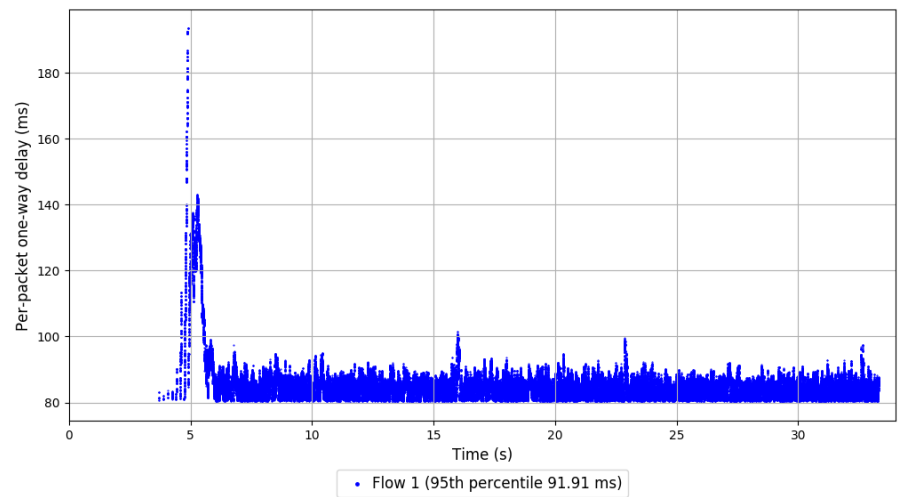
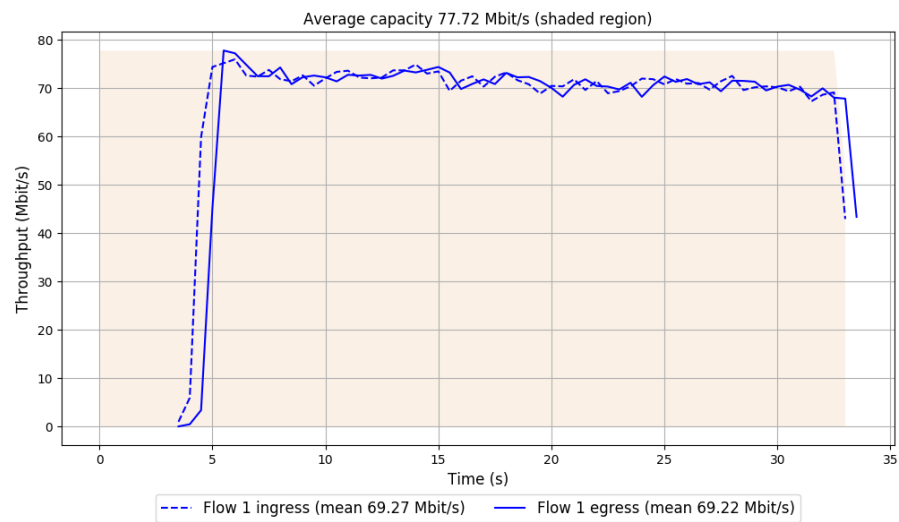



```
Run 1: Statistics of Indigo

Start at: 2019-07-02 03:51:01
End at: 2019-07-02 03:51:32

# Below is generated by plot.py at 2019-07-02 04:34:33
# Datalink statistics
-- Total of 1 flow:
Average capacity: 77.72 Mbit/s
Average throughput: 69.22 Mbit/s (89.1% utilization)
95th percentile per-packet one-way delay: 91.907 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 69.22 Mbit/s
95th percentile per-packet one-way delay: 91.907 ms
Loss rate: 0.34%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2019-07-02 04:02:52

End at: 2019-07-02 04:03:22

Below is generated by plot.py at 2019-07-02 04:34:36

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 71.99 Mbit/s (92.6% utilization)

95th percentile per-packet one-way delay: 115.834 ms

Loss rate: 0.35%

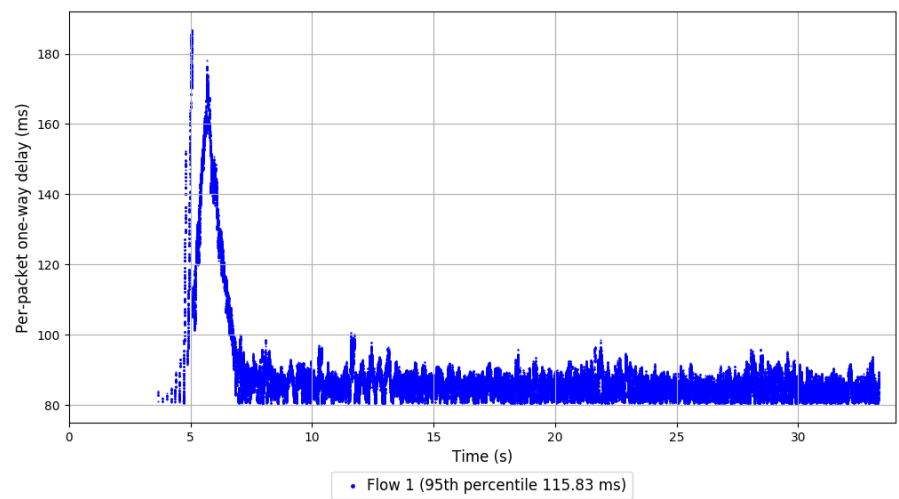
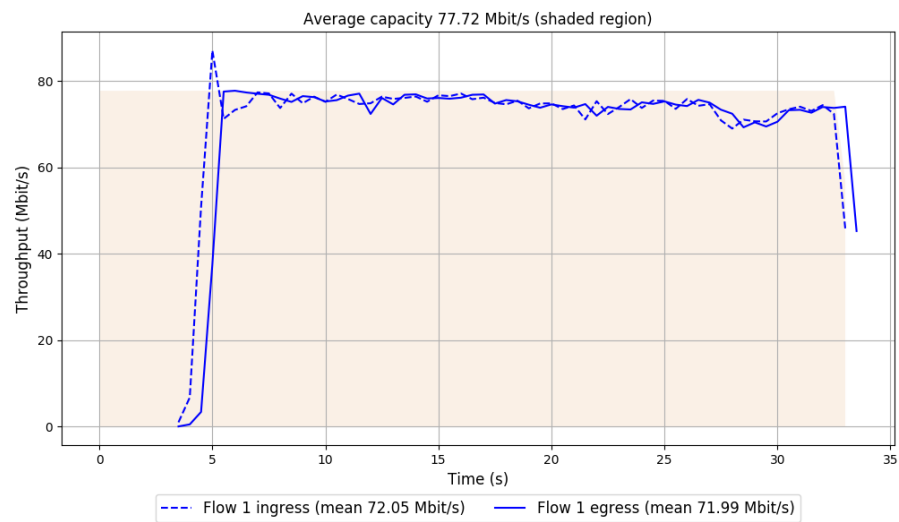
-- Flow 1:

Average throughput: 71.99 Mbit/s

95th percentile per-packet one-way delay: 115.834 ms

Loss rate: 0.35%

Run 2: Report of Indigo — Data Link

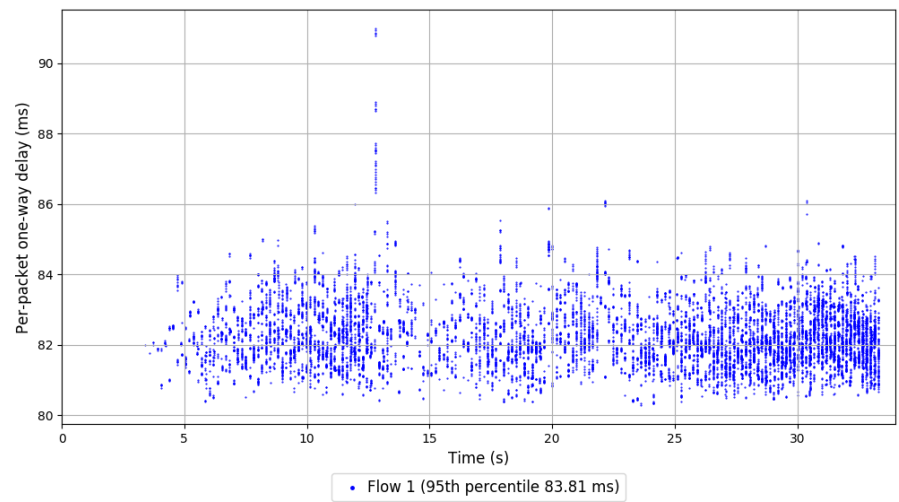
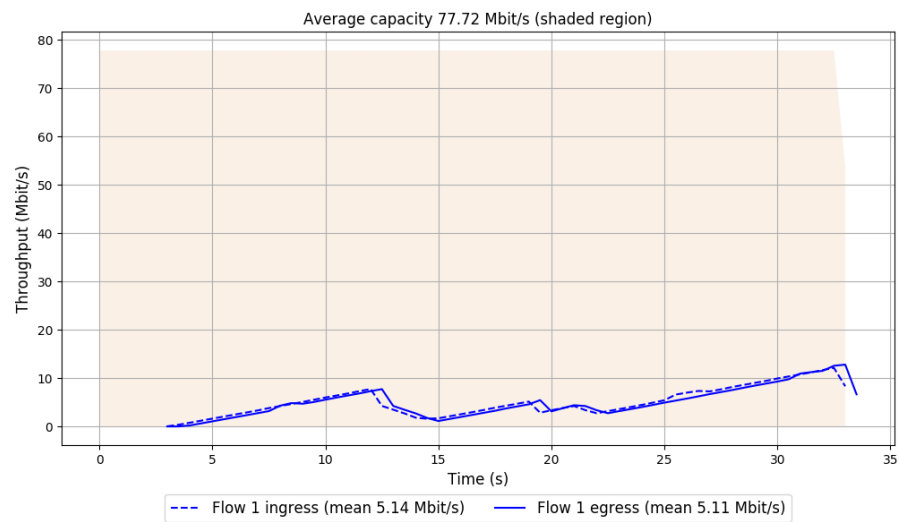


```
Run 1: Statistics of LEDBAT

Start at: 2019-07-02 04:00:18
End at: 2019-07-02 04:00:48

# Below is generated by plot.py at 2019-07-02 04:34:36
# Datalink statistics
-- Total of 1 flow:
Average capacity: 77.72 Mbit/s
Average throughput: 5.11 Mbit/s (6.6% utilization)
95th percentile per-packet one-way delay: 83.814 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 5.11 Mbit/s
95th percentile per-packet one-way delay: 83.814 ms
Loss rate: 0.72%
```

Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2019-07-02 04:12:11

End at: 2019-07-02 04:12:41

Below is generated by plot.py at 2019-07-02 04:34:36

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 5.41 Mbit/s (7.0% utilization)

95th percentile per-packet one-way delay: 83.968 ms

Loss rate: 0.52%

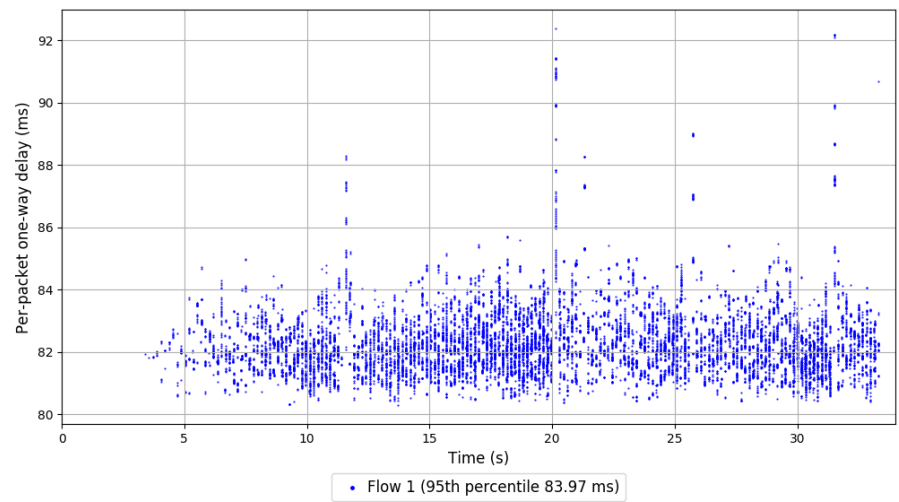
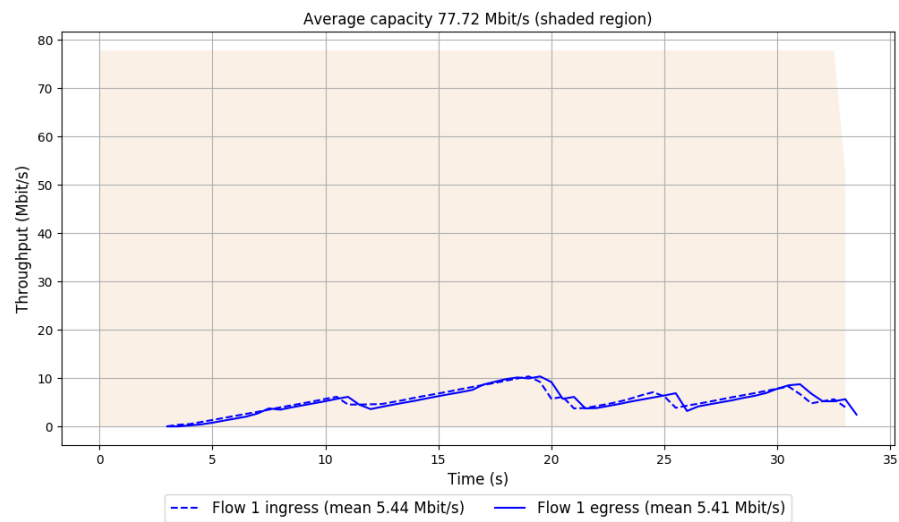
-- Flow 1:

Average throughput: 5.41 Mbit/s

95th percentile per-packet one-way delay: 83.968 ms

Loss rate: 0.52%

Run 2: Report of LEDBAT — Data Link

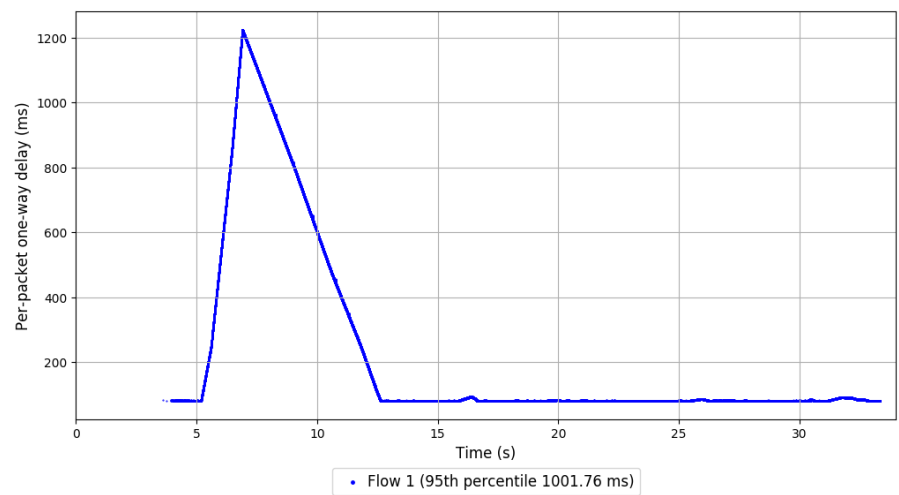
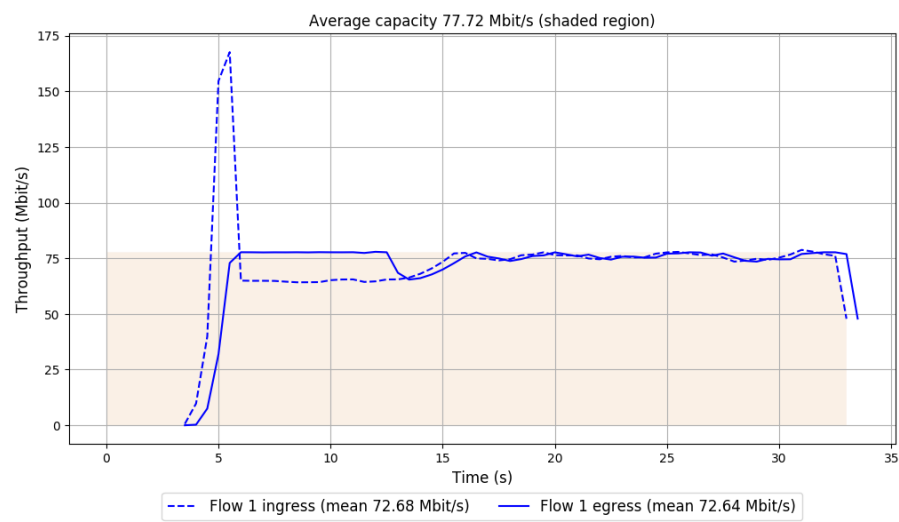



```
Run 1: Statistics of PCC-Allegro

Start at: 2019-07-02 03:59:05
End at: 2019-07-02 03:59:35

# Below is generated by plot.py at 2019-07-02 04:34:51
# Datalink statistics
-- Total of 1 flow:
Average capacity: 77.72 Mbit/s
Average throughput: 72.64 Mbit/s (93.5% utilization)
95th percentile per-packet one-way delay: 1001.765 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 72.64 Mbit/s
95th percentile per-packet one-way delay: 1001.765 ms
Loss rate: 0.34%
```

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2019-07-02 04:10:58

End at: 2019-07-02 04:11:28

Below is generated by plot.py at 2019-07-02 04:34:59

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 71.77 Mbit/s (92.3% utilization)

95th percentile per-packet one-way delay: 987.871 ms

Loss rate: 0.34%

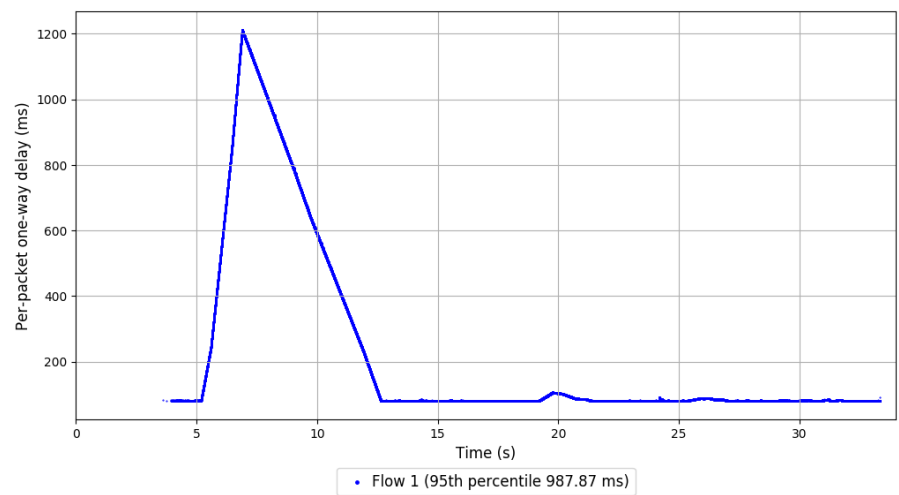
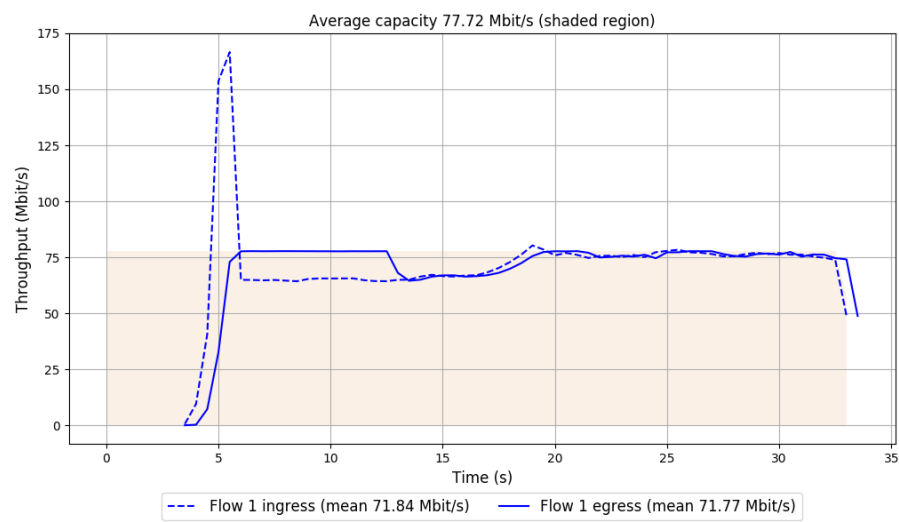
-- Flow 1:

Average throughput: 71.77 Mbit/s

95th percentile per-packet one-way delay: 987.871 ms

Loss rate: 0.34%

Run 2: Report of PCC-Allegro — Data Link

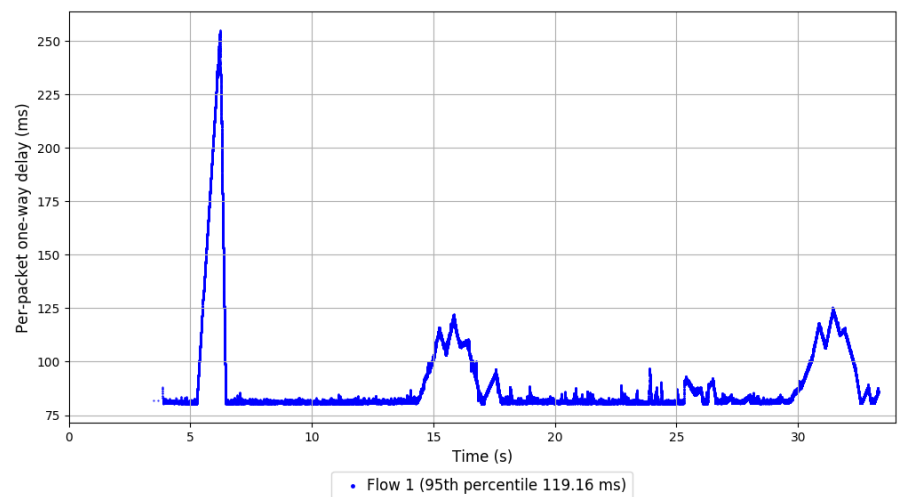
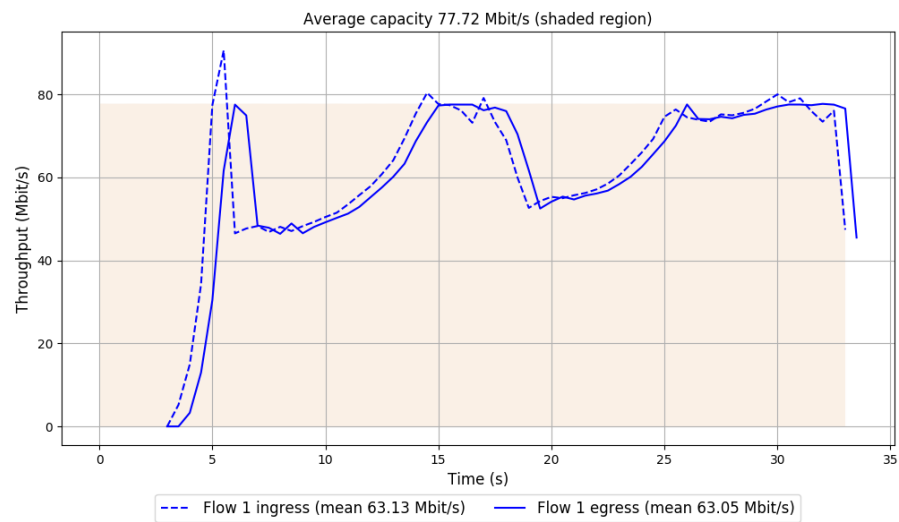


```
Run 1: Statistics of PCC-Expr

Start at: 2019-07-02 04:00:54
End at: 2019-07-02 04:01:24

# Below is generated by plot.py at 2019-07-02 04:35:25
# Datalink statistics
-- Total of 1 flow:
Average capacity: 77.72 Mbit/s
Average throughput: 63.05 Mbit/s (81.1% utilization)
95th percentile per-packet one-way delay: 119.163 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 63.05 Mbit/s
95th percentile per-packet one-way delay: 119.163 ms
Loss rate: 0.41%
```

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

Start at: 2019-07-02 04:12:46

End at: 2019-07-02 04:13:16

Below is generated by plot.py at 2019-07-02 04:35:31

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 66.77 Mbit/s (85.9% utilization)

95th percentile per-packet one-way delay: 648.160 ms

Loss rate: 2.49%

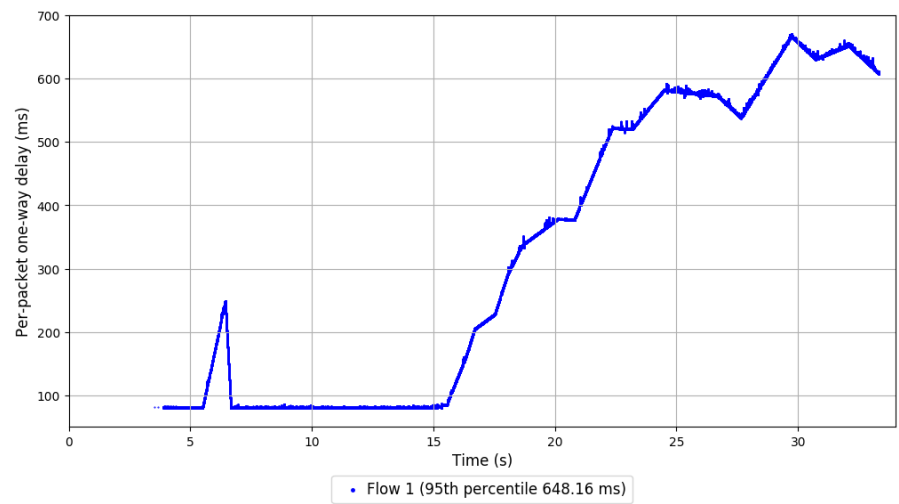
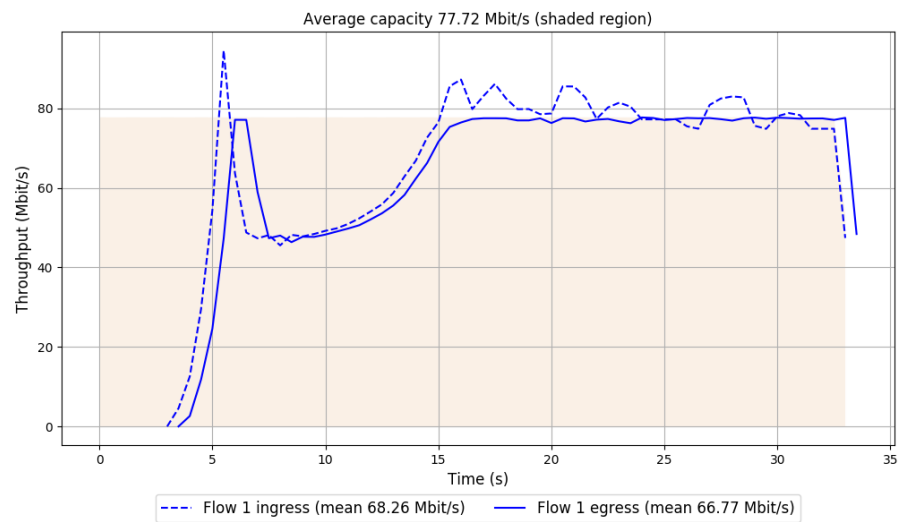
-- Flow 1:

Average throughput: 66.77 Mbit/s

95th percentile per-packet one-way delay: 648.160 ms

Loss rate: 2.49%

Run 2: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2019-07-02 03:58:31

End at: 2019-07-02 03:59:01

Run 1: Report of QUIC Cubic — Data Link

Figure is missing

Figure is missing

Run 2: Statistics of QUIC Cubic

Start at: 2019-07-02 04:10:23

End at: 2019-07-02 04:10:53

Run 2: Report of QUIC Cubic — Data Link

Figure is missing

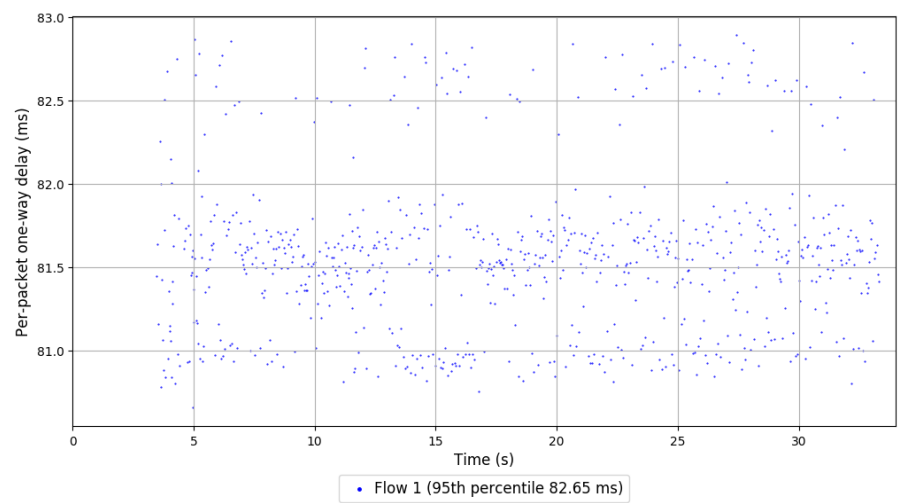
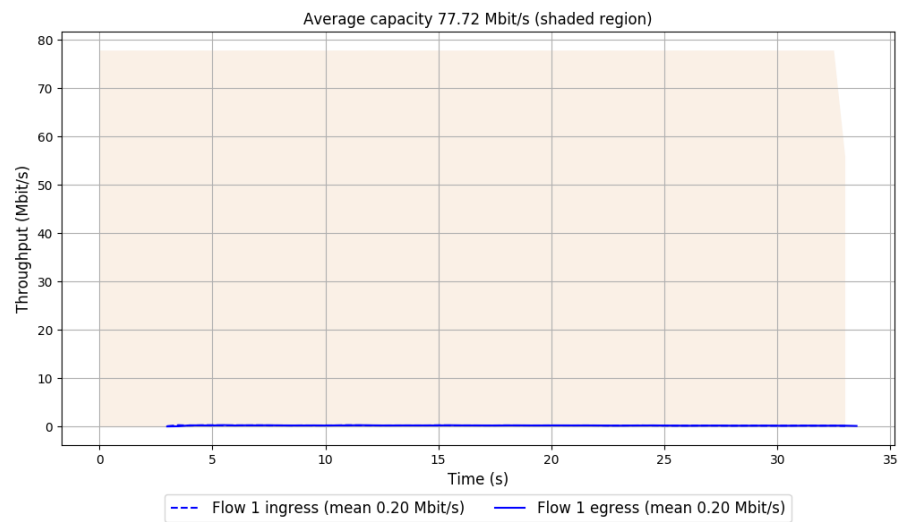
Figure is missing

```
Run 1: Statistics of SCReAM

Start at: 2019-07-02 03:57:55
End at: 2019-07-02 03:58:25

# Below is generated by plot.py at 2019-07-02 04:35:31
# Datalink statistics
-- Total of 1 flow:
Average capacity: 77.72 Mbit/s
Average throughput: 0.20 Mbit/s (0.3% utilization)
95th percentile per-packet one-way delay: 82.652 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 82.652 ms
Loss rate: 0.36%
```

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2019-07-02 04:09:48

End at: 2019-07-02 04:10:18

Below is generated by plot.py at 2019-07-02 04:35:31

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 0.22 Mbit/s (0.3% utilization)

95th percentile per-packet one-way delay: 82.662 ms

Loss rate: 0.26%

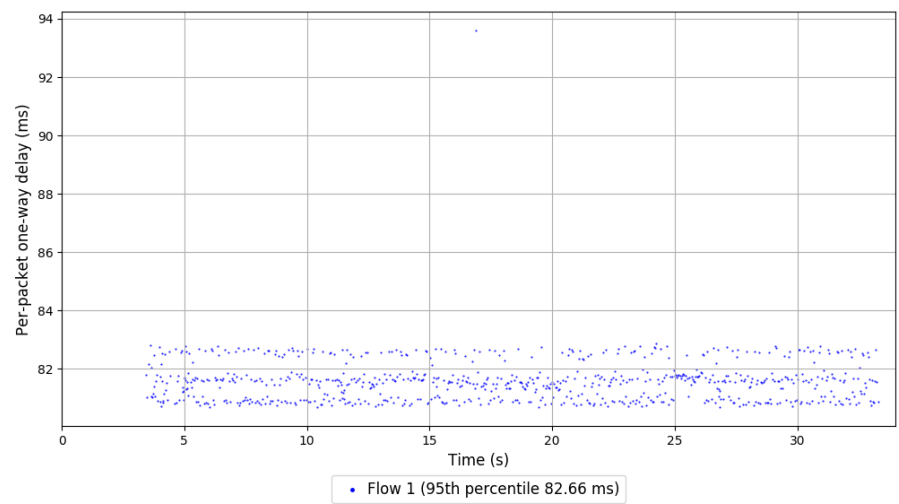
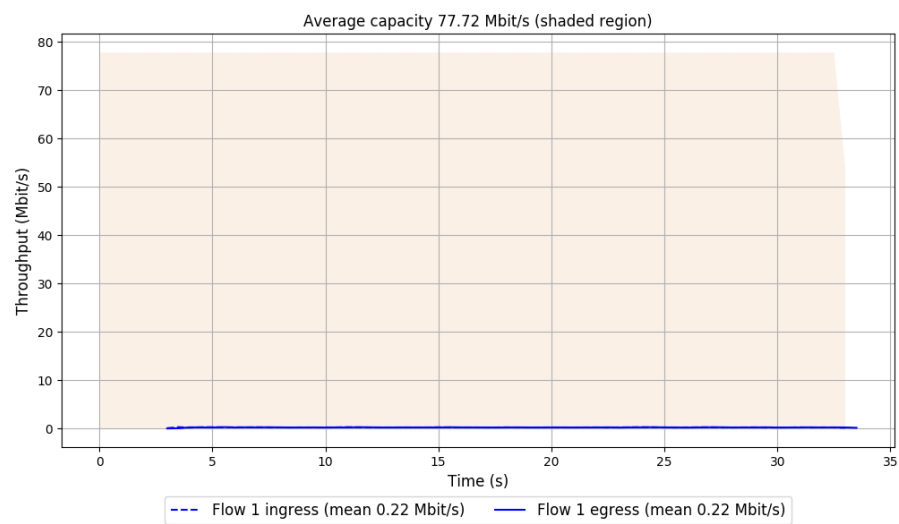
-- Flow 1:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 82.662 ms

Loss rate: 0.26%

Run 2: Report of SReAM — Data Link



Run 1: Statistics of Sprout

Start at: 2019-07-02 03:53:31

End at: 2019-07-02 03:54:01

Below is generated by plot.py at 2019-07-02 04:35:31

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 3.67 Mbit/s (4.7% utilization)

95th percentile per-packet one-way delay: 88.214 ms

Loss rate: 0.07%

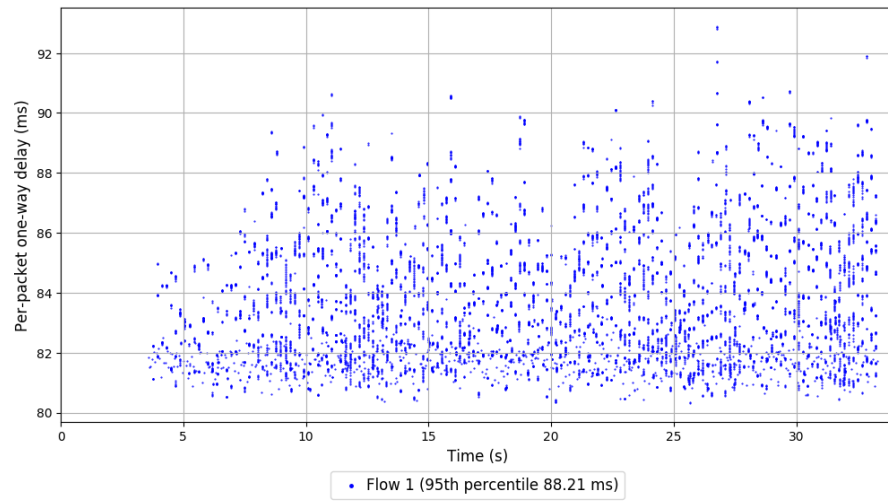
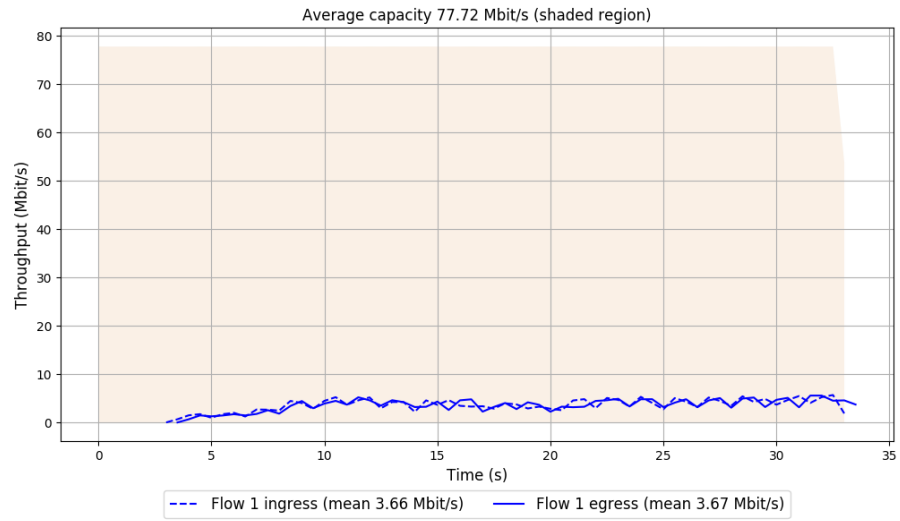
-- Flow 1:

Average throughput: 3.67 Mbit/s

95th percentile per-packet one-way delay: 88.214 ms

Loss rate: 0.07%

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2019-07-02 04:05:25

End at: 2019-07-02 04:05:55

Below is generated by plot.py at 2019-07-02 04:35:31

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 3.56 Mbit/s (4.6% utilization)

95th percentile per-packet one-way delay: 88.959 ms

Loss rate: 0.70%

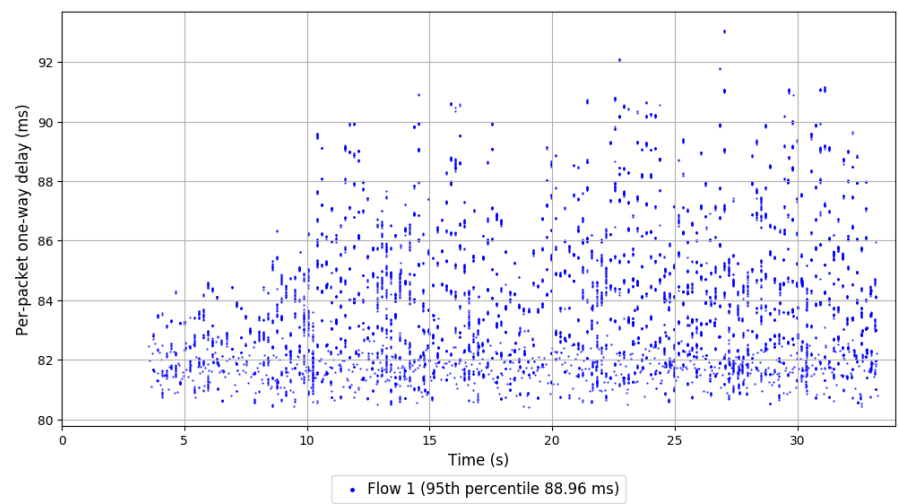
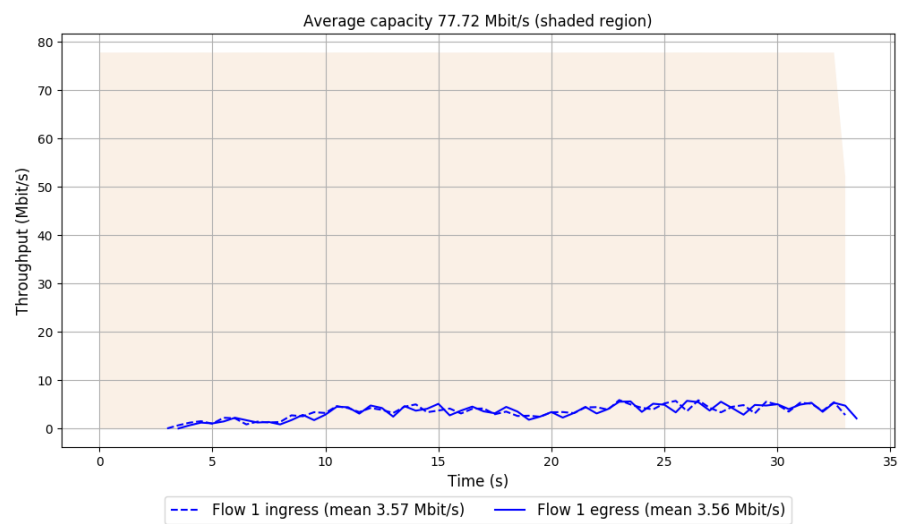
-- Flow 1:

Average throughput: 3.56 Mbit/s

95th percentile per-packet one-way delay: 88.959 ms

Loss rate: 0.70%

Run 2: Report of Sprout — Data Link

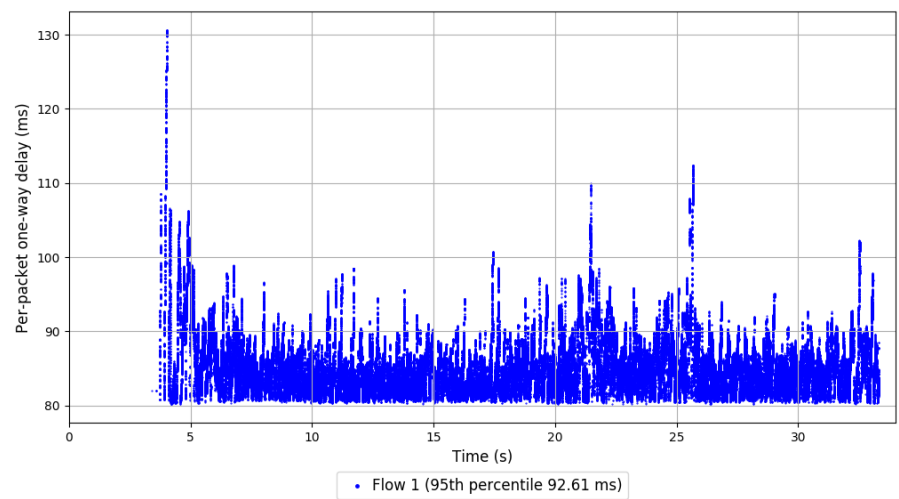
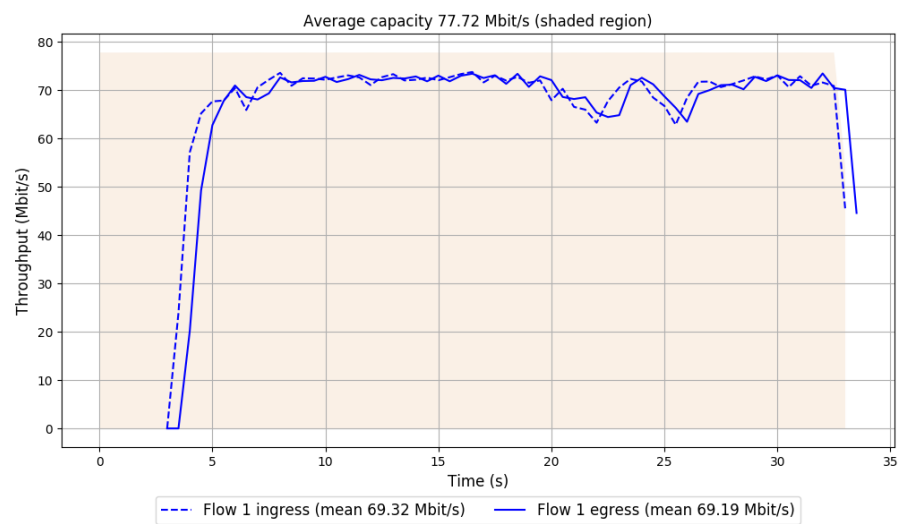


```
Run 1: Statistics of TaoVA-100x

Start at: 2019-07-02 03:56:36
End at: 2019-07-02 03:57:06

# Below is generated by plot.py at 2019-07-02 04:36:15
# Datalink statistics
-- Total of 1 flow:
Average capacity: 77.72 Mbit/s
Average throughput: 69.19 Mbit/s (89.0% utilization)
95th percentile per-packet one-way delay: 92.609 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 69.19 Mbit/s
95th percentile per-packet one-way delay: 92.609 ms
Loss rate: 0.44%
```

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

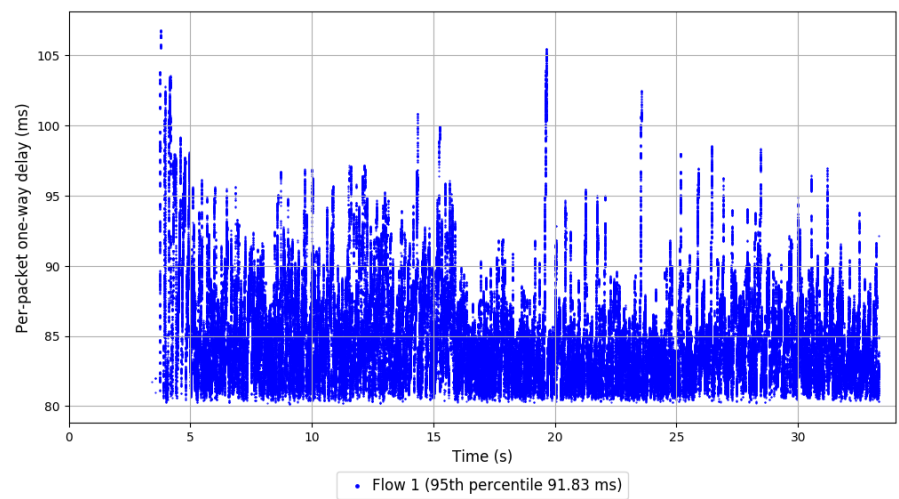
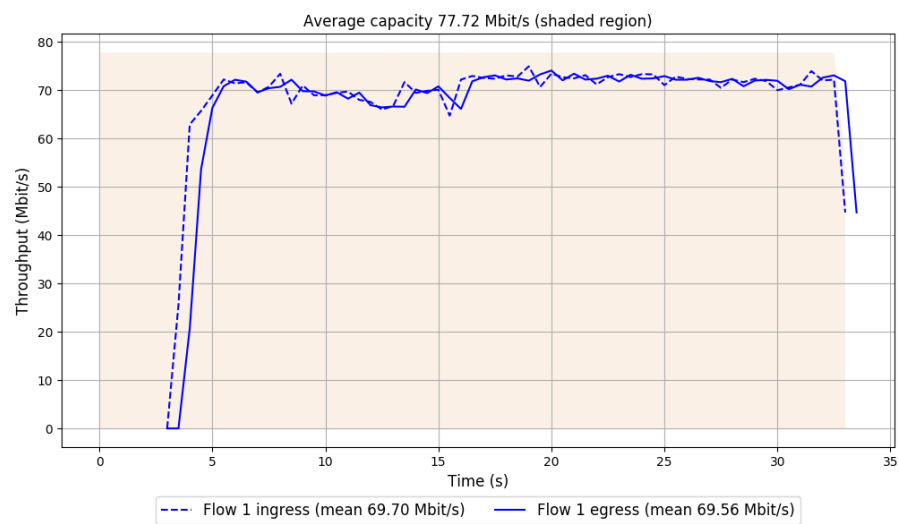


```
Run 2: Statistics of TaoVA-100x

Start at: 2019-07-02 04:08:28
End at: 2019-07-02 04:08:59

# Below is generated by plot.py at 2019-07-02 04:36:25
# Datalink statistics
-- Total of 1 flow:
Average capacity: 77.72 Mbit/s
Average throughput: 69.56 Mbit/s (89.5% utilization)
95th percentile per-packet one-way delay: 91.833 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 69.56 Mbit/s
95th percentile per-packet one-way delay: 91.833 ms
Loss rate: 0.44%
```

Run 2: Report of TaoVA-100x — Data Link



Run 1: Statistics of TCP Vegas

Start at: 2019-07-02 03:54:46

End at: 2019-07-02 03:55:16

Below is generated by plot.py at 2019-07-02 04:36:25

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 6.04 Mbit/s (7.8% utilization)

95th percentile per-packet one-way delay: 82.664 ms

Loss rate: 0.22%

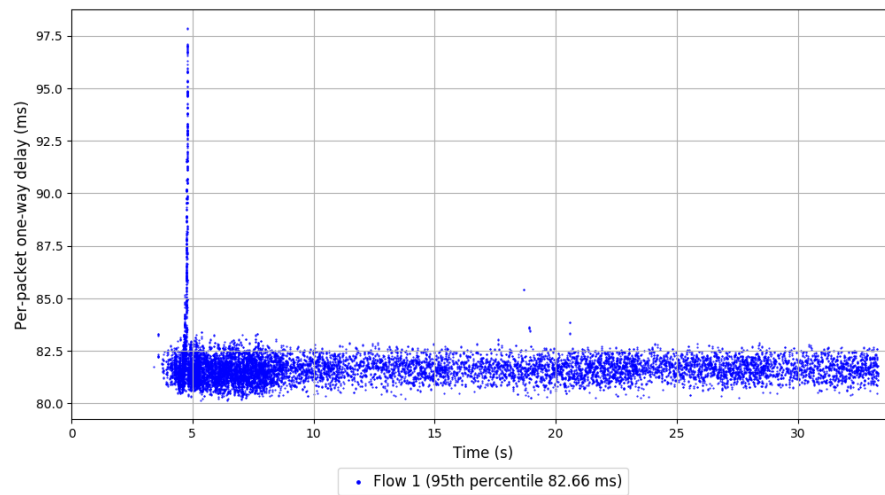
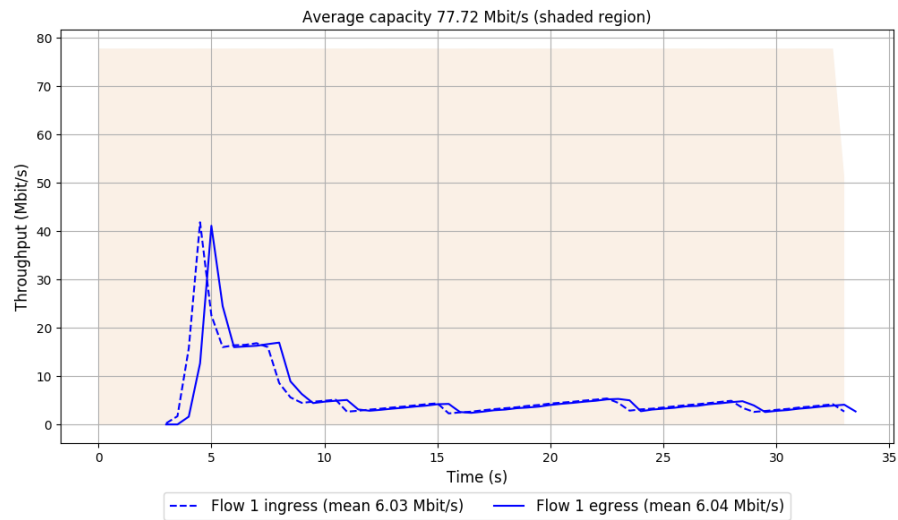
-- Flow 1:

Average throughput: 6.04 Mbit/s

95th percentile per-packet one-way delay: 82.664 ms

Loss rate: 0.22%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2019-07-02 04:06:39

End at: 2019-07-02 04:07:09

Below is generated by plot.py at 2019-07-02 04:36:25

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 10.22 Mbit/s (13.2% utilization)

95th percentile per-packet one-way delay: 239.835 ms

Loss rate: 0.12%

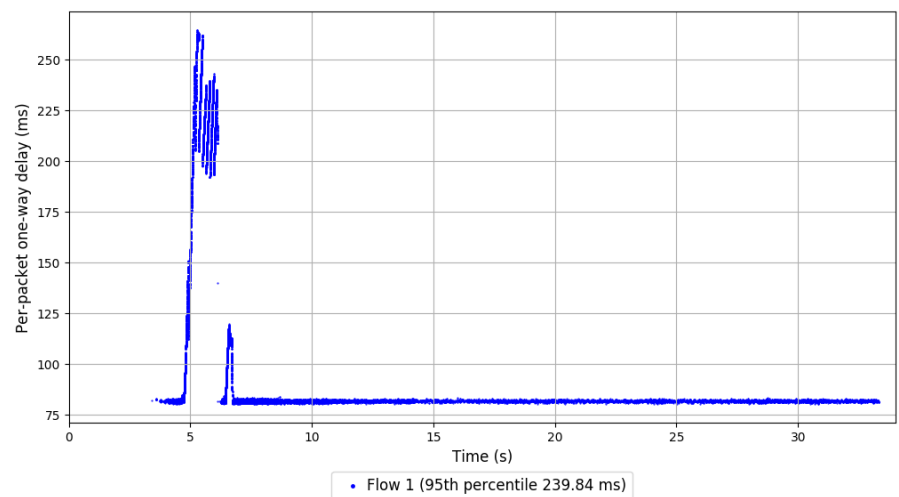
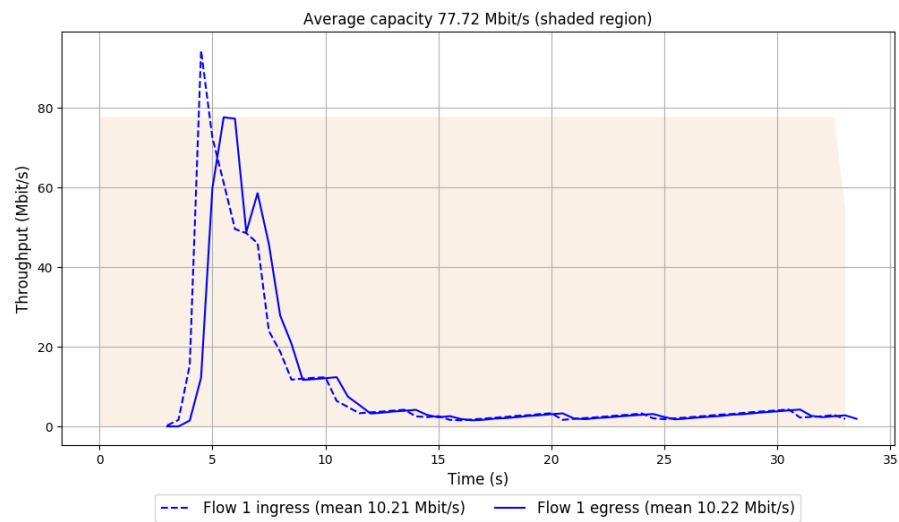
-- Flow 1:

Average throughput: 10.22 Mbit/s

95th percentile per-packet one-way delay: 239.835 ms

Loss rate: 0.12%

Run 2: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2019-07-02 03:51:41

End at: 2019-07-02 03:52:11

Below is generated by plot.py at 2019-07-02 04:36:25

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 53.26 Mbit/s (68.5% utilization)

95th percentile per-packet one-way delay: 191.265 ms

Loss rate: 0.76%

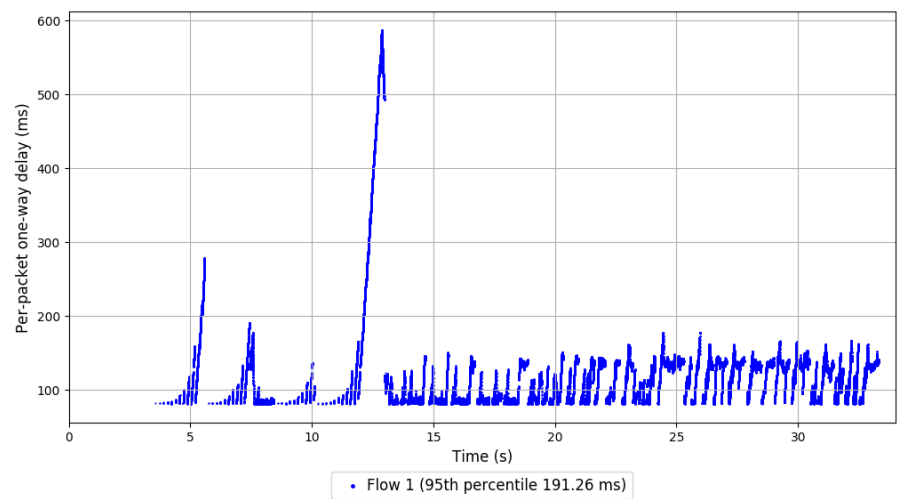
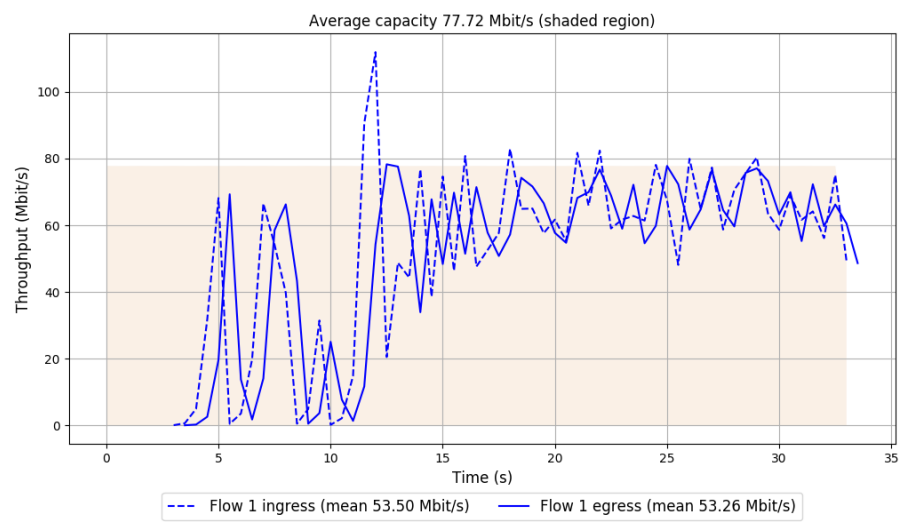
-- Flow 1:

Average throughput: 53.26 Mbit/s

95th percentile per-packet one-way delay: 191.265 ms

Loss rate: 0.76%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2019-07-02 04:03:31

End at: 2019-07-02 04:04:01

Below is generated by plot.py at 2019-07-02 04:36:25

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 53.09 Mbit/s (68.3% utilization)

95th percentile per-packet one-way delay: 238.050 ms

Loss rate: 0.72%

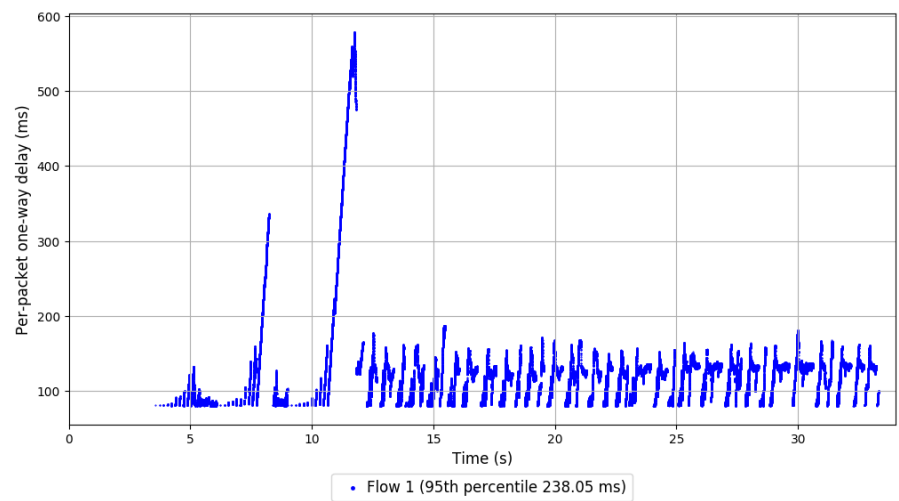
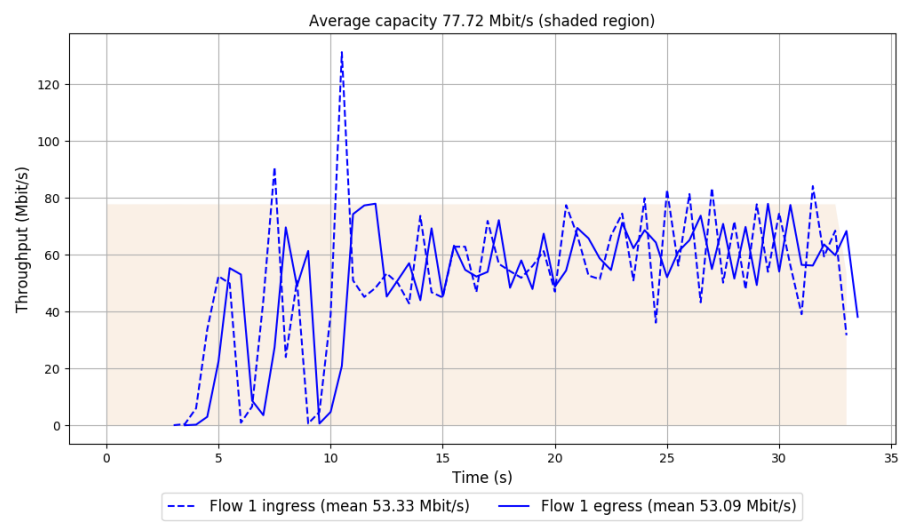
-- Flow 1:

Average throughput: 53.09 Mbit/s

95th percentile per-packet one-way delay: 238.050 ms

Loss rate: 0.72%

Run 2: Report of Verus — Data Link

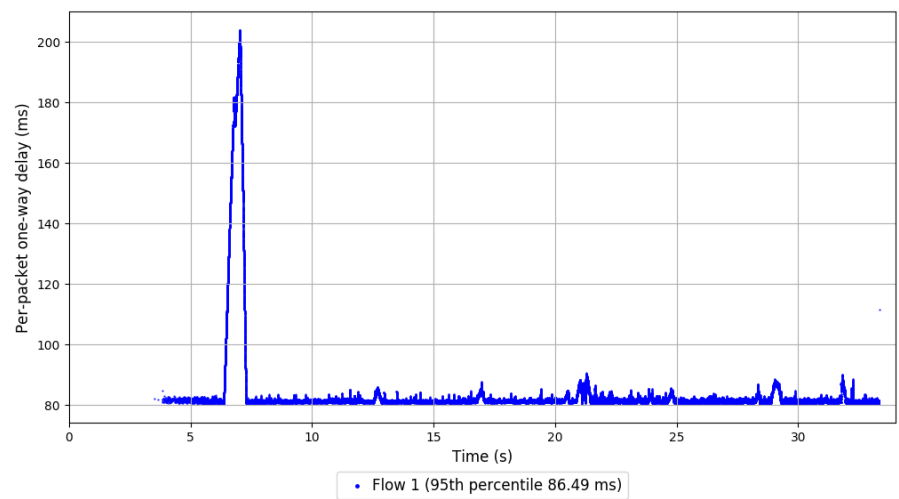
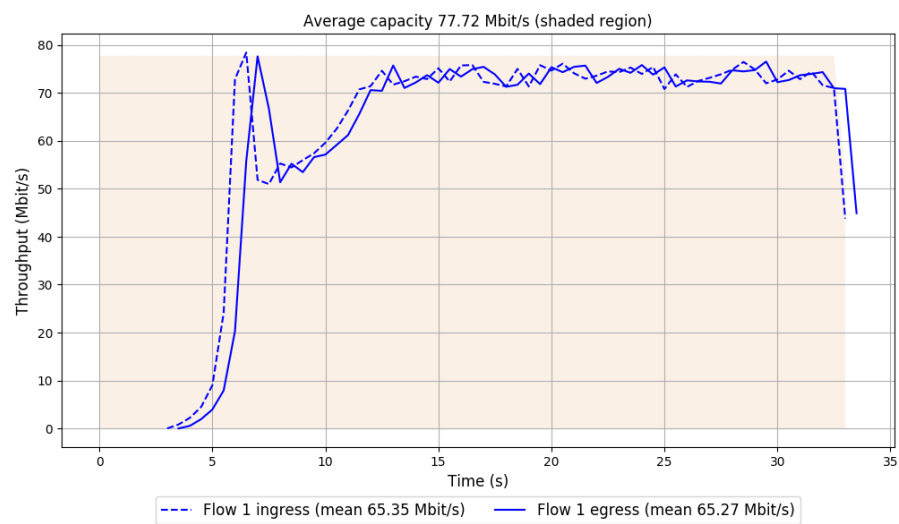



```
Run 1: Statistics of PCC-Vivace

Start at: 2019-07-02 03:54:07
End at: 2019-07-02 03:54:37

# Below is generated by plot.py at 2019-07-02 04:36:33
# Datalink statistics
-- Total of 1 flow:
Average capacity: 77.72 Mbit/s
Average throughput: 65.27 Mbit/s (84.0% utilization)
95th percentile per-packet one-way delay: 86.492 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 65.27 Mbit/s
95th percentile per-packet one-way delay: 86.492 ms
Loss rate: 0.33%
```

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2019-07-02 04:06:00

End at: 2019-07-02 04:06:30

Below is generated by plot.py at 2019-07-02 04:36:36

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 64.02 Mbit/s (82.4% utilization)

95th percentile per-packet one-way delay: 87.993 ms

Loss rate: 0.39%

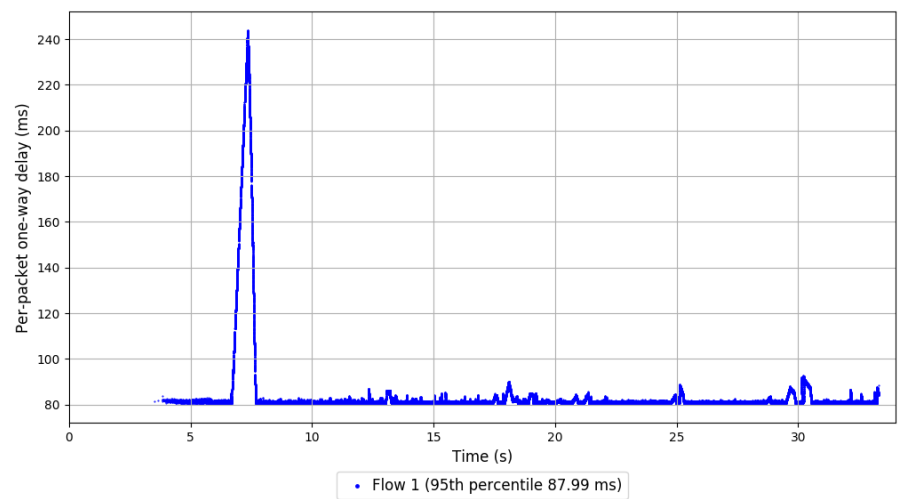
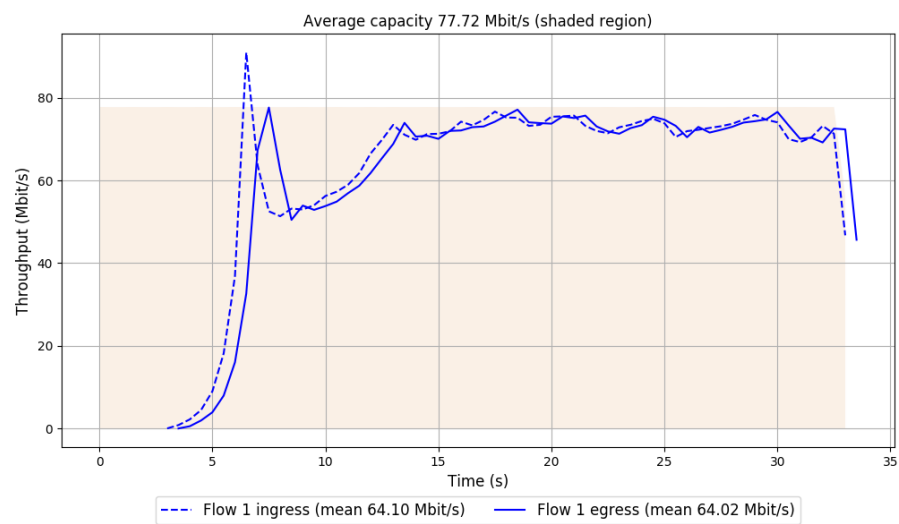
-- Flow 1:

Average throughput: 64.02 Mbit/s

95th percentile per-packet one-way delay: 87.993 ms

Loss rate: 0.39%

Run 2: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

Start at: 2019-07-02 03:59:43

End at: 2019-07-02 04:00:13

Below is generated by plot.py at 2019-07-02 04:36:36

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 2.30 Mbit/s (3.0% utilization)

95th percentile per-packet one-way delay: 84.345 ms

Loss rate: 0.52%

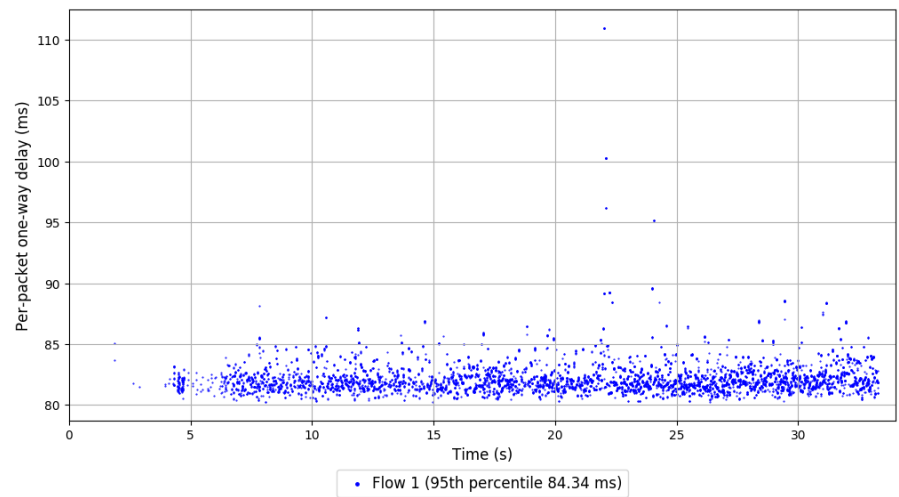
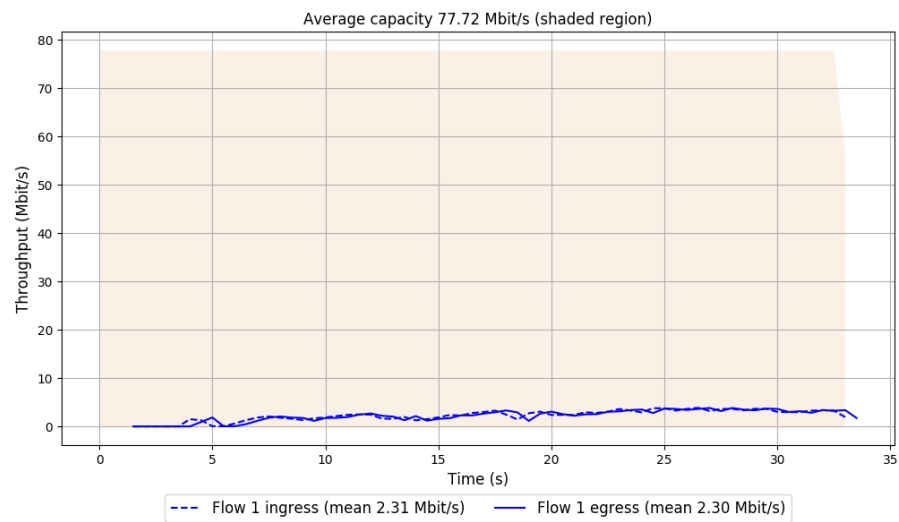
-- Flow 1:

Average throughput: 2.30 Mbit/s

95th percentile per-packet one-way delay: 84.345 ms

Loss rate: 0.52%

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2019-07-02 04:11:35

End at: 2019-07-02 04:12:05

Below is generated by plot.py at 2019-07-02 04:36:36

Datalink statistics

-- Total of 1 flow:

Average capacity: 77.72 Mbit/s

Average throughput: 0.05 Mbit/s (0.1% utilization)

95th percentile per-packet one-way delay: 82.957 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 82.957 ms

Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link

