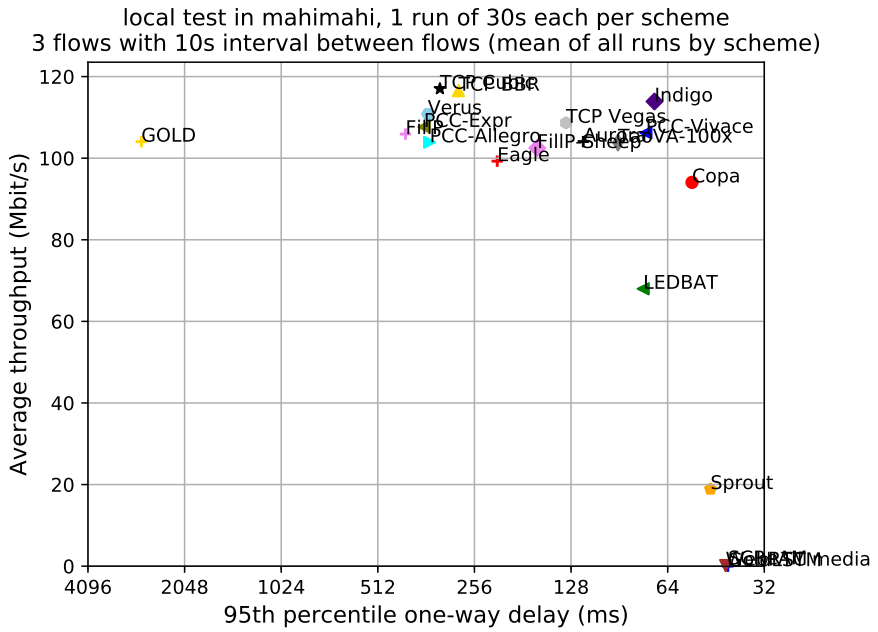
Pantheon Report

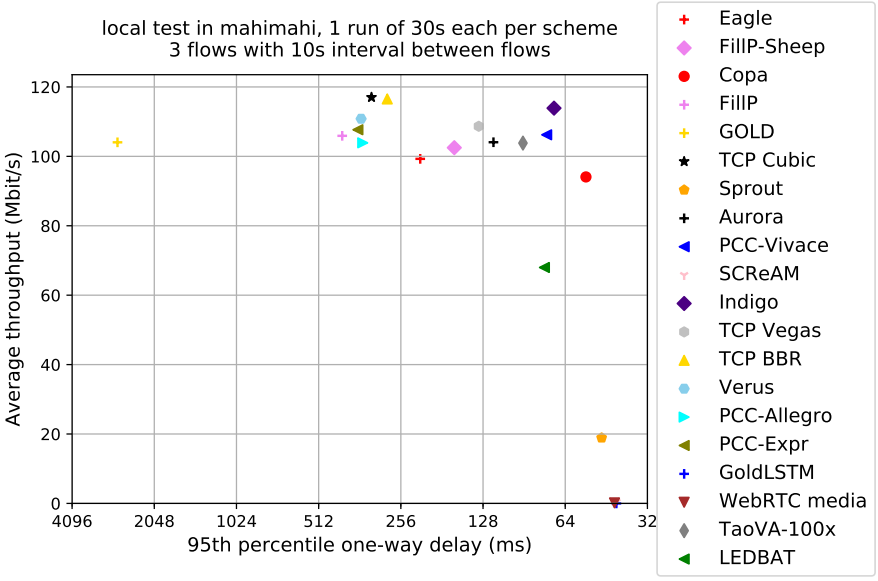
Generated at 2019-07-30 20:22:35 (UTC).
Tested in mahimahi: `mm-delay 40 mm-link 120mbps.trace 120mbps.trace`
Repeated the test of 21 congestion control schemes once.
Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.

```
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 @ d9052720aa269eea6989fcfdd455d39cb13e8411
third_party/aurora @ f3e943d61015b39960854ba6391797e0c7984d74
third_party/aurora-model @ e292c316c23fb837255c4e142e40590d154bbe95
third_party/eagle @ ce4c8d9511b8dfde83c08384f81b2617bfb10438
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
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 @ 6b512ee75b163fd680d7bf3cde4cf6d6aa7102c4
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/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
3 flows with 10s interval between flows (mean of all runs by scheme)
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
120
100
80
60
40
20
0
4096
2048
1024
512
256
128
64
32
GOLD
Verus
PCC-Expr
PCC-Allegro
Eagle
TCP Vegas
Indigo
PCC-Vivace
TaoVA-100x
Copa
LEDBAT
Sprout


local test in mahimahi, 1 run of 30s each per scheme
3 flows with 10s interval between flows
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
120
100
80
60
40
20
0
4096
2048
1024
512
256
128
64
32
Eagle
FillP-Sheep
Copa
FillP
GOLD
TCP Cubic
Sprout
Aurora
PCC-Vivace
SCReAM
Indigo
TCP Vegas
TCP BBR
Verus
PCC-Allegro
PCC-Expr
GoldLSTM
WebRTC media
TaoVA-100x
LEDBAT

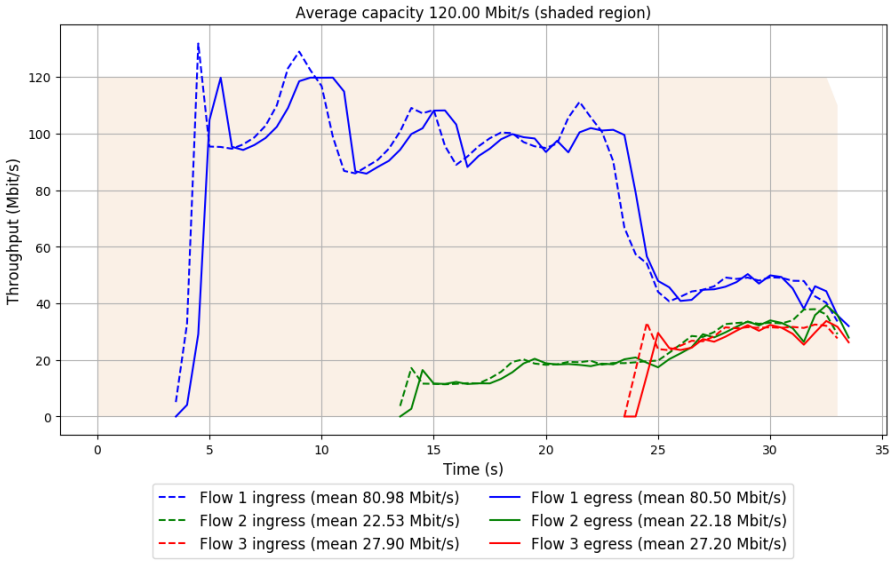
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
Aurora	1	80.50	22.18	27.20	122.18	113.98	77.01	0.72	1.77	3.00
TCP BBR	1	72.18	37.79	58.94	238.10	287.78	349.19	0.17	0.39	1.38
Copa	1	55.12	41.02	35.66	50.37	55.53	60.66	0.13	0.67	2.31
TCP Cubic	1	86.76	44.19	3.20	324.79	331.84	338.14	0.82	1.90	9.04
Eagle	1	91.91	0.51	22.61	221.54	210.29	105.58	0.77	0.24	0.64
FillP	1	60.42	46.85	44.74	390.55	416.70	599.63	1.00	1.55	3.34
FillP-Sheep	1	59.30	51.25	28.68	147.92	192.20	185.21	0.34	0.65	1.35
GOLD	1	103.85	0.22	0.21	2793.22	2792.25	2795.14	10.13	16.75	31.66
GoldLSTM	1	0.00	0.00	0.00	41.62	41.68	41.51	0.00	0.00	0.00
Indigo	1	89.25	25.85	23.77	64.46	76.20	79.38	0.16	0.11	0.50
LEDBAT	1	45.40	28.59	10.77	75.69	76.67	77.42	0.38	0.54	1.18
PCC-Allegro	1	95.20	9.10	8.18	352.46	354.57	357.16	0.90	1.51	2.76
PCC-Expr	1	85.88	27.15	11.62	364.78	374.36	378.87	1.67	2.56	4.19
QUIC Cubic	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SCReAM	1	0.22	0.22	0.22	41.52	41.40	41.51	0.13	0.19	0.35
Sprout	1	9.55	9.49	9.35	46.76	47.51	46.97	0.04	0.00	1.01
TaoVA-100x	1	60.51	44.99	40.51	81.29	93.81	118.91	0.20	0.39	0.94
TCP Vegas	1	58.28	71.24	9.15	131.47	133.36	133.86	0.27	0.59	1.31
Verus	1	79.20	33.57	30.48	371.99	405.46	214.38	2.65	8.07	14.44
PCC-Vivace	1	84.95	25.52	13.17	102.53	67.77	74.16	0.08	0.23	0.86
WebRTC media	1	0.05	0.05	0.05	42.26	42.23	42.13	0.00	0.00	0.00

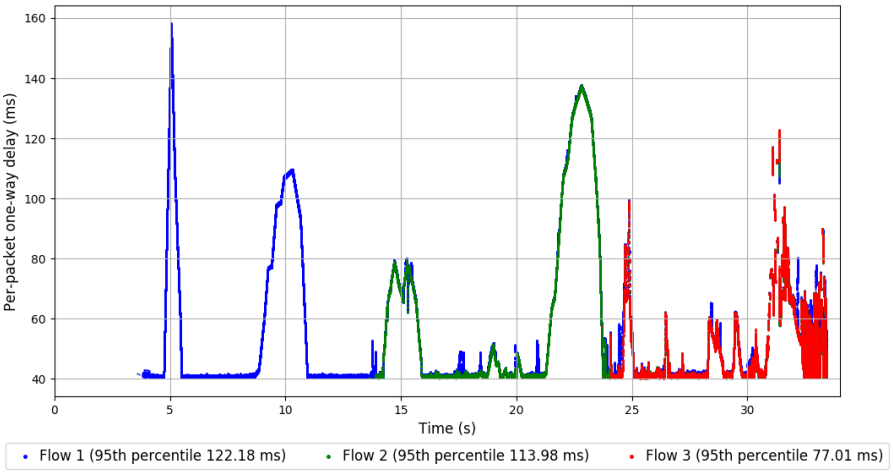
```
Run 1: Statistics of Aurora

Start at: 2019-07-30 20:07:31
End at: 2019-07-30 20:08:01

# Below is generated by plot.py at 2019-07-30 20:19:33
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 104.07 Mbit/s (86.7% utilization)
95th percentile per-packet one-way delay: 117.237 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 80.50 Mbit/s
95th percentile per-packet one-way delay: 122.176 ms
Loss rate: 0.72%
-- Flow 2:
Average throughput: 22.18 Mbit/s
95th percentile per-packet one-way delay: 113.985 ms
Loss rate: 1.77%
-- Flow 3:
Average throughput: 27.20 Mbit/s
95th percentile per-packet one-way delay: 77.008 ms
Loss rate: 3.00%
```

Run 1: Report of Aurora — Data Link



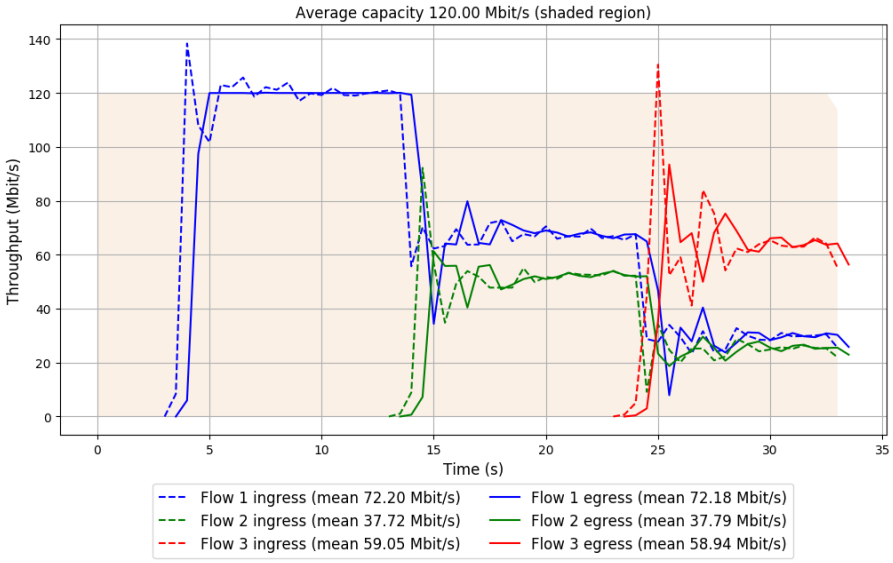


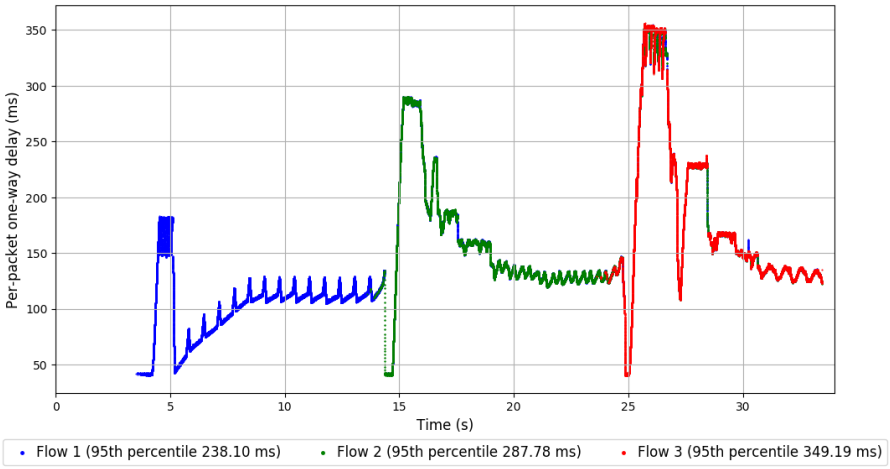
```
Run 1: Statistics of TCP BBR

Start at: 2019-07-30 20:09:49
End at: 2019-07-30 20:10:19

# Below is generated by plot.py at 2019-07-30 20:19:33
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 116.55 Mbit/s (97.1% utilization)
95th percentile per-packet one-way delay: 287.084 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 72.18 Mbit/s
95th percentile per-packet one-way delay: 238.105 ms
Loss rate: 0.17%
-- Flow 2:
Average throughput: 37.79 Mbit/s
95th percentile per-packet one-way delay: 287.784 ms
Loss rate: 0.39%
-- Flow 3:
Average throughput: 58.94 Mbit/s
95th percentile per-packet one-way delay: 349.186 ms
Loss rate: 1.38%
```

Run 1: Report of TCP BBR — Data Link



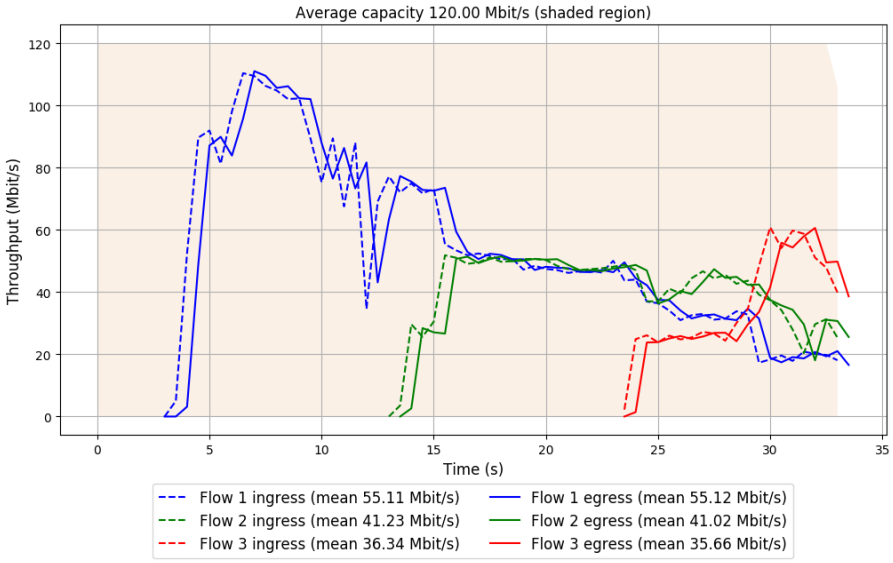


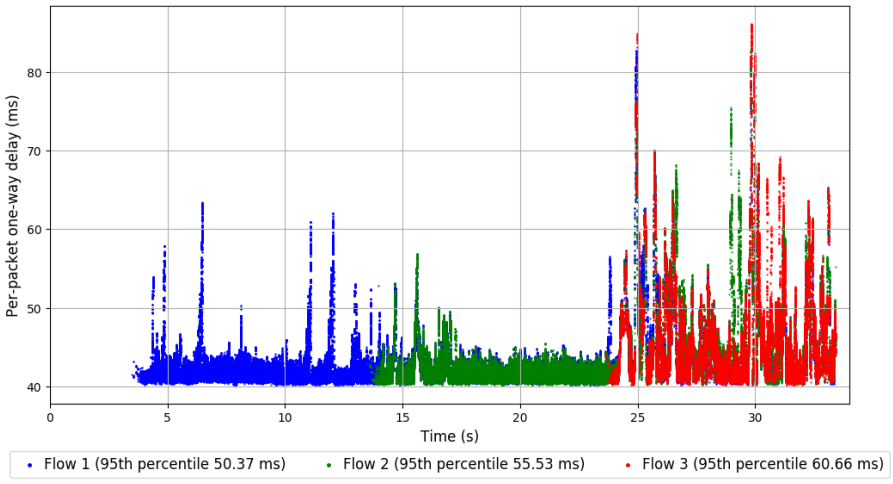
```
Run 1: Statistics of Copa

Start at: 2019-07-30 20:03:05
End at: 2019-07-30 20:03:35

# Below is generated by plot.py at 2019-07-30 20:19:33
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 94.07 Mbit/s (78.4% utilization)
95th percentile per-packet one-way delay: 53.745 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 55.12 Mbit/s
95th percentile per-packet one-way delay: 50.372 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 41.02 Mbit/s
95th percentile per-packet one-way delay: 55.526 ms
Loss rate: 0.67%
-- Flow 3:
Average throughput: 35.66 Mbit/s
95th percentile per-packet one-way delay: 60.661 ms
Loss rate: 2.31%
```

Run 1: Report of Copa — Data Link



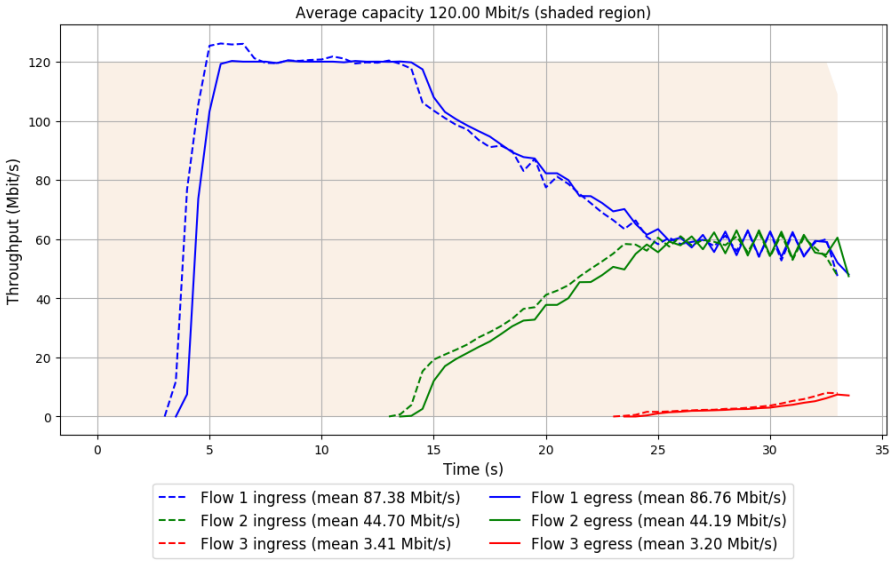


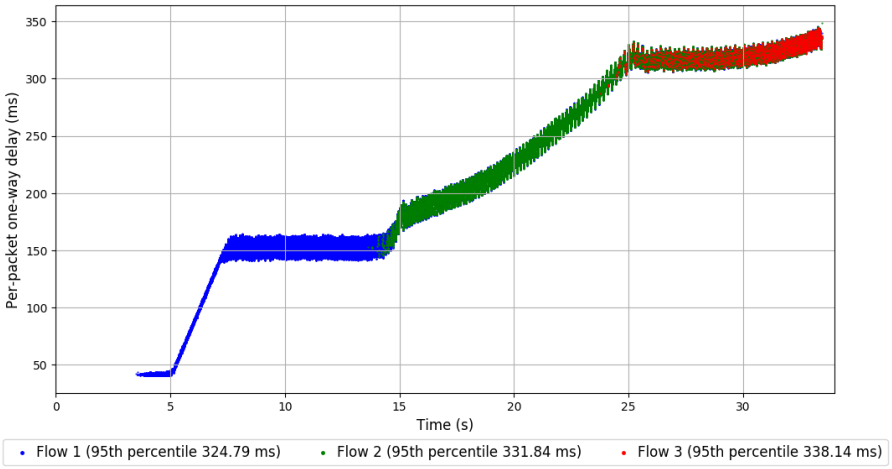
```
Run 1: Statistics of TCP Cubic

Start at: 2019-07-30 20:06:09
End at: 2019-07-30 20:06:39

# Below is generated by plot.py at 2019-07-30 20:19:33
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 117.01 Mbit/s (97.5% utilization)
95th percentile per-packet one-way delay: 327.940 ms
Loss rate: 1.17%
-- Flow 1:
Average throughput: 86.76 Mbit/s
95th percentile per-packet one-way delay: 324.790 ms
Loss rate: 0.82%
-- Flow 2:
Average throughput: 44.19 Mbit/s
95th percentile per-packet one-way delay: 331.841 ms
Loss rate: 1.90%
-- Flow 3:
Average throughput: 3.20 Mbit/s
95th percentile per-packet one-way delay: 338.137 ms
Loss rate: 9.04%
```

Run 1: Report of TCP Cubic — Data Link



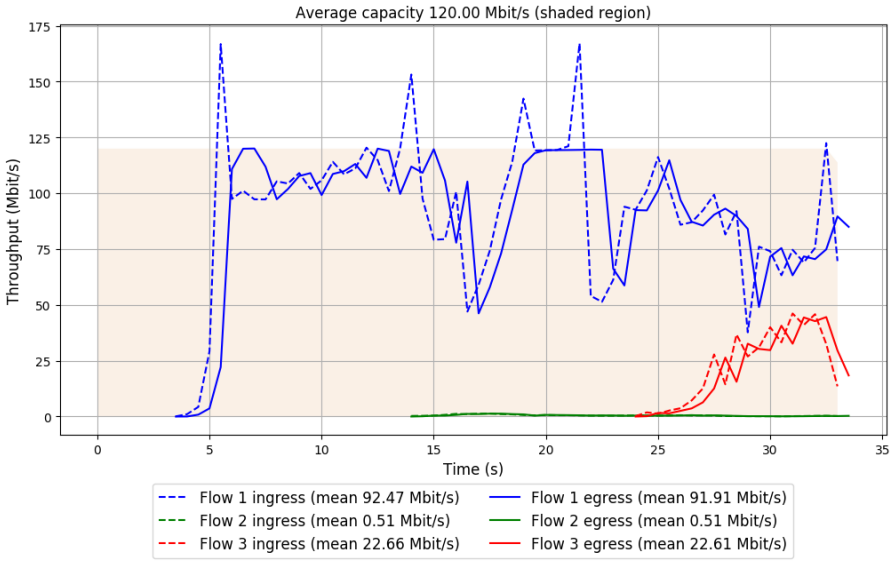


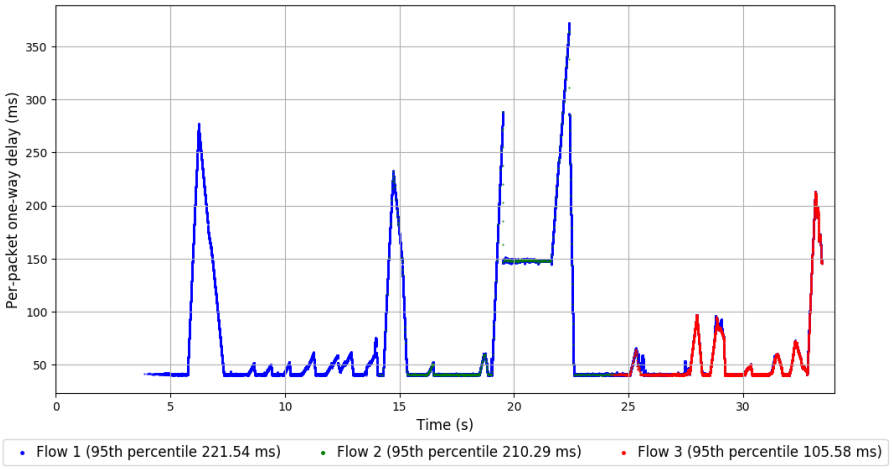
```
Run 1: Statistics of Eagle

Start at: 2019-07-30 20:01:39
End at: 2019-07-30 20:02:09

# Below is generated by plot.py at 2019-07-30 20:19:33
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 99.28 Mbit/s (82.7% utilization)
95th percentile per-packet one-way delay: 217.409 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 91.91 Mbit/s
95th percentile per-packet one-way delay: 221.545 ms
Loss rate: 0.77%
-- Flow 2:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 210.292 ms
Loss rate: 0.24%
-- Flow 3:
Average throughput: 22.61 Mbit/s
95th percentile per-packet one-way delay: 105.575 ms
Loss rate: 0.64%
```

Run 1: Report of Eagle — Data Link



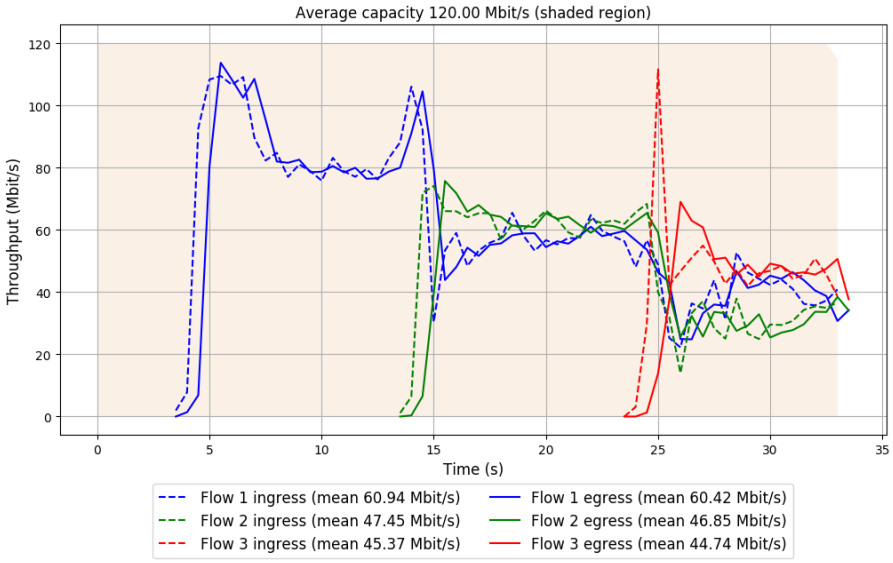


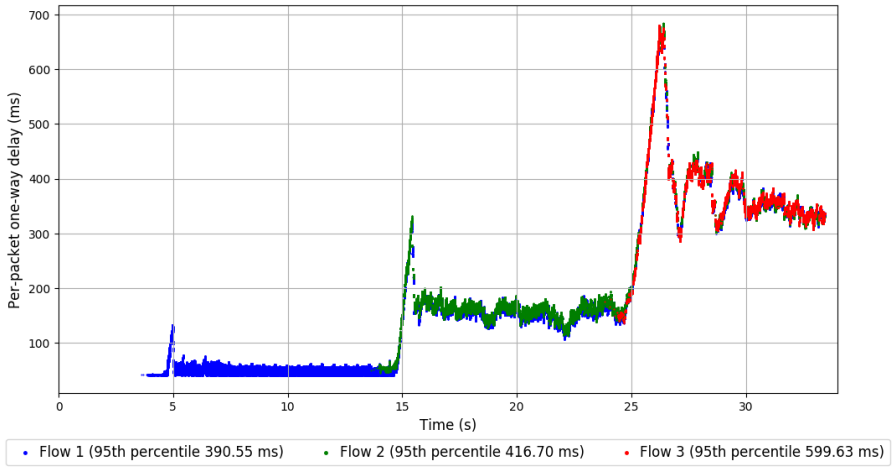
```
Run 1: Statistics of FillP

Start at: 2019-07-30 20:11:59
End at: 2019-07-30 20:12:29

# Below is generated by plot.py at 2019-07-30 20:19:33
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 105.91 Mbit/s (88.3% utilization)
95th percentile per-packet one-way delay: 419.747 ms
Loss rate: 1.49%
-- Flow 1:
Average throughput: 60.42 Mbit/s
95th percentile per-packet one-way delay: 390.551 ms
Loss rate: 1.00%
-- Flow 2:
Average throughput: 46.85 Mbit/s
95th percentile per-packet one-way delay: 416.696 ms
Loss rate: 1.55%
-- Flow 3:
Average throughput: 44.74 Mbit/s
95th percentile per-packet one-way delay: 599.634 ms
Loss rate: 3.34%
```

Run 1: Report of FillP — Data Link



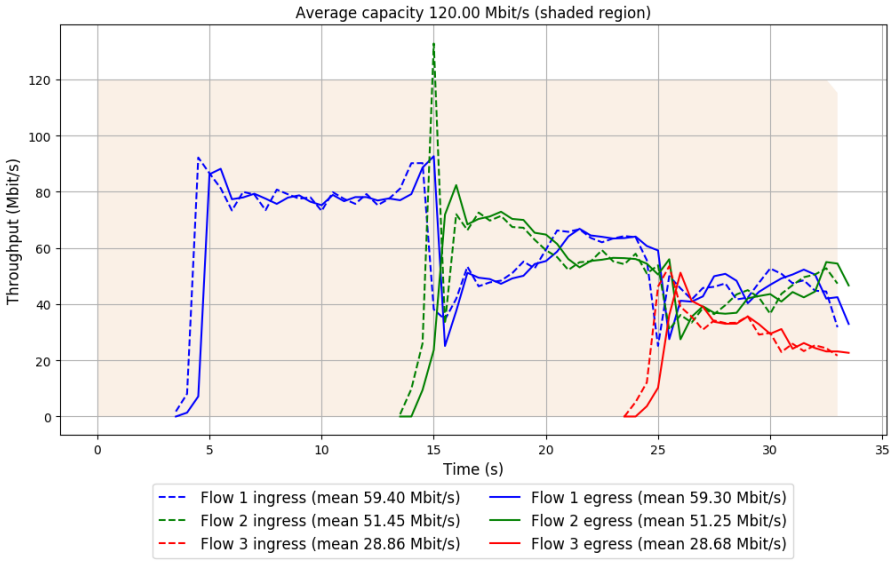


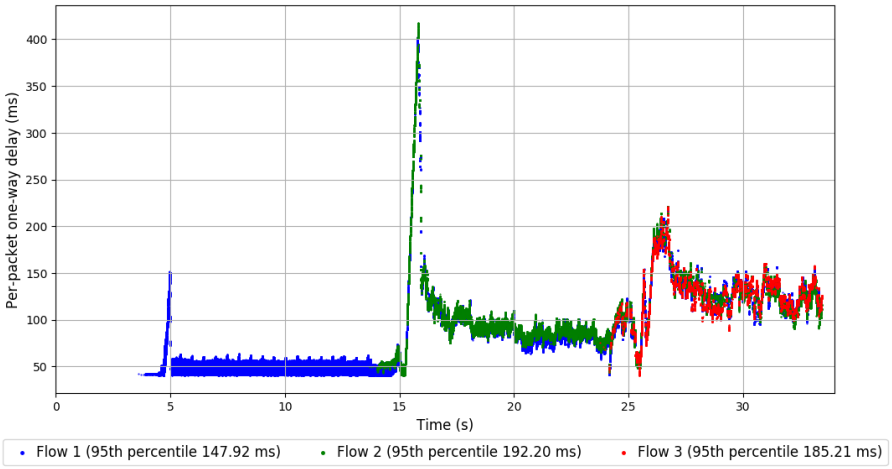
```
Run 1: Statistics of FillP-Sheep

Start at: 2019-07-30 20:02:24
End at: 2019-07-30 20:02:54

# Below is generated by plot.py at 2019-07-30 20:20:33
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 102.50 Mbit/s (85.4% utilization)
95th percentile per-packet one-way delay: 163.111 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 59.30 Mbit/s
95th percentile per-packet one-way delay: 147.924 ms
Loss rate: 0.34%
-- Flow 2:
Average throughput: 51.25 Mbit/s
95th percentile per-packet one-way delay: 192.199 ms
Loss rate: 0.65%
-- Flow 3:
Average throughput: 28.68 Mbit/s
95th percentile per-packet one-way delay: 185.205 ms
Loss rate: 1.35%
```

Run 1: Report of FillP-Sheep — Data Link



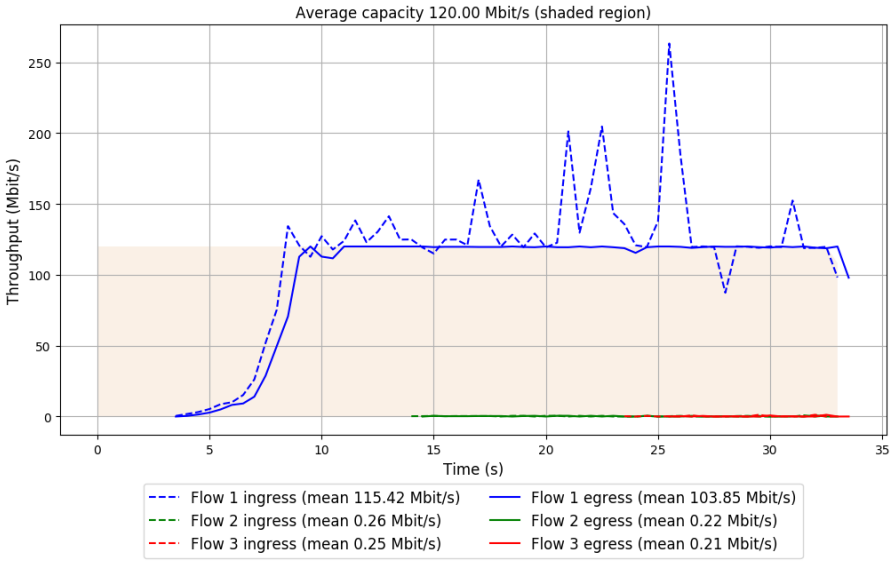


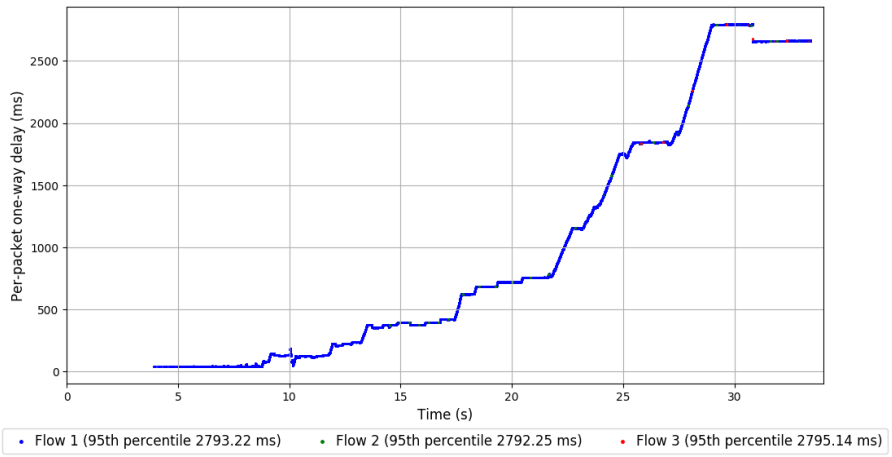
```
Run 1: Statistics of GOLD

Start at: 2019-07-30 20:05:24
End at: 2019-07-30 20:05:54

# Below is generated by plot.py at 2019-07-30 20:20:33
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 104.04 Mbit/s (86.7% utilization)
95th percentile per-packet one-way delay: 2793.221 ms
Loss rate: 10.16%
-- Flow 1:
Average throughput: 103.85 Mbit/s
95th percentile per-packet one-way delay: 2793.219 ms
Loss rate: 10.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 2792.254 ms
Loss rate: 16.75%
-- Flow 3:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 2795.135 ms
Loss rate: 31.66%
```

Run 1: Report of GOLD — Data Link



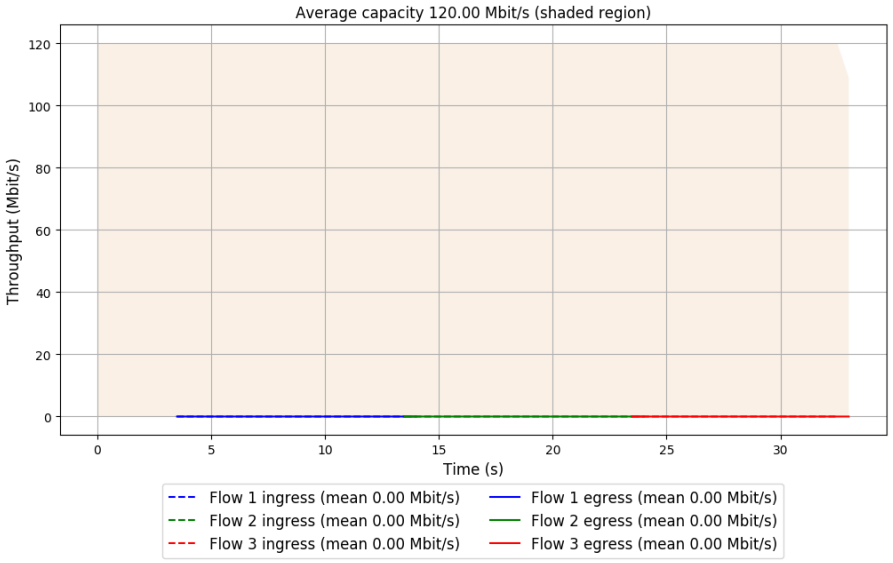


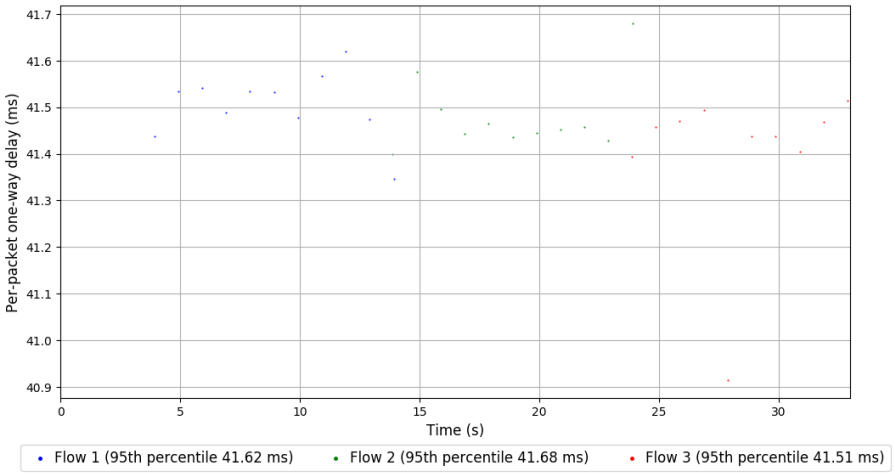
```
Run 1: Statistics of GoldLSTM

Start at: 2019-07-30 20:10:33
End at: 2019-07-30 20:11:03

# Below is generated by plot.py at 2019-07-30 20:20:33
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 0.00 Mbit/s (0.0% utilization)
95th percentile per-packet one-way delay: 41.575 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 41.620 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 41.679 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 41.514 ms
Loss rate: 0.00%
```

Run 1: Report of GoldLSTM — Data Link



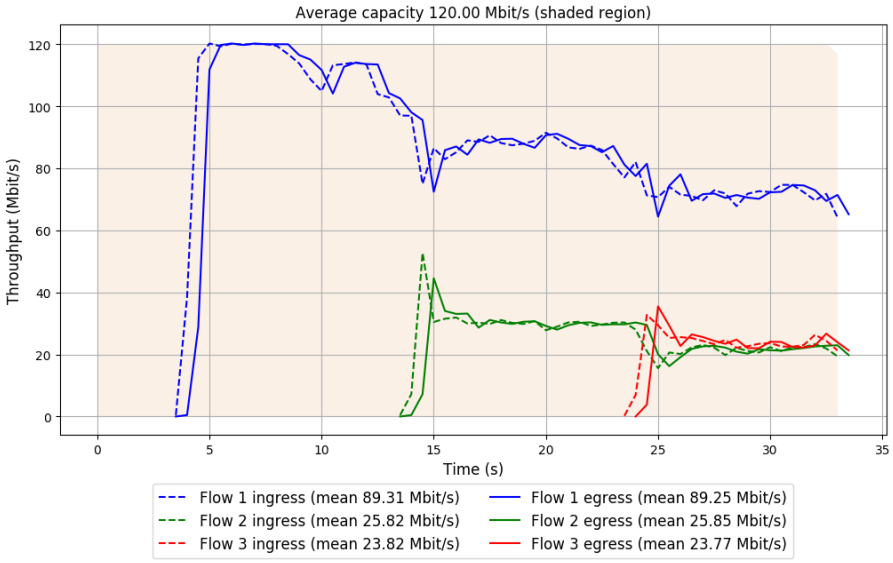


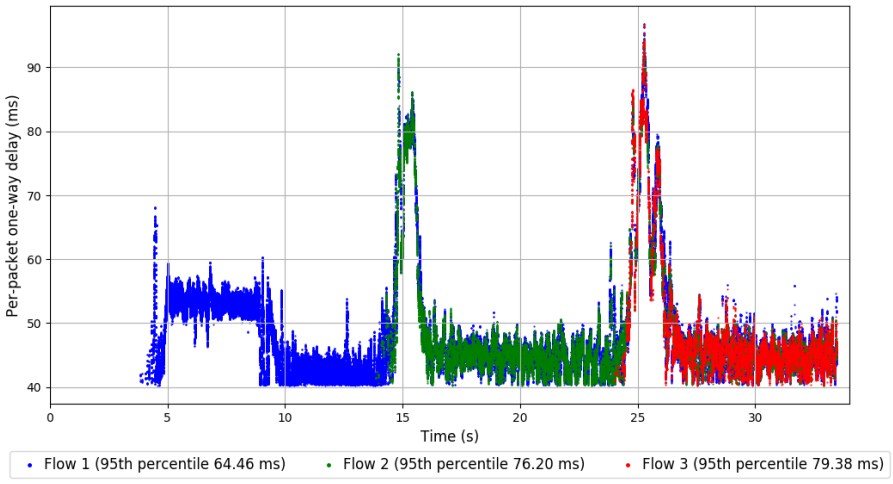
```
Run 1: Statistics of Indigo

Start at: 2019-07-30 20:03:53
End at: 2019-07-30 20:04:23

# Below is generated by plot.py at 2019-07-30 20:20:43
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 113.89 Mbit/s (94.9% utilization)
95th percentile per-packet one-way delay: 70.352 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 89.25 Mbit/s
95th percentile per-packet one-way delay: 64.464 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 25.85 Mbit/s
95th percentile per-packet one-way delay: 76.203 ms
Loss rate: 0.11%
-- Flow 3:
Average throughput: 23.77 Mbit/s
95th percentile per-packet one-way delay: 79.378 ms
Loss rate: 0.50%
```

Run 1: Report of Indigo — Data Link



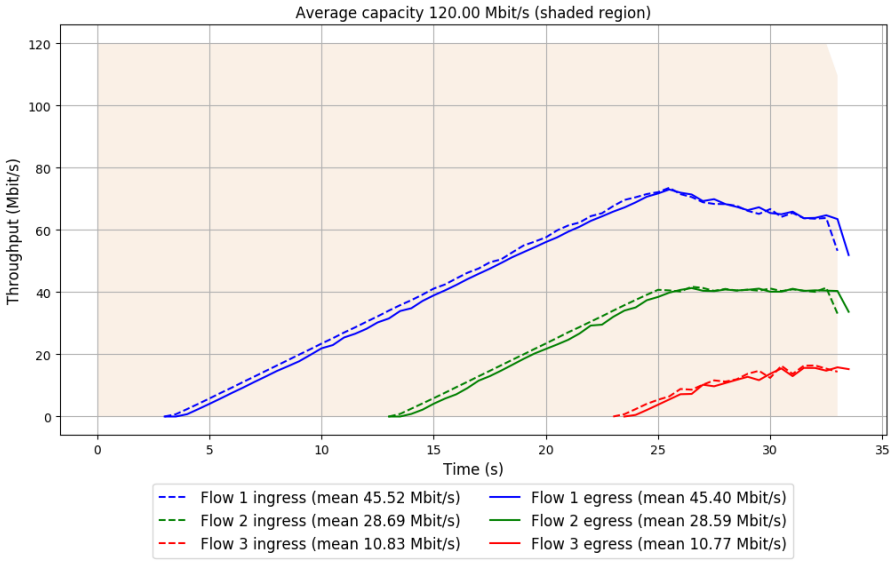


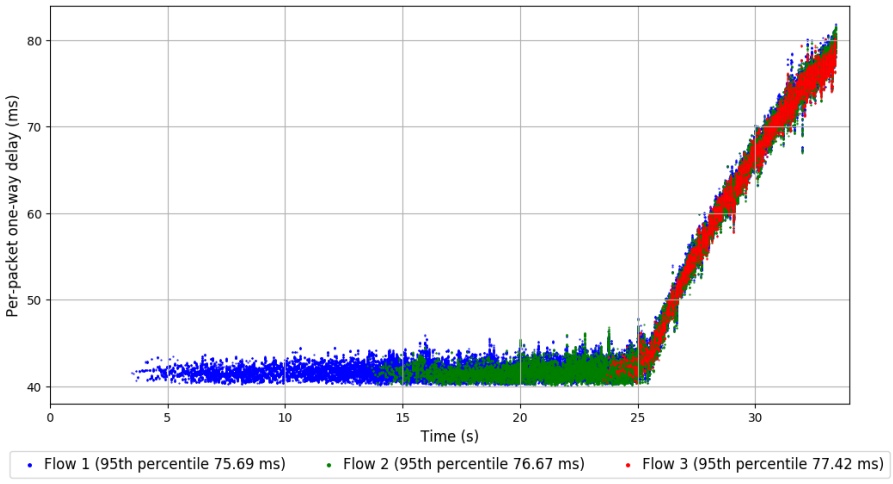
```
Run 1: Statistics of LEDBAT

Start at: 2019-07-30 20:15:10
End at: 2019-07-30 20:15:40

# Below is generated by plot.py at 2019-07-30 20:20:43
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 67.98 Mbit/s (56.6% utilization)
95th percentile per-packet one-way delay: 76.304 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 45.40 Mbit/s
95th percentile per-packet one-way delay: 75.685 ms
Loss rate: 0.38%
-- Flow 2:
Average throughput: 28.59 Mbit/s
95th percentile per-packet one-way delay: 76.675 ms
Loss rate: 0.54%
-- Flow 3:
Average throughput: 10.77 Mbit/s
95th percentile per-packet one-way delay: 77.420 ms
Loss rate: 1.18%
```

Run 1: Report of LEDBAT — Data Link



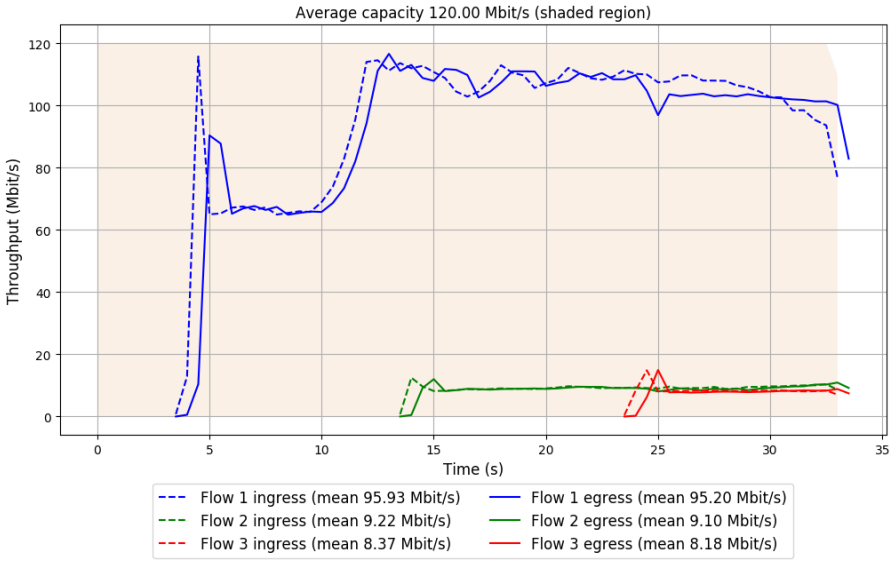


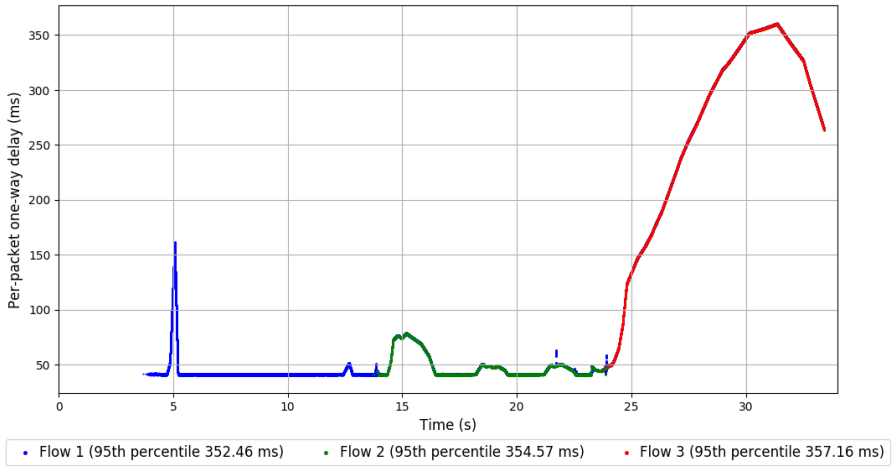
```
Run 1: Statistics of PCC-Allegro

Start at: 2019-07-30 20:13:52
End at: 2019-07-30 20:14:22

# Below is generated by plot.py at 2019-07-30 20:21:08
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 103.90 Mbit/s (86.6% utilization)
95th percentile per-packet one-way delay: 352.949 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 95.20 Mbit/s
95th percentile per-packet one-way delay: 352.464 ms
Loss rate: 0.90%
-- Flow 2:
Average throughput: 9.10 Mbit/s
95th percentile per-packet one-way delay: 354.569 ms
Loss rate: 1.51%
-- Flow 3:
Average throughput: 8.18 Mbit/s
95th percentile per-packet one-way delay: 357.161 ms
Loss rate: 2.76%
```

Run 1: Report of PCC-Allegro — Data Link



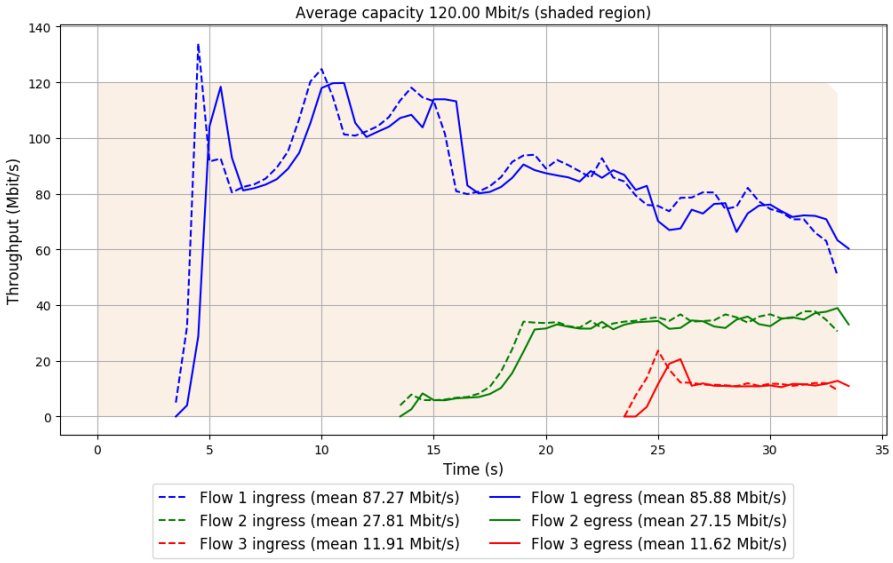


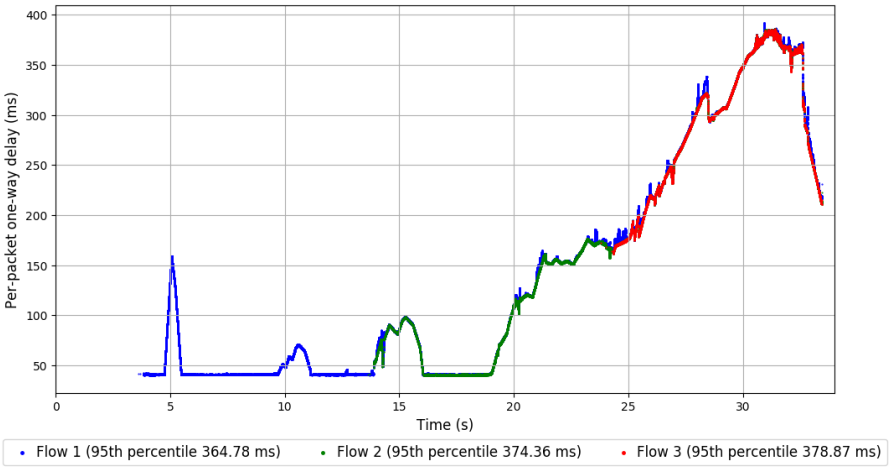
```
Run 1: Statistics of PCC-Expr

Start at: 2019-07-30 20:15:52
End at: 2019-07-30 20:16:22

# Below is generated by plot.py at 2019-07-30 20:21:59
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 107.67 Mbit/s (89.7% utilization)
95th percentile per-packet one-way delay: 367.871 ms
Loss rate: 1.91%
-- Flow 1:
Average throughput: 85.88 Mbit/s
95th percentile per-packet one-way delay: 364.780 ms
Loss rate: 1.67%
-- Flow 2:
Average throughput: 27.15 Mbit/s
95th percentile per-packet one-way delay: 374.355 ms
Loss rate: 2.56%
-- Flow 3:
Average throughput: 11.62 Mbit/s
95th percentile per-packet one-way delay: 378.873 ms
Loss rate: 4.19%
```

Run 1: Report of PCC-Expr — Data Link





```
Run 1: Statistics of QUIC Cubic

Start at: 2019-07-30 20:13:18
End at: 2019-07-30 20:13:48
```

Run 1: Report of QUIC Cubic — Data Link

Figure is missing

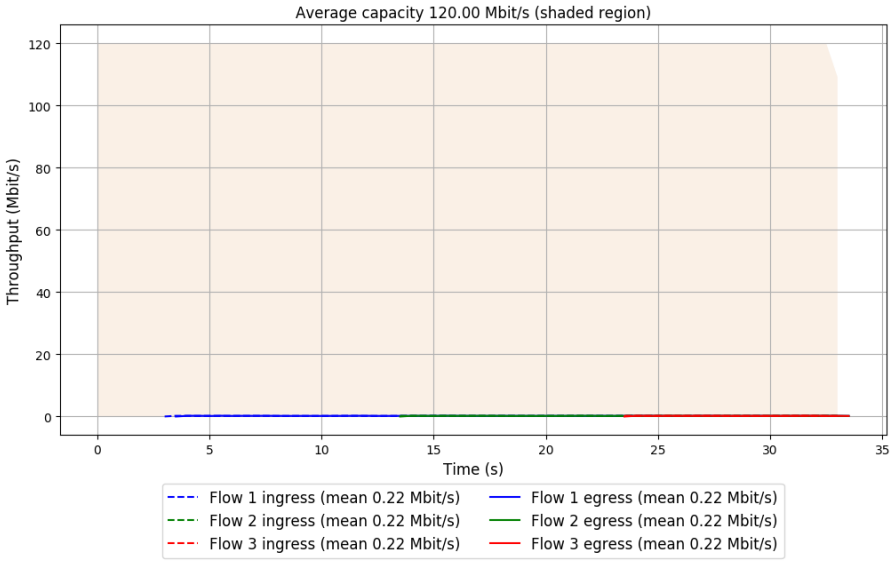
Figure is missing

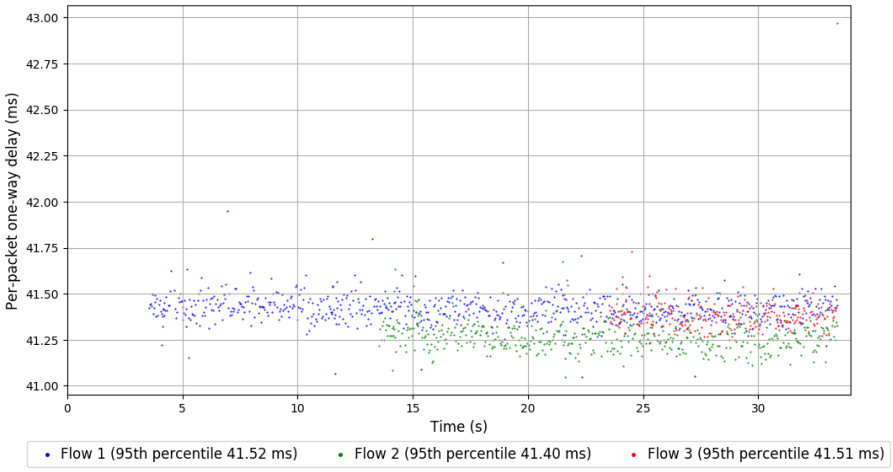
```
Run 1: Statistics of SCReAM

Start at: 2019-07-30 20:12:41
End at: 2019-07-30 20:13:11

# Below is generated by plot.py at 2019-07-30 20:21:59
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 0.43 Mbit/s (0.4% utilization)
95th percentile per-packet one-way delay: 41.506 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 41.525 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 41.395 ms
Loss rate: 0.19%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 41.510 ms
Loss rate: 0.35%
```

Run 1: Report of SCReAM — Data Link



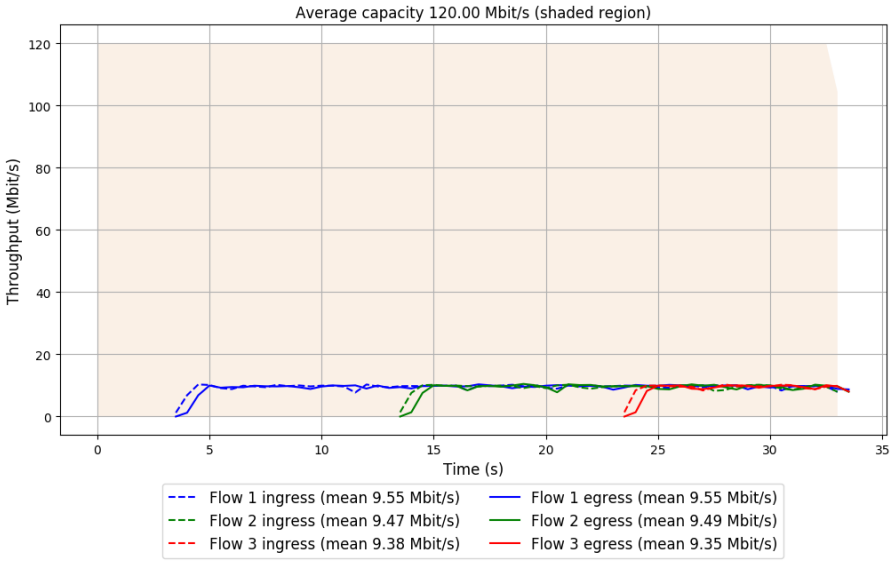


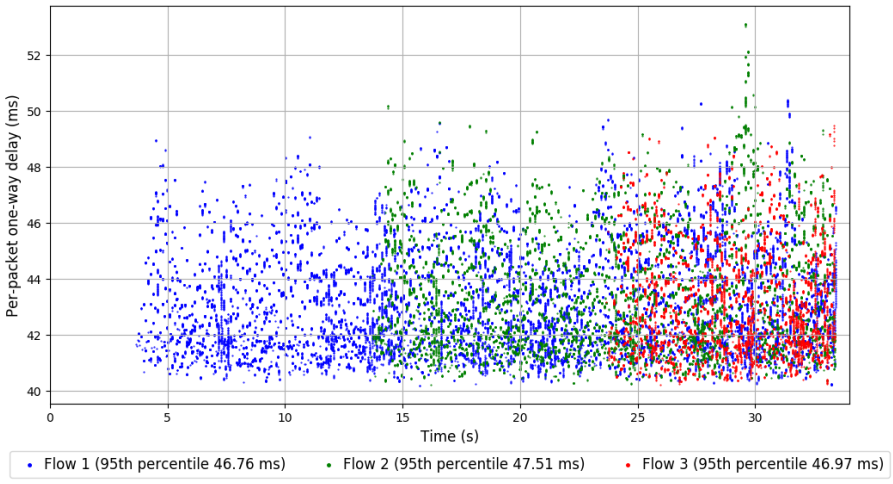
```
Run 1: Statistics of Sprout

Start at: 2019-07-30 20:06:54
End at: 2019-07-30 20:07:24

# Below is generated by plot.py at 2019-07-30 20:21:59
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 18.89 Mbit/s (15.7% utilization)
95th percentile per-packet one-way delay: 47.082 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 9.55 Mbit/s
95th percentile per-packet one-way delay: 46.755 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 9.49 Mbit/s
95th percentile per-packet one-way delay: 47.509 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 9.35 Mbit/s
95th percentile per-packet one-way delay: 46.966 ms
Loss rate: 1.01%
```

Run 1: Report of Sprout — Data Link



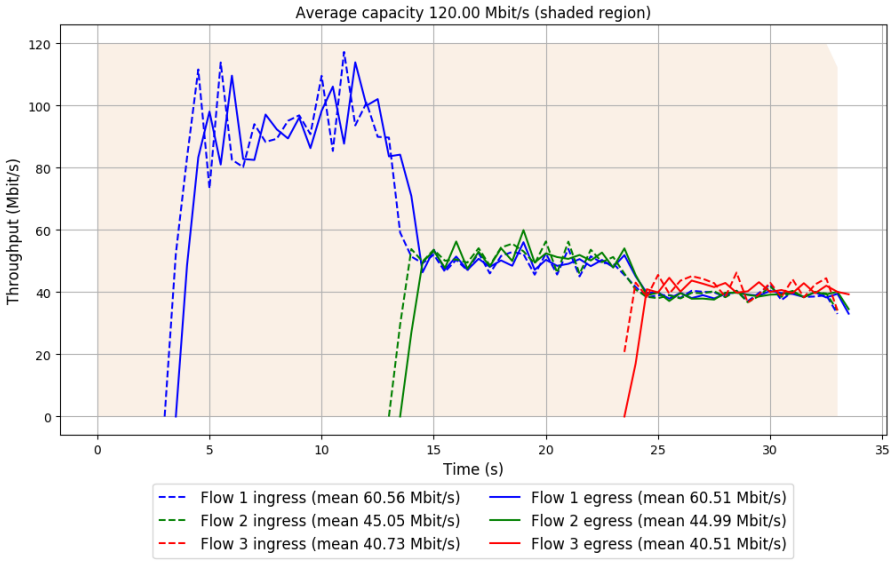


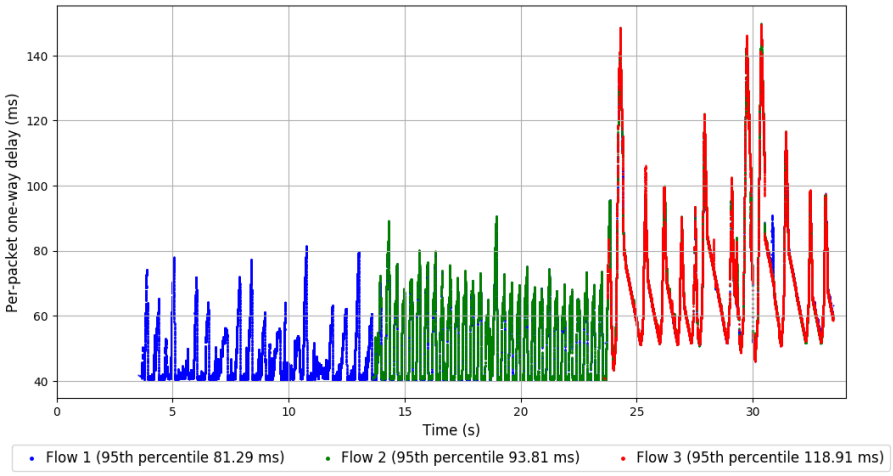
```
Run 1: Statistics of TaoVA-100x

Start at: 2019-07-30 20:11:10
End at: 2019-07-30 20:11:40

# Below is generated by plot.py at 2019-07-30 20:22:32
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 103.82 Mbit/s (86.5% utilization)
95th percentile per-packet one-way delay: 91.415 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 60.51 Mbit/s
95th percentile per-packet one-way delay: 81.289 ms
Loss rate: 0.20%
-- Flow 2:
Average throughput: 44.99 Mbit/s
95th percentile per-packet one-way delay: 93.806 ms
Loss rate: 0.39%
-- Flow 3:
Average throughput: 40.51 Mbit/s
95th percentile per-packet one-way delay: 118.908 ms
Loss rate: 0.94%
```

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



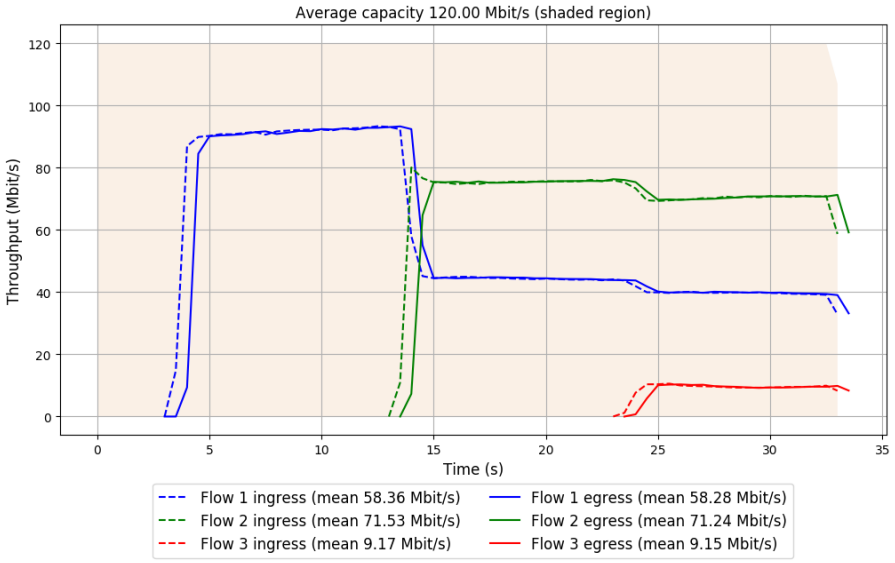


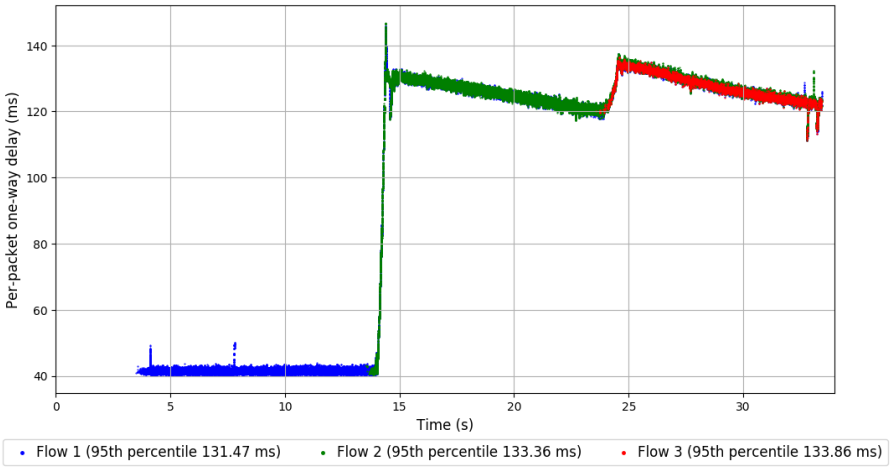
```
Run 1: Statistics of TCP Vegas

Start at: 2019-07-30 20:09:06
End at: 2019-07-30 20:09:36

# Below is generated by plot.py at 2019-07-30 20:22:32
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 108.67 Mbit/s (90.6% utilization)
95th percentile per-packet one-way delay: 132.742 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 58.28 Mbit/s
95th percentile per-packet one-way delay: 131.466 ms
Loss rate: 0.27%
-- Flow 2:
Average throughput: 71.24 Mbit/s
95th percentile per-packet one-way delay: 133.359 ms
Loss rate: 0.59%
-- Flow 3:
Average throughput: 9.15 Mbit/s
95th percentile per-packet one-way delay: 133.863 ms
Loss rate: 1.31%
```

Run 1: Report of TCP Vegas — Data Link



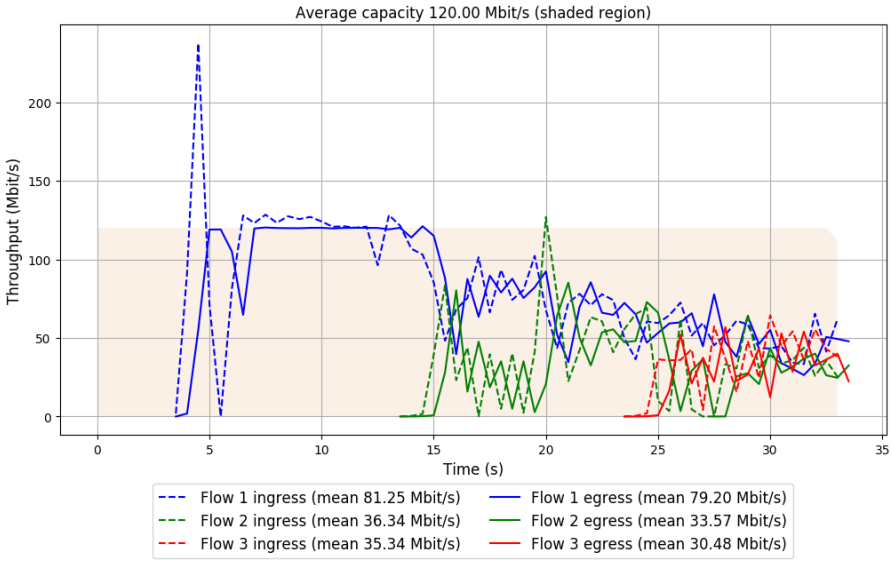


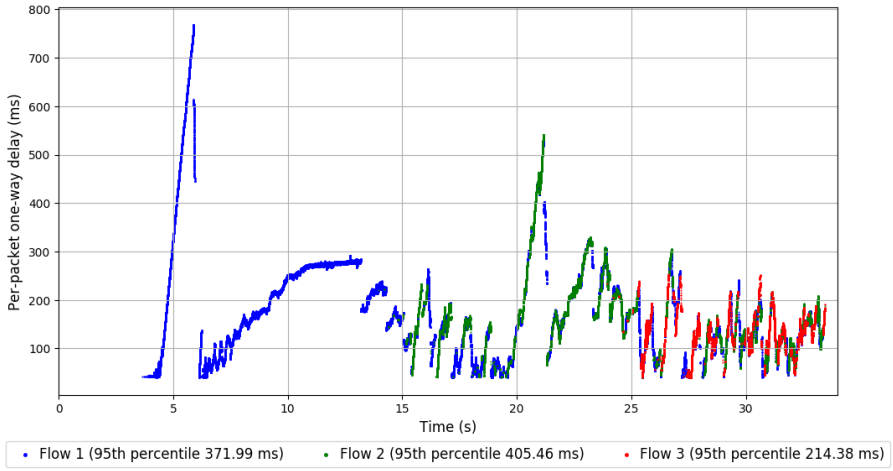
```
Run 1: Statistics of Verus

Start at: 2019-07-30 20:04:39
End at: 2019-07-30 20:05:09

# Below is generated by plot.py at 2019-07-30 20:22:32
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 110.84 Mbit/s (92.4% utilization)
95th percentile per-packet one-way delay: 357.936 ms
Loss rate: 4.91%
-- Flow 1:
Average throughput: 79.20 Mbit/s
95th percentile per-packet one-way delay: 371.987 ms
Loss rate: 2.65%
-- Flow 2:
Average throughput: 33.57 Mbit/s
95th percentile per-packet one-way delay: 405.465 ms
Loss rate: 8.07%
-- Flow 3:
Average throughput: 30.48 Mbit/s
95th percentile per-packet one-way delay: 214.384 ms
Loss rate: 14.44%
```

Run 1: Report of Verus — Data Link



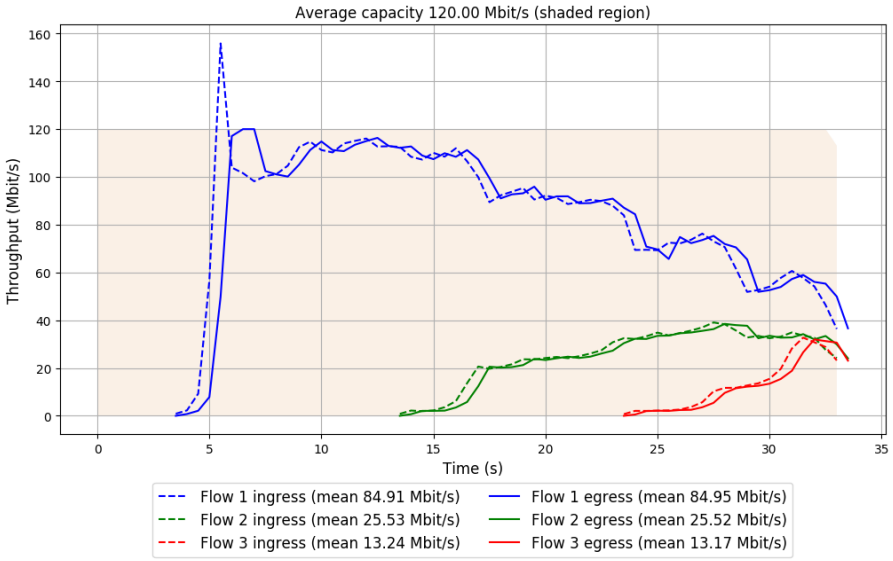


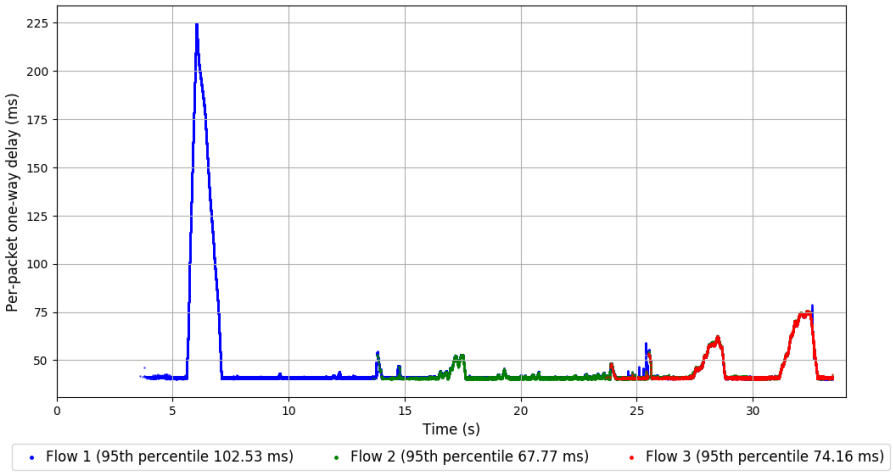
```
Run 1: Statistics of PCC-Vivace

Start at: 2019-07-30 20:08:20
End at: 2019-07-30 20:08:50

# Below is generated by plot.py at 2019-07-30 20:22:32
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 106.21 Mbit/s (88.5% utilization)
95th percentile per-packet one-way delay: 74.861 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 84.95 Mbit/s
95th percentile per-packet one-way delay: 102.525 ms
Loss rate: 0.08%
-- Flow 2:
Average throughput: 25.52 Mbit/s
95th percentile per-packet one-way delay: 67.773 ms
Loss rate: 0.23%
-- Flow 3:
Average throughput: 13.17 Mbit/s
95th percentile per-packet one-way delay: 74.164 ms
Loss rate: 0.86%
```

Run 1: Report of PCC-Vivace — Data Link





```
Run 1: Statistics of WebRTC media

Start at: 2019-07-30 20:14:34
End at: 2019-07-30 20:15:04

# Below is generated by plot.py at 2019-07-30 20:22:32
# Datalink statistics
-- Total of 3 flows:
Average capacity: 120.00 Mbit/s
Average throughput: 0.15 Mbit/s (0.1% utilization)
95th percentile per-packet one-way delay: 42.238 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 42.259 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 42.231 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 42.131 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link