

## Pantheon Report

Generated at 2018-11-15 10:38:59 (UTC).

Data path: GCE London on *ens4 (remote)* → GCE Tokyo on *ens4 (local)*.

Repeated the test of 18 congestion control schemes 5 times.

Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.

NTP offsets were measured against `time.google.com` and have been applied to correct the timestamps in logs.

### System info:

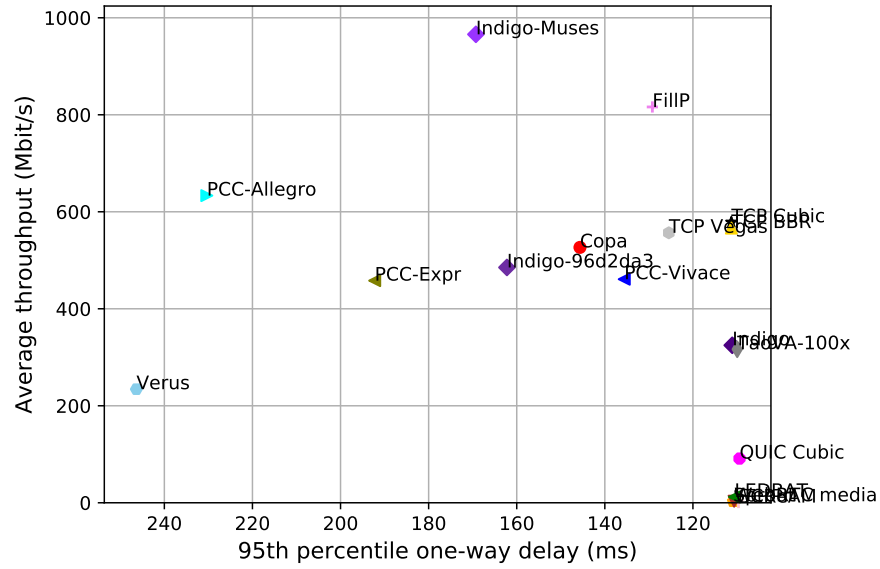
```
Linux 4.15.0-1021-gcp
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

### Git summary:

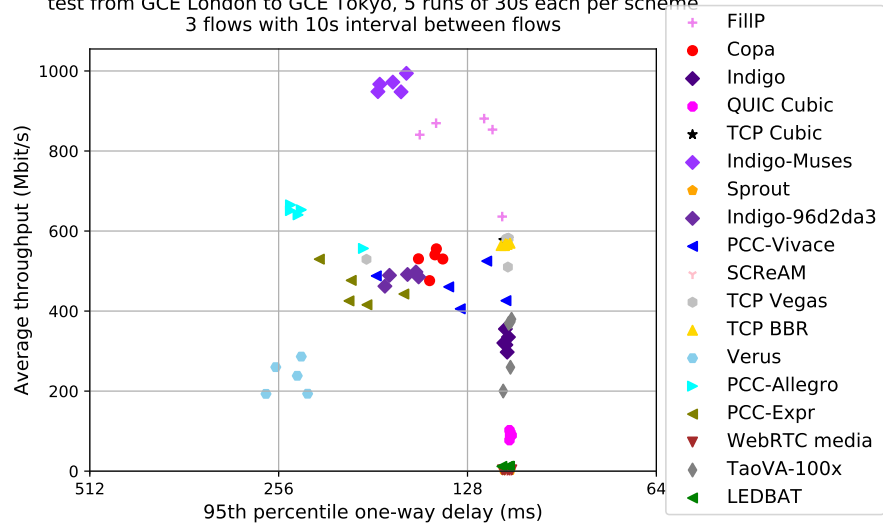
```
branch: muses @ 794ca3866981572cb73700a276691acf79c60f2b
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/indigo-96d2da3 @ 8413272d46f8aa0bcb967ed7048b6a8f994abb95
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
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

test from GCE London to GCE Tokyo, 5 runs of 30s each per scheme  
3 flows with 10s interval between flows (mean of all runs by scheme)



test from GCE London to GCE Tokyo, 5 runs of 30s each per scheme  
3 flows with 10s interval between flows



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
TCP BBR	5	295.90	282.24	254.48	110.80	110.62	109.61	0.79	1.25	2.79
Copa	5	271.73	270.38	230.41	136.44	145.74	159.69	0.67	1.17	2.85
TCP Cubic	5	301.78	291.12	254.54	110.69	110.77	111.87	0.78	1.22	2.79
FillP	5	511.37	348.51	226.65	134.82	114.05	111.73	0.80	0.89	2.62
Indigo	5	171.22	161.41	142.15	110.75	111.20	111.57	0.76	1.18	2.76
Indigo-96d2da3	5	264.81	234.73	201.90	162.15	162.49	159.45	1.20	1.17	3.46
LEDBAT	5	7.78	5.14	2.48	110.19	110.40	109.72	1.47	2.20	4.46
Indigo-Muses	5	548.79	458.11	351.22	166.39	178.51	161.71	0.80	1.49	3.36
PCC-Allegro	5	363.18	293.87	232.96	232.54	191.54	230.36	6.29	4.25	4.88
PCC-Expr	5	261.03	220.35	156.87	190.87	163.79	167.76	1.53	2.47	2.87
QUIC Cubic	5	47.98	45.84	38.25	109.07	109.42	109.34	1.13	1.89	3.50
SCReAM	5	0.22	0.22	0.22	109.31	109.41	109.35	0.72	1.25	2.22
Sprout	5	1.20	1.35	1.54	109.88	110.12	110.27	0.75	1.45	1.69
TaoVA-100x	5	158.36	152.93	172.88	109.31	109.70	111.60	0.72	1.23	2.33
TCP Vegas	5	298.33	286.57	207.92	126.84	122.49	124.36	0.79	1.24	2.79
Verus	5	132.42	123.46	68.33	201.91	241.48	177.60	2.11	4.45	2.11
PCC-Vivace	5	272.74	216.76	137.23	137.22	138.87	113.80	0.78	1.34	3.59
WebRTC media	5	1.76	1.07	0.37	109.25	109.80	110.31	0.93	1.40	3.63



Run 1: Statistics of TCP BBR

Start at: 2018-11-15 05:45:11

End at: 2018-11-15 05:45:41

Local clock offset: 0.166 ms

Remote clock offset: 0.465 ms

# Below is generated by plot.py at 2018-11-15 08:47:39

# Datalink statistics

-- Total of 3 flows:

Average throughput: 563.74 Mbit/s

95th percentile per-packet one-way delay: 111.734 ms

Loss rate: 1.26%

-- Flow 1:

Average throughput: 293.75 Mbit/s

95th percentile per-packet one-way delay: 111.912 ms

Loss rate: 0.81%

-- Flow 2:

Average throughput: 282.07 Mbit/s

95th percentile per-packet one-way delay: 110.618 ms

Loss rate: 1.26%

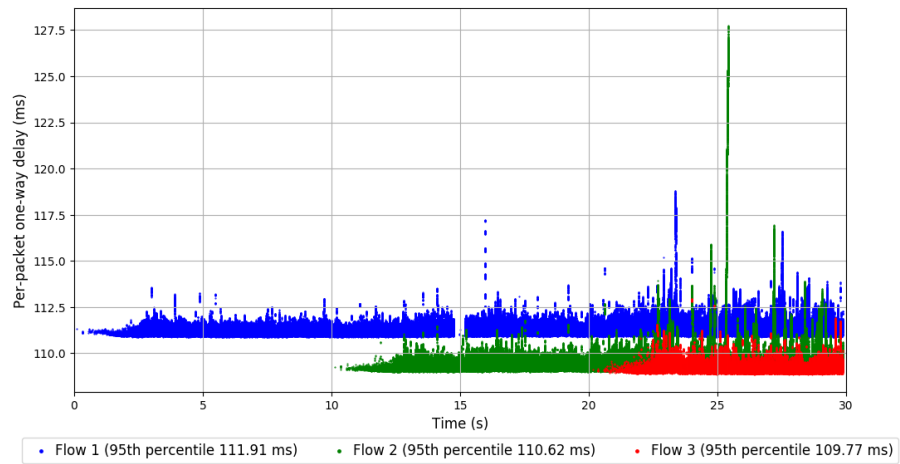
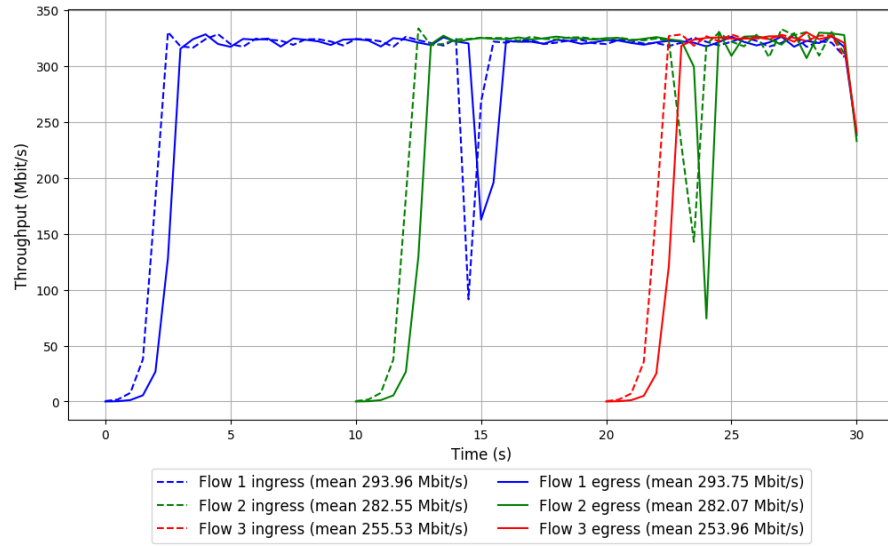
-- Flow 3:

Average throughput: 253.96 Mbit/s

95th percentile per-packet one-way delay: 109.773 ms

Loss rate: 2.81%

# Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-11-15 06:17:36

End at: 2018-11-15 06:18:06

Local clock offset: 0.773 ms

Remote clock offset: 0.128 ms

# Below is generated by plot.py at 2018-11-15 08:47:43

# Datalink statistics

-- Total of 3 flows:

Average throughput: 566.61 Mbit/s

95th percentile per-packet one-way delay: 110.676 ms

Loss rate: 1.24%

-- Flow 1:

Average throughput: 297.56 Mbit/s

95th percentile per-packet one-way delay: 110.631 ms

Loss rate: 0.79%

-- Flow 2:

Average throughput: 283.02 Mbit/s

95th percentile per-packet one-way delay: 110.703 ms

Loss rate: 1.23%

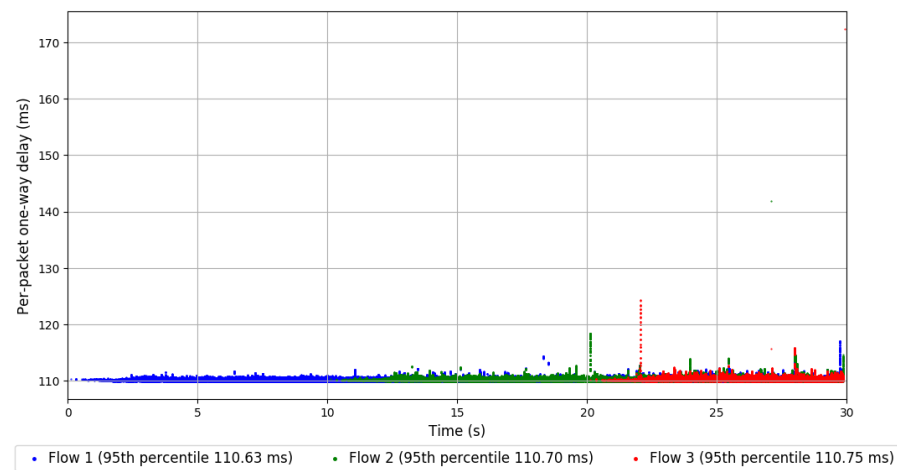
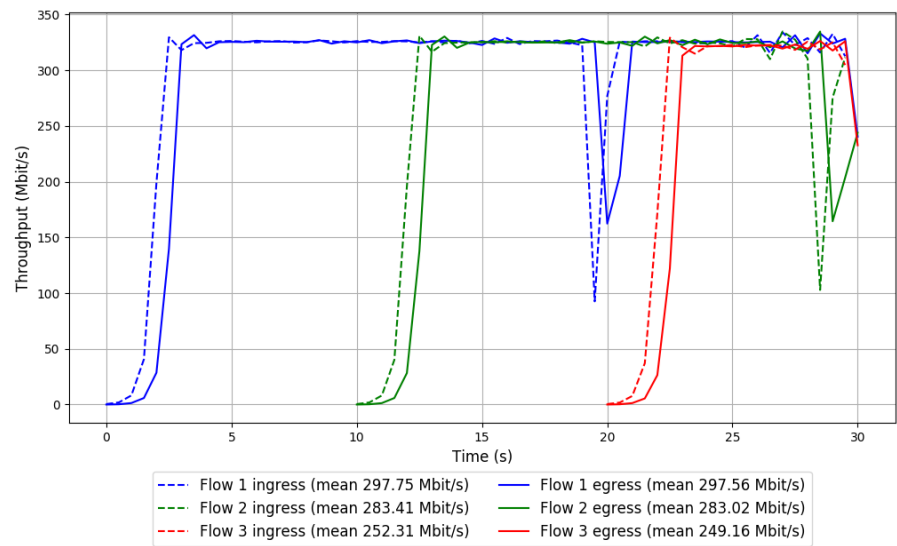
-- Flow 3:

Average throughput: 249.16 Mbit/s

95th percentile per-packet one-way delay: 110.750 ms

Loss rate: 2.84%

Run 2: Report of TCP BBR — Data Link

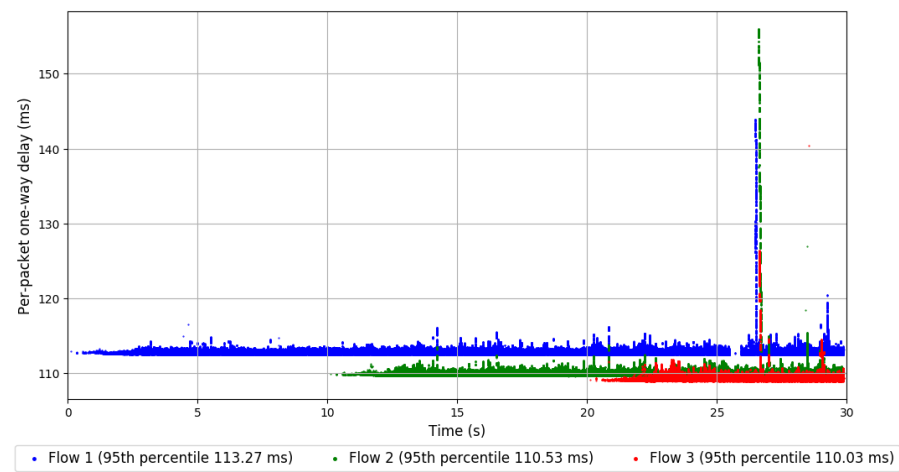
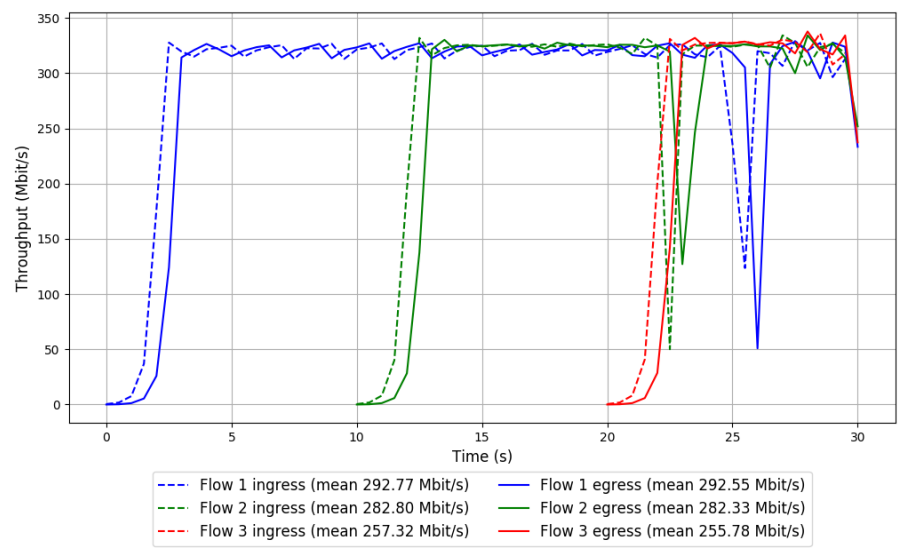


Run 3: Statistics of TCP BBR

Start at: 2018-11-15 06:49:50  
End at: 2018-11-15 06:50:20  
Local clock offset: 0.426 ms  
Remote clock offset: -0.012 ms

# Below is generated by plot.py at 2018-11-15 08:47:43  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 563.81 Mbit/s  
95th percentile per-packet one-way delay: 113.149 ms  
Loss rate: 1.26%  
-- Flow 1:  
Average throughput: 292.55 Mbit/s  
95th percentile per-packet one-way delay: 113.269 ms  
Loss rate: 0.81%  
-- Flow 2:  
Average throughput: 282.33 Mbit/s  
95th percentile per-packet one-way delay: 110.532 ms  
Loss rate: 1.26%  
-- Flow 3:  
Average throughput: 255.78 Mbit/s  
95th percentile per-packet one-way delay: 110.027 ms  
Loss rate: 2.78%

Run 3: Report of TCP BBR — Data Link



Run 4: Statistics of TCP BBR

Start at: 2018-11-15 07:22:04

End at: 2018-11-15 07:22:34

Local clock offset: -0.351 ms

Remote clock offset: 0.393 ms

# Below is generated by plot.py at 2018-11-15 08:47:50

# Datalink statistics

-- Total of 3 flows:

Average throughput: 569.56 Mbit/s

95th percentile per-packet one-way delay: 109.501 ms

Loss rate: 1.24%

-- Flow 1:

Average throughput: 297.27 Mbit/s

95th percentile per-packet one-way delay: 109.412 ms

Loss rate: 0.80%

-- Flow 2:

Average throughput: 283.46 Mbit/s

95th percentile per-packet one-way delay: 109.661 ms

Loss rate: 1.25%

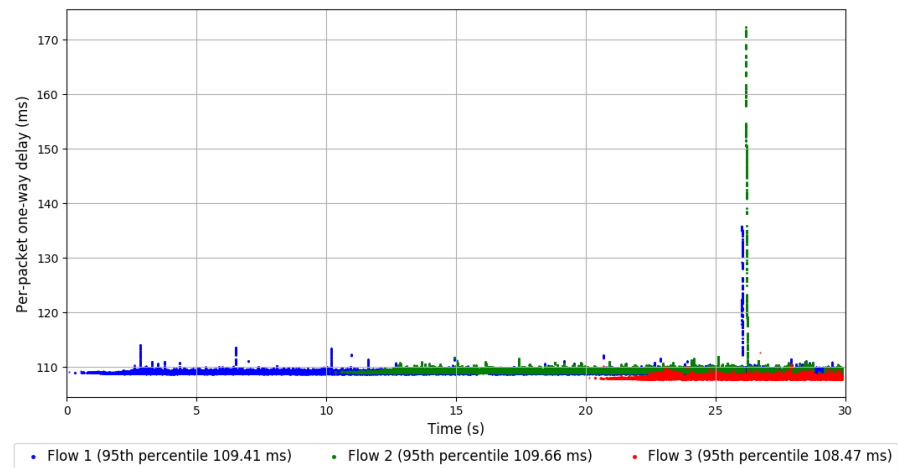
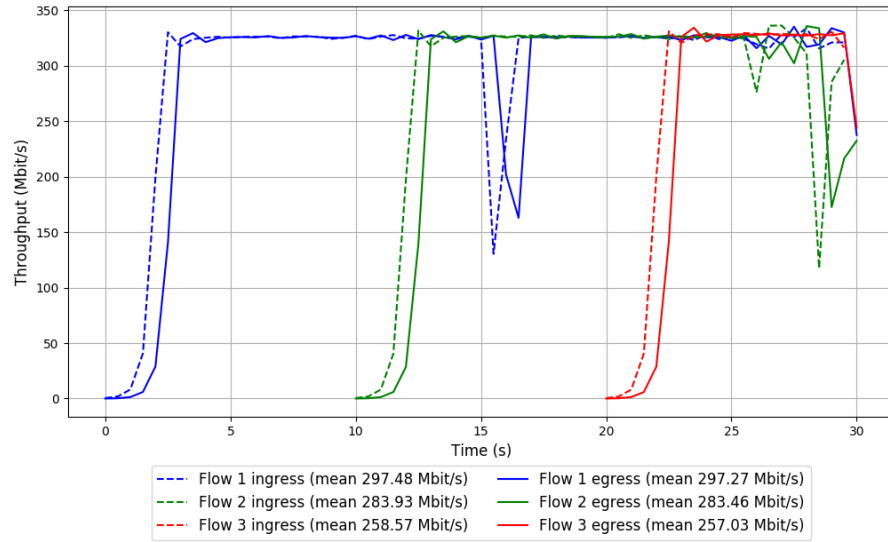
-- Flow 3:

Average throughput: 257.03 Mbit/s

95th percentile per-packet one-way delay: 108.471 ms

Loss rate: 2.76%

#### Run 4: Report of TCP BBR — Data Link





Run 5: Statistics of TCP BBR

Start at: 2018-11-15 07:53:44

End at: 2018-11-15 07:54:14

Local clock offset: -0.547 ms

Remote clock offset: 0.02 ms

# Below is generated by plot.py at 2018-11-15 08:47:50

# Datalink statistics

-- Total of 3 flows:

Average throughput: 568.37 Mbit/s

95th percentile per-packet one-way delay: 111.302 ms

Loss rate: 1.21%

-- Flow 1:

Average throughput: 298.37 Mbit/s

95th percentile per-packet one-way delay: 108.773 ms

Loss rate: 0.73%

-- Flow 2:

Average throughput: 280.30 Mbit/s

95th percentile per-packet one-way delay: 111.591 ms

Loss rate: 1.26%

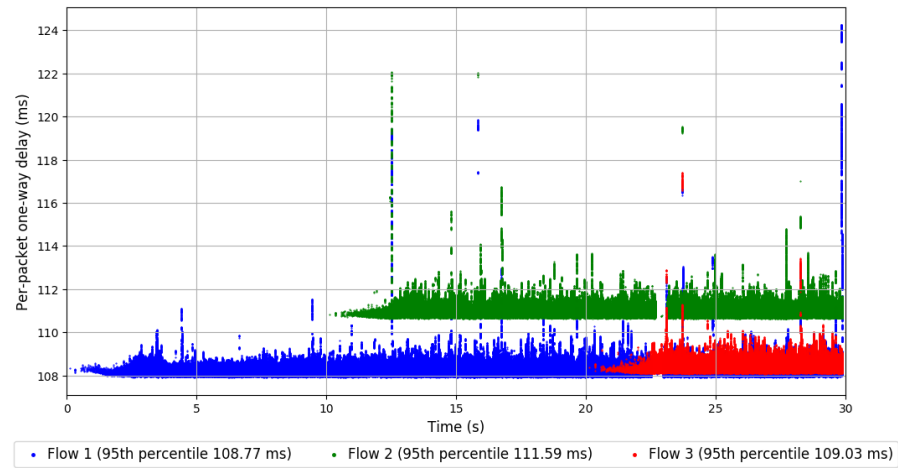
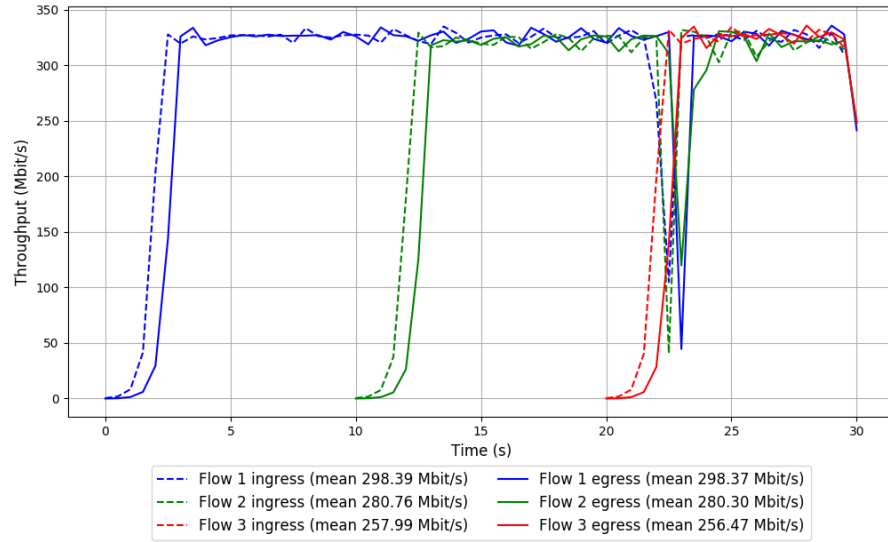
-- Flow 3:

Average throughput: 256.47 Mbit/s

95th percentile per-packet one-way delay: 109.026 ms

Loss rate: 2.76%

# Run 5: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

Start at: 2018-11-15 06:00:53

End at: 2018-11-15 06:01:23

Local clock offset: -0.023 ms

Remote clock offset: 0.101 ms

# Below is generated by plot.py at 2018-11-15 08:54:08

# Datalink statistics

-- Total of 3 flows:

Average throughput: 476.06 Mbit/s

95th percentile per-packet one-way delay: 147.104 ms

Loss rate: 1.02%

-- Flow 1:

Average throughput: 225.21 Mbit/s

95th percentile per-packet one-way delay: 133.010 ms

Loss rate: 0.44%

-- Flow 2:

Average throughput: 261.65 Mbit/s

95th percentile per-packet one-way delay: 159.400 ms

Loss rate: 1.02%

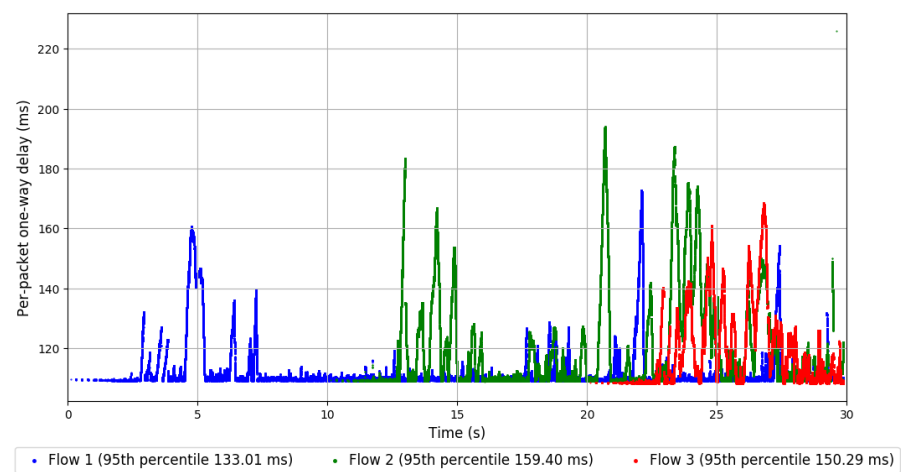
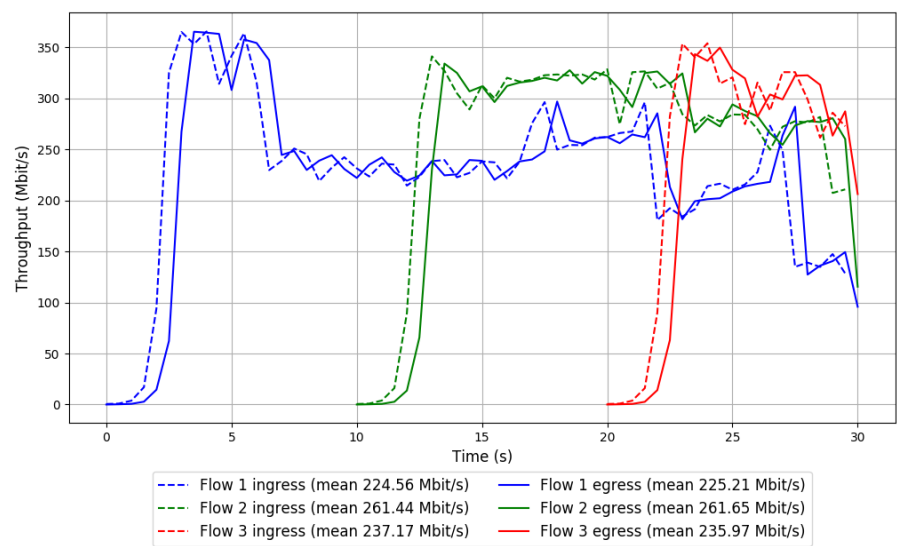
-- Flow 3:

Average throughput: 235.97 Mbit/s

95th percentile per-packet one-way delay: 150.289 ms

Loss rate: 2.68%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2018-11-15 06:33:17

End at: 2018-11-15 06:33:47

Local clock offset: -0.045 ms

Remote clock offset: 0.017 ms

# Below is generated by plot.py at 2018-11-15 08:56:49

# Datalink statistics

-- Total of 3 flows:

Average throughput: 540.53 Mbit/s

95th percentile per-packet one-way delay: 144.258 ms

Loss rate: 1.14%

-- Flow 1:

Average throughput: 288.76 Mbit/s

95th percentile per-packet one-way delay: 130.548 ms

Loss rate: 0.71%

-- Flow 2:

Average throughput: 276.08 Mbit/s

95th percentile per-packet one-way delay: 142.987 ms

Loss rate: 1.20%

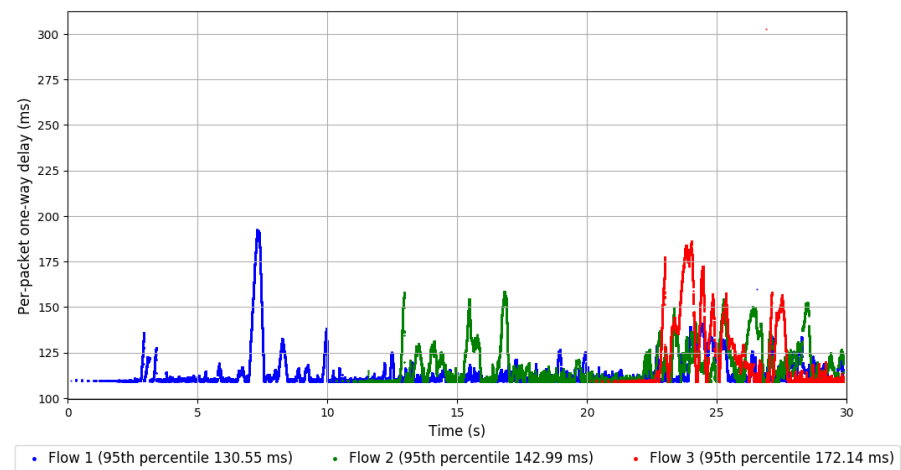
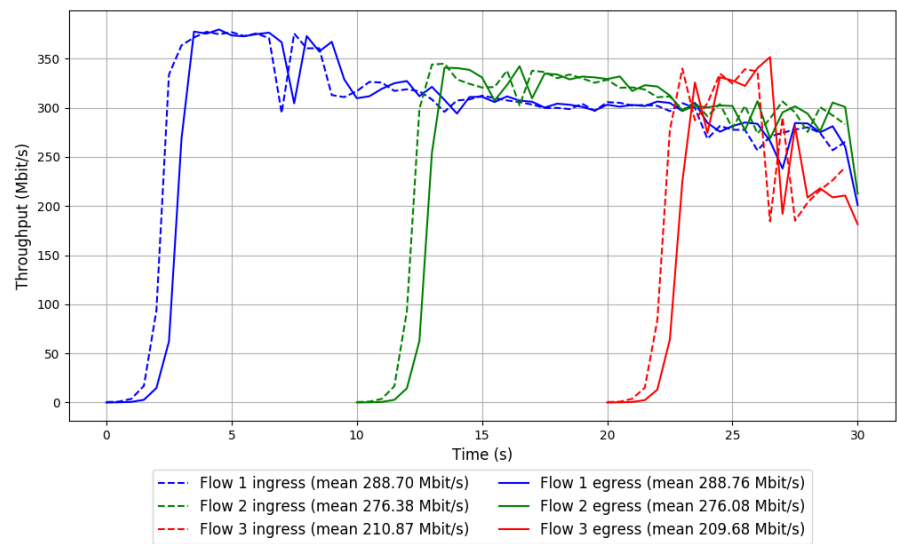
-- Flow 3:

Average throughput: 209.68 Mbit/s

95th percentile per-packet one-way delay: 172.144 ms

Loss rate: 2.74%

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2018-11-15 07:05:30

End at: 2018-11-15 07:06:00

Local clock offset: -0.046 ms

Remote clock offset: -0.01 ms

# Below is generated by plot.py at 2018-11-15 08:56:49

# Datalink statistics

-- Total of 3 flows:

Average throughput: 530.15 Mbit/s

95th percentile per-packet one-way delay: 140.147 ms

Loss rate: 1.29%

-- Flow 1:

Average throughput: 268.41 Mbit/s

95th percentile per-packet one-way delay: 136.927 ms

Loss rate: 0.83%

-- Flow 2:

Average throughput: 271.82 Mbit/s

95th percentile per-packet one-way delay: 130.251 ms

Loss rate: 1.22%

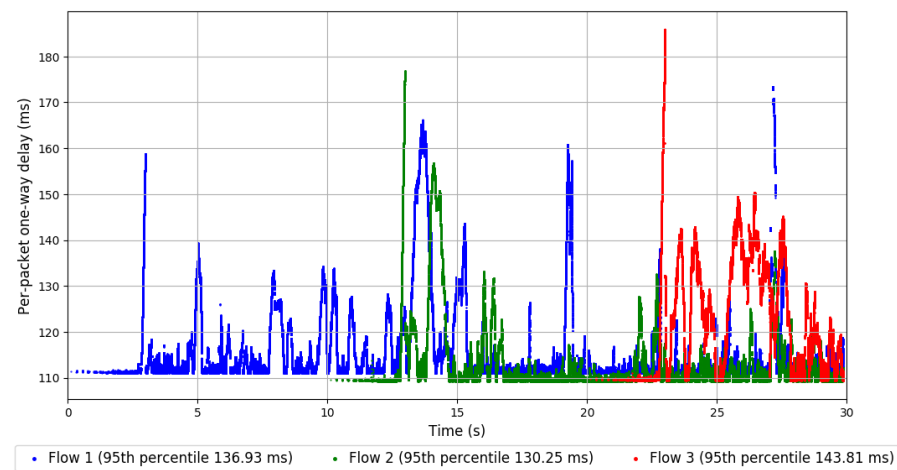
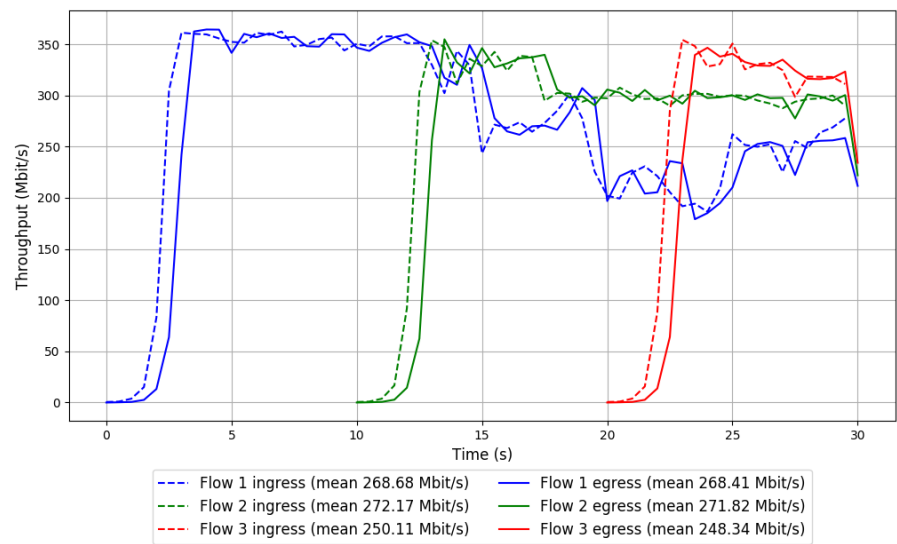
-- Flow 3:

Average throughput: 248.34 Mbit/s

95th percentile per-packet one-way delay: 143.810 ms

Loss rate: 2.89%

Run 3: Report of Copa — Data Link





Run 4: Statistics of Copa

Start at: 2018-11-15 07:37:26

End at: 2018-11-15 07:37:56

Local clock offset: -0.649 ms

Remote clock offset: 0.067 ms

# Below is generated by plot.py at 2018-11-15 09:07:27

# Datalink statistics

-- Total of 3 flows:

Average throughput: 530.63 Mbit/s

95th percentile per-packet one-way delay: 153.233 ms

Loss rate: 1.18%

-- Flow 1:

Average throughput: 278.38 Mbit/s

95th percentile per-packet one-way delay: 149.421 ms

Loss rate: 0.62%

-- Flow 2:

Average throughput: 267.34 Mbit/s

95th percentile per-packet one-way delay: 149.510 ms

Loss rate: 1.23%

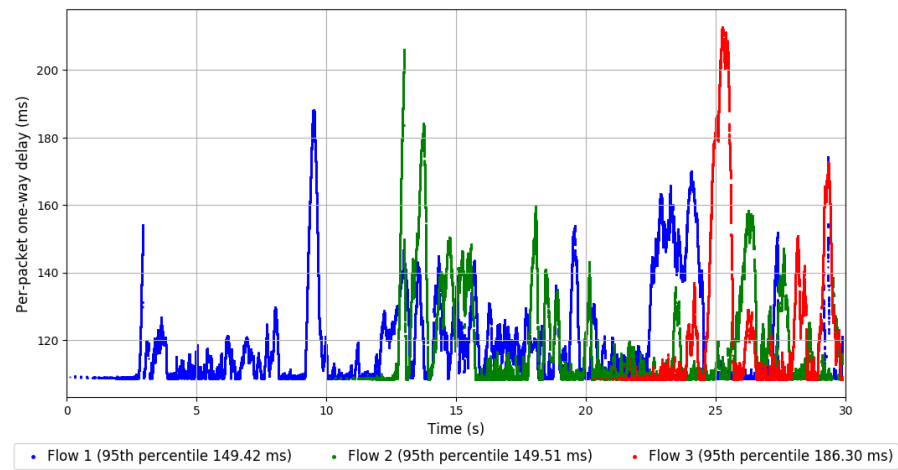
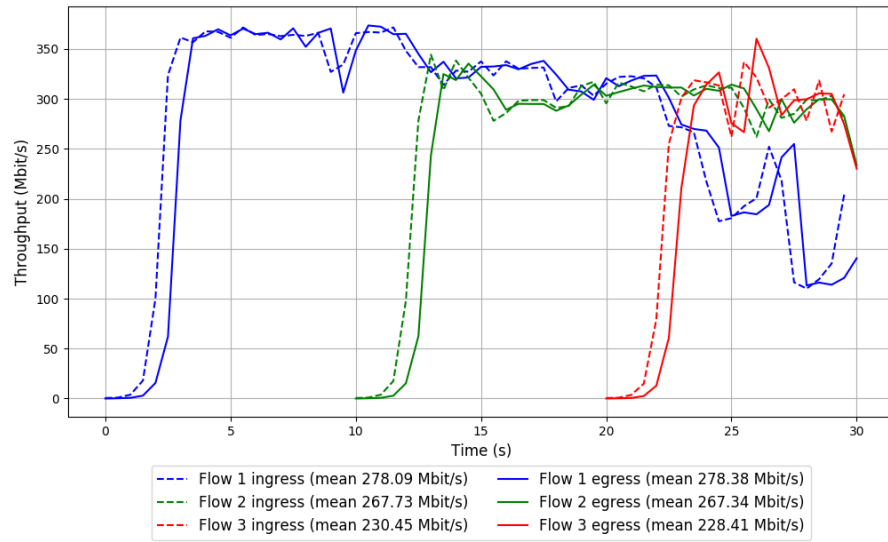
-- Flow 3:

Average throughput: 228.41 Mbit/s

95th percentile per-packet one-way delay: 186.301 ms

Loss rate: 3.05%

# Run 4: Report of Copa — Data Link

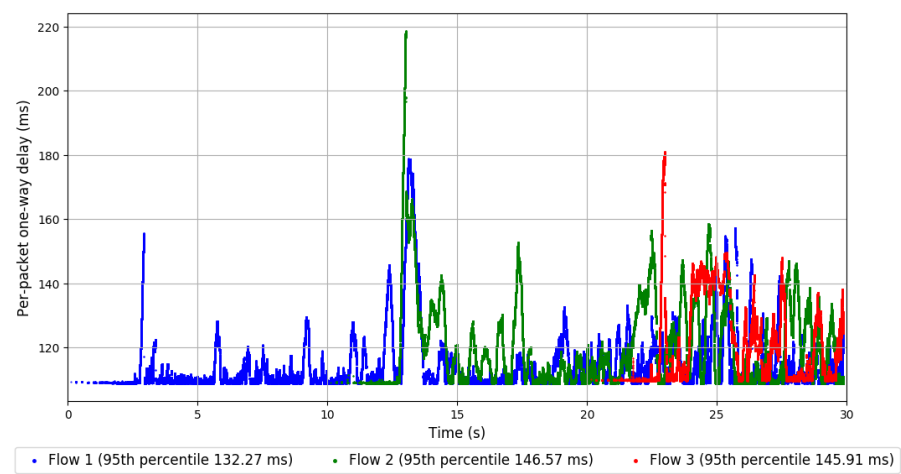
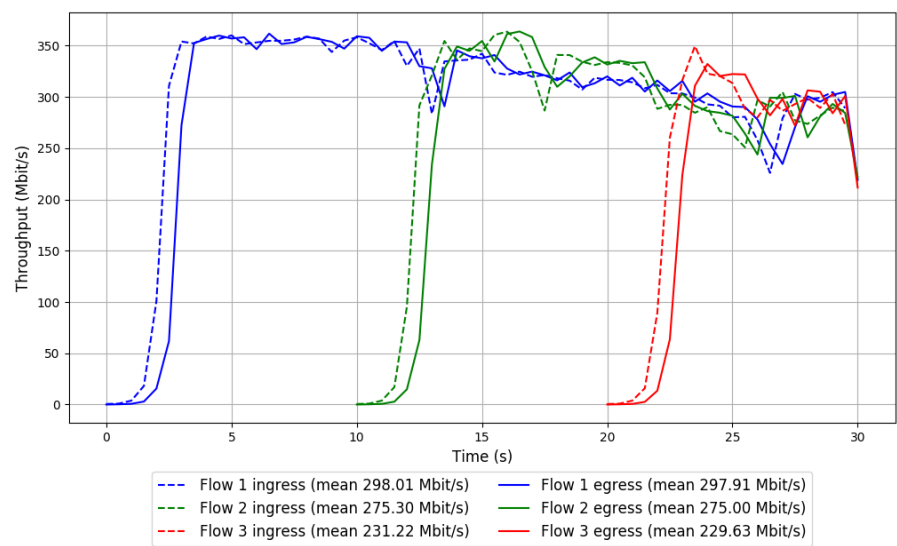


Run 5: Statistics of Copa

Start at: 2018-11-15 08:09:02  
End at: 2018-11-15 08:09:32  
Local clock offset: 0.327 ms  
Remote clock offset: -0.009 ms

# Below is generated by plot.py at 2018-11-15 09:08:20  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 555.54 Mbit/s  
95th percentile per-packet one-way delay: 143.491 ms  
Loss rate: 1.19%  
-- Flow 1:  
Average throughput: 297.91 Mbit/s  
95th percentile per-packet one-way delay: 132.273 ms  
Loss rate: 0.76%  
-- Flow 2:  
Average throughput: 275.00 Mbit/s  
95th percentile per-packet one-way delay: 146.569 ms  
Loss rate: 1.19%  
-- Flow 3:  
Average throughput: 229.63 Mbit/s  
95th percentile per-packet one-way delay: 145.909 ms  
Loss rate: 2.87%

Run 5: Report of Copa — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-11-15 05:47:02

End at: 2018-11-15 05:47:32

Local clock offset: 0.05 ms

Remote clock offset: 0.127 ms

# Below is generated by plot.py at 2018-11-15 09:08:20

# Datalink statistics

-- Total of 3 flows:

Average throughput: 581.04 Mbit/s

95th percentile per-packet one-way delay: 110.262 ms

Loss rate: 1.22%

-- Flow 1:

Average throughput: 302.43 Mbit/s

95th percentile per-packet one-way delay: 110.292 ms

Loss rate: 0.78%

-- Flow 2:

Average throughput: 291.63 Mbit/s

95th percentile per-packet one-way delay: 110.247 ms

Loss rate: 1.22%

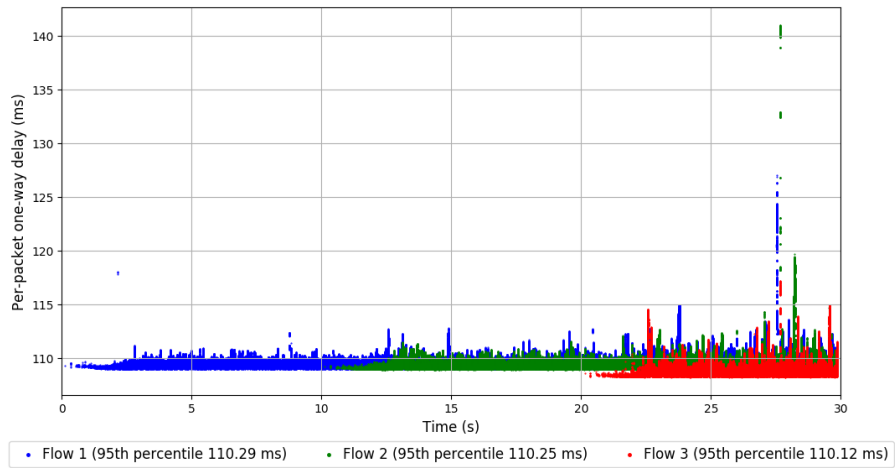
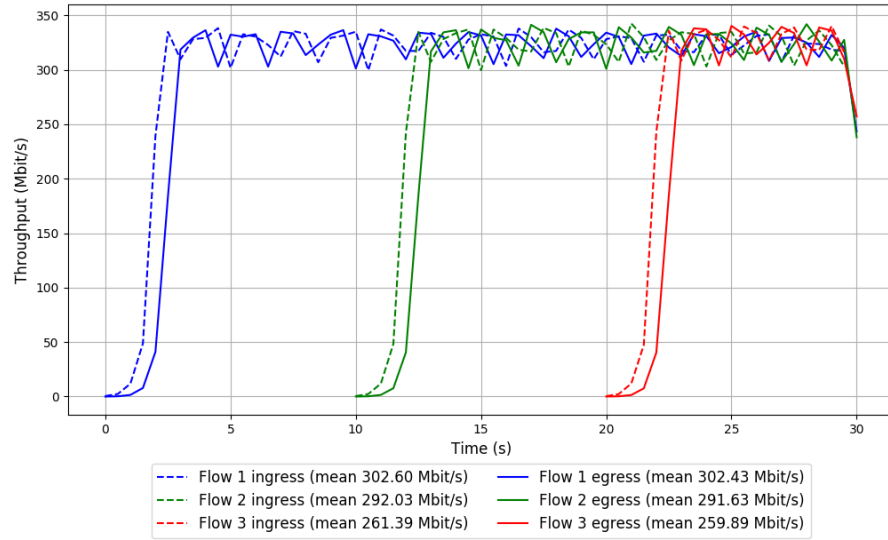
-- Flow 3:

Average throughput: 259.89 Mbit/s

95th percentile per-packet one-way delay: 110.120 ms

Loss rate: 2.74%

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



Run 2: Statistics of TCP Cubic

Start at: 2018-11-15 06:19:29

End at: 2018-11-15 06:19:59

Local clock offset: -1.302 ms

Remote clock offset: 0.121 ms

# Below is generated by plot.py at 2018-11-15 09:08:20

# Datalink statistics

-- Total of 3 flows:

Average throughput: 577.78 Mbit/s

95th percentile per-packet one-way delay: 111.367 ms

Loss rate: 1.22%

-- Flow 1:

Average throughput: 299.53 Mbit/s

95th percentile per-packet one-way delay: 109.295 ms

Loss rate: 0.79%

-- Flow 2:

Average throughput: 294.21 Mbit/s

95th percentile per-packet one-way delay: 108.419 ms

Loss rate: 1.21%

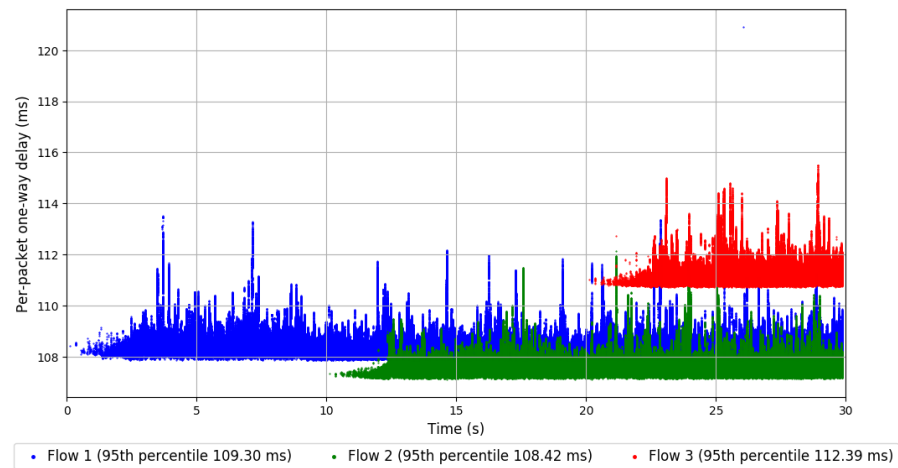
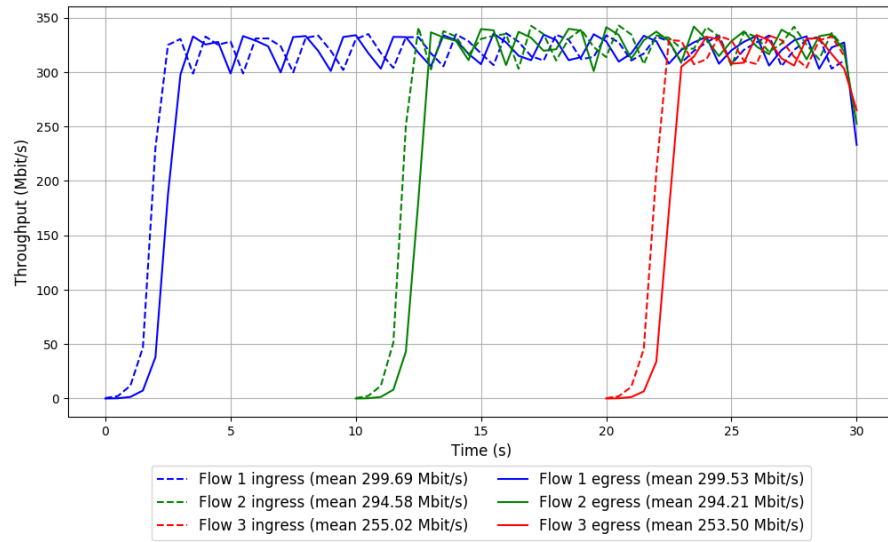
-- Flow 3:

Average throughput: 253.50 Mbit/s

95th percentile per-packet one-way delay: 112.389 ms

Loss rate: 2.80%

## Run 2: Report of TCP Cubic — Data Link





Run 3: Statistics of TCP Cubic

Start at: 2018-11-15 06:51:42

End at: 2018-11-15 06:52:12

Local clock offset: -0.062 ms

Remote clock offset: 0.007 ms

# Below is generated by plot.py at 2018-11-15 09:08:20

# Datalink statistics

-- Total of 3 flows:

Average throughput: 579.47 Mbit/s

95th percentile per-packet one-way delay: 110.702 ms

Loss rate: 1.22%

-- Flow 1:

Average throughput: 300.78 Mbit/s

95th percentile per-packet one-way delay: 110.604 ms

Loss rate: 0.79%

-- Flow 2:

Average throughput: 291.39 Mbit/s

95th percentile per-packet one-way delay: 110.954 ms

Loss rate: 1.22%

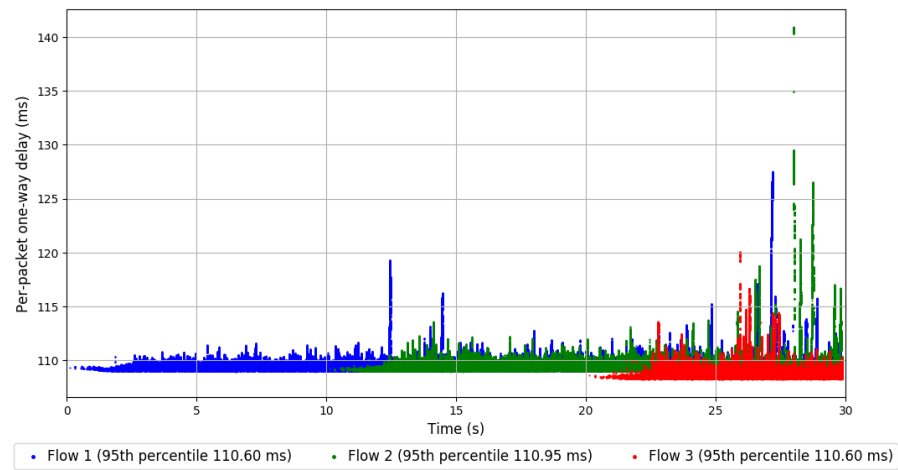
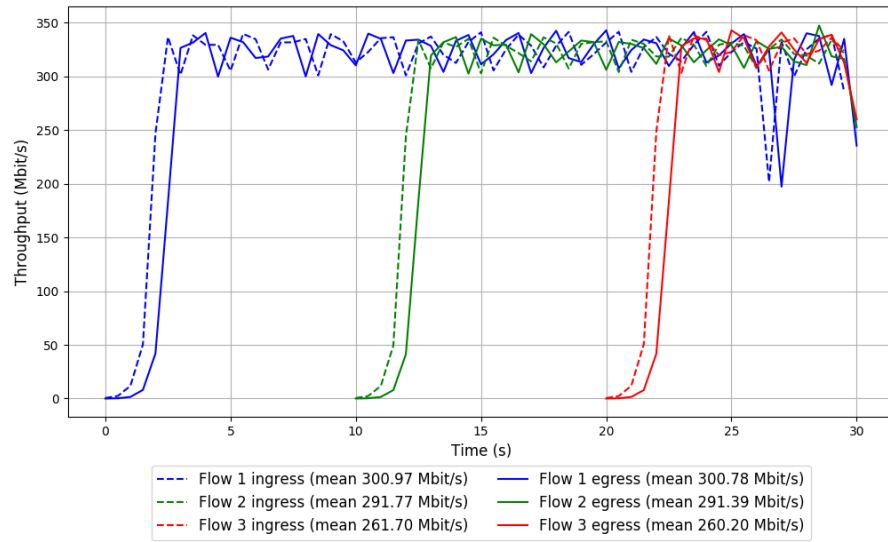
-- Flow 3:

Average throughput: 260.20 Mbit/s

95th percentile per-packet one-way delay: 110.598 ms

Loss rate: 2.72%

### Run 3: Report of TCP Cubic — Data Link



Run 4: Statistics of TCP Cubic

Start at: 2018-11-15 07:23:55

End at: 2018-11-15 07:24:25

Local clock offset: 0.551 ms

Remote clock offset: 0.358 ms

# Below is generated by plot.py at 2018-11-15 09:08:20

# Datalink statistics

-- Total of 3 flows:

Average throughput: 576.87 Mbit/s

95th percentile per-packet one-way delay: 112.085 ms

Loss rate: 1.23%

-- Flow 1:

Average throughput: 302.43 Mbit/s

95th percentile per-packet one-way delay: 112.175 ms

Loss rate: 0.78%

-- Flow 2:

Average throughput: 290.95 Mbit/s

95th percentile per-packet one-way delay: 111.997 ms

Loss rate: 1.22%

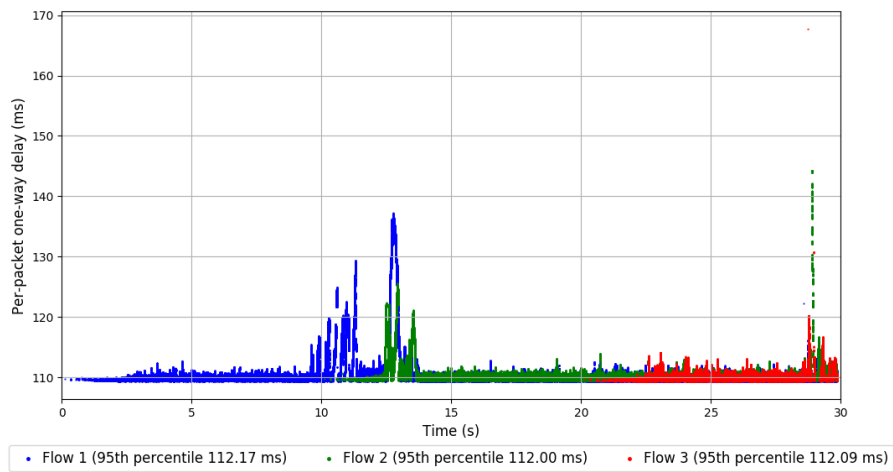
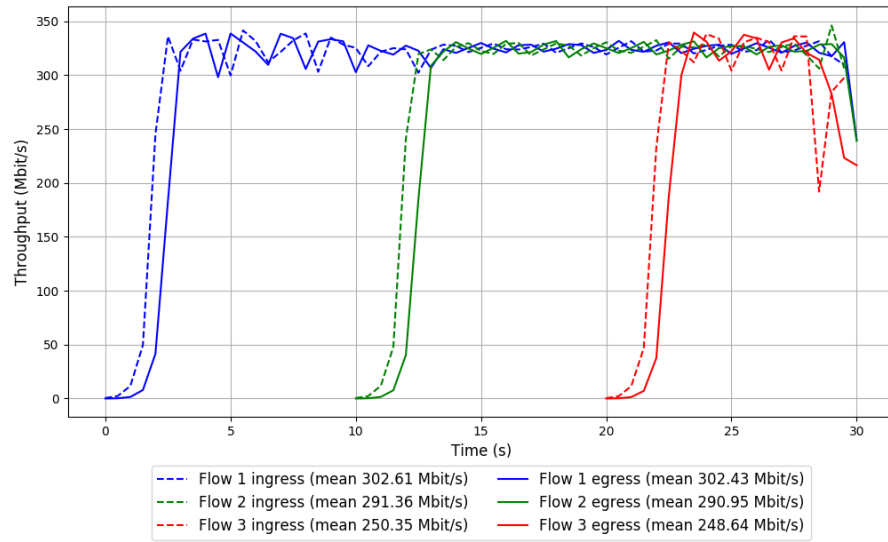
-- Flow 3:

Average throughput: 248.64 Mbit/s

95th percentile per-packet one-way delay: 112.094 ms

Loss rate: 2.86%

#### Run 4: Report of TCP Cubic — Data Link



Run 5: Statistics of TCP Cubic

Start at: 2018-11-15 07:55:34

End at: 2018-11-15 07:56:04

Local clock offset: 0.483 ms

Remote clock offset: 0.018 ms

# Below is generated by plot.py at 2018-11-15 09:08:20

# Datalink statistics

-- Total of 3 flows:

Average throughput: 576.50 Mbit/s

95th percentile per-packet one-way delay: 111.957 ms

Loss rate: 1.23%

-- Flow 1:

Average throughput: 303.75 Mbit/s

95th percentile per-packet one-way delay: 111.100 ms

Loss rate: 0.78%

-- Flow 2:

Average throughput: 287.41 Mbit/s

95th percentile per-packet one-way delay: 112.235 ms

Loss rate: 1.24%

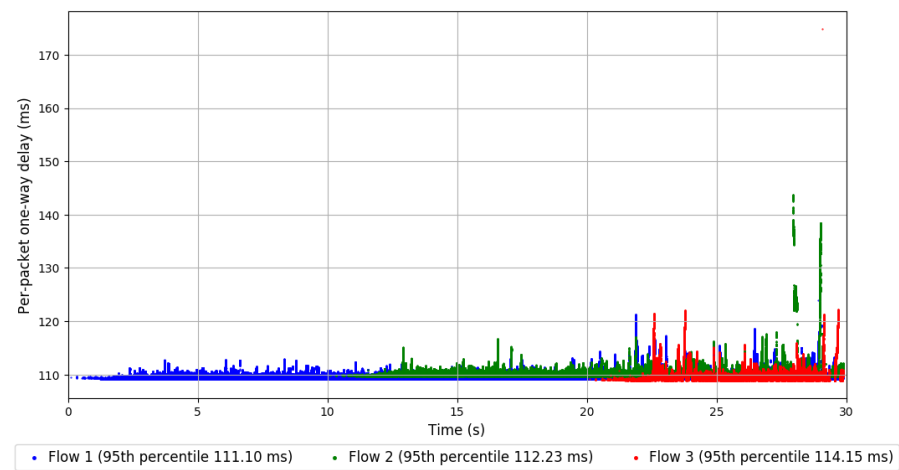
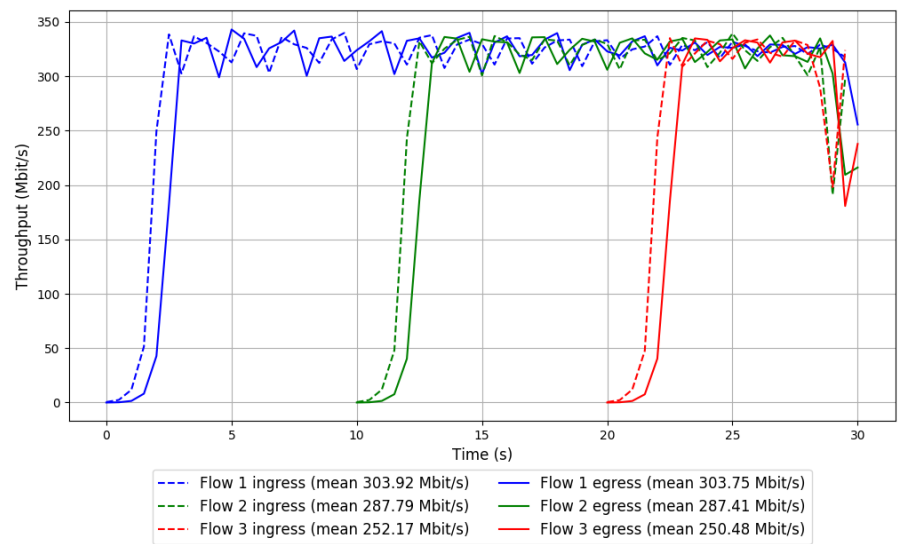
-- Flow 3:

Average throughput: 250.48 Mbit/s

95th percentile per-packet one-way delay: 114.146 ms

Loss rate: 2.84%

Run 5: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2018-11-15 05:56:57

End at: 2018-11-15 05:57:27

Local clock offset: 0.089 ms

Remote clock offset: -0.27 ms

# Below is generated by plot.py at 2018-11-15 09:17:12

# Datalink statistics

-- Total of 3 flows:

Average throughput: 840.64 Mbit/s

95th percentile per-packet one-way delay: 152.515 ms

Loss rate: 1.47%

-- Flow 1:

Average throughput: 543.55 Mbit/s

95th percentile per-packet one-way delay: 162.563 ms

Loss rate: 1.57%

-- Flow 2:

Average throughput: 338.80 Mbit/s

95th percentile per-packet one-way delay: 113.589 ms

Loss rate: 0.85%

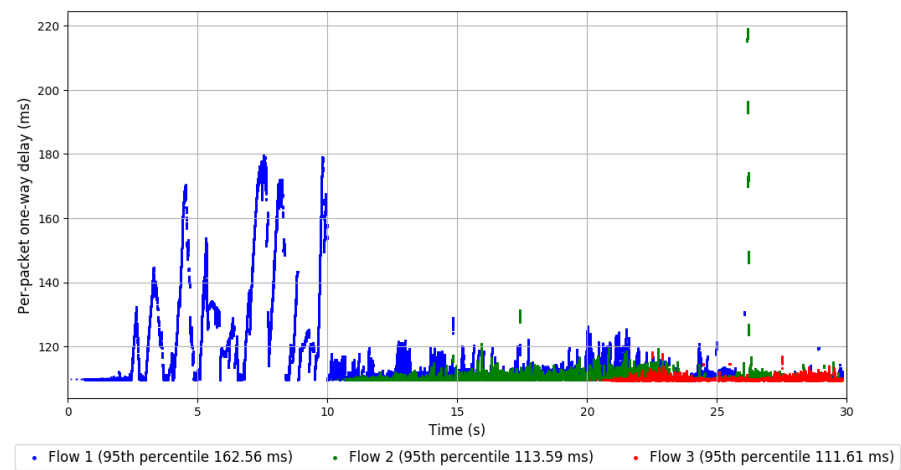
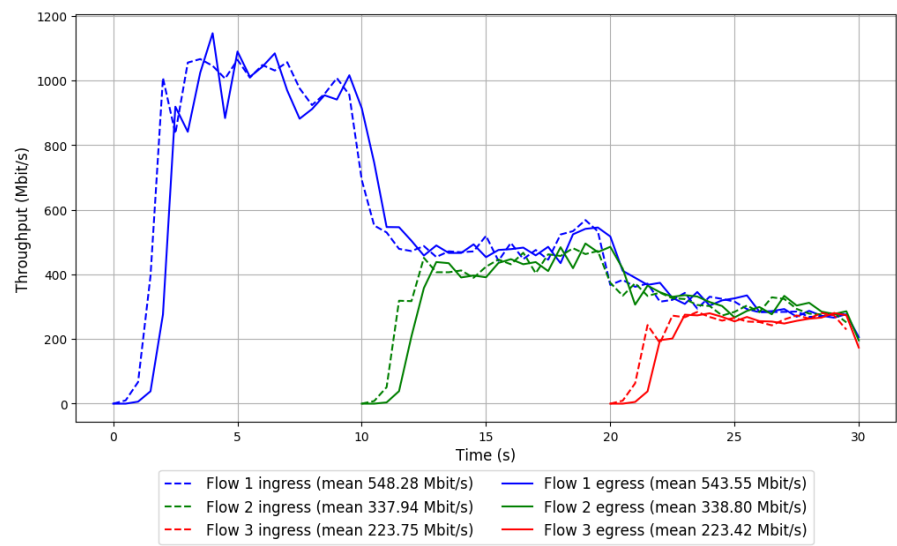
-- Flow 3:

Average throughput: 223.42 Mbit/s

95th percentile per-packet one-way delay: 111.613 ms

Loss rate: 2.60%

Run 1: Report of FillP — Data Link





Run 2: Statistics of FillP

Start at: 2018-11-15 06:29:20

End at: 2018-11-15 06:29:50

Local clock offset: 1.259 ms

Remote clock offset: 0.133 ms

# Below is generated by plot.py at 2018-11-15 09:21:20

# Datalink statistics

-- Total of 3 flows:

Average throughput: 869.53 Mbit/s

95th percentile per-packet one-way delay: 143.637 ms

Loss rate: 0.90%

-- Flow 1:

Average throughput: 556.87 Mbit/s

95th percentile per-packet one-way delay: 149.116 ms

Loss rate: 0.71%

-- Flow 2:

Average throughput: 356.87 Mbit/s

95th percentile per-packet one-way delay: 117.899 ms

Loss rate: 0.81%

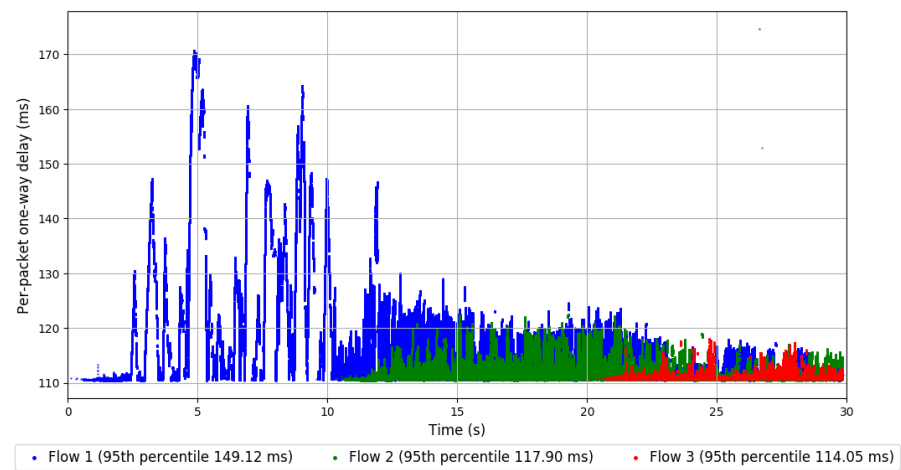
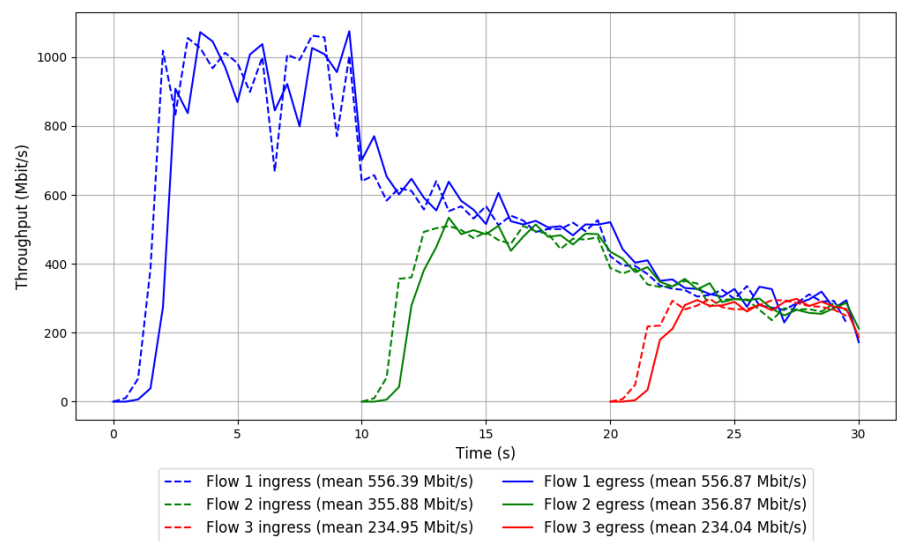
-- Flow 3:

Average throughput: 234.04 Mbit/s

95th percentile per-packet one-way delay: 114.046 ms

Loss rate: 2.56%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-11-15 07:01:36

End at: 2018-11-15 07:02:06

Local clock offset: -0.782 ms

Remote clock offset: 0.006 ms

# Below is generated by plot.py at 2018-11-15 09:21:20

# Datalink statistics

-- Total of 3 flows:

Average throughput: 853.45 Mbit/s

95th percentile per-packet one-way delay: 116.776 ms

Loss rate: 0.83%

-- Flow 1:

Average throughput: 554.58 Mbit/s

95th percentile per-packet one-way delay: 121.959 ms

Loss rate: 0.47%

-- Flow 2:

Average throughput: 342.31 Mbit/s

95th percentile per-packet one-way delay: 111.703 ms

Loss rate: 1.04%

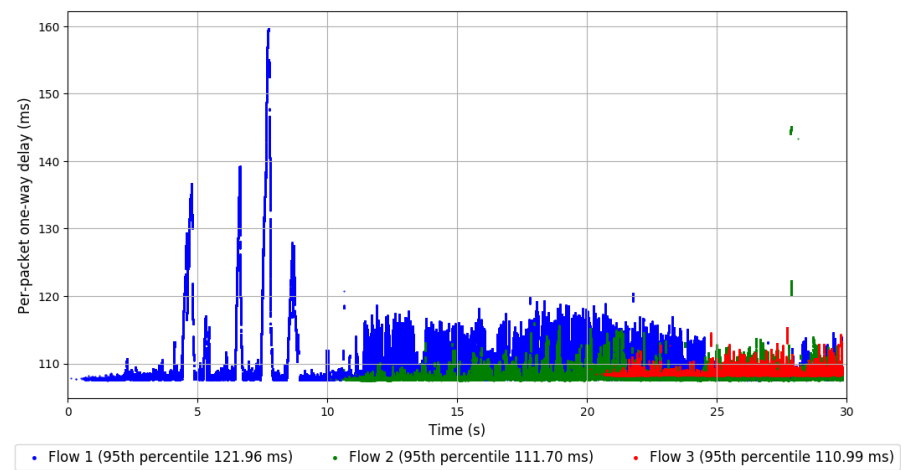
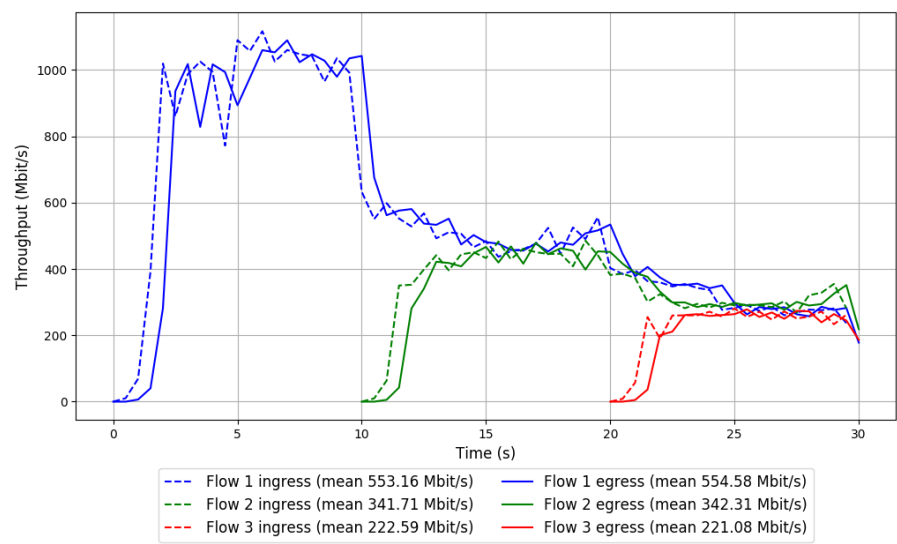
-- Flow 3:

Average throughput: 221.08 Mbit/s

95th percentile per-packet one-way delay: 110.988 ms

Loss rate: 2.87%

Run 3: Report of FillP — Data Link



Run 4: Statistics of FillP

Start at: 2018-11-15 07:33:48

End at: 2018-11-15 07:34:18

Local clock offset: -0.039 ms

Remote clock offset: 0.046 ms

# Below is generated by plot.py at 2018-11-15 09:21:53

# Datalink statistics

-- Total of 3 flows:

Average throughput: 880.97 Mbit/s

95th percentile per-packet one-way delay: 120.409 ms

Loss rate: 0.88%

-- Flow 1:

Average throughput: 570.35 Mbit/s

95th percentile per-packet one-way delay: 127.255 ms

Loss rate: 0.61%

-- Flow 2:

Average throughput: 353.20 Mbit/s

95th percentile per-packet one-way delay: 114.895 ms

Loss rate: 1.01%

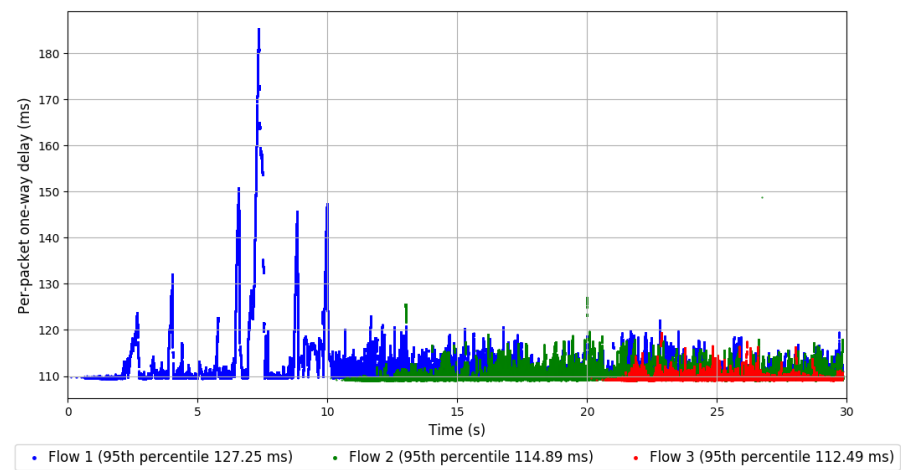
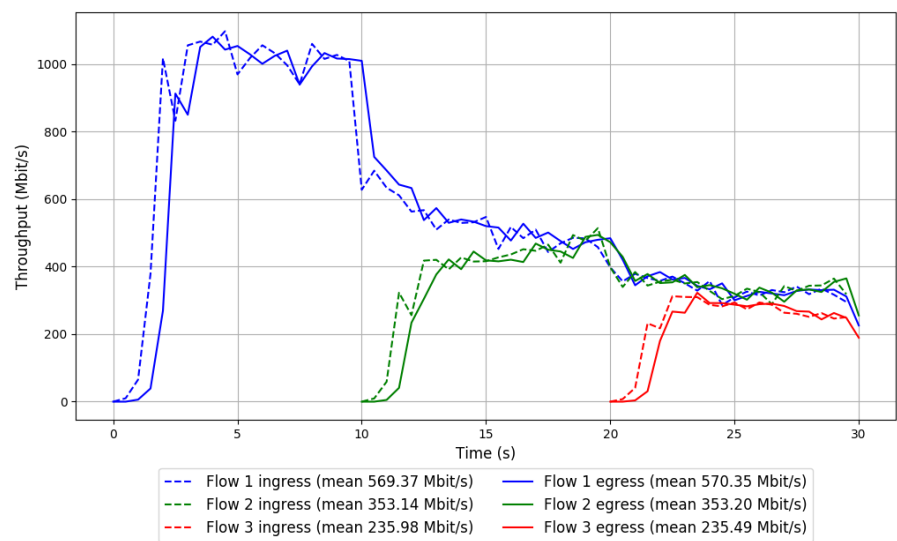
-- Flow 3:

Average throughput: 235.49 Mbit/s

95th percentile per-packet one-way delay: 112.494 ms

Loss rate: 2.53%

Run 4: Report of FillP — Data Link



Run 5: Statistics of FillP

Start at: 2018-11-15 08:05:28

End at: 2018-11-15 08:05:58

Local clock offset: -1.458 ms

Remote clock offset: 0.004 ms

# Below is generated by plot.py at 2018-11-15 09:22:15

# Datalink statistics

-- Total of 3 flows:

Average throughput: 636.12 Mbit/s

95th percentile per-packet one-way delay: 112.693 ms

Loss rate: 0.90%

-- Flow 1:

Average throughput: 331.52 Mbit/s

95th percentile per-packet one-way delay: 113.196 ms

Loss rate: 0.64%

-- Flow 2:

Average throughput: 351.38 Mbit/s

95th percentile per-packet one-way delay: 112.174 ms

Loss rate: 0.75%

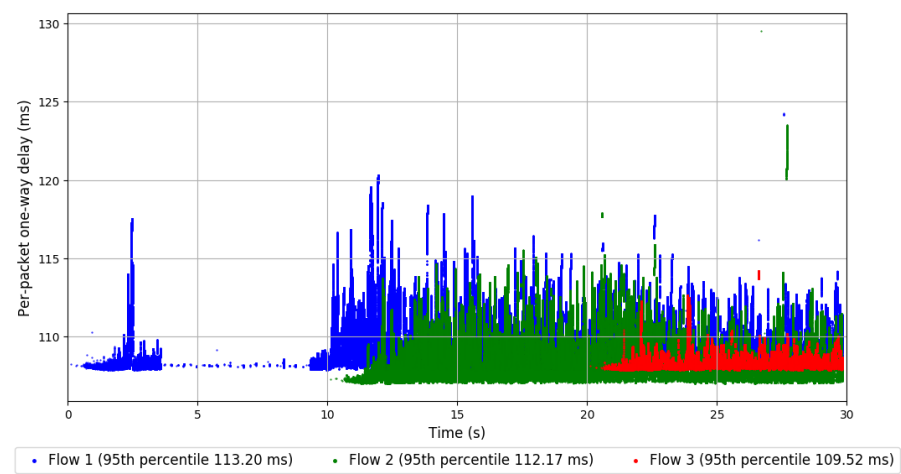
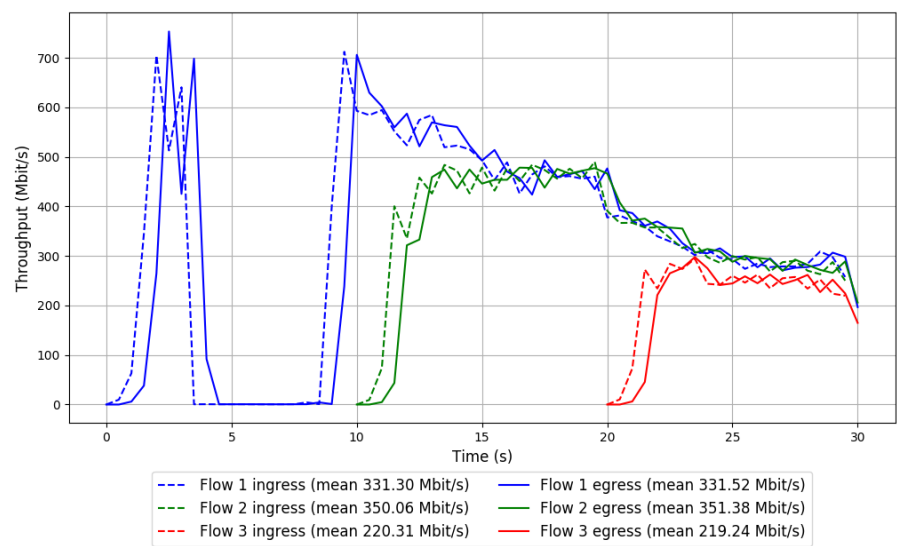
-- Flow 3:

Average throughput: 219.24 Mbit/s

95th percentile per-packet one-way delay: 109.518 ms

Loss rate: 2.55%

Run 5: Report of FillP — Data Link



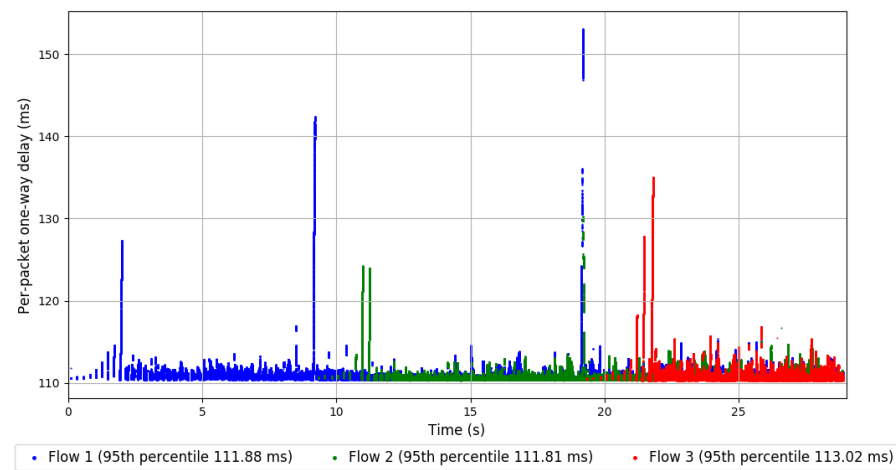
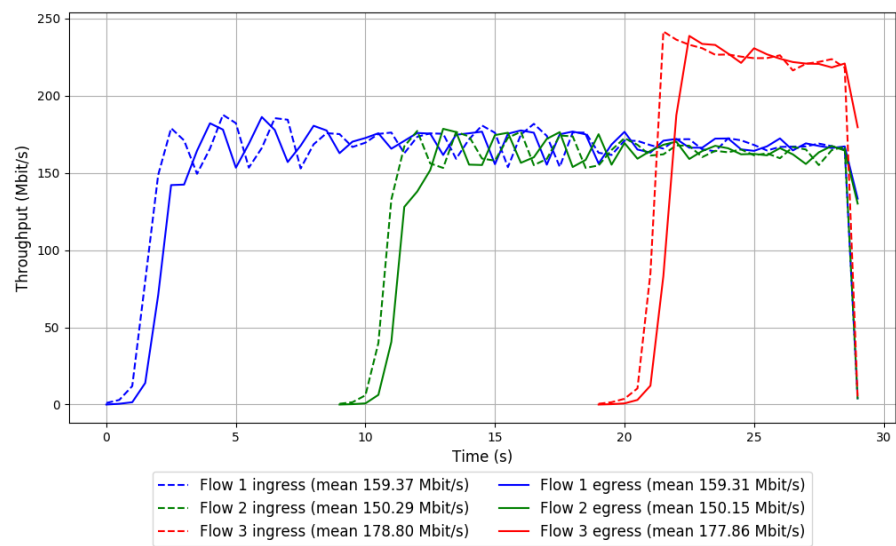


```
Run 1: Statistics of Indigo

Start at: 2018-11-15 06:09:04
End at: 2018-11-15 06:09:34
Local clock offset: 1.195 ms
Remote clock offset: 0.116 ms

# Below is generated by plot.py at 2018-11-15 09:22:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 320.37 Mbit/s
95th percentile per-packet one-way delay: 112.023 ms
Loss rate: 1.29%
-- Flow 1:
Average throughput: 159.31 Mbit/s
95th percentile per-packet one-way delay: 111.877 ms
Loss rate: 0.80%
-- Flow 2:
Average throughput: 150.15 Mbit/s
95th percentile per-packet one-way delay: 111.814 ms
Loss rate: 1.21%
-- Flow 3:
Average throughput: 177.86 Mbit/s
95th percentile per-packet one-way delay: 113.022 ms
Loss rate: 2.76%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-11-15 06:41:27

End at: 2018-11-15 06:41:57

Local clock offset: -1.434 ms

Remote clock offset: 0.028 ms

# Below is generated by plot.py at 2018-11-15 09:22:15

# Datalink statistics

-- Total of 3 flows:

Average throughput: 335.02 Mbit/s

95th percentile per-packet one-way delay: 110.140 ms

Loss rate: 1.15%

-- Flow 1:

Average throughput: 156.46 Mbit/s

95th percentile per-packet one-way delay: 109.344 ms

Loss rate: 0.78%

-- Flow 2:

Average throughput: 207.02 Mbit/s

95th percentile per-packet one-way delay: 110.857 ms

Loss rate: 1.07%

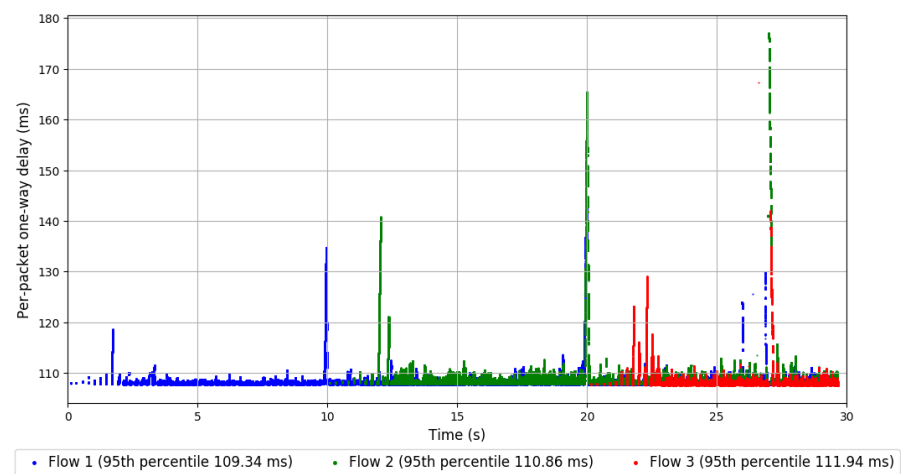
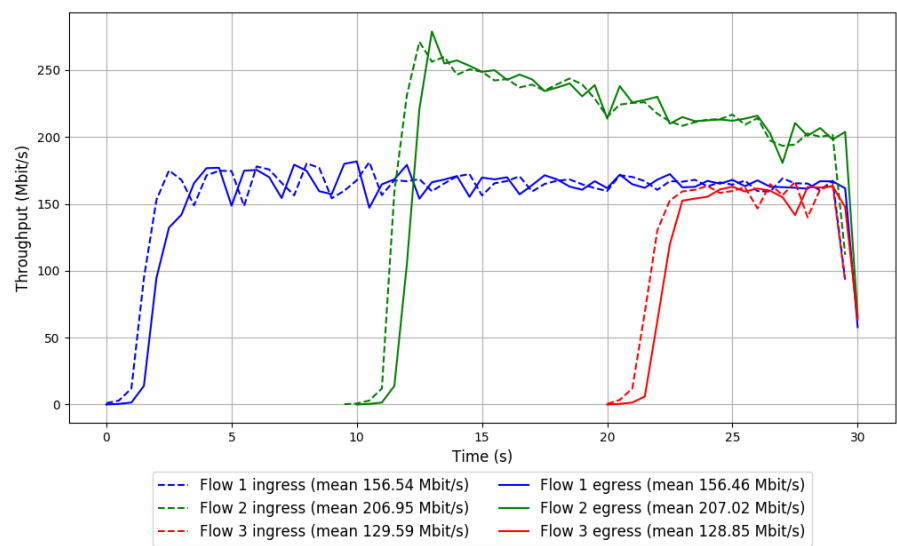
-- Flow 3:

Average throughput: 128.85 Mbit/s

95th percentile per-packet one-way delay: 111.942 ms

Loss rate: 2.80%

Run 2: Report of Indigo — Data Link

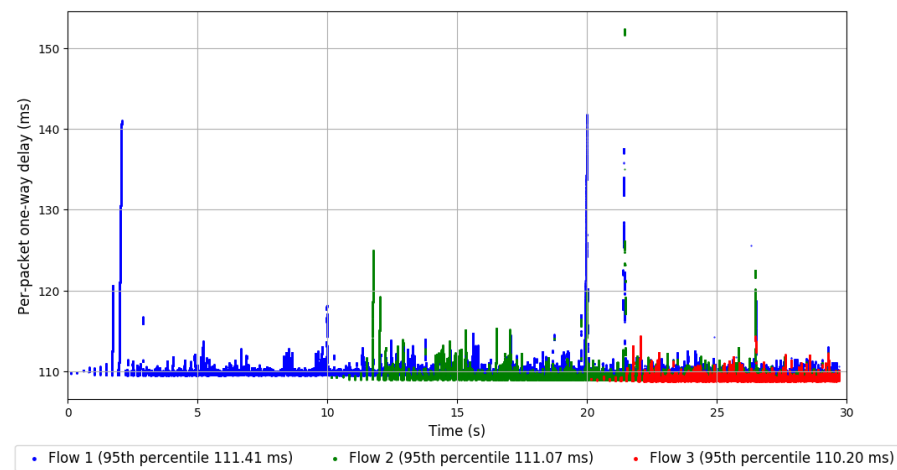
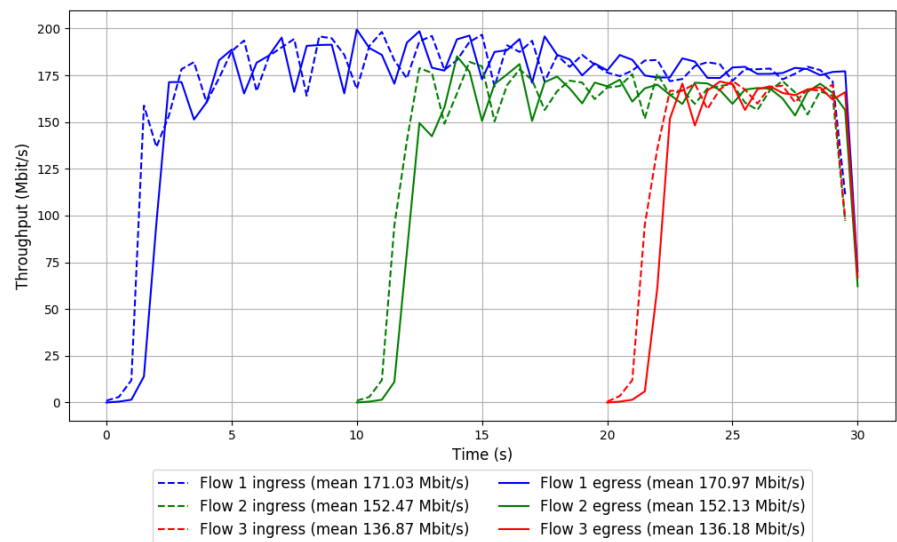


Run 3: Statistics of Indigo

Start at: 2018-11-15 07:13:49  
End at: 2018-11-15 07:14:19  
Local clock offset: -0.053 ms  
Remote clock offset: -0.433 ms

# Below is generated by plot.py at 2018-11-15 09:22:15  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 315.56 Mbit/s  
95th percentile per-packet one-way delay: 111.182 ms  
Loss rate: 1.18%  
-- Flow 1:  
Average throughput: 170.97 Mbit/s  
95th percentile per-packet one-way delay: 111.410 ms  
Loss rate: 0.76%  
-- Flow 2:  
Average throughput: 152.13 Mbit/s  
95th percentile per-packet one-way delay: 111.070 ms  
Loss rate: 1.20%  
-- Flow 3:  
Average throughput: 136.18 Mbit/s  
95th percentile per-packet one-way delay: 110.203 ms  
Loss rate: 2.72%

Run 3: Report of Indigo — Data Link

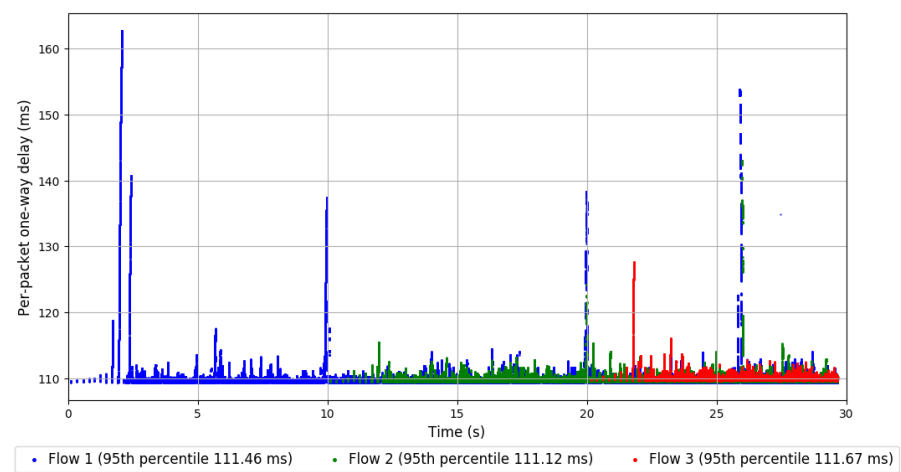
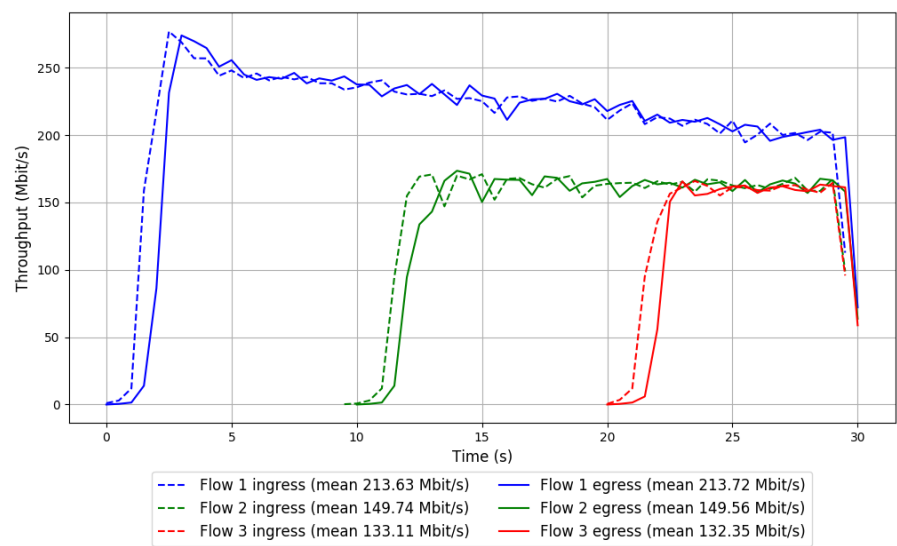


Run 4: Statistics of Indigo

Start at: 2018-11-15 07:45:16  
End at: 2018-11-15 07:45:46  
Local clock offset: -0.09 ms  
Remote clock offset: -0.348 ms

```
# Below is generated by plot.py at 2018-11-15 09:31:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 355.29 Mbit/s
95th percentile per-packet one-way delay: 111.379 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 213.72 Mbit/s
95th percentile per-packet one-way delay: 111.463 ms
Loss rate: 0.69%
-- Flow 2:
Average throughput: 149.56 Mbit/s
95th percentile per-packet one-way delay: 111.124 ms
Loss rate: 1.22%
-- Flow 3:
Average throughput: 132.35 Mbit/s
95th percentile per-packet one-way delay: 111.674 ms
Loss rate: 2.77%
```

Run 4: Report of Indigo — Data Link



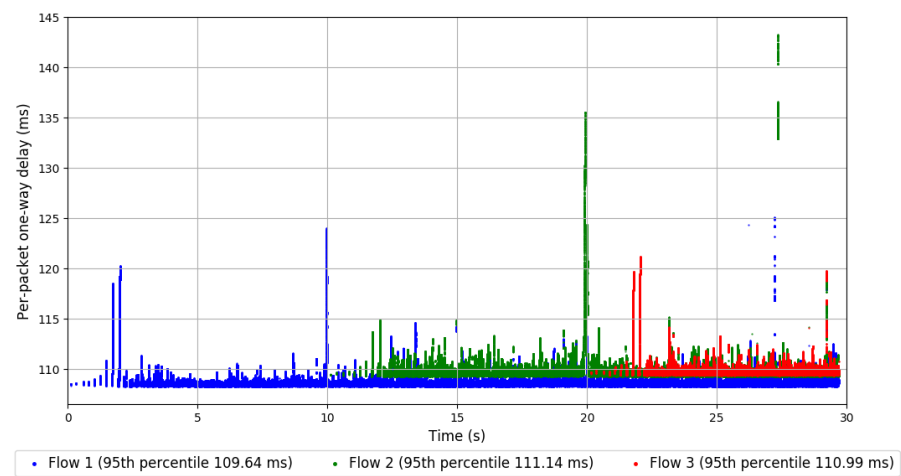
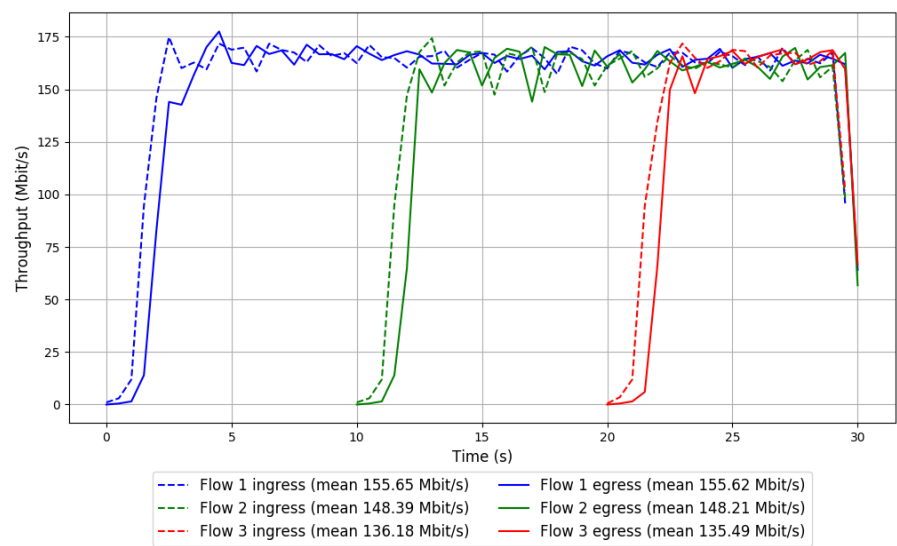


Run 5: Statistics of Indigo

Start at: 2018-11-15 08:16:57  
End at: 2018-11-15 08:17:27  
Local clock offset: -0.483 ms  
Remote clock offset: -0.347 ms

# Below is generated by plot.py at 2018-11-15 09:31:43  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 297.42 Mbit/s  
95th percentile per-packet one-way delay: 110.643 ms  
Loss rate: 1.20%  
-- Flow 1:  
Average throughput: 155.62 Mbit/s  
95th percentile per-packet one-way delay: 109.636 ms  
Loss rate: 0.75%  
-- Flow 2:  
Average throughput: 148.21 Mbit/s  
95th percentile per-packet one-way delay: 111.145 ms  
Loss rate: 1.22%  
-- Flow 3:  
Average throughput: 135.49 Mbit/s  
95th percentile per-packet one-way delay: 110.992 ms  
Loss rate: 2.73%

Run 5: Report of Indigo — Data Link



Run 1: Statistics of Indigo-96d2da3

Start at: 2018-11-15 06:15:43

End at: 2018-11-15 06:16:13

Local clock offset: -1.182 ms

Remote clock offset: 0.112 ms

# Below is generated by plot.py at 2018-11-15 09:31:43

# Datalink statistics

-- Total of 3 flows:

Average throughput: 491.45 Mbit/s

95th percentile per-packet one-way delay: 159.516 ms

Loss rate: 1.10%

-- Flow 1:

Average throughput: 274.28 Mbit/s

95th percentile per-packet one-way delay: 160.308 ms

Loss rate: 0.45%

-- Flow 2:

Average throughput: 226.71 Mbit/s

95th percentile per-packet one-way delay: 162.719 ms

Loss rate: 0.66%

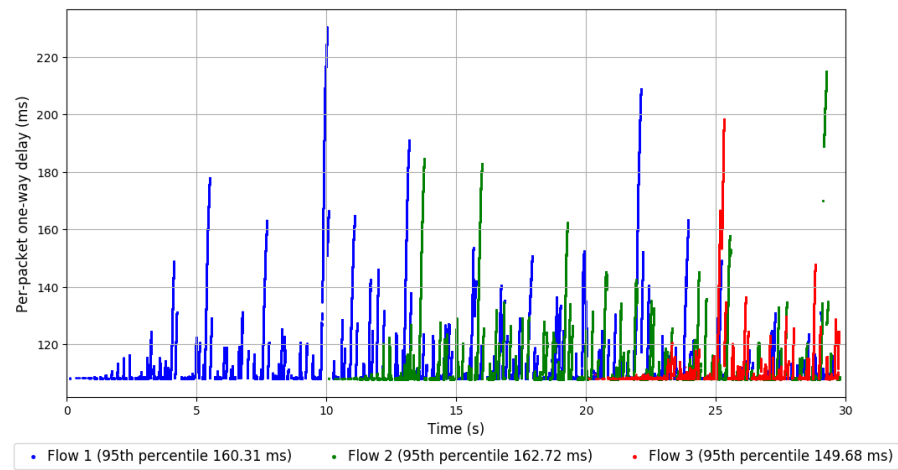
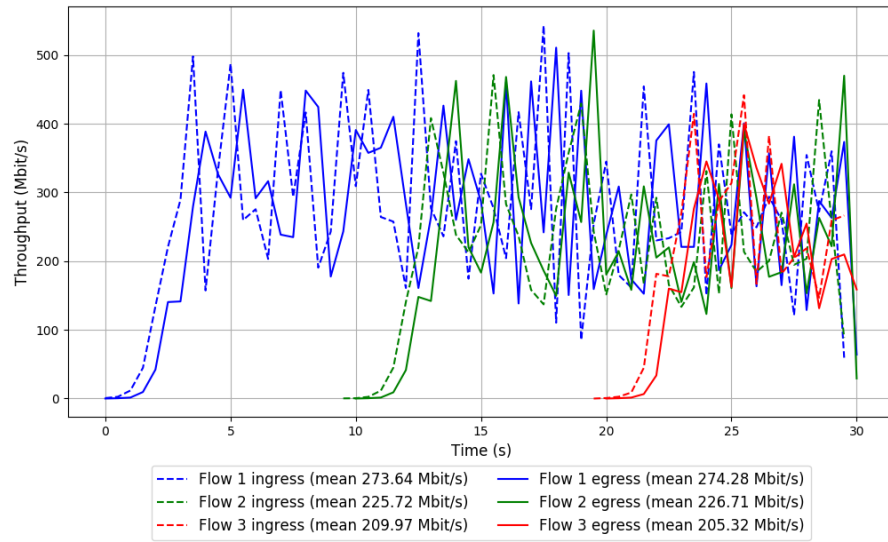
-- Flow 3:

Average throughput: 205.32 Mbit/s

95th percentile per-packet one-way delay: 149.681 ms

Loss rate: 4.63%

# Run 1: Report of Indigo-96d2da3 — Data Link



Run 2: Statistics of Indigo-96d2da3

Start at: 2018-11-15 06:48:04

End at: 2018-11-15 06:48:34

Local clock offset: -0.702 ms

Remote clock offset: -0.05 ms

# Below is generated by plot.py at 2018-11-15 09:31:43

# Datalink statistics

-- Total of 3 flows:

Average throughput: 485.40 Mbit/s

95th percentile per-packet one-way delay: 153.158 ms

Loss rate: 1.47%

-- Flow 1:

Average throughput: 259.99 Mbit/s

95th percentile per-packet one-way delay: 159.805 ms

Loss rate: 0.99%

-- Flow 2:

Average throughput: 247.19 Mbit/s

95th percentile per-packet one-way delay: 148.702 ms

Loss rate: 2.02%

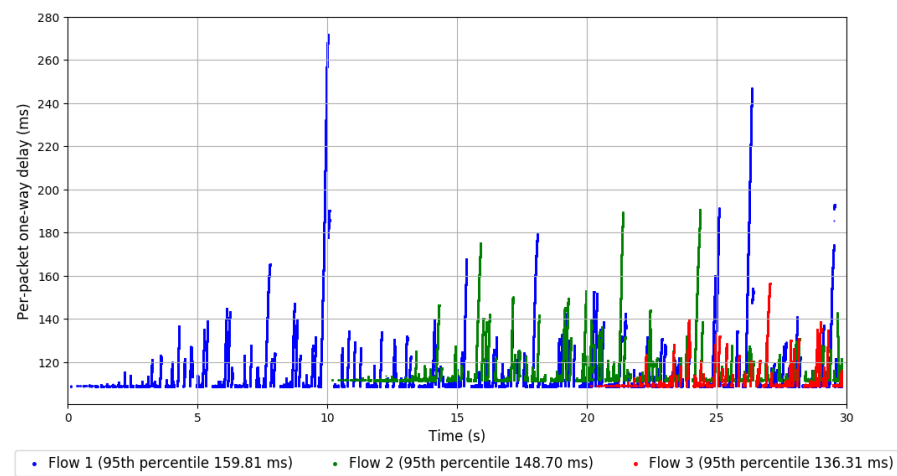
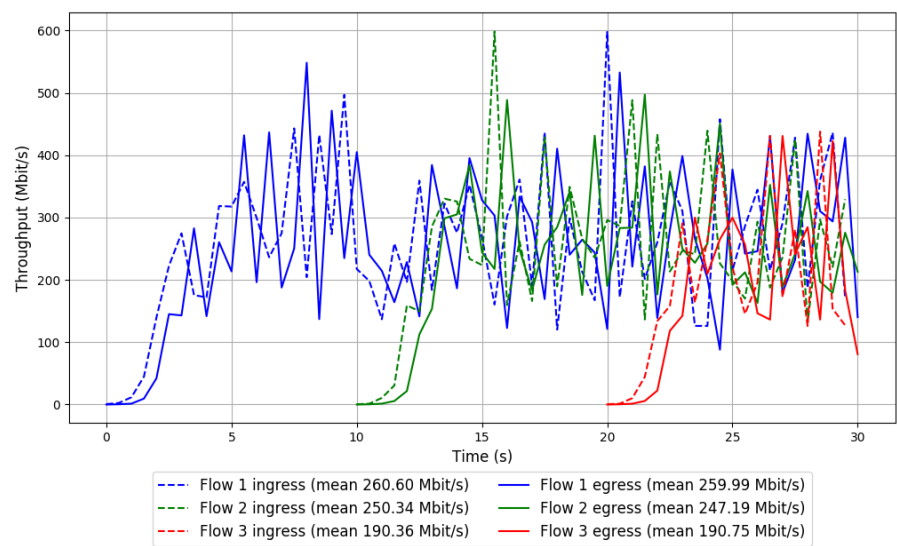
-- Flow 3:

Average throughput: 190.75 Mbit/s

95th percentile per-packet one-way delay: 136.312 ms

Loss rate: 2.02%

Run 2: Report of Indigo-96d2da3 — Data Link



Run 3: Statistics of Indigo-96d2da3

Start at: 2018-11-15 07:20:17

End at: 2018-11-15 07:20:47

Local clock offset: 1.146 ms

Remote clock offset: 0.063 ms

# Below is generated by plot.py at 2018-11-15 09:31:45

# Datalink statistics

-- Total of 3 flows:

Average throughput: 497.78 Mbit/s

95th percentile per-packet one-way delay: 154.675 ms

Loss rate: 1.92%

-- Flow 1:

Average throughput: 271.28 Mbit/s

95th percentile per-packet one-way delay: 158.478 ms

Loss rate: 2.36%

-- Flow 2:

Average throughput: 239.02 Mbit/s

95th percentile per-packet one-way delay: 150.497 ms

Loss rate: 1.00%

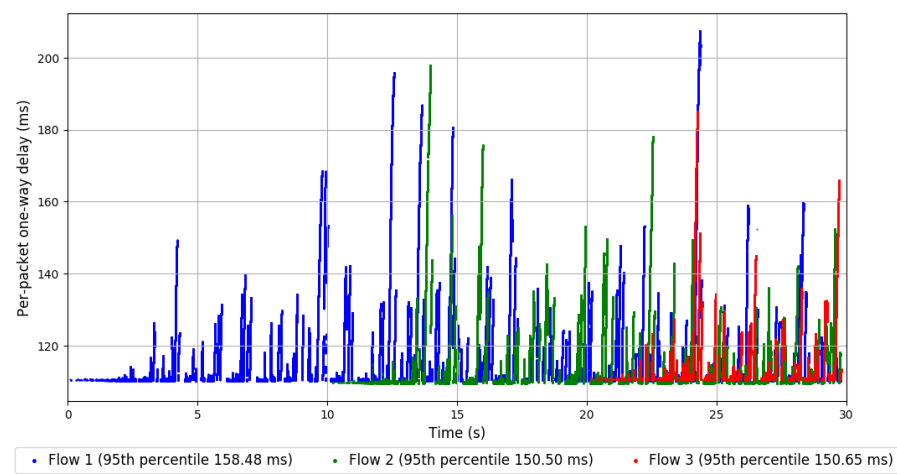
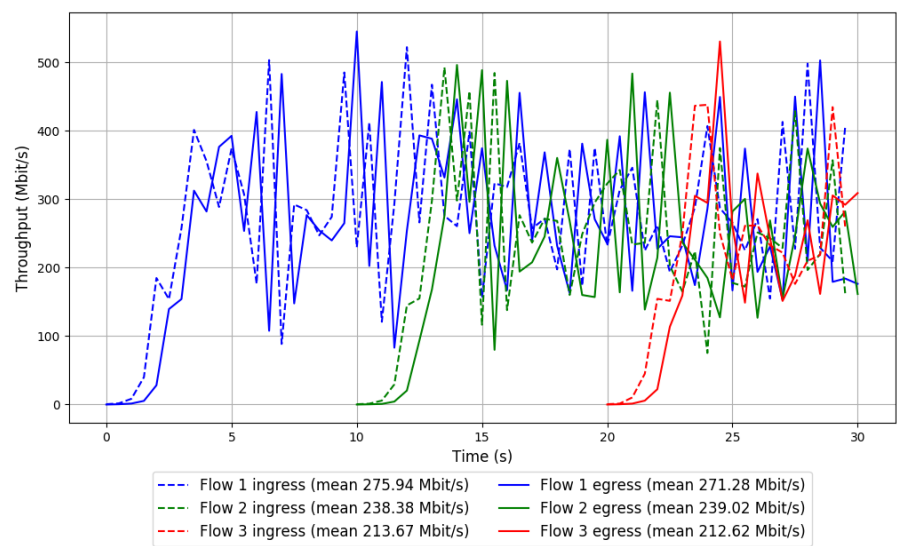
-- Flow 3:

Average throughput: 212.62 Mbit/s

95th percentile per-packet one-way delay: 150.654 ms

Loss rate: 2.29%

Run 3: Report of Indigo-96d2da3 — Data Link



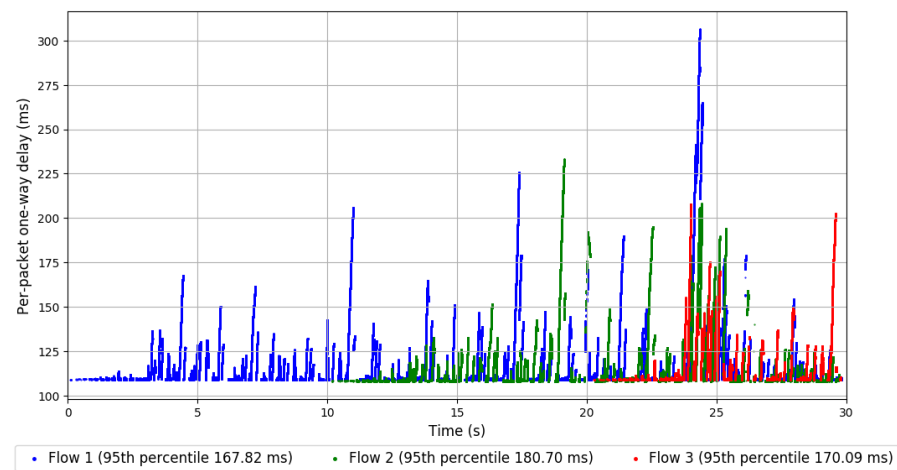
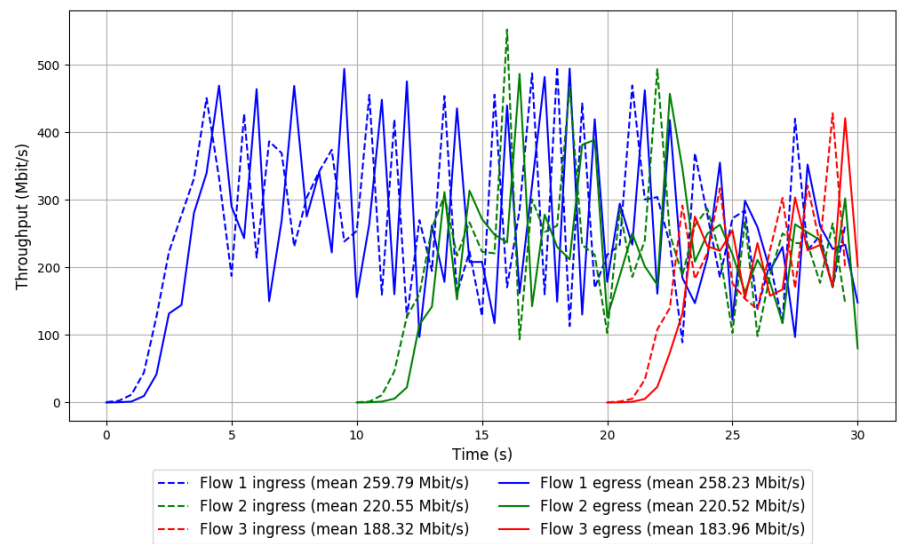


Run 4: Statistics of Indigo-96d2da3

Start at: 2018-11-15 07:51:59  
End at: 2018-11-15 07:52:29  
Local clock offset: -0.94 ms  
Remote clock offset: -0.347 ms

# Below is generated by plot.py at 2018-11-15 09:31:45  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 462.14 Mbit/s  
95th percentile per-packet one-way delay: 173.337 ms  
Loss rate: 1.65%  
-- Flow 1:  
Average throughput: 258.23 Mbit/s  
95th percentile per-packet one-way delay: 167.825 ms  
Loss rate: 1.33%  
-- Flow 2:  
Average throughput: 220.52 Mbit/s  
95th percentile per-packet one-way delay: 180.702 ms  
Loss rate: 1.13%  
-- Flow 3:  
Average throughput: 183.96 Mbit/s  
95th percentile per-packet one-way delay: 170.094 ms  
Loss rate: 4.27%

Run 4: Report of Indigo-96d2da3 — Data Link

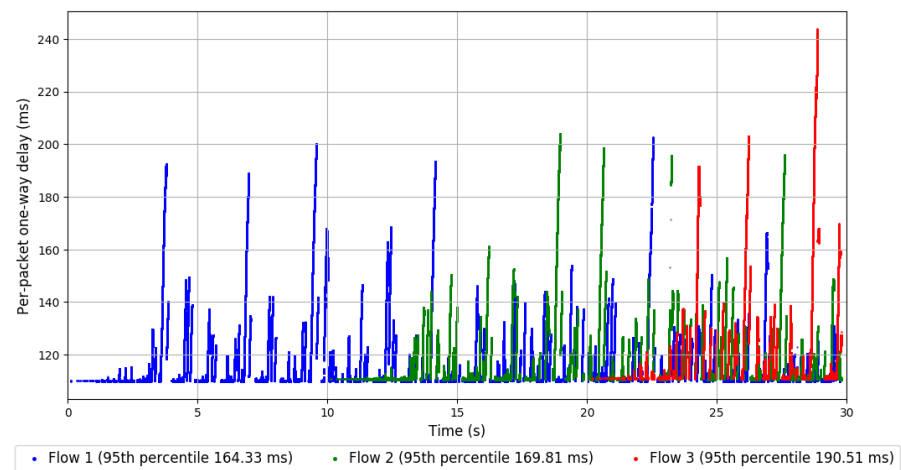
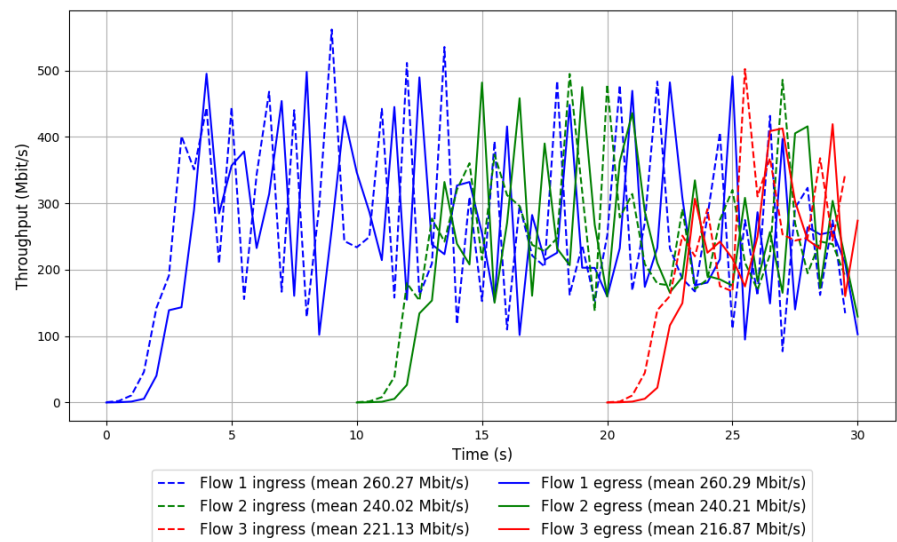


Run 5: Statistics of Indigo-96d2da3

Start at: 2018-11-15 08:23:25  
End at: 2018-11-15 08:23:55  
Local clock offset: 1.073 ms  
Remote clock offset: -0.335 ms

# Below is generated by plot.py at 2018-11-15 09:32:00  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 489.30 Mbit/s  
95th percentile per-packet one-way delay: 170.450 ms  
Loss rate: 1.39%  
-- Flow 1:  
Average throughput: 260.29 Mbit/s  
95th percentile per-packet one-way delay: 164.334 ms  
Loss rate: 0.86%  
-- Flow 2:  
Average throughput: 240.21 Mbit/s  
95th percentile per-packet one-way delay: 169.810 ms  
Loss rate: 1.02%  
-- Flow 3:  
Average throughput: 216.87 Mbit/s  
95th percentile per-packet one-way delay: 190.512 ms  
Loss rate: 4.10%

Run 5: Report of Indigo-96d2da3 — Data Link

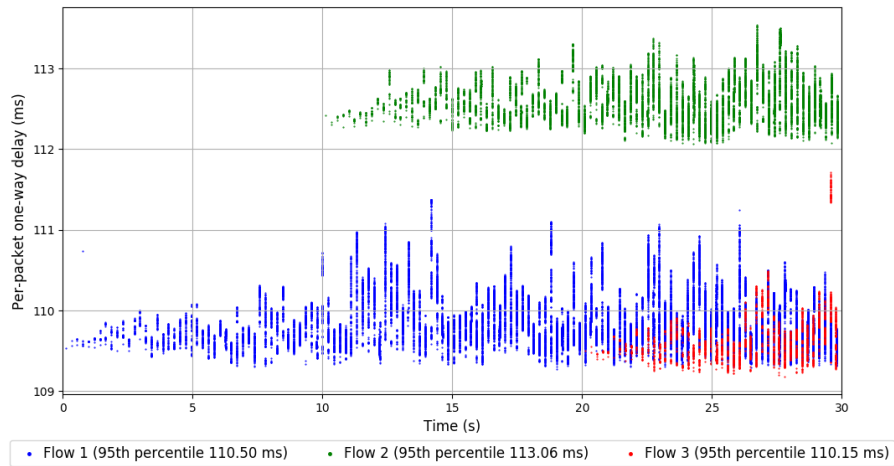
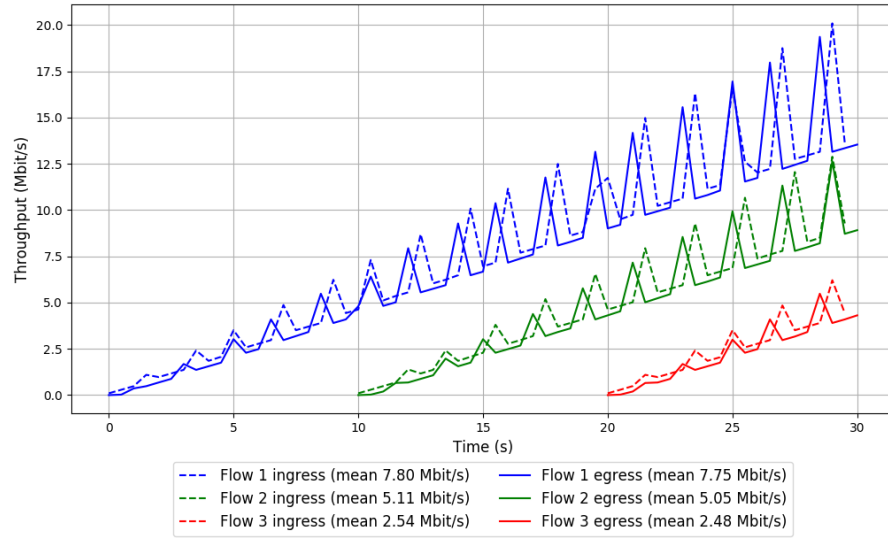


```
Run 1: Statistics of LEDBAT

Start at: 2018-11-15 06:10:58
End at: 2018-11-15 06:11:28
Local clock offset: 0.011 ms
Remote clock offset: 0.086 ms

# Below is generated by plot.py at 2018-11-15 09:32:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 11.89 Mbit/s
95th percentile per-packet one-way delay: 112.837 ms
Loss rate: 1.89%
-- Flow 1:
Average throughput: 7.75 Mbit/s
95th percentile per-packet one-way delay: 110.501 ms
Loss rate: 1.47%
-- Flow 2:
Average throughput: 5.05 Mbit/s
95th percentile per-packet one-way delay: 113.060 ms
Loss rate: 2.22%
-- Flow 3:
Average throughput: 2.48 Mbit/s
95th percentile per-packet one-way delay: 110.152 ms
Loss rate: 4.46%
```

## Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2018-11-15 06:43:22

End at: 2018-11-15 06:43:52

Local clock offset: -0.255 ms

Remote clock offset: 0.013 ms

# Below is generated by plot.py at 2018-11-15 09:32:00

# Datalink statistics

-- Total of 3 flows:

Average throughput: 12.09 Mbit/s

95th percentile per-packet one-way delay: 109.906 ms

Loss rate: 1.88%

-- Flow 1:

Average throughput: 7.86 Mbit/s

95th percentile per-packet one-way delay: 110.026 ms

Loss rate: 1.46%

-- Flow 2:

Average throughput: 5.17 Mbit/s

95th percentile per-packet one-way delay: 109.330 ms

Loss rate: 2.20%

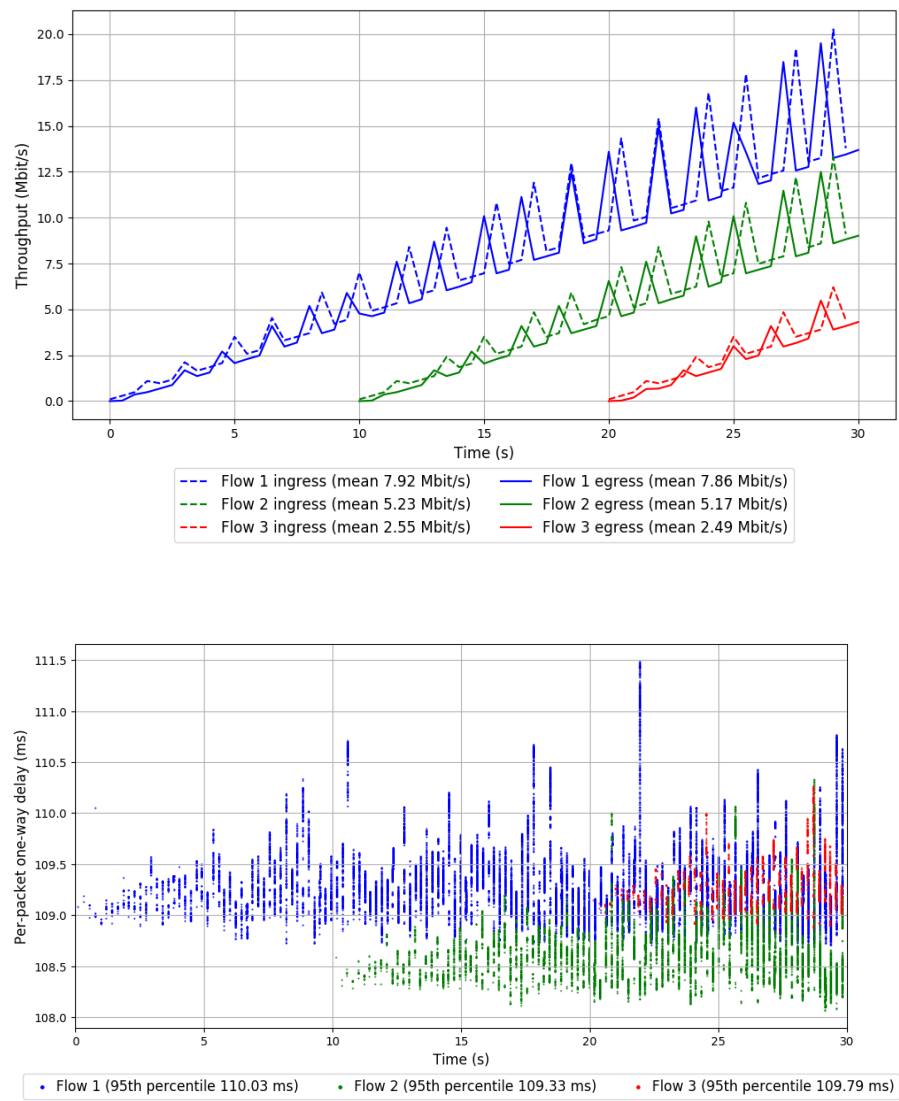
-- Flow 3:

Average throughput: 2.49 Mbit/s

95th percentile per-packet one-way delay: 109.790 ms

Loss rate: 4.46%

Run 2: Report of LEDBAT — Data Link





Run 3: Statistics of LEDBAT

Start at: 2018-11-15 07:15:40

End at: 2018-11-15 07:16:10

Local clock offset: 0.018 ms

Remote clock offset: 0.025 ms

# Below is generated by plot.py at 2018-11-15 09:32:00

# Datalink statistics

-- Total of 3 flows:

Average throughput: 11.98 Mbit/s

95th percentile per-packet one-way delay: 110.350 ms

Loss rate: 1.89%

-- Flow 1:

Average throughput: 7.76 Mbit/s

95th percentile per-packet one-way delay: 110.461 ms

Loss rate: 1.47%

-- Flow 2:

Average throughput: 5.18 Mbit/s

95th percentile per-packet one-way delay: 110.051 ms

Loss rate: 2.20%

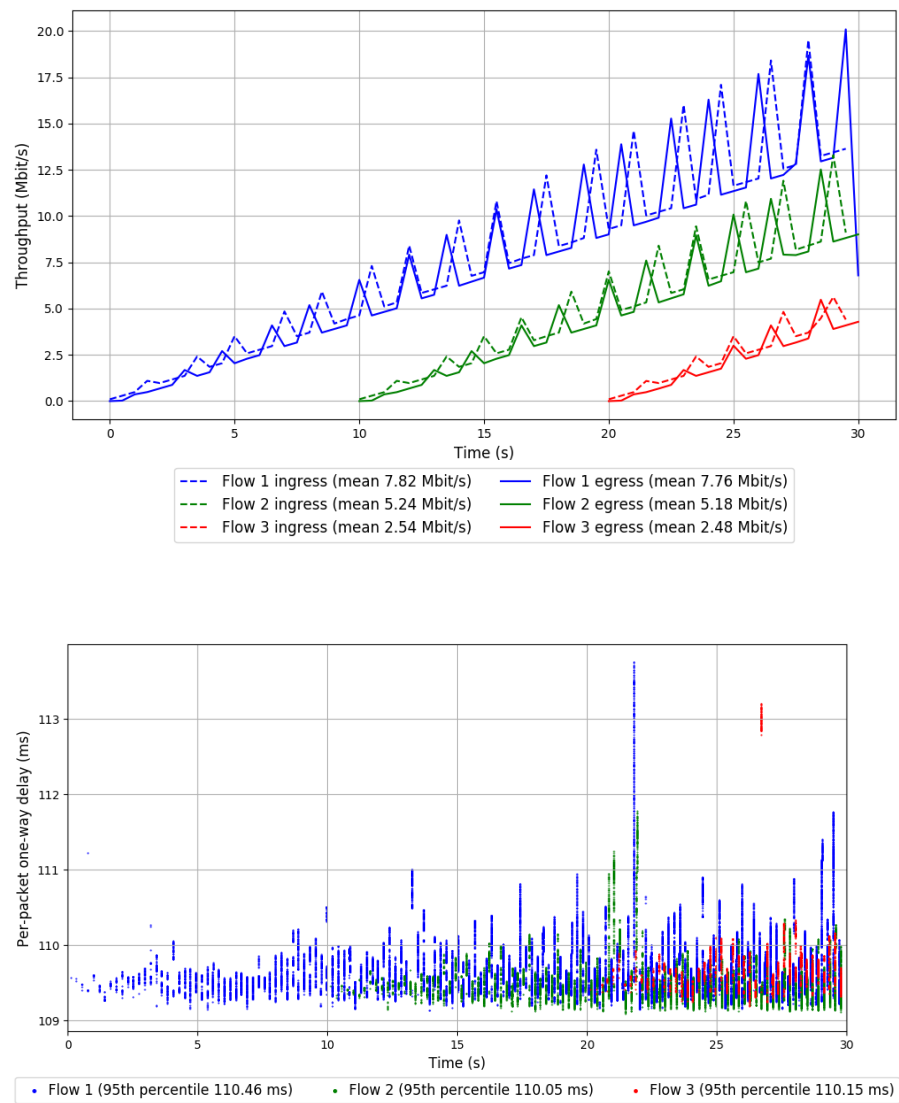
-- Flow 3:

Average throughput: 2.48 Mbit/s

95th percentile per-packet one-way delay: 110.150 ms

Loss rate: 4.47%

Run 3: Report of LEDBAT — Data Link

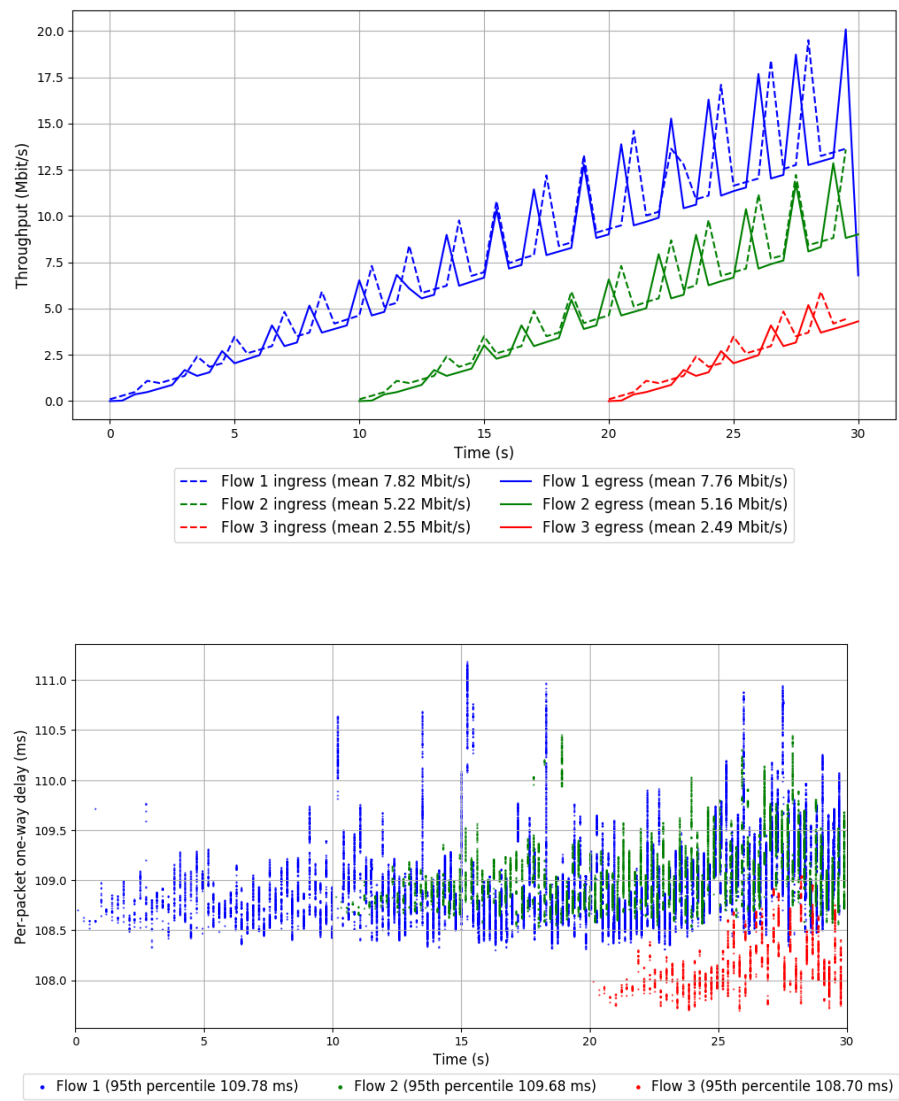


Run 4: Statistics of LEDBAT

Start at: 2018-11-15 07:47:13  
End at: 2018-11-15 07:47:43  
Local clock offset: -0.895 ms  
Remote clock offset: -0.009 ms

# Below is generated by plot.py at 2018-11-15 09:32:00  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 11.95 Mbit/s  
95th percentile per-packet one-way delay: 109.722 ms  
Loss rate: 1.89%  
-- Flow 1:  
Average throughput: 7.76 Mbit/s  
95th percentile per-packet one-way delay: 109.781 ms  
Loss rate: 1.47%  
-- Flow 2:  
Average throughput: 5.16 Mbit/s  
95th percentile per-packet one-way delay: 109.678 ms  
Loss rate: 2.20%  
-- Flow 3:  
Average throughput: 2.49 Mbit/s  
95th percentile per-packet one-way delay: 108.696 ms  
Loss rate: 4.46%

Run 4: Report of LEDBAT — Data Link



Run 5: Statistics of LEDBAT

Start at: 2018-11-15 08:18:48

End at: 2018-11-15 08:19:18

Local clock offset: 0.018 ms

Remote clock offset: 0.384 ms

# Below is generated by plot.py at 2018-11-15 09:32:00

# Datalink statistics

-- Total of 3 flows:

Average throughput: 11.97 Mbit/s

95th percentile per-packet one-way delay: 110.035 ms

Loss rate: 1.89%

-- Flow 1:

Average throughput: 7.77 Mbit/s

95th percentile per-packet one-way delay: 110.171 ms

Loss rate: 1.47%

-- Flow 2:

Average throughput: 5.16 Mbit/s

95th percentile per-packet one-way delay: 109.895 ms

Loss rate: 2.20%

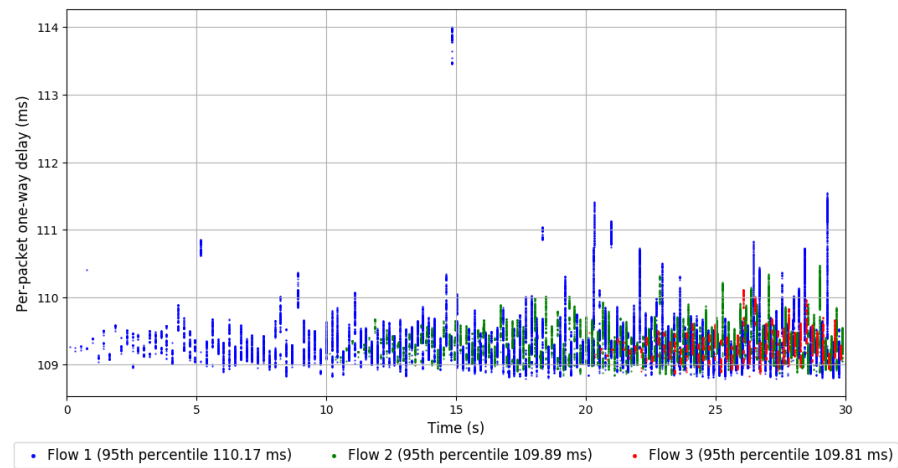
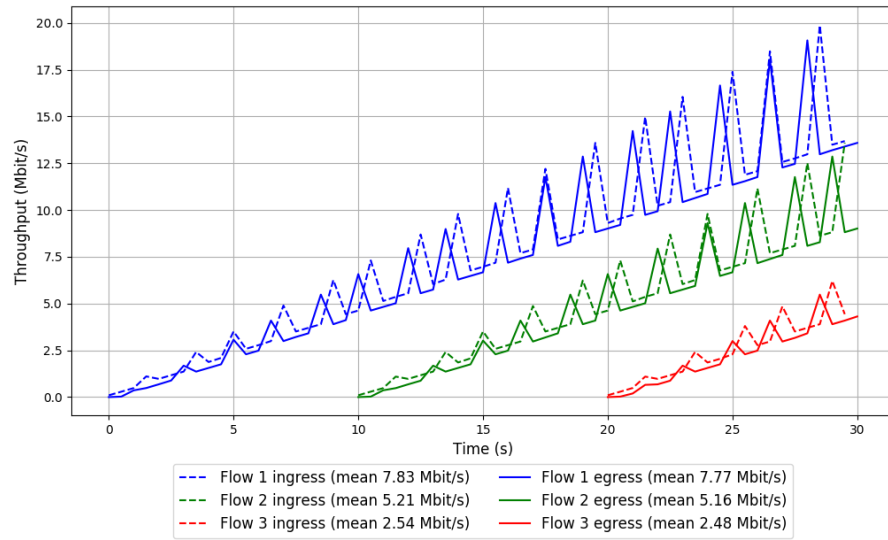
-- Flow 3:

Average throughput: 2.48 Mbit/s

95th percentile per-packet one-way delay: 109.807 ms

Loss rate: 4.46%

## Run 5: Report of LEDBAT — Data Link



Run 1: Statistics of Indigo-Muses

Start at: 2018-11-15 05:48:54

End at: 2018-11-15 05:49:24

Local clock offset: 0.071 ms

Remote clock offset: 0.095 ms

# Below is generated by plot.py at 2018-11-15 09:42:32

# Datalink statistics

-- Total of 3 flows:

Average throughput: 972.15 Mbit/s

95th percentile per-packet one-way delay: 168.361 ms

Loss rate: 1.31%

-- Flow 1:

Average throughput: 532.24 Mbit/s

95th percentile per-packet one-way delay: 168.067 ms

Loss rate: 0.80%

-- Flow 2:

Average throughput: 479.96 Mbit/s

95th percentile per-packet one-way delay: 173.026 ms

Loss rate: 1.27%

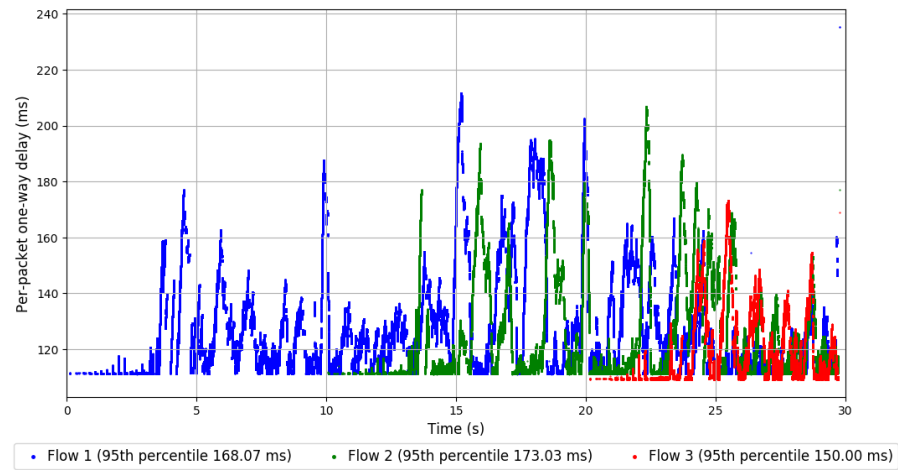
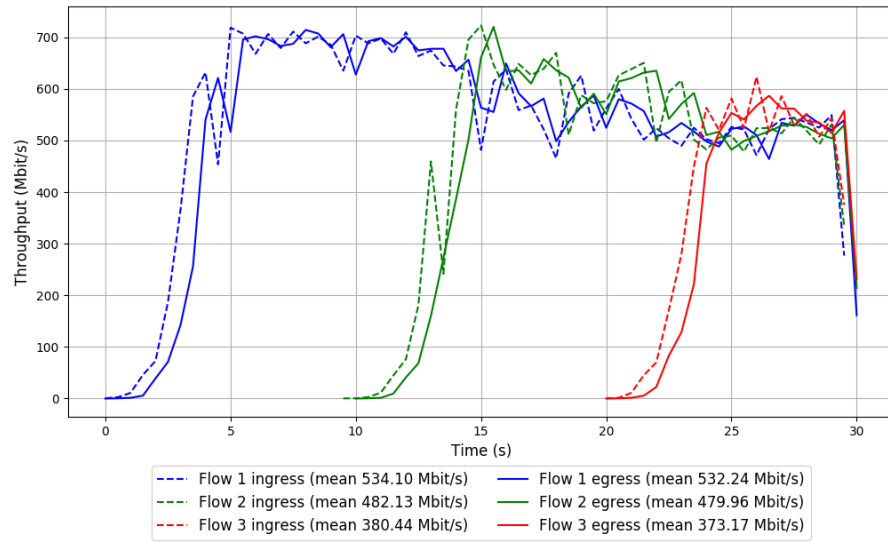
-- Flow 3:

Average throughput: 373.17 Mbit/s

95th percentile per-packet one-way delay: 149.996 ms

Loss rate: 3.62%

# Run 1: Report of Indigo-Muses — Data Link





Run 2: Statistics of Indigo-Muses

Start at: 2018-11-15 06:21:20

End at: 2018-11-15 06:21:50

Local clock offset: -0.037 ms

Remote clock offset: 0.493 ms

# Below is generated by plot.py at 2018-11-15 09:50:26

# Datalink statistics

-- Total of 3 flows:

Average throughput: 947.87 Mbit/s

95th percentile per-packet one-way delay: 163.350 ms

Loss rate: 1.23%

-- Flow 1:

Average throughput: 566.76 Mbit/s

95th percentile per-packet one-way delay: 163.459 ms

Loss rate: 0.67%

-- Flow 2:

Average throughput: 422.06 Mbit/s

95th percentile per-packet one-way delay: 174.686 ms

Loss rate: 1.62%

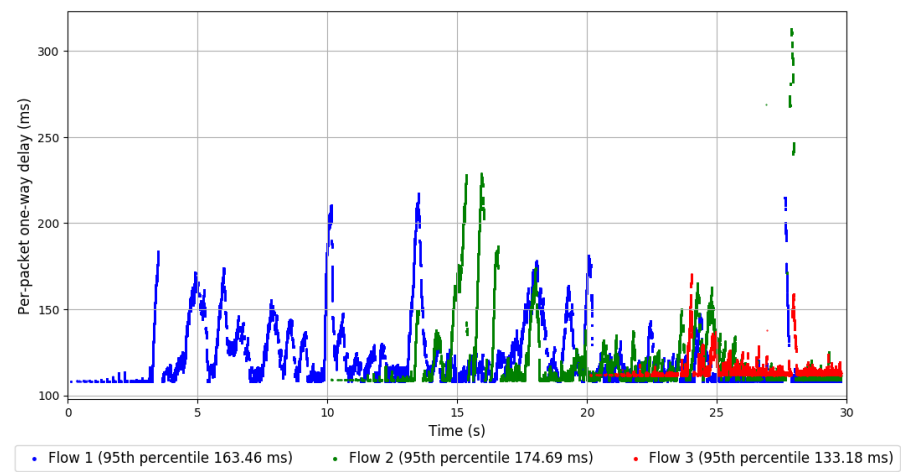
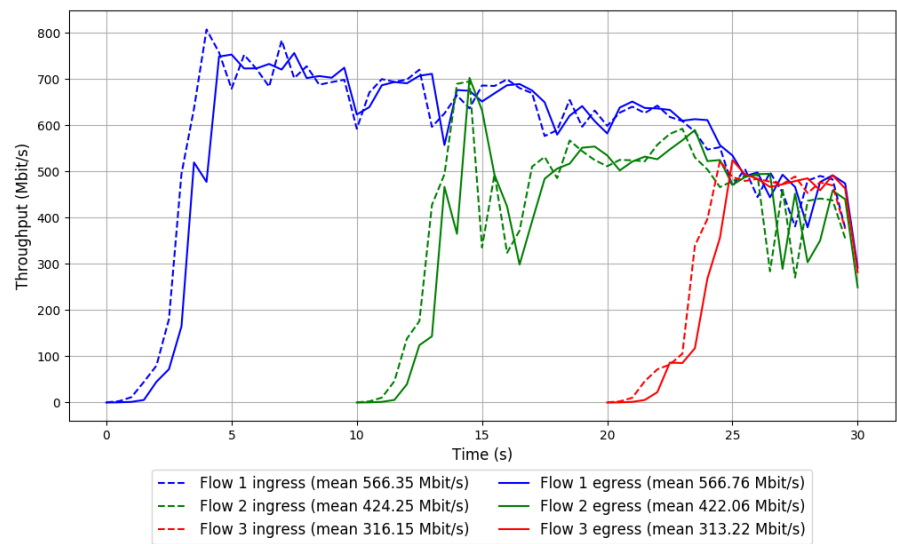
-- Flow 3:

Average throughput: 313.22 Mbit/s

95th percentile per-packet one-way delay: 133.176 ms

Loss rate: 3.20%

Run 2: Report of Indigo-Muses — Data Link

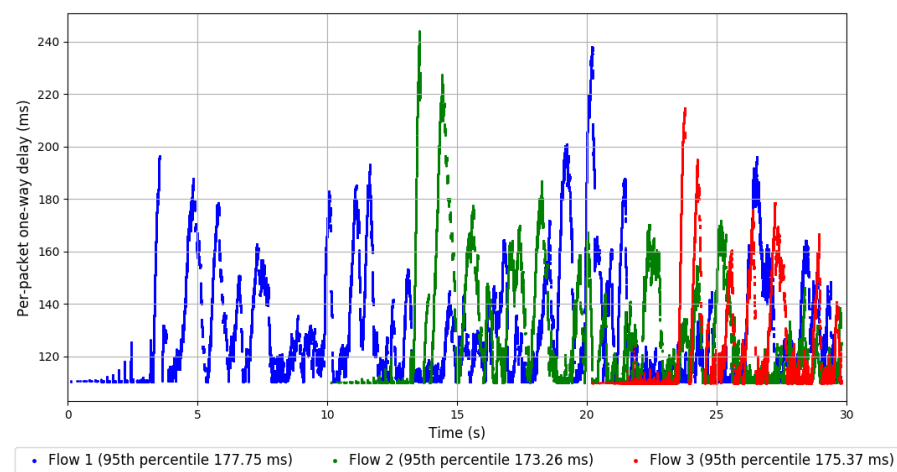
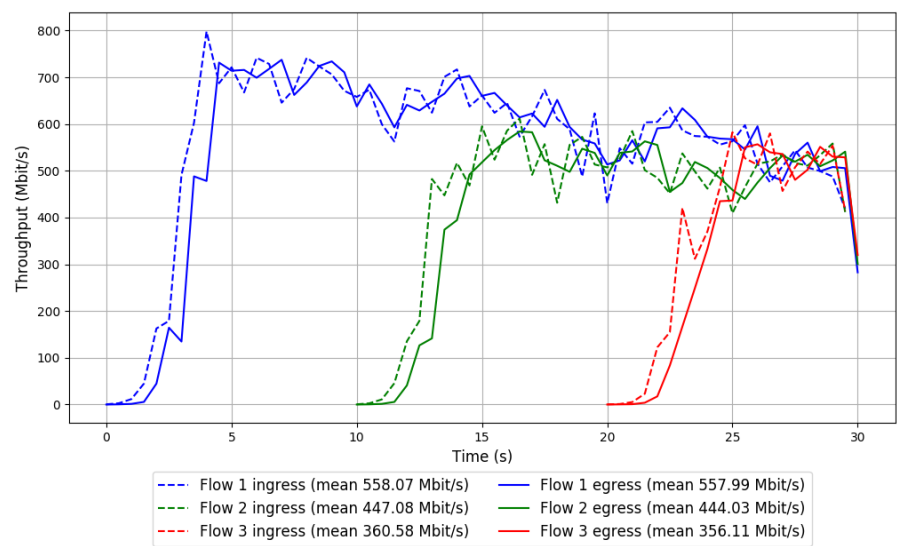


Run 3: Statistics of Indigo-Muses

Start at: 2018-11-15 06:53:33  
End at: 2018-11-15 06:54:03  
Local clock offset: 1.346 ms  
Remote clock offset: -0.021 ms

# Below is generated by plot.py at 2018-11-15 09:51:24  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 966.94 Mbit/s  
95th percentile per-packet one-way delay: 176.640 ms  
Loss rate: 1.38%  
-- Flow 1:  
Average throughput: 557.99 Mbit/s  
95th percentile per-packet one-way delay: 177.753 ms  
Loss rate: 0.75%  
-- Flow 2:  
Average throughput: 444.03 Mbit/s  
95th percentile per-packet one-way delay: 173.262 ms  
Loss rate: 1.75%  
-- Flow 3:  
Average throughput: 356.11 Mbit/s  
95th percentile per-packet one-way delay: 175.374 ms  
Loss rate: 3.45%

Run 3: Report of Indigo-Muses — Data Link



#### Run 4: Statistics of Indigo-Muses

Start at: 2018-11-15 07:25:47

End at: 2018-11-15 07:26:17

Local clock offset: -1.276 ms

Remote clock offset: 0.043 ms

# Below is generated by plot.py at 2018-11-15 09:51:46

# Datalink statistics

-- Total of 3 flows:

Average throughput: 994.11 Mbit/s

95th percentile per-packet one-way delay: 160.173 ms

Loss rate: 1.36%

-- Flow 1:

Average throughput: 546.24 Mbit/s

95th percentile per-packet one-way delay: 156.641 ms

Loss rate: 0.96%

-- Flow 2:

Average throughput: 505.41 Mbit/s

95th percentile per-packet one-way delay: 167.251 ms

Loss rate: 1.18%

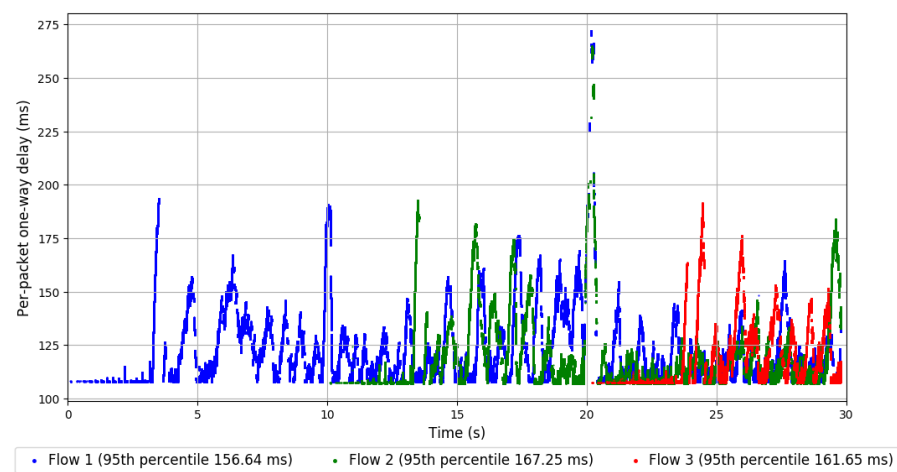
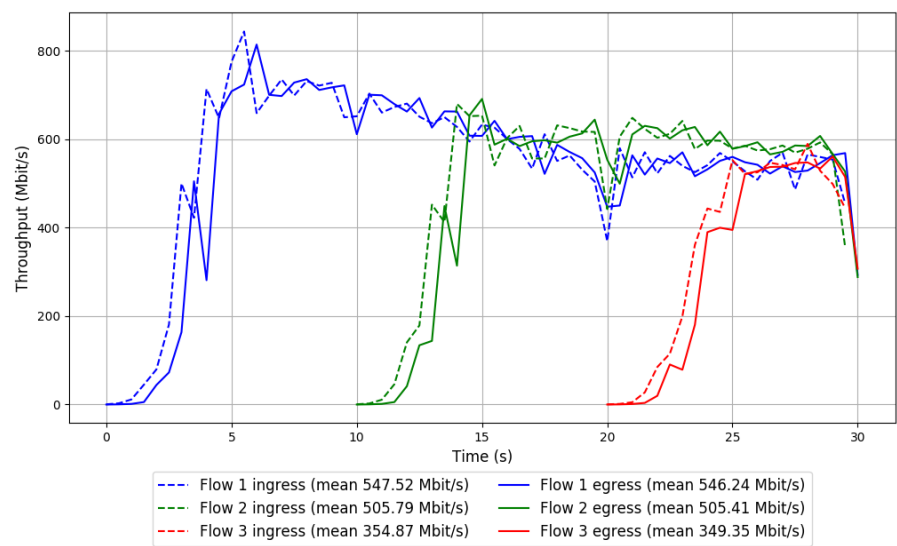
-- Flow 3:

Average throughput: 349.35 Mbit/s

95th percentile per-packet one-way delay: 161.646 ms

Loss rate: 3.77%

Run 4: Report of Indigo-Muses — Data Link



Run 5: Statistics of Indigo-Muses

Start at: 2018-11-15 07:57:26

End at: 2018-11-15 07:57:56

Local clock offset: -0.48 ms

Remote clock offset: 0.398 ms

# Below is generated by plot.py at 2018-11-15 09:51:46

# Datalink statistics

-- Total of 3 flows:

Average throughput: 948.33 Mbit/s

95th percentile per-packet one-way delay: 177.840 ms

Loss rate: 1.32%

-- Flow 1:

Average throughput: 540.73 Mbit/s

95th percentile per-packet one-way delay: 166.032 ms

Loss rate: 0.82%

-- Flow 2:

Average throughput: 439.08 Mbit/s

95th percentile per-packet one-way delay: 204.338 ms

Loss rate: 1.65%

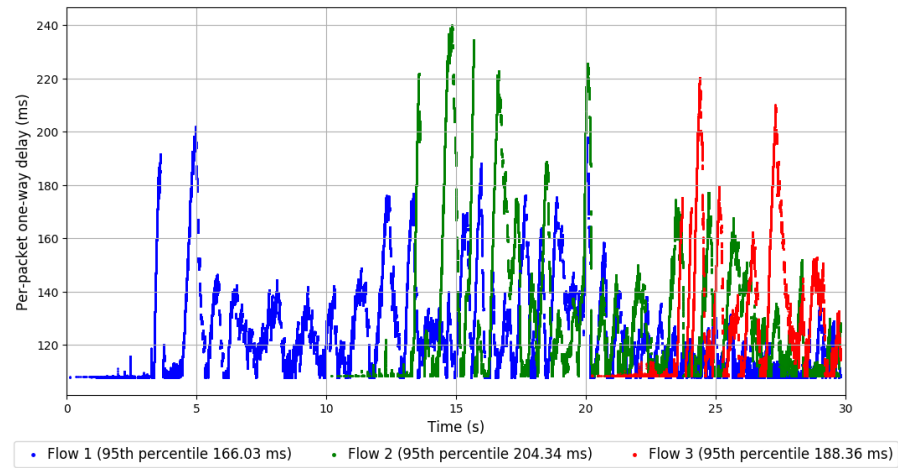
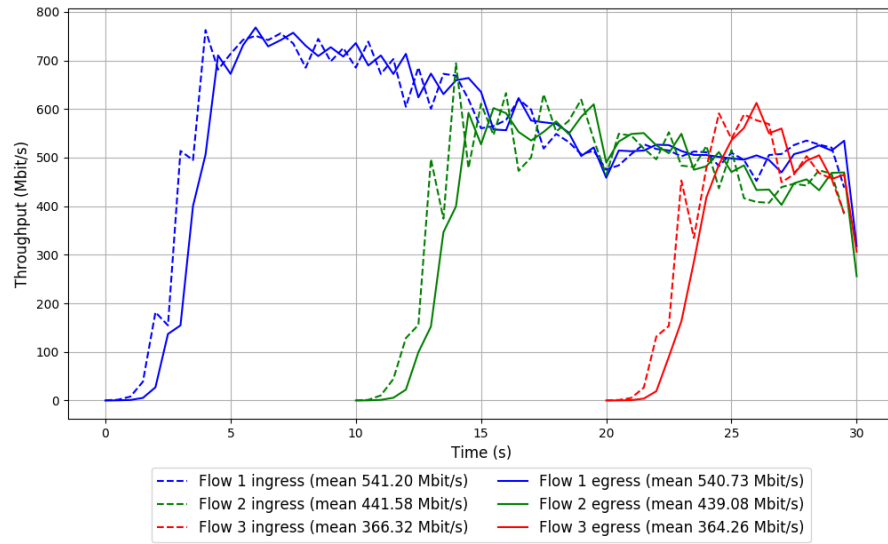
-- Flow 3:

Average throughput: 364.26 Mbit/s

95th percentile per-packet one-way delay: 188.358 ms

Loss rate: 2.77%

## Run 5: Report of Indigo-Muses — Data Link



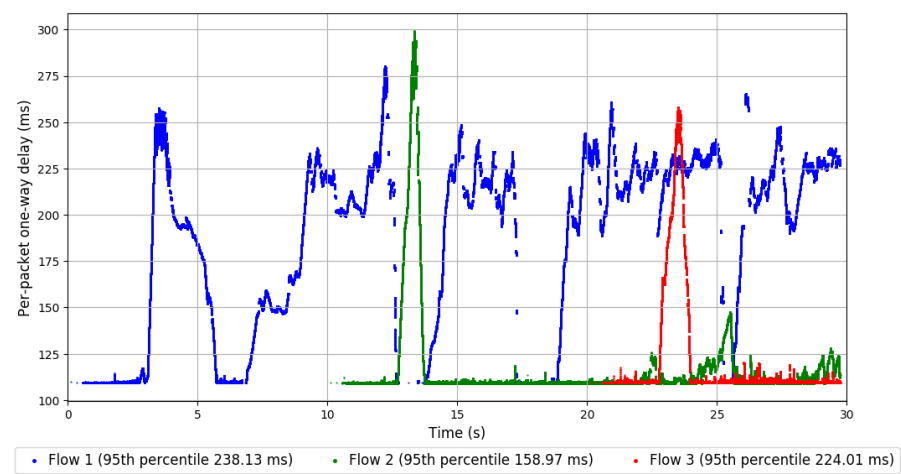
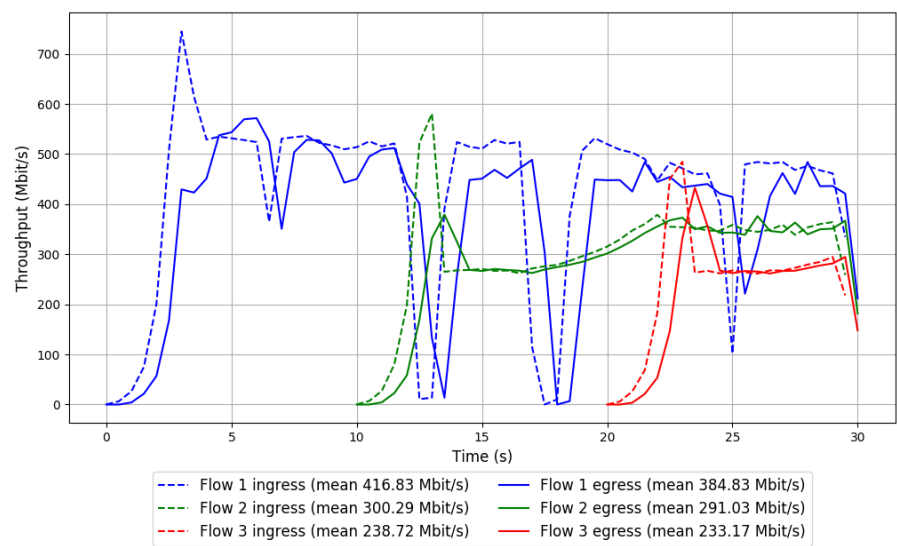


```
Run 1: Statistics of PCC-Allegro

Start at: 2018-11-15 06:03:01
End at: 2018-11-15 06:03:31
Local clock offset: -0.022 ms
Remote clock offset: 0.086 ms

# Below is generated by plot.py at 2018-11-15 09:56:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 653.19 Mbit/s
95th percentile per-packet one-way delay: 235.606 ms
Loss rate: 6.71%
-- Flow 1:
Average throughput: 384.83 Mbit/s
95th percentile per-packet one-way delay: 238.130 ms
Loss rate: 8.36%
-- Flow 2:
Average throughput: 291.03 Mbit/s
95th percentile per-packet one-way delay: 158.973 ms
Loss rate: 4.15%
-- Flow 3:
Average throughput: 233.17 Mbit/s
95th percentile per-packet one-way delay: 224.011 ms
Loss rate: 4.50%
```

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2018-11-15 06:35:37

End at: 2018-11-15 06:36:07

Local clock offset: -0.336 ms

Remote clock offset: 0.058 ms

# Below is generated by plot.py at 2018-11-15 09:56:42

# Datalink statistics

-- Total of 3 flows:

Average throughput: 651.08 Mbit/s

95th percentile per-packet one-way delay: 245.161 ms

Loss rate: 5.76%

-- Flow 1:

Average throughput: 373.84 Mbit/s

95th percentile per-packet one-way delay: 241.795 ms

Loss rate: 6.94%

-- Flow 2:

Average throughput: 298.90 Mbit/s

95th percentile per-packet one-way delay: 251.343 ms

Loss rate: 3.68%

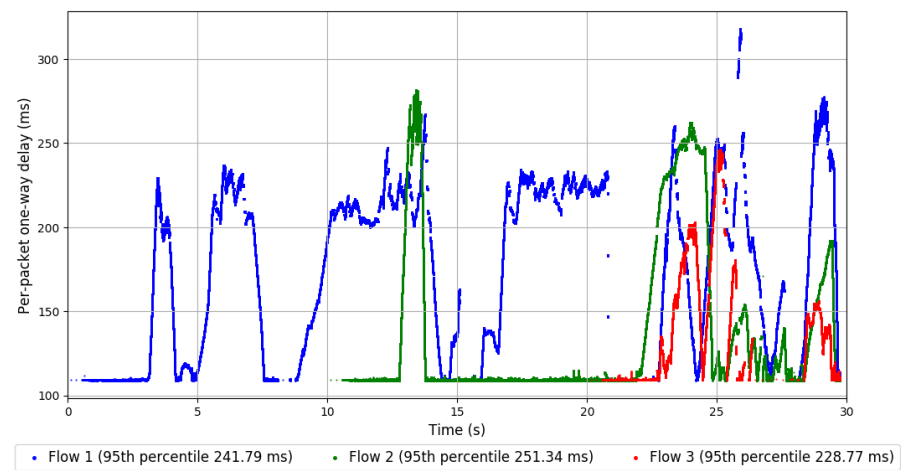
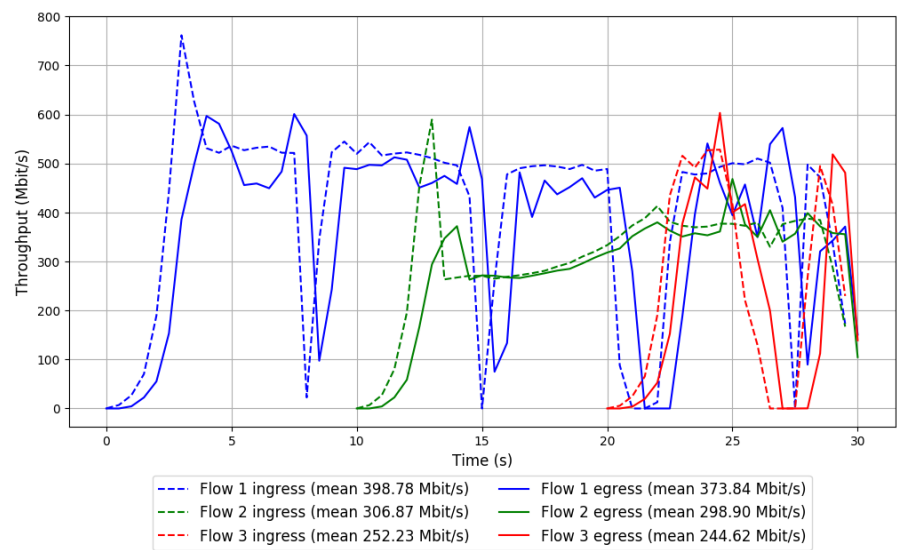
-- Flow 3:

Average throughput: 244.62 Mbit/s

95th percentile per-packet one-way delay: 228.774 ms

Loss rate: 5.19%

Run 2: Report of PCC-Allegro — Data Link

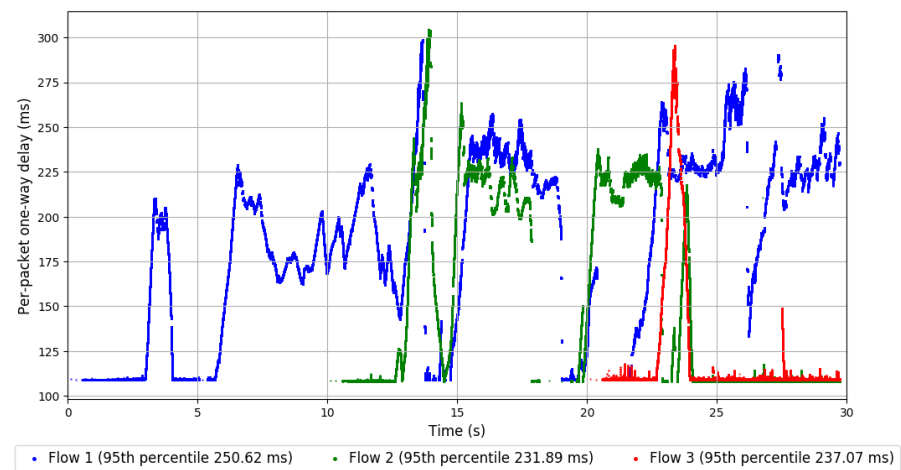
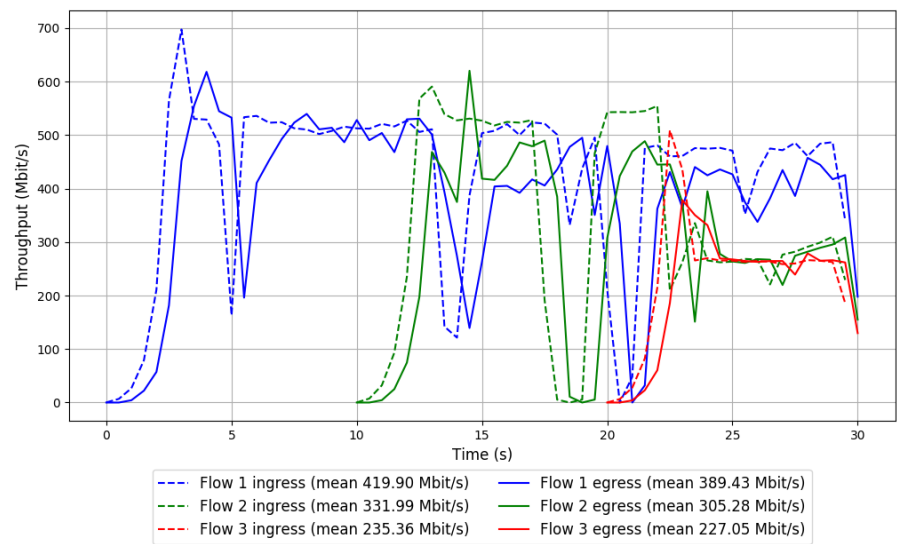


Run 3: Statistics of PCC-Allegro

Start at: 2018-11-15 07:07:46  
End at: 2018-11-15 07:08:16  
Local clock offset: -0.186 ms  
Remote clock offset: -0.015 ms

# Below is generated by plot.py at 2018-11-15 09:57:38  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 665.37 Mbit/s  
95th percentile per-packet one-way delay: 245.100 ms  
Loss rate: 8.04%  
-- Flow 1:  
Average throughput: 389.43 Mbit/s  
95th percentile per-packet one-way delay: 250.622 ms  
Loss rate: 7.94%  
-- Flow 2:  
Average throughput: 305.28 Mbit/s  
95th percentile per-packet one-way delay: 231.891 ms  
Loss rate: 9.06%  
-- Flow 3:  
Average throughput: 227.05 Mbit/s  
95th percentile per-packet one-way delay: 237.068 ms  
Loss rate: 5.69%

Run 3: Report of PCC-Allegro — Data Link



Run 4: Statistics of PCC-Allegro

Start at: 2018-11-15 07:39:40

End at: 2018-11-15 07:40:10

Local clock offset: 1.195 ms

Remote clock offset: 0.086 ms

# Below is generated by plot.py at 2018-11-15 10:10:45

# Datalink statistics

-- Total of 3 flows:

Average throughput: 640.54 Mbit/s

95th percentile per-packet one-way delay: 238.376 ms

Loss rate: 5.29%

-- Flow 1:

Average throughput: 369.17 Mbit/s

95th percentile per-packet one-way delay: 244.341 ms

Loss rate: 7.13%

-- Flow 2:

Average throughput: 295.13 Mbit/s

95th percentile per-packet one-way delay: 155.627 ms

Loss rate: 2.04%

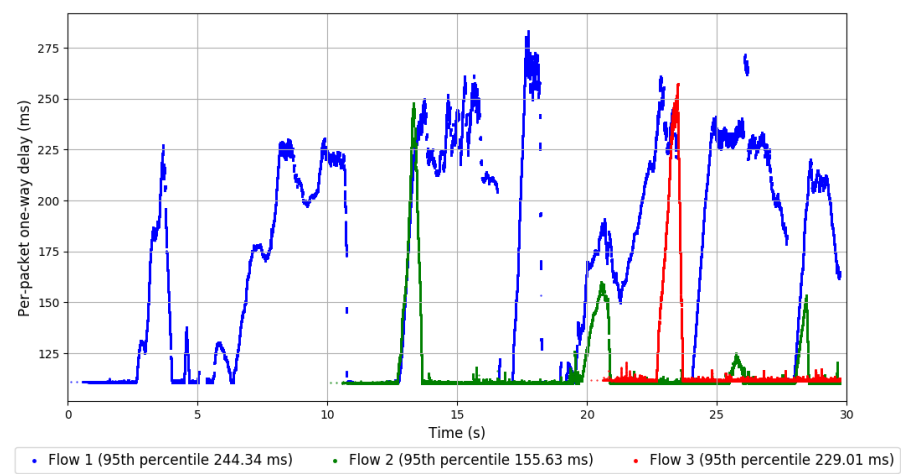
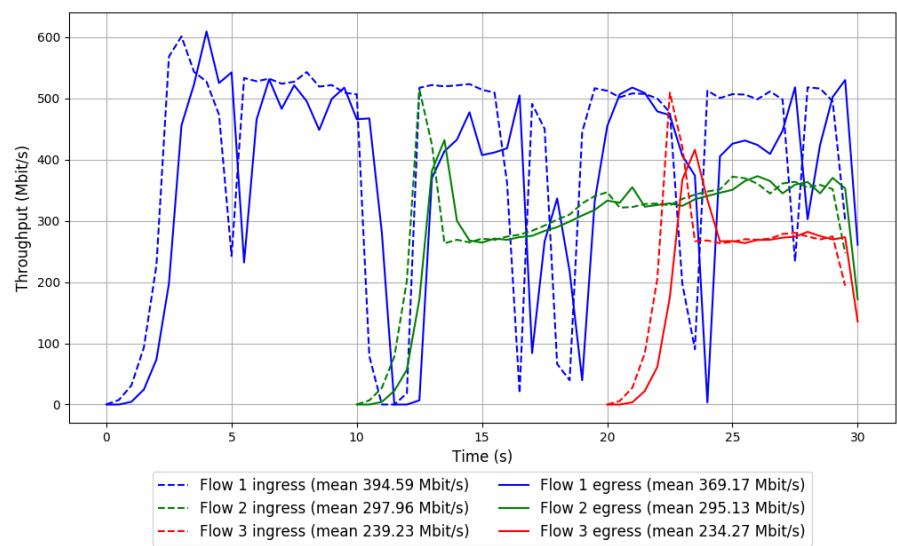
-- Flow 3:

Average throughput: 234.27 Mbit/s

95th percentile per-packet one-way delay: 229.010 ms

Loss rate: 4.26%

Run 4: Report of PCC-Allegro — Data Link





Run 5: Statistics of PCC-Allegro

Start at: 2018-11-15 08:11:20

End at: 2018-11-15 08:11:50

Local clock offset: -0.183 ms

Remote clock offset: 0.35 ms

# Below is generated by plot.py at 2018-11-15 10:13:00

# Datalink statistics

-- Total of 3 flows:

Average throughput: 556.51 Mbit/s

95th percentile per-packet one-way delay: 187.533 ms

Loss rate: 1.98%

-- Flow 1:

Average throughput: 298.64 Mbit/s

95th percentile per-packet one-way delay: 187.823 ms

Loss rate: 1.07%

-- Flow 2:

Average throughput: 279.02 Mbit/s

95th percentile per-packet one-way delay: 159.886 ms

Loss rate: 2.30%

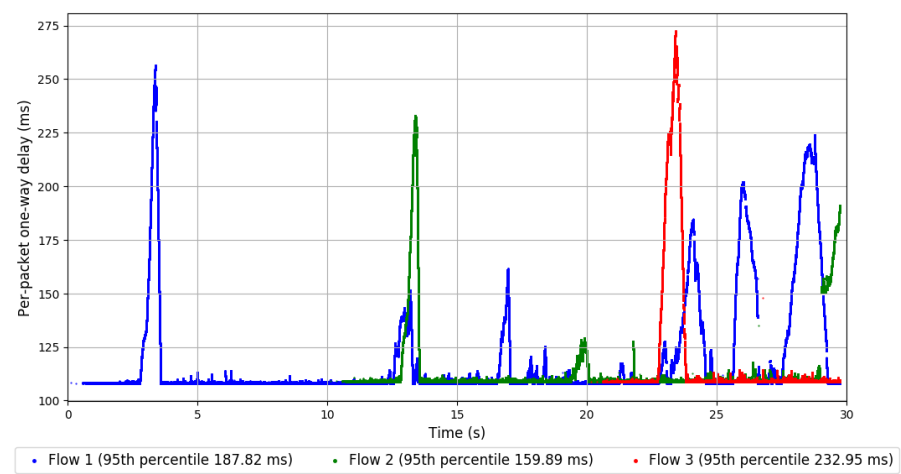
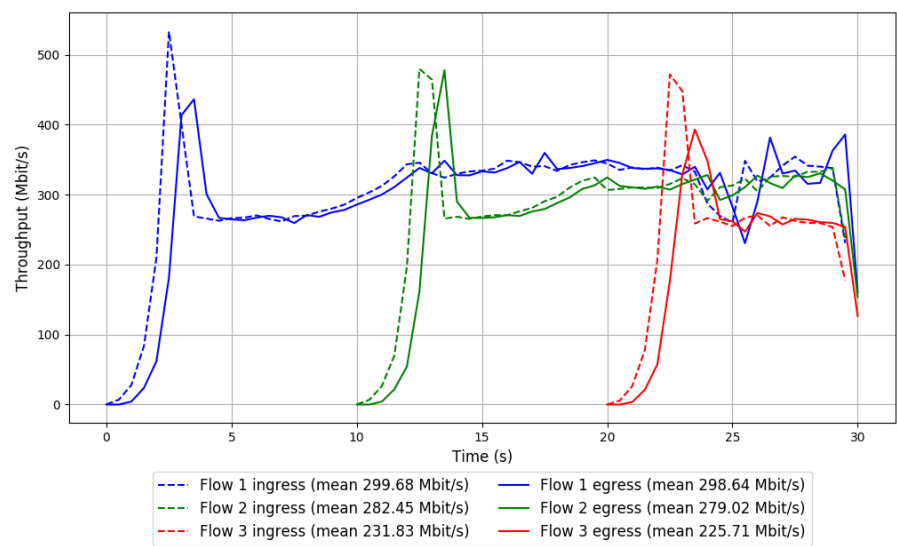
-- Flow 3:

Average throughput: 225.71 Mbit/s

95th percentile per-packet one-way delay: 232.953 ms

Loss rate: 4.77%

Run 5: Report of PCC-Allegro — Data Link

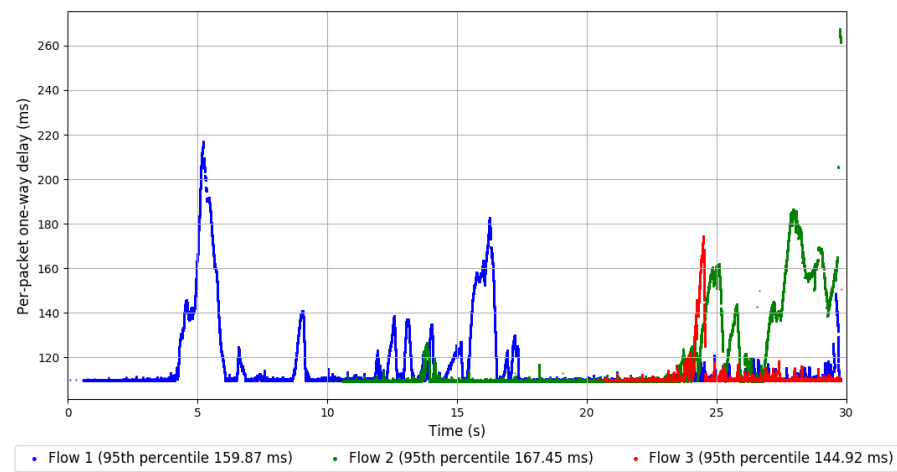
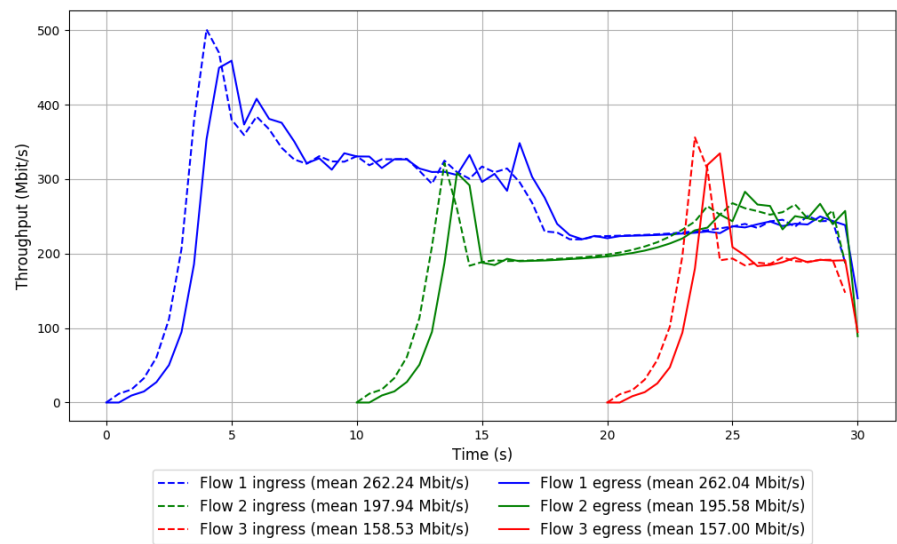


```
Run 1: Statistics of PCC-Expr

Start at: 2018-11-15 06:13:33
End at: 2018-11-15 06:14:03
Local clock offset: -0.021 ms
Remote clock offset: 0.064 ms

# Below is generated by plot.py at 2018-11-15 10:13:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 442.65 Mbit/s
95th percentile per-packet one-way delay: 161.688 ms
Loss rate: 1.50%
-- Flow 1:
Average throughput: 262.04 Mbit/s
95th percentile per-packet one-way delay: 159.872 ms
Loss rate: 0.81%
-- Flow 2:
Average throughput: 195.58 Mbit/s
95th percentile per-packet one-way delay: 167.446 ms
Loss rate: 2.28%
-- Flow 3:
Average throughput: 157.00 Mbit/s
95th percentile per-packet one-way delay: 144.919 ms
Loss rate: 3.03%
```

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

Start at: 2018-11-15 06:45:57

End at: 2018-11-15 06:46:27

Local clock offset: 0.536 ms

Remote clock offset: 0.339 ms

# Below is generated by plot.py at 2018-11-15 10:13:00

# Datalink statistics

-- Total of 3 flows:

Average throughput: 476.69 Mbit/s

95th percentile per-packet one-way delay: 196.152 ms

Loss rate: 2.83%

-- Flow 1:

Average throughput: 291.25 Mbit/s

95th percentile per-packet one-way delay: 201.300 ms

Loss rate: 3.43%

-- Flow 2:

Average throughput: 202.01 Mbit/s

95th percentile per-packet one-way delay: 120.204 ms

Loss rate: 1.63%

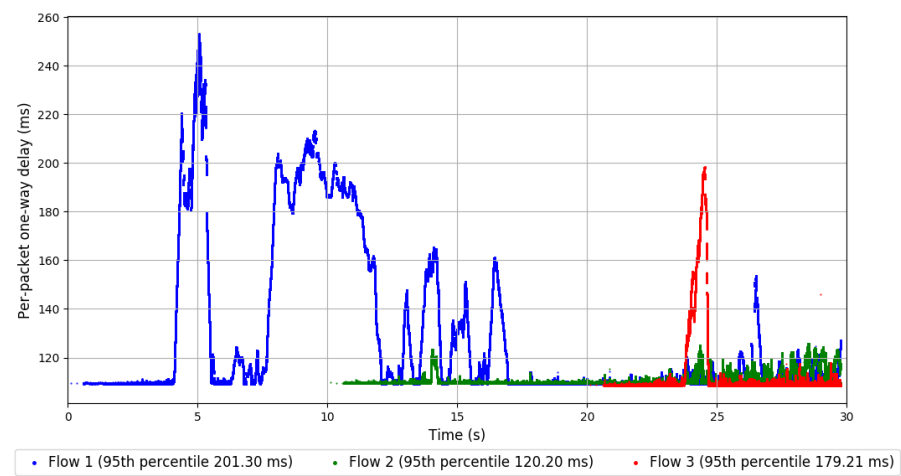
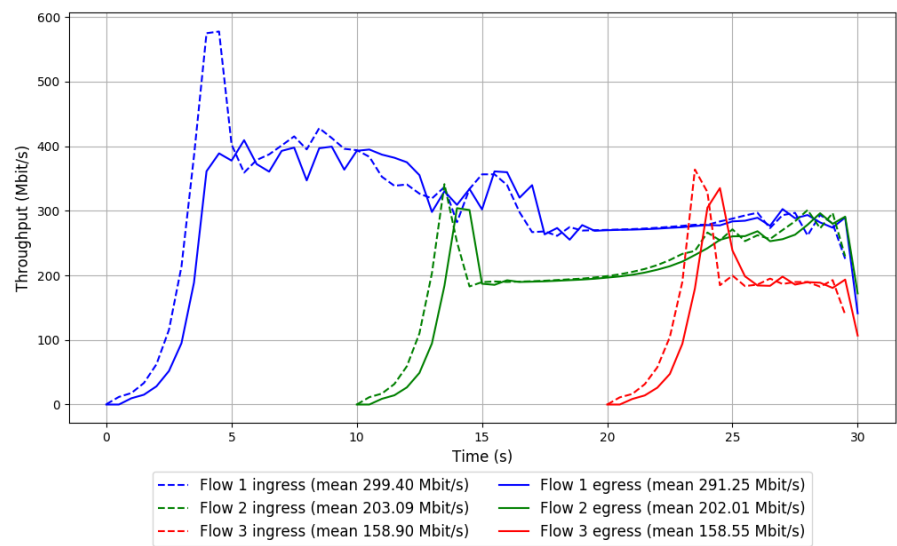
-- Flow 3:

Average throughput: 158.55 Mbit/s

95th percentile per-packet one-way delay: 179.206 ms

Loss rate: 2.43%

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

Start at: 2018-11-15 07:18:15

End at: 2018-11-15 07:18:45

Local clock offset: -0.258 ms

Remote clock offset: 0.01 ms

# Below is generated by plot.py at 2018-11-15 10:13:00

# Datalink statistics

-- Total of 3 flows:

Average throughput: 425.45 Mbit/s

95th percentile per-packet one-way delay: 197.759 ms

Loss rate: 1.40%

-- Flow 1:

Average throughput: 239.13 Mbit/s

95th percentile per-packet one-way delay: 208.868 ms

Loss rate: 1.07%

-- Flow 2:

Average throughput: 203.60 Mbit/s

95th percentile per-packet one-way delay: 128.292 ms

Loss rate: 1.45%

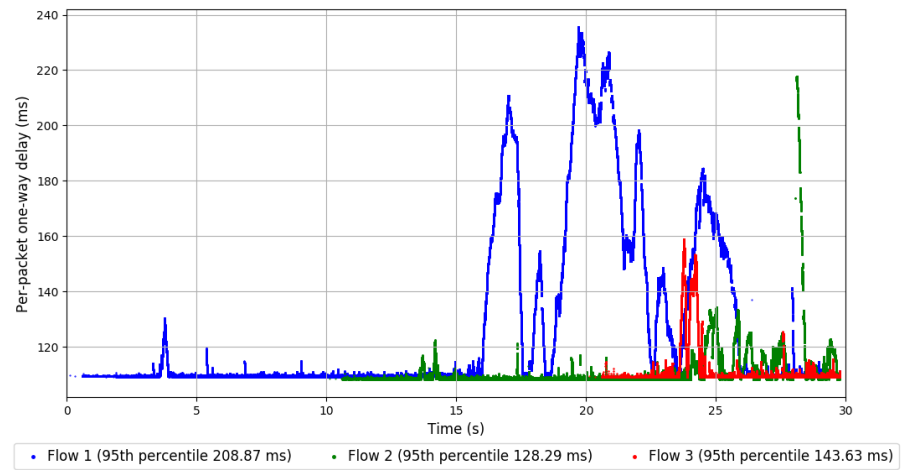
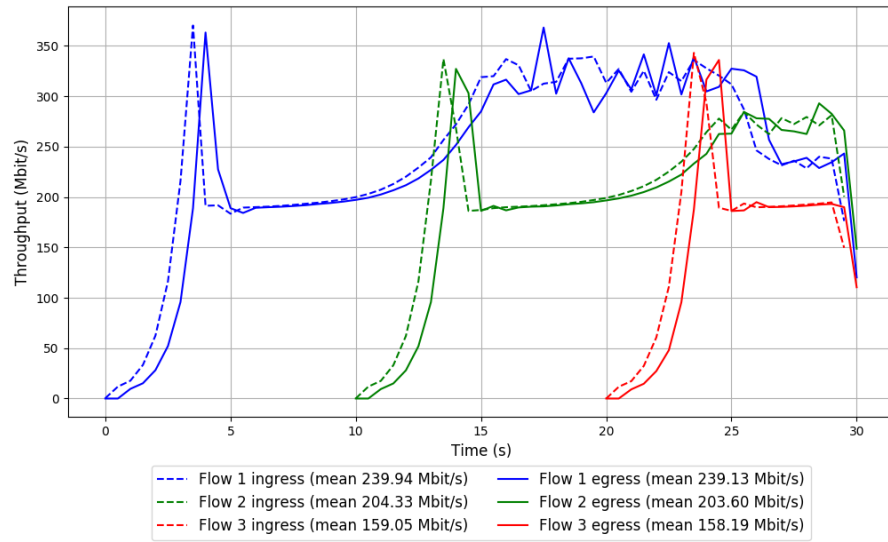
-- Flow 3:

Average throughput: 158.19 Mbit/s

95th percentile per-packet one-way delay: 143.627 ms

Loss rate: 2.75%

### Run 3: Report of PCC-Expr — Data Link



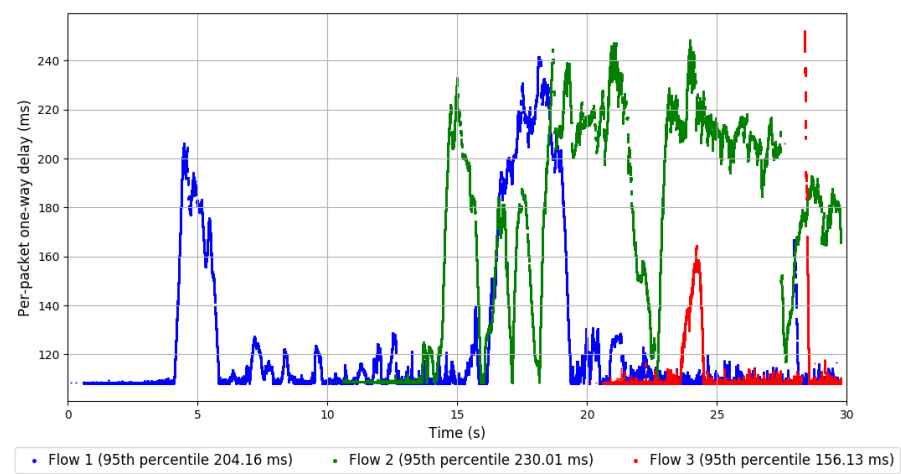
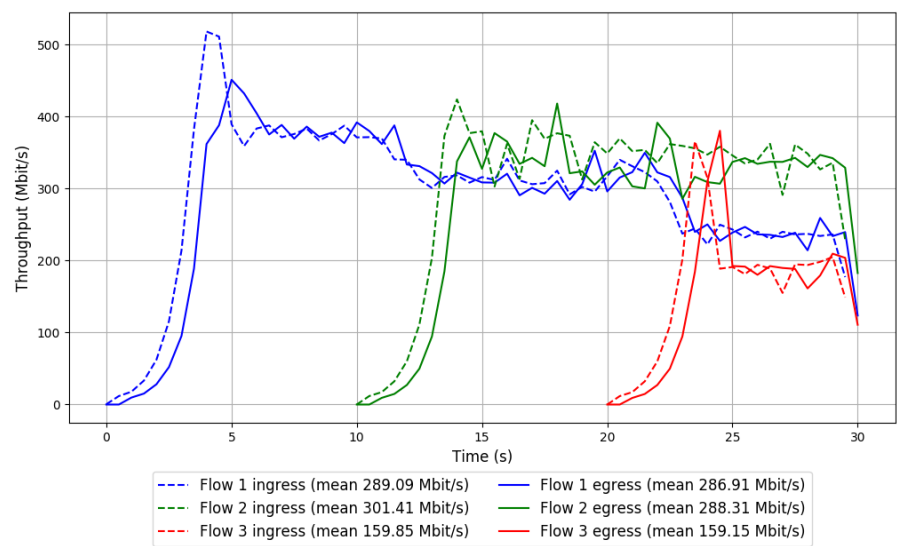


Run 4: Statistics of PCC-Expr

Start at: 2018-11-15 07:49:47  
End at: 2018-11-15 07:50:17  
Local clock offset: -1.1 ms  
Remote clock offset: -0.039 ms

# Below is generated by plot.py at 2018-11-15 10:17:34  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 529.74 Mbit/s  
95th percentile per-packet one-way delay: 220.509 ms  
Loss rate: 3.04%  
-- Flow 1:  
Average throughput: 286.91 Mbit/s  
95th percentile per-packet one-way delay: 204.159 ms  
Loss rate: 1.48%  
-- Flow 2:  
Average throughput: 288.31 Mbit/s  
95th percentile per-packet one-way delay: 230.007 ms  
Loss rate: 5.40%  
-- Flow 3:  
Average throughput: 159.15 Mbit/s  
95th percentile per-packet one-way delay: 156.126 ms  
Loss rate: 2.63%

Run 4: Report of PCC-Expr — Data Link



Run 5: Statistics of PCC-Expr

Start at: 2018-11-15 08:21:23

End at: 2018-11-15 08:21:53

Local clock offset: 1.215 ms

Remote clock offset: 0.368 ms

# Below is generated by plot.py at 2018-11-15 10:17:34

# Datalink statistics

-- Total of 3 flows:

Average throughput: 415.72 Mbit/s

95th percentile per-packet one-way delay: 185.145 ms

Loss rate: 1.43%

-- Flow 1:

Average throughput: 225.83 Mbit/s

95th percentile per-packet one-way delay: 180.153 ms

Loss rate: 0.87%

-- Flow 2:

Average throughput: 212.25 Mbit/s

95th percentile per-packet one-way delay: 173.008 ms

Loss rate: 1.58%

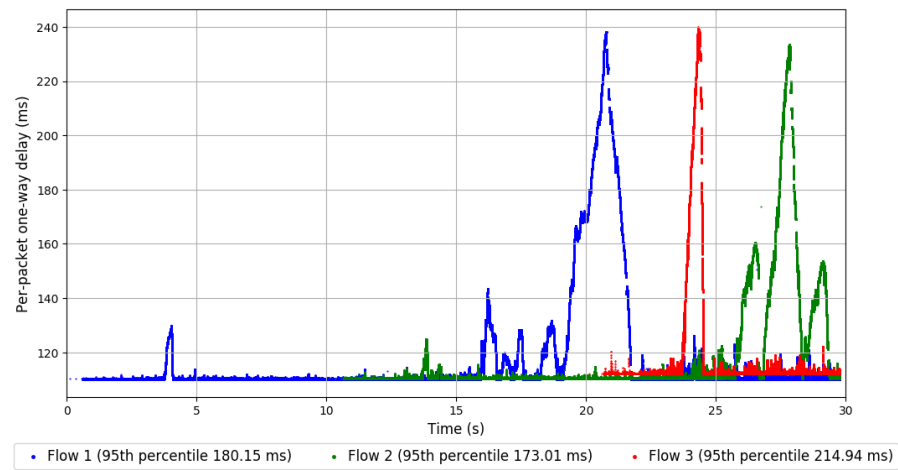
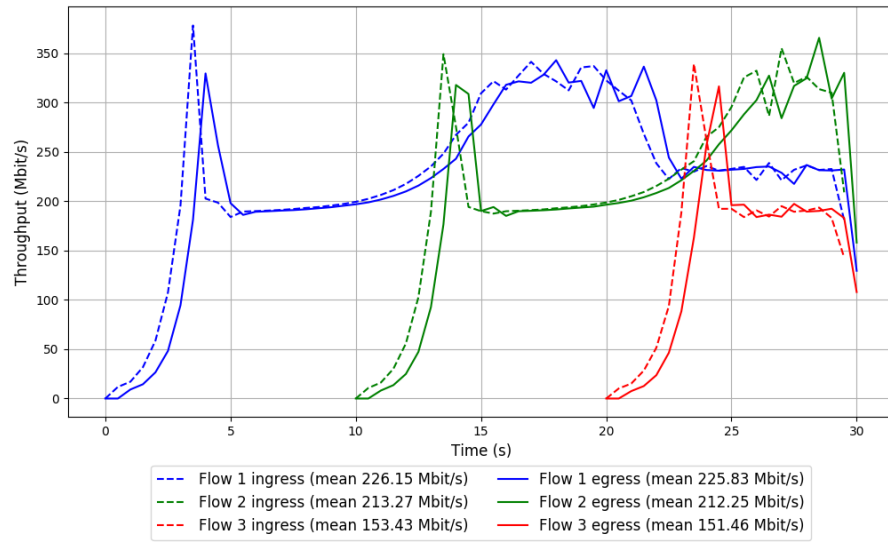
-- Flow 3:

Average throughput: 151.46 Mbit/s

95th percentile per-packet one-way delay: 214.944 ms

Loss rate: 3.49%

# Run 5: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-11-15 05:52:27

End at: 2018-11-15 05:52:57

Local clock offset: 0.416 ms

Remote clock offset: 0.11 ms

# Below is generated by plot.py at 2018-11-15 10:17:34

# Datalink statistics

-- Total of 3 flows:

Average throughput: 102.39 Mbit/s

95th percentile per-packet one-way delay: 109.724 ms

Loss rate: 1.79%

-- Flow 1:

Average throughput: 50.97 Mbit/s

95th percentile per-packet one-way delay: 109.531 ms

Loss rate: 1.24%

-- Flow 2:

Average throughput: 55.93 Mbit/s

95th percentile per-packet one-way delay: 109.753 ms

Loss rate: 1.80%

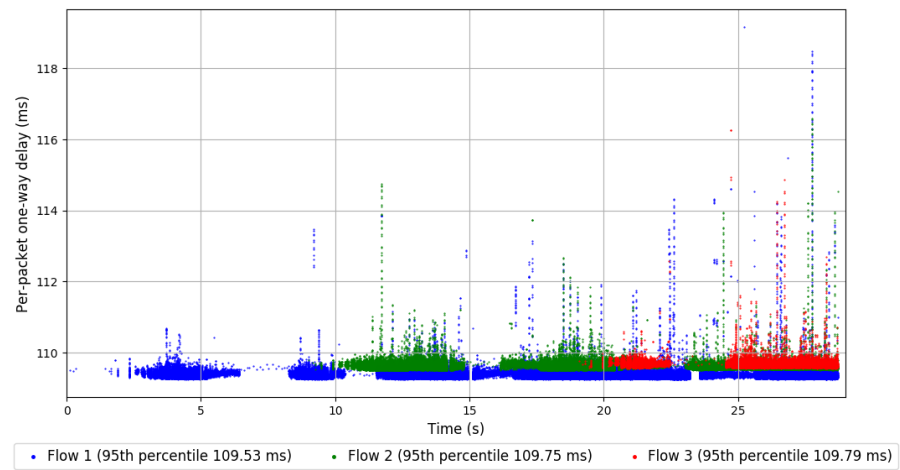
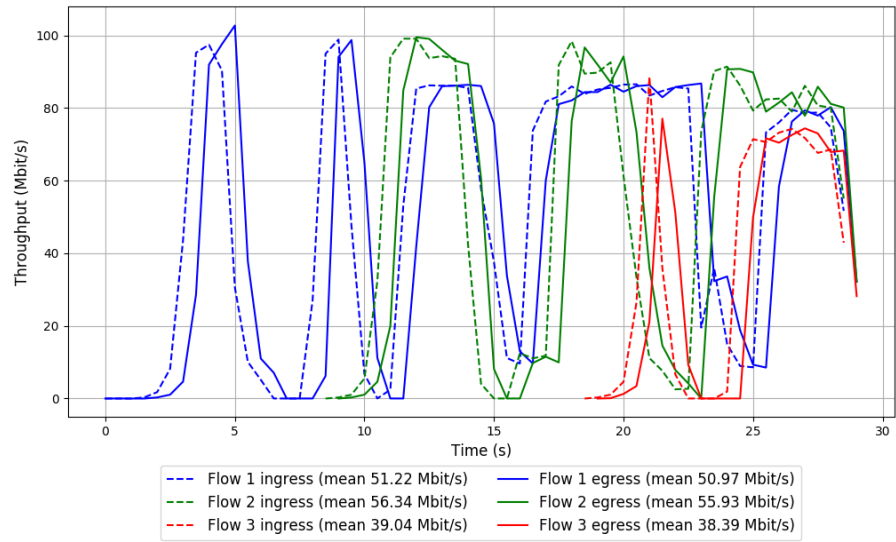
-- Flow 3:

Average throughput: 38.39 Mbit/s

95th percentile per-packet one-way delay: 109.794 ms

Loss rate: 3.86%

# Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-11-15 06:24:49

End at: 2018-11-15 06:25:19

Local clock offset: -0.708 ms

Remote clock offset: 0.038 ms

# Below is generated by plot.py at 2018-11-15 10:17:34

# Datalink statistics

-- Total of 3 flows:

Average throughput: 77.39 Mbit/s

95th percentile per-packet one-way delay: 109.724 ms

Loss rate: 1.21%

-- Flow 1:

Average throughput: 39.93 Mbit/s

95th percentile per-packet one-way delay: 110.034 ms

Loss rate: 0.92%

-- Flow 2:

Average throughput: 39.90 Mbit/s

95th percentile per-packet one-way delay: 109.506 ms

Loss rate: 2.13%

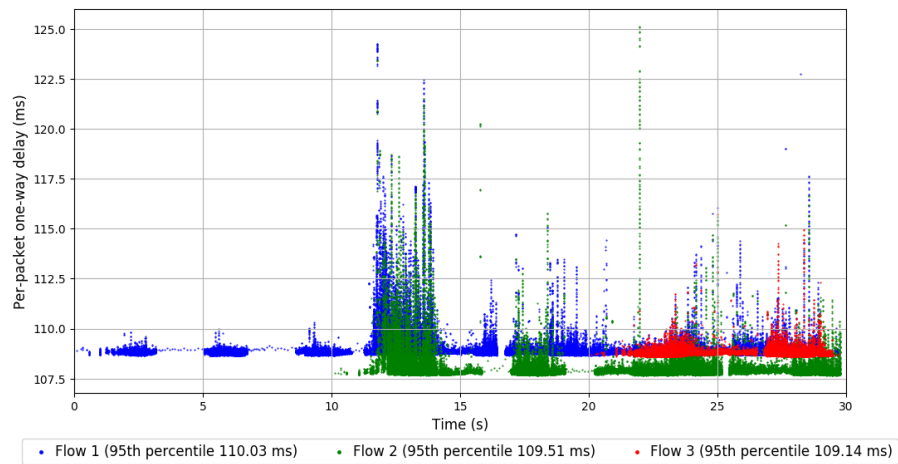
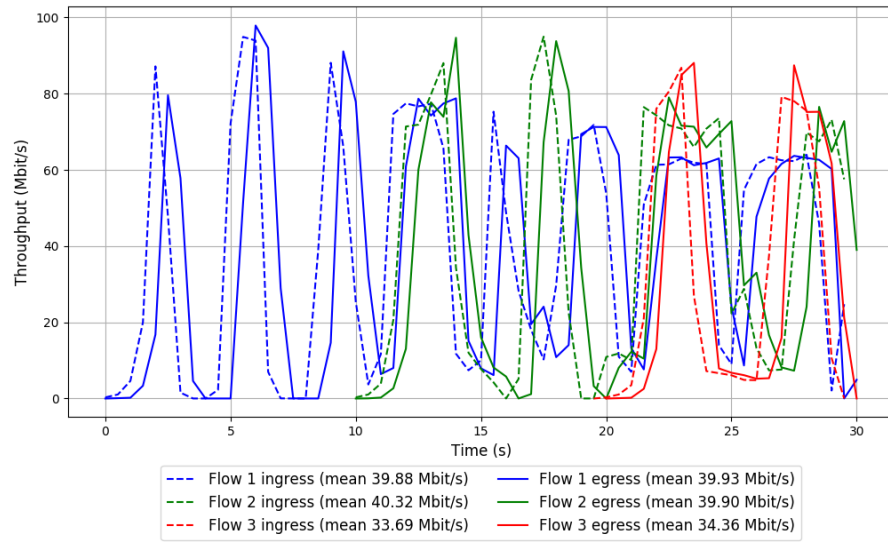
-- Flow 3:

Average throughput: 34.36 Mbit/s

95th percentile per-packet one-way delay: 109.143 ms

Loss rate: 0.00%

## Run 2: Report of QUIC Cubic — Data Link



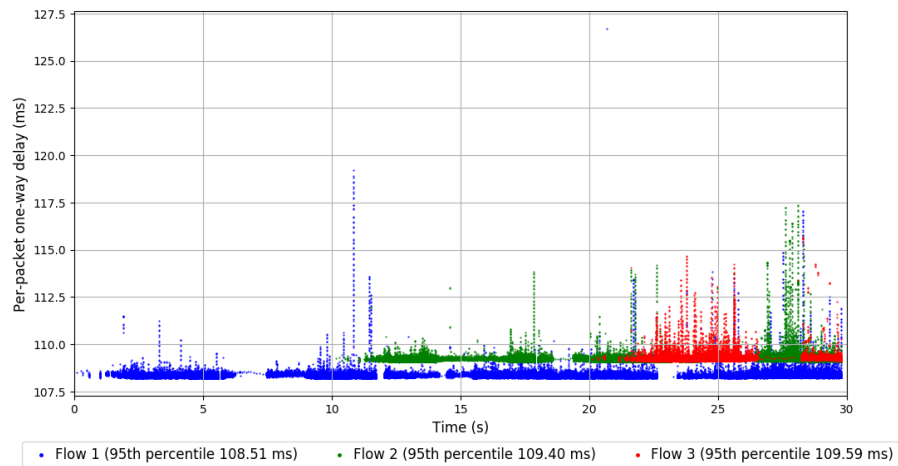
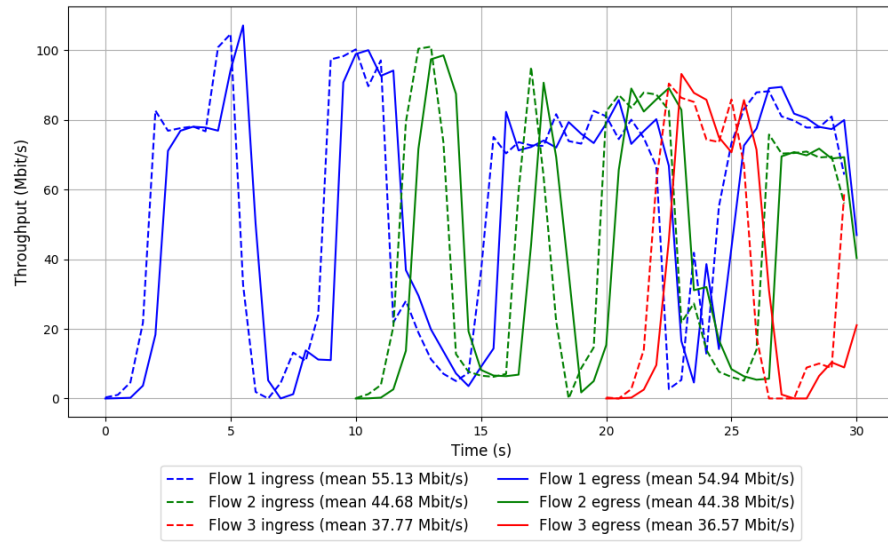


Run 3: Statistics of QUIC Cubic

Start at: 2018-11-15 06:57:04  
End at: 2018-11-15 06:57:34  
Local clock offset: -0.162 ms  
Remote clock offset: -0.086 ms

# Below is generated by plot.py at 2018-11-15 10:17:34  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 96.21 Mbit/s  
95th percentile per-packet one-way delay: 109.323 ms  
Loss rate: 1.82%  
-- Flow 1:  
Average throughput: 54.94 Mbit/s  
95th percentile per-packet one-way delay: 108.508 ms  
Loss rate: 1.07%  
-- Flow 2:  
Average throughput: 44.38 Mbit/s  
95th percentile per-packet one-way delay: 109.403 ms  
Loss rate: 1.76%  
-- Flow 3:  
Average throughput: 36.57 Mbit/s  
95th percentile per-packet one-way delay: 109.591 ms  
Loss rate: 5.30%

### Run 3: Report of QUIC Cubic — Data Link



Run 4: Statistics of QUIC Cubic

Start at: 2018-11-15 07:29:18

End at: 2018-11-15 07:29:48

Local clock offset: -0.733 ms

Remote clock offset: 0.022 ms

# Below is generated by plot.py at 2018-11-15 10:17:34

# Datalink statistics

-- Total of 3 flows:

Average throughput: 89.47 Mbit/s

95th percentile per-packet one-way delay: 108.837 ms

Loss rate: 1.94%

-- Flow 1:

Average throughput: 47.05 Mbit/s

95th percentile per-packet one-way delay: 108.760 ms

Loss rate: 1.26%

-- Flow 2:

Average throughput: 44.06 Mbit/s

95th percentile per-packet one-way delay: 108.863 ms

Loss rate: 1.88%

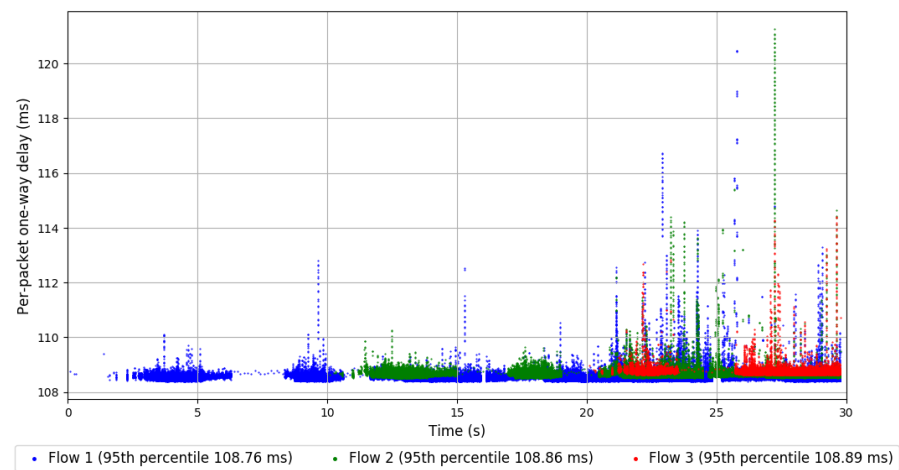
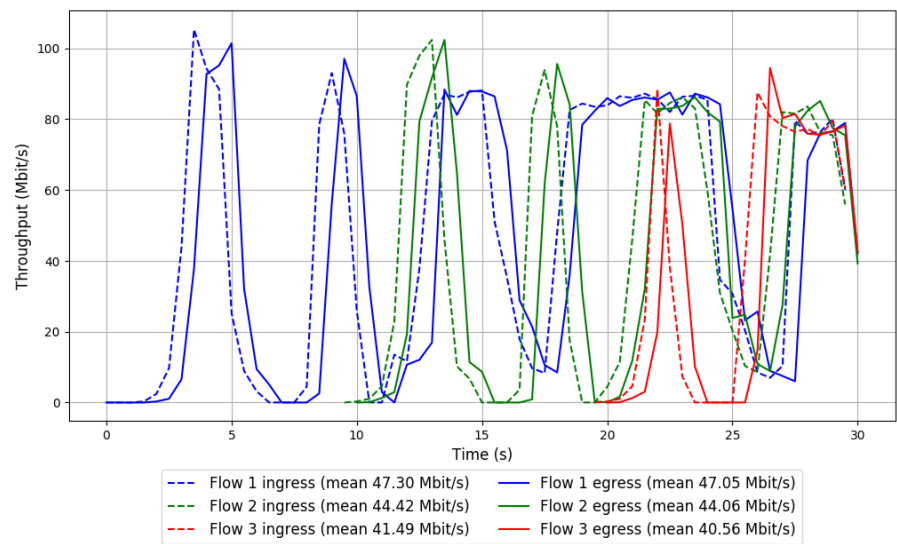
-- Flow 3:

Average throughput: 40.56 Mbit/s

95th percentile per-packet one-way delay: 108.888 ms

Loss rate: 4.39%

Run 4: Report of QUIC Cubic — Data Link



Run 5: Statistics of QUIC Cubic

Start at: 2018-11-15 08:00:56

End at: 2018-11-15 08:01:26

Local clock offset: -0.217 ms

Remote clock offset: 0.036 ms

# Below is generated by plot.py at 2018-11-15 10:17:34

# Datalink statistics

-- Total of 3 flows:

Average throughput: 90.26 Mbit/s

95th percentile per-packet one-way delay: 109.496 ms

Loss rate: 1.82%

-- Flow 1:

Average throughput: 47.00 Mbit/s

95th percentile per-packet one-way delay: 108.508 ms

Loss rate: 1.15%

-- Flow 2:

Average throughput: 44.93 Mbit/s

95th percentile per-packet one-way delay: 109.595 ms

Loss rate: 1.90%

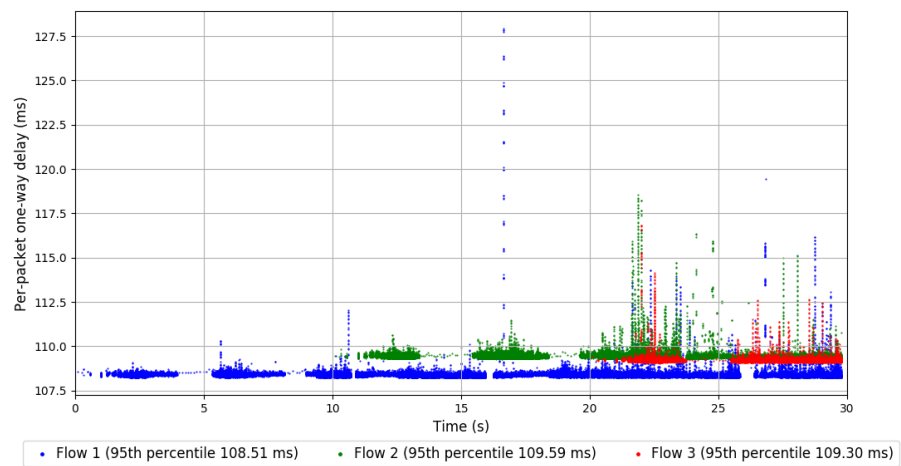
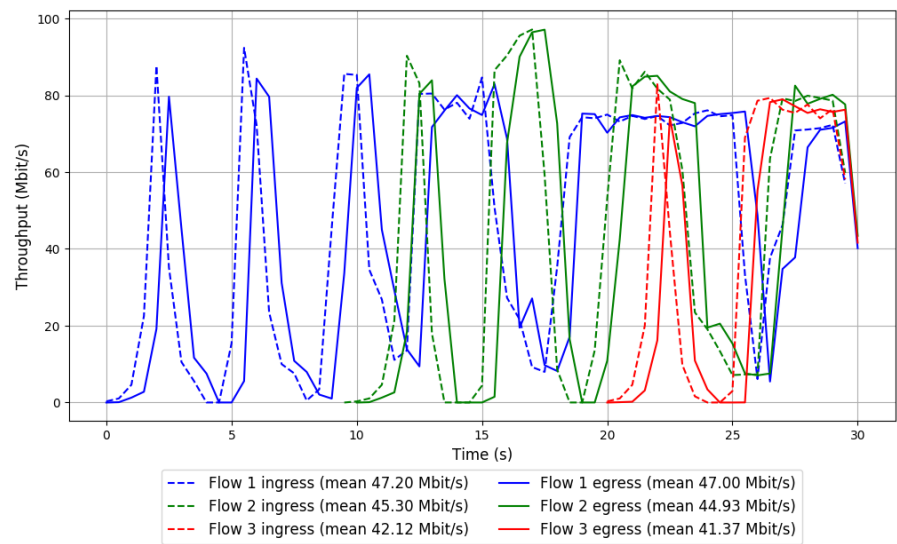
-- Flow 3:

Average throughput: 41.37 Mbit/s

95th percentile per-packet one-way delay: 109.301 ms

Loss rate: 3.95%

Run 5: Report of QUIC Cubic — Data Link

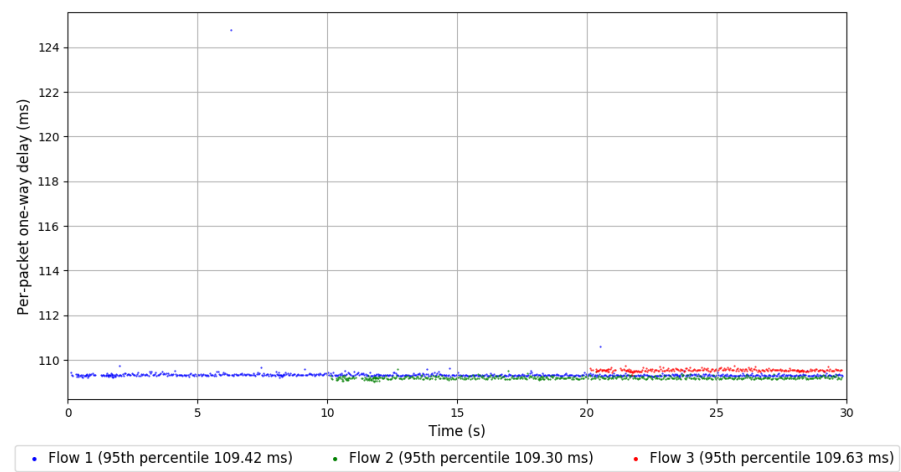
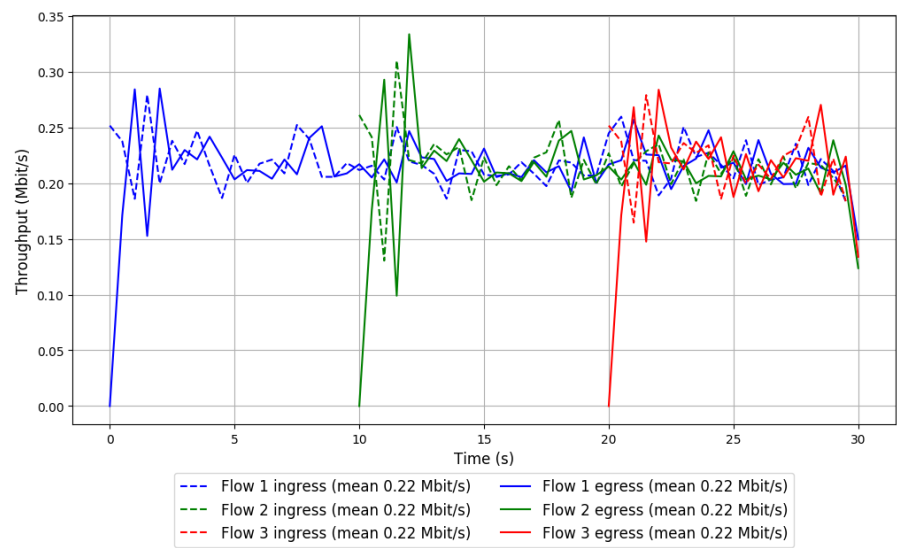


```
Run 1: Statistics of SReAM

Start at: 2018-11-15 06:12:16
End at: 2018-11-15 06:12:46
Local clock offset: -0.072 ms
Remote clock offset: 0.113 ms

# Below is generated by plot.py at 2018-11-15 10:17:34
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 109.560 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 109.415 ms
Loss rate: 0.64%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 109.296 ms
Loss rate: 1.24%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 109.633 ms
Loss rate: 2.22%
```

Run 1: Report of SReAM — Data Link



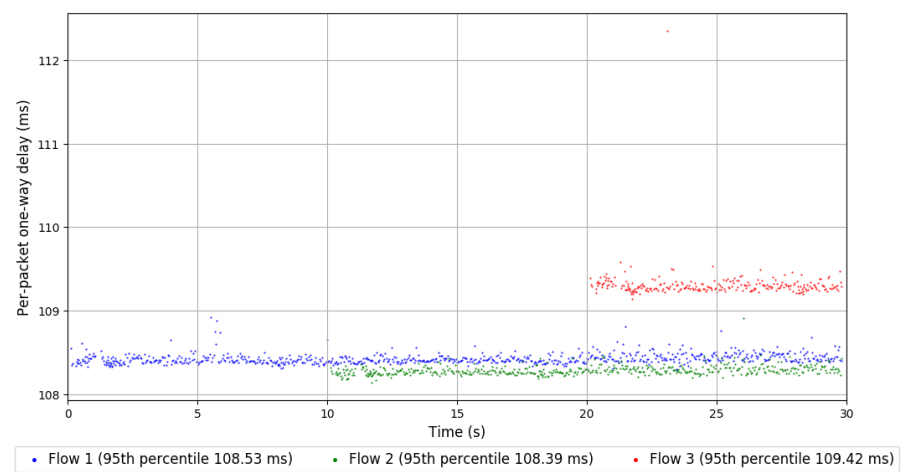
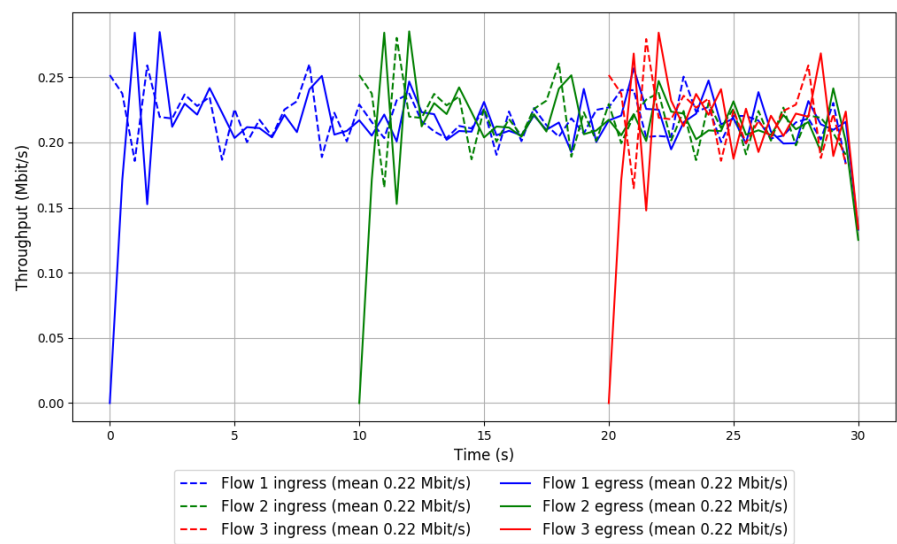


Run 2: Statistics of SReAM

Start at: 2018-11-15 06:44:41  
End at: 2018-11-15 06:45:11  
Local clock offset: -0.227 ms  
Remote clock offset: -0.019 ms

# Below is generated by plot.py at 2018-11-15 10:17:34  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 0.44 Mbit/s  
95th percentile per-packet one-way delay: 109.319 ms  
Loss rate: 1.17%  
-- Flow 1:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 108.527 ms  
Loss rate: 0.77%  
-- Flow 2:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 108.385 ms  
Loss rate: 1.25%  
-- Flow 3:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 109.423 ms  
Loss rate: 2.22%

Run 2: Report of SReAM — Data Link

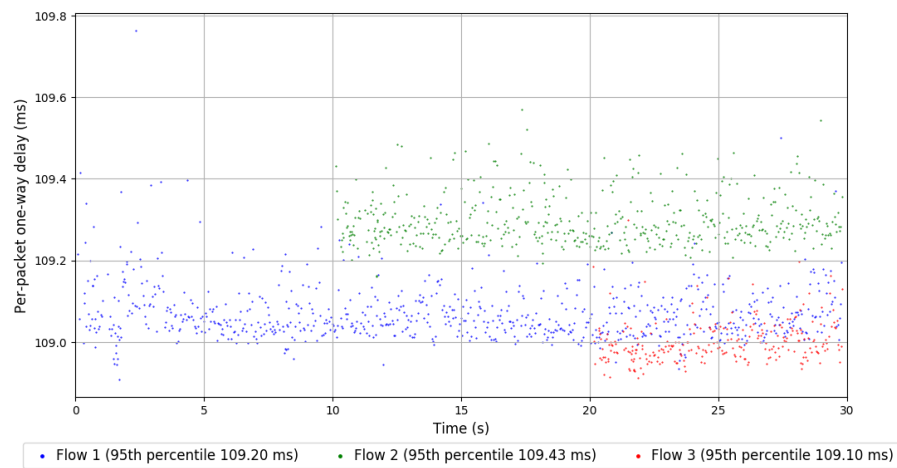
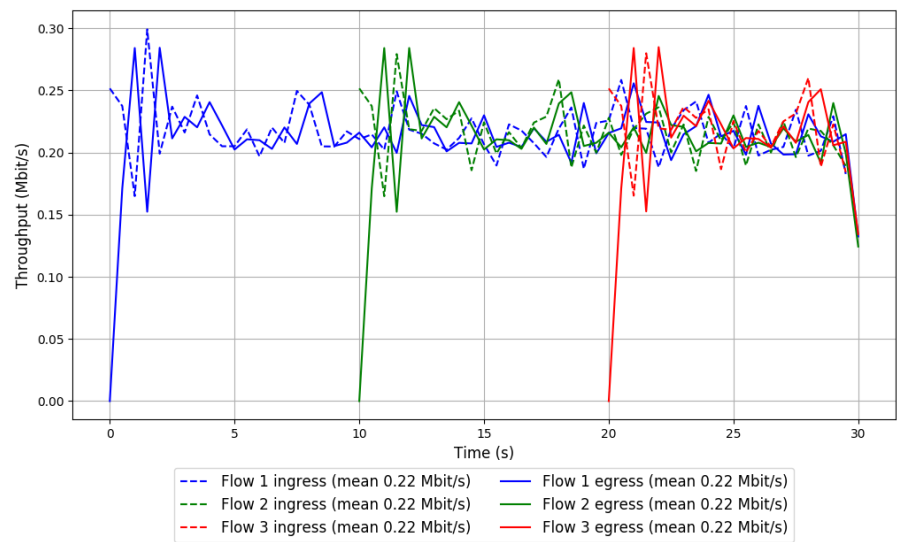


Run 3: Statistics of SReAM

Start at: 2018-11-15 07:16:59  
End at: 2018-11-15 07:17:29  
Local clock offset: -0.318 ms  
Remote clock offset: 0.016 ms

# Below is generated by plot.py at 2018-11-15 10:17:34  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 0.43 Mbit/s  
95th percentile per-packet one-way delay: 109.369 ms  
Loss rate: 1.17%  
-- Flow 1:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 109.196 ms  
Loss rate: 0.77%  
-- Flow 2:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 109.428 ms  
Loss rate: 1.25%  
-- Flow 3:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 109.096 ms  
Loss rate: 2.22%

Run 3: Report of SReAM — Data Link



Run 4: Statistics of SReAM

Start at: 2018-11-15 07:48:31

End at: 2018-11-15 07:49:01

Local clock offset: 1.143 ms

Remote clock offset: 0.042 ms

# Below is generated by plot.py at 2018-11-15 10:17:34

# Datalink statistics

-- Total of 3 flows:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 110.651 ms

Loss rate: 1.11%

-- Flow 1:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 110.010 ms

Loss rate: 0.64%

-- Flow 2:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 110.707 ms

Loss rate: 1.25%

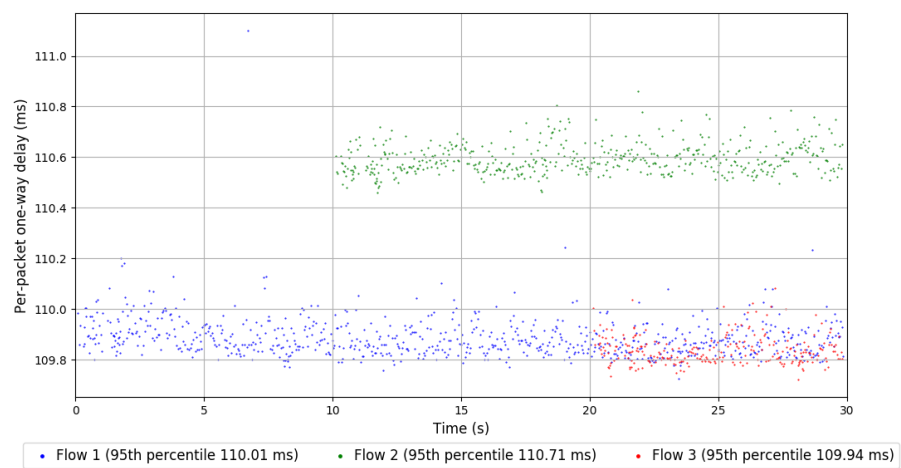
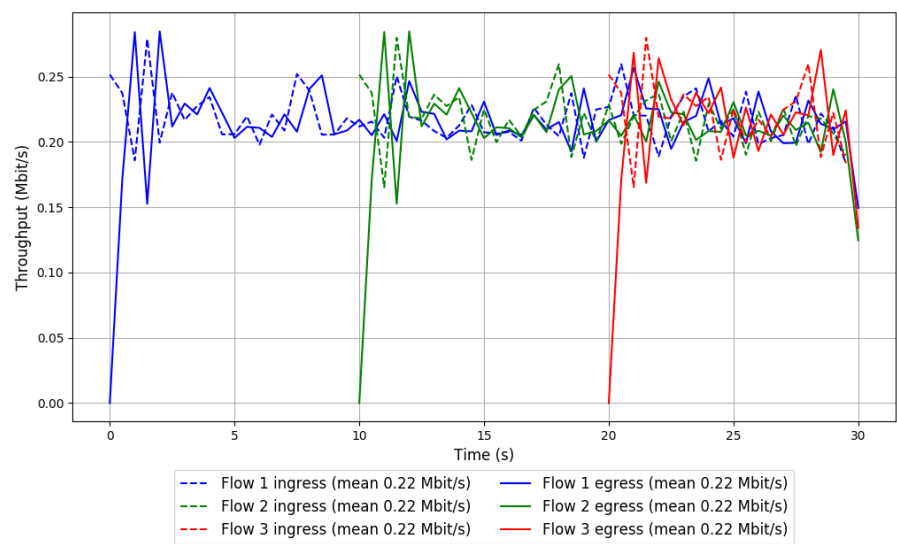
-- Flow 3:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 109.940 ms

Loss rate: 2.22%

Run 4: Report of SReAM — Data Link



Run 5: Statistics of SReAM

Start at: 2018-11-15 08:20:07

End at: 2018-11-15 08:20:37

Local clock offset: -0.223 ms

Remote clock offset: 0.023 ms

# Below is generated by plot.py at 2018-11-15 10:17:34

# Datalink statistics

-- Total of 3 flows:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 109.374 ms

Loss rate: 1.17%

-- Flow 1:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 109.414 ms

Loss rate: 0.77%

-- Flow 2:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 109.250 ms

Loss rate: 1.25%

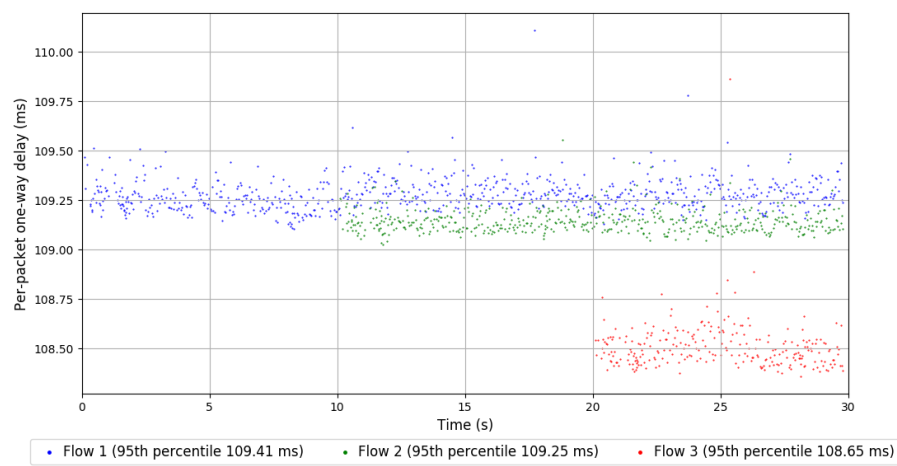
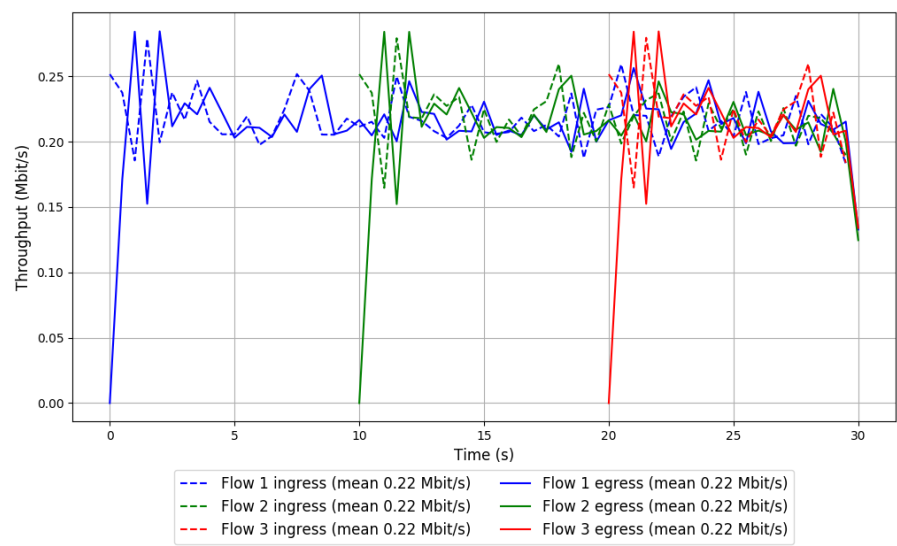
-- Flow 3:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 108.654 ms

Loss rate: 2.22%

Run 5: Report of SReAM — Data Link



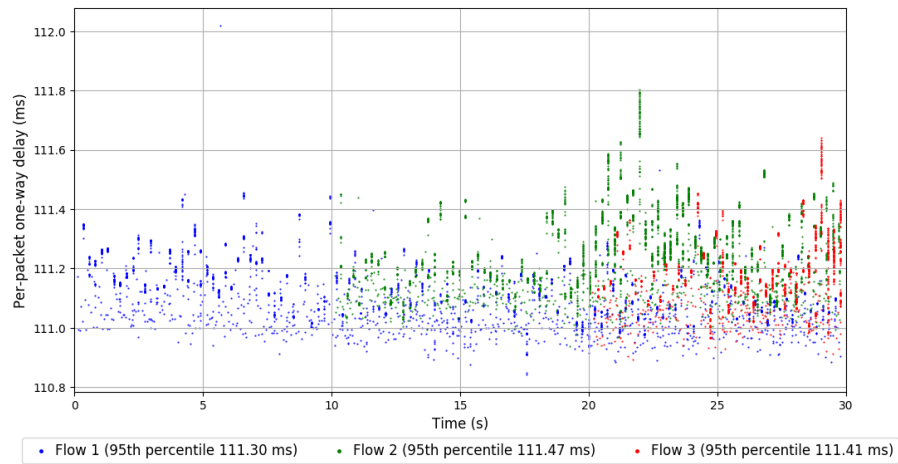
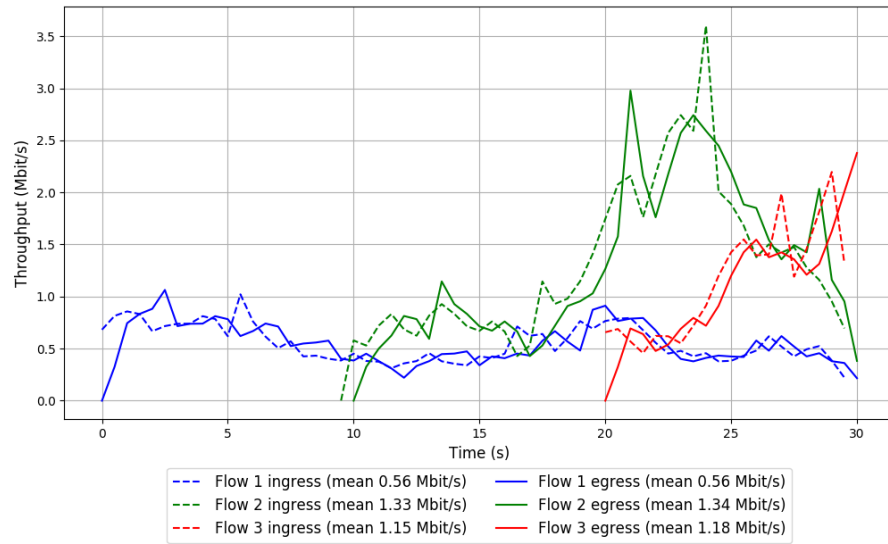


Run 1: Statistics of Sprout

Start at: 2018-11-15 05:51:10  
End at: 2018-11-15 05:51:40  
Local clock offset: 1.542 ms  
Remote clock offset: -0.248 ms

# Below is generated by plot.py at 2018-11-15 10:17:34  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.82 Mbit/s  
95th percentile per-packet one-way delay: 111.438 ms  
Loss rate: 0.56%  
-- Flow 1:  
Average throughput: 0.56 Mbit/s  
95th percentile per-packet one-way delay: 111.298 ms  
Loss rate: 0.65%  
-- Flow 2:  
Average throughput: 1.34 Mbit/s  
95th percentile per-packet one-way delay: 111.470 ms  
Loss rate: 0.60%  
-- Flow 3:  
Average throughput: 1.18 Mbit/s  
95th percentile per-packet one-way delay: 111.407 ms  
Loss rate: 0.36%

## Run 1: Report of Sprout — Data Link

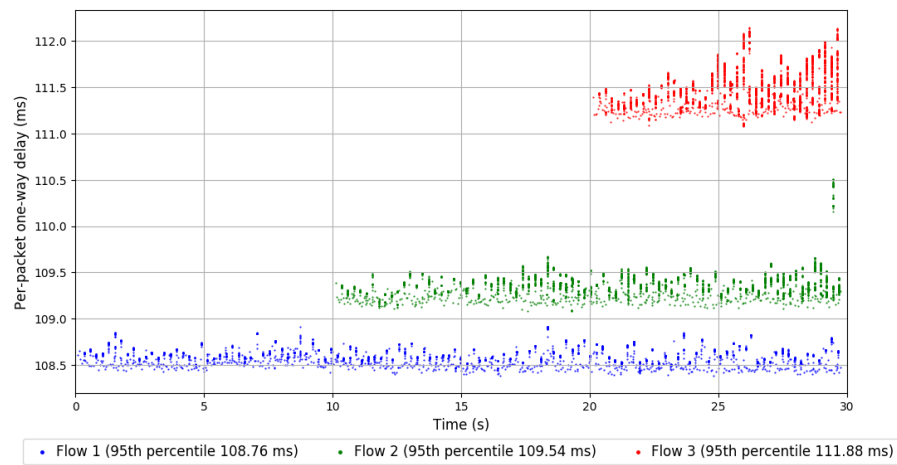
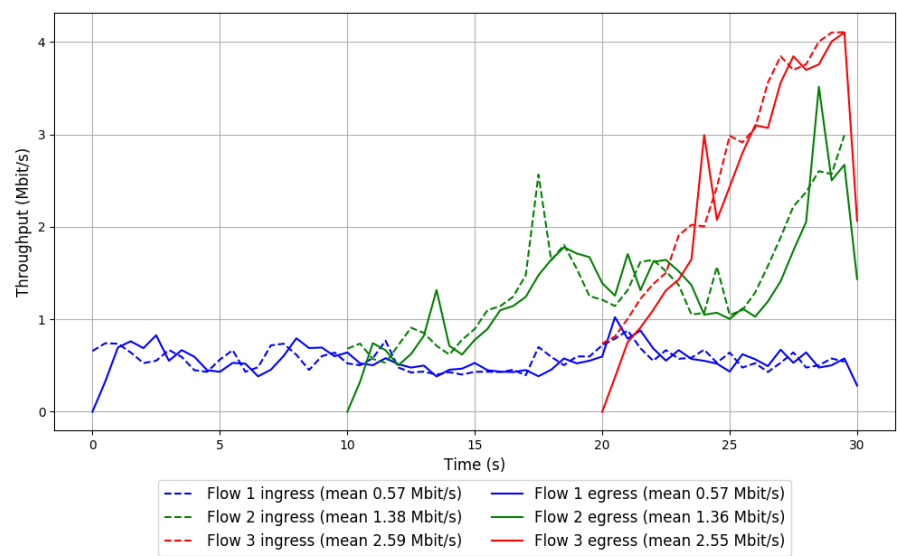


Run 2: Statistics of Sprout

Start at: 2018-11-15 06:23:32  
End at: 2018-11-15 06:24:02  
Local clock offset: -0.174 ms  
Remote clock offset: 0.075 ms

# Below is generated by plot.py at 2018-11-15 10:17:34  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 2.30 Mbit/s  
95th percentile per-packet one-way delay: 111.739 ms  
Loss rate: 2.76%  
-- Flow 1:  
Average throughput: 0.57 Mbit/s  
95th percentile per-packet one-way delay: 108.762 ms  
Loss rate: 0.77%  
-- Flow 2:  
Average throughput: 1.36 Mbit/s  
95th percentile per-packet one-way delay: 109.543 ms  
Loss rate: 2.84%  
-- Flow 3:  
Average throughput: 2.55 Mbit/s  
95th percentile per-packet one-way delay: 111.878 ms  
Loss rate: 4.00%

Run 2: Report of Sprout — Data Link



### Run 3: Statistics of Sprout

Start at: 2018-11-15 06:55:46

End at: 2018-11-15 06:56:16

Local clock offset: 0.115 ms

Remote clock offset: -0.05 ms

# Below is generated by plot.py at 2018-11-15 10:17:34

# Datalink statistics

-- Total of 3 flows:

Average throughput: 3.45 Mbit/s

95th percentile per-packet one-way delay: 112.072 ms

Loss rate: 0.94%

-- Flow 1:

Average throughput: 0.65 Mbit/s

95th percentile per-packet one-way delay: 110.190 ms

Loss rate: 0.86%

-- Flow 2:

Average throughput: 2.78 Mbit/s

95th percentile per-packet one-way delay: 112.143 ms

Loss rate: 1.45%

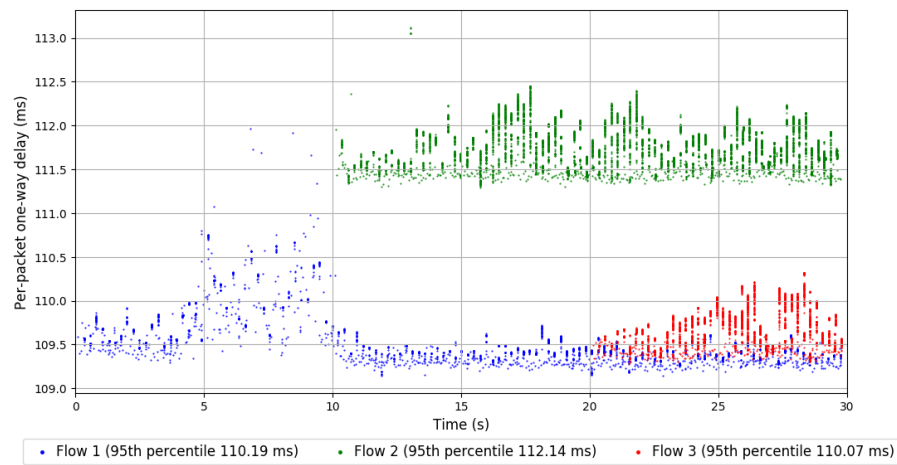
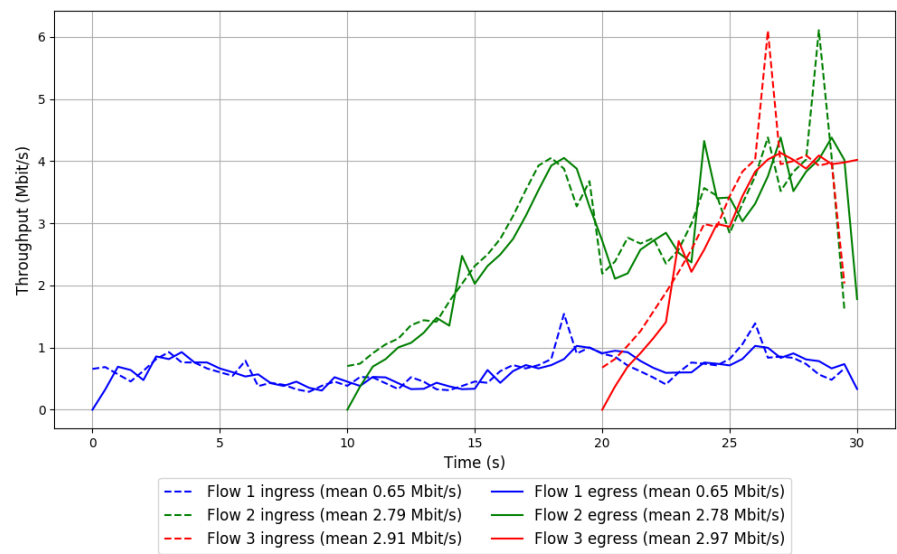
-- Flow 3:

Average throughput: 2.97 Mbit/s

95th percentile per-packet one-way delay: 110.072 ms

Loss rate: 0.01%

Run 3: Report of Sprout — Data Link

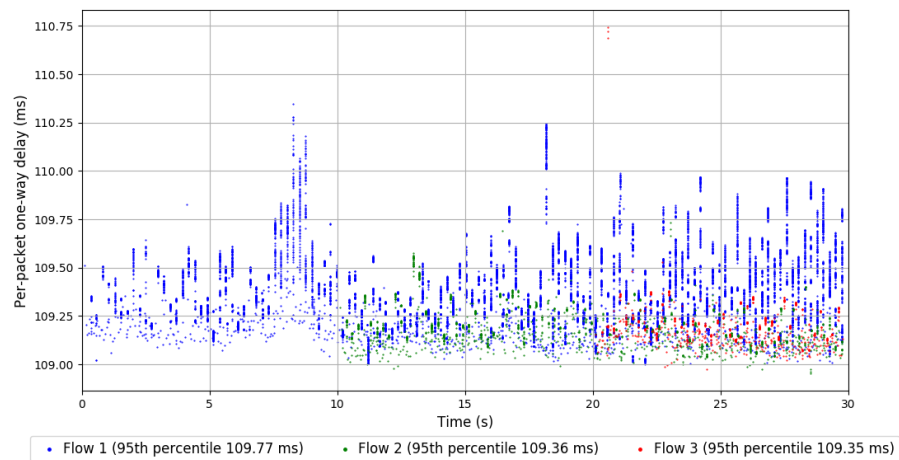
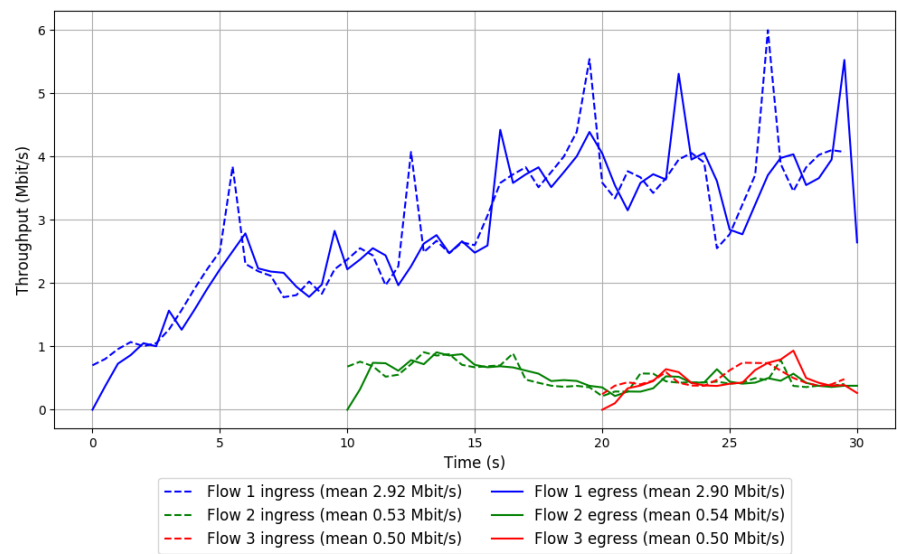


#### Run 4: Statistics of Sprout

Start at: 2018-11-15 07:28:01  
End at: 2018-11-15 07:28:31  
Local clock offset: -0.261 ms  
Remote clock offset: 0.011 ms

```
# Below is generated by plot.py at 2018-11-15 10:17:34
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.42 Mbit/s
95th percentile per-packet one-way delay: 109.744 ms
Loss rate: 1.21%
-- Flow 1:
Average throughput: 2.90 Mbit/s
95th percentile per-packet one-way delay: 109.770 ms
Loss rate: 1.16%
-- Flow 2:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 109.364 ms
Loss rate: 1.00%
-- Flow 3:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 109.350 ms
Loss rate: 2.39%
```

Run 4: Report of Sprout — Data Link



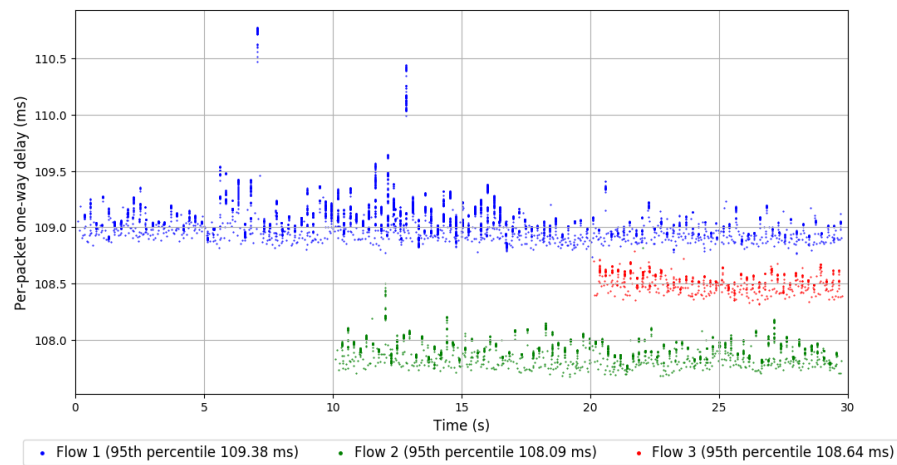
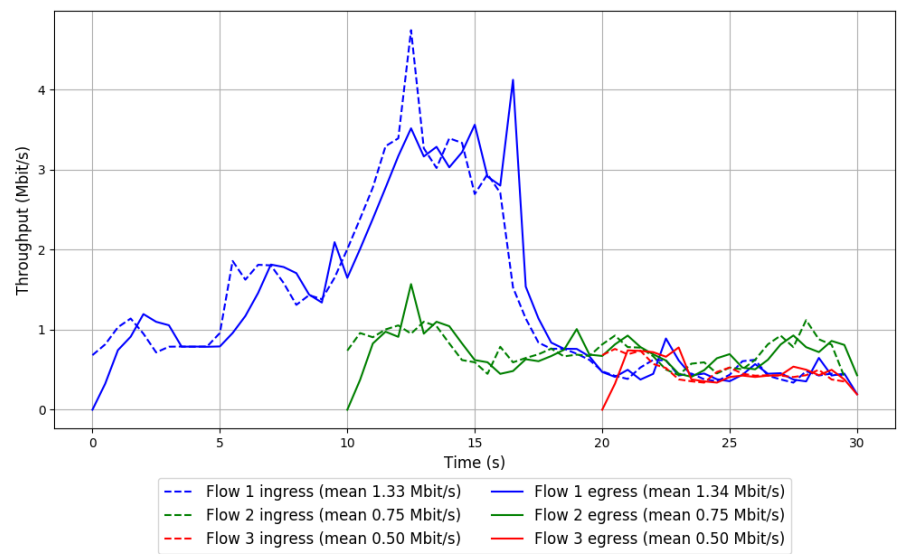


Run 5: Statistics of Sprout

Start at: 2018-11-15 07:59:39  
End at: 2018-11-15 08:00:09  
Local clock offset: -0.924 ms  
Remote clock offset: 0.004 ms

```
# Below is generated by plot.py at 2018-11-15 10:17:34
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.99 Mbit/s
95th percentile per-packet one-way delay: 109.335 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 1.34 Mbit/s
95th percentile per-packet one-way delay: 109.376 ms
Loss rate: 0.29%
-- Flow 2:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 108.089 ms
Loss rate: 1.37%
-- Flow 3:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 108.644 ms
Loss rate: 1.67%
```

Run 5: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-11-15 05:58:55

End at: 2018-11-15 05:59:25

Local clock offset: -0.294 ms

Remote clock offset: 0.103 ms

# Below is generated by plot.py at 2018-11-15 10:23:15

# Datalink statistics

-- Total of 3 flows:

Average throughput: 369.46 Mbit/s

95th percentile per-packet one-way delay: 110.045 ms

Loss rate: 0.65%

-- Flow 1:

Average throughput: 195.03 Mbit/s

95th percentile per-packet one-way delay: 109.919 ms

Loss rate: 0.41%

-- Flow 2:

Average throughput: 179.58 Mbit/s

95th percentile per-packet one-way delay: 109.814 ms

Loss rate: 1.04%

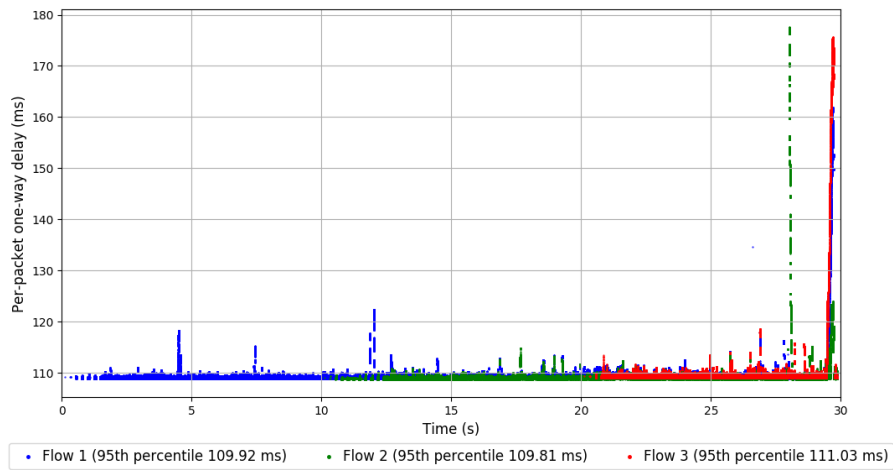
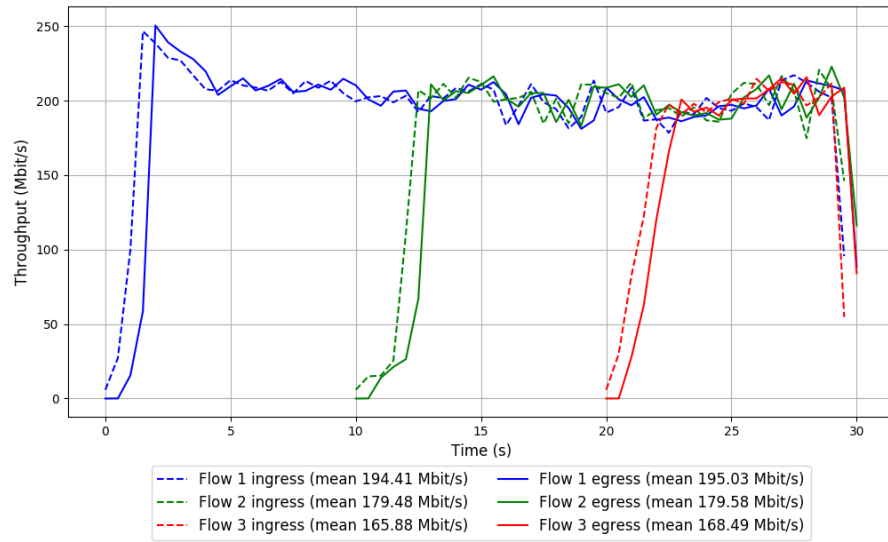
-- Flow 3:

Average throughput: 168.49 Mbit/s

95th percentile per-packet one-way delay: 111.028 ms

Loss rate: 0.65%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-11-15 06:31:19

End at: 2018-11-15 06:31:49

Local clock offset: -1.35 ms

Remote clock offset: 0.03 ms

# Below is generated by plot.py at 2018-11-15 10:23:35

# Datalink statistics

-- Total of 3 flows:

Average throughput: 379.65 Mbit/s

95th percentile per-packet one-way delay: 108.892 ms

Loss rate: 1.25%

-- Flow 1:

Average throughput: 196.38 Mbit/s

95th percentile per-packet one-way delay: 108.947 ms

Loss rate: 0.84%

-- Flow 2:

Average throughput: 191.95 Mbit/s

95th percentile per-packet one-way delay: 108.556 ms

Loss rate: 1.28%

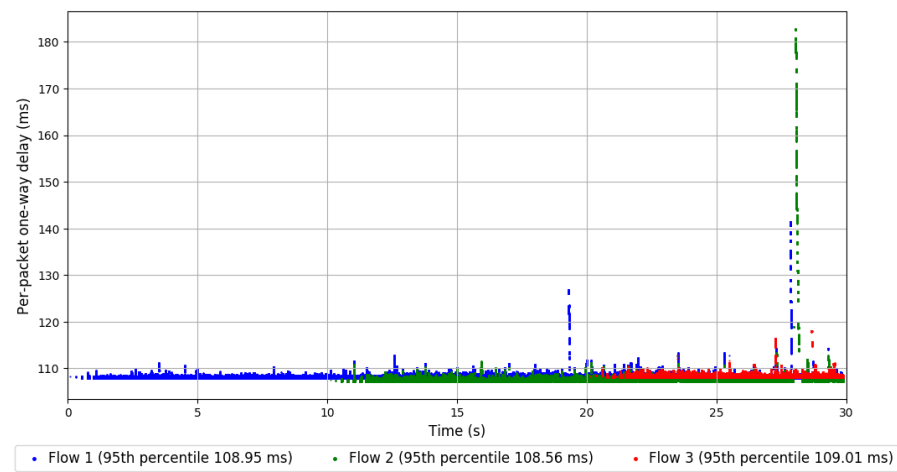
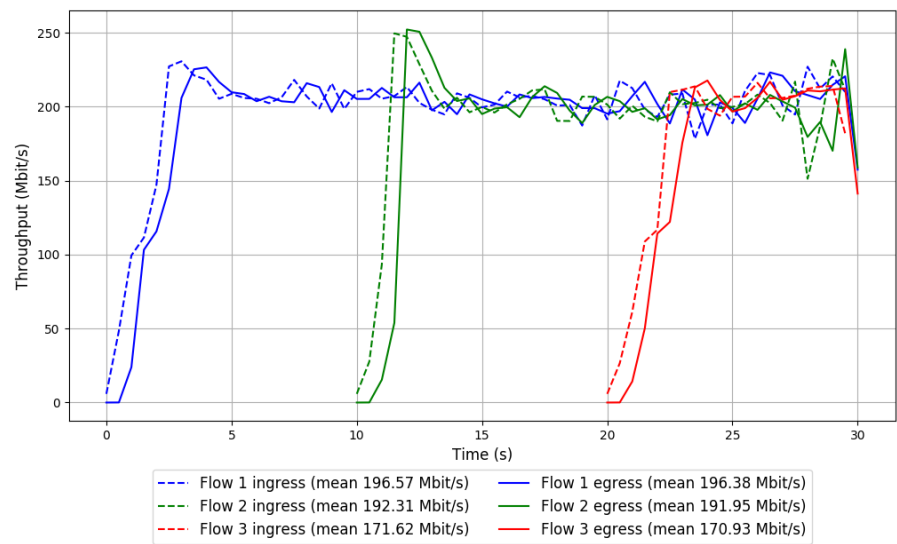
-- Flow 3:

Average throughput: 170.93 Mbit/s

95th percentile per-packet one-way delay: 109.007 ms

Loss rate: 2.59%

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

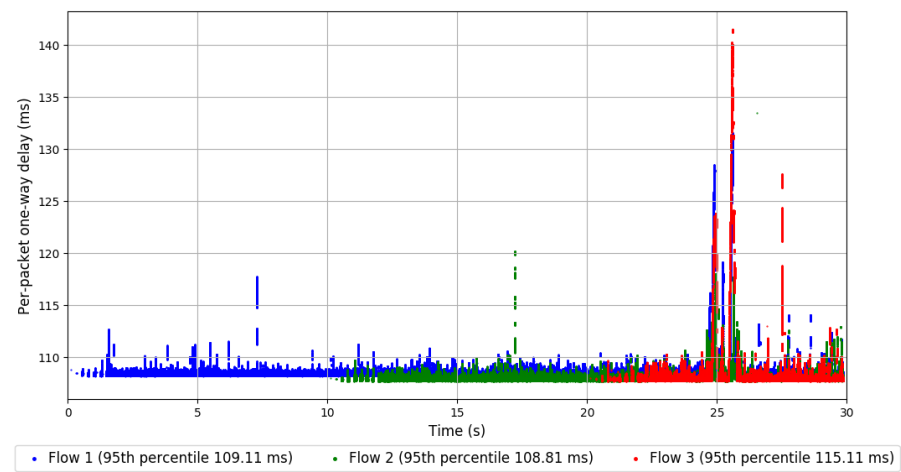
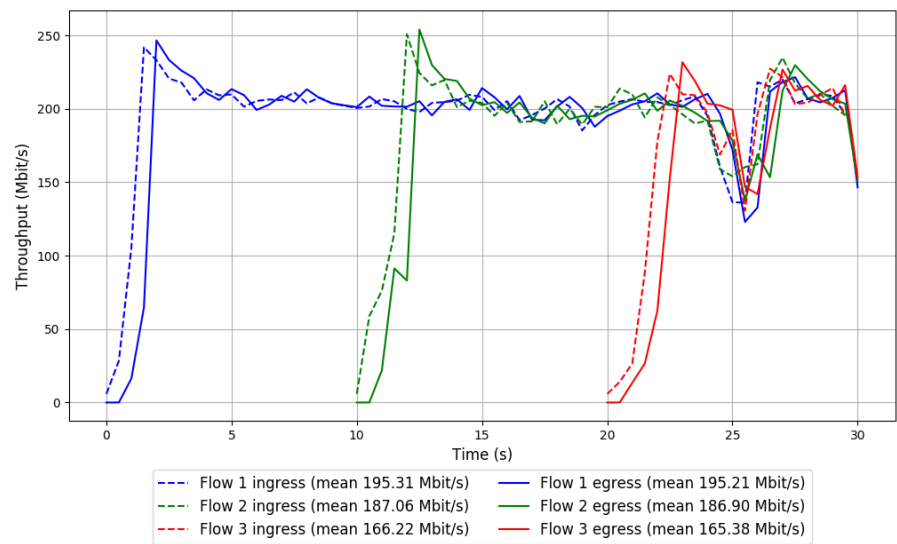


Run 3: Statistics of TaoVA-100x

Start at: 2018-11-15 07:03:33  
End at: 2018-11-15 07:04:03  
Local clock offset: -0.853 ms  
Remote clock offset: -0.071 ms

# Below is generated by plot.py at 2018-11-15 10:23:35  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 373.37 Mbit/s  
95th percentile per-packet one-way delay: 109.182 ms  
Loss rate: 1.22%  
-- Flow 1:  
Average throughput: 195.21 Mbit/s  
95th percentile per-packet one-way delay: 109.106 ms  
Loss rate: 0.80%  
-- Flow 2:  
Average throughput: 186.90 Mbit/s  
95th percentile per-packet one-way delay: 108.805 ms  
Loss rate: 1.21%  
-- Flow 3:  
Average throughput: 165.38 Mbit/s  
95th percentile per-packet one-way delay: 115.113 ms  
Loss rate: 2.74%

Run 3: Report of TaoVA-100x — Data Link





Run 4: Statistics of TaoVA-100x

Start at: 2018-11-15 07:35:47

End at: 2018-11-15 07:36:17

Local clock offset: 1.243 ms

Remote clock offset: 0.061 ms

# Below is generated by plot.py at 2018-11-15 10:23:35

# Datalink statistics

-- Total of 3 flows:

Average throughput: 200.18 Mbit/s

95th percentile per-packet one-way delay: 112.267 ms

Loss rate: 1.88%

-- Flow 1:

Average throughput: 15.87 Mbit/s

95th percentile per-packet one-way delay: 109.884 ms

Loss rate: 0.75%

-- Flow 2:

Average throughput: 190.52 Mbit/s

95th percentile per-packet one-way delay: 111.911 ms

Loss rate: 1.47%

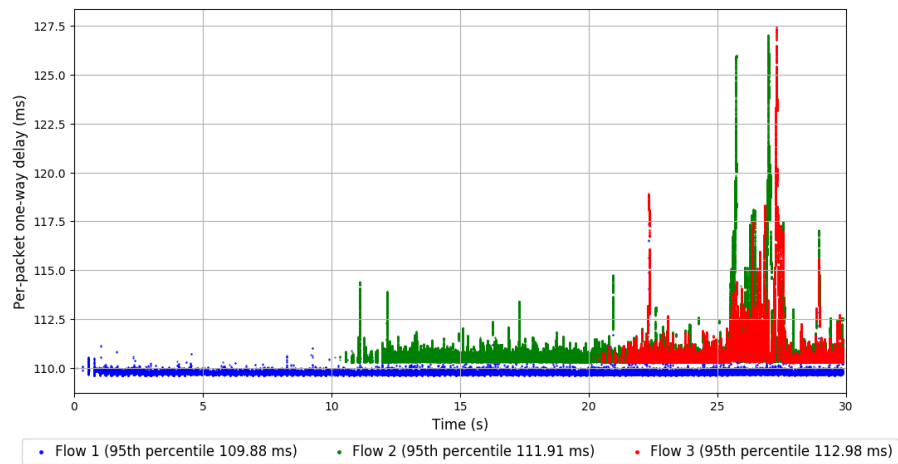
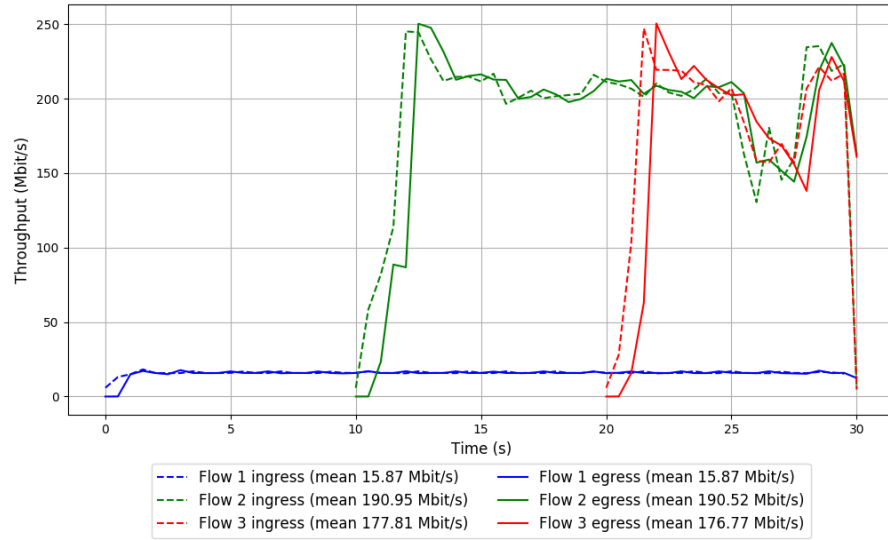
-- Flow 3:

Average throughput: 176.77 Mbit/s

95th percentile per-packet one-way delay: 112.978 ms

Loss rate: 3.05%

#### Run 4: Report of TaoVA-100x — Data Link

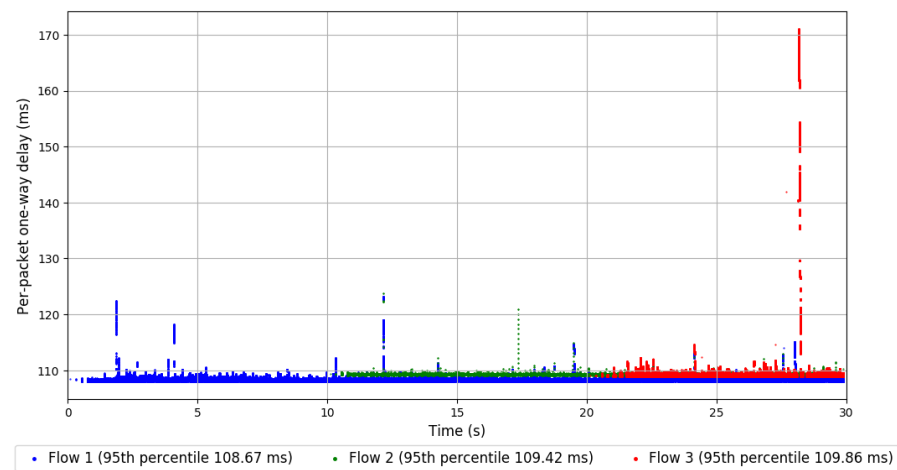
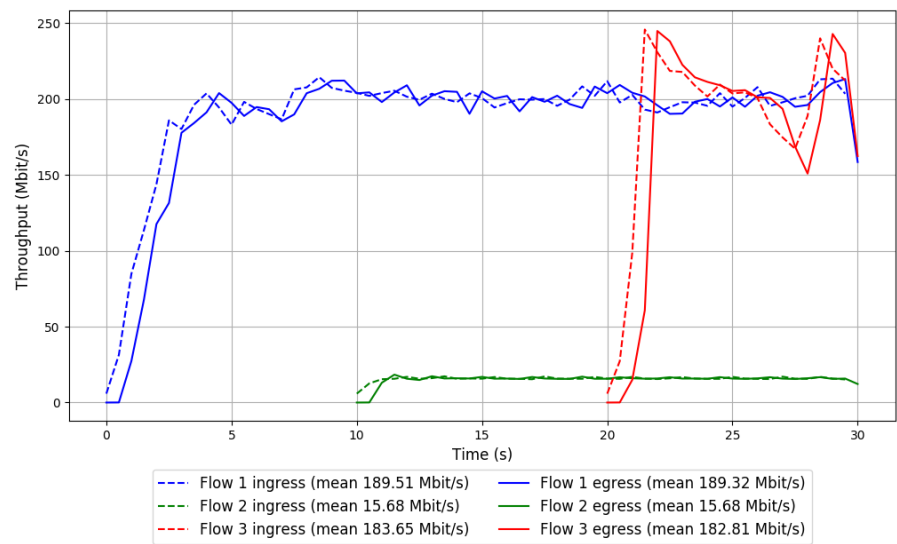


Run 5: Statistics of TaoVA-100x

Start at: 2018-11-15 08:07:16  
End at: 2018-11-15 08:07:46  
Local clock offset: -0.526 ms  
Remote clock offset: -0.033 ms

# Below is generated by plot.py at 2018-11-15 10:23:35  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 259.56 Mbit/s  
95th percentile per-packet one-way delay: 109.331 ms  
Loss rate: 1.26%  
-- Flow 1:  
Average throughput: 189.32 Mbit/s  
95th percentile per-packet one-way delay: 108.674 ms  
Loss rate: 0.82%  
-- Flow 2:  
Average throughput: 15.68 Mbit/s  
95th percentile per-packet one-way delay: 109.423 ms  
Loss rate: 1.14%  
-- Flow 3:  
Average throughput: 182.81 Mbit/s  
95th percentile per-packet one-way delay: 109.857 ms  
Loss rate: 2.64%

Run 5: Report of TaoVA-100x — Data Link



Run 1: Statistics of TCP Vegas

Start at: 2018-11-15 05:53:51

End at: 2018-11-15 05:54:21

Local clock offset: 0.381 ms

Remote clock offset: 0.083 ms

# Below is generated by plot.py at 2018-11-15 10:23:47

# Datalink statistics

-- Total of 3 flows:

Average throughput: 510.03 Mbit/s

95th percentile per-packet one-way delay: 110.362 ms

Loss rate: 1.00%

-- Flow 1:

Average throughput: 302.88 Mbit/s

95th percentile per-packet one-way delay: 110.319 ms

Loss rate: 0.78%

-- Flow 2:

Average throughput: 291.39 Mbit/s

95th percentile per-packet one-way delay: 110.640 ms

Loss rate: 1.22%

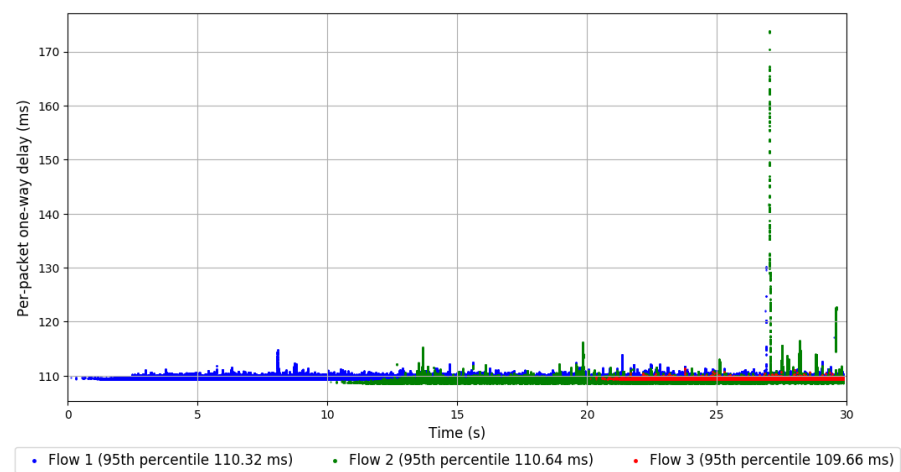
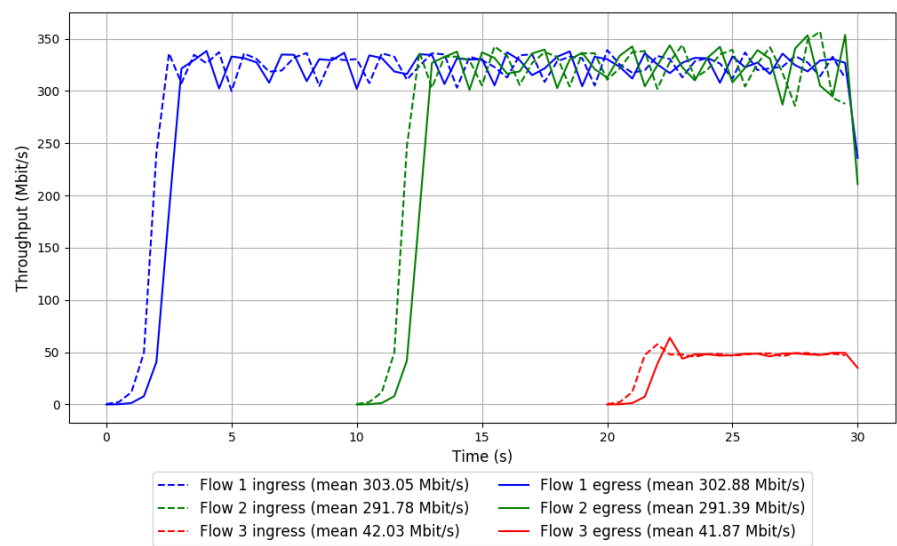
-- Flow 3:

Average throughput: 41.87 Mbit/s

95th percentile per-packet one-way delay: 109.657 ms

Loss rate: 2.56%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2018-11-15 06:26:11

End at: 2018-11-15 06:26:41

Local clock offset: -0.041 ms

Remote clock offset: 0.44 ms

# Below is generated by plot.py at 2018-11-15 10:25:52

# Datalink statistics

-- Total of 3 flows:

Average throughput: 581.15 Mbit/s

95th percentile per-packet one-way delay: 110.471 ms

Loss rate: 1.22%

-- Flow 1:

Average throughput: 303.83 Mbit/s

95th percentile per-packet one-way delay: 110.395 ms

Loss rate: 0.78%

-- Flow 2:

Average throughput: 289.57 Mbit/s

95th percentile per-packet one-way delay: 110.561 ms

Loss rate: 1.23%

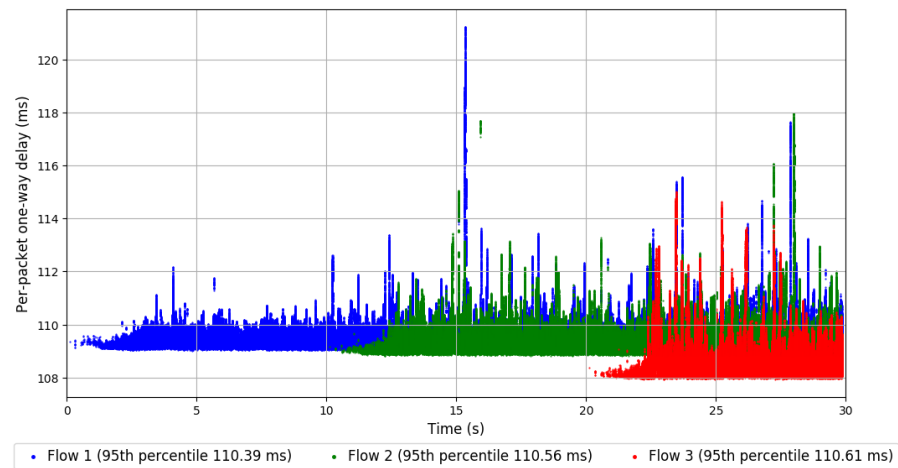
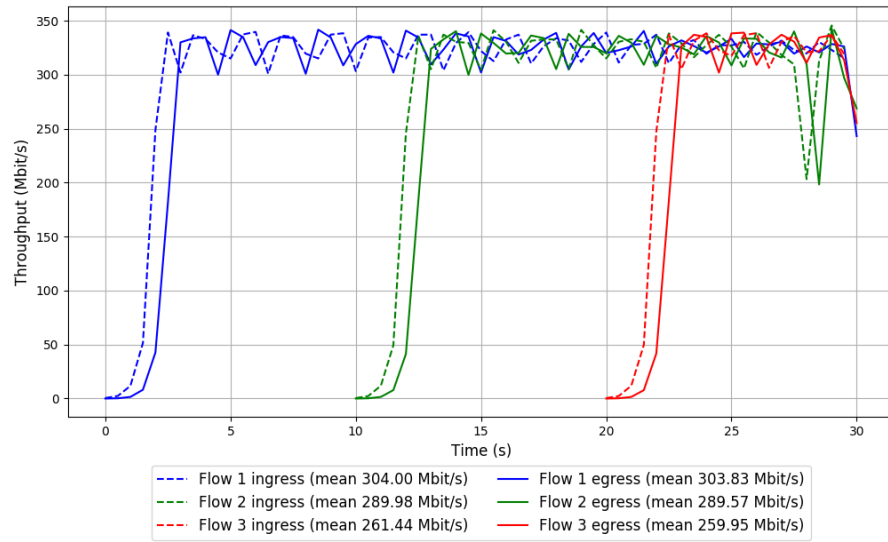
-- Flow 3:

Average throughput: 259.95 Mbit/s

95th percentile per-packet one-way delay: 110.614 ms

Loss rate: 2.74%

## Run 2: Report of TCP Vegas — Data Link



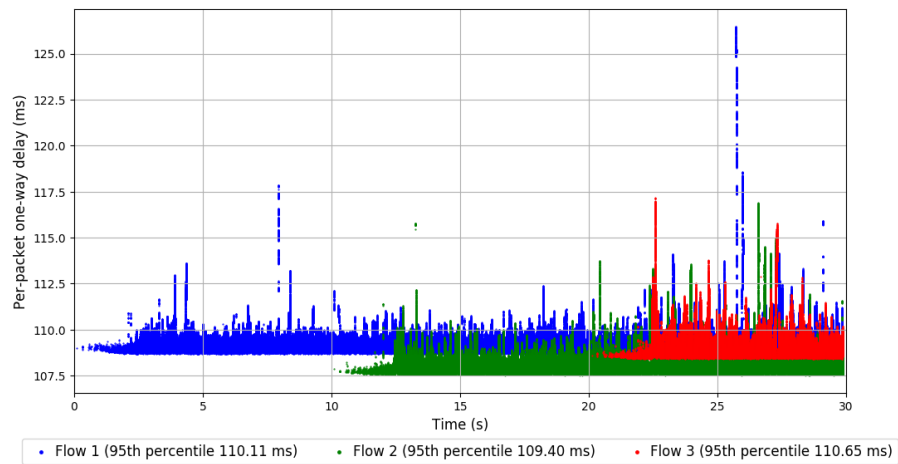
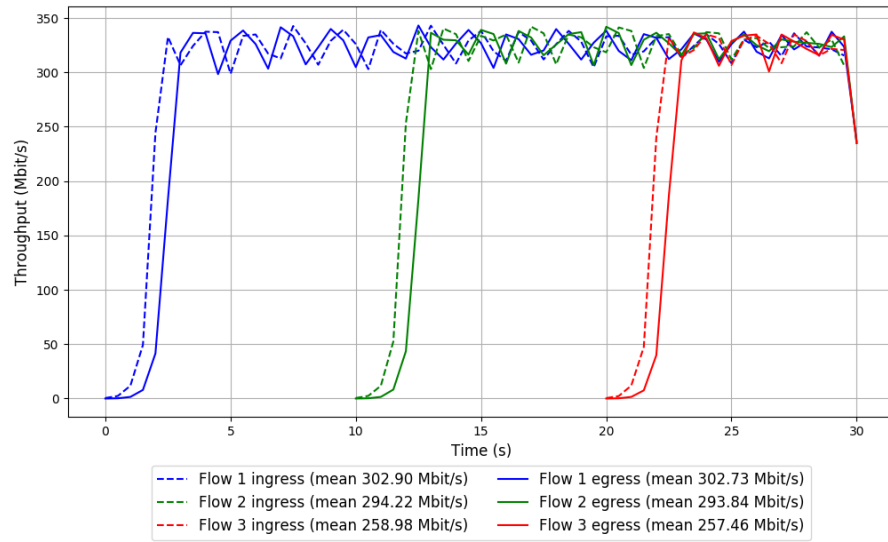


Run 3: Statistics of TCP Vegas

Start at: 2018-11-15 06:58:27  
End at: 2018-11-15 06:58:57  
Local clock offset: -0.842 ms  
Remote clock offset: -0.061 ms

# Below is generated by plot.py at 2018-11-15 10:30:15  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 582.13 Mbit/s  
95th percentile per-packet one-way delay: 110.079 ms  
Loss rate: 1.22%  
-- Flow 1:  
Average throughput: 302.73 Mbit/s  
95th percentile per-packet one-way delay: 110.109 ms  
Loss rate: 0.78%  
-- Flow 2:  
Average throughput: 293.84 Mbit/s  
95th percentile per-packet one-way delay: 109.399 ms  
Loss rate: 1.21%  
-- Flow 3:  
Average throughput: 257.46 Mbit/s  
95th percentile per-packet one-way delay: 110.649 ms  
Loss rate: 2.76%

### Run 3: Report of TCP Vegas — Data Link



Run 4: Statistics of TCP Vegas

Start at: 2018-11-15 07:30:41

End at: 2018-11-15 07:31:12

Local clock offset: -0.027 ms

Remote clock offset: 0.057 ms

# Below is generated by plot.py at 2018-11-15 10:30:15

# Datalink statistics

-- Total of 3 flows:

Average throughput: 529.39 Mbit/s

95th percentile per-packet one-way delay: 185.455 ms

Loss rate: 1.34%

-- Flow 1:

Average throughput: 278.23 Mbit/s

95th percentile per-packet one-way delay: 192.336 ms

Loss rate: 0.85%

-- Flow 2:

Average throughput: 266.54 Mbit/s

95th percentile per-packet one-way delay: 170.903 ms

Loss rate: 1.33%

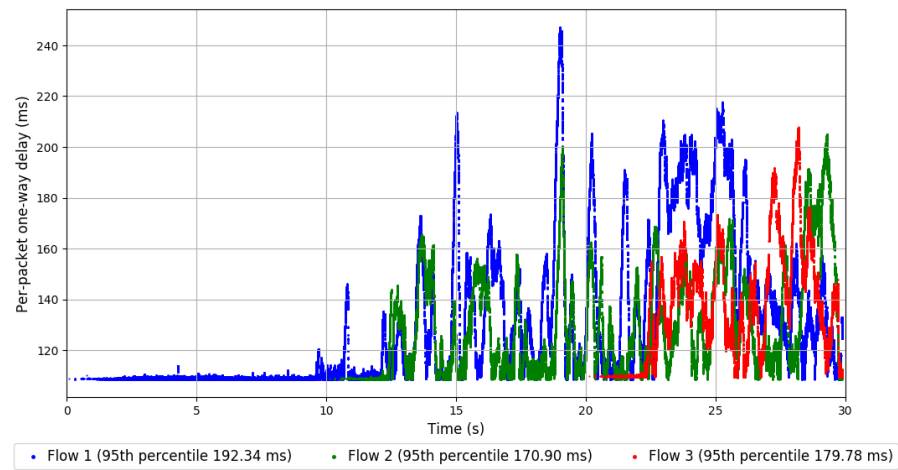
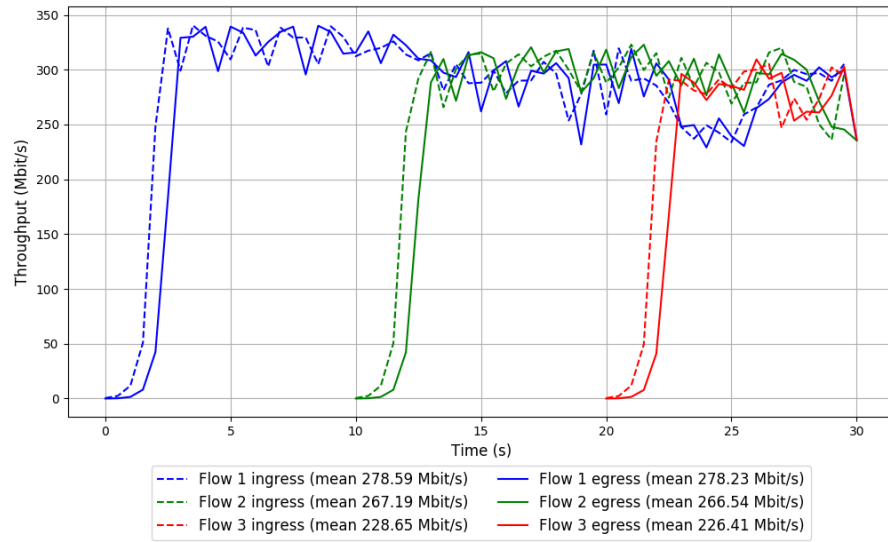
-- Flow 3:

Average throughput: 226.41 Mbit/s

95th percentile per-packet one-way delay: 179.777 ms

Loss rate: 3.12%

# Run 4: Report of TCP Vegas — Data Link



Run 5: Statistics of TCP Vegas

Start at: 2018-11-15 08:02:19

End at: 2018-11-15 08:02:49

Local clock offset: -0.342 ms

Remote clock offset: -0.03 ms

# Below is generated by plot.py at 2018-11-15 10:33:05

# Datalink statistics

-- Total of 3 flows:

Average throughput: 580.57 Mbit/s

95th percentile per-packet one-way delay: 110.996 ms

Loss rate: 1.22%

-- Flow 1:

Average throughput: 304.00 Mbit/s

95th percentile per-packet one-way delay: 111.020 ms

Loss rate: 0.78%

-- Flow 2:

Average throughput: 291.52 Mbit/s

95th percentile per-packet one-way delay: 110.934 ms

Loss rate: 1.22%

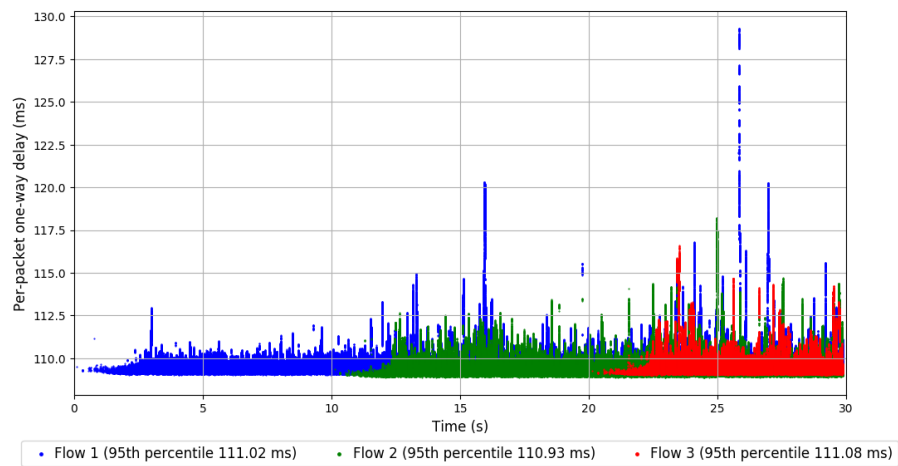
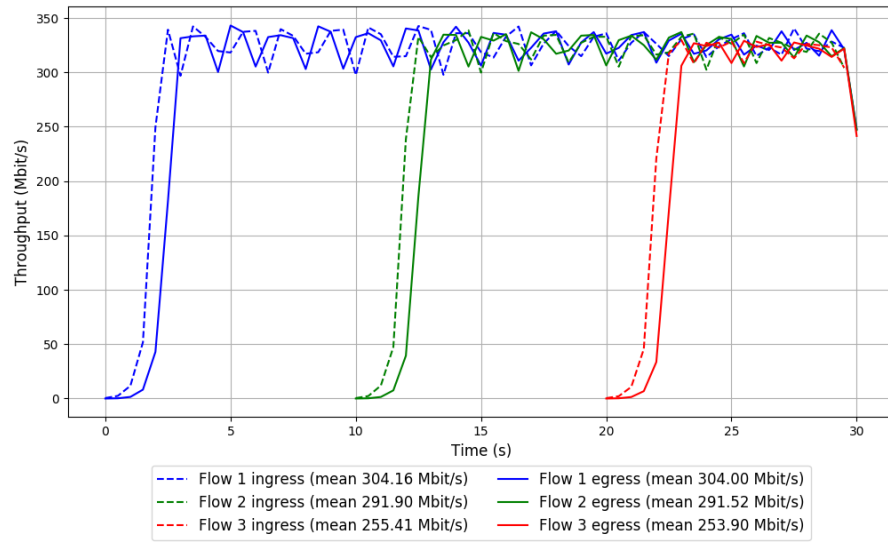
-- Flow 3:

Average throughput: 253.90 Mbit/s

95th percentile per-packet one-way delay: 111.084 ms

Loss rate: 2.79%

## Run 5: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-11-15 06:05:19

End at: 2018-11-15 06:05:49

Local clock offset: -0.049 ms

Remote clock offset: 0.099 ms

# Below is generated by plot.py at 2018-11-15 10:33:05

# Datalink statistics

-- Total of 3 flows:

Average throughput: 193.10 Mbit/s

95th percentile per-packet one-way delay: 268.165 ms

Loss rate: 6.93%

-- Flow 1:

Average throughput: 99.44 Mbit/s

95th percentile per-packet one-way delay: 152.617 ms

Loss rate: 1.76%

-- Flow 2:

Average throughput: 135.67 Mbit/s

95th percentile per-packet one-way delay: 289.212 ms

Loss rate: 12.38%

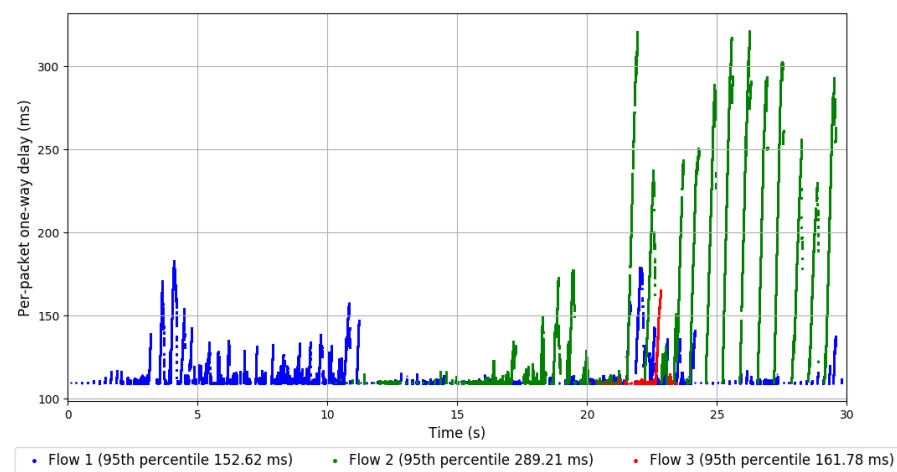
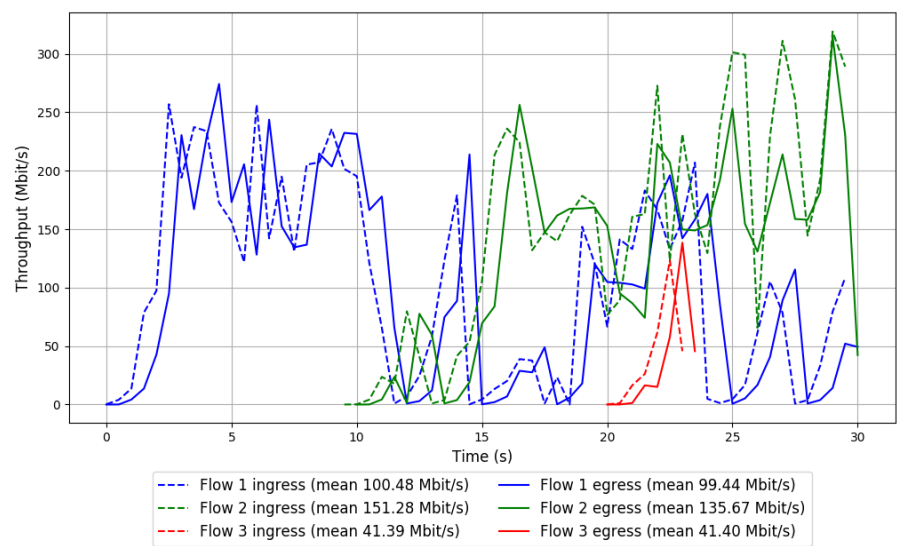
-- Flow 3:

Average throughput: 41.40 Mbit/s

95th percentile per-packet one-way delay: 161.777 ms

Loss rate: 0.00%

Run 1: Report of Verus — Data Link





Run 2: Statistics of Verus

Start at: 2018-11-15 06:37:45

End at: 2018-11-15 06:38:15

Local clock offset: -0.249 ms

Remote clock offset: 0.411 ms

# Below is generated by plot.py at 2018-11-15 10:33:05

# Datalink statistics

-- Total of 3 flows:

Average throughput: 238.27 Mbit/s

95th percentile per-packet one-way delay: 239.093 ms

Loss rate: 3.17%

-- Flow 1:

Average throughput: 146.08 Mbit/s

95th percentile per-packet one-way delay: 247.657 ms

Loss rate: 4.65%

-- Flow 2:

Average throughput: 122.31 Mbit/s

95th percentile per-packet one-way delay: 142.451 ms

Loss rate: 0.82%

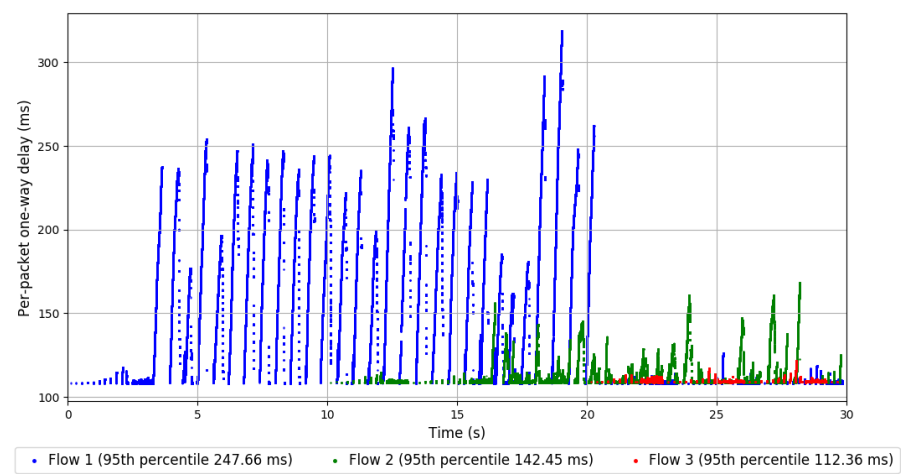
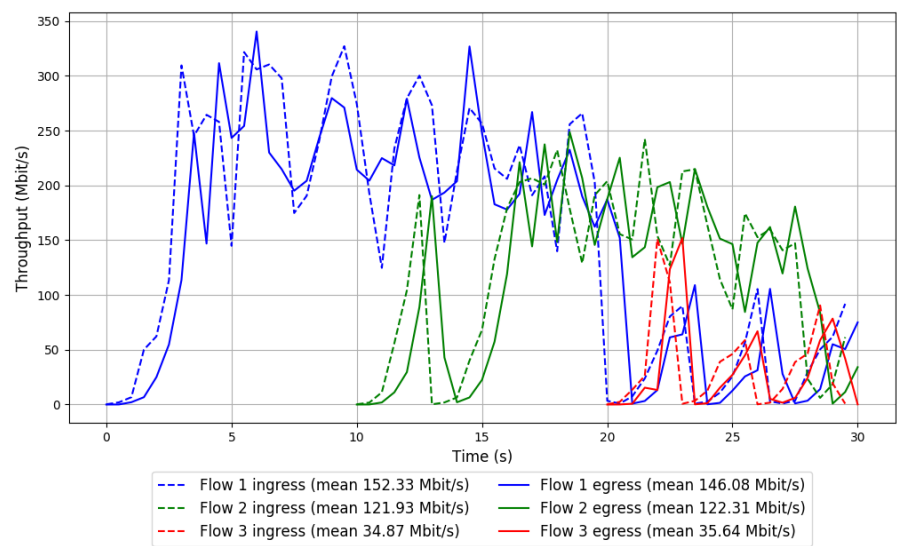
-- Flow 3:

Average throughput: 35.64 Mbit/s

95th percentile per-packet one-way delay: 112.363 ms

Loss rate: 0.10%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2018-11-15 07:09:56

End at: 2018-11-15 07:10:26

Local clock offset: 1.176 ms

Remote clock offset: 0.026 ms

# Below is generated by plot.py at 2018-11-15 10:34:50

# Datalink statistics

-- Total of 3 flows:

Average throughput: 286.27 Mbit/s

95th percentile per-packet one-way delay: 235.598 ms

Loss rate: 2.81%

-- Flow 1:

Average throughput: 145.58 Mbit/s

95th percentile per-packet one-way delay: 189.153 ms

Loss rate: 0.01%

-- Flow 2:

Average throughput: 157.80 Mbit/s

95th percentile per-packet one-way delay: 262.186 ms

Loss rate: 4.43%

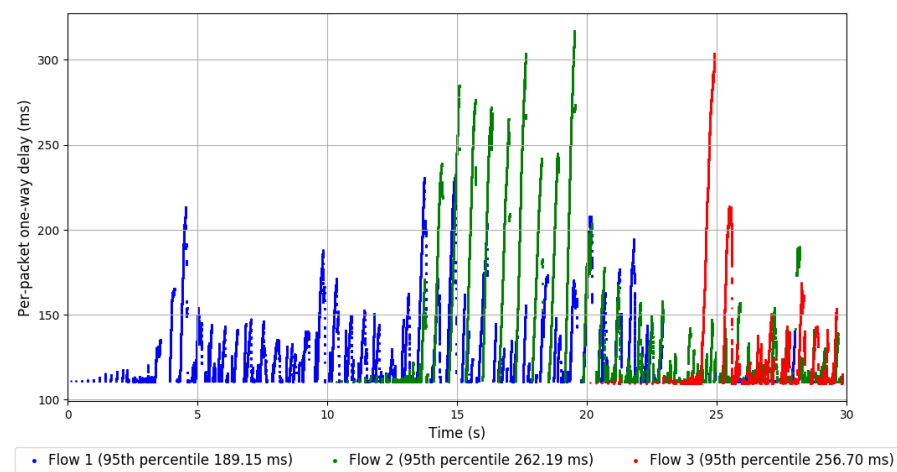
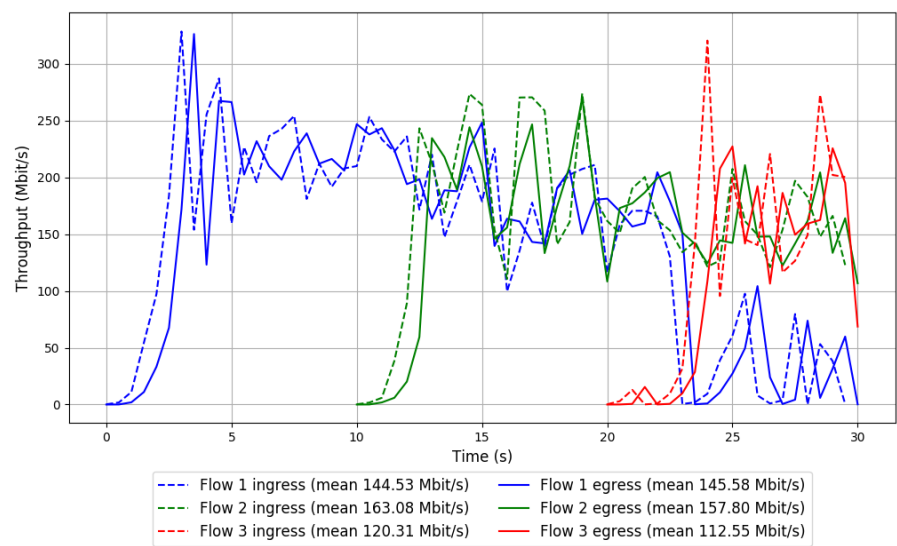
-- Flow 3:

Average throughput: 112.55 Mbit/s

95th percentile per-packet one-way delay: 256.702 ms

Loss rate: 8.51%

Run 3: Report of Verus — Data Link



Run 4: Statistics of Verus

Start at: 2018-11-15 07:41:46

End at: 2018-11-15 07:42:16

Local clock offset: -0.086 ms

Remote clock offset: 0.014 ms

# Below is generated by plot.py at 2018-11-15 10:34:50

# Datalink statistics

-- Total of 3 flows:

Average throughput: 193.46 Mbit/s

95th percentile per-packet one-way delay: 230.178 ms

Loss rate: 0.81%

-- Flow 1:

Average throughput: 103.31 Mbit/s

95th percentile per-packet one-way delay: 160.535 ms

Loss rate: 0.01%

-- Flow 2:

Average throughput: 97.01 Mbit/s

95th percentile per-packet one-way delay: 252.922 ms

Loss rate: 2.00%

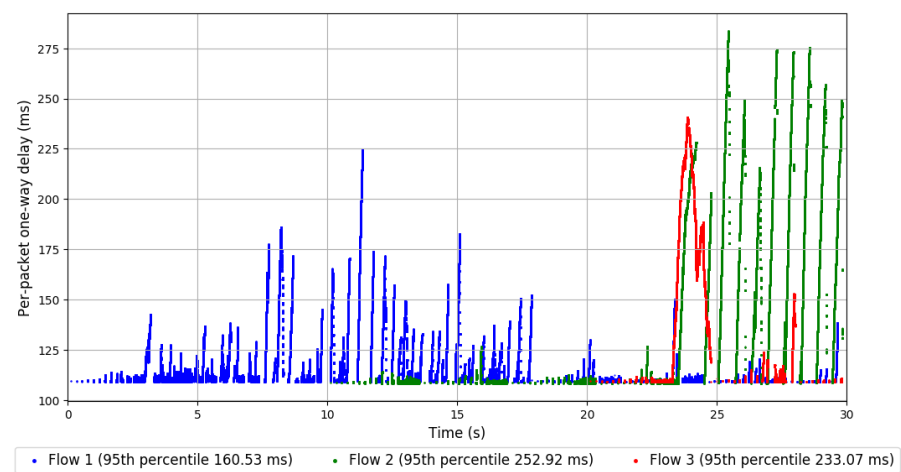
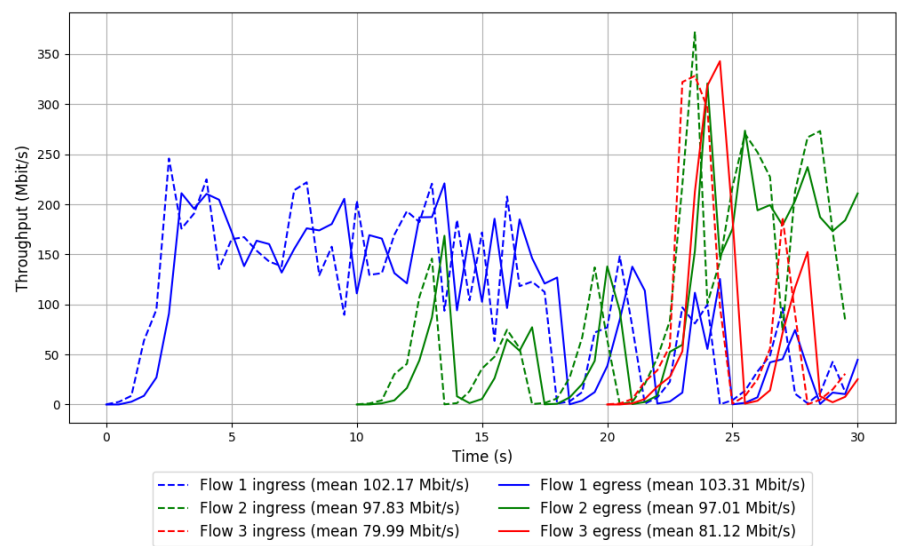
-- Flow 3:

Average throughput: 81.12 Mbit/s

95th percentile per-packet one-way delay: 233.075 ms

Loss rate: 0.97%

Run 4: Report of Verus — Data Link

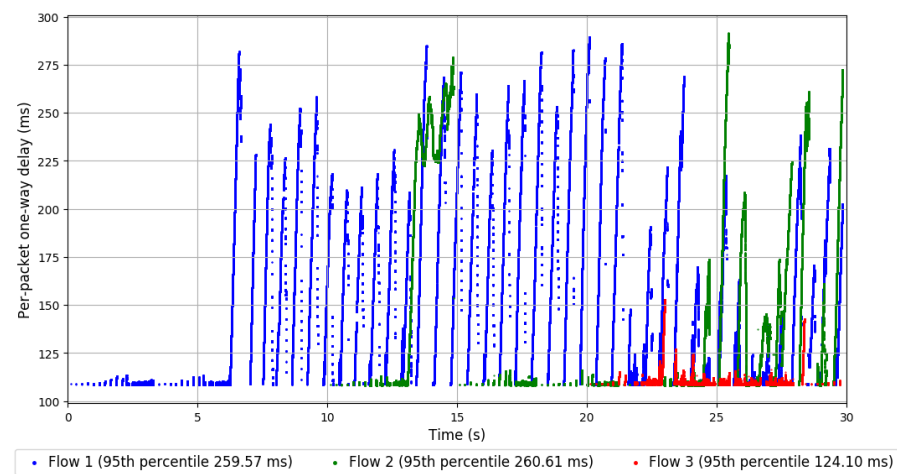
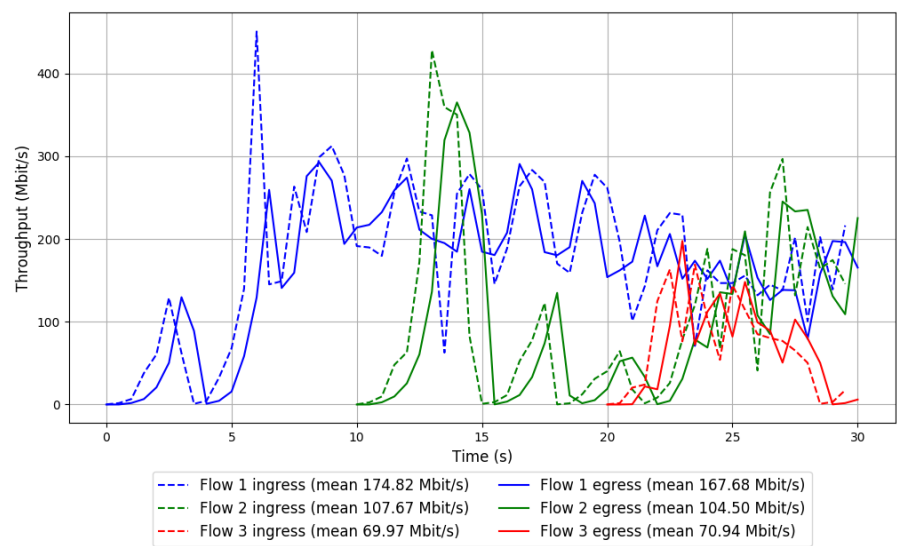


Run 5: Statistics of Verus

Start at: 2018-11-15 08:13:19  
End at: 2018-11-15 08:13:49  
Local clock offset: -1.003 ms  
Remote clock offset: -0.022 ms

# Below is generated by plot.py at 2018-11-15 10:35:50  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 259.93 Mbit/s  
95th percentile per-packet one-way delay: 258.710 ms  
Loss rate: 3.45%  
-- Flow 1:  
Average throughput: 167.68 Mbit/s  
95th percentile per-packet one-way delay: 259.570 ms  
Loss rate: 4.10%  
-- Flow 2:  
Average throughput: 104.50 Mbit/s  
95th percentile per-packet one-way delay: 260.613 ms  
Loss rate: 2.64%  
-- Flow 3:  
Average throughput: 70.94 Mbit/s  
95th percentile per-packet one-way delay: 124.102 ms  
Loss rate: 0.97%

Run 5: Report of Verus — Data Link



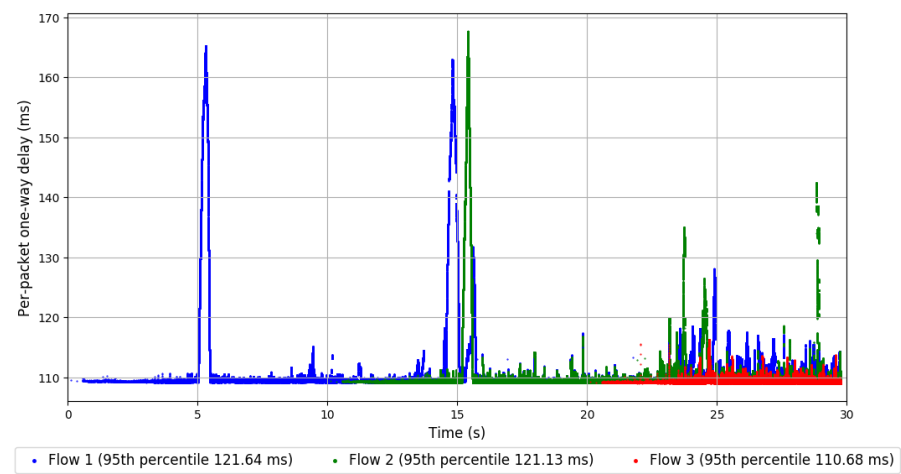
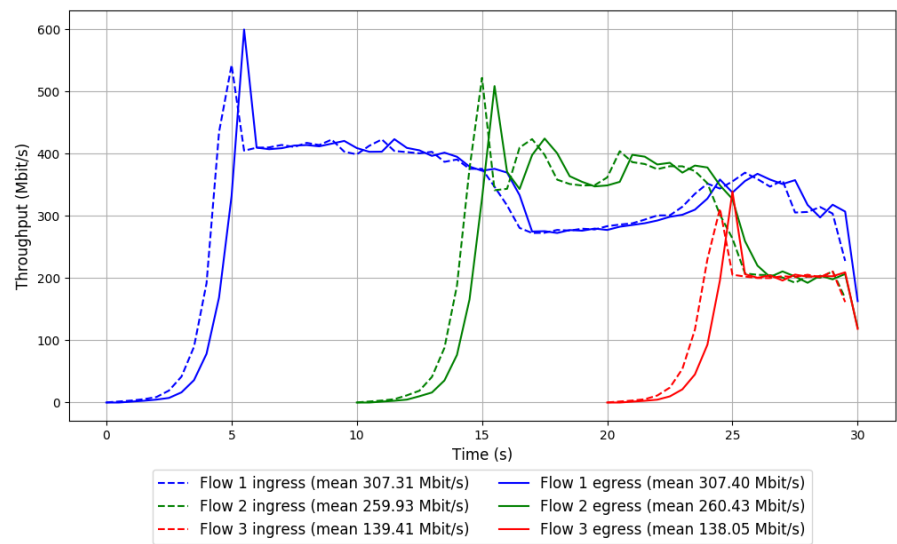


Run 1: Statistics of PCC-Vivace

Start at: 2018-11-15 06:07:02  
End at: 2018-11-15 06:07:32  
Local clock offset: -0.48 ms  
Remote clock offset: -0.329 ms

# Below is generated by plot.py at 2018-11-15 10:38:47  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 524.86 Mbit/s  
95th percentile per-packet one-way delay: 119.290 ms  
Loss rate: 1.00%  
-- Flow 1:  
Average throughput: 307.40 Mbit/s  
95th percentile per-packet one-way delay: 121.643 ms  
Loss rate: 0.70%  
-- Flow 2:  
Average throughput: 260.43 Mbit/s  
95th percentile per-packet one-way delay: 121.127 ms  
Loss rate: 0.93%  
-- Flow 3:  
Average throughput: 138.05 Mbit/s  
95th percentile per-packet one-way delay: 110.681 ms  
Loss rate: 3.21%

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2018-11-15 06:39:29

End at: 2018-11-15 06:39:59

Local clock offset: 0.733 ms

Remote clock offset: 0.024 ms

# Below is generated by plot.py at 2018-11-15 10:38:47

# Datalink statistics

-- Total of 3 flows:

Average throughput: 487.88 Mbit/s

95th percentile per-packet one-way delay: 178.911 ms

Loss rate: 1.30%

-- Flow 1:

Average throughput: 317.88 Mbit/s

95th percentile per-packet one-way delay: 204.583 ms

Loss rate: 0.75%

-- Flow 2:

Average throughput: 190.66 Mbit/s

95th percentile per-packet one-way delay: 111.594 ms

Loss rate: 1.52%

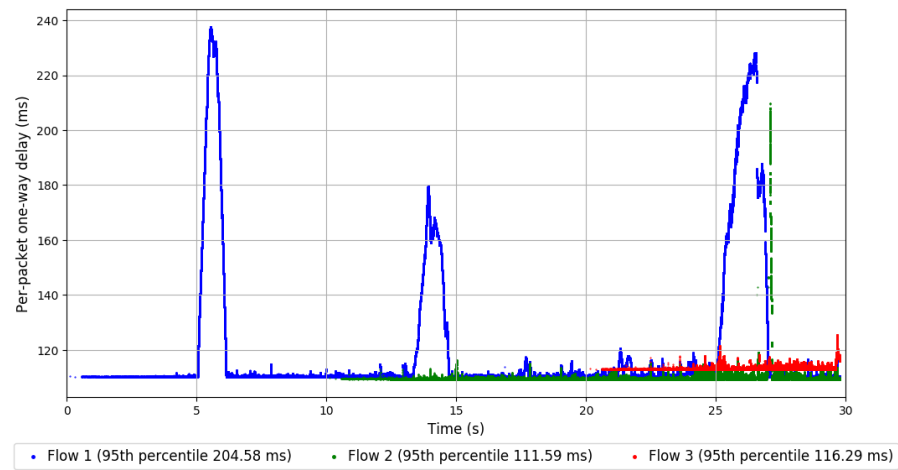
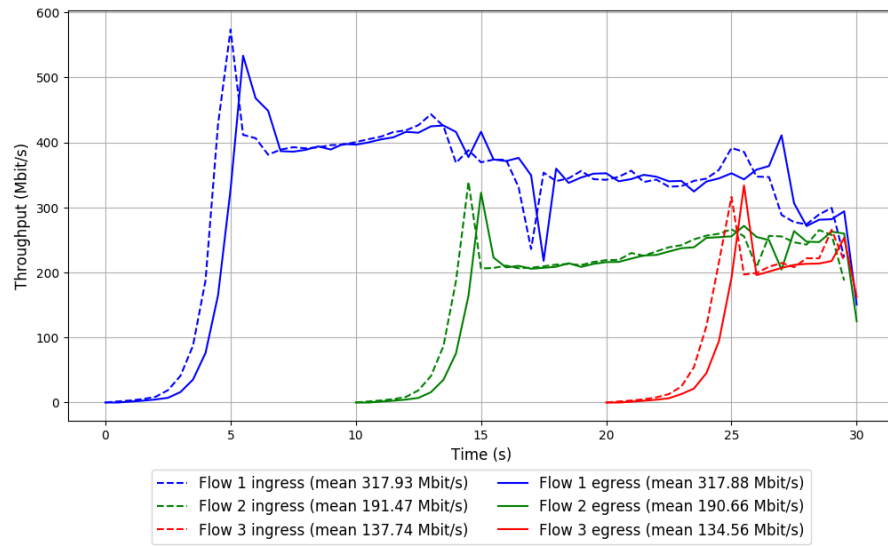
-- Flow 3:

Average throughput: 134.56 Mbit/s

95th percentile per-packet one-way delay: 116.293 ms

Loss rate: 4.55%

## Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2018-11-15 07:11:55

End at: 2018-11-15 07:12:25

Local clock offset: -0.165 ms

Remote clock offset: -0.36 ms

# Below is generated by plot.py at 2018-11-15 10:38:50

# Datalink statistics

-- Total of 3 flows:

Average throughput: 460.46 Mbit/s

95th percentile per-packet one-way delay: 137.151 ms

Loss rate: 1.32%

-- Flow 1:

Average throughput: 241.74 Mbit/s

95th percentile per-packet one-way delay: 111.357 ms

Loss rate: 0.87%

-- Flow 2:

Average throughput: 253.01 Mbit/s

95th percentile per-packet one-way delay: 205.315 ms

Loss rate: 1.33%

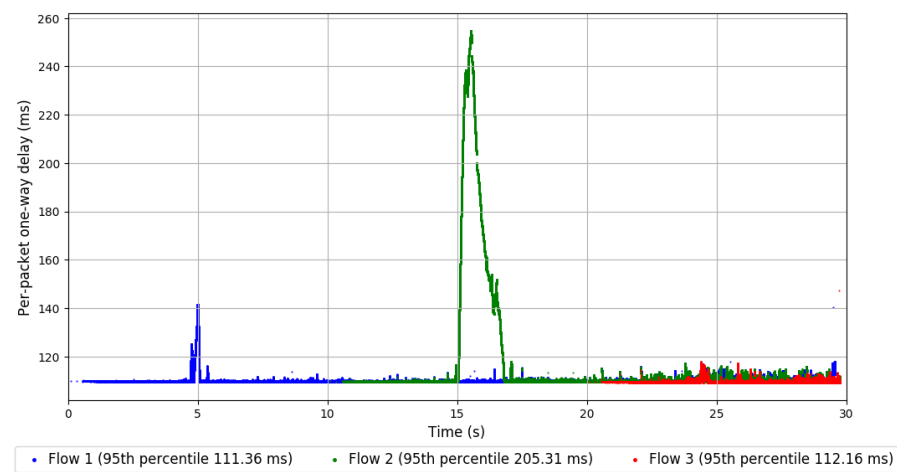
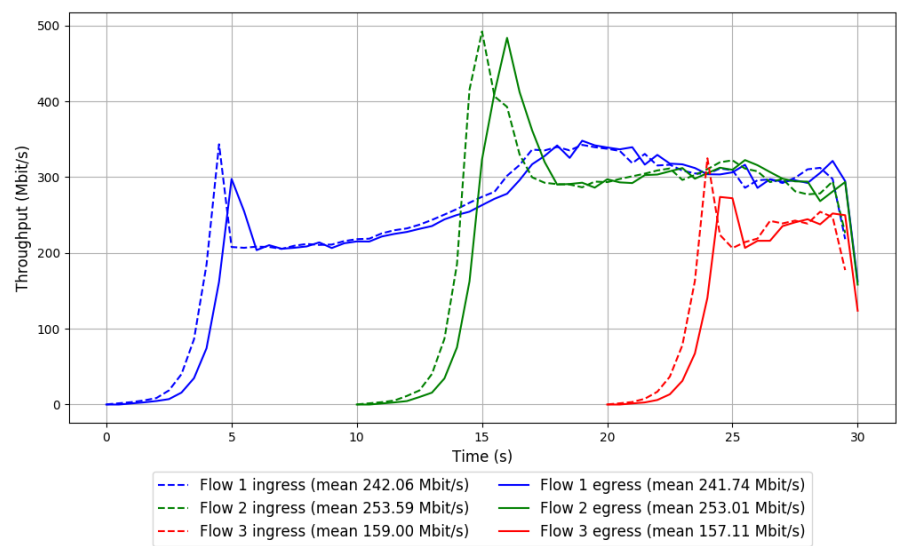
-- Flow 3:

Average throughput: 157.11 Mbit/s

95th percentile per-packet one-way delay: 112.164 ms

Loss rate: 3.39%

Run 3: Report of PCC-Vivace — Data Link



Run 4: Statistics of PCC-Vivace

Start at: 2018-11-15 07:43:26

End at: 2018-11-15 07:43:56

Local clock offset: 0.961 ms

Remote clock offset: 0.066 ms

# Below is generated by plot.py at 2018-11-15 10:38:50

# Datalink statistics

-- Total of 3 flows:

Average throughput: 405.61 Mbit/s

95th percentile per-packet one-way delay: 131.468 ms

Loss rate: 1.34%

-- Flow 1:

Average throughput: 247.35 Mbit/s

95th percentile per-packet one-way delay: 137.169 ms

Loss rate: 1.05%

-- Flow 2:

Average throughput: 176.49 Mbit/s

95th percentile per-packet one-way delay: 145.698 ms

Loss rate: 1.26%

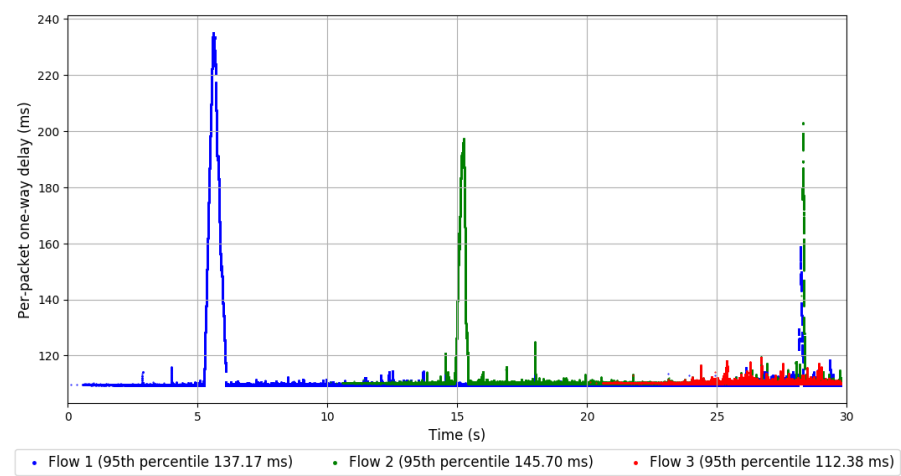
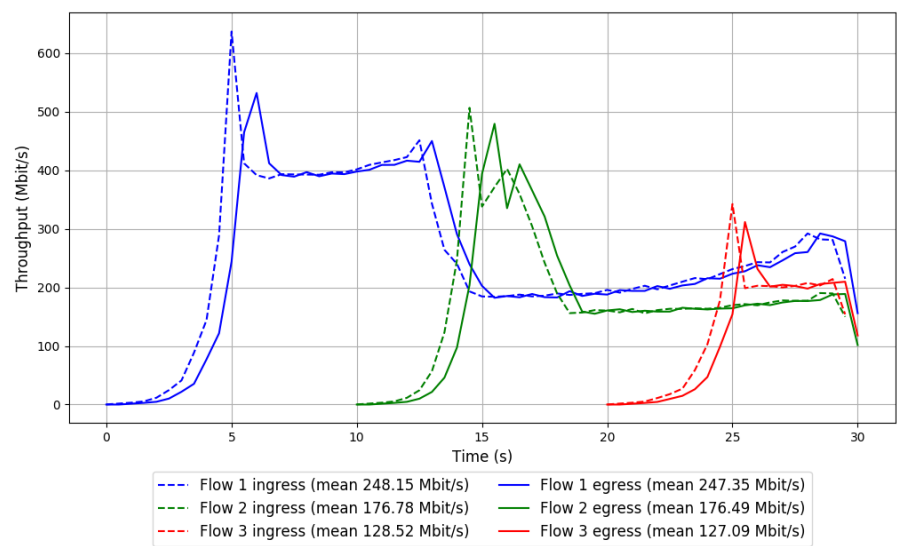
-- Flow 3:

Average throughput: 127.09 Mbit/s

95th percentile per-packet one-way delay: 112.377 ms

Loss rate: 3.30%

Run 4: Report of PCC-Vivace — Data Link





Run 5: Statistics of PCC-Vivace

Start at: 2018-11-15 08:15:06

End at: 2018-11-15 08:15:36

Local clock offset: -0.633 ms

Remote clock offset: 0.028 ms

# Below is generated by plot.py at 2018-11-15 10:38:57

# Datalink statistics

-- Total of 3 flows:

Average throughput: 426.04 Mbit/s

95th percentile per-packet one-way delay: 111.162 ms

Loss rate: 1.20%

-- Flow 1:

Average throughput: 249.34 Mbit/s

95th percentile per-packet one-way delay: 111.338 ms

Loss rate: 0.54%

-- Flow 2:

Average throughput: 203.23 Mbit/s

95th percentile per-packet one-way delay: 110.604 ms

Loss rate: 1.66%

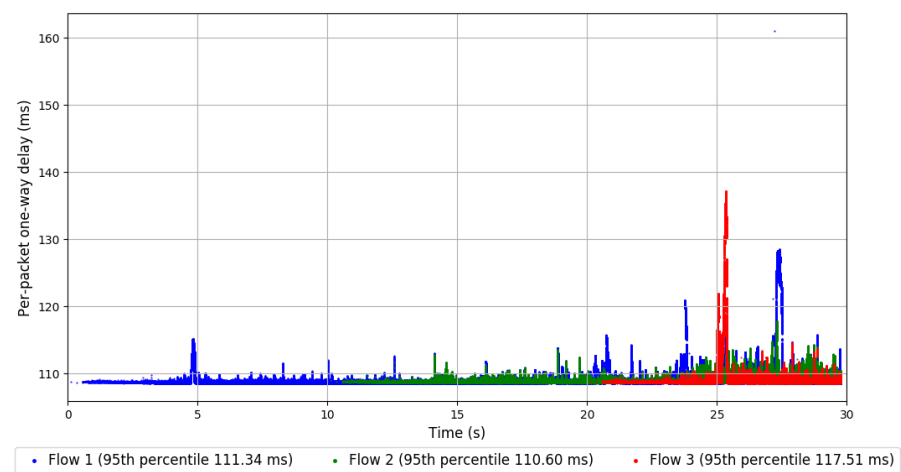
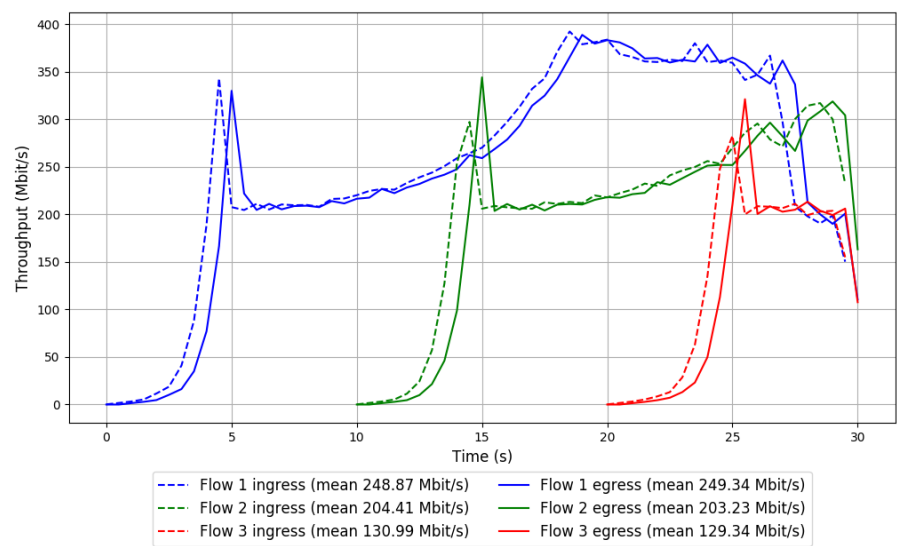
-- Flow 3:

Average throughput: 129.34 Mbit/s

95th percentile per-packet one-way delay: 117.506 ms

Loss rate: 3.50%

Run 5: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-11-15 05:55:39

End at: 2018-11-15 05:56:09

Local clock offset: -0.503 ms

Remote clock offset: 0.103 ms

# Below is generated by plot.py at 2018-11-15 10:38:57

# Datalink statistics

-- Total of 3 flows:

Average throughput: 2.85 Mbit/s

95th percentile per-packet one-way delay: 111.725 ms

Loss rate: 1.54%

-- Flow 1:

Average throughput: 1.44 Mbit/s

95th percentile per-packet one-way delay: 109.086 ms

Loss rate: 1.18%

-- Flow 2:

Average throughput: 1.06 Mbit/s

95th percentile per-packet one-way delay: 111.813 ms

Loss rate: 1.32%

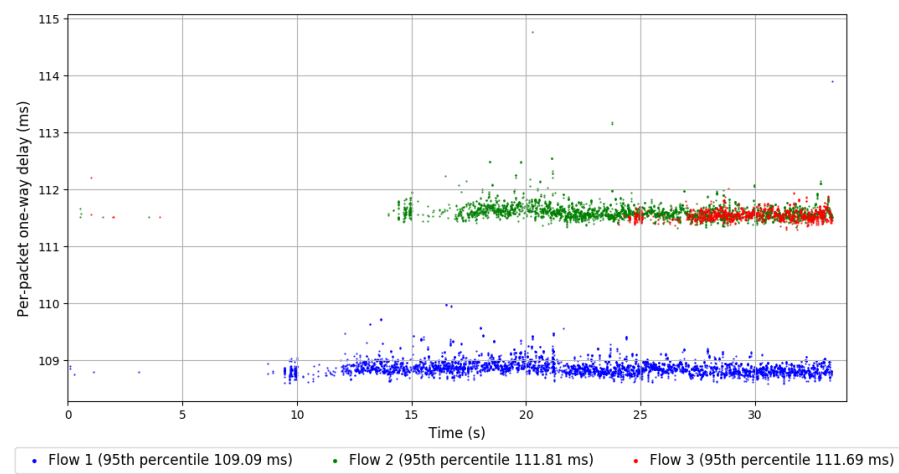
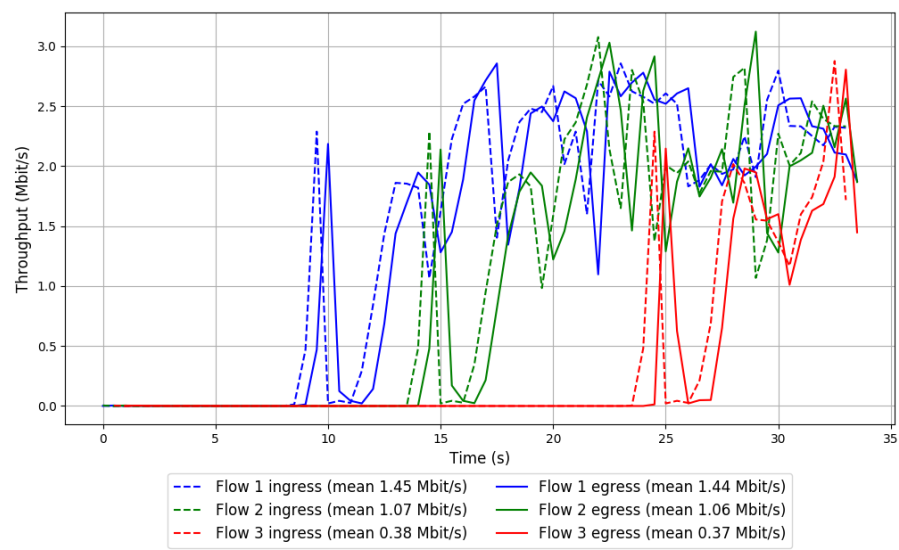
-- Flow 3:

Average throughput: 0.37 Mbit/s

95th percentile per-packet one-way delay: 111.694 ms

Loss rate: 3.52%

Run 1: Report of WebRTC media — Data Link

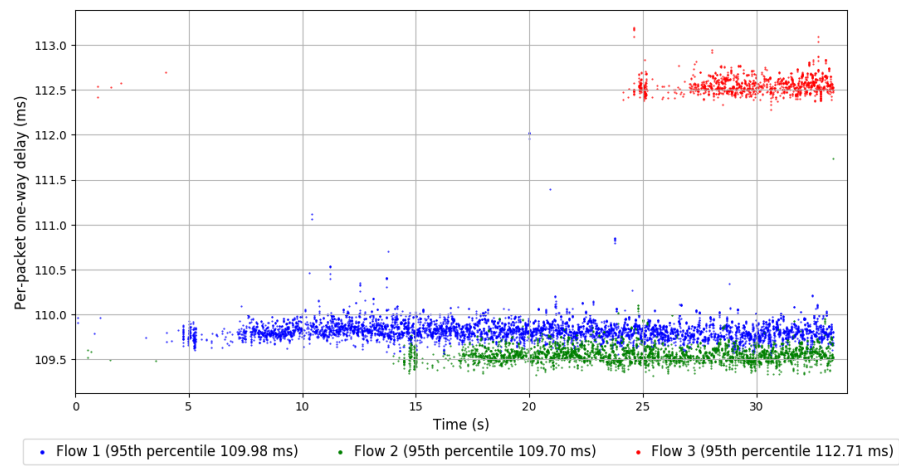
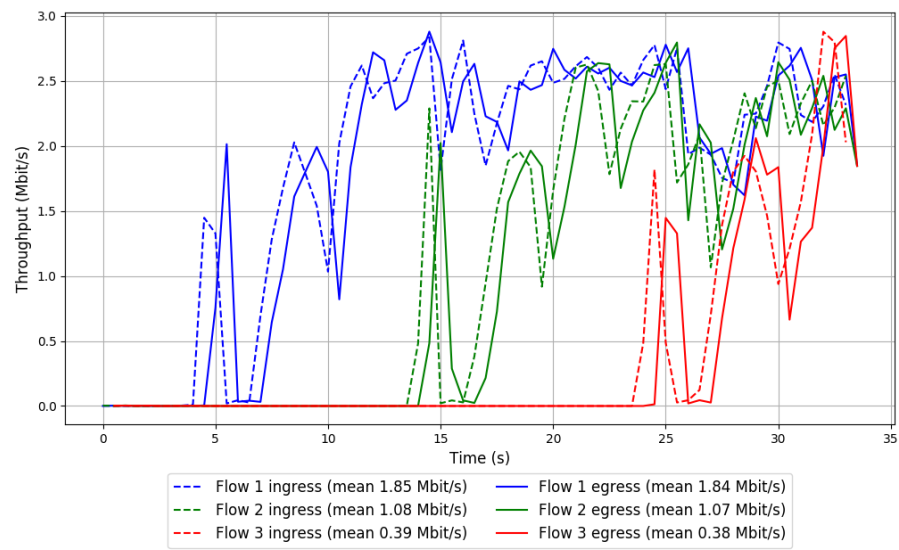


Run 2: Statistics of WebRTC media

Start at: 2018-11-15 06:28:03  
End at: 2018-11-15 06:28:33  
Local clock offset: -0.113 ms  
Remote clock offset: -0.236 ms

# Below is generated by plot.py at 2018-11-15 10:38:57  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 3.27 Mbit/s  
95th percentile per-packet one-way delay: 112.556 ms  
Loss rate: 1.31%  
-- Flow 1:  
Average throughput: 1.84 Mbit/s  
95th percentile per-packet one-way delay: 109.982 ms  
Loss rate: 0.75%  
-- Flow 2:  
Average throughput: 1.07 Mbit/s  
95th percentile per-packet one-way delay: 109.704 ms  
Loss rate: 1.61%  
-- Flow 3:  
Average throughput: 0.38 Mbit/s  
95th percentile per-packet one-way delay: 112.714 ms  
Loss rate: 3.19%

Run 2: Report of WebRTC media — Data Link

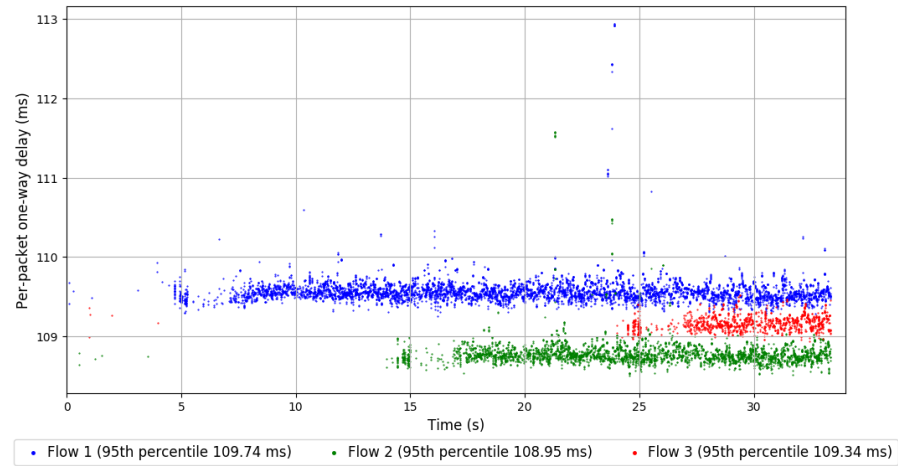
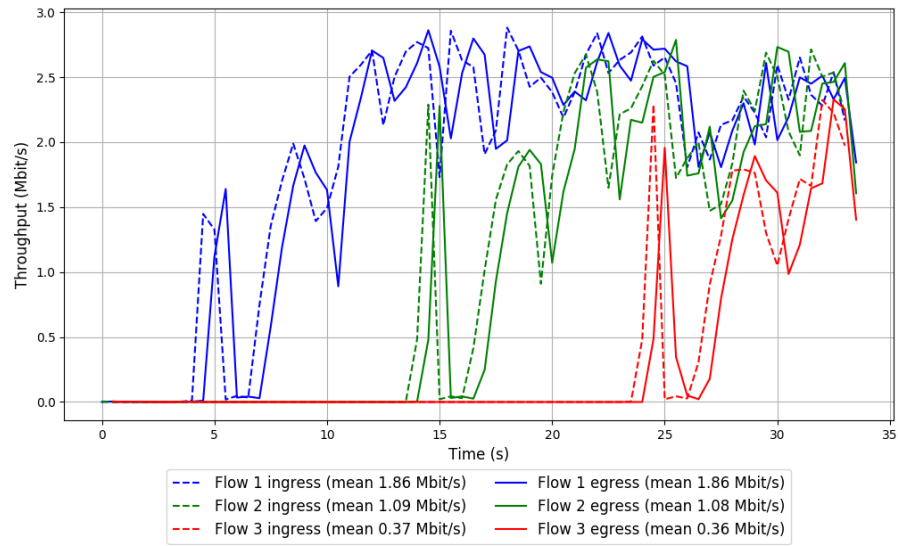


Run 3: Statistics of WebRTC media

Start at: 2018-11-15 07:00:18  
End at: 2018-11-15 07:00:48  
Local clock offset: -0.049 ms  
Remote clock offset: -0.017 ms

# Below is generated by plot.py at 2018-11-15 10:38:57  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 3.28 Mbit/s  
95th percentile per-packet one-way delay: 109.697 ms  
Loss rate: 1.36%  
-- Flow 1:  
Average throughput: 1.86 Mbit/s  
95th percentile per-packet one-way delay: 109.739 ms  
Loss rate: 0.78%  
-- Flow 2:  
Average throughput: 1.08 Mbit/s  
95th percentile per-packet one-way delay: 108.946 ms  
Loss rate: 1.49%  
-- Flow 3:  
Average throughput: 0.36 Mbit/s  
95th percentile per-packet one-way delay: 109.341 ms  
Loss rate: 3.94%

### Run 3: Report of WebRTC media — Data Link





Run 4: Statistics of WebRTC media

Start at: 2018-11-15 07:32:30

End at: 2018-11-15 07:33:00

Local clock offset: -1.0 ms

Remote clock offset: 0.088 ms

# Below is generated by plot.py at 2018-11-15 10:38:57

# Datalink statistics

-- Total of 3 flows:

Average throughput: 3.23 Mbit/s

95th percentile per-packet one-way delay: 110.461 ms

Loss rate: 1.42%

-- Flow 1:

Average throughput: 1.82 Mbit/s

95th percentile per-packet one-way delay: 108.632 ms

Loss rate: 0.89%

-- Flow 2:

Average throughput: 1.06 Mbit/s

95th percentile per-packet one-way delay: 110.534 ms

Loss rate: 1.29%

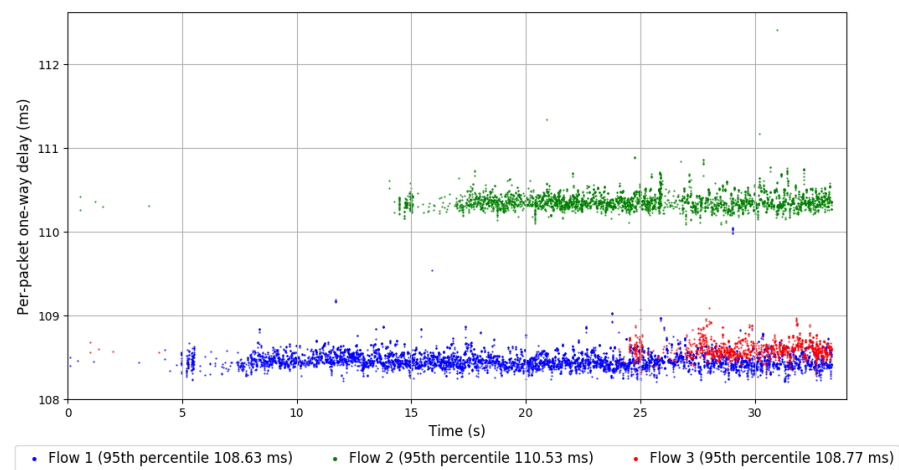
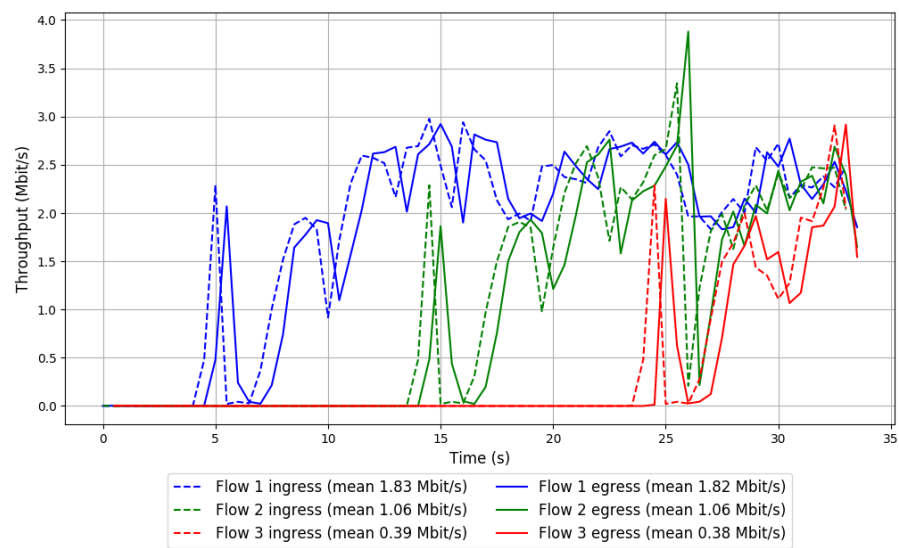
-- Flow 3:

Average throughput: 0.38 Mbit/s

95th percentile per-packet one-way delay: 108.768 ms

Loss rate: 4.27%

Run 4: Report of WebRTC media — Data Link



Run 5: Statistics of WebRTC media

Start at: 2018-11-15 08:04:11

End at: 2018-11-15 08:04:41

Local clock offset: -0.894 ms

Remote clock offset: -0.02 ms

# Below is generated by plot.py at 2018-11-15 10:38:57

# Datalink statistics

-- Total of 3 flows:

Average throughput: 3.24 Mbit/s

95th percentile per-packet one-way delay: 108.806 ms

Loss rate: 1.36%

-- Flow 1:

Average throughput: 1.84 Mbit/s

95th percentile per-packet one-way delay: 108.834 ms

Loss rate: 1.04%

-- Flow 2:

Average throughput: 1.07 Mbit/s

95th percentile per-packet one-way delay: 108.017 ms

Loss rate: 1.28%

-- Flow 3:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 109.014 ms

Loss rate: 3.25%

Run 5: Report of WebRTC media — Data Link

