

## Pantheon Report

Generated at 2018-12-11 01:39:00 (UTC).

Data path: AWS Brazil 2 on `ens5` (*local*) → Colombia cellular on `ppp0` (*remote*).

Repeated the test of 19 congestion control schemes 3 times.

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

NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

### System info:

```
Linux 4.15.0-1029-aws
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 @ c6268d7c473682290bfe9901ef81a6b6a1e51d3c
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
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
```

A scatter plot showing the relationship between Average throughput (Mbit/s) on the y-axis and 95th percentile one-way delay (ms) on the x-axis. The x-axis is reversed, with values decreasing from left to right (8192 to 128). The y-axis ranges from 0.25 to 2.00. Data points are labeled with congestion control algorithm names and color-coded: red for Reno, green for Vegas, blue for Cubic, yellow for BBR, and purple for others. The plot shows that algorithms like QUIC Cubic and PCC-Allegro achieve high throughput at low delay, while others like PCC-Expr and Spruce have lower throughput at higher delay.

Algorithm	95th percentile one-way delay (ms)	Average throughput (Mbit/s)	Color
QUIC Cubic	~1024	~2.00	Blue
PCC-Allegro	~4096	~1.90	Red
Verus	~2048	~1.90	Blue
TCP BBR	~1024	~1.80	Yellow
Indigo-96d	~4096	~1.75	Blue
PCC-Cubic	~2048	~1.75	Blue
TaoVA-100x	~1024	~1.65	Green
LEDBAT	~256	~1.65	Green
TCP Vegas	~512	~1.55	Green
Indigo-Cube	~512	~1.45	Blue
Indigo-Cue	~256	~1.45	Blue
WebRTC media	~512	~0.75	Red
PCC-Expr	~4096	~0.35	Red
Spruce	~128	~0.25	Blue
ReAM	~128	~0.25	Red

Figure 10: Average throughput vs. 95th percentile one-way delay. The plot shows the relationship between average throughput (Mbit/s) on the y-axis and 95th percentile one-way delay (ms) on the x-axis for various congestion control algorithms. The x-axis is reversed, with values decreasing from left to right (8192 to 128 ms). The y-axis ranges from 0.25 to 2.00 Mbit/s. The legend identifies the following algorithms: PRR-Sleep (pink diamond), Copa (red circle), Indigo (dark purple diamond), QUIC Cubic (magenta circle), TCP Cubic (black star), Indigo-Muses (light purple diamond), Sprout (orange circle), Indigo-96d2da3 (dark purple diamond), PCC-Vivace (blue triangle), SCReAM (pink triangle), TCP Vegas (grey circle), TCP BBR (yellow triangle), Verus (light blue circle), PCC-Allegro (cyan triangle), PCC-Expr (olive triangle), WebRTC media (brown triangle), TaoVA-100x (grey diamond), and LEDBAT (green triangle).

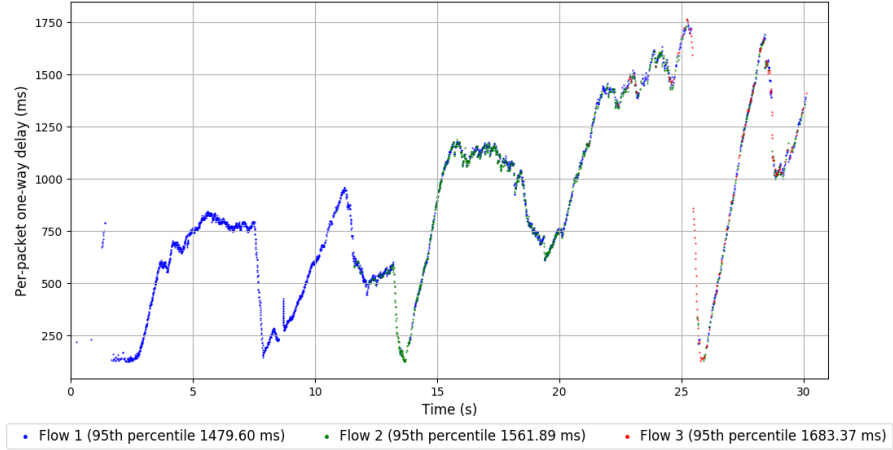
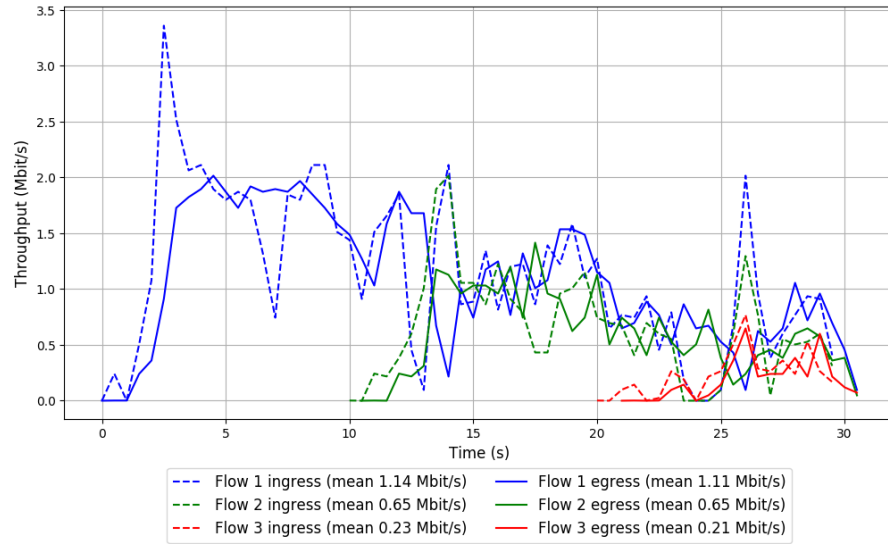
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	1.26	0.58	0.54	1346.84	1459.92	1504.94	2.41	3.92	13.80
Copa	3	1.43	0.87	0.68	284.57	231.78	283.68	0.53	1.14	0.48
TCP Cubic	3	1.08	0.90	0.22	1991.15	2497.01	2533.92	4.56	9.40	31.85
FillP	3	1.29	0.86	0.07	4140.37	4340.46	4241.05	19.28	38.60	97.91
FillP-Sheep	3	0.98	0.79	0.69	3475.86	4266.63	4243.26	10.14	19.73	70.07
Indigo	3	0.82	0.68	0.59	278.67	301.35	521.46	0.05	0.22	0.51
Indigo-96d2da3	3	1.33	0.65	0.19	4257.71	4673.70	3947.79	65.17	50.41	46.05
LEDBAT	3	1.19	0.56	0.33	328.92	347.37	343.92	0.54	0.73	1.76
Indigo-Muses	3	0.82	0.64	0.61	527.30	385.06	452.16	0.22	0.31	0.45
PCC-Allegro	3	1.89	0.00	0.00	3743.75	3352.25	2829.47	50.63	4.69	10.00
PCC-Expr	3	0.01	0.01	1.09	280.00	1398.42	4670.35	54.76	0.00	80.21
QUIC Cubic	3	1.46	0.68	0.27	1413.00	1569.99	1676.83	3.06	6.39	20.20
SCReAM	3	0.08	0.21	0.16	130.21	135.78	142.88	0.14	0.06	0.45
Sprout	3	0.13	0.14	0.16	183.30	160.27	173.09	0.14	0.67	0.03
TaoVA-100x	3	1.00	0.74	0.58	862.16	1164.76	1213.35	1.68	14.05	10.20
TCP Vegas	3	0.90	0.59	0.85	526.36	694.62	814.64	0.27	0.68	1.53
Verus	3	1.88	0.01	0.01	1924.42	1817.93	1672.69	2.98	10.45	16.56
PCC-Vivace	3	1.01	1.04	0.00	4629.65	4717.36	4777.51	27.54	36.94	18.82
WebRTC media	3	0.39	0.33	0.04	481.18	504.25	689.43	0.22	0.41	1.29

Run 1: Statistics of TCP BBR

Start at: 2018-12-11 00:30:56  
End at: 2018-12-11 00:31:26  
Local clock offset: -2.214 ms  
Remote clock offset: -854.739 ms

# Below is generated by plot.py at 2018-12-11 01:38:21  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.59 Mbit/s  
95th percentile per-packet one-way delay: 1536.513 ms  
Loss rate: 4.03%  
-- Flow 1:  
Average throughput: 1.11 Mbit/s  
95th percentile per-packet one-way delay: 1479.599 ms  
Loss rate: 2.84%  
-- Flow 2:  
Average throughput: 0.65 Mbit/s  
95th percentile per-packet one-way delay: 1561.892 ms  
Loss rate: 4.63%  
-- Flow 3:  
Average throughput: 0.21 Mbit/s  
95th percentile per-packet one-way delay: 1683.371 ms  
Loss rate: 18.30%

# Run 1: Report of TCP BBR — Data Link

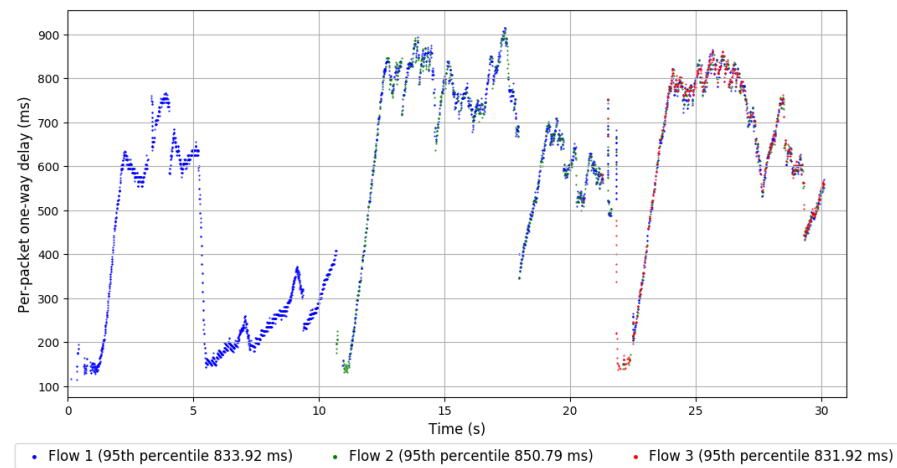
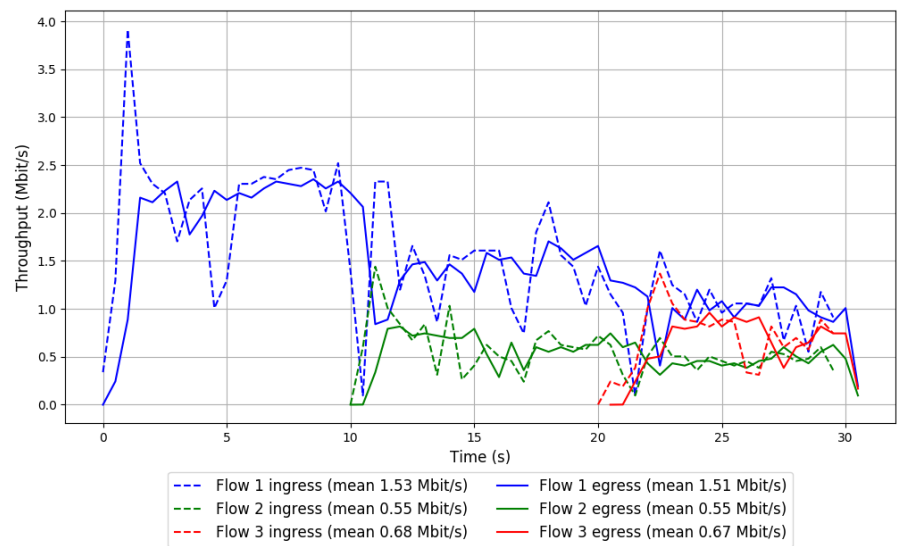


Run 2: Statistics of TCP BBR

Start at: 2018-12-11 00:54:23  
End at: 2018-12-11 00:54:53  
Local clock offset: -1.314 ms  
Remote clock offset: -1278.097 ms

# Below is generated by plot.py at 2018-12-11 01:38:22  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 2.09 Mbit/s  
95th percentile per-packet one-way delay: 838.056 ms  
Loss rate: 1.55%  
-- Flow 1:  
Average throughput: 1.51 Mbit/s  
95th percentile per-packet one-way delay: 833.921 ms  
Loss rate: 1.02%  
-- Flow 2:  
Average throughput: 0.55 Mbit/s  
95th percentile per-packet one-way delay: 850.790 ms  
Loss rate: 1.64%  
-- Flow 3:  
Average throughput: 0.67 Mbit/s  
95th percentile per-packet one-way delay: 831.917 ms  
Loss rate: 4.96%

Run 2: Report of TCP BBR — Data Link



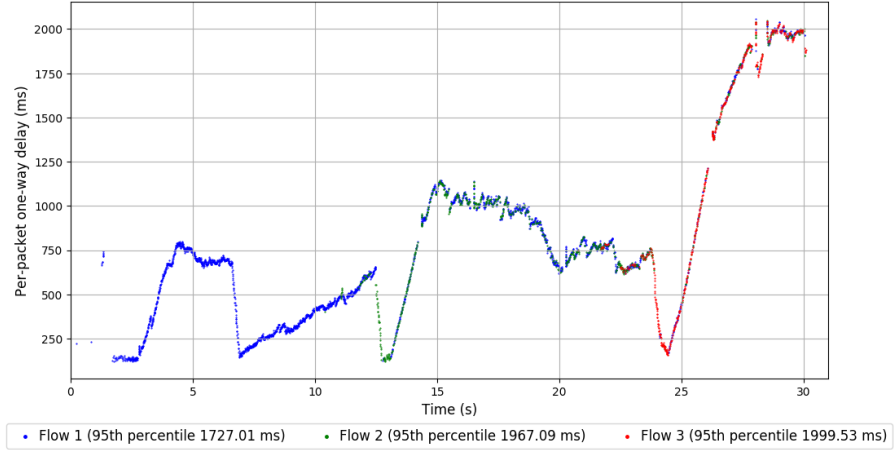
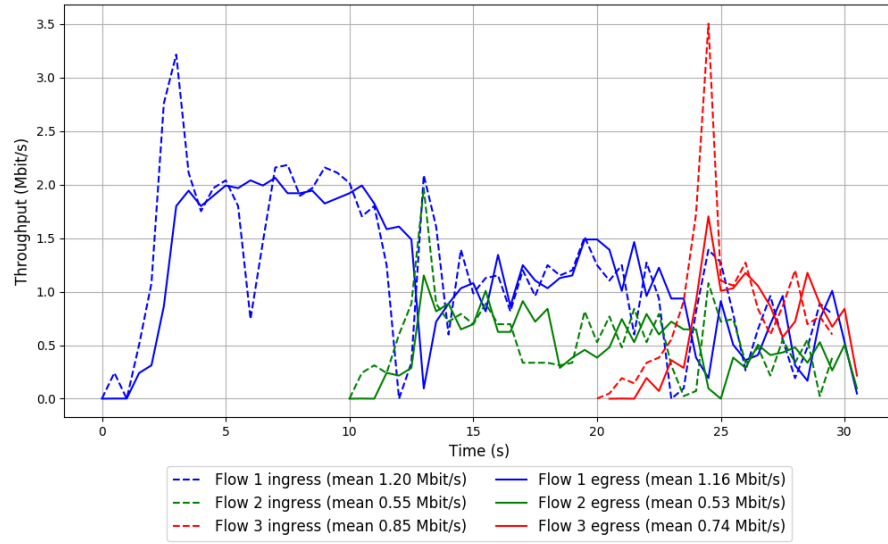


Run 3: Statistics of TCP BBR

Start at: 2018-12-11 01:17:51  
End at: 2018-12-11 01:18:21  
Local clock offset: -3.038 ms  
Remote clock offset: -189.061 ms

# Below is generated by plot.py at 2018-12-11 01:38:22  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.74 Mbit/s  
95th percentile per-packet one-way delay: 1960.994 ms  
Loss rate: 6.04%  
-- Flow 1:  
Average throughput: 1.16 Mbit/s  
95th percentile per-packet one-way delay: 1727.011 ms  
Loss rate: 3.37%  
-- Flow 2:  
Average throughput: 0.53 Mbit/s  
95th percentile per-packet one-way delay: 1967.090 ms  
Loss rate: 5.49%  
-- Flow 3:  
Average throughput: 0.74 Mbit/s  
95th percentile per-packet one-way delay: 1999.529 ms  
Loss rate: 18.14%

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

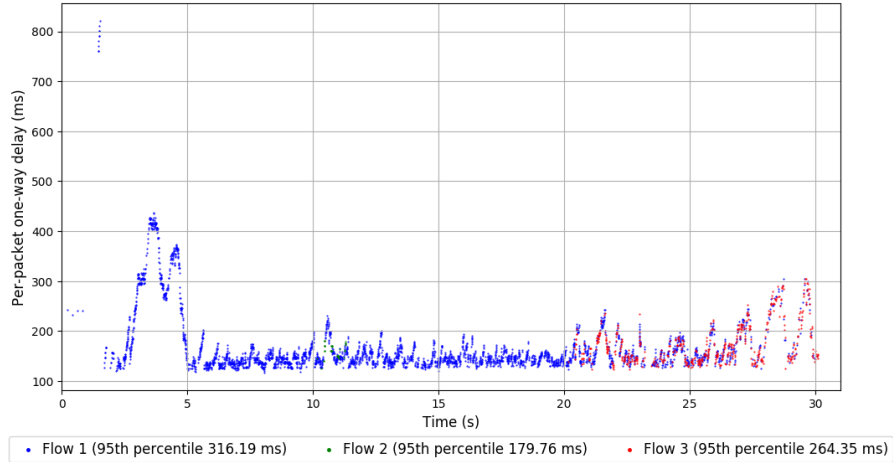
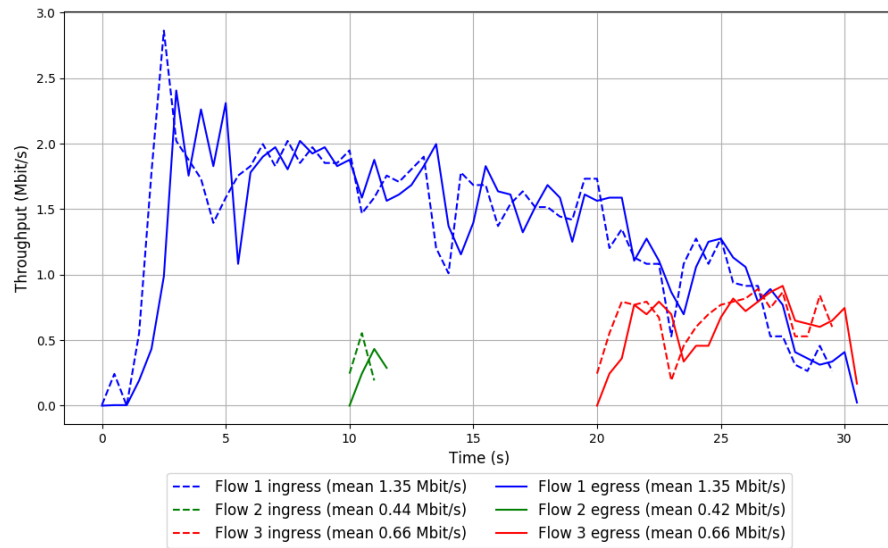


Run 1: Statistics of Copa

Start at: 2018-12-11 00:39:34  
End at: 2018-12-11 00:40:04  
Local clock offset: -1.818 ms  
Remote clock offset: -1009.828 ms

# Below is generated by plot.py at 2018-12-11 01:38:22  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.58 Mbit/s  
95th percentile per-packet one-way delay: 306.036 ms  
Loss rate: 0.51%  
-- Flow 1:  
Average throughput: 1.35 Mbit/s  
95th percentile per-packet one-way delay: 316.185 ms  
Loss rate: 0.42%  
-- Flow 2:  
Average throughput: 0.42 Mbit/s  
95th percentile per-packet one-way delay: 179.764 ms  
Loss rate: 2.43%  
-- Flow 3:  
Average throughput: 0.66 Mbit/s  
95th percentile per-packet one-way delay: 264.345 ms  
Loss rate: 0.91%

## Run 1: Report of Copa — Data Link

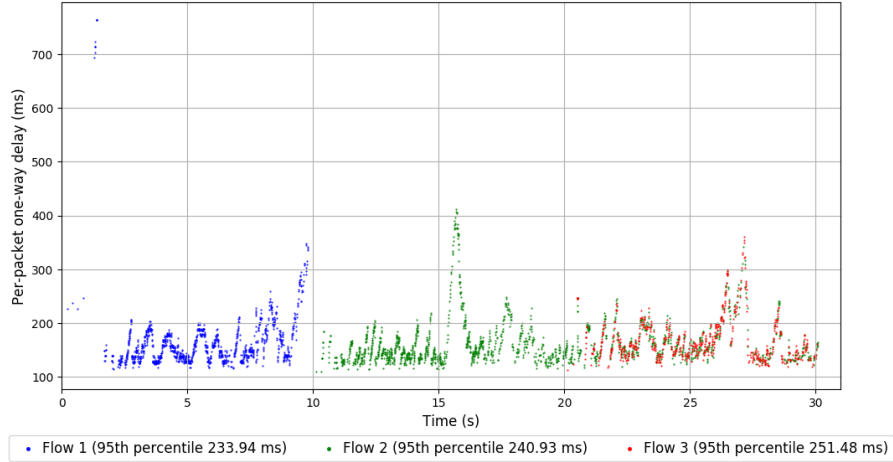
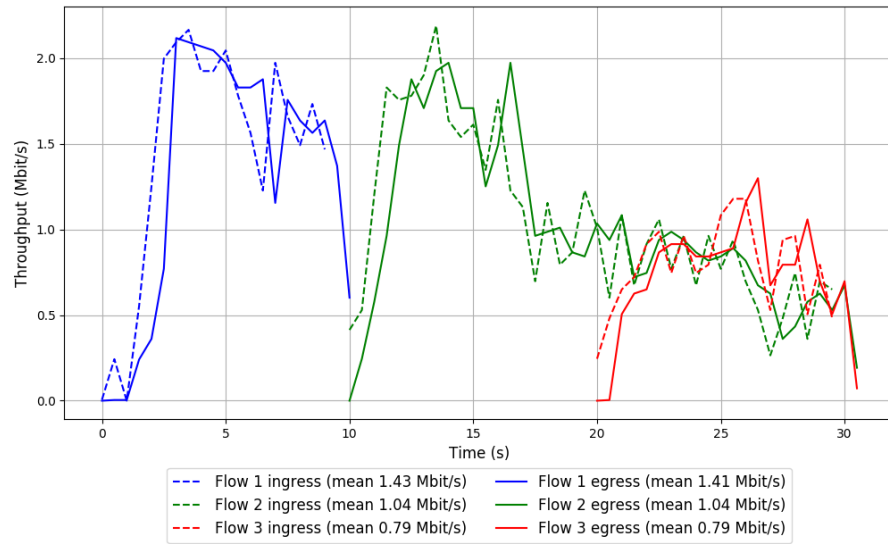


Run 2: Statistics of Copa

Start at: 2018-12-11 01:03:01  
End at: 2018-12-11 01:03:31  
Local clock offset: -1.279 ms  
Remote clock offset: -1442.797 ms

# Below is generated by plot.py at 2018-12-11 01:38:22  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.41 Mbit/s  
95th percentile per-packet one-way delay: 245.461 ms  
Loss rate: 0.37%  
-- Flow 1:  
Average throughput: 1.41 Mbit/s  
95th percentile per-packet one-way delay: 233.936 ms  
Loss rate: 0.62%  
-- Flow 2:  
Average throughput: 1.04 Mbit/s  
95th percentile per-packet one-way delay: 240.931 ms  
Loss rate: 0.23%  
-- Flow 3:  
Average throughput: 0.79 Mbit/s  
95th percentile per-packet one-way delay: 251.484 ms  
Loss rate: 0.31%

## Run 2: Report of Copa — Data Link

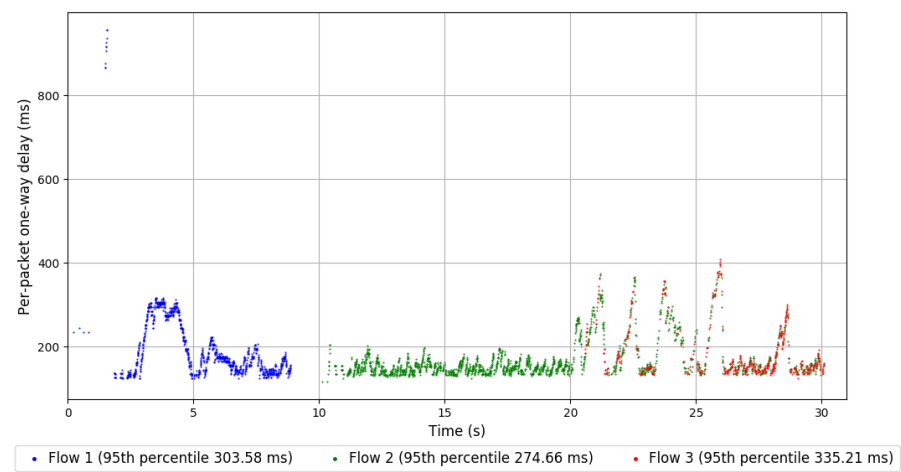
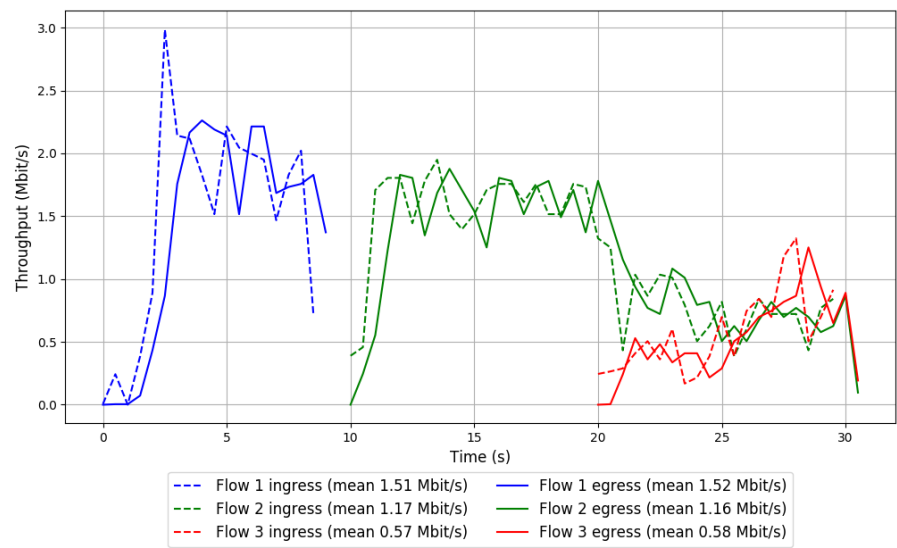


Run 3: Statistics of Copa

Start at: 2018-12-11 01:26:29  
End at: 2018-12-11 01:26:59  
Local clock offset: -3.144 ms  
Remote clock offset: -341.305 ms

# Below is generated by plot.py at 2018-12-11 01:38:22  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.40 Mbit/s  
95th percentile per-packet one-way delay: 302.924 ms  
Loss rate: 0.63%  
-- Flow 1:  
Average throughput: 1.52 Mbit/s  
95th percentile per-packet one-way delay: 303.582 ms  
Loss rate: 0.55%  
-- Flow 2:  
Average throughput: 1.16 Mbit/s  
95th percentile per-packet one-way delay: 274.660 ms  
Loss rate: 0.77%  
-- Flow 3:  
Average throughput: 0.58 Mbit/s  
95th percentile per-packet one-way delay: 335.215 ms  
Loss rate: 0.21%

Run 3: Report of Copa — Data Link



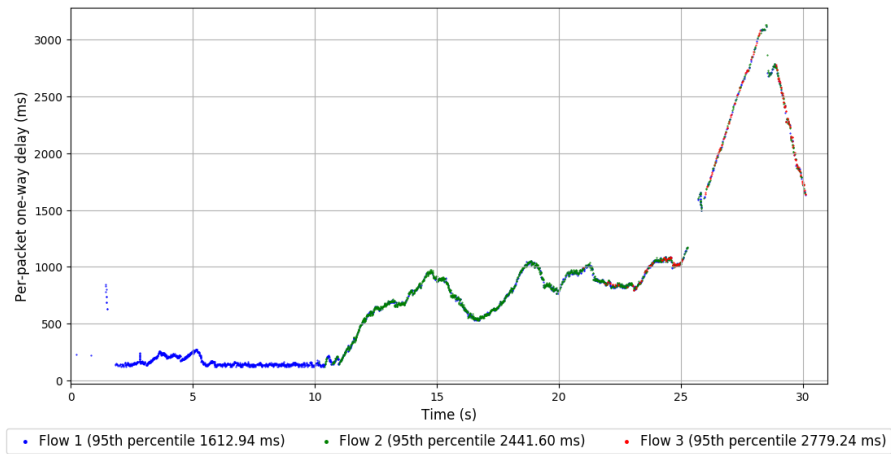
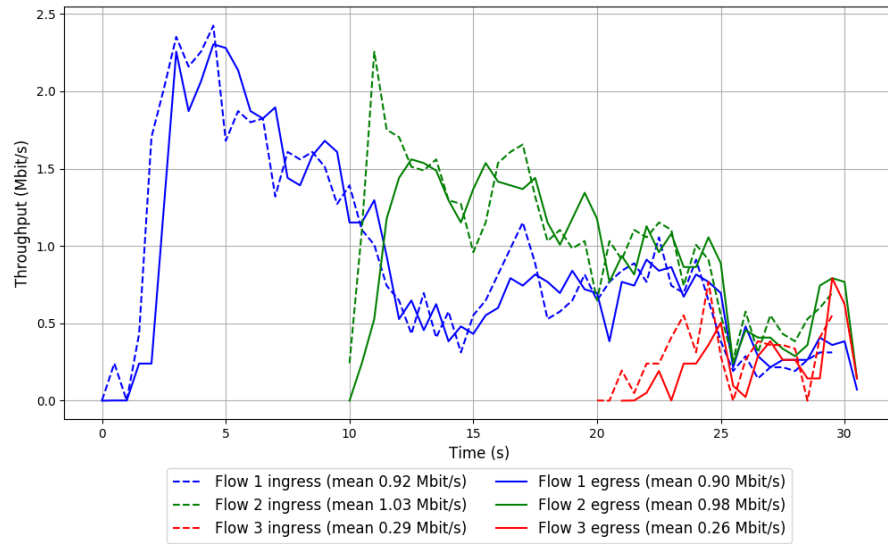


Run 1: Statistics of TCP Cubic

Start at: 2018-12-11 00:43:17  
End at: 2018-12-11 00:43:47  
Local clock offset: -1.657 ms  
Remote clock offset: -1074.941 ms

# Below is generated by plot.py at 2018-12-11 01:38:22  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.64 Mbit/s  
95th percentile per-packet one-way delay: 2310.622 ms  
Loss rate: 4.05%  
-- Flow 1:  
Average throughput: 0.90 Mbit/s  
95th percentile per-packet one-way delay: 1612.940 ms  
Loss rate: 2.05%  
-- Flow 2:  
Average throughput: 0.98 Mbit/s  
95th percentile per-packet one-way delay: 2441.601 ms  
Loss rate: 4.96%  
-- Flow 3:  
Average throughput: 0.26 Mbit/s  
95th percentile per-packet one-way delay: 2779.245 ms  
Loss rate: 16.79%

# Run 1: Report of TCP Cubic — Data Link

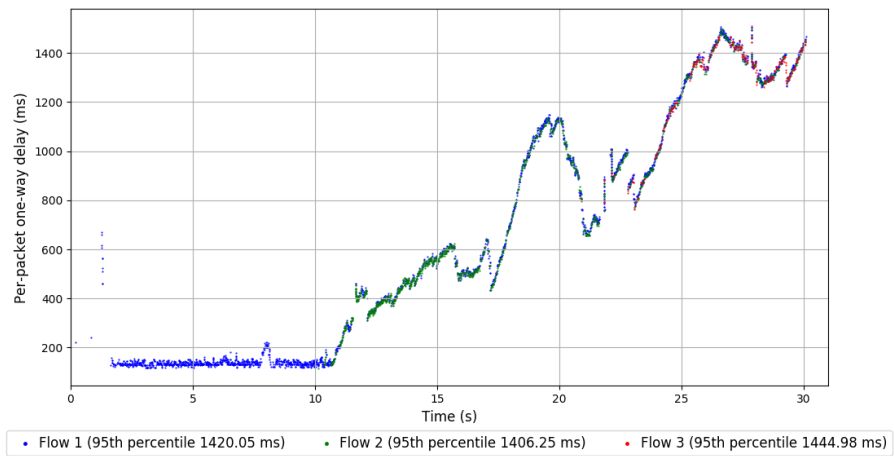
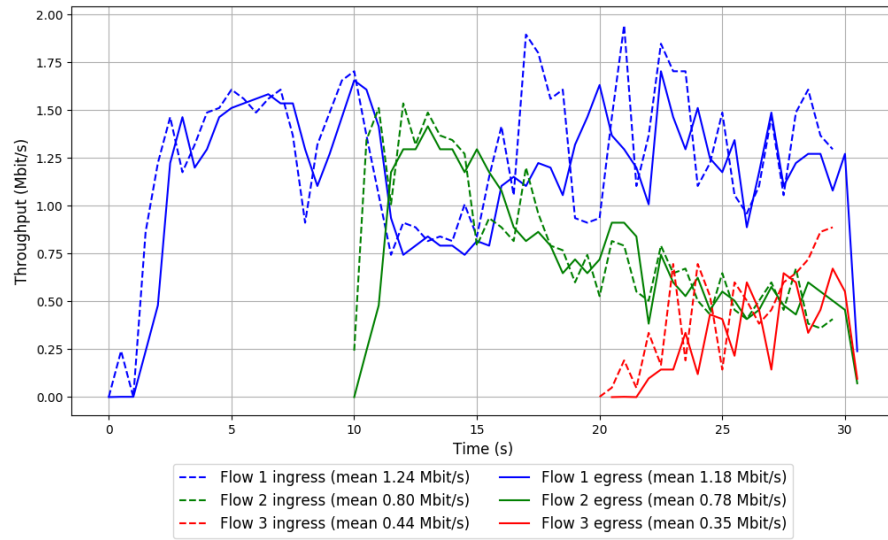


Run 2: Statistics of TCP Cubic

Start at: 2018-12-11 01:06:43  
End at: 2018-12-11 01:07:13  
Local clock offset: -2.528 ms  
Remote clock offset: -15.512 ms

# Below is generated by plot.py at 2018-12-11 01:38:22  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.81 Mbit/s  
95th percentile per-packet one-way delay: 1424.769 ms  
Loss rate: 6.33%  
-- Flow 1:  
Average throughput: 1.18 Mbit/s  
95th percentile per-packet one-way delay: 1420.051 ms  
Loss rate: 5.22%  
-- Flow 2:  
Average throughput: 0.78 Mbit/s  
95th percentile per-packet one-way delay: 1406.246 ms  
Loss rate: 3.59%  
-- Flow 3:  
Average throughput: 0.35 Mbit/s  
95th percentile per-packet one-way delay: 1444.980 ms  
Loss rate: 25.89%

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

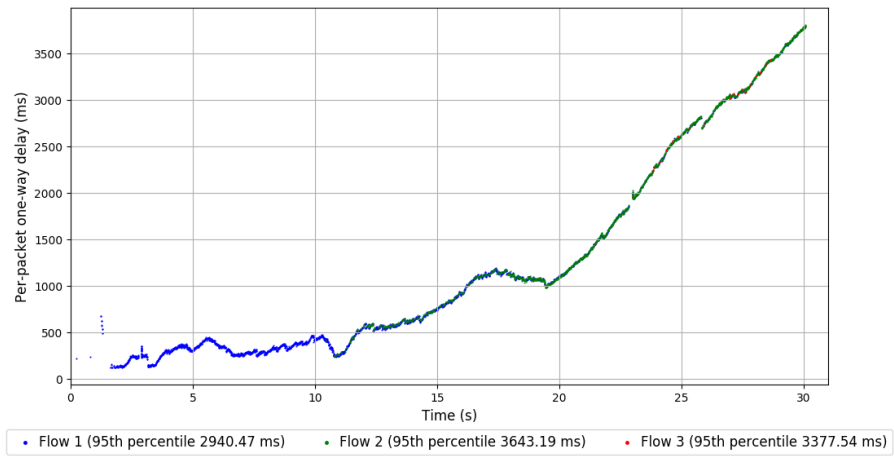
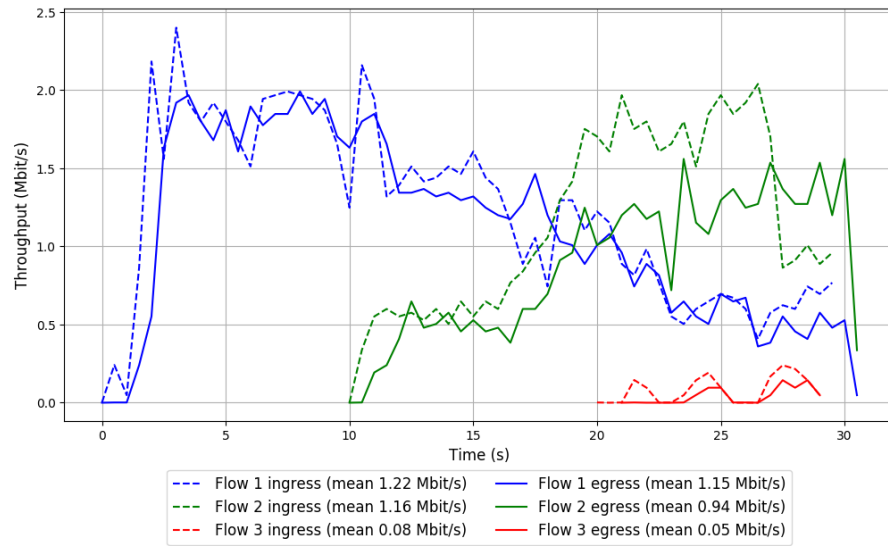


Run 3: Statistics of TCP Cubic

Start at: 2018-12-11 01:30:11  
End at: 2018-12-11 01:30:41  
Local clock offset: -3.188 ms  
Remote clock offset: -414.437 ms

# Below is generated by plot.py at 2018-12-11 01:38:23  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.78 Mbit/s  
95th percentile per-packet one-way delay: 3435.725 ms  
Loss rate: 12.05%  
-- Flow 1:  
Average throughput: 1.15 Mbit/s  
95th percentile per-packet one-way delay: 2940.472 ms  
Loss rate: 6.40%  
-- Flow 2:  
Average throughput: 0.94 Mbit/s  
95th percentile per-packet one-way delay: 3643.193 ms  
Loss rate: 19.66%  
-- Flow 3:  
Average throughput: 0.05 Mbit/s  
95th percentile per-packet one-way delay: 3377.537 ms  
Loss rate: 52.87%

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

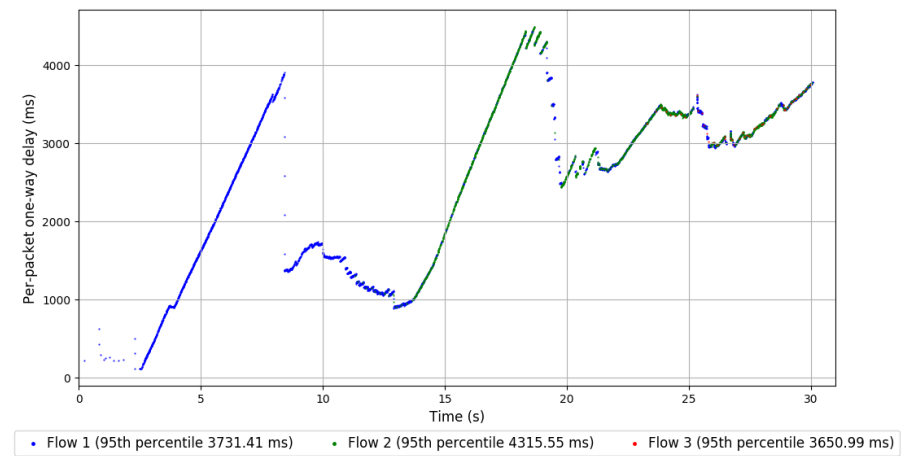
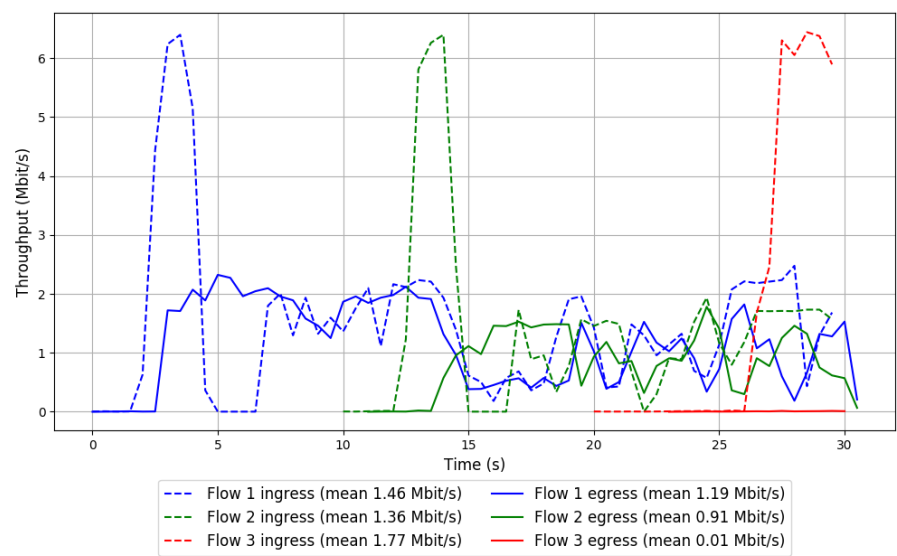


Run 1: Statistics of FillP

Start at: 2018-12-11 00:46:59  
End at: 2018-12-11 00:47:29  
Local clock offset: -0.643 ms  
Remote clock offset: -1146.637 ms

# Below is generated by plot.py at 2018-12-11 01:38:27  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.76 Mbit/s  
95th percentile per-packet one-way delay: 4094.809 ms  
Loss rate: 40.66%  
-- Flow 1:  
Average throughput: 1.19 Mbit/s  
95th percentile per-packet one-way delay: 3731.414 ms  
Loss rate: 18.86%  
-- Flow 2:  
Average throughput: 0.91 Mbit/s  
95th percentile per-packet one-way delay: 4315.547 ms  
Loss rate: 37.49%  
-- Flow 3:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 3650.987 ms  
Loss rate: 99.71%

Run 1: Report of FillP — Data Link



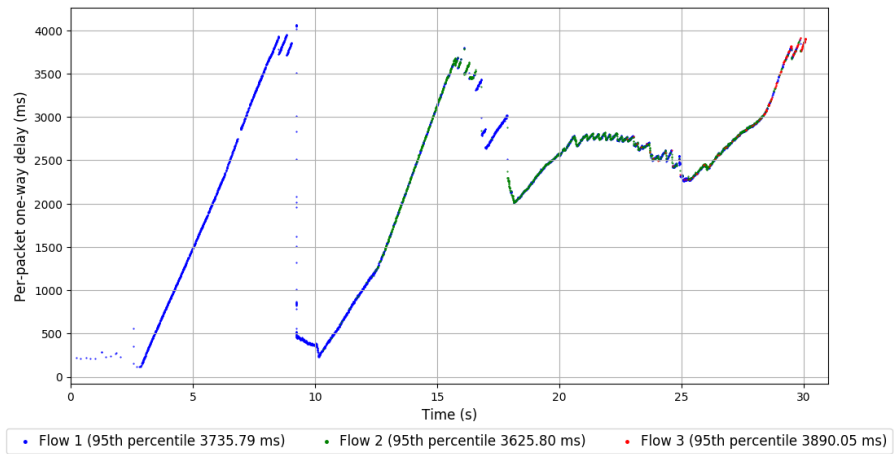
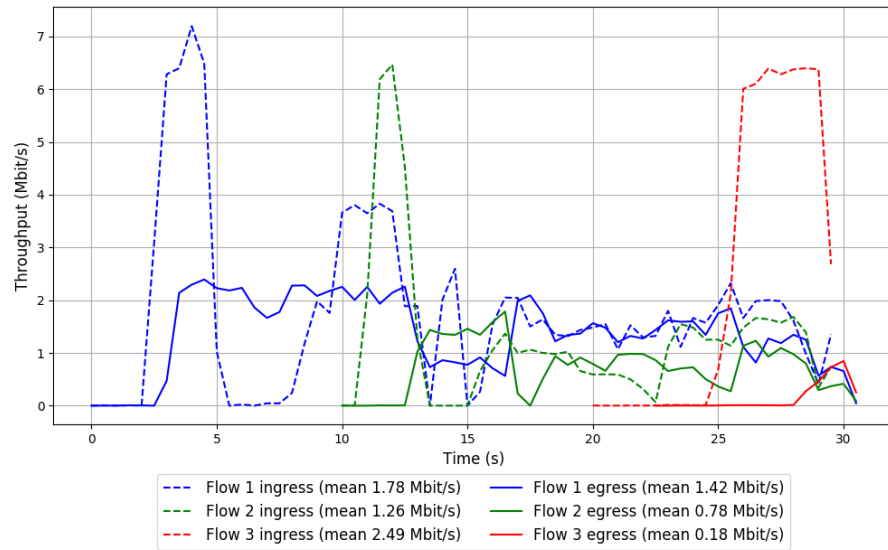


Run 2: Statistics of FillP

Start at: 2018-12-11 01:10:26  
End at: 2018-12-11 01:10:56  
Local clock offset: -1.901 ms  
Remote clock offset: -49.406 ms

# Below is generated by plot.py at 2018-12-11 01:38:29  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.97 Mbit/s  
95th percentile per-packet one-way delay: 3737.167 ms  
Loss rate: 43.05%  
-- Flow 1:  
Average throughput: 1.42 Mbit/s  
95th percentile per-packet one-way delay: 3735.794 ms  
Loss rate: 20.83%  
-- Flow 2:  
Average throughput: 0.78 Mbit/s  
95th percentile per-packet one-way delay: 3625.800 ms  
Loss rate: 39.33%  
-- Flow 3:  
Average throughput: 0.18 Mbit/s  
95th percentile per-packet one-way delay: 3890.055 ms  
Loss rate: 94.65%

## Run 2: Report of FillP — Data Link

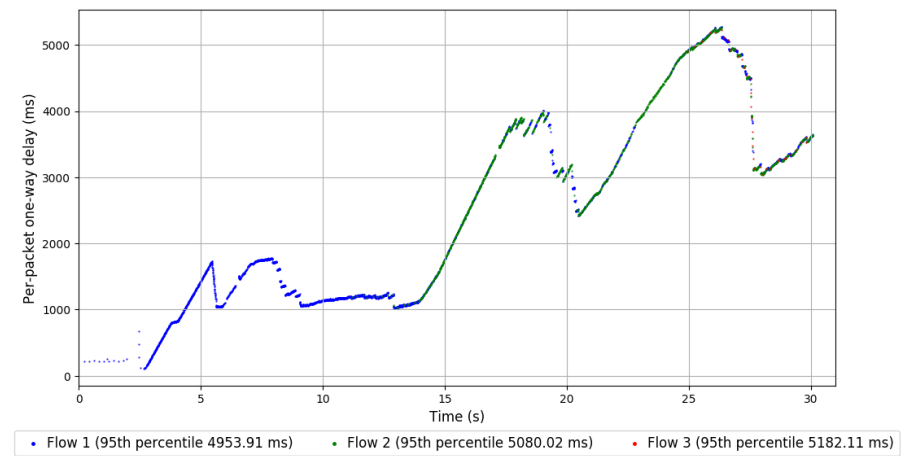
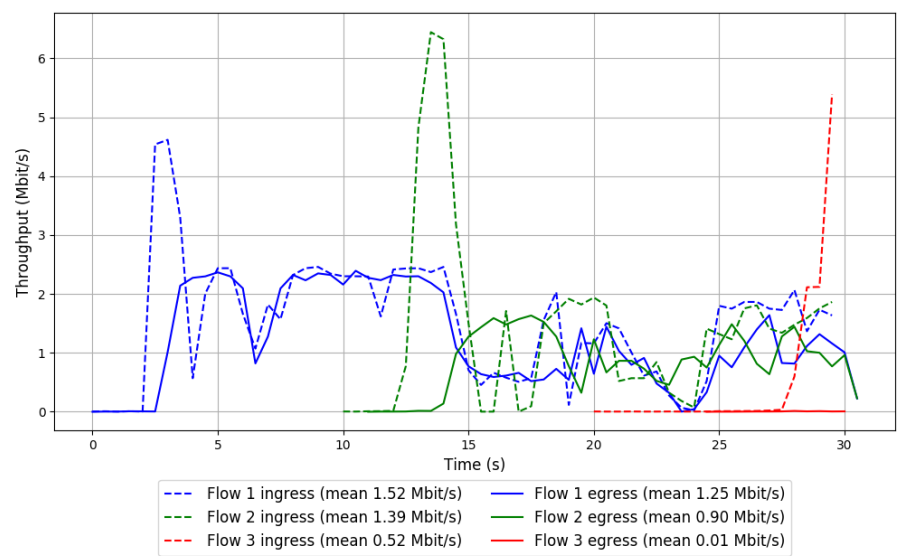


Run 3: Statistics of FillP

Start at: 2018-12-11 01:33:53  
End at: 2018-12-11 01:34:23  
Local clock offset: -3.155 ms  
Remote clock offset: -483.953 ms

# Below is generated by plot.py at 2018-12-11 01:38:29  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.82 Mbit/s  
95th percentile per-packet one-way delay: 5027.852 ms  
Loss rate: 30.88%  
-- Flow 1:  
Average throughput: 1.25 Mbit/s  
95th percentile per-packet one-way delay: 4953.907 ms  
Loss rate: 18.15%  
-- Flow 2:  
Average throughput: 0.90 Mbit/s  
95th percentile per-packet one-way delay: 5080.025 ms  
Loss rate: 38.98%  
-- Flow 3:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 5182.110 ms  
Loss rate: 99.38%

Run 3: Report of FillP — Data Link

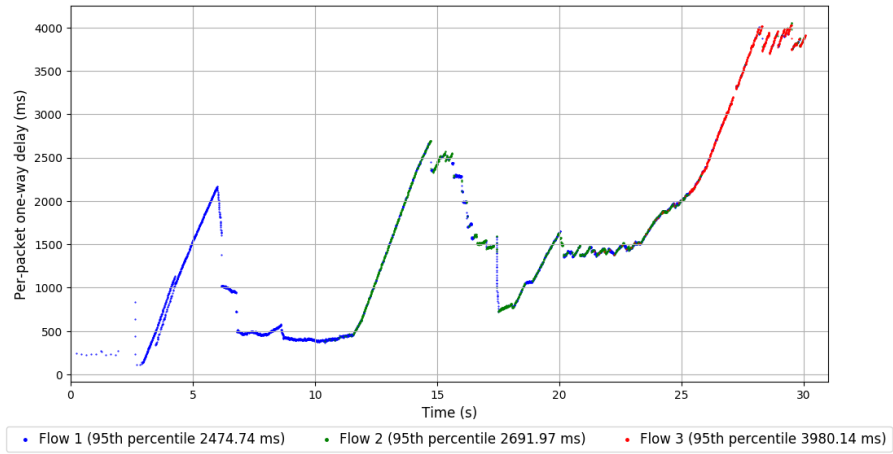
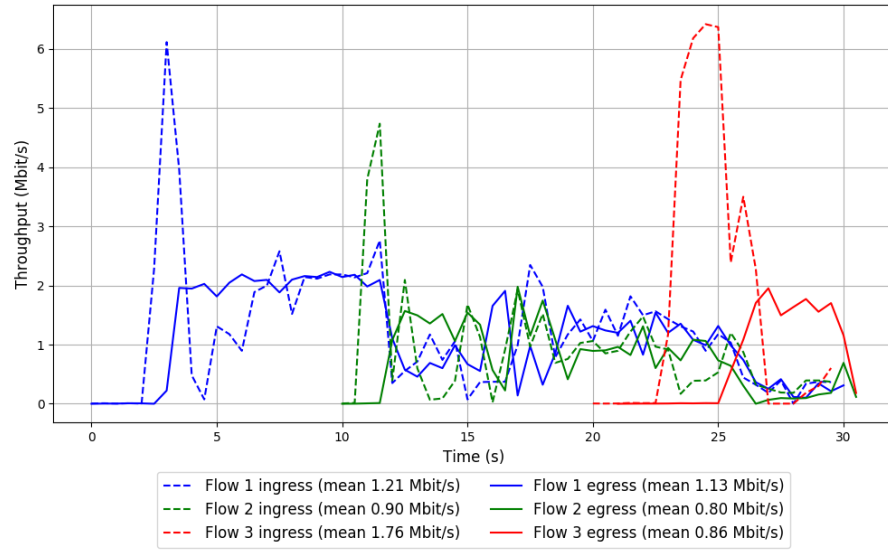


Run 1: Statistics of FillP-Sheep

Start at: 2018-12-11 00:28:28  
End at: 2018-12-11 00:28:58  
Local clock offset: -1.477 ms  
Remote clock offset: -806.928 ms

# Below is generated by plot.py at 2018-12-11 01:38:29  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.90 Mbit/s  
95th percentile per-packet one-way delay: 3831.147 ms  
Loss rate: 20.97%  
-- Flow 1:  
Average throughput: 1.13 Mbit/s  
95th percentile per-packet one-way delay: 2474.738 ms  
Loss rate: 7.83%  
-- Flow 2:  
Average throughput: 0.80 Mbit/s  
95th percentile per-packet one-way delay: 2691.965 ms  
Loss rate: 12.03%  
-- Flow 3:  
Average throughput: 0.86 Mbit/s  
95th percentile per-packet one-way delay: 3980.137 ms  
Loss rate: 57.52%

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

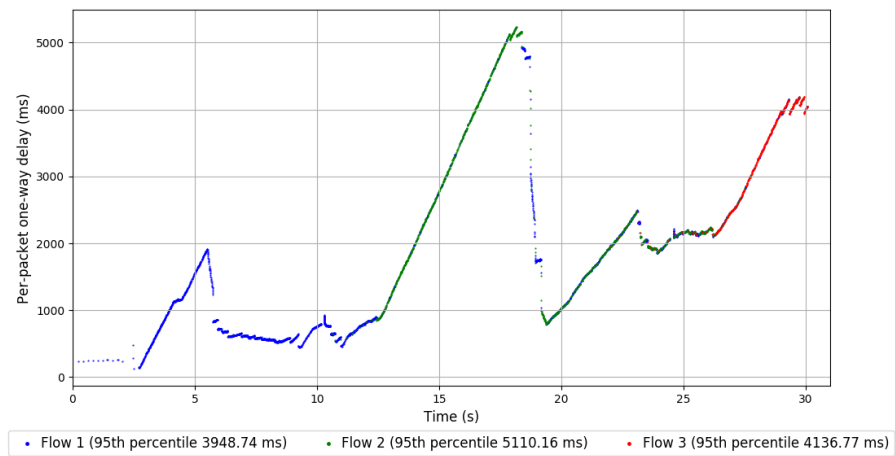
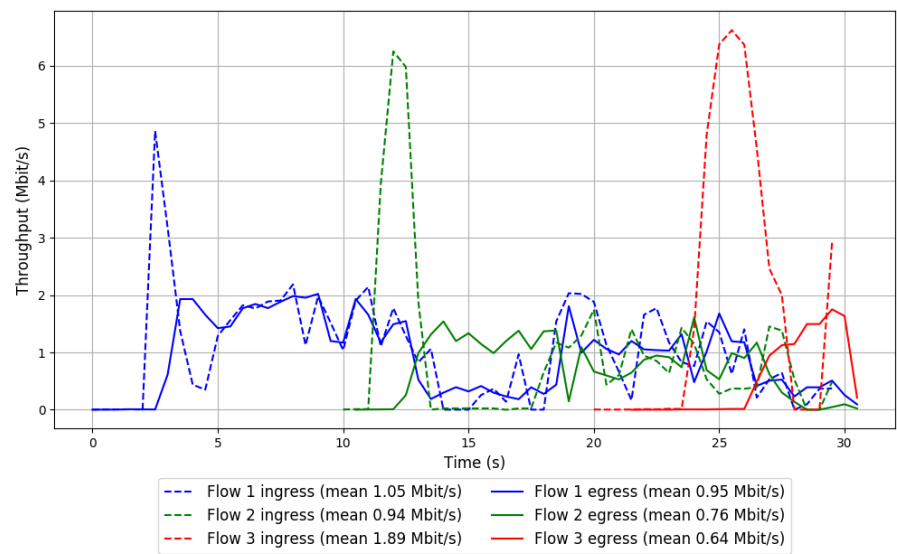


Run 2: Statistics of FillP-Sheep

Start at: 2018-12-11 00:51:55  
End at: 2018-12-11 00:52:25  
Local clock offset: -1.399 ms  
Remote clock offset: -1235.326 ms

# Below is generated by plot.py at 2018-12-11 01:38:29  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.62 Mbit/s  
95th percentile per-packet one-way delay: 4669.006 ms  
Loss rate: 29.86%  
-- Flow 1:  
Average throughput: 0.95 Mbit/s  
95th percentile per-packet one-way delay: 3948.737 ms  
Loss rate: 9.50%  
-- Flow 2:  
Average throughput: 0.76 Mbit/s  
95th percentile per-packet one-way delay: 5110.161 ms  
Loss rate: 21.36%  
-- Flow 3:  
Average throughput: 0.64 Mbit/s  
95th percentile per-packet one-way delay: 4136.774 ms  
Loss rate: 72.44%

Run 2: Report of FillP-Sheep — Data Link



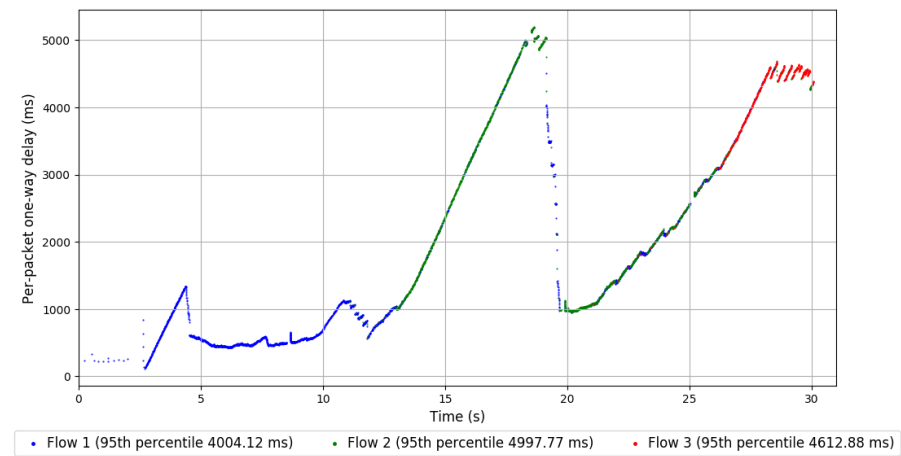
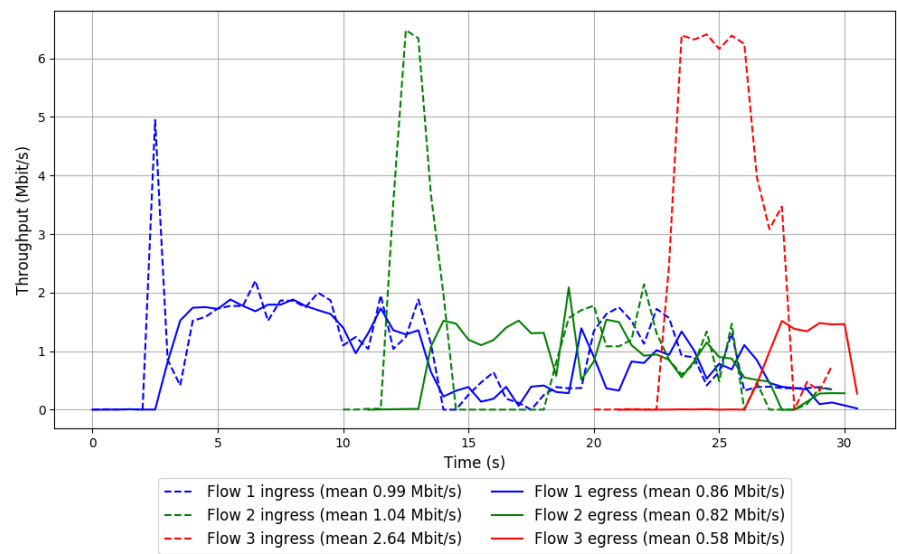


Run 3: Statistics of FillP-Sheep

Start at: 2018-12-11 01:15:22  
End at: 2018-12-11 01:15:52  
Local clock offset: -2.979 ms  
Remote clock offset: -137.353 ms

# Below is generated by plot.py at 2018-12-11 01:38:29  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.55 Mbit/s  
95th percentile per-packet one-way delay: 4625.013 ms  
Loss rate: 39.56%  
-- Flow 1:  
Average throughput: 0.86 Mbit/s  
95th percentile per-packet one-way delay: 4004.119 ms  
Loss rate: 13.09%  
-- Flow 2:  
Average throughput: 0.82 Mbit/s  
95th percentile per-packet one-way delay: 4997.775 ms  
Loss rate: 25.81%  
-- Flow 3:  
Average throughput: 0.58 Mbit/s  
95th percentile per-packet one-way delay: 4612.877 ms  
Loss rate: 80.24%

Run 3: Report of FillP-Sheep — Data Link

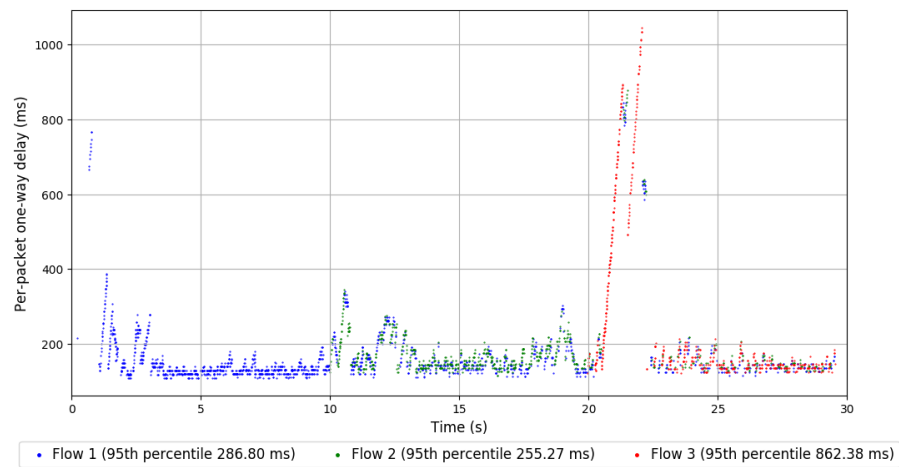
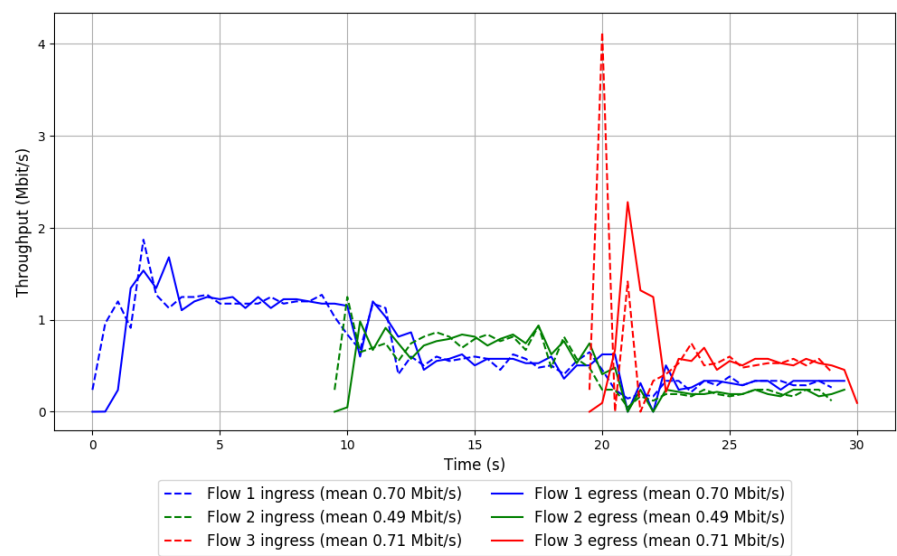


Run 1: Statistics of Indigo

Start at: 2018-12-11 00:35:52  
End at: 2018-12-11 00:36:22  
Local clock offset: -1.955 ms  
Remote clock offset: -947.839 ms

# Below is generated by plot.py at 2018-12-11 01:38:29  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.25 Mbit/s  
95th percentile per-packet one-way delay: 603.079 ms  
Loss rate: 0.10%  
-- Flow 1:  
Average throughput: 0.70 Mbit/s  
95th percentile per-packet one-way delay: 286.800 ms  
Loss rate: 0.00%  
-- Flow 2:  
Average throughput: 0.49 Mbit/s  
95th percentile per-packet one-way delay: 255.271 ms  
Loss rate: 0.13%  
-- Flow 3:  
Average throughput: 0.71 Mbit/s  
95th percentile per-packet one-way delay: 862.381 ms  
Loss rate: 0.35%

Run 1: Report of Indigo — Data Link

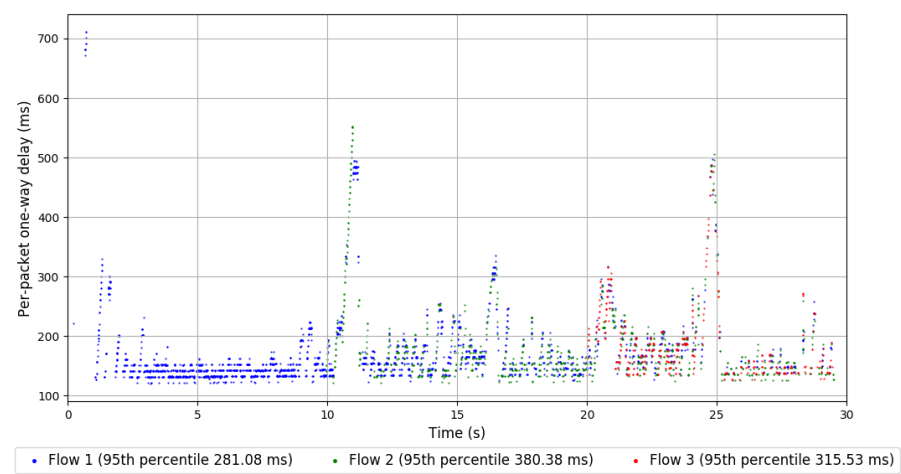
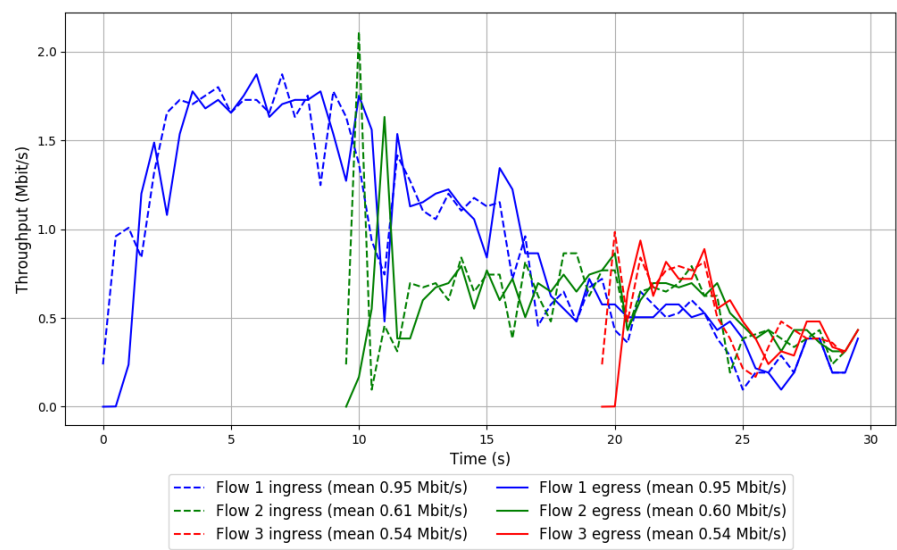


Run 2: Statistics of Indigo

Start at: 2018-12-11 00:59:19  
End at: 2018-12-11 00:59:49  
Local clock offset: -0.723 ms  
Remote clock offset: -1371.254 ms

# Below is generated by plot.py at 2018-12-11 01:38:29  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.53 Mbit/s  
95th percentile per-packet one-way delay: 301.487 ms  
Loss rate: 0.16%  
-- Flow 1:  
Average throughput: 0.95 Mbit/s  
95th percentile per-packet one-way delay: 281.078 ms  
Loss rate: 0.09%  
-- Flow 2:  
Average throughput: 0.60 Mbit/s  
95th percentile per-packet one-way delay: 380.380 ms  
Loss rate: 0.20%  
-- Flow 3:  
Average throughput: 0.54 Mbit/s  
95th percentile per-packet one-way delay: 315.531 ms  
Loss rate: 0.47%

Run 2: Report of Indigo — Data Link

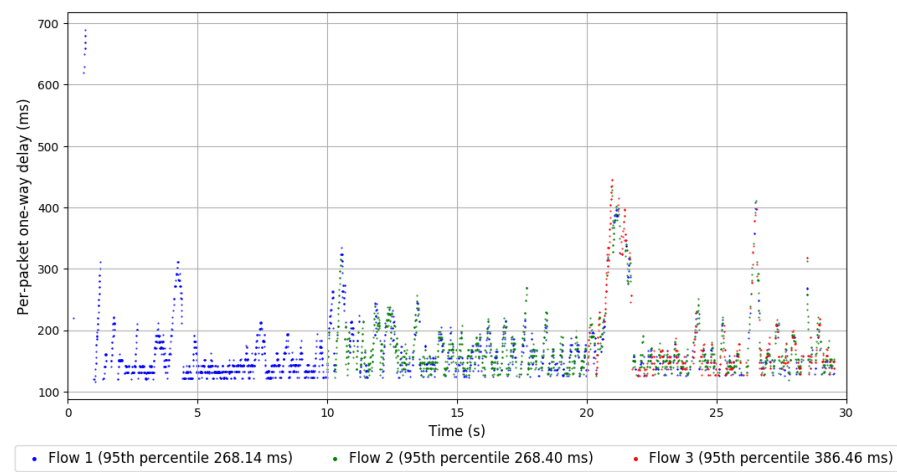
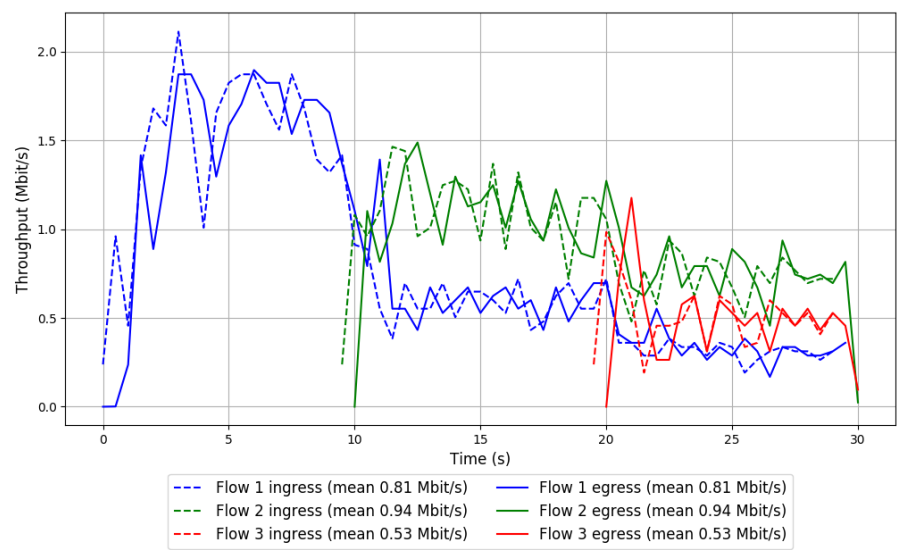


Run 3: Statistics of Indigo

Start at: 2018-12-11 01:22:48  
End at: 2018-12-11 01:23:18  
Local clock offset: -3.109 ms  
Remote clock offset: -280.579 ms

# Below is generated by plot.py at 2018-12-11 01:38:30  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.61 Mbit/s  
95th percentile per-packet one-way delay: 291.189 ms  
Loss rate: 0.23%  
-- Flow 1:  
Average throughput: 0.81 Mbit/s  
95th percentile per-packet one-way delay: 268.139 ms  
Loss rate: 0.05%  
-- Flow 2:  
Average throughput: 0.94 Mbit/s  
95th percentile per-packet one-way delay: 268.405 ms  
Loss rate: 0.33%  
-- Flow 3:  
Average throughput: 0.53 Mbit/s  
95th percentile per-packet one-way delay: 386.458 ms  
Loss rate: 0.71%

Run 3: Report of Indigo — Data Link



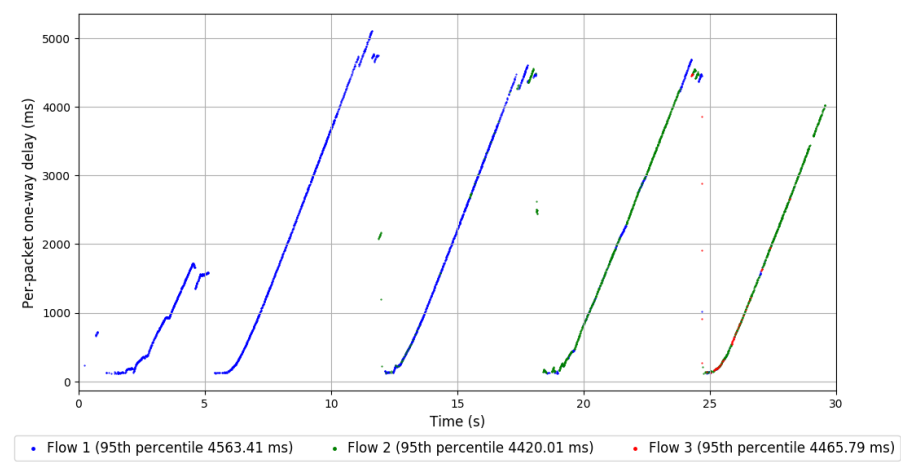
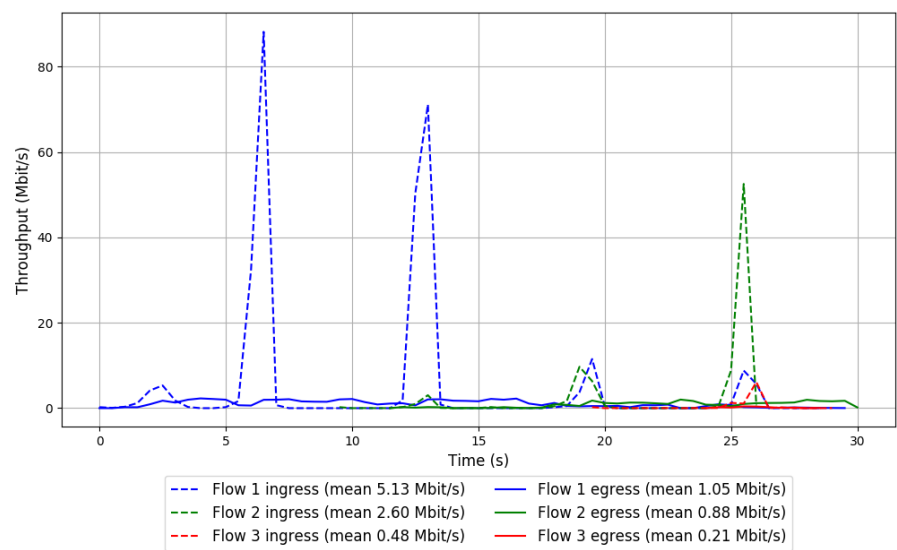


Run 1: Statistics of Indigo-96d2da3

Start at: 2018-12-11 00:34:38  
End at: 2018-12-11 00:35:08  
Local clock offset: -1.138 ms  
Remote clock offset: -919.925 ms

# Below is generated by plot.py at 2018-12-11 01:38:36  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.59 Mbit/s  
95th percentile per-packet one-way delay: 4483.481 ms  
Loss rate: 75.92%  
-- Flow 1:  
Average throughput: 1.05 Mbit/s  
95th percentile per-packet one-way delay: 4563.412 ms  
Loss rate: 79.30%  
-- Flow 2:  
Average throughput: 0.88 Mbit/s  
95th percentile per-packet one-way delay: 4420.005 ms  
Loss rate: 63.78%  
-- Flow 3:  
Average throughput: 0.21 Mbit/s  
95th percentile per-packet one-way delay: 4465.794 ms  
Loss rate: 81.90%

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

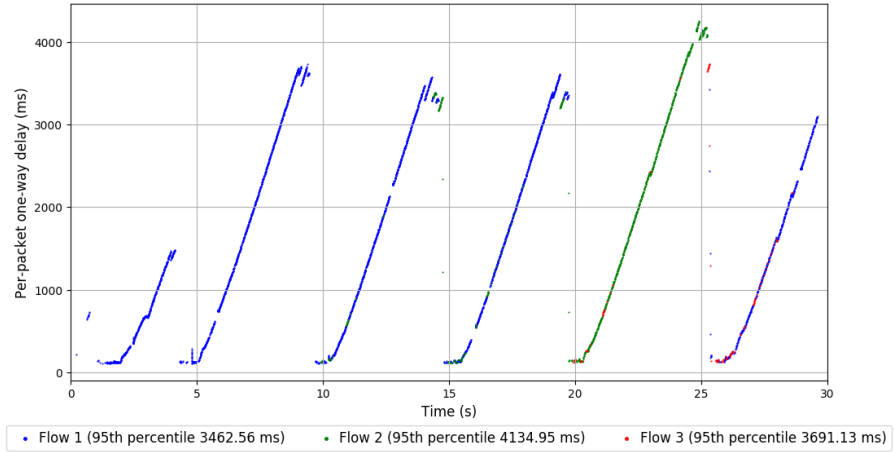
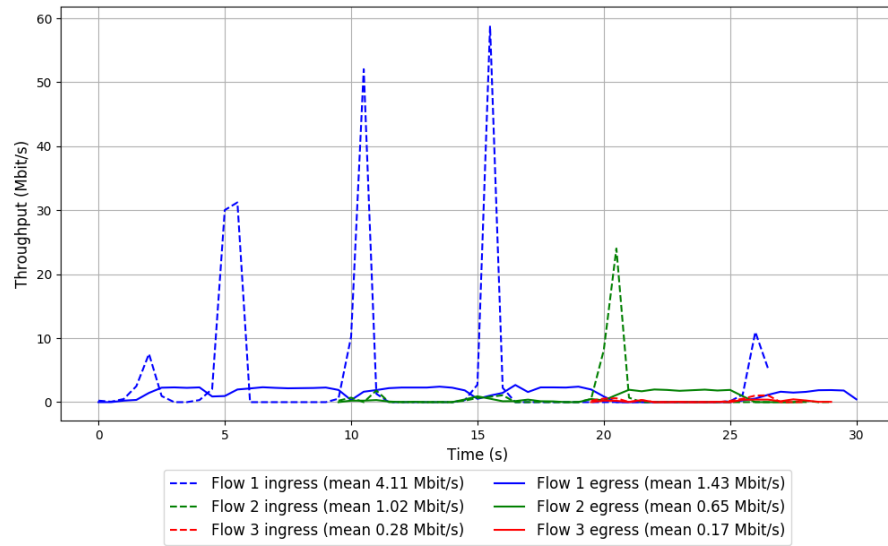


Run 2: Statistics of Indigo-96d2da3

Start at: 2018-12-11 00:58:05  
End at: 2018-12-11 00:58:35  
Local clock offset: -0.497 ms  
Remote clock offset: -1347.677 ms

# Below is generated by plot.py at 2018-12-11 01:38:36  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.88 Mbit/s  
95th percentile per-packet one-way delay: 3620.714 ms  
Loss rate: 58.37%  
-- Flow 1:  
Average throughput: 1.43 Mbit/s  
95th percentile per-packet one-way delay: 3462.556 ms  
Loss rate: 62.06%  
-- Flow 2:  
Average throughput: 0.65 Mbit/s  
95th percentile per-packet one-way delay: 4134.954 ms  
Loss rate: 40.26%  
-- Flow 3:  
Average throughput: 0.17 Mbit/s  
95th percentile per-packet one-way delay: 3691.128 ms  
Loss rate: 35.34%

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

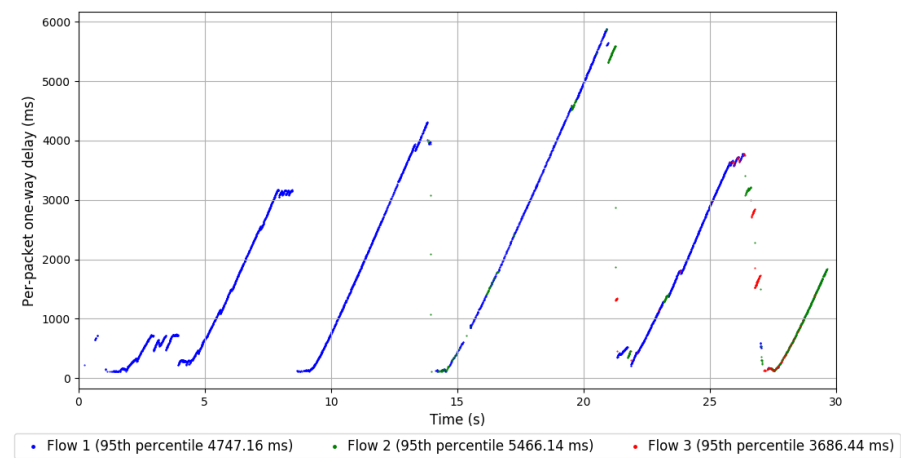
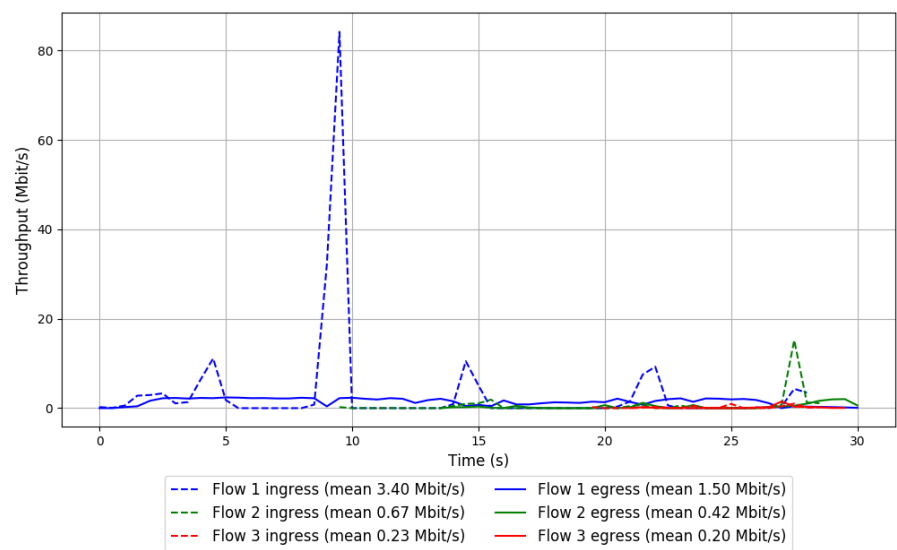


Run 3: Statistics of Indigo-96d2da3

Start at: 2018-12-11 01:21:34  
End at: 2018-12-11 01:22:04  
Local clock offset: -3.148 ms  
Remote clock offset: -257.883 ms

# Below is generated by plot.py at 2018-12-11 01:38:36  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.78 Mbit/s  
95th percentile per-packet one-way delay: 4857.176 ms  
Loss rate: 52.75%  
-- Flow 1:  
Average throughput: 1.50 Mbit/s  
95th percentile per-packet one-way delay: 4747.159 ms  
Loss rate: 54.14%  
-- Flow 2:  
Average throughput: 0.42 Mbit/s  
95th percentile per-packet one-way delay: 5466.139 ms  
Loss rate: 47.18%  
-- Flow 3:  
Average throughput: 0.20 Mbit/s  
95th percentile per-packet one-way delay: 3686.441 ms  
Loss rate: 20.92%

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

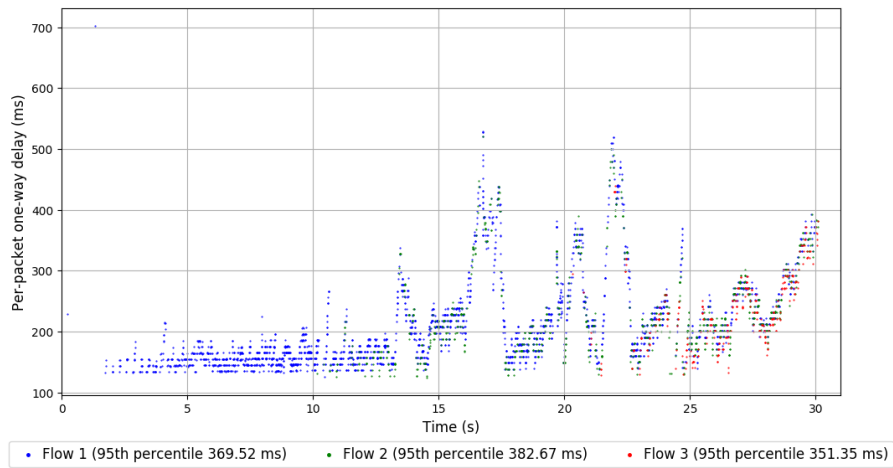
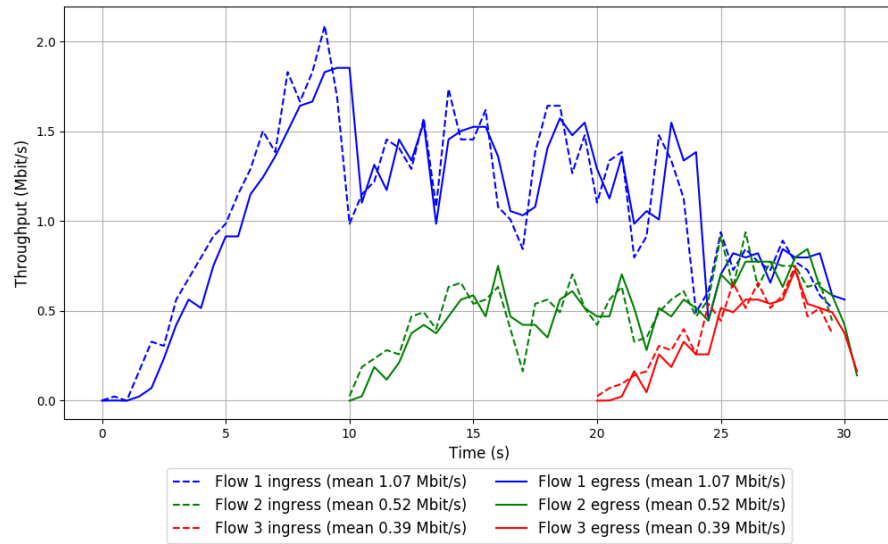


```
Run 1: Statistics of LEDBAT

Start at: 2018-12-11 00:44:31
End at: 2018-12-11 00:45:01
Local clock offset: -1.626 ms
Remote clock offset: -1096.059 ms

# Below is generated by plot.py at 2018-12-11 01:38:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 369.753 ms
Loss rate: 0.89%
-- Flow 1:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 369.525 ms
Loss rate: 0.51%
-- Flow 2:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 382.668 ms
Loss rate: 1.46%
-- Flow 3:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 351.354 ms
Loss rate: 2.42%
```

## Run 1: Report of LEDBAT — Data Link



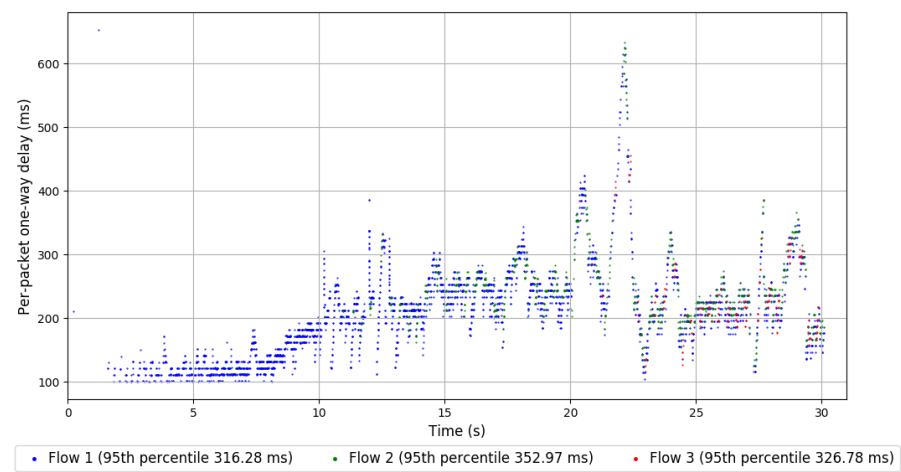
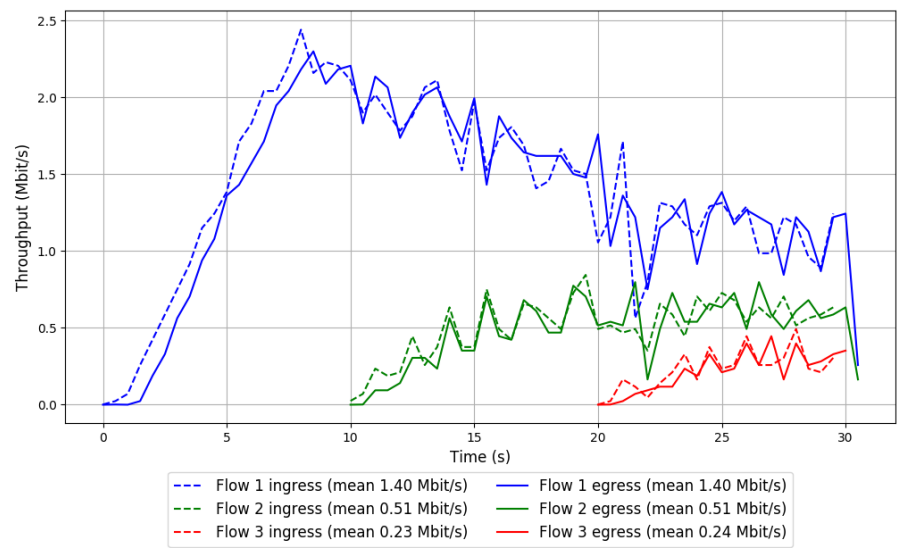


Run 2: Statistics of LEDBAT

Start at: 2018-12-11 01:07:57  
End at: 2018-12-11 01:08:27  
Local clock offset: -1.741 ms  
Remote clock offset: -22.178 ms

# Below is generated by plot.py at 2018-12-11 01:38:36  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.81 Mbit/s  
95th percentile per-packet one-way delay: 326.778 ms  
Loss rate: 0.24%  
-- Flow 1:  
Average throughput: 1.40 Mbit/s  
95th percentile per-packet one-way delay: 316.278 ms  
Loss rate: 0.14%  
-- Flow 2:  
Average throughput: 0.51 Mbit/s  
95th percentile per-packet one-way delay: 352.972 ms  
Loss rate: 0.35%  
-- Flow 3:  
Average throughput: 0.24 Mbit/s  
95th percentile per-packet one-way delay: 326.778 ms  
Loss rate: 1.54%

Run 2: Report of LEDBAT — Data Link

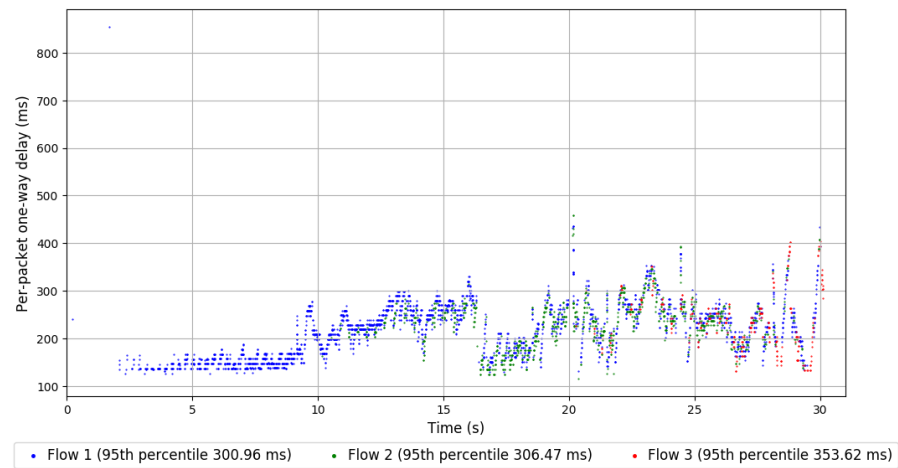
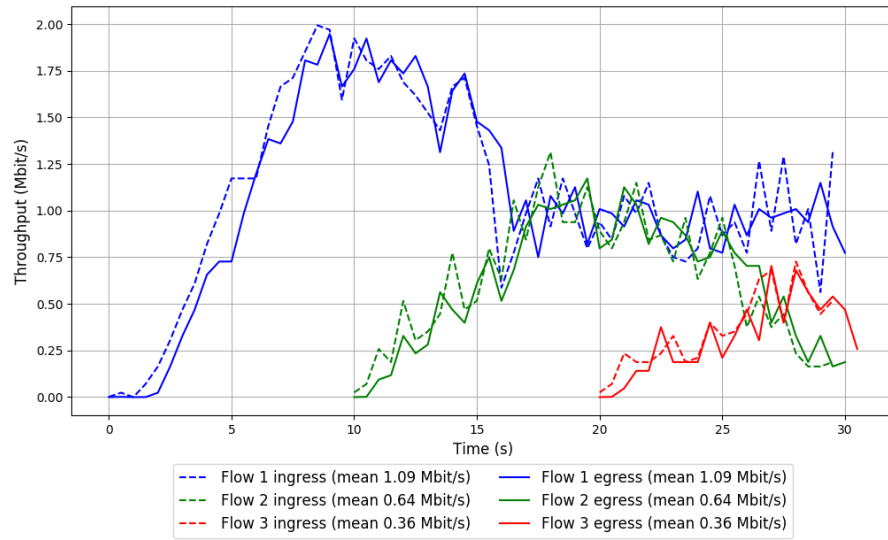


Run 3: Statistics of LEDBAT

Start at: 2018-12-11 01:31:25  
End at: 2018-12-11 01:31:55  
Local clock offset: -3.105 ms  
Remote clock offset: -438.404 ms

# Below is generated by plot.py at 2018-12-11 01:38:36  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.62 Mbit/s  
95th percentile per-packet one-way delay: 306.470 ms  
Loss rate: 0.84%  
-- Flow 1:  
Average throughput: 1.09 Mbit/s  
95th percentile per-packet one-way delay: 300.957 ms  
Loss rate: 0.97%  
-- Flow 2:  
Average throughput: 0.64 Mbit/s  
95th percentile per-packet one-way delay: 306.470 ms  
Loss rate: 0.37%  
-- Flow 3:  
Average throughput: 0.36 Mbit/s  
95th percentile per-packet one-way delay: 353.623 ms  
Loss rate: 1.31%

### Run 3: Report of LEDBAT — Data Link

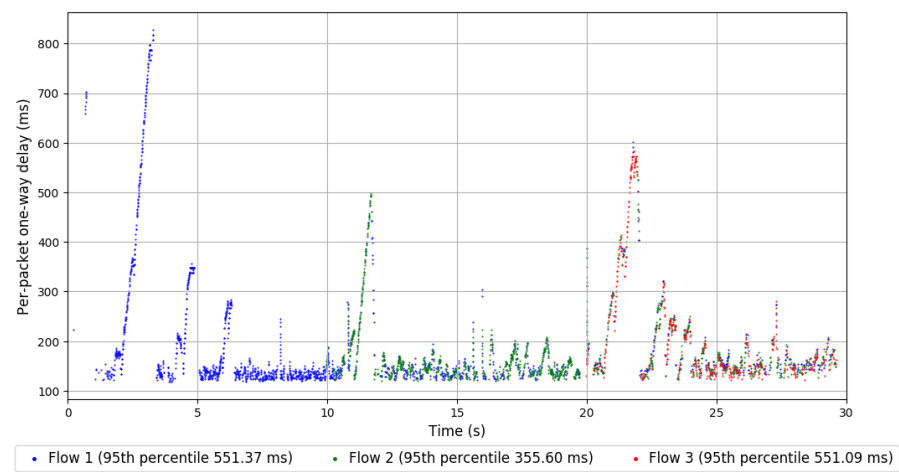
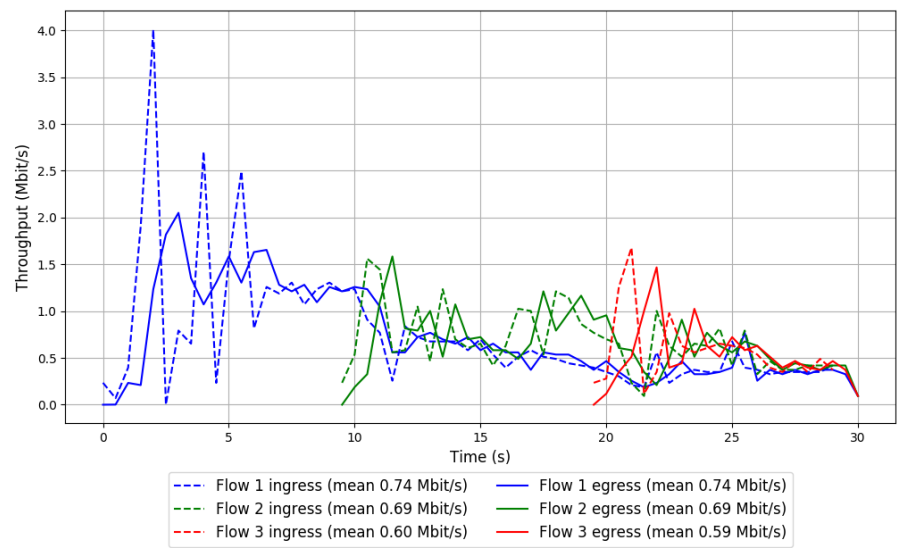


Run 1: Statistics of Indigo-Muses

Start at: 2018-12-11 00:48:13  
End at: 2018-12-11 00:48:43  
Local clock offset: -0.594 ms  
Remote clock offset: -1168.284 ms

# Below is generated by plot.py at 2018-12-11 01:38:36  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.40 Mbit/s  
95th percentile per-packet one-way delay: 476.020 ms  
Loss rate: 0.28%  
-- Flow 1:  
Average throughput: 0.74 Mbit/s  
95th percentile per-packet one-way delay: 551.368 ms  
Loss rate: 0.21%  
-- Flow 2:  
Average throughput: 0.69 Mbit/s  
95th percentile per-packet one-way delay: 355.595 ms  
Loss rate: 0.26%  
-- Flow 3:  
Average throughput: 0.59 Mbit/s  
95th percentile per-packet one-way delay: 551.090 ms  
Loss rate: 0.61%

Run 1: Report of Indigo-Muses — Data Link

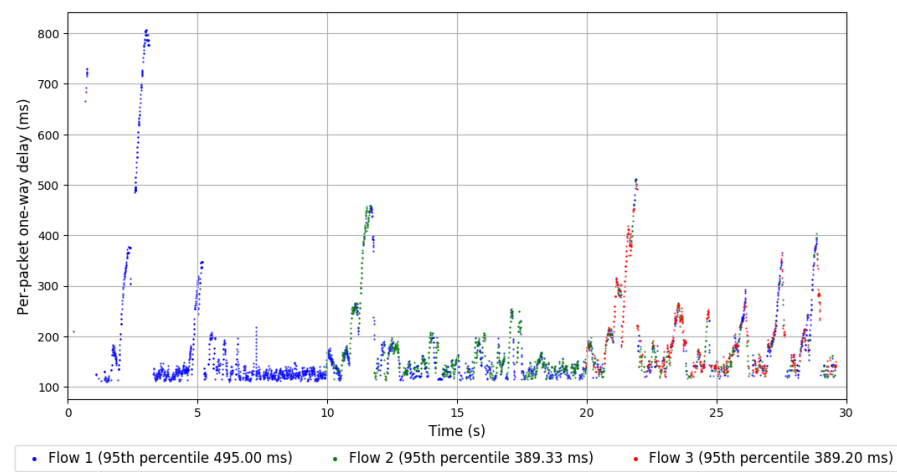
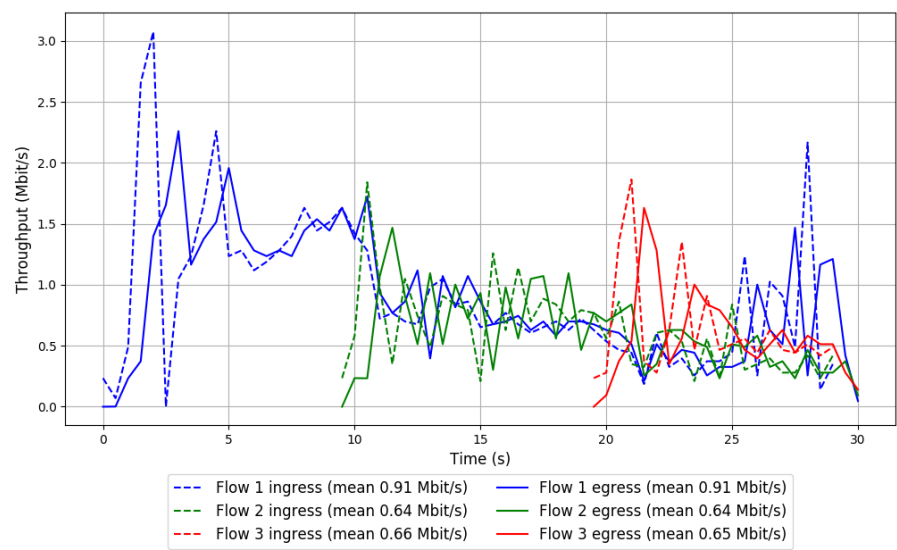


Run 2: Statistics of Indigo-Muses

Start at: 2018-12-11 01:11:41  
End at: 2018-12-11 01:12:11  
Local clock offset: -1.942 ms  
Remote clock offset: -75.556 ms

# Below is generated by plot.py at 2018-12-11 01:38:36  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.55 Mbit/s  
95th percentile per-packet one-way delay: 433.651 ms  
Loss rate: 0.38%  
-- Flow 1:  
Average throughput: 0.91 Mbit/s  
95th percentile per-packet one-way delay: 495.001 ms  
Loss rate: 0.22%  
-- Flow 2:  
Average throughput: 0.64 Mbit/s  
95th percentile per-packet one-way delay: 389.332 ms  
Loss rate: 0.56%  
-- Flow 3:  
Average throughput: 0.65 Mbit/s  
95th percentile per-packet one-way delay: 389.200 ms  
Loss rate: 0.74%

Run 2: Report of Indigo-Muses — Data Link



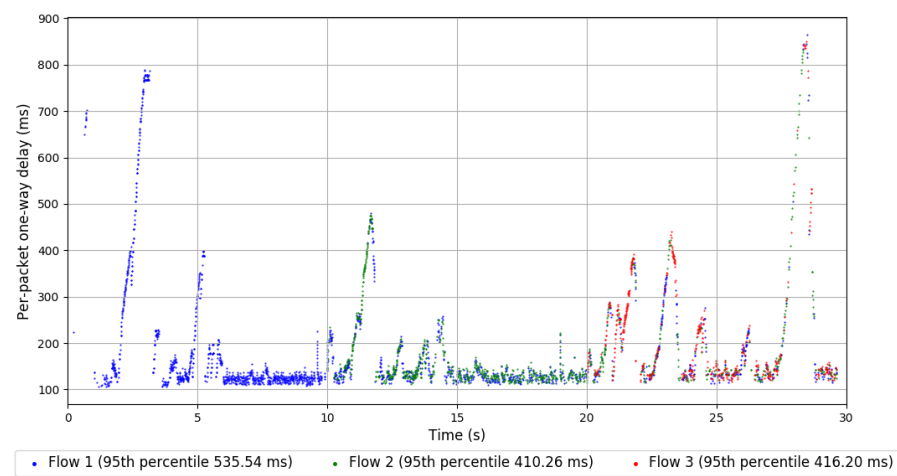
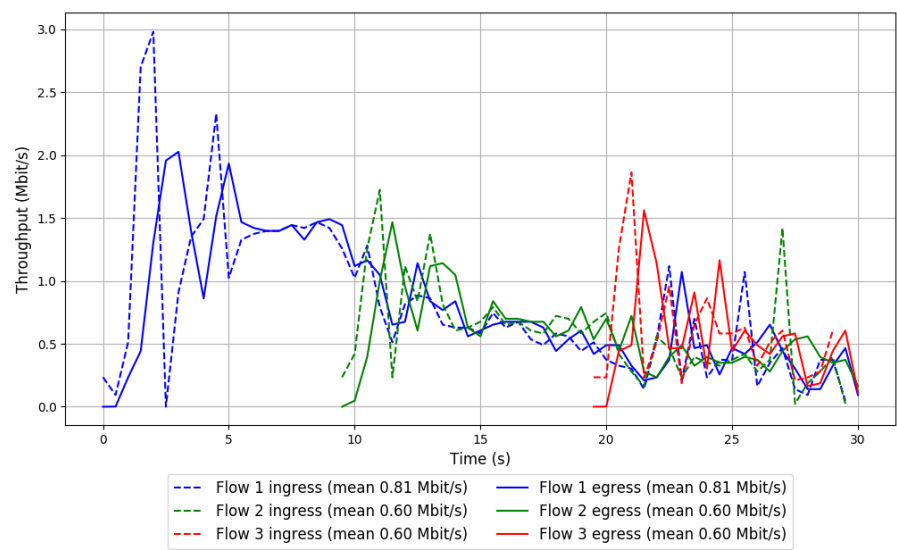


Run 3: Statistics of Indigo-Muses

Start at: 2018-12-11 01:35:07  
End at: 2018-12-11 01:35:37  
Local clock offset: -2.255 ms  
Remote clock offset: -505.137 ms

# Below is generated by plot.py at 2018-12-11 01:38:38  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.41 Mbit/s  
95th percentile per-packet one-way delay: 453.252 ms  
Loss rate: 0.17%  
-- Flow 1:  
Average throughput: 0.81 Mbit/s  
95th percentile per-packet one-way delay: 535.545 ms  
Loss rate: 0.24%  
-- Flow 2:  
Average throughput: 0.60 Mbit/s  
95th percentile per-packet one-way delay: 410.260 ms  
Loss rate: 0.10%  
-- Flow 3:  
Average throughput: 0.60 Mbit/s  
95th percentile per-packet one-way delay: 416.200 ms  
Loss rate: 0.00%

Run 3: Report of Indigo-Muses — Data Link

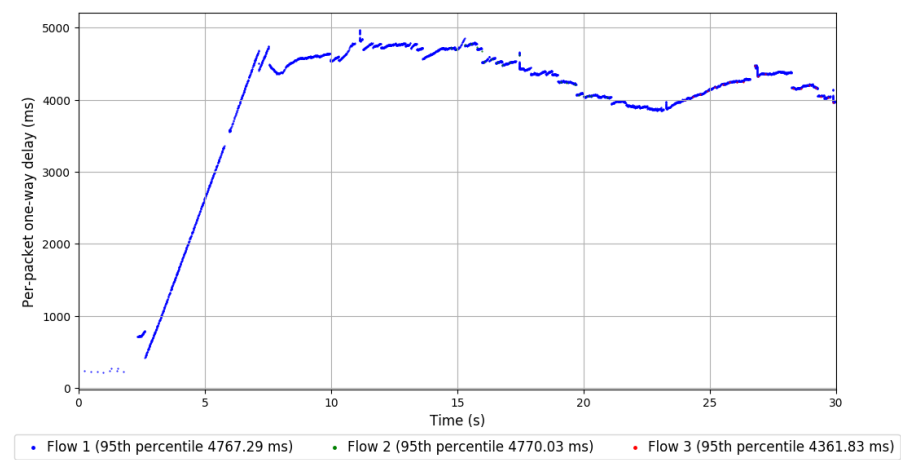
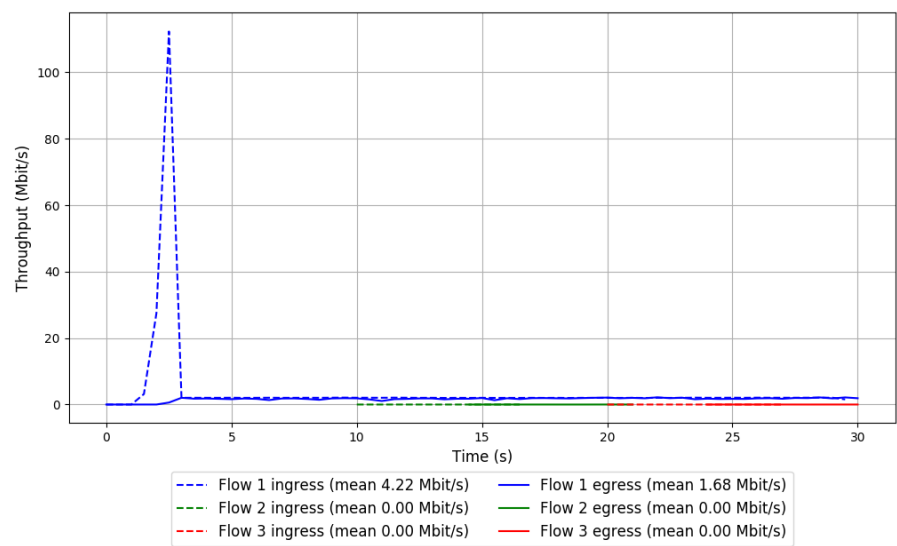


```
Run 1: Statistics of PCC-Allegro

Start at: 2018-12-11 00:45:45
End at: 2018-12-11 00:46:15
Local clock offset: -1.587 ms
Remote clock offset: -1125.164 ms

# Below is generated by plot.py at 2018-12-11 01:38:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 4767.289 ms
Loss rate: 60.47%
-- Flow 1:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 4767.289 ms
Loss rate: 60.49%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 4770.030 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 4361.826 ms
Loss rate: 10.61%
```

Run 1: Report of PCC-Allegro — Data Link

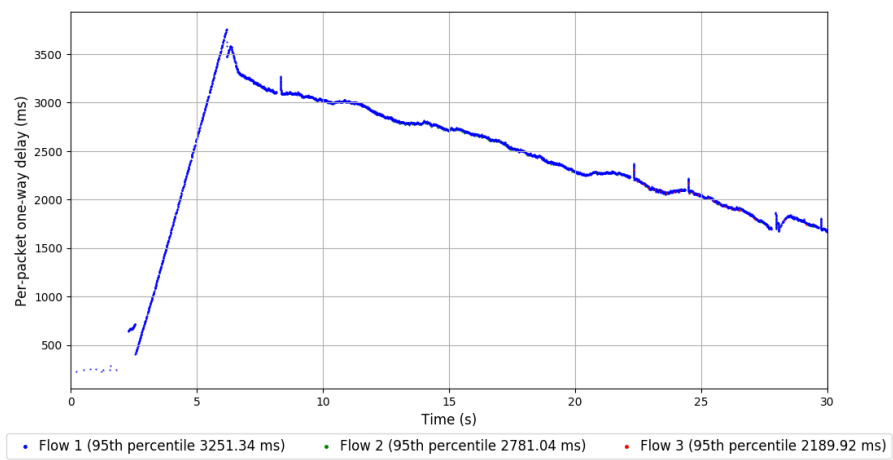
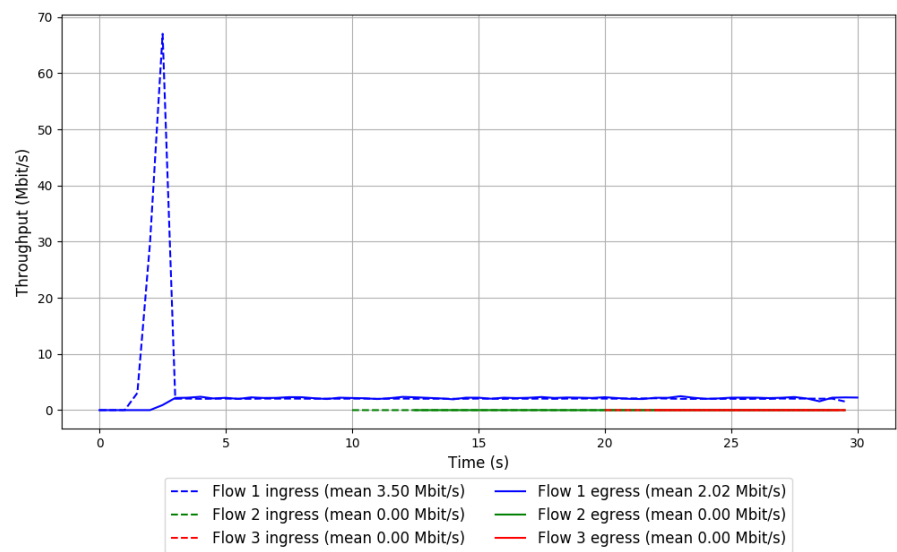


Run 2: Statistics of PCC-Allegro

Start at: 2018-12-11 01:09:11  
End at: 2018-12-11 01:09:41  
Local clock offset: -2.702 ms  
Remote clock offset: -29.299 ms

# Below is generated by plot.py at 2018-12-11 01:38:42  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 2.03 Mbit/s  
95th percentile per-packet one-way delay: 3250.373 ms  
Loss rate: 42.47%  
-- Flow 1:  
Average throughput: 2.02 Mbit/s  
95th percentile per-packet one-way delay: 3251.337 ms  
Loss rate: 42.49%  
-- Flow 2:  
Average throughput: 0.00 Mbit/s  
95th percentile per-packet one-way delay: 2781.037 ms  
Loss rate: 5.59%  
-- Flow 3:  
Average throughput: 0.00 Mbit/s  
95th percentile per-packet one-way delay: 2189.924 ms  
Loss rate: 7.77%

Run 2: Report of PCC-Allegro — Data Link

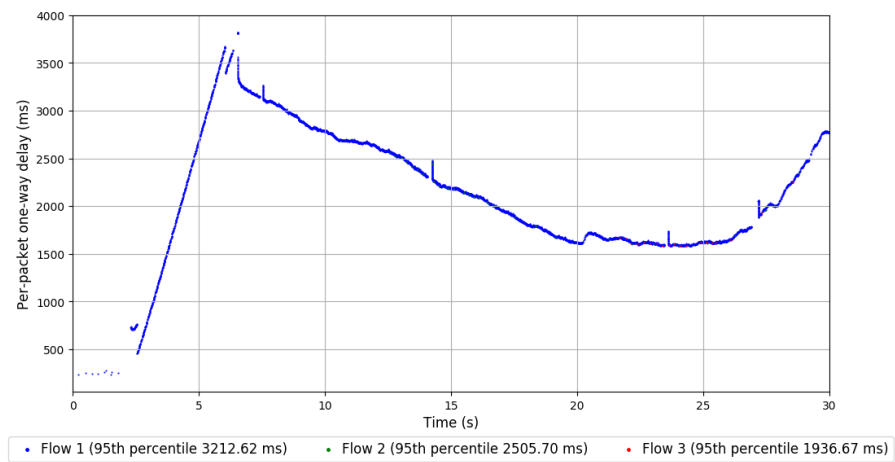
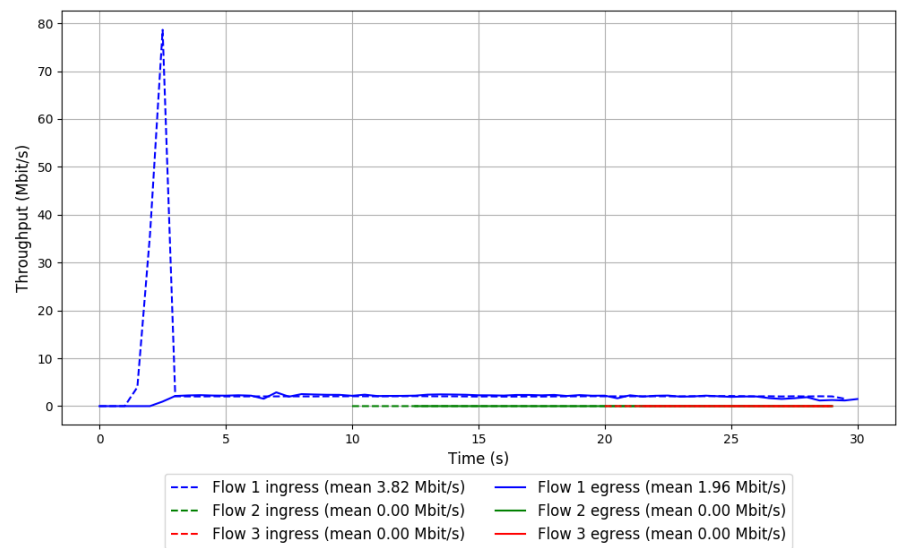


Run 3: Statistics of PCC-Allegro

Start at: 2018-12-11 01:32:39  
End at: 2018-12-11 01:33:09  
Local clock offset: -3.1 ms  
Remote clock offset: -457.359 ms

# Below is generated by plot.py at 2018-12-11 01:38:44  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.96 Mbit/s  
95th percentile per-packet one-way delay: 3211.987 ms  
Loss rate: 48.89%  
-- Flow 1:  
Average throughput: 1.96 Mbit/s  
95th percentile per-packet one-way delay: 3212.620 ms  
Loss rate: 48.92%  
-- Flow 2:  
Average throughput: 0.00 Mbit/s  
95th percentile per-packet one-way delay: 2505.696 ms  
Loss rate: 8.47%  
-- Flow 3:  
Average throughput: 0.00 Mbit/s  
95th percentile per-packet one-way delay: 1936.674 ms  
Loss rate: 11.61%

Run 3: Report of PCC-Allegro — Data Link



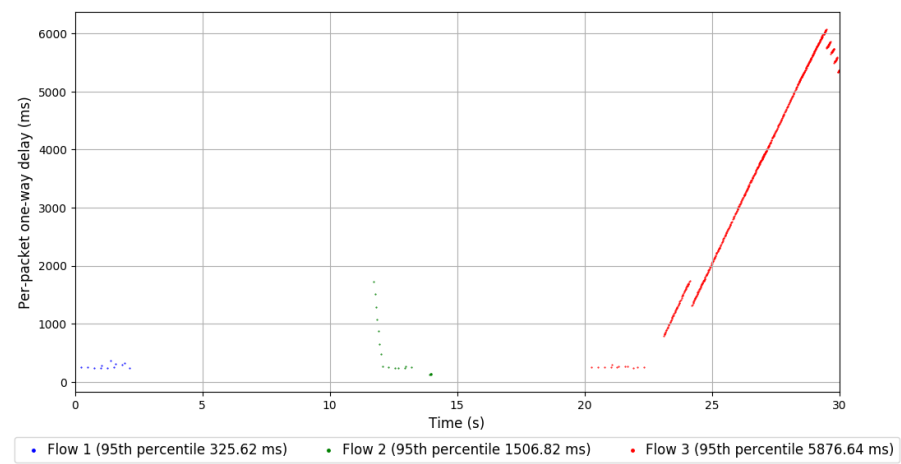
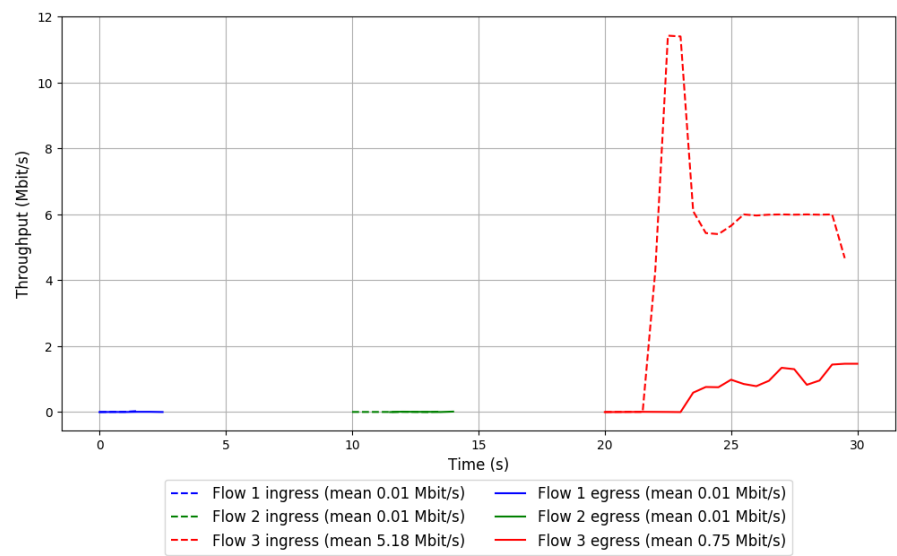


Run 1: Statistics of PCC-Expr

Start at: 2018-12-11 00:29:43  
End at: 2018-12-11 00:30:13  
Local clock offset: -2.284 ms  
Remote clock offset: -825.462 ms

# Below is generated by plot.py at 2018-12-11 01:38:44  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 0.25 Mbit/s  
95th percentile per-packet one-way delay: 5867.898 ms  
Loss rate: 85.76%  
-- Flow 1:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 325.620 ms  
Loss rate: 50.00%  
-- Flow 2:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 1506.822 ms  
Loss rate: 0.00%  
-- Flow 3:  
Average throughput: 0.75 Mbit/s  
95th percentile per-packet one-way delay: 5876.644 ms  
Loss rate: 85.82%

Run 1: Report of PCC-Expr — Data Link

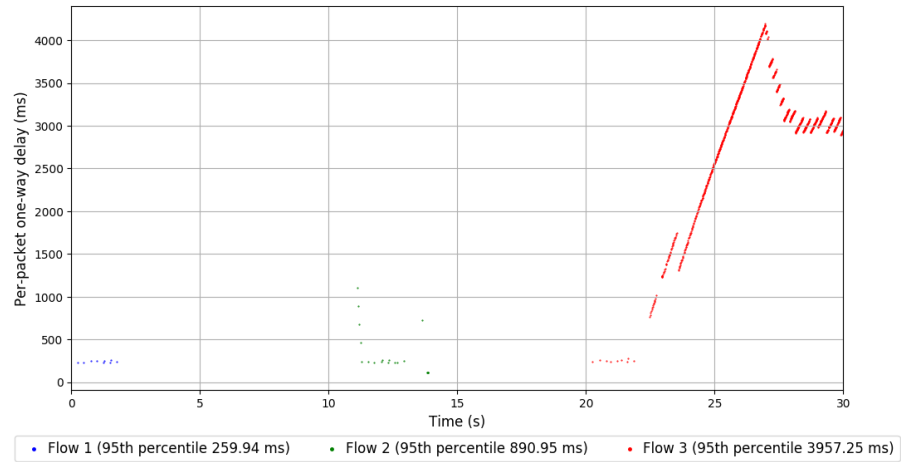
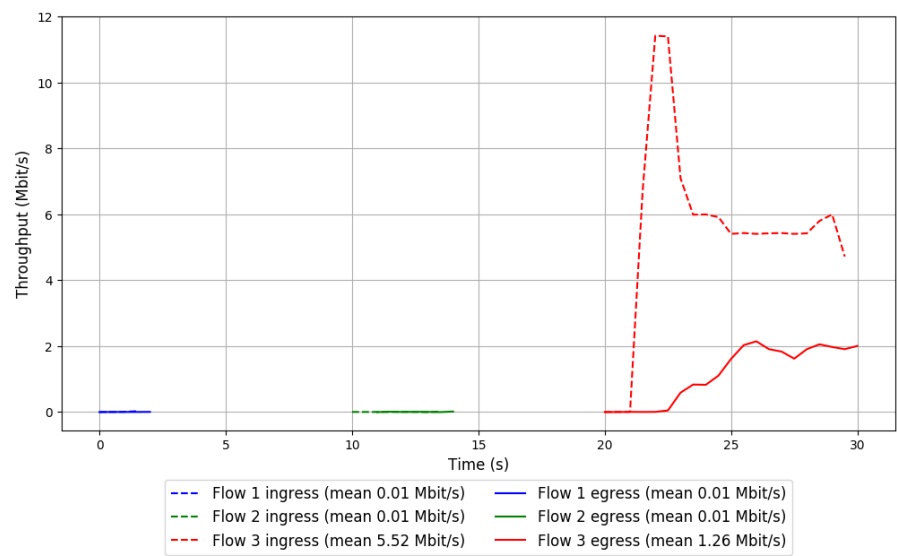


```
Run 2: Statistics of PCC-Expr

Start at: 2018-12-11 00:53:09
End at: 2018-12-11 00:53:39
Local clock offset: -0.449 ms
Remote clock offset: -1259.471 ms

# Below is generated by plot.py at 2018-12-11 01:38:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 3949.551 ms
Loss rate: 77.54%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 259.944 ms
Loss rate: 57.14%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 890.953 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 3957.248 ms
Loss rate: 77.58%
```

Run 2: Report of PCC-Expr — Data Link

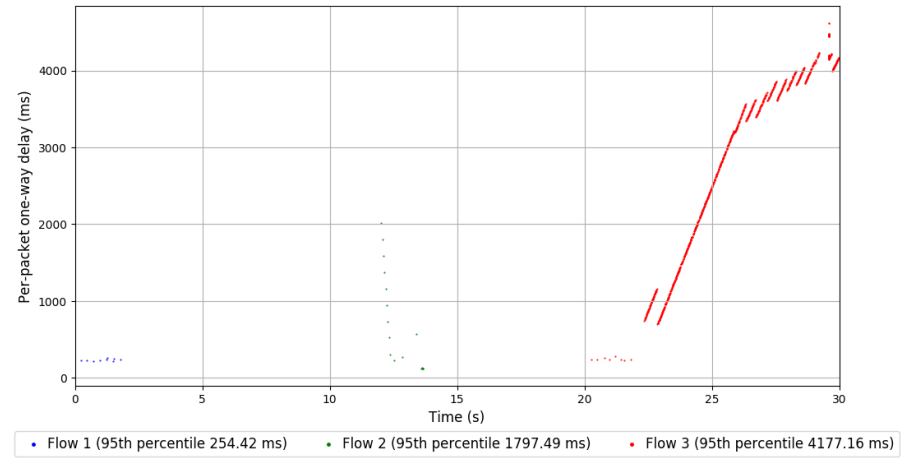
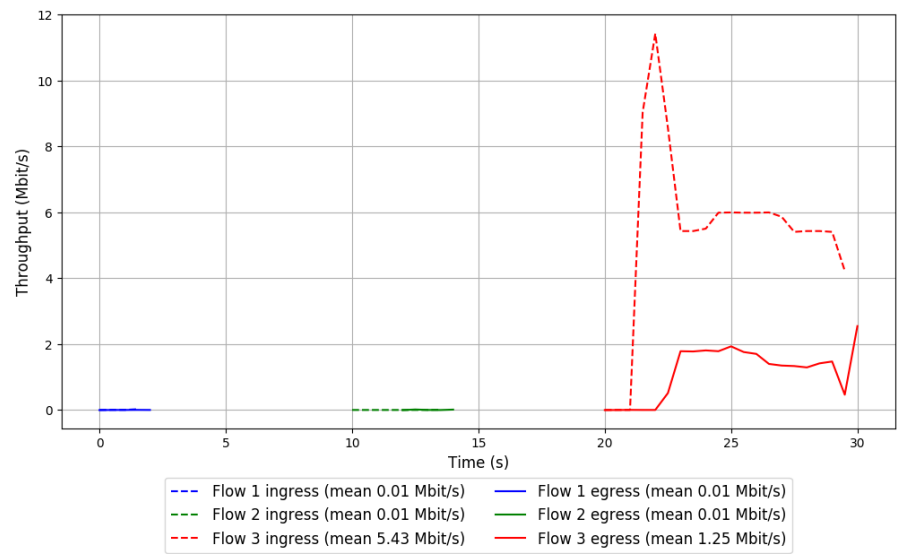


Run 3: Statistics of PCC-Expr

Start at: 2018-12-11 01:16:36  
End at: 2018-12-11 01:17:06  
Local clock offset: -2.12 ms  
Remote clock offset: -167.523 ms

# Below is generated by plot.py at 2018-12-11 01:38:44  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 0.41 Mbit/s  
95th percentile per-packet one-way delay: 4175.231 ms  
Loss rate: 77.20%  
-- Flow 1:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 254.424 ms  
Loss rate: 57.14%  
-- Flow 2:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 1797.492 ms  
Loss rate: 0.00%  
-- Flow 3:  
Average throughput: 1.25 Mbit/s  
95th percentile per-packet one-way delay: 4177.157 ms  
Loss rate: 77.24%

Run 3: Report of PCC-Expr — Data Link

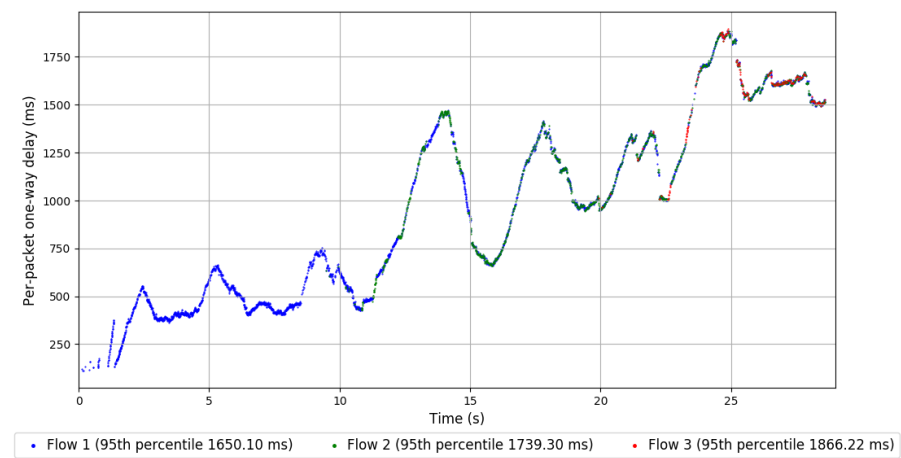
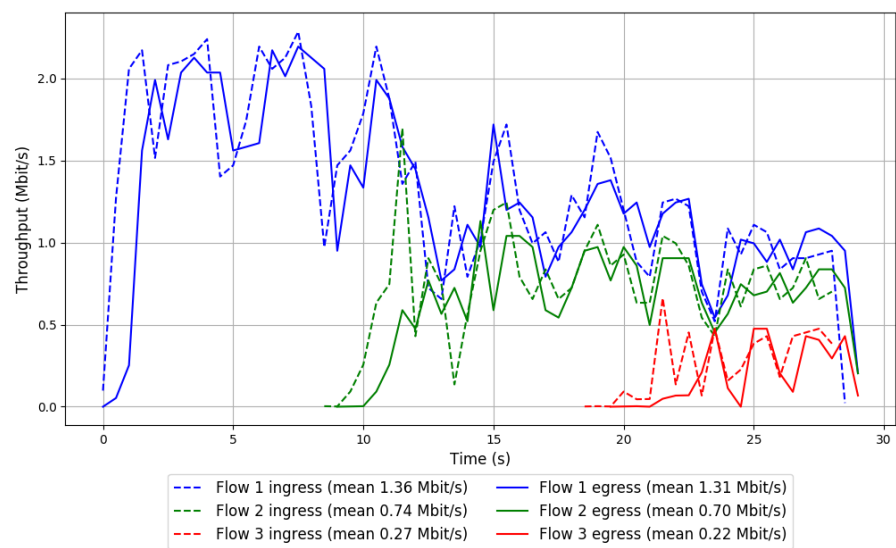


Run 1: Statistics of QUIC Cubic

Start at: 2018-12-11 00:33:24  
End at: 2018-12-11 00:33:54  
Local clock offset: -2.071 ms  
Remote clock offset: -897.303 ms

# Below is generated by plot.py at 2018-12-11 01:38:44  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.85 Mbit/s  
95th percentile per-packet one-way delay: 1701.309 ms  
Loss rate: 5.45%  
-- Flow 1:  
Average throughput: 1.31 Mbit/s  
95th percentile per-packet one-way delay: 1650.101 ms  
Loss rate: 3.50%  
-- Flow 2:  
Average throughput: 0.70 Mbit/s  
95th percentile per-packet one-way delay: 1739.300 ms  
Loss rate: 7.32%  
-- Flow 3:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 1866.222 ms  
Loss rate: 24.37%

Run 1: Report of QUIC Cubic — Data Link



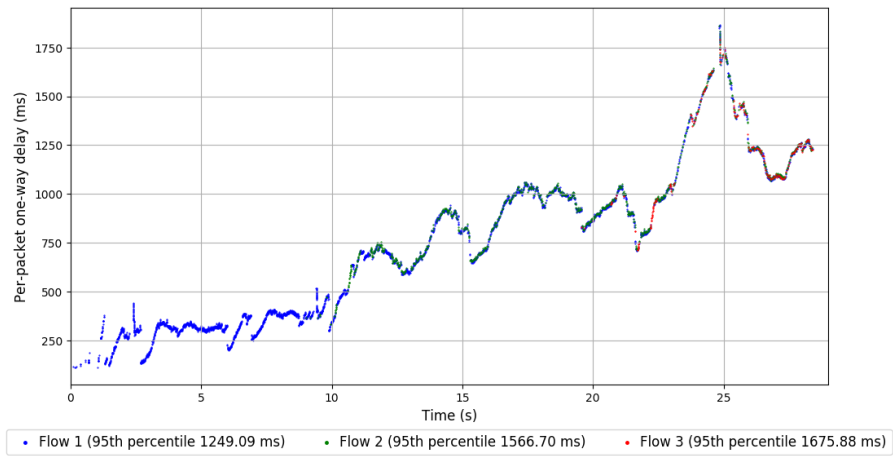
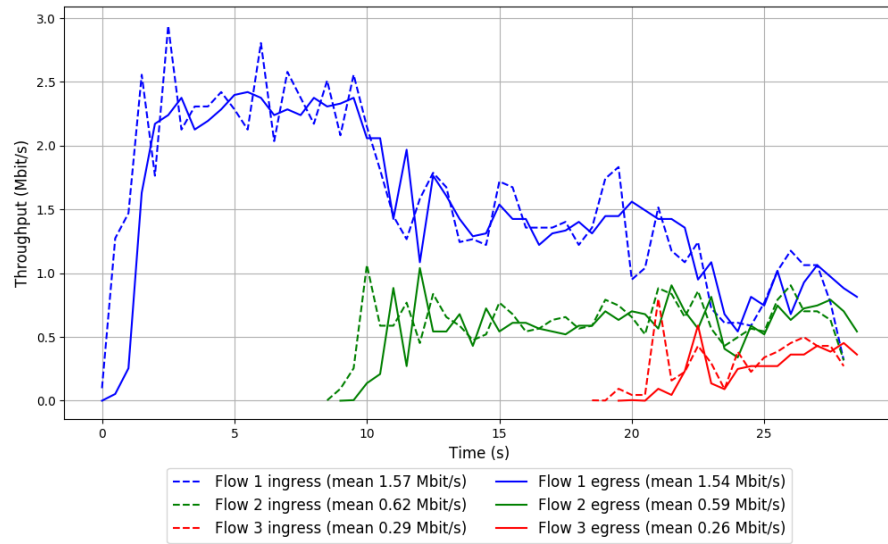


Run 2: Statistics of QUIC Cubic

Start at: 2018-12-11 00:56:51  
End at: 2018-12-11 00:57:21  
Local clock offset: -1.237 ms  
Remote clock offset: -1328.894 ms

# Below is generated by plot.py at 2018-12-11 01:38:45  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 2.03 Mbit/s  
95th percentile per-packet one-way delay: 1417.912 ms  
Loss rate: 3.74%  
-- Flow 1:  
Average throughput: 1.54 Mbit/s  
95th percentile per-packet one-way delay: 1249.087 ms  
Loss rate: 2.26%  
-- Flow 2:  
Average throughput: 0.59 Mbit/s  
95th percentile per-packet one-way delay: 1566.698 ms  
Loss rate: 5.91%  
-- Flow 3:  
Average throughput: 0.26 Mbit/s  
95th percentile per-packet one-way delay: 1675.881 ms  
Loss rate: 17.77%

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

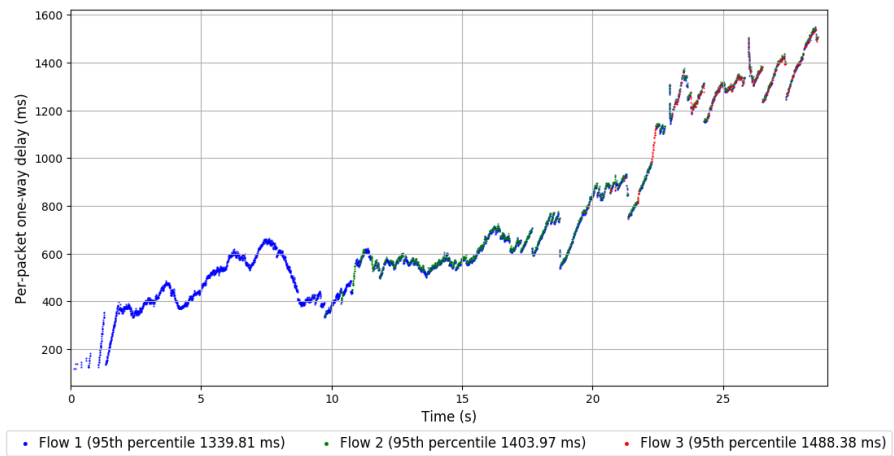
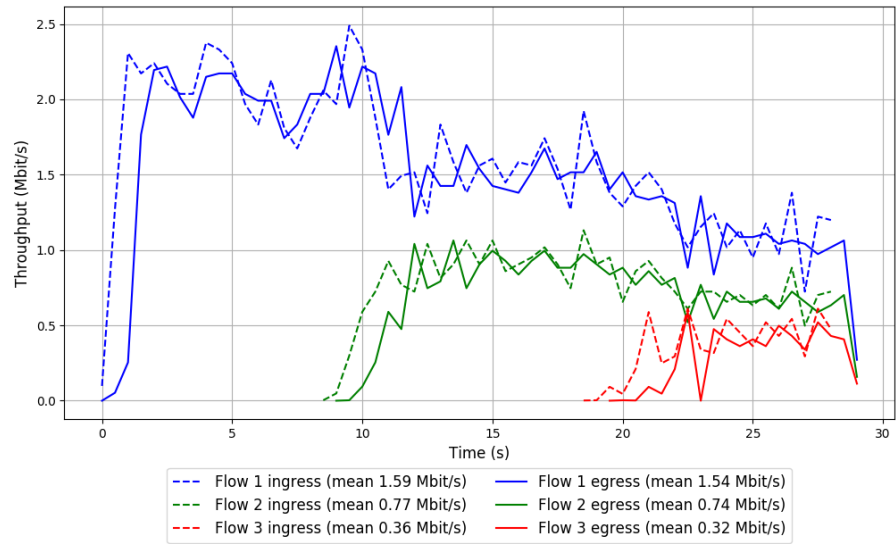


Run 3: Statistics of QUIC Cubic

Start at: 2018-12-11 01:20:19  
End at: 2018-12-11 01:20:49  
Local clock offset: -3.071 ms  
Remote clock offset: -228.667 ms

# Below is generated by plot.py at 2018-12-11 01:38:46  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 2.14 Mbit/s  
95th percentile per-packet one-way delay: 1381.559 ms  
Loss rate: 4.83%  
-- Flow 1:  
Average throughput: 1.54 Mbit/s  
95th percentile per-packet one-way delay: 1339.806 ms  
Loss rate: 3.41%  
-- Flow 2:  
Average throughput: 0.74 Mbit/s  
95th percentile per-packet one-way delay: 1403.967 ms  
Loss rate: 5.95%  
-- Flow 3:  
Average throughput: 0.32 Mbit/s  
95th percentile per-packet one-way delay: 1488.383 ms  
Loss rate: 18.47%

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

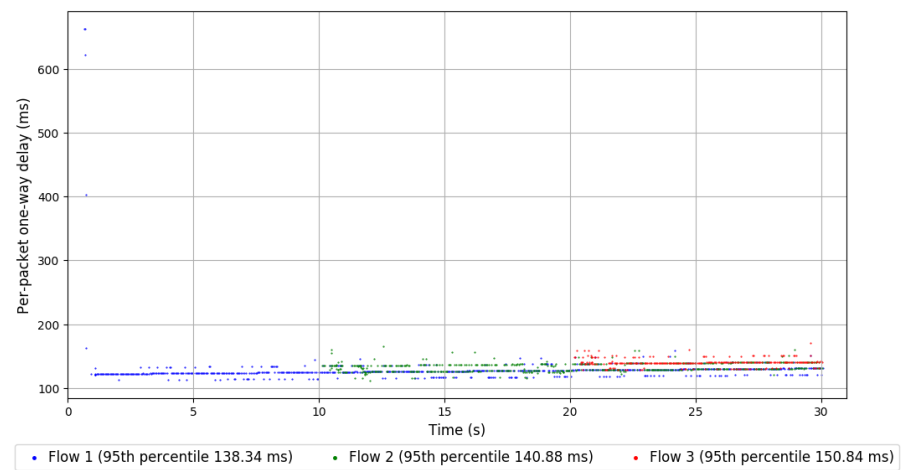
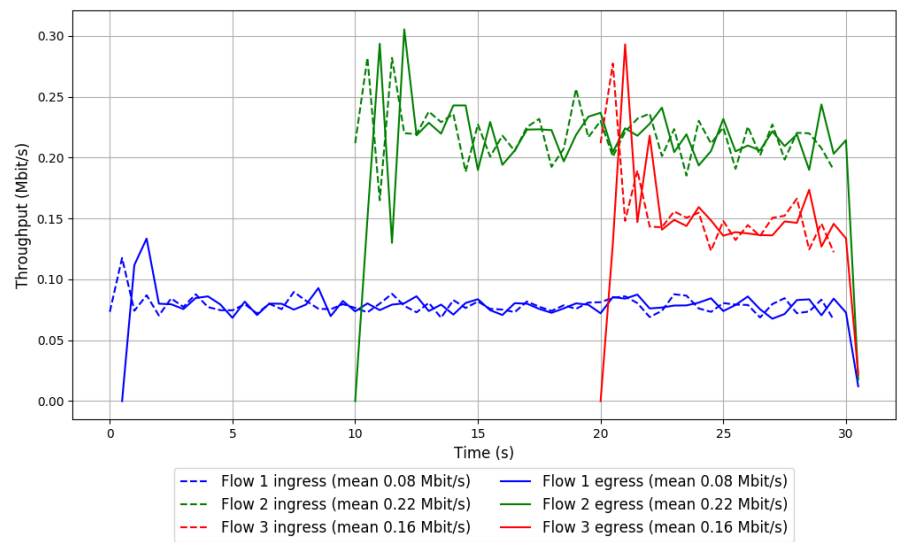


```
Run 1: Statistics of SReAM

Start at: 2018-12-11 00:49:27
End at: 2018-12-11 00:49:57
Local clock offset: -0.627 ms
Remote clock offset: -1190.689 ms

# Below is generated by plot.py at 2018-12-11 01:38:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 145.478 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 138.343 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 140.885 ms
Loss rate: 0.19%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 150.838 ms
Loss rate: 0.33%
```

Run 1: Report of SCSReAM — Data Link

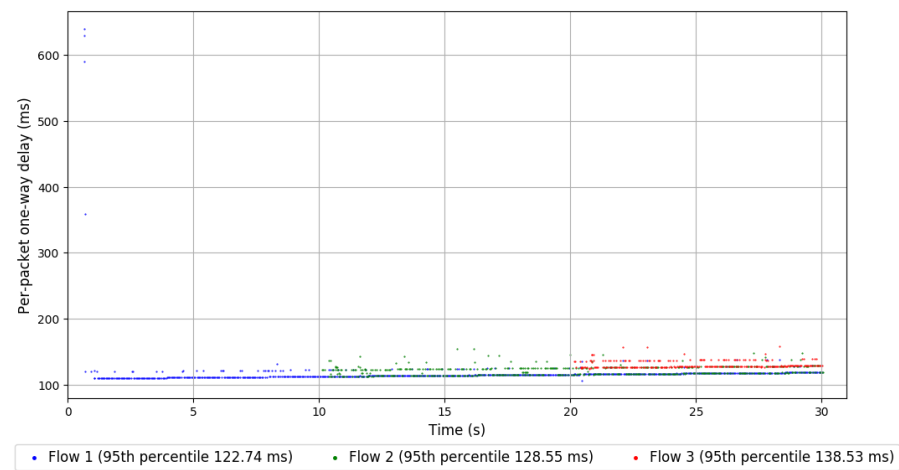
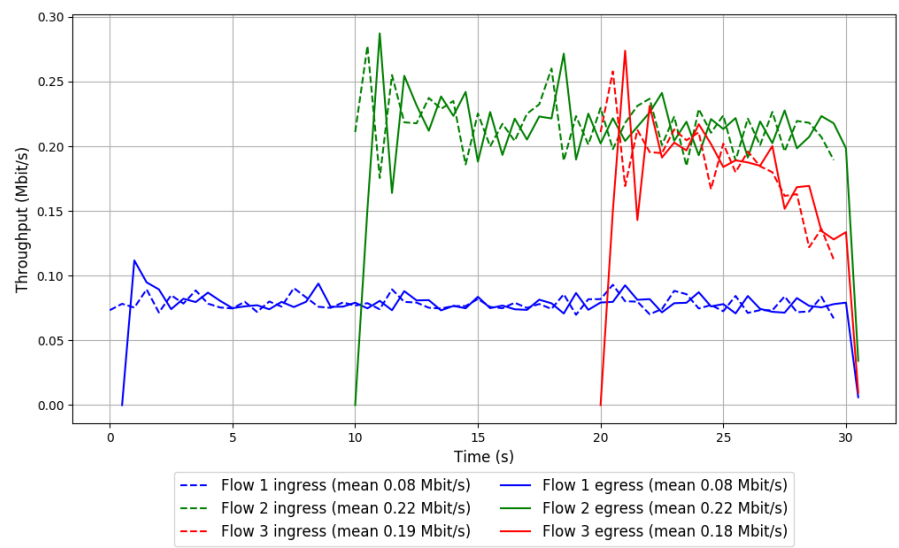


Run 2: Statistics of SReAM

Start at: 2018-12-11 01:12:55  
End at: 2018-12-11 01:13:25  
Local clock offset: -2.897 ms  
Remote clock offset: -100.313 ms

# Below is generated by plot.py at 2018-12-11 01:38:46  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 0.29 Mbit/s  
95th percentile per-packet one-way delay: 136.510 ms  
Loss rate: 0.15%  
-- Flow 1:  
Average throughput: 0.08 Mbit/s  
95th percentile per-packet one-way delay: 122.740 ms  
Loss rate: 0.00%  
-- Flow 2:  
Average throughput: 0.22 Mbit/s  
95th percentile per-packet one-way delay: 128.550 ms  
Loss rate: 0.00%  
-- Flow 3:  
Average throughput: 0.18 Mbit/s  
95th percentile per-packet one-way delay: 138.532 ms  
Loss rate: 0.68%

Run 2: Report of SReAM — Data Link



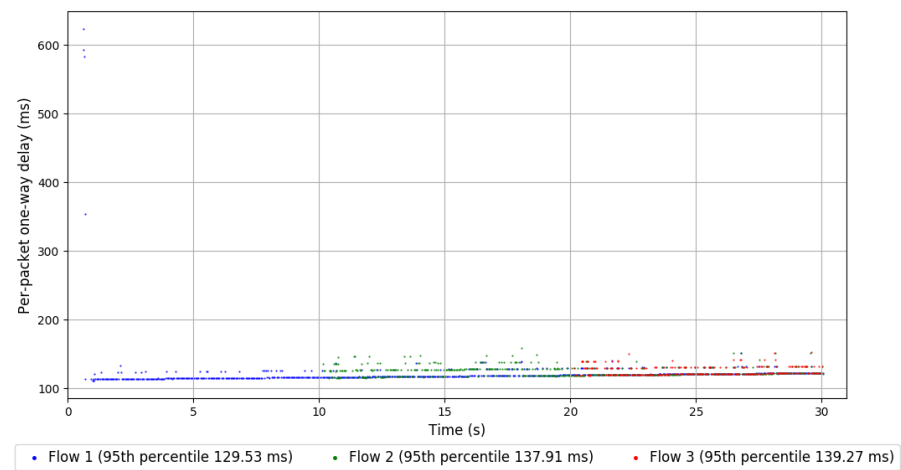
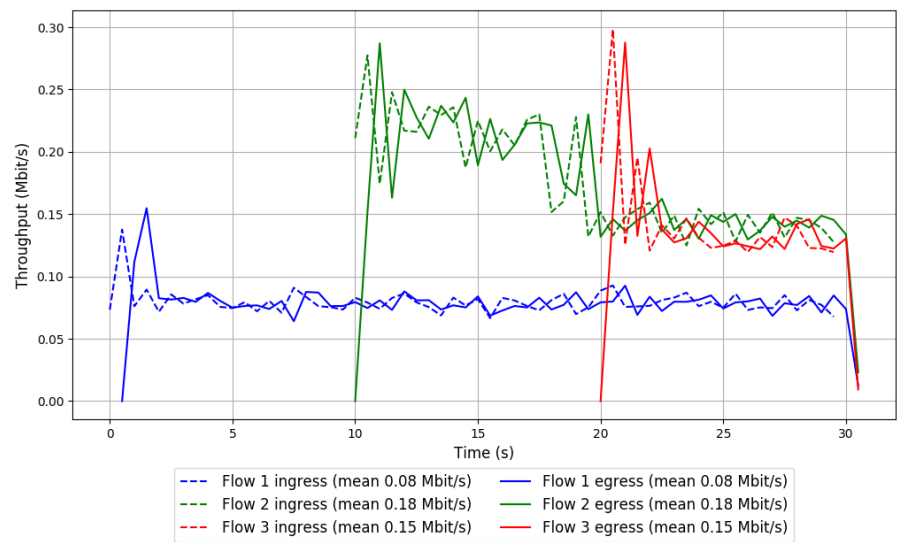


Run 3: Statistics of SCReAM

Start at: 2018-12-11 01:36:21  
End at: 2018-12-11 01:36:51  
Local clock offset: -2.258 ms  
Remote clock offset: -524.702 ms

# Below is generated by plot.py at 2018-12-11 01:38:46  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 0.25 Mbit/s  
95th percentile per-packet one-way delay: 136.976 ms  
Loss rate: 0.20%  
-- Flow 1:  
Average throughput: 0.08 Mbit/s  
95th percentile per-packet one-way delay: 129.533 ms  
Loss rate: 0.41%  
-- Flow 2:  
Average throughput: 0.18 Mbit/s  
95th percentile per-packet one-way delay: 137.905 ms  
Loss rate: 0.00%  
-- Flow 3:  
Average throughput: 0.15 Mbit/s  
95th percentile per-packet one-way delay: 139.267 ms  
Loss rate: 0.33%

Run 3: Report of SReAM — Data Link

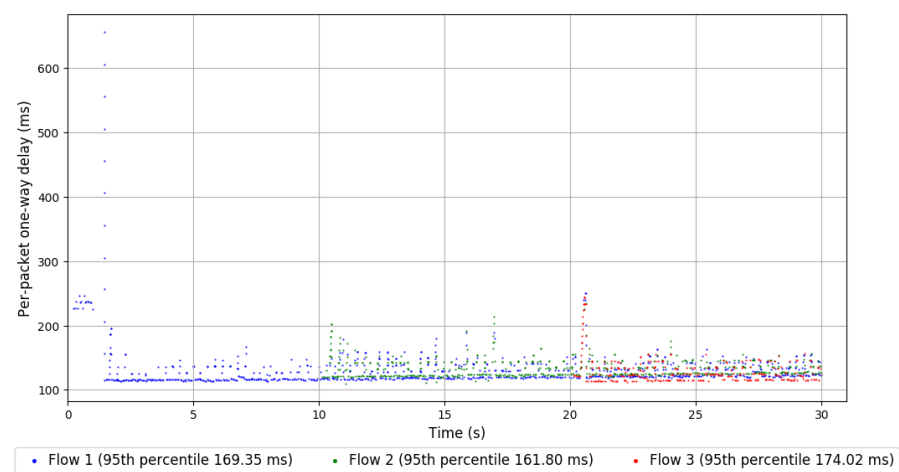
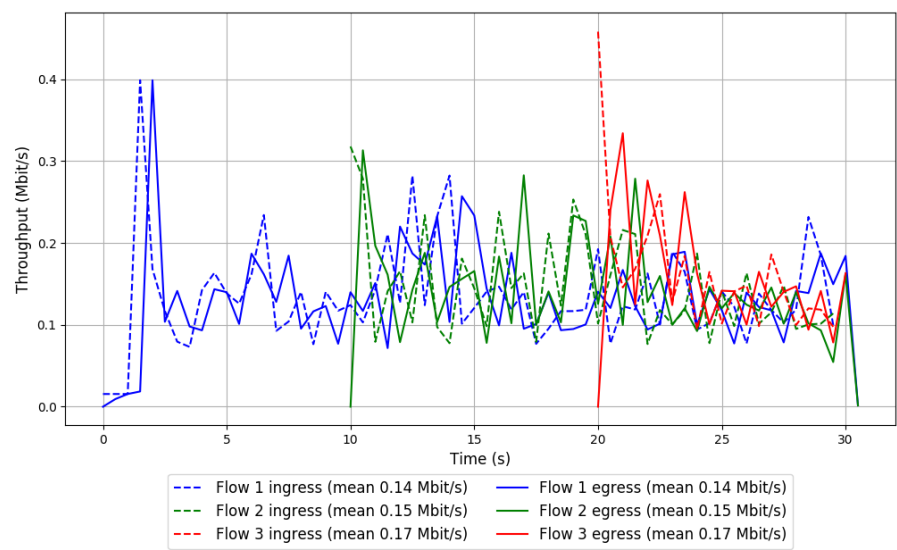


Run 1: Statistics of Sprout

Start at: 2018-12-11 00:37:06  
End at: 2018-12-11 00:37:36  
Local clock offset: -1.038 ms  
Remote clock offset: -965.971 ms

# Below is generated by plot.py at 2018-12-11 01:38:47  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 0.29 Mbit/s  
95th percentile per-packet one-way delay: 164.645 ms  
Loss rate: 0.16%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 169.350 ms  
Loss rate: 0.00%  
-- Flow 2:  
Average throughput: 0.15 Mbit/s  
95th percentile per-packet one-way delay: 161.800 ms  
Loss rate: 0.43%  
-- Flow 3:  
Average throughput: 0.17 Mbit/s  
95th percentile per-packet one-way delay: 174.022 ms  
Loss rate: 0.05%

Run 1: Report of Sprout — Data Link

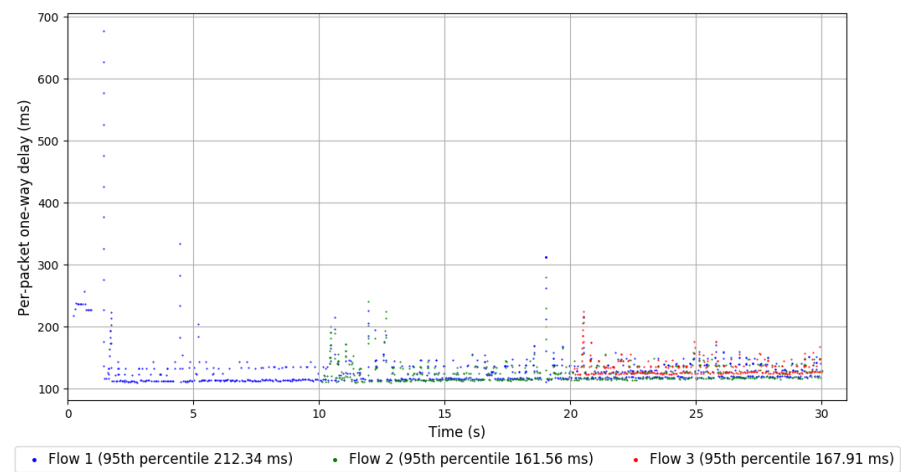
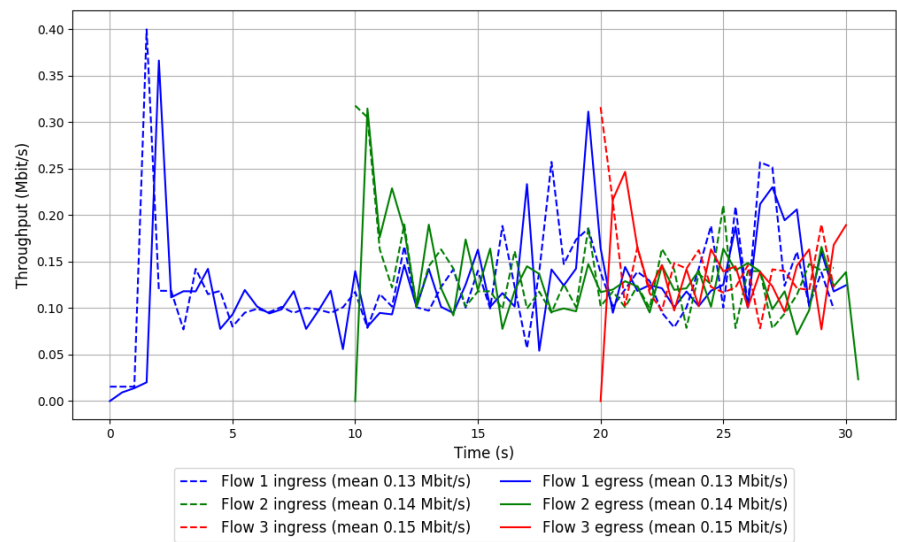


Run 2: Statistics of Sprout

Start at: 2018-12-11 01:00:33  
End at: 2018-12-11 01:01:03  
Local clock offset: -0.918 ms  
Remote clock offset: -1395.257 ms

# Below is generated by plot.py at 2018-12-11 01:38:47  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 0.27 Mbit/s  
95th percentile per-packet one-way delay: 175.693 ms  
Loss rate: 0.16%  
-- Flow 1:  
Average throughput: 0.13 Mbit/s  
95th percentile per-packet one-way delay: 212.337 ms  
Loss rate: 0.02%  
-- Flow 2:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 161.556 ms  
Loss rate: 0.43%  
-- Flow 3:  
Average throughput: 0.15 Mbit/s  
95th percentile per-packet one-way delay: 167.909 ms  
Loss rate: 0.00%

Run 2: Report of Sprout — Data Link

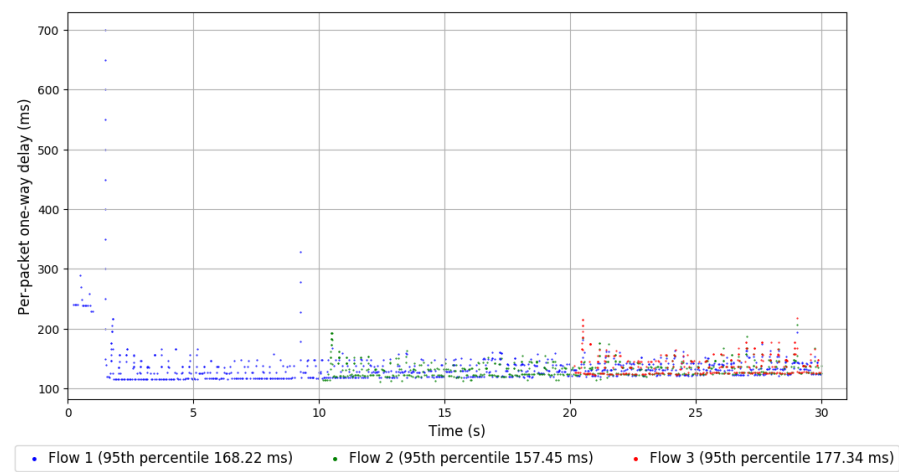
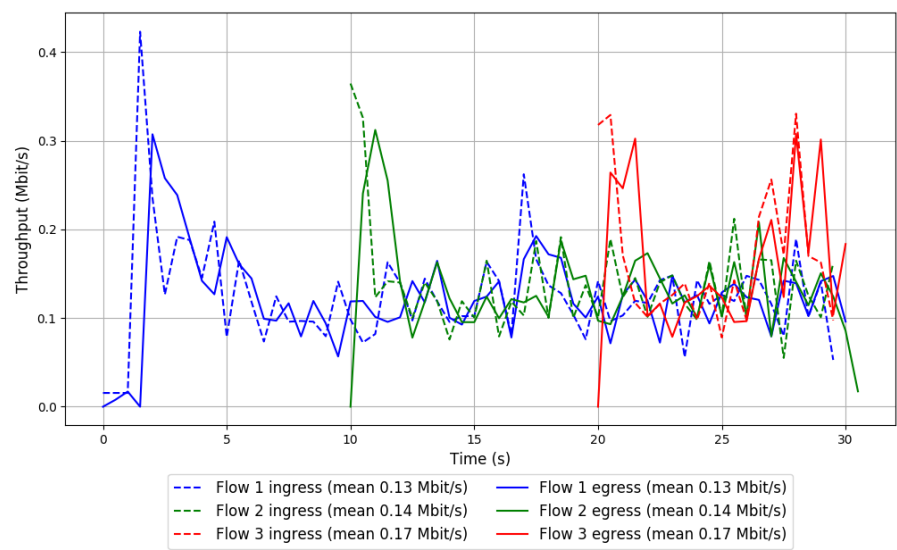


### Run 3: Statistics of Sprout

Start at: 2018-12-11 01:24:02  
End at: 2018-12-11 01:24:32  
Local clock offset: -3.128 ms  
Remote clock offset: -296.863 ms

```
# Below is generated by plot.py at 2018-12-11 01:38:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 167.978 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 168.225 ms
Loss rate: 0.39%
-- Flow 2:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 157.454 ms
Loss rate: 1.16%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 177.344 ms
Loss rate: 0.05%
```

Run 3: Report of Sprout — Data Link



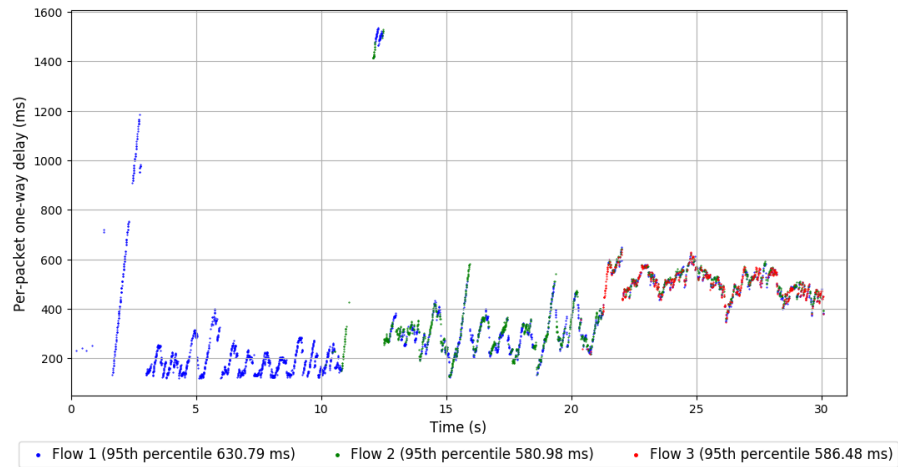
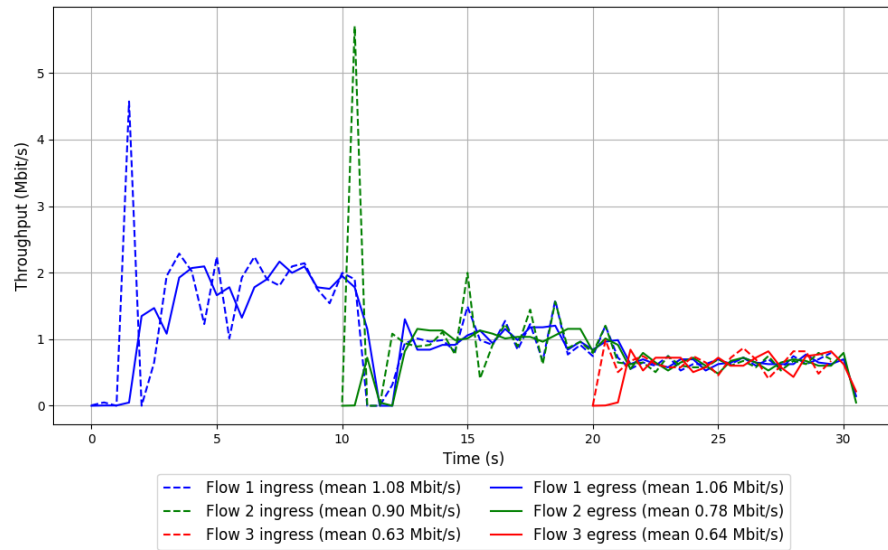


```
Run 1: Statistics of TaoVA-100x

Start at: 2018-12-11 00:42:03
End at: 2018-12-11 00:42:33
Local clock offset: -1.775 ms
Remote clock offset: -1055.976 ms

# Below is generated by plot.py at 2018-12-11 01:38:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 595.599 ms
Loss rate: 5.95%
-- Flow 1:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 630.789 ms
Loss rate: 2.34%
-- Flow 2:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 580.984 ms
Loss rate: 13.67%
-- Flow 3:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 586.480 ms
Loss rate: 2.47%
```

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

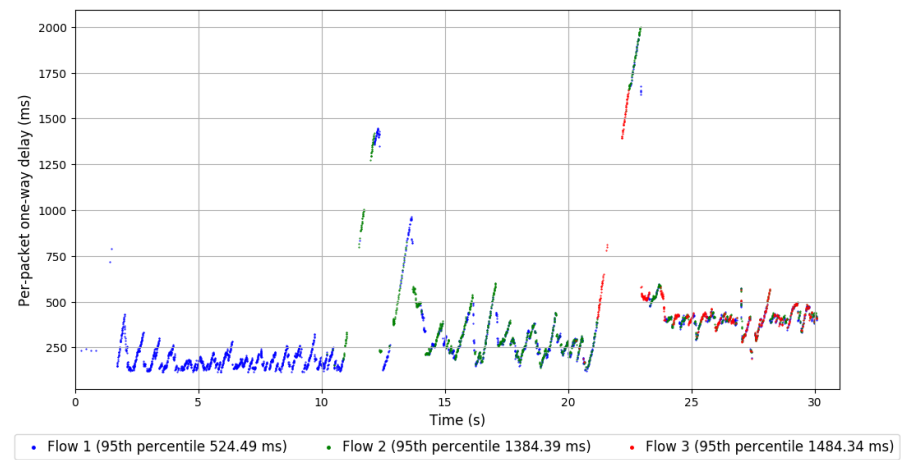
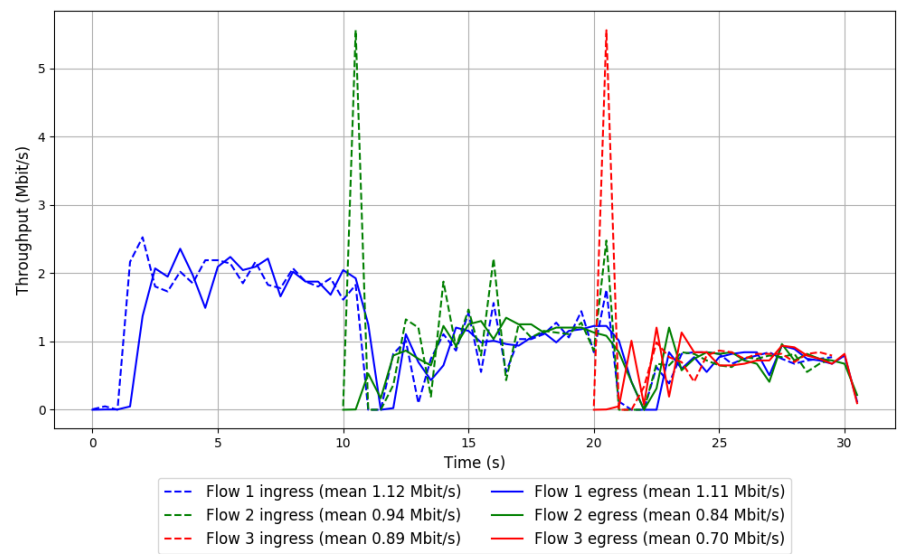


Run 2: Statistics of TaoVA-100x

Start at: 2018-12-11 01:05:29  
End at: 2018-12-11 01:05:59  
Local clock offset: -1.591 ms  
Remote clock offset: 12.654 ms

# Below is generated by plot.py at 2018-12-11 01:38:51  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.90 Mbit/s  
95th percentile per-packet one-way delay: 948.137 ms  
Loss rate: 6.98%  
-- Flow 1:  
Average throughput: 1.11 Mbit/s  
95th percentile per-packet one-way delay: 524.486 ms  
Loss rate: 0.90%  
-- Flow 2:  
Average throughput: 0.84 Mbit/s  
95th percentile per-packet one-way delay: 1384.395 ms  
Loss rate: 10.63%  
-- Flow 3:  
Average throughput: 0.70 Mbit/s  
95th percentile per-packet one-way delay: 1484.336 ms  
Loss rate: 22.20%

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

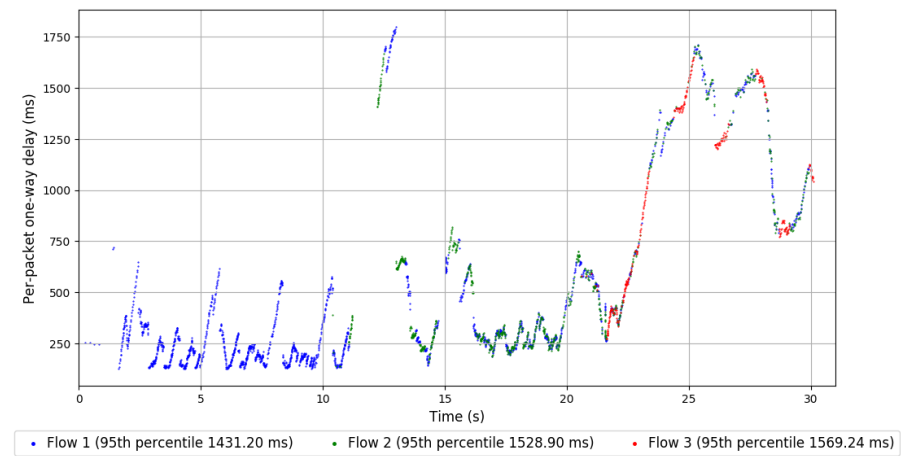
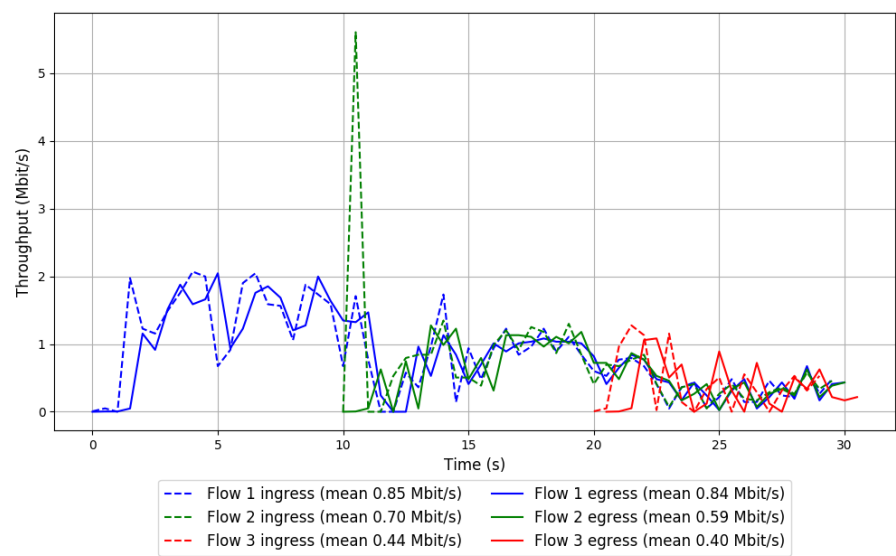


Run 3: Statistics of TaoVA-100x

Start at: 2018-12-11 01:28:57  
End at: 2018-12-11 01:29:27  
Local clock offset: -3.134 ms  
Remote clock offset: -386.493 ms

# Below is generated by plot.py at 2018-12-11 01:38:51  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.35 Mbit/s  
95th percentile per-packet one-way delay: 1521.280 ms  
Loss rate: 7.33%  
-- Flow 1:  
Average throughput: 0.84 Mbit/s  
95th percentile per-packet one-way delay: 1431.200 ms  
Loss rate: 1.79%  
-- Flow 2:  
Average throughput: 0.59 Mbit/s  
95th percentile per-packet one-way delay: 1528.904 ms  
Loss rate: 17.84%  
-- Flow 3:  
Average throughput: 0.40 Mbit/s  
95th percentile per-packet one-way delay: 1569.236 ms  
Loss rate: 5.93%

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

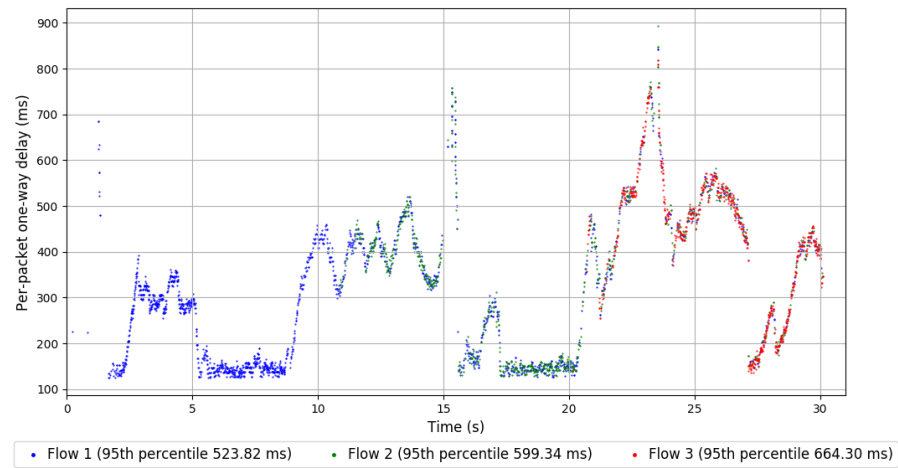
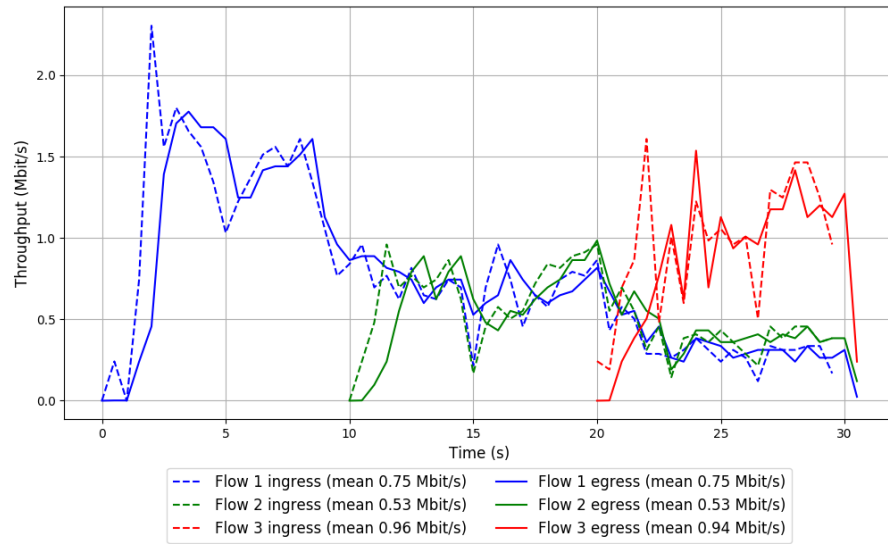


Run 1: Statistics of TCP Vegas

Start at: 2018-12-11 00:50:41  
End at: 2018-12-11 00:51:11  
Local clock offset: -0.532 ms  
Remote clock offset: -1210.317 ms

# Below is generated by plot.py at 2018-12-11 01:38:51  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.41 Mbit/s  
95th percentile per-packet one-way delay: 582.064 ms  
Loss rate: 1.01%  
-- Flow 1:  
Average throughput: 0.75 Mbit/s  
95th percentile per-packet one-way delay: 523.820 ms  
Loss rate: 0.43%  
-- Flow 2:  
Average throughput: 0.53 Mbit/s  
95th percentile per-packet one-way delay: 599.337 ms  
Loss rate: 0.80%  
-- Flow 3:  
Average throughput: 0.94 Mbit/s  
95th percentile per-packet one-way delay: 664.303 ms  
Loss rate: 2.64%

# Run 1: Report of TCP Vegas — Data Link



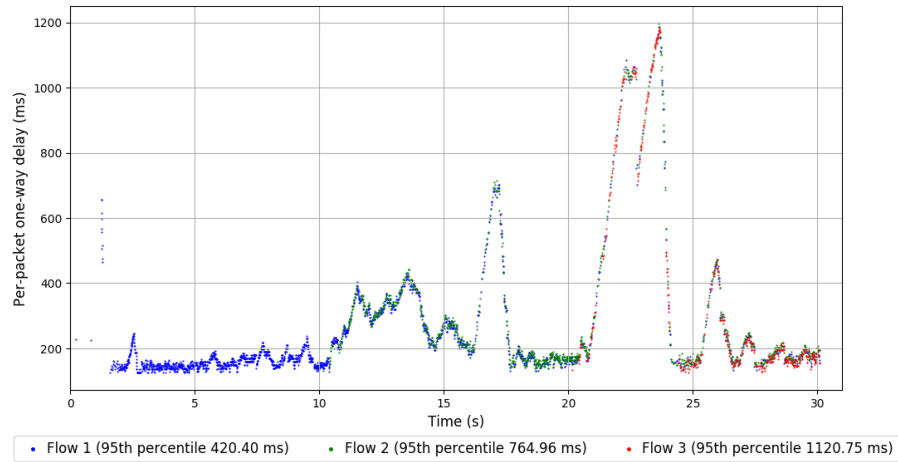
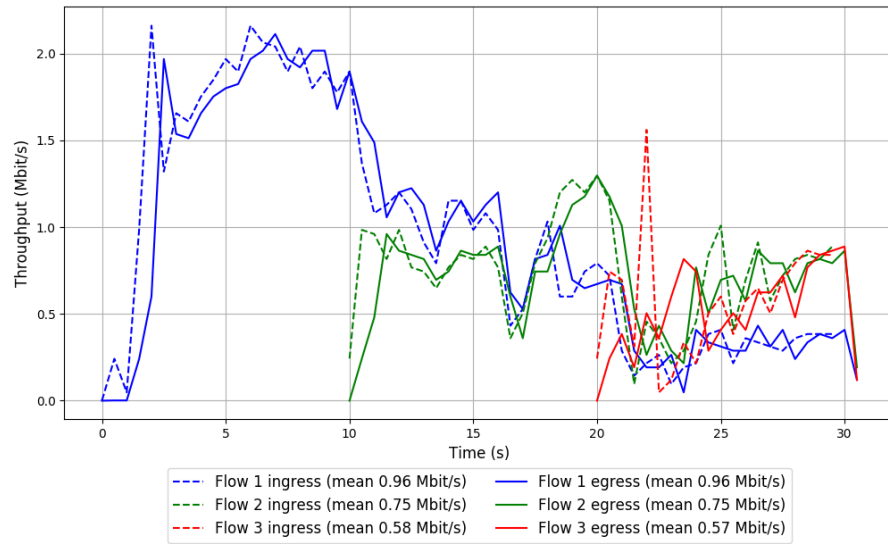


Run 2: Statistics of TCP Vegas

Start at: 2018-12-11 01:14:08  
End at: 2018-12-11 01:14:38  
Local clock offset: -2.04 ms  
Remote clock offset: -113.015 ms

# Below is generated by plot.py at 2018-12-11 01:38:52  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.65 Mbit/s  
95th percentile per-packet one-way delay: 753.481 ms  
Loss rate: 0.36%  
-- Flow 1:  
Average throughput: 0.96 Mbit/s  
95th percentile per-packet one-way delay: 420.397 ms  
Loss rate: 0.13%  
-- Flow 2:  
Average throughput: 0.75 Mbit/s  
95th percentile per-packet one-way delay: 764.962 ms  
Loss rate: 0.48%  
-- Flow 3:  
Average throughput: 0.57 Mbit/s  
95th percentile per-packet one-way delay: 1120.750 ms  
Loss rate: 1.25%

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

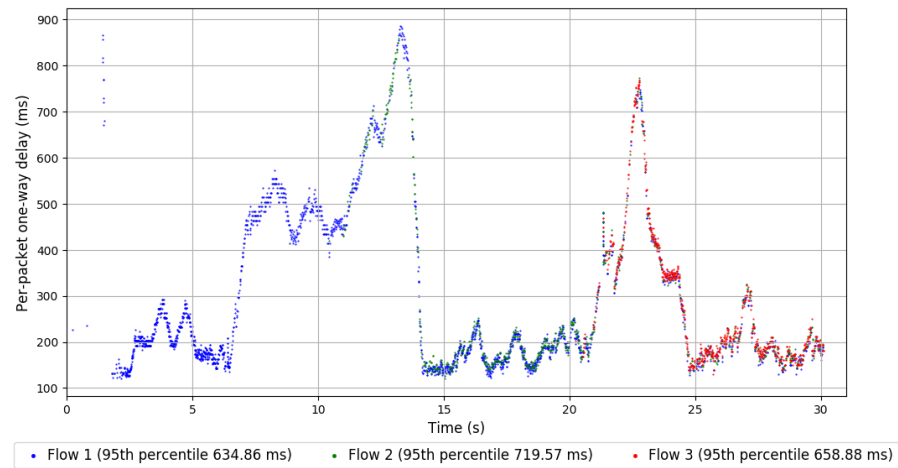
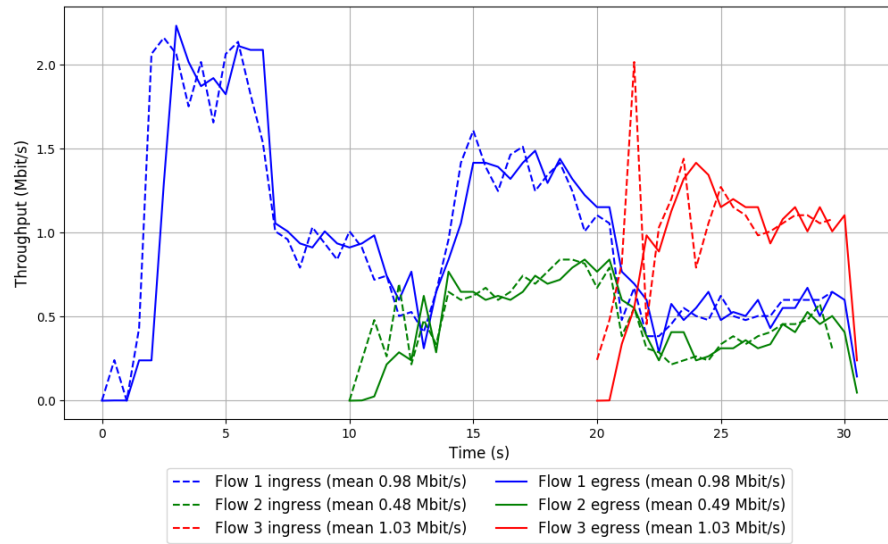


Run 3: Statistics of TCP Vegas

Start at: 2018-12-11 01:37:35  
End at: 2018-12-11 01:38:05  
Local clock offset: -2.252 ms  
Remote clock offset: -544.063 ms

# Below is generated by plot.py at 2018-12-11 01:38:53  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.64 Mbit/s  
95th percentile per-packet one-way delay: 660.152 ms  
Loss rate: 0.44%  
-- Flow 1:  
Average throughput: 0.98 Mbit/s  
95th percentile per-packet one-way delay: 634.856 ms  
Loss rate: 0.25%  
-- Flow 2:  
Average throughput: 0.49 Mbit/s  
95th percentile per-packet one-way delay: 719.565 ms  
Loss rate: 0.75%  
-- Flow 3:  
Average throughput: 1.03 Mbit/s  
95th percentile per-packet one-way delay: 658.882 ms  
Loss rate: 0.70%

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

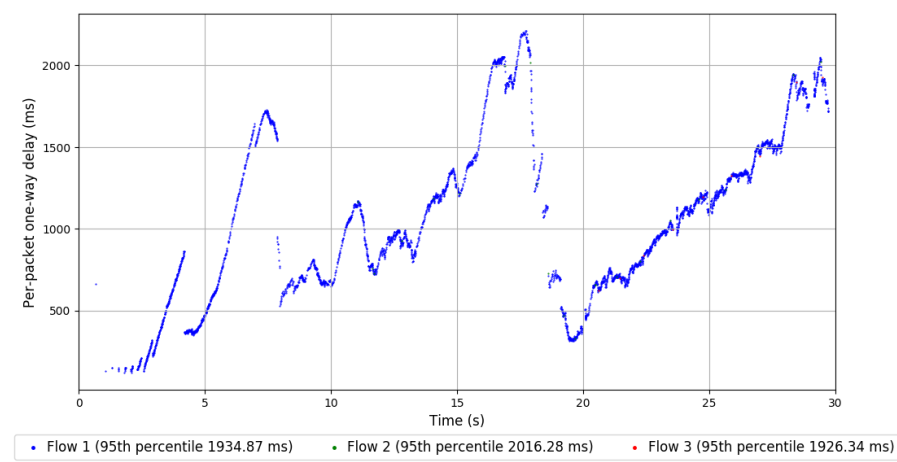
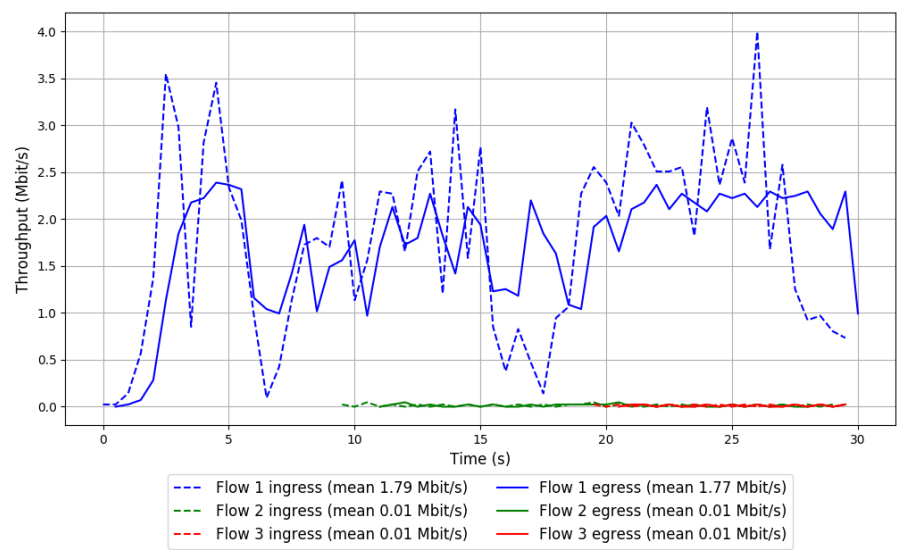


Run 1: Statistics of Verus

Start at: 2018-12-11 00:40:48  
End at: 2018-12-11 00:41:18  
Local clock offset: -0.868 ms  
Remote clock offset: -1036.284 ms

# Below is generated by plot.py at 2018-12-11 01:38:53  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.78 Mbit/s  
95th percentile per-packet one-way delay: 1935.038 ms  
Loss rate: 3.32%  
-- Flow 1:  
Average throughput: 1.77 Mbit/s  
95th percentile per-packet one-way delay: 1934.873 ms  
Loss rate: 3.25%  
-- Flow 2:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 2016.279 ms  
Loss rate: 8.33%  
-- Flow 3:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 1926.338 ms  
Loss rate: 18.18%

Run 1: Report of Verus — Data Link

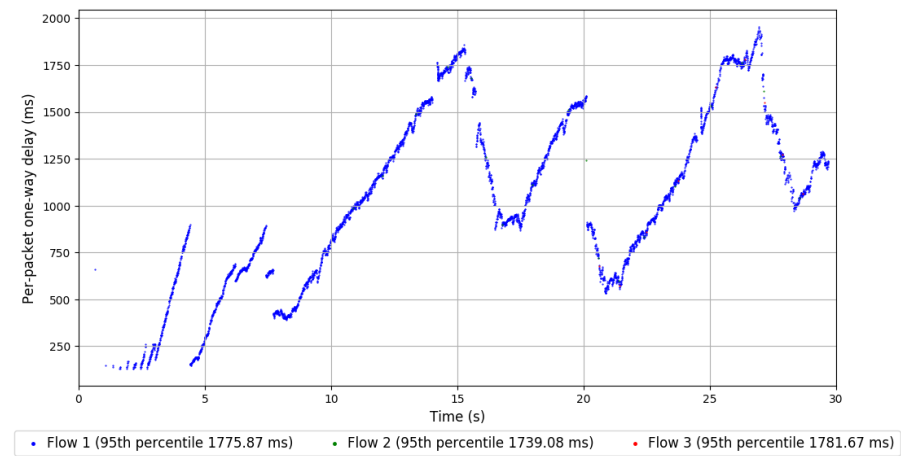
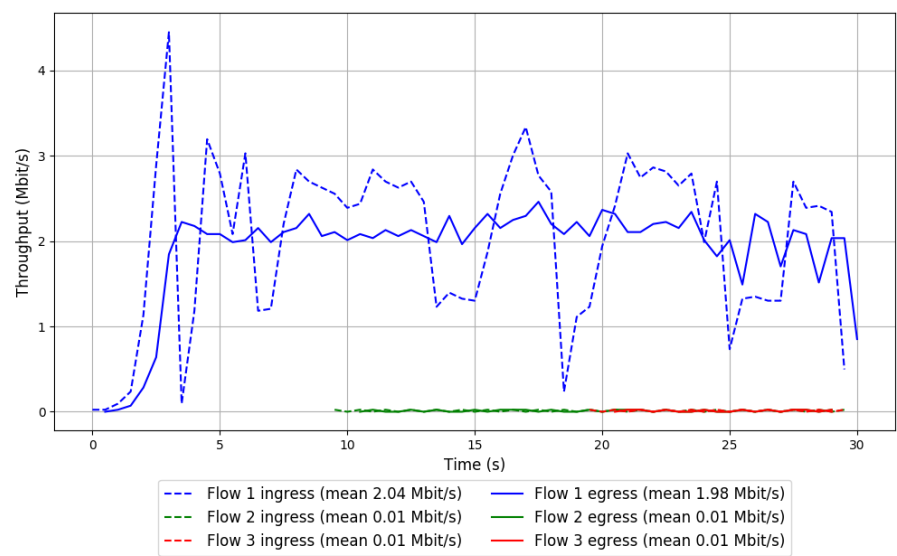


Run 2: Statistics of Verus

Start at: 2018-12-11 01:04:15  
End at: 2018-12-11 01:04:45  
Local clock offset: -2.311 ms  
Remote clock offset: -1460.502 ms

# Below is generated by plot.py at 2018-12-11 01:38:54  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 2.00 Mbit/s  
95th percentile per-packet one-way delay: 1775.873 ms  
Loss rate: 4.69%  
-- Flow 1:  
Average throughput: 1.98 Mbit/s  
95th percentile per-packet one-way delay: 1775.873 ms  
Loss rate: 4.64%  
-- Flow 2:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 1739.084 ms  
Loss rate: 9.52%  
-- Flow 3:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 1781.673 ms  
Loss rate: 18.18%

Run 2: Report of Verus — Data Link



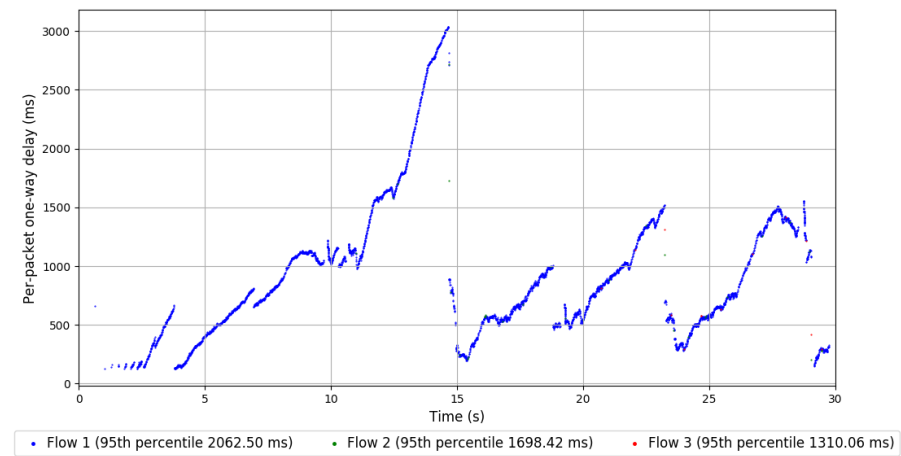
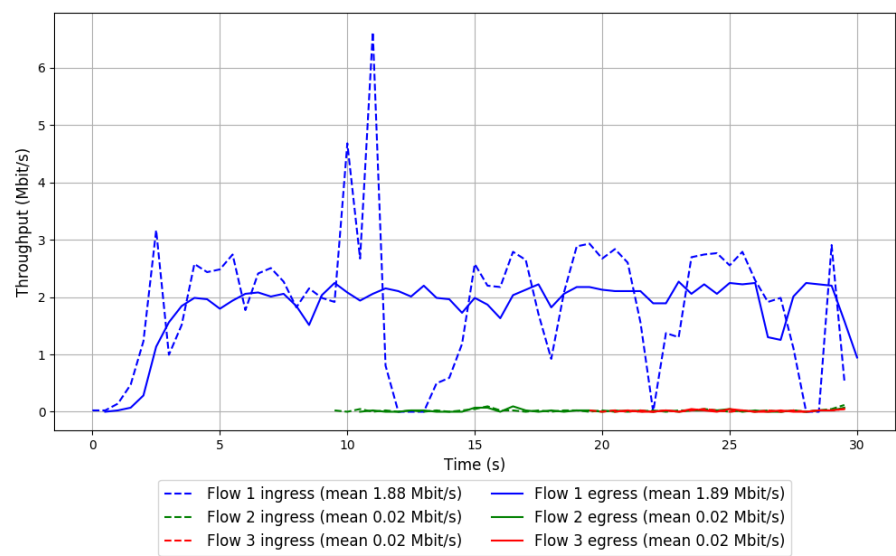


Run 3: Statistics of Verus

Start at: 2018-12-11 01:27:43  
End at: 2018-12-11 01:28:13  
Local clock offset: -2.266 ms  
Remote clock offset: -370.713 ms

# Below is generated by plot.py at 2018-12-11 01:38:55  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.91 Mbit/s  
95th percentile per-packet one-way delay: 2062.480 ms  
Loss rate: 1.20%  
-- Flow 1:  
Average throughput: 1.89 Mbit/s  
95th percentile per-packet one-way delay: 2062.504 ms  
Loss rate: 1.06%  
-- Flow 2:  
Average throughput: 0.02 Mbit/s  
95th percentile per-packet one-way delay: 1698.416 ms  
Loss rate: 13.51%  
-- Flow 3:  
Average throughput: 0.02 Mbit/s  
95th percentile per-packet one-way delay: 1310.062 ms  
Loss rate: 13.33%

Run 3: Report of Verus — Data Link

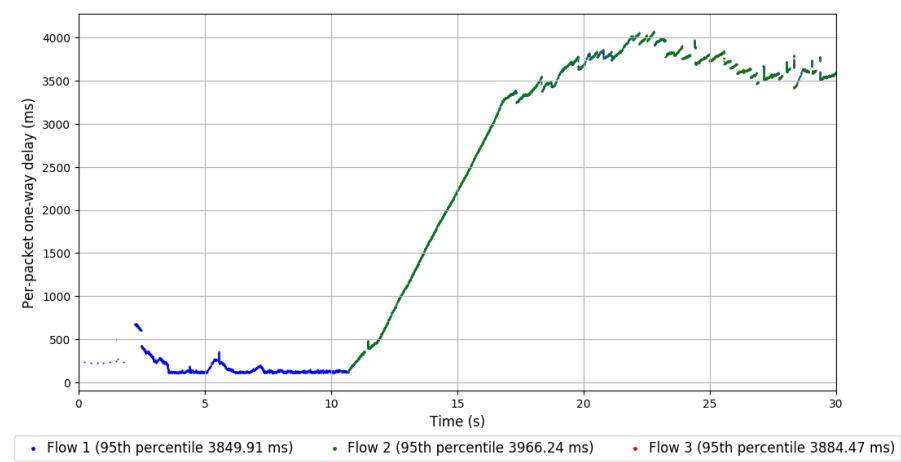
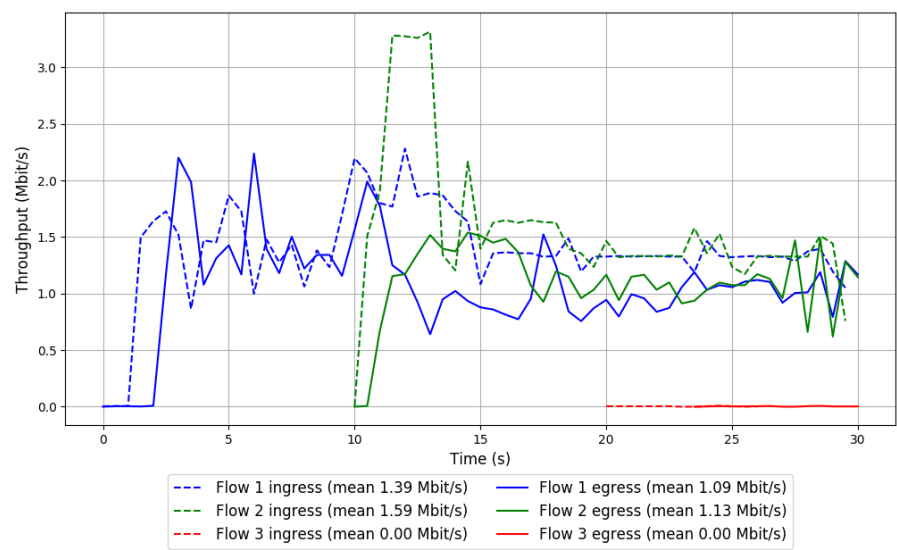


Run 1: Statistics of PCC-Vivace

Start at: 2018-12-11 00:38:20  
End at: 2018-12-11 00:38:50  
Local clock offset: -1.866 ms  
Remote clock offset: -988.007 ms

# Below is generated by plot.py at 2018-12-11 01:38:57  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.85 Mbit/s  
95th percentile per-packet one-way delay: 3931.047 ms  
Loss rate: 24.68%  
-- Flow 1:  
Average throughput: 1.09 Mbit/s  
95th percentile per-packet one-way delay: 3849.914 ms  
Loss rate: 21.55%  
-- Flow 2:  
Average throughput: 1.13 Mbit/s  
95th percentile per-packet one-way delay: 3966.243 ms  
Loss rate: 28.80%  
-- Flow 3:  
Average throughput: 0.00 Mbit/s  
95th percentile per-packet one-way delay: 3884.474 ms  
Loss rate: 0.00%

Run 1: Report of PCC-Vivace — Data Link

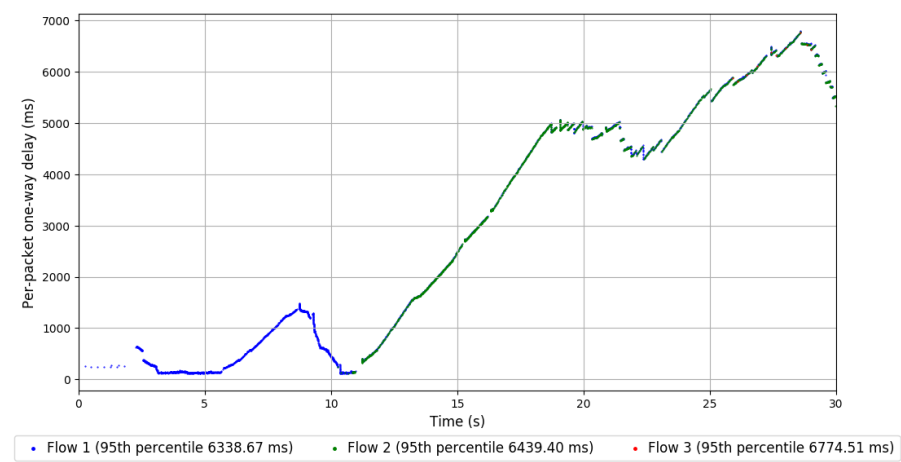
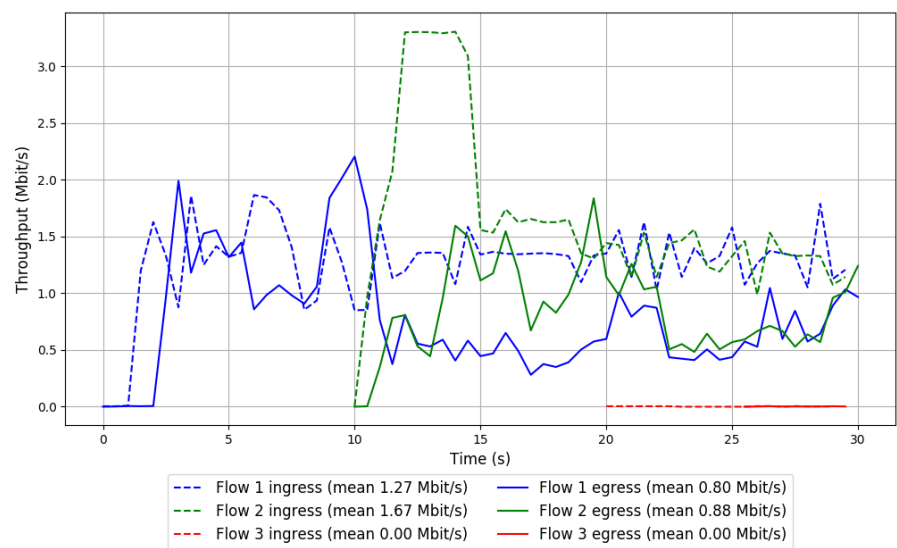


Run 2: Statistics of PCC-Vivace

Start at: 2018-12-11 01:01:47  
End at: 2018-12-11 01:02:17  
Local clock offset: -2.012 ms  
Remote clock offset: -1417.653 ms

# Below is generated by plot.py at 2018-12-11 01:38:57  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.38 Mbit/s  
95th percentile per-packet one-way delay: 6379.274 ms  
Loss rate: 42.25%  
-- Flow 1:  
Average throughput: 0.80 Mbit/s  
95th percentile per-packet one-way delay: 6338.674 ms  
Loss rate: 37.64%  
-- Flow 2:  
Average throughput: 0.88 Mbit/s  
95th percentile per-packet one-way delay: 6439.395 ms  
Loss rate: 47.51%  
-- Flow 3:  
Average throughput: 0.00 Mbit/s  
95th percentile per-packet one-way delay: 6774.507 ms  
Loss rate: 56.46%

Run 2: Report of PCC-Vivace — Data Link

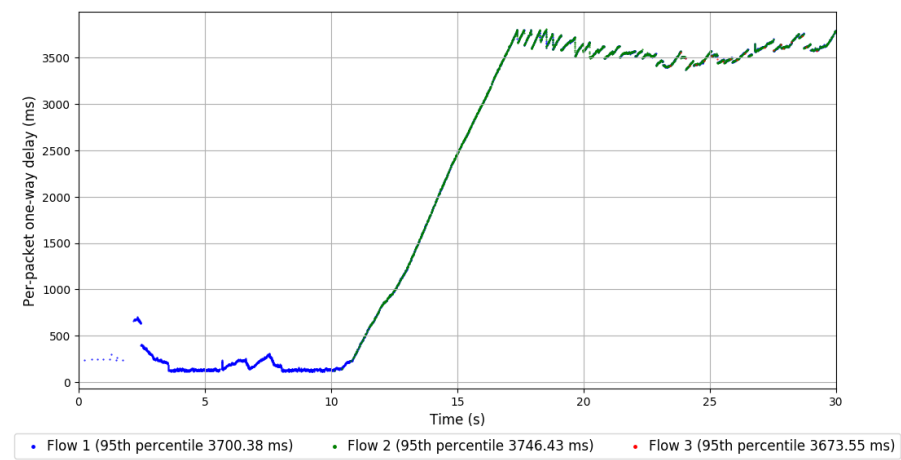
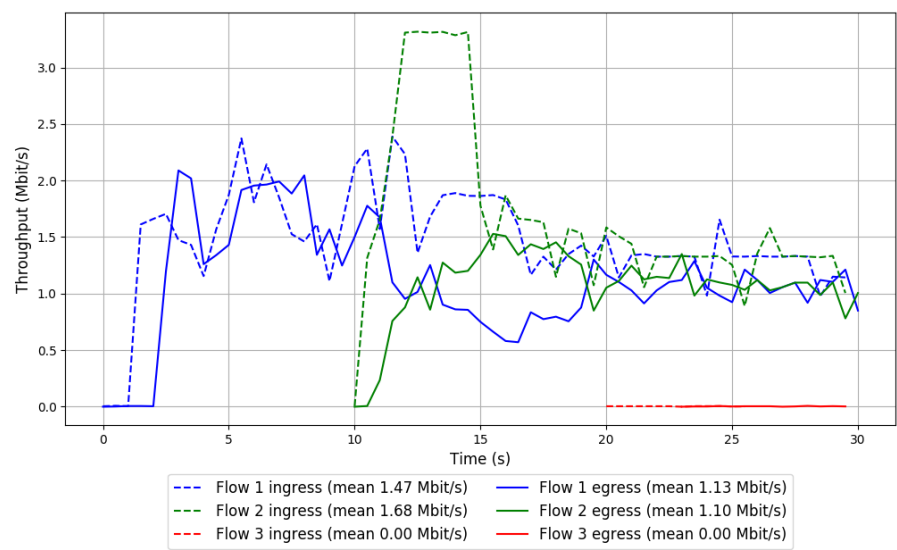


Run 3: Statistics of PCC-Vivace

Start at: 2018-12-11 01:25:15  
End at: 2018-12-11 01:25:45  
Local clock offset: -2.237 ms  
Remote clock offset: -321.529 ms

# Below is generated by plot.py at 2018-12-11 01:38:58  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 1.87 Mbit/s  
95th percentile per-packet one-way delay: 3727.942 ms  
Loss rate: 28.20%  
-- Flow 1:  
Average throughput: 1.13 Mbit/s  
95th percentile per-packet one-way delay: 3700.377 ms  
Loss rate: 23.42%  
-- Flow 2:  
Average throughput: 1.10 Mbit/s  
95th percentile per-packet one-way delay: 3746.429 ms  
Loss rate: 34.52%  
-- Flow 3:  
Average throughput: 0.00 Mbit/s  
95th percentile per-packet one-way delay: 3673.548 ms  
Loss rate: 0.00%

Run 3: Report of PCC-Vivace — Data Link



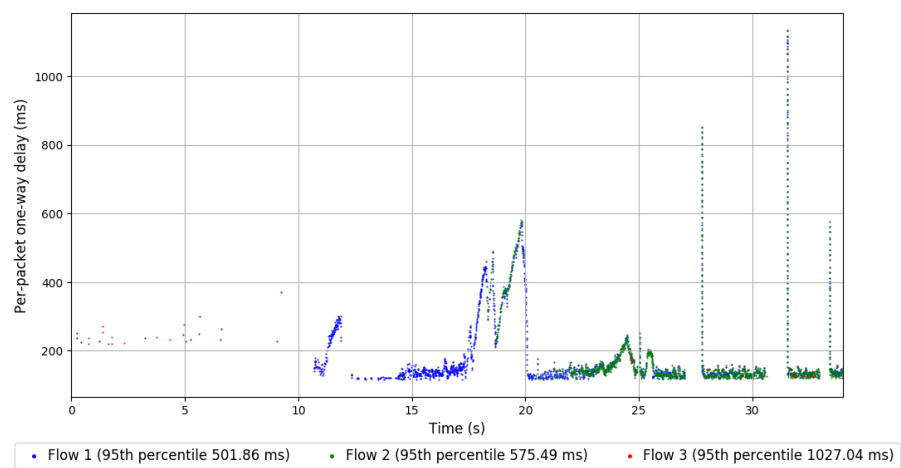
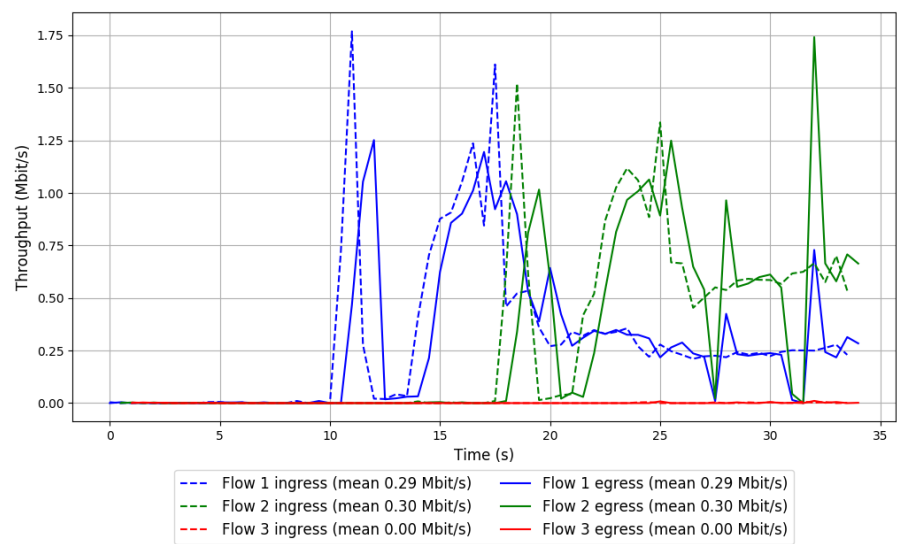


```
Run 1: Statistics of WebRTC media

Start at: 2018-12-11 00:32:10
End at: 2018-12-11 00:32:40
Local clock offset: -2.159 ms
Remote clock offset: -874.361 ms

# Below is generated by plot.py at 2018-12-11 01:38:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 540.573 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 501.864 ms
Loss rate: 0.41%
-- Flow 2:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 575.488 ms
Loss rate: 0.51%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 1027.041 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link

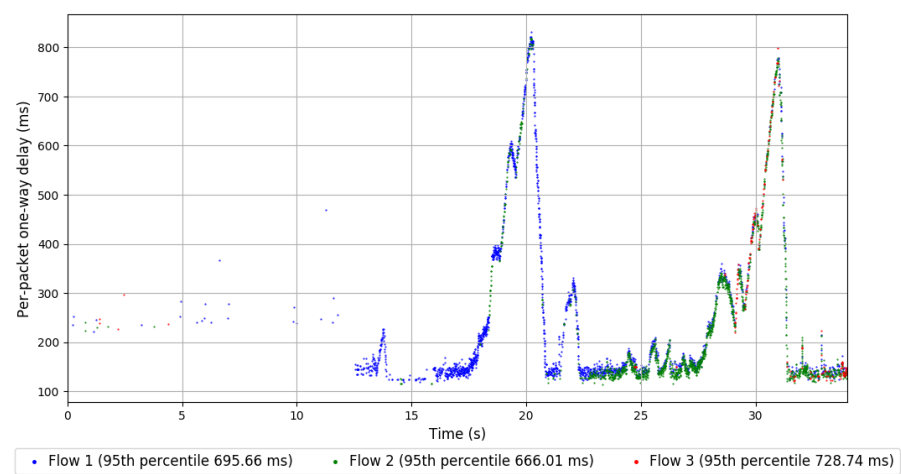
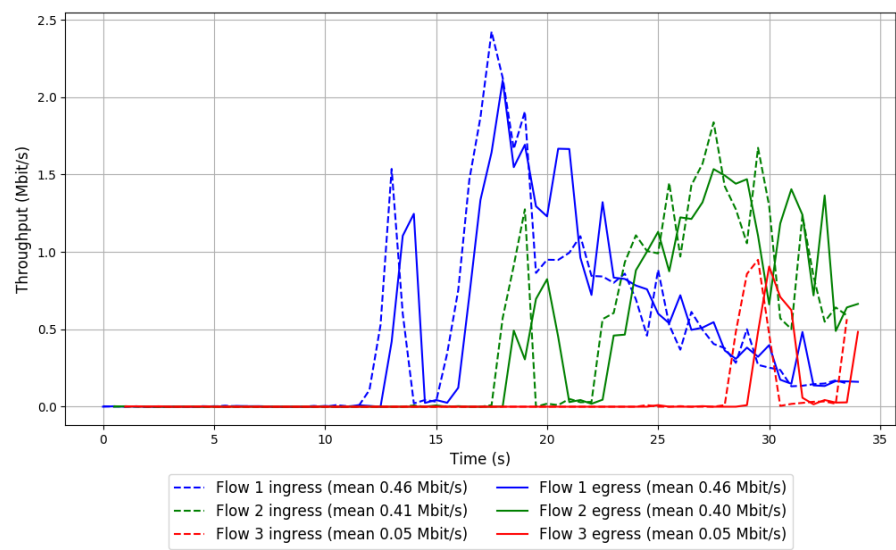


Run 2: Statistics of WebRTC media

Start at: 2018-12-11 00:55:37  
End at: 2018-12-11 00:56:07  
Local clock offset: -1.281 ms  
Remote clock offset: -1303.291 ms

# Below is generated by plot.py at 2018-12-11 01:38:58  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 0.91 Mbit/s  
95th percentile per-packet one-way delay: 685.963 ms  
Loss rate: 0.42%  
-- Flow 1:  
Average throughput: 0.46 Mbit/s  
95th percentile per-packet one-way delay: 695.663 ms  
Loss rate: 0.13%  
-- Flow 2:  
Average throughput: 0.40 Mbit/s  
95th percentile per-packet one-way delay: 666.015 ms  
Loss rate: 0.52%  
-- Flow 3:  
Average throughput: 0.05 Mbit/s  
95th percentile per-packet one-way delay: 728.740 ms  
Loss rate: 2.36%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-12-11 01:19:05  
End at: 2018-12-11 01:19:35  
Local clock offset: -3.044 ms  
Remote clock offset: -210.145 ms

# Below is generated by plot.py at 2018-12-11 01:38:58  
# Datalink statistics  
-- Total of 3 flows:  
Average throughput: 0.75 Mbit/s  
95th percentile per-packet one-way delay: 272.072 ms  
Loss rate: 0.28%  
-- Flow 1:  
Average throughput: 0.41 Mbit/s  
95th percentile per-packet one-way delay: 246.014 ms  
Loss rate: 0.11%  
-- Flow 2:  
Average throughput: 0.28 Mbit/s  
95th percentile per-packet one-way delay: 271.258 ms  
Loss rate: 0.21%  
-- Flow 3:  
Average throughput: 0.08 Mbit/s  
95th percentile per-packet one-way delay: 312.502 ms  
Loss rate: 1.50%

Run 3: Report of WebRTC media — Data Link

