

Pantheon Report

Generated at 2018-08-10 00:53:18 (UTC).

Data path: Colombia ppp0 ppp0 (*remote*) → AWS Brazil 2 Ethernet (*local*).

Repeated the test of 17 congestion control schemes 3 times.

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

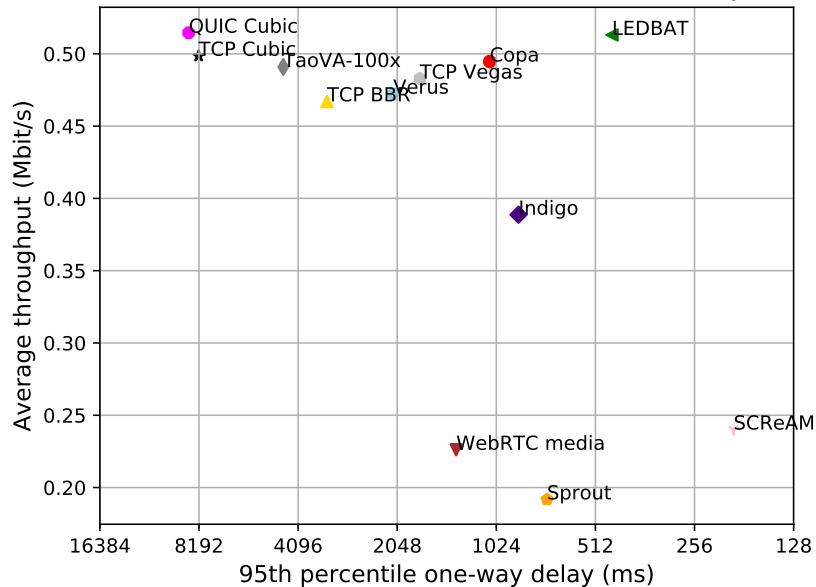
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

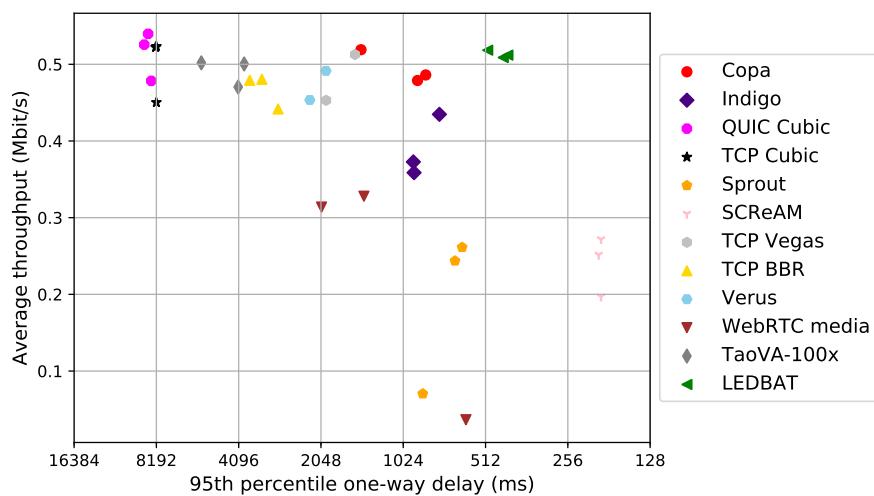
Git summary:

```
branch: master @ 7772df3413f4b07ba0096dfdd8e9d4c6dca623e3
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ 6f038ed31259d366f9840f65b82cbe8f464b1b39
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
  M src/ScreamClient
  M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from Colombia ppp0 to AWS Brazil 2, 3 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)



test from Colombia ppp0 to AWS Brazil 2, 3 runs of 30s each per scheme
3 flows with 10s interval between flows



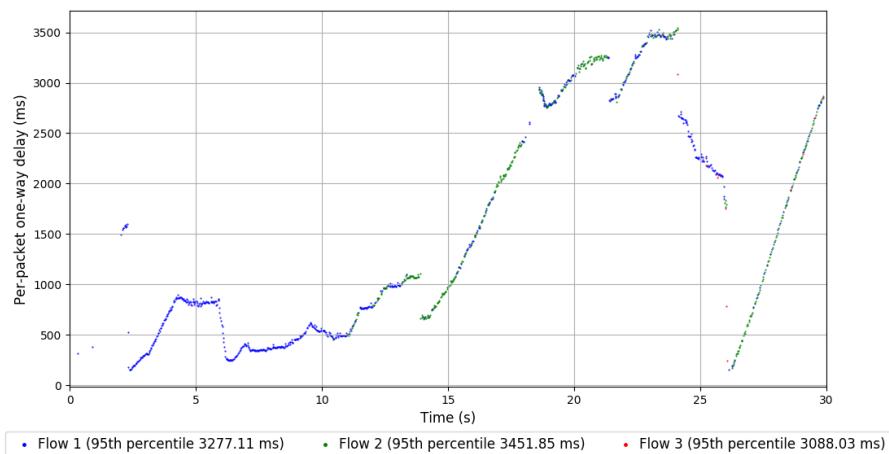
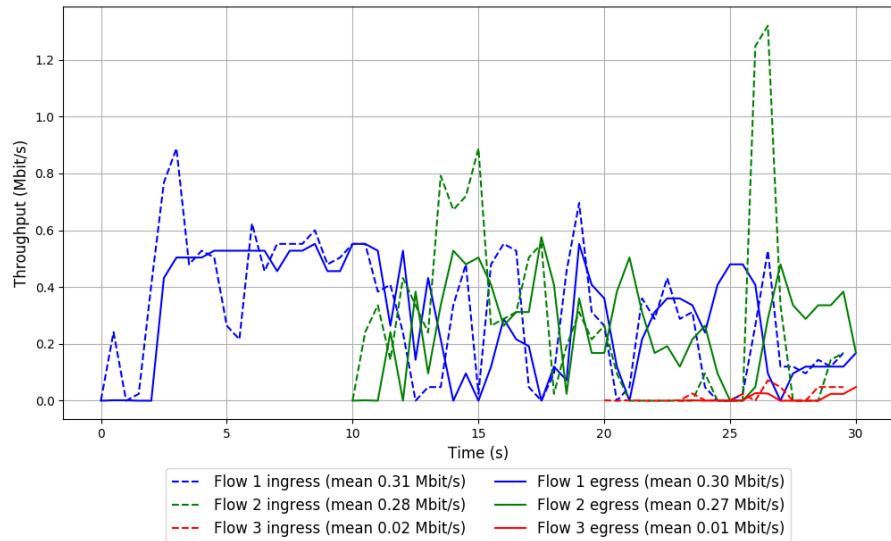
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	0.29	0.27	0.01	3305.74	3384.01	3109.97	4.06	6.95	53.22
Copa		0.30	0.23	0.15	1000.98	1108.93	1221.31	3.40	5.40	8.84
TCP Cubic		0.49	0.03	0.00	8222.32	6370.12	8622.63	31.59	52.84	90.93
FillP		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FillP-Sheep		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Indigo		0.20	0.19	0.19	739.65	860.87	982.26	0.74	1.34	2.23
LEDBAT		0.22	0.34	0.22	358.75	466.33	498.44	0.12	0.65	5.25
PCC-Allegro		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PCC-Expr		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
QUIC Cubic		0.52	0.00	0.01	8789.00	5875.74	9050.82	32.87	0.00	55.56
SCReAM		0.08	0.16	0.15	184.71	201.77	203.07	0.80	1.03	2.15
Sprout		0.09	0.10	0.11	772.92	572.14	784.77	18.89	19.55	23.85
TaoVA-100x		0.30	0.25	0.16	3751.69	4381.73	4474.67	7.23	10.74	41.20
TCP Vegas		0.29	0.22	0.20	1477.45	1777.84	1769.07	1.83	5.31	17.56
Verus		0.46	0.01	0.01	2106.23	2082.09	2062.60	4.21	4.55	13.34
PCC-Vivace		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WebRTC media		0.10	0.08	0.05	1611.37	1323.29	1179.24	19.62	19.99	23.69

Run 1: Statistics of TCP BBR

```
Start at: 2018-08-10 00:02:34
End at: 2018-08-10 00:03:04
Local clock offset: -3.735 ms
Remote clock offset: 7.265 ms

# Below is generated by plot.py at 2018-08-10 00:52:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 3368.493 ms
Loss rate: 5.21%
-- Flow 1:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 3277.113 ms
Loss rate: 4.02%
-- Flow 2:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 3451.847 ms
Loss rate: 5.82%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 3088.027 ms
Loss rate: 52.36%
```

Run 1: Report of TCP BBR — Data Link

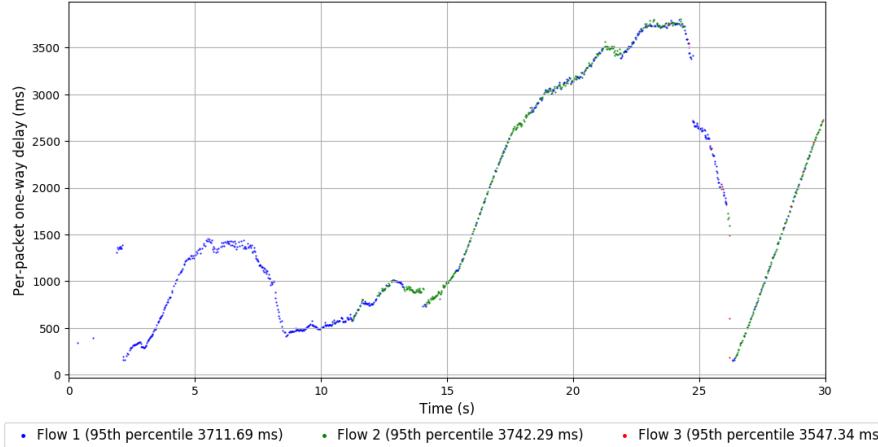
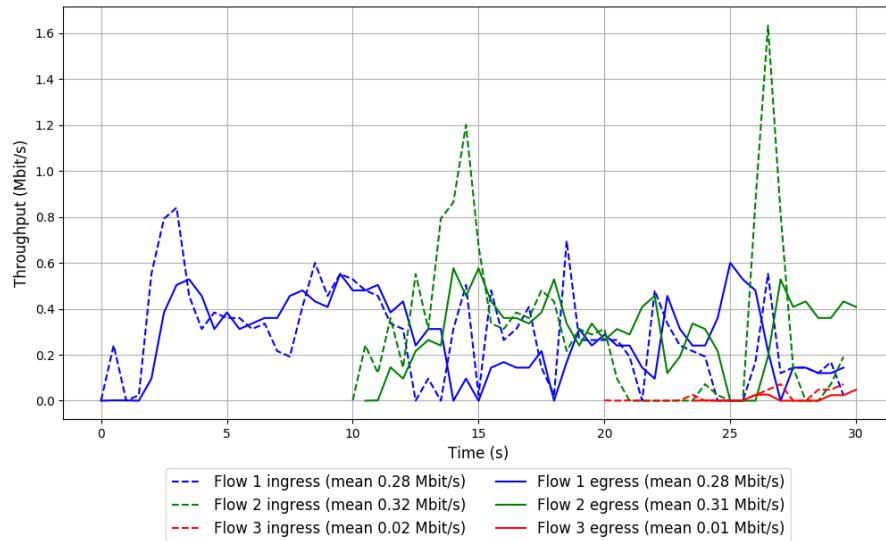


Run 2: Statistics of TCP BBR

```
Start at: 2018-08-10 00:23:09
End at: 2018-08-10 00:23:39
Local clock offset: -2.992 ms
Remote clock offset: 2.142 ms

# Below is generated by plot.py at 2018-08-10 00:52:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 3731.513 ms
Loss rate: 5.22%
-- Flow 1:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 3711.692 ms
Loss rate: 3.97%
-- Flow 2:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 3742.292 ms
Loss rate: 5.52%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 3547.343 ms
Loss rate: 55.68%
```

Run 2: Report of TCP BBR — Data Link

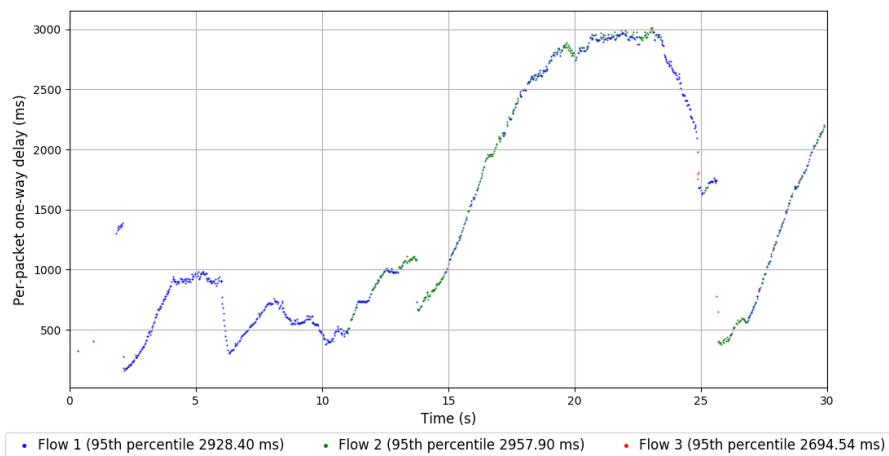
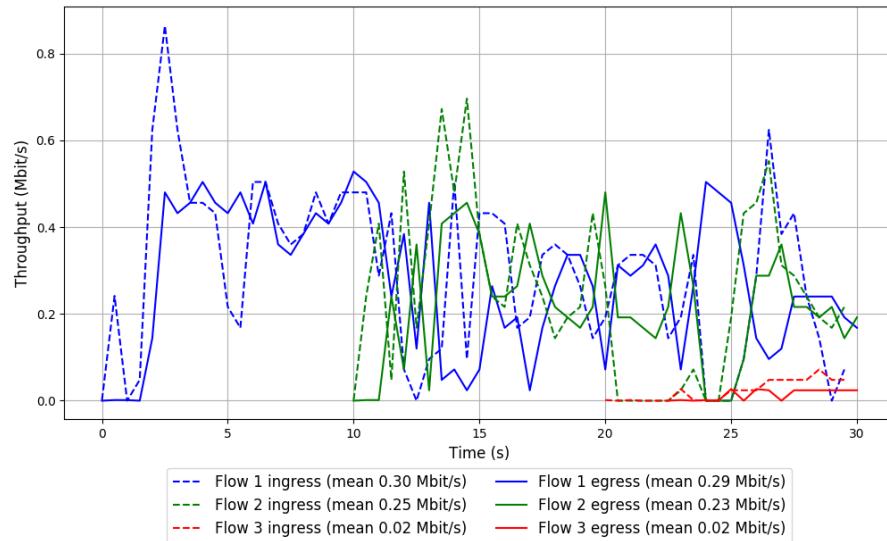


Run 3: Statistics of TCP BBR

```
Start at: 2018-08-10 00:43:36
End at: 2018-08-10 00:44:06
Local clock offset: -1.607 ms
Remote clock offset: 1.71 ms

# Below is generated by plot.py at 2018-08-10 00:52:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 2939.520 ms
Loss rate: 6.85%
-- Flow 1:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 2928.402 ms
Loss rate: 4.19%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 2957.901 ms
Loss rate: 9.51%
-- Flow 3:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 2694.544 ms
Loss rate: 51.63%
```

Run 3: Report of TCP BBR — Data Link

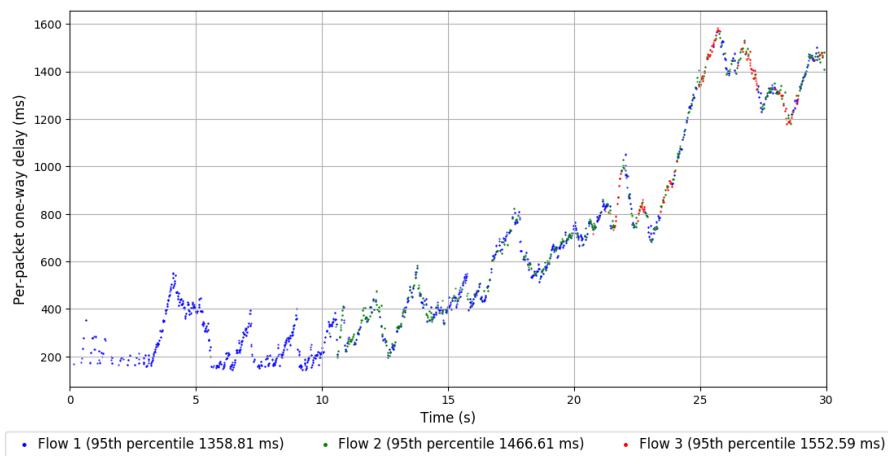
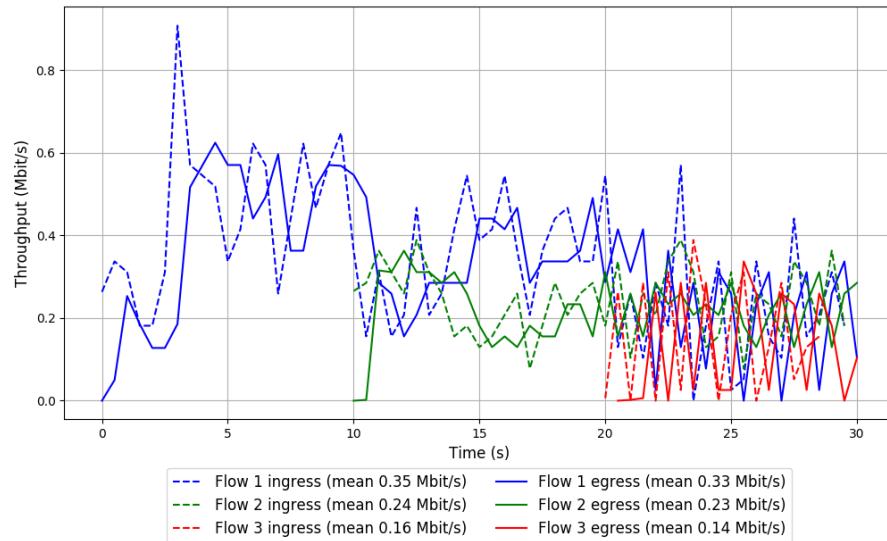


Run 1: Statistics of Copa

```
Start at: 2018-08-09 23:52:51
End at: 2018-08-09 23:53:21
Local clock offset: -3.262 ms
Remote clock offset: 3.529 ms

# Below is generated by plot.py at 2018-08-10 00:52:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 1462.120 ms
Loss rate: 6.47%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 1358.814 ms
Loss rate: 5.96%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 1466.613 ms
Loss rate: 7.54%
-- Flow 3:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 1552.592 ms
Loss rate: 6.52%
```

Run 1: Report of Copa — Data Link

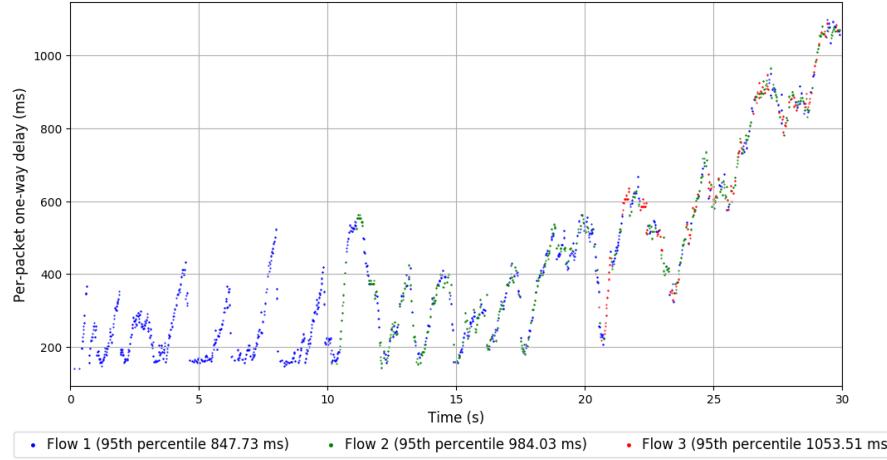
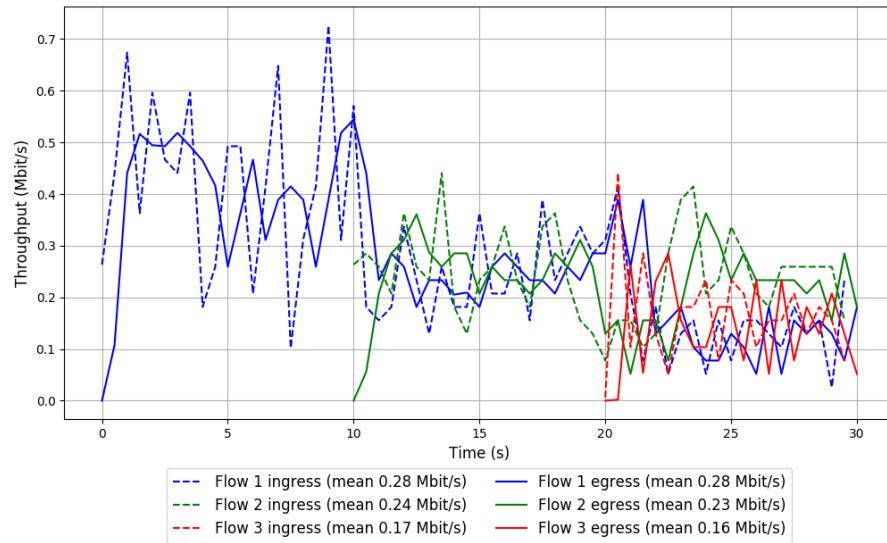


Run 2: Statistics of Copa

```
Start at: 2018-08-10 00:13:33
End at: 2018-08-10 00:14:03
Local clock offset: -3.597 ms
Remote clock offset: 2.677 ms

# Below is generated by plot.py at 2018-08-10 00:52:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 908.069 ms
Loss rate: 3.85%
-- Flow 1:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 847.734 ms
Loss rate: 1.71%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 984.034 ms
Loss rate: 5.08%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 1053.506 ms
Loss rate: 11.00%
```

Run 2: Report of Copa — Data Link

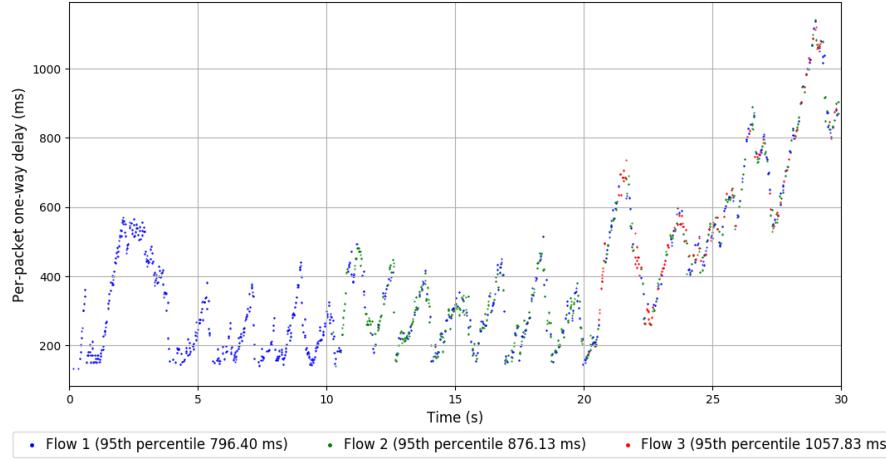
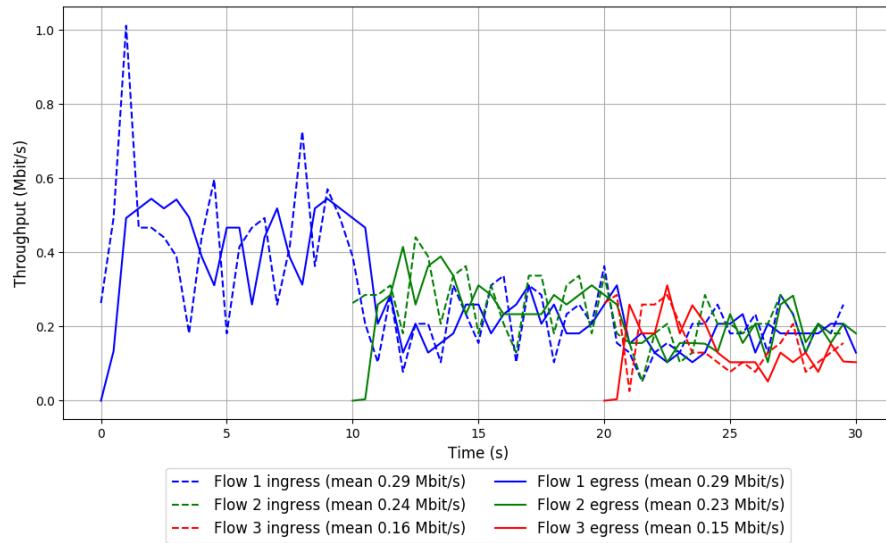


Run 3: Statistics of Copa

```
Start at: 2018-08-10 00:33:58
End at: 2018-08-10 00:34:28
Local clock offset: -2.562 ms
Remote clock offset: 2.911 ms

# Below is generated by plot.py at 2018-08-10 00:52:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 847.352 ms
Loss rate: 3.55%
-- Flow 1:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 796.396 ms
Loss rate: 2.54%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 876.135 ms
Loss rate: 3.57%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 1057.830 ms
Loss rate: 9.00%
```

Run 3: Report of Copa — Data Link

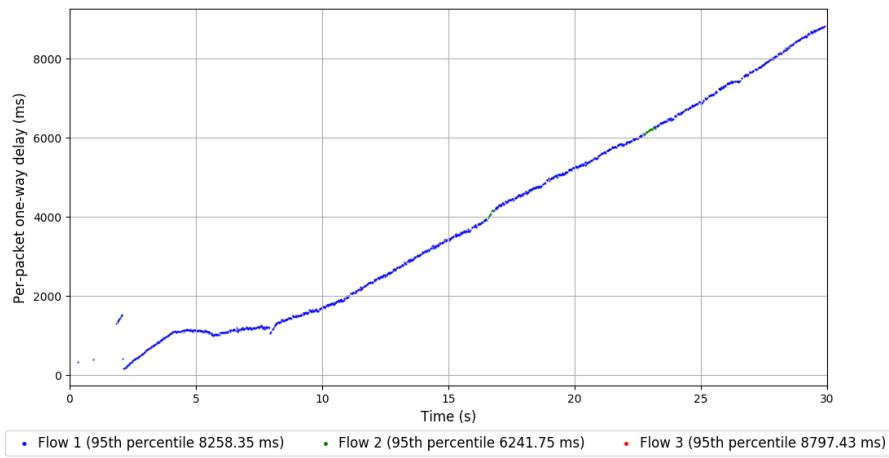
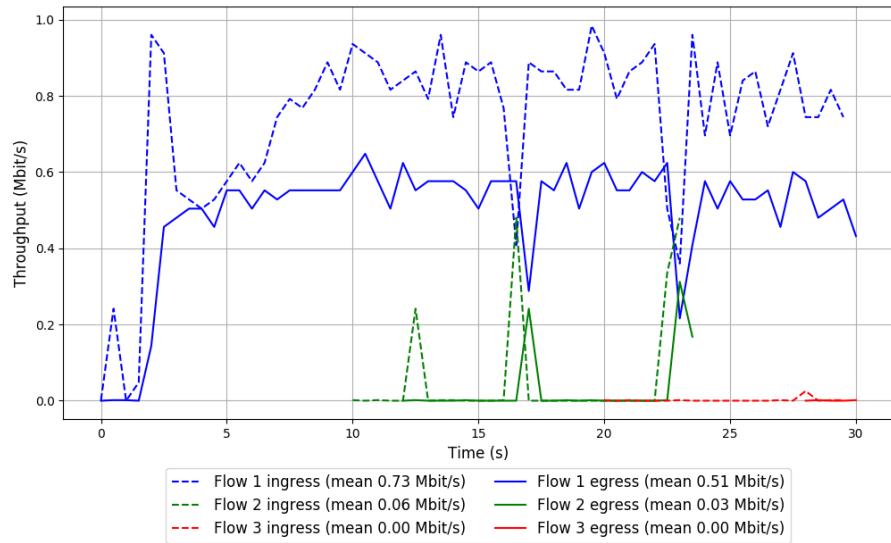


```
Run 1: Statistics of TCP Cubic
```

```
Start at: 2018-08-09 23:54:03
End at: 2018-08-09 23:54:33
Local clock offset: -3.953 ms
Remote clock offset: 3.501 ms

# Below is generated by plot.py at 2018-08-10 00:52:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 8247.937 ms
Loss rate: 32.24%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 8258.355 ms
Loss rate: 31.48%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 6241.749 ms
Loss rate: 52.83%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8797.429 ms
Loss rate: 91.06%
```

Run 1: Report of TCP Cubic — Data Link

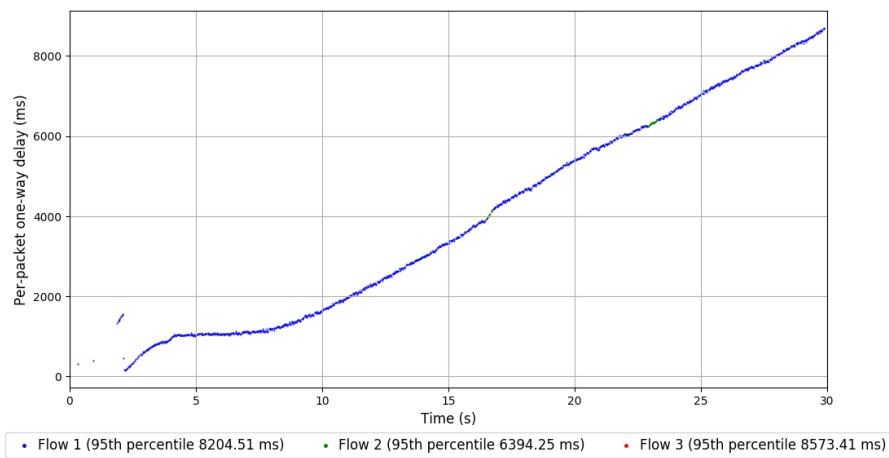
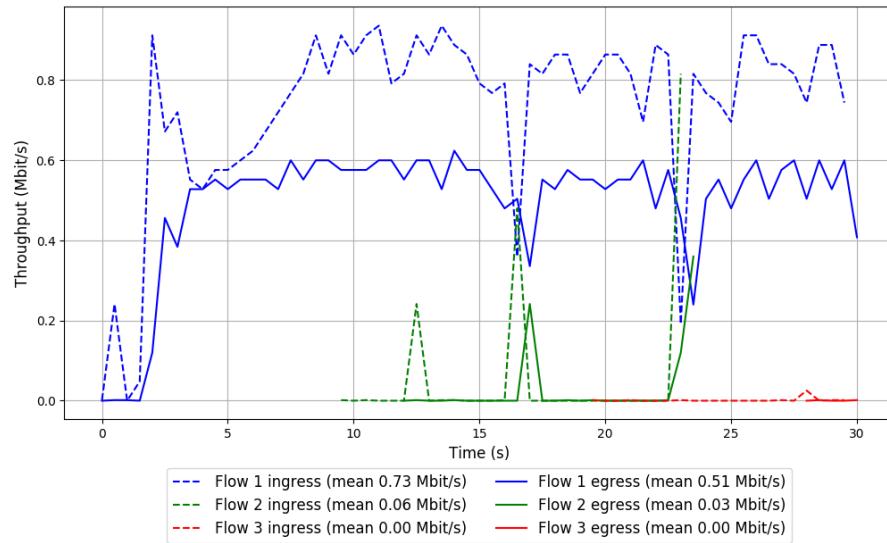


Run 2: Statistics of TCP Cubic

```
Start at: 2018-08-10 00:14:45
End at: 2018-08-10 00:15:15
Local clock offset: -3.613 ms
Remote clock offset: 2.72 ms

# Below is generated by plot.py at 2018-08-10 00:52:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 8194.851 ms
Loss rate: 31.98%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 8204.511 ms
Loss rate: 31.20%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 6394.254 ms
Loss rate: 52.83%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8573.407 ms
Loss rate: 91.06%
```

Run 2: Report of TCP Cubic — Data Link

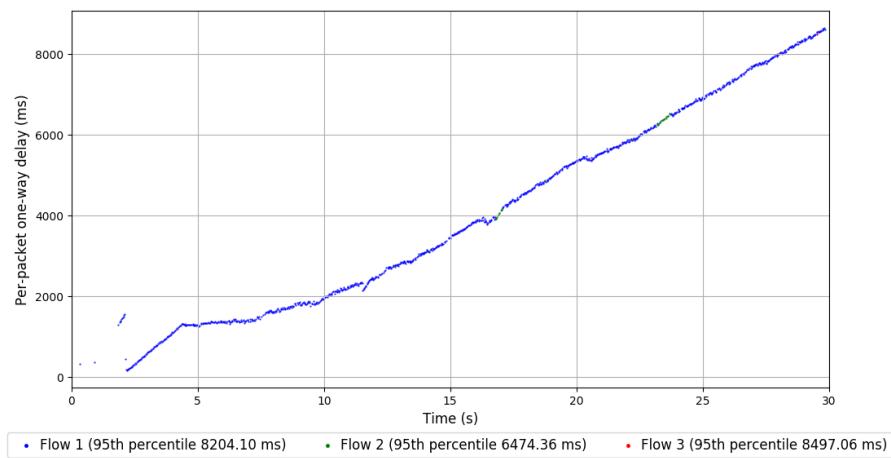
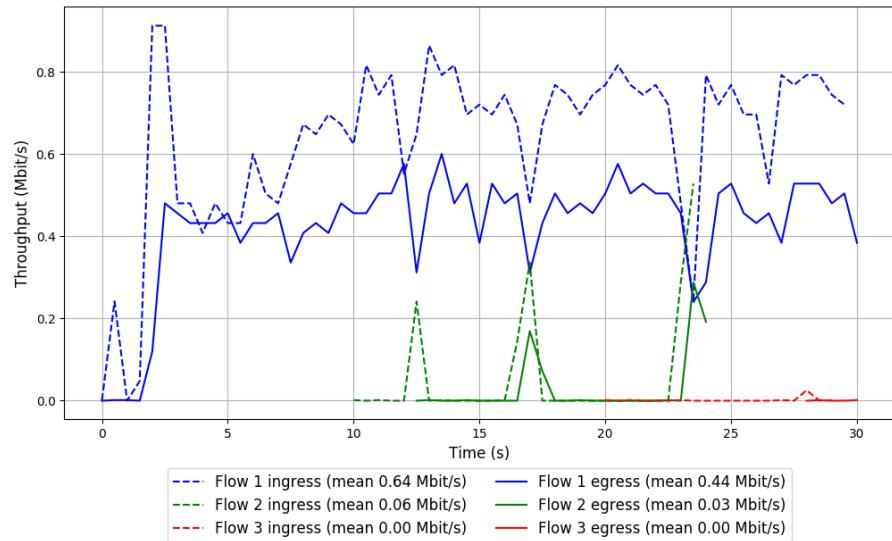


Run 3: Statistics of TCP Cubic

```
Start at: 2018-08-10 00:35:10
End at: 2018-08-10 00:35:40
Local clock offset: -3.36 ms
Remote clock offset: 6.555 ms

# Below is generated by plot.py at 2018-08-10 00:52:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 8194.073 ms
Loss rate: 32.95%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 8204.097 ms
Loss rate: 32.09%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 6474.357 ms
Loss rate: 52.87%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8497.062 ms
Loss rate: 90.68%
```

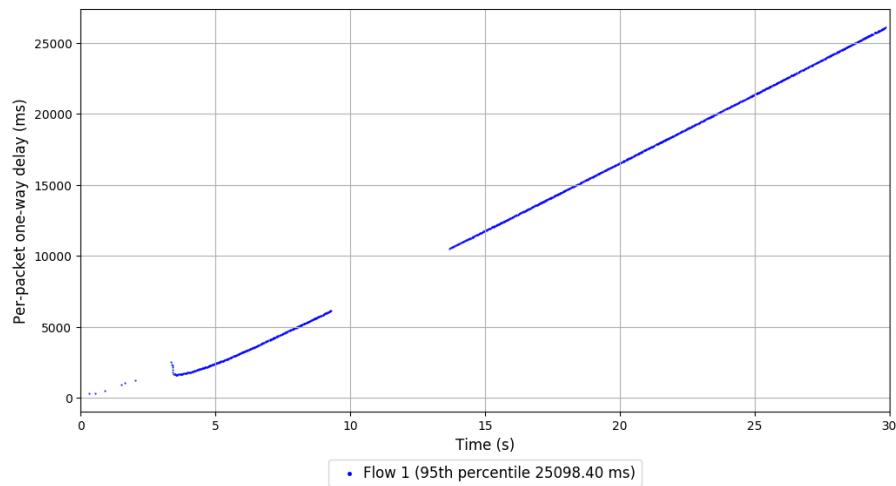
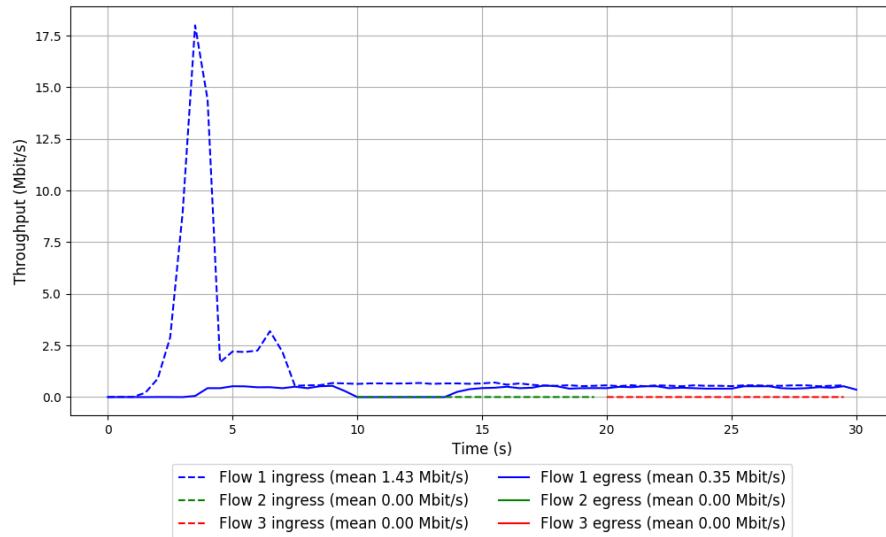
Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2018-08-10 00:04:57
End at: 2018-08-10 00:05:27
Local clock offset: -4.453 ms
Remote clock offset: 7.471 ms

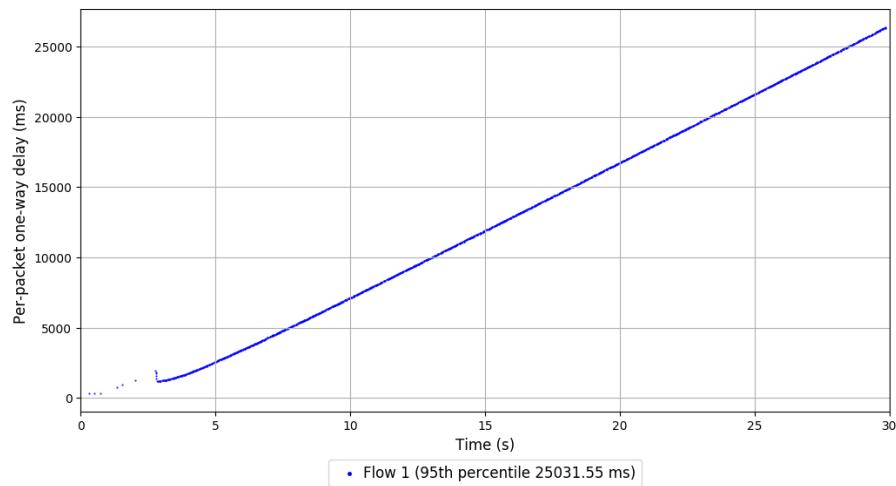
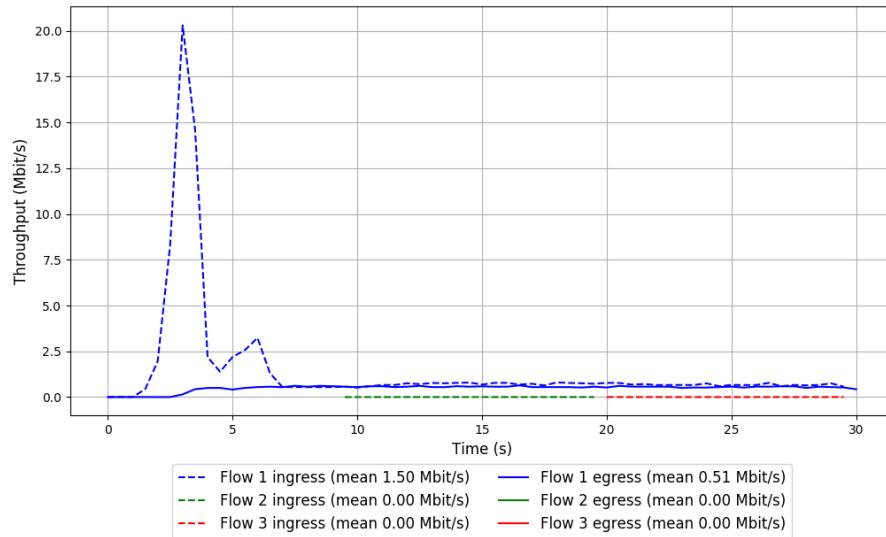
Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2018-08-10 00:25:32
End at: 2018-08-10 00:26:02
Local clock offset: -2.859 ms
Remote clock offset: 6.847 ms

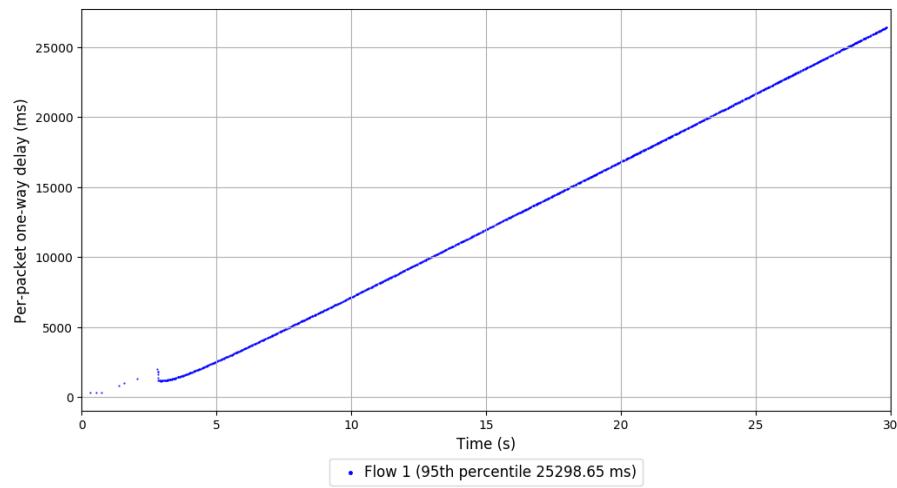
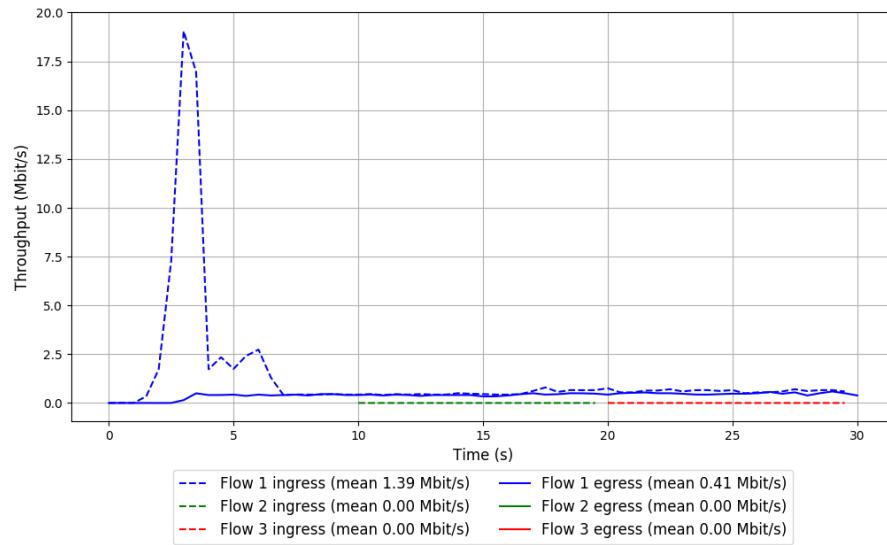
Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-08-10 00:45:59
End at: 2018-08-10 00:46:29
Local clock offset: -2.367 ms
Remote clock offset: 6.462 ms

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

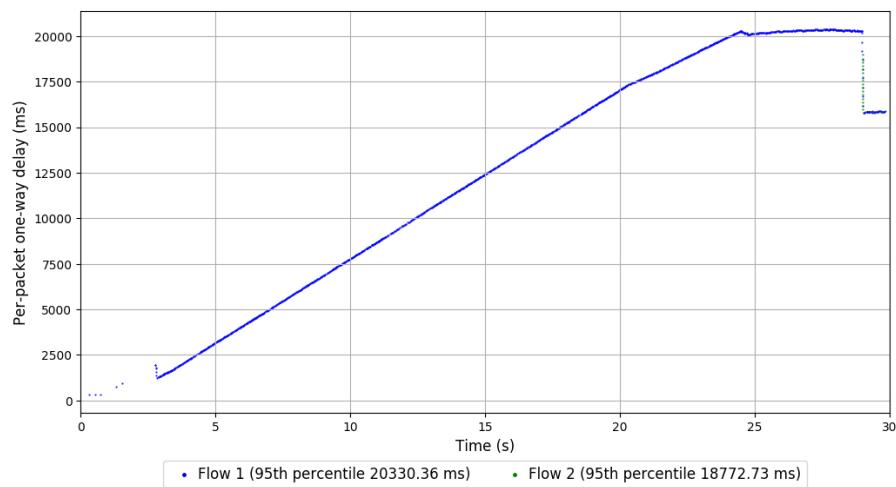
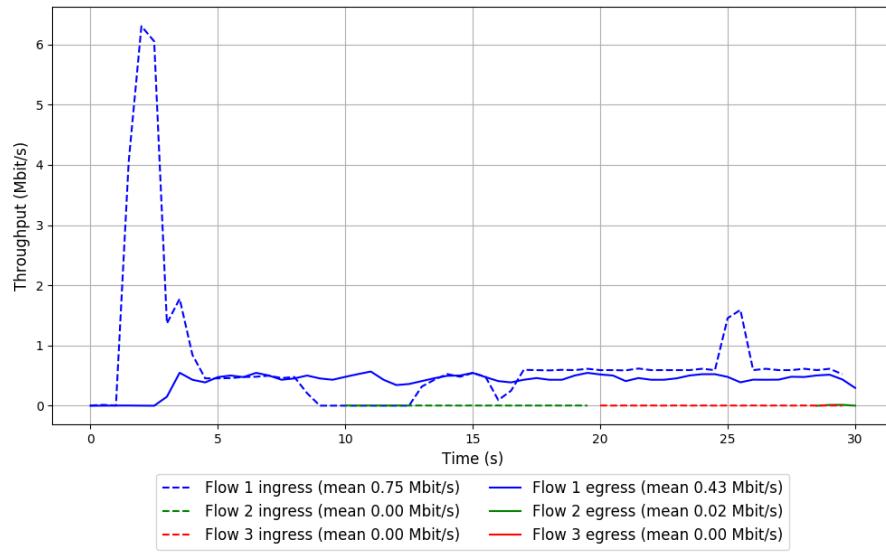
Start at: 2018-08-09 23:55:14

End at: 2018-08-09 23:55:44

Local clock offset: -3.935 ms

Remote clock offset: 2.541 ms

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

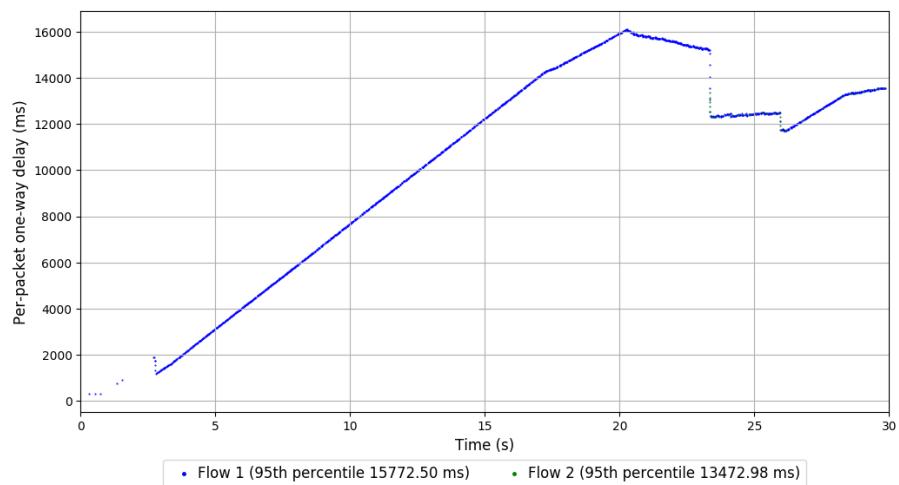
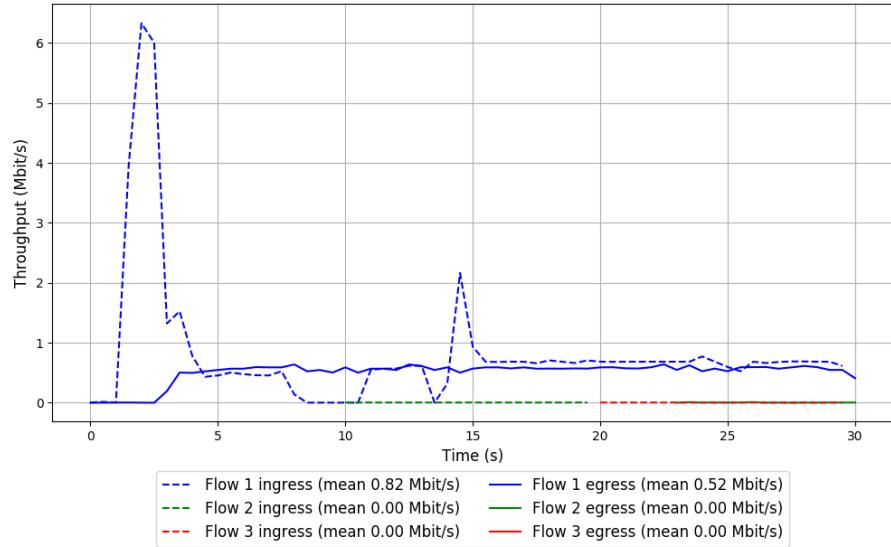
Start at: 2018-08-10 00:15:57

End at: 2018-08-10 00:16:27

Local clock offset: -3.571 ms

Remote clock offset: 8.486 ms

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

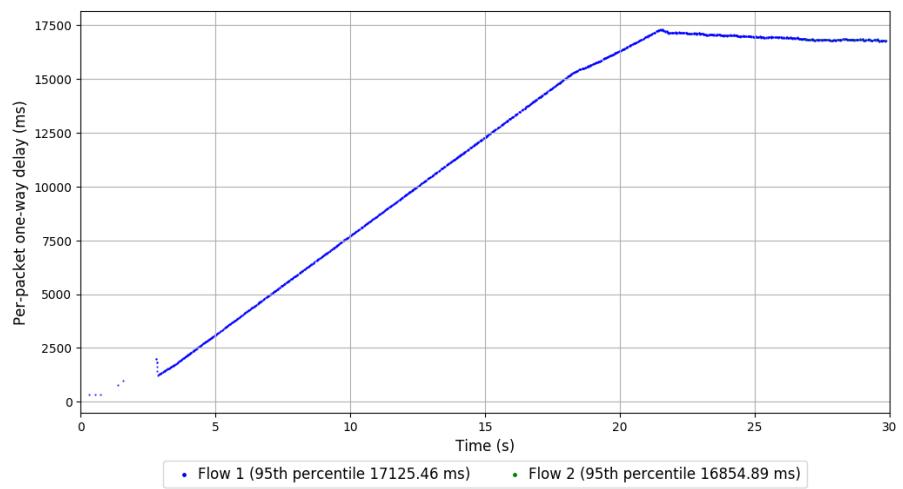
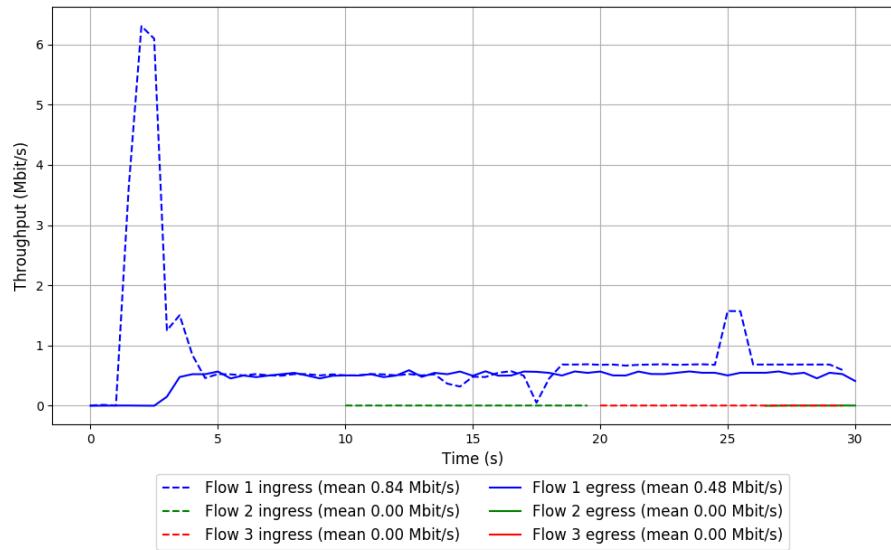
Start at: 2018-08-10 00:36:22

End at: 2018-08-10 00:36:52

Local clock offset: -2.518 ms

Remote clock offset: 6.615 ms

Run 3: Report of FillP-Sheep — Data Link

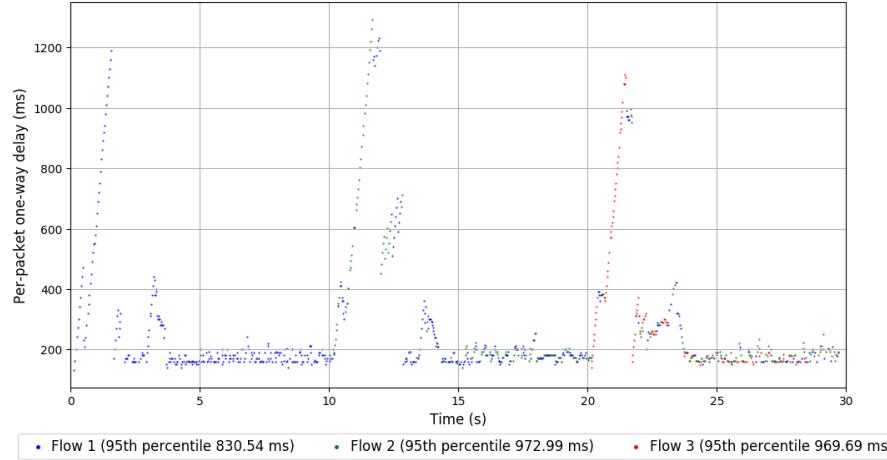
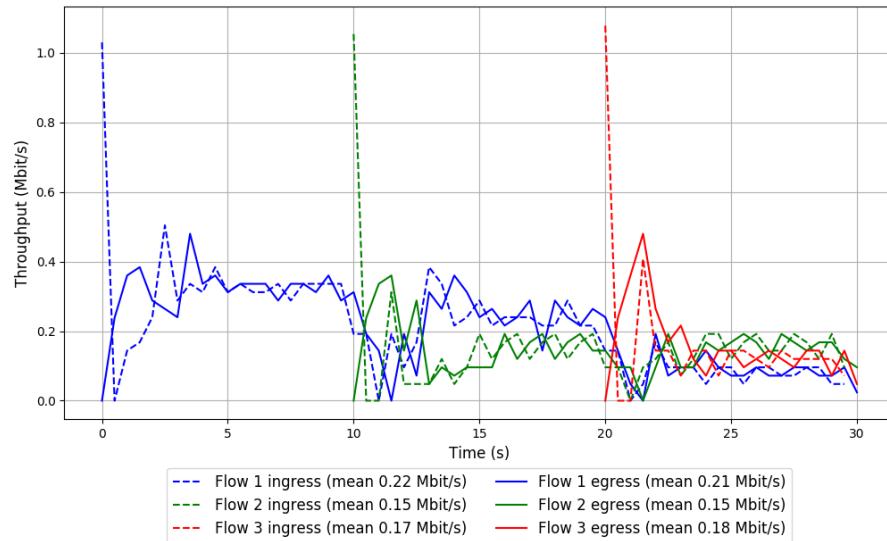


Run 1: Statistics of Indigo

```
Start at: 2018-08-10 00:06:18
End at: 2018-08-10 00:06:48
Local clock offset: -4.422 ms
Remote clock offset: 2.529 ms

# Below is generated by plot.py at 2018-08-10 00:52:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 940.449 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 830.544 ms
Loss rate: 0.19%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 972.987 ms
Loss rate: 1.58%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 969.691 ms
Loss rate: 2.11%
```

Run 1: Report of Indigo — Data Link

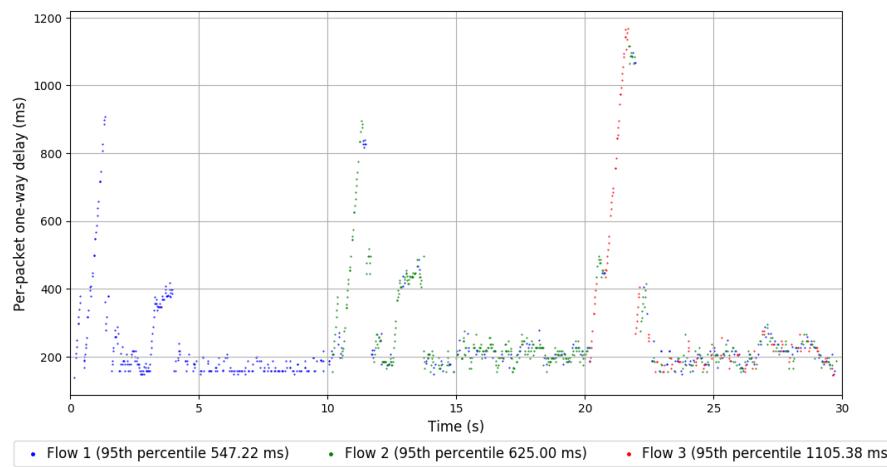
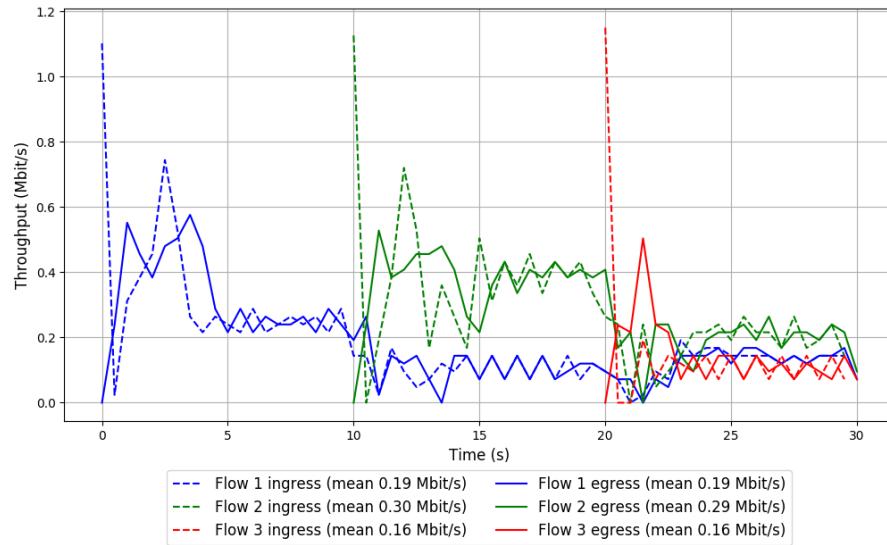


Run 2: Statistics of Indigo

```
Start at: 2018-08-10 00:26:45
End at: 2018-08-10 00:27:15
Local clock offset: -2.033 ms
Remote clock offset: 3.071 ms

# Below is generated by plot.py at 2018-08-10 00:52:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 755.149 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 547.222 ms
Loss rate: 0.85%
-- Flow 2:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 624.999 ms
Loss rate: 1.03%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 1105.378 ms
Loss rate: 2.35%
```

Run 2: Report of Indigo — Data Link

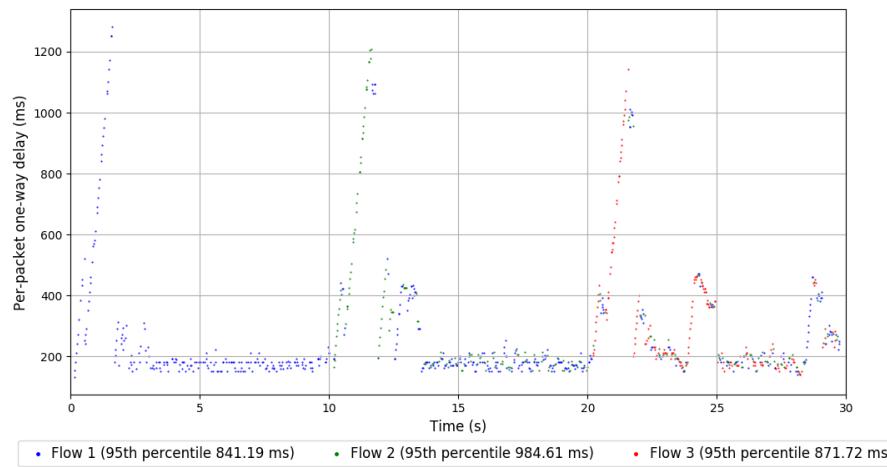
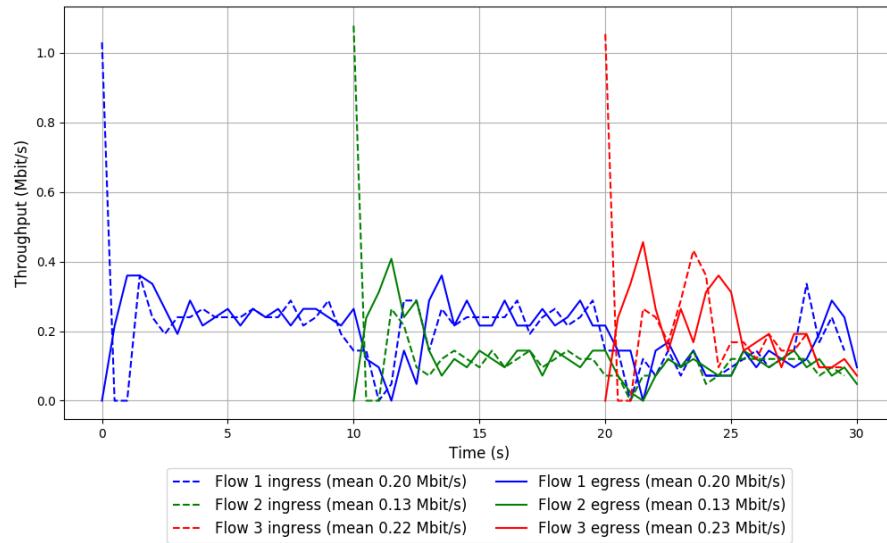


Run 3: Statistics of Indigo

```
Start at: 2018-08-10 00:47:17
End at: 2018-08-10 00:47:47
Local clock offset: -2.509 ms
Remote clock offset: 2.787 ms

# Below is generated by plot.py at 2018-08-10 00:52:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 934.882 ms
Loss rate: 1.45%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 841.187 ms
Loss rate: 1.19%
-- Flow 2:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 984.613 ms
Loss rate: 1.40%
-- Flow 3:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 871.715 ms
Loss rate: 2.22%
```

Run 3: Report of Indigo — Data Link

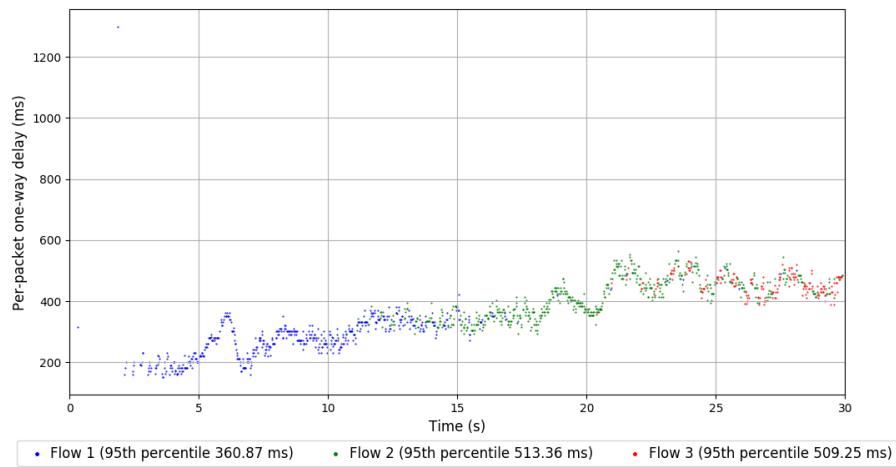
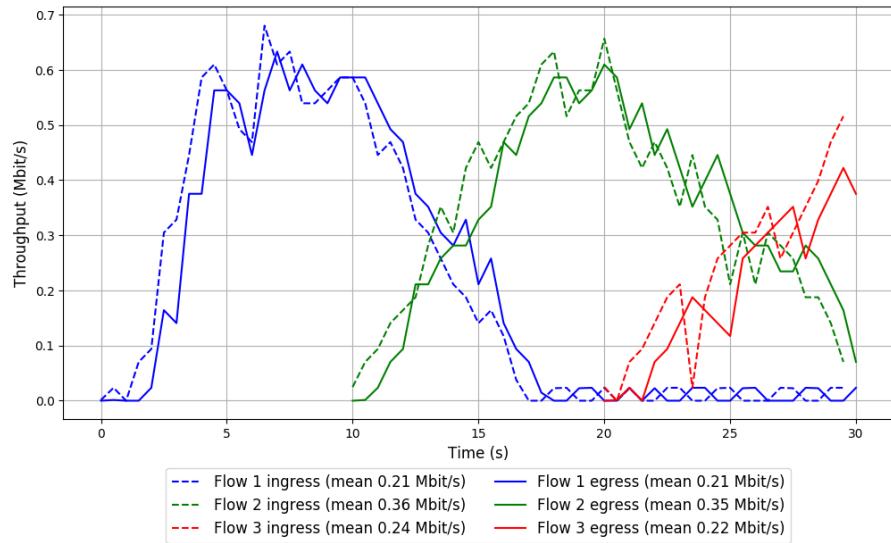


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2018-08-09 23:56:26
End at: 2018-08-09 23:56:56
Local clock offset: -4.688 ms
Remote clock offset: 2.426 ms

# Below is generated by plot.py at 2018-08-10 00:52:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 502.788 ms
Loss rate: 2.17%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 360.872 ms
Loss rate: 0.19%
-- Flow 2:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 513.358 ms
Loss rate: 1.01%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 509.253 ms
Loss rate: 10.89%
```

Run 1: Report of LEDBAT — Data Link

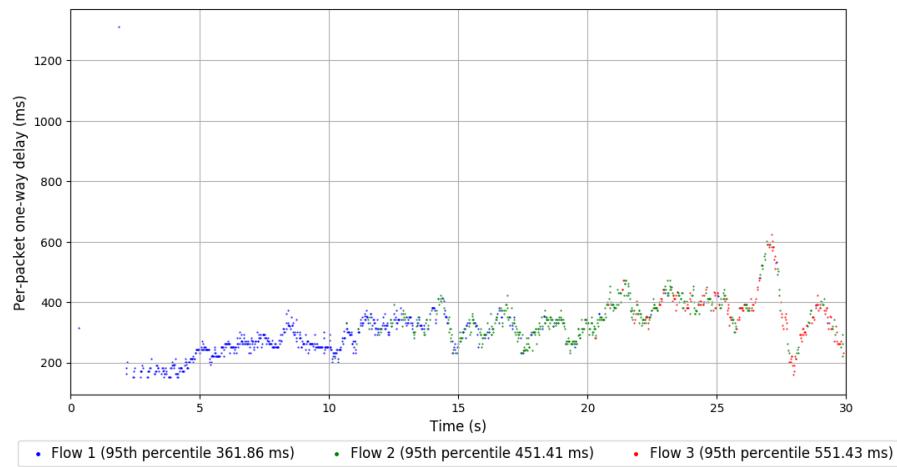
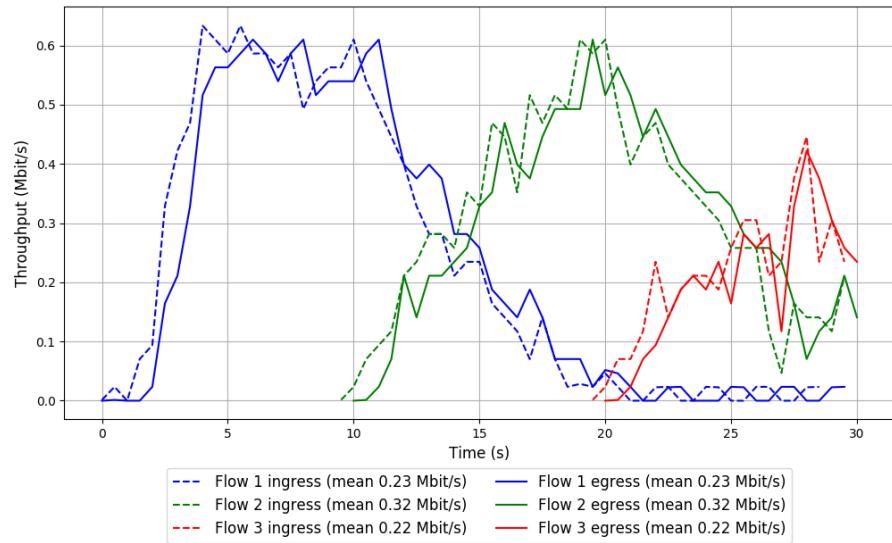


Run 2: Statistics of LEDBAT

```
Start at: 2018-08-10 00:17:09
End at: 2018-08-10 00:17:39
Local clock offset: -2.679 ms
Remote clock offset: 3.409 ms

# Below is generated by plot.py at 2018-08-10 00:52:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 441.259 ms
Loss rate: 1.00%
-- Flow 1:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 361.858 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 451.414 ms
Loss rate: 0.93%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 551.435 ms
Loss rate: 4.30%
```

Run 2: Report of LEDBAT — Data Link

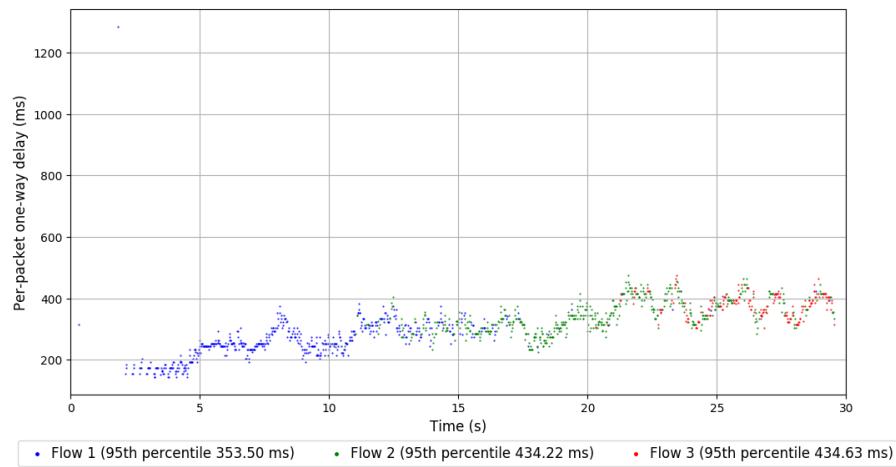
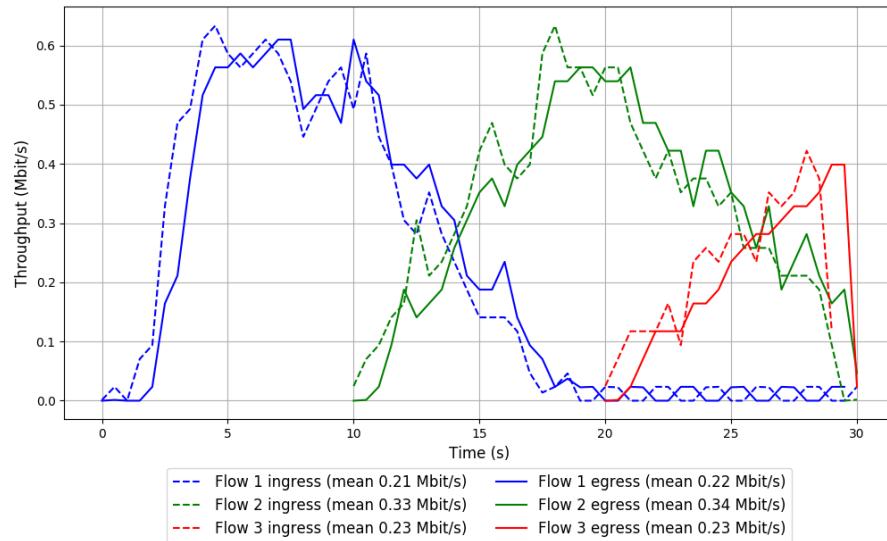


Run 3: Statistics of LEDBAT

```
Start at: 2018-08-10 00:37:34
End at: 2018-08-10 00:38:04
Local clock offset: -2.555 ms
Remote clock offset: 5.58 ms

# Below is generated by plot.py at 2018-08-10 00:52:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 424.228 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 353.505 ms
Loss rate: 0.18%
-- Flow 2:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 434.219 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 434.628 ms
Loss rate: 0.56%
```

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

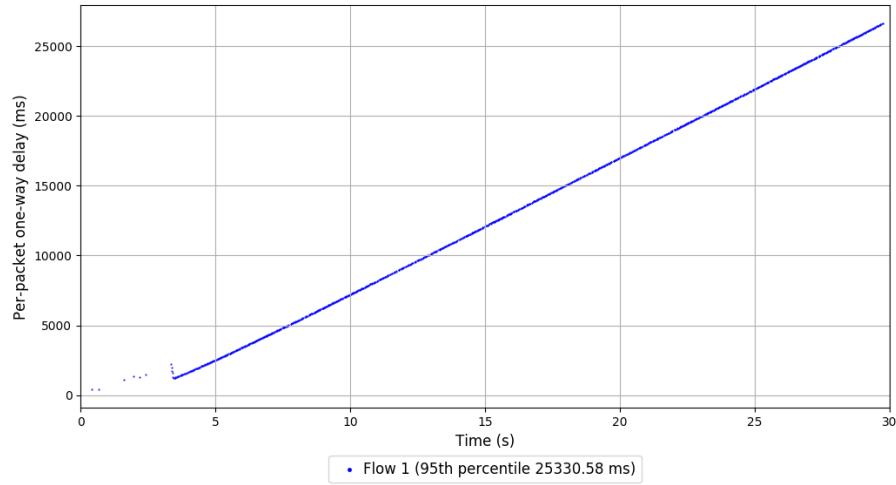
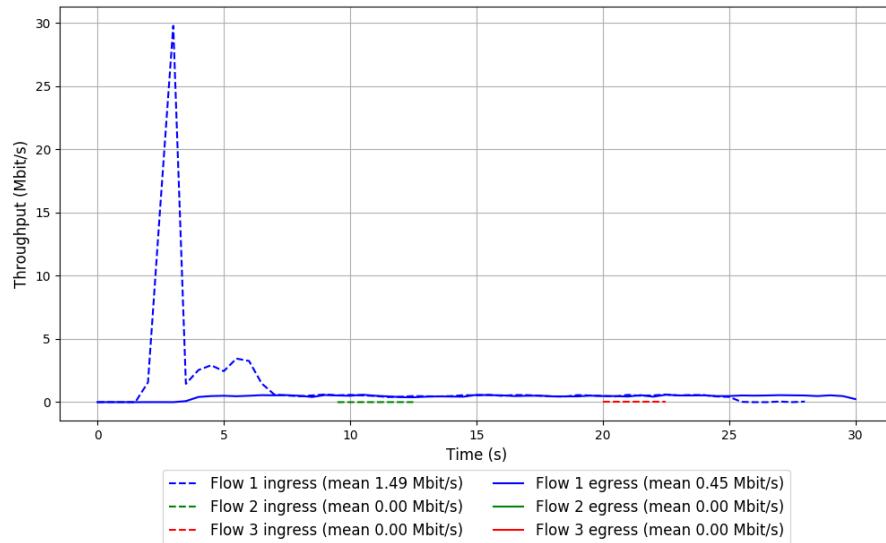
Start at: 2018-08-10 00:07:30

End at: 2018-08-10 00:08:00

Local clock offset: -3.639 ms

Remote clock offset: 2.581 ms

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

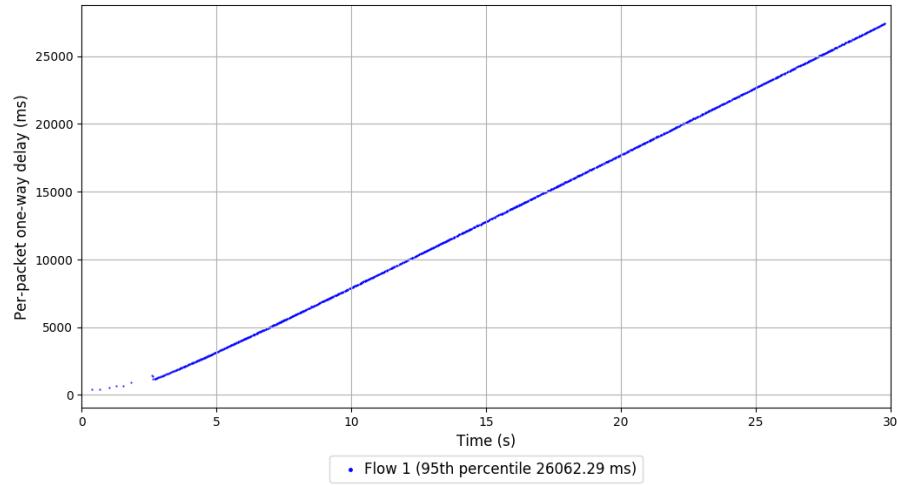
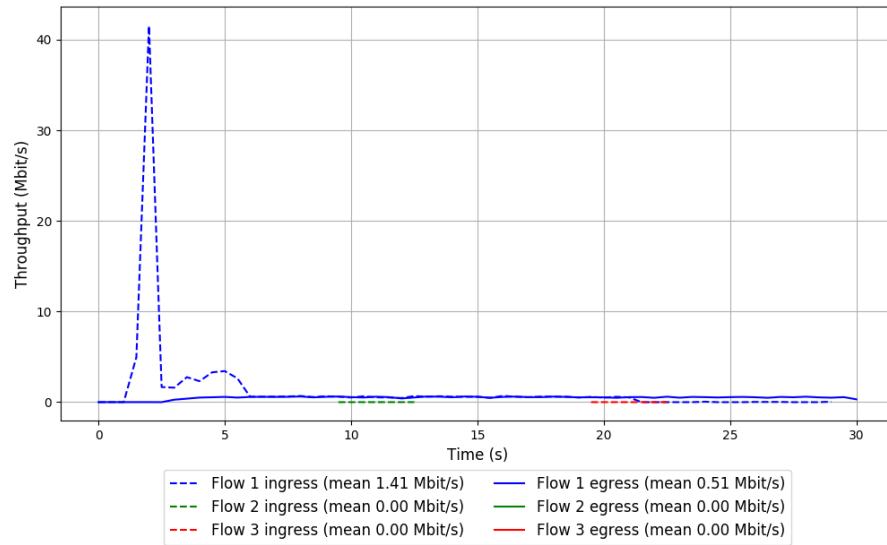
Start at: 2018-08-10 00:27:56

End at: 2018-08-10 00:28:26

Local clock offset: -2.775 ms

Remote clock offset: 3.046 ms

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

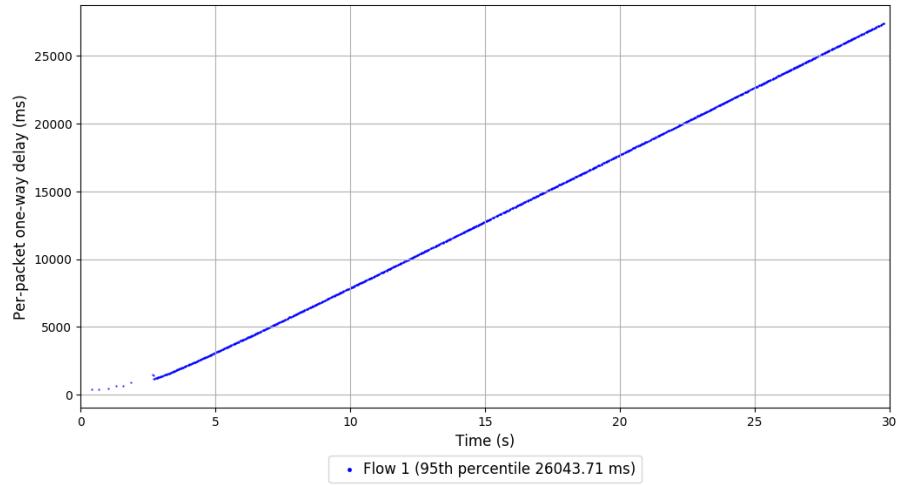
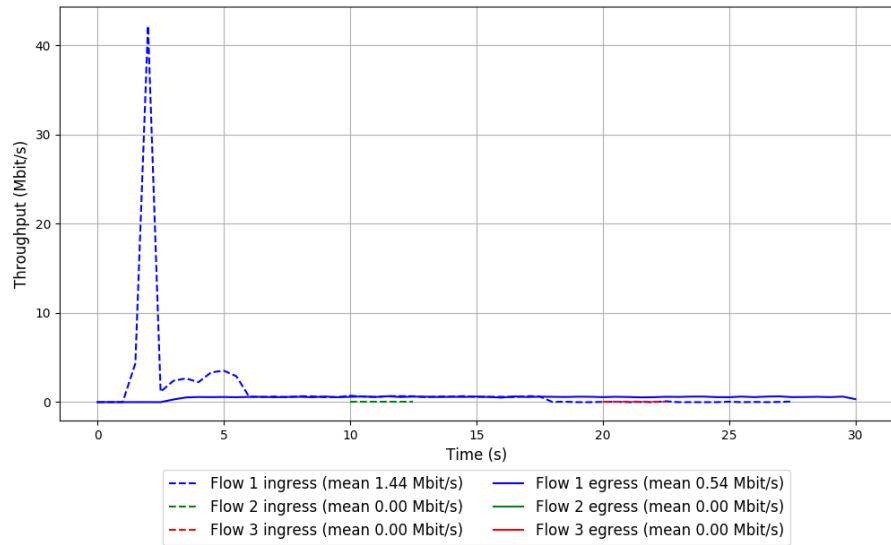
Start at: 2018-08-10 00:48:28

End at: 2018-08-10 00:48:58

Local clock offset: -1.735 ms

Remote clock offset: 2.734 ms

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

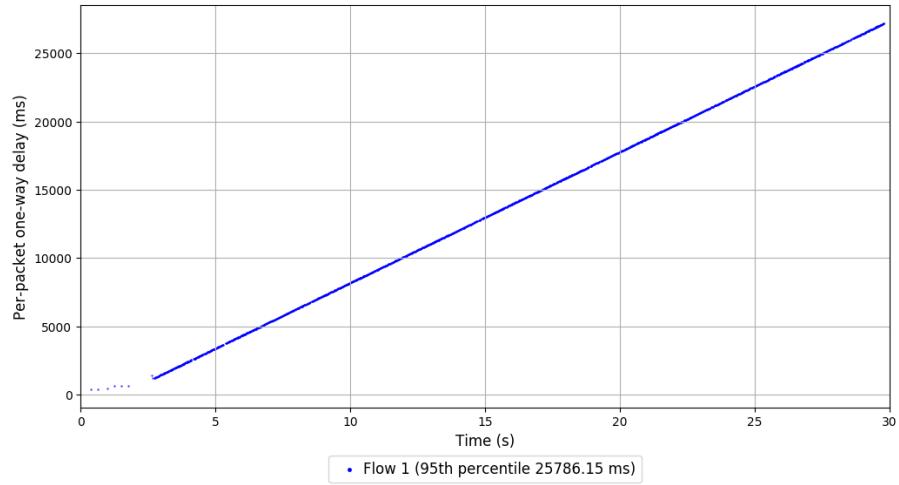
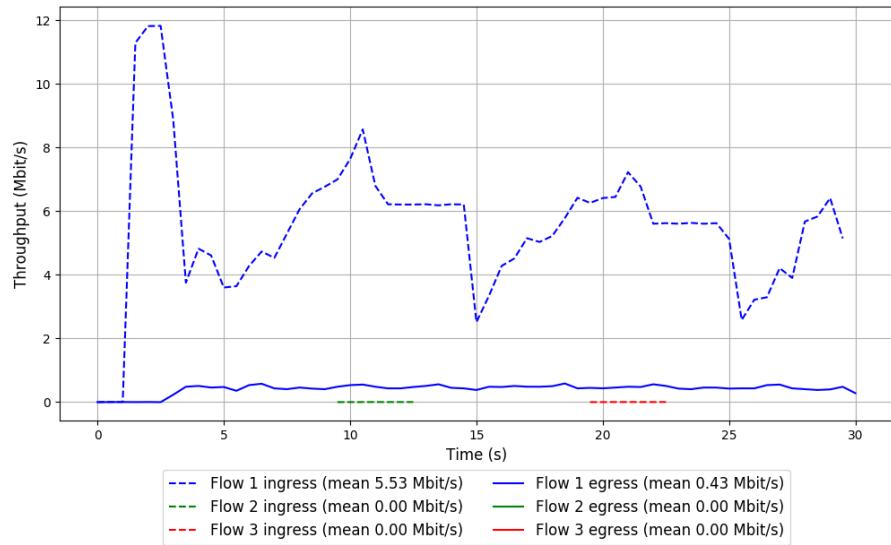
Start at: 2018-08-09 23:58:50

End at: 2018-08-09 23:59:20

Local clock offset: -3.804 ms

Remote clock offset: 7.255 ms

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

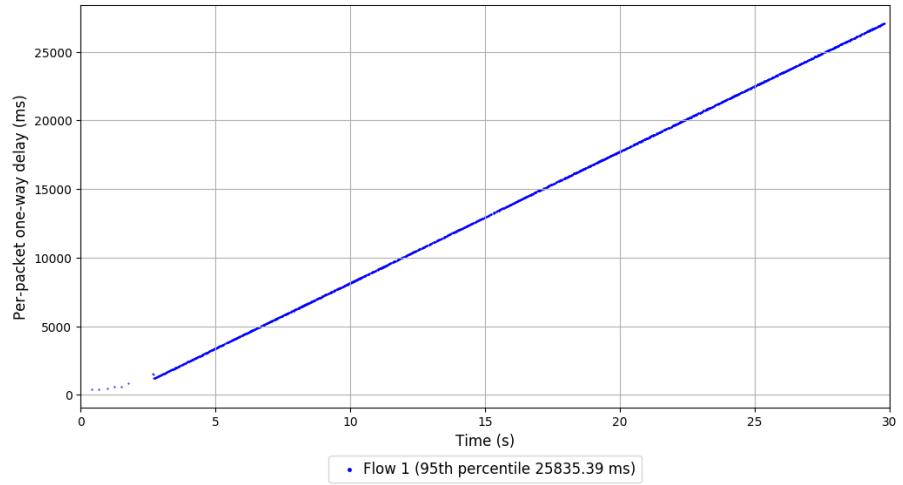
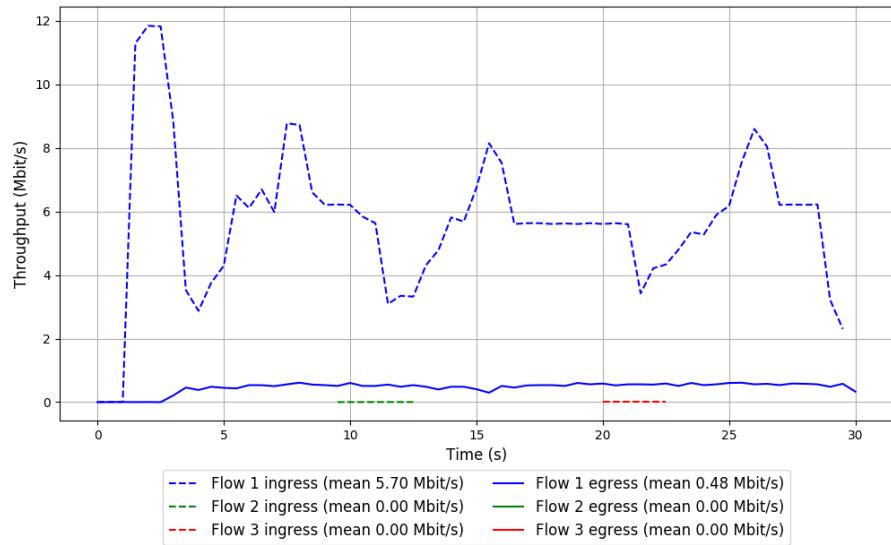
Start at: 2018-08-10 00:19:33

End at: 2018-08-10 00:20:03

Local clock offset: -2.456 ms

Remote clock offset: 5.886 ms

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

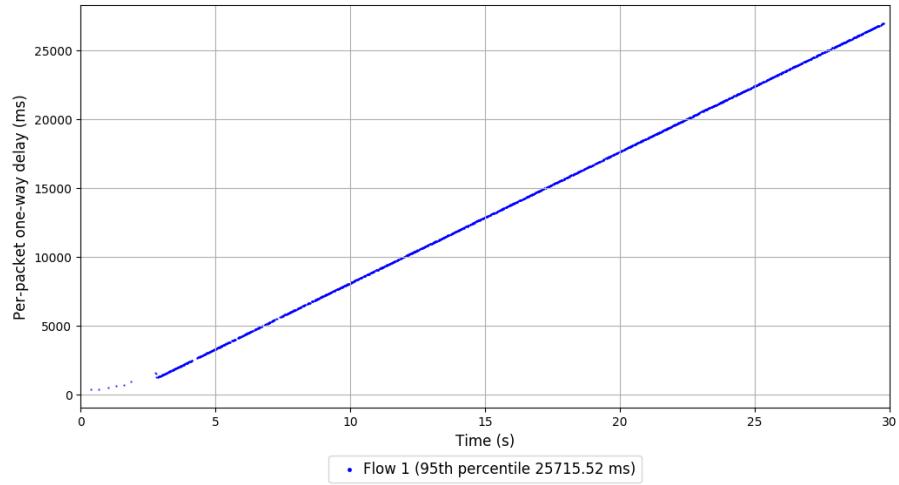
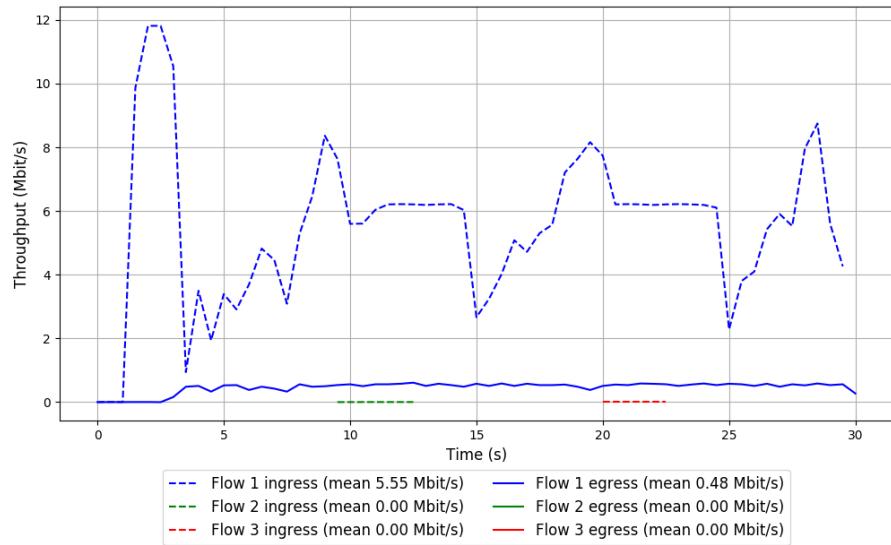
Start at: 2018-08-10 00:39:57

End at: 2018-08-10 00:40:27

Local clock offset: -1.669 ms

Remote clock offset: 6.574 ms

Run 3: Report of PCC-Expr — Data Link

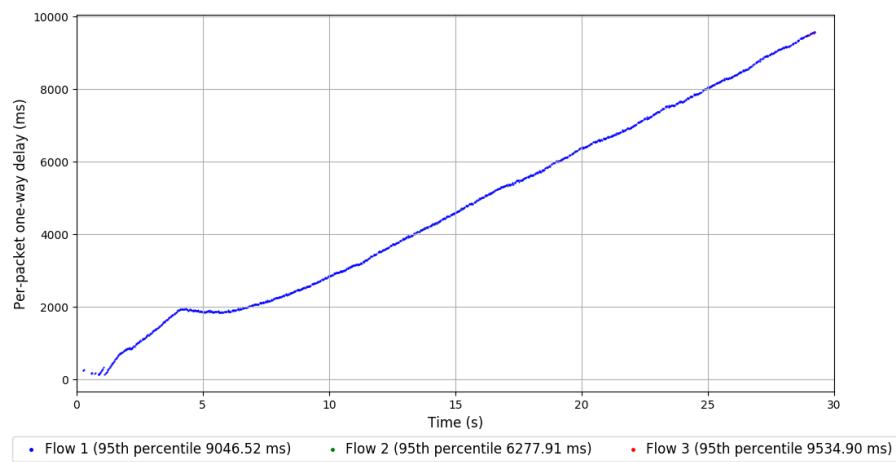
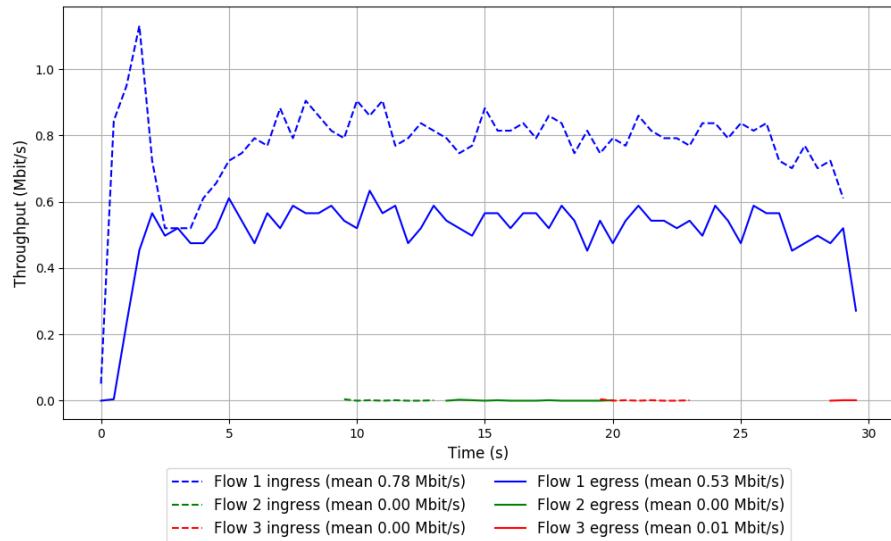


```
Run 1: Statistics of QUIC Cubic

Start at: 2018-08-09 23:57:38
End at: 2018-08-09 23:58:08
Local clock offset: -3.827 ms
Remote clock offset: 8.392 ms

# Below is generated by plot.py at 2018-08-10 00:53:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 9073.103 ms
Loss rate: 33.36%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 9046.518 ms
Loss rate: 33.36%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 6277.908 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 9534.903 ms
Loss rate: 66.67%
```

Run 1: Report of QUIC Cubic — Data Link

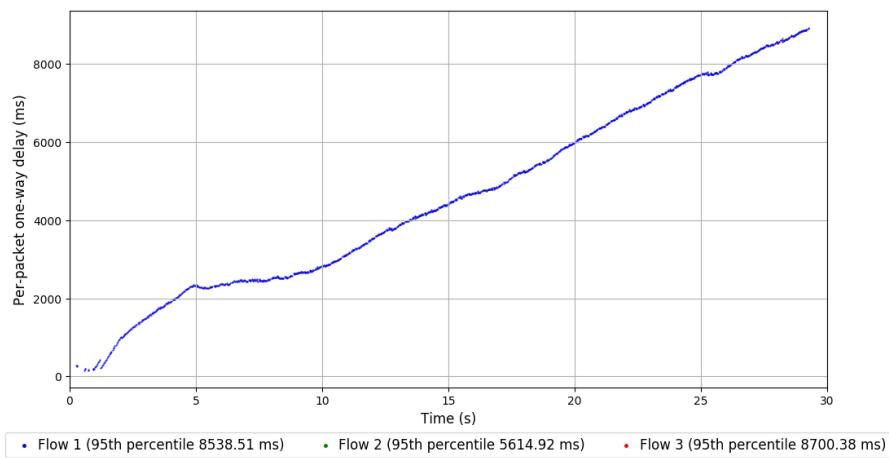
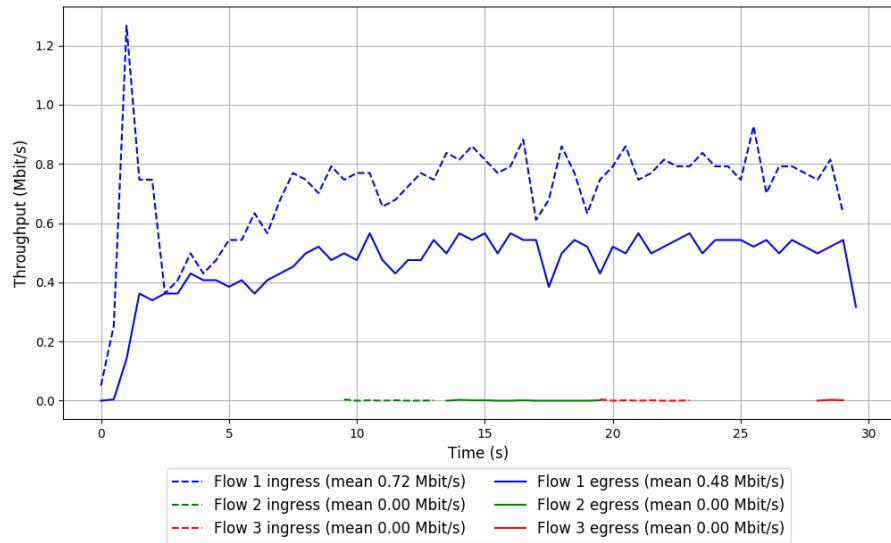


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-08-10 00:18:21
End at: 2018-08-10 00:18:51
Local clock offset: -4.103 ms
Remote clock offset: 3.463 ms

# Below is generated by plot.py at 2018-08-10 00:53:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 8550.794 ms
Loss rate: 34.06%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 8538.514 ms
Loss rate: 34.06%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 5614.920 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8700.384 ms
Loss rate: 50.00%
```

Run 2: Report of QUIC Cubic — Data Link

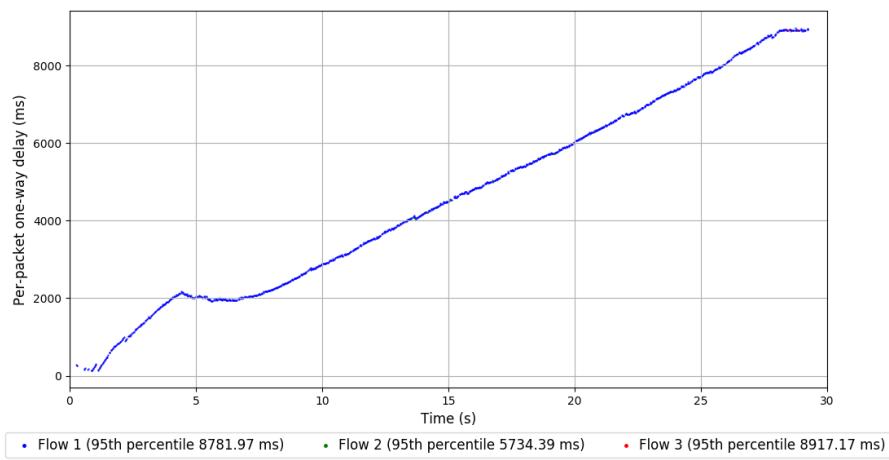
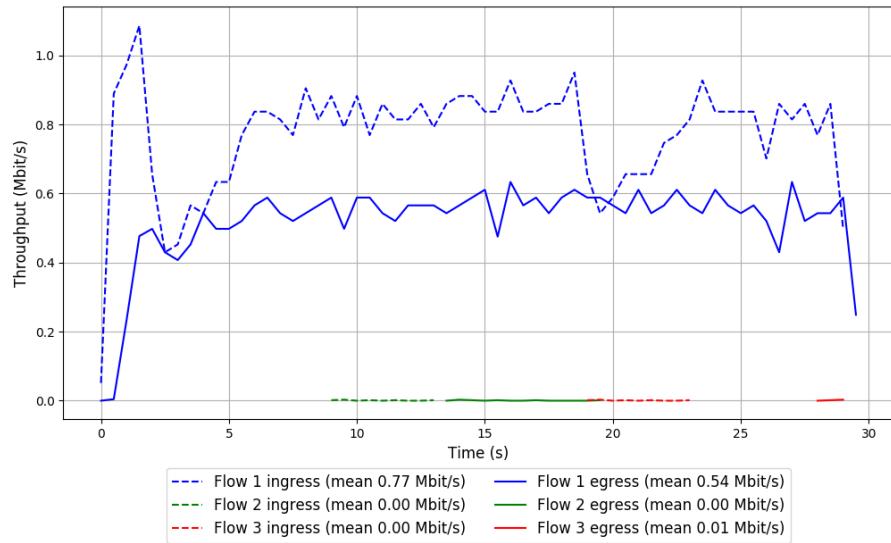


Run 3: Statistics of QUIC Cubic

```
Start at: 2018-08-10 00:38:46
End at: 2018-08-10 00:39:16
Local clock offset: -2.525 ms
Remote clock offset: 5.585 ms

# Below is generated by plot.py at 2018-08-10 00:53:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 8782.363 ms
Loss rate: 31.18%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 8781.968 ms
Loss rate: 31.18%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 5734.390 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 8917.173 ms
Loss rate: 50.00%
```

Run 3: Report of QUIC Cubic — Data Link

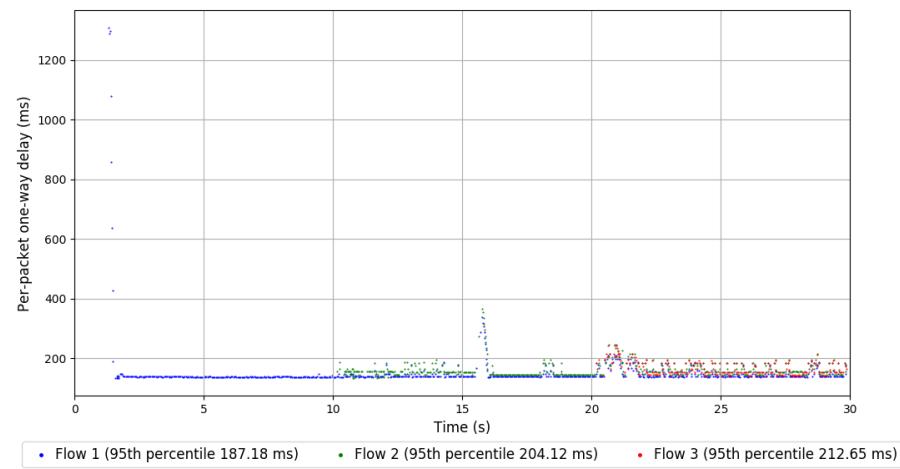
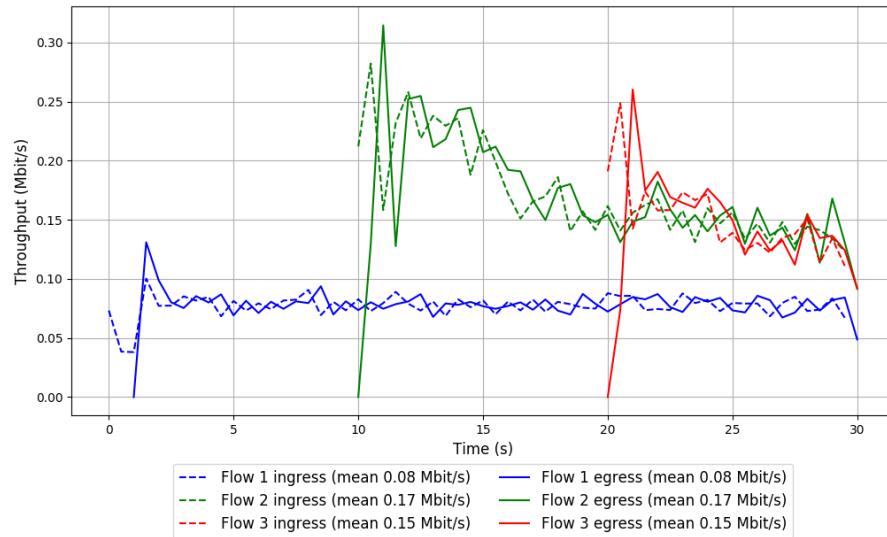


```
Run 1: Statistics of SCReAM

Start at: 2018-08-10 00:03:46
End at: 2018-08-10 00:04:16
Local clock offset: -4.469 ms
Remote clock offset: 2.519 ms

# Below is generated by plot.py at 2018-08-10 00:53:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 197.347 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 187.178 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 204.115 ms
Loss rate: 1.02%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 212.648 ms
Loss rate: 1.97%
```

Run 1: Report of SCReAM — Data Link

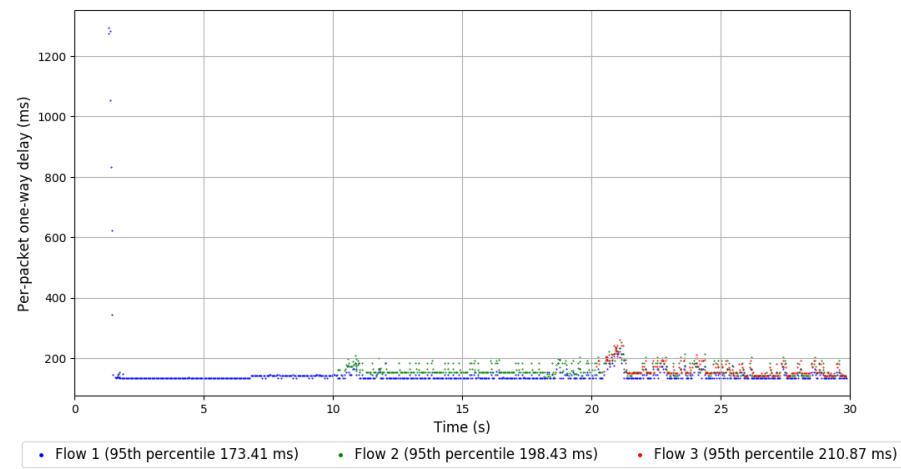
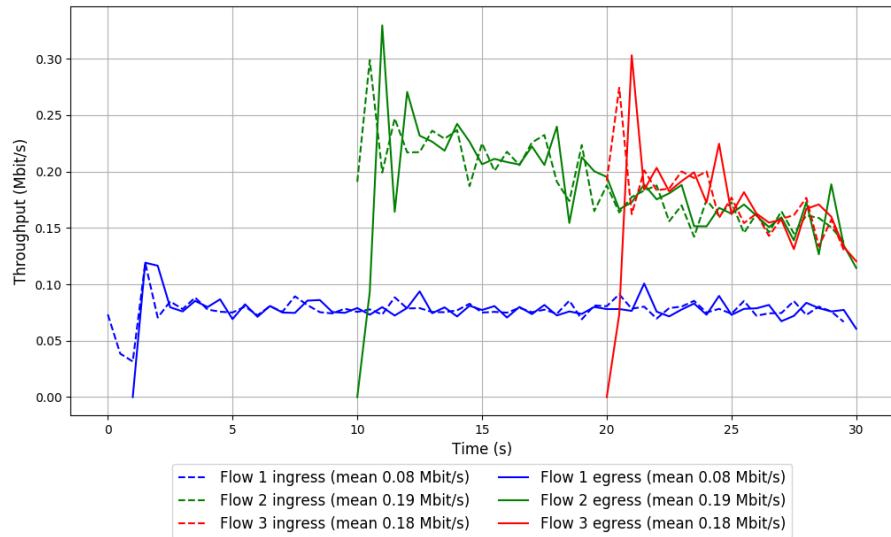


Run 2: Statistics of SCReAM

```
Start at: 2018-08-10 00:24:20
End at: 2018-08-10 00:24:50
Local clock offset: -3.694 ms
Remote clock offset: 3.153 ms

# Below is generated by plot.py at 2018-08-10 00:53:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 193.525 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 173.405 ms
Loss rate: 0.66%
-- Flow 2:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 198.434 ms
Loss rate: 1.04%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 210.871 ms
Loss rate: 1.98%
```

Run 2: Report of SCReAM — Data Link

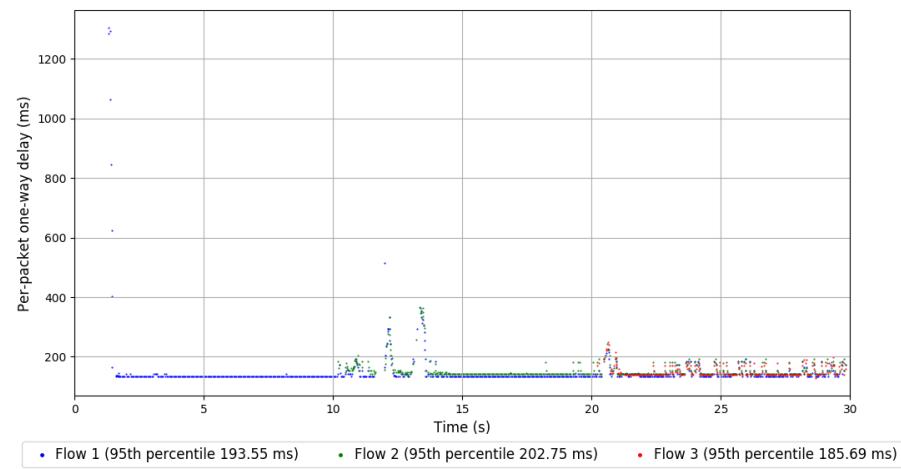
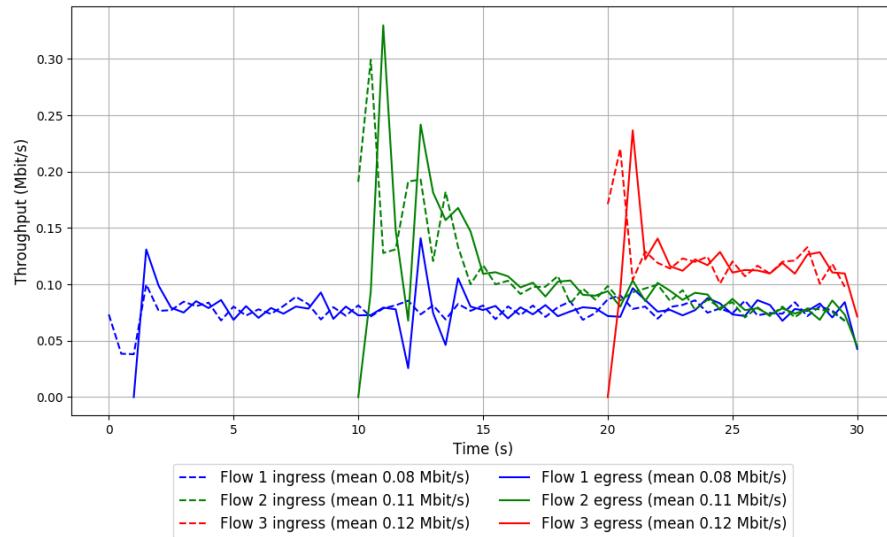


Run 3: Statistics of SCReAM

```
Start at: 2018-08-10 00:44:47
End at: 2018-08-10 00:45:17
Local clock offset: -2.345 ms
Remote clock offset: 6.555 ms

# Below is generated by plot.py at 2018-08-10 00:53:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 193.560 ms
Loss rate: 1.31%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 193.554 ms
Loss rate: 0.94%
-- Flow 2:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 202.754 ms
Loss rate: 1.03%
-- Flow 3:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 185.694 ms
Loss rate: 2.49%
```

Run 3: Report of SCReAM — Data Link

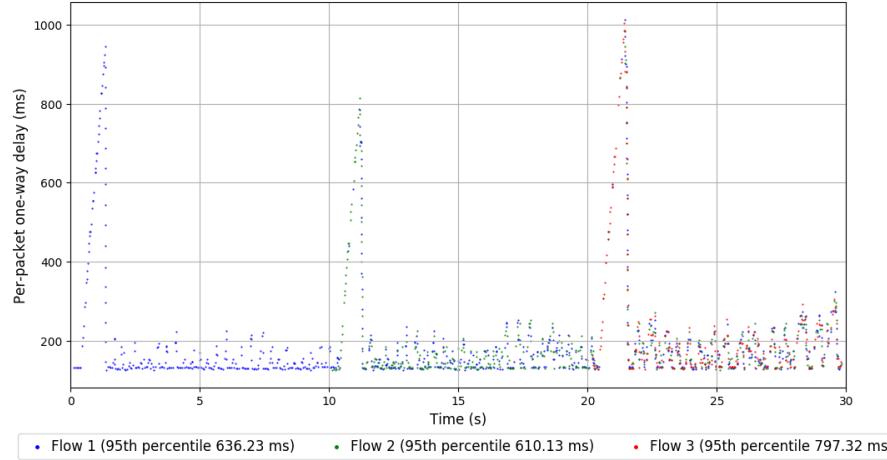
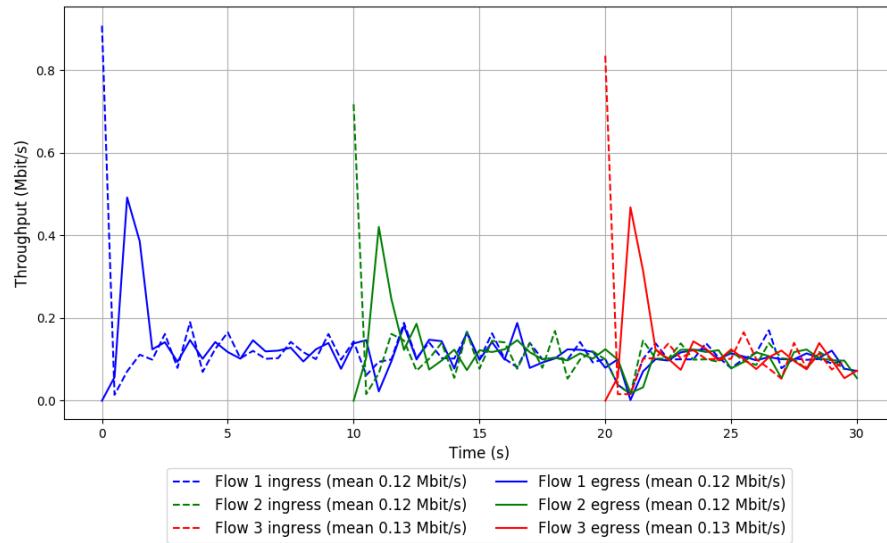


Run 1: Statistics of Sprout

```
Start at: 2018-08-10 00:08:45
End at: 2018-08-10 00:09:15
Local clock offset: -4.482 ms
Remote clock offset: 7.295 ms

# Below is generated by plot.py at 2018-08-10 00:53:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 662.322 ms
Loss rate: 1.39%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 636.226 ms
Loss rate: 0.94%
-- Flow 2:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 610.126 ms
Loss rate: 1.47%
-- Flow 3:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 797.316 ms
Loss rate: 2.49%
```

Run 1: Report of Sprout — Data Link

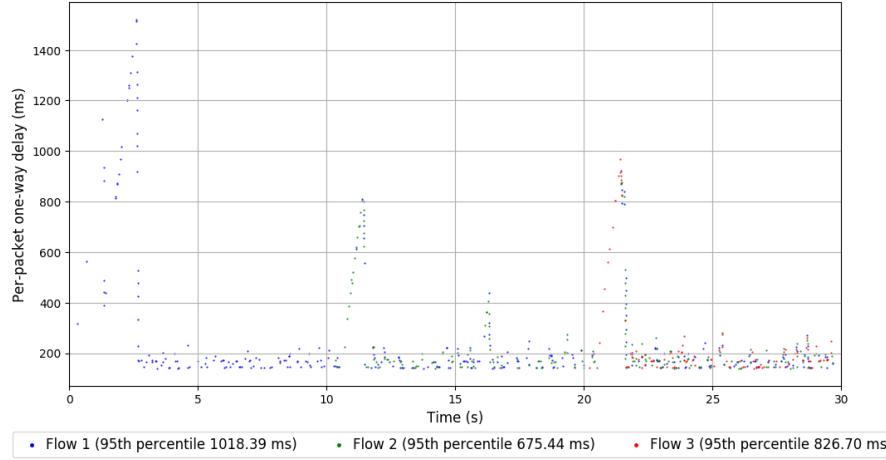
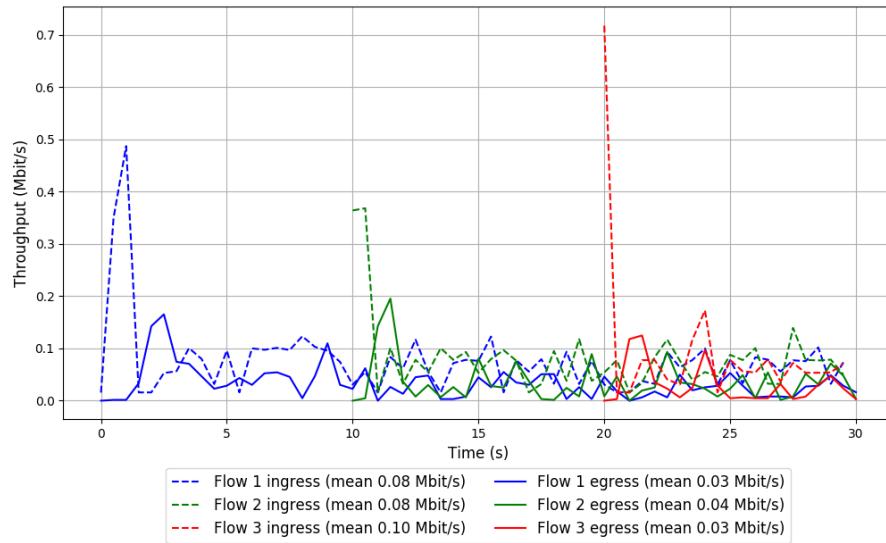


Run 2: Statistics of Sprout

```
Start at: 2018-08-10 00:29:09
End at: 2018-08-10 00:29:39
Local clock offset: -2.715 ms
Remote clock offset: 3.036 ms

# Below is generated by plot.py at 2018-08-10 00:53:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 868.745 ms
Loss rate: 57.48%
-- Flow 1:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 1018.390 ms
Loss rate: 55.12%
-- Flow 2:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 675.439 ms
Loss rate: 55.38%
-- Flow 3:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 826.700 ms
Loss rate: 66.77%
```

Run 2: Report of Sprout — Data Link

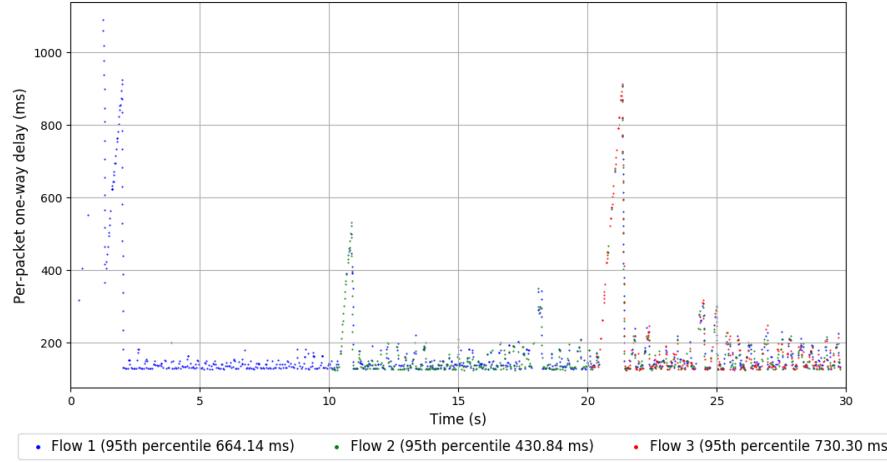
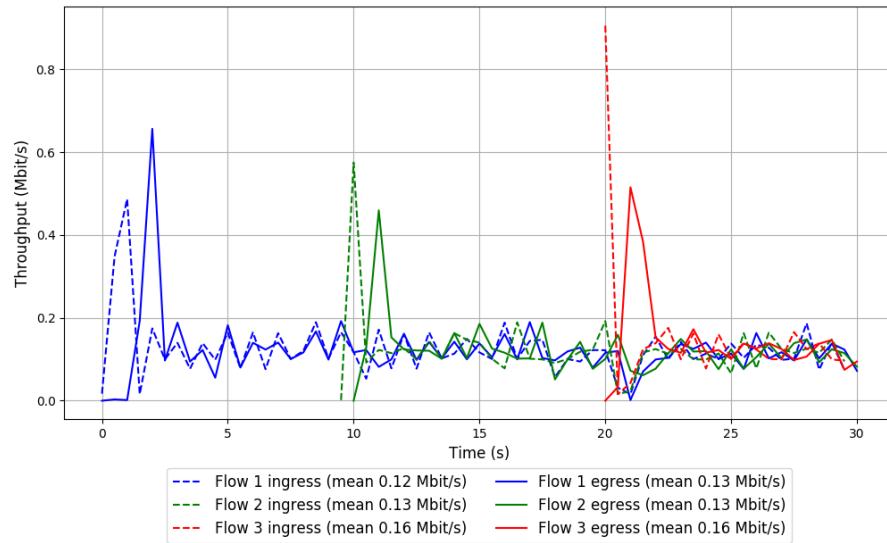


Run 3: Statistics of Sprout

```
Start at: 2018-08-10 00:49:40
End at: 2018-08-10 00:50:10
Local clock offset: -2.551 ms
Remote clock offset: 7.638 ms

# Below is generated by plot.py at 2018-08-10 00:53:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 623.739 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 664.140 ms
Loss rate: 0.62%
-- Flow 2:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 430.842 ms
Loss rate: 1.79%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 730.305 ms
Loss rate: 2.29%
```

Run 3: Report of Sprout — Data Link

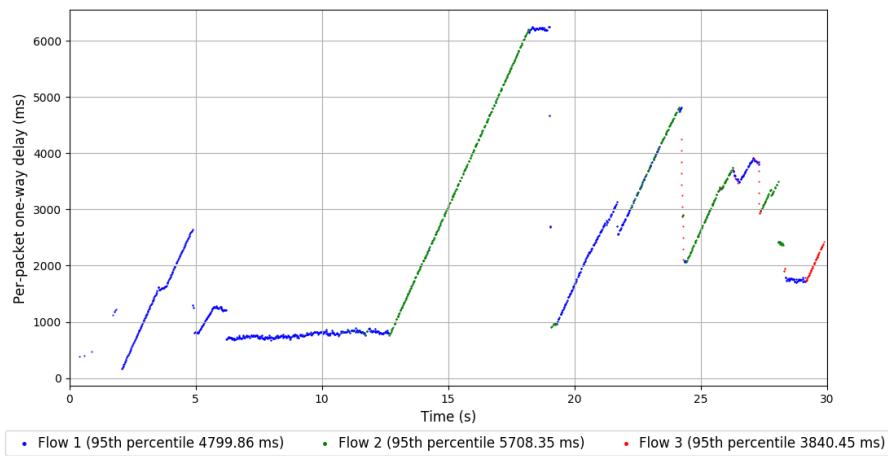
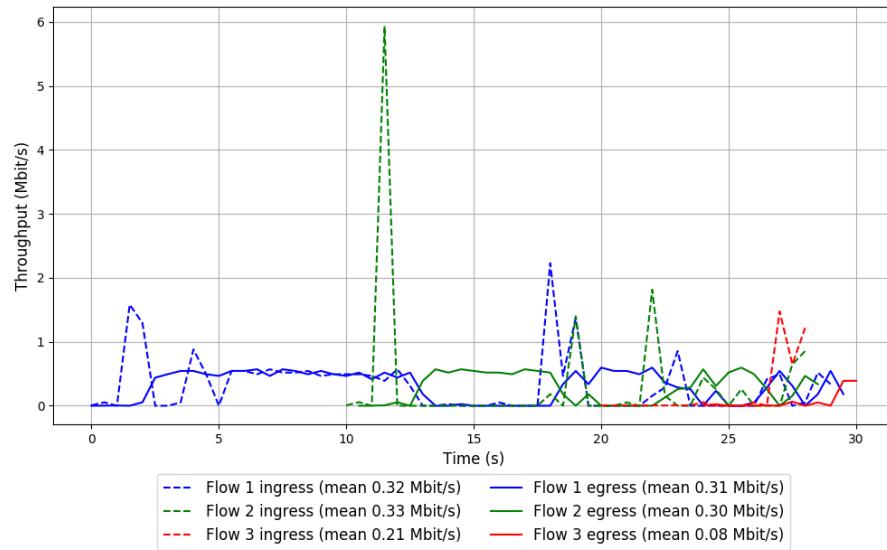


Run 1: Statistics of TaoVA-100x

```
Start at: 2018-08-10 00:11:09
End at: 2018-08-10 00:11:39
Local clock offset: -4.371 ms
Remote clock offset: 8.476 ms

# Below is generated by plot.py at 2018-08-10 00:53:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 5609.980 ms
Loss rate: 14.38%
-- Flow 1:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 4799.856 ms
Loss rate: 4.77%
-- Flow 2:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 5708.352 ms
Loss rate: 12.46%
-- Flow 3:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 3840.445 ms
Loss rate: 73.42%
```

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

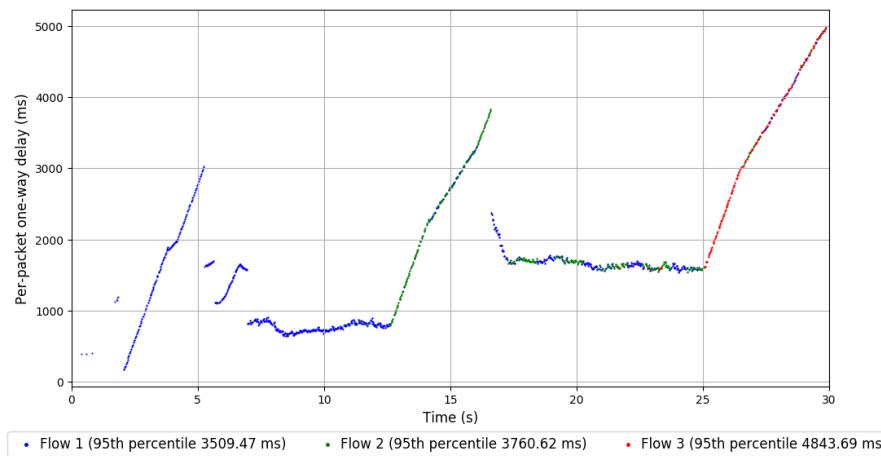
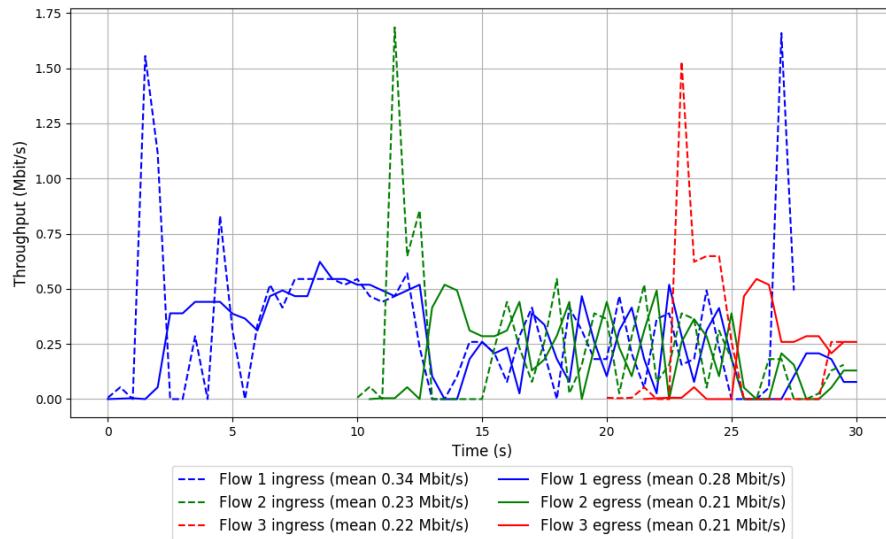


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-08-10 00:31:33
End at: 2018-08-10 00:32:03
Local clock offset: -2.682 ms
Remote clock offset: 1.872 ms

# Below is generated by plot.py at 2018-08-10 00:53:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 4113.647 ms
Loss rate: 12.72%
-- Flow 1:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 3509.472 ms
Loss rate: 12.20%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 3760.624 ms
Loss rate: 10.07%
-- Flow 3:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 4843.693 ms
Loss rate: 20.52%
```

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

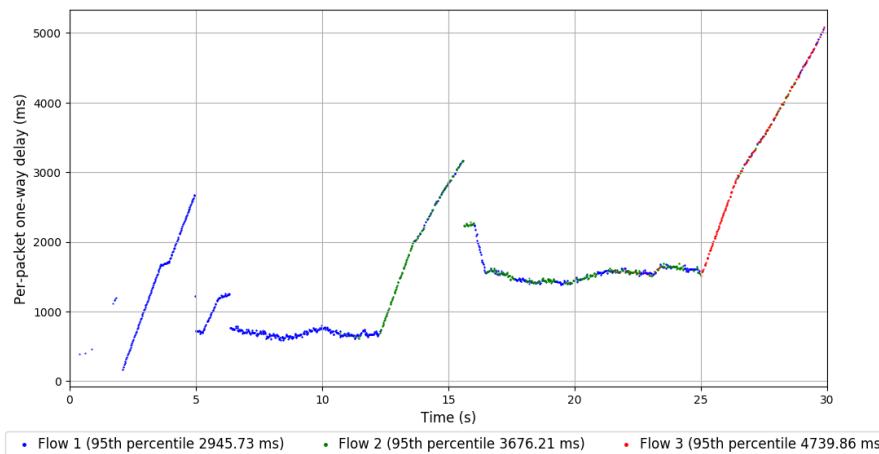
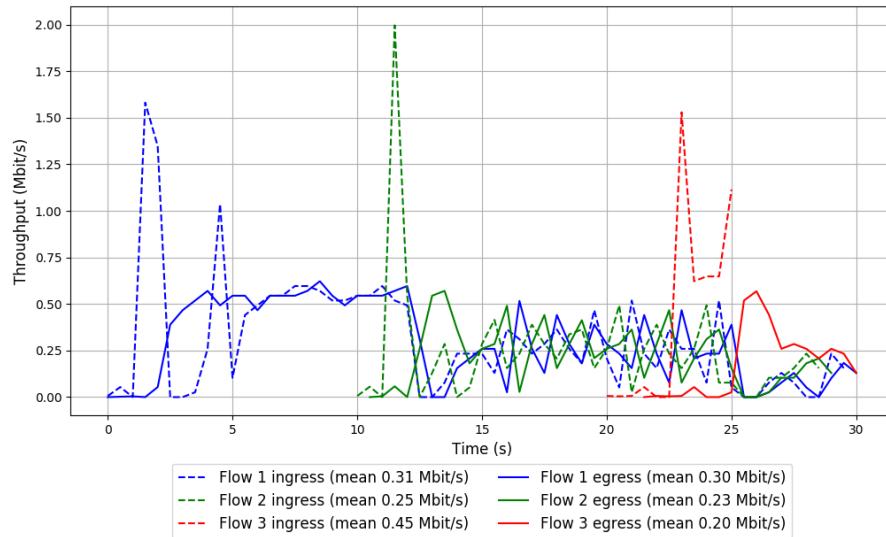


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-08-10 00:52:04
End at: 2018-08-10 00:52:34
Local clock offset: -2.654 ms
Remote clock offset: 7.761 ms

# Below is generated by plot.py at 2018-08-10 00:53:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 3910.481 ms
Loss rate: 9.68%
-- Flow 1:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 2945.730 ms
Loss rate: 4.72%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 3676.207 ms
Loss rate: 9.68%
-- Flow 3:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 4739.860 ms
Loss rate: 29.66%
```

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

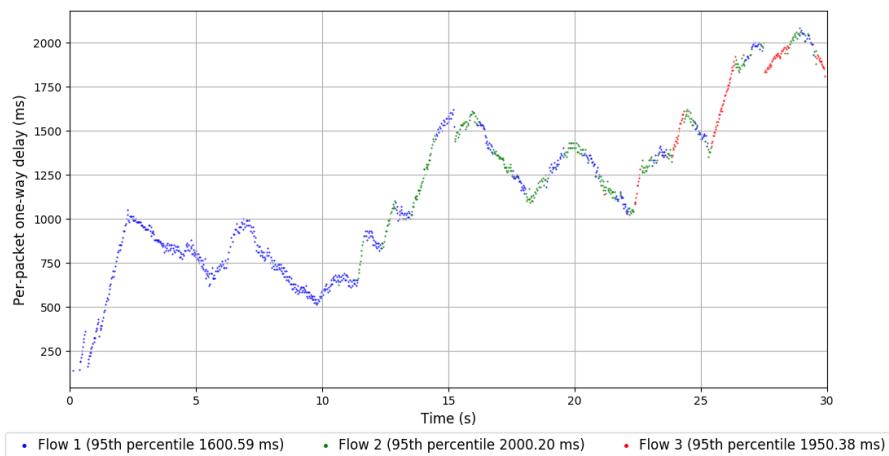
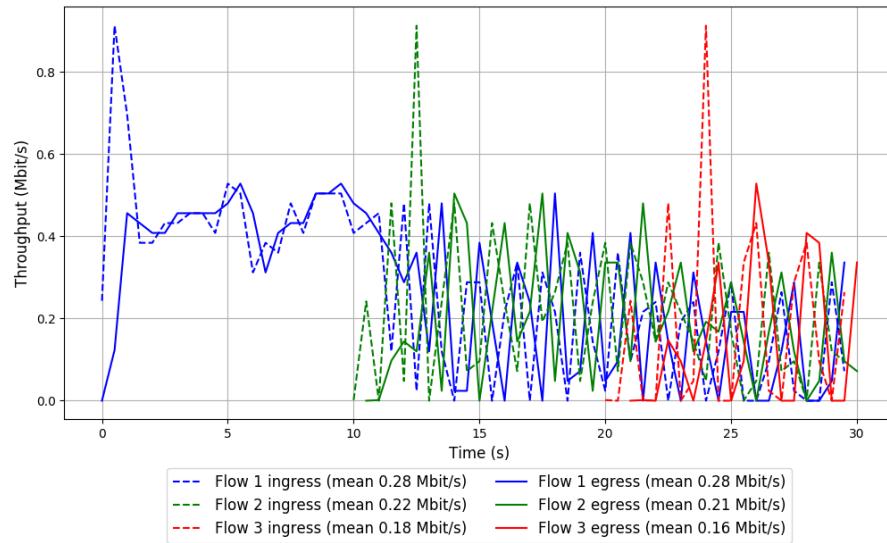


Run 1: Statistics of TCP Vegas

```
Start at: 2018-08-10 00:00:11
End at: 2018-08-10 00:00:41
Local clock offset: -3.78 ms
Remote clock offset: 3.571 ms

# Below is generated by plot.py at 2018-08-10 00:53:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 1960.110 ms
Loss rate: 5.63%
-- Flow 1:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 1600.592 ms
Loss rate: 2.18%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 2000.196 ms
Loss rate: 6.44%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 1950.378 ms
Loss rate: 19.83%
```

Run 1: Report of TCP Vegas — Data Link

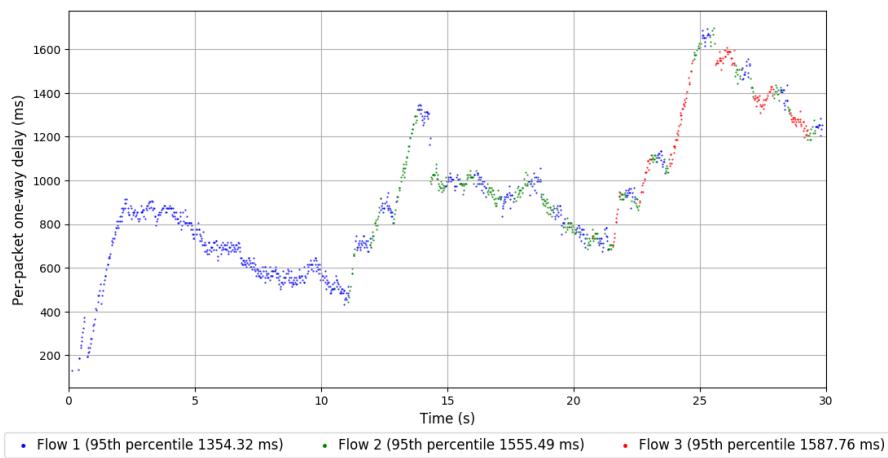
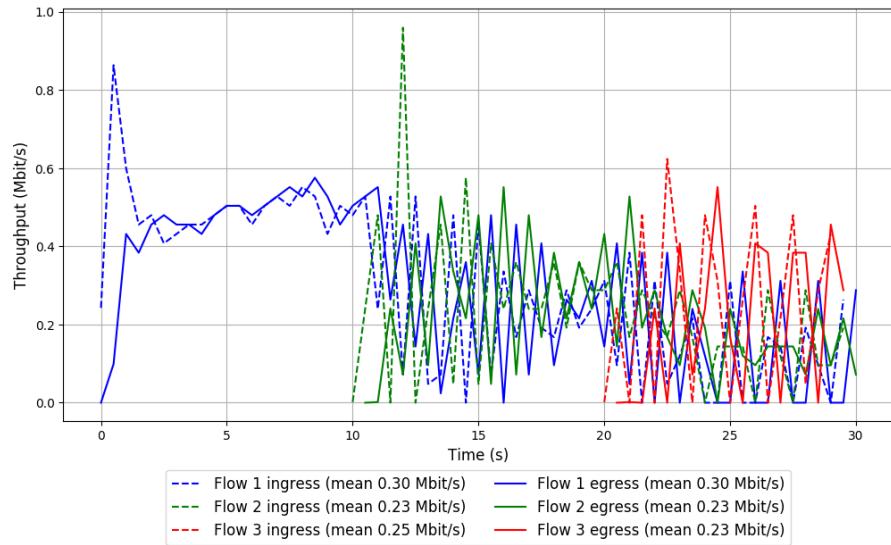


Run 2: Statistics of TCP Vegas

```
Start at: 2018-08-10 00:20:45
End at: 2018-08-10 00:21:15
Local clock offset: -2.375 ms
Remote clock offset: 7.035 ms

# Below is generated by plot.py at 2018-08-10 00:53:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 1537.936 ms
Loss rate: 4.30%
-- Flow 1:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 1354.316 ms
Loss rate: 1.47%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 1555.494 ms
Loss rate: 4.18%
-- Flow 3:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 1587.760 ms
Loss rate: 15.30%
```

Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

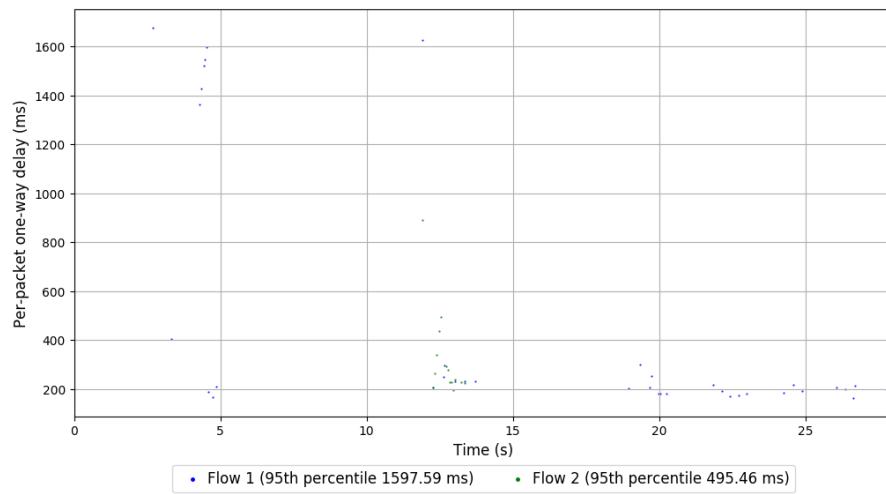
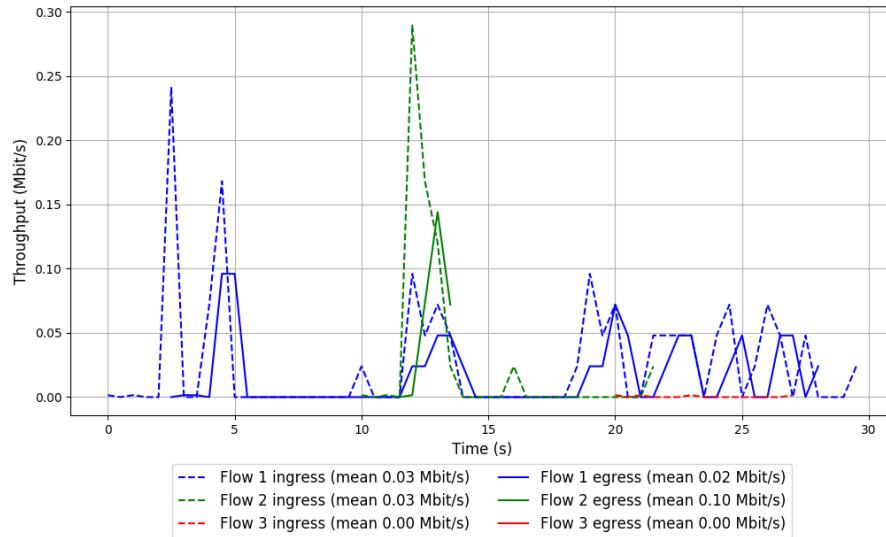
Start at: 2018-08-10 00:41:12

End at: 2018-08-10 00:41:42

Local clock offset: -3.247 ms

Remote clock offset: 1.758 ms

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

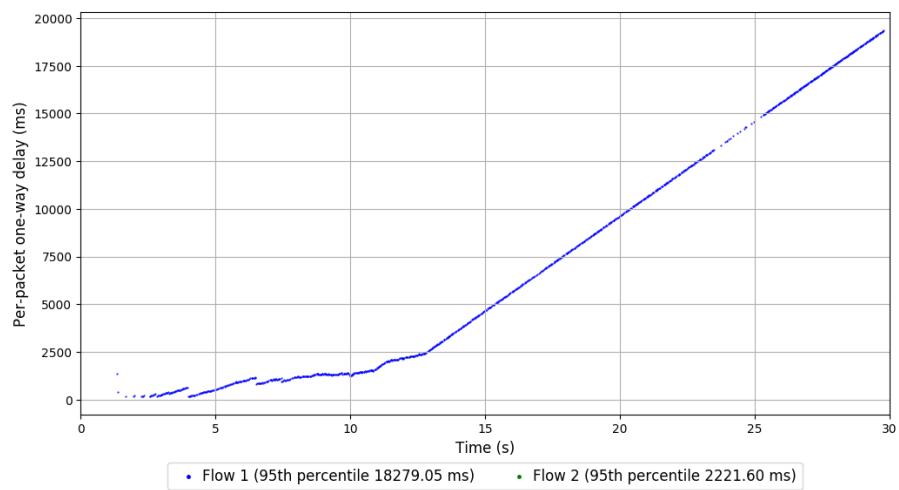
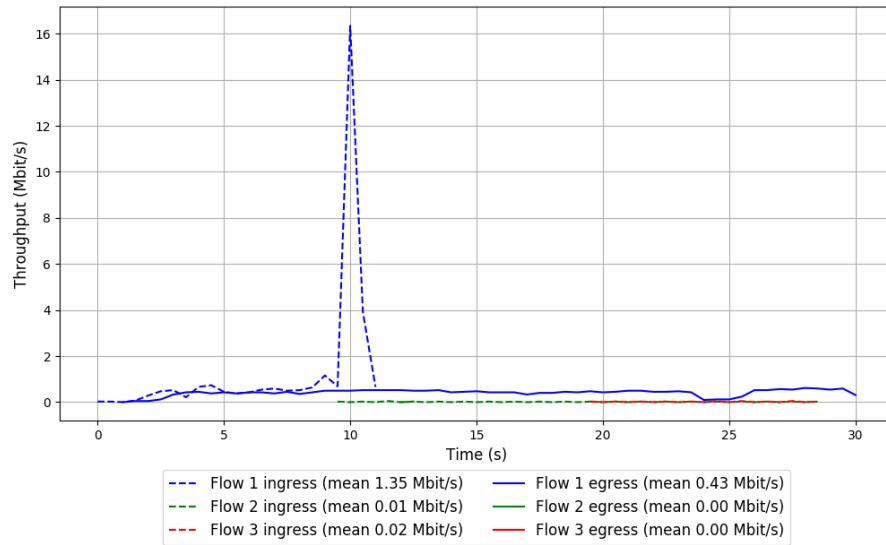
Start at: 2018-08-10 00:01:22

End at: 2018-08-10 00:01:52

Local clock offset: -2.973 ms

Remote clock offset: 2.572 ms

Run 1: Report of Verus — Data Link

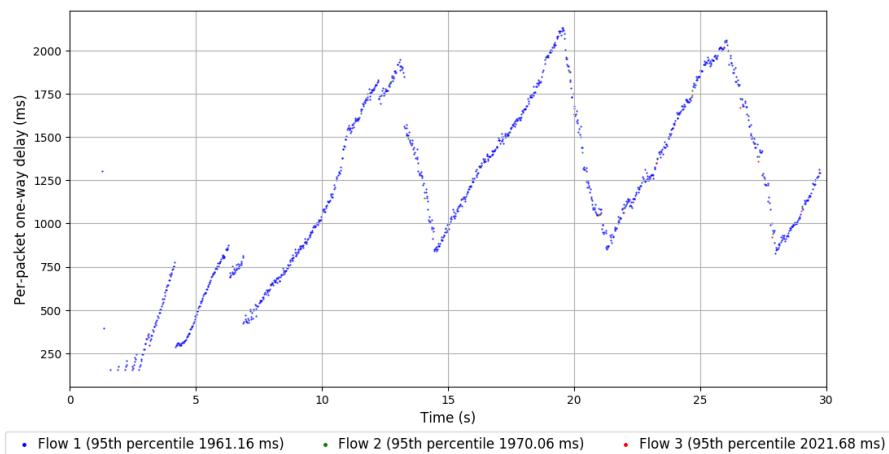
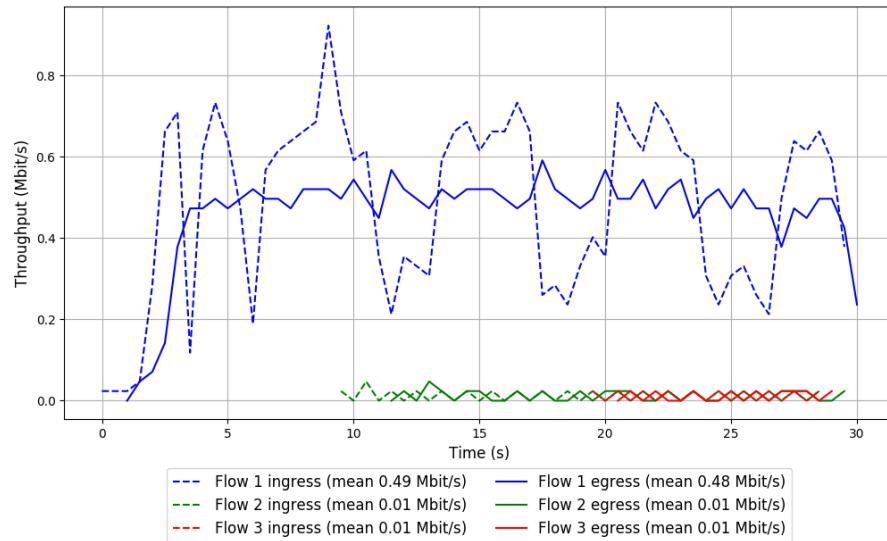


Run 2: Statistics of Verus

```
Start at: 2018-08-10 00:21:57
End at: 2018-08-10 00:22:27
Local clock offset: -3.058 ms
Remote clock offset: 5.918 ms

# Below is generated by plot.py at 2018-08-10 00:53:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 1962.366 ms
Loss rate: 5.74%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 1961.160 ms
Loss rate: 5.72%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1970.061 ms
Loss rate: 4.76%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2021.679 ms
Loss rate: 10.00%
```

Run 2: Report of Verus — Data Link

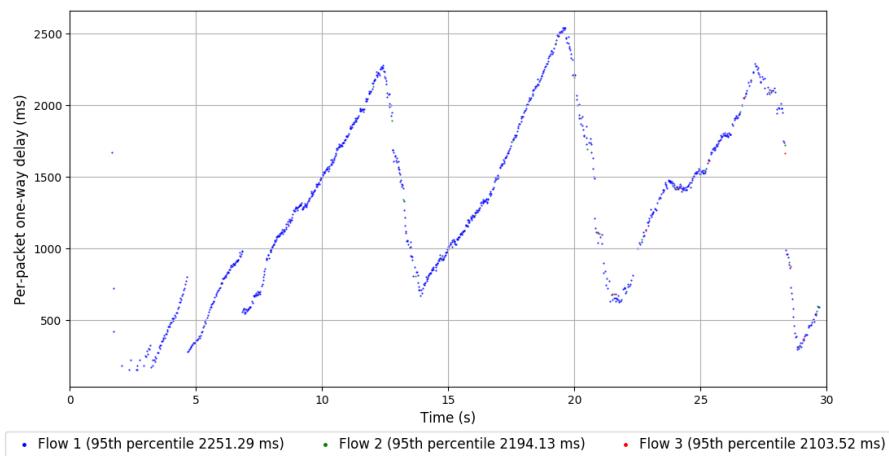
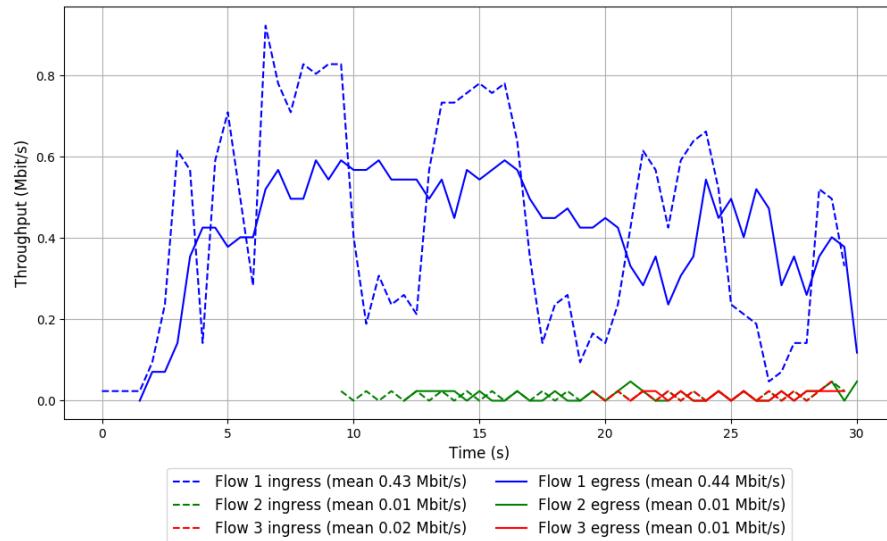


Run 3: Statistics of Verus

```
Start at: 2018-08-10 00:42:24
End at: 2018-08-10 00:42:54
Local clock offset: -3.229 ms
Remote clock offset: 6.538 ms

# Below is generated by plot.py at 2018-08-10 00:53:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 2249.621 ms
Loss rate: 2.89%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 2251.292 ms
Loss rate: 2.71%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2194.127 ms
Loss rate: 4.35%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2103.517 ms
Loss rate: 16.67%
```

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

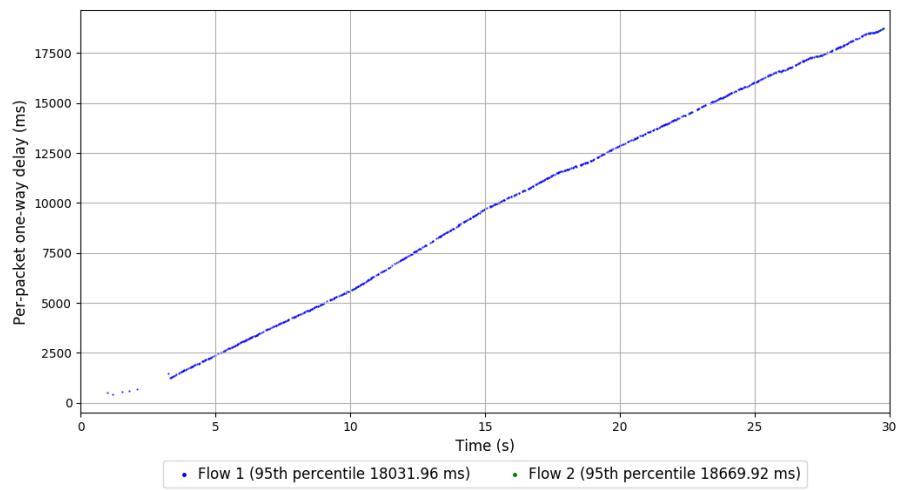
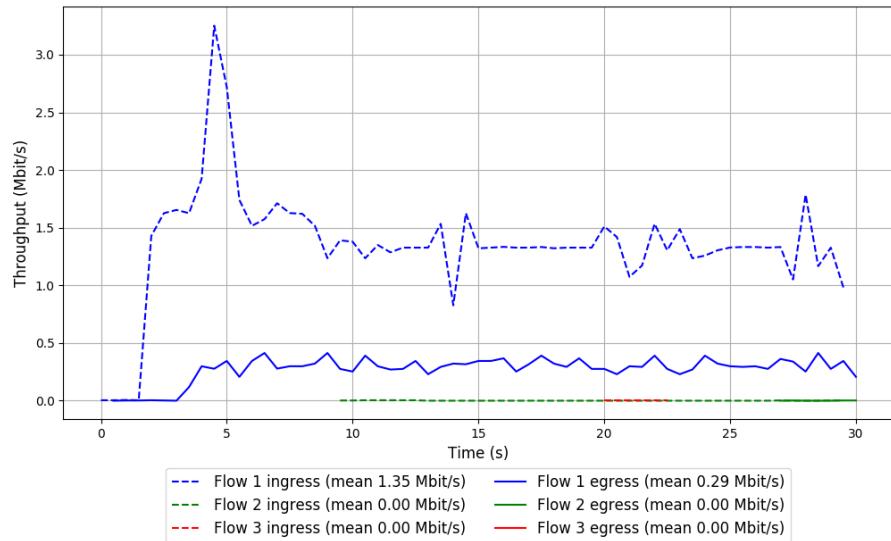
Start at: 2018-08-09 23:51:39

End at: 2018-08-09 23:52:09

Local clock offset: -3.336 ms

Remote clock offset: 7.286 ms

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

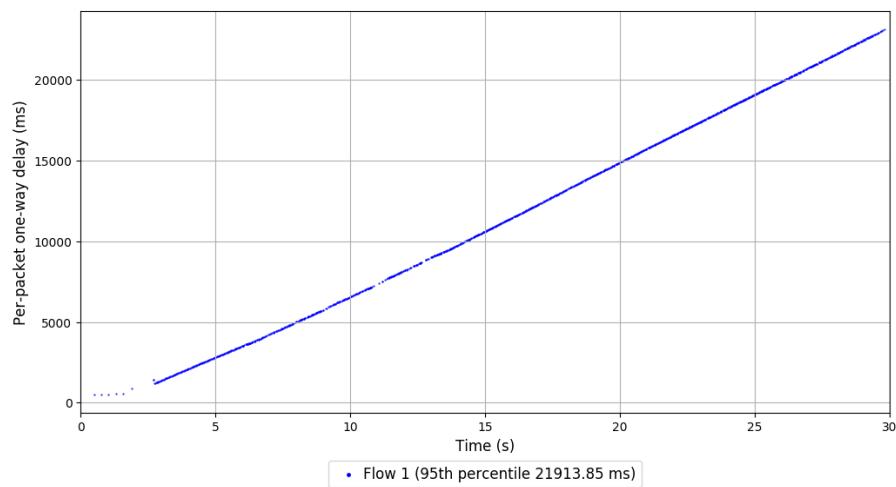
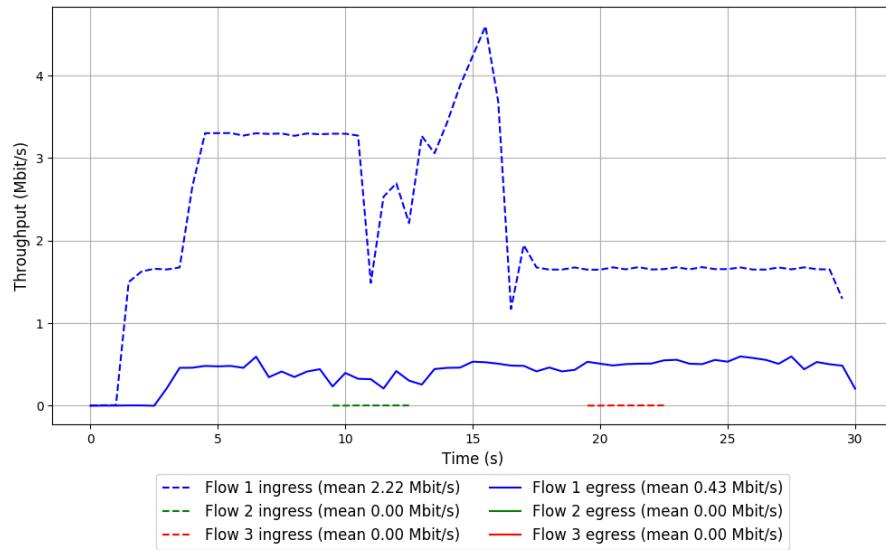
Start at: 2018-08-10 00:12:21

End at: 2018-08-10 00:12:51

Local clock offset: -2.837 ms

Remote clock offset: 3.67 ms

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

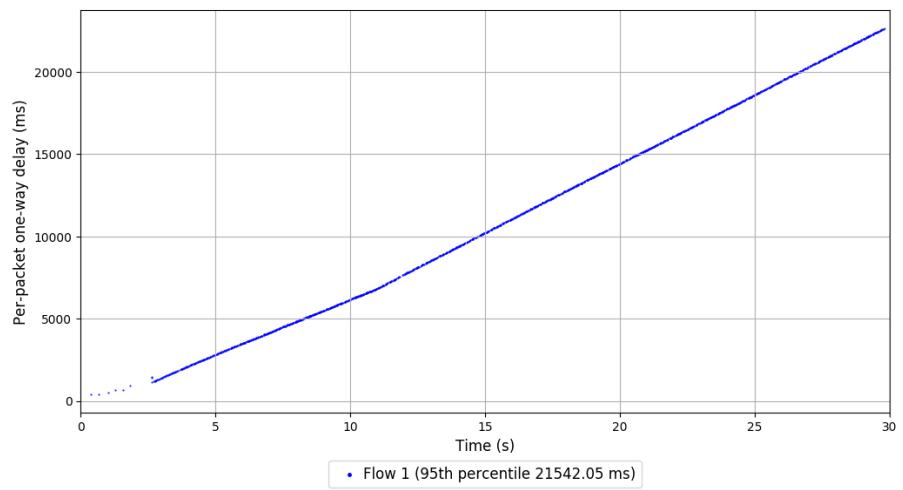
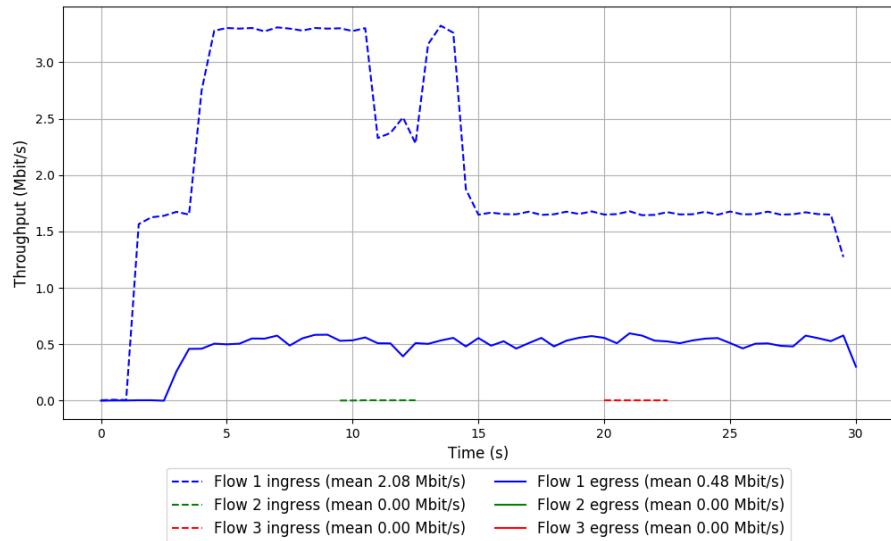
Start at: 2018-08-10 00:32:45

End at: 2018-08-10 00:33:15

Local clock offset: -3.355 ms

Remote clock offset: 2.871 ms

Run 3: Report of PCC-Vivace — Data Link

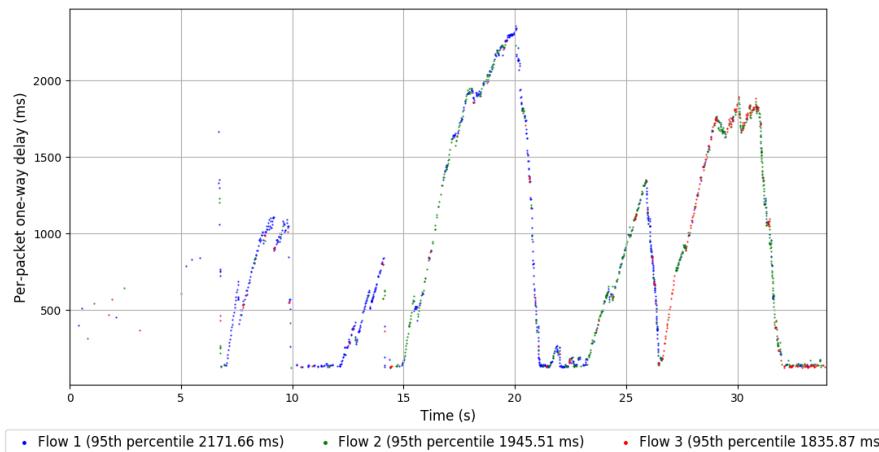
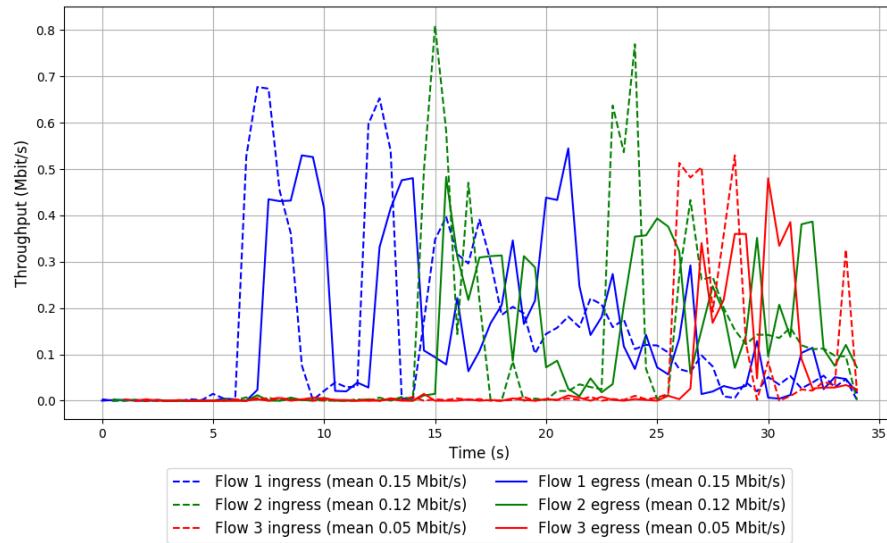


Run 1: Statistics of WebRTC media

```
Start at: 2018-08-10 00:09:57
End at: 2018-08-10 00:10:27
Local clock offset: -3.637 ms
Remote clock offset: 8.446 ms

# Below is generated by plot.py at 2018-08-10 00:53:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 2038.081 ms
Loss rate: 1.89%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 2171.663 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 1945.508 ms
Loss rate: 0.51%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 1835.872 ms
Loss rate: 9.83%
```

Run 1: Report of WebRTC media — Data Link

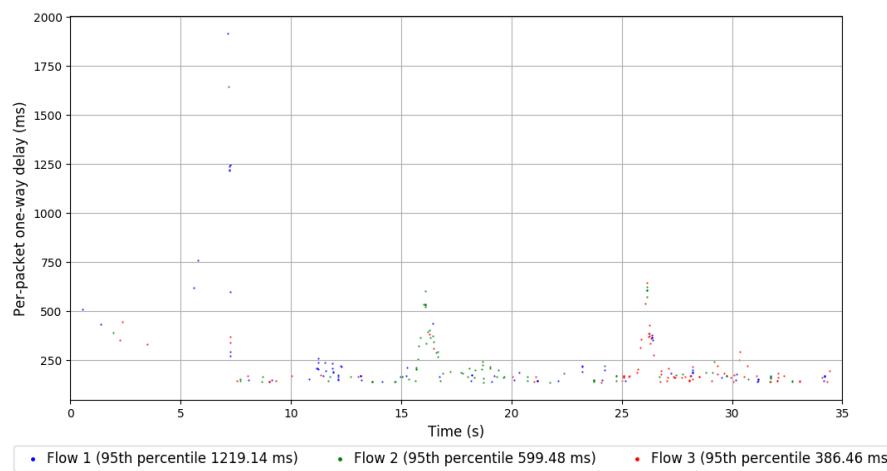
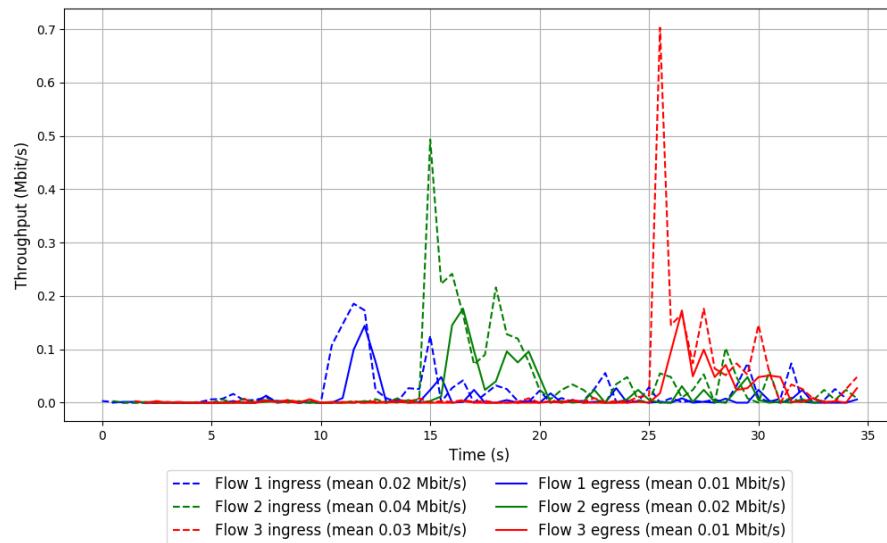


Run 2: Statistics of WebRTC media

```
Start at: 2018-08-10 00:30:22
End at: 2018-08-10 00:30:52
Local clock offset: -3.504 ms
Remote clock offset: 6.723 ms

# Below is generated by plot.py at 2018-08-10 00:53:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 604.053 ms
Loss rate: 58.75%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1219.144 ms
Loss rate: 58.35%
-- Flow 2:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 599.476 ms
Loss rate: 59.42%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 386.462 ms
Loss rate: 58.16%
```

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

```
Start at: 2018-08-10 00:50:52
End at: 2018-08-10 00:51:22
Local clock offset: -2.593 ms
Remote clock offset: 2.852 ms

# Below is generated by plot.py at 2018-08-10 00:53:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 1426.038 ms
Loss rate: 0.87%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 1443.293 ms
Loss rate: 0.21%
-- Flow 2:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 1424.900 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 1315.380 ms
Loss rate: 3.08%
```

Run 3: Report of WebRTC media — Data Link

