Pantheon Report

Generated at 2018-09-06 21:08:59 (UTC).

Data path: Brazil on `p4p1` (*remote*) →AWS Brazil 1 on `ens5` (*local*).

Repeated the test of 18 congestion control schemes 5 times.

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

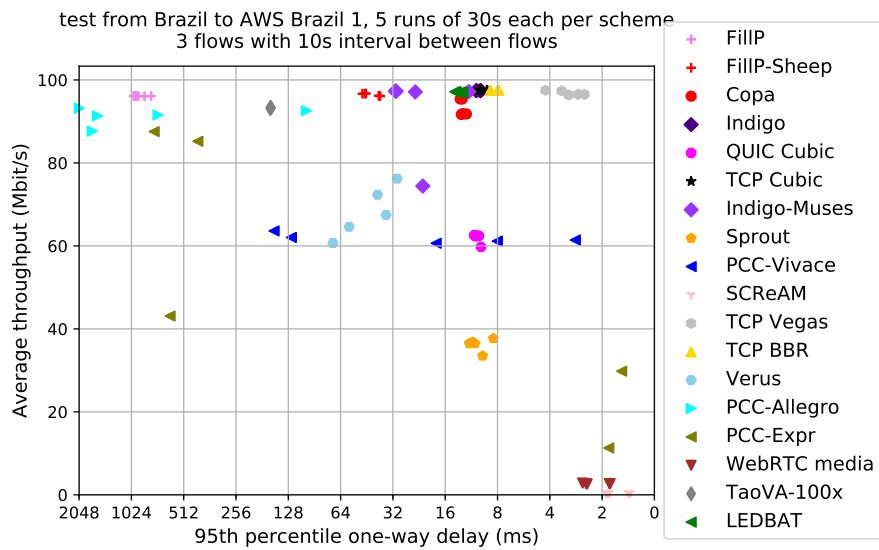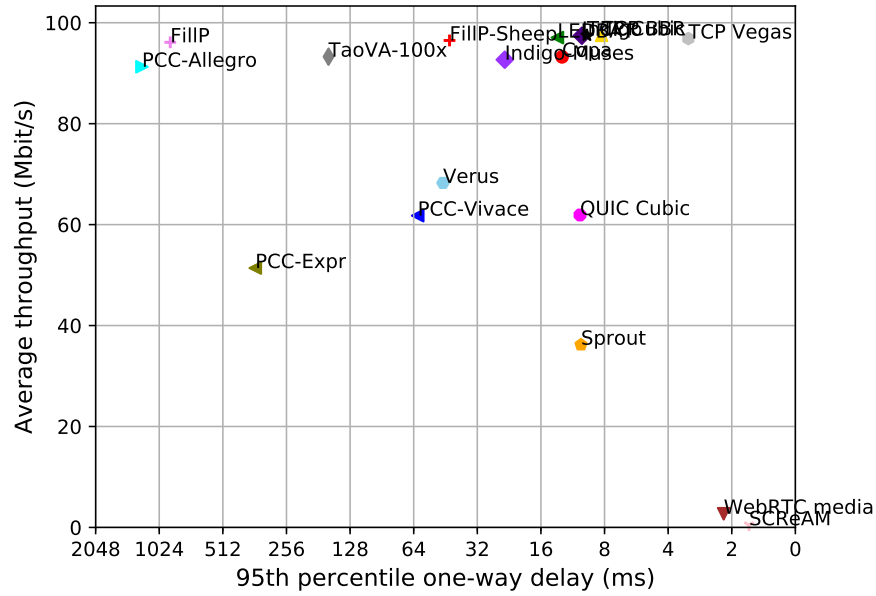NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

```
System info:
Linux 4.15.0-1020-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
net.ipv4.tcp_mem = 536870912 536870912 536870912
```

```
Git summary:
branch: muses @ f392ce15d580343f4432c3d7e068b3290f03eb4a
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ a28d20fb82a95a965a3da65fd1eb71b8994e9b84
third_party/pantheon-tunnel @ cbfce6db5ff5740dafe1771f813cd646339e1952
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 Brazil to AWS Brazil 1, 5 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)

test from Brazil to AWS Brazil 1, 5 runs of 30s each per scheme
3 flows with 10s interval between flows

scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	5	59.35	40.89	32.88	7.67	8.45	8.42	0.07	0.15	0.16
Copa	5	55.99	39.99	31.97	11.35	13.19	14.45	0.03	0.06	0.13
TCP Cubic	5	59.63	40.65	32.49	9.59	9.63	9.83	0.09	0.17	0.26
FillP	5	59.26	40.16	30.58	844.65	911.83	236.67	5.54	9.41	5.12
FillP-Sheep	5	59.10	40.21	32.08	35.46	45.45	76.11	1.42	1.54	1.02
Indigo	5	59.69	40.70	32.47	9.83	10.18	8.43	0.51	1.20	0.17
LEDBAT	5	59.39	40.67	31.87	12.94	13.33	13.76	0.15	0.25	0.39
Indigo-Muses	5	48.34	47.40	38.62	17.27	17.78	28.10	0.81	0.09	2.72
PCC-Allegro	5	63.47	27.66	28.59	1179.87	503.77	9.00	6.84	4.27	0.06
PCC-Expr	5	31.45	20.23	19.64	241.71	181.22	134.83	5.79	0.28	7.75
QUIC Cubic	5	1.65	69.23	47.87	1.24	10.10	10.86	0.00	0.13	0.37
SCReAM	5	0.22	0.22	0.22	1.45	1.45	1.46	0.00	0.00	0.00
Sprout	5	39.95	36.57	34.18	8.97	9.79	11.42	3.59	0.05	0.12
TaoVA-100x	5	56.21	39.73	31.86	160.92	162.32	162.48	0.58	1.26	2.99
TCP Vegas	5	51.44	47.81	40.88	2.71	2.96	3.67	0.00	0.01	0.03
Verus	5	35.95	32.35	32.44	37.45	26.74	138.30	0.05	0.08	0.10
PCC-Vivace	5	32.07	31.87	25.78	106.07	62.48	65.67	1.73	0.40	0.63
WebRTC media	5	1.52	0.80	0.39	2.11	2.16	2.40	0.00	0.00	0.00

```
Run 1: Statistics of TCP BBR

Start at: 2018-09-06 19:19:18
End at: 2018-09-06 19:19:48
Local clock offset: -2.942 ms
Remote clock offset: 0.218 ms


# Below is generated by plot.py at 2018-09-06 20:58:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.52 Mbit/s
95th percentile per-packet one-way delay: 8.792 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 59.35 Mbit/s
95th percentile per-packet one-way delay: 7.908 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 40.88 Mbit/s
95th percentile per-packet one-way delay: 8.554 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 32.82 Mbit/s
95th percentile per-packet one-way delay: 9.640 ms
Loss rate: 0.49%
```
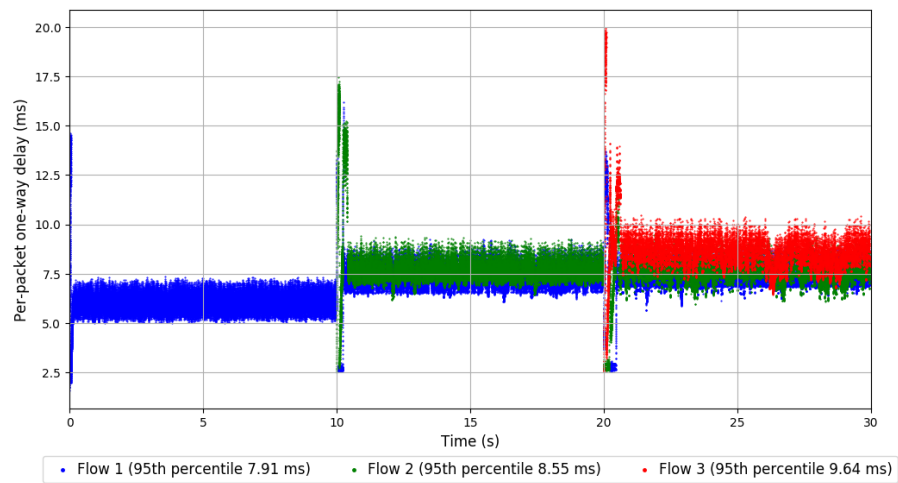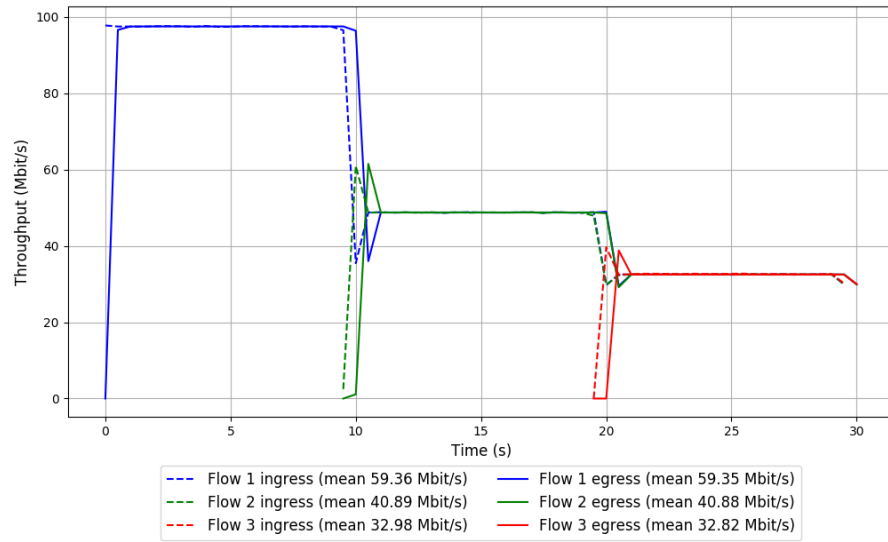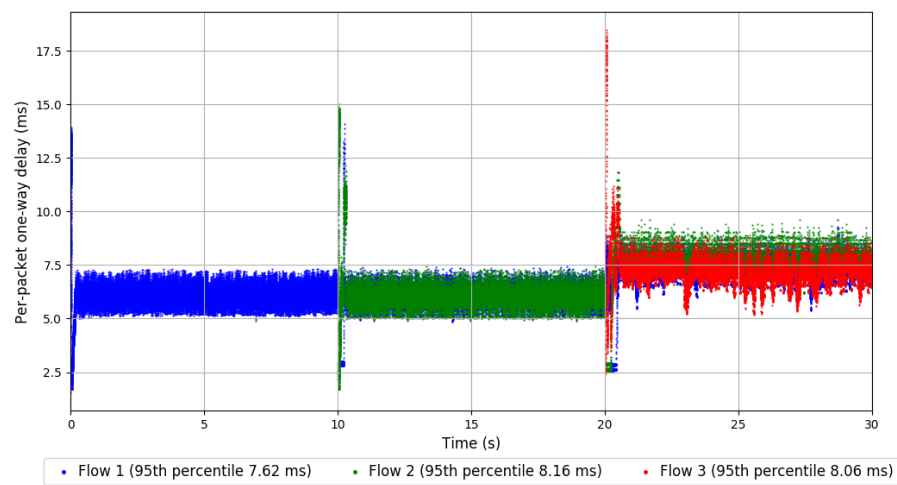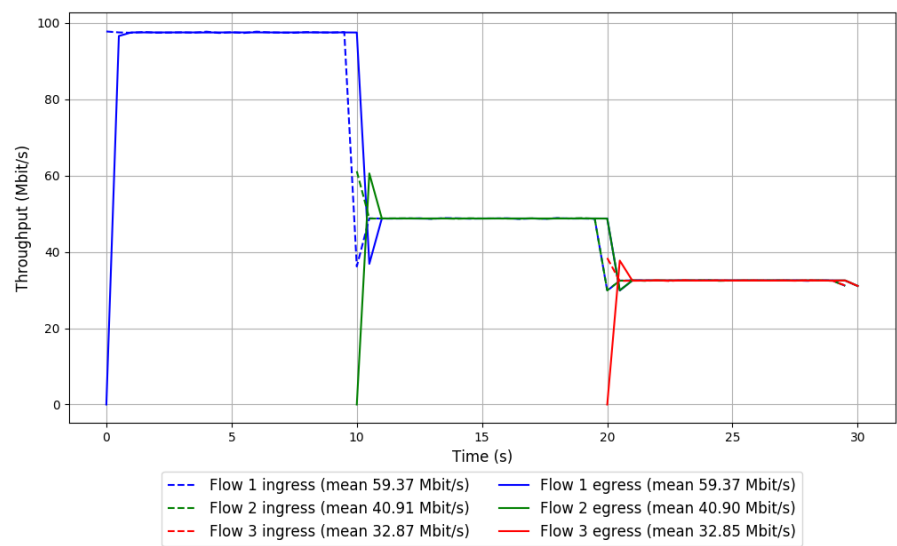
Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 59.36 Mbit/s)   Flow 1 egress (mean 59.35 Mbit/s)
Flow 2 ingress (mean 40.89 Mbit/s)   Flow 2 egress (mean 40.88 Mbit/s)
Flow 3 ingress (mean 32.98 Mbit/s)   Flow 3 egress (mean 32.82 Mbit/s)

Flow 1 (95th percentile 7.91 ms)   Flow 2 (95th percentile 8.55 ms)   Flow 3 (95th percentile 9.64 ms)

```
Run 2: Statistics of TCP BBR

Start at: 2018-09-06 19:39:58
End at: 2018-09-06 19:40:28
Local clock offset: -3.401 ms
Remote clock offset: 0.602 ms


# Below is generated by plot.py at 2018-09-06 20:58:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.52 Mbit/s
95th percentile per-packet one-way delay: 7.850 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 59.37 Mbit/s
95th percentile per-packet one-way delay: 7.623 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 40.90 Mbit/s
95th percentile per-packet one-way delay: 8.163 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 32.85 Mbit/s
95th percentile per-packet one-way delay: 8.056 ms
Loss rate: 0.08%
```
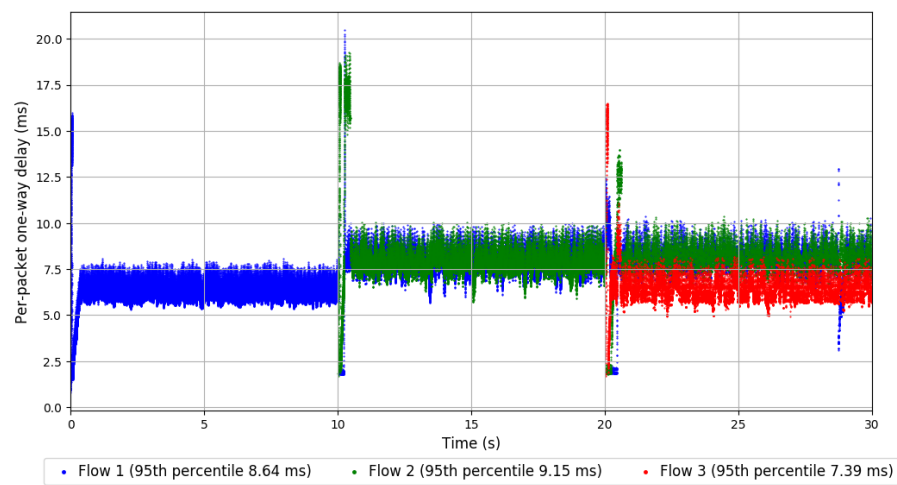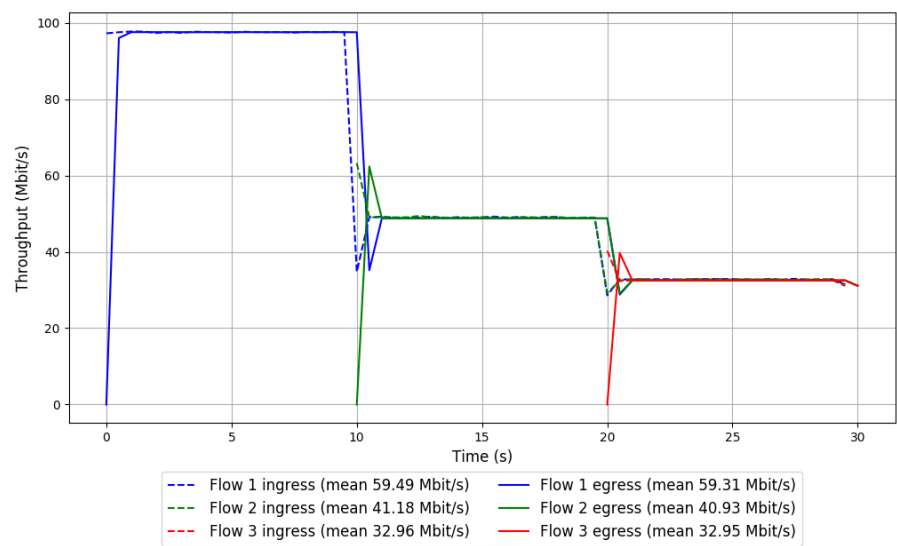
Run 2: Report of TCP BBR — Data Link

Flow 1 ingress (mean 59.37 Mbit/s)   Flow 1 egress (mean 59.37 Mbit/s)
Flow 2 ingress (mean 40.91 Mbit/s)   Flow 2 egress (mean 40.90 Mbit/s)
Flow 3 ingress (mean 32.87 Mbit/s)   Flow 3 egress (mean 32.85 Mbit/s)

Flow 1 (95th percentile 7.62 ms)   Flow 2 (95th percentile 8.16 ms)   Flow 3 (95th percentile 8.06 ms)

```
Run 3: Statistics of TCP BBR

Start at: 2018-09-06 20:00:41
End at: 2018-09-06 20:01:11
Local clock offset: -4.486 ms
Remote clock offset: 0.818 ms

# Below is generated by plot.py at 2018-09-06 20:58:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.51 Mbit/s
95th percentile per-packet one-way delay: 8.776 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 59.31 Mbit/s
95th percentile per-packet one-way delay: 8.644 ms
Loss rate: 0.31%
-- Flow 2:
Average throughput: 40.93 Mbit/s
95th percentile per-packet one-way delay: 9.154 ms
Loss rate: 0.64%
-- Flow 3:
Average throughput: 32.95 Mbit/s
95th percentile per-packet one-way delay: 7.395 ms
Loss rate: 0.07%
```
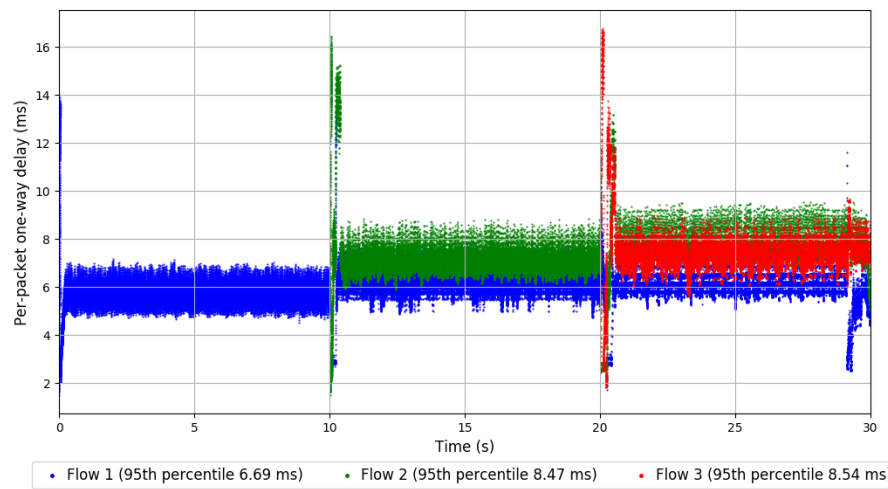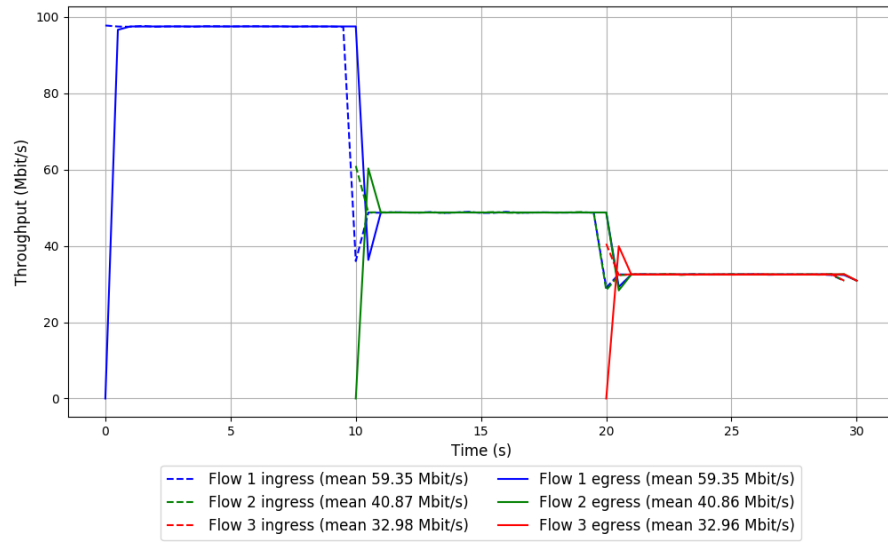
Run 3: Report of TCP BBR — Data Link

```
Run 4: Statistics of TCP BBR

Start at: 2018-09-06 20:21:25
End at: 2018-09-06 20:21:55
Local clock offset: -3.887 ms
Remote clock offset: 1.076 ms


# Below is generated by plot.py at 2018-09-06 20:58:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.51 Mbit/s
95th percentile per-packet one-way delay: 7.902 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 59.35 Mbit/s
95th percentile per-packet one-way delay: 6.686 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 40.86 Mbit/s
95th percentile per-packet one-way delay: 8.472 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 32.96 Mbit/s
95th percentile per-packet one-way delay: 8.535 ms
Loss rate: 0.08%
```
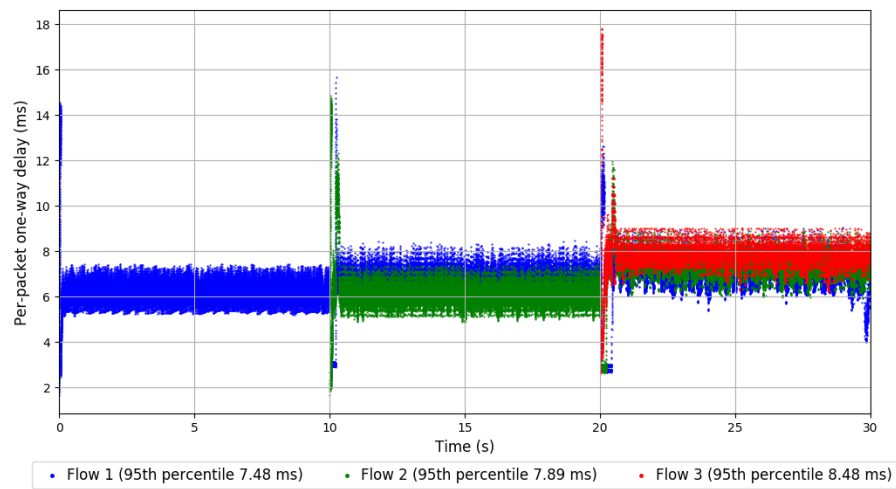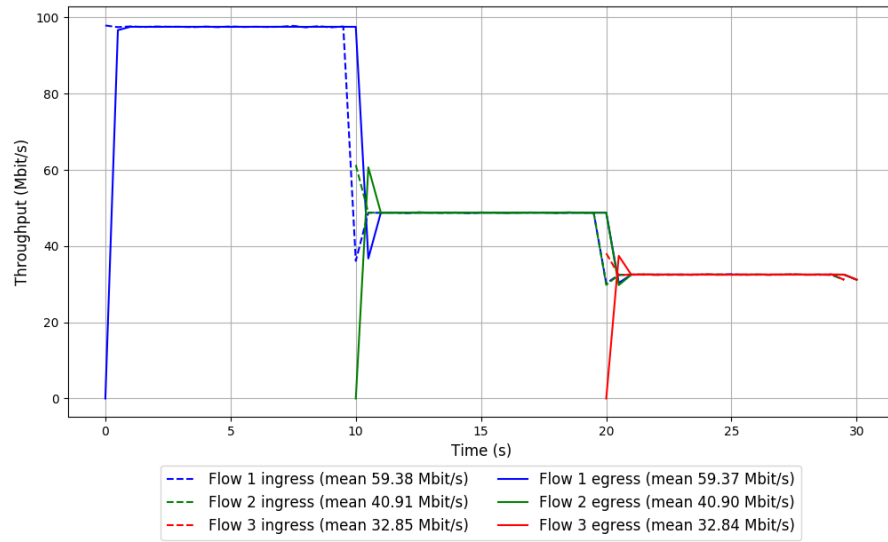
Run 4: Report of TCP BBR — Data Link

Flow 1 ingress (mean 59.35 Mbit/s) --- Flow 1 egress (mean 59.35 Mbit/s)
Flow 2 ingress (mean 40.87 Mbit/s) --- Flow 2 egress (mean 40.86 Mbit/s)
Flow 3 ingress (mean 32.98 Mbit/s) --- Flow 3 egress (mean 32.96 Mbit/s)

Flow 1 (95th percentile 6.69 ms) ・ Flow 2 (95th percentile 8.47 ms) ・ Flow 3 (95th percentile 8.54 ms)

11

```
Run 5: Statistics of TCP BBR

Start at: 2018-09-06 20:42:03
End at: 2018-09-06 20:42:33
Local clock offset: -3.971 ms
Remote clock offset: 0.961 ms


# Below is generated by plot.py at 2018-09-06 20:58:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.52 Mbit/s
95th percentile per-packet one-way delay: 7.978 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 59.37 Mbit/s
95th percentile per-packet one-way delay: 7.477 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 40.90 Mbit/s
95th percentile per-packet one-way delay: 7.890 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 32.84 Mbit/s
95th percentile per-packet one-way delay: 8.483 ms
Loss rate: 0.08%
```
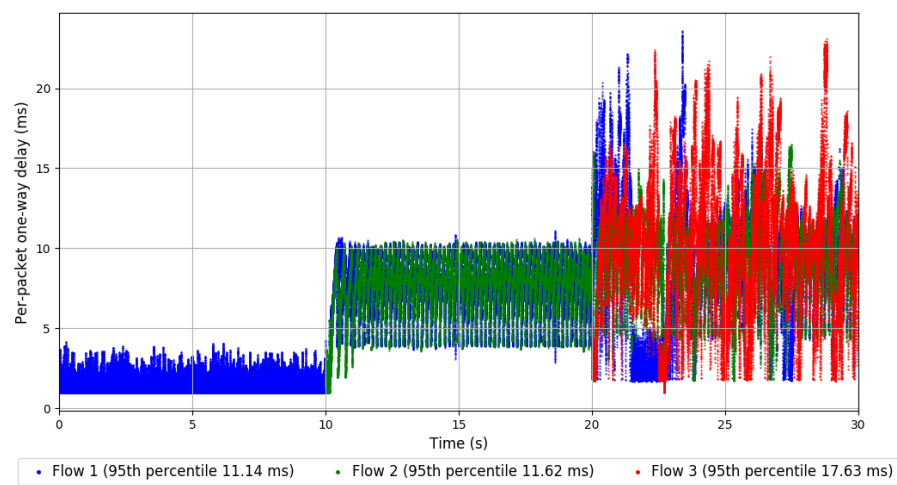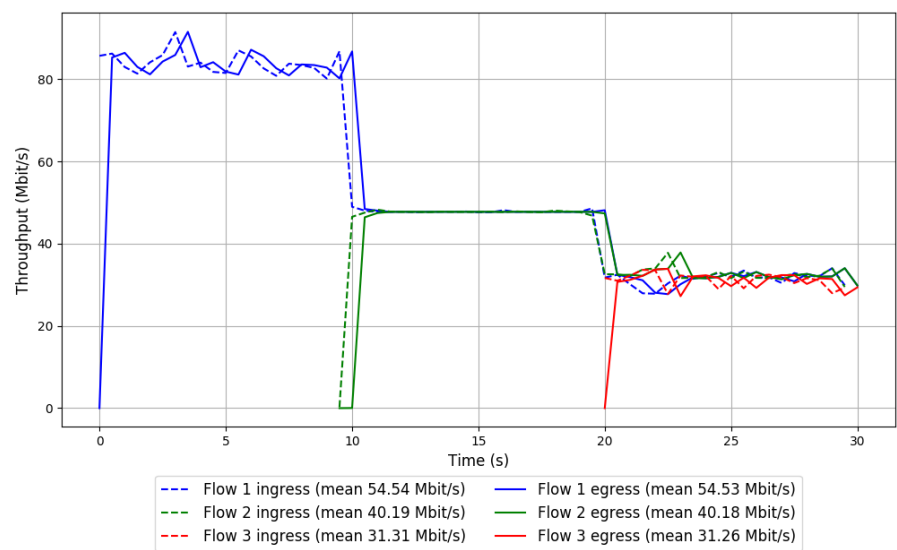
Run 5: Report of TCP BBR — Data Link

Flow 1 ingress (mean 59.38 Mbit/s) Flow 1 egress (mean 59.37 Mbit/s)
Flow 2 ingress (mean 40.91 Mbit/s) Flow 2 egress (mean 40.90 Mbit/s)
Flow 3 ingress (mean 32.85 Mbit/s) Flow 3 egress (mean 32.84 Mbit/s)

Flow 1 (95th percentile 7.48 ms) Flow 2 (95th percentile 7.89 ms) Flow 3 (95th percentile 8.48 ms)

13

```
Run 1: Statistics of Copa

Start at: 2018-09-06 19:28:31
End at: 2018-09-06 19:29:01
Local clock offset: -4.044 ms
Remote clock offset: 0.34 ms


# Below is generated by plot.py at 2018-09-06 20:59:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.68 Mbit/s
95th percentile per-packet one-way delay: 12.923 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 54.53 Mbit/s
95th percentile per-packet one-way delay: 11.142 ms
Loss rate: 0.03%
-- Flow 2:
Average throughput: 40.18 Mbit/s
95th percentile per-packet one-way delay: 11.620 ms
Loss rate: 0.05%
-- Flow 3:
Average throughput: 31.26 Mbit/s
95th percentile per-packet one-way delay: 17.633 ms
Loss rate: 0.19%
```
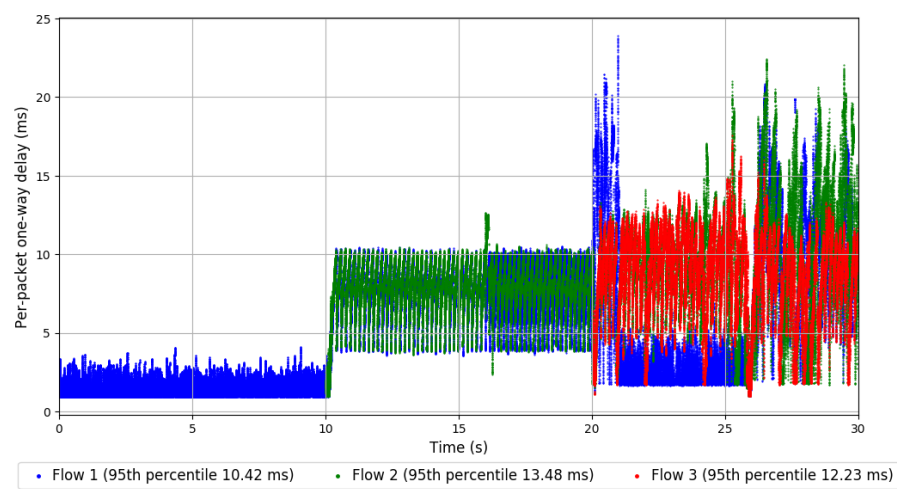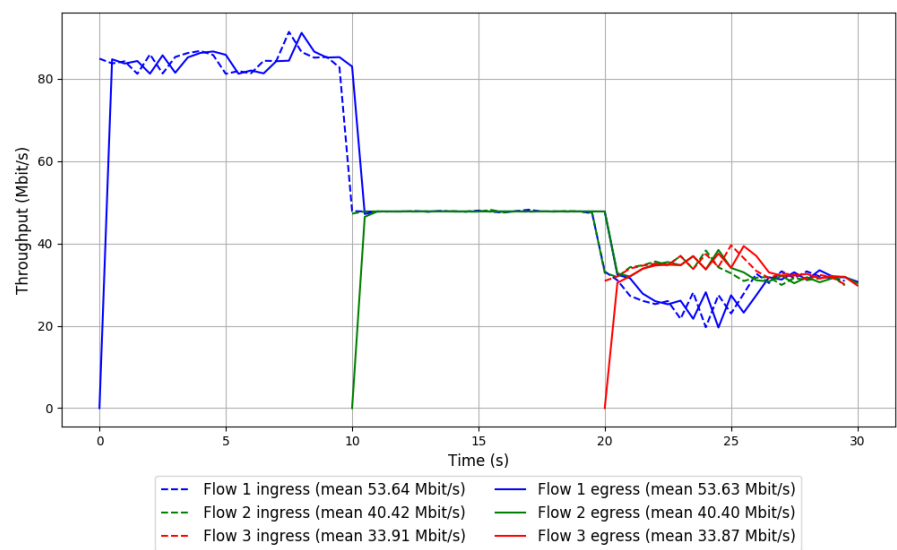
Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2018-09-06 19:49:11
End at: 2018-09-06 19:49:41
Local clock offset: -4.3 ms
Remote clock offset: 0.691 ms


# Below is generated by plot.py at 2018-09-06 20:59:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.80 Mbit/s
95th percentile per-packet one-way delay: 12.087 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 53.63 Mbit/s
95th percentile per-packet one-way delay: 10.419 ms
Loss rate: 0.03%
-- Flow 2:
Average throughput: 40.40 Mbit/s
95th percentile per-packet one-way delay: 13.481 ms
Loss rate: 0.05%
-- Flow 3:
Average throughput: 33.87 Mbit/s
95th percentile per-packet one-way delay: 12.233 ms
Loss rate: 0.16%
```
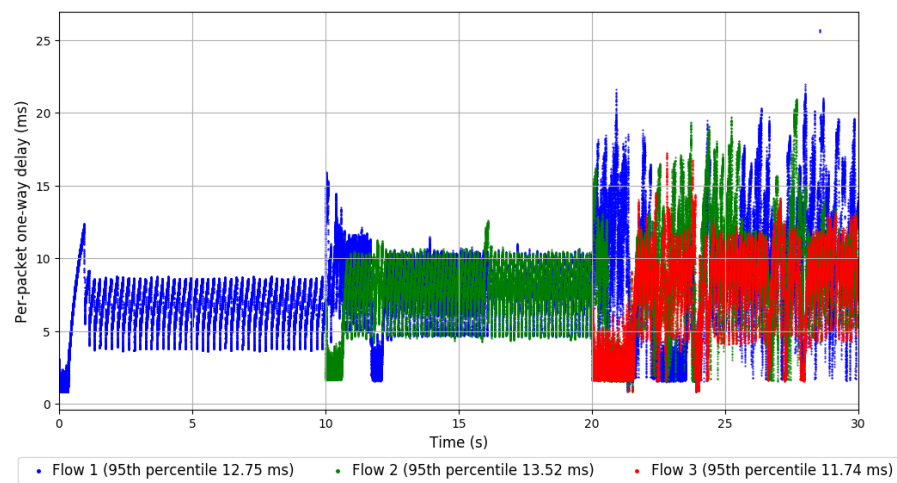
Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-09-06 20:09:54
End at: 2018-09-06 20:10:24
Local clock offset: -4.583 ms
Remote clock offset: 0.963 ms


# Below is generated by plot.py at 2018-09-06 20:59:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 95.43 Mbit/s
95th percentile per-packet one-way delay: 12.770 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 58.23 Mbit/s
95th percentile per-packet one-way delay: 12.748 ms
Loss rate: 0.03%
-- Flow 2:
Average throughput: 39.91 Mbit/s
95th percentile per-packet one-way delay: 13.524 ms
Loss rate: 0.07%
-- Flow 3:
Average throughput: 31.95 Mbit/s
95th percentile per-packet one-way delay: 11.739 ms
Loss rate: 0.13%
```
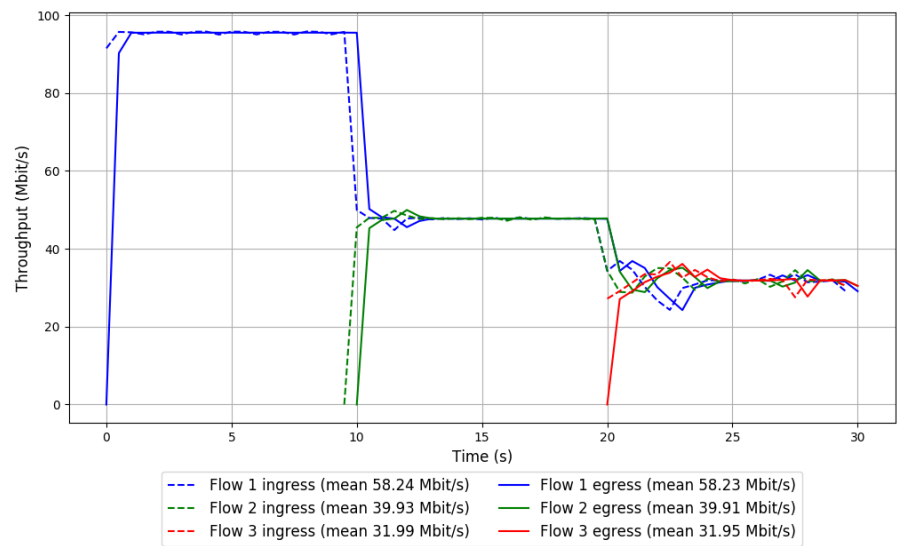
Run 3: Report of Copa — Data Link

```
Run 4: Statistics of Copa

Start at: 2018-09-06 20:30:37
End at: 2018-09-06 20:31:07
Local clock offset: -4.72 ms
Remote clock offset: 1.056 ms

# Below is generated by plot.py at 2018-09-06 21:00:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.88 Mbit/s
95th percentile per-packet one-way delay: 12.656 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 54.91 Mbit/s
95th percentile per-packet one-way delay: 10.632 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 39.90 Mbit/s
95th percentile per-packet one-way delay: 11.969 ms
Loss rate: 0.05%
-- Flow 3:
Average throughput: 31.29 Mbit/s
95th percentile per-packet one-way delay: 16.730 ms
Loss rate: 0.03%
```
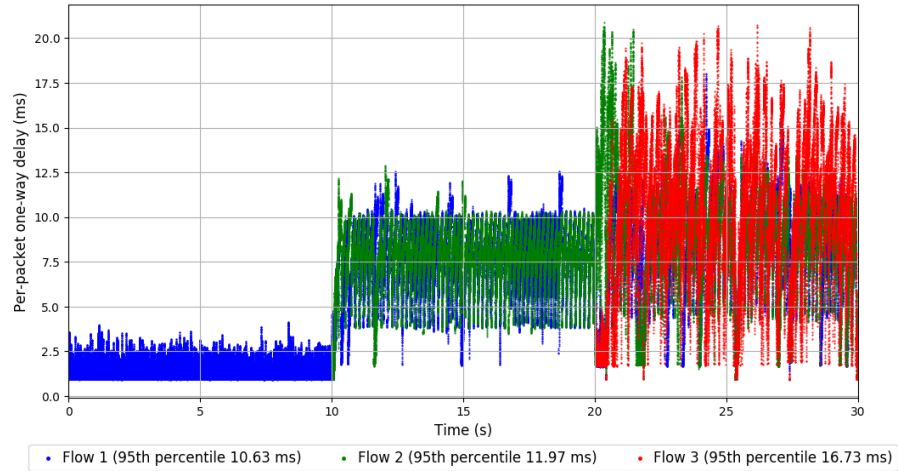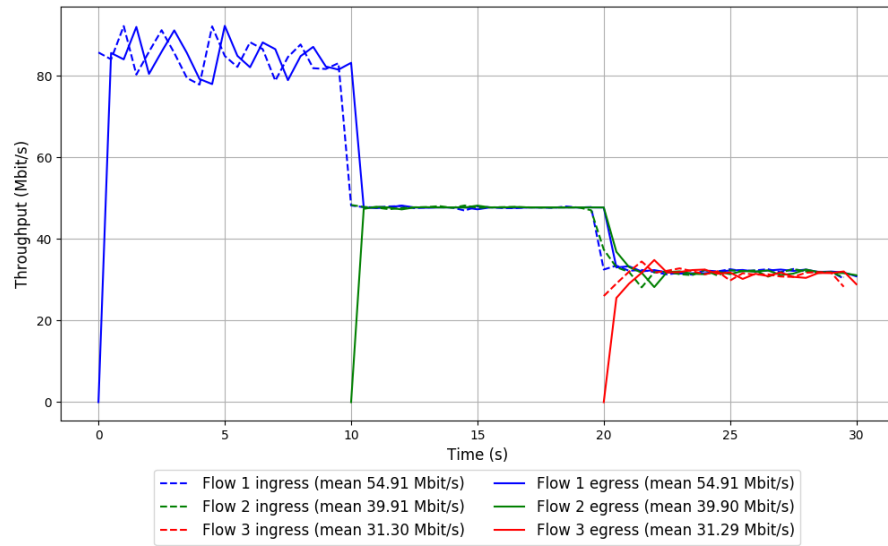
Run 4: Report of Copa — Data Link

```
Run 5: Statistics of Copa

Start at: 2018-09-06 20:51:16
End at: 2018-09-06 20:51:46
Local clock offset: -4.798 ms
Remote clock offset: 1.079 ms


# Below is generated by plot.py at 2018-09-06 21:00:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 95.42 Mbit/s
95th percentile per-packet one-way delay: 13.118 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 58.63 Mbit/s
95th percentile per-packet one-way delay: 11.824 ms
Loss rate: 0.03%
-- Flow 2:
Average throughput: 39.56 Mbit/s
95th percentile per-packet one-way delay: 15.345 ms
Loss rate: 0.08%
-- Flow 3:
Average throughput: 31.47 Mbit/s
95th percentile per-packet one-way delay: 13.890 ms
Loss rate: 0.16%
```
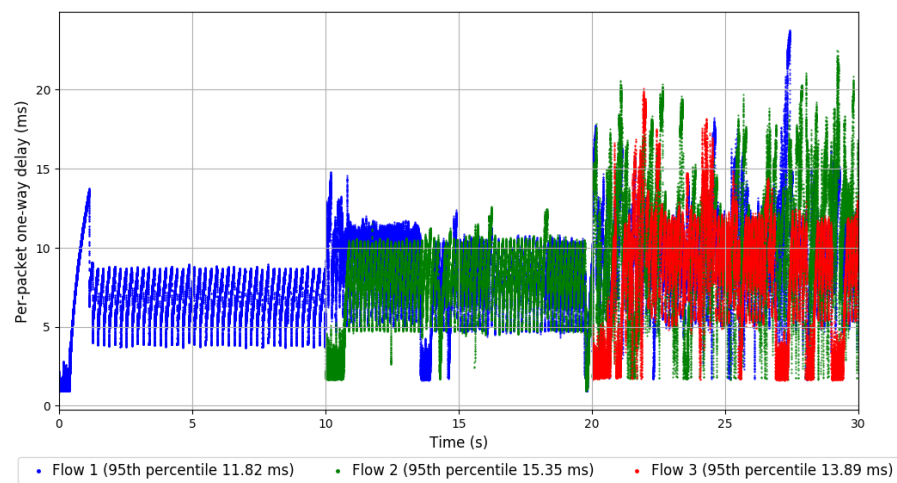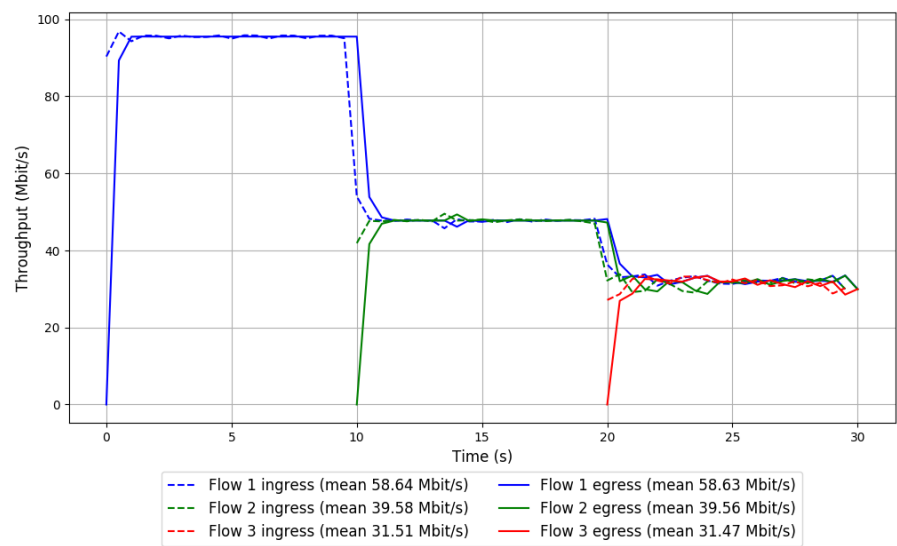
Run 5: Report of Copa — Data Link

Flow 1 ingress (mean 58.64 Mbit/s)   Flow 1 egress (mean 58.63 Mbit/s)
Flow 2 ingress (mean 39.58 Mbit/s)   Flow 2 egress (mean 39.56 Mbit/s)
Flow 3 ingress (mean 31.51 Mbit/s)   Flow 3 egress (mean 31.47 Mbit/s)

Flow 1 (95th percentile 11.82 ms)   Flow 2 (95th percentile 15.35 ms)   Flow 3 (95th percentile 13.89 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2018-09-06 19:20:27
End at: 2018-09-06 19:20:57
Local clock offset: -3.01 ms
Remote clock offset: 0.208 ms

# Below is generated by plot.py at 2018-09-06 21:00:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.48 Mbit/s
95th percentile per-packet one-way delay: 9.963 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 59.61 Mbit/s
95th percentile per-packet one-way delay: 9.949 ms
Loss rate: 0.08%
-- Flow 2:
Average throughput: 40.65 Mbit/s
95th percentile per-packet one-way delay: 9.828 ms
Loss rate: 0.15%
-- Flow 3:
Average throughput: 32.49 Mbit/s
95th percentile per-packet one-way delay: 10.092 ms
Loss rate: 0.24%
```
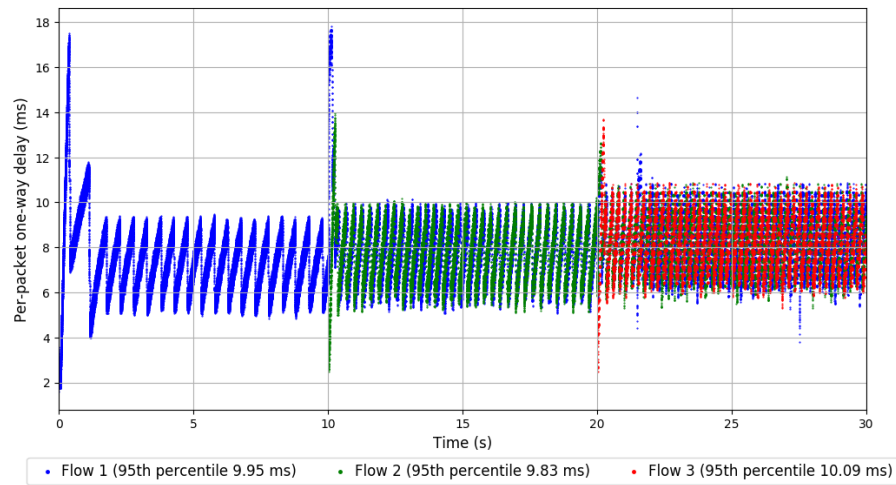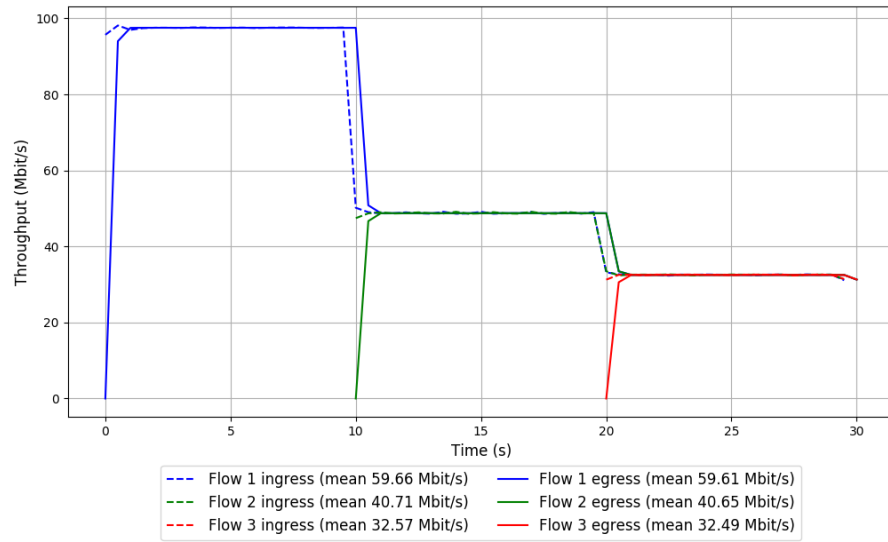
Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 59.66 Mbit/s) --- Flow 1 egress (mean 59.61 Mbit/s)
Flow 2 ingress (mean 40.71 Mbit/s) --- Flow 2 egress (mean 40.65 Mbit/s)
Flow 3 ingress (mean 32.57 Mbit/s) --- Flow 3 egress (mean 32.49 Mbit/s)

Flow 1 (95th percentile 9.95 ms)   Flow 2 (95th percentile 9.83 ms)   Flow 3 (95th percentile 10.09 ms)

```
Run 2: Statistics of TCP Cubic

Start at: 2018-09-06 19:41:07
End at: 2018-09-06 19:41:37
Local clock offset: -3.399 ms
Remote clock offset: 0.66 ms


# Below is generated by plot.py at 2018-09-06 21:00:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.52 Mbit/s
95th percentile per-packet one-way delay: 10.197 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 59.65 Mbit/s
95th percentile per-packet one-way delay: 10.332 ms
Loss rate: 0.10%
-- Flow 2:
Average throughput: 40.66 Mbit/s
95th percentile per-packet one-way delay: 9.999 ms
Loss rate: 0.18%
-- Flow 3:
Average throughput: 32.49 Mbit/s
95th percentile per-packet one-way delay: 9.972 ms
Loss rate: 0.25%
```
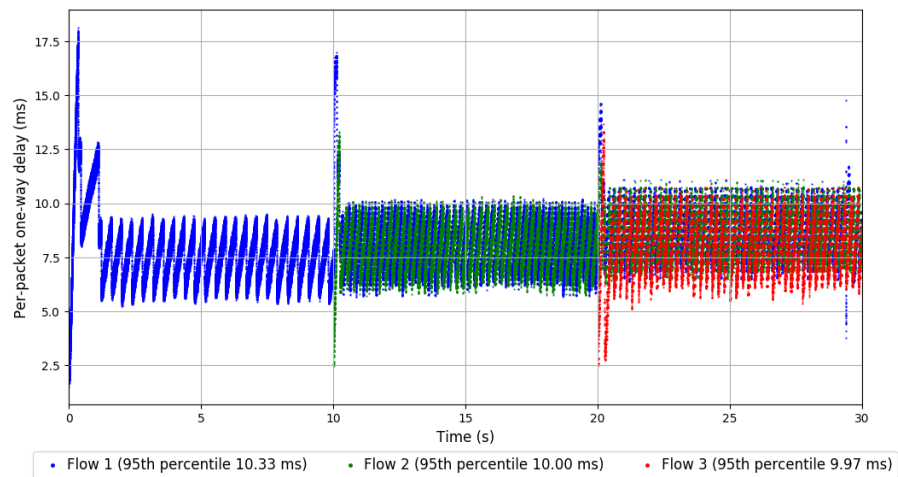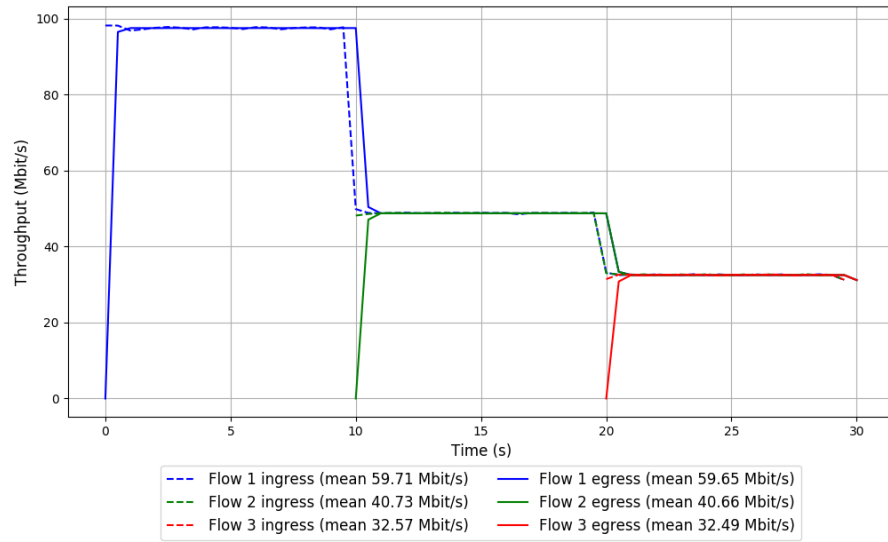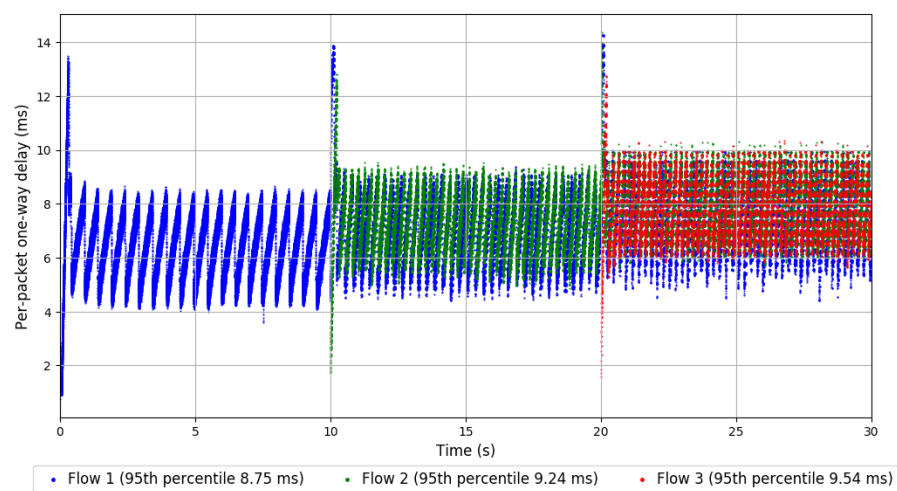
Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 59.71 Mbit/s) Flow 1 egress (mean 59.65 Mbit/s)
Flow 2 ingress (mean 40.73 Mbit/s) Flow 2 egress (mean 40.66 Mbit/s)
Flow 3 ingress (mean 32.57 Mbit/s) Flow 3 egress (mean 32.49 Mbit/s)

Flow 1 (95th percentile 10.33 ms) Flow 2 (95th percentile 10.00 ms) Flow 3 (95th percentile 9.97 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2018-09-06 20:01:50
End at: 2018-09-06 20:02:20
Local clock offset: -4.496 ms
Remote clock offset: 0.888 ms


# Below is generated by plot.py at 2018-09-06 21:00:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.47 Mbit/s
95th percentile per-packet one-way delay: 9.146 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 59.59 Mbit/s
95th percentile per-packet one-way delay: 8.752 ms
Loss rate: 0.08%
-- Flow 2:
Average throughput: 40.65 Mbit/s
95th percentile per-packet one-way delay: 9.241 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 32.50 Mbit/s
95th percentile per-packet one-way delay: 9.541 ms
Loss rate: 0.28%
```
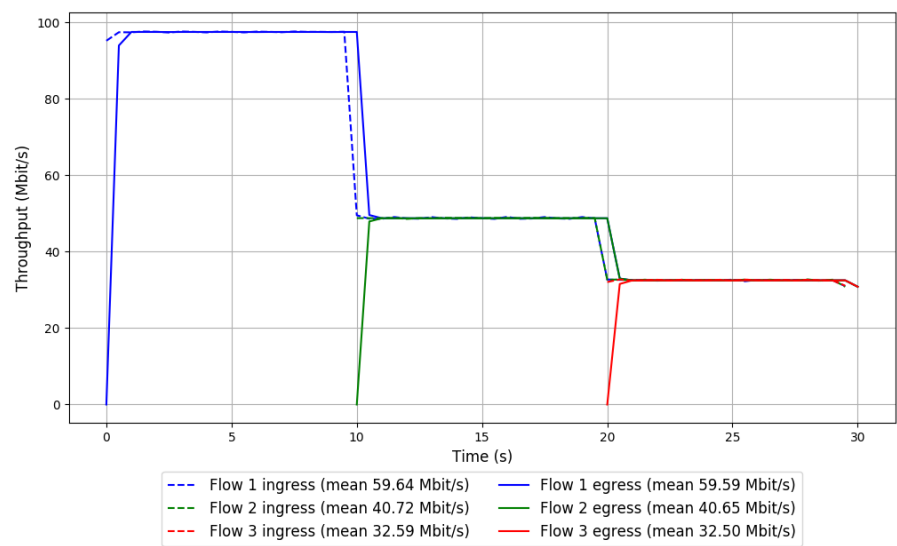
Run 3: Report of TCP Cubic — Data Link

- - - - Flow 1 ingress (mean 59.64 Mbit/s) ——— Flow 1 egress (mean 59.59 Mbit/s)
- - - - Flow 2 ingress (mean 40.72 Mbit/s) ——— Flow 2 egress (mean 40.65 Mbit/s)
- - - - Flow 3 ingress (mean 32.59 Mbit/s) ——— Flow 3 egress (mean 32.50 Mbit/s)

• Flow 1 (95th percentile 8.75 ms)   • Flow 2 (95th percentile 9.24 ms)   • Flow 3 (95th percentile 9.54 ms)

```
Run 4: Statistics of TCP Cubic

Start at: 2018-09-06 20:22:34
End at: 2018-09-06 20:23:04
Local clock offset: -3.895 ms
Remote clock offset: 1.089 ms


# Below is generated by plot.py at 2018-09-06 21:00:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.52 Mbit/s
95th percentile per-packet one-way delay: 9.918 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 59.65 Mbit/s
95th percentile per-packet one-way delay: 9.804 ms
Loss rate: 0.10%
-- Flow 2:
Average throughput: 40.65 Mbit/s
95th percentile per-packet one-way delay: 9.800 ms
Loss rate: 0.16%
-- Flow 3:
Average throughput: 32.50 Mbit/s
95th percentile per-packet one-way delay: 10.305 ms
Loss rate: 0.27%
```
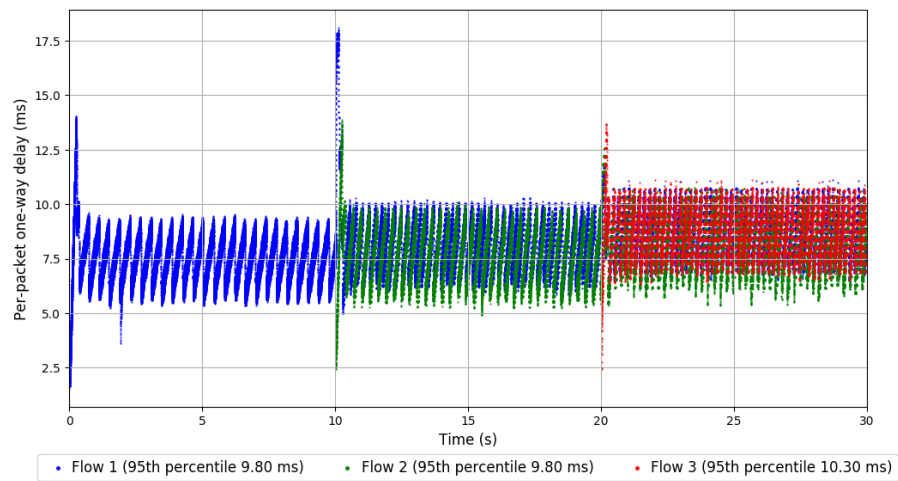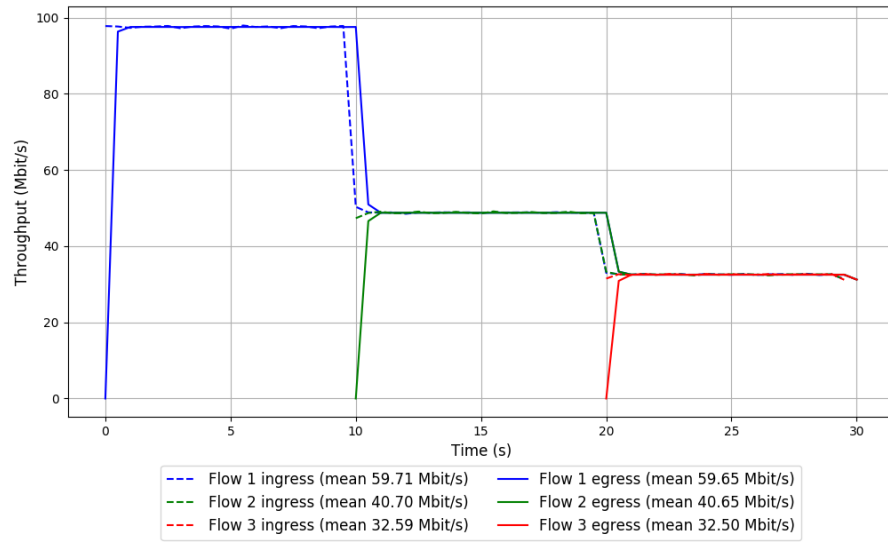
Run 4: Report of TCP Cubic — Data Link

```
Run 5: Statistics of TCP Cubic

Start at: 2018-09-06 20:43:12
End at: 2018-09-06 20:43:42
Local clock offset: -4.729 ms
Remote clock offset: 1.077 ms


# Below is generated by plot.py at 2018-09-06 21:00:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.52 Mbit/s
95th percentile per-packet one-way delay: 9.211 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 59.65 Mbit/s
95th percentile per-packet one-way delay: 9.105 ms
Loss rate: 0.10%
-- Flow 2:
Average throughput: 40.66 Mbit/s
95th percentile per-packet one-way delay: 9.273 ms
Loss rate: 0.18%
-- Flow 3:
Average throughput: 32.49 Mbit/s
95th percentile per-packet one-way delay: 9.259 ms
Loss rate: 0.24%
```
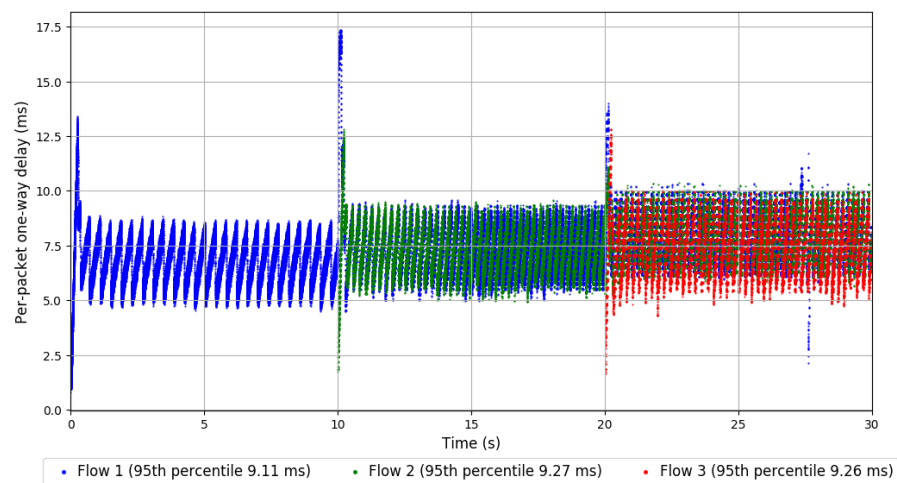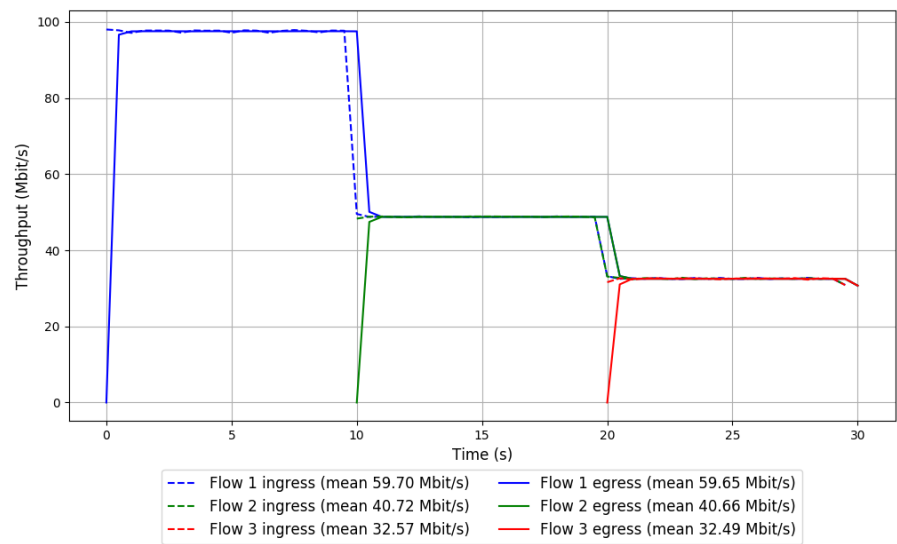
Run 5: Report of TCP Cubic — Data Link

```
Run 1: Statistics of FillP

Start at: 2018-09-06 19:13:35
End at: 2018-09-06 19:14:05
Local clock offset: -3.421 ms
Remote clock offset: 0.058 ms

# Below is generated by plot.py at 2018-09-06 21:00:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.12 Mbit/s
95th percentile per-packet one-way delay: 965.133 ms
Loss rate: 7.15%
-- Flow 1:
Average throughput: 59.09 Mbit/s
95th percentile per-packet one-way delay: 768.662 ms
Loss rate: 5.74%
-- Flow 2:
Average throughput: 40.39 Mbit/s
95th percentile per-packet one-way delay: 974.780 ms
Loss rate: 10.60%
-- Flow 3:
Average throughput: 30.55 Mbit/s
95th percentile per-packet one-way delay: 229.435 ms
Loss rate: 5.77%
```
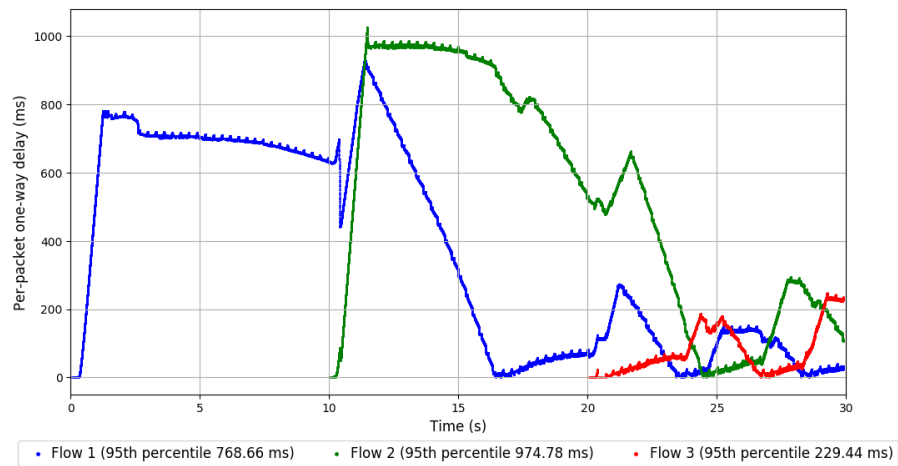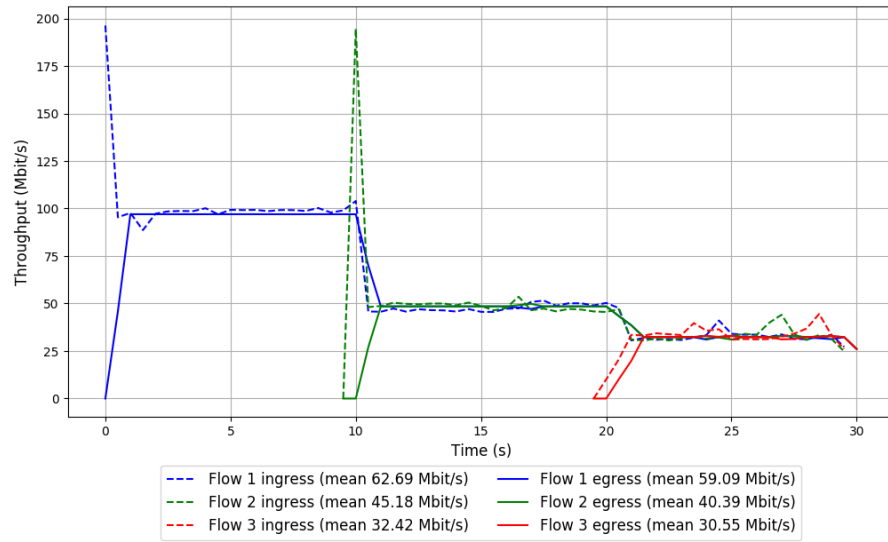
Run 1: Report of FillP — Data Link

Flow 1 ingress (mean 62.69 Mbit/s) --- Flow 1 egress (mean 59.09 Mbit/s)
Flow 2 ingress (mean 45.18 Mbit/s) --- Flow 2 egress (mean 40.39 Mbit/s)
Flow 3 ingress (mean 32.42 Mbit/s) --- Flow 3 egress (mean 30.55 Mbit/s)

Flow 1 (95th percentile 768.66 ms)   Flow 2 (95th percentile 974.78 ms)   Flow 3 (95th percentile 229.44 ms)

```
Run 2: Statistics of FillP

Start at: 2018-09-06 19:34:12
End at: 2018-09-06 19:34:42
Local clock offset: -4.207 ms
Remote clock offset: 0.462 ms


# Below is generated by plot.py at 2018-09-06 21:00:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.14 Mbit/s
95th percentile per-packet one-way delay: 993.974 ms
Loss rate: 5.28%
-- Flow 1:
Average throughput: 59.85 Mbit/s
95th percentile per-packet one-way delay: 1139.322 ms
Loss rate: 5.55%
-- Flow 2:
Average throughput: 39.36 Mbit/s
95th percentile per-packet one-way delay: 820.759 ms
Loss rate: 5.33%
-- Flow 3:
Average throughput: 30.44 Mbit/s
95th percentile per-packet one-way delay: 160.242 ms
Loss rate: 3.44%
```
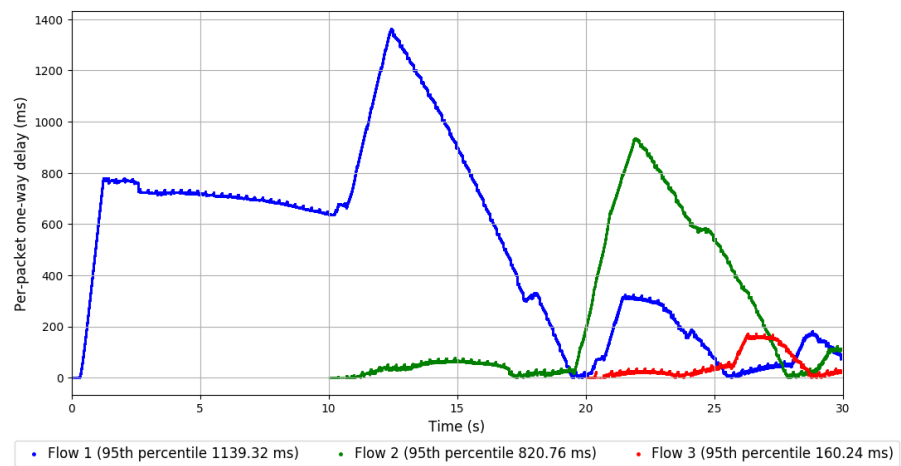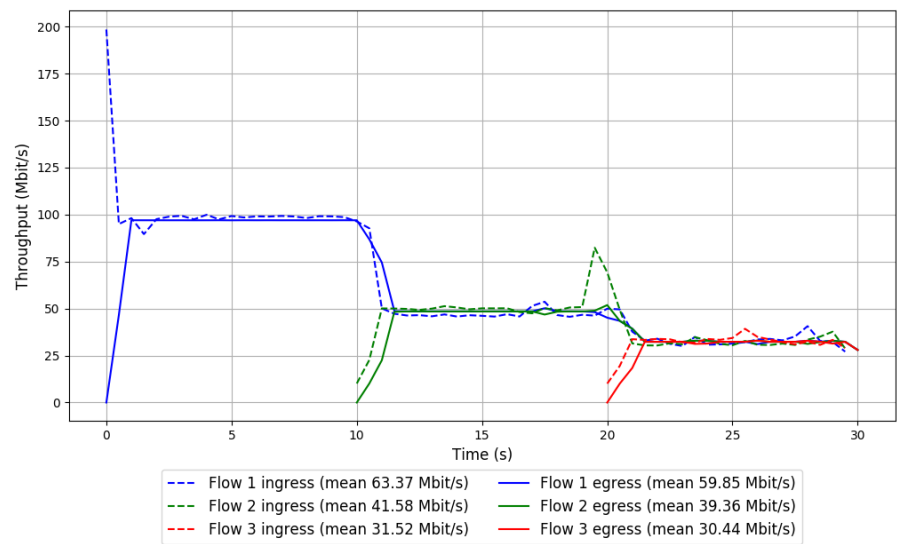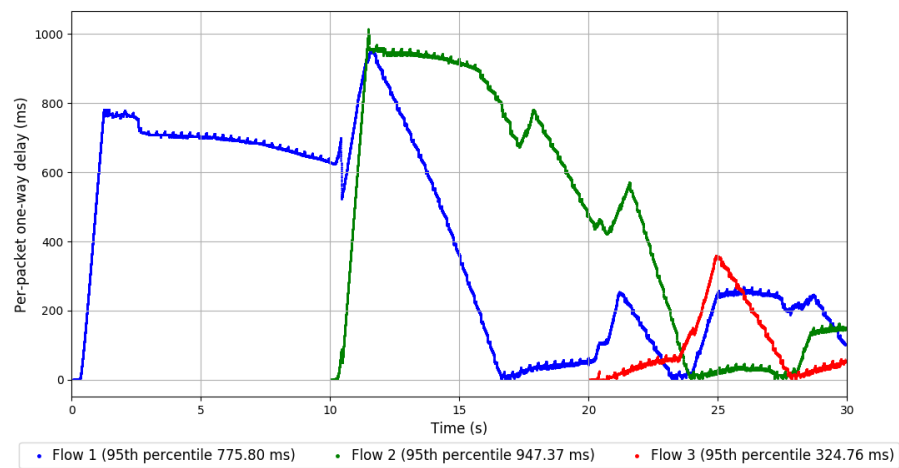
Run 2: Report of FillP — Data Link

Flow 1 ingress (mean 63.37 Mbit/s) --- Flow 1 egress (mean 59.85 Mbit/s)
Flow 2 ingress (mean 41.58 Mbit/s) --- Flow 2 egress (mean 39.36 Mbit/s)
Flow 3 ingress (mean 31.52 Mbit/s) --- Flow 3 egress (mean 30.44 Mbit/s)

Flow 1 (95th percentile 1139.32 ms)   Flow 2 (95th percentile 820.76 ms)   Flow 3 (95th percentile 160.24 ms)

37

```
Run 3: Statistics of FillP

Start at: 2018-09-06 19:54:53
End at: 2018-09-06 19:55:23
Local clock offset: -4.408 ms
Remote clock offset: 0.67 ms


# Below is generated by plot.py at 2018-09-06 21:00:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.12 Mbit/s
95th percentile per-packet one-way delay: 933.591 ms
Loss rate: 6.96%
-- Flow 1:
Average throughput: 59.16 Mbit/s
95th percentile per-packet one-way delay: 775.804 ms
Loss rate: 5.65%
-- Flow 2:
Average throughput: 40.34 Mbit/s
95th percentile per-packet one-way delay: 947.374 ms
Loss rate: 10.62%
-- Flow 3:
Average throughput: 30.56 Mbit/s
95th percentile per-packet one-way delay: 324.760 ms
Loss rate: 4.38%
```
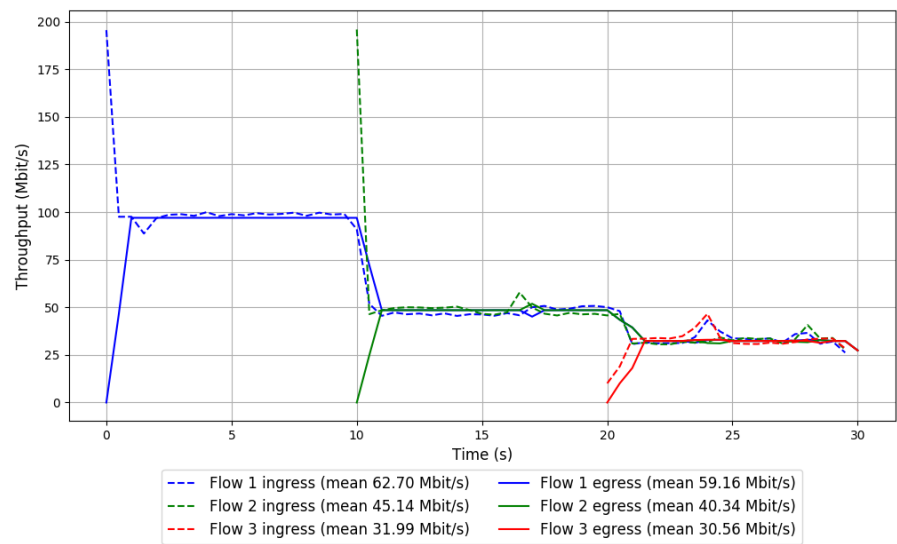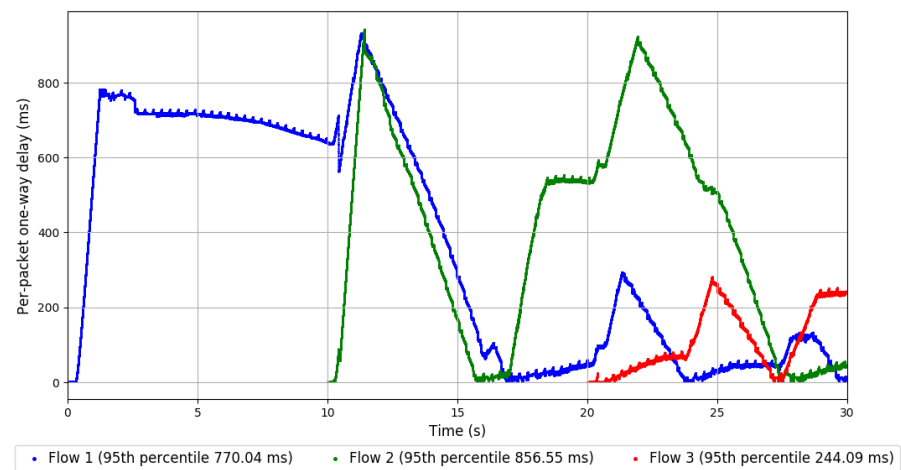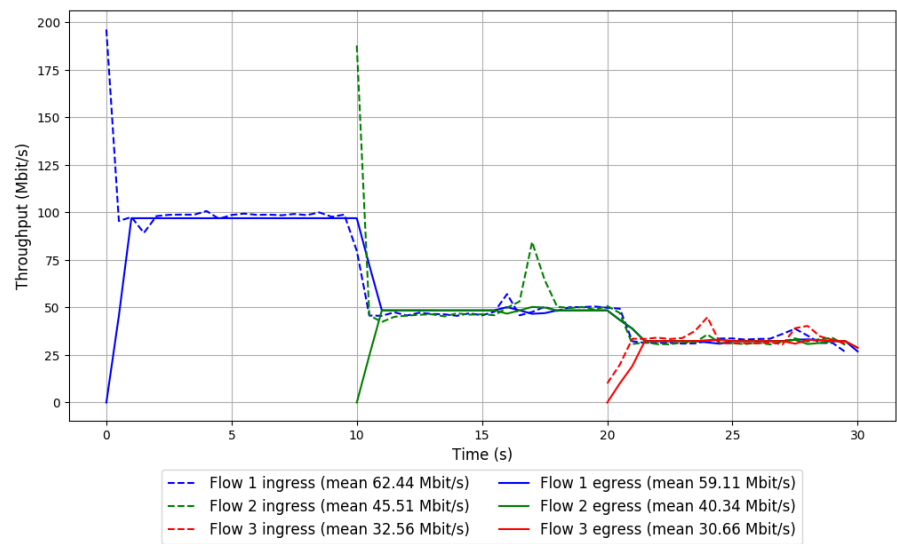
Run 3: Report of FillP — Data Link

- - - - Flow 1 ingress (mean 62.70 Mbit/s)   —— Flow 1 egress (mean 59.16 Mbit/s)
- - - - Flow 2 ingress (mean 45.14 Mbit/s)   —— Flow 2 egress (mean 40.34 Mbit/s)
- - - - Flow 3 ingress (mean 31.99 Mbit/s)   —— Flow 3 egress (mean 30.56 Mbit/s)

- Flow 1 (95th percentile 775.80 ms)   • Flow 2 (95th percentile 947.37 ms)   • Flow 3 (95th percentile 324.76 ms)

39

```
Run 4: Statistics of FillP

Start at: 2018-09-06 20:15:35
End at: 2018-09-06 20:16:05
Local clock offset: -3.778 ms
Remote clock offset: 0.978 ms


# Below is generated by plot.py at 2018-09-06 21:00:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.12 Mbit/s
95th percentile per-packet one-way delay: 787.674 ms
Loss rate: 7.14%
-- Flow 1:
Average throughput: 59.11 Mbit/s
95th percentile per-packet one-way delay: 770.044 ms
Loss rate: 5.31%
-- Flow 2:
Average throughput: 40.34 Mbit/s
95th percentile per-packet one-way delay: 856.555 ms
Loss rate: 11.36%
-- Flow 3:
Average throughput: 30.66 Mbit/s
95th percentile per-packet one-way delay: 244.087 ms
Loss rate: 5.88%
```
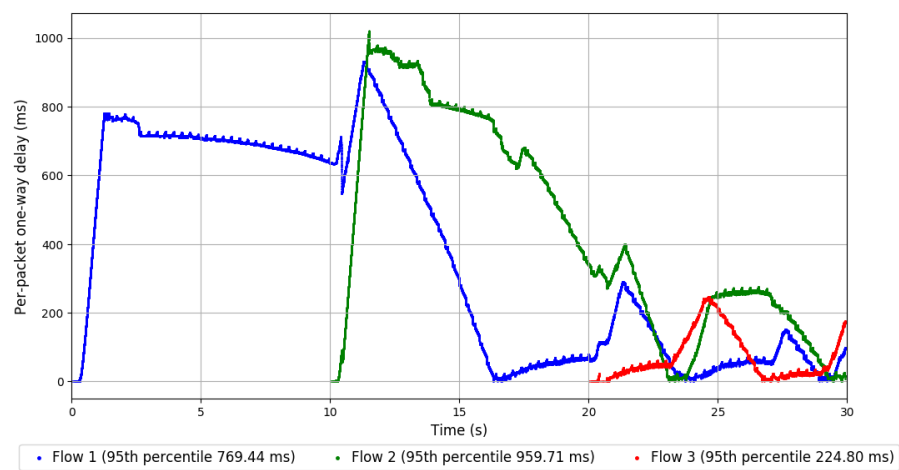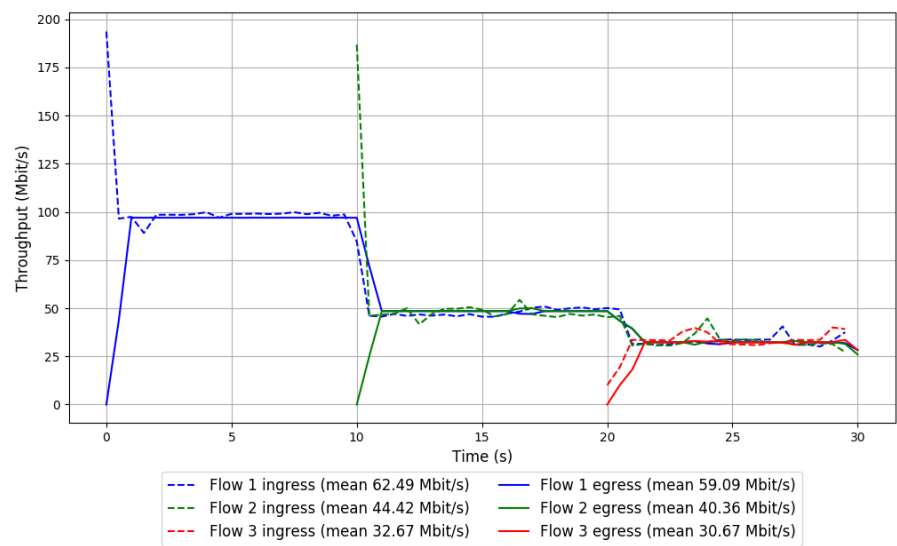
Run 4: Report of FillP — Data Link

- - - Flow 1 ingress (mean 62.44 Mbit/s)   —— Flow 1 egress (mean 59.11 Mbit/s)
- - - Flow 2 ingress (mean 45.51 Mbit/s)   —— Flow 2 egress (mean 40.34 Mbit/s)
- - - Flow 3 ingress (mean 32.56 Mbit/s)   —— Flow 3 egress (mean 30.66 Mbit/s)

• Flow 1 (95th percentile 770.04 ms)   • Flow 2 (95th percentile 856.55 ms)   • Flow 3 (95th percentile 244.09 ms)

41

```
Run 5: Statistics of FillP

Start at: 2018-09-06 20:36:18
End at: 2018-09-06 20:36:48
Local clock offset: -4.72 ms
Remote clock offset: 1.067 ms


# Below is generated by plot.py at 2018-09-06 21:01:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.09 Mbit/s
95th percentile per-packet one-way delay: 860.664 ms
Loss rate: 6.58%
-- Flow 1:
Average throughput: 59.09 Mbit/s
95th percentile per-packet one-way delay: 769.440 ms
Loss rate: 5.45%
-- Flow 2:
Average throughput: 40.36 Mbit/s
95th percentile per-packet one-way delay: 959.706 ms
Loss rate: 9.14%
-- Flow 3:
Average throughput: 30.67 Mbit/s
95th percentile per-packet one-way delay: 224.803 ms
Loss rate: 6.14%
```
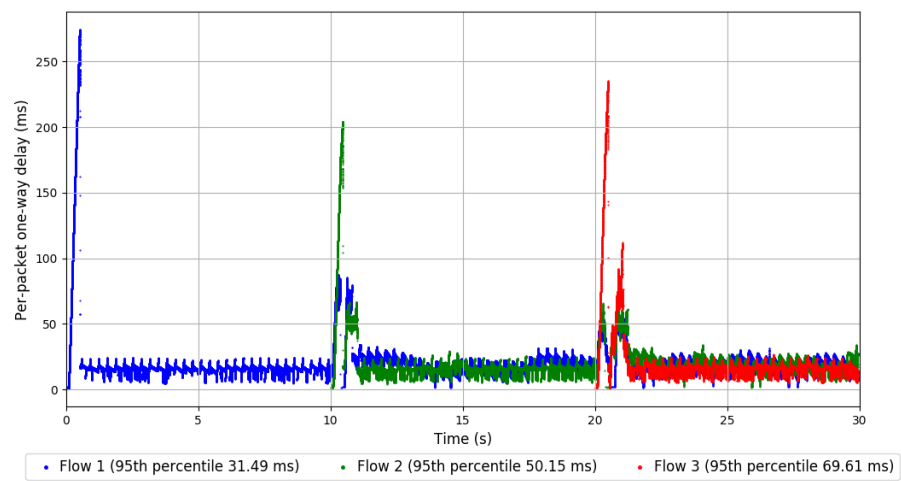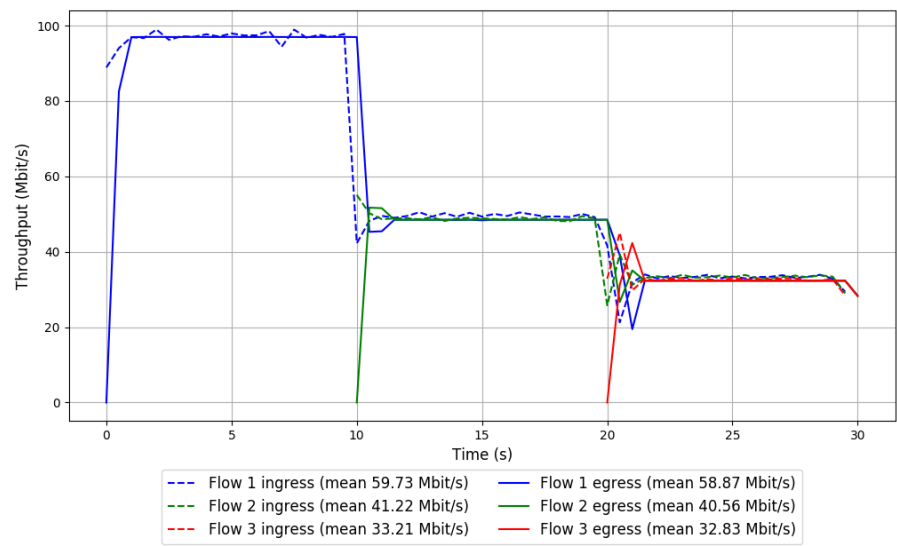
Run 5: Report of FillP — Data Link

Flow 1 ingress (mean 62.49 Mbit/s) --- Flow 1 egress (mean 59.09 Mbit/s)
Flow 2 ingress (mean 44.42 Mbit/s) --- Flow 2 egress (mean 40.36 Mbit/s)
Flow 3 ingress (mean 32.67 Mbit/s) --- Flow 3 egress (mean 30.67 Mbit/s)

Flow 1 (95th percentile 769.44 ms)   Flow 2 (95th percentile 959.71 ms)   Flow 3 (95th percentile 224.80 ms)

43

```
Run 1: Statistics of FillP-Sheep

Start at: 2018-09-06 19:22:45
End at: 2018-09-06 19:23:15
Local clock offset: -3.886 ms
Remote clock offset: 0.197 ms


# Below is generated by plot.py at 2018-09-06 21:01:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.73 Mbit/s
95th percentile per-packet one-way delay: 45.731 ms
Loss rate: 1.46%
-- Flow 1:
Average throughput: 58.87 Mbit/s
95th percentile per-packet one-way delay: 31.494 ms
Loss rate: 1.45%
-- Flow 2:
Average throughput: 40.56 Mbit/s
95th percentile per-packet one-way delay: 50.151 ms
Loss rate: 1.61%
-- Flow 3:
Average throughput: 32.83 Mbit/s
95th percentile per-packet one-way delay: 69.609 ms
Loss rate: 1.12%
```
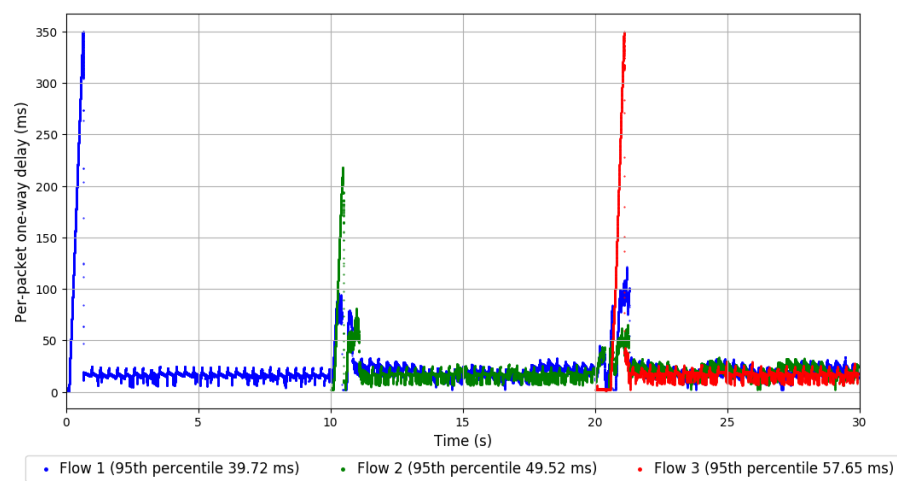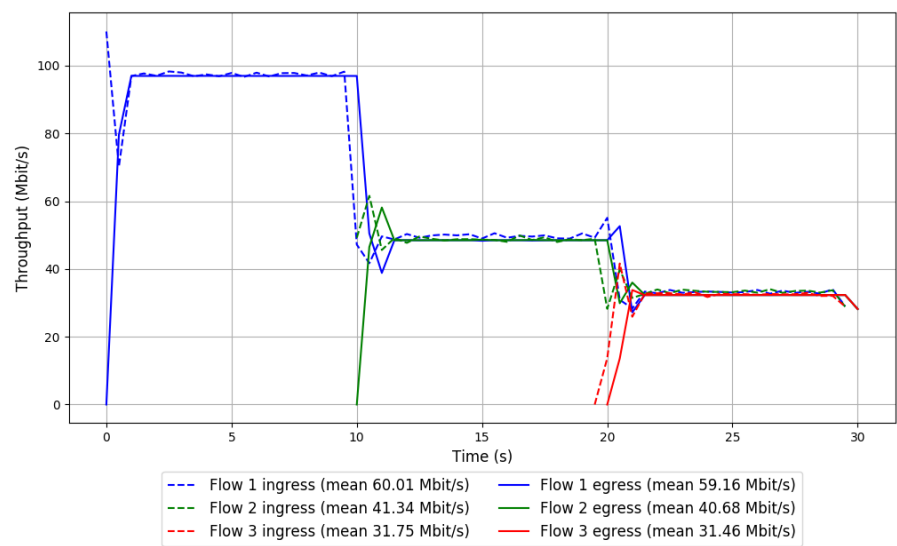
Run 1: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 59.73 Mbit/s) --- Flow 1 egress (mean 58.87 Mbit/s)
Flow 2 ingress (mean 41.22 Mbit/s) --- Flow 2 egress (mean 40.56 Mbit/s)
Flow 3 ingress (mean 33.21 Mbit/s) --- Flow 3 egress (mean 32.83 Mbit/s)

Flow 1 (95th percentile 31.49 ms)   Flow 2 (95th percentile 50.15 ms)   Flow 3 (95th percentile 69.61 ms)

```
Run 2: Statistics of FillP-Sheep

Start at: 2018-09-06 19:43:25
End at: 2018-09-06 19:43:55
Local clock offset: -3.404 ms
Remote clock offset: 0.656 ms


# Below is generated by plot.py at 2018-09-06 21:01:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.67 Mbit/s
95th percentile per-packet one-way delay: 47.953 ms
Loss rate: 1.42%
-- Flow 1:
Average throughput: 59.16 Mbit/s
95th percentile per-packet one-way delay: 39.721 ms
Loss rate: 1.43%
-- Flow 2:
Average throughput: 40.68 Mbit/s
95th percentile per-packet one-way delay: 49.519 ms
Loss rate: 1.60%
-- Flow 3:
Average throughput: 31.46 Mbit/s
95th percentile per-packet one-way delay: 57.647 ms
Loss rate: 0.92%
```
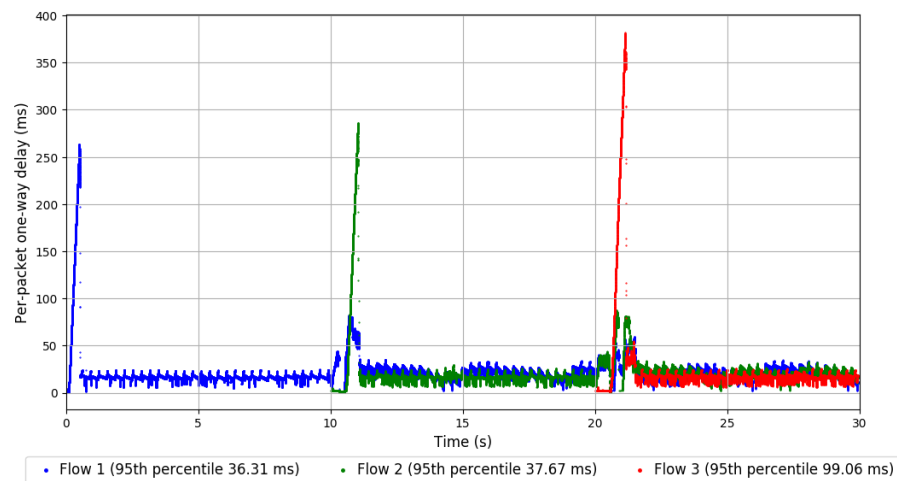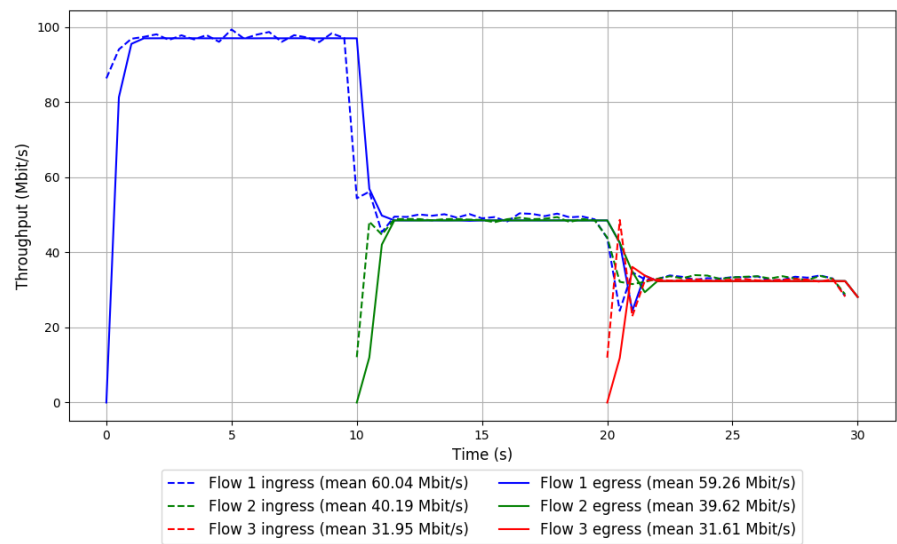
Run 2: Report of FillP-Sheep — Data Link

- - - Flow 1 ingress (mean 60.01 Mbit/s) ———— Flow 1 egress (mean 59.16 Mbit/s)
- - - Flow 2 ingress (mean 41.34 Mbit/s) ———— Flow 2 egress (mean 40.68 Mbit/s)
- - - Flow 3 ingress (mean 31.75 Mbit/s) ———— Flow 3 egress (mean 31.46 Mbit/s)

- Flow 1 (95th percentile 39.72 ms) • Flow 2 (95th percentile 49.52 ms) • Flow 3 (95th percentile 57.65 ms)

```
Run 3: Statistics of FillP-Sheep

Start at: 2018-09-06 20:04:09
End at: 2018-09-06 20:04:39
Local clock offset: -3.804 ms
Remote clock offset: 0.926 ms


# Below is generated by plot.py at 2018-09-06 21:01:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.10 Mbit/s
95th percentile per-packet one-way delay: 37.839 ms
Loss rate: 1.29%
-- Flow 1:
Average throughput: 59.26 Mbit/s
95th percentile per-packet one-way delay: 36.313 ms
Loss rate: 1.27%
-- Flow 2:
Average throughput: 39.62 Mbit/s
95th percentile per-packet one-way delay: 37.672 ms
Loss rate: 1.41%
-- Flow 3:
Average throughput: 31.61 Mbit/s
95th percentile per-packet one-way delay: 99.062 ms
Loss rate: 1.06%
```
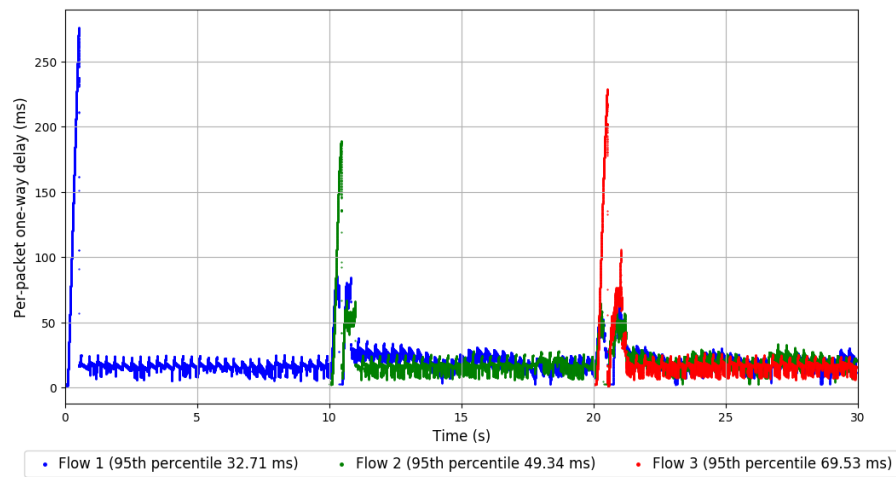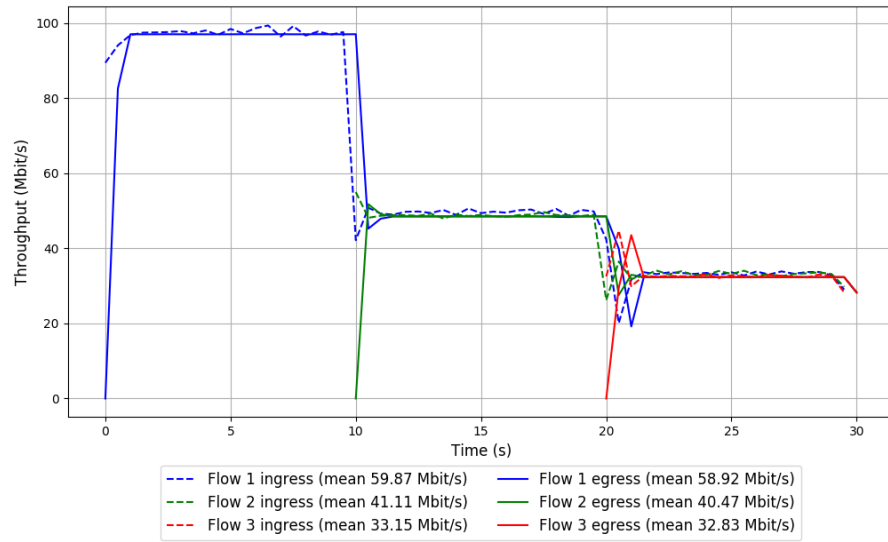
Run 3: Report of FillP-Sheep — Data Link

- - - Flow 1 ingress (mean 60.04 Mbit/s)   —— Flow 1 egress (mean 59.26 Mbit/s)
- - - Flow 2 ingress (mean 40.19 Mbit/s)   —— Flow 2 egress (mean 39.62 Mbit/s)
- - - Flow 3 ingress (mean 31.95 Mbit/s)   —— Flow 3 egress (mean 31.61 Mbit/s)

- Flow 1 (95th percentile 36.31 ms)   • Flow 2 (95th percentile 37.67 ms)   • Flow 3 (95th percentile 99.06 ms)

49

```
Run 4: Statistics of FillP-Sheep

Start at: 2018-09-06 20:24:52
End at: 2018-09-06 20:25:22
Local clock offset: -3.991 ms
Remote clock offset: 0.978 ms


# Below is generated by plot.py at 2018-09-06 21:01:52
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.72 Mbit/s
95th percentile per-packet one-way delay: 46.385 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 58.92 Mbit/s
95th percentile per-packet one-way delay: 32.710 ms
Loss rate: 1.58%
-- Flow 2:
Average throughput: 40.47 Mbit/s
95th percentile per-packet one-way delay: 49.345 ms
Loss rate: 1.57%
-- Flow 3:
Average throughput: 32.83 Mbit/s
95th percentile per-packet one-way delay: 69.531 ms
Loss rate: 0.97%
```
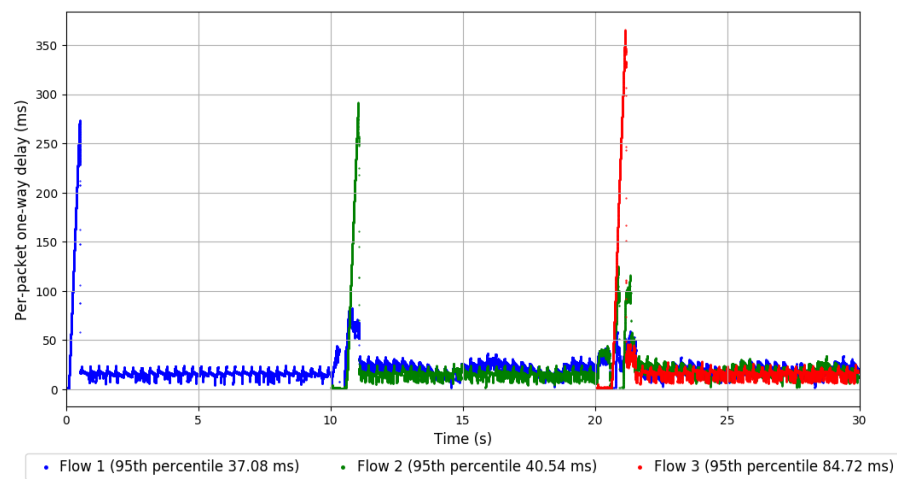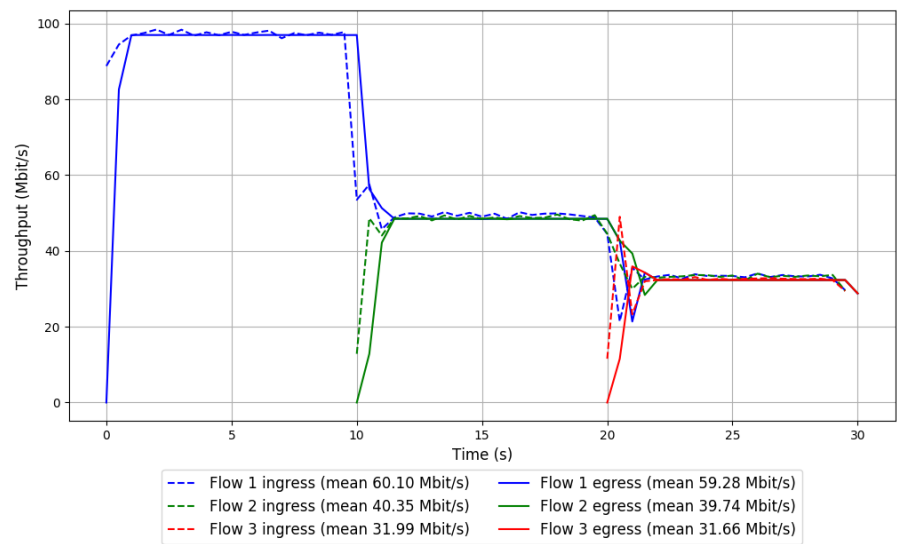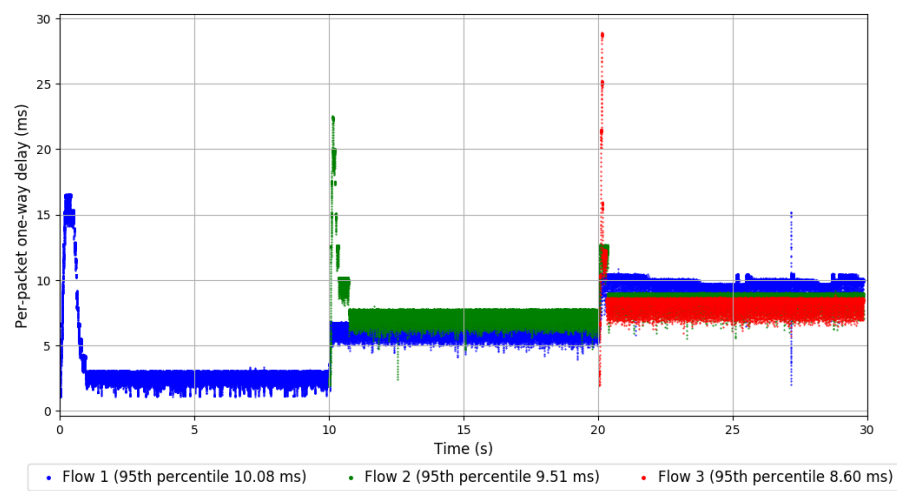
Run 4: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 59.87 Mbit/s) --- Flow 1 egress (mean 58.92 Mbit/s)
Flow 2 ingress (mean 41.11 Mbit/s) --- Flow 2 egress (mean 40.47 Mbit/s)
Flow 3 ingress (mean 33.15 Mbit/s) --- Flow 3 egress (mean 32.83 Mbit/s)

Flow 1 (95th percentile 32.71 ms)   Flow 2 (95th percentile 49.34 ms)   Flow 3 (95th percentile 69.53 ms)

```
Run 5: Statistics of FillP-Sheep

Start at: 2018-09-06 20:45:30
End at: 2018-09-06 20:46:00
Local clock offset: -4.795 ms
Remote clock offset: 1.017 ms


# Below is generated by plot.py at 2018-09-06 21:02:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.20 Mbit/s
95th percentile per-packet one-way delay: 38.647 ms
Loss rate: 1.37%
-- Flow 1:
Average throughput: 59.28 Mbit/s
95th percentile per-packet one-way delay: 37.075 ms
Loss rate: 1.38%
-- Flow 2:
Average throughput: 39.74 Mbit/s
95th percentile per-packet one-way delay: 40.540 ms
Loss rate: 1.50%
-- Flow 3:
Average throughput: 31.66 Mbit/s
95th percentile per-packet one-way delay: 84.718 ms
Loss rate: 1.02%
```
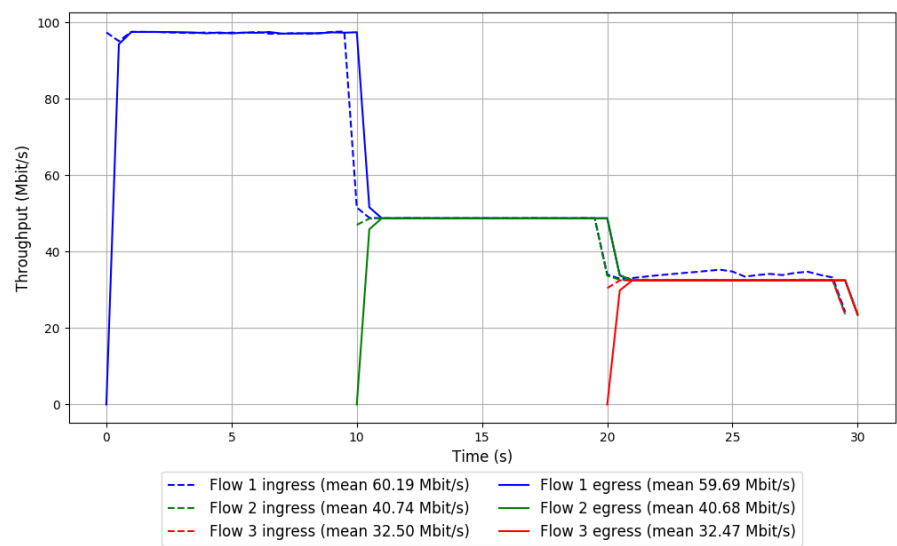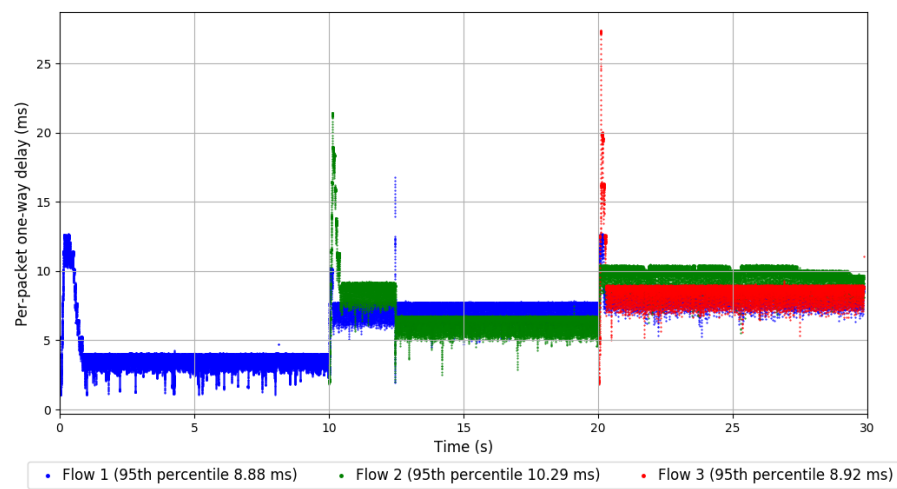
Run 5: Report of FillP-Sheep — Data Link

Flow 1 ingress (mean 60.10 Mbit/s) --- Flow 1 egress (mean 59.28 Mbit/s)
Flow 2 ingress (mean 40.35 Mbit/s) --- Flow 2 egress (mean 39.74 Mbit/s)
Flow 3 ingress (mean 31.99 Mbit/s) --- Flow 3 egress (mean 31.66 Mbit/s)

Flow 1 (95th percentile 37.08 ms)   Flow 2 (95th percentile 40.54 ms)   Flow 3 (95th percentile 84.72 ms)

```
Run 1: Statistics of Indigo

Start at: 2018-09-06 19:17:02
End at: 2018-09-06 19:17:32
Local clock offset: -3.539 ms
Remote clock offset: 0.048 ms

# Below is generated by plot.py at 2018-09-06 21:02:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.43 Mbit/s
95th percentile per-packet one-way delay: 10.017 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 59.69 Mbit/s
95th percentile per-packet one-way delay: 10.084 ms
Loss rate: 0.84%
-- Flow 2:
Average throughput: 40.68 Mbit/s
95th percentile per-packet one-way delay: 9.514 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 32.47 Mbit/s
95th percentile per-packet one-way delay: 8.601 ms
Loss rate: 0.11%
```
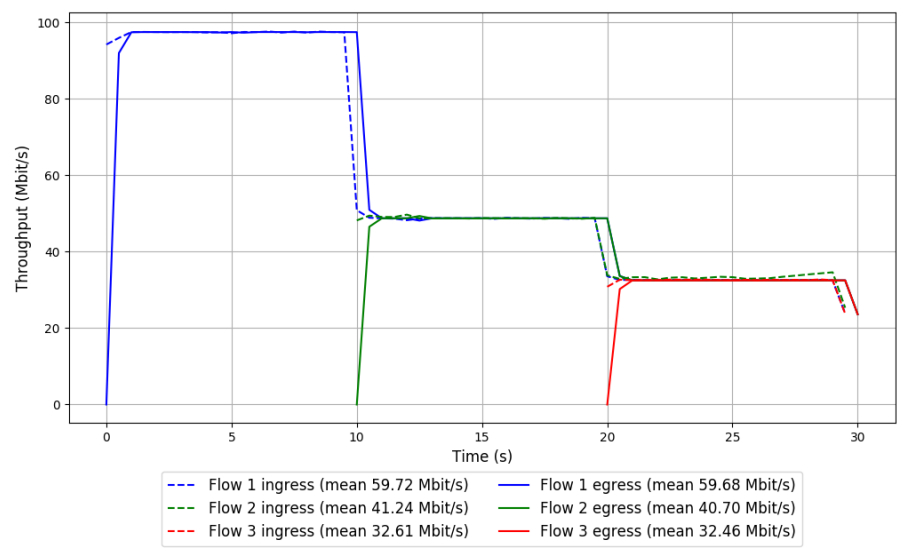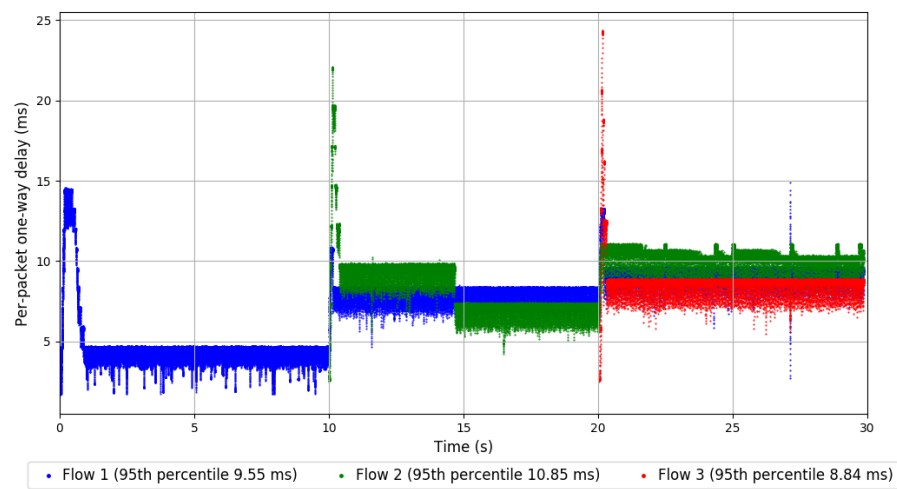
Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2018-09-06 19:37:39
End at: 2018-09-06 19:38:09
Local clock offset: -4.154 ms
Remote clock offset: 0.431 ms


# Below is generated by plot.py at 2018-09-06 21:02:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.43 Mbit/s
95th percentile per-packet one-way delay: 10.038 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 59.68 Mbit/s
95th percentile per-packet one-way delay: 8.875 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 40.70 Mbit/s
95th percentile per-packet one-way delay: 10.291 ms
Loss rate: 1.31%
-- Flow 3:
Average throughput: 32.46 Mbit/s
95th percentile per-packet one-way delay: 8.920 ms
Loss rate: 0.46%
```
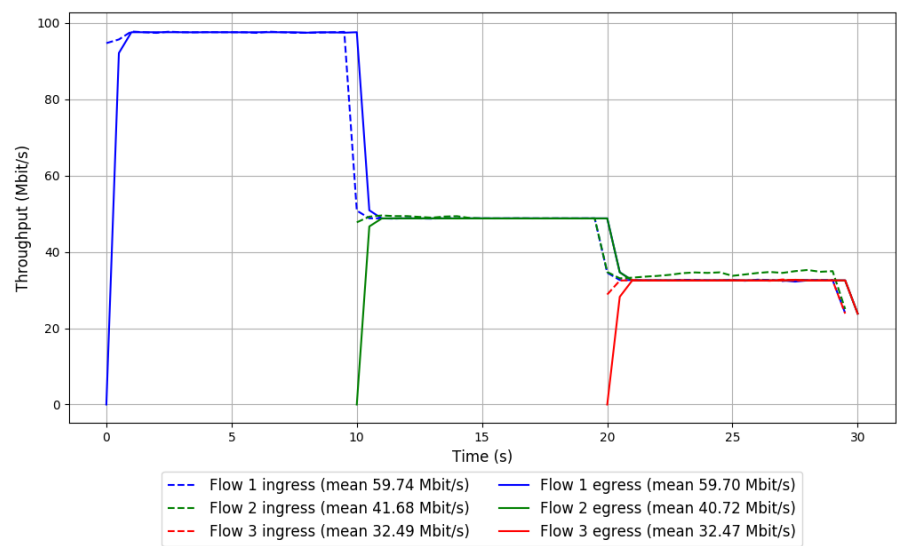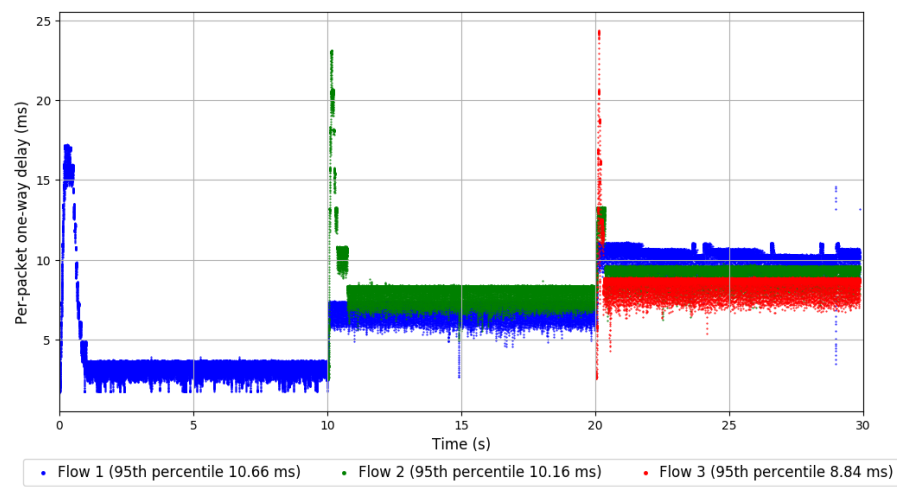
Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2018-09-06 19:58:19
End at: 2018-09-06 19:58:49
Local clock offset: -3.762 ms
Remote clock offset: 0.711 ms


# Below is generated by plot.py at 2018-09-06 21:02:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.44 Mbit/s
95th percentile per-packet one-way delay: 10.556 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 59.70 Mbit/s
95th percentile per-packet one-way delay: 9.549 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 40.72 Mbit/s
95th percentile per-packet one-way delay: 10.847 ms
Loss rate: 2.31%
-- Flow 3:
Average throughput: 32.47 Mbit/s
95th percentile per-packet one-way delay: 8.844 ms
Loss rate: 0.10%
```
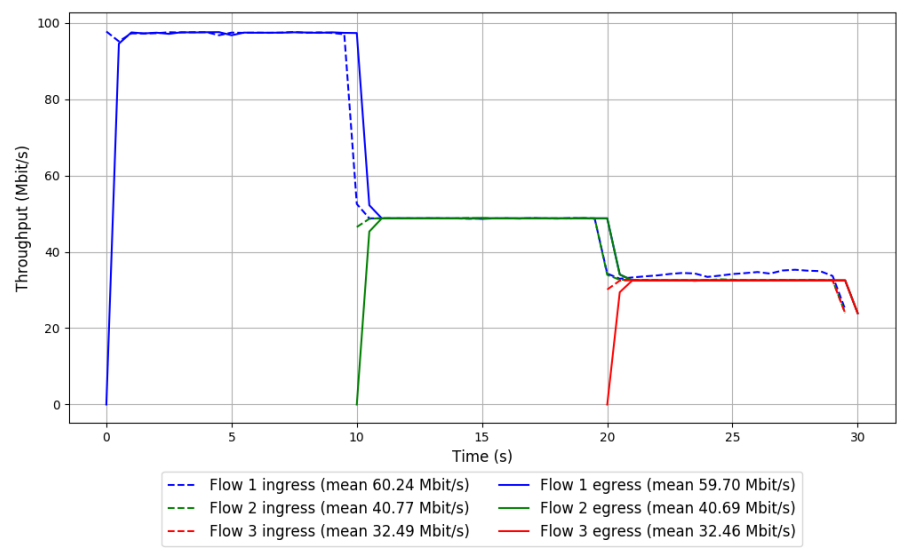
Run 3: Report of Indigo — Data Link

- - - - Flow 1 ingress (mean 59.74 Mbit/s) —— Flow 1 egress (mean 59.70 Mbit/s)
- - - - Flow 2 ingress (mean 41.68 Mbit/s) —— Flow 2 egress (mean 40.72 Mbit/s)
- - - - Flow 3 ingress (mean 32.49 Mbit/s) —— Flow 3 egress (mean 32.47 Mbit/s)

• Flow 1 (95th percentile 9.55 ms)   • Flow 2 (95th percentile 10.85 ms)   • Flow 3 (95th percentile 8.84 ms)

```
Run 4: Statistics of Indigo

Start at: 2018-09-06 20:19:01
End at: 2018-09-06 20:19:31
Local clock offset: -3.85 ms
Remote clock offset: 1.008 ms


# Below is generated by plot.py at 2018-09-06 21:02:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.42 Mbit/s
95th percentile per-packet one-way delay: 10.603 ms
Loss rate: 0.62%
-- Flow 1:
Average throughput: 59.70 Mbit/s
95th percentile per-packet one-way delay: 10.660 ms
Loss rate: 0.90%
-- Flow 2:
Average throughput: 40.69 Mbit/s
95th percentile per-packet one-way delay: 10.157 ms
Loss rate: 0.21%
-- Flow 3:
Average throughput: 32.46 Mbit/s
95th percentile per-packet one-way delay: 8.842 ms
Loss rate: 0.11%
```
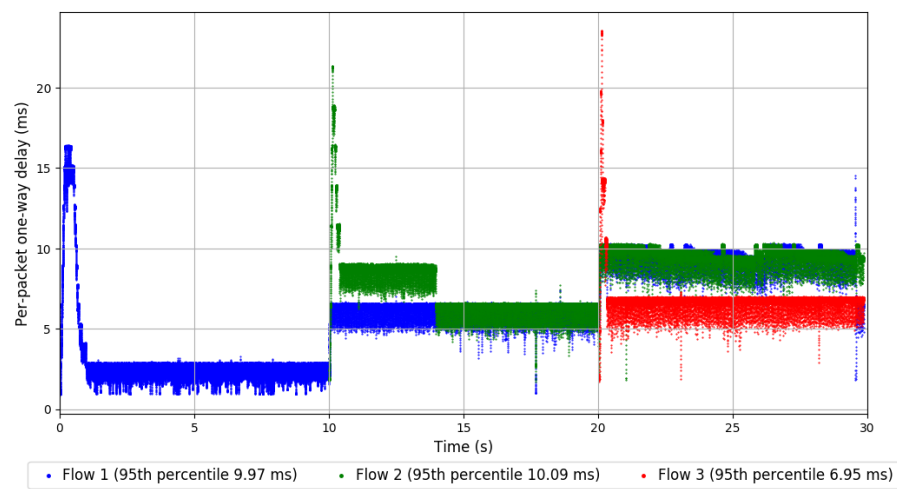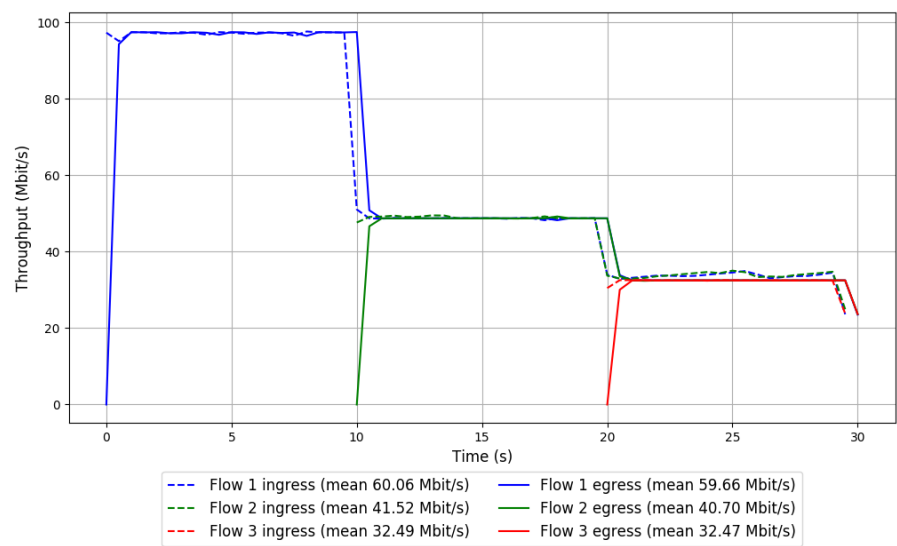
Run 4: Report of Indigo — Data Link

Flow 1 ingress (mean 60.24 Mbit/s) --- Flow 1 egress (mean 59.70 Mbit/s)
Flow 2 ingress (mean 40.77 Mbit/s) --- Flow 2 egress (mean 40.69 Mbit/s)
Flow 3 ingress (mean 32.49 Mbit/s) --- Flow 3 egress (mean 32.46 Mbit/s)

Flow 1 (95th percentile 10.66 ms) • Flow 2 (95th percentile 10.16 ms) • Flow 3 (95th percentile 8.84 ms)

```
Run 5: Statistics of Indigo

Start at: 2018-09-06 20:39:45
End at: 2018-09-06 20:40:15
Local clock offset: -4.732 ms
Remote clock offset: 1.059 ms


# Below is generated by plot.py at 2018-09-06 21:02:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.41 Mbit/s
95th percentile per-packet one-way delay: 10.006 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 59.66 Mbit/s
95th percentile per-packet one-way delay: 9.975 ms
Loss rate: 0.68%
-- Flow 2:
Average throughput: 40.70 Mbit/s
95th percentile per-packet one-way delay: 10.087 ms
Loss rate: 1.99%
-- Flow 3:
Average throughput: 32.47 Mbit/s
95th percentile per-packet one-way delay: 6.948 ms
Loss rate: 0.09%
```
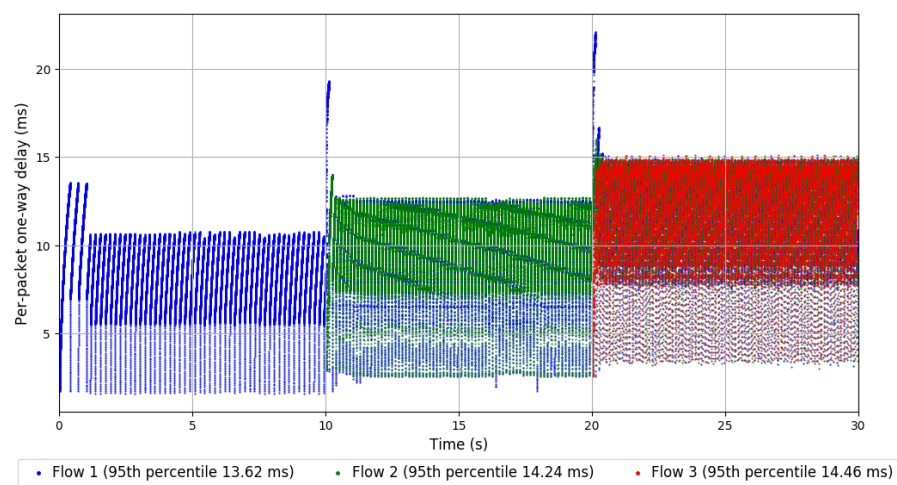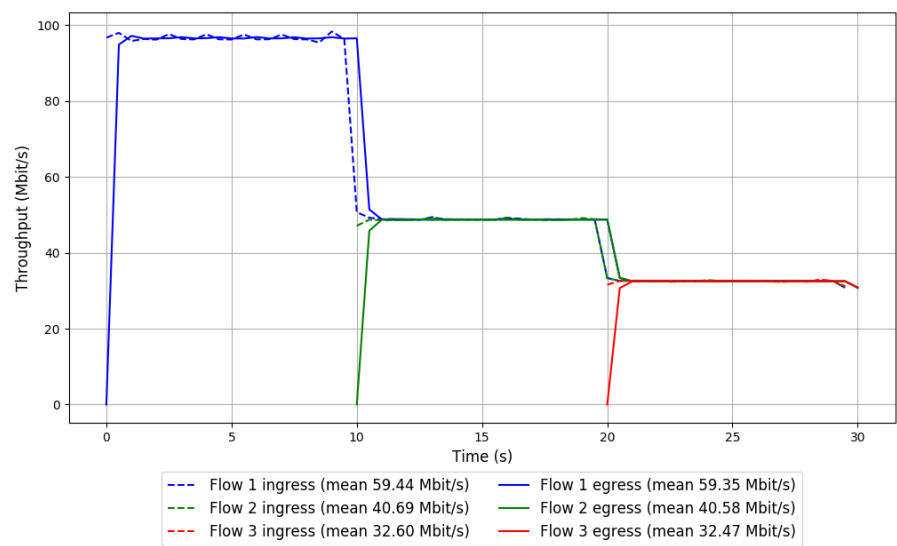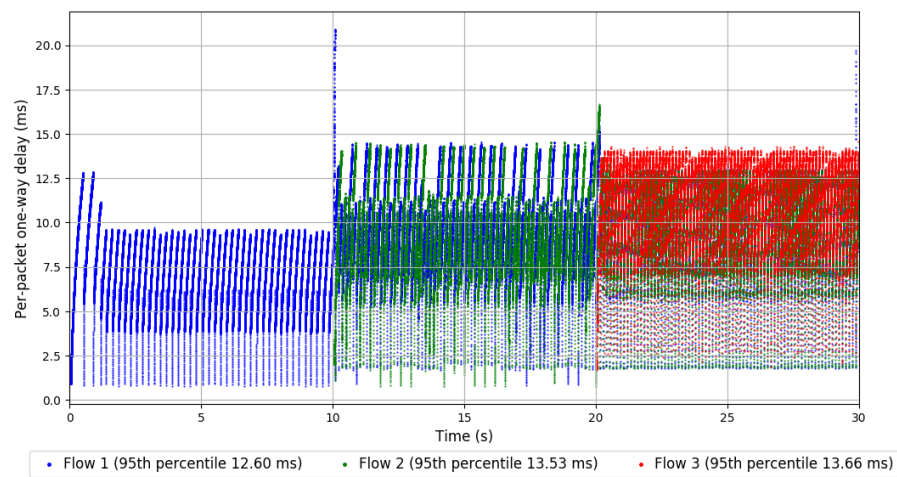
Run 5: Report of Indigo — Data Link

Flow 1 ingress (mean 60.06 Mbit/s) — — — Flow 1 egress (mean 59.66 Mbit/s)
Flow 2 ingress (mean 41.52 Mbit/s) — — — Flow 2 egress (mean 40.70 Mbit/s)
Flow 3 ingress (mean 32.49 Mbit/s) — — — Flow 3 egress (mean 32.47 Mbit/s)

Flow 1 (95th percentile 9.97 ms)   Flow 2 (95th percentile 10.09 ms)   Flow 3 (95th percentile 6.95 ms)

```
Run 1: Statistics of LEDBAT

Start at: 2018-09-06 19:26:15
End at: 2018-09-06 19:26:45
Local clock offset: -3.23 ms
Remote clock offset: 0.318 ms


# Below is generated by plot.py at 2018-09-06 21:02:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.16 Mbit/s
95th percentile per-packet one-way delay: 14.100 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 59.35 Mbit/s
95th percentile per-packet one-way delay: 13.621 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 40.58 Mbit/s
95th percentile per-packet one-way delay: 14.244 ms
Loss rate: 0.26%
-- Flow 3:
Average throughput: 32.47 Mbit/s
95th percentile per-packet one-way delay: 14.460 ms
Loss rate: 0.43%
```
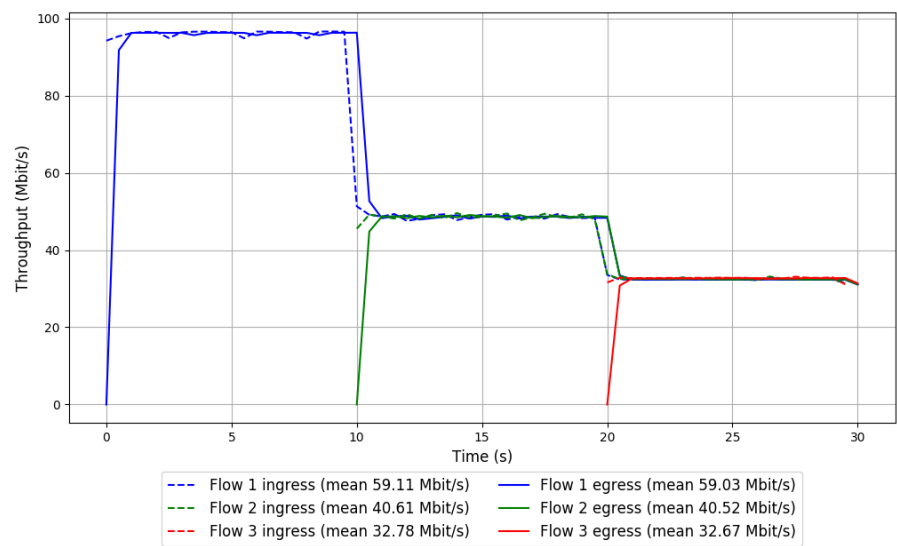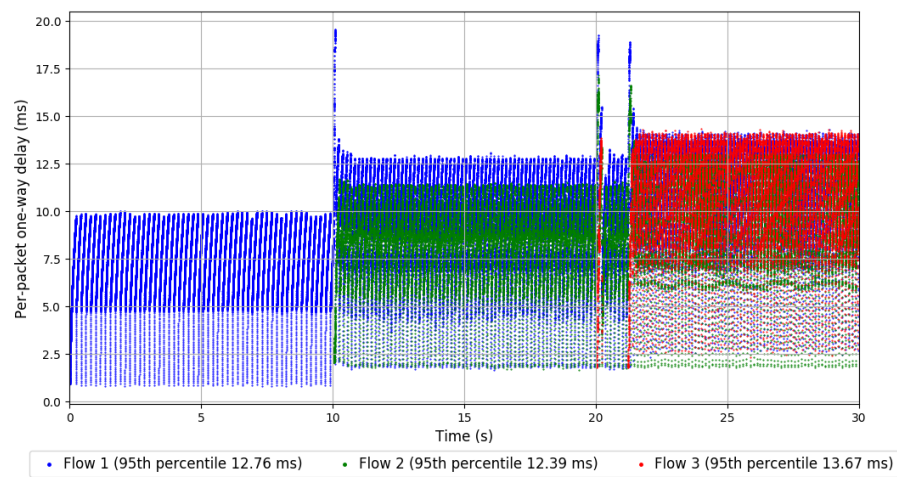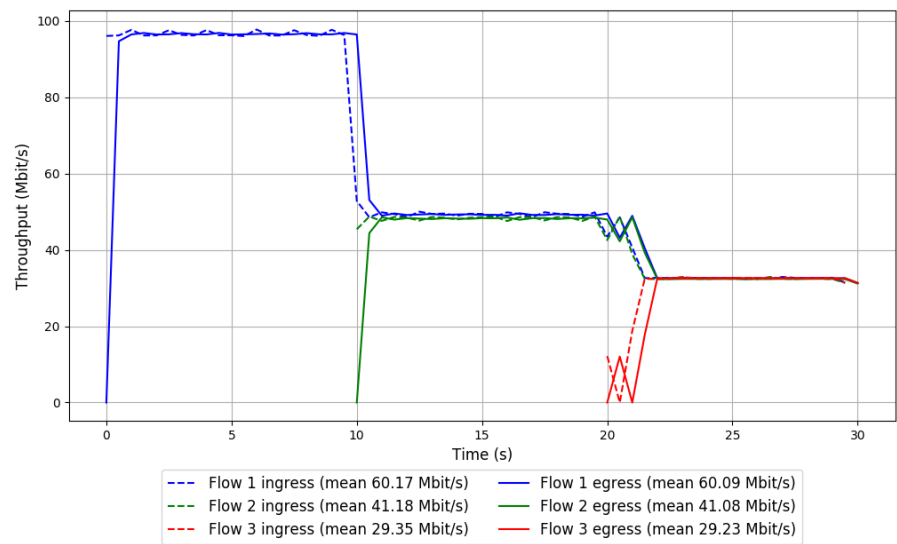
Run 1: Report of LEDBAT — Data Link

- - - - Flow 1 ingress (mean 59.44 Mbit/s) ——— Flow 1 egress (mean 59.35 Mbit/s)
- - - - Flow 2 ingress (mean 40.69 Mbit/s) ——— Flow 2 egress (mean 40.58 Mbit/s)
- - - - Flow 3 ingress (mean 32.60 Mbit/s) ——— Flow 3 egress (mean 32.47 Mbit/s)

• Flow 1 (95th percentile 13.62 ms)   • Flow 2 (95th percentile 14.24 ms)   • Flow 3 (95th percentile 14.46 ms)

```
Run 2: Statistics of LEDBAT

Start at: 2018-09-06 19:46:55
End at: 2018-09-06 19:47:25
Local clock offset: -4.223 ms
Remote clock offset: 0.724 ms


# Below is generated by plot.py at 2018-09-06 21:03:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.86 Mbit/s
95th percentile per-packet one-way delay: 13.297 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 59.03 Mbit/s
95th percentile per-packet one-way delay: 12.604 ms
Loss rate: 0.14%
-- Flow 2:
Average throughput: 40.52 Mbit/s
95th percentile per-packet one-way delay: 13.528 ms
Loss rate: 0.24%
-- Flow 3:
Average throughput: 32.67 Mbit/s
95th percentile per-packet one-way delay: 13.657 ms
Loss rate: 0.33%
```
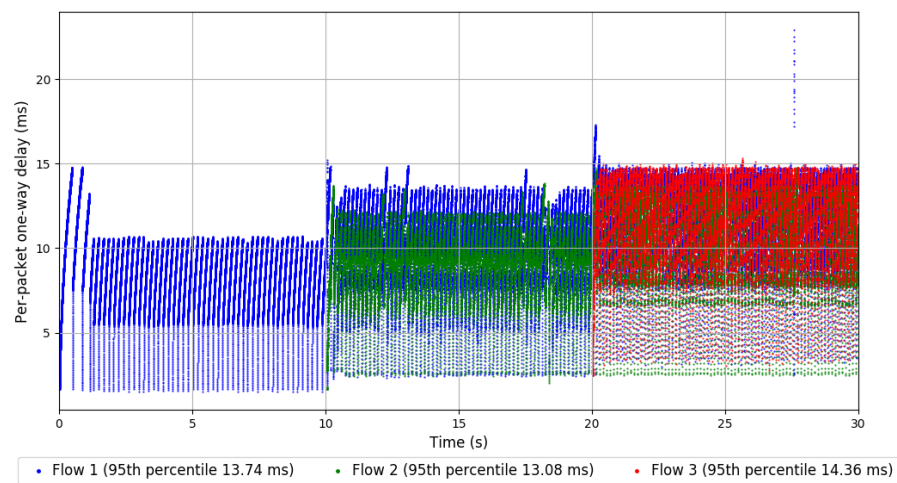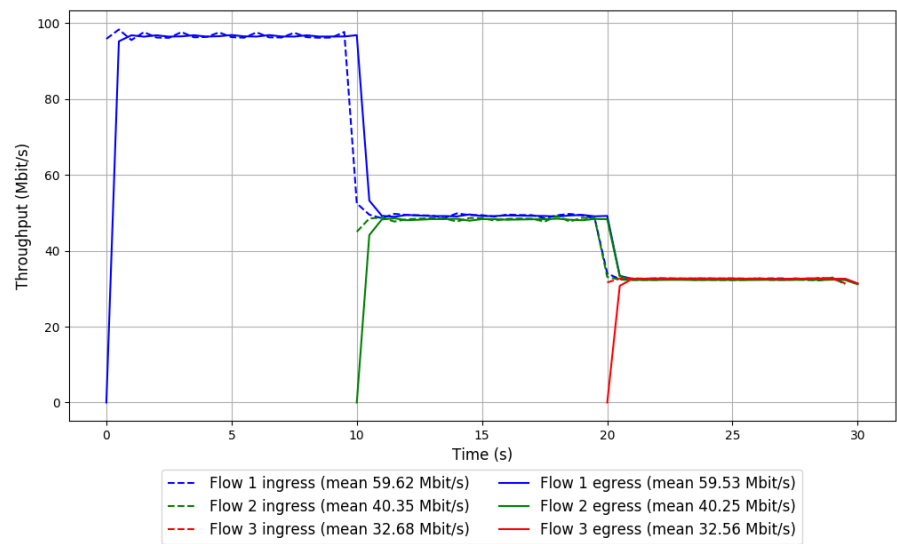
Run 2: Report of LEDBAT — Data Link

- - - - Flow 1 ingress (mean 59.11 Mbit/s) ——— Flow 1 egress (mean 59.03 Mbit/s)
- - - - Flow 2 ingress (mean 40.61 Mbit/s) ——— Flow 2 egress (mean 40.52 Mbit/s)
- - - - Flow 3 ingress (mean 32.78 Mbit/s) ——— Flow 3 egress (mean 32.67 Mbit/s)

• Flow 1 (95th percentile 12.60 ms)   • Flow 2 (95th percentile 13.53 ms)   • Flow 3 (95th percentile 13.66 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2018-09-06 20:07:38
End at: 2018-09-06 20:08:08
Local clock offset: -4.503 ms
Remote clock offset: 0.915 ms

# Below is generated by plot.py at 2018-09-06 21:03:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.15 Mbit/s
95th percentile per-packet one-way delay: 12.961 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 60.09 Mbit/s
95th percentile per-packet one-way delay: 12.762 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 41.08 Mbit/s
95th percentile per-packet one-way delay: 12.388 ms
Loss rate: 0.24%
-- Flow 3:
Average throughput: 29.23 Mbit/s
95th percentile per-packet one-way delay: 13.674 ms
Loss rate: 0.44%
```
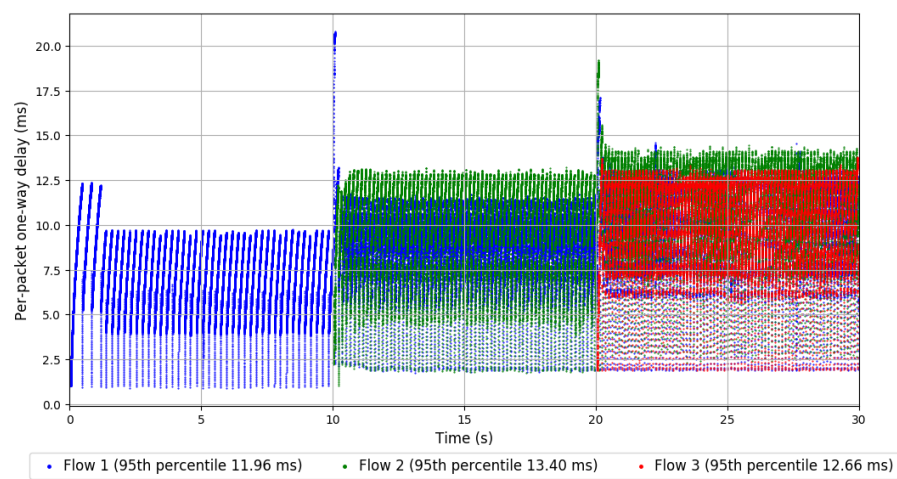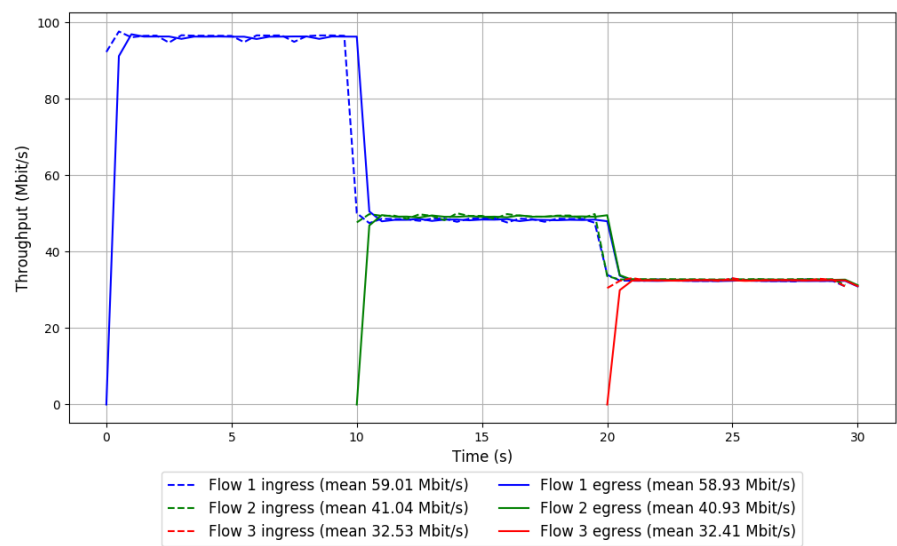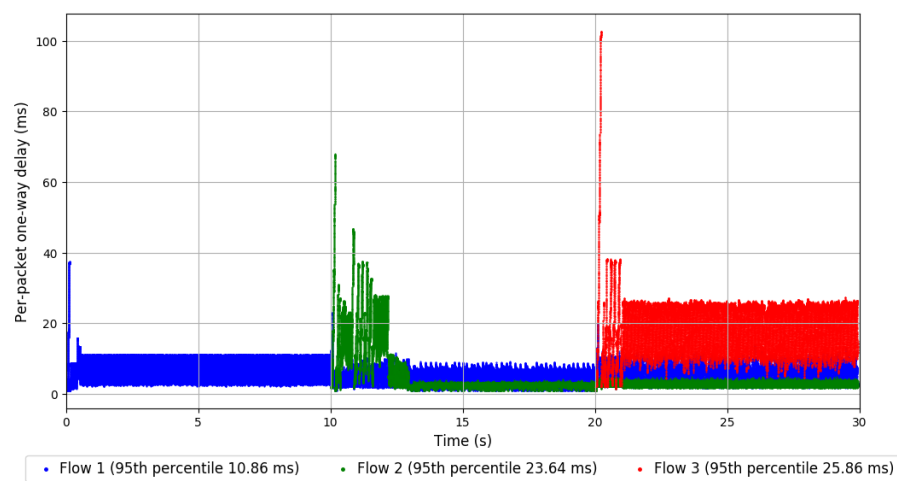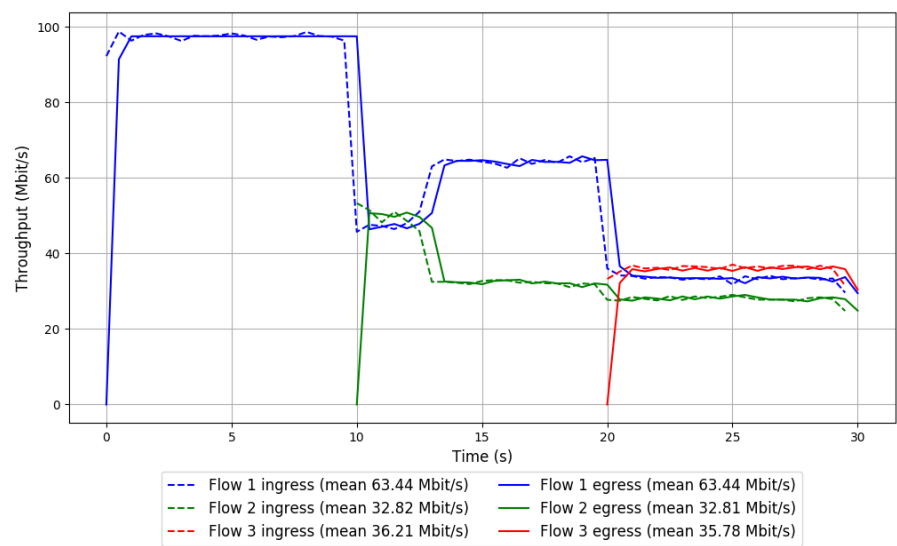
Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 60.17 Mbit/s) — Flow 1 egress (mean 60.09 Mbit/s)
Flow 2 ingress (mean 41.18 Mbit/s) — Flow 2 egress (mean 41.08 Mbit/s)
Flow 3 ingress (mean 29.35 Mbit/s) — Flow 3 egress (mean 29.23 Mbit/s)

Flow 1 (95th percentile 12.76 ms) • Flow 2 (95th percentile 12.39 ms) • Flow 3 (95th percentile 13.67 ms)

```
Run 4: Statistics of LEDBAT

Start at: 2018-09-06 20:28:21
End at: 2018-09-06 20:28:51
Local clock offset: -3.944 ms
Remote clock offset: 1.102 ms

# Below is generated by plot.py at 2018-09-06 21:03:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.15 Mbit/s
95th percentile per-packet one-way delay: 13.835 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 59.53 Mbit/s
95th percentile per-packet one-way delay: 13.741 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 40.25 Mbit/s
95th percentile per-packet one-way delay: 13.084 ms
Loss rate: 0.25%
-- Flow 3:
Average throughput: 32.56 Mbit/s
95th percentile per-packet one-way delay: 14.364 ms
Loss rate: 0.37%
```

Run 4: Report of LEDBAT — Data Link

Flow 1 ingress (mean 59.62 Mbit/s)   Flow 1 egress (mean 59.53 Mbit/s)
Flow 2 ingress (mean 40.35 Mbit/s)   Flow 2 egress (mean 40.25 Mbit/s)
Flow 3 ingress (mean 32.68 Mbit/s)   Flow 3 egress (mean 32.56 Mbit/s)

Flow 1 (95th percentile 13.74 ms)   Flow 2 (95th percentile 13.08 ms)   Flow 3 (95th percentile 14.36 ms)

```
Run 5: Statistics of LEDBAT

Start at: 2018-09-06 20:49:00
End at: 2018-09-06 20:49:30
Local clock offset: -4.769 ms
Remote clock offset: 0.997 ms


# Below is generated by plot.py at 2018-09-06 21:03:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.96 Mbit/s
95th percentile per-packet one-way delay: 12.687 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 58.93 Mbit/s
95th percentile per-packet one-way delay: 11.961 ms
Loss rate: 0.14%
-- Flow 2:
Average throughput: 40.93 Mbit/s
95th percentile per-packet one-way delay: 13.405 ms
Loss rate: 0.26%
-- Flow 3:
Average throughput: 32.41 Mbit/s
95th percentile per-packet one-way delay: 12.660 ms
Loss rate: 0.37%
```
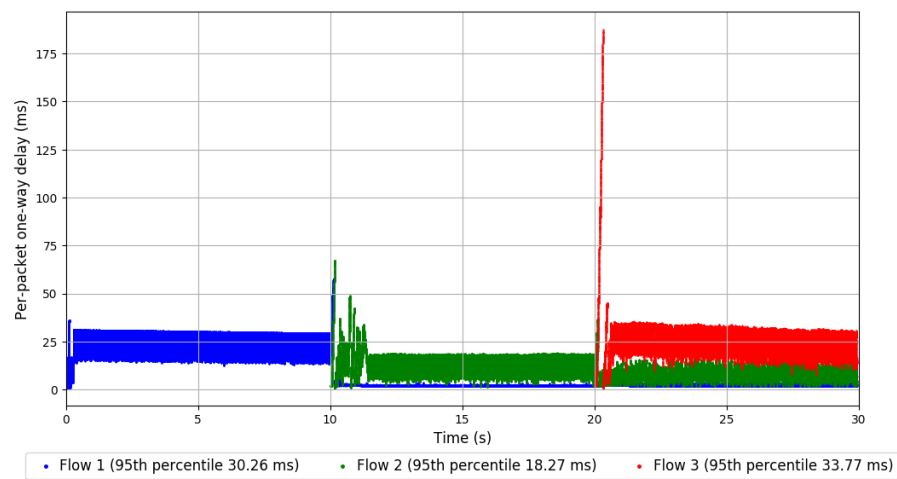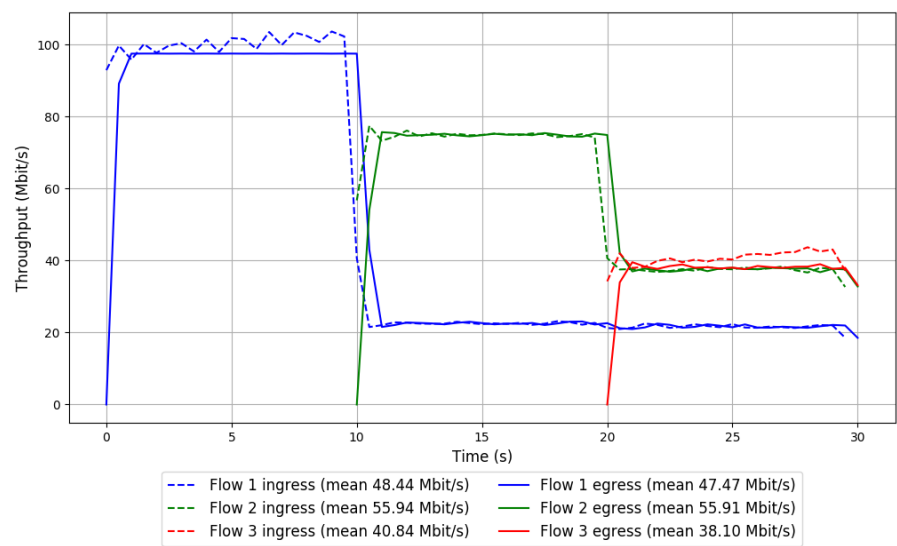
Run 5: Report of LEDBAT — Data Link

Flow 1 ingress (mean 59.01 Mbit/s) --- Flow 1 egress (mean 58.93 Mbit/s)
Flow 2 ingress (mean 41.04 Mbit/s) --- Flow 2 egress (mean 40.93 Mbit/s)
Flow 3 ingress (mean 32.53 Mbit/s) --- Flow 3 egress (mean 32.41 Mbit/s)

Flow 1 (95th percentile 11.96 ms) • Flow 2 (95th percentile 13.40 ms) • Flow 3 (95th percentile 12.66 ms)

```
Run 1: Statistics of Indigo-Muses

Start at: 2018-09-06 19:25:06
End at: 2018-09-06 19:25:36
Local clock offset: -3.959 ms
Remote clock offset: 0.314 ms


# Below is generated by plot.py at 2018-09-06 21:03:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.12 Mbit/s
95th percentile per-packet one-way delay: 23.785 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 63.44 Mbit/s
95th percentile per-packet one-way delay: 10.863 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 32.81 Mbit/s
95th percentile per-packet one-way delay: 23.640 ms
Loss rate: 0.04%
-- Flow 3:
Average throughput: 35.78 Mbit/s
95th percentile per-packet one-way delay: 25.858 ms
Loss rate: 1.17%
```
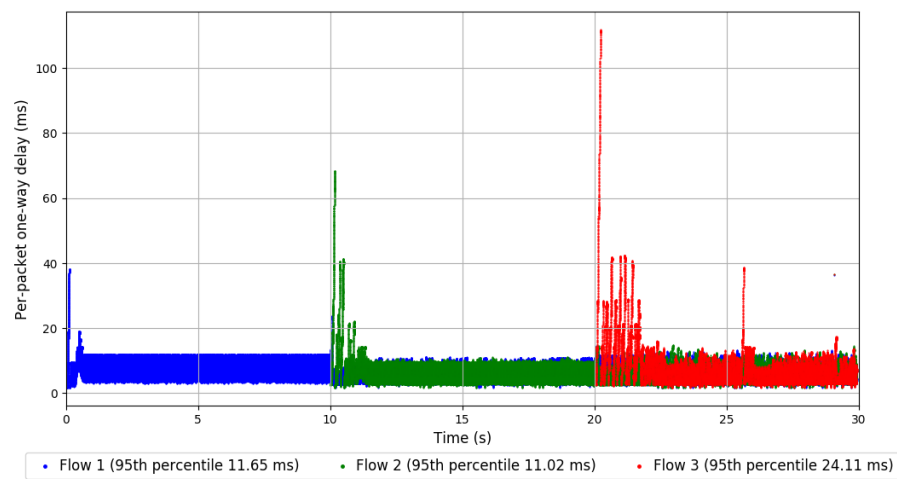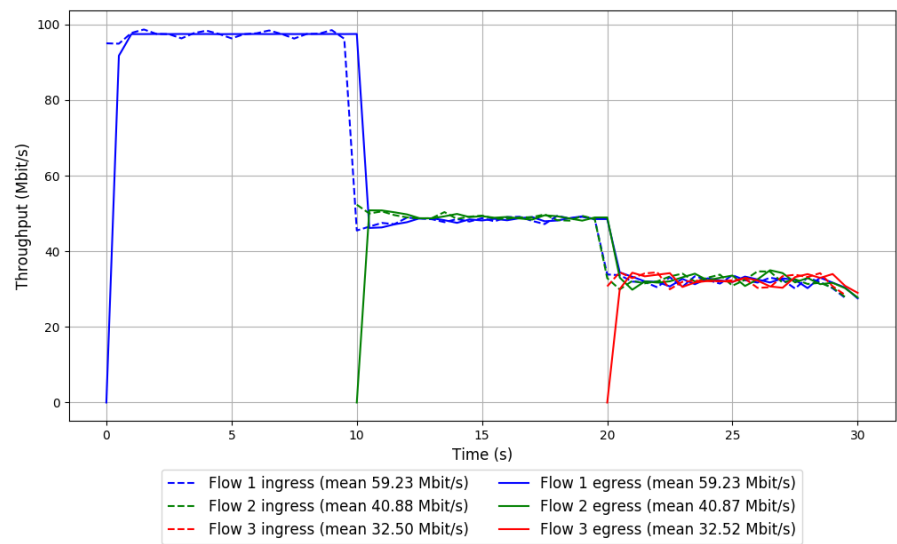
Run 1: Report of Indigo-Muses — Data Link

```
Run 2: Statistics of Indigo-Muses

Start at: 2018-09-06 19:45:46
End at: 2018-09-06 19:46:16
Local clock offset: -4.188 ms
Remote clock offset: 0.66 ms


# Below is generated by plot.py at 2018-09-06 21:03:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.30 Mbit/s
95th percentile per-packet one-way delay: 30.617 ms
Loss rate: 1.90%
-- Flow 1:
Average throughput: 47.47 Mbit/s
95th percentile per-packet one-way delay: 30.259 ms
Loss rate: 1.99%
-- Flow 2:
Average throughput: 55.91 Mbit/s
95th percentile per-packet one-way delay: 18.266 ms
Loss rate: 0.06%
-- Flow 3:
Average throughput: 38.10 Mbit/s
95th percentile per-packet one-way delay: 33.769 ms
Loss rate: 6.66%
```
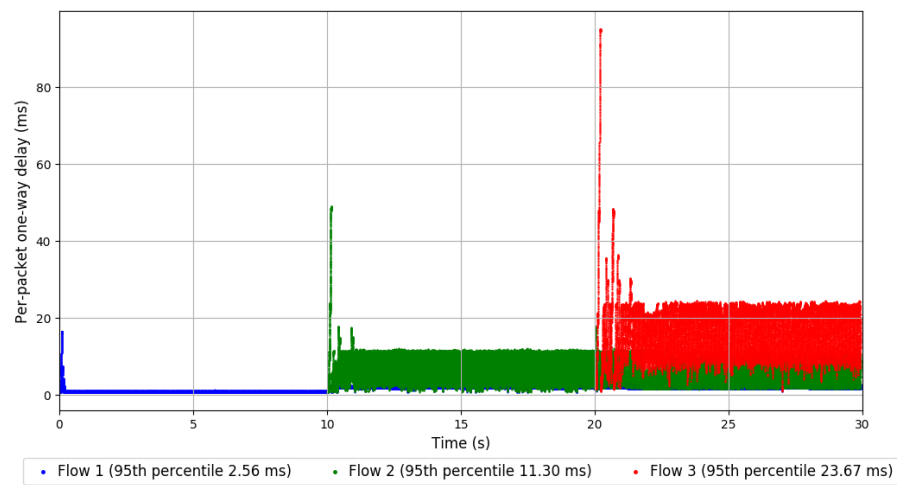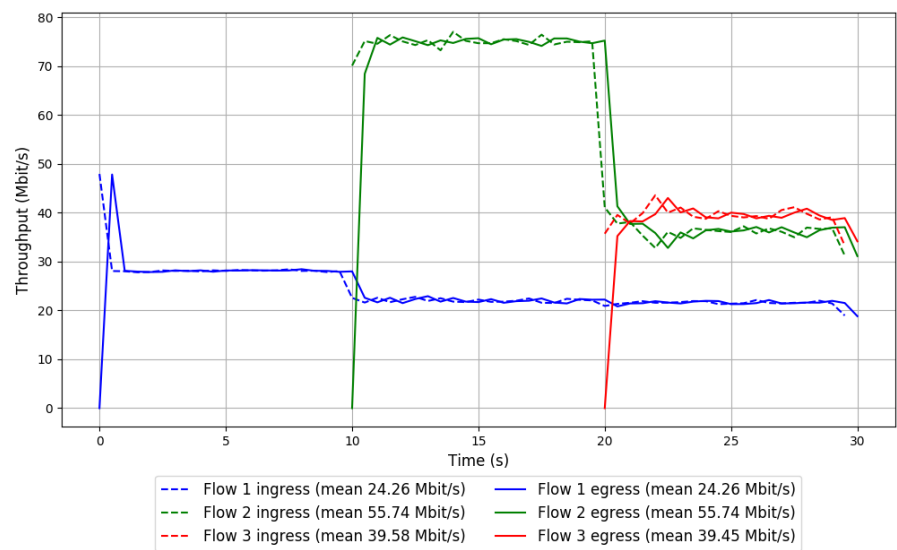
Run 2: Report of Indigo-Muses — Data Link

Flow 1 ingress (mean 48.44 Mbit/s)   Flow 1 egress (mean 47.47 Mbit/s)
Flow 2 ingress (mean 55.94 Mbit/s)   Flow 2 egress (mean 55.91 Mbit/s)
Flow 3 ingress (mean 40.84 Mbit/s)   Flow 3 egress (mean 38.10 Mbit/s)

Flow 1 (95th percentile 30.26 ms)   Flow 2 (95th percentile 18.27 ms)   Flow 3 (95th percentile 33.77 ms)

```
Run 3: Statistics of Indigo-Muses

Start at: 2018-09-06 20:06:29
End at: 2018-09-06 20:06:59
Local clock offset: -3.801 ms
Remote clock offset: 0.837 ms


# Below is generated by plot.py at 2018-09-06 21:03:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.19 Mbit/s
95th percentile per-packet one-way delay: 11.700 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 59.23 Mbit/s
95th percentile per-packet one-way delay: 11.649 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 40.87 Mbit/s
95th percentile per-packet one-way delay: 11.015 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 32.52 Mbit/s
95th percentile per-packet one-way delay: 24.107 ms
Loss rate: 0.03%
```
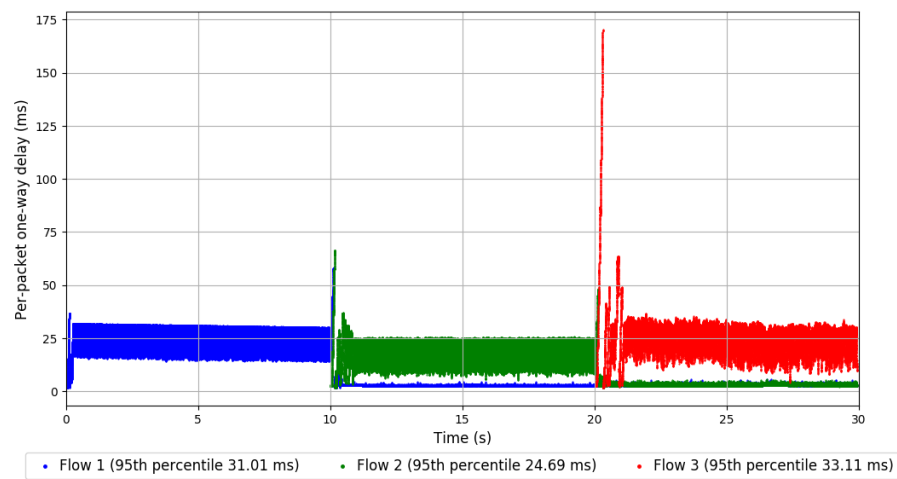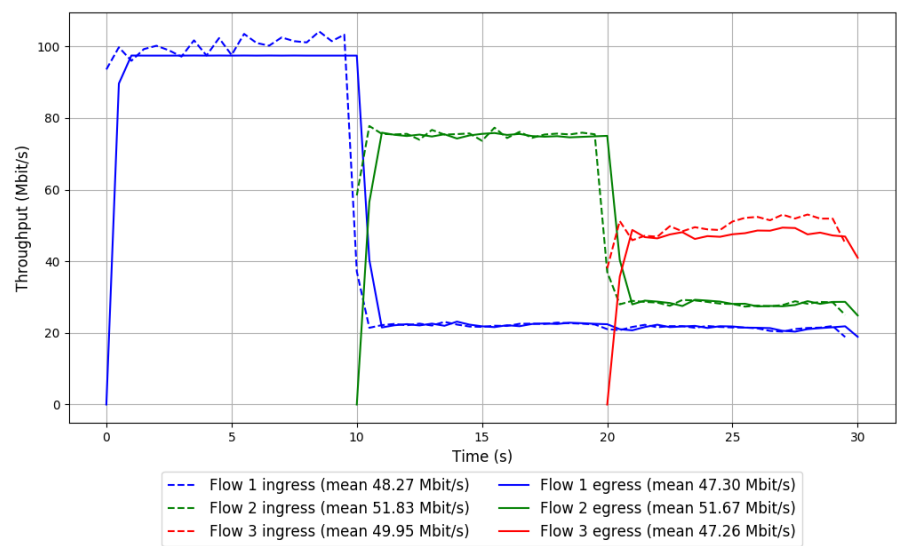
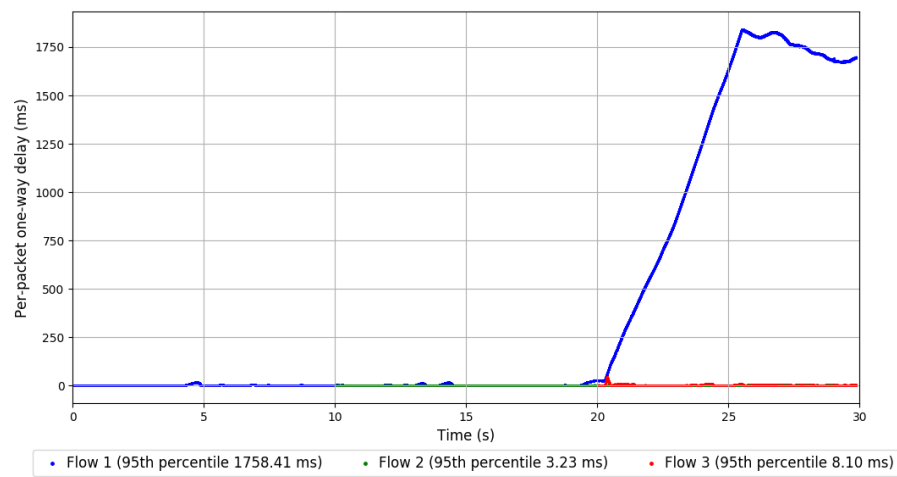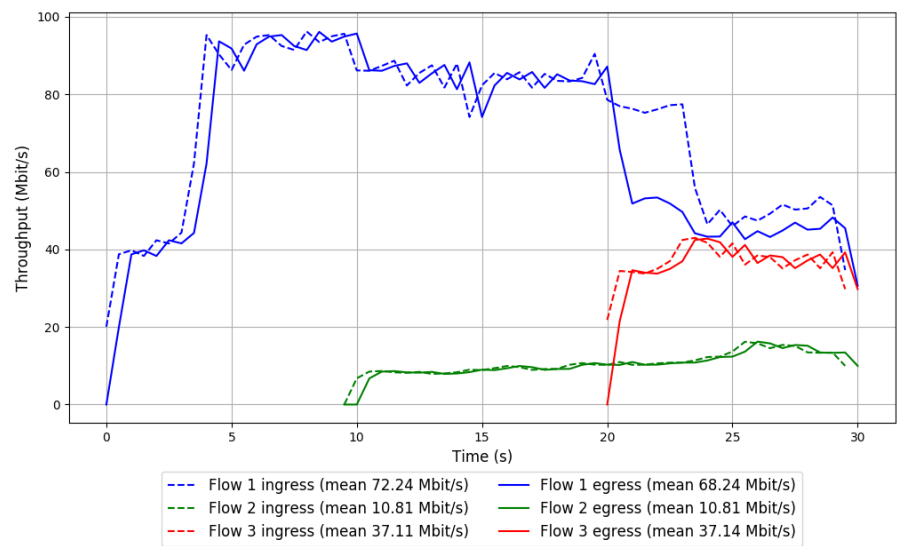Run 3: Report of Indigo-Muses — Data Link

Flow 1 ingress (mean 59.23 Mbit/s) ---- Flow 1 egress (mean 59.23 Mbit/s)
Flow 2 ingress (mean 40.88 Mbit/s) ---- Flow 2 egress (mean 40.87 Mbit/s)
Flow 3 ingress (mean 32.50 Mbit/s) ---- Flow 3 egress (mean 32.52 Mbit/s)

Flow 1 (95th percentile 11.65 ms)   Flow 2 (95th percentile 11.02 ms)   Flow 3 (95th percentile 24.11 ms)

79

```
Run 4: Statistics of Indigo-Muses

Start at: 2018-09-06 20:27:13
End at: 2018-09-06 20:27:43
Local clock offset: -4.767 ms
Remote clock offset: 1.116 ms


# Below is generated by plot.py at 2018-09-06 21:03:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 74.43 Mbit/s
95th percentile per-packet one-way delay: 21.539 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 24.26 Mbit/s
95th percentile per-packet one-way delay: 2.564 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 55.74 Mbit/s
95th percentile per-packet one-way delay: 11.297 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 39.45 Mbit/s
95th percentile per-packet one-way delay: 23.668 ms
Loss rate: 0.35%
```

Run 4: Report of Indigo-Muses — Data Link

```
Run 5: Statistics of Indigo-Muses

Start at: 2018-09-06 20:47:51
End at: 2018-09-06 20:48:21
Local clock offset: -4.0 ms
Remote clock offset: 1.084 ms

# Below is generated by plot.py at 2018-09-06 21:04:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.31 Mbit/s
95th percentile per-packet one-way delay: 31.007 ms
Loss rate: 1.99%
-- Flow 1:
Average throughput: 47.30 Mbit/s
95th percentile per-packet one-way delay: 31.007 ms
Loss rate: 2.02%
-- Flow 2:
Average throughput: 51.67 Mbit/s
95th percentile per-packet one-way delay: 24.690 ms
Loss rate: 0.31%
-- Flow 3:
Average throughput: 47.26 Mbit/s
95th percentile per-packet one-way delay: 33.111 ms
Loss rate: 5.40%
```
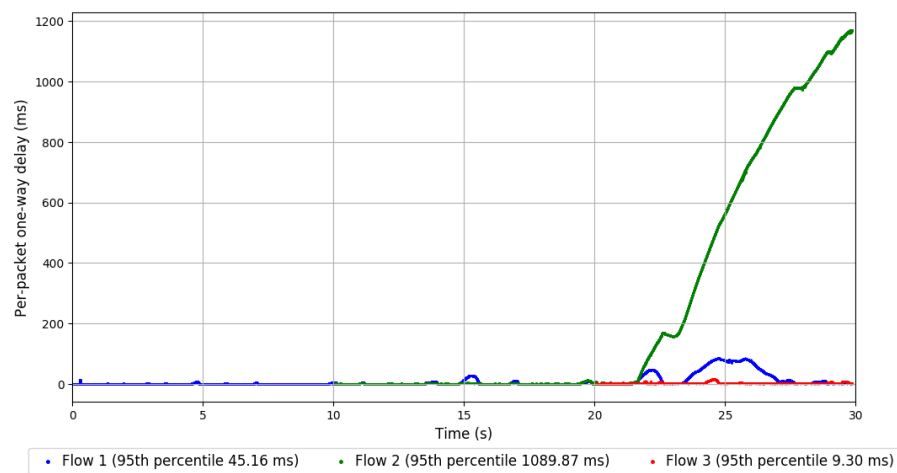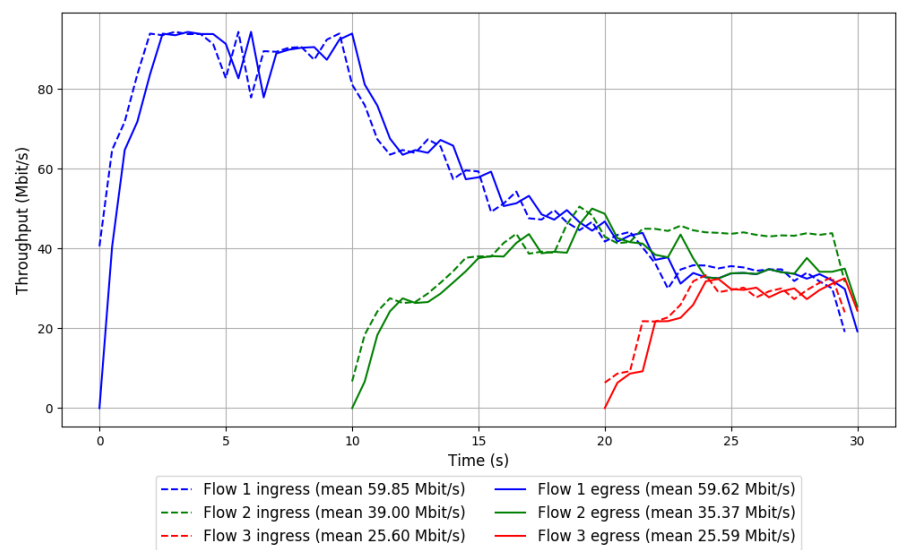
Run 5: Report of Indigo-Muses — Data Link

```
Run 1: Statistics of PCC-Allegro

Start at: 2018-09-06 19:15:53
End at: 2018-09-06 19:16:23
Local clock offset: -2.681 ms
Remote clock offset: 0.134 ms


# Below is generated by plot.py at 2018-09-06 21:04:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 87.66 Mbit/s
95th percentile per-packet one-way delay: 1718.870 ms
Loss rate: 4.37%
-- Flow 1:
Average throughput: 68.24 Mbit/s
95th percentile per-packet one-way delay: 1758.413 ms
Loss rate: 5.53%
-- Flow 2:
Average throughput: 10.81 Mbit/s
95th percentile per-packet one-way delay: 3.229 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 37.14 Mbit/s
95th percentile per-packet one-way delay: 8.099 ms
Loss rate: 0.05%
```
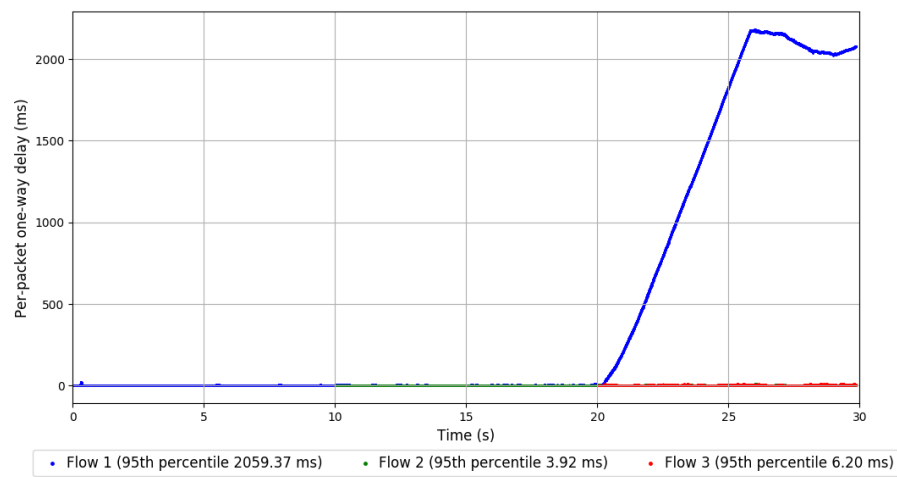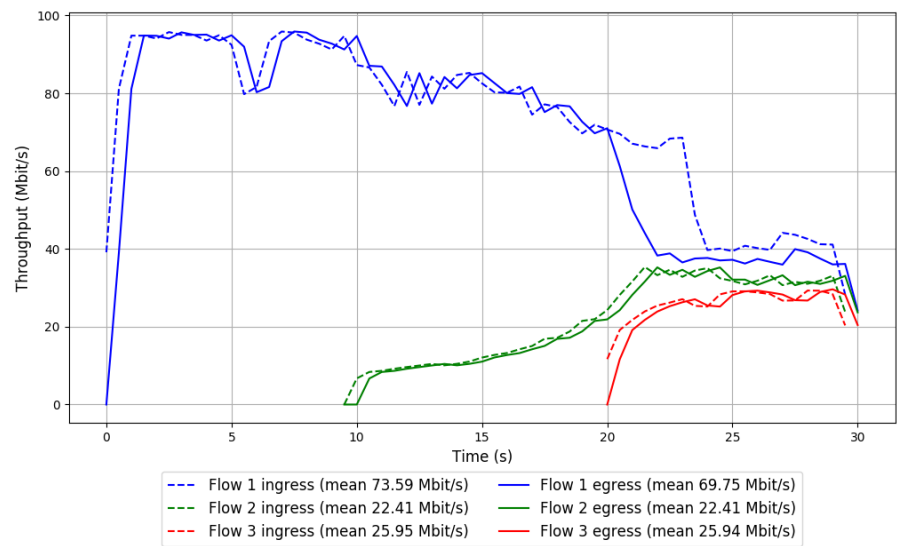
Run 1: Report of PCC-Allegro — Data Link

```
Run 2: Statistics of PCC-Allegro

Start at: 2018-09-06 19:36:30
End at: 2018-09-06 19:37:00
Local clock offset: -4.14 ms
Remote clock offset: 0.467 ms


# Below is generated by plot.py at 2018-09-06 21:04:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.55 Mbit/s
95th percentile per-packet one-way delay: 719.134 ms
Loss rate: 2.82%
-- Flow 1:
Average throughput: 59.62 Mbit/s
95th percentile per-packet one-way delay: 45.160 ms
Loss rate: 0.39%
-- Flow 2:
Average throughput: 35.37 Mbit/s
95th percentile per-packet one-way delay: 1089.873 ms
Loss rate: 9.30%
-- Flow 3:
Average throughput: 25.59 Mbit/s
95th percentile per-packet one-way delay: 9.296 ms
Loss rate: 0.07%
```
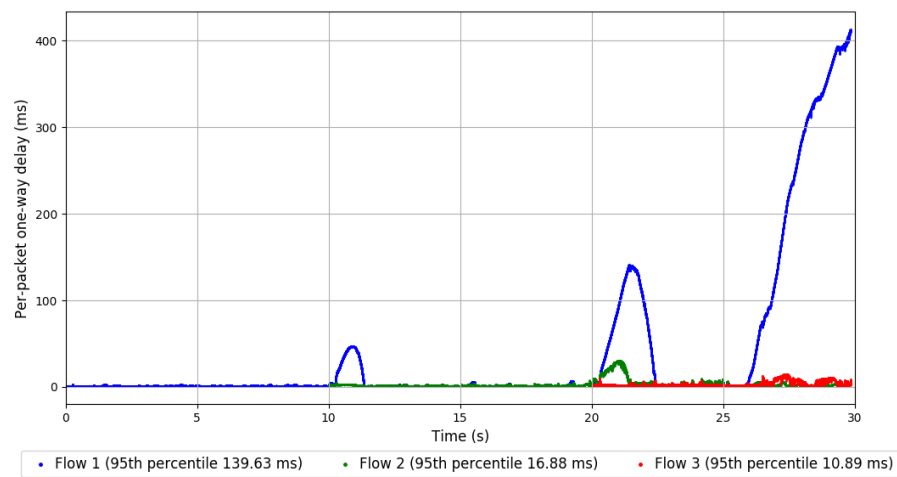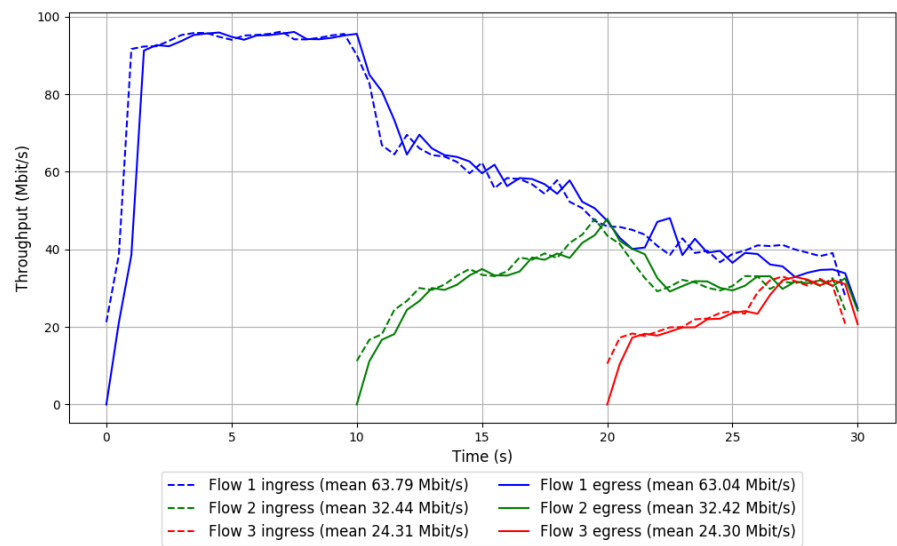
Run 2: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 59.85 Mbit/s)   Flow 1 egress (mean 59.62 Mbit/s)
Flow 2 ingress (mean 39.00 Mbit/s)   Flow 2 egress (mean 35.37 Mbit/s)
Flow 3 ingress (mean 25.60 Mbit/s)   Flow 3 egress (mean 25.59 Mbit/s)

Flow 1 (95th percentile 45.16 ms)   Flow 2 (95th percentile 1089.87 ms)   Flow 3 (95th percentile 9.30 ms)

87

```
Run 3: Statistics of PCC-Allegro

Start at: 2018-09-06 19:57:11
End at: 2018-09-06 19:57:41
Local clock offset: -4.445 ms
Remote clock offset: 0.788 ms


# Below is generated by plot.py at 2018-09-06 21:04:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 93.20 Mbit/s
95th percentile per-packet one-way delay: 2040.059 ms
Loss rate: 3.97%
-- Flow 1:
Average throughput: 69.75 Mbit/s
95th percentile per-packet one-way delay: 2059.366 ms
Loss rate: 5.22%
-- Flow 2:
Average throughput: 22.41 Mbit/s
95th percentile per-packet one-way delay: 3.915 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 25.94 Mbit/s
95th percentile per-packet one-way delay: 6.199 ms
Loss rate: 0.03%
```
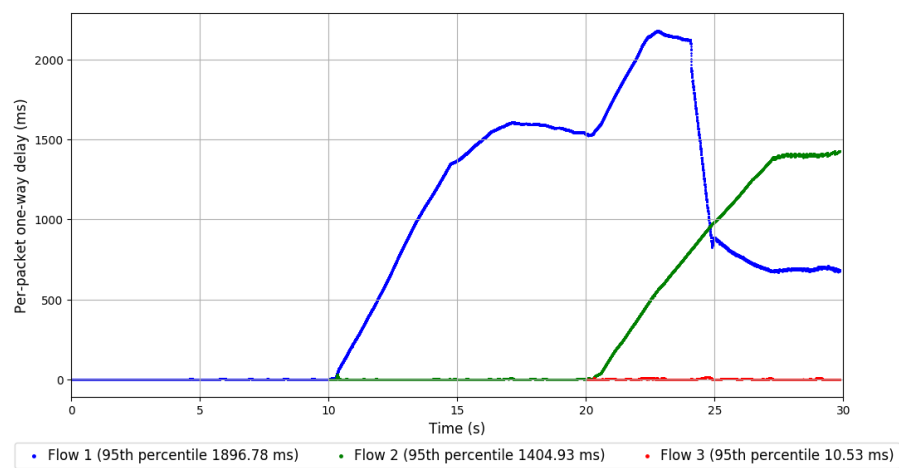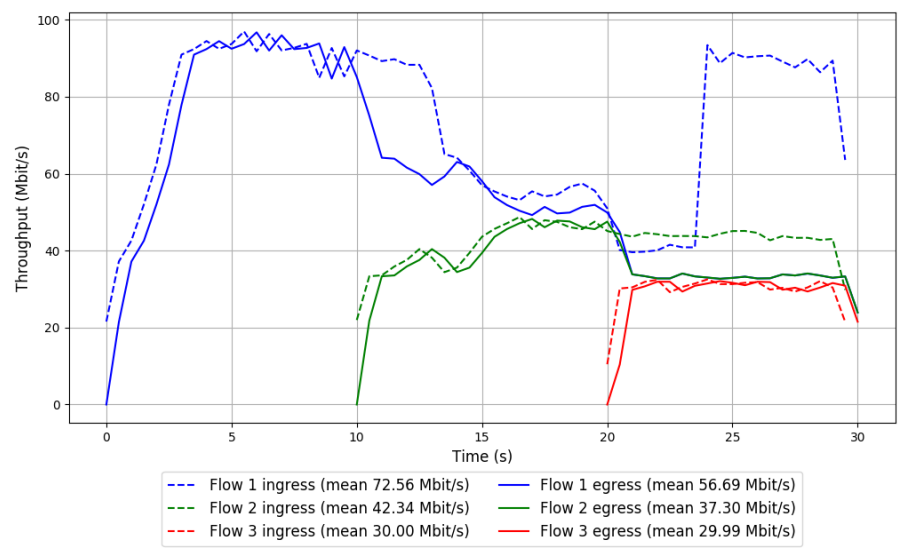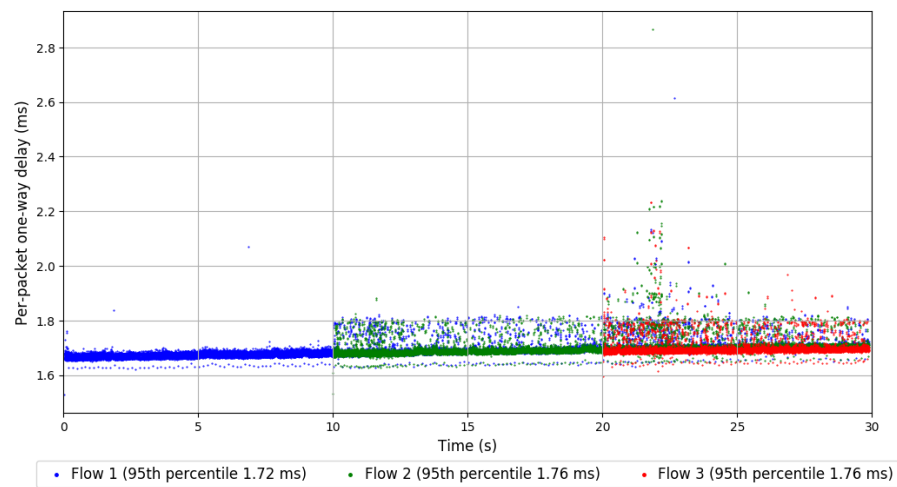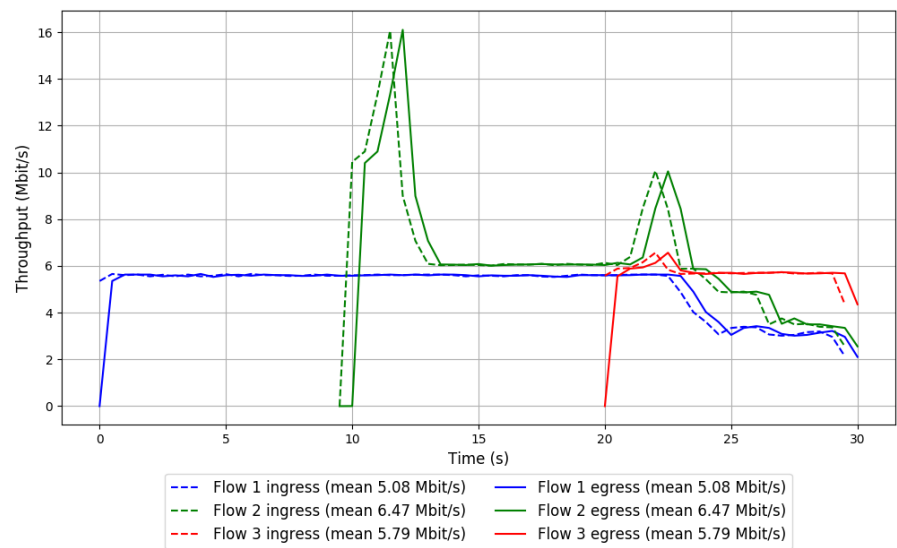
Run 3: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 73.59 Mbit/s) --- Flow 1 egress (mean 69.75 Mbit/s)
Flow 2 ingress (mean 22.41 Mbit/s) --- Flow 2 egress (mean 22.41 Mbit/s)
Flow 3 ingress (mean 25.95 Mbit/s) --- Flow 3 egress (mean 25.94 Mbit/s)

Flow 1 (95th percentile 2059.37 ms)   Flow 2 (95th percentile 3.92 ms)   Flow 3 (95th percentile 6.20 ms)

89

```
Run 4: Statistics of PCC-Allegro

Start at: 2018-09-06 20:17:53
End at: 2018-09-06 20:18:23
Local clock offset: -4.583 ms
Remote clock offset: 1.027 ms


# Below is generated by plot.py at 2018-09-06 21:04:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 92.58 Mbit/s
95th percentile per-packet one-way delay: 100.608 ms
Loss rate: 0.84%
-- Flow 1:
Average throughput: 63.04 Mbit/s
95th percentile per-packet one-way delay: 139.632 ms
Loss rate: 1.18%
-- Flow 2:
Average throughput: 32.42 Mbit/s
95th percentile per-packet one-way delay: 16.883 ms
Loss rate: 0.08%
-- Flow 3:
Average throughput: 24.30 Mbit/s
95th percentile per-packet one-way delay: 10.895 ms
Loss rate: 0.08%
```

Run 4: Report of PCC-Allegro — Data Link

```
Run 5: Statistics of PCC-Allegro

Start at: 2018-09-06 20:38:36
End at: 2018-09-06 20:39:06
Local clock offset: -4.037 ms
Remote clock offset: 1.08 ms


# Below is generated by plot.py at 2018-09-06 21:04:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.35 Mbit/s
95th percentile per-packet one-way delay: 1602.672 ms
Loss rate: 17.39%
-- Flow 1:
Average throughput: 56.69 Mbit/s
95th percentile per-packet one-way delay: 1896.778 ms
Loss rate: 21.88%
-- Flow 2:
Average throughput: 37.30 Mbit/s
95th percentile per-packet one-way delay: 1404.928 ms
Loss rate: 11.90%
-- Flow 3:
Average throughput: 29.99 Mbit/s
95th percentile per-packet one-way delay: 10.528 ms
Loss rate: 0.06%
```
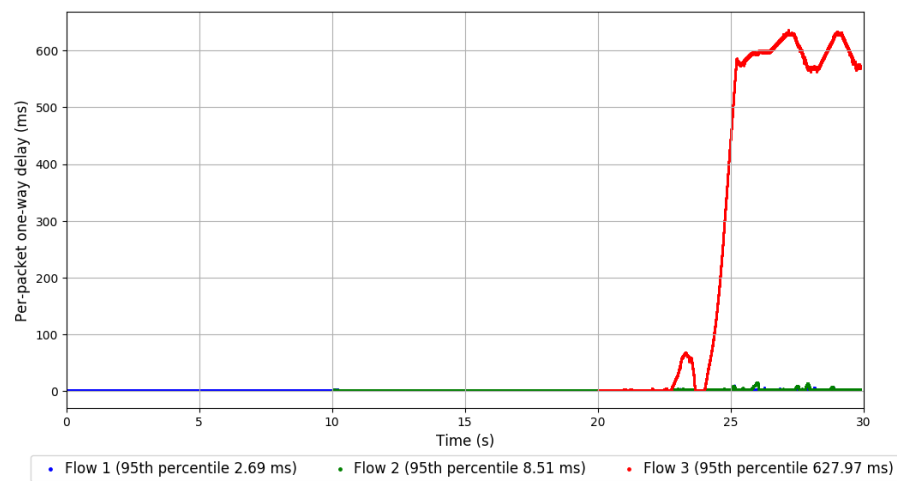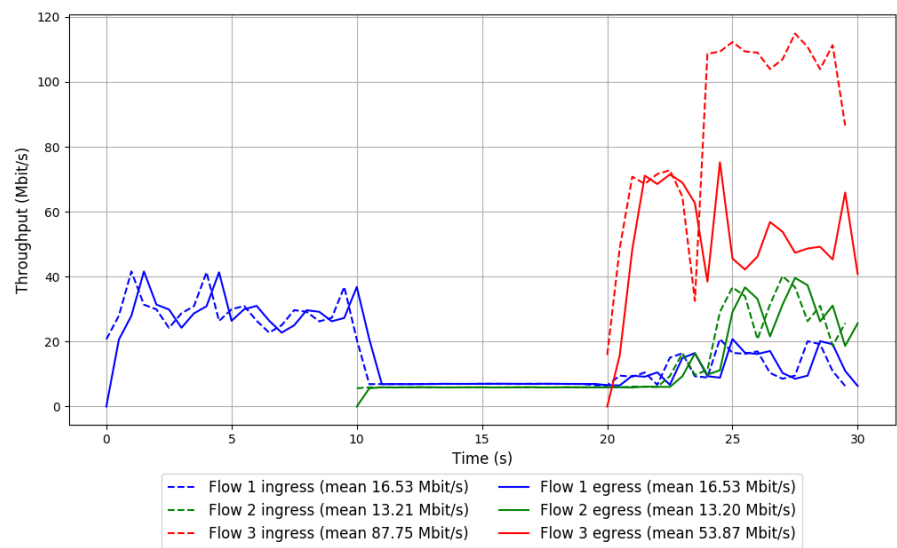
Run 5: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 72.56 Mbit/s) --- Flow 1 egress (mean 56.69 Mbit/s)
Flow 2 ingress (mean 42.34 Mbit/s) --- Flow 2 egress (mean 37.30 Mbit/s)
Flow 3 ingress (mean 30.00 Mbit/s) --- Flow 3 egress (mean 29.99 Mbit/s)

Flow 1 (95th percentile 1896.78 ms) • Flow 2 (95th percentile 1404.93 ms) • Flow 3 (95th percentile 10.53 ms)

```
Run 1: Statistics of PCC-Expr

Start at: 2018-09-06 19:18:12
End at: 2018-09-06 19:18:42
Local clock offset: -2.942 ms
Remote clock offset: 0.186 ms


# Below is generated by plot.py at 2018-09-06 21:04:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 11.30 Mbit/s
95th percentile per-packet one-way delay: 1.746 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 5.08 Mbit/s
95th percentile per-packet one-way delay: 1.723 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 6.47 Mbit/s
95th percentile per-packet one-way delay: 1.757 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 5.79 Mbit/s
95th percentile per-packet one-way delay: 1.764 ms
Loss rate: 0.02%
```
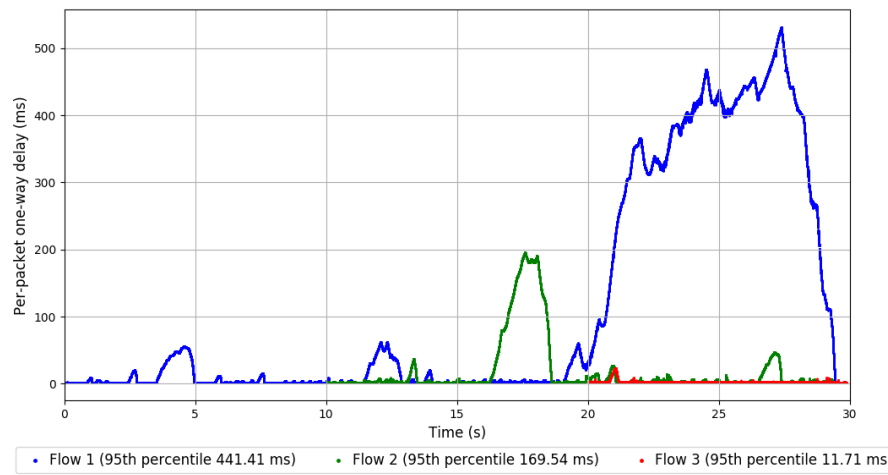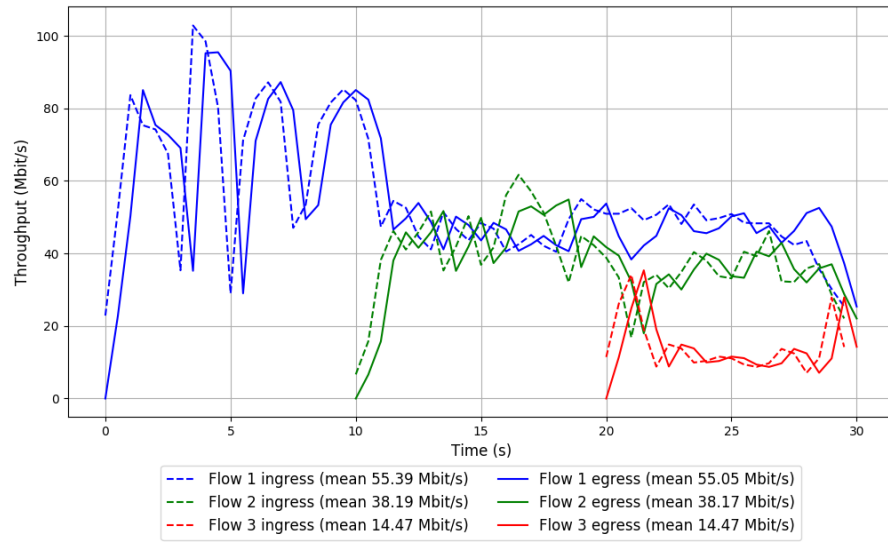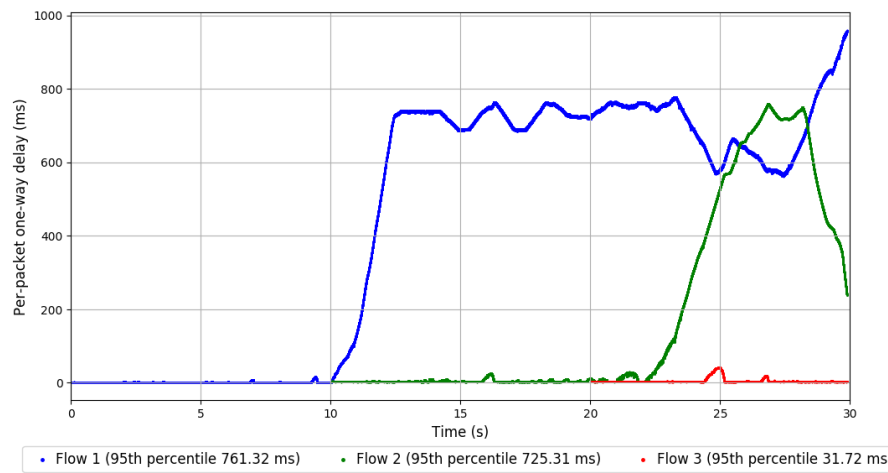
Run 1: Report of PCC-Expr — Data Link

```
Run 2: Statistics of PCC-Expr

Start at: 2018-09-06 19:38:49
End at: 2018-09-06 19:39:19
Local clock offset: -3.403 ms
Remote clock offset: 0.606 ms


# Below is generated by plot.py at 2018-09-06 21:04:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 43.09 Mbit/s
95th percentile per-packet one-way delay: 613.293 ms
Loss rate: 20.65%
-- Flow 1:
Average throughput: 16.53 Mbit/s
95th percentile per-packet one-way delay: 2.687 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 13.20 Mbit/s
95th percentile per-packet one-way delay: 8.512 ms
Loss rate: 0.04%
-- Flow 3:
Average throughput: 53.87 Mbit/s
95th percentile per-packet one-way delay: 627.968 ms
Loss rate: 38.67%
```
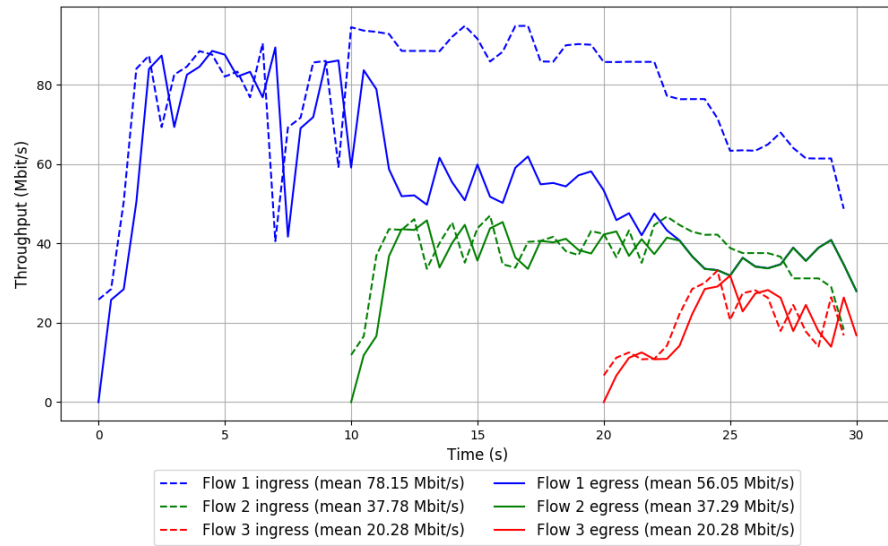
Run 2: Report of PCC-Expr — Data Link

Throughput (Mbit/s) vs Time (s)

- - - Flow 1 ingress (mean 16.53 Mbit/s) —— Flow 1 egress (mean 16.53 Mbit/s)
- - - Flow 2 ingress (mean 13.21 Mbit/s) —— Flow 2 egress (mean 13.20 Mbit/s)
- - - Flow 3 ingress (mean 87.75 Mbit/s) —— Flow 3 egress (mean 53.87 Mbit/s)

Per-packet one-way delay (ms) vs Time (s)

• Flow 1 (95th percentile 2.69 ms)   • Flow 2 (95th percentile 8.51 ms)   • Flow 3 (95th percentile 627.97 ms)

```
Run 3: Statistics of PCC-Expr

Start at: 2018-09-06 19:59:30
End at: 2018-09-06 20:00:00
Local clock offset: -3.72 ms
Remote clock offset: 0.772 ms


# Below is generated by plot.py at 2018-09-06 21:06:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 85.21 Mbit/s
95th percentile per-packet one-way delay: 424.619 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 55.05 Mbit/s
95th percentile per-packet one-way delay: 441.414 ms
Loss rate: 0.65%
-- Flow 2:
Average throughput: 38.17 Mbit/s
95th percentile per-packet one-way delay: 169.541 ms
Loss rate: 0.06%
-- Flow 3:
Average throughput: 14.47 Mbit/s
95th percentile per-packet one-way delay: 11.711 ms
Loss rate: 0.02%
```
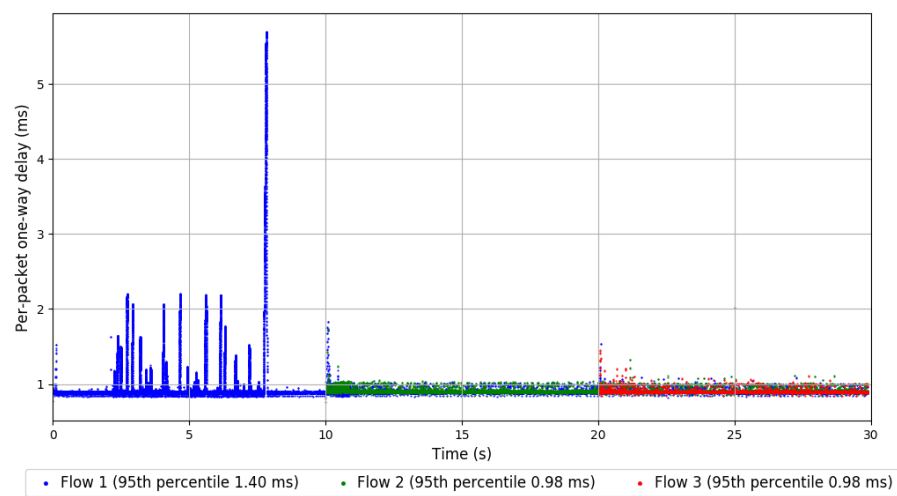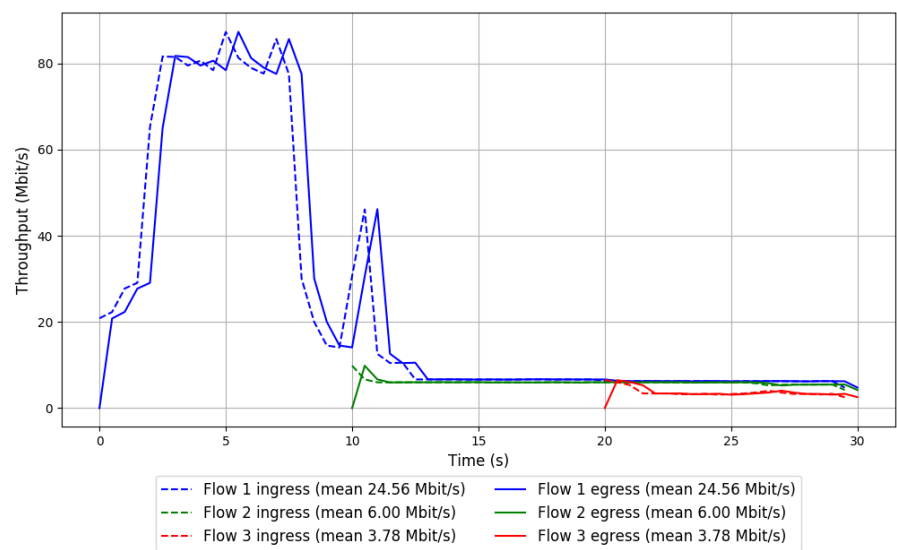
Run 3: Report of PCC-Expr — Data Link

Legend:
- Flow 1 ingress (mean 55.39 Mbit/s)
- Flow 1 egress (mean 55.05 Mbit/s)
- Flow 2 ingress (mean 38.19 Mbit/s)
- Flow 2 egress (mean 38.17 Mbit/s)
- Flow 3 ingress (mean 14.47 Mbit/s)
- Flow 3 egress (mean 14.47 Mbit/s)

Legend:
- Flow 1 (95th percentile 441.41 ms)
- Flow 2 (95th percentile 169.54 ms)
- Flow 3 (95th percentile 11.71 ms)

```
Run 4: Statistics of PCC-Expr

Start at: 2018-09-06 20:20:12
End at: 2018-09-06 20:20:42
Local clock offset: -4.623 ms
Remote clock offset: 1.094 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 87.55 Mbit/s
95th percentile per-packet one-way delay: 757.651 ms
Loss rate: 20.39%
-- Flow 1:
Average throughput: 56.05 Mbit/s
95th percentile per-packet one-way delay: 761.316 ms
Loss rate: 28.28%
-- Flow 2:
Average throughput: 37.29 Mbit/s
95th percentile per-packet one-way delay: 725.310 ms
Loss rate: 1.29%
-- Flow 3:
Average throughput: 20.28 Mbit/s
95th percentile per-packet one-way delay: 31.716 ms
Loss rate: 0.04%
```
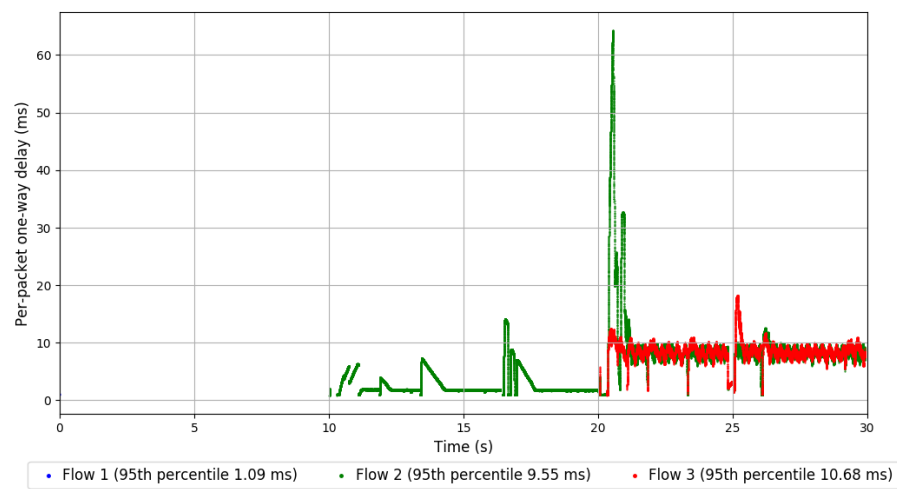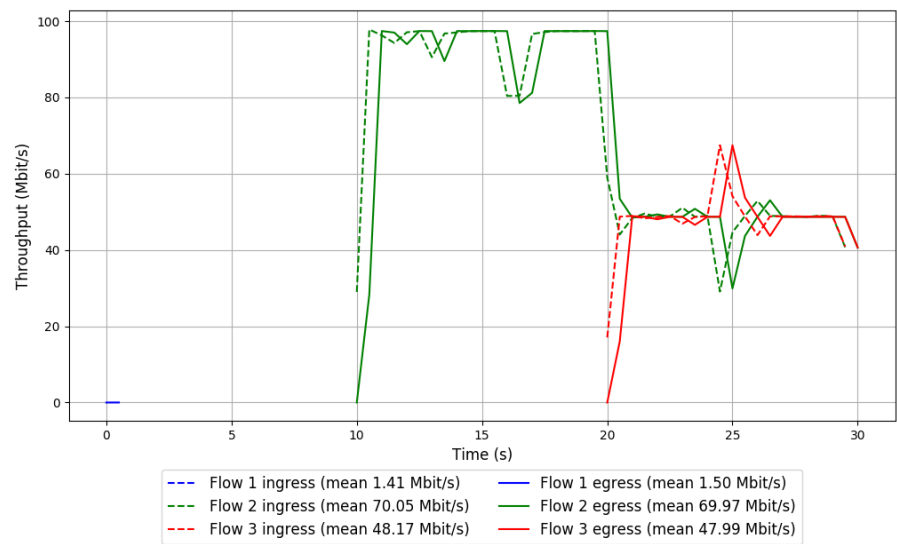
Run 4: Report of PCC-Expr — Data Link

Flow 1 ingress (mean 78.15 Mbit/s) --- Flow 1 egress (mean 56.05 Mbit/s)
Flow 2 ingress (mean 37.78 Mbit/s) --- Flow 2 egress (mean 37.29 Mbit/s)
Flow 3 ingress (mean 20.28 Mbit/s) --- Flow 3 egress (mean 20.28 Mbit/s)

Flow 1 (95th percentile 761.32 ms)   Flow 2 (95th percentile 725.31 ms)   Flow 3 (95th percentile 31.72 ms)

```
Run 5: Statistics of PCC-Expr

Start at: 2018-09-06 20:40:56
End at: 2018-09-06 20:41:26
Local clock offset: -4.729 ms
Remote clock offset: 1.114 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 29.80 Mbit/s
95th percentile per-packet one-way delay: 1.255 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 24.56 Mbit/s
95th percentile per-packet one-way delay: 1.400 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 6.00 Mbit/s
95th percentile per-packet one-way delay: 0.979 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 3.78 Mbit/s
95th percentile per-packet one-way delay: 0.977 ms
Loss rate: 0.00%
```
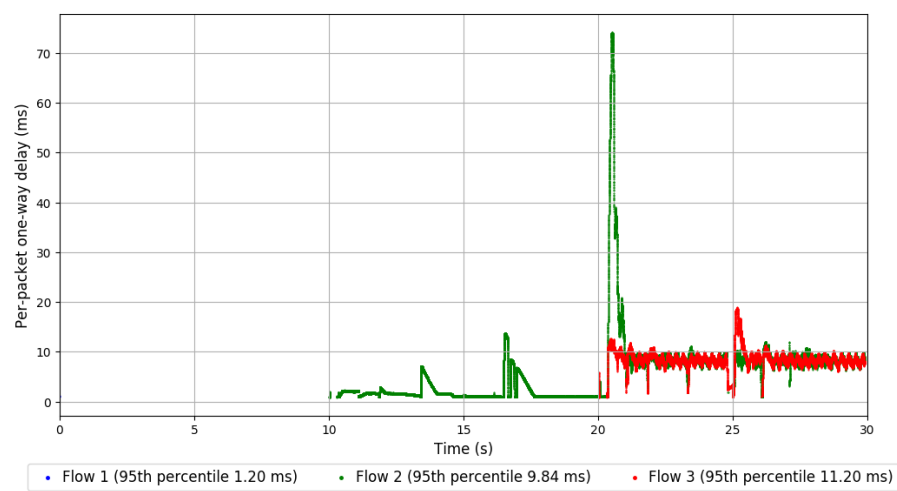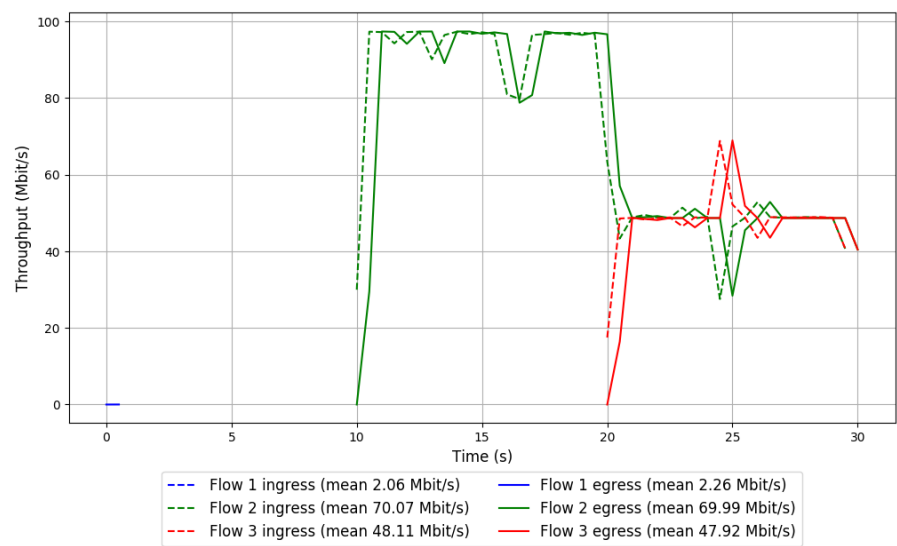
Run 5: Report of PCC-Expr — Data Link

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-09-06 19:12:27
End at: 2018-09-06 19:12:57
Local clock offset: -3.416 ms
Remote clock offset: 0.158 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 62.42 Mbit/s
95th percentile per-packet one-way delay: 10.241 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 1.095 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 69.97 Mbit/s
95th percentile per-packet one-way delay: 9.549 ms
Loss rate: 0.12%
-- Flow 3:
Average throughput: 47.99 Mbit/s
95th percentile per-packet one-way delay: 10.682 ms
Loss rate: 0.39%
```
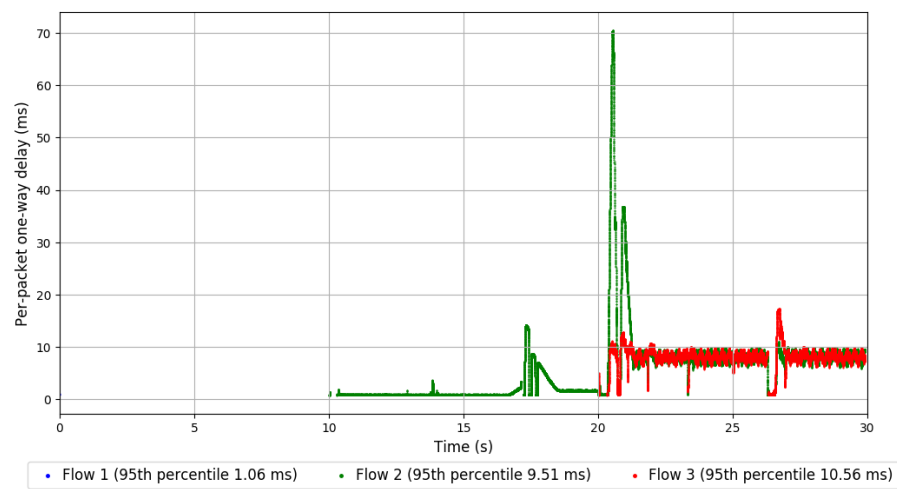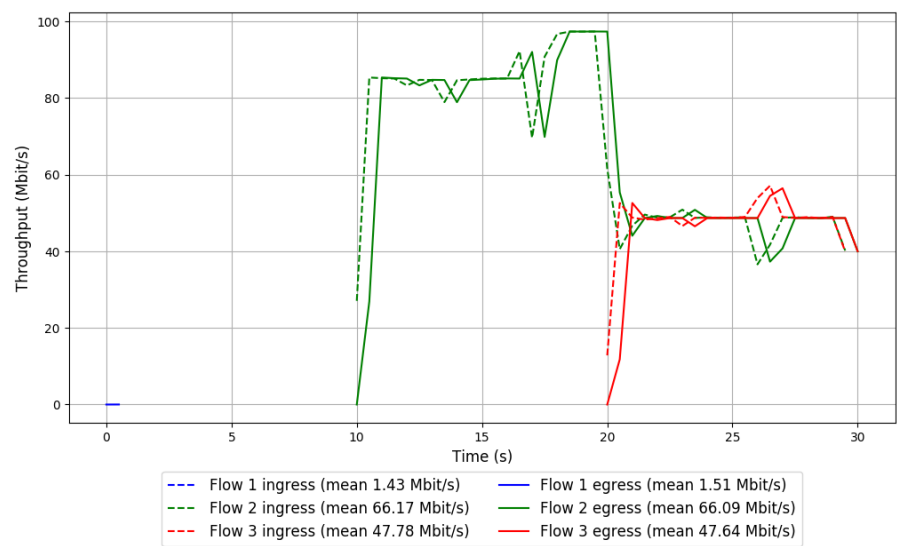
Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-09-06 19:33:04
End at: 2018-09-06 19:33:34
Local clock offset: -4.145 ms
Remote clock offset: 0.39 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 62.44 Mbit/s
95th percentile per-packet one-way delay: 10.420 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 2.26 Mbit/s
95th percentile per-packet one-way delay: 1.195 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 69.99 Mbit/s
95th percentile per-packet one-way delay: 9.844 ms
Loss rate: 0.12%
-- Flow 3:
Average throughput: 47.92 Mbit/s
95th percentile per-packet one-way delay: 11.195 ms
Loss rate: 0.40%
```
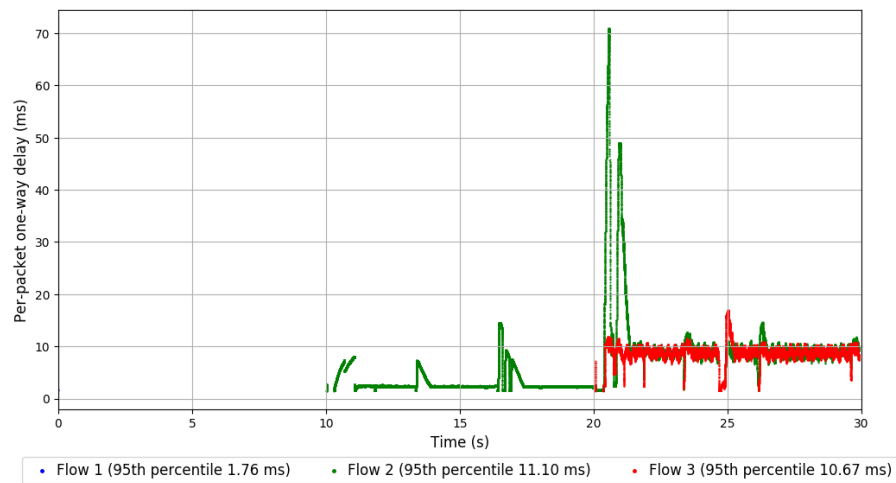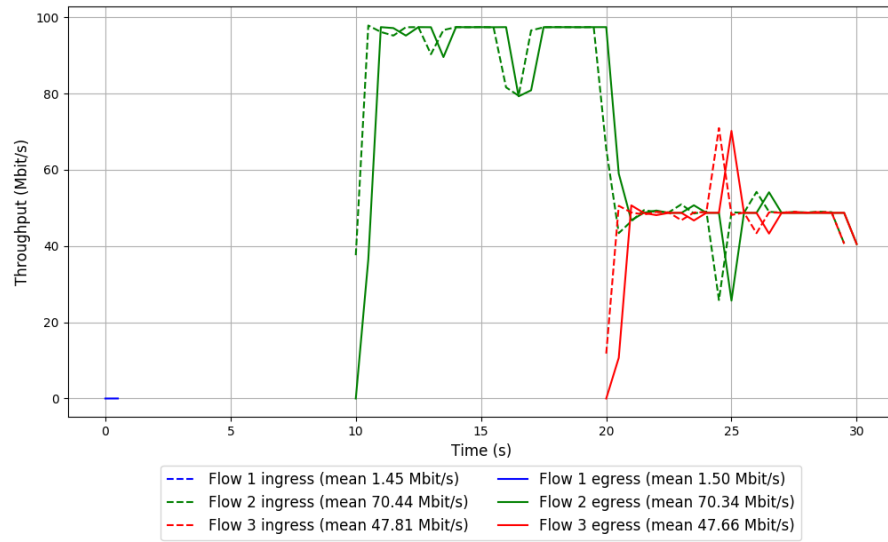
Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 2.06 Mbit/s) --- Flow 1 egress (mean 2.26 Mbit/s)
Flow 2 ingress (mean 70.07 Mbit/s) --- Flow 2 egress (mean 69.99 Mbit/s)
Flow 3 ingress (mean 48.11 Mbit/s) --- Flow 3 egress (mean 47.92 Mbit/s)

Flow 1 (95th percentile 1.20 ms) • Flow 2 (95th percentile 9.84 ms) • Flow 3 (95th percentile 11.20 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-09-06 19:53:45
End at: 2018-09-06 19:54:15
Local clock offset: -4.398 ms
Remote clock offset: 0.796 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 59.75 Mbit/s
95th percentile per-packet one-way delay: 9.956 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 1.060 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 66.09 Mbit/s
95th percentile per-packet one-way delay: 9.509 ms
Loss rate: 0.13%
-- Flow 3:
Average throughput: 47.64 Mbit/s
95th percentile per-packet one-way delay: 10.563 ms
Loss rate: 0.32%
```
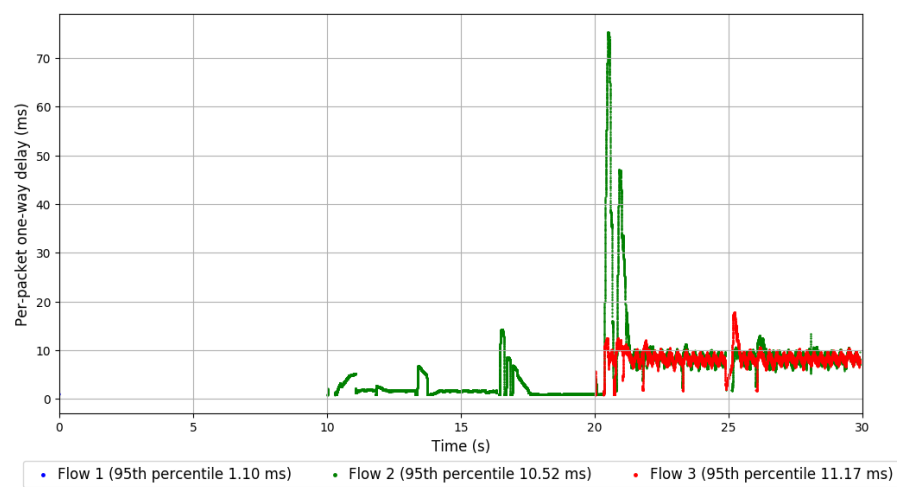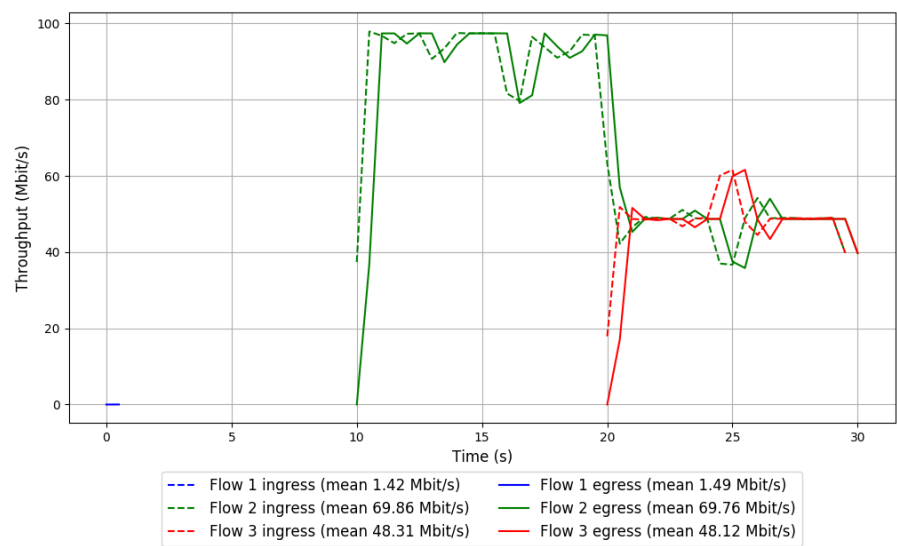
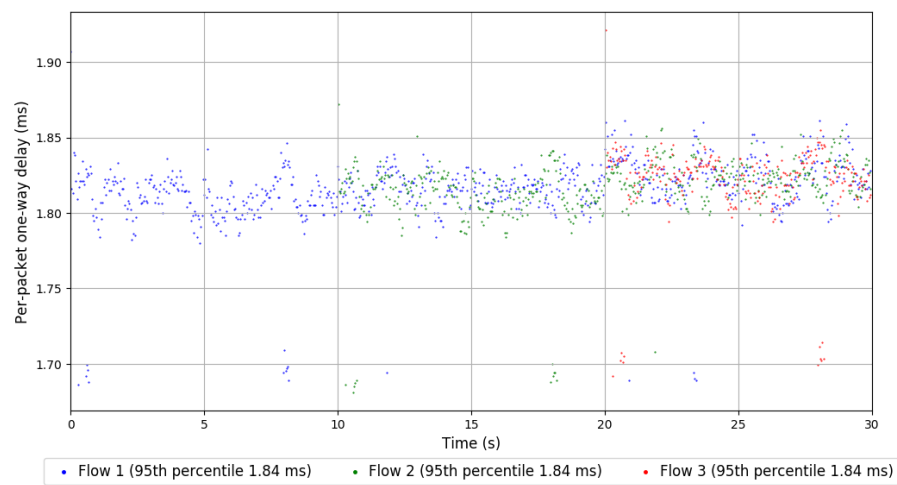Run 3: Report of QUIC Cubic — Data Link

```
Run 4: Statistics of QUIC Cubic

Start at: 2018-09-06 20:14:28
End at: 2018-09-06 20:14:58
Local clock offset: -3.834 ms
Remote clock offset: 1.051 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 62.58 Mbit/s
95th percentile per-packet one-way delay: 10.896 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 1.757 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 70.34 Mbit/s
95th percentile per-packet one-way delay: 11.099 ms
Loss rate: 0.14%
-- Flow 3:
Average throughput: 47.66 Mbit/s
95th percentile per-packet one-way delay: 10.668 ms
Loss rate: 0.33%
```
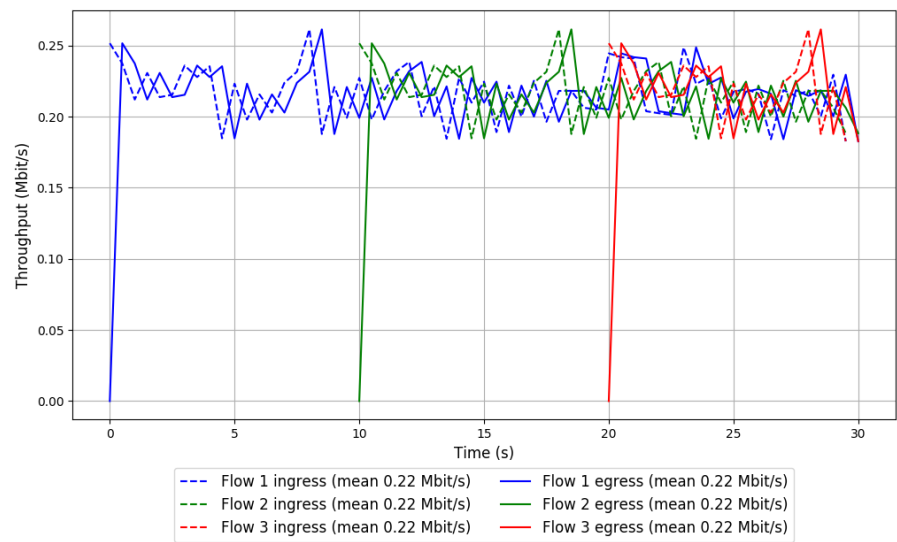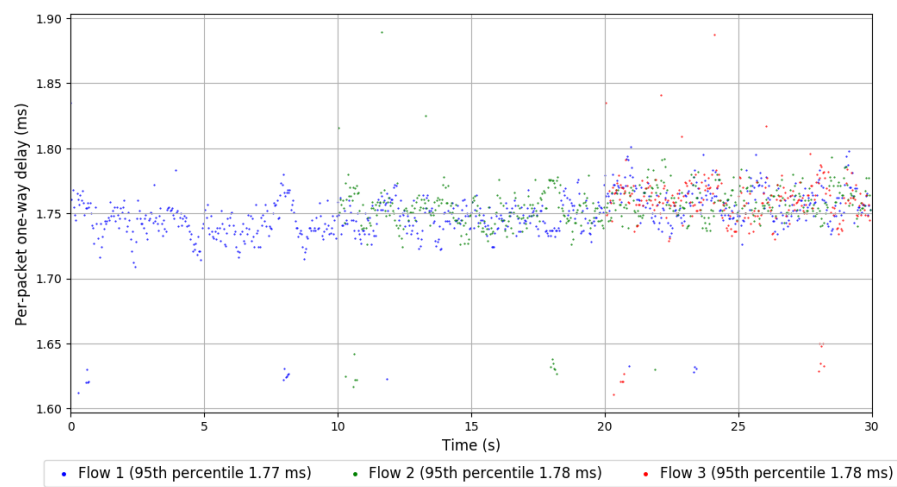
Run 4: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 1.45 Mbit/s) — Flow 1 egress (mean 1.50 Mbit/s)
Flow 2 ingress (mean 70.44 Mbit/s) — Flow 2 egress (mean 70.34 Mbit/s)
Flow 3 ingress (mean 47.81 Mbit/s) — Flow 3 egress (mean 47.66 Mbit/s)

Flow 1 (95th percentile 1.76 ms)   Flow 2 (95th percentile 11.10 ms)   Flow 3 (95th percentile 10.67 ms)

```
Run 5: Statistics of QUIC Cubic

Start at: 2018-09-06 20:35:10
End at: 2018-09-06 20:35:40
Local clock offset: -4.725 ms
Remote clock offset: 1.053 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 62.35 Mbit/s
95th percentile per-packet one-way delay: 10.750 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 1.49 Mbit/s
95th percentile per-packet one-way delay: 1.097 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 69.76 Mbit/s
95th percentile per-packet one-way delay: 10.516 ms
Loss rate: 0.13%
-- Flow 3:
Average throughput: 48.12 Mbit/s
95th percentile per-packet one-way delay: 11.170 ms
Loss rate: 0.40%
```
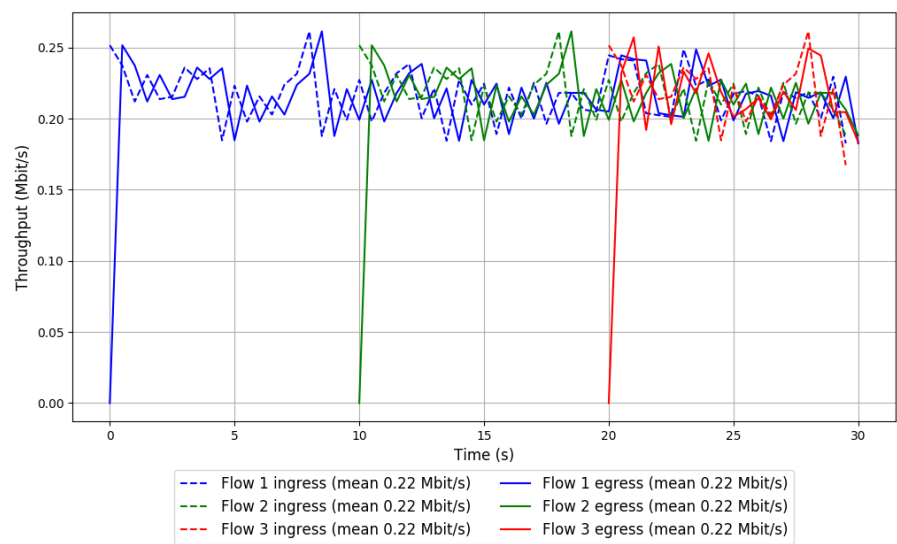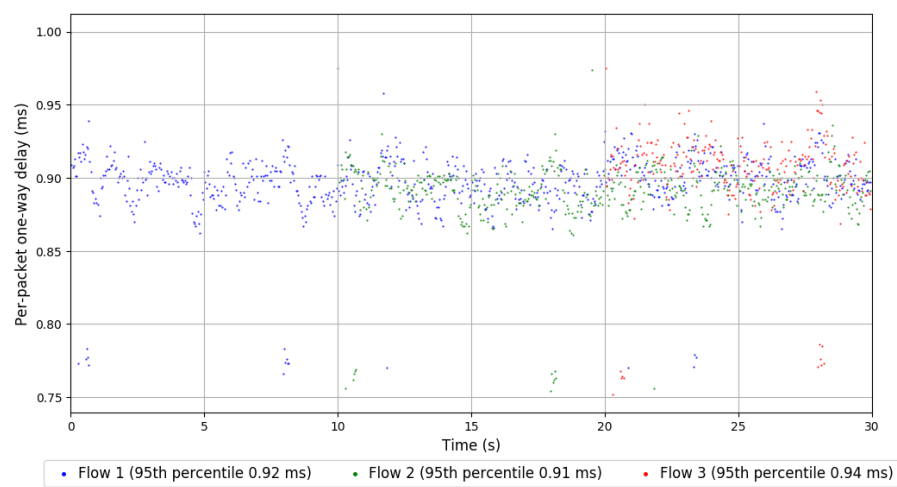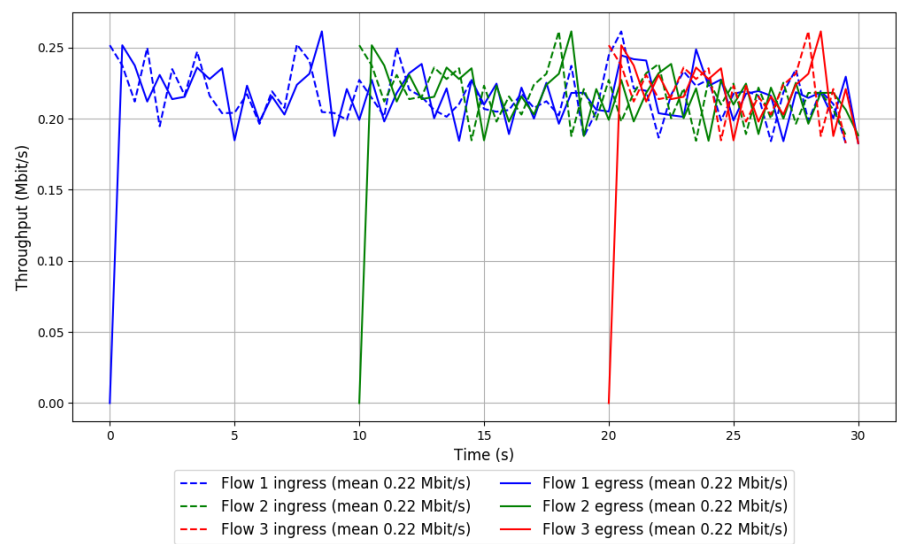
Run 5: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 1.42 Mbit/s) --- Flow 1 egress (mean 1.49 Mbit/s)
Flow 2 ingress (mean 69.86 Mbit/s) --- Flow 2 egress (mean 69.76 Mbit/s)
Flow 3 ingress (mean 48.31 Mbit/s) --- Flow 3 egress (mean 48.12 Mbit/s)

Flow 1 (95th percentile 1.10 ms)   Flow 2 (95th percentile 10.52 ms)   Flow 3 (95th percentile 11.17 ms)

113

```
Run 1: Statistics of SCReAM

Start at: 2018-09-06 19:27:26
End at: 2018-09-06 19:27:56
Local clock offset: -3.268 ms
Remote clock offset: 0.241 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 1.841 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.840 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.840 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.844 ms
Loss rate: 0.00%
```
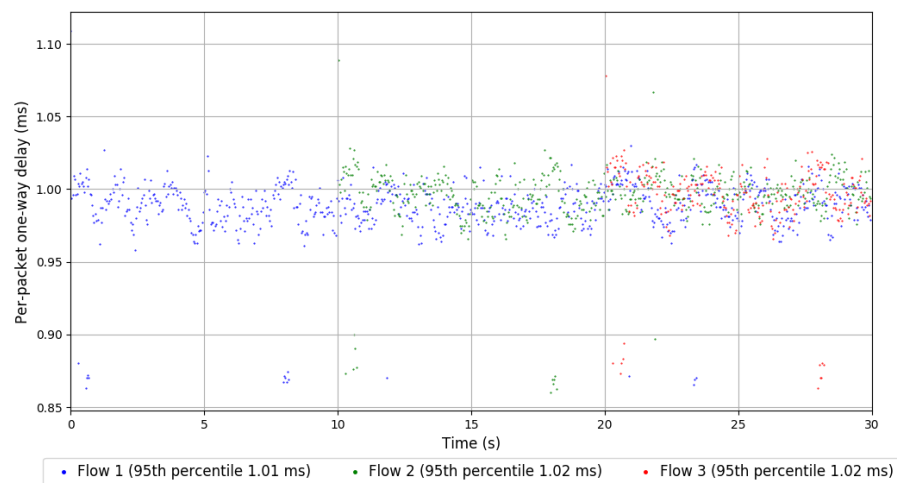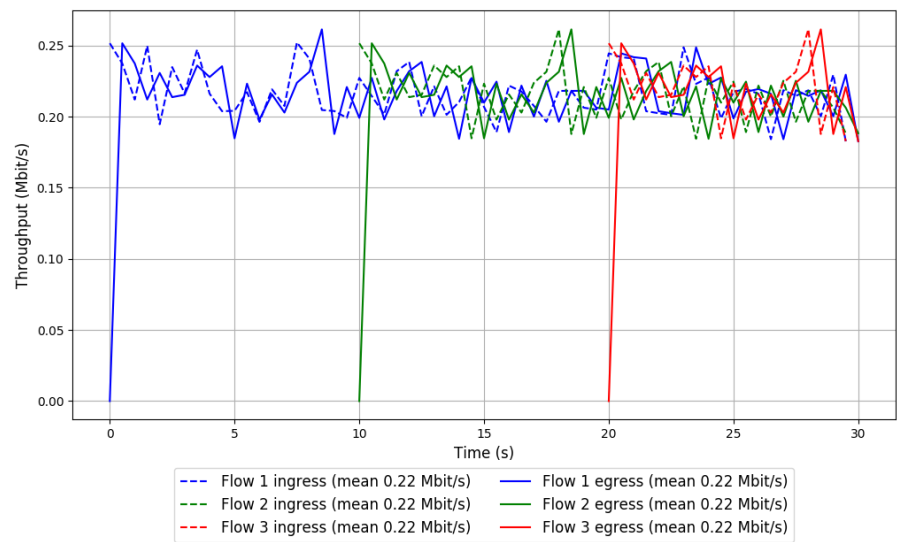
Run 1: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.22 Mbit/s) — — — Flow 1 egress (mean 0.22 Mbit/s) ———
Flow 2 ingress (mean 0.22 Mbit/s) — — — Flow 2 egress (mean 0.22 Mbit/s) ———
Flow 3 ingress (mean 0.22 Mbit/s) — — — Flow 3 egress (mean 0.22 Mbit/s) ———

Flow 1 (95th percentile 1.84 ms)   Flow 2 (95th percentile 1.84 ms)   Flow 3 (95th percentile 1.84 ms)

```
Run 2: Statistics of SCReAM

Start at: 2018-09-06 19:48:06
End at: 2018-09-06 19:48:36
Local clock offset: -3.523 ms
Remote clock offset: 0.643 ms

# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 1.778 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.774 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.778 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.781 ms
Loss rate: 0.00%
```
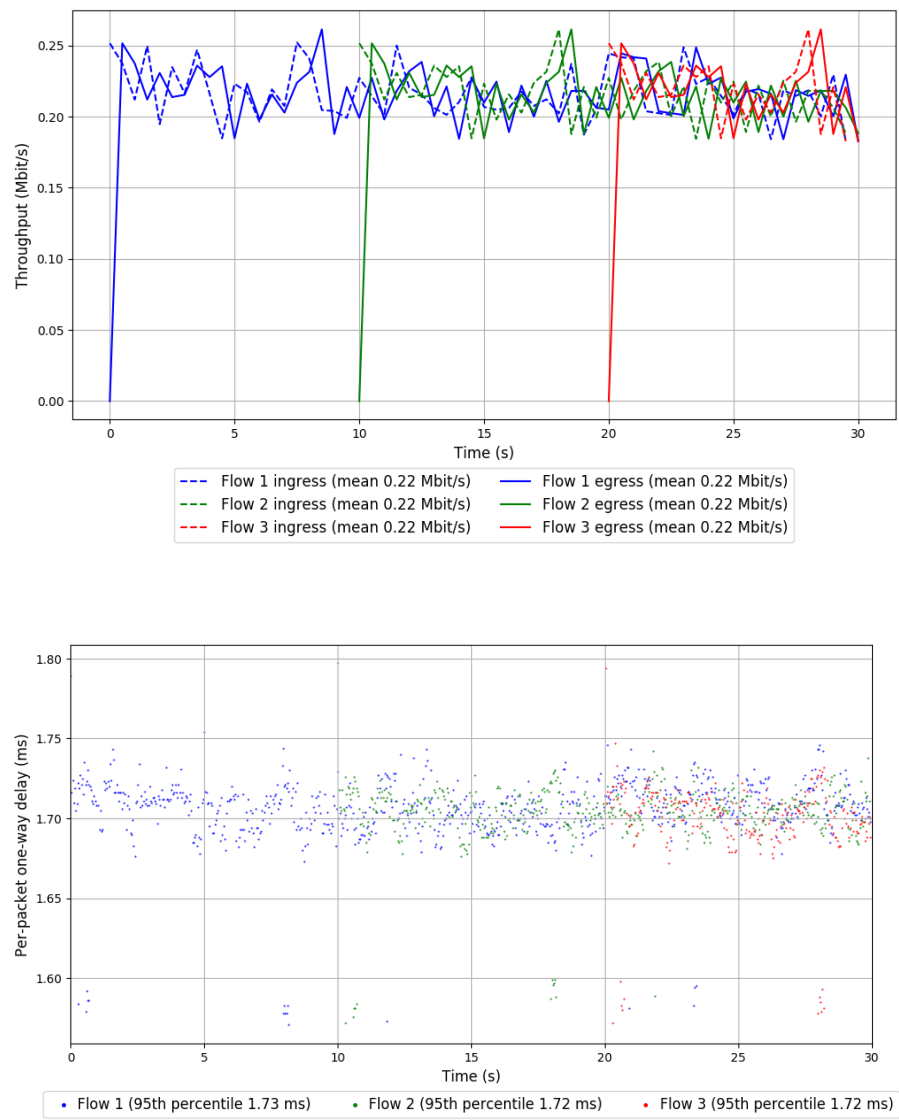
Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-09-06 20:08:49
End at: 2018-09-06 20:09:19
Local clock offset: -4.505 ms
Remote clock offset: 1.001 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 0.922 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 0.921 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 0.912 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 0.937 ms
Loss rate: 0.00%
```
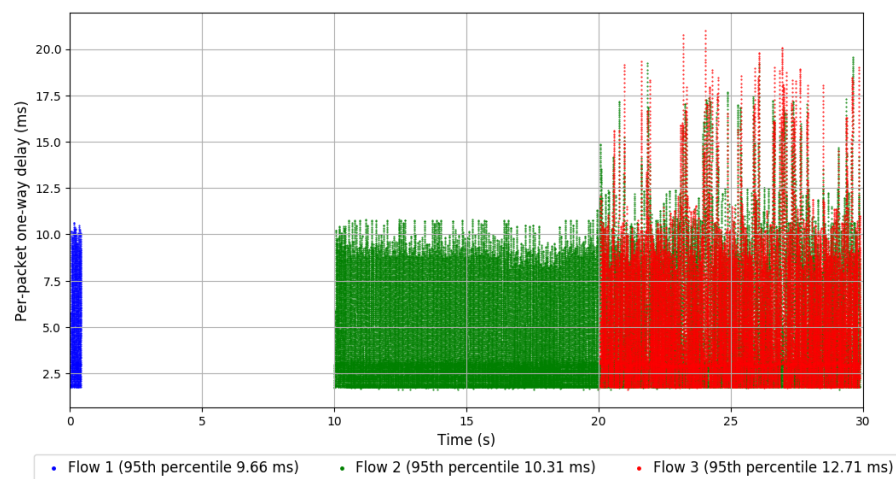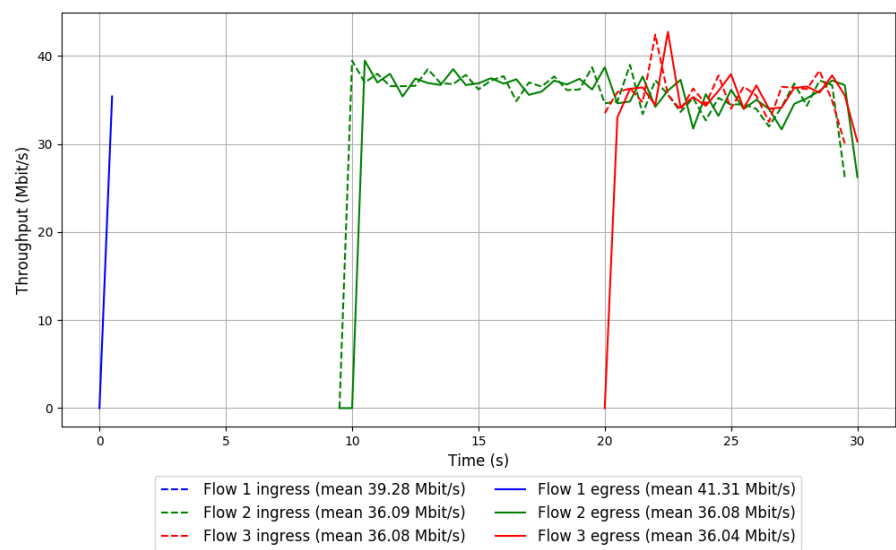
Run 3: Report of SCReAM — Data Link

```
Run 4: Statistics of SCReAM

Start at: 2018-09-06 20:29:32
End at: 2018-09-06 20:30:02
Local clock offset: -4.705 ms
Remote clock offset: 1.006 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 1.015 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.009 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.017 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.019 ms
Loss rate: 0.00%
```
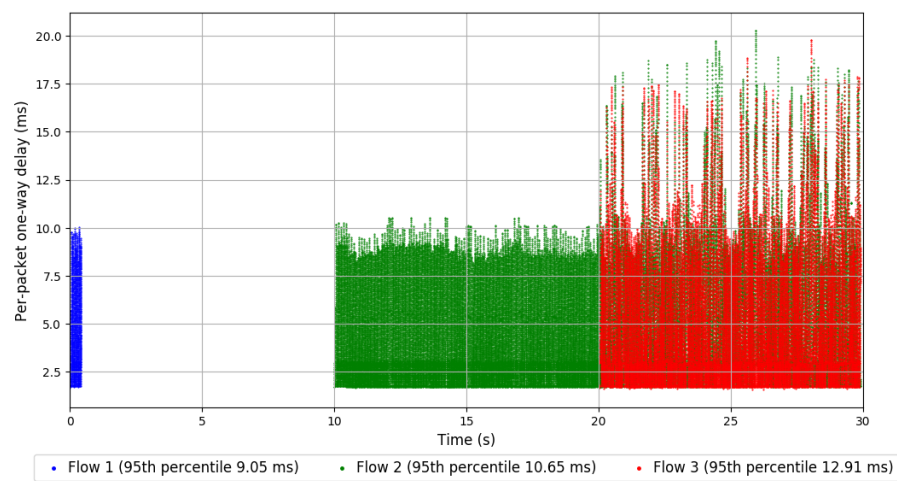
Run 4: Report of SCReAM — Data Link

```
Run 5: Statistics of SCReAM

Start at: 2018-09-06 20:50:11
End at: 2018-09-06 20:50:41
Local clock offset: -4.027 ms
Remote clock offset: 1.066 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 1.727 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.730 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.723 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 1.724 ms
Loss rate: 0.00%
```
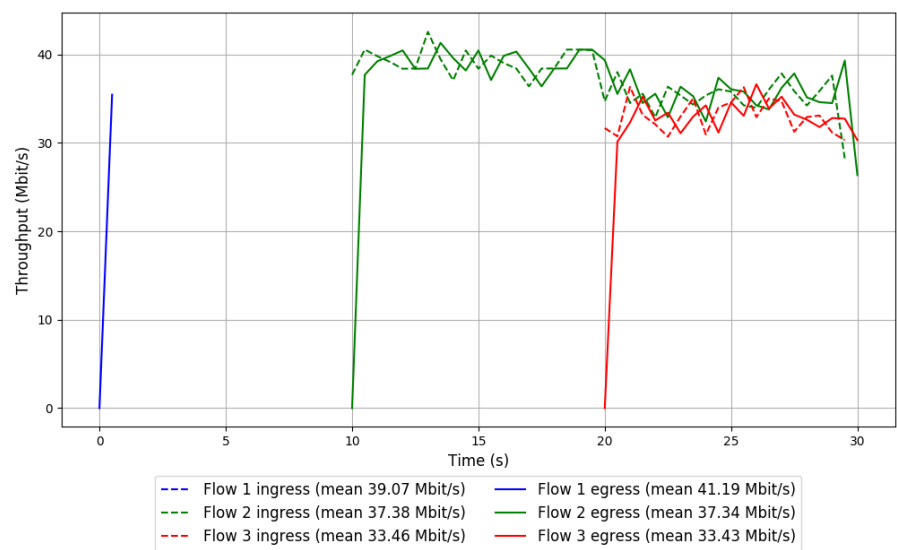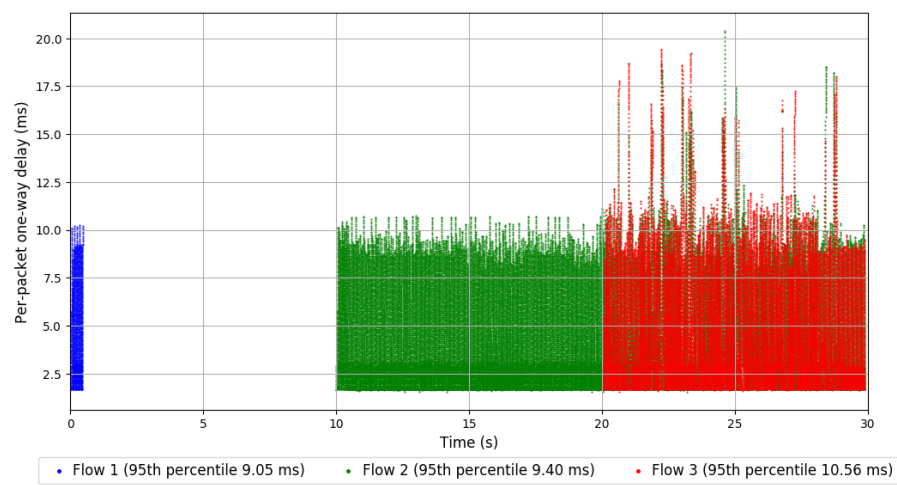
Run 5: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.22 Mbit/s)   Flow 1 egress (mean 0.22 Mbit/s)
Flow 2 ingress (mean 0.22 Mbit/s)   Flow 2 egress (mean 0.22 Mbit/s)
Flow 3 ingress (mean 0.22 Mbit/s)   Flow 3 egress (mean 0.22 Mbit/s)

Flow 1 (95th percentile 1.73 ms)   Flow 2 (95th percentile 1.72 ms)   Flow 3 (95th percentile 1.72 ms)

123

```
Run 1: Statistics of Sprout

Start at: 2018-09-06 19:30:48
End at: 2018-09-06 19:31:18
Local clock offset: -3.331 ms
Remote clock offset: 0.37 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 36.50 Mbit/s
95th percentile per-packet one-way delay: 10.778 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 41.31 Mbit/s
95th percentile per-packet one-way delay: 9.658 ms
Loss rate: 2.86%
-- Flow 2:
Average throughput: 36.08 Mbit/s
95th percentile per-packet one-way delay: 10.310 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 36.04 Mbit/s
95th percentile per-packet one-way delay: 12.707 ms
Loss rate: 0.02%
```
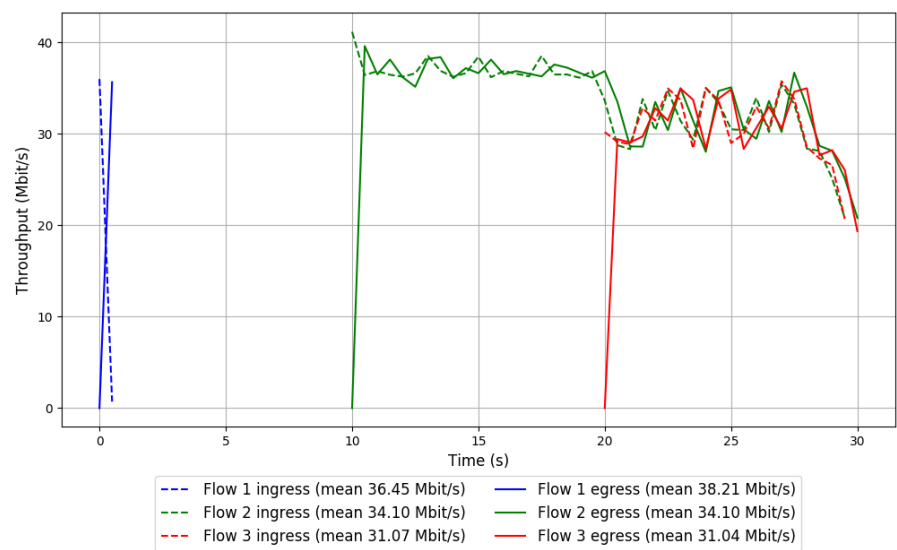
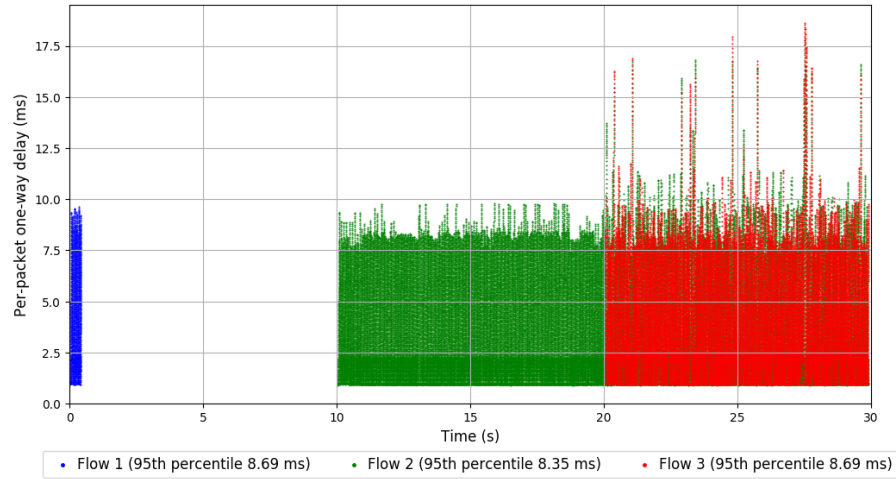## Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-09-06 19:51:28
End at: 2018-09-06 19:51:58
Local clock offset: -3.605 ms
Remote clock offset: 0.719 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 36.48 Mbit/s
95th percentile per-packet one-way delay: 11.632 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 41.19 Mbit/s
95th percentile per-packet one-way delay: 9.047 ms
Loss rate: 2.86%
-- Flow 2:
Average throughput: 37.34 Mbit/s
95th percentile per-packet one-way delay: 10.649 ms
Loss rate: 0.13%
-- Flow 3:
Average throughput: 33.43 Mbit/s
95th percentile per-packet one-way delay: 12.909 ms
Loss rate: 0.00%
```
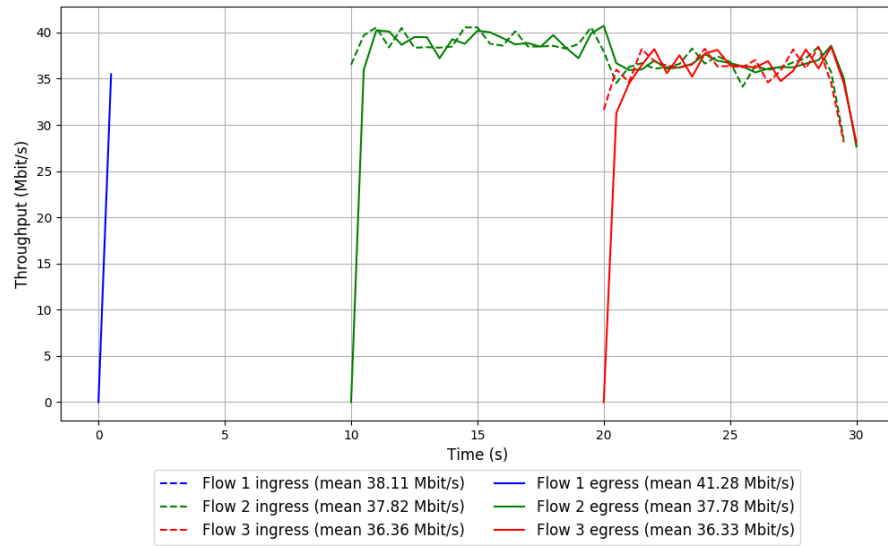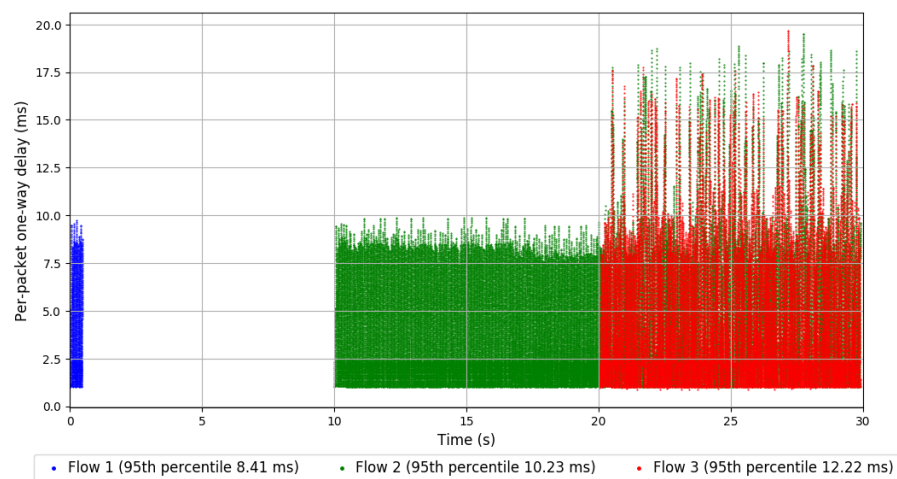
Run 2: Report of Sprout — Data Link

Flow 1 ingress (mean 39.07 Mbit/s) --- Flow 1 egress (mean 41.19 Mbit/s)
Flow 2 ingress (mean 37.38 Mbit/s) --- Flow 2 egress (mean 37.34 Mbit/s)
Flow 3 ingress (mean 33.46 Mbit/s) --- Flow 3 egress (mean 33.43 Mbit/s)

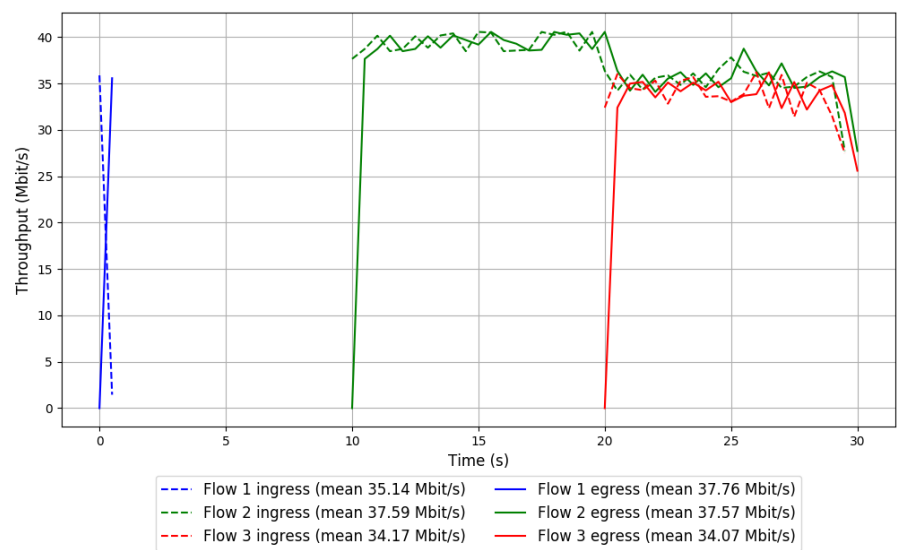Flow 1 (95th percentile 9.05 ms)   Flow 2 (95th percentile 10.65 ms)   Flow 3 (95th percentile 12.91 ms)

```
Run 3: Statistics of Sprout

Start at: 2018-09-06 20:12:12
End at: 2018-09-06 20:12:42
Local clock offset: -3.775 ms
Remote clock offset: 1.006 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 33.50 Mbit/s
95th percentile per-packet one-way delay: 9.744 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 38.21 Mbit/s
95th percentile per-packet one-way delay: 9.047 ms
Loss rate: 2.84%
-- Flow 2:
Average throughput: 34.10 Mbit/s
95th percentile per-packet one-way delay: 9.402 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 31.04 Mbit/s
95th percentile per-packet one-way delay: 10.560 ms
Loss rate: 0.31%
```

Run 3: Report of Sprout — Data Link

```
Run 4: Statistics of Sprout

Start at: 2018-09-06 20:32:54
End at: 2018-09-06 20:33:24
Local clock offset: -4.725 ms
Remote clock offset: 1.052 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 37.70 Mbit/s
95th percentile per-packet one-way delay: 8.450 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 41.28 Mbit/s
95th percentile per-packet one-way delay: 8.694 ms
Loss rate: 4.71%
-- Flow 2:
Average throughput: 37.78 Mbit/s
95th percentile per-packet one-way delay: 8.349 ms
Loss rate: 0.11%
-- Flow 3:
Average throughput: 36.33 Mbit/s
95th percentile per-packet one-way delay: 8.691 ms
Loss rate: 0.00%
```
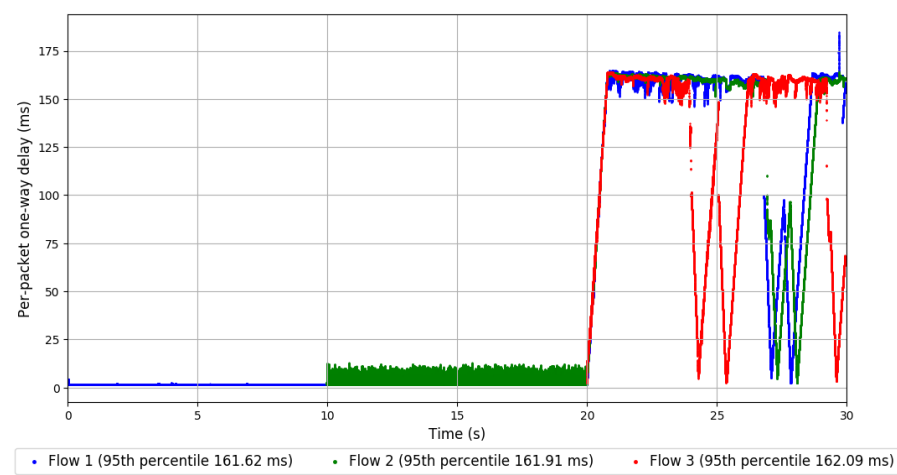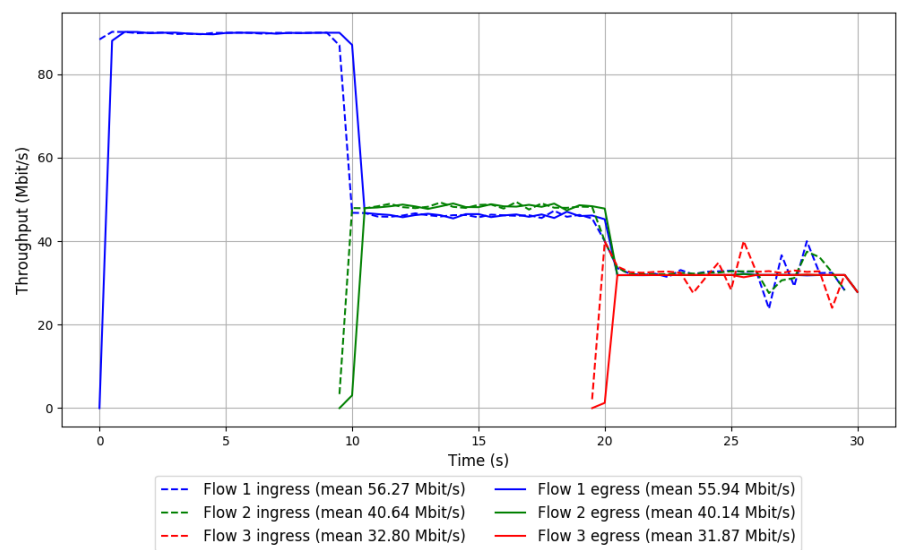
Run 4: Report of Sprout — Data Link

Flow 1 ingress (mean 38.11 Mbit/s) --- Flow 1 egress (mean 41.28 Mbit/s)
Flow 2 ingress (mean 37.82 Mbit/s) --- Flow 2 egress (mean 37.78 Mbit/s)
Flow 3 ingress (mean 36.36 Mbit/s) --- Flow 3 egress (mean 36.33 Mbit/s)

Flow 1 (95th percentile 8.69 ms)   Flow 2 (95th percentile 8.35 ms)   Flow 3 (95th percentile 8.69 ms)

131

```
Run 5: Statistics of Sprout

Start at: 2018-09-06 20:53:34
End at: 2018-09-06 20:54:04
Local clock offset: -4.814 ms
Remote clock offset: 1.001 ms


# Below is generated by plot.py at 2018-09-06 21:06:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 36.84 Mbit/s
95th percentile per-packet one-way delay: 11.095 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 37.76 Mbit/s
95th percentile per-packet one-way delay: 8.410 ms
Loss rate: 4.70%
-- Flow 2:
Average throughput: 37.57 Mbit/s
95th percentile per-packet one-way delay: 10.233 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 34.07 Mbit/s
95th percentile per-packet one-way delay: 12.225 ms
Loss rate: 0.28%
```
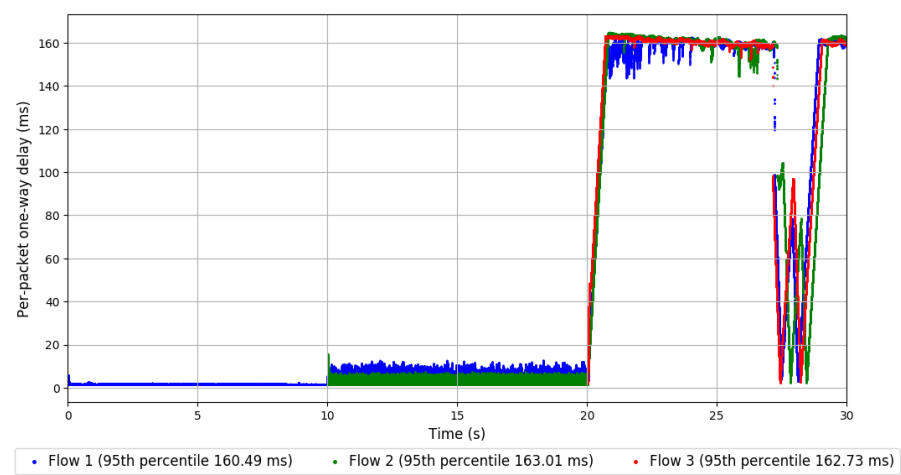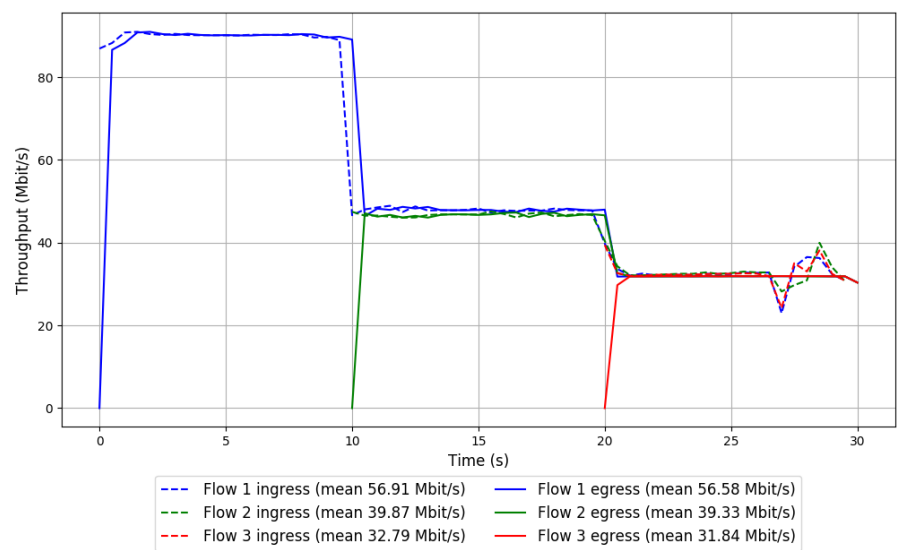
Run 5: Report of Sprout — Data Link

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

Start at: 2018-09-06 19:23:54
End at: 2018-09-06 19:24:24
Local clock offset: -3.163 ms
Remote clock offset: 0.329 ms


# Below is generated by plot.py at 2018-09-06 21:07:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 93.32 Mbit/s
95th percentile per-packet one-way delay: 161.820 ms
Loss rate: 1.04%
-- Flow 1:
Average throughput: 55.94 Mbit/s
95th percentile per-packet one-way delay: 161.619 ms
Loss rate: 0.58%
-- Flow 2:
Average throughput: 40.14 Mbit/s
95th percentile per-packet one-way delay: 161.912 ms
Loss rate: 1.24%
-- Flow 3:
Average throughput: 31.87 Mbit/s
95th percentile per-packet one-way delay: 162.086 ms
Loss rate: 2.86%
```
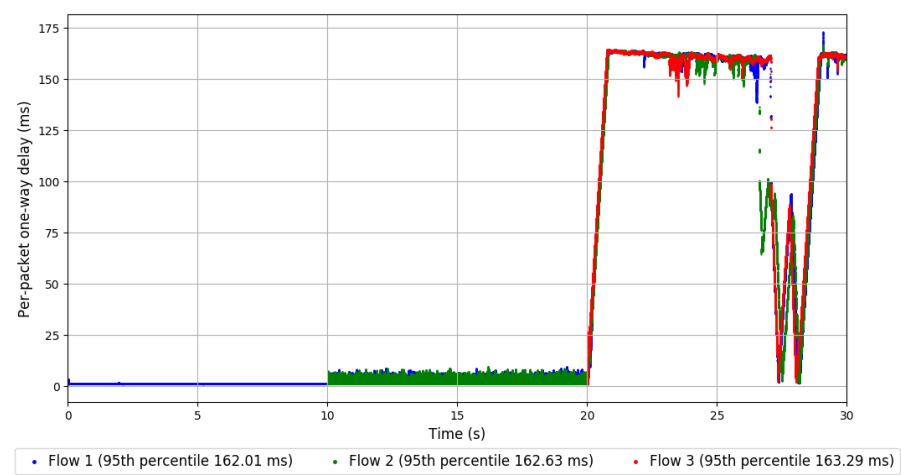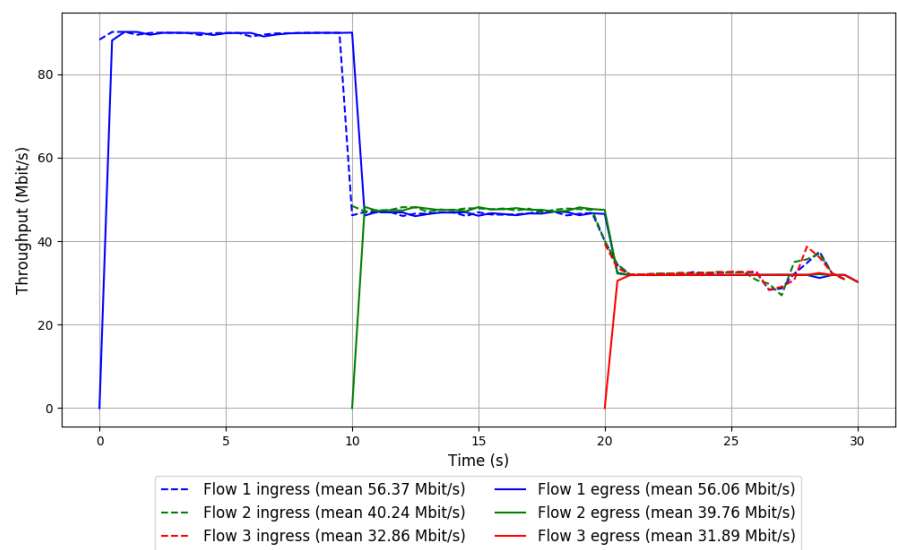
Run 1: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 56.27 Mbit/s) --- Flow 1 egress (mean 55.94 Mbit/s)
Flow 2 ingress (mean 40.64 Mbit/s) --- Flow 2 egress (mean 40.14 Mbit/s)
Flow 3 ingress (mean 32.80 Mbit/s) --- Flow 3 egress (mean 31.87 Mbit/s)

Flow 1 (95th percentile 161.62 ms) • Flow 2 (95th percentile 161.91 ms) • Flow 3 (95th percentile 162.09 ms)

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

Start at: 2018-09-06 19:44:34
End at: 2018-09-06 19:45:04
Local clock offset: -3.398 ms
Remote clock offset: 0.701 ms


# Below is generated by plot.py at 2018-09-06 21:07:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 93.35 Mbit/s
95th percentile per-packet one-way delay: 161.979 ms
Loss rate: 1.08%
-- Flow 1:
Average throughput: 56.58 Mbit/s
95th percentile per-packet one-way delay: 160.493 ms
Loss rate: 0.58%
-- Flow 2:
Average throughput: 39.33 Mbit/s
95th percentile per-packet one-way delay: 163.010 ms
Loss rate: 1.39%
-- Flow 3:
Average throughput: 31.84 Mbit/s
95th percentile per-packet one-way delay: 162.728 ms
Loss rate: 2.94%
```
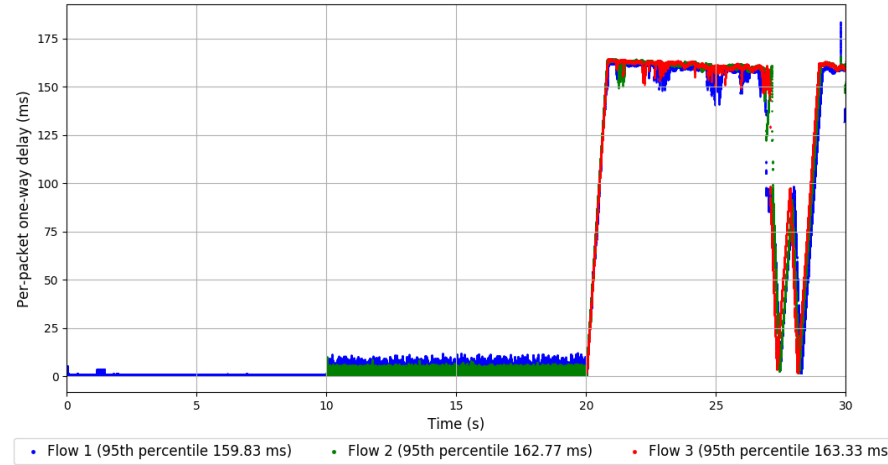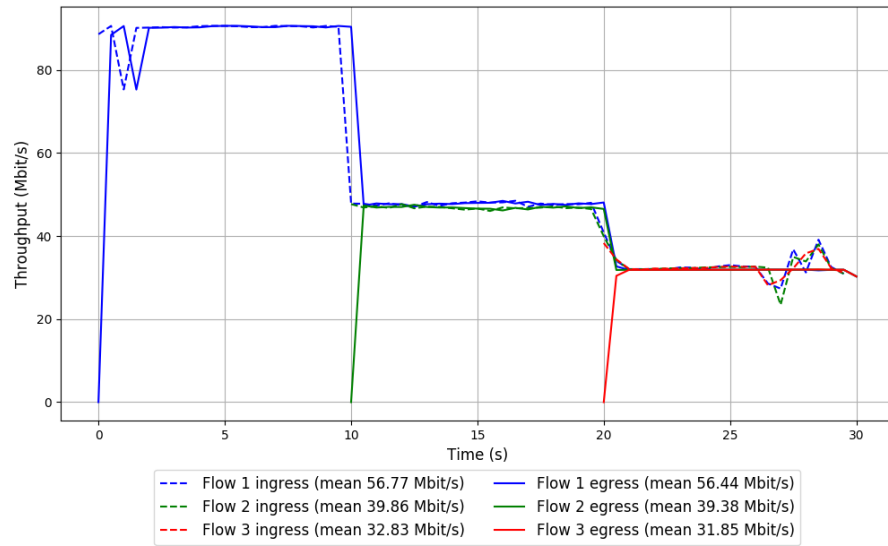
Run 2: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 56.91 Mbit/s) --- Flow 1 egress (mean 56.58 Mbit/s)
Flow 2 ingress (mean 39.87 Mbit/s) --- Flow 2 egress (mean 39.33 Mbit/s)
Flow 3 ingress (mean 32.79 Mbit/s) --- Flow 3 egress (mean 31.84 Mbit/s)

Flow 1 (95th percentile 160.49 ms)   Flow 2 (95th percentile 163.01 ms)   Flow 3 (95th percentile 162.73 ms)

```
Run 3: Statistics of TaoVA-100x

Start at: 2018-09-06 20:05:17
End at: 2018-09-06 20:05:47
Local clock offset: -4.5 ms
Remote clock offset: 0.866 ms


# Below is generated by plot.py at 2018-09-06 21:07:38
# Datalink statistics
-- Total of 3 flows:
Average throughput: 93.15 Mbit/s
95th percentile per-packet one-way delay: 162.575 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 56.06 Mbit/s
95th percentile per-packet one-way delay: 162.010 ms
Loss rate: 0.56%
-- Flow 2:
Average throughput: 39.76 Mbit/s
95th percentile per-packet one-way delay: 162.628 ms
Loss rate: 1.21%
-- Flow 3:
Average throughput: 31.89 Mbit/s
95th percentile per-packet one-way delay: 163.286 ms
Loss rate: 2.99%
```
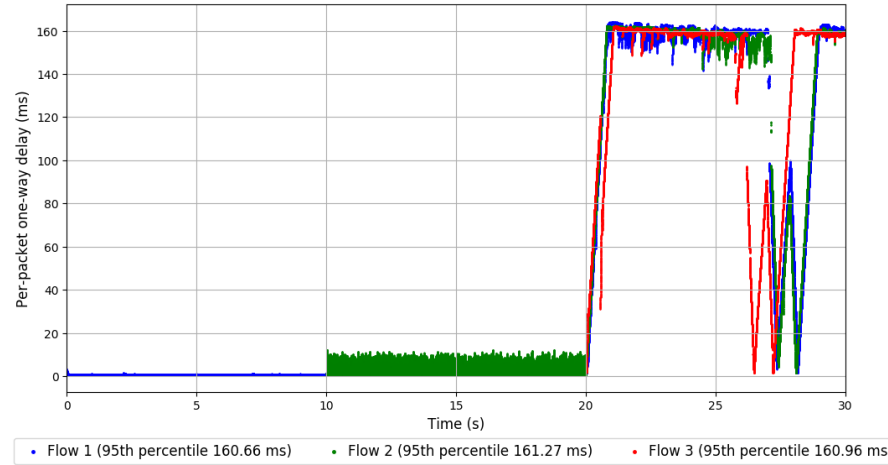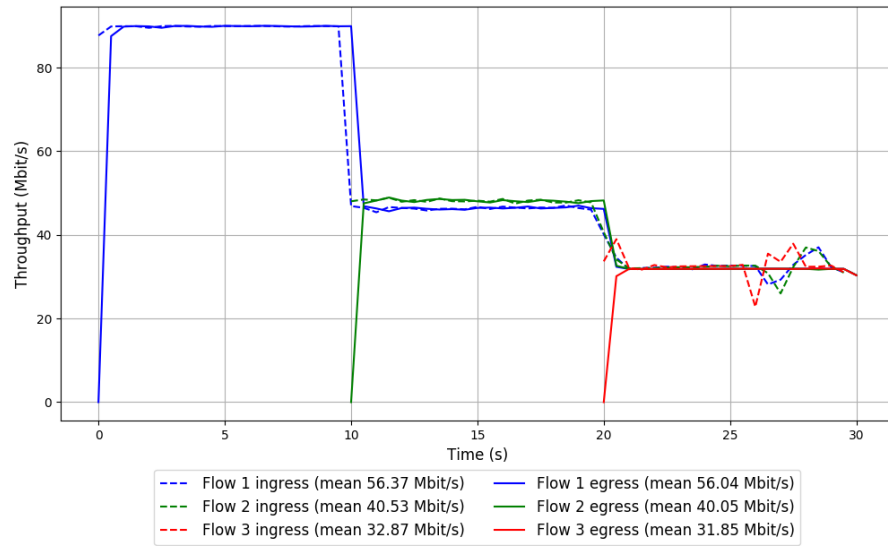
Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 56.37 Mbit/s)   Flow 1 egress (mean 56.06 Mbit/s)
Flow 2 ingress (mean 40.24 Mbit/s)   Flow 2 egress (mean 39.76 Mbit/s)
Flow 3 ingress (mean 32.86 Mbit/s)   Flow 3 egress (mean 31.89 Mbit/s)

Flow 1 (95th percentile 162.01 ms)   Flow 2 (95th percentile 162.63 ms)   Flow 3 (95th percentile 163.29 ms)

139

```
Run 4: Statistics of TaoVA-100x

Start at: 2018-09-06 20:26:01
End at: 2018-09-06 20:26:31
Local clock offset: -4.678 ms
Remote clock offset: 1.015 ms


# Below is generated by plot.py at 2018-09-06 21:07:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 93.25 Mbit/s
95th percentile per-packet one-way delay: 162.278 ms
Loss rate: 1.06%
-- Flow 1:
Average throughput: 56.44 Mbit/s
95th percentile per-packet one-way delay: 159.828 ms
Loss rate: 0.60%
-- Flow 2:
Average throughput: 39.38 Mbit/s
95th percentile per-packet one-way delay: 162.768 ms
Loss rate: 1.23%
-- Flow 3:
Average throughput: 31.85 Mbit/s
95th percentile per-packet one-way delay: 163.332 ms
Loss rate: 2.99%
```
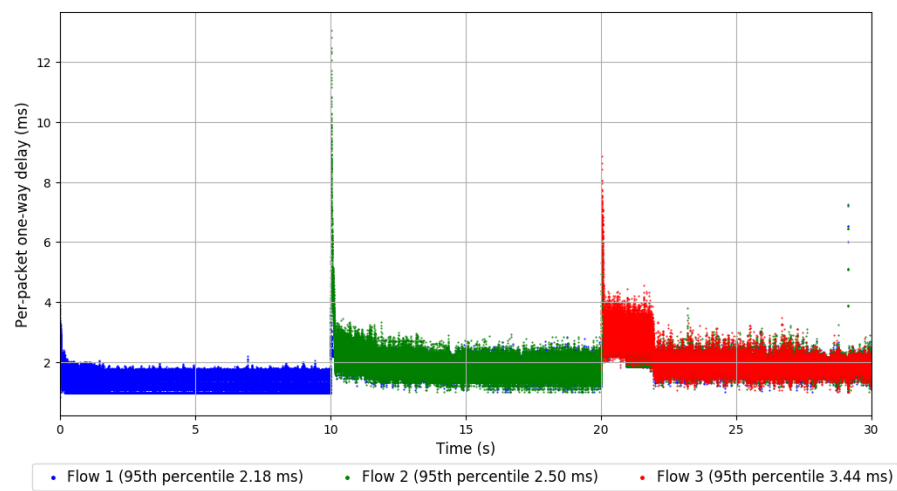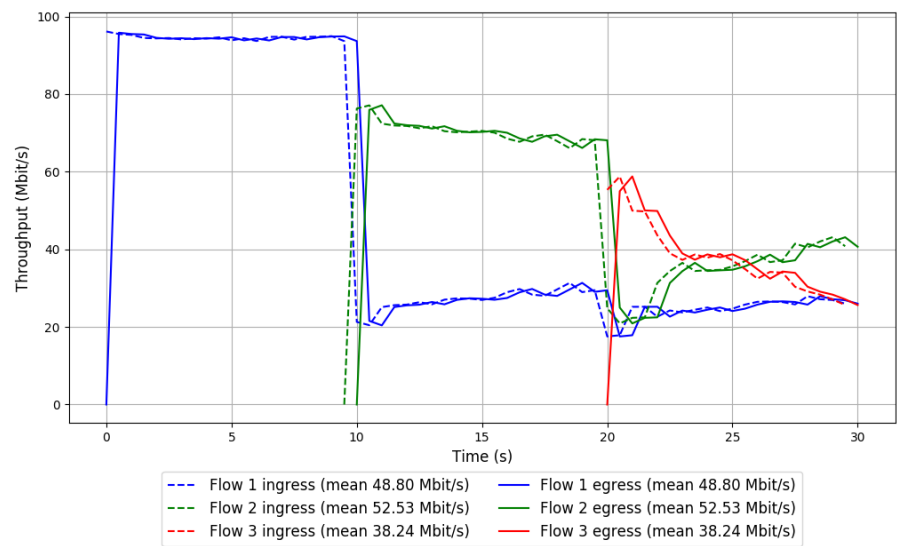
Run 4: Report of TaoVA-100x — Data Link

- - - - Flow 1 ingress (mean 56.77 Mbit/s)   —— Flow 1 egress (mean 56.44 Mbit/s)
- - - - Flow 2 ingress (mean 39.86 Mbit/s)   —— Flow 2 egress (mean 39.38 Mbit/s)
- - - - Flow 3 ingress (mean 32.83 Mbit/s)   —— Flow 3 egress (mean 31.85 Mbit/s)

- Flow 1 (95th percentile 159.83 ms)   • Flow 2 (95th percentile 162.77 ms)   • Flow 3 (95th percentile 163.33 ms)

141

```
Run 5: Statistics of TaoVA-100x

Start at: 2018-09-06 20:46:39
End at: 2018-09-06 20:47:09
Local clock offset: -4.745 ms
Remote clock offset: 1.119 ms


# Below is generated by plot.py at 2018-09-06 21:07:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 93.30 Mbit/s
95th percentile per-packet one-way delay: 160.989 ms
Loss rate: 1.06%
-- Flow 1:
Average throughput: 56.04 Mbit/s
95th percentile per-packet one-way delay: 160.656 ms
Loss rate: 0.58%
-- Flow 2:
Average throughput: 40.05 Mbit/s
95th percentile per-packet one-way delay: 161.268 ms
Loss rate: 1.21%
-- Flow 3:
Average throughput: 31.85 Mbit/s
95th percentile per-packet one-way delay: 160.960 ms
Loss rate: 3.18%
```
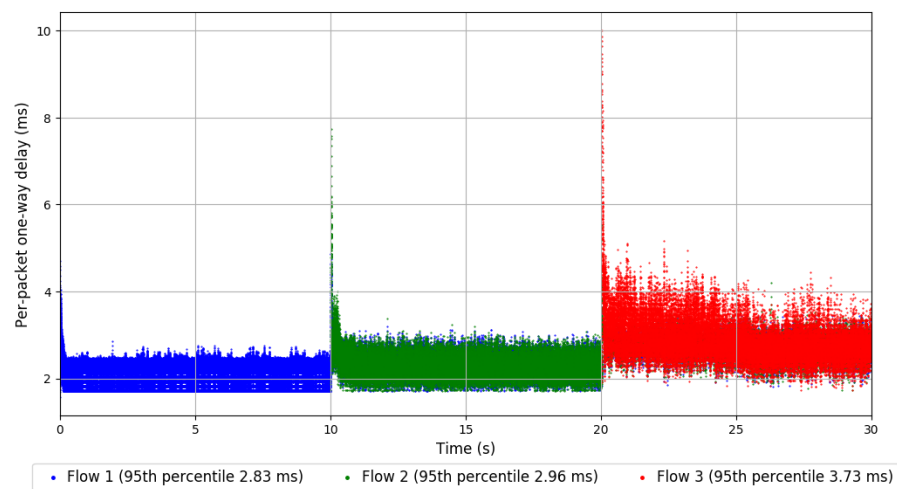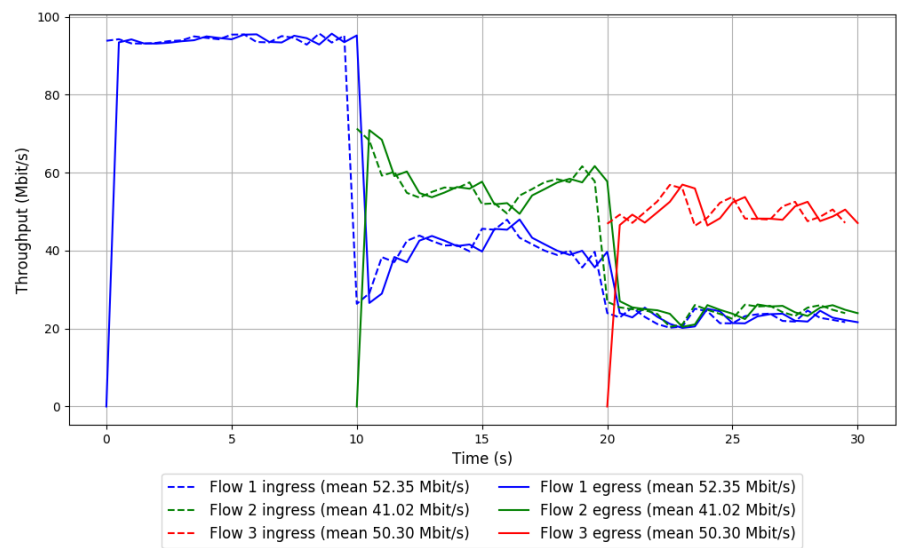
Run 5: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 56.37 Mbit/s) --- Flow 1 egress (mean 56.04 Mbit/s)
Flow 2 ingress (mean 40.53 Mbit/s) --- Flow 2 egress (mean 40.05 Mbit/s)
Flow 3 ingress (mean 32.87 Mbit/s) --- Flow 3 egress (mean 31.85 Mbit/s)

Flow 1 (95th percentile 160.66 ms)   Flow 2 (95th percentile 161.27 ms)   Flow 3 (95th percentile 160.96 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2018-09-06 19:21:36
End at: 2018-09-06 19:22:06
Local clock offset: -3.886 ms
Remote clock offset: 0.181 ms


# Below is generated by plot.py at 2018-09-06 21:07:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.52 Mbit/s
95th percentile per-packet one-way delay: 2.524 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 48.80 Mbit/s
95th percentile per-packet one-way delay: 2.182 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 52.53 Mbit/s
95th percentile per-packet one-way delay: 2.495 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 38.24 Mbit/s
95th percentile per-packet one-way delay: 3.444 ms
Loss rate: 0.02%
```
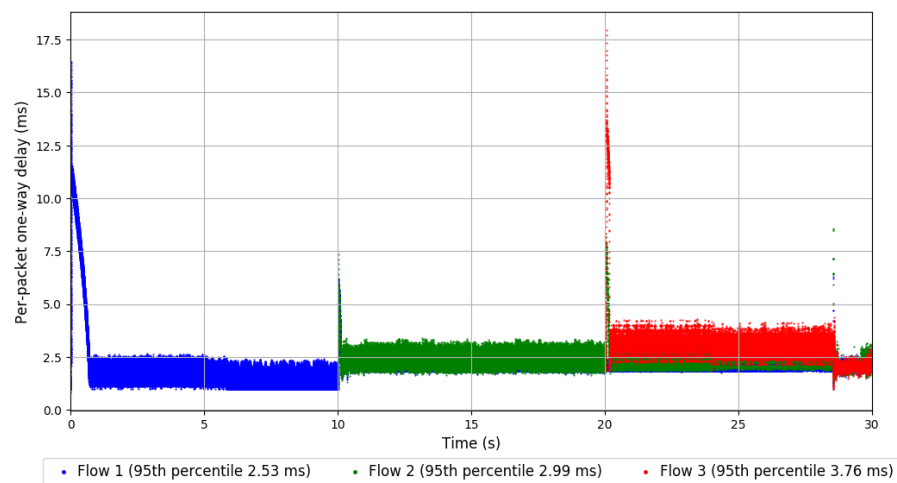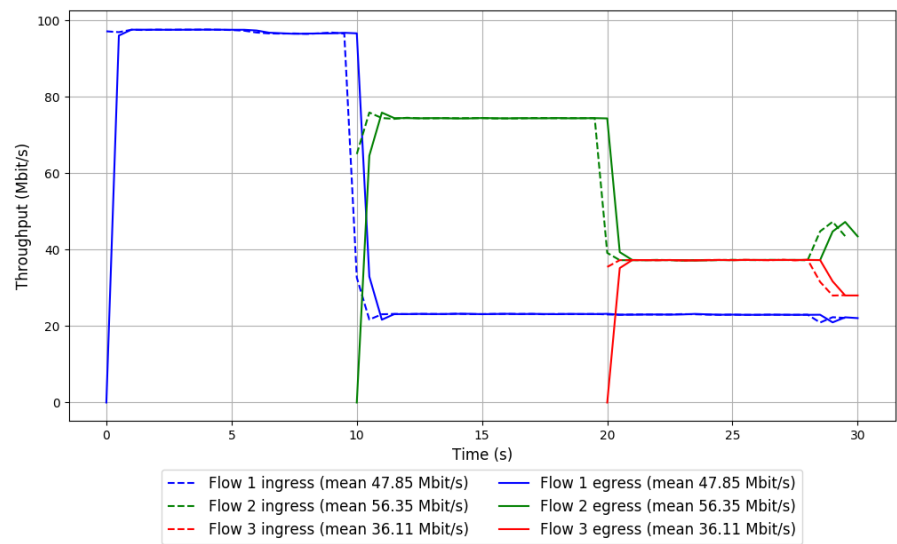
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-09-06 19:42:16
End at: 2018-09-06 19:42:46
Local clock offset: -3.468 ms
Remote clock offset: 0.554 ms


# Below is generated by plot.py at 2018-09-06 21:07:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.37 Mbit/s
95th percentile per-packet one-way delay: 3.115 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 52.35 Mbit/s
95th percentile per-packet one-way delay: 2.835 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 41.02 Mbit/s
95th percentile per-packet one-way delay: 2.965 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 50.30 Mbit/s
95th percentile per-packet one-way delay: 3.728 ms
Loss rate: 0.03%
```
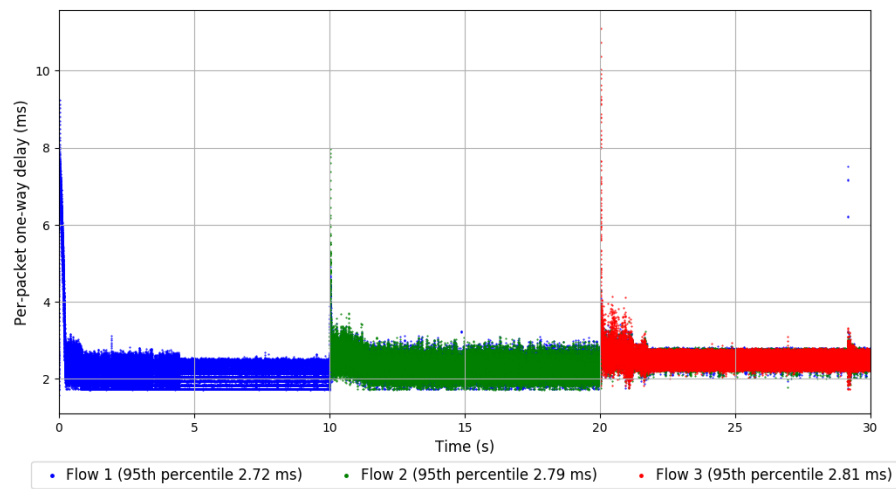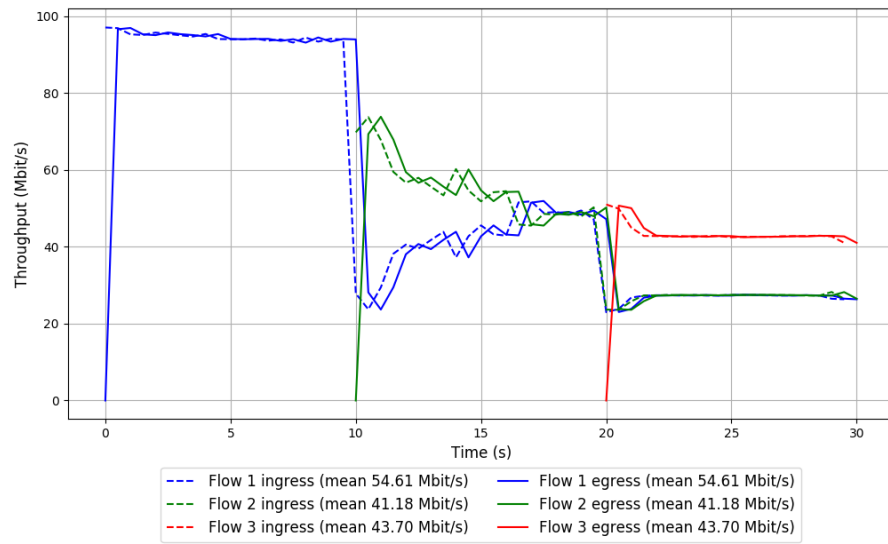
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-09-06 20:02:59
End at: 2018-09-06 20:03:29
Local clock offset: -4.486 ms
Remote clock offset: 0.845 ms


# Below is generated by plot.py at 2018-09-06 21:07:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.37 Mbit/s
95th percentile per-packet one-way delay: 3.417 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 47.85 Mbit/s
95th percentile per-packet one-way delay: 2.526 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 56.35 Mbit/s
95th percentile per-packet one-way delay: 2.991 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 36.11 Mbit/s
95th percentile per-packet one-way delay: 3.759 ms
Loss rate: 0.02%
```
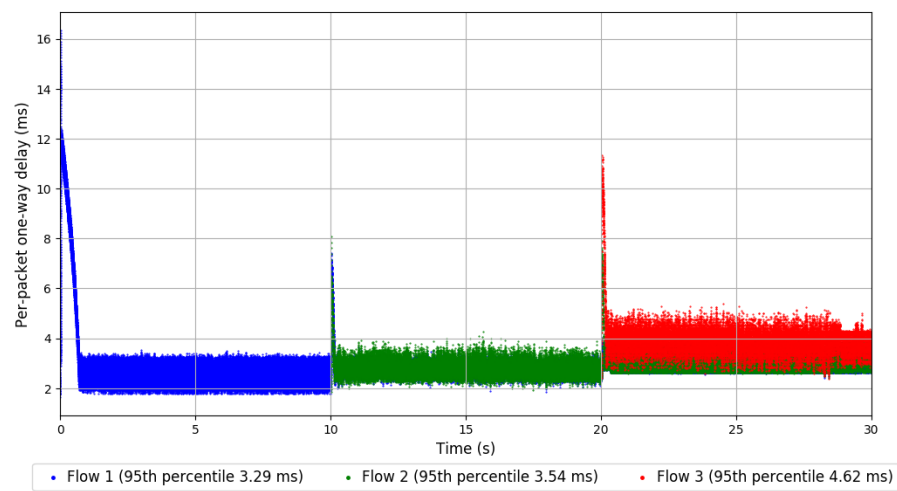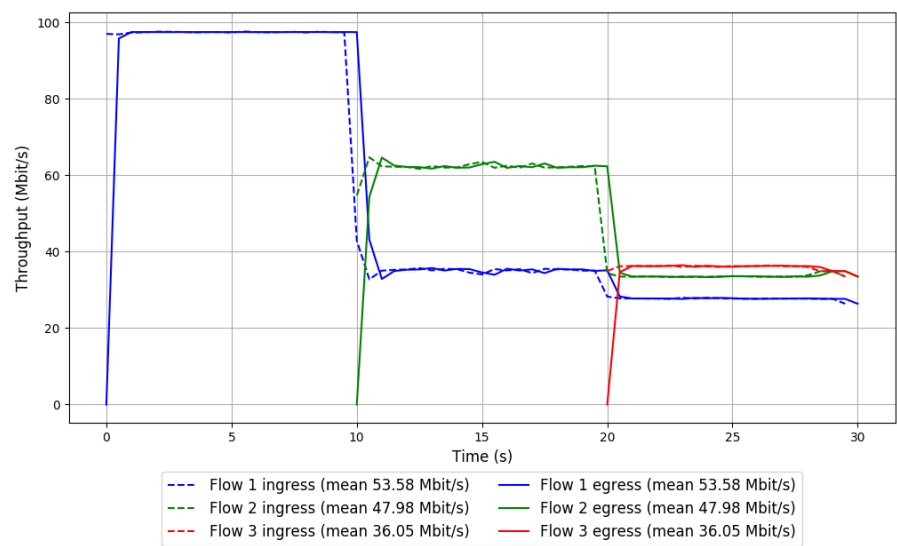
Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 47.85 Mbit/s) --- Flow 1 egress (mean 47.85 Mbit/s)
Flow 2 ingress (mean 56.35 Mbit/s) --- Flow 2 egress (mean 56.35 Mbit/s)
Flow 3 ingress (mean 36.11 Mbit/s) --- Flow 3 egress (mean 36.11 Mbit/s)

Flow 1 (95th percentile 2.53 ms)   •   Flow 2 (95th percentile 2.99 ms)   •   Flow 3 (95th percentile 3.76 ms)

```
Run 4: Statistics of TCP Vegas

Start at: 2018-09-06 20:23:43
End at: 2018-09-06 20:24:13
Local clock offset: -3.91 ms
Remote clock offset: 1.035 ms


# Below is generated by plot.py at 2018-09-06 21:08:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.55 Mbit/s
95th percentile per-packet one-way delay: 2.755 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 54.61 Mbit/s
95th percentile per-packet one-way delay: 2.723 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 41.18 Mbit/s
95th percentile per-packet one-way delay: 2.789 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 43.70 Mbit/s
95th percentile per-packet one-way delay: 2.805 ms
Loss rate: 0.03%
```
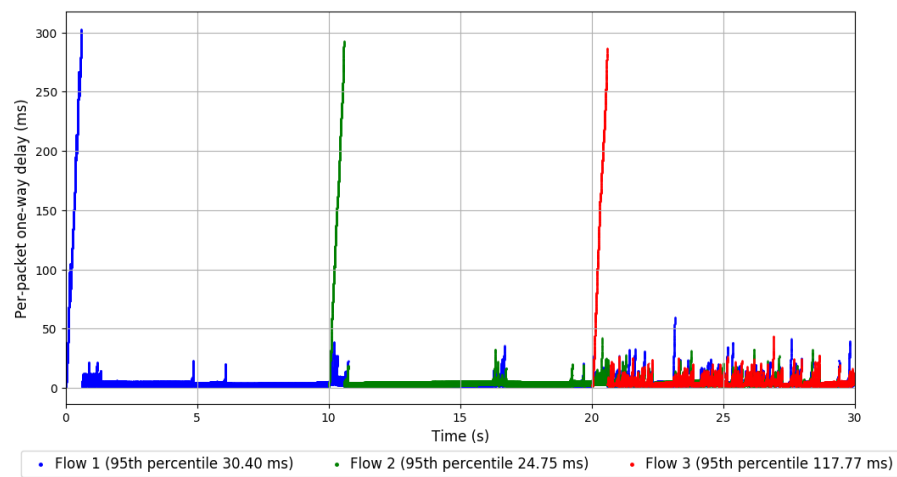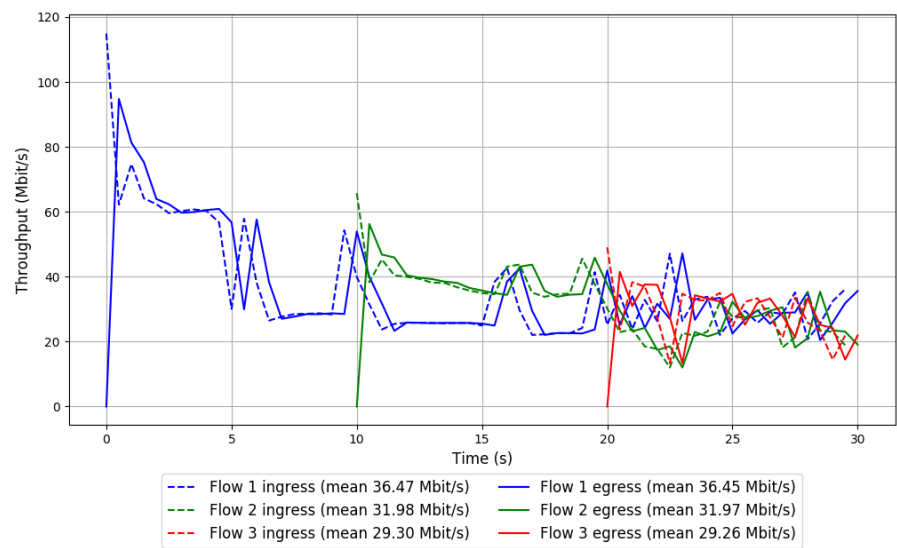
Run 4: Report of TCP Vegas — Data Link

```
Run 5: Statistics of TCP Vegas

Start at: 2018-09-06 20:44:21
End at: 2018-09-06 20:44:51
Local clock offset: -3.966 ms
Remote clock offset: 1.013 ms


# Below is generated by plot.py at 2018-09-06 21:08:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.51 Mbit/s
95th percentile per-packet one-way delay: 4.237 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 53.58 Mbit/s
95th percentile per-packet one-way delay: 3.288 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 47.98 Mbit/s
95th percentile per-packet one-way delay: 3.542 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 36.05 Mbit/s
95th percentile per-packet one-way delay: 4.617 ms
Loss rate: 0.03%
```
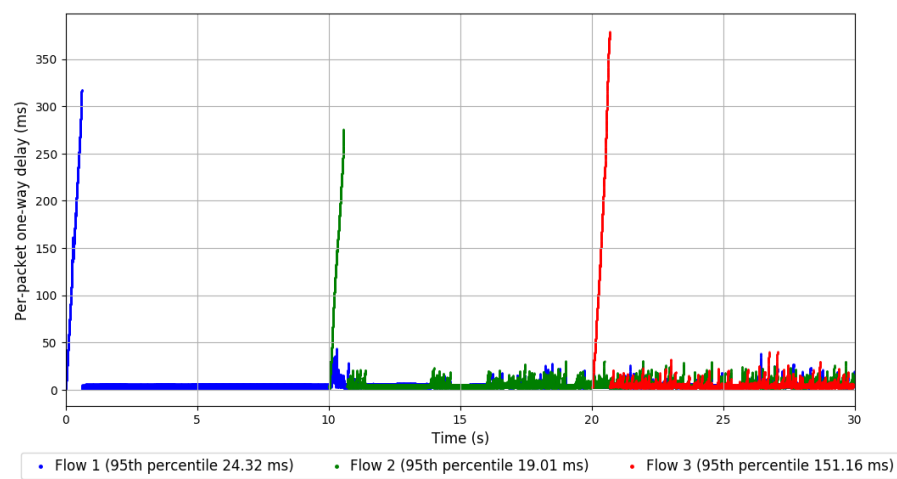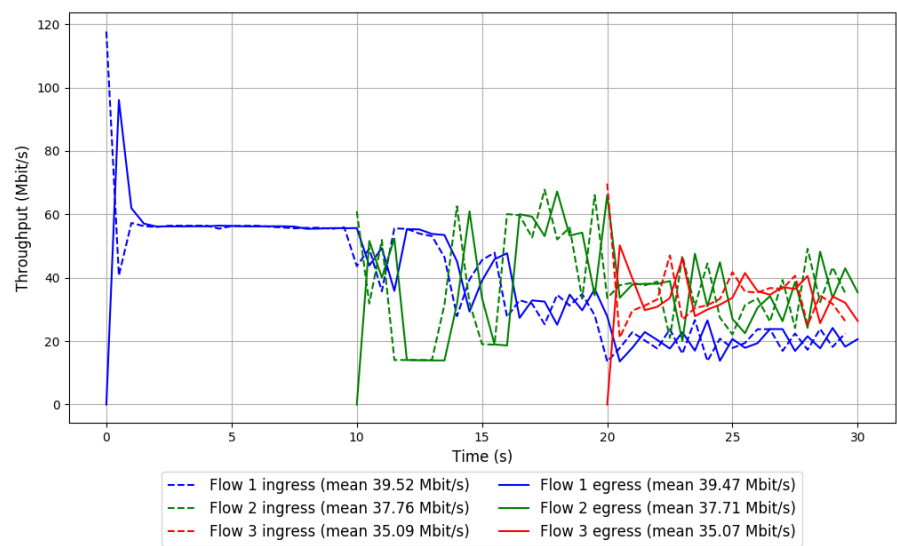
Run 5: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2018-09-06 19:31:55
End at: 2018-09-06 19:32:25
Local clock offset: -3.345 ms
Remote clock offset: 0.402 ms


# Below is generated by plot.py at 2018-09-06 21:08:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 67.45 Mbit/s
95th percentile per-packet one-way delay: 35.058 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 36.45 Mbit/s
95th percentile per-packet one-way delay: 30.400 ms
Loss rate: 0.06%
-- Flow 2:
Average throughput: 31.97 Mbit/s
95th percentile per-packet one-way delay: 24.751 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 29.26 Mbit/s
95th percentile per-packet one-way delay: 117.770 ms
Loss rate: 0.04%
```
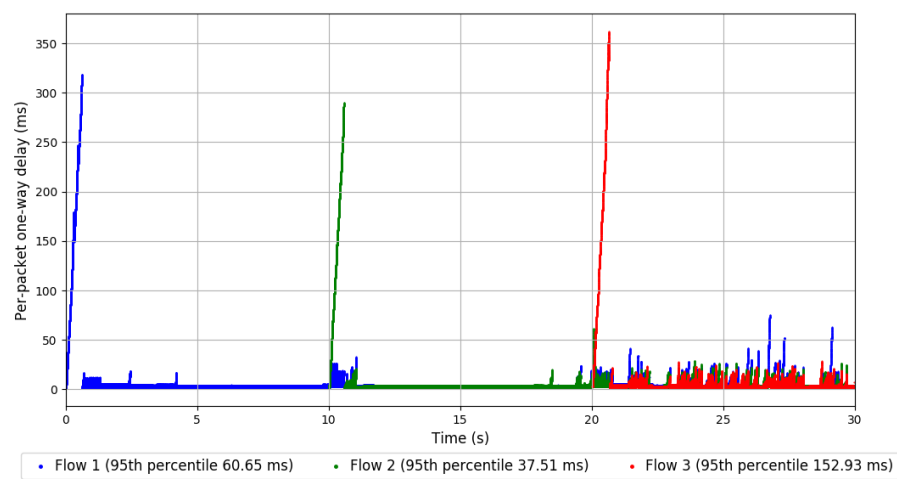
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2018-09-06 19:52:36
End at: 2018-09-06 19:53:06
Local clock offset: -3.688 ms
Remote clock offset: 0.669 ms


# Below is generated by plot.py at 2018-09-06 21:08:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 76.22 Mbit/s
95th percentile per-packet one-way delay: 30.229 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 39.47 Mbit/s
95th percentile per-packet one-way delay: 24.323 ms
Loss rate: 0.09%
-- Flow 2:
Average throughput: 37.71 Mbit/s
95th percentile per-packet one-way delay: 19.006 ms
Loss rate: 0.07%
-- Flow 3:
Average throughput: 35.07 Mbit/s
95th percentile per-packet one-way delay: 151.160 ms
Loss rate: 0.05%
```
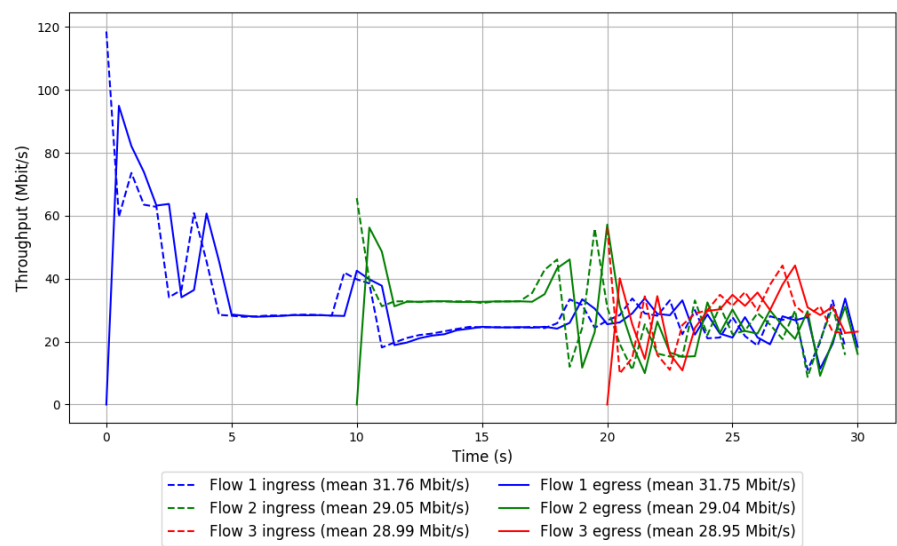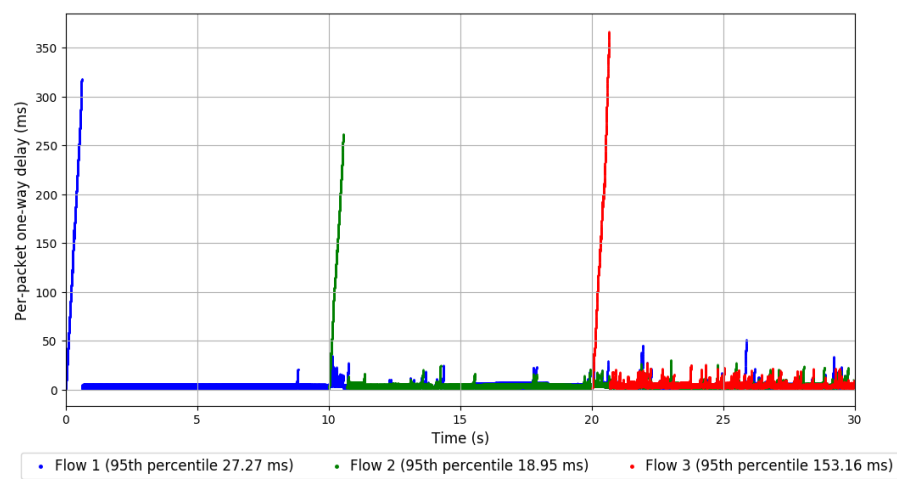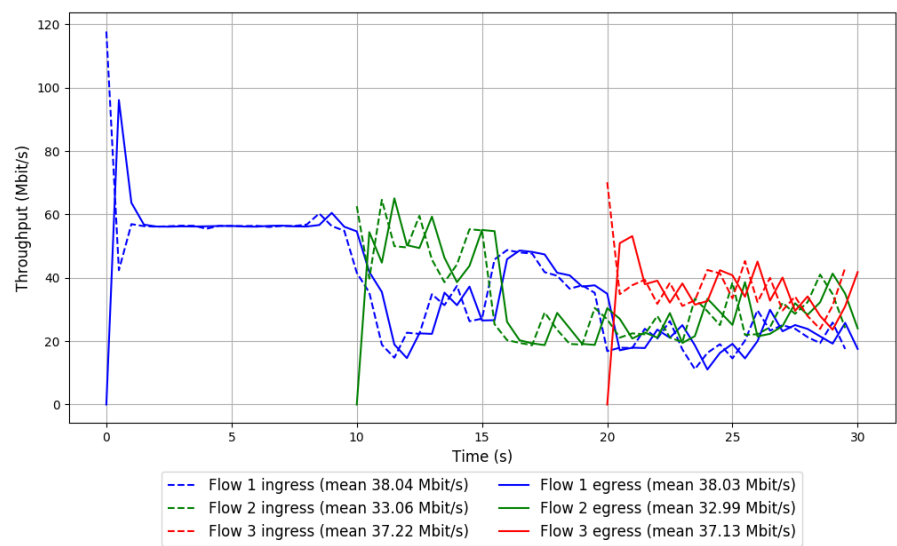
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-09-06 20:13:19
End at: 2018-09-06 20:13:49
Local clock offset: -4.587 ms
Remote clock offset: 1.049 ms


# Below is generated by plot.py at 2018-09-06 21:08:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 60.70 Mbit/s
95th percentile per-packet one-way delay: 70.817 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 31.75 Mbit/s
95th percentile per-packet one-way delay: 60.649 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 29.04 Mbit/s
95th percentile per-packet one-way delay: 37.514 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 28.95 Mbit/s
95th percentile per-packet one-way delay: 152.925 ms
Loss rate: 0.09%
```

Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 31.76 Mbit/s) --- Flow 1 egress (mean 31.75 Mbit/s)
Flow 2 ingress (mean 29.05 Mbit/s) --- Flow 2 egress (mean 29.04 Mbit/s)
Flow 3 ingress (mean 28.99 Mbit/s) --- Flow 3 egress (mean 28.95 Mbit/s)

Flow 1 (95th percentile 60.65 ms)   Flow 2 (95th percentile 37.51 ms)   Flow 3 (95th percentile 152.93 ms)

159

```
Run 4: Statistics of Verus

Start at: 2018-09-06 20:34:01
End at: 2018-09-06 20:34:31
Local clock offset: -4.016 ms
Remote clock offset: 0.968 ms


# Below is generated by plot.py at 2018-09-06 21:08:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 72.33 Mbit/s
95th percentile per-packet one-way delay: 39.202 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 38.03 Mbit/s
95th percentile per-packet one-way delay: 27.272 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 32.99 Mbit/s
95th percentile per-packet one-way delay: 18.948 ms
Loss rate: 0.18%
-- Flow 3:
Average throughput: 37.13 Mbit/s
95th percentile per-packet one-way delay: 153.162 ms
Loss rate: 0.28%
```
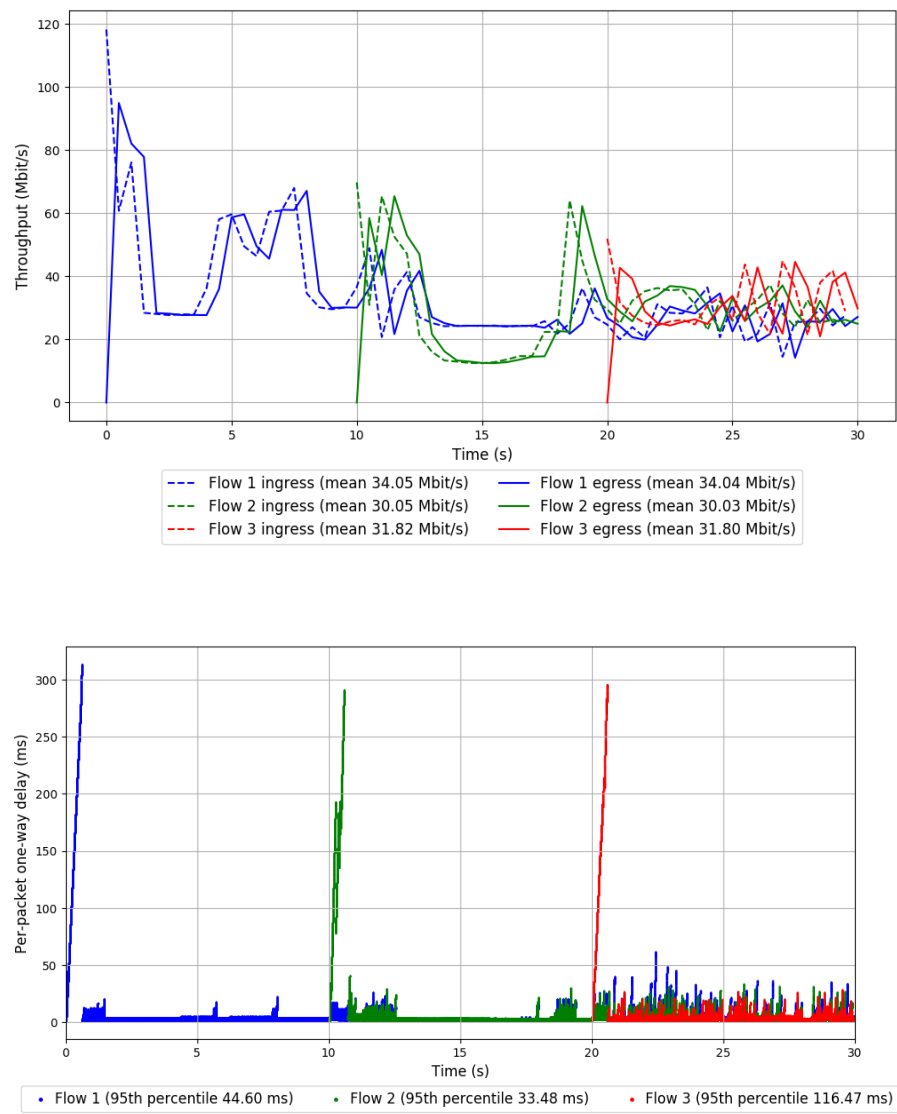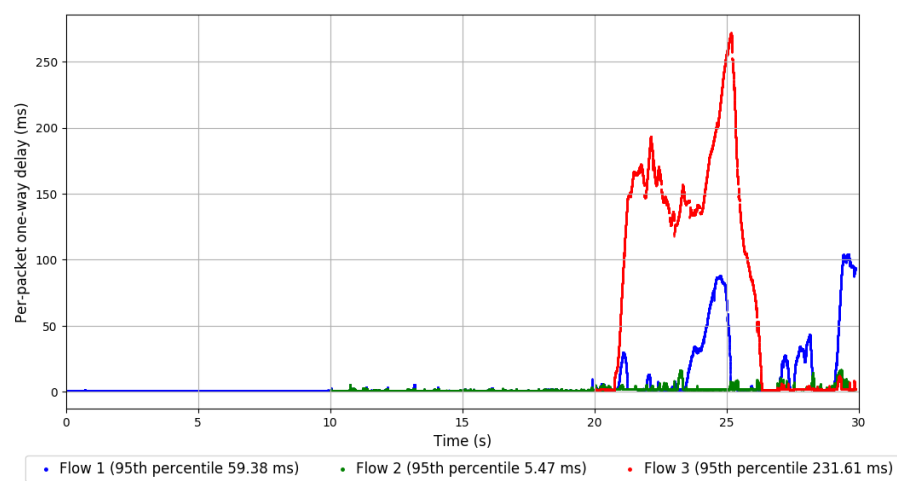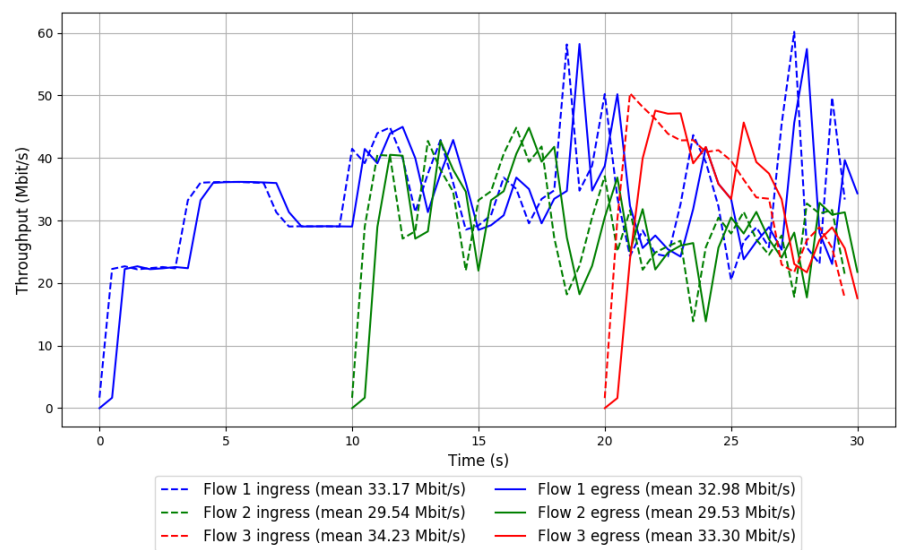
Run 4: Report of Verus — Data Link

Flow 1 ingress (mean 38.04 Mbit/s) Flow 1 egress (mean 38.03 Mbit/s)
Flow 2 ingress (mean 33.06 Mbit/s) Flow 2 egress (mean 32.99 Mbit/s)
Flow 3 ingress (mean 37.22 Mbit/s) Flow 3 egress (mean 37.13 Mbit/s)

Flow 1 (95th percentile 27.27 ms) Flow 2 (95th percentile 18.95 ms) Flow 3 (95th percentile 153.16 ms)

```
Run 5: Statistics of Verus

Start at: 2018-09-06 20:54:41
End at: 2018-09-06 20:55:11
Local clock offset: -4.891 ms
Remote clock offset: 1.134 ms


# Below is generated by plot.py at 2018-09-06 21:08:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 64.60 Mbit/s
95th percentile per-packet one-way delay: 57.186 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 34.04 Mbit/s
95th percentile per-packet one-way delay: 44.598 ms
Loss rate: 0.05%
-- Flow 2:
Average throughput: 30.03 Mbit/s
95th percentile per-packet one-way delay: 33.479 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 31.80 Mbit/s
95th percentile per-packet one-way delay: 116.470 ms
Loss rate: 0.04%
```
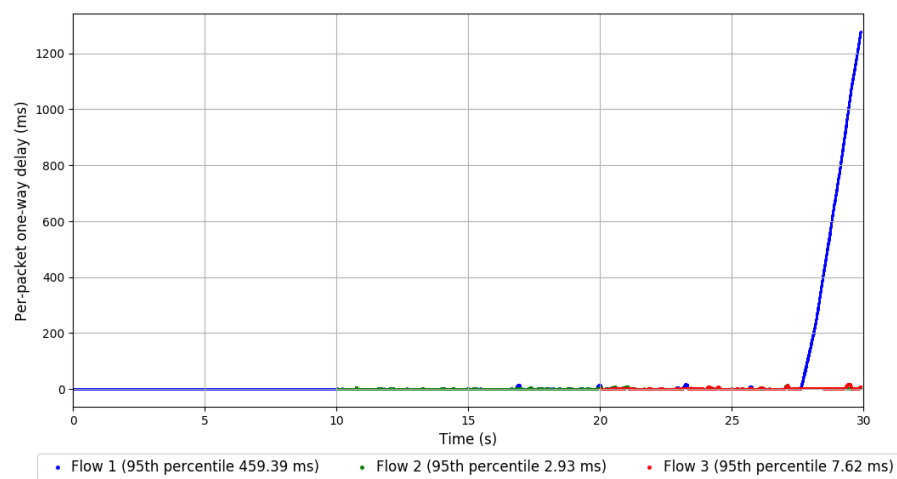
Run 5: Report of Verus — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2018-09-06 19:14:44
End at: 2018-09-06 19:15:14
Local clock offset: -3.399 ms
Remote clock offset: 0.129 ms


# Below is generated by plot.py at 2018-09-06 21:08:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 63.62 Mbit/s
95th percentile per-packet one-way delay: 154.554 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 32.98 Mbit/s
95th percentile per-packet one-way delay: 59.379 ms
Loss rate: 0.58%
-- Flow 2:
Average throughput: 29.53 Mbit/s
95th percentile per-packet one-way delay: 5.473 ms
Loss rate: 0.04%
-- Flow 3:
Average throughput: 33.30 Mbit/s
95th percentile per-packet one-way delay: 231.612 ms
Loss rate: 2.70%
```
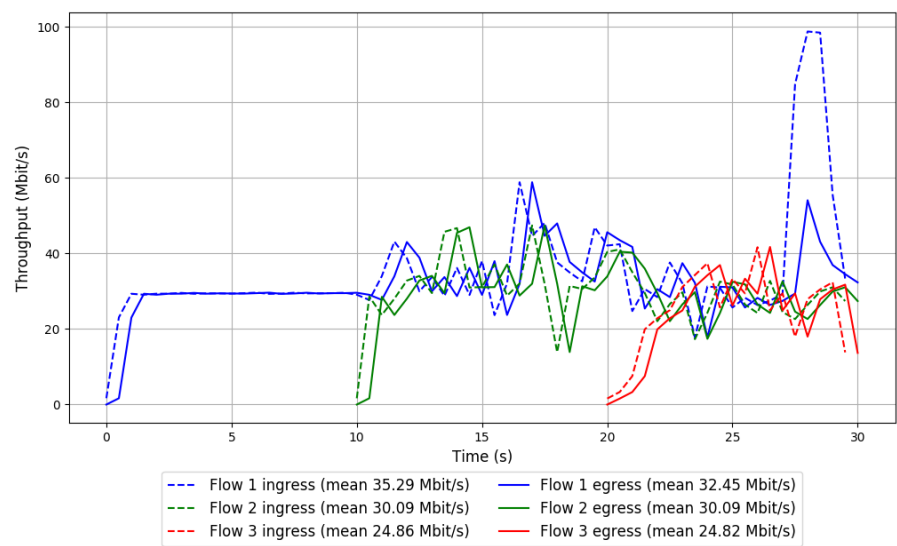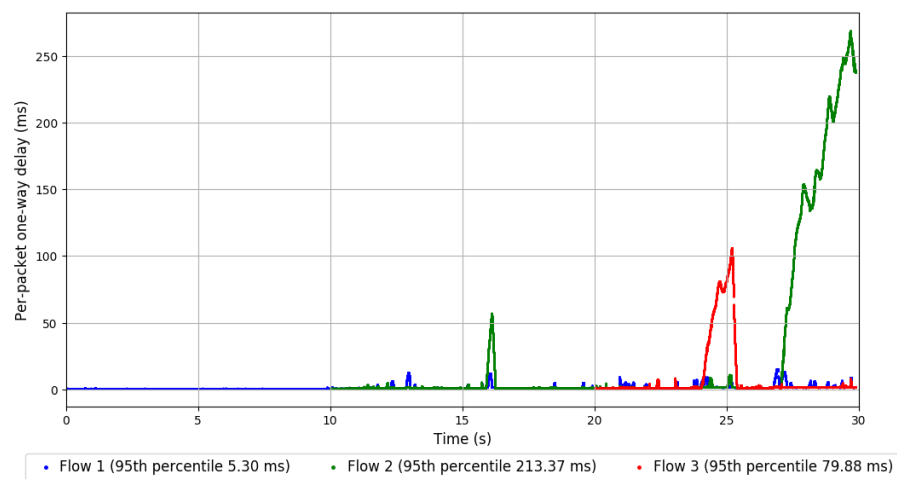
Run 1: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 33.17 Mbit/s) --- Flow 1 egress (mean 32.98 Mbit/s)
Flow 2 ingress (mean 29.54 Mbit/s) --- Flow 2 egress (mean 29.53 Mbit/s)
Flow 3 ingress (mean 34.23 Mbit/s) --- Flow 3 egress (mean 33.30 Mbit/s)

Flow 1 (95th percentile 59.38 ms) • Flow 2 (95th percentile 5.47 ms) • Flow 3 (95th percentile 231.61 ms)

```
Run 2: Statistics of PCC-Vivace

Start at: 2018-09-06 19:35:21
End at: 2018-09-06 19:35:51
Local clock offset: -4.136 ms
Remote clock offset: 0.449 ms


# Below is generated by plot.py at 2018-09-06 21:08:54
# Datalink statistics
-- Total of 3 flows:
Average throughput: 60.64 Mbit/s
95th percentile per-packet one-way delay: 18.036 ms
Loss rate: 4.51%
-- Flow 1:
Average throughput: 32.45 Mbit/s
95th percentile per-packet one-way delay: 459.393 ms
Loss rate: 8.06%
-- Flow 2:
Average throughput: 30.09 Mbit/s
95th percentile per-packet one-way delay: 2.930 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 24.82 Mbit/s
95th percentile per-packet one-way delay: 7.620 ms
Loss rate: 0.19%
```
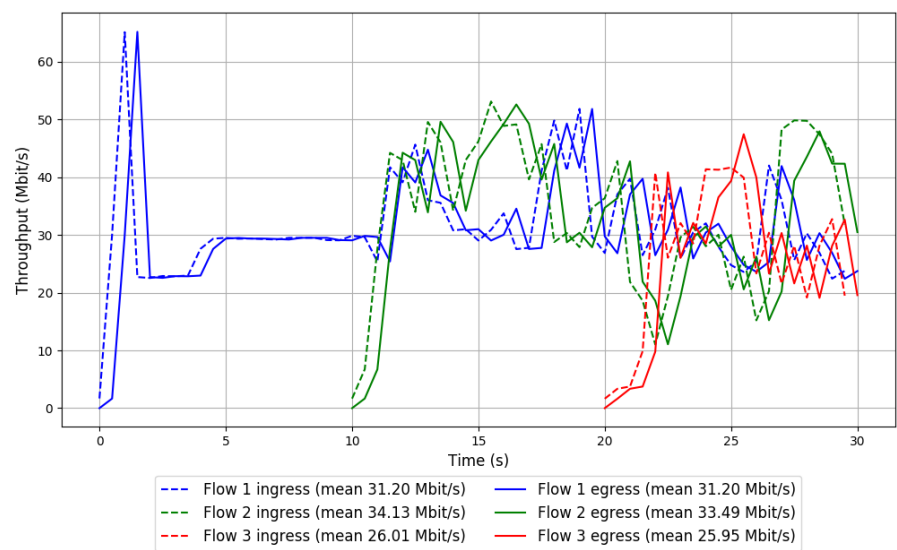
Run 2: Report of PCC-Vivace — Data Link

```
Run 3: Statistics of PCC-Vivace

Start at: 2018-09-06 19:56:02
End at: 2018-09-06 19:56:32
Local clock offset: -4.43 ms
Remote clock offset: 0.82 ms


# Below is generated by plot.py at 2018-09-06 21:08:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 62.04 Mbit/s
95th percentile per-packet one-way delay: 122.939 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 31.20 Mbit/s
95th percentile per-packet one-way delay: 5.296 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 33.49 Mbit/s
95th percentile per-packet one-way delay: 213.374 ms
Loss rate: 1.87%
-- Flow 3:
Average throughput: 25.95 Mbit/s
95th percentile per-packet one-way delay: 79.878 ms
Loss rate: 0.22%
```
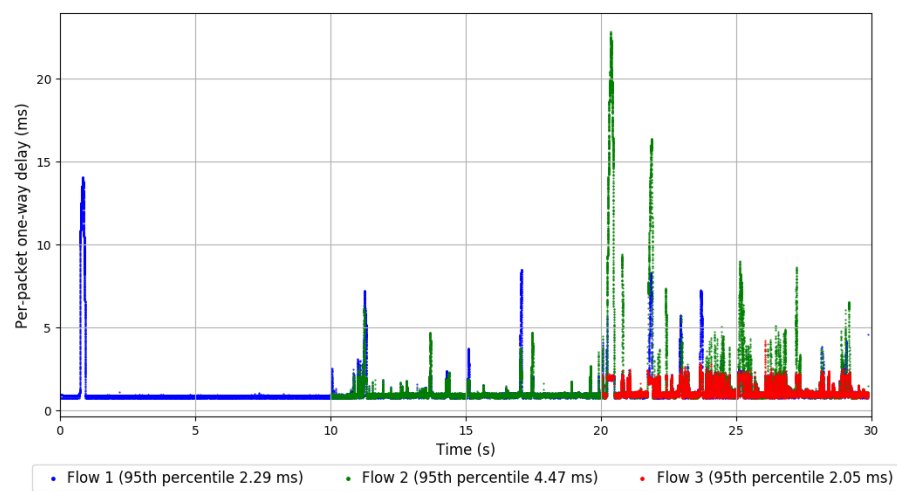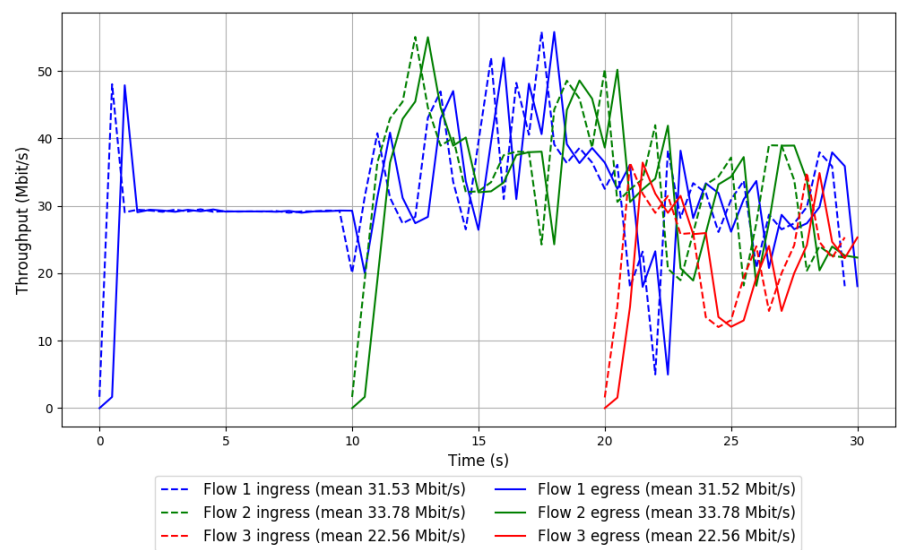
Run 3: Report of PCC-Vivace — Data Link

```
Run 4: Statistics of PCC-Vivace

Start at: 2018-09-06 20:16:45
End at: 2018-09-06 20:17:15
Local clock offset: -4.578 ms
Remote clock offset: 1.051 ms


# Below is generated by plot.py at 2018-09-06 21:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 61.43 Mbit/s
95th percentile per-packet one-way delay: 2.851 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 31.52 Mbit/s
95th percentile per-packet one-way delay: 2.285 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 33.78 Mbit/s
95th percentile per-packet one-way delay: 4.471 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 22.56 Mbit/s
95th percentile per-packet one-way delay: 2.048 ms
Loss rate: 0.02%
```
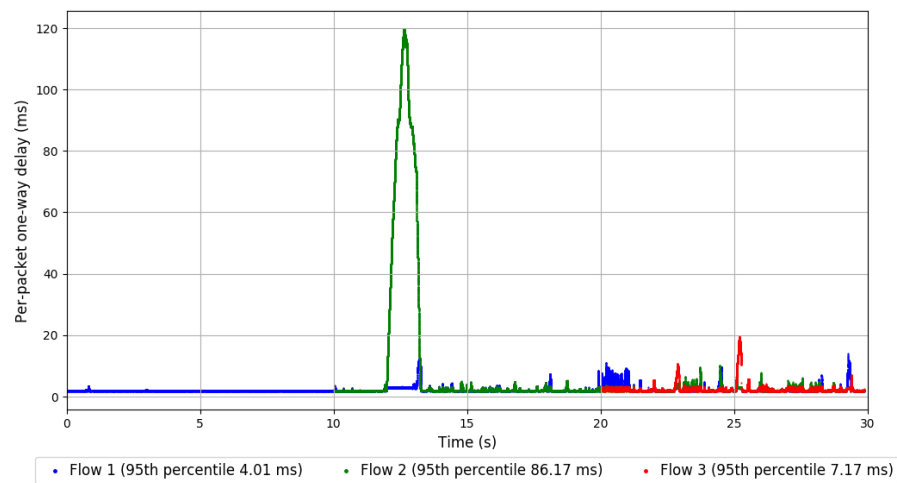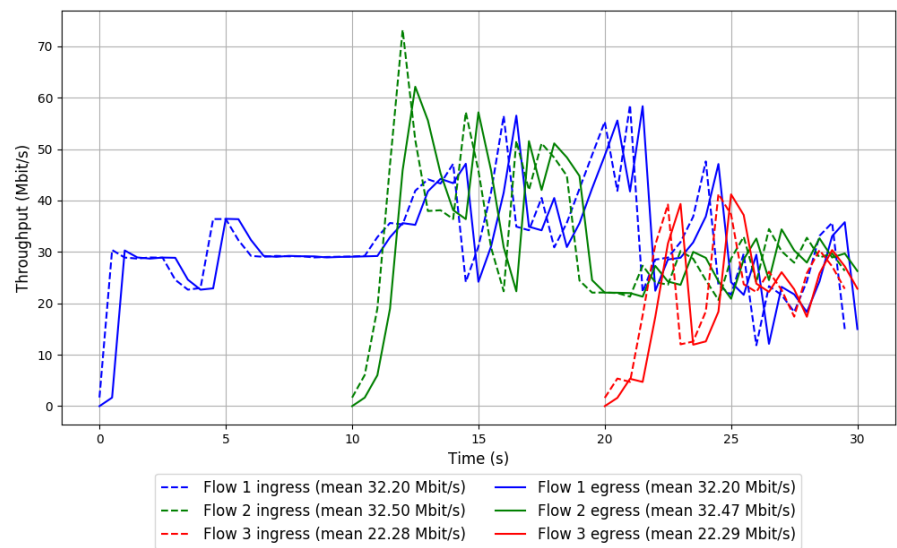
Run 4: Report of PCC-Vivace — Data Link

```
Run 5: Statistics of PCC-Vivace

Start at: 2018-09-06 20:37:27
End at: 2018-09-06 20:37:57
Local clock offset: -3.964 ms
Remote clock offset: 0.962 ms


# Below is generated by plot.py at 2018-09-06 21:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 61.16 Mbit/s
95th percentile per-packet one-way delay: 8.019 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 32.20 Mbit/s
95th percentile per-packet one-way delay: 4.009 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 32.47 Mbit/s
95th percentile per-packet one-way delay: 86.174 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 22.29 Mbit/s
95th percentile per-packet one-way delay: 7.173 ms
Loss rate: 0.03%
```
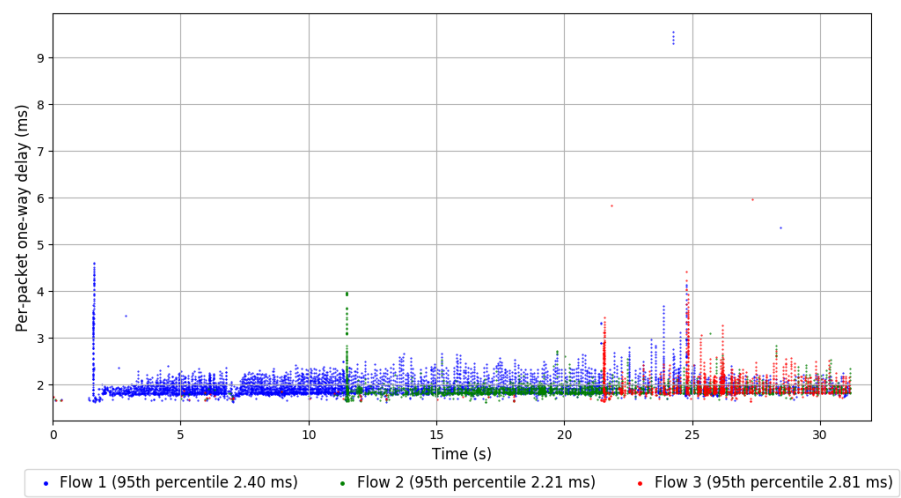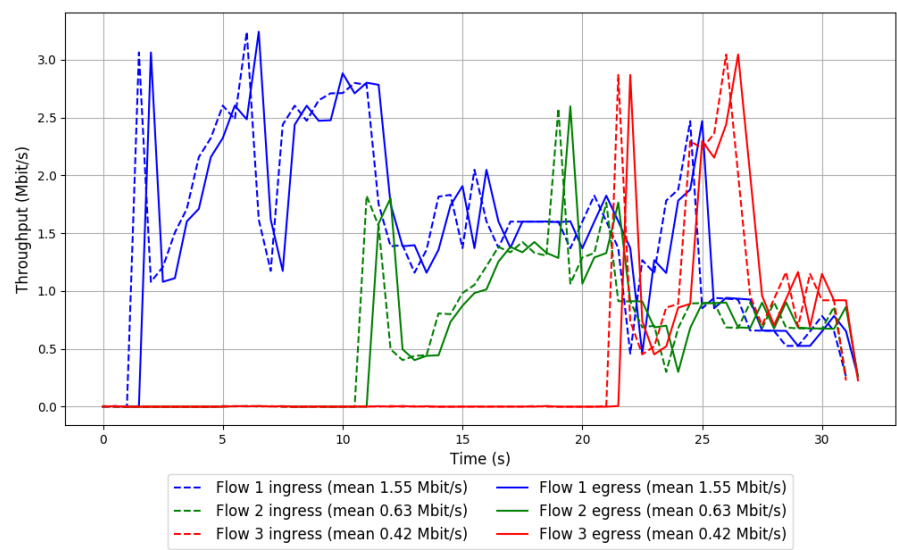
Run 5: Report of PCC-Vivace — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2018-09-06 19:29:43
End at: 2018-09-06 19:30:13
Local clock offset: -3.311 ms
Remote clock offset: 0.327 ms

# Below is generated by plot.py at 2018-09-06 21:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.59 Mbit/s
95th percentile per-packet one-way delay: 2.439 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 2.395 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 2.211 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 2.806 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-09-06 19:50:23
End at: 2018-09-06 19:50:53
Local clock offset: -4.356 ms
Remote clock offset: 0.646 ms


# Below is generated by plot.py at 2018-09-06 21:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 1.724 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 1.725 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.89 Mbit/s
95th percentile per-packet one-way delay: 1.653 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 2.192 ms
Loss rate: 0.00%
```
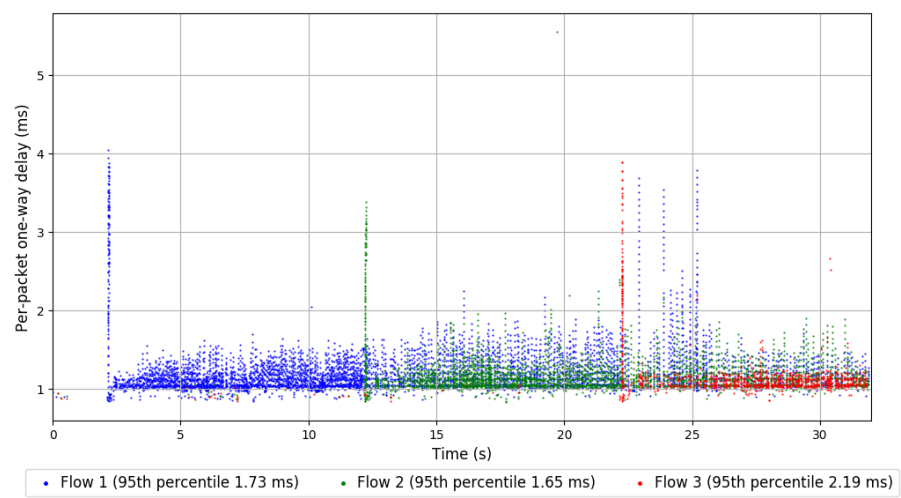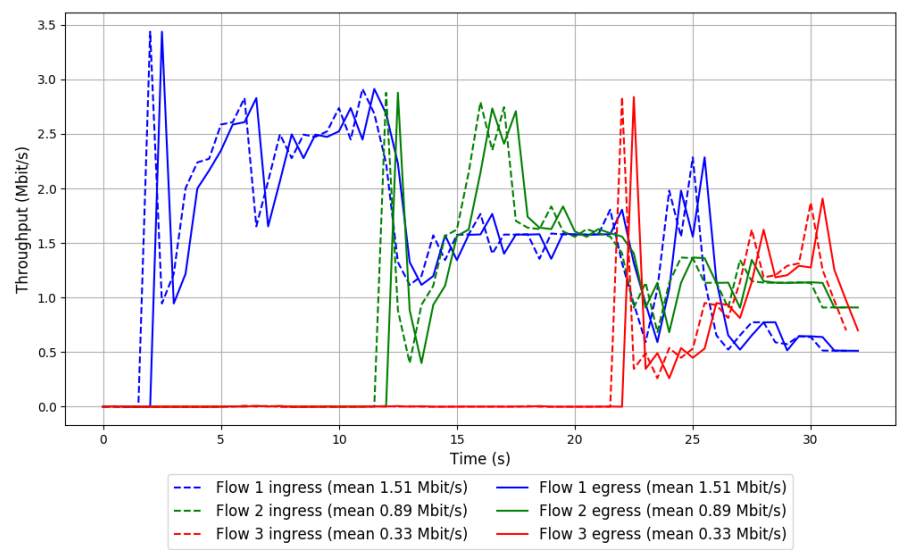
Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-09-06 20:11:06
End at: 2018-09-06 20:11:36
Local clock offset: -3.762 ms
Remote clock offset: 0.928 ms


# Below is generated by plot.py at 2018-09-06 21:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.84 Mbit/s
95th percentile per-packet one-way delay: 2.590 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 2.377 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 2.568 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 3.419 ms
Loss rate: 0.00%
```
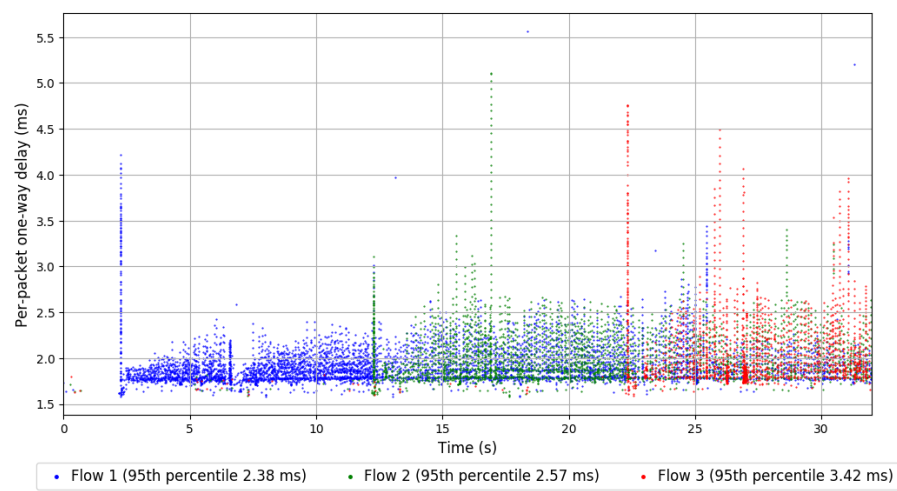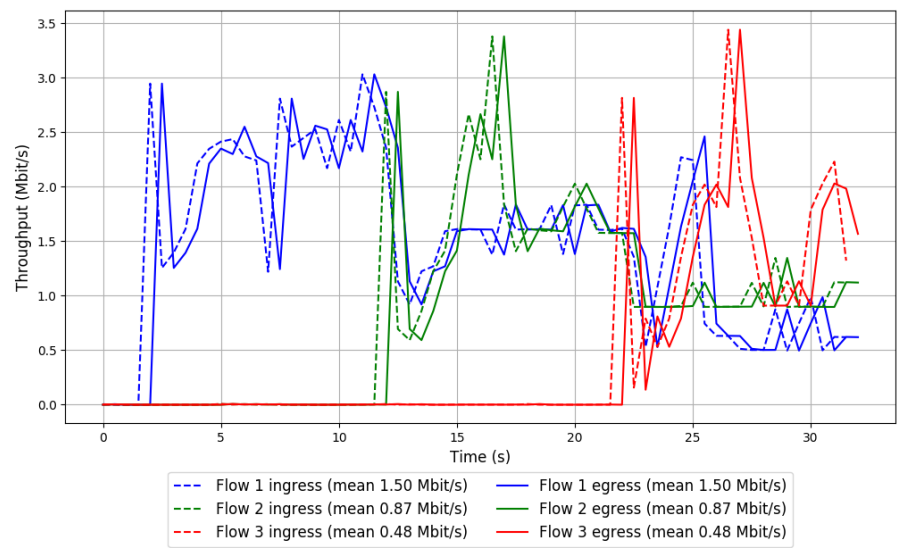
Run 3: Report of WebRTC media — Data Link

```
Run 4: Statistics of WebRTC media

Start at: 2018-09-06 20:31:49
End at: 2018-09-06 20:32:19
Local clock offset: -3.961 ms
Remote clock offset: 1.012 ms


# Below is generated by plot.py at 2018-09-06 21:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 2.474 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.56 Mbit/s
95th percentile per-packet one-way delay: 2.433 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 2.591 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 2.190 ms
Loss rate: 0.00%
```
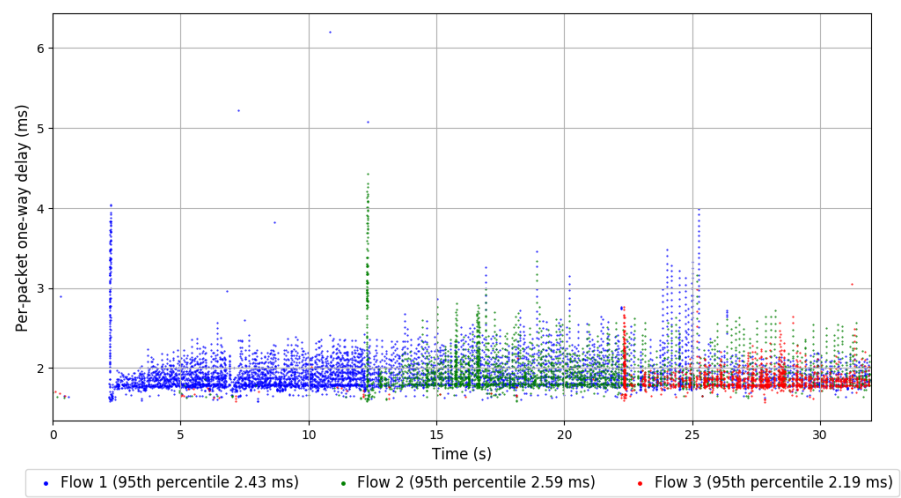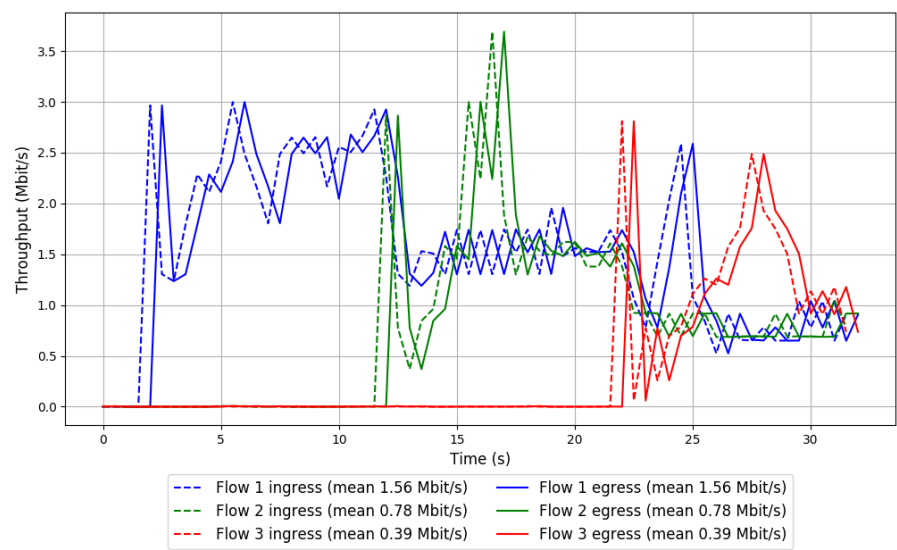
Run 4: Report of WebRTC media — Data Link

```
Run 5: Statistics of WebRTC media

Start at: 2018-09-06 20:52:28
End at: 2018-09-06 20:52:58
Local clock offset: -4.881 ms
Remote clock offset: 1.055 ms

# Below is generated by plot.py at 2018-09-06 21:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.67 Mbit/s
95th percentile per-packet one-way delay: 1.695 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 1.617 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 1.785 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 1.408 ms
Loss rate: 0.01%
```

Run 5: Report of WebRTC media — Data Link