

## Pantheon Report

Generated at 2019-09-18 15:29:17 (UTC).

Data path: Stanford cellular on `ppp0` (*remote*) → AWS California 1 on `ens5` (*local*).

Repeated the test of 24 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

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

System info:

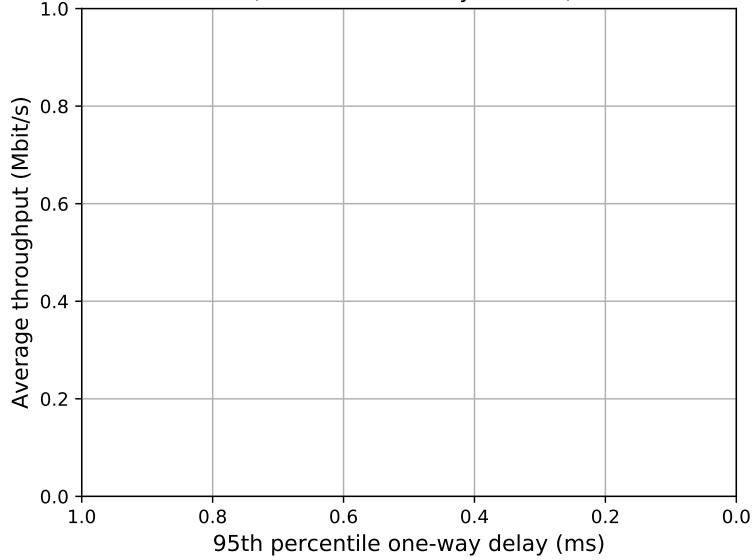
```
Linux 4.15.0-1045-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

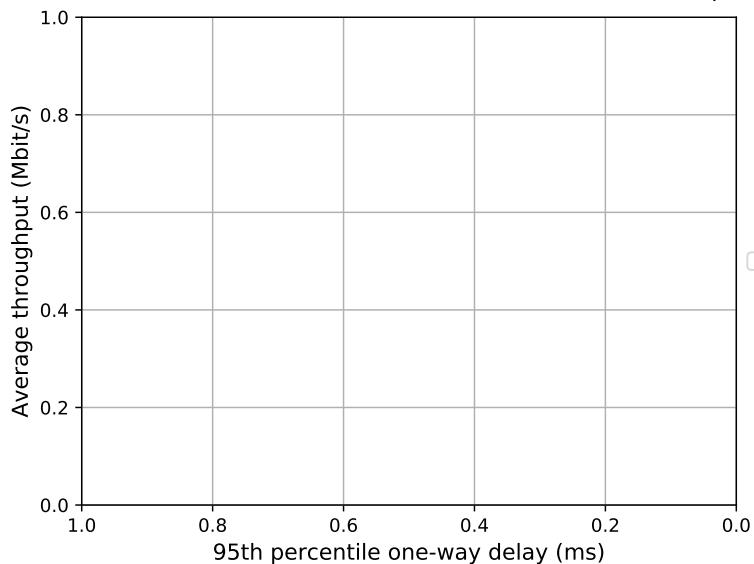
```
branch: muses @ de42328552b3776a75a932a94dfaf722537b0ec
third_party/fillp @ d6da1459332fce6963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 5ce721187ad823da20955337730c746486ca4966
third_party/muses_dtree @ 387225f7b5f61ddbe92d708a8869ffbb84eb3200
third_party/pantheon-tunnel @ f866d3f58d27af942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
M src/examples/cellsim.cc
M src/examples/sproutbt2.cc
M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
```

```
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from Stanford cellular to AWS California 1, 3 runs of 30s each per scheme  
(mean of all runs by scheme)



test from Stanford cellular to AWS California 1, 3 runs of 30s each per scheme



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	0	N/A	N/A	N/A
Copa	0	N/A	N/A	N/A
TCP Cubic	0	N/A	N/A	N/A
FillP	0	N/A	N/A	N/A
FillP-Sheep	0	N/A	N/A	N/A
Indigo	0	N/A	N/A	N/A
Indigo-MusesC3	0	N/A	N/A	N/A
Indigo-MusesC5	0	N/A	N/A	N/A
Indigo-MusesD	0	N/A	N/A	N/A
Indigo-MusesT	0	N/A	N/A	N/A
LEDBAT	0	N/A	N/A	N/A
Muses_DecisionTree	0	N/A	N/A	N/A
Muses_DecisionTreeH0	0	N/A	N/A	N/A
Muses_DecisionTreeR0	0	N/A	N/A	N/A
PCC-Allegro	0	N/A	N/A	N/A
PCC-Expr	0	N/A	N/A	N/A
QUIC Cubic	0	N/A	N/A	N/A
SCReAM	0	N/A	N/A	N/A
Sprout	0	N/A	N/A	N/A
TaoVA-100x	0	N/A	N/A	N/A
TCP Vegas	0	N/A	N/A	N/A
Verus	0	N/A	N/A	N/A
PCC-Vivace	0	N/A	N/A	N/A
WebRTC media	0	N/A	N/A	N/A

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Run 1: Statistics of TCP BBR

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/bbr

Run 1: Report of TCP BBR — Data Link

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Run 2: Statistics of TCP BBR

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/bbr

Run 2: Report of TCP BBR — Data Link

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Run 3: Statistics of TCP BBR

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/bbr

Run 3: Report of TCP BBR — Data Link

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Run 1: Statistics of Copa

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/copa

Run 1: Report of Copa — Data Link

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Run 2: Statistics of Copa

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/copa

Run 2: Report of Copa — Data Link

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Run 3: Statistics of Copa

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/cop

Run 3: Report of Copa — Data Link

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Run 1: Statistics of TCP Cubic

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/cub

Run 1: Report of TCP Cubic — Data Link

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Run 2: Statistics of TCP Cubic

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/cub

Run 2: Report of TCP Cubic — Data Link

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Run 3: Statistics of TCP Cubic

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/cub

Run 3: Report of TCP Cubic — Data Link

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Run 1: Statistics of FillP

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/fil

Run 1: Report of FillP — Data Link

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Run 2: Statistics of FillP

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/fil

Run 2: Report of FillP — Data Link

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Run 3: Statistics of FillP

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/fil

Run 3: Report of FillP — Data Link

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Run 1: Statistics of FillP-Sheep

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/fil

Run 1: Report of FillP-Sheep — Data Link

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Run 2: Statistics of FillP-Sheep

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/fil

Run 2: Report of FillP-Sheep — Data Link

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Run 3: Statistics of FillP-Sheep

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/fil

Run 3: Report of FillP-Sheep — Data Link

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Run 1: Statistics of Indigo

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/indigo

Run 1: Report of Indigo — Data Link

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Run 2: Statistics of Indigo

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/indigo

Run 2: Report of Indigo — Data Link

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Run 3: Statistics of Indigo

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/indigo

Run 3: Report of Indigo — Data Link

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Run 1: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/indigo-musesc3/statistics

Run 1: Report of Indigo-MusesC3 — Data Link

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Run 2: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/ind

Run 2: Report of Indigo-MusesC3 — Data Link

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Run 3: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/indigo-musesc3/statistics

Run 3: Report of Indigo-MusesC3 — Data Link

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Run 1: Statistics of Indigo-MusesC5

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/indigo-musesc5/statistics

Run 1: Report of Indigo-MusesC5 — Data Link

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Run 2: Statistics of Indigo-MusesC5

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/indigo-musesc5/statistics

Run 2: Report of Indigo-MusesC5 — Data Link

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Run 3: Statistics of Indigo-MusesC5

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/indigo-musesc5/statistics

Run 3: Report of Indigo-MusesC5 — Data Link

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Run 1: Statistics of Indigo-MusesD

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/ind

Run 1: Report of Indigo-MusesD — Data Link

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Run 2: Statistics of Indigo-MusesD

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/ind

Run 2: Report of Indigo-MusesD — Data Link

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Run 3: Statistics of Indigo-MusesD

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/ind

Run 3: Report of Indigo-MusesD — Data Link

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Run 1: Statistics of Indigo-MusesT

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/indigo-musesT/statistics

Run 1: Report of Indigo-MusesT — Data Link

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Run 2: Statistics of Indigo-MusesT

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/ind

Run 2: Report of Indigo-MusesT — Data Link

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Run 3: Statistics of Indigo-MusesT

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/ind

Run 3: Report of Indigo-MusesT — Data Link

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Run 1: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/led

Run 1: Report of LEDBAT — Data Link

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Run 2: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/led

Run 2: Report of LEDBAT — Data Link

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Run 3: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/led

Run 3: Report of LEDBAT — Data Link

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Run 1: Statistics of Muses\\_DecisionTree

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/mus

Run 1: Report of Muses\_DecisionTree — Data Link

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Run 2: Statistics of Muses\\_DecisionTree

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/mus

Run 2: Report of Muses\_DecisionTree — Data Link

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Run 3: Statistics of Muses\\_DecisionTree

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/mus

Run 3: Report of Muses\_DecisionTree — Data Link

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Run 1: Statistics of Muses\\_DecisionTreeH0

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/mus

Run 1: Report of Muses\_DecisionTreeH0 — Data Link

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Run 2: Statistics of Muses\\_DecisionTreeH0

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/mus

Run 2: Report of Muses\_DecisionTreeH0 — Data Link

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Run 3: Statistics of Muses\\_DecisionTreeH0

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/mus

Run 3: Report of Muses\_DecisionTreeH0 — Data Link

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Run 1: Statistics of Muses\\_DecisionTreeR0

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/mus

Run 1: Report of Muses\_DecisionTreeR0 — Data Link

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Run 2: Statistics of Muses\\_DecisionTreeR0

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/mus

Run 2: Report of Muses\_DecisionTreeR0 — Data Link

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Run 3: Statistics of Muses\\_DecisionTreeR0

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/mus

Run 3: Report of Muses\_DecisionTreeR0 — Data Link

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Run 1: Statistics of PCC-Allegro

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/pcc

Run 1: Report of PCC-Allegro — Data Link

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Run 2: Statistics of PCC-Allegro

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/pcc

Run 2: Report of PCC-Allegro — Data Link

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Run 3: Statistics of PCC-Allegro

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/pcc

Run 3: Report of PCC-Allegro — Data Link

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Run 1: Statistics of PCC-Expr

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/pcc

Run 1: Report of PCC-Expr — Data Link

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Run 2: Statistics of PCC-Expr

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/pcc

Run 2: Report of PCC-Expr — Data Link

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Run 3: Statistics of PCC-Expr

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/pcc

Run 3: Report of PCC-Expr — Data Link

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Run 1: Statistics of QUIC Cubic

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/qui

Run 1: Report of QUIC Cubic — Data Link

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Run 2: Statistics of QUIC Cubic

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/qui

Run 2: Report of QUIC Cubic — Data Link

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Run 3: Statistics of QUIC Cubic

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/qui

Run 3: Report of QUIC Cubic — Data Link

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Run 1: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/scr

Run 1: Report of SCReAM — Data Link

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Run 2: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/scr

Run 2: Report of SCReAM — Data Link

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Run 3: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/scr

Run 3: Report of SCReAM — Data Link

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Run 1: Statistics of Sprout

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/spr

Run 1: Report of Sprout — Data Link

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Run 2: Statistics of Sprout

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/spr

Run 2: Report of Sprout — Data Link

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Run 3: Statistics of Sprout

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/spr

Run 3: Report of Sprout — Data Link

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Run 1: Statistics of TaoVA-100x

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/tad

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

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Run 2: Statistics of TaoVA-100x

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/tad

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

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Run 3: Statistics of TaoVA-100x

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/tad

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

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Run 1: Statistics of TCP Vegas

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/veg

Run 1: Report of TCP Vegas — Data Link

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Run 2: Statistics of TCP Vegas

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/veg

Run 2: Report of TCP Vegas — Data Link

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Run 3: Statistics of TCP Vegas

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/veg

Run 3: Report of TCP Vegas — Data Link

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Run 1: Statistics of Verus

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/ver

Run 1: Report of Verus — Data Link

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Run 2: Statistics of Verus

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/ver

Run 2: Report of Verus — Data Link

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Run 3: Statistics of Verus

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/ver

Run 3: Report of Verus — Data Link

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Run 1: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/vivace

Run 1: Report of PCC-Vivace — Data Link

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Run 2: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/viv

Run 2: Report of PCC-Vivace — Data Link

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Run 3: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/viv

Run 3: Report of PCC-Vivace — Data Link

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Run 1: Statistics of WebRTC media

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/web

Run 1: Report of WebRTC media — Data Link

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Run 2: Statistics of WebRTC media

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/web

Run 2: Report of WebRTC media — Data Link

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Run 3: Statistics of WebRTC media

/home/ubuntu/pantheon/data/2019-09-18T13-30-Stanford-cellular-to-AWS-California-1-3-runs/web

Run 3: Report of WebRTC media — Data Link

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