

# Pantheon Report

Generated at 2019-07-12 15:57:11 (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 3 flows with 10-second interval between two flows.

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

## System info:

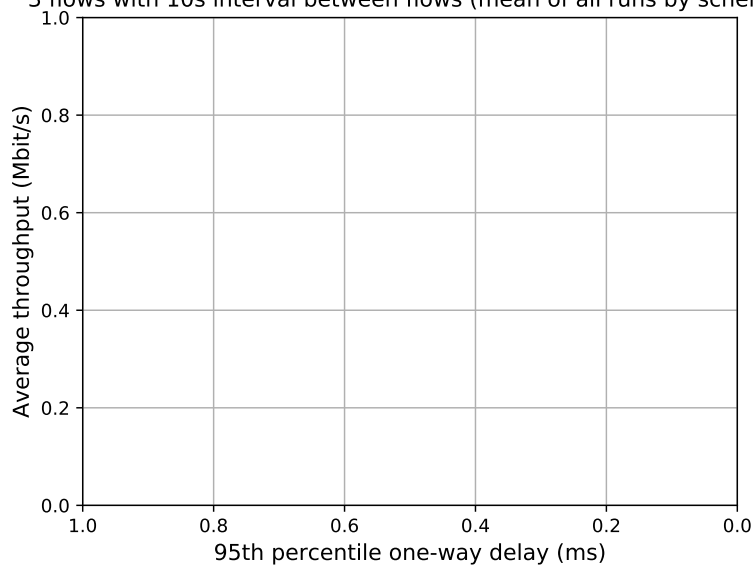
```
Linux 4.15.0-1041-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

## Git summary:

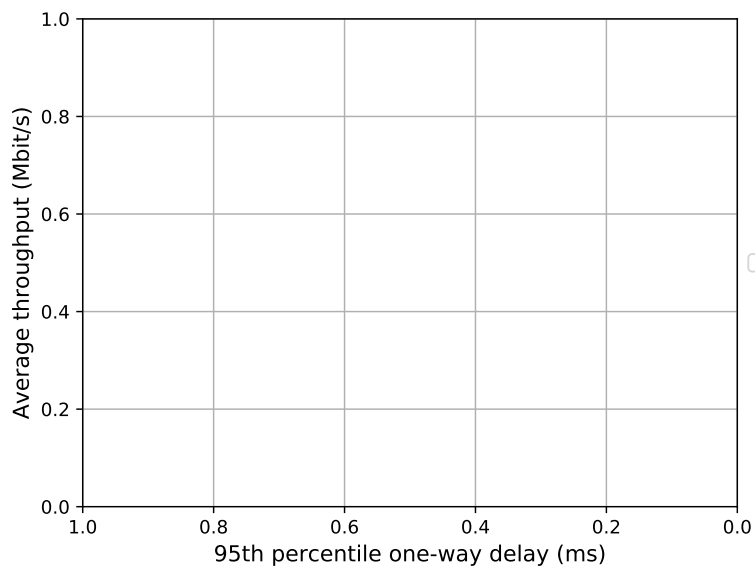
```
branch: muses @ 2076e1149a241f3edb4365d686df32342bf9561f
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 5ce721187ad823da20955337730c746486ca4966
third_party/muses_dtree @ 8bb93ffff2b107204a92d8b72449fc0c55e15f00
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quick @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
M src/examples/cellsim.cc
M src/examples/sproutbt2.cc
M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
```

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

test from Stanford cellular to AWS California 1, 3 runs of 30s each per scheme  
3 flows with 10s interval between flows (mean of all runs by scheme)



test from Stanford cellular to AWS California 1, 3 runs of 30s each per scheme  
3 flows with 10s interval between flows





Run 1: Statistics of TCP BBR

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of TCP BBR — Data Link

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Run 2: Statistics of TCP BBR

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of TCP BBR — Data Link

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Run 3: Statistics of TCP BBR

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 3: Report of TCP BBR — Data Link

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Run 1: Statistics of Copa

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Copa — Data Link

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Run 2: Statistics of Copa

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of Copa — Data Link

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Run 3: Statistics of Copa

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 3: Report of Copa — Data Link

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Run 1: Statistics of TCP Cubic

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of TCP Cubic — Data Link

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Run 2: Statistics of TCP Cubic

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of TCP Cubic — Data Link

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Run 3: Statistics of TCP Cubic

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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Run 1: Statistics of FillP

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of FillP — Data Link

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Run 2: Statistics of FillP

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of FillP — Data Link

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Run 3: Statistics of FillP

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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Run 1: Statistics of FillP-Sheep

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of FillP-Sheep — Data Link

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Run 2: Statistics of FillP-Sheep

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of FillP-Sheep — Data Link

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Run 3: Statistics of FillP-Sheep

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

### Run 3: Report of FillP-Sheep — Data Link

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Run 1: Statistics of Indigo

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Indigo — Data Link

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Run 2: Statistics of Indigo

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of Indigo — Data Link

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Run 3: Statistics of Indigo

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 3: Report of Indigo — Data Link

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Run 1: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Indigo-MusesC3 — Data Link

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Run 2: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

## Run 2: Report of Indigo-MusesC3 — Data Link

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Run 3: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

### Run 3: Report of Indigo-MusesC3 — Data Link

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Run 1: Statistics of Indigo-MusesC5

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Indigo-MusesC5 — Data Link

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Run 2: Statistics of Indigo-MusesC5

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of Indigo-MusesC5 — Data Link

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Run 3: Statistics of Indigo-MusesC5

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

### Run 3: Report of Indigo-MusesC5 — Data Link

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Run 1: Statistics of Indigo-MusesD

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Indigo-MusesD — Data Link

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Run 2: Statistics of Indigo-MusesD

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of Indigo-MusesD — Data Link

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Run 3: Statistics of Indigo-MusesD

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

### Run 3: Report of Indigo-MusesD — Data Link

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Run 1: Statistics of Indigo-MusesT

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Indigo-MusesT — Data Link

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Run 2: Statistics of Indigo-MusesT

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of Indigo-MusesT — Data Link

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Run 3: Statistics of Indigo-MusesT

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

### Run 3: Report of Indigo-MusesT — Data Link

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Run 1: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of LEDBAT — Data Link

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Run 2: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of LEDBAT — Data Link

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Run 3: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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Run 1: Statistics of Muses\\_DecisionTree

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Muses\_DecisionTree — Data Link

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Run 2: Statistics of Muses\\_DecisionTree

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of Muses\_DecisionTree — Data Link

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Run 3: Statistics of Muses\\_DecisionTree

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 3: Report of Muses\_DecisionTree — Data Link

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Run 1: Statistics of Muses\\_DecisionTreeH0

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Muses\_DecisionTreeH0 — Data Link

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Run 2: Statistics of Muses\\_DecisionTreeH0

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of Muses\_DecisionTreeH0 — Data Link

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Run 3: Statistics of Muses\\_DecisionTreeH0

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 3: Report of Muses\_DecisionTreeH0 — Data Link

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Run 1: Statistics of Muses\\_DecisionTreeR0

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Muses\_DecisionTreeR0 — Data Link

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Run 2: Statistics of Muses\\_DecisionTreeR0

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of Muses\_DecisionTreeR0 — Data Link

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Run 3: Statistics of Muses\\_DecisionTreeR0

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 3: Report of Muses\_DecisionTreeR0 — Data Link

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Run 1: Statistics of PCC-Allegro

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of PCC-Allegro — Data Link

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Run 2: Statistics of PCC-Allegro

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of PCC-Allegro — Data Link

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Run 3: Statistics of PCC-Allegro

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 3: Report of PCC-Allegro — Data Link

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Run 1: Statistics of PCC-Expr

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of PCC-Expr — Data Link

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Run 2: Statistics of PCC-Expr

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of PCC-Expr — Data Link

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Run 3: Statistics of PCC-Expr

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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Run 1: Statistics of QUIC Cubic

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of QUIC Cubic — Data Link

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Run 2: Statistics of QUIC Cubic

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of QUIC Cubic — Data Link

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Run 3: Statistics of QUIC Cubic

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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Run 1: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of SReAM — Data Link

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Run 2: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of SReAM — Data Link

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Run 3: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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Run 1: Statistics of Sprout

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Sprout — Data Link

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Run 2: Statistics of Sprout

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of Sprout — Data Link

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Run 3: Statistics of Sprout

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 3: Report of Sprout — Data Link

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Run 1: Statistics of TaoVA-100x

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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Run 2: Statistics of TaoVA-100x

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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Run 3: Statistics of TaoVA-100x

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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Run 1: Statistics of TCP Vegas

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of TCP Vegas — Data Link

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Run 2: Statistics of TCP Vegas

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of TCP Vegas — Data Link

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Run 3: Statistics of TCP Vegas

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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Run 1: Statistics of Verus

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of Verus — Data Link

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Run 2: Statistics of Verus

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of Verus — Data Link

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Run 3: Statistics of Verus

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 3: Report of Verus — Data Link

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Run 1: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of PCC-Vivace — Data Link

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Run 2: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of PCC-Vivace — Data Link

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Run 3: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 3: Report of PCC-Vivace — Data Link

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Run 1: Statistics of WebRTC media

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 1: Report of WebRTC media — Data Link

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Run 2: Statistics of WebRTC media

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

Run 2: Report of WebRTC media — Data Link

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Run 3: Statistics of WebRTC media

/home/ubuntu/pantheon/data/2019-07-12T13-57-Stanford-cellular-to-AWS-California-1-3-runs-3-1

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

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