## Data Streaming over an International 10GE Multipath OpenFlow Network

Sander Boele, Freek Dijkstra, Ronald van der Pol Artur Barczyk, Michael Bredel, Azher Mughal, Ramiro Voicu Gerben van Malenstein Jim Chen, Joe Mambretti



SURF NET



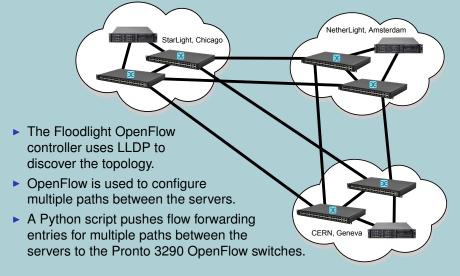
Caltech www.caltech.edu

© Dr. Michael Bredel | USLHCNET@CERN | Oct. 11th, 2012

### International Multipath OpenFlow Network

**i**CAIR

SURF NET





Caltech

© Dr. Michael Bredel | USLHCNET@CERN | Oct. 11th, 2012

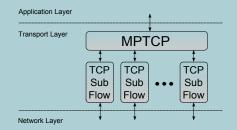
### MultiPath TCP

- Multipath TCP is a server side technology to send TCP data simultaneously over multiple paths. Congestion control takes care of sending traffic on the least congested path.
- For applications, MPTCP looks like standard TCP.
- Multiple TCP flows traverse the network on different paths.

\_ iCAIR

 In the demo, we present memory-to-memory data transfer from GVA to CHI using MPTCP.

SURF NET



ヘロト ヘ戸ト ヘヨト ヘヨト

# © Dr. Michael Bredel | USLHCNET@CERN | Oct. 11th, 2012

Caltech www.caltech.edu

### Monitoring the OpenFlow Network







#### ・ロト・西ト・ヨト・ヨー うらぐ



© Dr. Michael Bredel | USLHCNET@CERN | Oct. 11th, 2012