

# **Steroid OpenFlow Service**

**Ryan Izard**  
**rizard@g.clemson.edu**

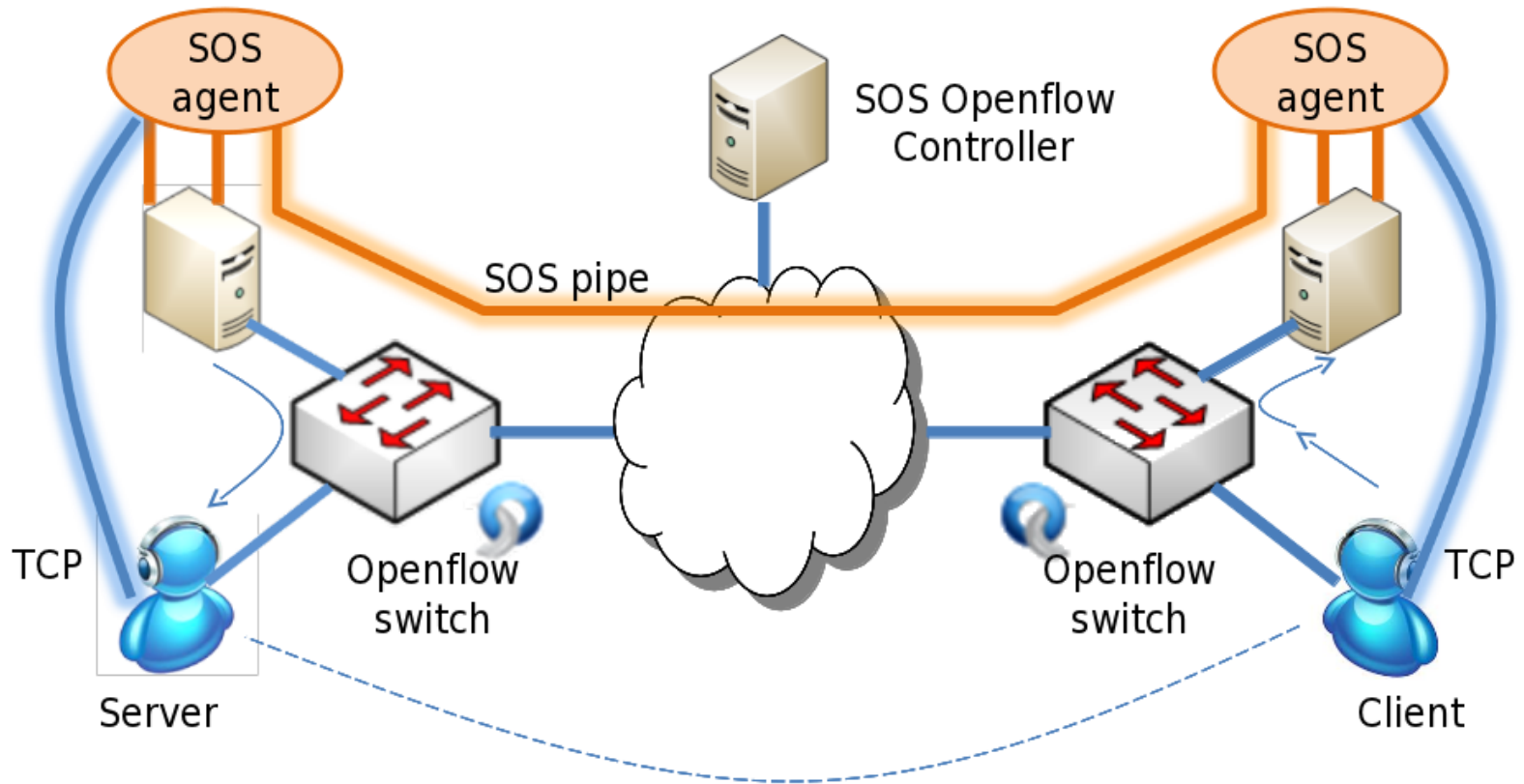
**Qing Wang**  
**qw@g.clemson.edu**

## **Steroid OpenFlow Service (SOS)**

- **Problem**
  - Large delay-bandwidth product networks
  - TCP window size problem
  - Cannot fill pipe
- **SOS solution**
  - SDN-based
  - Transparent service improvement to user
  - Single and multipath support

# General SOS Architecture

## System Architecture Overview

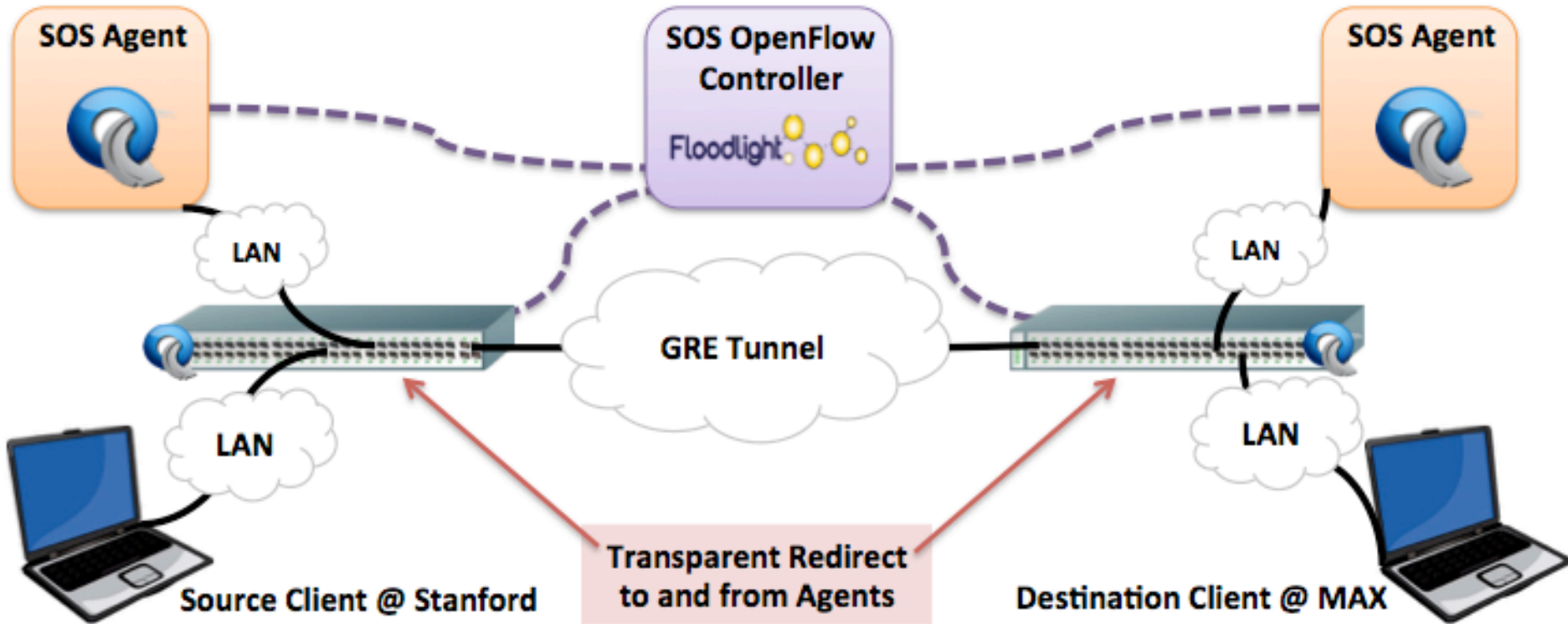


## SOS Use Case: DNA Data Transfer

- Genomics data sets are large
  - Cannot be shared easily
  - Mail hard disk
- SOS can increase network performance



# SOS Use Case: DNA Data Transfer



## Data Transfers on GENI with Steroid OpenFlow Service (SOS)

- Results over GENI GRE tunnel
  - *Without* SOS: 15.4Mbps
  - *With* SOS: 85.6Mbps
  - **Improvement: 5.6x**
  - Limitation: VMs, 489MB RAM, 32 parallel TCP connections, GRE tunnel BW > stitching BW
- SOS Design
  - *Agents*: initiate parallel TCP connections
  - *Clients*: no modification
  - *Controller*: detect, set up, and tear down SOS session