GENI for NDN Research and Education
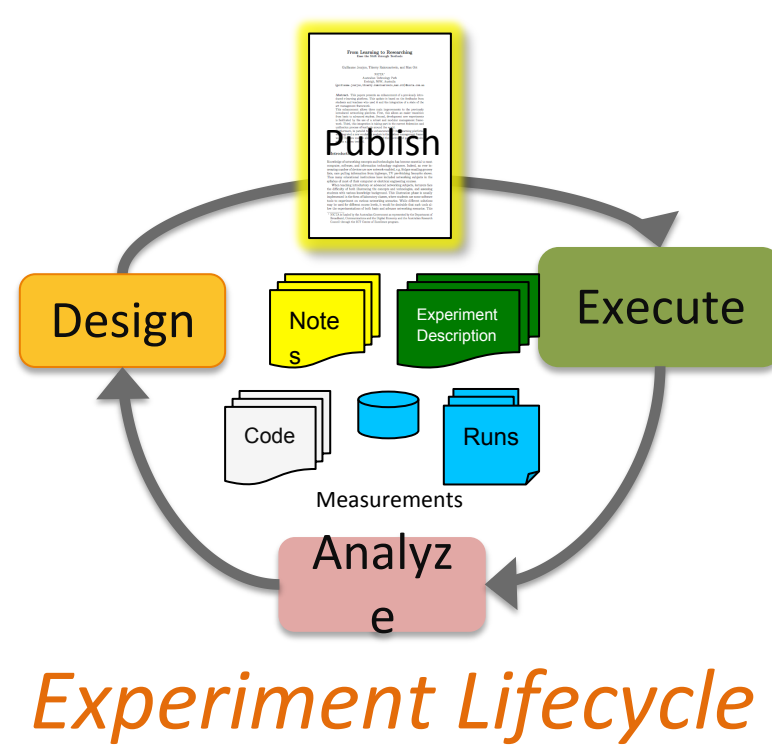
Niky Riga, PhD GENI Project Office

GENI, is a **virtual laboratory** for networking and distributed systems **research** and **education**.

It has a **Layer 2** network that is sliced to support **multiple simultaneous**, **IP** and **non-IP** experiments

GENI Layer 2 Backbone
deeply programmable
sliced by VLAN (≥ 1Gbps)

GENI tools to
- automate setup
- orchestrate
- measure and archive
- collaborate

Experiment Lifecycle

GENI Racks
network, compute , storage
at network core and edges

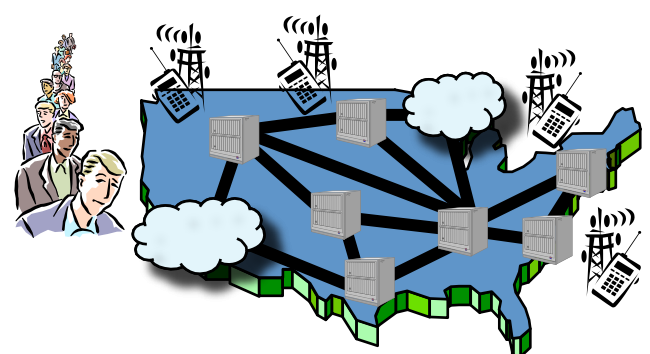**WiMAX base stations** w/ stationary and mobile clients

GENI for experimentation:
- Automated and repeatable runs (custom images, install scripts)
- Arbitrary multi-site topologies
- Share your experiments
- International federation
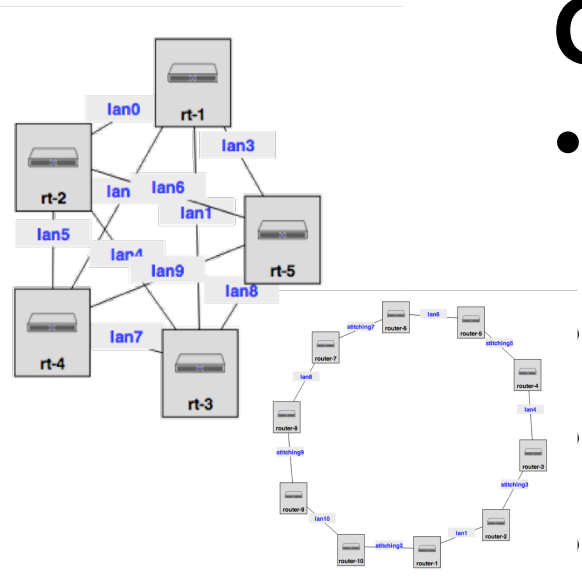
Services on GENI:
- long-running slice used by other experimenters
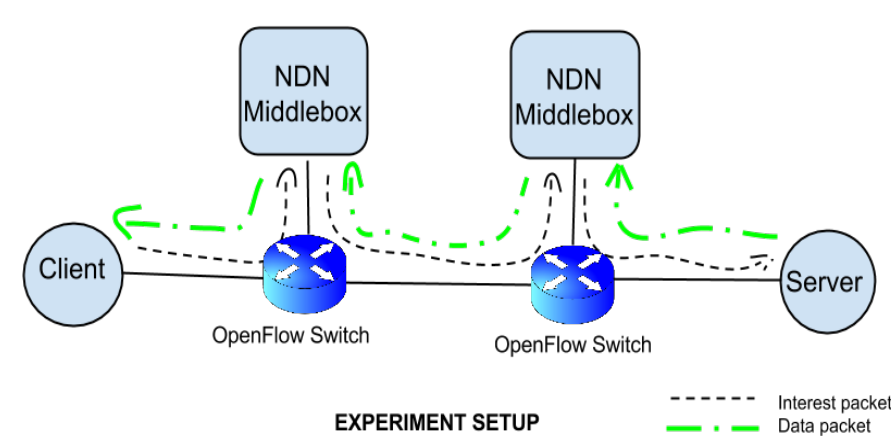 *NDN AL2S multi-point VLAN*

GENI for teaching:
- easy-to-use virtual lab
- tutorial use
- students can experiment (easy to start over)

NDN and SDN on GENI
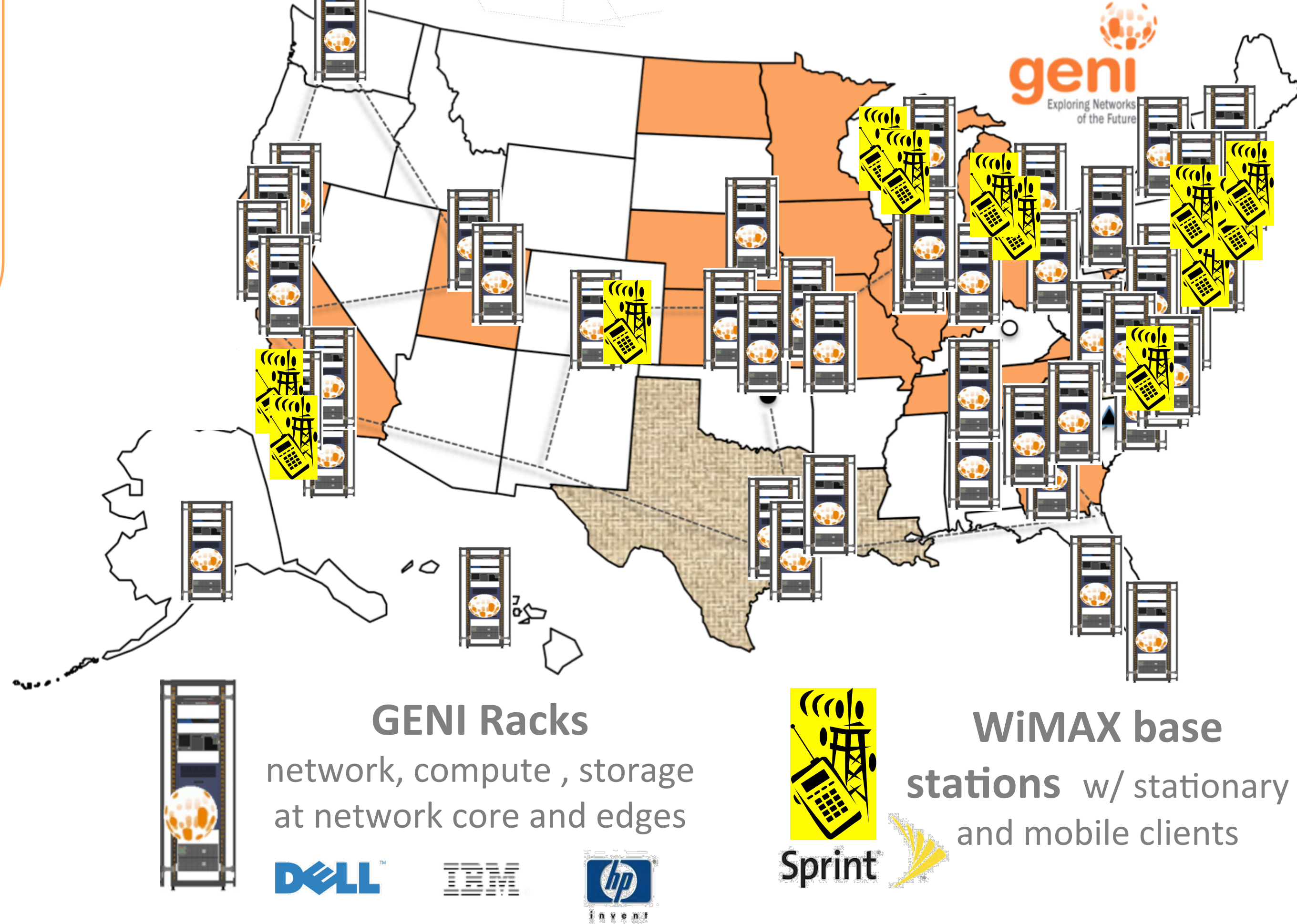*NDN experiment* by Divya Bhat, UMass Amherst*

Implement custom NDN routing using OpenFlow

1. Move from mininet to a real deployment and test performance
2. Extend to other custom NDN routing policies

*Providing CCN functionalities over OpenFlow switches, Xuan-Nam Nguyen, Damien Saucez, Thierry Turletti
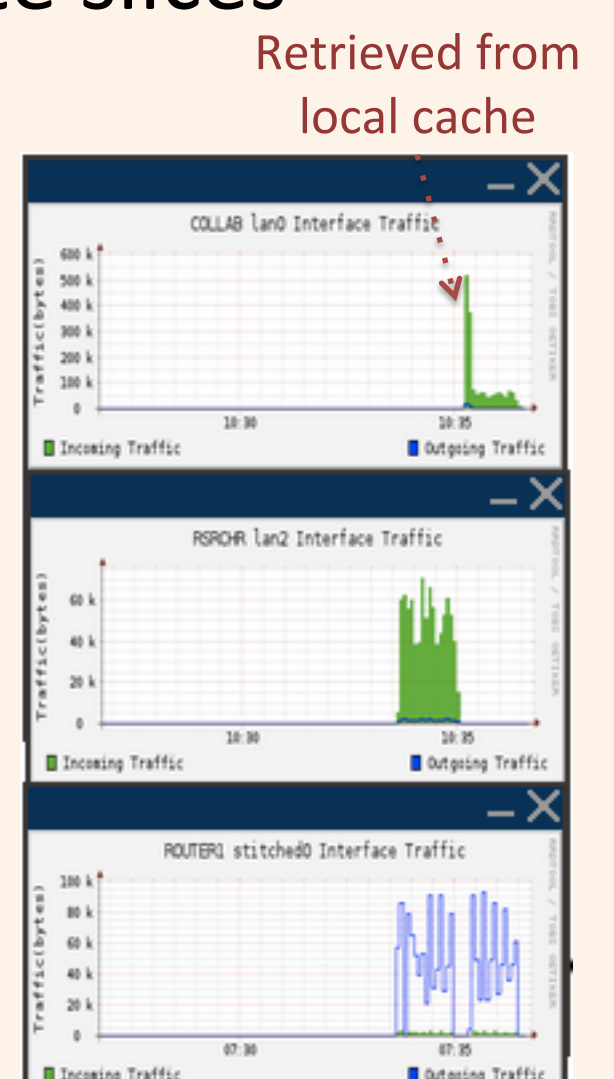
Simple NDN experiment/exercise running on GENI*

1. Create NDN Image
2. Write scripts
   - Download/install/configure app
   - Configure routers
3. Create many configurations
   - single site, multi site
   - different network sizes
4. Share with others
   - Multiple separate slices

NyserNET

NDN Routers

Internet 2

end hosts

Stanford

Multisite NDN Demo Setup
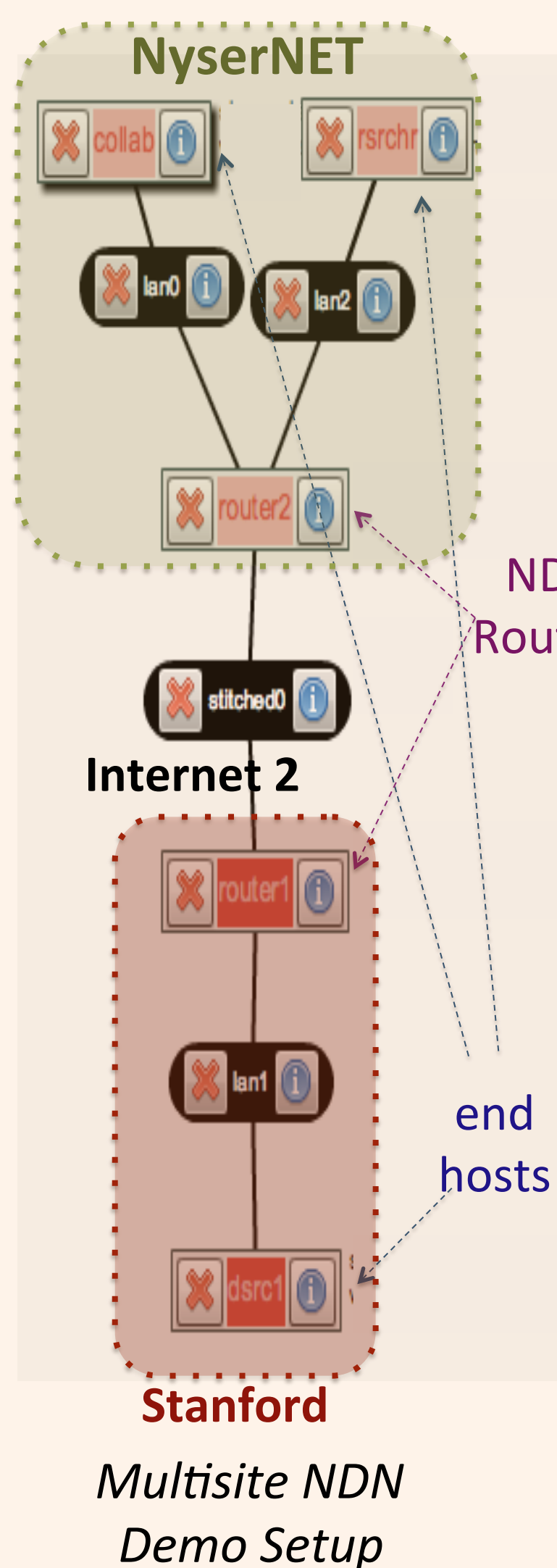
Standard GENI tutorial and classroom exercise

Retrieved from local cache

GENI Desktop monitoring network traffic

* Original exercise developed by Sonia Fahmy, using CCNX software

Sign up today:
https://portal.geni.net or email help@geni.net

GENI is available free of charge for research and education.