

# GENI

## Experimentation Update

### GENI Engineering Conference 12 Kansas City, Missouri

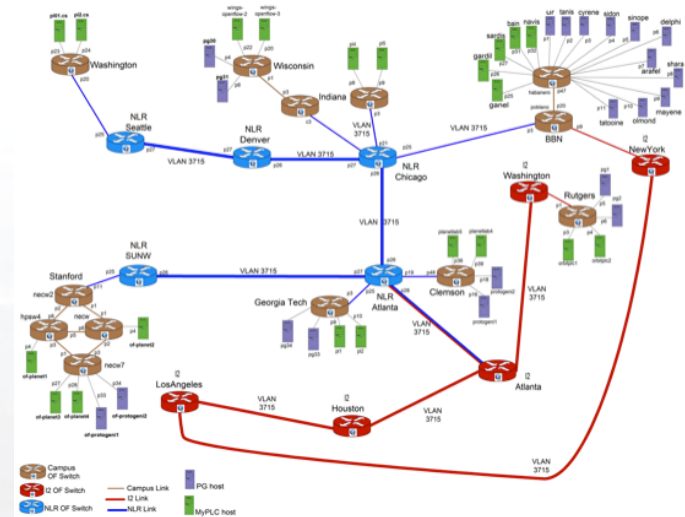
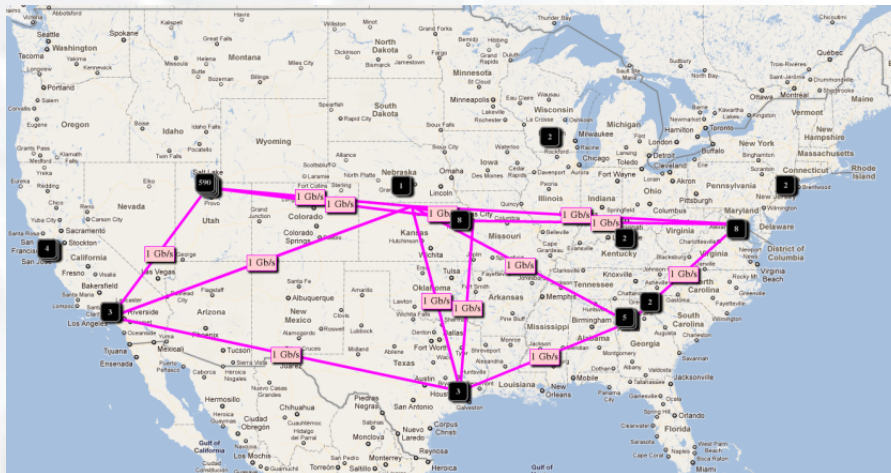
Mark Berman  
November 3, 2011  
[www.geni.net](http://www.geni.net)

- **“GENI Template” configurations of GENI mesoscale infrastructure support**
  - Novel, non-IP networking experiments
  - Test and deployment of experimental and emerging service offerings
- **Seven example services / experiments this afternoon**
  - Experimental capabilities deep in network, some in a collaborative effort with SuperComputing 2011 OpenFlow research sandbox
  - Services providing direct support to users at network edge
- **New developments in GENI and US Ignite! are enabling more experiments and larger experiments**
  - Campus expansion and GENI rack deployments create more deep programmability assets
  - US Ignite! city participation introduces new opportunities for novel applications that reach whole communities

GEC11 (July) was the debut for two GENI templates supporting Nationwide IP and non-IP experiments

- ProtoGENI + Internet2
- Mesoscale: PlanetLab, ProtoGENI, OpenFlow, I2, NLR

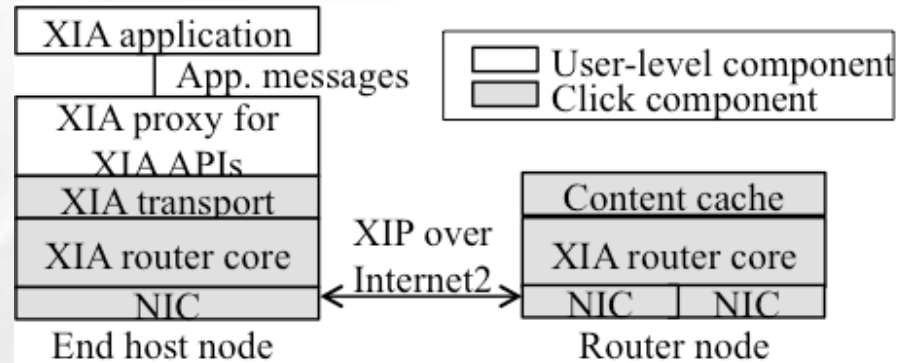
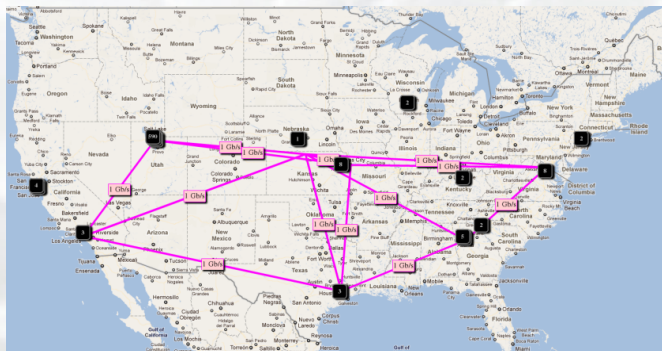
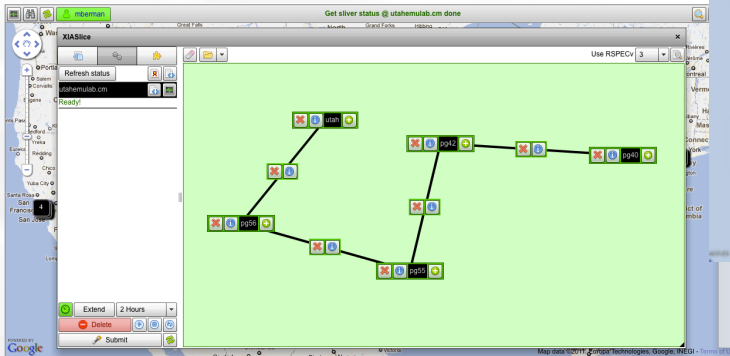
**This week, two Future Internet Architecture experiments are using these configurations**



Experimenters are ready and eager to use new GENI capabilities.

# eXpressive Internet Architecture – XIA

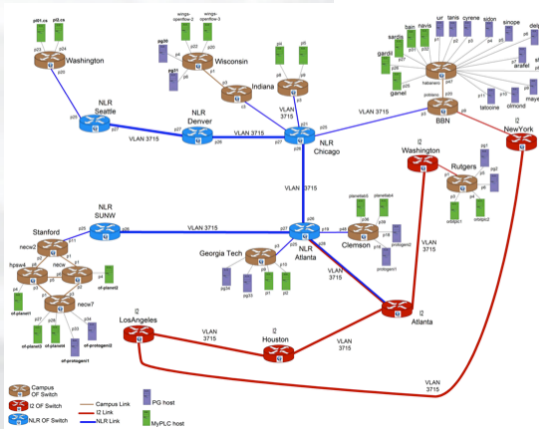
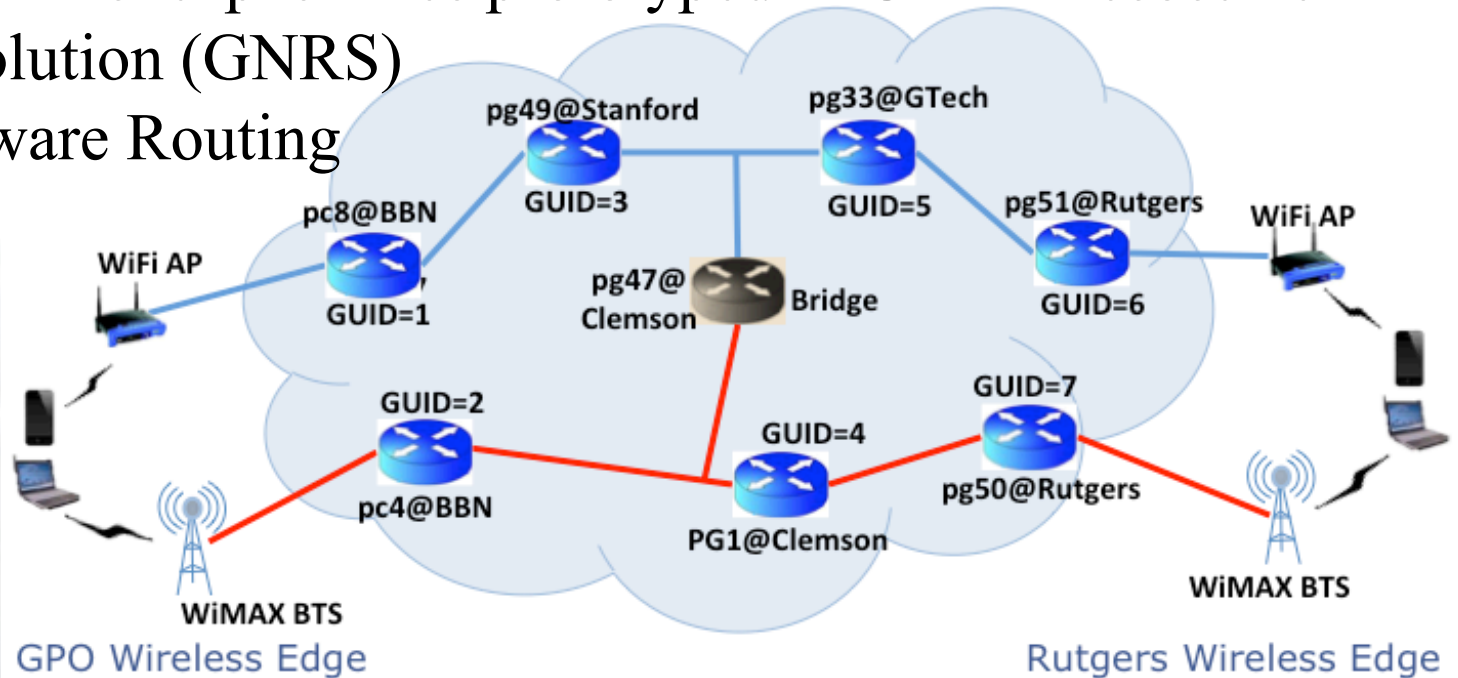
## XIA Click-router prototype deployed on ProtoGENI and Internet2






Figures courtesy: Rob Ricci, Matt Strum (U. Utah), Peter Steenkiste, Suk-Bok Lee (CMU)

## Key Mobility First capabilities prototyped in GENI Mesoscale

- Name resolution (GNRS)
- Storage Aware Routing

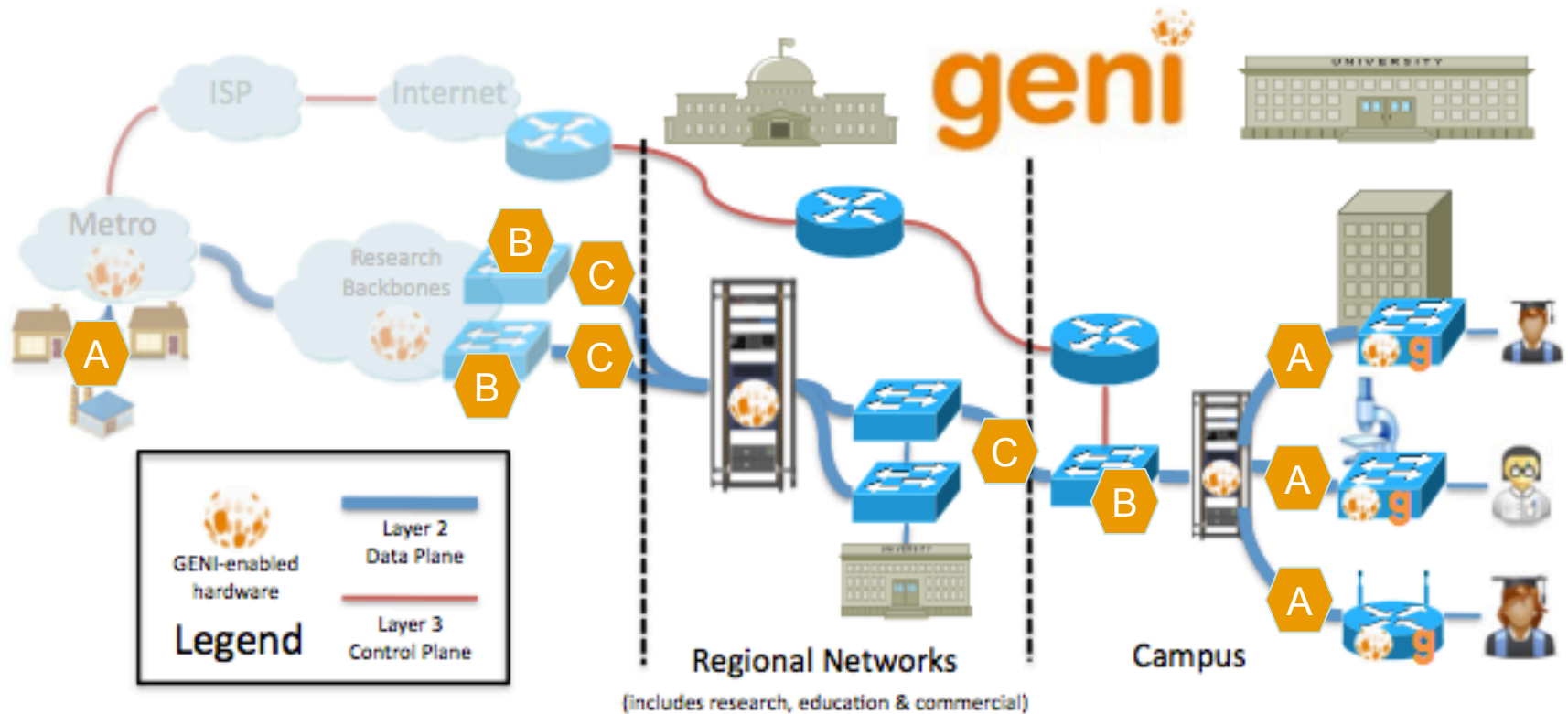


 NLR path using VLANs 3716, 3799 (Clemson)  
 I2 path using VLANs 3715, 3745(BBN), 3798 (Clemson)  
 ProtoGENI host running MF Router

Figures courtesy:  
Ivan Seskar, Kiran Nagaraja (Rutgers), Luisa Nevers (GPO)

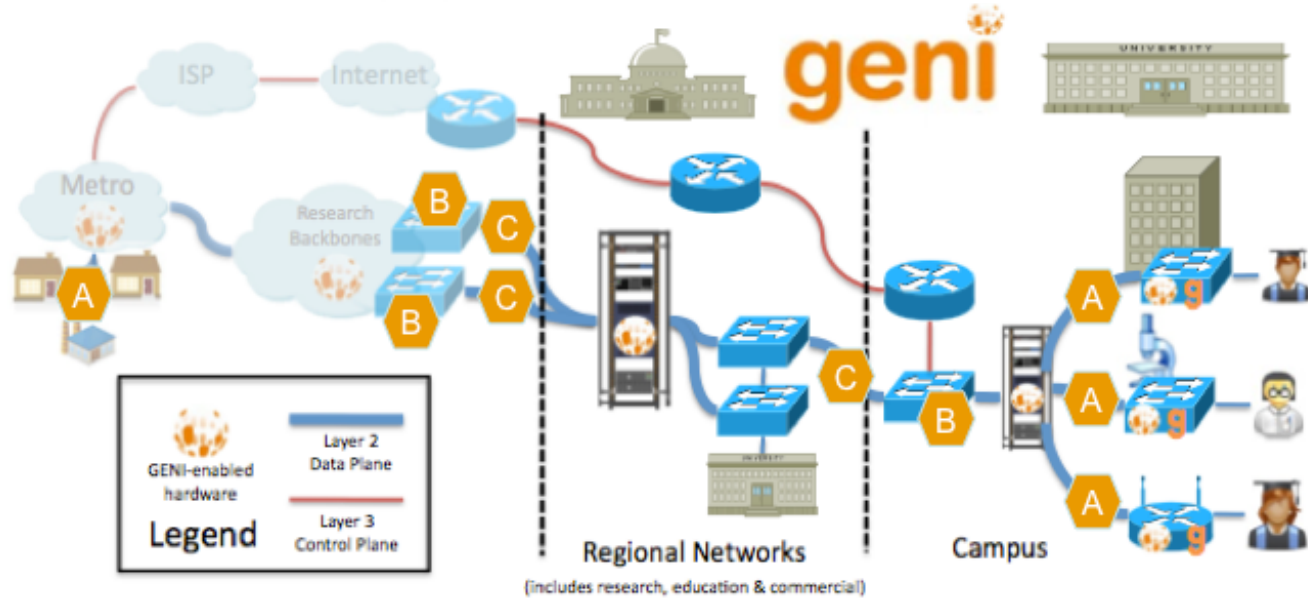
# GENI / US Ignite! Architecture Offers Multiple Ways to Insert Capability

Experiments and services may be deployed at different points in the “stack” – close to the user, deep in the network, or both.



Note: Conceptual architecture only.

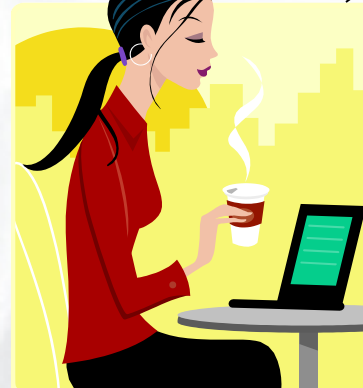
# Two Views of GENI and US Ignite!



Whew! I don't have to mess with the underlying network. (But I can if I want to.)



Wow! I can change the behavior of the underlying network. (But I don't have to.)



## GENI expansion – GENI racks, more campuses

## New support services, education, and training

- GENI summer camps and workshops
  - Seeking participants and instructors: see Kaiqi Xiong
- Tutorials at non-GENI venues (we're overbooked at GECs)
  - And expand capacity at GECs
- Expanded on-line tutorials and examples
- Targeted tools to facilitate “ready-to-go” experiments
  - Synthetic traffic / workloads for repeatable experiments
  - Low barrier-to-entry wireless sensor experimentation kits
- Operations support, helpdesk

**Attend Experimenters' Roundtable on Friday to have your say.**



## Learn how to use GENI

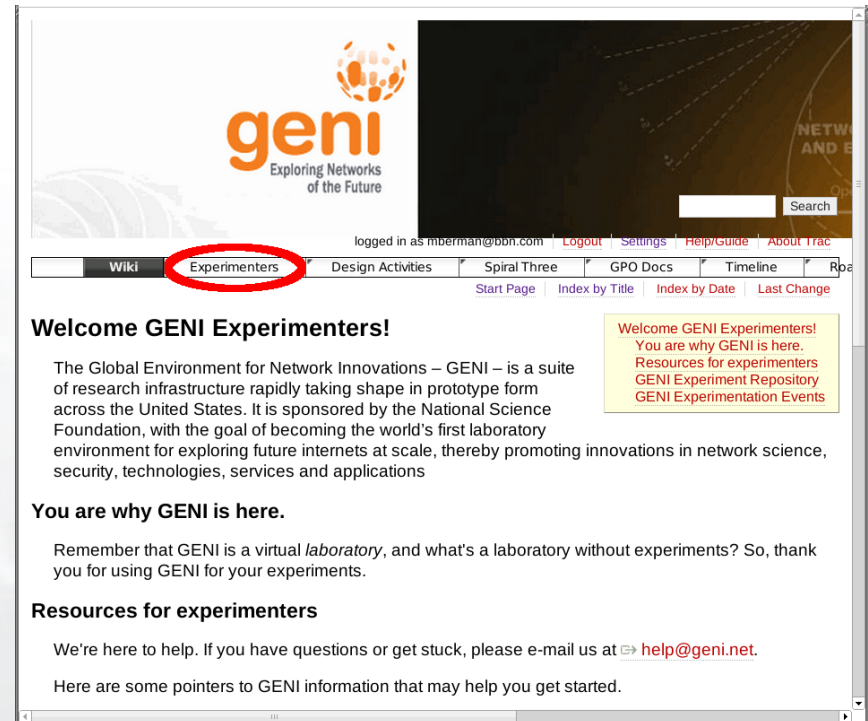
- Attend tutorials
- Visit the wiki:
  - <http://groups.geni.net/geni/wiki/GeniExperiments>

## Get an account

- Stop by the GENI help table
- Instructions on the wiki

## Start experimenting

- Help is available
  - [help@geni.net](mailto:help@geni.net)
  - Mark Berman  
<mberman@bbn.com>



The screenshot shows the GENI website interface. At the top left is the GENI logo. Below it is a navigation bar with links: Wiki, Experimenters (circled in red), Design Activities, Spiral Three, GPO Docs, Timeline, and Resources. A search box is visible on the right. Below the navigation bar, the main content area displays a welcome message for GENI Experimenters, including a list of resources and contact information for help@geni.net.

geni  
Exploring Networks  
of the Future

logged in as mberman@bbn.com | Logout | Settings | Help/Guide | About | Feedback

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### Welcome GENI Experimenters!

The Global Environment for Network Innovations – GENI – is a suite of research infrastructure rapidly taking shape in prototype form across the United States. It is sponsored by the National Science Foundation, with the goal of becoming the world's first laboratory environment for exploring future internets at scale, thereby promoting innovations in network science, security, technologies, services and applications

**You are why GENI is here.**

Remember that GENI is a virtual *laboratory*, and what's a laboratory without experiments? So, thank you for using GENI for your experiments.

### Resources for experimenters

We're here to help. If you have questions or get stuck, please e-mail us at [help@geni.net](mailto:help@geni.net).

Here are some pointers to GENI information that may help you get started.