



# GENI

## Experimentation Update

### GENI Engineering Conference 8 San Diego, CA

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July 21, 2010  
[www.geni.net](http://www.geni.net)  
[groups.geni.net](http://groups.geni.net)

- Brief Status of GENI Experimentation
- Report from GENI Experimenters Workshop

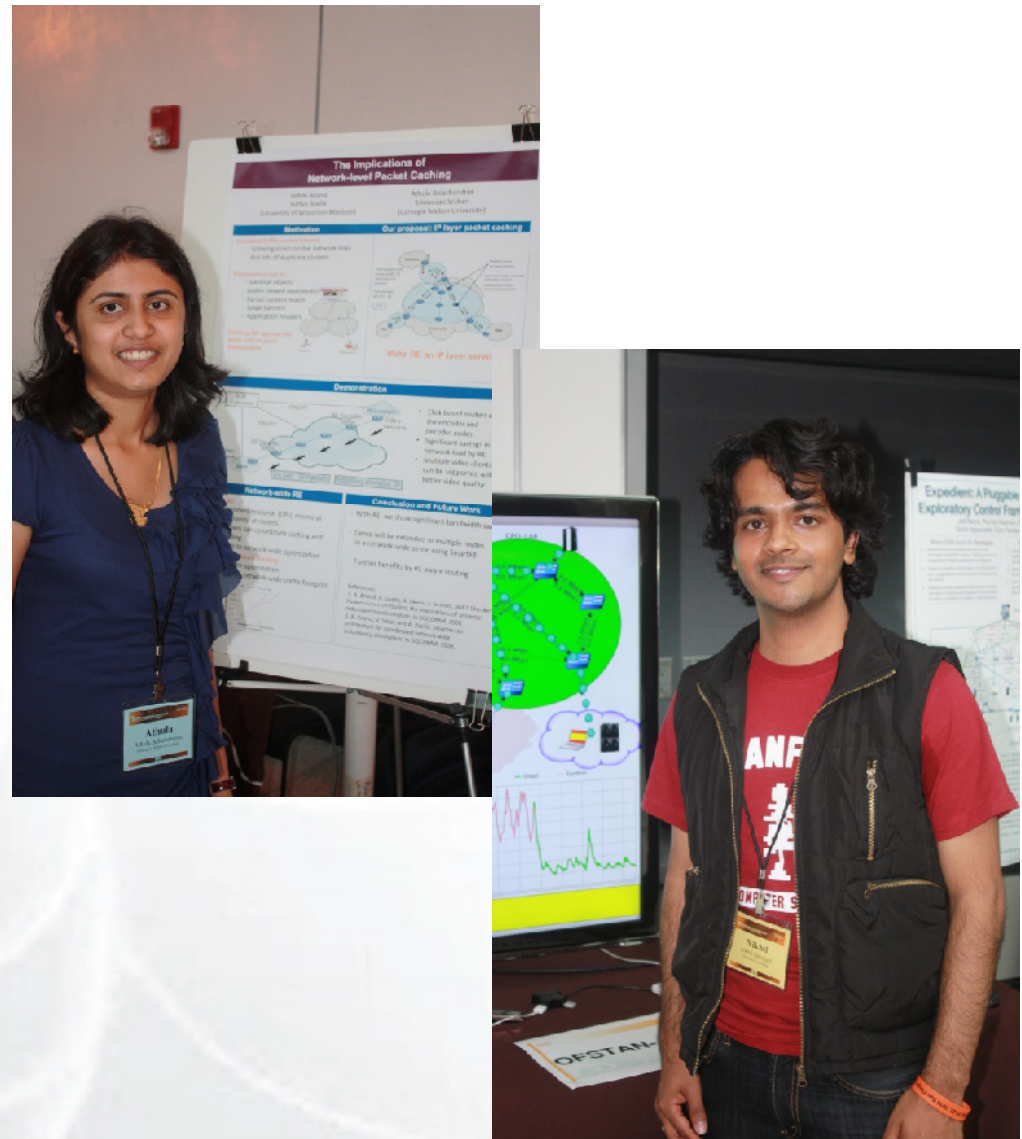
Where do GENI experiments come from?

- Initial “brave pioneers”
- GENI Alpha participants
  - You saw some last night
- Recent NSF GENI Experimenters Workshop
- Please join in with your experiment ideas



## Typical experiment wants

- A little network control
  - Bandwidth
  - Routing control
  - Isolation
- A little processing / storage
  - Caching
  - SW Routers
  - In-network intelligence
- Ability to spread out across network



# Getting Experiments Off the Ground

- Several experiments have designed and set up initial configurations
  - Modest resource sets and limited heterogeneity to start
  - Ready to scale up
- GPO lab can help
  - Strategically useful, although not infinite, resources for connectivity, computation, and consultation
  - Often useful for establishing an additional beachhead in an experimental configuration
  - Contact [mberman@bbn.com](mailto:mberman@bbn.com)
- [experimenters@geni.net](mailto:experimenters@geni.net) list
  - Announcements of available capabilities
  - Discussion of experiment needs, progress

- Current experiments are poised to take advantage of interoperable GENI components
  - Putting together a typical experiment still involves a fair amount of manual coordination to connect heterogeneous parts
  - Next steps are taking advantage of common API and tools to enable a less manual “stitching” process
- Power of GENI’s experimental infrastructure will grow significantly with meso-scale deployment
  - Several experimenters are eager to move up from just one or two backbone sites to a robust topology

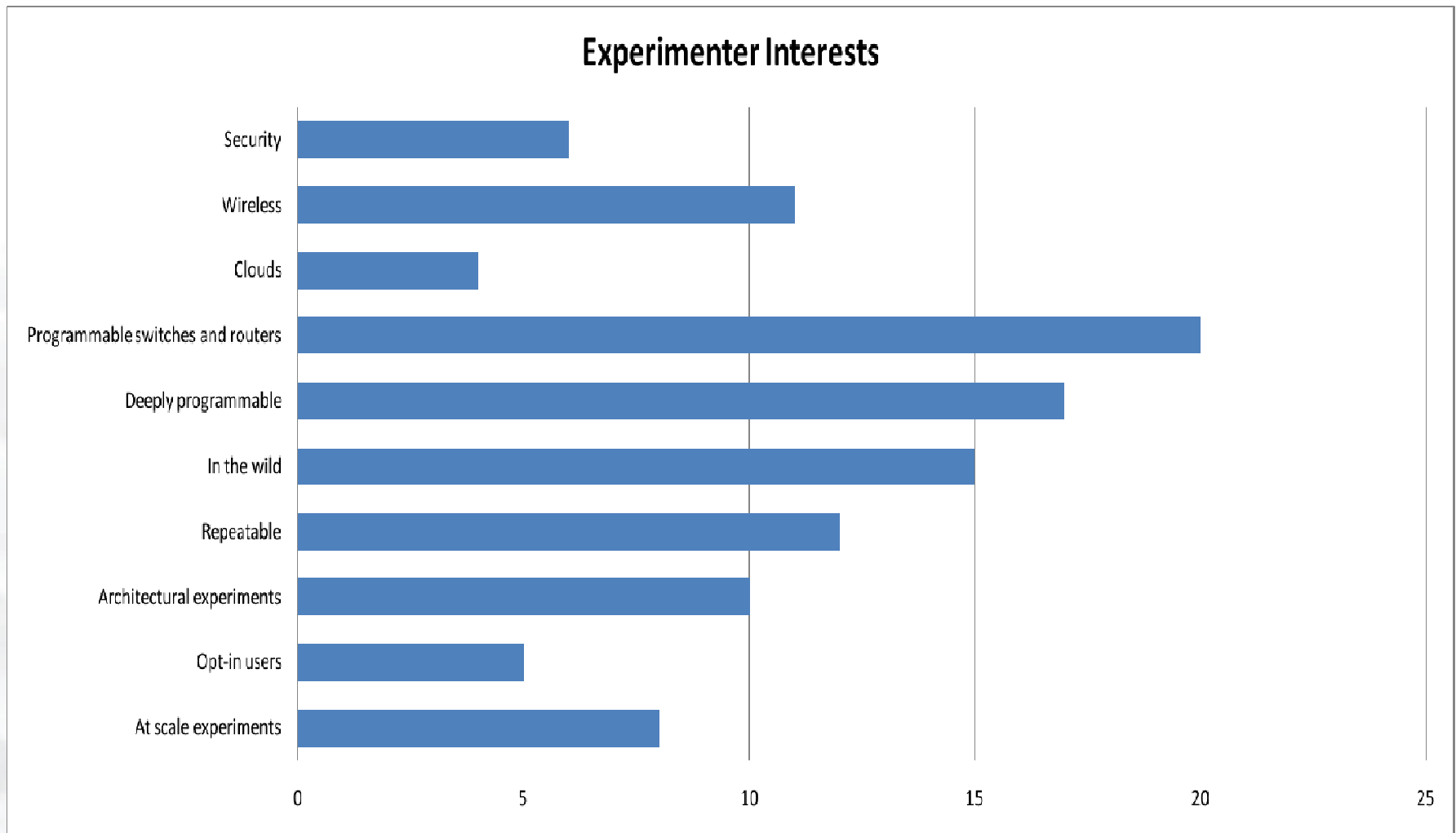
- Expect an increase in experimenter use of GENI
- Those of us building GENI need to step up to support our user community
  - Easier access to GENI via common API and rspecs
  - New experimenter tools that support
    - Integration
    - Stitching
    - In-slice visibility
  - Deeply programmable backbone resources destined to be popular places

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- Twenty-seven pairs of researchers participated in the GEW in Princeton, June 29-30
  - Thanks to NSF for sponsoring and to Guru Parulkar and Jen Rexford for chairing
- Many of the participants have submitted grant proposals for their experiments
  - We hope to have strong growth in experimentation over the coming year.
- Workshop provided powerful insight into experimenters' needs

- To succeed as a virtual laboratory, GENI must support a wide variety of experiments.
- Early GENI goals include support for
  - Repeatable and/or “in the wild” behavior
  - Large-scale infrastructure
  - Novel network architecture
  - Deep programmability
  - Programmable switches and routers
  - Opt-in users
- These capabilities are rapidly taking shape
  - GENI will continue to increase in capability, scale, and interoperability



- GEW white papers and discussion indicate that experimenters want what GENI is promising
  - We're still shaking it down, and we need to scale up
- This community needs to come through on our spiral 2 (and beyond) commitments
  - Interoperable access to heterogeneous GENI components
  - Continue growing capability deep in the network so experimenters can assemble exciting slices