



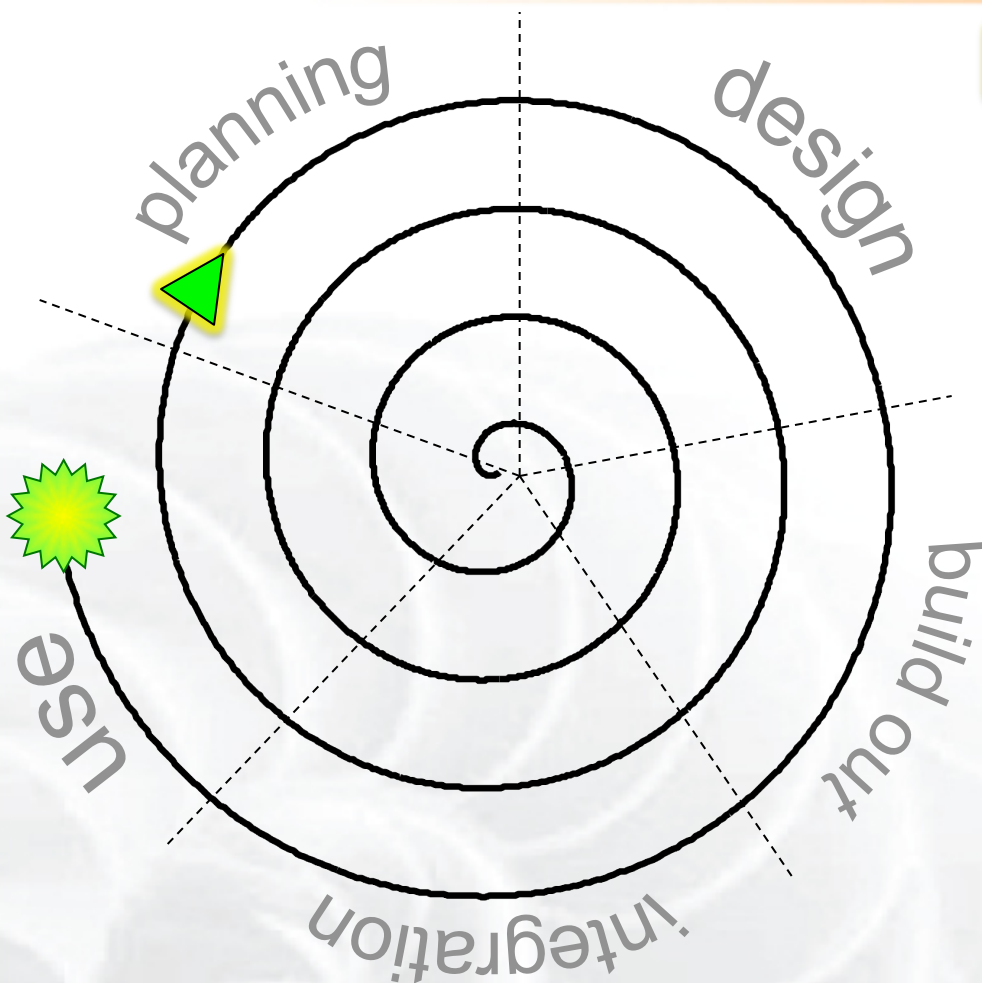
GENI

Welcome to Spiral 5

GENI Engineering Conference 15 University of Houston

Mark Berman
October 24, 2012
www.geni.net

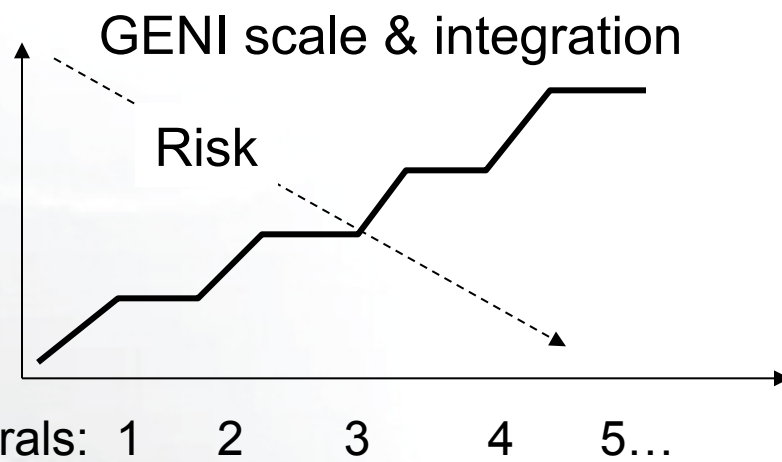
Welcome to GENI Spiral 5



GENI Prototyping Plan

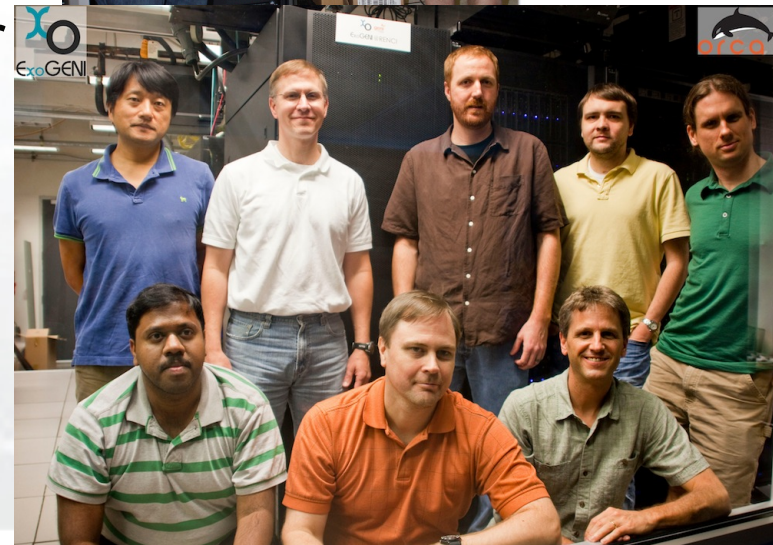
▶ Key Spiral 5 Goals

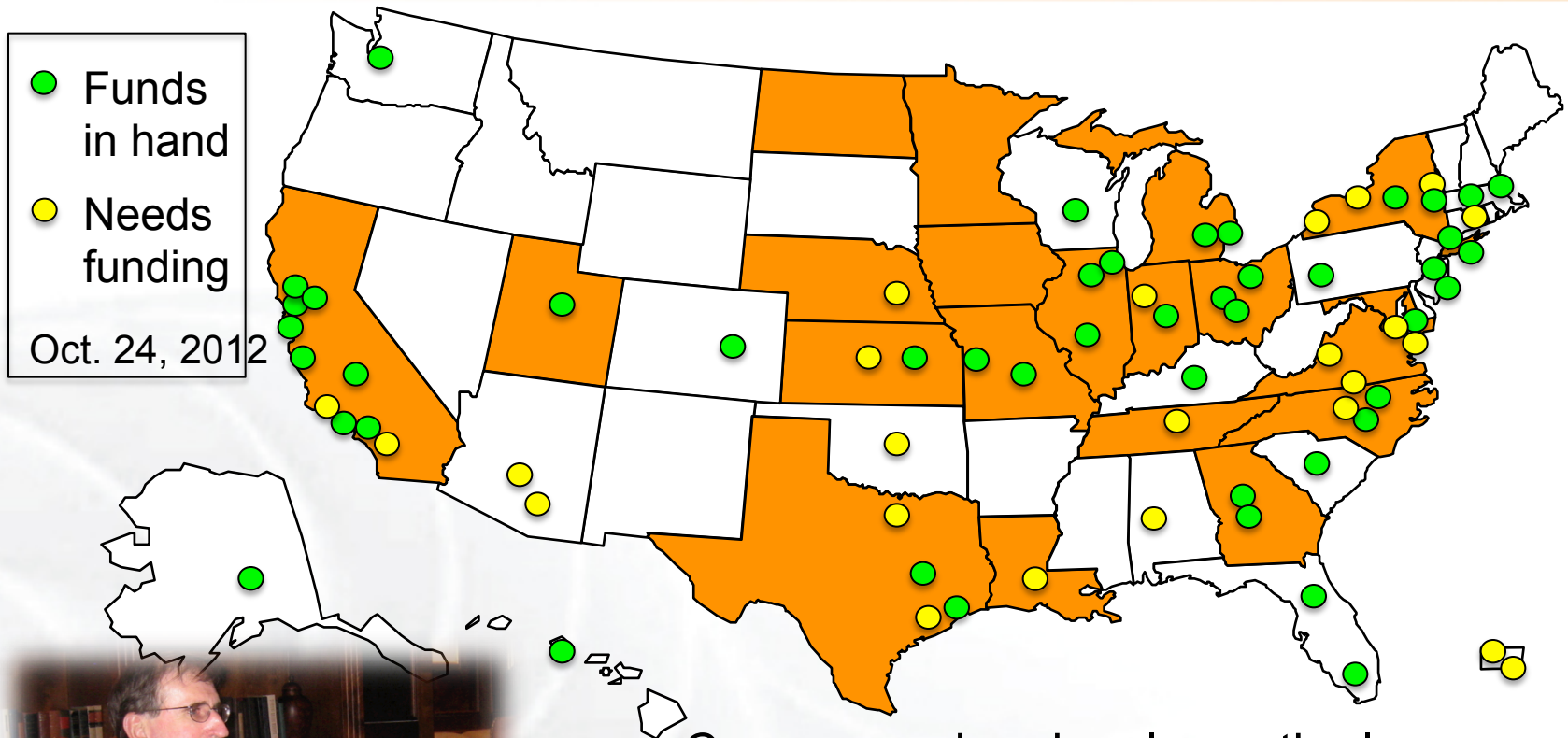
- Rapid growth in GENI resources (racks, campuses, regionals)
- Clean, consistent experimenter experience
- Steadily increasing experiment and classroom use



Make GENI bigger. Make GENI better. Bring your friends.

- First GENI racks in use by intrepid experimenters
 - Expected operational this winter
- Rapid deployment schedule
 - 3 GENI racks today
 - 17 GENI racks by March 2013
 - 46 GENI racks in the next year
- Complemented by spontaneous, commercially-driven rack developments
 - Interoperability is key to empowering experimenters





Campus and regional growth plans

- Today: 16 campuses and 8 regionals
- In one year: 42 campuses and 9 regionals

NSF's CC-NIE program will accelerate and amplify the effects

To GENI-enable your campus, bring your CIO and talk to Larry Landweber

Experimenter Experience: GENI Race (Run a Complete Experiment)

- Tools are in place today for you to run a complete GENI experiment, from soup to nuts.
 - Design your experiment
 - Obtain resources
 - Execute
 - Collect data
 - Analyze
- GENI Race demo this morning

Try your own experiment: Experimenter drop-in session
Help build better tools: Experiment lifecycle tools session

Experimenter Experience: Improve Consistency and Toolset

From this:



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Experimenter Experience: Improve Consistency and Toolset

To this:



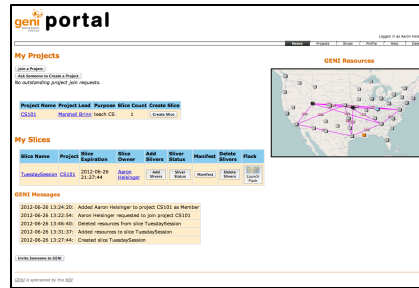
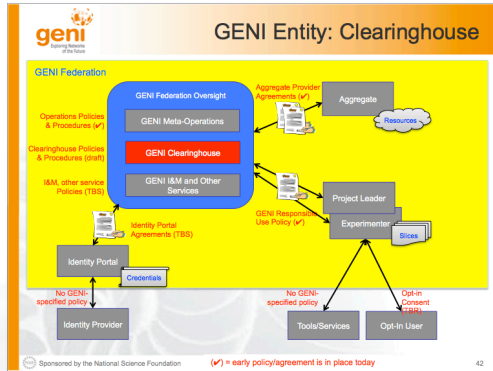
Consistent behavior

- ✓ Across aggregates
- ✓ Across aggregate types
- ✓ Across time

Rich experimenter tools

- ✓ Experiment management
- ✓ Instrumentation & measurement

Experimenter Experience: GENI Clearinghouse and Portal

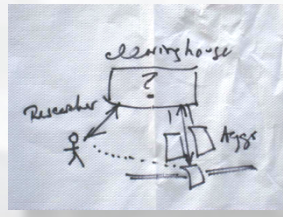


GEC14



GEC15: Portal and Clearinghouse Available to early adopters

GEC11: Federation Session Defined Clearinghouse

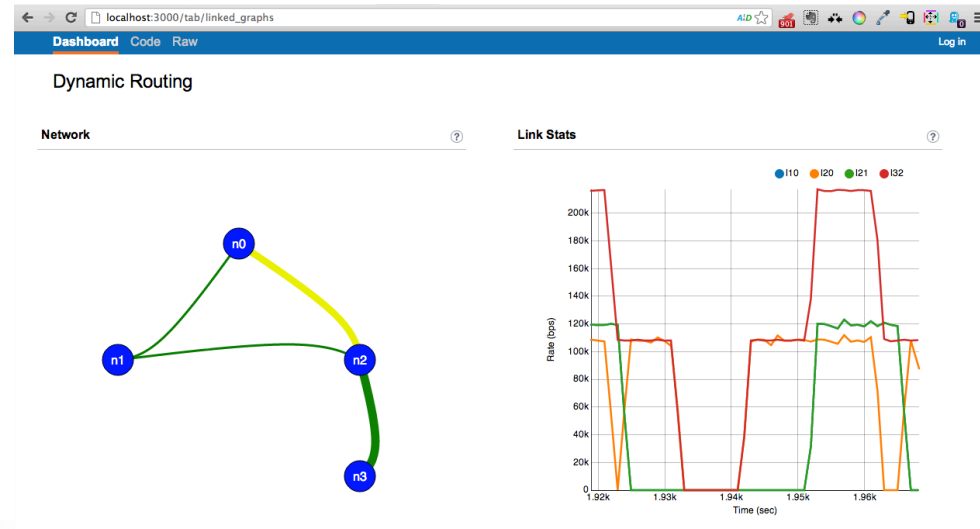


GEC13: Software Architecture Defined Clearinghouse Services

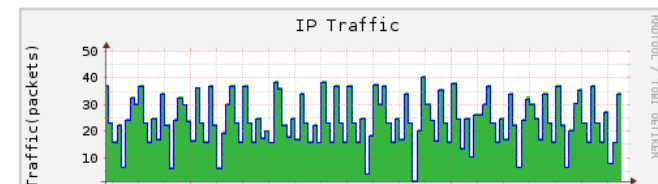
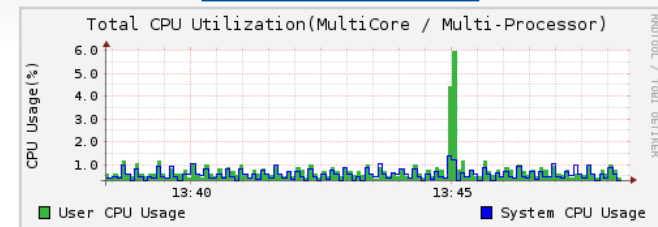


Early adopters – attend clearinghouse / portal session. Clearinghouse and portal code available for sharing.

- GIMI and GEMINI toolkits available now
 - Tutorials this week
- Initial releases are rack-specific
 - GIMI runs on ExoGENI
 - GEMINI runs on InstaGENI
 - Spiral 5 goals to run on either rack



Node Graphs for PCVM62-1



- Share your GENI experiment or classroom experience with others
 - Sample experiment / assignment outline
 - Screencast
 - Experiment setup / rspec / code
- GPO will help share your valuable experience with others who may benefit
 - Highlight at GEC
 - Post on geni.net
 - GENI LinkedIn group, GENITutorials YouTube channel

Send to help@geni.net.



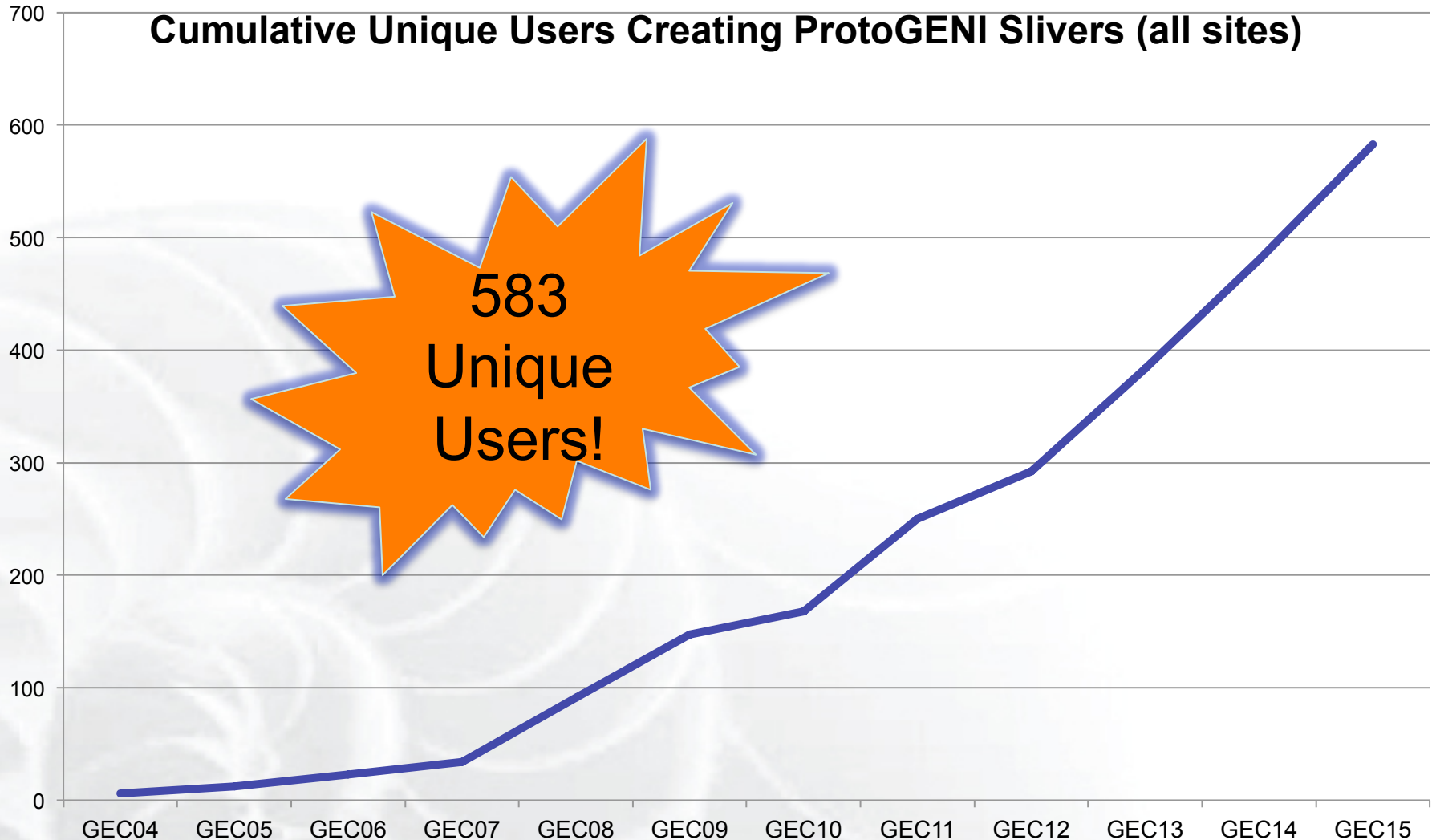
Why are we doing these things?

The top GENI goal of the upcoming year is increased adoption in the lab and classroom.

- GENI technology spreading to more campuses
 - Sometimes (not always) directly via GENI project
- Increasing experimenter and classroom uptake
- Commercial adoption of key GENI enablers
 - GENI racks, OpenFlow/SDN
- GENI research visibility is growing in academic literature
 - See the GENI bibliography under the experimenter section of the GENI wiki
 - To make sure your papers are included, send us a copy or include GENI in your keywords



- International collaborations based on federation and interoperability
 - Connecting some of the best researchers worldwide
 - Creating exciting, new opportunities for GENI researchers to collaborate on innovative research
 - Open, interoperable interfaces enable an open ecosystem of tools and federated infrastructure
- Several examples visible here in Houston
 - Demonstration of Brazil – US federated ProtoGENI aggregates based on dynamic circuit provisioning
 - XIA and Packet Caching demos, building on Japan – US federation of VNode and GENI technology
 - Slice Around the World demo



Data through 20 Oct 2012, excludes test users, includes tutorial users.

- 2nd GENI experiment and education workshop
 - Salt Lake City, March 21-2, 2013
 - Papers IEEE indexed
 - **PAPER DEADLINE: January 3**
 - Keynote speaker: Dipankar Raychaudhuri
- Summer Camp – June 2013
 - University of Connecticut
 - Theme: Using GENI Wireless Resources



Pick up a flyer at registration table or GENI help desk.

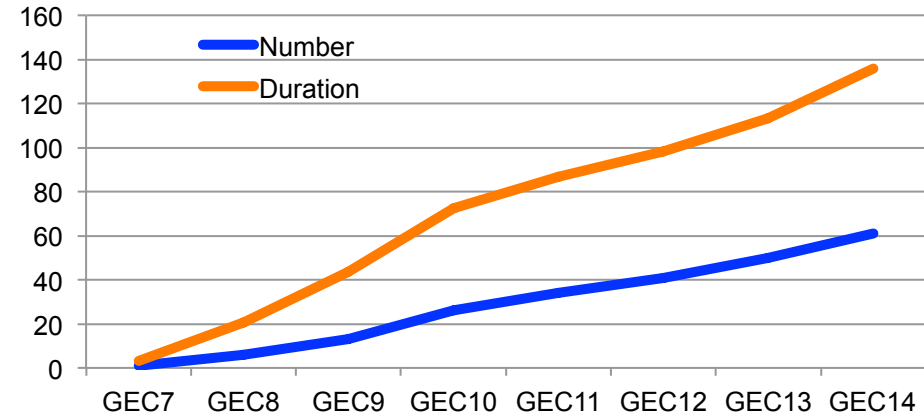
Increasing GENI Impact Training New Experimenters GENI Tutorials

- Instructor-Led Tutorials

- At GECs
- At conferences
- On campus

- Online, self-led training resources

- Do-it-yourself tutorials and examples on GENI wiki
- “Hello, GENI” new user example
- Experimenter tips and how-to’s
- Screencast videos



**Do you have an online tutorial to share?
Interested in a GENI tutorial on your campus?
Contact help@geni.net**

- Use of GENI in the classroom is accelerating
 - We know of three classes that used GENI in 2011-2
 - Two classes ongoing this semester
 - Rudra Dutta (NCSU) – Internetworking Protocols
 - Christos Papadopoulos (Colorado State) – Computer Networks & the Internet
 - At least four planning for upcoming Spring semester
- Instructors are benefiting from curriculum modules with online examples
 - Sonia Fahmy and Ethan Blanton (Purdue) have two (soon to be three) modules on GENI wiki
 - GPO can help develop / test your modules

Contact Niky Riga or help@geni.net

- NSF CC-NIE Program
 - J. Bryan Lyles, Program Director, NSF
- Applied Research Center for Computer Networking: GENI We Be of One Blood
 - Ruslan Smelyanskiy, Moscow State University
- eXpressive Internet Architecture (XIA)
 - Peter Steenkiste, Carnegie Mellon University

Break

- Using the Seattle Testbed for Education
 - Justin Cappos, NYU Poly
- More is Less: Improving Latency via Redundancy
 - Ashish Vulimiri, University of Illinois
- Leveraging OpenFlow for Resource Placement of Virtual Desktops
 - Prasad Calyam, Ohio State University
- GENI Race (Run a Complete Experiment)
 - Niky Riga, GENI Project Office

International Collaborations

- Slice Around the World Demo
 - Joe Mambretti, Northwestern University
- Federated VNode / GENI Packet Caching Demo
 - Aki Nakao, University of Tokyo

