



GENI

(the “Global Environment for Network Innovations”)

and

Cloud Computing

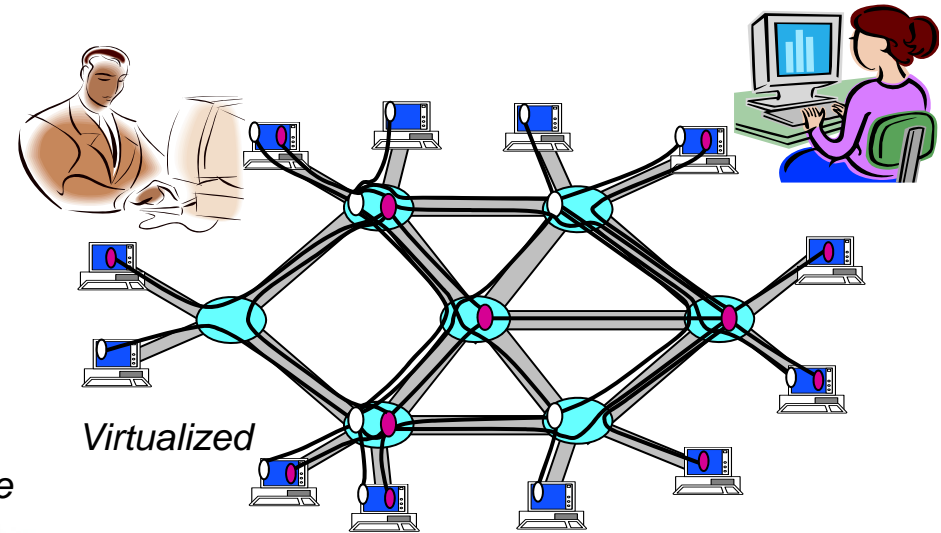
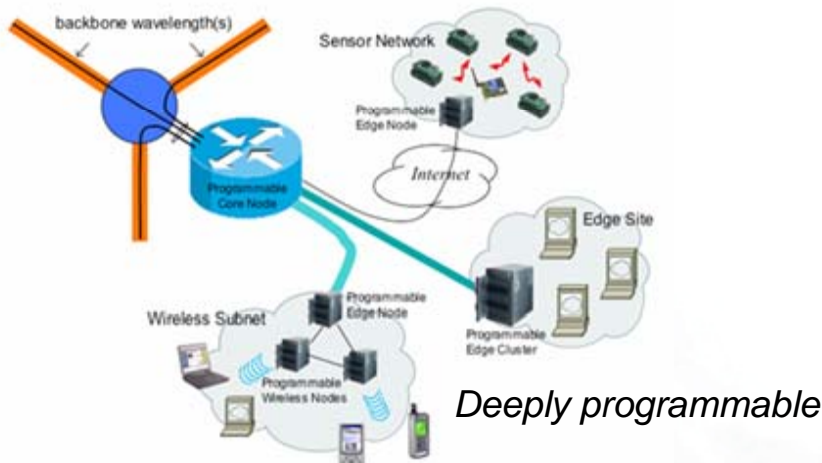
Harry Mussman
GENI Project Office at BBN Technologies
June 15, 2009
www.geni.net



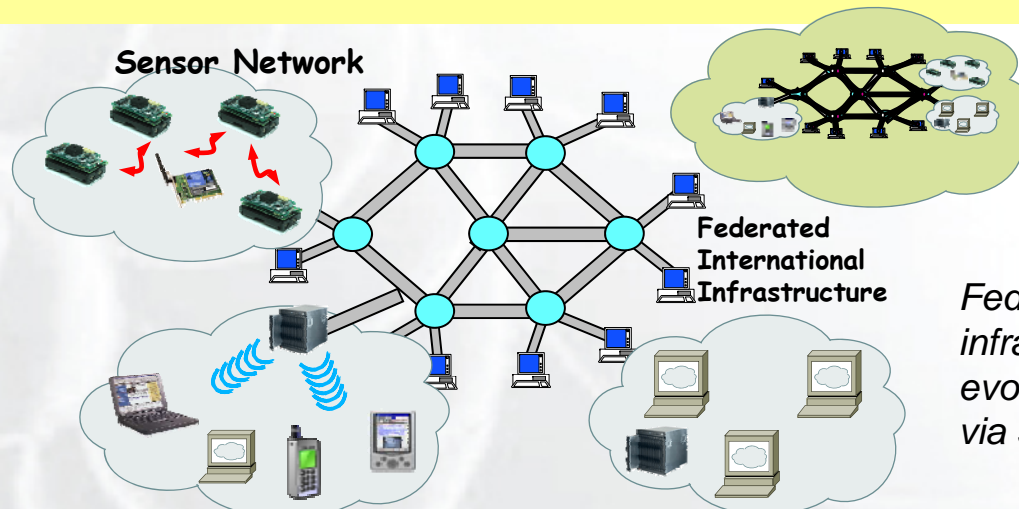
Sponsored by the National Science Foundation

- Conceptual design of GENI Infrastructure Suite
 - To support at-scale experimentation
- Status of the GENI Spiral 1 Prototype
 - Funded by the NSF
- Using GENI for Cloud Computing Experiments
- Learning more about GENI

GENI Suite Conceptual Design

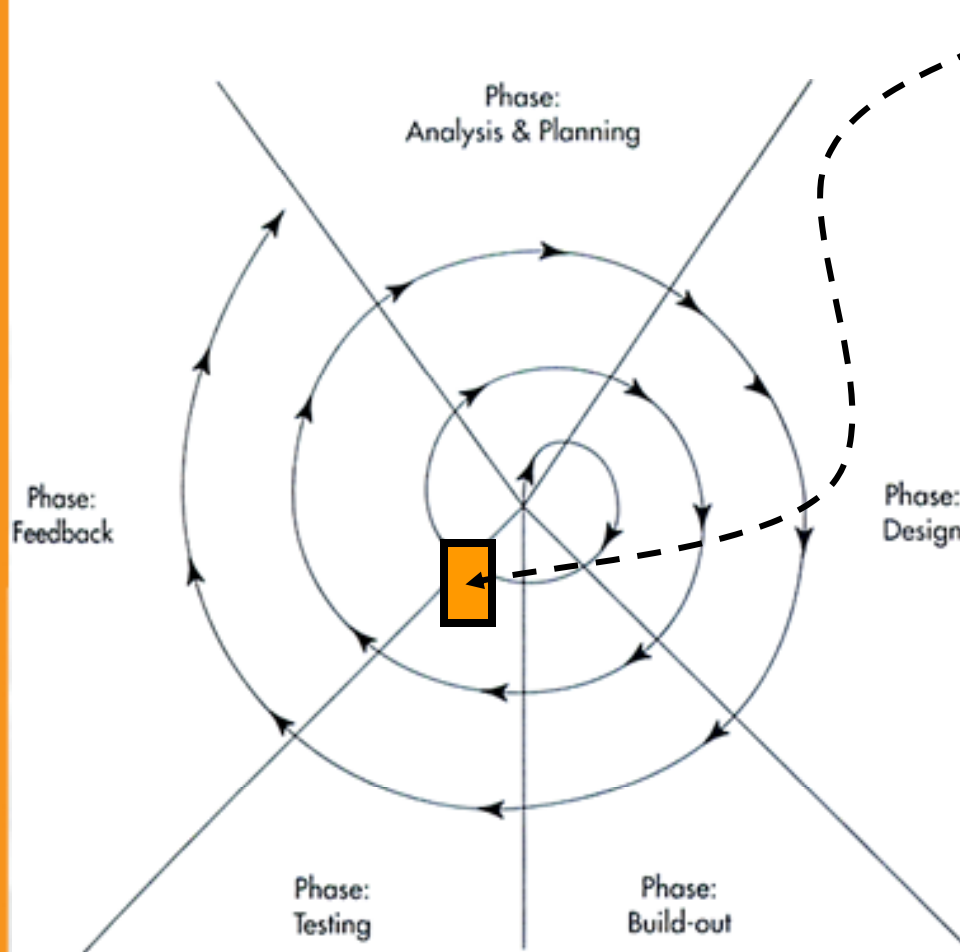


Programmable & federated, with end-to-end virtualized “slices”



Federated heterogeneous infrastructure, evolving over time via spiral development

GENI Spiral 1 Prototype



• We are here

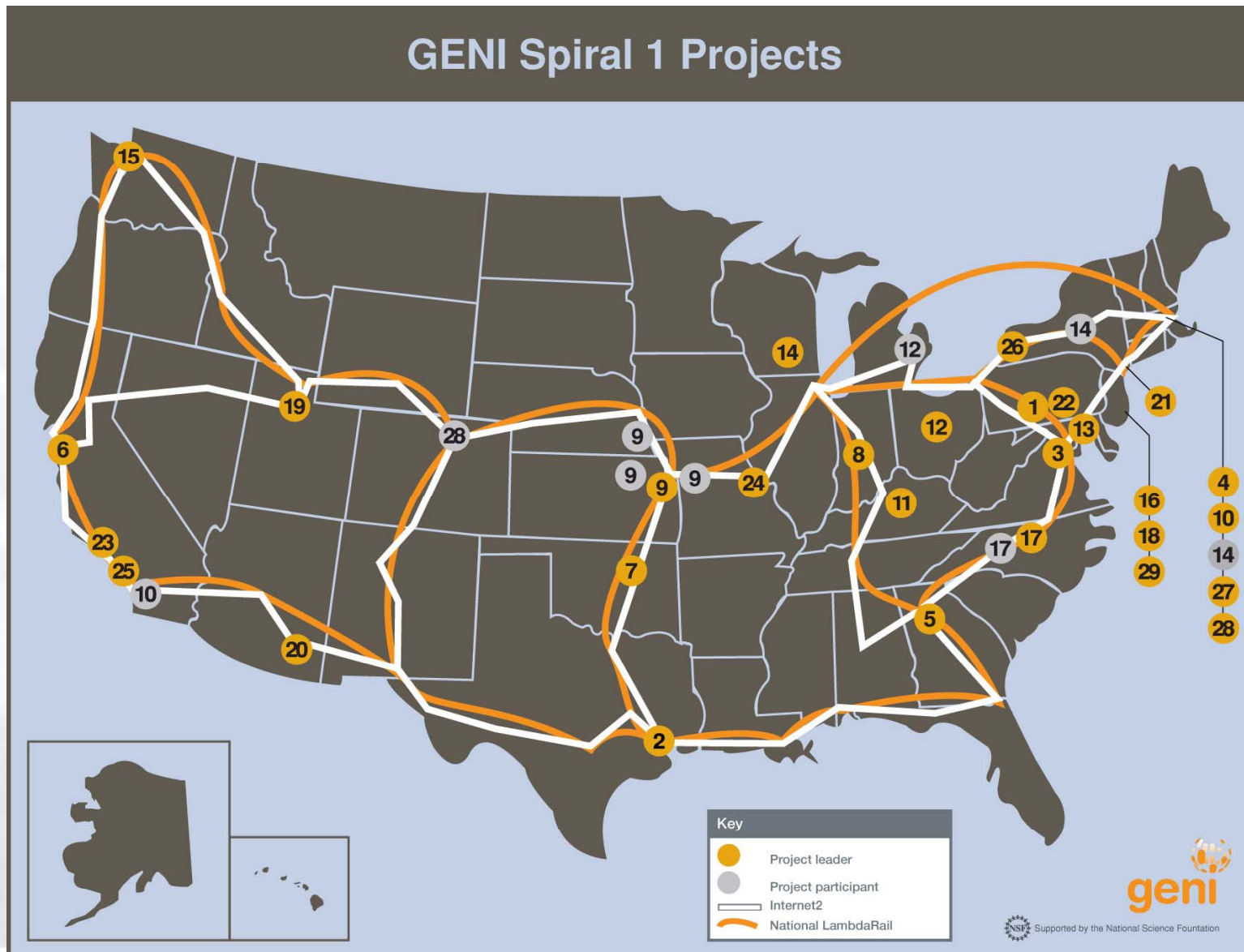
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Rapid prototyping and integration by 29 academic/industrial teams

Multiple competing control frameworks.

Beginnings of an at-scale experiment plane, including several current testbeds plus backbone and access networks

GENI Prototyping Plan

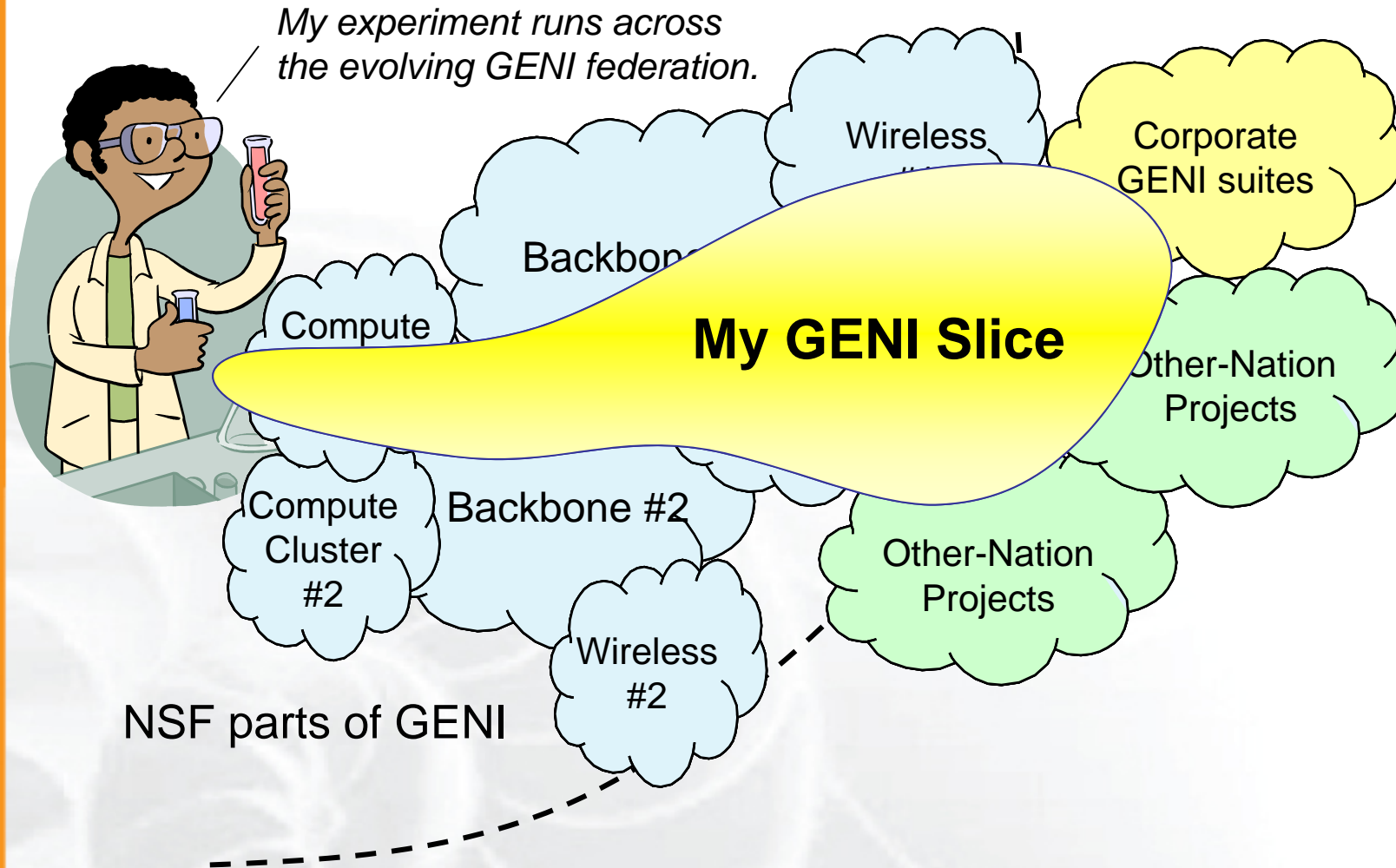


Spiral 1 Academic-Industrial Teams

Project Name	● Project Lead	● Project Participants
1. CMUlab	● Carnegie Mellon University	
2. D Meas	● University of Houston	
3. Digital Object Registry	● Corporation for National Research Initiatives (CNRI)	
4. DOME	● University of Massachusetts Amherst	
5. DTunnels	● The Georgia Institute of Technology	
6. EnterpriseGENI	● Stanford University	
7. GENI4YR	● Langston University	
8. GMOC	● Indiana University	
9. GpENI	● University of Kansas	● Kansas State University, ● University of Nebraska-Lincoln ● The University of Missouri-Kansas City (UMKC)
10. GushProto	● Williams College	● UC San Diego
11. INSTOOLS	● University of Kentucky	
12. KANSEI	● Ohio State University	● Wayne State University
13. MAX	● University of Maryland	
14. MeasurementSys	● University of Wisconsin-Madison	● Boston University ● Colgate University
15. MillionNodeGENI	● University of Washington (Seattle)	
16. ORBIT	● Rutgers University	
17. ORCA/BEN	● The Renaissance Computing Institute (RENCI)	● Duke University
18. PlanetLab	● Princeton University	
19. ProtoGENI	● University of Utah	
20. PROVSERV	● University of Arizona	
21. ERM	● Columbia	
22. REGOPT	● Pittsburgh Supercomputing Center (PSC)	
23. SECARCH	● SPARTA, Inc.	
24. SPP	● Washington University	
25. TIED	● USC Information Sciences Institute	● University of California, Berkeley
26. UB_OANets	● SUNY Buffalo	
27. UMLPEN	● University of Massachusetts Lowell	
28. ViSE	● University of Massachusetts Amherst	
29. WIMAX	● Rutgers University	



GENI grows by “gluing together” heterogeneous infrastructure



- Is the GENI prototype a cloud infrastructure for research experiments?
 - Networking and computing resources
 - Access to the Internet
 - Configured and programmed by “researchers”
 - Instrumented
- Can the GENI prototype be used for research experiments in cloud computing?
 - Consider available GENI resources: www.geni.net
 - What do you need for your cloud computing experiments?
 - Ready to start real experiments by YE2009
 - Expect continuously operational experiments by YE2010

- Check www.geni.net
- Ask those who are building GENI:
 - Jeff Chase, Duke
 - Nick Feamster, Georgia Tech
 - David Irwin, UMass Amherst
 - Prashant Shenoy, UMass Amherst
- Attend the next GENI Engineering Conference:
 - July 20-22, Seattle
 - Travel grants are available
- Attend USENIX BoF on GENI:
 - Wed, June 17, 8pm – 9pm
 - Royal Park Salon 5/6