

iGENI

International GENI

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August 26 2010

- The International Global Environment for Network Innovations project (iGENI) is developing national and international distributed infrastructure to enable the creation of a virtual laboratory for exploring future internets at scale. iGENI will ensure that GENI is truly global. Led by the International Center for Advanced Internet Research (iCAIR) at Northwestern University, the consortium includes the Electronic Visualization Laboratory (EVL) at the University of Illinois at Chicago; the California Institute for Telecommunications and Information Technology (Calit2) at the University of California, San Diego; Cisco Systems, Inc.; RENCi, various other GENI awardees, and the BBN Technologies GENI Program Office (GPO). iGENI Consortium members have formed partnerships with many participants in the Global Lambda Integrated Facility (GLIF) as well as with National Research and Education Networks (NRENs), and research consortia and institutions. In partnership with RENCi (Renaissance Computing Institute), Duke University, the University of Massachusetts, and other D-Cluster participants, iGENI Consortium has implemented the Open Resource Control Architecture (ORCA) control framework at the StarLight international exchange facility and has supported multiple demonstrations of flexible, programmable heterogeneous networking among multiple national and international sites, including dynamic path provisioning supporting applications based on scalable multi-domain clouds.

Applications supported by scaINSERT

Milestone & QSR Status

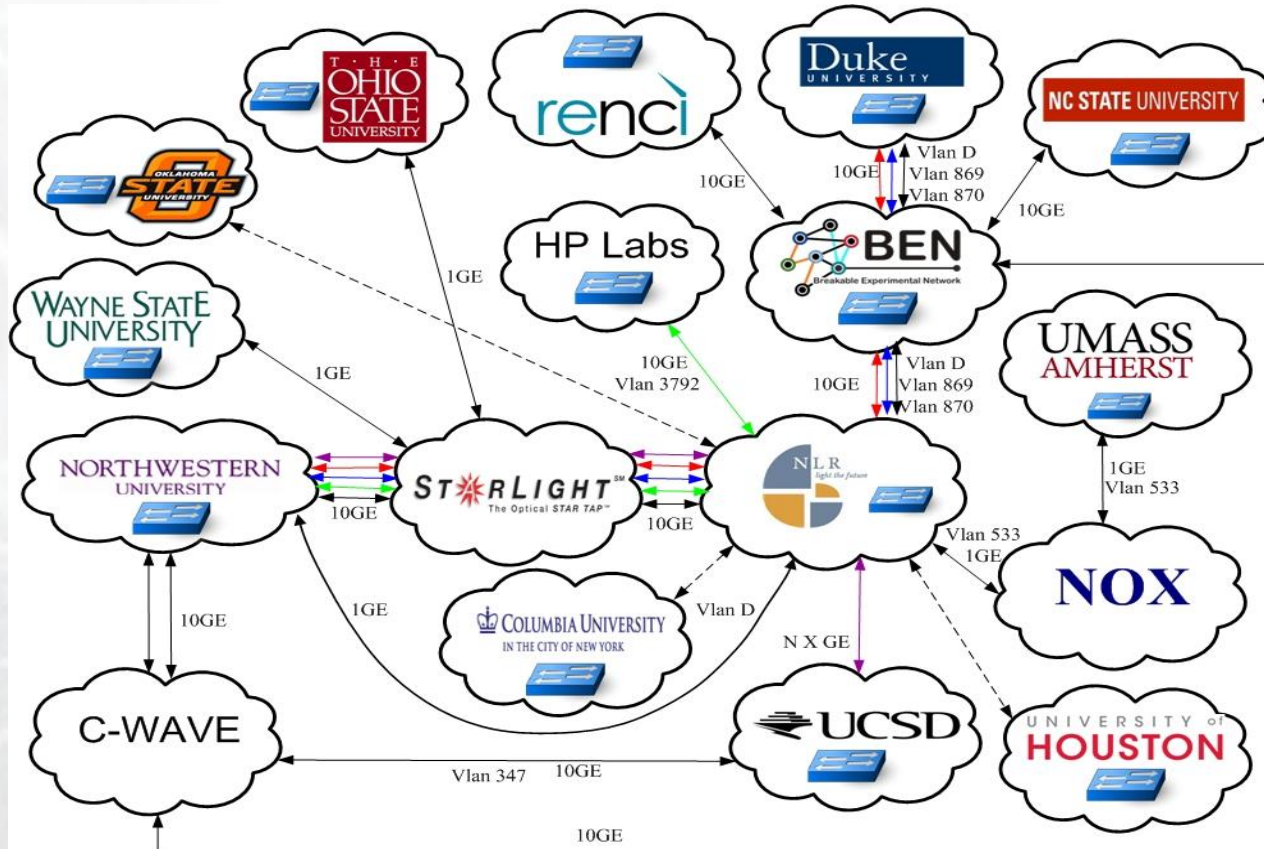
ID	Milestone	Status	On Time?	On Wiki?	GPO signoff?
S2.a	Define the iGENI infrastructure	Completed on time 11/17/09	On Time	Yes	Yes
S2.b	Cluster plan for VLANs between testbeds	Completed on time 11/17/09	On Time	Yes	Yes
S2.c	Integrate iGENI with ORCA	Completed on time 03/16/10	On Time	Yes	Yes
S2.d	Demo VLAN connections between GENI aggregates	Completed on time 07/20/10	Early	Yes	Yes
S2.e	Demo VLAN connections including other research communities	Completed on time 07/20/10	Early	Yes	Yes
S2.f	Control of iGENI via ORCA to GENI users	Completed on time 07/20/10	Early	Yes	Yes
S2.g	POC to GENI response team	Completed 8/19/10 Due 07/01/10	Late	Yes	Yes
S2.h	POC to GENI security team	Completed 8/19/10 Due 07/01/10	Late	Yes	Yes
S2.i	Contribution to GENI outreach	Due 09/30/10	Early	Yes	No
S2.j	Explore dynamic L1 connections	Completed early 06/15/10	Early	Yes	No

Accomplishments 1: Advancing GENI Spiral 2 Goals

- **Summary of Project Accomplishments This Year Contributing to the Spiral 2 Goals.**
 - **Continuous Experimentation:** iGENI demonstrated the use of a programmable, dynamically provisioned 7, and 12 thousand mile testbed to evaluate high performance transport protocols within a distributed GENI environment
 - **Integration:** After implementing the iGENI infrastructure, iGENI developed a cluster plan for provisioning VLANs among testbeds, integrated iGENI with ORCA , demonstrated VLAN connections among GENI aggregates, demonstrated VLAN connections including other research communities, demonstrated control of iGENI via ORCA to GENI users, explored dynamic L1 connections, demonstrated transcoding application supported by multi-domain clouds interconnected with dynamically provisioned L1/L2 paths. The iGENI initiative designed and implement multiple physical paths, including 10 G paths, among GENI sites.
 - **Contribution to GENI outreach:** Multiple GENI presentations to external audiences, eg international conferences (GLIF conference, Future Internet Conference), GLORIAD workshop, Quilt, etc.
 - **Instrumentation and Measurement:** iGENI used standard measurement techniques, and is planning to implement GENI based measurement techniques
 - **Interoperability:** Implemented and demonstrated multi-campus GENI capabilities
 - **Identity Management:** iGENI has been using ORCA for this function

Accomplishments 2: Other Project Accomplishments

- On this slide highlight additional project accomplishments that contribute to GENI's development.
 - iGENI provided capabilities that allowed multiple GENI sites to be integrated through interconnections
 - Also, several projects integrating GENI with Cloud capabilities were undertaken and demonstrated
 - Capabilities for dynamic provisioning were implemented and demonstrated, including L1/L2 paths
 - iCAIR is currently planning for expansion to multiple international sites – also awarded additional NSF grant to support international iGENI communities



- Issues of concern:
- Issues which have or may affect ability to complete the work described in SoW/milestones. None
- Other issues as well:
 - GENI infrastructure that is dependent on standard production network services to the exclusion of dedicated experimental network research resources can be problematic
 - More emphasis should be placed on distributed NOC functions, legacy centralized NOC functions for experimental networking does not scale and not appropriate for experimental functions

- What are your plans for the remainder of Spiral 2?
 - Further integrate GENI environment across multiple campus, e.g., further extend GCDnet., and related infrastructure , e.g., supporting PlanetLab. ProtoGENI, OpenFlow, OMF etc
 - Implement federated processes
 - Extend environment to international sites - Y1 was mainly focused on US sites
 - Further develop integrated cloud capabilities for GENI environments
 - Prepare for GEC 9 demonstration , and other GEC forums
 - iGENI will extend its mechanisms for dynamic L1/L2 provisioning, e.g., capabilities demonstrated at SC09, in November 2009
- The GPO is starting to formulate goals for Spiral 3. What are your thoughts regarding potential Spiral 3 work?
 - Spiral 3 should extend the GENI environment to as many additional sites as possible
 - Spiral 3 should reduce dependencies on standard production environments
 - Spiral 3 should take advantage of international partnerships