![GMOC - GENI Meta-Operations Center]

GENI Meta-Operations Center Quarterly Report

4/1/2009-6/30/2009

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Summary

- *Operating within Budget*
- *Development underway for GMOC operations portal prototype*
- *Continued work collecting data from PlanetLab*
- *Initial Data Exchange with ProtoGENI*
- *Roadmap discussion for data collection with ORCA*

Major Accomplishments

Milestones Achieved

Initial GMOC Data Translator Implementation: While we do not expect in Spiral 1 to have a single unified implementation to translate operational data into our internal format, we have worked with PlanetLab to collect operational data in their existing format (mainly from their Comon application) and translated it into our defined internal data format. In addition, we have started collecting a small set of data from the ProtoGENI project

Initial GMOC Data Exchanger Implementation: As with the Data Translator, we do not expect in Spiral 1 to have a unified exchange system used by all projects. However, we've worked with PlanetLab and ProtoGENI to collect data, using a translation to convert it from the form the projects keep it in, into the Exchange format defined in our Operational Data Exchange Format document, and then using that to collect the data. In the future, the translator can be developed to

translate additional data from these and other projects, or projects can send data directly in our defined Data exchange format.

Deliverables Made

GMOC Data Exchanger: The code developed for Data Exchange is stored in an internal GMOC version control system. This code is available on request, and we are working on a self-service system for access to this code.

GMOC Data Translator: The code developed for Data Translation is stored in an internal GMOC version control system. This code is available on request, and we are working on a self-service system for access to this code.

GMOC Data Repository: The GMOC Data Repository system is kept on an internal GMOC server. This data can be made available to GENI as required.

Description of Work Performed During Last Quarter

Activities and Findings

Our activities during Q3 were spent chiefly in 3 areas:

Increased Collection from PlanetLab: <is this true? > Parially, we started collection of operational data after GEC4.>
Collection of operational data from PlanetLab began on May 18, 2009. This data includes data from all the PlanetLab (proper) nodes and slices. Only a subset of the required data as specified by the data requirements is being collected at the moment.

Development/Discussion with ProtoGENI:
Initial work of integration with ProtoGENI stated. We created a ProtoGENI Rspec to GMOC data exchange translator. This allowed GMOC to store ProtoGENI's static topology. Initial work on sharing of operational data has been done but the type and detail of this data is still pending.

Development effort on Prototype GENI operational portal view:

In anticipation of GEC5 demo, we developed an initial prototype of a GENI Operational View system. We see 4 main sets of users for this system:

1.) Those interested in viewing GENI data as a whole, such as interested outside parties, GPO, etc.
2.) Those interested in viewing GENI data about a particular cluster

3.) Those interested in viewing GENI data about a particular aggregate or component
4.) The Research user who will be interested in viewing GENI data about their particular slice.

This early prototype focuses primarily on visualizing and graphing GENI clusters, and graphing GENI slices. Because the bulk of our data comes from PlanetLab, this is the data we've focused on showing. As this prototype evolves, we will focus on more data from other projects, topology, and especially on providing the views into slices, including better visualization, for the researcher users of GENI.

Project Participants

During this time, key participants in GMOC included:

Jon-Paul Herron, PI
Luke Fowler, Co-PI
Chris Small, Senior GMOC Engineer
Camilo Viecco

Publications & Documents

Herron, JP. (2009, June 10). *The GENI Meta-Operations Center*. Presented at Terena Networking Conference 2009, University of Malaga, Malaga, Spain.

This presentation focused on challenges of operations in a federated/distributed world, and how operations for GENI relate to the future of operations for production networks. Specifically, this related to projects like Federica in Europe.

Small, C. (2009, June 26) *Experiences with Measurement Data Collection in R&E Networks* Presented at GENI Measurement Workshop, University of Wisconsin, Madison WI

Presentation on experience learned in collecting measurement data and deploying experiments on Research and Educational networks. Discussed what data is collected currently by the GlobalNOC and concepts that may be used to facilitate collecting measurement data for GENI

GENI Documents:

Viecco, Camilo H. Proposal (2009 June 15) : *Use of URN's as GENI Identifiers*, Published at http://gmoc.grnoc.iu.edu/gmoc/file-bin/urn-proposal3.pdf and presented to the Cluster C for integration.

The GENI project current uses GGID for identifiers of GENI resources. This is problematic for several reasons such as the bundling of identification and authentication information and the inability to sub-allocate the UUID id space. This problems are documented and a proposal to solve this problems by using URNs and a grammar for these GENI URN's is presented. This proposed format is currently being adopted by the ProtoGENI cluster.

Outreach Activities

Undergraduate Development Assistance: Dan Doyle, an undergraduate for the IU Computer Science department continued to assist with research activities into GENI projects and existing data sharing options. A second undergraduate position is available but has not yet been filled.

GMOC attended the IU Informatics Career Fair on Feb 17 to advertise available positions for undergraduate students and discuss the GENI/GMOC projects with IU undergraduates as part of our outreach efforts

Collaborations

Worked with SPP and ProtoGENI groups to deploy hardware to be co-located in the Internet2 network.

Discussed collaboration with Franz Fidler of the Embedded Real-Time measurement project on optical level measurement, including how substrate measurements can be integrated into the GMOC Operational datasets. Showed optical measurements tools developed and data collected by the GlobalNOC.

Discussed topology format options and identifier format with other GENI aggregates. Discussed collaboration with Ilia Baldine for future data sharing with ORCA.

Similar to Q1 & Q2 GMOC worked on gathering input and developing discussions with many GENI stakeholders during this quarter.

PlanetLab: GMOC continued to work with PlanetLab to gather operational data about the Planetlab project itself, working to fix some minor bugs in the PlanetLab software, and working out a reasonable interval for operational data polling

ProtoGENI:
GMOC worked with ProtoGENI to collect Topology data from Emulab-Utah. GMOC also worked to ProtoGENI for the use of a common URN based identifiers for GENI resources. Started discussions for determining what operational data can be shared and the periodicity for polling data.

RSPEC Meeting:
Discussed with the Rspec Meeting attendees on how topology data is represented (NDL, NDL variations and GMOC exchange format) and continues discussion on identifiers for GENI resources.

Measurement Meeting: Discussed with Measurement Workshop attendees how measurement plane data, when available, may be integrated into the GMOC data sets.

Planned Activities for Q4

Further Development of GENI Operational View: We will take the GENI Operational View system demonstrated at GEC5 and make it robust and accessible to the GENI community via the GENI and GMOC websites. This system is expected to change continually in this early phase, so the GENI community can track the progress and provide feedback on an ongoing basis.

Draft Emergency Stop Strategy Proposal: GMOC will produce a draft document on how the important function of Emergency Stop might be accomplished, especially in the near term. More detail will be given to an initial implementation, with more general ideas for future implementations.

Draft Proposal for GENI Concept of Operations: in Year 1 Q4, GMOC will produce a proposed strategy for ongoing GENI operations. This is expected to cover the general guiding principles of how operations might work for a GENI facility, and what we see as the most important examples of operational functions, as well as a strategy for how such an operational model might be phased.

Strategy for Integration of GENI Security and GENI Meta-Operations: Early in Q4, we expect to publish a document laying out the strategy we've worked with the

GENI Security project to develop. This document will cover the GMOC's approach to security and privacy issues, especially in the early phase of operational data sharing

Continued Ramp-up of Operational Data Sharing from GENI projects: We anticipate further efforts from both the ORCA and ProtoGENI control frameworks to provide operational data to us in Q4. Additionally, we will be opening dialogues with several non-control-framework projects to attempt to gather more direct information. We will be targeting projects that exemplify types of infrastructure, so that we can make sure we fulfill the needs of different types of projects, such as sensor projects, network infrastructure projects, programmable node projects, etc.

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