

## **GENI Meta-Operations Center Quarterly Report**

**10/1/2008-12/31/2008**

**Jon-Paul Herron – Principal Investigator**

**Luke Fowler – Co-Principal Investigator**

### **Summary**

- *Operating within Budget*
- *On track to complete first milestones as planned*
- *Hired Camilo Viecco as Senior GMOC Developer (Start date is 1/8/09).*
- *Hired Dan Doyle as GMOC Hourly Undergraduate Developer*
- *Presented GMOC poster for IEEE eScience conference*
- *Presented GMOC plans for OMIS meeting at GEC3*
- *Presented GMOC overview for Chinese-American Networking Symposium*
- *GMOC website created*
- *Discussions begun with other GENI projects*
- *Research into potential existing operational data formats*
- *In discussions with Internet2 staff about PerfSONAR project's relation to GMOC data format*
- *GMOC Equipment in Ordering Process*

### **Major Accomplishments**

#### **Milestones Achieved**

*Progress toward Dataset & Format Definition:* The first set of GMOC milestones is on track for on-time completion at the 6 month mark of Spiral 1. This set of milestones includes a complete initial GENI Operational Dataset and a complete initial Operational Data Format. Our work to define the basic GENI operational dataset is in progress, with three main elements. It includes discussion of a strawman list of types of data to collect, a discussion of some basic questions



about the data collecting and sharing capabilities of various GENI projects, and research by GMOC into the existing data already included in various projects' data collections.

## **Deliverables Made**

High-level, Strawman dataset: GMOC has developed an initial high-level list of types of data to begin collecting from other GENI projects. This list is by no means finalized or complete; in fact, our intent with this list is to generate and focus our discussion with the other GENI projects. As this high-level list is improved through discussion, it will also begin to include a greater level of detail. This list was presented during our GMOC presentation at GEC3.

Operational Dataset Question List: Additionally, GMOC has formulated an initial set of questions to discuss with other GENI projects, in order to form a fair amount of consensus on what operational data is most sensible to collect.

## **Description of Work Performed During Last Quarter**

### **Activities and Findings**

Hiring: The GENI Meta-Operations Center posted, advertised, interviewed, and hired Camilo Viecco into the position of GMOC primary developer. Camilo starts on January 8th, and will be tasked with continuing the research into existing models for GMOC data formatting and protocols for sharing, as well as technical discussions about the operational dataset with other GENI projects. Camilo comes to GMOC from the Advanced Network Management Lab at Indiana University, and has extensive expertise in both development and networking.

GMOC also hired one of the two hourly undergraduate assistants to help with the project. The second position is available, but has not yet been filled.

Equipment: The budgeted equipment need to test and develop GMOC software has been specified and is in the procurement process.

### **Project Participants**

During this time, key participants in GMOC included:

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



Dan Doyle, Undergraduate

Camilo Viecco will be joining the GMOC effort on January 8, in Q2.

## Publications

Herron, JP. (2008, October 20-22). *Developing the GENI Meta-Operations Center*. Presented at Chinese American Networking Symposium, Indiana University, Indianapolis, IN.

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.

Herron, JP., Fowler, L., Small, C. (2008, October 28-30). *Introduction to the GENI Meta-Operations Center*. Presented at GENI Engineering Conference 3, Palo Alto, CA.

This presentation was a required introduction to the GMOC project concentrating on the deliverables, approach, and expectations this will have on other GENI projects.

Herron, JP., Fowler L. (2008, December 8-12). *The GENI Meta-Operations Center*. Poster presented at IEEE eScience 2008 conference, Indianapolis, IN.

This was a presentation of a poster on GMOC. During this session, we fielded questions from reporters and others interested in GMOC and in GENI.

*GMOC Website:* A website for the GENI Meta-Operations Center was launched at <http://gmoc.grnoc.iu.edu>. This is also available via the main GRNOC page at <http://www.grnoc.iu.edu>. This site initially contains information about the GMOC project's goals, and approach, including the proposal, presentations, and other introductory information. As the project accelerates, this will also house information about which GENI projects are sharing data with GMOC, and what kinds of data each is sharing. It will also be the site containing the GENI-wide operational system view data as it's developed.

## Outreach Activities

*Undergraduate Development Assistance:* GMOC hired Dan Doyle, an undergraduate for the IU Computer Science department 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.

## ***Collaborations***

GMOC has begun the process of collaboratively working to define the GENI Common Operational Dataset with the other GENI projects that will be sharing data with GMOC. Initial discussions are with the main control framework cluster projects, as well as infrastructure projects that have existing relationships with GRNOC, such as Internet2, NLR, and MAX GigaPoP. These initial discussions should open the door to further dialogue on technical details and sharing of existing data information with GMOC.

GMOC has formulated the initial questions to discuss with these projects, and requested time to discuss with PIs or their assigned delegates on these topics.

*ProtoGENI:* GMOC has had a discussion with ProtoGENI, and gathered a good deal of information and data produced by ProtoGENI that will be relevant to GMOC efforts. Capabilities are already in place in EmuLab for Emergency Stop and many of the topology and status data GMOC will need. More detailed discussions and GMOC research into the data ProtoGENI provided us will reveal how best to interact. But initially, it appears that we will be able to bring up operational data sharing with ProtoGENI quickly.

*Mid-Atlantic Crossroads/DRAGON:* GMOC has had discussions with MAX GigaPoP, and formulated a plan for further collaboration. This collaboration will involve a combination of direct polling of MAX components by GMOC and gathering of data already collected from this equipment by the DRAGON project. Further discussions will continue, with actual data gathering beginning sometime in January.

*NLR:* GMOC has also had discussions with NLR, and has come up with an initial plan for data sharing on NLR components. Since these components are already monitored and measured by the Global Research NOC at IU, NLR has agreed to allow GMOC to make use of any data that is already publicly available for GENI use. This should allow extensive data sharing on NLR components, but if netflow (or similar user) data is needed, further discussion would be necessary. Using the direct data collections should allow these components to be monitored much more easily and quickly.

## ***Planned Activities for Q2***

GMOC is on target to reach our planned milestones and provide the planned deliverables for Q2 of Spiral 1.



This includes the first version of working, well-defined GENI Common Operational and Specialized Operational Datasets.

This also includes a working well-defined Operational Data Format for sharing.

We expect to be sharing operational data with one or more GENI projects by GEC4.

These things will be accomplished using the same three-pronged approach mentioned before. That is, GMOC will continue discussions with GENI projects on the issues of the dataset, data format, and protocol for data sharing, using a combination of strawman and draft document discussion, direct questions, and research into existing capabilities and data by GMOC.