

GENI Quarterly Report for ViSE project April 1st, 2010 - June 30th, 2010

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I. Major Accomplishments

The seventh quarter of the ViSE project includes the following major accomplishments:

- Publication and presentation of three papers on ViSE-related technology. First, we presented the paper “Towards a Virtualized Sensing Environment,” which describes both the practical and research challenges of deploying virtualized sensing testbeds “in the wild,” at TridentCom 2010 in Berlin, Germany in May. Second, we presented the paper “Cloudy Computing: Leveraging Weather Forecasts in Energy Harvesting Sensor Systems”, which describes how to leverage weather forecasts to make a GENI testbed run off harvested energy more efficient, at SECON 2010 in Boston, MA in June. Finally, we presented the paper “Resource Management in Data-Intensive Clouds: Opportunities and Challenges,” which describes ViSE’s integration with the Cloud and its data flow, at LANMAN 2010 in May. Further, our work on “MultiSense: Fine-grained Multiplexing for Steerable Sensor Networks,” which describes our sensor virtualization technology, is currently in submission to SenSys 2010.
- Significant progress towards our three milestones in the eighth quarter, including demo’ing ViSE with another testbed, developing an allocation policy for sensors, and importing an extending version of Orca 2.2 release. We provided an initial demonstration of ViSE with another testbed at GEC7 in Durham, NC. The experiment showed ViSE being used in conjunction with BEN and the Starlight facility. We have also been developing allocation policies for sensors using the latest release of Orca, and have informed them of policy bugs in the pre-release of Orca 2.2. Finally, we are working on a GEC8 demonstration that shows NOWcast visualizations of severe weather. NOWcasts are short-term minute-level forecasts.
- Significant collaborations with, and contributions to, our Cluster D peers through numerous email exchanges, video conferences, and in-person meetings.

The rest of this document describes in detail the major accomplishments above.

I.A. Milestones Achieved

ViSE had no major milestones due in the seventh quarter.

I.B. Milestones in Progress

Below we list the milestones for the seventh quarter, as agreed upon in our Spiral 2 Statement-of-Work.

- **July 20th, 2010.** Import extended ORCA v2.2.

We are well-positioned to integrate with Orca v2.2 once it is released. Recently, we have been using Orca’s latest pre-release code checked into the trunk of the SVN repository. As a result, we have been able to test updates quickly and inform their development process of implementation bugs.

- **July 20th, 2010.** Allocation policy for sensors.

We are currently working on a lease-based queuing policy for ViSE sensors that supports advanced reservations of the sensors.

- **July 20th, 2010.** Demo experiment with another testbed.

We demo'd an experiment with the BEN testbed and the Starlight facility in Chicago for GEC7. As part of our GEC8 demo, we will be incorporating forecasting, in addition to streaming radar data.

II. Deliverables Made

ViSE had no deliverables scheduled in the seventh quarter.

III. Description of Work Performed During Last Quarter

The primary work during the quarter, including our Activities and Findings, centered on making progress on the milestones described above, preparing our GEC8 demo, and working with our REU students on GENI-related projects. In addition, we held bi-weekly Cluster D group meetings via teleconference to sync up with our other cluster members.

III.A. Project Participants

The primary PI is Prashant Shenoy. Co-PIs are Michael Zink, Jim Kurose, and Deepak Ganesan. Research Staff is David Irwin. Navin Sharma, a graduate student, is also contributing to the project and is the primary author of the ViSE-related technical report.

III.B. Publications (individual and organizational)

We had three ViSE-related publications in the quarter. "Towards a Virtualized Sensing Environment" at Trident-Com 2010, "Cloudy Computing: Leveraging Weather Forecasts in Energy Harvesting Sensor Systems" at SECON 2010, and "Resource Management in Data-Intensive Clouds: Opportunities and Challenges" at LANMAN 2010.

III.C. Outreach Activities

We are advising two REU students working on GENI-based projects this summer. First, Justin Duperre from West New England College is working on modifying both VCL and/or HybridFox as user interfaces for GENI testbeds. VCL is a Virtual Computing Laboratory from NC State that has a class-based web portal for requesting virtualized resources. HybridFox is an extensible Firefox plug-in for controlling both Amazon and Eucalyptus resources. Second, Sara Avila Oneill is from Puerto Rico at the Technical University of Puerto Rico. She is working on a energy monitoring infrastructure for ViSE nodes that are powered off of solar or wind energy. An important element of using energy harvesting testbeds is being how to monitor how much energy they are producing and using.

III.D. Collaborations

We collaborated with other Cluster D projects significantly during the quarter. We continue to maintain geni.cs.umass.edu for both the ViSE and DOME projects, and test pre-release versions of Orca. Additionally, we had numerous email exchanges on the Orca user mailing list about the intricacies of integration and setup.