University of Kentucky Quarterly GENI Report

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1 Major accomplishments

The following highlights some of our accomplishments.

1.1 Milestones achieved

The focus of this quarter has been on achieving Task 1, although we have made some early progress toward Task 2 as well. Aspects of Task 1 that have been achieved include:

- upgrading and moving our existing Edulab system, and identifying and testing new hardware that will add additional PCs and replace aging machines.
- holding discussions with our regional providers to improve our connection to Internet2.

1.2 Deliverables made

None yet.

2 Description of work performed during last quarter

The following provides a more detailed description of our work and results from the last quarter.

2.1 Activities and findings

The focus of this quarter has been on upgrading our existing Edulab facility to prepare it for the transformation into a ProtoGENI edge cluster. This has involved physical changes, hardware changes, and software changes.

First we decided to move our Edulab cluster into a larger room that would better accommodate the additional machines that would be added to the system. Given the massive number of Ethernet cables that comprise Edulab, tearing down the system and rebuilding it in the new room (ensuring all wires were connected as before) was a non-trivial matter. Although we encountered a few problems in the move, we were able to address them and get the system running again, now with room to grow. Figure 1 shows the Edulab system in its new location.

Second, we began the process of fixing and upgrading the existing hardware. We started by identifying machines that were reporting hardware issues and either fixed them or declared them irreparable. We were pleased to find that many of the machines were repairable. They have been fixed and returned to operation. We also researched PCs that are currently on the market for interoperability with our existing system. After identifying a few possibilities, we ordered one to test whether it would work. As with all new hardware there were incompatabilities. As a result integration with our existing system was not without problems, in large part, due to the newness of the Ethernet chipsets. After

Figure 1: The Kentucky Edulab

some work locating the appropriate network drivers and rebuilding kernels we were able to successfully integrate the new machine. Having successfully integrated the test machine into Edulab, we ordered an additional 23 units (for a total of 24) that we expect to quickly incorporate when they arrive. We also decided we would need an additional network switch to handle the new machines and so we ordered a 48 port switch to which we will attach the additional 24 machines. Because 47 of the existing machines were determined to be operable, our new system will have just over 70 machines.

Third, we upgraded the Emulab software we were running so that we would be running the latest version of the Emulab software. This involved upgrading the BSD kernels running on the main servers. Although there were some minor problems, this upgrade went quite smoothly and has positioned us to begin transitioning the system to a ProtoGENI edge cluster. We have also had discussions with the Utah ProtoGENI group about the changes required and have familiarized ourselves with the code and the transition instructions before we begin the process.

Although our connectivity to Utah and other Internet2 sites is already quite good (and sufficient for our immediate needs), we have begun to hold conversations with the regional providers and representatives from Internet2 about improving our connectivity even further. Planning is proceeding smoothly and we expect to have a true 10 Gbps connection to Internet2 in Q1 of 2009.

Finally, Jim Griffioen and Zongming Fei attended the GEC3 meeting and presented their work to date on Edulab.

2.2 Project participants

The following individuals have helped with the project in one way or another during the last quarter:

- Jim Griffioen - Project PI
- Zongming Fei - Project Co-PI
- Hussamuddin Nasir - The project's primary technician and programmer

- Lowell Pike - Network administrator
- Woody Marvel - Assists in Emulab administration

2.3 Publications

None yet.

2.4 Outreach activities

None yet.

2.5 Collaborations

Most of our collaborations have been with the Utah ProtoGENI team. We have been actively involved in the bi-weekly meetings of the ProtoGENI cluster, and have given a brief overview of our Edulab work there. We have also initiated discussions with Wisconsin about ways to combine our two instrumentation projects.

2.6 Other Contributions

None yet.