

Name of Principle Investigator: Christopher Rigby

Project Title: Introducing Virtualization via OpenStack “Cloud” System to SUNY Orange Applied Technologies Students

1. Please consider the original timeline and deliverable targets. How is your project progressing compared with the original estimates?

Our project is progressing reasonably well. Our original timeline and deliverables consisted of purchasing the materials for and assembling a small OpenStack “cloud” system. We have purchased almost all of the components and have already installed and configured the majority of the hardware and software. Our controller node and network node are operational along with about half of our compute nodes. The remainder of the machines have the software installed, and will be configured for the cluster when we move all of the machines into our campus data center. Work has already commenced on adapting some of our laboratory assignments for use with the cluster. The only item that we have yet to work on is the training component. Our grant called for two instructors to get training (and possibly industry certification) in the OpenStack system. Unfortunately, our schedules have prohibited us from carrying this out. It will be difficult to accomplish this during the academic year, and the only training sessions available outside of the academic year filled up before we could register. One possible avenue we are exploring is to take a self-paced, on-line training session.

2. How is spending progressing when compared with the original budget estimates?

As noted above, we have already obtained the majority of the hardware from our original budget estimates, and hence have already spent the majority of the funds. The remaining hardware item is a set of gigabit switches along with associated cabling, and this may be donated by SUNY Orange. Our training budget (2 week long training sessions at \$2500 each along with money set aside for travel expenses) has yet to be spent, as we have been unable, due to scheduling problems, to arrange a suitable week long travel window for which the training vendors have an appropriate class. As noted above, one solution to this problem may be to enroll for an on-line, distance learning workshop for our training component. Specifically, we are looking at RedHat’s on-line, self-paced OpenStack Administration course.

3. Please provide feedback regarding your experience with the project execution. In particular, any issues or roadblocks you've encountered that may have been unexpected.

Project execution has progressed reasonably well. Assembling the hardware and installing and configuring software took a bit longer than expected, however we were able to involve several of our students in the process, which proved a valuable

learning experience for them. Migration into our campus data center has been a bit slower than anticipated, since it requires the input of several members of our campus IT staff, and has been difficult to schedule. Nevertheless, we are about on target with our hardware and software resources. Our intention was to integrate our OpenStack virtualization cluster into several laboratory assignments throughout this semester, and that is relatively on track and we have several laboratory assignments ready for our Network Security and Operating Systems courses that we will utilize in the latter half of the term. As noted above, scheduling off-site training has proved somewhat difficult due to various factors and our academic schedule coupled with the sparsity of offered training sessions and high demand have conspired to prevent us from attending training. As noted above, we are currently assessing some on-line training opportunities with some of the large vendors, to decide whether or not their training offerings would be adequate for our needs.

4. What are your positive observations or pleasant surprises about your team's interaction or project process that might would be helpful to other PI's?

Our team was relatively small “two people at the same campus and in the same department” so communication was not really an issue. For phases that required interaction with others, scheduling was often an issue. For example, the migration of our cluster from the laboratory environment in which it was constructed into our campus data center requires involving several IT staff members, and the beginning of the semester is a busy time for them (as well as for us). Hence scheduling meetings and installation windows has been a bit difficult. As any technology project relies on the support and knowledge of our IT professionals, maintaining regular communications with our IT staff, being flexible in scheduling, and remaining mindful of their many responsibilities have been key factors in ensuring the success of our project.

5. Please describe any challenges you've encountered working with your project team that you've found solutions for that might be helpful to other PI's.

As noted above, the most challenging phase of our project has been obtaining a suitable venue for training. Scheduling factors have prohibited us from obtaining the training outlined in our grant proposal. However, we have been investigating on-line venues for our training, and have been suitably impressed by some of the programs offered. Such programs might be suitable for others who, like us, find themselves under rather rigorous scheduling constraints. We also found that involving students in our process, particularly with the assembly of our hardware and software resources, was rewarding for both them and us.