Patrick F. Wilbur
wilburpf@clarkson.edu

COSI Progress Report for Fall, 2005

I entered this semester with several goals, hoping to be able to help out a little with the lab server maintenance, learn PHP, and find some niche for me in the open source community. I started learning PHP and began familiarizing myself with and working on the server setup early this semester, but I misled myself by thinking that my niche during this semester would be making templates for Open Office. Although I had plenty of ambition, my lack of word processing skill caused me to be too dependent on the help of some business students that ended up finding their first year harder and busier than they imagined it would be; however, after spending more time around the amateur radio station and receiving my first amateur radio license, I later found a place in aiding the programmer-lacking open source amateur radio community. In addition to finding a specific need to help fulfill, I achieved several goals and unplanned things this semester.

It was only a matter of time before I would give in to the growing (well, long already grown) PHP movement and move myself forward. For a long time I had been a Perl "junkie," haven written several CGI applications for many years. This semester I studied quite a lot of PHP (and even some CSS since I was also very rusty with using stylesheets), thanks to the extensive COSI Library of Infinite Wisdom. I discovered how useful our bookshelf really is. My personal website (www.pdub.net) became a virtual playground for me to test what I learned, and I completely renovated it by making it dynamic, easily updateable, and styled. I also played around a little with accessing MySQL databases through PHP.

Once I became more involved with the amateur radio community through Clarkson's K2CC Amateur Radio/Electronics Club, I discovered a need for considerable open source software development. K2CC formed a goal of building a satellite array that could enable the station to engage in amateur satellite communications. This mandated that we build a computer to network with a hardware interface for our antenna rotator, since satellite communications require precise satellite tracking, via specialized computer software. We also wanted to use the computer for a bulletin board

service over the airwaves, data packet radio communications, weather/miscellaneous radio facsimile transmission, and other purposes. Unfortunately, some of our primary objectives that required the computer depended on software only available for Windows, and some only available for Linux. Most importantly, most of our decoders and data communication systems were programmed for Linux and not ported to Windows, our antenna rotator interface had an incomplete driver for Linux and a complete driver only for Windows, and none of the software would enable our computer to act as a server and for several computer terminals in the station to access separate services simultaneously over the network. I noticed that we were not the only station with the same problem, but in fact many amateur radio operators found the same issues, and often owned two or three "server" (controller) computers for a single task, although all the work could easily and less expensively be done on a single system. As a result, I took the incomplete Linux driver and completed its implementation (previously it was not finished enough to be able to even be used for satellite tracking, only for simpler antenna operations), and am currently collaborating with the original (and only other) developer to try and get it submitted upstream.

I also added to WispDDE, the Orbitron Satellite Tracking module responsible for its communication with our interface driver so that it could be set to send commands over the network/Internet to a Java-based daemon I wrote, WebRotatorD. WebRotatorD interfaces with a command-line backend I wrote, called ARSCTL, which interfaces with the Linux driver I finished or the already finished Windows driver. Eventually, I want to make it so WebRotatorD can be used for any command-line argument so that other brands of rotator interface cards may also be controlled by it. Together, Orbitron (through my patched WispDDE module) and WebRotatorD allow a user on any operating system (non-Windows users under WINE) on any system anywhere in the world to use Orbitron to track a satellite and send the rotation commands to a satellite antenna array rotator anywhere in the world. This is useful for demonstrations, amateur radio clubs/individuals that want to allow certain people to access resources remotely, or to sit on the roof next to one's own antenna array

and test one's rotator with a laptop over a wireless network (so one can more easily examine performance and debug problems). I also wrote a PHP web interface, called BrowserRotator, to enable browser-based control (or simply status displaying) of a rotator, to allow amateur radio clubs/individuals to develop more interactive station websites. I have yet to establish contact with the original (and only other) developer of the WispDDE module to see if he would be interested in including my additional features upstream.

In addition to my own work, I participated in several events both in and out of the lab. This semester I participated with Rouslan and Chris in the ACM Programming Contest in Montreal. The contest was a very rewarding experience, both for its beautiful scenery and for the great feeling to compete with others and attempt very interesting questions dealing with Computer Science problem solving. I also aided with maintaining the lab servers, attended almost every meeting, attended (I think every, or else nearly every) lab work day, used the lab build extensively, kept the lab open almost all the time, and helped outsiders install Linux on their own computers and discover and use open source applications. I also helped with the workshop on installing Xen, and familiarized myself with Xen a little on my own.

After a few twists and turns, I feel that I met all my goals for this semester. Beyond simply meeting goals, I found a very interesting and very needy section of the open source community that intersects the interests of the amateur radio community, a niche to which I also feel I belong. I also was lucky enough to participate in several fun and very educational/informative events, including maintenance, a contest, development, helping others, being helped by others, learning new languages and technologies, and interacting with potential employers like IBM.