Example Lessons Learned

WiiTools 2010

- Threads, while easy to implement, are very difficult to implement right. Our original strategy of combining the parsers involved threads, and we ran into many issues with them not starting or stopping properly. Using processes instead is a much more reliable and simple way to allow for multiple functions to be executed at once.
- Sockets are very useful when trying to decouple a program. Especially once you remove the overhead of connecting and disconnecting, they provide an efficient, solid interface between parts of a program. They are also useful in their ability to abstract data, and allow for easy logging and use of those logs. This is because the process listening to the socket does not care how the data was created, it just reads it and performs the necessary functions.
- Python is a very powerful programming language, yet is very easy to use. Python also has a very extensive list of modules. If you need to do a specific task, there is a good chance of an existing Python module to do the work for you.
- It is very helpful to be the administrator of your development environment. We ran into many problems in the Alamode lab trying to get Bluetooth to work, among other things. In the end, the primary testing machine that interfaced with Bluetooth turned out to be a personal laptop that we could fully access and manipulate.
- Agile methods actually work. For developing the Wii Event Parser, it was very helpful to start by reading basic data, then take it up to reading data from a Wiimote, then managing several Wiimotes, then abstracting the parser and the Wiimote manager, until the module was finished. The “war room” method of having the whole team coding in the same room was very helpful for solving problems and working out design issues.

Various projects

The efforts trying to get Joomla! to work taught our team to research third-party code more carefully and ensure that adequate documentation is available. Although Joomla! may be great for some applications, for our project it was too central to easily allow customization and it was too big to learn with the given time constraints.

The Rackspace API is RESTful. Representational State Transfer (REST) uses the client-server model. An application is said to be either in transition or at rest. When the application is in the rest state, the user can interact with it, but there is no load on the network. When the application is waiting for the response from an HTTP request, the application is said to be in transition. None of the members of the CSM Team had previously used REST, but it worked well for this application because allows low-level control of the HTTP requests that are made over the network connection.

Storing binary data in a file: Base64_encode proved to be very useful in the storage of user data within a document. The function writes the image as binary data, which can later be translated back to an image.

Mines offers a database class here that teaches students basic database efficiency and queries. Select statements and efficiency is a much larger subject when applying it to more than just a database of movies and actors. Knowing basics and looking up instructions and tips online helped out a lot when trying to implement the localization algorithm with a select statement. The team discovered that group-by and views are extremely powerful tools when working with databases.

Creating a Debian package, while not simple, greatly simplifies the install process on the Quanmaxes. Once a suitable guide was found, iterative changes allowed the production of a package that, after networking was installed, setup all the necessary production tools with minimal interaction.