

Hosanna House

George Haff, Student Consultant

Twan Becton and Sonja Garrison, Community Partners

Introduction

Hello, my name is George Haff and I am currently a Junior at Carnegie-Mellon University, studying mathematics and computer science. Over the past few months, I have been using my skills to aid in improving several facets of the computing systems at the Hosanna House, a prominent community service organization.

Situation

The Hosanna House can be found on Wallace Ave. and just off the 67 bus routes in Wilkesburg. The organization is located in an old four-story school building. The two lower floors are currently in use, while the remaining two upper floors have just finished being renovated (to match the condition of the lower floors). The structure conveniently houses a gymnasium, auditorium, swimming pool, and ample classroom / office space. The administration and some other departments are poised and ready to move into the newly expanded space. To match this expansion, the Hosanna House is also prepared to increase the capacity of their computer systems and several facets of their other programs. Up until now, many programs were limited in their functioning due to space constraints. This will change shortly.

The organization's motto, 'Hosanna House Is A Place Called Peace,' gives you a hint at their purpose. Most of their activities focus on after-school programs for children that allow them to gather and do constructive things, instead of being out on the street. Among the services offered are an open recreational center, several sports programs (including swimming and basketball), and instructional music and computer classes. Also within their walls are multiple health care and counseling service providers, which are not directly related to the Hosanna House. The Hosanna House has about 40 staff workers and volunteers, aged 20 to 30, with a much smaller administrative force of about 10.

The main computer lab, presently located on the first floor, has 12 Pentium-100 computers, each with a 1 gigabyte hard drive, 16 megabytes of RAM, sound cards, ethernet cards, the Windows 95 operating system, and some educational and general (Inter-)networking software. They are all networked together, with an ISDN link to the Internet, currently provided by the Hill House (another community service organization). There is also another computer in the lab, of server capability, which has a Pentium-233 processor, a 4 gigabyte hard drive, and two ethernet cards. There are other computers in the building, including a similarly configured (sans networking and sound capabilities) lab used for job training, individual personal computers for certain staff members, and a small administrative network (about 10 computers, using the Novell Netware protocol).

Running the computer lab are Twan Becton and Sonja Garrison. They administer the

computers there and teach classes on using software and the Internet. They are responsible for the general upkeep of the computers and maintaining their usability. The classes they run are geared towards introducing and furthering the use of computers for the children and other members of the community. This includes areas such as learning how to use the operating system, the Internet, and useful applications such as word processors and spreadsheets.

Problems and Possibilities

Now that the renovation has been completed, the entire building is wired throughout with category-5 ethernet cabling. This is an important asset, because it allows for the connection of all the computers in the building -- both with each other and with an outside link that connects them to the Internet. Category-5 ethernet cabling is special because it is made to specifications that make it usable with 100-base-T ethernet, a higher speed and higher capacity network interface structure.

Therefore, if and when the Hosanna House plans to expand its networking ability in the future, a large hurdle will already have been overcome. An increase of network capability and capacity can have many positive implications for the organization. People are scattered throughout the building, each in their respective offices, doing their respective duties. However, they all have a common goal: a constructive, worthwhile experience for the youngsters. Using the computer as a communication medium can bring them all together like nothing else can. Email is certainly faster than conventional postal mail, and sometimes even intraoffice memorandums. It is possible to fit more people into a chat room for a "meeting" than into a possibly cramped board room. Better communication between the administrators and the staff can only increase productivity. By letting each other know of event happenings, advances in classes, or personal achievements (of both children and staff), people can stay abreast of the situations in the Hosanna House. This prevents things like redundancy and can lead to a better rapport for all involved. In the same vein, if the administration knows more about the 'goings-on' of the staff and their daily routines, they can plan for budget and space allotments more effectively. Likewise, if the staff knows about other staff members' projects and endeavors, they may be able to lend a helping hand or improve upon their idea in some way.

Another area that computers can assist the Hosanna House is with the educational program. An improvement in the computing environment, along with an increase in the capacity or skill of those responsible for teaching, will be immediately apparent in the classroom.

A wider knowledge base would allow the teacher to educate the children in greater depth or in a larger range of topics. This can be attained through the Internet -- from almost anywhere (where there is a computer, at least), one has access to thousands of libraries worth of information. This information can be extremely detailed or even on topics never before considered.

Additionally, knowledge can be passed to the youth in the computer classroom so that they can effectively make use of this virtual treasure trove of information. The lab setting makes this even more of a potent resource, because they can do this under the supervision of the instructor who can gently guide them along their way. It also allows the children to interact with each other during the process, creating a synergistic effect where they can assist one another and increase the learning curve exponentially. The fact that the lab is wired for high speed access (in relation to slower home connections where analog modems are more commonly used) further accelerates the routine because it reduces or even eliminates the dreaded 'wait' generally associated with the

Internet today. All of this can help them in the short run, as it provides a medium for them to find information that they can use for schoolwork and for general enlightenment. With the long term in mind, learning things like this puts them at a higher level of understanding in a field that will most likely be a very large part of everyday life in the near future. Such programs could also be duplicated or modified for the staff workers, so that they can take part in this wonderful new medium and make good use of it.

Currently, there are some problems that face the computer lab in the Hosanna House. The lab is subject to very high amounts of traffic, from students and staff members alike. Because of this usage and for a multitude of other reasons, settings and configurations of the computers can become altered. This complicates the job of the administrators because standardization is key to the classroom setting. For example, people who install or remove programs can cause conflicts in the operation of the computer, or make it difficult for another person to find a program they would like to use.

Further problems arise because the connection the Hosanna House has to the Internet is unreliable. Too often, it goes down without notice and with no hint of an expected uptime. The pipeline to major routes in the Internet that they have now is shared with several other community organizations. This results in a connection speed that is not constant, and is often very slow. It can be extremely frustrating to those using it. To compound these problems, their Internet provider (Hill House) offers little to no support on such issues. However, this connection costs the Hosanna House very little, which makes it a valuable resource.

Scope Of Work

Over the course of our meetings, Twan, Sonja and I got a considerable amount of work done. We were able to accomplish these things despite a number of setbacks. Originally, we had another student working with us, but he was unable to continue when we had reached a point in time that was about halfway through the consulting period. We had been counting on his experience and knowledge in the area of using the linux operating system for certain special purposes. Another difficulty we faced was in scheduling our meetings. I had half-semester courses that took place during our initial meeting times, so we lost some valuable visits while finding a schedule that was agreeable to the entire group. First, we looked at the situation in the computer lab. Many of the computers were configured very differently from each other, and from what they should have been. There were a number of programs and applications that were installed on some computers but missing from others. Also, some of the computers had settings that were incorrect or in conflict with others. Problems like this can often arise when many people have access to a computer and each tries to arrange its setup to their personal liking. We remedied this by determining what was necessary in the way of hardware device drivers, isolating them, and performing clean installations of Windows 95. To do this, we needed to wipe the hard drives of all data, and start adding things back on from scratch.

To prevent this from happening again, we put BIOS passwords on all the computers. BIOS passwords are stored in the machine's hardware and are called upon when the computer is starting up. If a person tries to start the computer, but does not have a valid password, the computer will not load any programs or allow them entry into the system. This way, people must have

permission to use the computer and can be supervised when using it.

Twan and Sonja had an idea to increase the capability of the computers, and to add to the enjoyment of those using them. We purchased and installed sound cards on all of the lab computers. The cards are manufactured by Creative Labs, and use a 'PCI' interface to connect to the computer. PCI is a relatively newer standard in the personal computer peripheral market and it allows for easy setup and configuration (older standards had problems concerning conflicts with each other and with some basic system functionality). After physically putting the cards in the computers, we had to install drivers so the systems would recognize the sound cards and be able to use them. The drivers were included on a CD-ROM from the manufacturer.

Another issue that came up while we were there was with a seemingly trivial component of the computer, the mouse. It is often overlooked, but is a very important part of modern operating systems as much of the input from the user is through the mouse. Over time and with use, the mouse can collect dirt on its rollers. This causes it to act erratically, jumping around the screen instead of rolling smoothly. To the user, this can become an immense difficulty as it interferes with the normal operation of the computer. People may incorrectly see this as a malfunction and take the component to be repaired, paying money when all that is necessary is a simple cleaning. As Sonja knows how to properly do this now, it can save the Hosanna House some time and money.

We spent some time with the Linux operating system. Linux is an up and coming alternative to other operating systems. Its strengths lie in the fact that it is very stable and robust, that it can accomplish many tasks simultaneously without balking. It is also very powerful because it can be used for many 'user functions, like web surfing and word processing, but it can also act as a server -- in fact, many sites around the Internet use linux because it comes standard with web servers and the like. Perhaps its greatest asset is that, unlike its commercial competitors, it can be obtained and used for no monetary cost at all. The level we covered is not much more than an introduction, though. We installed a copy on the server computer and did some minimal configuring.

In addition to all this, we also covered some topics involving network setup and architecture. This is an important issue, because the Hosanna House has hopes of improving and upgrading its network in the near future. Hopefully, Twan and Sonja will be an asset to the organization when the time comes, as they can help plan a layout and assist in maintaining the structure. This is also related to the topic of setting up computers mentioned above, because each computer must have a particular set of parameters entered before it can be used to explore the Internet. These women are now aware of how conflicts may arise in this area, and how to resolve them.

Outcomes

As a result of our work together, Sonja and Twan have advanced in many areas of computing and computing knowledge. They are more capable than before in areas important to their positions in the Hosanna House and its computer lab. Their ability to administrate and run the computer lab has been augmented to a level at which they can diagnose many problems and find solutions of one sort or another to return the computers to their original functioning. They can

troubleshoot to find where a computer may be having issues, be it in hardware, software or configuration settings. The understanding they have at this point in the functioning of computer technology will also make them valuable to their organization when it decides to do some sort of expansion in terms of purchasing computers, increasing the capability of systems already there, or interconnecting them.

Evidence Of Expanded Capacity

The work we have done has increased the ability of Sonja and Twan, and with them, the capabilities of the Hosanna House have been enhanced. The computer lab is now more conducive to getting things (work, surfing the net, etc...) done, as the computers run more smoothly and are less prone to problems. The addition of sound makes the machines multimedia compliant, because programs, movies from the Internet and the like can be utilized by the user with greater content. Now that the women have had experience installing peripheral components, they know how to do it, and can reproduce that if a new function or device is needed. The fact that they are educators makes everything they know dually valuable, as they can pass such knowledge on to their students. They can even instruct other staff members to increase the number of the Hosanna House's technically knowledgeable employees.

Evidence Of Sustainability

The work that we have done will not quickly become obsolete. The hardware found in the computer lab, though it is not state-of-the-art, will continue to be usable for a long time to come. There are many programs that run on those computers that make use of the Internet or are of educational value that are available today. As time passes, the number of such programs can only increase, plus they may even come down in price. The knowledge that Sonja and Twan have will not become outdated for quite a while because it concerns technologies that are in wide use today, and that will continue to be in the future. For example, the process of installing a PCI card is nearly identical for all variations of that interface. They have a good grasp on networking and the Internet and some functionality therein, which is certainly going to be a hot topic for years to come.

Recommendations

To further advance the technical standpoint of the organization, the Hosanna House can do several things. Many of these are beyond the scope of what we could do as consultants, or require some sort of administrative decree. For instance, the quality of the connection they have to the Internet can be boosted. The Hill House as a service provider has its benefits, but even more could be attained by choosing a new one. For instance, Information Renaissance (who actually serves Hill House) would be a good choice. They can offer technical support which is not available through the current provider. Also, by choosing them, the connection is moved up a

level, in the sense that they can offer a generally higher bandwidth connection (a wider pipe to the Internet) which will not be shared with others. In this case, skipping the 'middle man' can ensure less down time because before, if the Hill House had a problem with their computers, it would result in a loss of service for the Hosanna House. To facilitate the change, an installation fee might be avoided (or at least lessened) because an incoming ISDN line already exists. In all, though it may be more expensive to use Information Renaissance, i believe the benefits outweigh the costs.

We had intended to use the server configured computer as a file sharing entity on the network, and also as a firewall. [A firewall is a tool in a network that can regulate traffic, allowing or denying any sort of outgoing or incoming connection based on the type and location of connection requested.] Use of this could facilitate parenting of the content the children in the lab can view on the Internet, as well as protect the computers from malicious attacks from outside sources. In addition, the computer could also serve as a world wide web server or local mail server. Doing this can remove the need for However, implementing all this requires a large amount of expertise, which would best be handled by taking an enrichment class through a local college or technical institute or by a professional.

In addition to using outside educational sources for instruction on linux, other options include Microsoft WindowsNT (another network management solution which is considerably more expensive and not necessarily as robust) or HTML (the language web pages are written in). Good places to look might be CCAC, University of Pittsburgh, or even Carnegie-Mellon.

Resources

Taking all of this into account, we can see some of the ramifications of the work we did in resources the Hosanna House can now claim. The computer lab is a powerful credit to the organization. It is more stable than before, and will experience a much smaller percentage of down time. Applications running on these computers are of a greater caliber because they can incorporate a new media, namely sound. As Twan and Sonja now have a greater knowledge base to work from, many of the software manuals and computer books located in their office are increased in worth. Also due to their widened knowledge area, these women can be helpful to other people in the organization (and in the community as a whole) and to any related projects they might have. The Hosanna House should consider itself very lucky that it has such skilled and adept workers as Sonja Garrison and Twan Becton.