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CAT-534
Shadow A Pro

On Monday, April 17th, I spent the day with the Tuscaloosa County School System's Technology Department. I first met the Director of Technology, Mr. Tom Perrymon, who introduced me to the other employees and gave me a little background information on each of them.

The department was scheduled to have a staff meeting that morning, so I was able to learn quite a bit about ongoing and upcoming projects.

- There is a large network infrastructure upgrade in the works right now – the school system will be (gradually) getting fiber-optic cable run onto each individual campus; the first schools to be completed will obviously be those in locations near existing fiber drops, but the entire district will hopefully be completed by the end of the 2006-2007 school term. These upgrades will be extremely beneficial for the district as a whole, but especially for the individual schools – under current conditions, the bandwidth demands are often much higher than what the existing network is able to deliver.
- Tuscaloosa County High School has recently purchased more than 150 new computers with private funding.
- A building addition at one of the schools (I don't recall which one) requires relocation of the existing network infrastructure on that campus; the relocation is proving to be very difficult, as there is a one foot thick concrete “firewall” through which the cables must be run.

After the staff meeting, I spent the rest of the morning with the network administrator, Michael Townsend. Michael's primary job responsibility is to ensure that the network is passing traffic as designed. This entails not only maintenance of the physical portions of the network (servers, ethernet cables, etcetera), but also monitoring of network traffic for misuse and abuse (excessive bandwidth usage by teachers, instant messaging, visiting inappropriate sites), intrusion by outsiders, and other issues (whether physical problems or upstream problems that affect us). Michael showed me quite a few software applications that make his job easier; with just a few clicks and/or keystrokes, one can easily see how much traffic each campus is using, which computers on that campus are using it, the ip addresses to/from which that traffic is going/coming – with this information, Michael is generally able to determine whether the traffic is legitimate or not. The Technology Department also makes use of quite a bit of remote management software; in other words, instead of being forced to visit an individual school to perform software updates on that school's servers, they are able to access that machine from the district office just as if they were sitting in front of it. There are several different implementations of this, and one or more may be appropriate depending upon the administrator's needs – for command line access only, a remote session with an SSH (Secure Shell) client will be sufficient, while a graphical session requires VNC or Microsoft's Remote Desktop Protocol (RDP). For the district's Windows servers, RDP is used, while the UNIX-based servers require SSH.

After giving me an overview of the network layout and administration procedures, Michael gave me a tour of the district's central server room. Because it houses the district's email server, web server, numerous shared data and backup data servers, the computer firewall, and numerous other electronic devices which produce quite a bit of heat during normal operation, this room is temperature controlled (and the temperature is monitored remotely).

We took a short break for lunch, and I then spent the remainder of the day with Kirk Junkin, who maintains and administers the vast majority of the district's software applications (to oversimplify the distinction, you might consider Michael to be the hardware person and Kirk the software person). Kirk detailed all of the daily routines followed to ensure that the STI data (enrollment, grades, discipline, basically **everything** regarding students) is being updated properly at all schools and is being backed up on a regular basis. Essentially, all of the school district operations that are done via software involved Kirk in some way – if Kirk doesn't do his job, nobody gets paid, regardless of if or how well the Payroll department completes their job.

One of the most surprising (and sad) discoveries I made in doing this assignment is that the TCSS Technology Department has no operating budget – aside from the salaries of the Director and four full-time employees, there are no funds set aside for this department. One might argue that each school and/or other department should purchase needed equipment and supplies from their own budgets, and while it's a valid point, the priorities of individual schools often differ from the priorities of the Technology Department. Also, it's exceedingly difficult to do a job correctly without the proper tools, and lack of an operating budget makes it harder for the Technology Department to purchase those tools. Furthermore, this department needs more employees – it is responsible for approximately 3500 desktop computers, 45 servers, hundreds of printers, network switches, wireless access points and other hardware, and enough network cable to stretch from the northern tip of the state to the Gulf of Mexico and back again. There were 45 work-orders waiting to be completed on the day I was there, and from what I gathered, that's about average. The ability to remotely manage and troubleshoot many problems, coupled with the trend toward web-based applications (no extra software needs to be installed on each individual desktop), helps to lighten the load considerably, but based on my experience in helping to maintain the computers in only one school, they are doing an **extremely** good job to simply keep their heads above water. With Michael's and Kirk's daily responsibilities keeping them busy, there is very little time (if any) time to visit individual schools for any reason, so this basically leaves only two other employees to handle initial setup, repair, troubleshooting, etcetera of computers on campuses – since we have a large county, much of their time is spent traveling to and from those campuses.

In conclusion, my “Shadow A Pro” assignment was very educational and enjoyable. I can't say enough good things about the guys in the TCSS Technology Department; not only are they knowledgeable about what they are doing, but they were also friendly enough to let an outsider into their world, if only for a brief time... :-)