Technology Update Report

Nelson County Board of Education

# Customer Service and End User Impact

## Chromebook Implementation

During the Spring and Summer of 2012, 32 teachers began preparing to use Google Apps in Education. In October of 2012, we rolled out 260 Chromebooks to TNHS, NCHS, and Boston. We created new accounts for teachers and students, and trained them how to use the Chromebooks along with Google Apps, and Edmodo. Teachers and students have been using the devices on a daily basis, creating, and sharing documents.

There have been more than 27,000 documents created since the rollout of this program. There was an average of 209 devices used every day of school. There have been 908 instances of sharing documents with teachers and other students. Teachers are using the Google Apps with PLC meetings. Administrators and teachers have been using Google docs to collaborate with each other to create lesson plans, common assessments, professional growth plans, etc. TNHS has purchased another 60+ Chromebooks to use next year.

## N-Computing Solution

Many of the computers that students have been using the last couple of years are at least 6 years old, or older. With the L-300 “Thin Client” solution we have been able to add a low cost, fast, and reliable solution to the school computer labs that should make them more efficient and easier to utilize for instruction. The host computers for the L-300’s will be much easier to maintain, and should provide several years of service.

## Teacher Computer Replacement

As part of the L300 rollout we are getting back some desktop computers that are less than 3 years old. We are re-deploying those to teachers and staff to replace old computers. We would like to purchase 150 teacher desktops this summer and have them in place before the 2013/2014 school year. According to the best data we can gather this should allow us to have almost every desktop computer that is 4+ years old replaced. Completing this during the summer will entirely depend on the budget and the timing of when we are allowed to make the purchase.

## Technology Professional Development

54 teachers have taken advantage of the Technology Professional Development. Sessions have included training on Skydrive, Google Docs, Web site creation, Edmodo, Lync, Office 365, Remind 101, Facebook, Twitter, OneCallNow, Email, Microsoft Office Suite, etc. We wish to increase participation in technology Professional Development.

## Standardizing Equipment and Procedures

We have implemented a technology purchase request process that will help to "standardize" equipment, and streamline training and support.

## Bandwidth

KETS has us set up with a 45 MB “pipe” to the internet that can “burst” up to 100 MB when bandwidth is available. Many times each day, our internet use is crippled because we are using up our entire bandwidth. The state is working to increase our bandwidth connection during this next school year. If they make it happen, we will see an increase to 250 MB bandwidth. That should take care of our needs.

## Help Desk

We are moving to a new ticketing system this summer. We currently use SchoolDude but are going to switch to Spiceworks. Our users currently must go to a portal and know a password to submit a ticket. Going forward, users will be able to submit a ticket by sending an email to the help desk. They can also update tickets using email. This means staff will only need to know two things to get help from the tech staff: email the help desk or call extension 2341. We are aiming for a response time of at least one business day on all tickets submitted for the next school year and will strive for even lower than that as the year goes on.

## Proxy change

We have successfully cutover to TMG as our internet filtering solution. This is the solution that is supported by KDE. Our iPrism device expires in June 2013 so we decided to go with the standard state solution. TMG is end of life in 12/2015 and KDE is currently evaluating it's replacement.

# Infrastructure and Licensing

## Server Room Environment – Hardware Longevity

During the fall of 2012 we installed several sensors in the server room: temperature, humidity, power failure and leak detection rope. The temperature was consistently between 83-90 degrees. The two main reasons for our heat issues were poor placement of the AC's and no containment of the exhaust from the hot aisle of the server cabinets. We cleared all non essential equipment out of the server room to improve air flow. We also installed strip doors (like at a butcher shop) on the end of the hot aisle to reduce the amount of cold air from the AC's that could enter the hot aisle. Our AC's have louvers that can be adjusted. To minimize the impact of poor AC placement we adjusted the louvers to direct the air toward the cool aisle. These measures should add to the longevity of the servers, etc. that are running in that room.

## Server Virtualization

In winter/spring of 2013 we began a server consolidation/virtualization project. In September of 2012 we had 24 physical servers that were managed by the local IT staff in Nelson County. Through consolidation of services and server virtualization we have that number down to 4. We currently have 36 virtual servers running on 3 VMware hosts. The physical hosts that these virtual machines run on were assets that we already had. We did not have to purchase hardware to achieve this consolidation. We will be cutting back on the number of virtual servers over the next year.

## Backups and Disaster Recovery

In the Fall of 2012 we did not have a backup or disaster recovery solution in place. After the server virtualization project was complete we began using a trial version of Veeam to backup the virtual servers between each physical host at the same site. Backups run once per night and we currently have 7 days worth of backups. These backups currently reside at the same location as the physical servers. To continue this we will need to purchase Veeam before July 1st. We are planning to replicate the virtual servers to TNHS so we have an offsite backup, but with the uncertainty in the budget we don't know if we can accomplish this in the next 6 months. Part of this offsite plan would also increase the retention period of the data to at least 2 weeks. In the event of a natural disaster at central office this would allow us to have our data in a second location so when our network connections at central office were restored we can restore the data as well.

## EES Agreement

Windows XP and Server 2003 will no longer be supported by Microsoft starting in April 2014. We will not be able to get security updates or patches for these operating systems after this date. This means we must get every desktop computer upgraded to at least windows 7 and every server up to at least server 2008 this summer. We don't want to be performing this upgrade during the school year if at all possible.

This is where the EES agreement comes into play. EES is a subscription based licensing agreement from Microsoft in which we would pay a yearly fee to license Microsoft products based on a yearly employee count. There are many advantages to this type of licensing solution. We will always have access to the latest desktop and server operating systems and it takes away some of the compliance concerns. This purchase must be made before July in order for us to complete the upgrade work this summer. Again, the budget and timing of the purchase will determine if we have enough time to complete this work during the summer.

## Wireless Network Redesign

We are going to build out another wireless network possibly listed as NCS-BYOD for students to use. This will greatly increase the number of IP addresses available for students to use. We ran out of IP addresses on the guest network last school year after Christmas break. We are also going to implement a sign in page for the use of the wireless network. Students will need to sign in using their school credentials to use the NCS-BYOD wireless network.

We are planning on changing our guest wireless network this summer to be throttled down to discourage use from students. The intent of this network going forward will be to allow vendors, guest speakers, or community members that are onsite to have internet access. Pomeroy has done the majority of the work on our wireless network so they will be brought in to assist with this project. The timing of this project will depend on the budget.

## VoIP phone system

We currently have 4 buildings (New Haven, Cox's Creek, OKH, ATC) that are not on the VOIP phone system. New Haven is being cutover in July, and we hope to be able to install the VoIP system at the other schools in the near future, but this is a pretty costly install and we will not receive E-rate funding for those buildings.

There is a possibility that we may look into switching providers due to the reliability issues we have encountered with our current carrier. That will require more research with the carrier to determine the exact reasons for our outages over the past school year. The outages that were experienced last school year were all due to carrier issues and not due to any equipment that the Nelson County IT staff manages.

# Cost Avoidance

## L-300 Rollout

In January of 2013 we purchased 500 L300 thin client computers. As part of an end of the year deal we negotiated we were given an additional 100 free units. We have rolled out ~300 of these units and will roll out the remaining 300 this summer. Our cost per seat for these units is at $ 213. These units will be replacing older lab machines and as many student classroom machines as we can. We have talked with several other districts in KY (some other states as well) about our L300 rollout. Ncomputing invited us to be on their Education Customer Advisory Council which allows us to have a seat at the table and help guide their future product features. They also just sent us an additional 100 free L300's ($ 16,500 worth) and considered it a bonus for all of the help and references that we have provided for them.

The L300 rollout is going to allow us to replace ~700 desktops. To calculate the cost reduction we used the Dell 755 as our desktop computer and connected all devices to a kilowatt meter to determine power usage. All device power usage statistics measured power usage at an idle state with no users accessing the devices. This allowed us to establish a baseline. Usage and cost will be higher than the numbers listed here but this gives us something for comparison. The difference in power usage between the 755's and the L300's is significant. Below is a table summarizing our power usage findings:

 

The cost to power the L300's does include the cost to power the 20 Dell 9010's that are the host servers for the N-computing solution. The cost to cool the labs and rooms that the 755's are in will also go down but that cost reduction would be more difficult to calculate based on different HVAC systems in the various buildings.

## Server Room Load

We have greatly reduced our utility cost for the server room due to the server virtualization and server room design projects. The load on our main UPS has went from 67 % in 09/2013 to 36 % currently. This has also reduced the cost of cooling this room dramatically. Below is a table summarizing our utility cost reduction in the server room:



## HVAC Cost Reduction

When we began the redesign of the cooling infrastructure for the server room, the set points on the two AC's were at 58 and 63 degrees and the temperature in the room was at 83 - 90 degrees. After our modifications we were able to raise the set points on the AC's to 73 degrees and the temperature in the room is anywhere from 66-72 degrees. We spent less than $ 100 dollars in materials for this project. We plan to install blanking panels (<$ 100) in the near future to further boost efficiency gains in this room. We have 4.3 tons of cooling capacity in our server room and have removed 1.14 tons of load from the room. This is enough load removed to serve close to 1,000 square feet of living space.

## Help Desk Cost Reduction

The move from SchoolDude to Spiceworks help desk for IT and Maintenance (mentioned earlier), will save the district approximately $8,800 per year.

## Proxy Server

The TMG proxy server solution is about half the cost of the iPrism solution that we had in place before, saving us approximately $11,000.