District Technology Plan

Mount Gilead Exempted Village School District

"...on a journey to excellence"

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Table of Revisions

Revision	Date	Changes
10162012	10-16-2012	Draft
11052012	11-05-2012	Draft
11162012	11-16-2012	Hardware Changes to Server Implementation - Final Draft for submission for Approval
06212013	06-21-2013	Added dollar figures to Infrastructure Project as well as figures to capital improvements from Five Year Forecast

Technology Plan

Mount Gilead Exempted Village School District

The mission of the Technology department is to provide a stable, reliable and current technology infrastructure to integrate, support and enrich the education of the students of the Mount Gilead Exempted Village Schools.

While the technology department operates under the district umbrella, we do realize that each building has different needs.   It is vital to define those needs so that we meet the technology needs in the precise areas where warranted.

District Goals

Short Term Goals:

1. To rebuild and make current the server infrastructure.   This provides the foundation for all of our computer and network systems throughout the district.
2. To develop a strategic plan for offering professional development to staff members.
3. Implement the Public School Works trouble ticket reporting system. This will streamline technology requests and allow for the technology director to utilize all resources to solve the technology issues.

Long Term Goals

1. To have a district-wide uniform classroom with technology (Projectors, Interactive White Boards, Sound Enhancement System and Wireless Coverage).
2. To investigate and implement updated Cafeteria Server software.
3. To implement wireless portable devices in the hand of students for educational use during the school day (Bring your own Device or a one-to-one solution).
4. To create customized virtual desktop Interfaces to grade level as well as remote application access through Citrix WMI.

High School Goals

Short Term Goals:

1. To continue to provide staff and students with the necessary skills to continue to use technology in classrooms and labs.
2. To continue to provide staff and students the necessary tools, (i.e., hardware/software), to continue to use technology in classrooms and labs.
3. To initiate online student assessments in preparation for the upcoming change to on-line assessments.

Long Term Goals:

1. To have all the tools, (i.e. Hardware/Software) ready for the on-line assessment program.
2. To have Promethean Boards in every classroom with teachers trained on their use.
3. To have iPads for every teacher in order to integrate 20th century skills into classroom lessons.
4. To have iPad/laptop/powerbook, etc. in the hands of all students.

Middle School Goals

1. To have an Interactive White Board for all classrooms
2. To have a laptop/mobile device cart for each grade level
3. To update all computer labs with current software.

Park Avenue Goals

Short Term goals:

1. To continue to provide staff with training to continue to use technology in their classrooms.
2. To become familiar with/ implement the purchase of applications which will support the academic Core content.
3. To have over 80% of teachers using (as recent as possible) technology to support their classroom teaching.

4. To have over 80% of teachers using technology for more than just attendance/ Powerschool / email types of use.

Long Term goals:

1. To have at least one teacher from each grade level be a "go to" technology resource.
2. To have Promethean boards in every classroom.
3. To have at least two to three iPads in each typical classroom and at least one in each special education class to implement 21st Century skills in the classroom.

Hardware Strategy

In order to accurately assess the district's technology needs, it is essential to evaluate the computer/server technology currently in place.

Hardware By Location	Total	Purchase Date
Administrators	8	August 2009
Secretaries & Support Staff	11	August 2009
High School Staff	31	July 2013
Middle School Staff	22	August 2011
Elementary Staff	41	August 2009 (refurbished computers)
High School Student Computers	81	Before August 2007
Middle School Computers	24	Before August 2007
Middle School Thin Clients	48	August 2008
Library Thin Clients	24	August 2010
Elementary Lab	24	Before August 2007
Elementary Classroom Thin Clients	81	August 2010
Total	391	

**Note the building secretaries and principals are accounted for under the building totals. Tomorrow Center Director and Secretary are under administrators and secretaries respectively.

The chart below details the current server infrastructure

Server	Total	Purchase Date	Location
Phone and Voice Mail Servers	3	January 2010	Park Avenue NOC
Virtual Hosting Servers (Hosting total of 8 Virtual Servers)	2	December 2008	Technology Office
File Server	1	December 2009	Technology Office
Bell, Security and Application Server	1	Before 2007	Technology Office
Camera Servers	2	January 2010	Middle School Tech Room
Lunchbox Server	1	August 2008	Technology Office
Total Hardware Servers	10		
Total Servers including Virtual	18		

This list will be kept up to date as equipment is acquired.

The districts overall inventory will be divided into four sections and hardware will be refreshed every four years.   Where it is both functionally and financially prudent, we will enter into lease agreements on all major hardware   The hardware will be grouped and updated according to the following schedule:

Year 1 Server Infrastructure and Labs (Appendix A)
Year 2 High School (Appendix B)
Year 3 Elementary School (Appendix C)
Year 4 Middle School (Appendix D)

The initial server infrastructure quote included upgrading all of the labs in each building. When the server infrastructure is up for lease end we will evaluate where our servers are and determine where and if upgrades are needed.

__Technology Department Hardware Additions and Advancements__

The above sections speak to the existing hardware in the district and are primarily computer systems.   As you see in the building goals, there is a great need for additional equipment in the classrooms to aid in the educational process.   What we would like to see over the term of this initial plan is an investment, both financial and in mindset, not to accept the status quo. Move forward to make the classrooms congruent in their offerings to provide equal learning experiences.   Specifically, the classrooms at the Elementary school should all be outfitted with projectors.   Over the term of this initial plan we would like to see an interactive white board in each classroom. This technology has proven to greatly increase student engagement in the learning process.

Software Strategy

As more technology is being integrated into the teachers day to day instruction, it is crucial that the district look at ways software can help. The dictrict currently uses software solutions at all buildings for reading, typing, multi-topic K-5, IEP's, lesson plans, grades & attendance, cafeteria and online document management and sharing. There are many software solutions that enhance the learning experience for the student, while making the job of a teacher more rewarding and effective. We will continually evaluate where software may accomplish these goals.

All current software will be assessed by the Technology Committee at the end of its respective maintenance term to ensure that we are providing the best solution possible.

We will investigate the values of Office productivity software upgrades as new packages are released by the manufacturer. We have held off upgrading our district's use of Microsoft Office since the 2003 release. There have not been improvements that make the costs associated with upgrades justifiable. We are now at an impasse where even though the improvements are not justifying the cost the current hardware is not adequately supporting the software as well as more and more compatibility issues are becoming evident.

The district has a Campus license of Windows XP for many years. However, the transition to Windows 7 is upon us and inevitable. We will order new client hardware from this point forward on the Windows 7 platform. As most users have this on their home PCs it doesn't appear necessary to provide professional development on the new operating system. Although, we will be open to the idea should the need arise.

Re-Occuring Annual Costs and Agreements

There are many agreements and services that we work under that incur annual or multi year (contractual) costs.   We will evaluate these at time of renewal to ensure they are the most appropriate and cost effective solution for the service needed.

Service	What it is	Contract Start Date	Term
Cisco SmartNet	Maintenance contract for phone system and core switches	n/a	Annual Contract
Kaspersky	Anti-Virus Protection	June 1st, 2011	3 Years
Gaggle	eMail Archiving	n/a	Annual Contract
Reading A-Z	Reading Curriculum at Elementary school.	5/12/2012	3 Years
Education City	Online Language Arts, Science & Math lessons for Elementary school.	3/4/2010	7 Years
Typing Pal	Online Keyboarding Software	12/15/2011	3 Years

This list will have additions and modifications as we enter into new or replacement contracts.

Copiers

We are using copiers obtained in a lease starting June 2008 with a term of 63 months. We have been approached by numerous document management companies to replace this equipment. All of the terms proposed include buying out our existing equipment at a cost savings to the district. The district would receive brand new equipment and the remainder of the lease paid out by the new vendor.

It would be our intention to enter into a new lease with a document management company. They would provide copiers at all locations that currently have devices as well as the leased network printers. The Vo-Ag and Transportation office needs will be reviewed and if appropriate a leased printer will be provided at each location. This will save time and money having them covered under a maintenance agreement.

With these new devices, color scanning will now be available at zero additional cost. This will enhance the teacher's ability to present attention grabbing presentations as well as content to the web that will be far more attractive to our public.

We will need to have the equipment re-quoted but initially our savings under the proposed contract would be right at $1,900/month equaling over $22,000 per year!

Professional Development

Mount Gilead Schools district's technology will only be as good as those using and presenting it. Time and money are the biggest roadblocks in training a staff on best technology utilization practices. We will work to find appropriate and current professional development offerings on waiver and in-service days.

In addition to these formal offerings we will start offering short informational sessions on a monthly basis, at least to start. We will re-evaluate the frequency as interest increases or decreases. The goal of these is to have knowledgeable instructors conduct (technology director or staff) no more than a 45 minute training on common topics. The topics of these sessions would be driven by the technology committee, technology director, admin staff and teachers. These trainings will be done on a purely volunteer basis.

We will look into what would be required for us to be able to offer CEU's for these sessions to make them more desirable and valuable.

Conclusion

This document is meant to be a road map for our district's technology. It is not to be viewed as either static or rigid in its design or contents. It is to be evaluated and assessed not only as needed but on a semiannual basis regardless of change. In order for our technology department and offerings to be successful, we must understand our mission and that is ever changing. This document will change and adapt as the needs, resources and climate do. The goal of this plan is to be a source of information for any interested party as well as an empowering device for the district leadership to move in a consensual direction to best serve the staff and students of Mount Gilead Exempted Village Schools.

Appendix A

This section will be a server inventory with more detailed information with regards to our server farm and infrastructure.   Earlier in the document was a general inventory, below you will find specifically what we have, what it does, when we bought it and what is proposed to replace it (when it is up for review).

Where We Are

Phone Servers

Server	What is does	When purchased	When to be Upgraded
Cisco Unified Call Manager (Publisher)	This handles the management of the phone system.	January 2009	No upgrade necessary at this this time. We will asses system viability on an annual basis.
Cisco Unified Call Manager (Subscriber)	Where phones receive their information and internal call routing.	January 2009	No upgrade necessary at this this time. We will asses system viability on an annual basis.
Cisco Unity	Voice Mail, external phone call routing and call manus.	January 2009	No upgrade necessary at this this time. We will asses system viability on an annual basis.

Virtual Host Servers

Server	What it Does	When Purchased	When to be Upgraded
Dell Poweredge R620 (3)	VMWare Host	January 2013	FY17 (evaluated for needs yearly as well)

Camera Servers

Server	What it Does	When Purchased	When to be Upgraded
Dell R610	Records and Stores Surveillance Images for campus camera System	January 2010	No upgrade necessary at this this time. We will asses system viability on an annual basis.
Dell R610	Records and Stores Surveillance Images for campus camera System	January 2010	No upgrade necessary at this this time. We will asses system viability on an annual basis.

Labs

Lab	Needed after 1:1 Initiative?	When Purchased	When to be Upgraded
High School Small Lab	No	Pre-2007	FY14
Lab across from Library	Yes	Pre 2007	FY14
Libary	Yes	Sept 2009	FY14
Middle School Lab (Behind Library)	No	August 2008	FY14

Where We Want To Be

The proposed replacement plan for our server infrastructure is to replace all indicated "standalone" servers with a Virtualized server farm. A virtualized server infrastructure will maximize hardware utilization, provide redundancy and real time resource allocation. The resultant system will have a much higher level of scalability also. For example: if a standalone server runs out of hard drive space but another server has extra we have no recourse but to order additional drives for that server that is lacking. Under the proposed model we would be able to allocate through the software additional storage (from another server or from free/unallocated space) immediately and on the fly.

Implementation Plan

We plan to roll out the new infrastructure in a two phased process.   Below you will see the different phases and an **estimated** cost associated with each item.

Phase 1

       Servers - We will replace all standalone servers with three new Dell PowerEdge R620 Servers.

       Cost $28,999.65

       Storage Area Network (SAN) - We are proposing a Dell EqualLogic PS6110S 9.6Tb Solid State Array for all of our production services. Supplementing this will be a 24Tb SAS SAN array. This will also add full backup capability of all data.

       Cost $64,056.5

       VMWare Software - This is the software that allows the servers to virtually host embedded server software.   This is for the production server farm. It also serves as a resource allocator to the virtual systems; lending resources to servers as they are being utilized at a high level. This cost includes three years of maintenance.

       Cost $14,751.66

       Switches -   We will install two 10GbE ethernet switches to support the data transfer between the servers and SAN. These will be Dell Force10 S4810. They will work in tandem with one another providing superior throughput and redundancy.

       Cost $33,345.64

       UPS - This is the battery backup system. It provided sufficient power to the server farm for safe shut down in the event of power loss.   More importantly it cleans the power stream so that the sensitive computer equipment is not subject to power fluctuations.

       Cost $5,483.14

       AppAssure Software - This software runs on the servers and performs backups of the entire system state.   It allows for backup of a singular file or the entire server farm. This software is needed to offload the snapshot backups to our remote location and provide redundant integrity to our servers.

       Cost $10,149.39

       Phase 1 Total   **$156,785.98**

Phase 2

Consulting - This is the fee for the consultant to assist with the implementation all of these pieces. He has been working in the educational IT deploying systems like this exclusively for years.   His expertise will help to maximize the functionality of this equipment

Cost $30,000

Lab Computers - We will be replacing all of the traditional desktops throughout the districts lab space with a thin client or google desktop.

Cost $49,825.00

Monitoring Software - This software runs to maintain the health of the server farm as a whole.   It will be set up to send alerts to the technology staff if there are issues that need attention, be those emergencies or routine maintenance.

Cost $8,166.40

Phase 2 Total **$87,991.40**

Project Total **$244,777.38**

Additional Projects Done During Implementation

Disaster Recovery - In being compliant with industry standards we purchased a second SAN and repurposed a server to replicate all of our back-up datat. This serves as a backup in the event of a natural disaster that causes damage to the primary server farm.   Costs include SAN, VMWare software and three years of maintenance. This is also a one time cost and not a recurring storage fee from an offsite backup vendor.

Cost $29,531.90

Network Backbone Upgrade - We realized that the new servers' bottleneck was a few connections between network closets. This necessitated an upgrade to our core network. This required new fiber be pulled between Central Office and Park Avenue, two switches and some adapters for our existing switchgear.   This will bring our core network backbone to 10GB throughout. This is a 100 fold upgrade over what our circuits were performing at previously.

Cost $23,005.23

Impact

For desktop workstations, virtualization provides a way to deliver a uniform student experience regardless of PC "flavor". A lab equipped with PCs with different processors and memory will provide a uniform student user experience because the virtualized desktop environment exists on the network servers rather than individual PCs. The students' personalized workspaces will follow them from classroom to lab to library, and, where connectivity is available, the workspaces can even follow students home.

Not only will we able to provide a consistent end user experience but we will be able to provide a more reliable end user experience.   With the ever growing requirement of software we can compartmentalize each application in its own server space. This will allow for specific hardware allocation to each application as needed.   It will also ensure that one application's failure doesn't affect any others.

In deploying Google devices to the common areas in the middle and high school we are preparing students for the 1:1 environment. An environment, that should be noted, is commonplace in higher education.   Using Google Apps for Education we will provide the students and teachers with a much more efficient workflow and do so in a manner contemporary with the technology they will find in the workplace.

By shifting the Virtual Desktop Interface (VDI) to the elementary we will be providing students at that grade level an "every-time" consistent look and feel that will enable them to concentrate on the work in front of them rather than frustration with minute details that could impeded their lab time's productivity.

In a business setting, operating year round, with 200 traditional desktop computers consuming an average of 150 watts per PC, we have a total power consumption of 30,000 watts. By replacing those machines with thin client hardware that consumes 20 watts per workstation (4,000 watts total) and adding a virtualized server farm, which consumes an additional 4,000 watts, we have a total power consumption for the entire system of 8,000 watts.

This means we're saving about 110 watts per desktop. If you're paying 10 cents per kilowatt hour for electricity, that's an estimated savings of more than $20,000 per year.

Appendix B

High School Equipment

Where we Are

The High School Staff has HP 4540 Laptops. Obviously the greatest benefit is their ability to take their laptop home with them and be able to have a consistent software base to prepare their lessons and complete class work from the comfort of their home. The best piece will be that when they return to school the docking station maintains all of the connections so that they don't have to spend time hooking everything back up every morning they return to school with the laptop.

Currently there are 8 Classrooms that are equipped with Interactive White Boards. After lengthy conversations and surveys of the High School staff is was determined that they have other needs that will be addressed through lab and 1:1 initiatives. One science classroom will be receiving a Promethean Board the 2013-2014 school year.

Below is a current hardware inventory for the building:

Computers	Number	Make & Model	When Purchased
Teachers	26	HP4540 Laptops	August 2013
Principal & Athletic Director	2	HP4540 Laptops	August 2013
Office Staff	3	HP dc5800	August 2009
Vo-Ag & CBI Classrooms	12	Systemax 1069	April 2010
Business Tech Classroom	24	Systemax 1075	September 2012
Mobile Lab	20	Gateway NV53A	April 2011

Where We Want To Be

We have implemented the plan for FY14 in providing High School staff with laptops.

Implementation Plan

We will review and update the implementation plan when the high school staff are due for new equipment in FY18.

Impact

The high school staff members received laptops the summer of 2013. After surveying them to discuss the needs and wants with respect to the computers they were going to use for their day to day instruction, grading and lesson preparation it was determined that the flexibility of a laptop coupled with a statically connected docking station in their classroom was the optimum solution.

Previously teachers were relegated to coming into the building when they needed to do work after hours. This way they have the flexibility to complete the work from home. This also eliminates the possible issue of incompatible software between their personal computer at home. For the technology department we are happy with this setup because we are assured that fewer outside files are coming into the district (via emails or flash drives) from unknown sources, thus reducing our susceptibility to virus or malware infection.

Appendix C

Middle School Equipment

Where we are

The middle school staff members received laptops the summer of 2011. After meeting with them to discuss the needs and wants with respect to the computers they were going to use for their day to day instruction, grading and lesson preparation it was determined that the flexibility of a laptop coupled with a statically connected docking station in their classroom was the optimum solution. A year after deployment we are still hearing positive things about this setup. Previously teachers were relegated to coming into the building when they needed to do work after hours. This way they have the flexibility to complete the work from home. This also eliminates the possible issue of incompatible software between their personal computer at home. For the technology department we are happy with this setup because we are assured that fewer outside files are coming into the district (via emails or flash drives) from unknown sources, thus reducing our susceptibility to virus or malware infection.

The middle school has a total of 6 whiteboards and they have a total of 20 classrooms. Middle School staff resoundingly reported to me that they would like to have Promethean Boards in their classrooms. Promethean Boards will be purchased and installed in July 2013 with professional development to follow.

Below is a current hardware inventory for the building:

Computers	Number	Make & Model	When Purchased
Staff	22	HP 6555b	August 2011
SPED Classroom Computers	4	Dell Optiplex 260	Prior to August 2007

Where We Want To Be

We have implemented the plan for FY12 in providing Middle School staff with laptops.

Implementation Plan

We will review and update the implementation plan when the Middle School staff are due for new equipment in FY16.

Impact

The Middle School staff members received laptops the summer of 2013. After surveying them to discuss the needs and wants with respect to the computers they were going to use for their day to day instruction, grading and lesson preparation it was determined that the flexibility of a laptop coupled with a statically connected docking station in their classroom was the optimum solution.

Previously teachers were relegated to coming into the building when they needed to do work after hours. This way they have the flexibility to complete the work from home. This also eliminates the possible issue of incompatible software between their personal computer at home.   For the technology department we are happy with this setup because we are assured that fewer outside files are coming into the district (via emails or flash drives) from unknown sources, thus reducing our susceptibility to virus or malware infection.

Appendix D

Park Avenue Equipment
Where We Are

Park Avenue Elementary has seen quite a few transitions in their technology that are unique to their building.   The North wing was updated completely with the most recent set of renovations ending in 2011. Specifically this plan will seek to flatten out the disparities left with classroom enhancements made in segments (solely as a result of OSFC's classroom standards at the time of construction).

The staff at park avenue is currently working with HP dc7100 refurbished desktops. They are functioning well as a product of steady maintenance and re-imaging. The goal at their time of replacement is to follow the middle school model empowering the staff to have the mobility a laptop provides with the ease of use provided by a docking station. This will happen in FY15. The Five Year Forecast has $62,000 allocated for this expenditure.

Currently there are 41 classrooms at park avenue. Six of these are split rooms that would not need an interactive whiteboard but all 41 of them would have use for and benefit from a projector. So there are 41 rooms that should have a projector and 36 that should have a promethean board.   There are a total of 29 projectors installed in the classrooms at Park Avenue and 9 Interactive Whiteboards.

The Five Year Forecast has allocated a total of $50,000 for promethean boards district wide. and $12,000 for projectors in FY14.   The installation of these boards and projectors will take place in the summer of 2013 and be ready for use and professional development by the beginning of the 2013-2014 school year.

Below is a current hardware inventory for the building:

Computers	Number	Make & Model	When Purchased
Staff Desktops	45	HP 7100SFF	July 2009
Classroom Thin Clients	81	Wyse v10L	January 2011

Where We Want To Be

As mentioned above, the staff are using desktops currently. Through frequent reimaging and software controls they are running well. The goal at their time of replacement is to follow the middle school model empowering the staff to have the mobility a laptop provides with the ease of use provided by a docking station. This will happen in FY15.   The Five Year Forecast has $62,000 allocated for this expenditure.

The Five Year Forecast has allocated a total of $50,000 for promethean boards district wide. and $12,000 for projectors in FY14.   The installation of these boards and projectors will take place in the summer of 2013 and be ready for use and professional development by the beginning of the 2013-2014 school year.

Implementation Plan

I will start collecting needs from the staff through surveys and my technology committee in the early spring of 2014. This will provide me the information I need to make an appropriate purchase based on their needs and wants.   We will image the laptops and have them ready for deployment during the summer so that staff can start to gain a familiarity with the new form factor.

Impact

Park Avenue staff members will receive laptops the summer of 2014. Through surveys them to discuss the needs and wants with respect to the computers they were going to use for their day to day instruction, grading and lesson preparation it was determined that the flexibility of a laptop coupled with a statically connected docking station in their classroom was the optimum solution.

Previously teachers were relegated to coming into the building when they needed to do work after hours. This way they have the flexibility to complete the work from home. This also eliminates the possible issue of incompatible software between their personal computer at home.   For the technology department we are happy with this setup because we are assured that fewer outside files are coming into the district (via emails or flash drives) from unknown sources, thus reducing our susceptibility to virus or malware infection.