



The Commonwealth of Massachusetts Department of Education

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David P. Driscoll
Commissioner of Education

MEMORANDUM

TO: James Connolly, Superintendent

FROM: David P. Driscoll, Commissioner of Education

SUBJECT: Approval of Natick School District Technology Plan Implementation Data

DATE: January 2006

A handwritten signature in dark ink, appearing to be "D. Driscoll", written over the "FROM" line of the memorandum.

Thank you for submitting the electronic data forms describing the implementation of your long-range local technology plan. I am pleased to inform you that based on your progress the Natick School District Technology Plan is approved through June 30, 2007.

I appreciate your district's commitment to using technology to improve teaching, learning, and administration. The information you provided shows you have made progress towards the recommended "Local Technology Plan Guidelines" (http://www.doe.mass.edu/edtech/tplanguide04_07.html). We will continue to work with you in the implementation of your technology plan so that you will remain eligible for E-rate discounts and state and federal technology grants.

If you have questions about your technology plan, Baiba Ozols, Instructional Technology Specialist, will be pleased to assist you. You can contact her at bozols@doe.mass.edu.

Copy: Dennis Roche, Director of Instructional Technology



Natick Public Schools

TECHNOLOGY AUDIT & STRATEGIC PLAN SCHOOL YEAR 2005 – 2008

Author: Dennis Roche, CISA – Director of Technology
Creation Date: 08/16/05
Last Updated: 02/06/06
Version: 4.0

Approvals:

James Connolly,
Superintendent

Technology Committee

School Committee

Document Control

Change Record

Date	Author	Version	Change Reference
08/16/05	Dennis Roche	1	
12/01/05	Dennis Roche	2	
01/09/06	Dennis Roche	3	
02/06/06	Dennis Roche	4	

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Technology Audit

Executive Summary

In general, the Natick Public Schools network is experiencing the same challenges found in many small companies facing rapid growth. As investments in technology have increased, many of the fundamental building blocks are either missing or not properly implemented to receive the maximum benefit.

In today's world, our expectations for technology are ever increasing and the need to recruit and develop a talented technology staff has never been more important than now. The technology team currently lacks many of the skills and depth necessary to maintain a network of this size and scale.

Most documentation simply does not exist and no formal project management framework is currently in place. As a result, many projects undertaken without proper planning and risk assessment. Therefore, there is no way to accurately measure the success or shortcomings of any individual initiatives.

Currently technology deployed throughout the school district utilizes a centralized model, all key servers and network services are located at Natick High School. Centralization can be a good strategy as long as proper planning and risk assessment conducted. However, with no formal plans developed, initial assessments conducted at the High School identified many issues that have district wide impact. Only by taking a district-wide approach, will we be able to make long term change and achieve improved results and value cross all schools.

Outlined in the following section is a high-level Technology Audit. It does not comprise a complete list of issues but results of this self-assessment indicate major rebuilding of our network technology and infrastructure will be necessary to achieve our long-term goals and success.

Audit Risks

Risk No	Objective	Effect on Technology Objectives	Recommended Action	Action Taken
1.	Team Organization			
		Ineffective support of existing network resources and too much reliance on the most highly skilled staff.	<p>Conduct individual skills assessment and develop long-range technology staffing plan.</p> <p>Team approach with a focus on customer service and satisfaction.</p> <p>Establish centralized Help Desk function for entire school district.</p>	<p>Long range staffing plan developed. See Appendix A & B.</p> <p>Hired Network Administrators to manage the network.</p> <p>Relocated all Technical Support Facilitators (TSFs) to the High School to staff the new centralized Help Desk function.</p> <p>Support personnel dispatched to each school based on priority and need.</p> <p>Cell phones used to coordinate many of the support personnel in timely manner.</p>
2.	Project Management			
		<p>No written plans for any technology initiatives (OSX rollout, moving all servers to High School, cabling of Johnson, etc.)</p> <p>No way to know how projects are in relation to time, budget, milestones or risks.</p>	We need to plan first then invest in what makes sense.	All technology projects are currently under review. Updated Technology Plan is under development.
3.	Computer Room Environment			
	Organization	<p>Equipment, combustibles and junk everywhere.</p> <p>Production and test equipment not clearly identified.</p> <p>Labelling poor or outdated.</p>	Major overhaul of the room is required to determine what equipment is necessary to operate the network in an effective manner.	<p>Transformed computer room at Natick High School into the school district's Network Operations Center operated by the Network Administrators.</p> <p>All equipment rack mounted.</p> <p>Non-essential combustibles and junk removed or relocated to another room.</p> <p>All cables replaced and bundled together in an organized fashion and labelled.</p> <p>Proactive monitoring of network displayed in real time throughout the</p>

				school day.
	Fire	No fire-suppression or smoke detectors exist within computer room.	Install dry fire suppression system to protect main computer room for school district.	Facilities aware of urgent issue but not included in the FY07 budget requests. This remains a high risk due to poor data backup capabilities present.
	Electrical	<p>Electrical supply to computer room shared with other areas of the High School. High School electrical system is currently not adequate during times of high use.</p> <p>No central UPS for computer room. Individual units untested with an unknown life expectancy.</p> <p>No main shut-off to electrical power installed.</p>	<p>Install dedicated electrical panel with adequate power to supply critical devices in main computer room tied into a backup electrical generator.</p> <p>Replace older UPS units and recycle to less critical roles.</p>	<p>Facilities installing a dedicated electrical panel protected by an electrical generator.</p> <p>Replaced and recycled UPS units.</p>
	HVAC	Reliance on single ductless AC unit. Two failures have occurred within past two months resulting in temperatures exceeding 100 degrees and failure of several network services.	Add second HVAC unit to minimize single point of failure.	Submitted request for redundant HVAC unit in facilities FY07 Budget.
	Environmental Monitoring	<p>No monitoring exists so problems could go on for long periods without notification.</p> <p>Leaky roof caused outage and water damage to firewall equipment.</p>	Add monitoring equipment to measure temperature, humidity, power problems, security, smoke and fire.	<p>Temperature and humidity monitoring equipment is now in place.</p> <p>Moved computer equipment within the computer room away from location with known water leaks as much as possible. More work needs to be done to address this.</p>
4.	Network Communications			
	IP Routing	<p>Core switches in place at Natick High School, Wilson Middle School and Ben-Hem Elementary School due to size of the networks in place at these locations.</p> <p>Network cores are single points of failure and only the High School has a current maintenance agreement.</p> <p>Routing of IP traffic does not appear to be working properly. Devices plugged</p>	<p>Determine maintenance options for all core switches and have plan in place in event of failure.</p> <p>Clearly define IP routing at the main core and to all locations.</p> <p>Revisit and simplify IP scheme.</p> <p>Gather more details on core routers at Natick High School, Wilson Middle School and Ben-Hem Elementary School.</p>	<p>Documenting network infrastructure. See Appendix C, D and E.</p> <p>Focus is on the network core at Natick High School, Wilson Middle School and Ben-Hem Elementary School.</p> <p>Investigating maintenance options and costs for Wilson and Ben-Hem.</p>

		<p>directly into main network core at the High School cannot ping devices at all locations.</p> <p>Both the Wilson Middle School and Ben-Hem Elementary School appear to have an excessive number of subnets.</p>		
	AppleTalk	AppleTalk seeders at the High School represent single point of failure.	Determine maintenance options and have plan in place in event of failure.	Investigating options and documenting setup. See Appendix F.
5.	Servers			
	Hardware	Minimum specifications not established. Most servers do not have monitors and only accessible via remote management, single hard disks, single power supplies, and single network cards.	<p>Establish minimum hardware specifications based on network function with proper redundancies.</p> <p>Install monitor cards and KVMs to manage servers even if network communication issues occur.</p>	<p>Minimum server specifications complete.</p> <p>Monitor cards and KVMs implemented.</p>
	Software	Servers that provide core network services are co-mingled with user data and applications	Move servers that provide network infrastructure services to dedicated boxes.	As we develop our plan to rebuild these boxes we will take into consideration upgrading them all to MAC OSX.
	Storage	No real strategy exists for organizing where data is stored for students and faculty. This makes account maintenance, backups and capacity planning a much more difficult task.	Investigate and implement centralized storage device. A properly organized storage strategy will allow student and faculty data to be better organized and protected, provide for reliable backups and improve ability to conduct adequate capacity planning activities.	Researching options to support MAC and Windows platforms along with a compatible backup device.
	Backups	<p>Current backup solution not adequate to conduct unattended backups.</p> <p>Incrementally backups done in the past but tapes have never sent off-site. Relied on a single tape appended to each night for an entire school year. A computer room fire or a simple media failure could jeopardize losing an entire year's worth of data.</p> <p>No backups scheduled to run since end of school year.</p>	<p>Identify all data storage devices.</p> <p>Research autoloader tape units with dual drives.</p> <p>Continue attempts to conduct full backups of the network. So far, all attempts have been unsuccessful.</p> <p>Establish daily, weekly and monthly backup procedures that include an off-site media rotation and long-term archival process.</p>	<p>Current tape drive is defective (eating tapes) and out of maintenance. Working with vendor on repair or replacement options.</p> <p>While investigating repair and replacement options we have implemented short-term backup solutions:</p> <p>Email backed up to an external drive once a week.</p> <p>Winnebago data burned to DVD once a month.</p> <p>QuickBooks data backed up locally by users to USB jump drives.</p>
	Software Configuration	Mis-configuration of the security system has contributed to a large number of permissions issues to both individual accounts and groups.	Rebuilding all servers and the entire domain will be required to correct these issues in the long term. With a single domain established correctly, with the proper permissions, windows and apple clients will be able to work seamlessly together.	Created a Windows Active Directory Domain in a test environment. Both MAC and Windows clients binding to it. Further testing is on going as we develop our migration plan.

		Apple and Windows clients currently communicate in separate domains. Making sharing of files not possible among platforms.		
6.	Perimeter Security Measures			
		<p>Current security measures are weak at best. High risk of unauthorized access or interruptions to network services.</p> <p>A number of servers have external IP addresses on the private side of our network and are port forwarding through our firewall. This allows unnecessary traffic through to the core of our network and subjecting it to attack from the internet.</p> <p>Current firewall appliance is an all-in-one product that is not very effective. Product is immature and not properly configured.</p>	<p>Eliminate port forwarding for all unnecessary services immediately to minimize risk.</p> <p>Establish a DMZ to isolate unnecessary external traffic from the core of our network.</p> <p>Investigate viability of current firewall solution or seek out a more robust firewall solution to safe guard our network.</p>	<p>Changed all administrative passwords.</p> <p>Locked down external access to core router.</p> <p>Port forwarding turned off for all unnecessary services.</p> <p>Due diligence was conducted on existing Joebox firewall. We determined the product lacked basic functionality and technical support found in other industry standards solutions.</p> <p>New firewall selected and ordered to due to it feature-set, technical support and attractive price-point. The solution to deploy when properly tested and configured.</p>
7.	Cabling			
	Patch Cables	A large number of patch cables used throughout the district are voice grade cables contributing to network slow downs.	Replace all known voice grade patch cables.	Verified and replaced patch cables at all schools. Visited all devices and conducted a physical inventory at the same time.
	Daisy Chaining	Daisy chaining of hubs and switches found in classrooms, wiring closets and main computer room at High School. This contributes to excessive network latency (network slow downs) and dropped connections.	<p>Eliminate the use of hubs.</p> <p>Switches should be the exception in the classroom and not the rule.</p> <p>Going forward, daisy chaining of devices should never be acceptable in computer lab environments. As labs are re-done, install an adequate number of cables to support number of computer devices.</p> <p>Daisy chaining within the computer room is never acceptable. This will be corrected ASAP. Servers on a hub and taking a big performance hit.</p>	<p>Eliminating hubs as found.</p> <p>Re-cabled computer lab A109 in the High School properly this past summer to support the number of devices.</p> <p>Dismantled and re-cabled computer room during the three October holidays early in the school year.</p>
	Exposed Cables	Exposed cables in classrooms and unsecured wiring locations at risk to tampering or modification.	Exposed data cables within reach in classrooms need to inside electrical conduit or wire-mold to protect from damage.	Installed new data cabling at Johnson Elementary school this past summer within electrical conduit.

	Wiring Locations	<p>Within most wiring closets ventilation is poor, temperature was warm to hot and unmonitored, shared storage with non-essential equipment intruding within 3ft of equipment, signs of dirty and dusty conditions present.</p> <p>Removed power cords from two servers at Ben-Hem during the school day caused unnecessary downtime. The source of the problem remains unsolved.</p>	<p>Secure all wiring locations. Build closets around wiring in open areas and secured with a locked door.</p> <p>Restrict access to all wiring closets and remove non-essential material from area.</p> <p>Environmental monitoring devices should be installed within all wiring closets and temperature and ventilation improvements considered.</p> <p>Clean on a regularly scheduled basis all equipment in wiring closets and main computer room to avoid premature damage or failure.</p>	<p>Conducted audit of all wiring locations. See Appendix G.</p> <p>Collected keys to most, but not all wiring locations. We remain too lax in securing these locations and it continues to present an unnecessary high risk of downtime.</p>
8.	Workstation and Classroom Technologies			
	District Wide	<p>Approximately 1500 computers exist in the district.</p> <p>Mostly MAC workstations.</p> <p>Windows machines in school front offices and in a limited number of classrooms at the High School.</p>	<p>Assess and determine need before making platform decisions.</p>	<p>Manual inventory conducted district wide and under review.</p>
	High School	<p>Most classrooms have only one computer for teacher access.</p> <p>Dedicated computer labs and the library are available for student access.</p> <p>One mobile cart available but not used very often.</p> <p>MAC workstations: Newer and more up to date computers running MAC OSX.</p> <p>Windows workstations: Older machines mostly acquired through donations and refurbished by A+ students.</p>	<p>Assess technology needs and use in the classroom and set district wide standards at all levels.</p> <p>At High School level need to determine platform based on need and increase student exposure to environments found in higher education and the work place.</p> <p>Explore mobile lab concept why it is failing.</p> <p>Explore other classroom technologies such as interactive white boards, web based applications, uses of internet2 and rich media.</p>	
	Middle Schools	<p>Major differences between two Middle Schools:</p> <p>Kennedy: Most classrooms have only one computer for both teachers and students.</p>	<p>Assess technology needs and use in the classroom and set district wide standards at all levels.</p> <p>Find strategies to equalize technology investment across both middle schools.</p> <p>Explore mobile lab concept why it is failing.</p>	

		<p>One computer lab and library available for student access.</p> <p>No mobile carts.</p> <p>MAC workstations: Newer and more up to date computers running MAC OSX.</p> <p>Wilson: Most classrooms have one computer available for teacher access and three computers available for student access.</p> <p>Two computer labs and library available for student access.</p> <p>Two mobile carts available but not used very often.</p> <p>MAC workstations: Newer and more up to date computers running MAC OSX.</p>	<p>Explore other classroom technologies such as interactive white boards, web based applications, uses of internet2 and rich media.</p>	
	<p>Elementary Schools</p>	<p>Classroom technology varies greatly by school. Some elementary schools only have one computer in the classroom while others may have three to four computers for both teacher and student use.</p> <p>Unclear how much student use the computers get in the classroom.</p> <p>Some elementary schools have a dedicated computer lab for student access.</p> <p>No mobile labs.</p> <p>Oldest machines in the district. Majority running MAC OS 9 and some running MAC OS 8.</p> <p>Most applications not compatible with MAC OSX.</p> <p>Failing machines are a daily occurrence. Requiring time to troubleshoot and not worth putting any money into repair. As a result, student to computer ratio is</p>	<p>Assess technology needs and use in the classroom and set district wide standards at all levels.</p> <p>Find strategies to equalize technology investment across all elementary schools.</p> <p>Explore other classroom technologies such as interactive white boards, web based applications, uses of internet2 and rich media.</p> <p>Determine strategy replacing aging equipment and upgrading to OSX and upgrading older applications.</p>	

		suffering due to attrition.		
9.	Wireless			
		Wireless access through low cost access point deployed throughout school district.	Need an enterprise wise strategy to effectively deploy wireless and protect against unauthorized access.	Until we have a stable wired infrastructure all action with wireless deployments are on-hold.
10.	Anti-Virus Protection			
		<p>Anti-virus solutions not effective.</p> <p>Joebox firewall has modest anti-virus services.</p> <p>First Class also has some basic anti-virus protection.</p> <p>Only a few Windows Servers and a few MAC clients had any anti-virus software.</p>	<p>Need to take a layered approach:</p> <p>Firewall Email Server Servers Workstations</p> <p>Adequate anti-virus protection needs to be in place, up to date and scanned on all the above layers on regular basis.</p>	<p>Discovered we own copies of both Symantec Anti-Virus and Computer Associates Etrust.</p> <p>Researching which product or products will work best and cost to implement.</p> <p>Symantec Anti-Virus (Centrally Managed) currently on all windows servers and a group of windows clients at Natick High School.</p> <p>Etrust running on a few MAC clients.</p>
11.	Anti-Spam Protection			
		<p>Anti-Spam protection provided by FirstClass and JoeBox is inadequate.</p> <p>Spam is a daily frustration for many.</p>	Evaluate solution against industry standards.	Will be address with new firewall solution.
12.	FirstClass Server			
	Reliability	<p>Currently Email and Website reside on same server and fails daily.</p> <p>Users have reported data loss.</p>	<p>Email and Website should run on separate servers. Investigate if First Class can handle this requirement or if another product needed. A more detailed audit of the First Class Server is required.</p>	<p>Conducted audit with outside company and confirmed our concerns.</p> <p>Many of the configuration and permission settings improperly configured and applied.</p> <p>Developing a detailed plan to correct and minimize any potential downtime.</p> <p>Installed script to check First Class is running all the time. If not, it restarts the necessary services.</p> <p>Manually pushing backups to an external drive.</p>
	Organization	All website data is public information. Need exists for internal intranet for school district.	Need to establish website for external use – face to the public and an internal site – Intranet for internal school district use.	
13.	Citrix Servers			

		<p>Citrix servers deployed to allow PC applications to run on MAC systems.</p> <p>OS drive running out of disk space. Server will not run until corrective action taken.</p> <p>Servers riddled with virus activity.</p> <p>Servers failed daily, negatively impacting:</p> <ol style="list-style-type: none"> 1.) Natick High School to teach some Business and Science classes. 2.) Nurses unable to access (SNAP) student medical records. 3.) Facilities unable to control heating systems to several schools. 	<p>Explore the need Citrix is addressing. Other approaches exist to manage Windows applications that may be more effective.</p> <p>Need to remove user data from C drive to create more space.</p> <p>Scan and clean server viruses.</p>	<p>Conducted extensive internal and external review of all Citrix servers and how we utilize the technology.</p> <p>It was determined the Citrix servers would need to be totally rebuilt if we wish to continue there use.</p> <p>Configuration and permission settings improperly configured and applied.</p> <p>To minimize the impact Citrix is having on our environment in the short term we have locally installed the necessary student applications needed to conduct classes.</p> <p>It is unknown at this point if Citrix is required in the environment. No further action until the need is determined.</p>
14.	Software Distribution			
		Many undocumented tools (Netboot, Filewave, Keyserver, etc.) and procedures exist that will be useful going forward.	Develop software distribution strategy for both Windows and MAC clients.	Testing of Netboot and Filewave have been conducted:
	Netboot	Netboot's current configuration and use to boot local workstations contributes to slow login times at Wilson and Ben-Hem.	<p>Evaluate the benefits of using Netboot to boot off a server image and the amount of network overhead generated.</p> <p>A better approach may be to use Netboot to deploy new images but still allow machines to boot locally.</p>	Conducted speed tests within both computer labs at the Wilson Middle School. Greatly enhanced boot and login time when machines were pointed to boot locally and re-imaged.
	Filewave	Used to push software packages to clients not in the standard Natick Public School image.	Need to explore solutions to deploy software across both MAC and Windows platforms.	Rebuilding the server with Filewave tech support team then will further explore distribution to Windows clients.
15.	Patch Management			
		Patch management tool is currently not in place to guard against OS vulnerabilities or bugs.	<p>Review and implement automated solutions for both Windows and MAC platforms.</p> <p>Evaluate MAC OSX.4 capabilities and Microsoft's Windows Update Services Server.</p>	
16.	Telecommunications			

Technology Audit & Plan

	Voice	NEC PBX installed locally within each school building managed by the town IT staff. Not all classrooms have telephones installed.	Develop plan to deploy phones to all classrooms. Should investigate VOIP possibilities.	
	Data	District relies on a single 5MB internet pipe from RCN to Natick High School to provide internet access to all the schools.	Review current bandwidth needs and utilization. Investigate options for increased bandwidth. Consider adding secondary service provider to balance traffic or provide failover capabilities.	

Technology Plan

Executive Summary

Going forward, we need to solidify our technology foundation. This means leveraging our existing investments and making sure our technology house is in order. The four corners that comprise this foundation are:

- Staffing
- Infrastructure
- Applications
- Professional Development

In order to move forward, a rebuilding process needs to take place, a process very similar to that of renovating or rebuilding a house. We cannot tear down the structure as it is being used and relied upon daily throughout the project. An assessment conducted before construction begins will allow for careful planning and execution.

As in any project, planning is the key to success. Before constructing the walls or roof of a house, the foundation under ground must be solid to support the structure to place above it.

In the case of the Natick Public Schools the first and most vital corner of our technology foundation is the technology staffing. By far, people are the most important element when it comes to technology and it is the first area we need to focus our attention on. If people do not have the proper training, the proper skill sets or not comfortable or cannot rely on the technology then we will not succeed.

We rely on people to evaluate, decide, implement and train others on technology so it is vital we get the right people in the right jobs. We need people who view technology as a tool to get things done and come each day with an open mind to achieving success.

Once we have the right team in place we then need to focus on our technology infrastructure. The infrastructure should be flexible and reliable giving us options to grow. Our vision for technology should be an open one that embraces all forms of technology and we need to be aware of emerging technologies and their future impact. We should not limit ourselves to a single vendor's solution or marry ourselves to a technology, as it would only back us into a corner that we would need to deal with later on.

As our infrastructure starts to take shape, we need to assess our applications and verify they are meeting not only our needs today but also our needs down the road. The first group of applications to focus on will be those that allow for improved communications and efficiency, as they will provide us the greatest return both now and in the future. Applications like email, web, student information systems and advanced notification systems to name a few.

The final corner in our foundation is professional development. Once the other three corners are complete, we need to focus all attention on getting the maximum value from all our investments. That will only occur by offering both

technology staff and faculty the proper amount of training and development opportunities. For each dollar spent on technology we need to invest in training our people how to use it. We also need to keep in mind, training and development is an on-going process, not just when new systems are deployed. As our plans develop and evolve much more attention and focus will be occur in this area.

As the following plan indicates it will be a rebuilding process. Much of the focus over the next several years will be on building the technology team and infrastructure. This will then lead to more strategic discussions on applications and professional development opportunities but what makes our technology plan unique from most other school districts is our plan begins and ends with people.

Technology Plan

Year 1 – School Year 2005 – 2006

Step	Objective	Recommended Action	Benefit	Priority	Risks	Cost Estimate
1.	Technology Staffing Plan	Execute Year 1 of Technology Staffing Plan	Skilled technical staff will provide on-going technology development and support.	High	1	Not to exceed current staffing budget
2.	Secure the network	<p>Purchase and implement new firewall solution.</p> <p>New solution doesn't need to be an all-in-one device but must include the following capabilities:</p> <ul style="list-style-type: none"> - DMZ - VPN - Website blocking - Content filtering - SPAM filtering - Anti-Virus 	Establish a secure network before the majority of the rebuilding begins.	High	6,10,11	15,000
3.	Fix Network Communication	<p>Map out physical & logical network all of school buildings.</p> <p>This may require consulting time and site visits to Natick High School, Wilson Middle School and Ben-Hem Elementary.</p> <p>Reconfiguration within the wiring closets may be required.</p>	<p>Documentation of both the physical and logical aspects of the network created and maintained going forward.</p> <p>All communication issues understood and addressed.</p>	High	4	15,000
4.	Rebuild Network Servers & Domain	<p>Rebuild domain controllers and servers in parallel to existing environment.</p> <p>This will require extensive testing and may require some consulting resources.</p>	Rebuilding will address both individual accounts and group permission and management issues that currently plague the network.	High	5	60,000

		<p>After testing, migrate user accounts and data to a new domain.</p> <p>Need to purchase centralized storage and backup device. Existing servers can be re-used as fileservers.</p> <p>The servers being rebuilt will include the following services: Authentication DHCP DNS Storage & Backup Network Printing</p> <p>Need to keep future email system in mind to integrate later into the domain.</p> <p>Development of new client images can then begin.</p>	<p>Core network services installed on dedicated servers.</p> <p>Centralizing storage and backup will give us a better way of managing and protecting the data on the network.</p> <p>Documents saved and accessed from multiple platforms.</p> <p>The added benefit of doing this right; all clients (Apple, Windows or Unix) will be able to authenticate seamlessly into the same domain. This will allow for single sign-in to other applications and require maintenance of only one directory of user accounts.</p>			
5.	Wiring Closets (High Priority)	<p>Ben-Hem</p> <p>Johnson</p> <p>High School A104</p>	<p>Replace aging switches at Ben-Hem Elementary School that are starting to fail. Core switch not under maintenance.</p> <p>Replace aging equipment and take full advantage of new cabling installed.</p> <p>Retire old HUBS now in use and increase performance of computer labs.</p>	High	7	<p>30,000</p> <p>6,000</p> <p>10,000</p>
6.	MS Office	Explore Open Source	Would allow all	Med	N/A	33,000

	Compatible Tools	options (ie: Open Office) or acquire MS Office licenses for all faculty and staff.	<p>faculty and staff to have access to the same tools.</p> <p>Budgeted amount upgrades all faculty and staff to the same version of MS Office.</p> <p>Build into standard image and manage through network security.</p>			
7.	High School Business & Science Labs	<p>Re-wire as needed.</p> <p>License to use MS Office and Windows XP on all client machines.</p>	<p>Improve performance and reliability of the computer labs by eliminating daisy chaining.</p> <p>Standard images built with current technology deployed.</p>	Med	7	<p>18,000</p> <p>10,000</p>
	Total					197,000

Technology Plan

Year 2 – School Year 2006 - 2007

Step	Objective	Recommended Action	Benefit	Priority	Risks	Cost Estimate
1.	Technology Staffing Plan	Execute Year 2 of Technology Staffing Plan	Skilled technical staff will provide on-going technology development and support.	High	1	Not to exceed current staffing budget
2.	Website Development	Research, develop and implement new district and school websites using new Content Management System (CMS).	Website will present a more professional image for the school district and no longer share dependencies with our email system.	High	12	50,000
3.	Student Information System	Evaluate current system against other offerings. Make decision to upgrade or replace current Student Information System.	Detailed student information will be available to faculty, staff, students and parents via an easy to use web interface. Integrate with new district website.	High	-	-
4.	Email System	Fully evaluate current email system. Upgrade or implement new email system that will offer enterprise class performance, protection and reliability.	More features, stability and reliability. Email accounts for both faculty and students. Tighter integration with the town email system. Reduced annual maintenance costs.	High	12	10,000
5.	Wiring Closets (Med Priority)	Switch Replacements: Memorial Brown	Replace next batch of aging switches and run fiber optic cable connecting closets.	Med	7	16,000 16,000

		Lilja Kennedy				12,000 6,000
6.	Workstation Replacement	Determine need for computers within school district and develop replacement cycle plan. Minimum amount budgeted to replace failing equipment Workstation replacement cycle should be finalized once ideal classroom technology standards are determined	Computer equipment will be capable of performing all required tasks.	High		100,000
	Total					210,000

Technology Plan

Year 3 – School Year 2007 - 2008

Step	Objective	Recommended Action	Benefit	Priority	Risks	Cost Estimate
1.	Student Information System	Upgrade or replace current Student Information System and implement.	Detailed student information will be available to faculty, staff, students and parents via an easy to use web interface. Integrate with new district website. Budgeted amount is for full replacement and training.	High	-	150,000
2.	Classroom Technology	Pilot interactive white boards as budget allows throughout the school district. Budgeted amount is one unit installed per school with one laptop computer. Mobile solution: \$6,000 Installed solution: \$10,000	Gives teachers the ability to create interactive multi-media lesson plans that will engage students. A technology teachers and students can utilize on a daily basis.	High	-	80,000
3.	Workstation Replacement	Determine need for computers within school district and develop replacement cycle plan. Minimum amount budgeted to replace failing equipment Workstation replacement cycle should be finalized once ideal classroom technology standards are determined	Computer equipment will be capable of performing all required tasks.	High		50,000

Technology Audit & Plan

	Total					280,000
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Technology Plan

Year 4 and Beyond

As our technology foundation is completed and the reality of building a new High School draws closer, we should be looking into technologies that will extend our open technology strategy. Enterprise class wireless and LAN security products that proactively assess a client's security vulnerabilities prior to connecting to the network have both become commonplace in the higher education. Implementation of these technologies within the Natick Public Schools would offer both faculty and students greater flexibility, use of personal computer equipment in a secure fashion and may also offer creative alternatives to funding annual replacement cycles.

For administrative purposes, selection and implementation of a data warehousing technologies and document management systems with workflow capabilities would help replace many of the manual processes and record keeping systems that exist today.

In the classroom, we should be looking into more web-based applications and services as the cost of bandwidth continues to decrease. Collaboration tools such as internet2 and use of interactive whiteboards that include interactive components for students.

In conclusion, the technology landscape at the Natick Public Schools is full of challenges and potential. Our future is only limited by our creativity and benefits teaching and learning in the classroom.