

SCHOOL DISTRICT OF SOUTH ORANGE AND MAPLEWOOD, NEW JERSEY
525 Academy Street, Maplewood, NJ 07040

Peter P. Horoschak, Ed.D.
Superintendent

973-762-5600 X 1820
FAX: 973-378-9464

MEMORANDUM

TO: Members, Board of Education

FM: Peter P. Horoschak, Superintendent

DT: February 2006

RE: BUDGET ANALYSIS #3 - TECHNOLOGY

The Board of Education requested a report on the cost and uses of **technology**, distinguishing between administrative and student computing, reporting on our effective installed base (i.e., precisely, how many client computers we have in working order, which are in use and their type, age and remaining years of use, together with the total cost per seat for supporting them, where total cost includes human support, maintenance contracts, and the annualized cost of renewing our desktop hardware at some recommended frequency.

INTRODUCTION

The IT (Information Technology) Department is responsible for the installation and maintenance of the network infrastructure, telephone system, audio visual equipment and security equipment in the district. As students, faculty and support staff rely more on applications that are now available centrally on district servers or over the internet, the maintenance of the overall network is crucial. Requests for new technologies and applications are being supplied with little or no disruption of service to the end user.

The initial installation that began in 1993 saw PC and Macintosh computers running most applications locally. Network access was used to store files as a backup to the local machine, with only a few applications actually accessing the network. Today, the internet plays a major role for everyone in the district, from email to Tie-Net (a Special Services database) to Internet research for students. Applications are being transported to our Citrix servers, so that users can access their applications from any machine within the district, with the goal being that everything looks the same all the time. The network is an integral service for the district.

The IT Department is also responsible for the telephone and audio-visual services. With the final phase of the Toshiba phone system being installed during the current year, every staff member will have voice mail and a phone with outside dialing capabilities. IT is also responsible for maintenance of the TV Studio, outbound cable feed, meeting setup and recordings and the security infrastructure.

In addition to the many activities involved in supporting the computing infrastructure and its large installed base, the Central Technical Support staff is also responsible for management and support of the security alarm systems, the district-wide card access systems, the master clock systems, closed circuit television, and audio visual repair and maintenance. For board meetings and other events, the department sets up and provides technical support for audio and video equipment, PowerPoint and video projection, and post production tasks.

The budgeting process for the IT department involves not only budgeting for this year but to also forecast the needs of the district five years from now. One cannot predict what technologies will be required or exist, but we must have the infrastructure available to support the needs of users. Although it is not possible to support all technological needs, we must strive to support or supply solutions for most needs. It is recommended that an assessment of the technology services in the district, similar to curriculum assessments, be conducted to review the technology needs and make recommendations for ensuring those needs are addressed in the short term as well as the long-term. A committee representing different aspects of the district could provide valuable guidance for directing the future of technology in the district. One thing is clear. The increasing demand for and reliance upon technology in the classroom and administration of schools has stressed the IT department's ability to respond adequately, given its current resources. An increase in staff with technical skill sets is needed to provide the service the district requires.

The technology needs of the district continue to grow. The district has moved from a Novell to Microsoft Directory services, and implemented a thin client solution where fat client machines are minimized. Laptops are being requested by administrators for portability. As more technology becomes available for the classroom, Smartboards or Whiteboards are being requested along with overhead projectors. VCR tapes are being phased out in the industry, and a possible solution is video servers. Parents and students are seeking ways to communicate with staff and administration via the Internet. Staff and administration are seeking solutions to work from areas outside the school building.

Bandwidth requirements within the district are now peaking in some areas and must be addressed immediately; however a long term solution must be developed. The service currently provided by Verizon through T-1 lines is very expensive. A number of solutions have been researched including fiber optics, cable (Comcast) and wireless. Comcast cable is only available in Maplewood. Cablevision, providing service in South Orange, does not offer similar solutions to those offered by Comcast. Long-range wireless is not satisfactory due to the line of sight requirement. A fiber network appears to be the best solution but requires an extensive initial investment. A discussion has been initiated with the municipalities exploring the opportunities for sharing costs of installing fiber throughout both communities while connecting all municipal buildings and schools.

Other options being considered for reducing technology costs and creating possible shared services opportunities with the municipalities include standardization on equipment such as printers in order to realize economies of scale in bulk purchasing and centralized printing. Computer replacement schedules have resumed and must continue not only with computing equipment, but also Audio Visual and security equipment.

ANALYSIS

The Installed Base

The following table summarizes the growth of the installed base since the large-scale introduction of computing technology in 1993-94.

	1993/1994	1999/2000	2005/2006
Enrollment	4962	6195	6268
LANS (Local Area Networks)	4	13	14
Private VLAN (Used for Labs in CHS)	0	0	3
WAN (Wide Area Network)	0	1	1
Servers	11	33	55
Workstations	118	1200	1477

Audio Visual Equipment	1200	783	1300
Video Distribution Centers	0	7	9
TV Studios	1	1	2
Computer Labs	5	28	35
Breakdown of IT staff support*:			
- Central Technical Support	3	3	3
- Audio-Visual & Telecommunications	1	1	1

* additional support services are bid and contracted as needed. The current contracted service provider is Synergy.

Ratio of Computers

Type	Total Of Qty	CO	CHS	CL	JE	MA	MM	MO	MT	SA	SB	SM	SO	TU
LAP	100	7	6	2	2	3	37				2	1	37	3
MAC	589		102	57	43	44	96			7	48	38	81	73
PC	788	43	439	11	28	9	67	32	25	9	11	29	72	13
Total	1477	50	547	70	73	56	200	32	25	16	61	68	190	89
Admin Machines	220	50	76	4	5	7	18	1	25	3	6	3	18	4
Staff / Student Machines	1257	0	471	66	68	49	182	31	0	13	55	65	172	85
Enrollment	6268		1992	456	381	399	715	^		172	491	336	754	572
Ratio* Computers per Student/Staff	4.9864 7574		3.968	6.909	5.603	8.143	3.929	^		13.2	8.93	5.17	4.38	6.73

*Although ratios of computers per student vary by school, attempts are made to ensure that elementary schools have the same number of workstations in each classroom, lab and library. Likewise the middle schools should have the same number of workstations in each classroom, lab and library.

Ratio of Computers per Student/Staff by Grade Grouping

	Students	Computers	Ratio	
Elementary	2807	401	7.000	
Middle School	1469	354	4.150	
High School	1992	502	3.968	
Total	6268	1257	4.986	

This year's installations and projects

Thin Client installations in Middle school libraries and library labs.

Administration workstation upgrades

NAS Data storage

Elementary School labs installation

Final phase of telephone installation in elementary schools

Total cost of computing

Description	Manufacturer/Supplier	05-06 Amount	06-07 Amount
On-line database	Thinkronize - netTrekker	2500	2500
Maintenance License	Oracle	6000	6000
Maintenance License	School Dude	10513	10513
Maintenance License	Caspr Library	4500	4500

Maintenance License	NCS Pearson – Sasi	32445	32445
Maintenance License	System 3000	14000	14000
Maintenance License	Eastman Kodak - Scanner Manjit	1756	1756
Maintenance License	Verizon _ ATM WAN Connections	77856	86456
Maintenance License	Scantron	4455	4455
Maintenance License	Cisco - SmartNet Switches	13600	13600
Maintenance License	Cisco - SmartNet Pix/IDS	1800	1800
Maintenance License	Hyland Software - Imaging Software	4140	4230
Maintenance License	Fluke	1995	1995
Maintenance License	SystemTools (Hyena)	306	306
Maintenance License	NCS Pearson - Sasi - NJ Code	1097	2402
Maintenance License	Citrix	3000	3000
Maintenance License	OBS- Symantec AV/SWS	19317	33000
Maintenance License	Internet Service Provider (Snip Communications)	8000	8000
Maintenance License	Horizon Software	3250	3250
Maintenance License	Adaware Type Software 500 PCS	18000	10000
Maintenance License	Microsoft \$50 per machine@1400	70000	70000
	Tricerat Printing S/W for Citrix	14990	10732
	Faronics (Desktop S/W Maint)	3284	3284
	Maintenance Totals	316804	328224
Replacement Servers	7 Servers @ 10,000		70000
Replacement Machine	300 machines @ \$950		285000
Maintenance License	Subscription Services		42000
	Maintenance of Computers @ \$92 per machine		156,124
	Total Cost of Computing		881,348
	A-Admin L-Library S-Student		

Yearly Maintenance Licensing, Online subscriptions, and replacement machines on a five year replacement schedule averages out to 528.82 per machine per year. The average cost per machine without the cost of replacements is 338.82 per year. The average cost per machine including server replacements is 575.48.

The staffing levels depicted above include a Central Technical Support function. This function provides support for the installed base, including:

- Maintenance and repair of the Network infrastructure;
- Maintenance, repair, and upgrading of District Servers at the central location
- Maintenance, repair, and upgrading of District Servers at the building level
- Maintaining and configuring Directory services
- Installation and repair of workstation hardware
- Configuration, maintenance, ongoing upgrades and troubleshooting of software
- Daily operational activities such as system backup, account/password maintenance and monitoring of system health
- Support of end-users in their use of specific software packages and installation of new packages.

In prior years, support was divided between two departments, The Media and Technology department and the IT Department. Today the IT Department provides the majority of the technical support in the district. With the conversion of Macintosh to IBM-PC computers, the IT Department will be expected to pickup the majority, if not all of the responsibility for support.

Technology changes at a fast rate and the roles to support the new technology must also change. The original technology focus was on training staff to use the technology in the workplace and in the classroom. The

present focus has changed to maintaining and upgrading systems and services, which has become a challenge with the limited IT staffing. Additions to the staff are necessary to attain the level of service demanded in the district. If additional staff is not possible, a redeployment of resources might be considered. As an example, the Media and Technology Department (MT) includes six (6) Technology Facilitators whose role is to provide classroom teacher training and support. This position was created when technology was being introduced and many teachers had little experience with it. In today's world, most teachers are very technically proficient and their support needs have changed. Most teachers need some training such as when new applications are introduced or equipment changes. Their more frequent need is for troubleshooting and technical support as provided by the IT Department. It is suggested that some of the training functions could be consolidated district-wide. The current 6 Technology Facilitators could be replaced with 1-2 Technology Trainers for teachers and staff and adding 2-3 skilled technician positions added in order to maintain and support the diverse technologies. Other recommendations that could be incorporated into this plan would include a centralized training center for the district, centralized printing in each building to reduce printing cost and centralized purchasing and warehousing for standardized equipment and consumables items such as printer cartridges.

Any reorganization as suggested would require that the district have an effective and unified technology goal, requiring all departments to communicate with each other on a regular basis. The IT and MT Departments must collaborate on all projects to ensure appropriate hardware is available to support the applications required to support the curriculum, classroom and administrative needs district-wide. It is also unrealistic and financially irresponsible to make every program or service work within our infrastructure. To strengthen and ensure a collaborative program, it is suggested that a Technology Advisory Committee be formed. The Committee would be comprised of administrators and teachers, along with the staff of the MT and IT departments. The charge of the Committee would be to provide a blue print for the path technology should take here in the district and then to oversee and monitor its progress.

Services currently being used on the network are being centralized to increase efficiency. The Infrastructure within the buildings is built to sustain current and future growth. Unfortunately, the biggest challenge is that bandwidth between buildings has not kept pace with changes and are being taxed in certain areas. Currently T-1's connect all of the buildings and out to the Internet. An increase is needed immediately for these taxed areas, and will be needed as technologies evolve. A proposed 10 Meg circuit is available through Verizon, and the monthly charges are E-rate eligible. A more cost effective solution would be to install a fiber network connecting the buildings, thus eliminating the large monthly charges. The initial costs of installing a network could be reduced by sharing them with one or both municipalities who also have connectivity needs among the various municipal buildings. The possibility for shared services in this area is being discussed with the townships and a potential advantage for all may result.

Requests for new technology applications are continually received. Other technology initiatives include the following:

- Central and school administration, staff, and parents often request a way to communicate with each other over the internet. A new collaboration service that will replace the basic mail service and, not only allow users to read email, but will have a centralized email directory, calendaring, task management and other features is proposed.
- A web-based service for parents to interact with teachers and administrators is also being requested. The CHS HSA purchased a program called Edline that was implemented during this school year. Other programs that provide similar service are being explored. One such application called Centerpoint, a product from NCS Pearson, the company that produces Sasi and ClassXP has an integrated product that allows parents to track the progress of their children and to communicate with the teachers. Teachers and students also are able to communicate with each other over the internet.

- The second year of Thin Client installations will begin in areas that do not require a full desktop.
- Installation of a new dimmer system in the South Orange auditorium is scheduled for the summer of 2006.
- Projects being explored include overhead projectors and Smartboards in the classroom, elimination of VCR and DVD players in exchange for a video server.
- Installation of security equipment, which began five years ago, is now reaching its end of life and must be budgeted for replacement. Included in this replacement schedule will be cameras, recorders and UPS batteries. Card readers for the card swipe system are also reaching their end of life. Additional cards and printing foil for replacement cards will need to be purchased.

A recent analysis of telephone services resulted in an agreement to change the district's carrier service from Verizon to Manhattan Telecommunications Corporation with the expectation of improved service and a net savings in annual expenses of an estimated \$25,000. As an example, under the new agreement, long distance services were reduced from \$0.17 to \$0.059 for intrastate and from \$0.15 to \$0.039 for domestic long distance.

SUMMARY

The technology budget for 2006-2007 is intended to update technology and provide the best possible tools to the students and staff in the district, while remaining conscious of the need for cost-efficiency. It strikes an appropriate balance and meets the adopted budget priority to "stabilize technology support capabilities."

Summary of Recommendations

The proposed IT budget for 2006-2007 to maintain the current level of service would include the following items:

Maintenance contracts for the next budget year.	\$328,224
7 servers @ \$10,000 (per replacement schedule)	\$70,000
Continue replacement schedule of older computers. Actual machines to be replaced will depend on software provided to us for testing that will go on new machines. If we do not receive this software, replacement will be based on the most seamless to the end user. Cost for 300 machines is estimated to be \$285,000 at \$950 per machine	\$285,000
On-line subscription services	\$42,000
Computer maintenance @ average \$92/machine.	\$156,124
The installation of the Secure Gateway to allow Citrix applications outside of the district network.	\$35,200
Upgrading IDS to IPS 4215 (intrusion prevention software)	\$12,000
Upgrading obsolete stage lighting system in South Orange auditorium	\$30,000
Continue investigation into connectivity to all buildings. Expanded bandwidth is immediately needed. Verizon's TLS solution is available at an additional cost over the current cost for a T-1 solution.	\$75,000
TOTAL:	\$1,033,548

In addition, the following table lists upgrades and enhancements that are desirable to do if we were in a different budget climate:

The addition of two (2) FTE technicians and one (1) FTE central distribution technician. One of the technicians would have a dual purpose to provide desktop support and to assist the Communication Specialist. Each technician would cost \$40,000 plus benefits. The central distribution technician would be responsible for purchasing, inventorying and distributing consumables along with other administrative duties and provide level one help desk support.	\$144,000
Upgrading email system to a new collaboration software package.	\$45,000
Conversion of SASI to Centerpoint.	\$130,000
Installation of Music Tech Lab. This would expand the elective offerings in music.	\$75,000
TOTAL:	\$394,000

Yearly cost associated with one time installations

	Proposed Budget	Projected Costs for Year			
	06-07 Costs	07-08	08-09	09-10	10-11
The installation of the Secure Gateway to allow Citrix applications outside of the district network.	\$35,200	\$3,000	\$3,000	\$3,000	\$3,000
Upgrading IDS to IPS 4215 (intrusion prevention software) ^b	\$12,000	\$1,500	\$1,500	\$1,500	\$1,500
Upgrading obsolete stage lighting system in South Orange auditorium	\$30,000	\$1,000	\$1,000	\$1,000	\$1,000
Upgrading email system to a new collaboration software package. ^a	\$45,000	\$4,500	\$4,500	\$4,500	\$4,500
Conversion of SASI to Centerpoint. ^b	\$130,000	\$36,589	\$38,419	\$40,340	\$42,357
Installation of Music Tech Lab. This would expand the elective offerings in music.	\$75,000	\$5,000	\$5,000	\$5,000	\$5,000
TOTAL:	\$327,200	\$51,589	\$53,419	\$55,340	\$57,357

^a - Actual Package chosen will determine yearly costs ranging from \$1200 to \$7000 for Maintenance contracts

^b - Current Maintenance charges would still apply

BUDGET IMPLICATION

It may be possible to realize a savings of an estimated \$161,000 in the 2006-07 budget by reorganizing the staffing as discussed in this report. Replacing the six Technology Facilitator positions at an estimated cost of (\$324,000) with two teacher trainers at a cost of \$108,000 and increasing contracted technical support at an estimated cost of \$80,000 would result in a net savings of \$136,000. This savings along with the estimated \$25,000 savings in telephone service would total a \$161,000 reduction in the technology budget.

Gerry Archibald, District Network Manager, performed the research and analysis on this topic and is commended for his outstanding effort.

