

AGENDA ITEM # 8



To: Board of Education
From: Marcus Thimm, CTO
Date: 4/1/13
Re: Technology Budget 2013/14

We present the proposed technology budget for 2013/14 for discussion/action. Attached to this memo we provide:

- 2014 New Technology Projects
Description of planned technology projects. Budgeted costs for each project
- 2013 Completed Technology Projects
Brief summary of the 2013 district initiative-aligned technology projects
- Historical Technology Spending
Overview of five-year technology budget history with payroll and non-payroll spending and its percentage of the district budget
- Technology Budget – Historical Trend – Payroll Dollars Not Included
Five-year view of the main technology budget program costs (Program 2660 – 2663)
- Technology Master Financial Plan
Five-year plan document with detailed view of annual replacement and refresh costs for various technology equipment and services categories

The proposed technology budget reflects an increase of 7% over the prior year, but includes a substantial capital investment of \$285,000 into network infrastructure enhancements that are fundamental upgrades and expansions of network service and capacity at both schools.

We will upgrade the fiber connections from 1 GB to 10 GB fiber between our network switches to handle the increased network traffic and number of network devices (both wired and wireless).

We will upgrade the wireless infrastructure with new controllers, additional access points and implement an access management portal. This will allow for increased mobile device density and better access control for staff, students and visitors throughout the district.

We will upgrade data wiring at GBN to meet Category 6 cabling standards so we can provide adequate network connection speeds to all wireless access points. They require 1 GB/s connectivity.

We will also upgrade the district's Internet access bandwidth from 300 MB/s to 2000 MB/s for only \$600 more per year.

We ask the board of education to approve the proposed technology budget for 2014.



To: Board of Education
From: Marcus Thimm, CTO
Date: 4/1/13
Re: 2014 New Technology Projects

The primary technology goal for 2014 is increasing the capacity of the district's network infrastructure to ensure organizational readiness as more mobile and wired computing devices are utilized in the district. Upon review and assessment of the existing network infrastructure we identified four main tasks to address this goal:

a. Wireless Access Point and Controller Device Upgrades

Our current wireless network consists of two wireless controllers and approximately 190 access points (AP) throughout the district's facilities. We have implemented this system over four years ago and followed a space-coverage model that maximizes wireless AP the floor space. With the increase in wireless devices and digital classroom strategies we need to add more AP to support classroom sets of wireless devices. This upgrade will provide for one AP per classroom. The controllers will be upgraded and a management portal appliance will be added to support the increased numbers of wireless client devices as well as advanced features for wireless network access management. The budgeted cost for this upgrade is \$165,000 and will be spread over a 5-year lease. (\$33,000 per year – included in Technology Master Financial Plan, New Initiatives)

b. Network Wiring Upgrades at GBN

We will upgrade data wiring at GBN to meet category 6 cabling standards so we can provide adequate network connection speeds to all wireless access points. The access points provide 450MB/s wireless throughput to connected wireless devices. This 450 MB/s bandwidth needs to be delivered into the wired network. This requires Gigabit (1 GB/s) connectivity to ensure there is no bottleneck in the network traffic. Only newly renovated areas of GBN (F-Wing, E-Wing, IMC) have Gigabit capable wiring. This wiring upgrade proposal will provide one dedicated Gigabit capable data cable to each classroom in the A, B, C wings of GBN. We have included \$45,000 for these cabling upgrades in the Technology Master Financial Plan - New Initiatives line item.

c. Internal Network Fiber Upgrades to 10 GB fiber standards

The district's existing internal fiber connections consist of 1-Gigabit fiber. Each data closet connects to the network core switches with either 2 or 4 connections at each school. That is either a 2 Gb/s or 4 Gb/s connection. The switches have typically 480 devices connected, therefore the fiber connection to the core of our network is critical to deliver adequate bandwidth to the connected clients. Upgrading network bandwidth without adding more fiber between the IDF closet and core switches is not possible.

This project will provide 10-Gigabit capable fiber to each IDF closet in both schools and provide equipment upgrades to 8 IDF switches in each of the schools high-density academic core areas. Completing the 10-Gigabit fiber deployment at one time is a significant cost savings versus a phased approach. The switches in non-core areas can be upgraded in phases at a later time.

d. Internet Access Bandwidth Upgrades

Please see the attached memo 'Internet Providers 2013-2014 for details.



To: Board of Education
From: Marcus Thimm, CTO
Date: 4/1/13
Memo: 2013 Completed Technology Projects

The primary technology goal established for the school year 2012/13 (see district initiatives 2012/13) was to ensure successful operation of technology systems during disaster and crisis situations. A focus was to establish resilient internal systems and connections. We identified and completed three main tasks to address this goal:

a. Establish additional fiber network connection between GBN and GBS.

The additional fiber link between GBN and GBS provides redundancy in our internal network to ensure that a fiber break or other component failure along that connection will not disrupt access to the critical internal files applications and Internet resources from either school building. This new fiber link has been installed and active since January 2013. D225 network staff is now in progress to reconfigure our core network switches to enable the new connection as an alternate route and perform failover testing.

b. Complete server and SAN (storage) system refresh.

The new Dell servers and SAN systems have been installed and configured at the district data center and GBN server room. All virtualized servers have been migrated from the HP blade server and storage systems. The HP servers and storage will now be used for testing purposes. (We are testing SCCM 2012, SCCM is the newest Windows system management software, needed to manage Windows 8 and Windows 2012 servers).

The new Dell blade servers and Dell Compellent SAN systems have been sized to provide the compute and storage capacity for the duration of this tech refresh cycle (3 years for servers, 5 years for storage)

c. Establish internal systems redundancy at GBN for Disaster Recovery.

Dell server and SAN systems have also been installed and configured at GBN and will be used actively for tier two systems and development and testing instances of our internal server applications. The district data center is the primary data center/network facility. It houses more servers and higher performing SAN systems as well as network equipment needed for district-wide network services, Internet access and security. The Data center and two high schools are now connected via a fiber ring, that provides redundant access to the Internet and server and storage resources.

These main tasks have been completed. In addition to the above completion of tasks addressing Disaster Recovery and Business Continuity goals (DR/BC), we are forward-looking and reviewing additional needs for our technology infrastructure.



To: Dr. Riggle, Superintendent , and Board of Education
From: Marcus Thimm, CTO
Date: 03/04/2013
Re: New Internet Service

Internet Access Services Upgraded

The federal E-Rate program provides funding for Internet access and telecommunications services to schools and libraries. During this year's E-rate process our district was able to greatly increase the Internet Access bandwidth for our schools (seven-fold) while only increasing the annual Internet access costs by \$600 (or \$50 per month). This increase in bandwidth will position us well with providing sufficient bandwidth to our staff and students as we increase usage of Internet based resources and hosting solutions. We also will have sufficient capacity for the upcoming online testing programs that the State of Illinois is implementing.

The district currently operates two separate Comcast Fiber connections with a combined bandwidth of 300Mb/s (one 200 Mb/s service and one 100 Mb/s service). The three-year contract for the 200 Mb/s service expires on 6/30/13 and must be replaced. The 100 Mb/s Comcast Internet service is in its third contract year expiring on 6/30/14 but will now be replaced with a new contract.

For next year, the district will implement two new 1 Gb/s bandwidth connections with two separate providers: Comcast and Hurricane Electric, a Tier 1 Internet provider. Comcast was able to offer our district an early replacement of our 100 Mb/s service contract with a new 1 Gb/s service contract that greatly lowered our cost per Mb/s.

The *Sunesys LLC* fiber network enables the district to access the Internet via a Tier 1 Internet Provider *Hurricane Electric*. Sunesys fiber was added to the district's network last year, providing a connection between GBN and GBS and allows us to reach commercial-grade Internet service providers like Hurricane Electric in downtown Chicago at very low cost.

The new Internet service with Hurricane Electric requires two contract elements. We will contract with Sunesys LLC for the fiber connection to downtown Chicago (transport), and we will contract with Hurricane Electric for the Internet bandwidth and cross-connect and port fees (bandwidth).

Internet bandwidth will be seven times higher while only adding \$50 monthly cost.

The District receives a 46% discount on Internet and telecommunication services (GBN 40% and GBS 50%) under the federal E-Rate program. The costs listed below are *before E-rate discounts are applied*.

Monthly cost for EXISTING Services/Internet connection:

Current 100 Mb/s Comcast Fiber and Internet bandwidth per month:	\$2550.00
Current 200 Mb/s Comcast Fiber and Internet bandwidth per month:	\$4000.00
	<u>\$6550.00</u>

Monthly cost for NEW services/Internet connections:

COMCAST FIBER

- NEW 1 Gb/s connection and Internet bandwidth per month:	<u>\$3300.00</u>
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HURRICAN ELECTRIC

- Sunesys fiber connection to 350 E. Cermak Ave, Chicago IL (60 months term)	\$1800.00
- Hurricane Electric 1 GB/s Internet bandwidth & cross-connection/port fees (36 months term)	<u>\$1500.00</u>
	<u>\$3300.00</u>
Total Cost	<u>\$6600.00</u>

Additional cost per month:	\$50.00
Additional cost per year:	\$600.00

Monthly cost AFTER E-rate discounts are applied:	\$3,593.00
Annual cost AFTER E-rate discounts are applied:	\$43,121.00

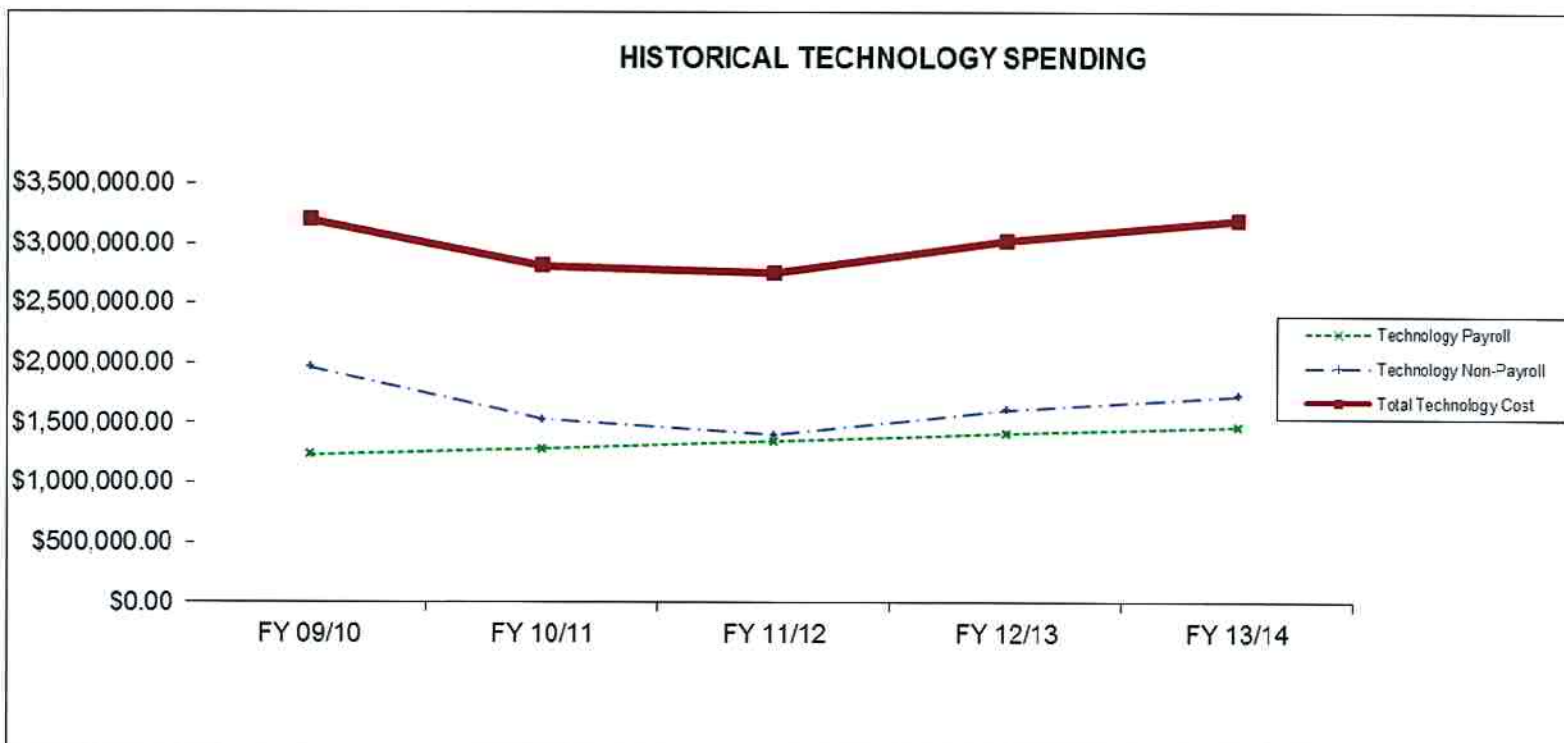
Internet bandwidth is a critical resource as we create and consume more data, services, and applications through Internet based solutions or hosting service providers. These two new Internet connections will enable the district to increase needed Internet bandwidth at the lowest possible costs. The Hurricane/Sunesys connection can be upgraded to 10 Gb/s bandwidth during the contract term, giving the district additional flexibility to address future needs.

Additional benefits of connecting to the commercial Internet data hub at 350 E Cermak, Chicago, IL include access to the ICN network (state-funded Illinois Century Network) and IlliniCloud – services of the Bloomington District 87 consortium furthering our vision to share in cloud services and collaboration with other entities.

Marcus Thimm
Chief Technology Officer

HISTORICAL TECHNOLOGY SPENDING

	<u>FY 09/10</u>	<u>FY 10/11</u>	<u>FY 11/12</u>	<u>FY 12/13</u>	<u>FY 13/14</u>
Technology Payroll	\$1,233,870 (budgeted)	\$1,283,225 (budgeted)	\$1,348,669 (budgeted)	\$1,410,708 (budgeted)	\$1,467,136 (proposed budget)
Technology Non-Payroll	\$1,962,500 (budgeted)	\$1,527,000 (budgeted)	\$1,400,000 (budgeted)	\$1,607,005 (budgeted)	\$1,725,934 (proposed budget)
Total Technology Cost	\$3,196,370 (budgeted)	\$2,810,225 (budgeted)	\$2,748,669 (budgeted)	\$3,017,713 (budgeted)	\$3,188,070 (proposed budget)
Increase (decrease) Over Prior Year	-19%	-12%	-2%	10%	6%
Total District Operating Budget	\$92,796,880	\$92,909,472	\$98,054,981	\$101,181,009	n/a
Tech Payroll as a % of District Operating Budget	1.3%	1.4%	1.4%	1.4%	n/a
Tech Non-Payroll as a % of District Operating Budget	1.9%	1.6%	1.4%	1.6%	n/a
Total Tech as a % of District Operating Budget	3.2%	3.0%	2.8%	3.0%	n/a
Total Budgeted Tech FTE	17.56	17.56	17.56	17.56	17.56 (proposed)



TECHNOLOGY BUDGET - HISTORICAL TREND - PAYROLL DOLLARS NOT INCLUDED

		<u>FY 09/10</u>	<u>FY 10/11</u>	<u>FY 11/12</u>	<u>FY 12/13</u>	<u>FY 13/14</u>
Program 2660	<u>Information Systems</u>					
109332	Professional Development	\$22,000	\$25,000	\$15,000	\$15,000	\$25,000
109419	Supplies Departmental	\$7,000	\$5,000	\$5,000	\$5,000	\$5,000
		\$29,000	\$30,000	\$20,000	\$20,000	\$30,000
Program 2662	<u>Information Services</u>					
108312	Consultants	\$75,000	\$20,000	\$20,000	\$20,000	\$0
108323	Repairs & Maintenance Services	\$70,000	\$70,000	\$80,000	\$80,000	\$80,000
108319	Professional Development		\$20,000	\$20,000	\$20,000	\$20,000
108390	Other Contractual Services	\$10,000	\$5,000	\$5,000	\$5,000	\$5,000
108414	Non Consumable Supplies	\$18,000	\$5,000	\$5,000	\$5,000	\$5,000
108542	Software & Licensing	\$180,000	\$200,000	\$200,000	\$200,000	\$200,000
108541	Technology Equipment	\$80,000	\$65,000	\$75,000	\$75,000	\$75,000
108318	Improvement of Instruction	\$85,000	\$50,000	\$50,000	\$50,000	\$25,000
108431	Electronic Resources	\$46,000	\$48,000	\$50,000	\$55,000	\$50,000
108343	Telecommunications/Internet Service	\$75,000	\$65,000	\$100,000	\$125,000	\$140,000
	Total Program 2660&2662	\$639,000	\$548,000	\$605,000	\$635,000	\$600,000
		\$668,000	\$578,000	\$625,000	\$655,000	\$630,000
Program 2661	<u>Information Systems</u>					
167471	Software	\$250,000	\$70,000	\$50,000	\$25,000	\$20,000
166690	Contingency				\$200,000	\$0
		\$250,000	\$70,000	\$50,000	\$225,000	\$20,000
Program 2663	<u>Information Systems</u>					
166312	Consultants	\$100,000	\$30,000	\$20,000	\$20,000	\$20,000
166320	Professional Development	\$20,000	\$10,000	\$10,000	\$10,000	\$10,000
166322	Leases	\$192,500	\$192,000	\$140,000	\$388,005	\$432,934
166470	Software/Non consumable	\$212,000	\$85,000	\$85,000	\$85,000	\$80,000
166541	Technology Equipment	\$520,000	\$562,000	\$470,000	\$224,000	\$533,000
		\$1,044,500	\$879,000	\$725,000	\$727,005	\$1,075,934
	Total Program 2661&2663	\$1,294,500	\$949,000	\$775,000	\$952,005	\$1,095,934
TOTAL BUDGET		\$1,962,500	\$1,527,000	\$1,400,000	\$1,607,005	\$1,725,934
BUDGET INCREASE/(DECREASE) Over Prior Year		-30%	-22%	-8%	15%	7%

TECHNOLOGY MASTER FINANCIAL PLAN

DISTRICT-WIDE INFRASTRUCTURE and STORAGE		USEFUL LIFE	LEASE OR PURCHASE	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018
Network Infrastructure									
Wired Switches and Routers (replaced 2008)	10	purchase							
Wireless Networks (installed 2009)	5	purchase	\$5,000	\$5,000	\$10,000	\$5,000			\$5,000
Firewalls (installed 2008) - upgrade for bigger pipeline	5	purchase	\$10,000	\$15,000					
Content Filter Appliance M86 (router/firewall)	5	purchase				\$50,000			
Fiber Connection between GBN and GBS	15	lease	\$38,000	\$22,000	\$22,000	\$22,000	\$22,000	\$22,000	\$22,000
UPS in IDF Closets	3	purchase		\$5,000	\$5,000	\$5,000	\$5,000	\$50,000	\$5,000
Server and SAN Storage									
Data Center Servers (replaced 2011)	3+	\$1 buy-out	\$168,000	\$168,000	\$168,000	\$168,000	\$168,000	\$168,000	\$168,000
Storage Area Network (SAN) replaced 2011	3+	\$1 buy-out	above	above	above	above	above	above	above
Disaster Recover - servers, storage - new item - do not exist	3+	\$1 buy-out	above	above	above	above	above	above	above
Back up Systems (2011)	3	purchase		\$22,000	\$22,000	\$22,000	\$22,000	\$22,000	\$22,000
Mitel Servers for VoerIP	3	purchase		\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
Intrusion Prevention System				\$30,000	\$30,000	\$120,000	\$3,000	\$3,000	\$3,000
Specialty Servers - Broadcasting etc. (2010)	3	purchase		\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
UPS battery back-up	on going		\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
New Initiatives/Projects									
Upgrade to 10 GB fiber (includes new fiber and transceivers/transmitters/receivers)					\$210,000				
Wireless Device Upgrade (double access points district-wide) to support BYOD - access points and controllers	5	\$1 buy-lease		\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
Upgrade wiring in A&B building at GBN				\$45,000					
Sub-totals District-wide Technology Equipment:				\$224,000	\$533,000	\$395,000	\$278,000	\$273,000	\$233,000
COMPUTERS									
Certified Staff Devices	500	3 year FMV	140,000	140,000	150,000	150,000	150,000	150,000	160,000
Other Devices									
PC Desktops - 2012	637	\$1 buy/4 yr	166,871	\$129,000	129,000	129,000	129,000	129,000	129,000
PC Desktops - 2013 (50 GBN, 30 Auto Cad)	80	\$1 buy/4 yr		26,000	26,000	26,000	26,000	26,000	28,600
PC Desktops - 2014	110	\$1 buy/4 yr		-	27,500	27,500	27,500	27,500	27,500
PC Desktops - 2015	36	\$1 buy/4 yr			9,000	9,000	9,000	9,000	9,000
	226		166,871	155,000	182,500	191,500	191,500	191,500	194,100
MAC									
MAC all-in-one - 2012	9	\$1 buy/5 yr	\$1,800	\$1,800	\$1,800	\$1,800	\$1,800	\$1,800	\$1,800
MAC all-in-one - 2013 (83 GBN and 2 GBS)	85	\$1 buy/5 yr		20,400	20,400	20,400	20,400	20,400	20,400
MAC all-in-one - 2014	147	\$1 buy/5 yr		-	29,400	29,400	29,400	29,400	29,400
MAC all-in-one - 2015	140	\$1 buy/5 yr			-	-	28,000	28,000	28,000
	372		1,800	20,400	49,800	77,800	77,800	77,800	77,800

TECHNOLOGY MASTER FINANCIAL PLAN

	USEFUL LIFE	LEASE OR PURCHASE	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018
Mobile Student Device - 2012	0	\$1 buy/3 yr						
Mobile Student Device - 2013	0	\$1 buy/3 yr						
Mobile Student Device - 2014	35	\$1 buy/3 yr			5,833	5,833	5,833	5,833
Mobile Student Device - 2015	0	\$1 buy/3 yr						
	35				5,833	5,833	5,833	5,833
PC Notebooks - 2012	200	\$1 buy/3 yr	66,667	66,667	66,667	68,667	68,667	68,667
PC Notebooks - 2013 (60 Lenovo PC Notebooks, 6 notebooks)	66	\$1 buy/3 yr		\$11,000	\$11,000	\$11,000	11,330	11,330
PC Notebooks - 2014	61	\$1 buy/3 yr			20,333	20,333	20,333	20,333
PC Notebooks - 2015	0	\$1 buy/3 yr						
	327		66,667	\$77,667	\$98,000	\$100,000	\$100,330	\$100,330
Apple Macbooks - 2012	38	\$1 buy/3 yr	12,667	12,667	12,667	12,667	12,667	12,667
Apple Macbooks - 2013 (48 GBS, 20 GBN Broadcast)	68	\$1 buy/3 yr		27,200	27,200	27,200	28,016	28,016
Apple Macbooks - 2014	30	\$1 buy/3 yr			10,000	10,000	10,000	10,000
Apple Macbooks - 2015	6	\$1 buy/3 yr		39,867	49,867	56,047	56,863	56,863
	104		12,667	39,867	49,867	56,047	56,863	56,863
Total Computer Leases			388,005	432,934	536,000	581,180	582,326	594,926
Grand Total Equipment			\$612,005	\$965,934	\$931,000	\$859,180	\$855,326	\$827,926