



**Sports, Leadership, Arts and Management
Strategic Technology Plan**

2018-2023

SLAM Technology Plan

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SLAM Technology Plan

EXECUTIVE SUMMARY

The SLAM Strategic technology plan 2018-2023 describes the current state of technology and also identifies short and long term goals for the organization. Due to the ever-changing nature of technology and the continuous appetite for improvement, this document should be viewed as a living document that should be revisited and updated on a yearly basis, or as needed in the face of significant technological advancement.

INTRODUCTION

PURPOSE

SLAM promotes a culture that maximizes student achievement and fosters the development of accountable, 21st century learners in a safe and enriching environment.

INTRODUCTION NARRATIVE

SLAM is a family of high-quality K-12 public charter schools serving families throughout Florida, Georgia and Nevada. SLAM promotes a culture that maximizes student achievement and fosters the development of accountable, 21st century learners in a safe and enriching environment. To meet its purpose, SLAM equips its schools with modern, 21st Century classrooms, best of breed enterprise applications and efficient and helpful technical support mechanisms. It also develops and assesses the need for training and professional development. It does so in a manner that is fiscally responsible while striving to obtain maximum return on investment. The following discusses the current implementation of technological platforms, hardware, software, technical support, training and budgetary information.

TECHNOLOGY INITIATIVES

TECHNOLOGY INITIATIVES AND TENANTS

- Provide every school with adequate bandwidth needed to sustain educational objectives.
- Provide every school with reliable connectivity and infrastructure.
- Provide a safe and secure computing experience.
- Outfit every classroom with interactive digital learning equipment.
- Provide equitable device access to support educational objectives.

TECHNOLOGY AREAS

INFRASTRUCTURE

ENTERPRISE LEVEL SYSTEMS

SLAM schools utilize several applications that are hosted and managed centrally, known as enterprise applications. SLAM currently uses the Microsoft Office 365 platform, primarily for its e-mail, calendaring, and contact management features. OneDrive is used for file Storage, and SharePoint is used for document and workflow management. The platform is integrated with two redundant sets of three servers each, distributing the roles of edge transport, authentication while leveraging the cloud for mailbox storage in a fault tolerant configuration. All SLAM employees are given access to this system that encompasses over 10,000 users in Florida and Nevada. The network also leverages the Google GSuites platform for collaboration and student e-mail access. A long-term goal for this platform would be to move the current configuration of servers to a fully redundant cluster hosted off-site using the Microsoft Azure cloud hosting platform.

Most SLAM servers, security appliances, and managed switches report uptime, as well as other important benchmarks to a centralized network management system, utilize the OpenNMS architecture. The NMS is then able to proactively notify key Tier 1 and Tier 2 Staff about any potential outages faster than they would otherwise be reported by users. The system greatly reduces impact on operations as any issues that may occur after hours and would normally go unreported until the beginning of the following school day can be resolved before then, eliminating any impact on instruction and operations. A short-term goal for this platform would be to expand this platform to all compatible devices. A long-term goal would be to establish an always open network operations center model where these issues could be analyzed 24/7/365 with the capabilities to dispatch personnel within the immediate notification of an issue.

The backbone of the enterprise infrastructure is SLAM's active directory forest. Microsoft Active directory services such as LDAP for authentication and DNS for resource location are at the heart of the network infrastructure. With over 50,000 objects, most other enterprise and school level applications utilize the directory services provided by active directory. A short-term goal is to upgrade the Active directory forest to Windows Server 2019, while a long-term goal is to add a geographically diverse mirror to increase uptime and availability, or migrate the entire platform to a cloud hosted solution.

SCHOOL LEVEL INFRASTRUCTURE

Each SLAM school resides in a unique facility, and as such the school's physical infrastructure layout varies markedly between schools, however, the schools' infrastructure is typically quite uniform from an equipment and logical functionality perspective. All SLAM schools use an open source, software based, security appliance to perform content filtering, VPN trunking, routing and external access, and IPS\IDS functions. These devices serve as the endpoints connecting all of the SLAM schools to each other in a mesh configuration, and allowing for failover and disaster recovery. Every site has a physical host server on site, on which multiple virtual servers run. Those virtual servers are usually assigned the role of local active directory domain controller, resource server or other specialized role needed to deploy software as needed by a specific site. The short-term goal is to upgrade the operating system on all Windows-based servers to Windows 2019. It is a long-term goal to consolidate these servers to a single data center or virtualized cloud environment.

Wired switching occurs at the site by way of medium rack dense 48 port layer 2 smart switches, typically managed Juniper Networks EX2300 or legacy Netgear GS752TP smart switches. While smart switches provide many of

the features needed in this environment without the additional cost associated with a fully managed switch, the ever-growing volume of data that needs to be moved requires a switching fabric capable of handling such loads, by implementing link speeds of 10 GBPS or greater for backbone connectivity. Switches are generally configured to use SNMP, STP and QoS as necessary for each application. It is a short-term goal to eliminate, or greatly reduce the number of unmanaged or “mini-switches” in use, as they can cause crippling switch loops due to their lack of support of spanning tree protocol. In order to achieve this, most cabling would be routed back to the closest IDF and serviced directly from that location. It is a long-term goal to upgrade all smart switches to fully managed switches and subsequently all backbone links to 10GbaseT or 10GbaseFX connectivity.

Wireless networking has become increasingly popular in the past few years and due to the density of devices that can be created in an educational environment, especially one with a 1:1 computing initiative. In order to reliably support this method of connectivity, SLAM has used a standardized managed wireless platform, manufactured by Ruckus Technology, and is in the process of upgrading to newer offerings by leveraging the e-rate program. All new SLAM schools are outfitted with this technology, and those with legacy wireless deployments have, or are being upgraded to this technology in the short term. A long-term goal would be to explore use of the still yet to be ratified 802.11AX standard of wireless connectivity, which is poised to offer higher throughput.

Network cabling at each SLAM facility is typically Category 5e, and is usually installed using the EIA/TIA 568B Standard. Physical network cabling is designed in the star or extended star topology to maximize throughput and provide for faster troubleshooting. As a best practice, computers used for high stakes standardized testing are hard wired, rather than wireless to reduce the number of variables that may lead to a failure. It is a short-term goal that all computers utilized for testing are connected using wired infrastructure. It is a long-term goal to begin phasing out Category 5e now that Category 6a has emerged as its likely replacement and to replace all backbone cabling with 50-micron multi-mode or single mode fiber to support 10 Gigabit links.

ADMINISTRATIVE SYSTEMS

SLAM schools generally outfit the school’s administrative and non-instructional staff with an individual desktop computer and laser printer. In addition, select administrative and clerical staff members require a multifunction device capable of scanning and or faxing capabilities in addition to printing. SLAM also typically purchases or leases 1-3 large copy machines capable of copying in excess of 45 PPM and typically have printing, faxing and document scanning capabilities built in. These devices are typically networked to allow all office users to communicate to the device using their computers. Most administrator and data entry personnel also have dual monitor capability which facilitates the multitasking. Administrators also typically have a notebook computer that they can use to work beyond the physical boundaries of their offices. Most administrative machines require the use of a VPN client to access secure information located on their district’s intranet. It is a continuing goal that administrative computers are to be no older than three years old and are to be repurposed for student use until they are replaced at the end of their useful life.

INTERACTIVE CLASSROOM TECHNOLOGY

The SLAM interactive classroom consists of multiple components that together provide instructional staff with the tools to provide an immersive and engaging learning experience. The centerpiece of the interactive classroom is the Interactive whiteboard and most recently the interactive panel. The overwhelming majority of SLAM’ classrooms have been outfitted with the ActivBoard\ActivPanel series interactive whiteboards from Promethean Learning. Some SLAM schools have piloted competing products from other manufacturers, with different degrees of success. Promethean continues to be the preferred standard choice of interactive whiteboard due to the ease of use and depth of its bundled

software packages, as well as access to the largest online professional learning community available, Promethean Planet.

Legacy interactive whiteboards are used in tandem with LCD projectors that are either ceiling mounted or wall mounted as part of a mounting system. If the model of the interactive board that is in use does not also have audio capabilities, ceiling mounted speakers may also be installed. Interactive panels are self-contained devices mounted on the lecture wall of the classroom. Another piece of the interactive classroom is the Document Image Camera, this device bridges the gap between legacy content that may be in paper medium, and converts it to a digital image in real time, allowing the teacher to display traditional content digitally, and allow user interaction through the whiteboard. The third standard piece of the interactive classroom is a desktop, which usually resides on the teacher's desk and is used to interface with the rest of the digital equipment; additionally, the desktop also typically includes an individual laser printer.

The interactive classroom may also contain a set of student response devices that enable a teacher to poll students and check for understanding and evaluate the results with appropriate, immediate feedback, and increasingly, this is replaced by the implementation of mobile apps that afford the same functionality without the overhead of managing additional devices. Another component that may be found in the interactive classroom is the digital slate that allows the teacher or student to interact with the content on the board from virtually anywhere in the room. The typical SLAM interactive classroom may also have student stations that may either be stationary desktops, mobile notebooks or netbooks or tablets. These allow students to utilize technology independently and are used to access many of the online applications that are used to supplement instruction.

SLAM currently utilizes Microsoft Windows 10 and Office Professional 2016 on all of its PCs and Mac OSX 10.14 Mojave on all Apple computers, and Apple iOS 12 on all iPad Tablets. All computers must have a minimum of 4GB of RAM, 8 GB is preferred. Hard drive space must be a minimum of 80 GB, while an NVME SSD of 128+ GB is preferred for new systems. New teacher computers are to have a 24-inch screen to allow for multitasking while new student desktops will have a 22 inch screen as a minimum. These minimum requirements are reevaluated yearly and are driven by increased resource demands of new software as well as market trends.

Computers for high availability use, such as teacher stations may be a maximum of three years old, where student stations may be a maximum of 7 years old, it is common practice to replace teacher machines and cycle the outgoing teacher stations for student use until their useful life has ended and they are replaced. SLAM engages with a registered e-waste recycler to ensure that all equipment that is disposed of is done so without ill effect to the environment.

It is a short-term goal to expand the availability of student response devices, be they physical in nature, or software based in situations where a 1:1 computing environment has been achieved. In the long term, SLAM decision makers will stay apprised of new product offerings by way of research and technology conference attendance and will examine new technologies as they enter the market.

TECHNICAL SUPPORT

Providing a technology rich environment does not just require a significant initial investment, it requires continued technical support by well trained and competent individuals. SLAM provides support using a two-tiered model.

Tier 1 support is provided by a team known as the school site technicians. This team provides the day to day tech support to the end users. This team is comprised of the following team members.

Microsystems Technician – An entry level position requiring a minimum of one year of technical support experience **or** equivalent collegiate level preparation **or** an approved high school preparation course.

Computer Specialist – An intermediate position requiring three years of technical support experience **or** equivalent college level preparation **or** two years of experience as a microsystems tech.

Senior Computer Specialist – An intermediate position requiring five years of technical experience **or** a four-year degree in information technology **and** three years of experience as a Computer specialist or MST.

Computer Engineer – The highest-level school site technician position requires a Bachelor's degree in computer engineering, or above and a minimum of five years' technical experience. The Computer engineer is also responsible for directing a MST.

Typically, schools with 500 Students or more employ one dedicated school computer specialist. Schools with less than 500 Students may share a microsystems technician with another such campus. Large campuses typically employ one microsystems technician and one computer engineer.

ON SITE TECHNICIANS BY SITE

School Site	On-Site Technician Name	Title
SLAM APOLLO (K-12)	Jose Velez	Computer Specialist
SLAM ATLANTA (K-12)	Robert Lee	Computer Specialist
SLAM BOCA (6-12)	Daniel Trimino	Computer Specialist
SLAM MIAMI (Middle and High)	Norlant Paredes	Computer Engineer
SLAM NORTH MIAMI (Middle and High)	Nassim Sarwar	Computer Specialist
SLAM NEVADA (K-12)	Keala Bobadilla	Microsystem Technician
SLAM OSCEOLA (6-12)	Carlos Paguaga	Computer Engineer
SLAM PALM BEACH (Middle and High)	Armando Torres	Computer Specialist
SLAM TAMPA (Elementary and 6-12)	Erik Tarallo	Microsystem Technican

Tier 2 support is typically provided by a consultant. SLAM currently uses two different consultants for tier 2 Support: Layer 8 Solutions and Intellatek.

Tier 2 Support consists of:

- Escalation assistance
- Enterprise level troubleshooting and support
- Network design and cabling
- 21st Century classroom design and installation
- Server deployment and implementation
- Phone system deployment and support
- Technician recruitment and staffing
- School site technician supervision and review
- Procurement assistance
- Product research and analysis
- Food service point of sale software
- Best practices dissemination
- Technical Training
- Large scale deployments
- Remote site support
- New school turn-up

SLAM schools typically use an electronic ticketing system to report and track any technical support issues. Periodically reports generated by the system are used to determine if the level of support is adequate and to make recommendations in regards to the staffing level, and technical aptitude of the technician, and to provide feedback regarding failure rates of specific equipment that can be used to assess the need for replacement.

While current support levels are adequate, it is a short-term goal of SLAM to improve its technical support further by filling any vacant positions and ensuring that all sites have access to an on-site technician as needed. It is a long-term goal of SLAM to identify and analyze strategies that can be implemented to improve service levels, reduce cost, and identify areas of need. SLAM may explore analysis by a third-party consultant to conduct such research.

TECHNOLOGY TRAINING

The development and implementation of quality, meaningful training in regards to technology will enable all participants in the SLAM schools to utilize technology to the full potential. Providing a well-defined and significant training program for the stakeholders will be a dynamic process that will adjust according to the technology initiatives that are executed.

The SLAM schools will determine how to conduct training by issuing several surveys to the involved parties at the individual school levels and at the level of the entity together. The findings from these surveys will serve to indicate what professional developments are in demand and on what information needs to be disseminated in order to impact the use of technology in a positive manner.

The trainings will be planned with the acknowledgement that there will be diverse levels of support and knowledge concerning technology users. The trainings will consider how to immerse the varying backgrounds of the participants for the common goal of integrating technology successfully with the education system and to increase student achievement. The trainings will be goal-oriented and will focus on supporting the participants to apply the skills and knowledge into the technological structure for SLAM schools. The technology training initiatives will address the individual needs but with the common goals of integrating knowledge on using the schools' technology tools, aligning school and SLAM district improvement plans with the infusion of technology, and applying technology effectively in the classrooms in order to prepare students to be productive, "Digital Age" learners in society. The delivery modalities for the trainings will vary but will include different modes, such as professional learning communities, workshops, virtual

webinars, and action research groups. The trainings will occur consistently and require the presentation of monitoring activities to provide demonstration of mastery, such as submitting technology products or displaying group research findings. The short-term goal is to ensure that surveys are administered in order to plan and develop the quality training sessions, while in the long term the goal is to host training sessions that integrate technology skills, tools, and support systems to meet school and district educational goals for ensuring student achievement.

DATA MANAGEMENT

The geographic diversity of SLAM sites has a defining effect on the way data is collected, managed and reported. Depending on the jurisdiction in which they are located, schools may be required, or encouraged to utilize administrative software proprietary to those school districts. As such, responsibility for backup, archiving and retention of those electronic records rests upon the corresponding school district, or is provided for by the developer if the system is not directly hosted by a school district.

While it has been a long-term goal to adopt a unified platform for student information, it is not currently feasible due to the conflicting requirements schools need to meet as part of their charter agreements with their sponsors. Should these requirements change, SLAM will reassess the use of varied student information systems accordingly.

In addition to these systems, all SLAM schools utilize a homogenous food service point of sale system, with the exception of those where food service is outsourced and managed directly by the school district. This system allows SLAM schools to accurately and efficiently submit claims and other pertinent information as required by the National School Lunch Program. The point of sale system is centrally managed and records are backed up daily and are archived for a minimum of five years in compliance with NSLP Standards.

COMMUNICATIONS

WEB SITES

SLAM has entered into a pricing agreement with Educational Networks to provide web hosting, website design and search engine optimization using Educational networks proprietary CMS platform. The platform provides the framework for the site, and allows school staff to publish information quickly and attractively with minimal technical know-how. Having all SLAM schools utilizing this platform enables a consistent user experience throughout all webpages, while each school is able to customize it to better meet their individual needs. The utilization of the Educational Networks platform enables a consistent user experience with the schools' web pages, while still allowing the individual schools to customize the web pages to meet their distinct needs.

In the long term, SLAM will explore incorporating additional services to its web presence, such as collecting fees electronically for extra-curricular activities, processing of food service payments, and availability of important forms to help reduce paper and increase efficiency.

TELEPHONE SYSTEMS

While electronic communication is increasingly becoming the preferred median for people to communicate with schools, telephone communication still remains a vital and viable mechanism for

communication. SLAM is modernizing its telephone infrastructure to harness advances in technology and to leverage the most value for its investment. SLAM facilities that opened prior to the 2013-2014 school year utilized traditional PBX telephone systems that were viewed as the industry standard at the time. Beginning with facilities opening in 2014 all new systems use VOIP (Voice over Internet Protocol) technology. This shift not only reduces the initial cost of implementation, but also reduces the cost of ads, moves and changes, and allows integration with other emergent technologies in the future. It is an immediate goal that all new SLAM facilities be furnished with this type of modern system, and that all schools using the PBX telephony system transition to the modern telephone system. It is a long-term goal to build on this investment and deploy, SLAM wide, a unified communications platform which integrates the new VOIP systems with e-mail and SMS functionality.

MOBILITY

Mobile Telecommunications have become ubiquitous in our society, and as a result, SLAM provides its administrators and key personnel with mobile smartphones as a way to extend their accessibility beyond the limits of their offices. The devices not only allow two-way voice communications, but also enable the administrators to reach stakeholders at various times of the day in different settings not restricted to their offices. It is a goal to continue to provide these devices to all administrators and key personnel and a long-term goal to identify others who will benefit from utilizing these devices.

FAX

All SLAM schools currently have fax support, and while this technology is being largely phased out, it is still a necessary tool to communicate with both parents as well as other agencies that still rely on this technology as their primary way to send and receive documents. It is a short-term goal to sustain these capabilities, but is a long-term goal, to identify, implement and support an “e-fax” technology to continue to allow functionality with legacy fax systems, but increase the efficiency and reducing operating cost of the existing implementation by reducing printing cost and labor cost.

EMERGENCY NOTIFICATION

Many SLAM schools utilize an emergency notification system, with automated phone dialer and SMS or email support that alerts parents en masse of upcoming events, school closures, and can issue emergency alerts in the unfortunate event of a catastrophe. Such a system is selected depending on the school district, in which they are sponsored, as some districts provide access to this system with integration with the corresponding districts Student Information System. It is a short-term goal to provide this service in all SLAM schools where SIS integration is possible and a long-term goal to utilize this service at all campuses.

INTERNET BANDWIDTH

SLAM schools utilize a myriad of web-based applications and resources, in order to support the high demand of today’s multimedia rich bandwidth intensive applications, SLAM has made substantial improvement in the amount of bandwidth available at each location over the last three years. This has been made possible largely due to subsidies provided by the federal e-rate program, administered by USAC. All SLAM schools utilize either a guaranteed SLA fiber optic connection or two redundant services from diverse providers to ensure

uptime and continuity. In the short-term SLAM will continue to outfit all existing facilities and any new campuses with robust internet connections capable of delivering the educational and administrative content needed to fulfil its objectives. In the long-term SLAM will continue to evaluate the amount of bandwidth required to meet its objectives, and where needed increase its connection speeds accordingly.

TIMELINE

TIMELINE

TOPIC	SHORT TERM GOALS (0-18 Months)	LONG TERM GOALS (24-60 Months)
E-mail platform	Improve the adoption of ancillary features offered in exchange online.	Additional training and customization of ancillary offerings within O365 and GSuites productivity suites.
Network monitoring system	expand this platform to all compatible devices	establish an always open network operations center model where these issues could be analyzed 24/7/365 with the capabilities to dispatch personnel within the immediate notification of an issue.
Active directory	upgrade the functional level of the Active directory forest to Windows Server 2019	add a geographically diverse mirror to increase uptime and availability, or migrate to cloud
Servers	upgrade the operating system on all Windows-based servers to Windows Server 2019	consolidate these servers to a single data center or virtualized cloud environment
Wired network infrastructure	eliminate, or greatly reduce the number of unmanaged or “mini-switches” in use, as they can cause crippling switch loops due to their lack of support of spanning tree protocol	Implement only fully managed switches capable of upgrading all backbone links to 10GbaseT or 10GbaseFX connectivity that allows 10 times the current speeds available
Wireless networking	upgrade to standardized managed wireless platform	explore use of the emerging 802.11AX standard of wireless connectivity
Network cabling	ensure computers are connected using wired infrastructure	phase out Category 5e now that Category 6a has emerged as a possible replacement and to replace all backbone cabling with single mode fiber to support 10 Gigabit links

Interactive classroom technology	Replace all legacy interactive whiteboards with ActivPanel or equivalent as they reach the end useful life	stay apprised of new product offerings and evaluate new technologies as they enter the market
Technical support	improve technical support further by filling any vacant positions and ensuring that all sites have access to an on-site technician as needed	identify and analyze strategies that can be implemented to improve service levels, reduce cost, and identify areas of need
Technology training	ensure that surveys are administered in order to plan and develop the quality training sessions	host training sessions that integrate technology skills, tools, and support systems to meet school and district educational goals for ensuring student achievement
Web sites	go live with Educational Networks as the provider in all schools	incorporate additional services to its web presence, such as electronic forms and online payment systems
Telephone system	furnish a modern IP system, and that all schools using the PBX telephony system transition to the modern telephone system	build on the modern telephony investment and deploy a unified communications platform which integrates the new VOIP systems with e-mail and SMS functionality.
Moblity	provide access to these devices to all administrators and key personnel	identify others who will benefit from utilizing these devices
Fax	sustain fax support capabilities	identify, implement and support an “e-fax” technology to continue to allow functionality with legacy fax systems
Emergency notification	service in all SLAM schools where SIS integration is possible	integrate the system in ALL campuses
Internet bandwidth	continue to outfit all existing facilities and any new campuses with robust Internet connections capable of delivering the educational and administrative content needed to fulfil its objectives	evaluate the amount of bandwidth required to meet its objectives, and where needed increase its connection speeds accordingly

BUDGET

SAMPLE HARDWARE BUDGET FOR AN AVERAGE SIZED SCHOOL (500 STUDENTS)

Administrative Systems

Description	Qty.	Price	Total	Manufacturer
Lenovo ThinkCentre M720q i-3/8GBRAM/128GBSSD	6	\$546.29	\$3,277.74	Lenovo
Lenovo Tiny-In-One 21.5" Monitor	12	\$171.52	\$2,058.24	Lenovo
Lenovo ThinkPad E490 i-3/8GBRAM/128GBSSD	2	\$648.64	\$1,297.28	Lenovo
Brother DCP-L2550DW	6	\$166.16	\$996.96	Brother
HP LaserJet Pro 400 color M452DN	1	\$410.00	\$410.00	Hewlett Packard
3Yr Repair Plan w/ADH for Laptops / \$350-699.99	2	\$150.00	\$300.00	Service Net
Brother MFC L2750DW	1	\$275.38	\$275.38	Brother Int.
C2G 10FT USB Cable	6	\$6.00	\$36.00	C2G
Intuit QuickBooks Pro 2019	1	\$201.24	\$201.24	Intuit
C2G DisplayPort to VGA Adapter Cable	6	\$24.61	\$147.66	C2G
Tripp Lite Surge Protector 6 Outlet 6ft Cord	6	\$10.00	\$60.00	Tripp Lite
C2G 10' CAT5e or CAT5 RJ45 Patch Cable Gray	6	\$2.74	\$16.44	Belkin Cables

\$ 9076.94

Lunch POS System

Description	Qty.	Price	Total	Manufacturer
HP Point of Sale System rp5800 - Core i3 2120	2	\$961.90	\$1,923.80	Hewlett Packard
FASTrack School Meal Program at 1 school	1	\$1,295.00	\$1,295.00	PCS-RCS
NKP06 Keypad Fred w/Scanner	2	\$545.00	\$1,090.00	PCS-RCS
HP L5015TM LED Monitor	2	\$435.07	\$870.14	Hewlett Packard
HP LaserJet Enterprise M607n	1	\$781.27	\$781.27	Hewlett Packard
3D-POS Terminal Software at 2 Serving Lines	2	\$295.00	\$590.00	PCS-RCS
Cash Drawer USB-Electronic	2	\$195.00	\$390.00	PCS-RCS
FASTrack Support	1	\$325.00	\$325.00	PCS-RCS
HP USB POS Keyboard	2	\$110.00	\$220.00	Hewlett Packard
APC Back-UPS ES 550 - "Green" 550VA UPS	2	\$69.00	\$138.00	APC
SanDisk Cruzer USB Flash Drive 16GB	2	\$7.70	\$15.40	Hewlett Packard
StarTech.com Fully Rated USB Cable A-B, 10'	2	\$2.50	\$5.00	StarTech

\$ 7,643.61**Servers**

Description	Qty.	Price	Total	Manufacturer
PowerEdge R740xd	1	\$4,807.88	\$4,807.88	Dell
PowerEdge R210II	2	\$975.00	\$1,950.00	Dell

\$6,757.88

Student Desktops

Description	Qty.	Price	Total	Manufacturer
Lenovo ThinkCentre M720q i-3/8GBRAM/128GBSSD	250	\$546.29	\$136,572.50	Lenovo
Lenovo Tiny-In-One 21.5" Monitor	250	\$171.52	\$42,880.00	Lenovo
Tripp Lite Surge Protector Strip	50	\$69.00	\$3,450.00	Tripp Lite
Cyber Acoustics ACM 70B - headphones	250	\$4.85	\$1,212.50	Cyber Acoustics

\$184,115.00

Interactive Classroom

Description	Qty.	Price	Total	Manufacturer
ClearTouch 75" 6000K Interactive Panel + i-5PC	30	\$4,215.58	\$126,467.40	ClearTouch
Lenovo ThinkCentre 720q i-5/8GB/256SSB	30	\$637.50	\$19,125.00	Lenovo
ClearTouch i5 Integrated PC	30	\$530.00	\$15,900.00	ClearTouch
AVer AVerVision 300af+ Document Camera	30	\$515.00	\$15,450.00	Aver USA
C2G RapidRun Runner Cable	30	\$325.00	\$9,750.00	C2G
HP LaserJet Pro M102W	30	\$125.00	\$3,750.00	Hewlett Packard
Lenovo Tiny-In-One 23.8" Monitor	30	\$196.22	\$5,886.60	Lenovo
C2G RapidRun Wall Plate	30	\$35.00	\$1,050.00	C2G
C2G 1.5ft RapidRun Flying Lead	30	\$16.00	\$480.00	C2G
C2G DisplayPort to VGA Adapter Cable	30	\$26.00	\$780.00	C2G
Tripp Lite Surge Protector 6 Outlet 6ft	30	\$10.00	\$300.00	Tripp Lite
C2G 10' CAT5e or CAT5 RJ45 Patch Cable Gray	30	\$2.74	\$82.20	C2G

\$199,021.20

Wired Infrastructure

Description	Qty.	Price	Total	Manufacturer
Juniper EX2300-48	8	\$935.00	\$7,480.00	Juniper
NETGEAR GS748T 48-port Gigabit Smart Switch	1	\$535.00	\$535.00	NETGEAR
Tripp Lite 1500VA 900W UPS	10	\$230.00	\$2,300.00	Tripp Lite
C2G 1' CAT5e or CAT5 RJ45 Patch Cable Gray	400	\$1.50	\$600.00	C2G
C2G 3' CAT5e or CAT5 RJ45 Patch Cable Gray	100	\$1.61	\$161.00	C2G
C2G 10' CAT5e or CAT5 RJ45 Patch Cable Gray	25	\$2.75	\$68.75	C2G

\$ 11,144.75**Wireless Infrastructure**

Description	Qty.	Price	Total	Manufacturer
Ruckus ZoneFlex R730	25	\$750.00	\$18,750.00	Ruckus Wireless
RUCKUS WATCHDOG SUP F/ZONEDIRECTOR	1	\$5,060.00	\$5,060.00	Ruckus Wireless
Ruckus ZoneDirector 3050 -management device	2	\$1,985.00	\$3,970.00	Ruckus Wireless
RUCKUS WD REDUN CONTROL SUP ZD3000-5	1	\$1,864.50	\$1,864.50	Ruckus Wireless

\$ 29,644.50**Totals**

Description	Total
Administrative Systems	\$9,076.94
Lunch POS System	\$7,643.61
Servers	\$6,757.88
Student Desktops	\$184,115.00
Interactive Classroom	\$199,021.20

Wired Infrastructure	\$11,144.75
Wireless Infrastructure	\$29,644.50
Total	\$ 447,403.88