El Dorado Union High School District

Technology Review

March 12, 2009

Joel D. Montero
Chief Executive Officer

FCMAT
FISCAL CRISIS & MANAGEMENT ASSISTANCE TEAM
CSIS California School Information Services

March 12, 2009

Sherry J. Smith, Superintendent
El Dorado Union High School District
4675 Missouri Flat Rd.
Placerville, CA 95667

Dear Superintendent Smith:

In August 2008, the El Dorado Union High School District entered into an agreement with the Fiscal Crisis and Management Assistance Team (FCMAT) for a study to perform the following:

1. Conduct a review of the district's administrative technology and make recommendations for improvement.
2. Conduct a review of the district's instructional technology and make recommendations for improvement.
3. Conduct a review of the district's technology services delivery and make recommendations for improvement.

FCMAT conducted fieldwork at the district October 2-3, 2008 to interview employees, review documents and collect information. This report is the result of those activities. We appreciate the opportunity to serve you, and please give our regards to all the employees of the El Dorado Union High School Distirct.

Sincerely,

Joel D. Montero
Chief Executive Officer

Table of Contents

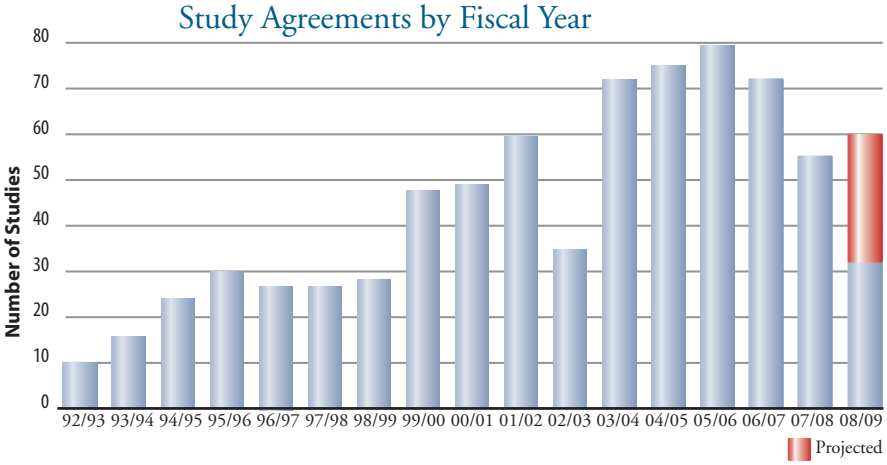
Foreword - FCMAT Background

The Fiscal Crisis and Management Assistance Team (FCMAT) was created by legislation in accordance with Assembly Bill 1200 in 1992 as a service to assist local educational agencies (LEAs) in complying with fiscal accountability standards.

AB 1200 was established from a need to ensure that LEAs throughout California were adequately prepared to meet and sustain their financial obligations. AB 1200 is also a statewide plan for county offices of education and school districts to work together on a local level to improve fiscal procedures and accountability standards. The legislation expanded the role of the county office in monitoring school districts under certain fiscal constraints to ensure these districts could meet their financial commitments on a multiyear basis. AB 2756 provides specific responsibilities to FCMAT with regard to districts that have received emergency state loans. These include comprehensive assessments in five major operational areas and periodic reports that identify the district's progress on the improvement plans.

In January 2006, SB 430 (charter schools) and AB 1366 (community colleges) became law and expanded FCMAT's services to those types of LEAs.

Since 1992, FCMAT has been engaged to perform nearly 750 reviews for local educational agencies, including school districts, county offices of education, charter schools and community colleges. Services range from fiscal crisis intervention to management review and assistance. FCMAT also provides professional development training. The Kern County Superintendent of Schools is the administrative agent for FCMAT. The agency is guided under the leadership of Joel D. Montero, Chief Executive Officer, with funding derived through appropriations in the state budget and a modest fee schedule for charges to requesting agencies.



Total Number of Studies.....743
Total Number of Districts in CA 982

- Management Assistance..... 705 (94.886%)
- Fiscal Crisis/Emergency..... 38 (5.114%)

Note: Some districts had multiple studies.

- Districts (7) that have received emergency loans from the state. (Rev. 1/22/09)

Introduction

Located in the Northern California city of Placerville, the El Dorado Union High School District serves more than 7,000 students at four comprehensive high schools, six alternative schools and a charter school. The district includes students from 12 feeder districts and employs approximately 600 classified and certificated staff members.

In July 2008, the district office and the Fiscal Crisis and Management Assistance Team (FCMAT) entered into an agreement for FCMAT to perform the following:

1. Conduct a review of the districts administrative technology and make recommendations for improvement.

2. Conduct a review of the district's instructional technology and make recommendations for improvement.

3. Conduct a review of the district's technology services delivery and make recommendations for improvement.

Study Team

The study team was composed of the following members:

Andrew Prestage
FCMAT Management Analyst
Bakersfield, CA

Elijah Vanslyke*
Network Engineer
Shasta Union High School District
Redding, CA

Leonel Martínez
FCMAT Public Information Specialist
Bakersfield, CA

Steve Carr*
Executive Director, Technology Services
Ventura County Office of Education
Ventura, CA

Mike Vincelli*
Director, Information Technology
Shasta Union High School District
Redding, CA

*As members of this study team, these consultants were not representing their employers but were working solely as independent contractors for FCMAT.

Study Guidelines

FCMAT visited the district October 2-3, 2008 to interview employees, collect data and review information. This report is the result of those activities.

Executive Summary

The El Dorado Union High School District can create a sustainable technology implementation program that will benefit students and teachers while performing the district's administrative functions. However, many instructional users have been unable to integrate technology resources into their curriculum because of antiquated equipment and the lack of a single district-level position to assist with technology planning, curriculum integration, and professional development for instructional staff. Despite the need for a single technology leader that would be accountable for all technology resources, the district should postpone creating a new Technology Services Director position pending the recovery of the state's fiscal condition and the availability of sufficient funds. When funds become available, the district should consider creating a TS Director position and assign the position responsibility for all aspects of administrative and instructional technology.

The volume of technology support requests has grown steadily over the past few years while the district's Technology Services Department staffing levels have remained unchanged. This report contains a variety of recommendations and support strategies designed to keep the district's technology resources operating smoothly and ensure more timely delivery of support services.

The district has had difficulty enforcing technology standards throughout the sites. The presence of both Windows and Macintosh computers in the district has increased the complexity of providing technology support services, and creates additional support costs. Standardizing on a single platform would maximize the knowledge base of support staff members and streamline the maintenance functions associated with technology support functions. Enforced standards and standardization of equipment are needed to simplify technology support and increase efficiency.

The district's technology plan meets statutory requirements but is outdated, not correlated with the TS Department budget, and has not been used as a reference document to guide technology activities. The plan does not reflect the district's vision and goals for technology initiatives, which has limited the plan's usefulness and credibility as a guiding document. In addition, none of the school sites have created site technology plans that support districtwide technology goals and initiatives.

Much of the district's computer inventory is obsolete and should be replaced. Outdated computer inventory has made the technology environment much more complex and difficult to support. An aggressive equipment replacement policy would alleviate many of the problems experienced by TS Department staff members who handle urgent problems for most of their workday. Replacement of obsolete equipment should become one of the first priorities for the district's Technology Committee.

Findings and Recommendations

Leadership and Communications

In 2001-02, the district's Director of Technology Services (TS) was one of three directors released to address fiscal concerns, and the position was eliminated from the district's organization chart. The remaining department is composed of a Lead Microcomputer Technician and two Microcomputer Technicians. The three TS staff members report to the Associate Superintendent of Business Services.

The level of support required by each site has created a situation where each support staff member is assigned a specific site. As a result, all three staff members work independently of each other. This has hindered the department's ability to establish and enforce consistent technology standards. For example, there is no standard for the district's Microsoft Active Directory implementation. The lack means that the configuration of user accounts, file servers, printers, and other network resources is more often based on the skill set of the individual technician rather than a logical design followed districtwide.

Because of the absence of technology standards, the district's four comprehensive high schools operate independently, leading to discrepancies in the type of technology implemented from site to site. Each site has been allowed to implement technology that meets particular needs instead of considering how instructional technology is used at the district level. Many staff members perceive that no central district vision is being developed, communicated, or followed. This hinders the TS Department's ability to support the integration of technology into classroom instruction.

To improve delivery of support and more closely align technology support with instructional initiatives, district administrators assigned supervision of the TS Department to the new Associate Superintendent of Educational Services and Testing in fall 2008. Shortly afterward, responsibility for technology infrastructure issues was reassigned to the Associate Superintendent of Business Services to balance the workload of technology leadership. Under this co-leadership, the TS Department has continued to provide capable technology support services. However, this shared responsibility for technology services administration has made it difficult to establish clear lines of responsibility and accountability.

While acknowledging that the Associate Superintendent has improved the district's handling of instructional technology issues, instructional staff members still indicated a desire for a single district-level position to help with technology planning, curriculum integration, and professional development for instructional staff. In response, district

administrators have recently considered filling the vacant TS Director position. Filling the vacant position would improve the overall delivery of technology support services. However the state's budget condition is severe, and the Governor's 2009-10 budget proposal includes the elimination of the .68% COLA for the 2008-09 fiscal year. Because this will create an increased revenue limit deficit, district administrators should postpone filling the TS Director position until sufficient funding becomes available. Until then, TS staff members should establish common standards for application, desktop, network, and classroom technology to promote more standardized technology throughout the district sites.

Technology Planning

The district's Technology Committee is composed of both Associate Superintendents, several assistant principals, the Director of Guidance, and the Lead Microcomputer Technician. In addition, committee meetings are occasionally attended by other district office or facilities administrators. Best practices for technology planning suggest that the Technology Committee should be composed of a more diverse group with members representing students, parents, teachers, library media specialists, resource specialists, site administrators, district administrators (curriculum and technology), classified staff, community leaders, business representatives and partners from higher education.

Although the district's technology plan meets statutory requirements for funding purposes, it is outdated, not correlated with the TS Department budget, and has not been used as a reference document to guide technology activities. The plan does not reflect the district's vision and goals for technology initiatives, which has limited its usefulness and credibility as a guiding document. In addition, none of the school sites have created site technology plans that support districtwide technology goals and initiatives. The District Technology Committee suggested that the lack of site-based technology planning may partly be because no one at the district level is assigned with full responsibility for developing a plan on how to integrate technology with instruction. As a result, instruction and learning have not benefitted from an organized approach to technology implementations.

Some instructional staff members commented that when new curriculum is adopted, there is no apparent method for extending technology materials (e.g., assessment and research tools, ancillary simulations, etc.) to the classroom. As a result, technology materials that are bundled with new adoptions are sometimes not used to support the delivery of instruction.

Some instructional staff members commented that they do not receive adequate information from the Technology Committee. No one is assigned to take minutes at Technology Committee meetings, and there is no regular feedback mechanism to inform the administration or the staff of technology plans and programs.

Site users perceive that the needs of classroom users are not adequately represented at Technology Committee meetings. The committee should improve its method of soliciting information from and communicating with teachers to ensure that the needs of classroom users are properly addressed.

Recommendations

The district should:

1. Postpone creation of a Technology Services Director position pending recovery of the state's fiscal condition and availability of sufficient funds. When sufficient funds are available, the TS Director position should be created and should be assigned responsibility for all aspects of administrative and instructional technology. The Director should report to the Associate Superintendent of Educational Services and Testing.

2. Until a director position is funded, maintain the currently established division of responsibility that assigns the Associate Superintendent of Business Services with overseeing network infrastructure issues and the Associate Superintendent of Educational Services and Testing with overseeing instructional technology issues.

3. Add new members to the Technology Committee by seeking representatives from other affected parties to join and participate in committee meetings.

4. Assign the Technology Committee to create a new five-year strategic technology plan. Development of the new technology plan should include input from classified, certificated and management personnel, parents, community members and student representatives. A list of committee responsibilities should be developed, including the following:

    - Reviewing the goals and objectives of the Technology Services Department.
    - Exploring available funding sources.
    - Exploring available educational systems.
    - Creating and reviewing site technology plans.
    - Submitting a proposed technology plan and budget to the Governing Board for consideration.

5. Establish a site-based technology committee at each comprehensive high school site. The site-based technology committees should be composed of representatives from site administration, instructional, classified, and community member groups. The committees should be responsible for creating site-based technology plans that are aligned with the overall goals and objectives contained in the districtwide technology plan.

6. Assign the Lead Microcomputer Technician to work with the other two TS staff members to identify and establish desktop and network technology standards. The standards should be reviewed by the district's Technology Committee for approval before districtwide enforcement. A standards-based approach to technology implementation will improve the TS Department's ability to provide timely support.

7. Assign the Technology Committee to establish standards to address the implementation and use of instructional technology materials that accompany new textbook adoptions. Instructional staff members should be encouraged and supported in their efforts to integrate technology-based materials that improve the delivery of instruction.

8. Assign responsibility for taking minutes at each Technology Committee meeting to an appropriate staff member. Meeting minutes should be reviewed and approved by committee members before distribution to other school district staff members. Meeting minutes should also be prepared for site-based technology committee meetings and should be made available to ensure that all interested staff members can remain apprised of TC proceedings.

9. Update the board regularly about district technology plans and programs.

10. Provide all interested staff members with a yearly in-service training session on current trends in instructional technology.

11. Link the TS Department budget with the objectives outlined in the new strategic technology plan.

Staffing and Support

The departure of the district's Director of Technology Services in 2001-02 reduced the department's staffing to one Lead Microcomputer Specialist and two Microcomputer Specialist positions. The three TS Department staff members work independently of each other. As a result, they have found it difficult to develop a sense of common identity and purpose. During interviews, TS staff members expressed a clear understanding of the daily challenges of their jobs, but did not seem to appreciate the unique role played by their department.

The district's Lead Microcomputer Technician spends a significant amount of time performing tasks related to E-Rate documentation, application, and funding requirements. The process of applying for E-Rate discounts is complex, and users must be thoroughly familiar with technology and the numerous strict application filing deadlines involved in completing applications. School districts increasingly contract with an E-Rate consultant to maximize their discounts and minimize the delays associated with inquiries from representatives of the organization overseeing this federal discount program. E-Rate consultants typically charge either a flat rate per year or a small percentage of the discount the district receives, with a "not to exceed" cap amount established in advance.

E-Rate consultants that other school districts and county offices have contracted with for services include, but are not limited to the following:

Kim Friends
California School Management Group
3333 Concours, Suite 4102
Ontario, CA 91764
(909) 944-7798
kfriends@csmgconsulting.com
http://www.csmgconsulting.com

Fred Brakeman
Infinity Communications & Consulting, Inc
1800 30th Street, Suite 175
Bakersfield, California 93301
(661) 716-1840
fbrakeman@infinitycomm.com
http://www.infinitycomm.com

Other E-Rate consultants can be identified with an Internet search or by contacting other school districts. The relatively small cost for these services can be justified by ensuring that allowable discounts are maximized by an experienced consultant, and the staff member assigned to perform E-Rate tasks could be reassigned to perform other tasks.

Four separate district positions have one or more responsibilities related to the district's student information system (SIS). These include the following:

- A district office Fiscal Technician performs all reporting functions related to the California School Information Services (CSIS);
- Another district office position is unofficially responsible for providing student information system (SIS) support;
- Another staff member enters assessment data into the SIS, and;
- The district's Lead Microcomputer Technician is responsible for all patches, upgrades, and queries submitted to the SIS.

All these functions are closely interrelated and will likely require additional support in the next year because of the increasing complexity of state reporting requirements. Several users expressed frustration regarding the extraction of data for student preidentification numbers, the California Basic Educational Data System (CBEDs) and/or other state reporting requirements. Many districts have consolidated these functions under a single district position, typically called Student System Manager. By reassigning these various functions to a single staff member, the district may be able meet state reporting requirements while improving the delivery of SIS support.

TS staff members perceive that their role is to ensure that district technology functions and that their jobs have become more stressful over time. Some perceive that technology staff members are primarily reactive and that they have little time to develop or implement strategies to make provision of support more sustainable. Increasingly, the Assistant Superintendent of Business Services has authorized technology support staff members to work overtime to meet the demand for support. The following table shows the TS Department's use of overtime.

Fiscal Year:	**2007-08**	**2008-09 (as of 12-31-08)**
Overtime (all TS staff):	634 hours	562 hours
Annual Overtime Salary Expense:	$28,072	$24,884

District office and school site staff members want additional technology support staff, but acknowledge that adding personnel will be difficult until the state's fiscal condition improves or new, ongoing funding can be secured. FCMAT believes the district could use its current overtime expenditures to offset the cost of adding a Microcomputer Technician, bringing the total number of Microcomputer Technicians to three. The option of creating a third Microcomputer Technician position should be considered mutually exclusive of the option of creating a TS Director position. Creation of both positions would be excessive and cannot be justified at this time. The creation of either position should be postponed pending the availability of new funds and an evaluation of how the other recommendations in this report provide relief to the TS Department.

The district's help-desk system is used as a list by TS staff members mainly to ensure that support requests are not missed or forgotten. Support tasks are prioritized by site administrators who determine daily tasks at the school sites. At the time of FCMAT's fieldwork, the TS Department staff indicated that approximately 50 percent or more work orders were open for each school site.

The district lacks a strategy for escalating technology service support requests. This problem was highlighted recently when the telephone system at one of the school sites failed late on a Friday afternoon, creating a safety concern. Although district and site administrators were able to use cell phones for communication needs, technology support staff members were not made immediately aware of the problem because they were off-site conducting other regularly scheduled duties. As a result, the site remained without regular telephone service Monday and part of Tuesday.

The TS Department lacks guidelines that govern the delivery of technology support services. Sample Technology Support Service Guidelines are attached as part of Appendix A to this report.

Recommendations

The district should:

1. Consider contracting with an experienced E-Rate consultant to help complete applications accurately and ensure that critical time lines and submission deadlines are met.

2. Consider combining the functions of CSIS reporting, SIS support, and assessment data input and support under a single district position. This would decrease the workload of the other two staff members performing these tasks. Responsibility for installing system patches and upgrades should remain with the Lead Microcomputer Technician.

3. Gradually reduce the authorization of overtime for TS Department staff members while continuing to ensure that support is delivered in a timely manner. This should be accomplished pending a review of TS Department workload reduction resulting from implementation of the recommendations contained in this report.

4. Consider creating a new Microcomputer Technician position, bringing the total number of Microcomputer Technician positions to three. This option should be considered mutually exclusive of the option to create a TS Director position. Consideration of this recommendation should be postponed pending review of any workload reduction that results from implementing the other recommendations contained in this report and pending the availability of sufficient funding.

5. Ensure that technology support staff members are quickly made aware of any technology failure that presents a safety concern for staff or students.

6. Assign the Technology Committee to work with the support staff to identify solutions to the root causes of common problems. The Technology Committee should work with support staff members to proactively develop systems that support continuous improvement and address the root causes of recurring problems.

7. Develop technology support service guidelines for TS Department staff members. The Technology Committee should review and edit the support policies attached as part of Appendix A to this report to establish the standard for delivery of technology support services.

Technology Resources

Network and Computer Equipment

Many technology users indicated they are frustrated with the slow performance of network resources such as the student information system and the Internet. Some of these network performance problems can be attributed to faulty network patch cables installed by the technology support staff. However, analysis of the district's network traffic patterns found that site-to-site and Internet traffic is forced through a core switching configuration that causes data packets to bounce unnecessarily from device to device. This results in poor network performance by increasing the amount of time required for each packet of data to travel through the network. The controls that govern network traffic routing and switching should be streamlined to improve network performance.

On a larger scale, a network analysis and overhaul is required to identify and eliminate redundant equipment, improve reliability, make the network easier to maintain, and improve performance. Resources such as a the district's Domain Name System , Dynamic Host Configuration Protocol, and Windows Internet Name Service, which are used to provide network and Internet connectivity, are configured improperly. This necessitates unnecessarily complex and time-consuming maintenance to keep the network operating. Improper configuration of these resources also hinders network performance, operation of Virtual Local Area Networks, Internet Protocol addressing schemes, multicasts setups, time synchronization, voice over IP quality of service, Web content filtering and uninterruptable power supply resources.

The district purchased two Cisco ASA5500 firewalls to be used in a failover configuration. This type of configuration is a backup operational mode in which the functions of one firewall can be assumed by the backup firewall if the primary firewall becomes unavailable because of failure or scheduled down time. However, only one ASA firewall was installed, and the other has remained in a storage room. An old Cisco VPN 3000 concentrator is being used to manage all Virtual Private Network services for the district even though the new firewalls could be configured as VPN concentrators.

The district's Internet border router is not configured with an Access Control List, leaving the router vulnerable to telnet access, pings, and other denial-of-service attacks. The router is rated at 20.48 megabit and is connected to the El Dorado County Office of Education via a 100 megabit link. This means that although district has a fast connection to the Internet from the county office, it cannot take full advantage of this connection because of the relatively slow border router.

Network equipment at the district office is located in a room in the bus barn or in the recently added server room. A variety of discarded networking equipment is stored in the bus barn room. The core switches located in the district office server room and at each high school are not enterprise class, and replacement of these switches will be critical to the network's future stability. Enterprise-class hardware is designed and suitable for large enterprises.

Some of the district's uninterruptable power supply (UPS) equipment is obsolete or nonfunctional and should be replaced. Some intermediate distribution frame (IDF) rooms are not equipped with a UPS that would provide power in an outage. Every main distribution frame (MDF) and IDF closet should be equipped with UPS equipment that has been updated and/or verified to function effectively.

The lock on the door to the district's new server room can be opened without a key. Each server rack in the room has a UPS at the bottom that would not permit efficient use of battery run time. Each rack also has a 48-port Linksys switch in the back, decreasing communication between the servers to only one gigabit and causing a traffic bottleneck. The servers use an older KVM (keyboard, video, mouse) switch that allows a user to control several computers with a single keyboard, monitor, and mouse. The KVM is connected using a large number of cables that are too short for the racks. This makes it difficult make network connections quickly and efficiently since the cables cannot be properly organized and maintained.

Three of the district's five VMware servers are configured to operate the enterprise version, and the other two operate the standard version of VMware. All the VMware servers have eight gigabytes of memory and are running with limited storage space. All other virtual servers must be shut down when a VMware server is patched, forcing patch maintenance to be conducted after hours.

Some MDF rooms and IDF closets lack appropriate air conditioning. Although the district saves money by not providing air conditioning in these areas, high heat levels can damage computer components, resulting in equipment failure. As a result, expensive network equipment must be replaced more frequently. The temperature in these equipment rooms must be maintained at 68 to 73 degrees to protect the district's investment in network hardware.

The district is installing a new Voice over Internet Protocol Shoretel telephone system. School-site system users reported a significant number of reliability problems. In some instances, all the phones ceased to function. When this happens, the school site can be contacted only through the fax line. Loss of telephone service is not acceptable for any school site, and district administrators have ceased installation of phone systems until these problems can be resolved. Cellular phones also function poorly at some sites.

Stable power during a power outage or disaster will be particularly important because the district installed the Voice over Internet Protocol (VoIP) telephone system. However, the district office lacks a backup that could keep critical network resources such as the Internet, telephone, e-mail, financial, and air conditioning systems operational during these emergencies.

The district's school sites have Linksys business switches in the IDFs with gigabit uplinks and small eight-port hubs and switches in most classrooms. These Linksys switches do not provide the high level of support provided by Cisco enterprise-grade network switches. The MDFs resemble an IDF more than an MDF because the network layout has no clear core switch. Switches and routers are not configured to run multicast. Many classrooms lack data drops. Some IP phones do not have a dedicated network drop, may not be powered by IDFs with backup batteries, and may not have the proper Quality of Service assigned to them. Quality of Service ensures that transmission rates, error rates, and other network traffic characteristics can be measured and improved.

Microsoft's Active Directory is used to manage user accounts, network printers, servers, and assorted network resources in the overall network infrastructure. The district's Active Directory is poorly configured, resulting in increased network management requirements and loss of user connectivity to network resources such as Virtual Private Network e-mail. Instead of configuring all network resources within a single Active Directory domain, each school site is a separate Active Directory domain, and each is separate from the district's Active Directory domain. This lack of integration increases the complexity of the network and forces users to log in much more than necessary.

Many district classrooms are equipped with a hub that connects computers to the main wiring system for network connectivity. Computers that are directly connected in this manner are a common cause of network downtime and outages. With modernization of each school site, wiring standards should be designed to allow for the necessary number of computer drops in every classroom. Standard classrooms should be equipped with 7-10 computer drops, science classrooms should have 15-20 drops, and computer labs should have 32-38 drops.

The district's large geographical area makes delivery of timely support services challenging. The time spent driving to a remote site to provide support represents a tremendous drain on staff time. The use of remove control software to assist with troubleshooting would enable technicians to remotely take control of computers and provide user assistance. Applications such as Dameware, Virtual Network Computing, and Windows Remote Desktop are capable of providing remote control capabilities.

The district is using InterMapper for network monitoring and mapping functions. TS Department technicians need a network monitoring system that is capable monitoring netflow, syslogs, VoIP, and that can generate bandwidth graphs.

Instructional Technology

Unreliable and unpredictable network resources have caused teachers to lose valuable instructional time, prompting a loss of confidence in technology as a teaching tool. As a result, many teachers have become reluctant to or do not employ technology in their lesson plans. One instructional staff member indicated that teachers consider technology merely an optional resource rather than a valuable tool for improving the delivery of instruction.

Instructional staff members use the Outlook Web Access method to access their district-hosted Microsoft Outlook e-mail, while administrators and classified staff use the Microsoft Outlook software application. The decision to require instructional staff to use the Web Access method was based primarily on the preferences of TS staff rather than on which access method would represent the most effective option for the user.

District administrators are considering an increase in the current installed base of thin client hardware in an effort to create technology environment that is more easily maintainable for support staff members. Thin client technologies will not operate the high-end video editing and graphics programs that are becoming common in high school computer labs. While thin client technologies have a place in a school setting, the processing requirements of high school district users far exceed the capabilities offered by thin client technologies. Therefore, this otherwise cost-saving alternative is not appropriate for high school labs.

Instructional users are interested in pursuing technology-enriched curriculum offerings, but indicated that in many cases, they cannot because of antiquated computer equipment. For example, Microsoft Office 2007 was recently purchased using Microsoft Voucher funding; however, few district systems are capable of running the new office application.

Computer carts are equipped with refurbished equipment that is typically two years old when purchased by the district. Although this equipment can be obtained at a substantially reduced cost, its useful life is generally one year from the date of receipt. Some instructional staff members indicated that the district retains the refurbished equipment in service well beyond its useful life.

Technology Standards and Policies

The district has had difficulty enforcing technology standards throughout the sites. The presence of both Windows and Macintosh computers has increased the complexity of providing technology support services and creates additional support costs. Technology staff members have found it increasingly difficult to provide support for both platforms due to limited staff resources and the proprietary nature of Macintosh hardware. Standardizing on a single platform would maximize the knowledge base of support staff members and streamline maintenance functions associated with technology support

functions. Enforced standards and standardization of equipment are needed to simplify technology support and increase efficiency.

Some staff members have not signed the district's new acceptable usage policy. All employees should sign a copy of this policy annually as part of the packet of forms distributed to employees by the Human Resources Department each year. The district lacks a log-in banner that could be used as a daily reminder of the acceptable usage policies.

The district lacks an obsolete equipment disposal policy. Most of the district's computer equipment is obsolete (more than five years old) and incapable of functioning with newer operating systems and applications. Users indicated that their computers are so old and slow that they frequently take work home to complete on their home computers. Older systems are significantly more time-consuming to support because they malfunction more frequently and cannot operate the latest software. Generally accepted practice is to replace computers every three to five years, depending on user needs.

TS staff members indicated that new district computers often displace older computers, which then displace even older computers and so forth, representing a tremendous drain on technology support staff time. Computers should be displaced no more than two times before being declared obsolete and sold as surplus. The district should consider adopting a policy of retiring an old computer each time a new one is purchased. The installed base of computer equipment should not continue to be expanded using antiquated and obsolete hardware.

In some instances, site administrators have operated independently to acquire technology resources without access to information on standard configurations for new equipment purchases. Standards should be determined for all computer equipment including printers, switches, access points, and wiring for rooms. Standard configurations (including cost information) for computers and printers should be posted to the district's Web site for easy access by administrators who are making technology purchase decisions.

The school sites do not make technology purchases through a single vendor or in large quantities to take advantage of pricing discounts. Purchasing from several vendors and in smaller quantities prevents the district from taking advantage of bulk discounts, needlessly expending resources that could be allocated to other purposes.

Miscellaneous

The district does not participate in any power company programs that rebate a percentage of the cost of automated energy conservation power management software. This type of application can be used to determine when computers are inactive so they can be powered down, providing, a return on investment through a reduction in networkwide power consumption. One application is Faronics Power Save (http://www.faronics.com/html/PowerSave.asp). Other energy auditing applications can be found with an Internet search or by contacting other school districts.

Information on the current PG&E program can be found on the Web at http://tinyurl.com/5grhzd. Information on which power companies throughout North America offer rebates to districts that utilize recognized methods to reduce power consumption can be found at http://www.faronics.com/powersave/PSRebates.asp.

Recommendations

The district should:

1. Contract with a private consulting vendor to conduct a detailed network analysis. The analysis should identify redundant and unnecessary equipment that can be removed, identify steps to improve network reliability, make the network easier to maintain, and improve performance.

2. Rebuild the core switching part of the network to streamline network traffic and improve performance. Routing issues related to DNS, WINS, and DHCP configurations should also be addressed and redesigned to improve network reliability and reduce maintenance requirements.

3. Install and program the backup Cisco ASA firewall to serve as a failover unit for the primary ASA firewall.

4. Move all VPN configurations currently hosted on the VPN 3000 to the new Cisco ASA firewall failover bundle. Once this has been completed, the VPN 3000 should be removed from service and declared surplus.

5. Configure an access control list on the outside border router located at the district office to help prevent denial-of-service attacks and lock down services that operate on the router and do not need to be open to the public.

6. Replace the outdated and slow outside border router with a faster unit that is capable of taking full advantage of the fast Internet connection offered by the county office.

7. Consolidate all core network equipment located at the district office into the new server room to improve security and maintenance control.

8. Purchase new core switches for use at the district office and each comprehensive high school. The switches should meet or exceed enterprise-class requirements. This project should be conducted in parallel with the network overhaul. A suggested scope of for this project is attached as part of Appendix A to this report.

9. Replace the UPS systems at the district office server room and at each high school with new 10kva-20kva single-phase and three-phase units along with new power distribution units. These units are more reliable and have more run time. The existing UPS units that operate effectively can be used in other locations at the school sites for the new VoIP telephone system.

10. Install a backup generator at the district office to protect the server room and keep critical network resources such as the Internet, e-mail, and financial system operational in case of a power loss. A generator would provide 24 hours of computer run time and would ensure communications to the district office administrators during emergencies.

11. Install more data drops into each classroom. This will allow support staff members to remove many of the small hubs and switches that create many support work orders.

12. Ensure that each IP telephone is connected via a dedicated data drop that runs back to the IDF. Installing a large core Cisco switch like a 6509-E with a Supervisor 720-3B in the MDF would allow the district to aggregate all of the equipment to a single backplane circuit board.

13. Ensure that Quality of Service and multicast capabilities are configured for wide-area network links and local area network switches.

14. Rebuild the Active Directory as a single domain with an organizational unit structure that incorporates the sites and all district network resources. The high school domains should be in the district domain, and all independent domains should be phased out. Having a single domain will provide the technology support staff with master control of the network and will seamlessly integrate software, content filtering, group policies, and a host of other needed controls. A sample Active Directory scheme and separate naming scheme are attached as part of Appendix A to this report.

15. Replace all homemade patch cables with new cables to eliminate connectivity and performance issues.

16. Install a latch guard on the door to the district office server room to prevent unauthorized access.

17. Replace all existing UPS systems in the district office server room with a single 20KVA UPS. This single, larger UPS will free at least one full server rack, making room for new servers and equipment.

18. Replace the older KVM in the server room with a newer, more cable-friendly setup. The new KVM should enable use of USB and P/S2 keyboard setups that will prevent the buildup of unneeded and unorganized cables. The older KVM should be used in one of the smaller server rooms or a technician work bench at another school site.

19. Upgrade the memory in three of the VMware servers to a minimum of 16 gigabytes and upgrade at least two of the servers to 32-gigabytes of memory. The two VMware servers running the standard version of VMware should be upgraded to the Enterprise version, and a storage area network (SAN) should be added. These upgrades would allow the district to add additional virtual servers and allow movement of virtual servers from one VMware server to another while the virtual server is still powered on. These changes would also allow TS support staff to work on the VMware servers during normal working hours.

20. Work with the VoIP telephone system vendor to add backup analog telephone lines to each school site. The analog phones should be run from the Shoretel equipment to the main office so that the main office can answer the school's main phone number.

21. Ensure that all MDF and IDF rooms/closets are equipped with appropriate air-conditioning to protect expensive network assets. During any modernization projects, these rooms should be equipped with independent air-conditioning systems that will not be turned off during summer months.

22. Relocate the old and unused network equipment that is stored in the bus barn to the Union Mine High School site for use in the Cisco Academy training program. Students would benefit from the opportunity to use and configure the equipment for training purposes.

23. Ensure that computers at the sites are not directly connected to the main wiring system and that modernization efforts provide for the appropriate number of computer drops in each type of classroom. Consideration should also be given to using category six wiring for all new wiring instead of the older category six

standard. Category six wire will enable much faster communication speeds to support future applications. New factory-made patch cables should also be used at the computer end of the connection and at the switch connection. Network wiring and a power wire (18-2 AWG) should be placed at all locations that may some day support new IP surveillance cameras.

24. Invest in a software application such as DameWare NT Utilities that would allow TS Department staff members to provide remote computer and user support. In addition, an application such as DameWare Mini Remote should be purchased for the office staff members that provide remote support for Aeries system users. Other remote support applications can be identified through an Internet search.

25. Purchase a more robust network monitoring system such as SolarWinds (http://www.solarwinds.com). Other network monitoring applications can be identified with an Internet search.

26. Ensure that all district e-mail has the Microsoft Outlook application installed for e-mail access. Besides being easier to use, the client application offers groupware functionality that is not found in the Web version, such as calendar and resource sharing and a variety of useful e-mail handling features.

27. Decline to increase the current installed base of thin client hardware. The district's old thin client setups and one or two of the servers could be used for library book lookup stations or a locked-down Internet browsing kiosk.

28. Ensure that the instructional staff members who receive new curriculum adoptions have computers that are capable of running the coupled technology resources to enhance learning.

29. Discontinue the practice of equipping computer carts with refurbished equipment.

30. Standardize on a single computer platform to streamline the maintenance functions associated with providing technology support. The remaining Macintosh computers should be retired through attrition. Exceptions to this recommendation should be considered when justified in the instructional setting. An exception may be the use of applications where the Macintosh excels such as in desktop publishing or digital movie editing.

31. Ensure that every employee has signed an acceptable usage policy (AUP) to affirm acceptance of its terms and conditions. Every employee should sign the AUP each year as part of the annual employee orientation process.

32. Install on every computer a log-in banner that displays a message at startup reminding the user of the district's acceptable usage polices. A sample log-in banner is attached as part of Appendix A to this report.

33. Develop a planned equipment replacement strategy. Computers should be replaced in a staggered fashion, with 25% of all systems replaced each year. In the fifth year, the district should start the process again, identifying year-one computers for replacement depending on the needs of the user(s).

34. Implement a policy of retiring an old computer each time a new one is purchased to ensure that obsolete computers are disposed of properly. Computers that are taken out of service should be stripped of any functional parts (memory, hard drive, etc.) and declared surplus. This practice will more clearly establish an end of life and time line for replacement of older computers.

35. Develop standards for computers, printers, and network equipment. Four- to six-computer configurations should be established that all sites may order from. Standard printer configurations should also be defined along with standards for networking equipment including switches, access points, and wiring.

36. Identify a single vendor and pool technology equipment purchases to take advantage of pricing discounts.

37. Contact the local power company to determine whether a power save rebate program is available. If this program is available, the district should consider participating in an effort to reduce the utilities expenses associated with desktop computer power consumption.

Staff Development

The district's technology support technicians are allowed to take advantage of professional development opportunities. However, staff members indicated that they rarely attend training courses, workshops, in-service sessions or conferences. It is important for technology support staff members to occasionally attend these events to update their skills, develop a network of colleagues, and foster new ideas for solving common problems.

Several users expressed a desire for cross-training in the use of the Aeries student information system. Some staff commented that the district's Lead Microcomputer Specialist is the only staff member capable of performing certain functions on the Aeries server. The Lead Microcomputer Specialist should work with other student system users to identify opportunities for cross-training such as creating ad-hoc reports, creating and running database queries, and performing database updates.

Recommendations

The district should:

1. Continue to allow and encourage TS Department staff members to take advantage of professional development opportunities through attendance at technology training courses, workshops, in-service sessions, and conferences.

2. Develop cross-training opportunities for student system users by allocating time for the Lead Microcomputer Specialist to cross-train other student system users on system tasks such as creating ad-hoc reports, creating and running database queries, and performing database updates.

Appendices

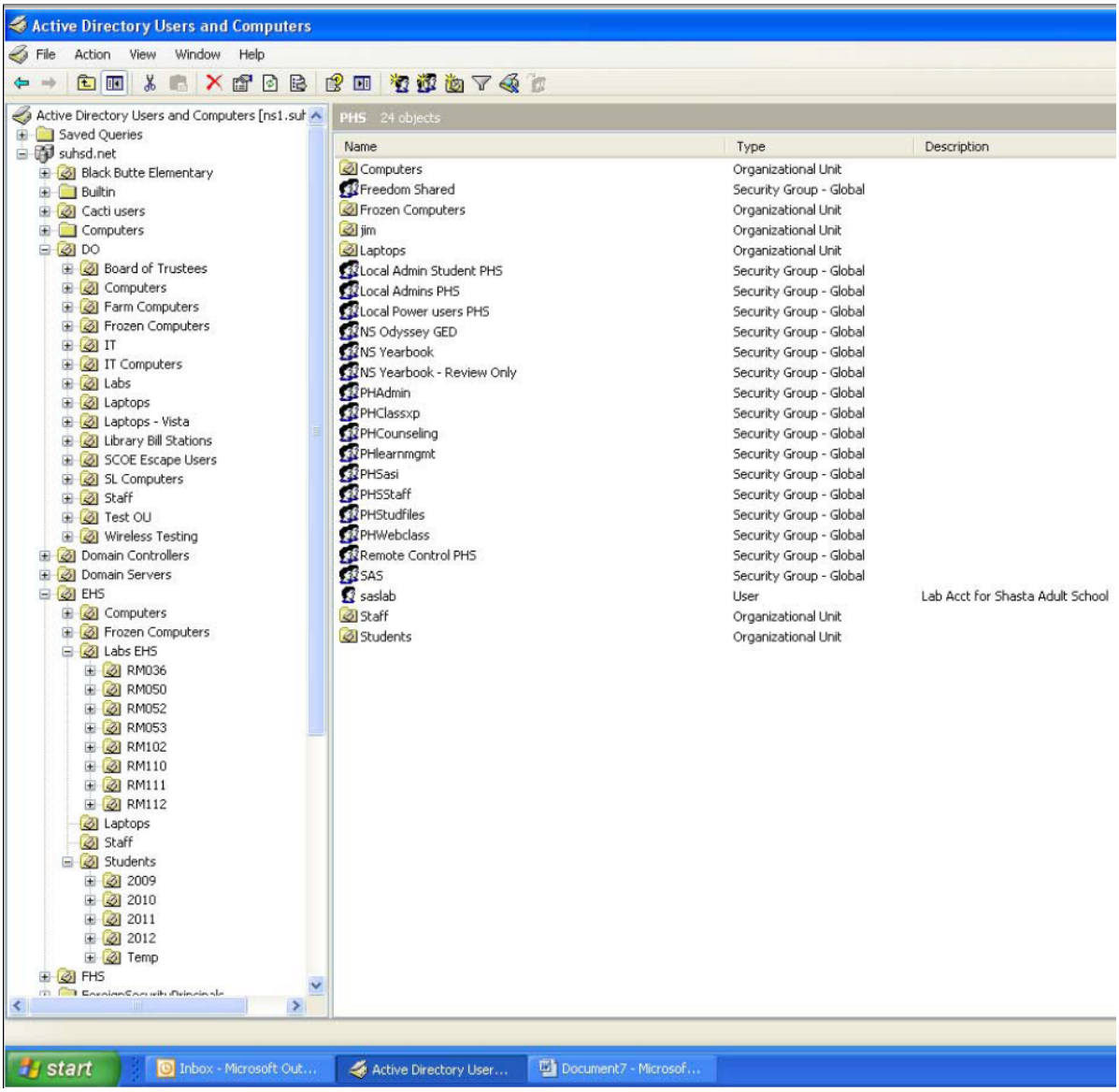
A: Sample Forms, Guidelines and Other Documents

B: Study Agreement

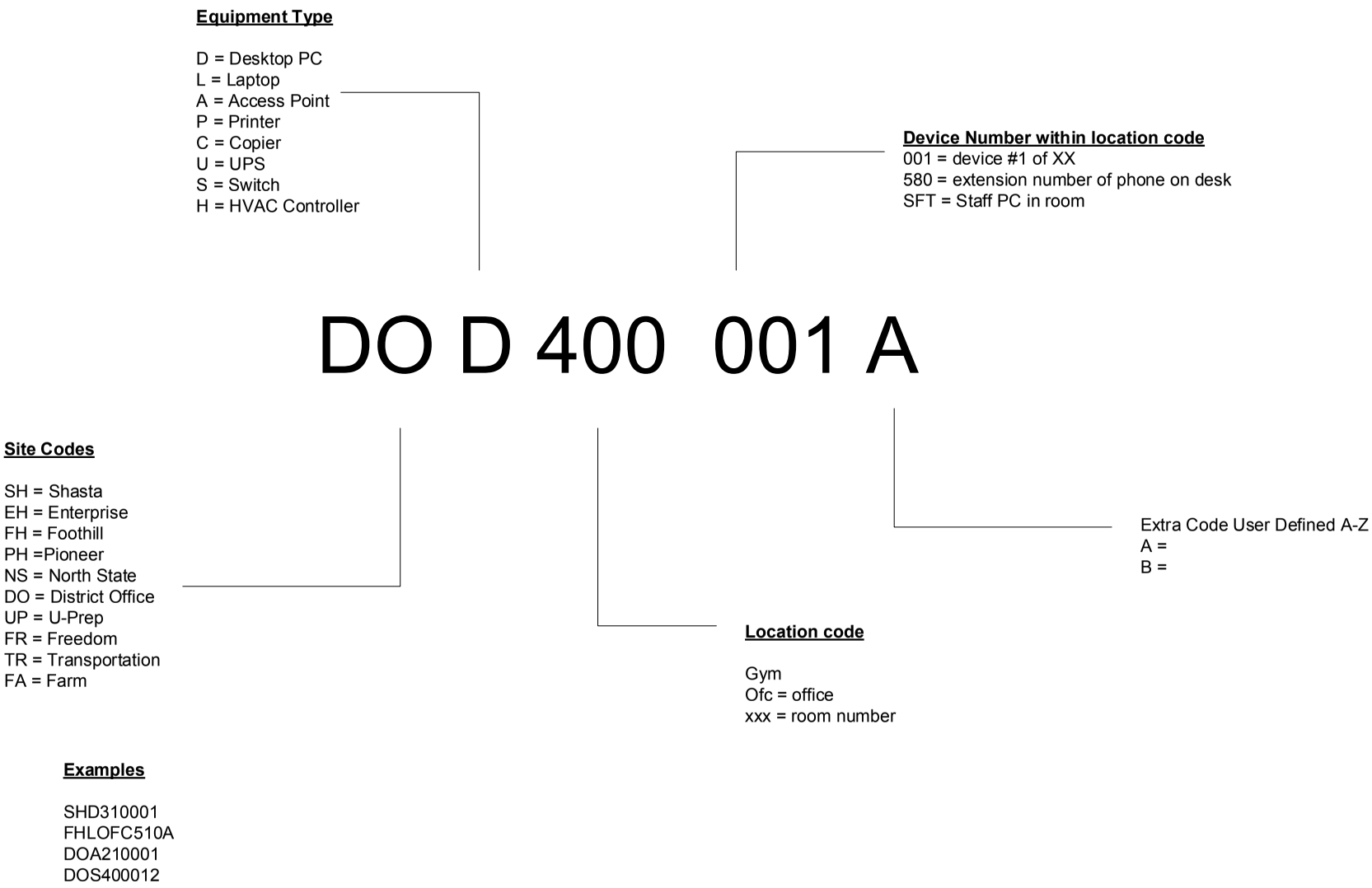
Sample Technology Support Guidelines

- Telephone calls to the Technology Services Department will be answered by a staff member rather than by voice mail.
- All e-mail support requests to the Technology Services Department will be responded to within 1 hour of receipt of the e-mail.
- The use of voice mail will be offered only if desired by the caller and after the caller has been presented with other support alternatives.
- Every attempt shall be made to resolve support requests at the time of first contact from the user.
- If a hardware failure cannot be resolved immediately, loaner equipment shall be installed and operating within 24 hours of first contact from the user.
- Technology support staff members will let users know when work is to be performed, what work is done, and problem resolution status information.
- If a personal update cannot be provided to the user, the technology support staff member will leave a detailed note or provide a status update to the office staff prior to leaving a site. In addition, a follow-up e-mail message explaining the reason(s) for not providing support shall be sent to the appropriate site administrator with copies sent to the Assistant Superintendents of Business and Education.
- Technology support staff members will check in with the site office staff upon arrival, and request information on the items that require attention. They will also check out with the site office staff prior to leaving, and provide an update on problems that have and have not been resolved, and what is being done to address the remaining problem(s).
- Prior to the end of their daily shift, technology support staff members will send an e-mail message to the appropriate site administrator summarizing support activities performed and problems resolved for that day.
- Any planned support activity that requires bringing down a server or other communications equipment shall be preceded by a message informing users of the planned outage duration at least one week in advance of the planned outage.
- Planned network outages shall be preceded by three broadcast network messages: 1) four hours prior; 2) one hour prior, and; 3) five minutes prior to the outage.
- Any unplanned support activity that requires downing a server or other communications equipment shall be preceded by at least three broadcast network messages informing users of the emergency outage and estimated duration.

Sample Active Directory Scheme



SUHSD Naming Scheme



Sample Scope of Work
Network Upgrade/Reconfiguration Project

1. **Network Core Infrastructure**
   - 1.1. Determine equipment specifications for core switching infrastructure for DO, and all high schools.
     - 1.1.1. Specifications should include all new equipment specs for core switching equipment at the DO server room and all high schools.
     - 1.1.2. Release spec for core equipment bidding.
     - 1.1.3. Select vendor and purchase equipment.
   - 1.2. Consider power requirements.
     - 1.2.1. Determine UPS size and runtime requirements for each high school MDF and DO server room.
     - 1.2.2. Determine if existing power plugs and breakers will need to be upgraded to support new UPS installations.
     - 1.2.3. Hire a consultant to determine generator needs for DO server room.
     - 1.2.4. Purchase new UPS's and install.
     - 1.2.5. Determine after cost analysis if backup generator is within budget.
     - 1.2.6. Purchase backup generator and transfer switch.
     - 1.2.7. Hire electrical contractor to install power panels and hookup generator.
   - 1.3. Conduct reconfiguration work for core switching.
     - 1.3.1. Replace district office server room core switch.
     - 1.3.2. Replace EDHS MDF core switch.
     - 1.3.3. Replace PHS MDF core switch Replace ORHS MDF core switch.
     - 1.3.4. Replace UMHS MDF core switch.
     - 1.3.5. Replace alternate school site core switching if needed.
     - 1.3.6. Move ASA firewall from bus barn to server room.
     - 1.3.7. Move Barracuda spam filter from bus barn to server room.
     - 1.3.8. Move the Lightspeed filter from bus barn to server room.
     - 1.3.9. Eliminate routers from DO, EDHS, UMHS, PHS and ORHS.
     - 1.3.10. Consolidate VPN appliance to ASA.
     - 1.3.11. Plan VLAN scheme for DO and sites.
     - 1.3.12. Plan IP scheme for entire network.
     - 1.3.13. Plan routing scheme for entire network.
     - 1.3.14. Integrate existing Blue Socket wireless network to new equipment and Active Directory (to be completed in Phase 3).
     - 1.3.15. Setup QOS between sites for VOIP phone system.
     - 1.3.16. Fix DHCP for all sites.
     - 1.3.17. Fix DNS for all sites.

1.3.18. Purchase consulting time 3-4 hours from Lightspeed to tune web content filter and integrate into Active Directory.

Note: While Phase 1 is a large part of the entire project, much of parts 1 and 2 can move along parallel, while part 3 will be sequential.

2. **Active Directory Reconfiguration and Expansion**
   - 2.1. Expand existing District AD domain to handle all school sites.
   - 2.2. Setup new OUs, for sites and security at DO level.
   - 2.3. Determine if/how to move existing high school domains in to existing DO domain.
   - 2.4. Setup DHCP to answer from sites.
   - 2.5. Setup integrated Active Directory DNS.
   - 2.6. Setup local Global catalog servers.
   - 2.7. Implement computer/equipment naming scheme.
   - 2.8. Setup GPO's for District wide polices.
   - 2.9. Setup Kix32 scripts for sites and DO.
   - 2.10. Setup time synchronization for server and all network equipment.

Note: Although this phase is smaller, it will be one of the more painful phases for users concerning the entire network upgrade process. This phase will bring changes that the users will notice on a day-to-day basis. The log in process will change along with security.

3. **Servers and Workstations**
   - 3.1. Determine SAN options to expand and leverage existing VMware servers.
   - 3.2. Purchase SAN and install.
   - 3.3. Determine cause of ABI slowness.
   - 3.4. Determine if Aeries slowness is server related or workstation related.
   - 3.5. Determine best method to deliver Aeries to desktop.
   - 3.6. Determine best setup for SchoolHouse food server.
   - 3.7. Start purchase of new standard workstations for users.
   - 3.8. Finish wireless Blue Socket setup from Phase 1.
   - 3.9. Determine best way to monitor network health.

4. **Site Edge Switching**
   - 4.1. Determine if site edge switches will need to be replaced or if existing switches will work.

Sample Log-in Banner Message

WARNING!

Use of this system constitutes understanding and acceptance of the terms and conditions outlined in the district's Acceptable Usage Policy (AUP) including the understanding and acceptance of the following:

This computer system is the property of El Dorado Union High School District (EDUHSD) and may be accessed only by authorized users. Unauthorized use of this system is strictly prohibited and is subject to disciplinary action up to and including termination and/or criminal prosecution.

Users have no expectation of privacy as to any communication on or information stored within the system, including information stored locally or remotely on this or any other system or any other media in use with this system.

All said communication or information is owned by EDUHSD and may be monitored, intercepted, recorded, read, copied, or captured in any manner by authorized personnel. Any potential evidence of misconduct or crime found on EDUHSD computer systems may be disclosed in any manner by authorized personnel. By continuing to access and use this computer, you are consenting to such monitoring and information retrieval for law enforcement and other purposes.

3. You should never allow another user to use your account/password to access the district network or Internet. No exceptions are permitted..

Sample Technology Support Guidelines

- Telephone calls to the Technology Services Department will be answered by a staff member rather than by voice mail.
- All e-mail support requests to the Technology Services Department will be responded to within 1 hour of receipt of the e-mail.
- The use of voice mail will be offered only if desired by the caller and after the caller has been presented with other support alternatives.
- Every attempt shall be made to resolve support requests at the time of first contact from the user.
- If a hardware failure cannot be resolved immediately, loaner equipment shall be installed and operating within 24 hours of first contact from the user.
- Technology support staff members will let users know when work is to be performed, what work is done, and problem resolution status information.
- If a personal update cannot be provided to the user, the technology support staff member will leave a detailed note or provide a status update to the office staff prior to leaving a site. In addition, a follow-up e-mail message explaining the reason(s) for not providing support shall be sent to the appropriate site administrator with copies sent to the Assistant Superintendents of Business and Education.
- Technology support staff members will check in with the site office staff upon arrival, and request information on the items that require attention. They will also check out with the site office staff prior to leaving, and provide an update on problems that have and have not been resolved, and what is being done to address the remaining problem(s).
- Prior to the end of their daily shift, technology support staff members will send an e-mail message to the appropriate site administrator summarizing support activities performed and problems resolved for that day.
- Any planned support activity that requires bringing down a server or other communications equipment shall be preceded by a message informing users of the planned outage duration at least one week in advance of the planned outage.
- Planned network outages shall be preceded by three broadcast network messages: 1) four hours prior; 2) one hour prior, and; 3) five minutes prior to the outage.
- Any unplanned support activity that requires downing a server or other communications equipment shall be preceded by at least three broadcast network messages informing users of the emergency outage and estimated duration.

FCMAT
FISCAL CRISIS & MANAGEMENT ASSISTANCE TEAM
CSIS California School Information Services

FISCAL CRISIS & MANAGEMENT ASSISTANCE TEAM
STUDY AGREEMENT
August 5, 2008

The FISCAL CRISIS AND MANAGEMENT ASSISTANCE TEAM (FCMAT), hereinafter referred to as the Team, and the El Dorado Union High School District hereinafter referred to as the District, mutually agree as follows:

1. BASIS OF AGREEMENT

The Team provides a variety of services to school districts and county offices of education upon request. The District has requested that the Team provide for the assignment of professionals to study specific aspects of the El Dorado Union School District operations. These professionals may include staff of the Team, County Offices of Education, the California State Department of Education, school districts, or private contractors. All work shall be performed in accordance with the terms and conditions of this Agreement.

2. SCOPE OF THE WORK

A. Scope and Objectives of the Study

The scope and objectives of this study are to:

1) Conduct a review of the district's administrative technology and make recommendations for improvement.
2) Conduct a review of the District's instructional technology and make recommendations for improvement.
3) Conduct a review of the district's technology services delivery and make recommendations for improvement.

B. Services and Products to be Provided

1) Orientation Meeting - The Team will conduct an orientation session at the District to brief District management and supervisory personnel on the procedures of the Team and on the purpose and schedule of the study.

2) On-site Review - The Team will conduct an on-site review at the District office and at school sites if necessary.

3) Progress Reports - The Team will hold an exit meeting at the conclusion

of the on-site review to inform the District of significant findings and recommendations to that point.

4) Exit Letter - The Team will issue an exit letter approximately 10 days after the exit meeting detailing significant findings and recommendatio to date and memorializing the topics discussed in the exit meeting.

5) Draft Reports - Sufficient copies of a preliminary draft report will be delivered to the District administration for review and comment.

6) Final Report - Sufficient copies of the final study report will be deliver to the District following completion of the review.

7) Follow-Up Support – Six months after the completion of the study, FCMAT will return to the District, if requested, to confirm the District' progress in implementing the recommendations included in the report, no costs. Status of the recommendations will be documented to the District in a FCMAT Management Letter.

3. PROJECT PERSONNEL

The study team will be supervised by Anthony L. Bridges, Deputy Executive Officer, Fiscal Crisis and Management Assistance Team, Kern County Superintendent of Scho Office. The study team may also include:

A. Andrew Prestage, FCMAT Management Consultant
B. Steven Carr, FCMAT Technology Consultant
C. Elijah Vanslyke, FCMAT Technology Consultant
D. Mike Vincelli, FCMAT Technology Consultant

Other equally qualified consultants will be substituted in the event one of the above nc individuals is unable to participate in the study.

4. PROJECT COSTS

The cost for studies requested pursuant to E.C. 42127.8(d)(1) shall be:

A. $500.00 per day for each Team Member while on site, conducting fieldwork at oth locations, preparing and presenting reports, or participating in meetings.

B. All out-of-pocket expenses, including travel, meals, lodging, etc. The District will billed for the daily rate and expenses of the independent consultant, only. Based o the elements noted in section 2 A, the total cost of the study is estimated at $12,500.00 The District will be invoiced at actual costs, with 50% of the estimate cost due following the completion of the on-site review and the remaining amount due upon acceptance of the final report by the District.

C. Any change to the scope will affect the estimate of total cost.

Payments for FCMAT services are payable to Kern County Superintendent of Schools-Administrative Agent.

5. RESPONSIBILITIES OF THE DISTRICT

A. The District will provide office and conference room space while on-site reviews are in progress.

B. The District will provide the following (if requested):

1) A map of the local area
2) Existing policies, regulations and prior reports addressing the study request
3) Current organizational charts
4) Current and four (4) prior year's audit reports
5) Any documents requested on a supplemental listing

C. The District Administration will review a preliminary draft copy of the study. Any comments regarding the accuracy of the data presented in the report or the practicability of the recommendations will be reviewed with the Team prior to completion of the final report.

Pursuant to EC 45125.1(c), representatives of FCMAT will have limited contact with District pupils. The District shall take appropriate steps to comply with EC 45125.1(c).

6. PROJECT SCHEDULE

The following schedule outlines the planned completion dates for key study milestones:

Orientation:	September 18, 2008
Staff Interviews:	to be determined
Exit Interviews:	September 19, 2008
Preliminary Report Submitted:	to be determined
Final Report Submitted:	to be determined
Board Presentation:	to be determined
Follow-Up Support:	If requested

7. CONTACT PERSON

Please print name of contact person: Stephen Luhrs, Associate Supt. of Business

Telephone (530) 622-5081 x208 FAX (530) 622-5087

Internet Address www.eduhsd.k12.ca.us

Sherry J. Smith 8/5/08

Sherry J. Smith, Superintendent Date

El Dorado Union High School District

Barbara Dean

July 30, 2008

Barbara Dean, Deputy Administrative Officer — Date
Fiscal Crisis and Management Assistance Team

In keeping with the provisions of AB1200, the County Superintendent will be notified of this agreement between the District and FCMAT and will receive a copy of the final report.