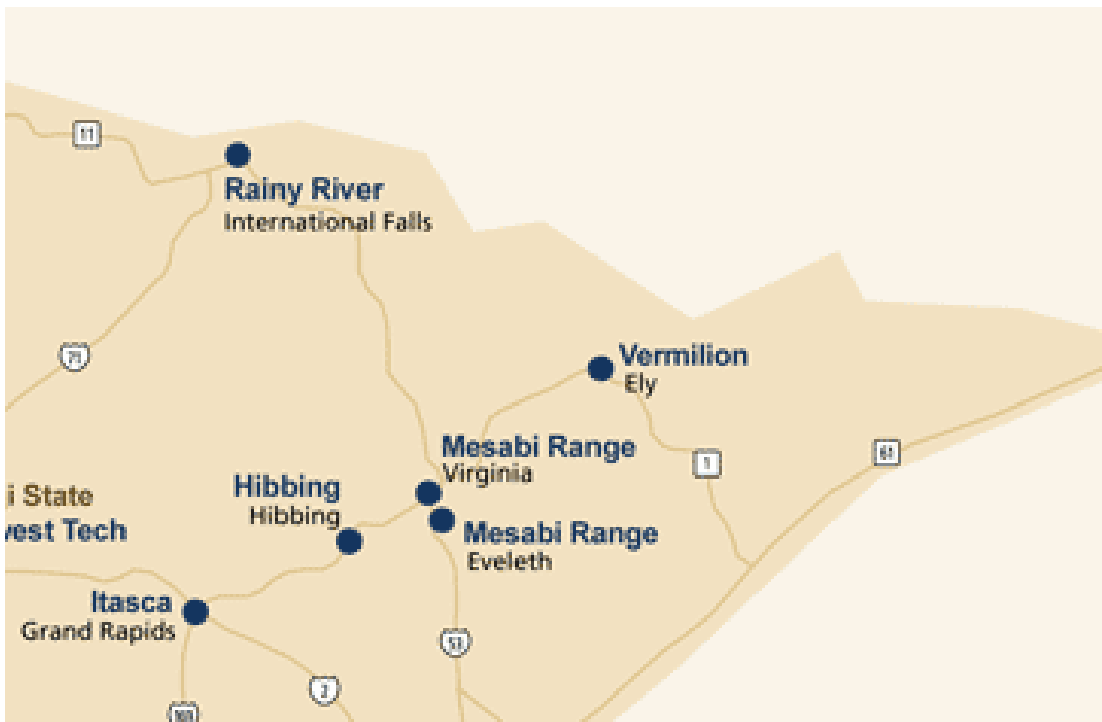




MNSCU Project Management Office NHED-IT

Workplan

Northeast Higher Education District (NHED) IT Shared Services



Version: 1.0 (Final)



MNSCU Project Management Office NHED-IT

Revision Sheet

Release No.	Date	Revision Description
Rev. 0.1	6/18/2009	Initial NHED-IT Workplan
Rev. 0.11	6/30/2009	Work in progress
Rev. 0.3	7/27/2009	Re-combine recommendations, minor formatting changes
Rev. 0.4	7/28/2009	Edits made during 7/28 meeting at Mesabi
Rev 0.5	8/03/2009	Added revised content for email and web services
Rev 0.6	8/04/2009	Document formatting cleanup - Linda
Rev 0.7	8/05/2009	Revisions from 8/5 Workplan Review meeting + Gantt chart + summary
Rev 0.8	8/06/2009	Minor formatting revisions, typo cleanup, etc.
Rev 1.0	8/07/2009	Minor revisions. Added cost estimates to DS, Network, Web Services
Rev 1.01	8/07/2009	Minor revisions. Added cost estimates to DS, Network, Web Services
Rev 1.02	10/15/2009	Minor revision. Removed two blank pages and renumbered.

Work Plan Acronym Key

AUP	Acceptable Use Policy	OOC	Office Of the Chancellor
CMS	Content Management System	QA	Quality Assurance
CSS	Cascading Style Sheets	SLA	Service Level Agreement
HVAC	Heating, Ventilating, and Air Conditioning	TBD	to be determined
IAM	Identity And Access Management	UPS	Uninterruptible Power Supply
ITIL	Information Technology Infrastructure Library	VoIP	Voice over Internet Protocol
OET	Office of Enterprise Technology	WAN	Wide Area Network



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Northeast Higher Education District (NHED) IT Assessment Workplan

Introduction

NHED President Sue Collins, in conjunction with MnSCU CIO and Vice Chancellor Ken Niemi, asked Insight Solutions Group, Inc. to conduct a high-level inventory and assessment of the District's information technology (IT) assets. Insight made a number of recommendations including infrastructure centralization, combined purchasing, collaborative support, and standardization of hardware, software, and services.

Jim Dillemath, System Director of the ITS Portfolio Management Office, was asked to serve as the MnSCU lead because of his prior work and familiarity with the colleges in the District. The district CIOs were then tasked with creating this workplan describing how these recommendations will be delivered, when they will be delivered, and the costs and benefits associated with each recommendation.

The CIOs identified ten recommendations. The workplan is divided into these ten sections, plus a Gantt chart giving a high-level schedule of activities.

The CIOs representing the campuses are:

Linda Raskovich	Hibbing Community College
Chad Haatvedt	Itasca Community College
Shelly McCauley-Jugovich	Mesabi Range Community and Technical College
Renee Peterson	Rainy River Community College
Harlan Tjader	Vermilion Community College

Other significant contributors:

Jim Bovee, Director	NorthEast Alliance for Telecommunications
Don Brearley, Systems Administrator	Hibbing Community College
Jim Dillemath, System Director	ITS Portfolio Management Office
Mike Zbacnik, Project Manager	ITS Portfolio Management Office



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RECOMMENDATION 1: VoIP Standard

Summary

It is the goal of this project to provide the Northeast Higher Education District with a common VoIP platform upon which we can conduct our daily business with clarity and ease. That we may do so by utilizing a reliable system is paramount. It is important that we agree to a standard VoIP implementation in order to reduce costs and improve communications efficiency district-wide.

We believe that the "Asterisk solution" already in place at Hibbing Community College is the standard to follow and will reduce our current costs significantly as well as have a lower implementation cost than the OET alternative.

Costs

Of the two options, the OET costs would be approximately \$209,000 for the installation fees, and an annual cost of \$155,000, while the Asterisk solution would be approximately \$91,000 for the installation and \$80,000 annually.

Benefits

- An overall reduction in district telecommunication expenditures.
- Simplified Management and faster repair response times.
- We would see a ROI approximately 6 months from project completion. Based upon on the \$91k project cost, and an annual savings of \$176,282k with a 1 year timeline for the overall VoIP project.



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Workplan

<i>VoIP</i>			
Action	Target Date	Responsible	Progress Update
<p>Action 1</p> <ul style="list-style-type: none"> ▪ Recommend a common VoIP platform which will provide the greatest number of services at the lowest cost while retaining or improving reliability. 	<p>July 2009</p>	<p>IT Group</p>	<ul style="list-style-type: none"> ▪ OET vs. Asterisk feature list outlined and compared. ▪ OET costs vs. Asterisk costs outlined and compared. ▪ Asterisk solution chosen by NHED IT group vote as desired solution. ▪ Pre-planning and testing of NHED Asterisk system has begun. ▪ Test/demo system installed at Virginia ▪ Contract discussion with CP Telecom and telephone vendors has begun. ▪ We have shown that existing Cisco IP telephones at these campuses are compatible with an Asterisk system through hands-on testing.
<p>Action 2</p> <ul style="list-style-type: none"> ▪ Migrate Mesabi Range CC to VoIP platform of choice. ▪ Migrate Rainy River CC to VoIP platform of choice. 	<p>December 2009</p> <p>February 2010</p>	<p>TBD</p>	<p>Progress for Action 2</p>
<p>Action 3</p> <ul style="list-style-type: none"> ▪ Merge Itasca CC into NHED VoIP System ▪ Merge Vermillion CC into NHED VoIP System 	<p>August 2010</p> <p>October 2010</p>	<p>TBD</p>	<p>Progress for Action 3</p>



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RECOMMENDATION 2: Integrated E-mail Platform

Summary

The NHED IT group recommends the move to an outsourced campus email solution such as Google gmail or Microsoft Live. After vendor selection, student accounts will be rolled out first. Based on satisfaction with Action 2 (student email), the project will proceed with implementing Action 3 (campus staff email). This implementation will help all campuses cut costs across the district and will allow for greater collaboration using standardized email tools.

Costs

Overall reduction of district staff time needed for account maintenance and backup. Overall reduction of hardware costs and the need for additional spam, virus solutions associated with email servers.

External Costs: minimal / Internal costs: 640 hours

Benefits

- Standardized email and collaboration tools across district.
- Reduction in time spent on email integration, backup, and support.
- Centralization allows for better utilization of support resources.
- Minimal costs associated with various solutions (Google gmail or Microsoft live).

Workplan

<i>Integrated E-mail Platform</i>			
Action	Target Date	Responsible	Progress Update
Action 1 <ul style="list-style-type: none"> ▪ Decide on outsourced email platform 	December 2009	TBD	Progress for Action 1
Action 2 <ul style="list-style-type: none"> • Migrate student email to outsourced email platform ▪ Phased approach 	October 2010		Progress for Action 2
Action 3 <ul style="list-style-type: none"> ▪ Migrate employee email to common platform. ▪ Phased approach (same as above) 	December 2010		Progress for Action 3



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RECOMMENDATION 3: Directory Services

Summary

This project involves developing an integrated directory service to allow users to authenticate to network services. NHED students and employees should be able to authenticate at any campus using a single set of credentials. If possible, the NHED system will leverage the Identify and Access Management services currently under development by MnSCU.

The role of Directory Services (hereafter referred to as DS) goes way beyond user authentication. Many, if not most of the information technology services that we use every day rely in some fashion on DS. Nearly every IT service/function that we hope to develop in our collaborative effort will rely on DS.

Costs

The selection process will consider costs and provide a more detailed analysis.

External costs: Up to \$25,000 / Internal costs: 320 hours

Benefits

The benefits of a common DS are difficult to quantify monetarily. It shows its value in the seamless access to IT services for all users across the District. One account in the DS allows a user to log in at any campus, have access to printers, wireless services, email, etc. On the back end, it allows servers, software agents, etc the ability to communicate and control resources.



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Workplan

<i>Directory Services</i>			
Action	Target Date	Responsible	Progress Update
<p>Action 1</p> <p>Select a common directory.</p> <p>We need to identify which services rely on Directory Services, and then select a DS for meeting those needs. Directories to consider may include, but are not necessarily limited to:</p> <ul style="list-style-type: none"> • eDirectory • OpenLDAP • MnSCU IAM • Active Directory 	November 1 2009	TBD	Progress for Action 1
<p>Action 2</p> <p>Develop an implementation plan for the common directory.</p> <p>Once the directory service has been identified, the next step is to develop the schema, or how the directory objects are organized, and the conventions used for organizing them.</p> <p>This process is relatively easy and just requires an agreement on naming conventions and how to organize the directory structure.</p>	January 2010	Campus Network Admin Staff with review by CIOs	Progress for Action 2
<p>Action 3</p> <p>Centralize directory services.</p> <p>This step involves deploying the new directory structure across the NHED network. It will involve, populating the directory, configuring the network services to use the directory, testing and educating our users.</p>	June , 2010		Progress for Action 3



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RECOMMENDATION 4: Centralized Data Centers

Summary

Data Center centralization will provide a strong return on the physical IT investments. Centralization will provide for improved hardware, disaster recovery, better utilization of staff resources, and improved customer support. The current wide area network has the capacity and stability to serve all campuses from a centralized solution.

The workplan addresses a number of decision points that still need to be made, such as:

- How many data centers will be needed to provide disaster recovery and load balancing for the district?
- Which data center(s) will be retained as the central data center(s)
- What happens to the non-central data centers? They will still be needed in a reduced capacity to support network equipment, local storage needs, and possibly other specialized, program-specific equipment.
- What business continuity strategy will be employed? For example, a two data center environment could be configured as “load-balanced with failover, or on-line primary with off-line backup, or production primary with development/test secondary.

Costs

Costs are dependent on decisions that have not yet been made, such as how many data centers are needed and what level of infrastructure strengthening is needed at each data center. Examples: waterless fire suppression, redundant HVAC, environmental monitoring, and secured access are areas to be analyzed.

External costs: up to \$100,000 to uplift primary data centers to a “high availability” standard. / Internal costs: 920 hours

Benefits

- Reduction of servers needed due to centralization and virtualization potentially saving \$15,000 annually in hardware/software upgrades and licensing.
- Overall reduction of staff time needed to operate data centers (fewer servers to install, upgrade, and maintain)
- Reduced overall power consumption and reduced environmental footprint due to reduced power consumption and hardware needs.
- Standardized equipment is easier to support.
- Business continuity is improved (if one data center is down, IT services can still be delivered from the other data center).
- Centralization allows better utilization of support resources. The district can afford to have specialists instead of everyone having to be a generalist.
- Improved response times for customer support.
- Provides for a more robust test/QA environment.



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- More secure facilities.

Workplan

<i>Centralized Data Centers</i>			
Action	Target Date	Responsible	Progress Update
<p>Action 1</p> <p>Determine costs and make data center decisions:</p> <ul style="list-style-type: none"> ▪ Determine centralized data center strategy: How many data centers are needed? Where will they be located? What data center upgrades are needed for the primary data center(s). 	October 2009		<ul style="list-style-type: none"> ▪ The following is a list of infrastructure criteria that will be compared across data centers. <ul style="list-style-type: none"> ✓ WAN connectivity (bandwidth, redundancy, etc) ✓ Available rack space ✓ Physical construct (available free space, door sizes, wall materials, etc) ✓ Available electrical service and proper grounding ✓ HVAC capacity/redundancy ✓ UPS and generator ✓ Fire suppression ✓ Flood Control ✓ Environmental monitoring and notification ✓ Security and access control ✓ Cable management
<p>Action 2</p> <p>Planning:</p> <ul style="list-style-type: none"> ▪ Analysis/design of centralized data center(s) <ul style="list-style-type: none"> ○ Hardware standards, i.e what type, what can be re-used, where to install. ○ Software standards ○ Network architecture ○ Business continuity strategy 	January 2009		Progress for Action 2
<p>Action 3</p> <p>Build:</p> <ul style="list-style-type: none"> ▪ The build phase should be easy if well-planned. 	April 2010		Progress for Action 3



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Action 4			
Implementation:	Summer 2010		Progress for Action 4
<ul style="list-style-type: none"> ▪ Testing ▪ Phased implementation 			

RECOMMENDATION 5: Network Management

Summary

This aspect of our district-wide IT integration project is absolutely the most critical. The success of our other projects hangs on the concept that we have a “well oiled” network capable of handling all of our needs quickly and reliably. This is an attainable goal; however this portion of the project will require much more time spent in the planning stages as we have several possible routes to choose from.

Network Management is a very broadly defined term, as it includes configuration & revision control over the network gear, Intrusion Detection, Threat Management, Equipment Warranty and Replacement Strategy, Bandwidth Monitoring, Quality of Service management, and the list goes on and on.

Costs

Costs are dependent on the management tools employed. Open Source tools are available for minimal costs. If commercial tools are needed due to a need for more robust feature set, there would be an additional cost. Another impact to the costs is how much support will be provided by the MnSCU OOC Infrastructure group.

External costs: Up to \$10,000 / Internal costs: 720 hours

Benefits

- Intrusion detection across the district.
- Network access control across the district.
- VLAN changes are enabled across the district.
- Improved detection and response to network issues.



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Workplan

<i>Network Management</i>			
Action	Target Date	Responsible	Progress Update
Action 1 <ul style="list-style-type: none"> • Individual College Network Equipment Inventory and Configuration Information 	October 2009	TBD	<ul style="list-style-type: none"> ▪ Some Schools are posting partial equipment inventories on the MnSPACE collaboration space.
Action 2 <ul style="list-style-type: none"> • NHED Network Design Planning 	February 2010	TBD	<ul style="list-style-type: none"> ▪ Pre-Planning and Strategy discussions are happening between Don and other IT/Cisco Professionals. ▪ Intrusion Detection Systems already being scaled up in Hibbing.
Action 3 <ul style="list-style-type: none"> • NHED Integrated Network Implementation 	April 2010	TBD	<ul style="list-style-type: none"> ▪ Some configuration changes are being made in Hibbing to allow for the VoIP project to continue. Broad, district wide network changes are a long way off.



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RECOMMENDATION 6: Web Services

Summary

Web services are an aspect of our district-wide IT integration project that is critical. The success of our district depends on effective marketing. Moving toward common web technologies will enhance the effectiveness of the district web presence and using a common navigation structure and terminology that will enhance the end user experience.

Consolidation of district web servers onto a common platform and backend will reduce costs. Use of a common content management system will also allow for better support and training for district personnel responsible for content.

Costs

External costs: Hardware and software costs up to \$7,500. / Internal costs: 920 hours.

Benefits

Hard benefits:

- Overall reduction of district staff time needed to configure web servers, web server security, databases and associated web technologies. There will be fewer servers to install, upgrade, and maintain.
- Overall reduction of district staff time needed to develop end user and content management system training.

Soft benefits:

- Improved marketing and enrollment is the ultimate goal of this project and has high benefit potential.
- Standardized web technologies.
- Business continuity will be improved.
- Common standards and policies will create consistency and improved understanding across the district.
- Common platforms and software will assure better CMS end user support and training.
- Having one NHED IT expert, along with one backup, in web technologies will allow NHED to better implement new technologies as they emerge and deploy advanced web technologies more quickly.



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Workplan

Web Services

Action	Target Date	Responsible	Progress Update
Action 1 <ul style="list-style-type: none"> • Research and evaluation of web server hardware and software will be conducted. • One common web platform will be selected for district-wide use. 	May 2010	TBD	Progress for Action 1
Action 2 <ul style="list-style-type: none"> • Research of Content Management Systems (CMS) will be conducted. • A test CMS environment will be established. • A pilot group of end users (minimum of one from each campus) will test, evaluate and provide feedback on each CMS. • One common Content Management System for district-wide use will be selected and purchased. 	August 2010	TBD	Progress for Action 2
Action 3 <ul style="list-style-type: none"> • Design templates, CSS and layouts for individual campuses. • Migrate campus web sites into selected Content Management System. 	December 2010	TBD	Progress for Action 3
Action 4 <ul style="list-style-type: none"> • Develop and deliver training for content managers. 	May 2011	TBD	Progress for Action 4



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RECOMMENDATION 7: Workstation Management

Summary

Workstation management, for the scope of this project, refers to the process of providing software updates, operating system updates, disk imaging and system inventory services to all computers, (except servers, which are addressed under other services) attached to the NHED network, whether via a physical cable connection, or via a wireless connection.

These services can be managed by centralized console(s) and management functions can be distributed if needed. It is expected that there be at least two subject matter experts in this area located on different campuses. In addition, each campus may desire to have an individual with the understanding of the basic operational aspects of the management tools.

Costs

There are software packages on the market that provide the type of workstation management tools that are described above. Zenworks Configuration Manager and its add-on product called Patch Management is one example that is in use by at least one College in the District. The licensing cost of deploying the Zenworks tools District wide would be about \$2,100. Other tools could be higher but should be under \$10,000 district-wide.

External Costs: Minimal software costs of \$2,000 to \$10,000. / Internal costs: 880 hours

Benefits

Enterprise workstation management tools enable the IT Staff to centrally manage all software aspects of computer workstations. The person(s) responsible for workstation management can install software remotely, apply updates and patches, can provide remote assistance tools to helpdesk staff. The updating and patching process can be automated and applied after hours.

It should be understood that workstation management tools do not replace the need for hands on technicians in some circumstances. Setup, replacement and repair still require skilled technicians to handle hardware issues. However, with modern, newer and more reliable computers deployed across the district, the amount of time spent on this should be reduced.



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Workplan

<i>Workstation Management</i>			
Action	Target Date	Responsible	Progress Update
<p>Action 1</p> <p>Workstation Management Tools</p> <p>Select a set of tools to perform workstation management across the district based on the management services we want to provide. These may include software for imaging workstation, patch management, drive locking, license management, software installations, network access control, etc.</p>	November 2009	ITS Staff	Progress for Action 1
<p>Action 2</p> <p>Workstation Policy</p> <p>Develop/recommend a common workstation security policy/AUP regarding user rights and access controls.</p>	August 2010	ITS Staff	Progress for Action 2
<p>Action 3</p> <p>Implementation</p> <p>Implementation of workstation management policies and tools.</p>	December 2010	ITS Staff	Progress for Action 3



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RECOMMENDATION 8: Help Desk

Summary

Though most users see helpdesk and want people our desire is to integrate a set of tools into a homogenous entity across NHED that is as unique to each user as it is identical to each helpdesk personnel. These tools will collect an inventory of hardware (with vendor), software, issues and solutions to be used first by the technology user (self-help) and secondly by the helpdesk personnel assigned to the issue. The interface should be web based for both customers and helpdesk personnel with an emphasis toward self-help with suggestions for the customer to solve the issue themselves.

With customer self-help and helpdesk issues and solutions being added to the back-end database we can provide a quicker resolution to customer issues. As well as tracking of potential vendor/product issues that can lead to a better experience for our customers. The web interface allows for universal access for customer to enter issues and find answers, and help desk personnel to look for open tickets, solutions and trends that may indicate the need for broader audience training.

Costs

Though open source software may be available it will be worth starting with a few low cost commercial packages. Many of these packages contain inventory modules that can be used for the workstation management and the network projects. This integration can reduce our ramp up time for several projects. Total cost should stay under \$15K

External costs: commercial help desk toolset cost should stay under \$15,000. / Internal costs: 560 hours

Benefits

- Helpdesk process can be the glue that keeps the other projects together.
- An inventory package for work station management.
- A problem database for potential vendor/hardware/software issues and future purchase decisions. A solution database for self-help and quicker problem resolution.
- A commercial package will shorten the time to a functional helpdesk.



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Workplan

<i>Help Desk</i>			
Action	Target Date	Responsible	Progress Update
Action 1 <ul style="list-style-type: none"> ▪ Review campus help desk tickets and current help desk process. ▪ Review ITIL standards ▪ NHED-IT group will pilot a help desk solution. 	May 2010		Progress for Action 1
Action 2 <ul style="list-style-type: none"> ▪ Planning: escalation procedures, SLAs, staffing, on-call, etc. 	August 2010		Progress for Action 2
Action 3 <ul style="list-style-type: none"> ▪ Select and implement a pilot help desk toolset for NHED-IT staff ▪ Implement the production help desk toolset for the district. 	May 2010 March 2011		Progress for Action 3



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RECOMMENDATION 9: Collaborative Purchasing

Summary

Collaborative purchasing for NHED is driven by the preceding recommendations and the desire to provide the best experience we can for our clientele. The ability to provide better support, centralized control, and continuation of operations should something happen at any one site is the goal of this collaborative purchasing plan.

Our desire is to first standardize on core equipment (infrastructure and communication) and common software (O/S, integrated office apps, security, and lab software), server hardware and software standards (as we move toward the data centers). Then move on toward a common standard for end user equipment and software where ever possible (this makes it possible for a centralized helpdesk to succeed). We realize that some of these items will take longer to replace as the current equipment and software finishes its normal replacement / contract cycle.

Costs

There are no additional external costs. Some internal labor costs will be needed to determine district standards.

External costs: none / Internal costs: 300 hours

Benefits

Benefits to collaborative purchasing are: 1) similar software and hardware on all campuses, 2) allowing for quicker helpdesk problem resolution and, 3) better tracking of issues. All the projects will benefit from similar tool sets used on the campuses, but the hard dollar benefit due to better vendor pricing is not yet determined.

Soft Benefits:

- Ease of support across district
- Improved support from vendor
- Standardization for all user groups
- Reduced need for backup items due to district-wide sharing

Workplan

<i>Collaborative Purchasing</i>			
Action	Target Date	Responsible	Progress Update
Action 1 <ul style="list-style-type: none"> ▪ Select common anti-virus package 	August 2009	Chad Haatvedt	President's council approved purchase and Sophos was purchased in July 2009.



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Action 2 ▪ Set standards for technology purchases	Fall 2009		Progress for Action 2
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RECOMMENDATION 10: District IT Structure

Summary

A consolidated IT department for the district will need a well-thought out strategy for funding, governance, organizational structure, and communications. These items should be well documented from the onset to ensure that all parties understand how the department will operate. The district strategies and policies need to be clearly defined, fair, and open and available. The policies/guidelines should provide clear direction to the department without getting in the way of providing services to the customers. Furthermore this structure will need official authorization so that its authority and policies will not be subject to frequent disputes.

Costs

Benefits

Workplan

<i>District IT Structure</i>			
Action	Target Date	Responsible	Progress Update



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<p>Action 1</p> <p>District Funding:</p> <ul style="list-style-type: none"> ▪ Create funding policy <ul style="list-style-type: none"> ○ Who approves and pays for district IT items? ○ Who approves and pays for campus specific IT items? ○ What is the approval process? It should be a different process for small vs. large expenditures. ▪ Funding for one-time district startup needs (Data Center Upgrades, for example) ▪ Student fees should remain with the campus and show value to the students. 	<p>September 2009</p>	<p>TBD</p>	<p>Progress for Action 1</p>
<p>Action 2</p> <p>District Governance:</p> <ul style="list-style-type: none"> ▪ Does the department need a charter (or similar document) that grants it the authority to exist? ▪ Policy making. Who makes policy at each level? (e.g. campus, district IT, etc) ▪ What is subject to central governance? 	<p>September 2009</p>	<p>TBD</p>	<p>Progress for Action 2</p>
<p>Action 3</p> <p>Organizational Structure:</p> <ul style="list-style-type: none"> ▪ Determine reporting structure changes, if any. ▪ Determine roles/job descriptions. 	<p>November 2009</p>		<p>Progress for Action 3</p>



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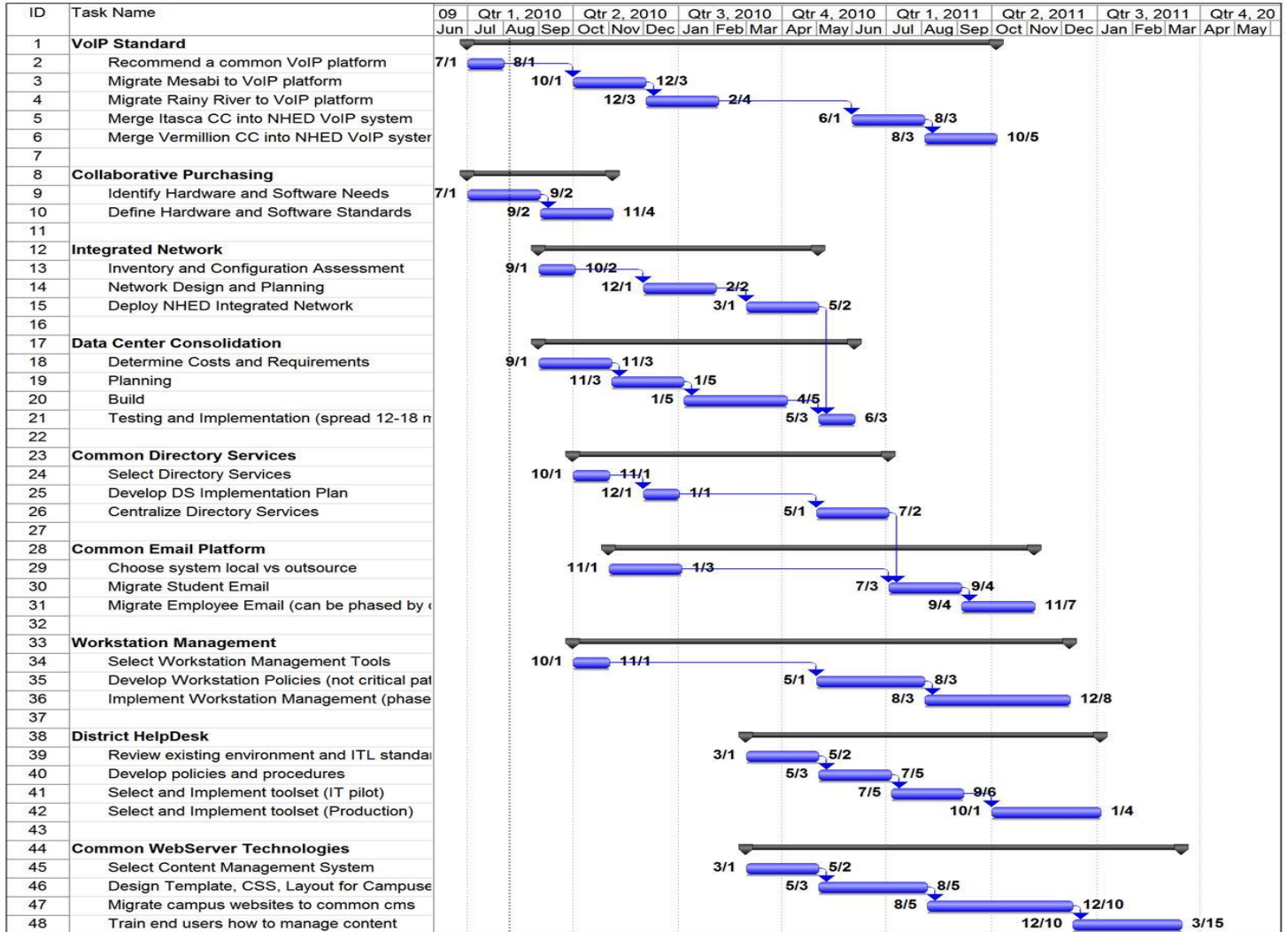
<p>Action 4</p> <p>Communication:</p> <ul style="list-style-type: none">Who speaks for the district IT department?Communication standards – what is the department called, for example.What reporting is required from the district and who is responsible for that?	December 2009	TBD	Progress for Action 4
<p>Action 5</p> <p>Create Policy/Procedure Manual:</p> <ul style="list-style-type: none">Create documentation describing the district's policies and procedures.	December 2009	TBD	Progress for Action 5



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Project Schedule

The following is a Gantt chart which gives a high-level view of the schedule of action items. Note that the top timeline is fiscal quarters, not calendar quarters.





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Summary of Recommendations

Recommendation 1: VoIP Standard

- External Costs/Benefits: Two options for VoIP platforms: OET or Asterisk

	Current	Asterisk	OET
One Time Startup costs	\$0	\$91,330	\$208,967
Recurring costs per year, e.g. monthly line charges, long distance, etc)	\$255,936	\$79,654	\$154,800
Annual Savings over Current	\$0	\$176,282	\$100,136
Break even from implementation date		6 months	24 months

Recommendation 2: Integrated E-Mail Platform (outsource to Google or Microsoft)

- External Costs: minimal / Internal costs: 640 hours
- Benefits: Reduced internal labor, improved support, district-wide standard email access, improved functionality.

Recommendation 3: Directory Services

- External costs: Up to \$25,000. / Internal costs: 320 hours
- Benefits: This is an enabling item. It is necessary for centralization of infrastructure and services.

Recommendation 4: Centralized Data Centers

- External costs: up to \$100,000 to uplift primary data centers to a “high availability” standard. / Internal costs: 920 hours
- Benefits, \$15,000 annually in hardware and licensing, reduced power consumption, reduced labor costs, business continuity, more secure facilities.

Recommendation 5: Network Management

- External costs: Up to \$10,000 depending on support from the OOC Infrastructure group. / Internal costs: 720 hours
- Benefits: This is an enabling item. It is necessary for centralization of infrastructure and services. Other benefits include improved monitoring and security and network access control across the district.

Recommendation 6: WEB Services

- External costs: Hardware and software up to \$7,500. / Internal costs: 920 hours.
- Benefits – Reduction of internal support labor, improved service, quicker implementations, better training.

Recommendation 7: Workstation Management

- External Costs: Minimal software costs of \$2,000 to \$10,000. / Internal costs: 880 hours
- Benefits – Reduced internal labor costs through central management of all software aspects of computer workstations.

Recommendation 8: Help Desk

- External costs: commercial help desk toolset cost should stay under \$15,000. / Internal costs: 560 hours
- Benefits – This is an enabling item and is necessary for supporting the district. Other benefits include improved customer support experience, improved knowledge base, and reduced support costs.



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Recommendation 9: Collaborative Purchasing

- External costs: none / Internal costs: 300 hours
- Benefits: Hard dollar benefit due to better vendor pricing is TBD. Soft benefits include 1) similar software and hardware on all campuses, 2) allowing for quicker helpdesk problem resolution, and 3) improved support from vendors

Recommendation 10: District IT Structure

- External costs: TBD / Internal costs: TBD
- Benefits: Central funding, governance, org structure, and communication are all necessary for district centralization.