

Faculty and Staff Computing Proposal

West Engineering Computing Networks (MEEM, ChemEng, Biomed)

Introduction

Information technology has become a pervasive and critically important departmental service. Use of technology is embedded in our business and academic processes and continues to grow in its importance both internally and externally. The functional aspect of supplying and supporting computing is in transition and with that we propose adopting new methodology, procedures, and policies to enhance our computing infrastructure.

This proposal will outline a new computing plan, discuss the impact the plan will have on faculty, staff, and computing support personnel, and discuss the financial impact on the departments. It will also present strategies to keep costs to a minimum while creating the most flexible and empowering computing environment possible.

Proposed Computing Infrastructure

Mobile computing devices have become extremely practical and affordable for all aspects of computing, from general to extreme graphical and computational use. Support for mobile computing has historically been a concern due to the instability of the hardware and the short life of maintenance agreements with vendors. Competition among hardware vendors has decreased this major concern; instead it is now possible to obtain maintenance agreements for the duration of life of the devices, approximately 3 years. In addition, wireless networks have been non-standard, insecure, and limiting in bandwidth until recently. With new developments in the wireless sector it is now possible to provide high bandwidth, high availability, and secure networks for mobile users.

In the new proposed model our faculty and staff would be provided laptops to create a mobile work environment. While in the office or moving about in the departments the devices would be on the West Engineering Computing Network (WECN). Laptops would be configured to be functional on both the wireless networks in the buildings and modem and DHCP access while traveling.

Our faculty work in diverse areas and have specific needs, because of this it would be limiting to suggest we could standardize on one laptop vendor. But, we also recognize that standardizing on hardware allows for greater financial savings. We will need to discuss this and determine our best solution. This proposal offers one scenario with different tier levels for varying hardware needs. We are proposing a 3-tiered plan with 3 different laptops to choose from and both a Windows and Macintosh environment. We could also look at supporting a Linux environment as well, but we'll need to have a sense for how many faculty and staff are interested before investing the time.

The Three Tiered Plan

Tier 1: General Use

This plan is intended to support faculty and staff who have general use needs; email, web browsing, word processing, spreadsheet use, presentation preparation, database creation/querying, publications, and PDF creation/modification.

Tier 2: Modified General Use

This plan is intended to support faculty and staff who have general use needs and who require additional hardware and who travel frequently; palm pilot, videoconferencing, electronic tablets, and other various devices.

Tier 3: Simulations/CAD/CAE/FEA 3D Application Use

This plan is intended to support faculty who are currently teaching 3D applications and/or developing course work that entails a significant level of hardware. This plan would also support faculty who have research UNIX workstations that the laptop would need to connect to and run applications from.

All laptops will have the following software installed and configured for the WECN:

Microsoft Office Professional Edition (Word, PowerPoint, Excel, Access)

Microsoft Visio

Microsoft Project

Microsoft Publisher

Adobe Acrobat

Adobe FrameMaker

MeetingMaker Calendar

Internet Explorer

Netscape

Eudora Professional Email Client

McAfee Virus Scanning Client

Additional software can be added on a case-by-case basis or the user can add and configure software as needed.

In this new model faculty and staff would be provided administrative access to install and configure hardware and software. This will be accomplished by creating various group policies in our newly deployed active directory and augmented with local policies. The departments will need to create written policies prior to this being available. Michigan Tech obtains Internet service from MichNet, which requires a qualified system administrator to maintain security on each and every machine that resides on the network. Because of this it is necessary to maintain a level of security acceptable by MichNet and WECN, but, at the same time provide the users with flexibility and freedom. The departments' computer committees should be charged with developing this policy. The committees will also need to discuss the new wireless networks and the implications of

deployment. Policy will need to be written defining where wireless networks will reside, who will have access to them and how secure they will be.

Physical Hardware For Desktop Use

Laptops provide computing freedom but they are not meant to act as desktop machines. The physical use of a laptop is not comfortable for long-term daily office work. We advise that all laptops, when used as a desktop workstations, be equipped with full sized keyboards, mice, and monitors. In order to accomplish this we have two possible solutions.

The first, deploy docking stations with each laptop. A docking station allows the user of a laptop to slip the laptop into a device that has a full size keyboard, mouse, and monitor plugged into it. This method of mobile computing works quite well if you have a very limited number of devices and they are all identical, but not well in a large deployment with variable devices. There is a big drawback with docking stations and that is their requirement of drivers (software). Because of this requirement there will be a much greater need for supplemental support and an increased probability for driver problems.

The second possible solution is use of a USB hub, which does not require any drivers for functionality. A USB hub would be deployed on each desktop with 4 available ports. Two ports would be used for the full size keyboard and mouse. The USB hub would be plugged into the laptop activating the keyboard and mouse for the laptop. In this case the users would need to plug the monitor cable into the laptop. The drawback in this case would be the likelihood of bend pins in the cable of the monitors.

In either of the above scenarios while the laptops are on the wired or wireless networks in WECN they will have access to all network shared filesystems, network printers, and centralized services provided by organizations outside of the departments. User will have the ability to download new software, install patches, access work related data, and have access to departmental databases.

Impact on Users and Support Staff

Our current method of computing for faculty and staff is not standardized and difficult to manage and support. And, in some cases it is inflexible and inefficient for the users. Currently, many of our faculty and some staff has both a desktop machine and a laptop, and in many cases a home desktop machine as well. Users have trouble keeping track of files, setup access and networking, buying and installing software, and configuring and troubleshooting hardware. Support personnel are often overwhelmed with the number of unique devices, operating systems, types of software, and various patch levels they are required to support. We do our very best to keep up but it is proving to be quite difficult.

With this new model of computing our support personnel will have the ability to better serve faculty and staff, providing a much more positive work environment for both those using computing and those supporting computing. Our users should feel a sense of

computing freedom and flexibility, they will have an opportunity to learn and develop their computing skills through experimentation and exploration. We strongly believe the users should feel much more empowered and will use computing more.

There will be a period of time in which our user base will be learning and honing their skills in this new environment. We do anticipate a fairly high demand will be placed on the support personnel for the first 6 months of transition. Development of training courses is in process. This training is geared to assist users in developing their troubleshooting skills and teaching them how to configure both Windows XP and Mac OS X. We do anticipate the support requests to decrease after the first 6 months and therefore are not requesting additional FTE's for this project. We will utilize the talents of our current student employees and will look for additional qualified students as necessary.

After we have agreed on our preferred vendor(s) and installed our wireless networks, test hardware will need to be ordered and configured before we can start our deployment plan. The initial deployment of this project would occur in stages. The major stages are outlined below:

Assumption: USB devices will be deployed and not docking stations.

Stage 0: Receipt of one hardware device in each of the three tiers. It will be necessary to receive in advance of the full shipment, one of each device. This is needed to build the images that will be installed on the laptops before deployment. Each laptop will have an OS, security patches, and software installed as well as configured for the networks before deployment to the users.

Stage 1: Purchase and deploy USB hubs to all desktops that will be receiving a laptop. This will entail creating space on ones desk to accommodate a 4"x5"x2" device that has three wires emanating from it. We could consider mounting these devices under desktops but this will impede a persons ability to quickly plug and unplug devices. We could also consider wall mounting, a drawback would be having to move the device every time a desk is moved.

Stage 2: Storage of laptops. We will require a space large enough to house the boxes of laptops as they arrive. The boxes will be approximately 24"x24"x24". Please see attached spreadsheet for number of boxes to determine overall storage space requirements.

Stage 3: Unpacking and installation of pre-designed images. At this stage the laptops are ready for deployment to the users. We will have a predefined prioritized list from the departments stating the order of deployment to the users and what tier each user is to be provided. We anticipate having the capacity to deploy 5 laptops per day during times in which our request system is receiving an average number of calls and up to 15 per day when requests are low.

Stage 4: Training. We will provide several training sessions for the users on how to configure Windows XP and Mac OS X operating systems. The focus of these sessions

will be to teach people how to troubleshoot and solve typical problems on their own. The objective will be to provide enough insight that people feel comfortable fixing problems. This will be necessary since we envision people taking their laptops home and on the road and in this scenario there may not be technical personnel to assist with problems.

Financial Impact on Department

There will be an initial cost involved in this proposal but there are long-term savings to counterbalance the initial cost. Until we decide on our vendor of choice and the hardware requirements it will not be possible to provide a definitive financial commitment. A preliminary commitment has been outlined in Appendix A. There is a significant amount of existing hardware that can be utilized; monitors, keyboards, and mice.

Installation of a new wireless network will be a significant financial commitment for the departments but the long-term costs should be less than our existing wired network. We do anticipate saving 10% on monthly network fees by making this transition, although the savings will not be realized for several years.

Partnerships, grants, and educational discounts for the laptops, USB hubs, and tablets will be utilized when possible. MTU is currently discussing partnerships with Dell and IBM, and we may want to evaluate partnerships with Cisco, Sony, and Toshiba as well. We currently receive an educational discount through these vendors but would like to augment that with increased maintenance and service contracts as well as replacement contracts.

There will be no request for additional FTE's during this project. Additional student workers may be necessary and have been factored into the financial projection (see Appendix A).

Future Plans

Graduate Students

This policy and service will be extended to our graduate students after we have completed deployment to faculty and staff. At this point graduate students would be required to purchase the laptop computer. The basic access fee the students pay each term will continue to pay for network costs, printing, software licenses, staff salaries and benefits, and general maintenance of the computing infrastructure.

VPN's

We will be assessing the need for virtual private networks for traveling personnel and personnel who work a significant amount from home. Supporting a VPN would allow the users to access network files, such as home directory files, from wherever they may be. Currently, our users need to transfer files from the home directory to the machine they are

working on and then back again when they are finished with editing. With a VPN the users would have the ability to work on their files without transferring.

Conclusion

Computing is a necessity in the workplace today and continued growth in the importance of flexible computing environments is not waning. Technology has empowered us all to be more productive, more innovative, and more creative. We can now functionally perform a majority of our job responsibilities from laptop devices. Situations will exist that will require desktop machines and not laptops and we will continue to be sensitive and supportive of these situations. This could be a software or hardware requirement or a personal preference. We will look for partnerships with vendors who can work with us on variable hardware needs. We are not advocating standardization across the board. An educational institution whose focus is research and engineering should not expect to standardize on one platform, one OS, or one set of applications. We understand this and have designed a backbone that can accommodate multiple hardware and software scenarios. What is being proposed is not meant to be restrictive but instead to be empowering and provide a sense of computing freedom.

We look forward to this new computing environment and the challenges we anticipate. We also look forward to hearing your comments and ideas. If you have any input on this please feel free to talk with me.

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