



Enterprise Network Proposal

Submitted to:

Sabah Randhawa
Provost and Executive Vice President
Oregon State University

and

Strategic Computing Deans and
Vice Provost for Research
Oregon State University

February 10, 2005

By Jon Dolan
Associate Director of Network Services
Oregon State University

EXECUTIVE SUMMARY

- Information Services has a standing request to issue \$15M in Certificates of Participation (COPs) to upgrade the campus wire plant. The request has broad support but still needs a firm commitment to pay the debt service.
- Even when the wire plant is upgraded we will still need to pay ongoing costs for the electronics and the personnel to operate the network.
- We need a uniform Enterprise Network to be able to effectively deploy now common place technologies such as electronic door locks, building environmental controls, enhanced classrooms, and wireless networking.
- Information Services (IS) has a track record of successful technology consolidation where services are hosted centrally but have decentralized control. Examples include DNS/DHCP maintenance, MS Exchange hosting, Central Web Services, Community Network, Active Directory and FlexNet.
- IS should be given the responsibility to run the Enterprise Data network and the ongoing normal operational costs should be centrally funded. This would cost approximately \$600K a year in E & G budget. This would allow departments to redirect the money they are currently spending on networking to services more closely aligned with their mission.
- This proposal is consistent with the University's strategic plan, and is a direct result of the initiatives outlined in it.
- Those units whose mission includes "advanced data networking" would not be compelled to participate in the Enterprise Network; however, funding of their advanced networking activities would continue to come from their resources.

BACKGROUND

As OSU's network has evolved, we have gone through several iterations of wiring standards and technologies. Coupled with a history of requiring departments to be financially and technically responsible for their local area networks, this has resulted in a fractured overall data network. Quality of installation and management varies widely from department to department and room to room in some buildings.

In 2002, IS attempted to correct the worst of the wiring on campus with a proposal to remove all "Thin Net" wiring. The project was funded with a combination of central funds, TRF funds, and departmental funds. Those departments participating were asked to pay for 25% of the cost of rewiring to current campus and industry standards, with the remaining 75% covered by central and TRF funds.

With this project, we were successful in bringing 17 buildings nearly to the campus wiring standard. I say nearly because in many of the buildings we found that we were not able to complete the entire building due to one or more units within the building not participating. Furthermore, we found the entire process hampered by the now entrenched territorial questions over who was responsible for what within a building. We could bring the wire up to date, but to actually use the wire required network electronics to be purchased and managed by someone, and often who that should be is either unclear or in dispute.

Overall the project was successful in updating the worst of the wiring on campus and did provide higher levels of service and functionality for those who participated. Hard lessons were learned, however. The most valuable lesson is that even if the cost requirement to departments is minimal, some departments will not be able to allocate additional funds from their already meager budgets to upgrade their networks. We also learned that the bulk of the expense in wiring a building correctly was in providing the pathways for wire and the wiring closets needed to support the electronics. This upgrade of pathways and closets can be considered a one-time expense for the building, and if done properly allows for extension and modification of the wire-plant relatively easily and cost effectively. Finally, we learned that wire and network electronics in a building should be approached from a whole building perspective, rather than from a departmental perspective. Insisting that departments be financially and technically responsible for their wire and network electronics, encourages duplication, redundancies, and unreliable networks.

CAMPUS WIDE UPGRADE PLAN

While the Thin Net Project was a good start, it is clear that we have a long way to go. We estimate that only 33 buildings are currently up to campus wire-plant standards. This leaves some 80 buildings needing to be rewired. Based on our experiences with the Thin Net Project we have proposed that a comprehensive wire-plant upgrade be done with central funds rather than requiring departments to partial fund wiring for the

buildings they occupy. At this time it is recommended we move forward with our (COP) request for \$15M with a suggested 7 to 10 year repayment schedule.

We expect that the earliest the funds would be available would be Spring of 2006, and that the project to rewire campus would take at least 2 years to complete. Network Services is currently working on a tentative project plan which will cover the rewire, initial network electronics, and a schedule of buildings to be completed.

THE PROBLEM WITH THE PLAN

While we have a proposal for paying for wiring and initial electronics, we have an unresolved issue regarding the funding of the ongoing costs in personnel and replacement electronics to effectively operate the network once installed.

Currently, close to 50% of the campus network is run by Telecommunications on a fee basis. FlexNet was designed to allow departments to pay on a per port per month basis to have Telecommunications Services take care of the data network for them. This model works well for smaller departments under the premise that departments should be responsible for their local networks, but continues to encourage a fractured network by giving larger departments a financial incentive to do their own thing.

WHAT'S WRONG WITH A FRACTURED NETWORK?

Until recently having various units across campus be responsible for their networks did not really cause any problems. The computers that connected to the network were static, it was clear who was responsible for what, and demands on the network were fairly low and mostly localized. That is no longer the case. We are now seeing that technology is going more and more away from local area network services with local servers, to Enterprise network services as our networks are getting more complicated and more capable of providing advanced functionality.

Services such as network attached building control systems, networked door locks, managed wireless networks, and enhanced classroom instructional systems now commonly assume a uniform Enterprise Network and count on interoperability across the network to function properly. Only the minimally required interoperability exists today and any error becomes nearly impossible to resolve based on the lack of clear accountability in all instances. The result is that the efficiencies possible by installing these technologies are either simply not realized or are completely negated by the overhead of trying to manage them across multiple networks.

NETWORK SERVICES SHOULD BE RESPONSIBLE FOR THE ENTERPRISE NETWORK TO THE ORANGE JACK IN THE WALL

Over the last several years, IS in general and Network Services in particular, have made great strides in building trust across campus in the services offered and managed. We have worked very hard to ensure reliability, be responsive to the needs of units across

campus, and to provide the highest level of technical knowledge and service. In doing so we have built a track record of providing timely and well managed services such as DNS/DHCP, IP Management, Email relay with anti-spam and anti-virus, Exchange Email hosting, Windows Active Directory, Central Web Hosting, and data networks.

In each of these cases, our services have been robust, reliable, and have set the standard for service. We have done this by being attentive and responsible to the needs of campus, and by putting control at the local level as much as possible without compromising integrity of the services offered. We have shown that we take our responsibilities seriously and we want to see the network function as well as it can to enable the units of the university to focus on their missions and accomplish their goals.

We believe the network should be as ubiquitous and easy to use as the power system on campus, and that it should be more reliable than the power system currently is. To accomplish this we need to centrally fund the ongoing operational costs of running the network. We propose the following annual budget be allocated:

* Personnel – 3 FTE Network Analysts	\$225,000
* Equipment Replacement – 4 year technology lifecycle	\$275,000
* Core Network Maintenance - replacing current service credits	\$100,000
 Total Annual Budget	 \$600,000

IMPACT AND CONSISTENCY WITH CAMPUS STRATEGIC PLAN

Network Services is currently realizing approximately \$400,000 in combined revenue between FlexNet Charges and Fees for connecting to the core network. As stated earlier, FlexNet only services 50% of campus networks today so while it may not be easy to determine a precise figure it is a safe assumption that the University is spending at least another \$200,000 annually on data networking. By centralizing this function and the funding, we will enable increased efficiencies campus wide in the use of technology at no additional cost. The impact of making this decision is that the costs are not uniformly dispersed and some means of reallocating funds will need to be determined.

This proposal was a direct result of the campus strategic plan and initiatives and therefore consistent with it. In support of Goal 1 (Provide outstanding academic programs that further strengthen our performance and pre-eminence in the five thematic areas.) the Vice Provost for Information Services was specifically directed to forward a plan to improve OSU's physical infrastructure in support of this goal, as well as the academic infrastructure of the University. The campus data network is the foundation of all the University's technology services. As described above, the physical infrastructure (wire) is not enough to ensure that this foundation is adequate to support the academic infrastructure and programs needed to achieve this goal, and that is why we are proposing funding of both the wire upgrade and the ongoing operational costs.

Furthermore, by forwarding this proposal we are consistent with the campus strategic plan in that we strive for accountability. It is a core value of the University that we share and we deeply feel that the responsibility to provide this fundamental technology infrastructure for campus is ours and we look forward to being held accountable for how well we provide it.

NON-ENTERPRISE NETWORK MANAGEMENT

By forwarding this proposal we do not mean to suggest that all networks on campus should be run by Network Services. It is clear that certain units have legitimate academic needs to run research networks and that the running of such networks is in line with their missions. It is our intention to help facilitate those networks as appropriate; however, we believe that the funding of such networks should still be the responsibility of the unit(s) involved. We intend to present the units across campus with the proposition of either having us provide the Enterprise Network for them at no cost, or them continuing to provide their own research networks at their own cost.

CONCLUSION

Simply put, Network Services believes that the current practice of requiring the departments across campus to be financially and technically responsible for the basic network infrastructure is an impediment to the University's ability to carry out its mission. By centrally funding and centralizing management of the network, OSU will enable departments to focus on their missions rather than basic IT requirements which can easily and more efficiently be done by Information Services.