

Campus Network Funding – Strategies and Challenges BoF Tuesday, May 7, 2002  
12:00 - 1:00 pm, Wednesday, May 08, 2002

### **Presenters**

Gordon Wishon, University of Notre Dame, Moderator  
Morteza Rahimi, Northwestern University  
Jack Seuss, University of Maryland, Baltimore County  
Ann Stunden, University of Wisconsin

### **Introduction/ Gordon Wishon, University of Notre Dame**

Current climate forces network funding assessment and concerns of current costs. Do high performance networks force more funding and pose different pricing models to accommodate big bandwidth usage? Concern and issues of funding network upgrades:

- Middleware/Security funding
- High volume use
- Optical Networks
- State & Regional network relationships
- Residential network

Panelists to address issues including the costs of advanced networking, how to budget, funding sources, and marketing this on campus.

### **Morteza Rahimi, Northwestern University**

- I. Funding Sources (university, federal and state grants, NSF, private, regional).
- II. Budgeting Models (cost recovery, base budget network investment, multi-year and single year budget models)
- III. Cost Elements/Controls (bandwidth growth, QOS across Univ., over provisioning, network bandwidth)
- IV. Marketing Models (selling, promotion, support)

Advanced networks are expensive, both for initial installation and for ongoing upgrade and maintenance.

Advanced networks are most appropriately viewed as part of the infrastructure. There is usually a budgetary process in place for “infrastructure,” such as regular replacement of water or sewer pipes, but usually not for networking infrastructure. Questions don’t arise when you see a hole being dug to replace water pipes, but they do when you’re replacing fiber. Also, network replacements seem to be needed much more frequently than for “normal” infrastructure.

At Northwestern, Mort has worked hard to get technology and networking expense budgeted for annually, as part of the operating budget, rather than be part of the non-recurring capital budget. Servers are also budgeted this way. CFOs like this model; it provides predictability. NWU also uses a “trickle-down” strategy, moving older equipment to users with less demanding applications.

It would be hard to sell this approach today, in a tough economic climate; it works best to sell it when times are good.

It also only works if there is clear evidence of the value of the network. A good test is to shut the network down and see if anyone complains!

Residence hall networking is handled separately from university networking. Part of the room charge (required and unavoidable) is a residence hall networking charge, just as there is a charge for access to telephone service in the dorm rooms.

Advanced networking costs are charged back 100% to the users – except for servers, which are not charged back at all (to avoid encouraging faculty to establish their own independent, unconnected servers). The charge is a flat fee (monthly) for the right to use the network – also required and unavoidable. A good test is how this fee compares to what commercial ISPs charge.

### **Jack Seuss, University of Maryland, Baltimore County**

There is an ongoing cost to upgrading networks. Network is not similar to other infrastructures in this respect:

- No consistent history of budget
- Budgeting exists everywhere (asking for more)

Chargeback-100% (network) Are charges realistic? What is it that you charge back for? This presents a challenge because people are not cutting back on # of connections (user has the right to plug in or not to lug in).

Marketing: At UMBC, a big motivation was the institution's desire to move to a different Carnegie classification. Advanced networking capabilities were viewed as something that would make a difference (and in fact UMBC has been reclassified as DR/E).

Special appropriations were received to wire the campus. Supporting the additional budget was easy, since about 50% of the students are majoring in disciplines directly related to information technology in some way.

After the dot-com bust, marketing has been a little harder. And a large-scale Peoplesoft implementation for administrative systems is soaking up many of the funds that might otherwise have been available.

Funding sources: Most important was getting the CFO on board and supportive. Several economic development grants were secured from the state for such projects as bringing fiber to an affiliated research park (and at the same time, connecting to state-owned fiber). Networking costs are now included as part of the capital appropriation for all new buildings (important in recent years when there has been a flurry of building activity), and also now included in capitalization of the central core campus as well). In recent years, thousands of beds have been added to residence hall capacity, and this included wiring, facilitating the inclusion of a communications fee assessed to all residence students.

Residential: Separate from University Model/Network is part of the room (rent) on campus. Traffic from residence halls has increased dramatically, and accounts for a very large percentage of university network usage; it was determined appropriate, therefore, that students pay an appropriate share of the costs, via this communications fee.

Budgeting: At UMBC, budgeting for networking is not yet on an annual operating basis like Northwestern, but there is awareness that this needs to happen, especially as the recent building boom (with related funding for capital projects) ends.

UMBC assesses a technology fee, but this typically supports student labs and servers (including the update and maintenance of these).

Costs: Central IT is responsible for the core network, up to the phone closets and the walls in the buildings, and then there is a small per-port assessment to the users.

To convince the campus of the need for advanced networking, a case was made for deployment of desktop video, something that would be used by everyone on campus for training, and thus the need for at least a 10Mb connection to support this.

UMBC ran much more fiber than was ever expected to be needed, making it easy to respond to requests from a lab, for example, to support 1Gb connectivity as needed.

An unresolved challenge is how to fund staff. This is much harder than funding operational costs, and UMBC has found it hard to keep pace.

Another issue is photonic networking. A group on campus is very interested in working on lambda routing. Some federal funds may be coming in for a photonics lab, but it will be difficult to get fiber connections beyond the campus, and support will be a real issue.

### **Ann Stunden, University of Wisconsin**

Current Funding:

- Government (wiring at their pace!)/Green Dollars (build back)
- System (13 college)
- Network Engineer grant funding (I2, NSF>>>)
- Student Technology Fee
- She inherited an ATM backbone, which now needs updating. Central IT provides the network up to the closets in the buildings, and local decisions determine what happens beyond that, making end-to-end support very difficult, for such things as multicast for example.

Campus networking is included to some extent in an overall statewide networking plan, and funding of about \$500,000 is provided via that route. Some funds come from subsidy of telephone services to dorms. These subsidies vary by grade of service and some schools (e.g., medicine) run their own fiber to avoid the port charges. There has been some small grant funding, and a student technology fee is assessed, but the students determine the use of those funds, typically for labs and modems but not networking.

It was determined that 80% of student network use from residence halls was for Napster-like applications, which led to a cap on student use of the network. Analysis suggests that just a few students account for the large majority of the use, and they are being "interviewed." A student network fee is part of the room rate.

The state network has greatly increased its fees to UW, from \$200,000/year to \$500,000/year, and now to \$1million/year.

A faculty governance committee on IT provides oversight, including considerations about IT costs. The committee (which includes many “have-nots” from music, art, etc) has recommended to the CFO that IT be covered as a central cost and not be charged back.

An analysis of IT costs is underway by another committee (on budget planning and analysis), and the anticipated budgetary need is estimated at \$26million over the next five years. Current budgets run about \$3million/year. A cost recovery proposal is being developed. But major decisions on all these issues are just ahead.

Analysis of peer practices among the Big 10 and others suggests that most are increasing their “cost per port” but are phasing it in, as it would be too much to do all at once.

Marketing: The University community is sold on networking, and supports high service quality. New funding is unlikely, and whether costs end up being charged back or not, the University still pays!

Staff is a challenge, and Ann is trying to build a virtual organization harnessing the services of departmental staff.

For marketing, it is important to constantly walk the campus and talk to key people-- include the researchers and the deans.

It would be helpful to get good data on costs, and to consider alternative models for funding. A consideration in not choosing the library model is the need to add in the extra cost of implementing and managing a billing system (and dealing with complaints about billing).

Q and A

Is the per-port cost best done one-time or on going? An argument for one-time is the availability of funds at the start of a grant-funded project, for example.

A show of hands indicated that more in the room fund networking centrally than on a charge-back basis, but several use a mixed approach. Many in the room indicated using “telephone subsidy” funding.

Does NWU charge the same networking fee to faculty and staff? Yes, but student fees are different. The networking fee includes funds for annual refreshing of technology, perhaps 25% of those funds – and the funds can be carried over from year to year. Mort stressed the importance of having the buy-in of university leaders, and the importance of standards. He made the point that the university community doesn’t get to decide where electrical outlets should go, or whether a blind faculty member could choose not to have lights; networking infrastructure (and corresponding fees) should similarly be non-debatable.

How long did it take to see NWU university leaders on these networking budgeting/funding approaches? At least two years – and remember that there will be complaints, no matter which model is used.

Doesn't central control stifle innovation, vs. allowing faculty freedom in network implementation? Perhaps, but "faculty freedom" would preclude the ability to guarantee service levels, which was viewed as more important. And is it good to have physicians and physicists climbing through the walls to do their own wiring?

How do you sell the campus on the need for funding for regular refreshment of networking infrastructure? Can only be done if the campus community values the network. So it is important to nurture the creation of new applications, etc. Also, the actual need for refreshment varies, some every two years and others every 5-7 years, so this can be applied as needed and resources re-applied as refreshment occurs.

What about funding things where the need arises suddenly, like middleware? LDAP? Directories? For large universities, it's relatively easy to find funding for such things as part of the normal budget. Some institutions indicated they have small budgets for developmental initiatives, which they then make a funding decision about if/when they decide to move into production. If so, and if funding is static, then decisions must be made about what to discontinue if something new is taken on. It's sometimes possible to move responsibility to users, for example in transferring responsibility for web site maintenance from IT to the PR office.

What about major shifts, such as the impending move of everything to wireless? If funding is part of recurring operational budgets, such "transformations" should be covered. Many institutions are hedging bets by equipping all new buildings (or renovations) for both wired and wireless.

What IS advanced networking? Many felt 100Mb/sec was average, with little need for 1Gb.

The group concluded by indicating a strong interest for follow-on sessions on this topic.