IT Operational Oversight Committee

Charges and Governance for Voice and Data (ITNS)

November 28, 2011

Project Title – Charges and Governance for Voice and Data (ITNS)

Project Team –

- Dave Carmichael, Director Engineering Computing Network
- Steve Hare, Director of Administrative Computing, College of Science
- Pam Horne, Assoc. Vice Provost-EM/Dean of Admissions
- Ned Howell, Managing Director Launching Centers and Institutes
- Logan Jordan, Associate Dean of Administration, School of Management

Problem Statement
Review the current ITNS charging model for telecommunications services and recommend potential changes to that model in light of fixed costs for telecommunications infrastructure.

Overview and History
It is said that “past is prologue” so we feel it is important to set the context of our campus telecommunications services.

Current System Attributes – Positive Elements
The current system of charging and delivery of telecommunications services has several positive elements and advantages. First, the voice and wired network service is reliable and robust. There is little if any complaint about this aspect of ITNS. We believe this has been achieved in part because ITaP ITNS acts as a single, unified service provider. A single service provider allows common standards and protocols to be used throughout campus. A single provider also allows for sufficient scale to ensure lower costs and good training of the support staff. The committee also felt that implicit subsidies provided by university administration encouraged adoption of central services and resulted in lower explicit costs to units and the campus.

The committee felt these were good elements of or model that should be retained.

Current System Attributes – Drawbacks and Challenges
As with all pricing systems, units can seek to “free ride” the system by obtaining services while lowering their local costs. This occurs most commonly by units avoiding charges for “PICs” (Purdue Information Connection) by deploying switches and routers. These steps actually increase costs globally, by decreasing them locally.

Further, some units have taken steps to save cost by abandoning technologies that no longer have as much value. Most commonly some units have opted to save local costs by choosing to not have phones or not have voicemail. Here again, only the local unit’s costs are reduced as there is no change in the overall cost to the university. Almost all of the cost of voicemail or local phone service is fixed; only the local unit assessment is changed.

This situation is made worse by the significant time spent by units and ITaP on unnecessary bookkeeping. Most of this administrative overhead is spent on managing assessments. The underlying
cost of the infrastructure is largely fixed. The committee highlighted this overhead burden as an area that could be addressed in a new pricing model.

While the costs of the wired network are aggressively assessed, the campus wireless network is currently “free” to all users. Of course, the wireless network is not free, but subsidized 100% from central sources. Thus there is a real cost to Purdue that is not being tied to the user base in any way.

In the current environment decisions about technology and administration are generally made centrally without significant input and feedback from users affected by the decisions. Early on the committee felt there was a need to broaden ownership of the technology and administrative decisions being made and to expand feedback from users to inform decisions.

In the circumstance of ITNS services at Purdue, the technology has changed at a faster pace than the amortization of the financial instruments used to pay for investments in technology. We are still paying for telecommunications switch equipment even though the campus reliance on the technology has greatly waned. This mismatch of assessments and technology life now seems to lock us into waning technologies. We need to be creative in future decisions regarding financing of new technology so we can remain nimble and react to emerging technologies.

Also, our best understanding of the current cash flows show that all telecommunications services (network operations, wireless and wired connections, telephone operations, the amortization of the cable plant, network equipment and the telephone switch building) costs $2.5M more per year than the cost of our telephone and wired network connection charges. Also, the charges for our network services is less than the costs related to our network, and the charges for the telephone connections exceed the costs incurred for that service. Thus, in additional to a central subsidy, there are cross subsidies between modalities as well.

At this time Purdue does not attempt to recoup costs for the wireless network; so this is a charge borne centrally with no assessment to the users. The committee felt that this new emerging infrastructure needed to be brought into the cost and assessment structure of the university.

**Benchmarking review and analysis**

Our committee felt it important to understand what our peer institutions are doing in this area and why. We created a list of universities to contact and obtain information they would share on their pricing models for telecommunications and network services. Our intent was to look for the most important criteria selected and decisions made for their service delivery pricing models to help inform and define Purdue’s model going forward.

We obtained information from colleagues at Michigan, Northwestern, Minnesota, Dartmouth, UNC, PSU, USC, Virginia, and MIT regarding how they handle voice and network infrastructure funding and administration. In general, most of them have faced the same challenges at least 3-5 years before us.
At the University of Michigan, some of the basic tenets for their pricing model include simplicity, cost recovery, allocation of costs based upon cost drivers, independence of network architecture, and cost predictability based upon knowledge of cost drivers. The pricing model consists of two main components, a backbone access fee and an internet utilization fee. Both are annual charges and are based exclusively on the number of people in the organizational unit who use the network. Weighted values for each individual are then calculated based upon their status (faculty/staff and students) and organizational unit appointment including exceptions necessary for Engineering, the Medical Center, and Residence Halls. The model does not include one-time installation fees as well as off-campus circuit fees.

The University of Minnesota views both voice and data services as "common good" with all university groups and constituents sharing in the cost via their pricing model regardless of actual usage levels. Like Michigan, it is based upon a headcount model (not FTE) and includes faculty, staff, and students. The FY08 rate at UMN was roughly $19 per month per person for the Communications portion of their common good IT budget model. It’s not clear from the materials provided if this charge was centrally funded (we believe it was) or if the common good portion was still charged back to the organizational units.

The model used at Northwestern University is also similar in many respects. They have required charges to organizational units for "Core Services" based upon a weighted headcount (not FTE). Their core services charges include basic data and voice connections, but also include other services such as email, campus TV, and anti-virus protection. The core services fee per individual before applying the appropriate weighting for 2010 was approximately $383 per year.

As a result of benchmarking via review of other peer institutions' pricing and chargeback models for voice and data service delivery, we find several common threads among most of their approaches. A list of common chargeback model trends and features is bulleted here:

- Most models have a "common good" component of bundled features that everyone pays for, either centrally or through organizational unit chargeback, and is independent of usage levels.
- Models reviewed primarily are using a headcount-based approach, and they include some weighted values for all constituents including faculty, staff, and students.
- Weighted values are often dependent on estimated access to the services, or exceptions due to other factors such as separate networks or multiple appointments.
- Simplicity of the model chargeback calculations is important and access to the data to compute these rates annually is readily available.
- Models from Michigan, Minnesota, and Northwestern all included weighted student headcounts allocated to the appropriate organizational units.

The rates reported to us varied greatly from USC at $110/month, Virginia at $58/month and Michigan at $92/month.
Alternative charging options considered

In our deliberations the committee considered several different pricing options. These included:

- Status quo
- Per machine/ping
- Per FTE
- Per headcount
- A variation currently in use in Engineering, with a blended model of ping + headcount
- Some commercial approach, not unlike a “Comcast Business Class” on campus

After some debate, we are suggesting a “citizenship” based charge, where we tabulate the number of citizens of each type (Faculty, A/P staff, Clerical staff, service staff and graduate assistants) in a unit and utilize a blend of “Headcount” and “FTE” to tabulate the digital citizen count for the unit, and assess the proscribed rate accordingly. Monitoring type of staff will be important as the consumption and use of ITNS services will differ significantly between across the citizen types.

We were attracted to this approach because of its combination of transparency and simplicity. All of the data should be available from our ongoing business processes, so bookkeeping should be reduced. A yearly charge would be assessed on a unit based on the citizenship of that unit at a given census date.

We recognize that not all of the required ITNS connectivity is necessarily tied to a “citizen”. Commons areas, conference rooms and labs have needs of their own. Fortunately, we can turn to a robust space management audit that that is conducted each year. If we assume that citizens are largely captured by our office space square footage count, all of our other spaces can be addressed by a “space type” count. Each space is assigned to a unit, so that unit can be assessed the standard Sq. Ft. rate for conference rooms, research labs, instructional labs, commons spaces, and study rooms.

In addition to the transparency of this data, we believe this approach allows us to address both wireless allocations and student access.

Assuming wireless is (or is soon to be) ubiquitous, it covers physical space – and each physical space is assigned to a unit. Thus the expenses of wireless can be tabulated on a square footage basis and the unit can be charged for the access. Of course, money will need to be transferred to the unit for the wireless infrastructure, and in turn assessed each year. Using the square footage model will also insure that money is available to build out and maintain wireless infrastructure as new campus spaces are added. Further, when wireless is “free” it is both underpriced and undervalued, and it is not rationed correctly. A wireless charge would address this shortcoming.

We also believe this allows us to address students on the academic campus. Wireless is addressed; and via the “type of space” charge, classrooms, commons areas and instructional labs are addressed to include student access to networked services.
IT Operational Oversight Committee

Charges and Governance for Voice and Data (ITNS)

November 28, 2011

A special case for students is the residence halls. We believe the same rate structure approach can be applied to the halls, and the halls should be assessed a charge in the same way we will charge the academic and administrative units. We further believe that the residence halls’ ITNS charges should stand separate from the campus, and no subsidy should be provided in either direction – to the halls from the rest of campus, or from the halls to the rest of campus.

Governance

Faculty and staff have a key stake in the telecommunication and network core services that are needed to facilitate their work. Deans and department heads have a strong interest in managing their budgets efficiently but also ensuring that their faculty, staff, and students have the resources needed for mission-critical and strategic activities.

Because both needs and technologies are ever-changing, a governance structure representative of these stakeholders should review proposals on major technology investments and directions and otherwise advise and make recommendations to the CIO regarding telecommunication and network services and an appropriate cost model for the West Lafayette campus. The cost model would be reviewed each year to ensure costs and revenues were well matched, and imbalances were not developing. ITNS would also be expected to gather and present twice per year customer satisfaction data for each of the major network modalities.

Broad governance should provide input to the campus IT leaders to make good, informed decisions. In addition to making good decisions, broader governance will allow for broader ownership of the decisions that are made. In the current model, technical and pricing decisions are perceived to be made by an independent entity, with representatives of the campus community not understanding and owning the hard decisions that must be made.

We recommend the Telecommunications and Network Governance Committee report directly to the Vice President for Information Technology and Chief Information Officer.

A voting membership of 7 shall include:

- An academic associate Dean as Chair
- Three tenured or tenure-track faculty
- Administrator or research scientist from a key lab/Discovery Park
- An administrative Associate Director or above that reports through the Executive Vice President and Treasurer
- An administrative Associate Director or above from a central unit that reports up through Provost

The committee will also include three Non-Voting Technical Advisory Members in ex-officio roles:

- Executive Director for IT Networks and Security
- Associate Vice President for IT Customer Relations
- A representative from the CIO Academic Liaisons
IT Operational Oversight Committee

Charges and Governance for Voice and Data (ITNS)

November 28, 2011

- A representative from the Administrative IT units reporting to the CIO
- An ITaP Business Manager

Financing
While not in the scope of the committee’s review, we did want to mention in passing the notion of matching financial amortization with technology life cycles. We believe some of the challenges we face with writing down the wired telephony infrastructure result from a mismatch of fees, technology life cycles and financial amortization. In the future we should endeavor to try to have a better temporal match of these flows.

Cost Model
The committee has raw data from Management and Engineering toward developing a worked example of this cost approach utilizing Space Management Data, HR FTE and headcount data and actual ITNS charges. We feel we should pass that work to an implementation team to further experiment with “curve fitting” this costing model. The goal of the curve fitting is to have only a modest difference, if any difference, between the current costs paid by departments and the charge assessed by the new rate structure.

The following equation outlines in rough fashion our proposal:

Departmental Charge =

\[
\frac{\text{Faculty Head Count} + \text{Faculty FTE}}{2} \times \text{Employment rate}_1 \\
+ \frac{\text{A/P Head Count} + \text{A/P FTE}}{2} \times \text{Employment Rate}_2 \\
+ \frac{\text{Clerical Head Count} + \text{Clerical FTE}}{2} \times \text{Employment Rate}_3 \\
+ \frac{\text{Service Head Count} + \text{Service FTE}}{2} \times \text{Employment Rate}_4 \\
+ \frac{\text{CTL Clinical Head Count} + \text{CTL Clinical FTE}}{2} \times \text{Employment Rate}_5 \\
+ \frac{\text{Graduate Staff Head Count} + \text{Graduate Staff FTE}}{2} \times \text{Employment Rate}_6 \\
+ \text{Square Ft assigned under Space Management space use code}_N \times \text{Space Rate}_N
\]

Where N = all categories of space use codes, EXCEPT 310, office space, which is addressed with employment