EPP Chairs Subcommittee on Rationalizing IT costs

Outline of Motivations and Approach

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History and Motivations

Seen in the broader campus context, EPP has historically been a leader in thinking about and providing for the costs associated with maintaining IT equipment, computer labs, and other technological resources associated with delivering a modern engineering education. Specifically, most (if not all) classes offered by EPP units have course fees associated with them; a percentage of these fees is automatically diverted to a specialized account to cover IT support. Although this provides a solid starting point, it has become clear that this model is too coarse-grained and no longer effective for covering our IT support costs. Some specific problems with this approach include:

- **No linkage of costs to expenses.** To date, there has been no attempt to articulate what IT costs associated with EPP really are. As a result, there is absolutely no way of knowing whether the influx of funds from course fees is adequate, too much, or inadequate. This makes it impossible to set class fees appropriately, much less justify those fees in any but the vaguest manner.
- **Missing cost items.** There is good evidence to suggest that we have underestimated overall IT costs, generally neglecting to consider less visible (but vital) shared resources like backup disk arrays, backup tape robots, servers, and shared drives.
- **Haphazard distribution of costs.** Because there is no concept of how much IT support really costs, individual department chairs have --- more or less at random --- adjusted the percentage of their course fees that are automatically contributed to the ITS fund. Percentages range from 9% for CM to 50% for CS.
- **The CEFNS fairness factor.** The CENS Technology Committee convened last year exposed substantial deficiencies in the way that Natural Sciences equip and maintain their technology environments. With some exceptions, no class fees are diverted to IT services; laboratories are maintained haphazardly; in many cases, the dean’s office is periodically asked for funds to completely renovate computer labs when the situation comes to an impasse (which means we all pay for them). The Technology Committee report recommended that all units should plan to maintain their computer labs and otherwise cover their fair share of IT costs. Although officially funds collected by EPP for maintaining our labs are separate and only used for EPP facilities, the danger exists that --- without a more careful accounting of what actual IT costs are and a robust model for distributing those costs --- EPP may end up subsidizing general CEFNS IT robustness.
As a result, the EPP Chairs convened this subcommittee to (a) for the first time, come up with a complete and detailed accounting of what IT-related equipment exists within CEFNS that is used by EPP; (b) detail what the life cycle of each piece of equipment is, along with replacement and maintenance costs; and (c) develop a fair, robust, and easy to maintain model for distributing those costs.

**Overview of Philosophy and Approach**

Our approach to tackling this problem has been guided by the following principles:

1. **Cost-driven.** Any approach must be based on actual costs to regularly maintain/replace IT resources. A complete, detailed, and careful inventory of equipment and costs is the cornerstone for an effective solution.
2. **Completeness.** All IT-related costs should be considered and allocated, including not only hardware, but also software and the time it takes for IT staff to maintain that equipment.
3. **Fairness.** All CEFNS units should be responsible for their fair split of the IT costs associated with supporting their programs. Calculation of fair cost should be based on (a) who uses the resources and (b) how much the resources are used by the unit.
4. **Reasonable Fidelity.** In the interest of low overhead, we seek a balance between an approach that is simple and easy to use and one that has maximum fairness built in, i.e. closely ties cost to actual usage, and is responsive to increases/decreases in student numbers and program size. In short, the system should be as fair as possible...but let’s not split hairs.

**Overview of Proposed Model**

The proposed model is based on four distinct components, embodied as separate (but interlinked) sheets in a master spreadsheet.

**Basic Cost Assumptions.** This sheet lists all types of hardware that appear in the IT cost calculation (e.g. “PC workstation”, “thin client”, “AV projector, etc.) and, for each types of hardware, lists presumed replacement costs, planned life cycle, and (where applicable) annual cost of maintenance (ITS staff time=dollars) associated with maintaining that kind of unit. These values are used in (linked to from) the other sheets. This approach factors out (versus hardwiring in) these cost assumptions, i.e., we could easily explore the effect of using a 7-year replacement cycle for AV projectors versus a 5-year cycle – change it here and it ripples through the other sheets.

**Per-room IT costs.** This sheet represents the complete inventory of IT-maintained equipment, listed by the room in which those pieces of equipment are deployed. For each piece of equipment, annual hardware (replacement), software, and maintenance costs are totaled to yield a total annual cost for that piece of equipment; all equipment in a room is totaled to give the total annual IT cost for each room.

Servers and other centralized resources are treated as a special case, since they are not really associated with any one room; the costs associated with these are calculated separately, based on a formula to be negotiated by EPP chairs for each
shared resource based on the “fair use” principle. That is, we start with the “portion” of those resources devoted to EPP (versus allocated to the rest of CEFNS), and then divide that out to the individual EPP units based on use by each unit.

**Yearly Room Usage Matrix.** This is a matrix of EPP rooms (rows) by EPP units (columns) that details, for a given AY, how many events (courses/labs/whatever) each unit held in each room. Since D4P also collects class fees of its own, it will appear as a unit here as well. This matrix provides the basis for dividing up IT costs fairly: the concept here is that equipment wear and tear is directly correlated to amount of usage so those who use it should pay proportionally for it’s upkeep. This is MUCH more fair and easier than haggling over who “owns” which lab or room. If one unit does, indeed, use a certain room (e.g. research lab) 100% of the time, they get stuck with 100% of the maintenance. Shared rooms are simply covered proportionally by whoever uses them.

This matrix is super-easy to fill in --- can be done in five minutes based on the room assignment matrix that Mary produces for class scheduling.

**The Annual IT costs breakout.** This sheet is where the rubber hits the road and annual IT costs are allocated to each EPP unit. It lists each room (rows) and shows that year’s IT cost for that room for each unit (columns) based on total annual IT cost for the room, and each units proportional usage of the room. Each units costs (based on formula to be negotiated) for centralized resources (servers, etc) are added to this to get the total annual IT support fee for each unit.

**How do we pay up?**
Under the current system, units have a percentage of class fees deducted automatically and routed to an account for IT. We propose to cease all automatic deductions. Instead, units collect 100% of their class fees in their respective class fee accounts. At the end of the academic year, the IT costs for that year are easily calculated by the spreadsheet described above, and units transfer whatever their calculated split is to the IT account. The amount due can actually be calculated far in advance of the end of the AY, i.e., as soon as room usage for the AY is known – effectively by the end of January (or whenever room assignments have shaken out for Spring term). Unit chairs can adjust their class fees accordingly for the next year, depending on whether they paid more of less than expected for IT support.

**Closing Comments**
This model not only provides a fair, transparent mechanism for tracking and distributing all relevant IT costs within EPP, it also could provide a basis for adding in other maintenance costs if we so desire. For instance, Dave suggested that we could come up with a “Furnishings” spreadsheet that – in the same way as is done for IT equipment above – details the replacement cost and cycle of chairs, tables, whiteboards, and other rooms amenities, and distributes those costs across units based on “fair usage” as well. The framework is there...

Finally, it is important that EPP not be the only units in CEFNS that take a serious and detailed look at IT costs associated with serving students, and planning
responsibly to meet those costs. By providing this model, we will have a strong basis for insisting that the other CEFNS units apply it as well, so that we have college-wide transparency and accountability for IT costs and who pays them. This should go a long way towards allaying any concerns that some units are paying more than their fair share while others are taking advantage of the lack of clarity in the current IT cost model.