

# Cockrell School of Engineering

## Vision Plan for Information Technology

### 2009-2010

<http://www.engr.utexas.edu/computing/vision/>)

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#### Summary of Cockrell School of Engineering ITAC funding requests for AY 2009/2010

Project Title	Description	Requested Funding
<ul style="list-style-type: none"> <li>▪ <b>Classroom Wireless</b></li> <li><i>Priority 1</i></li> </ul>	<p>Deployment of an effective wireless infrastructure for interactive classroom utilization is the objective of this project. The existing wireless infrastructure, nominally pervasive for general purpose, ad hoc usage, is inadequate to meet the bandwidth and concurrent session demands of intensive classroom usage.</p> <p>Engineering has 64 classrooms distributed throughout six buildings on main campus.</p>	<p>\$225,000</p> <p>100% Networking</p>
<ul style="list-style-type: none"> <li>▪ <b>Virtual Desktops for student-owned CPUs</b></li> <li><i>Priority 2</i></li> </ul>	<p>Although Engineering has successfully deployed hosted virtual desktops for students through our Virtual Learning Resource Center Project ( <a href="http://www.engr.utexas.edu/computing/labs/vlrc/">http://www.engr.utexas.edu/computing/labs/vlrc/</a> ), the hosted solution does not leverage the distributed compute power the Engineering students typically possess. This project aspires to deploy applications to student-owned CPUs and leverage this scalable and student-refreshed resource. Both the technological last-mile and software licensing challenges with industry vendors will be addressed in this pilot which could have transformative implications for the campus at-large.</p>	<p>\$50,000</p> <p>100% Software</p>
<ul style="list-style-type: none"> <li>▪ <b>Classroom wireless A/V</b></li> <li><i>Priority 3</i></li> </ul>	<p>Exploratory pilots need to commence in order to identify the infrastructure components for deploying wireless audio and video technologies into the classrooms in the coming years. Although the cost of this initial pilot is very small, we wanted to log this concept with the ITAC appropriately so that interested parties could have a focal point and work together</p>	<p>\$1,500</p> <p>100% Equipment</p>

<b>Increasingly critical operational imperatives – recurring funding in nature</b>		
<ul style="list-style-type: none"> <li>▪ Lifecycle Network Funding</li> </ul>	<p>Adequate network funding remains a priority of IT funding, and will remain so until consistent funding is identified. (please reference appendix 1)</p> <p><i>[P.S. if this item were funded, it would include priority 1 above.]</i></p>	<p style="text-align: right;">\$425,000 per year</p> <p style="text-align: right;">82% Networking 18% Personnel</p>
<b>Total:</b>		<b>\$701,500</b>

## **NEEDS AND PROPOSED USE OF FUNDS**

### ***Infrastructure***

- Adequate and sustainable **networking infrastructure** funding remains crucial and jeopardizes all other service offerings if not sufficiently addressed. Specific amounts are identified in **appendix 1**.
- Existing infrastructure allocations contribute to the daily operations of our departmental Learning Resource Centers (LRCs) largely in the form of hardware and software purchases.

### ***One-time Projects***

- The classroom and curriculum centric projects in the summary table, priorities 1, 2 and 3, are all one-time projects for implementing a classroom friendly wireless infrastructure, constructing the capability for deploying applications to student-owned CPUs and exploring wireless A/V for the classrooms.

### ***Innovative Support of Student Learning***

- Each of the projects in the summary table are unprecedented on campus and directly impact student learning directly in the classroom or through the delivery of software to enhance the curriculum. These projects will establish benchmarks and scalable infrastructures for the campus at large.

# OVERVIEW OF CURRENT IT PROGRAMS AND INFRASTRUCTURE

## Vision/Mission/Goals of Unit

Engineering continues on its diligent **vision** to foster world-class learning through the innovative and appropriate integration of technology into the curriculum.



- Enhance the educational **experience** through student-centered learning
- Provide a supportive **environment** to nurture STUDENTS, faculty, and staff
- Foster a first-class learning **community** that reaches beyond the classroom

The consistent **mission** of Information Technology is to optimize the Cockrell School of Engineering by providing its people with information technology resources that are relevant, accessible, reliable, and useable through planning, collaboration and skills.

**Goals** are identified annually to further these values aligned with the needs of students, faculty and staff.

## IT Organization

An **IT Policy Committee** consisting of Departmental Chairs, and chaired by the Associate Dean for Academic Affairs operates on behalf of the Engineering School at large as an advisory panel to the Dean. Departments convene their own **IT committees** in order to help inform this overarching endeavor. Departmental IT Managers meet regularly with the School's IT director and serve as the **Engineering Technical Advisory Group** (ETAG).

## Infrastructure

Engineering's heritage of Learning Resource Centers, Studio Classrooms, laptop/tablet mobility carts, robust server infrastructure, Faculty Innovation Center, deployment of Multimedia Teaching Podiums (64 classrooms), pervasive wireless infrastructure (248+ access points in 6 buildings) and Laptops for Learning Initiative (now entering its 13<sup>th</sup> year) depict the consistent efforts of Engineering to identify and address the practical roles of Information Technology to improve pedagogy.

Engineering has led the way in virtualizing server infrastructures and is leading the way in developing a broad-spectrum virtual desktop infrastructure.

## Current and proposed funding sources for IT programs and infrastructure

Engineering leverages the ITAC allocations for visionary IT projects at typically greater than a 100% matching level. We have yet to commit any Vision Plan funding toward recurring expenses and we aspire to continue this commitment.

The primary funding for the Cockrell Scholl of Engineering to support the IT infrastructure and activities is flat-rate tuition, ~4M/year. ITAC has typically contributed \$480,179 in infrastructure funding and the ITAC one-time project funding has continued to plummet as reflected in the table below.

Fiscal Year	Vision Plan Allocations
FY 03-04	\$281,920
FY 04-05	\$189,000
FY 05-06	\$170,000
FY 06-07	\$120,638
FY 07-08	\$87,784
FY 08-09	\$82,000

This is especially unfortunate since the Cockrell School of Engineering makes innovative use of this funding and leverages it with matching funds. In addition, this reduction in funding comes at a time when funding should be greatly increased.

Industry donations are a rarity these days for academic activities, but Engineering was able to secure about \$92,000 this past year toward the Virtual Desktop project.

Historically these sources of funding have been incrementally consumed by increases to operational obligations and rate increases have not kept pace with needed funding amounts. The recent series of budget-cuts and campus taxations are continuing to compound the financial challenges for academic IT endeavors just as services need to scale to meet broader and more pervasive needs.

### Best Practices

- Virtual Desktop deployment has come of age
  - o A student can login to the Virtual Learning Resource Center with their EID via a web-browser and have a CPU custom provisioned with the software they need within 90-seconds.
    - This environment is cost-effective and easily scalable to meet a broad-spectrum of campus needs.
- Streaming Operating Systems and Applications to conventional computer classrooms
  - o Technologies have offered us the opportunity to reinvent our student lab implementations providing cost-savings and flexibility for rapid CPU imaging and software deployment.
- Interactive classroom annotation and Tablet PCs
  - o Leveraging DIIA insights, this initiative continues to gain gradual traction as it brings interactive annotation into the classroom between faculty and students, leveraging the increasing, yet gradual, popularity of Tablet PCs.

- Generation 5 Classroom Multimedia Teaching Podiums with OnTouch intercom
  - o Our “Robo-Podiums” are height adjustable, movable and reduce barriers between students and faculty. If any problems do arise, the OnTouch intercom systems beckons help with the touch of a button – Service Desk personnel can then assist with remote controls for the room or field operatives can be rapidly dispatched as needed.

## USE OF PREVIOUS ACADEMIC YEAR ALLOCATIONS

### Infrastructure:

All infrastructure funding in the past year, \$480,179, was expended in routine daily operations contributing toward the departmental Learning Resource Centers (LRCs) largely in the form of hardware, software and networking purchases.

### One-time Projects:                    **Engineering Vision Plan One-time Allocations for fiscal 07/08\***

The Cockrell School of Engineering once again took an aggressive posture to ensure that our Vision Plan allocation was used in projects that represented innovative applications of information technology in teaching or student services.

Student computer labs, aka Learning Resource Centers (LRCs), have been a mainstay of Engineering computing facilities since the early 1980s in the days of the Quest grants. Currently we run about 600 CPUs in our LRCs, but the physical constraints of these facilities are not able to meet the 24x7 demands of our students. Leveraging our expertise in desktop and server virtualization, we have developed a “Virtual LRC” and begun a transformation of both teaching and general-use computer labs for campus.

These cyber-resources make **institutionally licensed software** available to students without physical or time-constrained barriers. Virtual computing sessions are available on-demand configured with the software tools the student needs from anywhere on the Internet.

Allocated Amount (rounded)	Project Description w/key partner
\$35,000	<b>BME:</b> Streaming OS computer lab (via Citrix Provisioning Server)
\$27,494	<b>ChE:</b> Streaming OS computer lab (via Citrix Provisioning Server)
\$939	<b>BME:</b> Virtual Learning Resource Center (leveraging School infrastructure)
\$939	<b>ChE:</b> Virtual Learning Resource Center (leveraging School infrastructure)
\$7,080	<b>CSE:</b> Thinapp infrastructure for facilitating streaming application capability
\$11,782	<b>ASE:</b> Virtual Desktop capability, pilot 1
\$21,192	<b>ECE:</b> Virtual Desktop capability, pilot 2
\$104,427	< Total*

**\* - It should be noted that Engineering continued the more than 100% leveraging of Vision Plan allocations. This year Dell provided more than \$92,000 toward the Virtual Desktop endeavor and the Engineering School also invested significantly to breathe life into the Virtual Desktop infrastructure for the School at large.**

**"The significant problems we face in life cannot be solved by the same level of thinking that created them."**

**Albert Einstein**

## Appendices:

### 1 – Critical Network Infrastructure Lifecycle Funding needs

Adequate funding for the mission critical network infrastructure remains a crucial concern for the Cockrell School of Engineering. Historically, we have found it necessary to sacrifice other needs in order to maintain essential networking capability. To transcend this undesirable situation, Engineering proposes a Network Lifecycle Model, as follows below, in order to provide for sustained capital replacement, maintenance and necessary expansion of the network.

#### Network Infrastructure Lifecycle Funding Budget Overview

<b>Annualized Equipment costs</b>	<b>\$350,000</b>
➤ Inclusive of core and edge switches, wireless and cabling	
<b>Annualized Labor costs</b>	<b>\$75,000</b>
➤ Three partial FTE for architecting, administering and maintain the network	
<b>Total Annualized Costs</b>	<b>\$425,000</b>
➤ For the six academic building on main campus	

Adequate network bandwidth, connectivity and redundancy remain chronic networking issues. While some buildings cannot confidently add additional connections to their existing infrastructure and struggle to identify funding for expansion, other buildings have a growing concern for single points of failure that could be disastrous for mission critical network infrastructures. All of these concerns converge to the necessity of having a consistent source of network funding as proposed in our network lifecycle funding model.