Engineering Student Technology Committee

http://www.engr.colostate.edu/ESTC

College of Engineering

Colorado State University

The Engineering Student Technology Committee (ESTC) invites proposals from students, faculty, and staff for technology related equipment to enhance the student educational environment in the College of Engineering at CSU. Each year, the ESTC allocates funding for strategic projects that will have a near-term benefit to students. This year, the committee is soliciting proposals in the $5K - $40K range. Proposals must be primarily for equipment and have a direct benefit to the educational mission of the college. Please review the Charge for Technology (CFT) manual for permissible use of CFT funds: http://ucft.colostate.edu/aspx/www.ucft/pdf/cftmanual.pdf.

The ESTC is particularly interested in intra-departmental proposals or proposals that benefit a large cross-section of students. Partnerships with the ESTC that fund projects beyond the limitations of the CFT are especially compelling. Note that the committee is not, in general, interested in funding projects that are specific to a particular research group or that affect only a small number of students. To submit a project proposal, please complete this form and send it as an e-mail attachment to estc@engr.colostate.edu by April 30 for full consideration.

1. Title of Proposal: ESTC Sun Ray x86 servers _____

2. Proposal Participants:

Primary Contact for Proposal

Name: CJ Keist _____E-Mail: cj.keist@colostate.edu_____

Department/Major: ENS _____

Circle One: Undergraduate Student Graduate Student Faculty Staff(X)

Additional proposal participants

Name: Dan Herrick _____E-Mail: Dan.Herrick@colostate.edu_____

Department/Major: ENS _____

Circle One: Undergraduate Student Graduate Student Faculty Staff(X)

Name: _____E-Mail: _____

Department/Major: _____

Circle One: Undergraduate Student Graduate Student Faculty Staff

3. Proposal Abstract (limit to 100 words):

ENS proposes that ESTC supply one-time funding in the amount up to $30k to use for replacing current Sun Ray servers with more compatible models, which will improve Sun Ray speed & performance for all users, and to add Windows servers to the existing infrastructure.

4. Proposal Budget

List of items to be purchased and cost

- 5 new x86 Sun Ray servers @ $6k each: $30k
- 12 new Windows Thin Farm servers: $50k

TOTAL: $80k

Dollar or percentage amount requested from ESTC: $30K

Dollar or percentage amount(s) to be provided by other fund(s):

Include name of person providing other funding (must be a participating party in the proposal):

$50k ($40 from Academic Village, $10k from College of Engineering)

Name of person providing other funding: Mark Ritschard (for Academic Village and College of Engineering)

5. Full description of proposal:

specifically address:

- student group(s) that will benefit from this proposal
- explanation of why the project is a valid use of CFT funds
- financial partnerships that leverage use of CFT funds for greater impact

ENS would like to replace Sun Ray infrastructure outside the normal replacement plan to greatly increase performance of Sun Rays.

BACKGROUND

The current Sun Ray server configuration is as follows: Four SPARC "Cool Threads" servers and two x86 servers, for a total of six Sun Ray servers.

Currently the Sun Ray servers' main role is to provide Engineering students with a desktop, from which they can launch Solaris (UNIX) applications or connect via Citrix to a Windows server. The desktop served through the Sun Ray server is called IceWM, which runs on top of the Solaris operating system. Most engineering software is not

available on this platform, so users typically connect to a Windows or Linux server from the Sun Ray desktop. The Windows servers they connect to are called the "Thin Farm", and host the same engineering applications as the college lab PCs.

Sun Rays are used throughout the Engineering college computer labs and electronic classrooms. The majority of available computer seats in these facilities are Sun Rays (183 Sun Rays to 115 Windows desktop PCs.) Of the 6 electronic classrooms, which have computer seats, 4 are Sun Ray classrooms. Users of the Sun Rays include undergraduate & graduate students in college computer labs and electronic classrooms, graduate students in offices, Academic Village residents in residences and in the facility, and some college staff in offices.

SPARC "Cool Threads" servers are new CPU technology from Sun Microsystems. They are called "Cool" because they generate very little heat. The CPU's come in 4, 6 and 8 cores, with each core supporting 4, 6, and even 8 physical threads per core. Our latest Sun Ray servers have the 8 core with 8 physical threads per core or 64 CPUs on a single die. We were sold on this idea from Sun so that we could run many Sun Ray thin clients, up to 150 thin clients per server. But the down side of the "Cool Threads" CPUs are their slow clock rate, ~1.2 Ghz. For single threaded apps like Firefox they will run at the speed of the CPU (which is slow in comparison to a PC's CPU.) Over the years Firefox has become more resource-hungry and the performance went down drastically on the SPARC systems. The new x86 servers with their very fast Intel Xeon processors will fix the slow performance problems with single threaded apps. ENS has tested and confirmed this.

ENS has begun phasing out the SPARC servers through natural replacement cycle, thus the two current x86 servers. Eventually, user experience will be improved when the natural replacement cycle for the SPARC servers is complete, in another 2 years. However, if ESTC provides one-time funding to replace these SPARC servers with x86 servers now, the user experience will be immediately and dramatically increased.

CFT funds are vital to the success of this project, and seems appropriate due to the high student use of Sun Rays throughout computer labs and electronic classrooms. In particular, students who

take classes in the Engineering electronic classrooms (see above) rely on Sun Rays for in-classroom technology. We have a unique opportunity to leverage Academic Village program fee funds plus some College of Engineering funds to enable this to be a successful project.

EQUIPMENT

We would like one-time funding to replace the remaining 4 SPARC servers with new x86 servers, which will place all Sun Ray servers on a level field. Future funding to maintain these servers is already in place; we are merely "bumping up" the replacement cycle. The new x86 servers, as currently configured, cost approximately $6k each. Replacing 4 servers and adding 1 for a performance increase will cost approximately $30k. The remaining balance would be used to supplement the existing Thin Farm servers, increasing the robustness of the Windows platform served through the Sun Rays.

The existing 4 SPARC servers would be re-purposed into general Solaris workstations, similar to the existing CAE workstations, which can be used to run applications supported on the Solaris platform. These servers will be powerful assets to the Solaris workstation pool.

Any remaining balance above that needed to replace the SPARC servers with equivalent x86 servers would be used to supplement the existing Thin Farm servers. With users defaulting immediately upon login to a Windows workspace (see 'Implementation', below), the load on the existing Thin Farm servers will go up. With 18 servers in the current Thin Farm, we feel that another 12 servers would be needed. Each server costs approximately $4.2K each, for a total of $50k. More would, of course, be better and would allow for better performance served to the users through the Windows servers.

If immediately funded, the server equipment can be purchased immediately and be completely in place by the Fall semester.

BENEFITS

All users would see dramatic improvements to the Sun Ray experience including speed, a better desktop experience (especially with Firefox), and multimedia. Implementing "kiosk mode", if possible, and making

Windows the default user session (see below) would streamline the users' workflow.

IMPLEMENTATION AND TIMELINE