



EECS Instructional Computing - Review and Plans Spring 2014

CONTENTS:

[Strategic Goals](#)
[Progress Report](#)
[Current Challenges](#)
[Mission Statement](#)
[Organizational Scope](#)
[Notable Events](#)

Strategic Goals

Reduce time spent on computer hardware maintenance, within existing budget limits. Consider virtualization of servers, enable student-owned computers.

Increase support of services that directly affect the instructors and students. Develop WEB-based and other resources to provide new services quickly and to increase staff efficiency.

Implementation:

- 1) Continue lab upgrades (2xx Soda, 200 SDH, 199 Cory, 105 Cory). New computers and other facilities require less maintenance. Seek donor funding for it.
- 2) Virtualize servers. Select physical servers that could be moved to Linux VMs, such as autograders, print spoolers and license servers. Identify a cost-effective cloud service for them and migrate them.
- 3) Consolidate server functions and reduce the complexity of maintaining services. Simplify the management of instructional computer accounts and cardkey access. Improve our WebAcct user portal for account management. Reevaluate the Windows IIS and video streaming services. Retire Solaris servers and transfer their functions to newer servers.
- 4) Enable student-owned computers in our labs. Create authentication services so laptop users can access our printers and software licenses. Install work areas and software for group collaboration.
- 5) Improve our tools for instructors to deploy course WEB sites.
- 6) Support VMWare licenses and VM images for specific classes.



- 7) Provide a secure git server; perhaps using a GitHub paid service.
- 8) Leverage student class projects that can improve ISG services. For example, CS169 seeks "customers" who define group projects.



Progress Report

1) Lab Improvements:

There have been major lab renovations in 2xx Soda, 140 Cory, 199 Cory. [SanDisk](#) is funding the latest improvements to 199 Cory and the adjacent area. New workstations have been installed in nearly all our labs within the last year (Intel NUCs, Lenovo Tinys, ZT desktop systems, NI PXI chassis systems).

Please see "[Lab renovations, major donations from Intel, TI, NI, Agilent, Yahoo](#)" for more information.

2) VMs for individual students:

We don't have an EC2-like environment where students can each run their own VMs, but they can run VMs on the workstations in our labs. We have VMware and/or Virtual Box on all our workstations. Students can store small images in their home directories and can create additional disk space on our /home/tmp filesystem. We may need lots more space on /home/tmp.

The students can also copy an image from the instructor account onto their own laptops via scp over 1GB wired AirBears network ports that are in many of our labs (271, 273, 273 Soda; 140, 199 Cory).

3) VMs for backend servers:

We bought 2 servers (\$3K each) to run the ESXi VMWare hypervisor, where we will consolidate several physical backend servers (for LDAP, printing, licenses, etc) and add agility to deploying or upgrading them.

4) Replacing control software for HP parameter analyzers:

We have solutions for replacing the software that we couldn't afford to upgrade (\$78K). [Agilent](#) offered us their EasyEXPERT software for free, and that works on our newer HP parameter analyzers. Staff in ESG have developed an interface in LabView that works for all of our HP parameter analyzers. This is very timely, as the old software runs only on Windows XP which is no longer supported. This is for EE105, E140, EE143.

5) Replacing Solaris servers:

We plan to retire the Solaris login servers before summer session 2014. To replace them, we increased the RAM (to 24GB) on the [24 systems](#) that were donated by [Yahoo Labs](#) in 2013, and they are running either:

- * Ubuntu for lower division classes (python, gcc, java, emacs, etc)
- * Centos for classes running CAD tools (Synopsys, Cadence, etc)
- * Windows 2008 for classes running design tools (LabView, ADS, etc)

6) Upgrading Netshow:



A 2-step replacement plan is in progress for the Netshow video server. ESG uses it to stream course and faculty candidate presentations. Netshow01 is currently 3 interdependent servers. Our first step is to migrate those to identical VMs on our new ESXi server so we can remove the old servers from the 165 Cory machine soon. The second step is to work with ESG to reorganize and reinstall the contents on a new server with the latest versions of Windows Media Services and IIS.



Current Challenges

Issues with VMs:

- 1) We need an affordable cloud service such as the EC2/SA3 to host student VMs.
- 2) To accommodate VMs on our existing file server, we might need 5TB per class of 500 students (ie 10GB images). Currently we have about 3TB total for that. We pay about \$1080/TB/year for our storage & backup service.
- 3) We need a high-capacity service for downloading large VM images to student computers at home, such as dedicated WEB servers or BitTorrent.

Currently our best technology is to copy the VM from our file server over 1GB wired Airbears using scp to students' laptops, but that means they have to bring in their laptops. They can also download it from our WEB server (<http://inst.eecs>), but that does not scale well.

Lab & computer upgrades needed:

- 1) 200 SDH: Mac lab used by CS10 and DeCals; needs A/V upgrade (~\$10K)
- 2) 200 SDH: MacPros are 5 years old; we have no replacement plan (~\$30K)
- 3) Icluster: Mapreduce, Synopsys, MarkLogic (CS61A, CS250, EE241); 26 cluster nodes (Dell 1950s) are 7 years old (although new RAM and disk have been added); no replacement plan (~\$60K); ideally we'd replace it with a cloud service.
- 4) 105 Cory: across from 199 Cory; has new computers but is physically decrepit; needs renovation; used by EE20



Mission Statement

The EECS Instructional Support Group (ISG) installs and maintains networked computers that are used by EECS classes. ISG provides computer accounts for instructors and students in the Instructional labs and on Instructional servers. ISG purchases, installs and maintains application software needed for classes. ISG supports instructional labs in Cory Hall, Soda Hall and Sutardja-Dai Hall.

ISG wishes to anticipate and meet the computing needs of instructors and students in EECS courses and to provide support for new and innovative learning environments. We wish to be accessible and responsive to requests for service. We also wish to learn about new and interesting technologies that may be of value in this service.

Organizational Scope

These are functions in which ISG interacts with other UCB support groups:

- ▶ we use EECS department services (IDSG) for
Active Directory, disk space, network access and security scans
- ▶ we synchronize our user accounts with the EECS department (IDSG)
- ▶ we obtain enrollments from the Registrar (Student Information Services)
- ▶ we obtain cardkey numbers from the CAL1 office
- ▶ we submit cardkey authorization to our labs in batch uploads to UCPD
- ▶ we bill students' voluntary printer charges to CARS
- ▶ we manage the computers in engineering labs with ESG
- ▶ we manage the licenses for Synopsys/TCAD/HSPICE with the Device Group
- ▶ we manage the licenses for Cadence with the BSAC group
- ▶ we manage the licenses for Maya and Renderman with the BCAM group

Notable Events

See <http://inst.eecs.berkeley.edu/notices.html> for current events.

For additional reports, please see <https://inst.eecs.berkeley.edu/reports>
For additional information, please contact me:

Kevin Mullally, ISG Manager
EECS Instructional Support Group
378 Cory Hall, (510) 643-6141
kevinm@eecs.berkeley.edu
<http://inst.eecs.berkeley.edu/>