

Instructional Support Group (ISG)

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Agenda for CNIL – Feb 14, 2012

I. Status Report

- Salaries vs equipment replacement: competing for same S&E funds
- Increasing reliance on donations; inconsistent equipment replacement cycle
- How to be “agile” but also plan ahead? (ie course fees: a year in advance)

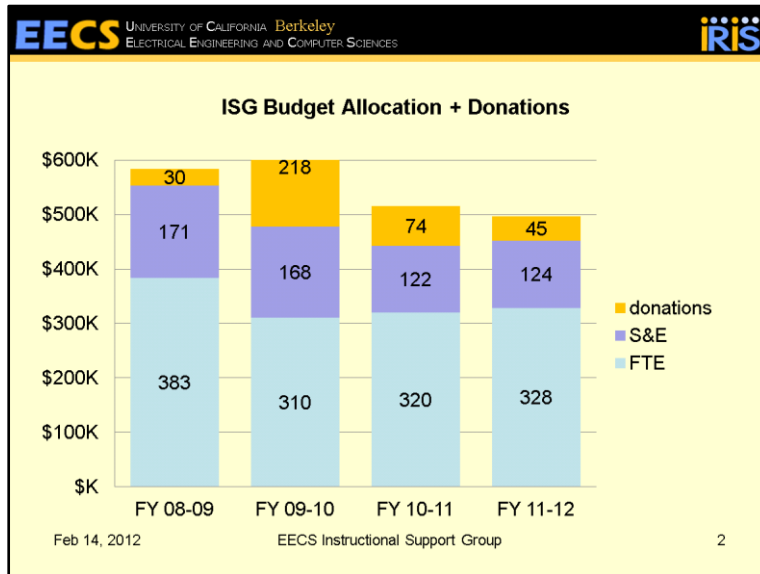
II. Discussion

Main points:

Salaries vs equipment replacement: competing for same S&E funds

Increasing reliance on donations; inconsistent equipment replacement cycle

How to be “agile” but also plan ahead? (ie course fees: a year in advance)



Budget Cuts:

18% (\$101K) cut since 2009

We paid \$50K for salaries from S&E last year

Donations:

FY 08-09 125 Cory: 16 PCs for EE141 (\$30K, Intel)

FY 09-10 200 SDH: Macs (\$135K, Apple)
 2 SUN SPARC servers (\$42K, SUN)
 2 SUN X86 servers (\$23K, SUN)
 LCD displays (\$18K, UC energy-saving initiative)

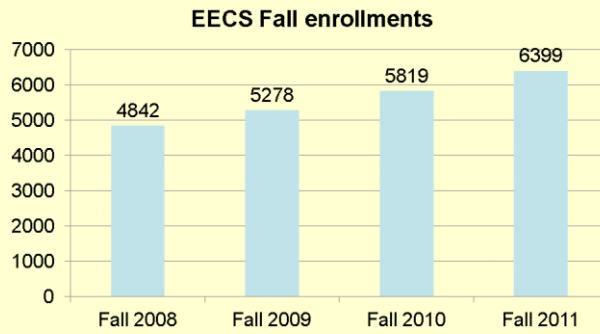
FY 10-11 330 Soda (\$74K, Intel)

FY 11-12 140 Cory (\$30K Intel); Icluster (\$15K Intel)

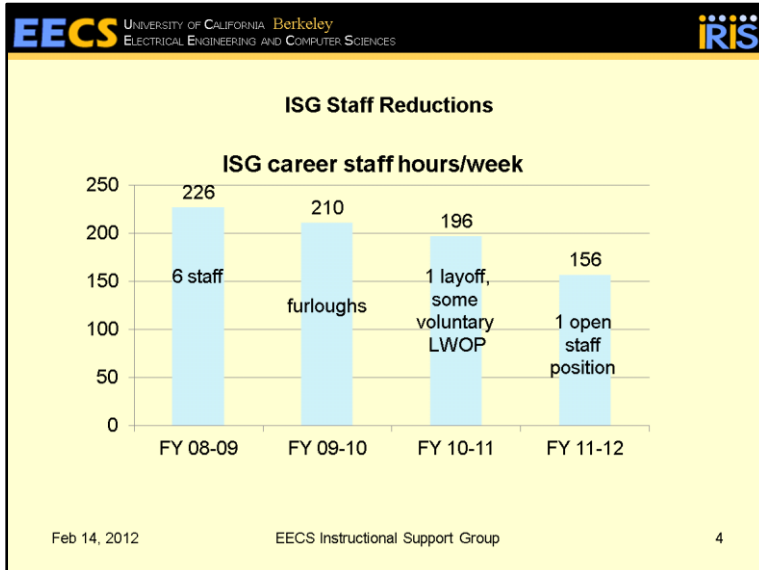
(I don't have records about earlier donations here, but it was not uncommon to receive \$30K-\$100K in computers from SUN, Intel and HP in previous years.)

FY 97-98: 28 workstations and server (\$292K, HP)

ISG Staff Reductions vs Course Enrollment



Here is a contrast between the increasing enrollment in EECS classes...



...and decreasing staff hours.

Staff were on required furloughs in FY 09-10.

1 career staff (SAIII) was laid off in FY 10-11 (July 2010).

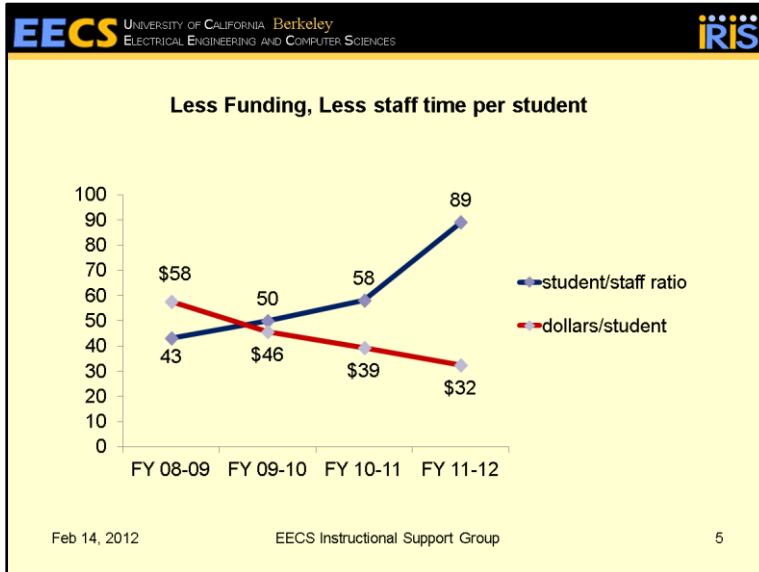
1 career staff (SAIII) took another job in FY 11-12 (August 2011).

I have deferred rehiring to accrue cash for replacement of computers in Cory labs.

We are now, temporarily, 4 career staff.

@ 5 staff, salaries are about 80% of budget

@ 4 staff, salaries are about 66% of budget



Here is a contrast between the increasing enrollment in EECS classes and decreasing staffing and funding.

“dollars/student” is $(\text{total funding for the year}) / (\text{total fall + spring enrollments})$

“student/staff ratio” is $(\text{total fall + spring enrollments}) / (\text{staff work hours in a week})$

The “student/staff ratio” is meaningful only when viewed in series, indicating the trend.

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Computers – new...		
140 Cory:	35 i7 PCs; TI grant (2012)	\$40K
353 Cory:	24 i7 PCs; Intel grant (2012)	\$30K
Icluster:	26 servers; Intel & Google grants (2007, 2012)	\$105K
330 Soda:	30 dual-quad Xeon, Tesla; Intel grant (2010)	\$90K
200 SDH:	30 MacsPros; Apple grant (2009)	\$135K
Sun servers:	2 SPARC T5220s; SUN AEG grant (2009)	\$42K
	2 Opteron X4600; SUN AEG grant (2009)	\$23K
Total value of Instructional computers: \$1M		
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Here are the newest computers and how they were funded:

140 Cory:

Windows; i7, 16BG RAM, 2TB disk, PCI & PCIe; EE40, EE42, EE100; TI grant via Prof Lee

353 Cory, 277 Soda:

Windows; i7, 16BG RAM, 2TB disk, PCI & PCIe; EE105, EE140; Intel grant via Prof Spanos

330 Soda:

Linux, Dual Quad Core Xeon, 6GB, NVidia Tesla gpu; CS194-15, CS61C, CS186; Intel grant via Prof Yelick

Icluster:

Linux; CS61A, CS294-1, CS250; Hadoop, MarkLogic, Synopsys; Intel & Google grants via Prof Yelick

IDSG disk storage:

Retired ISG NetApp and tape backups; moved UNIX home dirs to IDSG server (Project/Inst-fs)

200 SDH:

MacOSX; CS10, CS198, CS61a; Apple grant via Prof Garcia

SUN servers:

- Solaris SPARC: 8-core UltraSPARC, 32-GB RAM; deployed as SunRay/login servers in 271 & 273 Soda
- Solaris X86: 8-core Opteron 885, 32-GB RAM; deployed as several servers using zones

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..and old

SunRays:	271, 273, 277 Soda, 199 Cory (2000) ...\$50K
Renovate 105 Cory:	new PCs, furniture, wiring, etc (2002) ...\$50K
Linux servers:	old Broadcom systems (2003)\$ 30K
Windows servers:	Iserver[123] for RDC (2003)\$30K
Video streaming:	Netshow01 - Windows only (2003)\$10K
Solaris servers:	Cory, Pulsar, Quasar (2004) \$90K

For a 5-year replacement cycle: \$1MK/5 = \$200K per year

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Here are the oldest computers:

SunRays:

Default labs for CS61A, CS61B, CS16*, CS188, EE122, etc.

Solaris servers:

Login servers for Cadence, Synopsys, etc (Cory, C199, Quasar, Pulsar)

Mamba: used for Samba and /home/tmp (c. 2001)

- CS186 was relying on Mamba
- Will re-purpose a 400-GB filesystem from IDSG server (Project/Inst-fs)

Linux servers:

Icom*; alternatives to Icluster* servers; classes now use Hive* (330 Soda), p380* and T7400* (125 Cory)

Windows servers:

Used for remote access to Windows software; can't run Win2008 or some newer software

Video Steaming:

Current service is Windows *.avi, *.wmv only; old version on Netshow, old hardware

New Equipment Wish List

3 Sun SPARC (UNIX) servers (\$30K each)

3 X86 (UNIX or Windows) servers (\$12K each)

Virtual Hosting server:

- 1 Sun Fire X4450 Server w/ 24-core cpu, 64-GB RAM (\$24K)
- 100-user license for Thinsy VM server software (\$???)
- Students in several programming classes would be issued a persistent virtual computer on which they could safely develop programs that have special security or performance risks. Users could include EE122 (network protocols), CS186 (database and WEB servers) and CS161 (computer security) , etc.

New lab for EE149 (or EE128 if displaced by EE149)

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Services & Planning

- SunRays & 4 Solaris servers are old: what next?
- Competition for newest systems
- Be more "agile" about deploying new servers
- Video Streaming and CMS WEB servers
- Masters in Eng, other new classes?

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SunRays & 4 Solaris servers are aging (CS61A, CS61B, CS188, CS16*, etc):

- Old Solaris servers are being abandoned for Linux, puts overload on our Linux workstations.
- unexpected migration from Solaris to Linux for Postgres (CS186), Synopsys (EE241) lead to competition for Linux resources
- No deals being offered by Oracle
- Replace with Linux servers (need more)
- Can't get Linux servers with the equivalent power of the SUN SPARC servers.

Be more "agile" about deploying new servers:

- Provide servers that can run VMs (in-house or in the cloud)?
- Run VMs on home and lab computers? Network and disk concerns, large files to move around.

Competition for newest systems:

- Icluster (servers), 330 Soda (Linux) , 200 SDH (MacOSX).

Video Streaming and CMS WEB servers:

- Dept has offered \$\$\$ to upgrade server for Masters in Engineering programs.
- Courses want video and CMS servers (Real, Wordpress, Moodle).
- We are providing sys admin for Netshow01/California/IESG, Helix, UCWise servers now.
- We need to define the production goals.
- We should consider using the IST/ETS servers (CalCentral.b.e and Media.b.e).

Support old software/hardware in EE labs:

- New computers must have PCI slots for old GPIB boards for 140 Cory, 353 Cory.
- Can't afford to upgrade Metrics (\$3220 per license)(EE143), stuck on WinXP.

Masters in Eng, other new classes?

- What future demands for labs and ISG/ESG services?
- I need to survey the instructors more often.

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Discussion

1. Demand on current clients, servers, rooms
2. Current limitations/Constraints - License, attached HW, GPU/graphics demand
3. Funding options - Dept, Corporate, Grant, OE, lab fee
4. Historical funding/staffing per student credit hour
5. Service model - drop-in display, client Pcs, Timesharing
6. Future directions

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End of presentation

References:

<http://inst.eecs.berkeley.edu/~kevinm/budget>
<https://inst.eecs.berkeley.edu/~inst/reports>
<http://inst.eecs.berkeley.edu/~inst/iesglabs.html>

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Recent Events

- 1) service interruption on Feb 8/9

LDAP and disk access failures affected all UNIX users for several hours on Wednesday night (6am-11pm); disk access failures affected CS186 through 9am the next day; they had an assignment due.
- 2) EE241 request for use of lcluster

Prof Nikolic requested use of some lcluster systems for custom Synopsys tools; previously used by CS250 (Asanovic); now used by CS294-1 (Canny). Controversy over rights to use systems.

A common factor:
unexpected migration from Solaris to Linux (for Postgres, Synopsys)

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Review of recent events:

1) service interruption on Feb 8/9

- One LDAP server failed ~6pm; Linux (330 Soda, CS186) doesn't fail over. We failed them over manually within an hour.
- Home drive for all class accts filled up ~8pm. We deleted old accounts within an hour.
- While we were increasing disk quotas for CS186, they could not write to home dirs (until 9am for some).

2) EE141 (Prof Nikolic) request (Feb 9) for use of lcluster

- We have worked with his grad student to port software to other Linux systems.
- Prof Canny's app (MarkLogic) uses the cluster; he found funding to upgrade RAM and disks for it.
- Prof Canny started on this last November.

A common factor:

- unexpected migration from Solaris to Linux for Postgres, Synopsys