QUESTIONS FROM THE CS TOWN HALL SURVEY

2014

What can be done to reduce theft from the bike racks on campus?

Bicycle theft is a tremendous problem on college campuses, and UC Berkeley is no exception. Bicycles and bicycle parts, including “quick release” seats and wheels, are in big demand, and thieves are well-equipped and organized.

Unfortunately, there is no full-proof measure to prevent a bicycle from being stolen. However, there are certain measures that can be done to assist in the prevention of bicycles being stolen. For example, registering your bicycle with the UCPD, locking your bicycle properly with U type locks, and parking your bicycle in one of the Secure Bicycle Parking lots (http://pt.berkeley.edu/around/biking/bikeparking). Additional suggestions can be found on the UCPD website, http://police.berkeley.edu/prevention/bike.html.

Why do EE classes not satisfy CS breadth requirements but CS classes satisfy EE breadth requirements?

In spring 2014, the CS prelim Faculty committee spent a considerable amount of time revising the breadth requirements to ensure CS PhD students would have both breadth and depth in Computer Science upon graduation. Although CS PhD students are expected to take at least one course from each grouped areas (Group 1 : THY, AI, GR; Group 2:Programming, Systems, and Architecture), students can petition to have an EE class satisfy one of their CS breadth requirements.

How can we increase faculty attendance at grad events?

One suggestion that came out of the EE Town Hall was to create a faculty liaison position to encourage more faculty/student interaction. In this way, a designated faculty member could personally invite and ensure that more faculty members attend GSA events. Perhaps this is also something that CS PhD students and faculty would like to explore. We also recommend students encourage and send reminders to their advisors to attend events.

There are a lot of issues with the wireless network (EECS-Secure). Can the network infrastructure be improved?

Summary: We are aware of a number of issues relating to the EECS wireless network, including frequent disconnects, inability to connect at all, and the failure of multicast-based services such as video mirroring and streaming. These issues are due largely in part to our outdated network equipment and design, and the fact that the network was not designed to handle today’s volume of wireless traffic and devices. We are currently working to address these issues: first with a refresh of the wired routing and switching core scheduled for deployment in January 2015, after which we will be fully replacing the wireless broadcast infrastructure with a design geared towards greatly increased radio density and performance. The wireless upgrades are scheduled to take place during summer 2015, and we expect to resolve the majority of our wireless issues in time for the fall 2015 semester.
As many in the EECS community know, there are a number of deficiencies in the EECS network infrastructure that have created a lot of pain for anyone trying to use EECS wireless networks. We would like to take a moment to address those issues, and to describe the steps being taken to rectify them and bring our wireless networks up to the high standard expected and deserved by the EECS community. These issues are most commonly experienced in Soda, Cory, and Sutardja Dai Halls; they can also be experienced to a lesser extent in Blum Hall, the Hearst Memorial Mining Building, the Calvin Lab, and the Berkeley Wireless Research Center, as a result of a shared underlying wired infrastructure.

The most common symptoms we have seen are:

- Inability to connect to the wireless networks in several locations
- Slow association times or trouble reconnecting after a device wakes from sleep
- Occasional or frequent disconnects while using the wireless network
- Difficulty utilizing services such as Bonjour/AirPlay, Chromecast, or anything relying on multicast IP traffic

There are a number of contributing causes to these issues, which is why it has taken so long for them to be addressed. For one, the EECS network has not undergone a major refresh since 2008; we generally aim for a five-year cadence on each section of the network, and the next refresh is due to land in January 2015. Additionally, the lower cost of laptops and the incredible popularity of mobile phones, tablets, e-readers, and the like have drastically changed how networks are designed and built. As a result, our old equipment and designs, while appropriate in 2008, have not scaled well with the explosion of wireless devices. This growth is especially apparent in EECS due to the nature of the work being done. Our wireless networks were never designed to handle today’s volume of wireless devices, nor modern user expectations of wireless network performance. Combine this with age-related architectural shortcomings in our wired core network, and several years of decreased network staffing in the department, and one begins to see how we got to where we are today.

The good news is that IRIS, the department’s IT organization, has been working tirelessly over the past year to lay the groundwork for a cutting edge replacement of the network infrastructure. Our current project, which is in the late design phase, is a full overhaul of the wired routing and switching core. Targeted for a release in early January 2015, this refresh will address a large number of issues and limitations within the wired network on which the wireless relies. This project is expected to resolve some, but not all, of the symptoms related to slow association times and frequent disconnects. It will also introduce multicast routing capability, as well as several other features, which will allow us to support applications such as AirPlay and Chromecast. The core refresh is the first project in a larger effort, and we have subsequent refreshes planned to address other parts of the network.

The largest contributor to our troubles, as alluded to above, is that we lack sufficient radio coverage (in terms of number, location, and quality of access points) to support today’s wireless needs. During the spring semester, after the new routing core is complete, we will dedicate ourselves to addressing wireless coverage. This will involve the selection of new, state-of-the-art wireless access points, as well as contracting professional RF surveys of EECS buildings to determine the correct density and number of access points. Initial back of the envelope estimations indicate that we can expect to increase our number of access points by approximately 50%; we will also utilize better placement and newer equipment with more powerful radios. Our current hope is CS Graduate Student Town Hall 2014
that this project can be completed during the summer of 2015, so that we will finally have resolved the majority of the wireless issues in time for the fall 2015 semester.

The unfortunate crux of the issue is that this is a systemic problem with many causes and nothing close to a quick or easy fix. In extreme cases, we are able to deploy access points on-demand in particularly bad areas. However, it is preferable to focus our time, money, and efforts on developing a sustainable and scalable long-term solution, rather than dispensing short term band-aids. For the time being, we are regrettfully recommending the use of a wired network connection whenever the wireless is unreliable or if you are in need of a more stable, high-speed connection.

If you have any further questions or concerns about the wireless network, please direct all inquiries to help@eecs.berkeley.edu, where they will be directed to the engineers working on these projects.

We apologize for any and all difficulties caused by the current state of the wireless network, and we’re sorry that we don't have a more expedient solution for you. We hope you understand the reasoning behind our logic and that we are working diligently to bring the department’s network up to the highest possible standard.

Thanks,

EECS/IRIS Network Infrastructure Group

[1] For the sake of this document, EECS wireless is defined as all wireless networks (any beginning with “EECS-” as well as AirBears, AirBears2, and attwifi) being broadcast by EECS Department infrastructure, which is located in the buildings described in the first paragraph.

**Students spend a considerable amount of time administering software packages. What can the department do to provide better IT support?**

We recognize that administering systems and software can take a significant amount of time. This extra time spent by graduate students detracts from their primary roles and responsibilities. Most graduate students administer their laptops and other end user devices, which often involves configuration, patch management, backup, and maintenance. Some graduate students also find themselves responsible for managing server infrastructure in support of research, which can consume even more time keeping those systems up to date, functional, and secure. Below, we identify some of the support models and services that are currently in place as well as pointers for getting further information and support.

**Opt-In IT Support Models**

To address the gaps between the current IT services provided by EECS and specific needs of research groups, there are a few opt-in support models offered. A conversation with the Helpdesk staff may be the best start to determining what level of support would be most appropriate.

- Some of the larger research groups or groups with complex needs hire one or more staff to support specific IT needs.
- For smaller research groups, a fraction of an FTE may be needed to support the specific IT needs. We accomplish this by assigning a staff to multiple research groups with similar needs. To be most effective,
we prefer not to split up a staff’s effort less than 50% on an annual basis, but in certain cases where there is good alignment between multiple research groups we have gone as low as 20% of an FTE (or one day per week).

- IRIS offers annual system administration support contracts for desktops/laptops, servers, and virtual machines. This can be a good way to offload the system work for systems where it is needed the most.
- Lastly, infrequent IT requests can be handled through the helpdesk at an hourly rate.

Best Practices
In order to simplify administering machines, we strongly suggest taking advantage of the many IT services offered. For end user devices, we recommend that students do as little custom configuration and local installation as possible. This will help keep administration as simple as possible. Developers should take advantage of virtual machines and containers to simplify efforts and minimize the amount of reliance on local customization. Server administrators also will benefit from virtual machines and containers, as well as configuration management tools like Puppet.

Storage / Backup
- Ensure that all of your data is stored on persistent and reliable storage services. You can take advantage of EECS NetApp Home and Project directories to keep your data. Hourly snapshots are kept of all data stored on these servers and monthly backups are archived to tape and kept securely offsite.
- You can also take advantage of the bDrive and Box accounts offered to all members of the campus community. Of particular interest is the recent Google announcement last month that educational members can store unlimited amount of data to bDrive.
- You can also get local client software for cloud storage to allow you to keep local cached copies of files stored there.
- repo.eecs version control supports Git and SVN and can be used for internal and external collaboration.

Virtual Machines / Containers
- VMWare offers many of their software packages for free to faculty and students as part of their Academic Program. Information about this program can be found at https://software.berkeley.edu/vmware.
- For servers, we strongly encourage groups to provision virtual machines instead of buying hardware. This will help simplify administration and allow for more flexible scaling of resources based on changing needs. We can help with provisioning these servers as well as providing additional support in maintaining virtual machines.
- For web servers that have a content management requirement, Pantheon is a paid service that we have been using for hosting Drupal deployments.
- Containers are a promising approach for development and operations. We are currently exploring the best use cases for Docker containers both locally and in the cloud.
- Lastly, many of the cloud compute providers, such as Amazon Web Services, Microsoft Azure, and Google Cloud are providing reduced cost compute and other services for research groups. UC Berkeley now has a dedicated link to one of the Amazon data centers which has allowed us to reduce the egress data costs. Microsoft has been giving out grants and has specifically targeted EECS at Berkeley for these. Google, being the latest player is looking to provide $500 credits to those who have a need.
Security

- Unlike devices used at home or at most companies, the campus and EECS network uses public IP addresses, has minimal firewall rules, and is therefore widely open to the Internet. While this has been valuable for several research efforts, it creates additional burden to protect devices from intrusion. All end user devices should install endpoint protection software if available. The current campus solution is SCEP available at https://software.berkeley.edu/SCEP.
- For servers, it is imperative to use strong local firewall rules and to keep these systems up to date. In the past we have put some critical servers on restricted networks to add an additional level of security. Please talk to us if this is something that you’d like to explore.

EECS IT Staff in IRIS would like to better understand the primary pain points that graduate students are experiencing so that we can effectively address those areas in most urgent need of support. We have identified some support models, guidelines and services above but there may be other concerns and gaps not addressed. If you would like to consult with one of the IT professionals in the department, please contact the help@eecs.berkeley.edu. Based on your needs or concerns, we will match you with one of the IT staff to help find the best solution.

Thanks,
EECS/IRIS Infrastructure Group