How To Compute Like A Grad Student

http://www.cs.cmu.edu/~mahim/ic05/

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Featuring slides stolen from
cache, josullvn, colohan

Why this talk?

- "What does the computing infrastructure look like?"
- "What does the network look like?"
- "Where are the printers?"
- "How do I obtain help?"
- "What is with all these +s in email addresses?"
- "What is this zephyr thing?"

What sits on your desk

- **Dell Optiplex GX620**

- **3.2GHz Pentium 4 640 processor (EMT64, hyperthreaded)**

- **160 GB hard disk**

- **2GB RAM**

- **19" LCD**

- **Dual boot**
  - Fedora Core 3, 2.6.11 kernel
  - Windows XP Pro

What used to sit on these desks

- '90 Concept Terminal w/ Vaxen
- '91 IBM RT 12MB/250MB
- '92 16MHz MIPS R3000 DecStation 3100
- '93 20MHz MIPS R3000 DecStation 5000/20
- '94 25MHz MIPS R3000 DecStation 5000/25 or PowerMac 7100/66
- '95 DecStation 5000/200s with mono monitor
- '96 Sun SparcStation 4
- '97 266MHz Pentium II/64MB/4GB
- '98 400MHz Pentium II/128MB/6GB
- '99 500MHz Pentium III/128M/8GB
- '00 733MHz Pentium III/256MB/20GB
- '01 1GHz Pentium III/512MB/40GB
- '02 1.8GHz Pentium IV/1GB/60GB
- '03 2.4GHz Pentium IV/1GB/80GB LCD
- '04 3.0GHz Pentium IV/1GB/80GB LCD

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What the network looks like

- Switched network, 10/100 Mbps to offices

- We connect to CMU, they connect to PSC, they connect to the world
  - You will hear a lot of griping about PSC

- Network service needs to be paid for (magic money)
  - Do not plug computers in without registering

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What the network looks like (cont)

- **Wireless network**
  - Run by the Andrew folks
  - Free, look at https://netreg.net.cmu.edu/

- **Connecting from home**
  - Cable or DSL broadband service
    - http:/www.broadbandreports.com and zephyr for comparisons
  - Department subsidy of $400/yr
    - Contact maverick@cs for details

- **When traveling**
  - Learn about iPass

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SCS Community

- **Facilidudes**
  - Your friends
  - Overworked
  - Could make more in industry
  - Keep them your friends
    - Bake them cookies!

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SCS Community

- Users
  - Many platforms
    - Linux, Windows, Solaris, MacOS, IRIX, netBSD, freeBSD, Plan9...
  - Volunteers
    - Maintain critical/useful software
    - Help facilities serve other students
  - Savvy users have unique problems

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SCS Community – RPP

- **Reasonable Person Principle**
  - "Do unto others…but better"

- **Respect others' privacy**

- **Hardware and Network**
  - Ask before doing anything Weird
    - FC3 Mirrors, Broadcasts, Floods, Moving Hardware

SCS Community – Finding Help

- Google
- man pages
- Fac Documentation
  - http://www.cs.cmu.edu/~help
- Officemates
- Zephyr, FZQ, Zarchive
  - http://www.cs.cmu.edu/~fzq
  - http://zarchive.srv.cs.cmu.edu/
- Facilidudes
  - help@cs : "When you get a chance, how do I?"
  - Help Desk (8-4231) : "How do I?"
  - Phone Operator (8-2607) :
    - "Network is on fire!", "No more printer paper/toner!"

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Printers

- Printer List
  - http://www.cs.cmu.edu/~help/printing
- Extra-RPP
  - Big jobs at off hours   Pick up your printouts "soon"
  - Clean up messes, jams   Refill paper, Report ENOPAPER
  - Color printers best for final color documents
- Windows
  - Printers off `\\monolith`
- Linux – CUPS
  - Configuration: http://localhost:631/
  - `lpq` lies about queue stats: Use `klpq -P printername`

Misc hardware

- **Fax machine in WeH 4212**
  - Free for work
  - Fee for personal

- **Copiers in the large printer rooms**

- **Scanners in WeH 3501 Terminal Room**

- **Windows machines in Andrew clusters have flash card readers etc.**

Communications – Email

- MMDF – "Fuzzy Matches", "Aliases", Headaches
    - Maybe to me:
        - mahim@cs.cmu.edu
    - To me:
        - mahim+@cs.cmu.edu
        - mahim+foo@cs.cmu.edu (Filter on foo)
        - Mahim.Mishra@cs.cmu.edu
- Mail Servers
    - imap.srv
    - POP wrapper provided
- Clients
    - mutt, pine, Thunderbird, Evolution, kmail (unsupported but works)
    - http://webmail.cs.cmu.edu/
        - Also: http://webmail.andrew.cmu.edu/

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Communications – Email Filtering

- **IMAP and Sieve**
  - http://www.cs.cmu.edu/~help/mail_news/imap.html
  - http://www.cs.cmu.edu/~help/mail_news/imapsieve.html

- **Facilities detects spam for you**
  - Sieve rule to filter it to INBOX.SPAM

- **See talk resource page for an example filtering script**

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Communications – Netnews

- cmu.cs.scs: important announcements
- cmu.cs.*.announce: new software or changes
- cmu.cs.general: general interest items
- cmu.misc.market: for sale, and randomness
- Servers
    - Unix : localhost
    - Windows : dnntpd.srv
- Clients
    - http://webmail.andrew.cmu.edu/
    - Mozilla, Thunderbird, slrn, pine etc.

Communications – Zephyr

- **First: Think AIM Chat**
  - Restrict it to CMU students
    - Well…Many ex-CMU students too
  - Add helpful facilidudes, superpeers
  - Add notices for
    - free food, talks, weather, dept problems, news, printouts
  - Add daylong flamewars and thesis avoidance
  - Add bitterness
- **Public Zephyr is Logged**
  - http://zarchive.srv.cs.cmu.edu/

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Communications – Zephyr

- Xemacs
    - Most easy-to-use and comprehensive client
    - See talk resource page for directions
- kzephyr
    - KDE-friendly interface, installed by default
    - C-j to send messages
- Java/Windows
    - jzephyr: http://www.cs.cmu.edu/~honus/jzephyr/
    - Not working atm; let me know if you want this
- Commandline
    - zwgc – On by default
        - Annoying. To stop: remove from .xinitrc

Communications – Zephyr Demo

- Zephyrites live for this moment

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Communications – Phone/Addr

- **Finger, Home Pages**
  - `finger mahim@cs`
  - `finger mahim.mishra@cs`
  - `finger mahim@cs`
- **Phone**
  - `man phones`
  - `phone help`
  - `phone pizza`
  - `phone burks`

Software – Facilitization

- ## Pluses
  - Kerberos, AFS, Misc Collections
    - Hacked Fedora Core 3
  - Security fixes/updates
  - Backups (Impossible on non-fac'ed hosts)

- ## Minuses
  - Network outages
  - Kernel patches become scary
    - Rebuild AFS, who knows what
  - What if you really want BSD or gentoo or Windows ME?

Software – Defacilitization

- **WAIT. Don't do it**
  - Unless you're REALLY sure. 2nd year?
- **Pluses**
  - Install whatever OS you want
  - Same problems as rest of world
- **Minuses**
  - You must administrate
  - TA'ing and collaboration harder without AFS
  - No backups
- **Options**
  - Work with facilities: Maintain a facilitized BSD/gentoo!

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Software: administering your machine

- You will get root access if you ask nicely, but...
- If you mess something up, you fix it.
  - Fac will do a clean reinstall, recover data from backups.
  - That's it.

- Installing software
  - Be nice, don't install random RPMs
  - Learn about depot
    - This will make your life MUCH better

Software – Depot

- Packages copied/symlinked from AFS each night
  - gcc, matlab, maple, perl, etc
  - Update now (as root): `dosupdepot`
- AFS failure means software failure
  - Force copies in `/usr/local/depot/depot.pref.local`
    - `collection.installmethod copy PKGNAME`
    - pine, gcc?, ssh? etc
- Report problems to help@cs
- man depot.pref.local
- See example on talk resource page
- VOLUNTEER

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Software – Kerberos

- CMU: Hostile Environment (dozens of attacks per hour per machine)
- Authentication/Encryption Clearinghouse
  - Login and get a "ticket"
    - Expire in 25 hours
  - Good for authentication/encryption for AFS/telnet
    - `kinit` – get fresh ticket
    - `krenew` – renew tickets as long as possible
    - `kkerberos` – graphical front end
    - `klist` – list tickets
  - "Access Denied" implies tickets expired
- Create .mail, .ftp instances, ask help desk to create .root
- **http://www.cs.cmu.edu/~help/accounts_passwords/kerberos.html**

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Software – AFS

- /afs/
  - Links to hundreds of sites
  - Stitched together from multiple AFS volumes
  - Fancy, painful "cross-realm authentication" to access them
- You have CS and Andrew accounts
  - /afs/cs/user/mahim
  - /afs/andrew/usr/mmishra
- Backups in `~/OldFiles`
- Use local disk wisely
  - AFS/Network failures suck
    - Home dir on /usr0/ ?
  - Compiles, etc, very slow out of afs
  - Hard to make cron access /afs

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Software – AFS

- `fs help`
- Access control:
  - Read, Lookup, Insert, Delete, Write, locK, Administrative
  - `fs listacl /afs/cs/user/mahim`
  - `fs setacl /afs/cs/user/mahim mahim rlidwka`
  - `fs setacl ~/pub system:anyuser rl`
  - `fs setacl ~/drop system:anyuser i`
  - `fs setacl ~/private –clear mahim rlidwka`
  - *Ignores* unix permissions!
- Quotas:
  - `fs quota /afs/cs/user/cache`
  - Max 1GB: `telnet jeeves`
- Install IBM's free AFS client to access AFS from home/laptop

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Software – Windows Misc

- **Run Updates Regularly**
  - Vulnerable machines pulled from the network
- **Secure Connections**
  - AFS module can be flakey
  - Putty (ssh), NiftyTelnet
- **Dual Boot Systems**
  - Share data via FAT partitions
    - 10 GB on your machines
    - Mounted as /shared
  - `ntfsresize` can change allocations

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ssh

- ## Defacto Standard

  - "Secure" connections sans kerberos
  - `ssh -X mahim@host` (`-X` for X11 forwarding)
  - `ssh -Y mahim@host` (`-Y` for secure X11 forwarding)
  - `ssh -X mahim.root@host` (Login as root)
  - `ssh mahim@cs remote-command`
  - `scp src mahim@host:dst`
  - `scp mahim@host:src dst`
  - `sftp mahim@host`

- ## Windows

  - Use putty.exe or WinSCP (google them)

- ## Fancy tricks let you login without typing passwords

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VNC

- **Idea: Virtualize Your Server**
  - Desktop: `vncserver -geometry 1024x768`
  - Anywhere: `vncviewer hostname:1`
  - Session always just like you left it
    - No matter where you are now
- **Options**
  - Tightvnc – More efficient net performance
  - Windows Remote Desktop
    - Linux client: `rdesktop -u cache host`

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Web Proxies

- Reduces Bandwidth

- Improves Response Times

- Removes Ads

- Servers
  - Squid:3128, junkbuster:8000
  - Privoxy
    - local adbuster
  - http://access.web.cmu.edu/
    - Lets you access CMU-only material

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Resources

- Ergonomics
  - http://www.cmu.edu/ehs/workplacesafe.htm
  - Jim Skees for furniture
- FZQ
  - http://www.cs.cmu.edu/~fzq
- Zarchive
  - http://zarchive.srv.cs.cmu.edu

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Resources

- ## www.library.cmu.edu
  - ### Free IEEE, ACM Databases
    - Use access.web.cmu.edu externally
  - ### INSPEC

- ## www.citeseer.com

Do Today – Part 1

- Make `~/.plan`
  - Office Location, Office, Home, Cell Phone Numbers

- Make doorlabel
  - http://www.cs.cmu.edu/~mahim/ic05/doorlabel

- Make web page
  - http://www-2.cs.cmu.edu/webhelp/howto.html
  - Office Location, Office, Home, Cell Phone Numbers

- Main Office for Copier #
  - Library uses SCS copycard

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Do Today – Part 2

- Accounts for officemates on your machine
- MyAndrew: http://www.cmu.edu/myandrew
  - Forward your @andrew mail to @cs
  - Create @cmu.edu address
- Root Access
  - Ask help@cs to add <you>.root@CS.CMU.EDU to klogin.local
- Kerberos .mail instance
  - telnet jeeves; `kerberos create <you>.mail`
  - Use this in mail clients
- Local Passwords
  - `passwd`
  - Login as <you>/local or <you>:local
  - Do this for you AND for root
- Set up spam filtering (use imap-ns; see resource page)

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Do Today – Part 3

- Volunteer to maintain a misc collection
  - help@cs

- Volunteer to join Decfive

- Volunteer to become an espresso elf or a minion of the coke czar

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Conclusion

- http://www.cs.cmu.edu/~mahim/ic05

- Be reasonable

- Be healthy

- Volunteer

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