

# How To Compute Like A Grad Student

<http://www.cs.cmu.edu/~mahim/ic07/>

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Mahim Mishra

Featuring slides stolen from  
cache, josullvn, colohan

# Why this talk?

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Some nuggets of accumulated wisdom

Some strong opinions

... and everything else you wanted to know, but were afraid to ask

- 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?
- Can't sleep, computer will eat me

(but really, all you need is at <http://www.cs.cmu.edu/~help>)

# Talk organization

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- SCS people
- Hardware and software stuff, services
- Resources
- TODOs for today

I will run through many slides. Look them over at your leisure.  
(<http://www.cs.cmu.edu/~mahim/ic07/>)

# SCS Community

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- Facilities and facilities
  - Your friends
  - Overworked
  - Keep them your friends
    - Be polite and considerate
    - Bake them cookies!
- Facilities (and your fellow students) are more benevolent towards people who volunteer
  - Maintain software (more on this later)
  - Maintain the coffee machine (we all need coffee)
  - Maintain the coke machine (sugar will also do)

# SCS Community

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## ■ Users

- Many platforms
  - Windows, Linux, MacOS, Solaris, freeBSD, netBSD, IRIX, Plan9...
- Many users, many problems...

## ■ Volunteers

- Maintain critical/useful software
  - gcc, matlab, mozilla, ...
- Help facilities serve other students
- Volunteer today to maintain a software collection! (write to `ken2@cs`)

# SCS Community – RPP

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- Reasonable Person Principle
  - “Do unto others...but better”
- Respect others’ privacy
- Ask before doing anything Weird
  - Download mirrors, Floods, Moving Hardware, ...

# SCS Community – Finding Help

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- Officemates, google, man pages
- Fac Documentation
  - <http://www.cs.cmu.edu/~help>
- Zephyr, FZQ, Zarchive
  - <http://www.cs.cmu.edu/~fzq>
  - <http://zarchive.srv.cs.cmu.edu/>
- Facilidades
  - **help@cs** : “When you get a chance, how do I?”
  - Help Desk (8-4231) : “How do I?”
  - Operations (8-2607) : “Network is on fire!”, “No more printer paper/toner!”

# What sits on your desk

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- Dell Optiplex GX750
- 2.66GHz Core 2 Duo processor
- 250 GB hard disk
- 2GB RAM
- 19" LCD
- Dual boot
  - Fedora Core 7, 2.6.21 kernel
  - Windows XP Pro



# What used to sit on your desks

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- '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
- '05 3.2GHz Pentium IV (EMT64)/2GB/160GB/LCD
- '06 3.4GHz Pentium D (EM64 Dual core)/2GB/160GB/LCD

# SCS network

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- See <http://www.cs.cmu.edu/~help/networking/>
- Network service needs to be paid for (magic money)
  - Do not plug computers in without registering
  - <http://www.cs.cmu.edu/~help/networking/netregister.html>
- Switched network, 10/100 Mbps to offices
- We connect to CMU, they connect to PSC, they connect to the world
  - You will might hear a lot of some griping about PSC

# SCS network (cont)

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- 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
    - No, iPhones don't count as "broadband"
- When traveling
  - Learn about iPass

# Printers

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- 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 `k lpq -P printername`

# Misc hardware

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- Fax machine in WeH 4212
  - Free for work
  - Fee for personal
  - Work stuff can also be handled by your advisor's AA
- Copiers in the large printer rooms
- Scanners in WeH 3501 Terminal Room
- Windows machines in Andrew clusters have flash card readers (see the cluster in the 5100 corridor)

# Communications – Email

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- [http://www.cs.cmu.edu/~help/mail\\_news/index.html](http://www.cs.cmu.edu/~help/mail_news/index.html)
- Mail Server
  - [imap.srv.cs.cmu.edu](http://imap.srv.cs.cmu.edu)
  - POP wrapper provided
- Clients
  - Outlook, mutt, pine, thunderbird, kmail (unsupported but works)
  - <http://webmail.cs.cmu.edu/>
    - Also: <http://webmail.andrew.cmu.edu/>

# Communications – Email Filtering

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- IMAP and Sieve
  - [http://www.cs.cmu.edu/~help/mail\\_news/imap.html](http://www.cs.cmu.edu/~help/mail_news/imap.html)
  - [http://www.cs.cmu.edu/~help/mail\\_news/imapsieve.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 (<http://www.cs.cmu.edu/~mahim/ic07>)

# Communications – Netnews

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- 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

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- Private zephyr
  - Great for communicating with your friends, group members, other CS folks, email and printer notifications
  
- Public zephyr
  - First: Think IRC Chat
  - Restrict it to CMU students (many ex-CMU students too)
  - Add helpful facilidudes, superpeers
  - Add notices for free food, talks, weather, dept problems, news
  - Add daylong flamewars and thesis avoidance
  - Add bitterness
  - Public Zephyr is Logged: <http://zarchive.srv.cs.cmu.edu/>

# Communications – Zephyr

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- Xemacs
  - Most easy-to-use and comprehensive client
  - See talk resource page for directions
- kzephyr
  - KDE-friendly interface
  - Not currently installed on FC7
    - Run from `/afs/cs.cmu.edu/local/kde/i386_rh80/3.1/bin/kzephyr-bin`
- Commandline
  - `zwrite` to send
  - `zwgc` to receive– On by default
    - Annoying. To stop: remove from `~/.xinitrc`
- Java/Windows
  - `jzephyr`: <http://www.cs.cmu.edu/~honus/jzephyr/>
  - Not working at the moment
  - Volunteer and fix it!

# Communications – Zephyr Demo

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- Zephyrites live for this moment

# Communications – Phone/Addr

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## ■ finger

- `finger mahim@cs`
- `finger mahim+@cs`
- `finger mahim.mishra@cs`
- Does some fuzzy matching and disambiguation
- Somewhat retarded; follows email forwarding

## ■ lookup

- Especially useful for people whose email is forwarded off-site

## ■ Phone

- `man phone`
- `phone help`
- `phone pizza`
- `phone burks`

# Software – Facilitization

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## ■ Pluses

- Kerberos, AFS, Misc Collections
  - Hacked Fedora Core 7
- 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

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- WAIT. Don't do it
  - Unless you're REALLY sure. 2nd year?
- Pluses
  - Install whatever OS you want
  - Bypass CS problems (AFS, depot breakages, ...)
- Minuses
  - You must update, patch, troubleshoot, ...
  - AFS and kerberos are tricky to get working right
  - No backups

# Software: administering your machine

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- 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
    - We will come back to depot later

# Software – Kerberos

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- Authentication/Encryption Clearinghouse
  - Login and get a “ticket”
    - Expires in 25 hours
  - Good for authentication/encryption for AFS/telnet
    - `kinit` – get fresh (ticket-granting) ticket
    - `krenew` – renew tickets as long as possible (a month)
    - `klist` – list tickets
    - `klog` – get AFS tokens for many different cells
  - “Access Denied” usually implies tickets expired
- Create .mail, .ftp instances, ask help desk to create .root
- [http://www.cs.cmu.edu/~help/accounts\\_passwords/kerberos.html](http://www.cs.cmu.edu/~help/accounts_passwords/kerberos.html)



# Software – AFS

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“You know you have [a distributed system] when the crash of a computer you've never heard of stops you from getting any work done.”

- Leslie Lamport

At CMU, AFS is that distributed system.

# Software – AFS

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- /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
- Day-old 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

# Software – AFS

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- **fs help**
- **Access control: rlidwka!**
  - 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/mahim`
  - **Max 1GB:** telnet jeeves
    - you can get more if you ask nicely
- **Install IBM's free AFS client to access AFS from home/laptop**

# Software – Depot

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- Packages copied/symlinked from AFS each night
  - gcc, matlab, maple, perl, etc
- AFS failure means software failure
  - Force copies in `/usr/local/depot/depot.pref.local`
    - `collection.installmethod copy PKGNAME`
    - pine, gcc?, ssh? etc
- `man depot.pref.local`
- See example on talk resource page
- VOLUNTEER

# Software – Windows Misc

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- `\\monolith\pc_dist` is your friend
- Install Updates Regularly
  - (All you should need to do is reboot)
  - 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

# ssh

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- “Secure shell”: 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 or WinSCP (google them)
- Fancy tricks let you login without typing passwords
  - <http://www.snailbook.com/faq/no-passphrase.auto.html>
  - You will still need to kinit to use any kerberos-protected resources

# VNC

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- 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

- Other options

- Tightvnc – More efficient net performance
- Windows Remote Desktop
  - Linux client: `rdesktop -u cache host`

# Web Proxies

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- Reduces Bandwidth, Improves Response Times
- Removes Ads
  
- Servers
  - Squid:3128, junkbuster:8000
  - <https://www.vpn.cmu.edu/webvpn.html>
    - Lets you access CMU-only material



# Resources

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- 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>

# Resources

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- [www.library.cmu.edu](http://www.library.cmu.edu)
  - Free IEEE, ACM Databases
    - Use <https://www.vpn.cmu.edu/webvpn.html> externally
  - Loads of other resources

# Do Today – Part 1

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- Make ~/ .plan
  - Office Location, Office, Home, Cell Phone Numbers
- Make doorlabel
  - <http://www.cs.cmu.edu/~mahim/ic07/doorlabel>
- Make web page
  - <http://www.cs.cmu.edu/webhelp/howto.html>
  - Office Location, Office, Home, Cell Phone Numbers
- Accounts for officemates on your machine
- Ask Main Office for Copier #
  - Library uses SCS copycard

# Do Today – Part 2

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- 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 ~root/.klogin.local
- Kerberos .mail instance
  - telnet jeeves; kerberos create <you>.mail
  - Use this in mail clients
- Local Passwords
  - Login as root, use `passwd <you>`
  - Login as <you>/local or <you>:local
  - Do this for you AND for root

# Do Today – Part 3

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- Volunteer to maintain a misc collection
  - ken2@cs
- Volunteer to join Decfive
- Volunteer to become an espresso elf or a minion of the coke czar

# Conclusion

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- <http://www.cs.cmu.edu/~mahim/ic07>
- Be reasonable
- Be healthy
- Volunteer