

# How To Compute Like A Grad Student

<http://www.cs.cmu.edu/~mahim/ic06/>

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Featuring slides stolen from  
cache, josullvn, colohan

# Why this talk?

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- 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?

# Talk organization

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- SCS people
- Hardware and network
- Communications
- Software
- Resources
- TODOs for today
- I will run through many slides. Look them over at your leisure. (<http://www.cs.cmu.edu/~mahim/ic06/>)



Pay attention to these points.  
They will make your life better.

# SCS Community

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- Facilidades and facilidudettes
  - Your friends
  - Overworked
  - Could make more in industry
- Keep them your friends
  - Bake them cookies!



# SCS Community

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## ■ Users

- Many platforms
  - Linux, Windows, Solaris, MacOS, IRIX, netBSD, freeBSD, Plan9...
- Savvy users have unique problems

## ■ Volunteers

- Maintain critical/useful software
- Help facilities serve other students
- Volunteer today to maintain a misc collection! (write to **goob@cs**)



# SCS Community – RPP

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- Reasonable Person Principle
  - “Do unto others...but better”
- Respect others’ privacy
- Hardware and Network
  - Ask before doing anything Weird
    - Download mirrors, Broadcasts, 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/>
- 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!”

# What sits on your desk

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- Dell Optiplex GX620
- 3.4GHz Pentium D processor (EMT64, dual-core)
- 160 GB hard disk
- 2GB RAM
- 19" LCD
- Dual boot
  - Fedora Core 5, 2.6.15 kernel
  - Windows XP Pro



# What used to sit on these 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

# What the network looks like

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- 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

# What the network looks like (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
- 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 `klpq -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 etc. (there is one in the 5100 corridor)

# Communications – Email

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- 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.cs.cmu.edu
  - POP wrapper provided
- Clients
  - 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/impsieve.html](http://www.cs.cmu.edu/~help/mail_news/impsieve.html)
- Facilities detects spam for you
  - Sieve rule to filter it to INBOX.SPAM
- See talk resource page for an example filtering script

# 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 facilities, 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 FC5
  - Run from `/afs/cs.cmu.edu/local/kde/i386_rh80/3.1/bin/kzephyr-bin`

- Commandline

- zwgc – On by default
  - Annoying. To stop: remove from `~/.xinitrc`

- Java/Windows

- jzephyr: <http://www.cs.cmu.edu/~honus/jzephyr/>
- Not working at the moment; let me know if you want this

# 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`
  - Somewhat retarded; follows email forwarding
- Lookup
  - Not available on fc5 yet?
- Phone
  - `man phones`
  - `phone help`
  - `phone pizza`
  - `phone burks`

# Software – Facilitization

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## ■ Pluses

- Kerberos, AFS, Misc Collections
  - Hacked Fedora Core 5
- 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
  - Same problems as rest of world; you must administrate
  - TA'ing and collaboration harder without AFS
  - No backups (is this really true?)
- Options
  - Work with facilities: Maintain a facilitized BSD/gentoo!

# 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



# Software – Kerberos

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- CMU: Hostile Environment (dozens of attacks per hour per machine)
- 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) (bug `bhudson@cs`)
    - `klist` – list tickets
    - `klog` – get AFS tokens for many different cells
  - “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](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`
- 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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- 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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## ■ 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

- <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
- 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/ic06/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
  - help@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/ic06>
- Be reasonable
- Be healthy
- Volunteer