# Carnegie Mellon

Intro Meeting

Fall 2005

**COMPUTER CLUB**

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# Our Mission

*"The computer club was founded in 1899 to study wire…"*

- Encourage tinkering
- Spread appreciation for cool retro hardware
- Promote open source software
- Provide useful services to campus community

# Club History

- May have been an ACM chapter back in '60s
- Large presence in early '90s
- Petered out in late '90s
  - People got old, tired, didn't recruit
- Regained funded recognition 2 years ago, bunch of new members
- Actively recruiting!

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# Who are we?

- Officer introductions
- ~10 undergrads, about 5 active
  - Did I mention we're actively recruiting?
- A few old people
- Staff advisor: Dave Eckhardt

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# What do we do?

- Run an andrew-like environment
  - AFS servers, kerberos KDCs, shell servers, mail servers, DNS servers…
- Hack on programming projects in this context
  - (But it doesn't have to be!)
- Use it to offer a bunch of useful services to campus
- Occasionally hold events (like this one)

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# Services we offer to campus

- Contributed webserver
  - Serves pages straight out of AFS (no publishing required)
  - Will execute CGIs (perl, php, python, etc.)
  - Also host a MySQL and postgreSQL server
- USENET server
- Open source FTP mirror
- DNS hosting for student organizations
- Jabber server
- …others I'm not thinking of…

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# Services we offer to members

- Shell account on our machines
- 300MB AFS space
- Flexible mail delivery
- Another website
  - http://www.club.cc.cmu.edu/~you
- Access to Drycas, the VMS/Vax cluster
- Serious members/officers get admin bits and machine room access

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# Service philosophy

- Like to run things andrew won't touch
  - Too sensitive, too obscure, too expensive
- Want to be useful to students and other organizations
- We don't do service level agreements (SLAs)
- Everything's for fun, on a best-effort basis

- *Nobody is "on call" or carries a pager*

- Frequently better than andrew!

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# Infrastructure

- Machine room in Cyert B6
- Most things run on PC or alpha workstations running Debian GNU/Linux
  - Have a bunch of suns, but phased out of active service
- Run OpenAFS, Heimdal Kerberos, qmail, apache, ...
- Hardware mostly hand-me-downs from CS/ECE facilities or clusters
  - Still decent hardware, perfect for Linux

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# Philosophy

- Bit tired of spending so much time running an ISP
  - Would love to split the work over a few more people
- Interested in pursuing some more CS-ish stuff
  - Virtual hosting
  - Clusters
  - Filesystems

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# How to get involved

- Seriously looking for people
- Don't need to be a UNIX or programming whiz

- Bunch of projects and could-be-projects...

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# How to get involved: Open Source

- By running alphas and suns, we've rattled a lot of relatively untested parts of Linux
  - At least 2 kernel patches due to us
- Filesystems
  - We've experimented with xfs and jfs in production (on alpha!)
  - Our testing has elicited several patches
- AFS and other CMU oddities...
  - Abuse and break regularly
  - Active communication with several developers

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# How to get involved: OSS, cont.

- Can help OSS by just using it

- Need a place to host/test a favorite project?

- Just looking for other people who run alternative OSes?

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# How to get involved: OSS, cont.

- Linux Users Group
  - We are not associated with WPLUG
  - Want to start a student LUG?

- Interested in giving/coordinating interesting talks?
  - OS, network, OSS advocacy, UNIX help sessions

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# How to get involved: Contrib Web

- Contributed web services needs you!

- Focus of a lot of work
- By far the most heavily used service
  - ~50,000 hits/day

- Lots of ideas

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# Contrib Web: Infrastructure

- Two DNS-load-balanced apache servers serving static pages out of AFS
- CGI scripts are detected and passed via mod_rewrite to a dedicated CGI machine
  - CGI scripts for club users go to separate CGI machine
- MySQL/PostgreSQL run on yet another machine
- A lot of code and trickery to make it all work

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# How to get involved: Contrib Web

- We want to provide a suite of useful CGI scripts that people can drop in their web directory
  - Forum, mailback form, blog, whatever

- Want to help find/write a decent selection?

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# How to get involved: Contrib Web

- We also want to make the front page of www.contrib.andrew.cmu.edu be a wiki

- No campus-wide wiki exists to our knowledge
  - Great way for students to share info about CMU, the city, life, whatever
  - Great way for groups to advertise events
  - Great way for club to get publicity…

- Our pipe dream: crush my.cmu in terms of popularity

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- Aside: events AI mumble

# How to get involved: Contrib Web

- CGI scripts run without tokens, cannot read from protected AFS areas or write to AFS
  - How to read database passwords, etc?
- Apache runs without tokens
  - Even if password protect (via .htaccess) a directory, still world-readable
- Interested in hacking on apache (/suexec) to add krb/AFS magic?

# How to get involved: Contrib Web

- CGI scripts are loaded once per request
  - Very slow for stuff like perl
- Want to implement/find a way to implement fast (persistent) CGI execution in our environment?

# How to get involved: Contrib Web

- Authentication to pages and scripts can be done via pubcookie (WebISO)
  - We've just received SSL certificates from andrew to allow us to do this
- Pubcookie painful to setup
  - Anyone want to help?

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# Aside: How not to write code

- Because we like pain, our apache front-ends are alphas and our webiso server is a PC
- No problem! Network protocols are designed to be host-independent
  - Or are they?

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# Aside: How not to write code, cont.

- Pubcookie has a cookie structure:

```
typedef struct
{
    unsigned char user[PBC_USER_LEN];
    unsigned char version[PBC_VER_LEN];
    unsigned char appsrvid[PBC_APPSRV_ID_LEN];
    unsigned char appid[PBC_APP_ID_LEN];
    unsigned char type;
    unsigned char creds;
    int pre_sess_token;
    time_t create_ts;
    time_t last_ts;
}
cookie_data_struct;
```

- Packs it into string (in network byte order, phew!), dumps it on the wire…

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# Aside: How not to write code, cont.

- Strange error message appears in log…
  "cookie size 228 != 240" – huh?!

- On a PC:
  - sizeof(time_t) == 4
  - sizeof(pbc_cookie_data) == 228
- On an alpha:
  - sizeof(time_t) == 8
  - sizeof(pbc_cookie_data) == 240

- Oops…

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# How to get involved: Contrib Web

- Firebomb pubcookie developers!

- Want to write a replacement?

- Actually…

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# How to get involved: Contrib Web

- A problem with pubcookie:
  - Authentication requests coming from our servers for andrew users go to andrew's WebISO (which can't authenticate club users)
  - Authentication requests from our servers for club users go to club's WebISO (which can't authenticate andrew users)
- So if you have an authenticated webapp, it can authenticate andrew users *or* club users
  - So alumns and friends with just club accounts can't access something you're providing to primarily andrew users (or vice-versa)

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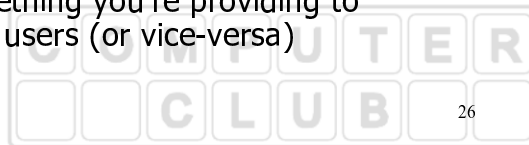
# How to get involved: Contrib Web

- Another limitation of pubcookie: you can't have public users who register to use your webapp authenticate via *either* webiso

- Idea: write a higher-level authentication system that wraps andrew webISO, club webISO, and a custom contribISO

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# How else to get involved

- Enough with contrib already, you hate webservers

- Ok, fine...

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# How to get involved: Infrastructure

- Are you a debian guru?  Are you a package pedant?

- Help us keep our systems consistent and up to date (and make our current package maintainer's life easier)

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# How to get involved: Machines DB

- We have so many machines we can barely keep track of them
  - Not kidding! I'm constantly confused

- We'd love to have some database that collects/stores/displays machine information
  - Including kernel and other critical software versions would be great, too...

- Even better...

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# How to get involved: Central Reporting

- It would be great to have all machines log to a central location that parses incoming logs and warns of serious issues
  - We had a syslog-ng setup, but it got lost/broke

- Don't underestimate this! We lost a hard drive once that had been spewing smart errors for months that we hadn't noticed!

- Could be extended to a full status-monitoring system

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# How to get involved: Accounts DB

- Creating accounts is an insanely complicated process
- We don't have any clean repository of user information (such as secondary contact info)
- We don't have any way for officers of affiliated organizations to create club accounts for their members
  - Ex: robotics club project volumes

- Want to help setup a database of some sort for this?
- Want to learn more kerberos and AFS than you ever wanted to clean up account creation?

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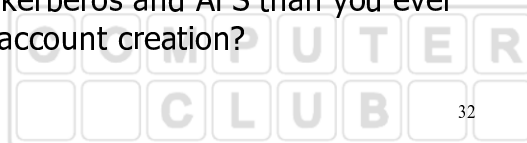
# How to get involved: Restricted kadmin

- Kerberos has only one level of administrative privilege: full administrator
- This makes it dangerous to write scripts that automatically create principals
  - Why this is useful

- Want to write a super-safely written program that has admin rights but has a specific restricted interface on the other end?

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# How to get involved: nfsv4

- AFS is old, slow, and *uggggly*
  - Not to mention broken in many subtle ways
- We've been stuck with it because it's the best distributed authenticated FS
- We want to eventually transition to NFSv4
  - supports GSSAPI/krb authentication and volume management!

- Want to setup our first NFSv4 tests?

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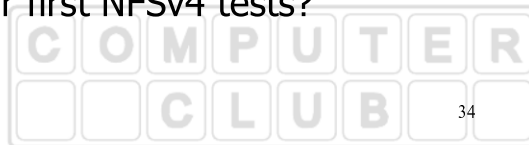
# How to get involved: Docs/Website

- Online documentation is rapidly getting out of date

- Several complaints that website isn't CSS compliant

- Want to help?

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# How to get involved: Anything else?

- None of that interesting?
- Have some other ideas?

- Sure!

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# How to get involved: Administrivia

- Traditionally, we've had problems getting new people involved because most of this work requires root/admin bits
- We now have several Xen installations up, so we can give you a whole virtual machine!
  - Just not for personal use, please…

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# How to find us

- We hold machine room hour weekly:
  - Saturdays @ 6pm in Cyert B6

- We hold weekly discussion meetings:
  - Wednesdays @ 4:30pm
  - Meet in Cyert B6, usually move to atrium

- Come on by, we'll give you a tour, create an account for you

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