MacOS X for ITSS
Short Course

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OUCS
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1. Introduction

- Background
- Goals of the course

“It makes me very happy to hear that you are as well a happy Mac user! For some reasons I got the impression that whole Oxford University is based on ‘poor’ PC’s, bearing in mind when I showed my Macintosh upon arrival to Oxford to [*IT Officer A*] and [*IT Officer B*] here at [*Unit*], they were loudly laughing at me and shaking their head off...”

We will...

- Describe layout of OS X file system
- Look at how to maintain healthy OS
- Look at installing & configuring common apps
- Discuss typical sw & hw problems
- Discuss solutions to typical problems

We won't...

- Get much actual hands-on (sadly) because of equipment restrictions
- Spend time discussing the apps themselves
- Rerun the "Intro to OS X" course going on next door
- Talk about OS9
- Be doing an advanced MacOS X user course

What about OS9 (and earlier)?

- Don't know much about it
- It's basically defunct anyway
- Not enough time to do both
- May touch on Classic environment.

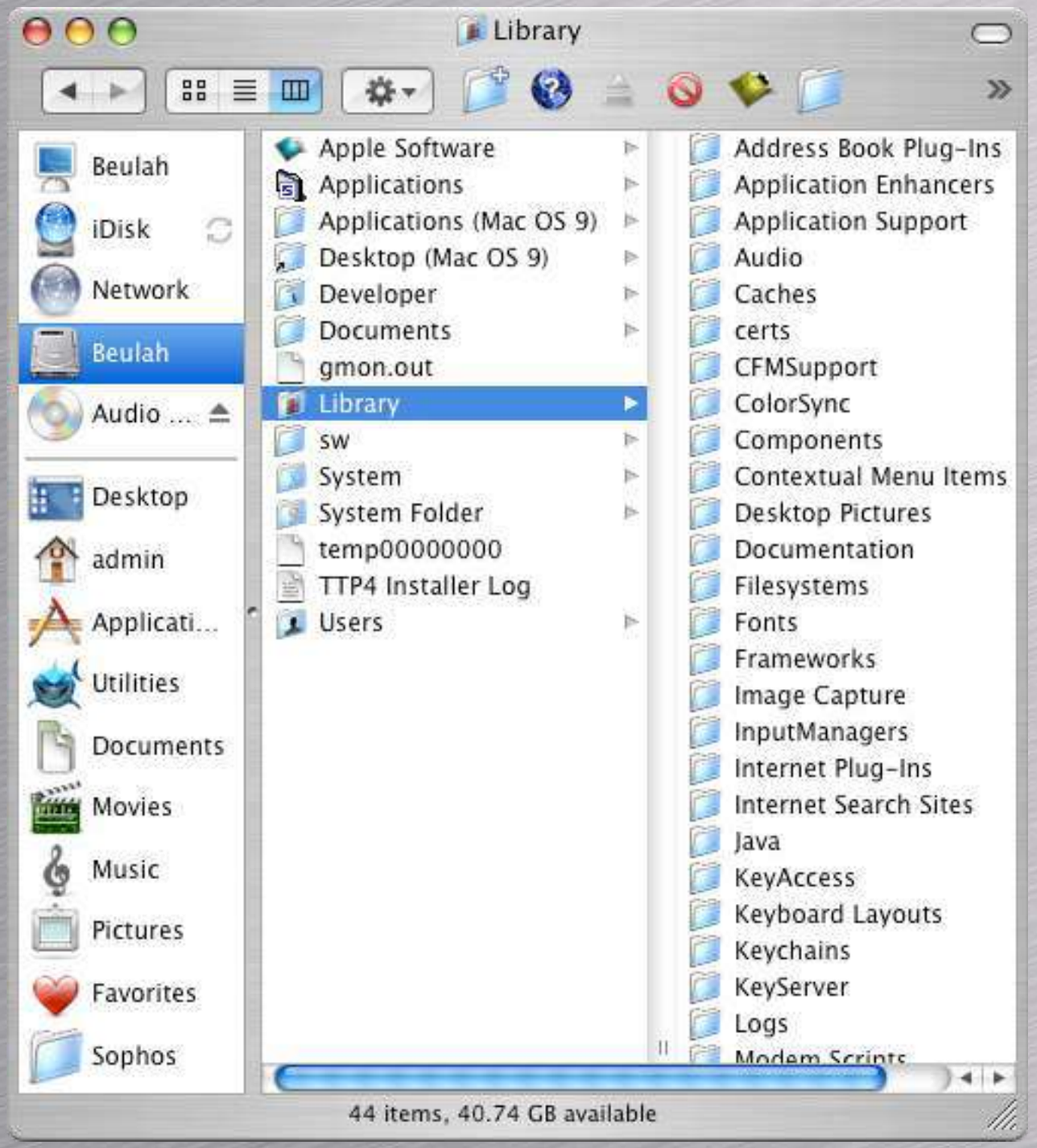
2. OS & File System

- Versions of the OS
- OS Structure

Versions of the OS

- **10.0 Cheetah** (proof-of-concept)
- **10.1 Puma** (public beta)
- **10.2 Jaguar** (first ‘mature’ version)
- **10.3 Panther** (current OS)
- [***10.4 Tiger*** (*tba on 28.6.04*)]

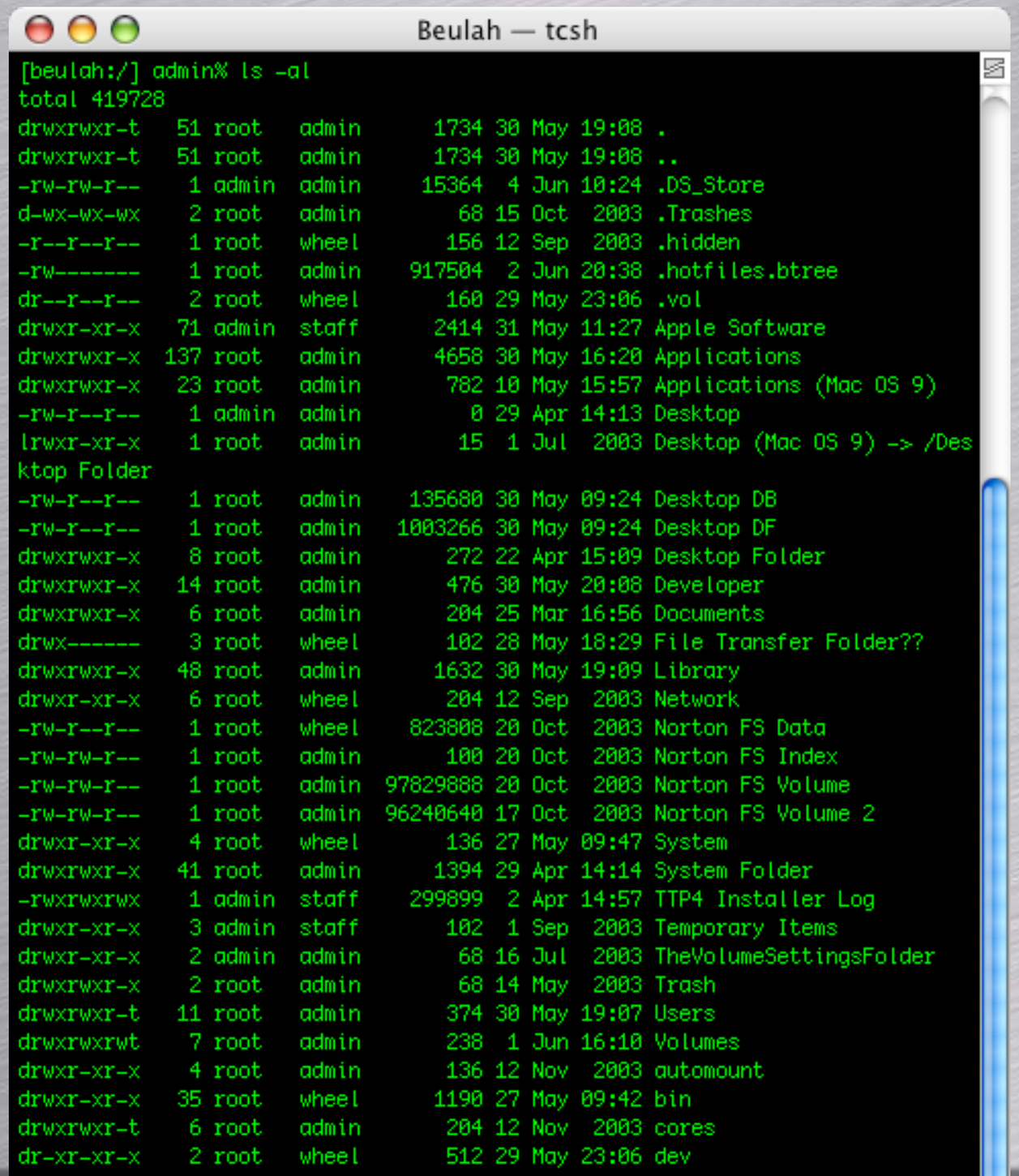
OS Structure



Four Domains:

- **User**: under complete control of current user (incl. Home folder)
- **Local**: Folders & files usable by all users of the machine; can be modified by admin users; not crucial to OS
- **Network**: as 'Local', but accessible to all users of a network and modifiable by Network admins
- **System**: Not intended for use by anyone but the system itself.

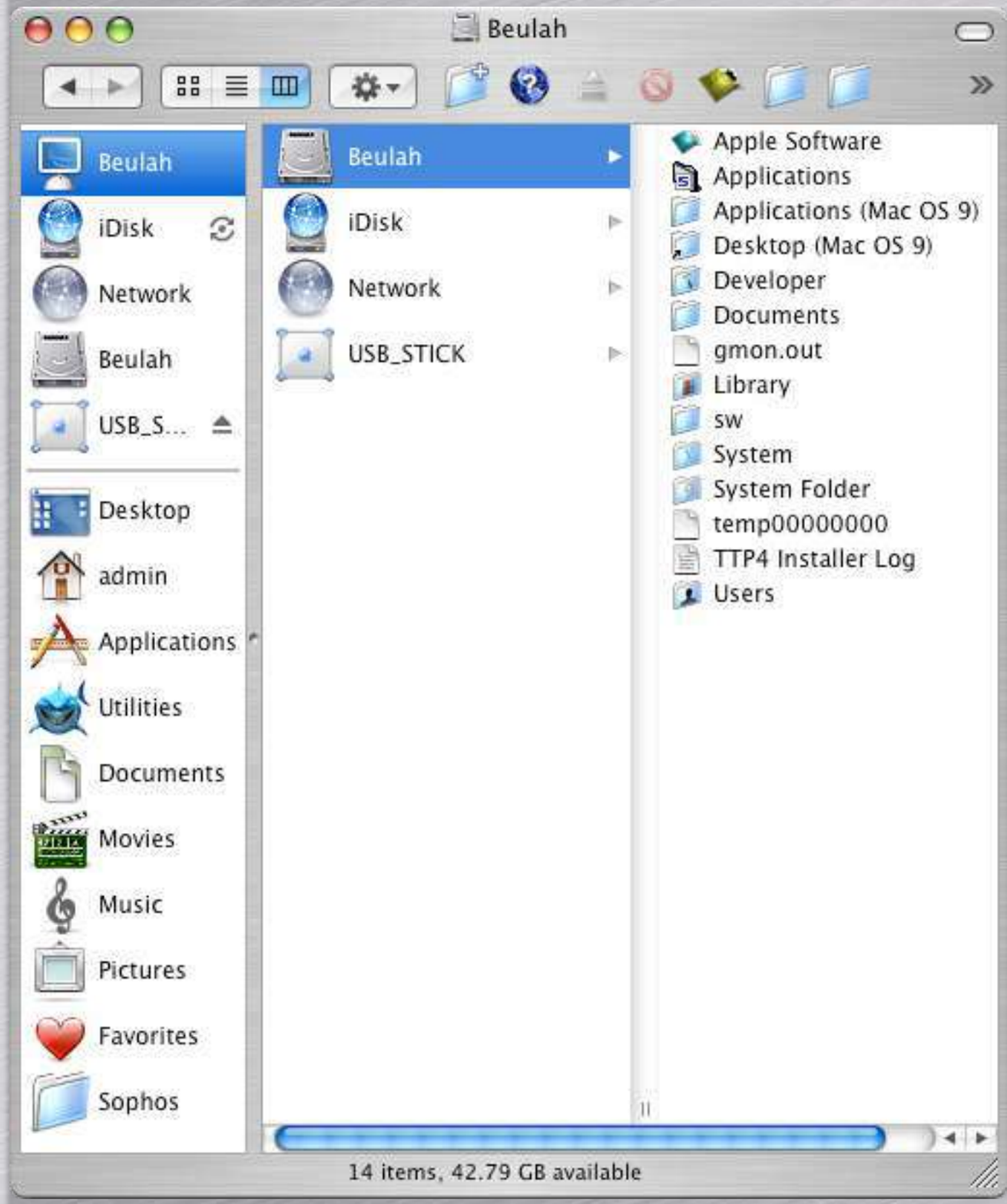
The Terminal View

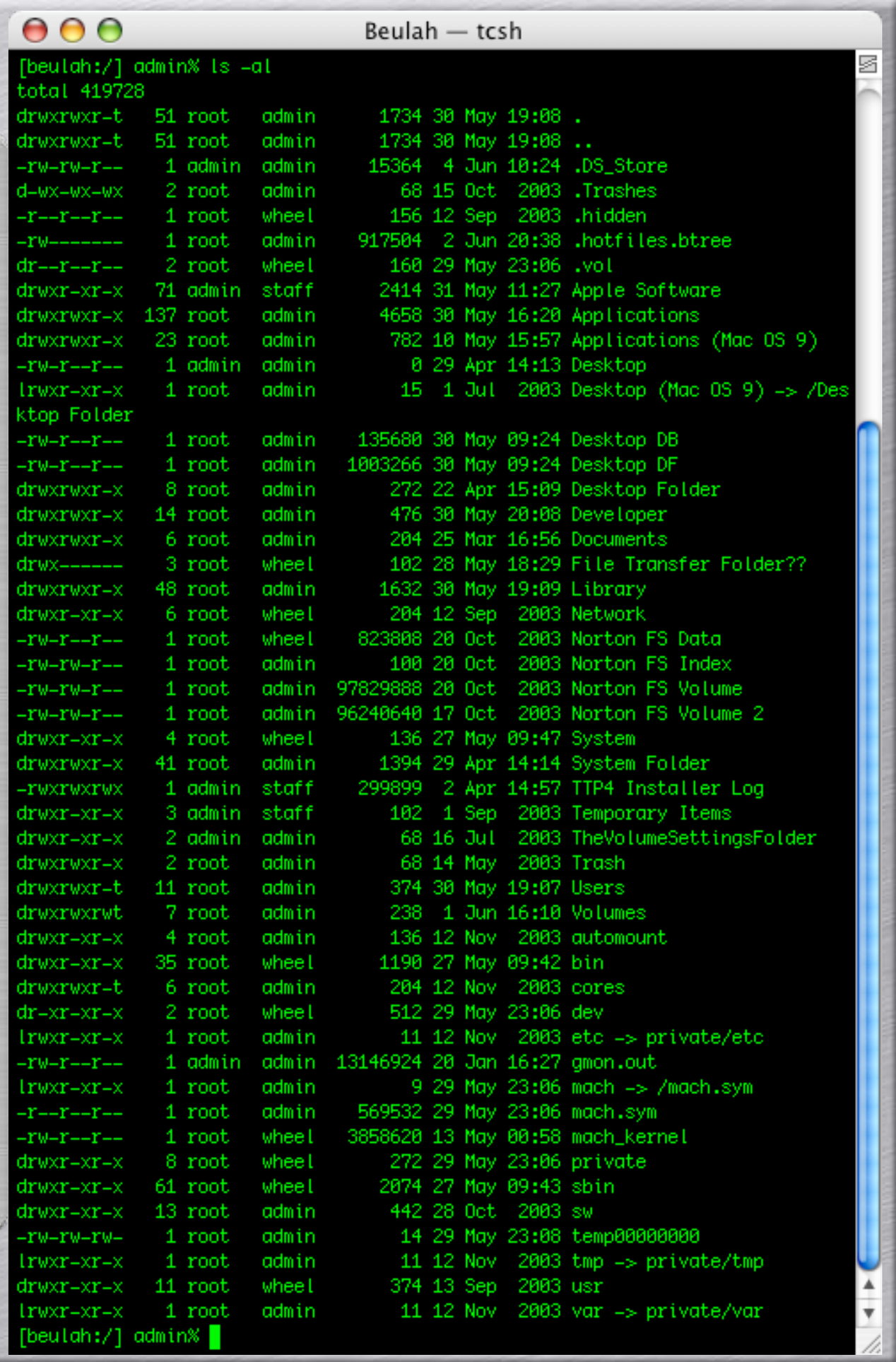


```
lrwxr-xr-x    1 root   admin        11 12 Nov  2003 etc -> private/etc
-rw-r--r--    1 admin  admin  13146924 20 Jan 16:27 gmon.out
lrwxr-xr-x    1 root   admin         9 29 May 23:06 mach -> /mach.sym
-r--r--r--    1 root   admin    569532 29 May 23:06 mach.sym
-rw-r--r--    1 root   wheel   3858620 13 May 00:58 mach_kernel
drwxr-xr-x    8 root   wheel       272 29 May 23:06 private
drwxr-xr-x   61 root   wheel      2074 27 May 09:43 sbin
drwxr-xr-x   13 root   admin       442 28 Oct  2003 sw
-rw-rw-rw-    1 root   admin        14 29 May 23:08 temp00000000
lrwxr-xr-x    1 root   admin        11 12 Nov  2003 tmp -> private/tmp
drwxr-xr-x   11 root   wheel       374 13 Sep  2003 usr
lrwxr-xr-x    1 root   admin        11 12 Nov  2003 var -> private/var
[beulah:/] admin%
```

- Terminal.app is in **`/Applications/Utilities`**
- It's your friend (and legacy Mac users should be encouraged to use it too)

More Terminal View


Beulah
Beulah
iDisk
Network
Beulah
USB_S...
Desktop
admin
Applications
Utilities
Documents
Movies
Music
Pictures
Favorites
Sophos
Beulah
iDisk
Network
USB_STICK
Apple Software
Applications
Applications (Mac OS 9)
Desktop (Mac OS 9)
Developer
Documents
gmon.out
Library
sw
System
System Folder
temp00000000
TTP4 Installer Log
Users
14 items, 42.79 GB available


Beulah — tcsh
[beulah:/] admin% ls -al
total 419728
drwxrwxr-t 51 root admin 1734 30 May 19:08 .
drwxrwxr-t 51 root admin 1734 30 May 19:08 ..
-rw-rw-r-- 1 admin admin 15364 4 Jun 10:24 .DS_Store
d-wx-wx-wx 2 root admin 68 15 Oct 2003 .Trashes
-r--r--r-- 1 root wheel 156 12 Sep 2003 .hidden
-rw------- 1 root admin 917504 2 Jun 20:38 .hotfiles.btree
dr--r--r-- 2 root wheel 160 29 May 23:06 .vol
drwxr-xr-x 71 admin staff 2414 31 May 11:27 Apple Software
drwxrwxr-x 137 root admin 4658 30 May 16:20 Applications
drwxrwxr-x 23 root admin 782 10 May 15:57 Applications (Mac OS 9)
-rw-r--r-- 1 admin admin 0 29 Apr 14:13 Desktop
lrwxr-xr-x 1 root admin 15 1 Jul 2003 Desktop (Mac OS 9) -> /Des
ktop Folder
-rw-r--r-- 1 root admin 135680 30 May 09:24 Desktop DB
-rw-r--r-- 1 root admin 1003266 30 May 09:24 Desktop DF
drwxrwxr-x 8 root admin 272 22 Apr 15:09 Desktop Folder
drwxrwxr-x 14 root admin 476 30 May 20:08 Developer
drwxrwxr-x 6 root admin 204 25 Mar 16:56 Documents
drwx------ 3 root wheel 102 28 May 18:29 File Transfer Folder??
drwxrwxr-x 48 root admin 1632 30 May 19:09 Library
drwxr-xr-x 6 root wheel 204 12 Sep 2003 Network
-rw-r--r-- 1 root wheel 823808 20 Oct 2003 Norton FS Data
-rw-rw-r-- 1 root admin 100 20 Oct 2003 Norton FS Index
-rw-rw-r-- 1 root admin 97829888 20 Oct 2003 Norton FS Volume
-rw-rw-r-- 1 root admin 96240640 17 Oct 2003 Norton FS Volume 2
drwxr-xr-x 4 root wheel 136 27 May 09:47 System
drwxrwxr-x 41 root admin 1394 29 Apr 14:14 System Folder
-rwxrwxrwx 1 admin staff 299899 2 Apr 14:57 TTP4 Installer Log
drwxr-xr-x 3 admin staff 102 1 Sep 2003 Temporary Items
drwxr-xr-x 2 admin admin 68 16 Jul 2003 TheVolumeSettingsFolder
drwxrwxr-x 2 root admin 68 14 May 2003 Trash
drwxrwxr-t 11 root admin 374 30 May 19:07 Users
drwxrwxrwt 7 root admin 238 1 Jun 16:10 Volumes
drwxr-xr-x 4 root admin 136 12 Nov 2003 automount
drwxr-xr-x 35 root wheel 1190 27 May 09:42 bin
drwxrwxr-t 6 root admin 204 12 Nov 2003 cores
dr-xr-xr-x 2 root wheel 512 29 May 23:06 dev
lrwxr-xr-x 1 root admin 11 12 Nov 2003 etc -> private/etc
-rw-r--r-- 1 admin admin 13146924 20 Jan 16:27 gmon.out
lrwxr-xr-x 1 root admin 9 29 May 23:06 mach -> /mach.sym
-r--r--r-- 1 root admin 569532 29 May 23:06 mach.sym
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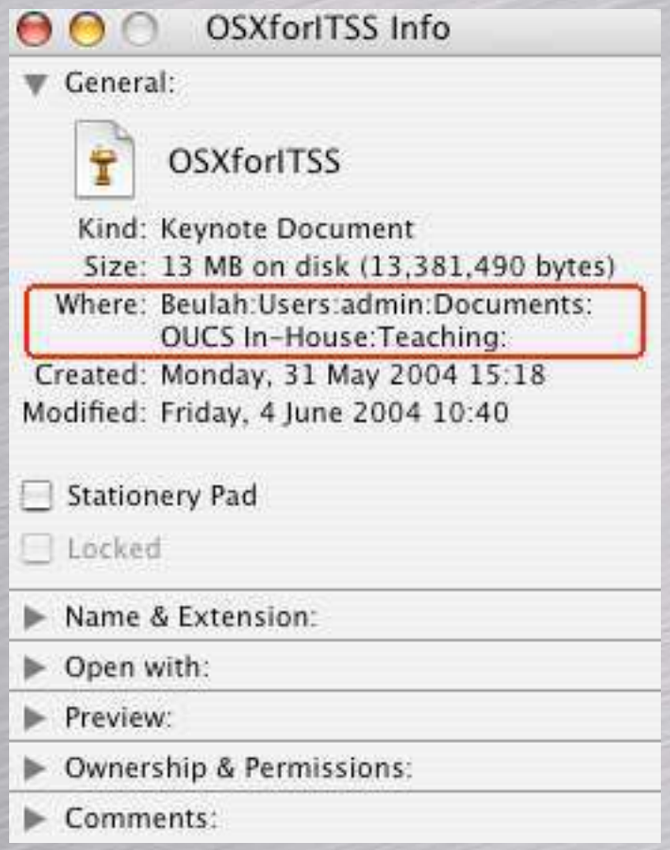
drwxr-xr-x 8 root wheel 272 29 May 23:06 private
drwxr-xr-x 61 root wheel 2074 27 May 09:43 sbin
drwxr-xr-x 13 root admin 442 28 Oct 2003 sw
-rw-rw-rw- 1 root admin 14 29 May 23:08 temp00000000
lrwxr-xr-x 1 root admin 11 12 Nov 2003 tmp -> private/tmp
drwxr-xr-x 11 root wheel 374 13 Sep 2003 usr
lrwxr-xr-x 1 root admin 11 12 Nov 2003 var -> private/var
[beulah:/] admin%

Notation

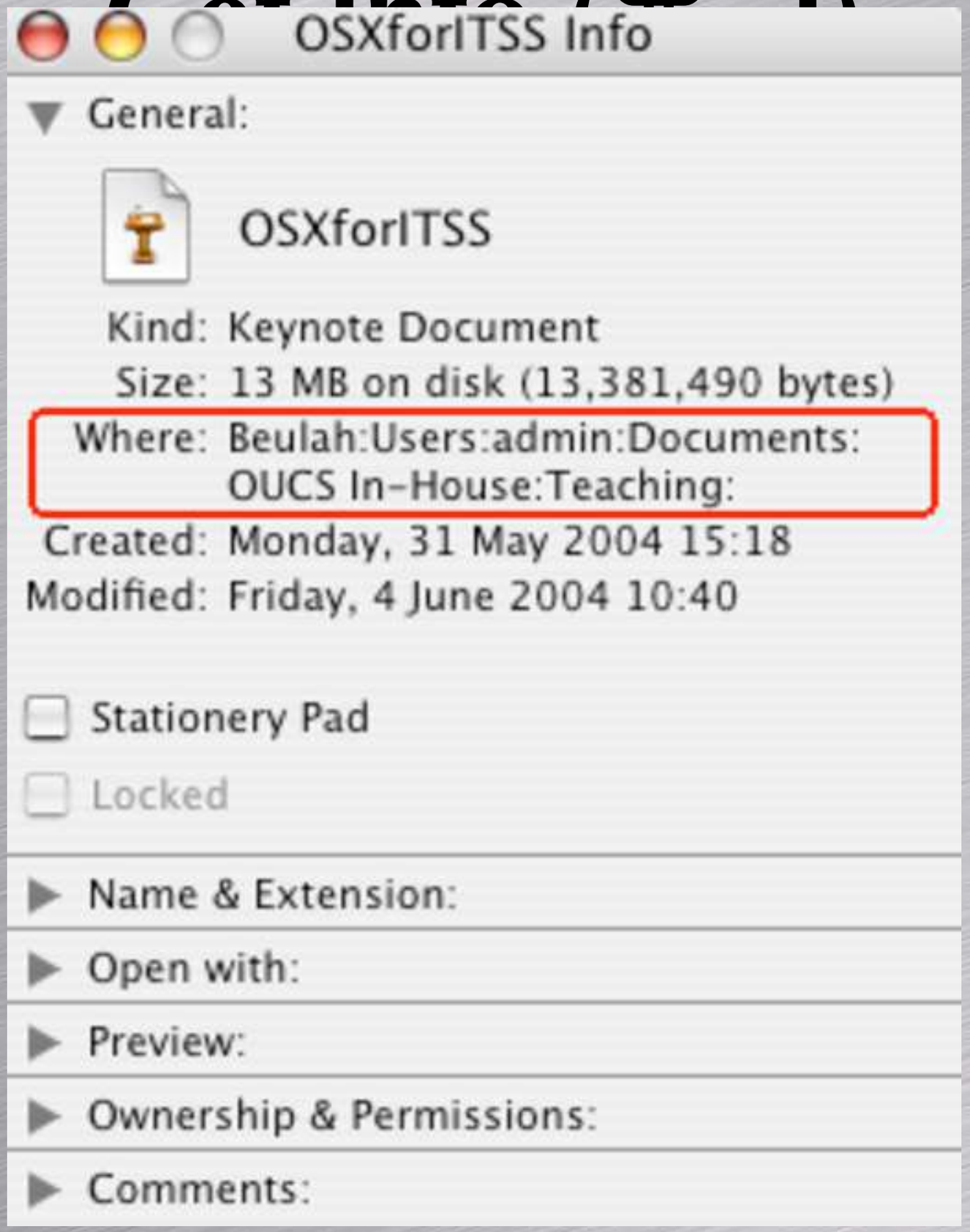
- Unix path notation:
  - `/` (this is the root of the file store)
  - **`/Library/logs/tivoli/tsm/TSM Error.log`**
  - **`/Users/admin/Desktop/Sophos/ides.zip`**
- HFS+ path notation
  - **`Macintosh HD:`**
  - **`Macintosh HD:Library:Logs:tivoli:tsm:`**
  - ***`Macintosh HD:Users:admin:`*****`Desktop:Sophos:`**

⌘-click on the proxy icon

Get Info (⌘-i)


OSXforITSS Info
General:
OSXforITSS
Kind: Keynote Document
Size: 13 MB on disk (13,381,490 bytes)
Where: Beulah:Users:admin:Documents:
OUCS In-House:Teaching:
Created: Monday, 31 May 2004 15:18
Modified: Friday, 4 June 2004 10:40
Stationery Pad
Locked
Name & Extension:
Open with:
Preview:
Ownership & Permissions:
Comments:

Get Info (⌘ i)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Locked
Name & Extension:
Open with:
Preview:
Ownership & Permissions:
Comments:

/Library
(Macintosh HD:Library)

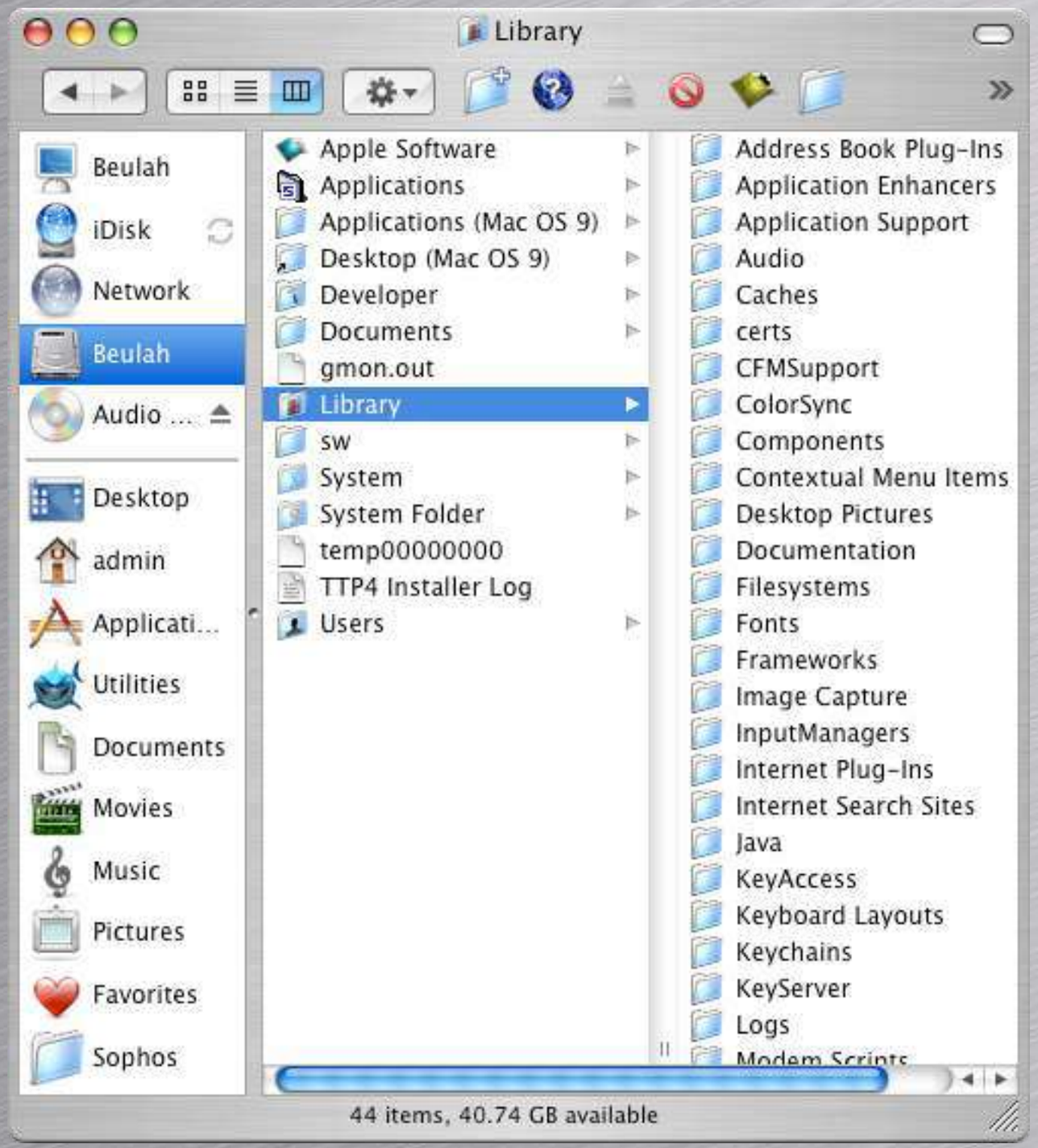
- **/Library/Application Support/ Sophos Anti-Virus/IDEs**
- **/Library/Preferences** (but only for TSM unless certain)
- **/Library/Desktop Pictures**
- **/Library/Documentation**
- **/Library/Logs**
- **/Library/Packages** (good if you download from SU rather than just installing)
- **/Library/Receipts**
- **/Library/Scripts**

Careful with /Library, although it's not *usually* too catastrophic if something does go wrong.

/System/Library

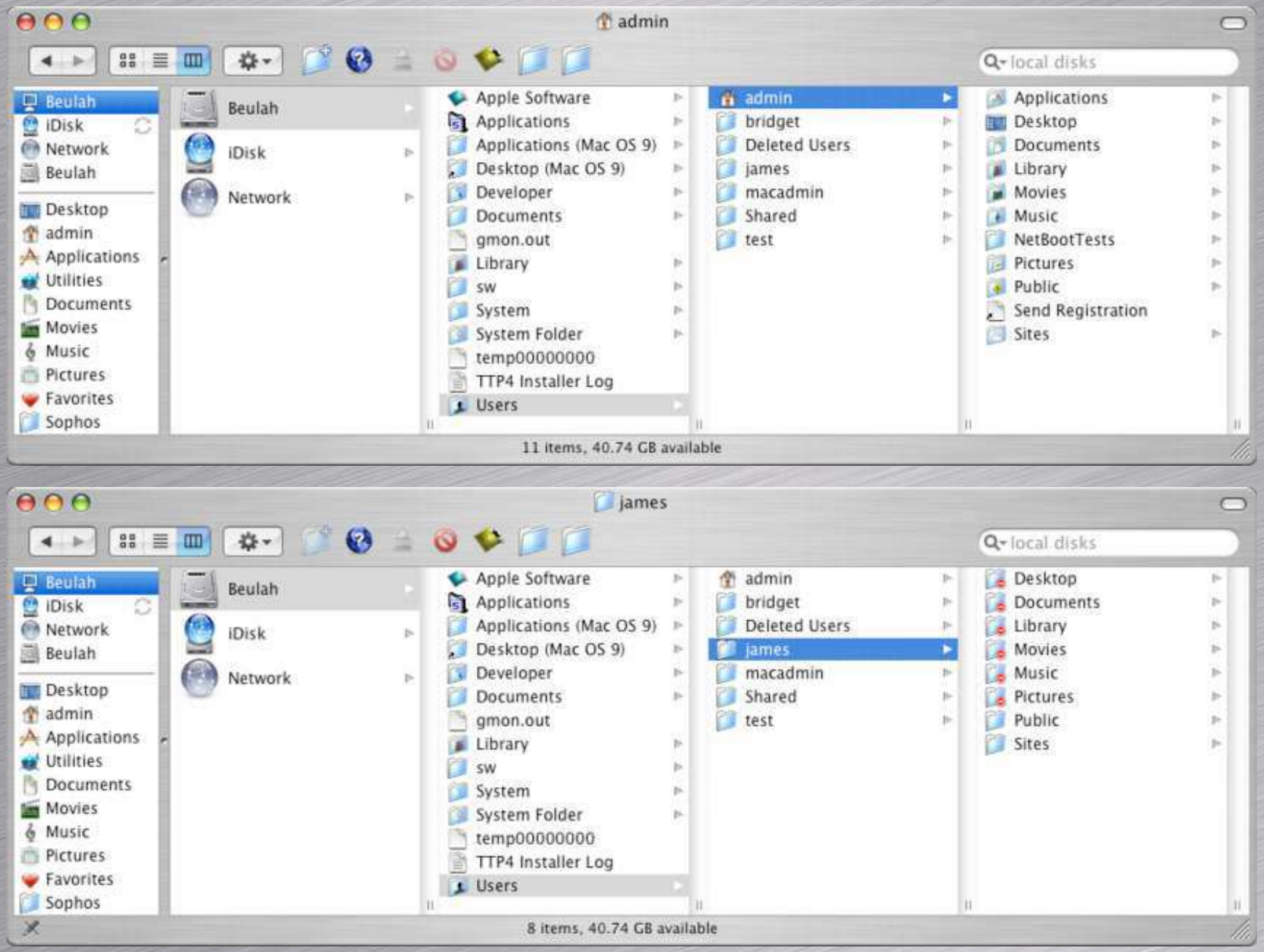
Usually catastrophic!

Other Folders...



- /Applications (Mac OS 9)
- /Desktop (Mac OS 9)
- /System Folder
- /Developer
- /sw

/Users


admin
local disks
Beulah
iDisk
Network
Beulah
Desktop
admin
Applications
Utilities
Documents
Movies
Music
Pictures
Favorites
Sophos
Beulah
iDisk
Network
Apple Software
Applications
Applications (Mac OS 9)
Desktop (Mac OS 9)
Developer
Documents
gmon.out
Library
sw
System
System Folder
temp00000000
TTP4 Installer Log
Users
admin
bridget
Deleted Users
james
macadmin
Shared
test
Applications
Desktop
Documents
Library
Movies
Music
NetBootTests
Pictures
Public
Send Registration
Sites
11 items, 40.74 GB available
james
local disks
Beulah
iDisk
Network
Apple Software
Applications
Applications (Mac OS 9)
Desktop (Mac OS 9)
Developer
Documents
gmon.out
Library
sw
System
System Folder
temp00000000
TTP4 Installer Log
Users
admin
bridget
Deleted Users
james
macadmin
Shared
test
Desktop
Documents
Library
Movies
Music
Pictures
Public
Sites
8 items, 40.74 GB available

/Users (in terminal.app)

- Home file store is: **`~/`**
  - e.g., **`~/Desktop`**, **`~/Documents`**
- All users can access **`/Users/Shared`**
- Move files between accounts by using **`/Users/[`*`username`*`]/Public/Drop Box`**

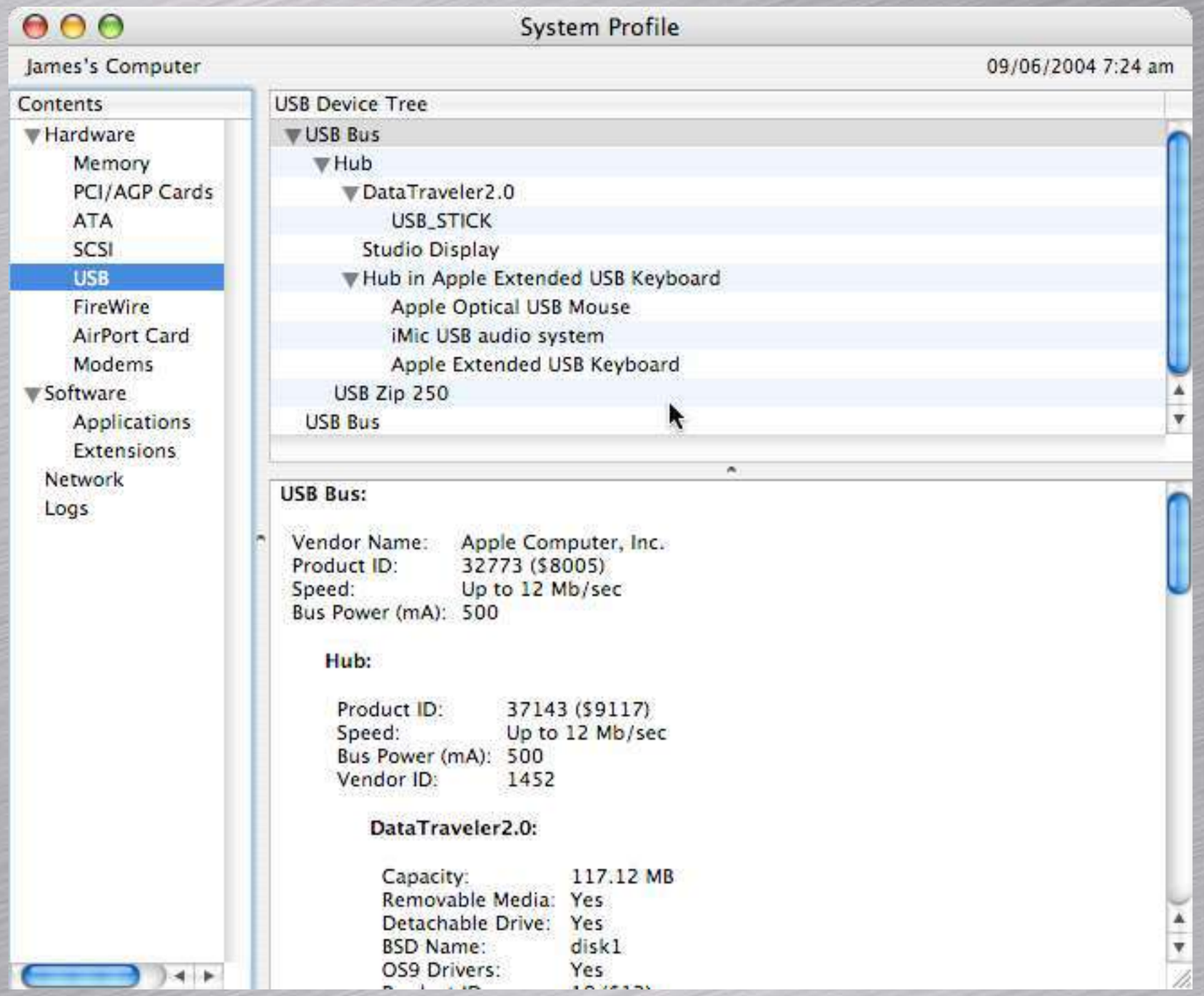
3. Approaches to Troubleshooting

- What can go wrong?
  - Applications won't start, or crash, or won't shut down
  - Printing problems
  - Problems after Software Updates
  - Kernel panics
  - Mac won't start at all

System Preferences

About this Mac / System Profile

On the menu



The ⌘ and ⌥ keys

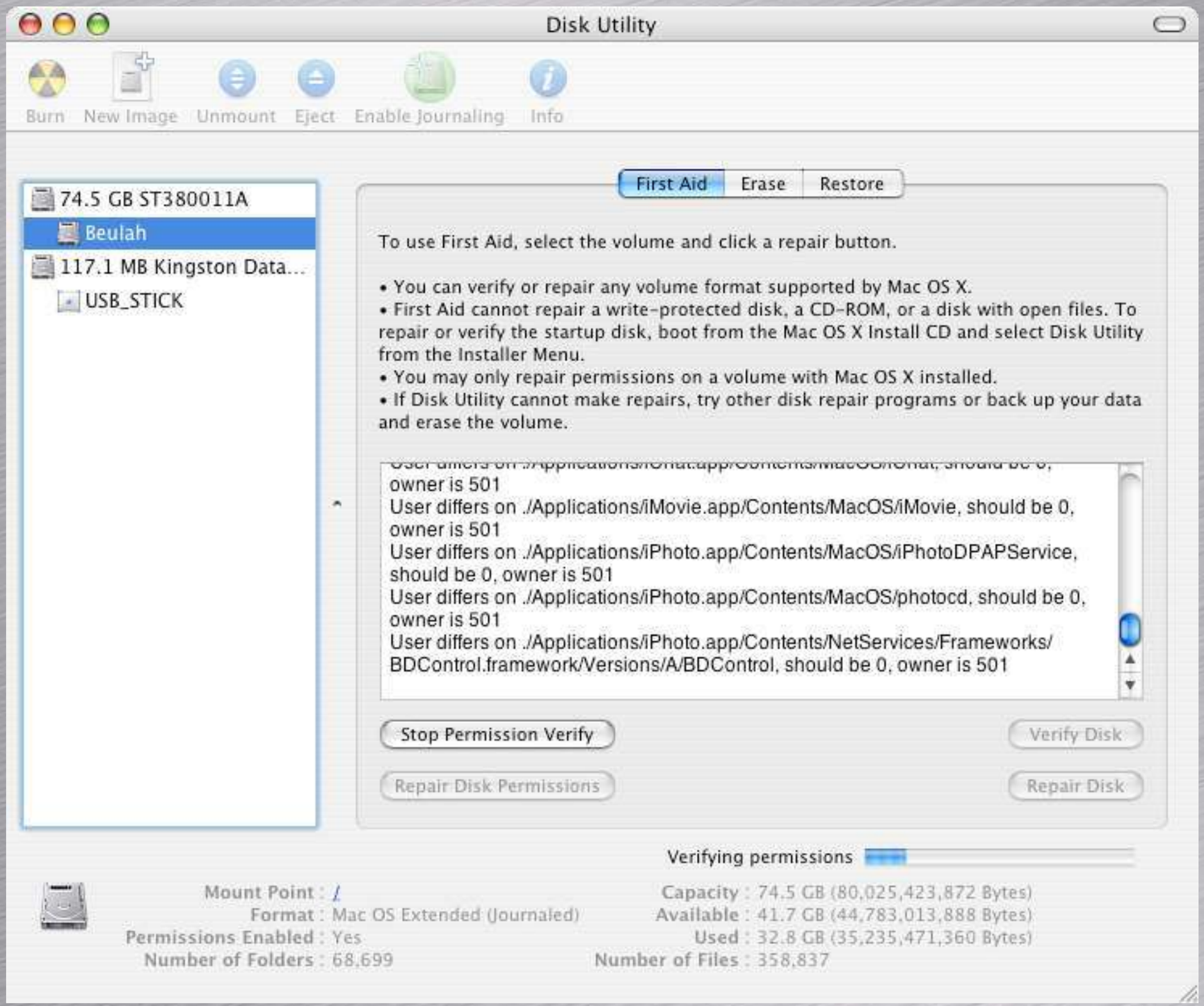
Command key ⌘ is actually the sign for something interesting in a Swedish campground

Option key ⌥ also has some interesting properties

Hold it down when looking at application menus (e.g., Finder / File) and see what happens

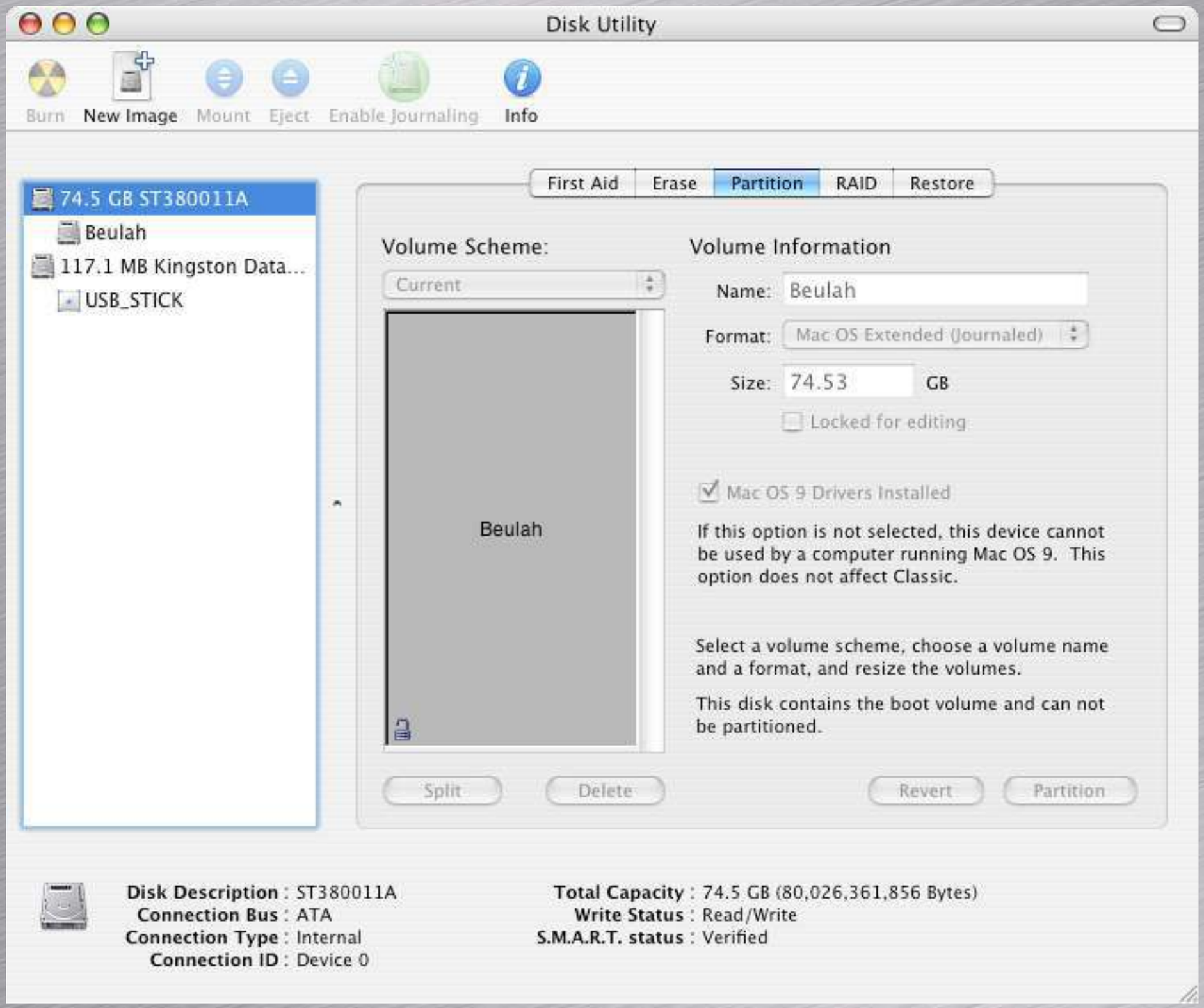
Troubleshooting Applications

- What to check:
  - Disk permissions
  - Web-based resources
  - Log files (Console.app)
  - .plist files in **`/user/Library/Preferences`**



Disk Utility is in *//Applications/Utilities*

or in terminal.app: `sudo diskutil repairPermissions /`



run: `man diskutil` in terminal.app for more info.

Disk Permissions (cont'd)

For most permission troubleshooting, **Get info** is good enough: ⌘-i

Padlock icon means that permissions are locked and you can't change them without authenticating.

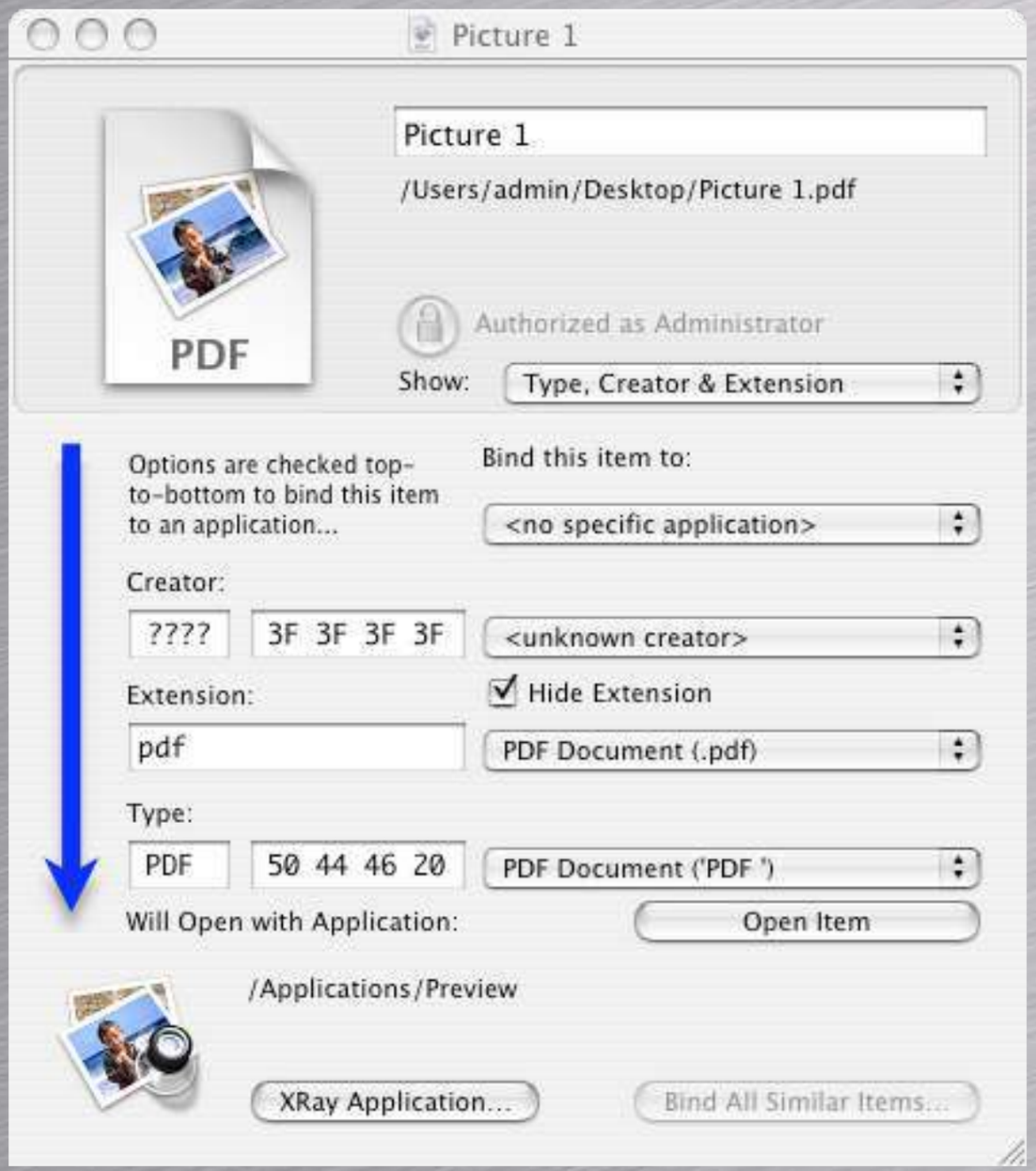
Disk Permissions (cont'd)

OK, that's better. Now you can really break things (if you don't know what you're doing).

Disk Permissions (for experts)

If you want an advanced GUI, use XRAY

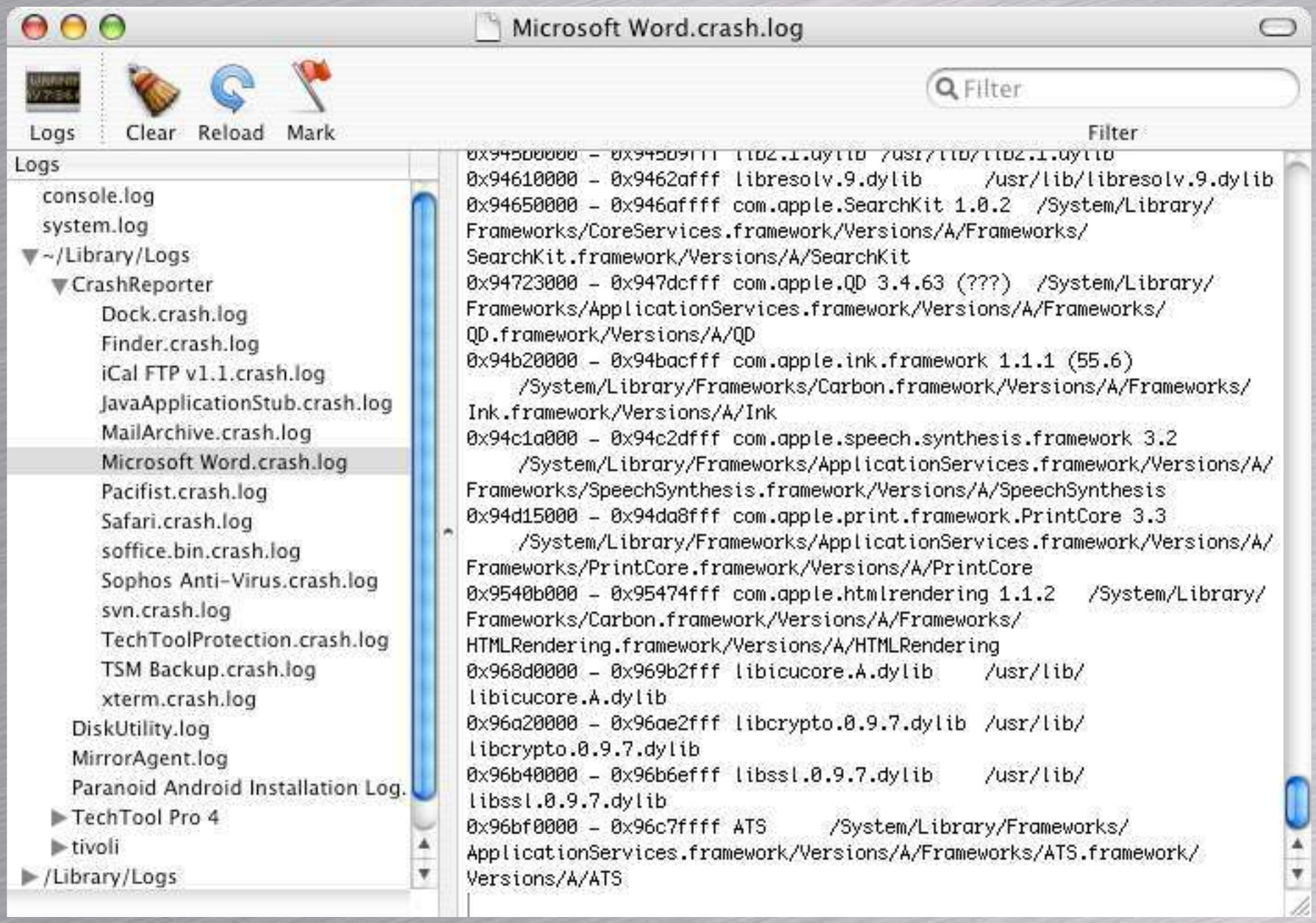
(**`http://www.brockerhoff.net/xray/index.html`**) - $10 Shareware



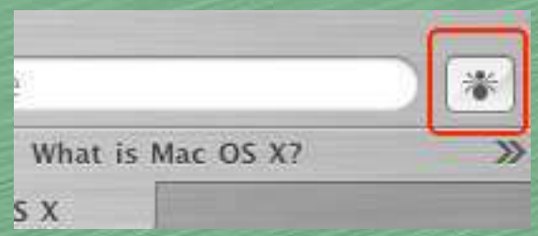
Web Sites & Resources

Apple Knowledge Base http://support.apple.com	mac-supporters (*JISC list: 5-15 a day*)
MacFixIt http://www.macfixit.com	kbupdates *1 per week*
MacOSXHints http://www.macosxhints.com/	macfixit *daily newsletter*
MacTracker http://www.mactracker.ca	Apple Developer Connection *1 per week*
The Apple Museum http://www.theapplemuseum.com/	
EveryMac http://www.everymac.com	
MacInTouch http://www.macintouch.com/	

Log Files (console.app)



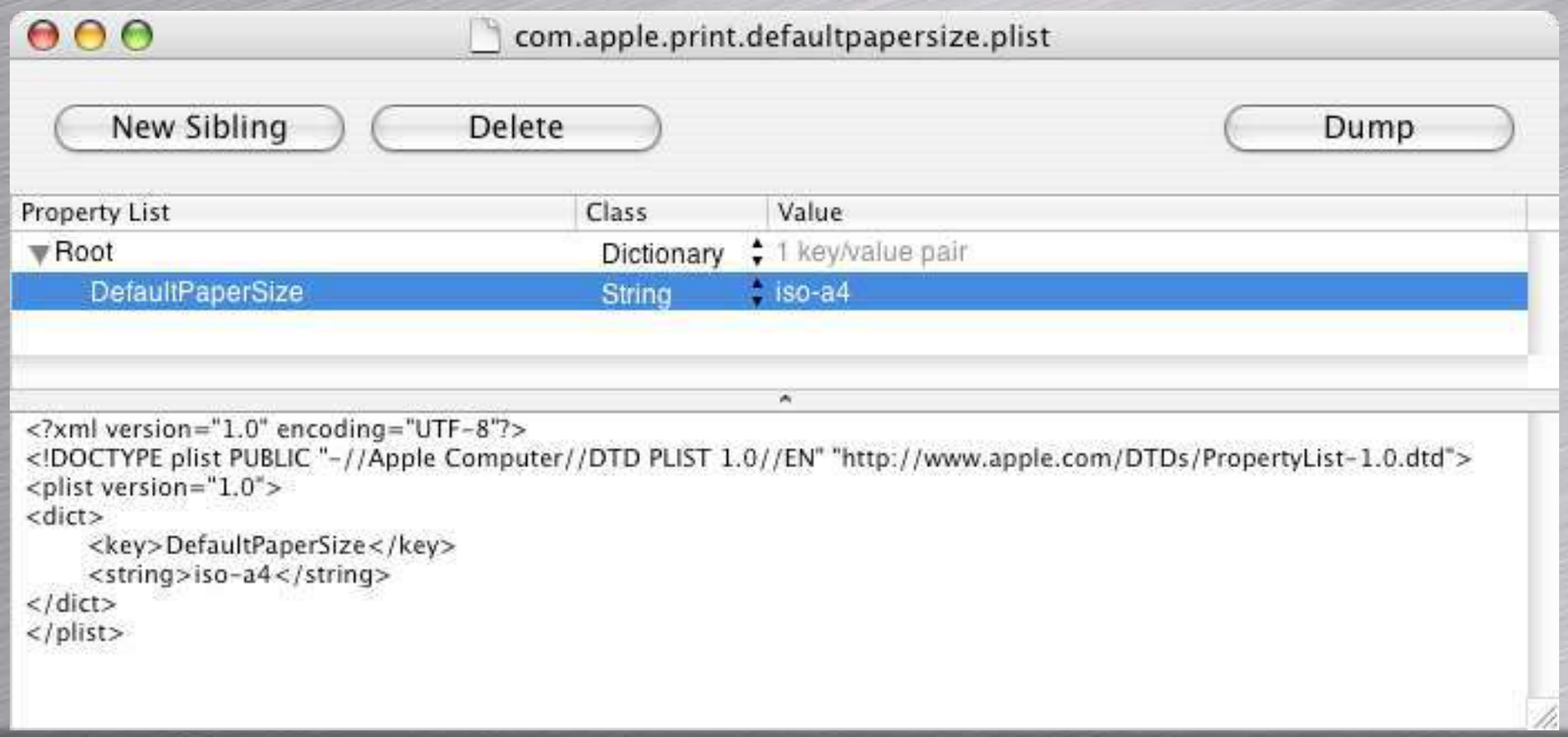
Safari bug reporter



This won't help most people, but can be submitted to Apple for recurrent problems

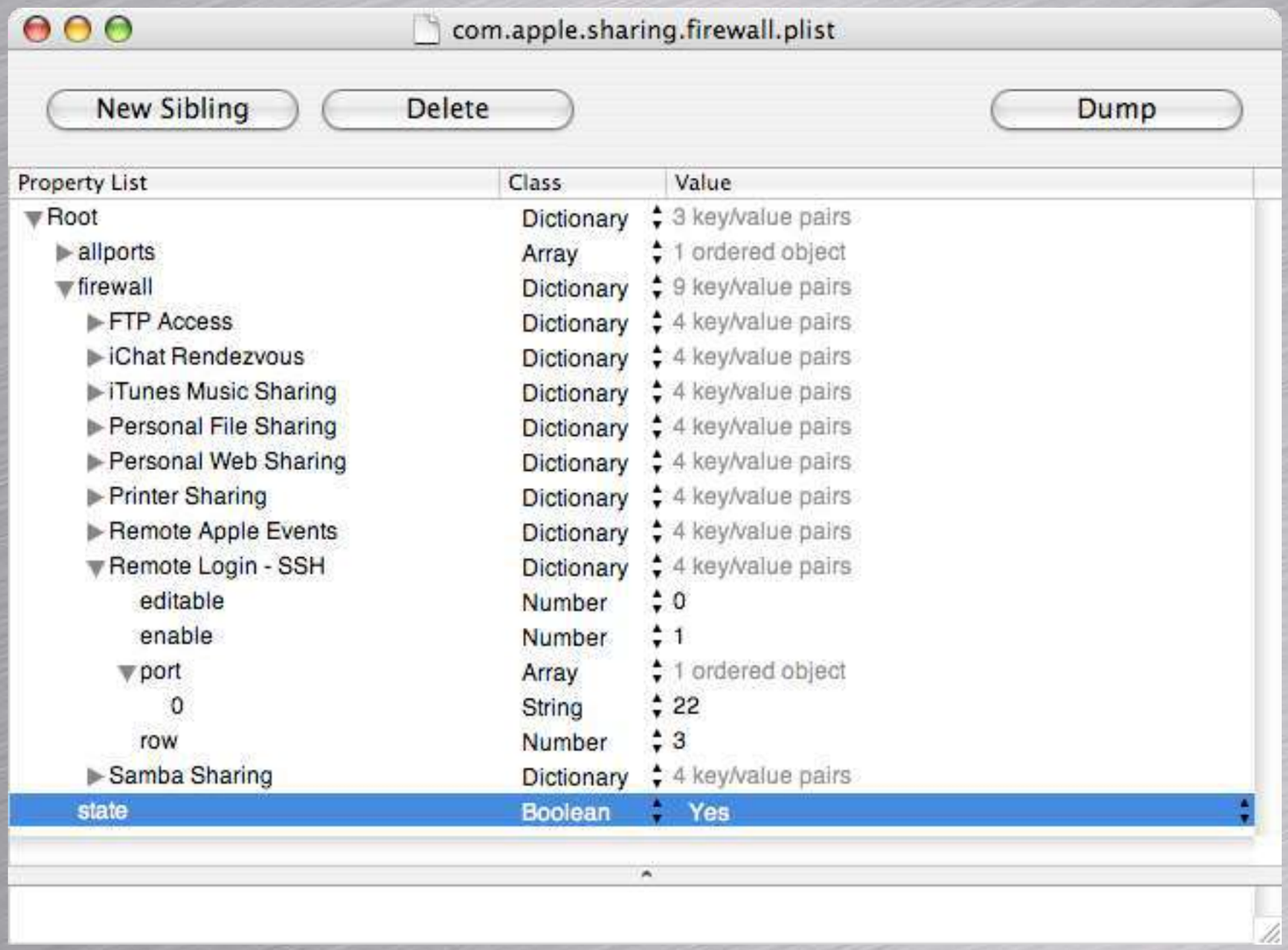
.plist files (`~/Library/Preferences`)

- .plist files are XML files containing all User or Application preferences. Think of them as configuration files
- User-defined .plist files in **`~/Library/Preferences`** can be deleted or edited fairly safely
- can be read (e.g., **`defaults read -app Safari`**) or edited (e.g., **`defaults write com.apple.Safari IncludeDebugMenu 1`**) in terminal.app. See **`man defaults`** for more info.



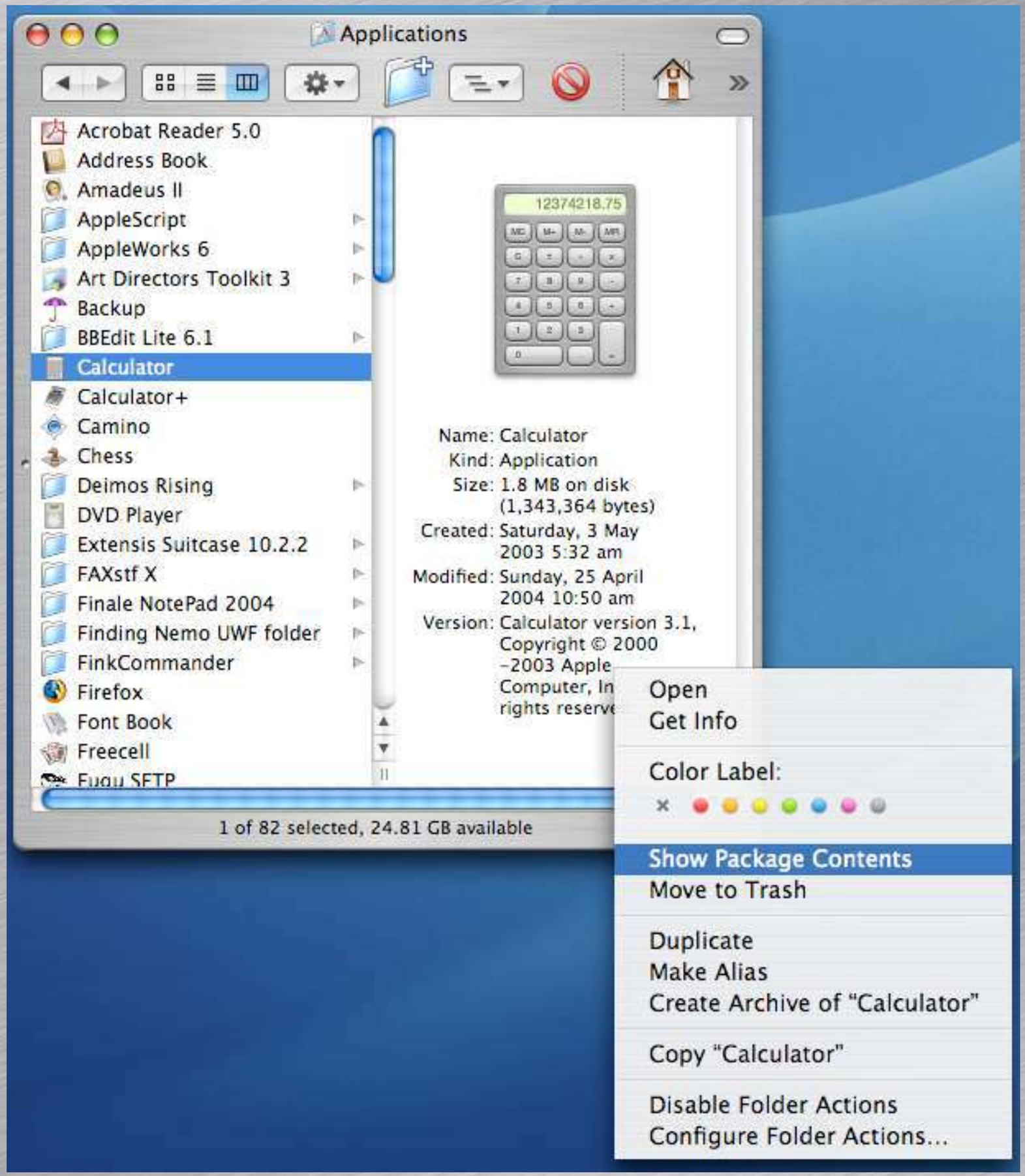
.plist files (`/Library/Preferences`)

- These will override preference files in **`~/Library/Preferences`** if the same (Sophos when installing from CID)
- Can be edited but be more cautious



More about apps

- Many OS X apps are, more correctly, application *bundles* or *packages*
- Bundle contents can be seen by control-click on app name, then selecting ‘Show Package Contents’

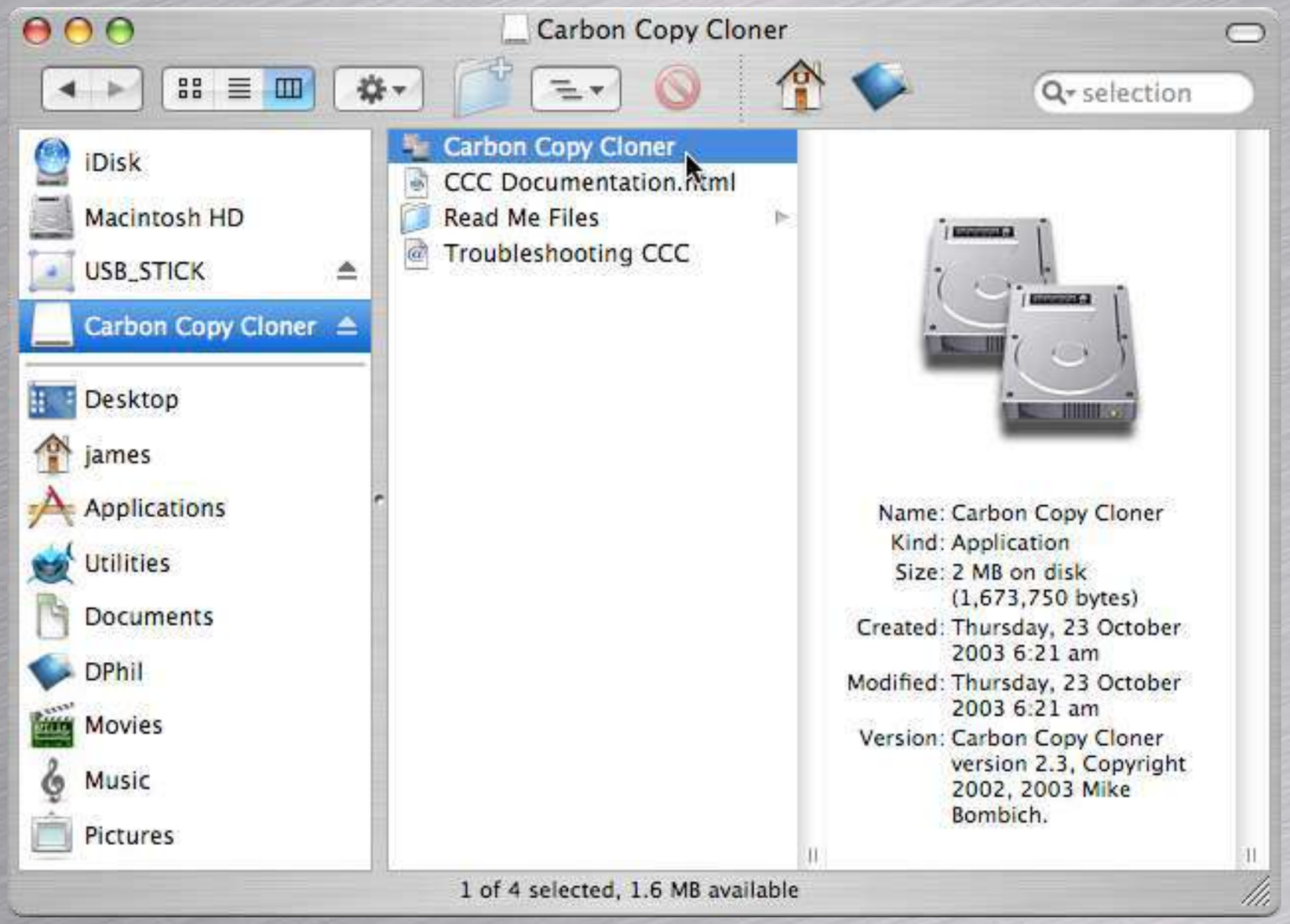


Yet more about apps

Apps are often distributed as **disk image** (.dmg) files: these mount on the desktop when run and are then like any other volume. Are also distributed compressed with GZip or BZip:

Firefox-0.8-mac.dmg.gz (9.4 Mb)

Firefox-0.8-mac.dmg (30.5 Mb)



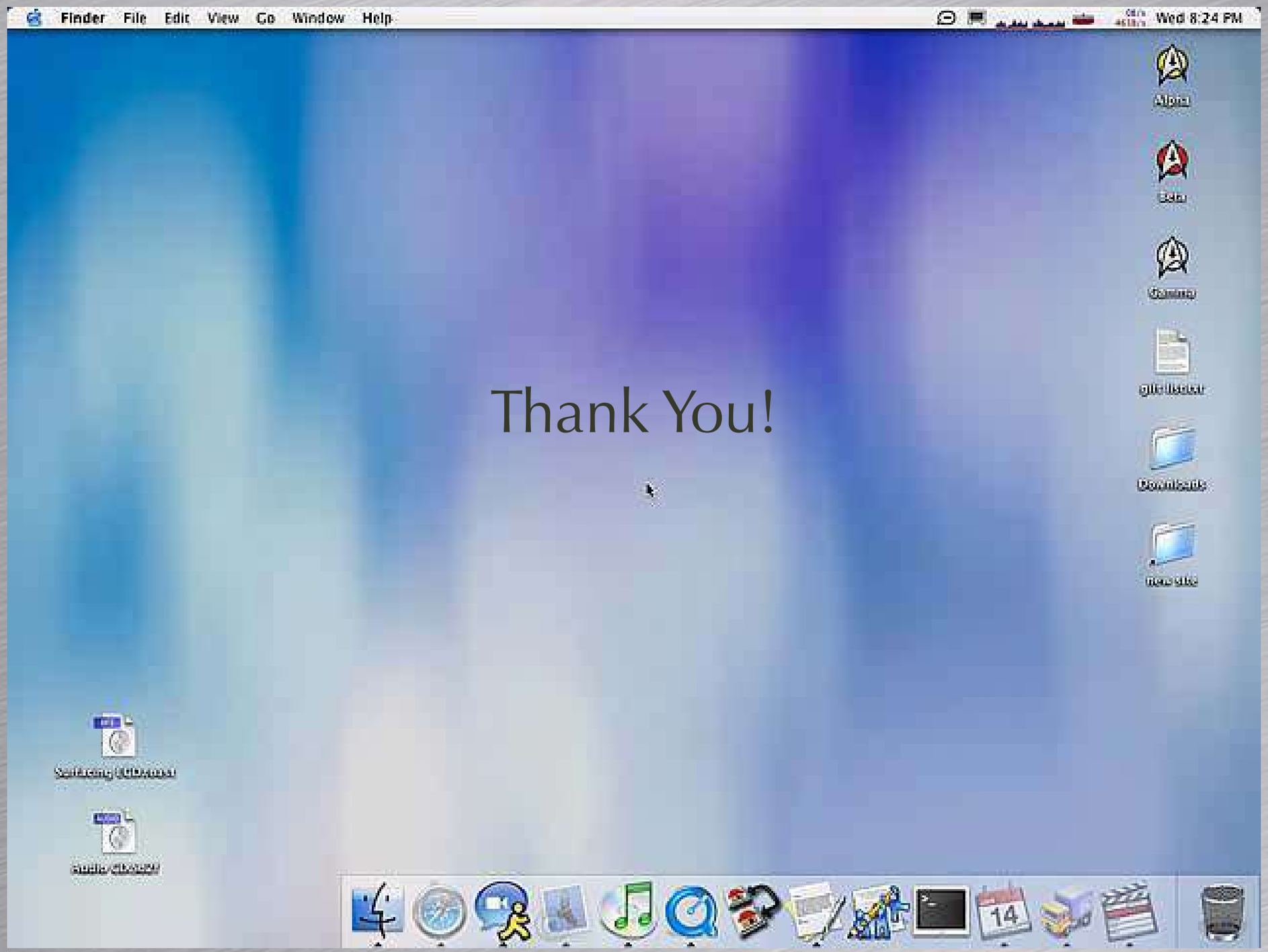
Other formats:

- .pkg & .mpkg (OS X Installer Packages)
- .gz (Gzip compressed - .tar.gz, .dmg.gz also common)
- .zip (Zip archive)
- .bz2 (Bzip2 compressed)
- .smi (Self-mounting image)
- .sit (Stuff-it archive)
- .hqx (Bin-Hex encoded file)

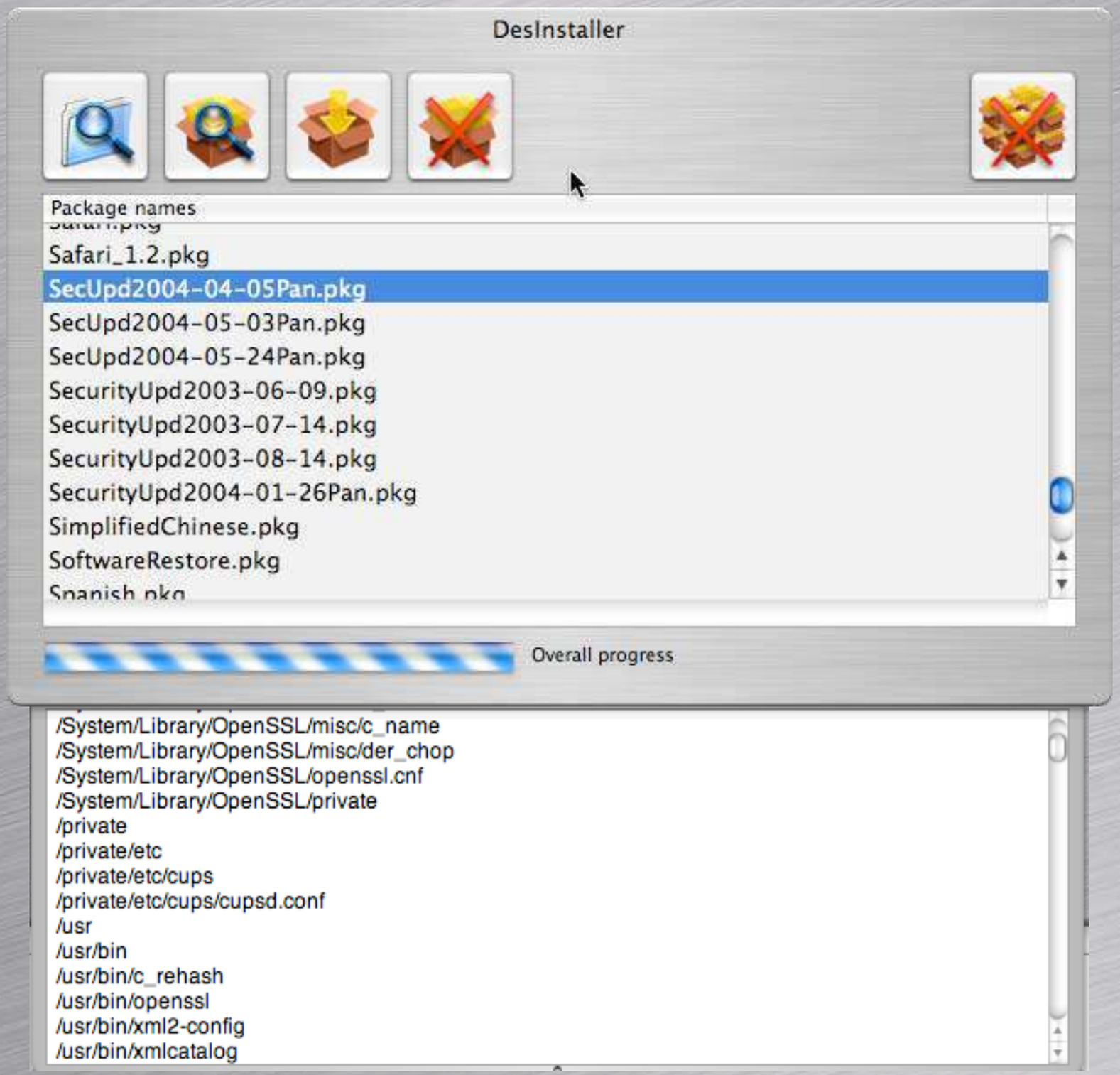
Uninstalling

- In most cases, simply drag app to Trash
- .plist files may be left in **`~/Library/Preferences`** but these are tiny and harmless and can be deleted or left
- Some apps are messier. **DesInstaller** is a big help (but use with caution)
  - Download from **`http://krugazor.free.fr/software/desinstaller/DesInstaller.php`** (free)
  - DesInstaller reads the Package Receipts in **`/Library/Receipts`**
  - The lsbom tool shows the same info (**`man lsbom`**)

Example: Uninstalling IE



DesInstaller

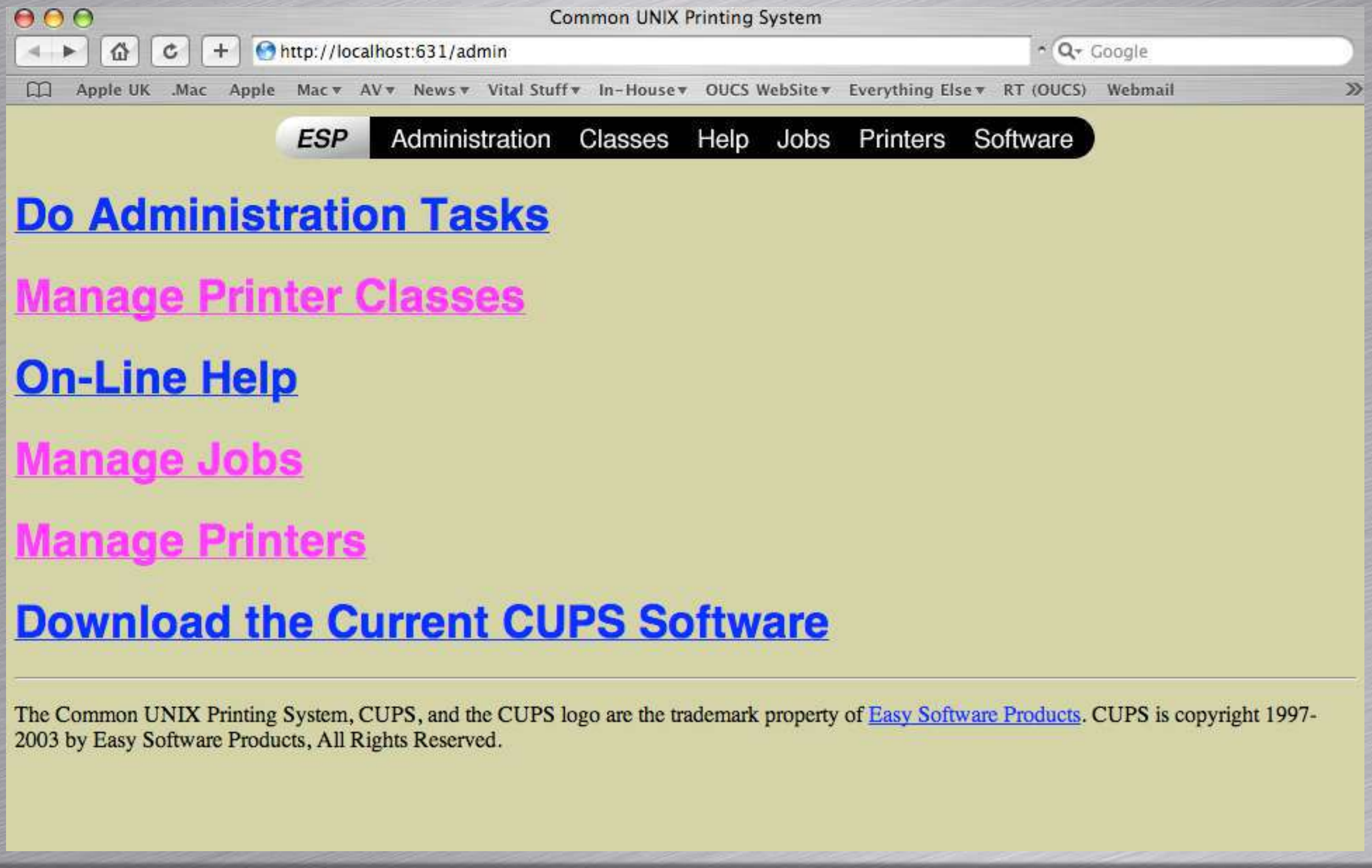


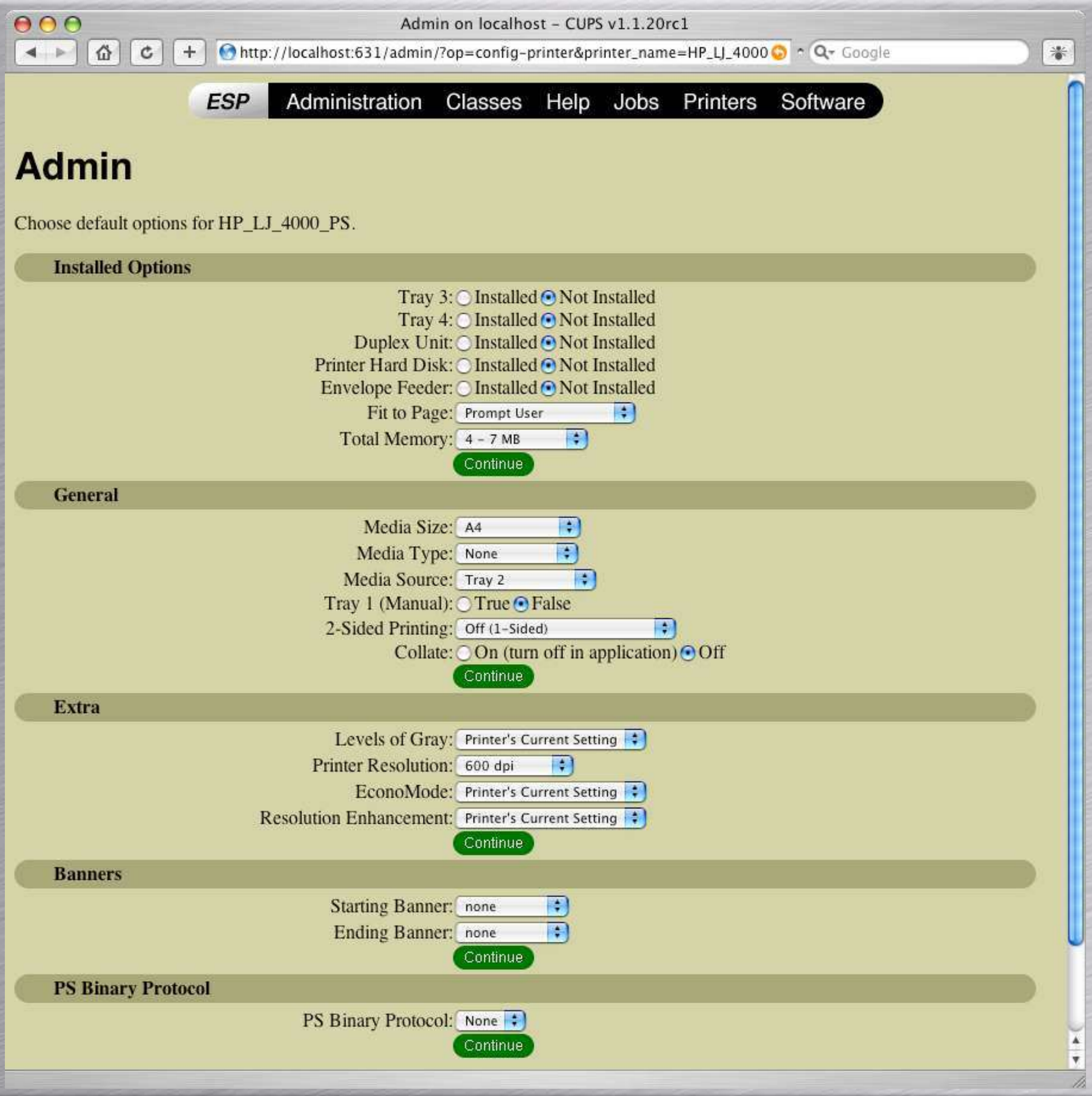
Printing

- OS X uses CUPS (Common Unix Printing System)
  - Add and configure printers using /Applications/Utilities/Printer Setup Utility
  - Further configuration using CUPS interface: **`http://localhost:631`**
  - CUPS log files in **`/var/log/cups/`** (or use Console.app

CUPS Interface

http://localhost:631

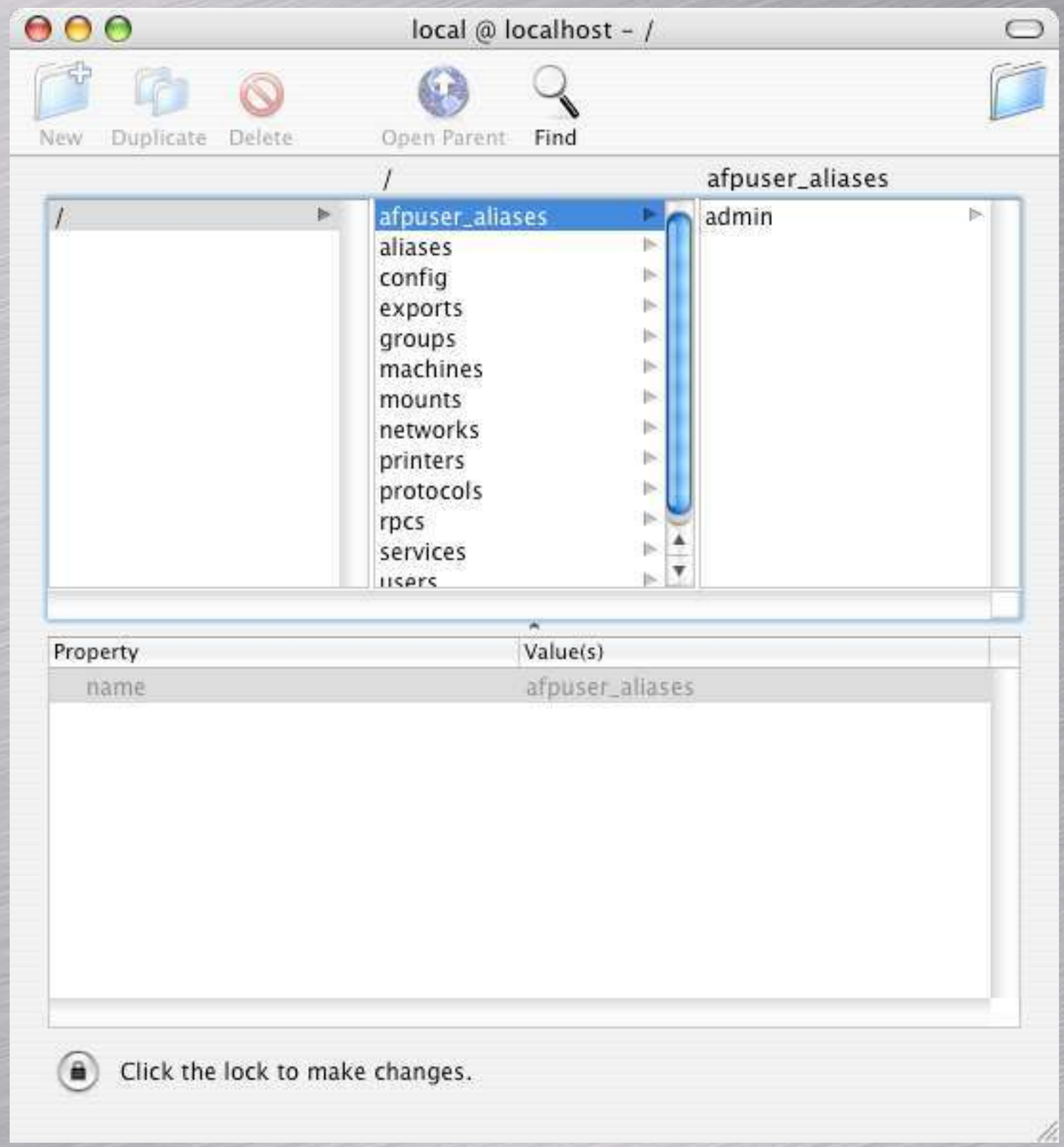




Root user must now be enabled to allow access to these options.

Enabling Root User

- Open /Applications/ Utilities/Netinfo Manager
- Click on Security menu
- Select “Enable Root User”
- Use a **strong** password.
- Be ***very careful*** with Netinfo Manager



Software Update

Can be set to check for updates daily, weekly or monthly

In **Panther** this can be run straight from the menu; in **Jaguar** it must be run from System Preferences.

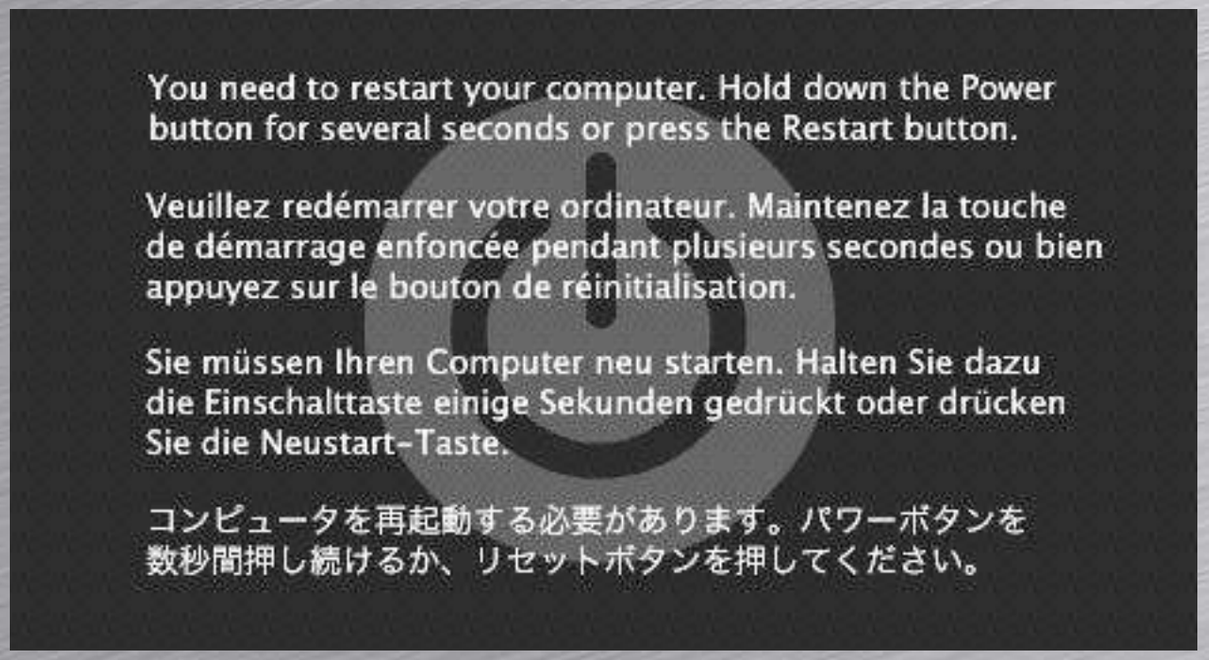
Software Update Tips

- SU Preferences are in the System Preferences app.
- Default behaviour is to install ticked updates, but you can also "Download only" or "Install and keep package"
- Downloaded or kept packages are in **`/Library/Packages`** (useful for installing to several machines)
- Updates can be ignored. Detailed install logs in Console.app
- Read advice (especially **`http://www.macfixit.com`**) before plunging in with minor point upgrades. Don't be brave!
- **Always** repair permissions before and after installing a minor point upgrade
- Updates are also published and archived on **`http://www.apple.com/uk/software/`**

When SU goes wrong

- You backed up your computer beforehand anyway, so it's ok!
- Restart the computer and boot into 'Safe mode' or 'Single-user mode' to run **`FSCK`** (more on this later)
- If the Mac still won't start then try 3rd-party recovery software (e.g., Diskwarrior)

Kernel Panics



- You'll need to force a restart
- On OS X 10.2 or later the panic is logged in **`/Library/Logs/panic.log`** (if you haven't reset PRAM)
- See **`http://docs.info.apple.com/article.html?artnum=106228`**) for instructions on how to tell Apple

And if it won't start at all...?

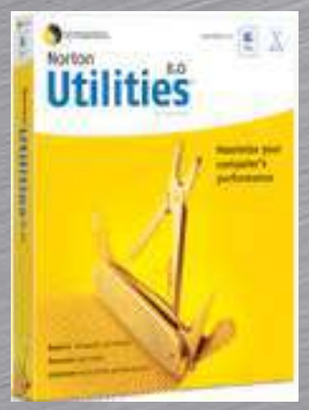
Essential Software

- Install CDs
- Alsoft DiskWarrior
- CCC (Carbon Copy Cloner)
- TechTool Pro
- Norton Utilities

Major OS X Disk Utilities

- DiskWarrior 3.0 (with CD updater)
  - http://www.alsoft.com/DiskWarrior/index.html

- TechTool Pro v.4
  - http://www.micromat.com/



- Norton Utilities 8.0
  - http://www.symantec.com/nu/nu_mac/index.html

Carbon Copy Cloner

http://www.bombich.com/software/ccc.html

- Mike Bombich is hugely respected in the Mac community
- Fantastic tool: use for backup and restore of clean installs
- Use for cloning and distributing known systems
- Clone volume before repartitioning drive
- Free for Education (otherwise donation ware)

Essential Hardware

- FireWire Drive (LaCie)
- Good FW Cable
- Another Mac

FireWire

- Two speeds: 400 and 800 Mbps
  - New drives have both + USB2
- Cheap cables are frequent cause of problems - buy good ones

- **Always** dismount drives cleanly before unplugging (⌘e)
- Check devices in System Profiler
- Blue & White G3 Macs *cannot* boot from FireWire drives, most others can
- Some compatibility issues with multiple FW devices
- If device won't show, unplugging Mac completely from power supply and leaving for 5 mins can help

Start-up Keys

⌘⌥of	Open Firmware
⌘⌥pr	Reset PRAM
t	FireWire Target Disk Mode
⌥	Startup Manager
⌘s	Single User Mode
⌘v	Verbose Mode
n	NetBoot (boot from network)
c	Boot from CD / DVD
x	Boot into OS X
⇧ (immediately at startup)	Safe Boot
⇧ (after boot, until login)	Override auto-login

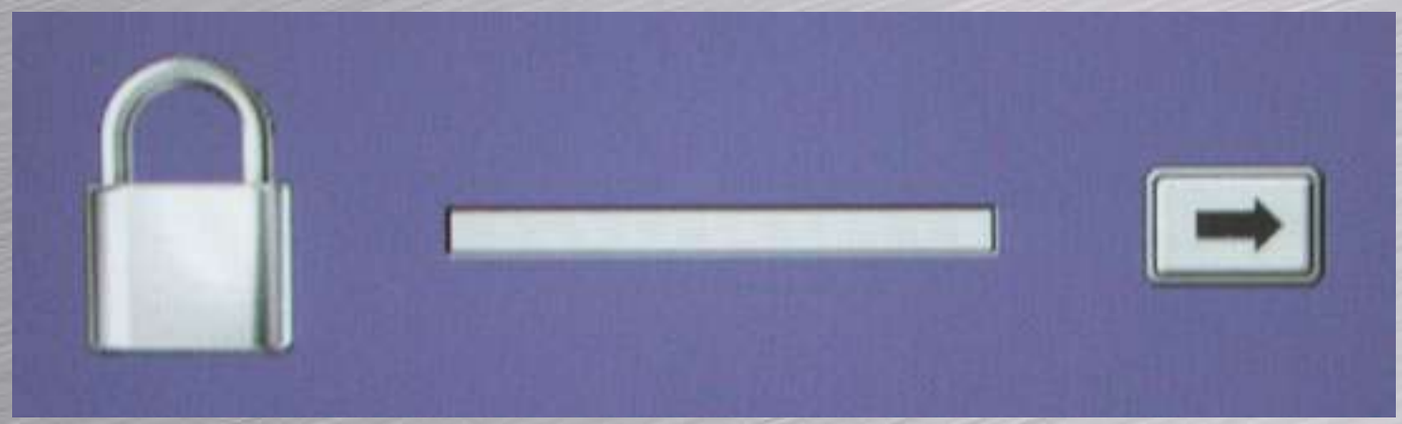
PRAM and NVRAM

- In OS X, PRAM contains the following:
  - Time zone setting
  - Choice of start-up volume
  - Speaker volume
  - Kernel panic record (if any)
  - DVD region setting
- Reset thus:
  - Turn computer off, then on again
  - Hold down ⌘⌥pr keys before grey screen appears
  - Keep holding the keys down until you hear the startup chime again

Open Firmware

For Macs in a public area it's a good idea to password protect the Open Firmware. This prevents:

- Startup from CD (**c**)
- Startup from Network (**n**)
- Startup in Target Disk Mode (**t**)
- Startup in Single User (⌘**s**) or Verbose (⌘v) Mode
- Blocks a PRAM reset (⌘⌥pr)
- Access to Open Firmware (⌘⌥of) blocked without password
- Password required for Startup Manager (⌥)



Safe Boot / Single User Mode

- Hold down shift key (⇧) at startup - this starts the computer in 'Safe mode':
  - forces a directory check of the startup volume
  - loads only required kernel extensions
  - loads only Apple startup items
- Can also boot into Single-user mode with ⌘s and run:
  - (On Jaguar): `/sbin/fsck -y`
  - (On Panther): `/sbin/fsck -fy` (but better to safe boot)

If this still doesn't work then try resetting PRAM and NVRAM

- Other bad signs:
  - Broken folder icon
  - Plain blue or grey screen
  - Kernel Panic
  - Flashing question mark
  - "Forbidden" icon

http://docs.info.apple.com/article.html?artnum=106464

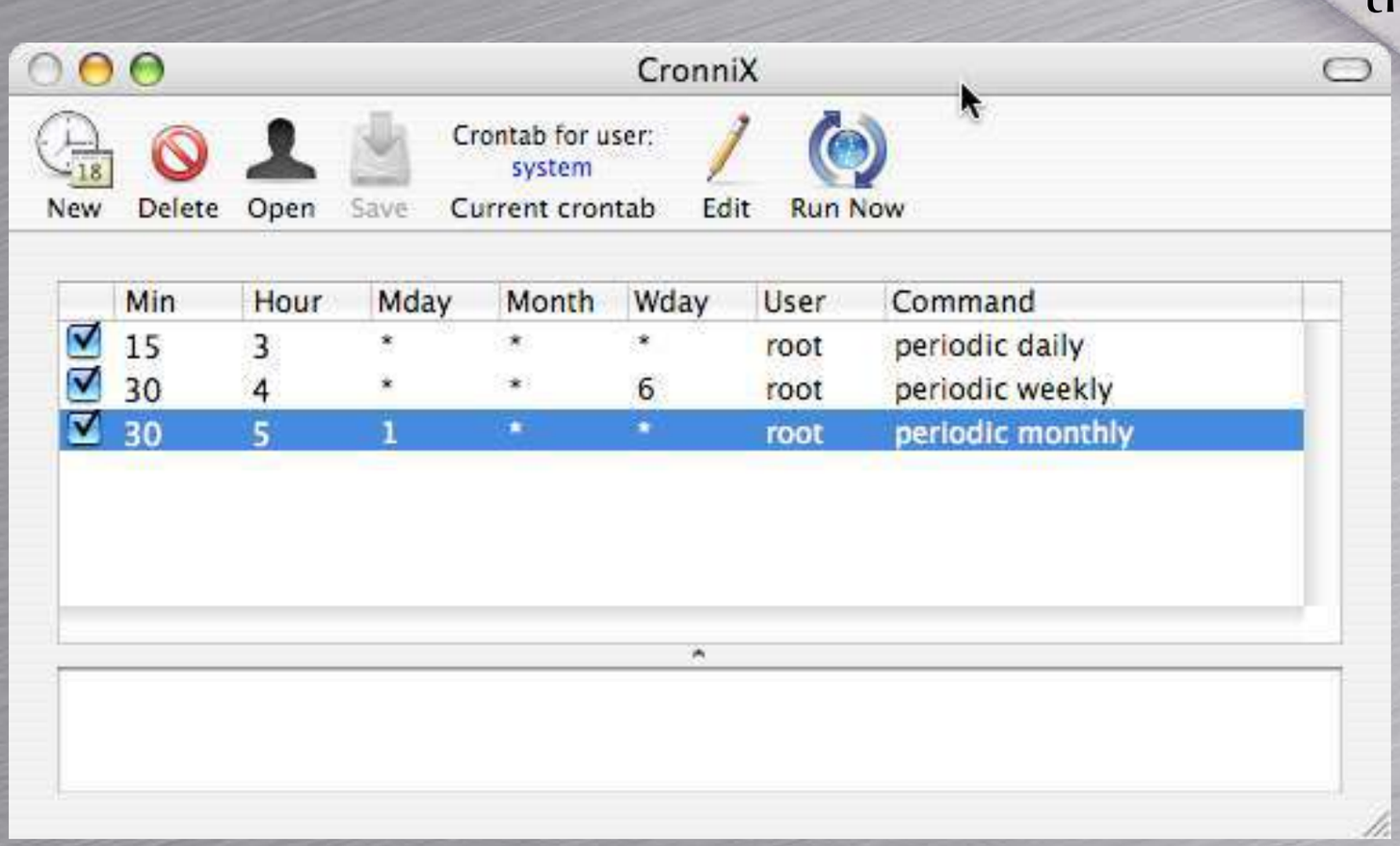
http://docs.info.apple.com/article.html?artnum=58042

Maintenance

- Maintenance
  - Disk permissions
  - Cron jobs (Cronnix)
  - Prebinding: `sudo update_prebinding -root / -force`
  - Using maintenance tools: Onyx, TinkerTool, Xupport, etc.

Cronned scripts

- **`periodic daily`**: 03:15 every day
- **`periodic weekly`**: 04:30 every Saturday
- **`periodic monthly`**: 05:30 on the 1st of every month



Maintenance tools:

Onyx: http://www.titanium.free.fr/english/onyx/index.html

Xupport: http://www.computer-support.ch/Xupport/index.html

TinkerTool / TinkerTool Pro:
http://www.bresink.com/osx/index.html

Cronnix: http://www.koch-schmidt.de/cronnix/

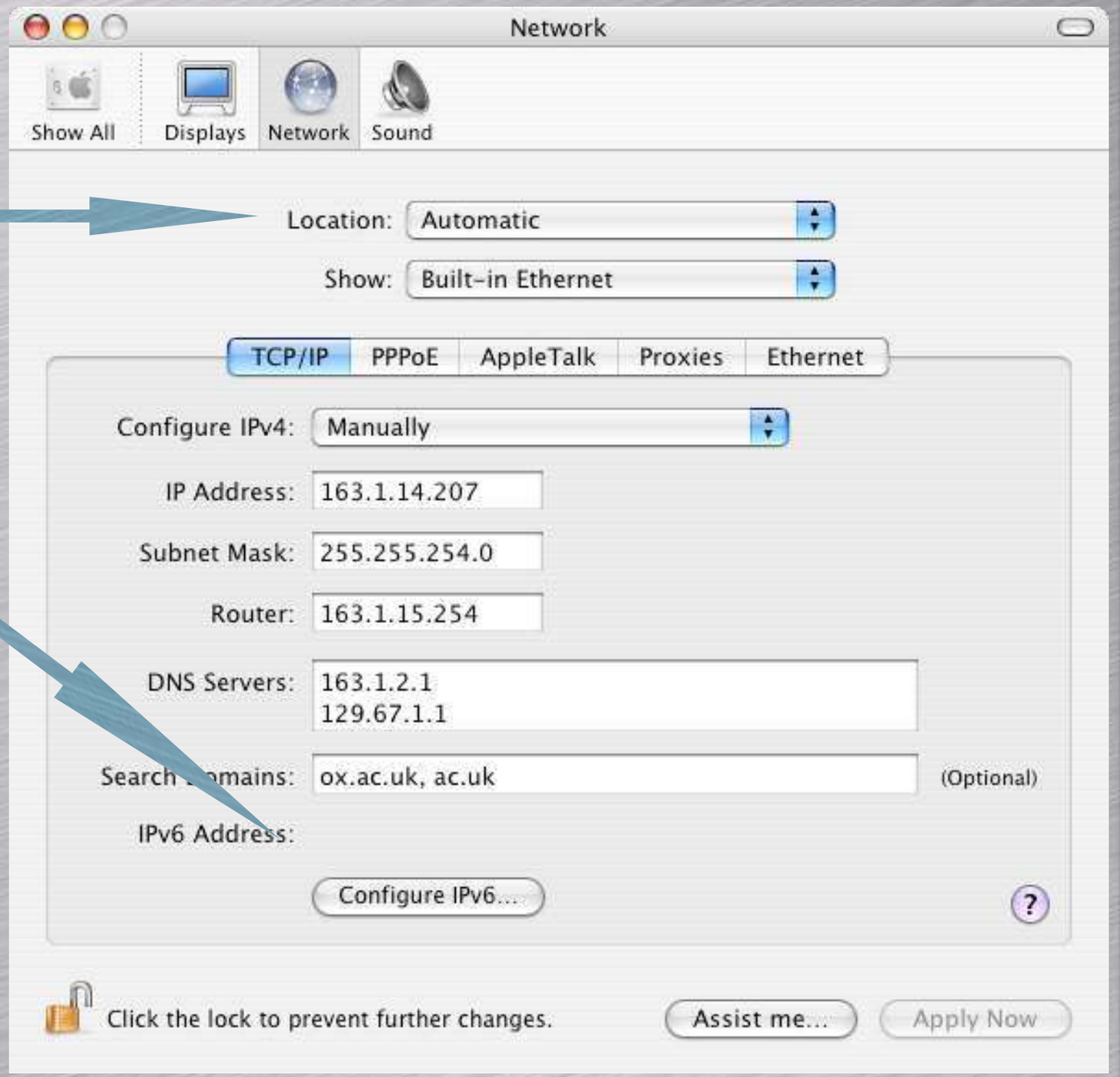
Also Rans:
Panther Cache Cleaner (http://www.northernsoftworks.com/pantherchachecleaner.html)
MacJanitor (http://personalpages.tds.net/~brian_hill/macjanitor.html)

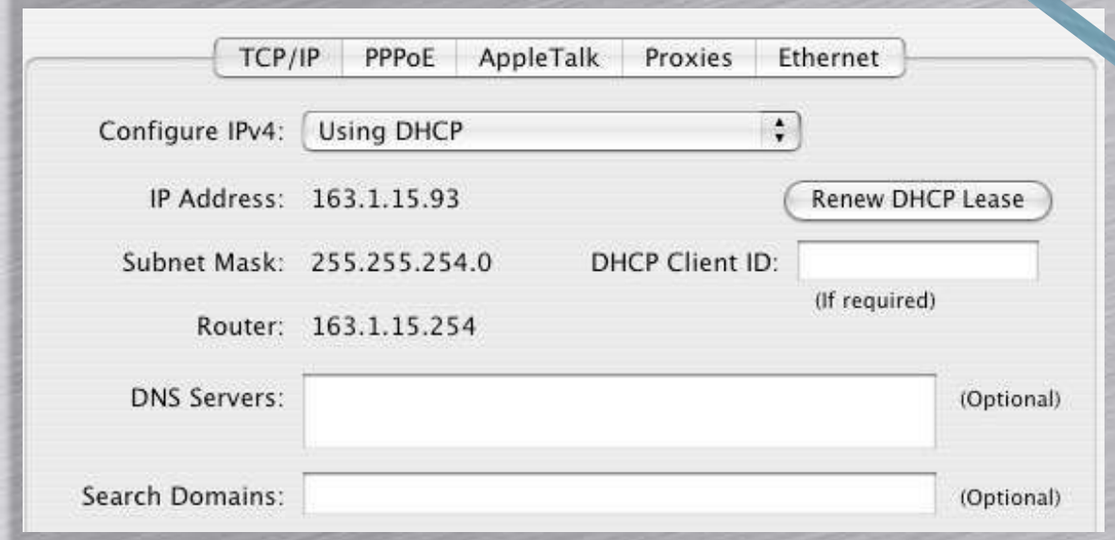
How do I configure stuff?

- Network
  - Use System Preferences / Network
- Mail Client
  - Mail.app
- Browsers
  - Safari is default browser
  - Mozilla, Firefox, Camino, Opera are all excellent too

Network Settings

- Trivial to set up multiple locations
- Turn off IPv6 (Panther only)

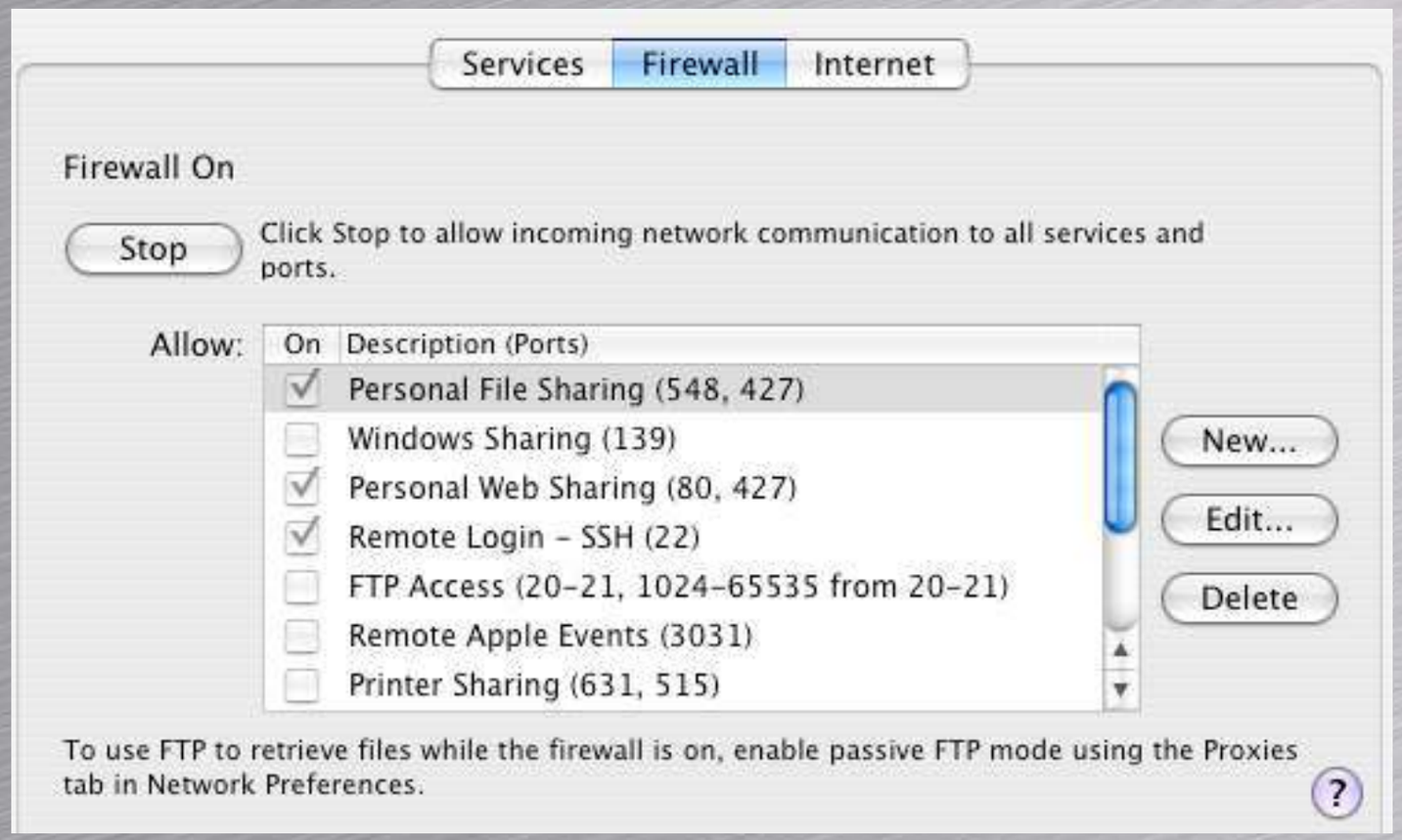




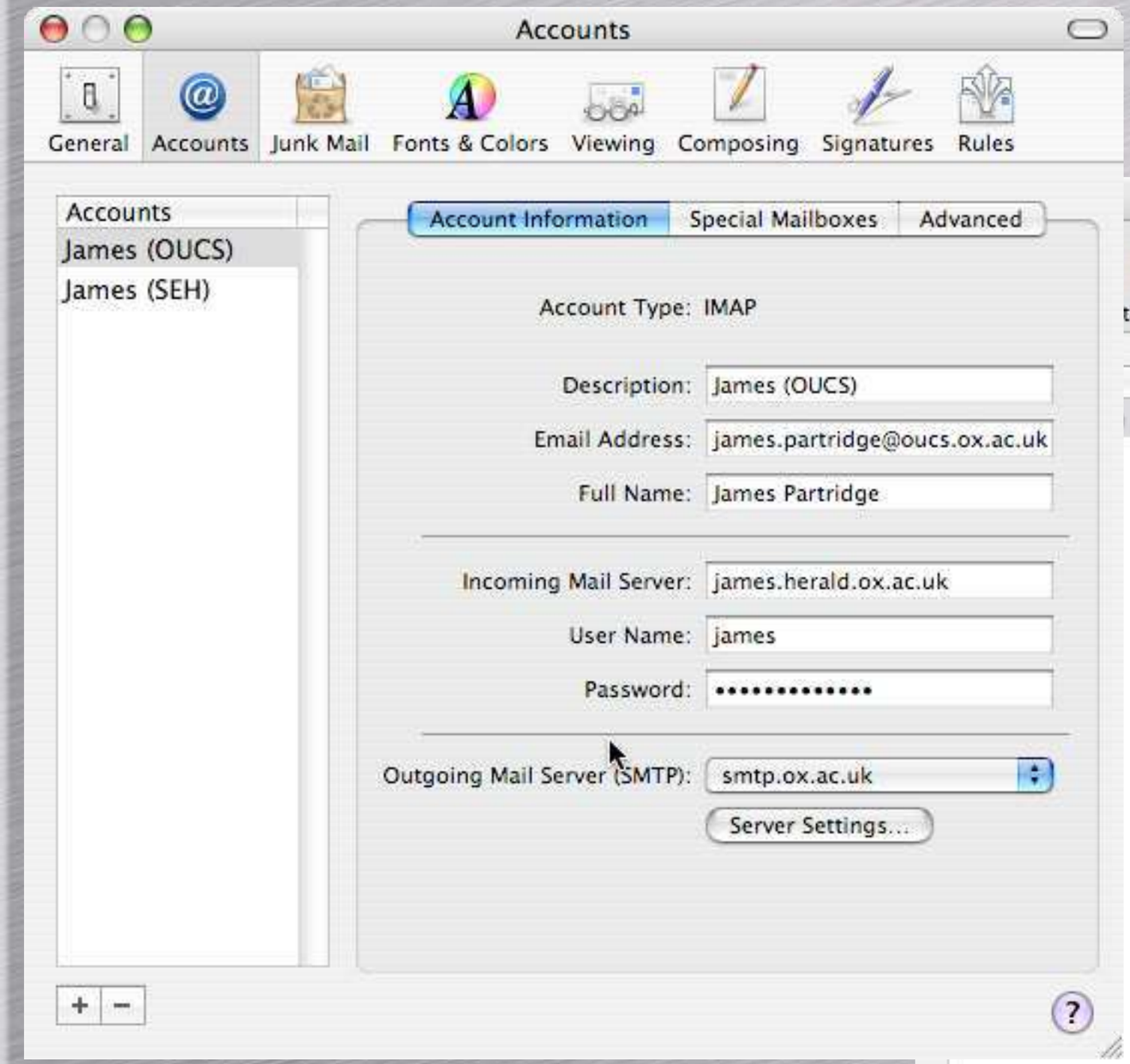
DHCP

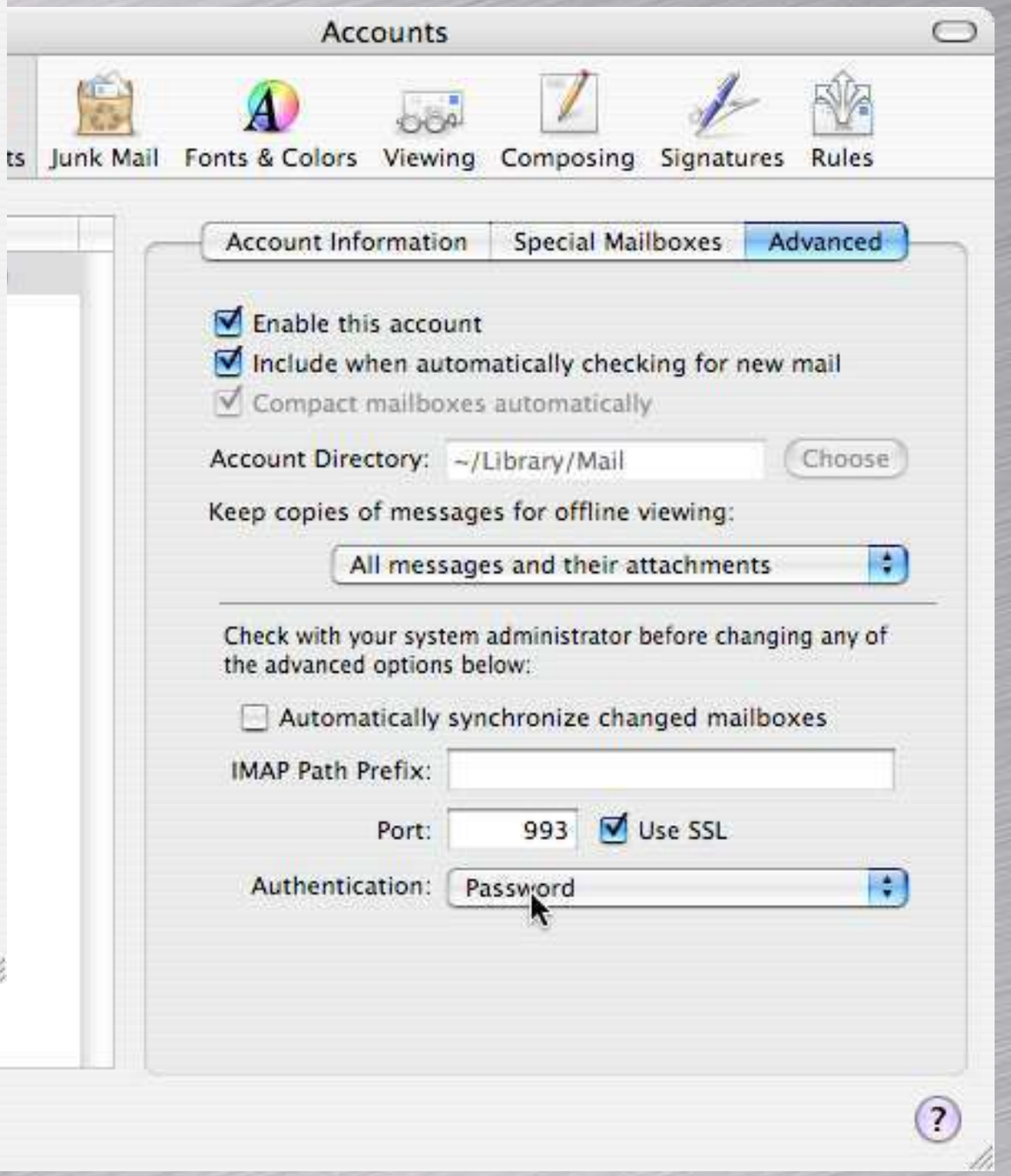
FireWall

Found in System Preferences / Sharing



Mail.app





Mail / Preferences

Anti-Virus

- No OS X-specific viruses; no Mac virus outbreaks for over 5 years
- Word macro viruses can still be a problem
- Macs can be “carriers”
- Use AV software

AV Products

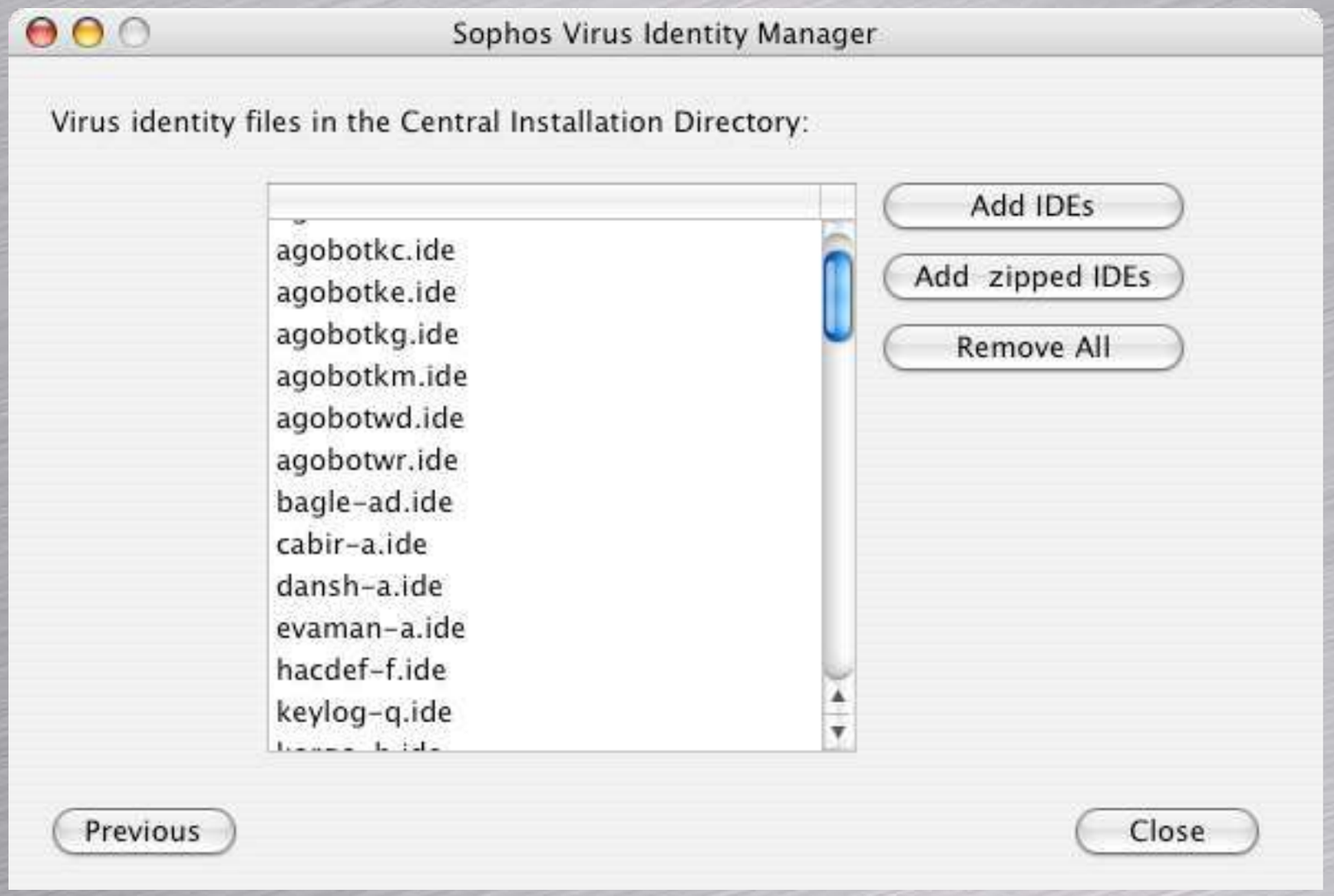
- Sophos Anti-Virus 10.2+
- McAfee Virex 6.2
- Norton Anti-Virus 9.0

Sophos 10.2+ Client

Now auto-updates (like the Windows client) when connected to a CID on a Mac or Windows server.

Sophos CID on OS X Server

Sophos CID on OS X Server



A few tips and tricks

- .Mac
- Exposé
- Spring-loaded folders
- Finder
- Dock
- PDF trickery
- Services

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