Chris Dawe

Born and raised in Texas, Chris studied history at the University of Chicago before being sidetracked into the worlds of Apple and networking.

A member of the Seattle consulting community since 1999 and Principal Systems Engineer for Wheelwrights since 2007, Chris provides planning, solutions, and support for a variety of business and education customers in Western Washington.

Chris spends his spare time in the kitchen, enjoys a good whisky, and went on an unexpected cider kick this summer.



Using OS Resources to Diagnose Troubles

Subjects of Interest

- Startup Process and Tools
- Recovery Partition and Recovery Mode
- OS X Graphical Tools
- Some Command Line Tools
- A Few Words on Technique
- A Quick Example

Startup Process and Tools

Use timing to troubleshoot a boot problem

- Why does it matter which stage you're in?
- How do you determine which stage you are in?
- What does that tell you?

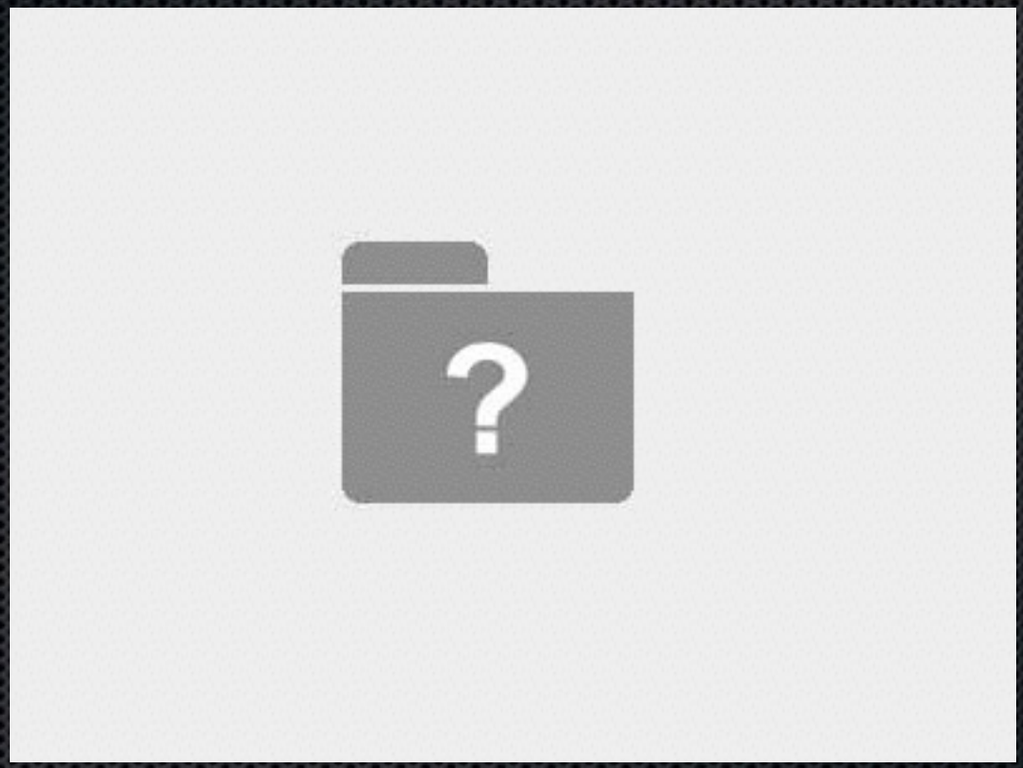
OS X System Boot stages

- Firmware (logic board)
- Booter
- Kernel
- launchd
- User Interface

Boot Stages, Boot Tones, and Startup Keyboard Shortcuts

- Boot Stages
  https://support.apple.com/en-us/HT2674
- Boot Tones
  https://support.apple.com/en-us/HT202768
- Startup Keyboard Shortcuts
  http://support.apple.com/en-us/HT201255

Boot Failure Examples



Boot Failure Examples



Startup Shortcuts: option Boot

- Boots into the Startup Manager
- Allows you to view available bootable disks, and choose one to start up from
- (Under Yosemite, doesn't seem to show Recovery Disks any more, but YMMV)

Startup Shortcuts: Single User and Verbose Mode

- Command-S and Command-V
- Single User Mode is handy for seeing if the OS can function at a bare minimum level
- Verbose mode can be useful for seeing where startup might be hanging.

launchd

- Handles the loading of other software; really the parent of everything else
- Resources at different file system levels: System, Library, and User
- Launch Agents vs. Launch Daemons

Recovery Partition and Recovery mode

Recovery Partition (Hold Command-R at boot)

- Created as part of an OS install since 10.7
- What do you do if one doesn't exist?
- Having a portable recovery partition (e.g., USB drive)

Recovery Partition

- Password Reset utility accessed from Terminal to reset a user password
- Using network utility from the recovery partition to troubleshoot network issues outside of the boot OS.
- Reinstall and restore from a Time Machine backup

Recovery Partition

- See Apple's Notes on Recovery Mode https://support.apple.com/en-us/HT4718

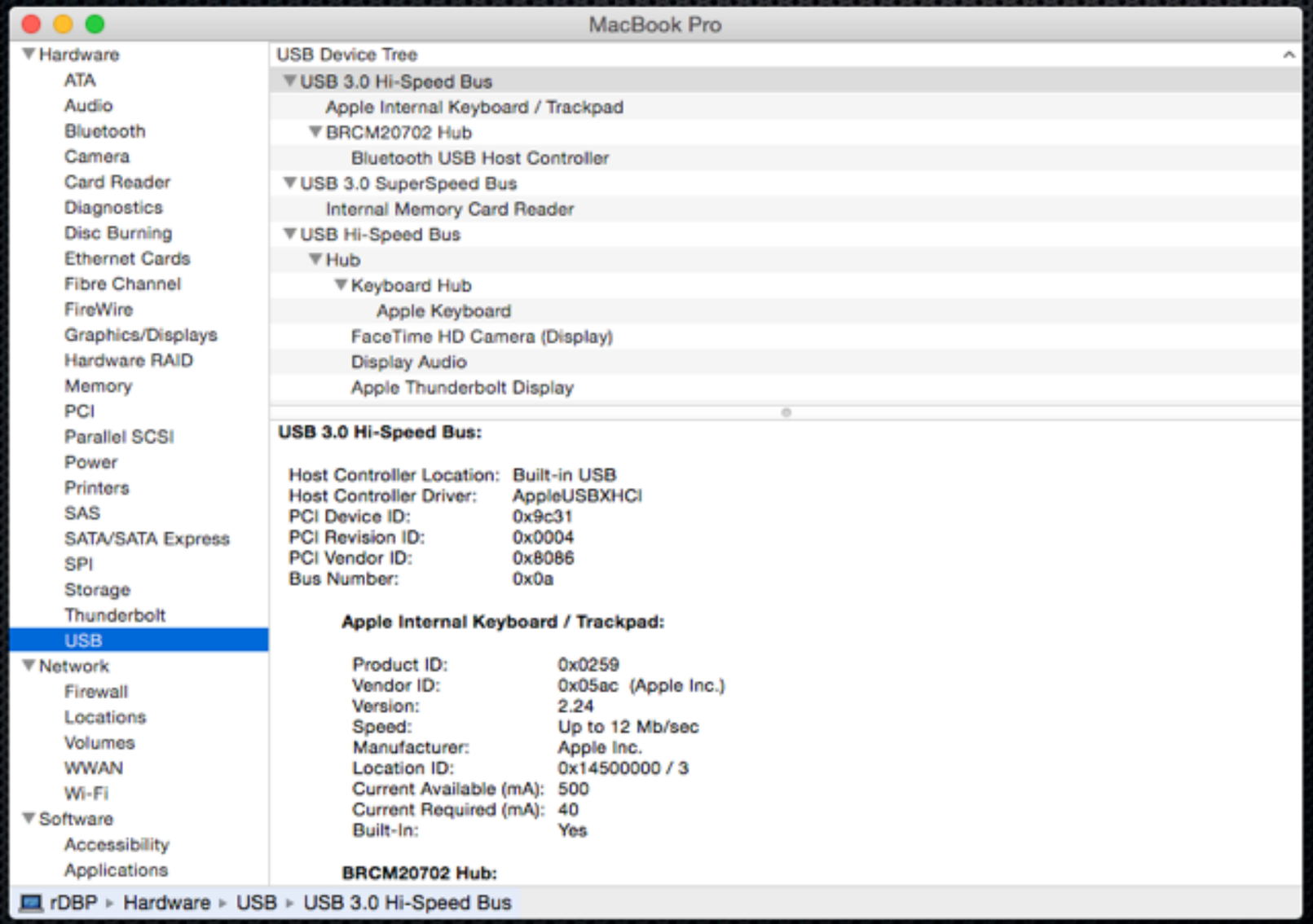
GUI Tools

System Information (neé System Profiler)

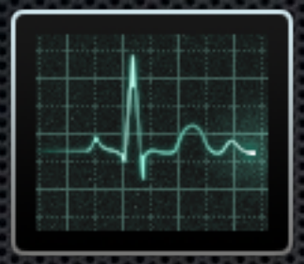


- Still called system_profiler in Terminal

System Information (née System Profiler)



Activity Monitor



- Troubleshooting Server specific concerns with Activity Monitor
- Finding the “pigs”
  - CPU
  - Memory
  - Energy
  - Disk
  - Network

Activity Monitor

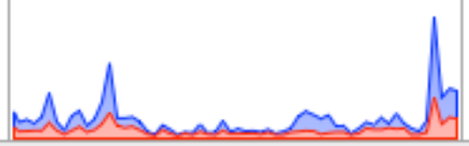
Activity Monitor (All Processes, Hierarchically)

CPU | Memory | Energy | Disk | Network | Search

Process Name	% CPU	CPU Time	Threads	Idle Wake Ups	PID	User
kernel_task	31.7	1:03:06.85	110	2,162	0	root
launchd	0.2	46.86	6	0	1	root
Google Chrome	11.2	4.62	45	106	66792	dawe
WindowServer	9.9	13:57.01	6	144	144	_windowserver
mds	5.5	40.45	7	6	32	root
coreaudiod	1.5	46.22	8	55	226	_coreaudiod
com.apple.audio.DriverHelper	0.0	0.05	3	0	229	_coreaudiod
airportd	1.3	5:23.58	12	7	29	root
Activity Monitor	1.3	1:02.88	7	2	45566	dawe
WiFi Signal	0.8	3:16.00	9	2	382	dawe
locationd	0.6	1:24.01	12	1	216	_locationd
launchservicesd	0.6	15.01	7	0	51	root
loginwindow	0.4	6.22	5	1	65	dawe
sysmond	0.4	42.96	3	1	160	root
ocspd	0.4	0.10	2	0	66793	root
opendirectoryd	0.3	11.57	10	0	46	root
notifyd	0.2	7.06	3	0	72	root
hidd	0.2	1:51.69	4	0	69	root
Dock	0.2	16.97	6	0	222	dawe

System: 14.66%
User: 18.76%
Idle: 66.58%

CPU LOAD



Threads: 1006
Processes: 229

Using Disk Utility



- Repairing a disk
- Repairing permissions

Console



- The log reading tool for OS X
- Google is your friend
- What actions might destroy useful logs?

Utilities moved from the Utilities Folder

- Apple has been moving tools for years; they tend to end up a little more hidden away with progressive releases
- Look in /System/Library/CoreServices/Applications/

CoreServices Tools

- Directory Utility



- Wireless Diagnostics



- Network Utility



Some Command Line Tools

Configuration Tools

- scutil
- networksetup
- systemsetup
- dscl and dseditgroup

File System and File Tools

- lsof
- iostat
- tail (use -f /path/to/log for live updating)
- fs_usage

Process and CPU Tools

- top
- ps

Network Tools

- ipconfig
- ifconfig
- airport
- tcpdump
- nettop
- netstat
- dig
- nslookup

Reference Tools

- man
- apropos
- whatis

A Bit of Advice on Technique

Be Specific

- Be specific, troubleshoot an authentication problem or a network problem using the appropriate logs
- Describe exactly what happens in as much specific detail as possible.

Difference between a hang and a crash

- Application Hang
- Application Crash

Binary method of troubleshooting

- Group items to reduce scope
- The roots of this are way back in the OS 9 days, when we used to troubleshoot (shudder) extensions

Contemporary Example of Binary Search

- If a user is having trouble with Adobe Reader, build a new user account, logging in, and try Adobe Reader under that account.
- You've just learned a lot about whether the problem is with the computer, or with something in the user's account

Lean Toward Unobtrusive

- Start with techniques that don't change the user environment
- Change one thing at a time

Beware of Confirmation Bias and Your Own Experience

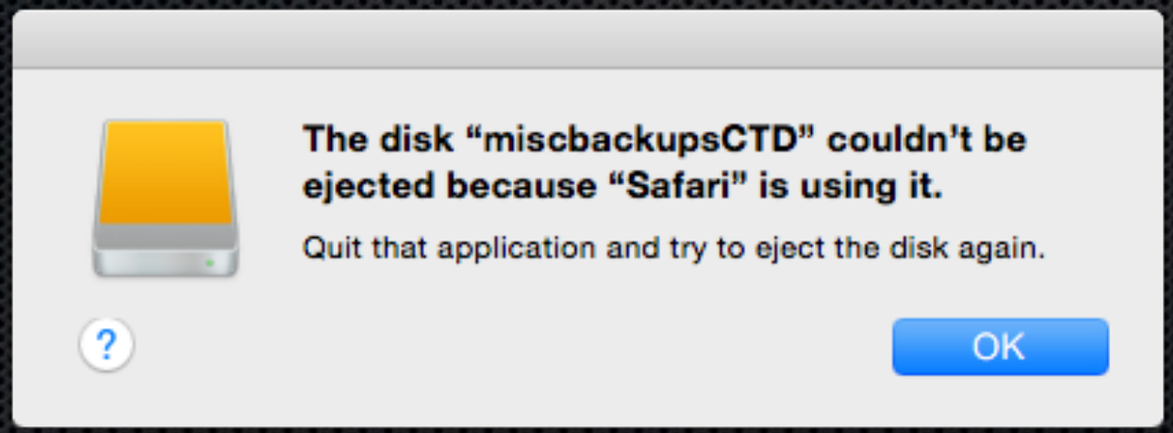
- "No need to check the settings; I always do things according to the documentation."
- "Well, last time it was X."
- You know what my friend told me? The plural of anecdote still isn't data.

Remember that GUIs Lie

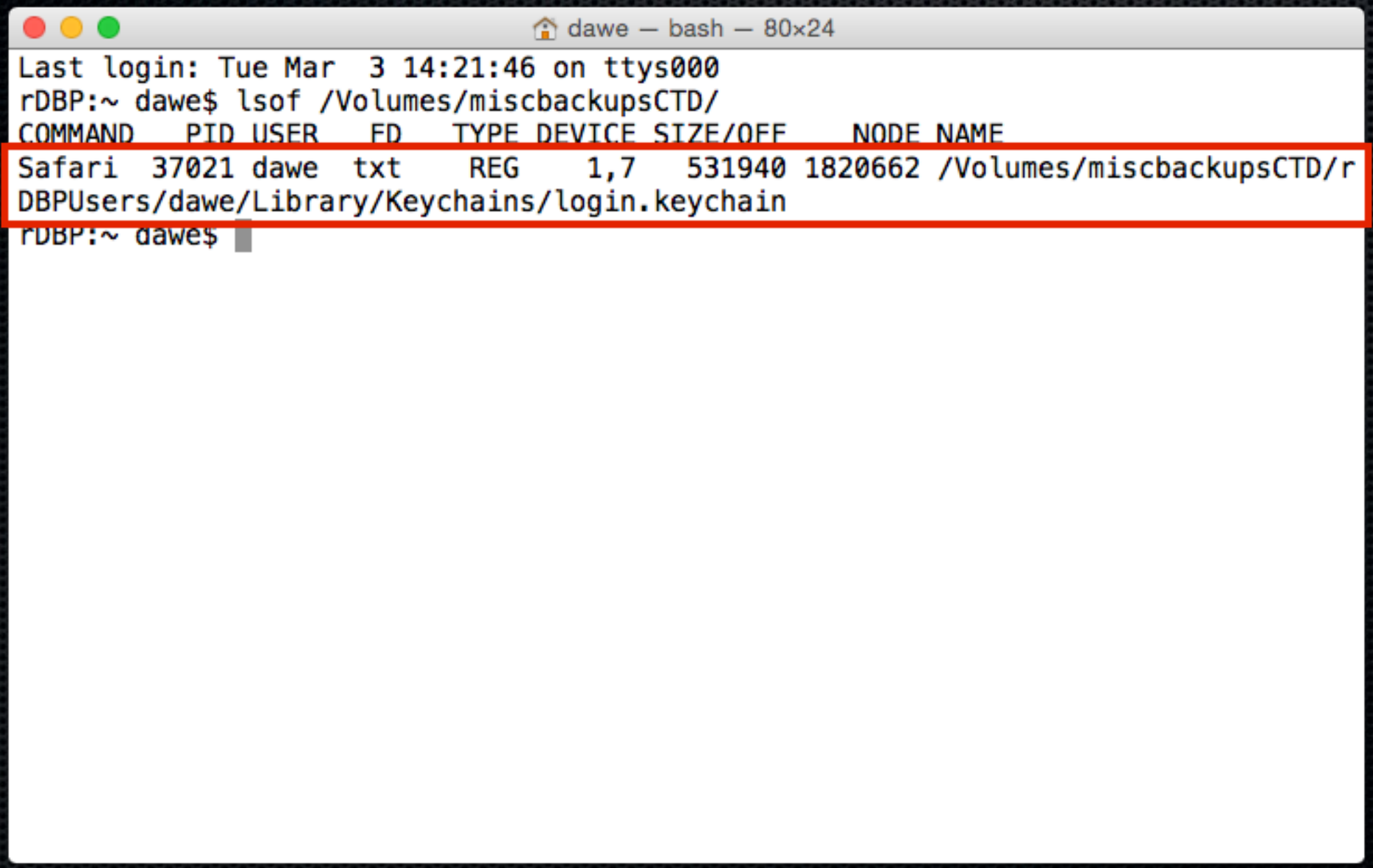
- “Get me a command line.”

One Final Example

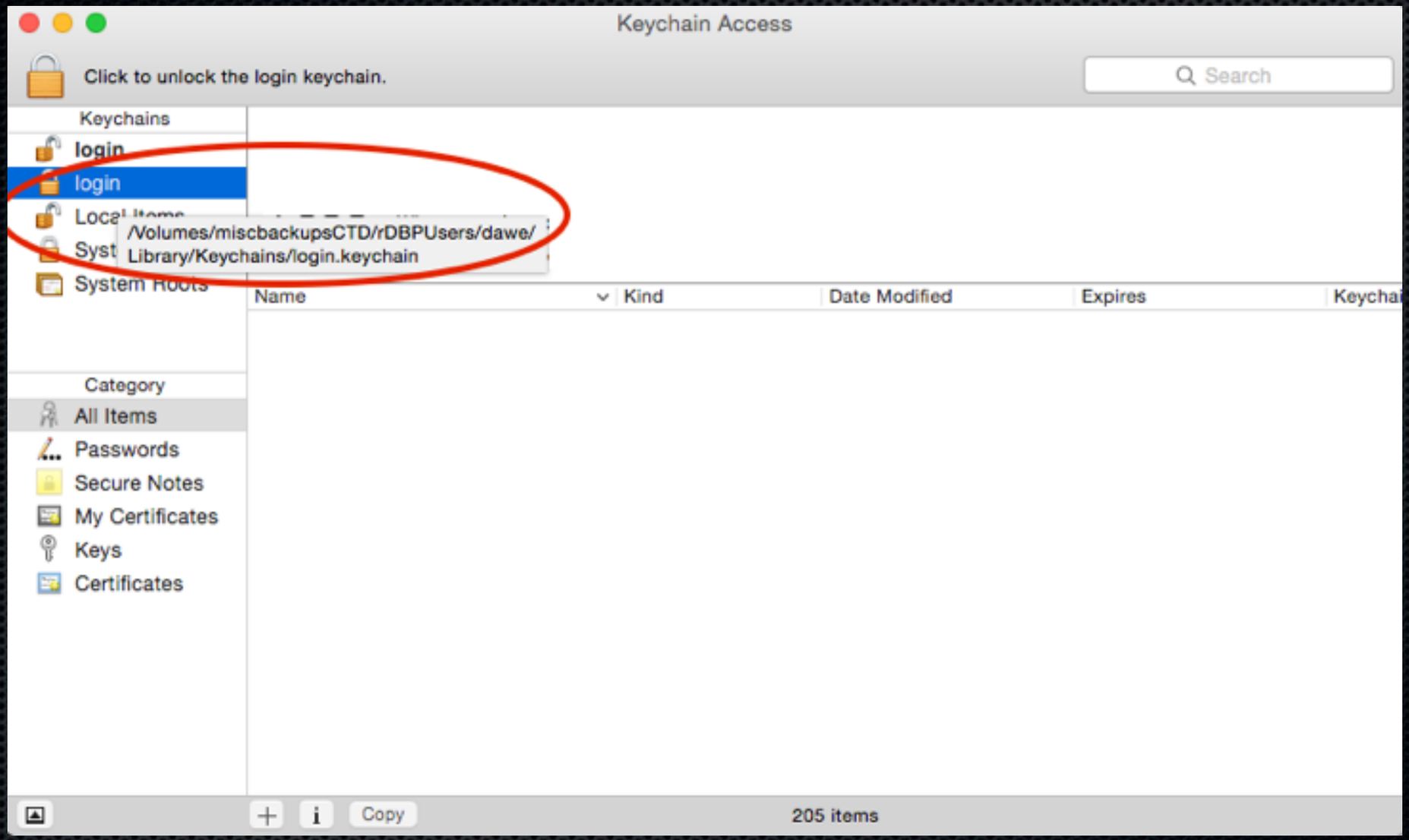
External Disk Issue



I know ~~Kung-Fu~~ lsof



On to Keychain Access!



More Resources

- ##osx-server freenode channel
- OS X Support Essentials (Peachpit)
- Apple Knowledge Base (updated at uneven intervals)

Questions?



Chris Dawe
@ctdawe
dawe@wheelwrights-llc.com

MACTECH PRO EVENTS