

Randy McMillan (aka Randy Mac)

Born and raised in the Washington DC Area, Randy started his career as a lithographer. After an industrial accident and then trying something new, Randy's career path changed again and he was introduced to the Apple computer.

From that initial instruction, he began his new career as a Mac Tech. Inspired to carve his own path, he left the security of his day job in May 2005 and RMACS was born! Everything that he knows has been achieved through hard work, reading anything and everything he can on what was happening in the world of Apple, networking with other techs and taking classes.

When he's not on the computer, he enjoys riding his Harley, kayaking or camping in the great outdoors with his wife/partner in crime!



Using OS Resources to Diagnose Troubles

Areas of Interest

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

Startup Process and Tools

Use Timing to Troubleshoot Startup Problems

- 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 (Initializes hardware - locates the booter file - Boot Chime - POST)
- Booter (loads OS X kernel - and essential hardware drivers - The Apple Logo appears)
- Kernel (Provides the system foundation and loads additional drivers and the core BSD UNIX system - loading of the kernel is indicated by the appearance of a progress bar that can look like a spinning gear)
- launchd (loads the remainder of the system - If successful it presents a login screen or the Finder if the user is set to automatically log in.)

Boot Stages, Startup Tones and Startup Keyboard Shortcuts

- Boot Stages
<https://support.apple.com/en-us/HT2674>
- Startup 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: Using the Option Key

- Holding the option key at boot prompts the Startup Manager
- Allows you to view available bootable disks and choose one to start up from

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 Explained, How it Starts Up and Keeps Things Running

- Difference between Mavericks (and before) vs. Yosemite (and after).
- System level
- Shared Library level
- User level
- Launch Daemon's (occur at user boot)
- Launch Agents (occur at login)

Recovery Partition and Recovery Mode

Disk Utility on the Boot Volume and on the Recovery Partition

- Repairing a disk
- Repairing permissions, and where the system reads what permissions to check and what they should be (so you know exactly what you are repairing).
- Special concerns when working across different versions of the OS

Recovery Partition

- What do you do if one doesn't exist?
<http://support.apple.com/kb/HT5911>
- Having a portable recovery partition (e.g., USB drive)
- Using Terminal to reset a user's password
- Using Network Utility from the recovery partition to troubleshoot network issues outside of the boot OS.
- Restore from a Time Machine backup or reinstall OS X

Graphical User Interface (GUI) Tools

Activity Monitor



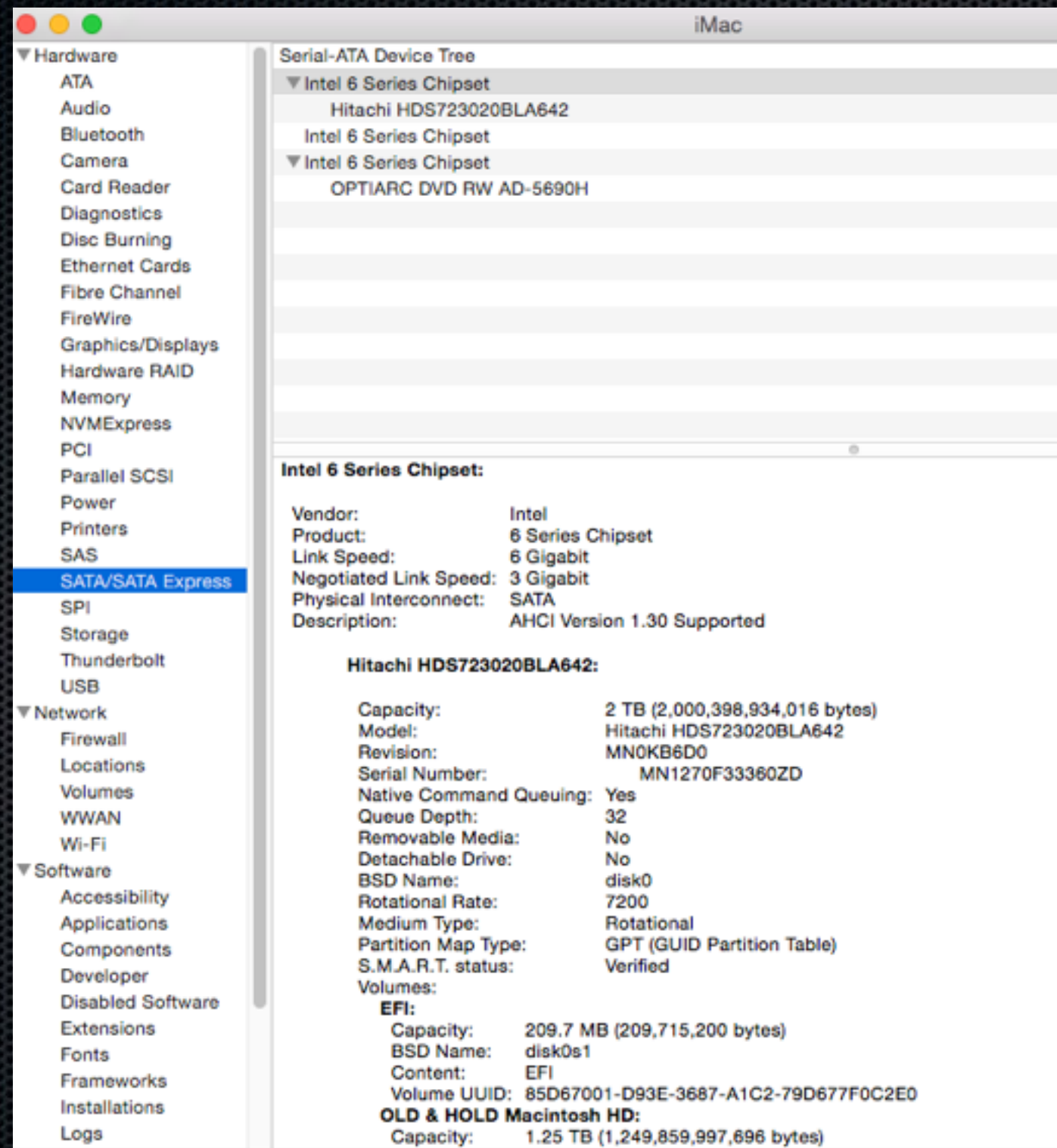
- What's the command line equivalent of this tool?
- Troubleshooting Server-specific concerns with Activity Monitor
- Troubleshooting Clients with Activity Monitor
- Finding the “System resource hogs”
 - CPU
 - Memory
 - Energy
 - Disk
 - Network

System Console



- Log locations: what's the difference between the different locations
- About reading logs.
- Google is your friend.
- Note that sometimes logs are not available in console
- Notes on using logs for troubleshooting, search terms, use warn, fail, error, etc...
- What actions might destroy useful logs?

System Information



Using Disk Utility



- Repairing a disk
- Repairing permissions

Utilities moved from the Utilities Folder

- Look in /System/Library/CoreServices/Applications/
- What else is in /System/Library/CoreServices/
- What to use, what to avoid

CoreServices Tools

- Directory Utility



- Wireless Diagnostics



- Network Utility



Command Line Tools

Command Line Tools to Know

- *Configuration Tools*
 - scutil - Manage system configuration parameters
 - networksetup - Configuration tool for network settings in System Preferences
 - systemsetup - Configuration tool for certain machine settings in System Preferences
 - dscl - Directory Service command line utility
 - dseditgroup - Group record manipulation tool
- *File System and File Tools*
 - lsof - List open files
 - iostat - Report I/O statistics
 - fs_usage - Report system calls and page faults related to filesystem activity in real-time

Command Line Tools to Know (continued)

- *Network Tools*
 - ipconfig - View and control IP configuration state
 - ifconfig - Configure network interface parameters
 - airport - Get information for 802.11 interface
 - tcpdump - Dump traffic on a network
 - nettop - Display updated information about the network
 - netstat - Show network status
 - dig - DNS lookup utility
 - nslookup - Query Internet name servers interactively

Command Line Tools to Know (continued)

- *Process and CPU Tools*
 - top - Display and update sorted information about processes
 - ps - Process status
- *Reference Tools*
 - man - Format and display the on-line manual pages
 - apropos - Search the whatis database for strings
 - whatis - Search the whatis database for complete words

Techniques

Be Specific

- Be specific, troubleshoot a Mail.app problem by searching for the appropriate logs
- Be specific, troubleshoot an authentication problem using the appropriate logs
- Be specific, troubleshoot a network connection problem using the appropriate logs

Difference between a Hang and a Crash

- Define an application *hang* - A hang is when a software program becomes unresponsive
- Define an application *crash* - A crash is when a software program stops working and then closes
- How to troubleshoot each

More Resources

- Boot Stages
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- Startup Tones
<https://support.apple.com/en-us/HT202768>
- Startup Keyboard Shortcuts
<http://support.apple.com/en-us/HT201255>
- Apple
<http://www.apple.com/support/mac/>
- [lynda.com](http://www.lynda.com/)
<http://www.lynda.com/>