

Troubleshooting Hardware, Software & Network Problems

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About this Session

- ▶ Troubleshooting Mindset
- ▶ Soft Skills for Troubleshooting
- ▶ Best Practice Methodology
- ▶ Troubleshooting Tools
- ▶ Q & A



What this Session is and is not

- ▶ Sharing of My Practices
- ▶ My Observations of Common Oversights
- ▶ It Used to Work Properly, Correct?
- ▶ Avoid Troubleshooting by Avoiding Trouble
- ▶ Troubleshooting is art + science + skills



Troubleshooting Mindset

- ▶ 90% Diagnostics + 10% Remedy = Effectiveness
 - ▶ Work like a good Doctor
No surgery without proper diagnosis
 - ▶ Ask lots of questions
 - ▶ Listen to all your senses for clues
 - ▶ Gather data with tools, knowledge & feel

“mindset” {noun}

a set of beliefs or a way of thinking that determines one's behavior, outlook and mental attitude.



Troubleshooting Mindset

“mindset” {noun}

a set of beliefs or a way of thinking that determines one's behavior, outlook and mental attitude.

- ▶ Logic Evolves as Assumptions Change
 - ▶ What used to be a cause may no longer be
 - ▶ What used to be a solution may no longer be
 - ▶ As we gain more knowledge, our logical thinking changes



Troubleshooting Mindset

“mindset” {noun}

a set of beliefs or a way of thinking that determines one's behavior, outlook and mental attitude.

- ▶ Best Practice Always
 - ▶ Seek knowledge about the problem
 - ▶ Make unknowns known
 - ▶ Replace suspect things with known good things
 - ▶ Eliminate one variable at a time



Troubleshooting Mindset

“mindset” {noun}

a set of beliefs or a way of thinking that determines one's behavior, outlook and mental attitude.

▶ Work With a Calm Mind

- ▶ Be methodical—randomness may not fix the root problem
- ▶ Avoid overlooking causes by slowing down
- ▶ Seek to fix the root causes and not superficial symptoms
- ▶ Look for multiple causes—perfect storm scenarios



Soft Skills for Troubleshooting

“soft skills” {pl noun}

desirable qualities that do not depend on acquired knowledge: including the ability to deal with people, and a positive flexible attitude

▶ Be Like a Good Doctor

- ▶ Let the user speak to you
- ▶ Let the everything else speak to you
- ▶ Speak only when user is listening
- ▶ Speak at the level of the user
- ▶ Boasting stops flow of clues



Soft Skills for Troubleshooting

“soft skills” {pl noun}

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▶ Users Often Have the Answers You Seek

- ▶ Users are closest to the problem
- ▶ Users may have critical clues
- ▶ Observe user habits intently
- ▶ Engage in full-circle communication
- ▶ Tread lightly to keep information flowing



Best Practice Methodology

“methodology” {pl noun}

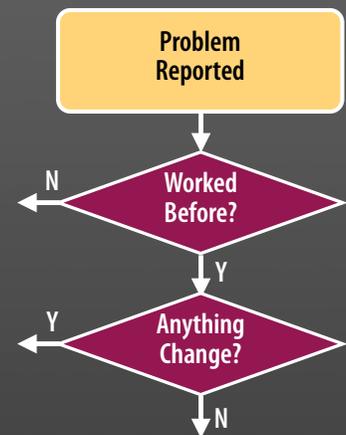
a set or system of methods, principles, and rules for regulating a given discipline, as in troubleshooting.

- ▶ Troubleshooting is art + science + skills
- ▶ Listen to instinct and intuition along with logic
- ▶ Following a method is the best practice for most cases
- ▶ If something works for you, use it, share it



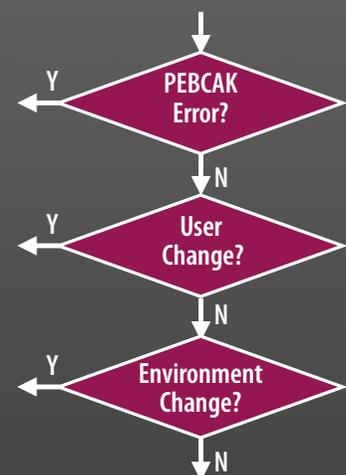
Best Practice Methodology

- ▶ If it never worked before, perhaps it won't work, ever
- ▶ Check feasibility, requirements & compatibility
- ▶ Assume change and ask "What's Changed?"
- ▶ Check effect of the change
- ▶ Can change be reversed or fixed for verification or fix?



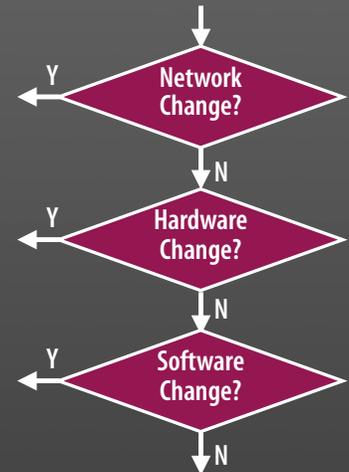
Best Practice Methodology

- ▶ Can you reproduce error experienced by the user?
- ▶ Different user or is the user using the system differently?
- ▶ Electrical, Grounding, Cabling, Connections?
- ▶ Temperature, Dust?
- ▶ Reseat connections—don't just check them



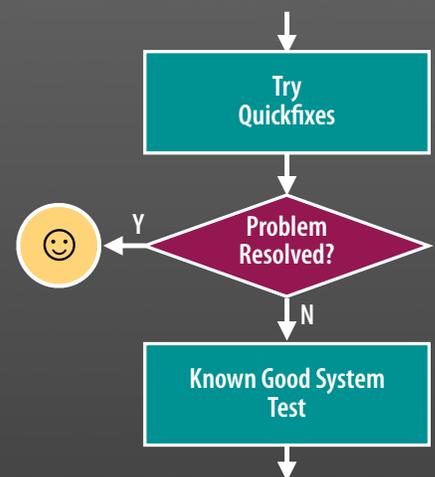
Best Practice Methodology

- ▶ Directory, Firewall, DNS, DHCP, Network Services, Box Changes?
- ▶ Hardware upgrade, damage or repair? Intermittent?
- ▶ Clock battery, noises or other physical signs?
- ▶ Software updates, upgrades or installs?
- ▶ Excessive forced restarts, settings and plists?



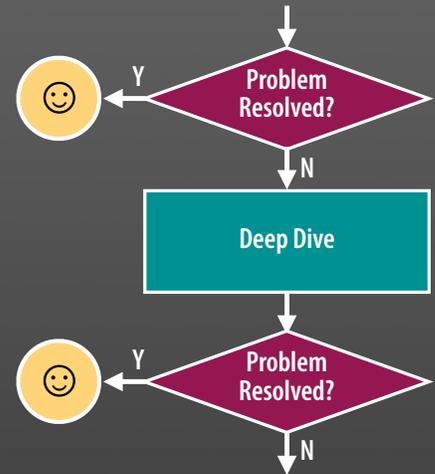
Best Practice Methodology

- ▶ Eliminate unknowns or make them known
- ▶ Replace cables, swap parts
- ▶ Change environment
- ▶ Test with known good system



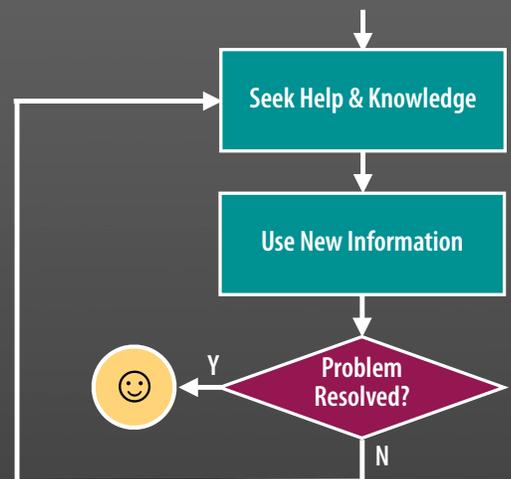
Best Practice Methodology

- ▶ Gather more data & analyze
- ▶ Research for known issues
- ▶ Split-half tests
- ▶ Reduce and eliminate variables



Best Practice Methodology

- ▶ Research online
- ▶ Contact tech support
- ▶ Post on lists
- ▶ Consult with colleagues
- ▶ Sleep on it



Troubleshooting Tools

“tools” {pl noun}

anything used as a means of accomplishing a task or purpose.

▶ Physical Tools

- ▶ Service HD, Netboot HD
 - ▶ Known clean bootable OS
 - ▶ Favorite diagnostics applications collection
 - ▶ Common updaters and installers
- ▶ High quality known good cables



Troubleshooting Tools

“tools” {pl noun}

anything used as a means of accomplishing a task or purpose.

▶ Apple GUI Tools

- | | |
|--------------------------------|-------------------|
| ▶ Command Line Shell: | Terminal |
| ▶ Directory Services Editor: | WorkGroup Manager |
| ▶ Log Reader: | Console |
| ▶ Network Tools: | Network Utility |
| ▶ Server Services: | Server Admin |
| ▶ System Activity: | Activity Monitor |
| ▶ System & Configuration Data: | System Profiler |



Troubleshooting Tools

“tools” {pl noun}

anything used as a means of accomplishing a task or purpose.

▶ 3rd Party GUI Tools

- ▶ Command Line Manuals:
- Directory Queries:
- Files & Permissions:
- Network Discovery:
- Plist Viewer & Editor:

ManOpen
LDapper
BatChmod, fseventer, Sandbox
Bonjour Browser
PlistEdit Pro, TextMate



Troubleshooting Tools

“tools” {pl noun}

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▶ Command Line Tools

- ▶ DNS & Directory Services:
- Files & Permissions:
- Network:
- System Activity:

```
changeip -checkhostname, dcsl,  
dscacheutil -flushcache,  
host, hostname  
chmod, chown, fsck, ls -la  
dig, ifconfig, ipconfig,  
netstat, ping, traceroute  
tail, top, ps
```



Q & A

*“Q & A” {noun informal}
an exchange of questions and
answers.*

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- ▶ Soft Skills for Troubleshooting:
Be a Good Doctor
- ▶ Best Practice Methodology:
Listen to instinct and intuition along with logic
- ▶ Troubleshooting Tools:
Service HD, Netboot HD

