



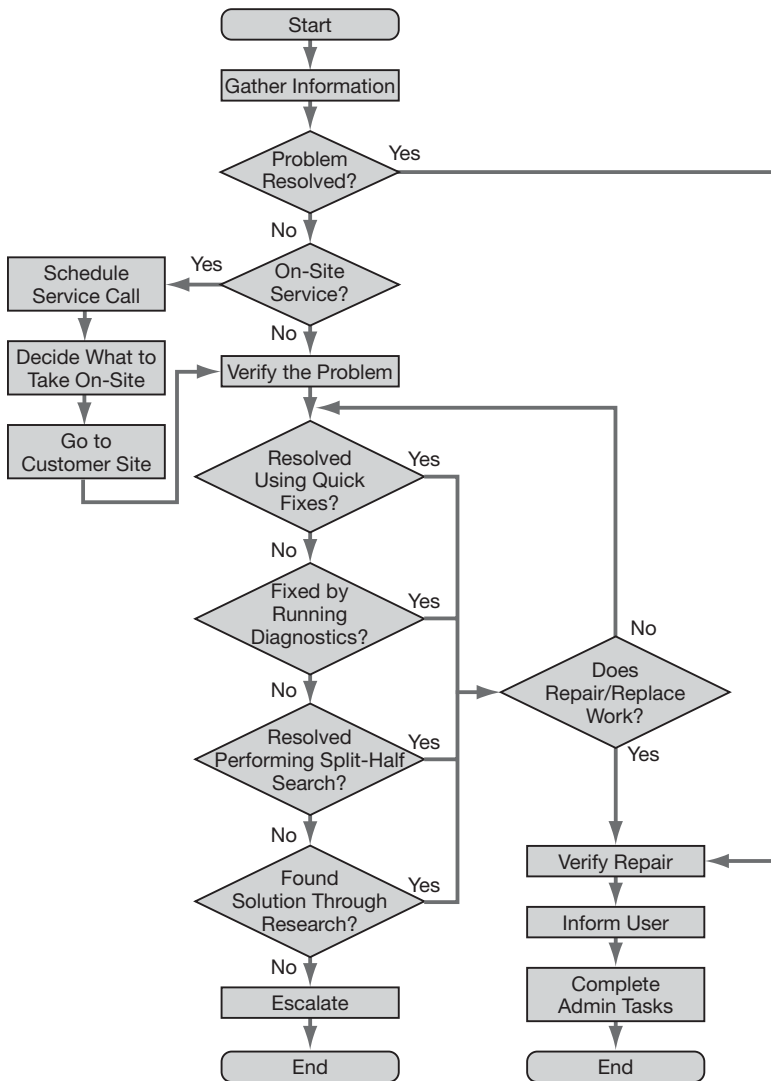
Appendix

General Apple Troubleshooting

Each lesson in this guide features troubleshooting information specific to the technologies covered in that lesson. This appendix serves as a supplementary quick reference to general Apple troubleshooting techniques.

Troubleshooting Workflow

Always remember that the two primary goals of troubleshooting are to fix the issue properly and to fix it quickly. Following a systematic troubleshooting process will let you consistently achieve both of these goals. Even if you or your organization already has a preferred troubleshooting process, you will still find the following workflow useful.



The AppleCare support group uses this workflow to ensure that all customer issues are properly handled. The beginning steps involve gathering information and verifying the problem. The end steps involve verifying the solution and informing the user, or escalating the problem to a higher support level. This appendix focuses on the four primary troubleshooting steps in the diagram: quick fixes, diagnostic tools, split-half search, and research resources.

Quick Fixes

The quick fixes applicable to troubleshooting Mac OS X range from innocuous to invasive; it's usually best to try fixes from the innocuous end of the spectrum first.

Innocuous Fixes (Consider These First)

The following general troubleshooting steps have little impact on the computer and Mac OS X, and may fix transient issues:

- ▶ Shut down and then restart the Mac.
- ▶ Repair disk volumes with Disk Utility.
- ▶ Disconnect all external devices.
- ▶ Run Software Update to check for any uninstalled updates.

When you begin troubleshooting, you might try these innocuous tactics to assess the problem:

- ▶ Try the same task in another application if available.
- ▶ If you're experiencing a network issue, try connecting to another network service.
- ▶ Check with other Macs to see if they are experiencing the same problem, indicating a possible network issue.
- ▶ Inspect your Mac using System Profiler.
- ▶ Review logs using Console.
- ▶ Perform a safe boot by holding down the Shift key during startup until the words *Safe Boot* appear at the login screen; then you will be running Mac OS X in Safe Mode.
- ▶ Start in single-user mode by pressing Command-S during startup.

- ▶ Start in verbose mode by pressing Command-V during startup.
- ▶ Start from another known good system such as the Mac OS X Install DVD.

Less Innocuous Fixes (Consider Next)

The following fixes have a moderate impact on the computer or the user environment. They are somewhat more time-consuming, so you should use caution and document your work:

- ▶ Choose Force Quit from the Apple menu if an application is not responding.
- ▶ Adjust user-specific settings using System Preferences.
- ▶ Log in with another user account or with an administrative user account. Remember that it's easy to create a new account for testing, and delete it when you are finished.
- ▶ Delete cache files from the ~/Library/Caches and /Library/Caches folders.
- ▶ Move, rename, or delete suspect user preference files in ~/Library/Preferences.
- ▶ Try a different network interface or port.
- ▶ Verify network settings using the Network, Sharing, and Security preferences.
- ▶ Create a new test network location, and then test with that location.
- ▶ Update peripheral and printer drivers.
- ▶ Try another known good peripheral.
- ▶ Check the settings in the Startup Disk preference.
- ▶ Fix permissions using Disk Utility.
- ▶ Check for firmware updates.
- ▶ Move, rename, or delete suspect system preference files in /Library/Preferences.

Invasive Fixes (Consider Last)

The following fixes have a more substantial impact on the system:

- ▶ Reinstall the suspect application.
- ▶ Reset Parameter Random Access Memory (PRAM) or nonvolatile RAM (NVRAM) by pressing Command-Option-P-R at startup until you hear the startup chime twice. Note that after resetting NVRAM, you should reselect the boot volume in Startup Disk preferences.

- ▶ Remove non–Apple internal hardware upgrades from your computer, including memory or expansion cards.
- ▶ Reinstall Mac OS X over the current installation.
- ▶ Back up important user data, use Disk Utility to erase the system volume, perform a “new” installation of Mac OS X, reconfigure the system, and restore the user’s data.

Diagnostic Tools

The following tools are often used for diagnostics on Mac OS X:

- ▶ Activity Monitor
- ▶ System Profiler
- ▶ Console
- ▶ Network Diagnostics accessed from the Network preferences
- ▶ Network Utility
- ▶ Directory Utility
- ▶ Disk Utility
- ▶ Apple Hardware Test, which is accessed by inserting the restore disc that came with your Mac and then restarting while holding down the “D” key. Note that newer Mac models don’t require the restore disc as they include the diagnostics in hardware ROM.
- ▶ Apple Service Diagnostic, which is available to Apple Authorized Service Providers
- ▶ Display Utilities, which is available to Apple Authorized Service Providers
- ▶ MacTest Pro, which is available to Apple Authorized Service Providers

TIP ▶ Several third-party utilities are useful for troubleshooting, including Tech Tool Deluxe, which is available with the purchase of an AppleCare Protection Plan.

Split-Half Search

When you cannot quickly isolate the cause of a problem, a technique known as a split-half search can be helpful. Split-half searches can take a considerable amount of time, so you should exhaust any quick-fix techniques before proceeding. The aim of a split-half search is to isolate an issue by systematically eliminating variables that could be its cause. You must temporarily remove half the variables, and then try to re-create the problem. When you discover which half contains the problem-causing item, you again halve the set of variables with the issue. Repeat to get successively smaller sets of variables. With each subsequent split you come closer to the source, ultimately narrowing down to the problematic item.

The following are common split-half search techniques:

- ▶ Start using Safe Boot by pressing Shift during startup.
- ▶ Start in single-user mode by pressing Command-S during startup.
- ▶ Systematically remove potential problem files such as third-party system items, cache files, or preference files.
- ▶ Disconnect peripherals.
- ▶ Use Network Utility to evaluate connectivity to other devices and computers on a network.

Research Resources

The best problem-solving experts don't necessarily know every answer; instead, they know where to *find* every answer.

Common resources to consult for troubleshooting Mac OS X issues are:

- ▶ User documentation
- ▶ Read Me files
- ▶ The Mac Help menu
- ▶ Command `man` pages viewable using the Terminal
- ▶ Log files viewable using Console
- ▶ The Apple support website: www.apple.com/support

- ▶ Internet support communities
- ▶ Results gathered from a well-queried Google search (Specific error messages “in quotes” are often good search terms.)
- ▶ Apple’s Service Source, which is available to Apple Authorized Service Providers