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# Resolving Mac Hardware and Software Issues

## Introduction



Once environmental factors or educational opportunities are eliminated, the remaining causes of a Mac issue are based on hardware or software.

Other training courses have introduced you to basic troubleshooting, issue evaluation, and Apple diagnostic tools. The Resolving Mac Hardware and Software Issues course concentrates on the means of resolving hardware and software issues.

### Course Description

The Resolving Mac Hardware and Software Issues course provides a chance to use systematic troubleshooting methodology to correctly evaluate and isolate Mac issues.

This course is part of the ACMT 2016 curriculum and is used to prepare for the Mac Service Certification Exam (MAC-16A).



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# Resolving Mac Hardware and Software Issues

## Overview

### Lesson Objectives

- Upon completion of this course, you should be able to do the following:
- Describe when hardware troubleshooting should occur in relation to perceptual, environmental, and software troubleshooting.
  - Identify resources that can identify and resolve hardware issues.
  - Describe types of software issues and the corresponding techniques likely to resolve them.
  - Given specific troubleshooting scenarios, identify troubleshooting techniques that should be used.

Audience	Prerequisites	Time Required	You will need...
 Service Technicians	 Successful completion of the Apple Service Fundamentals exam	 45 minutes	 No additional materials or equipment are required.

**i** Your course is organized by chapters and pages. Chapters are sections you see on the side navigation. Pages are now found within a chapter. You can navigate pages by clicking the grey radio buttons at the bottom of a window.



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# Resolving Mac Hardware and Software Issues

## Resolution Resources and Tools



### Diagnostics and Service Guides

The resources and tools provided by Apple are designed for use by Apple-authorized service facilities. Global Service Exchange (GSX) is the portal to diagnostics, special tools, and up to date service documentation.

Service Guides include take apart instructions for specific component replacements. More importantly, they include dozens of individual troubleshooting flows that systematically narrow the problem space for all likely issues for that particular model of Mac.

Apple also provides the Apple Service Toolkit 2 (AST 2), a cloud-based diagnostic system to help technicians triage and verify repairs.














### Service Guide Troubleshooting

Service Guide troubleshooting follows these principles:

- Provide comprehensive symptoms for each issue.
- List the Quick Checks that apply for each issue and require that Quick Checks be done first.
- Require AST 2 or other diagnostics early in the process.
- Go from least intrusive procedures to most intrusive procedures in the Deep Dive Steps.
- Completely eliminate software causes before checking hardware components.
- Reseat and reconnect components before replacing them.
- Use known-good components (when available) to test functionality before ordering replacement parts.
- Verify complete functionality before declaring an issue resolved.
- In situations where resolution is not clear, escalate the repair according to the procedures of the service facility.



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## Resolving Mac Hardware and Software Issues

### Symptom Categories

#### Symptom Charts Example

Apple Service Guides provide a large number of Symptom Charts for different issues. Each one consists of a troubleshooting process for a specific issue.

This list shows basic categories of Mac issues and the issues within each category. This example was taken from the Service Guide Symptom Charts for the MacBook Pro (Retina, Mid 2015).

- ▶ [Communication](#)
- ▶ [Display](#)
- ▶ [Input/Output Devices](#)
- ▶ [Mass Storage](#)
- ▶ [Mechanical](#)
- ▶ [Startup and Power](#)



# ATLAS Apple Technical Learning Administration System

Emily Nahmanson

Resolving Mac Hardware and Software Issues




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## Resolving Mac Hardware and Software Issues

### Symptom Categories



### Blank Screen Exercise

Review the symptoms lists and identify all issues that could exhibit an apparently blank screen.

▼ [Check your answers.](#)












A blank screen can occur as a part of the following issues:

- Backlight Issue / No Backlight
- Power But Blank / No Video
- No Power
- Will not Startup





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## Resolving Mac Hardware and Software Issues

Using Service Guides



### Service Guide Example

The integrated troubleshooting procedure used for Thunderbolt issues on late model iMacs is found on the next page.

Review all steps and note that there are numerous decision points that can lead to very different solutions.

This material will be referenced in the following quiz.



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## Resolving Mac Hardware and Software Issues












Using Service Guides

- ▶ Unlikely Causes
- ▶ Symptoms
- ▶ Quick Checks
- ▶ Deep Dive Step 1
- ▶ Deep Dive Step 2
- ▶ Deep Dive Step 3
- ▶ Deep Dive Step 4
- ▶ Deep Dive Step 5
- ▶ Deep Dive Step 6
- ▶ Deep Dive Step 7
- ▶ Deep Dive Step 8





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## Resolving Mac Hardware and Software Issues

### Using Diagnostics



#### Impact of Improved Diagnostics

Current diagnostics from Apple such as AST 2 and Apple Diagnostic are faster, easier to use, and more reliable than previous Apple or third-party diagnostic tools.

As a result, they are used early in the troubleshooting/repair process and can immediately eliminate hardware as the probable cause of an issue.

Apple-authorized service technicians should run AST2 as soon as the issue has been verified with the customer. This saves time for the service technician and is likely to improve the customer experience as well.

Please note that this is a change from past troubleshooting recommendations from Apple. Previously technicians were asked to eliminate software issues first.



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## Resolving Mac Hardware and Software Issues

### Software Resources

#### Software Troubleshooting Resources

These Apple Support articles describe correct methods of investigating and resolving software issues.

- [HT201516: Mac OS X: How to troubleshoot a software issue](#)
- [HT204156: About the screens you see when your Mac starts up](#)
- [HT201255: Startup key combinations for Mac](#)
- [HT201236: Keyboard Short Cuts](#)
- [PH21908: OS X El Capitan: Ways to start up your Mac](#)
- [HT203161: Isolating issues in Mac OS X](#)
- [HT203001: OS X: About System Information and System Profiler](#)

#### Software Techniques Resources

The following techniques can assist you in resolving software issues:

- System setting in Preferences (see help system)
- Force quit any application (see Apple Support article, [PH21895: OS X El Capitan: Log out, sleep, restart, and shut down](#))
- Sleep/Wake (see Apple Support article, [PH21895: OS X El Capitan: Log out, sleep, restart, and shut down](#))
- Safe Boot/Safe Mode (see Apple Support article, [HT201262: Try safe mode if your Mac doesn't finish starting up](#))
- Startup Manager (see Apple Support article, [HT204417: How to choose a startup disk on your Mac](#))
- Restart (see Apple Support article, [PH21895: OS X El Capitan: Log out, sleep, restart, and shut down](#))
- Shut down (see Apple Support article, [PH21895: OS X El Capitan: Log out, sleep, restart, and shut down](#))
- Reset SMC (see Apple Support article, [HT201295: Reset the System Management Controller \(SMC\) on your Mac](#))
- Reset NVRAM/PRAM (see Apple Support article, [HT204063: How to Reset NVRAM on your Mac](#))
- Apple Diagnostics (see Apple Support article, [HT202731: Using Apple Diagnostics](#))
- Use known-good startup volume from Recovery system (see Apple Support article, [HT201314: OS X: About OS X Recovery](#))

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## Resolving Mac Hardware and Software Issues

Software Techniques



### Software Problem Space and Solutions

Software issues can be localized to one file or involve much more. The following material provides suggested remedies for various types of software issues.

### Software Tips

- ▶ Issue limited to one file
- ▶ Issue limited to one application
- ▶ Issue limited to one user account
- ▶ Issue affects all accounts
- ▶ Possible Directory damage
- ▶ Startup issues

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## Resolving Mac Hardware and Software Issues

### Summary

Having completed this course, you should be able to do the following:

- Describe when hardware troubleshooting should occur in relation to perceptual, environmental, and software troubleshooting.
- Identify resources that can identify and resolve hardware issues.
- Describe types of software issues and the corresponding techniques likely to resolve them.
- Given specific troubleshooting scenarios, identify troubleshooting techniques that should be used.

This concludes the Resolving Mac Educational and Environmental Issues course. For other courses in the ACMT 2016 curriculum, see Apple Support article, [HT205332: AppleCare Service Certifications](#), or search for ACMT 2016 in ATLAS.