



# The Mac OS X Support Essentials v10.5 Exam Skills Assessment Guide

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The Mac OS X Support Essentials v10.5 Exam (Prometric exam no. 9L0-402) is a computer-based test offered at Apple Authorized Training Centers and Prometric Testing Centers.

The exam is the only required exam in the Apple Certified Support Professional (ACSP) 10.5 certification track. You must pass this exam to become ACSP 10.5 certified.

The exam is one of two required exams in the Apple Certified Technical Coordinator (ACTC) 10.5 certification track. You must pass this exam and the Mac OS X Server Essentials v10.5 Exam to become ACTC 10.5 certified.

You may take up to two hours to complete the exam, which consists of 90 multiple-choice questions that are based on the knowledge-area objectives listed in this guide.

The score required to pass is 73 percent. Eight demographic questions are presented but are not scored.

To prepare for the exam, read through the objectives in this guide to determine which areas you need to review. The primary reference source for this exam is the book: *Apple Training Series: Mac OS X Support Essentials, Second Edition* (Peachpit 2008).

You will not have access to any resources or references during the exam. Please note that the exam is based on Mac OS X version 10.5.1, which was the most current version available at the time of publication. All references to Mac OS X and Mac OS X v10.5 refer to version 10.5.1.

The number of test questions drawn from each knowledge area is indicated below. Please note that although this guide divides the objectives into ten knowledge areas, questions are presented randomly during the exam. Also note that UNIX commands and processes are shown in `monospace font` in the exam.

## Installation & Configuration

This topic has 12 items, drawn from the following objectives:

- Identify the minimum hardware requirements for Mac OS X v10.5 installation.
- Explain how to determine if a computer meets the minimum hardware requirements for Mac OS X v10.5 installation.

- Identify critical, pre-installation steps, including updating firmware, verifying application compatibility, backing up vital data, documenting critical system settings, and verifying or repairing the target hard disk, and existing permissions.
- Describe how to determine a Macintosh computer's firmware version, and how to discover the most up-to-date version of firmware that is available.
- Identify possible reasons for installing Mac OS X v10.5 on a single- or multiple-partition hard drive.
- Describe the various volume formats available for a Mac OS X v10.5 installation, and their strengths and weaknesses.
- Describe the Mac OS X v10.5 installation process.
- Contrast a Mac OS X v10.5 computer's system version number, build number, and serial number.
- Describe where to find a Mac OS X v10.5 computer's system version number, build number, and serial number.
- Identify utilities that are available while a Macintosh computer is booted from the Mac OS X v10.5 Install DVD.
- Differentiate between the three types of Mac OS X v10.5 installation: "Update Install," "Erase and Install," and "Archive and Install."
- List the packages that are installed during an Easy Install of Mac OS X v10.5.
- Describe how to custom install a subset of the packages available in the Installer.
- Describe how to verify a successful installation of Mac OS X v10.5.
- Describe how to troubleshoot a failed installation of Mac OS X v10.5.
- Describe how to migrate user data to a Mac OS X v10.5 computer.
- Explain how to configure a local administrator user account, network connections, and date and time settings on a Mac OS X v10.5 computer.
- Contrast the four preference categories shown in System Preferences: Personal, Hardware, Internet & Network, and System.
- Describe how the Software Update utility can be configured to make updates available.
- Explain how to identify which updates the Software Update utility has already installed.

## User Accounts

This topic has 11 items, drawn from the following objectives:

- List, compare, and contrast the five types of "user" in Mac OS X v10.5: standard user, administrator (admin) user, guest user, sharing user, and root user.
- Identify at least three attributes of a user account, including user ID, user name, and primary group.
- Identify security risks posed by enabling the guest user account, the root user account, and the sharing user account in Mac OS X v10.5.
- Identify an advantage and a security risk posed by using an administrator user account as the primary user account on a Mac OS X v10.5 computer.
- Describe how to create and configure a local user account in the Accounts pane of System Preferences, so that the user has a name, a short name, a picture, a parental

control setting, administrator access, a password with a hint, several login items, and custom login window appearance and behavior.

- Describe how to reset a user password in the Accounts pane of System Preferences.
- Identify and contrast the usages of the default folders in a user's home folder.
- Identify resources that an administrator user can specify for users in the Parental Controls pane of Accounts preferences.
- Describe fast user switching, how to enable it, and how to switch between users.
- Describe potential errors and security risks posed by enabling fast user switching.
- Explain how to delete a user account, and how to restore a deleted user's data.
- Describe how to troubleshoot issues related to lost user account passwords.
- Compare and contrast how each of the passwords in Mac OS X v10.5 function: login password, Open Firmware password, master, password resource password, and keychain password.
- Identify a tool available in Mac OS X v10.5 to test a password's robustness, and describe how to use that tool.
- Compare and contrast the roles of keychains, keychain items, and keychain first aid.
- Explain how FileVault secures user data on a Mac OS X v10.5 computer.
- Describe how to set and reset a master password and the password for a FileVault-encrypted account.
- Explain how resetting a master password impacts existing FileVault-encrypted accounts.
- Explain how keychain and user passwords, as well as how FileVault and user passwords can become out of sync when a user account password is reset.
- Describe the security options available in the Security pane of System Preferences.
- Describe benefits of the Open Firmware password.
- Describe how to troubleshoot issues related to lost FileVault-encrypted user account passwords, and lost master passwords.

## File Systems

This topic has 14 items, drawn from the following objectives:

- Differentiate between hard disk drives, partitions, and volumes.
- Compare and contrast GUID and APM partition map schemes.
- Compare and contrast the six volume formats supported by Mac OS X v10.5.
- Describe how file system journaling works in Mac OS X v10.5.
- Describe how to format a disk and change the partition map scheme of an external hard disk.
- Differentiate between RAID 0 and RAID 1.
- Identify and describe how to use the tools that are available in Mac OS X v10.5 to gather information about local disk drive format, volume format, partition scheme, bus type, and available disk space.
- Describe the verify and repair features of Disk Utility, and how to use them.
- Compare and contrast the four erase options available in Disk Utility, and describe how to use them.

- Describe how the Secure Empty Trash feature in the Finder works.
- Describe how power failures and force-ejecting a disk can corrupt a volume.
- Describe three ways to unmount a disk.
- Describe how to burn a CD or DVD using the Finder and using Disk Utility.
- Explain what it means to "ignore volume ownership".
- Describe target disk mode and how to boot in target disk mode.
- Describe how to troubleshoot corrupted volume permissions.
- Describe how to migrate user data.
- Explain the function of each of the permissions settings and access control list (ACL) settings on Mac OS X v10.5 files and folders.
- Describe how to identify and change each of the permissions settings and ACL settings on Mac OS X v10.5 files and folders.
- Describe and explain the default permissions settings on the Shared user folder, user home folders, and each folder inside a user's home folder.
- Describe where to store applications and data so they are only accessible to specific users.
- Describe how the file system organization makes it possible for multiple users to safely share local files and folders.
- Explain how to troubleshoot permissions issues.

## File Management

This topic has 9 items, drawn from the following objectives:

- Define these file system terms: path, directory, folder, absolute path, and relative path.
- Compare and contrast absolute and relative paths.
- Explain how to locate a file in a file system given a relative or an absolute path.
- Compare and contrast permissions visible from the Finder, with those displayed in an `ls` listing in Terminal.
- Describe how to list all files, hidden and visible, using Terminal.
- List two ways a file can be hidden from the Finder.
- Describe how to use Terminal to:
  - set file and folder visibility (`SetFile`)
  - modify file permissions and ownership (`chmod`, `chown`)
  - navigate the file system (`cd`, `pwd`)
  - copy files in a directory (`cp`)
  - move and rename files in a directory (`mv`)
  - delete files (`rm`)
  - delete directories (`rmdir`)
  - create directories (`mkdir`)
  - open a file in the graphical user interface (`open`)
- Define a "sticky bit," and describe how to set it on a folder.

- Describe how to execute any command-line utility as the root user.
- List the four default, top-level folders visible in the Finder.
- Compare and contrast the System, Local, User, and Network domains, identifying resources stored in each domain, and the order in which Mac OS X v10.5 searches for resources in the file system.
- Compare and contrast extensions, frameworks, fonts, preferences, startup items, and logs, and identify where each type of file is stored in the file system.
- Describe how to install a font for use by a single user, using Font Book.
- Explain how and why the Finder hides certain folders by default.
- Compare and contrast the file system layout visible from Finder with that visible with Terminal's `ls` command.
- Describe how to troubleshoot issues related to missing resources, such as fonts.
- Describe a resource fork, and its advantages and disadvantages.
- Describe and offer examples of extended attributes in Mac OS X v10.5.
- Compare and contrast Mac OS X v10.5 file system bundles and packages, and their functions.
- Describe how to access the contents of a bundle.
- Describe how Spotlight functions in Mac OS X v10.5.
- Identify potential privacy and security issues related to Spotlight.
- Explain how to configure privacy settings in System Preferences.
- Explain where metadata indexes and plug-ins are stored in the Mac OS x v10.5 file system.
- Describe how to use Finder preferences to hide all extensions in the Finder.
- Describe how the Finder identifies the application to be used to open a file.
- Describe how to change which application the Finder will use to open a file.
- Describe how to mount a disk that is booted in target disk mode.
- List common command-line utilities used to find and review files and their attributes, including `more`, `find`, `cat`, `which`, and `file`.
- Identify common UNIX commands that support resource forks, including `cp` and `mv`.
- Compare and contrast disk images created by Disk Utility with zip archives created by the Finder.
- Describe how to create a compressed archive in the Finder.
- Describe how to create a new blank disk image in Disk Utility, and what options are available.
- Describe how Time Machine functions.
- Identify files omitted by default from Time Machine back ups.
- Describe how to configure Time Machine's back up process, including back up destination, back up frequency, retention schedule, and items excluded from the back up process.
- Describe how to restore individual files, a complete set of user data, and a full system that has been backed up by Time Machine.

- Identify issues with backing up large database files that change frequently, including space limitations.
- Describe the archive format used by Time Machine.
- Describe how to view items inside a Time Machine archive.
- Describe limitations on archive availability due to backup or retention schedules.

## Applications

This topic has 11 items, drawn from the following objectives:

- Define "protected memory".
- Identify the six application environments supported by Mac OS X v10.5.
- Explain how to identify how much RAM or processor time processes and applications are using.
- Describe how to view a list of ALL installed applications.
- Explain how to troubleshoot issues related to corrupt files.
- Describe several methods to force quit an application.
- Describe the Safe Relaunch feature in Mac OS X v10.5.
- Identify where application preferences are stored.
- Identify the preference pane that enables accessibility features for users with sensory limitations, and how to configure its settings.
- Describe the VoiceOver feature in Universal Access.
- Define "64-bit memory addressing".
- Explain how to troubleshoot corrupt application preference issues.
- Explain what Rosetta is and how to identify applications that will open in Rosetta.
- List types of applications not supported by Rosetta, including drivers and other software that directly accesses hardware.
- Explain how to identify the architecture an application supports.
- Describe how to view and kill processes using the `top` utility.
- Describe the format of preference files in Mac OS X v10.5.
- Define a "signed application" and describe its advantages.
- Describe a method of troubleshooting application environment issues.
- Explain how Dashboard widgets work.
- Describe how to install a widget so it can be accessed by one or all users.
- Identify where Dashboard widget preferences are stored.
- Identify security risks posed by installing Dashboard widgets.
- Describe how to remove Dashboard widgets.
- Describe how to troubleshoot issues with Dashboard widgets.
- Describe how Boot Camp functions.
- List minimum system requirements for using Boot Camp.
- Describe how to install a Windows operating system using Boot Camp.
- Describe how to switch between Windows and Mac OS X v10.5 using Boot Camp.

- Describe how to resize a boot partition, format a partition as NTFS, and select the correct partition for a Windows installation.
- Describe three tools for selecting a startup disk on a Mac OS X v10.5 computer with Windows installed, and how to use them, including the firmware system picker, the Macintosh Startup Disk preferences, and the Windows Startup Disk control panel.

## Network Configuration

This topic has 10 items, drawn from the following objectives:

- Explain the purpose and format of Internet Protocol (IP) addresses and subnet masks.
- Describe how Internet Protocol uses a MAC address to send messages between computers over a local area network (LAN).
- Describe how Internet Protocol uses IP address, subnet masks, and routers to send messages between computers over a wide area network (WAN).
- Describe how Domain Name Service (DNS) is used to relate computer host names to IP addresses on a network.
- Define these terms: service, interface, and protocol.
- Differentiate between an IPv6 address, an IPv4 address, and a MAC address.
- Describe how to troubleshoot network connection issues.
- Explain how to identify the Ethernet and Airport MAC address of a Mac OS X v10.5 computer.
- Describe how to monitor network traffic for an interface.
- Explain how to use Network Utility to verify that a DNS entry is configured properly.
- List common issues that can interrupt network services, including disconnected cables, dysfunctional interface port, and DHCP and DNS server issues.
- List the interfaces and interface protocols supported in a default Mac OS X v10.5 installation.
- Describe how to configure a network interface for TCP/IP, DNS, and DHCP for static and dynamic addressing.
- Describe how Mac OS X v10.5 computers acquire and use link-local TCP/IP addresses on a network.
- Describe how to configure:
  - a network interface for WINS
  - proxy settings for a network interface
  - AppleTalk settings for a network interface
  - 802.1x settings for a network interface
  - link speed, duplex, and MTU for a network interface
  - PPP settings for a modem interface
  - PPPoE settings for an Ethernet interface
  - VPN settings for an network interface
  - a virtual interface for VLAN or for bonding
- Describe how AppleTalk works.
- Explain how to troubleshoot network connectivity issues.

- Describe how to identify whether a network interface has received an IP address from a DHCP server, or is using a link-local address.
- Describe how network port priority affects network connectivity.
- Describe how to configure multiple network interfaces and their priority.
- Describe how to identify the port being used for network access.
- Explain how to create and how to change to a new network location.
- Describe how to use Network Utility to verify that a network route exists between two computers.

## Network Service Access

This topic has 8 items, drawn from the following objectives:

- Explain how to discover file services available on a network.
- Describe common issues related to connecting to file sharing services, including issues with file forks, and file servers that don't support AFP 3.1.
- Explain how to access remote login (SSH) services on a remote computer.
- Describe how to map all open ports on a network computer.
- Explain how to troubleshoot network connectivity issues related to incorrect network configuration.
- Describe the relationship between:
  - client software, client configurations, server software, and server configurations, relative to network service access
  - a network service and a network port
- Describe how to access network services such as email, the Internet, and instant messaging.
- List troubleshooting techniques for failure to connect to various network services.
- List the five types of servers accessible via the Finder's Connect to Server command, and describe how to access them, including AFP, NFS, FTP, WebDAV, and SMB.
- Describe how to troubleshoot issues related to accessing services via the Finder's Connect to Server command.
- Explain how to configure and use Screen Sharing in Mac OS X v10.5.
- List the service discover protocols supported by Mac OS X v10.5.
- Explain how Mac OS X v10.5 uses dynamic service discovery protocols to access network services, and how to configure them.
- Describe the impact of disabling dynamic service discovery protocols in Mac OS X v10.5.
- Describe how items inside the /Network are populated and organized.
- Define a "directory," as it is used in the phrase, "directory services".
- List three kinds of resources Mac OS X v10.5 can use from a directory, including users, groups, and machines.
- Compare and contrast local and network user accounts.
- Identify advantages of using directory services to store user account information, including centralization and security.

- Describe three static service discovery protocols used in Mac OS X v10.5, including LDAP, Active Directory, and BSD.
- Explain how to configure a Mac OS X v10.5 computer to connect to an LDAP server or an Active Directory server for authentication and directory services.
- Describe how to troubleshoot directory services issues.
- Compare and contrast:
  - authentication and authorization functions, processes, and outcomes
  - Kerberos, LDAP, and Active Directory authentication methods in Mac OS X v10.5
  - Kerberos and Keychain for managing authentication for services accessed in Mac OS X v10.5
- Describe the Kerberos Distribution Center (KDC) and a Kerberos ticket.
- Describe how to use the Kerberos application to to:
  - change a user password
  - obtain a ticket
  - view a ticket
  - renew a ticket
  - destroy a ticket
  - troubleshoot an authentication issue
- Explain how to troubleshoot an authentication issue using the Console.
- Describe common authentication troubleshooting techniques, including attempting to authenticate as another user, resetting the user password, and verifying directory connectivity.

## Network Service Provision

This topic has 6 items, drawn from the following objectives:

- Explain how to configure a Mac OS X v10.5 computer so that other computers can connect to it over AFP, SMB, and FTP.
- Describe the default permissions structure of the personal file sharing feature in Mac OS X v10.5.
- Describe how to configure personal file sharing to share files with other computers on the network using AFP, SMB, and FTP.
- List the Mac OS X v10.5 computer volumes that will be accessible when sharing over AFP is enabled for a:
  - standard user
  - administrator user
- Describe how to provide Windows file services in Mac OS X v10.5.
- List the Mac OS X v10.5 computer volumes that will be accessible to any user when Windows sharing over SMB is enabled.
- Describe how to provide FTP file services in Mac OS X v10.5.
- List the Mac OS X v10.5 computer volumes that will be accessible to any user when sharing over FTP is enabled.

- Describe how to troubleshoot file service issues using the Finder's Get Info pane, the Sharing preferences, and Network Utility.
- Describe how to enable provision of web services in Mac OS X v10.5.
- Identify the files associated with a Mac OS X v10.5 local user's website, as well as those associated with a Mac OS X v10.5 computer's website.
- Describe the URL used to connect to a Mac OS X v10.5 local user's website and a Mac OS X v10.5 computer's website.
- Identify the files that will be made available to users who connect to a Mac OS X v10.5 local user's website, and those that will be made available to users who connect to a Mac OS X v10.5 computer's website.
- Identify network services that can be enabled from the Sharing preferences, including remote login, Xgrid, and Apple Events.
- Describe the effect of enabling remote login and Apple Events.
- Explain how Xgrid is implemented in Mac OS X v10.5.
- Describe how firewalls work in Mac OS X v10.5.
- Describe how to enable, configure, and disable firewalls in Mac OS X v10.5.
- Describe the advanced firewall setting in Mac OS X v10.5.
- Identify the services enabled when Internet Sharing is enabled in Mac OS X v10.5.
- List the options available for Internet Sharing in Mac OS X v10.5.

## Peripherals

This topic has 3 items, drawn from the following objectives:

- Identify the buses supported by Mac OS X v10.5 to connect to and communicate with peripheral devices.
- Compare and contrast uses of the buses available on a Macintosh computer, and their characteristics, such as speed, power requirements, and connector types, including these buses: Bluetooth, SCSI, ATA, Serial ATA, FireWire, and USB.
- List common USB error messages and issues.
- Describe how to identify connected peripheral devices and their buses using System Profiler.
- Compare and contrast device classes used in Mac OS X v10.5 to categorize peripherals, including: the human input device class, storage device class, and digital camera and scanner device class, and list examples of each device class.
- Define a "device driver".
- List three ways a device driver can be implemented in Mac OS X v10.5, including: kernel extensions, framework plug-ins, and applications.
- Describe the function of iSync, relative to phones.
- Describe how to troubleshoot faulty hardware and corrupt firmware issues that interfere with connecting to a peripheral device.
- Describe the role of CUPS in Mac OS X v10.5.
- Identify the processes involved in printing in Mac OS X v10.5.
- Describe how to add a USB, AppleTalk, Bonjour, or network LPR printer in Mac OS X v10.5.
- Describe the role of PPD files in Mac OS X v10.5.

- Explain how to configure the correct PPD for a specified printer.
- Describe how to share a printer in Mac OS X v10.5.
- Describe how to configure printing in Mac OS X v10.5 to share a printer with a Windows user.
- Explain how to configure a document's page setup and print characteristic features.
- Describe how to manage print jobs and print queues.
- Explain how to save a file in PDF format or as a PostScript file.
- Describe how to configure the name, location and driver options for a printer.
- Describe how to create a desktop printer.
- Describe how to reset the printing system.
- Explain how to troubleshoot printing issues.
- Describe how to view print queues and print documents using Terminal.
- Describe how to configure:
  - a modem to send and receive faxes in Mac OS X v10.5
  - a Mac OS X v10.5 computer so others can send faxes through its modem

## Startup Process

This topic has 6 items, drawn from the following objectives:

- Identify each of the processes that start up in a Mac OS X v10.5 computer at system startup, and the order in which they launch.
- List all visual and audible cues and the stages of the startup sequence when they occur.
- Describe the role of:
  - BootROM and the Power On Self Test (POST)
  - the `launchd` processes during system initialization, and the role of startup scripts in the startup sequence
  - the `login window` process in user environment setup
- Compare and contrast startup items with login items.
- Identify the stages of a shutdown in a Mac OS X v10.5 computer.
- Describe the stages of logout in a Mac OS X v10.5 computer.
- Describe how to start up a Mac OS X v10.5 computer in single-user mode.
- Identify the location of files and scripts essential the the Mac OS X v10.5 startup process.
- Describe how to troubleshoot startup issues related to:
  - `launchd` items
  - startup items
  - login items
- Compare and contrast safe boot and safe mode.
- Identify the items that load when a Mac OS X v10.5 computer starts up in safe mode.

- Describe how to start up a Mac OS X v10.5 computer in safe mode.
- Describe how to troubleshoot startup issues related to non-essential kernel extensions, or startup items.
- Describe how to isolate issues that disappear when a Mac OS X v10.5 computer starts up in safe mode.

## For More Information

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