



The Mac OS X Support Essentials 10.6 Exam Skills Assessment Guide

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The Mac OS X Support Essentials 10.6 Exam (Prometric exam no. 9L0-403) 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) 10.6 certification track. You must pass this exam to become an ACSP 10.6.

The exam is one of two required exams in the Apple Certified Technical Coordinator (ACTC) 10.6 certification track. You must pass this exam and the Mac OS X Server Essentials 10.6 Exam to become an ACTC 10.6.

You may take up to two hours to complete the exam, which consists of 86 multiple-choice questions that are based on the knowledge-area objectives listed in this guide.

The score required to pass is 73 percent. Five 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: *Mac OS X Support Essentials v10.6: A Guide to Supporting and Troubleshooting Mac OS X v10.6* (Peachpit 2009).

You will not have access to any resources or references during the exam. Please note that this exam is based on Mac OS X version 10.6. All references to Mac OS X refer to version 10.6.

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. Finally, when the term “by default” is used in the exam, it means using only the settings or values assigned automatically by the operating system or application, without any custom configuration.

Installation and Configuration

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

- Identify the minimum hardware requirements to install Mac OS X.
- Verify that a computer meets the minimum hardware requirements to install Mac OS X.

- Identify four critical steps that should be taken prior to installing Mac OS X.
- Identify the version of firmware installed on a Mac OS X computer.
- Verify that installed applications are compatible with Mac OS X.
- Identify how to restore a Mac OS X computer's hard disk from a Time Machine backup using the Installer utility.
- Describe how formatting a Mac computer's hard disk into a single partition can simplify the process of preparing to install Mac OS X.
- Identify several advantages of formatting a Mac computer's hard disk into multiple partitions, such as simplifying the process of configuring and using the Mac, simplifying maintenance of multiple operating systems, and simplifying the process of keeping operating system and user data separate.
- From a description of organizational needs, identify an appropriate partition structure and volume format for the hard disk where Mac OS X will be installed.
- Given a Mac booted from the Mac OS X Install DVD, format the computer's hard disk into one or more partitions in a specific volume format.
- Describe how to verify and repair file and folder permissions on a Mac OS X computer's hard disk.
- Describe the Mac OS X installation process, including decisions made in response to Installer interface options.
- Describe how to configure a Mac that is booted from the Mac OS X Install DVD to boot from a specified disk.
- List the utilities available to a user when a Mac is booted from the Mac OS X Install DVD.
- Identify the default sets of packages installed by the Mac OS X Install DVD.
- Describe how to view the Mac OS X installation log on a Mac still booted from the Mac OS X Install DVD after a successful installation.
- Describe how to troubleshoot a failed Mac OS X installation.
- Describe how to migrate user data to a Mac OS X computer from another Mac or from a Time Machine backup.
- Compare and contrast the five categories of preferences in System Preferences: Personal, Hardware, Internet and Network, System, and Other.
- Describe how the Software Update utility makes software updates available to client computers via the utility's preference pane in System Preferences or the Apple menu's Software Update item.
- Describe how to download software updates for installation on multiple computers.
- Describe how to identify software updates that have been installed on a Mac OS X computer.
- Define the terms, "system version number", "build number", and "serial number".
- Describe how to identify the version number, build number, and serial number of an installed copy of Mac OS X.

User Accounts

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

- List five types of user accounts in Mac OS X.

- Compare and contrast the five types of users.
- Identify three attributes of user accounts in Mac OS X.
- Describe security risks related to enabling the Guest account, the root user account, and the Sharing Only user account in Mac OS X.
- Describe a security risk related to using an administrator account as the primary user account in Mac OS X.
- Describe an advantage related to using an administrator account as the primary user account in Mac OS X.
- Describe how to reset a Mac OS X standard or admin user password.
- List the default folders in a user home folder and compare and contrast the functions of each of the folders.
- List the resources that an administrator can limit in the Parental Controls pane of System Preferences.
- Describe three errors that can occur when fast user switching is enabled in Mac OS X, and two users access the same file, application, or peripheral device simultaneously.
- Describe a security risk related to enabling fast user switching, when logged-in users switch to their accounts.
- Compare and contrast how each of these passwords functions in Mac OS X: user login password, firmware password, master password, resource password, keychain password.
- Given a Mac with Mac OS X installed and a password, test the password's robustness.
- Identify a built-in tool that can help create a secure password in Mac OS X.
- Compare and contrast the roles of keychains, keychain items, and Keychain First Aid on a Mac OS X computer.
- Describe how FileVault secures user data on a Mac OS X computer.
- Describe how resetting a master password affects access to existing FileVault-encrypted user accounts on a Mac OS X computer.
- Describe how resetting a user account password can cause the Keychain and user account passwords to get out-of-sync on a Mac OS X computer.
- Describe how resetting a user account password can cause the FileVault and user account passwords to get out-of-sync on a Mac OS X computer.
- Describe how the firmware password feature prevents users from changing passwords for user accounts other than their own on a Mac OS X computer.

Command Line and Automation

This topic has 7 items, drawn from the following objectives:

- State five reasons for using the command-line interface to manage a Mac OS X computer.
- Compare and contrast four methods for accessing the command line on a Mac OS X computer.
- Describe the components that make up the prompt in Mac OS X's default shell.

- Identify three components of a shell command.
- Describe the function of the `sudo` command as a tool for privilege escalation.
- Define these terms associated with a file system: path, directory, folder, absolute path, relative path.
- Compare and contrast absolute and relative paths to files.
- List two ways a file or folder can be hidden in the Finder.
- List five common command-line utilities used to find and review files and their attributes in Mac OS X.
- Describe how to execute any command-line utility as the root user.
- Describe how Automator can be used to automate repetitive tasks by grouping actions together to create workflows.
- Describe how Applescript can be used to automate repetitive tasks by using the natural language syntax and application dictionaries.
- Describe how the Services menu enables access to features of one application from within another application.
- Compare and contrast the features and functions of Mac OS X's built-in automation technologies including Automator, Applescript, the Services menu, and the command-line shell.

File Systems

This topic has 15 items, drawn from the following objectives:

- Differentiate between hard disks, volumes, and partitions.
- Compare and contrast GUID and APM partition map schemes.
- Compare and contrast the six volume formats supported by Mac OS X: Mac OS Extended; Mac OS Extended, Journaled; Mac OS Extended Journaled, Case-Sensitive; UFS; FAT32; NTFS.
- Describe how file system journaling works in Mac OS X.
- Compare and contrast the RAID schemes supported by the Disk Utility application included with Mac OS X.
- Describe the Verify and Repair features of Disk Utility.
- Compare and contrast the four erase options available in Disk Utility, including Erase, Zero All Data, 7-Pass, and 35-Pass erases.
- Describe the function of the Secure Empty Trash feature in the Finder.
- Describe how power failures and force-ejecting a disk can corrupt a volume.
- Identify three ways to unmount a disk from the Finder in Mac OS X.
- Describe the steps required to burn a CD or DVD using the Finder in Mac OS X, and using Disk Utility.
- Describe target disk mode.
- Describe how to mount the hard disk of a Mac OS X computer in target disk mode.
- Describe the function of each of the permissions and ACLs that Mac OS X files and folders can have.
- Describe how to identify the owner and group for any file in a Mac OS X file system.

- State the owner and group permissions for user home folders in Mac OS X.
- Describe why the root of Mac OS X user home folders are accessible to other users.
- Compare and contrast permissions visible in the Finder with permissions displayed when the `ls` command is run in Terminal.
- Describe which permissions on the Shared folder in Mac OS X allow it to act as a shared storage location for local user accounts.
- Describe what it means to "ignore volume ownership" in Mac OS X.
- Identify one risk of ignoring volume ownership in Mac OS X.
- Describe when it is useful to ignore volume ownership in Mac OS X.
- Describe how the organization of the Mac OS X file system allows multiple users to safely share local files and folders.
- Define the term "sticky bit" as it applies to the Mac OS X file system.

Data Management and Backup

This topic has 7 items, drawn from the following objectives:

- List the four default top-level folders visible in the Mac OS X Finder.
- Describe a resource fork, including its advantages and disadvantages.
- Compare and contrast the System, Local, User, and /Network, including what resources are stored in each, and the order in which Mac OS X searches for resources in the file system.
- Describe Mac OS X extended attributes, and offer examples of information the system records as extended attributes.
- Compare and contrast these file types and identify where they are located in the Mac OS X file system: extensions, frameworks, fonts, preferences, startup items, and logs.
- Compare and contrast file system packages and bundles, and their purposes.
- Describe how Spotlight metadata is used in Mac OS X.
- Describe how and why the Finder hides certain folders by default.
- Compare and contrast the file system layout that's visible in the Finder with the layout displayed when the `ls` command is run in Terminal.
- Identify potential privacy and security issues with Spotlight in Mac OS X.
- Describe where metadata indexes and plug-ins are stored in the Mac OS X file system.
- Describe how the Finder in Mac OS X identifies which application should be used to open a file.
- Compare and contrast disk images created with Disk Utility and zip archives created by the Finder in Mac OS X.
- Describe the options available when creating a new blank image using Disk Utility in Mac OS X.
- Describe how Time Machine functions.
- Identify the files that are omitted by default from Time Machine backups.
- Describe issues with backing up large database files that are frequently updated.
- Describe the archive format used by Time Machine.

- Describe why a specific archived file may not be available due to backup or retention schedule parameters.

Applications and Boot Camp

This topic has 5 items, drawn from the following objectives:

- Define protected memory.
- Describe the six application environments supported by Mac OS X.
- Describe Rosetta.
- Define 64-bit memory addressing.
- Describe how to identify an application that will be launched in Rosetta.
- Describe how to identify the architecture (PowerPC or Intel) that an application supports.
- List examples of types of PowerPC applications not supported by Rosetta.
- Identify three ways to force quit an application.
- Describe where application preferences are stored in Mac OS X.
- Describe the format of preference files in Mac OS X.
- Identify the preference pane that enables accessibility features in the Finder and other applications.
- Describe Universal Access's VoiceOver feature in Mac OS X.
- Describe the function of Universal Access in Mac OS X.
- Identify where Universal Access settings are configured in Mac OS X.
- Describe advantages of signed applications in Mac OS X.
- Describe how to troubleshoot application environment issues in Mac OS X.
- Describe how Dashboard widgets work in Mac OS X.
- Describe the security implications of installing Dashboard widgets.
- Describe how Boot Camp works in Mac OS X.
- Identify the steps that Boot Camp Assistant performs when preparing a Mac OS X computer for the installation of a Windows operating system.
- Describe how to install a Windows operating system using Boot Camp in Mac OS X.
- Describe how to switch from Mac OS X to Windows and vice versa using BootCamp.
- List the system requirements for using Boot Camp in Mac OS X.
- Describe three methods of setting the startup disk on a Mac OS X computer with Windows Vista installed.

Network Configuration

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

- Identify where in the GUI interface you configure a Mac OS X computer's network settings.
- Describe the purpose and format of Internet Protocol (IP) addresses and subnet masks.

- Calculate network IP address ranges based on a Mac OS X computer's Network preferences.
- Describe how the IP uses a MAC address to send messages between computers over a local area network (LAN).
- Describe how the IP transfers messages between computers over a wide area network (WAN), including how IP addresses, subnet masks, and routers work.
- Describe how domain name service (DNS) is used to associate computer host names with IP addresses on a network.
- Describe how to use Network Utility to verify that a DNS entry is correctly configured.
- Define the terms service, interface, and protocol.
- Differentiate between an IPv4 address, and IPv6 address, and a MAC address.
- List the interfaces and interface protocols supported in a default installation of Mac OS X.
- Describe how Mac OS X computers acquire and use link-local TCP/IP addresses on a network.
- 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 to monitor the incoming and outgoing traffic on a network interface for network connectivity issues.
- List four common issues that can interrupt network services on a Mac OS X computer.
- Describe how network port priority affects network connectivity.
- Describe how to configure the network interface priority.
- Describe the steps required to configure a VPN server, including VPN settings such as PPTP, L2TP, and 802.1x, and the implementation specifications necessary to determine the appropriate configuration.
- Describe how to use Network Utility to troubleshoot network configuration issues.

Network Services

This topic has 13 items, drawn from the following objectives:

- Describe the relationship between client software, client configurations, server software, and server configurations relative to network service access.
- Describe the relationship between a network service and a network port
- List three troubleshooting techniques for issues involving failure to connect to various network services.
- List the five types of file servers accessible via the Connect to Server command in Mac OS X.
- List service discovery protocols supported by Mac OS X.
- Describe how Mac OS X uses dynamic service discovery protocols to access network services.
- Describe how items inside /Network in Mac OS X are populated and organized.
- Describe common issues when connecting to file sharing services using Mac OS X.
- Define a directory as it relates to directory services.

- List three types of resources Mac OS X can use from a directory.
- Compare and contrast local and network user accounts.
- Identify two advantages of using directory services to store user account information.
- Describe three service discovery protocols used in Mac OS X.
- Describe how to troubleshoot and resolve directory services issues using log files.
- Define authentication and authorization.
- Compare and contrast Kerberos, LDAP, and Active Directory authentication methods in Mac OS X.
- Compare and contrast the authentication and authorization processes and outcomes.
- Describe the Kerberos Distribution Center and a Kerberos ticket.
- Compare and contrast Kerberos and Keychain for managing authentication for services accessed in Mac OS X.
- Describe how to obtain, view, renew, and destroy Kerberos tickets.
- Describe clock skew as it relates to Kerberos tickets.
- Describe three common authentication troubleshooting techniques.
- Describe how to configure a Mac OS X computer's file services so that other computers can connect to it over AFP, SMB, and FTP.
- Describe the default File Sharing permissions in Mac OS X.
- List the volumes that will be accessible to either an administrator user or a non-administrator user who connect to a Mac OS X computer that has File Sharing over AFP or Windows Sharing over SMB enabled.
- List the volumes that will be accessible to any user who connects via FTP to a Mac OS X computer that has FTP service enabled.
- Describe new password issues related to Windows Sharing in Mac OS X.
- Describe how to provide web services in Mac OS X.
- Identify the files associated with a local user's website, and those associated with a computer's website.
- Identify three network services that Mac OS X can provide from the Sharing preferences.
- Describe how to configure Mac OS X to connect to an Active Directory server for authentication and directory services.
- Describe the effects of enabling remote login or remote Apple Events in Mac OS X.
- Describe how Xgrid is implemented in Mac OS X.
- Describe how firewalls work in Mac OS X.
- Describe the advanced firewall settings in Mac OS X.
- Identify the services that are turned on when Internet Sharing is enabled in Mac OS X.
- List the options available for Internet Sharing in Mac OS X.

Peripherals and Printing

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

- Identify the buses supported by Mac OS X to connect to and communicate with peripheral devices.
- Compare and contrast characteristics and uses of the buses available in a Mac computer, such as speed, power requirements, and connector types, including these buses: Bluetooth, SCSI, ATA, Serial ATA, FireWire, USB, PC Card bus.
- List common USB issues and error messages as documented in Apple's Knowledge Base article, "USB: Troubleshooting Error Messages" <<http://docs.info.apple.com/article.html?artnum=43023>>
- Identify the tool to use to identify connected peripherals and the buses they are using.
- Compare and contrast device classes used in Mac OS X to categorize peripherals, including the human input device class, storage device class, and digital camera and scanner device class.
- List examples of peripheral devices that are members of each device class.
- Define the term "device driver" as it applies to Mac OS X.
- List three ways a device driver can be implemented in Mac OS X.
- Describe the function of iSync, relative to phones.
- Describe the role of CUPS in Mac OS X printing.
- Given a process listing, identify the processes involved in printing in Mac OS X.
- Describe the role of PPD files in Mac OS X printing.
- Describe how to configure printing in Mac OS X to allow Windows users to print to a printer shared from a Mac OS X computer.
- Describe how to manage print queues and print jobs in Mac OS X, including holding, deleting, and resuming print jobs.
- Describe how to reset the printing system in Mac OS X.

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 computer at system startup, and the order in which they launch.
- Map visual and audible cues to the stages of the Mac OS X startup sequence.
- Describe the role of BootROM and the Power On Self Test (POST) in Mac OS X startup.
- Describe the role of the `launchd` process during Mac OS X system initialization.
- Describe the role of the `loginwindow` process in user environment configuration during startup and login.
- Describe the role of startup scripts in the startup sequence of a Mac OS X computer.
- Compare and contrast startup items with login items in Mac OS X.
- Identify the stages of shutdown in Mac OS X.
- Identify the stages of logout in Mac OS X.
- Describe how to boot a Mac OS X computer into single-user mode.
- Identify the location of files and scripts essential to the Mac OS X startup process.

- Compare and contrast Safe Boot and Safe Mode.
- Identify the items that load when starting a computer in Safe Mode, in the order in which they load.
- Identify the keyboard combination to start a computer in Safe Mode.

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