

ACSP
Apple Certified
Support Professional

Mac OS X Support Essentials v10.6 (Snow 101)



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Apple Certified Support Professional v10.6

Ideal for help desk personnel, service technicians, technical coordinators and other who support Mac OS X customers over the phone or who perform Mac OS X troubleshooting and support in schools and businesses.

This certification verifies an understanding of Mac OS X core functionality and an ability to configure key services, perform basic troubleshooting and assist end users with essential Mac OS X capabilities.



Disclaimer

This notebook is intended for personal use only, it is a collection of questions and answers regarding the subjects concerning the ACSP certification.

It has never been authorized by Apple or Editors of the Apple Training Series books and is not intended to substitute any official Apple resource suggested to obtain the ACSP certification.

The following content is an unofficial (my personal) guide to acquire knowledge to pass the certification exam Snow 101, it may be inaccurate and contain mistakes, it is just the result of my studies and was intended to help myself in memorizing the main concepts learned reading the official books part of the Apple Training Series.

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Installation and Initial Setup

What Utilities are available when booted from the Mac OS X Install DVD?

1. Disk Utilities
2. Reset Password
3. Network Utilities
4. Firmware Password Utility
5. Startup Disk
6. Terminal
7. System Profiler
8. Restore System from Backup

What are the minimum hardware requirement for installing Mac OS X v10.6?

1. 1 GB of RAM
2. 5 GB of Hard Drive
3. Intel Processor
4. DVD drive (MacBook Air needs an external DVD drive or another computer with a DVD device)
5. Built-in display or external display connected to an Apple supplied video card
6. Internet and Mobile Me for some features only

What four preparation steps must you take before installing Mac OS X?

1. Check for Firmware updates
2. Check for Applications compatibility
3. Backup data (files & folders)
4. Backup document critical settings

What are the advantages and disadvantages of using a single-partition drive with Mac OS X? How about a multiple-partition drive?

	single-partition drive	multiple-partition drive
Advantages	<ul style="list-style-type: none"> • as most drives are single-partitioned by default no changes are needed and there's no risk of data loss due to partitioning • most efficient use of drive space 	<ul style="list-style-type: none"> • possibility to have multiple Operating Systems installed • possibility to create an utility system to repair the primary system • safer data stored on a different partition than the Operating System that permit to replace the O.S. without compromising data
Disadvantages	<ul style="list-style-type: none"> • reduced Administration Flexibility: many tasks require multiple volumes then Administrators are forced to use external drives • Administration is more difficult because System and Users data are in the same partition 	<ul style="list-style-type: none"> • the drive needs to be repartitioned • some partition configuration need to erase all data on the drive • Boot Camp Assistant do not supports multiple partitions • if not properly partitioned it can be really space inefficient

Which packages are installed by default when installing Mac OS X?

1. Essential System software
2. Printer drivers for currently used printers
3. Additional fonts
4. Language translations
5. X11
6. Rosetta (optional)
7. QuickTime 7 (optional): only if in the previous system was installed QuickTime 7 Pro

Where can you locate the System Version Number, Build Number, Serial Number? What is the significance of these numbers?

1. It's possible to locate them in About This Mac menu or in the Login Screen
2. The System Version Number identify the currently running Mac OS version
3. The Build Number is a more specific identifier of the running Mac OS version intended for developers. Different builds of the same OS version may identify some model specific version that may not run properly in different models of Mac
4. the Serial Number is a unique hardware identifier of the Mac in use

How do the four System Preferences categories differ?

1. Personal: they effect the current settings only
2. Hardware: they effect every users, require administrative access
3. Internet and Wireless: effect personal and system wide settings; Network and Sharing preferences require administrative access
4. System: they have system wide effect, require administrative access
5. Others (optional): includes third-party preference panes, it's up to the developer to request administrative access or not

How do you ensure that you have the latest Apple Software?

1. Running the Software Update application
 2. Configuring Automatic Software Updates from the System Preferences
- Both solutions require internet access

User Accounts

What are the five types of user accounts in Mac OS X? How are they different?

1. Standard user:
 - default user kind
 - member of staff group
 - can change only his home and preferences
 - can read Public and Sites folders of other users.
2. Administrative user:
 - member of admin group
 - do not have access to protected filesystems, but can pass the restrictions
3. Guest user:
 - by default is sharing only
 - has no password
 - it's like a standard user
 - his home content is wiped out at every logout
4. Sharing user:
 - has no home folder
 - is not enabled to login
 - can access the network Shared folders only
5. root user:
 - has no password by default
 - cannot login by default
 - has unlimited access to everything

What are account attributes

They are pieces of information that define the user account:

1. Full name
2. MobileMe name
3. Account name (short name)
4. User ID: numeric
5. UUID (GUID - Universally Unique [Generated] User ID): numeric
6. Group ID: numeric, define a group dedicated to the specific user
7. Login shell
8. Home folder

How can you limit a user account?

You can limit a user account through the Parental Control preferences:

1. Simplified Finder
2. Limit use of certain applications or widgets
3. Restrict access to Dock, Optical Drives, Printers, and password changes
4. Exclude profanities from the Dictionary application
5. Limit Safari use to certain websites and activation of web filtering
6. Limit iChat and Mail to certain address
7. Set usage limits
8. Maintain iChat, Mail and Safari logs

What are some security risks associated with each type of user account?

1. Standard user:
 - quite secure as it can't change anything might affect the system software
2. Administrative account:
 - it's the first kind of user generated during the installation process and has the capacity to do everything
 - if there are multiple administrative accounts they can modify each other settings and files
 - it could execute malicious software
 - it could make active the root user password and login
3. Guest account:
 - could execute malicious software
 - could fill up the hard drive through the Drop Box folders
4. Sharing user:
 - could fill up the hard drive through the shared Drop Box folders
5. root user:
 - has unlimited access to everything: could damage the entire filesystem

What default folders make up a user's home folder

1. Desktop
2. Download
3. Library
4. Documents
5. Music
6. Movies
7. Pictures
8. Public (including the Drop Box folder)
9. Sites

What three types of resources contention can occur when fast user switching is enabled?

1. Document contention
2. Application contention
3. Peripheral contention

What security risk can occur when fast user switching is enabled?

1. External storage devices attached are visible to any logged-in user
2. Mounted disk images are readable(read-only) by any logged-in user

What does a keychain do?

It's a special encrypted file to store passwords, notes, and certificates. By default it shares the same password as the user account it's associated to.

How does FileVault secure a user's data?

It puts the home folder files and folders in an encrypted disk image that mounts and dismounts at the user's login and logout. All its content remains visible to the FileVault user only.

How does resetting the Master Password affect existing FileVault user accounts?

1. If the current Master Password is known, resetting it doesn't affect the capability to reset the FileVault account passwords
2. If you reset the Master Password because the current one has been lost then it's necessary to login to each fileVault account to disable and then reenable again the FileVault encryption. If the FileVault password is lost too then the FileVault volume content is lost forever.

How does resetting a user's password as an administrative user affect that user's keychain?

The Keychain Password is not changed with the user's account password change, then at the next login the user will be asked with the option to change the keychain password, to create a new keychain file or to continue ignoring the issue.

How does the Firmware Password Utility help prevent the users from making unauthorized password changes?

It stores a password into the firmware of the Mac separate from the operating System, preventing the users to deliberately startup the Mac with the Mac OS X Install DVD and stopping any password or drive reset.

Command Line and Automation

What are six reasons for using the command line environment?

1. Additional options not available in the graphical environment
2. Bypass Finder limitations: through the CLI you can manipulate and access any file and folder
3. Invisible remote access through the SSH service
4. Access and execution as root user
5. Environment easily scriptable through many languages: bash, Tcl, Python, Perl and others
6. Administration of multiple Macs simultaneously through ARD and CLI interaction

What four methods can be used to access the command line environment?

1. Terminal application
2. Simple User Mode session initialized pressing the Command-S keyboard combination at the system startup
3. Entering '>console' in the username field in the login screen
4. starting a remote session through the SSH service

What three items are in the default command-line user prompt?

1. Computer Host name
2. Current Location (directory name)
3. Current User's credential in use (username)

What are the three main components of a typical command?

1. Command Name
2. Command Options (optional parameters)
3. Command Arguments (optional, usually a file or folder name)

What do the following terms describe: folder, directory, path, absolute path and relative path?

1. Folder and Directory are interchangeable terms to describe containers of files in the filesystem
2. The Path define directions to a specific element in the filesystem
3. Absolute Path are full directions
4. Relative Path are partial directions

What is the difference between absolute and relative paths?

1. Absolute Paths define the directions to a specific element in the filesystem starting from the root directory
2. Relative Paths define directions to a specific element in the filesystem starting from the current working location

Which command is used to list elements, items, in a folder?

ls (optionally with parameters and arguments)

Which two commands can be used to read text files?

1. cat and less to read text files
2. vim, nano, pico, emacs to edit text files

What is the sudo command used for?

sudo command (Super User DO, Substitute User DO) is used to execute commands in behalf of the superuser (root) or other identity if specified with the '-u <username>' option.

What are the two primary automation technologies for the graphical interface?**How do they differ?**

1. Apple Script: English like scripting language, script graphical applications
2. Automator: based on Apple Script, can create workflows based on predefined actions

What are the three minimal steps required for creating a command-line script?

1. Create an empty plain text file, and fill it with commands
2. Make the first line '#!/bin/bash'
3. Change file permissions to allow execution

File Systems

What is the difference between disk drives, partitions and volumes?

1. Drives are the physical storage, actual storage hardware
2. Partitions are the logical division of a disk drive used to define the storage space
3. Volumes are contained inside partitions and are used to define how single files and folders are saved to the storage

What are the two primary partitions schemes for Mac formatted drives?

What are their differences?

1. GUID, used by all intel-based Macs
2. APM, Apple Partition Map used by PowerPC-based Macs

What are six volume formats supported by Mac OS X? How are they different?

1. HFS+, JHFS+, JHFS+ Case-Sensitive are supported as startup volumes
2. HFS, UFS, FAT32 are supported as read/write volumes
3. NTFS, UDF, ISO9660 are supported as read-only volumes

How does File System Journaling work?

1. It preserves volume integrity but not file integrity
2. It records what file operations are executed at any time.
3. In case of crash or power loss the journaled operations are 'replayed' to complete at the next reboot of the system. This avoid volume corruption and save time avoiding the need to run deep and slow file system checks.

What are four erase options available in Disk Utility?

What are the differences between them?

1. Don't erase: overwrite the volume Directory structure only
2. Zero Data erase: overwrite all the volume data with zeros
3. 7-pass erase: overwrite all the volume 7 times, each time with a different random pattern of data
4. 35-pass erase: overwrite all the volume 35 times, each time with a different random pattern of data

How does the Finder's Secure Empty Trash feature work?

It performs a 7-pass erase on the content of the Trash folder

What three methods can be used to eject a volume or drive from the Finder?

1. Select the volume to eject then use the menubar option File->Eject
2. Keep pressed the Eject button in the keyboard
3. Select the volume from the Finder's sidebar and click the little eject button next to the volume's name you want to eject

What is the potential side effect of improperly unmounting or ejecting a drive or volume?

1. It may cause data corruption as any opened file may not have all the updated data written yet.
2. It also may lead to volume corruption, because of this after any improper eject or system crash the system forces a volume check (except for journaled volumes)

What differentiate RAID 0 set from RAID 1 set?

RAID 0	RAID 1
<ul style="list-style-type: none"> • stripping data among disks • add performance in read/write • zero increase on reliability • increase of risks for data loss as augment the points of failure for any disk you attach to the set • space efficient 	<ul style="list-style-type: none"> • mirroring data among disks • read performance increase • increased reliability because provides redundancy • space-inefficient as provide the same amount of space as the one provided by the smallest drive of the set

How do you use the Finder's Burn Folder feature?

There are three ways:

1. Select files and folders you want to burn the use the menubar option File->'Burn # items to Disc..' and insert the blank disc when requested
2. Use the menubar option File->New Burn Folder to create an empty Burn Folder, then drag and drop the items you want to burn into the Burn Folder and click the Burn button*
3. Insert a blank CD or DVD and choose to open it with Finder, then drag and drop the items you want to burn directly into the disc so you will click the Burn button*

How do you use Disk Utility to burn an optical disc?

From the menubar click the Burn button* and you will be given the option to choose a Disk Image to burn. After the selection of the Disk Image you have to insert the proper empty disc.

*Burn button



Why is the root, or beginning, level of a user's home folder visible to other users?

This is to allow other users to navigate to the Public and Sites shared folders

How are permissions on the Shared folder set to allow for local user sharing?

1. Every user can create, read and write files and folders
2. Only the user that own an item can delete it, this is guaranteed with the use of the sticky bit

How does the default organization of the filesystem allow users to safely share local files and folders?

1. Inside the Public folder of each user's home folder there's a Drop Box folder that allow every user to drop any file but doesn't allow anybody to read its content
2. The Sites folder located in the user's home folder is meant to be readable by everyone
3. All other subfolders of the user's home folder are not accessible by other users
4. The /Users/Shared folder is also meant for file sharing among users

What does it mean when you choose the option to 'ignore volume ownership' in the Finder? What are the security ramifications of ignoring volume ownership?

1. You can ignore the ownership in any non-system volume
2. There is a potential vulnerability as it grant access to the full content of the volume to every user also if it's not the one that mounted the volume

How do you identify the ownership and permissions of a file or folder in the Finder? In the Terminal?

1. In the Finder you can identify them by the Get Info window or the Inspector
2. In the Terminal by the command `ls -le`

How do permissions in the Finder appear different than permissions in Terminal?

1. In the Finder the view of permissions is limited to only-read, only-write, read and write, no access
2. In Terminal you can choose and view all the possible permissions allowed by ACLs

What is the Sticky Bit?

It's a special permission option (flag) in the file permissions that allow the owner exclusively to move or delete the file or rename it. The file work in 'append only' mode.

How is Disk Utility's Verify and Repair feature used?

1. It verify and repair the Directory Structure of a filesystem as it contains all the information used to locate the files and folders on the volume
2. In Disk Utility is present another feature, Verify and Repair Disk Permissions, it is used to fix possible access issues on the filesystem due to an incorrect alteration of the permissions of Apple Software. It works only on issues related to Apple Software.

What is Target Disk mode and how is it engaged?

1. It's a specific hardware feature that allow to share the hard drive of the Mac to another PC or Mac through the Firewire connection
2. It's engaged through the Startup Disk preferences or holding the 'T' key during the boot, when you turn on the Mac.

Data Management and Backup

What are the four default top level folders visible in the Finder?

1. System
2. Users
3. Applications
4. Library (local)
5. Developer (optional)

What are six common system resources? What purpose does each resource serve?

Where are they located in the file hierarchy?

1. Extensions: Kernel Extensions, found in System and Local Library folders
2. Application Support folders: contain files to support applications, found in User and Local Library folders
3. Fonts: describe typefaces for screen displays and printers, found in all Library folders
4. Frameworks: repositories of shared code the Operative System, found in every Library folders
5. Keychains: encrypted databases to store secured informations, found in every Library folders
6. Launch Daemons and Launch Agents: used to define processes that start automatically, found in Local and System Library folders, Launch Agents are fund in users' Libraries too
 - Launch Daemons run in background without need of any user logged in
 - Launch Agents run in background after a user logs in
7. Logs: archives for progress and errors messages, found in every Local Library folder
8. Preference Panes: provided interfaces for system preferences, found in any Library folder
9. Preferences: used to store system and application configurations, found in Local and User Library folders
10. Startup Items: precursors of Launch Daemons and Launch Agents, found only in Local and System Library folders

What are the four system resource domains? What purpose does each domain serve?

1. User: Every user has its own resources such Library and Application folders
2. Local: Available to all local users
3. Network: to be enabled by Network Sharing, give access to network resources
4. System: encompasses all the resources to provide Core System functionalities

Why does the Finder hide certain folders at the root of the system volume?

1. Keeps a tidier work environment
2. Prevent average users to damage the core system

What two methods can be used to hide items from the finder?

1. Rename the files and folders adding a leading period to the name
2. Setting the hidden file flag of and item through the `chflag` command in the CLI

What are resource forks and why have they fallen out of favor?

1. They contain metadata information regarding an item they represent with the data fork, they make appear complex items as a single icon (element)
2. They have fallen out of favor because they are not supported by default in non Apple volumes

What are some of the common file flags and extended attributes used by Mac OS X?

1. Item's color labels
2. Hide extension option
3. Stationary pad option
4. Locked item option
5. Spotlight comments

What does Mac OS X use bundles or packages for?

They are used to combine complex items into a single folder. As they appear as single items in the Finder they can be filled with resources need by the Application preventing users to mess with them

How does the system identify which application to open when a user double-clicks on a file?

1. Files are identified by file attributes or filename extension
2. Launch Service (launchd) maintains a database of known applications and which file types they can open

What three common UNIX commands supports Mac filesystems metadata?

`mv`, `cp` and `rm`

What are the differences between ZIP archives and Disk Images?

ZIP	DISK IMAGE
<ul style="list-style-type: none"> • generated through the Finder from a specific folder or group of files • multi-platform compatible 	<ul style="list-style-type: none"> • generated by Disk Utility • can contain entire volumes • by default compatible with Mac systems only • flexible: many compression and security features

How does the Spotlight Search service use metadata?

It creates its database based mainly on metadata information

When does Spotlight store its metadata index database? How about the Spotlight plugins?

1. The Spotlight indexes are stored in the root directory of every volume in a folder called '.Spotlight-V100'
2. Mail application maintain its own Spotlight index in the use home folder Library: ~/Library/Mail/Envelope Index
3. FileVault volumes store the index in their root directory
4. Spotlight plugins can be located in any Library folder named Spotlight

What backup destinations does Time Machine support?

1. Any Local non-system volumes in HFS+ format
2. AFP network shared volumes, the backup will be stored in Disk Image files

How does Time Machine maintain a backup history of the filesystem?

1. Creates an initial full backup of the filesystem or selected directories
2. Creates a backup every hour
3. Keeps track of the changes since the last backup, and only copies the changes
4. Uses hard-links to unchanged files to reproduce a simulation of a full filesystem

What are some privacy and security concerns with the Spotlight service

As it's possible to ignore the credentials on any non-system volume Spotlight may give access to every user to any resource stored in the attached volume ignoring configured permissions

What type of files are omitted from Time Machine backups?

1. Temporary files
2. Every kind of cache
3. Spotlight indexes
4. Every file and application declared non backupable from the developer
5. Log files
6. Items in Trash
7. Files and Folders declared exempt in Time Machine preferences

Why is Time Machine inefficient at backing-up large databases?

Databases are seen as a unique file, the minor changes to the databases induce Time Machine to backup the entire file that usually reach large dimensions so will rapidly saturate the backup volume

Why might a previously backed-up item be no longer available in time Machine?

Time Machine keeps as many copies of files as there's space on the backup volume. When the volume is full Time Machine start deleting the copies of files no longer available on the system volume making room for updated backups of the current system

Applications and Boot Camp

What is Protected Memory? What is 64-bit memory addressing?

1. Protected Memory is the technique that allow the system to segregate each process in a dedicated area of the memory denying to other precesses without the proper credentials and authorizations the access to that portion of memory
2. 64-bit memory addressing permit to 64-bit enabled systems on 64 bit processors to address memory locations over 4GB of space

What are the five application environments supported by Mac OS X?

What is each one used for?

1. Cocoa: native Mac OS X environment
2. Carbon: native Mac OS 9 environment still supported by Mac OS X
3. Java: architecture independent environment developed by Sun Microsystem
4. BSD: CLI environment of Mac OS X
5. X11: graphical environment for UNIX applications

What are advantages of code signing?

It permit the system to understand when an application code is modified during its execution, verify software and resource integrity. In this way it's possible to terminate the affected precess avoiding malicious executions or system crash due to bugs.

What is Rosetta? What type of items are not supported by Rosetta?

Rosetta is an optional software that permit the translation of non Universal application designed for PowerPC-based Mac OS X systems, to run in Intel-based Mac OS X systems.

Rosetta do not support:

1. Applications written for Classic Environment
2. Java applications written with JNI libraries
3. Java in applications that Rosetta can translate (like applets in browsers)
4. Applications written for OS prior o Mac OS X
5. Screen Savers written for PowerPC
6. Software that inserts PowerPC Preference Panes in system Preferences
7. Applications requiring PowerPC G5 processors
8. Applications that depose PowerPC Kernel Extensions
9. Plugins written for PowerPC architecture if the software they tie in is run as Intel Native

How can you identify the type of a particular application?

1. Accessing the Get Info pane
2. By the use of the Inspector window
3. By the use of the System Profiler, Application section

What System Preference enables the accessibility features in Mac OS X?**What Accessibility features are available in Mac OS X?****Finally, Where is the preference file for these features located?**

1. Universal Access preference pane provides configuration to accessibility features
2. The features include options to help users who have difficulties in:
 - hearing
 - seeing
 - using the keyboard
 - using mouse and trackpads
3. The preference files for Universal Access are stored in users' Library/Preferences/com.apple.universalaccess.plist

How can you identify which application are installed on your Mac?

Through the System Profiler, Applications section

What steps should you use when troubleshooting application issues?

1. Restart the application (forcibly quit it if necessary)
2. Try to open a different file
3. Try to open the same file with a different application
4. Try to run the application with another user account
5. Check diagnostic reports and logs
6. Delete the cache files
7. Replace the preference files
8. Replace the resources files

What three ways can you forcibly quit an application from the graphical interface?

1. Force Quit dialog (Option-Command-Esc shortcut) from Apple menu
2. Dock (Control-RightClick on the application's icon)
3. Activity Monitor

What does the Reporting Feature do?

It monitors the applications' activities. If an application crash or hang it collect the System Status and Application information and give the opportunity to send to Apple the crash or hang report. I also saves a copy of the report to consult it the future with the Console Application.

Where are application preferences stored?**What format is often used for preference files?**

1. Application preferences are stored in any Library folder, most are placed in user's Library folder
2. They can be saved in XML format or Binary format

What process or processes are responsible for Dashboard widgets?

1. Dock
2. DashboardClient
(both 32 bit and 64 bit instances if supported, max 2 instances to manage all widgets)

How does Boot Camp work?

1. It allows to install Windows XP SP2 or Vista or Windows 7 on a Mac
2. Boot Camp Assistant prepare the Mac's drive for Windows installation
3. After Windows installation Boot Camp Drivers permit the use of Mac's specific hardware to run under Windows environment

What are the minimum system requirement for Boot Camp

1. Intel-based Mac
2. Latest update of the firmware
3. Latest update of Mac OS X v10.5 or later
4. Directly attached input devices (keyboard, mouse,DVD/CD reader)
5. Mac OS X installation disc (for drivers) v10.5 or later
6. Hard Drive with at least 10GB of available space (30GB for Vista)
7. 2GB of RAM when running Vista on Intel Xeon based Mac Pros
8. Boot Camp Assistant
9. A Single Full Windows installation disc

What are three primary steps for setting up Boot Camp with Windows?

1. Run Boot Camp Assistant to repartition the Hard Drive
2. Install Windows through its installation disc
3. Install Boot Camp drivers from Mac OS X Installation disc

What three methods can be used for selecting the startup disk on a Mac with Windows installed?

1. Startup Manager, started holding the ALT key at the very first instant of the Mac startup
2. Startup Disk Preference Pane of System Preferences in Mac OS X
3. Windows Boot Camp Control Panel in Windows
4. Startup Disk Utility available when booted from the Mac OS X Install DVD

Network Configuration

What do the terms interface, protocol and service mean in relation to computer networks?

1. Interface: is medium through which the network data flows
2. Protocol: is the set of rules that define data representation, signaling, authentication and error detection across the network
3. Service: describes a network interface's settings, which are necessary to define a network connection

What is the purpose of Internet Protocol (IP) address and subnet masks?

1. The IP address identifies the location of a specific network device. It's the primary identification of the Internet Protocol Suite TCP/IP for both WANs and LANs. Most of IP addresses are 32 bit numbers composed by four groups of 3 digits numbers (called octets) separated by periods.
2. The subnet masks are used by network devices to identify their local network range. The subnet mask is a 32 bit number composed by four groups of octets and determines if outgoing data is designated for a network device in the LAN

How does the IP transfer messages between computers over a Wide Area Network (WAN)?

1. The subnet mask is used to determine if the destination IP address is on the same LAN, when it's identified that is not part of the LAN the device send the data to the IP address of the local router
2. The local router will redirect the data to the router on the WAN that it thinks to be the closest to the destination IP
3. The data will be sent from router to router on WAN until it will reach the destination IP

How does the IP use the MAC address to send messages between computers on a LAN?

1. The network device will address the outgoing packets based on the destination's MAC address
2. The device's Mac address is resolved by IP through the ARP protocol that maintain a list of correspondences between IP addresses and MAC addresses called ARP Tables

How is the Domain Name Service (DNS) used to facilitate network naming?

1. It exists a hierarchical network of DNS servers that maintain the correspondences between IP addresses and Domain Names, usually grouped by geographical location
2. Every network device may consult one or more DNS servers to resolve the IP address of a service by its domain name or perform a reverse lookup to obtain the domain names owned by a certain IP address
3. There exist Local DNS servers that resolve local domain names (in a LAN) and unknown domain names connecting to higher level DNS servers

How do Mac OS X acquire and use link-local TCP/IP addresses?

If DHCP is configured for a TCP/IP connection and no DHCP service is available or reachable the system will automatically generate a link-local address on the range of 169.254.0.0 with subnet mask 255.255.0.0, it will verify that the address is not already in use on the local network then will assign it to the network device that will be able to start the communication with other network devices on the local network that are using link-local addresses

What interfaces and protocols are supported by default on Mac OS X?

1. Ethernet
2. Airpot (Wi-Fi)
3. Bluetooth DUN
4. PPP protocol over Integrated modem
5. Firewire 400 and Firewire 800
6. PPP protocol over USB External Modems
7. VPN via PPTP, CISCO IPsec, L2TP over IPsec
8. PPPoE: PPP over Ethernet for (H)DSL
9. 6to4: IPv6 across IPv4 networks
10. VLAN: multiple LANs over a single hardware interface
11. Link Aggregator: a single virtual LAN that use multiple hardware interfaces
12. TCP/IP Internet Suite
13. DHCP
14. DNS
15. NetBIOS/WINS
16. Authenticated Ethernet via 802.1x (WEP, WPA, WPA2 are examples)
17. IP Proxy

How does network service order affect network connectivity?

1. It defines the primary network interface as the one on top of the list
2. All the traffic that is not handled by any of the local interfaces is redirected to the primary interface
3. Therefore all internet traffic is redirected to the primary interface

In the Network Preferences how can you tell which interface is currently being used for network activities?

1. The green indicator next to a local interface indicate network activity on it
2. The primary network interface is the topmost active interface in the list to which all the traffic, not better handled by other local interfaces is redirected.

What functionality does Mac OS X v10.6 support with the AppleTalk protocol?

With Mac OS X v10.6 AppleTalk protocol is no more supported

What are four common issues that can interrupt network serves on a Mac OS X computer?

1. Local issues: a disconnected cable or improperly configured network settings
2. Network issues: a non functioning network interface port
3. Service issues: a DHCP service issue or a DNS service issue

How can you identify the MAC address for all the Mac's network interfaces?

1. Consulting the Network Utility application in the info tab
2. You need to select the interface listed in the drop-down menu by its UNIX name
3. Repeat pass 2 per each network interface

The hardware address (MAC address) is shown in the same tab

Network Services

What is the relationship between clients and servers as it relates to network service access?

1. The client software is used to access network services provided by the server software
2. The connection between client and server is established with a protocol known by both the client and server
3. Client and server may reside in different services

What is the relationship between a network service and a network port?

1. The TCP (and UDP) protocol supports simultaneous services and connections
2. To handle multiple connections and services, one or more network ports are assigned to each one of them, they will use those ports for all the communications

What two dynamic network service discovery protocols are supported by Mac OS X?

1. Apple Bonjour
2. Microsoft NetBIOS/WINS

How does Mac OS X use dynamic network discovery protocols to access network services?

Mac OS X Client on a network send a broadcast request and all the devices using those discovery protocols answer advertising themselves to this broadcast request

What five network file services can you connect to from the Finder's Connect to Server dialog?

1. SMB
2. AFPv3
3. FTP
4. WebDAV
5. NFSv4

How are items inside the Finder's Network folder populated?

1. Lists dynamically discovered network file services that use AFP or SMB protocols
2. Lists all the currently mounted network filesystems
3. It's actually changing depending in the information gathered by AFP and SMB protocols only
4. The resources may appear grouped in folders representing ZONES or WORKGROUPS

How do you provide Mac OS X file-sharing services so other computers can access them?

1. Set Mac's network identification
2. Activate file sharing options from the Sharing Preference Pane in System Preferences
3. It's possible to configure file sharing of a folder through it's Get Info panel

What password issues may arise related to SMB service?

SMB keeps its own list of users and relative passwords so it may not exist a user in SMB password database or the password of a SMB user may be different from the homonymous user account's password

What shared items are accessible to an Administrative user who connect via AFP or SMB? What about a standard user?

1. Administrative users can access the whole filesystem included local connected (mounted) storage devices along with the home folder and all the Public and Shared folders
2. Standard users can only access their home folder and all Public folders

What items are shared by default to all users?

Local users' Public folders

What shared items are accessible to any user who connects via FTP?

When a FTP user access the service it will start from its home folder but will be able to browse the whole filesystem depending on the local filesystem ownership and permissions

How do you provide Mac OS X Web-Sharing service?

Enabling Web-Sharing from the Sharing Preference Pane on the System Preferences

What files are associated with the computer's website?**What about an individual user's website?**

Computer's website files are stored in /Library/WebServer/Documents folder

Users's website files are stored in /Users/<username>/Sites folder

What Client-Sharing services can Mac OS X provide?

1. Screen Sharing
2. Remote Login (SSH)
3. Remote Management (ARD)
4. Remote Apple Events
5. Xgrid Sharing

What is the security risk of enabling Client-Sharing services?

If a Client-Sharing is compromised as unauthorized user can control your Mac and arbitrarily execute applications and process

How is Xgrid implemented in Mac OS X?

1. Each Mac OS X system can be part of Xgrid network by the preinstalled client software to share its computing resources and submit processes to the Xgrid network by Xgrid compatible applications or using specific CLI tools
2. Only Mac OS X Servers can play the role of coordinator to accept and initiate distributed computing into the Xgrid network by the use of the Controller application

**What network services are provided by your Mac to facilitate Internet Sharing?
What options are available for Internet Sharing via your Mac's Airport wireless Ethernet interface?**

1. When Internet Sharing is started Mac provides:
 - NAT (Network Address Translation), the `natd` process to allow multiple IP addresses to share the same internet connection
 - DHCP (Dynamic Host Configuration Protocol), to provide any attached network device with a unique local IP address
 - DNS (Domain Name System), to permit local network device to resolve each other names
2. When sharing through an Airport interface it's possible to specify:
 - the created network's name
 - the communication channel (by default is automatic)
 - WEP password and settings (optional)

How does Mac OS X's built-in firewall works?**What advanced firewall settings are available?**

1. The built-in firewall inspects each incoming connection and they are allowed on a per-application basis
2. The advanced settings are:
 - to decide whether signed application are automatically allowed through the firewall
 - to control the list of allowed (or denied) applications
 - enable the Stealth mode

What are some known issues that arise when connecting to network file services?

1. Forked files (AppleDouble) may cause problems in NFS and WebDAV network filesystems
2. AFPv2 provided by Windows Server are not fully compatible with AFPv3 client present in Mac OS X

What are the common troubleshooting techniques for issues involving failure to connect to network services?

1. Attempt to connect to different network services
2. Attempt to connect to the service through another computer on the same network
3. Review Network Preferences
4. Review Network Utility statistics

What is a directory as it relates to a Directory service?

1. It's a database of informations usually related to accounts for identification, authentication, authorization purposes
2. They can be local informations or information shared with a network

What are seven common types of resources Mac OS X can access from a directory service?

1. User Accounts
2. User Groups
3. Computer Accounts
4. Computer Groups
5. Network file mounts
6. Client Management Settings, account and computer settings
7. Collaboration Informations, to facilitate collaboration services like iCal, iChat, Wiki services

What are the primary differences between local, network and mobile accounts?

1. Local accounts are not shared on the network and they are related to the local machine
2. Network accounts are shared in the Open Directory network, then each network user can login through any computer connected to the Open Directory network without the need to configure a specific user in a specific computer
3. Mobile accounts are store in the Open directory network but they differ from network accounts as a full copy of the account settings is caches locally into the machine allowing the user to login also if the computer is temporarily disconnected from the network

What are four advantages of using network directory services to store account information?

1. User accounts are no longer tied to a single computer on the network
2. The same account information can be used for multiple network services
3. You can use Kerberos to provide single-sign-on authentication
4. Define user and computer settings from a centralized location

What four directory service types can be used in Mac OS X?

1. Open Directory (Local)
2. Active Directory
3. LDAPv3 (like OpenLDAP)
4. NIS (BSD Directory Service)

What is authentication? What is authorization?

1. Authentication is the process to identify a user account, “Who you are
2. Authorization is the process to identify the permissions and ownership of a user, which items and services the user is allowed to access, “What you can do”

What are these common authentication methods?

1. Basic, clear-text password
2. Encrypted password (some LDAP implementations)
3. Kerberos, ticket-base authentication (Active Directory and Open Directory)

What is a Kerberos ticket? What is a Key distribution Center (KDC)?

1. A Kerberos ticket (TGT - Ticket to Get Tickets) is a special encrypted file that only the account user with the proper password can decrypt. Decrypting the file means identifying the user allowing it to access the other network services. The ticket is generated by a KDC and is sent to a client computer while the user tries to login.
2. The KDC is a trusted service that runs alongside the network directory service. It generates the TGTs.

How do Kerberos and Keychain systems differ for managing authentication services?

1. Kerberos passwords never transit on the network, the TGTs are decrypted on the local machine that requests authentication. Kerberos is usually used in network wide scale.
2. Keychain stores local and network passwords in an encrypted database, the user uses Keychain when it needs to retrieve passwords for other services authentication processes. Keychains are accessible only to the local Mac.

What are five common directory services and authentication troubleshooting techniques?

1. Attempt to authenticate with another user account
2. Reset the account password
3. Verify the network directory service connectivity and configuration
4. Verify Kerberos authentication and configuration by Ticket Viewer application, and check the system clock of both the client and server (Kerberos is time-sensitive)
5. Check directory service log files (/var/log/krb5kdc)

Peripherals and Printing

Which peripherals, expansion and storage busses are supported by Mac OS X?

1. Peripheral busses:
 - USB
 - Firewire, IEEE1394
 - Bluetooth
2. Expansion busses:
 - PCIe
 - PCCard
 - ExpressCard 34
3. Storage busses
 - ATA, SATA
 - SCSI, SAS (Serial Attached SCSI)
 - Fiber Channel

What does iSync do?

It's the software to synchronize mobile devices personal information to the Mac via Bluetooth

What are the device classes in Mac OS X to categorize peripherals?

What are some example peripherals of each class?

1. HID: mice, trackpads, keyboards
2. Storage: disk drives, flash drives, optical drives
3. Printers: printers, plotters, fax machines
4. Scanners: flatbed, negative, slide, drum devices
5. Video devices: video cameras, USB and Firewire video converters, expansion bus attached
6. Audio devices: external devices attached via USB and Firewire

What is a device driver? What the primary types of device drivers are there?

A device driver is a piece of software that tells the system how to communicate to a peripheral directly attached, network or wirelessly attached.

There are three primary types of device drivers:

1. Kernel Extensions (KEXTs)
2. Framework Extensions (plugins)
3. Standalone applications

What does CUPS do?

CUPS is the Common UNIX Printing System and is driven by the `cupsd` system process that manages all printing and faxing

What are PPD files responsible for?

PPD are PostScript Printer Descriptors and are the drivers for printers and faxes that describe printer features that can be used by the Mac OS X printer system

How do you share printers with other Mac and Windows users?

1. You can enable printer sharing from the Print and Fax Preference Pane or Sharing Preference Pane
2. If you need authentication by Windows users you need to enable SMB sharing from Sharing Preference Pane

System Startup

What are the Primary system initialization stages and user environment stages in Mac OS X and in what order do they start?

1. System initialization:

- Firmware
- Booter
- Kernel
- System launchd

2. User initialization

- Loginwindow
- User launchd
- User environment

What are the visual and/or audible cues of the stages of system initialization?

1. Firmware:

- audible startup chime
- flash from power-on light
- light gray background

2. Booter:

- dark grey Apple logo on the main display

3. Kernel:

- spinning gear under the Apple logo on the main display

4. System launchd:

- bright blue background on all displays

What does the Firmware do?

1. It's responsible to verify the basic Mac hardware running the POST (Power On Self-Test)
2. It will locate the system booter trying to take its location saved into the NVRAM (Non Volatile RAM)
3. It will start the booter

What role does the system launchd process serve during the system initialization process?

It's responsible to run all the other process like Window Server and loginwindow

What items are automatically started by the system launchd during the system initialization process?

1. /System/Library/LaunchDaemons items
2. /Library/LaunchDaemons items
3. /etc/rc.local scripts
4. StartupItems, legacy items launched by SystemStarter process

What role does the loginwindow process serve in system startup?

1. Coordinate the Login Screen
2. Communicate with the directory service to authenticate the user
3. Setup and manage the graphical interface in the user environment, at that moment it changes its own ownership to the current user

What is the difference between LaunchDaemons, StartupItems, LaunchAgents and LoginItems?

1. LaunchDaemons and StartupItems are opened during the system initiation by the system launchd process (as root user)
2. LaunchAgents and LoginItems are opened during the initialization of the user environment on behalf of the user by specific instance of user launchd process

What happens during user logout?

The loginwindow process does the following:

1. Requests to all the user's applications to quit
2. Quit any background process started by the user
3. Runs any logout script
4. Record the logout into the main system.log
5. Reset device permissions to their defaults
6. Quits the user's loginwindow (itself) and the user launchd

What happens during system shutdown?

1. Logout the current user
2. Forcibly quits all other user sessions currently opened if Fast User Switching is enabled
3. The user's loginwindow tells the Kernel to issue the quit command to all the running system services
4. The Kernel stops the system launchd
5. The Kernel shuts down the system

What is the difference between Safe Boot, Safe Mode, Safe Login?

1. Safe Boot occurs when the system is starting up
2. Safe Mode is when the system is actually running
3. Safe Login is when the system starts up the user session

Which items are not loaded when Mac OS X safe-boots?

1. Third-party LaunchDaemons
2. Third-party StartupItems
3. Third-party KEXTs
4. Third-party LaunchAgents
5. Third-Party fonts
6. Any user LoginItems
7. Any user-specific LaunchAgents

What keyboard combination is used to safe-boot Mac OS X?

Keep holding the SHIFT key during system startup

How do you further resolve an issue that disappear when the Mac successfully safe-boot?

1. Restart the system in Verbose mode holding the Command-V keyboard combination to isolate what element is preventing the system to properly startup the Mac
2. Once isolated the faulty element, restart the system in Single-User mode using the Command-S keyboard combination to run a basic BSD CLI console and through it put in quarantine the corrupted file