Training and Certification

# Mac OS X Deployment 10.6

## Exam Preparation Guide


Updated June 2010

# Contents



Produced by Apple Training & Certification.


## Introduction

Use this guide as a resource in your preparation for the Mac OS X Deployment 10.6 Exam. Read on to:

- Learn about Apple Certification.
- Find out how to register to take the exam.
- Locate resources to help you prepare for the exam.
- Review the range of objectives that the exam may cover.
- Test your knowledge by answering chapter review questions.
- Get a feel for the style of questions that appear on the exam.

## Becoming an Apple Certified Pro

The Apple Training & Certification program is designed to keep you at the forefront of Apple technology. Apple Certification creates a benchmark to demonstrate your proficiency in specific Apple technologies and gives you a competitive edge in today's evolving job market.

### What is an Apple Certified Pro?

An Apple Certified Pro is someone who has proven his or her professional competency in the use and operation of a specific Apple technology or application by passing the relevant Apple Certification exam(s).

### How do I become an Apple Certified Pro?

To become an Apple Certified Pro, you must pass one or more Apple Certification exams. Exams are usually administered at the end of each course delivered at an Apple Authorized Training Center (AATC). If you prefer to learn on your own or believe you already have the necessary skills to become certified, you may register to take the exam at a Prometric Testing Center or at an AATC.

### What are the benefits of being an Apple Certified Pro?

Beside differentiating you as a skilled user or technical professional supporting users of a specific Apple technology or application, becoming an Apple Certified Pro allows you to leverage the power of the Apple brand. When you pass an Apple Certification exam, you receive an email with a PDF copy of your Apple certificate, along with instructions on how to order a printed and/or a printed and framed certificate. The email includes LinkedIn, Facebook, and Twitter icons to make it easy for you to share news of your certification with your networks on these sites.

You also receive a login for the Apple Certification Records System, where you can:

- Update your profile information and opt in to display your Apple Certification(s) on the Apple Certified Professionals Registry.
- Review your certification progress.

- Download your certification logo(s) to use on business cards, resumes, websites, and more.
- Provide access to employers to verify your certifications.

## Exam Details

The Mac OS X Deployment 10.6 Exam is a computer-based test offered at Apple Authorized Training Centers (AATCs) and Prometric Testing Centers. To find the closest AATC, please visit training.apple.com/locations. To find a Prometric Testing Center, visit www.prometric.com/apple.

Many AATCs post schedules for Certification Exam Sessions at training.apple.com/schedule. If you don't see a session scheduled at your nearest AATC, you can contact the AATC and they will often schedule a session. **Please note that all AATCs offer all Mac OS X and Pro Apps exams, even if they don't offer the corresponding course.**

Mac OS X Deployment 10.6 Exam details:

- Exam number: 9L0-623
- Number of test questions: 70 technical, 5 demographic (unscored)
- Passing score: 75% (scores are *not* rounded; you must earn a score of 75% or higher to pass the exam)
- Details on exam scoring appear at training.apple.com/certification/faq
- Test duration: 2 hours
- Certifications:
  - Apple Certified Specialist - Deployment (ACS - DEP) 10.6. To earn ACS - DEP 10.6, you must also earn Apple Certified Technical Coordinator (ACTC) 10.6 certification by passing the Mac OS X Support Essentials 10.6 Exam (exam number 9L0-403) and the Mac OS X Server Essentials 10.6 Exam (exam number 9L0-510).
  - Apple Certified System Administrator (ACSA) 10.6. To earn ACSA 10.6, you must also pass the Mac OS X Server Essentials 10.6 Exam (exam number 9L0-510), the Mac OS X Directory Services 10.6 Exam (exam number 9L0-624), and the Mac OS X Security and Mobility 10.6 Exam (exam number 9L0-625)

The exam timer does not start until you view the first technical question.

You may not access any resources or references during the exam.

## Recommended Exam Preparation

We recommend these exam preparation strategies:

- Gain experience with the technology.
- Learn from experts: Mac OS X Deployment course.

- Study the appropriate training materials—including the *Apple Training Series* book Mac OS X Deployment v10.6: A Guide to Deploying and Maintaining Mac OS X and Mac OS X Software by Kevin M. White (ISBN 0-321-63531-0).
- Review the objectives, chapter review questions, and sample test questions in this guide.

### Gain Experience with the Technology

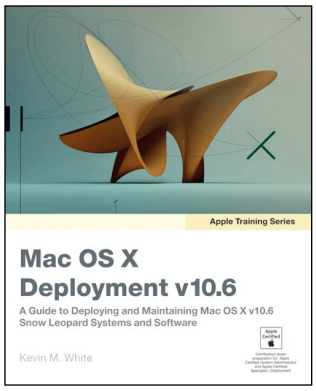
Nothing can substitute for time spent learning the technology first hand. After you read the book and/or take the class, spend time increasing your familiarity with the software on your own to ensure your success on the certification exam.

### Learn from Experts

Apple Authorized Training Centers (AATCs) offer classes where you can learn hands-on with the technology and benefit from the expertise of Apple Certified Trainers and your peers. Visit the Apple Training & Certification website to find course offerings at nearby AATCs.

### Study the Apple Training Series Book

Apple Training Series books are the basis for the related Apple Certification exams. You can purchase the Apple Training Series book at peachpit.com (click here for a 30% discount code) or access the online version at browse.creativeedge.com/appletraining.




The book associated with this exam is Mac OS X Deployment v10.6: A Guide to Deploying and Maintaining Mac OS X and Mac OS X Software by Kevin M. White.

### Review the Objectives and Questions

Even if you're self-taught or have taken courses that do not use the Apple Training Series curriculum, you can still prepare yourself for the certification exam by making sure that you can complete all the tasks and answer all the review questions in the following sections.

The Exam Objectives describe the knowledge domains assessed by the exam. The Review Questions help you identify areas you should study further. Answers to the chapter review questions can be found in the Apple Training Series book. The Sample Questions demonstrate the style of questions on the exam. Reviewing all three can increase your chances of success on the exam.

## Exam Objectives and Review Questions

Prepare yourself for the certification exam by making sure you can complete all the tasks described in the following sections, and answer all the chapter review questions.

Please note that although this guide divides the topics into chapters, questions are presented randomly during the exam. The exact number of

questions presented on the exam per chapter is noted in the paragraph under each chapter heading.

## Chapter One: Deployment Planning

Upon completion of Chapter One, "Deployment Planning", you should be able to complete the following tasks. The *four* items from this chapter that appear on the exam are drawn randomly from the following objectives:

- Given a target audience, create policies regarding acceptable use of software and hardware.
- Given access to the Internet, identify manufacturers of hardware that can physically secure Macintosh computers and peripheral devices.
- Given a document of software and hardware-use policies, develop a plan to distribute the policies to users.
- Without references, describe the issues regarding disposal of electronic equipment including compliance with local, state, and federal regulations, cost, and the storage and transportation of potentially hazardous materials.
- Given a list of equipment, including computers and peripherals, calculate the equipment's total power requirements.
- Without references, describe how a directory service system can be incorporated as part of a software deployment to enforce usage policies, including access to applications or hardware.
- Given a hardware deployment plan, modify the plan to include details on how to physically secure the hardware.
- Without references, define the following terms: ampere, watt, click matrix.
- Given a plan for deployment of new hardware and a list of hardware being replaced, modify the deployment plan to include instructions on how to properly dispose of the obsolete hardware.
- Without references, describe physical security features built into Macintosh computers.
- Given a hardware deployment plan, identify context-appropriate considerations to take to physically secure the hardware.
- Given a description of a target audience, identify context-appropriate considerations to take into account when developing policies for acceptable use of software and hardware.
- Given technical specifications for a Macintosh computer, identify appropriate temperature range for operation of the computer.
- Given a list of installed hardware and software, and a list of software to be deployed, create a testing matrix that covers the full range of the installed hardware and software.
- Given access to the Internet, list third-party solutions that can assist in testing images and packages prior to deployment.

- Given one or more servers connected to a network, select a testing method for optimizing deployment server stream (bandwidth). Without references, explain what a Service Level Agreement is.
- Without references, explain the role of a Service Level Agreement in relationship to the deployment of Mac OS systems.

## Chapter One Review Questions

After completing Chapter One, you should be able to answer the following questions.

1. How do you calculate the total power required to safely operate your deployed computers?
2. How can you identify the appropriate operating temperature range of Apple hardware? What operational temperature range does most Apple hardware support?
3. What key hardware feature included on Mac systems helps you ensure physical security?
4. What are some of the issues that must be addressed when disposing of electronic equipment?
5. What five primary technologies in Mac OS X can be used to enforce usage policies?
6. How does using a shared network directory service actually enforce usage policies?
7. What is a click matrix?
8. What is a service-level agreement (SLA)?

## Chapter Two: Deploying Individual Items and Containers

Upon completion of Chapter Two, "Deploying Individual Items and Containers", you should be able to complete the following tasks. The *fourteen* items from this chapter that appear on the exam, are drawn randomly from the following objectives:

- Given one or more files and the Finder, create a .zip archive of the files.
- Without references, define the following terms: resource fork, Mac OS X file system metadata, bundle, package, AppleDouble.
- Given one or more files and the command line interface, create a .zip archive of the files.
- Without references, describe the key issues in distributing files with Mac OS X file system metadata.
- Given Terminal and a .zip archive, list the contents of the archive.
- Without references, list at least two methods for distributing files with Mac OS X file system metadata through mechanisms that don't support file system metadata.

- Given an archived/zipped file and the Finder, retrieve the files from the archive.
- Without references, describe the issues in distributing bundled files.
- Given an archived zipped file and the command line interface, decompress the files.
- Without references, list methods for distributing bundled files to ensure that the entire bundle's contents are kept intact.
- Given a collection of files, Apple Remote Desktop, and a Mac OS X computer configured to be managed by ARD, copy the files to the remote computer via drag & drop.
- Without references, describe the pros and cons of using each of the following methods for distributing a single file or a group of files: drag and drop, archived files, disk images.
- Given a collection of files, Apple Remote Desktop, and a Mac OS X computer configured to be managed by ARD, copy the files to specific locations on remote computer.
- Without references, state the command-line utility appropriate to use for archiving files with Mac OS file system metadata.
- Given a Mac OS X computer and a copy of Apple Remote Desktop, install and configure Apple Remote Desktop on the computer so that it can be used to manage one or more computers on the network.
- Given a Mac OS X computer with Apple Remote installed and one or more Mac OS X computers on the network, configure the computer list in Apple Remote to include the Mac OS X computers.
- Given a folder of files and Disk Utility, create a disk image containing the files.
- Without references, list the image formats available when using Disk Utility to create disk images on a Mac OS X computer
- Given a disk image and Disk Utility, resize the disk image so that additional files can be added to the contents.
- Without references, describe the key differences between each of the image formats that can be used when creating a disk image on a Mac OS X computer.
- Given a disk image and Disk Utility, convert a disk image of one type, such as read-only, to another, such as compressed.
- Without references, state the name of the command-utility (hdiutil) for manipulating and creating disk images
- Given a disk image, modify the disk image to include a background image in the Finder window that provides the user with information about the contents (such as instructions to drag an application to / Applications).
- Without references, list the advantages of using disk images over .zip files
- Given a disk image, modify the disk image to include a file system link to a location on the user's system, such as /Application, to assist in the

copying of files from the disk image to the correct location on the user's computer.

- Without references, list the advantages of using .zip files over disk images
- Given a disk image, convert it to an Internet-enabled disk image.
- Without references, explain how an Internet-enabled disk image functions differently than other disk image types.
- Given an extremely large disk image, segment the image so that it can be distributed as multiple smaller files.
- Without references, explain how a bundled sparse disk image functions differently than a standard sparse disk image.
- Without references, explain how to segment an extremely large disk image so that it can be distributed as multiple smaller files.
- Given a list of the types of disk images that are supported on a Mac OS X system, identify all of the image types that can be segmented.
- Without references, explain how to create an Internet-enabled disk image.
- Without references, state which utility is used to create disk images.

## Chapter Two Review Questions

After completing Chapter Two, you should be able to answer the following questions.

1. What is file-system metadata? What is AppleDouble?
2. What is a bundle? How does it differ from a package?
3. What is a container?
4. What issues arise when trying to deploy items with file-system metadata or bundles and packages?
5. What two methods can be used to safely distribute files with file-system metadata or bundles and packages?
6. What types of disk images can be created with Mac OS X v10.6? What are the key differences between these disk image types?
7. Why would you want to use disk images over archive files?
8. Why would you want to use archive files over disk images?
9. What are the names of the graphical and command-line tools for managing disk images?
10. What is an Internet-enabled disk image? How can you create one?
11. What types of disk images can be segmented? What tools can be used to segment a disk image?

## Chapter Three: Deploying with Installation Packages

Upon completion of Chapter Three, "Deploying with Installation Packages", you should be able to complete the following tasks. The *sixteen* items from this chapter that appear on the exam are drawn randomly from the following objectives:

- Given a folder of files and PackageMaker, create an installation package to install the files in the correct locations on a system.
- Without references, define the following terms: installation package, metapackage, receipts, payload.
- Given two or more sets of files and PackageMaker, create a metapackage that contains an installation package for each set of files.
- Without references, describe the differences between the flat-file installation package format of Snow Leopard and the bundled format used in earlier versions of the OS.
- Given a PackageMaker project and PackageMaker, add a license that will be displayed when the user opens the final installation package.
- Without references, describe the purpose and benefits of using installation packages for software distribution.
- Given a PackageMaker project and PackageMaker, add a Read-Me document that will be displayed when the user opens the final installation package.
- Without references, state the versions of Mac OS X that support the new flat-file installation package format.
- Given a PackageMaker project and PackageMaker, add an image that will be displayed as the background for the Installer window when the user opens the installation package.
- Given a list of files within an unflattened installation package, describe the purposes of each of the files.
- Given a PackageMaker project and PackageMaker, add scripts to an installation package so that they are executed during the execution of the package.
- Without references, list three methods for distributing software via installation packages (server, SSH, Apple Remote Desktop).
- Given one or more scripts and PackageMaker, create an installation package that executes scripts but does not install files (a payload-free package)
- Without references, list the types of scripts that can be added to an installation package (pre-flight, pre-install, post-install, etc.)
- Given PackageMaker, create a Snapshot installation package of files that had been installed or modified during a specific monitoring period.
- Without references, describe when each type of installation package script is run.

- Given an existing installation package, modify the package to include additional files.
- Without references, list alternative third-party solutions for creating and modifying installer packages.
- Given the command-line interface and a flattened installation package, expand the package to a directory.
- Without references, describe how the Repair Permissions command in Disk Utility determines what permissions to check and what to set them to.
- Given an installation package, extract specific files from a package without installing all of the files in the package.
- Without references, describe the importance of installation package inspection prior to installation/distribution.
- Given a receipt from a previously installed installation package, list which files were installed by a pre-made package.
- Without references, describe the purpose and benefit of checksumming with respect to package installers.
- Given an installation package, list what files will be installed by an installation package.
- Without references, describe how Mac OS X tracks the installation of installer packages.
- Given Disk Utility and a Mac OS X computer which is not functioning correctly following the installation of an installation package, repair permissions issues that may have been caused by an installation package.
- Without references, explain how Apple Remote Desktop can be used to open installation packages on one or more remote computers.
- Given an installation package and a Mac OS X computer, verify the package properly installs files and runs the package's scripts.
- Without references, explain how to display a list of files that were installed by an installation package on a Mac OS X computer.
- Given SSH, an installation package, and a remote Mac OS X computer, install the package on the remote computer.
- Given a PackageMaker project, identify the command-line utility that can display the files that an installation package will install.
- Given one or more installation packages, Apple Remote Desktop and one or more remote Mac OS X computers, install the package on the remote computer(s).
- Without references, explain which files are effected when the Repair Permissions function in Disk Utility is used on a Mac OS X computer.
- Given a Mac OS X computer, list the installation packages that have been installed on a Mac OS X system.
- Without references, explain the recommended format of an installation package's identifier.

- Given the command-line interface and a Mac OS X file system, repair permission issues caused by installation of an incorrectly-built installation package.
- Without references, state the types of disk images that can be segemented using the hdiutil command.
- Given a Mac OS X  computer, list the installation package receipts that are used in correcting permissions
- Without references, define the term "installation action" as it applies to PackageMaker projects.
- Given a Mac OS X computer and the pkgutil command, remove receipt data associated with an installed package.
- Given a flat package and Flat Package Editor, display the contents of the flat package.
- Given a PackageMaker project file and a list of minimum system requirements for the target computers, configure the project so that the final installation project will only install its contents on systems that meet the stated minimum system requirements.
- Given a PackageMaker project, modify the project to include one or more installation actions.

## Chapter Three Review Questions

After completing Chapter Three, you should be able to answer the following questions.

1. What are the main benefits of using installation packages for deployment?
2. What are installation packages, installation metapackages, PackageMaker projects, payloads, and receipts?
3. What are the main differences between a flat installation package and a bundle-based installation package? What versions of Mac OS X support flat installation packages?
4. When creating an installation package, what format is recommended for the installation package identifier?
5. What types of scripts can be added to an installation package? When is each type of script executed?
6. Why is installation package inspection an important step prior to installation?
7. How does file checksumming help to provide greater security for downloaded installation packages?
8. What are three methods for deploying installation packages?
9. How does Mac OS X track previously installed installation packages?

10. How do you display a list of files that were installed by an installation package?

11. How does the repair permissions process determine which permissions to check and repair?

## Chapter Four: Creating System Images

Upon completion of Chapter Four, "Creating System Images", you should be able to complete the following tasks. The *thirteen* items from this chapter that appear on the exam, are drawn randomly from the following objectives:

- Given a deployment plan and a target audience, specify application and system configuration requirements for a custom image.
- Without references, state which files should be removed from a system before imaging a pre-configured system.
- Given a Mac OS X computer connected to the Internet, list the currently available software updates provided by Apple.
- Without references, state the minimum OS version that can be imaged using System Image Utility.
- Given an image to be applied to one or more hardware systems with software installed, identify applicable software updates that should be applied to the image.
- Without references, state the image sources that can be used by System Image Utility for creating images.
- Given a Mac OS X computer, configure the main administrator account so that it is not visible from standard user accounts.
- Without references, explain the differences between the NetBoot, NetRestore, and NetInstall types of images.
- Given a Macintosh computer with a new copy of Mac OS X installed, configure the system to either not play the startup video or play an alternate version.
- Without references, describe the underlying structure and format of Mac OS X Server's managed client system (MCX).
- Given a Mac OS X computer bound to an Open Directory server, configure the desktop to display a locked image embedded with the acceptable use policy.
- Without references, describe how System Image Utility uses Automator actions to create images.
- Given a Mac OS X computer bound to an Open Directory server, configure the login window to display an organization-specific message such as an acceptable use notice.
- Without references, define the following terms: Automator, Automator actions, Automator workflows, Shadow files.
- Given a Mac OS X computer, delete computer or user-specific files that should be removed when creating an system image.

- Without references, describe the relationship between the inputs and outputs of Automator actions and how actions are combined together to create a workflow.
- Given System Image Utility and a Mac OS X Install DVD, create a NetBoot, Network Install, or NetRestore image
- Without references, describe how other Automator actions can be used to enhance the creation of a Network Disk image.
- Given System Image Utility and an imaged Macintosh computer, create a NetBoot, or NetRestore image
- Without references, describe the function of each of the primary Automator actions in System Image Utility
- Given System Image Utility and a disk image containing a system image, create a NetBoot or NetRestore image
- Without references, describe the features and benefits of Mac OS X Server's managed preferences system.
- Given System Image Utility, an image source, and one or more installation packages, create a NetBoot or NetRestore image that includes the packages.
- Without references, describe the features and benefits of Mac OS X Server's preference manifests.
- Given a default installation of Mac OS X Server with properly configured services and installed developer tools, configure a client's preference settings using Mac OS X Server's preference editor.
- Without references, list the steps required when using Disk Utility to create a cloned image of a Mac OS X computer.
- Given a default installation of Mac OS X Server with properly configured services and installed developer tools, configure an application's preference settings using Mac OS X Server's preference manifests.
- Without references, explain an alternative method to Disk Utility for creating a cloned image of a Mac OS X system.
- Without references, state which utility is used to create network disk images on a Mac OS X Server computer.
- Given a Macintosh computer to be imaged, configure the computer to boot into target disk mode.
- Without references, describe how to determine the minimum version of Mac OS X that should be used to create an image for a Macintosh computer
- Given Disk Utility and a configured Mac OS X computer, create a disk image of the computer's disk drive.
- Given a disk image of a Mac OS X computer and Disk Utility, prepare the disk image for deployment.
- Without references, describe the two methodologies for creating a deployment system image: creating an image of a completely

configured system, and applying installation packages to a base OS image.

- Given Terminal and a configured Mac OS X computer, create a disk image from an configured system.
- Without references, COMPARE the two methodologies for creating a deployment system image, including the benefits of each method.
- Given a disk image of a Mac OS X computer and Terminal, prepare the disk image for deployment.
- Given a Macintosh computer, a second computer or an external hard drive, System Image Utility, create a base OS image.
- Given System Image Utility, a base OS image and one or more installation package, modify the base OS image to include files and configurations performed by the installation packages.

## Chapter Four Review Questions

After completing Chapter Four, you should be able to answer the following questions.

1. What is the minimum version of Mac OS X supported by a new Mac computer?
2. What two methods can be used to create a Mac OS X v10.6 system disk image suitable for deployment?
3. What are the benefits of each system image creation method?
4. What is the underlying format of Mac OS X's preference management system?
5. What is a preference manifest?
6. What three methods can be used for creating a cloned system image?
7. Which files should be removed prior to creating a cloned system image?
8. What Mac OS X v10.6 utility is used to create network disk images? Where can this utility be found? What is the minimum version of Mac OS X supported by this utility?
9. What two sources can be used to create a network disk image?
10. What are the differences between NetBoot, NetInstall, and NetRestore images?
11. What is Automator? What is an Automator action? What is an Automator workflow?
12. How can Automator facilitate network disk image creation?
13. What is the primary SIU action required for creating network disk images? What other SIU action is almost always required?

14. Aside from SIU, how else can you access actions used to create network disk images?

15. What are the specific steps for building a modular system image using SIU?

## Chapter Five: Deploying System Images

Upon completion of Chapter Five, "Deploying System Images", you should be able to complete the following tasks. The *eight* items from this chapter that appear on the exam, are drawn randomly from the following objectives:

- Given System Image Utility and an image source, create a System Image Utility project that includes an Automator action to create predefined user accounts.
- Without references, describe how a NetBoot image ID is used by the NetBoot service to provide load balancing.
- Given a Mac OS X computer with a Boot Camp partition, list methods for creating an image the system.
- Given System Image Utility and an image source, create a System Image Utility project that includes an Automator action to define system configuration settings.
- Given a disk image of a Mac OS X system, Disk Utility, and a target computer, restore the target computer with the given disk image.
- Without references, state the format of the asr command when used to multicast images across the network.
- Given System Image Utility, an installer disc, create a System Image Utility project that includes an Automator action to select which installation packages provided by the installer disc to apply to a newly created image.
- Given a list of files contained within a Network DIsk image, describe the purpose of each file.
- Given a disk image of a Mac OS X system, Terminal, and a target computer, restore the target computer with the given disk image.
- Without references, describe how Apple's Custom Software Solutions service can be used to deploy software on new Apple hardware.
- Without references, explain how ASR can be used to restore multiple computers simultaneously across the network.
- Given System Image Utility and an image source, create a System Image Utility project that includes an Automator action to filter client computers based upon their MAC addresses.
- Given a network configuration, calculate the data rate and multicast IP address range values to be used by ASR when restoring computers across the network.
- Without references, state how a Macintosh computer boots using a NetBoot server.

- Given System Image Utility, and an image source, create a System Image Utility project that includes an Automator action to filter client computers based upon their model type.
- Without references, list what protocols can be used when restoring an image via the "Define NetRestore Source" Automator action.
- Given a disk image, Terminal, and one or more computers on the network, restore the image to the remote computers.
- Without references, state the network requirements for using the NetBoot service to boot Macintosh computers.
- Given System Image Utility, and an image source, create a System Image Utility project that includes an Automator action to partition a disk before the resultant disk image is installed on a target computer.
- Without references, state the locations on a server where NetBoot images should be stored so that they are recognized by the NetBoot service.
- Given a Mac OS X Server computer and Server Admin, specify which network ports are used by the NetBoot service.
- Without references, describe how to configure a NetBoot server and a network to allow the NetBoot service to be accessed across subnets.
- Given a Mac OS X Server computer and Server Admin, specify which volumes are used by the NetBoot service for the storage of image and client data.
- Without references, explain how an Automator workflow can be created in place of System Image Utility to create a Mac OS X deployment image.
- Given a Mac OS X Server computer configured as a NetBoot server, a NetBoot image stored on the server and Server Admin, configure the NetBoot service to allow the image to be used by client computers.
- Without references, explain how to create additional Automator Actions to enhance the image creation process in System Image Utility.
- Given access to the Internet, list third-party alternatives for system image creation and deployment, and the benefits of each.
- Given a Mac OS X Server computer configured as a NetBoot server, a NetBoot image stored on the server and Server Admin, specify the file sharing protocol (AFP or HTTP) used to share the given NetBoot image.
- Given a Mac OS X Server computer configured as a NetBoot server, a NetBoot image stored on the server, Server Admin and a list of client computers, configure the NetBoot service to restrict access for specified image to specified computers.
- Without references, list the methods for configuring a Macintosh computer to boot from a network disk image.
- Given a Mac OS X computer, and a Mac OS X Server computer hosting the NetBoot service, configure the client computer to temporarily boot using the default image provided by the NetBoot server.

- Given System Preferences on a Mac OS X computer, and a Mac OS X Server computer hosting one or more images, configure the client computer to boot using a specific image provided by the NetBoot server.
- Given a NetBoot server and Server Admin, display the log files for the NetBoot service.
- Given a Mac OS X Server computer configured as a NetBoot server and Server Admin, list the addresses of computers currently booted using the NetBoot service.
- Given a client computer that is unable to boot properly from a NetBoot server, apply the troubleshooting techniques to troubleshoot the client computer and server.

## Chapter Five Review Questions

After completing Chapter Five, you should be able to answer the following questions.

1. How can the Apple Custom Software Solutions (CSS) help with your deployment?
2. What are the minimum network requirements to use NetBoot on a Mac client computer?
3. What are the primary steps involved in starting from the NetBoot service?
4. What are NetBoot shadow files and how do they relate to NetBoot diskless mode?
5. How does the NetBoot image ID, or index value, affect the NetBoot service?
6. On a Mac OS X Server computer, where should the network disk images be stored in order to be recognized by the NetBoot service?
7. What do you configure to allow a client computer to access the NetBoot service across subnets?
8. What does the Define NetRestore Source action do?
9. How can Apple Software Restore (ASR) be used to restore a system image to multiple computers simultaneously?
10. What do you enter at the command line to start an ASR restore or clone?

## Chapter Six: Post System Deployment Considerations

Upon completion of Chapter Six, "Post System Deployment Considerations", you should be able to complete the following tasks. The *seven* items from this chapter that appear on the exam, are drawn randomly from the following objectives:

- Given a Mac OS X computer, a Macintosh computer that meets the system requirements for Mac OS X Server, Server Assistant, and a directory domain, create in the directory domain a configuration record that will be applied to a computer after Mac OS X Server has been installed.
- Without references, list the basic server settings that are established during initial server setup.
- Given Server Assistant and an external storage volume such as a hard drive or a keychain drive, create a configuration file the storage volume so that the file will be applied to a computer after Mac OS X Server has been installed.
- Without references, describe the method for automatically configuring a fresh install of Mac OS X Server software.
- Given Apple Remote Desktop and a remote Macintosh computer, configure the system settings on the remote computer.
- Without references, state what file extension must be used in order for a file to be recognized as an auto server setup file by Mac OS X Server.
- Given a collection of application serial numbers and a remote computer, configure the applications on the remote computer with the given serial numbers.
- Without references, describe how a file should be be created to distribute a password to allow Mac OS X Server to access an encrypted auto server setup file.
- Given one or more remote computers, apply system settings such as static network values after a system has been installed.
- Without references, define the valid storage location(s) for saving auto-configuration files.
- Given one or more remote computers, create scripts to apply system configuration settings and set machine variables after the remote computers have been imaged.
- Without references, list the requirements for using auto-configuration settings stored in a directory.
- Given access to the Internet, list third party solutions for configuring multiple remote computers after they have been imaged.
- Given the Terminal application and a property list editor on a default installation of Mac OS X Server, create a `launchd` item to launch a service on demand.
- Without references, list the conditions that can be set to restrict an auto server setup file to specific computers.
- Given the Terminal application and a property list editor on a default installation of Mac OS X Server, create a `launchd` item to launch a service at a regular interval
- Without references, explain the function of byhost preferences and identify which computers they apply to.

- Given `launchctl` on a default installation of Mac OS X Server, load a `launchd` job.
- Without references, describe the underlying structure and format of Mac OS X Server's property list (.plist) architecture
- Given the ARD Admin application on a default installation of Mac OS X Server and an inactive ARD client on a default installation of Mac OS X, configure the ARD client to activate the ARD agent using the `kickstart` tool from a remote machine.
- Without references, list the tools included with Mac OS X that are capable of altering preference list (.plist) files
- Given a Mac OS X system and a script, configure the operating system to execute the script every time a user logs in.
- Without references, describe the features and benefits of Mac OS X's defaults system.
- Given a Mac OS X system and a script, configure the operating system to execute the script every time a user logs out.
- Without references, describe the purpose, features, and benefits of `launchd` and `launchctl`.
- Given a Mac OS X system, create a script that uses the `systemsetup` command to configure general system settings including date, time, computer name, and energy settings.
- Without references, list the valid locations for storing `launchd` items in a standard install of Mac OS X.
- Given a Mac OS X system, configure the network settings of the computer using the `networksetup` command.
- Given a default installation of Mac OS X, identify proper format and syntax of a `launchd` property list file.
- Given a Mac OS X system, enable ARD for a specific account using the `kickstart` command.
- Without references, list the common triggers `launchd` "understands" by default for launching jobs.
- Given a default installation of Mac OS X, configure computer settings using defaults.
- Without references, list the common keys included in a `launchd` property list file
- Given a default installation of Mac OS X and installed developer tools, configure application preference settings using an XML-compatible text editor.
- Given the Terminal application and a property list editor on a default installation of Mac OS X Server, create a `launchd` item to launch a service at startup
- Without references, explain what a login hook is.

- Without references, identify which Mac OS X command-line utility is used to configure general system settings.
- Without references, identify the Mac OS X command-line utility that is used to configure network settings in System Preferences.
- Without references, state which Mac OS X command-line utility is used to enable ARD remote management for a specific local administrator account.
- Without references, identify which Mac OS X command-line utility is the primary tool for reading and writing directory system data.
- Without references, identify which Mac OS X command-line utility should be used to bind a Mac OS X system to an Active Directory service.
- Without references, identify which Mac OS X command-line utility should be used to bind a Mac OS X system to an LDAP service.
- Without references, list the order of precedence of the restriction conditions that can be applied to specify which auto server setup file should be applied to a given computer.

## Chapter Six Review Questions

After completing Chapter Six, you should be able to answer the following questions.

1. What are some command-line tools that you can use to configure primary Mac OS X settings?
2. What are the command-line tools used for configuring Directory Service settings?
3. What is the default underlying format for many Mac OS X preference files?
4. What tools can be used to modify Mac OS X preference files?
5. What techniques can be used to automatically run scripts on Mac OS X?
6. What are the two primary types of `launchd` jobs? How are they configured?
7. To create a `launchd` configuration file that will run a job at startup, what are the three required keys in the configuration file?
8. How does starting a job automatically with `loginwindow` differ from starting a job automatically with a launch agent?
9. What basic server settings are required during the initial Mac OS X Server setup?
10. How can you automate the configuration of a newly installed Mac OS X Server system?

**11.** In what order does the Server Assistant search restriction settings in a server setup profile?

## Chapter Seven: System Maintenance

Upon completion of Chapter Seven, "System Maintenance", you should be able to complete the following tasks. The *eight* items from this chapter that appear on the exam, are drawn randomly from the following objectives:

- Given Apple Remote Desktop and a number of Macintosh computer, configure ARD to monitor/track hardware and software.
- Given access to the Internet, list available license and software tracking systems.
- Without references, define the following terms: Apple Remote Desktop, Task Server
- Given a Mac OS X Server computer, list all of the currently available software updates provided by Apple.
- Without references, state how to configure a router to prevent Mac OS X computers on the local network from accessing and downloading updates from Apple's update servers.
- Given a list of software updates provided by Apple, identify software updates that are applicable to a given set of hardware and software.
- Without references, state the default location where updates downloaded from Apple are stored on a Software Update server.
- Given a Mac OS X Server computer configured to act as a Software Update server, configure the Software Update Service to automatically copy to the server all software updates provided by Apple.
- Without references, state the preference where you set the URL of the Software Update server to be accessed for software updates.
- Given a Mac OS X Server computer configured to act as a Software Update server and a list of software updates provided by Apple, configure the Software Update service to download from Apple only the listed updates.
- Without references, state what process on a Mac OS X Server computer is used to synchronize updates between the server and Apple's software update servers.
- Given a Mac OS X Server computer configured to act as a Software Update server, configure the Software Update service to automatically enable all updates copied down from Apple.
- Without references, identify which process is used to provide the software update service on a Mac OS X Server computer.
- Given a Mac OS X Server computer configured to act as a Software Update server and a list of software updates stored on the server, configure the Software Update service to share only the specified updates to other computers.

- Without references, state which file should be modified to reconfigure the Software Update service on one Mac OS X Server to retrieve updates from a second Mac OS X Server computer.
- Set up a test Software Update server to test distribution of updates provided by Apple before enabling the updates on an organization's primary Software Update server.
- Given a Mac OS X Server computer hosting the Software Update service, configure the server to limit the network bandwidth used by the Software Update service.
- Given a Mac OS X computer, and a Mac OS X Server computer that is running the Software Update service, configure the preferences on the client computer to use the specified Software Update service to access available updates.
- Given a Mac OS X Server computer that is managing the preferences of one or more Mac OS X computer and a Mac OS X Server computer that is running the Software Update service, configure the client computers to use the given Software Update service to access available updates.
- Given a Mac OS X Server  computer, configure the Software Update service to identify and download software updates provided by the Software Update service running on another Mac OS X Server computer.
- Given a Mac OS X Server computer with the Software Update service not functioning correctly, troubleshoot the server so that the client computers are able to access and download updates correctly.
- Given the Apple Remote Desktop 3 application on a default installation of Mac OS X, configure an Apple Remote Desktop task server.
- Given a description of an organization's computers, network infrastructure, and organizational needs, create a document that describes the policies and processes of a context-appropriate change management plan for OS and Security updates and upgrades.
- Given a list of software to be deployed, select a deployment method, or combination of methods, to distribute the software.
- Given a list of computers and software to deploy, identify during the planning state the appropriate methods for deploying software.
- Given access to the Internet, identify third party products that can be used as supplements or replacements for Apple-developed software and hardware.
- Given a deployment plan, modify the plan to incorporate steps to roll-back an update or software release should issues be encountered.
- Given a description of a target audience, create a policy permitting image modification.

## Chapter Seven Review Questions

After completing Chapter Seven, you should be able to answer the following questions.

1. What are the three primary concepts that you should consider as part of a complete system maintenance plan?
2. What service does the ARD Task Server provide?
3. What three methods can you use to manage ARD access privileges with Directory Services?
4. Where can you place UNIX scripts to run automatically on a periodic basis?
5. How do you configure a Mac OS X client to use a custom Software Update server?
6. What should be blocked to prevent access to the main Software Update servers?
7. To set up cascading Software Update servers, what file should you update on a secondary server to retrieve updates from another primary Software Update server?
8. Where are the updates stored on a Software Update server?
9. What processes are used to provide the Software Update service?

## Sample Test Questions

Below is a selection of ten questions similar in style and content to those presented in the Mac OS X Deployment 10.6 Exam. The answers are provided below the questions. Please note that UNIX commands and processes are shown in monospace font in both these Sample Questions and in the actual exam.

1. Which statement best defines the term "bundle" as it applies to the Mac OS X v10.6 file system?

   **A.** A folder that is invisible in the Finder

   **B.** A folder of files that the Finder displays as a single file

   **C.** A folder of files that have been gathered and organized for deployment

   **D.** A hierarchical directory structure containing an executable code and related resources

2. Which command-line tool can display the ID of a specific installation package?

   **A.** `pkgs`

   **B.** `pkgutil`

   **C.** `swupdate`

**D.** `packagemaker`

**3.** In Mac OS X v10.6, which tool do you use to restore a multicasted image to a target volume?

**A.** `asr`

**B.** `hdiutil`

**C.** `diskutil`

**D.** Disk Utility

**E.** System Image Utility

**4.** Your organization has 100 Intel iMac computers. You are creating a NetInstall image on a Mac OS X Server v10.6 computer. Which Automator action should you add if you want to specify that the finished image can be accessed only by a specific subset of your iMac computers?

**A.** Define Image Source

**B.** Filter Computer Models

**C.** Filter Clients by IP Address

**D.** Customize Package Selection

**E.** Filter Clients by MAC Address

**F.** Apply System Configuration Settings

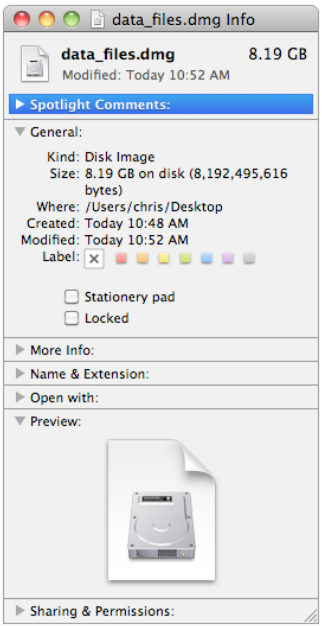
**5.** You are adding a RAID system to your IT infrastructure. The new RAID system will consume electricity at a maximum rate of 600 watts and will be connected to a 120 volt outlet. How many amperes of electric current must be supplied in order to power this RAID system?

**A.** 1.8 amps

**B.** 5 amps

**C.** 8 amps

**D.** 10 amps




**6.** You have created the disk image shown in the screenshot above. Which command can you enter in Terminal to convert this disk image into four files that will appear as a single volume when they are downloaded and opened on a Mac OS X computer?

**A.** `hdiutil convert -o data_part -count 4 data_files.dmg`

**B.** `diskutil convert -o data_part -count 4 data_files.dmg`

**C.** `hdiutil segment -o data_part -segmentCount 4 data_files.dmg`

**D.** `diskutil segment -o data_part -segmentCount 4 data_files.dmg`

**7.** In Mac OS X, what extension follows DVD and CD master disk image names?

**A.** .dmg

**B.** .dvd

**C.** .cdr

**D.** .dcm

**E.** .img

**8.** In a Mac OS X v10.6 file system, Disk Utility can repair permissions errors in which files?

**A.** All files installed by the packages listed in the standard packages list

**B.** All files installed from the Install DVD that shipped with the computer

**C.** All files listed in the BOMs in all of the .pkg files in /Library/Receipts/

**D.** All files listed in the BOMs in all of the .pkg files in /System/Library/Receipts/

**9.** You are creating a NetBoot image in Mac OS X Server v10.6. What is the minimum version of Mac OS X that you can use as the source for the NetBoot image?

**A.** Mac OS X v10.3.9

**B.** Mac OS X v10.4.0

**C.** Mac OS X v10.4.8

**D.** Mac OS X v10.5.0

**E.** Mac OS X v10.6.0

**10.** How can you start up in target disk mode a Mac OS X-compatible computer that has a FireWire port?

**A.** Hold down the T key on the keyboard while the computer starts up, until an icon appears on the screen.

**B.** Hold down the Option key on the keyboard while the computer starts up, until a dialog appears, and click the Target Disk Mode button.

**C.** Hold down the S key on the keyboard while the computer starts up, and type the command reboot -target -firewire at the command line.

**D.** Insert the Mac OS X Install DVD, and hold down the C key on the keyboard while the computer starts up, then choose Target Disk Mode from the Utilities menu, and choose Restart from the Apple menu.

### Answers

1. D
2. B
3. A
4. E
5. B
6. C
7. C
8. A
9. E
10. A

## FAQ

Please visit training.apple.com/certification/faq to see answers to common questions regarding Apple Certification. If you do not find the answer to your question, then email us. Please allow at least two business days for a response to your email.