

Deploying Dual-Boot Computers in an Open Lab Environment

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Introduction:

This guide outlines a detailed procedure for deploying dual-boot Macintosh computers in an open-access lab environment. The guide includes customizations that are unique to our environment, so it is indented to be an illustration of one type of setup – not a catchall for every dual-boot scenario.

Build – This section outlines building your “model” computer that you will use to create your deployment image. This is by far the most time-consuming part of the process.

1. Select you model machine - it should be “best of breed” and most similar to the machines that you will be deploying the image to
2. Install Mac OS X
 - a. Using a Mac OS X CD, run through the standard Mac OS installation procedure
 - b. Keep the installation as light as possible – remove any printer drivers or programs that will not be used
 - c. Install OS updates
3. Install customizations to Mac OS X
 - a. Install additional applications - our additional applications are:
 - i. Firefox
 - ii. Google Earth
 - iii. Microsoft Office
 - iv. Real Player
 - v. Lab Stats (Lab usage tracking software)
 - b. Set the login screen background
 - i. Create an image of your own design that is the same or higher resolution than the highest native resolution on the computers you will be deploying the image to
 - ii. Save the image as a JPEG image named “DefaultDesktop.jpg”
 - iii. Copy the file into /System/Library/CoreServices/ - note that you will be overwriting the existing “DefaultDesktop.jpg” image file
 - iv. The login background will now be the background that you created
 - c. Turn off automatic user login
 - i. In the “Accounts” control panel, click on “Login Options”
 - ii. In the “Automatic Login” field, select “Disabled”
 - iii. For “Display login window as” select “Name and Password”
 - d. Configure default user profile

- i. Create a new, non-admin user named “template” with any password of your choice
 - ii. Login to the machine with the “template” user
 - iii. Configure any and all user specific settings:
 1. Default user desktop background – this can easily include important messages to your users printed right on the desktop
 2. Items in the “Dock”
 3. Default home pages in web browsers
 4. Right-click functionality in “Keyboard and Mouse” control panel
 5. Login Items in the “Accounts” control panel under the “Login Items” tab
 6. Shared network space mappings
 - a. Drag and drop network share to login items in the “Accounts” control panel
 - b. OR: Create script to mount network share and set it as a login item
 7. Optimize program settings by opening all programs and dealing with all automated dialog boxes so that users will not see them at each login
 8. Set default program save locations – for example, you may want to set Microsoft Office’s default save location to be a network share
 9. Setup a printer and/or configure default printer settings (duplex etc.)
 10. Setup any other desired customizations
 - iv. Log out of the “template” user
 - v. Enable the “Root” user (note, if you are familiar with the command line, you can and may wish to skip this step)
 1. From the Finder's Go menu, choose “Utilities”
 2. Open “Directory Utility”
 3. Click the lock in the Directory Utility window
 4. Enter an administrator account name and password, then click “OK”
 5. Choose “Enable Root User” from the Edit menu
 6. Enter the root password you wish to use in both the Password and Verify fields, then click “OK”
 - vi. Copy template user files into default user directory (note, if you are familiar with the command line, you can do this using the Terminal application)
 1. Login to the computer as the root user
 2. Copy all files from the folder /Users/template into the folder /System/Library/User Template/English.lproj
 3. Logout of the root user
- e. Setup management scripts
- i. Setup script to remove user folders at startup - NOTE!! This requires user education about not saving files to the local computer, as they will be deleted when the computer boots

- ii. Setup script to logout and reboot computer after a logged in user exceeds idle time limit - in our environment this is set to 15 minutes
 - iii. Setup script to allow users to reboot into Windows with a simple double-click
 - iv. Setup script to reboot computer into Windows for the scheduled installation of Windows updates
4. Install Windows OS
- a. Insert a Windows install disk of your choice – this guide currently assumes a Windows XP SP3 install CD
 - b. From the Finder’s “Go” menu, select “Utilities”
 - c. Open “Boot Camp Assistant”
 - d. When Boot Camp asks you to partition your drive, be conservative! Your Windows partition on your model computer **MUST** be smaller than the destination partition on the computers you will eventually deploy the image to In our environment, we set the Windows partition on the model computer to be 20GB
 - e. Follow the rest of the on-screen Boot Camp instructions to begin the Windows Installation
 - f. Once the initial Windows OS installation is complete and the computer is booted into Windows, insert a Mac OS X install disk - the Boot Camp setup installer should begin automatically
 - g. Allow the computer to complete the Boot Camp setup in Windows - this configures all of the drivers and utilities that Windows needs to operate the Mac hardware
 - h. Install Windows updates
 - i. Open Internet Explorer and go to update.microsoft.com
 - ii. Follow the in-browser instructions to find and install all Windows updates
5. Configure the Windows OS Installation
- a. Install additional applications - our additional applications are:
 - i. Adobe Acrobat Reader
 - ii. Adobe Flash Player
 - iii. CDBurnerXP Pro (Free CD/DVD burning software)
 - iv. Faronics Deep Freeze
 - v. Firefox
 - vi. Google Earth
 - vii. Java
 - viii. Lab Stats (Lab usage tracking software)
 - ix. MatLab
 - x. Microsoft NET framework
 - xi. Microsoft Office
 - xii. Quicktime
 - xiii. Real Player
 - xiv. Symantec Endpoint Protection
 - xv. VLC Media Player

- b. Set default login background
 - i. Create an image of your own design that is the same or higher resolution than the highest native resolution on the computers you will be deploying the image to
 - ii. Save the image as a BMP image file named “DefaultDesktop.bmp”
 - iii. Copy the file into C:\Windows\ - Note that you will be overwriting the existing “DefaultDesktop.bmp” image file
- c. Set the C: drive name to “.Windows” so that it will not appear in the Mac OS
 - i. Open “My Computer”
 - ii. Right-Click on the “C:” drive and select “Rename”
 - iii. Rename the drive to “Windows” (no quotes)
 - iv. This will cause the drive to be “invisible” to the Mac OS – note that this can cause some imaging tools to be unable to read the Windows partition
- d. Configure default user profile
 - i. Login to the computer as the local administrator
 - ii. Create a user named “template”
 - iii. Login to the machine with the “template” user
 - iv. Configure any and all user specific settings:
 - 1. Default user desktop background – this can easily include important messages to your users printed right on the desktop
 - 2. Items in the “Start” menu
 - 3. Default home pages in web browsers
 - 4. Login Items in the folder “Startup Items” folder inside the “Start” menu folder
 - a. Script to mount network share(s) at login
 - b. Script to map network printer(s)
 - c. Other desired scripts
 - 5. Edit registry to suppress balloon popups
 - a. Click on the “Start” menu and select “Run”
 - b. Enter “regedit” and hit enter
 - c. Once the registry editor is displayed, navigate to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced
 - d. Create a new DWORD value named “EnableBalloonTips” and give it the value “0”
 - 6. Optimize program settings by opening all programs and dealing with all automated dialog boxes so that users will not see them at each login
 - 7. Set default program save locations – for example, you may want to set Microsoft Office’s default save location to be a network share
 - 8. Other customizations
 - v. Log out of the “template” user
 - vi. Login as the local administrator
 - vii. Copy template user files into default user directory
 - 1. Right-click on “My Computer” and select “Properties”
 - 2. Click the “Advanced” tab

3. Under the “User Profiles” section, click “Settings”
4. On the list of existing user profiles, you should see the local user named “template” that you created previously
5. Click on the “template” user and then click “Copy To”
6. On the “Copy To” Window, enter “C:\Documents and Settings\Default User
7. Click “OK”
8. When prompted if you want to continue, click “Yes”
- e. Configure anti-virus software to update during a specified maintenance window (our maintenance window is Sunday morning between 4am and 8am)
- f. Configure Windows updates to install during specified maintenance window (in our environment, this is handled by Deep Freeze)
- g. Modify registry to set numlock to be on by default
 - i. Click on the “Start” menu and select “Run”
 - ii. Enter “regedit” and hit enter
 - iii. Once the registry editor is displayed, navigate to HKEY_USERS\Default\Control Panel\Keyboard
 - iv. Change the value for “InitialKeyboardIndicators” from “0” to “2”
- h. Configure Windows to read the system clock the same way that Mac OS does:
 - i. Edit Windows registry to view system clock in “Real Time”
 1. On the “Start” menu, select “Run”
 2. Type in “regedit” and hit enter
 3. In the registry editor, navigate to:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\TimeZoneInformation\
 4. In this location in the registry create a new DWORD value named “RealTimeIsUniversal” and set its value to 1
 - ii. Disable Windows Time service
 1. On the “Start” menu, select “Run”
 2. Type in “services.msc” and hit enter
 3. In the Windows services list, find the “Windows Time” Service
 4. Right-click on the service, and select “Properties”
 5. In the “Startup Type” drop-down, select “Disabled”
 6. Click “Apply”
- i. Name the computer something generic such as “temp”

Image – This portion of the guide outlines the process of creating a disk image from your model computer. The tools used will be Apple’s Disk Utility, and Mike Bombich’s NetRestore.

1. Prepare Windows partition for deployment using Microsoft SysPrep (if desired)
 - a. Login to Windows as a local admin user
 - b. Google “Download Windows XP SP3 Deployment Tools” and download the file directly from Microsoft
 - c. The file downloaded will be called “deploy.cab”
 - d. On the root directory of the Windows HD, create a new folder called “sysprep”

- e. Open the “deploy.cab” file and copy its contents into the C:\sysprep
 - f. If prompted with security warnings, simply bypass them
 - g. Create your customized sysprep answer file:
 - i. In the new sysprep folder, open the file “setupmgr.exe”
 - ii. When shown the welcome screen, click “Next” to continue
 - iii. Select “Create new” and click next
 - iv. Select “Sysprep setup” to create a sysprep answer file for “Mini Setup” then click “Next”
 - v. Select “Windows XP Professional” and click “Next”
 - vi. Click “Yes, fully automate the installation” and click “Next”
 - vii. Enter name and organization, then click “Next”
 - viii. Leave the Display settings as default, unless otherwise desired, and click, “Next”
 - ix. Enter time zone, then click “Next”
 - x. Enter product Key, then click “Next”
 - xi. For computer Name, select “Automatically generate computer name”
Note, for our setup we will tweak this setting late to prompt us for a computer name during first-run
 - xii. Enter Admin Password, and click “Next”
 - xiii. For networking components, select “Typical settings” and click “Next”
 - xiv. For workgroup or domain, enter your domain information if you have one, otherwise enter a desired Workgroup and then click “Next”
 - xv. For Telephony, leave the settings as default and click “Next”
 - xvi. For Regional Settings, leave the setting as default and click “Next”
 - xvii. For Languages, select “Western Europe and United States” and then click “Next”
 - xviii. For Install Printers, leave this blank unless you want a single printer installed on all computers, then click “Next”
 - xix. For “Run Once,” “Additional Commands,” and “Identification String” you can leave all the default settings unless you want to configure them
 - xx. Click “Finish to create your “sysprep.inf” file - save it in the C:\sysprep folder
 - xxi. Close Setup Manager
 - h. When you are ready to image the Windows partition, open the “sysprep.exe” file
 - i. When prompted, click “OK” to continue
 - j. In the sysprep program window, select “Use Mini-Setup”
 - k. For the “Shutdown mode” select “Shutdown”
 - l. Click the “Reseal” button, and then click “OK”
 - m. Sysprep will begin it’s work, and then shutdown the computer - your windows partition is now ready for imaging
2. Put the model computer into Target Disk Mode by booting the computer while holding down the “T” key then connect it to your deployment system via firewire – the model computer’s partitions should now be visible accessible from your deployment system
 3. Image the Windows partition using Bombich’s NetRestore

- a. Google “Net Restore” and download the newest version you can find
 - b. Install it in your Applications\Utilities folder
 - c. Launch “NetRestore Helper”
 - d. On the “Master Disk” dropdown menu, select your Windows partition (should be called “.Windows” if named using instructions in this guide)
 - e. Click the “Lock” icon and authenticate as an admin user
 - f. Click “Create Master Image”
 - g. Name the file “Win.dmg” and save it to your desired location on your deployment server
4. Image the Mac OS partition using Apple’s Disk Utility
 - a. Open your Applications\Utilities folder, and open “Disk Utility”
 - b. Click on the Macintosh partition that is mounted via firewire
 - c. Click the “New image” button at on the top toolbar
 - d. Name your file “Mac.dmg” and save it to your desired location on your deployment server

Deploy – This portion of the guide outlines the process for deploying your completed image to your lab computers. The tools used will be Apple’s NetBoot process and Bombich’s NetRestore.

1. Configure NetBoot on your Mac OS X Server
 - a. Open the “Server Admin” application
 - b. Click on “Settings” and then on the “Services” tab
 - c. Click on the checkbox next to “Netboot” and click “Save” to enable the Netboot service
 - d. On the left-side column, you should now see the Netboot service - click on it to display the Netboot window
 - e. Click on the “Settings” button to view the Netboot settings
 - f. Under the “General” tab, select the network port you wish to use to serve Netboot images from, and select the HD where your Images and Client Data will be stored
 - g. Click, “Save” and then click “Start NetBoot”
2. Create NetInstall Set on your Mac OS X server to use for network deployment of images
 - a. Open “Net Restore Helper”
 - b. In the “Name” field, enter a name of your choice
 - c. In the “Image ID” field, enter a number of your choice ranging from 1 to 4095
 - d. In the “Description” field, enter a description for your image
 - e. Click the “Lock” icon and authenticate as a local admin user
 - f. Click on “Save NetInstall-Restore set”
 - g. Give your file a name of your choice and then save it to Library\NetBoot\NetBootSP0
 - h. Go back into the Mac OS Server admin and back into the NetBoot configuration, and select the “Images” tab
 - i. You should see the image that you just created - check the boxes for “Enable” and “Default” next to your created Image.

3. Move your “Mac.dmg” and “Win.dmg” images into the folder Library\NetBoot\NetbootSP0\Resources\ - this will allow NetRestore to easily find your images for deployment
4. NetBoot computer(s) to be imaged:
 - a. If your computer(s) are connected to your network on the same subnet as your server, you can simply boot them while holding down the “N” key on their keyboard
 - b. If the computer(s) to be imaged are on a different subnet than the server, you will need to use a terminal command to point them to your server - for more information on this, check out Mike Bombich’s page on netbooting across subnets: <http://wwwbombichcom/mactips/nbas.html>
5. Image the Mac Partition:
 - a. Once the machine being imaged is booted, partition its drive into 2 partitions
 - i. On the toolbar at the top, of the screen, click “Utilities” and select “Disk Utility”
 - ii. Click the main local drive, and then click on the “Partition” tab
 - iii. Under “Volume Scheme”, select “2 Partitions”
 - iv. Name the first “Macintosh HD” or another name of your choice - set it’s format type as “Mac OS Extended (Journaled)”
 - v. Name the second partition “WINDOWS” and set its format type to “MS-DOS (FAT)”
 - vi. Click “Apply”
 - vii. Close Disk Utility
 - b. On the displayed “NetRestore” window, go to the the “Source” drop-down and select the “Mac.dmg” image
 - c. On the “Target” drop-down, select the Mac partition that is to be imaged
 - d. Un-check the box labeled “verify restored disk” if desired – it makes the deployment process take twice as long
 - e. Wait as the image is deployed across the network - he amount of time this process takes will be determined by the speed of your network, as well as how many computers are being imaged simultaneously
6. Image the Windows Partition
 - a. While, still in NetRestore, go to the “Source” drop-down and select you’re the “Win.dmg” image
 - b. On the “Target” drop-down, select the Windows partition that is to be imaged
 - c. Click “Restore” to begin the restore process
 - d. Wait for the Windows partition imaging procedure to complete
7. Reboot your newly imaged computer(s) to boot from their own local Mac OS partition
8. Configure the Mac OS partition with any last-minute customizations that you may desire
 - a. Naming computer

- b. Adding printers
 - c. Joining Active Directory domain
 - i. Open the folder Applications\Utilities\ and open “Directory Utility”
 - ii. Click the “Lock” icon and authenticate as an admin user
 - iii. Click the “+” button
 - iv. Select the type of directory service you wish to use (Active Directory, or Open Directory)
 - v. Fill in the requested information, and then click “OK”
 - vi. NOTE!!! If you are joining the Mac OS to a Windows Active Directory domain, make sure your “Computer ID” contains only alphanumeric characters (A thru Z, 0 thru 9) - this is imperative to avoiding problems with AD authentication
9. Configure the Windows partition with any last-minute customizations that you may need
- a. Naming the computer
 - b. Join Active Directory domain
 - c. Enable Faronics Deep Freeze to “Freeze” the Windows partition to protect it

References

- Mike Bombich – Deploying a Dual-boot Macintosh
 - <http://www.bombich.com/mactips/dualboot.html>
- Apple Support Library
 - <http://support.apple.com/>
- Mac OS X Hints
 - <http://www.macosxhints.com/>
- Microsoft TechNet
 - <http://technet.microsoft.com/>
- Mac nnforums
 - <http://forums.macnn.com/>