What’s it all about
From Software Distribution to Imaging
The Software Imaging & Deployment Process

Major steps

[Image of a process with steps related to software imaging and deployment]
Terminology

UDIF  Image  HFS+  Boot Camp
Virtualization  NetBoot  Package
Payload  NetInstall  Remote Desktop
Hypervisor  Bundle  Multicast
Receipt  Cloning  ASR
Extended Attributes  PackageMaker
What is an image?

“Disk images are files that behave like disk volumes”
What is NetBoot?

"A service that boots clients over the network from an image that looks and acts like a mountable disk or volume and contains all the system software needed to act as a startup disk."
What is NetInstall?

“Starts up the client computer long enough to install software from the image. The client can then start up from its own hard drive.”
What is Apple Software Restore?

“ASR (Apple Software Restore) is a tool that is used to clone disks and to restore a disk image to a machine’s hard drive."
What is a Package?

“Contains product files (the *payload*), instructions on how to add them to a Mac OS X-based system, and information used to create the install experience for the user.”
Creating an image
What to image

Deploy the current OS to any “supported” system

10.5 LEOPARD is now Universal
What to image
Verify you’re using the latest

• 10.5.6 isn’t necessarily the latest
  - verify build number
• ROM Changes from version to version
• Specific Drivers change (ie video)
• Some Exceptions
  - 10.2.7 G5
  - iBook G4 2005
  - PowerPC to Intel
  - MacBook 2008 (Penryn)
Building your image
Client system configuration suggestions

- Create at least one Administrator
- Create an Apple Remote Desktop Admin
- Install latest Apple Remote Desktop drivers
- Set the Master Password for FileVault
- Install all applications and run them once to verify license numbers etc.
- Launch Applications like MS Word to create font cache
- Enable Apple Remote Desktop
- Enable Network Time Protocol
- Delete Directory Service entries
Building your image

Things to watch out for

· Start with a clean install image
· Install all updates
· Do NOT update from a major OS version to the next (ie Tiger to Leopard)
· Recognize which apps install preferences in the user’s directory
· Verify licensing installation issues (ie. Final Cut Pro)
Preparing your image
Local Kerberos Distribution Center (LKDC)

• Must be removed for several reasons
  – eliminate any keychain entries including com.apple.kerberos.kdc
    – certificate
    – public key
    – private key
  – sudo rm -fr /var/db/krb5kdc

• Post deployment the LKDC must be recreated
  – sudo /usr/libexec/configureLocalKDC
Preparing your image
Things you may want to remove Tiger

- /private/var/db/.AppleSetupDone
- /private/var/db/netinfo/local.nidb (Tiger only)
- Delete the users home directory and preferences
Preparing your image
Things you may want to remove Leopard

- /private/var/db/.AppleSetupDone
- Delete all users on the system (in single user mode)
  - mount -uw /
  - rm -R /Library/Preferences
  - rm -R /Users/<user name>/
  - /bin/launchctl load /System/Library/LaunchDaemons/com.apple.DirectoryServices.plist &
  - dscl . -delete /Users/<user name>/
  - rm /var/db/.AppleSetupDone
Preparing your image
Things you may want to remove (cont.)

- /Library/Caches/*
- /System/Library/Caches/*
- /System/Library/Extensions.kextcache
- /System/Library/Extensions.mkext
- /private/var/volinfo.database
- /private/var/vm/swap*
Preparing your image
Things you may want to remove (cont.)

- /Library/Preferences/SystemConfiguration
  - com.apple.airport.preferences.plist
  - com.apple.PowerManagement.plist
  - NetworkInterfaces.plist
  - preferences.plist
Preparing your image

Things you may want to change

• Intro movie/sound
  – System/Library/CoreServices/Setup\ Assistant/Contents/Resources/TransitionSection.bundle/Contents/Resources
  – intro.mov
  – intro-sound.mp3
Building your image

Repair your image

- Run Disk Utility Verify Disk
- Run Disk Utility Repair Permissions
- Use a drive utility like DiskWarrior or TechTool Pro
- Run fsck
Deployment Tools
Preparing and Deploying your image

Tools of the trade

- Disk Utility
- System Image Utility
- Apple Software Restore
- NetBoot/NetInstall
- NetRestore/NetRestore Helper
- Winclone
- Carbon Copy Cloner
- Jamf Casper
- SuperDuper
- CopyCatX
Winclone

- Back up your entire Boot Camp Windows image
- Shrink/expand NTFS volumes
- Deploy the image to other systems
- Easily partition the drive on the fly
- Utilize Apple Remote Desktop to deploy Windows images across the network
- Works great with DeployStudio and the NetBoot/NetInstall Tools
DeployStudio

- Create NetBoot Sets
- Create master images for Windows and Mac OS X
- Centrally manage images and workflows
- Create default deployments
- Manage computer by computer settings
- Completely automate the process
DeployStudio

- **DeployStudio Server repository**: local folder or network sharepoint where DeployStudio stores and retrieves disk images, packages, scripts, logs and all the databases (computers and workflows).

- **DeployStudioServer daemon**: shares the repository’s databases to client applications like DeployStudio Admin and Runtime. It also manages multicast ASR instances.

- **DeployStudio Assistant**: Configure DeployStudio Server, create NetBoot images, create PXE images and create drive images for drive-to-drive deployments.

- **DeployStudio Admin**: workflows, computers, scripts and disk images are managed in this interface and called on by the Runtime.

- **DeployStudio Runtime**: deployment workflows execution tool for creating images, deploying images or running workflows.
Comparison

DeployStudio Server Repository = Images Folder

DeployStudio Assistant = NetRestore Helper

DeployStudio Runtime = NetRestore
Usage

Local Boot + Local Repository

Local Boot + Network Repository

Network Boot + Network Repository
Multicast Apple Software Restore (ASR)
Features include

- Multicast client can handle up to 20% packet loss
- The multicast server loops, so the client can retrieve lost packets
- The server and client advertise their state via Bonjour
- The multicast server does not begin sending packets until a client requests them
- The multicast server can throttle output based on a configured maximum client data rate
- Offers a TTL for multicasting through routers
- **Now supports NTFS image deployment using Winclone**
Department installations

Typical solutions acting together
Department installations

Typical solutions acting together

Network services
- Users directory
- File sharing
- Client management
- Network booting

Imaging services
- Imaging tools
- Software maintenance

Help desk
- Remote control

Ethernet network

Department 1

Department 2

Department 3
NetBoot/Install/Restore
NetBoot/Install/Restore
NetBoot/Install/Restore

Request for Bootfile via TFTP

DHCP Server

NetBoot Server
NetBoot/Install/Restore

Bootfile via TFTP

DHCP Server

NetBoot Server
NetBoot/Install/Restore

HTTP/NFS Boot Image Mount

DHCP Server

NetBoot Server
Step-by-Step Image Creation and Deployment
Deploying a Dual Boot Configuration

Steps - Part 1

- Set up OS X Server
  - Set up DNS
  - Set up DHCP (if necessary)
  - Set up Open Directory
  - Set up AFP
  - Configure NetBoot
  - Create users and groups
Deploying a Dual Boot Configuration
Steps - Part 2

- Install Mac OS X
- Install & test Mac OS X applications
- Install Windows XP on an NTFS partition
- Install Boot Camp Windows Drivers
- Install Windows Applications
- Set startup volume as Mac OS X
- Run Setup Manager then SysPrep
Deploying a Dual Boot Configuration

Steps - Part 3

• Using DeployStudio Assistant
  - Create NetBoot set
• Using DeployStudio Runtime
  - Create Mac OS X image
  - Create Windows ntfs image
• Using DeployStudio Admin
  • Create workflows
  • Specify the default workflow