

Disk Imaging and Software Deployment

How **do** we do it?
How **should** we do it?

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Our Labs

- Two Labs: 20 & 10 stations + Instructor
- Xserve G5, mostly as a file server
- All workstations Power Mac G5 or Mac Pro
- Drop-in and Class use
- After hours access via proximity card
- Interdisciplinary = huge software load (60 GB)
 - Audio, Video, Imaging, Music, CAD, modelling
- One full-time technician; student help during the business day in Fall/Winter

How **Do** We Do It?

1. Build the master
2. Deploy software loads
3. Lock systems down
4. Student file storage
5. Deploy updates

1. Build The Master



- a. Install old master disk image on a lab machine
- b. Install updates onto machine
- c. Create disk image using NetRestore Helper and bootable FireWire800 external hard drive
- d. For machines with other processor type, install an OS and use Migration Assistant to create a second master image

1. Build The Master



Pros

- Everything set up the way you want it
- Can be deployed in a number of ways

Cons

- Difficult to make small changes
- Multiple masters needed if you have both Intel and PPC Macs
- Hard to replicate if master goes bad

2. Deploy Software Loads



- a. Boot machine from FireWire drive (or NetBoot from server)
- b. Overwrite hard drive with disk image using NetRestore (either locally or from server), setting IP address and name
- c. Manually post-process for copy-protected software and other finicky settings

2. Deploy Software Loads



Pros

- Consistent deployment, regardless of size of disk image
- Hard drives are relatively cheap and offer faster deployment than servers in most cases
- Tried and true solution

Cons

- Requires multiple hard drives or a fast server with available storage space
- Network installs can bog down as images get larger
- May be hard to get enough DHCP addresses on your subnet
- Lots of human interaction needed when using Hard Drive solution

3. Lock Systems Down



- Three local accounts on each machine:
 - Admin account (Technicians)
 - Standard account (Instructors)
 - Fine Arts User account (everyone else)
- Only specific Applications and Preference Panels allowed for Fine Arts User
 - managed manually by altering the MCX settings plist, accessed using within NetInfo
- No OD or AD management

3. Lock Systems Down



Pros

- Fine control of permissions possible
- Automatically deployed with image

Cons

- Adding an application to the Allowed list requires touching each machine
- Does not support portable home directories or individual accounts

4. Student File Storage

- Students generally save locally due to the file sizes they are dealing with
- About 400 GB of storage space on server
- Flash and Hard Drives encouraged for backup and portability
- Have provided a simpler way to connect to our servers and from machine to machine

5. Deploy Updates

- Apple Remote Desktop



How **Should** We Do It?

Lessons from Apple and Macworld Expo 2008

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A network diagram with 'learn' at the center. It is connected to 'instruct', 'teach', 'read', and 'study'. There are also unlabelled nodes connected to 'instruct', 'teach', and 'study'. An orange button labeled 'TRY IT NOW!' is in the top right corner.

THINKMAP[™] VISUAL THESAURUS[™]

A partial network diagram showing 'instruct' and 'learn' connected. An orange button labeled 'TRY IT NOW!' is in the top right corner.

1. Build The Master



Out of the Box

How to best create deployment images?

- Use disk images and packages
- Really, use packages, not scripts or hand-rolled collections of files
- Really, use packages
- Packagemaker, JAMF Composer, Iceberg, loggen

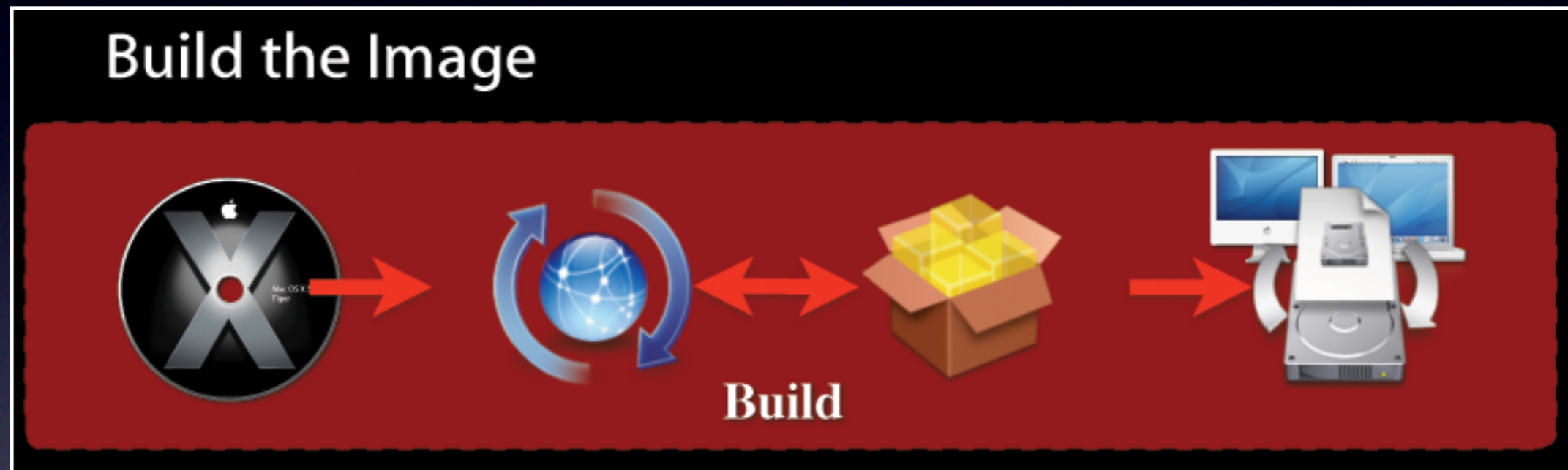
- Packagemaker, JAMF Composer, Iceberg, loggen
- Really, use packages

Josh Wisenbaker & Joel Rennich, AFP548.com
Macworld Conference and Expo 2008

1. Build The Master



Using InstaDMG (www.afp548.com):



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1. Build The Master



Pros

- Easy to change components, including OS!
- Easier to troubleshoot
- Can have a greater variety of deployments (incl. user desktops)
- Since packages can be deployed with ARD, knowledge can be leveraged for quick fixes and maintenance

Cons

- Image creation may be an “overnight” task
- Requires change in operating procedures

2. Deploy Software Loads

Simple			Complex		
Install DVDs	External Drive	Image from server	NetBoot/NetInstall	NetRestore	mASR
Low Cost Quick and Easy Can be done by the end user	Fast Simple	Host image on anything Always up to date	Fully automated No local boot	Fully automated No local boot Many image options	Many at once
Annoying Lots of DVDs Updates are hard	Expensive Lots of HDDs Not very scaleable	Still need local boot	Server Networking needs	Server Knowledge	Server Network!
1-15	1-25	1-50	1-50	5-100	20-2000+

1-12	1-52	1-20	1-20	2-100	50-5000+
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3. Lock Systems Down



- Restrict users' privileges via **policy** whenever possible
 - Run Open Directory server and manage centrally
 - Can also have users authenticate via Active Directory but have Open Directory control what they can do on your Macs
- Use Workgroup Manager (local) to lock down specific apps and panels
 - NetInfo is gone in Leopard

3. Lock Systems Down



Pros

- Can make changes to settings rapidly
- Can let users have their own accounts if desired

Cons

- Management by policy requires Mac OS X Server and network access by clients
- May require new learning and/or procedures

4. Student File Storage

- Local storage could be trickier, but user accounts are now possible
- Other options still work (Flash, hard drives)

5. Deploy Updates

- Apple Remote Desktop



Resources

- www.macworldencore.com
- www.afp548.com
- www.apple.com/remotedesktop
- www.macenterprise.org
(formerly MacOSXLabs.org)
- www.ucalgary.ca/iaml (these slides)