

# Deployment

Presented by: Sam Arseneau



SupportMyMac

MACTECH



# About me...

- ✦ **Sam Arseneau**
- ✦ Owner of SupportMyMac  
Ottawa-based Apple MSP
- ✦ Apple certified since Mac OS X 10.4.
- ✦ Clients: SMB, Enterprise & Government





# Agenda



- ✦ Planning
- ✦ Strategies
- ✦ Methods
- ✦ Software Deployment
- ✦ Deployment & Management Tools
- ✦ Links & Resources
- ✦ Q&A, Discussion



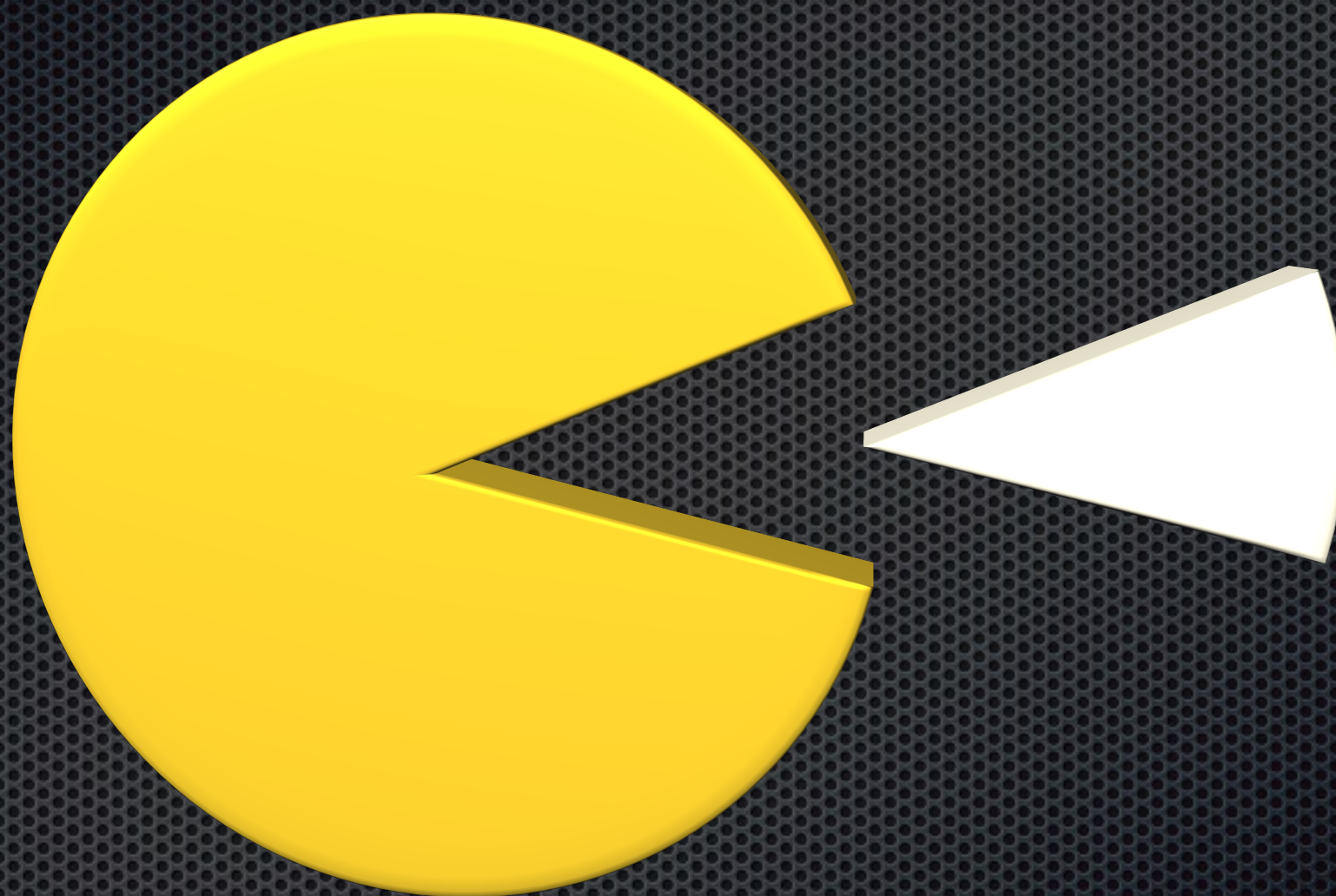


# Successful Deployments

- ✦ Putting the right tools in the right hands
- ✦ Criteria:
  - ✦ Consistency
  - ✦ Quality
  - ✦ Repeatability
- ✦ No perfect solution













# The 6 Ps of Planning



**P**roper

**P**lanning

**P**revents

**P**oor

*Pac Man.*

**P**erformance!





# Planning

- ✦ Kick off meeting: know what they're about; dream out loud
  - ✦ Gather user & security requirements, machine lifecycle
  - ✦ Understand the client's environment & budget
- ✦ Obtain client sign-off on your project
  - ✦ Scope of Work, Prerequisites, Project Acceptance
- ✦ Pre-Stage Time: Hardware, Network, Power, Quantity
- ✦ Stage Time: What could go wrong? Plan for it.





# More Planning...

- ✦ Automation is key... Time is money. Pick the right solution!
- ✦ Celebrate and learn from your wins; Document Them!
- ✦ Monetize: Rinse and Repeat!





# Deployment Methods



- ✦ **Manual, Non-Imaging** *aka* Laissez-faire
- ✦ **Checklist:** “Follow the checklist, Uncle Jim”
- ✦ **Bare Metal:** Monolithic “Golden Master Image”
- ✦ **Thin-Provisioning:** Building on top of the existing OS
- ✦ **Modular Imaging:** Package-based deployment





# Laissez-faire *aka* Manual, Non-Imaging

- ✦ The user opens up the box and sets up his/her own Mac
- ✦ This is a **really bad idea** if you are concerned about consistency, troubleshooting, configuration, or any other normal IT functions!
- ✦ No Mac will ever be the same. Ever.
- ✦ Very inefficient
- ✦ #Disaster #Fail





# Checklist Imaging



- ✦ Manually “image” by following a checklist of items to install and settings to configure
- ✦ Very time consuming but a process driven workflow
- ✦ Prone to user errors and “oops, I forgot to install that”
- ✦ No automation = No scalability
- ✦ #NotThereYet





# Monolithic “Golden Master Image”

- ✦ Why? We’ve been doing it for years... Easy to do but takes a lot of time, every time.
- ✦ New hardware requires new image because of their core OS build ([support.apple.com/kb/HT1159](https://support.apple.com/kb/HT1159))
- ✦ Image is quickly outdated. Need to re-create your image from the newest Mac.
- ✦ Requires additional post-deployment configuration
- ✦ Storage Space requirements, drain on the network





# Thin Imaging

The evolution of iMac.



## Don't be fooled!

The Macs have been getting slimmer and slimmer... but thin imaging is something totally different, my friends!



# Thin Provisioning

- ✦ It's what we refer to as an “Out-of-the-box approach”
- ✦ Fastest way to deploy
- ✦ Doesn't rely on system-specific monolithic images
- ✦ Supports Internet-based OS restores
- ✦ Human Factor Risk
- ✦ Can support a BYOD model





# Thin/Layered Imaging

- ✦ Use existing, good OS & Recovery HD
- ✦ Build packages for everything
- ✦ Build scripts for configuration
- ✦ Using tools like Casper Suite, Munki, etc.
  - ✦ Useful for BYOD environments
  - ✦ Could support major OS release within one day





# Modular Imaging

- ✦ “Gotta keep ‘em separated” (OS / Recovery Partition / Applications / Settings)
- ✦ Fast to deploy updated image for new Apple hardware
- ✦ 3rd Party applications and patches stay current
- ✦ Consistent experience across images
- ✦ BYOD “capable” as well





# Solutions for Any Budget

- ✦ Cloning
- ✦ Command Line
- ✦ Deployment Solutions
- ✦ Additional Options





# Cloning Tools





# Command Line

*asr*

*hdiutil*

*diskutil*

```
sarseneau — less — Solarized Dark xterm-256color — 81x29

ASR(8)                                BSD System Manager's Manual                                ASR(8)

NAME
  asr — Apple Software Restore; copy volumes (e.g. from disk images)

SYNOPSIS
  asr verb [options]
  asr restore —source source —target target [options]
  asr server —source source —config configuration [options]
  asr restore —source asr://source —file file [options]
  asr imagescan —source image [options]
  asr help | version

DESCRIPTION
  asr efficiently copies disk images onto volumes, either directly or via a
  multicast network stream. asr can also accurately clone volumes without
  the use of an intermediate disk image.

  In its first form, asr copies source (usually a disk image, potentially
  on an HTTP server) to target. source can be specified using a path in
  the filesystem, or an http or https URL. It can also be an asr:// URL to
  indicate a multicast source. asr can also be invoked with its second
  form to act as a multicast server. In its third form, asr will restore a
  multicast disk image to a file instead of disk volume. In its fourth
  form, asr prepares a disk image to be restored efficiently, adding whole-
  volume checksum information. help and version provide usage and version
  information, respectively.

:
```





# Software Deployment





# You deployed, now what?

- ✦ You want to deploy new apps to your workstations
- ✦ You need to deploy a new version of Flash, Office, etc.
- ✦ You need a way to package it before pushing it out.





# Packaging Tools



- ✦ Use package from vendor (if available)
- ✦ Creating .pkg can be easy with the right tools
- ✦ Many third-party packaging tools
  - ✦ PackageMaker, pkgutil, Iceberg, Packages, The Luggage, JAMF Composer, InstallEase
  - ✦ Adobe uses a tool called Adobe Application Manager Enterprise Edition (AAMEE) to create your .pkg





# Packaging Tools

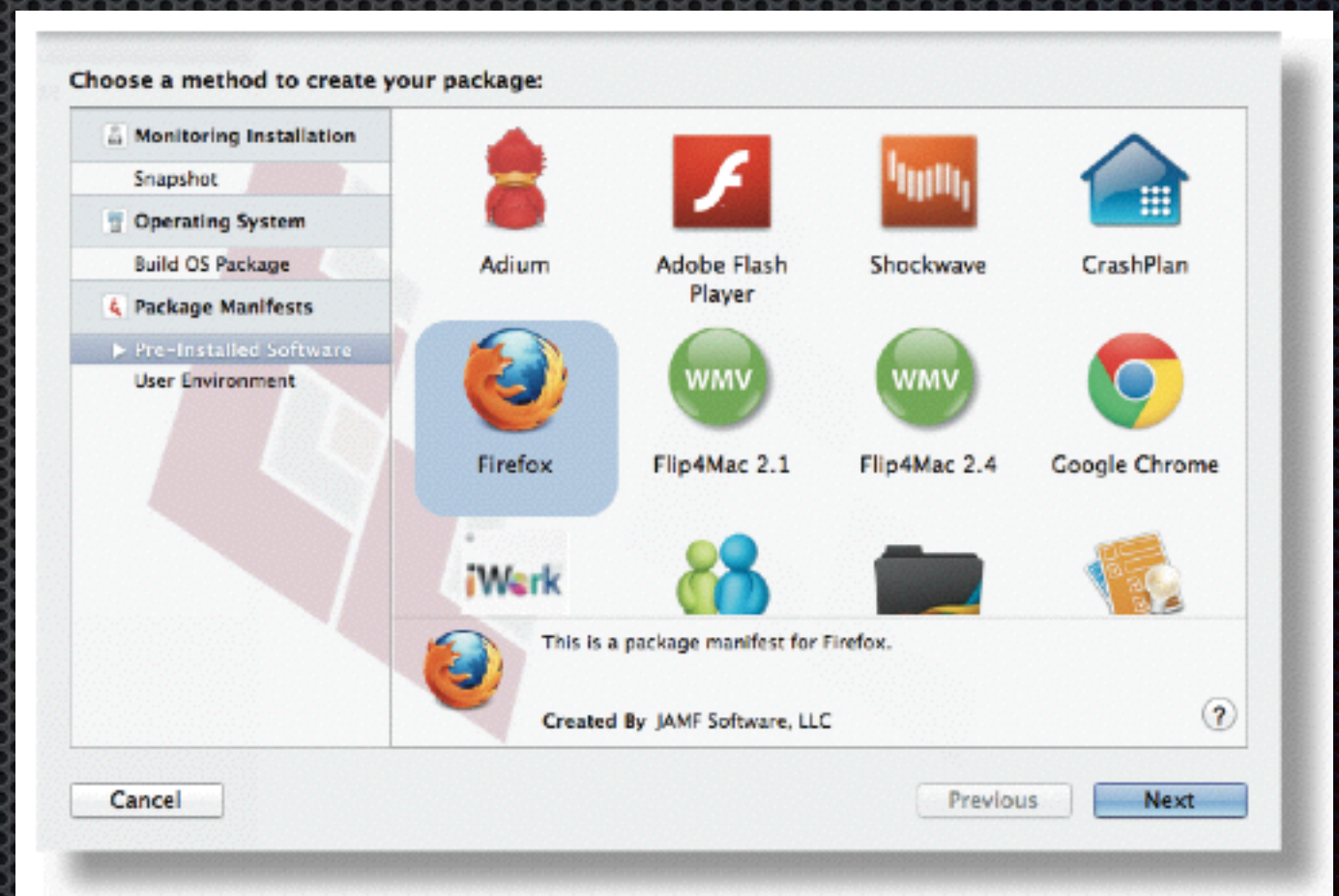


## JAMF Composer

Create Packages from  
Pre-installed software

Monitor File

System Changes





# Software Deployment

- ✦ Apple Remote Desktop
  - ✦ Remote Control/Observe (Glorified VNC)
  - ✦ Push packages manually (or use a task server)
  - ✦ Limited Reporting; Asset Management
  - ✦ \$79 (App Store)
  - ✦ Do you use ARD Inspector?
- ✦ Munki
  - ✦ Automates software deployment (pkg) & Adobe
  - ✦ Managed software updates; doesn't require admin
  - ✦ OS X Server not required; Webserver-based repository
  - ✦ Free; Available at <http://code.google.com/p/munki/>





# Deployment & Management Tools





# JAMF Casper Suite



- Modular Approach
- Packages are Everything
- Casper Tools: Casper Admin, Casper Imaging, Composer, Recon





# Casper Suite

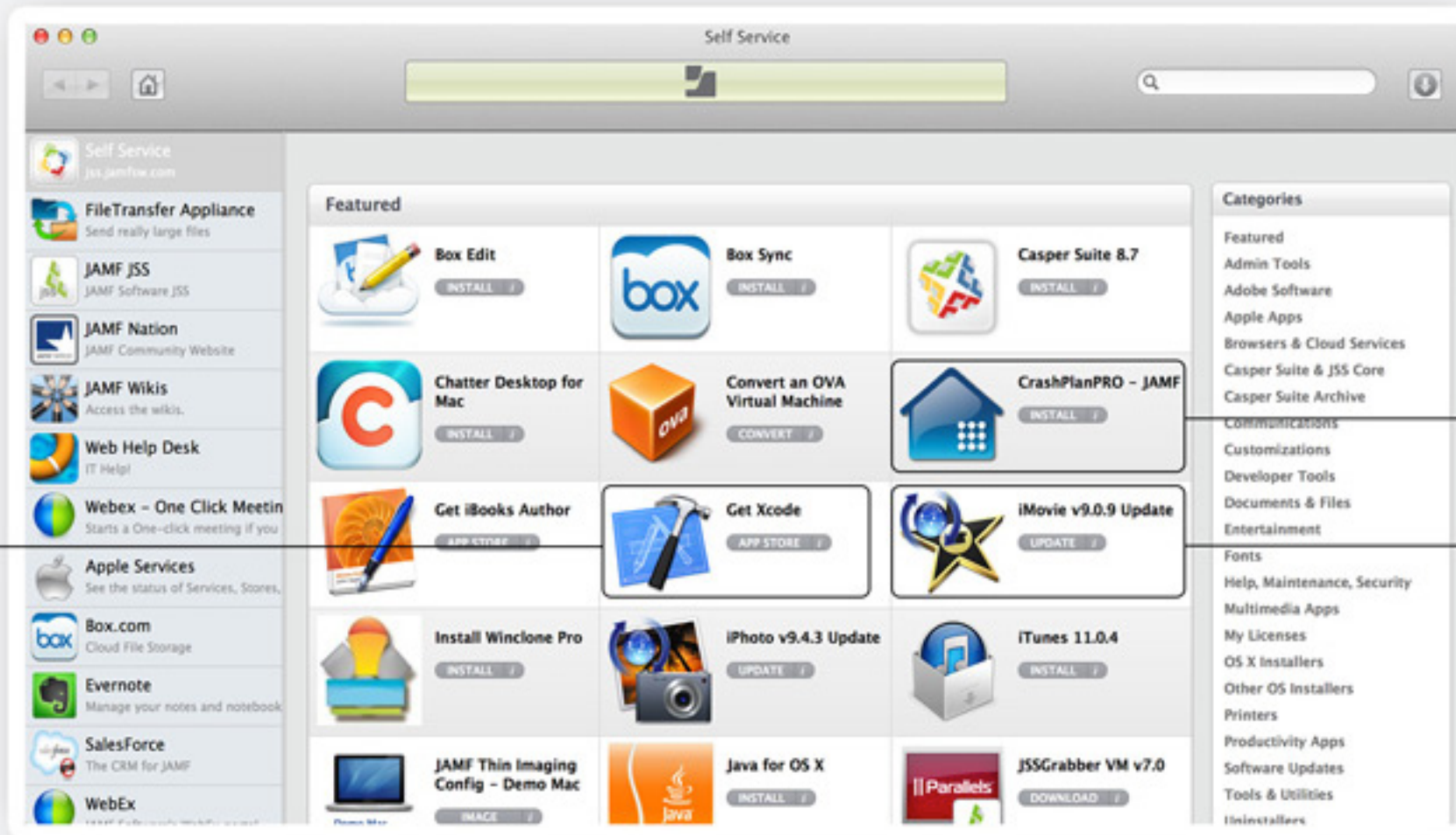
- ✦ Composer - build scripts and base OS
- ✦ Recon - scan/get machines enrolled
- ✦ Casper Admin - upload packages and build imaging workflows
- ✦ Casper Imaging - installed on your NetBoot image, runs workflows
- ✦ Casper Remote - remote assistance and instant installs





# Casper Suite

Distribute Apple  
App Store apps.



Install any  
application,  
from any vendor,  
via Self Service.

Update Apple  
App Store apps.





# DeployStudio



- ✦ Setup, create NetBoot images
- ✦ Create workflows, add
- ✦ Installed on your NetBoot image, runs workflows
- ✦ Requires OS X Server
- ✦ Cost: Free





# DeployStudio



- ✧ DeployStudio Assistant
  - ✧ Setup, create NetBoot images
- ✧ DeployStudio Admin
  - ✧ Manage configs/workflows
- ✧ DeployStudio Runtime
  - ✧ installed on your NetBoot image, runs workflows



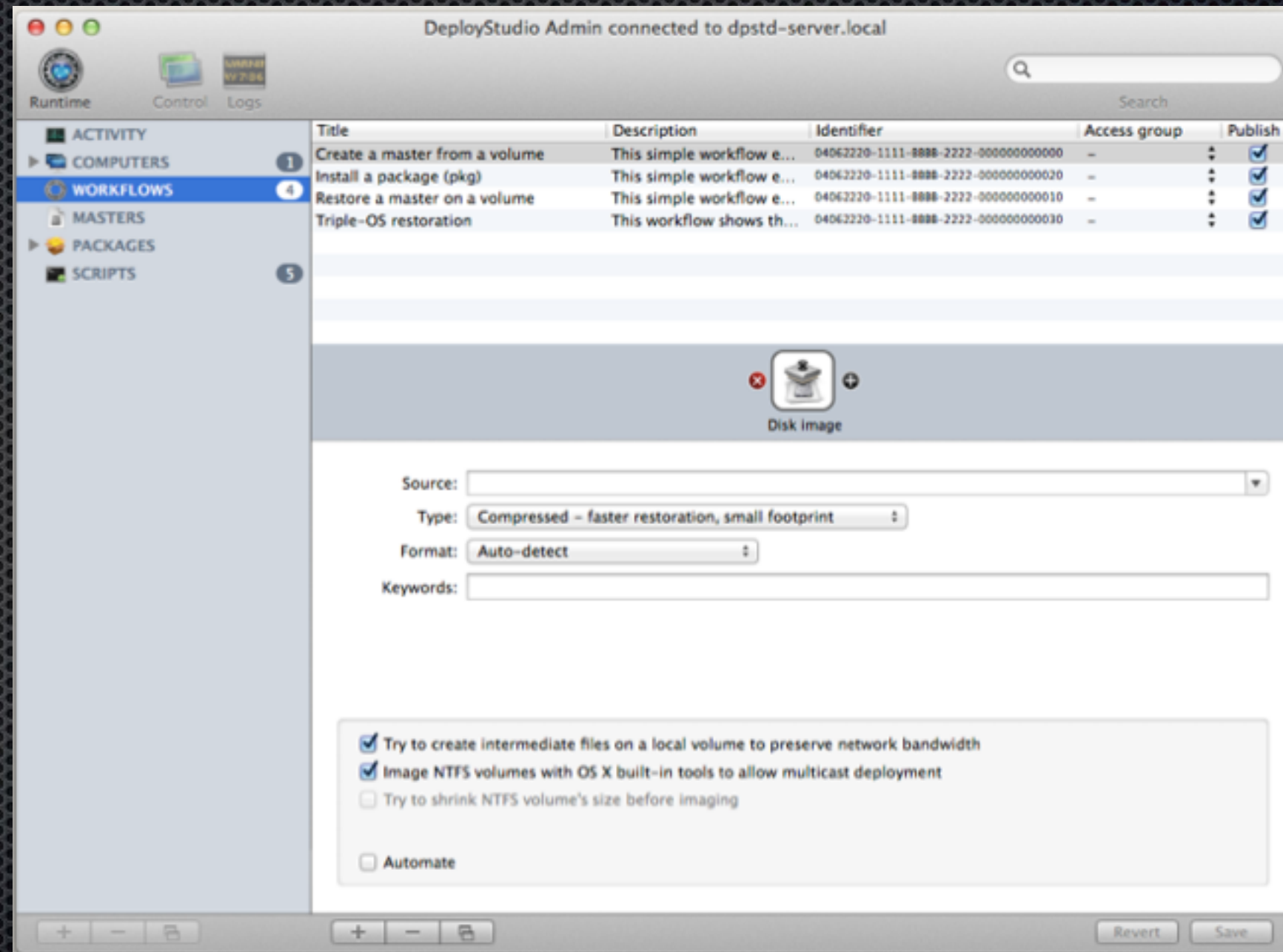


# DeployStudio



4 sample workflows:

- ✦ Create a master (image) from a volume!
- ✦ Install a package (pkg)
- ✦ Restore a master (image) on a volume
- ✦ Triple OS Restoration





# Sample Workflow

The screenshot shows the DeployStudio Admin interface with the title bar 'DeployStudio Admin connected to mainserver.pretendco.com'. The left sidebar contains a tree view with categories: Runtime, Control, Logs, ACTIVITY, COMPUTERS (Lab), WORKFLOWS (5), MASTERS, PACKAGES, and SCRIPTS (5). The main pane displays a workflow configuration for 'Triple-OS restoration'. At the top, a table lists workflow tasks:

Title	Description	Access group	Identifier
Create a master from a volume	This simple workflow enables you...	-	04062220-1111-8888-2222-000000000000
Create Master Images		-	C883578C-D52B-4622-B13B-87011205F82E
Install a package (.pkg)	This simple workflow enables you...	-	04062220-1111-8888-2222-000000000020
Restore a master on a volume	This simple workflow enables you...	-	04062220-1111-8888-2222-000000000010
Triple-OS restoration	This workflow shows the 4 tasks...	-	04062220-1111-8888-2222-000000000030

Below the table, a 'Partition' section shows a visual disk layout with three partitions: LINUX (10GB), MacOSX (80%), and WINDOWS (20%). The 'Target volume' is set to 'First disk available'. The 'Apply layout template' is set to 'Custom'. There are checkboxes for 'Secure erase before partitioning with the algorithm' (set to 'single-pass zero-fill (~4 hours for 500GB)') and 'Automate'. A yellow callout bubble points to the 'Install a package (.pkg)' task in the workflow timeline.

On the right, a list of available workflow tasks is shown, including: Active Directory binding, Alert, Automatic enrollment, Configure, Disk image, File copy, Firmware Security, Generic, Hostname form, Licenses form, Localization, Network location form, New user form, Open Directory binding, Package install, Partition, Periodic NetBoot, Restore, Shut down, Software update, Time, and Workflow.

At the bottom, there are 'Revert' and 'Save' buttons, and a note: 'Drag an icon to the workflow timeline'.

- Install a package (.pkg)





# Sample Workflow

The screenshot displays the DeployStudio Admin application window, connected to mainserver.pretendco.com. The interface is divided into several sections:

- Left Sidebar:** Contains navigation icons for Runtime, Control, and Logs, and a tree view with categories: ACTIVITY, COMPUTERS (Lab), WORKFLOWS (5), MASTERS, PACKAGES, and SCRIPTS (5).
- Top Panel:** Shows a search bar and a table of workflows.
- Workflow Table:**

Title	Description	Access group	Identifier
Create a master from a volume	This simple workflow enables you...	-	04062220-1111-8888-2222-000000000000
Create Master Images			C883578C-D52B-4622-813B-87011205F82E
Install a package (pkg)	This simple workflow enables you...	-	04062220-1111-8888-2222-000000000020
Restore a master on a volume	This simple workflow enables you...	-	04062220-1111-8888-2222-000000000010
Triple-OS restoration	This workflow shows the 4 tasks...	-	04062220-1111-8888-2222-000000000030
- Workflow Configuration Panel:** Below the table, there's a 'Restore' button and a 'Target volume' dropdown set to 'MacOSX'. The 'Image' is set to 'HFS' and 'macosx.hfs.dmg'. Below this, 'HFS only options' are listed with checkboxes for various restoration settings.
- Right Panel:** A grid of workflow icons with descriptions, including 'Active Directory binding', 'Automatic enrollment', 'Disk image', 'Firmware Security', 'Hostname form', 'Localization', 'New user form', 'Package install', 'Periodic NetBoot', 'Shut down', 'Time', 'Alert', 'Configure', 'File copy', 'Generic', 'Licenses form', 'Network location form', 'Open Directory binding', 'Partition', 'Restore', 'Software update', and 'Workflow'.

A yellow callout box with a bullet point is overlaid on the bottom right, stating: **Restore a master from a volume**.





# Sample Workflow

The screenshot displays the DeployStudio Admin application window, titled 'DeployStudio Admin connected to mainserver.pretendco.com'. The interface includes a sidebar with navigation options: Runtime, Control, Logs, ACTIVITY, COMPUTERS (Lab), WORKFLOWS (5), MASTERS, PACKAGES, and SCRIPTS (5). The main pane shows a list of workflows with columns for Title, Description, Access group, and Identifier. The 'Triple-OS restoration' workflow is selected, showing its description: 'This workflow shows the 4 tasks...'. Below the list is a 'Restore' button with a red arrow icon. The configuration section for the selected workflow includes a 'Target volume' dropdown set to 'WINDOWS', an 'Image' dropdown set to 'NTFS', and a file path 'windows.ntfs.gz'. Under 'HFS only options', several checkboxes are visible, including 'Don't check restoration (faster)', 'Rename ByHost prefs', 'Restore system recovery partitions', 'Erase target for block copy restoration (faster)', 'Cleanup machine dependent files and caches', 'Set as default startup volume', and 'Automate'. A 'Triple OS Restoration (Windows)' workflow is highlighted in yellow. The right sidebar contains a list of available workflow tasks, such as 'Active Directory binding', 'Automatic enrollment', 'Disk image', 'Firmware Security', 'Hostname form', 'Localization', 'New user form', 'Package install', 'Periodic NetBoot', 'Shut down', 'Time', 'Alert', 'Configure', 'File copy', 'Generic', 'Licenses form', 'Network location form', 'Open Directory binding', 'Partition', 'Restore', 'Software update', and 'Workflow'. A 'Revert' and 'Save' button are at the bottom right.

Title	Description	Access group	Identifier
Create a master from a volume	This simple workflow enables you...	-	04062220-1111-8888-2222-000000000000
Create Master Images		-	C883578C-D52B-4622-813B-87011205F82E
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Target volume: Enter value... WINDOWS  
Image: NTFS windows.ntfs.gz

HFS only options:

- ☒ Don't check restoration (faster)
- ☒ Rename ByHost prefs
- ☒ Restore system recovery partitions
- ☐ Enable multicast restoration
- ☐ Add generic BCD (Vista and later)
- ☐ Automate
- ☒ Erase target for block copy restoration (faster)
- ☒ Cleanup machine dependent files and caches
- ☐ Pause workflow until multicast ends
- ☐ Expand restored NTFS volume

Stream data rate: 100 MBs  
Client disk speed: 125 MBs  
Startup trigger: 0 clients  
Timeout: 0 minutes

Triple OS Restoration (Windows)

Revert Save

Drag an icon to the workflow timeline



# Sample Workflow

The screenshot displays the DeployStudio Admin application window, titled 'DeployStudio Admin connected to mainserver.pretendco.com'. The interface is divided into several sections:

- Left Sidebar:** Contains navigation icons for Runtime, Control, and Logs, and a tree view with categories: ACTIVITY, COMPUTERS (Lab), WORKFLOWS (5), MASTERS, PACKAGES, and SCRIPTS (5).
- Table:** A list of workflows with columns: Title, Description, Access group, and Identifier. The 'Triple-OS restoration' workflow is selected.
- Workflow Configuration:** Below the table, there's a 'Restore' button and a 'Target volume' dropdown set to 'LINUX'. The 'Image' dropdown is set to 'DEV' with the file 'linux.dd.gz'.
- HFS only options:** A section with various checkboxes and sliders for configuring the restoration process.
- Right Panel:** A grid of task icons with descriptions, including 'Active Directory binding', 'Automatic enrollment', 'Alert', 'Configure', 'Disk image', 'File copy', 'Firmware Security', 'Generic', 'Hostname form', 'Licenses form', 'Localization', 'Network location form', 'New user form', 'Open Directory binding', 'Package install', 'Partition', 'Periodic NetBoot', 'Restore', 'Shut down', 'Software update', 'Time', and 'Workflow'.

**HFS only options:**

- Rename volume to:
- ☒ Don't check restoration (faster)
- ☒ Rename ByHost prefs
- ☒ Restore system recovery partitions
- ☐ Enable multicast restoration
- ☐ Add generic BCD (Vista and later)
- ☒ Set as default startup volume
- ☐ Automate
- ☒ Erase target for block copy restoration (faster)
- ☒ Cleanup machine dependent files and caches
- ☐ Pause workflow until multicast ends
- ☐ Expand restored NTFS volume
- Stream data rate:  100 MBs
- Client disk speed:  125 MBs
- Startup trigger:  0
- Timeout:  0

**Triple OS Restoration (Linux)**





# Deployment & Management Tools

## **Other Tools:**

- ✦ FileWave
- ✦ Absolute Manage
- ✦ Puppet
- ✦ Simian (Google Apps Engine)

## **Limited Systems:**

- ✦ LANDesk - Windows focus
- ✦ Microsoft SCCM





# Additional Options

- ✦ Centrify: From a Directory Point of view
- ✦ LANDesk InstaDMG or AutoDMG
- ✦ CanHazImage
- ✦ AutoPkg
- ✦ CreateUserPkg





# Real World Tips & Tricks

- ✦ Use a barcode scanner for inventory
- ✦ Make use of asset management tags, labels/stickers
- ✦ Create a checklist for onsite deployments
- ✦ Image workstations at your office, then bring them onsite
- ✦ Setup a mobile deployment Mac mini
- ✦ Don't forget a UPS. #MurphysLaw
- ✦ Measure twice, cut once.





# Summary



- ✦ Pick the right tools for the job; Don't discount free/open source software
- ✦ Pick a solution based on requirements/functions rather than price
- ✦ Pac-Man Planning: Spend more time planning than doing (90/10)
- ✦ Document your process; rinse and repeat!
- ✦ Remember the 3 key concepts: Quality, Consistency & Repeatability





# Links & Resources

- ✦ AFP548.com
- ✦ Krypted.com
- ✦ MacTech.com
- ✦ <http://managingosx.wordpress.com/category/deployment/>
- ✦ Apple Consultants Network  
[consultants.apple.com](http://consultants.apple.com)





# Don't be a stranger...



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