X
World 2012

Building a SOE / MOE

Adam Reed
Division of Information
The Australian National University

Agenda

First Session

- Introduction
- Definition of Terms
- Planning a SOE
- OS X File System
- Tracking Changes
- Packaging

Agenda

Second Session

- Deployment
- Scripting and the CLI
- Remote Access
- Extension Ideas
- Conclusion and Questions

Introduction

Why are we here and what are we going to cover?

Who Am I?

Adam Reed

Team Leader - Managed Operating Environments
Systems and Desktop Services,
Information Technology and Infrastructure,
Division of Information,
The Australian National University

Email: adam.reed@anu.edu.au
Ph: (02) 6125 1479

What Do I Do?

- Responsible for the MOE Team who manage the desktop images provided by SDS
- 5.4 Staff - 2 Windows Admins, 1 Mac Admin, 1 Support Tech, .4 Liaison Officer and myself.
- Primarily Student Images (~1700 machines)
- Roughly 2/3 (1100) Windows, 1/3 (600) Mac
- Multiple Mac images - 3 main images

This Session Is About

- Sharing knowledge, tips and tricks on building a SOE / MOE
- Showing you some of the tools you can use to assist you
- Giving you the foundations to build your own SOE that suits your environment
- Showing you ways to extend your SOE

This Session Is Not About

- Providing a “cookbook” of steps to building a SOE
- Comprehensive coverage of all of the faucets of building a SOE
- The only way to do things - its based on ideas, implement them as you see fit.

Questions

- Feel free to ask questions at any time
- If you have any area you are particularly interested in let me know - time permitting I'll answer what I can
- I may not be able to answer all questions but can hopefully point you in the right direction

Definition of Terms

SOE / MOEs have a language of their own so....

SOE

Standard Operating Environment(s)

"The Standard Operating Environment (SOE) is a specification for standards for computer hardware, operating system, security and applications software."

http://www.dundee.ac.uk/ics/services/soe/

AUC

XW12

MOE

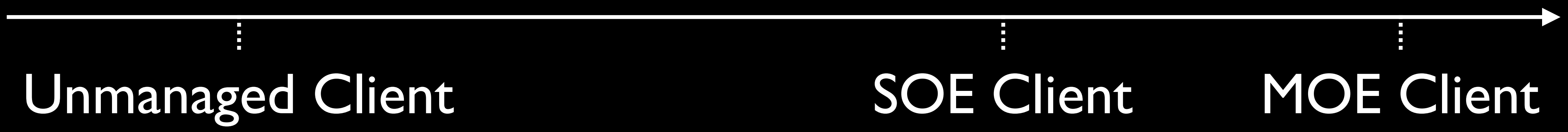
Managed Operating Environment

Unlike an image-based SOE, a MOE is an adaptable and dynamic environment able to grow and change with an organisation's hardware and software needs. It allows user-level customisation without affecting the integrity of the environment.

MOE

Managed Operating Environment

Unlike an image-based SOE, a MOE is an adaptable and dynamic environment able to grow and change with an organisation’s hardware and software needs. It allows user-level customisation without affecting the integrity of the environment.



Unmanaged Client

SOE Client

MOE Client

Image

Term given to the software set of a managed computer. Each SOE / MOE will have an image.

Can refer to either a currently running machine, or the file(s) that is deployed to a machine.

Deployment

The process of making changes to and installing / removing software from SOE machines. Typically achieved remotely in a SOE environment

Various tools to assist like:-
Munki, Radmind, Apple Remote Desktop, Puppet, Casper, Absolute Manage, etc.

Packaging

The art and science of collecting all of the required items together into a container that can then be deployed to machines

Doesn't need to be a complete application but typically is, however can be things like preferences, applications, resources, scripts etc.

Planning a SOE

SOEs start away from the keyboard

Know your needs

Different Environments mean different SOEs

- Who is your target user group?
- What are your users needs? What are your needs? What are your organisational needs?
- How often are changes going to be needed?
- What are your software licensing models?

Solve technical problems technically and political problems politically

Environment

- Will your machines be always on and connected to your network?
- What is there network connection?
- Desktops vs Laptops?
- Energy saving profile?
- Administrator Access?

SOEs are built one component at a time. You don't need an über image from day one!

Deployment Options

- What technologies are you going to use?
- What are its needs for things like packages?
- How are you going to interact with your image?
- How and how often are you going to update it?
- Modularity and reuse are **vital**
  - Plan for Major OS upgrades

Remember that more ≠ better.

If it isn't broken don't fix it

XW12

Policies and Procedures

- Have defined policies for things like change management and requests - you **can** drive these regardless of your position
- Documentation is **really** important! Use it to cover your backside and to make what you do repeatable
- Testing is also vital. Make sure you, and particularly your uses do testing - if possible make them sign off on changes.

OS X - The File System

Where to look to bend it to your will

File System

Primary Folders - User Perspective

- /
- /Applications and ~/Applications
- /Library and ~/Library
- /System
- /Users and ~/

In Terminal

```
cd /path/
to/folder
```

File System

Primary Folders - Unix Perspective

- /etc - configuration items
- /tmp - temporary files
- /var
- /usr - binaries and libraries
- /Volumes - external mounts

In Finder Go → Go to Folder (⌘⇧G)

File System

Permissions

- Two forms of permissions
- Standard POSIX
  - Based on Owner, Group and Other
- ACLs (Access Control Lists)
  - ACLs are the same as available in Windows
  - Used in clean Snow Leopard \ Lion installs

File System

Permissions (ls -la /path/to/dir)

```
drwxrwxr-x    2 adam  admin    68 Jul  1 10:37 dir
```

File System

Permissions (ls -la /path/to/dir)

```
drwxrwxr-x    2 adam  admin    68 Jul  1 10:37 dir
```

Entry Type (d = directory, l = symlink, - = regular file)

File System

Permissions (ls -la /path/to/dir)

```
drwxrwxr-x    2 adam  admin    68 Jul  1 10:37 dir
```

Entry Type (d = directory, l = symlink, - = regular file)

Permissions for the owner (in this case Adam)

File System

Permissions (ls -la /path/to/dir)

```
drwxrwxr-x   2 adam  admin   68 Jul  1 10:37 dir
```

Entry Type (d = directory, l = symlink, - = regular file)

Permissions for the owner (in this case Adam)

Permissions for the group (in this case Admin)

File System

Permissions (ls -la /path/to/dir)

```
drwxrwxr-x    2 adam  admin    68 Jul  1 10:37 dir
```

Entry Type (d = directory, l = symlink, - = regular file)

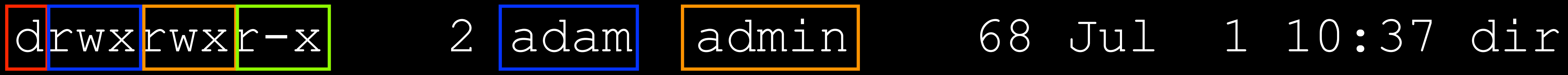
Permissions for the owner (in this case Adam)

Permissions for the group (in this case Admin)

Permissions for other (used if the user isn't the owner or a member of the assigned group

File System

Permissions (ls -la /path/to/dir)



```
drwxrwxr-x    2 adam  admin    68 Jul  1 10:37 dir
```

Entry Type (d = directory, l = symlink, - = regular file)

Permissions for the owner (in this case Adam)

Permissions for the group (in this case Admin)

Permissions for other (used if the user isn't the owner or a member of the assigned group

In this case, Adam can do everything, so can members of the Admin group and all other users can read and execute only

File System

Permissions (ls -la /path/to/dir)

```
drwxr-x---    2 adam  admin    68 Jul  1 10:37 dir
```

rwx

Read (r = on | - = off)

Write (w = on | - = off)

Execute (x = on | - = off) - needs to be on for directories

File System

Permissions (ls -la /path/to/dir)

```
drwxr-x---    2 adam  admin    68 Jul  1 10:37 dir
```

rwx

Read (r = on | - = off)

Write (w = on | - = off)

Execute (x = on | - = off) - needs to be on for directories

In this case, Adam can do everything, members of the Admin group can read and execute and other users no access rights

File System

Permissions - Unix Commands

Command	Description	Example
`ls`	List Directory contents	`ls -lae`
`chmod`	Change file modes or ACLs	`chmod 644 file`
`chown`	Change file owner and group	`chown root:wheel file`
`chgrp`	Change Group	`chgrp admin file`
`chflags`	Change file flags	`chflags nouchg file`

See Man Pages for more information

File System

Permissions - Unknown User (99)

- UID 99 and / or GID 99
- Means that the file inherits the current users UID and / or GID
- Particularly handy in multi-user machines as you can set generic permissions and have them correctly applied for any user on the system

File System

Hidden Files

- You can “hide” files from your users if you wish, and many (particularly unix) apps do.
- .[filename] - Add a dot at the begining of the file, or
- SetFile -a V /path/to/file

Note: hidden ≠ inaccessible or un-findable. If a user shouldn’t access a file, change its permissions, don’t hide it.

File System

Symbolic Links (`ln -s source name_of_link`)

- Symlinks allow you to put files in one location, and then have a reference that points to it.
- The system will automatically traverse the link.
- Using for lots of things - e.g. if you are using Network Home Directories, symlink ~/Library/Caches to /tmp (which is a symlink) so that Cache info isn't written to your fileserver.
- Generally, link parent directories, not individual files for the best results

File System

Domains

- Files can be placed in one of 4 domains.
- User - Applicable to only the current user
- Computer - Applicable to all users on the machine
- Network - Applicable to appropriate machines on the network
- System - Reserved for the system. Don’t modify.

File System

Domains - Example (Safari Preferences)

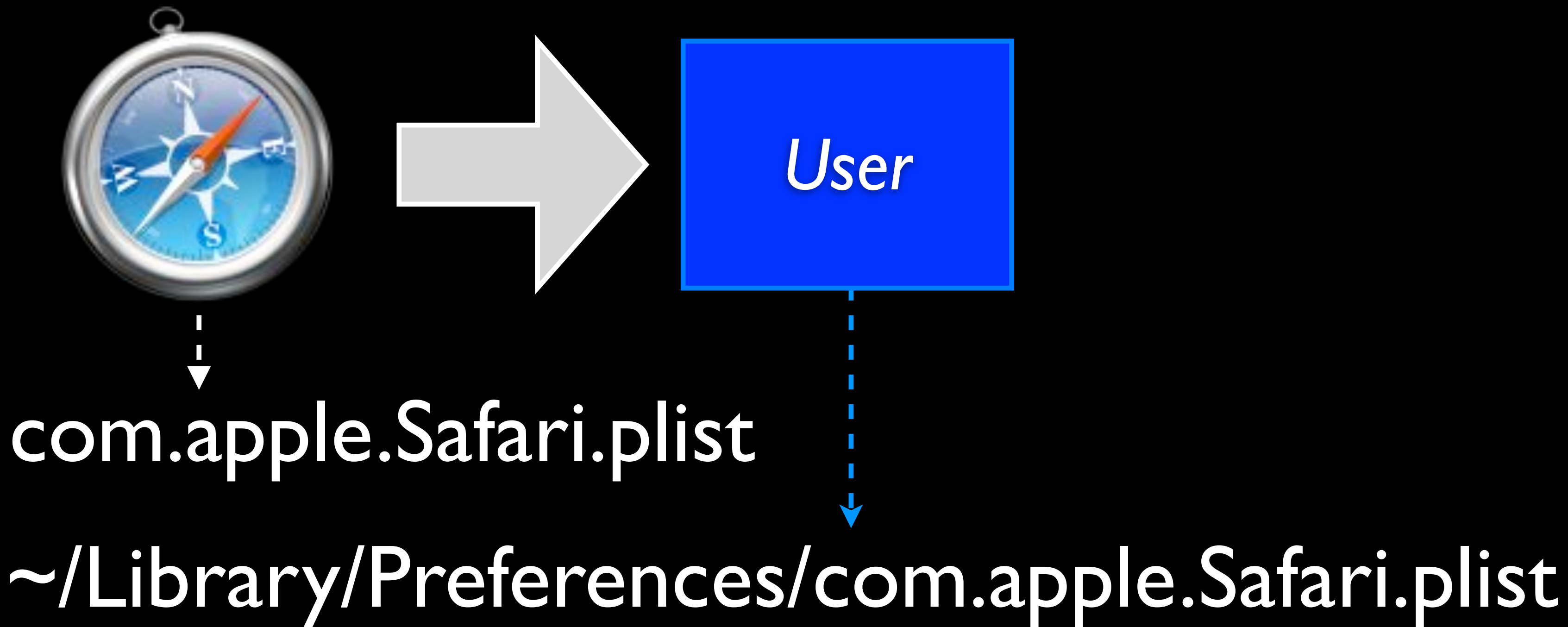
Search Precedence

com.apple.Safari.plist

File System

Domains - Example (Safari Preferences)

Search Precedence



User

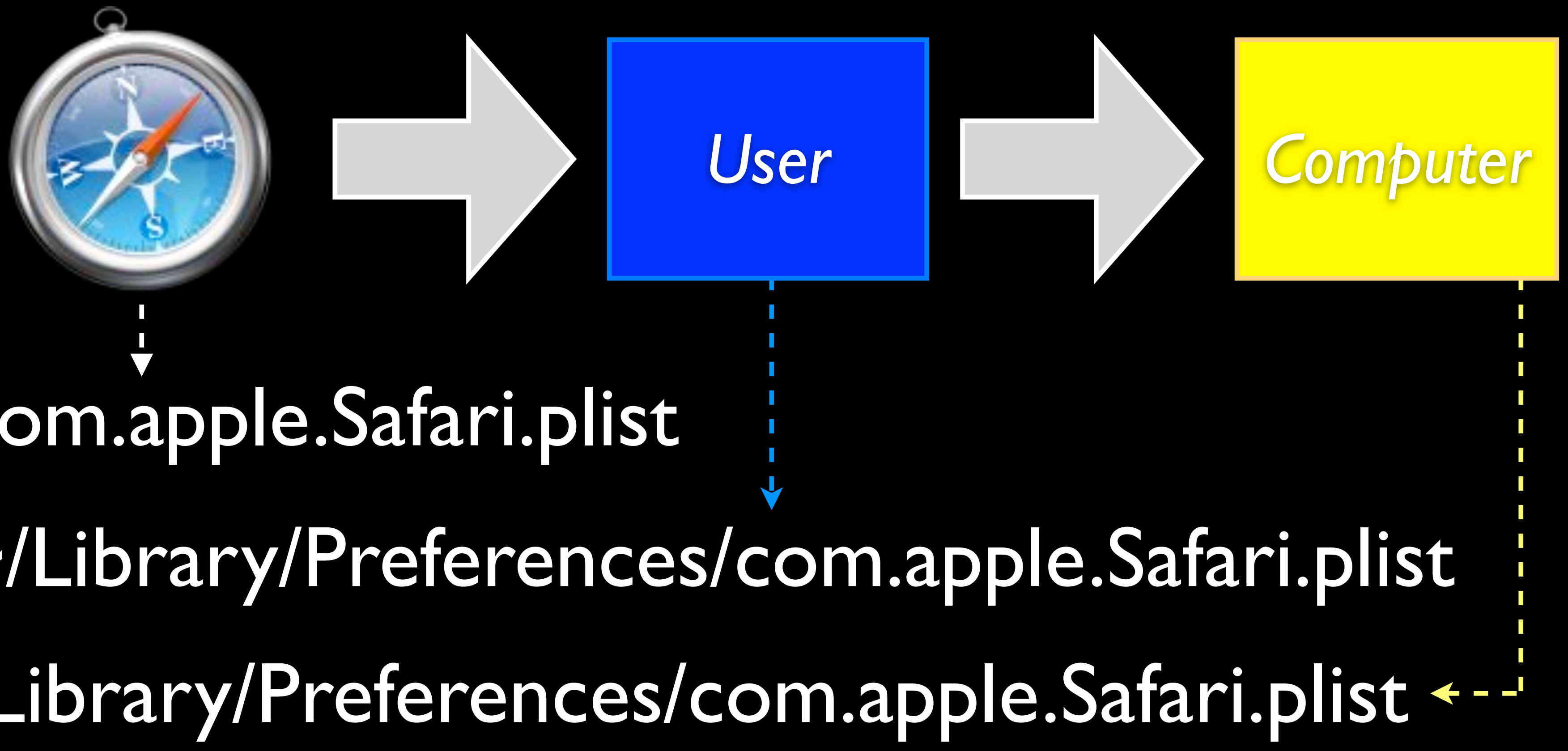
com.apple.Safari.plist

~/Library/Preferences/com.apple.Safari.plist

File System

Domains - Example (Safari Preferences)

Search Precedence



User

Computer

com.apple.Safari.plist

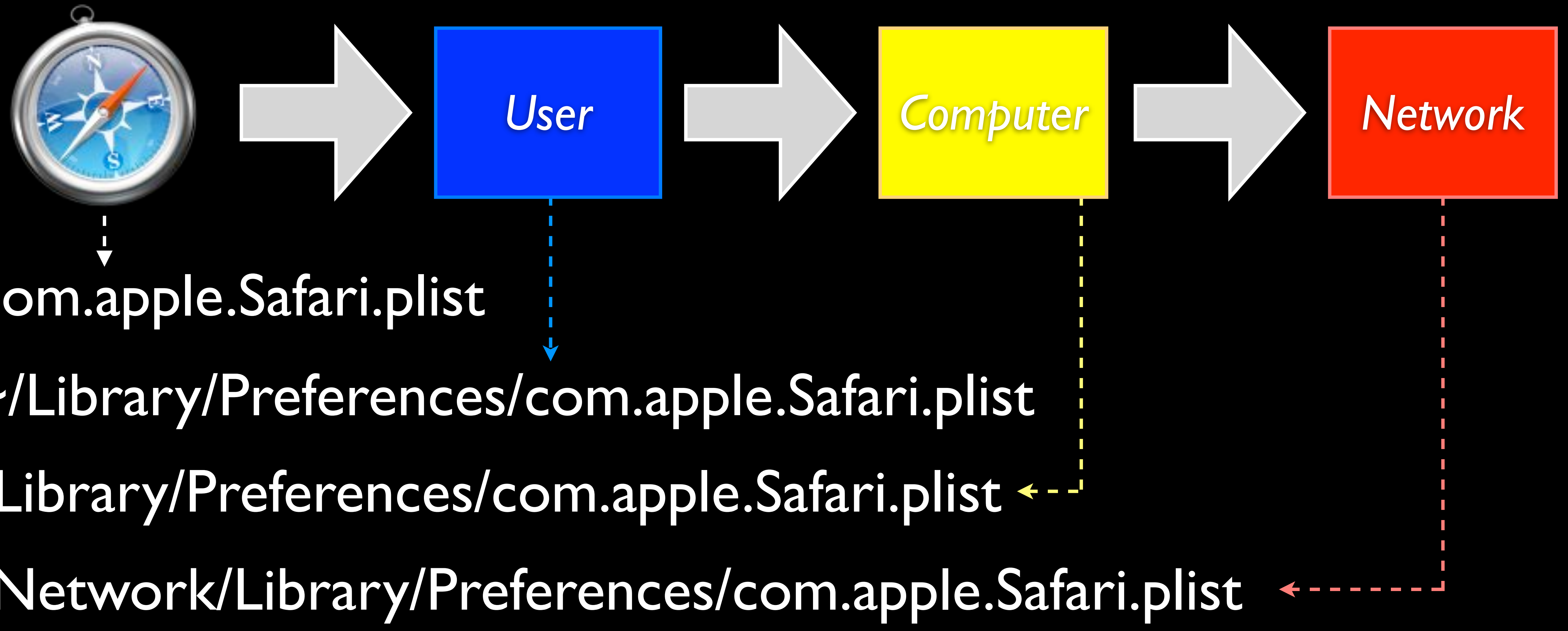
~/Library/Preferences/com.apple.Safari.plist

/Library/Preferences/com.apple.Safari.plist

File System

Domains - Example (Safari Preferences)

Search Precedence



com.apple.Safari.plist

~/Library/Preferences/com.apple.Safari.plist

/Library/Preferences/com.apple.Safari.plist

/Network/Library/Preferences/com.apple.Safari.plist

File System

Domains - Why they are important in a SOE

- Watch installers putting items in Users Domain when Machine Domain is more appropriate
- Some items you could consider moving include:- Spotlight Importers, Widgets, Plug-ins, Preference Panes, Screen Savers, Quicklook Plugins, etc
- Move Resources, not user configuration files

Disclaimer: It *should* work but it depends on developers using the relevant Apple APIs. **Test** any changes you make.

Tracking Changes

How to find out what has happened...

Tracking Changes

What’s changed?

- The ability to track changes made to the file system is vital for maintaining a SOE
- If you can determine what changes, you can deploy those changes in a repeatable and exact manor
- Also a good troubleshooting tool

Tracking Changes

Tools - Live as it happens

- FSEventer - GUI App
- Subscribe to the same mechanisms Spotlight and Time Machine uses
- Doesn’t require any pre-configuration
  - Very handy tool in your arsenal

Tracking Changes

Tools - Pre and Post “Snapshotting”

- Mix of GUI and CLI Tools
  - InstallEase, Casper, PackageMaker, Radmind, logGen, etc
- These apps take a before and after snapshot then show the difference
- I use InstallEase and Radmind in conjunction with FSeventer. Different tasks have different needs.

Hands On

Lets watch some live changes

Tracking Changes

- Start fseventer
- Configure Prefs (Events Expire - Never)
- Start by clicking on the black “play” arrow
- Enter username and password - only needed on first run to give the app permission to view what is going on
- Watch what happens when you open some random apps, change prefs and quit.

Tracking Changes

Troubleshooting

- If you have moved items, or changed permissions you may see weird behaviour and errors.
- Run the app on a "clean" machine and track it, then run it on a SOE machine and look for similar items.
- Any differences maybe the cause of your problems.

Tracking Changes

Difference Tools

- Once you know what changes, you can compare a pre change to a post change file and determine what actually changed
- Tools like `diff`, `twdiff`, TextWrangler and FileMerge will show you changes in text based file - binary is harder.
- To convert plists from binary to xml

  ```
  plutil -convert xml1 /path/to/
  plist.plist
  ```

AUC

XW12

Packaging

Installing and creating installable packages

Packaging

Three Sub Topics

- Types of installer packages
- Installing software
- Creating packages

Packaging

Types

- Drag and Drop
- Custom Installers (Scripts, VISE, etc)
- Installer Packages and MetaPackages
- Distribution and Flat Packages
- Mac App Store
- Built-in Auto Updating mechanisms (Sparkle framework and others - e.g. Adium).

Packaging

Installing - Drag and Drop

- Drag and Drop is common for a lot of smaller applications, and typically involves dragging the application from a Disk Image into /Applications e.g. FireFox
- Some applications will do an “installation” on first run - going to be less prevalent with the introduction of sandboxing

Packaging

Installing - Drag and Drop

- Drag and Drop installation is bad for a SOE
  - Too manual a process
  - Potentially error prone - you need to remember where you put the app last time
- ARD can do a copy file operation to install a drag and drop app
- Watch what happens on first run as it may setup its environment which you may need to replicate

Hands On

Install and Packaging of “TextWrangler”

Install TextWrangler

1. Create the initial snapshot

   1.1. Start Absolute Manage InstallEase from /Applications/Utilities

   1.2. Leave “Automatic” Selected

   1.3. Click Continue

   1.4. Accept Defaults and Click “Take Snapshot”

   1.5. Enter Admin Password

   1.6. Wait for snapshot to complete

2. Start fseventer and observe while completing the rest of the steps
3. Mount “TextWrangler 4.0.1.dmg
    3.1. Drag TextWrangler to the Applications Folder
    3.2. Unmount “TextWrangler 4.0.1”
4. Run TextWrangler
    4.1. Ensure “Install the current command line tools” is enabled then click “Skip Registration”
    4.2. Enter admin password
    4.3. Quit TextWrangler

5. Back in InstallEase

   5.1. Click “Take Snapshot”

   5.2. Enter Admin Password if prompted

   5.3. Review added files, removing items not needed (i.e. Users folder). Click “Continue”

   5.4. Check “Iceberg project”

   5.5. Click “Create”

   5.6. Save to Desktop as “TextWrangler”

   5.7. Enter Admin Password if prompted

Installing TextWrangler

What Happened?

- You will have noticed a couple of things about the install
- XAttr (quarantine flag) was removed
- Initial install was completed when you dragged and dropped the app
- Additional components were installed on first run
- Preferences were written on quit

Installing TextWrangler

What Happened?

- Files now in:-
  /Applications
  /Library/LaunchDaemons
  /Library/PrivilegedHelperTools
  /usr/local/bin
  /usr/local/share/man/man1
  ~/Library/Application Support
  ~/Library/Preferences
- All of these from a simple Drag and Drop.
  See how important the first run is!

Packaging

Installing - Installer

- Installer installs Apple Packages, using the same technology regardless of vendor - like MSIs for Windows.
- Can run pre and post action scripts and check the machine matches set requirements
- Can be installed via a GUI or CLI tool
- Changes can be examined before they are made
- Repeatable

Packaging

Installing - Installer

- You really should look at "packaging" custom changes you make
- Allows for Automation
- If you use Apple's Package Format you can use tools like Munki, ARD, or InstaDMG
- We have a MetaPackage that will configure a generic OS X install to an ANU Base Config

AUC

XW12

Hands On

Install “Iceberg”

XW12

Installing Iceberg

The long but educational way...

- Mount Iceberg 1.2.9
- Right click on Iceberg.pkg and select show package contents, double click on Contents
- Start a terminal window and type lsbom and drag Archive.bom onto the window. Click enter.
- Should read lsbom /path/to/Archive.bom

Installing Iceberg

The long but educational way...

- Leave terminal open but double click on package.
- Go Files → Show Files (⌘1)
- Both show the Bill of Materials which is what will be installed - note that scripts may make additional changes
- Hit space on the package to inspect with Suspicious Package
- Again see what is happening. Have a look at resources - particularly post* scripts.

Installing Iceberg

The long but educational way...

- Now we know what is going to happen. Install via command line

  ```
  sudo installer -verbose -pkg /path/to/pack -target /
  ```

- Determined what happened, and installed.
- Wasn’t asked for a restart but it is needed. So reboot.

Installing Iceberg

What did we learn?

- Most of the steps were designed to show you how to look at the Bill of Materials
- Don’t forget that Scripts can also make changes
- The command line installer is the same as running the GUI in most cases

Creating a Package

PackageMaker vs Iceberg

- Apple provide PackageMaker for making packages.
- PackageMaker continues to improve but has a number of quirks (much better since Leopard - was useless in Tiger)
  - It's part of the Axillary Dev Tools Download
- That said I still prefer Iceberg (a third party tool)

Hands On

Package SSH Settings

Creating a Package

Using Iceberg

1. Start Iceberg
2. File → Preferences
   - Default Reference Style: Project Relative
3. File → New
4. Select “Package” and Click Next
5. Project Name: “SSH”
6. Project Directory: “~/Desktop”
7. Click Finish

AUC

XW12

Creating a Package

Packaging SSH Settings

- Copy my SSH Source folder into the SSH folder on your desktop
- Absolute vs Relative
  - I use relative so that a package template can be passed around and is repeatable
  - Absolute is easier but not as repeatable

Creating a Package

Packaging SSH Settings

- Expand the SSH Item
- Settings
  - Version: 10.7
  - Identifier: com.mygreatcompany.pkg.SSH
  - Get Info: SSH 10.7
  - Short Version: 10.7
  - Version: Major 10, Minor 7

Creating a Package

Packaging SSH Settings

- Settings
    - Options
        - Authorization - Root Authorization
        - Flags
            - Allow Revert to Previous Version
            - Follow Symlinks

Creating a Package

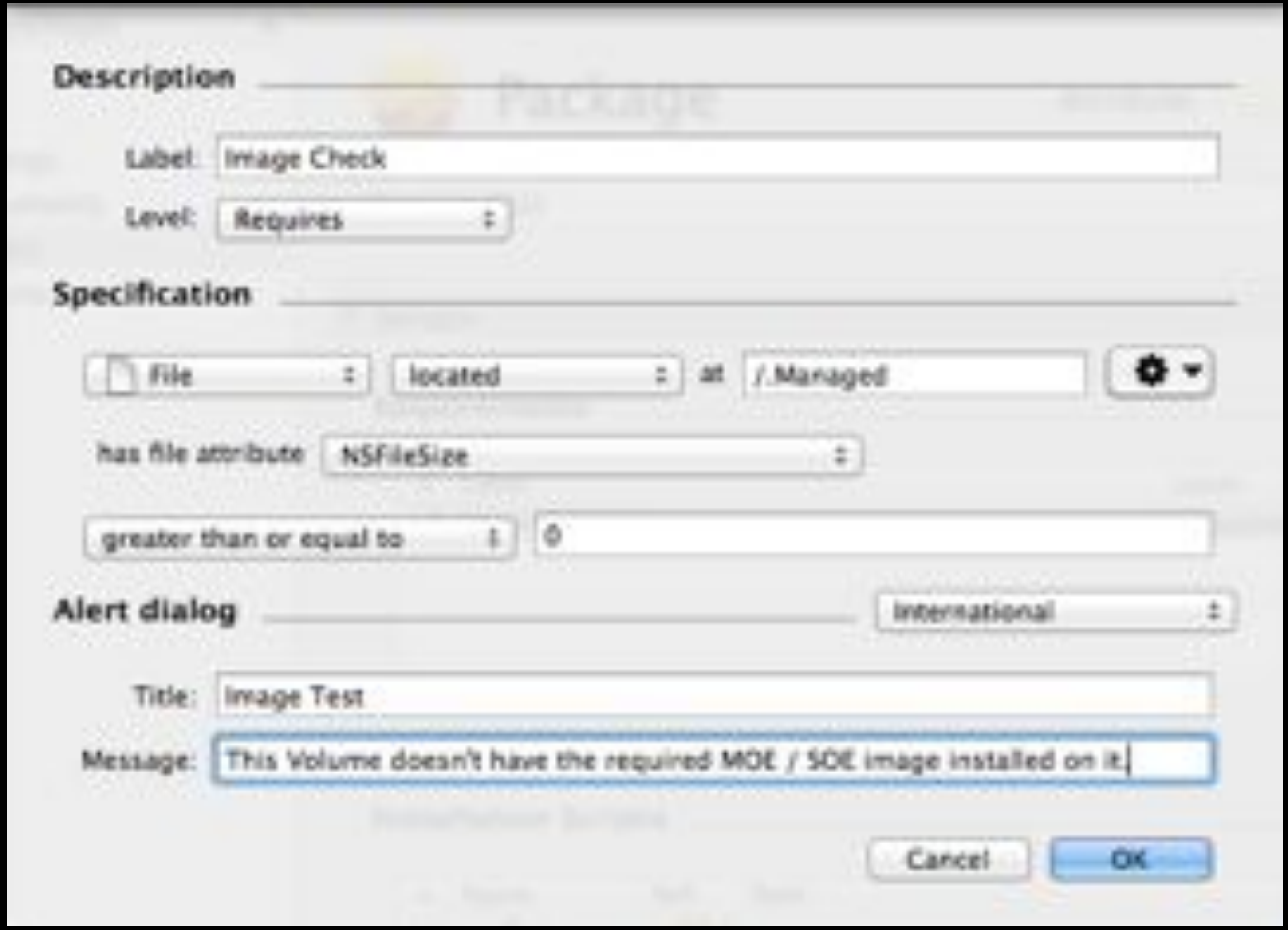
Packaging SSH Settings

- Documents
  - Add read me and select path
  - Add a background image, no scaling with bottom left alignment, ensure path is selected
  - Make sure both are set to “R”, not “A”

Creating a Package

Packaging SSH Settings

- Scripts
  - Add a postflight scripts from the provided resources
  - Add InstallationCheck to Additional Resources
  - Add this requirement



Description

Label: Image Check

Level: Requires

Specification

File located at /.Managed

has file attribute NSFileSize

greater than or equal to 0

Alert dialog International

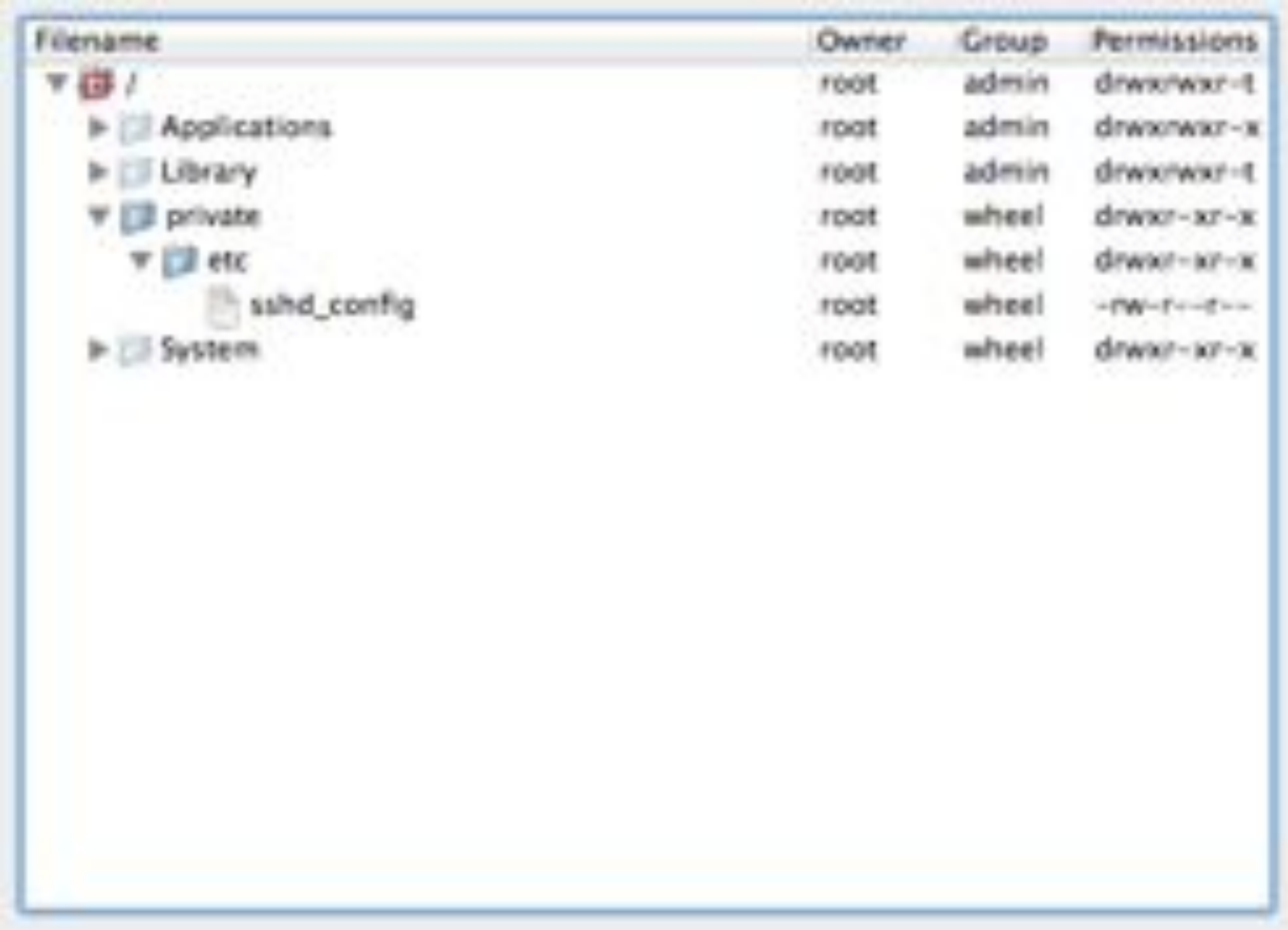
Title: Image Test

Message: This Volume doesn't have the required MOE / SOE image installed on it.

Creating a Package

Packaging SSH Settings

- Files
  - Create the private and etc folders
  - Add the sshd_config file
  - It should look like this



Filename	Owner	Group	Permissions
/	root	admin	drwxrwxr-t
Applications	root	admin	drwxrwxr-x
Library	root	admin	drwxrwxr-t
private	root	wheel	drwxr-xr-x
etc	root	wheel	drwxr-xr-x
sshd_config	root	wheel	-rw-r--r--
System	root	wheel	drwxr-xr-x

AUC

XW12

Creating a Package

Packaging SSH Settings

- Build → Build and Run (⌘R)
- See that it installs as expected (it should fail)
  - Run: `sudo touch /.Managed` and try again
- Open the package up and have a look at the Info.plist file.

Deployment

A *brief* look at deployment. It is a topic that we could spend weeks on.

Deployment

Thick vs Thin Images

- Accepted practice has change over the years, and Thin imaging is now considered best practice
- Thin imaging is basically only deploying the bare minimum to get the machine to boot, and then bootstrap your deployment tool (like Munki)
- That said thick images are still acceptable, if your smart in how you build them
  - Hint: Build a Thick image from a Thin image

Deployment

Thick vs Thin Images

- Thin Images
  - Very reusable and adaptable
  - Minimal amount of work to support new hardware
- Thick Images
  - Quicker to deploy
  - All software already installed and configured

Deployment

Creating an Image

- To create an image from scratch
  - Format the machine
  - Using the latest installer from the AppStore, install with all of the appropriate options selected

Deployment

Creating an Image

- To create an image from an existing machine
    - Update the Machine (using a Combo Updater) to the latest patch levels
    - Ensure all items are configure as appropriate
    - Clean up after yourself (empty the trash, clear browser histories etc)

Deployment

Creating an Image

- Consider using InstaDMG
  - Automates the work for you
  - Highly flexible
  - Reusable
- It's build around the principles we discussed earlier of modularity, consistency, and repeatability.

Deployment

Creating an Image

- To create the Apple Software Restore (asr) image use DeployStudio.
  - System Image Utility is ok, but DeployStudio is a far better option.
  - NetRestore has been EOL - Use DeployStudio

Deployment

Updating an Imaged Machine

- Once an image is deployed how do you update it?
- You could re-image it later but this is destructive to any local data on the volume
- Use products like Munki, Radmind, Apple Remote Desktop, Puppet, Casper, Absolute Manage etc.

Lion

No DVD version

- Lion is only be avaliable from the AppStore
  - Apple has a guide for how to deploy it in a managed environment
  - Basically get a code from Edu sales rep, redeem via AppStore, then run the installer on any machine
- NetInstall, NetBoot still supported in the same manner as Snow Leopard

AppStore

- Tied to Apple ID - Make sure you use University Accounts, not peoples own private ID
- Work with vendors to acquire apps outside of store
- Apps in and out of store are not necessarily the same (TextWrangler)
- No real solution to date to dealing with it consider disabling, or allowing no admins to install AppStore apps...

Scripting and the CLI

Automating common tasks and saving you time while giving you more power

Scripting

Learn to love it!

- Provides a method of automation
- Saves you time and energy
- Saves you needing to remember what to do
- Repeatable
- Extremely powerful
- Plenty of help and pre-existing scripts available

AUC

XW12

Scripting

Learn to love it!

- OS X provides a lot of the functionality via the GUI but it is extended or in some cases only available via the CLI
- You can string commands together and manipulate the output
- You can run scripts on boot, login, logout, set intervals, and user driven
- There are endless possibilities.....

AUC

XW12

Running Scripts on Boot

- LaunchD

  ```
  /Library/LaunchDaemons
  /Library/LaunchAgents
  ```

- SystemStarter

  ```
  /Library/StartupItems
  ```

Running Scripts on Login and Logout

- Login Hook

```
defaults write /var/root/Library/
Preferences/com.apple.loginwindow
LoginHook /path/to/script
```

- Logout Hook

```
defaults write /var/root/Library/
Preferences/com.apple.loginwindow
LogoutHook /path/to/script
```

Note: These are run as Root, not the user

Scripting

Notifying Users what is going on

- Scripts have no GUI - but at times, particularly if they are delaying the system (Boot, Login and Logout) you may want to let the user know what is going on.
- iHook is a way of providing a UI for a script
- Growl is also useful for providing notifications

Hands On

Scripts with iHook - try `iHook Test.command`

Hands On

Scripts with Growl - try `growl.sh`

CLI Commands

Running Commands

- There are multiple shells available but bash is the default and what I recommend using
- Most command line tools will be installed in:- /usr/bin, /usr/sbin, /usr/local/bin, and /usr/local/sbin but can be anywhere
- If the location is on your path you can Tab complete. Type the first few characters and hit Tab

CLI Commands

Running Commands

- To modify your path type
  `export PATH=$PATH:/new/path`
- Or create `~/.bash_profile` and add the above line to it. It is searched in order of items. To print current path use `echo $PATH`
- The /usr/local/bin and /usr/local/sbin aren't added by default so I recommend at least having
  `export PATH=$PATH:/usr/local/bin:/usr/local/sbin`

CLI Commands

Getting Help

- The first step should always be to read the manual page
  `man command` or `man -k term`
- Additionally running the command with -h or --help will normally print usage information
  `command -h` or `command --help`
- To get a plain text version try
  `man command | col -b > ~/command.txt`

CLI Commands

Commands

- `nano -w /path/to/file` - Text Editor
  (if you use nano you **must** use the -w option)
- `defaults` and `plutil` - Manipulates Plists
- `system_profile` - Returns system information
- `touch` - creates an empty file
- `grep` - searches for a pattern
- `awk` - pattern scanning
- `rsync` - file synchronisation

XW12

CLI Commands

Some useful commands

- `ssh`, `scp`, `sftp` - Secure methods for working on remote machines
- `hostname` - Get hostname on machine
- `top` - show info on running processes
- `ps` - show currently running processes
- `cp` and `mv` - copy and move files
- `open` - open a file

CLI Commands

Some useful commands

- `sudo` - run a command as root
- `mount_*` - mount a remote file system
- `hdiutil` - work with disk images
- `update_dyld_shared_cache` - update caches
- list goes on and on....

CLI Commands

`touch`

- Touch will create a file if it doesn't exist, or update its modified time to the current time.
- Useful for creating "flags" - little files that reflect a state of some sort.
- I create flags for to instruct scripts on what to do, and to reflect information like its a managed machine.
- We used a flag in the Packaging Example

Remote Access

Saves you time and money and lets you get home earlier

Remote Access

Your life blood. Don’t leave home without it

- You **must** be able to access your managed machines remotely. Doesn’t need to be publicly accessible but at least on the local subnet.
- It is too costly to visit each machine, and users have a tendency of turning a 5 minute trip into an hour.
- Remote Access leads to automation

Apple Remote Desktop

More powerful then just the Screen Sharing

- Apple Remote Desktop (ARD) is an awesome tool. It can collect system information, make changes, install software, send UNIX commands and much more to multiple machines.
- It also has VNC capabilities allowing you to share and view screen sessions to assist a user over and above Snow Leopards
- Has a Task Server option to enable running scheduled tasks - ARD could be your Deployment Tool!

Apple Remote Desktop

Enabling

- System Preferences → Sharing → Remote Management
  Configure the Access Privileges (Tip: Option Click next to a user will automatically select all options)
- Or via the CLI
  `sudo /System/Library/CoreServices/RemoteManagement/ARDAgent.app/Contents/Resources/kickstart -h` (for options and usage)

XW12

SSH

CLI Remote Access

- SSH allows you to run commands on a remote system.
- Encrypted protocol so it is secure
- You can also do file (scp) and ftp (sftp) operations over the ssh protocol
- Can be configured for private / public key authentication
- Automatable, particularly with keys

SSH

Enabling

- System Preferences → Sharing → Remote Logon
- Or via the CLI

  ```
  sudo /usr/sbin/systemsetup
  -setremotelogin on
  ```

- Be aware that this will enable anybody that can logon to the machine via the login window to be able to login via ssh (Including people in the Directory Service if configured)
  - Limit the access as appropriate

SSH

Configuring and Securing

- Edit `/etc/sshd_conf`
- Recommend Changes:
  - Protocol 2 - forces use of newer protocol
  - AllowUser <user>
  - If you have setup public / private keys disable password based authentication
    - PasswordAuthentication no & UsePAM no

Hands On

Setting up SSH Keys

AUC

XW12

SSH

Creating the Public and Private Keys

```
ssh-keygen -t dsa
```

- Hit enter to save it in the default location(~/.ssh)
- Enter a passphrase twice. Make it secure.
- This will create two files in ~/.ssh. The public key is called id_dsa.pub, this is the key that you put onto the remote hosts. The private key is called id_pub. Make sure that the private key is kept secure, it is now your "password" for accessing remote systems.

SSH

Deploying the Key

- Copy Public Key to Remote Machine

```
cd ~/.ssh; scp id_dsa.pub
username@remotehost:~/id_dsa.pub
```

- Login to Remote Machine

```
ssh username@remotehost
```

- Activate Key

```
cd ~/.ssh (If .ssh doesn't exist then
mkdir ~/.ssh; chmod 700 ~/.ssh)
touch authorized_keys2; chmod 600
authorized_keys2
cat ~/id_dsa.pub >> authorized_keys2
rm ~/id_dsa.pub
```

SSH

Testing Key Deployment

- Login to Remote Machine
```
ssh username@remotehost
```
- You should have logged in without being asked for the password. Keychain manages the Agent in Snow Leopard or later

Extension Ideas

A couple of fun little asides to open your mind to possibilities

Web Based Reporting

Use simple web based databases for management and reporting

- You can leverage the web and dynamic database backed websites to drive your needs
- Consider having your machines report in the with appropriate info for your needs
- You can also provide information for your clients from a web page
- Have a look at `webreport.pl` and `xworld.php`

AUC

XW12

Customising Login Window

- Display System Status

  ```
  sudo defaults write /Library/
  Preferences/com.apple.loginwindow
  AdminHostInfo <option>
  ```

  where <option> is SystemBuild, SerialNumber, IPAddress, DSStatus, Time, or HostName

- Hide Users from Login Window

  ```
  sudo defaults write /Library/
  Preferences/com.apple.loginwindow
  HiddenUsersList -array-add shortname1
  ```

Customising Login Window

- Disable console access

```
sudo defaults write /Library/Preferences/
com.apple.loginwindow DisableConsoleAccess -bool
true
```

- Disable Restart, Power Off, and Sleep buttons

```
- defaults write /Library/Preferences/
 com.apple.loginwindow RestartDisabled -bool true
- defaults write /Library/Preferences/
com.apple.loginwindow PowerOffDisabled -bool true
- defaults write /Library/Preferences/
com.apple.loginwindow SleepDisabled -bool true
```

Using MCX without OD

Workgroup Manager will work on localhost

- If you have an Open Directory server you can use it to customise a lot of the users environment - OD and MCX are covered in different session
- However it also can be applied to local users. It’s not the most “repeatable” process as its individual to each machine but may save you from that particular user.

Conclusion and Questions

Recapping what we have covered and opening the floor to any outstanding questions

Conclusion

We have covered a lot...

- Terminology of SOEs,
- Things to consider when planing a SOE,
- The OS X File System and how to adapt it to your needs,
- How to track changes to your system,
- Investigating and Creating packages,
- Briefly touched upon deployment,

Conclusion

We have covered a lot...

- Looked at scripting and CLI tools,
- Covered remote access and ssh, and
- Discussed so extension ideas for existing SOEs

Key Points

- When working with a SOE things need to be repeatable
- Document what you do, as you will need to refer to it later
- The command line is your friend
- Take SOEs one step at a time

Good Resources

- MacEnterprise and its mailing list
  http://macenterprise.org
- AFP548
  http://afp548.com
- Apple and some of their mailing lists
  http://www.apple.com particularly the developer documentation (where the sysadmin stuff is)
- UniMacTech - AUC mailing list
  http://www.auc.edu.au/mailman/listinfo/unimactech

Good Resources

- Your colleagues - every environment is different but the problems normally are similar
- Bug Reporter - If you think you find a bug with OS X or any Apple product report it at http://bugreporter.apple.com
- Google (or the search engine of your choice) http://www.google.com.au

Questions

Additional Links

Tools that might be useful

- Pacifist
  http://www.charlessoft.com/
- Iceberg
  http://s.sudre.free.fr/Software/Iceberg.html
- Suspicious Package
  http://www.mothersruin.com/software/SuspiciousPackage/
- fseventer
  http://www.fernlightning.com/doku.php?id=software:fseventer:start
- Roaring Apps - Lion App Compatibility Crowd Sourced DB
  http://roaringapps.com/

Additional Links

Tools that might be useful

- TextWrangler
  http://www.barebones.com/products/textwrangler/
- Growl (fork)
  https://bitbucket.org/pmetzger/growl/downloads
- iHook
  http://sourceforge.net/projects/ihook/
- BatChmod
  http://www.lagentesoft.com/batchmod/index.html
- MacTracker
  http://mactracker.ca/

Additional Links

Tools that might be useful

- Munki
  http://code.google.com/p/munki/
- Radmind
  http://radmind.org
- InstaDMG
  http://afp548.com/forums/forum/software/instadmg/
  http://code.google.com/p/instadmg/
- DeployStudio
  http://www.deploystudio.com/Home.html
- Lingon
  http://lingon.sourceforge.net/

World 2012