PSUMAC201: Packaging

PENNSTATE

MACADMINS CONFERENCE 2010

Who are these guys?

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  - IT Support Specialist, College of Education

Overview

- What Are Packages
- Why Use Packages
- How to Use Packages
- Demo Time

Quick Audience Survey

- Brand New to Creating Software Package Installers on Macs?
- Created a Package?
- Used PackageMaker/IceBerg/Composer/Other packaging tools?

Package Installers

What Packages Do

- User Installer.app /System/Library/ CoreServices/
- Installs Files & Applications
- Run Scripts

Package Settings

- Product Information
  Title, Description, Welcome, Read Me, License...
- Package Properties:
  Package Identifier, Version...
- Installation Properties
  System, Volume, & Authentication Requirements...
- Install Operations
  Pre & Post flight, install, upgrade

Package Installers

What are Packages

- File Directory or Flat File
  - Appears as single file in Finder
- Created with PackageMaker
  - /Developer/Applications/Utilities
- Contain Product or Component (The Payload)
  - Installed based on Package Configuration

Package Formats

- .pkg
  - Component Package 10.2+
  - Flat Package 10.5+
- .mpkg
  - Metapackage 10.2+
  - Distribution Packages 10.4+

Component Package

- Single choice
  - No Custom Choices
- Some parts editable in Finder
- Folder Bundle
  - Right-Click -> Show Package Contents

Component Package

Contents

Archive.bom

Archive.pax.gz

Info.plist

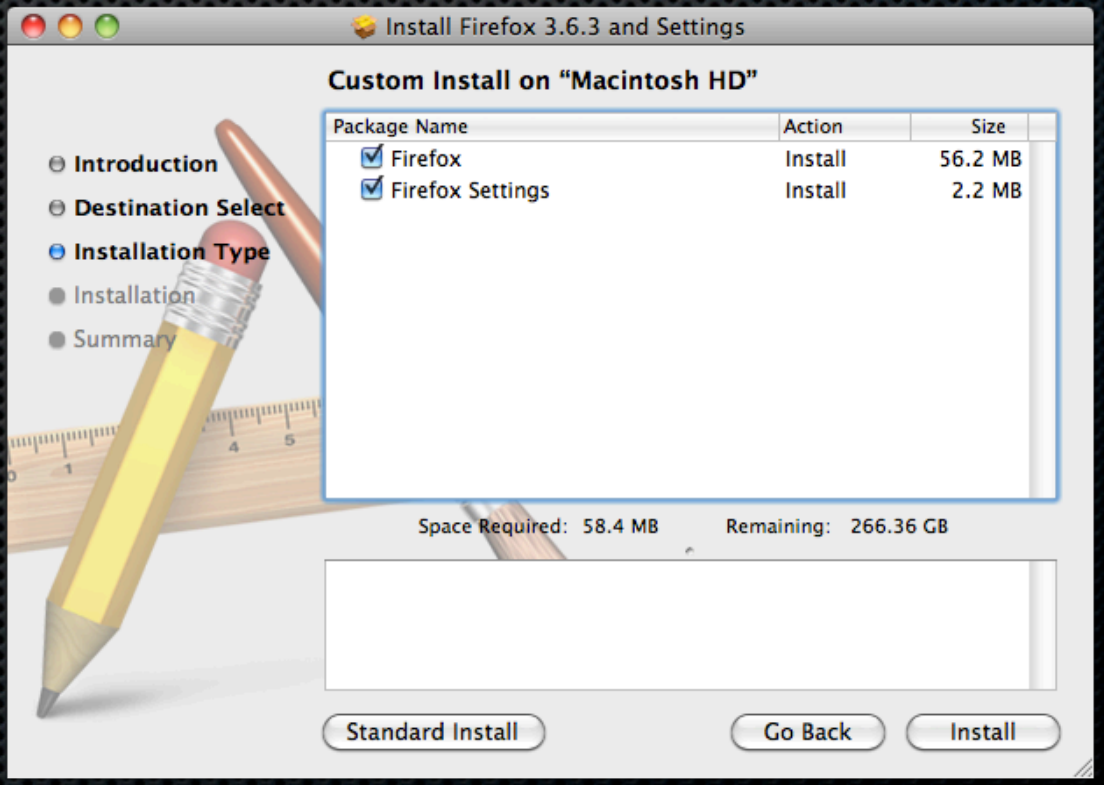
PkgInfo

Resources

Component Package

Distribution Package

- Multiple Component Packages
- Component Choices
- Define Single Install Experience



Distribution Package

Distribution Package

Contents

distribution.dist

Packages

Resources

en.lproj

Flat Package

- Single File - XAR Archive
- Edit with Flat Package Editor
- Expand Flat Packages
  - pkgutil --expand *package.pkg /path/to/destination*

Flat Package

- PackageInfo
- Bom
- Payload
- Scripts

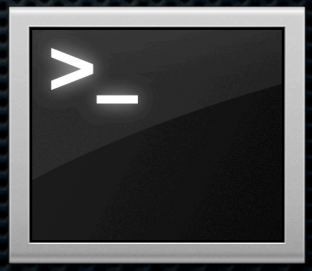
Why Use Packages

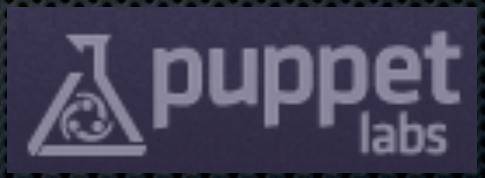
Why Use Packages

- Silent
- Free
- Easy Deployment
- Capture Licensing Info
- Set Computer Requirements
- Log of Install Files and Permissions (Bill of Materials)

Deploying Packages

- Disk Image Container
- Apple Remote Desktop
- Command Line
  - sudo installer -pkg /path/to/pkg -target /
- 3rd Party Tools





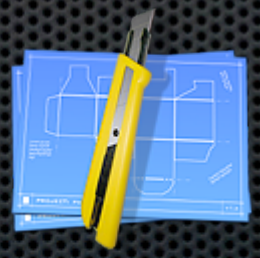
How to Make Packages

How to make Packages

- Manually Define Payload
  - GUI
  - Command Line
- File System Events
- Before & After Snapshots

Packaging Tools

- Manual
  - GUI
    - PackageMaker
    - Iceberg
    - Composer
    - Packages
    - InstallEase



  - Command Line
    - PackageMaker
    - luggage
    - Packages

Packaging Tools

- File System Events
  - GUI
    - PackageMaker
    - Composer
    - Packages
    - FSEventer
  - Command Line
    - PackageMaker
    - fslogger

Packaging Tools

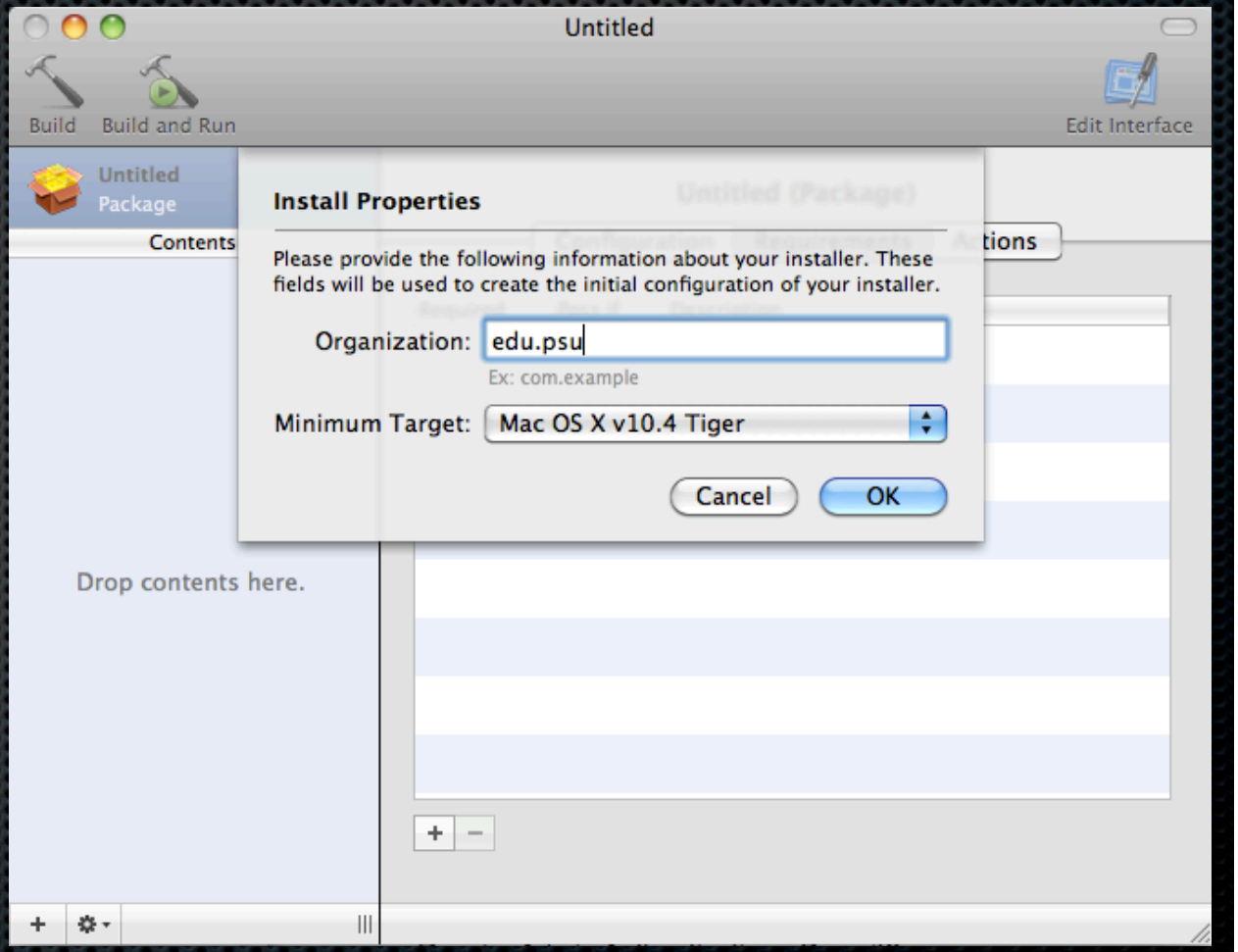
- Snapshots
  - GUI
    - Composer
    - Packages
    - InstallEase
  - Command Line
    - loggen/pkggen

Basic Packaging

- Manually choose Install files
- Manually set Installation Destination
- Can be complicated
  - Experience
  - When to Include & Exclude Files and Components

Basic Packaging

- Set
  - Organization
  - Minimum Target

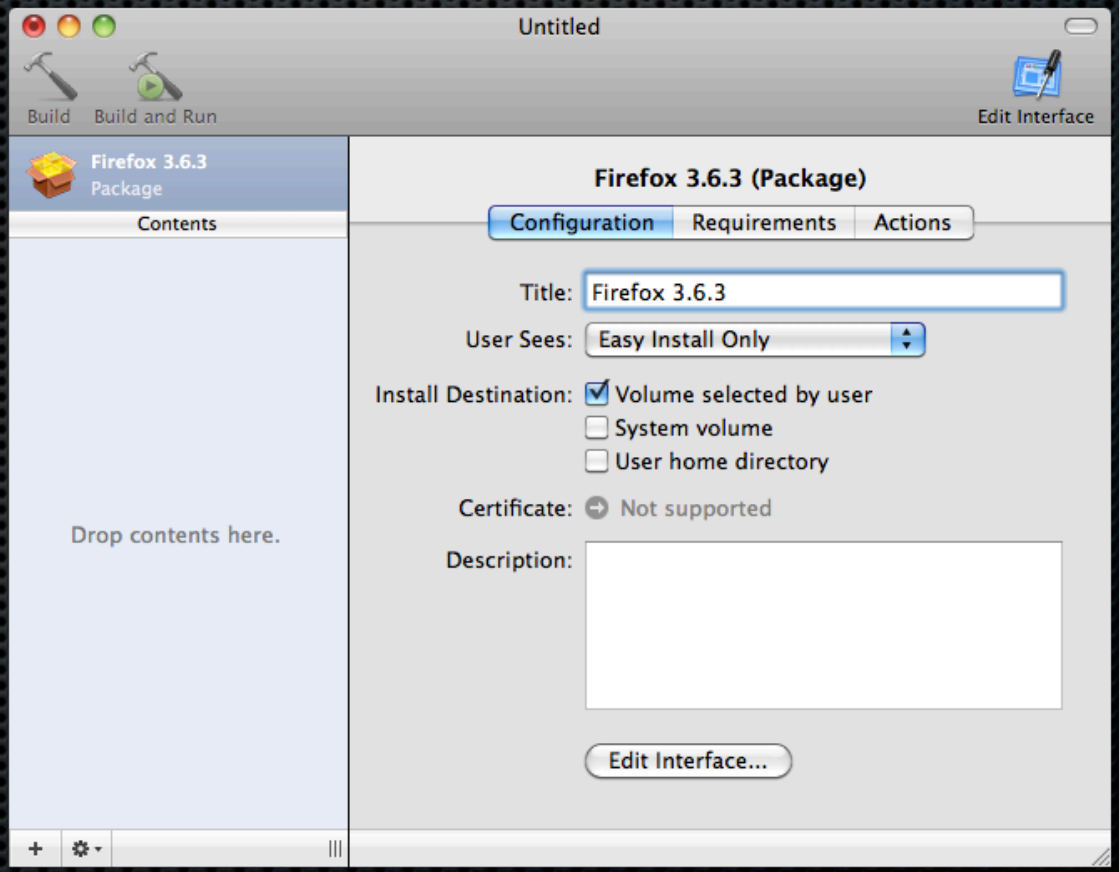


Minimum Target

- Mac OS X 10.3
  - component packages & metapakages
- Mac OS X 10.4
  - component & distribution packages
- Mac OS X 10.5
  - flat packages & metapackages

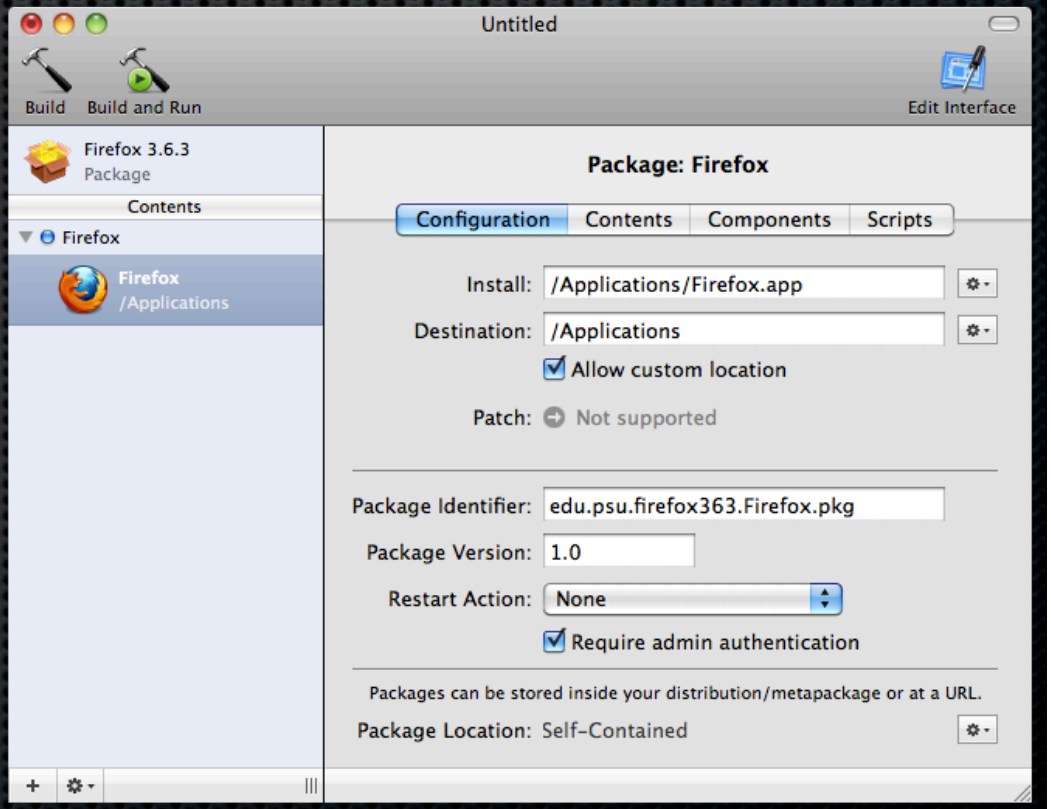
Basic Packaging

- Set the
  - Title
  - Install Destination
    - Don’t be cruel
  - Description



Basic Packaging

- Set the
  - Destination
  - Package Version
- Make sure Package Identifier is unique

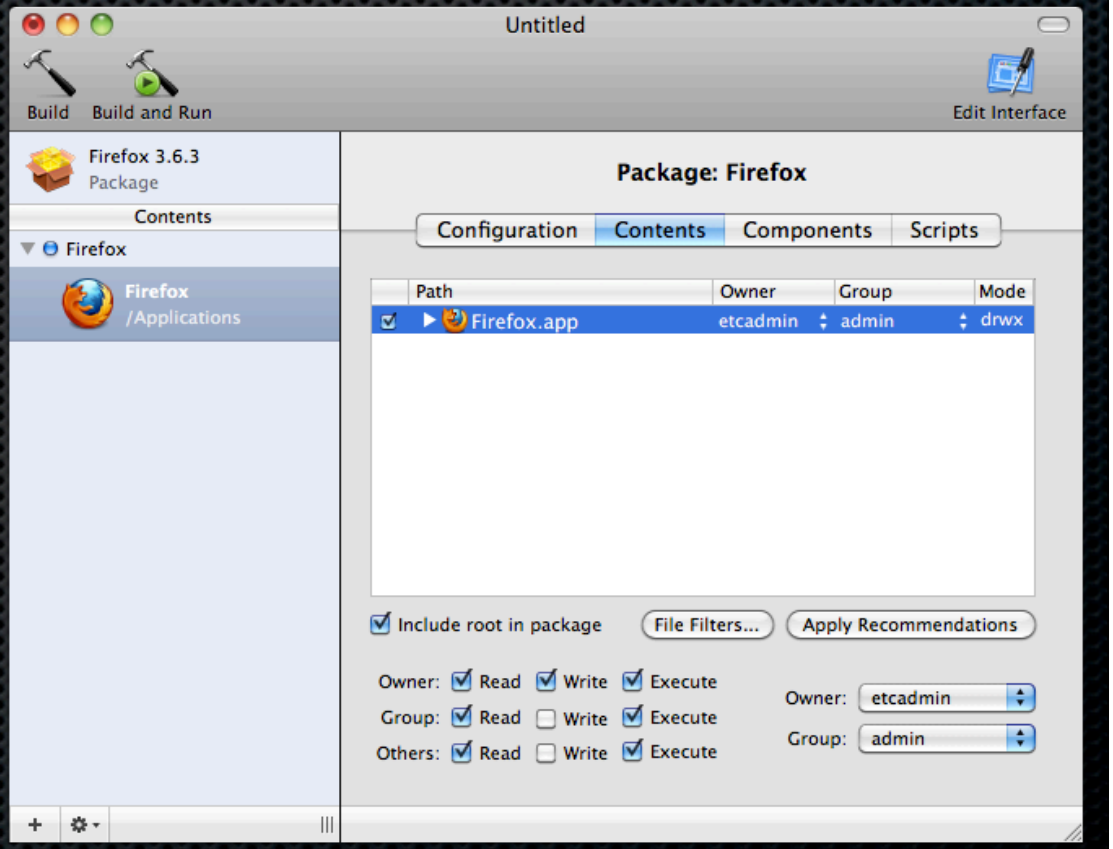


Basic Packaging

- Do you need to...
  - Restart?
    - Only if Needed
  - Require Admin authentication?
    - Installing in /Users/ or /tmp
      or
    - Installing in /Library or /Applications

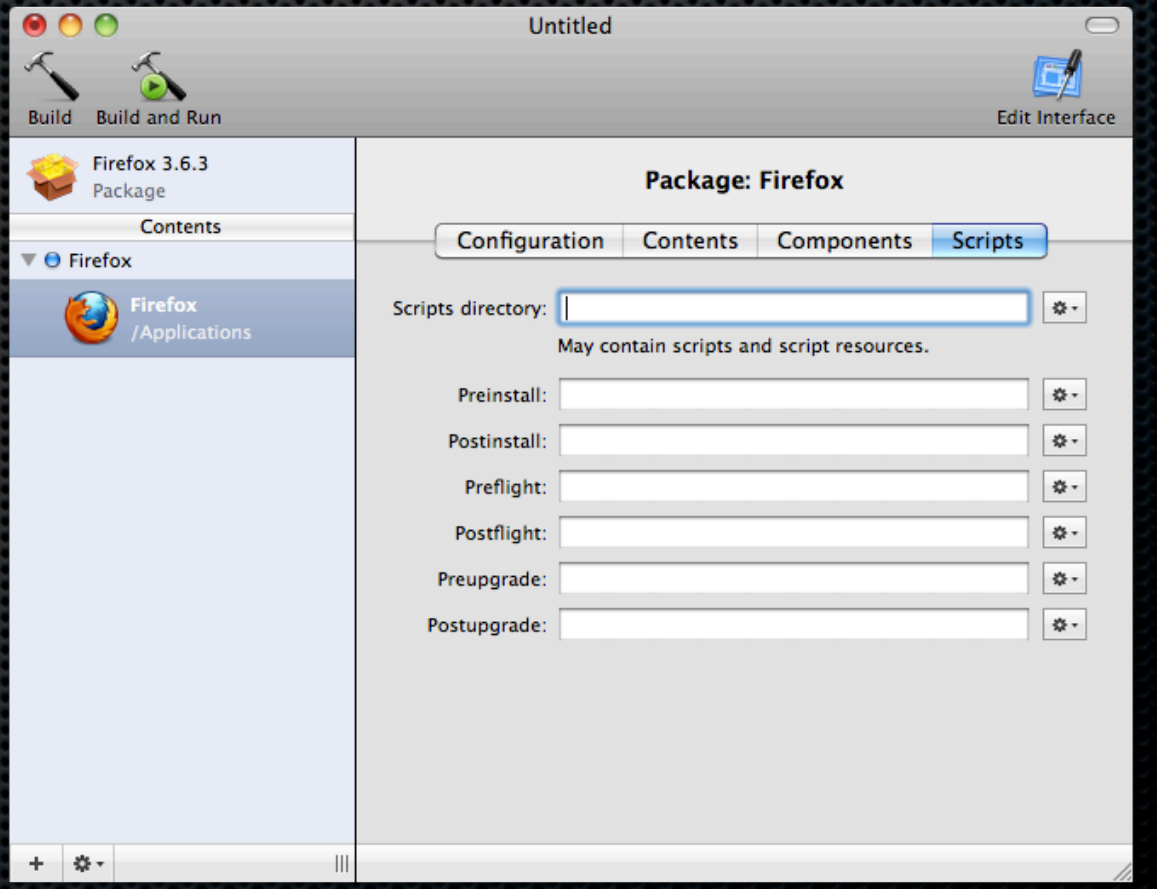
Basic Packaging

- Unchecked items are not installed.
- Set
  - Permissions
  - Owner & Group



Basic Packaging

- Add Script if used
  - Preflight Runs Before Script
  - Postflight Runs After Script
- Add script resources to “Scripts directory”

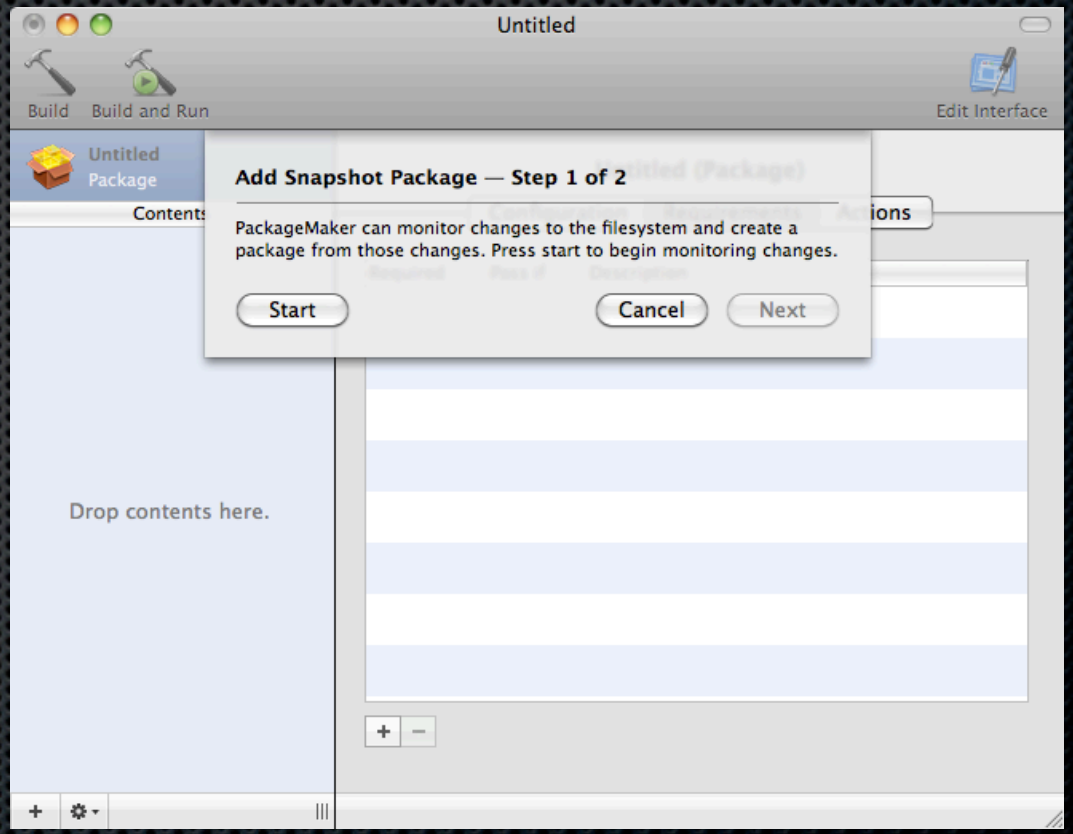


Events Packaging

- Finds New and Modified Files for You in Real Time
- Does not survive Restarts
- Can capture unwanted files

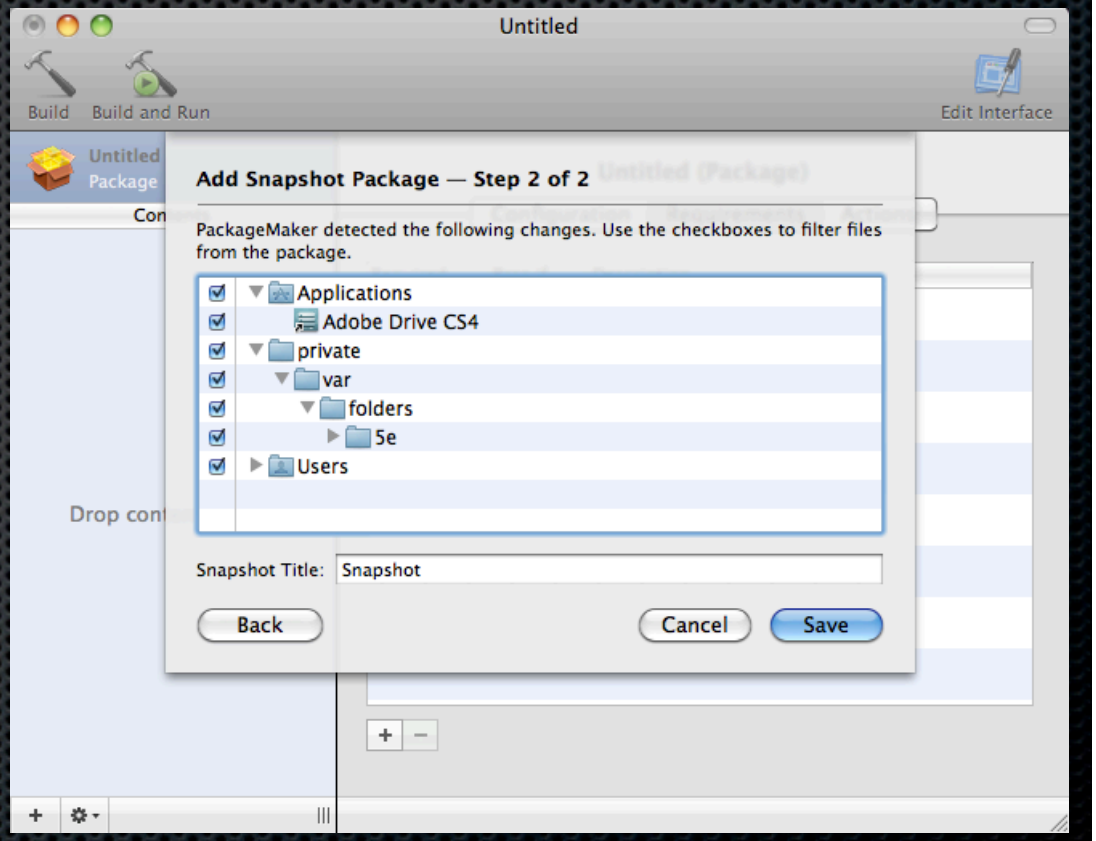
Events Packaging

- Choose Project Menu & Add Snapshot Package
- Install Software
- Stop Capture



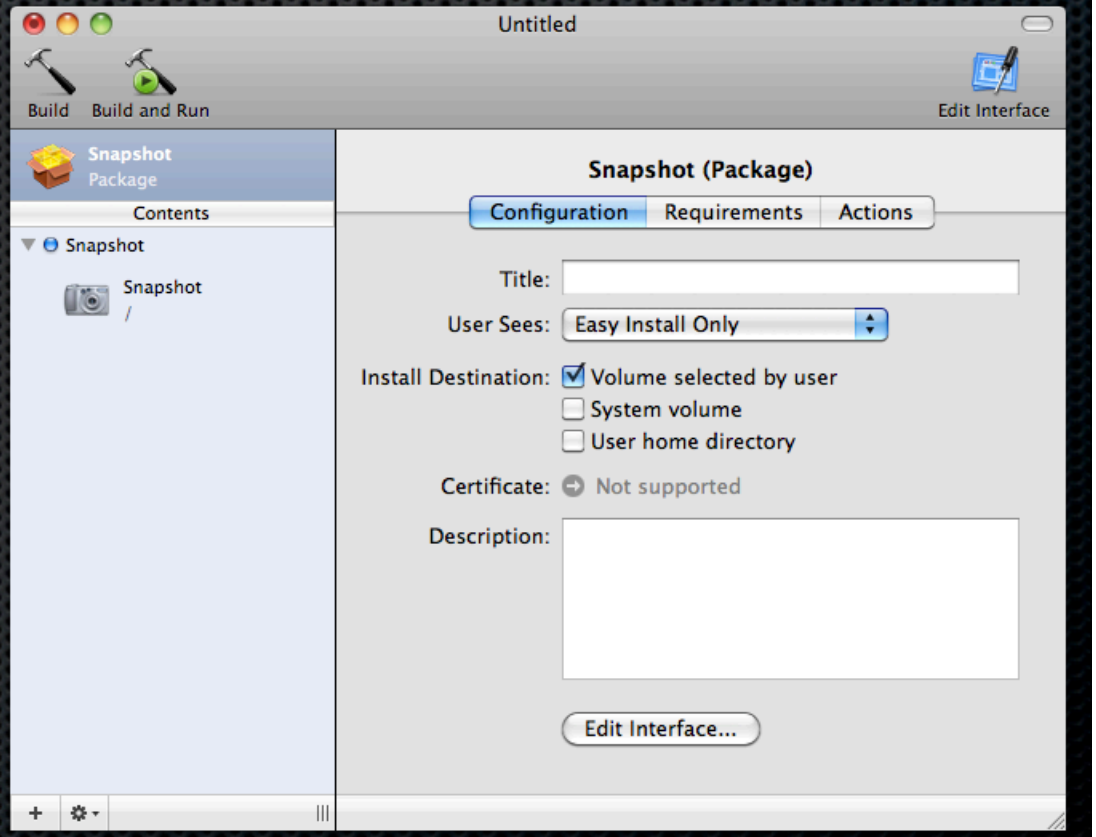
Events Packaging

- Choose Project Menu & Add Snapshot Package
- Install Software
- Stop Capture
- Uncheck boxes to remove files
- Save



Events Packaging

- Same settings as Basic Package
- Double Check Payload

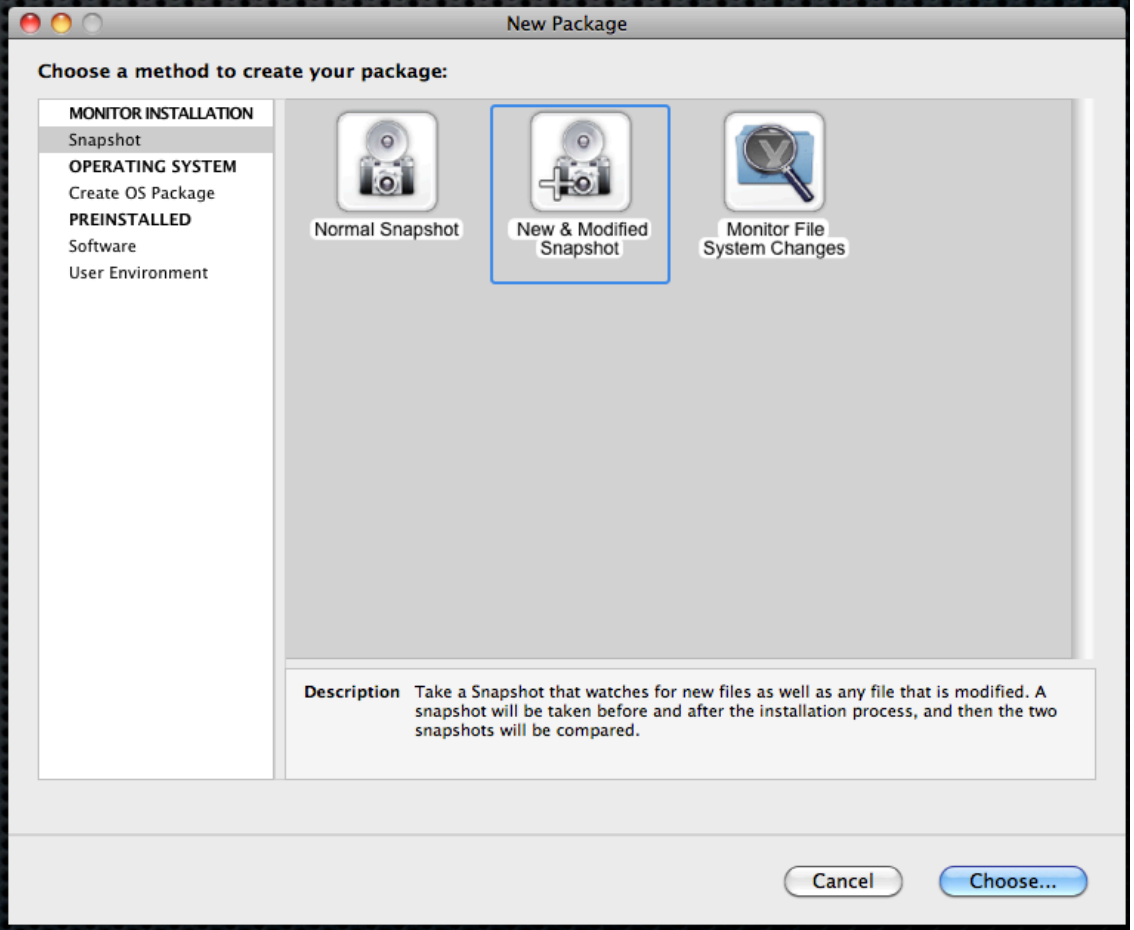


Snapshot Packaging

- Find Filesystem Differences
- Can capture unwanted files
- Can handle restarts

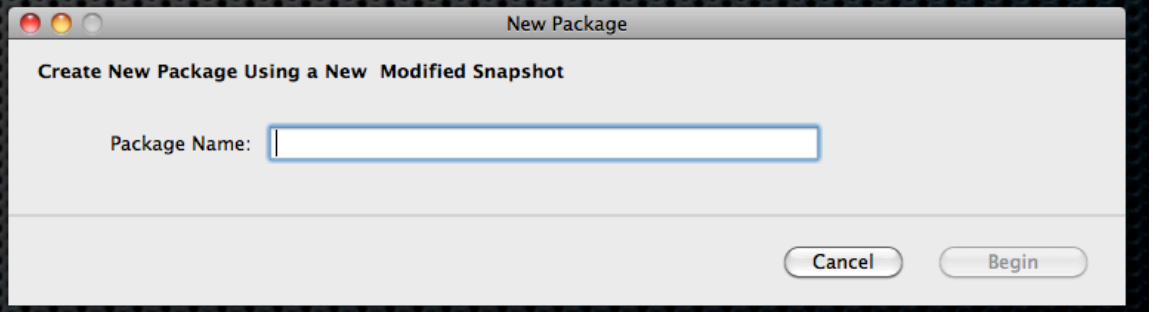
Composer Snapshots

- Choose Snapshot Method



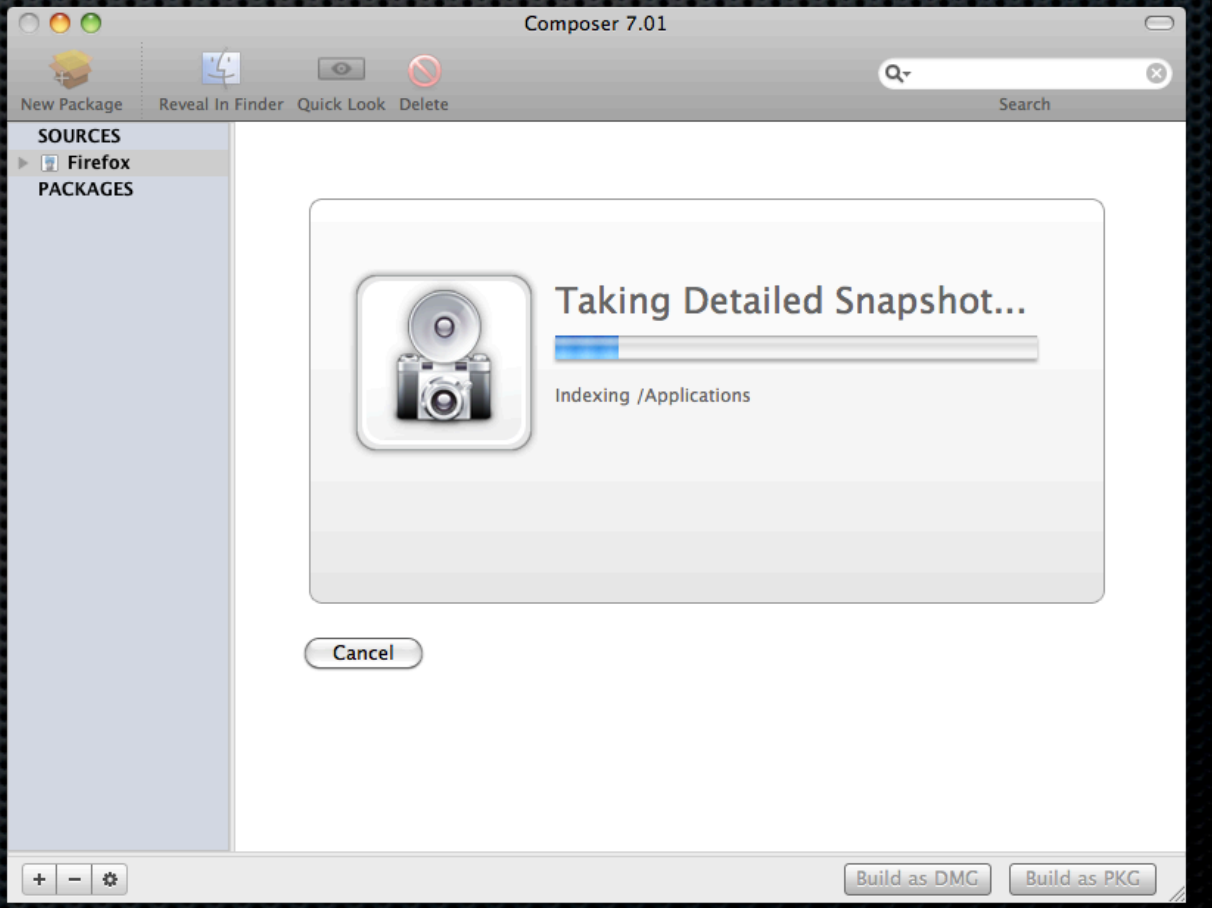
Composer Snapshots

- Choose Snapshot Method
- Set Package Name



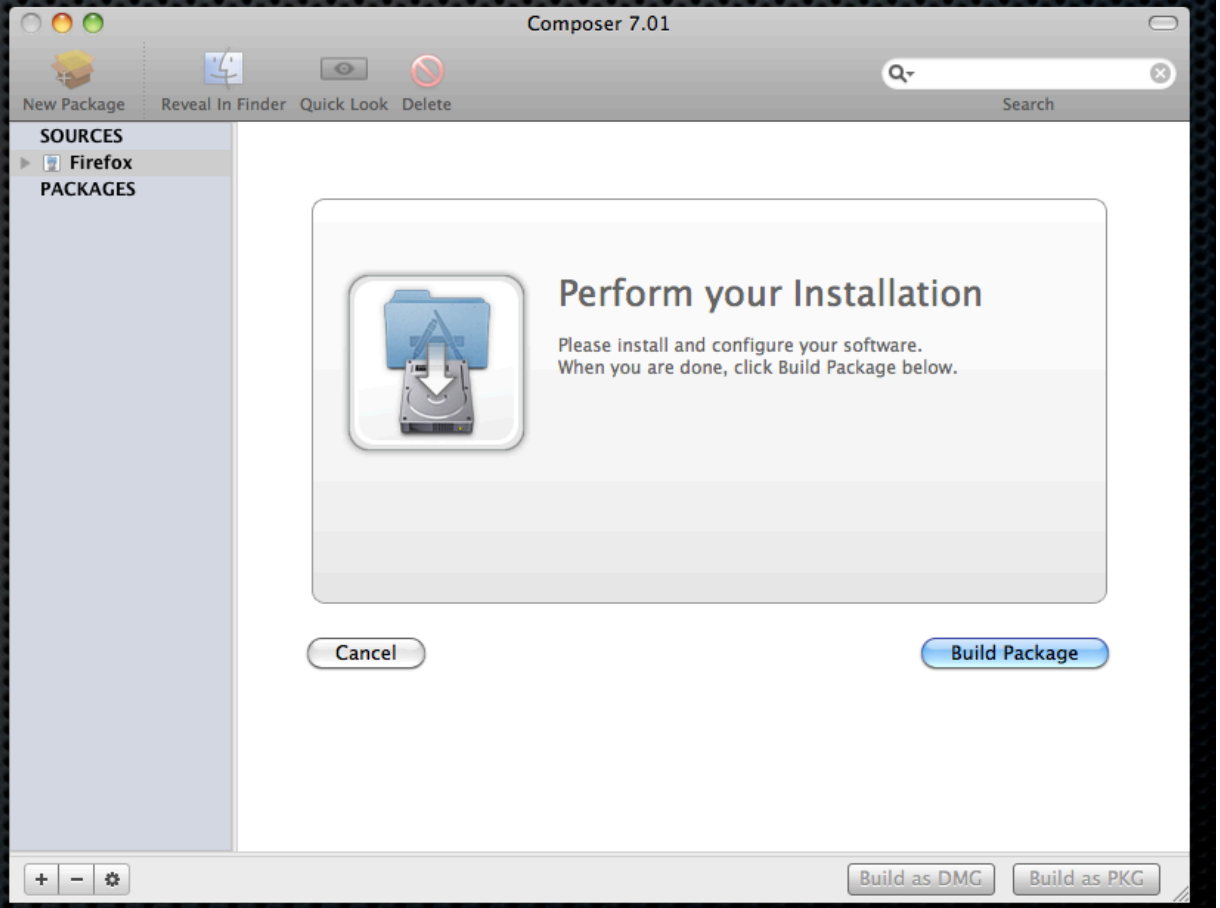
Composer Snapshots

- Choose Snapshot Method
- Set Package Name
- First Snapshot is taken



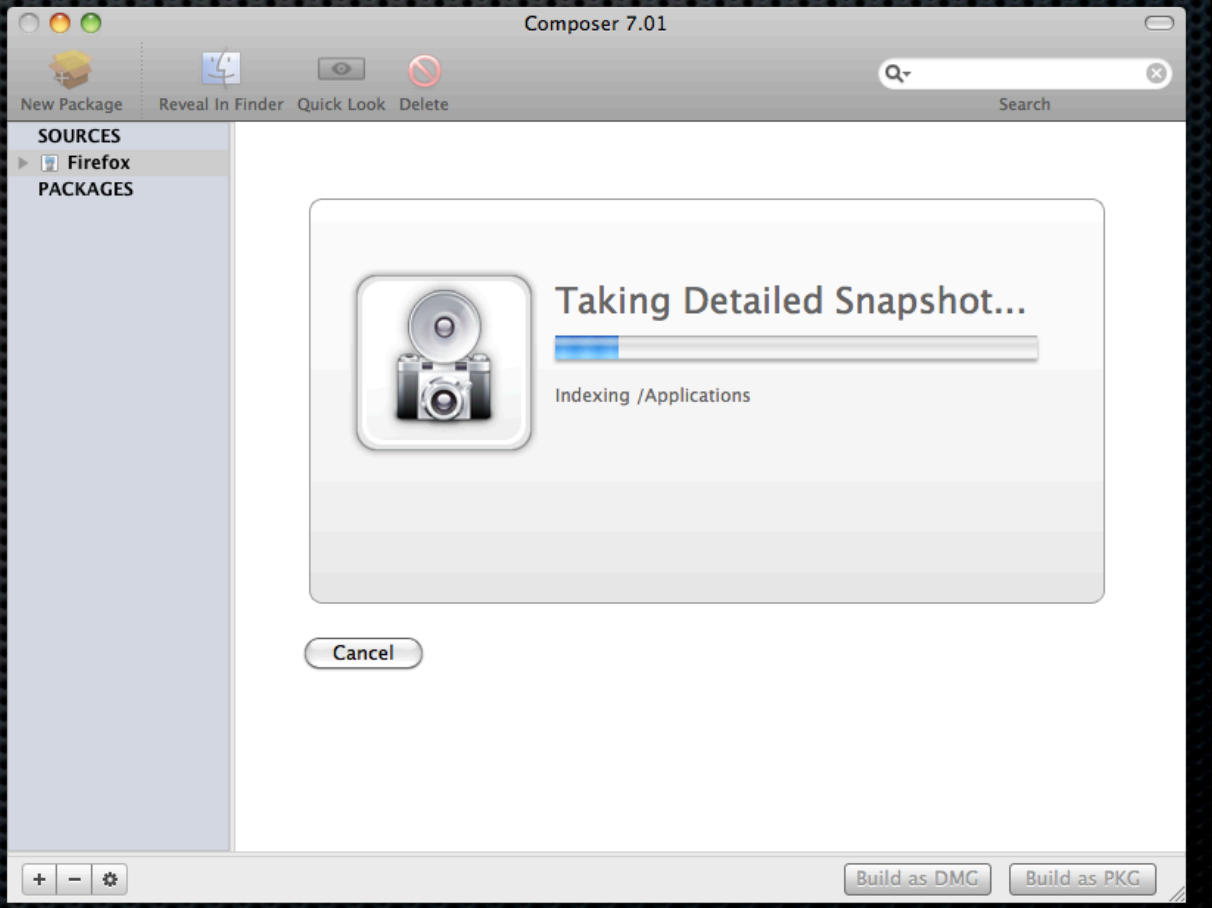
Composer Snapshots

- Choose Snapshot Method
- Set Package Name
- First Snapshot is taken
- Install Software



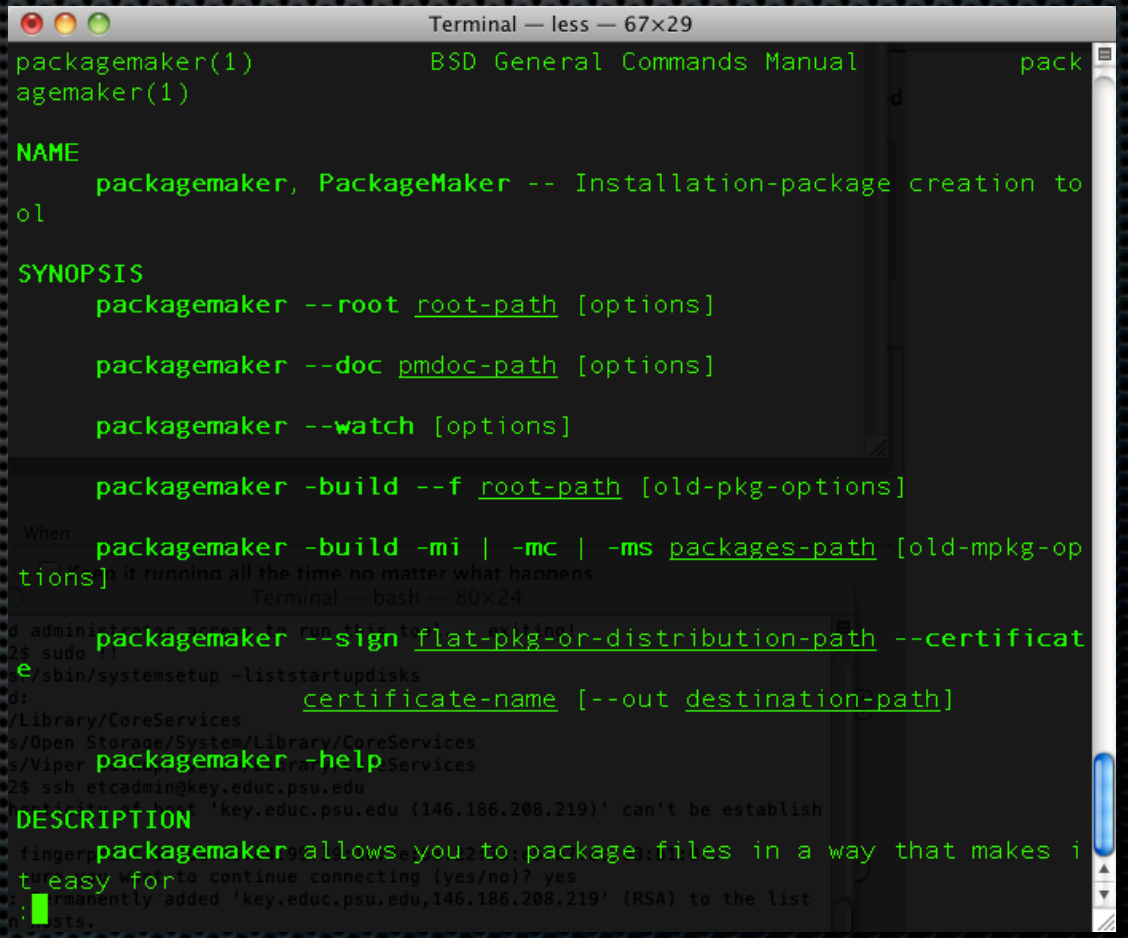
Composer Snapshots

- Second Snapshot is taken
- Remove unwanted files
- Package is built



Command Line Packaging

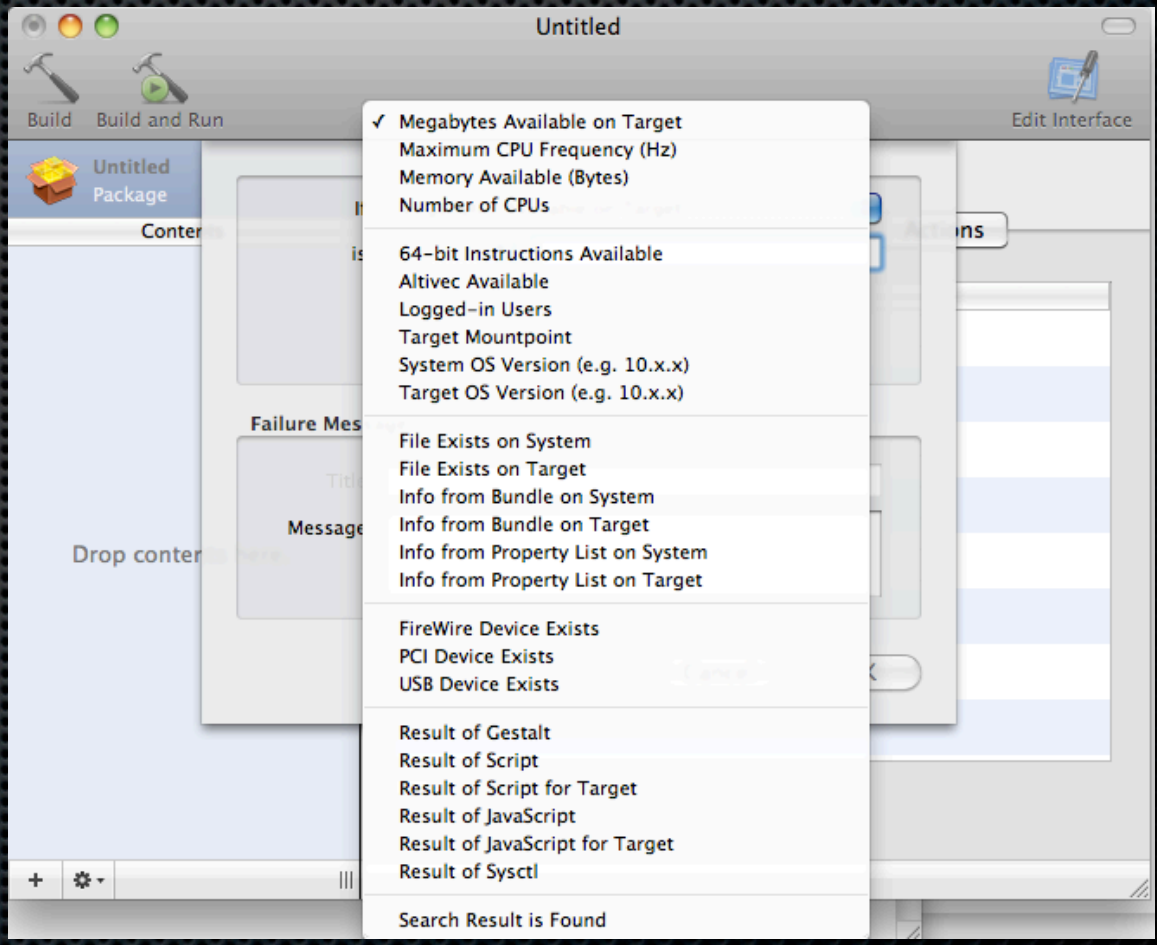
- Scriptable
- Advanced
- Easily Repeatable



Advanced Packages...

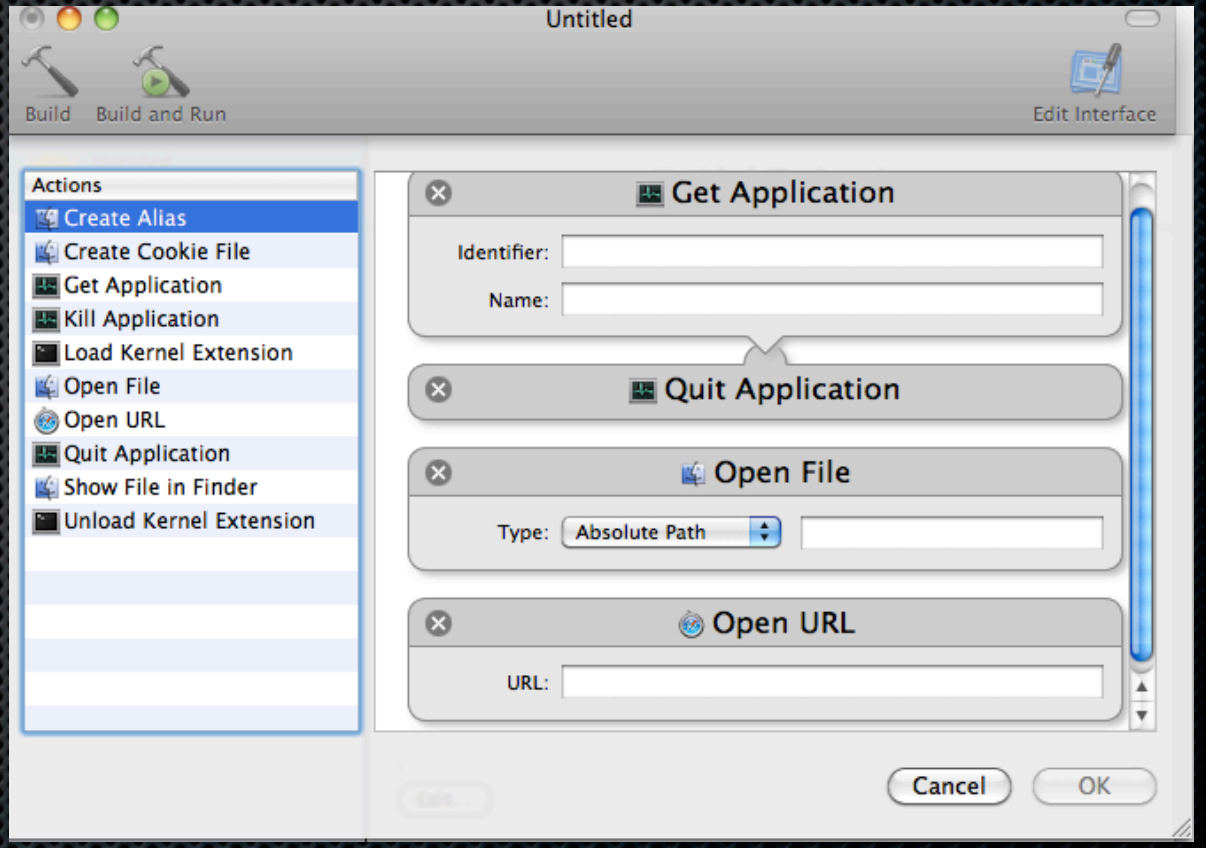
Requirements

- Require Minimum Resources



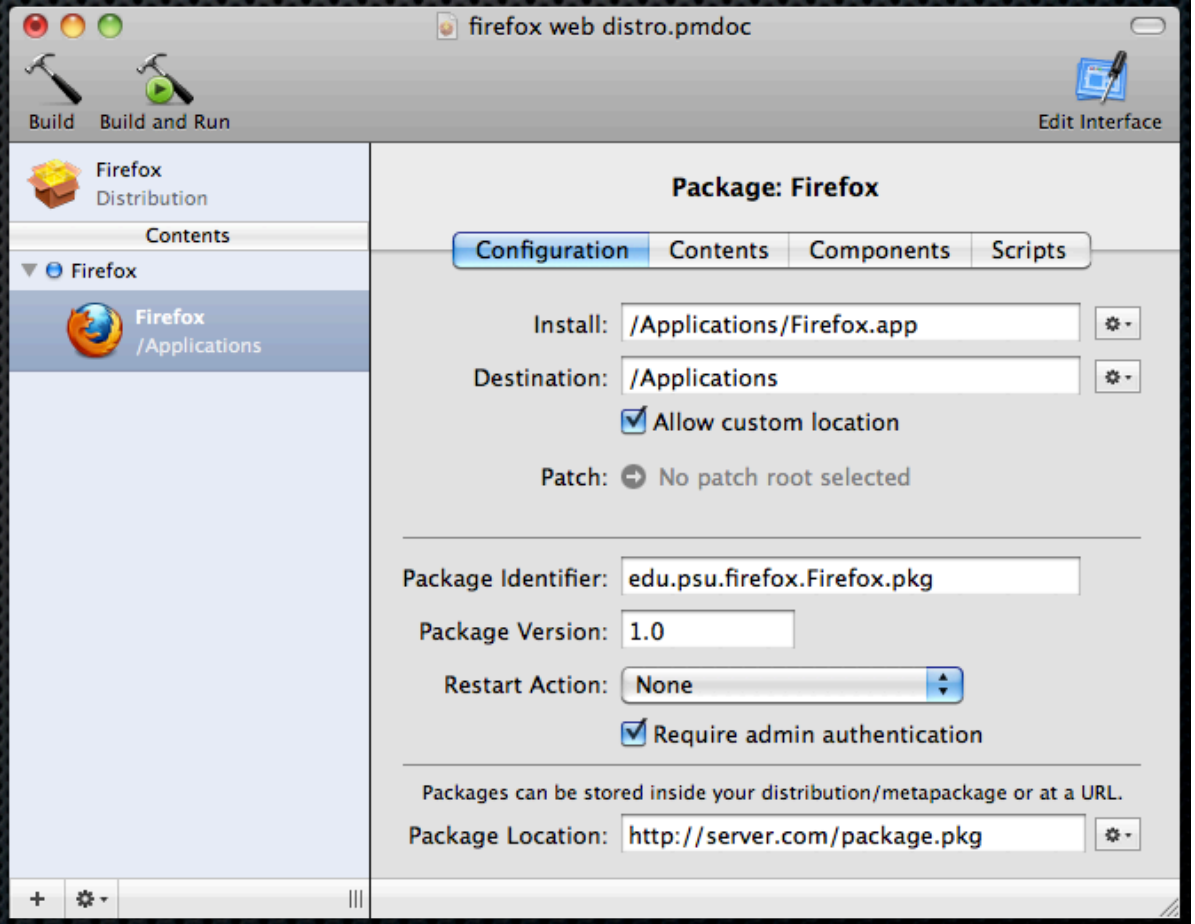
Actions

- Pre and Post Install
- Workflow style



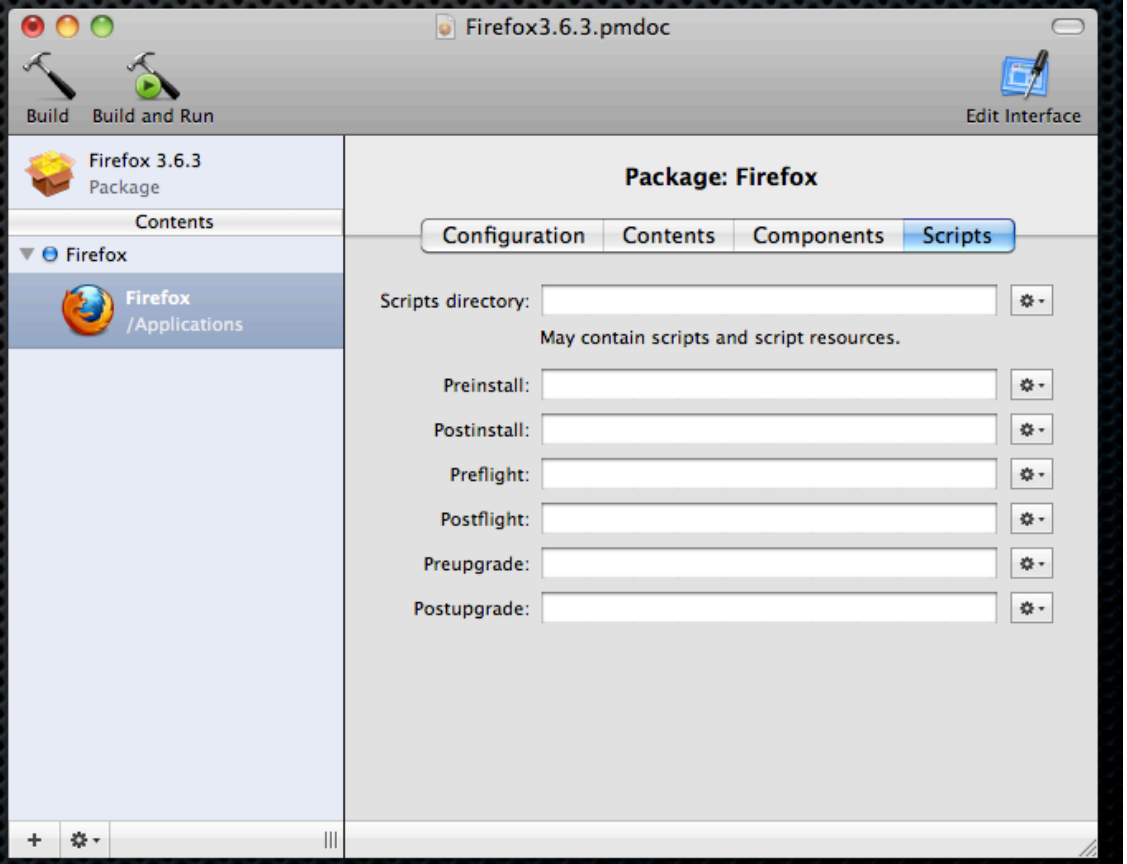
Payload Location

- Internal (Default)
- Same Level
- Custom Path
- HTTP URL
- Removable Media



Scripts

- Perl, Shell, Python, Ruby
- Variables
- Includes
- Preinstall & Postinstall only 10.5+



Shell Variables

- $0 = Path to this Script
- $1 = Destination path of where package is being installed
- $2 = Path to the Target Location
- $3 = Mountpoint of the destination volume

Perl Variables

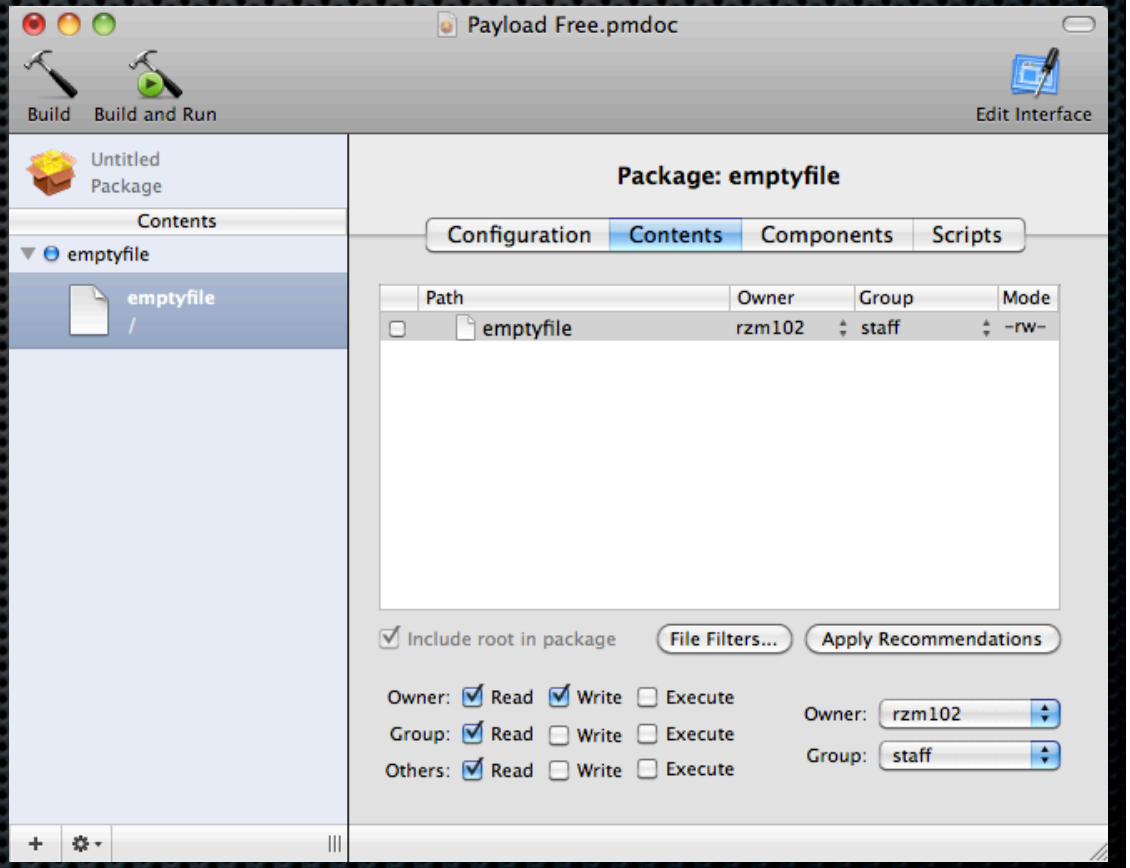
- $0 = Path to this script
- $ARGV[0] = Path to the Package being installed
- $ARGV[1] = Destination path of where package is being installed
- $ARGV[2] = Mountpoint of the destination volume
- $ARGV[3] = Path to the directory containing the System folder that contains the active Installation framework.

Payload Free

- Run a script
- Doesn’t install anything
- Easier for Users to Run
- Scripts receives target volume path ($3)

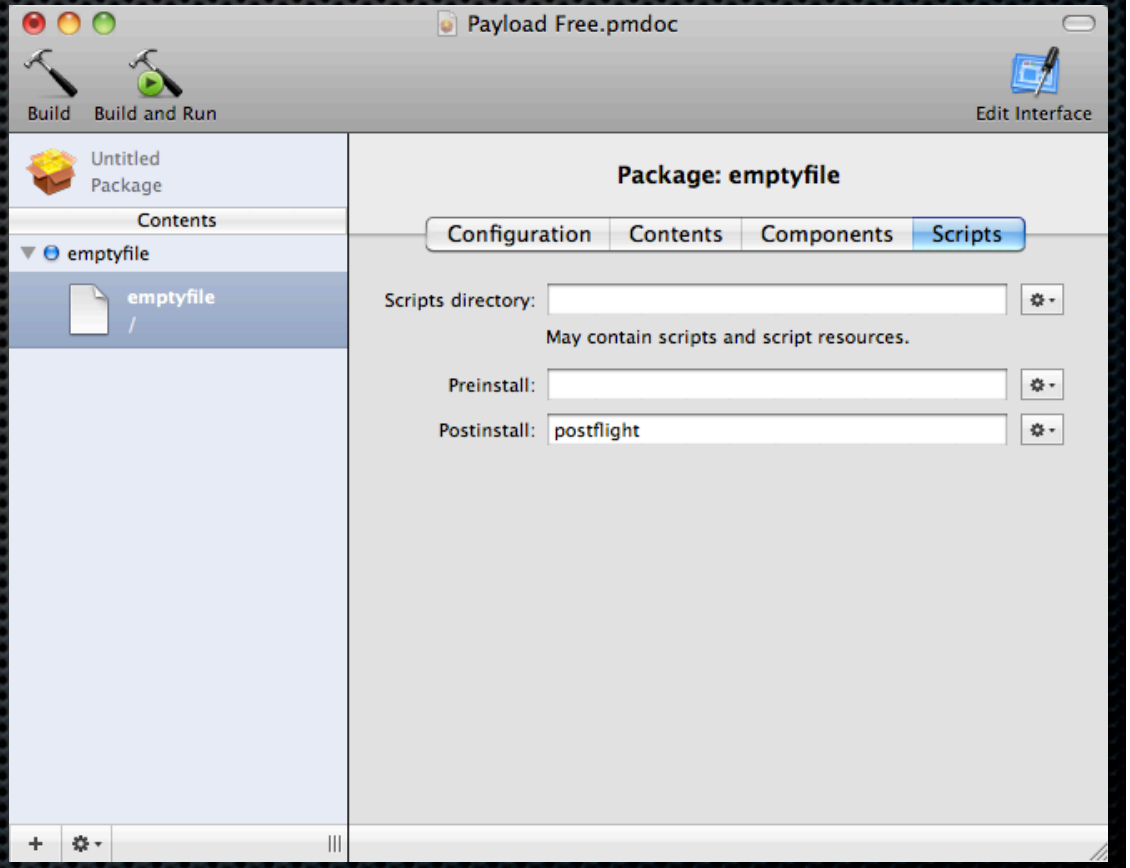
Payload Free

- % touch emptyfile
- Add to PackageMaker
- Uncheck Contents
- Add Post Install script



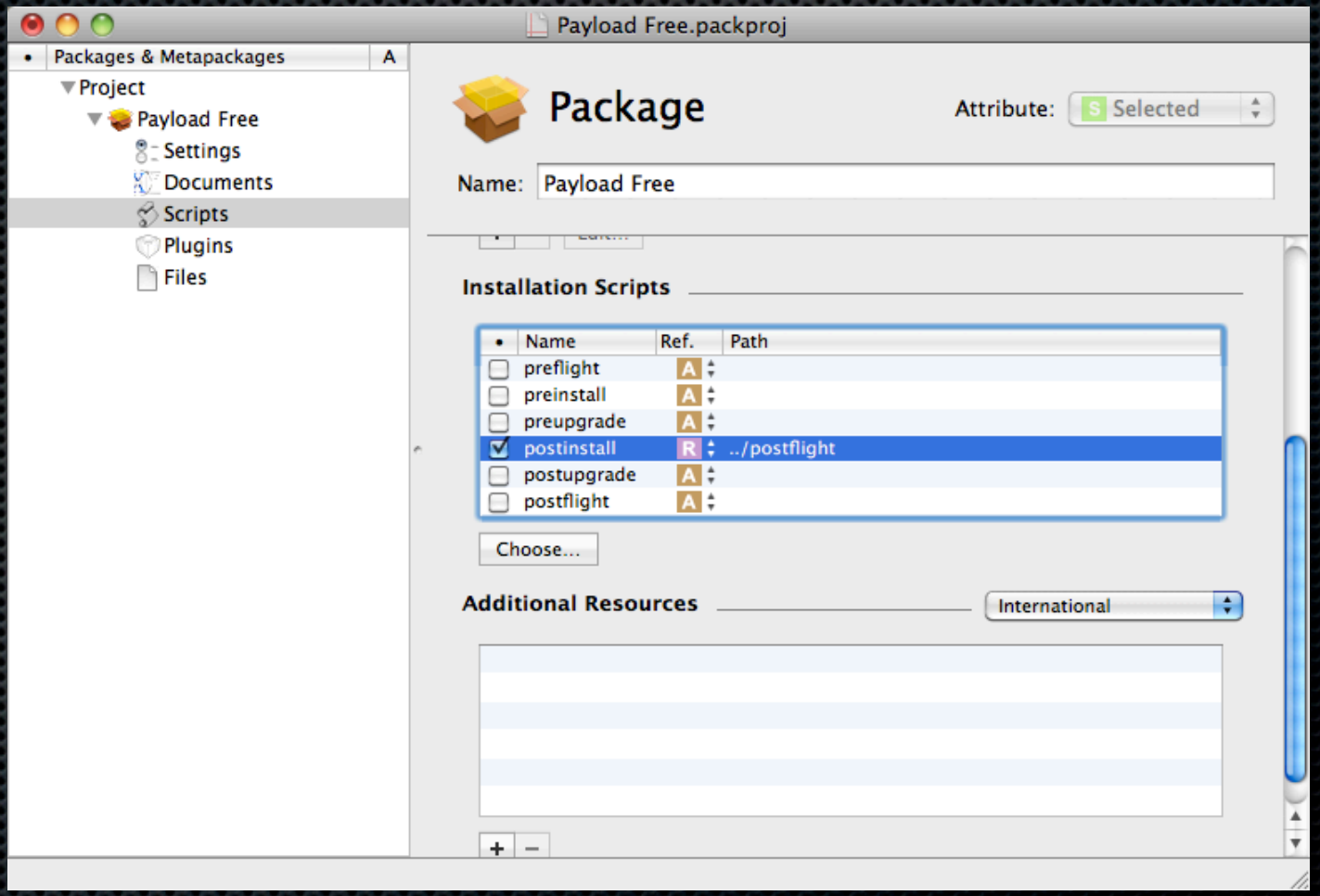
Payload Free

- % touch emptyfile
- Add to PackageMaker
- Uncheck Contents
- Add Post Install script



Payload Free

- Iceberg is Easier



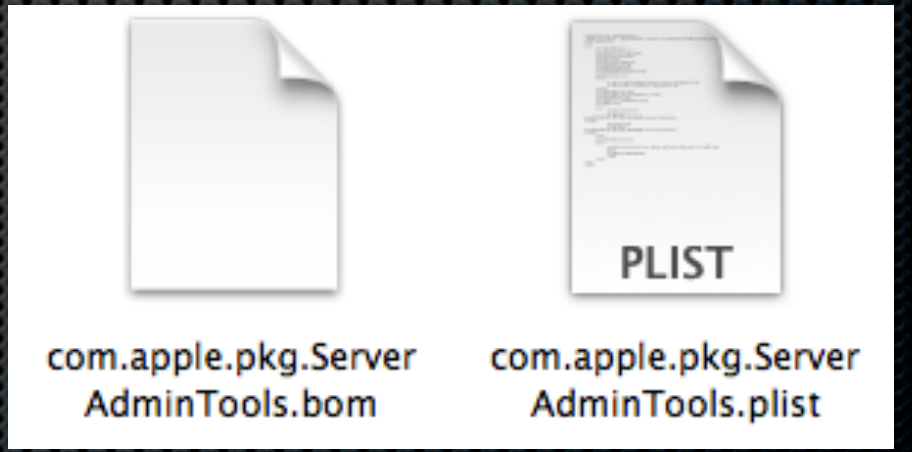
Post-Packaging

Installed Packages

- List installed packages by Unique Identifier 10.6 Only
    - pkgutil --pkgs
- History of Installed Packages 10.6+
    - /Library/Receipts/InstallHistory.plist

Verify Installation

- Package Receipt Locations
  - 10.6 ≥ /var/db/receipts/
  - 10.5 ≤ /Library/Receipts/



List Bill of Materials (BOM)

- 10.5
  lsbom -p UGMsF /Library/Receipts/boms/com.org.app.bom
- 10.6
  lsbom -p UGMsF /var/db/receipts/com.org.app.bom
- Files may be changed with postflight scripts

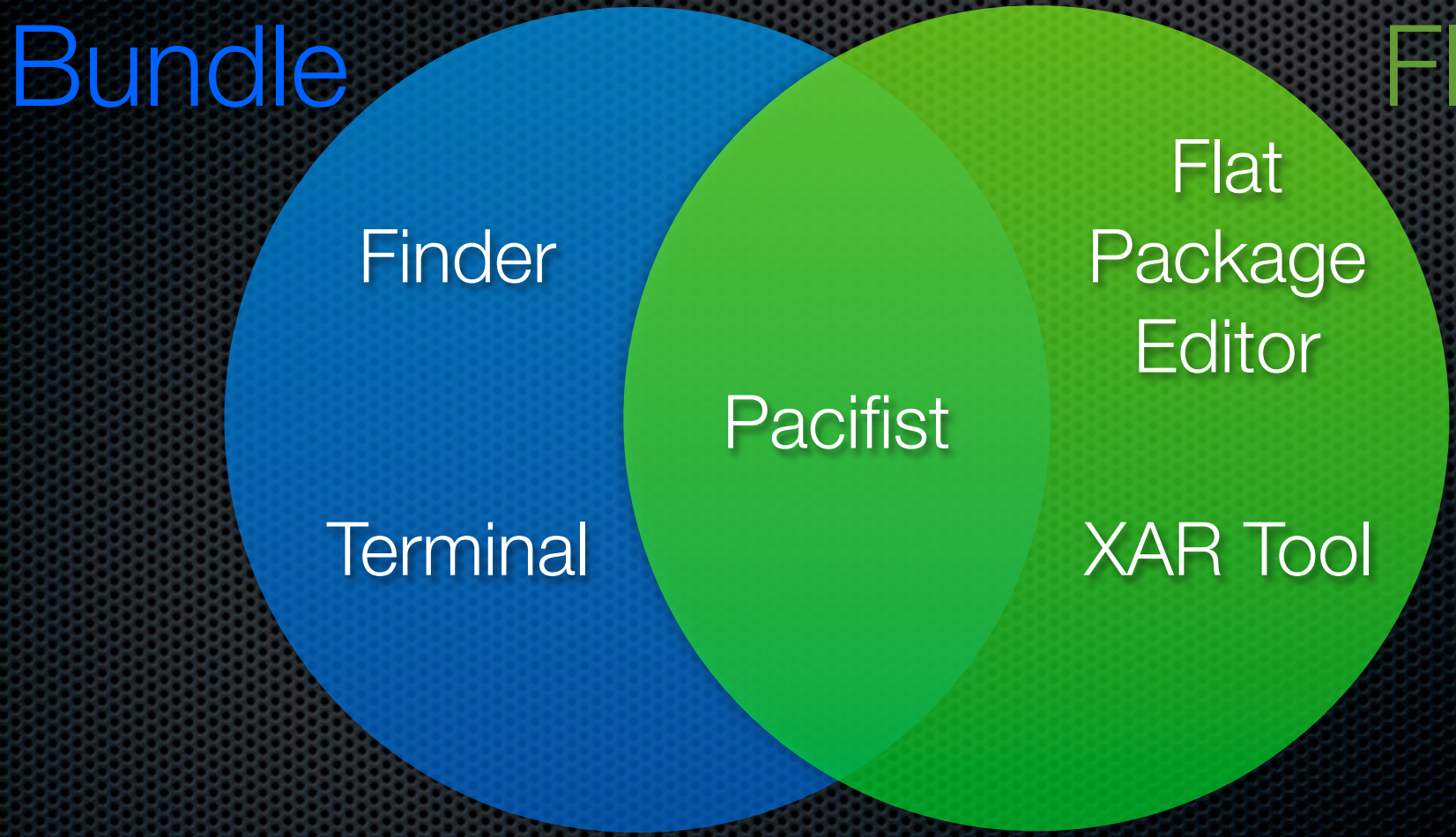
Force Reinstall

- Remove Old Files
- Remove Receipt
  - sudo pkgutil --forget com.org.pkg --volume /

Maintaining Packages

- Use Versions
- Use Component Package
  - Easier to edit Script
- Save PackageMaker (Or Other) Project File (.pmdoc)
  - Reusable settings (Permissions, Destination, Scripts)

Tools to Examine or Edit Packages



Package Names & Versions

```
$ find /path/to/some/folder -name \*pkg |while IFS= read -r x;
do echo -n "${x##/*/} "; grep -A1 CFBundleShortVersionString "$x/Contents/
Info.plist" |
sed '/string/!d;s@^.*<string>\([^<]*\)</string>.*$@\1@g'; done
```

```
$ find /Volumes/iTunes\ 8.1.1 -name \*pkg |while IFS= read -r x;
do echo -n "${x##/*/} "; grep -A1 CFBundleShortVersionString "$x/Contents/
Info.plist" |
sed '/string/!d;s@^.*<string>\([^<]*\)</string>.*$@\1@g'; done
```

```
iTunes.mpkg 8.1.1
AppleMobileDeviceSupport.pkg 2.3
CoreFP.pkg 1.3
iTunesAccess.pkg 8.1
iTunesX.pkg 8.1.1
```

script fails when package doesn't have a *.pkg/Contents/Info.plist file. Instead they have a *pkg/some.pkg/PackageInfo file.

http://forums.macosxhints.com/showthread.php?t=101838

Future Packaging

The Luggage

- Makefiles with Payloads/Scripts Referenced
- Easy to Review Packages
- Easy to Rollback Changes (SVN)

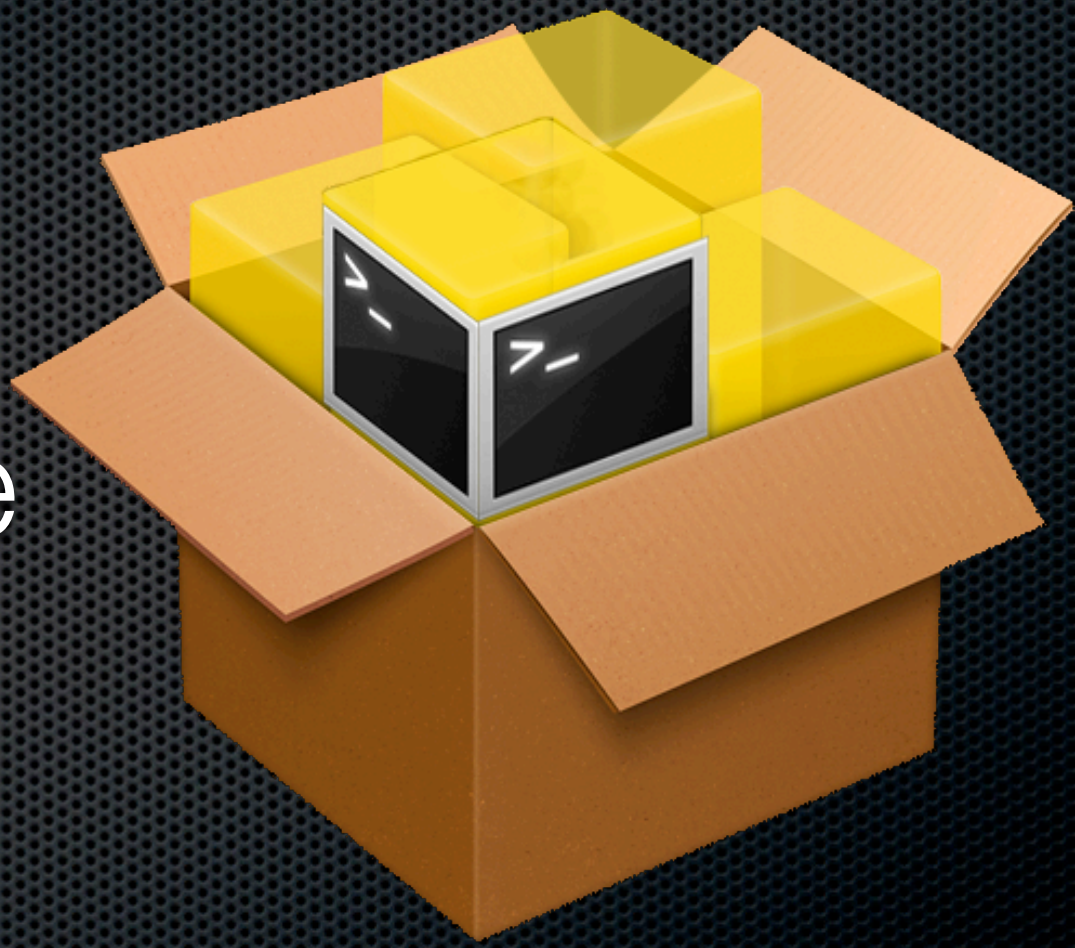
http://luggage.apesseekingknowledge.net/

Demo Time

Iceberg

Firefox/Chrome

Payload Free



Resources

Tools

IceBerg, Packages, Pacifist, InstallEase
http://s.sudre.free.fr/Packaging.html

http://blog.macadmincorner.com/mac-software-packaging-utilities-list/

References

Apple Software Delivery Guide
http://tinyurl.com/SoftwareDeliveryGuide

PackageMaker User Guide
http://tinyurl.com/PackageMakerUG

MacEnterprise: Packaging for Sys Admins
http://tinyurl.com/MacTechPackaging

Packaging Guides

Sudre PackageMaker How To
http://s.sudre.free.fr/Stuff/PackageMaker_Howto.html

Sudre Flat Package Missing Documentation
http://s.sudre.free.fr/Stuff/Ivanhoe/FLAT.html

Q & A

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