

# Managing Munki repositories with MunkiAdmin

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 [@hjuutilainen](https://github.com/hjuutilainen)

# Hannes?

- Sysadmin, University of Jyväskylä, IT Services
  - Since 2003
  - Responsible for everything Apple related
  - Part of the infrastructure team
- Just started as consultant for mcare pro Oy
  - Working with Puppet and Munki

Finland?

# Finnish Nightmares

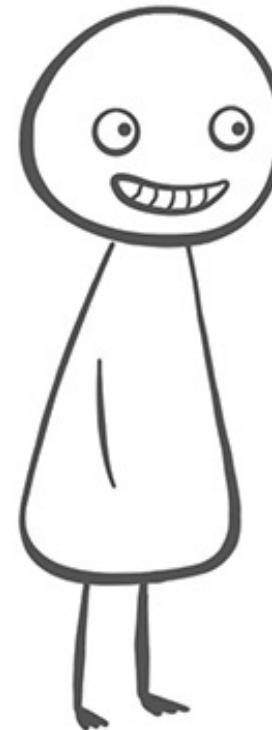
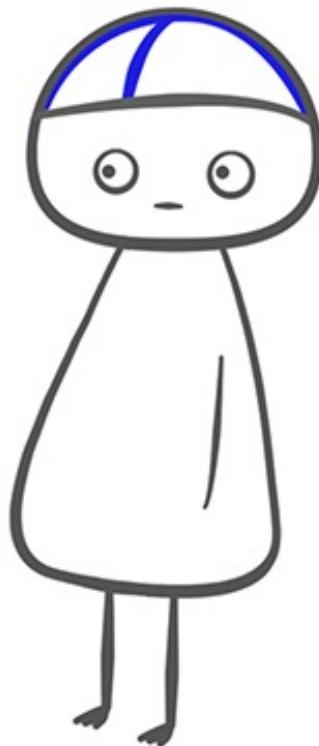
Uncomfortable social situations, uncomfortable  
everything.

<http://finnishnightmares.blogspot.fi>

by Karoliina Korhonen

# FINNISH NIGHTMARES

FINNISHNIGHTMARES.BLOGSPOT.FI - FACEBOOK.COM/FINNISHNIGHTMARES - TWITTER.COM/FINN\_MATTI



WHEN A STRANGER LOOKS  
YOU IN THE EYES

AND SMILES

# FINNISH NIGHTMARES

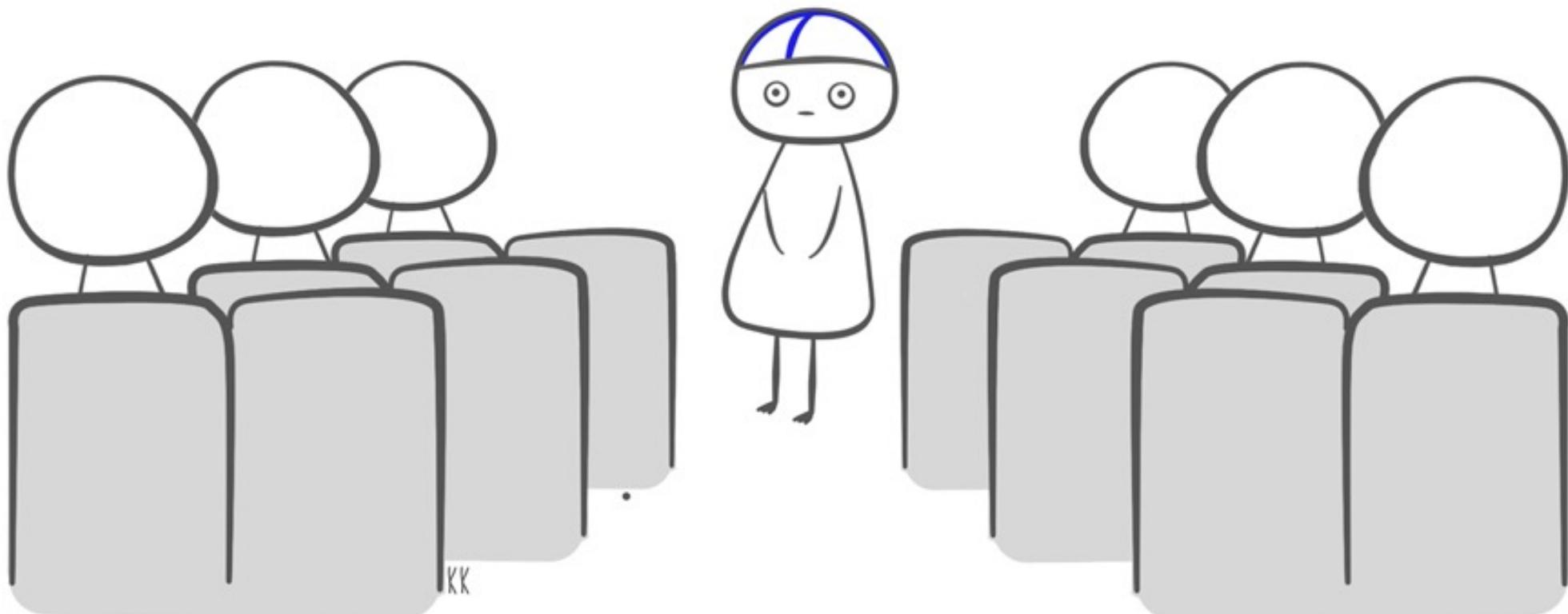
FINNISHNIGHTMARES.BLOGSPOT.FI - FACEBOOK.COM/FINNISHNIGHTMARES - TWITTER.COM/FINN\_MATTI



"SMALL" TALK

# FINNISH NIGHTMARES

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THE BUS IS "FULL".

# FINNISH NIGHTMARES

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FOR SOME REASON, SOMEONE SOMEWHERE DOESN'T LIKE FINLAND.



MunkiAdmin

# MunkiAdmin

- OS X application for managing Munki repositories
- Started in 2010 along with our initial Munki deployment
- Designed to complement your current workflow
- Doesn't require any configuration or changes to the repository
- <https://github.com/hjuutilainen/munkiadmin>

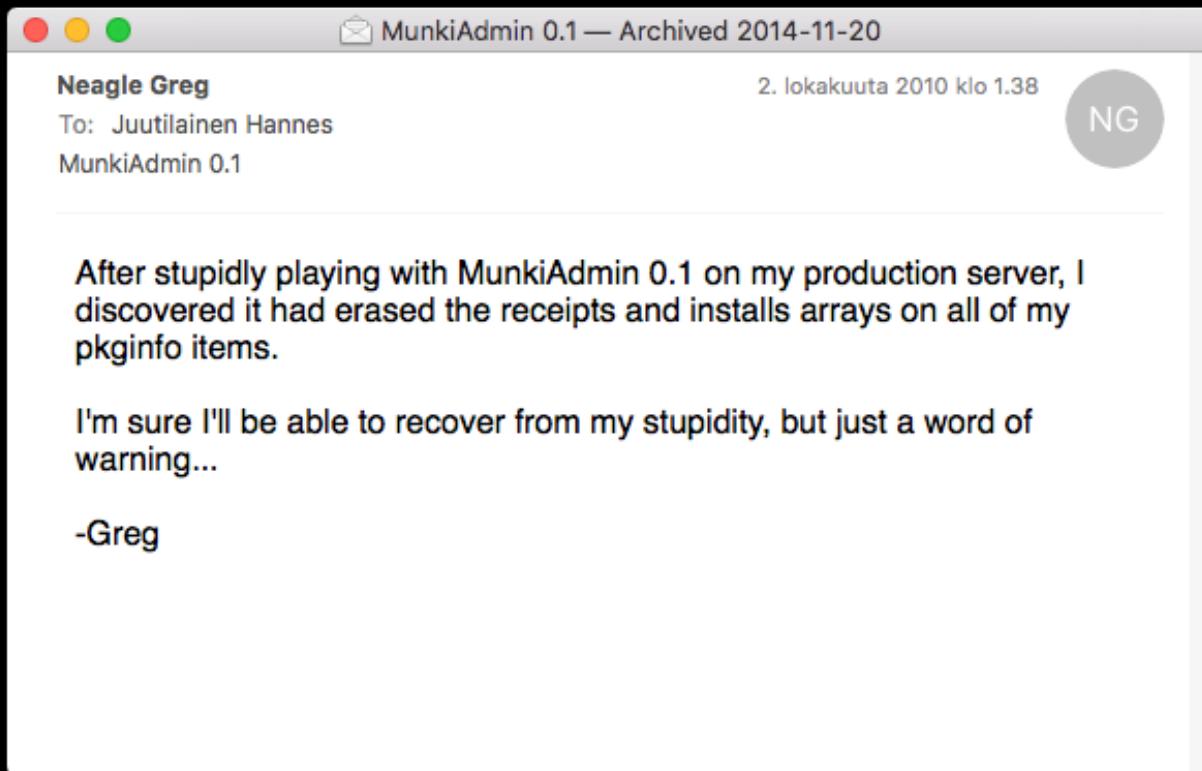
# MunkiAdmin

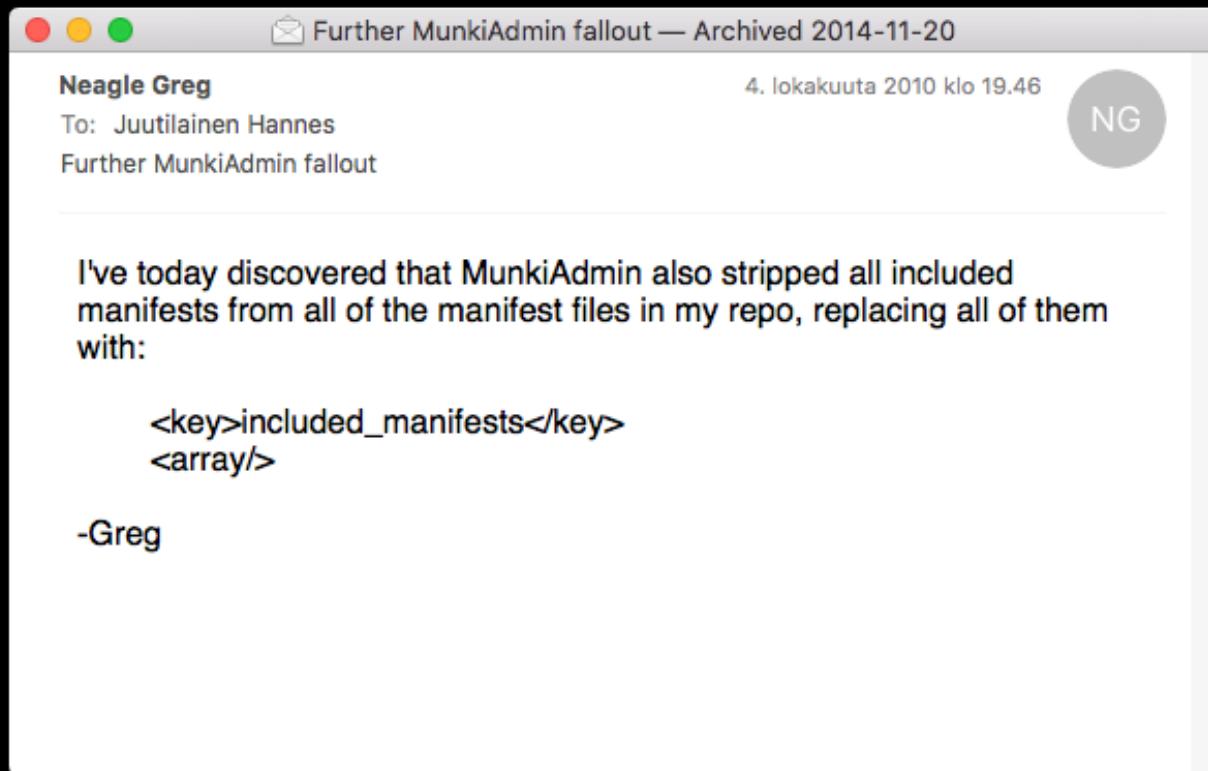
- Can open repositories from any local disks or network shares
- Originally designed to be used with version control and local repositories
- Can easily work with thousands of packages and manifests

# History

# History

- Munki 0.6.0 was released
- It was good. It added things like:
  - "New copy\_from\_dmg installer type"
  - "Support for optional installs"
  - "Support for managed\_updates"
- MunkiAdmin 0.1 was released
- It wasn't good...





# Basics

MunkiAdmin - Packages

View Open Save Reload Properties Search

Repository

- All Packages
- Recently Modified
- Installer Types
  - Copy from Disk Image
  - Installer Package
  - No Package
  - Apple Update Metadata
  - Configuration Profile
  - On Demand
  - Adobe Installer
- Categories
  - Uncategorized
  - Developer
  - File Sharing
  - Graphics
  - Internet
  - Media
  - Office
  - Productivity
  - Text Editors
  - Utilities
  - Virtual Machines
- Developers
  - Unknown
  - Bare Bones Software, Inc.
  - GitHub, Inc.
  - JetBrains
  - Microsoft Corporation
  - Oracle Corporation
  - Plex
  - Puppet Labs

Name	Display Name	Version	Catalogs	Modified
1Password	1Password	6.0.1	pr te	2.2.2016 9.18
Acorn	Acorn 4	4.5.6	pr te	2.2.2016 9.18
Adium	Adium	1.5.10.1	pr te	2.2.2016 9.18
AdobeFlashPlayer	Adobe Flash Player	20.0.0.286	pr te	2.2.2016 9.18
Alfred2	Alfred 2	2.8.2	pr te	2.2.2016 9.18
AppCleaner	AppCleaner	3.2.1	pr te	2.2.2016 9.19
AppCode	AppCode	3.3.2	pr te	2.2.2016 9.19
Atom	Atom	1.4.2	pr te	2.2.2016 9.19
BBEdit	BBEdit	11.5	pr te	2.2.2016 9.19
Box Sync	Box Sync	4.0.7100	pr te	2.2.2016 9.19
Cyberduck	Cyberduck	4.7.3	pr te	2.2.2016 10.31
Dropbox	Dropbox	3.12.6	pr te	2.2.2016 9.20
Evernote	Evernote	6.4	pr te	2.2.2016 10.31
Facter	Facter	2.4.6	pr te	2.2.2016 10.31
Firefox	Firefox	44.0	pr te	2.2.2016 9.21
GitHub Desktop	GitHub Desktop	216	pr te	2.2.2016 9.21
Go2Shell	Go2Shell	2.3	pr te	2.2.2016 9.21
GoogleChrome	Google Chrome	48.0.2564.97	pr te	2.2.2016 9.21
HandBrake	HandBrake	0.10.3 x86_...	pr te	2.2.2016 9.21
Hiera	Hiera	1.3.4	pr te	2.2.2016 10.31
Kaleidoscope	Kaleidoscope	2.1.1	pr te	2.2.2016 9.22
LibreOffice	LibreOffice	5.0.4002	pr te	2.2.2016 10.31
MPlayerX	MPlayerX	1.1.1	pr te	2.2.2016 9.22
munkireport	Managed Software C...	2.7.3	pr te	2.2.2016 10.31
munkitools_admin	Managed Software C...	2.4.0.2561	pr te	2.2.2016 10.31
munkitools_app	Managed Software C...	4.1.2531	pr te	2.2.2016 10.31
munkitools_core	Managed Software C...	2.4.0.2561	pr te	2.2.2016 10.31
munkitools_launchd	Managed Software C...	2.0.0.1969	pr te	2.2.2016 10.31
OmniFocus	OmniFocus	2.4.2	pr te	2.2.2016 9.23
OpenOffice	Apache OpenOffice	4.1.2	pr te	2.2.2016 10.31
OracleJava7	Oracle Java 7	1.7.79.15	pr te	2.2.2016 10.28
OracleJava8	Oracle Java 8	1.8.71.15	pr te	2.2.2016 10.31
PlexHomeTheater	Plex Home Theater	1.4.1	pr te	2.2.2016 9.24
PlexMediaServer	Plex Media Server	0.9.15.2	pr te	2.2.2016 9.24
Puppet	Puppet	3.8.5	pr te	2.2.2016 10.31

Summary

- Pkginfo keys 19
- Architectures 0
- Blocking apps 0
- Catalogs 2
- Choices XML 0
- Installs 1
- Items to copy 1
- Receipts 0
- Requires 0
- Update for 0

Pkginfo

- Location Dropb....6.plist
- Created 2.2.2016 9.20
- Modified 2.2.2016 9.20
- Last opened 2.2.2016 10.32

Installer

- Location Dropb....6.dmg
- Created 2.2.2016 9.20
- Modified 2.2.2016 9.20
- Last opened 2.2.2016 10.15

Properties...

MunkiAdmin - Catalogs

View Open Save Reload Properties Search

Q Search Q Package Name

	Name	Display Name	Version
✓	1Password	1Password	6.0.1
✓	Acorn	Acorn 4	4.5.6
✓	Adium	Adium	1.5.10.1
✓	AdobeFlashPlayer	Adobe Flash Player	20.0.0.286
✓	Alfred2	Alfred 2	2.8.2
✓	AppCleaner	AppCleaner	3.2.1
✓	AppCode	AppCode	3.3.2
✓	Atom	Atom	1.4.2
✓	BBEdit	BBEdit	11.5
✓	Box Sync	Box Sync	4.0.7100
✓	Cyberduck	Cyberduck	4.7.3
✓	Dropbox	Dropbox	3.12.6
✓	Evernote	Evernote	6.4
✓	Facter	Facter	2.4.6
✓	Firefox	Firefox	44.0
✓	GitHub Desktop	GitHub Desktop	216
✓	Go2Shell	Go2Shell	2.3
✓	GoogleChrome	Google Chrome	48.0.2564.97
✓	HandBrake	HandBrake	0.10.3 x86_64
✓	Hiera	Hiera	1.3.4
✓	Kaleidoscope	Kaleidoscope	2.1.1
✓	LibreOffice	LibreOffice	5.0.4002
✓	MPlayerX	MPlayerX	1.1.1
✓	munkireport	Managed Software Center reporting	2.7.3
✓	munkitools_admin	Managed Software Center admin to...	2.4.0.2561
✓	munkitools_app	Managed Software Center	4.1.2531
✓	munkitools_core	Managed Software Center core tools	2.4.0.2561
✓	munkitools_launchd	Managed Software Center launchd f...	2.0.0.1969
✓	OmniFocus	OmniFocus	2.4.2
✓	OpenOffice	Apache OpenOffice	4.1.2

MunkiAdmin - Manifests

Repository	Name	Catalogs	Filename	Notes
All Manifests	client1.local	testing	client1.local	--
	client2.local	production	client2.local	--
	client3.local	production	client3.local	--
	client4.local	production	client4.local	--
	client5.local	testing	client5.local	--
Manifest Types	groups/common	--	common	--
	groups/common-testmachines	--	common-testmachines	--
	groups/munkitools	--	munkitools	--
	groups/puppet	--	puppet	--
	groups/server	--	server	--
Catalogs	server1.local	production	server1.local	--
	site_default	production	site_default	--
Machine Manifests				
Group Manifests				
Install Manifests				
Directories				
	manifests			
	groups			

# Opening a repo

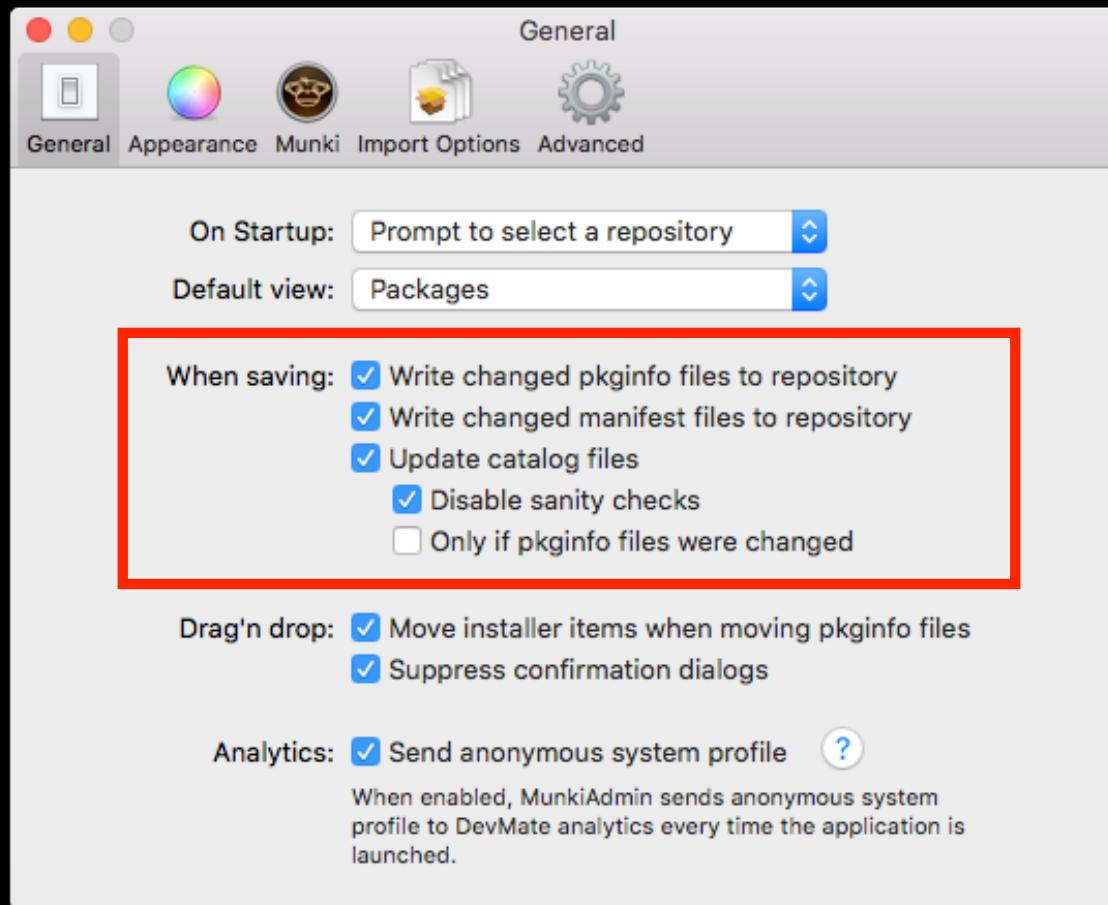
# Opening a repo

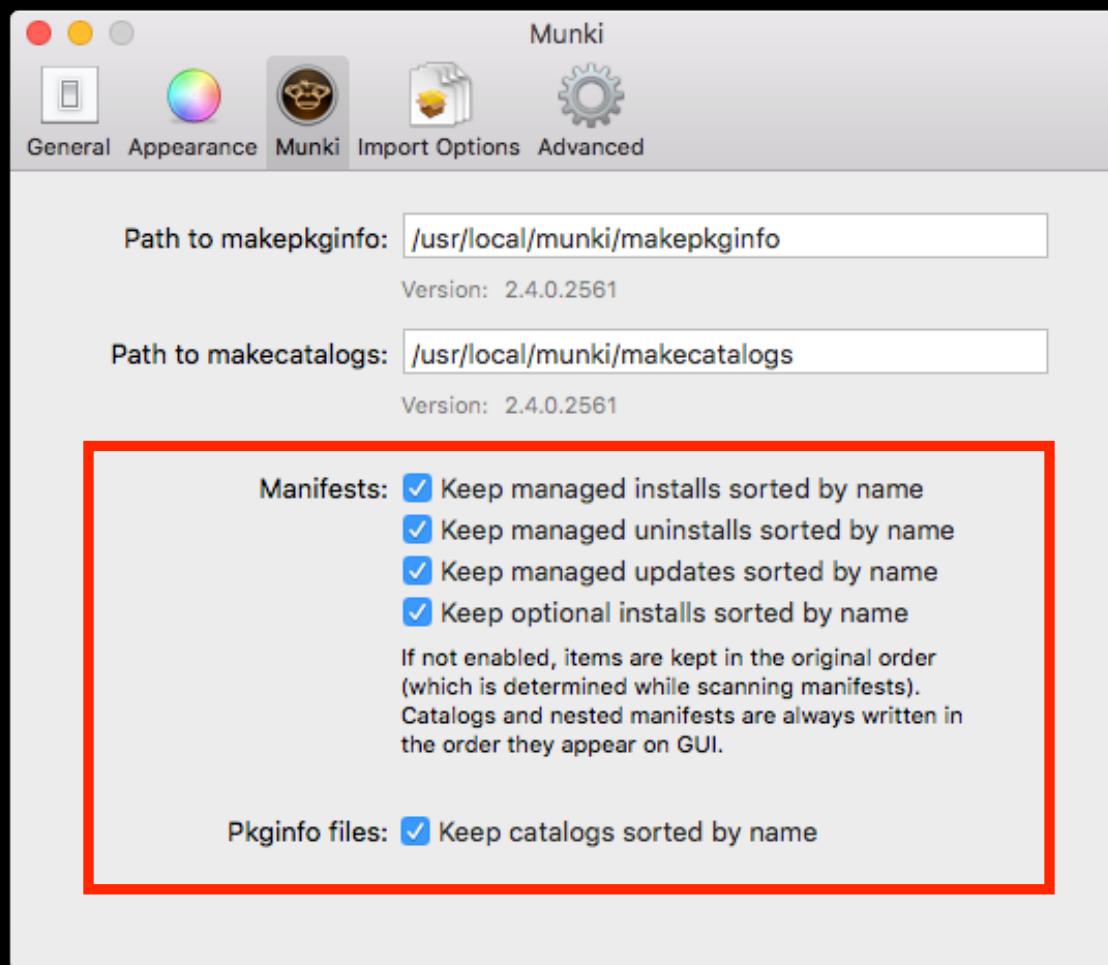
- Munki repository is (as far as MunkiAdmin cares) a folder with subfolders named catalogs, manifests and pkgsinfo
- Opening a repository does not make any changes
- MunkiAdmin does not care about the existence of the actual installer files (pkgs)

# Saving

# Saving

- Get pkginfos and manifest the user has modified, don't even consider others for writing
- For each of these, check if the file produced by MunkiAdmin is different than the one on disk
- Preserves keys that MunkiAdmin does not know about but can not preserve <!--comments-->





# Saving

- Creates backups in ~/Library/Application Support/MunkiAdmin/

# Packages

Editing ATLAS.ti - version 1.0.39

Basic Info    Contents    Requirements    Installation    Install Scripts    Uninstall    Install Check Scripts    Alerts

Name:  Edit...

Display Name:

Version:

Icon Name:

Category:  New...

Developer:  New...

Autoremove     Uninstallable  
 Unattended install     Unattended uninstall

Description:  
ATLAS.ti is one of the most powerful tools for qualitative research. Managed documents, multi-document view, high-performance multimedia engine, intuitive margin-area coding for all data types, and much more.

Admin notes:

Restart Action:

Force Install After Date:

Installer Item Location:

Installer Item Hash:

Installed Size:  Installer Item Size:

Installer Type:   On demand

Package Path:

Catalogs:

- production
- release-candidates
- testing

Previous    Next    Cancel    Ok

Editing Xcode Command Line Tools (El Capitan) - version 7.2.0.0.1.1447826929

Basic Info **Contents** Requirements Installation Install Scripts Uninstall Install Check Scripts Alerts

Installs:

Path	CFBundleName	Type	CFBundleIdentifier	CFBundleShortName	CFBundleVersion
/Library/Developer/CommandLineTools/...		bundle	1.340.4.119	340.4.119	

... + -

Receipts:

Opt.	Package ID	Version	Size	Filename	Name
<input type="checkbox"/>	com.apple.pkg.CLTools_Executables	7.2.0.0.1.1447826929	365 074		
<input type="checkbox"/>	com.apple.pkg.DevSDK OSX1011	7.2.0.0.1.1447826929	256 290		

+ -

Previous Next Cancel Ok

## Editing MSOffice2016 - version 15.18.0

Basic Info    Contents    Requirements    Installation    Install Scripts    Uninstall    Install Check Scripts    Alerts

Requires



Minimum OS version:

10.10

Maximum OS version:

▼

Minimum munki version:

Installable condition:

Update for



MSExcel2016

15.17



MSOneNote2016

15.17



MSOutlook2016

15.17



MSPowerPoint2016

15.17



Previous

Next

Cancel

Ok

## Editing ATLAS.ti - version 1.0.39

Basic Info    Contents    Requirements    **Installation**    Install Scripts    Uninstall    Install Check Scripts    Alerts

Items to copy



ATLAS.ti.app  
/Applications/ATLAS.ti.app, --:--, --

+ -

Destination Path:

/Applications

Source Item:

ATLAS.ti.app

Destination Item:

+ -

Owner:

Group:

Mode:

Blocking applications ^

+ -

Include empty list

Supported architectu... ^

+ -

Installer Choices XML

Identifier ^ | Choice attribute

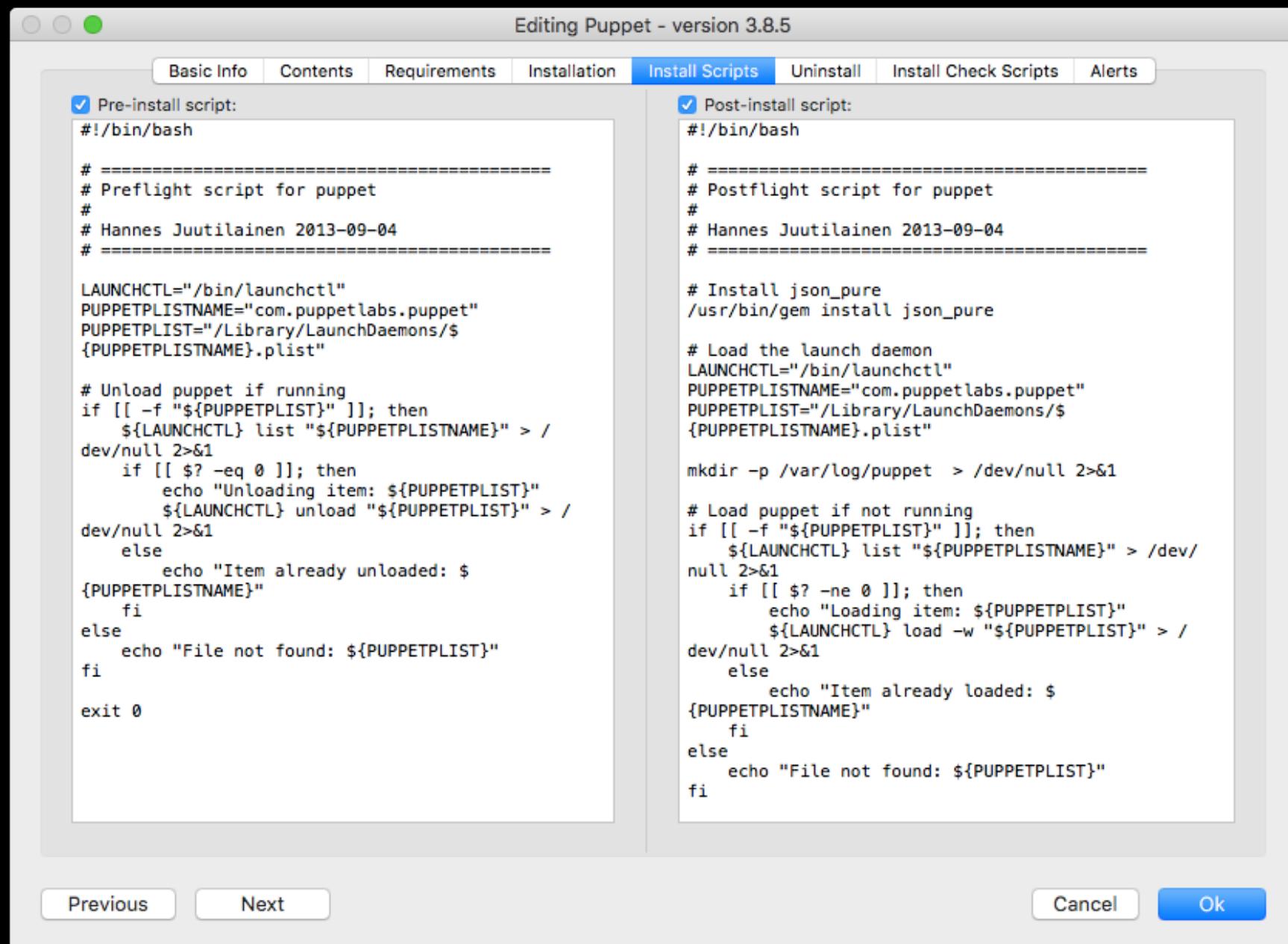
+ -

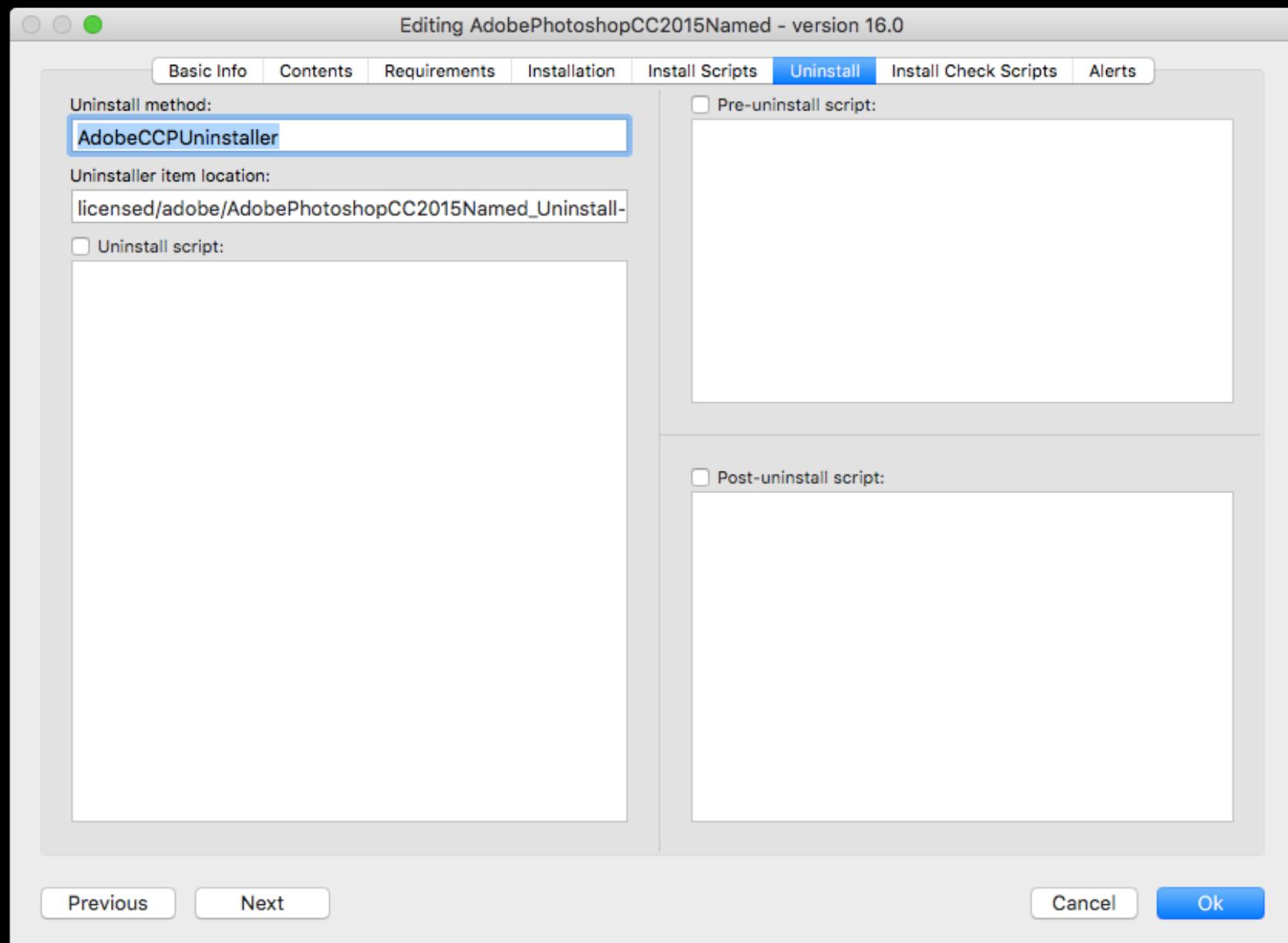
Previous

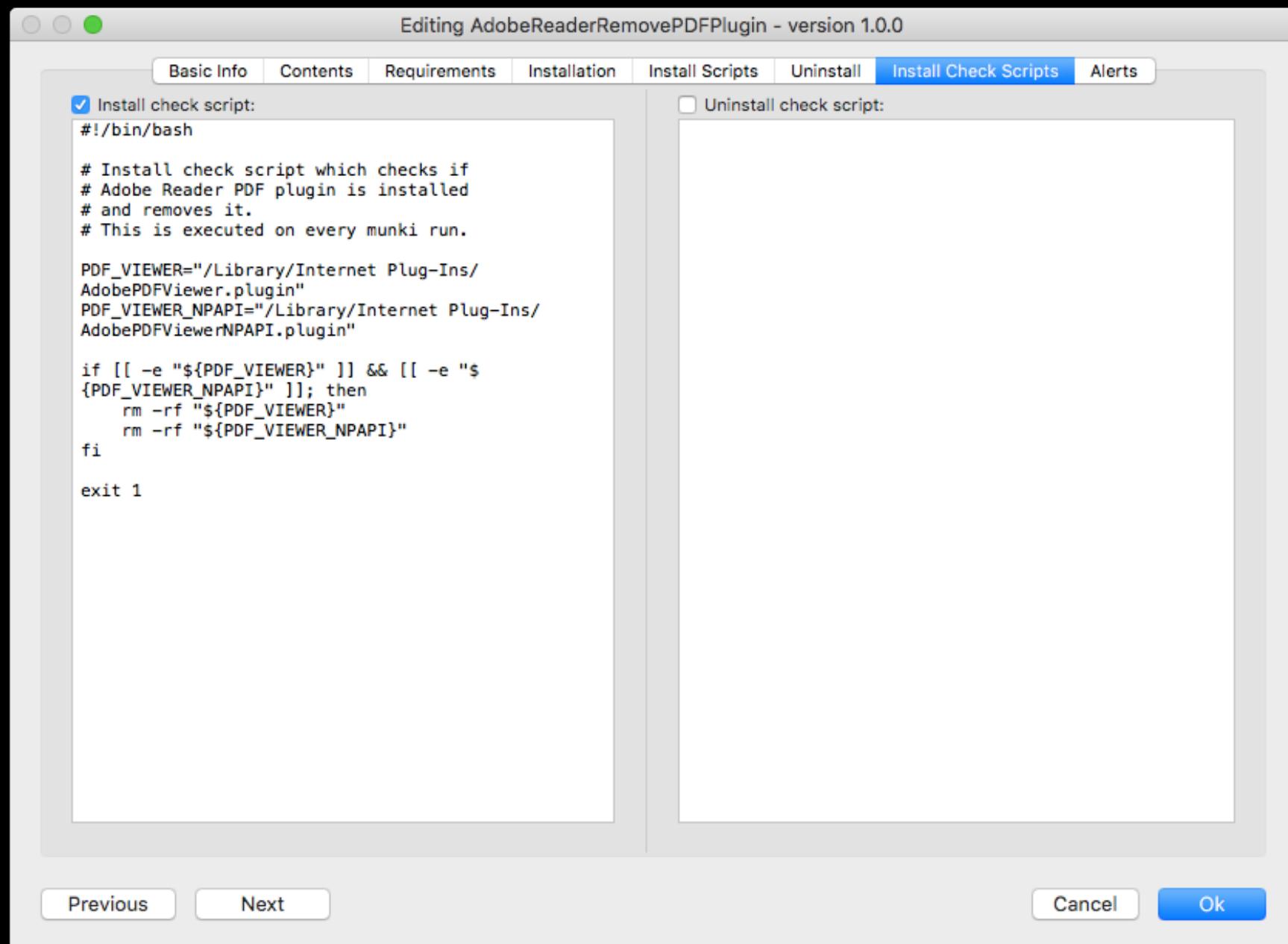
Next

Cancel

Ok







Editing AdobeReaderRemovePDFPlugin - version 1.0.0

Basic Info    Contents    Requirements    Installation    Install Scripts    Uninstall    Install Check Scripts    **Alerts**

Enable pre-install alert

Title:  
Attention

Detail:  
Some conditions apply to this software. Please contact your administrator for more details

Cancel Button Title:     OK Button Title:

Enable pre-uninstall alert

Title:  
Attention

Detail:  
Some conditions apply to this software. Please contact your administrator for more details

Cancel Button Title:     OK Button Title:

# Manifests

MunkiAdmin - Manifests

Repository	Name	Catalogs	Filename	Notes
All Manifests	client1.local	testing	client1.local	--
	client2.local	production	client2.local	--
	client3.local	production	client3.local	--
	client4.local	production	client4.local	--
	client5.local	testing	client5.local	--
Manifest Types	groups/common	--	common	--
	groups/common-testmachines	--	common-testmachines	--
	groups/munkitools	--	munkitools	--
	groups/puppet	--	puppet	--
	groups/server	--	server	--
Catalogs	server1.local	production	server1.local	--
	site_default	production	site_default	--
Machine Manifests				
Group Manifests				
Install Manifests				
Directories				
	manifests			
	groups			

profiles/hannes

**General**  
No catalogs

**Managed Installs**  
19 managed installs

**Managed Uninstalls**  
No managed uninstalls

**Managed Updates**  
No managed updates

**Optional Installs**  
46 optional installs

**Included Manifests**  
1 included manifest

**Referencing Manifests**  
1 referencing manifest

**Conditions**  
2 conditions

Name: profiles/hannes

Display Name:

User:

Notes:

Catalogs:

production  
 testing

profiles/hannes

General  
No catalogs

Managed Installs  
19 managed installs

Managed Uninstalls  
No managed uninstalls

Managed Updates  
No managed updates

Optional Installs  
46 optional installs

Included Manifests  
1 included manifest

Referencing Manifests  
1 referencing manifest

Conditions  
2 conditions

Package	Condition
1Password	--
AppCode	--
BBEdit	--
Box Sync	--
Dropbox	--
ExifTool	--
Firefox	--
Go2Shell	--
HandBrake	--
Kaleidoscope	--
mogenerator	--
OmniFocus	--
PyCharm	--
SourceTree	--
Sublime Text	--

profiles/hannes

**General**  
No catalogs

**Managed Installs**  
19 managed installs

**Managed Uninstalls**  
No managed uninstalls

**Managed Updates**  
No managed updates

**Optional Installs**  
46 optional installs

**Included Manifests**  
1 included manifest

**Referencing Manifests**  
1 referencing manifest

**Conditions**  
2 conditions

Package	Condition
+ -	

profiles/hannes

Package	Condition
---------	-----------

+ -

**General**  
No catalogs

**Managed Installs**  
19 managed installs

**Managed Uninstalls**  
No managed uninstalls

**Managed Updates**  
No managed updates

**Optional Installs**  
46 optional installs

**Included Manifests**  
1 included manifest

**Referencing Manifests**  
1 referencing manifest

**Conditions**  
2 conditions

profiles/hannes

Package	Condition
1Password	--
Acorn	--
Adium	--
AdobeFlashPlayer	--
Alfred2	--
AppCleaner	--
AppCode	--
Atom	--
BBEdit	--
Box Sync	--
Cyberduck	--
Dropbox	--
Evernote	--
ExifTool	--
Firefox	--

profiles/hannes

Manifest	Condition
profiles/common	--

+

General  
No catalogs

Managed Installs  
19 managed installs

Managed Uninstalls  
No managed uninstalls

Managed Updates  
No managed updates

Optional Installs  
46 optional installs

Included Manifests  
1 included manifest

Referencing Manifests  
1 referencing manifest

Conditions  
2 conditions

profiles/hannes

General  
No catalogs

Managed Installs  
19 managed installs

Managed Uninstalls  
No managed uninstalls

Managed Updates  
No managed updates

Optional Installs  
46 optional installs

Included Manifests  
1 included manifest

Referencing Manifests  
1 referencing manifest

Conditions  
2 conditions

Manifest	Condition
dozer.private	--

+ -

profiles/hannes

General  
No catalogs

Managed Installs  
19 managed installs

Managed Uninstalls  
No managed uninstalls

Managed Updates  
No managed updates

Optional Installs  
46 optional installs

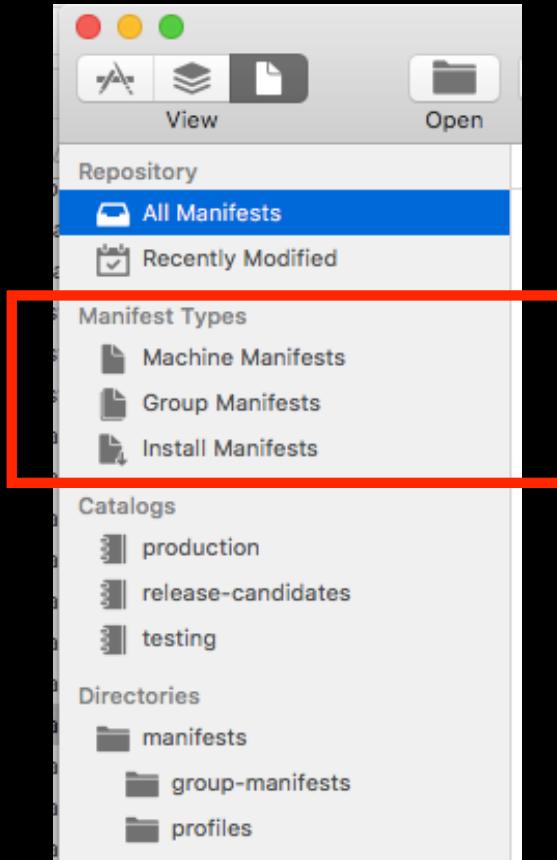
Included Manifests  
1 included manifest

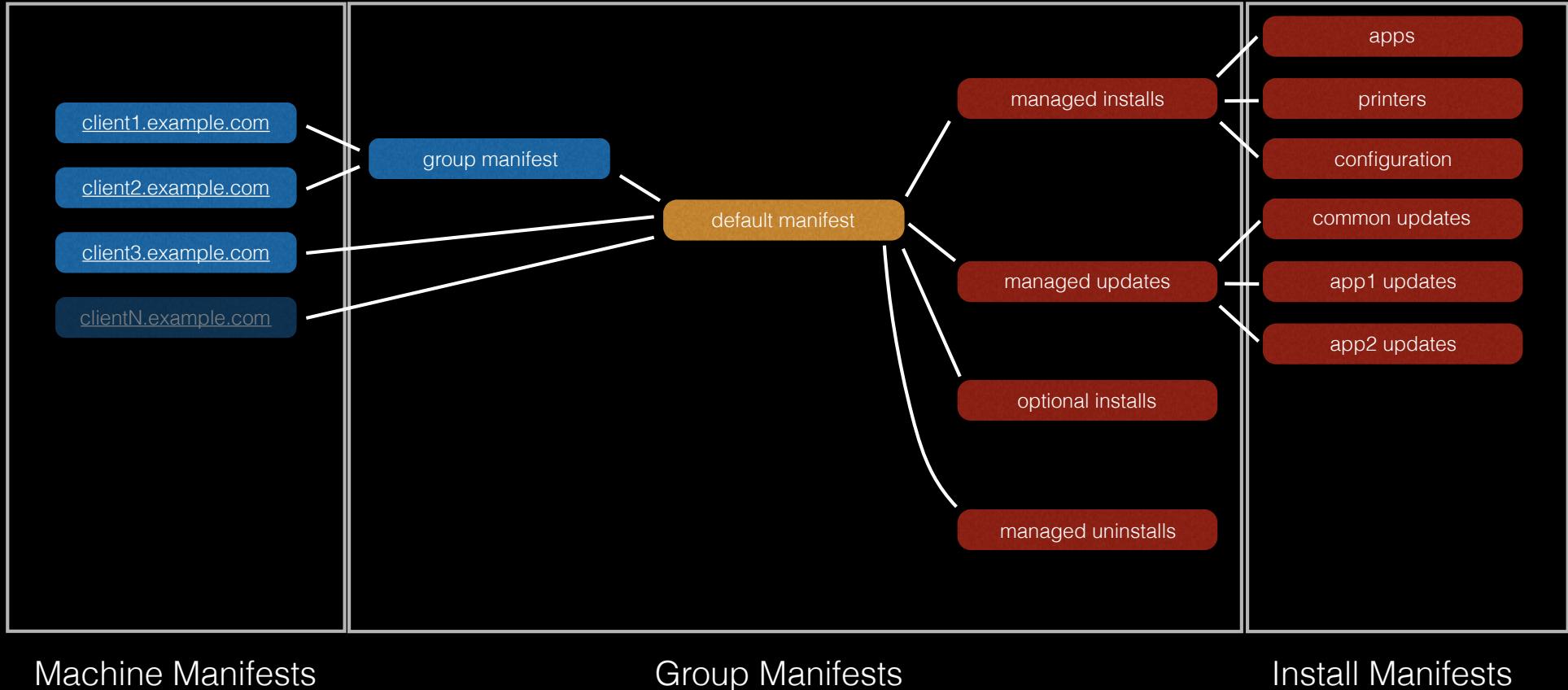
Referencing Manifests  
1 referencing manifest

Conditions  
2 conditions

Condition	
os_vers_minor == 7	No items
os_vers_minor == 8	No items

+ -





# Everyday workflows

Any

Name	Display Name	Icon	Catalogs	Modified
Cyberduck	Cyberduck	✓ Icon	pr te	22.2016 10.31
Evernote	Evernote	✓ Admin Notes	pr te	22.2016 10.31
Facter	Facter	✓ Catalogs	te	22.2016 10.31
Hiera	Hiera	Created	te	22.2016 10.31
LibreOffice	LibreOffice	Description	pr te	22.2016 10.31
OpenOffice	Apache OpenO	✓ Display Name	pr te	22.2016 10.31
OracleJava8	Oracle Java 8	Max OS	pr te	22.2016 10.31
Puppet	Puppet	Min OS	pr te	22.2016 10.31
Slack	Slack	✓ Modified	te	22.2016 10.31
TeamViewer	TeamViewer	✓ Name	pr te	22.2016 10.31
TeamViewerQS	TeamViewer Qu	Size	pr te	22.2016 10.31
munkireport	Managed Software Cen...	✓ Version	pr te	22.2016 10.31
munkitools_admin	Managed Software Cen...	pr te	pr te	22.2016 10.31
munkitools_app	Managed Software Cen...	pr te	pr te	22.2016 10.31
munkitools_core	Managed Software Cen...	pr te	pr te	22.2016 10.31
munkitools_launchd	Managed Software Cen...	2.0.0.1969	pr te	22.2016 10.31
OracleJava7	Oracle Java 7	1.7.79.15	pr te	22.2016 10.28
XQuartz	XQuartz	2.7.86	pr te	22.2016 9.28
VirtualBox	VirtualBox	5.0.14	pr te	22.2016 9.27
VLC	VLC Media Player	2.2.1	pr te	22.2016 9.27
Transmit	Transmit	4.4.10	pr te	22.2016 9.27
TheUnarchiver	The Unarchiver	3.10.1	pr te	22.2016 9.27
TextWrangler	TextWrangler	5.0.2	pr te	22.2016 9.26

Any

	Name	Display Name	Version	Catalogs	Modified	▼
duck	Cyberduck	Cyberduck	4.7.3	pr te	2.2.2016 10.31	
evernote	Evernote	Evernote	6.4	pr te	2.2.2016 10.31	
chef	Facter	Facter	2.4.6	te	2.2.2016 10.31	
chef	Hiera	Hiera	1.3.4	te	2.2.2016 10.31	
libreoffice	LibreOffice	LibreOffice	5.0.4002	pr te	2.2.2016 10.31	
openoffice	OpenOffice	Apache OpenOffice	4.1.2	pr te	2.2.2016 10.31	
java	OracleJava8	Oracle Java 8	1.8.71.15	pr te	2.2.2016 10.31	
puppet	Puppet	Puppet	2.2.5	te	2.2.2016 10.31	
slack	Slack	Slack		Properties...		
teamviewer	TeamViewer	TeamViewer		Rename...		
teamviewerqs	TeamViewerQS	TeamViewer		Show pkginfo in Finder		
munkireport	munkireport	Managed Software		Show installer in Finder		
munkitools_admin	munkitools_admin	Managed Software		Search in Manifests		
munkitools_app	munkitools_app	Managed Software		Import Packages...		
munkitools_core	munkitools_core	Managed Software		Delete Package...		
munkitools_launchd	munkitools_launchd	Managed Software		Assimilate Properties...		
oraclejava	OracleJava7	Oracle Java		Catalogs ▶		
xquartz	XQuartz	XQuartz		Enable All Catalogs		
virtualbox	VirtualBox	VirtualBox		Disable All Catalogs		
vlc	VLC	VLC Media Player		▶ production		
transmit	Transmit	Transmit		▶ testing		
theunarchiver	TheUnarchiver	The Unarchiver		▶ pr te	2.2.2016 9.26	
textwrangler	TextWrangler	TextWrangler	0.0.2	▶ pr te	2.2.2016 9.26	
textmate2	TextMate2	TextMate 2	2.0-beta.8.5	pr te	2.2.2016 9.26	
textexpander	TextExpander	TextExpander	5.1.3	pr te	2.2.2016 9.26	
subler	Subler	Subler	1.0.8	pr te	2.2.2016 9.26	
spotify	Spotify	Spotify	1.0.20.101.ge...	pr te	2.2.2016 9.25	

# Working with icons

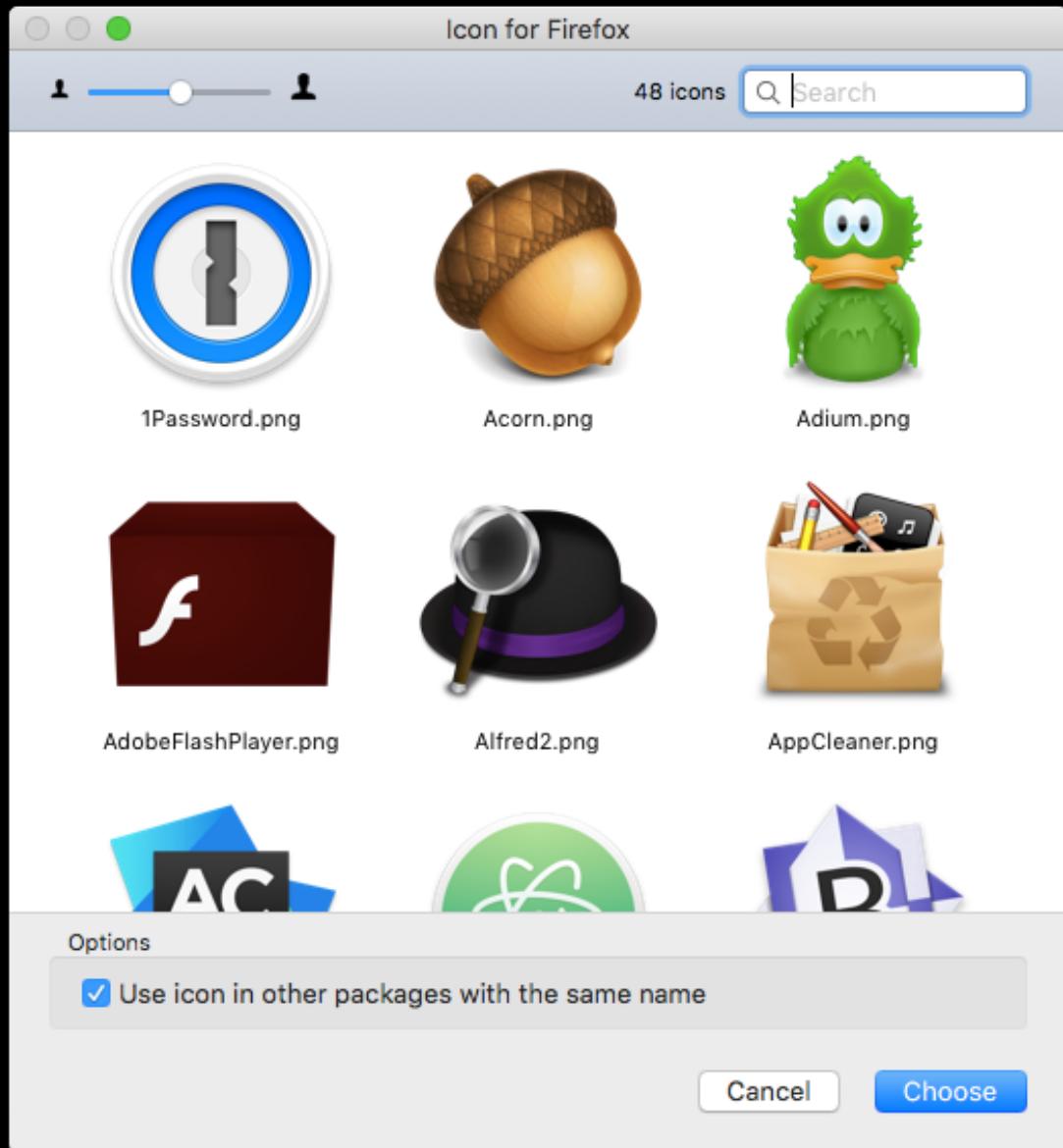
# Working with icons

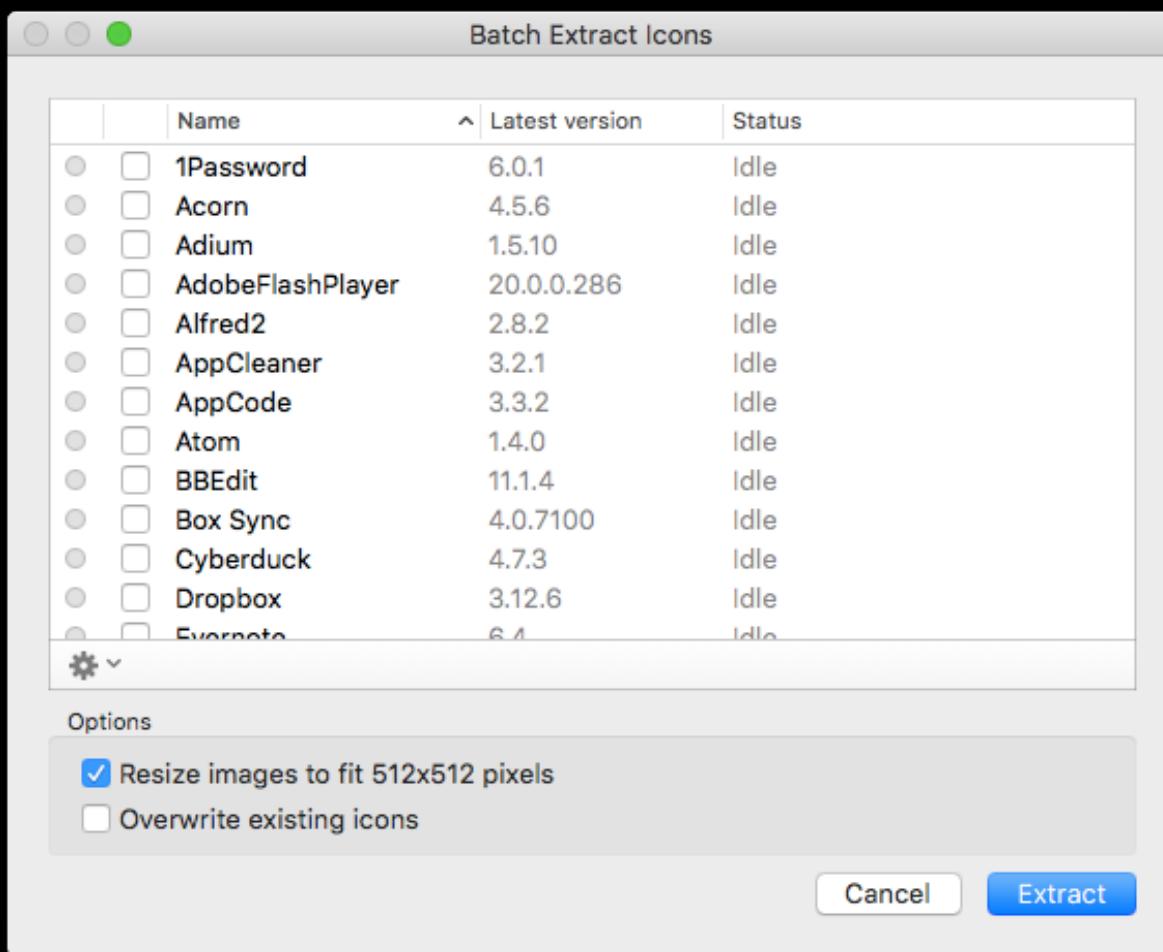
- MunkiAdmin uses icon files (if available)
- Can extract icons from .app bundles and installer packages
- Can batch extract all missing icons

	1Password	1Password	5.4.3	pr	te	16.1.2016 9.49	Pkginfo	Loca
①	1Password	1Password	6.0	pr	te	16.1.2016 9.49		
①	1Password	1Password	6.0.1	pr	te	24.1.2016 20.41		
①	Acorn	Acorn 4	4.5.6	pr	te	21.10.2015 20....		
①	Adium	Adium	1.5.10	pr	te	2.8.2015 14.21		
②	AdobeFlash		0.0.245	pr	te	29.11.2015 20.41		
②	AdobeFlash		0.0.235	pr	te	31.12.2015 12.10		
②	AdobeFlash		0.0.267	pr	te	16.1.2016 9.49		
②	AdobeFlash		0.0.286	pr	te	24.1.2016 20.41		
②	Alfred2		1	pr	te	29.11.2015 20.41		
②	Alfred2		2	pr	te	16.1.2016 9.49		
②	AppCleaner		1	pr	te	29.11.2015 20.41		
②	AppCode		1	pr	te	29.11.2015 20.41		
②	AppCode		2	pr	te	16.1.2016 9.49		
②	Atom		3	pr	te	29.11.2015 20.41		
②	Atom		4	pr	te	29.11.2015 20.41		
②	Atom	Icon					Batch Extract Icons...	
②	Atom	Category					Clear Custom Icon	
②	Atom	Developer					Choose Existing Icon for Selected Packages...	
②	Atom	Atom	1.4.	pr	te	29.11.2015 20.41		
②	BBEdit	BBEdit	11.1.4	pr	te	29.11.2015 20.41		
②	Box Sync	Box Sync	4.0.6746	pr	te	21.10.2015 20....		

	1Password	1Password	6.0	pr te 16.1.2016 9.49	Catalogs 2
	1Password	1Pas	Properties...	pr te 24.1.2016 20.41	Choices XML 0
●	Acorn	Acorn	Rename...	pr te 21.10.2015 20....	Installs 1
●	Adium	Adiu	Show pkginfo in Finder	pr te 2.8.2015 14.21	Items to copy 1
●	AdobeFlashPlayer	Adob	Show installer in Finder	pr te 29.11.2015 20.41	Receipts 0
●	AdobeFlashPlayer	Adob	Search in Manifests	pr te 31.12.2015 12.10	Requires 0
●	AdobeFlashPlayer	Adob	Import Packages...	pr te 16.1.2016 9.49	Update for 0
●	AdobeFlashPlayer	Adob	Delete Package...	pr te 24.1.2016 20.41	
●	Alfred2	Alfre	Assimilate Properties...	pr te 29.11.2015 20.41	
●	Alfred2	Alfre	Catalogs ►	pr te 16.1.2016 9.49	
●	AppCleaner	AppC	Icon ►	pr te 29.11.2015 20.41	
●	AppCode	AppC	Category ►	pr te 29.11.2015 20.41	
●	AppCode	AppC	Developer ►	pr te 16.1.2016 9.49	
●	Atom	Atom	Batch Extract Icons...		
●	Atom	Atom	Clear Custom Icon		
●	Atom	Atom	Choose Existing Icon for Name "1Password"...		
●	Atom	Atom	Choose Existing Icon for Package 1Password 6.0.1...		
●	Atom	Atom	Create New Icon for Name "1Password"...		
●	Atom	Atom	Create New Icon for Package 1Password 6.0.1...		
●	BBEdit	BBEdit	pr te 29.11.2015 20.41		







# Refactoring

# Renaming

- MunkiAdmin can rename items in the repo and make sure the dependencies are also updated:
  - Renaming a package also updates referencing items in manifests, other packages and icons. Does not rename files on disk.
  - Renaming a manifest updates referencing items in other manifests and (of course) renames files on disk.

# Moving

- Move packages and manifests around by dragging and dropping
- Moving packages moves both the pkginfo and the installer item (if any)

# Deleting packages

- Deleting a package also removes the associated installer item if there are no other references to the installer
- Deleting a package removes references in manifests and other packages if it is the last one
- Deleting a package removes the icon file if there are no other references to it

# Deleting manifests

- Deleting a manifest also deletes referencing items in other manifests.

# Scripts

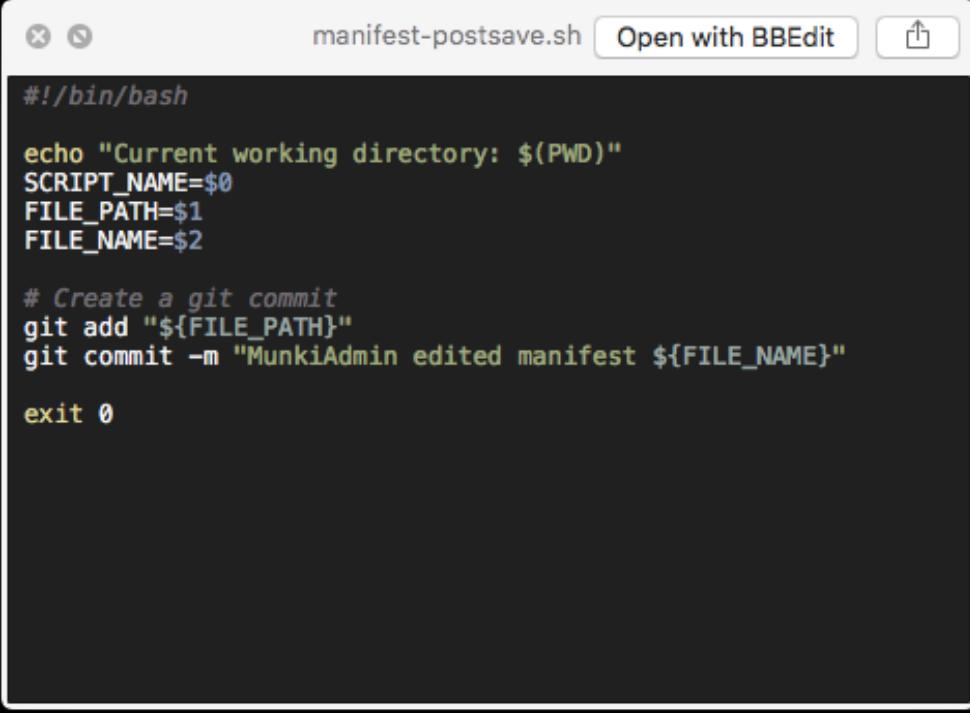
# Scripts

- MunkiAdmin looks for executable files (with any extension) with the following names:
  - pkginfo-presave
  - pkginfo-postsave
  - manifest-presave
  - manifest-postsave
  - repository-presave
  - repository-postsave

# Scripts

- The scripts should be saved in
  - <repository>/MunkiAdmin/scripts/ or
  - ~/Library/Application Support/MunkiAdmin/scripts/
- Working directory will be set to repository root
- The pre\* scripts can abort saving by exit 1

# Scripts



A screenshot of a terminal window titled "manifest-postsave.sh". The window has standard OS X window controls (close, minimize, zoom) and a toolbar with "Open with BBEdit" and a share icon. The script content is displayed in white text on a dark background:

```
#!/bin/bash

echo "Current working directory: $(PWD)"
SCRIPT_NAME=$0
FILE_PATH=$1
FILE_NAME=$2

# Create a git commit
git add "${FILE_PATH}"
git commit -m "MunkiAdmin edited manifest ${FILE_NAME}"

exit 0
```

# GitHub issues

will get my attention

# Managing Munki repositories with MunkiAdmin

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