

Unpacking Apple Archives

This thread has been locked by a moderator.



1.8k

I support Mac code signing and notarisation for DTS and, as part of that work, I often need to look inside various Apple-specific archive file formats. This post explains how I do this. It's mostly for the benefit of Future Quinn™, but I figured other folks would appreciate it as well.

IMPORTANT This post explains low-level techniques for inspecting archives. Do not use them to create archives. Instead, create your archives using the highest-level tool that will get the job done [1].

Flat Installer Package

A flat installer package — appropriate for uploading to the Mac App Store or the notary service — is actually a xar archive. Unpack it using the xar tool. For example:

```
% # List the contents:
%
% xar -tf InstallTest-1.0d1.pkg
com.example.apple-samplecode.InstallTest.pkg
com.example.apple-samplecode.InstallTest.pkg/Bom
com.example.apple-samplecode.InstallTest.pkg/Payload
com.example.apple-samplecode.InstallTest.pkg/PackageInfo
Distribution
%
% # Actually unpack:
% #
% mkdir tmp
% cd tmp
% xar -xf ../InstallTest-1.0d1.pkg
% find .
.
./Distribution
./com.example.apple-samplecode.InstallTest.pkg
./com.example.apple-samplecode.InstallTest.pkg/Bom
./com.example.apple-samplecode.InstallTest.pkg/Payload
./com.example.apple-samplecode.InstallTest.pkg/PackageInfo
```

See the xar man page for more info on that tool.

The resulting Bom file is a 'bill of materials'. For more on this, see the bom man page for details. Use lsbom to dump this:

```
% lsbom ./com.example.apple-samplecode.InstallTest.pkg/Bom
. 0 0/0
./InstallTest.app ...
./InstallTest.app/Contents ...
./InstallTest.app/Contents/Info.plist ...
./InstallTest.app/Contents/MacOS ...
./InstallTest.app/Contents/MacOS/InstallTest ...
...
```

The Payload file contains... you guessed it... the installer's payload. This is a gzipped cpio archive. To unpack it, pipe the file through cpio:

```
% cpio -i < com.example.apple-samplecode.InstallTest.pkg/Payload
5072 blocks
% find InstallTest.app
InstallTest.app
InstallTest.app/Contents
InstallTest.app/Contents/Info.plist
InstallTest.app/Contents/MacOS
InstallTest.app/Contents/MacOS/InstallTest
...
```

See the cpio man page for more info on that tool.

Xip Archives

To extract a xip archive (pronounced, I believe, as chip archive), run the xip tool with the --expand argument:

```
% xip --expand XipTest.xip
```

However, if that doesn't work you'll need to dig into the archive. First, undo the outer xar wrapper:

```
% xar -xf XipTest.xip
```

This produces two files, Content and Metadata:

```
% ls -l
total 7552
-rw-r--r-- 1 quinn staff 1683391 10 Jun 17:05 Content
-rw-r--r-- 1 quinn staff 287 10 Jun 17:08 Metadata
-rw-r--r-- 1 quinn staff 1697157 10 Jun 17:05 XipTest.xip
```

The Metadata file is an XML property list:

```
% cat Metadata
...
<dict>
  <key>UncompressedSize</key>
  <integer>2598653</integer>
  <key>Version</key>
  <integer>1</integer>
</dict>
</plist>
```

The Content file is an Apple Archive. Unpack this using the aa tool:

```
% aa extract -ignore-eperm -i Content -d tmp
% find tmp
tmp
tmp/XipTest
tmp/XipTest/XipTest.app
tmp/XipTest/XipTest.app/Contents
tmp/XipTest/XipTest.app/Contents/Info.plist
tmp/XipTest/XipTest.app/Contents/MacOS
tmp/XipTest/XipTest.app/Contents/MacOS/QCodeIndex
tmp/XipTest/XipTest.app/Contents/MacOS/XipTest
...
```

See the aa man page for more info on that tool.

Note aa was previously known as yaa.

Share and Enjoy

Quinn "The Eskimo!" @ Developer Technical Support @ Apple
let myEmail = "eskimo" + "1" + "@" + "apple.com"

[1] For installer package specifically, productbuild is your friend, but you can also use the lower-level tools like productsign, pkgbuild, and pkgutil.

Revision History

- 2022-09-30 Changed yaa to aa and added a reference to the Apple Archive framework.
- 2021-02-26 Fixed the formatting.
- 2020-06-10 First posted.

GatekeeperDeveloper IDApple Archive

Reply

Posted 2 years ago by eskimo

Add a Comment

This site contains user submitted content, comments and opinions and is for informational purposes only. Apple disclaims any and all liability for the acts, omissions and conduct of any third parties in connection with or related to your use of the site. All postings and use of the content on this site are subject to the Apple Developer Forums Participation Agreement.

Platforms	Topics & Technologies	Resources	Programs
iOS	Accessibility	Documentation	Apple Developer Program
iPadOS	Accessories	Curriculum	Apple Developer Enterprise Program
macOS	App Extensions	Downloads	App Store Small Business Program
tvOS	App Store	Forums	MFJ Program
watchOS	Audio & Video	Videos	News Partner Program
	Augmented Reality		Video Partner Program
Tools	Business	Support	Security Bounty Program
Swift	Design	Support Articles	Security Research Device Program
SwiftUI	Distribution	Contact Us	
SF Symbols	Education	Bug Reporting	Events
Swift Playgrounds	Fonts	System Status	App Accelerators
TestFlight	Games		App Store Awards
Xcode	Health & Fitness	Account	Apple Design Awards
Xcode Cloud	In-App Purchase	Apple Developer	Apple Developer Academies
	Localization	App Store Connect	Entrepreneur Camp
	Maps & Location	Certificates, IDs, & Profiles	Tech Talks
	Machine Learning	Feedback Assistant	WWDC
	Security		
	Safari & Web		