

Unpacking Apple Archives

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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:

```
1 % # List the contents:
2 %
3 % xar -tf InstallTest-1.0d1.pkg
4 com.example.apple-samplecode.InstallTest.pkg
5 com.example.apple-samplecode.InstallTest.pkg/Bom
6 com.example.apple-samplecode.InstallTest.pkg/Payload
7 com.example.apple-samplecode.InstallTest.pkg/PackageInfo
8 Distribution
9
10 % # Actually unpack:
11 #
12 % mkdir tmp
13 % cd tmp
14 % xar -xf ../InstallTest-1.0d1.pkg
15 % find .
16 .
17 ./Distribution
18 ./com.example.apple-samplecode.InstallTest.pkg
19 ./com.example.apple-samplecode.InstallTest.pkg/Bom
20 ./com.example.apple-samplecode.InstallTest.pkg/Payload
21 ./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:

```
1 % lsbom ./com.example.apple-samplecode.InstallTest.pkg/Bom
2 . 0 0/0
3 ./InstallTest.app ...
4 ./InstallTest.app/Contents ...
5 ./InstallTest.app/Contents/Info.plist ...
6 ./InstallTest.app/Contents/MacOS ...
7 ./InstallTest.app/Contents/MacOS/InstallTest ...
8 ...
```

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**:

```
1 % cpio -i < com.example.apple-samplecode.InstallTest.pkg/Payload
2 5072 blocks
3 % find InstallTest.app
4 InstallTest.app
5 InstallTest.app/Contents
6 InstallTest.app/Contents/Info.plist
7 InstallTest.app/Contents/MacOS
8 InstallTest.app/Contents/MacOS/InstallTest
9 ...
```

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**:

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

The **Metadata** file is an XML property list:

```
1 % cat Metadata
2 ...
3 <dict>
4   <key>UncompressedSize</key>
5   <integer>2598653</integer>
6   <key>Version</key>
7   <integer>1</integer>
8 </dict>
9 </plist>
```

The **Content** file is a yaa archive. Unpack this using the **yaa** tool:

```
1 % yaa extract -ignore-eperm -i Content -d tmp
2 % find tmp
3 tmp
4 tmp/XipTest
5 tmp/XipTest/XipTest.app
6 tmp/XipTest/XipTest.app/Contents
7 tmp/XipTest/XipTest.app/Contents/Info.plist
8 tmp/XipTest/XipTest.app/Contents/MacOS
9 tmp/XipTest/XipTest.app/Contents/MacOS/QCodeIndex
10 tmp/XipTest/XipTest.app/Contents/MacOS/XipTest
11 ...
```

See the **yaa** [man page](#) for more info on that tool.

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—
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](#).

Gatekeeper
Developer ID
Apple Archive

Asked 8 months ago by eskimo

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