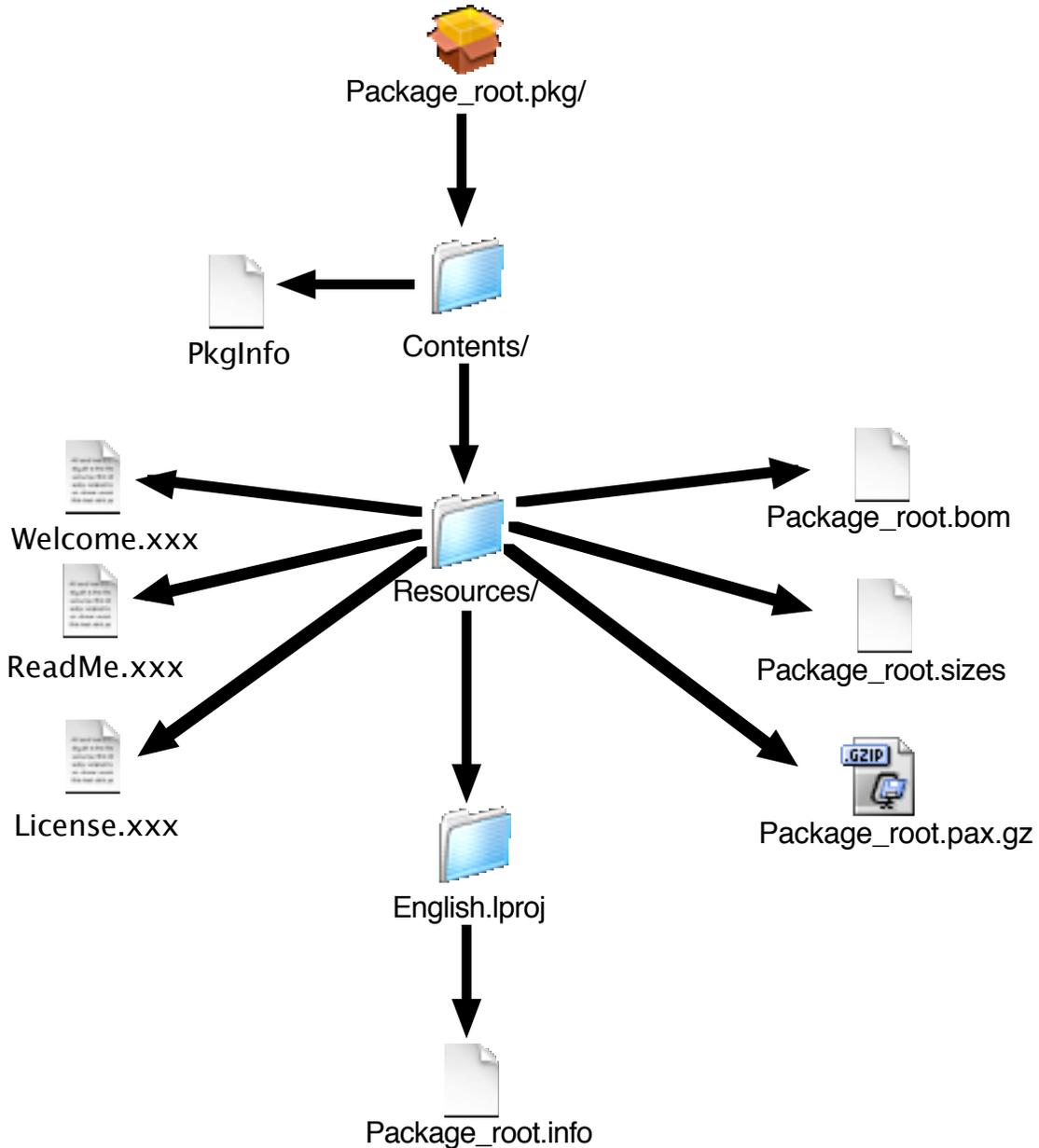


## OSXGNU Extensions the Apple/NeXT Package format.

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The NeXT package format (package bundle) is quite powerful and easily extended to support many features not currently found in the format.

The bundle structure is as follows:



The bundle is actually a set of nested directories and files.

It should be stated that File/Directory name Case is significant in all bundles.



At the root level of the package you have the “Package\_root” folder. It sets the name of the package. Changing the name of this folder will cause havoc as we will see later.



Inside the “Package\_root” folder is the “Contents” folder. It contains one folder and one text file.



This file is called “PkgInfo”. This text file is optional and contains the “Finder Hints”. Much like the MAC Classic file system this is the type/creator hint for the package in a Package bundle made by Apple’s PackageMaker the file contains “pmkrpkg1” which says made by “pmkr” file type of “pkg1”



Now comes the meat of the bundle the “Resource” folder. It contains:

- Welcome.xxx (xxx=.txt or .html or .rtf or .rtfd)(optional)
- ReadMe.xxx (xxx=.txt or .html or .rtf or .rtfd)(optional)
- License.xxx (xxx=.txt or .html or .rtf or .rtfd)(optional)
- Package\_Root.pax.gz
- Package\_Root.bom
- Package\_Root.sizes
- Package\_Root.post-xxxx (xxxx= install or delete or upgrade)(optional)
- Package\_Root.pre-xxxx (xxxx= install or upgrade)(optional)
- preflight (optional)
- postflight (optional)
- English.lproj folder



The Bundle archive is stored using PAX and compressed using gzip (bzip2 unaware). and is named for the “Package\_Root” with the .pax.gz suffix



The Bundle archive “Bill Of Materials” is stored using MKBOM and is named for the “Package\_Root” with the .bom suffix



The Bundle archive “sizes” file is a text file and is named for the “Package\_Root” with the .sizes suffix. It contains three lines of information:

1. Quantity of files+directories in the archive.
2. Size of the Archive Uncompressed in Kbytes.
3. Size of the Archive Compressed in Kbytes.



The Three user information files Welcome, ReadMe and License do not provide any functionality to the bundle although most package installers require you to agree to the license before installation can take place. For more on these files read Apple's PackageMaker Information.

#### Scripts:

Apple's Installer.app passes arguments to all scripts they are:

- [0] location of package to be installed
- [1] selected install location
- [2] selected volume
- [3] default install location



The preflight, postflight scripts may be in any installed scripting language including shell and perl. They are run before or after all other scripts and archive installation respectively. These two scripts although used constantly are not documented by Apple in any of the current user or Developer documentation. During deletion these scripts are NEVER RUN.



The Package\_Root.post-xxx and The Package\_root.pre-xxx scripts are run as the xxxx name implies where xxx can be delete, install, or upgrade and all of these scripts are run after the "preflight" script except the pre-delete script. The postflight script is always run after the other post-xxxx scripts except the post-delete script.

#### Localization:



The English.lproj folder contains resources localized in English. There is only one required file in this directory. The Package\_Root.info file.



The Package\_Root.info file contains all the configuration information for the bundle. the default Apple PackageMaker .info format is:

Title (title of the package)

Version (package revision)

Description (description of the contents of the package with no cr until the end)

DefaultLocation (where to extract the bundle archive to)

DeleteWarning (warning of what may happen if package is deleted with no cr until the end)

### Package Flags (comment)

NeedsAuthorization YES/NO

(install as root)

Required YES/NO

(can not be deleted it is a system package)

Relocatable YES/NO

(allow the user to place the archive extraction anywhere)

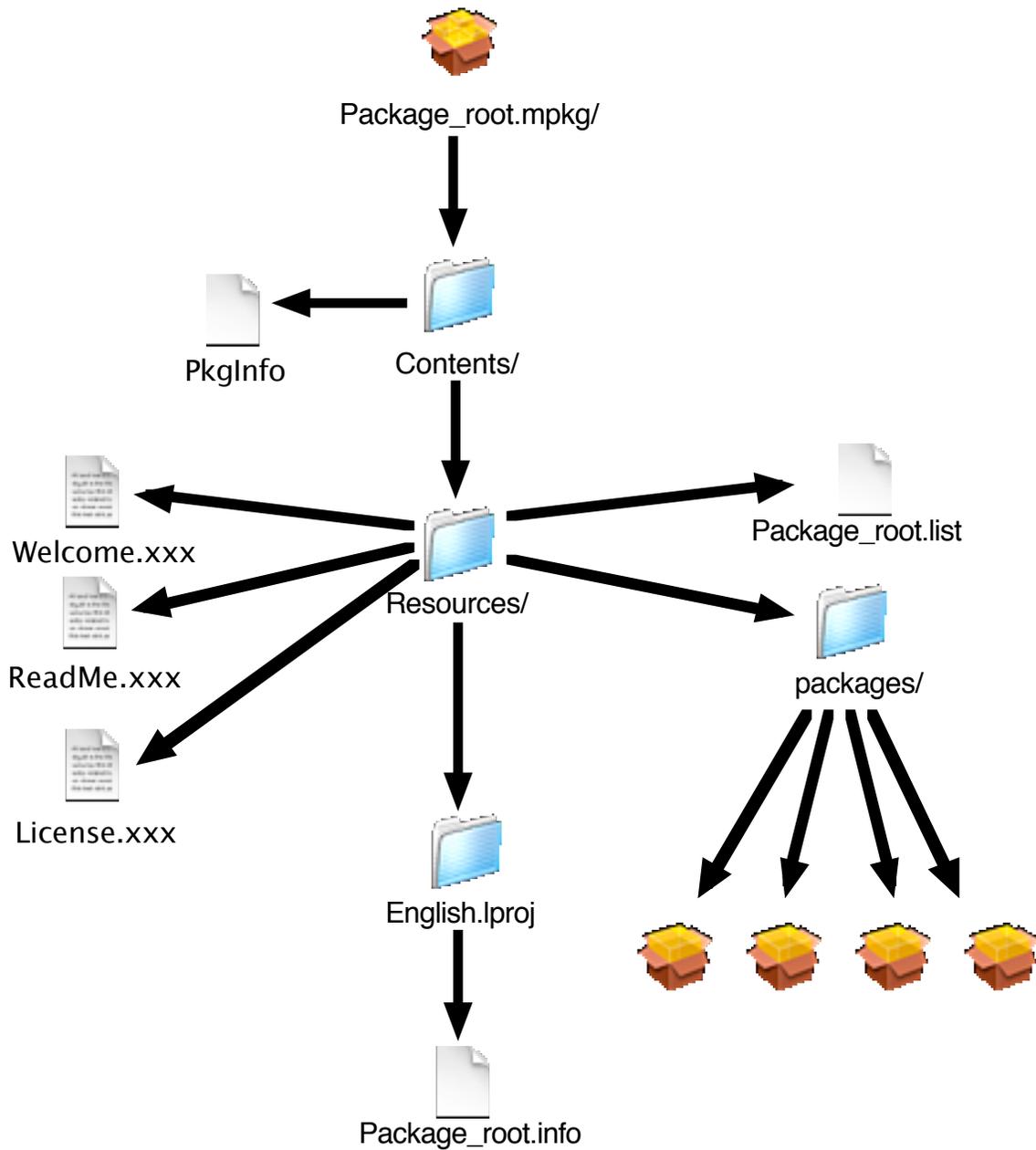
RequiresReboot YES/NO

(require a reboot upon successful installation or deletion)

UseUserMask YES/NO (apply the Users privilege map to the files)  
OverwritePermissions YES/NO (force permissions to the "default")  
InstallFat YES/NO (for dual resource files are copied by DITTO)

The first true extension of the Apple/NeXT format was implemented by Apple with the introduction of the "Meta Package".

This was a package bundle that pointed to a set of packages and used the format of:





At the root level of the meta package you have the “Package\_root” folder. It sets the name of the metapackage. Changing the name of this folder will cause havoc as we will see later.



Inside the “Package\_root” folder is the “Contents” folder. It contains one folder and one text file.



This file is called “PkgInfo”. This text file is optional and contains the “Finder Hints”. Much like the MAC Classic file system this is the type/creator hint for the package in a Package bundle made by Apple’s PackageMaker the file contains “pmkrmpkg” which says made by “pmkr” file type of “mpkg”



Now comes the meat of the bundle the “Resource” folder. It contains:

- Welcome.xxx (xxx=.txt or .html or .rtf or .rtfd)(optional)
- ReadMe.xxx (xxx=.txt or .html or .rtf or .rtfd)(optional)
- License.xxx (xxx=.txt or .html or .rtf or .rtfd)(optional)
- packages folder
- Package\_Root.list
- English.lproj folder



The Three user information files Welcome, ReadMe and License do not provide any functionality to the bundle although most package installers require you to agree to the license before installation can take place. For more on these files read Apple’s PackageMaker Information.



The metapackage “.list” file is a text file and is named for the “Package\_Root” with the .list suffix. It contains a list of packages to be installed and how they should be listed to the user. The three list OPTIONS are:

- Required ( the user will always install this package)
- Selected ( this package is selected by default for installation but, may be deselected by the user)
- Unselected ( this package is deselected by default for no installation, but may be selected by the user to be installed)

The “.list” file format is:

```
packagename.pkg:Required  
packagename.pkg:Selected  
packagename.pkg:Unselected
```



The packages folder contains the various packages  that will be installed by the metapackage. The meta package installer should read each packages .info file to know how

to install it and display its name and description. It should be noted that the package's Welcome, ReadMe and License files are not read or displayed by Apples meta Installer.



The English.lproj folder contains resources localized in English. There is only one required file in this directory. The Package\_Root.info file.



The Package\_Root.info file contains all the configuration information for the metapackage. The default Apple PackageMaker metapackage .info format is:

```
#
# Human-readable string for this group of packages
#
Title    (title of the package with no cr until the end)

#
# Version
#
Version    (meta package revision)

#
# MetaPackage Description
#
Description (meta package description with no cr until the end)

#
# Where to search for packages. For a real release, this would
# be relative to the .mpkg directory (probably "..")
#
PackageLocation    Contents/Resources/packages/
```

The next extension of NeXT/Apple's Installation system was made by the OS X Package Manager known as OSXPM.



The first version of OSXPM while maintains the same structure as the NeXT/Apple package bundles it extended the archiving and compression methods. It also extended the .info file format to include new entries.

The Archive format for .xpm bundles ( OSXPM's Package format) moved from PAX to GNUTAR which honors sym-links and permissions in a standardized way.

The compression format remained GZIP until the second release when it moved to BZIP2 format.

The extensions to the .info file format included the following additions:

```
CreateDate 2002-06-19 11:22:30 -0600    ( when the package was made in Cocoa
NSDate format)
License    APSL                        (the type of license this package was
released under)
```

Archiver GNUTAR (The archiver used to make the package)  
Compressor BZIP2 (the compressor used to compress the package)  
HomePage <http://www.osxgnu.org/> (optional content home page URL of the package)  
PackageAuthor OSXGNU-Chris Roberts ( company-author of who made the package)  
Packager OSXPM REV 1.1 (packaging application name and revision)

#### #installer Flags

ReceiptUpdate YES/NO (Overwrite the Receipt of a package with the same title with this one so the current revision only shows)  
UserOnly YES/NO (Is this package to be installed in the users directory structure ONLY)  
Dependency YES/NO (Use the OSXPM 1.1.X dependency system to obtain requisite dependent packages while installing this package)

If the Dependency flag is set to YES a Package\_Root.dep file is added to the Resource directory by OSXPM 1.1.x which contains the dependency information for the OSXPM open dependency system. the file is written in NSPlist format. and is used in conjunction with a DB3 unix database in the /Library/Receipts directory in OS X.

The OSXPM 1.1.x Metapackage system .MXPM uses the Exact same format as the Apple Metapackage system with some minor differences:

- The “.info” file format may include URL path to packages so they can be downloaded and then installed by the installer from the internet:  
“PackageLocation <ftp://ftp.osxgnu.org/pub/osxgnu/>”
- The “.list” format may contain additional path information for the URL:  
“OSXPM/OSXPMComplete-1.1.3.8.pkg:Required”

The OSXPM 1.1.x met package installer also displays Optionally the Welcome, ReadMe files and Always displays the License for each package for the user to agree with.

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