

- [Monobjc](#)

- [Downloads](#)
- [Documentation](#)
- [Samples](#)
- [Support](#)
- [Resources](#)

# Xcode Project File Format

- [Getting Started](#)
- [Tutorials](#)
- [Programming Guide](#)
- [MonoDevelop Addins](#)
- [MSBuild Tasks](#)
- [NAnt Tasks](#)
- [F.A.Q.](#)
- [Building Monobjc](#)
- [How Monobjc Works](#)
- [Technical Notes](#)
  - [XIB File Format](#)
  - [Xcode Project File Format](#)

## Introduction

The Xcode project file is an old-style plist (Next style) based on braces to delimit the hierarchy. The file begins with an explicit encoding information, usually the UTF-8 one. This means that the file must not bear a BOM (Byte Ordering Mark) at its start or the parsing will fail.

Note: The following document is based on observations of various \*.pbxproj files and element properties have been inferred. There was not code reverse engineering involved what so ever.

## Unique Identification

Each element in the file is uniquely identified by a 96 bits identifier using a 24 hexadecimal representation. This unique identifier is unique accross the document.

The algorithm used by Xcode to generate the unique identifier seems to be based both on date, sequence and pre-defined values, but as there is no evidence that these identifiers must follow a generation convention, one can think that arbitrary identifier can be used, as long as they are unique accross the document.

The following references were useful while writing this note:

A brief look at the Xcode project format [Cmake] Re: CMake Apple XCode support? PBTOMAKE -- Xcode to Unix

## Elements

Here is the list of elements contained in the file format:

- Root Element
- PBXBuildFile
- PBXBuildPhase
  - PBXAppleScriptBuildPhase
  - PBXCopyFilesBuildPhase
  - PBXFrameworksBuildPhase
  - PBXHeadersBuildPhase
  - PBXResourcesBuildPhase
  - PBXShellScriptBuildPhase
  - PBXSourcesBuildPhase
- PBXContainerItemProxy
- PBXFileElement
  - PBXFileReference
  - PBXGroup
  - PBXVariantGroup
- PBXTarget
  - PBXAggregateTarget
  - PBXLegacyTarget
  - PBXNativeTarget
- PBXProject
- PBXTargetDependency
- XCBuildConfiguration
- XCConfigurationList

## Root Element

The root section contains the general informations.

Attribute	Type	Value	Comment
archiveVersion	Number	1	Default value.
classes	List	Empty	
objectVersion	Number		See XcodeCompatibilityVersion enumeration.
objects	Map	A map of element	The map is indexed by the elements identifier.
rootObject	Reference	An element reference	The object is a reference to a PBXProject element.

Example:

```
// !$*UTF8*$!  
{  
    archiveVersion = 1;  
    classes = {  
    };  
    objectVersion = 45;  
    objects = {  
  
        ...  
  
    };  
    rootObject = 0867D690FE84028FC02AAC07 /* Project object */;  
}
```

## PBXAggregateTarget

This is the element for a build target that aggregates several others.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXAggregateTarget	Empty	
buildConfigurationList	Reference	An element reference	The object is a reference to a XCConfigurationList element.
buildPhases	List	A list of element reference	The objects are a reference to a PBXBuildPhase element.
dependencies	List	A list of element reference	The objects are a reference to a PBXTargetDependency element.
name	String	The name of the target.	
productName	String	The product name.	

Example:

```
4DA521A6115A00AF007C19C3 /* documentation */ = {  
    isa = PBXAggregateTarget;  
    buildConfigurationList = 4DA521AE115A00ED007C19C3 /* Build configuration list for PBXAggregateTarget "documentation" */;  
    buildPhases = (  
        4DA521A5115A00AF007C19C3 /* ShellScript */,  
    );  
    dependencies = (  
        4DA521AA115A00BC007C19C3 /* PBXTargetDependency */,  
    );  
    name = documentation;  
    productName = documentation;  
};
```

## PBXBuildFile

This element indicate a file reference that is used in a PBXBuildPhase (either as an include or resource).

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXBuildFile	Empty	
fileRef	Reference	An element reference	The object is a reference to a PBXFileReference element.
settings	Map		A map of key/value pairs for additionnal settings.

Example:

```
4D05CA6B1193055000125045 /* xxx.c in Sources */ = {  
    isa = PBXBuildFile;  
    fileRef = 4D05CA411193055000125045 /* xxx.c */;  
};
```

## PBXBuildPhase

This element is an abstract parent for specialized build phases.

## PBXContainerItemProxy

This is the element for to decorate a target item.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXContainerItemProxy	Empty	
containerPortal	Reference	An element reference	The object is a reference to a PBXProject element.
proxyType	Number	1	
remoteGlobalIDString	Reference	An element reference	A unique reference ID.
remoteInfo	String		

Example:

```

4D22DC0C1167C992007AF714 /* PBXContainerItemProxy */ = {
    isa = PBXContainerItemProxy;
    containerPortal = 08FB7793FE84155DC02AAC07 /* Project object */;
    proxyType = 1;
    remoteGlobalIDString = 87293EBF1153C114007AFD45;
    remoteInfo = xxx;
};

```

## PBXCopFilesBuildPhase

This is the element for the copy file build phase.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXCopFilesBuildPhase	Empty	
buildActionMask	Number	2^32-1	
dstPath	String	The destination path	
dstSubfolderSpec	Number		
files	List	A list of element reference	The objects are a reference to a PBXBuildFile element.
runOnlyForDeploymentPostprocessing	Number	0	

Example:

MISSING

## PBXFileElement

This element is an abstract parent for file and group elements.

## PBXFileReference

A PBXFileReference is used to track every external file referenced by the project: source files, resource files, libraries, generated application files, and so on.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXFileReference	Empty	
fileEncoding	Number		See the PBXFileEncoding enumeration.
explicitFileType	String		See the PBXFileType enumeration.
lastKnownFileType	String		See the PBXFileType enumeration.
name	String	The filename.	
path	String	The path to the filename.	
sourceTree	String	See the PBXSourceTree enumeration.	

Example:

```

87293F901153D870007AFD45 /* monobjc.mm */ = {
    isa = PBXFileReference;
    fileEncoding = 4;
    lastKnownFileType = sourcecode.cpp.objcpp;
    name = monobjc.mm;
    path = sources/monobjc.mm;
    sourceTree = "";
};

```

## PBXFrameworksBuildPhase

This is the element for the framewrok link build phase.

Attribute	Type	Value	Comment
reference	UUID		

		A 96 bits identifier	
isa	PBXFrameworksBuildPhase	Empty	
buildActionMask	Number	2^32-1	
files	List	A list of element reference	The objects are a reference to a PBXBuildFile element.
runOnlyForDeploymentPostprocessing	Number	0	

Example:

```
4D05CA2C119304BD00125045 /* Frameworks */ = {
    isa = PBXFrameworksBuildPhase;
    buildActionMask = 2147483647;
    files = (
    );
    runOnlyForDeploymentPostprocessing = 0;
};
```

## PBXGroup

This is the element to group files or groups.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXGroup	Empty	
children	List	A list of element reference	The objects are a reference to a PBXFileElement element.
name	String	The filename.	
sourceTree	String	See the PBXSourceTree enumeration.	

Example:

```
4DA521A21115A003E007C19C3 /* scripts */ = {
    isa = PBXGroup;
    children = (
        4D22DBAF116742DE007AF714 /* fix_references.sh */,
        4DA521A1115A0032007C19C3 /* generate_descriptors.sh */,
    );
    name = scripts;
    sourceTree = "";
};
```

## PBXHeadersBuildPhase

This is the element for the framewrok link build phase.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXHeadersBuildPhase	Empty	
buildActionMask	Number	2^32-1	
files	List	A list of element reference	The objects are a reference to a PBXBuildFile element.
runOnlyForDeploymentPostprocessing	Number	0	

Example:

```
87293EBC1153C114007AFD45 /* Headers */ = {
    isa = PBXHeadersBuildPhase;
    buildActionMask = 2147483647;
    files = (
    );
    runOnlyForDeploymentPostprocessing = 0;
};
```

## PBXLegacyTarget

MISSING

## PBXNativeTarget

This is the element for a build target that produces a binary content (application or library).

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXNativeTarget	Empty	
buildConfigurationList	Reference	An element reference	The object is a reference to a XCConfigurationList element.

buildPhases	List	A list of element reference The objects are a reference to a PBXBuildPhase element.	
dependencies	List	A list of element reference The objects are a reference to a PBXTargetDependency element.	
name	String	The name of the target.	
productInstallPath	String	The product install path.	
productName	String	The product name.	
productReference	Reference	An element reference	The object is a reference to a PBXFileReference element.
productType	String	See the PBXProductType enumeration.	

Example:

```
8D1107260486CEB800E47090 /* XXX */ = {
    isa = PBXNativeTarget;
    buildConfigurationList = C01FCF4A08A954540054247B /* Build configuration list for PBXNativeTarget "XXX" */;
    buildPhases = (
        8D1107290486CEB800E47090 /* Resources */,
        8D11072C0486CEB800E47090 /* Sources */,
        8D11072E0486CEB800E47090 /* Frameworks */,
    );
    buildRules = (
    );
    dependencies = (
    );
    name = XXX;
    productInstallPath = "$(HOME)/Applications";
    productName = TrackIt;
    productReference = 8D1107320486CEB800E47090 /* XXX.app */;
    productType = "com.apple.product-type.application";
};
```

PBXProject

This is the element for a build target that produces a binary content (application or library).

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXProject	Empty	
buildConfigurationList	Reference	An element reference	The object is a reference to a XCConfigurationList element.
compatibilityVersion	String	A string representation of the XcodeCompatibilityVersion.	
developmentRegion	String		The region of development.
hasScannedForEncodings	Number	0 or 1	Whether file encodings have been scanned.
knownRegions	List	A list of string	The known regions for localized files.
mainGroup	Reference	An element reference	The object is a reference to a PBXGroup element.
productRefGroup	Reference	An element reference	The object is a reference to a PBXGroup element.
projectDirPath	String	The relative path of the project.	
projectReferences	Array of map	Each map in the array contains two keys: ProductGroup and ProjectRef.	
projectRoot	String	The relative root path of the project.	
targets	List	A list of element reference	The objects are a reference to a PBXTarget element.

Example:

```
29B97313FDCFA39411CA2CEA /* Project object */ = {
    isa = PBXProject;
    buildConfigurationList = C01FCF4E08A954540054247B /* Build configuration list for PBXProject "XXX" */;
    compatibilityVersion = "Xcode 2.4";
    developmentRegion = English;
    hasScannedForEncodings = 1;
    knownRegions = (
        English,
        Japanese,
        French,
        German,
        en,
    );
    mainGroup = 29B97314FDCFA39411CA2CEA /* XXX*/;
    projectDirPath = "";
    projectRoot = "";
    targets = (
        8D1107260486CEB800E47090 /* XXX*/,
    );
};
```

PBXResourcesBuildPhase

This is the element for the resources copy build phase.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXResourcesBuildPhase	Empty	
buildActionMask	Number	2^32-1	
files	List	A list of element reference	The objects are a reference to a PBXBuildFile element.
runOnlyForDeploymentPostprocessing	Number	0	

Example:

```
8D1107290486CEB800E47090 /* Resources */ = {
    isa = PBXResourcesBuildPhase;
    buildActionMask = 2147483647;
    files = (
        535C1E1B10AB6B6300F50231 /* ReadMe.txt in Resources */,
        533B968312721D05005E617D /* Credits.rtf in Resources */,
        533B968412721D05005E617D /* InfoPlist.strings in Resources */,
        533B968512721D05005E617D /* MainMenu.nib in Resources */,
        533B968612721D05005E617D /* TableEdit.nib in Resources */,
        533B968712721D05005E617D /* TestWindow.nib in Resources */,
    );
    runOnlyForDeploymentPostprocessing = 0;
};
```

## PBXShellScriptBuildPhase

This is the element for the resources copy build phase.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXShellScriptBuildPhase	Empty	
buildActionMask	Number	2^32-1	
files	List	A list of element reference	The objects are a reference to a PBXBuildFile element.
inputPaths	List	A list of string	The input paths.
outputPaths	List	A list of string	The output paths.
runOnlyForDeploymentPostprocessing	Number	0	
shellPath	String	The path to the shell interpreter.	
shellScript	String	The content of the script shell.	

Example:

```
4D22DBAE11674009007AF714 /* ShellScript */ = {
    isa = PBXShellScriptBuildPhase;
    buildActionMask = 2147483647;
    files = (
    );
    inputPaths = (
    );
    outputPaths = (
    );
    runOnlyForDeploymentPostprocessing = 0;
    shellPath = /bin/sh;
    shellScript = "./fix_references.sh";
};
```

## PBXSourcesBuildPhase

This is the element for the sources compilation build phase.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXSourcesBuildPhase	Empty	
buildActionMask	Number	2^32-1	
files	List	A list of element reference	The objects are a reference to a PBXBuildFile element.
runOnlyForDeploymentPostprocessing	Number	0	

Example:

```
4DF8B22D1171CFBF0081C1DD /* Sources */ = {
    isa = PBXSourcesBuildPhase;
```

```
buildActionMask = 2147483647;
files = (
    4DF8B23E1171D0310081C1DD /* test.mm in Sources */,
);
runOnlyForDeploymentPostprocessing = 0;
};
```

## PBXTarget

This element is an abstract parent for specialized targets.

## PBXTargetDependency

This is the element for referencing other target through content proxies.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXTargetDependency	Empty	
target	Reference	An element reference	The object is a reference to a PBXNativeTarget element.
targetProxy	Reference	An element reference	The object is a reference to a PBXContainerItemProxy element.

Example:

```
4D22DC0D1167C992007AF714 /* PBXTargetDependency */ = {
    isa = PBXTargetDependency;
    target = 87293EBF1153C114007AFD45 /* libXXX */;
    targetProxy = 4D22DC0C1167C992007AF714 /* PBXContainerItemProxy */;
};
```

## PBXVariantGroup

This is the element for referencing localized resources.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	PBXVariantGroup	Empty	
children	List	A list of element reference	The objects are a reference to a PBXFileElement element.
name	String	The filename.	
sourceTree	String	See the PBXSourceTree enumeration.	

Example:

```
870C88031338A77600A69309 /* MainMenu.xib */ = {
    isa = PBXVariantGroup;
    children = (
        870C88041338A77600A69309 /* en */,
    );
    name = MainMenu.xib;
    sourceTree = "";
};
```

## XCBuildConfiguration

This is the element for defining build configuration.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	XCBuildConfiguration	Empty	
baseConfigurationReference	String	The path to a xcconfig file	
buildSettings	Map	A map of build settings.	
name	String	The configuration name.	

Example:

```
870C88151338ABB600A69309 /* Debug */ = {
    isa = XCBuildConfiguration;
    buildSettings = {
        PRODUCT_NAME = "$(TARGET_NAME)";
    };
    name = Debug;
};
870C88161338ABB600A69309 /* Release */ = {
    isa = XCBuildConfiguration;
    buildSettings = {
        PRODUCT_NAME = "$(TARGET_NAME)";
    };
};
```

```
        name = Release;
};
```

## XCConfigurationList

This is the element for listing build configurations.

Attribute	Type	Value	Comment
reference	UUID	A 96 bits identifier	
isa	XCConfigurationList	Empty	
buildConfigurations	List	A list of element reference	The objects are a reference to a XCBuildConfiguration element.
defaultConfigurationIsVisible	Number	0	
defaultConfigurationName	String	The default configuration name.	

Example:

```
870C87E41338A77600A69309 /* Build configuration list for PBXProject "CocoaApp" */ = {
    isa = XCConfigurationList;
    buildConfigurations = (
        870C88061338A77600A69309 /* Debug */,
        870C88071338A77600A69309 /* Release */,
    );
    defaultConfigurationIsVisible = 0;
    defaultConfigurationName = Release;
};
```

Copyright © 2008-2014 Laurent Etiemble. All rights reserved. Logo licenced from iStockPhoto.  
All trademarks and copyrights on this website are owned by their respective owners.