Java y Objective-C a .NET

Escuela Técnica Superior de Ingeniería Informática

Cartuja .NET
Grupo de usuarios .NET de Sevilla

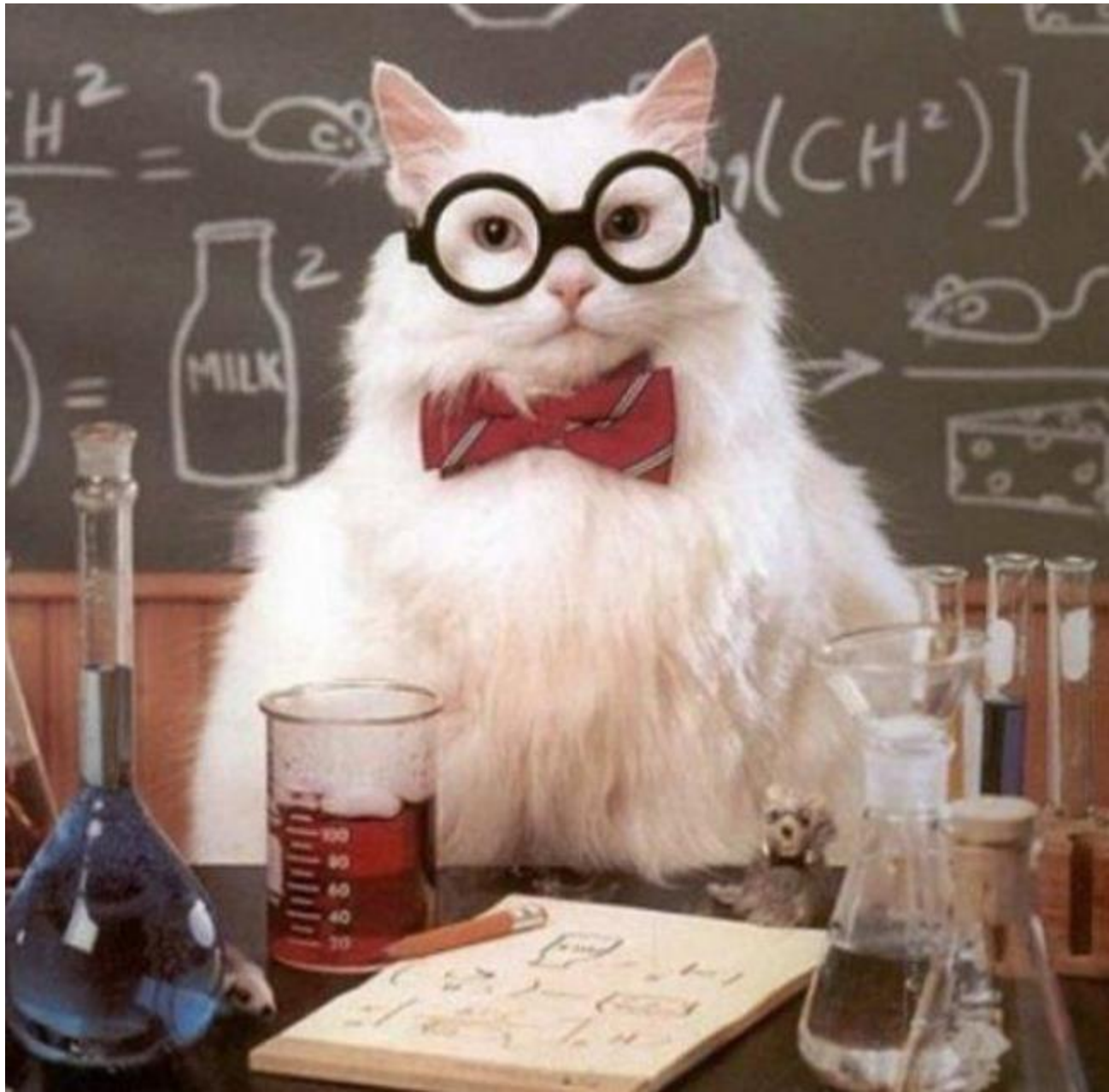
plain concepts

¿Para qué?

- Reutilizar código
- Usar código que necesita rendimiento especial

Objective-C y Swift

- Obtener una librería (.a o .framework)
- Generar una fat library (ojo con las dependencias)
- Crear un proyecto de binding
- Definir la API (Sharpie)
- Arreglar errores
- Usarla



Preparar proyecto Swift

- Directiva @objc

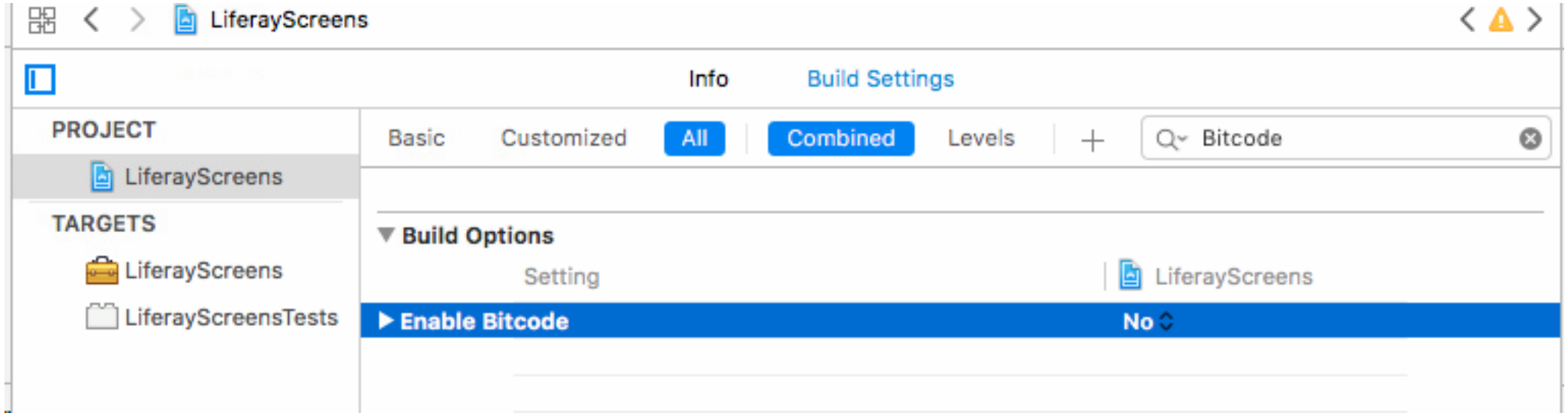
@objc(BaseScreenlet)
@IBDesignable open class BaseScreenlet: UIView {
...

@objc(LoginScreenlet)
open class LoginScreenlet: BaseScreenlet, BasicAuthBasedType {
…

@objc(LoginScreenletDelegate)
public protocol LoginScreenletDelegate: BaseScreenletDelegate {

Preparar proyecto Swift

- Deshabilitar bitcode



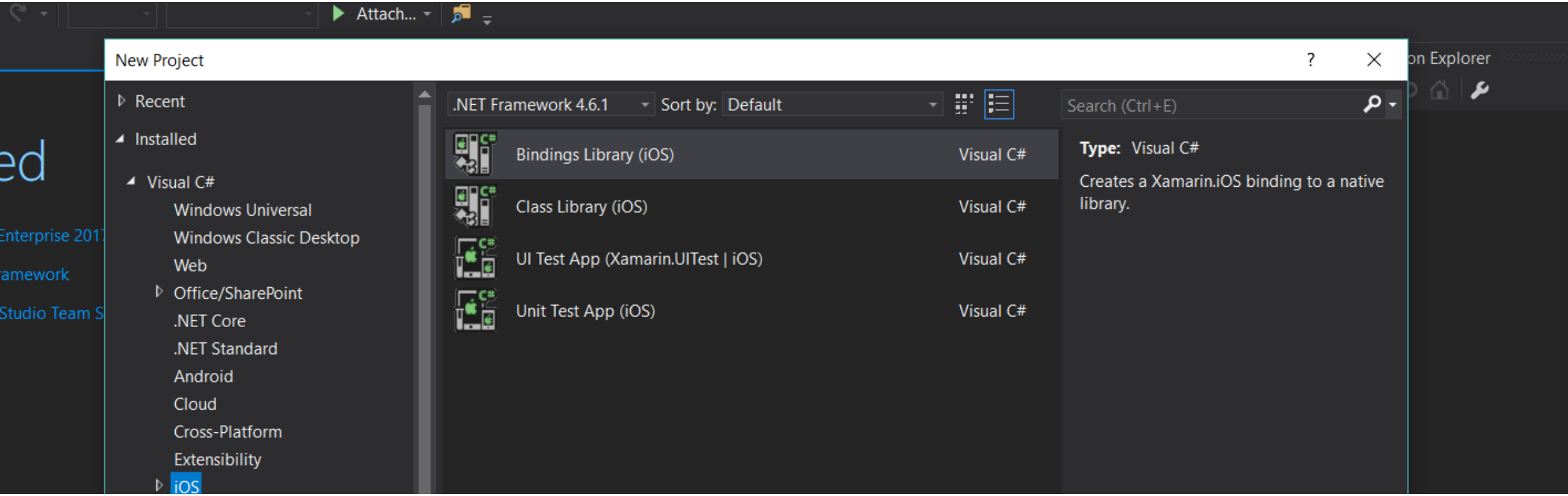
Generar una fat library

- Que contenga las versiones :
  - ARM y ARM64x86
  - X86 y x86_64

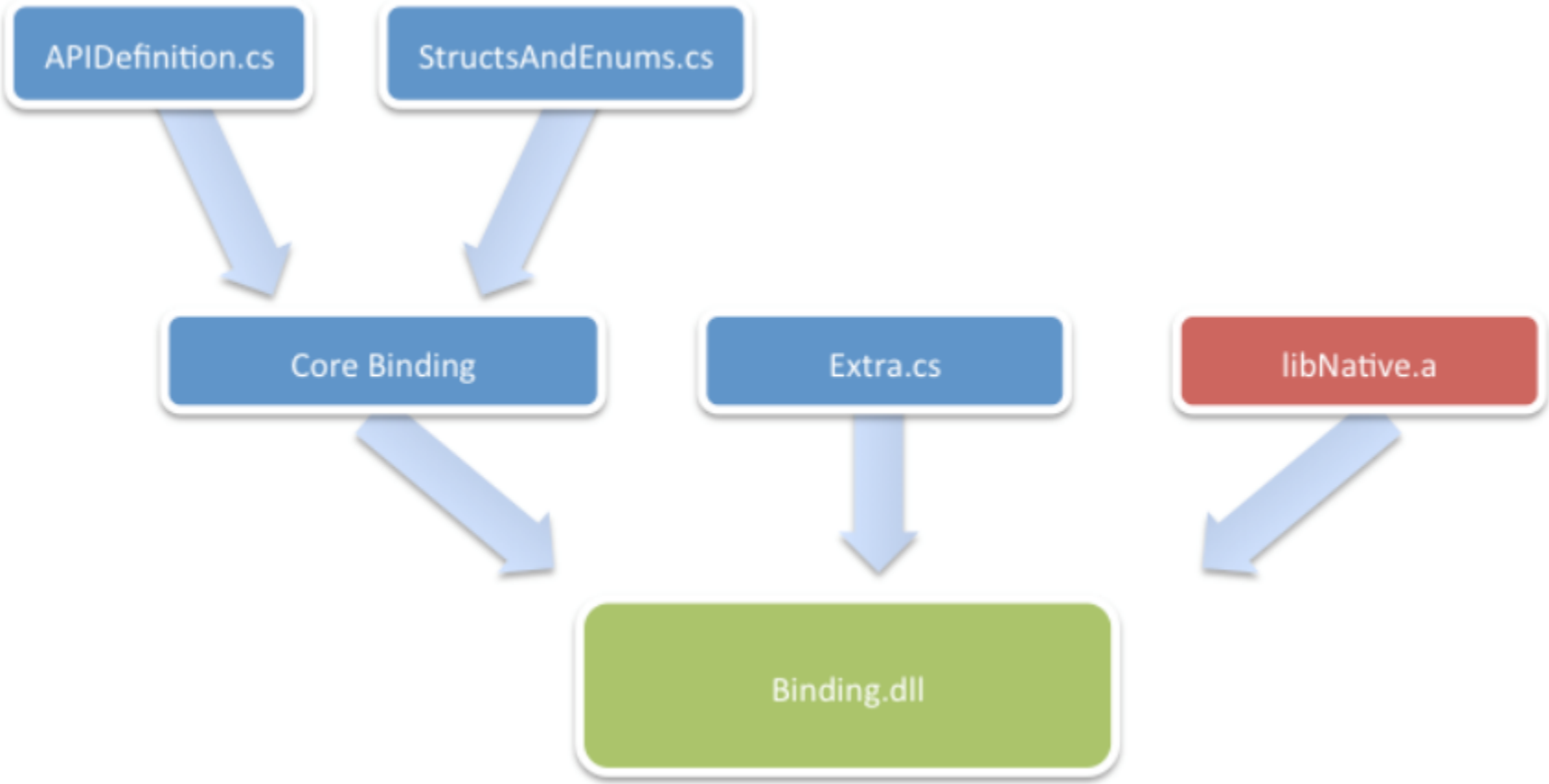
- **lipo -create Release-iphonesimulator/LiferaySreens.framework/LiferaySreens Release-iphoneos/LiferaySreens.framework/LiferaySreens -output LiferaySreens.framework/LiferaySreens**

- Lo mismo para las dependencias

Crear Binding library

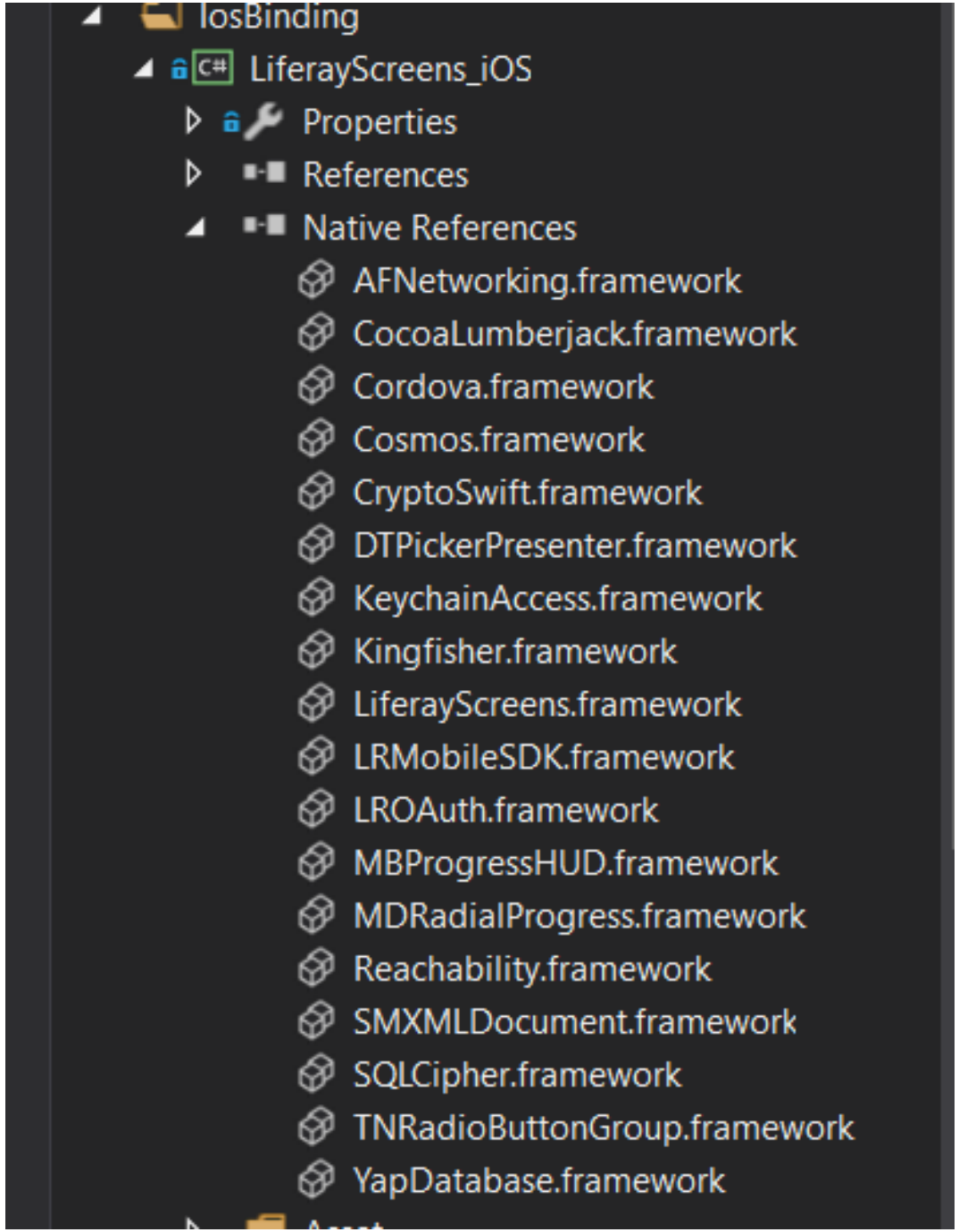


Crear un proyecto de binding



Dependencias

- Ojo



Sharpie

- Objective-C:
  - **sharpie bind --output=InfColorPicker --namespace=InfColorPicker --sdk=[iphone-os] [full-path-to-project]/InfColorPicker/InfColorPicker/*.h**

- Swift:
  - **Sharpie bind -sdk iphoneos10.3 LiferayScreens.framework/Headers/LiferayScreens-Swift.h**

APIDefinition.cs

```
// @interface BaseListCollectionView : BaseListView <UICollectionViewDataSource, UIC
[BaseType(typeof(BaseListView))]
– references | Sarai Díaz, 10 days ago | 1 author, 2 changes
interface BaseListCollectionView : IUICollectionViewDataSource, IUICollectionViewDel
{
    // @property (nonatomic, strong) UICollectionView * _Nullable collectionView __a
    [NullAllowed, Export("collectionView", ArgumentSemantic.Strong)]
    – references | Sarai Díaz, 11 days ago | 1 author, 1 change
    UICollectionView CollectionView { get; set; }

    // -(void)onCreated;
    [Export("onCreated")]
    – references | Sarai Díaz, 11 days ago | 1 author, 1 change
    void OnCreated();

    // -(void)onShow;
    [Export("onShow")]
    – references | Sarai Díaz, 11 days ago | 1 author, 1 change
```

[Protocol] y [BaseType]

- Si es una librería de Swift:
  - Original:

    SWIFT_CLASS("_TtC11SwiftSample7MyClass")
    @interface MyClass : NSObject

    SWIFT_PROTOCOL("_TtP6Charts17ChartDataProvider_")
    @protocol ChartDataProvider

- Corregirlo:

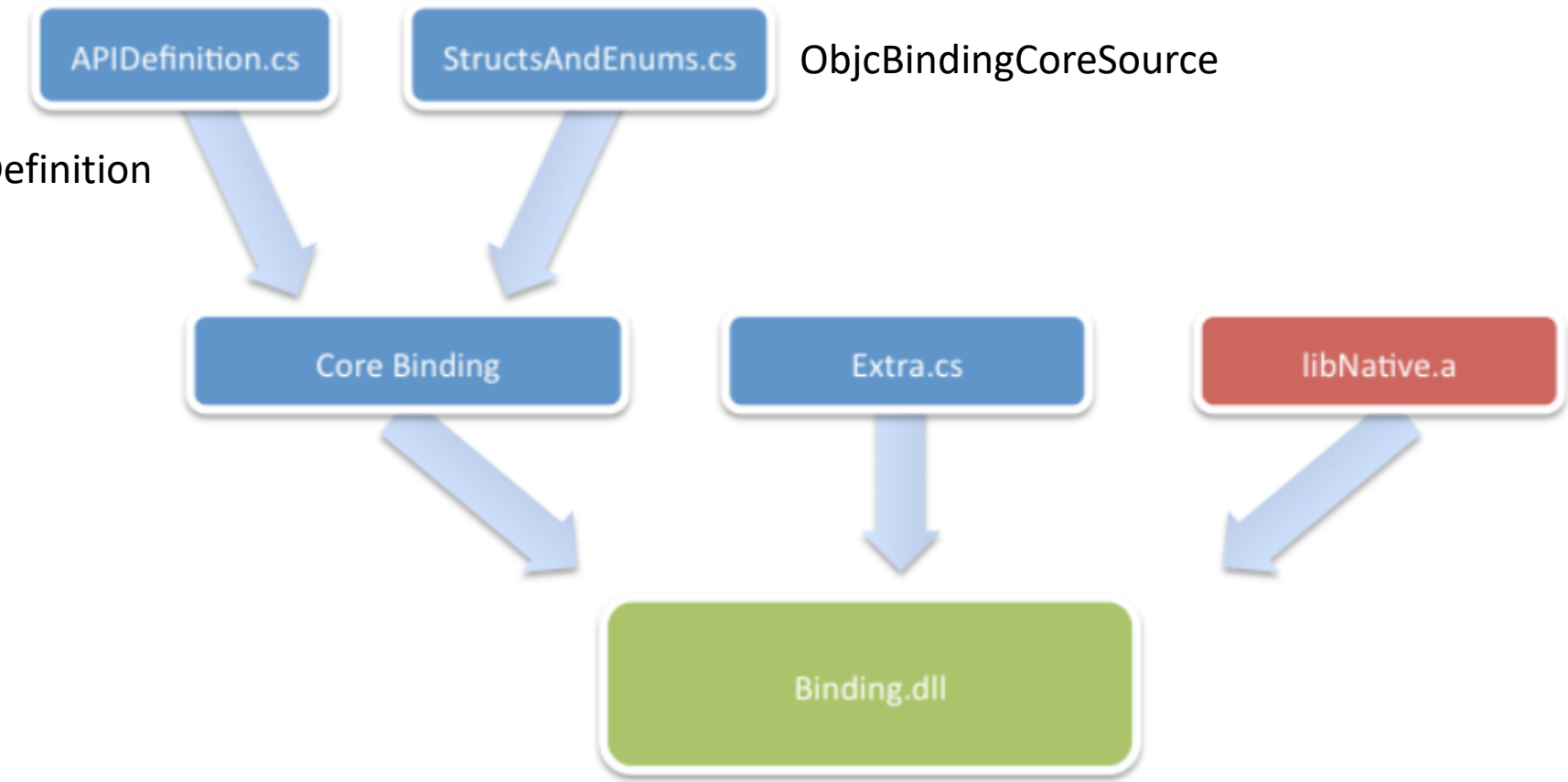
  [BaseType(typeof(NSObject), Name = "_TtC11SwiftSample7MyClass")]
  interface MyClass

- SwiftClassify (https://github.com/Flash3001/SwiftClassify)

Modificaciones

- [Verify]
  - https://developer.xamarin.com/guides/cross-platform/macios/binding/objective-sharpie/platform-features/verify/

ObjcBindingApiDefinition



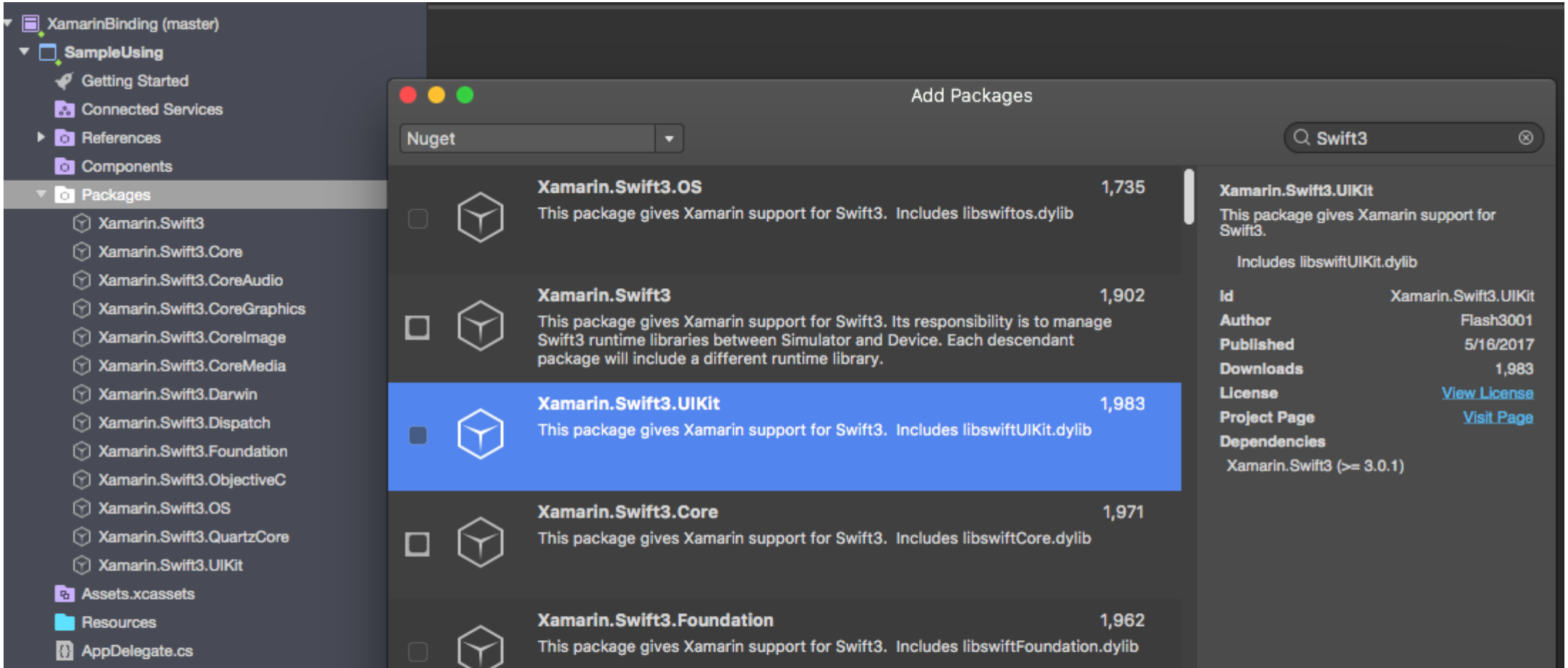
Dependencias Swift

- **otool -l -arch armv7 [Mylib] | grep libswift**

```
name @rpath/libswiftAVFoundation.dylib (offset 24)
name @rpath/libswiftCloudKit.dylib (offset 24)
name @rpath/libswiftContacts.dylib (offset 24)
name @rpath/libswiftCore.dylib (offset 24)
name @rpath/libswiftCoreAudio.dylib (offset 24)
name @rpath/libswiftCoreGraphics.dylib (offset 24)
name @rpath/libswiftCoreImage.dylib (offset 24)
name @rpath/libswiftCoreLocation.dylib (offset 24)
name @rpath/libswiftCoreMedia.dylib (offset 24)
name @rpath/libswiftDarwin.dylib (offset 24)
```

Usando la librería

- Incluir el core de swift: [Xamarin.Swift3.Support]



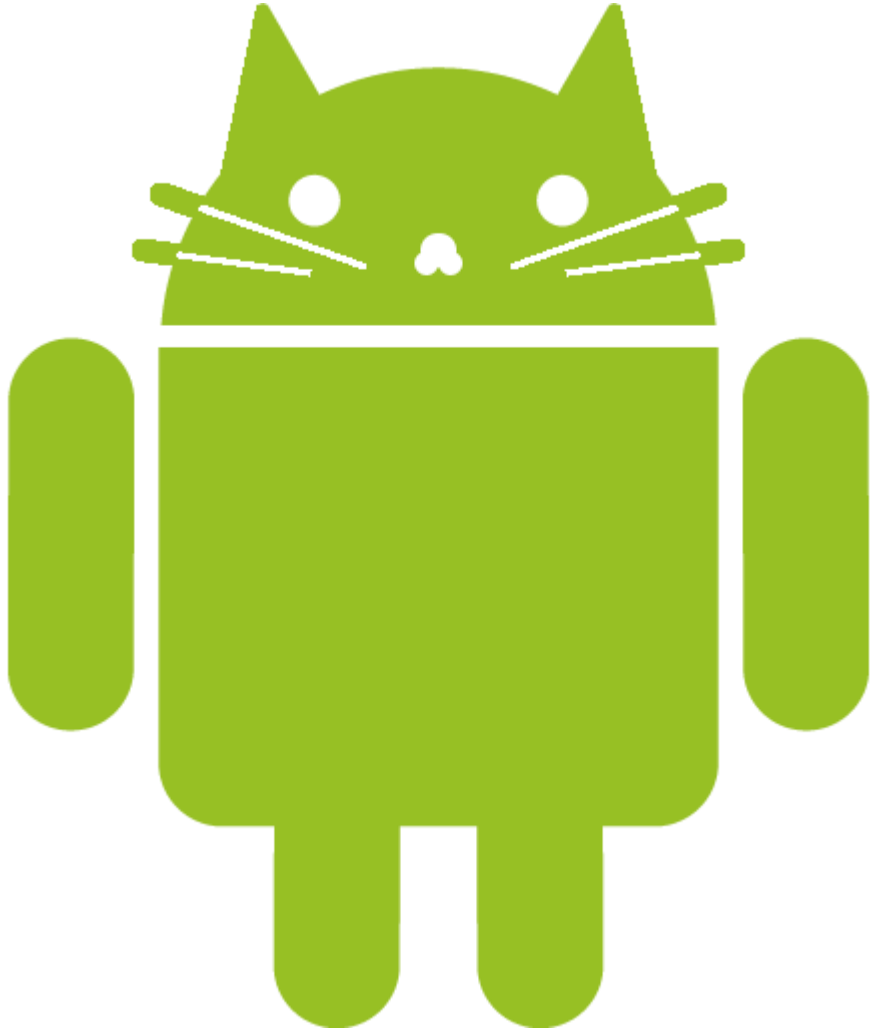
Cosas Nazis

- Herencia:
  - de protocolos y delegados
- Depuración

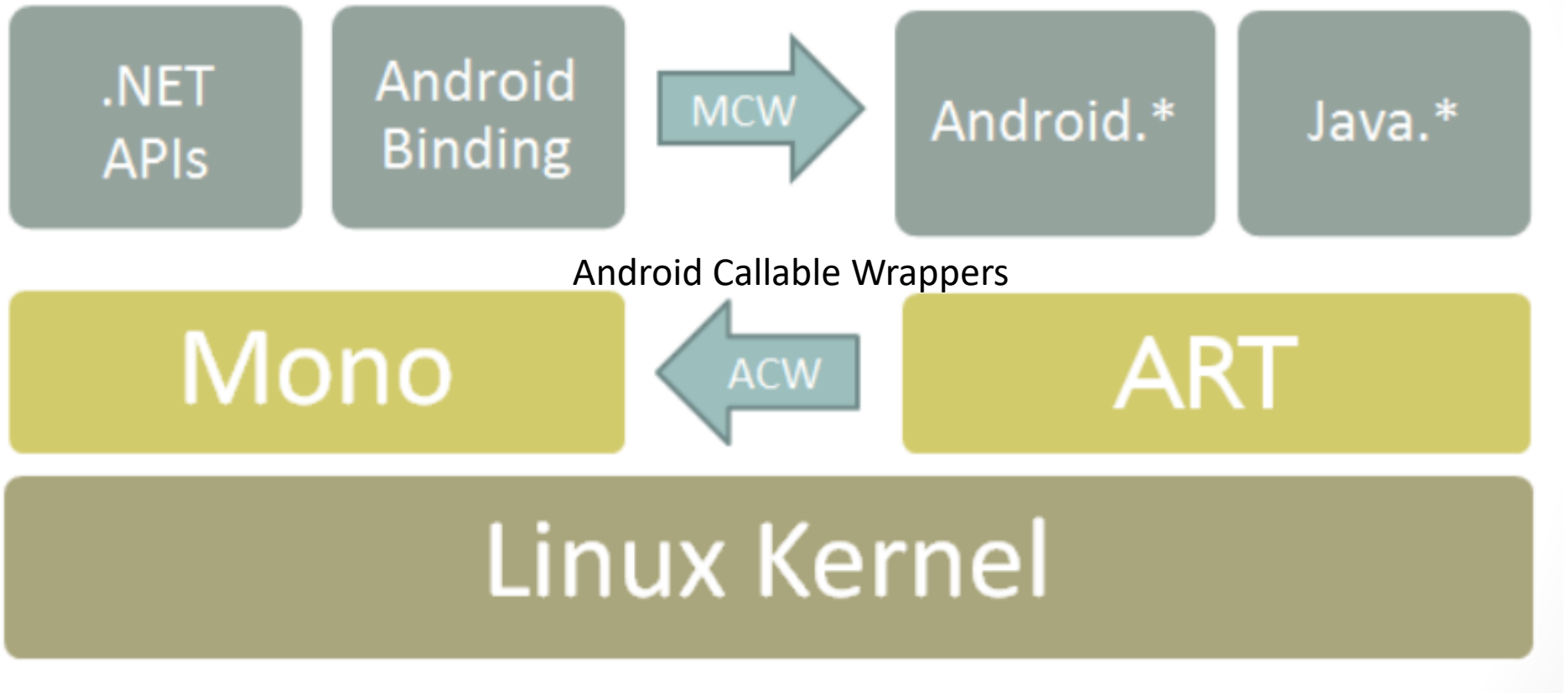
- No hay soporte oficial para Swift

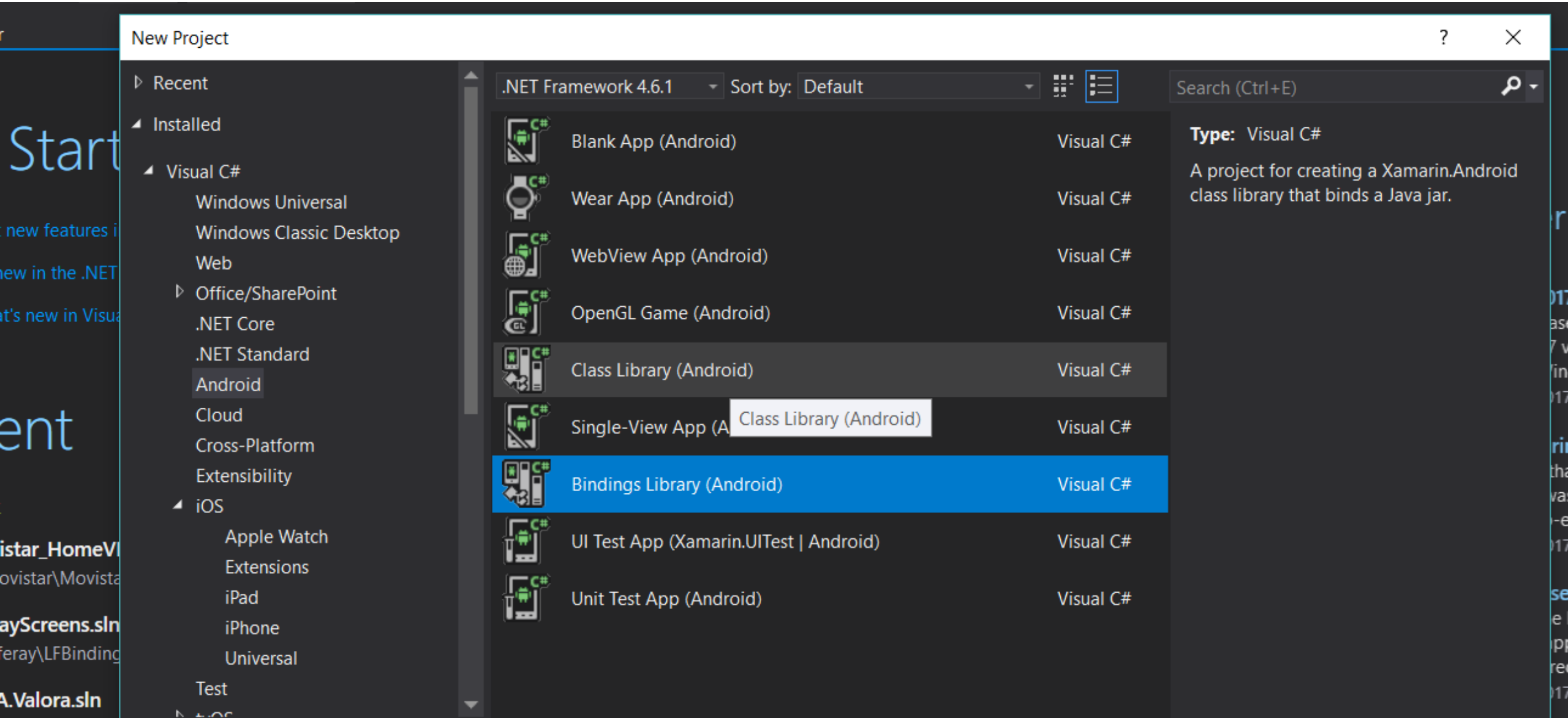
Android

- Crear un proyecto Binding Library
- Añadir las librerías:
  - .jar
  - .aar
  - Eclipse Library Project
- Corregir cosas
- Usarla



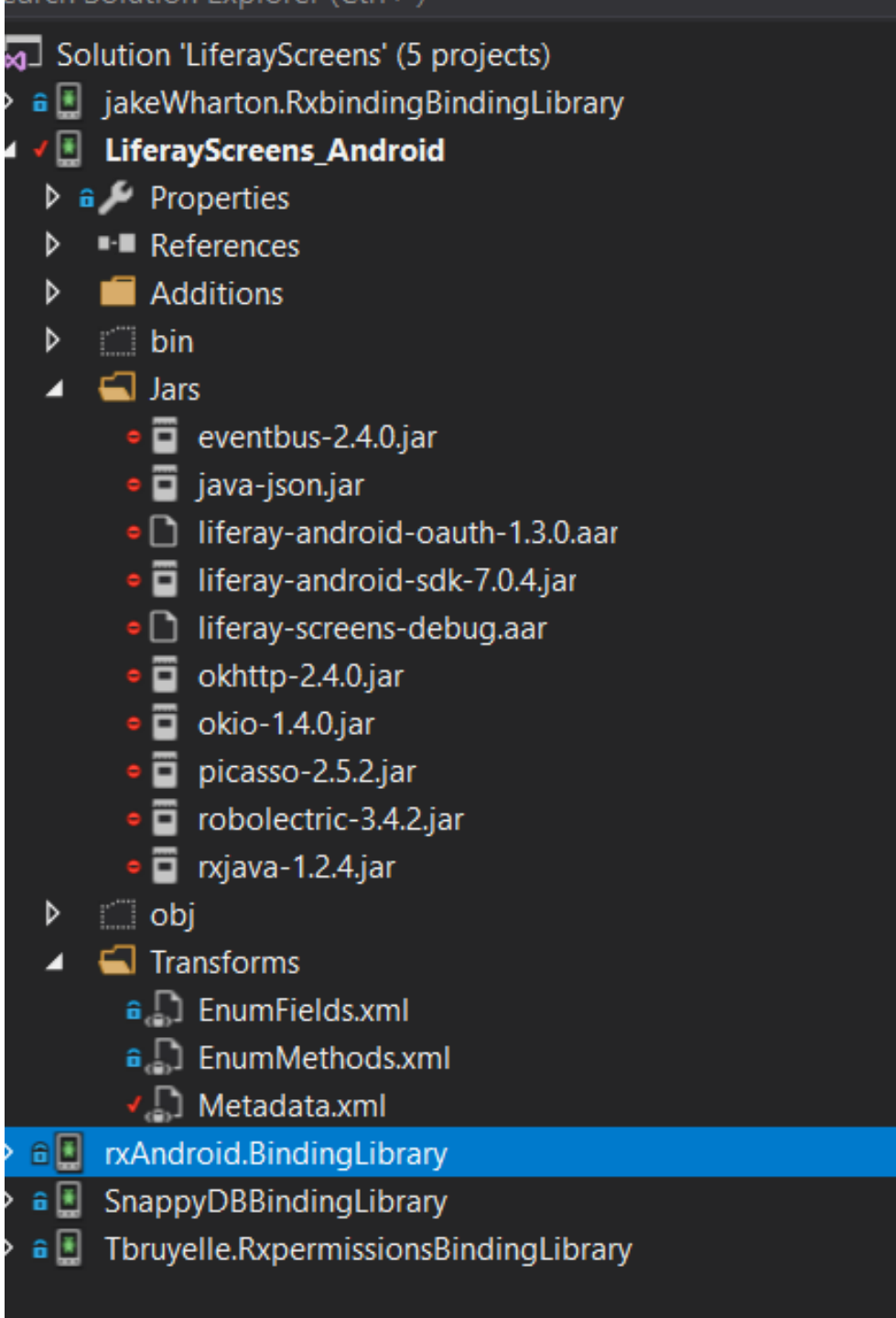
Managed Callable Wrappers (*MCW*).




New Project
Recent
Installed
Visual C#
Windows Universal
Windows Classic Desktop
Web
Office/SharePoint
.NET Core
.NET Standard
Android
Cloud
Cross-Platform
Extensibility
iOS
Apple Watch
Extensions
iPad
iPhone
Universal
Test
.NET Framework 4.6.1
Sort by:
Default
Search (Ctrl+E)
Blank App (Android) Visual C#
Wear App (Android) Visual C#
WebView App (Android) Visual C#
OpenGL Game (Android) Visual C#
Class Library (Android) Visual C#
Single-View App (A Visual C#
Class Library (Android)
Bindings Library (Android) Visual C#
UI Test App (Xamarin.UITest | Android) Visual C#
Unit Test App (Android) Visual C#
Type: Visual C#
A project for creating a Xamarin.Android class library that binds a Java jar.

Build Actions

- EmbeddedJars
- InputJars
- LibraryToProjectZip
- ReferenceJar
- EmbeddedReferenceJar
- EmbeddedNativeLibrary



Bindings Metadata

- Api.xml
  - Define los bridges

```
<api>
    <package name="android">
        <class abstract="false" deprecated="not deprecated" extends="java.lang.Object"
            extends-generic-aware="java.lang.Object"
            final="true"
            name="Manifest"
            static="false"
            visibility="public">
            <constructor deprecated="not deprecated" final="false"
                name="Manifest" static="false" type="android.Manifest"
                visibility="public">
            </constructor>
        </class>
...
</api>
```

Metadata.xml

```
<metadata>
    <!-- Normalize the namespace for .NET -->
    <attr path="/api/package[@name='com.evernote.android.job']"
        name="managedName">Evernote.AndroidJob</attr>

    <!-- Don't  need these packages for the Xamarin binding/public API -->
    <remove-node path="/api/package[@name='com.evernote.android.job.v14']" />
    <remove-node path="/api/package[@name='com.evernote.android.job.v21']" />

    <!-- Change a parameter name from the generic p0 to a more meaningful one. -->
    <attr path="/api/package[@name='com.evernote.android.job']/class[@name='JobManager']/method[@name='forc
        name="name">api</attr>
</metadata>
```

EnumFields.xml

```
<mapping jni-class="com/skobbler/ngx/map/realreach/SKRealReachSettings" clr-enum-type="Skobbler.Ngx.Map.RealRe
    <field jni-name="UNIT_SECOND" clr-name="Second" value="0" />
    <field jni-name="UNIT_METER" clr-name="Meter" value="1" />
    <field jni-name="UNIT_MILIWATT_HOURS" clr-name="MilliwattHour" value="2" />
</mapping>
```

Corrigiendo cosas

- No se implementan ciertos métodos
- Mapeando propiedades

Cosas Nazis

- Genericos parcialmente soportados
- Depuracion

Gracias

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plain concepts

- @juanlao
- jlao@plainconcepts.com
- https://github.com/juanlao/Talks/tree/master/FromSwiftAndAndroidToCSharp

Referencias

- https://medium.com/@Flash3001/binding-swift-libraries-xamarin-ios-ff32adbc7c76

- https://developer.xamarin.com/guides/android/advanced_topics/binding-a-java-library