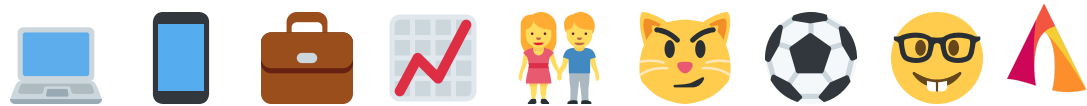


Embeddinator

From Xamarin libraries to Java & Objective-C libraries

About me



From Xamarin libraries to Java & Objective-C libraries



Why on earth...?



Embeddinator 4000

.NET Embedding allows your existing .NET Code (C#, F#, and others) to be consumed from other programming languages and in various different environments.

Supported language consumers

- Objective-C
- Java
- C

Contributors

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Sample: MonkeysSDK  

Setup

- ✓ CrossPlatform library
- ✓ Add Embeddinator NuGet Package
- ✓ Download ndk r15c

Android

After build command

```
mono ../packages/Embeddinator-4000.0.4.0/tools/Embeddinator-4000.exe  
  '${TargetPath}' '${TargetDir}/MonkeysSDK.dll' --gen=Java  
  --platform=Android --outdir='${SolutionDir}/androidoutput' -c
```

Android Studio

- ✓ Import .JAR/.AAR Package
- ✓ Add module as dependency
- ✓ Enable D8
- ✓ minSDKVersion 24
- ✓ `multiDexEnabled true`
- ✓ `aaptOptions { noCompress 'dll' }`
- ✓ Inherit from `Java.Lang.Obj` -> [Register] / [Export]

iOS

After build command

```
../packages/Embeddinator-4000.0.4.0/tools/objcgen ${TargetPath}  
  --target=framework --platform=iOS  
  --outdir=${SolutionDir}/iosoutput/ -c --nativeexception
```

XCode

- ✓ Disable BITCODE
- ✓ Add Framework
- ✓ Add Framework path to *Library Search Paths*

Collections

Android

Neither `Monkey[]` nor `List<Monkey>` will work. Workaround: iterator

iOS

`Monkey[]` is converted to `NSArray<MonkeysSDK_Monkey *> *`

Exceptions

Android

Any unhandled exception on .NET code **will crash the app**

iOS

You **can catch the exceptions** if you use `--nativeexception` option on the after build command

Async

Tasks are not recognized by Embeddinator so any async method will be ignored. Instead you could give a synchronous alternative.

 to avoid locking the UI thread on Android consider using `AsyncTask`

 you need to inherit your objects from `Java.Lang.Obj`, otherwise your app will crash!

 to avoid locking the UI thread on iOS consider using `dispatch_async`

```
class Something extends AsyncTask<Void, Void, String>{

    @Override
    protected void onPreExecute() {
        ...
    }

    @Override
    protected Void doInBackground(Void... voids) {
        return new MonkeysSDK().getRandomMonkey();
    }

    @Override
    protected void onPostExecute(String randomMonkey) {
        ...
    }
}
```

```
dispatch_queue_t queue = dispatch_get_global_queue(DISPATCH_QUEUE_PRIORITY_DEFAULT, 0);
dispatch_async(queue, ^{

    MonkeysSDK* sdk = [[MonkeysSDK alloc] init];
    NSString* monkey = [sdk getRandomMonkey]

    dispatch_async(dispatch_get_main_queue(), ^{
        ...
    });
});
```


Callbacks

Android

You can have callbacks. but it is tricky

Calling to Java from C# is somewhat a risky business

iOS

NOT possible

iOS - Awful useful hack

CFBundleSupportedPlatforms

```
sed -i '.bak' 's/&lt;string&gt;iPhoneSimulator&lt;\\string&gt;//g'  
${SolutionDir}/iosoutput/FastAuthSDK.iOS.Library.framework/Info.plist
```

Be aware (part 1) ⚠️

- Slow build times 🐢
- 1st step: Unit test everything on .NET
- Big binaries, mostly on iOS 🦸
- Any complex type might be a problem to migrate 😞
- Not every dependency is easily migrated 😓
- Although the forum is very active, you won't always find a solution 🤔
- No bitcode support
- ctor: `public MonkeyIterator(Monkey[] monkeys)` fails on iOS 😞

Be aware (part 2) ⚠



We are problem solvers!

The end! 

Acknowledgements

- Alex Llanes
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Contact info

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References

- <https://docs.microsoft.com/en-us/xamarin/tools/dotnet-embedding/>
- <https://github.com/mono/Embeddinator-4000>
- <https://github.com/jsuarezruiz/Embeddinator-4000-Sample>
- <https://github.com/java-decompiler/jd-gui>
- <https://github.com/johannperez/primavera-xamarin-uy>