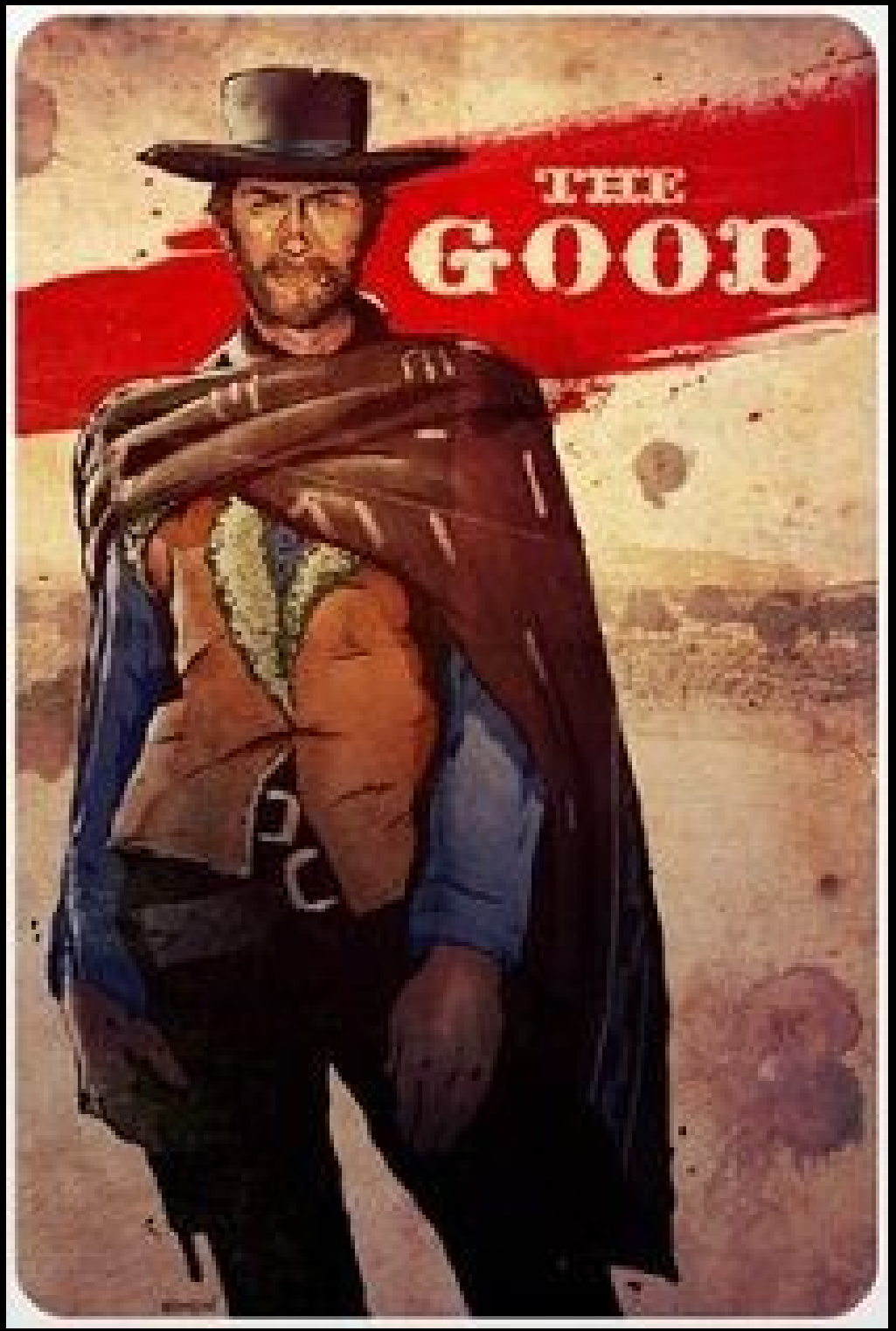
From Objective-C to Xamarin

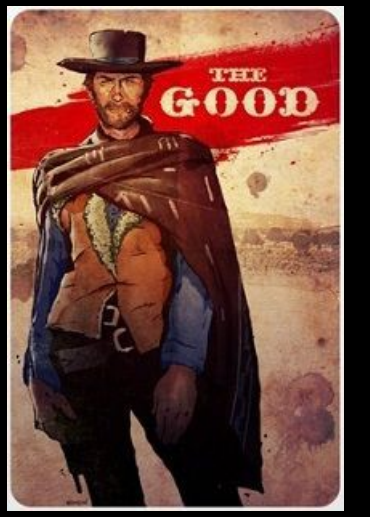
First impressions and common pitfalls

Alexander Dodatko
2015

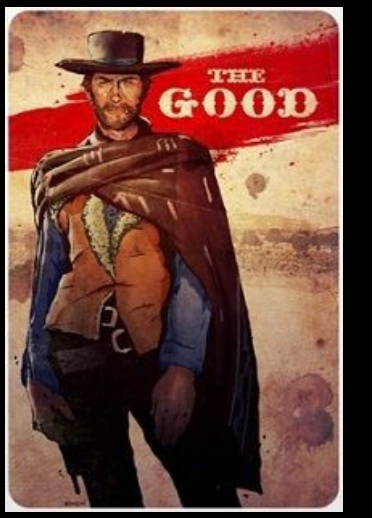
Xamarin == C# for Mobile


THE
GOOD

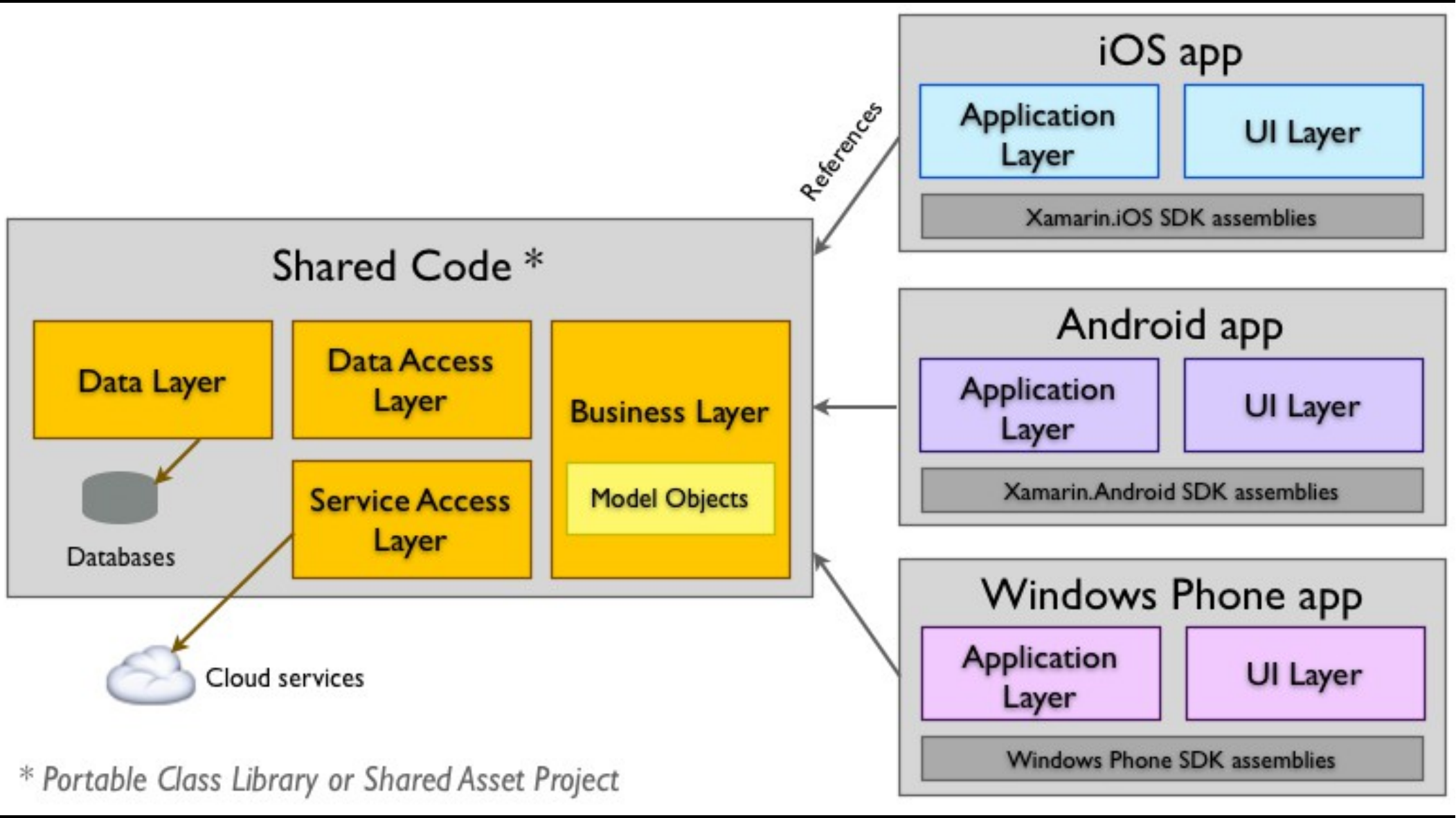
Xamarin's Promise



One Codebase — Many Platforms



Native UI and UX



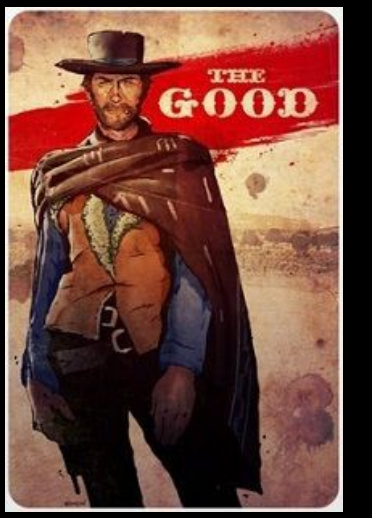
http://bit.ly/1xV1ATx

PCL - Portable Class Libraries

A standard by M$ and Xamarin

Your Code Runs Everywhere

If a platform has .NET

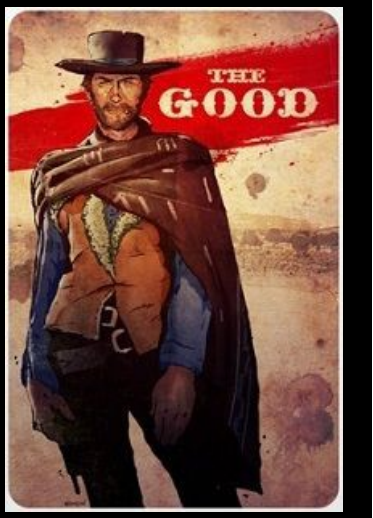


CI requires NO Simulator


Windows 8
Compatible


Compatible with
Windows 7


NuGet



Binary Packets

As Good as Swift

- Closures
- Optionals
- Namespaces
- Generics
- Type Safety
- Functional

You can use exceptions

And you should do so

Callback Hell

http://bit.ly/
11suEXP

```objc
- (void)suspendURLIfDownloading:(NSURL *)url automaticallyResumeLater:(BOOL)autoResume
{
    [_session getTasksWithCompletionHandler:^(NSArray *dataTasks, NSArray *uploadTasks, NSArray *downloadTasks) {
        [downloadTasks enumerateObjectsUsingBlock:^(id obj, NSUInteger idx, BOOL *stop) {
            NSURLSessionDownloadTask *task = (NSURLSessionDownloadTask *)obj;
            if ([task.originalRequest.URL.absoluteString isEqualToString:url.absoluteString]) {
                *stop = YES;
                [task cancelByProducingResumeData:^(NSData *resumeData) {
                    [_queue addOperationWithBlock:^{
                        [_db executeUpdate:
                            @"UPDATE FCDownloadQueue SET state = ?, resumeData = ? WHERE url = ?",
                            @( autoResume ? FCDownloadStatePausedAutoResume : FCDownloadStatePausedDoNotAutoResume ),
                            resumeData ? resumeData : [NSNull null],
                            url.absoluteString
                        ];
                        [self.delegate downloadQueue:self didPauseDownloadingURL:url userInfo:[self userInfoForURL:url]];
                        [self ensureEnoughDownloadsAreRunning];
                    }];
                }];
            }
        }];
    }];
}
```

http://bit.ly/1ryzV4Z

Async/Await

Async but Looks Linear

```
public class RestApiCallFlow
{
  public static async Task<TResult> LoadRequestFromNetworkFlow
  <TRequest, THttpResult, Tresult>(
     TRequest request,
     IRestApiCallTasks<TRequest,
     THttpResult, TResult> stages)
  {
    string requestUrl =
       await stages.BuildRequestUrlForRequestAsync(request);

    // TODO : check cache

    THttpResult serverResponse =
        await stages.SendRequestForUrlAsync(requestUrl);

    TResult parsedData =
        await stages.ParseResponseDataAsync(serverResponse);

    return parsedData;
  }
}
```

```
public class RestApiCallFlow
{
  public static async Task<TResult> LoadRequestFromNetworkFlow
  <TRequest, THttpResult, Tresult>(
     TRequest request,
     IRestApiCallTasks<TRequest,
     THttpResult, TResult> stages)
  {
    string requestUrl =
    await stages.BuildRequestUrlForRequestAsync(request);

    try
    {
       TResult parsedDataFromCache =
       await stages.LoadDataFromCacheForRequestAsync(request);

       return parsedDataFromCache;
    }
    catch
    {
        // Load from network code
    }
  }
}
```

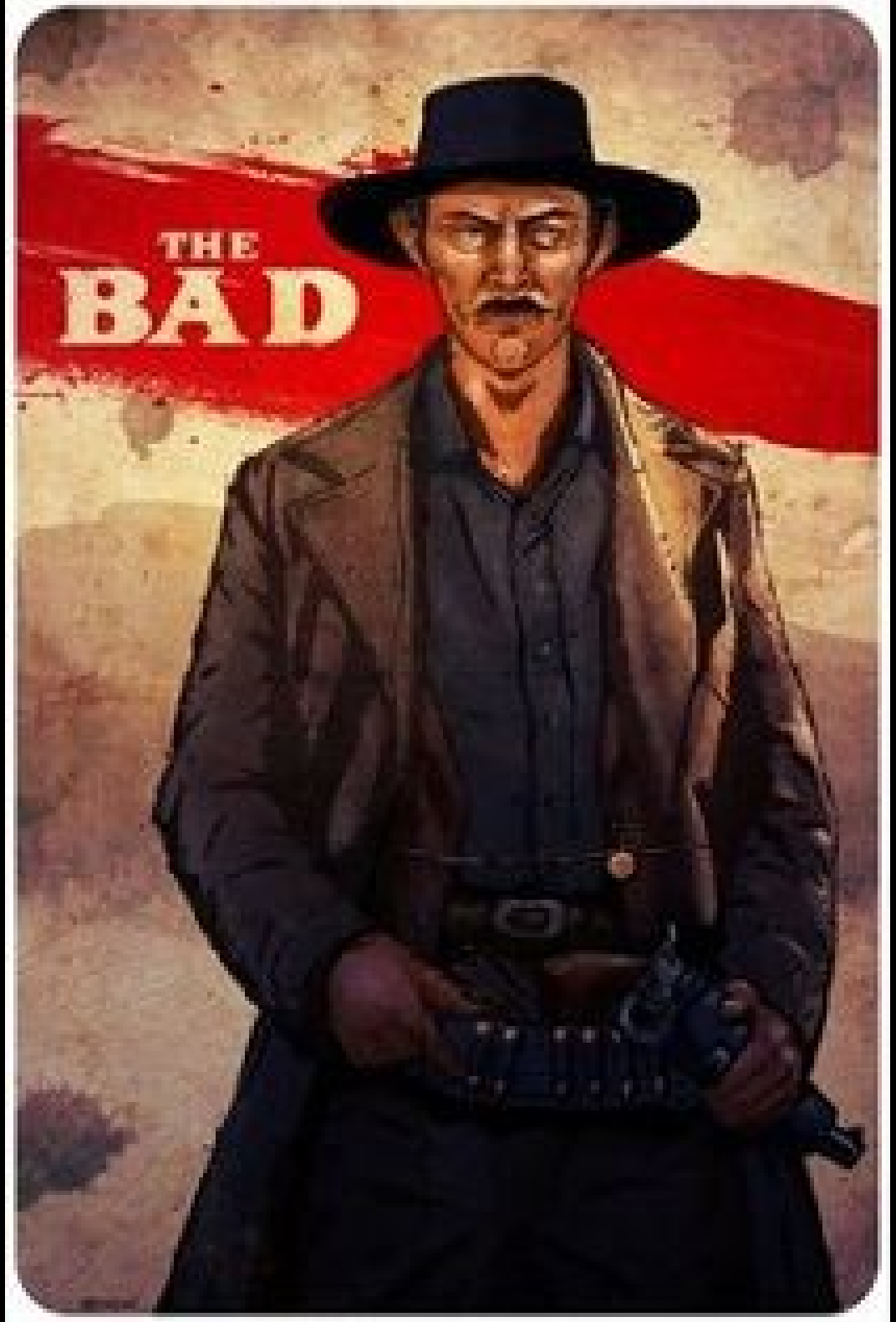
```
public interface IRestApiCallTasks<TRequest, THttpResult, TResult>
{
    Task<string> BuildRequestUrlForRequestAsync(TRequest request);

    Task<THttpResult> SendRequestForUrlAsync(string requestUrl);

    Task<TResult> ParseResponseDataAsync(THttpResult httpData);

    Task<TResult> LoadDataFromCacheForRequestAsync(TRequest request);
}
```


SOLVED


THE
BAD

Is this lib portable?

Same API may Work Differently


GC

Xamarin is Slow and has Lots of Memory Leaks

From some holy war

Image Loading :
A Typical Implementation


```
using (var webclient = new WebClient())
{
  var imageBytes = webclient.DownloadData(url);

  return UIImage.LoadFromData(NSData.FromArray(imageBytes));
}
```

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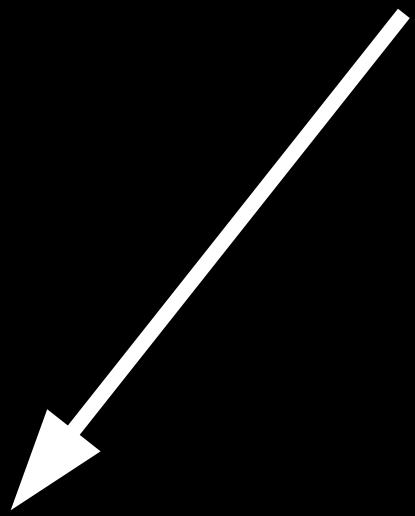
1rMJL3B

Words cannot express how much I don't care.

Synchronous



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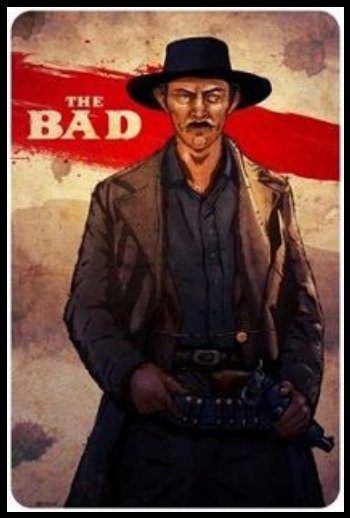


```
using (var webclient = new WebClient())
{
  var imageBytes = webclient.DownloadData(url);

  return UIImage.LoadFromData(NSData.FromArray(imageBytes));
}
```

Leaks

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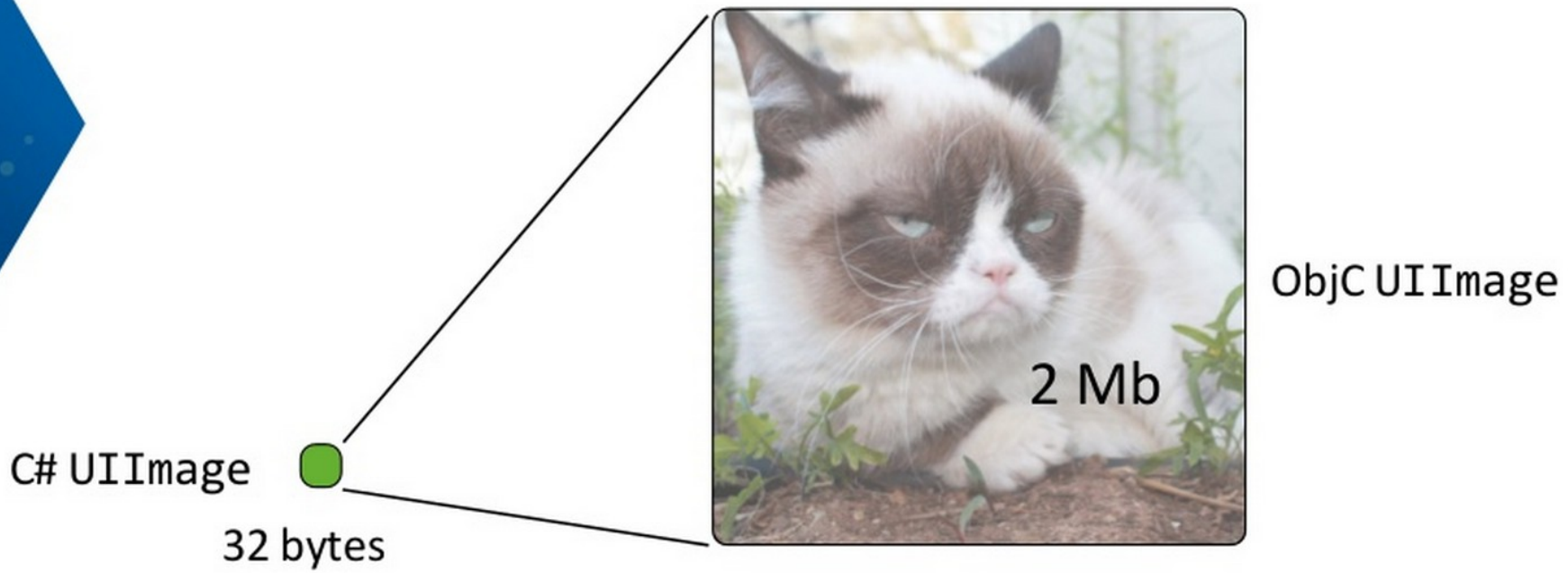
1rMJL3B

The Illusion

The garbage collector cannot see what's behind an innocent object



http://bit.ly/1cay6bO

Dispose Your Resources

```
01 public override void ViewDidLoad ()
02 {
03   var imageView = new UIImageView (IMG_VIEW_POSITION);
04   var image = UIImage.FromBundle ("grumpy-cat.jpg");
05   imageView.Image = image;
06   View.Add (imageView);
07
08   var button = UIButton.FromType (UIButtonType.RoundedRect);
09   button.Frame = BUTTON_POSITION;
10   View.Add (button);
11
12   button.TouchUpInside += (sender, e) => {
13     imageView.RemoveFromSuperview ();
14     imageView.Dispose ();
15     image.Dispose ();
16   };
17 }
```

http://bit.ly/1cay6bO

What If I Told You...

All Obj-C/Java bindings are IDisposable

UIImage, NSData, sockets, threads

```
byte[] data = null;
using (Stream response = await
session.DownloadResourceAsync(request))
using (MemoryStream responseInMemory = new MemoryStream())
{
  await response.CopyToAsync(responseInMemory);
  data = responseInMemory.ToArray();
}

BeginInvokeOnMainThread(delegate
{
  using ( NSData imageData = NSData.FromArray(data) )
  {
    using ( UIImage image = new UIImage(imageData) )
    {
      this.ImageView.Image = image;
    }
  }
});
```

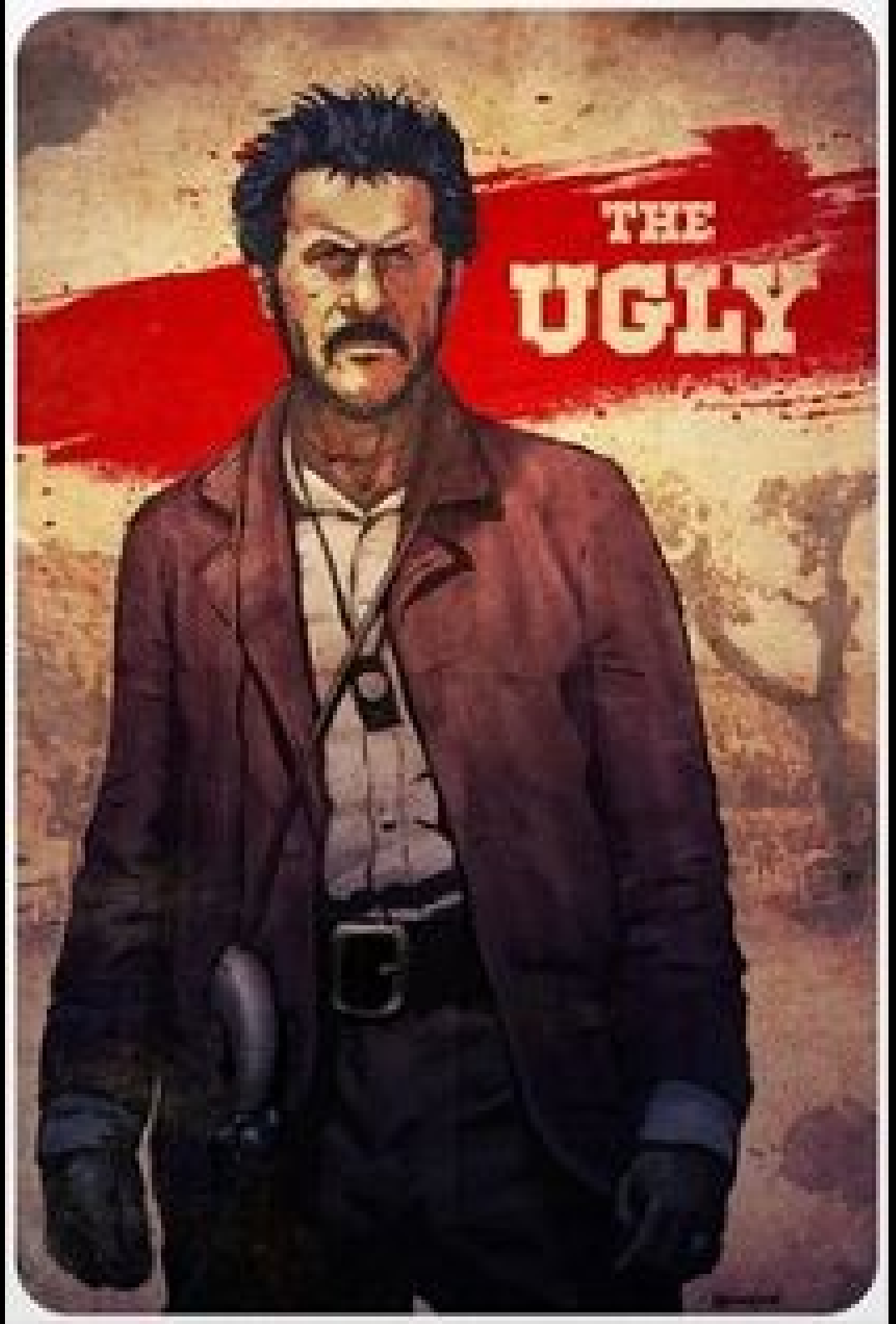
http://bit.ly/1ukw1ii

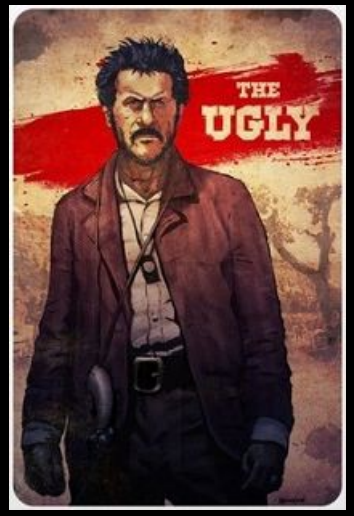
```
byte[] data = null;
using (Stream response = await
session.DownloadResourceAsync(request))
using (MemoryStream responseInMemory = new MemoryStream())
{
  await response.CopyToAsync(responseInMemory);
  data = responseInMemory.ToArray();
}

BeginInvokeOnMainThread(delegate
{
  using ( NSData imageData = NSData.FromArray(data) )
  {
    using ( UIImage image = new UIImage(imageData) )
    {
      this.ImageView.Image = image;
    }
  }
});
```

http://bit.ly/1ukw1ii

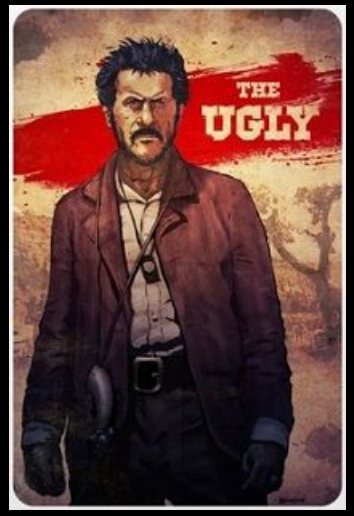
```
byte[] data = null;
using (Stream response = await
session.DownloadResourceAsync(request))
using (MemoryStream responseInMemory = new MemoryStream())
{
  await response.CopyToAsync(responseInMemory);
  data = responseInMemory.ToArray();
}

BeginInvokeOnMainThread(delegate
{
  using ( NSData imageData = NSData.FromArray(data) )
  {
    using ( UIImage image = new UIImage(imageData) )
    {
      this.ImageView.Image = image;
    }
  }
});
```

http://bit.ly/1ukw1ii

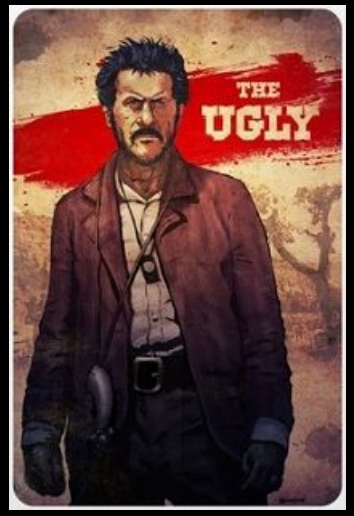

THE
UGLY



Xamarin.Forms



Aiming for a Single Codebase



Break their own Principles

Unlike other cross-platform mobile frameworks that only offer lowest common denominator experiences through UI abstraction libraries, we make 100% of the iOS and Android APIs available through our native bindings.

Per Seat Per Platform

	STARTER **FREE**	INDIE **$25** / month paid **monthly** or **annually**	MOST POPULAR BUSINESS **$83** / month paid **annually** ($999 / year)	ENTERPRISE **$158** / month paid **annually** ($1899 / year)
Permitted Use	Individual	Individual	Organization	Organization
Subscription Type	N/A	Monthly	Annual	Annual
Deploy to Device	✓	✓	✓	✓
Deploy to App Stores	✓	✓	✓	✓
Xamarin Studio	✓	✓	✓	✓
Unlimited App Size		✓	✓	✓
Xamarin.Forms		✓	✓	✓
Visual Studio Support			✓	✓
Business Features			✓	✓
Prime Components				✓
Email Support			✓	✓
One Business Day SLA				✓
Hotfixes				✓

Try it!

Test on All Platforms

Dispose Native Objects Aggressively

Build Dedicated GUI for Each Platform

Try it!