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**CHICAGO**

# Extending & Optimizing Xamarin.Forms Apps

**Matthew Soucoup**  
Sr. Cloud Developer Advocate,  
Microsoft

## Slides & Code!

Slides: [slideshare.net/MatthewSoucoup](https://slideshare.net/MatthewSoucoup)

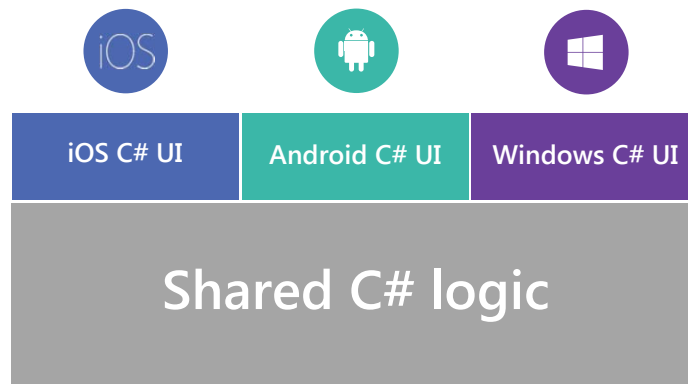
Code: [github.com/codemillmatt/MyWeather.Forms](https://github.com/codemillmatt/MyWeather.Forms)

Code: [github.com/codemillmatt/app-imagesearch-cogs](https://github.com/codemillmatt/app-imagesearch-cogs)

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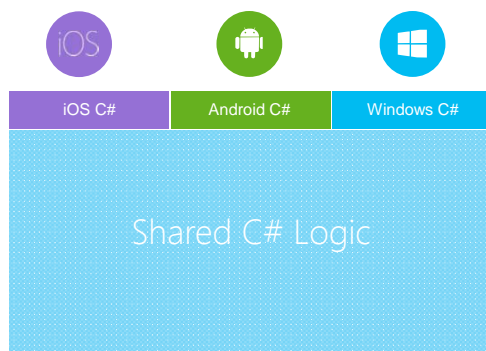


## Xamarin's unique approach

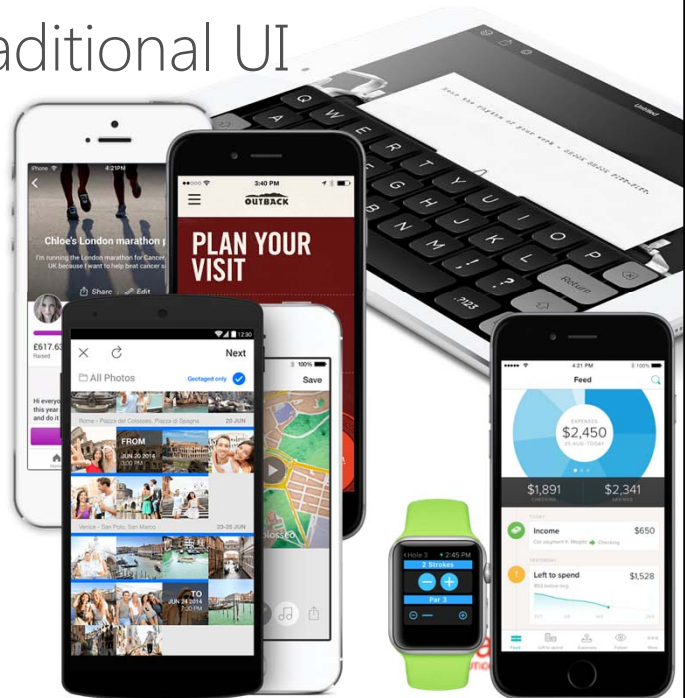


Shared C# codebase • 100% native API access • High performance

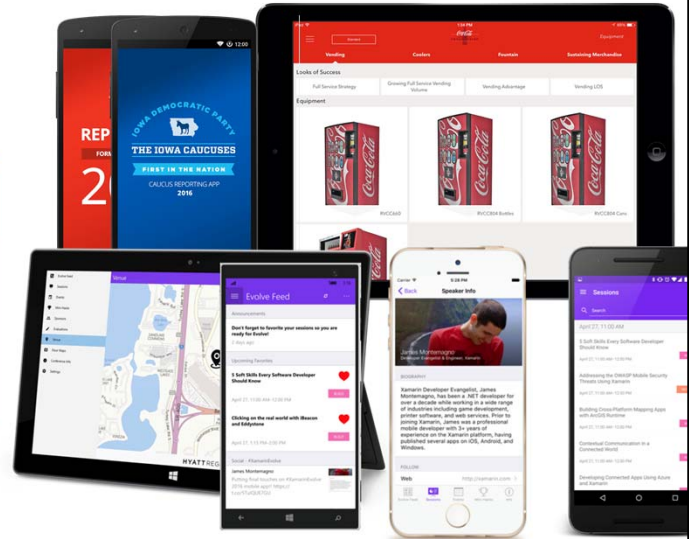
## Xamarin Native – Traditional UI



- 3 Native User Interfaces
- Shared App Logic



# Xamarin.Forms- Cross Platform UI



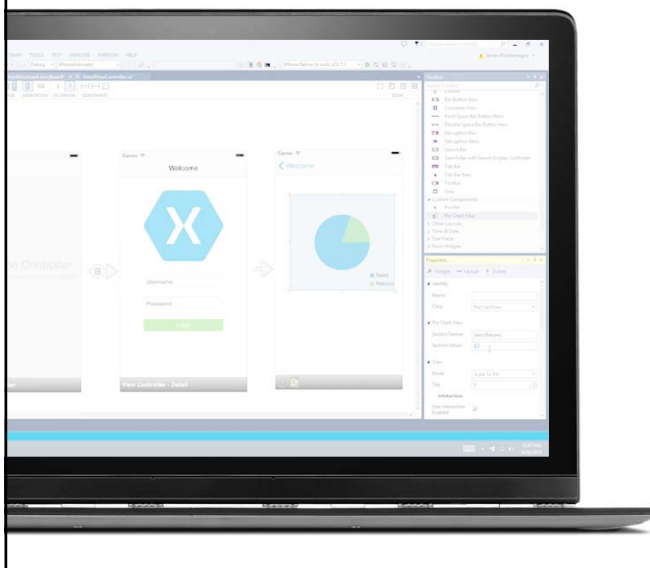
# Xamarin Platform is included in Visual Studio

Including Community Edition

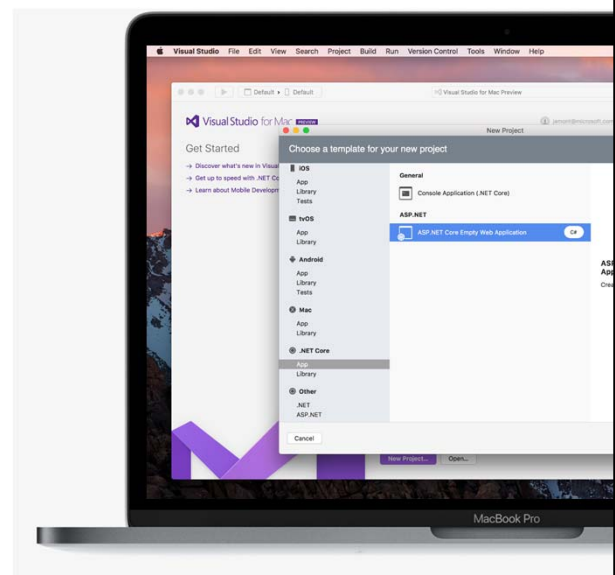
### Open Source – [open.xamarin.com](https://open.xamarin.com)



### Visual Studio

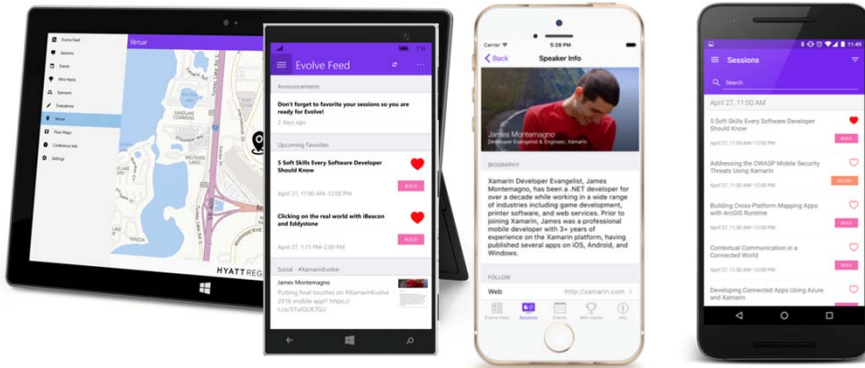


### Visual Studio for Mac

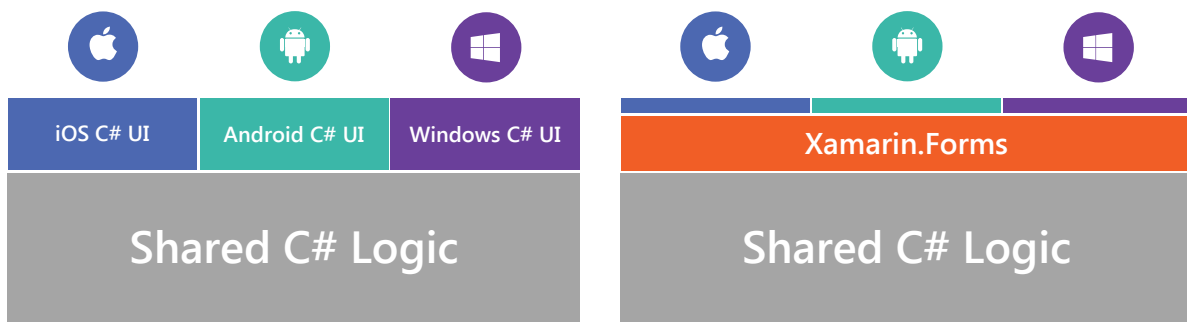


## Meet Xamarin.Forms

Build native UIs for iOS, Android, and Windows from a single, shared C# codebase.



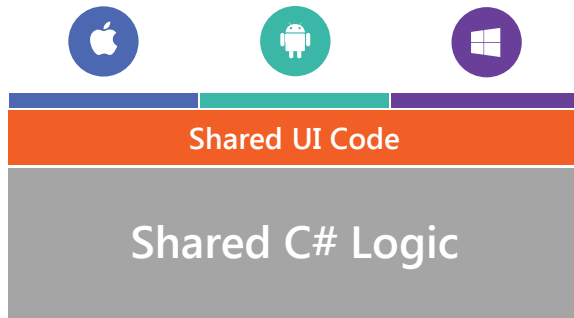
## Xamarin + Xamarin.Forms



Traditional Xamarin approach

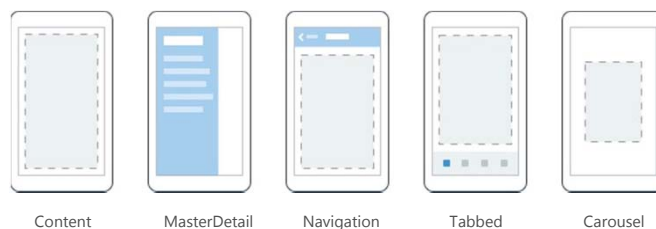
With Xamarin.Forms:  
More code-sharing, all native

## What's included

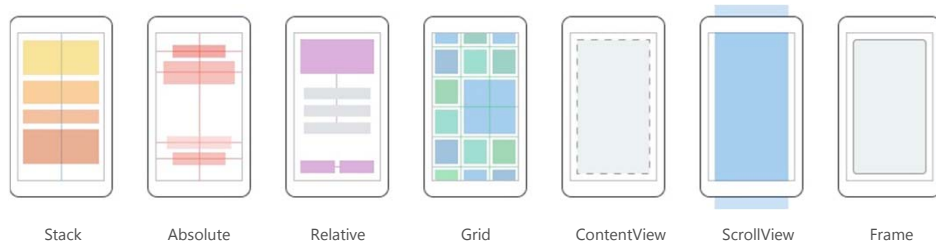


- ✓ 40+ Pages, layouts, and controls (Build from code behind or XAML)
- ✓ Two-way data binding
- ✓ Navigation
- ✓ Animation API
- ✓ Dependency Service
- ✓ Messaging Center

## Pages



## Layouts



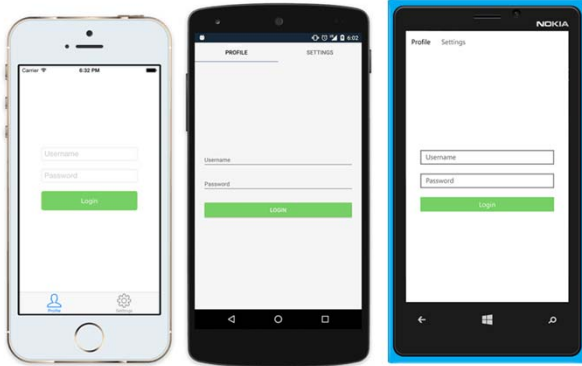
### Controls

ActivityIndicator	BoxView	Button	DatePicker	Editor
Entry	Image	Label	ListView	Map
OpenGLView	Picker	ProgressBar	SearchBar	Slider
Stepper	TableView	TimePicker	WebView	EntryCell
ImageCell	SwitchCell	TextCell	ViewCell	

### Xamarin & Xamarin.Forms ecosystem



# Native UI from shared code



```
<?xml version="1.0" encoding="UTF-8"?>
<TabbedPage
  xmlns="http://xamarin.com/schemas/2014/forms"

  xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
  x:Class="MyApp.MainPage">
  <TabbedPage.Children>
  <ContentPage Title="Profile" Icon="Profile.png">
    <StackLayout Spacing="20" Padding="20"
      VerticalOptions="Center">
      <Entry Placeholder="Username"
        Text="{Binding Username}"/>
      <Entry Placeholder="Password"
        Text="{Binding Password}"
        IsPassword="true"/>
      <Button Text="Login" TextColor="White"
        BackgroundColor="#77D065"
        Command="{Binding LoginCommand}"/>
    </StackLayout>
  </ContentPage>
  <ContentPage Title="Settings" Icon="Settings.png">
    <!-- Settings -->
  </ContentPage>
  </TabbedPage.Children>
</TabbedPage>
```

# Xamarin.Forms in Action

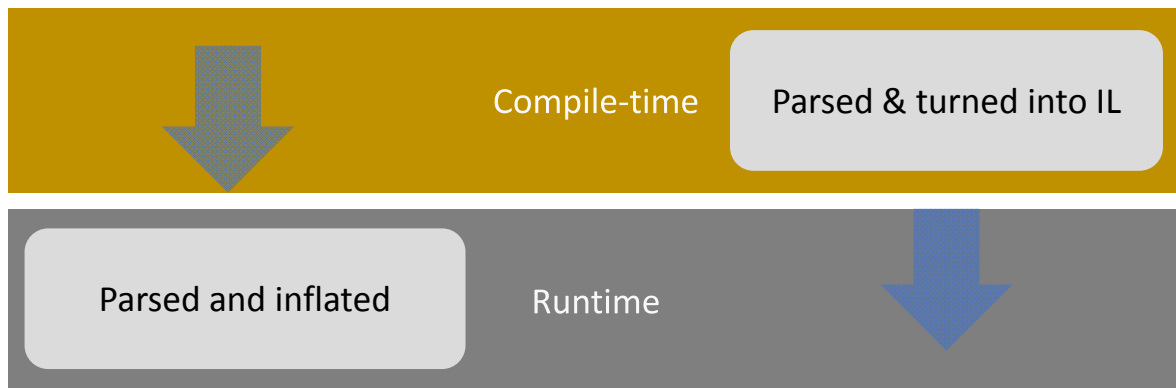


Built-In Awesome

## XAML Compilation

XAML

XAMLC



## XAML Compilation Usage

At assembly level:

```
[assembly: XamlCompilation(XamlCompilationOptions.Compile)]
```

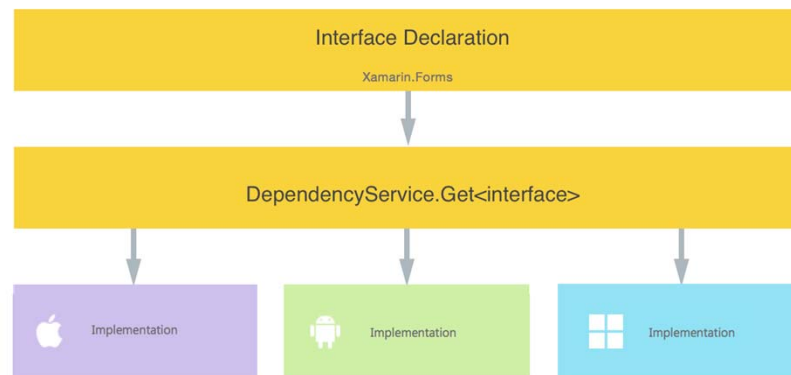
At class level:

```
[XamlCompilation(XamlCompilationOptions.Compile)]
```

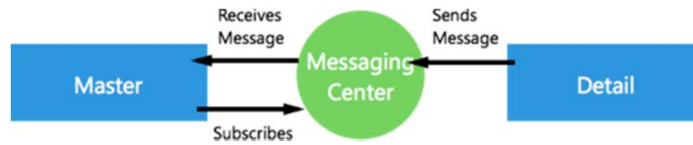
```
[XamlCompilation(XamlCompilationOptions.Skip)]
```

## Dependency Service

Access Native Features Easily



## Messaging Center



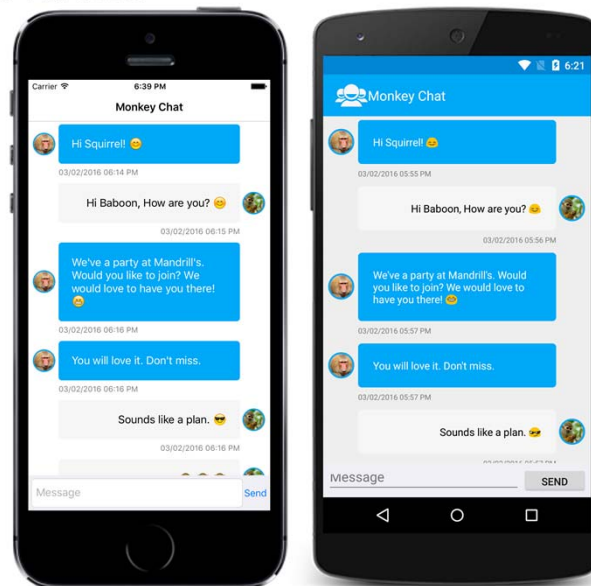
### ▪ Master Page:

```
//Subscribe to insert expenses
MessagingCenter.Subscribe<TripExpense>(this, "AddNew", (expense) =>
{
    Expenses.Add(expense);
});
```

### ▪ Detail Page:

```
MessagingCenter.Send(expense, "AddNew");
```

## Data Templates



```
<ContentPage.Padding>
  <OnPlatform x:TypeArguments="Thickness">
    <OnPlatform.iOS>
      0, 20, 0, 0
    </OnPlatform.iOS>
    <OnPlatform.Android>
      0, 0, 0, 0
    </OnPlatform.Android>
    <OnPlatform.WinPhone>
      0, 0, 0, 0
    </OnPlatform.WinPhone>
  </OnPlatform>
</ContentPage.Padding>
```

## Platform Customization

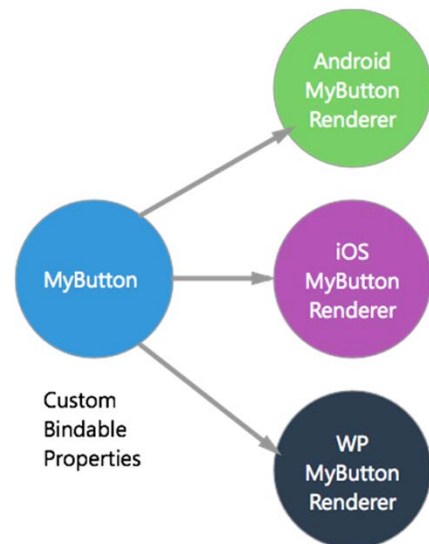


In Action

# Custom Renderers

## Custom Renderers

- Extend Forms functionality
- Platform-specific implementations
- Customize an existing control or write your own

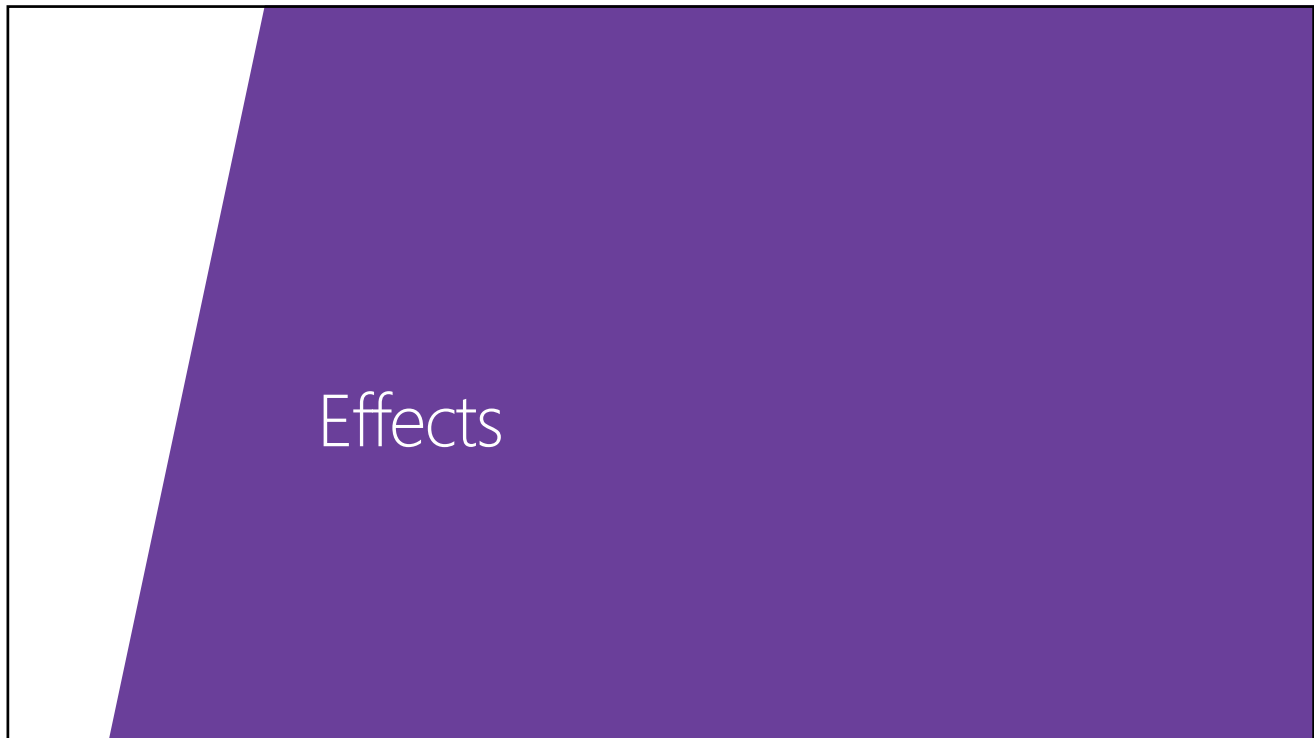


## Custom Renderers - Examples

- Custom page (subclass PageRenderer)
- Circle Image (subclass ImageRenderer)
- Calendar (subclass ViewRenderer)



In Action



## Effects

- ✓ Custom renderer "lite"
- ✓ Change properties on the native control
- ✓ Optional
- ✓ "stringly-typed"
- ✗ *No methods or events*
- ✗ *No replacing the control*

## Effects

```
// located inside iOS specific codebase
public class BorderEffect : PlatformEffect
{
    protected override void OnAttached ()
    {
        Control.Layer.BorderColor = UIColor.Purple.CGColor;
        Control.Layer.BorderWidth = 2;
    }

    protected override void OnDetached ()
    {
        Control.Layer.BorderWidth = 0;
    }
}
```



In Action



## New & Next

### Features and Enhancements

Native Control Binding

Startup Time

Frame Corners

macOS Preview

Deep Linking

Xamarin.Forms Embedding

Partial Collapse MasterPage

Memory Improvements

XAMLC

Forms Previewer

FlexLayout Preview

Tizen

Themes

Styles

Accessibility

Bindable Picker

Fast Renderers Preview

Map Extensibility

Android Support Libraries

Enhanced GestureRecognizers

Blur Behind

Embedded Native Controls

Fast Scroll

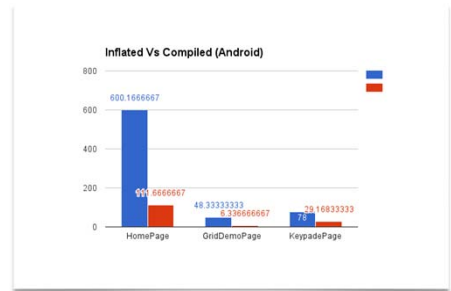
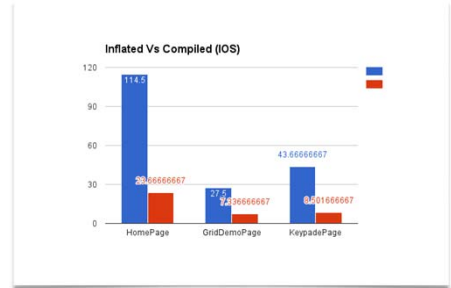
NavigationPage Translucency

DataPages

PlatformSpecifics

### Quality and Performance

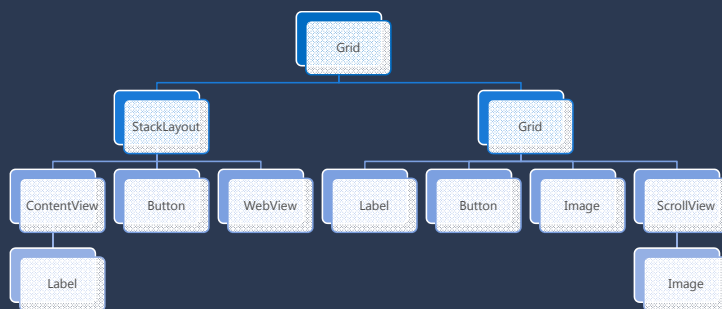
- Aggressive bug triage
  - New issues reviewed within 24 hrs
  - Reproduction projects for quick resolution
- Performance Improvements
  - Startup Time
  - Fast Renderers for Android
  - ListView improvements, Fast Scroll
  - XAMLC – 5x faster
  - Discussion: [aka.ms/xfperformance](http://aka.ms/xfperformance)



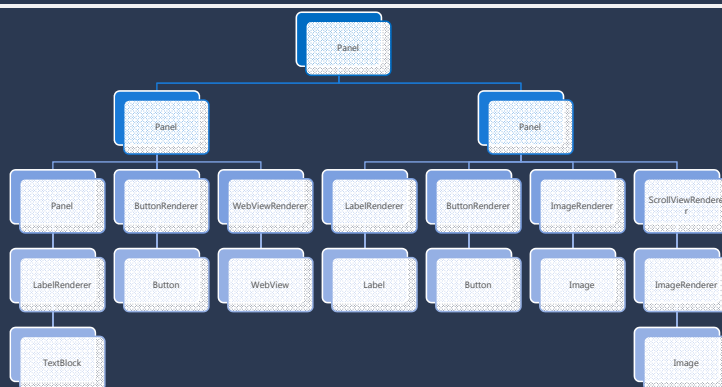
Source: Matthew Robbins - MFractor

## Compression + Fast Renderers

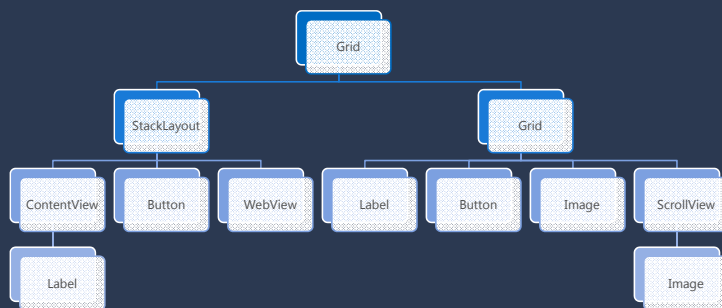
## Forms



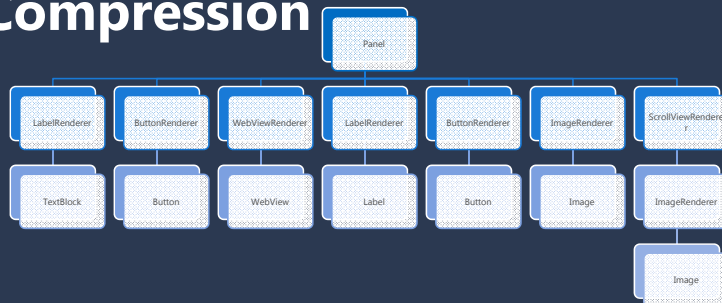
## UWP



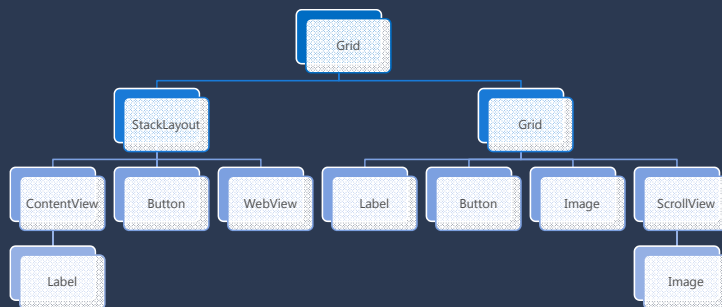
## Forms



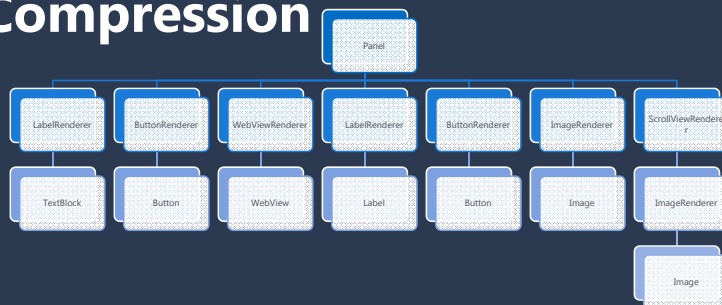
## UWP+Compression



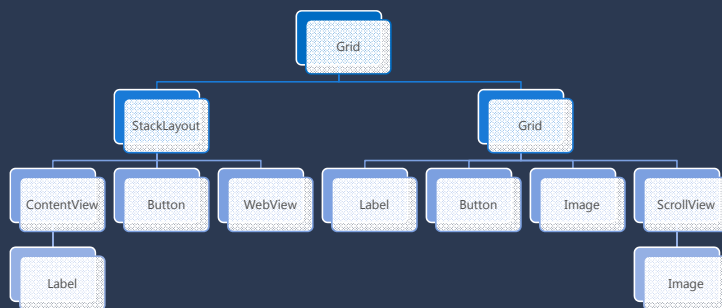
## Forms



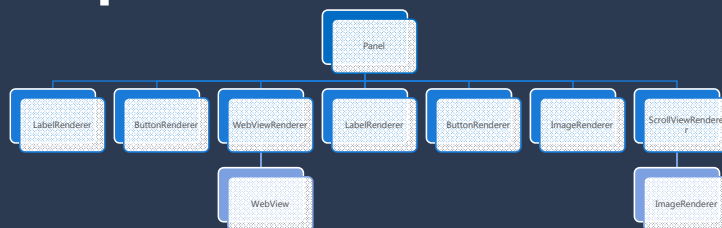
## UWP+Compression



## Forms



## UWP+Compression+Fast Renderers





# Flex Layout

## FlexLayout

- A CSS FlexBox inspired layout system
- Used for
  - Flowing items
  - Adaptive layout

### FlexLayout Example

```
<?xml version="1.0" encoding="UTF-8"?>
<ContentPage xmlns="http://xamarin.com/schemas/2014/forms"
             xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
             x:Class="FormsFlexLayoutDemo.FlexDemoPage">
    <FlexLayout x:Name="flexbox">
        <Label Text="Flex Element 1" />
        <Label Text="Flex Element 2" />
        <Label Text="Flex Element 3" />
        <Label Text="Flex Element 4" />
        <Label Text="Flex Element 5" />
    </FlexLayout>
</ContentPage>
```



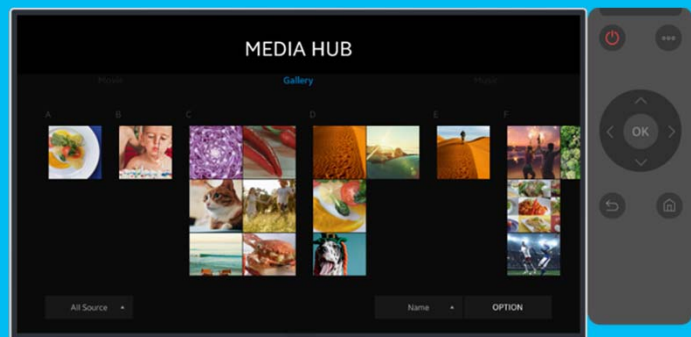
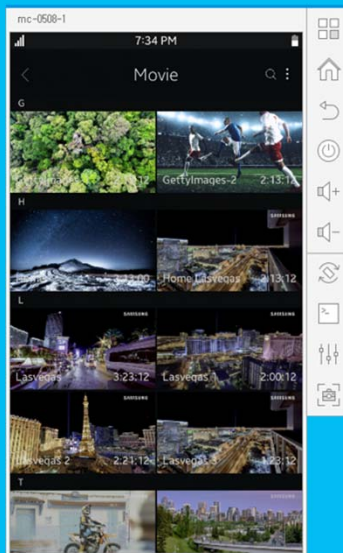
New Platforms

## New Platforms

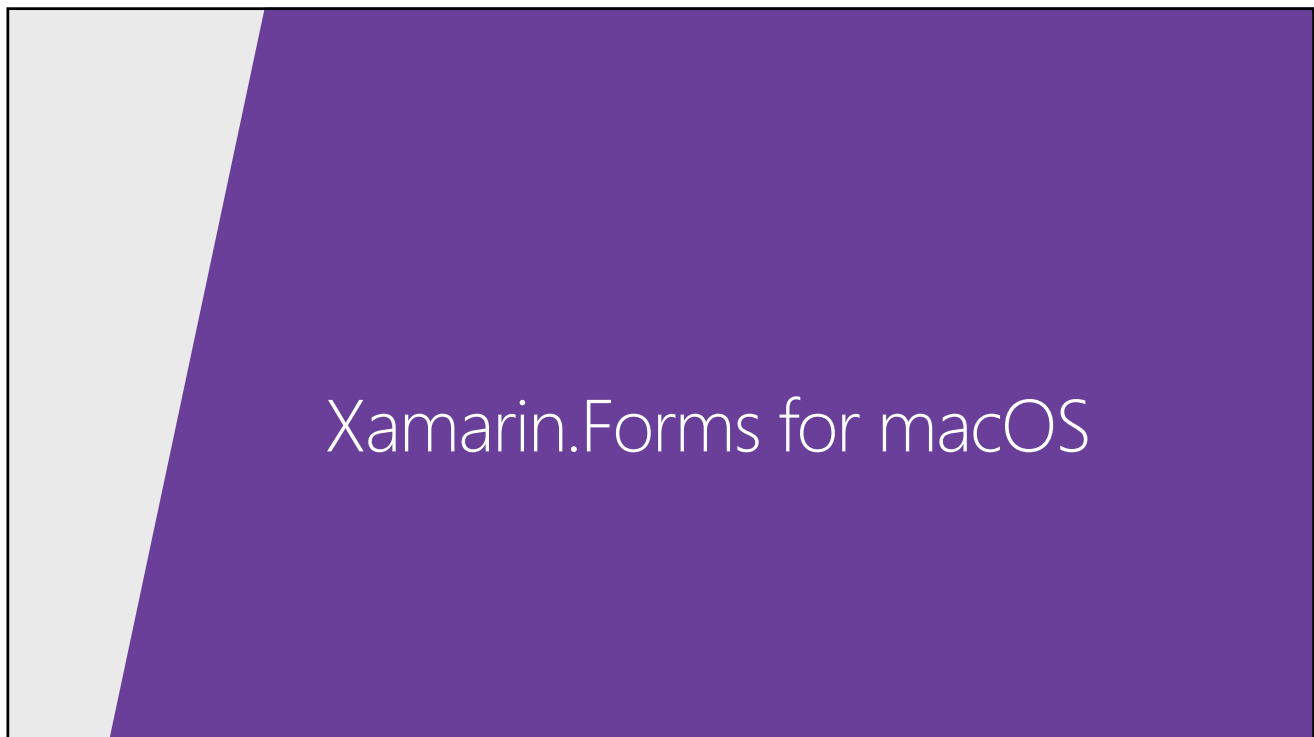
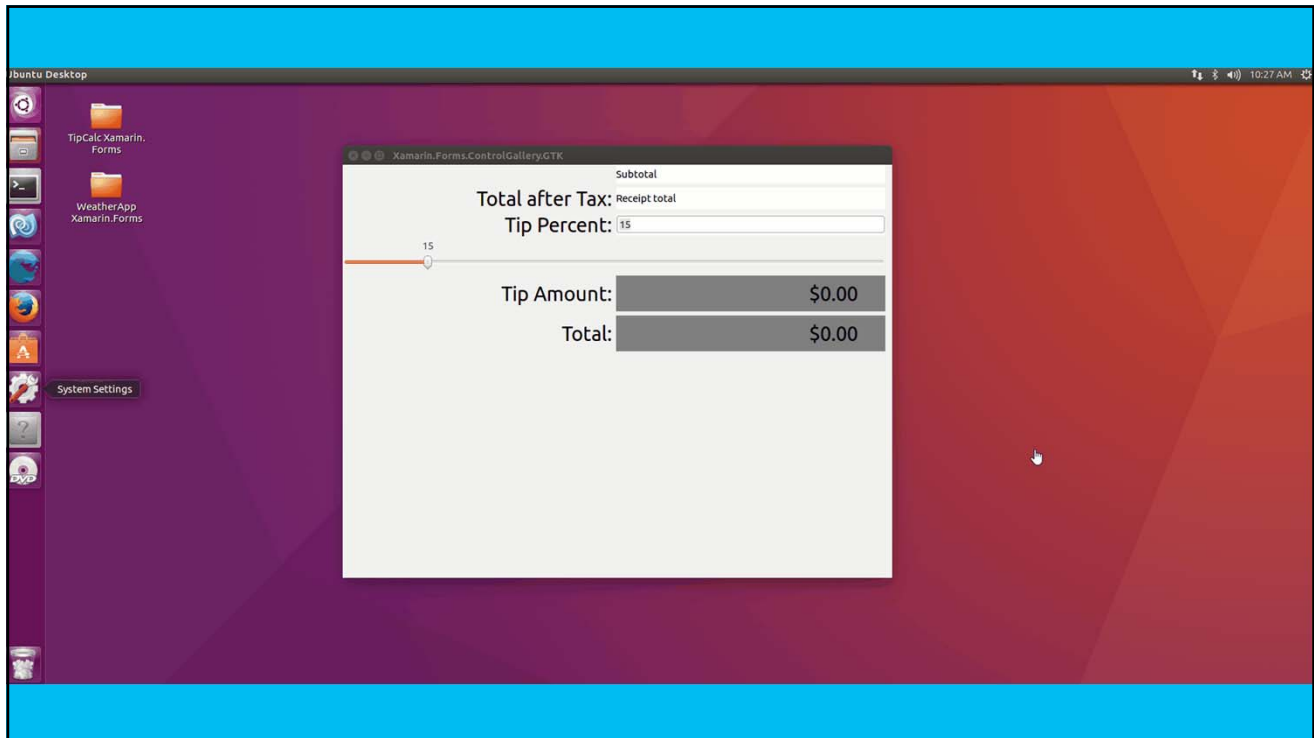
- Samsung Tizen
  - Televisions, Wearables, Mobile
- macOS
- WPF
- Linux: GTK#

macOS

Linux



## Visual Studio Live! Chicago 2017







Now available 2.3.5-pre

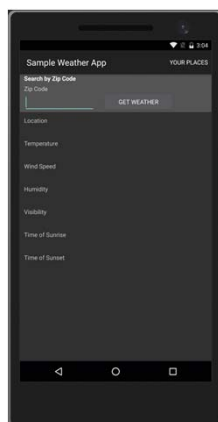
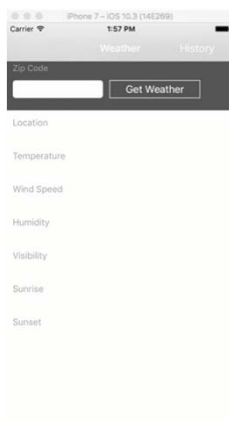
Available Today: Xamarin.Forms 2.3.5-pre3

- .NET Standard Compatible
  - Recommend 1.1+ target
- Fast Renderers for Android
  - Button, Image, Label
- Accessibility
- macOS Preview
- XAMLC type improvements
- 160+ bug fixes and enhancements

## The Future: Xamarin.Forms Embedding

### Xamarin.Forms Embedding

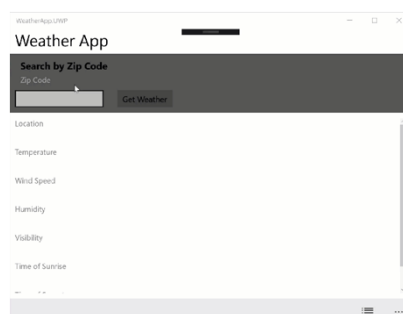
- Easily embed any page into a Xamarin Native Application



```
// Android
Forms.Init(this, null);
var androidFragment = new MyFormsPage().CreateFragment(this);

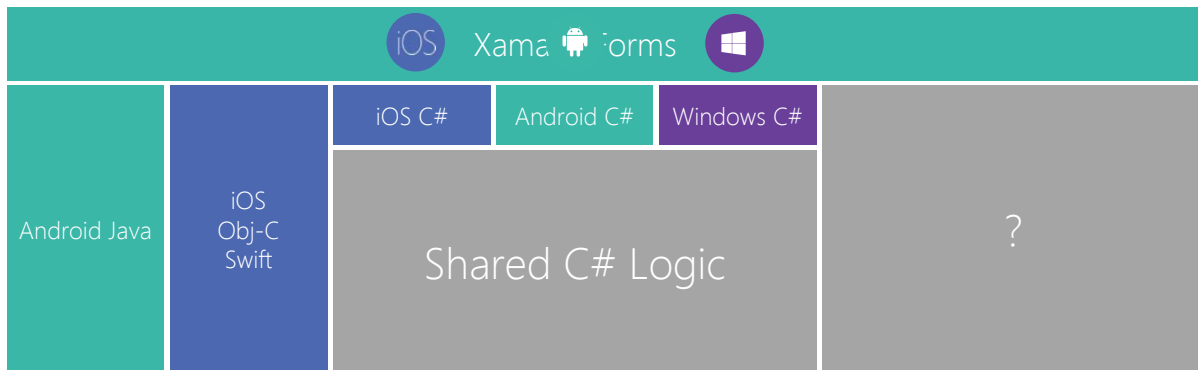
// iOS
Forms.Init()
var iosViewController = new MyFormsPage().CreateViewController();

// UWP
Forms.Init(e);
var uwpElement = new MyFormsPage().CreateFrameworkElement();
```



## Embedding

- Works on ContentPages
- Full support for DependencyService and MessagingCenter



In Action

LR11  
LR12  
JM4



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A presentation slide with a dark grey brick wall background. At the top left is the Visual Studio LIVE! logo with the tagline 'EXPERT SOLUTIONS FOR .NET DEVELOPERS'. At the top right are the 'ROCK YOUR CODE TOUR 2017' and 'CHICAGO' logos. In the center, the text 'Thank You!' is displayed in a large, white, sans-serif font. To the right of the center, the name 'Matthew Soucoup' is written in orange, followed by 'Sr. Cloud Developer Advocate,' and 'Microsoft' in white. At the bottom, three contact details are listed in white: '@codemillmatt', 'codemilltech.com', and 'matt.soucoup@microsoft.com'.

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# Thank You!

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