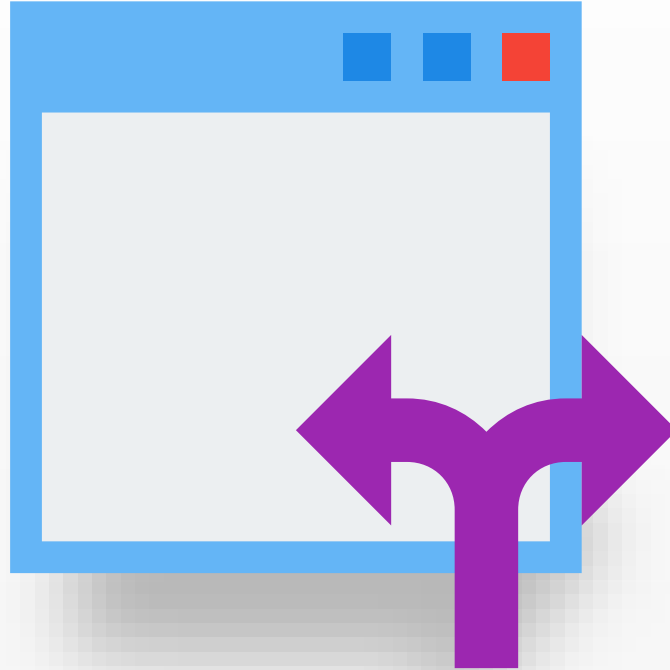




Uno Platform – UWP everywhere

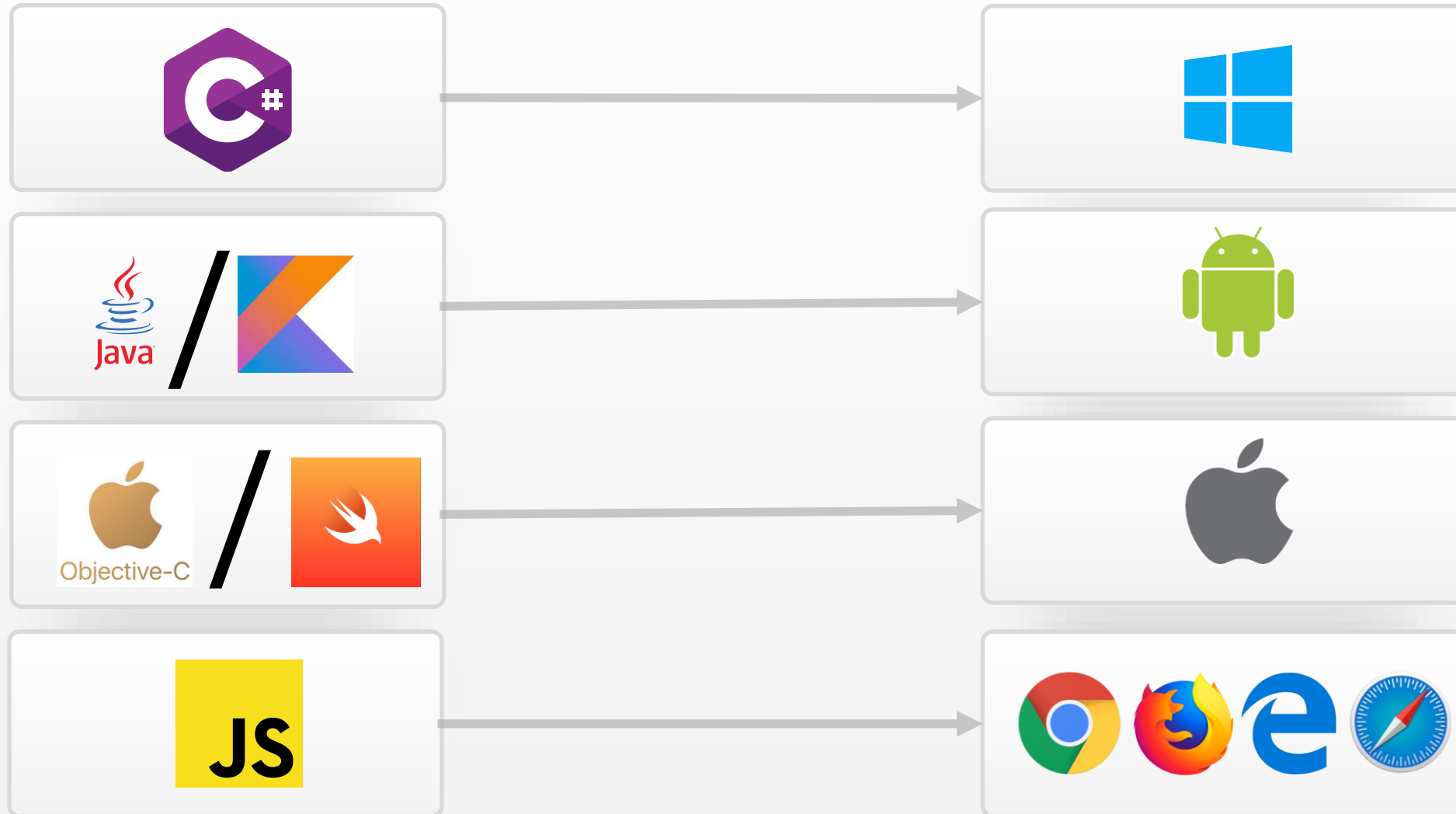
Martin Zikmund

@mzikmunddev

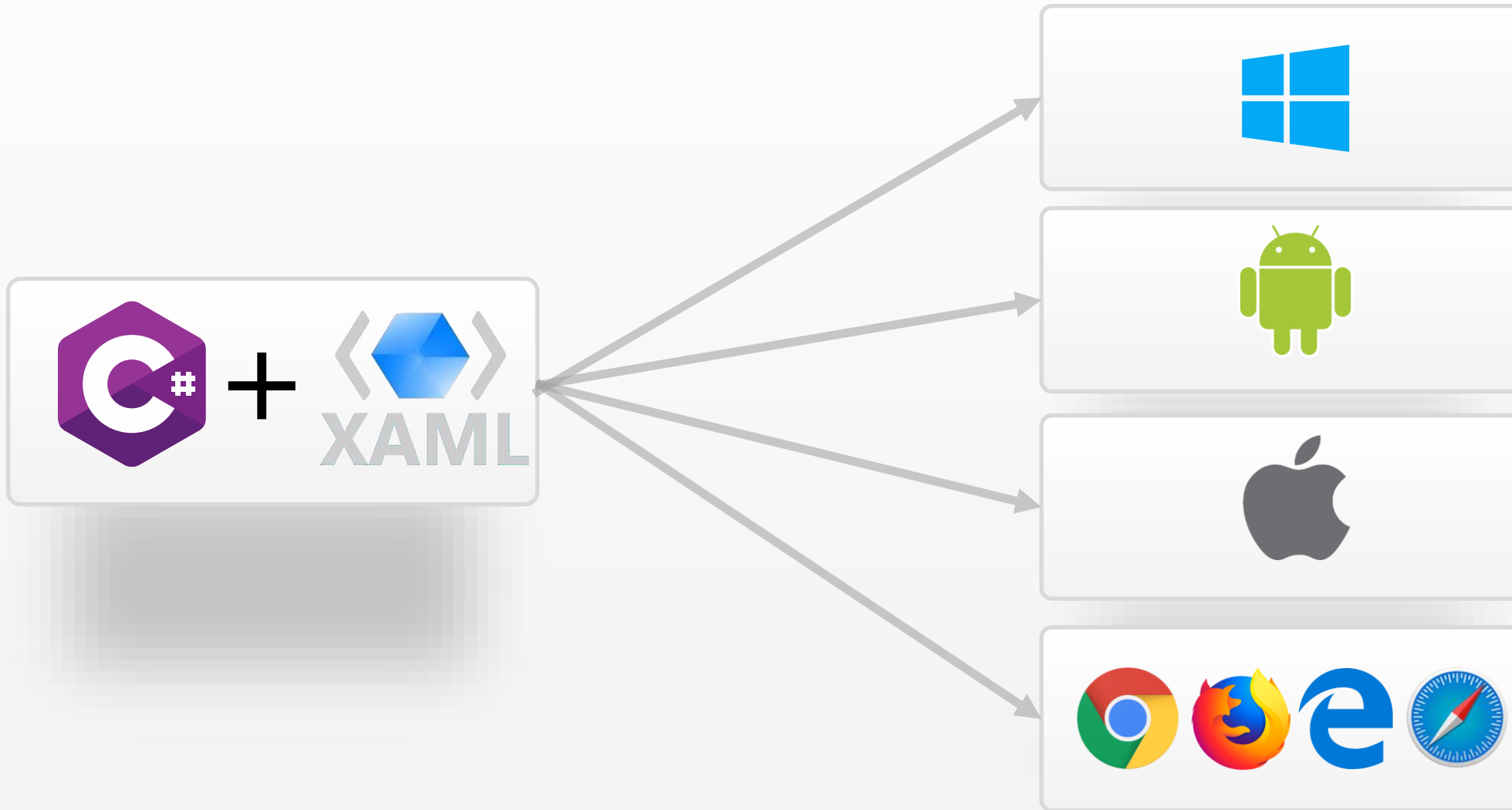


Cross-platform app development

O(N) development time



~~$\Theta(1)$~~ $O(\lg N)$ development time

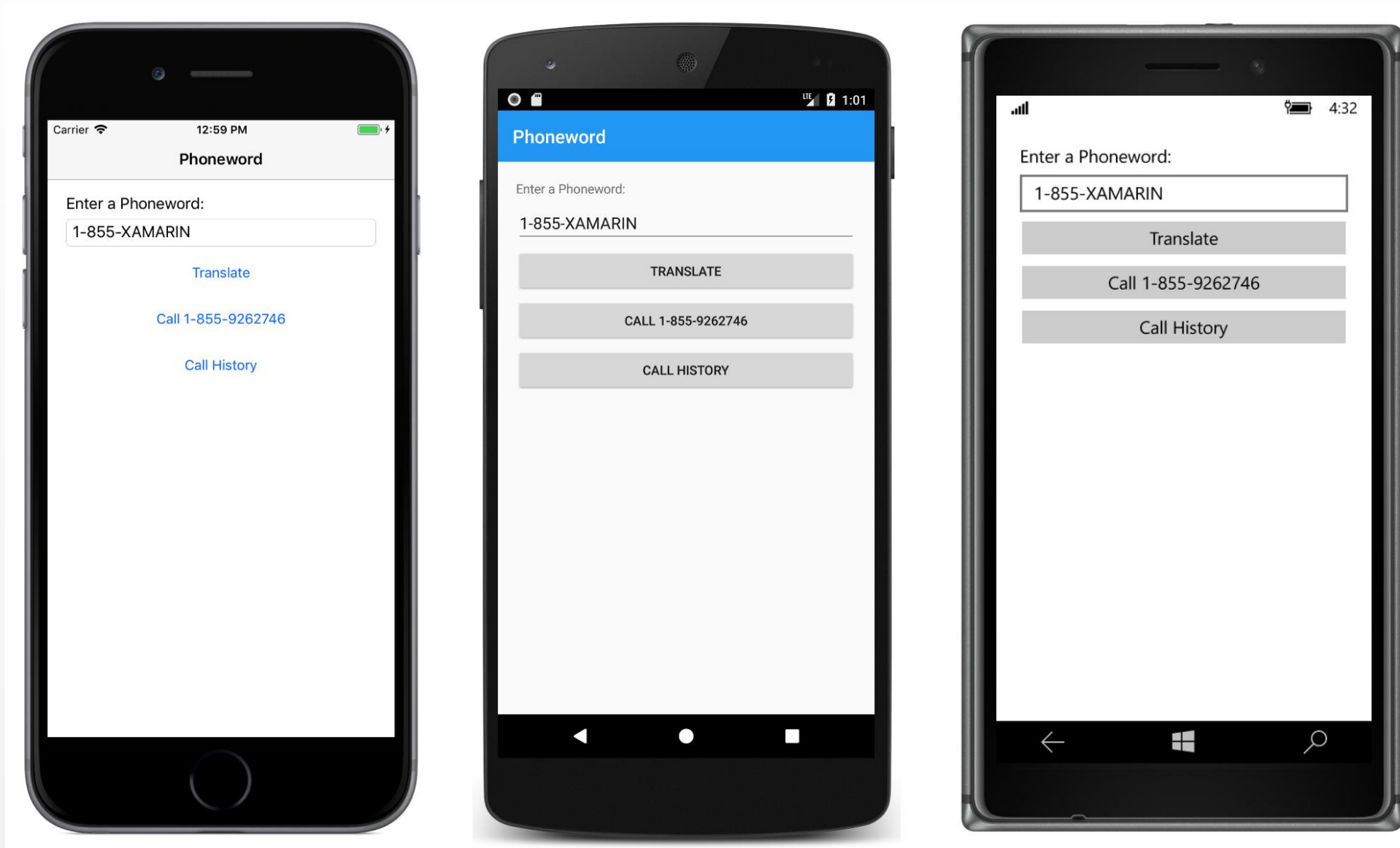


First attempt – Xamarin.Forms

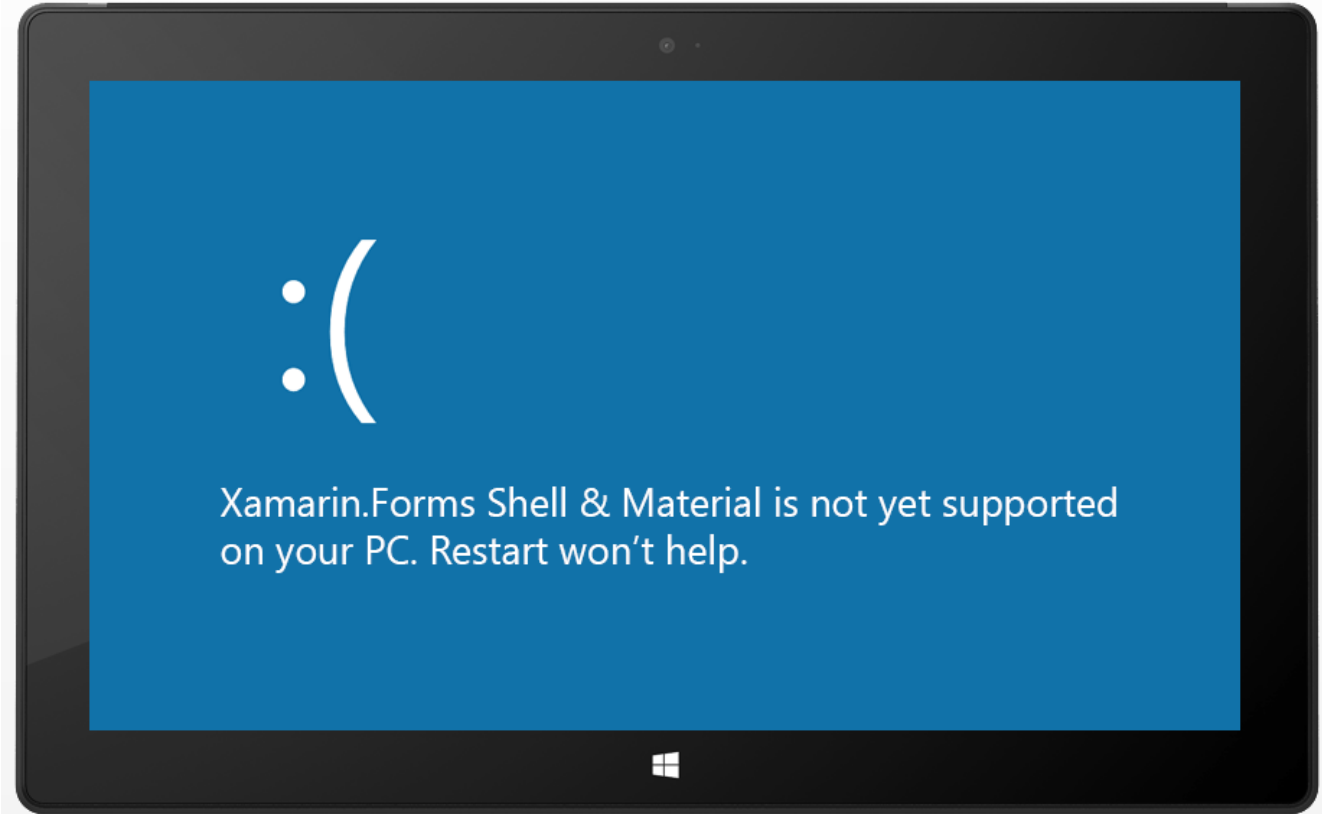
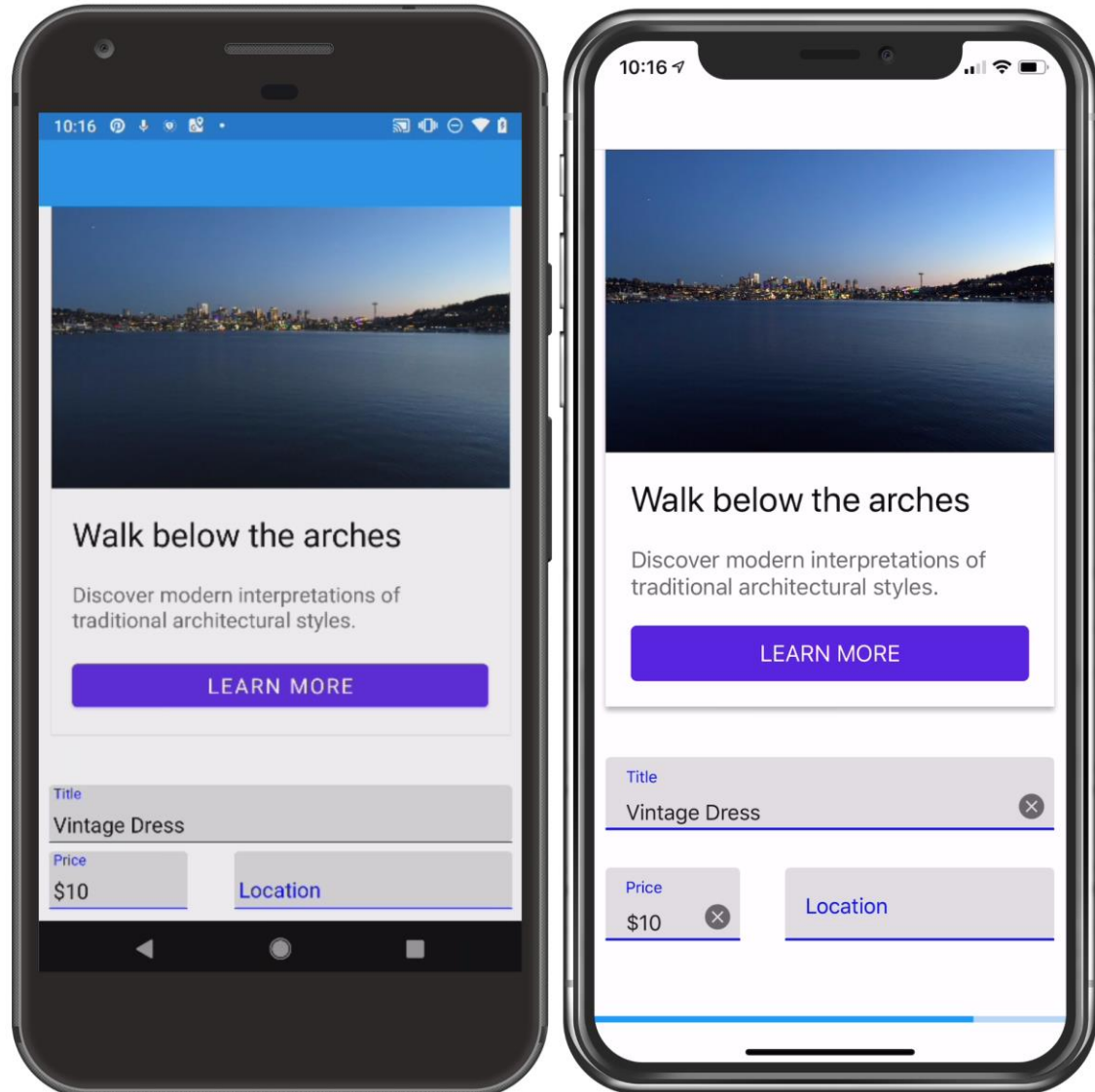
- XAML → platform UI controls
- Simplified XAML and styling, different naming conventions
 - Width / WidthRequest
 - Background / BackgroundColor
- Xamarin.Essentials



Xamarin.Forms UI comparison



Xamarin.Forms Shell/Material design



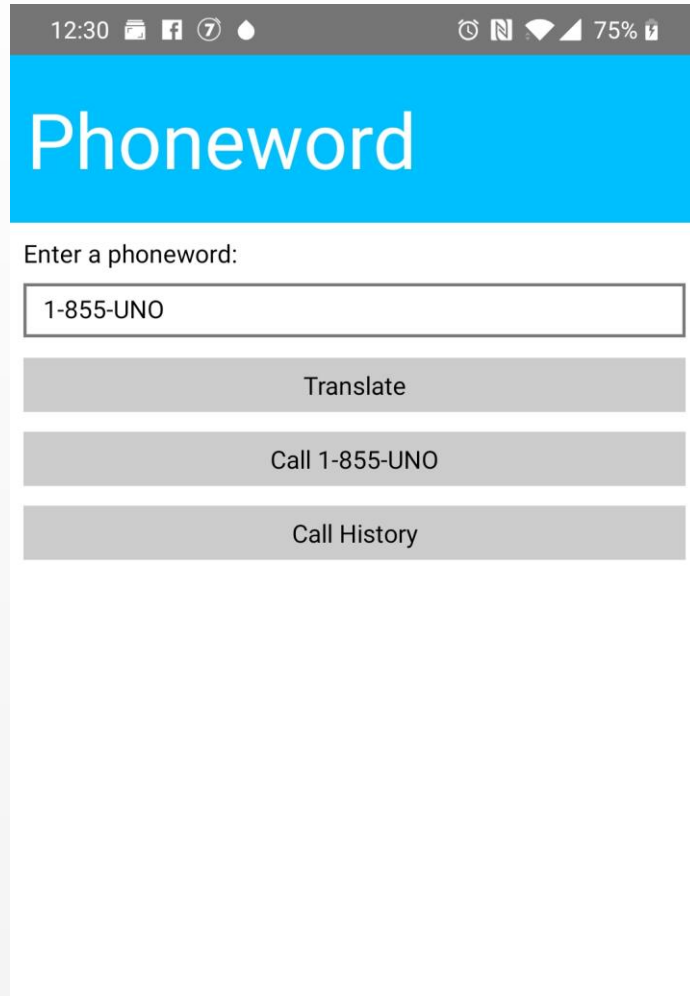
Uno Platform

- Port of Universal Windows Platform (UWP) **API and XAML** to iOS/Android/WASM/macOS
- Written in **C#** (with bits of Java and JavaScript)
- 1:1 compatibility with UWP XAML, existing skills – consistent UI
- Developed by **nventive**
- **Free** and **open source**

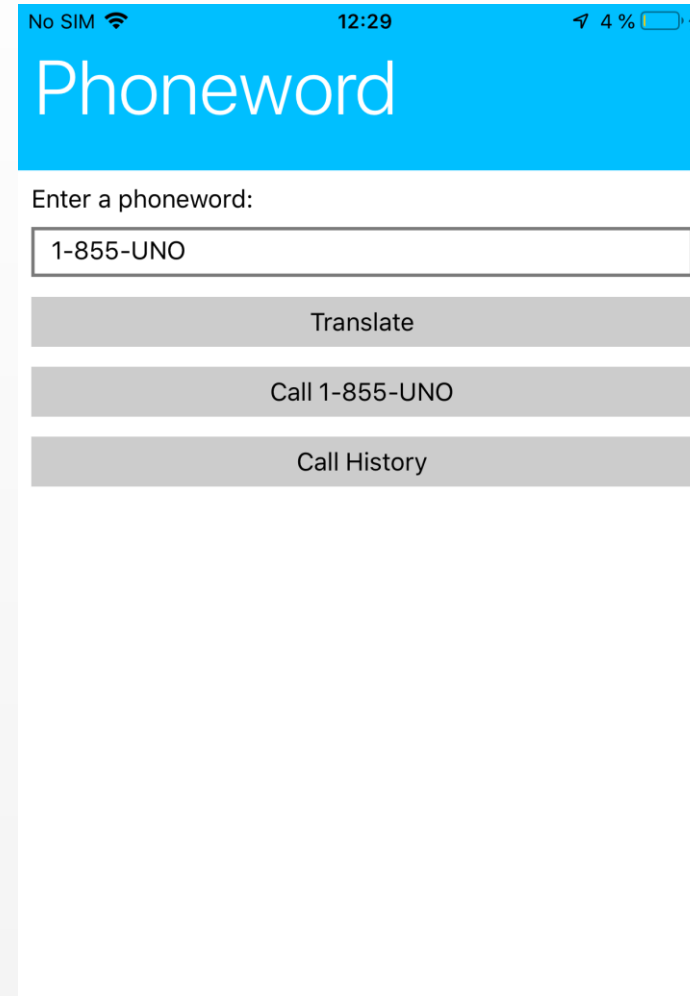


<https://platform.uno/>

Uno Platform UI comparison

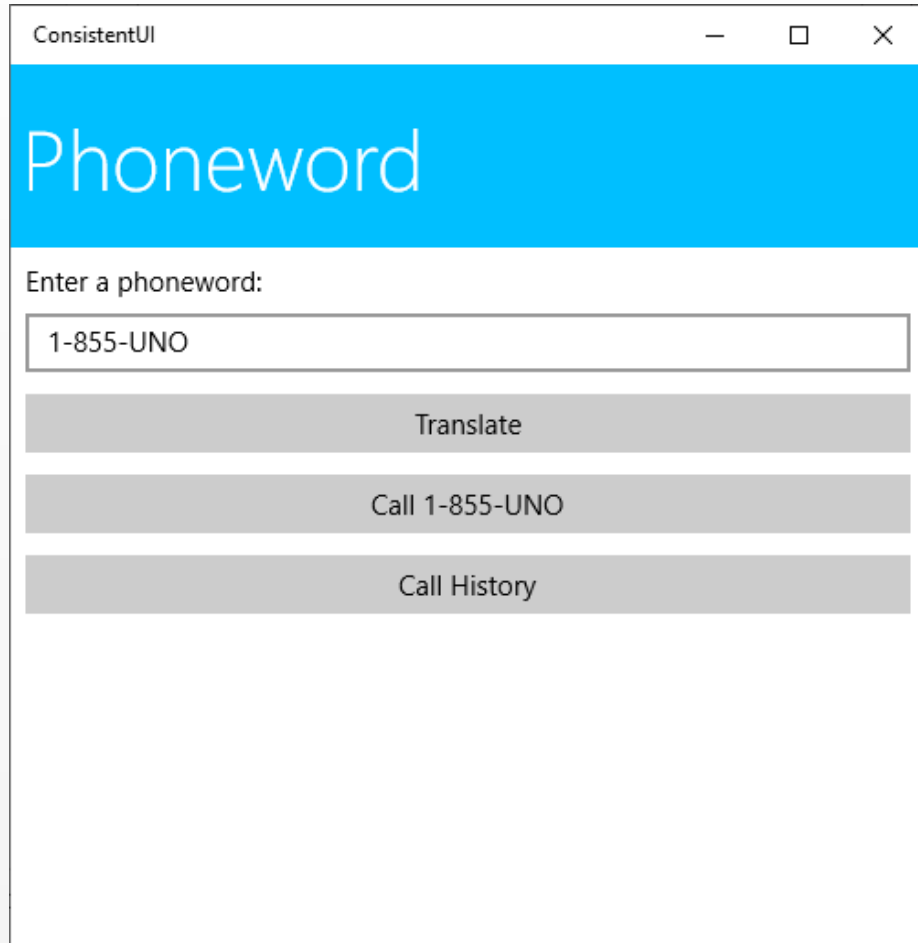


Android

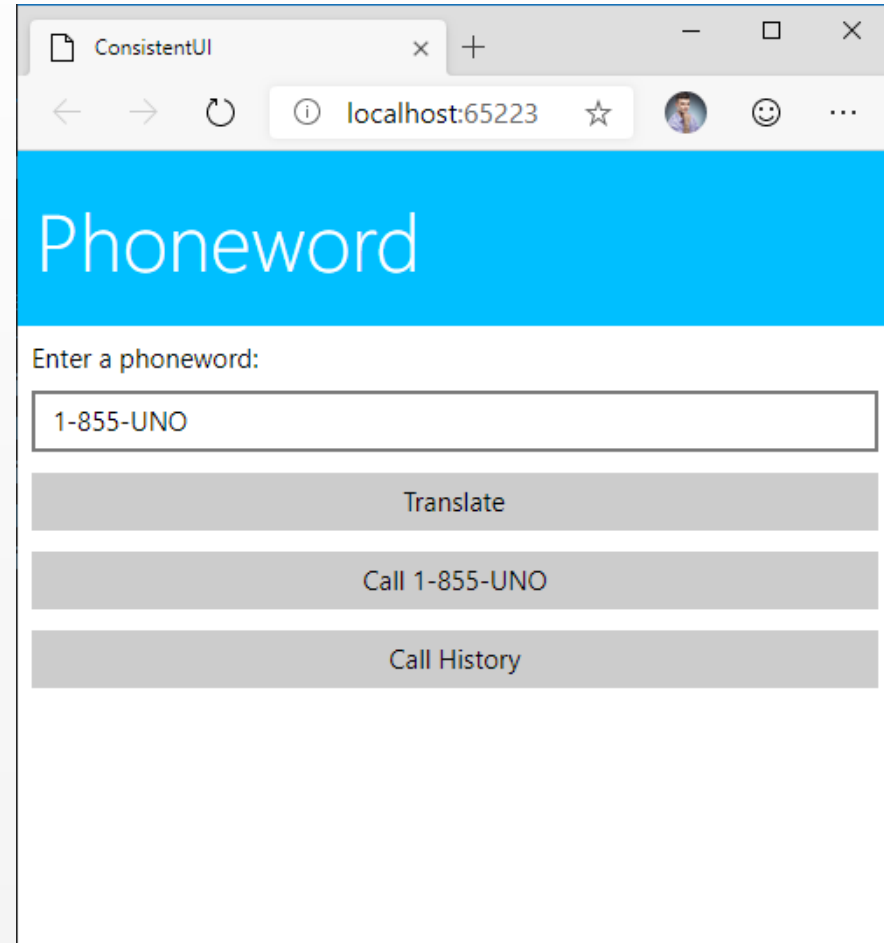


iOS

Uno Platform UI comparison

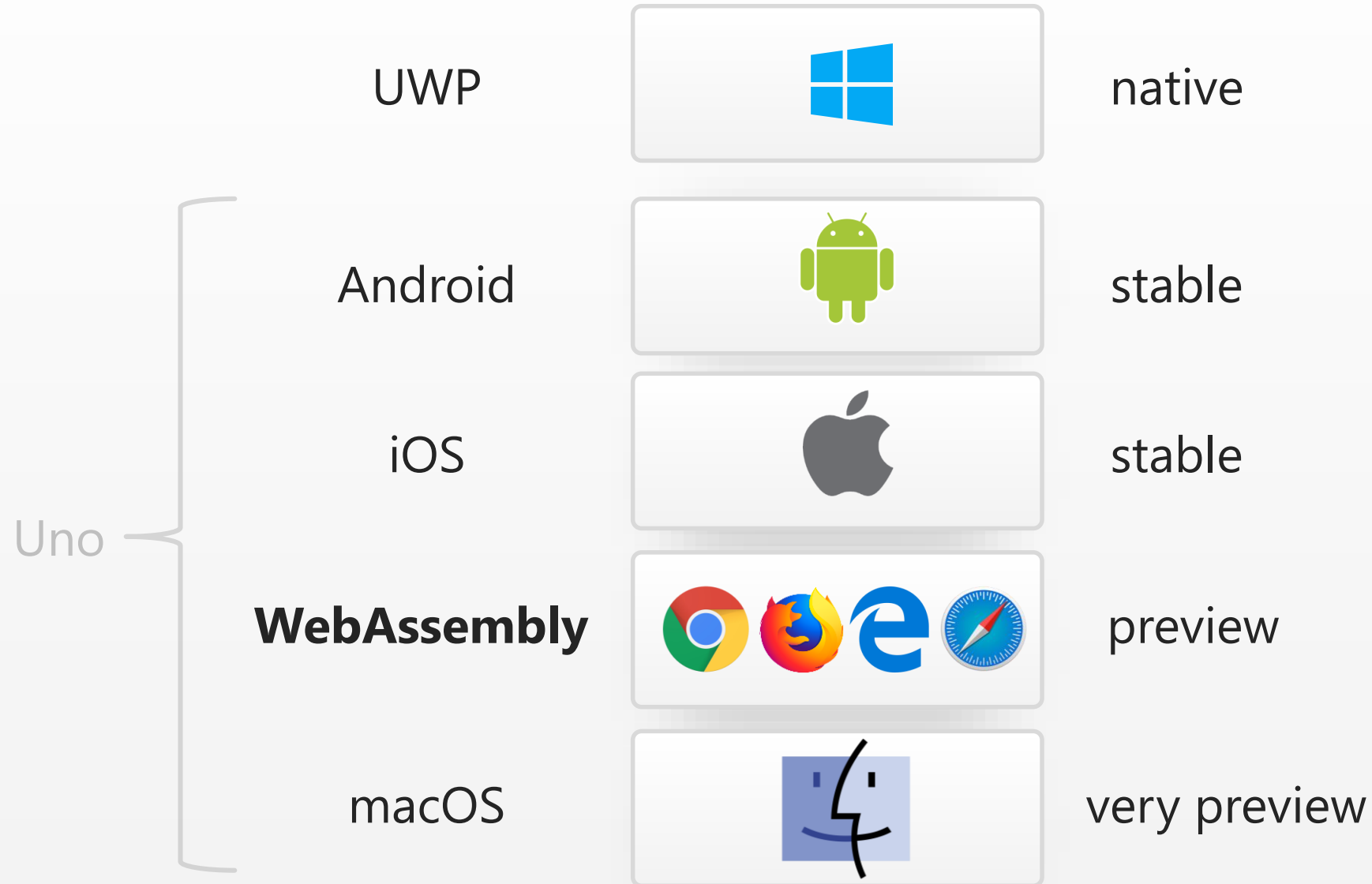


UWP



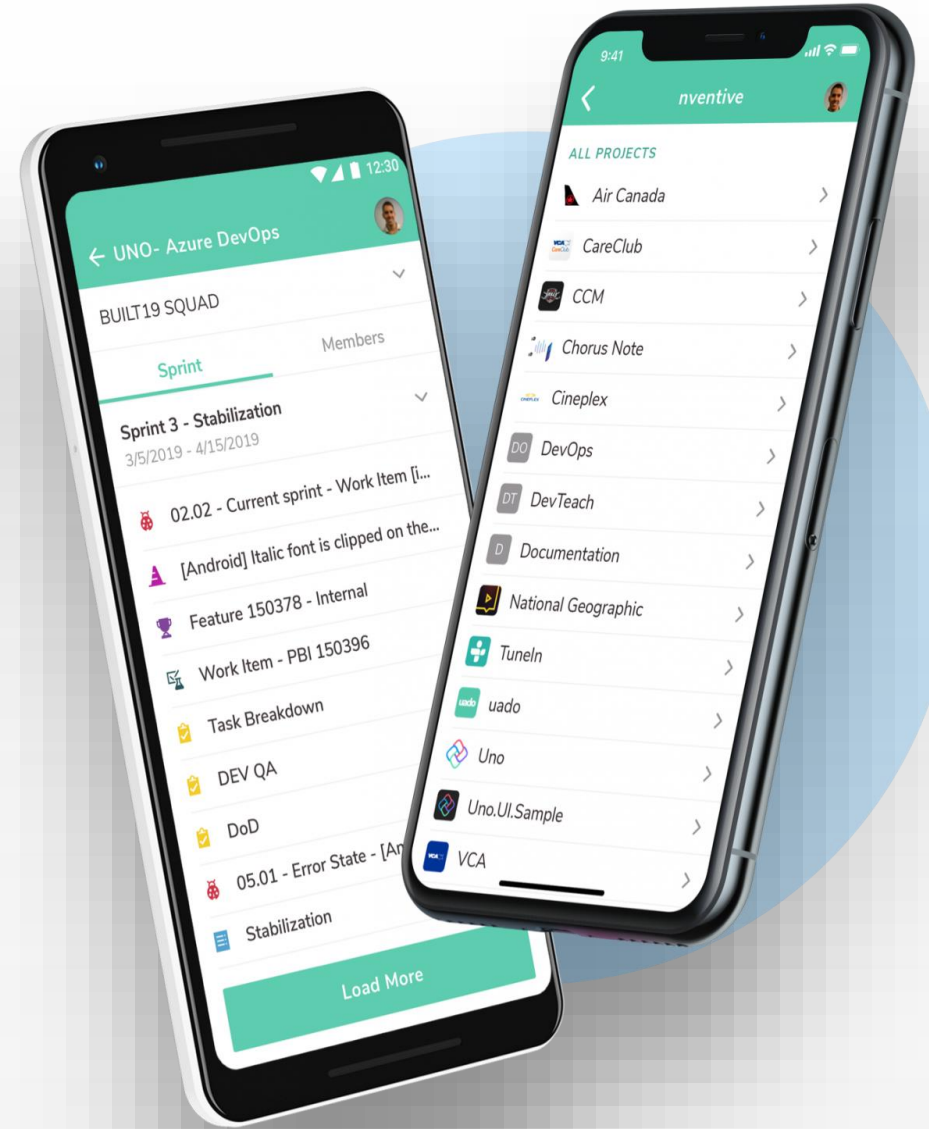
WebAssembly

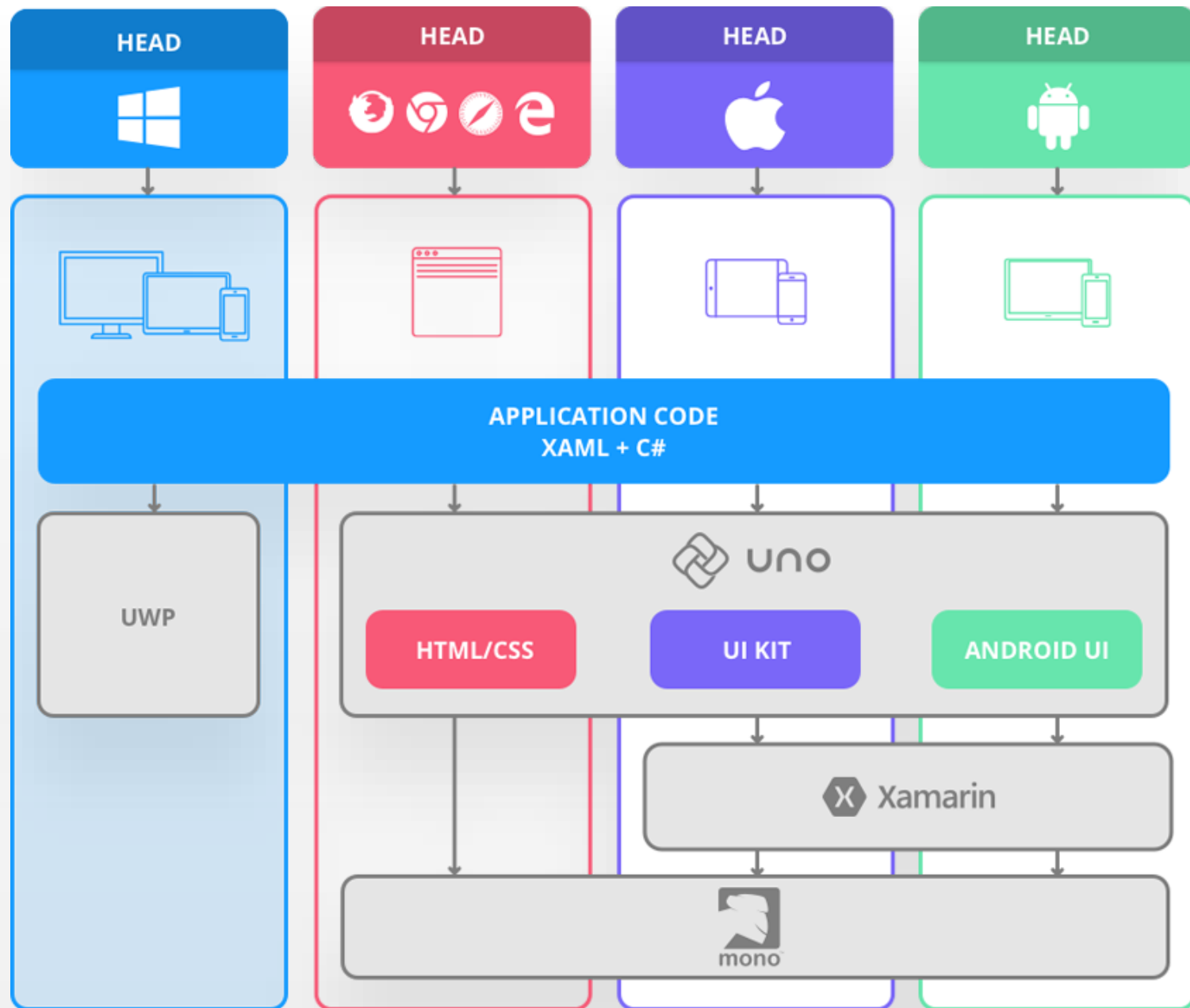
Supported platforms



The Uno Philosophy

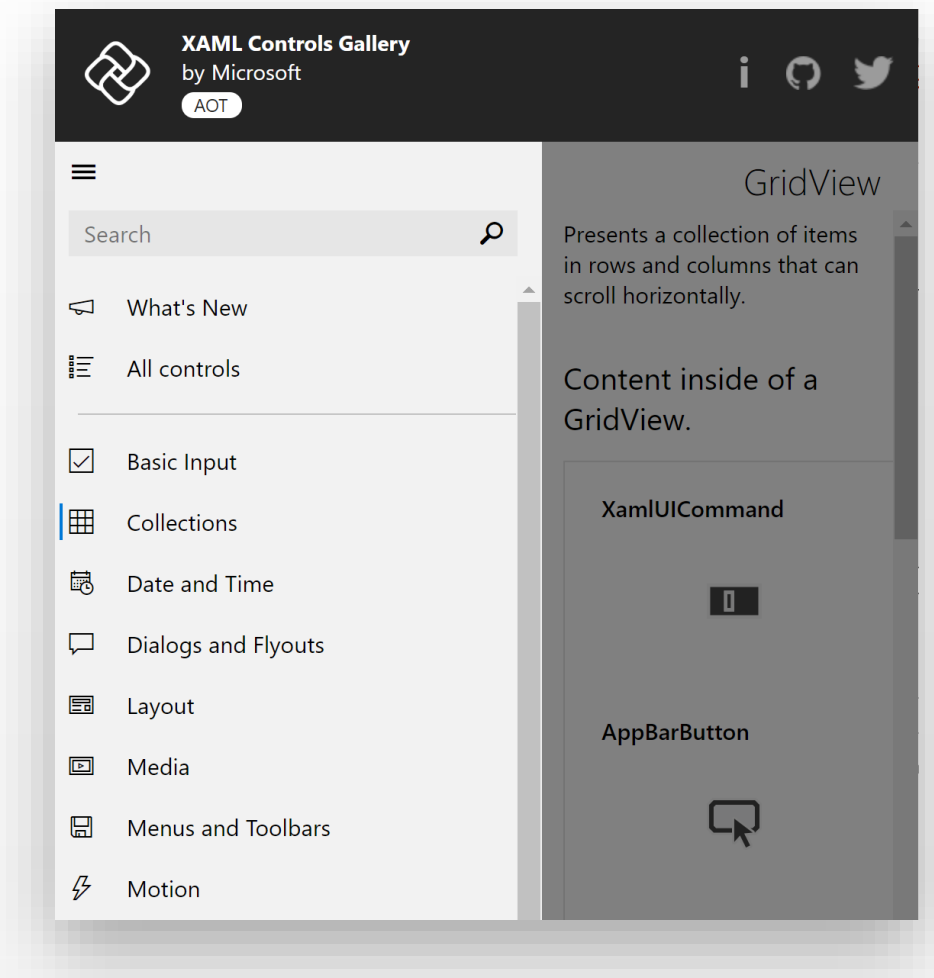
1. Leverage existing tools
2. Create rich, responsive apps
3. Let views do views
4. Native interoperability
5. Performance is a feature





Uno UI

- Control/Data templating, styling
- Animations, VisualState, StateTrigger
- Data binding
- Shapes and Brushes
- Conditional XAML
- Native Controls embedding
- <https://xamlcontrolsgallery.platform.uno/>



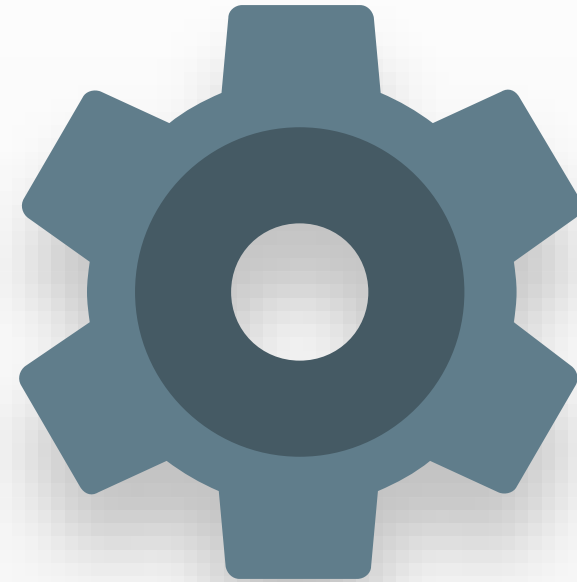
Uno – UI? Not only!

PowerManager
Launcher Geolocator
DisplayInformation
ApplicationData
ChatMessageManager
Clipboard StorageFile
MapLocationFinder
SimpleOrientationSensor
BrightnessOverride
SpeechRecognizer
PasswordVault
MediaPlayer

And many more!

Uno Platform Prerequisites

- **Visual Studio 2019** for Windows
 - Universal Windows Platform
 - Mobile development with .NET
 - ASP.NET and Web
- **macOS** for iOS build host
- **Uno Platform Solution Templates**
Visual Studio extension



Uno Platform Solution Templates

A solution template for Uno Platform enabled projects.

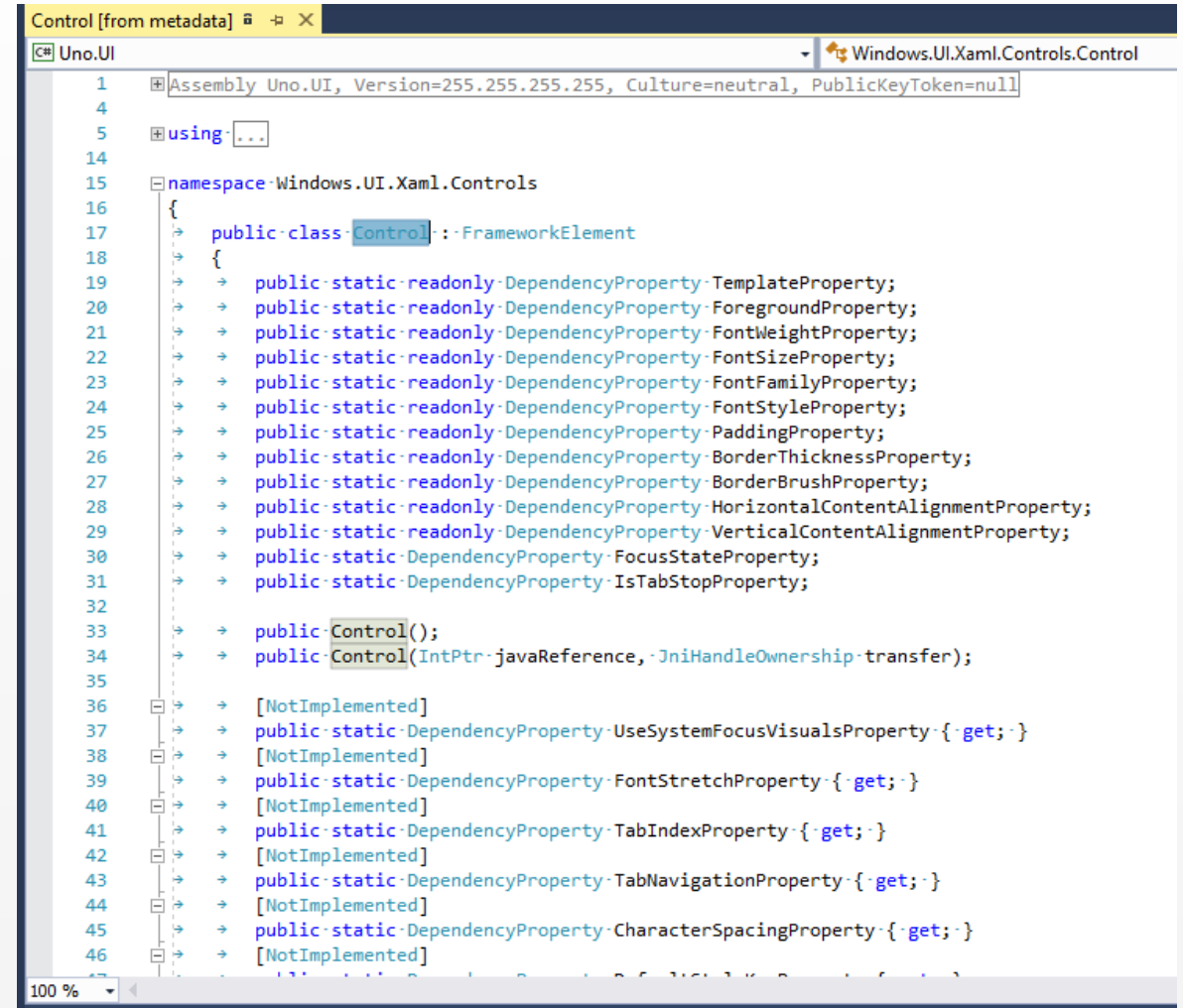


Demo

Hello, Uno Platform

How does it work?

- **All** UWP types and members are **exposed** by Uno.UI
- **Subset implemented** by Uno
- Any existing UWP C# code should compile with Uno
- Non-implemented features will throw an exception at runtime
- Non-implemented types, properties etc. are marked with the [NotImplemented] attribute and will show a warning in VS (Roslyn analyzer)



```
Control [from metadata]
Uno.UI
Windows.UI.Xaml.Controls.Control
1  Assembly Uno.UI, Version=255.255.255.255, Culture=neutral, PublicKeyToken=null
4
5  using ...
14
15 namespace Windows.UI.Xaml.Controls
16 {
17     public class Control : FrameworkElement
18     {
19         public static readonly DependencyProperty TemplateProperty;
20         public static readonly DependencyProperty ForegroundProperty;
21         public static readonly DependencyProperty FontWeightProperty;
22         public static readonly DependencyProperty FontSizeProperty;
23         public static readonly DependencyProperty FontFamilyProperty;
24         public static readonly DependencyProperty FontStyleProperty;
25         public static readonly DependencyProperty PaddingProperty;
26         public static readonly DependencyProperty BorderThicknessProperty;
27         public static readonly DependencyProperty BorderBrushProperty;
28         public static readonly DependencyProperty HorizontalContentAlignmentProperty;
29         public static readonly DependencyProperty VerticalContentAlignmentProperty;
30         public static DependencyProperty FocusStateProperty;
31         public static DependencyProperty IsTabStopProperty;
32
33         public Control();
34         public Control(IntPtr javaReference, JniHandleOwnership transfer);
35
36         [NotImplemented]
37         public static DependencyProperty UseSystemFocusVisualsProperty { get; }
38         [NotImplemented]
39         public static DependencyProperty FontStretchProperty { get; }
40         [NotImplemented]
41         public static DependencyProperty TabIndexProperty { get; }
42         [NotImplemented]
43         public static DependencyProperty TabNavigationProperty { get; }
44         [NotImplemented]
45         public static DependencyProperty CharacterSpacingProperty { get; }
46         [NotImplemented]
```

Uno namespaces = UWP namespaces

UWP

`Windows.UI.Xaml.Controls.Button`

`Windows.UI.Xaml.Controls.Border`

Uno Platform

`Windows.UI.Xaml.Controls.Button`

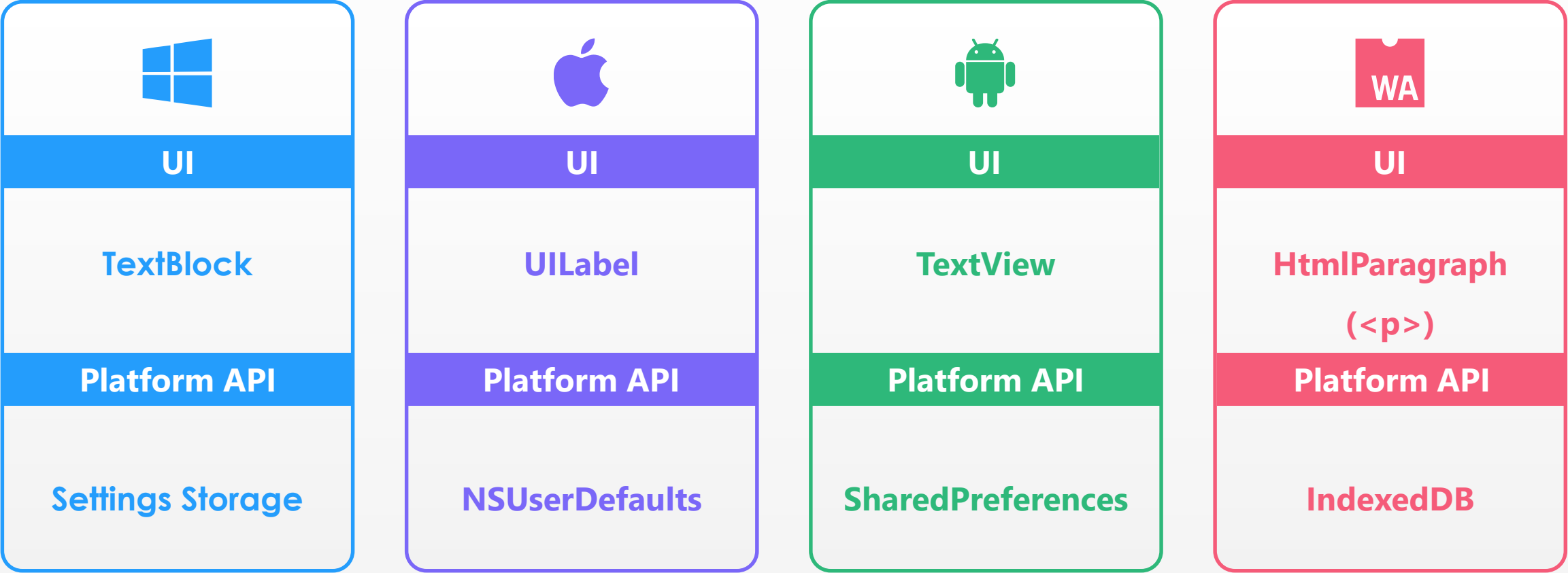
`Windows.UI.Xaml.Controls.Border`

Compiling for:

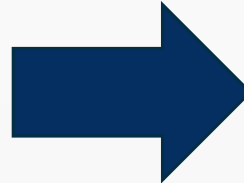
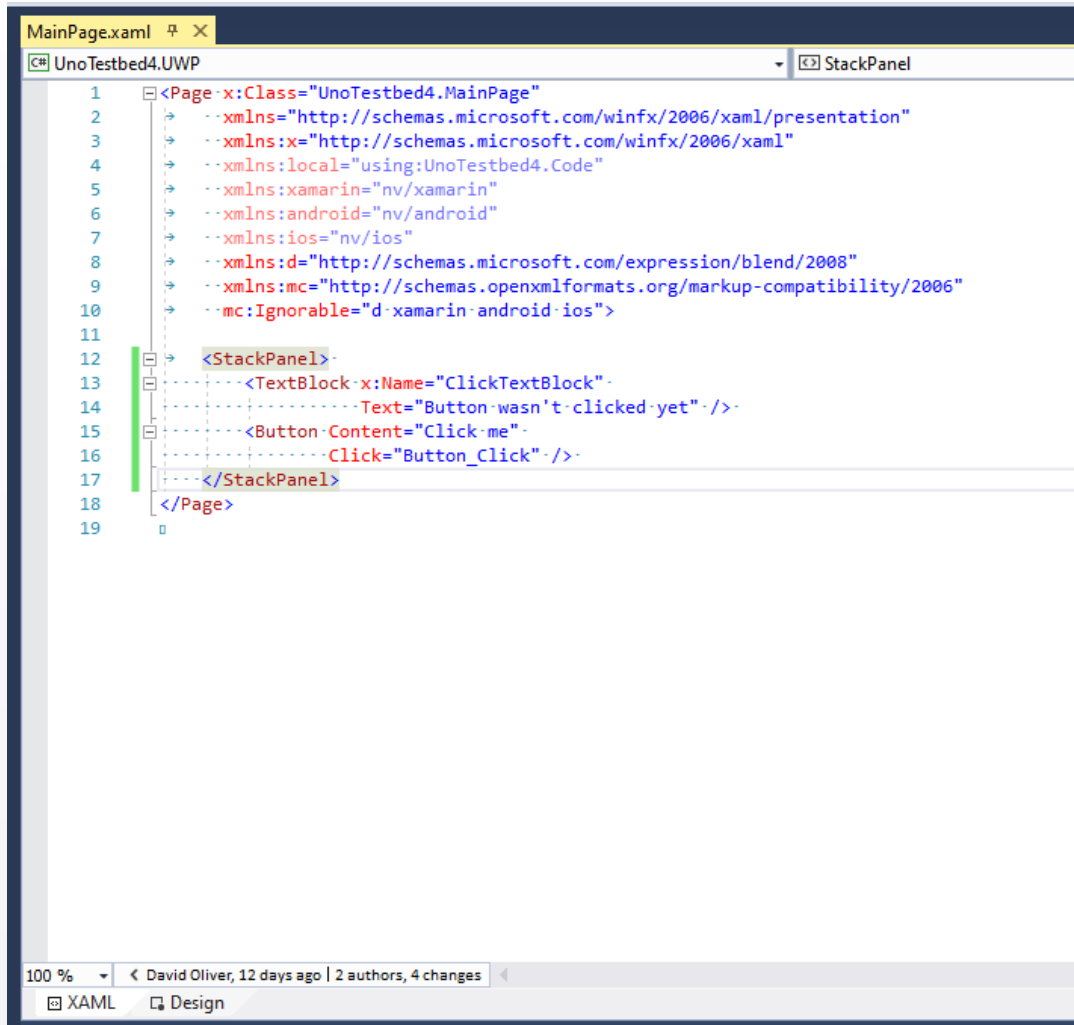
UWP – `Windows.Foundation.UniversalApiContract`

Android, iOS, WASM – `Uno, Uno.UI`

API to Native Mapping



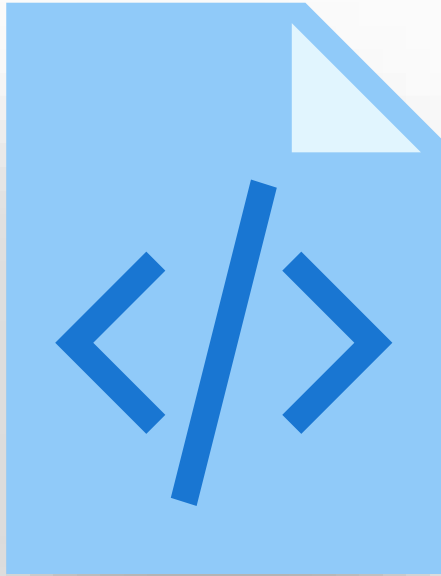
XAML Code generation



```
public sealed partial class MainPage : Windows.UI.Xaml.Controls.Page
{
    private void InitializeComponent()
    {
        var nameScope = new global::Windows.UI.Xaml.NameScope();
        NameScope.SetNameScope(this, nameScope);
        // Source ..\..\..\..\UnoExtTestbed.Shared\MainPage.xaml (Line 1:2)
        Content = new global::Windows.UI.Xaml.Controls.StackPanel
        {
            // Source ..\..\..\..\UnoExtTestbed.Shared\MainPage.xaml (Line 8:3)
            Children =
            {
                new global::Windows.UI.Xaml.Controls.TextBlock
                {
                    Name = "ClickTextBlock",
                    Text = "Button wasn't clicked yet",
                    // Source ..\..\..\..\UnoExtTestbed.Shared\MainPage.xaml (Line 9:4)
                }
            }
        };

        .MainPage_05a03e67d6a6581089c5d12899278d61_XamlApply((MainPage_05a03e67d6a6581089c5d12899278d61XamlApplyExtensions.XamlApplyHandler0)(c0 =>
        {
            nameScope.RegisterName("ClickTextBlock", c0);
            this.ClickTextBlock = c0;
        })
        ,
        new global::Windows.UI.Xaml.Controls.Button
        {
            Content = @"Click me",
            // Source ..\..\..\..\UnoExtTestbed.Shared\MainPage.xaml (Line 11:4)
        }
        );

        .MainPage_05a03e67d6a6581089c5d12899278d61_XamlApply((MainPage_05a03e67d6a6581089c5d12899278d61XamlApplyExtensions.XamlApplyHandler1)(c1 =>
        {
            c1.Click += Button_Click;
        })
        ,
        );
    }
}
```

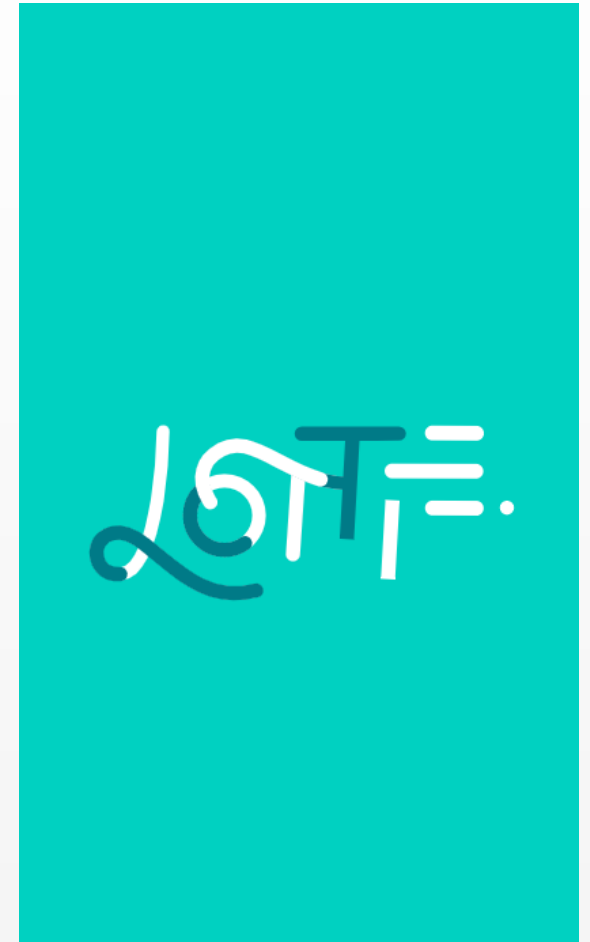


Demo

A peek under the hood

Third-party libraries

- Uno = new target platform
- Forks of existing third-party libraries
 - **Windows Community Toolkit**
 - Prism
 - Telerik UI for UWP
 - WindowsStateTriggers
- Experimental **Lottie** support (<https://lottie.platform.uno/>)



Uno ❤️ WebAssembly

- Key platform
- Full-featured WASM UI framework
- See Build 2019 session about WASM by Jerome Laban, nventive CTO



<https://youtu.be/mhoEqkJQIkY>

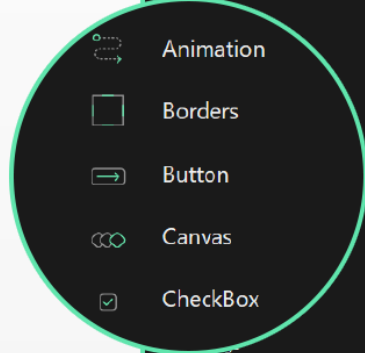
Uno Platform Playground

Built with Uno to demo Uno

Uno Gallery App



SAMPLES
LIST



XAML EDITOR

```
<StackPanel Orientation="Vertical" Spacing="10" Margin="10">
  <!-- Type your favorite XAML code here
  ...or pick a snippet on the left. -->

  <TextBlock Text="{Binding message}"
    FontSize="22" />

  <TextBlock>
    - This is an <b>experimental</b> preview of UWP on #wasm. We're continuously adding support for more
    features, come back often!
    - The underlying platform (wasm) is in preview and is running in a mode which isn't reflecting the
    final product performance. More details: https://github.com/stefan-schweiger/dotWasmBenchmark.
    - Please use Firefox or Edge for better performance.
    - Safari isn't supported at this point. For iPhone or iPad, you can use the iOS Uno Gallery app from
    the app store.
    - No List virtualization yet supported.

  </TextBlock>
</StackPanel>
```

XAML EDITOR

XAML
VISUALIZER

Welcome to the web
Playground!

- This is an **experimental** preview of UWP on #wasm. We're continuously adding support for more features, come back often!
- The underlying platform (wasm) is in preview and is **running in a mode which isn't reflecting the final product performance**. More details: <https://github.com/stefan-schweiger/dotWasmBenchmark>.
- Please use Firefox or Edge for better performance.
- Safari isn't supported at this point. For iPhone or iPad, you can use the iOS Uno Gallery app from the app store.
- No List virtualization yet supported.

DATACONTEXT
EDITOR & VISUALIZER

Data Context

```
{
  message: "Welcome to the WebAssembly Uno Playground!",
  tips: [
    "You can bind two-way to the datacontext",
    "You can click \"Save Snippet\" to get a permalink to your sample (top of XAML box)"
  ]
}
```

Uno Platform Playground



Android <https://bit.ly/2HDI2S9>



iOS <https://apple.co/2QowZhg>



WASM <https://playground.platform.uno/>

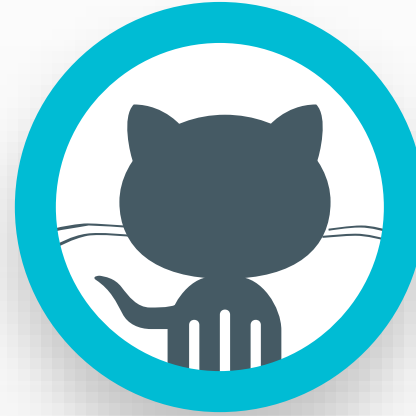
Call to action



Create app with Uno

<https://platform.uno/>

<https://bit.ly/2JKIRtl>

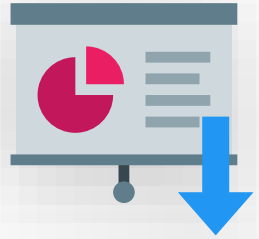


Submit feedback
&
Contribute

<https://github.com/nventive/Uno>

<https://bit.ly/2WvknKL>

Resources



<https://github.com/MartinZikmund/meet-uno-talk>



<https://blog.mzikmund.com/>



@mzikmunddev



@mzikmunddev



mzikmunddev



<https://github.com/MartinZikmund/>