



# Native Cross-Platform Mobile & Desktop apps with .NET



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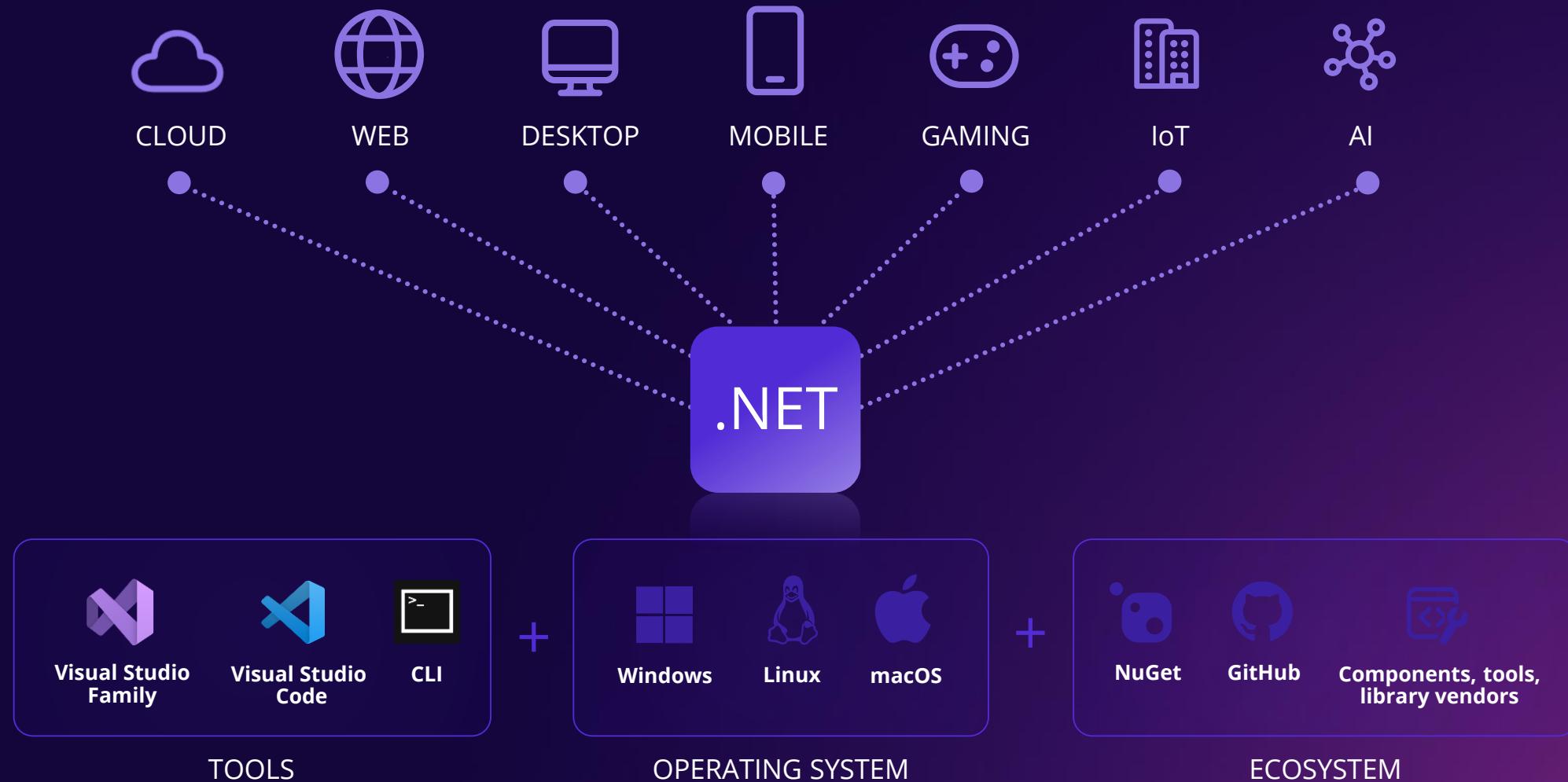
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The Ultimate Education Destination  
**ORLANDO 2022**

Level: Introductory

# Build anything with a unified platform



A blurred, high-angle photograph of several people walking through a modern office building's lobby or hallway. The floor has large, light-colored tiles. In the background, there are glass walls and doors. The people are dressed in professional attire like suits and dresses. The overall effect is one of motion and activity.

# Client app development is important

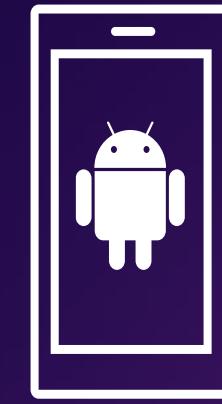
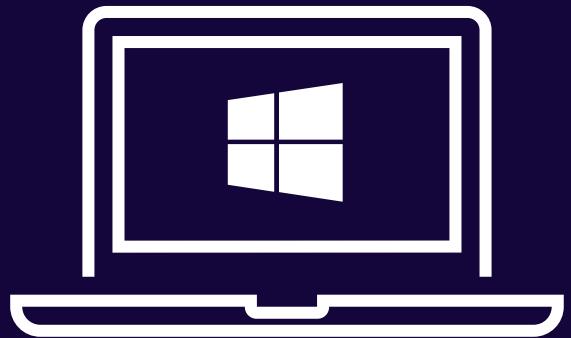
>1B

Windows 10 & 11  
devices worldwide

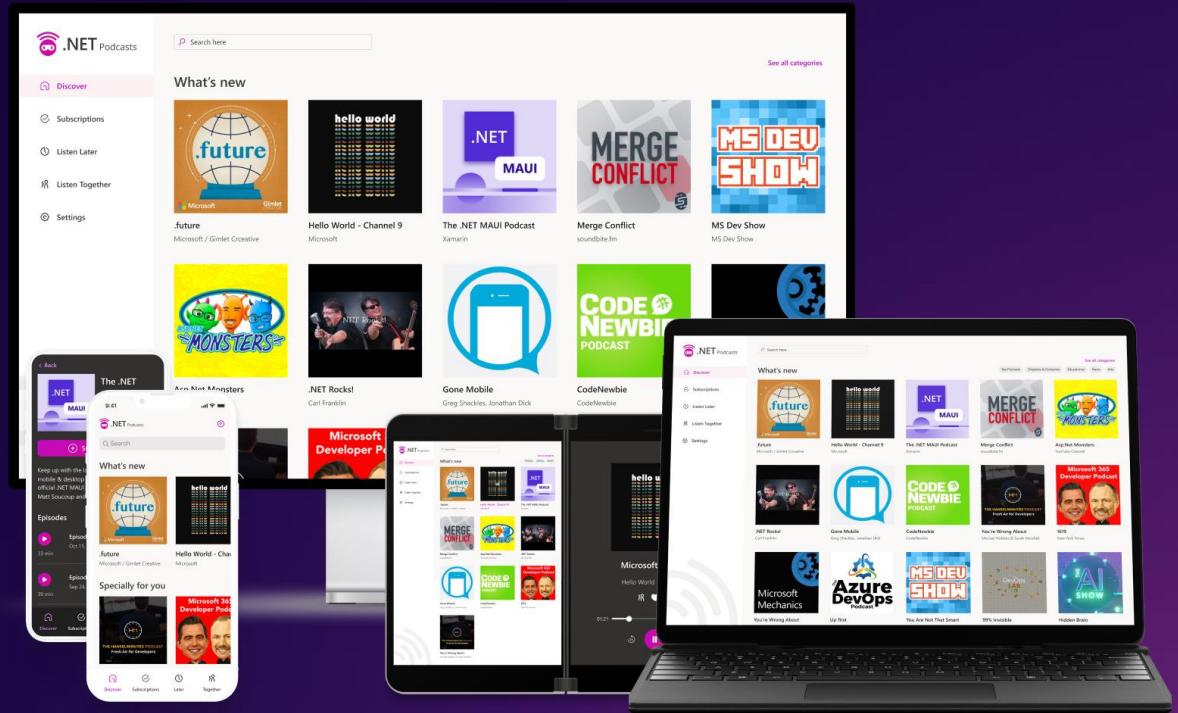
>4B

iPhone & Android  
devices worldwide

Sources: [blog.google/products/android/android-12-beta/](http://blog.google/products/android/android-12-beta/) ;  
[www.imore.com/apple-earnings-call-transcripts-q1-2021](http://www.imore.com/apple-earnings-call-transcripts-q1-2021) ;



**.NET Multi-platform App UI** is  
the most productive way to  
develop native apps with a  
**single codebase** that perform  
great on any consumer device.



# .NET MAUI in .NET

## Unified .NET

One Base Class Library  
Type Unification  
CLI Support  
SDK Style Projects  
Modern Support Lifecycle

## Mobile, desktop, hybrid

Android  
iOS  
WinUI  
Mac Catalyst  
Blazor WebView

## Productive development

Single Project  
Microsoft.Extensions  
.NET Hot Reload  
XAML Hot Reload  
Visual Diagnostics

.NET

.NET MAUI

WinUI

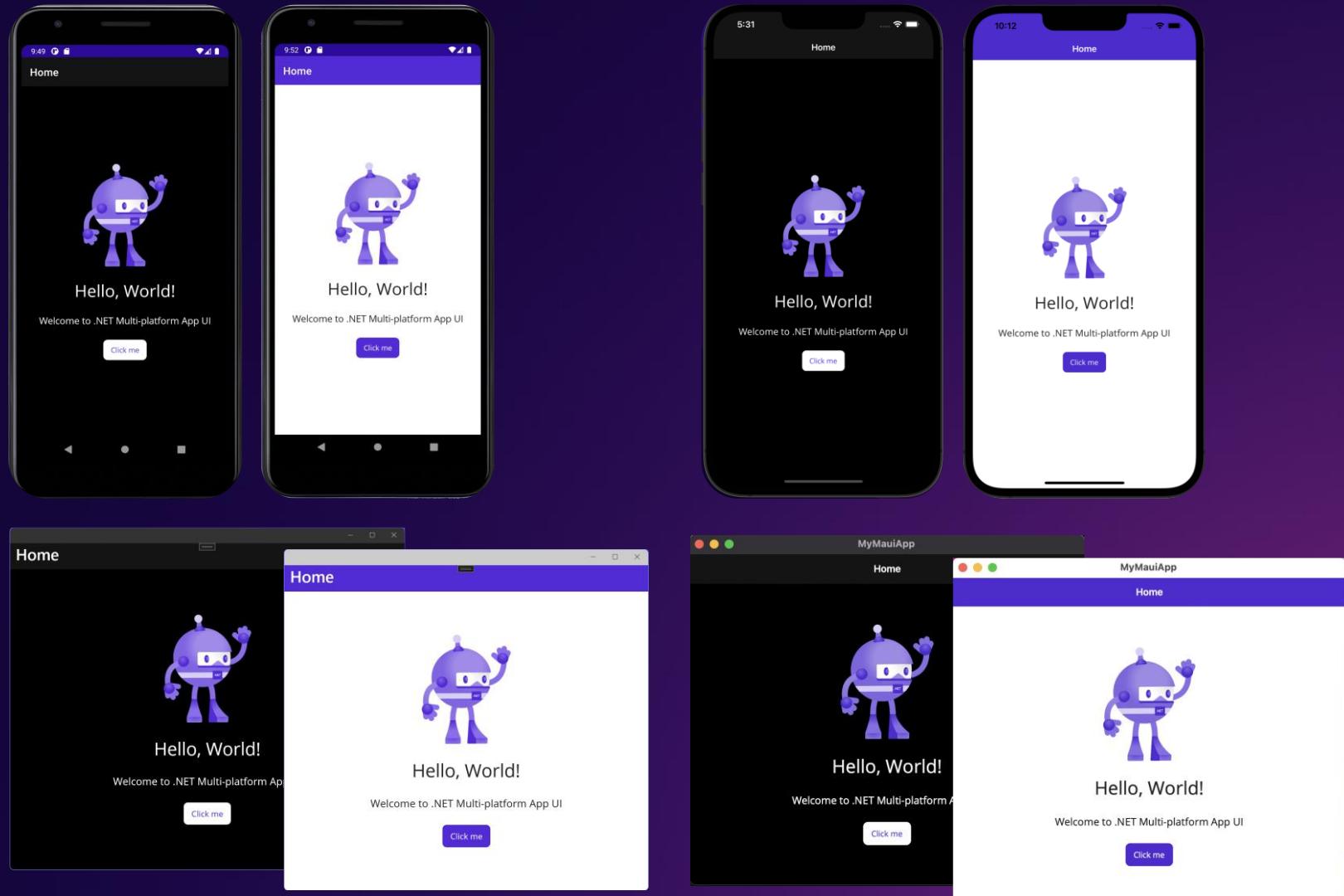
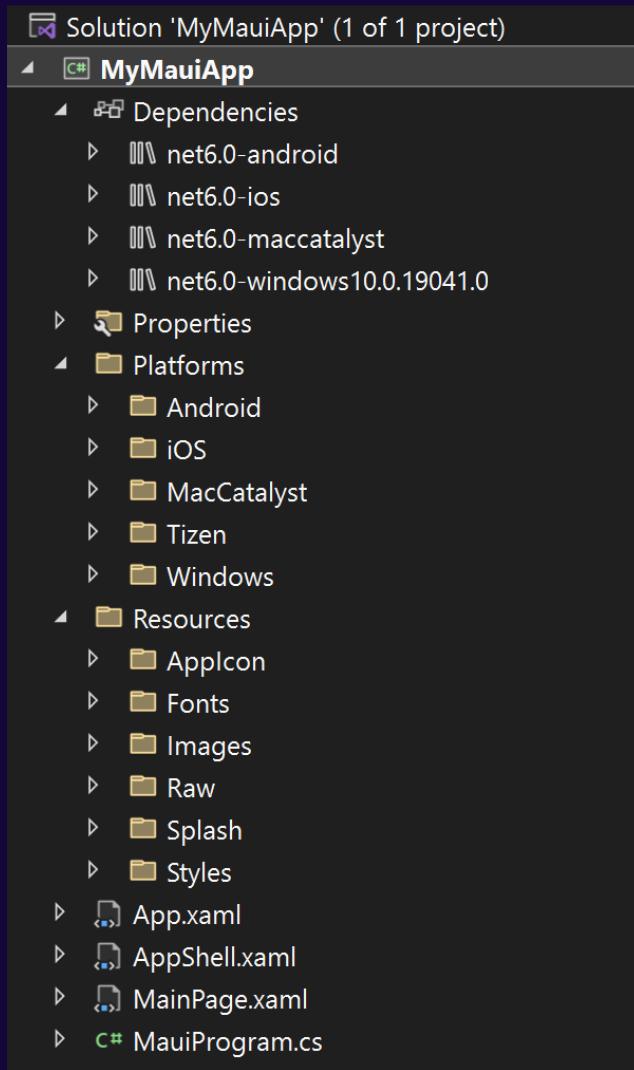
Mac Catalyst

iOS

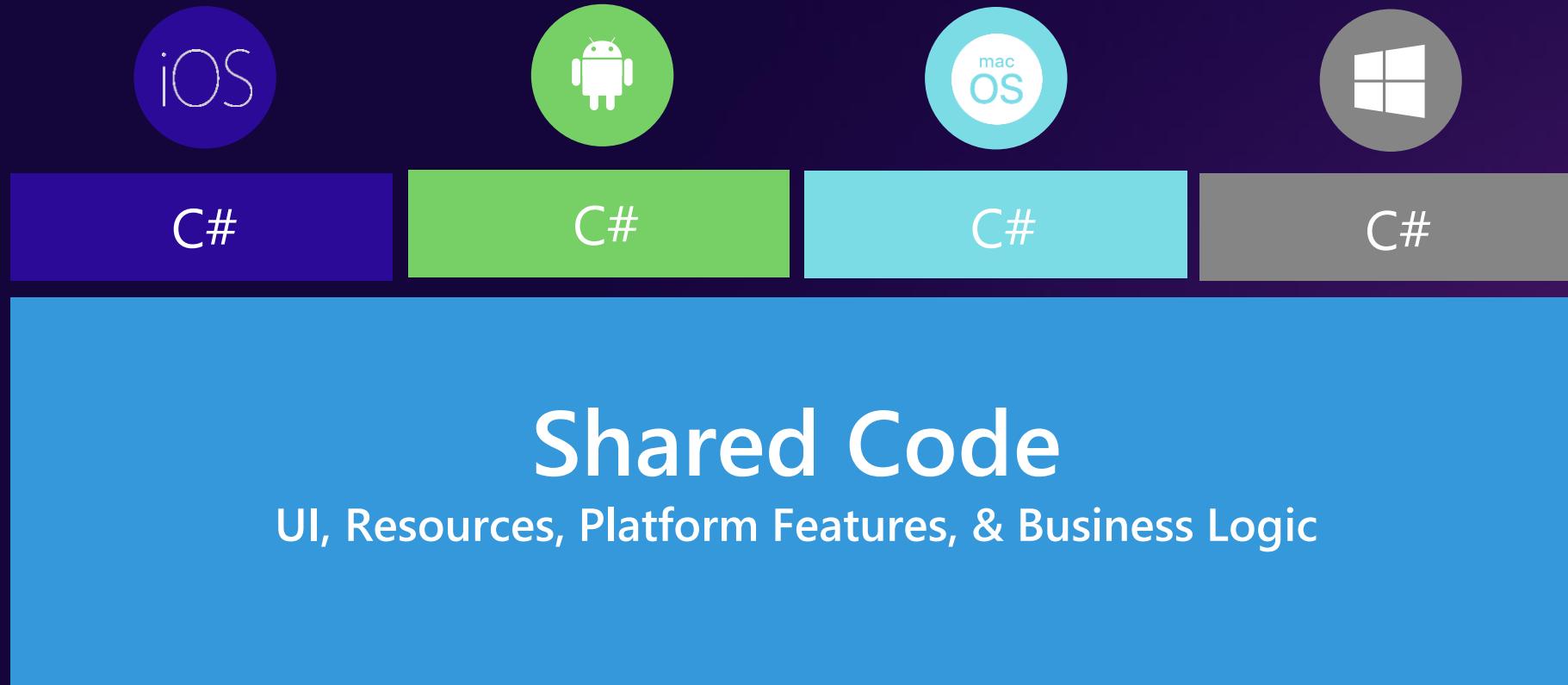
Android



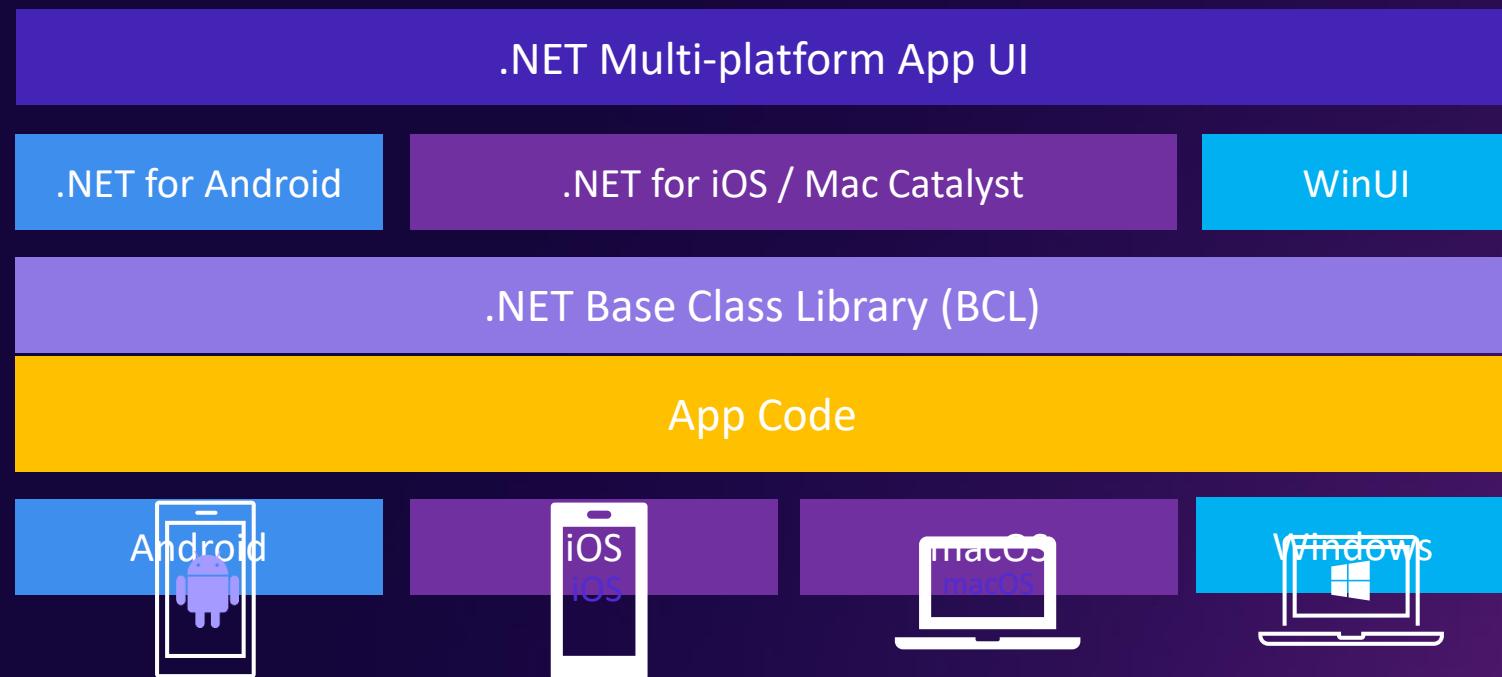
# One codebase, single project, multi target



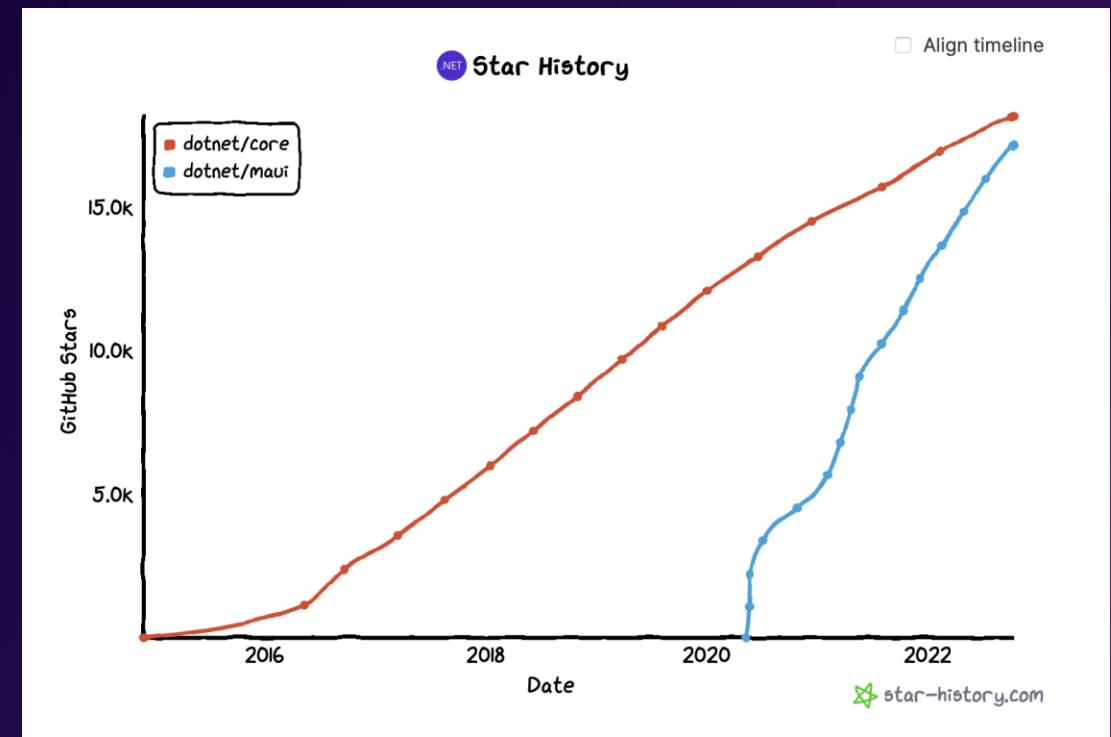
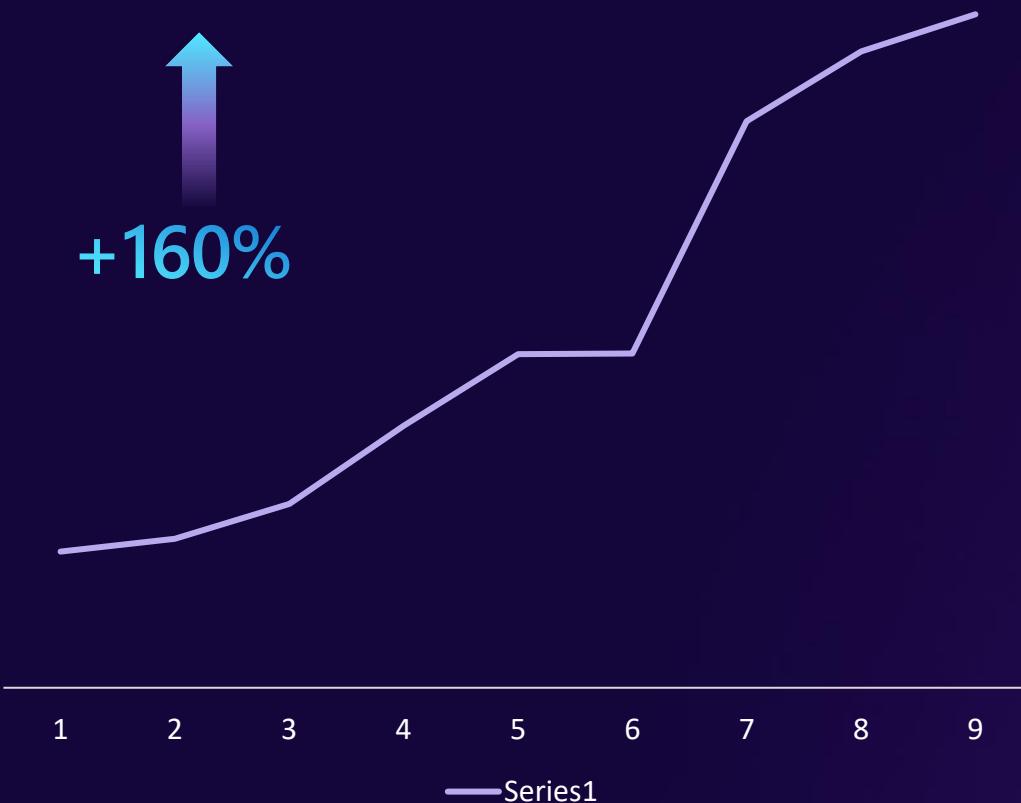
# .NET MAUI Architecture



# How does .NET MAUI really work?



# .NET MAUI Growth YTD



# aka.ms/dotnetmaui/showcase

# Adoption

CIVICA



Microsoft

ÄHDUS  
TECHNOLOGY

# Logius

Your DigiD allows you to identify yourself when making arrangements on the internet, such as with the government, educational institutes, healthcare institutions or your pension fund.

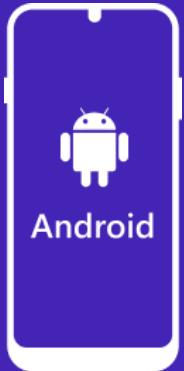


# Native

Platform experiences are the best experiences.



# Native



- android.widget
- AndroidX libraries
- Java/Kotlin APIs



- UIKit
- ARKit, AVKit, CarPlay, and dozens more
- Obj-C/Swift APIs



MacOS Application

- Mac Catalyst
- UIKit + AppKit
- Dozens of frameworks
- Obj-C/Swift APIs



Windows Application

- Windows App SDK
- WinUI 3
- C++ APIs

# iOS for .NET

MapKit	UIKit	SiriKit	ARKit	CoreML
System.Net	System	System.IO	System.Linq	System.Xml
System.Data	System.Windows	System.Numerics	System.Core	System.ServiceModel

C#

# Android for .NET

Fingerprint

Bluetooth

Picture-in-Picture

Geolocation

NFC

System.Net

System

System.IO

System.Linq

System.Xml

System.Data

System.Windows

System.Numerics

System.Core

System.ServiceModel

C#

# Optimize Compilation



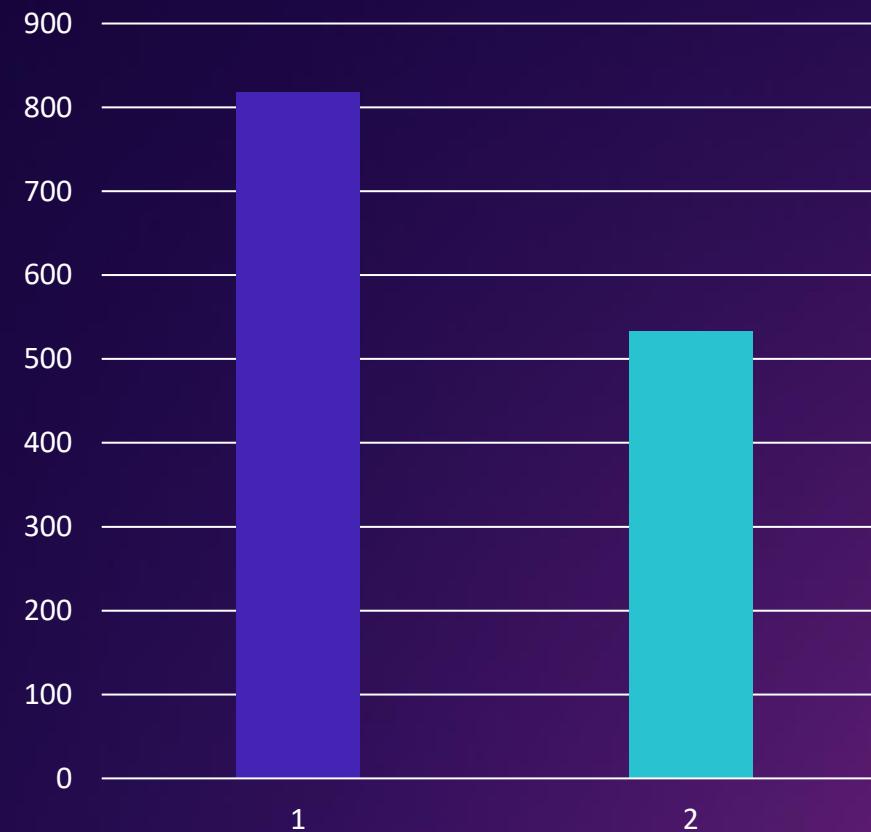
**.NET for iOS** does full Ahead Of Time (AOT) compilation to produce an ARM binary for Apple's App Store.

**.NET for Android** takes advantage of Just In Time (JIT) & Ahead of Time (AOT) compilation on the Android device.

# .NET MAUI perf improvements

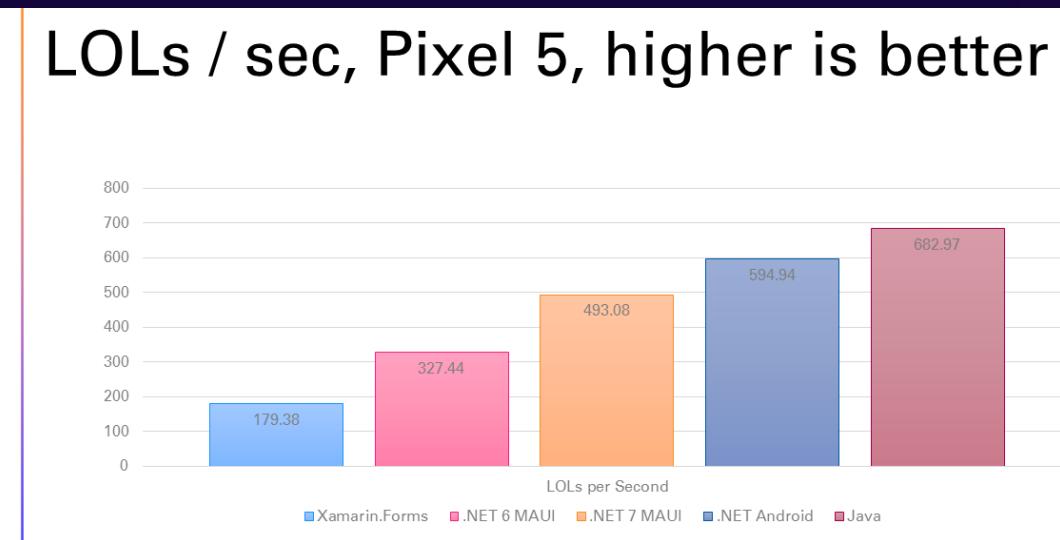
53%

Faster than Xamarin.Forms

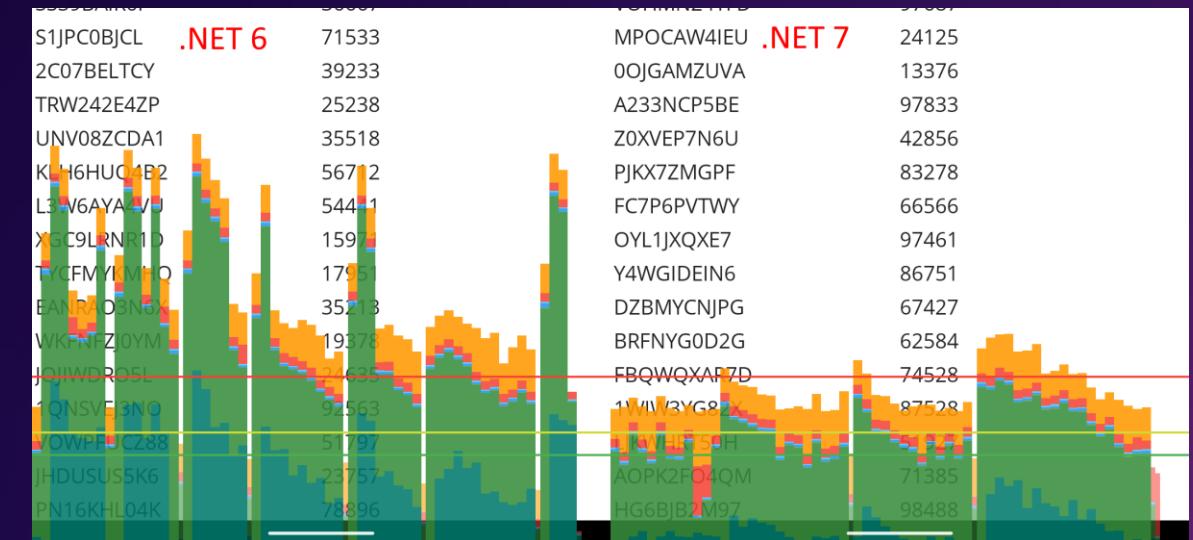


# Performance - LOL/s

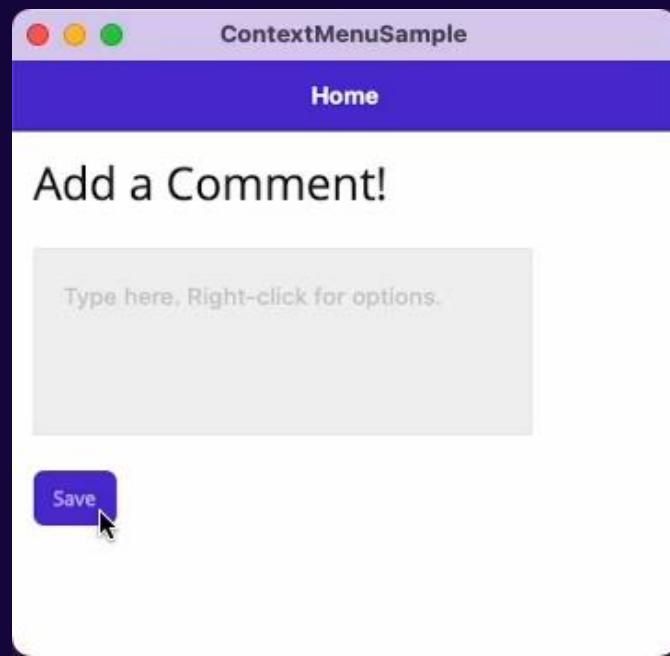
51% faster rendering



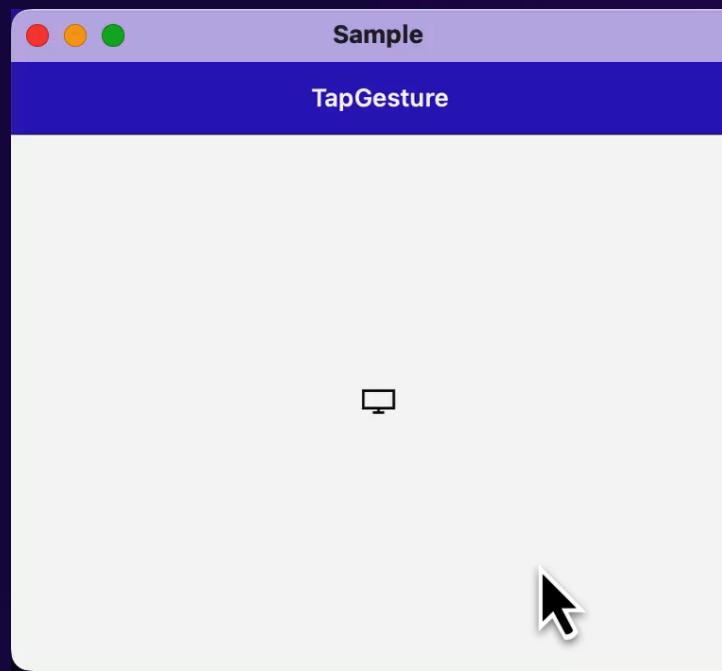
Faster scrolling



# Focus on Desktop



Context Menus



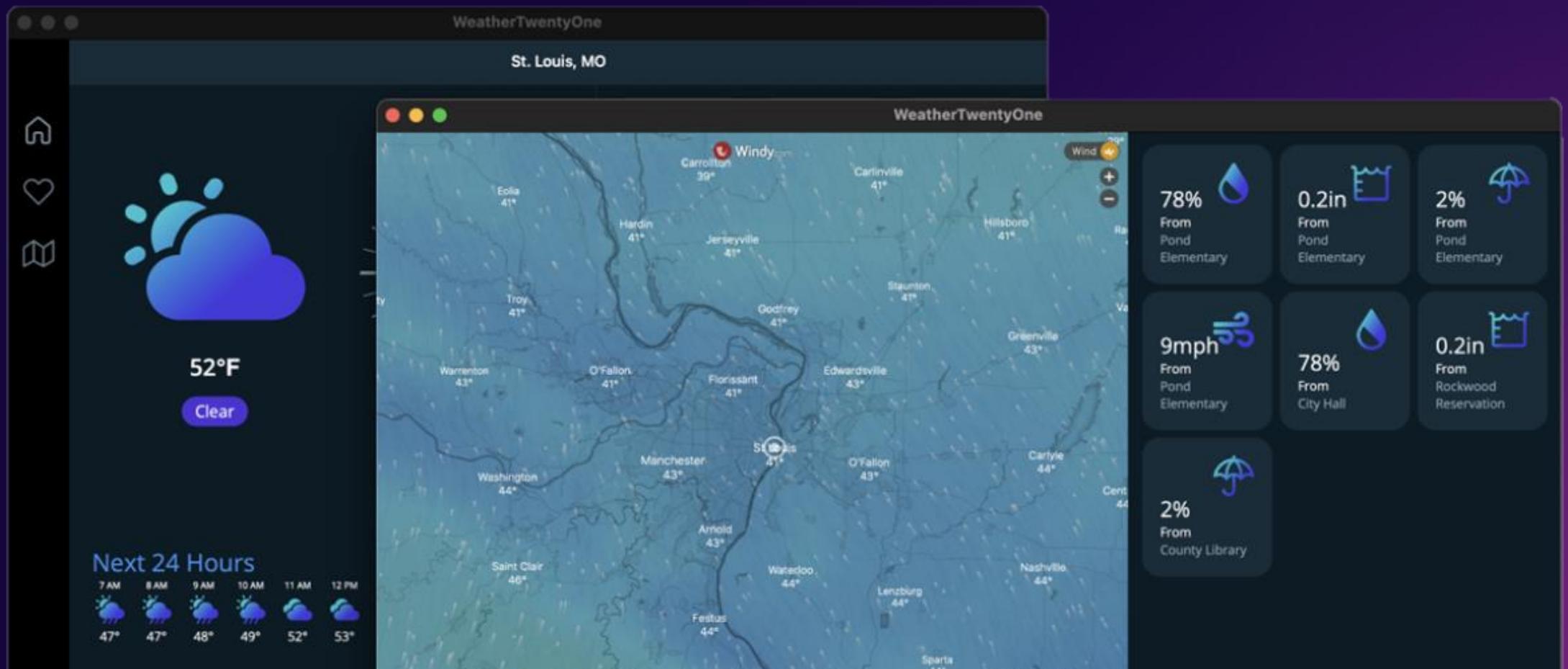
Right-Click



Tooltips &  
Pointer Hover

# Multi-window

```
var secondWindow = new Window { Page = new NewPage1 { } };
Application.Current.OpenWindow(secondWindow);
```



# What's in .NET MAUI?

More than just a user interface library.



# What's "in the box" and nearby?

## Features

MVVM & XAML  
Android, iOS, macOS, Windows  
7 Layouts  
44 Views  
Maui.Essentials  
Maui.Graphics  
Xamarin.Forms Compat  
CommunityToolkit.  
Maui  
Maui.Markup  
Mvvm

## New Capabilities

BlazorWebView  
Border  
Shadows  
GraphicsView  
MenuBar  
Window/Multi-Window  
Default theme  
AppIcon  
SplashScreen  
Fonts  
Images  
Map  
Toolips  
Pointer Gestures  
Context Menu  
Window Size & Positioning  
Shell flyout templates

## Changes from Xamarin

Color/Colors  
Zero'd defaults  
Namespace  
More XAMLC  
App Startup  
Lifecycle Events  
.NET workloads

# Over 50 Controls, Layouts and Views

**Activity Indicator**

**Button**

**Editor**

**Multiline**

**Entry**

**Checkbox**

**Clipping**

**Grid**

**Editor**

**Placeholder**

**Disabled**

**Read-only**

**With error message**

**Progress Bar**

**Styled**

**Shadow**

**Slider**

**Picker**

**Cascade Layout**

**FlexLayout**

**Horizontal Wrap Layout**

**Image**

**Shapes**

**Switch**

**Disabled and untagged**

**Disabled and toggled**

**Date Picker**

**Stepper**

**BackgroundColor**

**Frame**

**Card Title**

Lorum ipsum dolor sit amet, consectetur adipiscing elit. Nulla elit dolor, convallis non interdum.

**HorizontalStackLayout**

**Image Button**

**Label**

Font name: OpenSans Regular  
Version: 1.00  
Digitally Signed, TrueType Outlines  
abcdefghijklmnopqrstuvwxyz ABCDEFGHIJKLMNOPQRSTUVWXYZ  
1234567890,-+\*/=

12 The quick brown fox jumps over the lazy dog. 1234567890  
18 The quick brown fox jumps over the lazy dog. 1234567890  
24 The quick brown fox jumps over the lazy dog. 1234567890  
30 The quick brown fox jumps over the lazy dog. 1234567890  
36 The quick brown fox jumps over the lazy dog. 1234567890  
48 The quick brown fox jumps over the lazy dog. 1234567890  
60 The quick brown fox jumps over the lazy dog. 1234567890  
72 The quick brown fox jumps over the lazy dog. 1234567890

**Bindable Layout**

**CollectionView**

**Bindable Layout**

**WebView**

**AbsoluteLayout**

**VerticalStackLayout**

**SearchBar**

**CarouselView**

**ListView**

**CollectionView**

**BindableView**

**BindableView**

**BindableView**

**BindableView**

**BindableView**

# APIs Beyond UI

Simple access to APIs

Access services and features of each platform

App actions

Clipboard

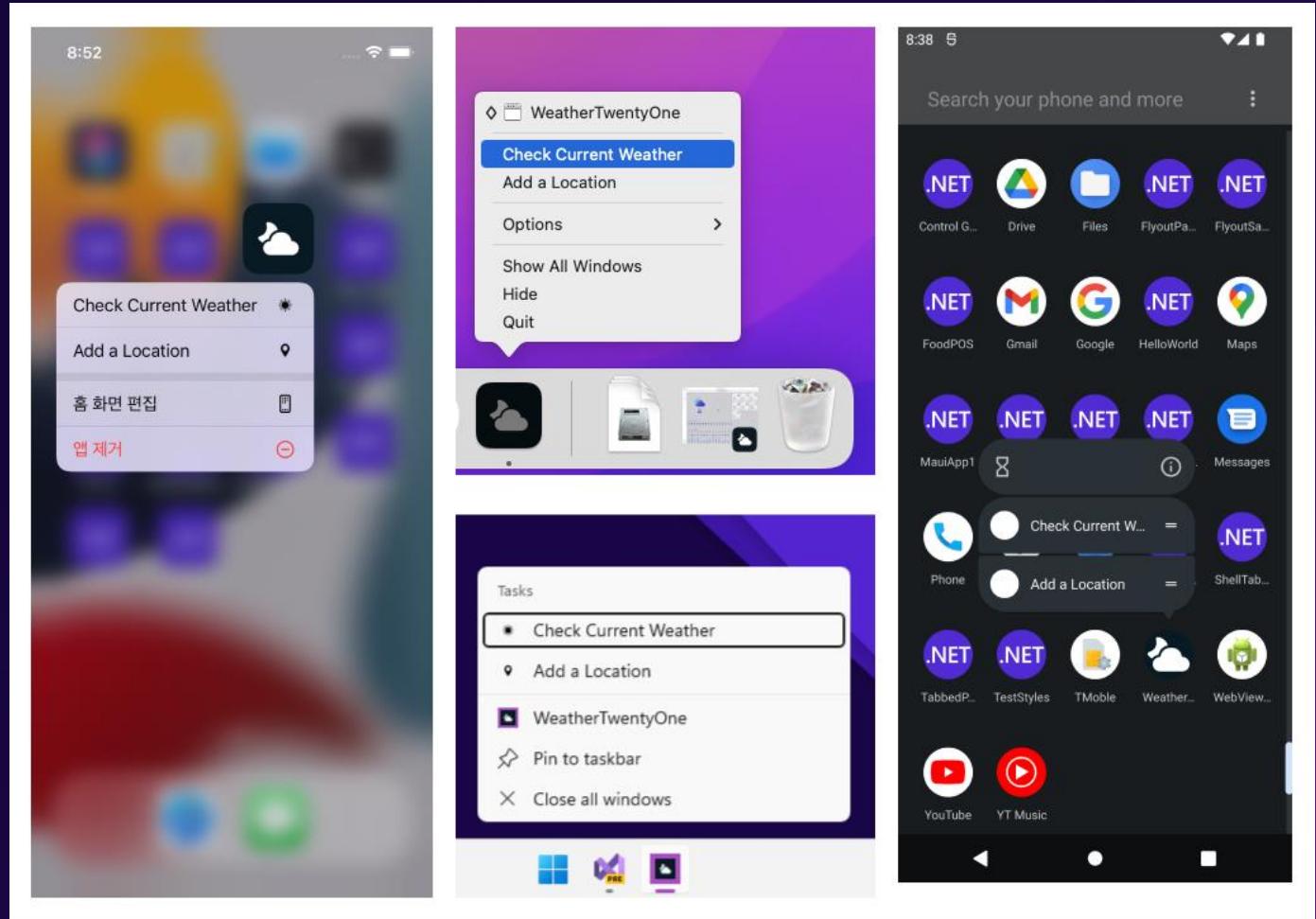
Device sensors

File system

Network

Notifications

+More



```
AppActions.SetAsync(  
    new AppAction("current_info", "Check Current Weather", icon: "current_info"),  
    new AppAction("add_location", "Add a Location", icon: "add_location")  
);
```

# Geolocation Example

```
// Get cached location, else get real location.  
var location = await Geolocation.GetLastKnownLocationAsync();  
  
if (location == null)  
{  
    location = await Geolocation.GetLocationAsync(new GeolocationRequest  
    {  
        DesiredAccuracy = GeolocationAccuracy.Medium,  
        Timeout = TimeSpan.FromSeconds(30)  
    });  
}
```

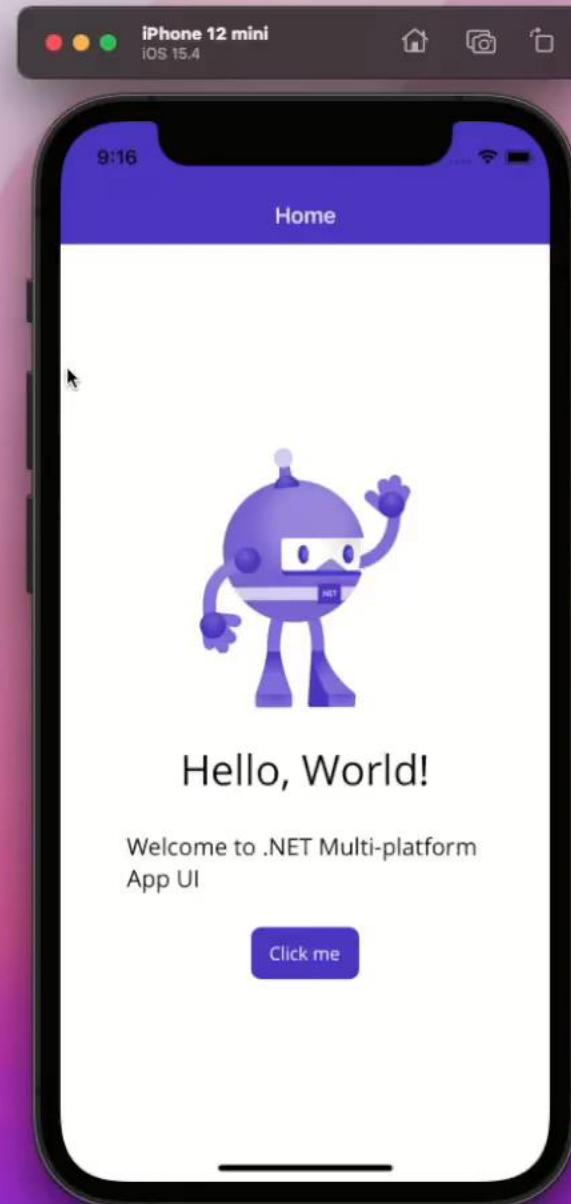
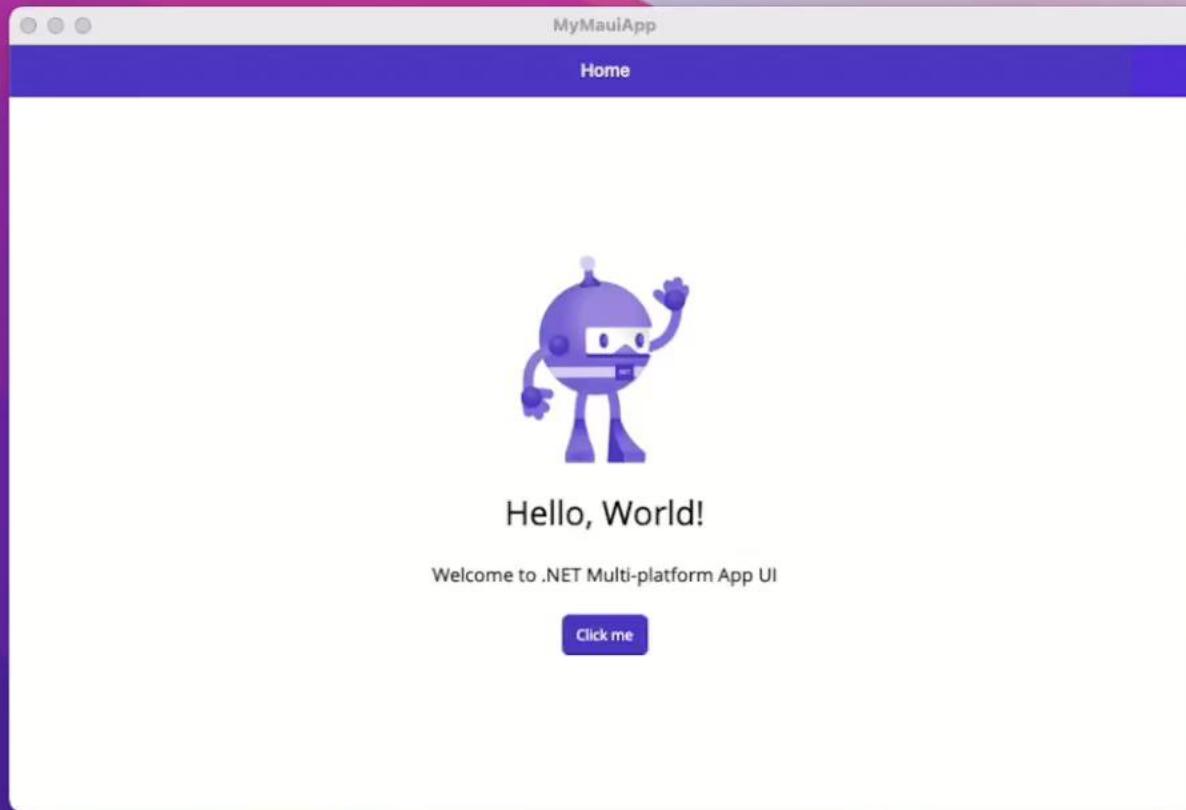
# Geolocation Example

```
// Register service
builder.Services.AddSingleton<IGeolocation, Geolocation.Default>();

// Inject service
IGeolocation geolocation;
public MyViewModel(IGeolocation geolocation)
{
    this.geolocation = geolocation;
}
```

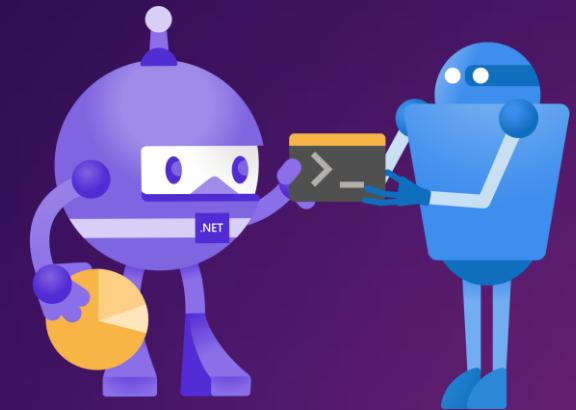
# Demo

Let's build an app!

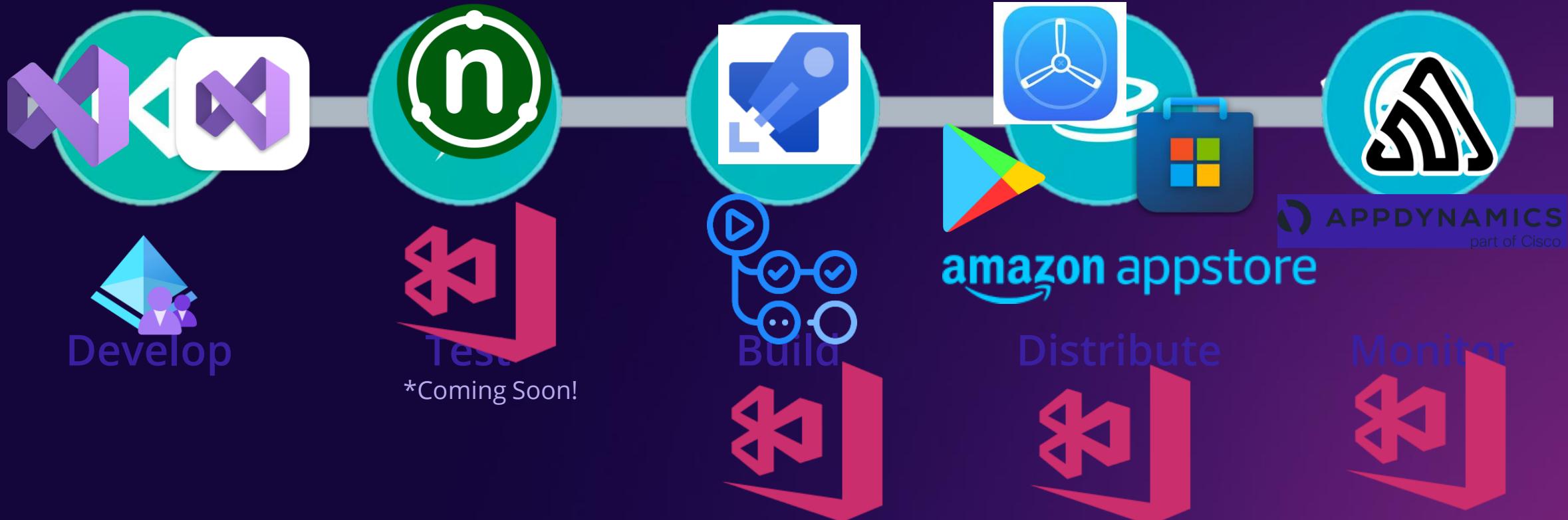


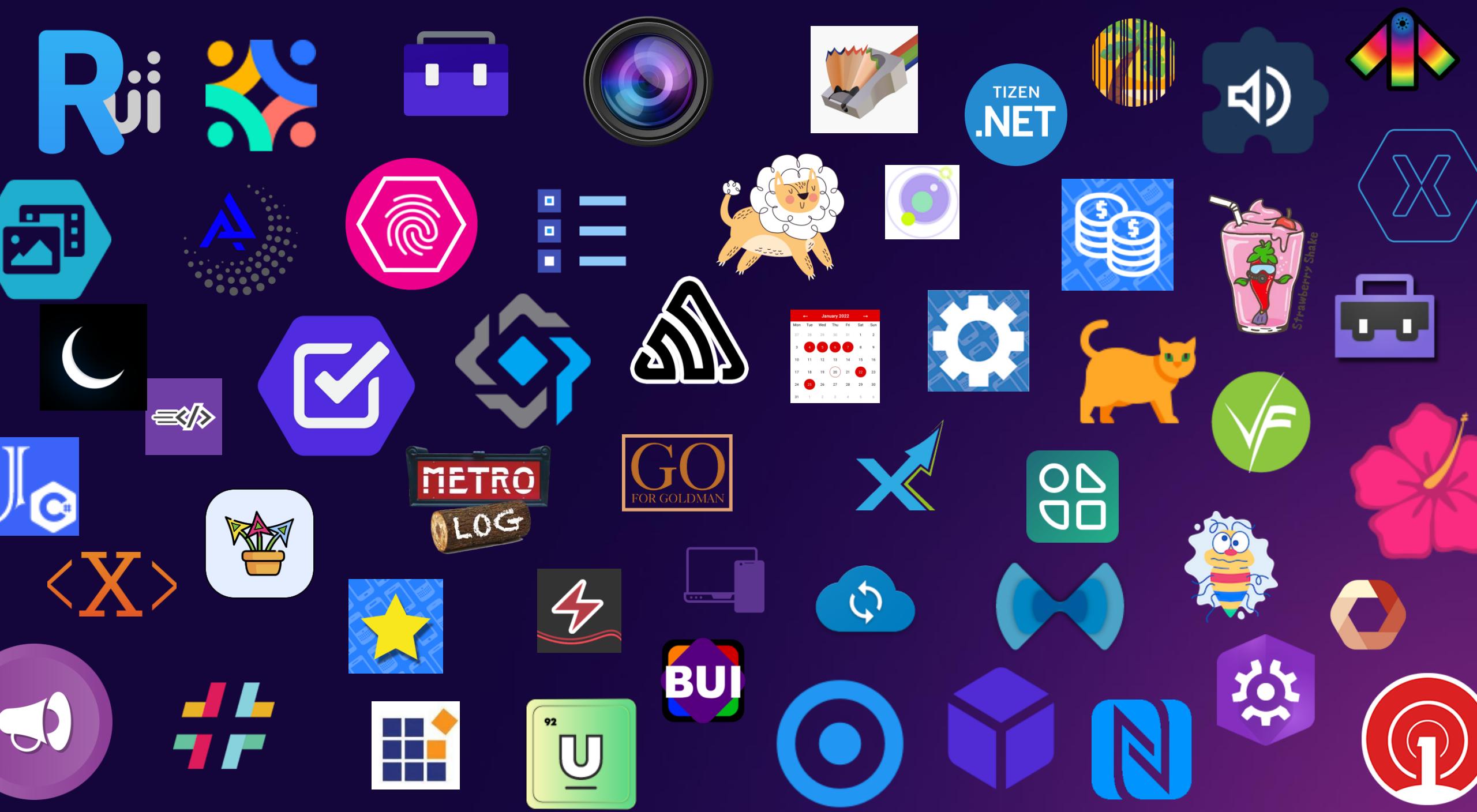
# Ecosystem

Let's build this together!

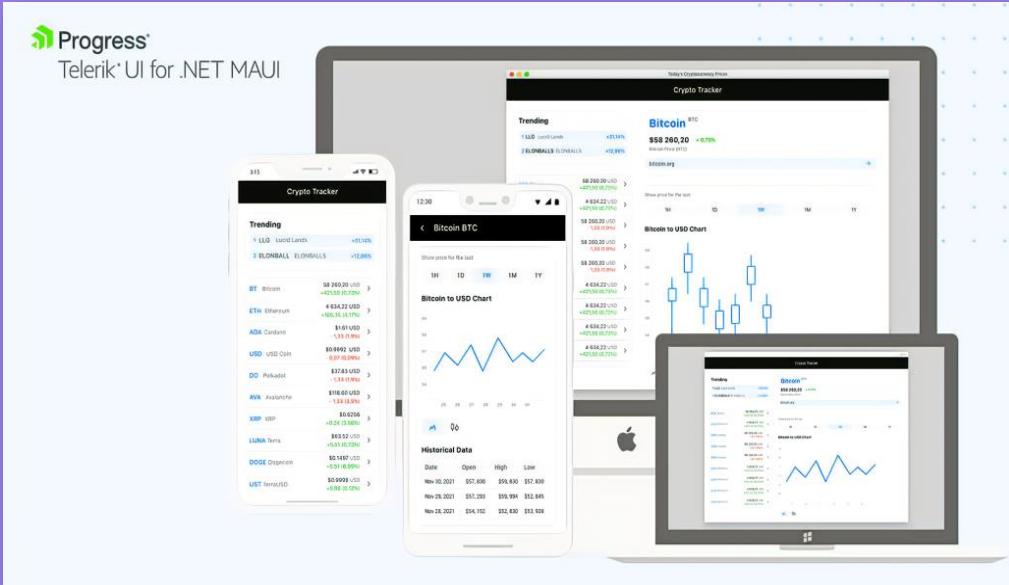


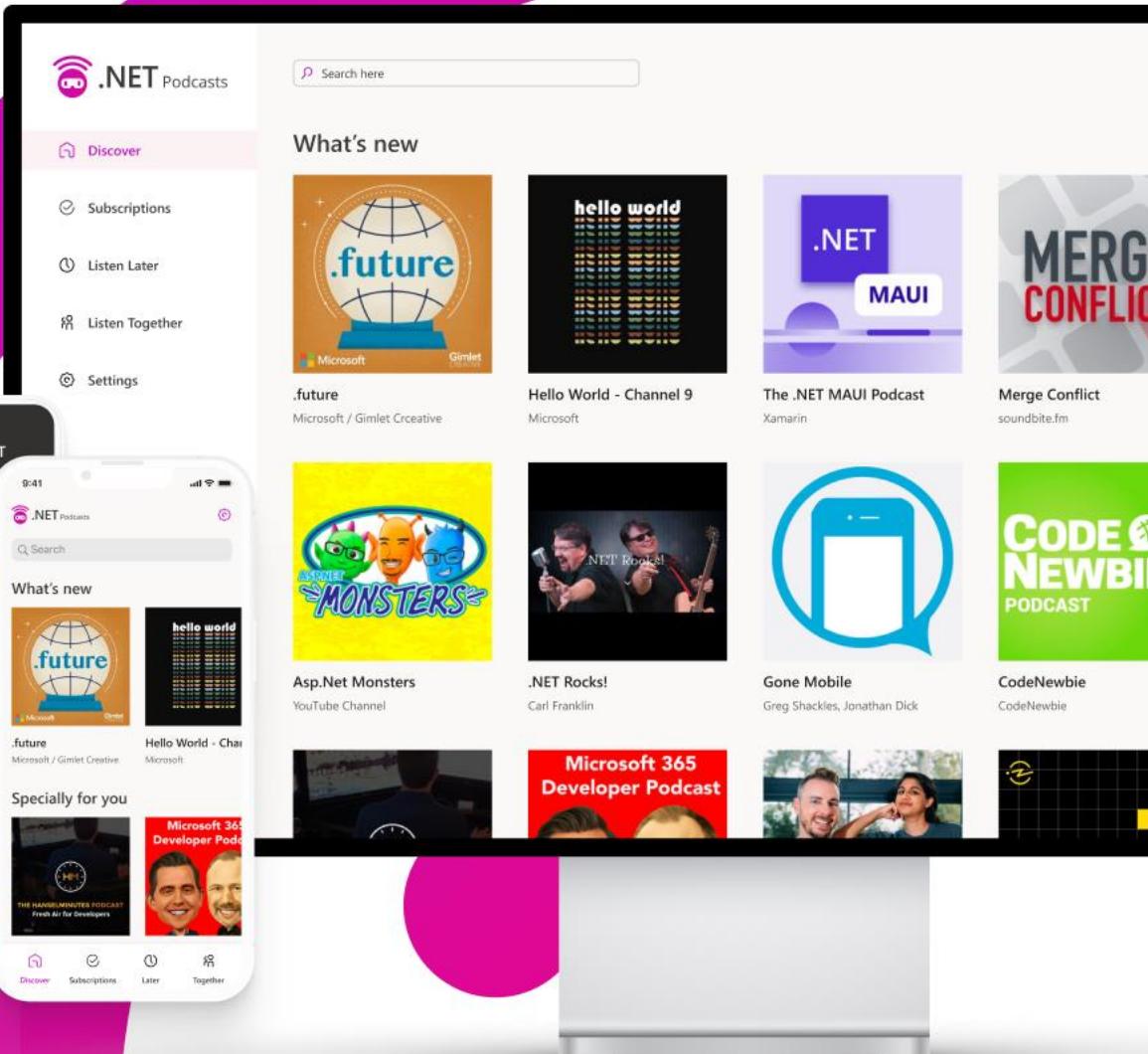
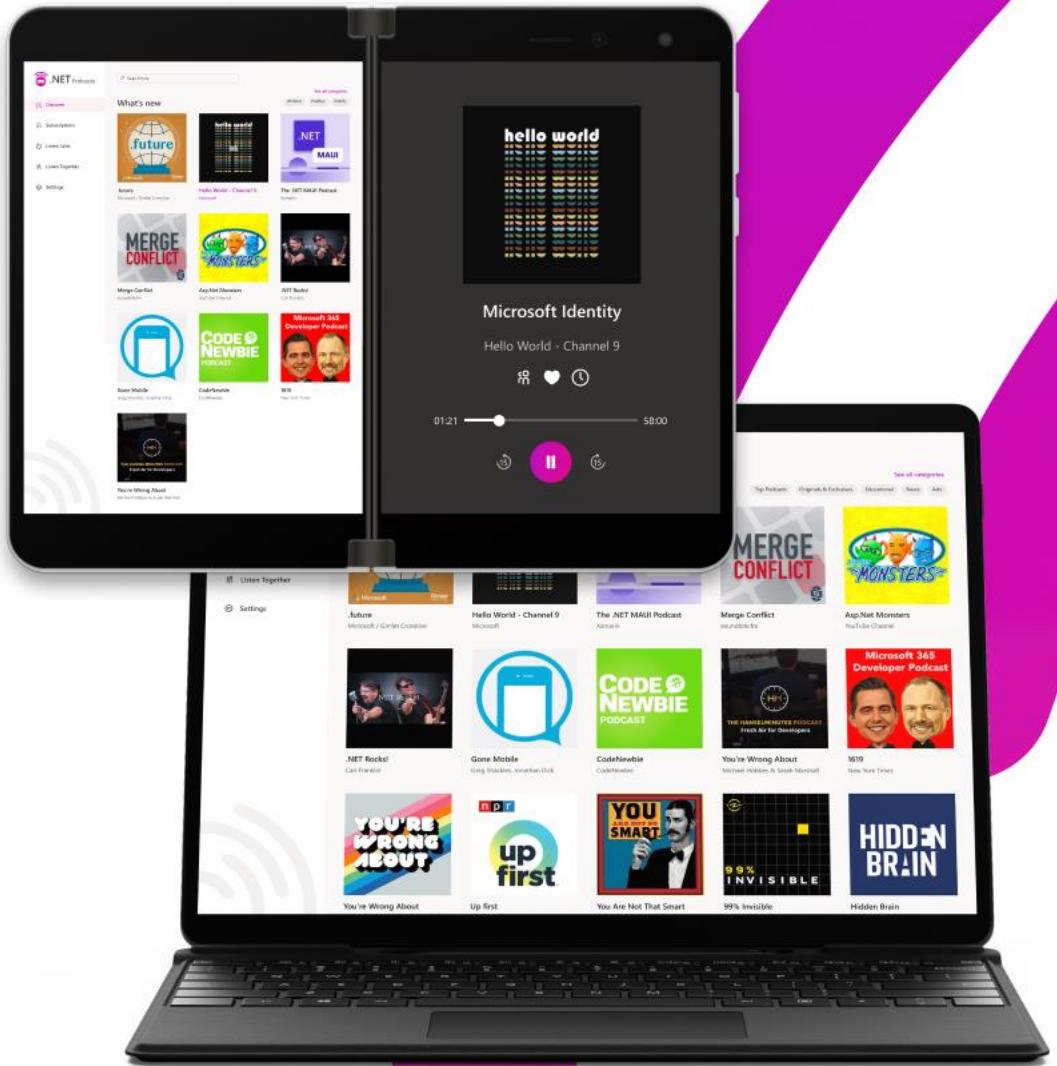
# Complete Product Lifecycle





# Rich Controls Vendor Ecosystem





# Demo

.NET Podcasts in Action

# .NET MAUI as a platform

Better together

# Hybrid

Bring native client capabilities to your web apps.



# Blazor Hybrid apps

Reuse UI components across native and web

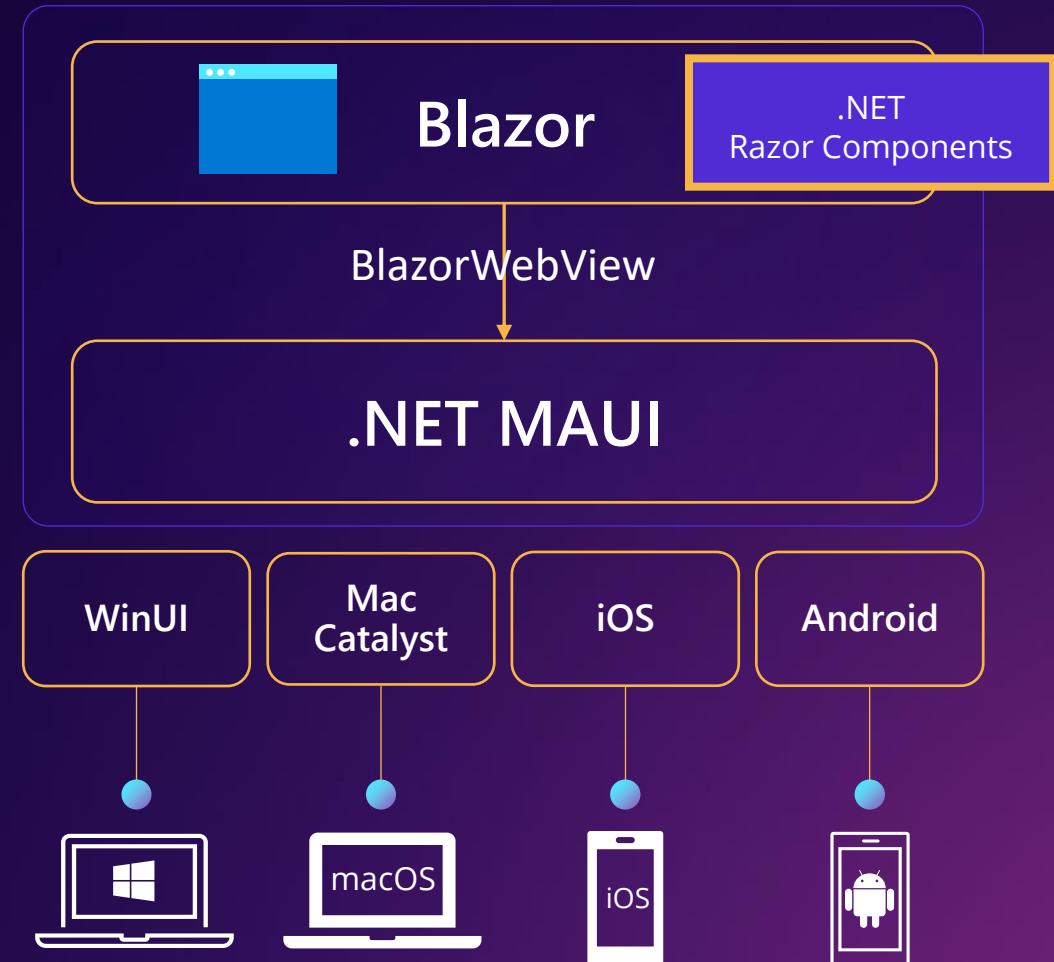
Native app container & embedded controls

No WebAssembly, No Server

Built on top of .NET Multi-platform App UI

Access native APIs

Mix & Match Web/Native UI



# Hybrid Architecture



# .NET offers choice for developers



# Demo

Let's look at Hybrid with .NET MAUI

# .NET MAUI as a platform

Better together

Avalonia UI



MAUI

# The Future of .NET MAUI

# Release schedule, support & patching



- A major version of .NET MAUI will ship with .NET going forward (.NET 7, .NET 8, etc.)
- .NET MAUI is an optional workload with external dependencies (such as Xcode & Android SDK tools)
- A major version of .NET MAUI will receive patches for 6 months after a successor (major version) ships
- Xamarin SDKs will receive support until May 2024

# .NET Multi-platform App UI (MAUI)

Generally available

**Single project system, single codebase**

WinUI

Mac Catalyst

iOS

Android



**Unified .NET**

**Mobile, desktop, hybrid**

**Productive development**

**Native APIs, Native performance**

# Get started today!

## Get started with .NET MAUI



**.NET Multi-platform App UI**  
Build native, cross-platform desktop and mobile apps all in one framework.

[Get started](#) [Read docs](#)

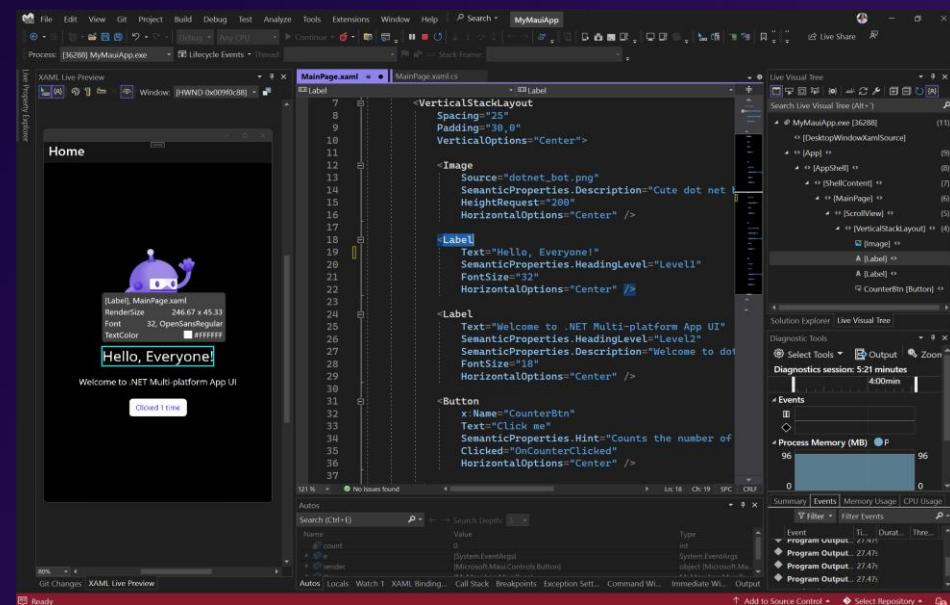
**Multi-platform**  
.NET MAUI uses the latest technologies for building native apps on Windows, macOS, iOS, and Android, abstracting them into one common framework built on .NET.

**One codebase**  
Use a single C# codebase and project system for all device targets to build apps that look and feel like the native platforms.

**Productive**  
Build beautiful apps faster and easier by integrating the power of Visual Studio with .NET MAUI.

[dot.net/maui](https://dot.net/maui)

## Download Visual Studio 2022



[visualstudio.com/download](https://visualstudio.com/download)

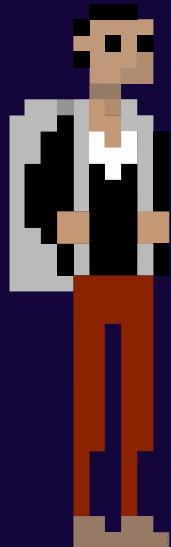
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- Your feedback is very important to us
- Please take a moment to complete the session survey found in the mobile app
- Use the QR code or search for “Converge360 Events” in your app store
- Find this session on the Agenda tab
- Click “Session Evaluation”



# Thank you so much!

## Q&A



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