DotNet 2021

ONLINE TECH CONFERENCE

#DotNet2021

22nd June 2021

Future of Modern Development with .NET

www.dotnet2021.com

DotNet 2021

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plain concepts

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#DotNet2021

Scott Hunter

Director of Languages and Platforms, Microsoft

I joined Microsoft in 2007 working on ASP.NET, in 2010 I moved to Azure to work on making .NET work great in Azure and then in 2016 I moved into DevDiv to work on all of .NET.

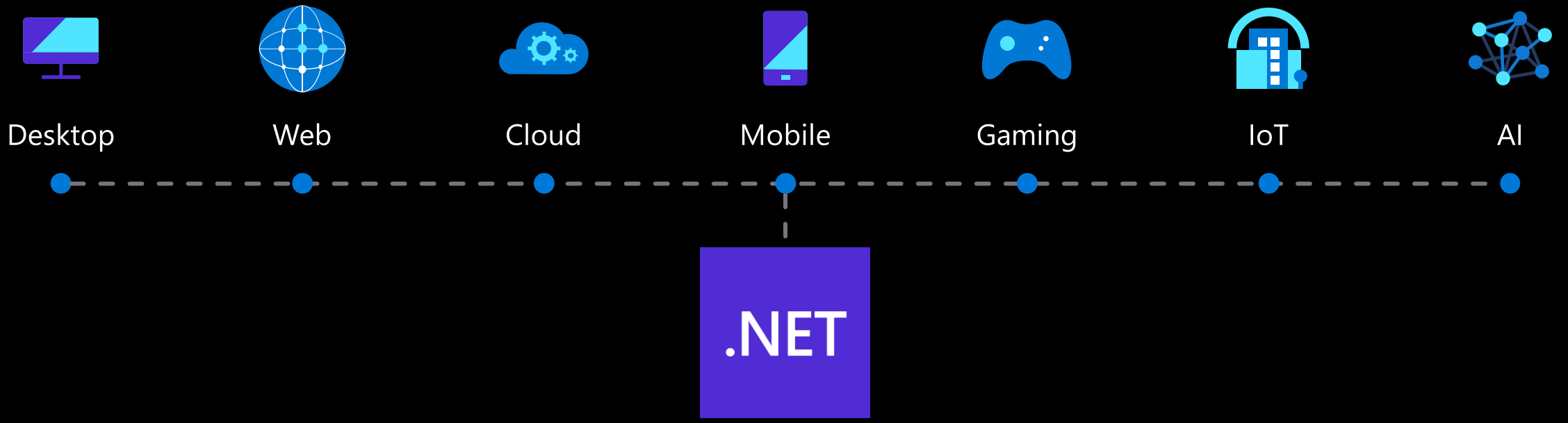
Today my team works on .NET, C#, F#, VB.NET and .NET Tooling. My team also works on Microsoft Open JDK and C++.

@coolcsh

scott.hunter@microsoft.com

.NET

Your platform for building anything



.NET ecosystem momentum

>5M

.NET developers

In Visual Studio family

#1

Most Loved Framework (2019 & 2020)

.NET Core

Top 30

Highest velocity OSS project

github.com/dotnet

Top 5

Language on GitHub

C#

>10X

Faster than Node.js

ASP.NET Core

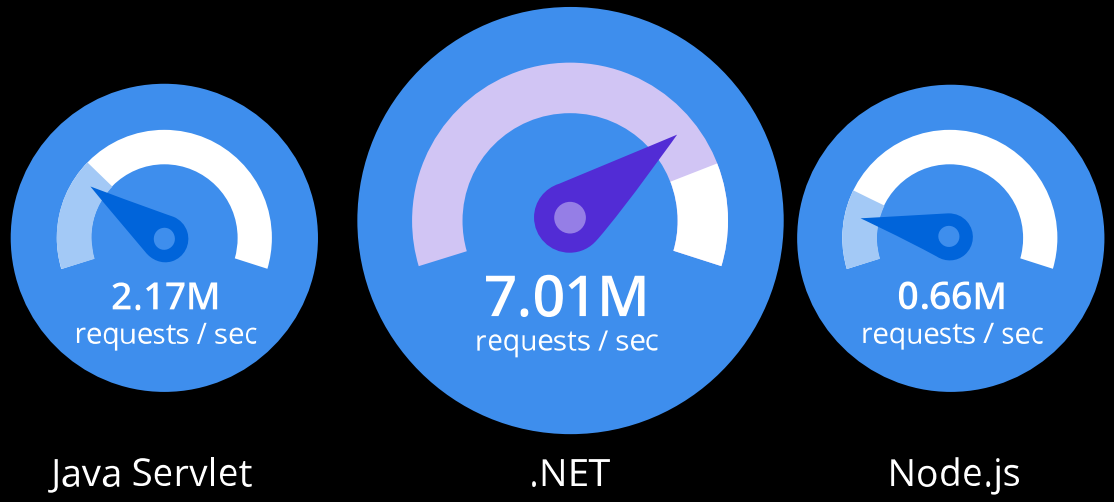
40%

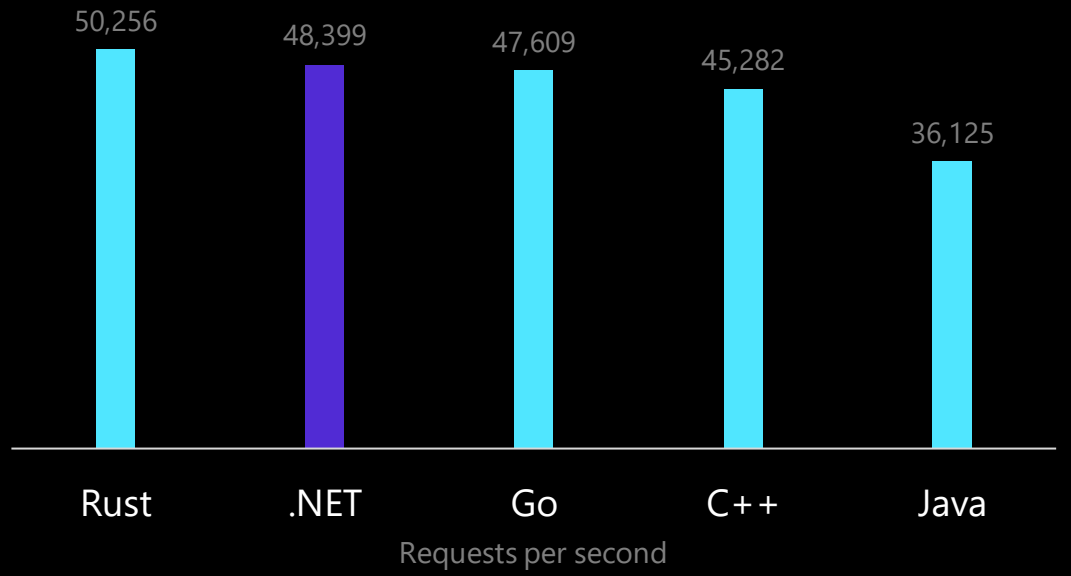
New to .NET are students

dot.net download survey

Sources: insights.stackoverflow.com/survey/2019#most-loved-dreaded-and-wanted; insights.stackoverflow.com/survey/2020#most-loved-dreaded-and-wanted; github.com/cncf/velocity/blob/master/reports/top_projects_by_activity.txt; octoverse.github.com/; www.techempower.com/benchmarks/#section=data-r20&hw=ph&test=plaintext

.NET 5 Performance





>10X faster than Node.js

ASP.NET Core web framework

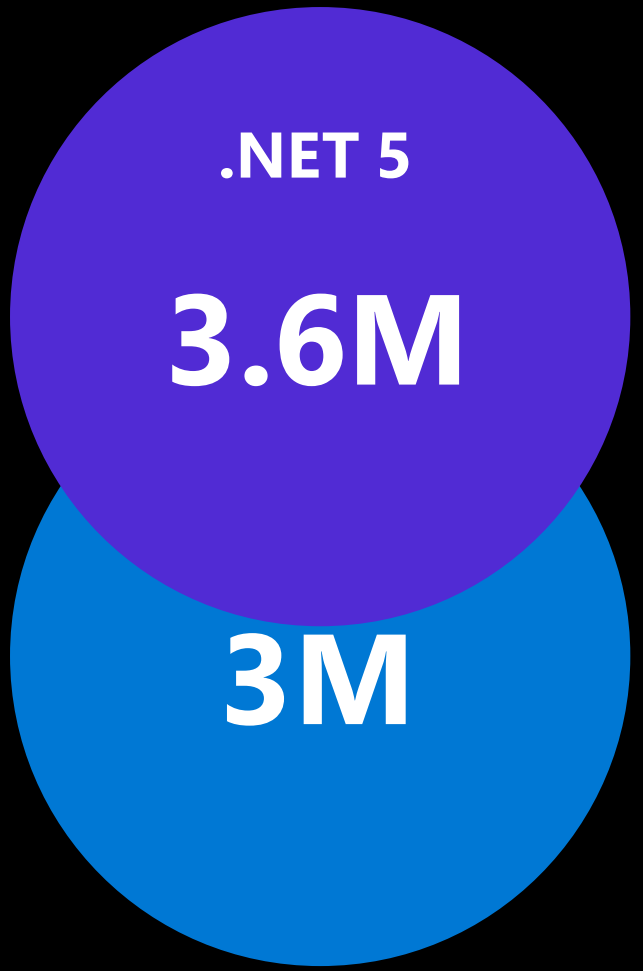
Faster than Go, C++ and Java

gRPC server performance

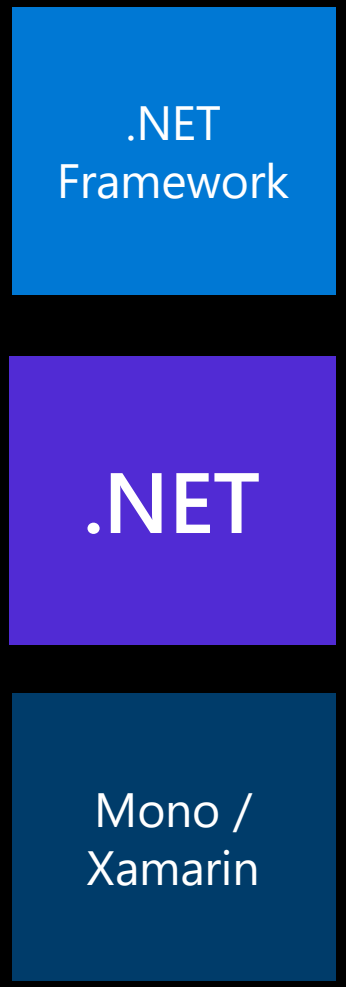
Sources:
https://www.techempower.com/benchmarks/#section=data-r20&hw=ph&test=plaintext
https://github.com/LesnyRumcajs/grpc_bench/wiki/2020-08-11-bench-results

.NET adoption

Downloads in first 6 months of release



Why .NET 5?



Flexible deployment

Unparalleled performance

Reduced infrastructure & hosting costs

Modern, innovative languages and APIs

PREVIEW

.NET Upgrade Assistant

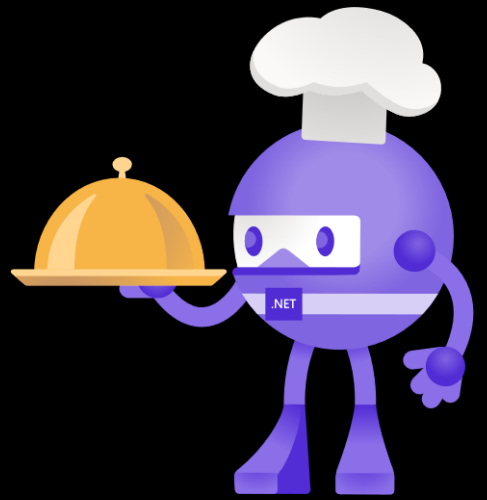
Reduce time and difficulty modernizing older .NET codebases

Guided, step-by-step experience

Multiple project types supported

Learn more | aka.ms/dotnet-upgrade-assistant

Demo – Upgrade Assistant



One .NET - .NET 6

.NET

Single SDK, one BCL, unified toolchain

Cross-platform native UI

Cross-platform web UI

Cloud native investments

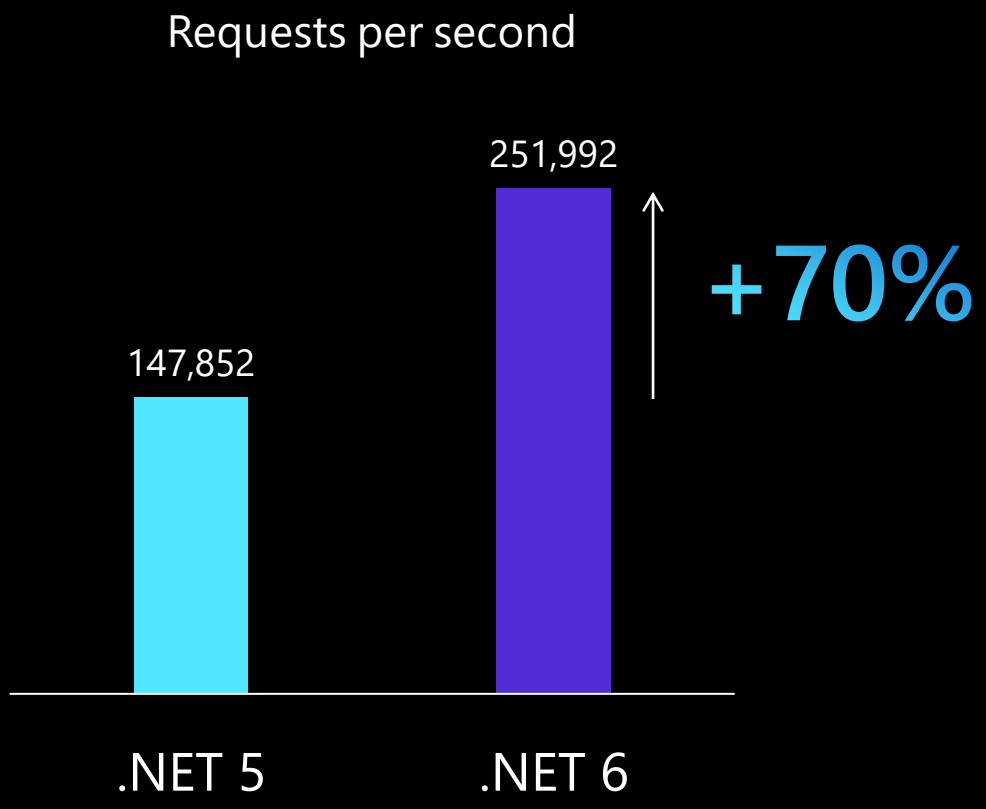
Performance & productivity improvements

.NET has the best of breed solutions for all modern workloads in a single, unified development platform

.NET 6 main features

- Simplify and write less code with C# 10
- .NET Multi-platform App UI for native mobile & desktop apps
- Blazor desktop web apps with native device capabilities
- Minimal web APIs for cloud native apps
- More device targets including Apple M1
- Windows Forms and WPF on ARM64 & Single file EXE deployment
- Developer productivity enhancements like hot reload
- Continued performance improvements in runtime and build time

Entity Framework Core performance



Tests done in-house on the same hardware as TechEmpower Fortunes benchmark

Many optimizations within EF Core

70% faster with .NET 6

31% faster query performance

Up to 43% reduced memory allocation

Simplify your code with C# 10

```
global using System;

namespace Model;

public record struct Person
{
    public required string Name
    {
        get;
        init => field = value.Trim();
    }
}
```

Many syntactic simplifications, less boilerplate

Record structs

Improvements to lambdas and auto-properties

General availability in .NET 6

Minimal web APIs for cloud native apps

```
var app = WebApplication.Create(args);

app.MapGet("/", () => "Hello World!");

app.Run();
```

Lightweight, single-file, cloud native APIs

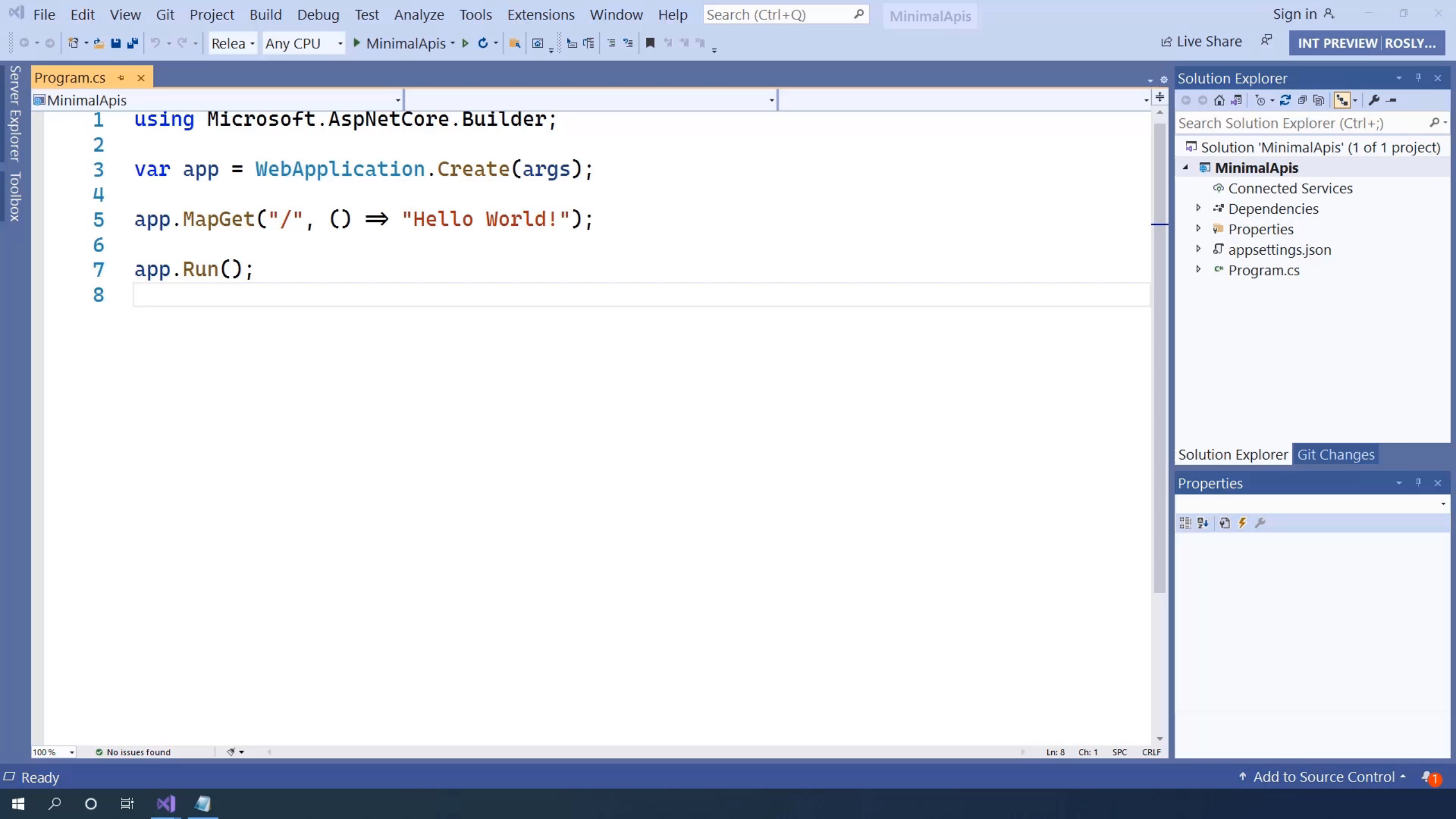
Low ceremony, top-level C# programs

Path to MVC

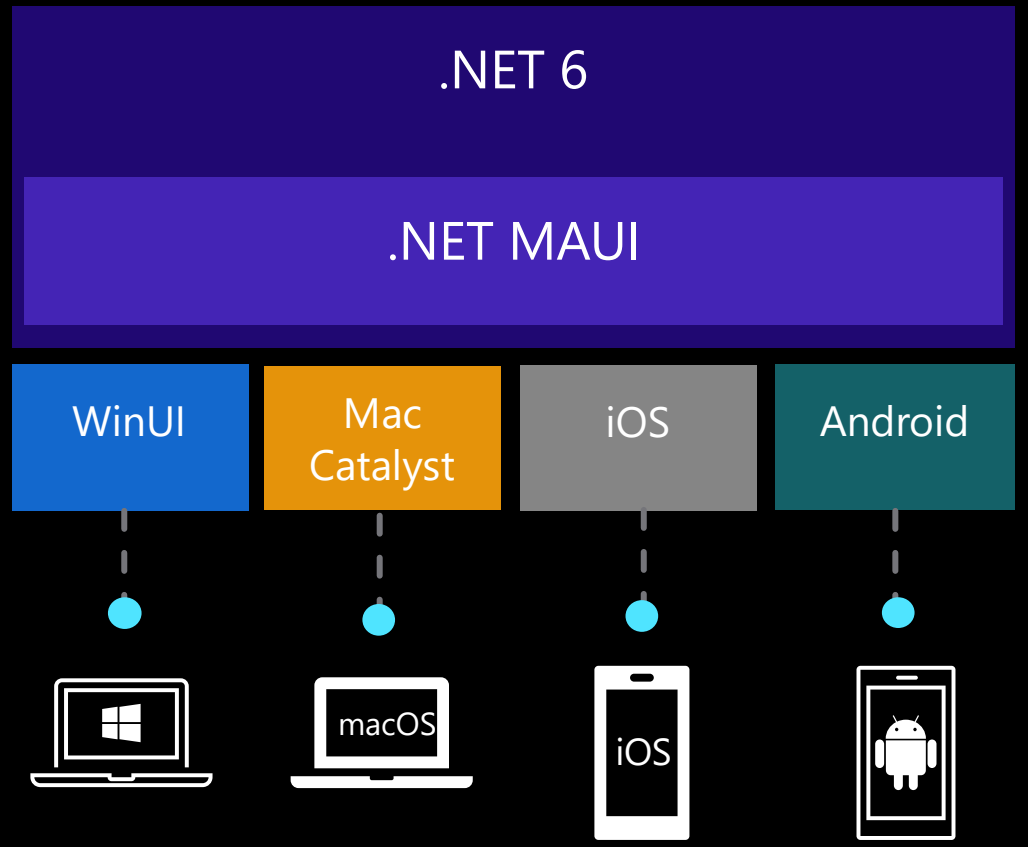
General availability in .NET 6

Minimal code for minimal apps

Demo – minimal web APIs


File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help
Search (Ctrl+Q)
MinimalApis
Sign in
Live Share
INT PREVIEW ROSLY...
Releа
Any CPU
MinimalApis
Server Explorer
Toolbox
Program.cs
MinimalApis
1 using Microsoft.AspNetCore.Builder;
2
3 var app = WebApplication.Create(args);
4
5 app.MapGet("/", () ⇒ "Hello World!");
6
7 app.Run();
8
Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'MinimalApis' (1 of 1 project)
MinimalApis
Connected Services
Dependencies
Properties
appsettings.json
Program.cs
Solution Explorer
Git Changes
Properties
100 %
No issues found
Ln: 8
Ch: 1
SPC
CRLF
Ready
Add to Source Control
1

.NET Multi-platform App UI



Cross-platform, native UI

Single project system, single codebase

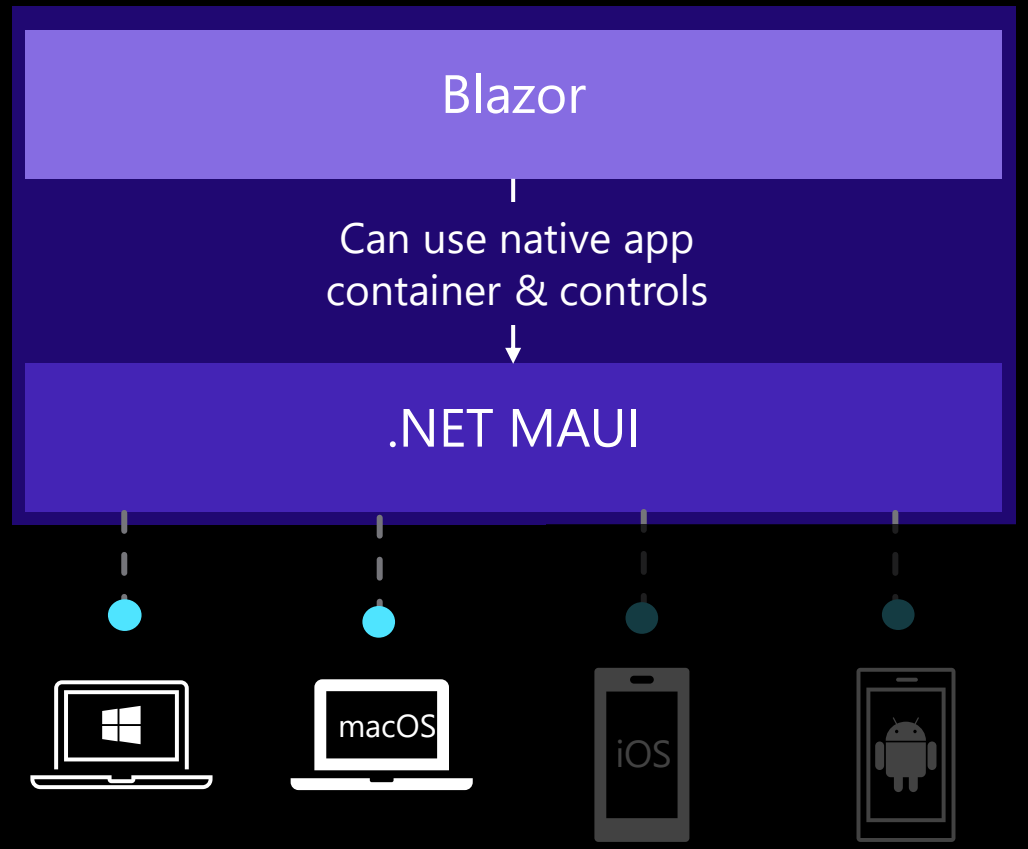
Deploy to multiple devices, mobile & desktop

General availability in .NET 6

github.com/dotnet/maui

Demo – .NET Multi-platform App UI

Blazor desktop apps



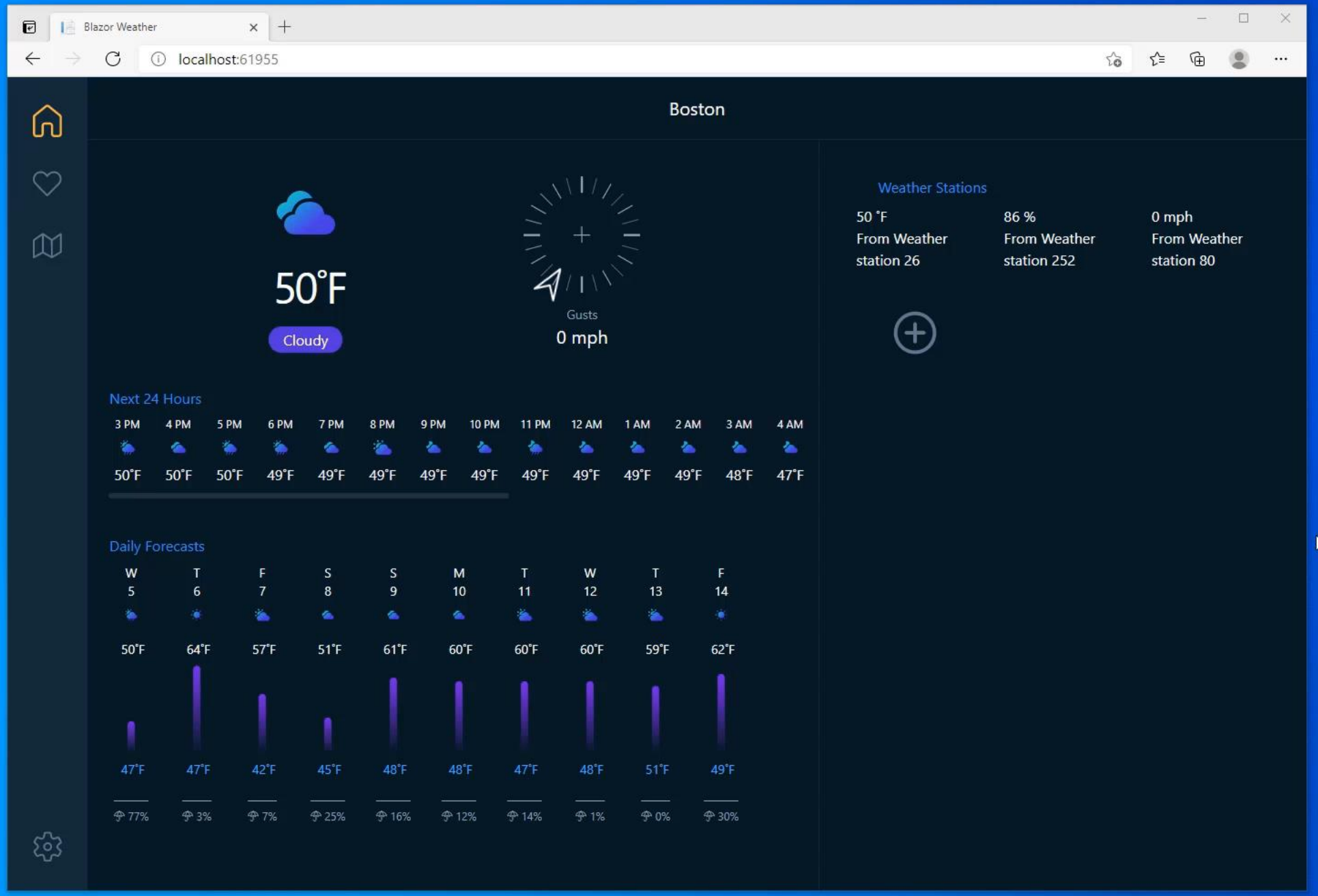
Reuse UI components across native and web

Built on top of .NET Multi-platform App UI

Native app container & embedded controls

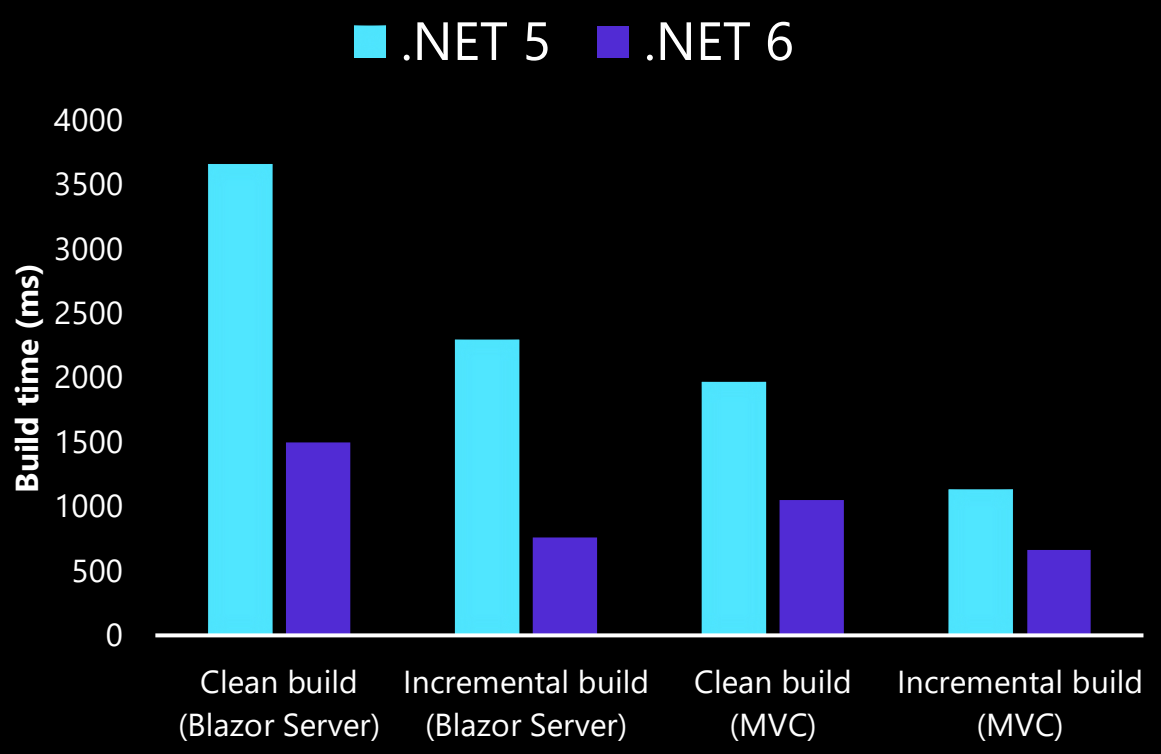
General availability in .NET 6

Demo –ASP.NET Core & Blazor



Windows 10 Enterprise
For testing purposes only. Build 19041.vb_release.191206-1406

Developer productivity improvements (“inner loop”)



Build time perf improvements in CLI & Visual Studio

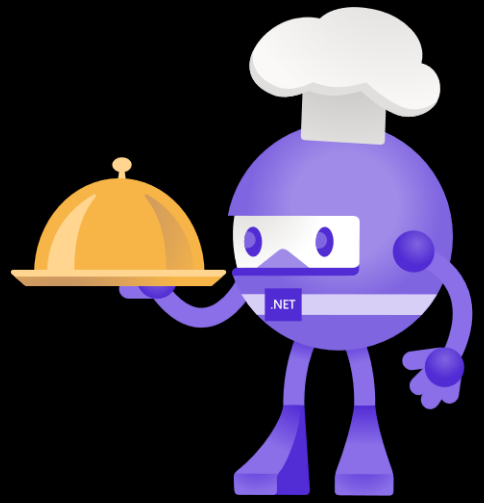
Hot reload everywhere, all project types

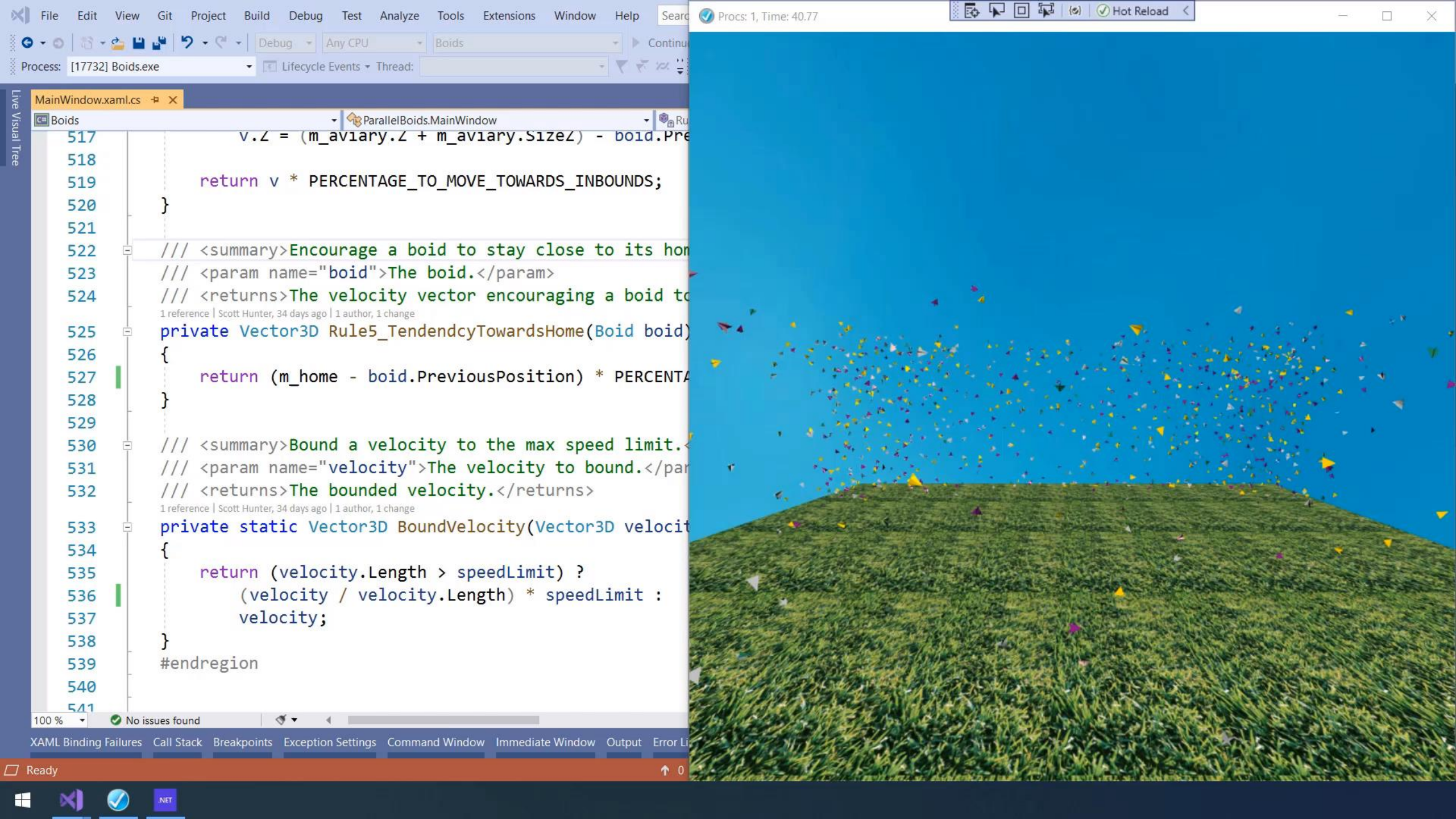
No process restart, maintains state

Optionally attach the debugger

Evolution of “Edit & Continue”

Demo – Hot reload




File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help
Debug
Any CPU
Boids
Process: [17732] Boids.exe
Lifecycle Events
Thread:
MainWindow.xaml.cs
Boids
ParallelBoids.MainWindow
517 v.Z = (m_aviary.Z + m_aviary.SizeZ) - boid.Pre
518
519 return v * PERCENTAGE_TO_MOVE_TOWARDS_INBOUNDS;
520 }
521
522 /// <summary>Encourage a boid to stay close to its hom
523 /// <param name="boid">The boid.</param>
524 /// <returns>The velocity vector encouraging a boid to
1 reference | Scott Hunter, 34 days ago | 1 author, 1 change
525 private Vector3D Rule5_TendendcyTowardsHome(Boid boid)
526 {
527 return (m_home - boid.PreviousPosition) * PERCENTA
528 }
529
530 /// <summary>Bound a velocity to the max speed limit.<
531 /// <param name="velocity">The velocity to bound.</par
532 /// <returns>The bounded velocity.</returns>
1 reference | Scott Hunter, 34 days ago | 1 author, 1 change
533 private static Vector3D BoundVelocity(Vector3D velocit
534 {
535 return (velocity.Length > speedLimit) ?
536 (velocity / velocity.Length) * speedLimit :
537 velocity;
538 }
539 #endregion
540
100 %
No issues found
XAML Binding Failures
Call Stack
Breakpoints
Exception Settings
Command Window
Immediate Window
Output
Error Li
Ready
Procs: 1, Time: 40.77
Hot Reload

PREVIEW

.NET 6 Preview 4

.NET MAUI now supported in Visual Studio

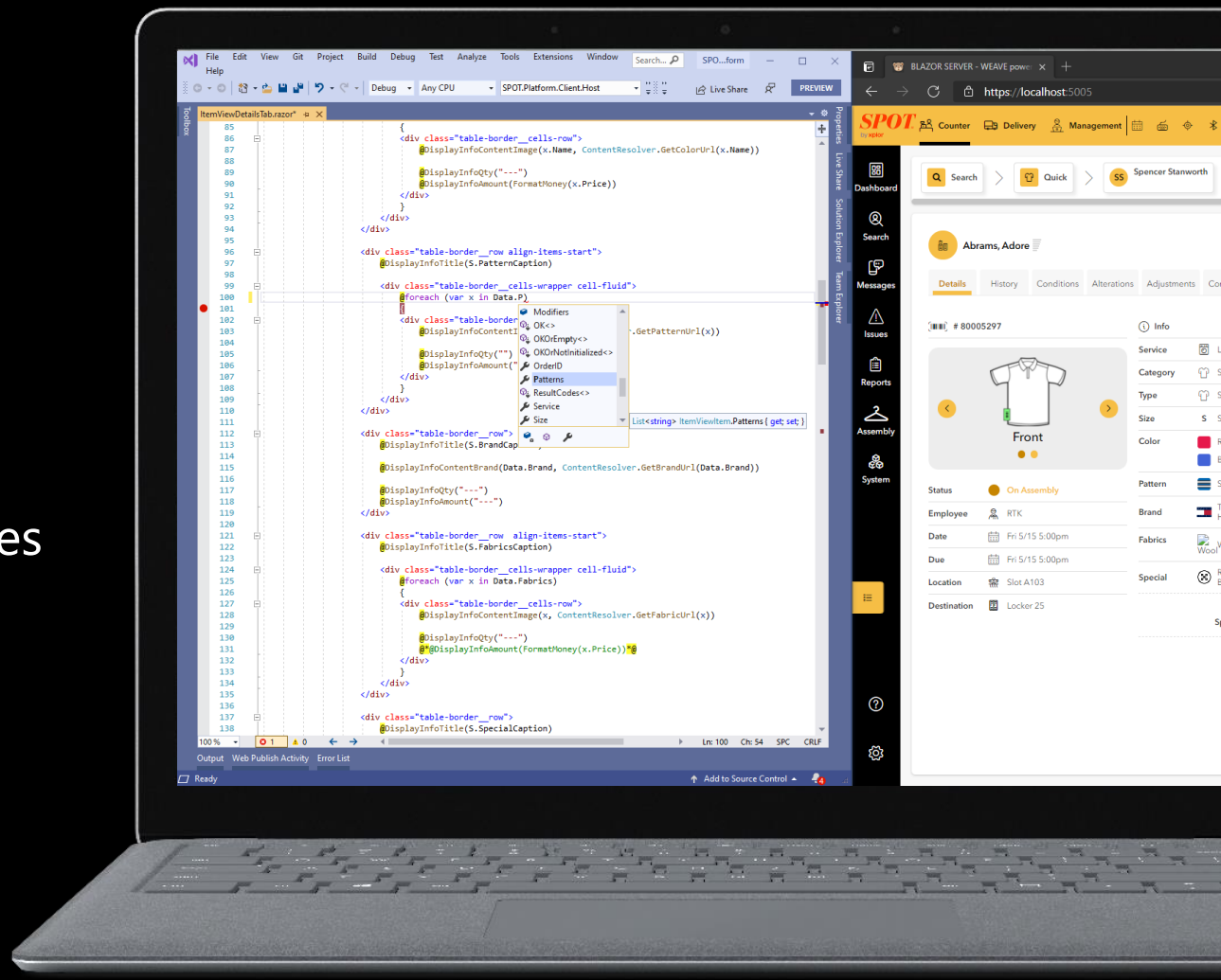
ASP.NET Blazor hybrid desktop apps

Minimal web APIs and smaller, faster microservices

More device targets, more flexible deployment

Performance and productivity improvements

Download | dot.net/get-dotnet6



NEW CAPABILITIES

ML.NET

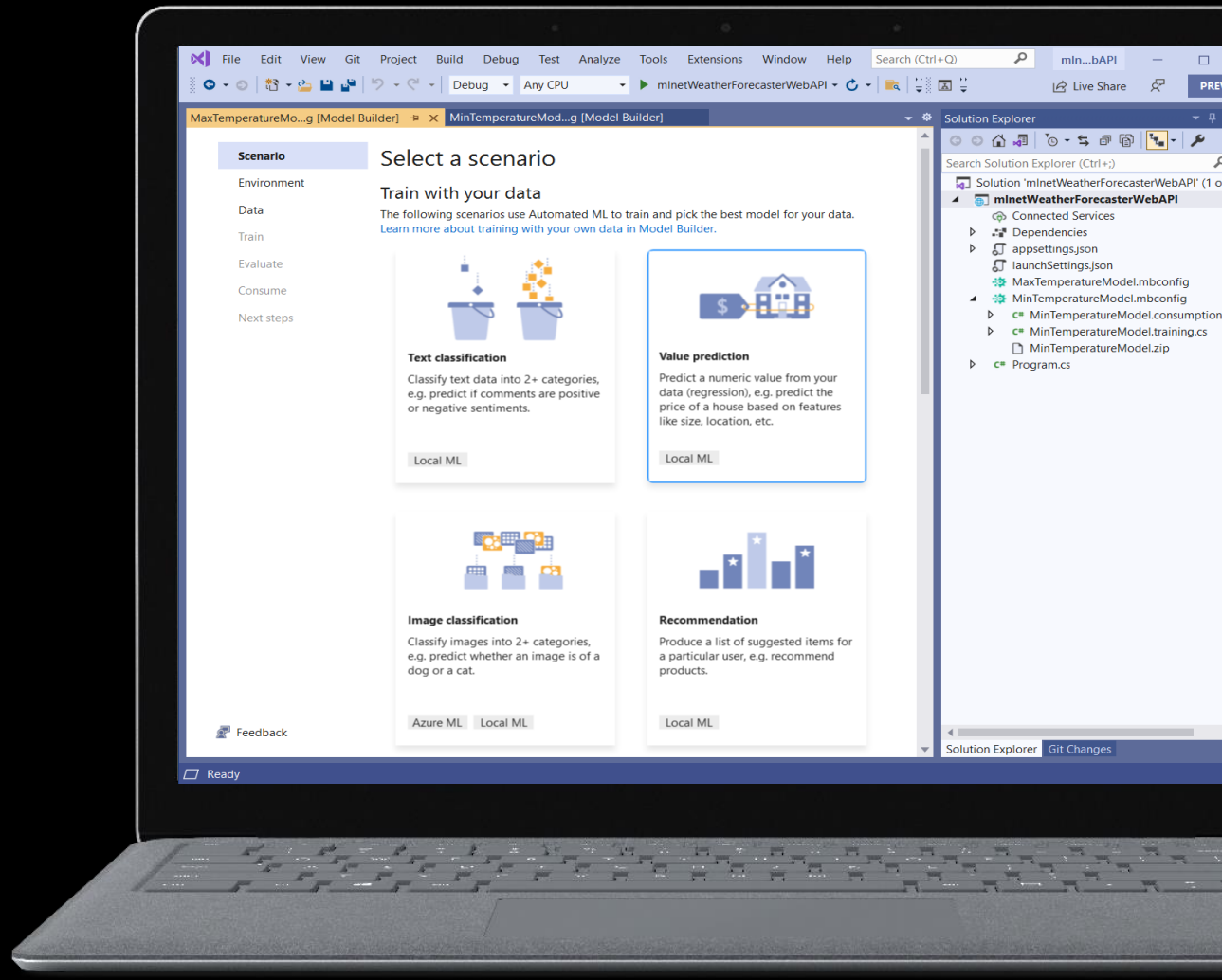
Now supports ARM64 and Apple M1

Config-based training enables saved training state

Model builder perf improvements

Improved AutoML

Learn more | dot.net/ml



ANNOUNCING

.NET Conf 2021

November 9 – 11

.NET 6 launch

Free, three-day, virtual event

Save the date!

www.dotnetconf.net

Take Aways

Download .NET 6 Preview 4

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.NET 6 Preview 4 blog post

aka.ms/dotnet6-preview4

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