

# State of .NET

## BUILD 2022 Recap & .NET 7 Preview

### **Markus Egger**

President and Chief Software Architect  
CODE Magazine, CODE Consulting, CODE Staffing

# Kicking Things Off

## Jim Duffy

- Director of Business Development  
CODE Magazine & Consulting
- Former Developer – Drawn to the Dark Side: Now Responsible for  
Marketing & Business Development
- [jduffy@codemag.com](mailto:jduffy@codemag.com) / [My Bio](#)
- International Author and Speaker
- Former Microsoft RD (Regional Director) 9 years
- Former 11-time Microsoft Most Valuable Professional (MVP)
- Twitter: @jmduffy



# About CODE Consulting

## “Helping People Build Better Software”

- Microsoft Certified Partner
- Custom Software Development, Training, Mentoring,...
- Web, Cloud, Mobile, Desktop, Serverless, Databases,...
- User Interface and Interaction Design
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- Just help from our team of experienced software developers.
- Got questions? Stuck on an issue? Platform and/or architecture decisions to make? We can help!



Contact us at:  
[info@codemag.com](mailto:info@codemag.com) or  
[jduffy@codemag.com](mailto:jduffy@codemag.com)

# Reference Links

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- Want to write for us?

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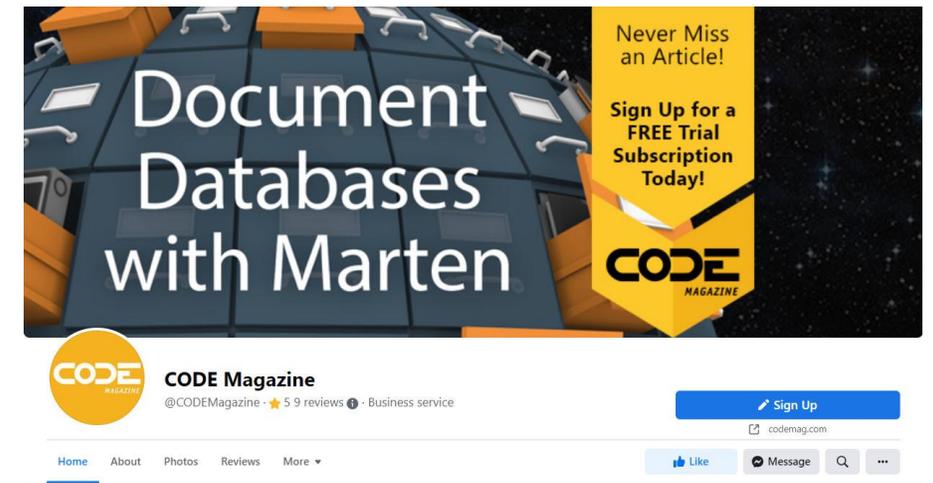
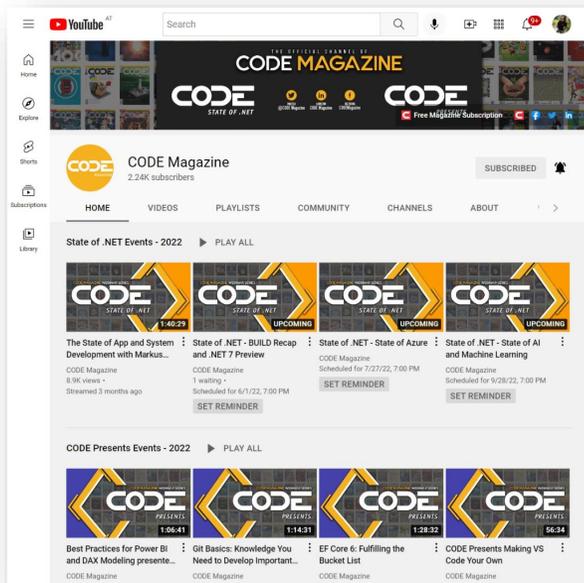
- Need to add talent to your development team?

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- Check out the new CODE Magazine Mobile application!
- Available for iOS & Android



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- Survey must be completed by 11:59pm ET on Friday 6/3/2022 to be eligible!
- Name selected from registered attendee list. Completed survey is required to win.
- **THIS SLIDE WILL BE REPEATED AT THE END AND SURVEY LINK REPEATED IN THE CHAT WINDOW!**

## State of .NET - BUILD Recap and .NET 7 Preview with Markus Egger

The survey will take just a couple of minutes to complete.

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\* Required

1. Full Name \*

Enter your answer

2. Company Name \*

Enter your answer

# Build Cross Platform Apps With Photino

- Build native, cross-platform desktop apps that are lighter than light.
- Open-source framework for building native, cross-platform desktop applications with Web UI technology (HTML/CSS & JavaScript).
- Photino is maintained by the CODE Team with the help of the open-source community.

- [tryphotino.io](https://tryphotino.io)
- [Github.com/tryphotino](https://github.com/tryphotino)



# Recordings & Slide Decks

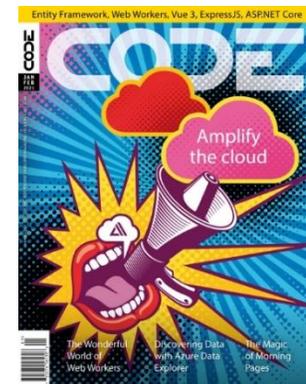
- State of .NET Webinar Series
  - <https://www.codemag.com/StateOfDotNet>
- CODE Presents Webinar Series
  - <https://www.codemag.com/CODEPresents>

**Recent Event Recordings**

<b>State of .NET - The State of .NET App and System Development</b> 2/23/2022	<b>State of .NET - .NET Conf Recap</b> 11/17/2021
	
<b>State of .NET - .NET 6 Preview</b> 10/27/2021	<b>State of .NET - Azure Architecture</b> 9/29/2021
	

# About the Presenter

- **Markus Egger**
- President and Chief Software Architect  
EPS Software Corp. (dba CODE Consulting)
- Publisher – CODE Magazine
- International Author and Speaker
- Microsoft RD (Regional Director)
- Microsoft MVP 1995-2019
- [Email: markus@codemag.com](mailto:markus@codemag.com)
- Twitter: @markusegger



# Agenda

- What happened at BUILD 2022?
  - With a special eye on things that are important for developers
- What is coming in .NET 7 (and when)?

# Microsoft Build

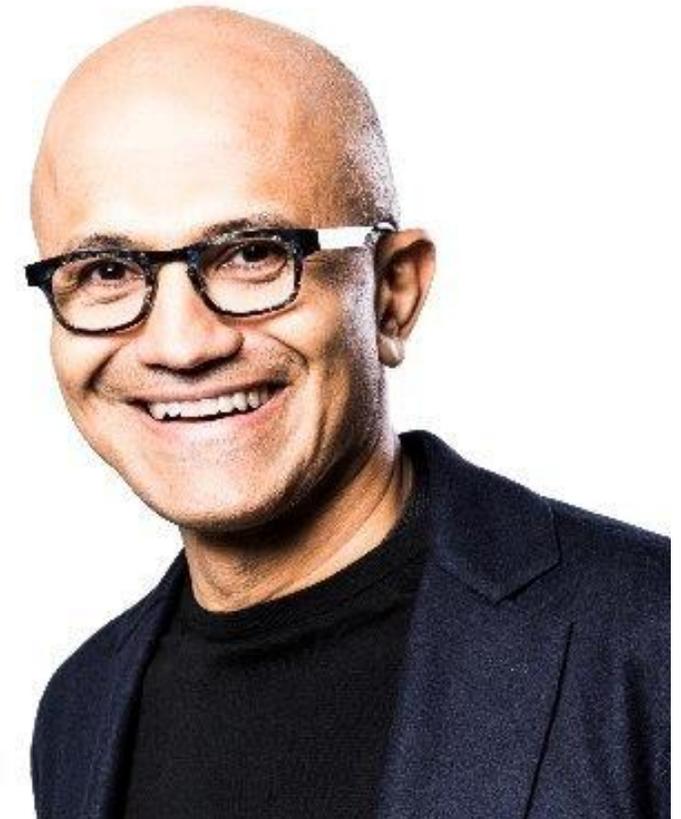
The background features a light purple gradient. On the right side, there is a cluster of colorful, semi-transparent rectangular blocks in shades of pink, blue, and yellow, arranged in a somewhat chaotic, overlapping manner. At the bottom, several smooth, wavy lines in shades of teal, light blue, and purple flow across the frame, creating a sense of motion and depth.

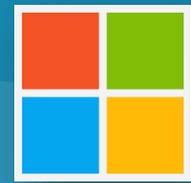
# Markus Egger's "BUILD in one slide"

- Azure & Cloud Everywhere
- AI Everywhere
- Low-Code gains in importance
- .NET is stronger than ever
  
- All in all, ... a continuation of prior themes

# Satya Nadella's 10 Keynote Pillars

1. Developer Flow
2. Cloud Ubiquity
3. App Ubiquity
4. Cloud Native Computing
5. Unified Data
6. Models as Platforms
7. Hybrid AI
8. Low Code/no-code
9. Collaborative Apps
10. Metaverse





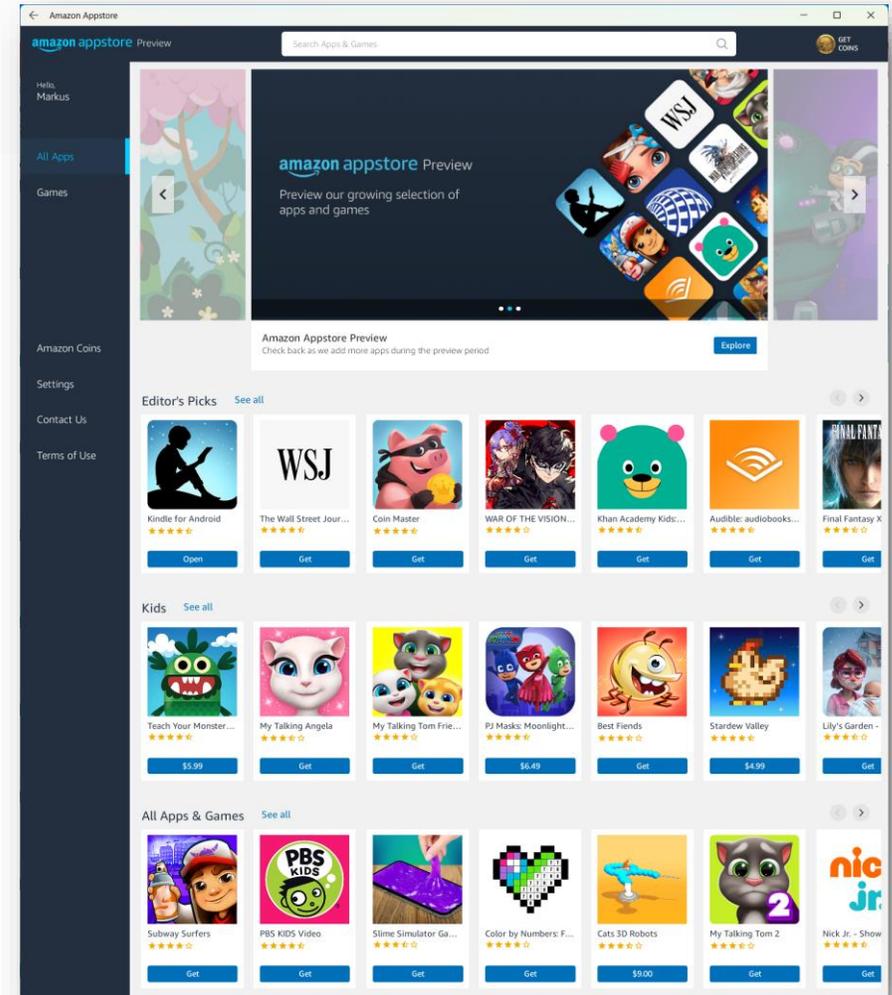
# Windows

# Windows

- Not a whole lot of Windows news at BUILD...
- Windows Store
- WSL (preview) is now available in the Microsoft Store
- Windows 365
- Windows Subsystem for Android
- Windows-on-Arm (WoA)
- Windows App SDK 1.1 (preview) available
- Widgets (including 3<sup>rd</sup> party widgets)

# Windows Subsystem for Android

- Enables Android Apps to run on Windows
- Delivered to Windows through the Amazon Appstore
  - The Amazon Appstore can be installed through the Windows Store
  - This automatically installs the Android Subsystem
- This is currently in public preview (US only)

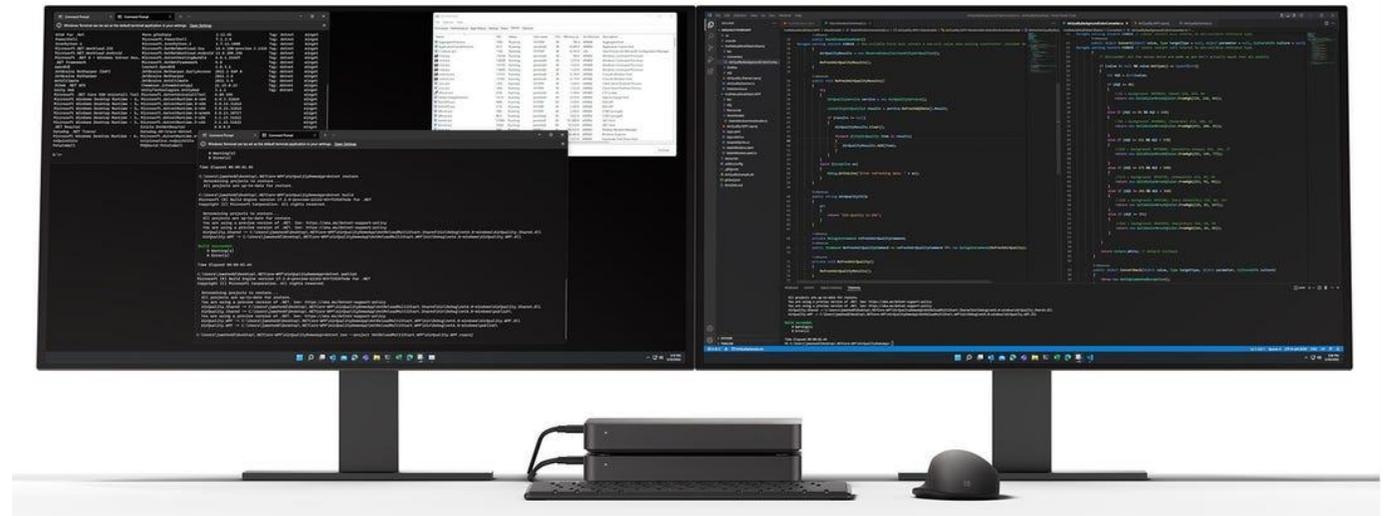


# Microsoft Dev Box (Project "Fidalgo")

- High-performance developer workstations on Azure based on Windows 365 Cloud PCs that are instantly ready to use
  - Currently in preview
- Motivations:
  - Tackling the complexity of dev environment setup
  - Managing incompatibility and conflicts between environments
  - "Day 1" onboarding experience for new developers
  - Security of remote devices
  - Varying industry standards
  - Enabling and leveraging remote working in development
    - 82% of people working remotely assume this will continue
    - 52% of developers say they would leave an on-site job for remote work

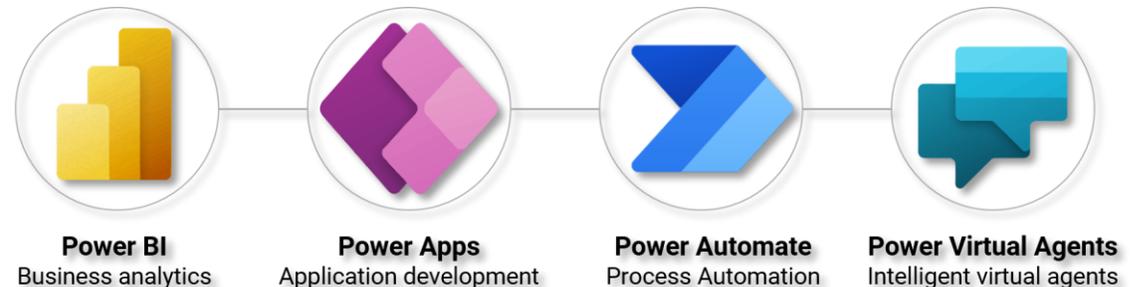
# Project "Volterra"

- ARM dev kit built in the Snapdragon compute platform
- Windows-on-Arm (WoA) development environment
- ARM-based versions of dev tools
- Includes NPUs (Neural Processing Units) for AI scenarios



# Microsoft Power Platform

- Low-Code platform
- Low-Code development is becoming more and more important
  - Some estimates predict 70% of future development needs may be covered by low-code technologies
- Power Platform: 5 Products
  - Power BI
  - Power Apps
  - Power Pages (new!)
  - Power Automate
  - Power Virtual Agents





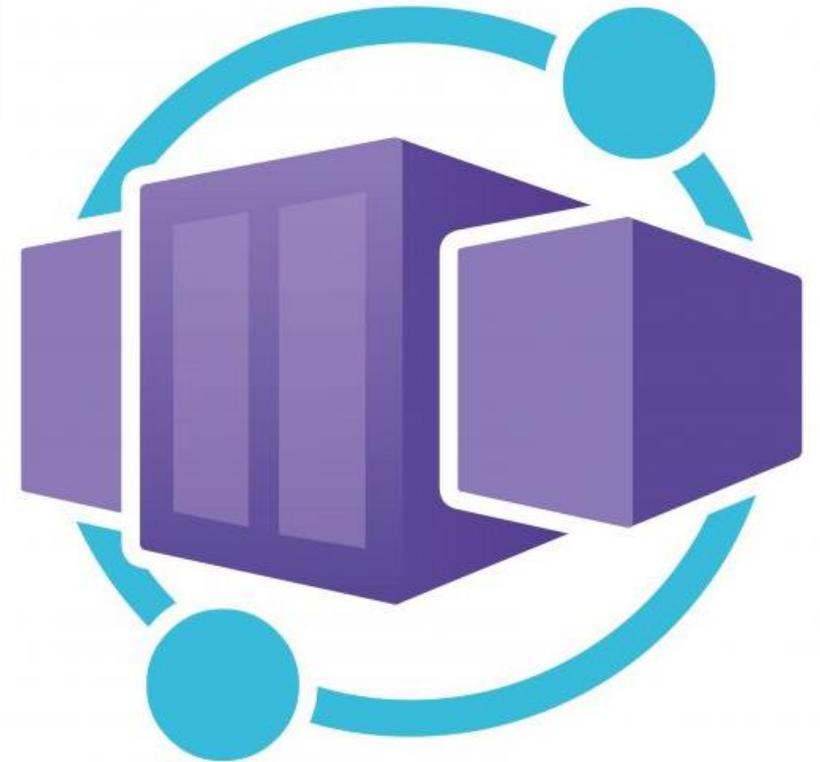
# Azure App Service

- Fundamental service used to host web apps on Azure
- Windows and Linux
- Recent enhancements:
  - Google Remote Procedure Call (gRPC)
  - Bulk migration capabilities
  - Landing Zone Accelerator



# Azure Container Apps

- Serverless container solution
- Auto-scale (including “scale-to-zero”)
- Easier to use and deploy, compared to a typical Kubernetes setup
- However: Seamlessly upgrades to Kubernetes as needed



# Azure Kubernetes Service

- Still a great way to set up container-driven environments
- Provides great control over containerized systems
- Enabled DevOps scenarios



# SQL Azure

- New version of SQL Server on Azure
- Microsoft Intelligent Data Platform
- Cool feature alert: Ledger support (Blockchain)



# Azure Cosmos DB Preview

- Increased serverless capacity to 1TB
- New 30-day free trial!



# AI & Machine Learning

# Azure AI

- AI is becoming more and more important in many scenarios
  - It is more difficult to think of scenarios that *can't* benefit from AI, than it is to think of scenarios that can
- Microsoft is launching more and more turn-key AI services
- Microsoft is also enabling fundamental AI & Machine Learning development in a variety of ways

# Models as a Platform

- Microsoft AI
  - Turing – Rich language understanding
  - Z-Code – 100 languages translation
  - Florence – Breakthrough visual recognition
- OpenAI
  - GPT – Human-like language generation
  - DALL-E – Realistic image generation
  - Codex – Advanced code generation

# Azure OpenAI Services

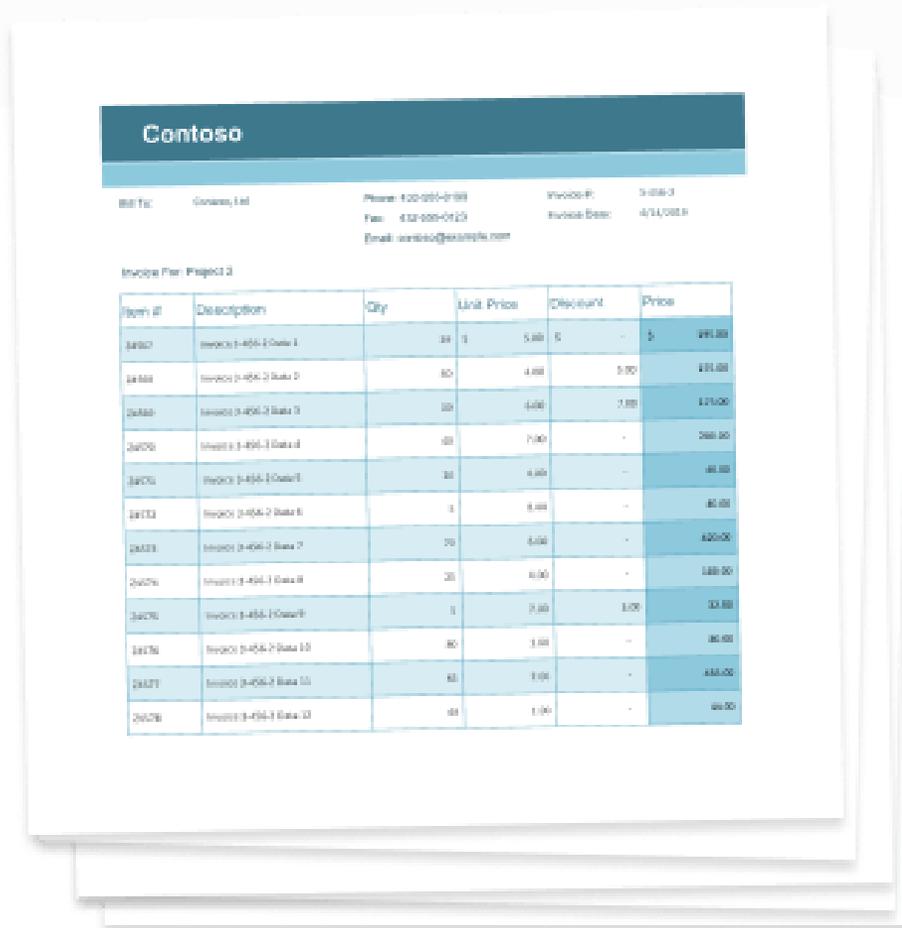
- New reasoning and comprehension capabilities for text-based scenarios
- Examples: Writing assistance, code generation, making sense of unstructured data
- Now available as a limited access preview

# Cognitive Service for Language

- Natural Language Processing (NLP)
- Examples:
  - Named entity recognition (NER)
  - Key phrase extraction
  - Summaries, language detection
  - Sentiment analysis
  - ...
- <https://docs.microsoft.com/en-us/azure/cognitive-services/language-service/overview>

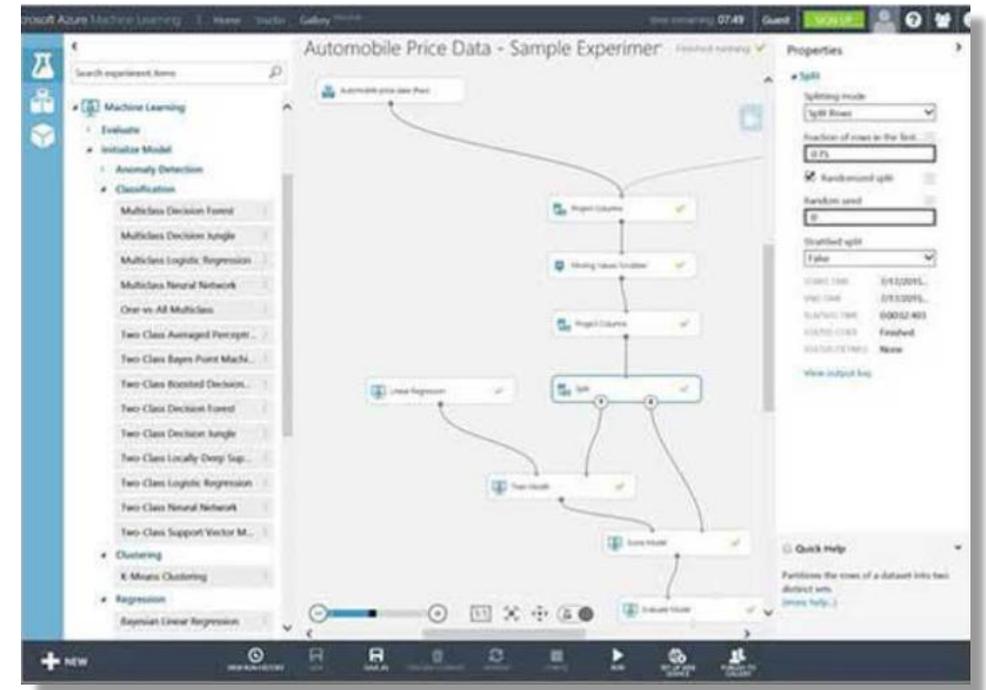
# Azure Form Recognizer

- Another great example for a pre-trained model that has recently been improved
- Very useful service for business application scenarios



# Responsible AI Dashboard

- Dashboard for Data Scientists
- Aims to more easily implement responsible AI
- Helps analyze why AI comes to certain conclusions
  - Data exploration
  - Fairness
  - Model interpretability
  - Error analysis
  - Counterfactual inference analysis
  - Causal inference analysis
  - ...



# .NET

Where Are We At?



.NET

20

YEARS

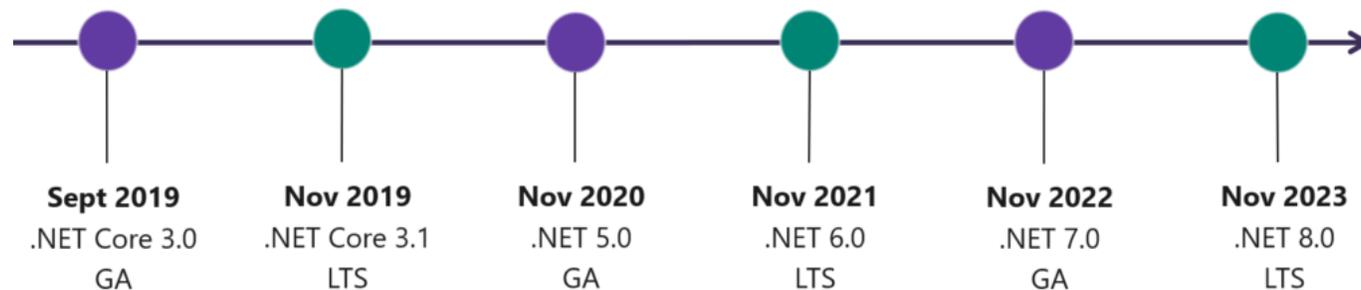
# 20 Years of .NET!

- .NET just turned 20!
- Visual Studio just turned 25!
- <https://dotnet.microsoft.com/en-us/>



# .NET Timeline/Roadmap

- .NET 6 Released: November 9<sup>th</sup>, 2021
- .NET 7 Release: November 8<sup>th</sup>, 2022 (at .NET Conf... as always 😊)
- Annual, predictable releases (started with .NET Core 3.1)
- Minor Releases if needed

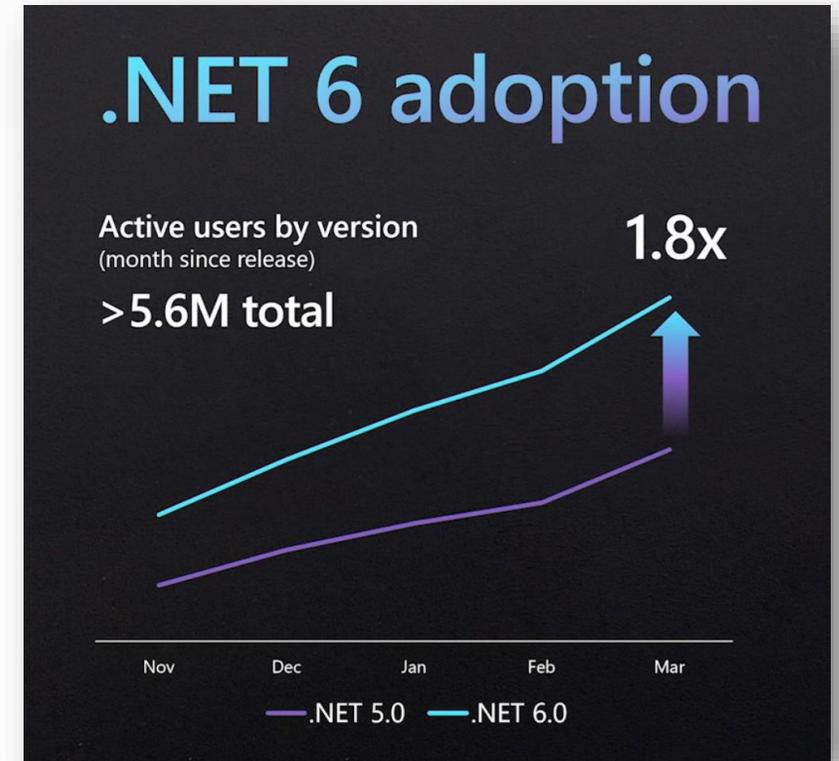


# .NET 6 on Azure

- All the key Azure services support .NET 6 in all regions on Windows and Linux
- Azure App Services
- Azure Functions
- Azure Static Web Apps
- ...

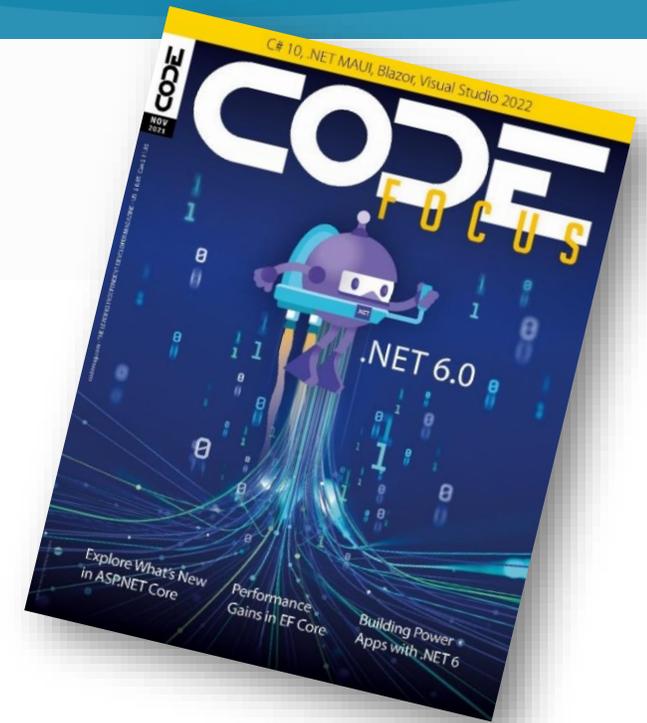
# .NET 6 Adoption Rate

- In one word: Awesome!
- .NET adoption has been going up with every .NET release since 3.1



# Side-Note: CODE Focus Magazine - .NET 6

- We created CODE Focus issue on .NET 6
- Great source of free information
- Produced in conjunction with Microsoft
- All CODE Magazine subscribers get this special issue for free
- Free online content at [www.codemag.com/focus](http://www.codemag.com/focus)
- Get a free subscription at: [www.codemag.com/subscribe/CF2021](http://www.codemag.com/subscribe/CF2021)



# Side-Note: CODE Focus Magazine - .NET 5

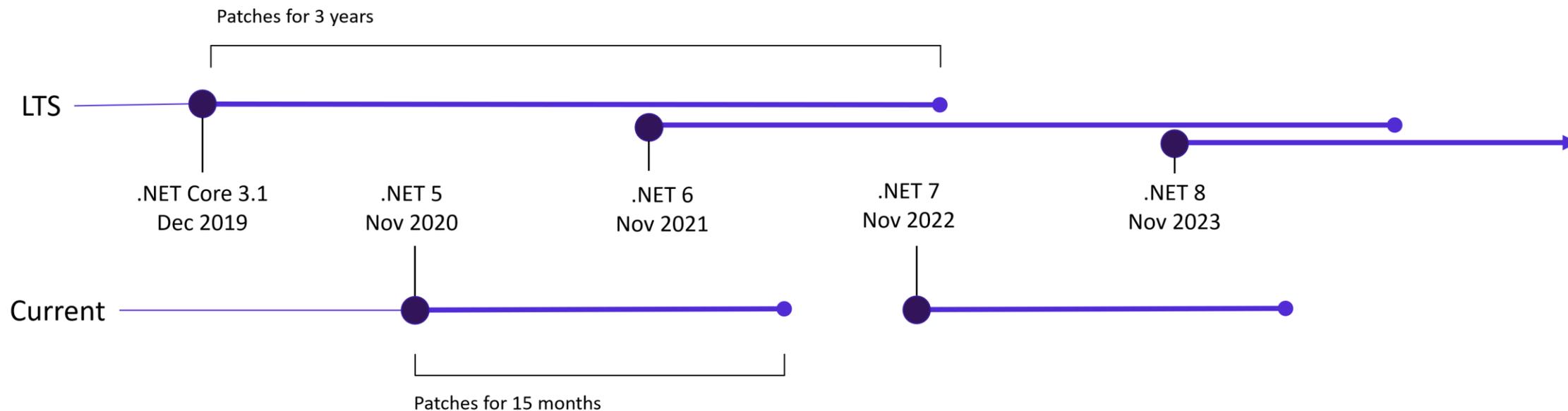
- We also created CODE Focus issue on .NET 5
- Also produced in conjunction with Microsoft
- Content is still available online and very applicable today



# .NET 5 – End of Support

- .NET 5 Extended Support ended May 8<sup>th</sup>, 2022
- Apps will continue to run, but will not be patched
- Transition to .NET 6 if possible
  - Which should be exceptionally easy to do
  - This is not an emergency, but a good idea when convenient

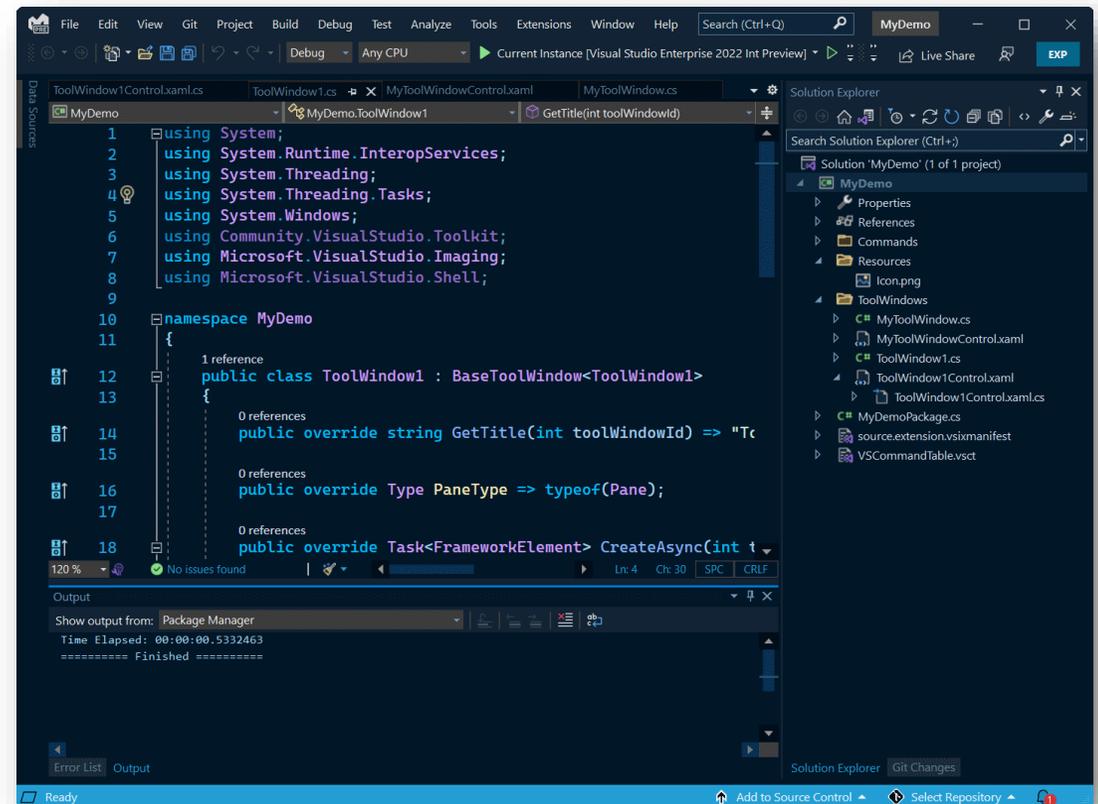
# GA/Current vs. LTS



- Current versions (GA) are supported 15 months
  - (3 months after the next version's release date)
- LTS versions are supported for 3 years
- It should be easy to update from GA to LTS versions

# Visual Studio 2022

- Resurgence of the “Full VS IDE”
- Snappier due to optimizations, including native 64-bit
- 17.3 Preview 2 includes Windows-on-Arm support
  - Supporting the most common Arm project types



# Visual Studio Port Tunneling

- Seamlessly connect your localhost to remote compute
- Enables you to access “would-be localhost” on a temporary public address
- Currently in private preview:
  - Sign up at: <https://aka.ms/tunnels-signup>



# GitHub Copilot



- AI-aided development
- Currently available as a technical preview

```
1 reference
public static List<MyProcessInfo> GetRunningSystemProcessesByMemoryFootprint()
{
    // Get all system processes, sort them descending by memory usage, return as a list
    var processes = new List<MyProcessInfo>();
    var processList = Process.GetProcesses();
    foreach (var process in processList)
    {
        var processMemory = process.WorkingSet64 / 1024 / 1024;
        if (processMemory > 100)
        {
            processes.Add(new MyProcessInfo { Name = process.ProcessName, MemoryUsage = processMemory });
        }
    }
    return processes.OrderByDescending(x => x.MemoryUsage).ToList();
}
```

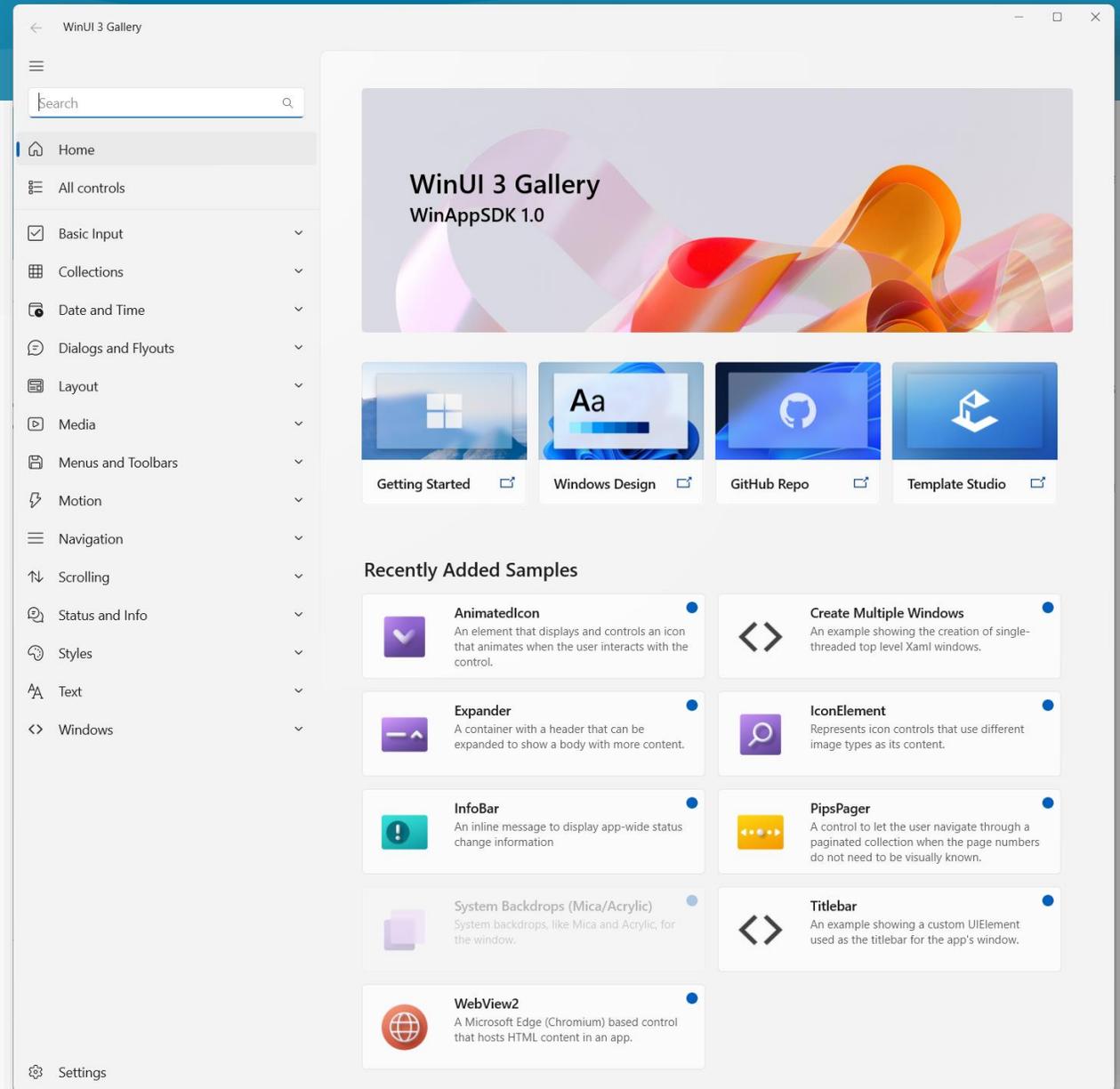
# GitHub

- GitHub is “the place to be” for developers
- Expect GitHub to grow in importance
- More and more features depend on GitHub as a backbone
  
- *Note: Don't panic if you are using Azure DevOps, but I would start new things on GitHub instead*



# WinUI 3

- New Gallery
- Windows 11 support (mica)



# MAUI

- .NET MAUI 1.0 Released!
  - Available with Visual Studio 17.3 Preview 1
- Cross-platform, native UI with XAML and C#
- Access native capabilities from a single API
- Deploy to mobile devices and desktops



# Pillars of MAUI in .NET 6

## Unified .NET

- Base Class Library
- Type unification
- CLI support
- SDK Style Projects
- Modern Support Lifecycle

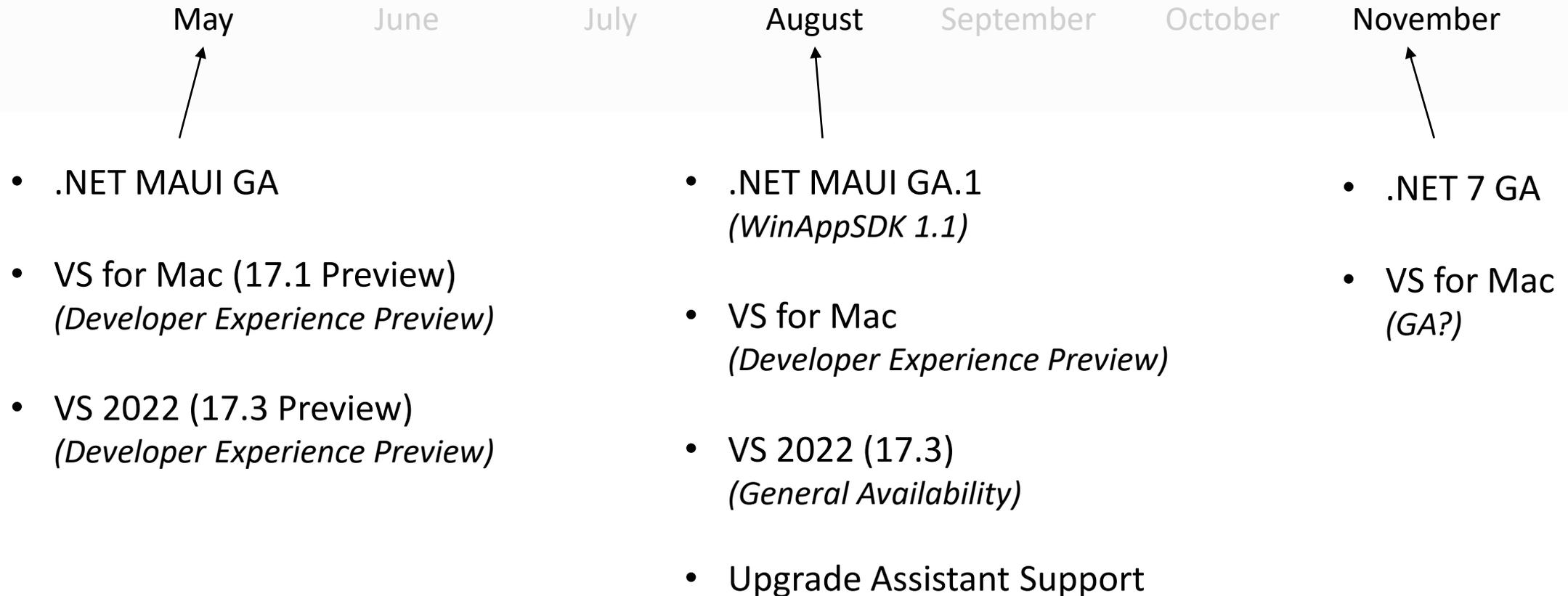
## Desktop & Hybrid

- WinAppSDK
- Mac Catalyst
- BlazorWebView
  - Modernization of WinForms and WPF

## Productivity

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

# .NET MAUI Roadmap 2022



# Blazor

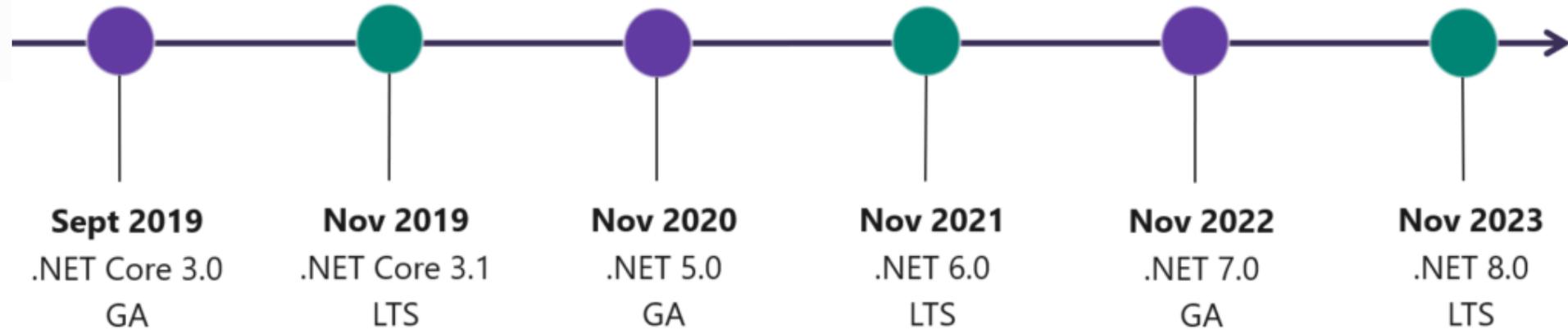


- Blazor has now been around for 4 years!
- Blazor “traditionally” supports two hosting models:
  - Blazor Server
  - Blazor WebAssembly
- With MAUI, we can now build native apps using Blazor hybrid components
  - This enables us to reuse Blazor skills and components
  - Blazor components execute natively when hosted inside of MAUI
  - Note: This also works with WPF and WinForms

# Blazor Enhancements in .NET 7

- Hot Reload Improvements
- Multithreading
- Web crypto
- .NET Web Assembly without Blazor UI
- Performance improvements
- Running multiple Blazor apps in the same page
- Prerendering with authentication
- Data binding improvements
- Editor Improvements
- ...

# .NET 7 Preview



- .NET 7 Preview 4 is now available for download
  - New previews are available every month
- [get.dot.net/7](https://get.dot.net/7)

# What's New in .NET 7

- App modernization
  - Windows, Xamarin, ASP.NET,...
- Even better support for Cloud Native development
- Great cross-platform development experience with MAUI

# What's New in C#?

- Yearly release cadence (with the rest of .NET)
- Language simplification features
  - Automated null checking
  - Improved pattern matching
  - Static abstract interface members
  - Abstraction of numeric types through `INumber<T>`
  - Raw string literals
  - Required property initializers
  - Code in auto-properties

# Other Announcements

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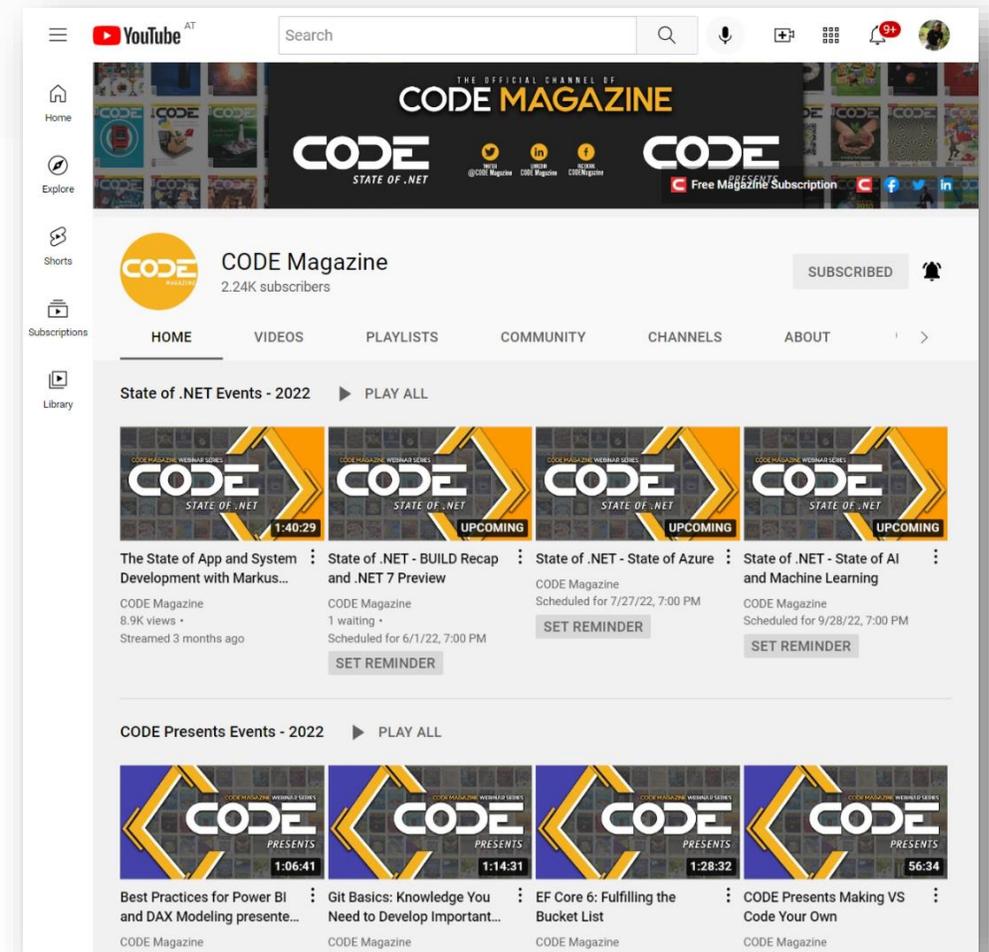
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- .NET Desktop Developer
- WPF Developer
- REACT Developer
- ASP.NET MVC Developer

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- No strings. No commitment. No credit card required.
- Just help from our team of experience software developers.
- Got questions? Stuck on an issue? Platform and/or architecture decisions to make? We can help!



Contact us at:  
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[jduffy@codemag.com](mailto:jduffy@codemag.com)

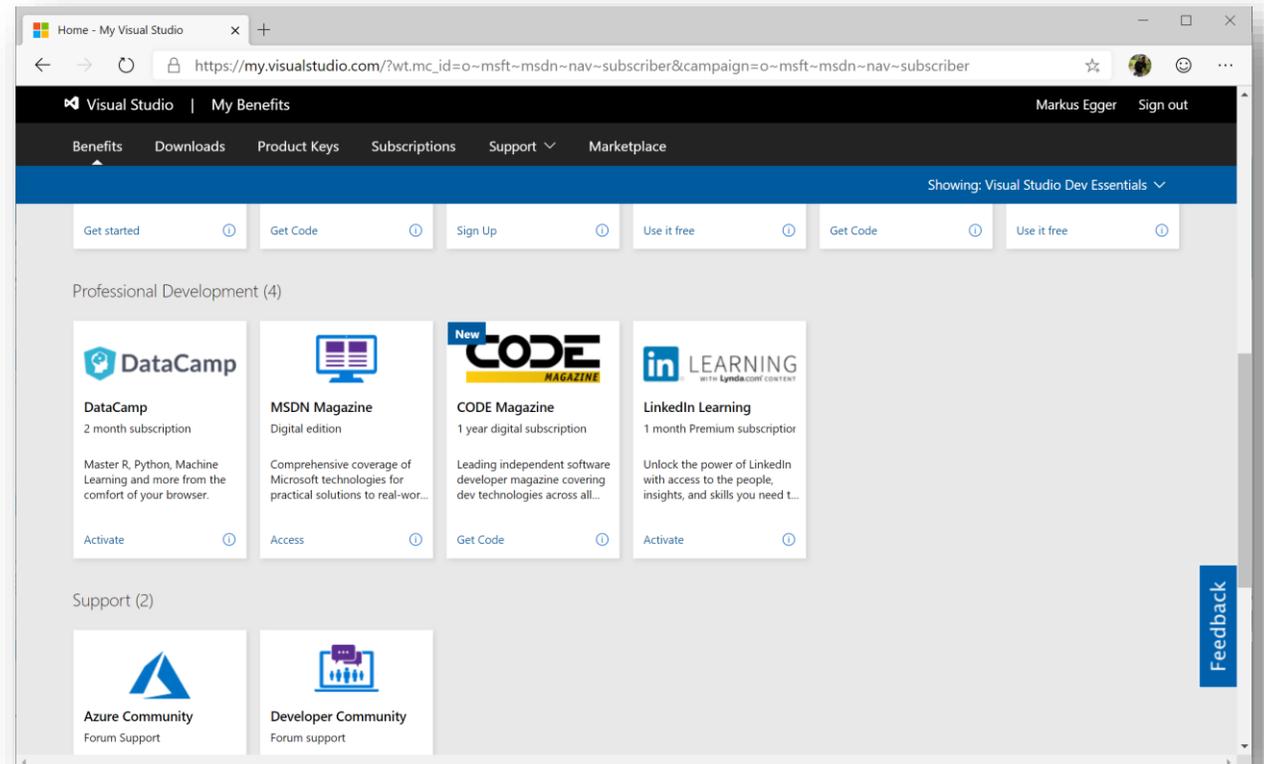
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**State of .NET**  
**State of the Microsoft Azure Cloud**  
July 27<sup>th</sup>

A horizontal banner with a space-themed background. The background shows a view of Earth from space with a network of white nodes and lines overlaid. The text is in white on black rectangular backgrounds.

**State of .NET**  
**State of AI and Machine Learning**  
September 28<sup>th</sup>

A horizontal banner with an AI-themed background. The background features a brain with circuitry, gears, and a computer monitor icon. The text is in white on black rectangular backgrounds.

# Q&A

Contact us with questions!

**CODE/EPS Contact:**

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