

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 / [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
- Project Rescue, App Modernization (VB, VFP, Access, etc.)
- Development Team Staff Augmentation



Your Ticket to Free Consulting

- One hour on us. Really. Schedule a call today. Slots are limited.
- No strings. No commitment. No credit card required.
- 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 or
jduffy@codemag.com

Reference Links

- Looking for work?

<https://www.codemag.com/Jobs>



- Want to write for us?

<https://www.codemag.com/Write>



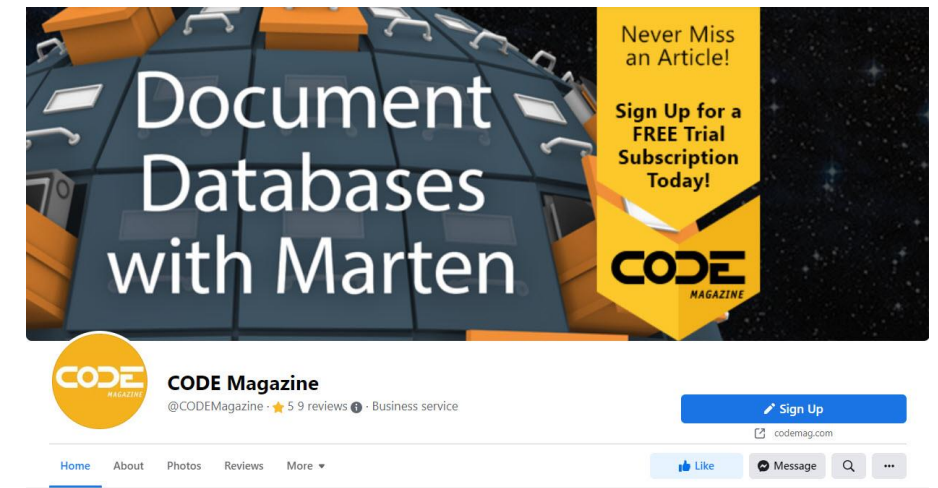
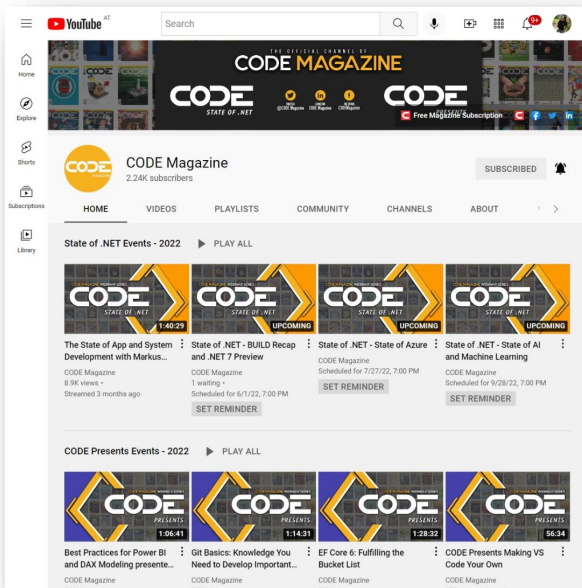
- Need to add talent to your development team?

<https://www.codemag.com/Staffing>



Join Us On Social Media

- YouTube channel: <https://tinyurl.com/CODEYTC>
- Twitter: <https://twitter.com/CODEmagazine>
- Facebook: www.facebook.com/CODEMagazine/
- LinkedIn: <https://www.linkedin.com/company/code-magazine/>



Free Subscription to CODE Magazine!

- The leading software development magazine written by expert developers for developers.
 - All registered attendees will automatically receive a free digital subscription to CODE Magazine – no need to do anything, it'll happen auto-magically.
 - Subscribers get Focus issues free of charge!
 - Microsoft Visual Studio Subscription customers are entitled to a free subscription as a benefit.
-
- Please share this free subscription link:
<https://bit.ly/3z7j8nW>



CODE Mobile App

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



Event Survey – Win \$100!

- Complete this very short 12 question survey for a chance at a \$100 Amazon Gift Card!

<https://bit.ly/3wZgSwn>

- 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.

Thank you for attending! Please complete this brief 12 question survey to be eligible to win a \$100 Amazon Gift Card. Your survey must be completed by 11:59pm EDT (UTC-5) on 6/3/2022 to be eligible to win! One entry per person please. Drawing will occur and the individual winner notified by 6/10/2022.

Thank you for attending! Please complete this brief survey. Yes, we still want to hear from you if you were unable to attend but watched the recording instead. :-)

* 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
- Github.com/tryphotino



Recordings & Slide Decks

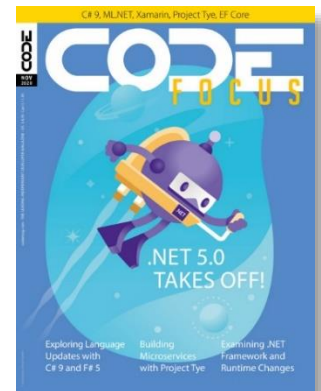
- State of .NET Webinar Series
 - <https://www.codemag.com/StateOfDotNet>
- CODE Presents Webinar Series
 - <https://www.codemag.com/CODEPresents>

Recent Event Recordings

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



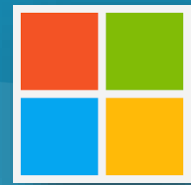
Markus Egger's "BUILD in one slide"

- 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





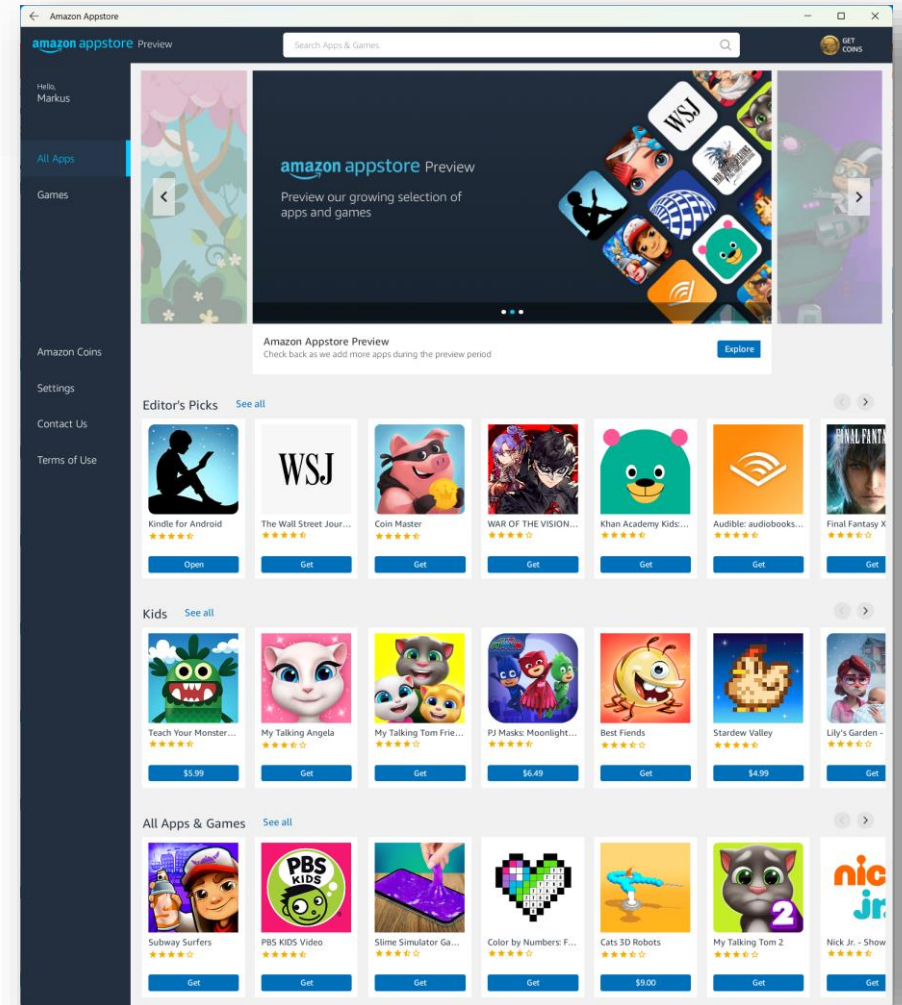
Windows

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 3rd 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)

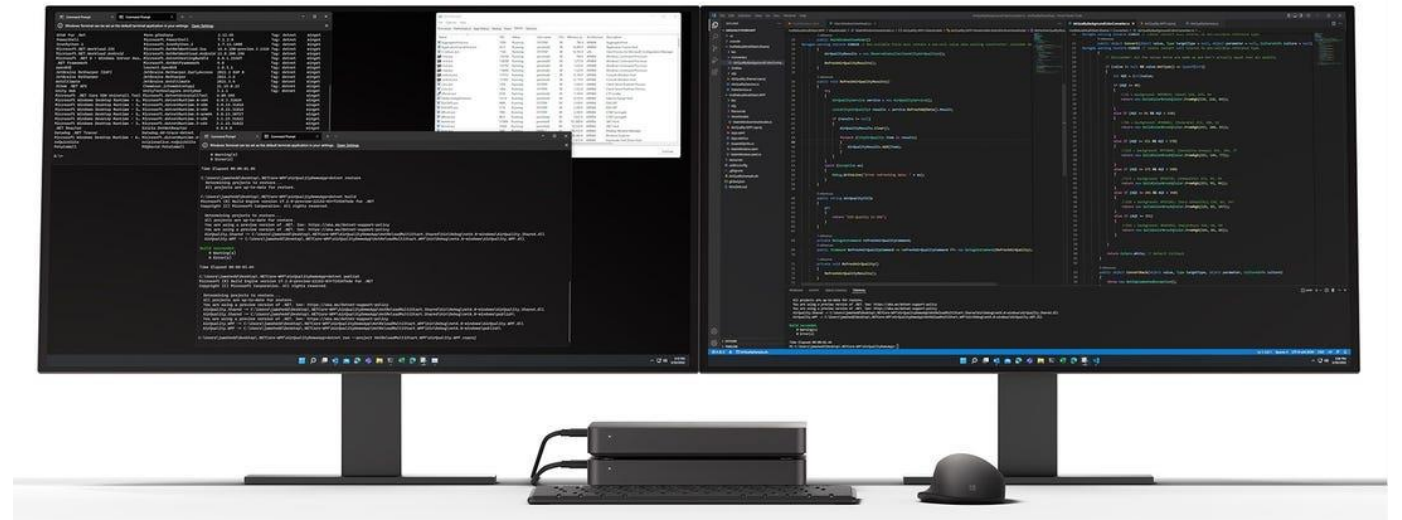


Microsoft Dev Box (Project "Fidalgo")

- 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

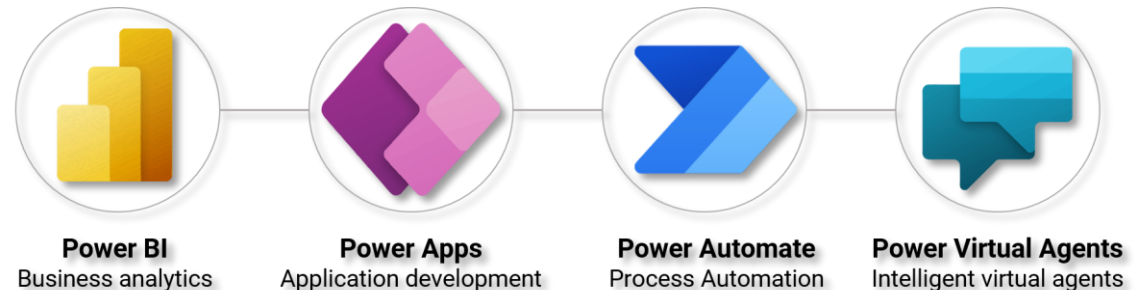
Project "Volterra"

- 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





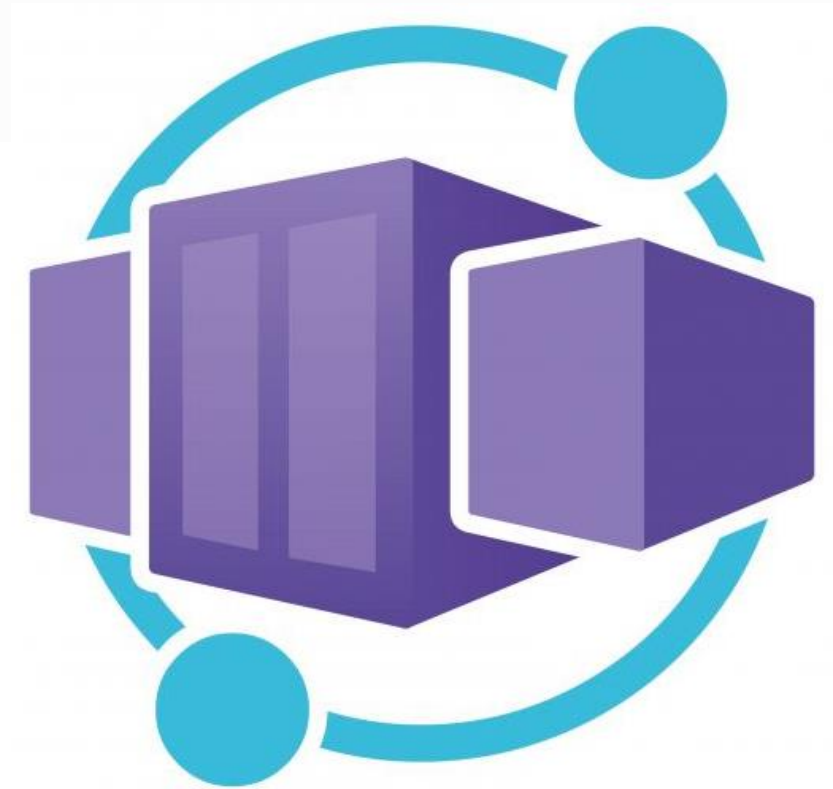
Azure App Service

- 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

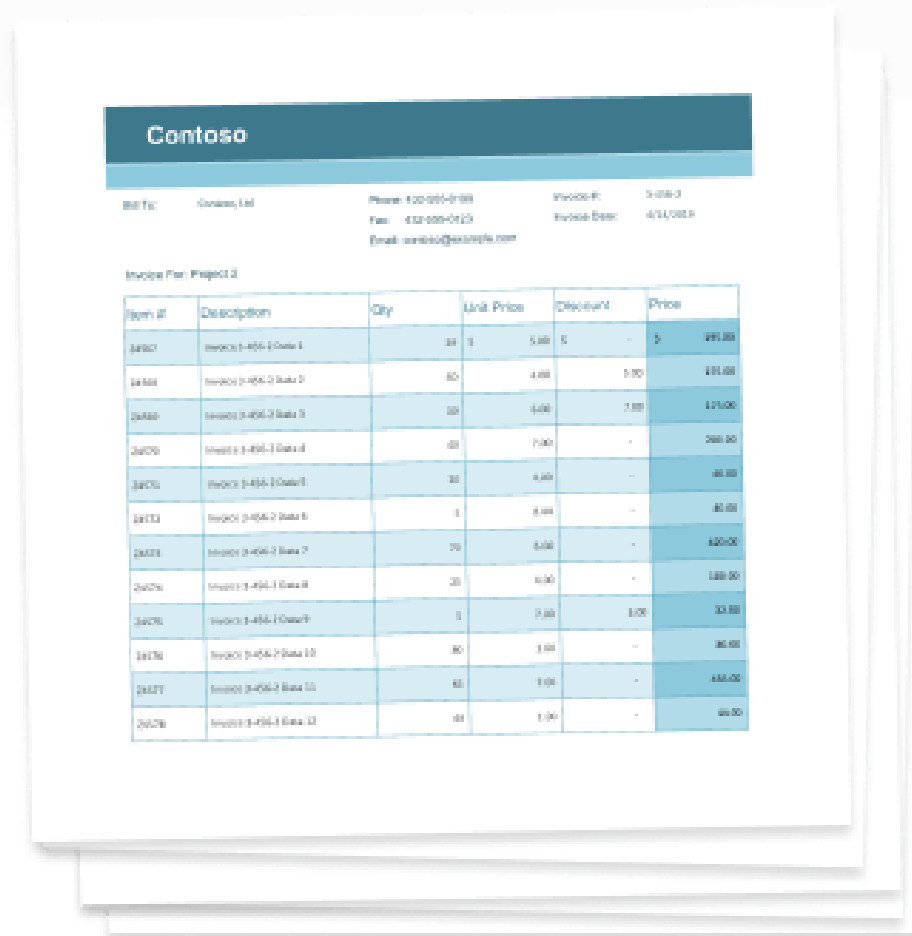
- New reasoning and comprehension capabilities for text-based scenarios
- Examples: Writing assistance, code generation, making sense of unstructured data
- Now available as a limited access preview

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



Contoso

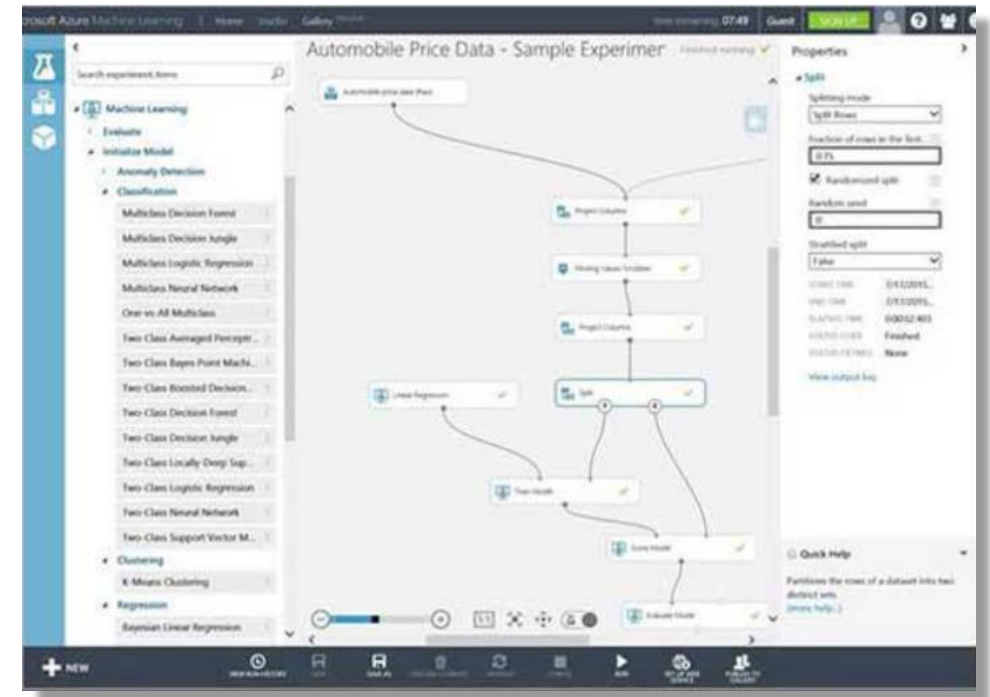
Bill To: Contoso, Ltd. Phone: 432-555-0199 Invoice #: 5-000-3
Fax: 432-555-0123 Invoice Date: 4/14/2019
Email: contoso@example.com

Invoice For: Project 2

Item ID	Description	Qty	Unit Price	Discount	Price
24007	Invoice 3-456-1 Data 1	24	5.00	-	\$96.00
24008	Invoice 3-456-2 Data 2	80	4.00	5.00	\$304.00
24009	Invoice 3-456-3 Data 3	10	4.00	7.00	\$124.00
24010	Invoice 3-456-4 Data 4	40	7.00	-	\$280.00
24011	Invoice 3-456-5 Data 5	10	6.00	-	\$60.00
24012	Invoice 3-456-6 Data 6	1	8.00	-	\$8.00
24013	Invoice 3-456-7 Data 7	70	6.00	-	\$420.00
24014	Invoice 3-456-8 Data 8	30	6.00	-	\$180.00
24015	Invoice 3-456-9 Data 9	1	3.00	1.00	\$2.00
24016	Invoice 3-456-10 Data 10	80	1.00	-	\$80.00
24017	Invoice 3-456-11 Data 11	60	1.00	-	\$60.00
24018	Invoice 3-456-12 Data 12	40	1.00	-	\$40.00

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

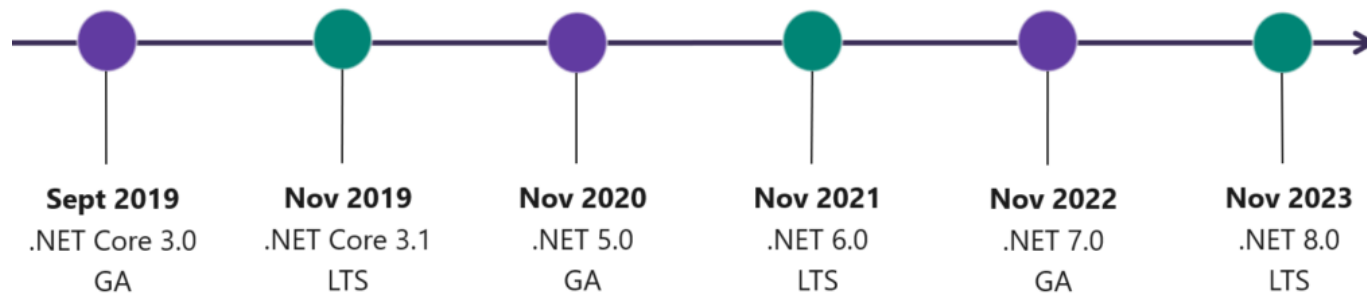
20 Years of .NET!

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



.NET Timeline/Roadmap

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

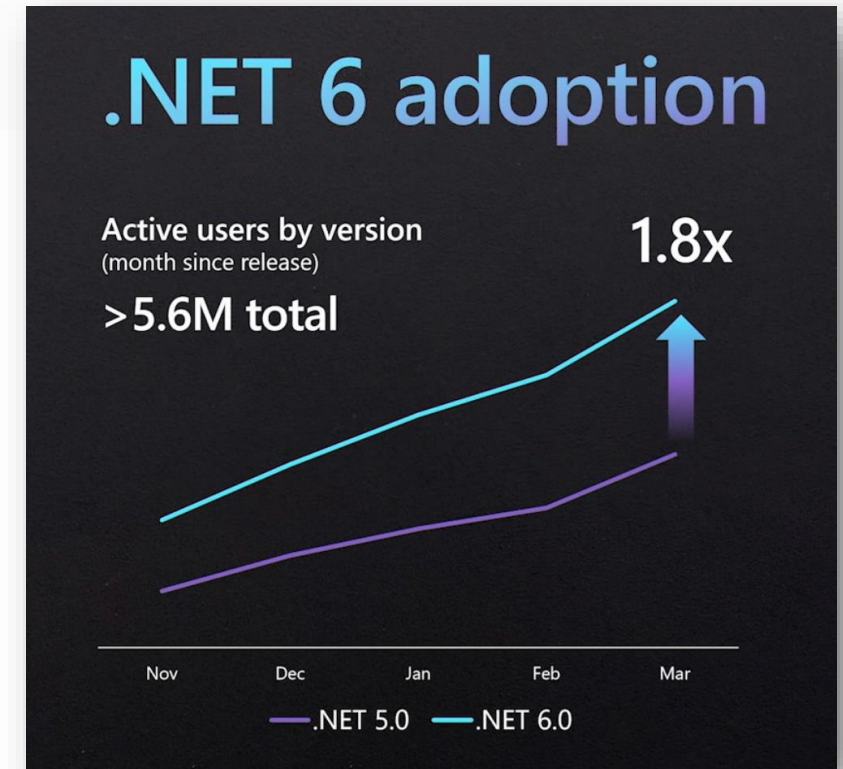


.NET 6 on Azure

- 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
- Get a free subscription at: www.codemag.com/subscribe/CF2021



Side-Note: CODE Focus Magazine - .NET 5

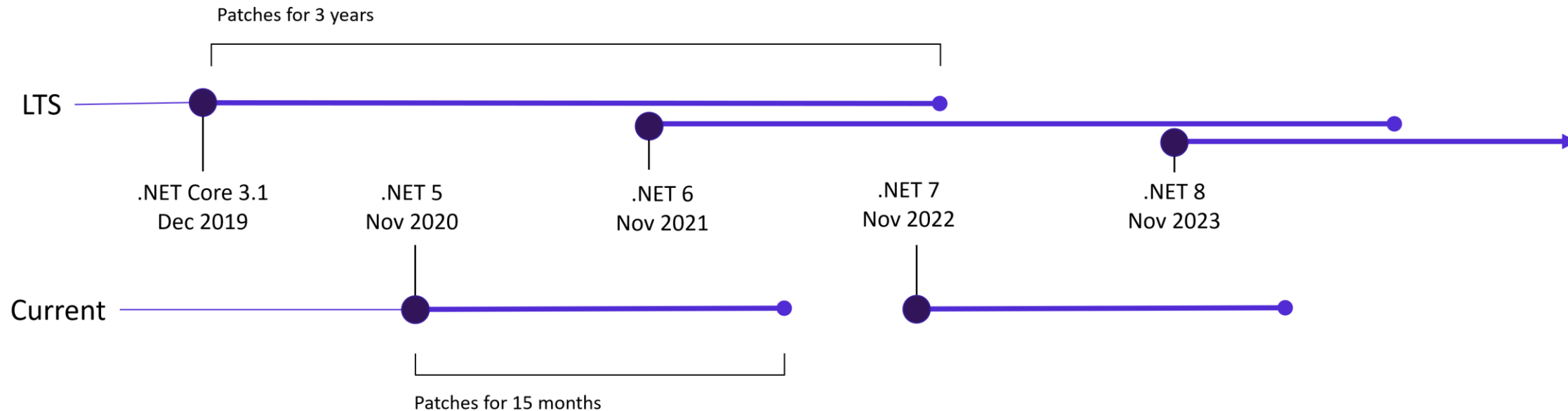
- We also created CODE Focus issue on .NET 5
- Also produced in conjunction with Microsoft
- Content is still available online and very applicable today



.NET 5 – End of Support

- .NET 5 Extended Support ended May 8th, 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

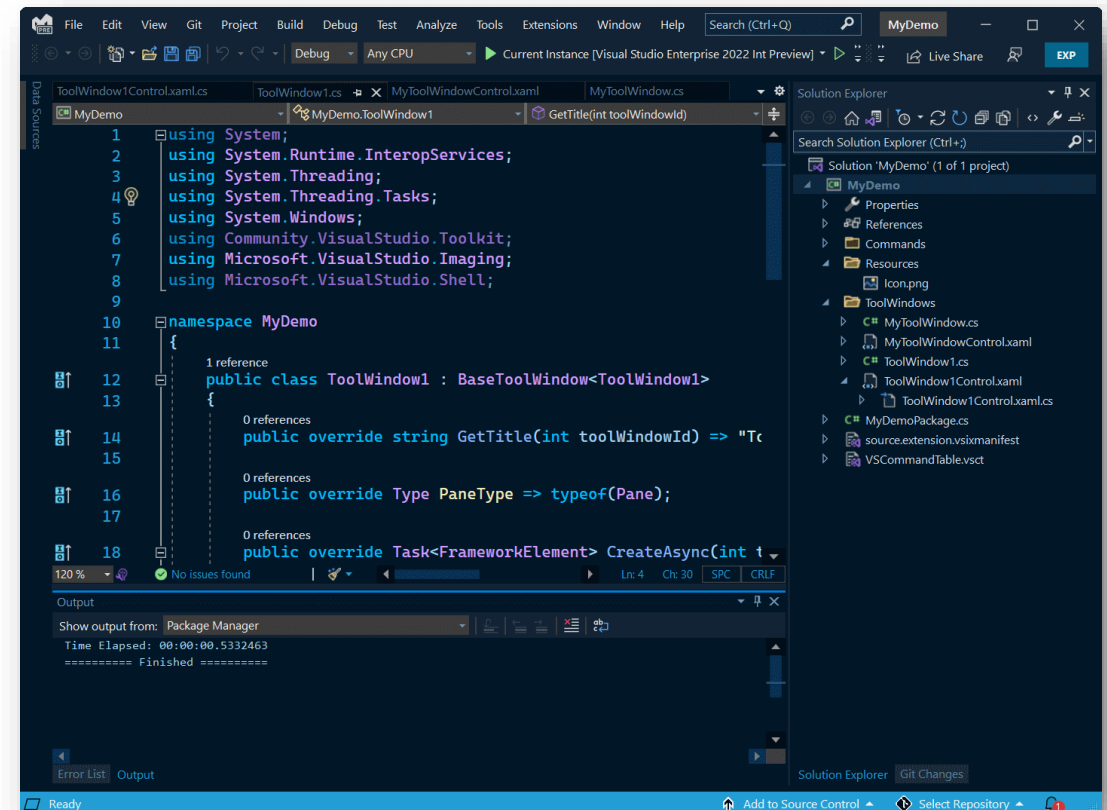
GA/Current vs. LTS



- 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

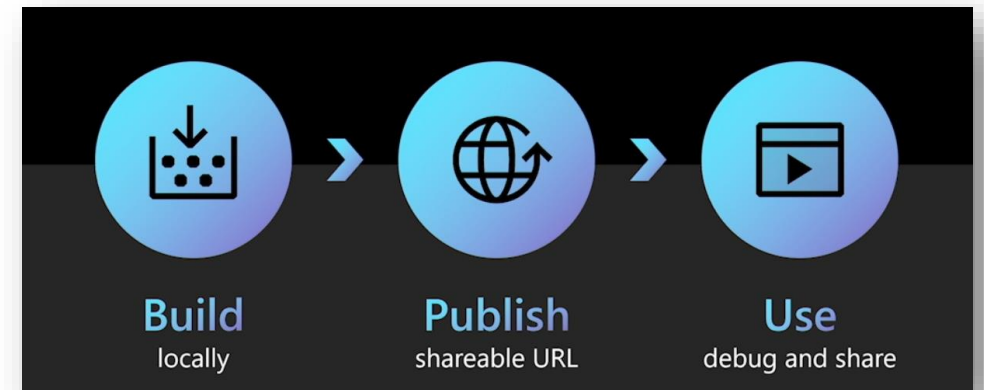
Visual Studio 2022

- 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();
}
```

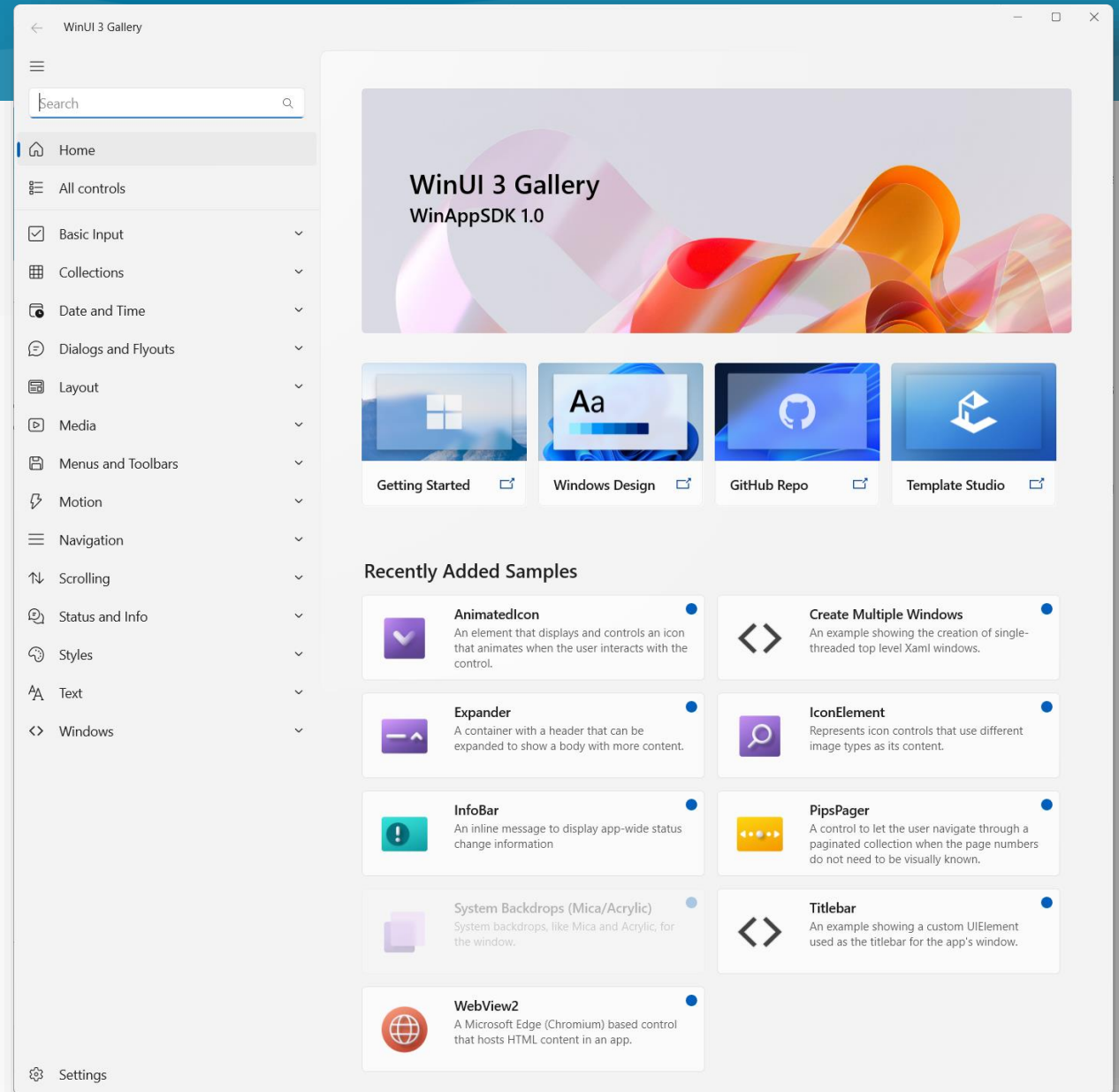
GitHub

- 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

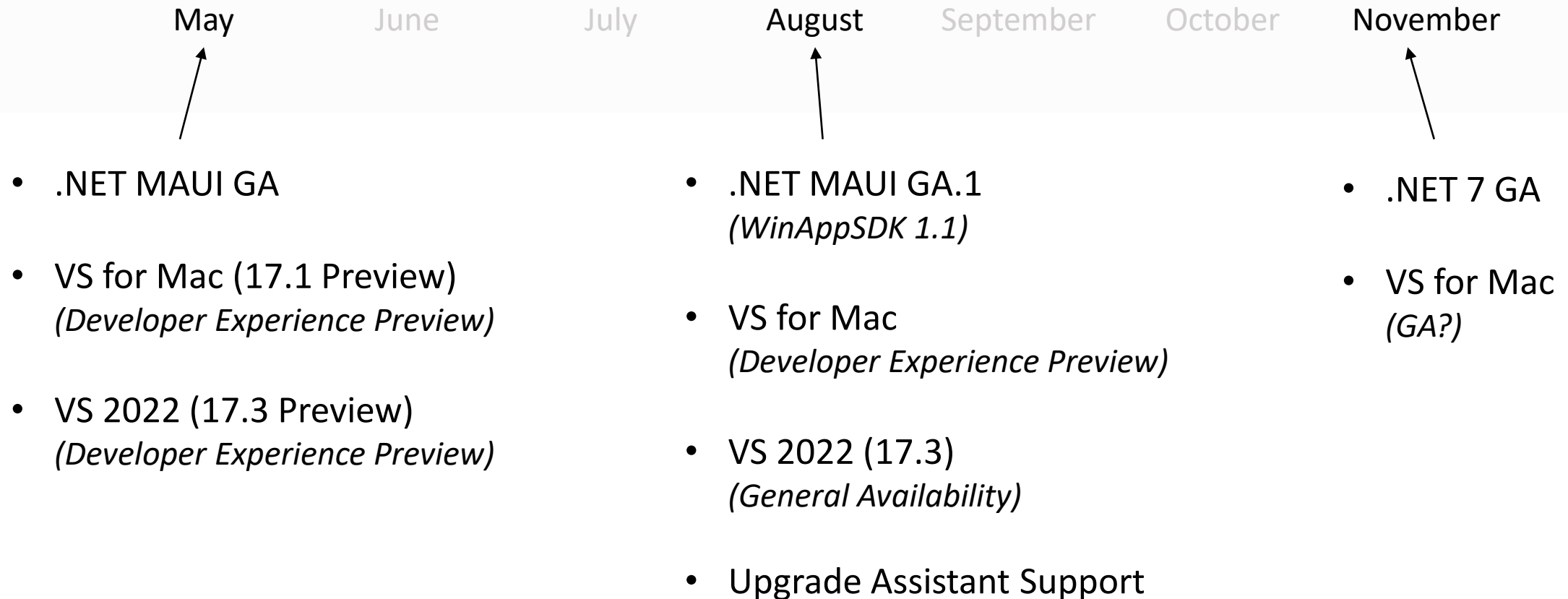
Desktop & Hybrid

- 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

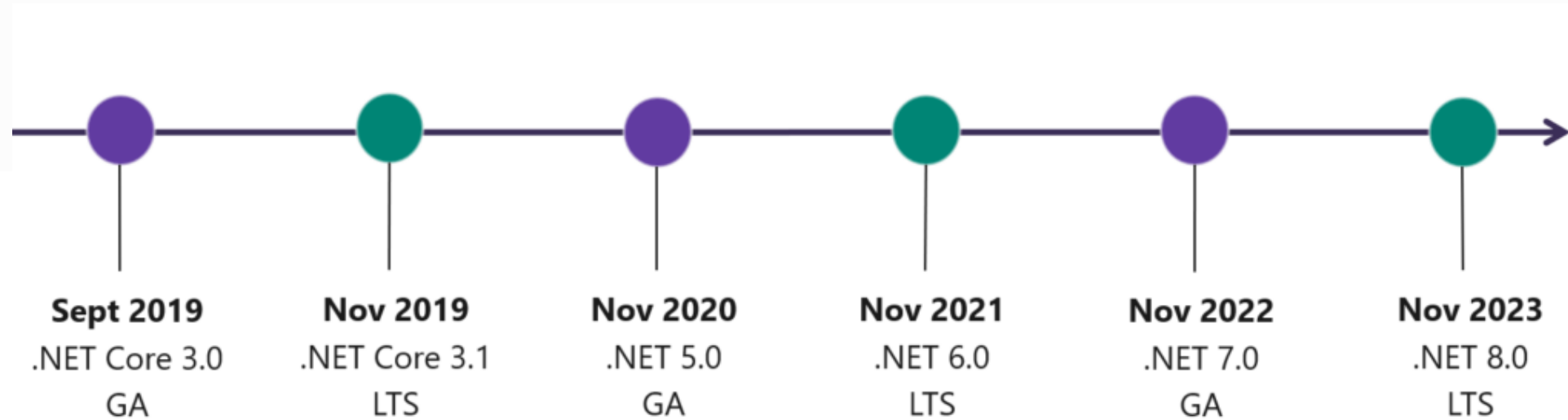


- Blazor has now been around for 4 years!
- Blazor “traditionally” supports two hosting models:
 - Blazor Server
 - Blazor WebAssembly
- With MAUI, we can now build native apps using Blazor hybrid components
 - This enables us to reuse Blazor skills and components
 - Blazor components execute natively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

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

Event Survey – Win \$100!

- Complete this very short 12 question survey for a chance at a \$100 Amazon Gift Card!

<https://bit.ly/3wZgSwn>

- 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.

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

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

Thank you for attending! Please complete this brief 12 question survey to be eligible to win a \$100 Amazon Gift Card. Your survey must be completed by 11:59pm EDT (UTC-5) on 6/3/2022 to be eligible to win! One entry per person please. Drawing will occur and the individual winner notified by 6/10/2022.

Thank you for attending! Please complete this brief survey. Yes, we still want to hear from you if you were unable to attend but watched the recording instead. :-)

* Required

1. Full Name *

Enter your answer

2. Company Name *

Enter your answer

Free Subscription to CODE Magazine!

- The leading software development magazine written by expert developers for developers
- All registered attendees will automatically receive a free digital subscription to CODE Magazine – no need to do anything, it'll happen auto-magically
- Subscribers get Focus issues free of charge!





- Please share this free subscription link:
<https://bit.ly/3z7j8nW>



Recordings & Slide Decks

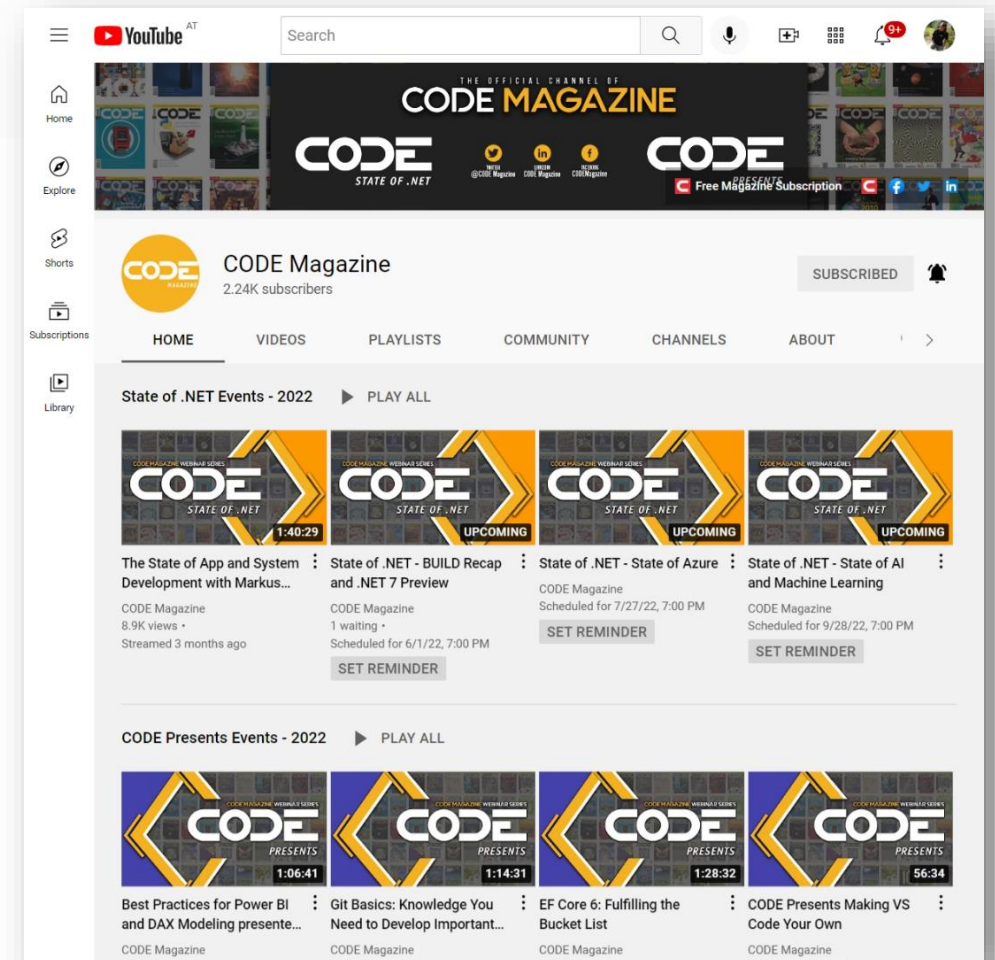
- State of .NET Webinar Series
 - <https://www.codemag.com/StateOfDotNet>
- CODE Presents Webinar Series
 - <https://www.codemag.com/CODEPresents>

Recent Event Recordings

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

Subscribe to our YouTube Channel!

- Subscribe and “hit the bell” to never miss any of our content!
- www.youtube.com/Codemag



Join the CODE Consulting Team!

We're Hiring Developers!

- Senior C# Developer
- .NET Desktop Developer
- WPF Developer
- REACT Developer
- ASP.NET MVC Developer

<https://codemag.com/Jobs>

Your Ticket to Free Consulting

- One hour on us. Really. Schedule a call today. Slots are limited.
- 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:
info@codemag.com or
jduffy@codemag.com

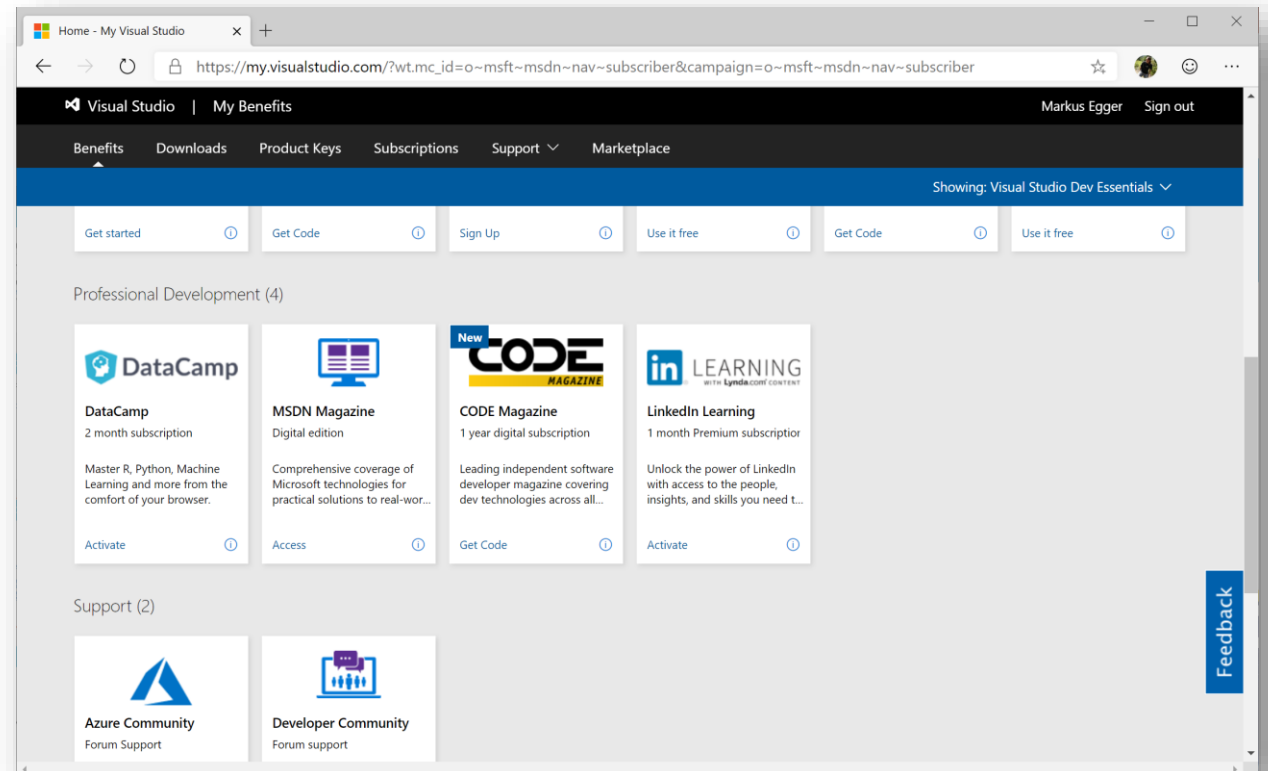
CODE Mobile App

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



CODE Magazine as a Microsoft Benefit

As a Microsoft Visual Studio Subscriptions customer, you qualify for a **free**, one year print and/or digital CODE Magazine subscription!



Upcoming Events

A horizontal banner with a space-themed background. It features a glowing blue and orange nebula or galaxy with a network of white dots and lines overlaid, suggesting a digital or cloud environment.

State of .NET

State of the Microsoft Azure Cloud

July 27th

A horizontal banner with a dark background. It features a stylized white brain with circuit-like patterns, surrounded by various white gears and icons, including a computer monitor and a cloud, suggesting a focus on artificial intelligence and machine learning.

State of .NET

State of AI and Machine Learning

September 28th

Q&A

Contact us with questions!

CODE/EPS Contact:

www.codemag.com
info@codemag.com
facebook.com/codemag
twitter.com/codemagazine

Presenter Contact:

markus@codemag.com
jduffy@codemag.com