

State of .NET

.NET 5 and .NET 6 Preview

Vishal P Pandey

Secretary

Vision Group of Institutions

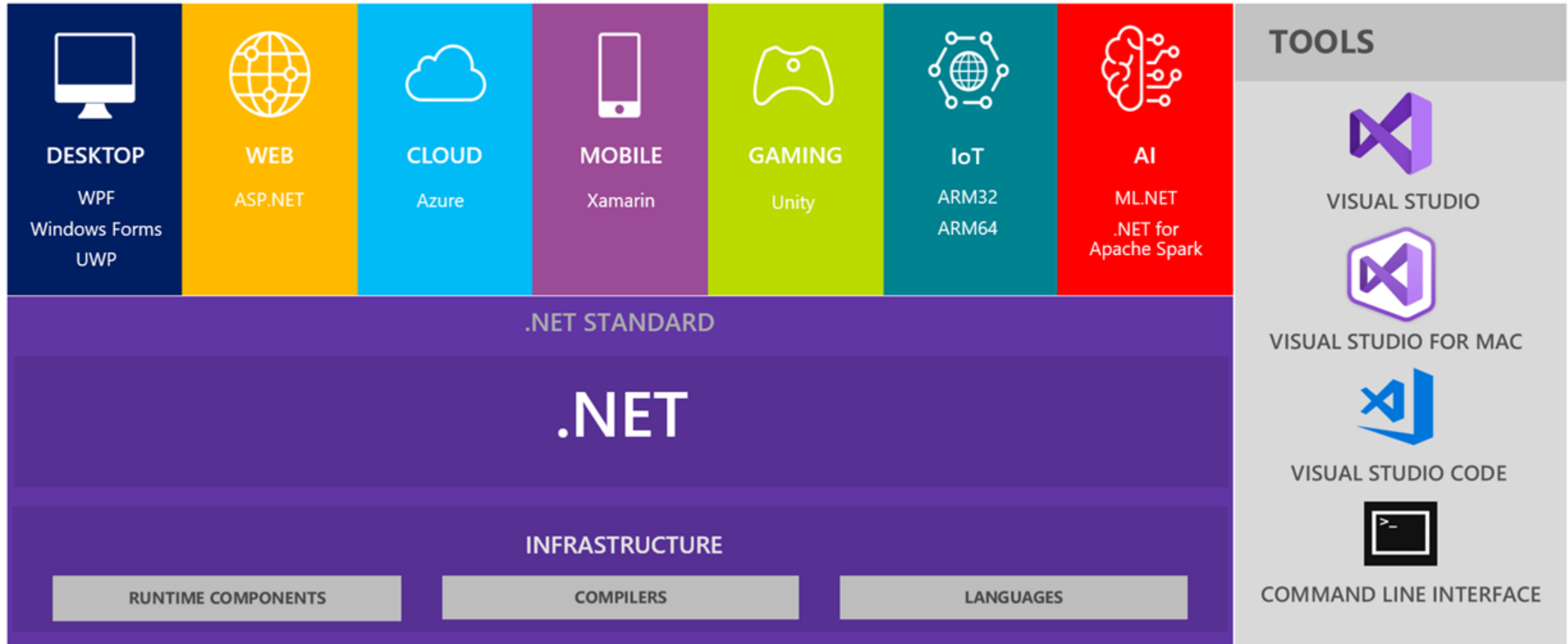
Discussion Points : State of .NET



- Overview of .NET 5 and .NET 6
- Visual Studio 2022
 - 2 Live demonstrations
- **Unified Platform-** Windows, Web, Native, Cloud, Gaming, IoT, ML... list goes on
- Web Development (Blazor, APIs,...)
- Desktop Development (WinForms, WPF, MAUI, Blazor, Windows App SDK,...)
- Some things for future- Web Services & REST API, MVC, GitHub, Dockers, ...

Lecture Details: 10 July, 2021; 13:00 hrs; Zoom Id:898 4251 7864; Passcode:114319

.NET – A unified platform

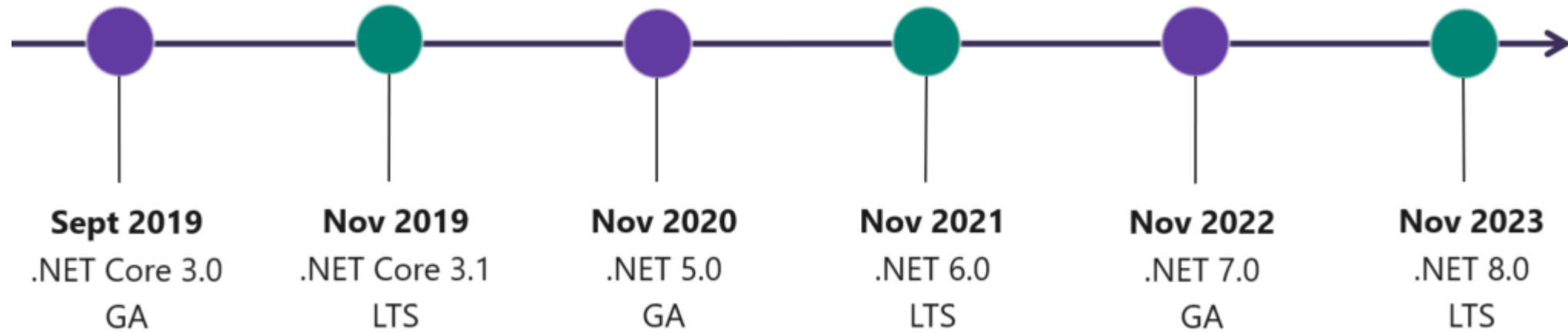


The Journey to One .NET



- .NET now looks back at a history lasting two decades...
- ...with many twists and turns
- .NET Framework, .NET Core, Mono, Xamarin, UWP, Silverlight, Windows Phone,...
- Different components, project structures, APIs,...
- .NET 6 completes the journey to reunification of the .NET platform
- The goal is to get away from worrying about “what runs where” and simply “targeting .NET” with code that runs everywhere

.NET Timeline/Roadmap



- .NET 5 Release: November 10th, 2020
- .NET 6 Release: November 9th, 2021
- Annual, predictable releases (started with .NET Core 3.1)
- Minor Releases if needed

.NET 6 Preview



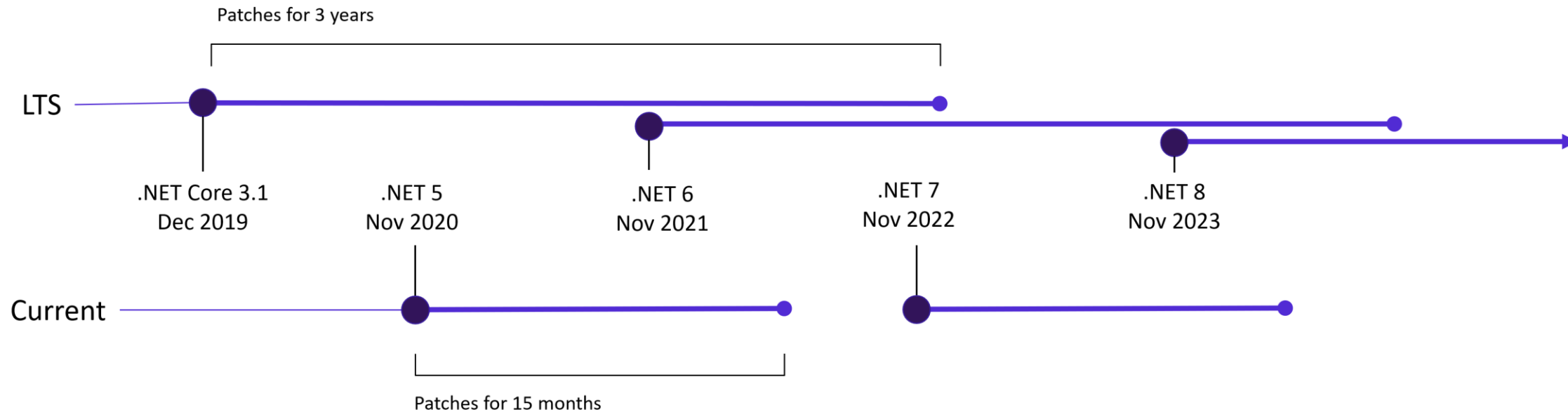
- .NET 6 (Preview 5) is currently available to download
- The same is true for Visual Studio 2022

.NET 5 vs. .NET 6



- Originally, .NET 5 was supposed to be "One .NET"..
 - ...but Covid (and probably a few other things) made that impossible
- In a way, many of the things I will say for .NET 6 today, you may have heard in similar fashion for .NET 5
- .NET 6 brings us full circle and provides the full vision for "One .NET"
- .NET 6 is the LTS (Long Term Support) version of the current generation of .NET

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

.NET ecosystem momentum

>5M

.NET developers

In Visual Studio family

#1

Most Loved Framework (2019 & 2020)

.NET Core

Top 30

Highest velocity OSS projects

github.com/dotnet
github.com/aspnet



Top 5

Language on GitHub



7X

Faster than Node.js

ASP.NET Core

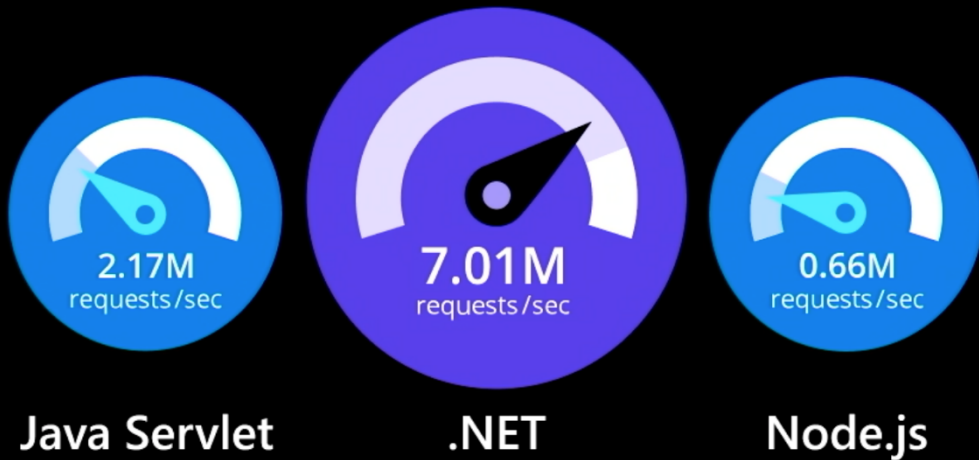
40%

New to .NET are students

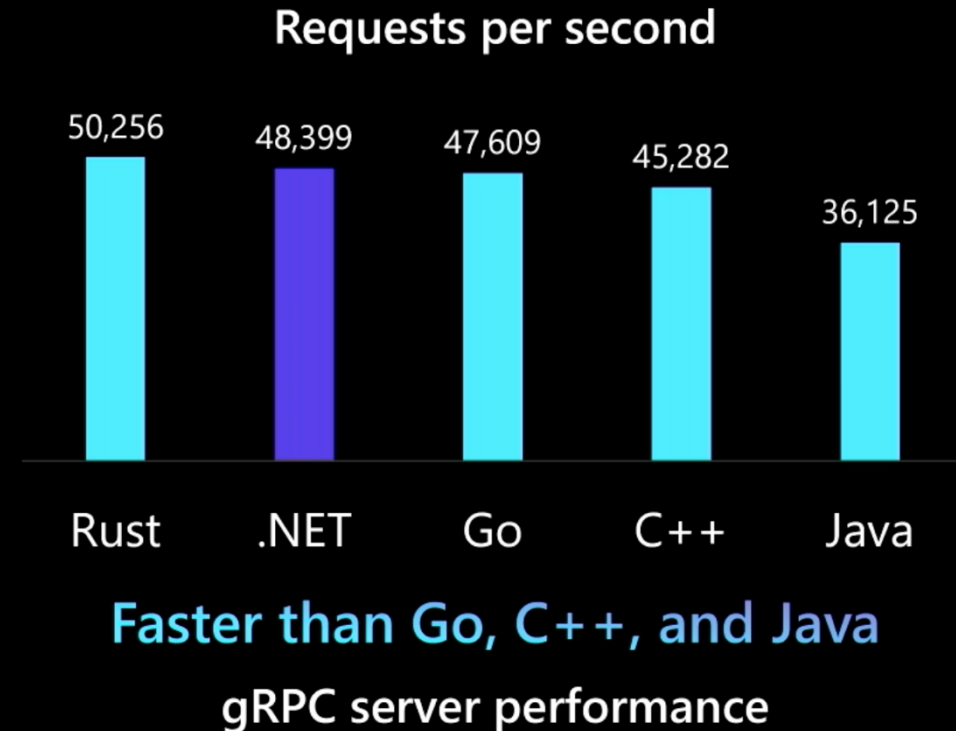
dot.net download survey

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/ octoverse.github.com/ www.techempower.com/benchmarks/#section=data-r18&hw=ph&test=plaintext

.NET Performance



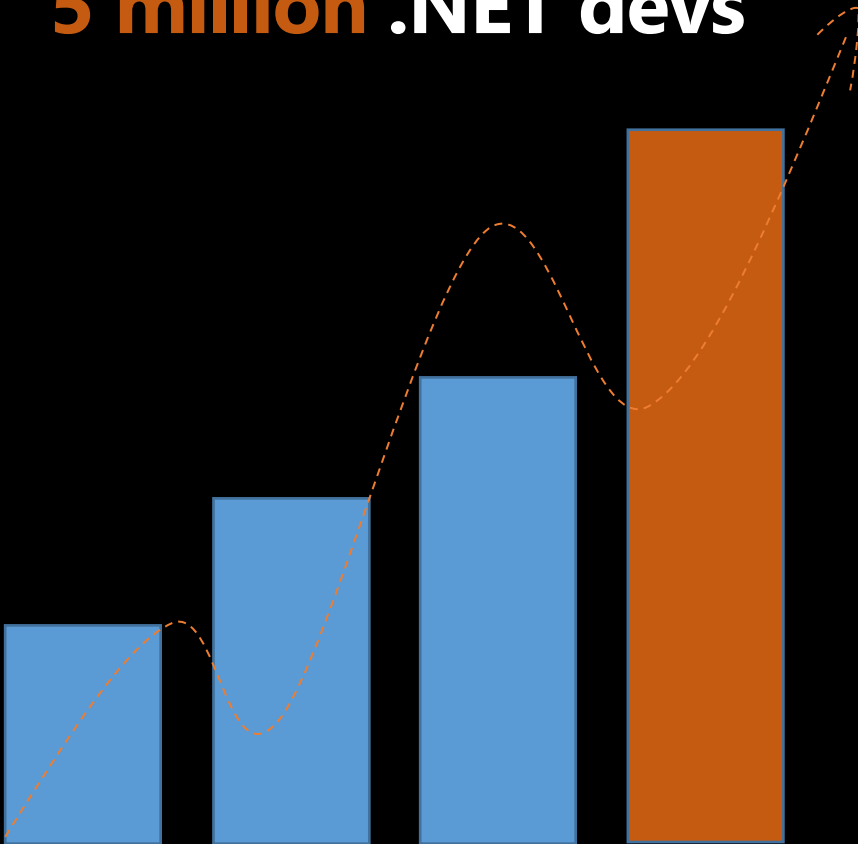
>10X faster than Node.js
ASP.NET Core web framework



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

5 million .NET devs



Visual Studio

+1 million new

Monthly active .NET developers in the last year

.NET Core

+600K new

Monthly active .NET Core developers in the last year

.NET on Linux

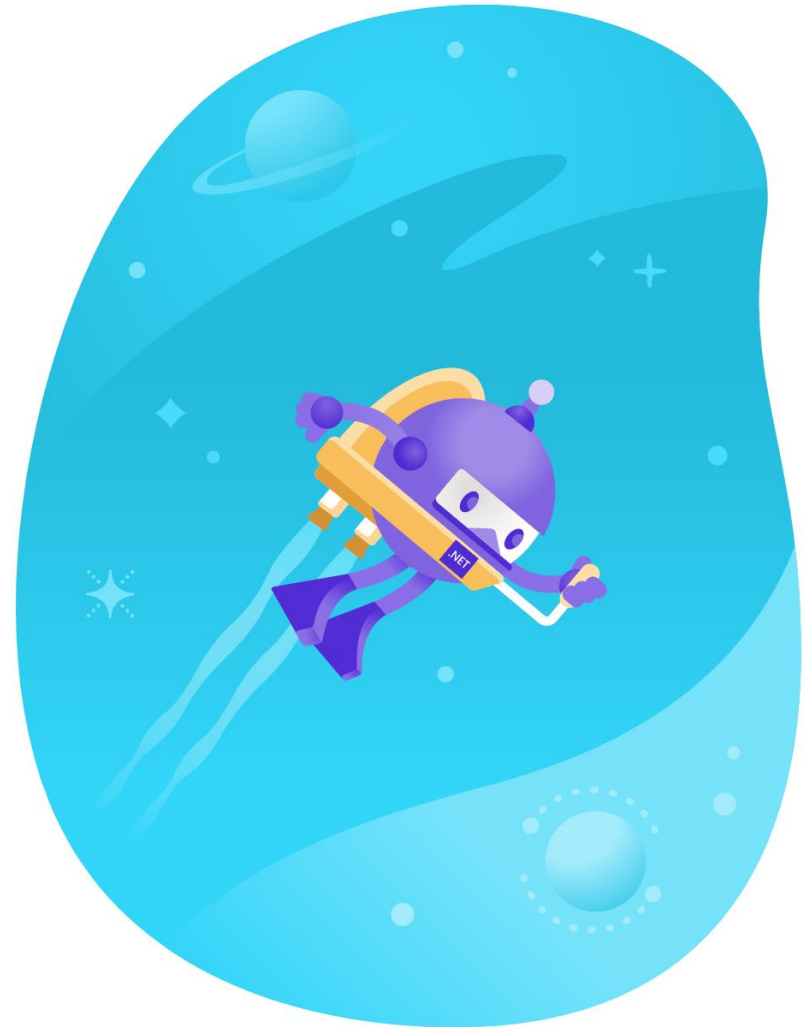
2 million

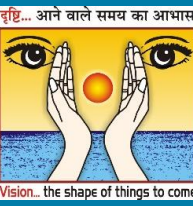
Publishes to Linux from Visual Studio

.NET Conf 2021



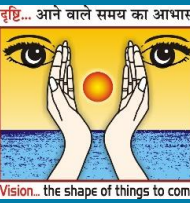
- <https://www.dotnetconf.net/>
- November 9 - 11
- .NET 6 Launch Event





Visual Studio 2022

What's New in VS 2022



- Native 64-bit Application
- Improved performance, especially on very large projects
- Improved look with new icons and colors
 - Note: Turn on preview features
- Improved debugging and productivity
- AI IntelliCode



Hot Reload



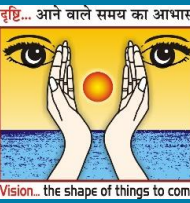
- Edit & Continue on steroids
- Applies code changes while debugging without restarting the debug session (not even behind the scenes)

Visual Studio AI IntelliCode



- IntelliCode analyzes your editing patterns to provide various AI-driven features
- Auto-completions
- Auto-refactorings

Side-Note: Visual Studio Code



- Visual Studio Code is free for download on Windows, Mac & Linux
- This presentation is not about Visual Studio Code, but that is not meant to take away from the significance of VS Code!
- VS Code is a great editor for code-focused development!



.NET 6 - The Platform

.NET 6 Main Features

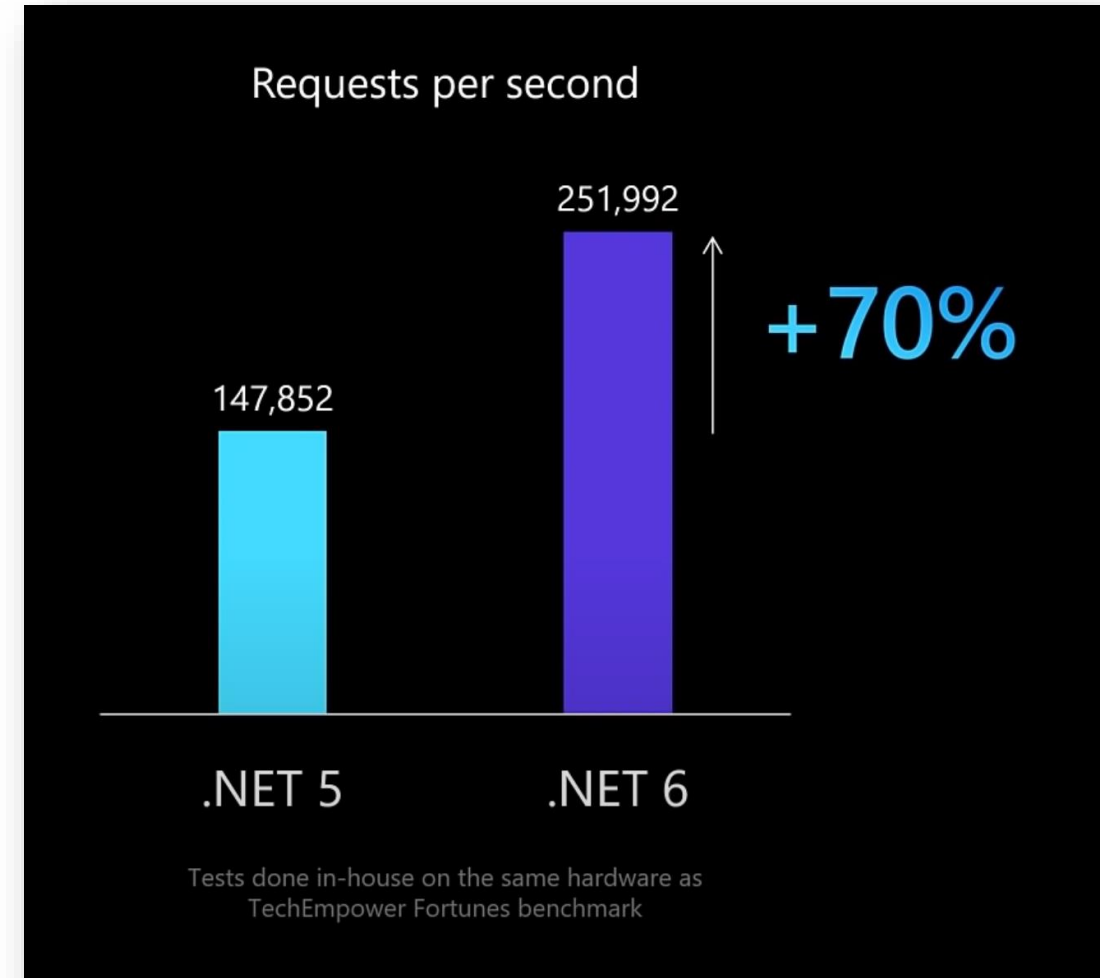


- C# 10 aims to simplify your code base
- Minimal Web APIs
- MAUI (Multi-Platform App UI) for cross-platform apps
- Blazor desktop web apps with native device capabilities
- More Device Targets
- WinForms and WPF on ARM64 and single EXE deployment
- Developer Productivity (like hot reload)
- Performance improvements in the runtime

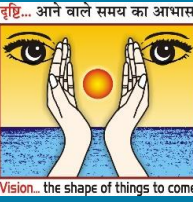
Entity Framework Core Performance



- 70% faster with .NET 6
- 31% faster query performance
- Up to 43% reduced memory allocation



Windows Development



- WPF and Windows Forms supported as first-class citizens in .NET
- Improved Designer Support (both WinForms and XAML)
- Improved ClickOnce Support

Windows App SDK



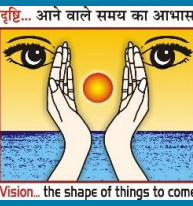
- This is the former “Project Reunion”
- Re-unification of various Windows/Desktop UI technologies
- WinForms, WPF, UWP, WinUI, Xamarin

WebView2



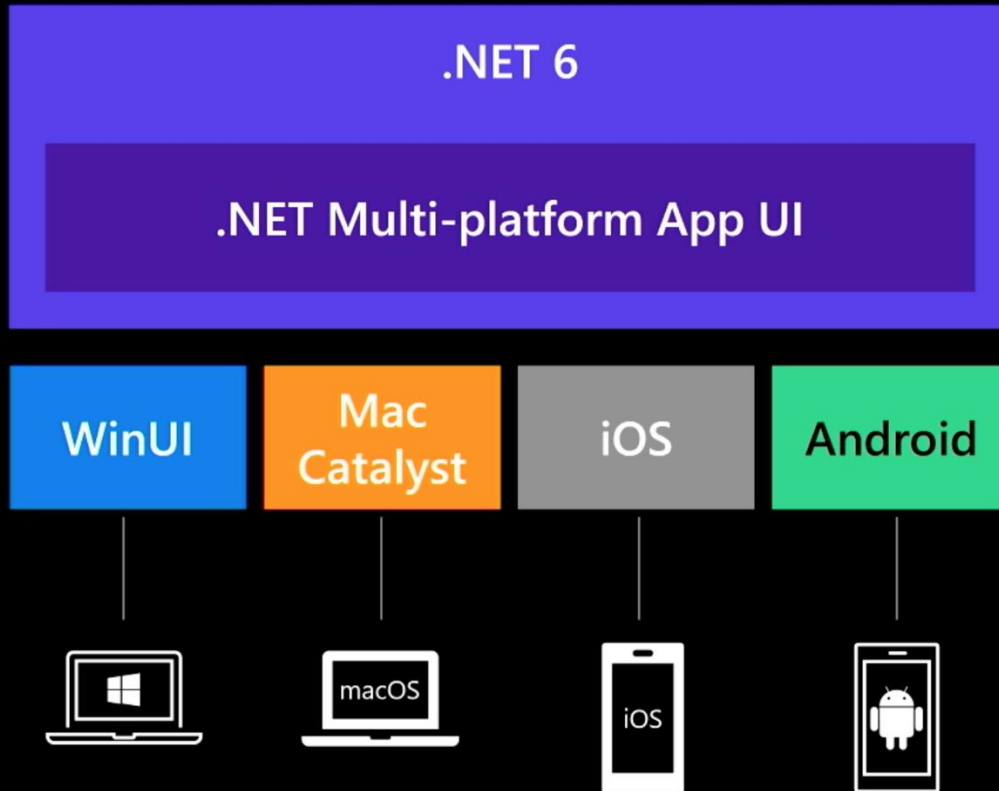
- New Edge-Chromium-based HTML control
- Available in Windows Forms, WPF
- .NET Framework, .NET Core 3.x, and .NET 5/6
- Windows 7 and later
- Evergreen (updated every 6 weeks)
- WebView2 Evergreen is now a Windows component

MAUI



- .NET Multi-Platform Application UI
- An evolution of the Xamarin.Forms Toolkit
- XAML-based development experience for rich applications
- Supported on Android, iOS, macOS, and Windows
- Access to each platform's native features

.NET Multi-platform App UI



Cross-platform, native UI

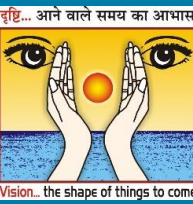
Single project system, single codebase

Deploy to multiple devices:
mobile and desktop

General availability in .NET 6

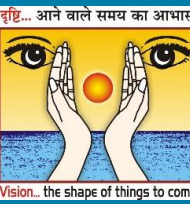
github.com/dotnet/maui

Blazor Overview



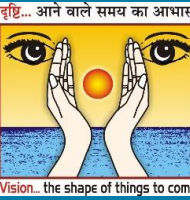
- Microsoft's latest web development framework
- An "application programming model"
- Based entirely on HTML and Web Standards
- Client-side Blazor using Web Assembly (web standard)
- Server-side Blazor
- Desktop Blazor built on top of MAUI

Blazor Updates in .NET 5



- Move to the new .NET runtime (away from Mono)
- Significant Performance Improvements
 - Computational performance up to 30% faster
 - Component rendering 2-4x faster
- Virtualization support
 - Virtualize component rather than foreach-loops
- Prerendering for performance and search optimization
- CSS Isolation
- Lazy Loading of assemblies

Blazor Updates in .NET 6



- Blazor Desktop on top of MAUI
- Error Boundaries
- Performance Improvements
 - Blazor WebAssembly ahead-of-time (AOT) compilation

Blazor vs MAUI



- Blazor is an HTML-based app development model/framework
 - Can be deployed in different ways (server, client, desktop)
 - Server and Client models work on any platform (Windows, Mac, Android, iOS, Linux, ...)
 - In exceptional cases, can bring in native elements on various platforms
- MAUI is a cross-platform native app development model
 - Windows, Mac, Android, iOS
 - In exceptional cases, can bring in hosted HTML
- Blazor Desktop sits on top

ASP.NET Core new features

Runtime

- HTTP/3
- HTTP logging middleware
- Shadow copying for IIS deployment
- OpenTelemetry support
- Higher throughput & reduced memory usage

APIs

- Minimal APIs
- Async streaming
- IAsyncDisposable support
- gRPC client retries & load balancing

Web UI

- CSS isolation for Pages & Views
- Improved SPA support

.NET Upgrade Assistant



- <https://aka.ms/dotnet-upgrade-assistant>
- Helps to analyze and upgrade older codebases
- Understands dependencies
- Provides guidance and assistance
- Multiple project types supported (and more coming)
- Currently in preview