

.NET

*Free. Cross-platform. Open source.
A developer platform for building all your apps.*

www.dot.net

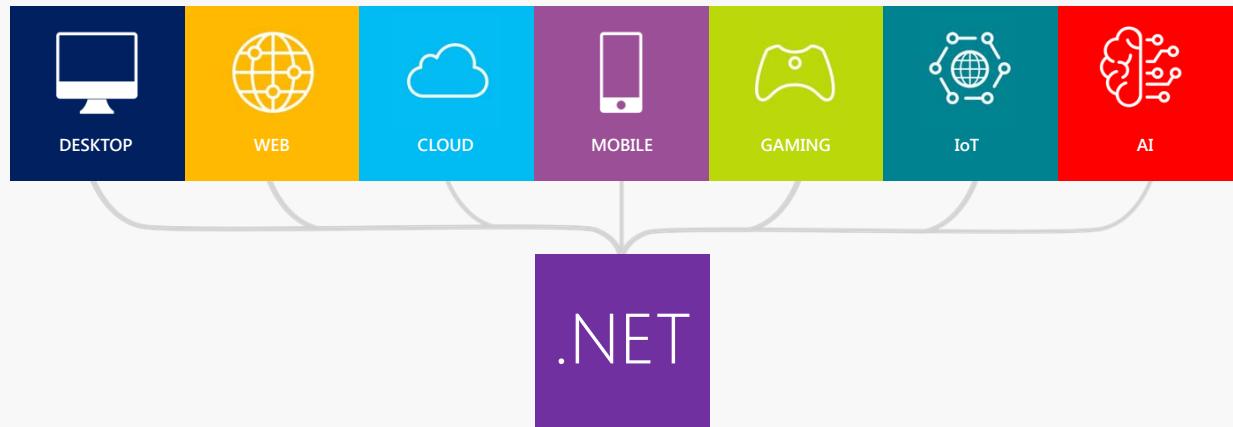
.NET Today and Tomorrow

Jon Galloway – Executive Director, .NET Foundation
@JonGalloway

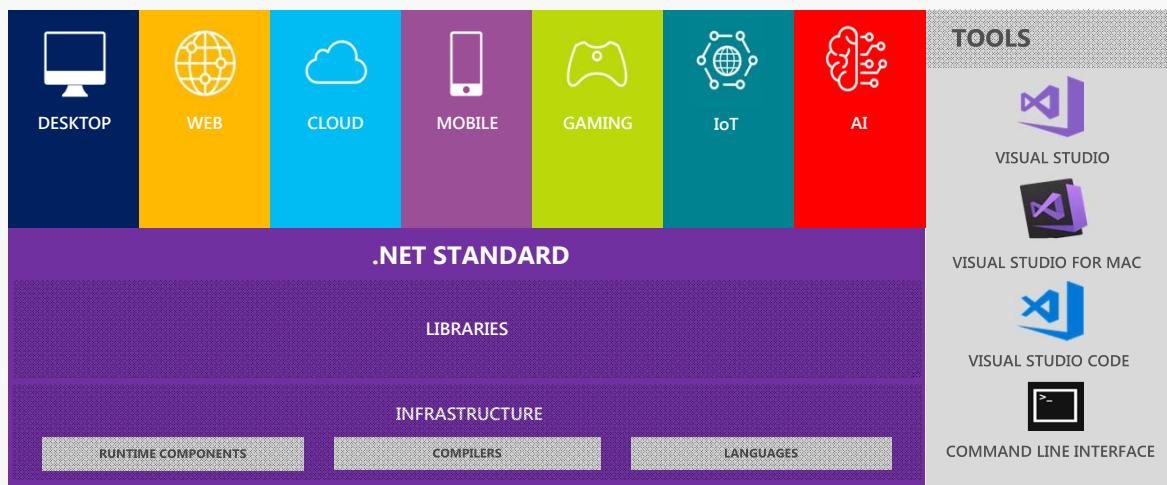
Beth Massi – Product Marketing Manager, .NET Platform
@BethMassi



Your platform for building **anything**



.NET – A unified platform



.NET Growth Continues

Visual Studio

+1 million new monthly active .NET developers in last year

.NET Core

Over half a million .NET Core 2.0 developers

RayGun
"Using the same-size server, we were able to go from 1,000 requests per second per node with Node.js to 20,000 requests per second with .NET Core."
- John-Daniel Trask, CEO and Co-Founder

AstroReality, Quantum Technologies
"We think .NET Core is mature, very powerful, and a great choice for advanced modern apps."
- Zerlot Ma, Cofounder and CEO

Jet.com Inc.
"The event-driven, microservices paradigm eliminated a lot of the overhead that comes with a service-oriented architecture."
- Mike Hanrahan, CTO

Tencent
"The cross-platform capabilities of .NET Core were very important to us. Also, Microsoft designed .NET Core with a microservice architecture in mind, and that fits right in with our redesign plans."
- Shanyou Zhang: Senior Software Architect

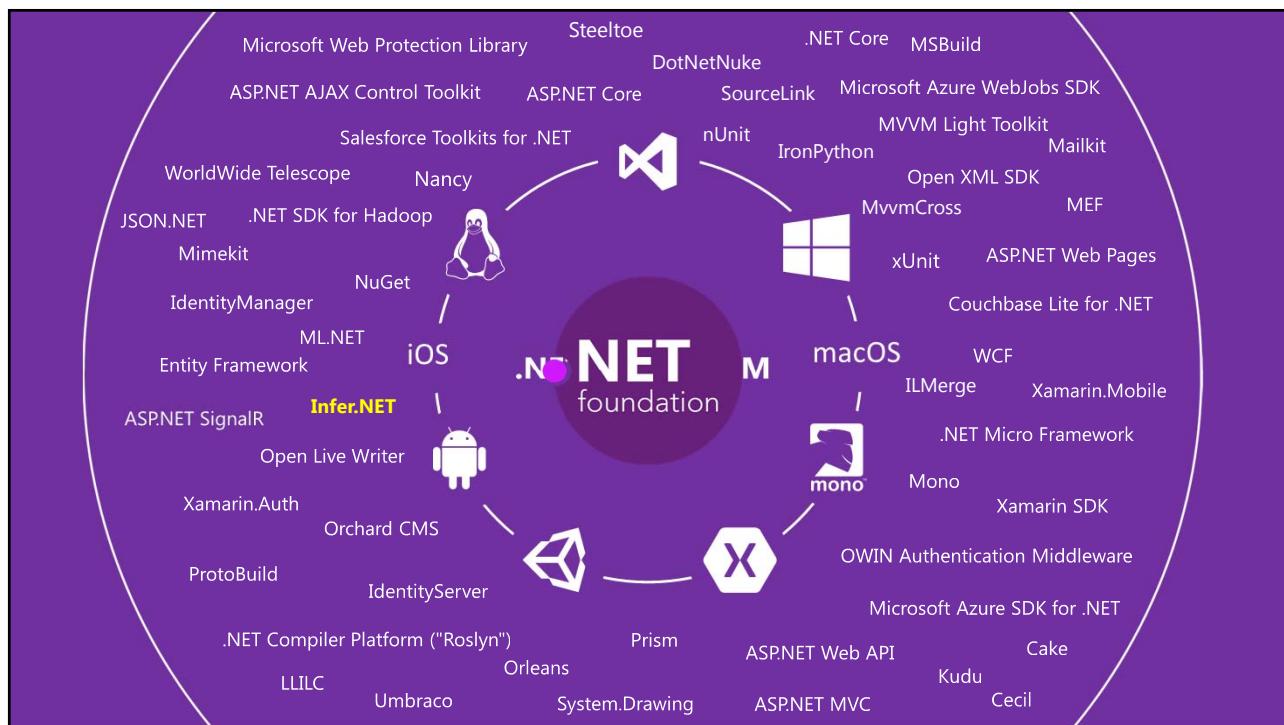
Age of Ascent, Iliyriad Games
"Our game microservices are built using ASP.NET Core which gives us superior performance. ASP.NET is open source, that allows us to contribute back to it if we have any performance issues which Microsoft review and together we make a better product."
- Ben Adams, CTO and Co-founder

United Parcel Service (UPS)
"Xamarin allowed us to develop a single code base in C# and deploy the application to two completely different mobile phone ecosystems."
- Scott Hildebrand, Application Development Manager

NetEase
".NET Core doesn't just help us get to market faster, it also enables our developers to focus on the core logic and what really matters, our players' experience. They don't have to deal with the communication gap and different ways of implementing the algorithm on the back and front end. They can just work on finding better ways to implement their ideas."
- Feng Zhou, Product Director

GoDaddy
"Services can be developed more quickly, perform faster in production, and scale better if they're written using .NET Core with C#."
- Jeremiah Gowdy: Principal Software Architect

And many more: microsoft.com/net/customers



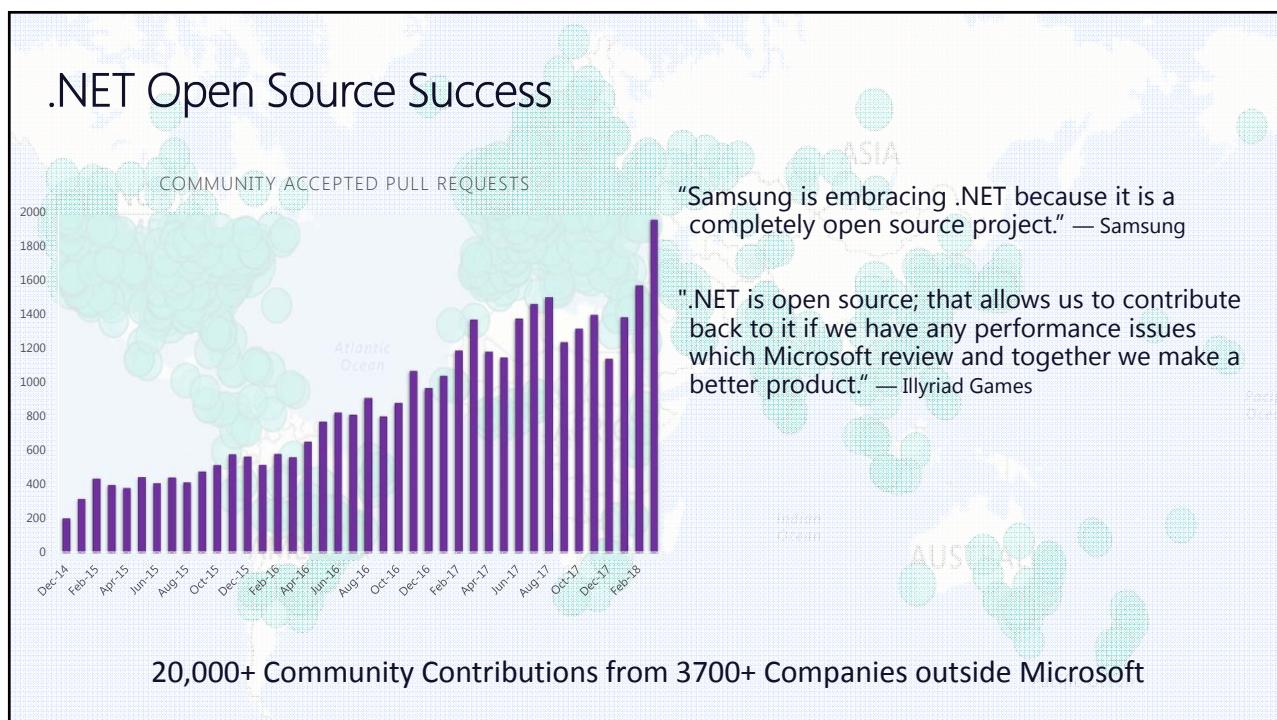
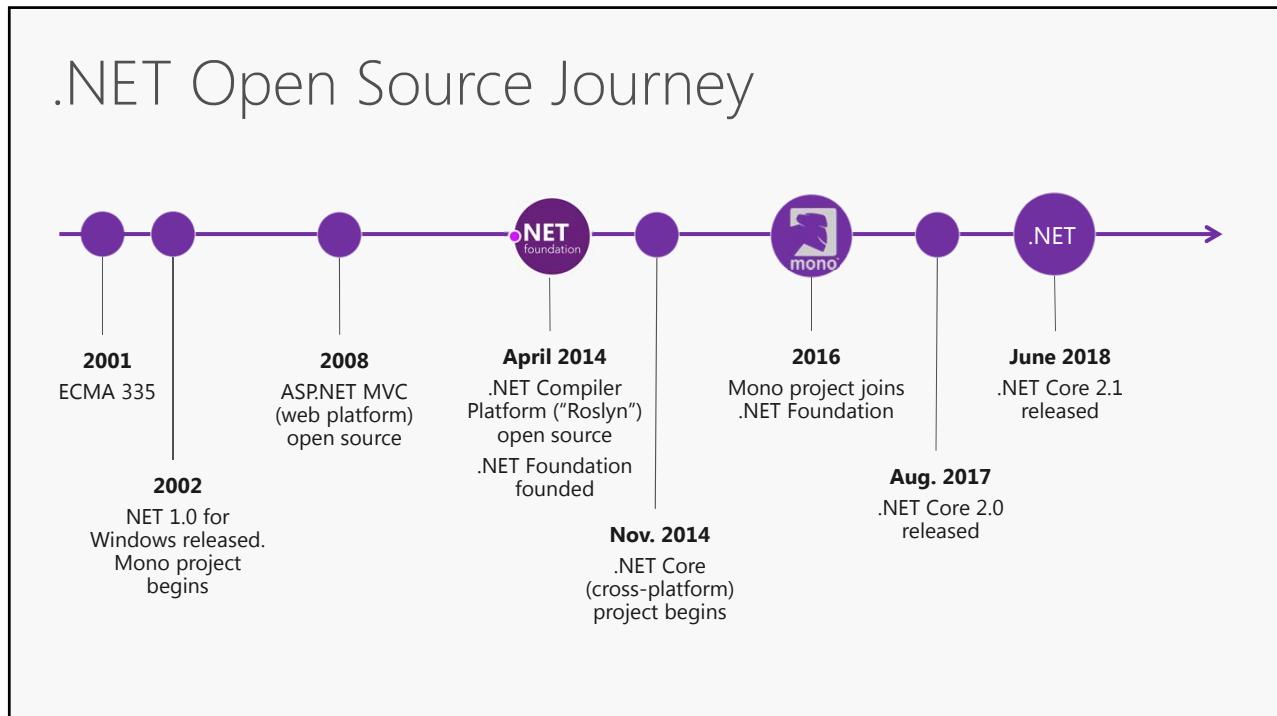
Visual Studio Live! San Diego 2018

The screenshot shows the .NET Foundation website. At the top left is the .NET foundation logo. To its right is the URL www.dotnetfoundation.org. Further right are links for "Get Involved", "Projects", "About", and "News". Below the header is a large banner image showing a group of people from behind, looking towards a bright horizon. Overlaid on the banner is the text "Independent. Innovative. And always open source." Below this is a smaller text block: "You've found the heartbeat of .NET—where projects and communities come together to get things done in our open-source world. Share your skills for the greater good. Meet in person, get involved virtually, and stay on top of the latest news, meetups, and events." At the bottom of the banner are three pink buttons: "Find a Meetup", "Dive into projects", and "Get the news". Below the banner are four white boxes containing statistics: "25,000 CONTRIBUTORS" (with a people icon), "1700 COMPANIES" (with a building icon), "55 ACTIVE PROJECTS" (with a code icon), and "462 RESOURCES" (with a GitHub icon).

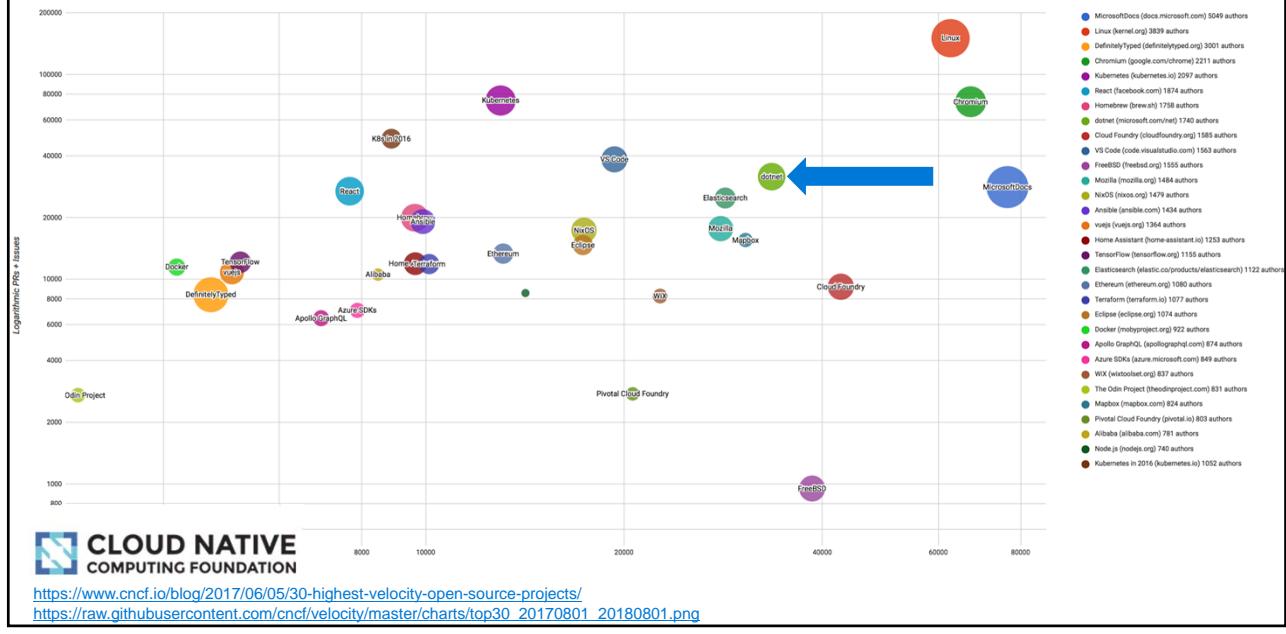
25,000 CONTRIBUTORS	1700 COMPANIES	55 ACTIVE PROJECTS	462 RESOURCES
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The screenshot shows the Meetup.com page for the ".NET" group. At the top left is the Meetup logo. To its right are links for "Start a new group", "Log in", and "Sign up". Below the header is a map of the world with red location pins marking various .NET groups. The map includes labels for continents and countries. At the bottom of the map are three boxes: "Groups" (221), "Members" (134,509), and "Countries" (50). Below these boxes is the text "Join us: meetup.com/pro/dotnet".

Groups 221	Members 134,509	Countries 50
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Top 30 Highest Velocity OSS Projects on GitHub



Now Available
.NET Core 2.1!

www.dot.net

.NET Core 2.1 Themes



**Improved
Compatibility with
.NET Framework**

GDPR & Security

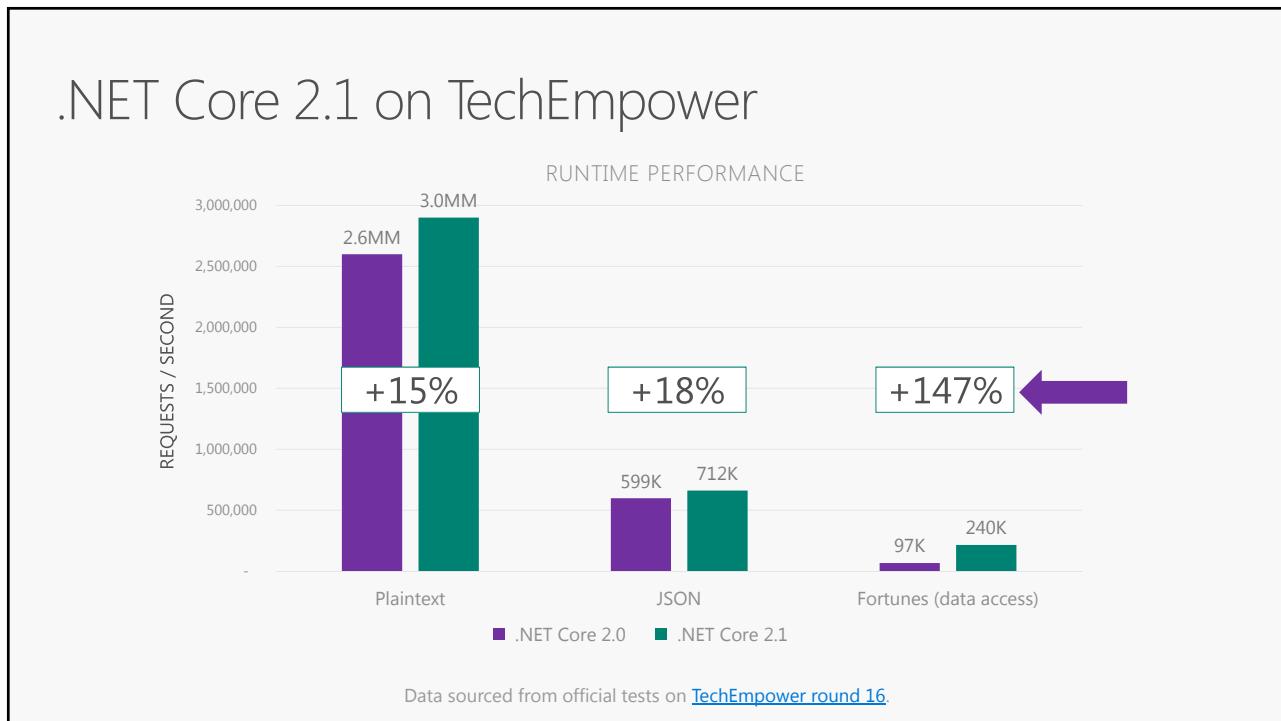
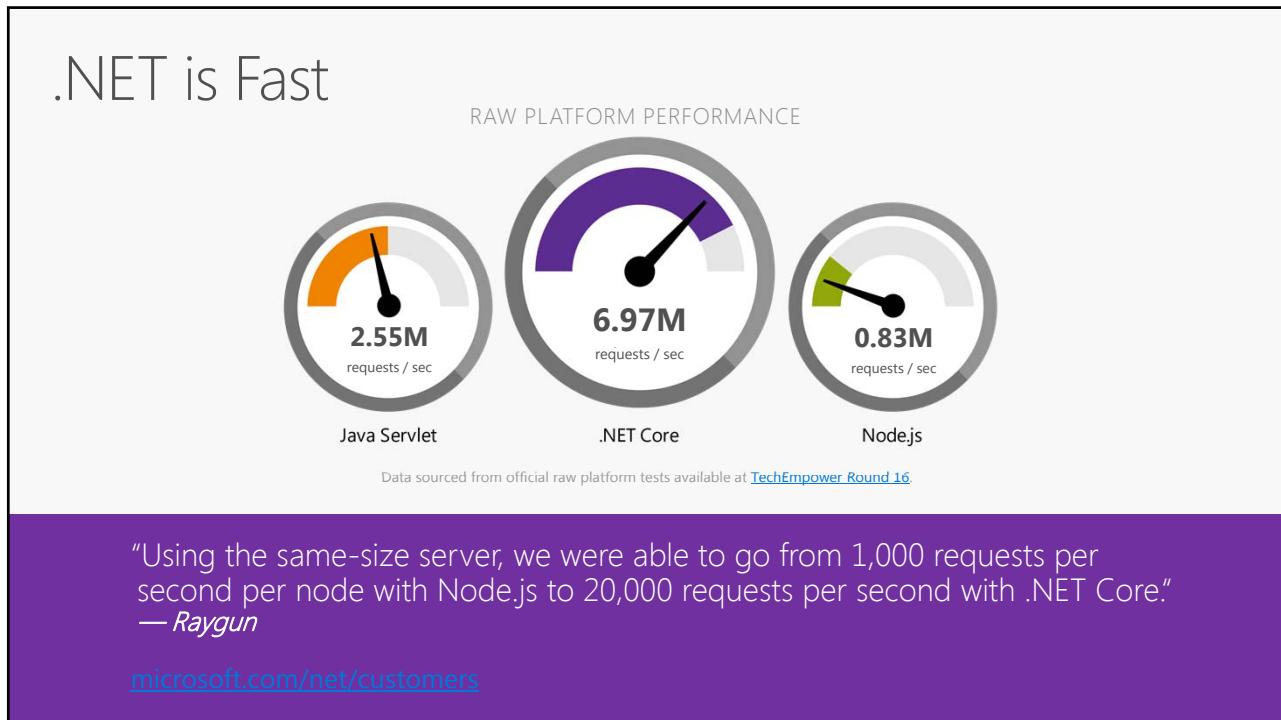
**Microservices and
Azure**

**Continued
Performance
Improvements**

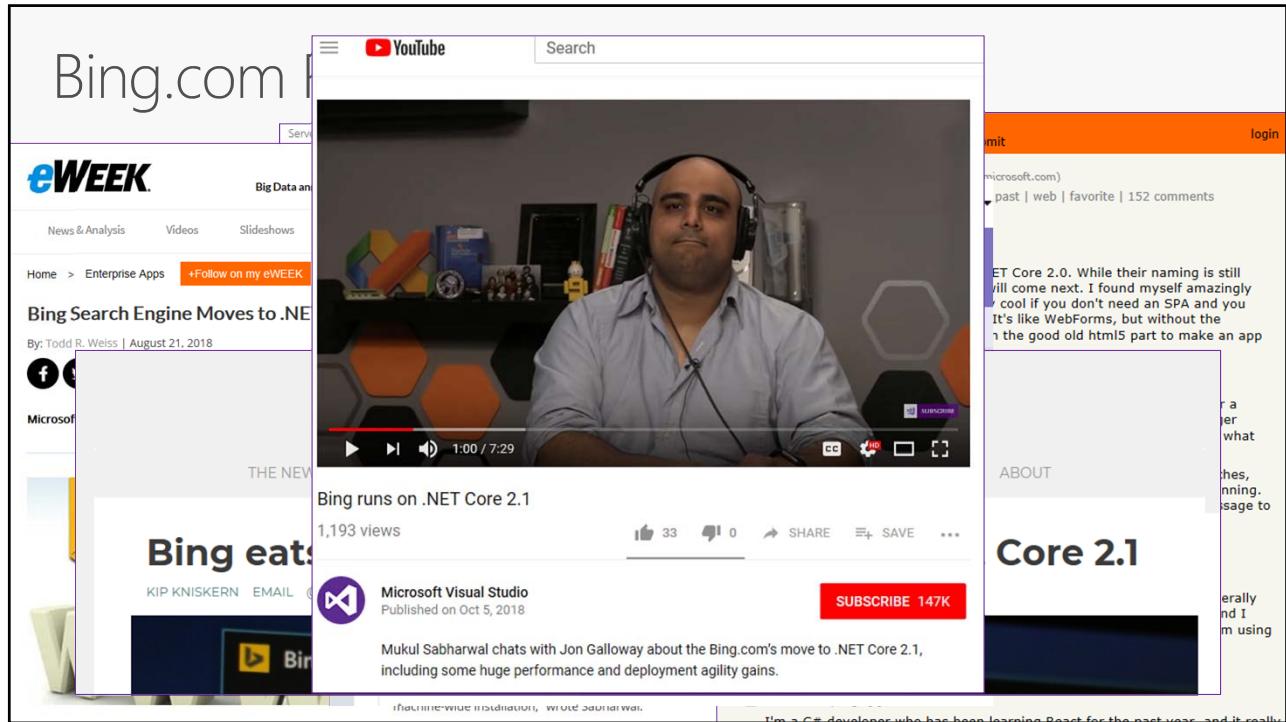
"We are honored that Microsoft has made it a priority to improve ASP.NET's performance in these benchmarks, and in so doing, improve the performance of all applications built on ASP.NET."

We believe this to be the most significant performance improvement that this project has ever seen."

- *TechEmpower*



Visual Studio Live! San Diego 2018



This screenshot shows the .NET Blog page on MSDN. The top navigation bar includes links for Server & Tools Blogs, Developer Tools Blogs, and .NET Blog. The main content area features a post titled "Performance Improvements in .NET Core 2.1" by Stephen Toub - MSFT, dated April 18, 2018. The post discusses various performance improvements in .NET Core 2.1 compared to .NET Core 1.1 and the .NET Framework. To the right, there's a sidebar for Visual Studio, sections for .NET Application Architecture, and a search bar. At the bottom, there's a footer with the URL "aka.ms/dotnetperf".

Performance - Span<T> and Friends

TLDR: Manipulate a chunk of data without copying it

Example: StringBuilder

```
private static readonly StringBuilder s_builder = new StringBuilder();

public void StringBuilderAppend()
{
    StringBuilder sb = s_builder;
    sb.Length = 0;

    for (int i = 0; i < 100_000; i++)
        sb.Append(i);
}
```

Toolchain	Mean	Allocated
.NET Core 2.0	6.523 ms	3992000 B

Example: Strings

```
public string StringToLowerChangesNeeded() =>
    "This is a test to see what happens when we call ToLower.".ToLower();

public string StringToLowerAlreadyCased() =>
    "this is a test to see what happens when we call tolower.".ToLower();
```

Method	Toolchain	Mean	Allocated
StringToLowerChangesNeeded	.NET Core 2.0	187.00 ns	144 B

.NET Core 2.1 Major Features

.NET Core

- Global Tools
- Span<T>
- Sockets
- HttpClient Performance
- Windows Compatibility Pack

EF Core

- Lazy Loading
- Value conversions
- Query types
- Data seeding

ASP.NET Core

- HTTPS
- Razor UI as a library
- HttpClientFactory
- ASP.NET Core SignalR

New in ASP.NET Core 2.1

SignalR

Razor class
libraries

Identity UI library
& scaffolding

HTTPS

GDPR

MVC functional
testing

[ApiController],
ActionResult<T>

IHttpClientFactory

Kestrel on Sockets

Generic host
builder

Performance

Updated SPA
templates

Azure SignalR Service

- Add real-time web functionalities easily with Azure and .NET Core
- Enable via "services.AddSignalR().AddAzureSignalR()"



Fully managed service

No more worries about capacity provisioning,
scaling, or persistent connections



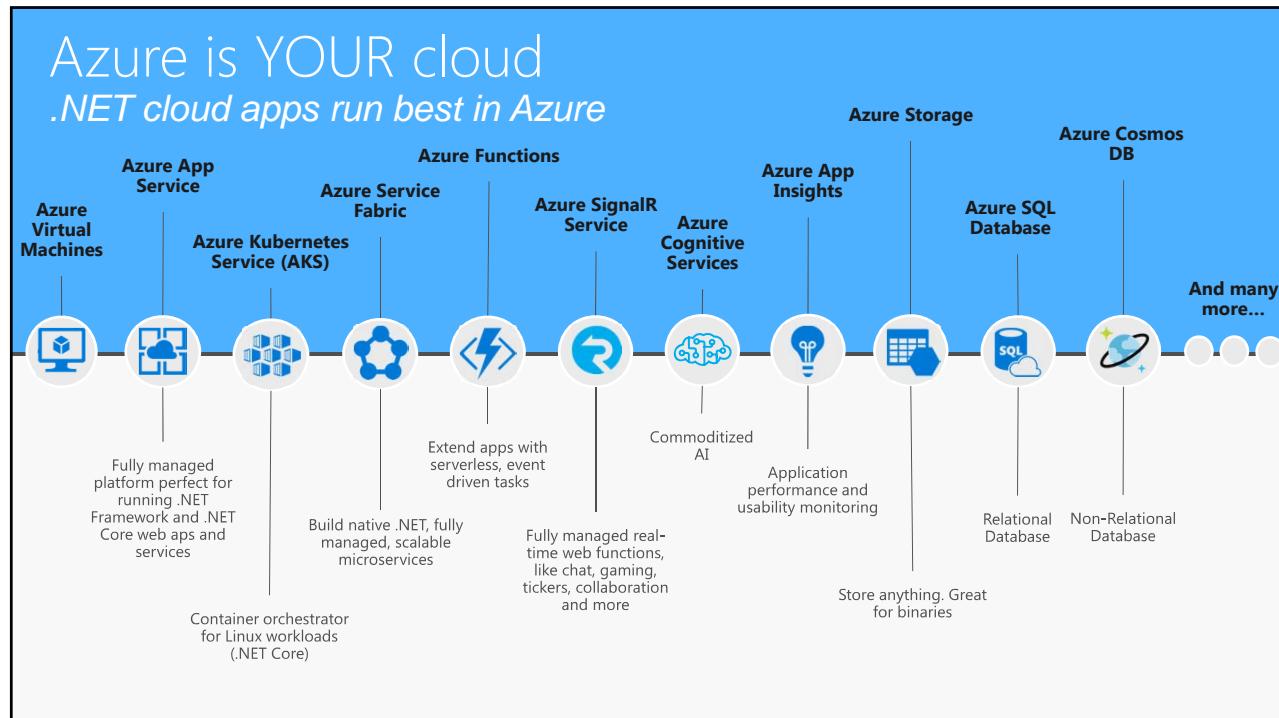
Native SignalR development

Use ASP.NET Core SignalR to build real-time
experiences such as chat, stock tickers, live
dashboards, and instant broadcasting

"By using Azure SignalR Service, we gain
the best practices of built-in security and
scalability—a comfort for our clients and a
huge win for us."

- Lars Kemmann: Solutions Architect, Netrix





Visual Studio

Accelerate your ~~cloud~~ development

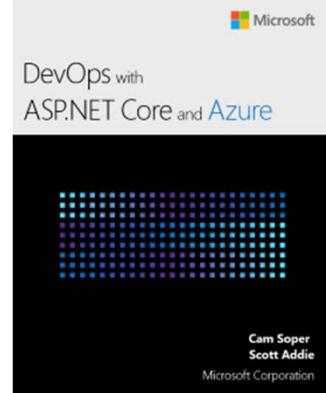
The screenshot shows the Visual Studio interface with several windows open:

- Seamless Azure Integration**: Publish directly to Azure without leaving the IDE.
- Connected Services**: A new experience for easily discovering and extending your app with cloud services.
- Container Tools**: Quickly add Docker compose and container orchestrator support to your apps.
- App Insights with Code Lens**: Get a 360° view of your app that includes availability, performance and user behavior.
- Azure Functions**: Get started quickly with serverless using templates and tools for development and debugging.
- Snapshot Debugging**: Production debugging your cloud apps has never been so simple.

Get Help Migrating your .NET app to Azure

aka.ms/migratetothecloud

Download free e-books and assessment resources....



Apply for **free** assistance from the .NET team!

Demo: .NET Core 2.1



Now Available .NET Core 2.2 Preview

<https://aka.ms/DotNetCore22>

.NET Core 2.2 Themes



**Improved Web API
Development**



**Microservices and
Azure**



**Continued
Performance
Improvements**

.NET Core 2.2 Major Features

.NET Core

- Multi-tier JIT compilation
- SQL Connection token auth

EF Core

- Cosmos DB provider
- Spatial extensions for SQL Server and SQLite providers
- Reverse engineering of database views
- Collections of owned entities
- Query tagging

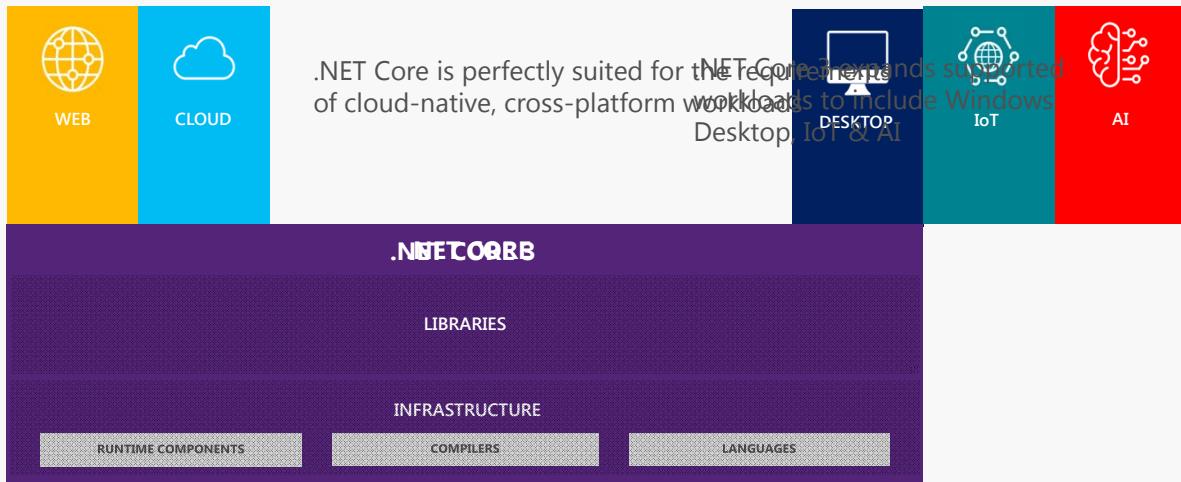
ASP.NET Core

- Template updates: Bootstrap 4, Angular 6
- Web API improvements, including API security
- HTTP/2
- IIS in-process hosting
- Health checks
- Endpoint routing
- SignalR Java client

Demo: .NET Core 2.2



.NET Core 3



.NET Core 3.0 Themes



**Desktop
Workloads
& UI Interop**



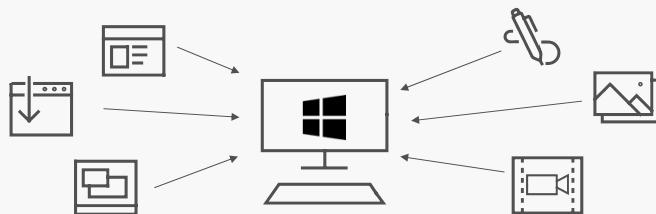
**Artificial
Intelligence &
Machine Learning**



**Web App
Development
Productivity**

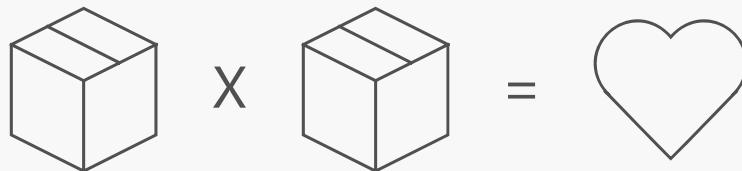
Desktop Improvements

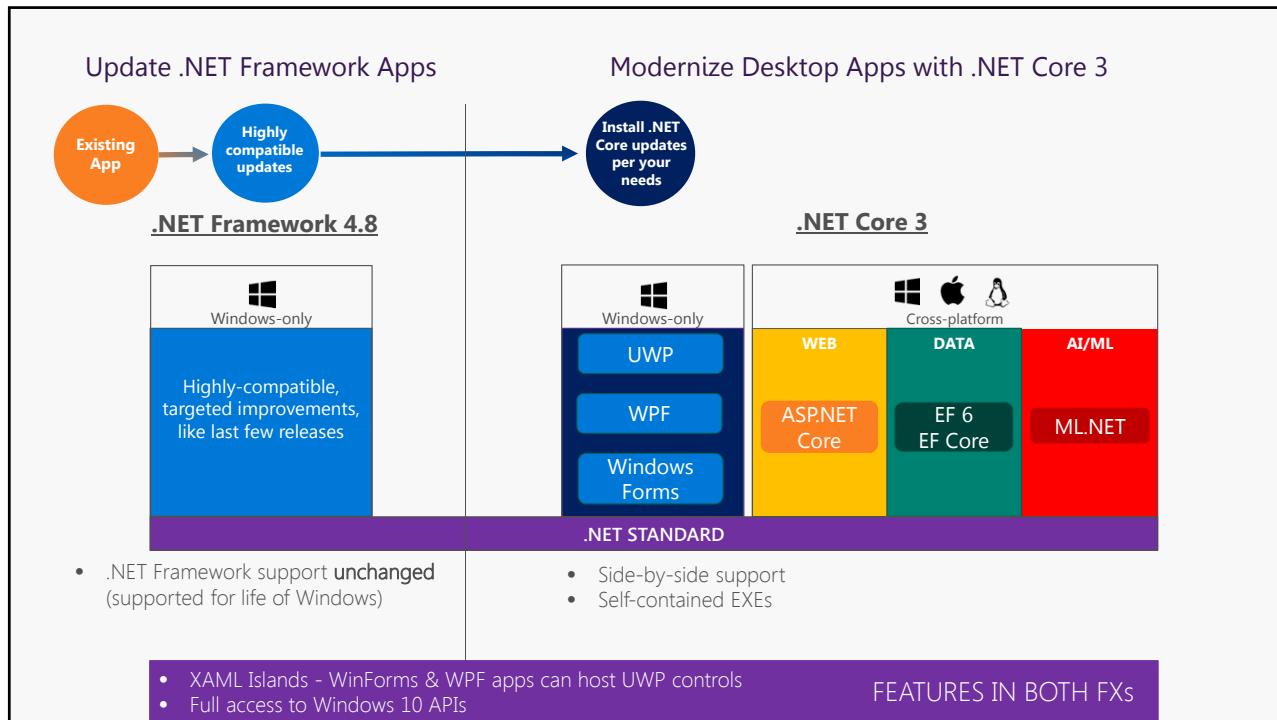
- UI Framework Enhancements
 - XAML Islands - WinForms & WPF can host UWP
 - XAML Controls – WinForms & WPF browser and media UWP controls
 - High DPI fixes for WinForms
- Access to all the Windows 10 APIs
- Also available in next version of .NET Framework (4.8)



Why Windows Desktop on .NET Core?

- Deployment Flexibility
 - Side-by-side support
 - Machine global or app local framework
 - Self-contained EXEs
- Core runtime and API improvements
- Performance





The Future of .NET Framework

- .NET Framework is slowing down
- Why? We want to stop breaking your apps!
 - Billions of installs. Getting much harder to release major features without compatibility issues
 - Can innovate much faster with .NET Core because of its side-by-side nature
- We *will* continue to update
 - Many major product lines within Microsoft depend on .NET Framework
 - We will continue to update .NET Framework for years to come. *High-compat features only.*
 - Things like... new security protocols, bug fixes, Windows features, etc.
- No changes to support policy
 - Support for 10 years (5 mainstream+5 custom) per Windows support policy for each release
 - .NET Framework will remain a Windows component and service policy is the same as Windows
- Recommend new development on .NET Core

Demo: .NET Core 3 for Desktop Apps



Experimental Blazor: .NET in the Browser

- Build client-side Web UI in .NET
 - You don't need to know AngularJS, React, Vue, etc.
 - Take advantage of stability and consistency of .NET
- Runs in all browsers via WebAssembly
 - Native performance
 - Strongly typed on client and server
 - Requires no plugin or code transpilation
 - Share C# code with the client and the server

Razor Components ("server-side Blazor")

- Blazor programming model integrated into ASP.NET Core
- Runs server-side on .NET Core
- Handle client UI interactions using SignalR
- Same code can run client-side on WebAssembly with no code changes
- WebAssembly support remains experimental while runtime matures
- Razor Components shipping in .NET Core 3.0

Demo: Blazor .NET

Microsoft Cognitive Services Commoditized AI

Vision From faces to feelings, allow your apps to understand images and video	Speech Hear and speak to your users by filtering noise, identifying speakers, and understanding intent	Language Process text and learn how to recognize what users want	Knowledge Tap into rich knowledge amassed from the web, academia, or your own data	Search Access billions of web pages, images, videos, and news with the power of Bing APIs	Labs An early look at emerging Cognitive Services technologies: discover, try and give feedback on new technologies before general availability
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ML.NET

Machine Learning framework made for .NET developers

Build-your-own Build your own custom models by writing C# or F# code	Developer focused ML.NET provides just the right amount of productivity and control	Extensible Tap into other machine learning toolkits with the rich extensibility model like TensorFlow	Proven ML.NET has been used internally in products like Office and Bing for years	Open source and Cross-platform Runs on Windows, macOS and Linux and developed in the open on GitHub
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<https://github.com/dotnet/machinelearning>

A few things you can do with ML.NET ...



Sentiment Analysis



Forecasting



Issue Classification



Predictive maintenance



Image classification



Recommendations



Object detection



Customer segmentation



And more! Samples @ <https://github.com/dotnet/machinelearning-samples>

New Preview Available
ML.NET 0.6

<https://aka.ms/MLNET06>

Demo: ML.NET



Your platform for building **anything**

