

State of .NET

Jim Duffy

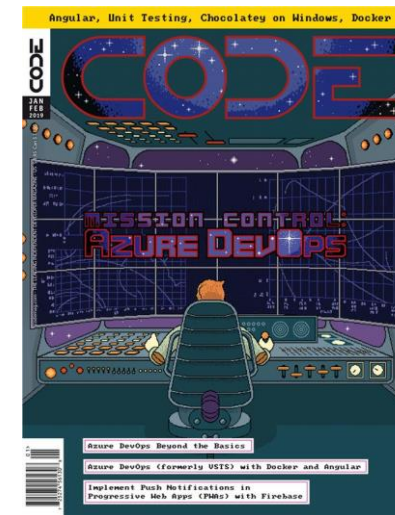
Director of Business Development
CODE Magazine & Consulting



About the Presenter

Jim Duffy

- Director of Business Development
CODE Magazine & Consulting (*EPS Software Corp.*)
- jduffy@codemag.com
- International Author and Speaker
- Former Microsoft RD (Regional Director) 9 years
- Former 11 time Microsoft Most Valuable Professional (MVP)
- Twitter: @jmduffy



Housekeeping Items

- Rest rooms
- Breaks
- Longest distance traveled?
- First timers?
- Complete eval later to be entered into drawing for Samsung Gear 360 camera!



TRINUG Meeting Afterward

- TRINUG (Triangle .NET User Group) meeting after this event. If staying for TRINUG you need to check out/check back in. If you leave this event early please check out with reception.

13 FEB

Wednesday, February 13, 2019

Main Meeting: What's behind Core number 3? A technical dive into .Net Core 3

Hosted by Rob Z. and Justin S.
From Triangle .NET User Group
Public group

Are you going? 35 spots left

Share: [f](#) [t](#) [in](#)

The logo for VACO features the word "vaco" in a bold, blue, lowercase sans-serif font. Above the letters "a" and "c" are stylized blue and orange shapes resembling leaves or petals. Below the word "vaco" is the tagline "Free Yourself" in a smaller, blue, sans-serif font.

Details

At the 2018 Build Developer Conference Microsoft shared the roadmap for .NET Core 3.0. Since then two preview releases have shipped. Some major new additions include support for Windows desktop applications, including Windows Forms, UWP XAML, and Windows Presentation Framework (WPF) as

Wednesday, February 13, 2019
5:30 PM to 8:00 PM

Microsoft Corporation
3025 Carrington Mill Blvd - Morrisville, NC

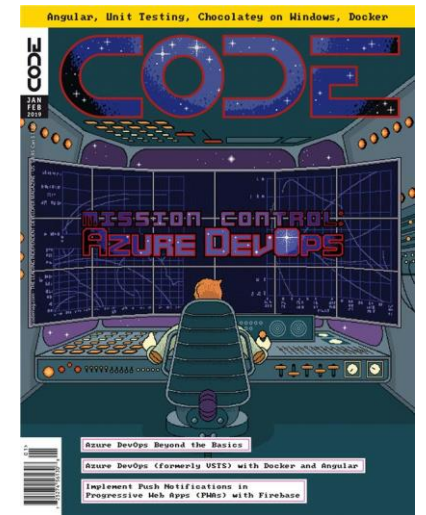
How to find us
Take the elevator to the 2nd floor, enter the glass doors to the left.

A Google Maps snippet showing the location of the event. A red location pin is placed on Carrington Mill Blvd in Morrisville, NC. The map shows surrounding streets and a building labeled "ChannelAdvisor".

About CODE & EPS Software Corp.

“Helping People Build Better Software”

- Custom Software, Consulting, Training, Mentoring,...
- Windows, Web, Mobile, Cloud, Serverless, Databases,...
- User Interface and Interaction Design
- Project Rescue, Legacy Conversions
- Development team augmentation
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About CODE & EPS Software Corp.

- Looking for work?

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

- Want to write for us?

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

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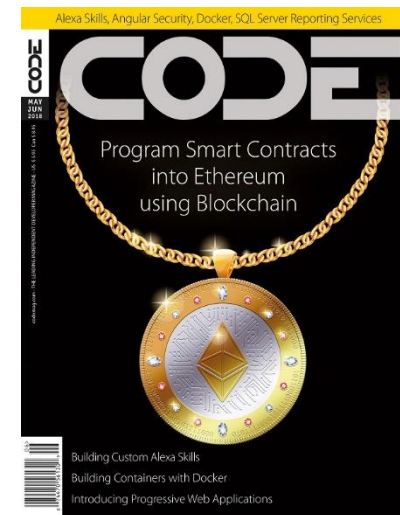


Social Networks

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- Facebook: www.facebook.com/CODEMagazine/



Agenda

- Where are we at? How do we develop today? Not just MS stuff.
- What's new with .NET?
- What's new with Visual Studio?
- What's new with Azure and the Cloud?
- Windows & Windows Phone
- Artificial Intelligence and Machine Learning

Microsoft Today



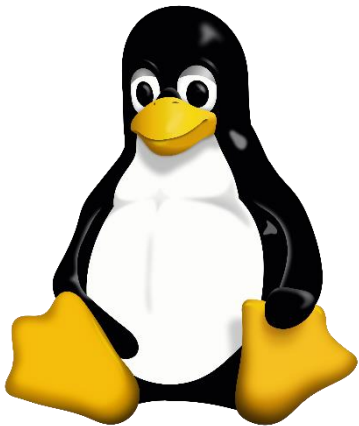
The “New Microsoft”



- Microsoft is Back!!!
- My non-Microsoft take on things:
 - Microsoft is back to being the friendlier, cooler Microsoft!
 - Microsoft is back to building cool new stuff that’s actually exciting!
 - Microsoft is back as the leader in OS innovation
 - Microsoft is building incredible Enterprise-level software
 - Microsoft’s developer ecosystem is growing rapidly
 - Microsoft’s customer satisfaction ratings are outstanding
- Very rapid developments
- Paying off! \$37/share Satya Nadella day #1 – now \$106 (\$115 high)

Embracing Everything

- In the past, Microsoft can be seen as “Windows only”
- Today, Microsoft embraces all developers and all platforms



The "Open Microsoft" – Biggest OS Contributor

- Strategic move to Open Source
 - Example: ASP.NET Core 2.2
- Strategic move to embracing all technologies and platforms

A screenshot of the ASP.NET Core GitHub repository page. The page shows the repository name 'aspnet / Home', navigation links for 'Code', 'Issues', 'Pull requests', 'Projects', 'Wiki', and 'Insights'. It displays statistics: 381 commits, 23 branches, 30 releases, and 49 contributors. A table lists recent commits, including one by 'danroth27' on May 10. Below the table, the 'README.md' file is open, showing the title 'ASP.NET Core', a 'chat on gitter' link, and introductory text about the framework.

Features Business Explore Marketplace Pricing This repository Search Sign in or Sign up

aspnet / Home Watch 1,121 Star 6,111 Fork 1,587

<> Code Issues 653 Pull requests 4 Projects 0 Wiki Insights

The Home repository is the starting point for people to learn about ASP.NET Core.

381 commits 23 branches 30 releases 49 contributors

Branch: dev New pull request Find file Clone or download

danroth27 committed on GitHub Update README.md Latest commit 698fabf on May 10

.github	Add issue template with list of repos (#1971)	3 months ago
.gitattributes	initial commit	3 years ago
.gitignore	Clean up samples to work with the current tooling.	2 years ago
CONTRIBUTING.md	Name change ASP.NET 5 --> ASP.NET Core	a year ago
LICENSE.txt	Update LICENSE.txt and license header on files.	2 years ago
README.md	Update README.md	a month ago

README.md

ASP.NET Core

chat on gitter

This is the home page of the ASP.NET Core source code repositories and is intended for those contributing to ASP.NET Core or using bleeding edge nightly builds.

ASP.NET Core is a new open-source and cross-platform framework for building modern cloud based internet connected applications, such as web apps, IoT apps and mobile backends. ASP.NET Core apps can run on .NET Core or on the full .NET

Microsoft Buys GitHub (June 2018)

- Interesting scenarios about combining Visual Studio Online and GitHub
- Free Private Repos
- <https://github.com/pricing>

A screenshot of the GitHub repository page for 'aspnet / Home'. The page shows the repository name, navigation links (Code, Issues, Pull requests, Projects, Wiki, Insights), and statistics (Watch: 1,121, Star: 6,111, Fork: 1,587). Below the repository name, it states 'The Home repository is the starting point for people to learn about ASP.NET Core.' and provides statistics: 381 commits, 23 branches, 30 releases, and 49 contributors. A table lists recent commits, including one by 'danroth27' on May 10. The 'README.md' file is highlighted, and its content is shown below, including the title 'ASP.NET Core', a 'chat on gitter' link, and introductory text about the framework.

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Git

- Git (the technology) has won the “asset-management wars”
- It is now used for anything from source code to content management
- It is used as a central technology for things such as DevOps
- Don't be afraid of branching (or initial setup)!
- Visual Studio Integration
 - Git is integrated in pretty much any IDE
 - Git can be accessed from the command line and (with third party tools) from Explorer, GitHub for Windows, and many others

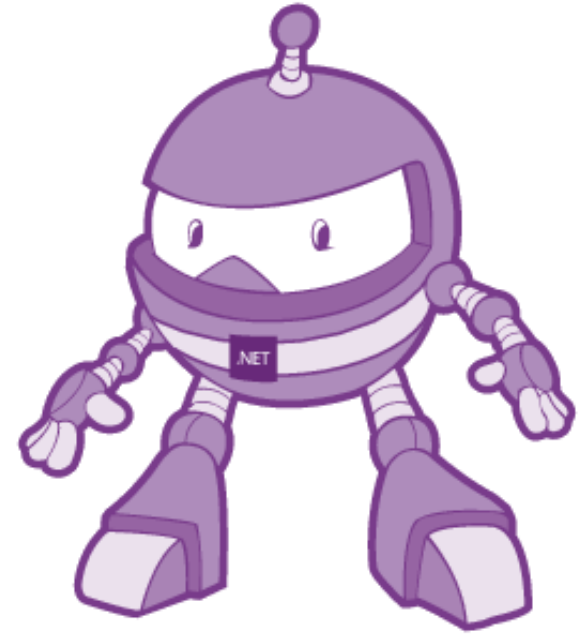


Food for Thought: GitHub owns Electron

- <https://electronjs.org/>
- Very popular open-source framework to build Desktop apps with HTML5
- Used by GitHub to build the GitHub Desktop Client
 - Used by many others too     
- Electron is a direct counter-part to Universal Windows Apps
- We do not know how that will work out yet



.NET

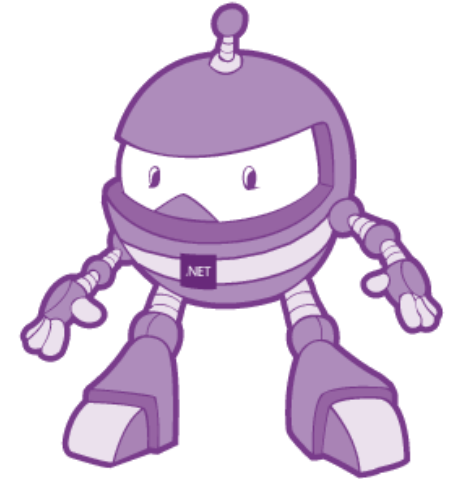


Your platform for building **anything**



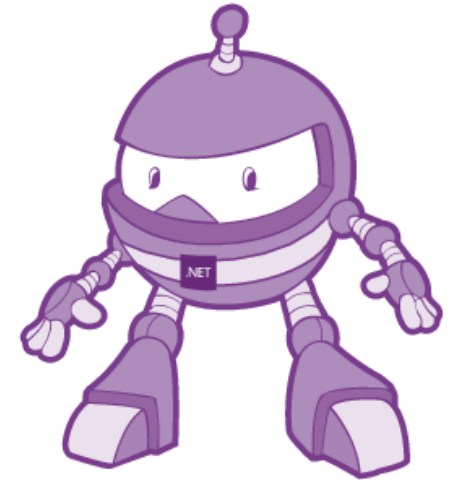
.NET Overview

- .NET is going strong
- .NET Core is being adopted industry wide
- .NET Framework is NOT going away
 - Current version: 4.7.2
 - Work on 4.8 underway
- According to Microsoft, over a **million** new monthly active .NET developers were added in the last year



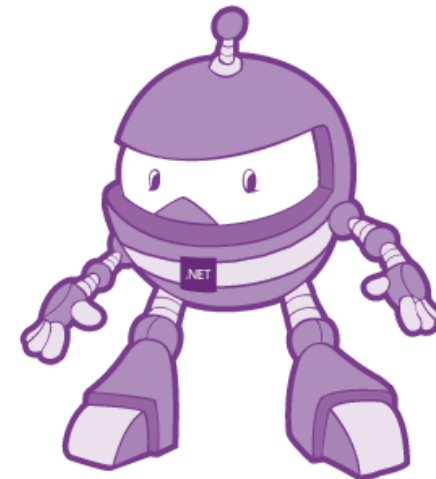
.NET Framework

- Current Version: 4.7.2
 - Version 4.8 is in development and will probably ship with VS 2019
- YES, Microsoft is committed to enhancing and supporting it
- Slower update & enhancement cadence
- Office 365, Dynamics, Sharepoint, Bing and others will all continue to use .NET Framework



.NET Framework Roadmap

- .NET Framework 4.8
 - Modern browser and modern media controls
 - Access to touch and UWP Controls
 - High DPI improvements
- Focus on NOT breaking people's apps with any new .NET Framework update
 - **2 billion installs worldwide**
- Goal is to desktop applications more modern
- No Side-by-Side support



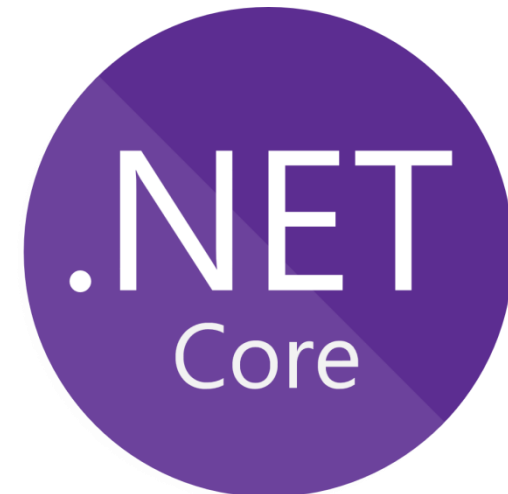
.NET Core

- Re-write of the .NET Runtime
- Re-envisioning of .NET for today's scenarios
- Open-source framework
- Cross-platform (Windows, Linux & Mac)
- Subset of .NET Framework
- Side-by-Side Support
- <http://dot.net>



.NET Core Roadmap

- .NET Core 2.2 is the latest released version
 - <https://www.microsoft.com/net/download/dotnet-core/2.2>
- .NET Core 3 Preview is Available
 - Announced in May 2018 at Microsoft Build
 - Regular release sometime this year (we will probably hear more at Build 2019)



.NET Core 2.2

.NET Core 2.2 Major Features

.NET Core

- Multi-tier JIT compilation
- SQL Connection token auth

EF Core

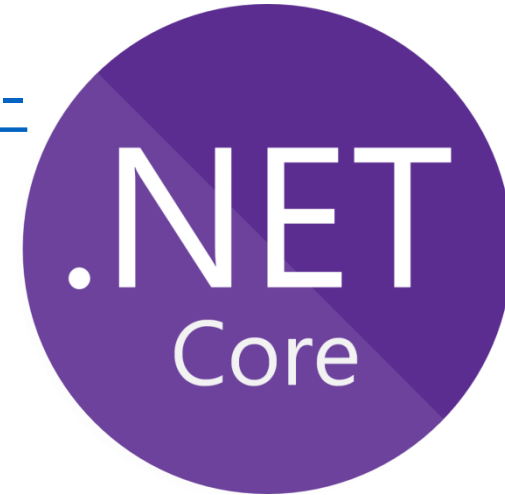
- Cosmos DB provider
- Spatial extensions for SQL Server and SQLite providers
- Reverse engineering of database views
- Collections of owned entities
- Query tagging

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

New in ASP.NET Core 2.2

- <https://docs.microsoft.com/en-us/aspnet/core/release-notes/aspnetcore-2.2?view=aspnetcore-2.2>
- New Endpoint Routing System
- Health Checks
- SignalR Java Client
- Open API Analyzers & Conventions
- Problem Details support
- Project Templates updated to Bootstrap 4 and Angular 6
- MVC Validation Performance enhancements
- Much More



New in Entity Framework Core 2.2

- <https://docs.microsoft.com/en-us/ef/core/what-is-new/ef-core-2.2>
- Spatial data support
- Collections of owned entities
- Query Tags



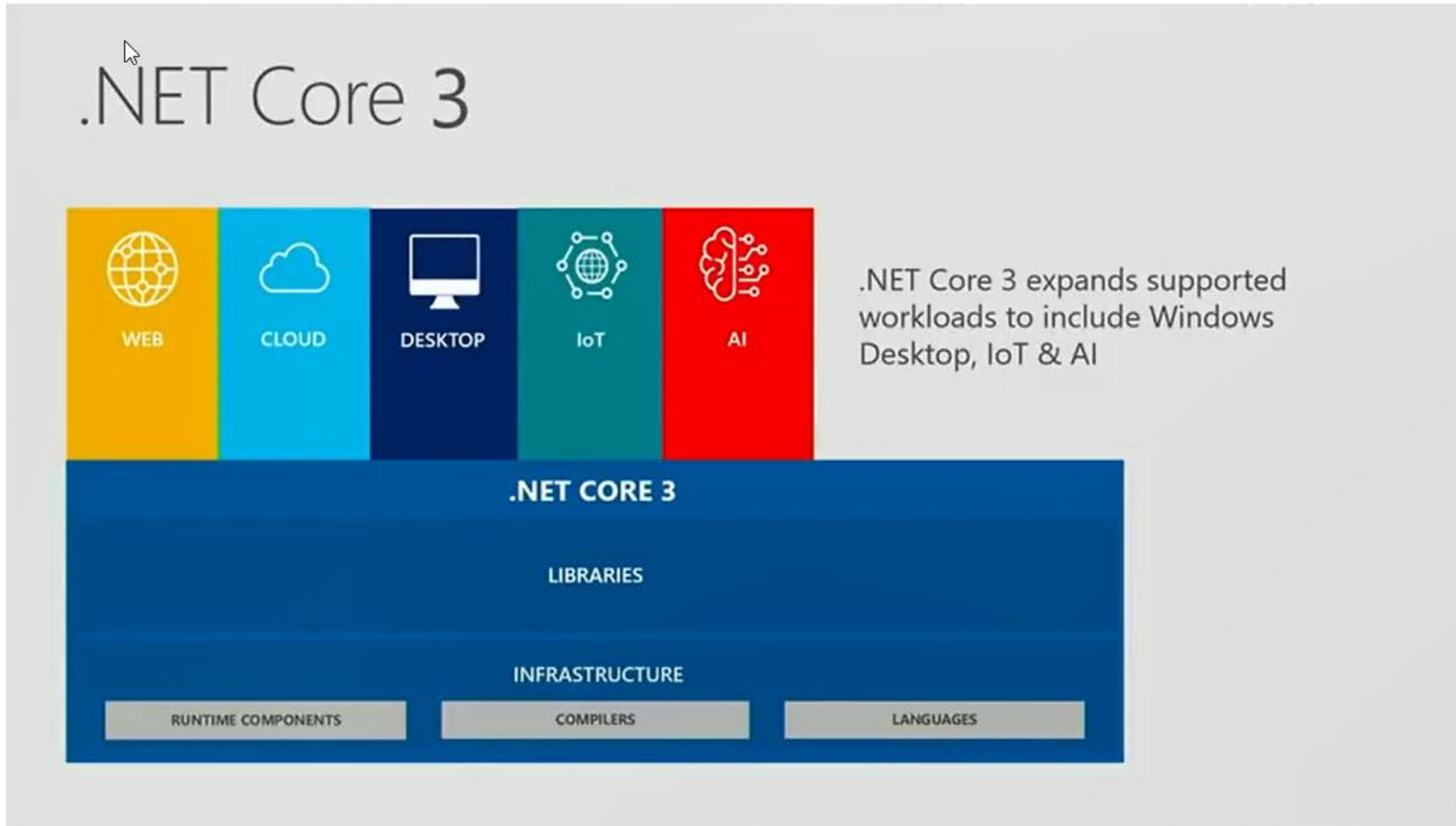
CODE Magazine - .NET Core 2.1

- Our July/August issue was produced in conjunction with Microsoft and has lots of info specific to .NET Core 2.1

<https://www.codemag.com/Magazine/Issue/JulAug18>



.NET Core 3.0



.NET Core 3.0

- Side-by-side versions of .NET that support WinForms and WPF
 - Allow multiple versions of .NET on a machine
- Embed .NET directly into an application
 - Ship the framework as part of your application
- Take advantage of .NET Core features
 - Use the latest enhancements without risk of breaking compatibility
- .NET Core 3 Preview MSDN Blog Post (12/4/18):

<https://blogs.msdn.microsoft.com/dotnet/2018/12/04/announcing-net-core-3-preview-1-and-open-sourcing-windows-desktop-frameworks/>



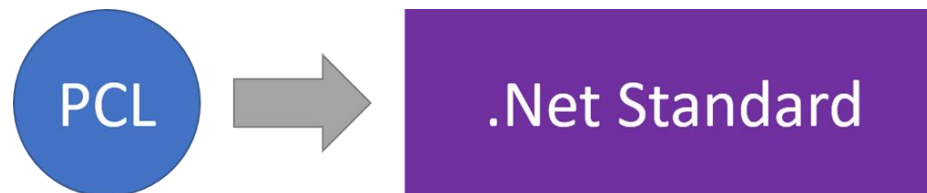
.NET Core 3.0 and Windows Desktop

- .NET Core 3.0 will run Desktop applications
 - WinForms and WPF
- Be aware, that WinForms and WPF are still technologies that rely on Windows as an underlying operating system
 - For instance: WPF requires DirectX 9 to run, which is only available on Windows
- .NET Core App Bundler
 - Single self-contained .exe



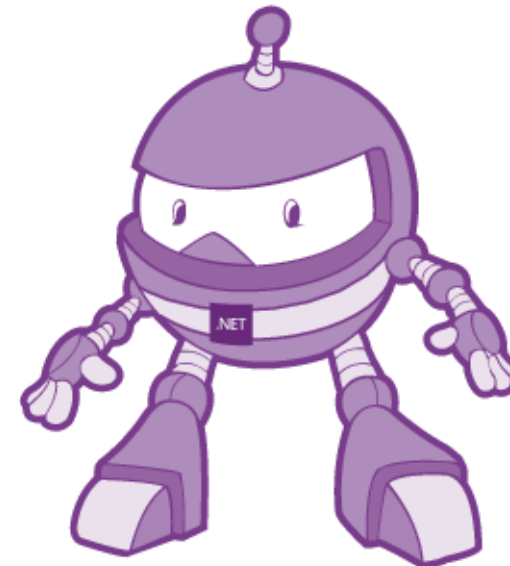
.NET Standard

- A standard set of APIs that all .NET platforms have to implement
- Unifies the .NET platforms and prevents future fragmentation
- Think of this as an evolution of portable libraries
 - Do not use PCL! Use .NET Standard now!
- NET Standard 2.0 is a big step forward and is implemented by:
 - .NET Framework
 - .NET Core
 - Xamarin
- <https://docs.microsoft.com/en-us/dotnet/standard/net-standard>



Food for Thought: .NET Core

- .NET Core is a refresh of the aging .NET platform
- It gives Microsoft ways to fix and change things that are outdated
- This is the platform on which “new stuff” will happen
- This is why it is important that WPF and WinForms move to .NET Core



.NET Foundation

- <https://dotnetfoundation.org/>
- The .NET Foundation supports .NET open source in a number of ways.
 - Promote the broad spectrum of software available to .NET developers through NuGet.org, GitHub, and other venues
 - Advocate for the needs of .NET open source developers in the community
 - Evangelize the benefits of the .NET platform to a wider community of developers
 - Promote the benefits of the open source model to developers already using .NET
 - Offer administrative support for a number of .NET open source projects



Development Environment and Languages

Languages

- .NET Languages
 - C#: Leader of the pack
 - VB: Still going strong
 - F#: Darling of a dedicated smaller functional programming community
 - All have a bright future with specific roles to play
- Other Languages
 - JavaScript
 - TypeScript
 - Python, R,...

Visual Studio 2017

- Very nice performance improvements
- Very nice editor improvements
- Has all the things you'd expect from a new version of VS
- Very easy to migrate to, thanks to high compatibility
- Selective install



Visual Studio®
visualstudio.com

Visual Studio 2019 - Preview

- A better performing and more reliable debugger, moving to an out-of-process 64-bit process
- Improved search accuracy for menus, commands, options, and installable components
- Tooling for Windows Forms and WPF development on .NET Core 3
- Visual Studio Roadmap: <https://docs.microsoft.com/en-us/visualstudio/productinfo/vs-roadmap>
- Visual Studio 2019 Info: <https://blogs.msdn.microsoft.com/visualstudio/2018/10/17/visual-studio-roadmap-updates-and-visual-studio-2019-information/>



Visual Studio[®]
visualstudio.com

Visual Studio Community Edition

- Free version of Visual Studio
 - You can think of this as “Visual Studio Professional”
- Full support for features such as add-ins and extensions
- Free for non-Enterprise developers
- visualstudio.com/vs/community/

Visual Studio Community

A fully-featured, extensible, free IDE for creating modern applications for Android, iOS, Windows, as well as web applications and cloud services.

Download VS Community 2017 

Visual Studio Editions

Visual Studio Community

Free, full-featured and extensible tool for developers building non-enterprise applications

- **Full-featured** Integrated Development Environment for building Web, Windows Desktop and cross-platform iOS, Android, and Windows apps
- **Ecosystem** with thousands of extensions to choose from in the [Visual Studio Gallery](#), or [create your own](#)
- **Free** for open source projects, academic research, training, education and small professional teams

Visual Studio Professional with MSDN

Professional developer tools and services for individual developers or small teams

- **Professional** developer tool for building any application type
- **Powerful features** to improve your team's productivity such as CodeLens
- **Improve team collaboration** with Agile project planning tools, Team Rooms, charts and more
- **MSDN subscription benefits** including access to core software for dev/test, Team Foundation Server, Visual Studio Online Basic, \$50/month in Azure credits, training and support.

Visual Studio Enterprise with MSDN

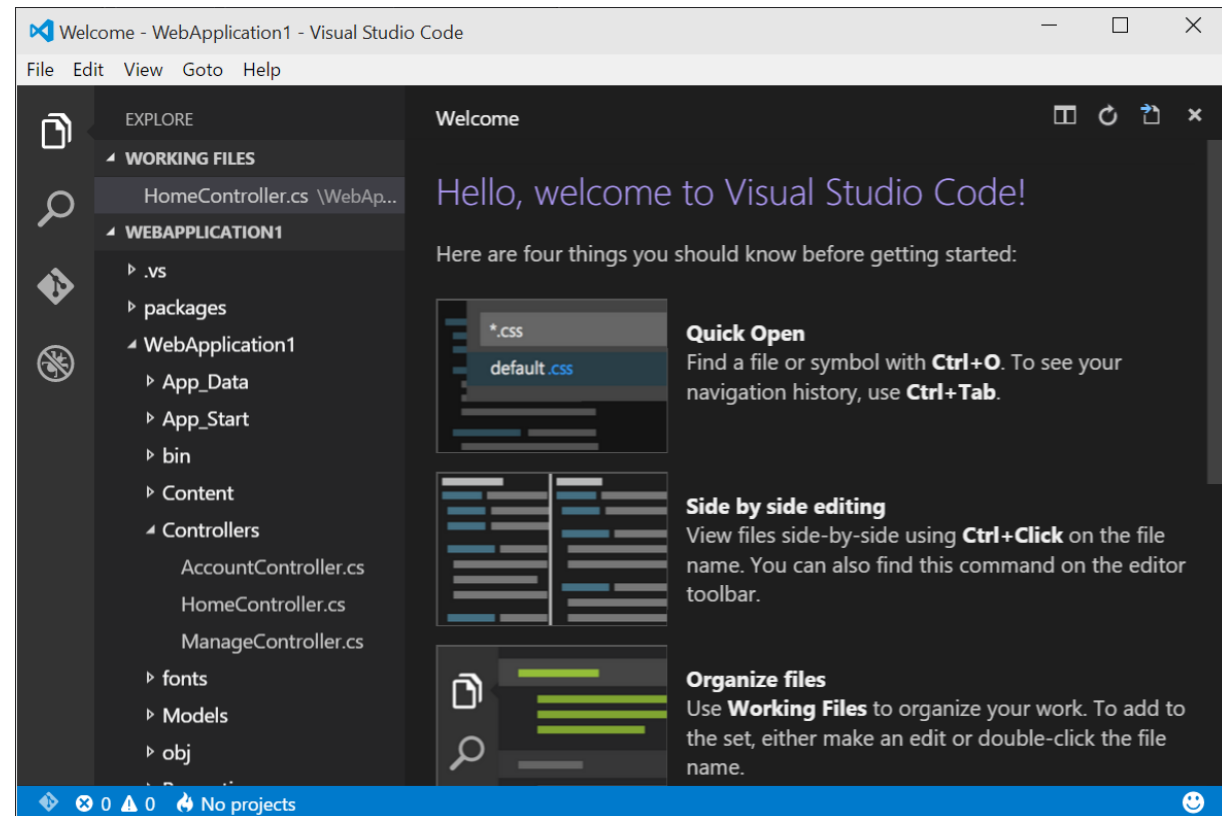
Enterprise grade solution with advanced capabilities for teams working on projects of any size or complexity, including advanced testing and DevOps

NEW

- **End-to-end solution** for your development teams, including the most feature-rich Visual Studio IDE for working on any type of project
- **Build quality applications** at scale with advanced features such as Load Testing, automated and manual testing and new IntelliTest capabilities
- **Manage complexity and resolve issues quickly** with features such as Code Map and IntelliTrace
- **Enhanced MSDN subscription benefits** including comprehensive access to software for dev/test, Team Foundation Server, Visual Studio Online Advanced, \$150/month in Azure credits, training and support

Visual Studio Code

- A new, lightweight IDE / code editor that is part of the Visual Studio family
- Completely free of charge
- Runs on Windows, Mac, and Linux
- Great for modern web and cloud development
- Lots of add-ins
- Embraced by the community
- <https://code.visualstudio.com/>



Xamarin

- Very important for building native mobile apps on iOS, Android, and more... using .NET
- Key scenario: Code reuse across platforms
- <https://www.xamarin.com/>



Microsoft Ignite 2018 - Build You First
Xamarin.Forms Application session:

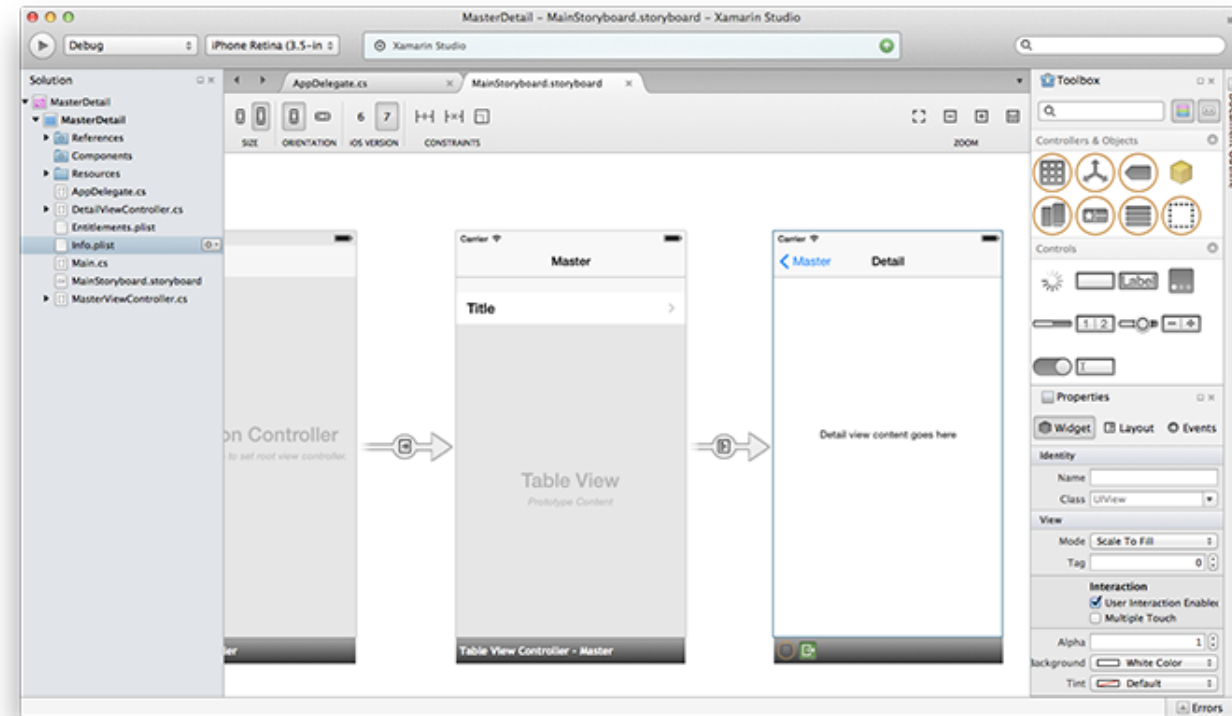
<https://www.youtube.com/watch?v=BlritDZLYy0>

Visual Studio for the Mac

- .NET IDE for the Mac
- Geared towards creating .NET Core and Xamarin apps
- <https://visualstudio.microsoft.com/vs/mac/>

Microsoft Ignite 2018 - Visual Studio for Mac tips and tricks

<https://www.youtube.com/watch?v=kvTI6lp6xnk>



Visual Studio Live Share

- Mixture of collaborative editing and screen share

```
80
81 @blueprint.route('/api/articles/<slug>', methods=('GET',))
82 def get_article(slug): PJ Meyer
83     article = Article.query.filter_by(slug=slug).first()
84     if not article:
85         raise InvalidUsage.arti
86     return article
87
88
80
81 @blueprint.route('/api/articles/<slug>', methods=('GET',))
82 def get_article(slug):
83     article = Article.query.filter_by(slug=slug).first()
84     if not article: Jonathan Carter
85         raise InvalidUsage.arti
86     return article
87
88
```

The screenshot displays the Visual Studio Live Share interface. On the left, a code editor shows the `ArticlesController.cs` file with a breakpoint set at line 27. The `Locals` window below shows the current state of variables: `this` (Conduit.Feature), `tag` ("dotnet"), `limit` (10), `offset` (20), `query` (IQueryable), `articles` (List), and `tagEntity` (ArticleTag). The `CALL STACK` window shows the current call stack, including `Conduit.dll!Conduit` and `ArticlesController.cs` at line 27. The `DEBUG` window on the right shows the current execution context, including the `HttpContext` and the `ArticlesController` instance.

C# 8

- Nullable reference types
- Async streams
- Ranges and indices
- Default implementations of interface members
- Recursive patterns
- Switch expressions
- Target-typed new-expressions
- May gain importance with Web Assembly
- <https://blogs.msdn.microsoft.com/dotnet/2018/11/12/building-c-8-0/>

Web Development

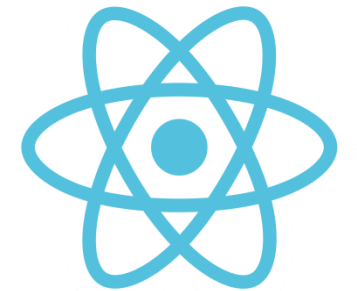
General Overview of Web Development

- ASP.NET for server-side development
 - How much server-side development do you need?
- HTML5 client-side development
 - Angular has momentum and strong adoption
 - React & Vue.js are very popular as well
- Node.js



ASP.NET

HTML



ASP.NET

Problems with “Classic” ASP.NET Architecture

- Limited hosting capabilities (IIS only)
- Dependency on IIS environment (System.Web)
- Web evolves faster than the .NET Framework
- Requires full .NET Framework
 - Resource-intensive and not Web/Cloud friendly
- Hard to optimize and scale down for lightweight apps
- How much server-side processing do you really need?

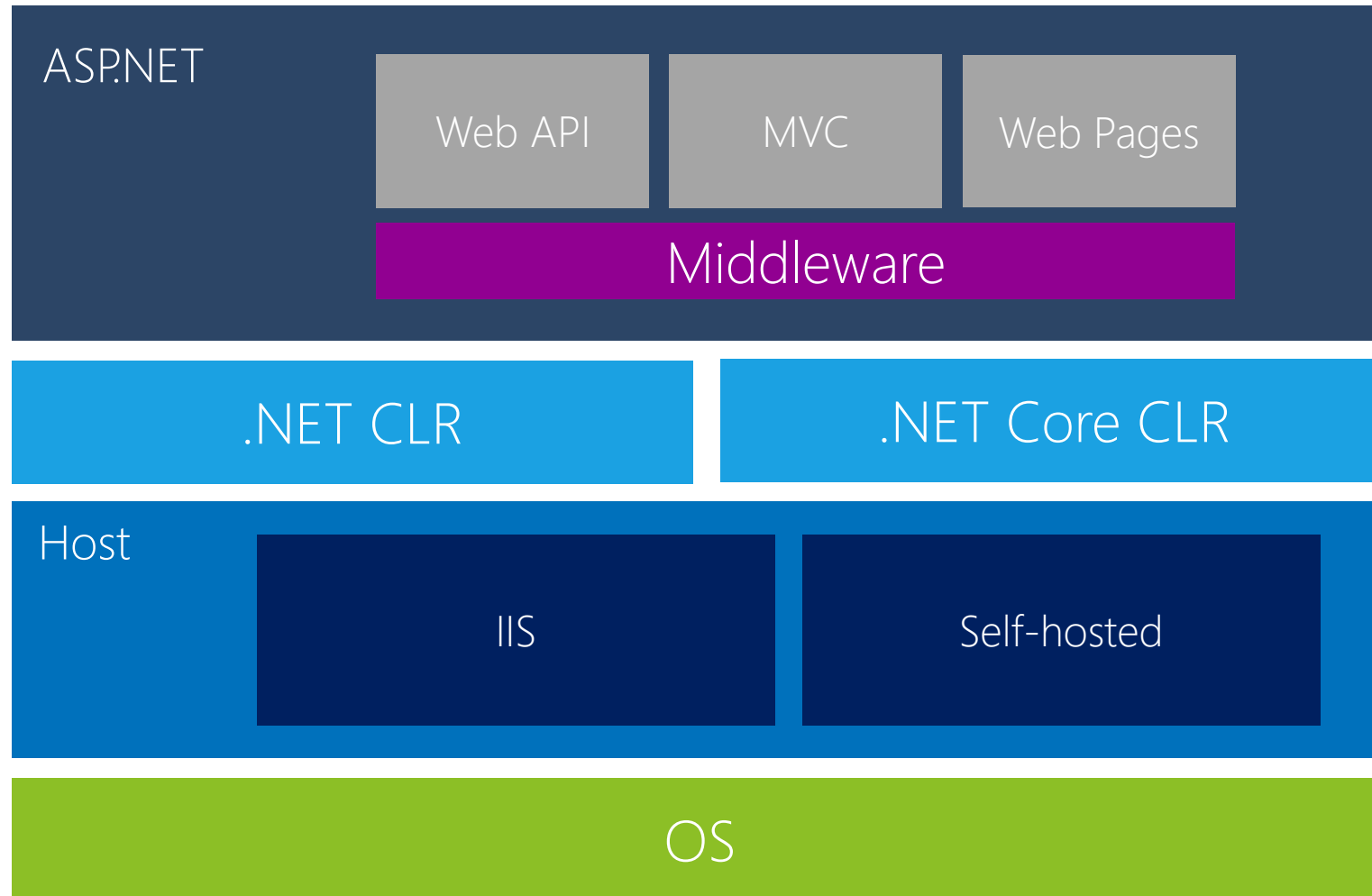
ASP.NET Core

- ASP.NET Core is a complete re-write of ASP.NET
- Modular and not platform dependent
 - The ASP.NET Framework now comes in lots of tiny packages that are brought in through NuGet
 - Pick and choose the features and components you would like to use
- Better suited for Cloud-operations
- MVC Core
 - No separate WebAPI, no more WebForms

Microsoft Ignite 2018 - Migrate your existing ASP.NET application to ASP.NET Core

https://www.youtube.com/watch?v=shn3gL_UJ38

ASP.NET Core Stack



.NET Core vs. Full .NET Runtime

- In ASP.NET Core, there are two versions of the .NET Runtime
 - Full .NET Runtime, and .NET Core
- ASP.NET Core runs on both!
- .NET Core runs cross platform
 - Windows, Mac, Linux
- .NET Core Runtime is a sub-set of the Full .NET Runtime

A Word about 4.x

- There are many features of ASP.NET 4.x that will continue to be supported
- It is fine to keep using that version...
- ...and the full .NET Runtime

HTML



HTML 5 Frameworks

- There are now quite a few frameworks geared towards writing applications based on top of HTML5
 - Single Page Applications – SPAs
- Angular, React, Vue.JS...
- Angular and React are the most popular
 - Nevertheless, others are viable options as well

Angular

- Google's rich-client HTML framework
- MVVM and data binding
- "Opinionated"
- Has a considerable amount of market-share



React

- JavaScript library for building user interfaces
- Created by Facebook
- Declarative & Component-based
- Also has a considerable amount of market-share



Vue.js

- A lightweight JavaScript framework for building HTML UI
- Designed to be a more lightweight version of “the best parts of Angular”
- Extensible and incrementally adoptable
- Great to combine with “classic” server-side generated HTML
 - Which is making a comeback



WebAssembly

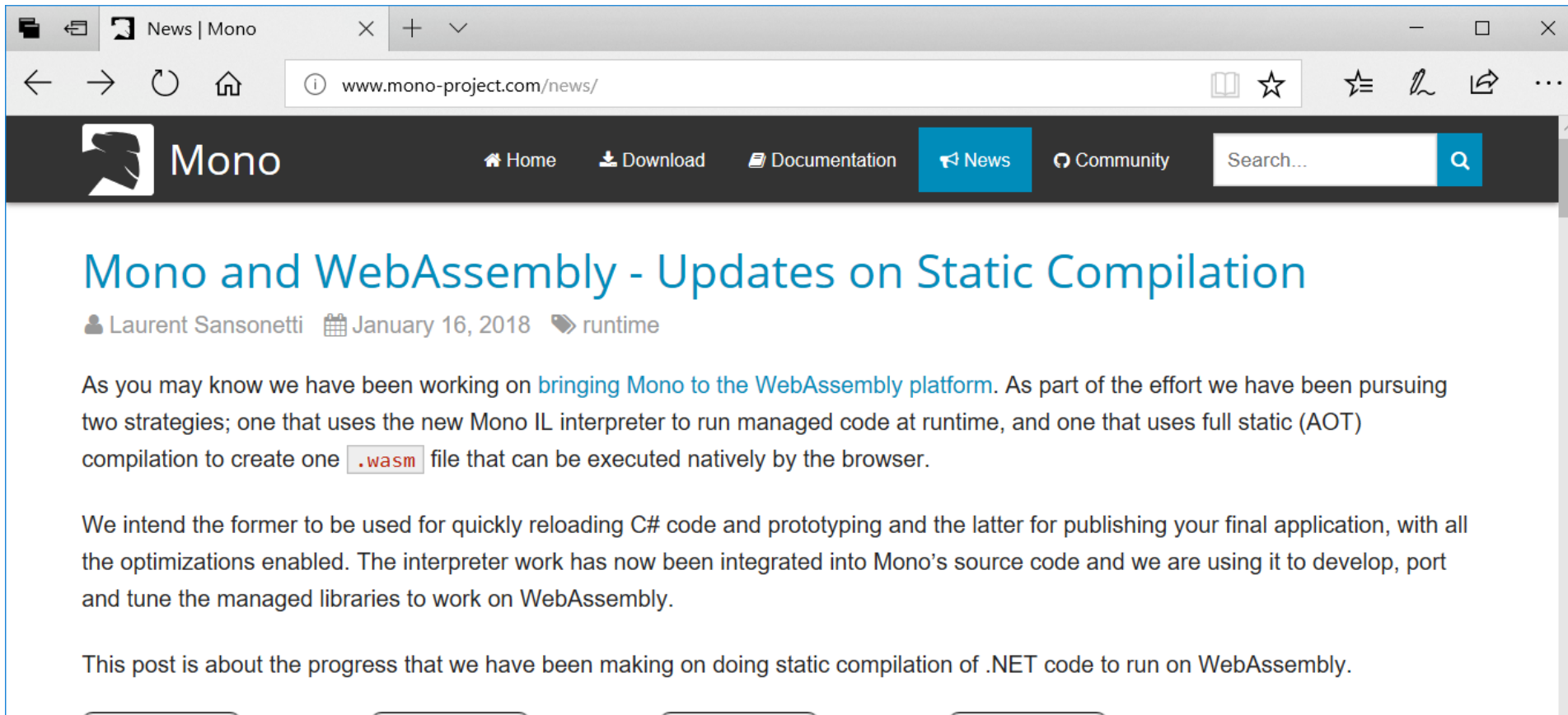


WebAssembly is changing the Web

- In simple terms: binary code for web browsers
- Native performance for the web
 - Think of it as executing native compiled code in a browser
- Cross platform compilation target for any language
- Available in all major browsers
- Provides a “compilation target” for all kinds of languages
- Originally, this was mostly used by C++ game developers

.NET (Mono) on WebAssembly

<http://www.mono-project.com/news/2018/01/16/mono-static-webassembly-compilation/>



The screenshot shows a web browser window with the address bar displaying `www.mono-project.com/news/`. The page header features the Mono logo and navigation links for Home, Download, Documentation, News, and Community, along with a search bar. The main content area displays the article title "Mono and WebAssembly - Updates on Static Compilation" by Laurent Sansonetti, dated January 16, 2018, with a "runtime" tag. The article text discusses the progress of bringing Mono to the WebAssembly platform, mentioning the use of Mono IL interpreter and full static (AOT) compilation to create `.wasm` files. It also notes the integration of the interpreter work into Mono's source code and the goal of publishing final applications with optimizations enabled.

As you may know we have been working on [bringing Mono to the WebAssembly platform](#). As part of the effort we have been pursuing two strategies; one that uses the new Mono IL interpreter to run managed code at runtime, and one that uses full static (AOT) compilation to create one `.wasm` file that can be executed natively by the browser.

We intend the former to be used for quickly reloading C# code and prototyping and the latter for publishing your final application, with all the optimizations enabled. The interpreter work has now been integrated into Mono's source code and we are using it to develop, port and tune the managed libraries to work on WebAssembly.

This post is about the progress that we have been making on doing static compilation of .NET code to run on WebAssembly.

Why use .NET for browser apps?

- **Easy to get started:** File -> New project, dotnet new blazor
- **Stable and consistent:** .NET Standard, MSBuild
- **Modern innovative languages:** C#, F#, Razor
- **Industry leading tools:** Visual Studio, IntelliSense
- **Fast and scalable:** .NET Core for backend services, IL trimming

Welcome Blazor

- Browser + Razor = Blazor!
- An experimental web UI framework using C#/Razor and HTML, running in the browser via WebAssembly
 - **Not** a way of deploying existing UWP or Xamarin mobile apps in the browser
- Requires no plugin or code transpilation
- Works in all modern browsers including mobile browsers
- <https://blazor.net/>
- <https://github.com/aspnet/blazor>

What Blazor is like:

```
@page "/counter"
<h1>Counter</h1>

<p>Current count: @currentCount</p>

<button @onclick(IncrementCount)>Click me</button>

@functions {
    int currentCount = 0;

    void IncrementCount()
    {
        currentCount++;
    }
}
```

```
@page "/"

<h1>Hello, world!</h1>

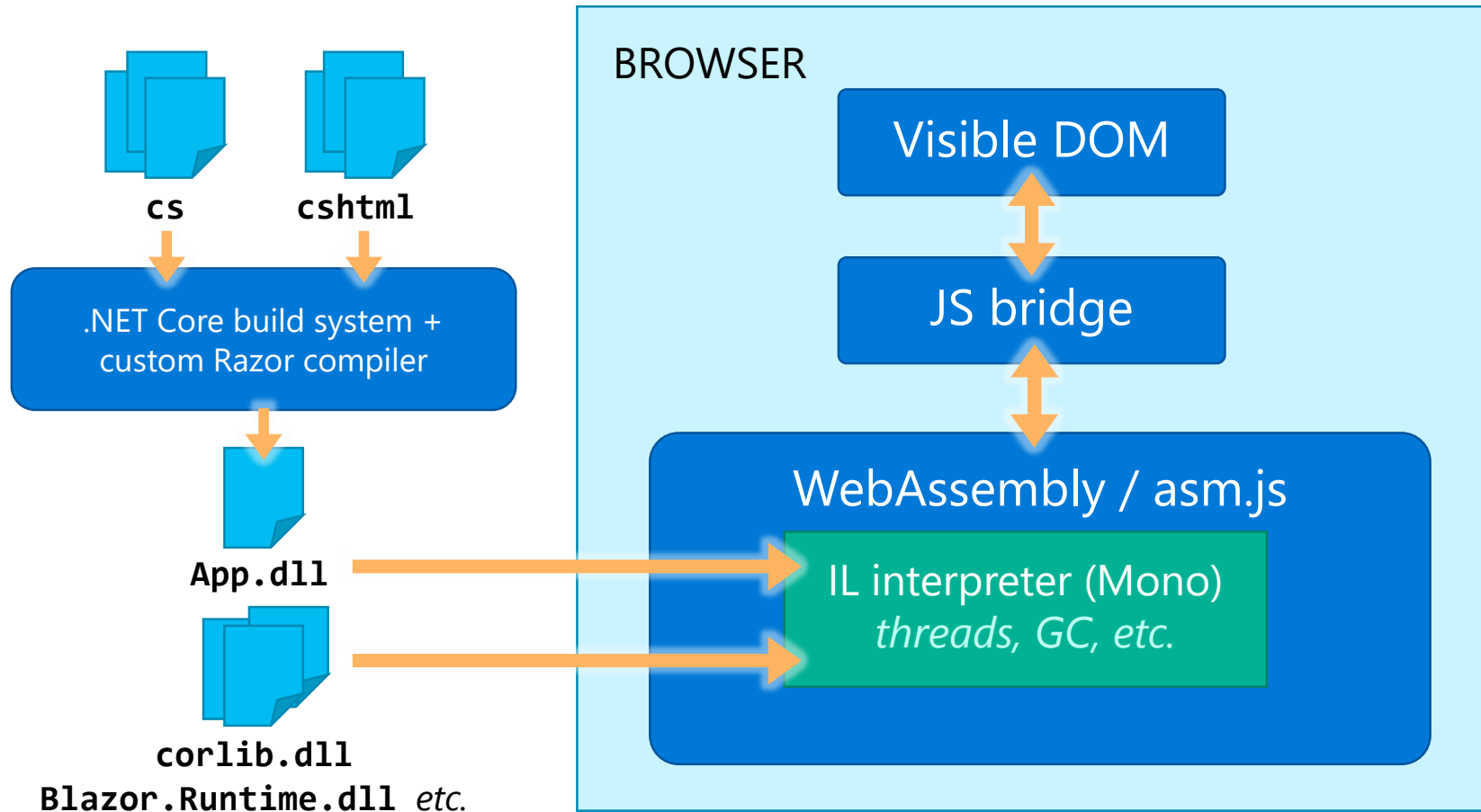
Welcome to your new app.

<SurveyPrompt Title="How is Blazor working for you?" />

<Counter />
```



How Blazor works



Blazor features

- Component model
- Routing
- Layouts
- Forms and validation
- Dependency injection
- Live reload
- JavaScript interop
- Server-side rendering
- Debugging (browser & IDE)
- Rich IntelliSense and tooling
- Fallback to asm.js
- Publishing
- App size trimming

Sep/Oct 2018 Issue of CODE Magazine

- Blazor Article by Rick Strahl
- [Re-Assembling the Web with Web Assembly and Blazor](#)
- <https://www.codemag.com/Article/1809061/Re-Assembling-the-Web-with-Web-Assembly-and-Blazor>



Windows & Windows Mobile Development

- The Windows Phone Platform is dead (support ends 12/10/19)
 - Microsoft's recommendation is now to move to iOS or Android
- There is no set standard for Windows Desktop Development
 - We use mostly WPF (and it is going stronger than most people would think)
 - WinForms is also alive and kicking, but it looks very old
 - UWP is the most modern environment, but it offers few benefits for business application developers
- <https://support.microsoft.com/en-us/help/4485197/windows-10-mobile-end-of-support-faq>

Augmented Reality

- Microsoft HoloLens
- MagicLeap is actually real!
 - Supports Unity development
- Augmented reality through phones (such as iPhone and Apple's ARKit) may be the most prevalent form of augmented reality in the wild
 - Pokemon GO, furniture simulation,...
- Not to be confused with Virtual Reality (VR) such as Oculus Rift or Google Cardboard



DECEMBER 6, 2018 9:00 AM

Microsoft Edge: Making the web better through more open source collaboration

By [Joe Belfiore](#) / Corporate Vice President, Windows

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For the past few years, Microsoft has meaningfully increased participation in the open source software (OSS) community, becoming one of the world's largest supporters of OSS projects.

Today we're announcing that we intend to adopt the Chromium open source project in the development of Microsoft Edge on the desktop to create better web compatibility for our customers and less fragmentation of the web for all web developers.

As part of this, we intend to become a significant contributor to the Chromium project, in a way that can make not just Microsoft Edge — but other browsers as well — better on both PCs and other devices.

Edge to use Chromium

<https://blogs.windows.com/windowsexperience/2018/12/06/microsoft-edge-making-the-web-better-through-more-open-source-collaboration/>



Edge Browser to use Chromium

- “We will move to a Chromium-compatible web platform for Microsoft Edge on the desktop.”
- “Microsoft Edge will now be delivered and updated for all supported versions of Windows and on a more frequent cadence.”
- “We will contribute web platform enhancements to make Chromium-based browsers better on Windows devices.”
- “We expect to have a preview build ready in early 2019 for you to try for yourself.”





Cloud & Azure

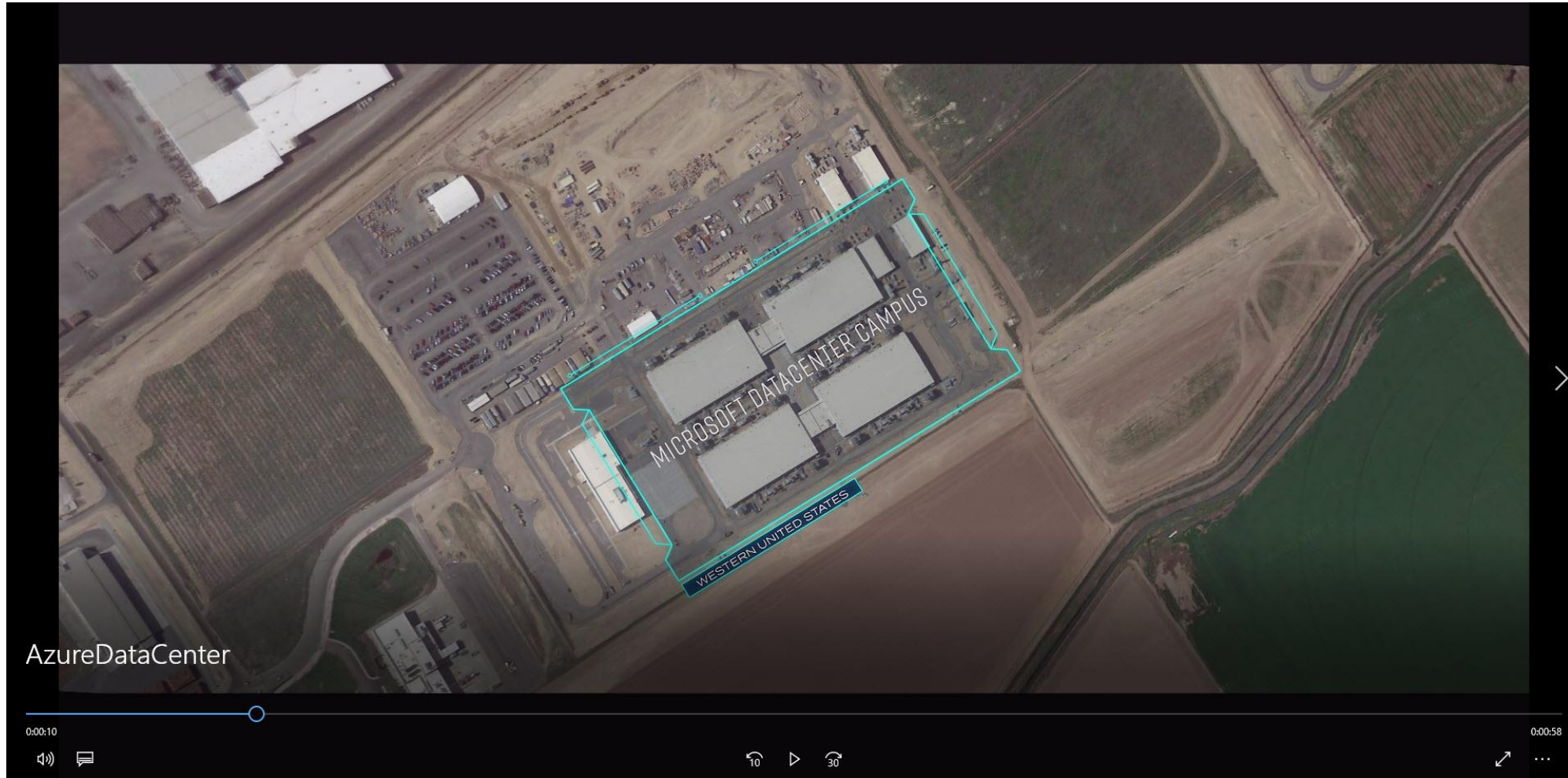
The World's Computer

What is Azure?

- Azure is an open and flexible cloud platform that enables you to quickly build, deploy and manage applications across a global network of Microsoft-managed datacenters.
- You can build applications using any language, tool, or framework. And you can integrate your public cloud applications with your existing IT environment.



Azure Data Center Video



Quincy



Cheyenne



Dublin



Amsterdam





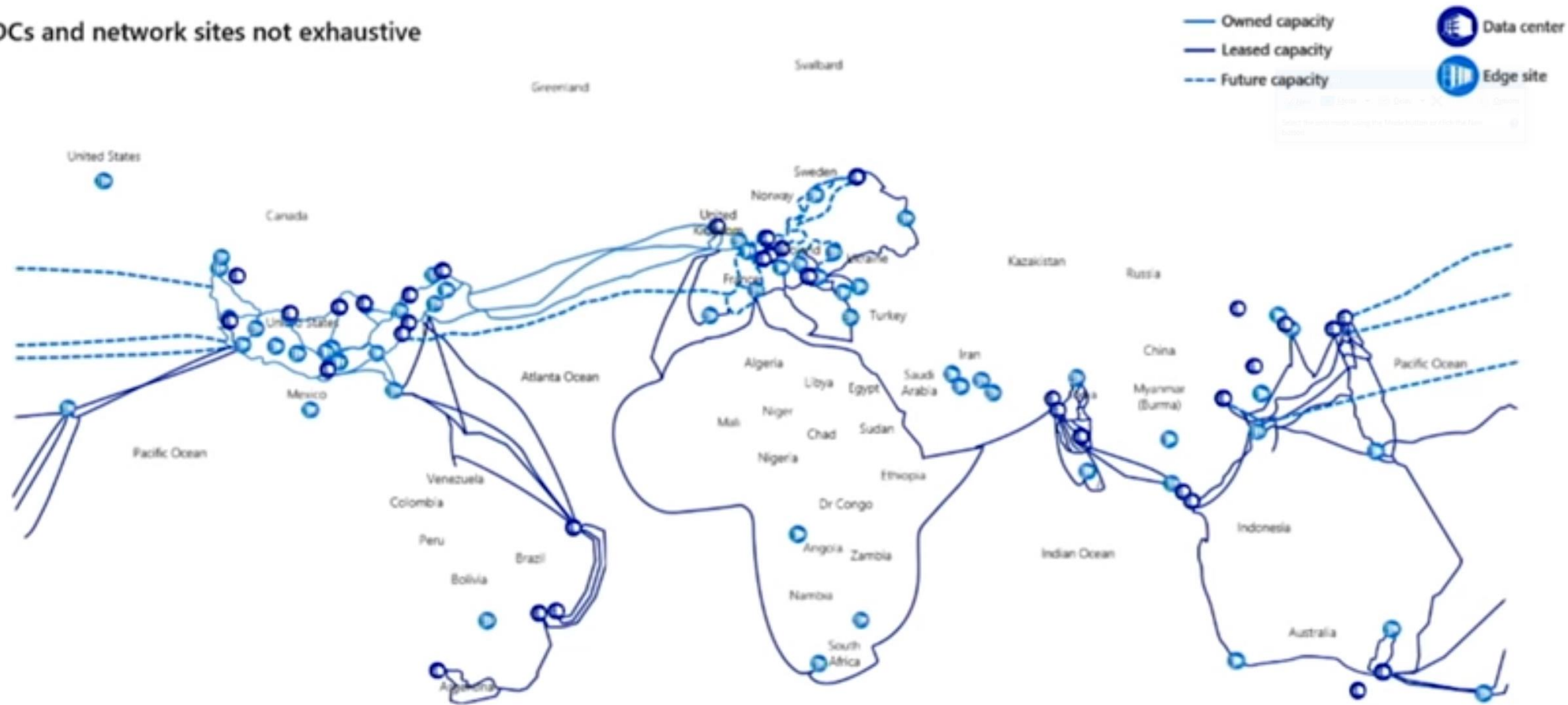
54

Azure regions in 140 countries



Azure inter-DC dark fiber backbone

DCs and network sites not exhaustive



Inside Azure Datacenter Architecture with Mark Russinovich : Build 2018

<https://channel9.msdn.com/Events/Build/2018/BRK2508>

Azure: The Trusted Cloud

More certifications than any other cloud provider

GLOBAL



ISO 27001



ISO 27018



ISO 27017



ISO 22301



SOC 1 Type 2



SOC 2 Type 2



SOC 3



CSA STAR Self-Assessment



CSA STAR Certification



CSA STAR Attestation

US GOV



Moderate JAB P-ATO



High JAB P-ATO



DoD DISA SRG Level 2



DoD DISA SRG Level 4



DoD DISA SRG Level 5



SP 800-171



FIPS 140-2



Section 508 VPAT



ITAR



CJIS



IRS 1075

INDUSTRY



PCI DSS Level 1



CDSA



MPAA



FACT UK



Shared Assessments



FISC Japan



HIPAA / HITECH Act



HITRUST



GxP 21 CFR Part 11



MARS-E



IG Toolkit UK



FERPA



GLBA



FFIEC

REGIONAL



Argentina PDPA



EU Model Clauses



UK G-Cloud



China DJCP



China GB 18030



China TRUCS



Singapore MTCS



Australia IRAP/CCSL



New Zealand GCIO



Japan My Number Act



ENISA IAF



Japan CS Mark Gold



Spain ENS



Spain DPA



India MeitY



Canada Privacy Laws



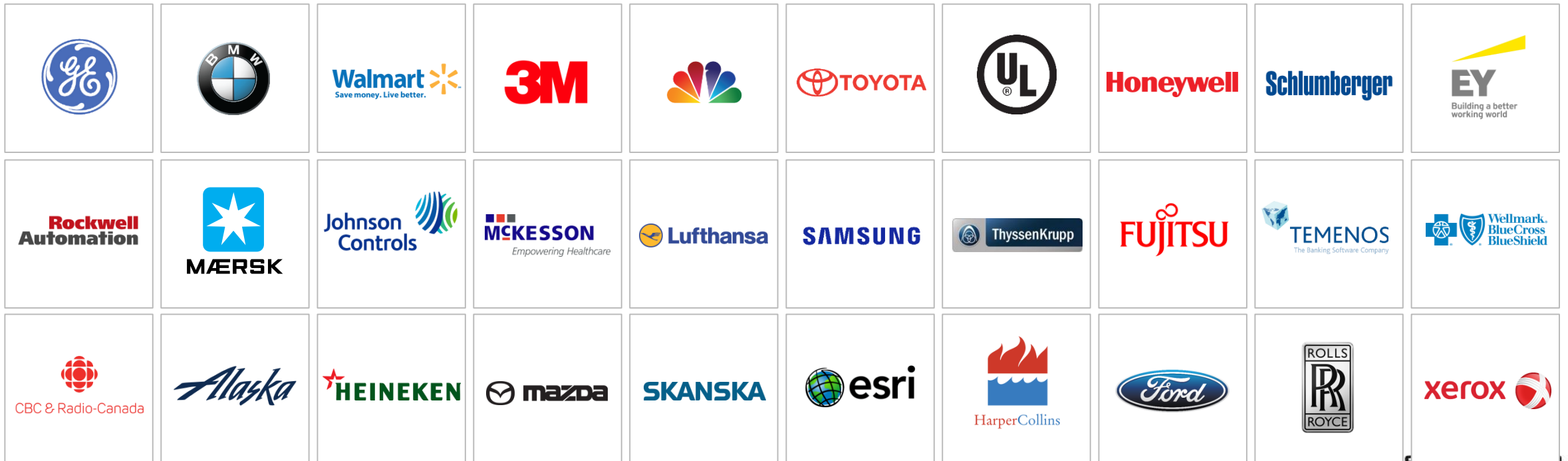
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Germany Grundschutz workbook

90%

Of the Fortune 500 use Microsoft Cloud



Second wave of adoption

- We are currently in a “second wave of Azure/Cloud adoption”
- We saw an initial surge towards the Cloud from companies that were always excited about the Cloud idea
- We are now seeing a second wave of those companies that were initially skeptical and took a “wait & see” approach

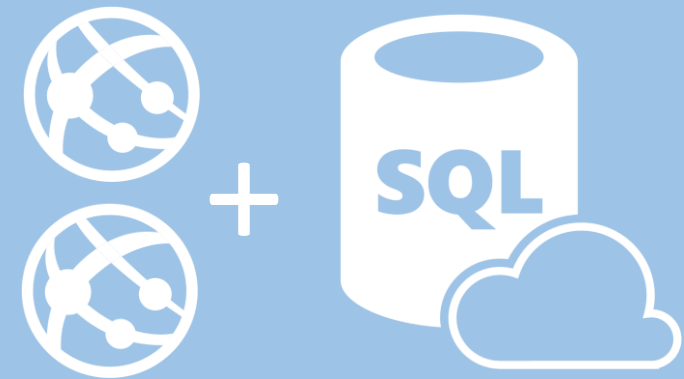
Activate your MSDN Benefits...



3 VMs for 16 hrs a day



80 VMs for 20 hour load test



Up to 100 web sites + DB

Up to **\$150**
per Month

33%^{off}
Dev/Test VMs

25%^{off}
Other Dev/Test

89
Countries

Related: Azure Stack

- Azure Services in your own data center and on your own devices
- Reuse the same technologies without moving to a Microsoft Data Center
- Great for disconnected scenarios



Related: Cloud vs. Edge

- Azure Services in your own data center and on your own devices
- Reuse the same technologies without moving to a Microsoft Data Center
- Great for disconnected scenarios

Azure Concepts: Hosting vs Services

- Hosting
 - Code you write and deploy to Azure
 - Azure runs the code you wrote
 - ASP.NET MVC applications, etc.
- Services
 - Code Azure provides for you to run
 - You provide data to Azure services
 - Blob storage, SQL Azure, etc.

Azure Concepts: Serverless Computing

- Which is a horrible name, as it most definitely involved servers 😊
- This simply is a concept where you do not worry that there need to be servers
- You will never be exposed to server provisioning or management
- You simply say "Go ahead, Cloud!... Run this stuff of mine!"
- Intro Video: <https://azure.microsoft.com/en-us/resources/videos/get-started-with-azure-functions/>
- <https://www.codemag.com/Article/1801081/Understanding-Microservices-and-Microservice-Architecture>

5 Azure Services Every Developer Should Know

- #1 App Service
 - Web Apps, Mobile Apps, API Apps, etc.
 - Fully managed: OS patching, high availability, scaling
 - First class Visual Studio integration
- #2 Azure SQL Database
 - Same source code as SQL Server
 - Updates are available in Azure before SQL Server
 - Fully managed: Automatic patching & scalability

5 Azure Services Every Developer Should Know

- #3 Azure Storage
 - Blobs, tables, queues & files
 - Auto replicated & backed up
 - Optional Geo-replication
- #4 Azure Functions
 - Serverless
 - Event driven off of HTTP, Queues, Timers, etc.
 - Great for simple jobs & workers
 - Pay for resource usage (CPU & memory)
- #5 Application Monitor
 - Application monitoring & diagnostics
 - Collects metrics, logs, requests, dependencies, etc.
 - Profiler for performance issues
- <https://channel9.msdn.com/Events/dotnetConf/2018/S203>

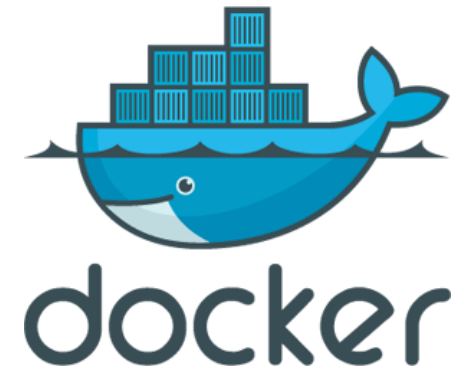
Containers, Containers, Containers!

Containers

- Containers isolate environments (“virtualization”)
 - Contrary to virtual machines, containers do not include a virtualized OS
- Containers are typically lightweight
- Containers are now becoming ubiquitous and are used for all kinds of deployment scenarios
 - Including scenarios you may not intuitively think of, such as deploying AI services to IoT devices

Docker

- Docker is supported on Windows as well as Linux
- .NET Core is great for deploying to Docker...
- ...but the full framework works as well
 - But it is not as lightweight
- Docker is becoming the “de-facto” standard of “Unit of Deployment”



Kubernetes

- Container Orchestration System
- Originally created by Google, but now taken over by the Cloud Native Computing Foundation
- Supports various container technologies, including Docker
- Azure Kubernetes Services (AKS)

AI



Artificial Intelligence Has Arrived!

- But what exactly does that mean?!?
- One word!!!
- We are generally talking about Machine Learning and advanced pattern recognition
 - Yes, there is Cortana and Siri and Alexa and... but “digital assistants” are really just a special application of AI, which is certainly interesting...
 - ...but there are many other scenarios
- We are ultimately talking about improving every feature in every app by infusing more intelligence
- <https://partner.microsoft.com/en-US/solutions/data-ai/artificial-intelligence>

Machine Learning Article

- Getting Started With Machine Learning
- <https://www.codemag.com/article/1709071/Getting-Started-with-Machine-Learning-Using-Microsoft-Azure-ML-Studio>



Some Recent AI Achievements

- Speech recognition human parity (2017)
- Machine reading comprehension human parity (January 2018)
- Human Parity in Translation (March 2018)

ML.NET

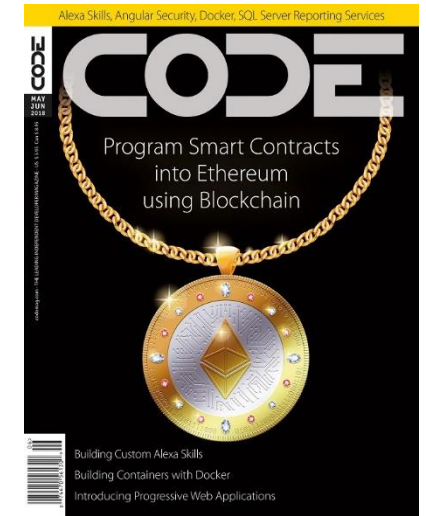
- Open-Source, cross-platform machine learning framework designed for .NET developers
 - Especially C# and F# developers
- Builds on top of existing and proven machine learning infrastructure and technologies
- ML.NET 0.10 current version
- <https://dotnet.microsoft.com/apps/machinelearning-ai/ml-dotnet>

Microsoft Cognitive Toolkit

- Toolkit used to train deep-learning algorithm
- Free, and Open Source
- <https://www.microsoft.com/en-us/cognitive-toolkit/>

Microsoft Cognitive Services

- Vision
- Speech
- Language
- Knowledge
- Search
- <https://azure.microsoft.com/en-us/services/cognitive-services/>
- <https://www.codemag.com/Article/1805031/Identify-Faces-with-Microsoft-Cognitive-Services>
- <https://www.codemag.com/Article/1807031/Identify-Voices-with-Microsoft-Cognitive-Services>



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Other Announcements

Free CODE Consulting

- You are also entitled to a free 1-hour consultancy if you need a recommendation as to what technologies to use in your project(s)
- info@codemag.com

Samsung Gear 360 Drawing

- Send all evaluations to the center isle for collection



Q&A

Contact us with questions!

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