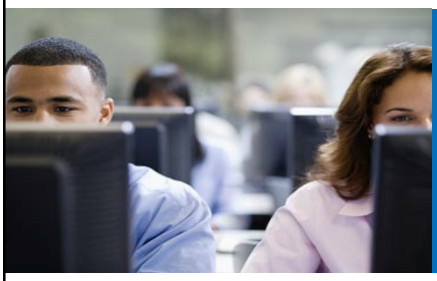
.NET Series



What is .NET?

.NET Foundational Concepts

Manoj Kumar Sharma

- Freelance Consultant / Corporate Trainer
- 31+ years of Experience in the Software Industry
  - 23+ years as a Software Architect / Systems Analyst / Project Lead
  - Last Designation held: *Director of Technology* at ExamRoom.AI
- 17+ years of Corporate Training Experience.
  - Delivered over 1600 in-person trainings across India, US, China, Oman and Thailand, and over 700+ remote trainings
  - Microsoft Certified Trainer (2012-2025)

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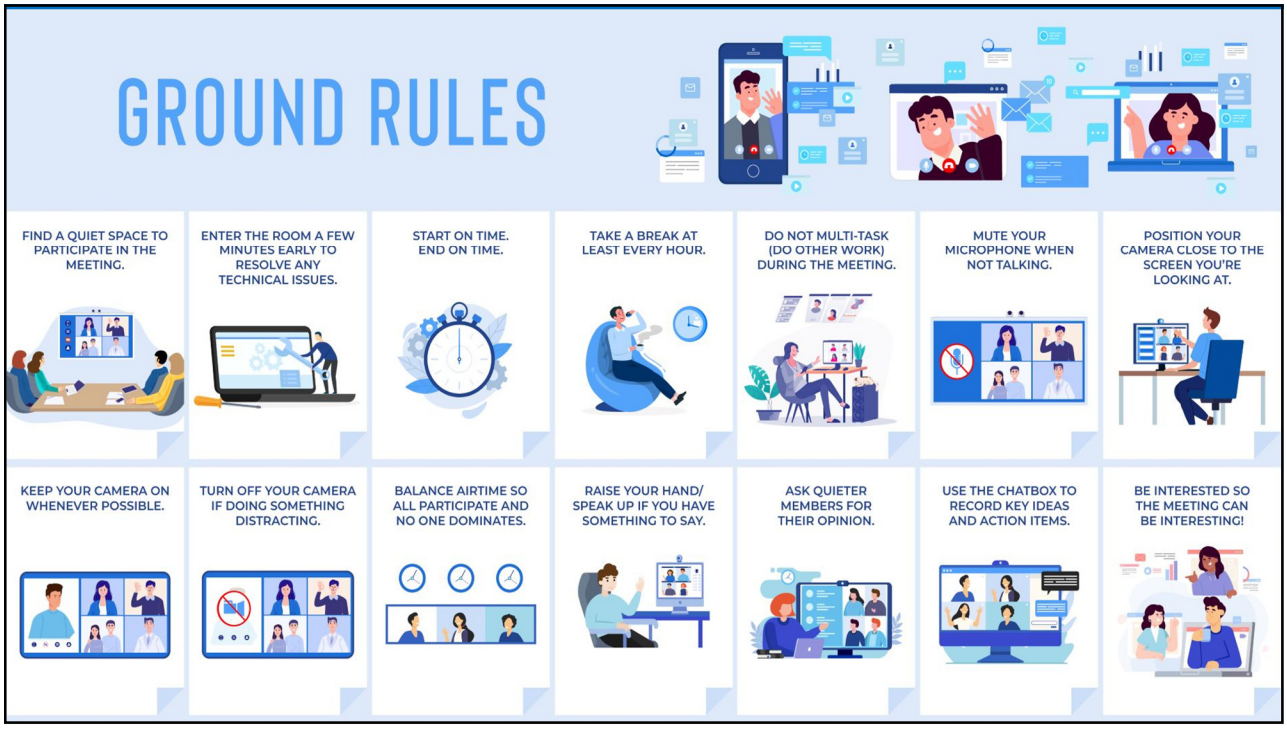
Introductions

- Name
- Company affiliation
- Title/function
- Job responsibility
- Relevant Experience
- Your expectations for the course



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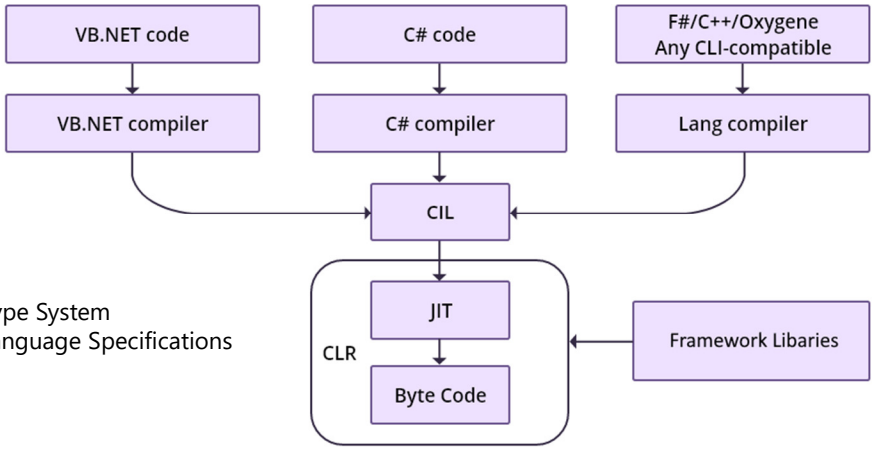
How .NET Code Works

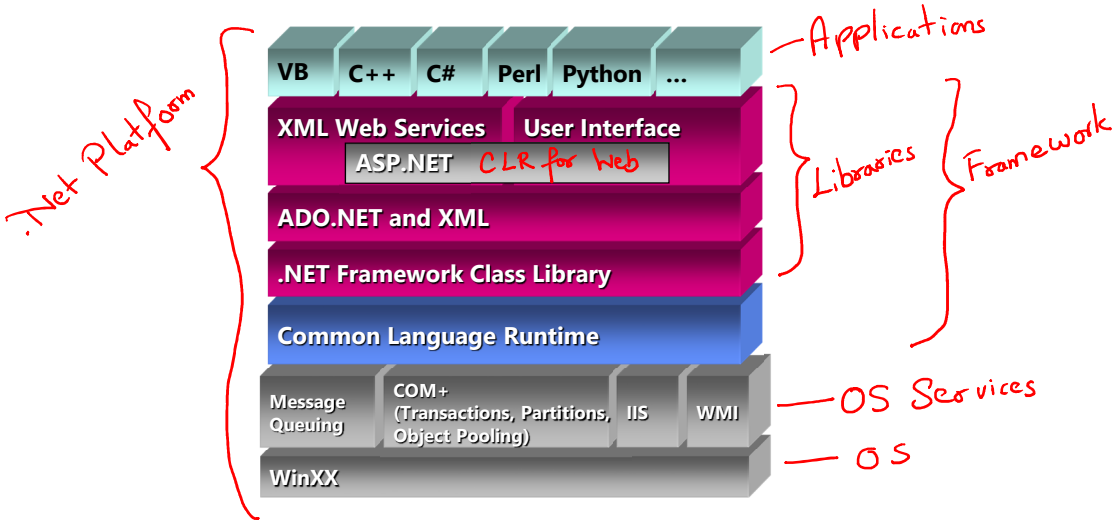


CTS: Common Type System
CLS: Common Language Specifications

BENEFITS:
OS Independent
Architecture Independent
Device Independent
Development Tool Independent

5

.NET Framework Components



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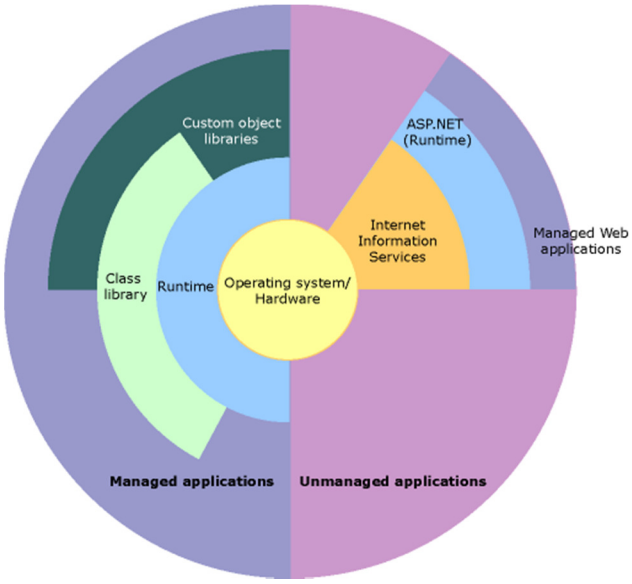
Managed Code



.NET Compatible OS (OS + FW)
.NET Enabled OS

7

CLR Components

- .NET Framework Class Library Support
- Thread Support
- COM Marshaler
- Type Checker
- Exception Manager
- Security Engine
- Debug Engine
- MSIL to Native Compilers
- Code Manager
- Garbage Collector
- Class Loader

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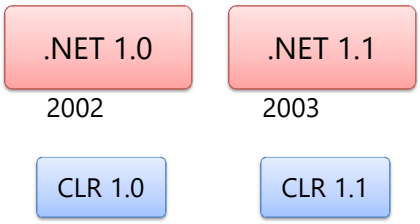
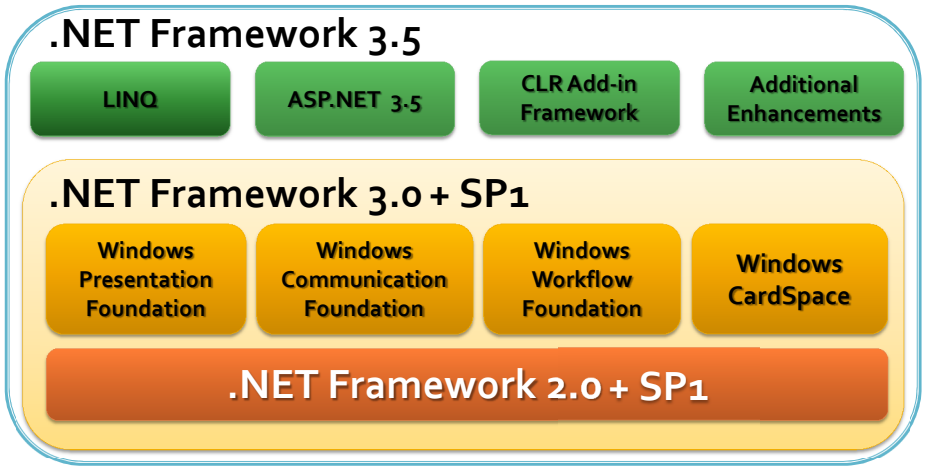
A Look Back…



A Look Back…



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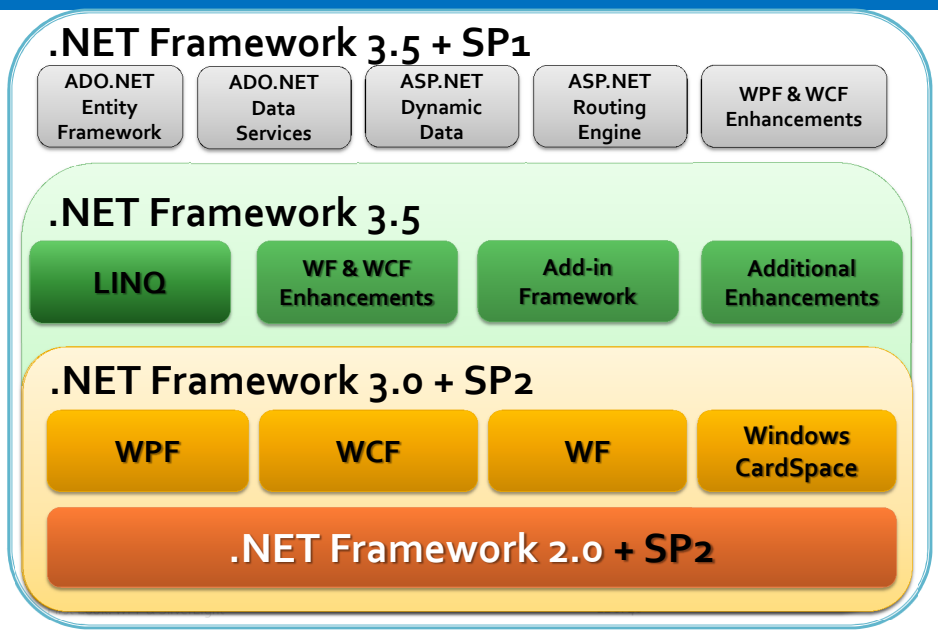
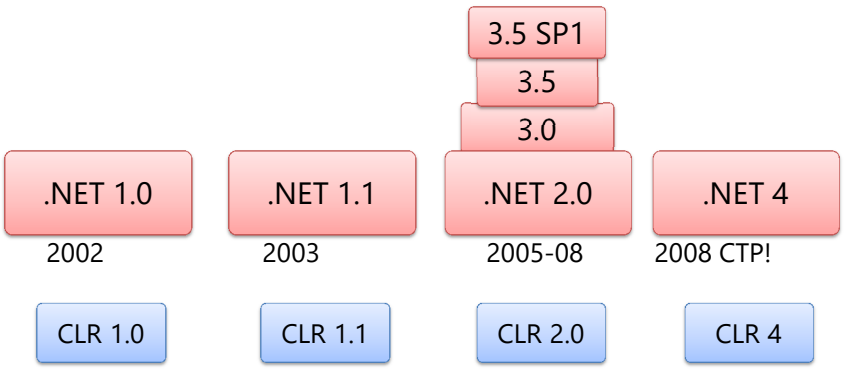
A Look Back…



A Look Back…



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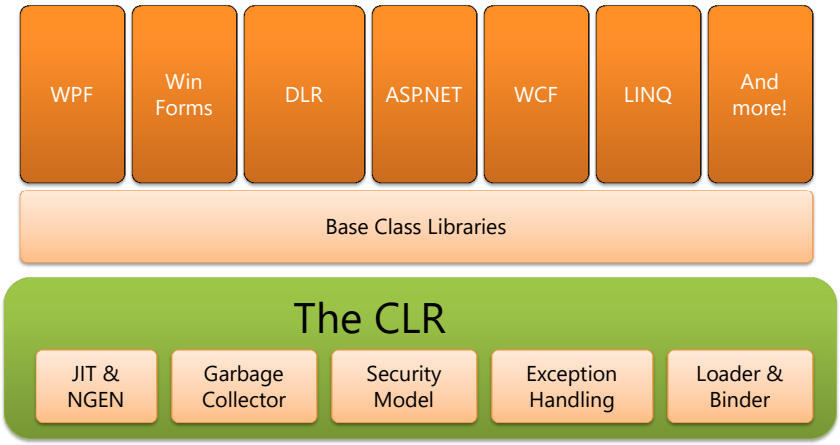
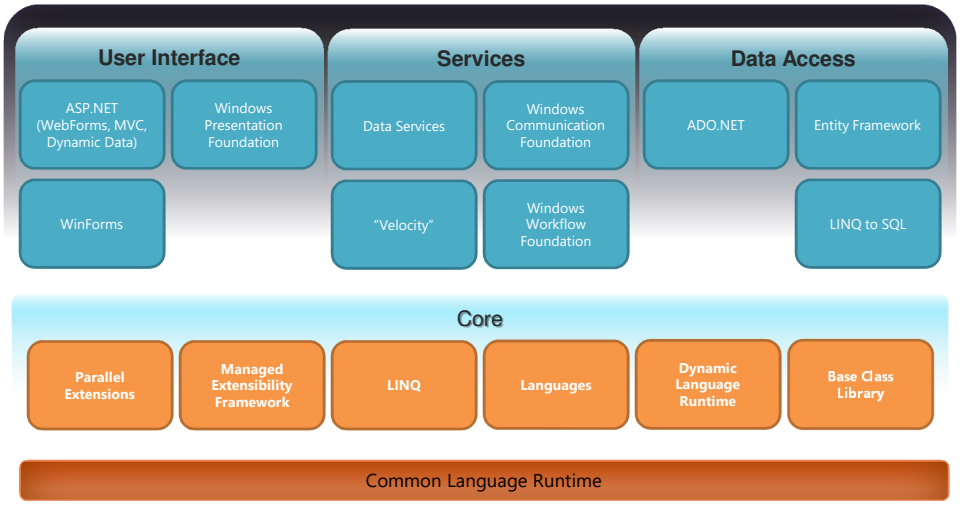
What Is The .NET Framework?



.NET Framework 4.0



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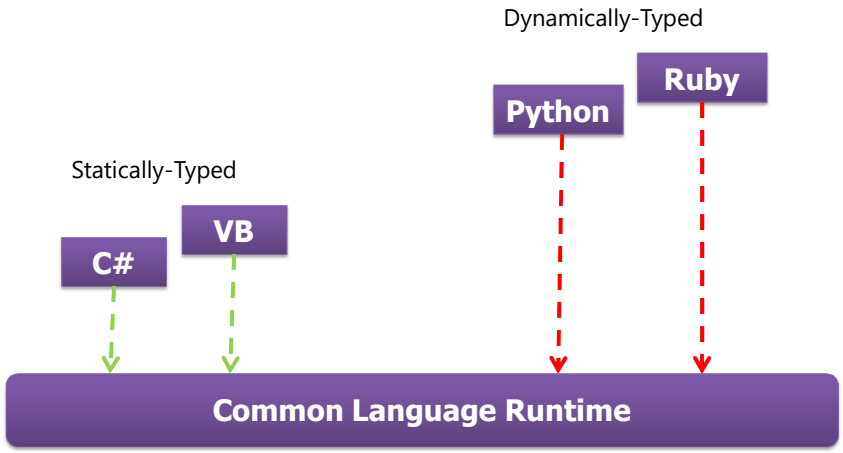
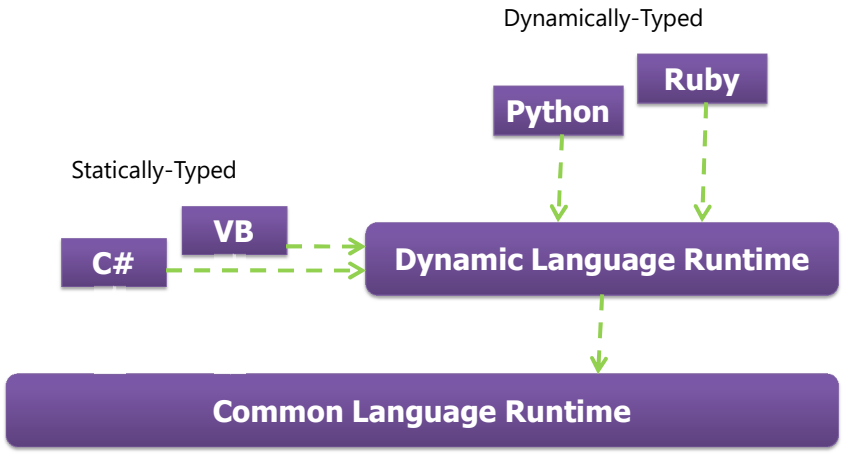
Why a "Dynamic Language Runtime"?



Why a "Dynamic Language Runtime"?



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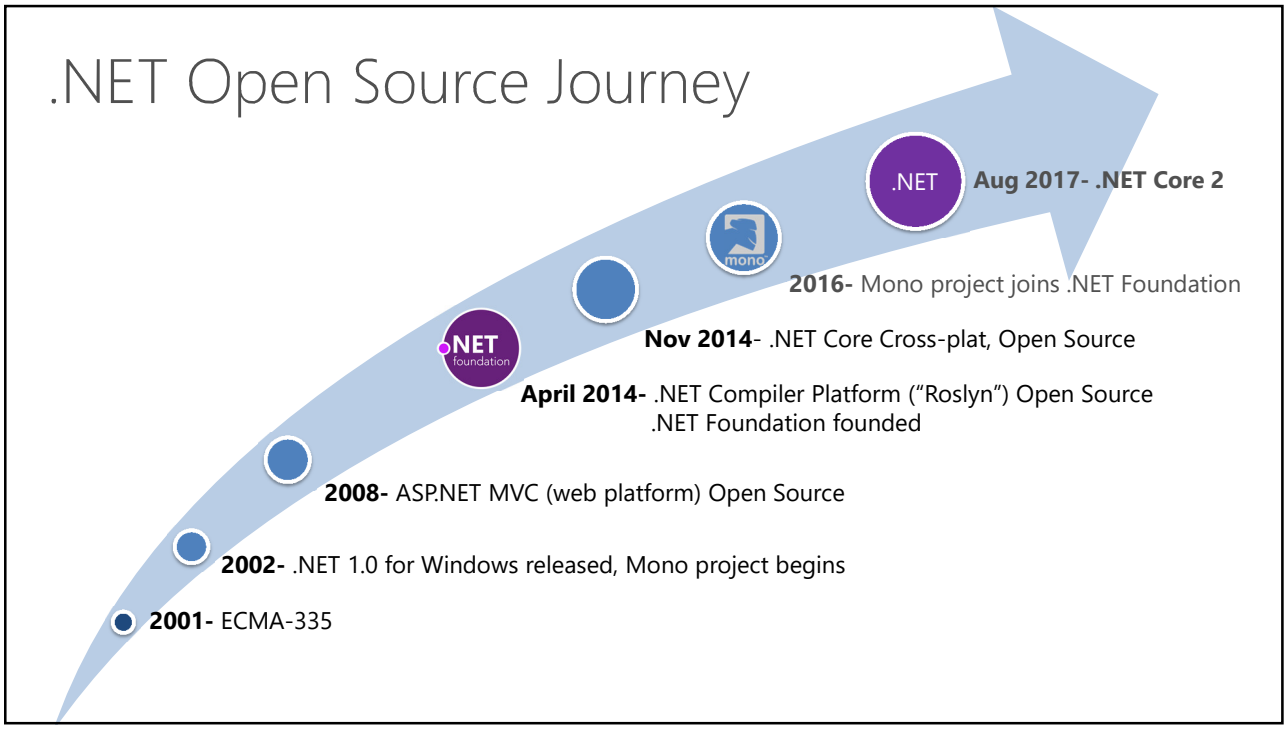

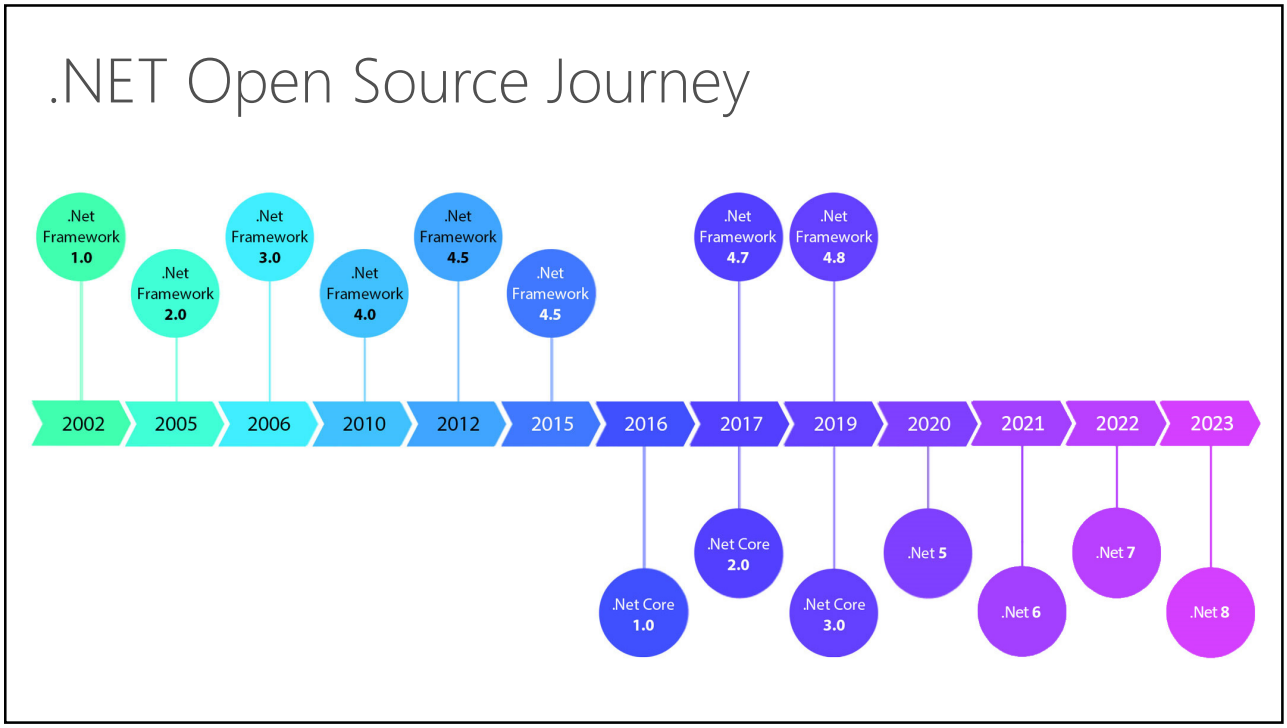

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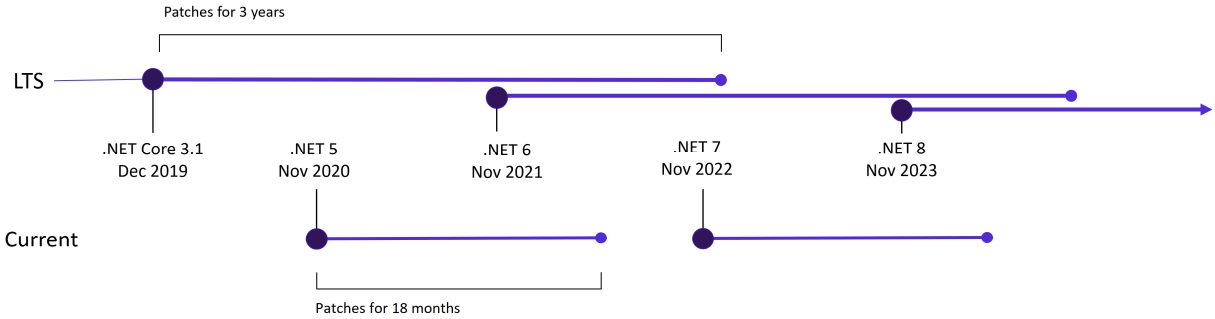
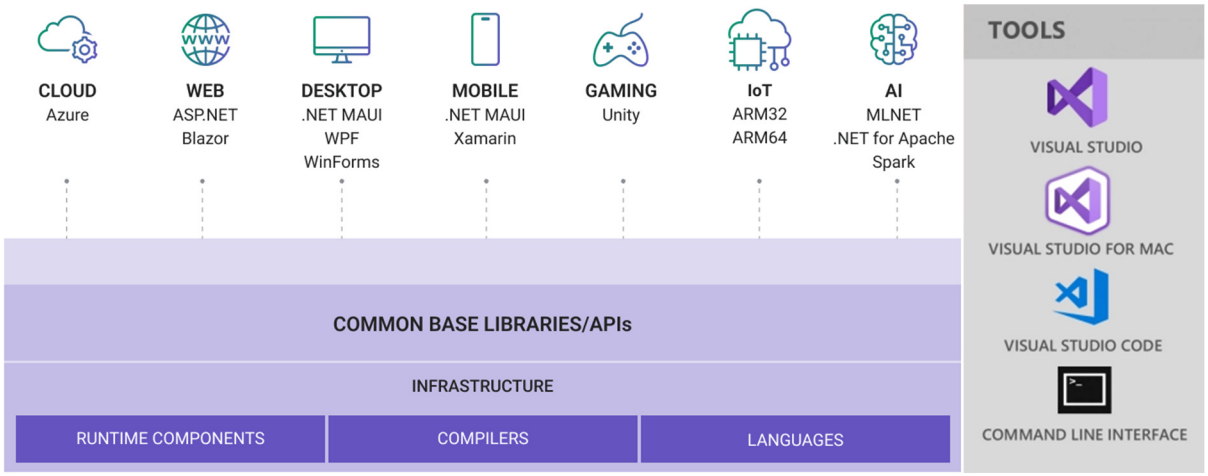
.NET Release Journey



.NET – a Unified Development Platform



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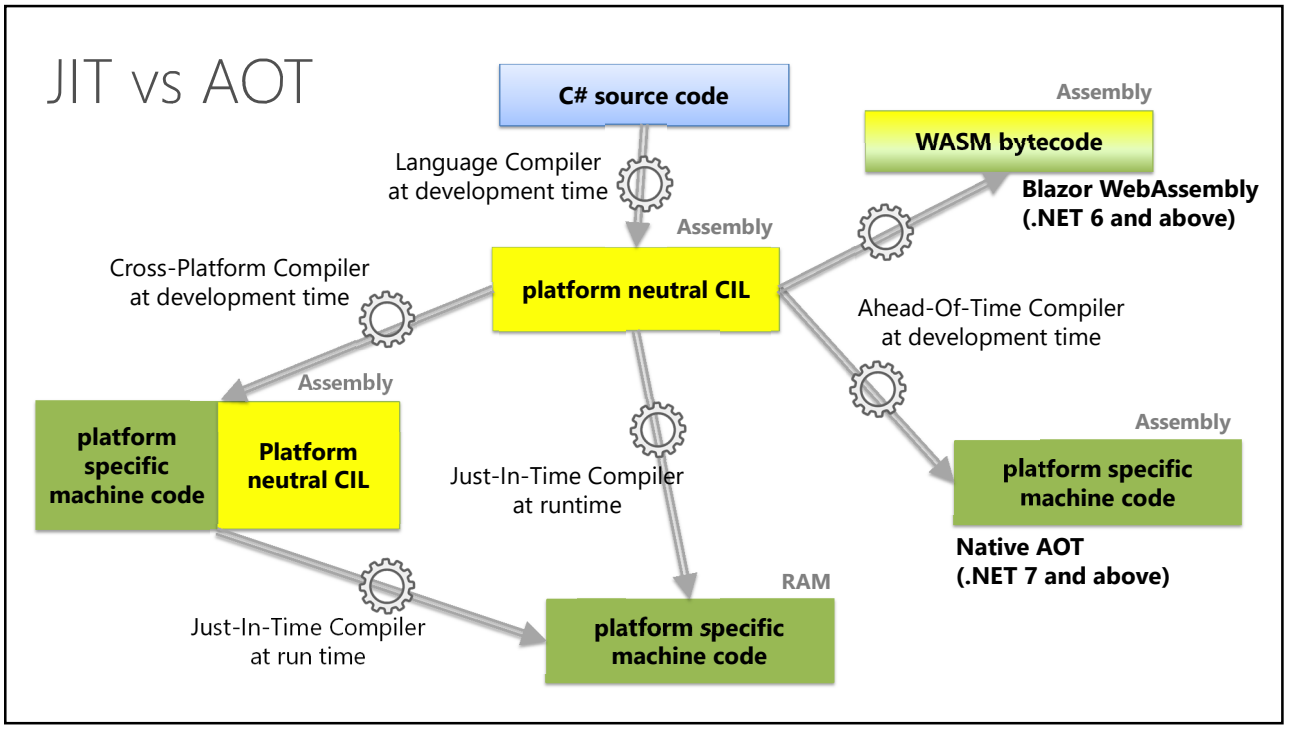

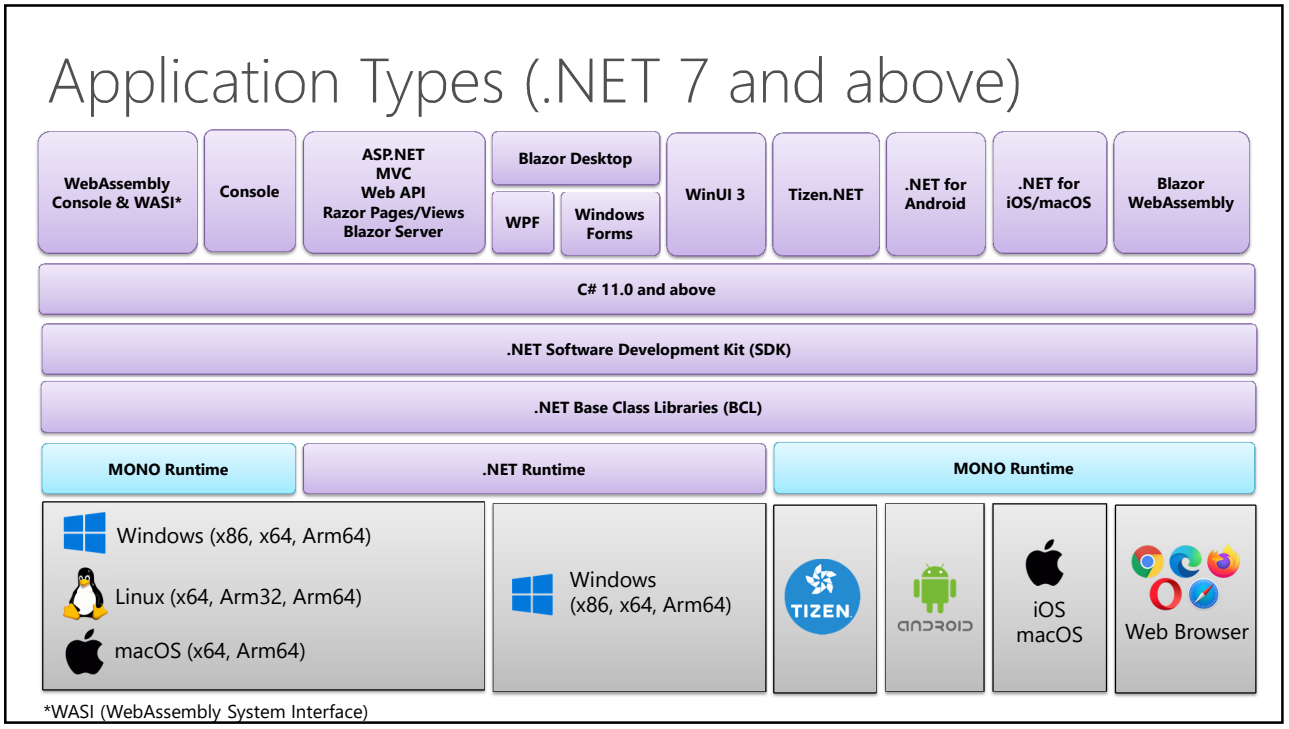

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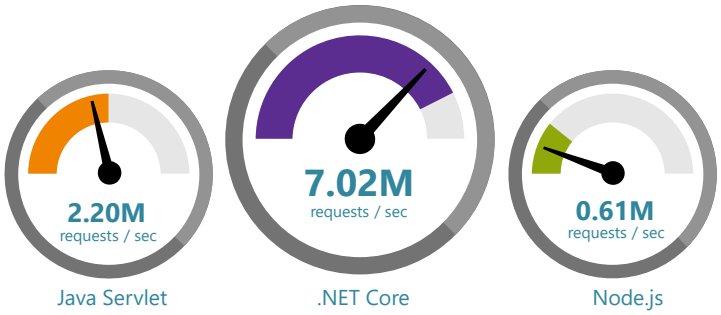
.NET is Fast. Really Fast!



Data sourced from official tests available at TechEmpower Round 21.

"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."
— Raygun

https://www.microsoft.com/net/customers

C# Language

- C#1 (Jan 2002 - Apr 2003)
- C#2 – Generics (Nov 2005)
- C#3 – LINQ (Nov 2007)
- C#4 – dynamic (Apr 4.0)
- C#5 – async/await, Task (Aug 2012)
- C#6 – Roslyn, string interpolation, nameof (Jul 2015)
- C#7 – out variables, discards (Mar 2017 – May 2018)
- C#8 for .NET CORE - Pattern Matching, Async Streams, Null-coalescing, etc. (Nov 2019)
- Emergence of .NET Standard
- C#9 with .NET 5 – code generators, lambda discards (Nov 2020)
- C#10 – record structs, const interpolated string, global usings (Nov 2021)
- C# 11 – generic math (Nov 2022)
- C# 12 (Nov 2024)

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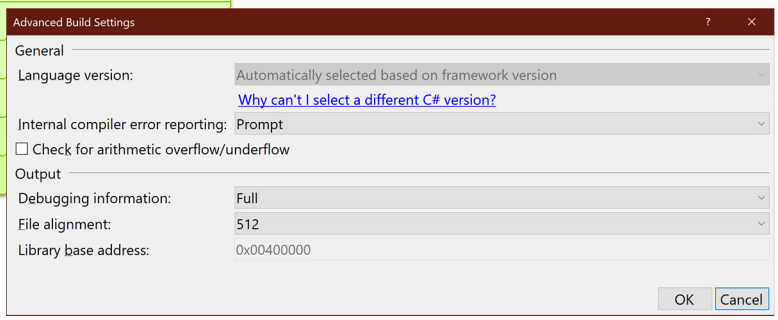
Default Language Version

Target framework	Version	Default C# language version
.NET 8 (LTS)	8.0	**C# 12.0**
.NET 7	7.0	C# 11.0
.NET 6 (LTS)	6.0	C# 10.0
.NET 5	5.0	C# 9.0
.NET Core	3.x	**C# 8.0**
.NET Core	2.x	
.NET Standard	2.1	
.NET Standard	2.0	
.NET Standard	1.x	
.NET Framework	all	

The Compiler determines the DEFAULT Language Version.



How to check available C# versions?

Open Developer Command Prompt

Developer Command Prompt for Visual Studio

```
➢ csc -langversion:?
```

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How to use C# Specific Version

To override the DEFAULT version to use C# 8.0:

.csproj

```
...
<PropertyGroup>
   ...
   <OutputType>Exe</OutputType>
   ...
   <TargetFrameworkVersion>v4.8</TargetFrameworkVersion>
   <LangVersion>8.0</LangVersion>
   ...
</PropertyGroup>
...
```

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Thank You

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