.NET Applications and Tools

Chapter 1

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Topics

.NET Intro

Technologies

Tools

Hello, World!

.NET Terms

- .NET SDK
  - .NET CLI
- .NET Runtime
  - Required to run the application
  - Can be delivered as part of the application
- .NET Compiler Platform
- .NET Framework
  - Windows only
  - Latest version: 4.8

- .NET Core
  - Open source
  - Modern patterns
- .NET
  - Starting with .NET 5, a new name for .NET Core
- .NET Standard
  - https://docs.microsoft.com/dotnet/standard/net-standard
- NuGet Packages
  - Libraries from Microsoft and 3rd Parties

.NET Support Length

.NET Core / .NET	Release Date	Support Level	End of Life
~~1.0~~	~~2016/6/27~~	~~LTS~~	~~2019/6/27~~
~~1.1~~	~~2016/11/16~~	~~LTS*~~	~~2019/6/27~~
~~2.0~~	~~2017/8/14~~	~~Current~~	~~2018/10/1~~
2.1	2018/5/30	LTS	2021/8/21
~~2.2~~	~~2018/12/4~~	~~Current~~	~~2019/12/23~~
~~3.0~~	~~2019/9/23~~	~~Current~~	~~2020/3/3~~
3.1	2019/12/3	LTS	2022/3/12
5.0	2020/11/10	Current	Feb-2022
6.0	Nov-2021	LTS	Nov-2024
7.0	Nov-2022	Current	Feb-2023
8.0	Nov-2023	LTS	Nov-2026

Data Access

Files and Streams	ADO.NET	Entity Framework Core
• System.IO	• Connection • Command • Reader	• Object mapping • Use provider to relational and NoSQL databases

Windows & Mobile Applications

WinUI

- Windows 10
- XAML
- Desktop & UWP

UWP

- Sandbox Environment

WPF

- XAML

Windows Forms

- Wrapping old Windows controls

ASP.NET Core Blazor (.NET 6)

- HTML, CSS & C#
- WebAssembly

.NET MAUI

- Successor of Xamarin.Forms

Web Applications

Razor Pages	ASP.NET Core MVC	Blazor Server	Blazor WebAssembly
• Mixing C# and HTML with Razor Syntax	• MVC Pattern • Models – Controllers – Razor Views	• Server-side C# Code	• C# Code running in the Browser

Services

- ASP.NET Core Web API
  - ASP.NET Controllers
- Azure Functions
  - Small functions triggered on HTTP, timing, queues…
- gRPC
  - Platform independent binary communication
- SignalR
  - Real-time communication

Microsoft Azure

- Infrastructure as a Service (IaaS)
  - Virtual Machines
- Platform as a Service (PaaS)
  - App Services
- Functions as a Service (SaaS)
  - "Serverless"
  - Azure Functions
- Software as a Service (SaaS)
  - Office 365
  - Azure DevOps

Developer Tools

- .NET CLI
- Visual Studio Code
- Visual Studio
  - Community / Professional / Enterprise / Mac
- Windows Terminal
- WSL 2
  - Windows Subsystem for Linux
- Docker Desktop

Using the .NET CLI

- Show current version
- List Runtimes
- List SDKs
- Select the SDK to use
- Create new Applications
- Restore, Add NuGet Packages
- Build Applications
- Run the Application
- Run Tests
- Publish the Application

Hello, World (Top Level Statements)

> dotnet new console –o HelloWorld

Top-Level Statements

Project File

- SDK Selected
- Ouput Type
- Target Framework(s)
- Language Version
- Nullable
- NuGet Packages

Publish the Application

- Self Contained Deployments
- Single Executable
- ReadyToRun
- Trimming

Summary

Tools

Frameworks

Hello, World!