Introduction to .NET Core

What will we learn?

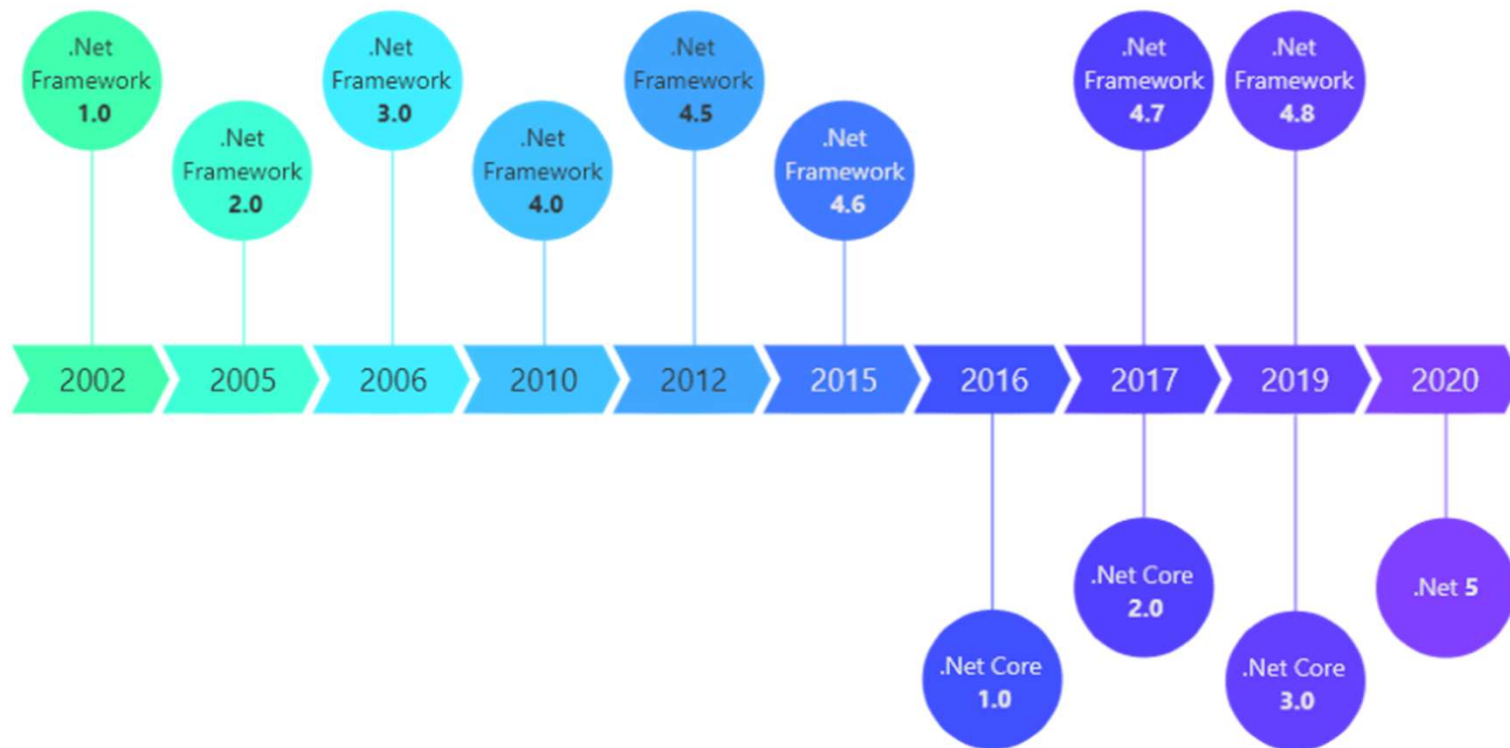Brief history of .NET Framework 4.x

What is .NET Core

How it is different than .NET Framework

Creating and executing .NET Core application using CLI

Creating and executing .NET Core application using Visual Studio 2019

Version 1.0

History of .NET Platform

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.NET

▶ .NET allows to develop different types of applications like window form, web applications, services and mobile applications.

  – Contains Common Language Runtime(CLR) and the .NET Framework class library that support an extensive range of technologies.
  – Runs on Windows OS only.
 – The most recent official release of .NET is 4.8
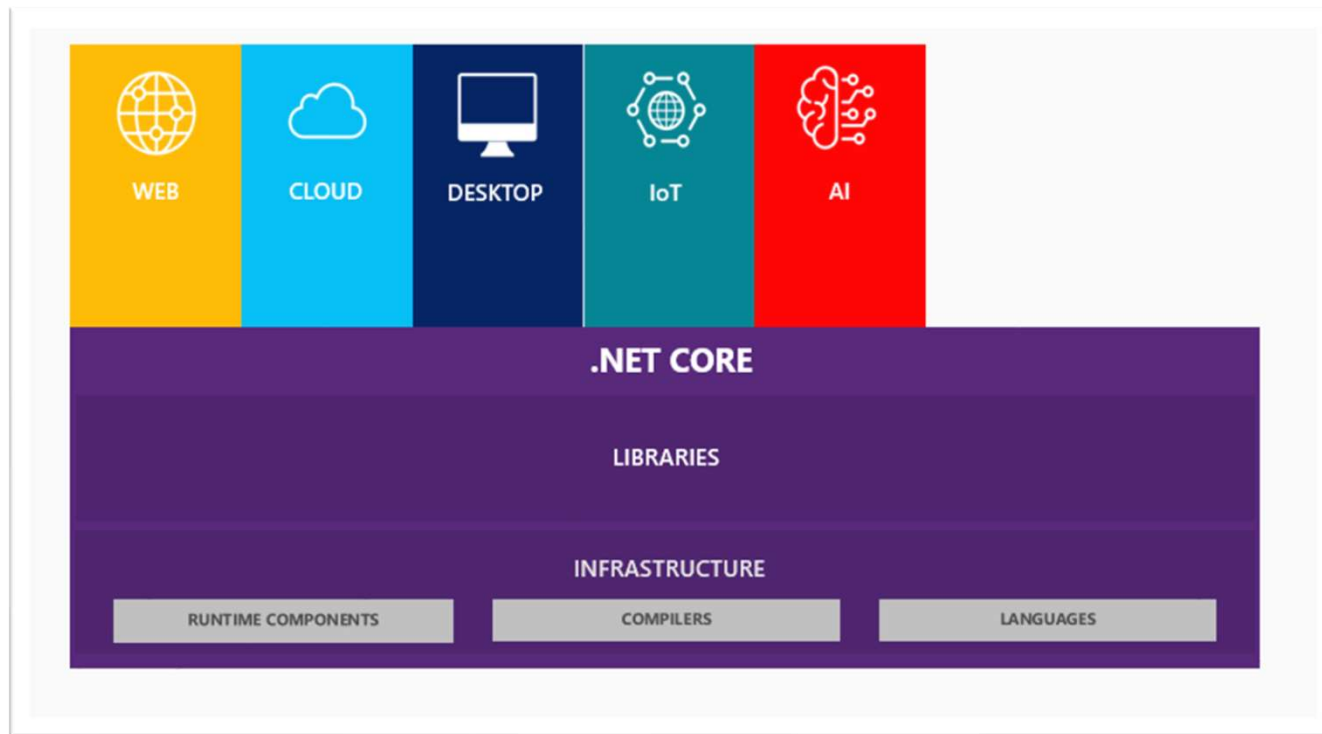
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.NET Core

- It is modular and smaller implementation of .NET
- Cross-platform and Open Source
- Containers Support
  - Docker and Kubernetes
- Micro services Architecture Support
- Optimized for high performance and scalability
- Cross-platform development tools like
  - VS Code, Dot Net CLI
- **In couple of years, .NET Core will replace all the implementation of .NET**

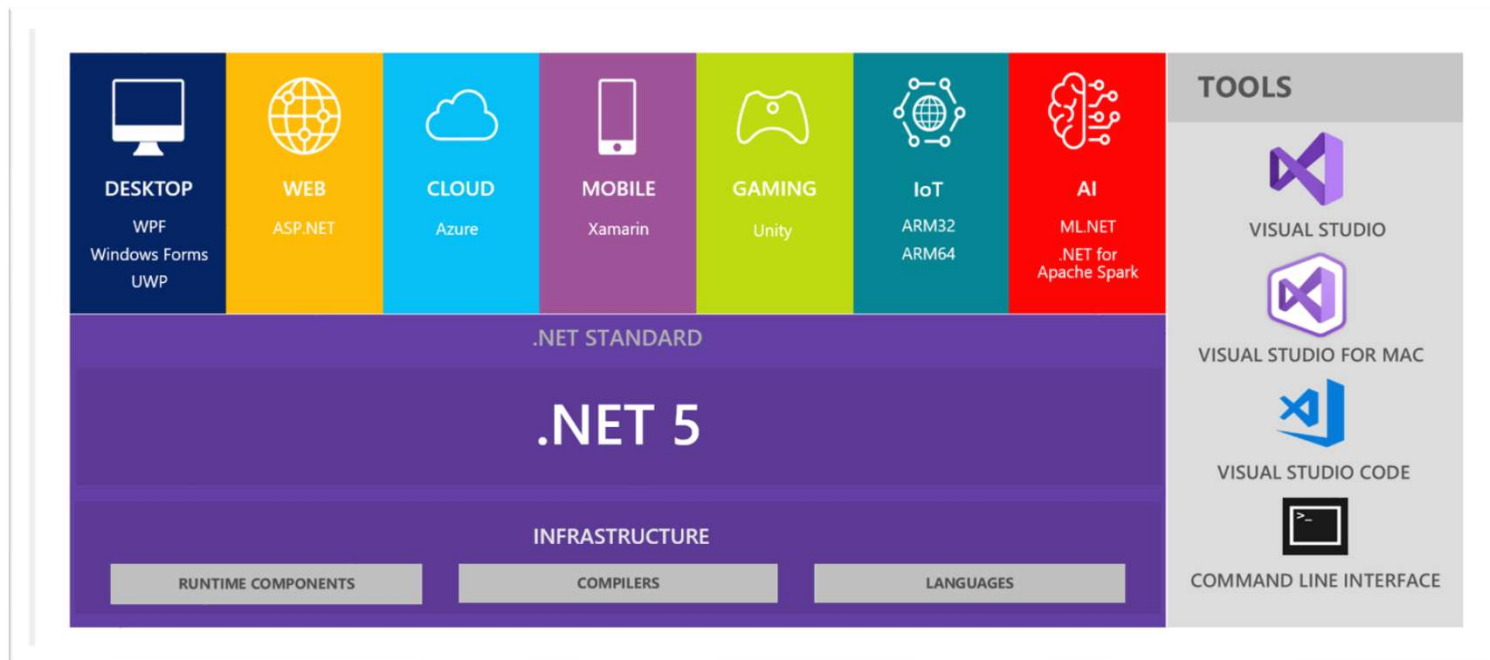Version 1.0

.NET Platform
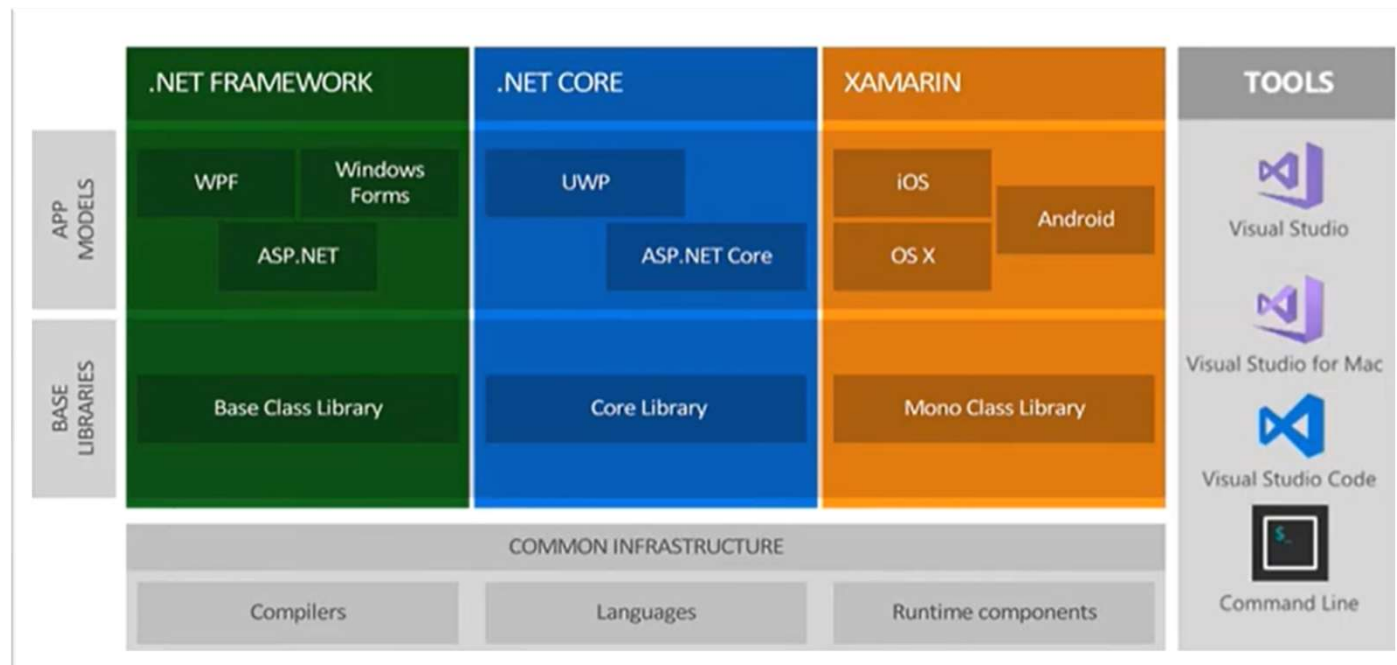
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.NET Platform

Version 1.0

.NET Platform

Version 1.0

.NET Standard

▶ .NET Standard is a formal specification of .NET APIs that are available on multiple .NET implementations.

▶ If you want to share code between .NET Framework and any other .NET implementation, such as .NET Core, your library should target .NET Standard 2.0.

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.NET Core 3.0 Drawback

- ▶ .NET Core 3.0 does not support
  - WebForms
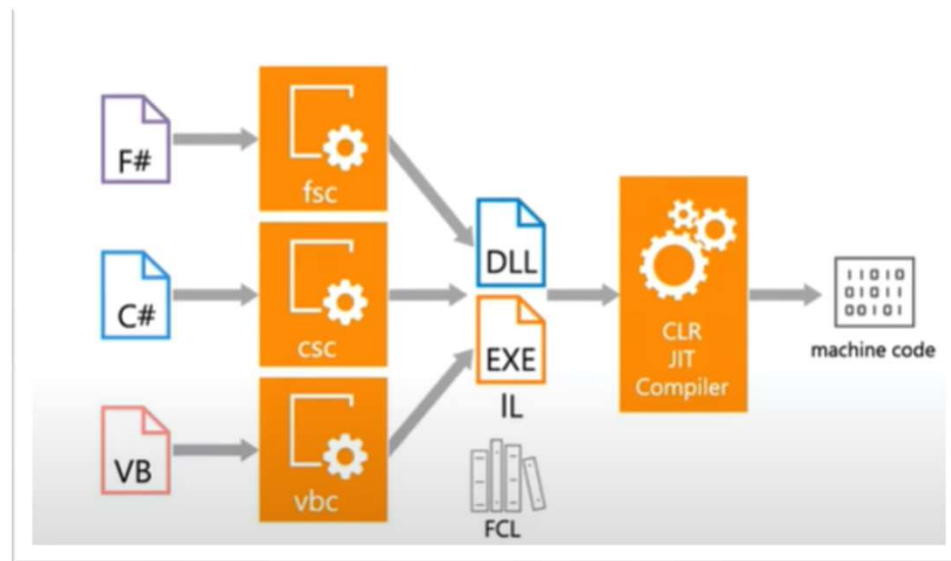 - ASMS Services
  - WCF Services
  - WWF
  - LINQ to SQL

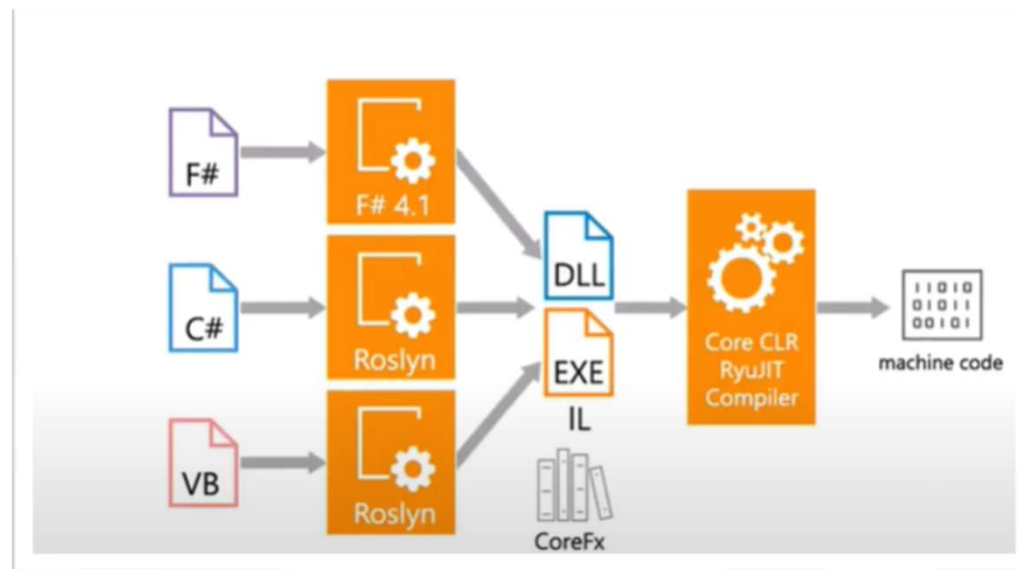Version 1.0

.NET Compilation

▶ .NET Framework compilation

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.NET Compilation

▶ .NET Core Compilation

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Roslyn - .NET Core Compiler

▶ A new .NET compiler platform which is based on compiler "As-A-Service".

▶ An open source C# and VB compiler with rich code analysis APIs

▶ Enables building code analysis tools with the same APIs that are used by Visual Studio.

▶ For more details visit: https://docs.microsoft.com/en-us/archive/msdn-magazine/2017/may/net-core-cross-platform-code-generation-with-roslyn-and-net-core

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CoreCLR

▶ Runtime implementation of .NET Core.

▶ A group of technologies that are fundamental to the runtime such as RyuJIT, Garbage collector, native interop and many other components.

▶ CLR runs only on Windows but CoreCLR is used to run on other platforms.

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RyuJIT (Just-In-Time Compiler)

▶ Next generation JIT compiler for .NET Core.

▶ Supports high performance JIT architecture, focused on high throughput, JIT compilation.

▶ The new JIT is twice as fast, meaning apps compiled with RyuJIT start up to 30% faster.

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.NET CLI

▶ A toolchain for building, developing and publishing .NET Core based Apps

▶ Support various commands

▶ Supports installation of Packages
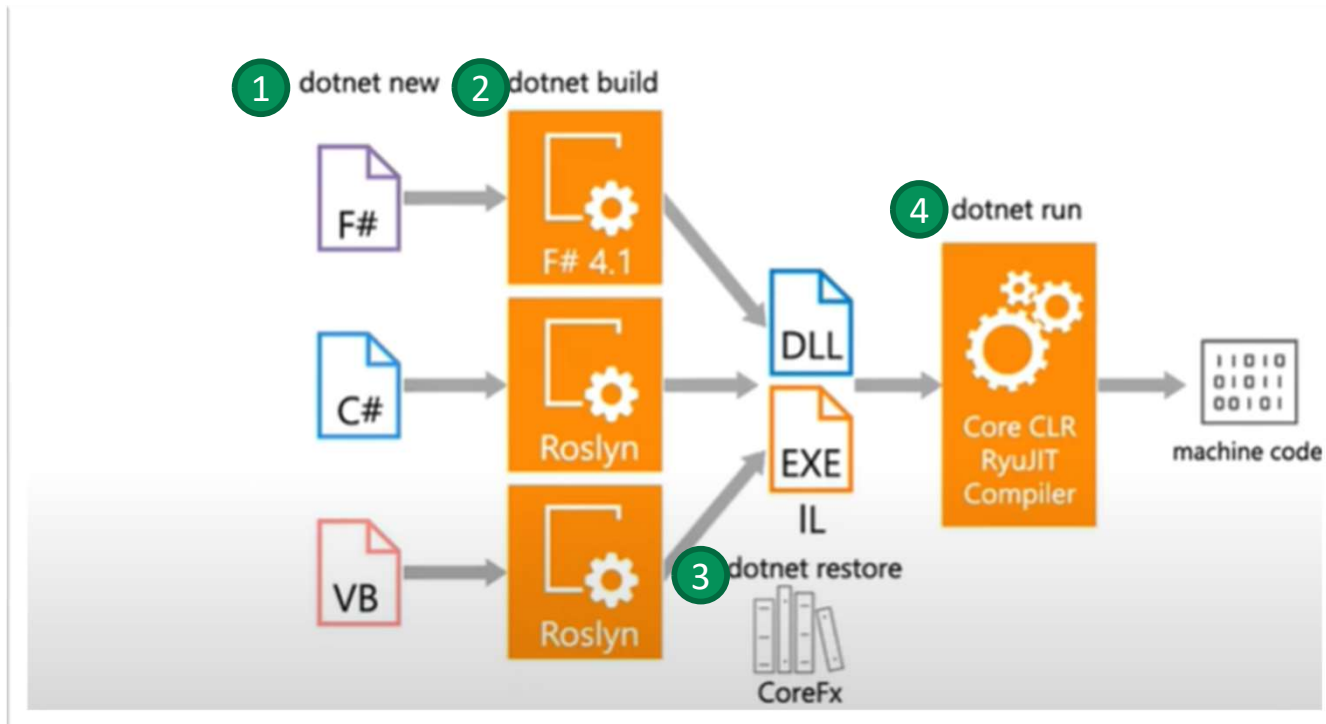
▶ Cross-platform supports.

    – Examples

• dotnet new	Scaffolds a minimal app
• dotnet restore	Restores packages for the project
• dotnet run	Compiles and runs the app
• dotnet build	Compiles to IL
• dotnet build -native	Compiles to a single executable
• dotnet dosomethingcool	Build your own commands

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.NET CLI

Version 1.0

Setting up the Environment

Download and Install

▶ .NET 5.0 SDK from

– https://dotnet.microsoft.com/en-us/download/dotnet/5.0

Cross verify if the SDK is installed, run following command in command window

▶ IDE

`Dotnet -- version`

– Visual Studio Code - https://code.visualstudio.com/download

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Application Development

Create, Build and Run Console Application

▶ CLI Commands

– To check for the templates

`dotnet new -1`

– To create new console app name **ConsoleApp**

`dotnet new console –name ConsoleApp`

– To build the application

`dotnet build`

– To run the application

`dotnet run`

NOTE: make sure the current working directory before build command is the folder where **.csproj** or **.sln** file exists.

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CLI Commands

▶ To check for all the commands which CLI support

`dotnet help`

▶ To publish the application

`dotnet publish`

▶ To run the application

`dotnet run`

▶ To Restore dependencies specified in a .NET Project

`dotnet restore`

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CLI Commands

▶ To build a .NET project

`dotnet build`

▶ To clean build outputs of a .NET project

`dotnet clean`

▶ To list project references of a .NET project

`dotnet list package`

▶ To display all the files in tree view

`tree/f`

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CLI Commands(continued)

▶ To build for Ubuntu

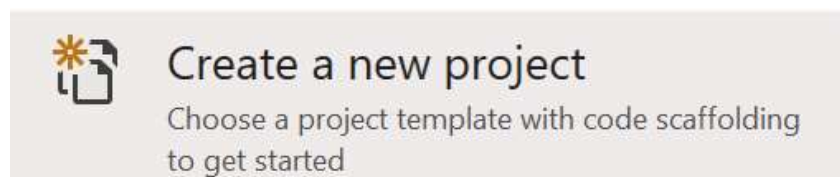`Dotnet build –runtime ubuntu.16.04-x64`

▶ For more commands visit: https://docs.microsoft.com/en-us/dotnet/core/tools/dotnet-build

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Creating .NET Core application using Visual Studio

Creating .NET Core using VS 2019

In Visual Studio, click on

Create a new project
Choose a project template with code scaffolding to get started

Select the type of application to create(ex: Console app)

Search for templates (Alt+S)   Clear all

C#   All platforms   Console

Console Application
A project for creating a command-line application that can run on .NET Core on Windows, Linux and macOS

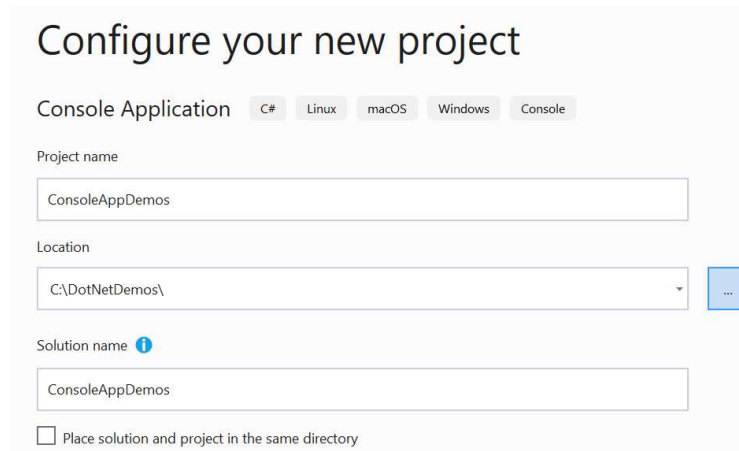C#   Linux   macOS   Windows   Console
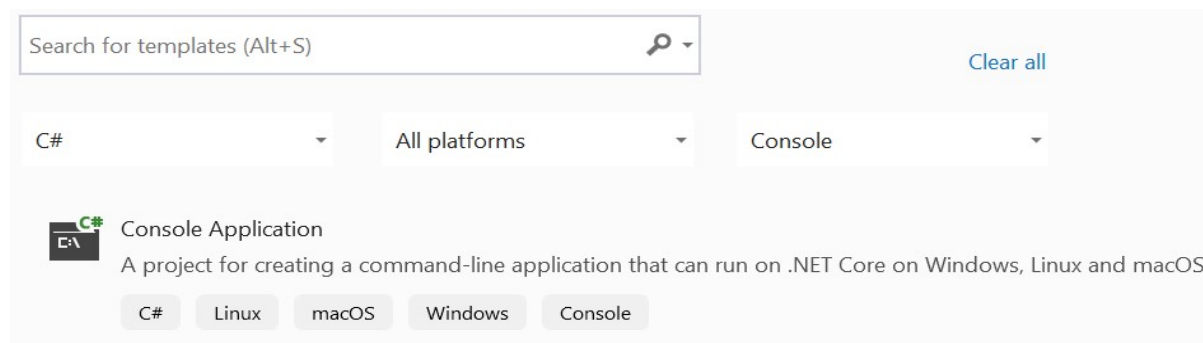
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Creating .NET Core using VS 2019

Specify project name and the location to store the application

Configure your new project

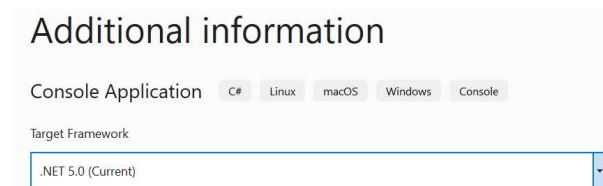Console Application   C#   Linux   macOS   Windows   Console

Project name

ConsoleAppDemos

Location

C:\DotNetDemos\

Solution name ⓘ

ConsoleAppDemos

☐ Place solution and project in the same directory

Select the version and click on **Create** button

Additional information

Console Application   C#   Linux   macOS   Windows   Console

Target Framework

.NET 5.0 (Current)

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