ASP.NET CORE

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About the Tutorial

ASP.NET Core is the new web framework from Microsoft. ASP.NET Core is the framework you want to use for web development with .NET. At the end this tutorial, you will have everything you need to start using ASP.NET Core and write an application that can create, edit, and view data from a database.

Audience

This tutorial is designed for software programmers who would like to learn the basics of ASP.NET Core from scratch.

Prerequisites

You should have a basic understanding of Computer Programming terminologies. A basic understanding of any of the programming languages is a plus.

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1. ASP.NET — OVERVIEW

ASP.NET Core is the new web framework from Microsoft. It has been redesigned from the ground up to be fast, flexible, modern, and work across different platforms. Moving forward, ASP.NET Core is the framework that can be used for web development with .NET. If you have any experience with MVC or Web API over the last few years, you will notice some familiar features. At the end this tutorial, you will have everything you need to start using ASP.NET Core and write an application that can create, edit, and view data from a database.

A Brief History of ASP.NET

ASP.NET has been used from many years to develop web applications. Since then, the framework went through a steady evolutionary change and finally led us to its most recent descendant ASP.NET Core 1.0.

- ASP.NET Core 1.0 is not a continuation of ASP.NET 4.6.
-
- It is a whole new framework, a side-by-side project which happily lives alongside everything else we know.
-
- It is an actual re-write of the current ASP.NET 4.6 framework, but much smaller and a lot more modular.
-
- Some people think that many things remain the same, but this is not entirely true. ASP.NET Core 1.0 is a big fundamental change to the ASP.NET landscape.

What is ASP.NET Core

ASP.NET Core is an open source and cloud-optimized web framework for developing modern web applications that can be developed and run on Windows, Linux and the Mac. It includes the MVC framework, which now combines the features of MVC and Web API into a single web programming framework.

- ASP.NET Core apps can run on .NET Core or on the full .NET Framework.
-
- It was architected to provide an optimized development framework for apps that are deployed to the cloud or run on-premises.
-
- It consists of modular components with minimal overhead, so you retain flexibility while constructing your solutions.
-

- You can develop and run your ASP.NET Core apps cross-platform on Windows, Mac and Linux.

-

Advantages of ASP.NET Core

ASP.NET Core comes with the following advantages:

- ASP.NET Core has a number of architectural changes that result in a much leaner and modular framework.
-
- ASP.NET Core is no longer based on System.Web.dll. It is based on a set of granular and well factored NuGet packages.
-
- This allows you to optimize your app to include just the NuGet packages you need.
-
- The benefits of a smaller app surface area include tighter security, reduced servicing, improved performance, and decreased costs

With ASP.NET Core, you can get the following improvements:

- Build and run cross-platform ASP.NET apps on Windows, Mac and Linux
-
- Built on .NET Core, which supports true side-by-side app versioning
-
- New tooling that simplifies modern wWeb development
-
- Single aligned web stack for Web UI and Web APIs
-
- Cloud-ready environment-based configuration
-
- Built-in support for dependency injection
-
- Tag Helpers which makes Razor markup more natural with HTML
-
- Ability to host on IIS or self-host in your own process

2. ASP.NET CORE — ENVIRONMENT SETUP

ASP.NET Core is a significant redesign of ASP.NET. This topic introduces the new concepts in ASP.NET Core and explains how they help you develop modern web apps.

To use ASP.NET Core in your application, the following must be installed in your system:

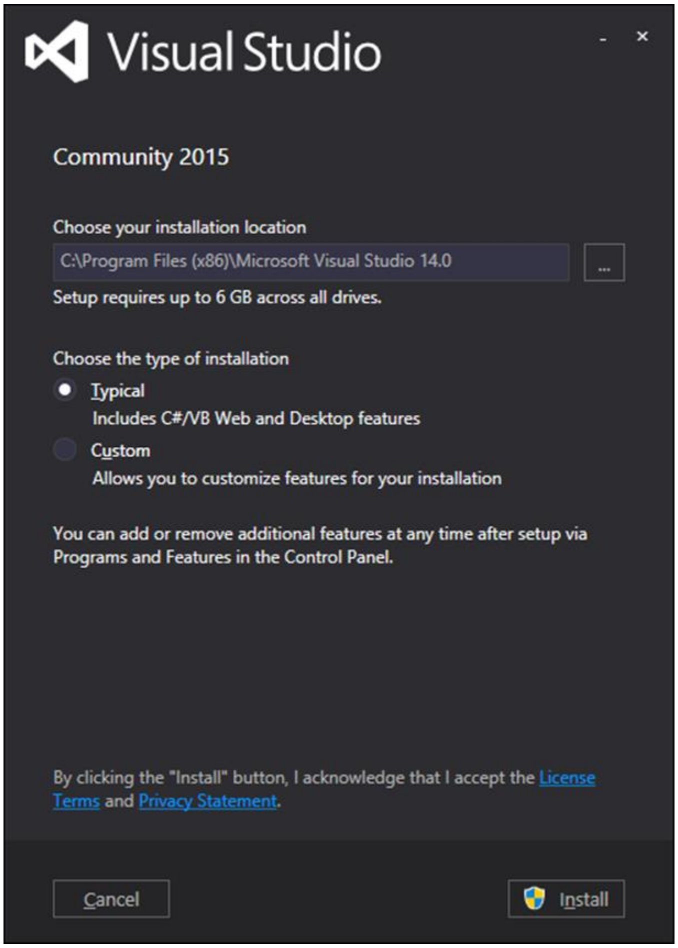
- Microsoft Visual Studio 2015
-
- Microsoft .NET Core 1.0.0 - VS 2015 Tooling Preview 2

Microsoft provides a free version of Visual Studio which also contains the SQL Server and it can be downloaded from https://www.visualstudio.com/en-us/downloads/download-visual-studio-vs.aspx and Microsoft .NET Core 1.0.0 - VS 2015 Tooling Preview 2 can be downloaded from https://go.microsoft.com/fwlink/?LinkId=817245.

Installation of Microsoft Visual Studio 2015

Let us now understand the steps involved in the installation of

Step 1: Once downloading is completed, run the installer. The following dialog box will be displayed.



Visual Studio

Community 2015

Choose your installation location

C:\Program Files (x86)\Microsoft Visual Studio 14.0

Setup requires up to 6 GB across all drives.

Choose the type of installation

● Typical

Includes C#/VB Web and Desktop features

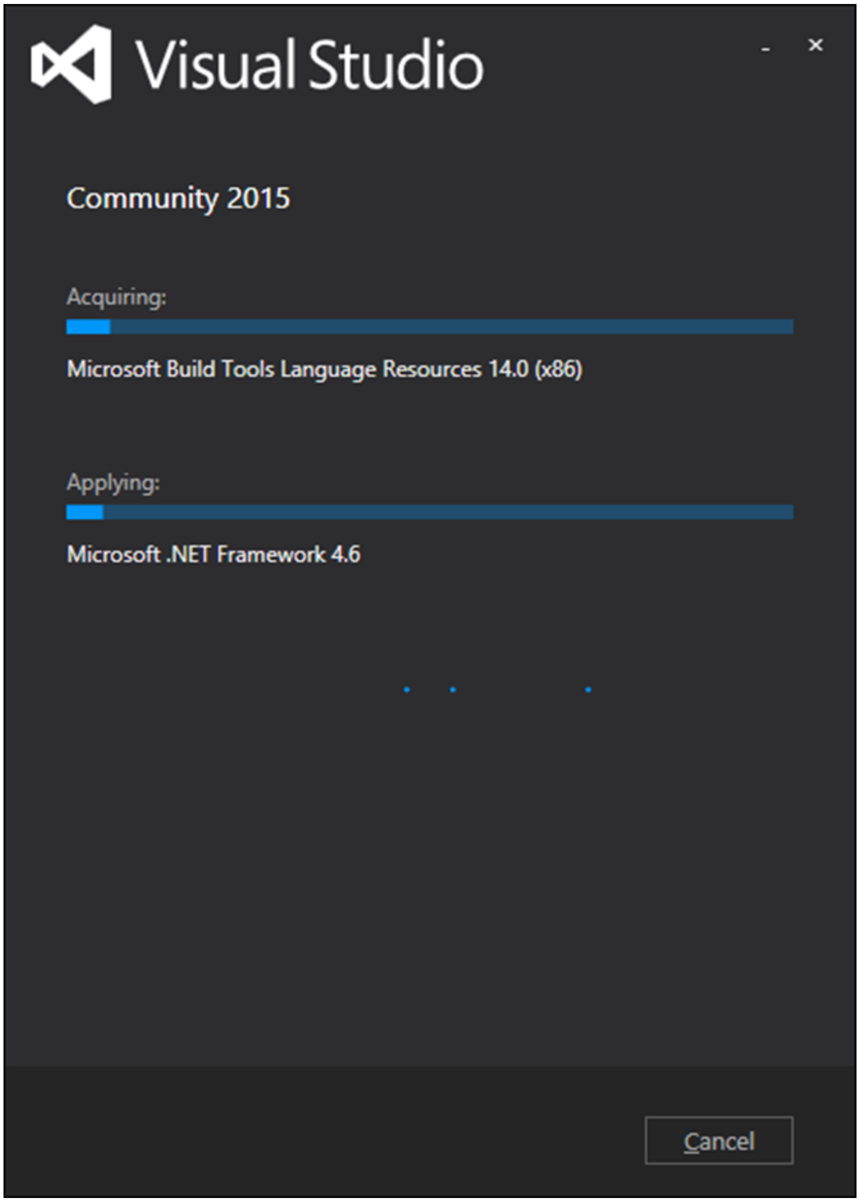
○ Custom

Allows you to customize features for your installation

You can add or remove additional features at any time after setup via Programs and Features in the Control Panel.

By clicking the "Install" button, I acknowledge that I accept the License Terms and Privacy Statement.

Step 2: Click the Install button as in the above screenshot. The installation process will then start.



Community 2015

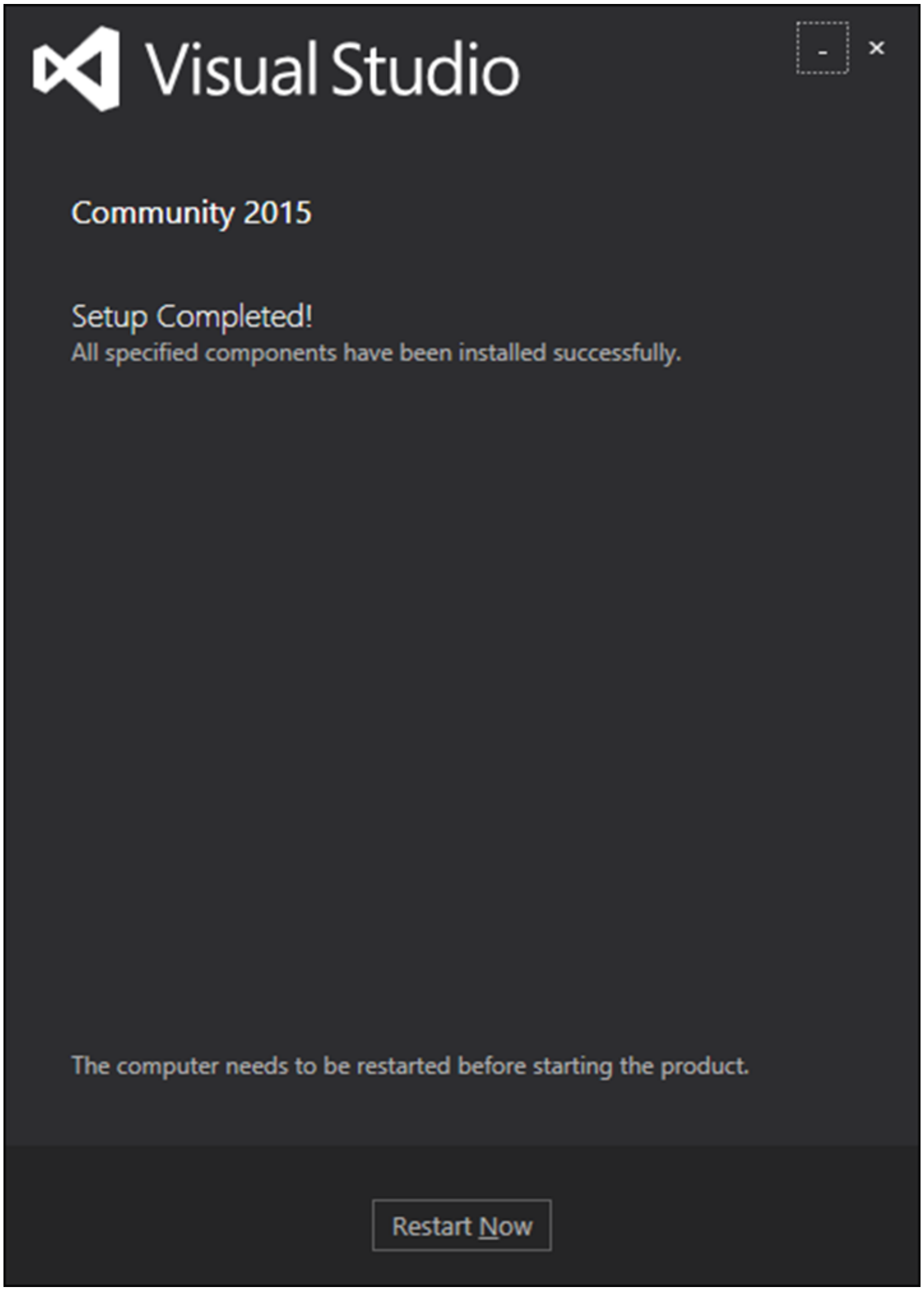
Acquiring:

Microsoft Build Tools Language Resources 14.0 (x86)

Applying:

Microsoft .NET Framework 4.6

Step 3: Once the installation process is completed successfully, you will see the following dialog box.



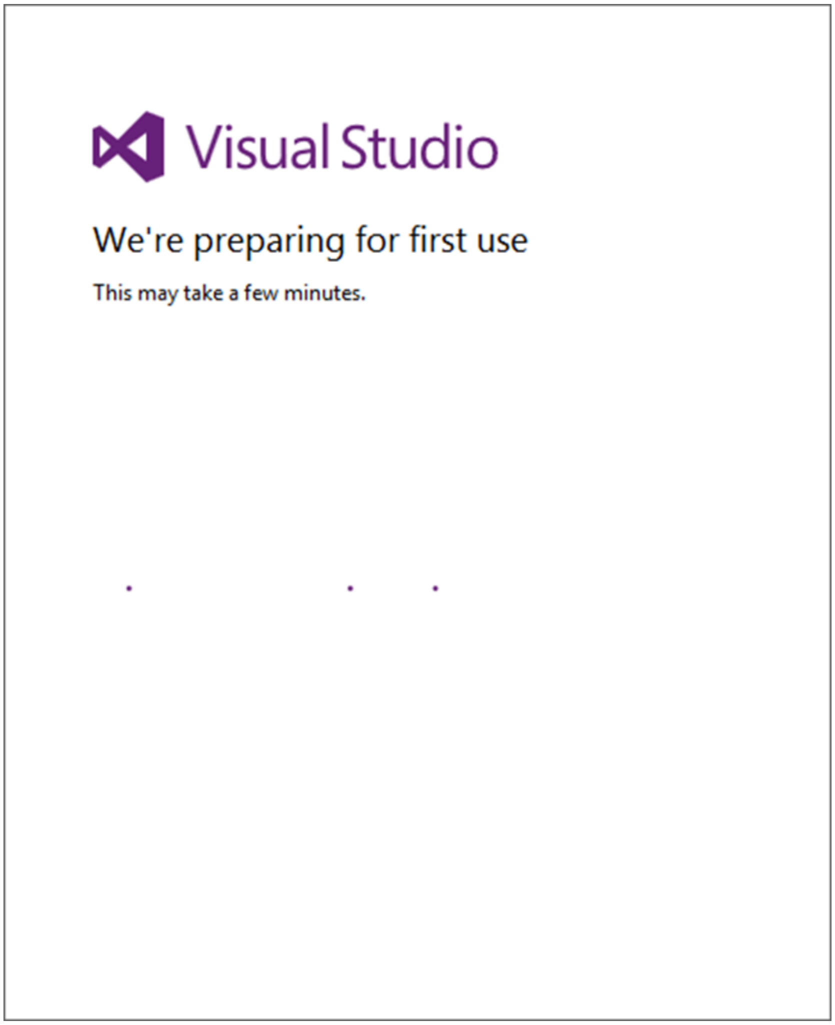
Community 2015

Setup Completed!
All specified components have been installed successfully.

The computer needs to be restarted before starting the product.

Step 4: Close this dialog and restart your computer if required.

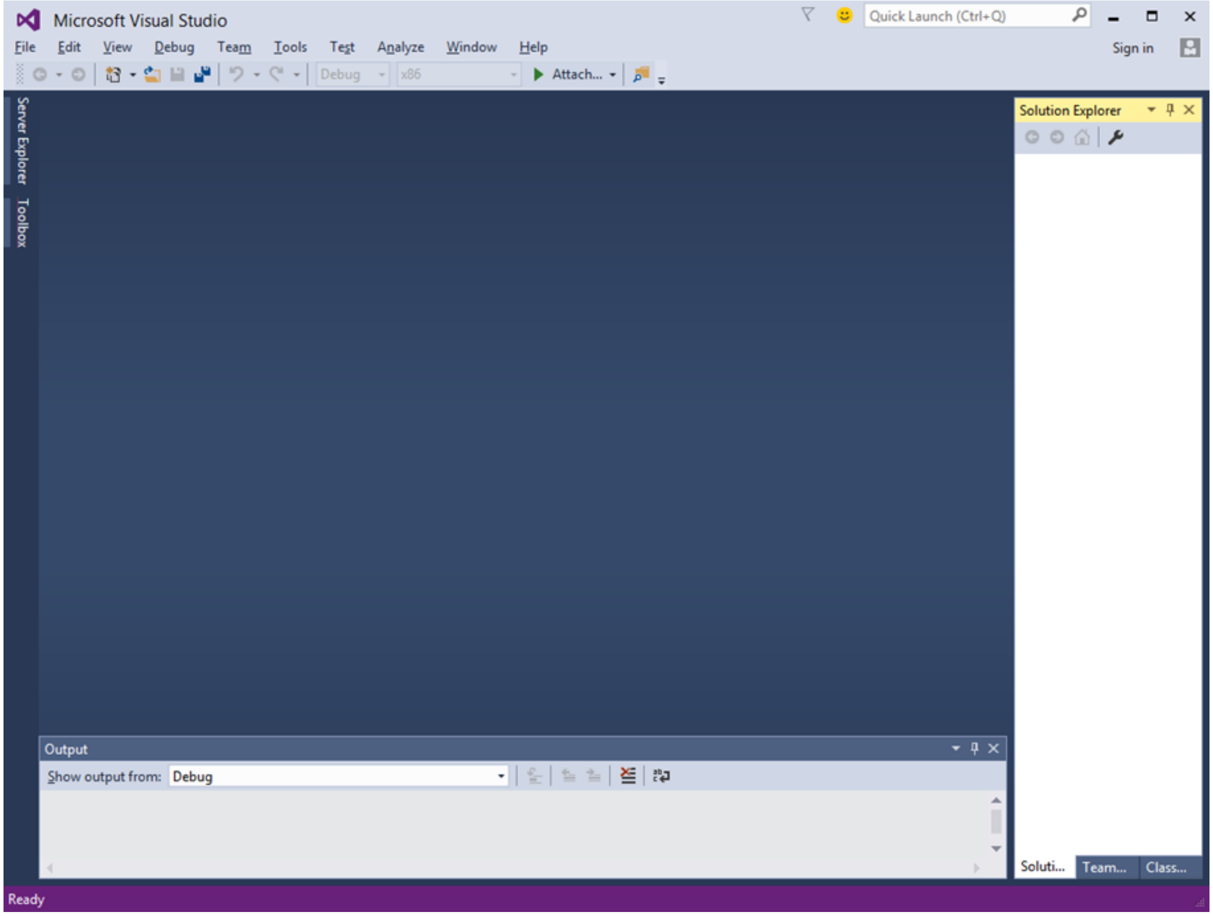
Step 5: Open the Visual studio from the Start menu. This will open the following dialog box and it will take some time for the first time (only for preparation).



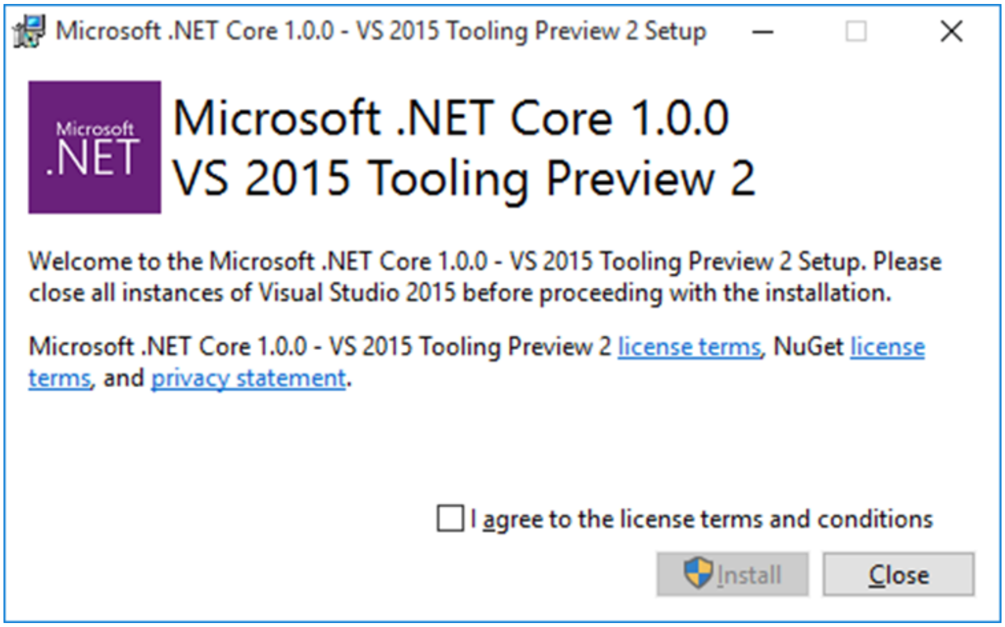
We're preparing for first use

This may take a few minutes.

Step 6: You will now see the main window of the Visual studio.



Step 7: Once the Visual Studio is installed, close the Visual Studio and launch the Microsoft .NET Core 1.0.0 - VS 2015 Tooling Preview 2



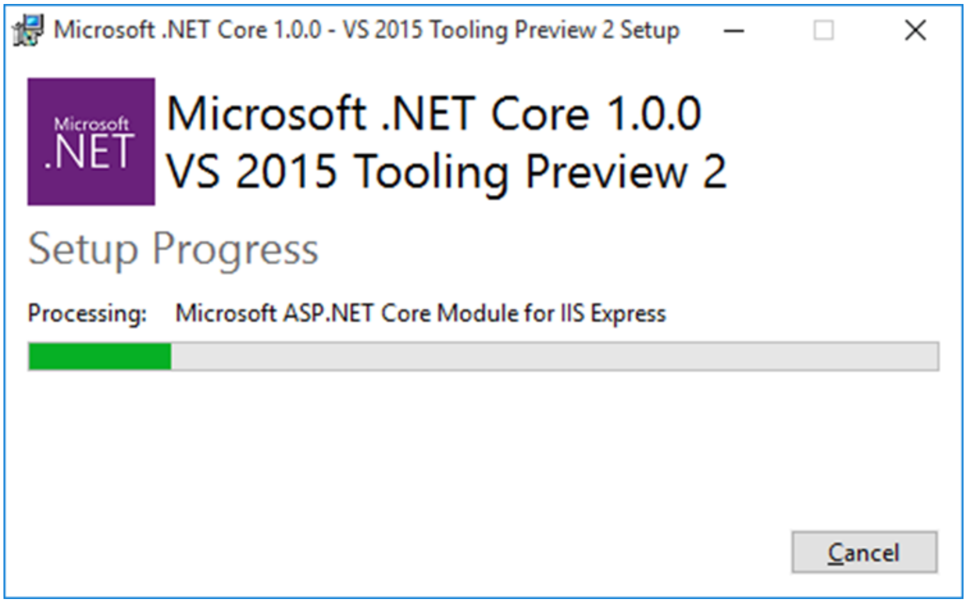
Microsoft .NET Core 1.0.0
VS 2015 Tooling Preview 2

Welcome to the Microsoft .NET Core 1.0.0 - VS 2015 Tooling Preview 2 Setup. Please close all instances of Visual Studio 2015 before proceeding with the installation.

Microsoft .NET Core 1.0.0 - VS 2015 Tooling Preview 2 license terms, NuGet license terms, and privacy statement.

□ I agree to the license terms and conditions

Step 8: Check the checkbox and click Install.

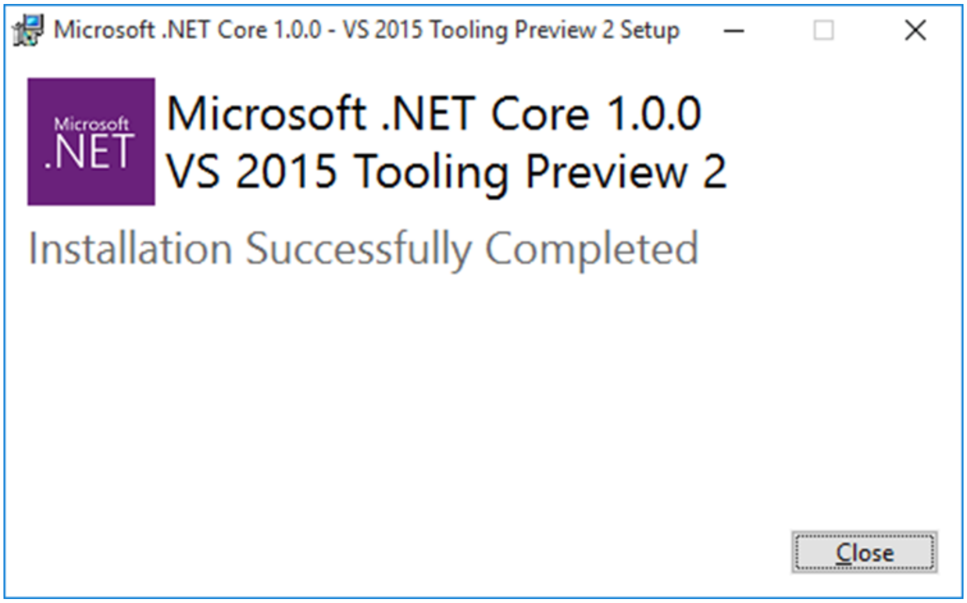


Microsoft .NET Core 1.0.0
VS 2015 Tooling Preview 2

Setup Progress

Processing: Microsoft ASP.NET Core Module for IIS Express

Step 9: Once the installation is completed, you will see the following message.



Microsoft .NET Core 1.0.0 - VS 2015 Tooling Preview 2 Setup

Microsoft .NET Core 1.0.0
VS 2015 Tooling Preview 2

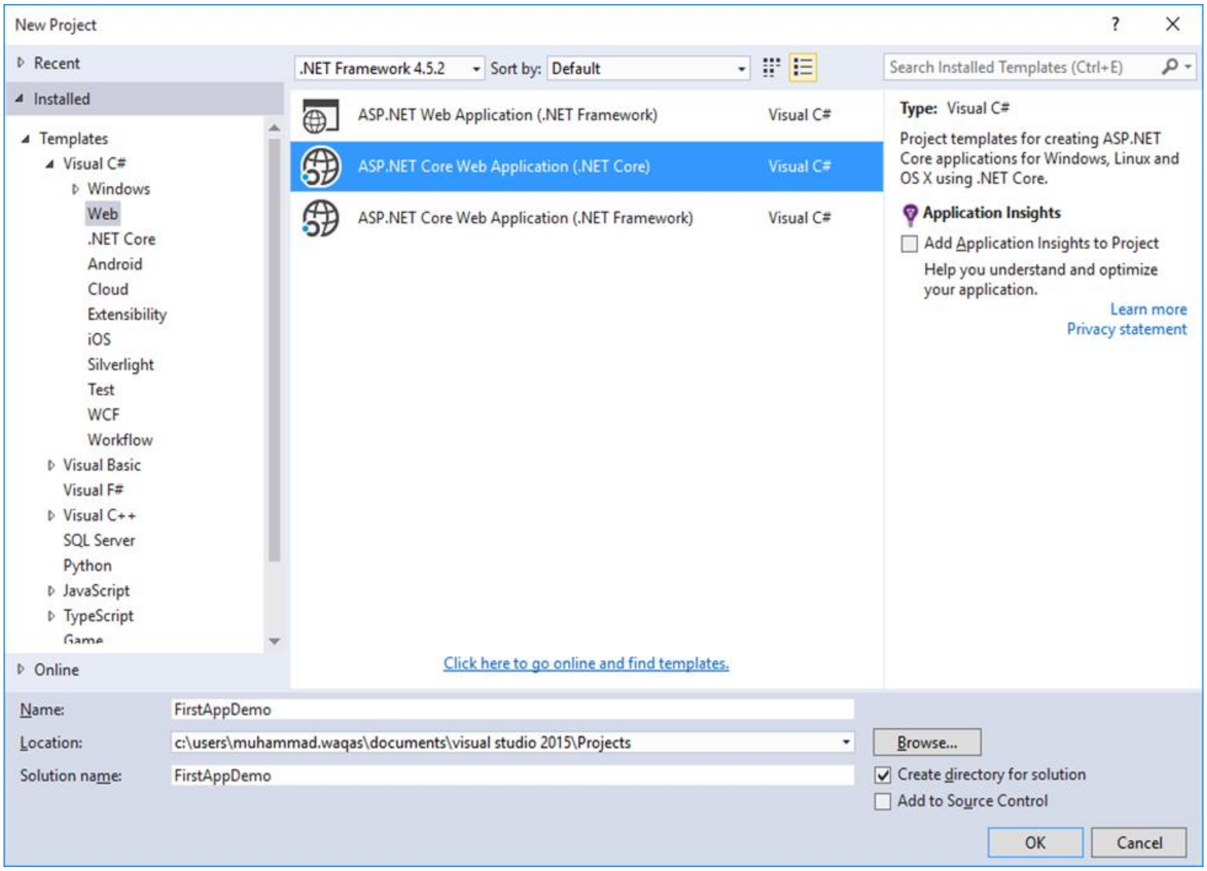
Installation Successfully Completed

Step 10: You are now ready to start your application using ASP.NET Core.

3. ASP.NET CORE — NEW PROJECT

In this chapter, we will discuss how to create a new project in Visual Studio.

Once you have installed the Visual Studio 2015 tooling, you can start building a new ASP.NET Core Application from the **File > New Project** menu option.



Type: Visual C#

Project templates for creating ASP.NET Core applications for Windows, Linux and OS X using .NET Core.

Application Insights

☐ Add Application Insights to Project

Help you understand and optimize your application.

Name: FirstAppDemo

Location: c:\users\muhammad.waqas\documents\visual studio 2015\Projects

Solution name: FirstAppDemo

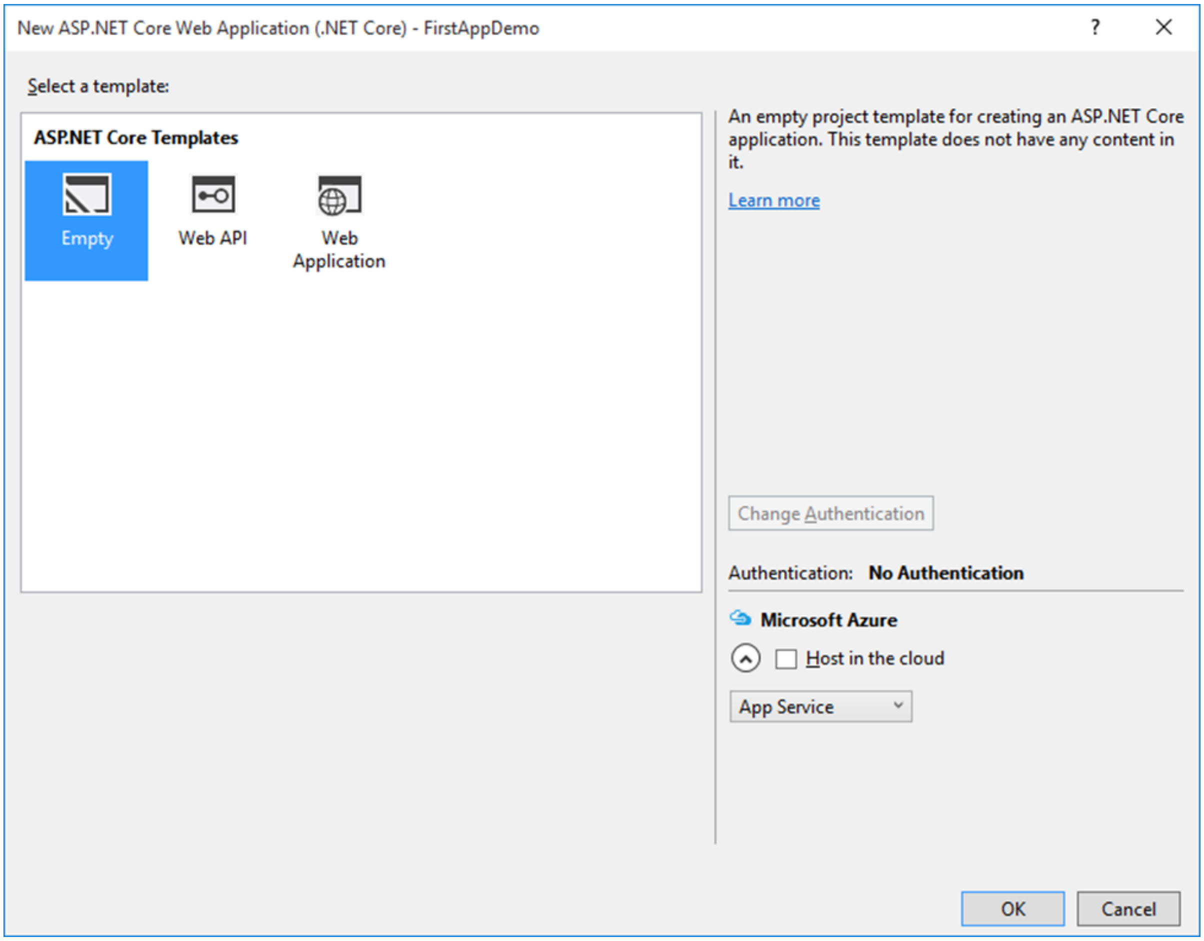
☑ Create directory for solution

☐ Add to Source Control

On the New Project dialog box, you will see the following three different templates for Web projects:

- **ASP.NET Web Application:** The simple ASP.NET application templates
-
- **ASP.NET Core Web Application (.NET Core):** This will start you with a cross-platform compatible project that runs on the .NET Core framework
-
- **ASP.NET Core Web Application (.NET Framework):** This starts a new project that runs on the standard .NET Framework on Windows.

In the left pane, select **Templates > Visual C# > Web** and in the middle pane select the ASP.NET Core Web Application (.NET Core) template. Let us call this application **FirstAppDemo** and also specify the Location for your ASP.NET Core project and then Click OK.



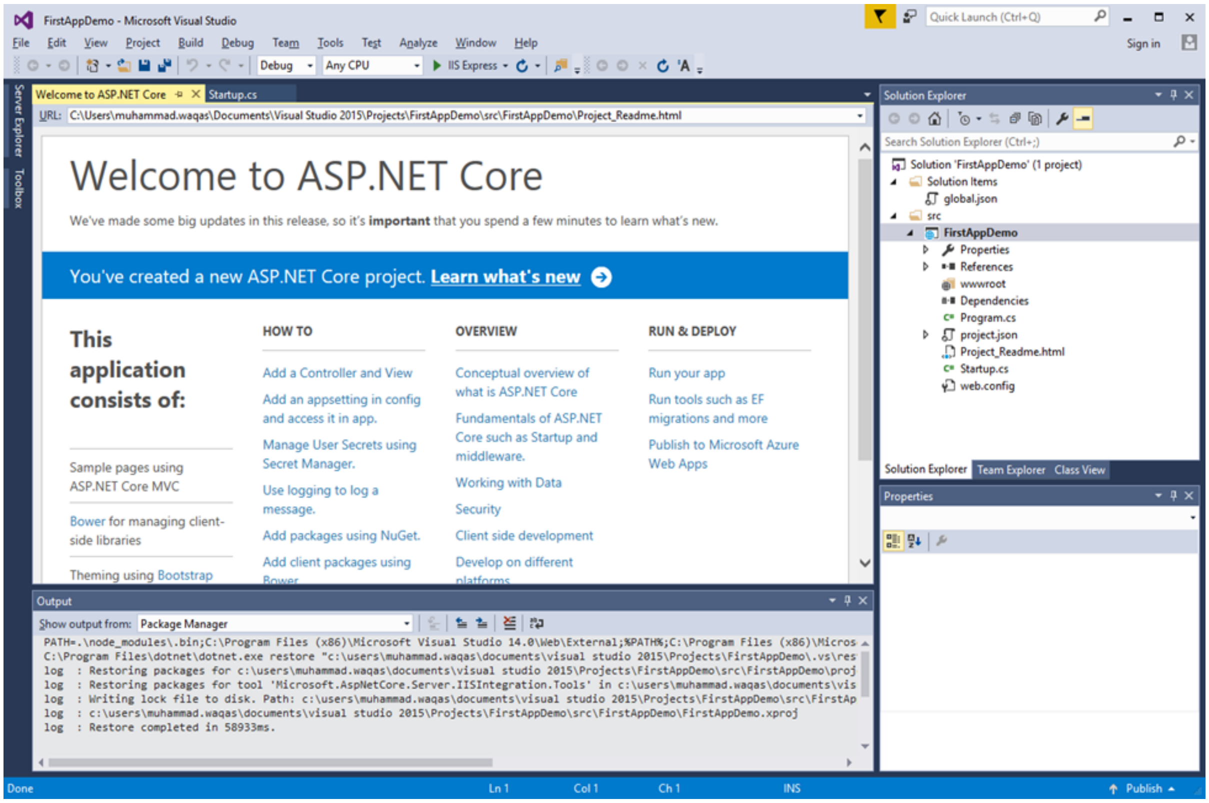
An empty project template for creating an ASP.NET Core application. This template does not have any content in it.

Authentication: **No Authentication**

In the above dialog box, you can select a specific template for the ASP.NET application from the available ASP.NET Core Templates.

ASP.NET Core templates currently contain three different templates. Of these, the **Web Application template** will help you lay out a lot of files on your file system. This also allows you to use ASP.NET MVC right away.

Here, we will start with an empty template. This would help us build it from scratch. Let us select the Empty template, turn off the Host in the cloud and click OK.



Welcome to ASP.NET Core

We've made some big updates in this release, so it's **important** that you spend a few minutes to learn what's new.

You've created a new ASP.NET Core project. Learn what's new

This application consists of:

- Sample pages using ASP.NET Core MVC
- Bower for managing client-side libraries
- Theming using Bootstrap

HOW TO

- Add a Controller and View
- Add an appsetting in config and access it in app.
- Manage User Secrets using Secret Manager.
- Use logging to log a message.
- Add packages using NuGet.
- Add client packages using Bower

OVERVIEW

- Conceptual overview of what is ASP.NET Core
- Fundamentals of ASP.NET Core such as Startup and middleware.
- Working with Data
- Security
- Client side development
- Develop on different platforms

RUN & DEPLOY

- Run your app
- Run tools such as EF migrations and more
- Publish to Microsoft Azure Web Apps

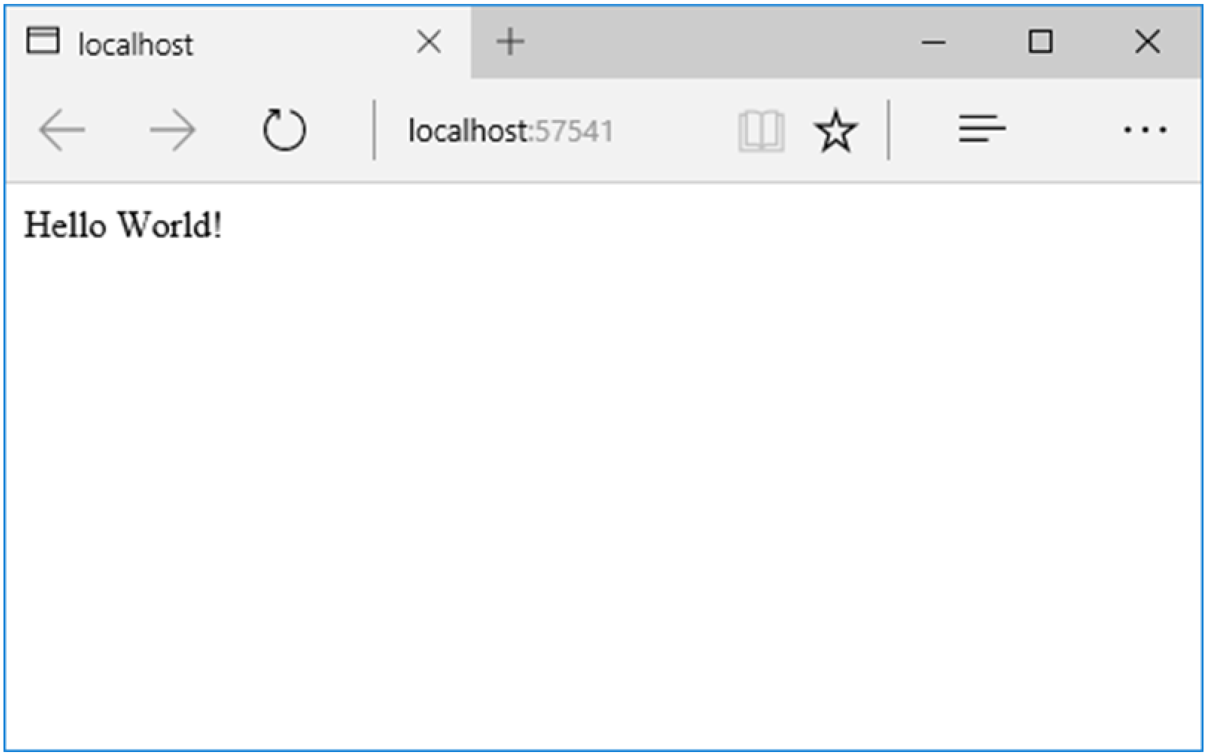
Output

Show output from: Package Manager

```
PATH=.\node_modules\.bin;C:\Program Files (x86)\Microsoft Visual Studio 14.0\Web\External;%PATH%;C:\Program Files (x86)\Micros
C:\Program Files\dotnet\dotnet.exe restore "c:\users\muhammad.waqas\documents\visual studio 2015\Projects\FirstAppDemo\.vs\res
log  : Restoring packages for c:\users\muhammad.waqas\documents\visual studio 2015\Projects\FirstAppDemo\src\FirstAppDemo\proj
log  : Restoring packages for tool 'Microsoft.AspNetCore.Server.IISIntegration.Tools' in c:\users\muhammad.waqas\documents\vis
log  : Writing lock file to disk. Path: c:\users\muhammad.waqas\documents\visual studio 2015\Projects\FirstAppDemo\src\FirstAp
log  : c:\users\muhammad.waqas\documents\visual studio 2015\Projects\FirstAppDemo\src\FirstAppDemo\FirstAppDemo.xproj
log  : Restore completed in 58933ms.
```

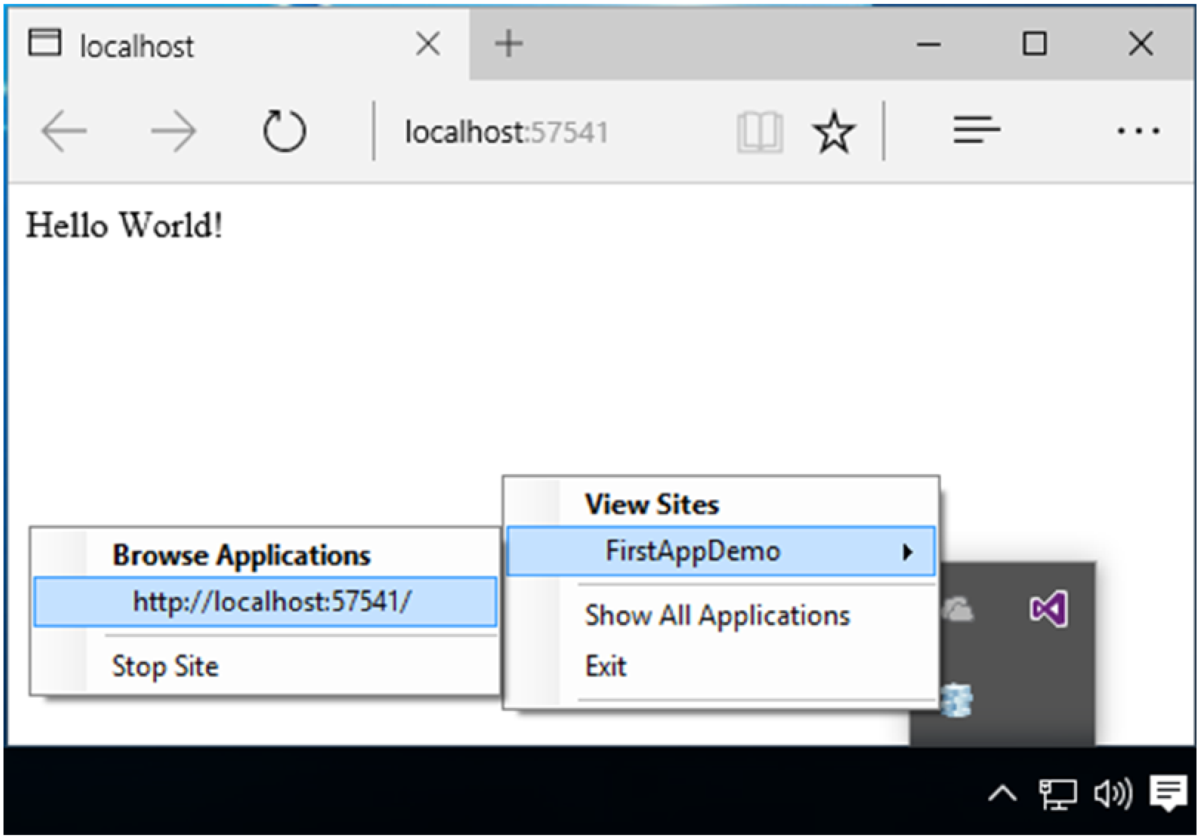
Visual Studio will now launch the project in some time. In the Solution Explorer window, you will see all the files that are in this project.

Let us run this application, you can do that by pressing Ctrl+F5 or by going to the Debug menu. After going to the Debug menu, select **Start Without Debugging**.



Hello World!

This application can display only Hello World! This runs on **localhost:57741**. In the window system tray, you can also see that IIS Express is running.

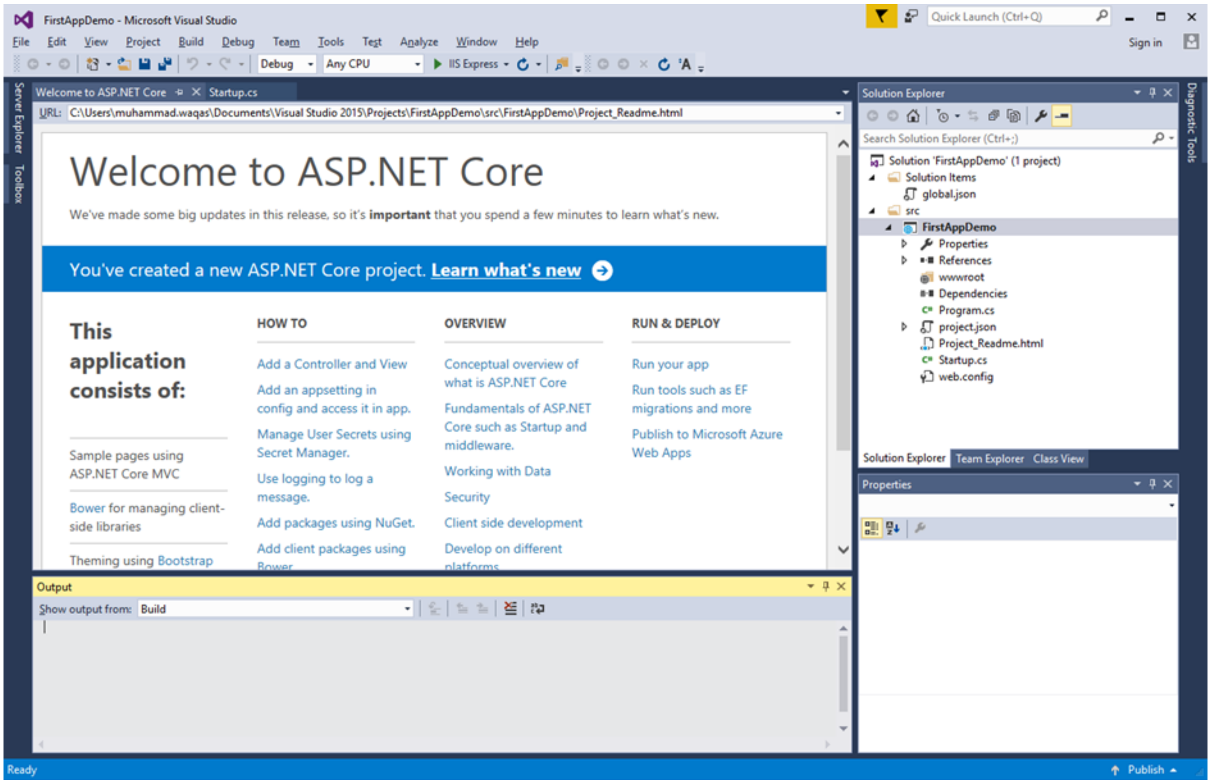


And the name of the site is **FirstAppDemo**. If you have been programming with ASP.NET with the previous versions of the framework, the way you would interact with the Visual Studio and the way Visual Studio uses IIS Express to host your application, all these aspects will be familiar.

4. ASP.NET CORE — PROJECT LAYOUT

In this chapter, we will discuss how ASP.NET core project appears on the file system and how the different files and directories all work together.

Let us open the **FirstAppDemo** project created in the previous chapter.



URL: C:\Users\muhammad.waqas\Documents\Visual Studio 2015\Projects\FirstAppDemo\src\FirstAppDemo\Project_Readme.html

Welcome to ASP.NET Core

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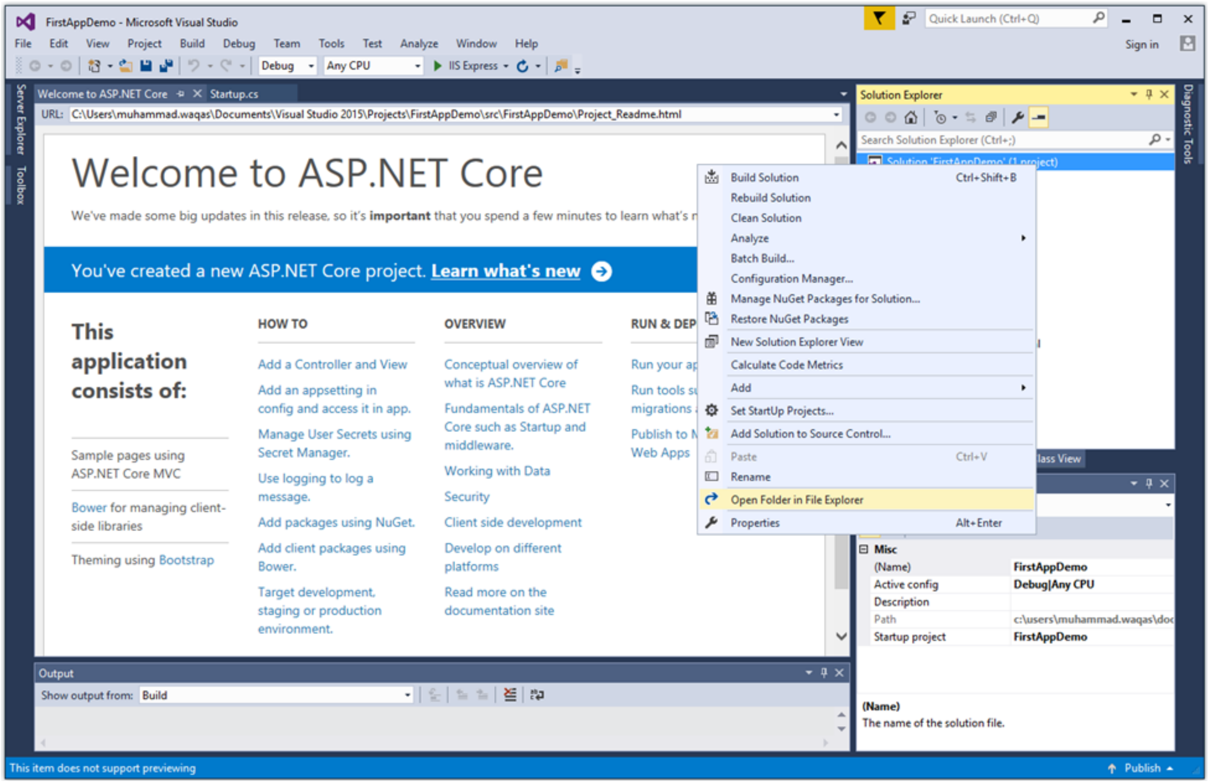
Run your app

Run tools such as EF migrations and more

Publish to Microsoft Azure Web Apps

Show output from: Build

In the Solution Explorer window, right-click on the **Solution** node and select the **Open Folder** in **File Explorer**.



FirstAppDemo - Microsoft Visual Studio
Quick Launch (Ctrl+Q)
File Edit View Project Build Debug Team Tools Test Analyze Window Help
Sign in
Debug
Any CPU
IIS Express
Server Explorer
Toolbox
Welcome to ASP.NET Core
Startup.cs
URL: C:\Users\muhammad.waqas\Documents\Visual Studio 2015\Projects\FirstAppDemo\src\FirstAppDemo\Project_Readme.html
Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'FirstAppDemo' (1 project)
Build Solution Ctrl+Shift+B
Rebuild Solution
Clean Solution
Analyze
Batch Build...
Configuration Manager...
Manage NuGet Packages for Solution...
Restore NuGet Packages
New Solution Explorer View
Calculate Code Metrics
Add
Set StartUp Projects...
Add Solution to Source Control...
Paste Ctrl+V
Rename
Open Folder in File Explorer
Properties Alt+Enter
lass View
Diagnostic Tools
Output
Show output from: Build
This item does not support previewing
Publish

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Add an appsetting in config and access it in app.

Manage User Secrets using Secret Manager.

Use logging to log a message.

Add packages using NuGet.

Add client packages using Bower.

Target development, staging or production environment.

OVERVIEW

Conceptual overview of what is ASP.NET Core

Fundamentals of ASP.NET Core such as Startup and middleware.

Working with Data

Security

Client side development

Develop on different platforms

Read more on the documentation site

RUN & DEP

Run your ap

Run tools su migrations

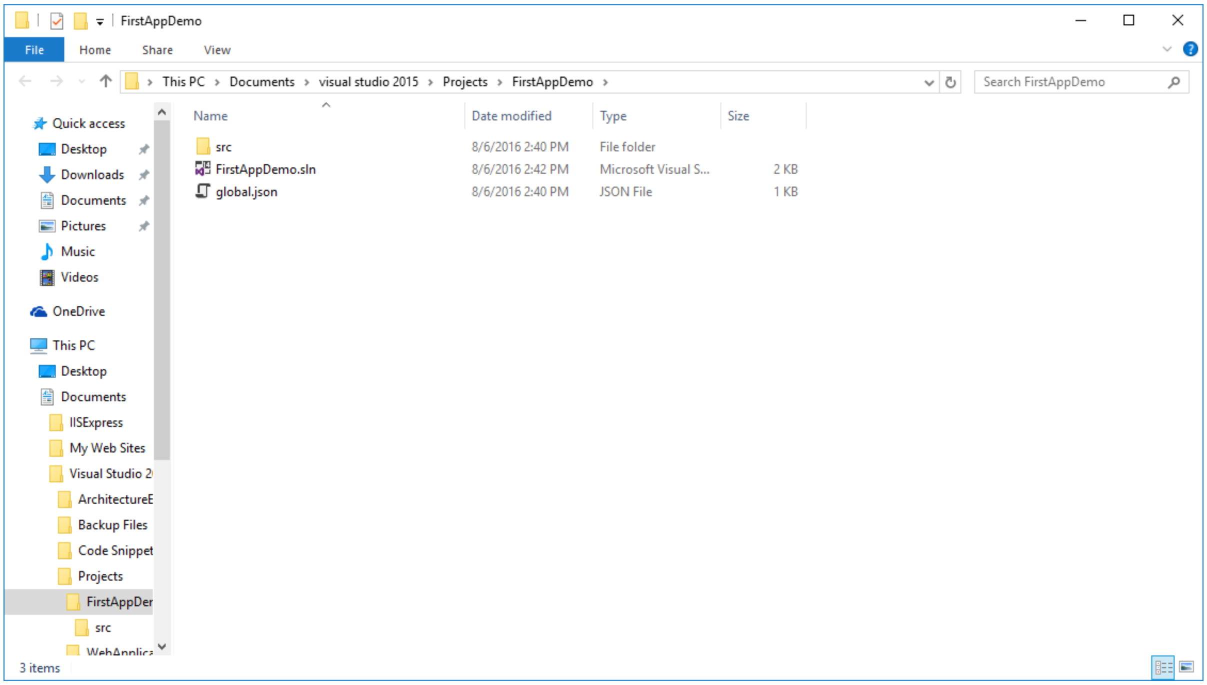
Publish to M Web Apps

Misc

(Name)	FirstAppDemo
Active config	Debug|Any CPU
Description	
Path	c:\users\muhammad.waqas\doc
Startup project	FirstAppDemo

(Name)
The name of the solution file.

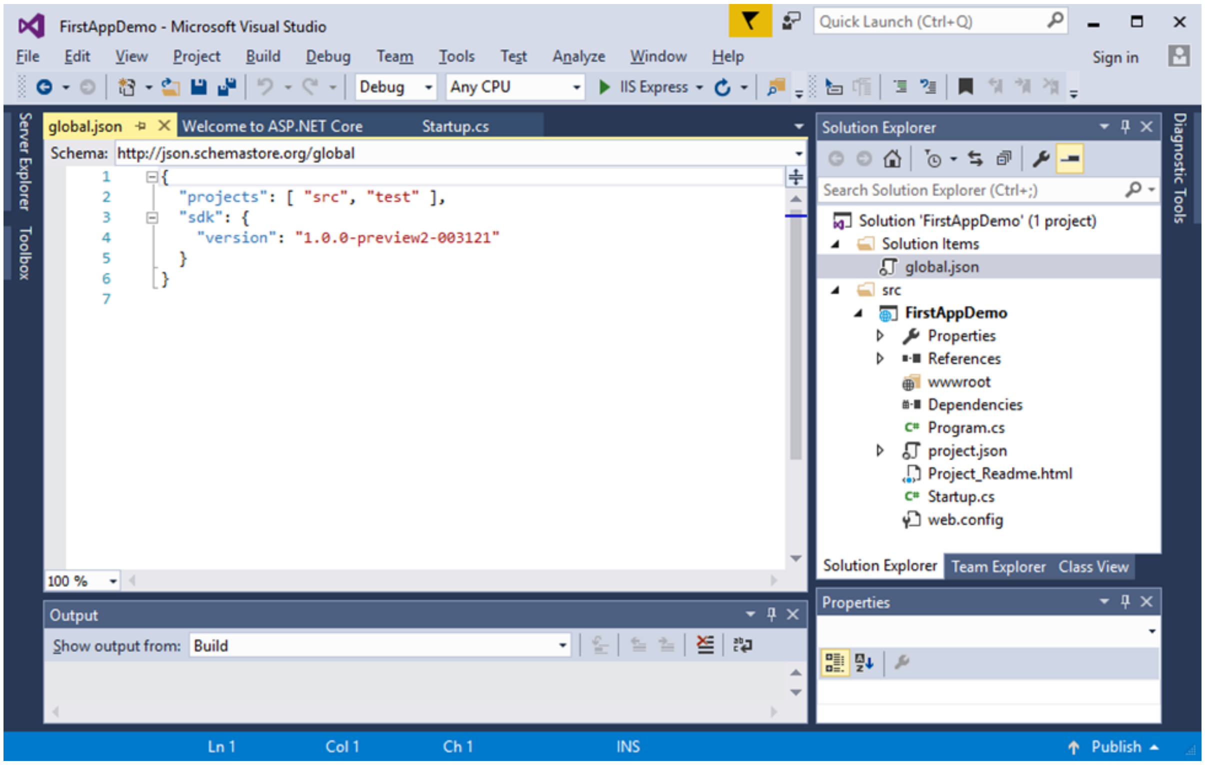
You will see now the root directory with two files in it: **FirstAppDemo.sln** and **global.json**.



Name	Date modified	Type	Size
src	8/6/2016 2:40 PM	File folder	
FirstAppDemo.sln	8/6/2016 2:42 PM	Microsoft Visual S...	2 KB
global.json	8/6/2016 2:40 PM	JSON File	1 KB

FirstAppDemo.sln is a solution file. Visual Studio has used this extension for years by default, and you can double-click on the file if you want to open the app in Studio and work on it.

There is also a **global.json** file. Let us open this file in Visual Studio.



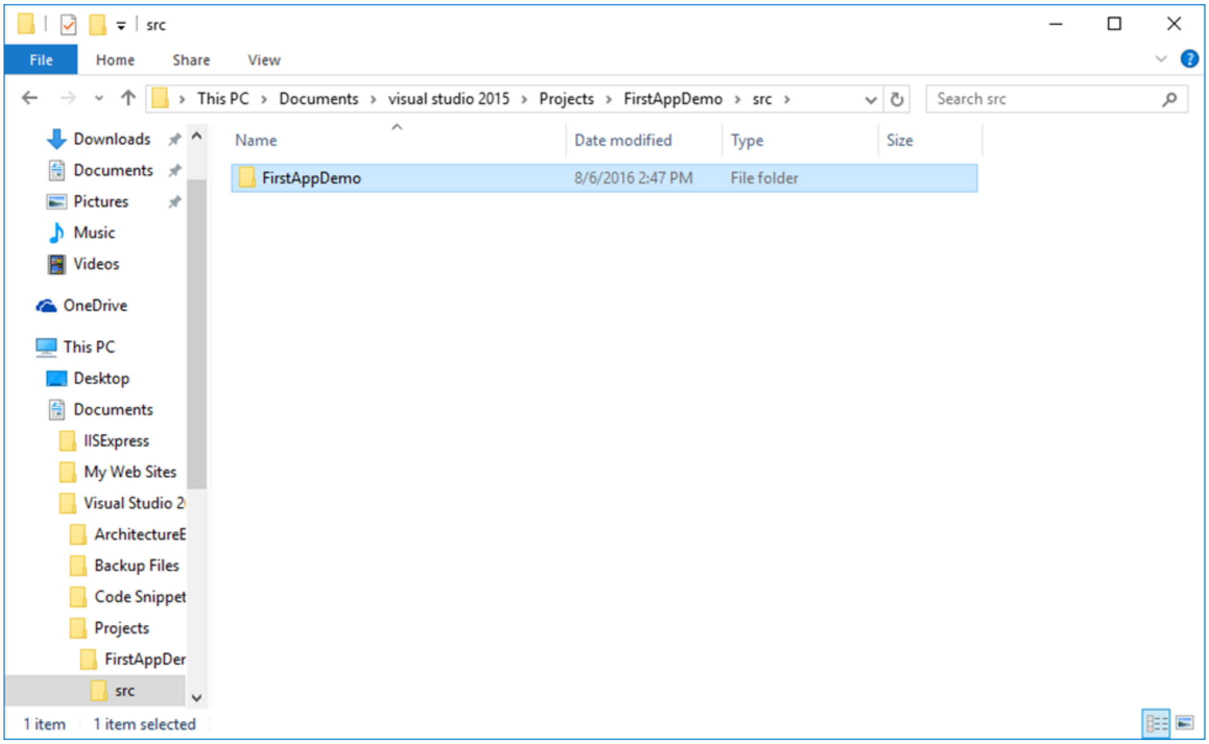
Schema: http://json.schemastore.org/global

```
{
  "projects": [ "src", "test" ],
  "sdk": {
    "version": "1.0.0-preview2-003121"
  }
}
```

In the file, the project's setting is significant. This project setting tells ASP.NET where to look for your source code and what folders contain your projects.

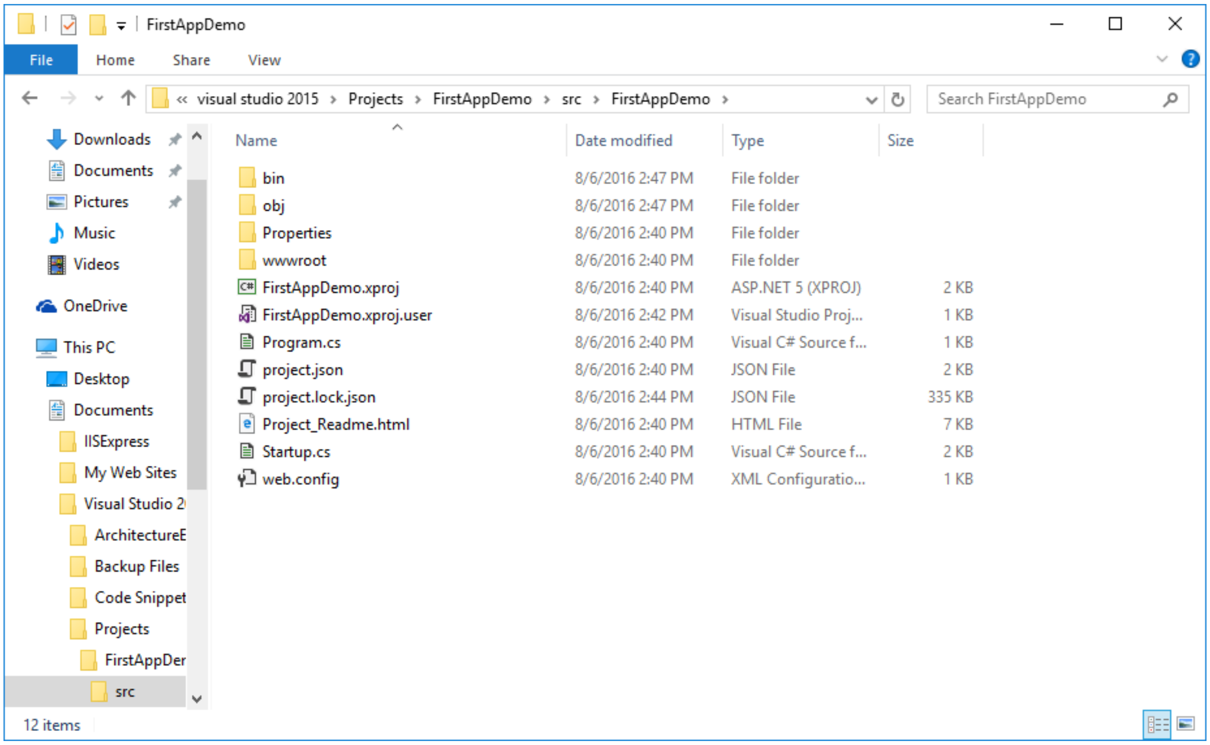
There are two possible folders **"src"** for source and a **"test"** folder. Unless your projects and source code are in one of these two folders, the code won't be available to build. You can change these settings if you want.

The Windows Explorer has the **"src"** folder on disk. You don't have a test folder. In the test folder, you could place your unit testing projects. Let us double-click on the **"src"** folder.



Name	Date modified	Type	Size
FirstAppDemo	8/6/2016 2:47 PM	File folder	

You can see the FirstAppDemo project, and the web application. Now, double-click on the folder.



Name	Date modified	Type	Size
bin	8/6/2016 2:47 PM	File folder	
obj	8/6/2016 2:47 PM	File folder	
Properties	8/6/2016 2:40 PM	File folder	
wwwroot	8/6/2016 2:40 PM	File folder	
FirstAppDemo.xproj	8/6/2016 2:40 PM	ASP.NET 5 (XPROJ)	2 KB
FirstAppDemo.xproj.user	8/6/2016 2:42 PM	Visual Studio Proj...	1 KB
Program.cs	8/6/2016 2:40 PM	Visual C# Source f...	1 KB
project.json	8/6/2016 2:40 PM	JSON File	2 KB
project.lock.json	8/6/2016 2:44 PM	JSON File	335 KB
Project_Readme.html	8/6/2016 2:40 PM	HTML File	7 KB
Startup.cs	8/6/2016 2:40 PM	Visual C# Source f...	2 KB
web.config	8/6/2016 2:40 PM	XML Configuratio...	1 KB

These are the source code files for the application and you can also see this folder structure in the Solution Explorer window. This is because in the present version of ASP.NET Core, the file system determines what is in your project.