

Build an EF and ASP.NET Core 2.2 App HOL

Lab 1

Welcome to the Build an ASP.NET Core 2.2 and Entity Framework Core 2.2 Application in a Day Hands-on Lab. This lab walks you through creating the projects and adding/updating the NuGet packages.

Prior to starting this lab, you must have completed Lab 0, Installing the Prerequisites.

Part 1: Creating the Solution and Projects

Visual Studio (all versions) is capable of creating projects and solutions, but it is much more efficient to use the .NET Core command line. When creating projects using the command line, the names of solutions, projects, and directories are case sensitive.

Step 1: Pin the .NET Core Version

When using the command line, .NET Core will use the most current version of the SDK installed. For this reason, the required version of .NET Core must be pinned with a `global.json` file.

1. Check current version by typing:

```
dotnet --version
```

2. If the version is not the version you need (e.g. 2.2.104), enter the following command to create a new file named `global.json`:

```
REM .NET Core 2.1
dotnet new globaljson --sdk-version 2.1.504
REM .NET Core 2.2
dotnet new globaljson --sdk-version 2.2.104
```

3. This creates the `global.json` file with the following content (2.1.504 for .NET Core 2.1):

```
{
  "sdk": {
    "version": "2.2.104"
  }
}
```

4. Execute `dotnet --version` again and the version will return as 2.2.104 (2.1.504 for .NET Core 2.1).

Step 2: Create the Solution

The templates that are installed with .NET Core range from very simple to quite complex. Creating the `global.json` file is an example of a simple template, as is creating a new solution.

1. To create a new solution file named `SpyStore.Hol`, enter the following command:

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```
dotnet new sln -n SpyStore.Hol
```

Step 3: Create the ASP.NET Core project

- 1) The mvc template is extremely configurable. In addition to setting the name, authentication scheme, and directory location, there are many other options. These can be explored by entering:

```
dotnet new mvc -h
```

- 2) From the same directory as the solution file, enter the following command to create the ASP.NET Core project using the model-view-controller pattern, set the name, turn off authentication, not require https, and set the directory for the project as SpyStore.Hol.Mvc:

```
dotnet new mvc -n SpyStore.Hol.Mvc -au none --no-https -o .\SpyStore.Hol.Mvc
```

- 3) Add the project to the solution with the following command:

```
dotnet sln SpyStore.Hol.sln add SpyStore.Hol.Mvc
```

Step 4: Create the Models and Data Access Layer projects

The classlib template create .NET Core class libraries or .NET Standard class libraries. Either will work. For this lab, use .NET Core class libraries.

- 1) The template takes a name and an output directory. Create the SpyStore.Hol.Dal and SpyStore.Hol.Models projects by entering the following commands:

```
REM .NET Core 2.1
dotnet new classlib -n SpyStore.Hol.Dal -o .\SpyStore.Hol.Dal -f netcoreapp2.1
dotnet new classlib -n SpyStore.Hol.Models -o .\SpyStore.Hol.Models -f netcoreapp2.1
REM .NET Core 2.2
dotnet new classlib -n SpyStore.Hol.Dal -o .\SpyStore.Hol.Dal -f netcoreapp2.2
dotnet new classlib -n SpyStore.Hol.Models -o .\SpyStore.Hol.Models -f netcoreapp2.2
```

- 2) Add the projects to the solution with the following commands:

```
dotnet sln SpyStore.Hol.sln add SpyStore.Hol.Dal
dotnet sln SpyStore.Hol.sln add SpyStore.Hol.Models
```

Step 5: Create the Unit Test project [Optional]

The xUnit template creates a new .NET Core class library with all of the required packages for unit testing. This include xUnit and the Microsoft.NET.Test.Sdk.

- 1) Create the project with the name of SpyStore.Hol.Dal.Tests and the directory SpyStore.Hol.Dal.Tests using the following command:

```
dotnet new xunit -n SpyStore.Hol.Dal.Tests -o .\SpyStore.Hol.Dal.Tests
```

- 2) Add the project to the solution with the following command:

```
dotnet sln SpyStore.Hol.sln add SpyStore.Hol.Dal.Tests
```

Part 2: Add the Project References

When adding project references through the command line, the commands are not case sensitive.

Step 1: Update the SpyStore.Hol.Mvc Project

The SpyStore.Hol.Mvc project references the SpyStore.Hol.Dal and the SpyStore.Hol.Models projects.

1) Enter the following commands to add the references:

```
dotnet add SpyStore.Hol.Mvc reference SpyStore.Hol.Models
dotnet add SpyStore.Hol.Mvc reference SpyStore.Hol.Dal
```

Step 2: Update the SpyStore.Hol.Dal Project

The SpyStore.Hol.Dal project references the SpyStore.Hol.Models project.

1) Enter the following command to add the reference:

```
dotnet add SpyStore.Hol.Dal reference SpyStore.Hol.Models
```

Step 3: Update the SpyStore.Hol.Dal.Tests Project

The SpyStore.Hol.Dal.Tests project references the SpyStore.Hol.Dal and the SpyStore.Hol.Models projects.

2) Enter the following commands to add the references:

```
dotnet add SpyStore.Hol.Dal.tests reference SpyStore.Hol.Models
dotnet add SpyStore.Hol.Dal.tests reference SpyStore.Hol.Dal
```

Part 3: Add the NuGet packages

.NET Core, ASP.NET Core, and EF Core are composed of a series of NuGet packages. Additional tools are also distributed as NuGet packages. The command line can also be used for adding NuGet packages.

Step 1: Update the SpyStore.Hol.Mvc Project

The SpyStore.Hol.Mvc project needs AutoMapper, Newtonsoft.Json, and Ligershark.WebOptimizer.Core added.

1) Enter the following commands to add the packages:

```
dotnet add SpyStore.Hol.Mvc package AutoMapper
dotnet add SpyStore.Hol.Mvc package Newtonsoft.Json
dotnet add SpyStore.Hol.Mvc package LigerShark.WebOptimizer.Core
```

Step 2: Update the SpyStore.Hol.Models Project

The SpyStore.Hol.Models project needs AutoMapper and Microsoft.EntityFrameworkCore.Abstractions. The version of EF Core added into the support projects should match the version that is included with Microsoft.AspNetCore.App (unless you update all projects to the same version)

- 1) Add the packages with the following commands:

```
REM .NET Core 2.1
dotnet add SpyStore.Hol.Models package Microsoft.EntityFrameworkCore.Abstractions -v 2.1.1
REM .NET Core 2.2
dotnet add SpyStore.Hol.Models package Microsoft.EntityFrameworkCore.Abstractions -v 2.2.0
REM Both Versions
dotnet add ./SpyStore.Hol.Models/SpyStore.Hol.Models.csproj package AutoMapper
```

Step 3: Update the SpyStore.Hol.Dal Project

The SpyStore.Hol.Dal project needs Newtonsoft.Json, Microsoft.EntityFrameworkCore.SqlServer (SQL Server provider for EF Core), and Microsoft.EntityFrameworkCore.Design (command line tooling). In order to use the EF Core tooling from Package Manager Console, the project also needs Microsoft.EntityFrameworkCore.Tools.

- 1) Add the packages with the following commands:

```
REM .NET Core 2.1
dotnet add SpyStore.Hol.Dal package Microsoft.EntityFrameworkCore.SqlServer -v 2.1.1
dotnet add SpyStore.Hol.Dal package Microsoft.EntityFrameworkCore.Design -v 2.1.1
dotnet add SpyStore.Hol.Dal package Microsoft.EntityFrameworkCore.Tools -v 2.1.1
REM .NET Core 2.2
dotnet add SpyStore.Hol.Dal package Microsoft.EntityFrameworkCore.SqlServer -v 2.2.0
dotnet add SpyStore.Hol.Dal package Microsoft.EntityFrameworkCore.Design -v 2.2.0
dotnet add SpyStore.Hol.Dal package Microsoft.EntityFrameworkCore.Tools -v 2.2.0
REM Both Version
dotnet add SpyStore.Hol.Dal package Newtonsoft.Json
```

Step 4: Update the Unit Test Project

The SpyStore.Hol.Dal.Tests project needs the Microsoft.EntityFrameworkCore.SqlServer package.

- 1) Add the package with the following command:

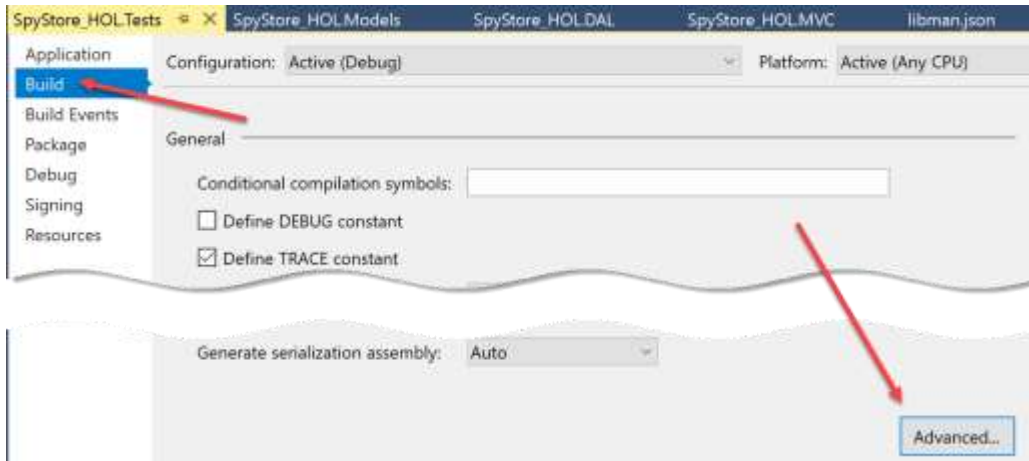
```
REM .NET Core 2.1
dotnet add SpyStore.Hol.Dal package Microsoft.EntityFrameworkCore.SqlServer -v 2.1.1
REM .NET Core 2.2
dotnet add SpyStore.Hol.Dal package Microsoft.EntityFrameworkCore.SqlServer -v 2.2.0
```

Part 4: Update the projects to use the latest version of C#

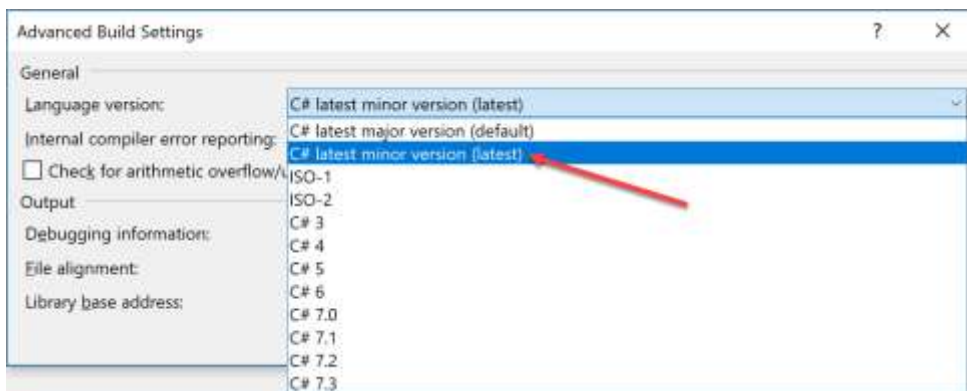
By default, C# projects are set to use the latest Major version. To get all of the latest features of C# 7.x, the projects need to enable the latest Minor version. This can be done with Visual Studio or by editing the project files directly.

Option 1: Update Using Visual Studio

- 1) To change to the latest Minor version, right click each project, select Properties, choose the Build tab, and click Advanced.



- 2) Select “C# latest minor version (latest)” in the resulting dialog:



Option 2: Update Using the Project File

- 1) To enable Minor version by editing the project file, add the LangVersion tag to the top PropertyGroup, as follows (changes in bold):

```
<PropertyGroup>
  <!--omitted for brevity -->
  <LangVersion>latest</LangVersion>
</PropertyGroup>
```

Summary

This lab created all of the projects for the HOL, added the NuGet packages, and the appropriate references.

Next steps

In the next part of this tutorial series, you will start to build the data access library using Entity Framework Core.