

.NET App Dev Hands-On Lab

MVC Lab 3 –Pipeline Configuration, Dependency Injection

This lab walks you through configuring the pipeline, setting up the configuration, and dependency injection. Prior to starting this lab, you must have completed MVC Lab 2b.

Part 1: Configure the Application

Step 1: Update the Development App Settings

- Update the `appsettings.Development.json` in the `AutoLot.Mvc` project to the following (adjusted for your connection string and ports):

```
{
  "AppLoggingSettings": {
    "MSSqlServer": {
      "TableName": "SerilogLogs",
      "Schema": "Logging",
      "ConnectionStringName": "AutoLot"
    },
    "File": {
      "Drive": "c",
      "FilePath": "temp",
      "FileName": "log_AutoLot_Debug.txt"
    },
    "General": {
      "RestrictedToMinimumLevel": "Information"
    }
  },
  "AppName": "AutoLot.Mvc - Dev",
  "RebuildDataBase": false,
  "ConnectionStrings": {
    //SQL Server Local Db
    "AutoLot": "Server=(localdb)\\MSSQLLocalDB;Database=AutoLot_Hol;Trusted_Connection=True;",
    //"AutoLot": "Server=(localdb)\\ProjectModels;Database=AutoLot_Hol;Trusted_Connection=True;"
    //Docker
    //"AutoLot": "Server=.,5433;Database=AutoLot_Hol;User ID=sa;Password=P@ssw0rd;"
  },
  "DealerInfo": {
    "DealerName": "Skimedic's Used Cars Development Site",
    "City": "West Chester",
    "State": "Ohio"
  }
}
```

Step 2: Add the Staging Settings File

- Add a new file named `appsettings.Staging.json` to the root of the `AutoLot.Mvc` project and update it to the following:

```
{
  "AppLoggingSettings": {
    "MSSqlServer": {
      "TableName": "SeriLogs",
      "Schema": "Logging",
      "ConnectionStringName": "AutoLot"
    },
    "File": {
      "Drive": "c",
      "FilePath": "temp",
      "FileName": "log_AutoLot_Staging.txt"
    },
    "General": {
      "RestrictedToMinimumLevel": "Information"
    }
  },
  "AppName": "AutoLot.Mvc - Staging",
  "RebuildDataBase": false,
  "ConnectionStrings": {
    //SQL Server Local Db
    "AutoLot": "Server=(localdb)\\MSSQLLocalDB;Database=AutoLot_Hol;Trusted_Connection=True;"
    //"AutoLot": "Server=(localdb)\\ProjectModels;Database=AutoLot_Hol;Trusted_Connection=True;"
    //Docker
    //"AutoLot": "Server=.,5433;Database=AutoLot_Hol;User ID=sa;Password=P@ssw0rd;"
  },
  "DealerInfo": {
    "DealerName": "Skimedic's Used Cars Staging Site",
    "City": "West Chester",
    "State": "Ohio"
  }
}
```

Step 3: Update the root AppSettings.json file

- Update the `appsettings.json` in the `AutoLot.Mvc` project to the following:

```
{
  "AllowedHosts": "*",
  "DealerInfo": {
    "DealerName": "Skimedic's Used Cars",
    "City": "West Chester",
    "State": "Ohio"
  }
}
```

Step 4: Update the Production Settings File

- Update the appsettings.Production.json in the AutoLot.Mvc project to the following:

```
{
  "AppLoggingSettings": {
    "MSSqlServer": {
      "TableName": "SerilogLogs",
      "Schema": "Logging",
      "ConnectionStringName": "AutoLot"
    },
    "File": {
      "Drive": "c",
      "FilePath": "temp",
      "FileName": "log_AutoLot.txt"
    },
    "General": {
      "RestrictedToMinimumLevel": "Error"
    }
  },
  "AppName": "AutoLot.Mvc",
  "RebuildDataBase": false,
  "ConnectionStrings": {
    "AutoLot": "[its-a-secret]"
  }
}
```

Part 2: Add the GlobalUsings.cs File

- Create a new file named GlobalUsings.cs in the AutoLot.Mvc project and update the contents to the following:

```
global using AutoLot.Dal.EfStructures;
global using AutoLot.Dal.Initialization;
global using AutoLot.Dal.Repos;
global using AutoLot.Dal.Repos.Interfaces;

global using AutoLot.Mvc.Models;

global using AutoLot.Services.Logging.Configuration;
global using AutoLot.Services.Logging.Interfaces;
global using AutoLot.Services.Simple;
global using AutoLot.Services.ViewModels;

global using Microsoft.AspNetCore.Mvc;
global using Microsoft.AspNetCore.Mvc.Infrastructure;

global using Microsoft.EntityFrameworkCore;
global using Microsoft.Extensions.DependencyInjection.Extensions;
global using Microsoft.Extensions.Options;
global using Microsoft.EntityFrameworkCore.Diagnostics;

global using System.Diagnostics;
```

Part 3: Update the Program.cs Top Level Statements

Step 1: Add Logging

- Add Serilog into the WebApplicationBuilder and add the logging interfaces to the DI container in Program.cs:

```
var builder = WebApplication.CreateBuilder(args);
builder.ConfigureSerilog();
builder.Services.RegisterLoggingInterfaces();
```

Step 2: Add Application Services to the Dependency Injection Container

- Add the repos to the DI container after the comment *//Add services to the container* and after the call to `AddControllersWithViews()`:

```
//Add services to the DI container
builder.Services.AddControllersWithViews();
builder.Services.AddScoped<ICarDriverRepo, CarDriverRepo>();
builder.Services.AddScoped<ICarRepo, CarRepo>();
builder.Services.AddScoped<ICreditRiskRepo, CreditRiskRepo>();
builder.Services.AddScoped<ICustomerOrderViewModelRepo, CustomerOrderViewModelRepo>();
builder.Services.AddScoped<ICustomerRepo, CustomerRepo>();
builder.Services.AddScoped<IDriverRepo, DriverRepo>();
builder.Services.AddScoped<IMakeRepo, MakeRepo>();
builder.Services.AddScoped<IOrderRepo, OrderRepo>();
builder.Services.AddScoped<IRadioRepo, RadioRepo>();
```

- Add the keyed services into the DI container:

```
builder.Services.AddKeyedScoped<ISimpleService, SimpleServiceOne>(nameof(SimpleServiceOne));
builder.Services.AddKeyedScoped<ISimpleService, SimpleServiceTwo>(nameof(SimpleServiceTwo));
```

- Add the following code to populate the DealerInfo class from the configuration file:

```
builder.Services.Configure<DealerInfo>(builder.Configuration.GetSection(nameof(DealerInfo)));
```

- Add the IActionContextAccessor and HttpContextAccessor:

```
builder.Services.TryAddSingleton<IActionContextAccessor, ActionContextAccessor>();
builder.Services.AddHttpContextAccessor();
```

- Add the ApplicationDbContext:

```
var connectionString = builder.Configuration.GetConnectionString("AutoLot");
builder.Services.AddDbContextPool<ApplicationDbContext>(
    options =>
    {
        options.ConfigureWarnings(wc => wc.Ignore(RelationalEventId.BoolWithDefaultWarning));
        options.UseSqlServer(connectionString,
            sqlOptions => sqlOptions.EnableRetryOnFailure().CommandTimeout(60));
    });
```

Step 3: Call the Data Initializer and Update the Project File

- In the section after the call to build the `WebApplicationBuilder`, flip the `IsDevelopment` if block around and add the `UseDeveloperExceptionPage` so the code looks like this:

```
// Configure the HTTP request pipeline.
if (app.Environment.IsDevelopment())
{
    app.UseDeveloperExceptionPage();
}
else
{
    app.UseExceptionHandler("/Home/Error");
    // The default HSTS value is 30 days.
    //You may want to change this for production scenarios, see https://aka.ms/aspnetcore-hsts.
    app.UseHsts();
}
```

- In the `IsDevelopment` if block, check the settings to determine if the database should be rebuilt, and if yes, call the data initializer:

```
if (app.Environment.IsDevelopment())
{
    app.UseDeveloperExceptionPage();
    if (app.Configuration.GetValue<bool>("RebuildDataBase"))
    {
        using var scope = app.Services.CreateScope();
        var dbContext = scope.ServiceProvider.GetRequiredService<ApplicationDbContext>();
        SampleDataInitializer.ClearAndReseedDatabase(dbContext);
    }
}
```

- Comment out the `IncludeAssets` tag for `EntityFrameworkCore.Design` in the `AutoLot.Mvc.csproj` file:

```
<PackageReference Include="Microsoft.EntityFrameworkCore.Design" Version=" [8.0.*,9.0)">
  <!--<IncludeAssets>runtime; build; native; contentfiles; analyzers;
buildtransitive</IncludeAssets>-->
  <PrivateAssets>all</PrivateAssets>
</PackageReference>
```

Step 4: Update the Routing for Attribute Routing

- Back in `Program.cs` in the `AutoLot.Mvc` project, comment out the call to `MapControllerRoute` and add the `MapControllers` call:

```
app.MapControllers();
//app.MapControllerRoute(
//    name: "default",
//    pattern: "{controller=Home}/{action=Index}/{id?}");
```

Part 4: Update the Home Controller

Step 1: Update the Controller and Action method routing

- Add the Controller level route to the HomeController (the commented-out route shows the equivalent route using a literal instead of a token):

```
[Route("[controller]/[action]")]
//[Route("Home/[action]")]
public class HomeController : Controller
{
    //omitted for brevity
}
```

- Add `HttpGet` attribute to all Get action methods:

```
[HttpGet]
public IActionResult Index()
{
    return View();
}
[HttpGet]
public IActionResult Privacy()
{
    return View();
}
```

- Add the default, controller only, and controller/action routes to the Index action method (the commented-out route shows a route using just a literal):

```
//[Route("/MyHomePage")]
[Route("/")]
[Route("/[controller]")]
[Route("/[controller]/[action]")]
[HttpGet]
public IActionResult Index()
{
    return View();
}
```

Step 2: Update the constructor to a primary constructor, then add and test logging

- Replace the default ILogger with the IAppLogging and convert it into a primary constructor. This also allows for removing the logger field:

```
public class HomeController(IAppLogging<HomeController> logger) : Controller
{
    //omitted for brevity
}
```

- Update the HomeController Index method to log an error:

```
public IActionResult Index([FromServices]IOptionsMonitor<DealerInfo> dealerOptionsMonitor)
{
    logger.LogAppError("Test error");
    return View(dealerOptionsMonitor.CurrentValue);
}
```

- Run the application and make sure to launch a browser. Since the Index method is the default entry point for the application, just running the app should create an error file as well as an entry into the SerilogEntry table. Once you have confirmed that logging works, comment out the error logging code:

```
//logger.LogAppError("Test error");
```

- Inject the DealerInfo OptionsMonitor into the Index method and pass the CurrentValue to the View (the view will be updated in a later lab):

```
public IActionResult Index([FromServices]IOptionsMonitor<DealerInfo> dealerOptionsMonitor)
{
    return View(dealerOptionsMonitor.CurrentValue);
}
```

- Inject the SimpleService into the two new action methods and pass the message from the service to the SimpleService view (the view will be created in the next lab):

```
[HttpGet]
public IActionResult GetServiceOne(
    [FromKeyedServices(nameof(SimpleServiceOne))] ISimpleService service)
{
    return View("SimpleService",service.SayHello());
}
```

```
[HttpGet]
public IActionResult GetServiceTwo(
    [FromKeyedServices(nameof(SimpleServiceTwo))] ISimpleService service)
{
    return View("SimpleService",service.SayHello());
}
```

Part 5: Add WebOptimizer

Step 1: Add WebOptimizer to DI Container

- Update the Program.cs top-level statements by adding the following code after adding the services but before the WebApplication is built:

```
if (builder.Environment.IsDevelopment() || builder.Environment.IsEnvironment("Local"))
{
    builder.Services.AddWebOptimizer(false, false);
}
else
{
    builder.Services.AddWebOptimizer(options =>
    {
        options.MinifyCssFiles(); //Minifies all CSS files
        //options.MinifyJsFiles(); //Minifies all JS files
        options.MinifyJsFiles("js/site.js");
        options.MinifyJsFiles("lib/**/*.js");
        options.MinifyJsFiles("js/**/*.js");
    });
}
var app = builder.Build();
```

Step 2: Add WebOptimizer to HTTP Pipeline

- Update the Configure method by adding the following code (**before** app.UseStaticFiles()):

```
app.UseWebOptimizer();
app.UseHttpsRedirection();
app.UseStaticFiles();
```

Step 3: Update _ViewImports to enable WebOptimizer Tag Helpers

- Update the _ViewImports.cshtml file to enable WebOptimizer tag helpers:

```
@using AutoLot.Mvc
@using AutoLot.Mvc.Models
@addTagHelper *, Microsoft.AspNetCore.Mvc.TagHelpers
@addTagHelper *, WebOptimizerCore
```

Summary

This lab added the necessary classes into the DI container and modified the application configuration.

Next steps

In the next part of this tutorial series, you will add support for client-side libraries, update the layout, and add GDPR Support.