Build an EF and ASP.NET Core 2 App HOL

Welcome to the Build an Entity Framework Core and ASP.NET Core 2 Application in a Day Hands On Lab. This lab walks you through creating custom validation attributes and the related client-side scripts.

Prior to starting this lab, you must have completed Lab 4.

All labs and files are available at https://github.com/skimedic/dotnetcore_hol.

Part 1: Create the Server-Side validation attributes

Step 1: Create the MustBeGreaterThanZeroAttribute attribute

1) Create a new folder in the MVC project named Validation.
2) Add a new class named MustBeGreaterThanZeroAttribute.cs.
3) Add the following using statements:

```
using System.ComponentModel.DataAnnotations;
using Microsoft.AspNetCore.Mvc.ModelBinding.Validation;
```

4) Make the class public, inherit from ValidationAttribute, and implement IClientModelValidator:

```
public class MustBeGreaterThanZeroAttribute : ValidationAttribute, IClientModelValidator
{
  public void AddValidation(ClientModelValidationContext context)
  {
  }
}
```

5) Add two constructors. One that takes a custom error message and another that generates a default error message:

```
public MustBeGreaterThanZeroAttribute() : this("{0} must be greater than 0") { }
public MustBeGreaterThanZeroAttribute(string errorMessage) : base(errorMessage) { }
```

6) Override the FormatErrorMessage method to properly format the ErrorMessageString (which is a property on the base ValidationAttribute class)

```
public override string FormatErrorMessage(string name)
{
  return string.Format(ErrorMessageString, name);
}
```

7) Override the IsValid method to test if the value is greater than zero. This is used for server-side processing:

```
protected override ValidationResult IsValid(object value, ValidationContext validationContext)
{
  if (!int.TryParse(value.ToString(), out int result))
  {
    return new ValidationResult(FormatErrorMessage(validationContext.DisplayName));
  }
  if (result > 0)
  {
    return ValidationResult.Success;
  };
  return new ValidationResult(FormatErrorMessage(validationContext.DisplayName));
}
```

8) Implement the AddValidation method. This method is used when generating the client side implementation of the property.

```
public void AddValidation(ClientModelValidationContext context)
{
  string propertyDisplayName =
    context.ModelMetadata.DisplayName ?? context.ModelMetadata.PropertyName;
  string errorMessage = FormatErrorMessage(propertyDisplayName);
  context.Attributes.Add("data-val-greaterthanzero", errorMessage);
}
```

Step 2: Create the MustNotBeGreaterThanAttribute attribute

1) Add a new class named MustNotBeGreaterThanAttribute.cs.
2) Add the following using statements to the top of the file:

```
using System;
using System.ComponentModel.DataAnnotations;
using System.Linq;
using System.Reflection;
using Microsoft.AspNetCore.Mvc.ModelBinding.Validation;
```

3) Make the class public, inherit from ValidationAttribute, and implement IClientModelValidator. Also, add the AttributeUsage attribute to the class so it targets properties and can be used more than once in a class:

```
[AttributeUsage(AttributeTargets.Property, AllowMultiple = true)]
public class MustNotBeGreaterThanAttribute : ValidationAttribute, IClientModelValidator
{
  public void AddValidation(ClientModelValidationContext context)
  {
  }
}
```

4) Add two constructors. Since this attribute compares the value of this property to another property of the class instance, the constructors need to take in the other property name and an optional prefix. Just like the previous example, one takes a custom error message and the other generates a default error message:

```
readonly string _otherPropertyName;
string _otherPropertyDisplayName;
readonly string _prefix;
public MustNotBeGreaterThanAttribute(string otherPropertyName, string prefix = "")
  : this(otherPropertyName, "{0} must not be greater than {1}", prefix) { }
public MustNotBeGreaterThanAttribute(string otherPropertyName, string errorMessage, string prefix)
  : base(errorMessage)
{
  _otherPropertyName = otherPropertyName;
  _otherPropertyDisplayName = otherPropertyName;
  _prefix = prefix;
}
```

5) Override the FormatErrorMessage method to properly format the ErrorMessageString (which is a property on the base ValidationAttribute class)

```
public override string FormatErrorMessage(string name)
{
  return string.Format(ErrorMessageString, name, _otherPropertyDisplayName);
}
```

6) Override the IsValid method to test if the value is less than or equal to the other property. Once again, this is used for server-side processing:

```
protected override ValidationResult IsValid(object value, ValidationContext validationContext)
{
  var otherPropertyInfo = validationContext.ObjectType.GetProperty(_otherPropertyName);
  SetOtherPropertyName(otherPropertyInfo);
  if (!int.TryParse(value.ToString(), out int toValidate))
  {
    return new ValidationResult($"{validationContext.DisplayName} must be numeric.");
  }
  var otherValue = (int)otherPropertyInfo.GetValue(validationContext.ObjectInstance, null);
  return toValidate > otherValue
    ? new ValidationResult(FormatErrorMessage(validationContext.DisplayName))
    : ValidationResult.Success;
}
```

7) Implement the AddValidation method. This method uses a helper method to get the Display attribute (if it exists) or the straight property name of the other property. This method is used when generating the client-side implementation of the property.

```
internal void SetOtherPropertyName(PropertyInfo otherPropertyInfo)
{
  var displayAttribute =
    otherPropertyInfo.GetCustomAttributes<DisplayAttribute>().FirstOrDefault();
  _otherPropertyDisplayName = displayAttribute?.Name ?? _otherPropertyName;
}
public void AddValidation(ClientModelValidationContext context)
{
  string propertyDisplayName = context.ModelMetadata.GetDisplayName();
  var propertyInfo = context.ModelMetadata.ContainerType.GetProperty(_otherPropertyName);
  SetOtherPropertyName(propertyInfo);
  string errorMessage = FormatErrorMessage(propertyDisplayName);
  context.Attributes.Add("data-val-notgreaterthan", errorMessage);
  context.Attributes.Add("data-val-notgreaterthan-otherpropertyname", _otherPropertyName);
  context.Attributes.Add("data-val-notgreaterthan-prefix", _prefix);
}
```

Part 2: Create the Client-Side validation scripts

Step 1: Create the Validators

1) Add a new folder named validations under the wwwroot/js folder.
2) Add a new JavaScript file named validators.js in the new folder.
3) Add the validator method for the GreaterThanZero validation. This name must match the name from the AddValidation method:

```
//This is the code from AddValidation
context.Attributes.Add("data-val-greaterthanzero", errorMessage);
//This is the code to add in the validators.js file
$.validator.addMethod("greaterthanzero", function (value, element, params) {
    return value > 0;
});
```

4) Add the unobtrusive adapter for the GreaterThanZero validation next. The rules property is simply set to true to enable validation, and the message is message from the AddValidation method:

```
//This is the code from AddValidation
context.Attributes.Add("data-val-greaterthanzero", errorMessage);
//This is the code to add in the validators.js file
$.validator.unobtrusive.adapters.add("greaterthanzero", function (options) {
    options.rules["greaterthanzero"] = true;
    options.messages["greaterthanzero"] = options.message;
});
```

5) Add the validator method for the NotGreaterThan validation. As with the previous example, the name must match the name from the AddValidation method:

```
$.validator.addMethod("notgreaterthan", function (value, element, params) {
    return +value <= +$(params).val();
});
```

6) Add the adapter for the NotGreaterThan validation:

```
$.validator.unobtrusive.adapters.add("notgreaterthan", ["otherpropertyname","prefix"], function
(options) {
    options.rules["notgreaterthan"] = "#" + options.params.prefix +
options.params.otherpropertyname;
    options.messages["notgreaterthan"] = options.message;
});
```

Step 2: Create the formatter code

This code prettifies errors in the UI.

1) Create a new JavaScript file named errorFormatting.js in the validations folder.
2) Update the code to match the following:

```
$.validator.setDefaults({
    highlight: function (element, errorClass, validClass) {
        if (element.type === "radio") {
            this.findByName(element.name).addClass(errorClass).removeClass(validClass);
        } else {
            $(element).addClass(errorClass).removeClass(validClass);
            $(element).closest('.form-group').addClass('has-error'); //.removeClass('has-
success');
        }
    },
    unhighlight: function (element, errorClass, validClass) {
        if (element.type === "radio") {
            this.findByName(element.name).removeClass(errorClass).addClass(validClass);
        } else {
            $(element).removeClass(errorClass).addClass(validClass);
            $(element).closest('.form-group').removeClass('has-error');  //.addClass('has-
success');
        }
    }
});
```

Part 3: Bundle and Minify the JavaScript

Step 1: Add Bundler & Minifier Visual Studio Extension

The Bunlder & Minifier Visual Studio extension adds context menus in the Solution Explorer for bundling and minifying files.

1) Select Tools -> Extensions and Updates
2) Select Online in the left rail, and enter Bundler in the search box:

3) Click Download. This requires a restart of Visual Studio.

Step 2: Update the bundleconfig.json

1) Open the bundleconfig.json file and add the following to the end of the file (make sure to add a comma after the last block before adding the new code):

```
{
  "outputFileName": "wwwroot/js/validations/validations.min.js",
  "inputFiles": [
    "wwwroot/js/validations/*.js"
  ],
  "minify": {
    "enabled": true,
    "renameLocals": true
  },
  "sourceMap": false
}
```

Step 3: Add BundlerMinifier.Core

This package provides bundling and minification commands for the .NET Core CLI

1) Right click on the SpyStore_HOL.MVC project and select Edit SpyStore_HOL.MVC.csproj.
2) Add the following after the existing DotNetCliToolReference:

```
<DotNetCliToolReference Include="BundlerMinifier.Core" Version="2.6.362" />
```

3) Open the Package Manager Console

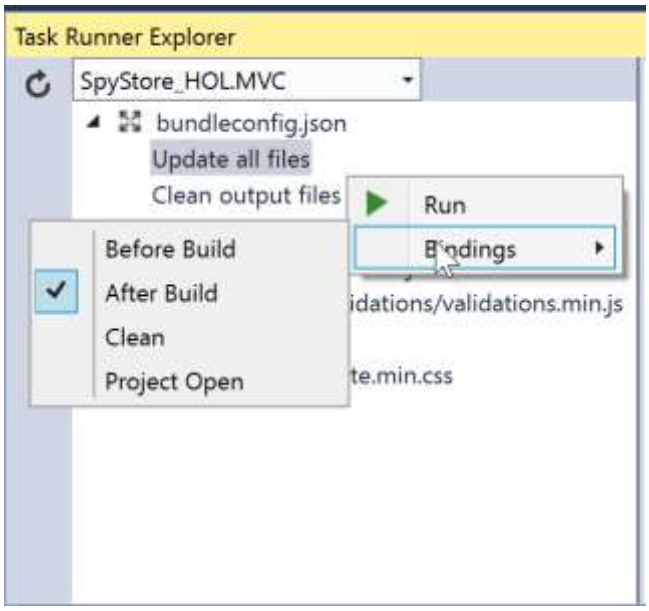
4) Change to the SpyStore_HOL.MVC directory:

```
cd .\SpyStore_HOL.MVC
```

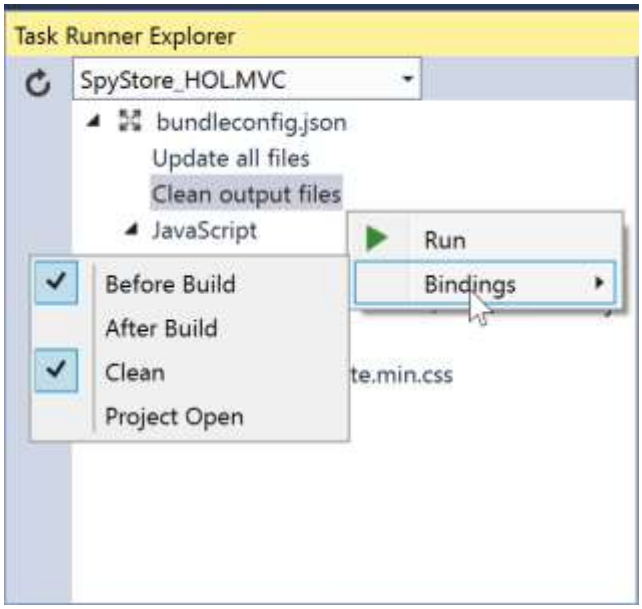
5) Enter “dotnet bundle” to execute the settings in bundleconfig.json
6) Enter “dotnet bundle” -h for help

Step 4: Update the Task Runner Explorer

1) Open the Task Runner Explorer by select View -> Other Windows -> Task Runner Explorer.
2) Right click on Update All Files, select Bindings -> After Build



3) Right click on Clean Output Files, and select Bindings -> Before Build and Bindings -> Clean:



Part 4: Update the _ValidationScriptsPartial.cshtml

1) Open Views\Shared_ValidationScriptsPartial.cshtml.
2) Add the following to the block defined as the `include="Development"` environment:

```
<script src="~/js/validations/validators.js" asp-append-version="true"></script>
<script src="~/js/validations/errorFormatting.js" asp-append-version="true"></script>
```

3) Add the following to the block defined as the `exclude="Development"` environment:

```
<script src="~/js/validations/validations.min.js"></script>
```

Summary

The lab created the custom validation attribute, client-side validation scripts and formatting, bundled and minified the scripts, and updated the validation partial view.

Next steps

In the next part of this tutorial series, you will create a View Component to create the menu items.