.NET App Dev Hands-On Workshop

API Lab 3 –Controllers

This lab creates and configures the controllers for the RESTful service. Prior to starting this lab, you must have completed API Lab 2b.

Part 1: The BaseCrudController

Step 1: Initial File and Constructor Code

- Create a new folder named `Base` under the `Controllers` folder. Add a new class file named `BaseCrudController.cs` to the folder. Make the class public and abstract and generic, accepting a `BaseEntity` type and a class type (for logging). Add the `ApiController` attribute (to opt-in to the API benefits) and the base route to the class, and a primary constructor that takes in an instance of the logger and a rep:

```
namespace AutoLot.Api.Controllers.Base;

[ApiController]
[Route("api/[controller]")]
public abstract class BaseCrudController<TEntity, TController>(
    IAppLogging<TController> logger, IBaseRepo<TEntity> repo)
  : ControllerBase
     where TEntity : BaseEntity, new()
     where TController : class
{
  protected readonly IBaseRepo<TEntity> MainRepo = repo;
  protected readonly IAppLogging<TController> Logger = logger;
}
```

Step 2: Add the Get Methods

- There are two base methods to get records – `GetAll` and `GetOne`:

```
[HttpGet]
public ActionResult<IEnumerable<TEntity>> GetAll()
{
  return Ok(MainRepo.GetAllIgnoreQueryFilters());
}

[HttpGet("{id}")]
public ActionResult<TEntity> GetOne(int id)
{
  var entity = MainRepo.Find(id);
  if (entity == null)
  {
    return NoContent();
  }
  return Ok(entity);
}
```

Step 3: Add the Update Method

```
[HttpPut("{id}")]
public IActionResult UpdateOne(int id, TEntity entity)
{
  if (id != entity.Id)
  {
    return BadRequest();
  }
  if (!ModelState.IsValid)
  {
    return ValidationProblem(ModelState);
  }
  try
  {
    MainRepo.Update(entity);
  }
  catch (CustomException ex)
  {
    //This shows an example with the custom exception
    //Should handle more gracefully
    return BadRequest(ex);
  }
  catch (Exception ex)
  {
    //Should handle more gracefully
    return BadRequest(ex);
  }
  return Ok(entity);
}
```

Step 4: Add the Add Method

```
[HttpPost]
public ActionResult<TEntity> AddOne(TEntity entity)
{
  if (!ModelState.IsValid)
  {
    return ValidationProblem(ModelState);
  }
  try
  {
    MainRepo.Add(entity);
  }
  catch (Exception ex)
  {
    return BadRequest(ex);
  }
  return CreatedAtAction(nameof(GetOne), new {id = entity.Id}, entity);
}
```


Step 5: Add the Delete Method

```
[HttpDelete("{id}")]
public ActionResult<TEntity> DeleteOne(int id, TEntity entity)
{
  if (id != entity.Id)
  {
    return BadRequest();
  }
  try
  {
    MainRepo.Delete(entity);
  }
  catch (Exception ex)
  {
    //Should handle more gracefully
    return new BadRequestObjectResult(ex.GetBaseException()?.Message);
  }
  return Ok();
}
```

Step 6: Update the GlobalUsings

- Add the following to the `GlobalUsings.cs` file:

```
global using AutoLot.Api.Controllers.Base;
```

Part 2: Add the Entity Specific Controllers

Step 1: The Cars Controller

- Create a new class named `CarsController.cs` in the Controllers directory. Make the class `public`, inherit from `BaseCrudController` passing in the generic types, and add the controller level `Route` attribute. The `ApiController` attribute isn't needed, as it is provided by the base class. Add a primary constructor that takes in the logger and the repo:

```
namespace AutoLot.Api.Controllers;

public class CarsController(IAppLogging<CarsController> logger, ICarRepo repo)
    : BaseCrudController<Car, CarsController>(logger, repo)
{
  //implementation goes here
}
```

- Add the `GetCarsByMake` method:

```
[HttpGet("bymake/{id?}")]
public ActionResult<IEnumerable<Car>> GetCarsByMake(int? id)
{
  if (id.HasValue && id.Value>0)
  {
    return Ok(((ICarRepo)MainRepo).GetAllBy(id.Value));
  }
  return Ok(MainRepo.GetAllIgnoreQueryFilters());
}
```

Step 2: The CarDrivers Controller

- Create a new class named `CarDriversController.cs` in the Controllers directory. Make the class public, inherit from `BaseCrudController`. Add a primary constructor that takes an instance of the logger and the `ICarDriverRepo`. All needed functionality is provided by the base class. Here is the controller code:

```
namespace AutoLot.Api.Controllers;

public class CarDriversController(IAppLogging<CarDriversController> logger, ICarDriverRepo repo)
    : BaseCrudController<CarDriver, CarDriversController>(logger, repo);
```


Step3: The remaining controllers

- The rest of the controllers follow the same pattern. Here is the listing for them:

```
//DriversController
namespace AutoLot.Api.Controllers;
public class DriversController(IAppLogging<DriversController> logger, IDriverRepo repo)
    : BaseCrudController<Driver, DriversController>(logger, repo);

//MakesController
namespace AutoLot.Api.Controllers;
public class MakesController(IAppLogging<MakesController> logger, IMakeRepo repo)
    : BaseCrudController<Make, MakesController>(logger, repo);

//RadiosController
namespace AutoLot.Api.Controllers;

public class RadiosController(IAppLogging<RadiosController> logger, IRadioRepo repo)
    : BaseCrudController<Radio, RadiosController>(logger, repo);
```

Summary

This lab created and configured the Controllers for the service.

Next steps

In the next part of this tutorial series, you will add versioning and augment the basic Swagger support.

