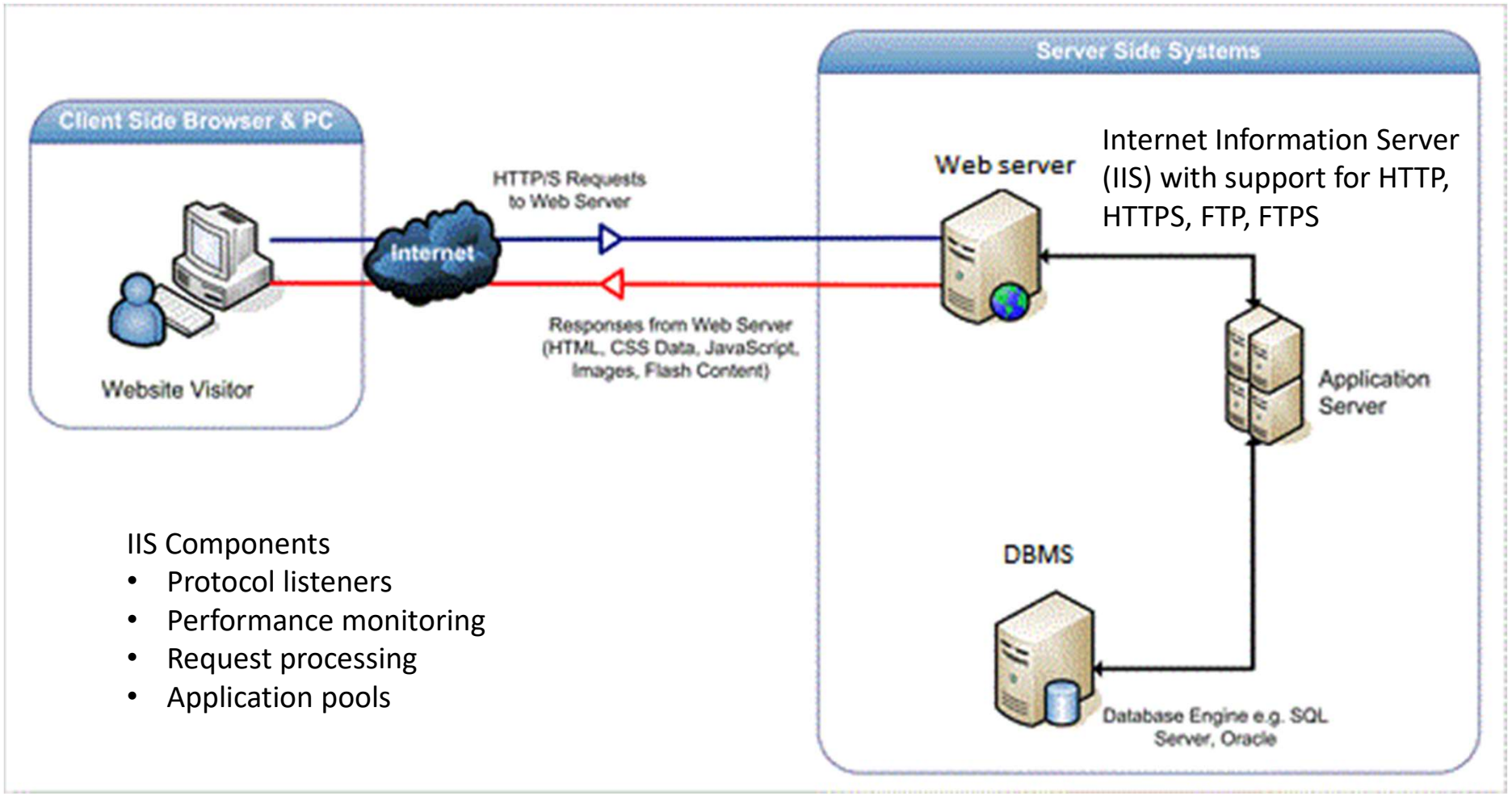
MODULE 3

Server Side API: Part 1

Anatomy of an HTTP request



IIS Components

- Protocol listeners
- Performance monitoring
- Request processing
- Application pools

ASP.NET Framework

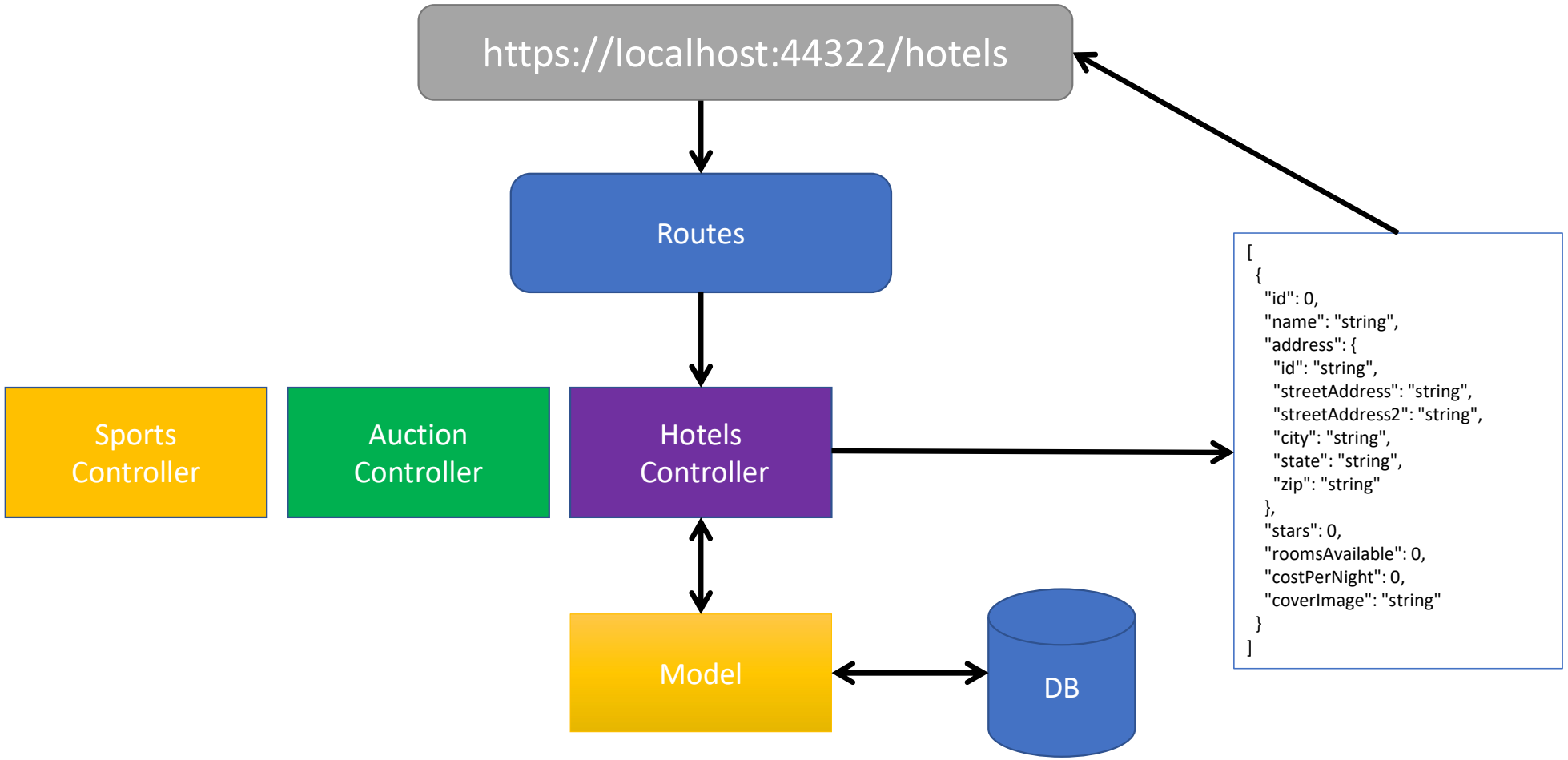
- Offers security, request management, session management, configuration management
- Offers three frameworks for web applications

Web Forms	ASP.NET MVC	ASP.NET Web Pages
Similar to desktop applications	Specific pattern design	Entry level ASP.NET
Very WYSIWYG heavy	Separation of concerns	Similar in structure to PHP apps
Work with web components	Most popular of the three	Best for small projects
Grandfather of others		

MVC Pattern

- MVC = Model View Controller
- Model (Database)
  - application state and business logic
  - only part of the application that talks to the database
  - Models could be classes
- View (Front End)
  - presents data to user
  - accepts input from user
  - Views might be a desktop display, a mobile display, a file output based on a model
- Controller (API/Back End)
  - Takes input from the view and passes it to the appropriate model objects
  - Grabs all necessary building blocks and organizes them for the output
  - Takes results from the model and passes it to the appropriate view

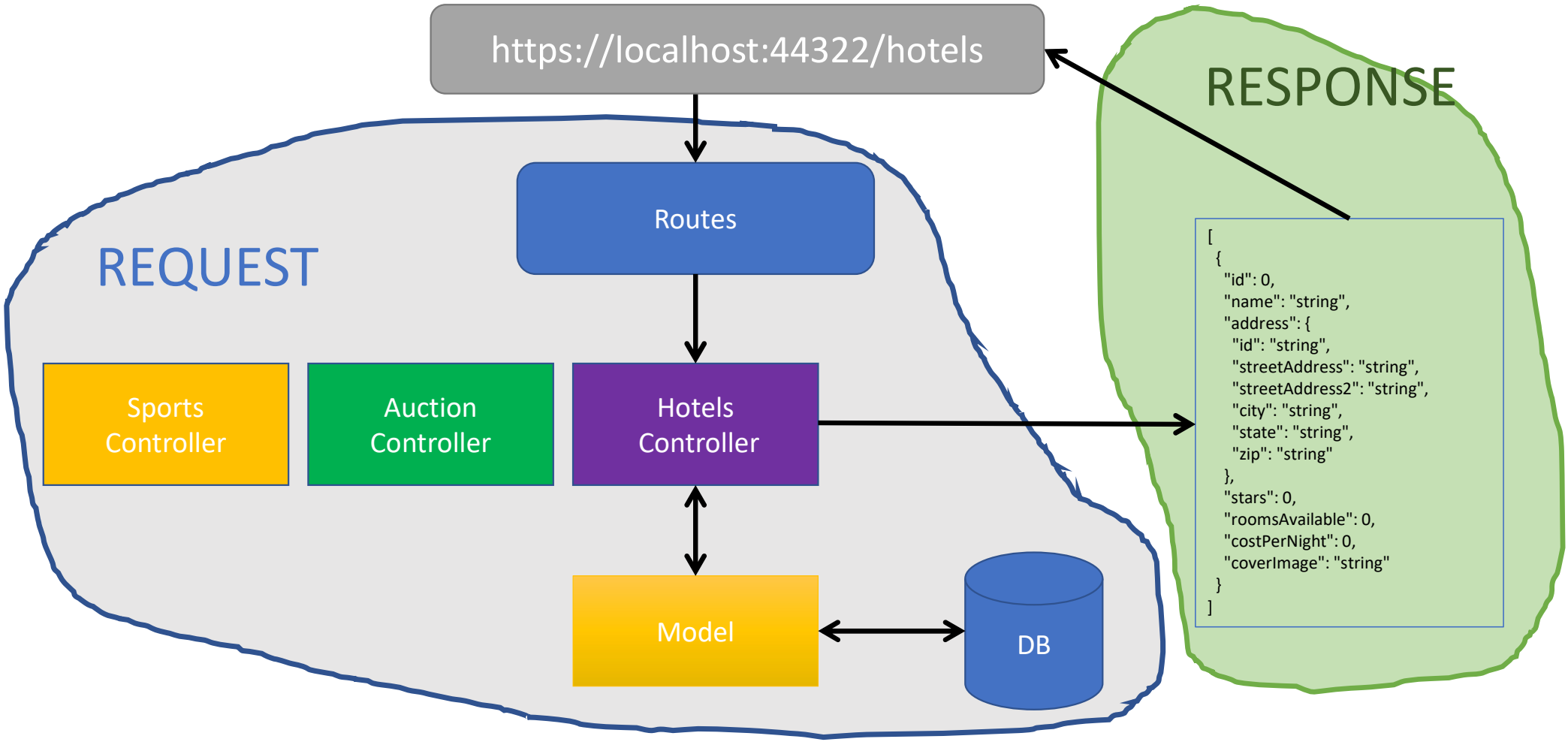
Web Service Parts



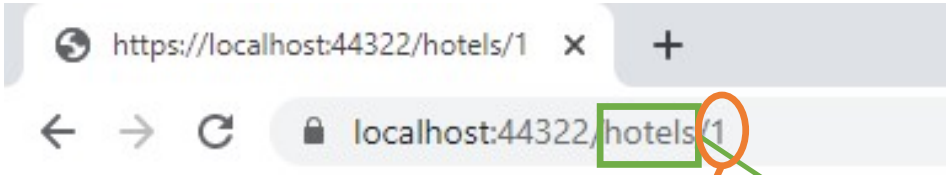
The MVC Application Lifecycle

- Request
  - Creation of Request begins with a URL
  - When the request arrives the route maps to a controller and a specific action
  - The request arrives with additional parameters that are accessible in code
- Response
  - The action is executed to provide a response
  - Response are sent back as an Action Result
    - Action Result is an abstract class. Results can be Views, Files, JSON, etc.

Web Service Parts



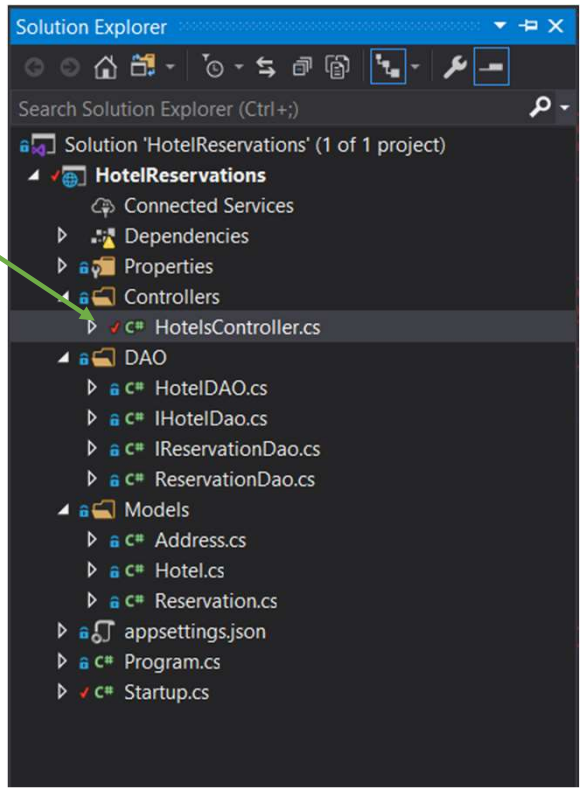
The man behind the curtain




```
[Route("/")]
[ApiController]
1 reference
public class HotelsController : ControllerBase
{
    private static IHotelDao _hotelDao;
    private static IReservationDao _reservationDao;

    0 references
    public HotelsController()
    {
        _hotelDao = new HotelDao();
        _reservationDao = new ReservationDao();
    }

    [HttpGet("hotels/{id}")]
    public Hotel GetHotel(int id)
    {
        Hotel hotel = _hotelDao.Get(id);
        if (hotel != null)
        {
            return hotel;
        }
        return null;
    }
```



Controller Decoration

```
namespace WebAPI.Controllers
{
    [Route("api/[controller]")]
    [ApiController]
    public class HotelsController : ControllerBase
    {
```

This defines the route to use.
Normally, starts with api/

This brings in some new features for APIs.

- Auto model validation
- Auto binding of JSON to Model

Provides the needed controller functions without support for building Views

Decorating Methods

Attribute	Usage
`[HttpGet]`	Matches actions on `GET` requests, to retrieve resources
`[HttpPost]`	Matches actions on `POST` requests, to create resources
`[HttpPut]`	Matches actions on `PUT` requests, to update resources
`[HttpDelete]`	Matches actions on `DELETE` requests, to delete resources

HttpGet

- In APIs, it is common to provide at least two [HttpGet] actions:
  - An action that retrieves all resources.
  - An action that retrieves a single resource given an identifier.

```
[HttpGet]
public ActionResult<List<Article>> GetAll()
{
    return dao.GetArticles().ToList();
}
```

```
[HttpGet("{id}", Name = "GetArticle")]
public ActionResult<Article> GetArticle(int id)
{
   var article = dao.GetArticle(id);

   if (article != null)
   {
      return article;
   }

   return NotFound();
}
```

HttpPost

- For adding new information to the system.
  - If you are updating, use HttpPut

```
[HttpPost]
public ActionResult Create(Article article)
{
   dao.AddArticle(article);

   // Return a created at route to indicate where the resource can be found
   return CreatedAtRoute("GetArticle", new { id = article.Id }, article);
}
```

HttpPut

Used to update data in the system.

1. First look up the resource that the user is updating to ensure it exists (return an HTTP 404 if not).
2. Update the resource with the new content passed in.
3. Return HTTP 204 (No Content), indicating the server has fulfilled the request.

```
[HttpPut("{id}")]
public ActionResult Update(int id, Article updatedArticle)
{
   // Get the existing article
   var existingArticle = dal.GetArticle(id);

   // If that article does not exists, return 404
   if (existingArticle == null)
   {
      return NotFound();
   }

   // Copy over the fields we want to change
   existingArticle.Title = updatedCity.Title;
   // ...

   // Save back to the database
   dao.UpdateArticle(existingArticle);

   // return a 201
   return CreatedAtRoute("GetArticle", new { id = article.Id }, article);
}
```

HttpDelete

- Used for “deleting” data

1. First look up the resource that the user is deleting to ensure it exists (return an HTTP 404 if not).
2. Delete the resource.
3. Return HTTP 204 (No Content)

```
[HttpDelete("{id}")]
public ActionResult Delete(int id)
{
   var article = dao.GetArticle(id);

   if (article == null)
   {
      // return HTTP 404
      return NotFound();
   }

   // delete the resource
   dao.DeleteArticle(id);

   // return HTTP 204
   return NoContent();
}
```

LET'S CODE!

WHAT QUESTIONS DO YOU HAVE?

Reading for tonight:

Server Side APIs Part 2