ASP.NET Core 6 Web API Deep Dive

Getting Started with REST

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ASP.NET Core 6 Web API Deep Dive

Version Check

Version Check

This version was created by using:

- ASP.NET Core 6.0.6
- .NET 6.0
- Visual Studio 2022

Version Check

This course is 100% applicable to:

- ASP.NET Core 6.x, 7.x
- .NET 6.x, 7.x

Relevant Notes

New course versions are regularly released:

- https://app.pluralsight.com/profile/author/kevin-dockx

Coming Up

Course prerequisites, frameworks and tooling

Positioning ASP.NET Core MVC for building RESTful APIs

- Introducing the demo application
- Introducing Postman

Coming Up

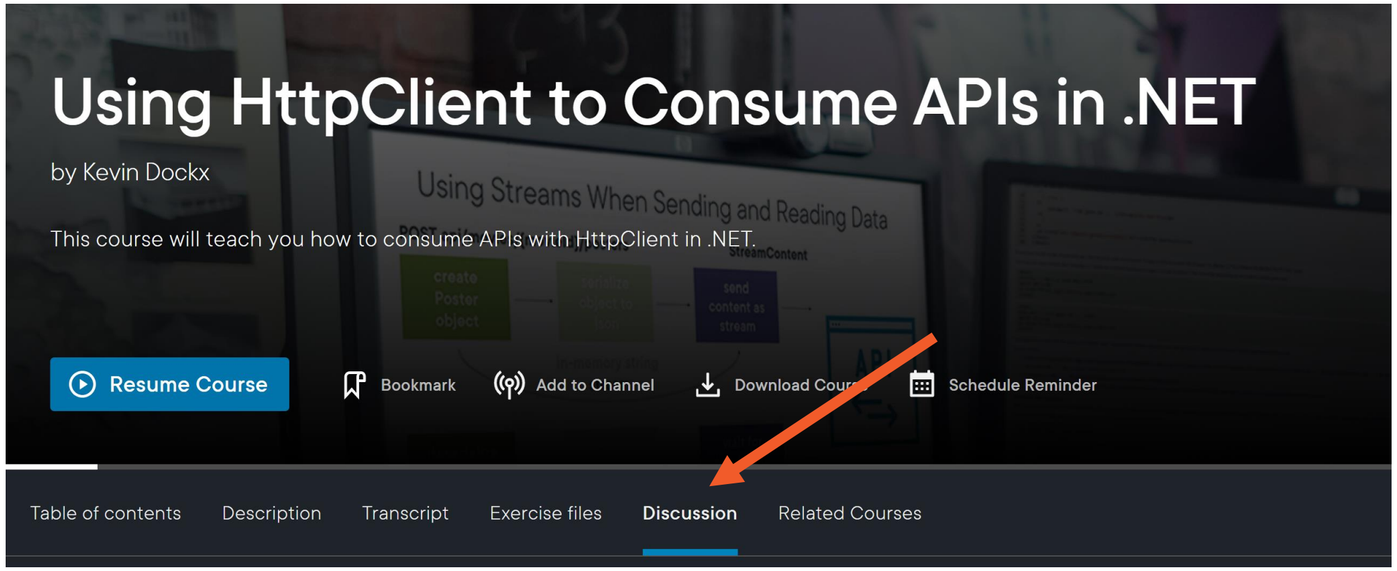
Introducing REST

- Learning about the constraints

The Richardson maturity model

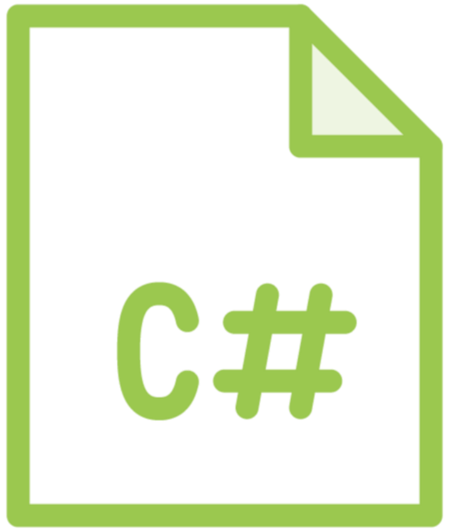
Discussion tab on the course page

Twitter: @KevinDockx

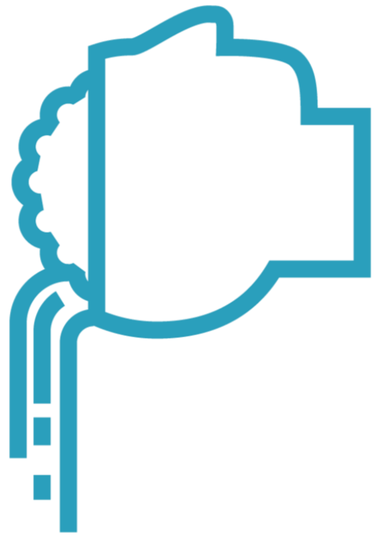


(course shown is one of my other courses, not this one)

Course Prerequisites



Good knowledge of C#



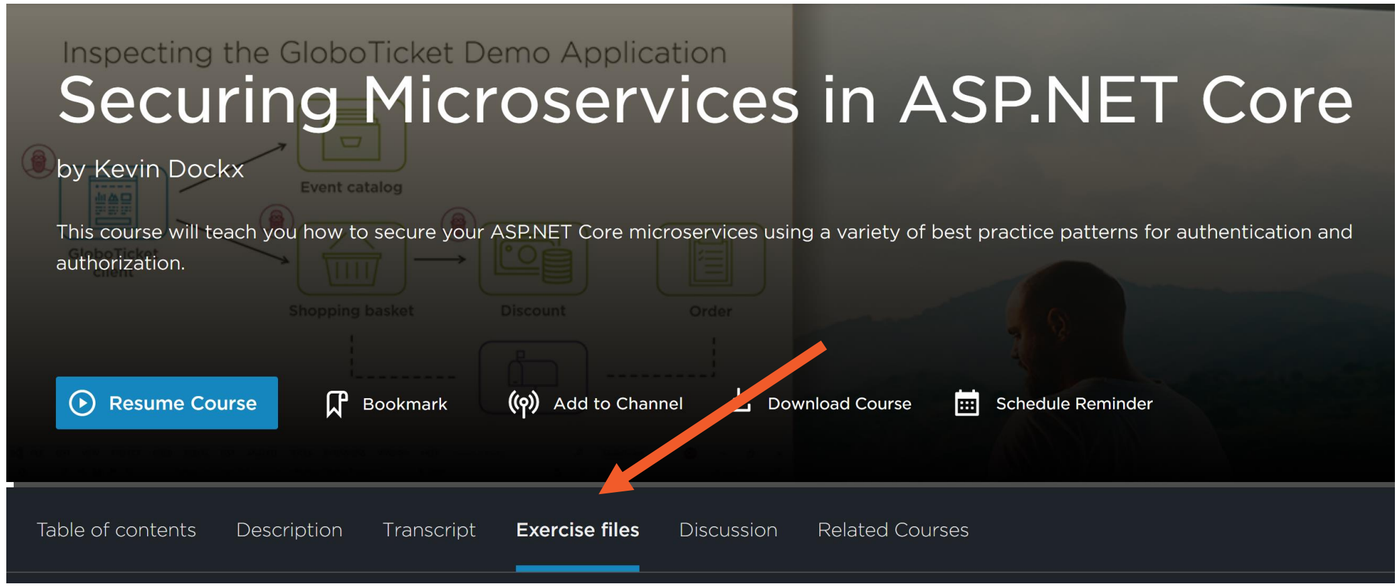
Some knowledge of building ASP.NET Core 6 web APIs

Course Prerequisites

While some important API concepts are repeated, the basics are not covered again in this course

- Have a look at the “Introducing the starter project” clip

Exercise files tab on the course page



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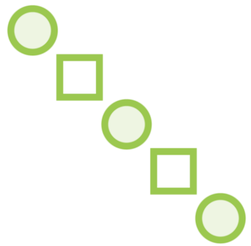
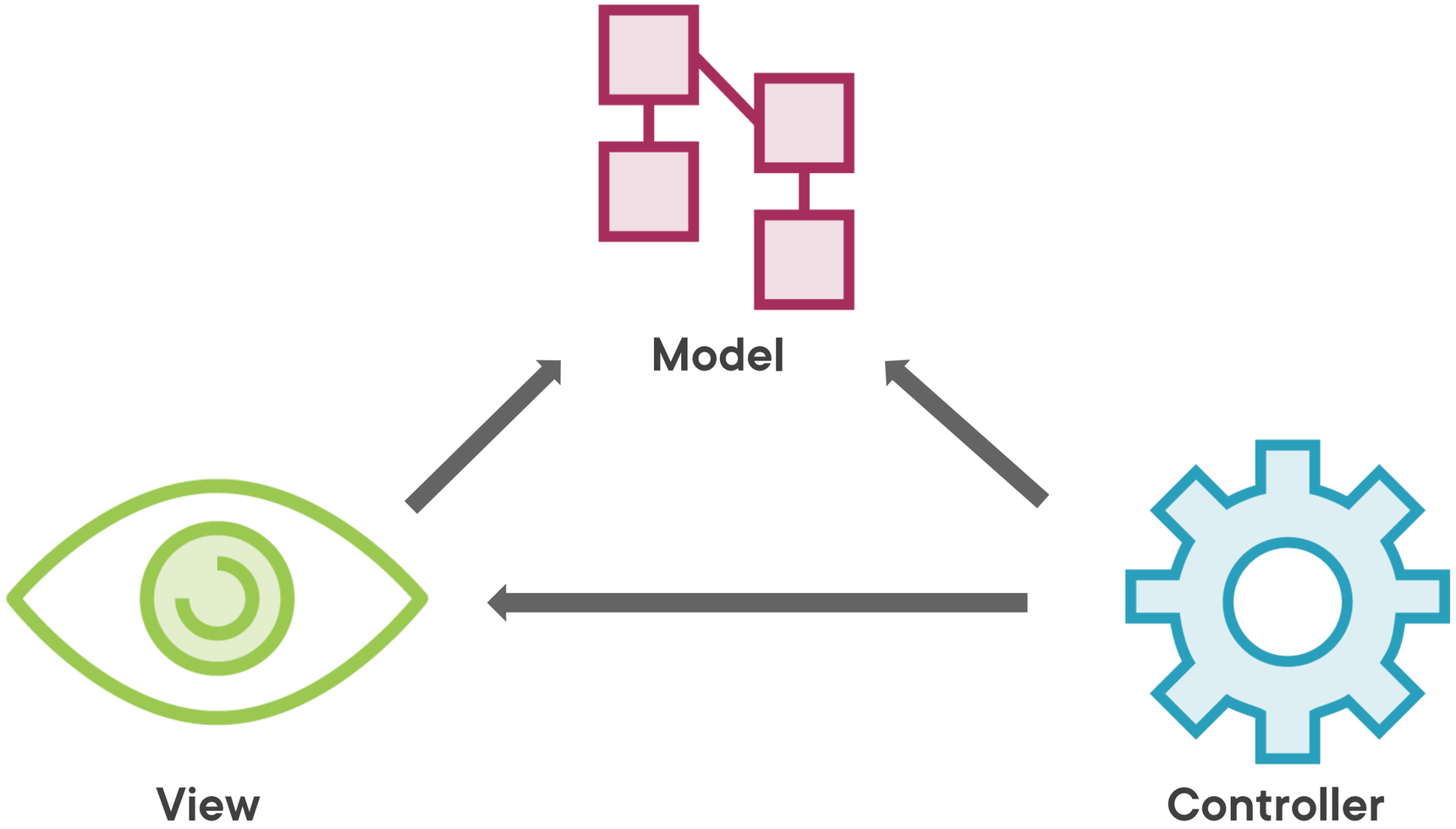
Positioning ASP.NET Core MVC for Building RESTful APIs

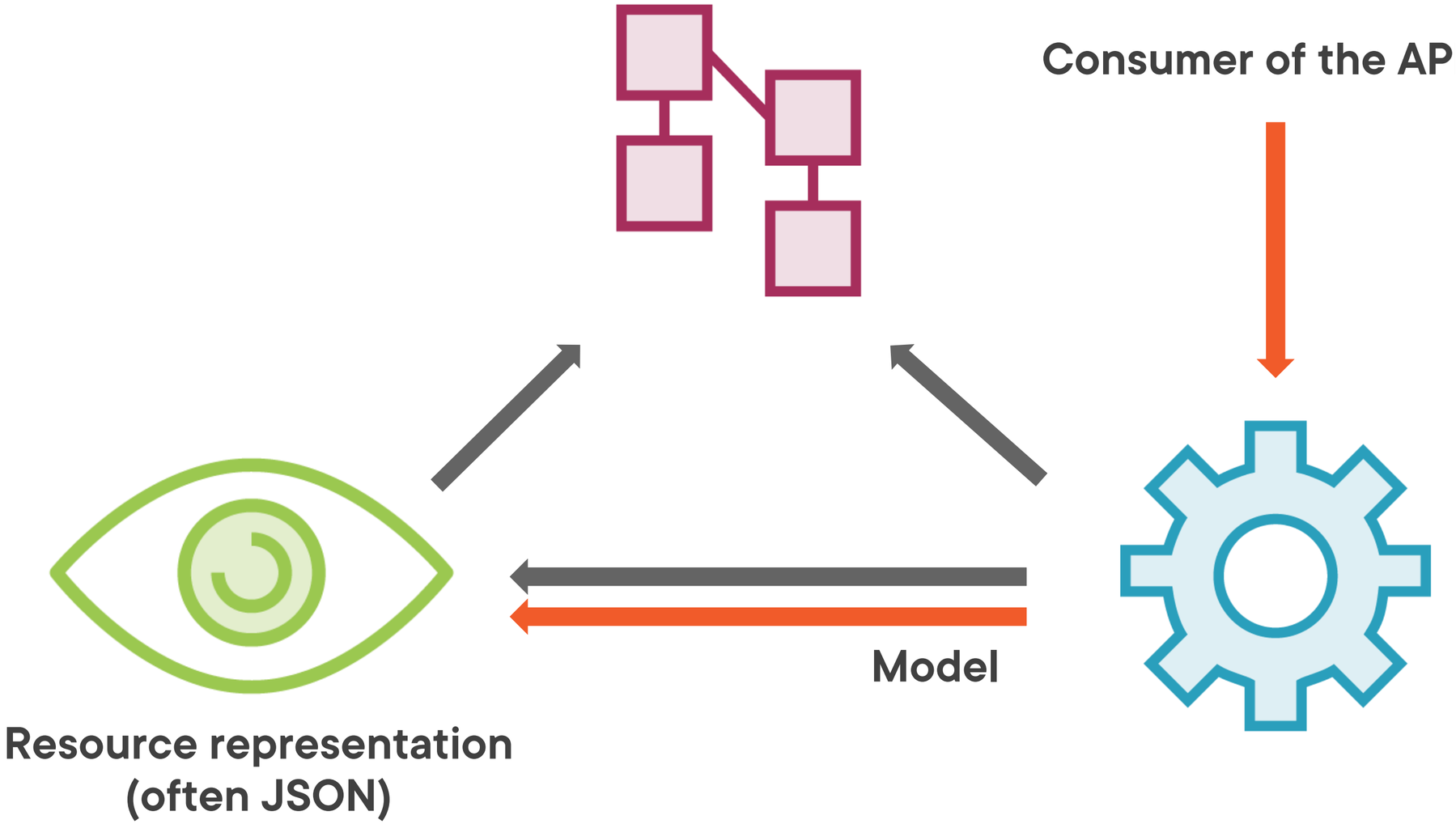
Model-View-Controller is an architectural pattern for implementing user interfaces



Encourages loose coupling and separation of concerns

… but it's not a full application architecture!


Model
View
Controller


Consumer of the API
Model
Resource representation
(often JSON)

You don’t get a RESTful API out of the box just because you use the ASP.NET Core MVC pattern

You get that by adhering to a set of RESTful constraints we’ll learn about

Demo

Introducing the starter project

Demo

Using Postman and importing the collection with sample requests

Introducing REST

REST is... about HTTP?

REST is... about building APIs?

REST is... about returning JSON from HTTP request?

REST ...

Roy Fielding
https://www.ics.uci.edu/~fielding/pubs/dissertation/top.htm

REpresentational State Transfer is intended to evoke an image of how a well-designed web application behaves:

a network of web pages (a virtual state-machine)...

... where the user progresses through an application by selecting links (state transitions)...

... resulting in the next page (representing the next state of the application) being transferred to the user and rendered for their use

Roy Fielding
https://www.ics.uci.edu/~fielding/pubs/dissertation/top.htm

Introducing REST

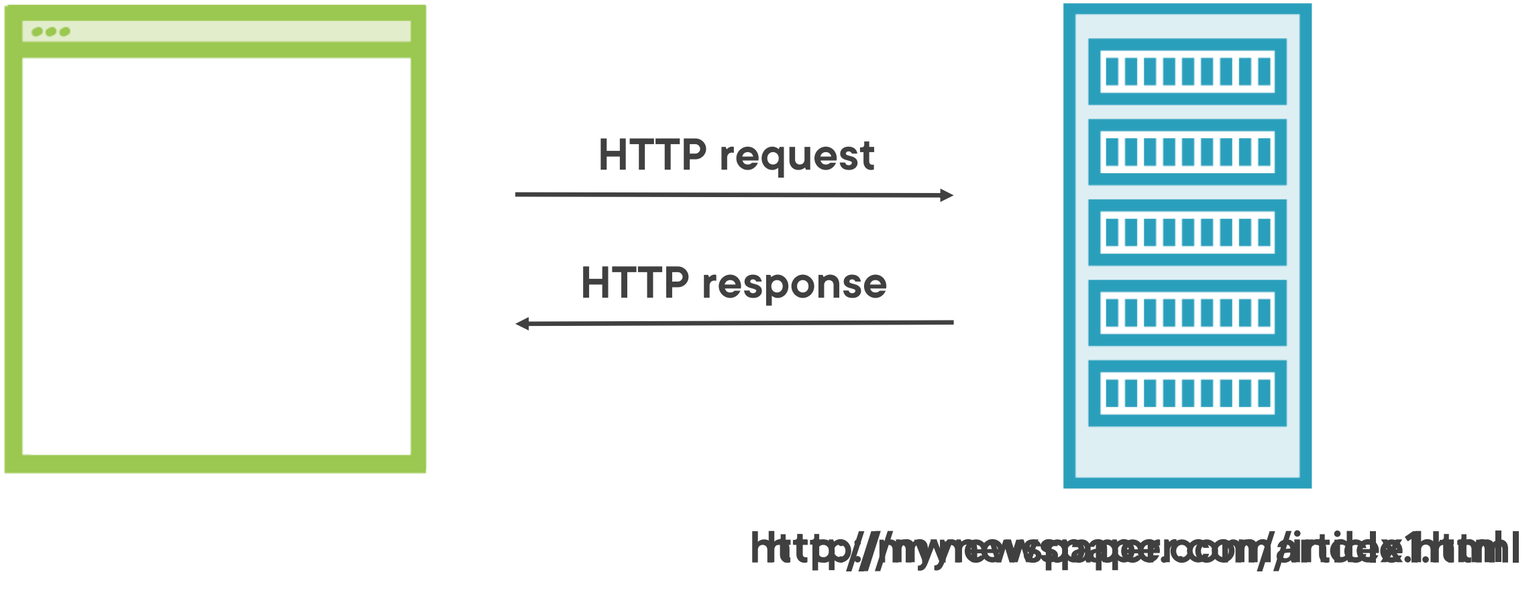
REST is an architectural style

REST is not a standard in its own right

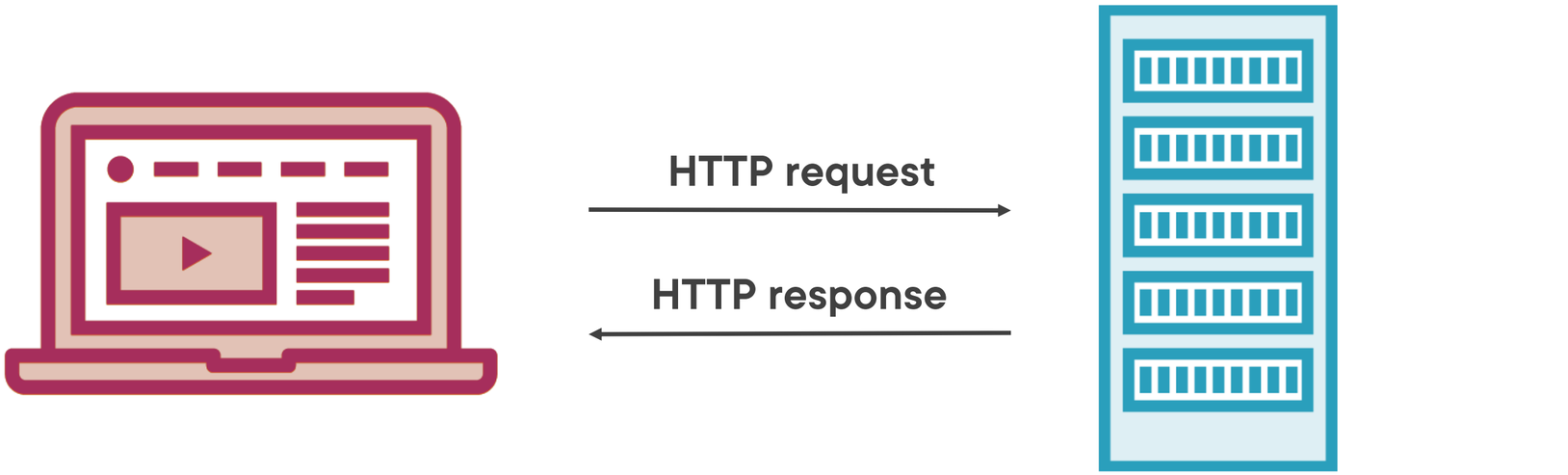
Standards are used to implement the REST architectural style

REST is, in principle, protocol agnostic

Introducing REST



Introducing REST



Learning what the REST Constraints Are About

REST is defined by 6 constraints

- 5 obligatory constraints
- 1 optional constraint

Constraint

A design decision that can have positive and negative impacts

Learning what the REST Constraints Are About

Uniform Interface

API and consumers share one single, technical interface: URI, Method, Media Type (payload)

Identification of Resources

A resource is conceptually separate from its representation

Representation media types:

- application/json
- application/xml
- custom, ...

Manipulation of Resources through Representations

Representation + metadata must be sufficient to modify or delete the resource

Self-descriptive Message

Each message must include enough info to describe how to process the message

Hypermedia as the Engine of Application State (HATEOAS)

Hypermedia is a generalization of Hypertext (links)

- Drives how to consume and use the API
- Allows for a self-documenting API

Learning what the REST Constraints Are About

Uniform Interface

API and consumers share one single, technical interface: URI, Method, Media Type (payload)

Client-Server

client and server are separated (client and server can evolve separately)

Statelessness

state is contained within the request

Learning what the REST Constraints Are About

Layered System

client cannot tell what layer it's connected to

Cacheable

each response message must explicitly state if it can be cached or not

Code on Demand (optional)

server can extend client functionality

A system is only considered RESTful when it adheres to **all the required constraints...**

Most “RESTful” APIs aren’t really RESTful...

... but that doesn’t make them bad APIs, as long as you understand the potential trade-offs

The Richardson Maturity Model

This model grades APIs by their RESTful maturity

```
POST (info on data)
http://host/myapi

POST (author to create)
http://host/myapi
```

Level 0 (The Swamp of POX)

HTTP protocol is used for remote interaction
… the rest of the protocol isn't used as it should be

RPC-style implementations (SOAP, often seen when using WCF)

```
POST
http://host/api/authors

POST
http://host/api/authors/{id}
```

Level 1 (Resources)

Each resource is mapped to a URI
HTTP methods aren’t used as they should be

Results in reduced complexity

```
GET
http://host/api/authors
200 Ok (authors)

POST (author representation)
http://host/api/authors
201 Created (author)
```

Level 2 (Verbs)

Correct HTTP verbs are used
Correct status codes are used

Removes unnecessary variation

```
GET
http://host/api/authors
200 Ok (authors + links that
drive application state)
```

Level 3 (Hypermedia)

The API supports Hypermedia as the Engine of Application State (HATEOAS)

Introduces discoverability

The Richardson Maturity Model

Level 3 is a precondition for a RESTful API

Summary

ASP.NET Core MVC provides a framework for building APIs and web applications using the Model-View-Controller pattern

Summary

REST is an architectural style, evoking an image of how a well-designed web application should behave

Six constraints

- Uniform Interface
- Client-Server
- Statelessness
- Layered System
- Cacheable
- (Code on Demand)

Summary

The Richardson maturity model grades APIs by their RESTful maturity

- Level 3 is a precondition for RESTful APIs

Up Next:
Designing the Outer Facing Contract