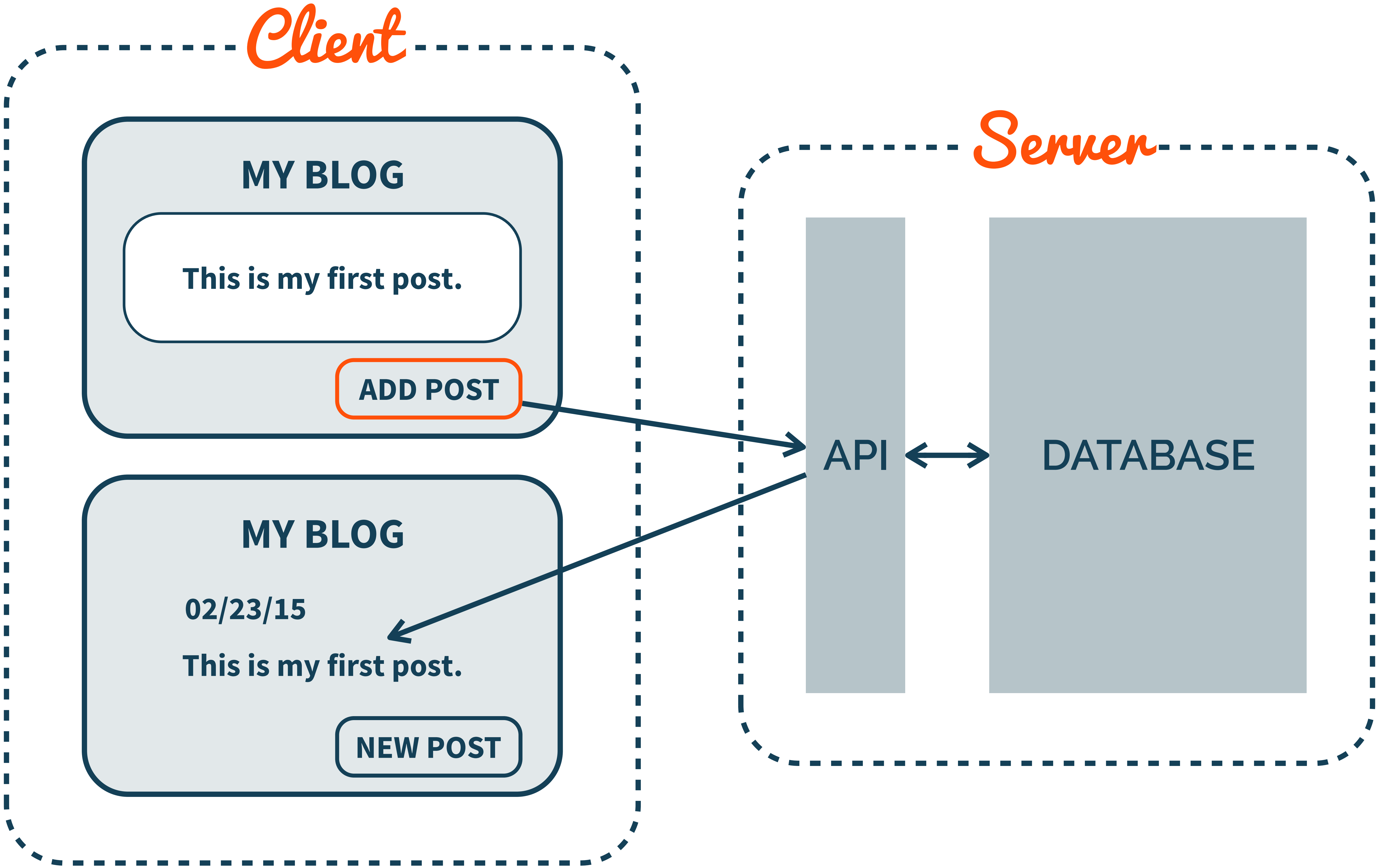
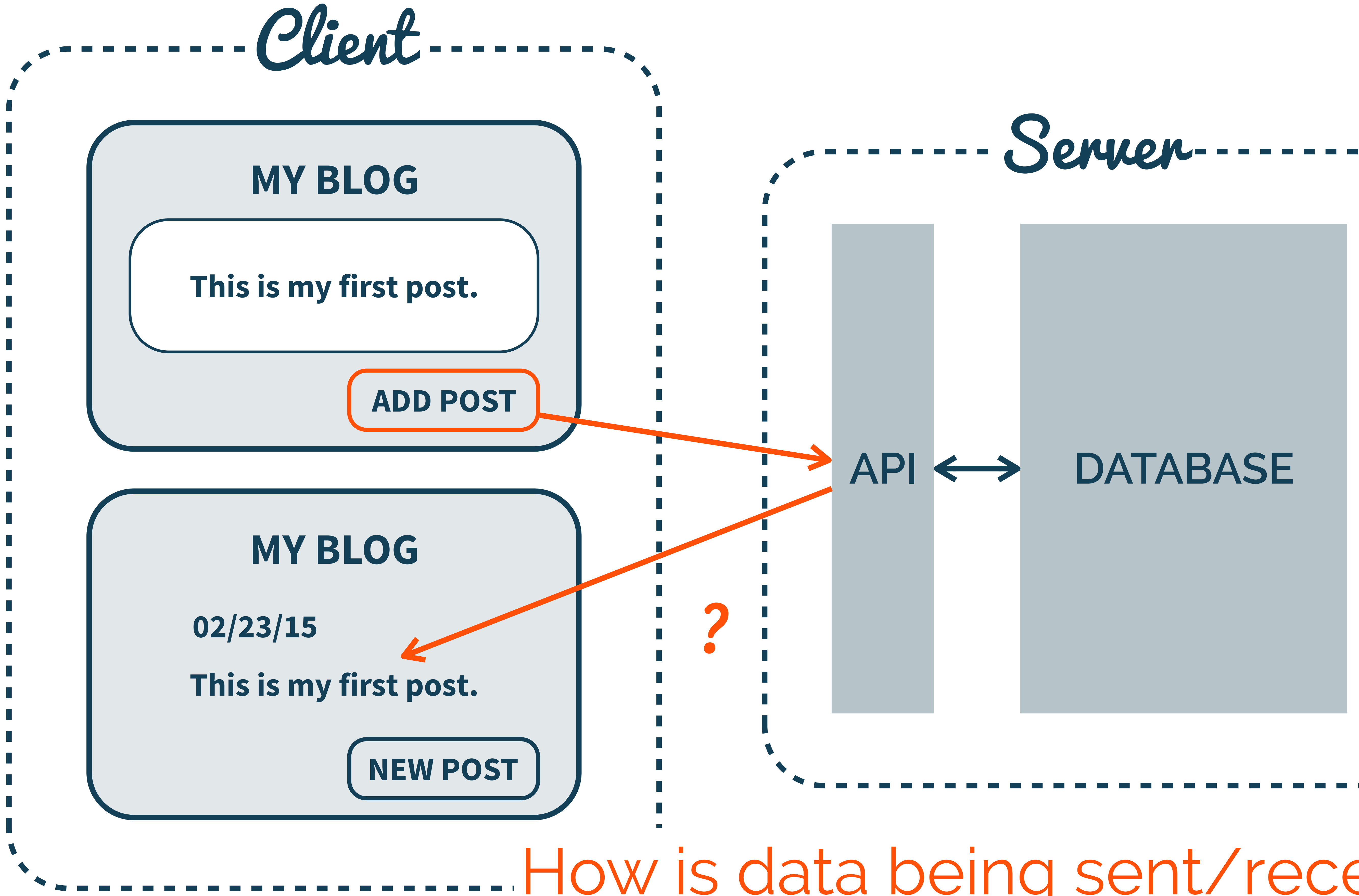
HTTP + TEMPLATING

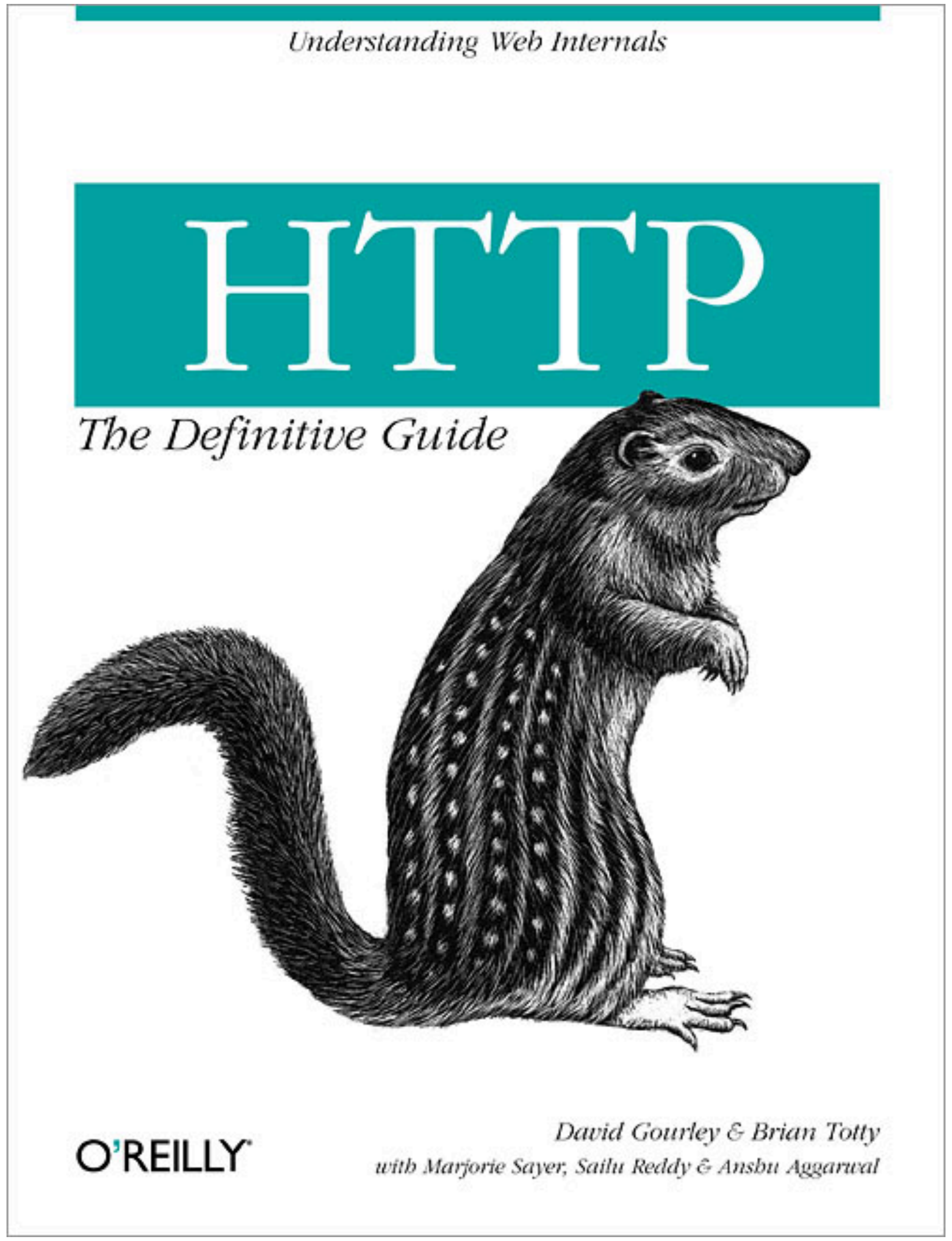

Client
MY BLOG
This is my first post.
ADD POST
MY BLOG
02/23/15
This is my first post.
NEW POST
Server
API
DATABASE



How is data being sent/received?

Http

RECOMMENDED READING


Understanding Web Internals

HTTP

The Definitive Guide

O'REILLY

David Gourley & Brian Totty

with Marjorie Sayer, Sailu Reddy & Anshu Aggarwal

HTTP

`Hypertext Transfer Protocol`

request-response protocol

sent using TCP/IP sockets

More details in Socket lecture

“all about applying verbs to nouns”

nouns: resources (*i.e.*, concepts)

verbs: GET, POST, PUT, DELETE

web.archive.org/web/20130116005443/http://tomayko.com/writings/rest-to-my-wife

URL

Uniform Resource Locator

type of URI (Identifier)

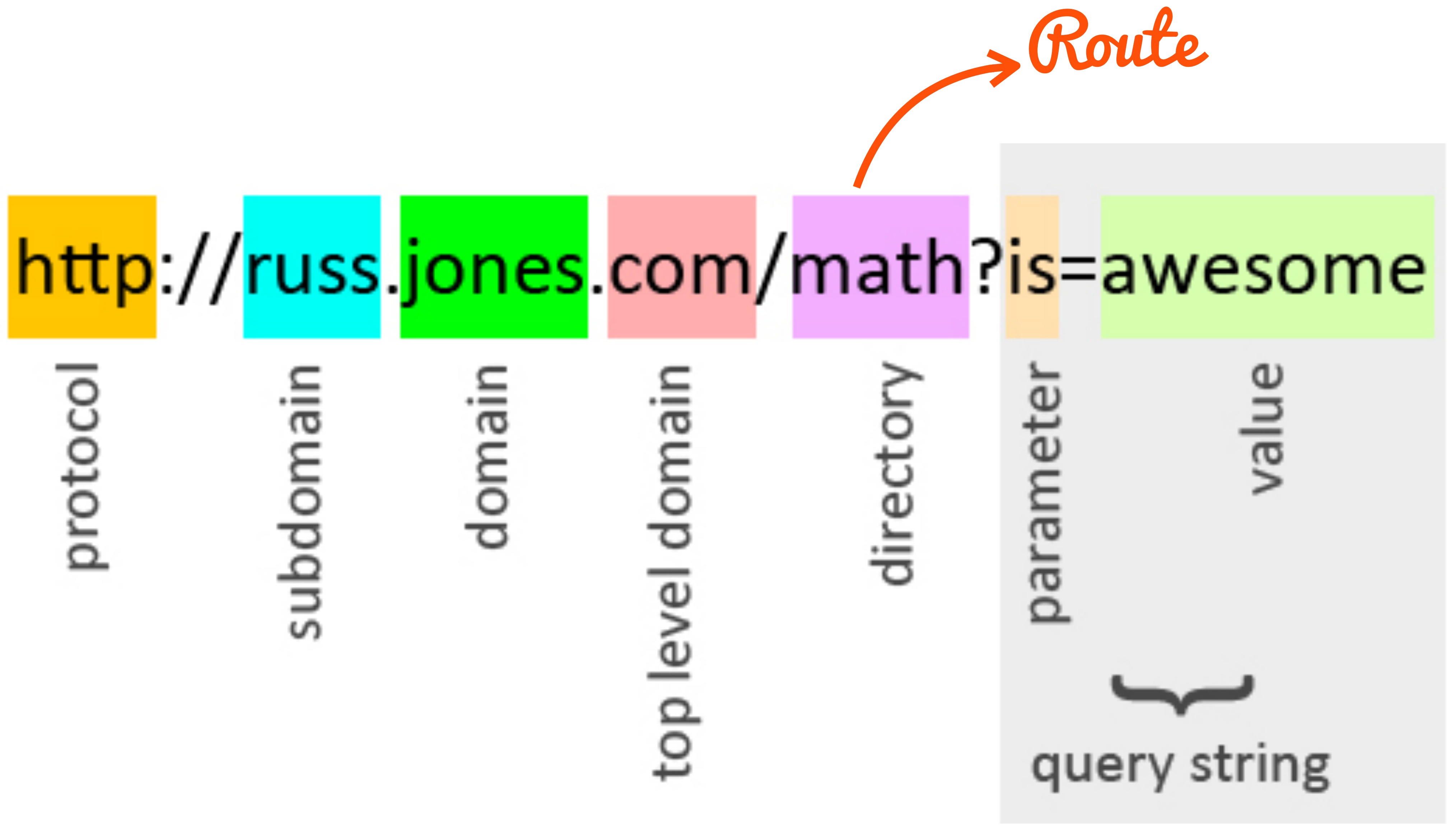
specifies the location of a resource on a network

server responds with **representations** of resources and not the resources themselves

$\searrow$ Rest lecture

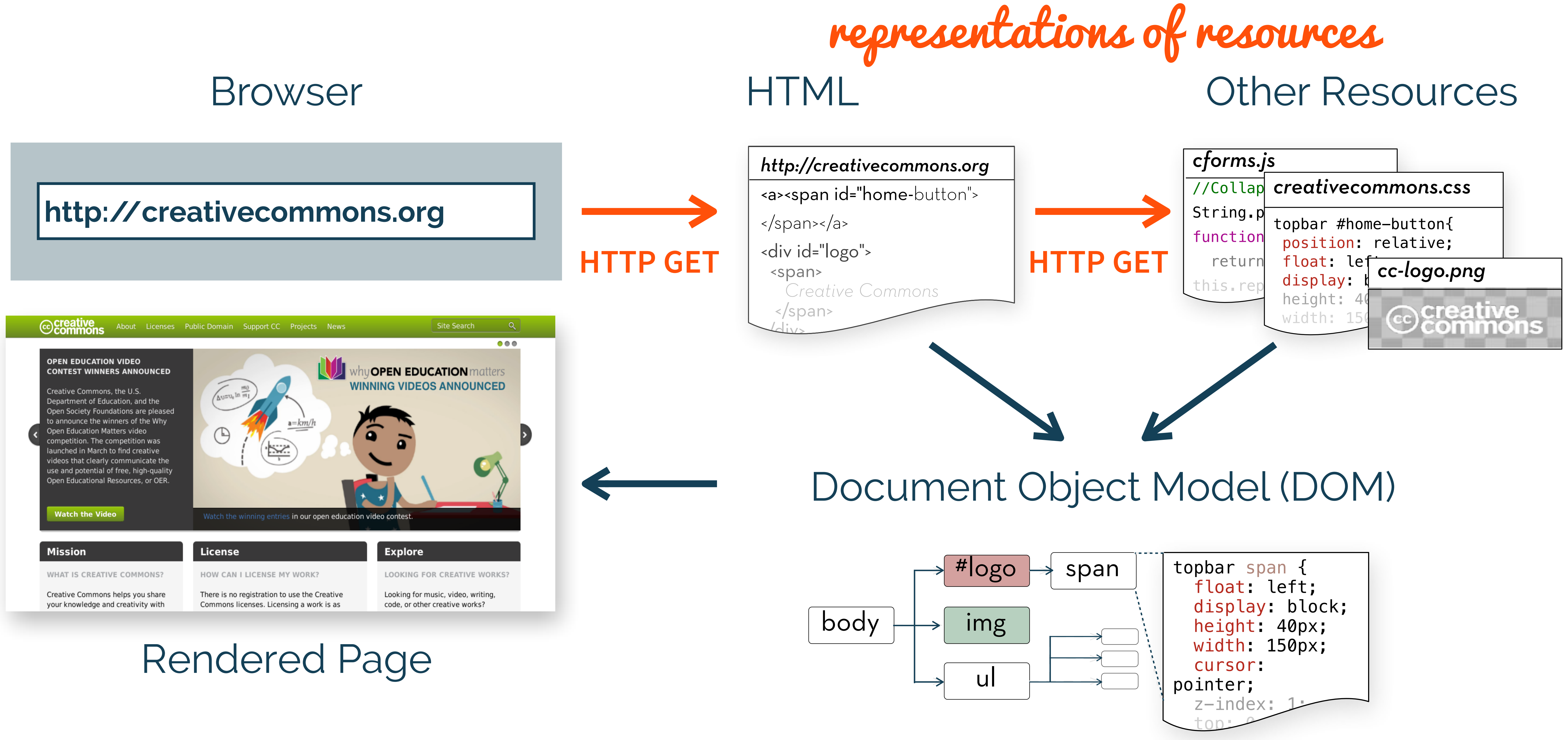
web.archive.org/web/20130116005443/http://tomayko.com/writings/rest-to-my-wife

URL ANATOMY



moz.com/blog/solving-the-subdomain-equation-predicting-traffic-and-value-when-merging-subdomains

LOADING A PAGE IN A BROWSER



```
<a><span id="home-button">
</span></a>
<div id="logo">
  <span>
    Creative Commons
  </span>
</div>
```

```
//Collap
String.p
function
  return
this.rep
```

```
topbar #home-button{
  position: relative;
  float: lef
  display: b
  height: 40
  width: 150
```

```
topbar span {
  float: left;
  display: block;
  height: 40px;
  width: 150px;
  cursor:
pointer;
  z-index: 1;
  top: 0
```

creative commons About Licenses Public Domain Support CC Projects News Site Search

OPEN EDUCATION VIDEO CONTEST WINNERS ANNOUNCED

Creative Commons, the U.S. Department of Education, and the Open Society Foundations are pleased to announce the winners of the Why Open Education Matters video competition. The competition was launched in March to find creative videos that clearly communicate the use and potential of free, high-quality Open Educational Resources, or OER.

Watch the Video

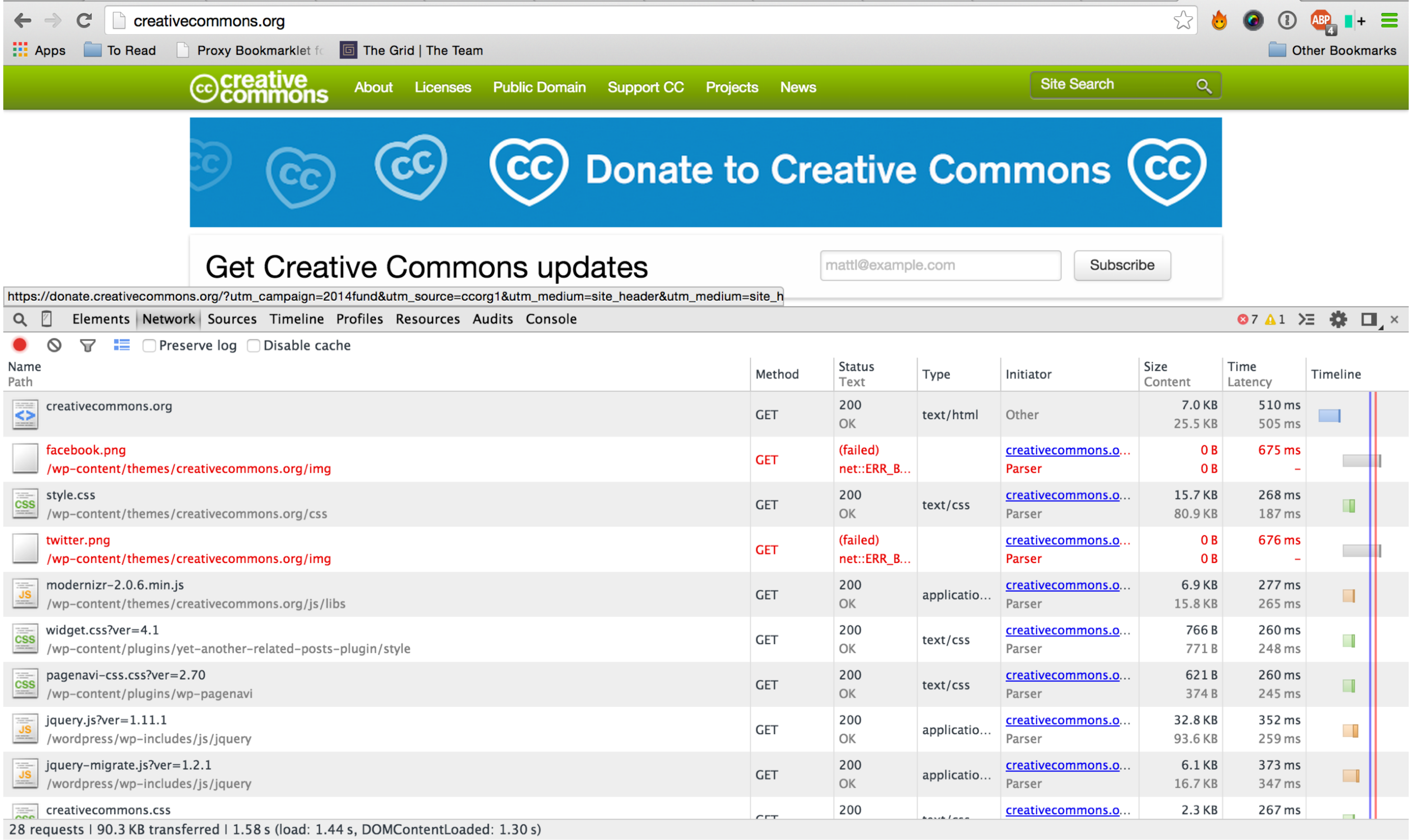
why OPEN EDUCATION matters WINNING VIDEOS ANNOUNCED

Watch the winning entries in our open education video contest.

Mission
WHAT IS CREATIVE COMMONS?
Creative Commons helps you share your knowledge and creativity with

License
HOW CAN I LICENSE MY WORK?
There is no registration to use the Creative Commons licenses. Licensing a work is as

Explore
LOOKING FOR CREATIVE WORKS?
Looking for music, video, writing, code, or other creative works?



creativecommons.org

Apps | To Read | Proxy Bookmarklet f | The Grid | The Team | Other Bookmarks

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Donate to Creative Commons

Get Creative Commons updates

mattl@example.com | Subscribe

https://donate.creativecommons.org/?utm_campaign=2014fund&utm_source=ccorg1&utm_medium=site_header&utm_medium=site_h

Elements | Network | Sources | Timeline | Profiles | Resources | Audits | Console | ✕7 ⚠1

Preserve log | Disable cache

Name / Path	Method	Status / Text	Type	Initiator	Size / Content	Time / Latency	Timeline
creativecommons.org	GET	200 OK	text/html	Other	7.0 KB / 25.5 KB	510 ms / 505 ms	
facebook.png /wp-content/themes/creativecommons.org/img	GET	(failed) net::ERR_B...		creativecommons.o... Parser	0 B / 0 B	675 ms / –	
style.css /wp-content/themes/creativecommons.org/css	GET	200 OK	text/css	creativecommons.o... Parser	15.7 KB / 80.9 KB	268 ms / 187 ms	
twitter.png /wp-content/themes/creativecommons.org/img	GET	(failed) net::ERR_B...		creativecommons.o... Parser	0 B / 0 B	676 ms / –	
modernizr-2.0.6.min.js /wp-content/themes/creativecommons.org/js/libs	GET	200 OK	applicatio...	creativecommons.o... Parser	6.9 KB / 15.8 KB	277 ms / 265 ms	
widget.css?ver=4.1 /wp-content/plugins/yet-another-related-posts-plugin/style	GET	200 OK	text/css	creativecommons.o... Parser	766 B / 771 B	260 ms / 248 ms	
pagenavi-css.css?ver=2.70 /wp-content/plugins/wp-pagenavi	GET	200 OK	text/css	creativecommons.o... Parser	621 B / 374 B	260 ms / 245 ms	
jquery.js?ver=1.11.1 /wordpress/wp-includes/js/jquery	GET	200 OK	applicatio...	creativecommons.o... Parser	32.8 KB / 93.6 KB	352 ms / 259 ms	
jquery-migrate.js?ver=1.2.1 /wordpress/wp-includes/js/jquery	GET	200 OK	applicatio...	creativecommons.o... Parser	6.1 KB / 16.7 KB	373 ms / 347 ms	
creativecommons.css		200		creativecommons.o...	2.3 KB	267 ms	

28 requests | 90.3 KB transferred | 1.58 s (load: 1.44 s, DOMContentLoaded: 1.30 s)

HTTP Request

method url version

```
GET /index.html HTTP/1.1
Host: www.example.com
User-Agent: Mozilla/5.0
Accept: text/xml,application/
xml,application/xhtml+xml,text/html*/*
Accept-Language: en-us
Accept-Charset: ISO-8859-1,utf-8
Connection: keep-alive
<blank line>
```

request headers

en.wikipedia.org/wiki/Hypertext_Transfer_Protocol#Example_session

GET *vs* POST

GET

retrieve representations of resources

no side effects

no data in request body

POST

upload data from the browser to server

returns information from the server

side effects are likely

data contained in request body

HTTP Response

version status code text explanation

```
HTTP/1.1 200 OK
```

response headers

```
Date: Mon, 23 May 2005 22:38:34 GMT
Server: Apache/1.3.3.7 (Unix) (Red-Hat/Linux)
Content-Type: text/html; charset=UTF-8
Content-Length: 131
```

content

```
<!DOCTYPE html>
<html>
…
</html>
```

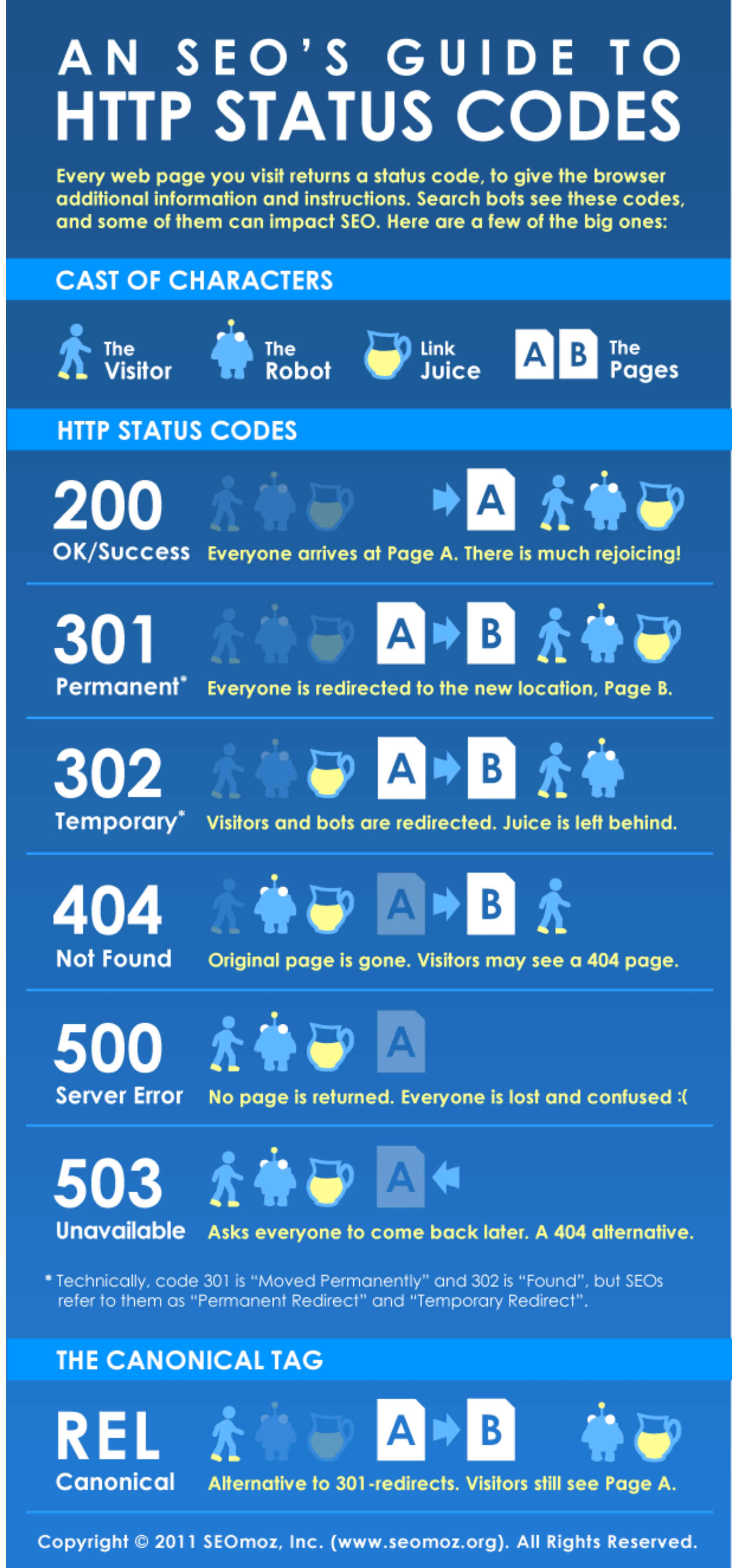
en.wikipedia.org/wiki/Hypertext_Transfer_Protocol#Example_session

HTTP Response

```
HTTP/1.1 200 OK

Date: Mon, 23 May 2005 22:38:34 GMT

Server: Apache/1.3.3.7 (Unix) (Red-Hat/Linux)

Content-Type: text/html; charset=UTF-8

Content-Length: 131


<!DOCTYPE html>

<html>

…

</html>
```

MIME Type

en.wikipedia.org/wiki/Hypertext_Transfer_Protocol#Example_session



AN SEO'S GUIDE TO
HTTP STATUS CODES

Every web page you visit returns a status code, to give the browser additional information and instructions. Search bots see these codes, and some of them can impact SEO. Here are a few of the big ones:

CAST OF CHARACTERS

The Visitor · The Robot · Link Juice · The Pages

HTTP STATUS CODES

200 OK/Success	Everyone arrives at Page A. There is much rejoicing!
301 Permanent*	Everyone is redirected to the new location, Page B.
302 Temporary*	Visitors and bots are redirected. Juice is left behind.
404 Not Found	Original page is gone. Visitors may see a 404 page.
500 Server Error	No page is returned. Everyone is lost and confused :(
503 Unavailable	Asks everyone to come back later. A 404 alternative.

* Technically, code 301 is "Moved Permanently" and 302 is "Found", but SEOs refer to them as "Permanent Redirect" and "Temporary Redirect".

THE CANONICAL TAG

REL Canonical	Alternative to 301-redirects. Visitors still see Page A.

HTTP STATUS CODES

moz.com/learn/seo/http-status-codes

HTTPS

More details in Security lecture

request and response messages are transmitted securely using encryption

USEFUL TOOLS

`curl` command line tool (**tutorial**)

Postman

Ajax

AJAX

`Asynchronous JavaScript and XML`

send and receive data without reloading page

Before, every user interaction required the complete page to be reloaded

AJAX

Issue HTTP request to the server from Javascript

Process response with Javascript in the browser

AJAX TECHNOLOGIES

HTML and CSS

DOM

XML

`XMLHttpRequest` object

JavaScript

JSON

AJAX doesn’t require XML

JSON has become de facto standard data interchange format

lightweight and simple format

types: Number, String, Boolean, Array, Object, **`null`**

objects are key/value pairs

JSON CODE EXAMPLE

```
{
  “camelids”: [
    {
      “name”: “llama”,
      “height”: 1.8
    },
    {
      “name”: “alpaca”,
      “height”: 0.9
    }
  ]
}
```

Look familiar?

XMLHttpRequest

```
var xhr = new XMLHttpRequest();
xhr.onreadystatechange = xhrHandler;
xhr.open('get', 'llama.json');
xhr.send(null);
```

http://www.w3.org/TR/XMLHttpRequest/

XMLHttpRequest

```
function xhrHandler() {
  if (xhr.readyState == 4
      && xhr.status == 200) {
    var data = JSON.parse(xhr.responseText);
    myFunction(data);
  }
};
```

CODEPEN

AJAX CHALLENGES

hard to go back to a particular state

URL fragment identifier

content retrieved by AJAX not easily indexable

The same origin policy prevents some Ajax techniques from being used across domains

JSONP

callback-style programming is hard to maintain/test

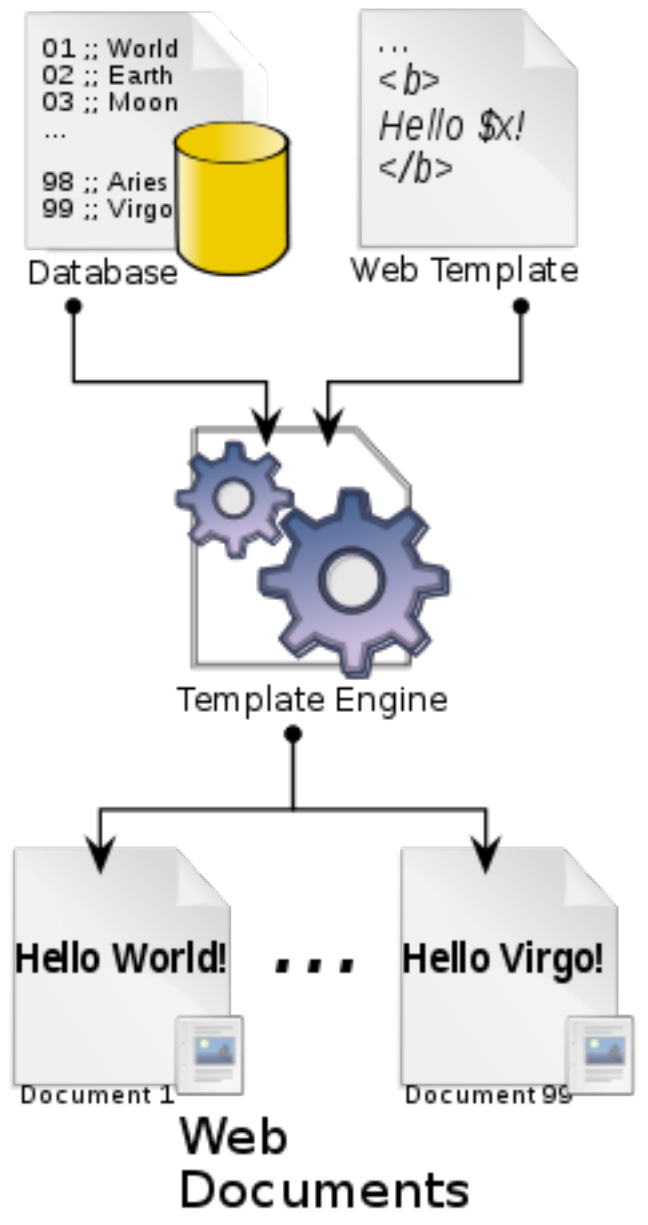
Templating

TEMPLATES

common way to generate dynamic HTML for multi-page web sites and apps

separation of markup and data (content)

SERVER-SIDE TEMPLATES



server puts HTML and data together and sends it to the browser

platforms like Rails, PHP, JSP

http://www.w3.org/TR/XMLHttpRequest/

CLIENT-SIDE TEMPLATES

AngularJS

browser receives HTML and data and puts it together

server serves templates and data required by the templates

made popular by AJAX

Model View Controller

MODEL VIEW CONTROLLER (MVC)

introduced in 1970s as part of SmallTalk

popular in desktop UI development (C++, Java)

more recently introduced to the Web

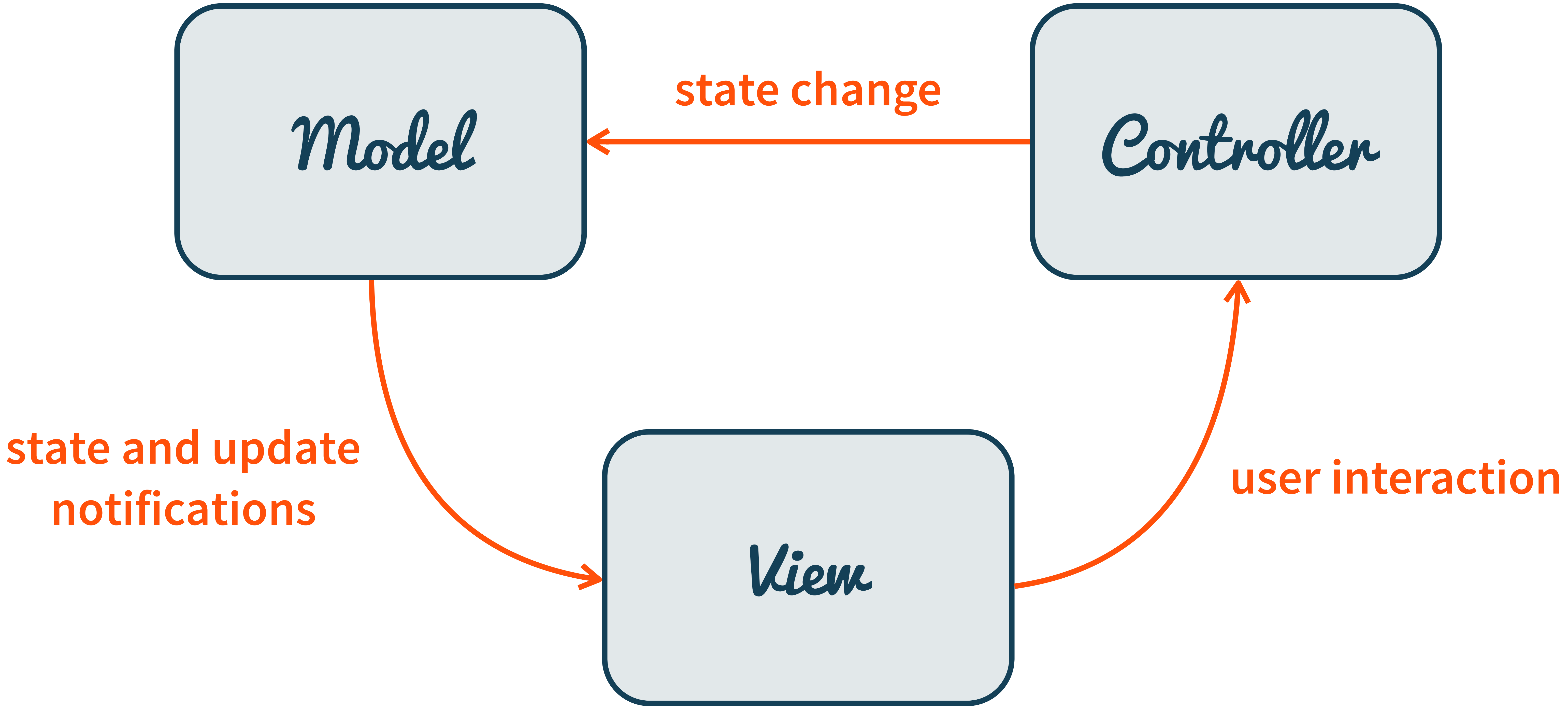
mental model makes it easier to extend, maintain, and test apps

MODEL VIEW CONTROLLER (MVC)

Separation between

Model	managing data
Controller	application logic
View	presenting the data

MODEL VIEW CONTROLLER (MVC)



MVC CHALLENGE

non-trivial to get the data into the correct state, both in the *View* and in the *Model*

Data Binding

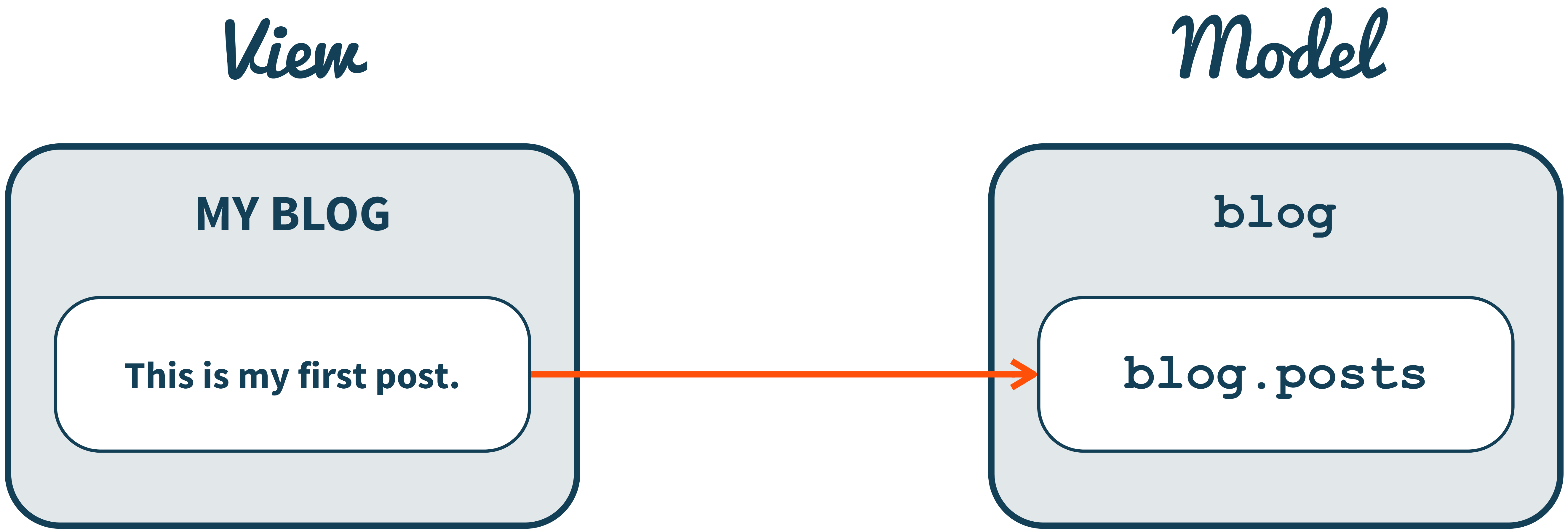
Just declare mapping between *View* and *Model* and have them **sync automatically**?

DATA BINDING

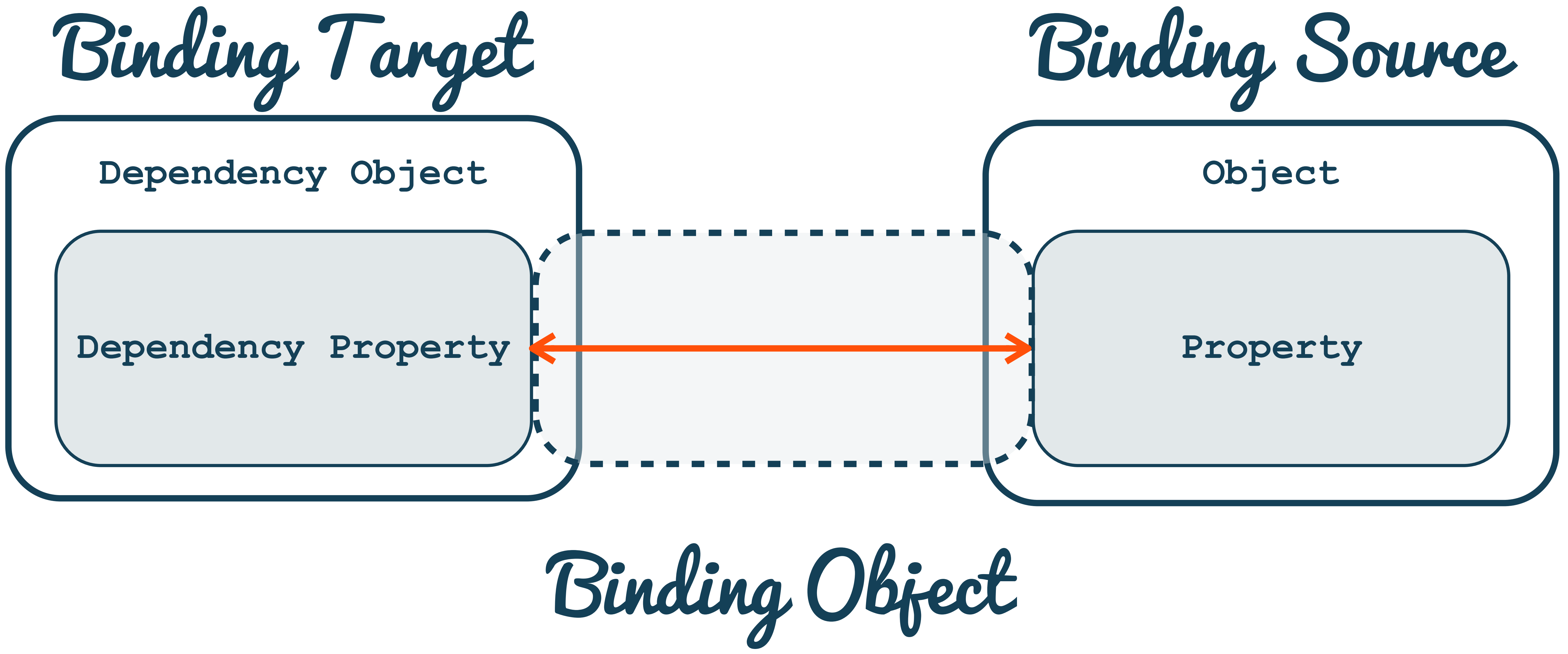
automatically keep state in View and Model in sync

frameworks provide scaffolding to eliminate a lot of code

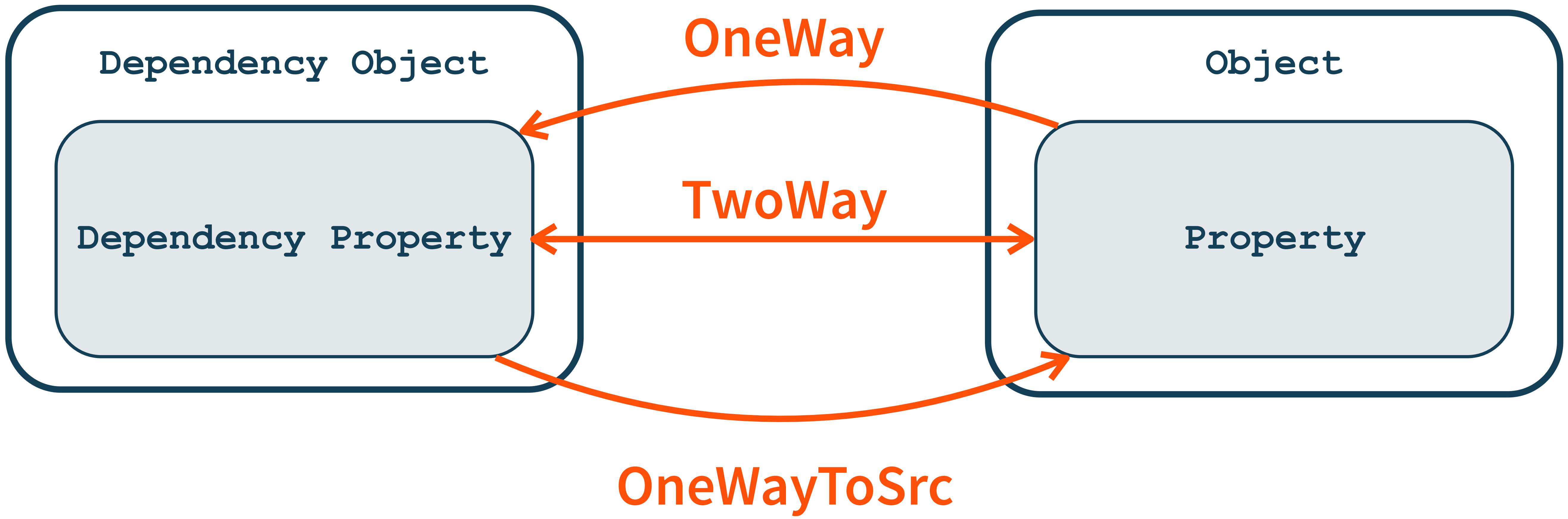
EXAMPLE



MENTAL MODEL



MENTAL MODEL


Dependency Object
Dependency Property
OneWay
TwoWay
OneWayToSrc
Object
Property