

HTMX: Webapps for tired engineers



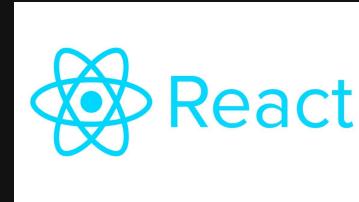
Knockout.



aurelia

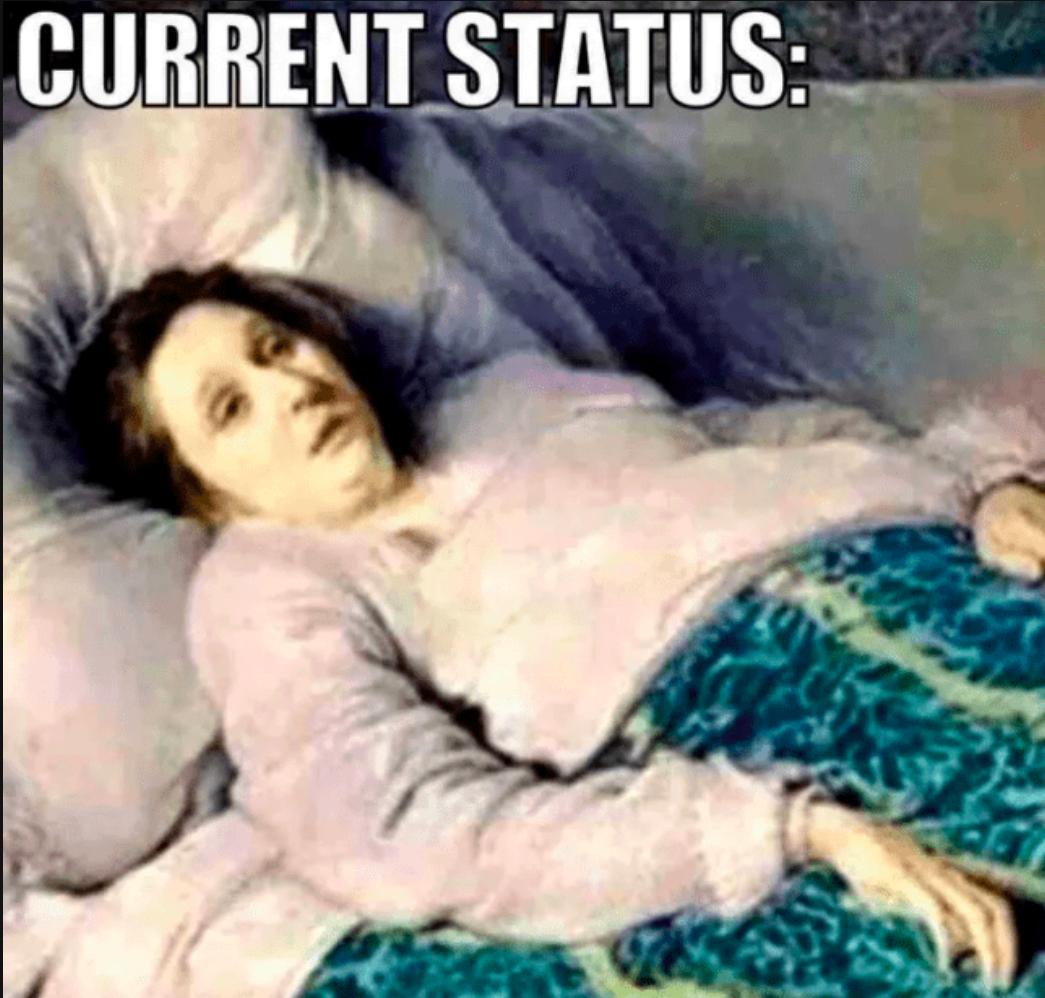


AngularJS



?

CURRENT STATUS:



I HAVE A NEW
FRAMEWORK DOWN HERE



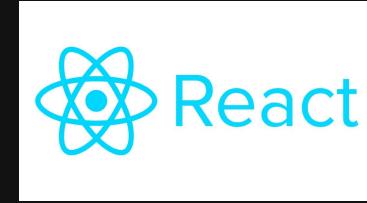
Knockout.



aurelia



AngularJS



PREACT



?

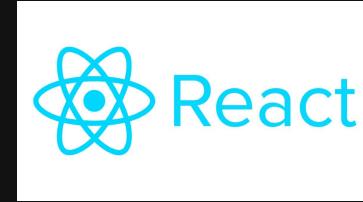
Knockout.



aurelia



AngularJS



 Preact



</>htm{x}



</>htm^x

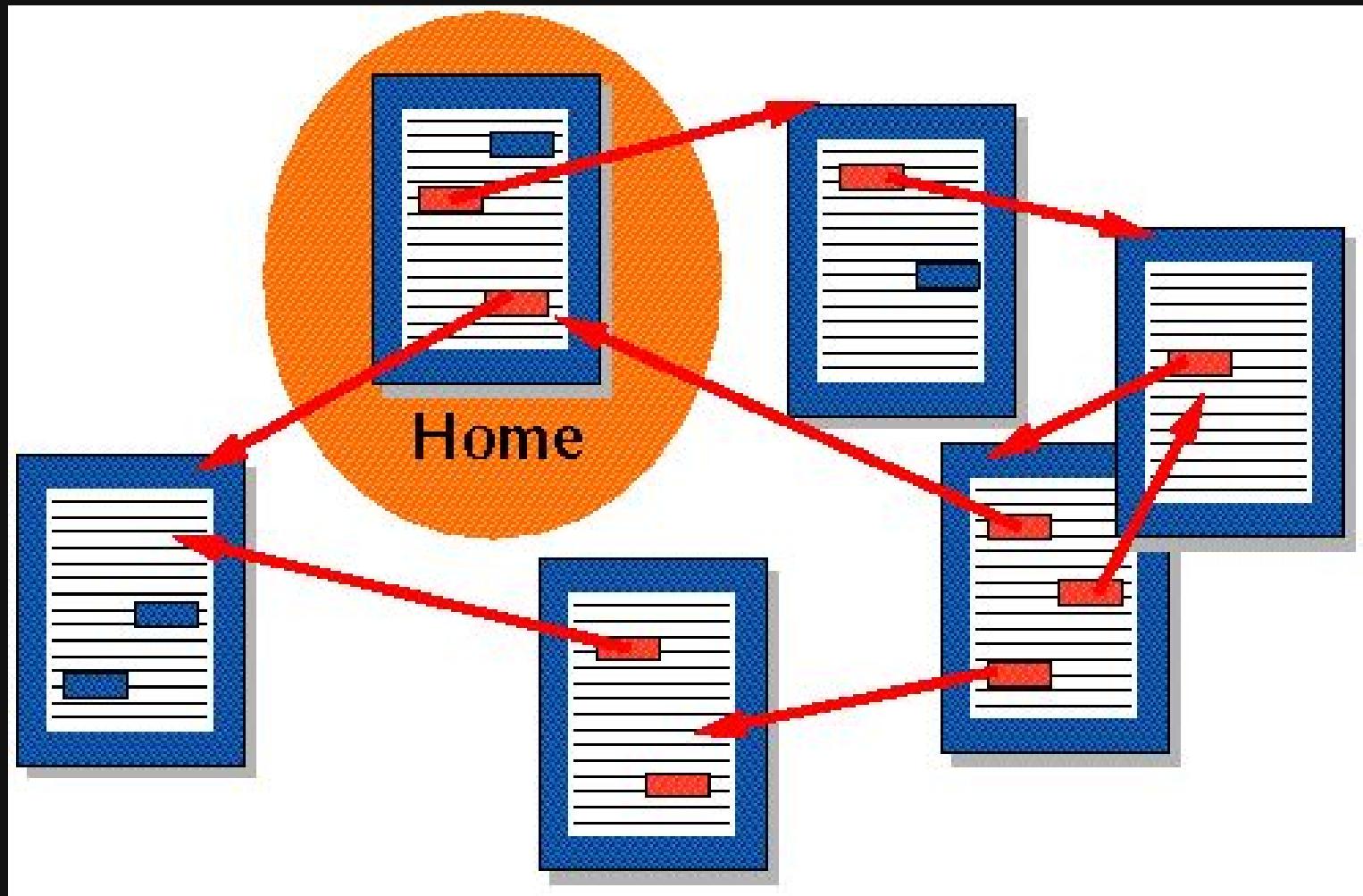




</>htmlx



HOWL
/ >htmlx



```
GET /accounts/12345
```

```
{
  "account": {
    "account_number": 12345,
    "balance": {
      "currency": "usd",
      "value": 100.00
    },
    "status": "good"
  }
}
```

```
<html>
  <body>
    <div>Account number: 12345</div>
    <div>Balance: $100.00 USD</div>
    <div>Links:
      <a href="/accounts/12345/deposits">deposits</a>
      <a href="/accounts/12345/withdrawals">withdrawals</a>
      <a href="/accounts/12345/transfers">transfers</a>
      <a href="/accounts/12345/close-requests">close-requests</a>
    </div>
  </body>
</html>
```

```
GET /accounts/12345
```

```
{
  "account": {
    "account_number": 12345,
    "balance": {
      "currency": "usd",
      "value": -50.00
    },
    "status": "overdrawn"
  }
}
```

```
<html>
  <body>
    <div>Account number: 12345</div>
    <div>Balance: -$50.00 USD</div>
    <div>Links:
      <a href="/accounts/12345/deposits">deposits</a>
    </div>
  <body>
</html>
```

Glory of REST

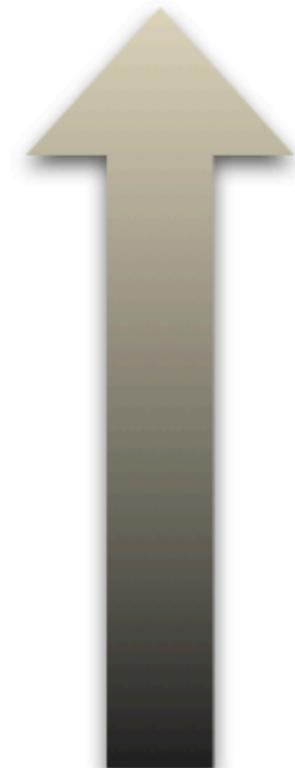


Level 3: Hypermedia Controls

Level 2: HTTP Verbs

Level 1: Resources

Level 0: The Swamp of POX



REST - What exactly is meant by Uniform Interface?

Asked 10 years, 9 months ago Modified 1 year, 7 months ago Viewed 56k times



[Wikipedia has:](#)

59



Uniform interface



The uniform interface constraint is fundamental to the design of any REST service.^[14] The uniform interface simplifies and decouples the architecture, which enables each part to evolve independently. The four guiding principles of this interface are:



Identification of resources

Individual resources are identified in requests, for example using URIs in web-based REST systems. The resources themselves are conceptually separate from the representations that are returned to the client. For example, the server may send data from its database as HTML, XML or JSON, none of which are the server's internal representation, and it is the same one resource regardless.

Manipulation of resources through these representations

When a client holds a representation of a resource, including any metadata attached, it has enough information to modify or delete the resource.

Self-descriptive messages

Each message includes enough information to describe how to process the message. For example, which parser to invoke may be specified by an Internet media type (previously known as a MIME type). Responses also explicitly indicate their cacheability.

Hypermedia as the engine of application state (A.K.A. HATEOAS)





The **Uniform Interface** constraint (that any **ReSTful API** should comply with) suggests that server responses, in addition to containing data, should also announce available actions and resources.

15



In [chapter 5 \("Representational State Transfer"\)](#) of his dissertation, [Roy Fielding](#) states that the aim of using *uniform interfaces* is to:



ease and improve global architecture and the visibility of interactions



In other words, **querying resources should allow the client to request other actions and resources without knowing them in advance.**

The **JSON-API** specs ([jsonapi.org](#)) offer a good example in the form of a JSON response to an (hypothetical) HTTP `GET` request on <http://example.com/articles> :

```
{  
  "links": {  
    "self": "http://example.com/articles",  
    "next": "http://example.com/articles?page[offset]=2",  
    "last": "http://example.com/articles?page[offset]=10"  
  },  
  "data": [{  
    "type": "articles",  
    "id": "1",  
    "attributes": {  
      "title": "JSON API paints my bikeshed!"  
    },  
    "relationships": {  
      "author": {  
        "links": {  
          "self": "http://example.com/articles/1/relationships/author",  
          "related": "http://example.com/articles/1/author"  
        }  
      }  
    }  
  }]
```



Architectural Styles and the Design of Network-based Software Architectures

DISSERTATION

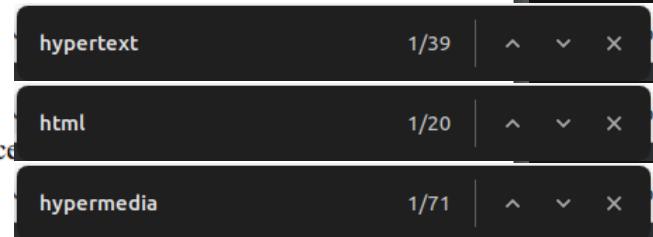
submitted in partial satisfaction of the requirements for the degree of

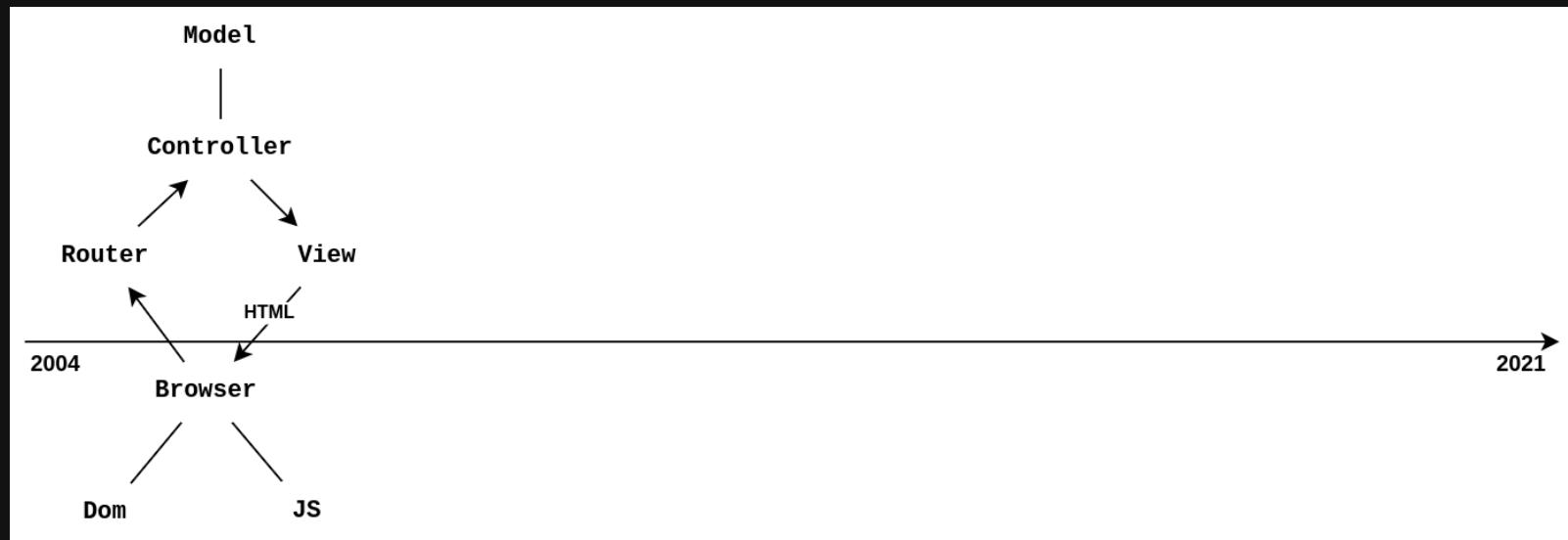
DOCTOR OF PHILOSOPHY

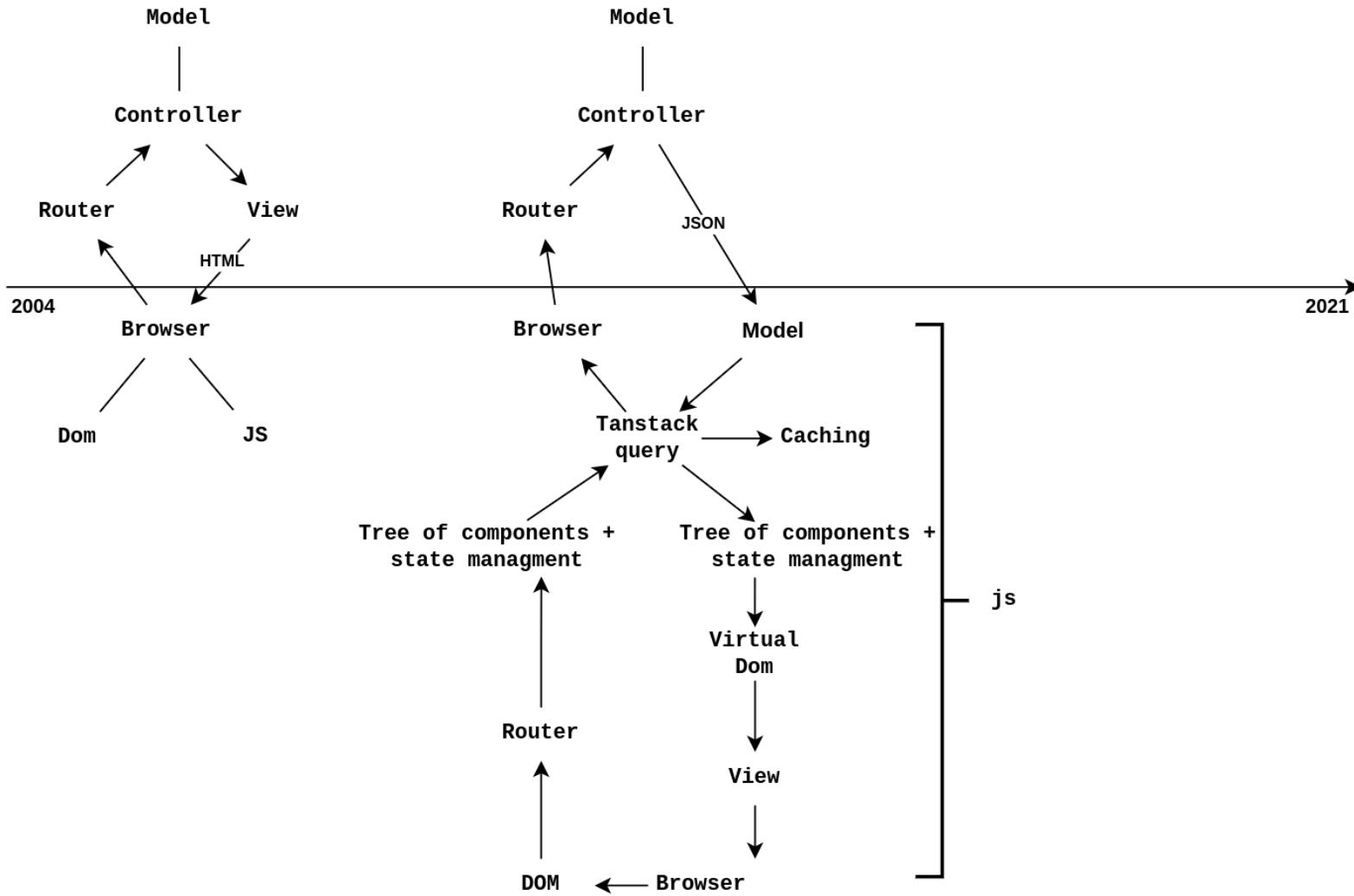
in Information and Computer Science

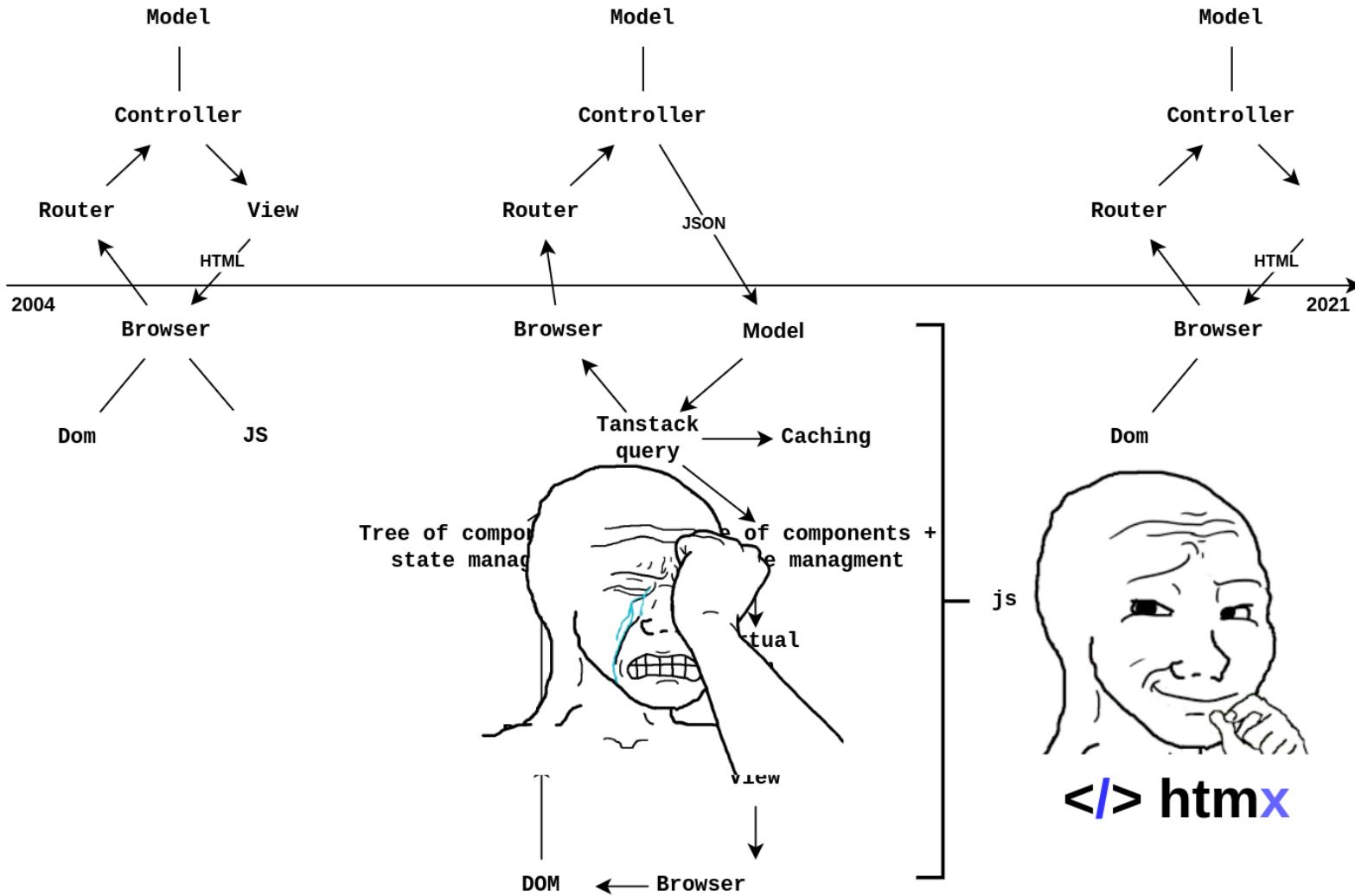
by

Roy Thomas Fielding









How?

- Why should only <a> and <form> be able to make HTTP requests?
- Why should only click & submit events trigger them?
- Why should only GET & POST methods be available?
- Why should you only be able to replace the entire screen?

By removing these constraints, htmx completes HTML as a hypertext

HTMX example 1: validation

```
<p>
  <label for="email">Email</label>
  <input name="email" id="email" type="email"
    placeholder="Email" value="{{contact.email}}"
    hx-get="/contacts/{{contact.id}}/email"
    hx-trigger="change, keyup delay:200ms changed"
    hx-target="next .error">
    <span class="error">{{contact.errors['email']}}</span>
</p>
```

HTMX example 2: Edit

```
<form>
  <article class="focus-dim">
    <header class="action-header">
      <span>Beneficjenci</span>
      <div class="action-header-actions">
        <button hx-get="/organizations/105/beneficjenci" hx-target="closest article" hx-swap="outerHTML">
          // cancel-icon svg boilerplate
        <button hx-put="/organizations/105/beneficjenci" hx-target="closest article" hx-swap="outerHTML">
          // ok-icon svg boilerplate
      </div>
    </header>
    <p>
      <label><b>Liczba Beneficjentów</b></label>
      <input value="180" name="LiczbaBeneficjentow">
    </p>
    <p>
      <label><b>Beneficjenci</b></label>
      <input value="Osoby starsze, samotne" name="Beneficjenci">
    </p>
  </article>
</form>
```

Beneficjenci

Liczba Beneficjentów

180

Beneficjenci

Osoby starsze, samotne

HTMX example 3: Implementation details (1/2)

```
// list.templ
package views

templ ListTable(data []OrganizationSummary) {
    <tbody>
        { for _, row := range data {
            <tr style="position: relative">
                <td>
                    <a href={"/organizations/" + strconv.Itoa(row.Teczka)} hx-target="main">
                        {row.Teczka}
                    </a>
                </td>
                <td>{row.NazwaPlacowkiTrafiaZywnosc}</td>
                // ... add more <td>{ ... }</td> cells as needed
            </tr>
        } }
    </tbody>
}
```

105	Jadłodajnia "Pomocna Dłoń"	ul. Leśna 12, 90-001 Łódź
104	Przedszkole "Razem dla Dzieci"	ul. Słoneczna 5, 80-001 Gdańsk
103	Restauracja "Zdrowie i Smak"	ul. Ogrodowa 22, 50-001 Wrocław
102	Świetlica "Dobroczynność"	ul. Lipowa 7, 30-001 Wrocław

HTMX example 4: Server Sent Events

```
<div hx-ext="sse" sse-connect="/event-source" sse-swap="EventName"></div>
```

SPA Attack!

HOW DO YOU MANAGE
STATE IN THE CLIENT SIDE?



REDUX ZUSTAND PINO MOBX

SPA Attack!



Strategy 1: Expand the target

/organizations/list?search=jadłodajnia&sort=Teczka&dir=asc

Szukaj po teczce, nazwie placówki...									
Teczka	Nazwa placówki	Adres placówki	Gmina/ Dzielnica	Forma prawa	Telefon	Email	Kontakt	Osoba kontaktowa	
105	Jadłodajnia "Pomocna Dłoń"	ul. Leśna 12, 90-001 Łódź	Widzew	Fundacja	+48 42 123 45 67	kontakt@pomocnadlon.org	Krzysztof Nowak, +48 42 123 45 67	Małgorzata Kovalewska	
104	Przedszkole "Razem dla Dzieci"	ul. Śloneczna 5, 80-001 Gdańsk	Śródmieście	Stowarzyszenie	+48 58 345 67 89	kontakt@razemladzieci.org	Ewa Wiśniewska, +48 58 345 67 89	Tonja Kovalewska	
103	Restauracja "Zdrowie i Smak"	ul. Ogrodowa 22, 50-001 Wrocław	Krzyki	Spółka z o.o.	+48 71 234 56 78	kontakt@zdrowieismak.pl	Marek Zieliński, +48 71 234 56 78	Agnieszka Nowak	
102	Świetlica "Dobroczynność"	ul. Lipowa 7, 30-001 Kraków	Stare Miasto	Fundacja	+48 12 345 67 89	kontakt@dobroczylnosc.org	Piotr Nowak, +48 12 345 67 89	Katarzyna Kovalewska	
101	Jadłodajnia "Nadzieja"	ul. Kwiatowa 15, 00-001 Warszawa	Śródmieście	Stowarzyszenie	+48 22 123 45 67	kontakt@nadzieja.org	Jan Kowalski, +48 22 123 45 67	Aneta Nowak	

Strategy 1: Expand the target

/organizations/list?search=jadłodajnia&sort=Teczka&dir=asc

<input type="text"/> Szukaj po teczce, nazwie placówki...							
Tecz.	Nazwa placówki	Adres placówki	Gmina/Dzielnica	Forma prawna	Telefon	Email	K
105	Jadłodajnia "Pomocna Dłoń"	ul. Leśna 12, 90-001 Łódź	Widzew	Fundacja	+48 42 123 45 67	kontakt@pomocnадlon.org	K+
104	Przedszkole "Razem dla Dzieci"	ul. Słoneczna 5, 80-001 Gdańsk	Śródmieście	Stowarzyszenie	+48 58 345 67 89	kontakt@razemdla-dzieci.org	E+
103	Restauracja "Zdrowie i Smak"	ul. Ogrodowa 22, 50-001 Wrocław	Krzyki	Spółka z o.o.	+48 71 234 56 78	kontakt@zdrowieismak.pl	M7
102	Świetlica "Dobroczynność"	ul. Lipowa 7, 30-001 Wrocław	Stare Miasto	Fundacja	+48 12 345 67 89	kontakt@dobroczynosc.org	P1
101	Jadłodajnia "Nadzieja"	ul. Kwiatowa 15, 00-001 Warszawa	Śródmieście	Stowarzyszenie	+48 22 123 45 67	kontakt@nadzieja.org	J2

Expand ur mum! I'm building a complex app here!

Customer Service Sell

Friends 

throws 

SeaRoomy [Shop SeaRoomy](#)

Sponsored  **K**

Subtotal **\$24.99** [Go to Cart](#)

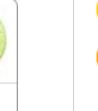
Tortilla Blanket, Baby Burritos Swaddle
Blanket, Taco Blanket for Newborn Toddler,
285 GSM Soft Flannel Wearable Wrap Funny
Gifts for Baby Shower Boy Girl 0-3 6 9 Months
[Visit the Lhedon Store](#)

4.7 ★★★★☆ 3,324 ratings **Amazon's Choice**

1K+ bought in past month

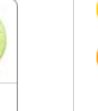
\$18⁹⁹

FREE International Returns ▾
No Import Fees Deposit & \$12.29 Shipping to Poland [Details](#) ▾
Color: Beige

 \$18.99	 1 option from \$17.99	 1 option from \$21.99	 \$17.99	 1 option from \$15.99	 1 option from \$17.99
----------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------

\$18⁹⁹

FREE International Returns ▾
No Import Fees Deposit & \$12.29 Shipping to Poland [Details](#) ▾
Color: Beige

 \$18.99	 1 option from \$17.99	 1 option from \$21.99	 \$17.99	 1 option from \$15.99	 1 option from \$17.99
----------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------

In Stock

Quantity: 1 ▾

Add to Cart **Buy Now**

Ships from Amazon
Sold by Fanli-US
Returns 30-day refund/replacement

Expand ur mum! I'm building a complex app here!

The screenshot shows a dark-themed e-commerce website interface. At the top, there's a navigation bar with a search icon, language selection (EN), account links (Hello, sign in / Account & Lists), returns information, and a cart icon indicating two items. The cart subtotal is \$43.98. Below the navigation, a message says "Added to cart" with a checkmark, followed by "Color: Beige" and "Size: 36 inch". To the right, a "Cart Subtotal: \$43.98" summary includes a yellow "Proceed to checkout (2 items)" button and a "Go to Cart" button. A note encourages users to "sign in to your account". On the left, there's a grid of baby products: a photo frame with footprints, a handprint, and a baby photo; a silver coin with "PADDY'S TURN" and "MOMMY'S TURN"; a white t-shirt with the text "FEELIN' CUTE MIGHT SHIT ITSELF LATER"; a yellow plush toy shaped like a taco with a smiling face; and a grey t-shirt with a "TACO 'BOUT CUTE!" graphic. On the right, another grid shows a tortilla and a burrito for \$18.99, and a product with the word "fuck" in a stylized font for \$24.99. The bottom right corner shows "Page 1 of 4".

Customer Service Sell

Added to cart

Color: Beige
Size: 36 inch

Cart Subtotal: \$43⁹⁸

Proceed to checkout (2 items)

Go to Cart

For best experience [sign in to your account](#)

Page 1 of 4

Subtotal
\$43.98

Go to Cart

K

\$18.99

1 +

\$24.99

1 +

Strategy 2: Out of band swaps

```
<div>
  Item added to cart
</div>
<div id="cartItemsCount" hx-swap-oob="true">
  2
</div>
<div id="cartItemsPreview" hx-swap-oob="true">
  <li>
    ...
  </li>
  ...
</div>
```

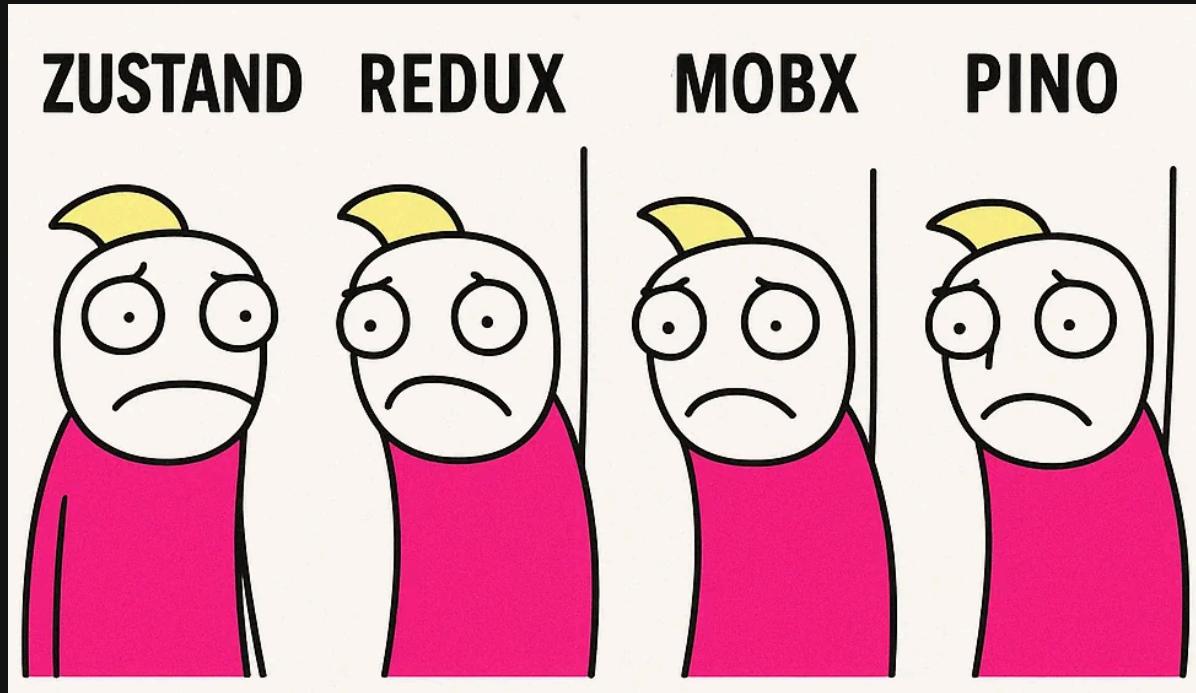
Strategy 3: Events

```
<tbody id="contacts-table" hx-get="/contacts/table" hx-trigger="newContact from:body">  
  ...  
</tbody>
```

HTTP/1.1 200 OK

HX-Trigger:newContact

Client side state summary:



A real success story

<https://www.youtube.com/watch?v=3GObi93tjZI>

	Django + React	Django + htmx
Python (LoC)	500	1,200
HTML + CSS + JS (LoC)	21,000	6,000 (1,500 + 3,500 + 1,000)
JS deps (sub-deps)	49 (255)	5 (9)
JS + CSS build time	41s	5s

A real success story

<https://www.youtube.com/watch?v=3GObi93tjZI>

	Django + React First load	Django + React Second load	Django + htmx
Time-to-interactive Nav + Right column	6s	2s	2s
Time-to-interactive Left column, 50 items	2s	2s	1s
Time-to-interactive Left column, 3,000 items	n/a	n/a	2s
Memory usage	75MB	75MB	40MB

Recent example from my work:

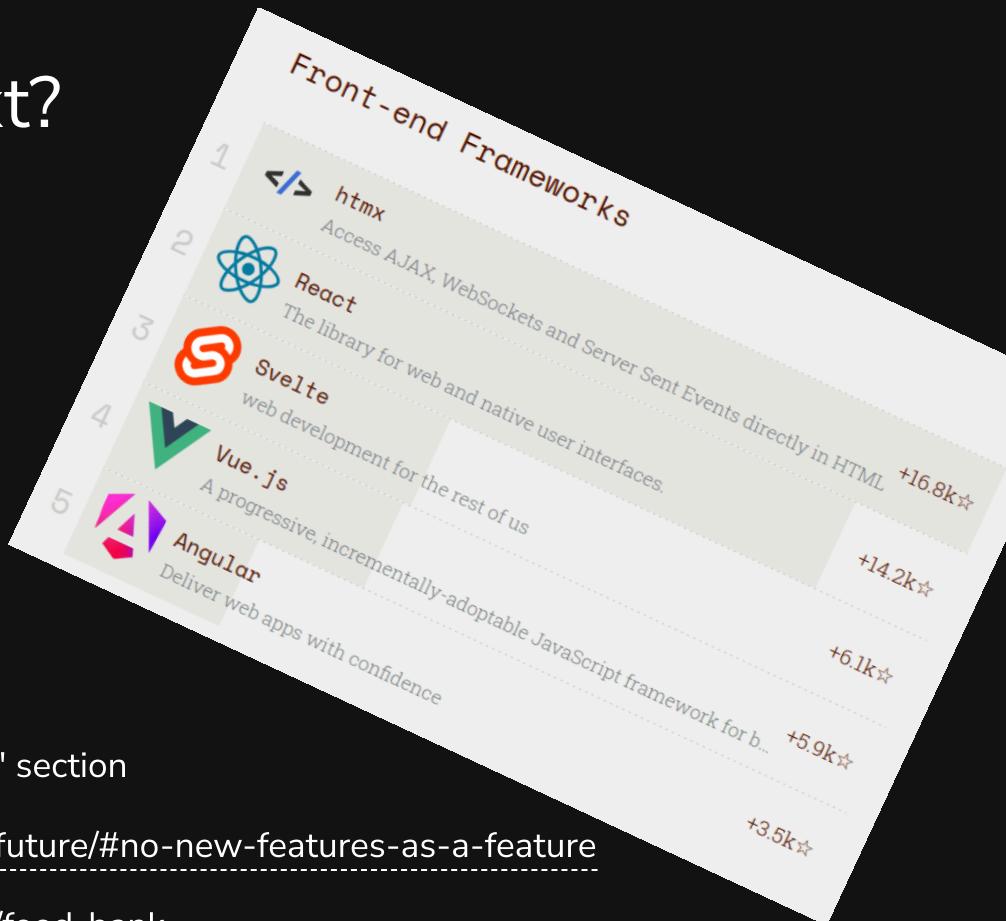
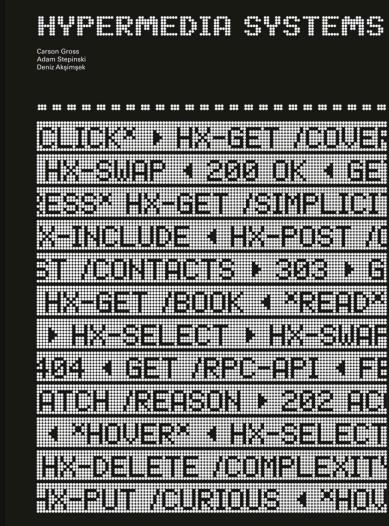
-  [SCMD-9495] disable tss for non aws accounts [BE] • ✓ TinkerBell Review Finished

#5659 opened yesterday by sfc-gh-mgolenia • Review required  4 tasks done

-  [SCMD-9495] disable tss for non aws accounts [FE] ✓

#5641 by sfc-gh-mgolenia was merged 2 days ago • Review required  4 of 5 tasks

Where to go next?



<https://htmx.org/> -> great "essays" section

Also see: <https://htmx.org/essays/future/#no-new-features-as-a-feature>

<https://github.com/Good-Function/food-bank>

We talked about:

1. </htmx> uses javascript so you don't have to.
2. </htmx> is a great way to build REST style systems. Most JSON APIs aren't REST.
3. </htmx> makes you to think about the fundamentals of Web development.
4. Learn </htmx> once, use it with programming language you love.
5. With SSR and </htmx> lack of client state management is not a blocker.
6. With SSR and </htmx> rich UI like active search, page transitions, fast navigation with good UX is possible and simple!
7. One app is simpler than 2 apps (versioning, permissions, localization, infra, deployments,...)

Questions?