
Web Development Somewhat differently

By Peter Ullrich

Who am I?

- Peter Ullrich
- RuG Alumni
- Senior/Staff Elixir (Backend) Developer and Team Lead
- Previously: Remote.com & Jobvalley
- Currently: Founder of IndieCourses.com and Freelancer
- Side-projects: Blog, Podcast, YouTube, Conference Talks, Book, Video Course
- More on: peterullrich.com



Why am I here?

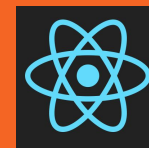
- SPA vs SSR vs ?
- Reactive Server-side Rendered (rSSR)
 - Phoenix LiveView (Elixir)
 - Livewire (PHP)
 - Vaadin (Java)
 - Many more (<https://github.com/liveviews/liveviews>)
- But why?

How to build for the Web

Django (Python)
Laravel (PHP)
Rails (Ruby)
Spring (Java)
Phoenix (Elixir)

Web Framework

+



-
- Stateless
 - Low complexity

- Stateful
 - High complexity
-

Do I really need an SPA?

Listing Movies (62058)

[New Movie](#)

Title	Rating	Year ▾	Description	Review user count	Review user score	Review meta score	Imdb url	
A Fall from Grace	TV-MA	2020	Disheartened since her ex-husband's affair, Grace Waters feels restored by a new romance. But when secrets erode her short-lived joy, Grace's vulnerable side turns violent.	9339	5.8	34	Link	Show Edit Delete
Assassin 33 A.D.	PG-13	2020	While doing research , a group of young geniuses accidentally stumble upon a secret terrorist plot to create a time machine to go back in time and change history.	920	3.7		Link	Show Edit Delete

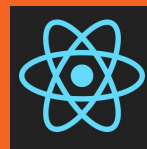
How to build for the Web

rSSR



Web Framework

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Django (Python)

Laravel (PHP)

Rails (Ruby)

Spring (Java)

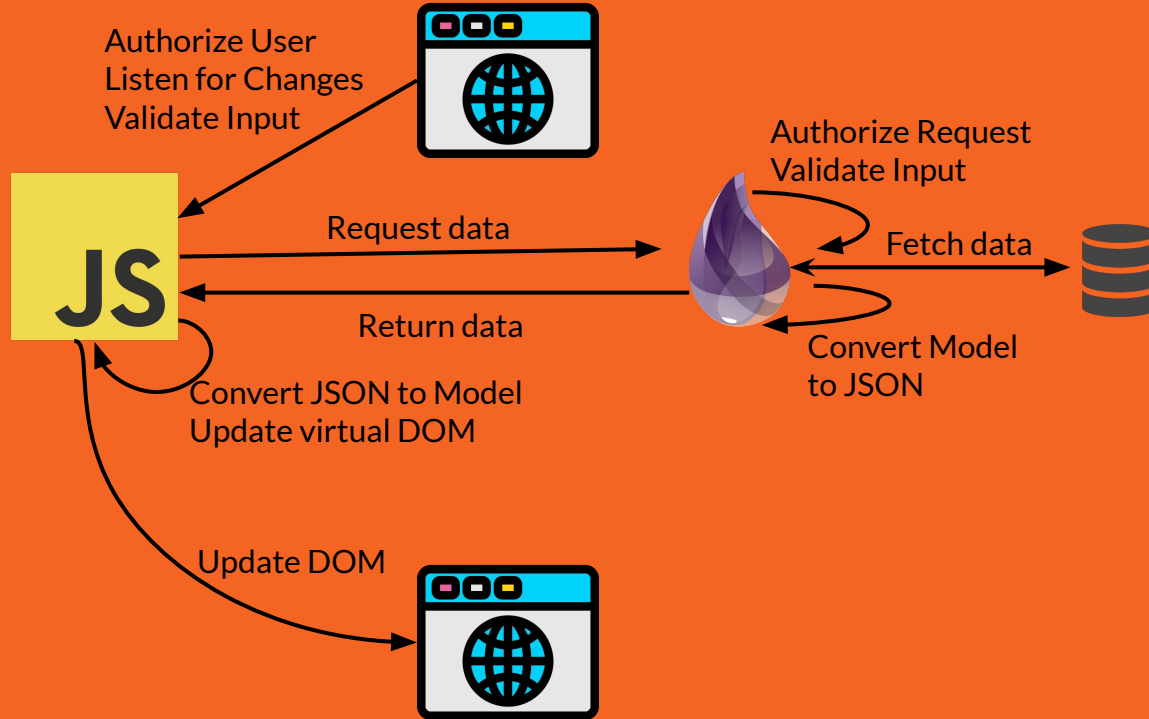
Phoenix (Elixir)

- Stateless
- Low complexity

- Stateful
- High complexity

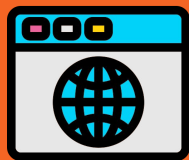
Example: SPA

Search for a movie



Example: rSSR

Search for a movie



JS

Listen for changes
Send/Listen for WebSocket messages
Update DOM



Fetch data



No more:

- Duplicate Models
- Duplicate Auth and Validation Logic
- Separate codebases
- Two languages

Authorize User
Listen for Changes
Validate Input
Update internal state

Temperature Demo

So, how does it work? -> Change tracking!

LiveEEx Template

```
liv class="bar">
  <%= strftime!(@time, "%r") %>
  <span><%= @val %></span>
  <a phx-click="dec">-</a>
  <a phx-click="inc">+</a>
</div>
```

Compiled

```
arg0 =
  if changed?(__changed__, :time) do
    strftime!(assigns.time, "%r")
  end

arg1 =
  if changed?(__changed__, :val) do
    assigns.val
  end

%Phoenix.LiveView.Rendered{
  static: [
    "<div class=\"bar\">\n",
    "\n<span>",
    "%</span><a phx-click=\"dec\">...",
  ],
  dynamic: [arg0, arg1],
  fingerprint: 10166643792495386329
}
```

Server Mount

```
0: "cooling",
1: "11:53:41 PM",
2: "72",
3: "cooling",
static: [
  '<div class="bar ',
  '">',
  '<span>',
  '</span>',
  '<a phx-click="dec">-</a><a phx-click...',
  '</div>'
]
```

```
<div class="bar <%= @mode %>">
  <%= strftime!(@time, "%r") %>
  <span><%= @val %>°</span>
  <a phx-click="dec">-</a>
  <a phx-click="inc">+</a>
  <%= @mode %>
</div>
```

Server Update

```
assign(socket, :val, 70)
```

```
assign(socket, mode: :heating)
```

```
<div class="bar" <%= @mode %>">  
  <%= strftime!(@time, "%r") %>  
  <span><%= @val %>°</span>  
  <a phx-click="dec">-</a>  
  <a phx-click="inc">+</a>  
  <%= @mode %>  
</div>
```

Data on the wire

```
{2: 70}
```

```
{  
  0: "heating",  
  3: "heating"  
}
```

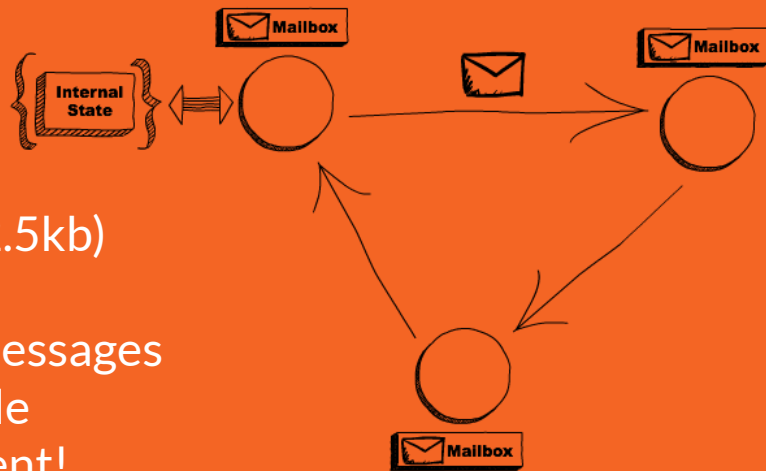
Uses morphdom to
update the DOM

Messages Demo

Why is LiveView better than e.g. Livewire? -> Elixir!

Elixir:

- Functional & dynamic programming language
- Ruby-like syntax
- 12-years old
- Built on erlang (1986, 38y old)
- Which gives us the **Actor Model**
 - Many lightweight processes (~2.5kb)
 - Own HEAP/state
 - Communication only through messages
 - Fault-tolerant -> Highly available
- So, Elixir is great for Web development!



Movies Demo

peterullrich.com/rug

Thank you!

Slides and Code on GitHub: github.com/pjullrich/uog-webdev-2024

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