

Zeppelin Helium : Spell

[1ambda](#)

ZEPL

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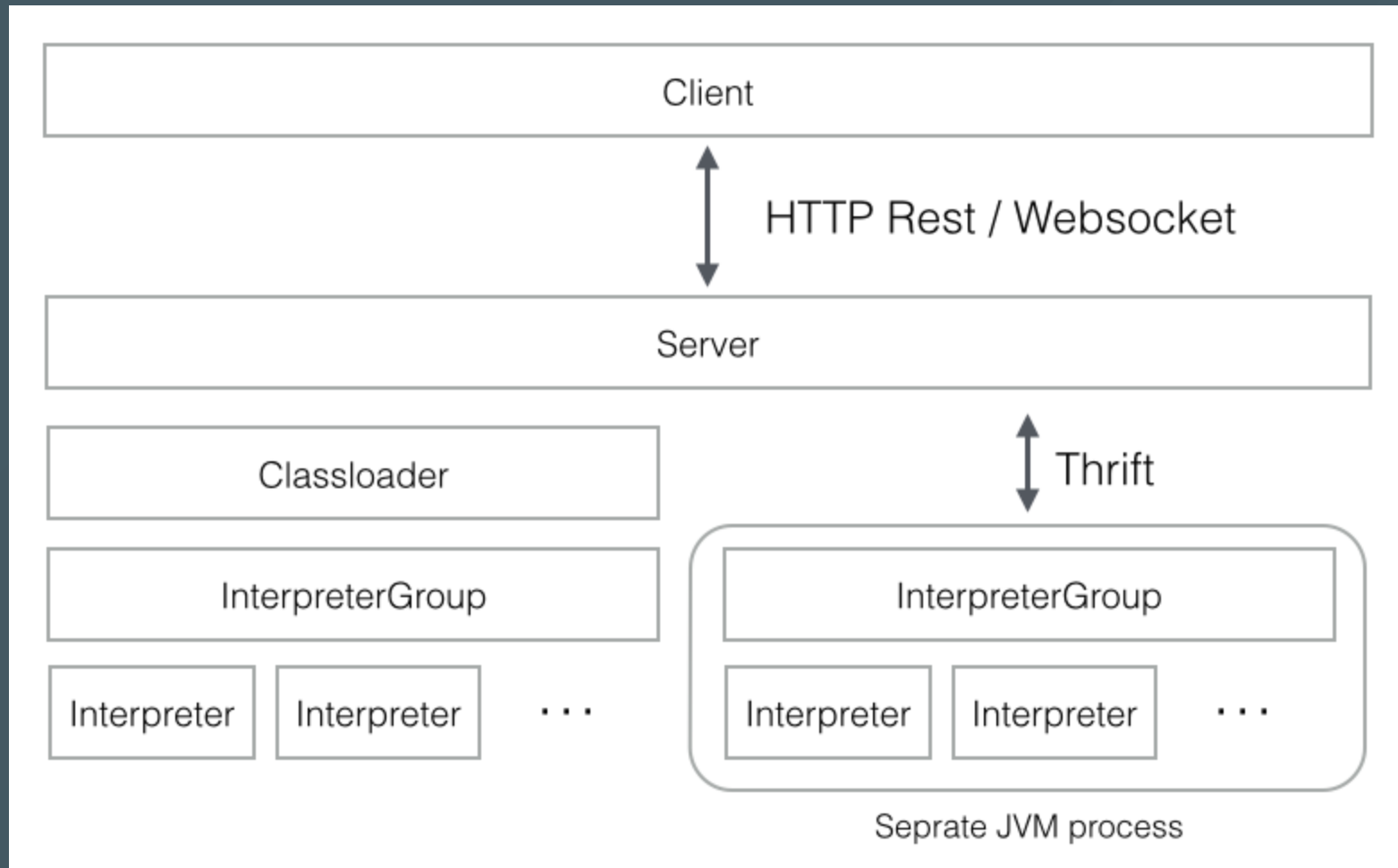
What is Spell?

Frontend interpreter **runs on browser** not in backend.

- **pluggable**
- **written in javascript**
- **can be display system**
- available in **0.8.0-SNAPSHOT** ([ZEPPELIN #1940](#))

What?! 🤔

Background: Interpreter



Background: **Interpreter** (cont.)

- Interpreter consumes paragraph text and render output.
- Each interpreter has **magic**. For example, the markdown interpreter uses `%markdown`

```
%spark
```

```
println("Hello, Zeppelin!")
```

```
%markdown
```

```
## Hello, Zeppelin
```

Background: Display System

- Display system renders result which already translated by backend interpreters **on browser** (Basic Display System: `%html`, `%table`, `%angular`)

```
%spark
```

```
val total = 195
```

```
println(s"%html <h3>result is ${total}</h3>")
```

```
// will be interpreted by spark interpreter
```

```
// `%html <h3>total value is 195<h3>`
```

- Can we do better? (e.g. `%markdown` display type)

Motivation: Spell

- How can i pass variables from spark to markdown in Zeppelin
- Do we really need **backend** markdown interpreter? (awesome js markdown library)
- What if we implement `%markdown` as a **frontend** interpreter?
- Then, **we can also use them as display system** because it runs on browser like `%html` 😊

This is Spell 🧐

Frontend interpreter runs on browser not in backend.

- **pluggable**: can be installed / removed easily ([Helium Online Registry](#))
- **written in javascript**: can utilise existing libraries ([flowchart](#), [sigma.js](#), [vega](#), [papaparse](#), ...)
- **can be display system as well** ([ZEPPELIN-2089](#))

DEMO

I wanna create my own spell 🤖

- [Doc: How to create new spell](#)
- [Basic Examples](#)
- [Published Spells](#)
- [Configuration Support: #1982](#)
- Ideas: `%slack`, `%sigma`, `%vega`

DEMO

1. **zeppelin-echo-spell**
2. **zeppelin-markdown-spell**

Creating Spell: **interpret()**

- every spell takes paragraph text (**string**)
- returns **SpellResult**
- [spell-base.js](#)
- example: [zeppelin-echo-spell](#)

```
interpret(paragraphText) {  
    return new SpellResult(paragraphText)  
}
```

Creating Spell: **SpellResult**

- `SpellResult(data, displayType)`
- `displayType` can be optional (default is `%text`)

```
import {
  SpellBase,
  SpellResult,
  DefaultDisplayType,
} from 'zeppelin-spell';

interpret(paragraphText) {
  const html = `

## ${paragraphText}</h2>`; return new SpellResult(html, DefaultDisplayType.HTML) }


```

Creating Spell: **SpellResult** (cont.)

- **SpellResult** supports multiple results: `add()`
- See also: [Multiple paragraph results \(PR #1658\)](#)

```
interpret(paragraphText) {  
    const html = '<h4>Hello</h4>'  
    const text = 'Spell'  
  
    return new SpellResult()  
        .add(html, DefaultDisplayType.HTML)  
        .add(text, DefaultDisplayType.TEXT /** optional */)  
}
```

Creating Spell: **SpellResult** (cont.)

- pass **Promise** for **API call** (async)
- pass **Function** which takes elem id to **draw DOM**
- [default display types](#)

data	displayType	example
String	ALL (except %element)	<u>markdown-spell</u>
Promise	ALL (except %element)	<u>translator-spell</u>
Function	ELEMENT (%element)	<u>flowchart-spell</u>

Creating Spell: Configuration

- Actually, `interpret()` takes `config` as the second argument

```
interpret(paragraphText, config) { ... }
```

- Define config specification in [`package.json`](#) like

```
"config": {  
  "repeat": {  
    "type": "number",  
    "description": "How many times to repeat",  
    "defaultValue": 1  
  }  
},
```


(unresolved) Helium, Spell Issues

we need your help 🥹

- [ZEPPELIN-2089](#): Use spell as display system with backend interpreters
- [ZEPPELIN-2088](#): Evaluate helium bundles one by one
- [ZEPPELIN-2122](#): Add execution time to paragraphs executed by spell
- [Other Issues](#)

References

- Image: [Zeppelin Interpreter Architecture](#)

Resources

- Slide: [github.com/1ambda/talk/2017/fly-zeppelin](#)

Thanks 😊