Building Web APIs in R with Plumber

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RStudio


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1. What is an API?
2. What is Plumber?
3. Demo
4. Tips & tricks

1. **What is an API?**
2. What is Plumber?
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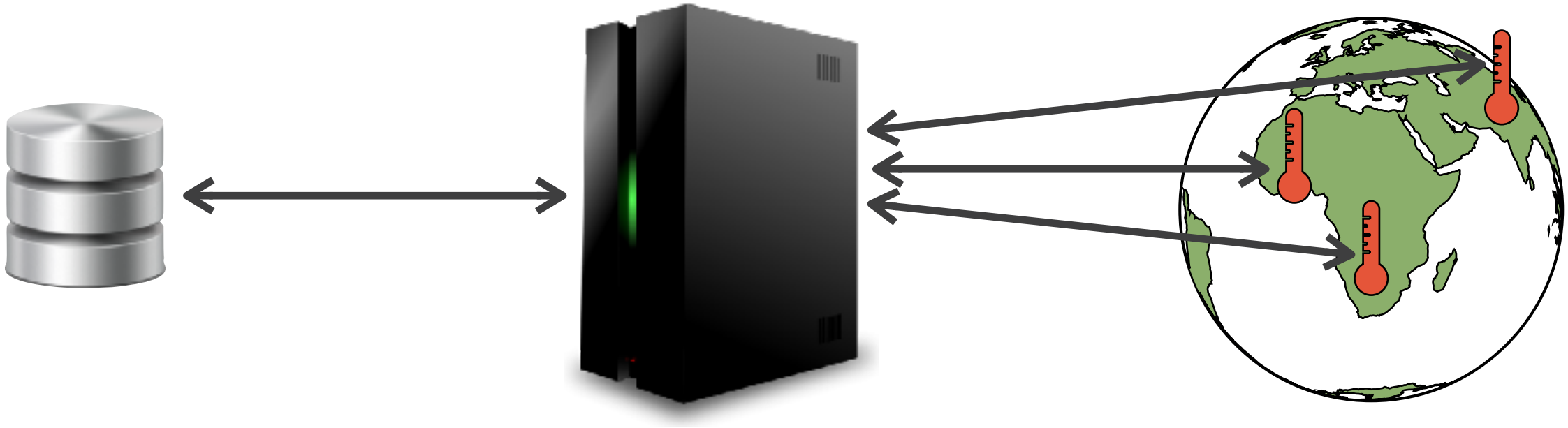
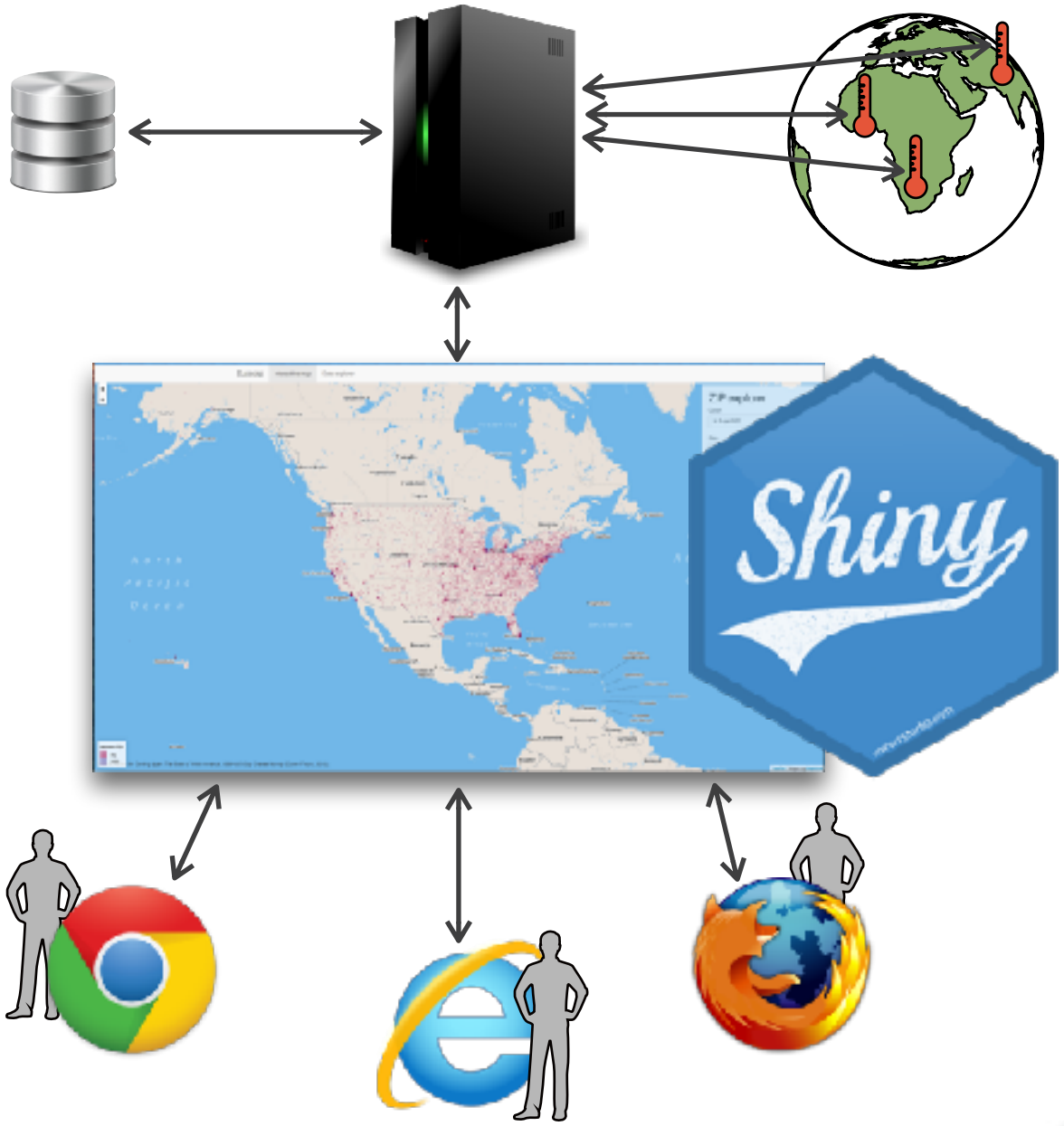
Web APIs

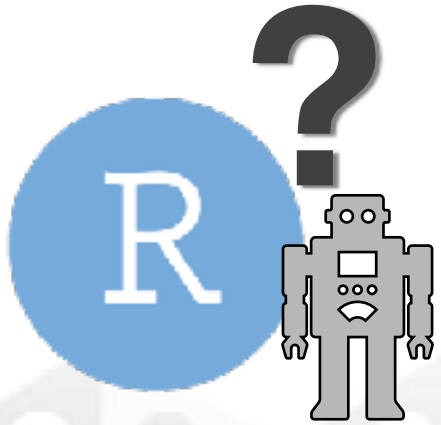
- Machine-friendly data formats (JSON)
- Programmatically consumed
- Accessible from all major programming languages and platforms
  - Including R (httr), and web browsers

Weather System

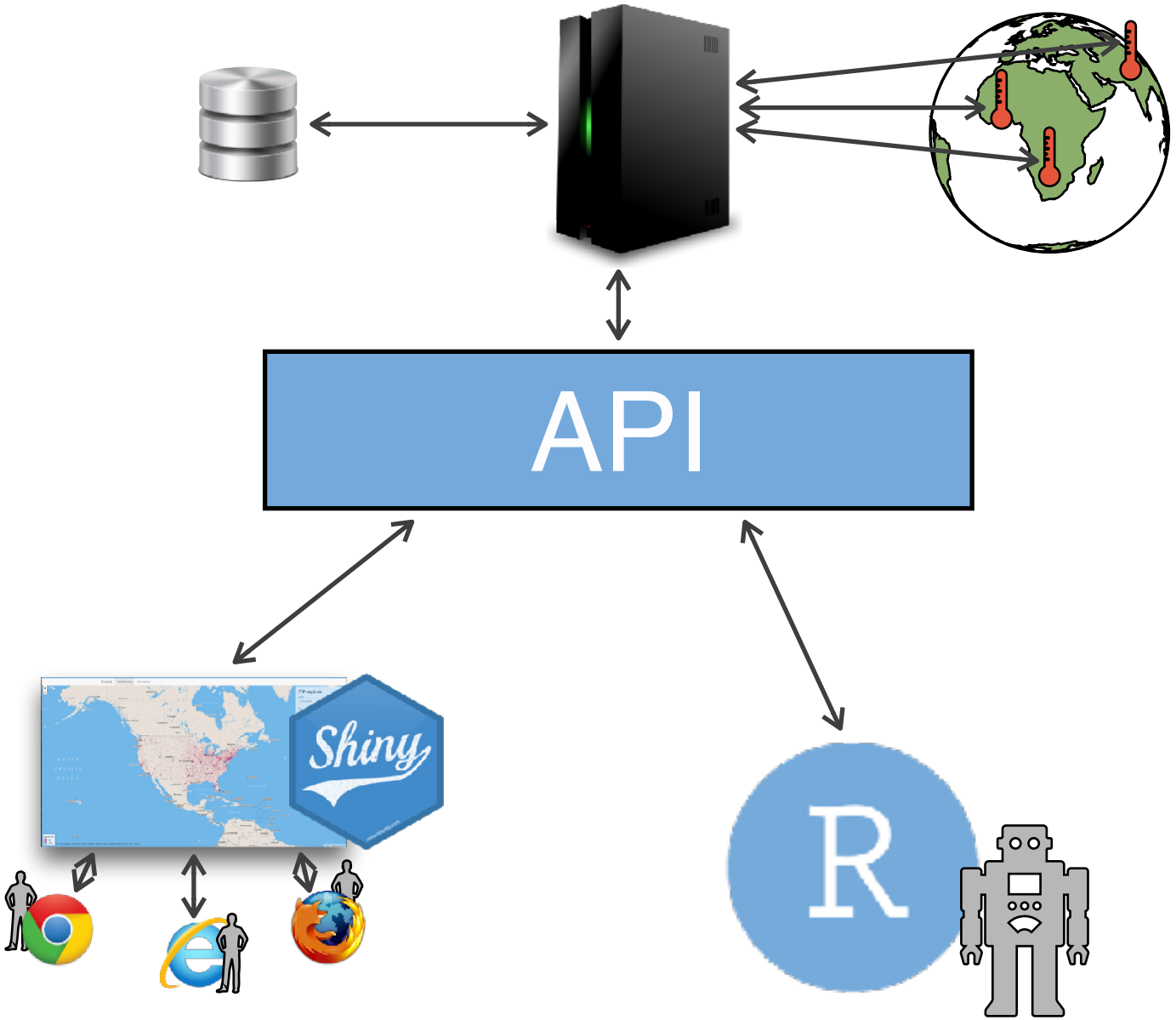


Weather System





Weather System



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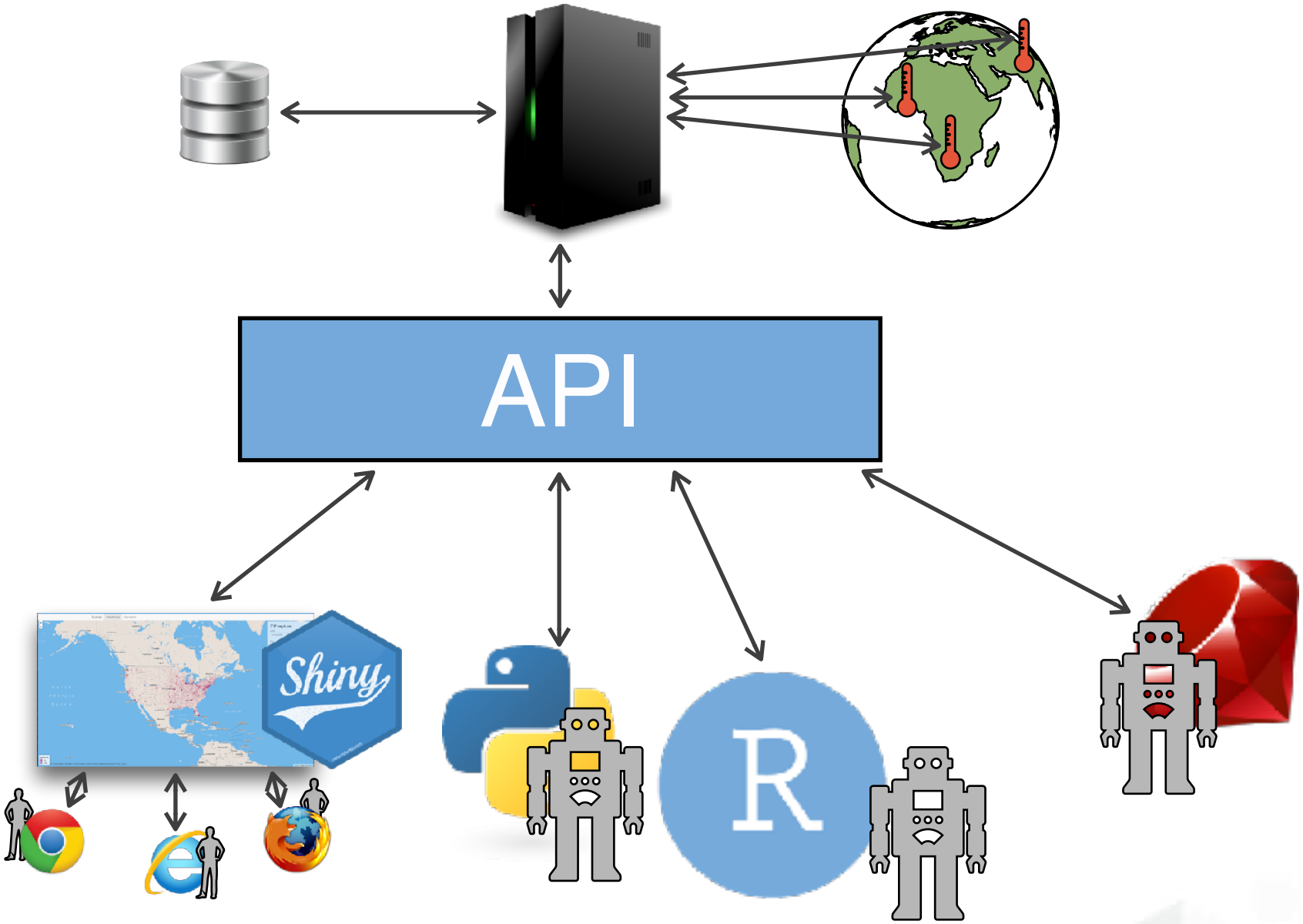
Weather System



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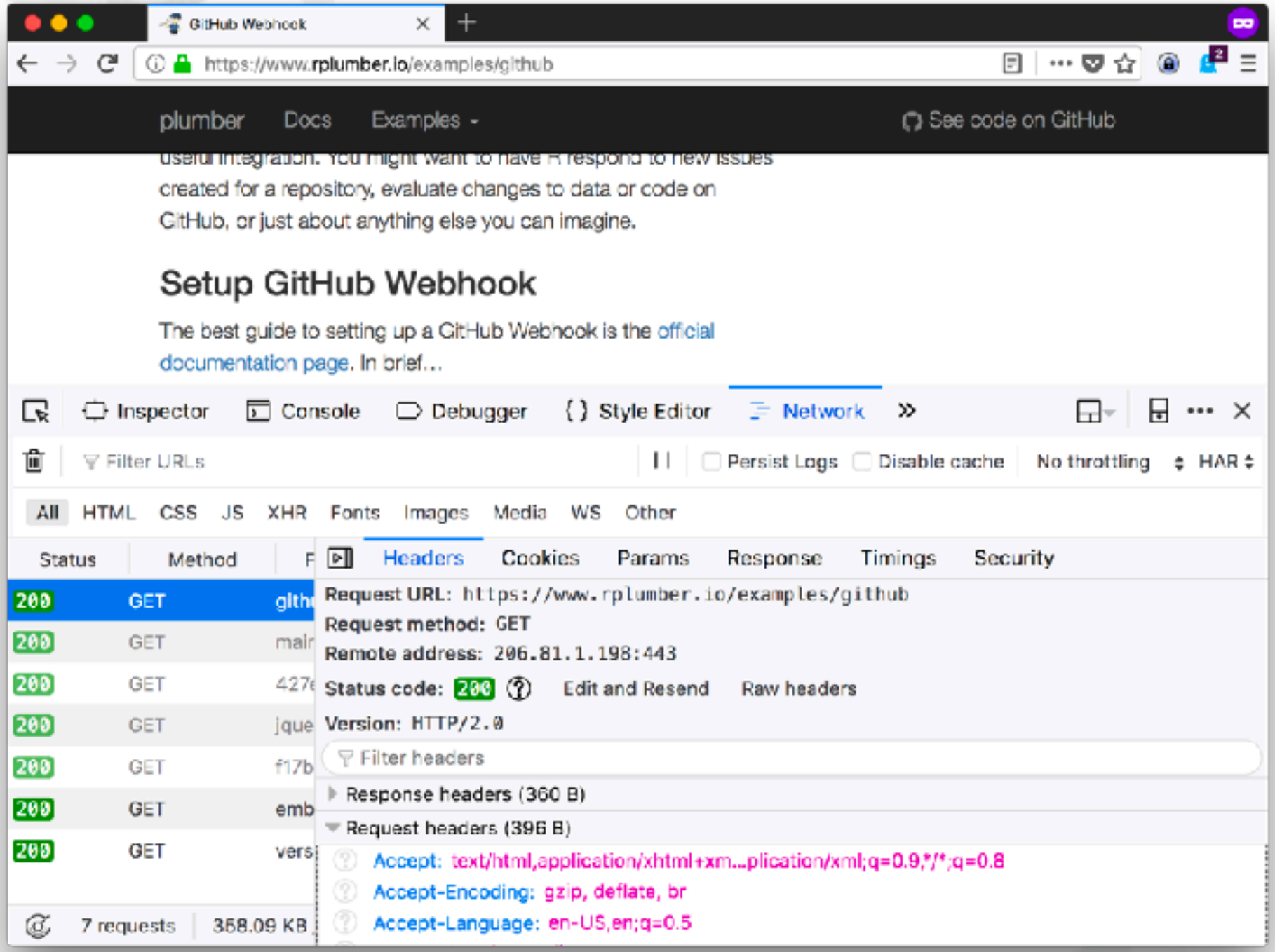
Hypertext Transfer Protocol (HTTP)

- Specify the "path" of the request: `/hello.html`
- Different types of requests: `GET`, `POST`, `PUT`, `DELETE`, etc.
  - Browsers default to `GET`
- "REST" is a common convention for organizing APIs


GitHub Webhook
https://www.rplumber.io/examples/github
plumber
Docs
Examples
See code on GitHub
created for a repository, evaluate changes to data or code on
GitHub, or just about anything else you can imagine.
Setup GitHub Webhook
The best guide to setting up a GitHub Webhook is the official
documentation page. In brief...
Inspector
Console
Debugger
Style Editor
Network
Filter URLs
Persist Logs
Disable cache
No throttling
HAR
All
HTML
CSS
JS
XHR
Fonts
Images
Media
WS
Other
Status
Method
Headers
Cookies
Params
Response
Timings
Security
200
GET
Request URL: https://www.rplumber.io/examples/github
Request method: GET
Remote address: 206.81.1.198:443
Status code: 200
Edit and Resend
Raw headers
Version: HTTP/2.0
Filter headers
Response headers (360 B)
Request headers (396 B)
Accept: text/html,application/xhtml+xm...plication/xml;q=0.9,*/*;q=0.8
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.5
7 requests
368.09 KB

1. What is an API?
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APIs with Plumber

- Open-source R package
- Converts your existing R code into web APIs using special comments
- `install.packages("plumber")`

```
#* @get /echo
function(msg){
  paste("You said:", msg)
}
```

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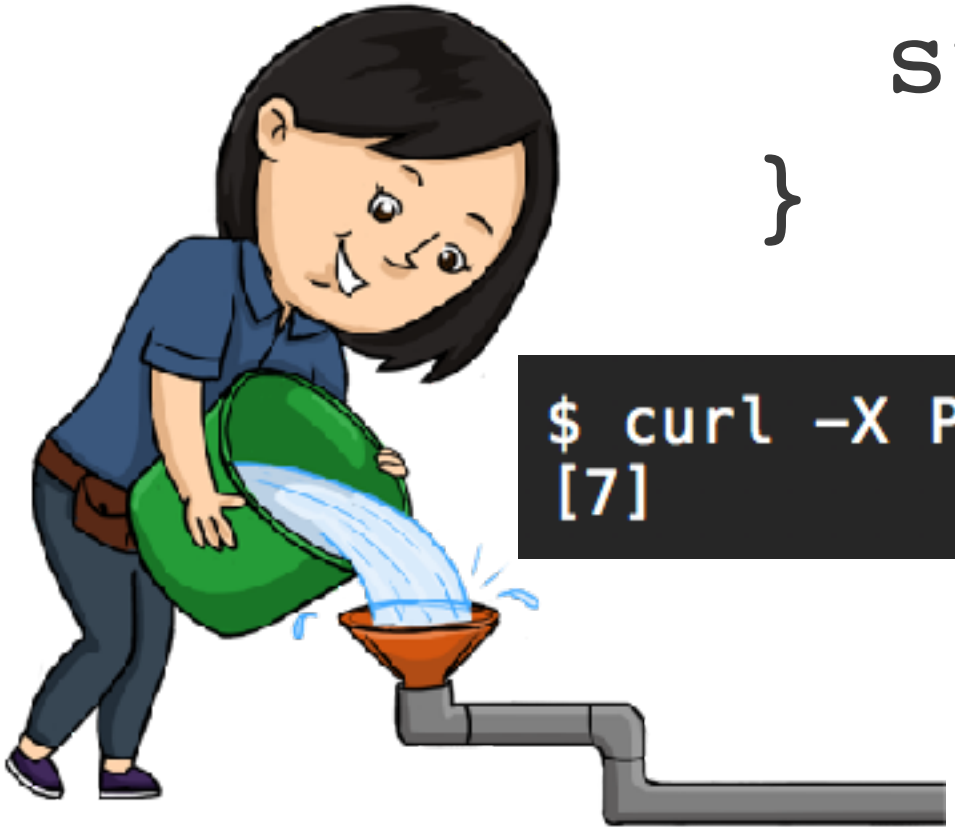
```
#* @post /sum
function(a, b){
   sum(a,b)
}
```



```
$ curl -X POST "http://localhost:8000/sum?a=3&b=4"
[7]
```

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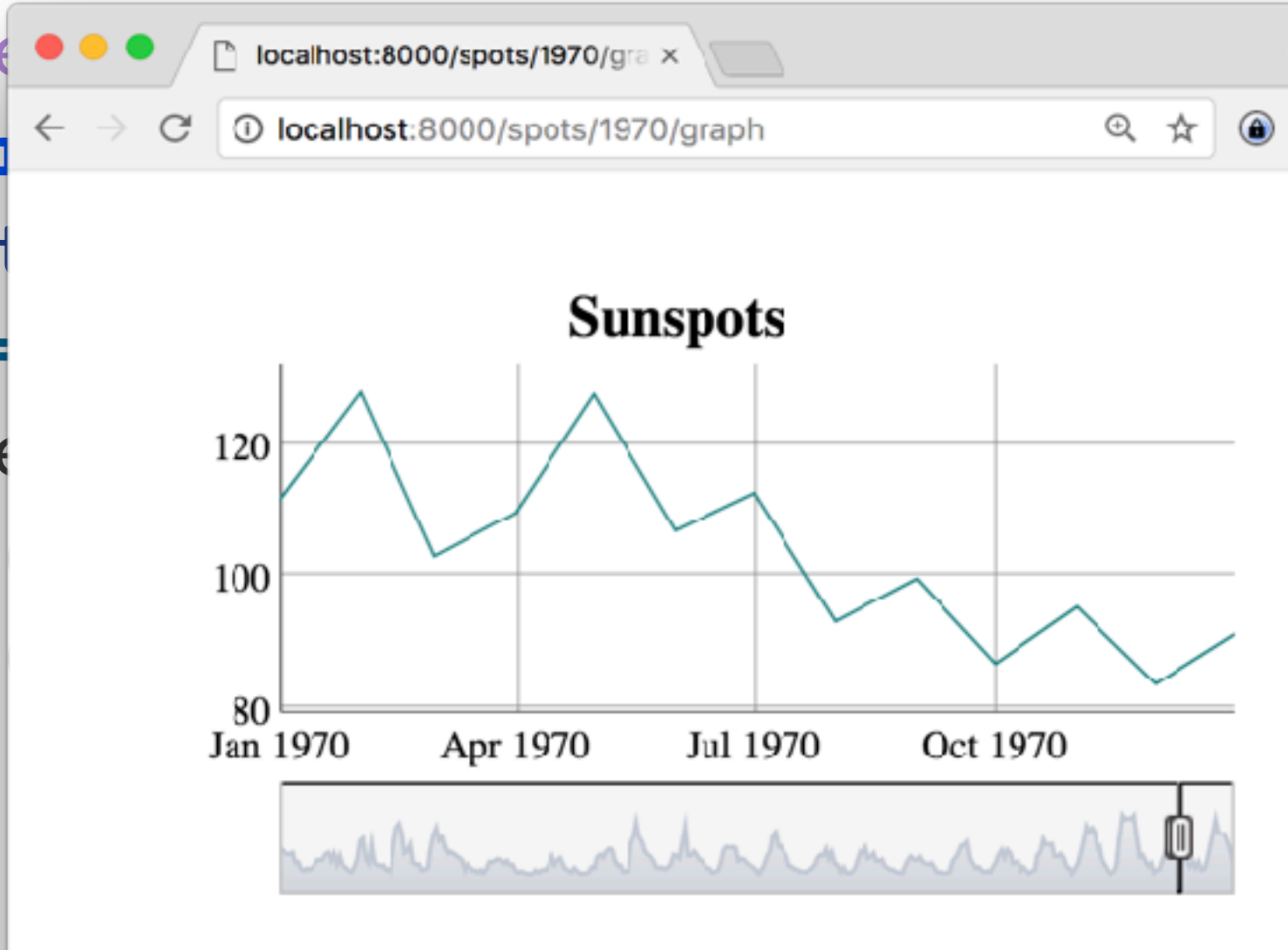
```
library(dygraphs)

#' @get /spots/<year>/graph
#' @serialize
function(yea
  dygraph(dat
      main =
    dyRangeSe
      paste0
      paste0
    )
}
```



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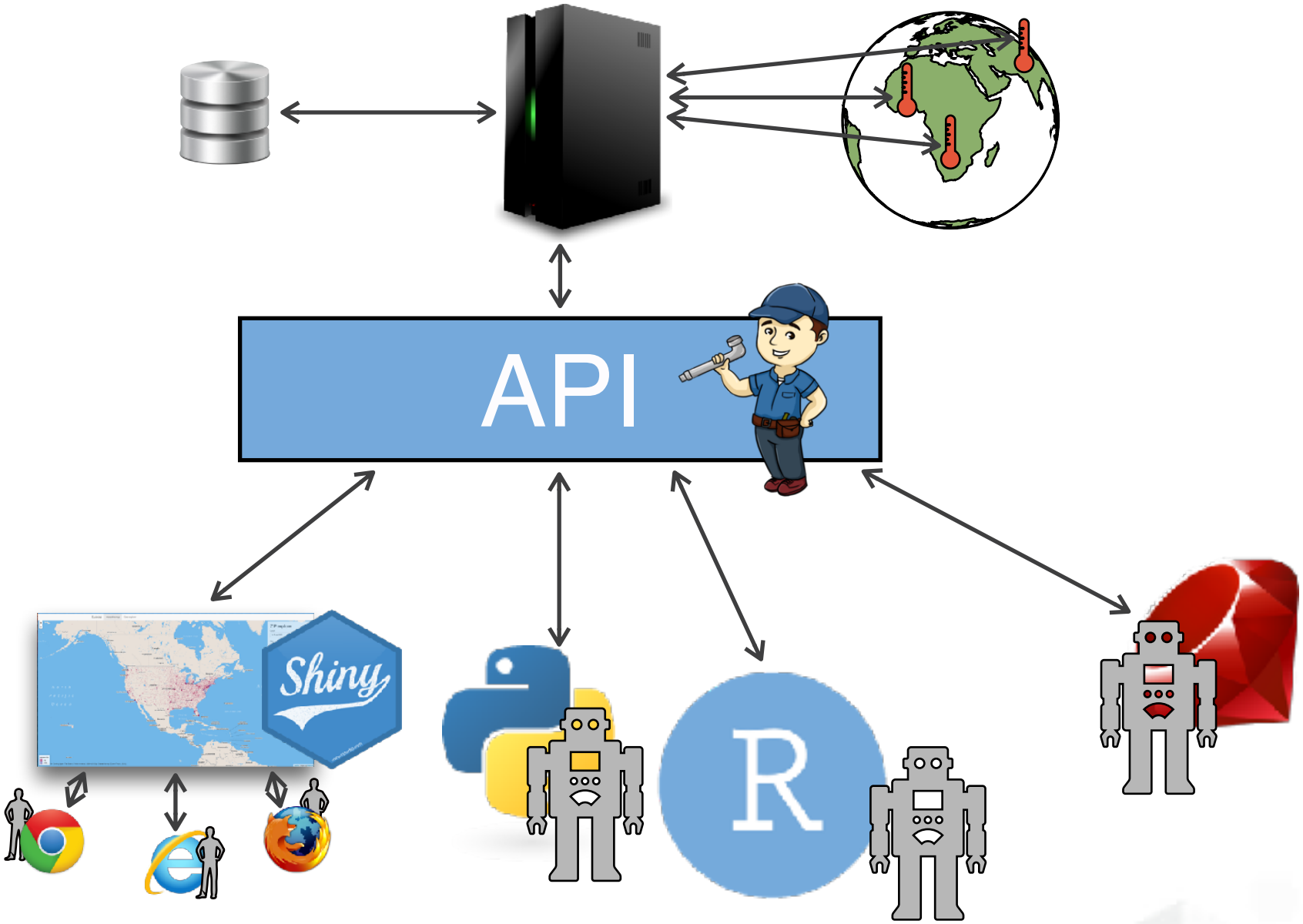
APIs with Plumber

```
library(plumber)
pr <- plumb("plumber.R")
pr$run(port=8000)

# OR

plumber::plumb("plumber.R")$run(port=8000)
```

Weather System



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Compare to…

- Porting your existing software to R
- Porting your existing R code to another language

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Text recently used emojis to

972-218-0013

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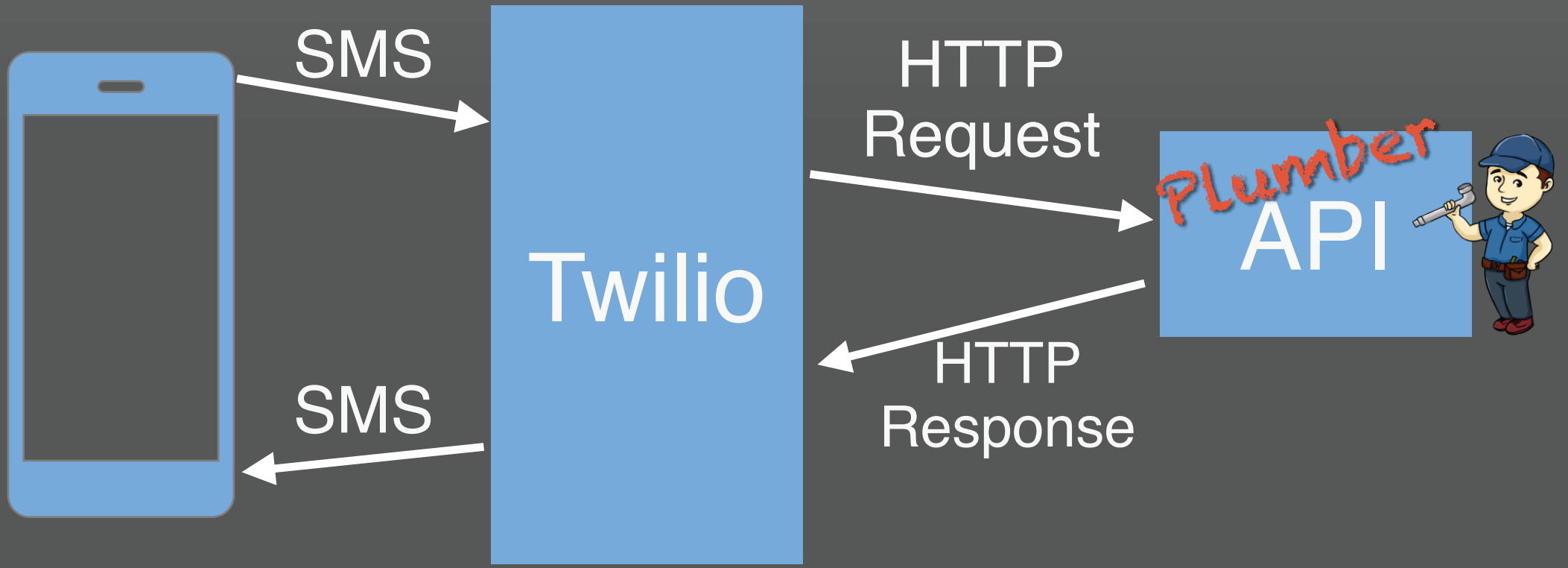

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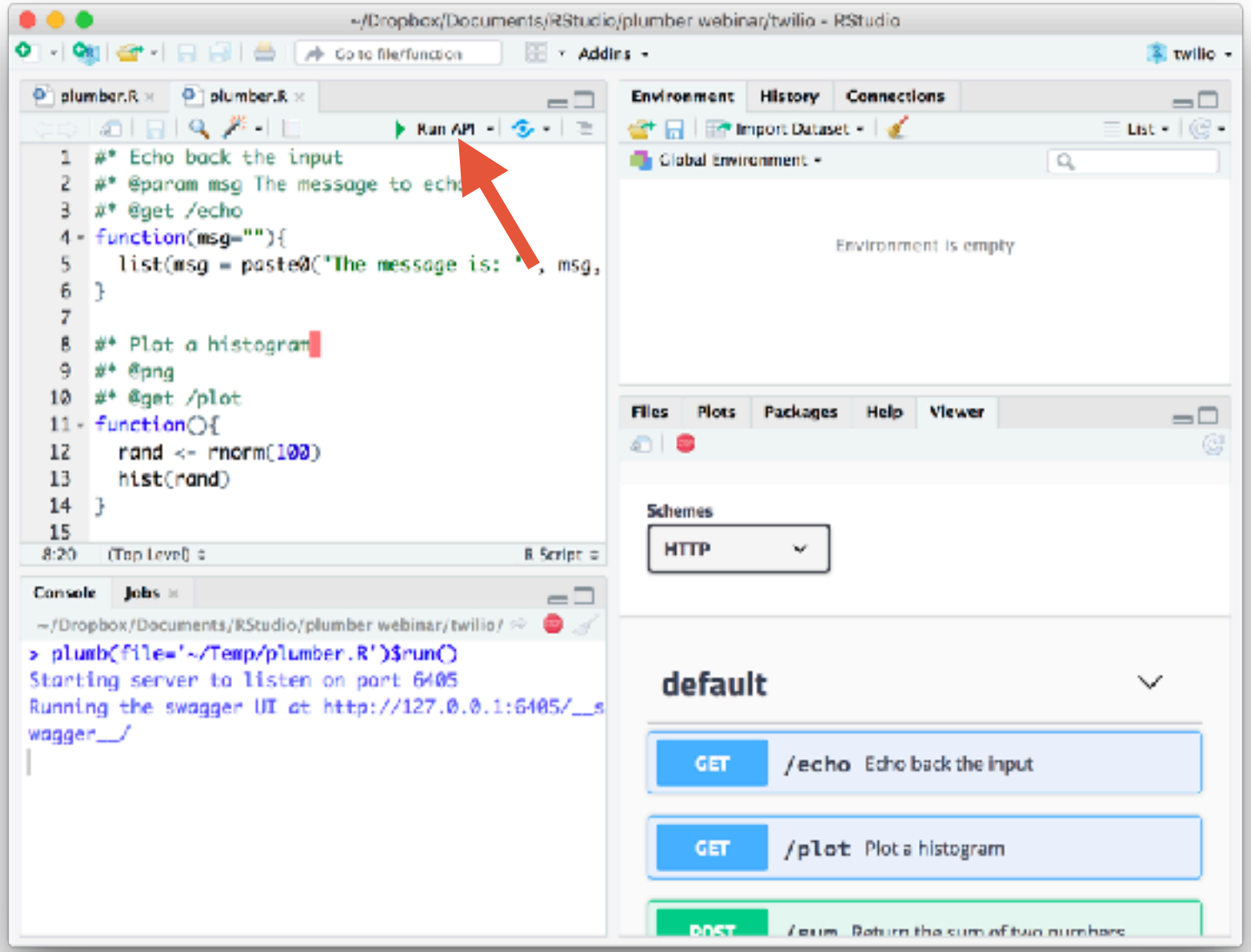
Hosting

- RStudio Connect
  - `rsconnect::deployAPI()`
  - Load balancing, access controls
  - https://rstd.io/rsc
- Digital Ocean
  - `do_provision()`

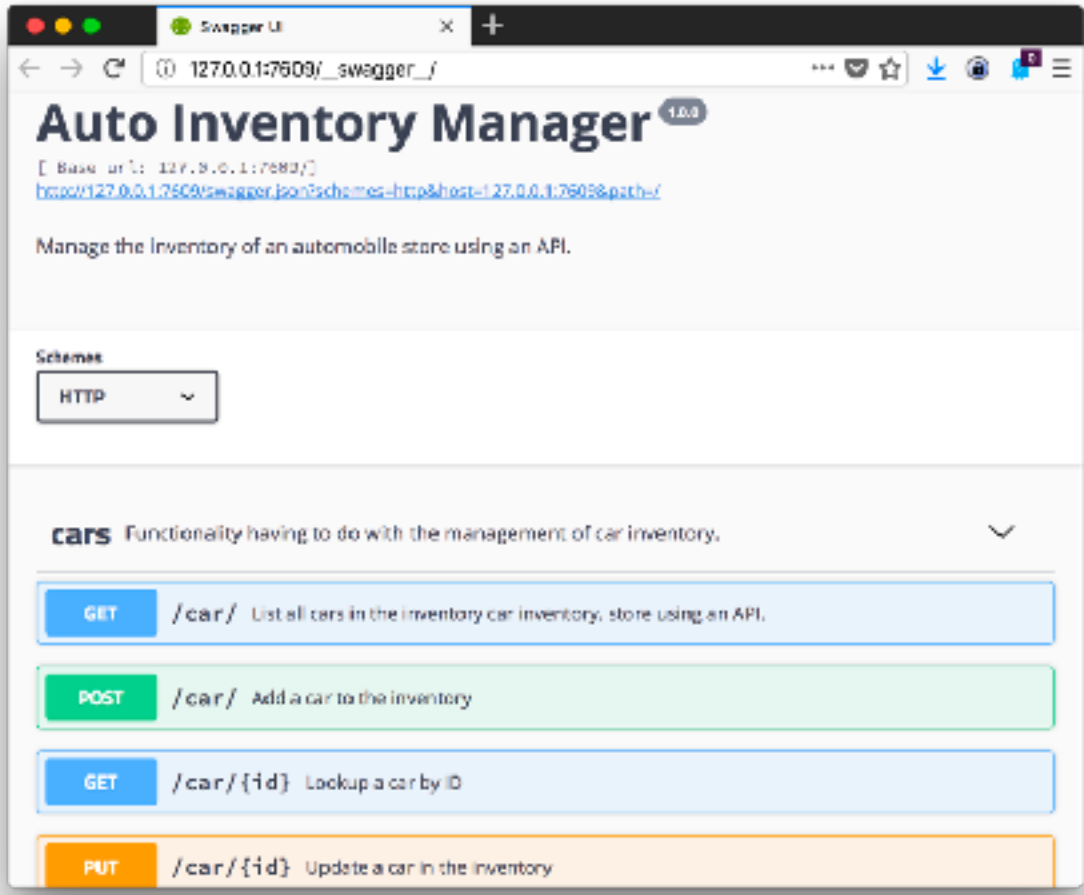
IDE Integration

- Available in 1.2 preview
- Brings up Swagger automatically



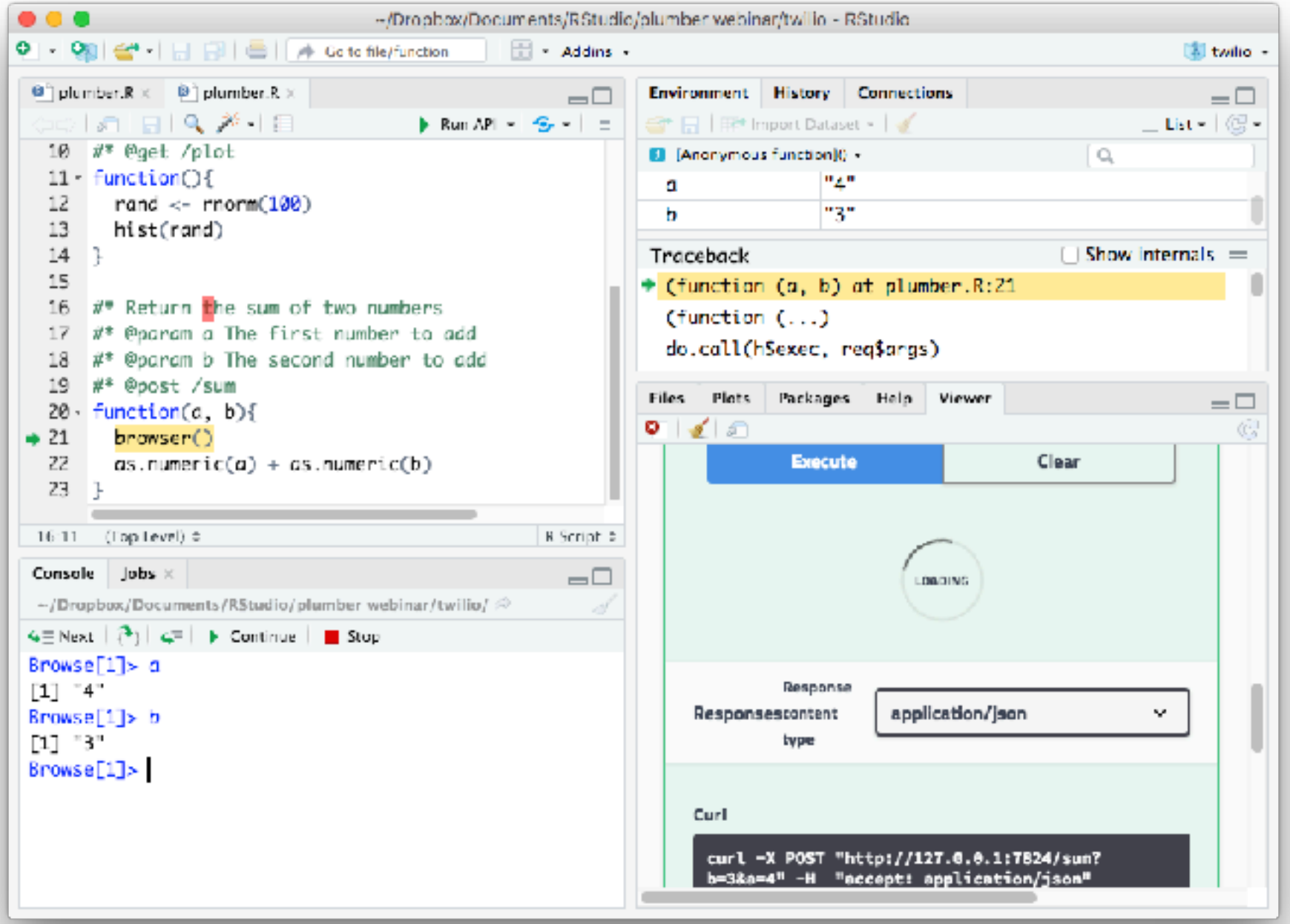
Swagger

- Support the OpenAPI specification with accompanying tooling
- Auto-generated, control with `$run(swagger=TRUE)`



Debugging

- Pause and inspect
- Mutate values
- Continue



```
#' @get /count
function(){
  read_csv_async("file.csv") %...>%
  nrow()
}
```

Upcoming

- Async support
- Testing?
- Expanded documentation
- Additional maintainers

Questions?

- https://rplumber.io
- StackOverflow: `plumber` tag
- GitHub: trestletech/plumber
- Slides: http://rstd.io/plumber-webinar