Introduction to Web Scraping with R

Accessing APIs from Scratch

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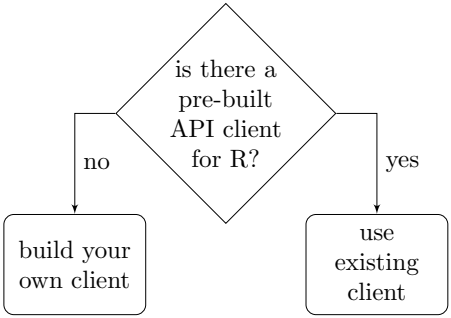
API access with R

There are basically **two scenarios:**



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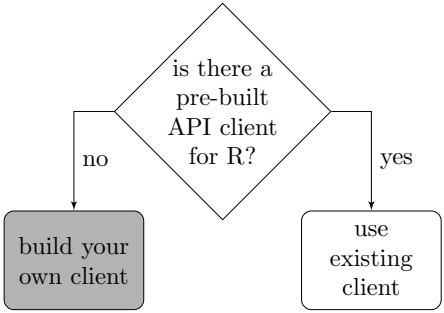

Here, we talk about the case where you have to build your own API binding.

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2. build access to the API via R
3. build functionality that processes the data output (e.g., turns it into R objects)

Example

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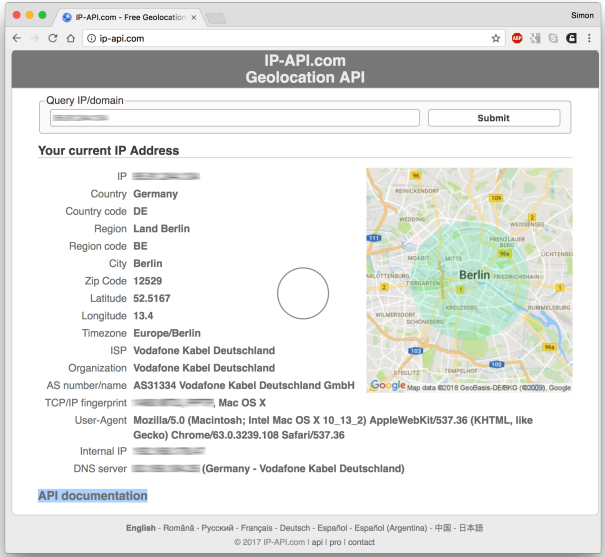
The IP API

- available at http://ip-api.com/
- its purpose: parses your IP (or a bunch of given IPs) and returns some values, including guessed location, service provider, and organization behind the IP



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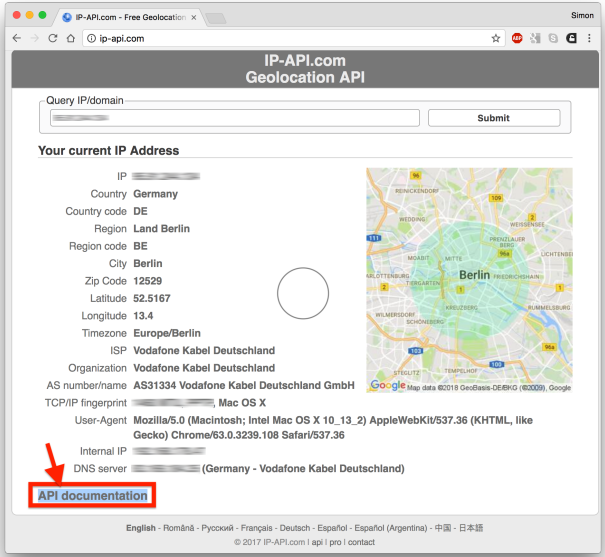
The IP API

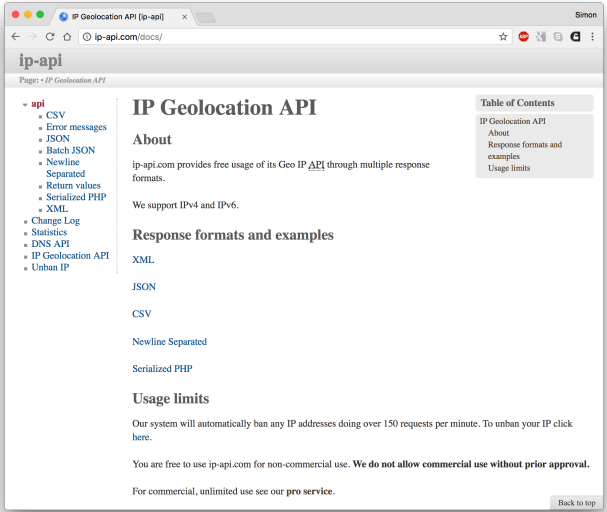
- available at http://ip-api.com/
- its purpose: parses your IP (or a bunch of given IPs) and returns some values, including guessed location service provider, and organization behind the IP
- check out API documentation



Example

The IP API

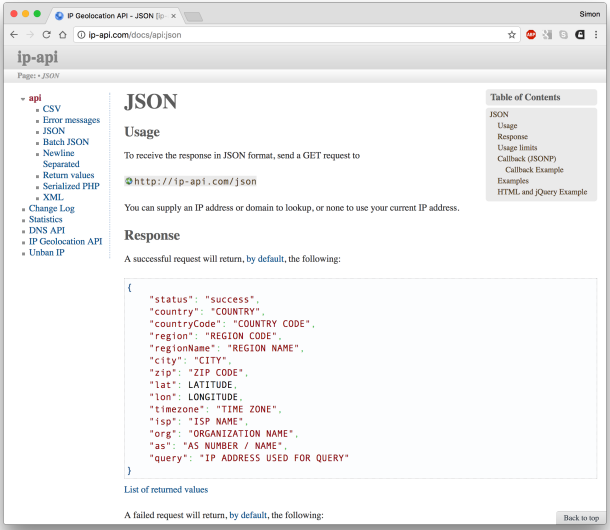
- access is free for non-commercial use (up to 150 requests per minute)
- various response formats available
- paid pro service available



Example

The IP API

- to access the API, we have to send a `GET` request to http://ip-api.com/json
- we can provide any IP we want
- the response is raw JSON code



Example

IP API access in R

A `GET` request essentially means that we assemble a URL using

- the API **endpoint** (a basic URL) and
- **parameters-value pairs** that are added to the URL
- here, we only add the literal IP address
- we use `fromJSON` to pose the request and directly parse the data from the API

R code

```
1 url <- "http://ip-api.com/json"
2 url_ip <- paste0(url, "/208.80.152.201")
3 ip_parsed <- jsonlite::fromJSON(url_ip)
```

end

Example

Investigating the output

R code

```
4  names(ip_parsed)
 [1] "as"          "city"        "country"     "countryCode" "isp"
 [6] "lat"         "lon"         "org"         "query"       "region"
[11] "regionName"  "status"      "timezone"    "zip"
5  ip_parsed
$as
[1] "AS14907 Wikimedia Foundation, Inc."

$city
[1] "Cleveland"

$country
[1] "United States"

$countryCode
[1] "US"

$isp
```

Example

Bringing it into shape

- in our case, `fromJSON()` has created an R list object
- we turn it into a data frame

R code

```
6  ip_parsed %>% as.data.frame(stringsAsFactors = FALSE)
                                  as      city       country countryCode
1 AS14907 Wikimedia Foundation, Inc. Cleveland United States          US
                         isp     lat      lon                       org
1 Wikimedia Foundation, Inc. 41.4995 -81.6954 Wikimedia Foundation, Inc.
           query region regionName  status         timezone   zip
1 208.80.152.201     OH       Ohio success America/New_York 44192
```

end

Summary

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- accessing APIs from scratch can be almost as easy as using a readily available R client
- often however, APIs are more complex (provide much more parameters and varations in data output)
- ideally, you build functions around your API calls to make it even more accessible