



Web APIs

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What are we doing?

- × Introduction: what are APIs
- × Finding APIs and interpreting documentation
- × Working with APIs in R
 - × Querying API
 - × Using queries to enrich data
 - × Using data to create content via API
- × Resources for building APIs
- × Questions



What is an API?

From Wikipedia:

In computer programming, an application programming interface (API) is a set of subroutine definitions, protocols, and tools for building application software. In general terms, it's a **set of clearly defined methods of communication** between various software components. A good API makes it easier to develop a computer program by providing all the building blocks, which are then put together by the programmer.



What's an API?

(contd.)

For an online data source, an API gives you a consistent means of **requesting** data, and a consistent **format** for the data that you receive.



Stories

GET /articlesearch.json

Article Search

Article Search requests use the following URI structure:

Hide details ↑

Try it out →

Parameters

q string

Location: `query` `?q=xyz`

Search query term. Search is performed on the article body, headline and byline.

fq string

Location: `query` `?fq=xyz`

"Filtered search query using standard Lucene syntax.

The filter query can be specified with or without a limiting field: label.

See Filtering Your Search for more information about filtering."

begin_date string

Location: `query` `?begin_date=xyz`

"Format: YYYYMMDD

Restricts responses to results with publication dates of the date specified or later."

end_date string

Location: `query` `?end_date=xyz`

"Format: YYYYMMDD

Restricts responses to results with publication dates of the date specified or earlier."

sort string

Location: `query` `?sort=newest`

"By default, search results are sorted by their relevance to the query term (q). Use the sort parameter to sort by pub_date."

Allowed values are:

- newest

Responses

200

The docs requested by the article search.

Schema Example

```
▼ {
  response: ▼ {
    docs: ▼ [
      ▼ {
        web_url: string
        snippet: string
        lead_paragraph: string
        abstract: string
        print_page: string
        blog: ▼ [
          ▼ {
            source: string
            headline: ▼ {
              main: string
              kicker: string
            }
            keywords: ▼ {
              rank: string
              name: string
              value: string
            }
            pub_date: string
            document_type: string
            news_desk: string
```

Request

- Query parameters

Response

- Formatted output
 - JSON
 - XML

Why do we use (web) APIs?

- Modern web apps
 - Many small parts
 - Exchange data
 - Control access to data
- Researchers
 - Access to live data
 - Ability to query for exactly the data you want



HTTP

- Web APIs are based on HTTP (Hypertext Transfer Protocol)
- Traffic over port :80 or :443 (HTTPS)
 - Web pages, media, data
- This is the same protocol that delivers the rest of the web content
- HTTP Methods (CRUD)
 - POST: create
 - **GET: read**
 - PUT / PATCH: update
 - DELETE: delete



API Design Approaches

- Older: SOAP, XML-RPC
- New: GraphQL
 - One endpoint
 - Client driven
 - JSON only
- Most common: REST
 - Representational State Transfer protocol
 - Series of endpoints: one endpoint per resource
 - Server-driven
 - JSON, but also XML, etc
 - HTTP status codes



Finding APIs

- × APIs are the backbone of the interactive web
- × Places to start:
 - × <https://www.programmableweb.com/>
 - × <https://rapidapi.com/>
 - × <https://apis.guru/browse-apis/>
 - × <https://github.com/toddmotto/public-apis>



Reading API Docs

- × Writing good documentation is time consuming
 - × Learn to read spotty or bad documentation
 - × Email devs if you need to
 - × [Reading API Documentation](#)
- × Watch out for versioning and deprecation



- JSON:

- Use a formatter

Before

XML:

[illegible]

After

10/076-3+PZAM+INV2

Harvard Art Museums API

- × Documentation: <https://github.com/harvardartmuseums/api-doc>
- × Register: <https://www.harvardartmuseums.org/collections/api>
- × API Toolkit + Guide: <https://api-toolkit.herokuapp.com/>
- × API App Examples
 - × <http://apps.harvardartmuseums.org/art-explorer/>
 - × <http://apps.harvardartmuseums.org/museum-explorer/>
 - × <http://apps.harvardartmuseums.org/suns-explorer/>

