

Introduction to Web-APIs

Github: <https://github.com/ashish-mw/workshop-webapis>

Websites

The screenshot shows the Amazon.co.uk website search results for the query "Animal Farm". The page title is "Amazon.co.uk : Animal Farm". The search bar shows the query "Animal Farm". The top navigation bar includes links for "All", "Best Sellers", "Prime Video", "Customer Service", "New Releases", "Prime", "Today's Deals", "Books", "Beauty", "Home & Garden", "Electronics", "Gift Ideas", "Kindle Books", "Gift Cards & Top Up", "Fashion", "Vouchers", "PC", "PC & Video Games", "Amazon Prime | 30-day free trial", and account information. The main content area displays 1-16 of over 50,000 results for "Animal Farm".
Left sidebar filters:

- Eligible for free delivery:** Includes "Free UK Delivery by Amazon" and "FREE Delivery on orders over £10 for books or over £20 for other categories shipped by Amazon".
- Climate Pledge Friendly:** Includes "Climate Pledge Friendly".
- Department:** Books, Political Fiction, Fiction Classics, Literary Fiction, Contemporary Fiction, Parodies, Education & Reference Material for Young Adults, School Books, Literature & Fiction for Young Adults, and a link to "See All 22 Departments".
- Avg. Customer Review:** Filters by star ratings: 4 & Up, 4 & Up, 4 & Up, 4 & Up, and 5 & Up.
- Price:** Filters by price range: Up to £5, £5 to £10, £10 to £20, £20 to £50, and £50 & above. Includes input fields for "£Min" and "£Max" and a "Go" button.
- Deals:** Includes "Today's Deals".
- New Arrivals:** Filters by time: Last 30 days, Last 90 days, and Next 90 days.
- Book Format:** Filters by format: Hardcover, Paperback, Audiobooks, Kindle Books.
- Kindle Unlimited:** Includes "Kindle Unlimited Eligible".
- Author:**

Search results:

George Orwell in Penguin Classics
Shop now >

1984 Nineteen Eighty-Four (Penguin Modern Classics)
by George Orwell | 7 Jan 2021
★★★★★ 6,508
prime

The Complete Novels of George Orwell: Animal Farm, Burmese Days, A Clergyman's Daughter, C...
by George Orwell | 24 Feb 2000
★★★★★ 349

Animal Farm: A Fairy Story (Penguin Modern Classics)
by George Orwell | 24 Feb 2000
★★★★★ 3,147

Animal Farm: The Internationally Best selling Classic from the Author of 1984 (Collins Classics)
by George Orwell | 7 Jan 2021
★★★★★ ~ 24,261
prime Get it Monday, May 3
More buying choices
£1.88 (21 used & new offers)

Paperback
£2.15 £2.50
prime Get it Monday, May 3
More buying choices
£1.88 (21 used & new offers)

Kindle Edition
£0.49 £3.99
Available instantly

Audible Audiobooks
£0.00 £7.09
Free with Audible trial
Other formats: Hardcover, Audio CD

Animal Farm: A Fairy Story (Penguin Modern Classics)
by George Orwell and Robert Colls | 24 Feb 2000
★★★★★ ~ 3,147
Paperback
£5.99 £7.99
prime Get it Thursday, Apr 29
More buying choices
£0.31 (63 used & new offers)

Kindle Edition
£3.99 £7.99
Available instantly

Hardcover
£9.73 £12.99
prime Get it Thursday, Apr 29

Display data in HTML as browsers can only understand HTML

Databases/DBMS

ACME Shopping ★ 📁 🌐 **Database**

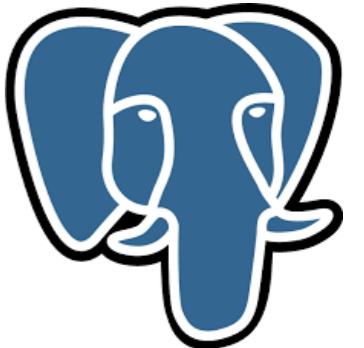
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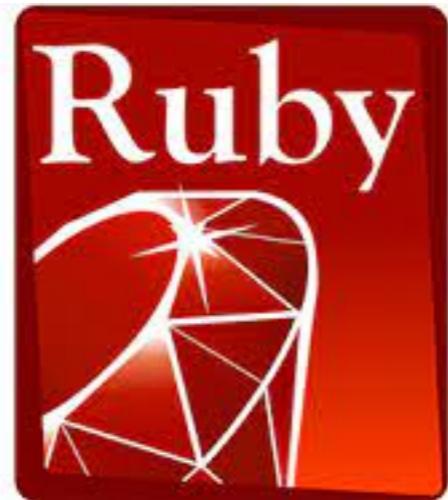
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7631	HEH-9133	On Cloud Nine Pillow	https://www.domain.com/product/heh-9133	24.99	24.99	2018-03-03 17:41:13	9897612	Active	
7615	HEH-2245	Simply Sweet Blouse	https://www.domain.com/product/heh-2245	42	59.95	2018-03-20 22:24:21	9897611	Active	
7625	HEH-2145	Power Shoes	https://www.domain.com/product/heh-2145	232	240	2018-03-02 11:02:09	9897610	Inactive	
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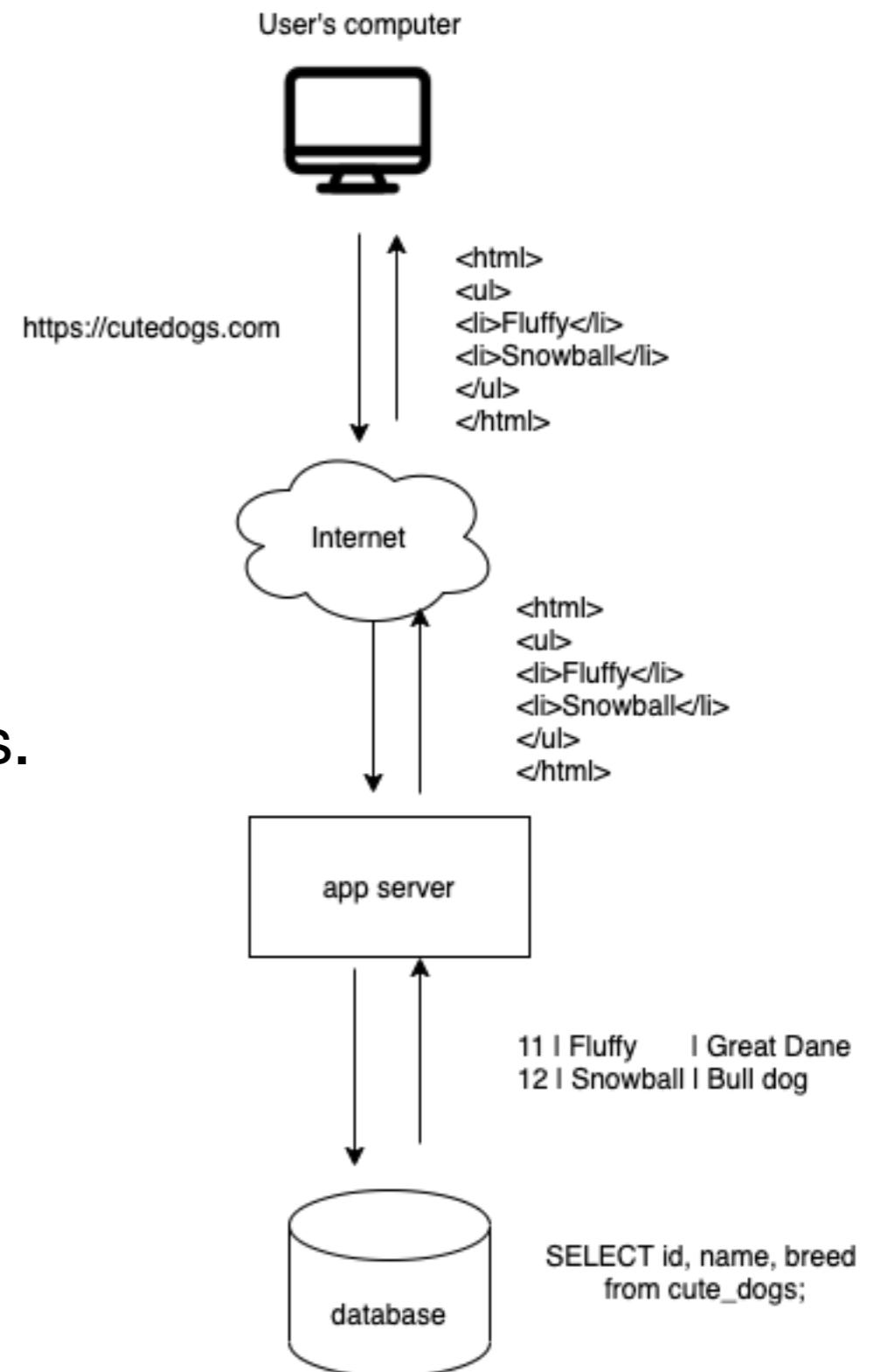
A program that helps us organise data.



Websites

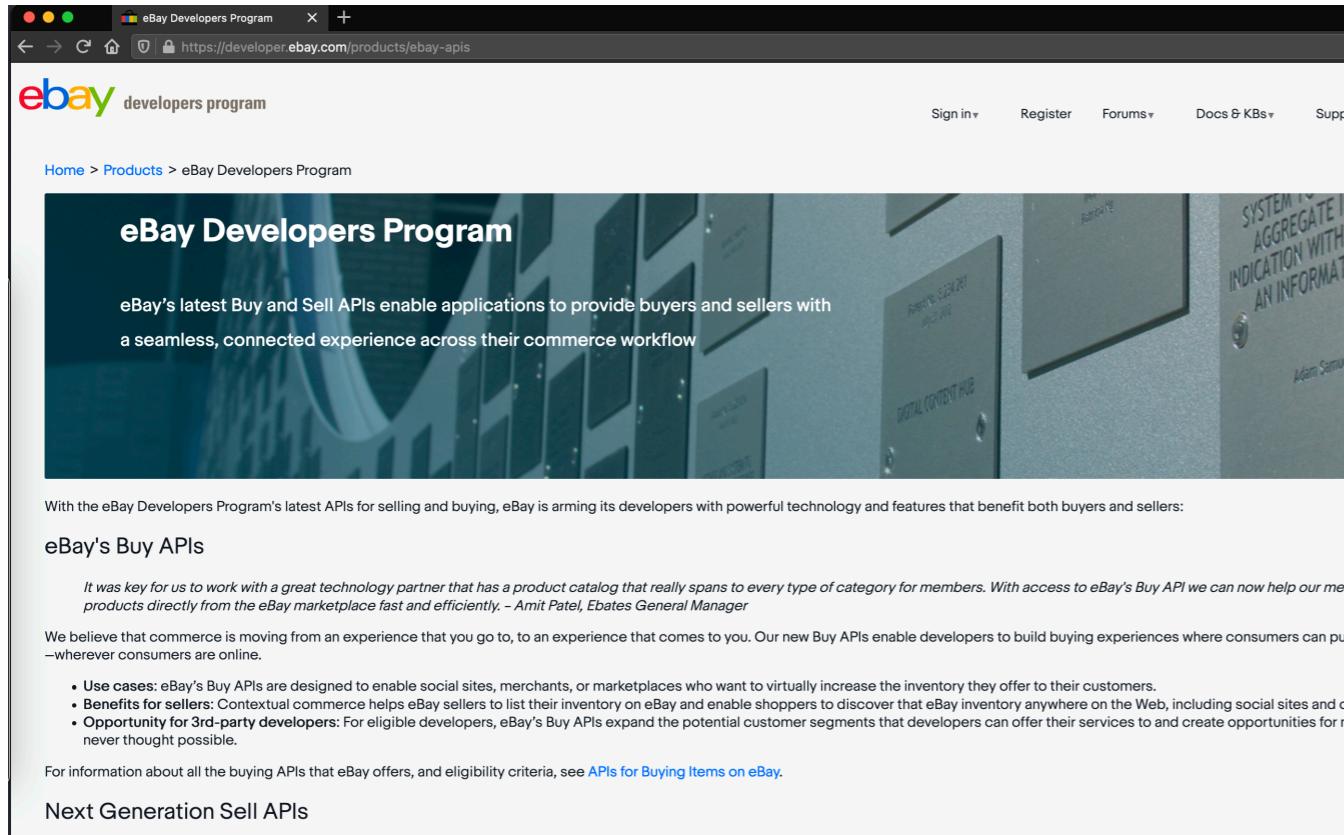


- We mean “dynamic” websites or web apps.
- A web server takes data from a database.
- Makes HTML.
- Gives it to the browser to display.



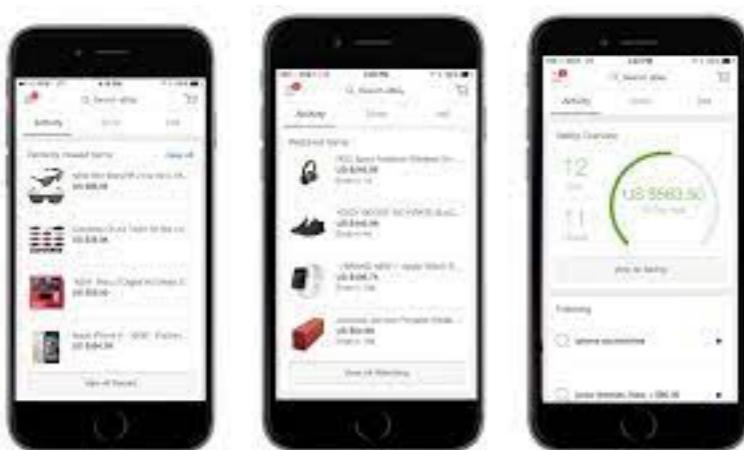
What if?

- We want to share just the data from acme.com to smith.com?



The screenshot shows the eBay Developers Program website. The main heading is "eBay Developers Program". Below it, a sub-section titled "eBay's Buy APIs" is highlighted with a large image of a server rack. The text reads: "With the eBay Developers Program's latest APIs for selling and buying, eBay is arming its developers with powerful technology and features that benefit both buyers and sellers: eBay's Buy APIs". A quote from Amit Patel, Ebates General Manager, is displayed: "It was key for us to work with a great technology partner that has a product catalog that really spans to every type of category for members. With access to eBay's Buy API we can now help our members find products directly from the eBay marketplace fast and efficiently." Below the quote, there is a bulleted list of benefits for sellers and 3rd-party developers. At the bottom, there is a link to "APIs for Buying Items on eBay".

- We want to display our data not just on our website?

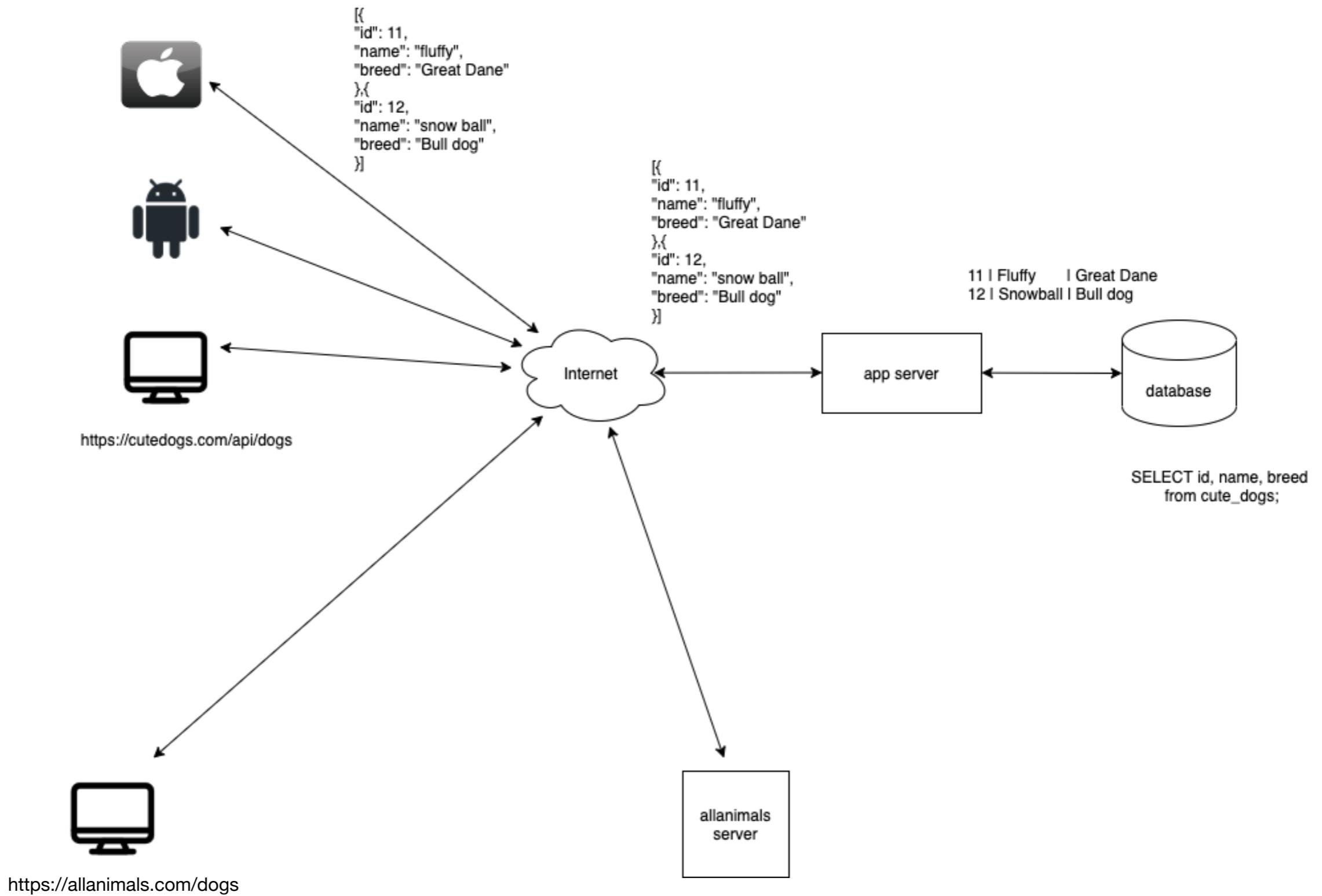


The solution

- Make websites give out just the data with API endpoints.
- Allow applications to consume that data and display however they like it.
- The application can be another web app or even a mobile app.
- An API endpoint is just a URL that returns some data in a **structured format** for some **resource**

<https://api.coronavirus.data.gov.uk/v1/data>

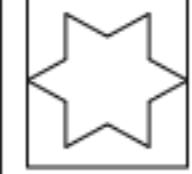
The solution - overview



Example web app

ACME Shopping John Smith

HEH Search



HEH-9133 On Cloud Nine Pillows
£ 24.99

[Buy now](#) [Add to cart](#)



HEH-2245 On Simply Sweet Blouse
£ 42

[Buy now](#) [Add to cart](#)

Structured format

ACME Shopping ★ 📁 🌐 Database

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1	Product_ID	SKU	Name	Product_URL	Price	Retail_Price	Date_Created	Uploaded_By_User	Product_Status	
2	7631	HEH-9133	On Cloud Nine Pillow	https://www.domain.com/product/heh-9133	24.99	24.99	2018-03-03 17:41:13	9897612	Active	
3	7615	HEH-2245	Simply Sweet Blouse	https://www.domain.com/product/heh-2245	42	59.95	2018-03-20 22:24:21	9897611	Active	
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Tables

+ ⚒ Products ▾ Users ▾ Shops ▾

Structured format - XML

```
<?xml version="1.0" encoding="UTF-8"?>
<Products>
  <Product>
    <Product_ID>7631</Product_ID>
    <SKU>HEH-9133</SKU>
    <Name>On Cloud Nine Pillow</Name>
    <Product_URL>https://www.domain.com/product/heh-9133</Product_URL>
    <Price>24.99</Price>
    <Retail_Price>24.99</Retail_Price>
    <Date_Created>2018-03-03 17:41:13</Date_Created>
  </Product>
  <Product>
    <Product_ID>7615</Product_ID>
    <SKU>HEH-2245</SKU>
    <Name>Simply Sweet Blouse</Name>
    <Product_URL>https://www.domain.com/product/heh-2245</Product_URL>
    <Price>42</Price>
    <Retail_Price>59.95</Retail_Price>
    <Date_Created>2018-03-20 22:24:21</Date_Created>
  </Product>
</Products>
```

eXtensible Markup Language - SOAP

Where something **starts** and **ends** in a document == **markup**

Tags represent a data value



SoapUI

Structured format - JSON

```
{  
  "Products": [  
    {  
      "Product_ID": "7631",  
      "SKU": "HEH-9133",  
      "Name": "On Cloud Nine Pillow",  
      "Product_URL": "https://www.domain.com/product/heh-9133",  
      "Price": "24.99",  
      "Retail_Price": "24.99",  
      "Date_Created": "2018-03-03 17:41:13"  
    },  
    {  
      "Product_ID": "7615",  
      "SKU": "HEH-2245",  
      "Name": "Simply Sweet Blouse",  
      "Product_URL": "https://www.domain.com/product/heh-2245",  
      "Price": "42",  
      "Retail_Price": "59.95",  
      "Date_Created": "2018-03-20 22:24:21"  
    }  
  ]  
}
```

JavaScript Object Notation - REST

Less emphasis on structure and simpler to work with.

Key-Value pairs represent a data value



POSTMAN

How to read?

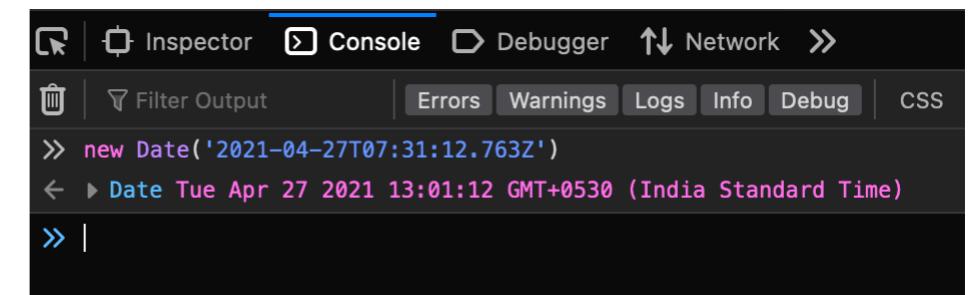
```
{  
  "has_cod": true,  
  "min_delivery_date": "2021-04-27T07:31:12.763Z",  
  "orders_from": null,  
  "sales": 32  
}
```

has_cod / hasCod / HasCod / has-cod / Has-Cod

The letter casing depends on the developer. But it'll be consistent. The **key** simply states if the item has Cash on Delivery available or not. What COD stands for will be mentioned in API documentation.

2021-04-27T07:31:12.763Z

Dates are usually mentioned with Timezone or in UTC format.



null

No data

Demo

Sample API server

Sample web client

The screenshot shows a web browser window with the following details:

Address Bar: localhost:3334

Page Title: F.O.R.C.E Health Center

Patient list:

Name	Doctor in charge	Symptoms	Admitted date	Action
Darth Vader	Dr. Yoda Adoy [Bariatric Surgery]	cough dry throat cant feel legs	18/4/2021, 11:00:25 am	<button>Edit</button> <button>Delete</button>
Luke Skywalker	Dr. Palpatine [General Surgery]	fever no sensation in one arm oh wait!	11/3/2021, 10:00:25 am	<button>Edit</button> <button>Delete</button>
Kylo Ren	Dr. Palpatine [General Surgery]	cough	3/4/2021, 9:00:25 pm	<button>Edit</button> <button>Delete</button>
Han Solo	Dr. Obi-Wan Kenobi [Neonatology]	headaches	18/10/2020, 8:00:25 am	<button>Edit</button> <button>Delete</button>
Ahsona Tano Jedi	Dr. Yoda Adoy [Bariatric Surgery]	breathing heavily	27/4/2021, 5:55:20 pm	<button>Edit</button> <button>Delete</button>

Doctors list:

Name	Department
Dr. Yoda Adoy	Bariatric Surgery
Dr. Palpatine	General Surgery
Dr. Darth Maul	Nephrology
Dr. Obi-Wan Kenobi	Neonatology

Questions?

<https://github.com/public-apis/public-apis>

<https://public-apis.xyz>

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