Internet and the Web

2020 This Is What Happens In An Internet Minute

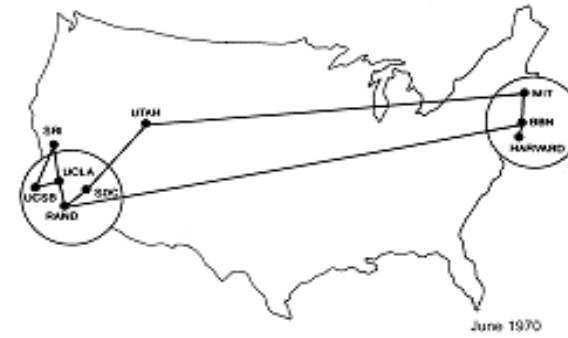**60 SECONDS**

facebook — 1.3 Million Logging In

Google — 4.1 Million Search Queries

NETFLIX — 764,000 Hours Watched

$1.1 Million Spent Online

2.5 Million Snaps Created

59 Million Messages Sent
Facebook Messenger / *WhatsApp*

2.5 Million Images Viewed
imgur

305 Smart Speakers Shipped
amazon echo / *Google Home*

1,400 Downloads
Tik Tok

1.2 Million Views
twitch

190 Million Emails Sent

1.6 Million Swipes
tinder

194,444 People Tweeting

694,444 Scrolling Instagram

400,000 Apps Downloaded
ANDROID APP ON Google play / *Available on the App Store*

YouTube — 4.7 Million Videos Viewed

19 Million Texts Sent

Created By:
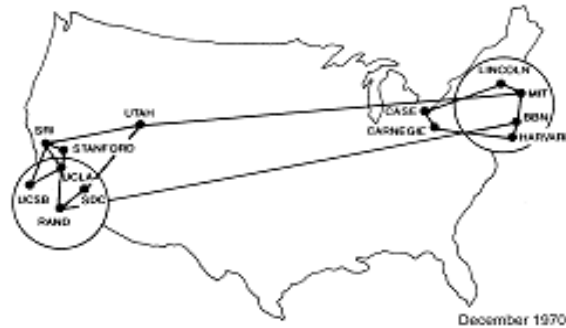@LoriLewis
@OfficiallyChadd

ARPANET goes online with 4 nodes (1969)
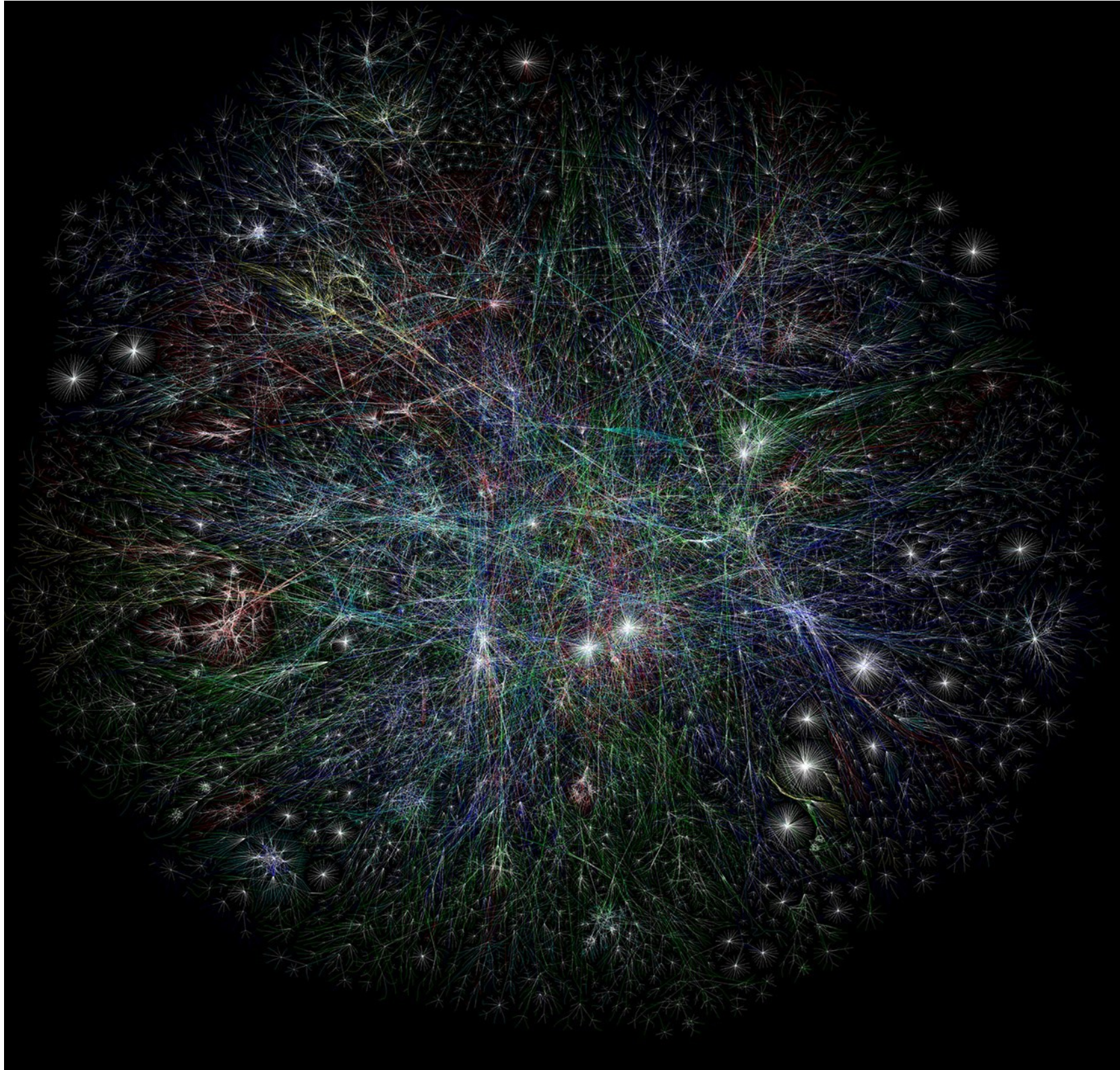

Dec 1969

June 1970

Dec 1970

Sept 1971

Aug 1972

June 1975
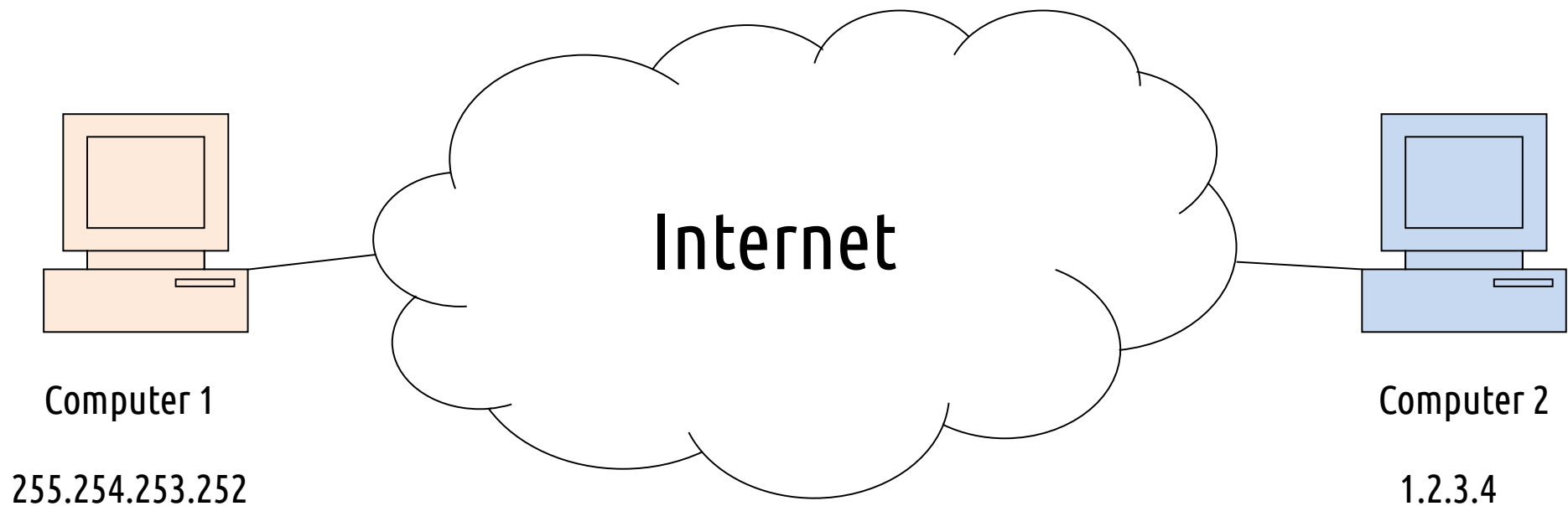
http://www.mappingcyberspace.com/gallery/figure1_2.html
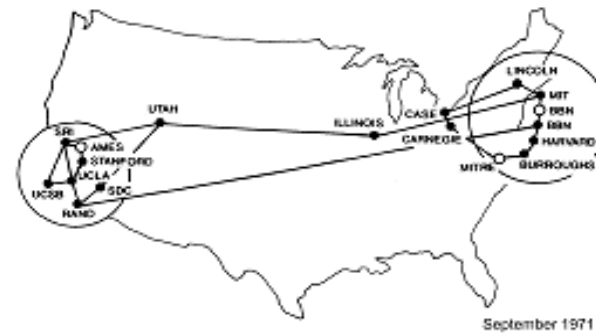
"The **Internet** is a global system of interconnected
[computer networks](http://en.wikipedia.org/wiki/Internet) that use the standard
[Internet Protocol Suite](http://en.wikipedia.org/wiki/Internet) (TCP/IP) to serve billions of users
worldwide."
http://en.wikipedia.org/wiki/Internet

Internet

Computer 1
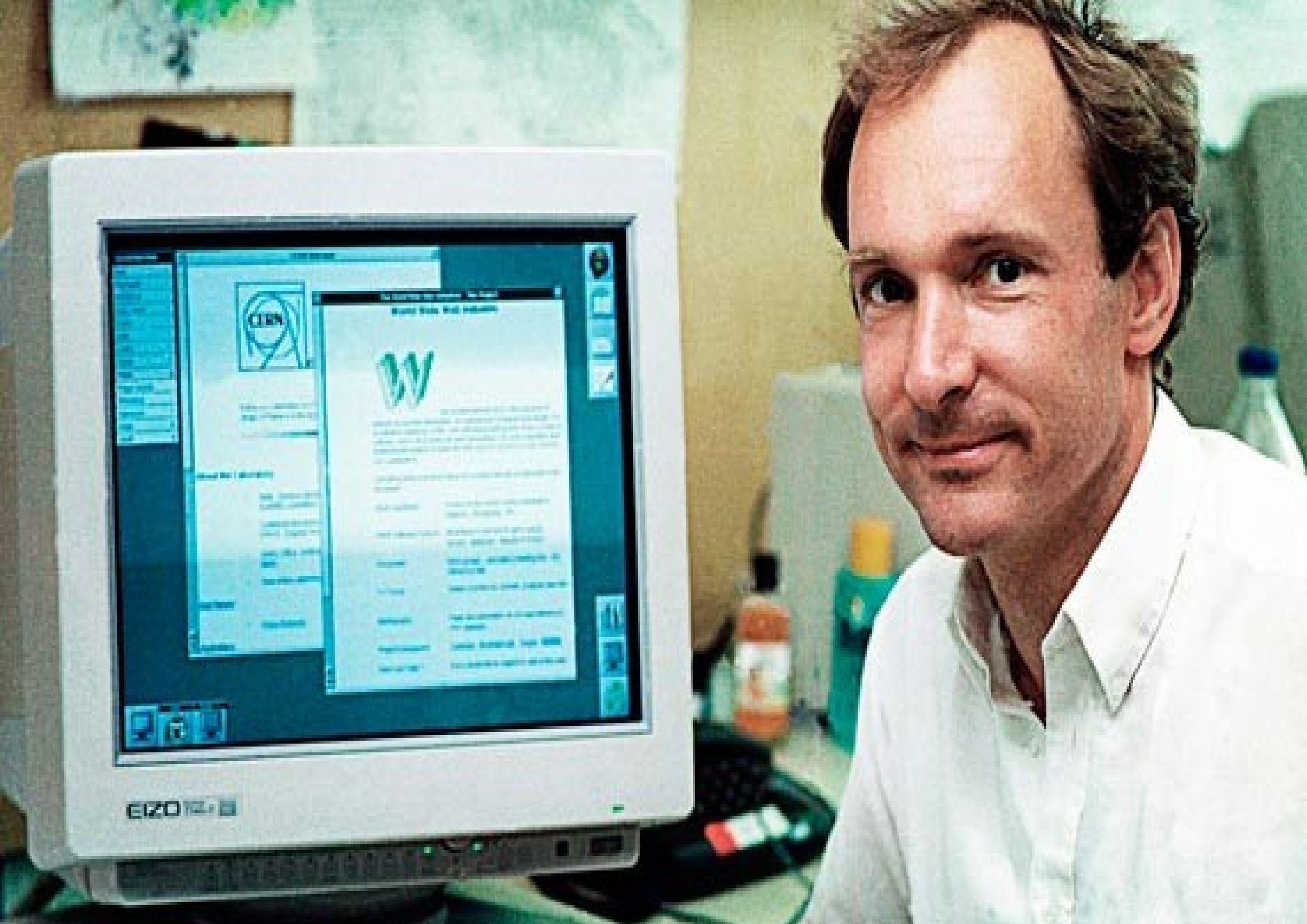
255.254.253.252

Computer 2

1.2.3.4

Internet Protocol Suite

- Internet Protocol (IP): directs packets to a specific computer using an IP address

- Transmission Control Protocol (TCP): directs packets to a specific application on a computer using a port number.

  – Common port numbers:

    - 22 – ssh
    - 23 – telnet
    - 25 – email
    - 80 – Web

World Wide Web (WWW)

Tim Berners-Lee and others at CERN developeb the **World Wide Web (WWW)**, HTML documents transmitted over the Internet by a web server to web browsers using URIs and HTTP (1st web page online on Aug 6, 1991)

Web Standards

- Uniform Resource Identifiers (URI), an universal system to reference intenet resources
- Hypertext Transfer Protocol (HTTP), specifies how the browser and the server communicate
- Hypertext Markup Language (HTML), used to define the structure and content of hypertext documents

Uniform Resource Locator (URL)

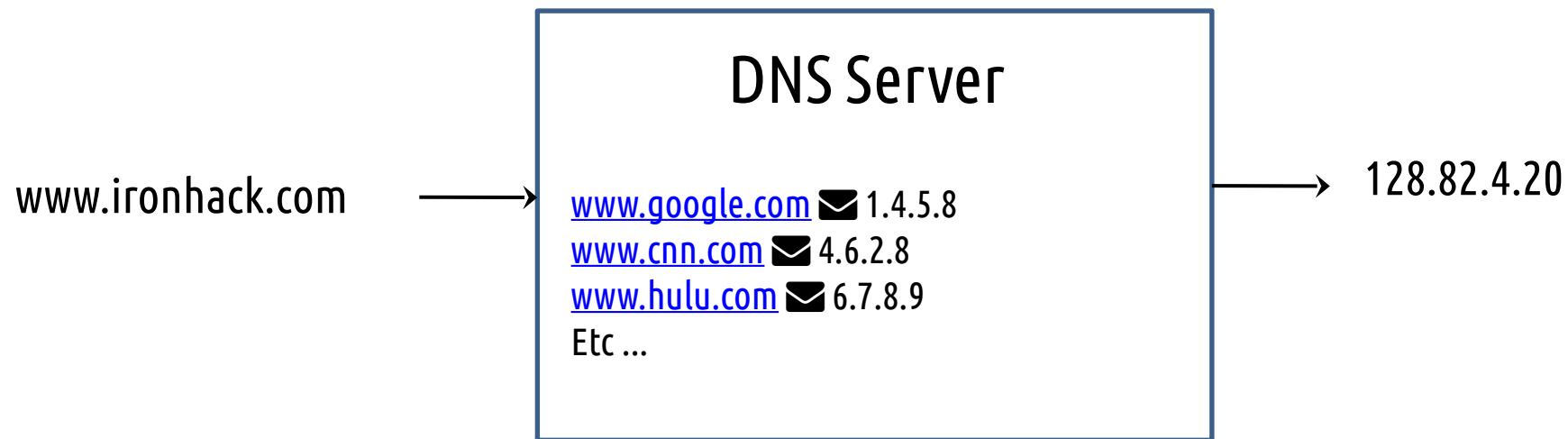A URL identifies the location of a resource on the Web.

```
                userinfo              host        port
              ┌─────┴─────┐    ┌───────┴──────┐ ┌─┴─┐
      http://john.doe:password@www.example.com:123/forum/questions/?tag=networking&order=newest#top
      └─┬─┘ └────────────────┬──────────────────┘└───────┬───────┘ └─────────────┬─────────────┘└┬┘
      scheme              authority                     path                   query          fragment
```

Domain Name System (DNS)

DNS is a hierarchical look-up service that converts a given hostname into its equivalent IP address

www.ironhack.com →

DNS Server

www.google.com ✉ 1.4.5.8
www.cnn.com ✉ 4.6.2.8
www.hulu.com ✉ 6.7.8.9
Etc ...

→ 128.82.4.20

- DNS servers contact parent servers for missing entries
- Authoritative name servers are responsible for specific domains
- Warning: DNS cache poisoning

HTTP: Hypertext Transfer Protocol

Protocol that runs over TCP/IP and governs communication between web browsers and web servers

http request

http response

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⌖ Inspector   ▷ Consola   ↑↓ Red   »   ⊟ ❐ ··· ✕

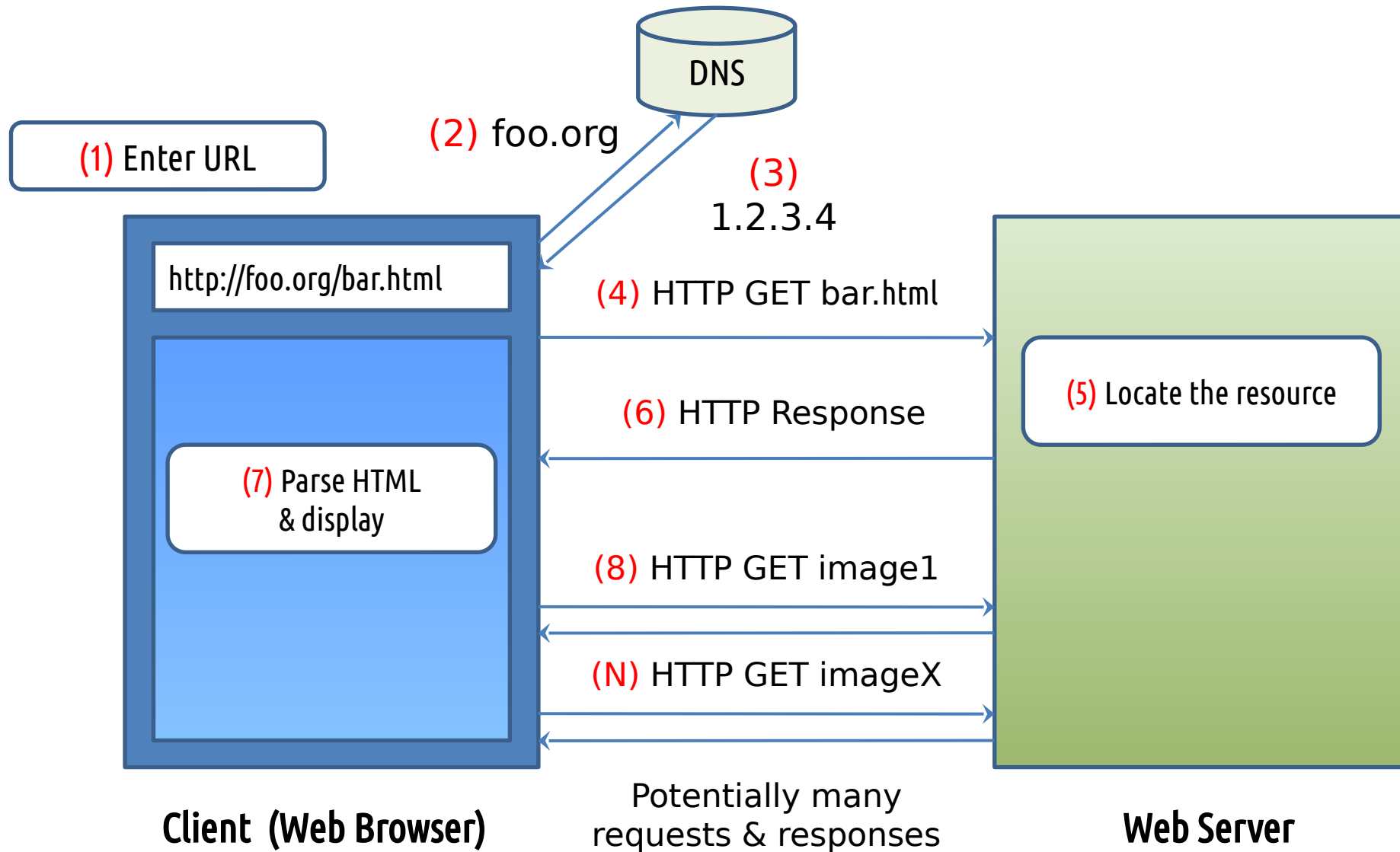🗑   ▽ Filtrar las URL || ⚲ ⊘ ☐ Desactivar caché   Sin limi... ⇕   ⚙

Todos   HTML   CSS   JS   XHR   Tipografía   Imágenes   Medios   WS   Otros

Es...	M...	Dominio	Archivo	Inici...	Tipo	Transferido
200	GET	🔒 heapanalyti...	h?a=1810020855&u=60036713...	hea...	gif	299 B
200	GET	🔒 heapanalyti...	h?a=1810020855&u=60036713...	hea...	gif	299 B
200	P...	🔒 ⍉ www.fa...	/tr/	fbev...	plain	3,85 KB
200	P...	🔒 ⍉ www.fa...	/tr/	fbev...	plain	3,66 KB
200	GET	🔒 heapanalyti...	h?a=1810020855&u=60036713...	hea...	gif	299 B
200	GET	🔒 www.ironh...	favicon.ico	Favi...	x-i...	cacheado
200	GET	🔒 www.ironh...	favicon.ico	Favi...	x-i...	cacheado

⏱ 7 solicitudes   29,57 KB / 8,39 KB transferido   Finalizado: 16,01 s

Example: Web Page Request

DNS

(2) foo.org

(1) Enter URL

(3)
1.2.3.4

http://foo.org/bar.html

(4) HTTP GET bar.html

(6) HTTP Response

(5) Locate the resource

**(7) Parse HTML
& display**

(8) HTTP GET image1

(N) HTTP GET imageX

Client (Web Browser)

Potentially many
requests & responses

Web Server

Hypertext Transfer Protocol (HTTP)

Protocol that runs over TCP/IP and governs communication between web browsers and web servers

Client Request
GET / HTTP/1.1
Host: www.unavarra.es

Server Response
HTTP/1.1 200 OK
Content-Length: 6018
Content-Type: text/html
Content-Location: http://www.unavarra.es/
Last-Modified: Mon, 05 Jul 2014 18:49:40 GMT
Server: nginx

HTTP Request & Response

Contain two parts in request and response
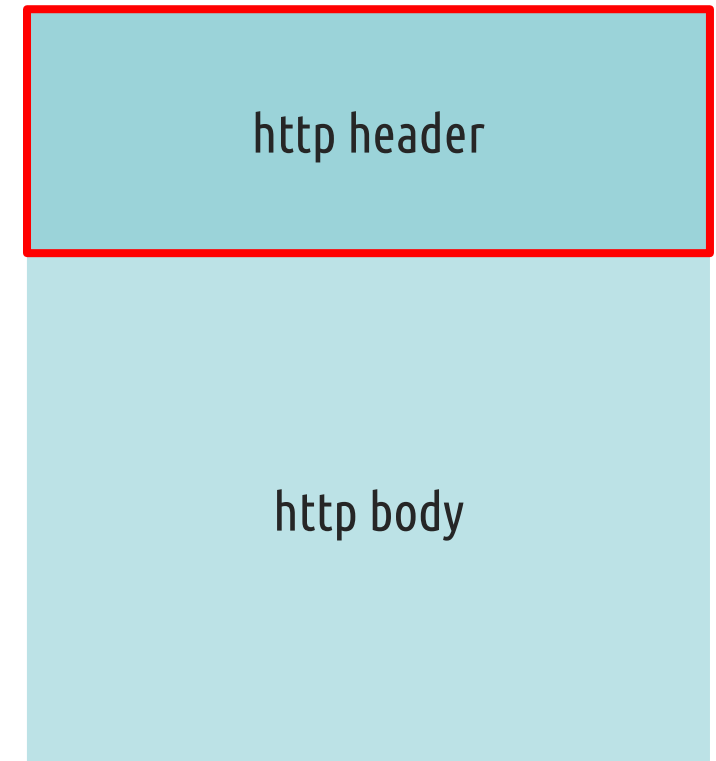
- ○ http header
- ○ http body

http header

http body

HTTP Header

Request fields
- Accept, Accept-Encoding, Accept-Language, Connection, **Cookie**, Host, Referer, User-Agent, and etc.

Response fields
- Connection, Content-Type, Date, Server, and etc.

http header

http body

Common HTTP Request Headers

- Accept: List of MIME types supported

- Accept-Language: List of languages read by the user

- Content-Length: Length in bytes of the request body

- Content-Type: MIME type of the request body

- Cookie: List of cookies stored by the client

- Host: Host name of the website

- User-Agent: Identification string for the web browser

Example set of headers

- **Host**: en.wikipedia.org

- **User-Agent**: Mozilla/5.0 Firefox/64.0

- **Accept**: text/html,application/xhtml+xml,application/xml;
q=0.9,/;q=0.8

- **Accept-Language**: en-GB,en-US;q=0.8,en;q=0.6,fr-FR;q=0.4,
fr;q=0.2

- **Accept-Encoding**: gzip, deflate, br

- **Connection**: keep-alive

- **Cookie**: Auth=8QXA5fSQeZAEKZVG6iRjMWvQ8KtQKAaj

HTTP Request Methods

- GET: used to retrieve a resource. Has no request body.

- POST: used to submit a new resource (path) or send data. Usually has a body.

- HEAD: used to preview the result of a GEToperation. Has no request body and no respond body.

- PUT: used to submit an update to an existing resource

- DELETE: used to delete the specified resource

- TRACE: echoes the received request for tracing purposes

- OPTIONS: verify the server supports a specified request (see Preflight requests)

- CONNECT: used by HTTPS

- PATCH: allows partial modification of a resource

HTTP status codes

Google

404. That's an error.

The requested URL /asdasdasd was not found on this server. That's all we know.
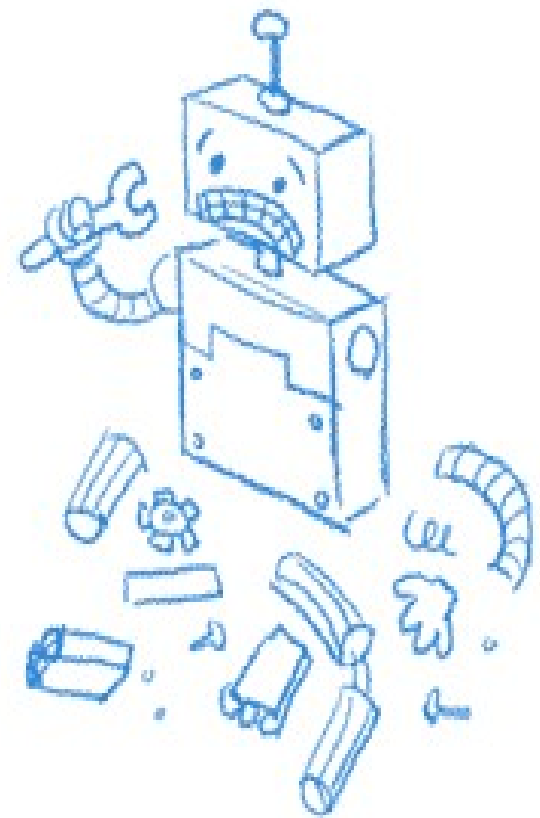
HTTP Status Codes

2xx Success:
◦ 200 OK, Standard response for successful HTTP requests.

3xx Redirection:
◦ 302 Found, An HTTP response with this status code will additionally provide a URL in the location header field.

4xx Client Error:
◦ 404 Not Found, 400 Bad Request, The server cannot or will not process the request due to an apparent client error

5xx Server Error:
◦ 503 Service Unavailable, 502 Bad Gateway, The server was acting as a gateway or proxy and received an invalid response from the upstream server

HTTP Status Codes	
1xx	*Informational*
100	Continue
2xx	*Successful*
200	OK
201	Created
202	Accepted
204	No Content
3xx	*Redirection*
301	Moved permanently
302	Found
304	Not Modified
308	Permanent Redirect
4xx	*Client Error*
400	Bad Request
401	Unauthorized
403	Forbidden
404	Not Found
405	Method Not Allowed
5xx	*Server Error*
500	Internal Server Error
502	Bad Gateway
503	Service Unavailable
504	Gateway Timeout

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⬚ 🔲 Inspector   ⟩_ Consola   ▭ Depurador   »   ⊟ ⟦⟧ ••• ✕

🔍 Buscar en HTML   + ⚲

```
<!DOCTYPE html>
<html data-react-helmet="lang" lang="es"> event scroll
  ▶ <head> ··· </head>
  ▼ <body id="dummybodyid">
      <div class="cc-revoke cc-bottom cc-animate cc-color-override--
      2049367119 " style="">Cookie Policy</div> event
    ▶ <div class="cc-window cc-banner cc-type-opt-in cc-theme-classic cc-
      bottom cc-color-override--2049367119 cc-invisible" role="dialog"
      aria-live="polite" aria-label="cookieconsent" aria-
      describedby="cookieconsent:desc" style="display: none;"> ··· </div>
      event
    ▶ <noscript id="gatsby-noscript"> ··· </noscript>
    ▶ <div id="___gatsby"> ··· </div>
      <script id="gatsby-script-loader">
      /*<![CDATA[*/window.pagePath="/es";/*]]>*/</script>
    ▶ <script id="gatsby-chunk-mapping"> ··· </script>
      <script src="/webpack-runtime-7cbe47a5925127898f3f.js"
      async=""></script>
      <script src="/commons-4c2bfd7f82f51ed27457.js" async=""></script>
      <script src="/component---src-template-home-index-
      tsx-4e3e16875c442ca376fc.js" async=""></script>
      <script src="/app-076889b248be18e2846b.js" async=""></script>
      <div id="diigo-video-capture" style="display: none;"> ··· </div>
    ▶ <div id="diigo-video-capture-wrapper"> ··· </div>
    ▶ <div id="diigolet-notice" class="diigolet notice" style="display:
      none;"> ··· </div>
    ▶ <div id="diigolet-dlg-sticky" class="diigolet diigoletFN yellow"
      style="position: absolute; left: 100px; top: 100px; display:
      none;"> ··· </div>
    ▶ <div id="diigolet-csm" class="yellow" style="position: absolute;
      display: none;"> ··· </div>
```

html > body#dummybodyid

▷ℓ Disposición   **Calculado**   Cambios   Tipografía ▾

▽ Filtrar estilos   ☐ Estilos de navegación

```
:hov  .cls  +  🗎          ▽ Filtrar estilos
elemento ⚙  en línea        ▶ box-sizing
{                             border-box
}                           ▶ font-family
* ⚙ {          en línea       "Roboto"
  box-sizing:               ▶ font-size
    border-box;               10px
  margin: ▶ 0px;            ▶ margin-bottom
  padding: ▶ 0px;             0px
}                           ▶ margin-left
Heredado de html             0px
html ⚙ {       en línea     ▶ margin-right
  font-family:                0px
    "Roboto";               ▶ margin-top
  font-size: 10px;            0px
}                           ▶ padding-bottom
                              0px
                            ▶ padding-left
                              0px
```

HTML

```
<!DOCTYPE html>
<html>

<head>
<meta content="IE=edge" http-equiv="X-UA-Compatible">
</head>

<body>

<h1>Hello World!</h1>

</body>

</html>
```

CSS

- Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language like HTML.

```
<h1><font color="red"> Chapter 1. </font></h1>
```

```
<style>
h1 {
    color: red;
}
</style>
```

Javascript

- JavaScript is high-level, often just-in-time compiled, and multi-paradigm. It has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions.

```
<html>
<body>

<h2>JavaScript in Body</h2>

<p id="demo">A Paragraph.</p>

<button type="button" onclick="myFunction()">Try it</button>

<script>
function myFunction() {
  document.getElementById("demo").innerHTML = "Paragraph changed.";
}
</script>

</body>
</html>
```

Python and the web

urlib

```python
from urllib.request import urlopen

response = urlopen("http://www.google.com/")

if response.code == 200:

    html = response.read()

    print(html)
```

urlib

```python
for header, value in response.headers.items():

    print('{}:{}'.format(header,value))
```

HTTPError and URLError

Two exceptions to be taken into account when using urllib:

urllib.error.HTTPError, urllib.error.URLError

    URLError: module error

    HTTPError: server errors (404 Page not found)

HTTPError, URLError

```
from urllib.error import HTTPError, URLError

from urllib.request import urlopen

try:

    response = urlopen("http://www.google.kom/")

except(HTTPError, URLError) as err:

    print(err)
```

requests

```python
import requests

response = requests.get("http://www.gooogle.com")

if response.status_code == 200:

    print(response.content)
```

HTTPError, ConnectionError

```python
from requests.exceptions import HTTPError, ConnectionError

try:

    response = requests.get("http://www.google.kom/")

except(HTTPError, ConnectionError) as err:

    print(err)
```

RSS

What is RSS?

- RSS stands for Rich Site Summary, also known Really Simple Syndication, which allows the audiences of websites or web-based applications to access the latest updates standardised in a computer readable format, XML basically. An RSS document (also shortly called feed, web feed or channel) often includes full or summarised text, metadata like publishing date and author's name.

RSS

```xml
<?xml version="1.0" encoding="UTF-8"?>
<rss version="2.0"
    xmlns:atom="http://www.w3.org/2005/Atom"
    xmlns:content="http://purl.org/rss/1.0/modules/content/"
    xmlns:wfw="http://wellformedweb.org/CommentAPI/"
    xmlns:dc="http://purl.org/dc/elements/1.1/"
    xmlns:georss="http://www.georss.org/georss"
    xmlns:media="http://search.yahoo.com/mrss/"
    xmlns:meneame="http://meneame.net/faq-es.php"
 >
<channel>
    <title>Menéame: más activas</title>
    <atom:link href="http://www.meneame.net/rss?active" rel="self" type="application/rss+xml" />
    <link>http://www.meneame.net</link>
    <image><title>Menéame: más activas</title><link>http://www.meneame.net</link><url>http://mnmstatic.net/img/mnm/eli-rss.png</url></image>
    <description>Sitio colaborativo de publicación y comunicación entre blogs</description>
    <pubDate>Wed, 22 Jul 2020 19:24:02 +0000</pubDate>
    <generator>http://blog.meneame.net/</generator>
    <language>es</language>
    <item>
        <meneame:link_id>3352013</meneame:link_id>
        <meneame:sub>actualidad</meneame:sub>
        <meneame:status>published</meneame:status>
        <meneame:user>filosofo</meneame:user>
        <meneame:clicks>4739</meneame:clicks>
        <meneame:votes>276</meneame:votes>
        <meneame:negatives>3</meneame:negatives>
        <meneame:karma>1723</meneame:karma>
        <meneame:comments>177</meneame:comments>
        <meneame:url>https://www.meneame.net/story/punetazo-limpio-contra-socorrista-helmantico-tras-pedir-unos?utm_source=meneame_rss</meneame:url>
        <title>A puñetazo limpio contra un socorrista del Helmántico tras pedir a unos niños que se comportaran</title>
        <link>https://www.meneame.net/story/punetazo-limpio-contra-socorrista-helmantico-tras-pedir-unos</link>
        <comments>https://www.meneame.net/story/punetazo-limpio-contra-socorrista-helmantico-tras-pedir-unos</comments>
      <pubDate>Wed, 22 Jul 2020 16:20:03 +0000</pubDate>
        <dc:creator>filosofo</dc:creator>
        <category><![CDATA[actualidad]]></category>
        <category><![CDATA[piscina]]></category>
        <category><![CDATA[violencia]]></category>
        <guid>https://www.meneame.net/story/punetazo-limpio-contra-socorrista-helmantico-tras-pedir-unos</guid>
        <description><![CDATA[<img src='https://mnmstatic.net/cache/33/25/media_thumb-link-3352013.jpeg?1595429402' width='155' height='155' alt='' 
        <media:thumbnail url="https://mnmstatic.net/cache/33/25/media_thumb-link-3352013.jpeg?1595429402" width='155' height='155' />
        <wfw:commentRss>http://www.meneame.net/comments_rss?id=3352013</wfw:commentRss> </item>
```
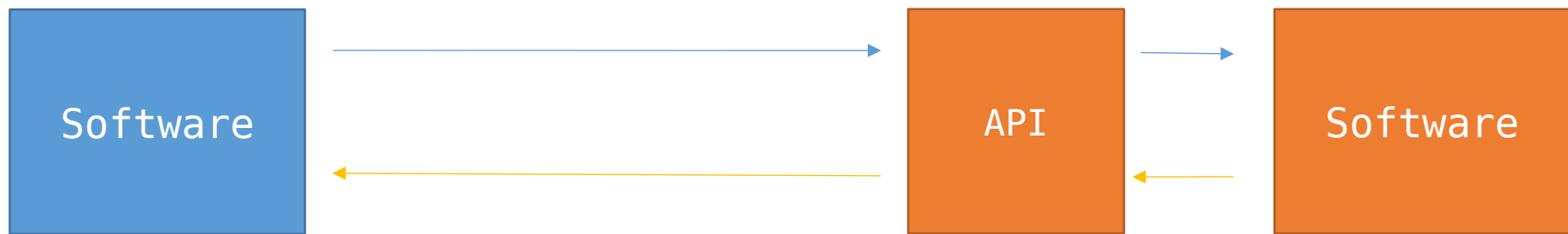
feedparser

```python
import feedparser

url = 'https://www.meneame.net/rss?active'

feedburner = feedparser.parse(url)
```
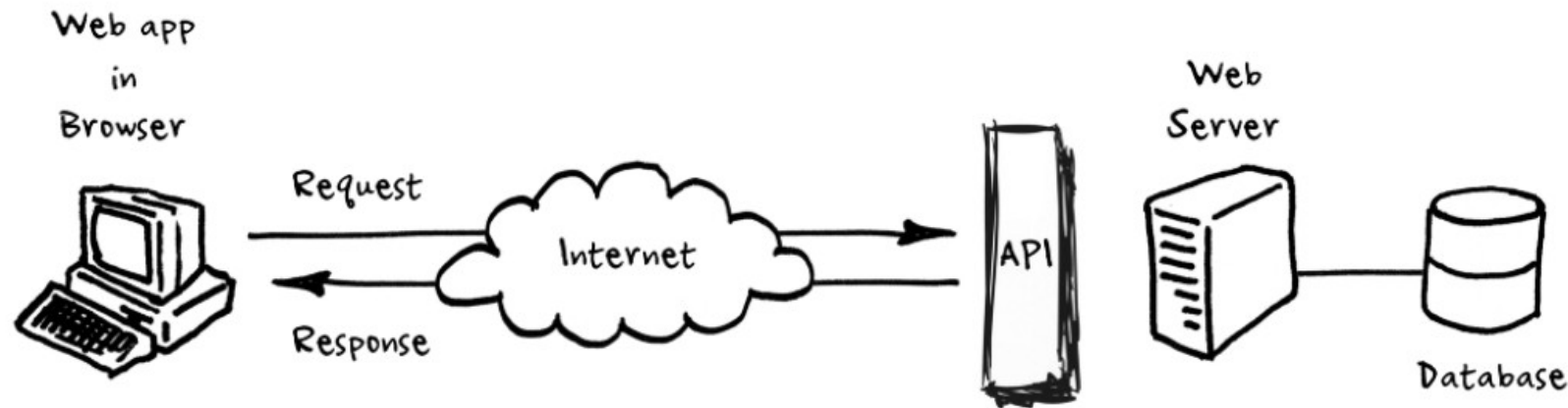
API

¿What is an API?


Application Programing Interfaz: A software interface for application communication

¿What is an API REST?

REST architecture: Representational State Transfer, a distributed architecture based on HTTP web services allowing the requesting systems to access and manipulate textual representations of web resources by using a uniform and predefined set of stateless operations.

exchangerateapi.io
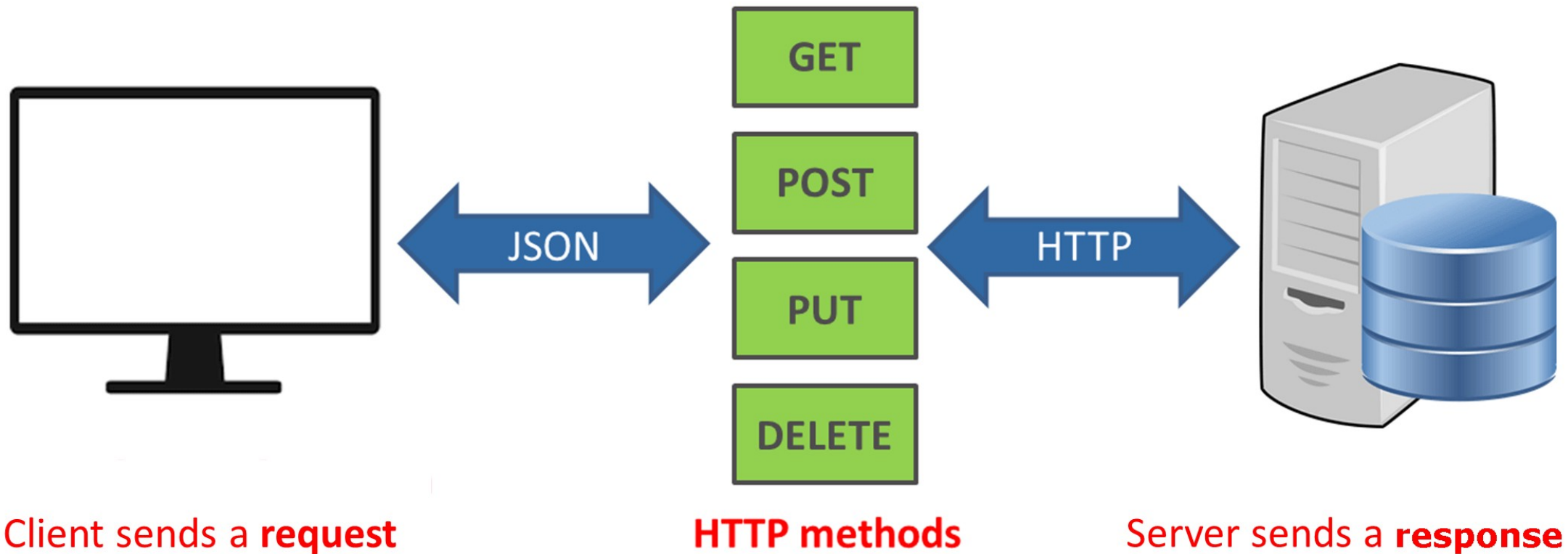
https://api.exchangeratesapi.io/latest

Foreign exchange rates API
with currency conversion

Exchange rates API is a free service for current and historical foreign exchange rates
published by the European Central Bank

```
GET https://api.exchangeratesapi.io/latest HTTP/1.1

{
  "base": "EUR",
  "date": "2018-04-08",
  "rates": {
    "CAD": 1.565,
    "CHF": 1.1798,
    "GBP": 0.87295,
    "SEK": 10.2983,
    "EUR": 1.092,
    "USD": 1.2234,
    ...
  }
}
```

Example

```python
from urllib.request import urlopen

import json

def get_rates():

    api_url = 'https://api.exchangeratesapi.io/latest'

    response = urlopen(api_url)

    rates = json.loads(response.read())

    return rates['rates']

def convert(cantidad, de='EUR', a='USD'):

    rates = get_rates()

    return rates['USD'] * cantidad


cantidad_en_euros = 100

cantidad_en_dolares = convert(cantidad_en_euros)

print('{} euros son {} dólares'.format(cantidad_en_euros, cantidad_en_dolares))
```

NAVARRA

MUNICIPIOS DESTACADOS

Estella-Lizarra	☁️	19°C	9°C	Pamplona	☁️	18°C	9°C
Roncal	🌤️	18°C	4°C	Tudela	🌤️	20°C	11°C

PREVISIÓN NAVARRA

HOY | **MAÑANA**

Nuboso o cubierto en el norte y el oeste y poco nuboso en el cuadrante sureste, con lluvias de madrugada que serán poco probables en el extremo este, aumentando a cubierto durante las horas centrales, cuando se esperan lluvias y chubascos en el norte, y tendiendo a disminuir la nubosidad a intervalos por la tarde en el este y el sur, y a remitir las precipitaciones, pudiendo persistir de forma débil en el noroeste. No se descartan brumas y bancos de niebla matinales en los entornos de las sierras de Urbasa y Aralar y del Pirineo. Temperaturas mínimas con pocos cambios y máximas en aumento. Viento débil del norte y noroeste, con algún intervalo algo más intenso en la Ribera baja durante las horas centrales.

https://www.el-tiempo.net/

Weather API

- https://www.el-tiempo.net/api

- https://www.el-tiempo.net/api/json/v2/provincias/09/municipios/08019

A Collective List Of APIs. Build Something.

Search	All ∨

▦ **GRID**   ☰ LIST

⬇ᴬᶻ

AMAZON S3 API	API2CART	BEST BUY COMMERCE API

https://apilist.fun/