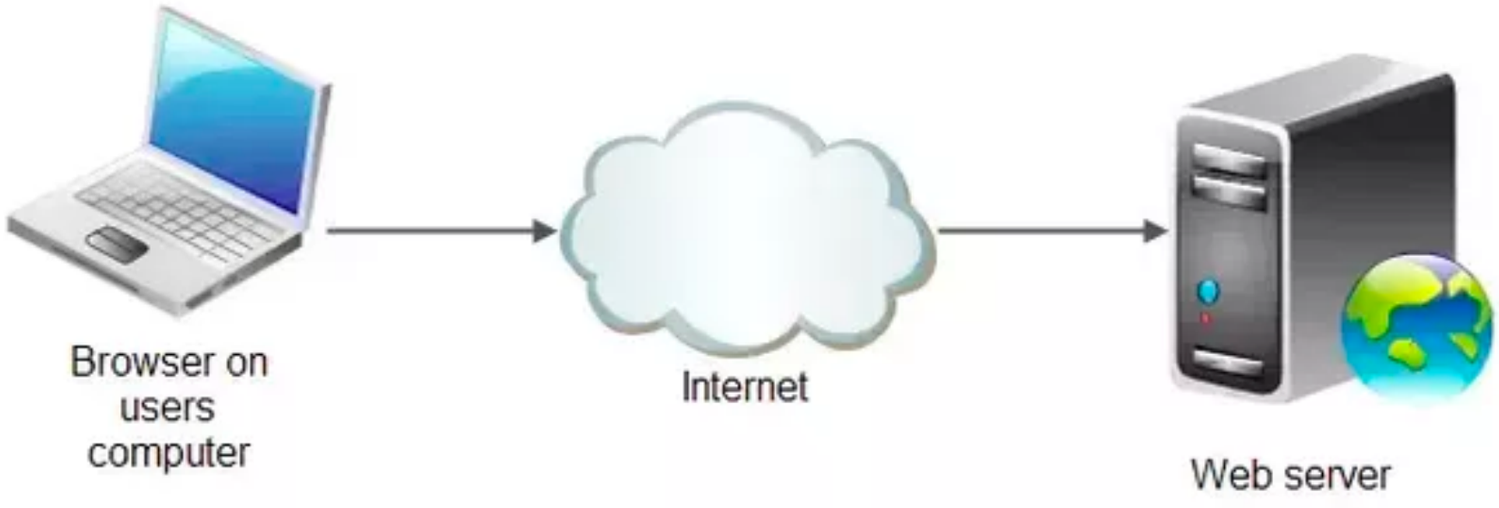
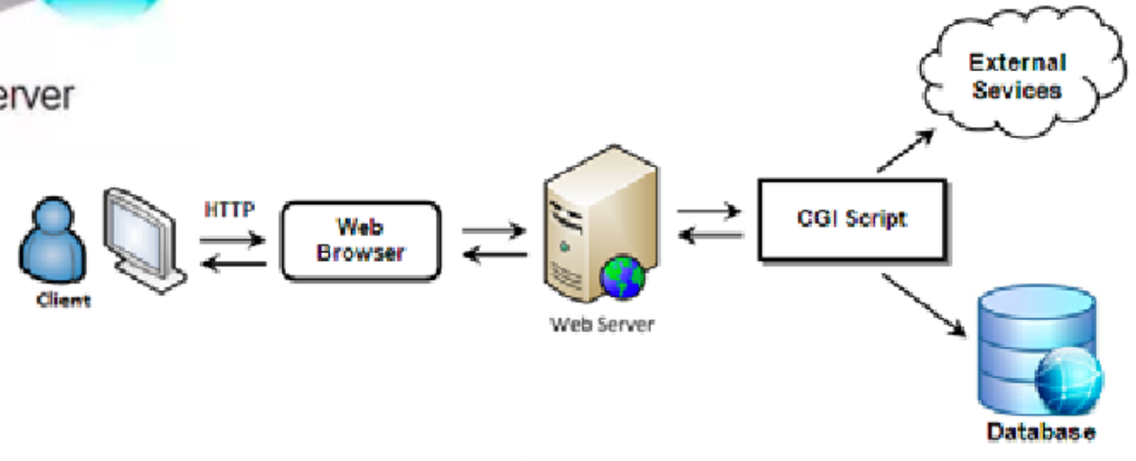
Les 11 - Web

20181211 - 13

M. DIMA

- HTTP Protocol
- Webservers
    - Apache HTTP Server
    - Apache Tomcat
    - NGINX
    - Node.js
    - Lighthttpd
- REST API





- Webserver

Een **webserver** is een programma dat via een netwerk HTTP-verzoeken ontvangt en documenten naar de client stuurt. …

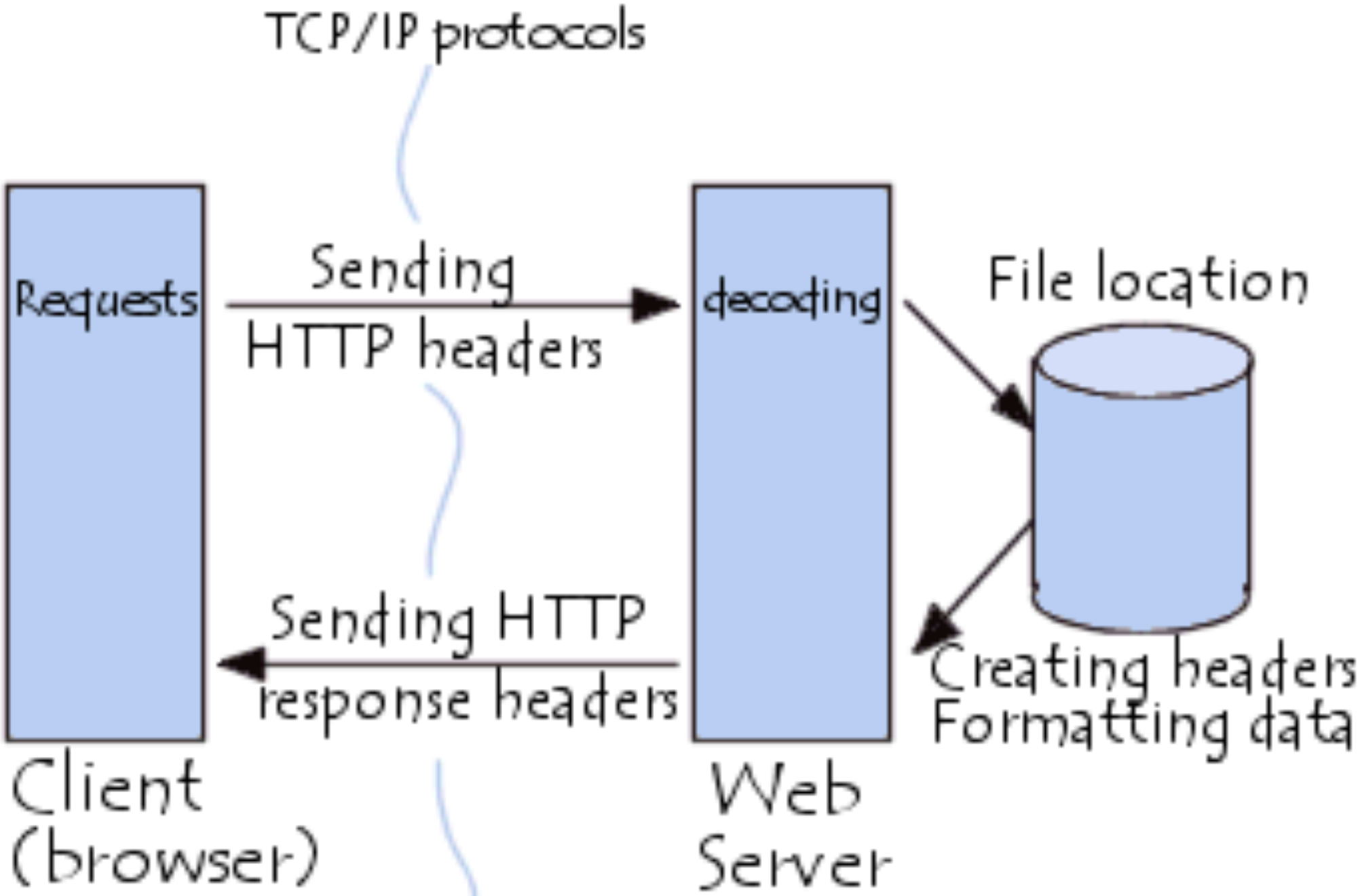
Het Engelse begrip server betekent zoveel als "dienstverlener". De dienst, het leveren van documenten, wordt doorgaans verleend aan webbrowsers. De verzoeken aan een webserver moeten niet noodzakelijkerwijs via een fysiek netwerk gesteld worden, een dergelijke communicatie kan ook binnen één en dezelfde computer plaatsvinden.

Bron: https://nl.wikipedia.org/wiki/Webserver

HTTP (Hypertext Transfer Protocol)

HTTP (Hypertext Transfer Protocol) is the set of rules for transferring files (text, graphic images, sound, video, and other multimedia files) on the World Wide Web. As soon as a Web user opens their Web browser, the user is indirectly making use of HTTP. HTTP is an application protocol that runs on top of the TCP/IP suite of protocols (the foundation protocols for the Internet).

Bron: https://searchwindevelopment.techtarget.com/definition/HTTP


TCP/IP protocols
Requests
Sending
HTTP headers
decoding
File location
Sending HTTP
response headers
Creating headers
Formatting data
Client
(browser)
Web
Server

Google

https://www.google.be

Paused

Gmail Afbeeldi

Google

Google zoeken Ik doe een gok

Google aangeboden in: Français Deutsch English

België

Adverteren Bedrijf Over Privacy V

Elements Console Sources Network Performance Memory 3

View: Group by frame Preserve log Disable cache Offline Or

Filter Hide data URLs

All XHR JS CSS Img Media Font Doc WS Manifest Other

50000 ms 100000 ms 150000 ms 200000 ms 250000 ms 300000 ms 350

Name

www.google.be
googlelogo_color_272x9…
i2_2ec824b0.png
photo.jpg
googlemic_color_24dp….
data:image/gif;base…
gen_204?s=webhp&t=af…
nav_logo242.png
rs=ACT90oFAA9GOubZ…
gen_204?atyp=csi&ei=I…
search?q&cp=0&client=…
m=sb_wiz,aa,abd,async…
rs=AA2YrTse0MYZF-M…
dn/
cb=gapi.loaded_0
count
dn.js
gen_204?atyp=csi&ei=I…
ui
favicon.ico
widget?sourceid=1&hl=…
m=wmwg8b
m=OJUrvb
KFOmCnqEu92Fr1Mu4…
m=CyO4we,EFQ78c,G4…
api.js
m=NTMZac,SKR2De
m=ZxDaqc,w9hDv
cb=gapi.loaded_0
m=FCpbqb,WhJNk,_lat…

39 requests | 345 KB transfe…

Headers Preview Response Cookies Timing

General

Request URL: https://www.google.be/
Request Method: GET
Status Code: 200
Remote Address: [2a00:1450:400e:80b::2003]:443
Referrer Policy: no-referrer-when-downgrade

Response Headers

alt-svc: quic=":443"; ma=2592000; v="44,43,39,35"
cache-control: private, max-age=0
content-encoding: br
content-type: text/html; charset=UTF-8
date: Mon, 10 Dec 2018 16:49:38 GMT
expires: -1
p3p: CP="This is not a P3P policy! See g.co/p3phelp for more info."
server: gws
set-cookie: 1P_JAR=2018-12-10-16; expires=Wed, 09-Jan-2019 16:49:38 GMT; path=/; domain=.google.be
set-cookie: NID=150=svE3cIS7u-tNmVsxfKq2WeyoM09_VUY0RCLO169XkGjuj3li4CDuOU4LnIUX3fD-73CIo5WYpmXqJz92cf7M6gLuqTDvefYdpYAqI1DG2Yc-jGQ_z5IQG_FxGz2q4PFsBDw_V2Q9JXGSfzRL9hM4nPJqli5d34T3eeRVx3bb1drhJcvpR4cPnTJ2W6K5DjkmsfzPGQXdkNWt2pfuQVmVxbUj7QDK_vIsodPe; expires=Tue, 11-Jun-2019 16:49:38 GMT; path=/; domain=.google.be; HttpOnly
status: 200
strict-transport-security: max-age=31536000
x-frame-options: SAMEORIGIN
x-xss-protection: 1; mode=block

Request Headers

:authority: www.google.be
:method: GET

Console What's New

HTTP Methodes

GET
The GET method requests a representation of the specified resource. Requests using GET should only retrieve data and should have no other effect. (This is also true of some other HTTP methods.)[1] The W3C has published guidance principles on this distinction, saying, "Web application design should be informed by the above principles, but also by the relevant limitations."[17] See safe methods below.
POST
The POST method requests that the server accept the entity enclosed in the request as a new subordinate of the web resource identified by the URI. The data POSTed might be, for example, an annotation for existing resources; a message for a bulletin board, newsgroup, mailing list, or comment thread; a block of data that is the result of submitting a web form to a data-handling process; or an item to add to a database.[18]
PUT
The PUT method requests that the enclosed entity be stored under the supplied URI. If the URI refers to an already existing resource, it is modified; if the URI does not point to an existing resource, then the server can create the resource with that URI.[19]
DELETE
The DELETE method deletes the specified resource.

The GET Method

GET is used to request data from a specified resource.

GET is one of the most common HTTP methods.

Note that the query string (name/value pairs) is sent in the URL of a GET request:

```
/test/demo_form.php?name1=value1&name2=value2
```

Some other notes on GET requests:

- GET requests can be cached
- GET requests remain in the browser history
- GET requests can be bookmarked
- GET requests should never be used when dealing with sensitive data
- GET requests have length restrictions
- GET requests is only used to request data (not modify)

localhost:8000/formget.html

localhost:8000/form...

First name: milan
Last name: dima
Submit

Click on the submit button, and the input will be sent

formGet.html — UNREGISTERED

formGet.html

```
1  <!DOCTYPE html>
2  <html>
3  <body>
4
5  <form action="/action_page.html" method="get" target="_blank">
6    First name: <input type="text" name="fname"><br>
7    Last name: <input type="text" name="lname"><br>
8    <input type="submit" value="Submit">
9  </form>
10
11 <p>Click on the submit button, and the input will be sent to a page
   on the server called "/action_page.html".</p>
12
13 </body>
14 </html>
15
```

localhost:8000/formget.html

localhost:8000/action_page.ht

localhost:8000/action_page.html?fname=milan&lname=dima

Paused

HTML

Uw formulier werd verstuurd

action_page.html — UNREGISTERED

action_page.html

```
1  <!DOCTYPE html>
2  <html>
3  <body>
4
5
6  <p>Uw formulier werd verstuurd</p>
7
8  </body>
9  </html>
10
```

Line 1, Column 1 Tab Size: 4 HTML

vives

- **GET Method**

As explained above, before sending any information , it converts values/data into a query string in URL known as **Url Encoding.** Which contains both page link and encoded information separated by the **?** character.

```
http://www.example.com/index.html?name=john&email=john@gmail.com&contact=9877989898
```

Client Side: Below code is an HTML form with **method="get"** for user to fill information.

```
<form action="#" method="get">
<input type="text" name="name" placeholder="Your Name"></input><br/>
<input type="text" name="email" placeholder="Your Email"></input><br/>
<input type="text" name="contact" placeholder="Your Mobile"></input><br/>
<input type="submit" name="submit" value="Submit"></input>
</form>
```

Server Side: Below code has PHP script where, **$_GET** associative array is used to receive sent information at server end.

```
<?php
if( $_GET["name"] || $_GET["email"] || $_GET["contact"])
{
echo "Welcome: ". $_GET['name']. "<br />";
echo "Your Email is: ". $_GET["email"]. "<br />";
echo "Your Mobile No. is: ". $_GET["contact"];
}
?>
```

Above query string of information, generated by Get method can be readable in address bar therefore, never use Get method for sending sensitive information to server.

One should avoid use of this method to send binary data like, Images or Word Document file to the server.

The POST Method

POST is used to send data to a server to create/update a resource.

The data sent to the server with POST is stored in the request body of the HTTP request:

```
POST /test/demo_form.php HTTP/1.1
Host: w3schools.com
name1=value1&name2=value2
```

POST is one of the most common HTTP methods.

Some other notes on POST requests:

- POST requests are never cached
- POST requests do not remain in the browser history
- POST requests cannot be bookmarked
- POST requests have no restrictions on data length

- **POST Method**

As explained above, before sending information to server, it converts client's information into a query string in URL.

Client Side: Below code is an HTML form with **method="post"** for user to fill information.

```
<form action="#" method="post">
....
</form>
```

Server Side: Below code has PHP script where, **$_POST** associative array is used to receive sent information at server end.

```
<?php
if( $_POST["name"] || $_POST["email"] || $_POST["contact"])
{
echo "Welcome: ". $_POST['name']. "<br />";
echo "Your Email is: ". $_POST["email"]. "<br />";
echo "Your Mobile No. is: ". $_POST["contact"];
}
?>
```

Query string , generated by Post method never appears in address bar i.e. it is hidden for the user therefore, we can use this method for sending sensitive information to server. Moreover, we can make use of this method to send binary data to the server without any restrictions to data size.

POST en GET methods uitproberen op https://www.formget.com/php-post-get/

Watch our live demo or just follow our codes and download it.

DOWNLOAD SCRIPT

The PUT Method

PUT is used to send data to a server to create/update a resource.

The difference between POST and PUT is that PUT requests are idempotent. That is, calling the same PUT request multiple times will always produce the same result. In contrast, calling a POST request repeatedly have side effects of creating the same resource multiple times.

The DELETE Method

The DELETE method deletes the specified resource.

HTTP Status Codes

- https://nl.wikipedia.org/wiki/Lijst_van_HTTP-statuscodes
  - 100+: Mededelend
  - 200+: Goed gevolg
  - 300+: Omleiding
  - 400+: Aanvraagfout
  - 500+: Serverfout

Statuscodes [bewerken]

100+: Mededelend [bewerken]

- 100: Doorgaan
- 101: Protocolwissel
- 102: Processing

200+: Goed gevolg [bewerken]

- 200: OK
- 201: Aangemaakt
- 202: Aanvaard
- 203: Niet-gemachtigde informatie
- 204: Geen inhoud
- 205: Inhoud opnieuw instellen
- 206: Gedeeltelijke inhoud
- 207: Meerdere statussen

300+: Omleiding [bewerken]

- 300: Meerkeuze
- 301: Definitief verplaatst
- 302: Tijdelijk verplaatst
- 303: Zie andere
- 304: Niet gewijzigd
- 305: Gebruik Proxy (*: vele HTTP-clients (zoals Mozilla en Internet Explorer) gaan, wegens veiligheidsredenen, slecht met deze code om.)
- 306: (Gereserveerd)
- 307: Tijdelijke omleiding
- 308: Definitieve omleiding

400+: Aanvraagfout [bewerken]

- 400: Foute aanvraag
- 401: Niet geautoriseerd
- 402: Betalende toegang
- 403: Verboden toegang
- 404: Niet gevonden
- 405: Methode niet toegestaan
- 406: Niet aanvaardbaar
- 407: Authenticatie op de proxyserver verplicht

404 - Page not found

https://www.w3schools.com/unexistingpage.htm

Paused

Sorry

404 - The page cannot be found

We cannot find the page you are looking for.

It might have been removed, had its name changed, or is temporarily unavailable.

Please check that the Web site address is spelled correctly.

Or go to our home page, and use the menus to navigate to a specific section.

Other things to try:

- Search **https://www.w3schools.com**:

nonexistent page

Google Search

Elements Console Sources Network Performance Memory

View: Group by frame Preserve log Disable cache Offline

Filter Hide data URLs

All XHR JS CSS Img Media Font Doc WS Manifest Other

2000 ms 4000 ms 6000 ms 8000 ms 10000 ms 12000 ms 14000 ms

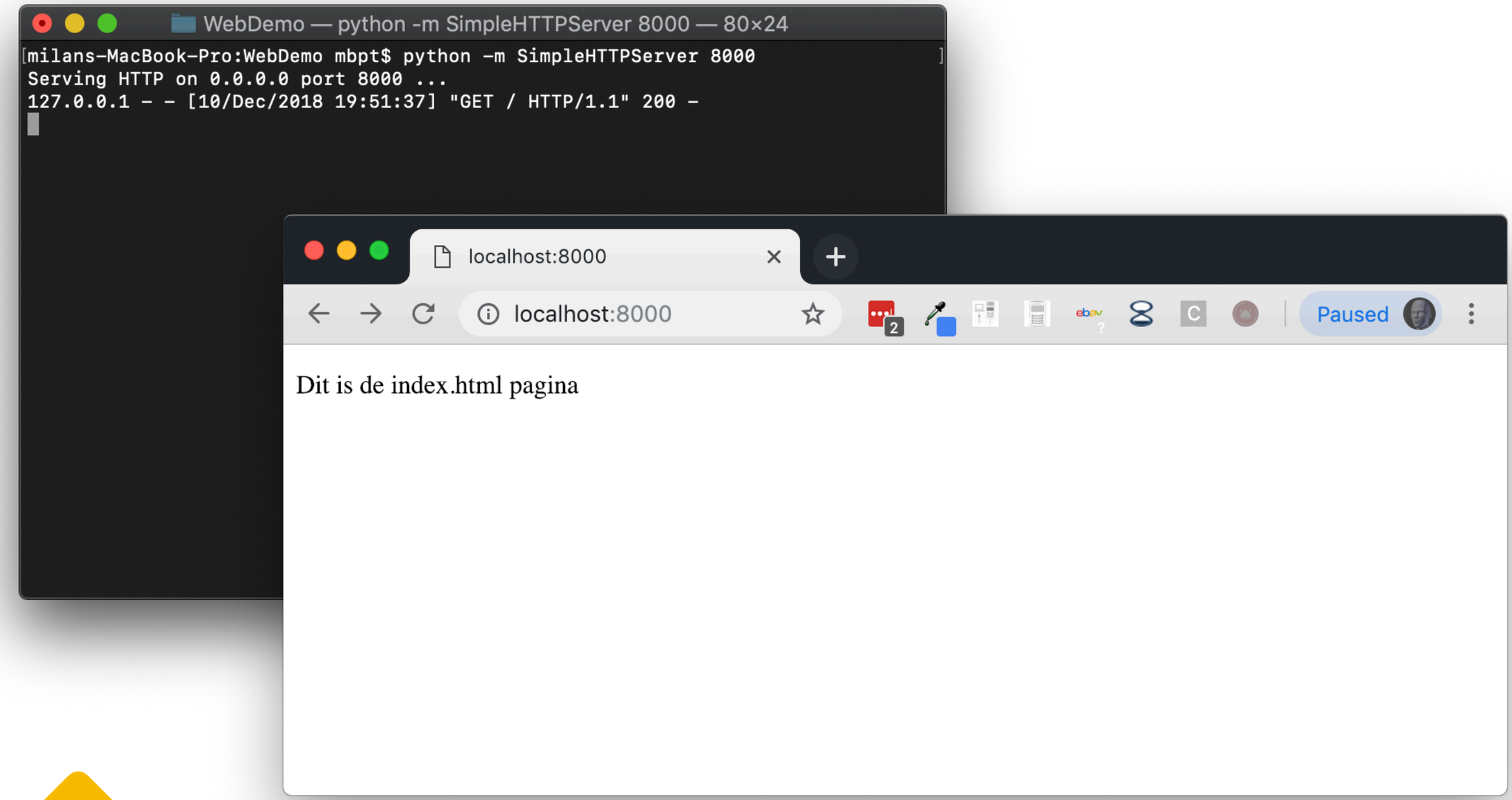
Name	Status	Type	Initiator	Size	Ti…	Waterfall
unexistingpage.htm	404	docu…	Other	2.7 KB	7…	
w3.css	200	styles…	unexistingp…	8.5 KB	1…	
fixurl.js	200	script	unexistingp…	18.5 …	2…	
analytics.js	200	script	unexistingp…	(from…	1…	
wm?sourceid=wm&url=http…	200	script	fixurl.js:142	1.0 KB	1…	
collect?v=1&_v=j72&a=2070…	200	gif	analytics.js:15	63 B	7…	
collect?t=dc&aip=1&_r=3&v…	200	gif	analytics.js:15	280 B	6…	

7 requests | 31.0 KB transferred | Finish: 12.59 s | DOMContentLoaded: 12.52 s | Load: 13.55 s

Console What's New

Running a Http server

```
$ python -m SimpleHTTPServer 8000
```



index.html UNREGISTERED

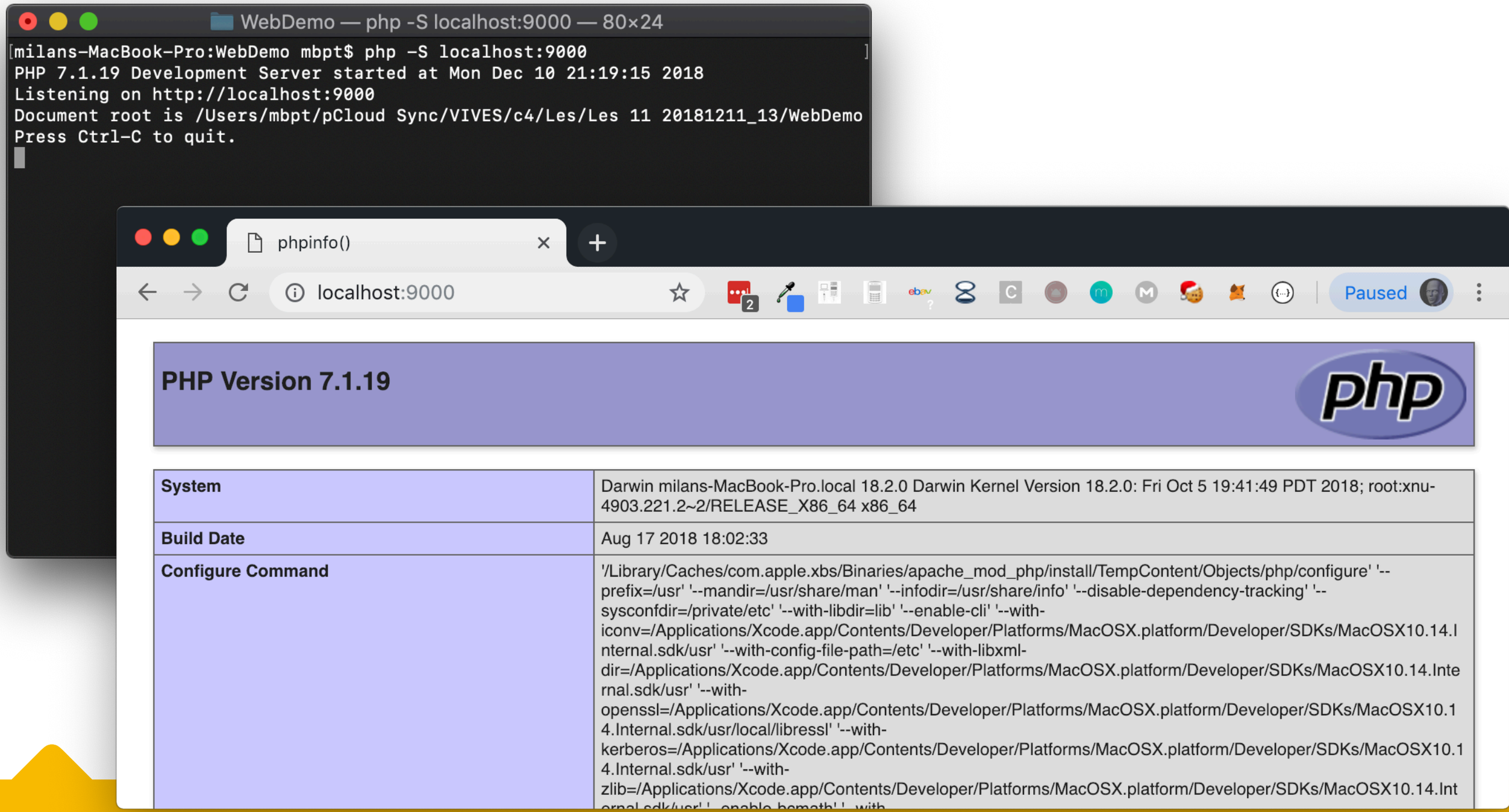
index.html

```
1  <!DOCTYPE html>
2  <html>
3  <body>
4
5
6  <p>Dit is de index.html pagina</p>
7
8  </body>
9  </html>
10
```

Line 1, Column 1 Tab Size: 4 HTML

Running a PHP server

```
$ php -S localhost:9000
```



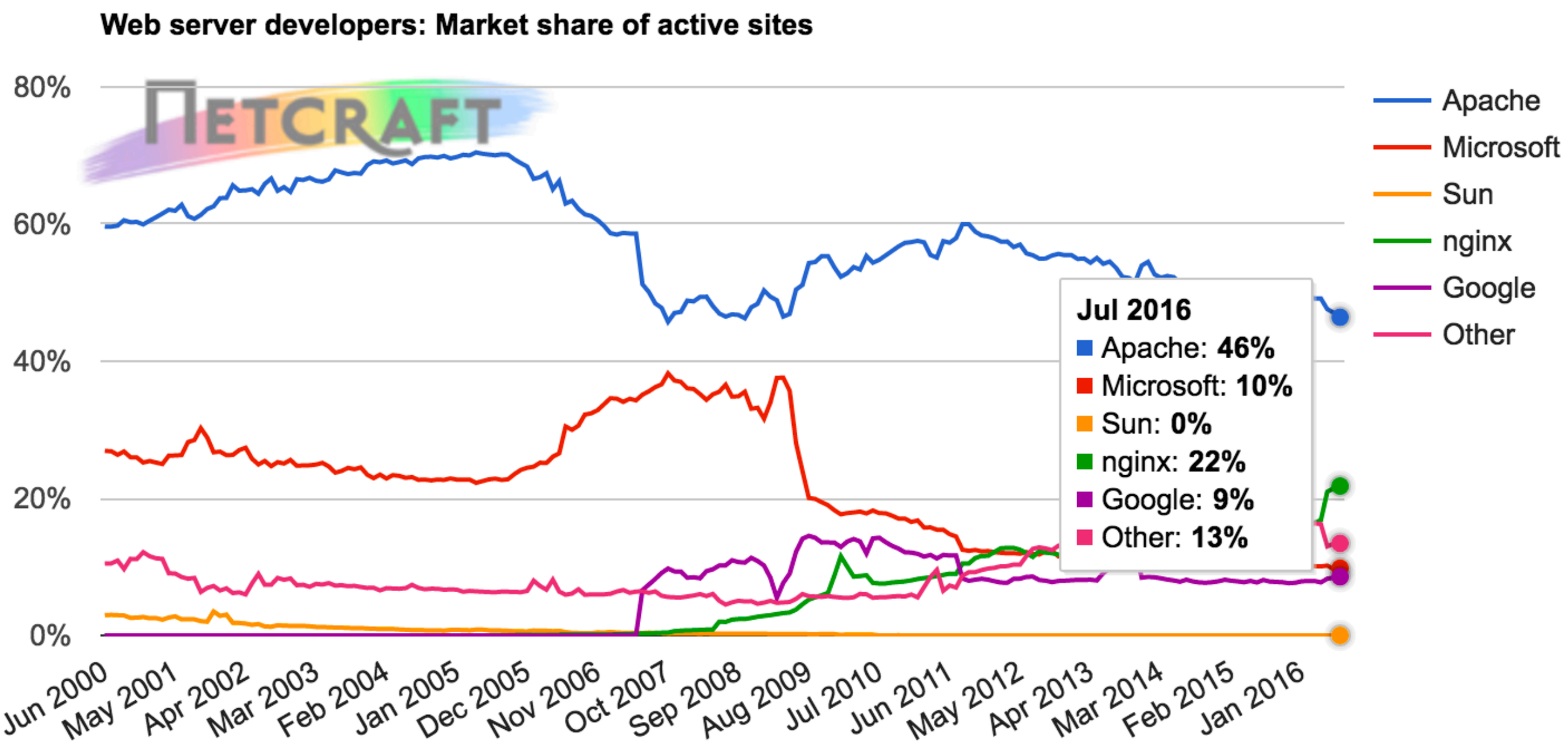
index.php UNREGISTERED

index.php

```php
<?php

// Show all information, defaults to INFO_ALL
phpinfo();

// Show just the module information.
// phpinfo(8) yields identical results.
phpinfo(INFO_MODULES);

?>
```

Line 1, Column 6 Tab Size: 4 PHP

Webservers


Web server developers: Market share of active sites
NETCRAFT
80%
60%
40%
20%
0%
Jun 2000
May 2001
Apr 2002
Mar 2003
Feb 2004
Jan 2005
Dec 2005
Nov 2006
Oct 2007
Sep 2008
Aug 2009
Jul 2010
Jun 2011
May 2012
Apr 2013
Mar 2014
Feb 2015
Jan 2016
Apache
Microsoft
Sun
nginx
Google
Other
Jul 2016
Apache: 46%
Microsoft: 10%
Sun: 0%
nginx: 22%
Google: 9%
Other: 13%

Apache HTTP Server

The Apache HTTP Server—often referred to as httpd, or simply Apache—was first launched in 1995, and celebrated its 20th birthday in February 2015. Apache powers 52% of all websites globally, and is by far the **most popular** web server.

While Apache httpd is most often seen running on **Linux**, you can also deploy Apache on OS X and Windows. Apache is, unsurprisingly, licensed under the Apache License version 2. The web server itself uses a modular architecture, in which extra modules can be loaded to extend its features. For example, loading the mod_proxy will allow for a proxy/gateway on your server, and mod_proxy_balancer will enable load balancing for all supported protocols. As of version 2.4, Apache also supports HTTP/2 through a new module, mod_http2.

As the Apache HTTP Server has been the most popular web server **since 1996**, it "benefits from great documentation and integrated support from other software projects." You can find more information on the Apache Foundation project page.

APACHE

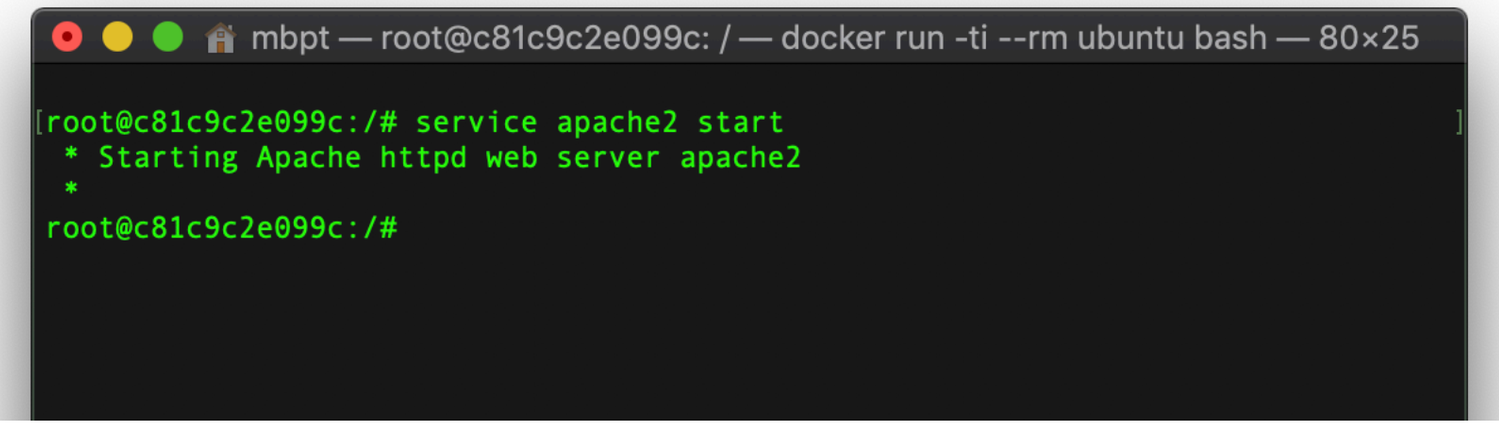
HTTP SERVER PROJECT

Apache HTTP Server

https://httpd.apache.org/download.cgi

https://httpd.apache.org/docs/2.4/getting-started.html

```
sudo apt install apache2
sudo service apache2 start
```



Apache Tomcat

Apache Tomcat is an open source *Java servlet* container that functions as a web server. A Java servlet is a Java program that extends the capabilities of a server. Although servlets can respond to any types of requests, they most commonly implement **applications** hosted on Web servers. Such web servlets are the **Java** counterpart to other dynamic web content technologies such as PHP and ASP.NET. Tomcat's code base was donated by Sun Microsystems to the Apache Software Foundation in 1999, and became a top-level Apache project in 2005. It currently powers just under 1% of all websites.

Apache Tomcat, released under the Apache License version 2, is typically used to run Java applications. It can, however, be extended with Coyote, to also perform the role of a normal web server that serves local files as HTTP documents. More information can be found on the project website.

Apache Tomcat is often listed among other open source Java application servers. Some examples are JBoss, Wildfly, and Glassfish.

Nginx

NGINX

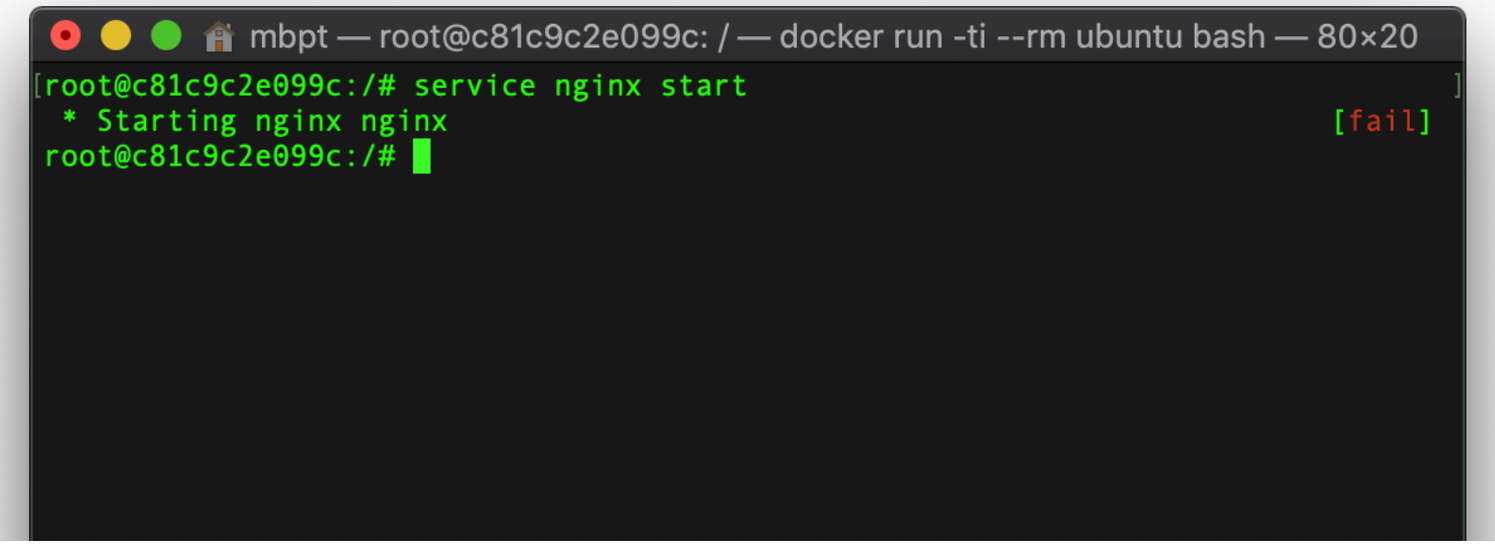
Igor Sysoev began developing NGINX back in 2002, with its first public release in 2004. NGINX was developed as an answer to the so-called C10K problem, which is shorthand for "**how do you design a web server which can handle ten thousand concurrent connections?**" NGINX is second on a list of open source web servers by usage, running just over 30% of all websites.

NGINX relies on an **asynchronous** event-driven architecture to help power its goal of handling massive concurrent sessions. It has become a very popular web server among administrators due to its **light** resource utilization and its ability to **scale easily**.

NGINX is released under a BSD-like license, and can not only be deployed as web server, but also as proxy server or **load-balancer**. You can find more information on the NGINX community site.

https://www.nginx.com/resources/wiki/start/topics/tutorials/install/

```
sudo apt-get update
sudo apt-get install nginx
```



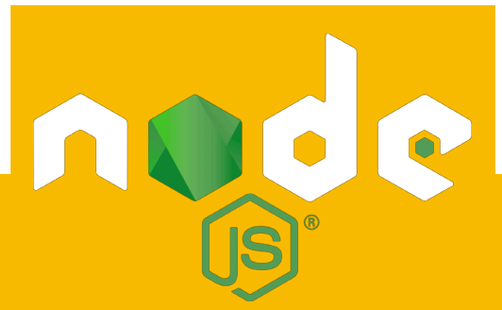

```
sudo systemctl start nginx
sudo systemctl stop nginx
sudo systemctl restart nginx
```

Node.js

Node.js is a **server-side JavaScript** environment for network applications such as web servers. With a smaller market position, Node.js powers 0.2% of all websites. Node.js was originally written in 2009 by Ryan Dahl. The Node.js project, governed by the Node.js Foundation, is facilitated by the Linux Foundation's Collaborative Projects program.

The difference between Node.js and other popular web servers is that it is primarily a cross-platform runtime environment to build network applications with. Node.js applies an event-driven architecture capable of asynchronous I/O. These design choices optimize throughput and scalability in web applications allowing to run real-time communication and browser games. Node.js also highlights the difference in web development stacks, where **Node.js is clearly part of the HTML, CSS, and JavaScript stack**, as opposed to Apache or NGINX which are a part of many different software stacks.

Node.js is released under a mix of licenses; more information is available on the project's website.



https://nodejs.org/en/

https://nodejs.org/en/download/

HOME | ABOUT | DOWNLOADS | DOCS | GET INVOLVED | SECURITY | NEWS | FOUNDATION

Downloads

Latest LTS Version: **10.14.1** (includes npm 6.4.1)

Download the Node.js source code or a pre-built installer for your platform, and start developing today.

LTS Recommended For Most Users	Current Latest Features
Windows Installer node-v10.14.1-x86.msi	macOS Installer node-v10.14.1.pkg
Source Code node-v10.14.1.tar.gz	

Windows Installer (.msi)	32-bit	64-bit	
Windows Binary (.zip)	32-bit	64-bit	
macOS Installer (.pkg)	64-bit		
macOS Binary (.tar.gz)	64-bit		
Linux Binaries (x64)	64-bit		
Linux Binaries (ARM)	ARMv6	ARMv7	ARMv8
Source Code	node-v10.14.1.tar.gz		

Additional Platforms

```
sudo apt install nodejs
sudo node http_server.js
```

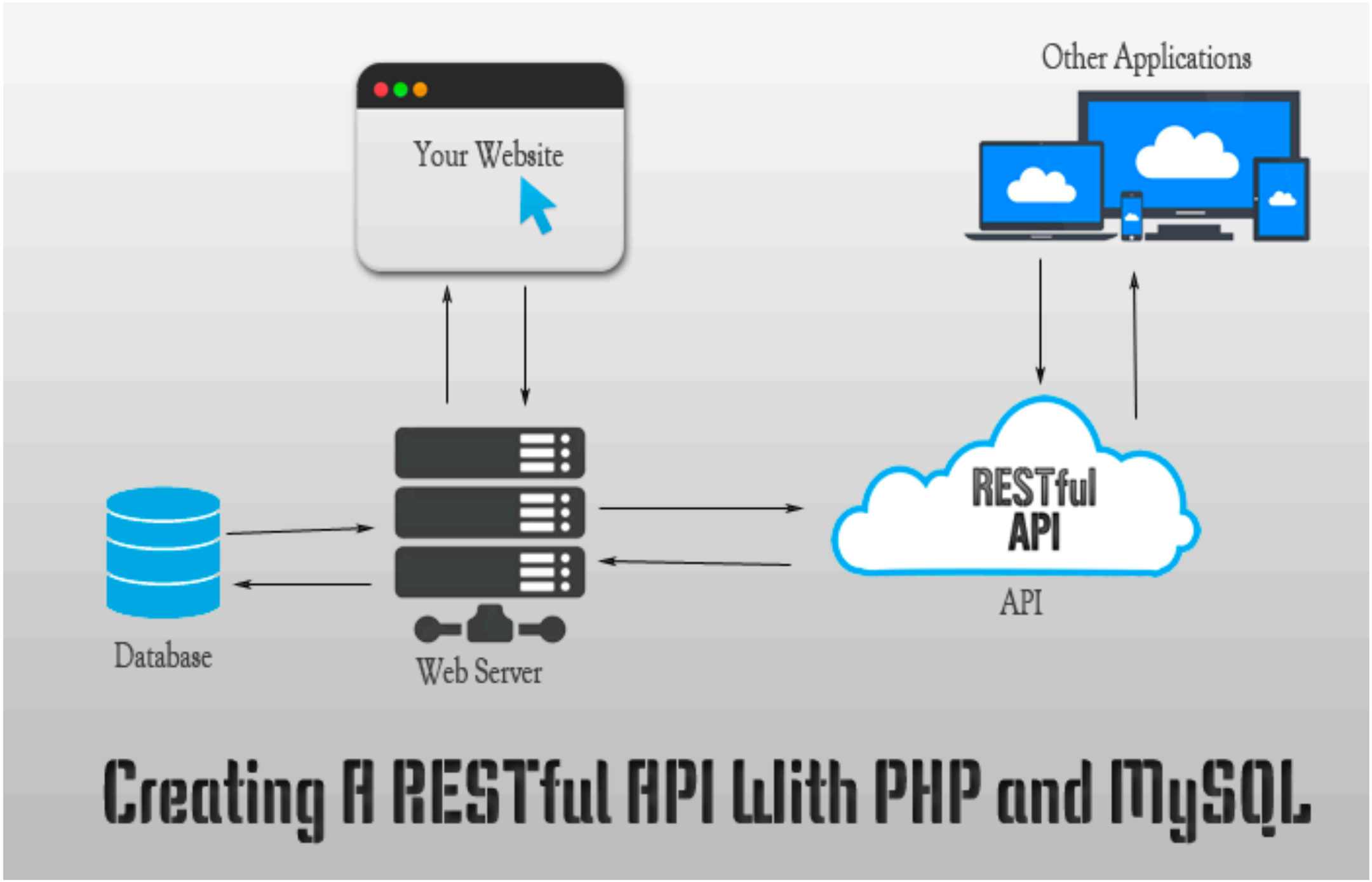
https://websiteforstudents.com/install-the-latest-node-js-and-nmp-packages-on-ubuntu-16-04-18-04-lts/

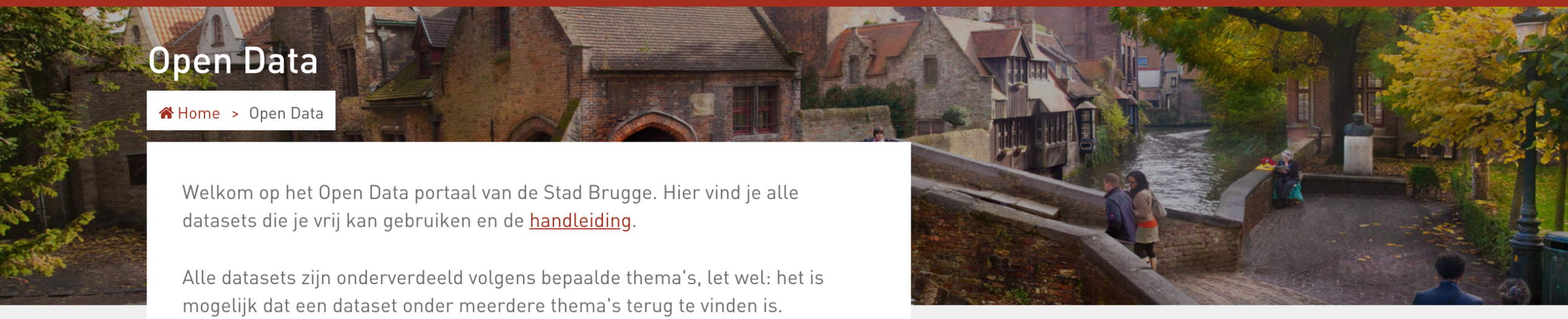
Lighthttpd

Lighttpd—pronounced "lightly"—saw its initial release in March 2003. It currently powers approximately 0.1% of all websites and is distributed under a BSD license.

Lighttpd distinguishes itself with its **low memory footprint**, small CPU load, and speed optimizations. It uses an event-driven architecture, is optimized for a large number of parallel connections, and supports FastCGI, SCGI, Auth, Output-compression, URL-rewriting and many more features. Lighttpd is a popular web server for the Catalyst and Ruby on Rails web frameworks. Find more information on the project homepage.

REST API


Other Applications
Your Website
RESTful
API
API
Database
Web Server
Creating A RESTful API With PHP and MySQL



Open Data

Welkom op het Open Data portaal van de Stad Brugge. Hier vind je alle datasets die je vrij kan gebruiken en de handleiding.

Alle datasets zijn onderverdeeld volgens bepaalde thema's, let wel: het is mogelijk dat een dataset onder meerdere thema's terug te vinden is.

Voor vragen m.b.t. deze site kun je gis@brugge.be contacteren.

Datasets:

Bevolking | Grondgebied | Milieu en Natuur | Mobiliteit | Werk en Economie

Contactinformatie

GIS-cel

Dienst informatica | Binnenweg 2 | 8000 Brugge
T 050 47 40 42 | gis@brugge.be

Documenten

https://any-api.com

Paused

Any API

Search APIs

Document your API

Any API

Documentation and Test Consoles for Over 500 Public APIs

Powered by LucyBot and APIs Guru

- ALL
- ANALYTICS
- BACKEND
- CLOUD
- COLLABORATION
- CUSTOMER RELATION
- DEVELOPER TOOLS
- ECOMMERCE
- EDUCATION
- EMAIL
- ENTERPRISE
- ENTERTAINMENT
- FINANCIAL
- HOSTING
- IOT
- LOCATION
- MACHINE LEARNING
- MARKETING
- MEDIA
- MESSAGING
- MONITORING

Oxford Dictionaries

Oxford Dictionaries

NBA Stats

The destination for current and historic NBA statistics.

Spotify

Our Web API lets your applications fetch data from the Spotify music catalog and manage user's playlists and saved music.

Amadeus Travel Innovation...

Amadeus Travel Innovation Sandbox

traccar

Open Source GPS Tracking Platform

Books

The Books API provides information about book reviews and The New York Times bestsellers lists.

Rotten Tomatoes

Access Tomatometer, critic reviews and ratings through the Rotten Tomatoes APIs

Instagram

The Instagram API Platform can be used to build non-automated, authentic, high-quality apps.

https://jsonplaceholder.typicode.com/

Example

Run this code in a console or from any site:

```
fetch('https://jsonplaceholder.typicode.com/todos/1')
  .then(response => response.json())
  .then(json => console.log(json))
```

Try it


```
{
  "userId": 1,
  "id": 1,
  "title": "delectus aut autem",
  "completed": false
}
```


Congrats you've made your first call to JSONPlaceholder! 😀 🎉

Tip: you can use `http` or `https` when making requests to JSONPlaceholder.

https://www.getpostman.com

Paused

POSTMAN

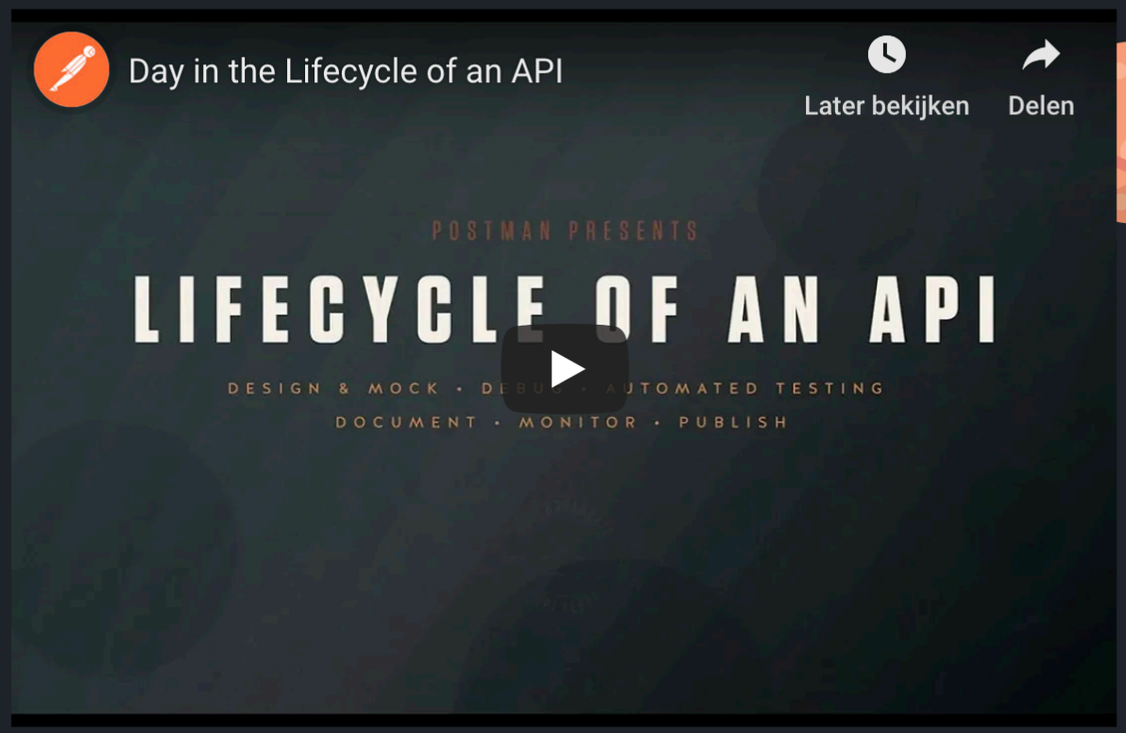
PRODUCT SOLUTIONS ENTERPRISE PLANS & PRICING DOCS API NETWORK SIGN IN

Postman Makes API Development Simple.

Developers use Postman to build modern software for the API-first world.

Download the App

Want to improve your Postman skills? Take the next step!



vives

VIVES HBO V

Postman

New | Import | Runner | My Workspace | Invite | Sign In

Filter

History | Collections

Clear all | Save Responses

Today

GET https://jsonplaceholder.typicode.com/todos/1?userId=1

GET Untitled Request | GET test

No Environment

test

Examples (0)

GET | https://jsonplaceholder.typicode.com/todos/1?userId=1 | Send | Save

Params | Authorization | Headers | Body | Pre-request Script | Tests | Cookies | Code

KEY	VALUE	DESCRIPTION	Bulk Edit
userId	1		
Key	Value	Description	

Body | Cookies (1) | Headers (19) | Test Results | Status: 200 OK | Time: 504 ms | Size: 859 B | Save | Download

Pretty | Raw | Preview | JSON


```
{
    "userId": 1,
    "id": 1,
    "title": "delectus aut autem",
    "completed": false
}
```

Oefeningen

1. Installeer en run de 5 verschillende servers en display telkens een “hello world”-pagina in het ondersteund formaat.
2. Zoek een interessante API en stuur requests via Postman (bv facebook/instagram enz…)