WHAT'S UNDER THE HOOD OF INTERNET

BASIC TECHNICAL CONCEPTS


0101100011010101100011010101100011010

LET'S START WITH

A BIT OF HISTORY

1969 — ARPANET

1971 — EMAIL

1979 — EMOTICON

1980 — FIRST VIRUS

1986 — INTERNET IN ITALY

1991 — WORLD WIDE WEB

...

1998 — GOOGLE



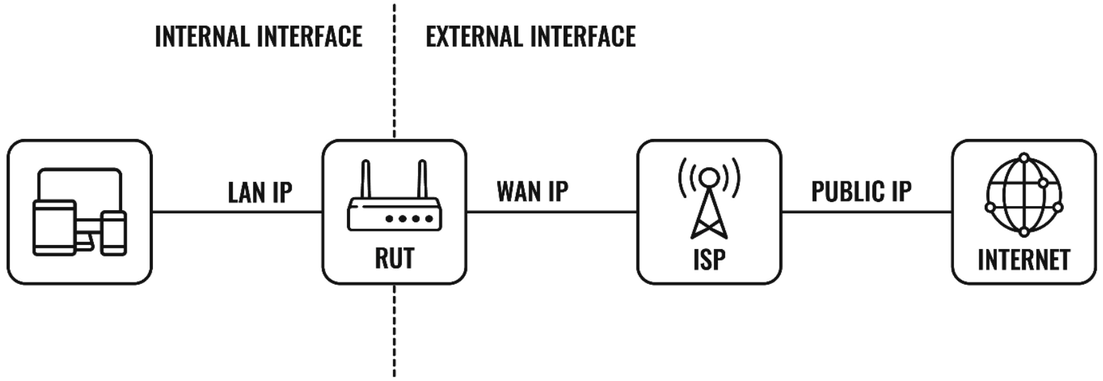

0011010
0011

WHAT'S A

IP ADDRESS

192.168.32.170

Network ID Host ID



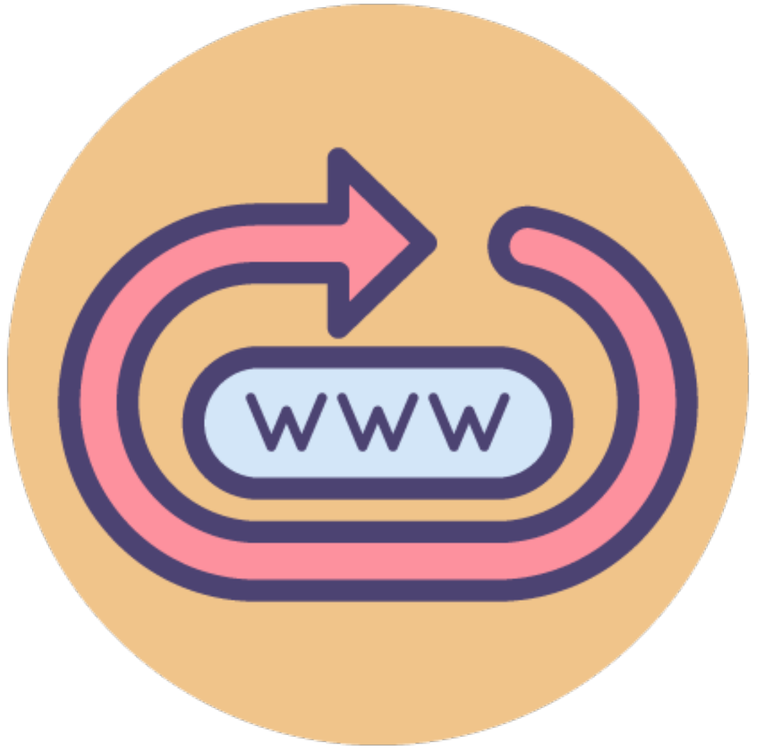


HOW IT IS MADE UP

A WEB ADDRESS

http://animali.esempio.it/cani/cuccioli?colore=bianco&taglia=piccola

- protocol
- sub-domain
- domain
- top-level domain
- path
- query parameters



WHAT HAPPENS WHEN

WE WRITE AN ADDRESS AND WE PRESS "Enter"





IP SEARCH

INTERNET PROTOCOL ADDRESS

DNS

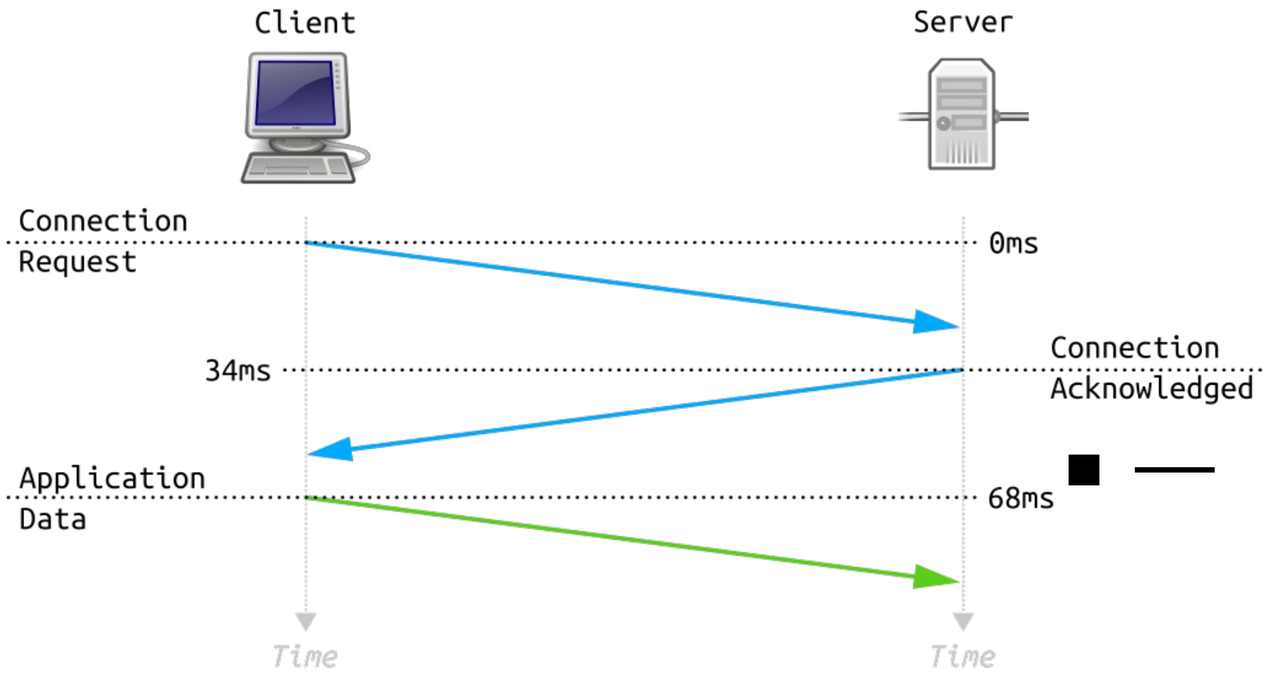
DOMAIN NAME SYSTEM



CONNECTION TO THE SERVER

TCP/IP

TRANSMISSION CONTROL PROTOCOL





THE BROWSER SENDS THE REQUEST

GET vs POST

Send information by appending it to the page request	Transfers information via HTTP header
The data ivisible in the URL	The data not visible in the UR
You can send a limited number of characters	“Unlimited” amount of information
Sending non-sensitive data	Used, for example, to send sensitive data (e.g. passwords), binary data (documents, images) and upload files
Not very secure	Safer
You can bookmark the entire request	The request cannot be saved



THE COMPONENTS OF THE SYSTE

A SIMPLIFICATIO

WEBSERVER

[APPLICATION SERVER]

DATABASE



{

DIGRESSION

WHAT'S UNDER THE HOOD OF A SITE?

}


{}
C++
</>

WHAT DO WE MEAN BY FRONTEND?



BACKEND



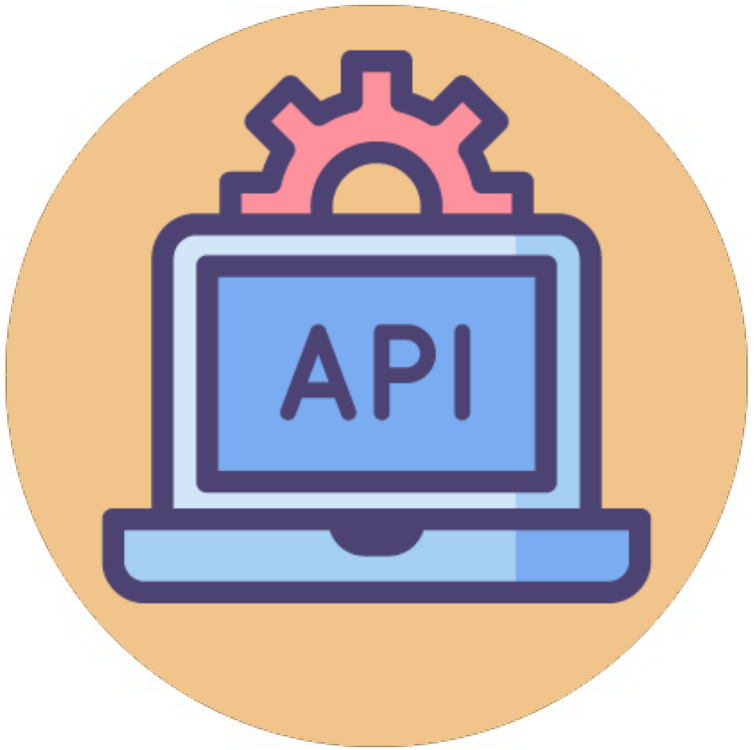
DATABASE



AJAX



RESTful Services and API



WHAT'S A

FULL STACK DEV



WE WERE HERE...

THE SERVER RECEIVES AND MANAGES THE REQUEST OF BROWSER



THE MAIN

SERVER RESPONSE

200 OK

301 MOVED PERMANENTLY

403 FORBIDDEN

404 NOT FOUND

500 INTERNAL SERVER ERROR



PER CONOSCERLI TUTTI

https://it.wikipedia.org/wiki/Codici_di_stato_HTTP

MANAGEMENT OF

ERROR PAGES

Error: 500 Unexpected Error



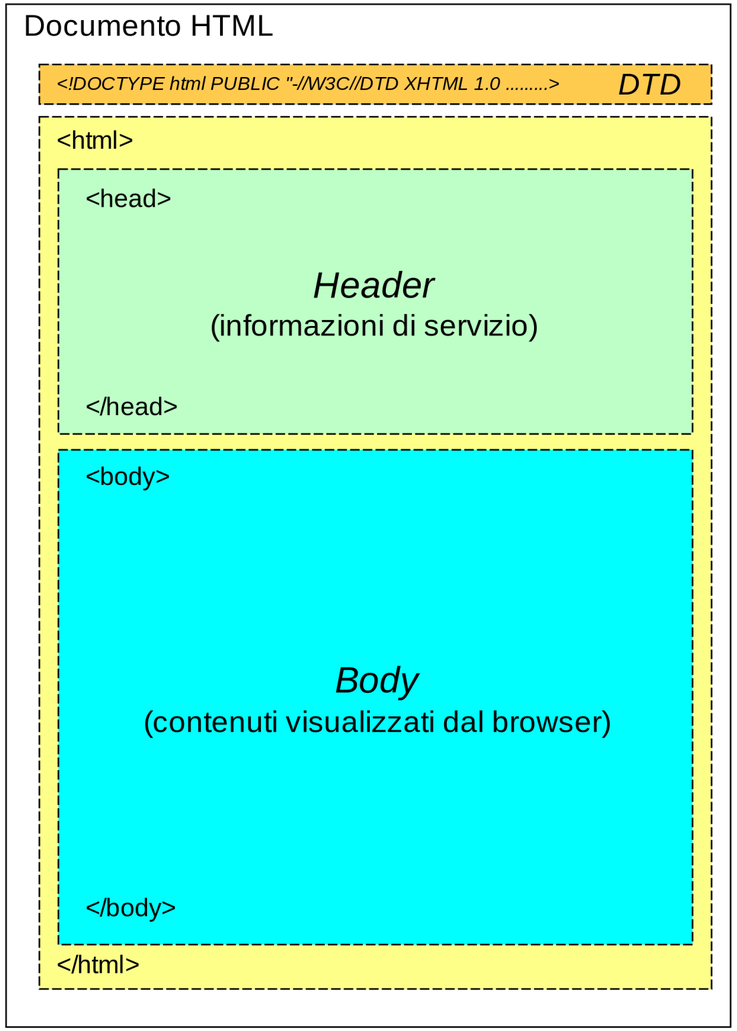
Error: 403 Forbidden



Error: 404 Page Not Found



THE BROWSER PROCESSES THE ANSWER





Fonte immagine: Wikipedia

HTML

HYPERTEXT MARKUP LANGUAGE

```
<!doctype html>
<html lang="it">
<head>
<title>Titolo Pagina</title>
</head>
<body>
<h1>Ciao a tutti!</h1>
<p>Questa è la mia prima pagina</p>
<img src="immagine.jpg">
</body>
</html>
```



STATIC FILES

```
<!doctype html>
<html itemscope itemtype="http://schema.org/WebPage" lang="it">
▼<head>
   <meta charset="UTF-8">
   <meta content="origin" name="referrer">
   <meta content="/images/branding/googleg/1x/googleg_standard_color_128dp.png" itemprop="image">
   <meta content="origin" name="referrer">
   <title>Google</title>
   <script src="https://apis.google.com/_/scs/abc-static/_/js/k=gapi.gapi.en.jw7XZ…/sv=1/d=1/ed=1/rs=AHpOoo-L1iz4xVj0PCdm2On38RCj6aYemA/
   cb=gapi.loaded_0" nonce="BXT6D6y9RGC53vEpuUm09g==" async></script>
 ▶<script nonce="BXT6D6y9RGC53vEpuUm09g==">…</script>
 ▶<style data-iml="1588495831706">…</style>
   <script async type="text/javascript" charset="UTF-8" src="https://www.gstatic.com/og/_/js/k=og.og2.en_US.0Za8pteyW8s.O/rt=j/m=def,aswid/
   exm=in,fot/d=1/ed=1/rs=AA2YrTuDd1iZH3trt-Wubgr7J0iKILxzpA" nonce="BXT6D6y9RGC53vEpuUm09g==">></script>
 </head>
▼<body jsmodel=" TvHxbe" class="hp vasq big" id="gsr" jsaction="tbSCpf:.CLIENT">
 ▶<style data-iml="1588495831744">…</style>
 ▶<style data-jiis="cc" id="gstyle" data-iml="1588495831745">…</style>
 ▶<style data-iml="1588495831745">…</style>
 ▼<div class="ctr-p" id="viewport">
  ▶<div id="cst">…</div>
  ▶<style data-iml="1588495831745">…</style>
  ▶<div id="gb" class="gb_1f">…</div>
  ▶<div class="jhp big" id="searchform">…</div>
  ▶<dialog class="spch-dlg" id="spch-dlg">…</dialog>
   <div jscontroller="fEVMic" style="display:none" data-u="0" jsdata="C4mkuf;;CQjicI" jsaction="rcuQ6b:npT2md"></div>
  ▼<div class="content" id="main">
   ▼<span class="ctr-p" id="body">
    ▼<center>
...  ▶<div id="lga">…</div> == $0
      <div style="height:118px"></div>
     ▶<div style="margin-top:12px">…</div>
     </center>
    </span>
   ▶<div class="ctr-p" id="footer">…</div>
   ▶<div id="footc">…</div>
   ▶<div class="gTMtLb" id="lb">…</div>
  </div>
```



CSS

CASCADING STYLE SHEETS

```
<html>
 <head>
 <title>Esempio</title>
 <link rel="stylesheet" type="text/css" href="foglio_di_stile.css"/>
 </head>
selettore1 {
  proprietà1:valore1;
  proprietà2:valore2;
}
selettore2 {
  proprietà3:valore3
}
```



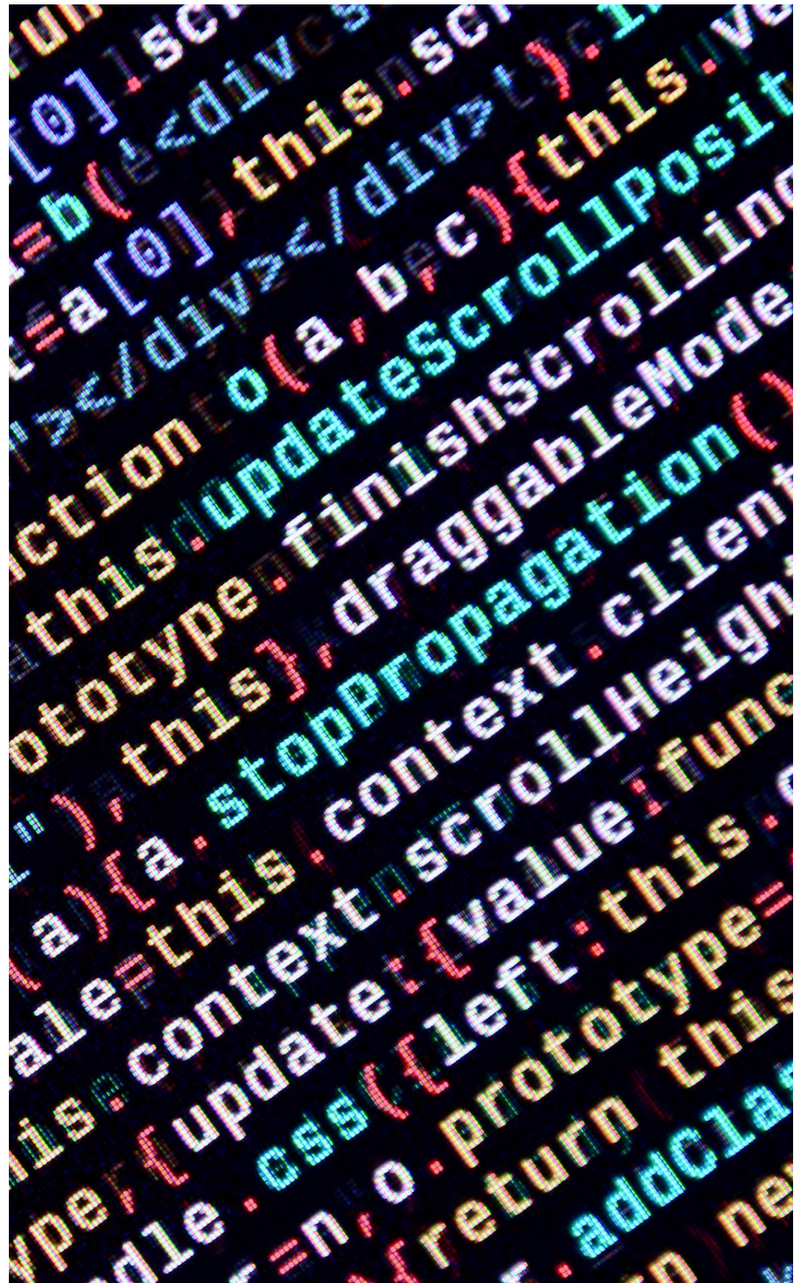
JS

JAVASCRIPT

```
<img src = "normal.png"
     onclick = "window.location.href='http://en.wikipedia.org/'"
     onmouseover = "this.src='rollover.png'"
     onmouseout  = "this.src='normal.png'" />
```

```
<script type="text/javascript"> ... </script>
```

```
<script type="text/javascript">
   document.write('Hello world');
</script>
```



BROWSER CACHE

Filter | Hide data URLs | All | XHR | JS | CSS | Img | Media | Font | Doc | WS | Manifest | Other | Has blocked cookies

500 ms | 1000 ms | 1500 ms | 2000 ms | 2500 ms | 3000 ms | 3500 ms | 4000 ms | 4500 ms | 5000 ms | 5500 ms | 6000 m

Name	Status	Domain	Type	Initiator	Size	Time	Waterfall
data:image/gif;base…	200		gif	/search?source=hp&ei=14WuX…	(memory cache)	0 ms	
photo.jpg	200	lh3.googleuserc…	jpeg	/search?source=hp&ei=14WuX…	(memory cache)	0 ms	
desktop_searchbox_sprites302_hr.webp	200	www.google.com	webp	/search?source=hp&ei=14WuX…	(memory cache)	0 ms	
googlelogo_color_92x30dp.png	200	www.google.com	png	/search?source=hp&ei=14WuX…	(disk cache)	12 ms	
data:image/png;base…	200		png	VM145 search:134	(memory cache)	0 ms	
data:image/png;base…	200		png	VM145 search:134	(memory cache)	0 ms	
data:image/png;base…	200		png	VM145 search:134	(memory cache)	0 ms	
data:image/png;base…	200		png	VM145 search:134	(memory cache)	0 ms	
data:image/jpeg;bas…	200		jpeg	VM145 search:134	(memory cache)	0 ms	
nav_logo299_hr.webp	200	www.google.com	webp	/search?source=hp&ei=14WuX…	(disk cache)	2 ms	
data:image/jpeg;bas…	200		jpeg	VM153 search:139	(memory cache)	0 ms	
data:image/png;base…	200		png	VM153 search:139	(memory cache)	0 ms	
data:image/png;base…	200		png	VM153 search:139	(memory cache)	0 ms	
data:image/png;base…	200		png	VM153 search:139	(memory cache)	0 ms	
data:image/jpeg;bas…	200		jpeg	VM153 search:139	(memory cache)	0 ms	
data:image/jpeg;bas…	200		jpeg	VM153 search:139	(memory cache)	0 ms	
data:image/png;base…	200		png	VM153 search:139	(memory cache)	0 ms	
gen_204?atyp=i&ct=rfl&cad=&ei=hIauXoazL-um1fAPla-n6Ao&…	204	www.google.com	text/html	search?source=hp&ei=14WuXr…	100 B	119 ms	
fb_32x32.png	200	www.gstatic.com	png	search?source=hp&ei=14WuXr…	(disk cache)	2 ms	
twitter_32x32.png	200	www.gstatic.com	png	search?source=hp&ei=14WuXr…	(disk cache)	2 ms	
email_grey600_24dp.png	200	www.google.com	png	search?source=hp&ei=14WuXr…	(disk cache)	3 ms	
si?gadsid=AORoGNTgnVaBvhZqiQTyNbE7Utcs5vyRFZNHks6I…	204	googleads.g.dou…	text/html	si	0 B	63 ms	
p2_3a0632af.png	200	ssl.gstatic.com	png	app?origin=https%3A%2F%2…	(disk cache)	3 ms	
17bdcddea9.png	200	ssl.gstatic.com	png	app?origin=https%3A%2F%2…	(disk cache)	2 ms	
photo.jpg	200	lh3.googleuserc…	png	app?origin=https%3A%2F%2…	(disk cache)	2 ms	



XMLHttpRequest

Filter | Hide data URLs | All | XHR | JS | CSS | Img | Media | Font | Doc | WS | Manifest | Other | Has blocked cookies

20000 ms | 40000 ms | 60000 ms | 80000 ms | 100000 ms | 120000 ms | 140000 ms | 160000 ms | 180000 ms | 200000 ms | 220000 ms | 240000 ms

Name	Status	Domain	Type	Initiator	Size	Time	Waterfall
search?q&cp=0&client=psy-ab&xssi=t&gs_ri=gws-wiz&h…Pla…	200	www.google.com	xhr	rs=ACT90oGx3ZGihHDI6CiDY…	223 B	63 ms	
bgasy?ei=hlauXoazL-um1fAPla-n6Ao&yv=3&async=_fmt:jspb	200	www.google.com	xhr	rs=ACT90oGx3ZGihHDI6CiDY…	3.7 kB	59 ms	
ecr?ei=hlauXoazL-um1fAPla-n6Ao&lei=hlauXoazL-um1fA…m…	200	www.google.com	xhr	rs=ACT90oGx3ZGihHDI6CiDY…	2.2 kB	79 ms	
log?format=json&hasfast=true&authuser=0	200	play.google.com	xhr	m=_b,_tp:301	623 B	76 ms	
log?format=json&hasfast=true	200	play.google.com	xhr	m=_b,_tp:301	767 B	70 ms	



ALL OF THIS

IN A HANDFUL OF SECONDS



