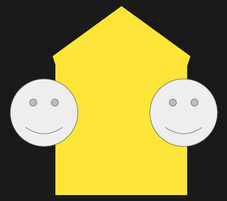
WEB TECHNOLOGIES PROGRAM

An introduction to web technologies

Laying the foundations

Product development process

Users



Business stakeholders

Product Manager

Engineers

Code

Browser / app

The evolving web

?

Web 1.0

Web 2.0

Web 3.0

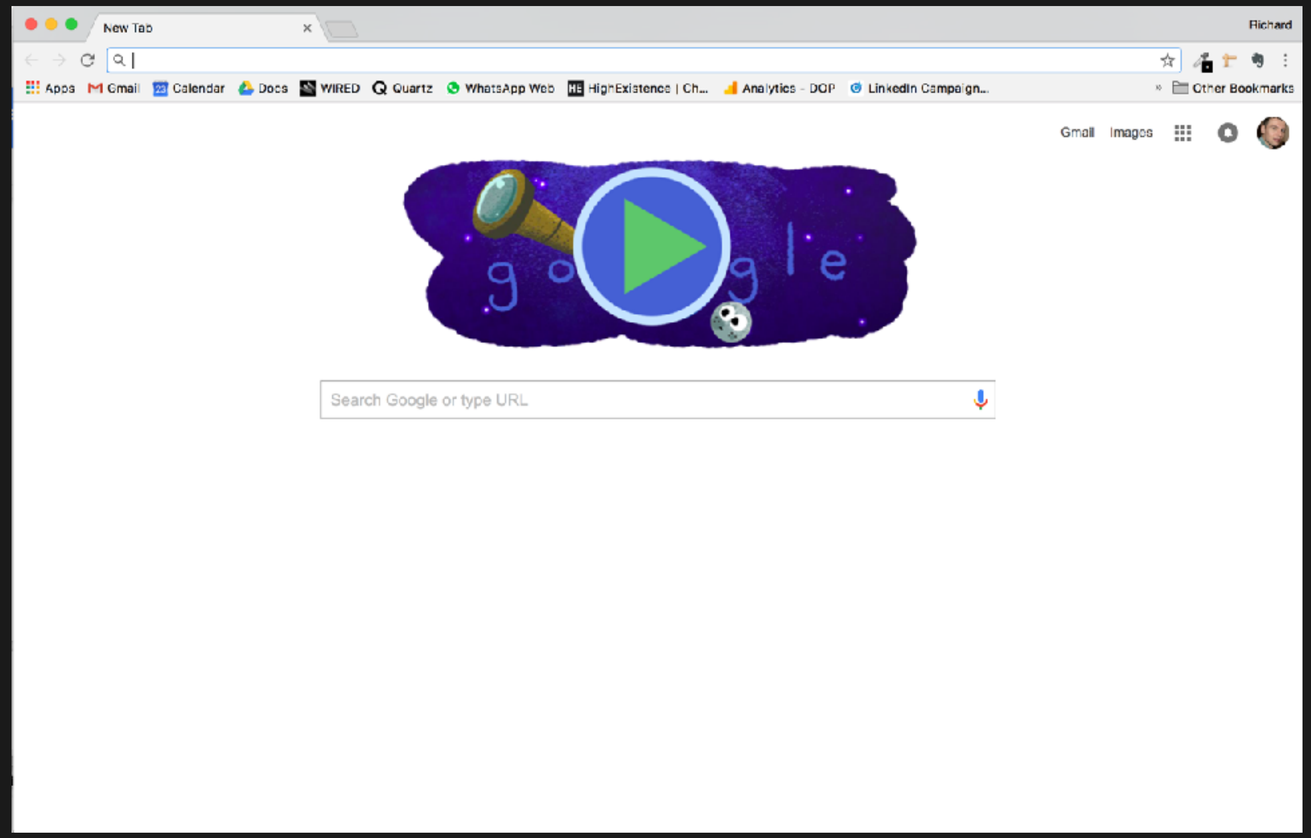
Web apps vs. native apps

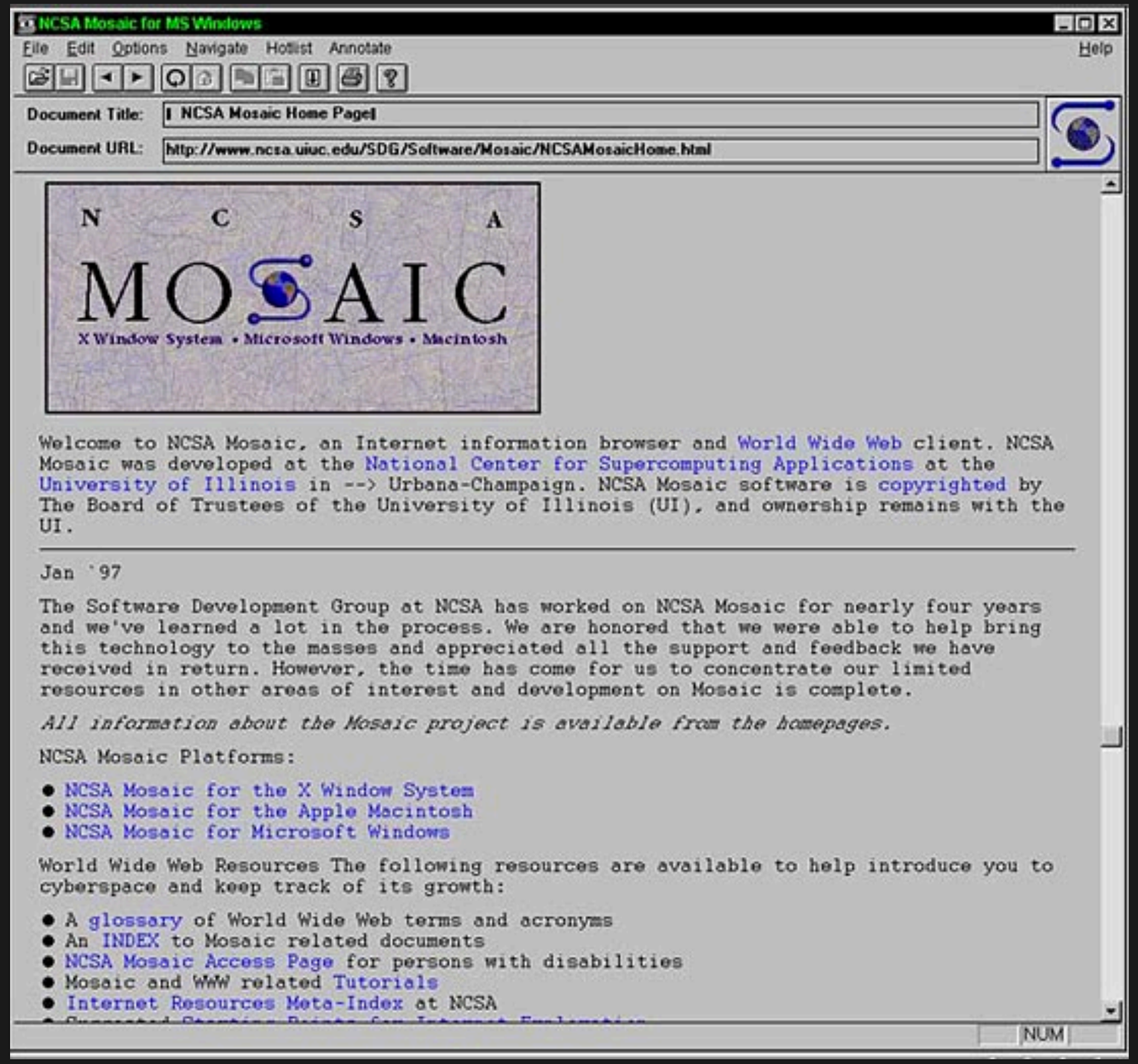
Web apps

1. Applications served through web browsers
2. Require internet connection
3. Platform agnostic
4. More than static websites - e.g. Google docs

Native apps

1. Downloaded / installed
2. Stored on device
3. Doesn’t always require internet connection
4. Platform specific e.g. MS office


New Tab
Richard
Apps
Gmail
Calendar
Docs
WIRED
Quartz
WhatsApp Web
HighExistence | Ch...
Analytics - DOP
LinkedIn Campaign...
Other Bookmarks
Gmail
Images
Search Google or type URL


NCSA Mosaic for MS Windows
File Edit Options Navigate Hotlist Annotate Help
Document Title: NCSA Mosaic Home Page
Document URL: http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/NCSAMosaicHome.html
N C S A
MOSAIC
X Window System • Microsoft Windows • Macintosh
Welcome to NCSA Mosaic, an Internet information browser and World Wide Web client. NCSA Mosaic was developed at the National Center for Supercomputing Applications at the University of Illinois in --> Urbana-Champaign. NCSA Mosaic software is copyrighted by The Board of Trustees of the University of Illinois (UI), and ownership remains with the UI.
Jan '97
The Software Development Group at NCSA has worked on NCSA Mosaic for nearly four years and we've learned a lot in the process. We are honored that we were able to help bring this technology to the masses and appreciated all the support and feedback we have received in return. However, the time has come for us to concentrate our limited resources in other areas of interest and development on Mosaic is complete.
All information about the Mosaic project is available from the homepages.
NCSA Mosaic Platforms:
NCSA Mosaic for the X Window System
NCSA Mosaic for the Apple Macintosh
NCSA Mosaic for Microsoft Windows
World Wide Web Resources The following resources are available to help introduce you to cyberspace and keep track of its growth:
A glossary of World Wide Web terms and acronyms
An INDEX to Mosaic related documents
NCSA Mosaic Access Page for persons with disabilities
Mosaic and WWW related Tutorials
Internet Resources Meta-Index at NCSA
NUM

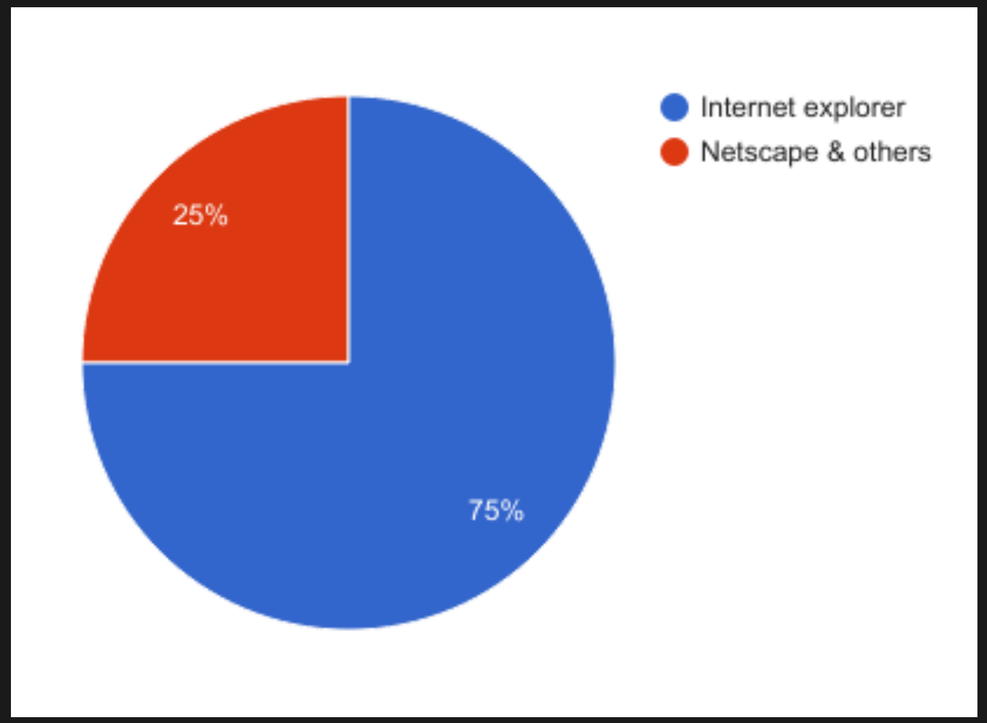
Browsers

The timeline

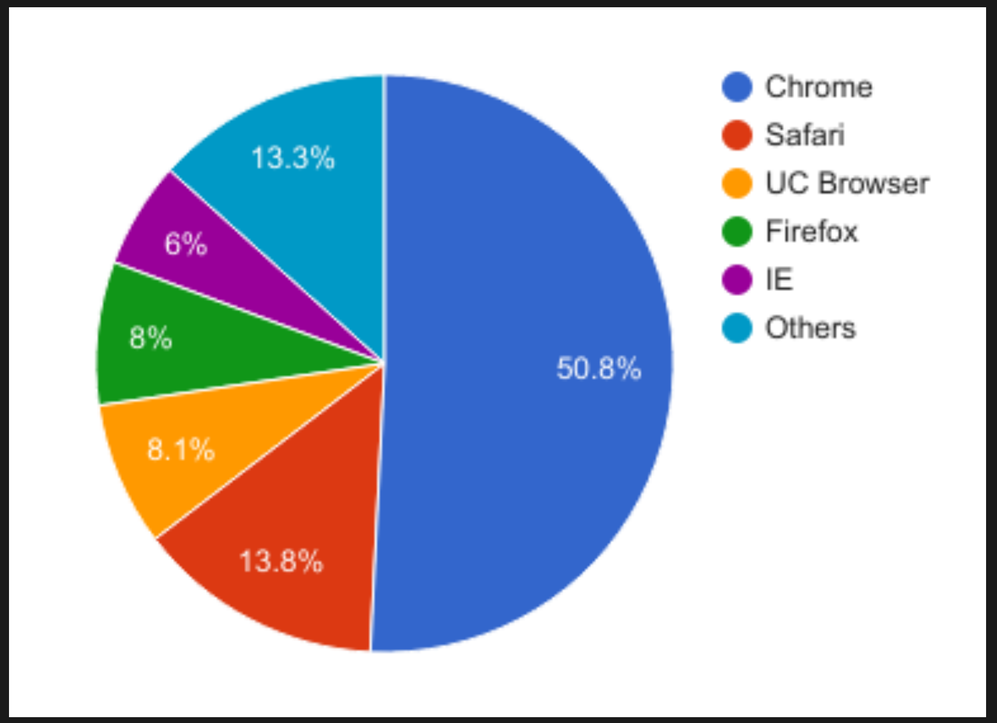
1994 2000 2017

Browser Wars

Microsoft Market share 1999 vs. 2017



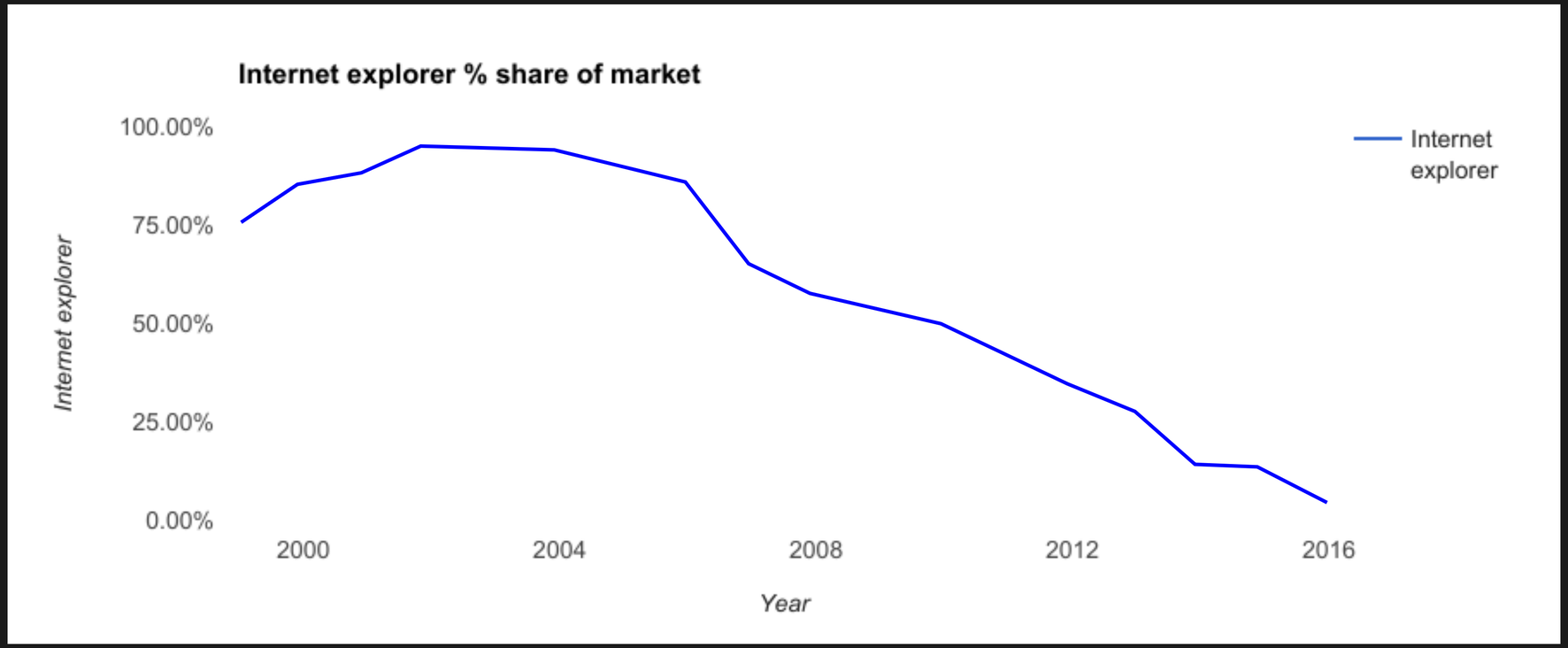
1999



2017

Browser Wars

Internet Explorer market share



https://en.wikipedia.org/wiki/Usage_share_of_web_browsers

MUST READ FROM MALWARE TO CYBER-SPIES, THE 15 BIGGEST THREATS ONLINE, RANKED

Australian retailer charges customers IE 7 "Tax"

It's more of a marketing stunt than anything else, but Austalian electronics retailer Kogan really is charging IE 7 users an extra 6.8% "tax."

By Steven J. Vaughan-Nichols for Networking | June 14, 2012 -- 14:39 GMT (15:39 BST) | Topic: Enterprise Software

If you're shopping for electronics online at Australian retailer Kogan, an Oz equivalent of the U.S.' Best Buy with the horribly out of date Microsoft Internet Explorer (IE) 7 browser brace yourself for a nasty surprise. Kogan will charge you an extra 6.8% sales "tax" on your purchase.

Australian online retailer


W3C®

How do browsers work?

What's this about?

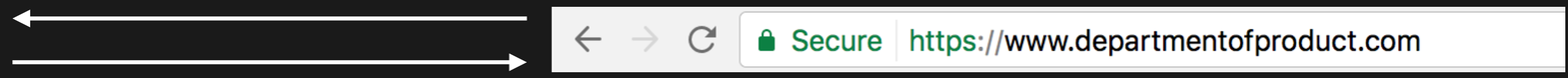
Domain name systems (DNS)

Making sense of web addresses

What's the IP address for www.departmentofproduct.com?

Ooh, I found a match. Here it is!

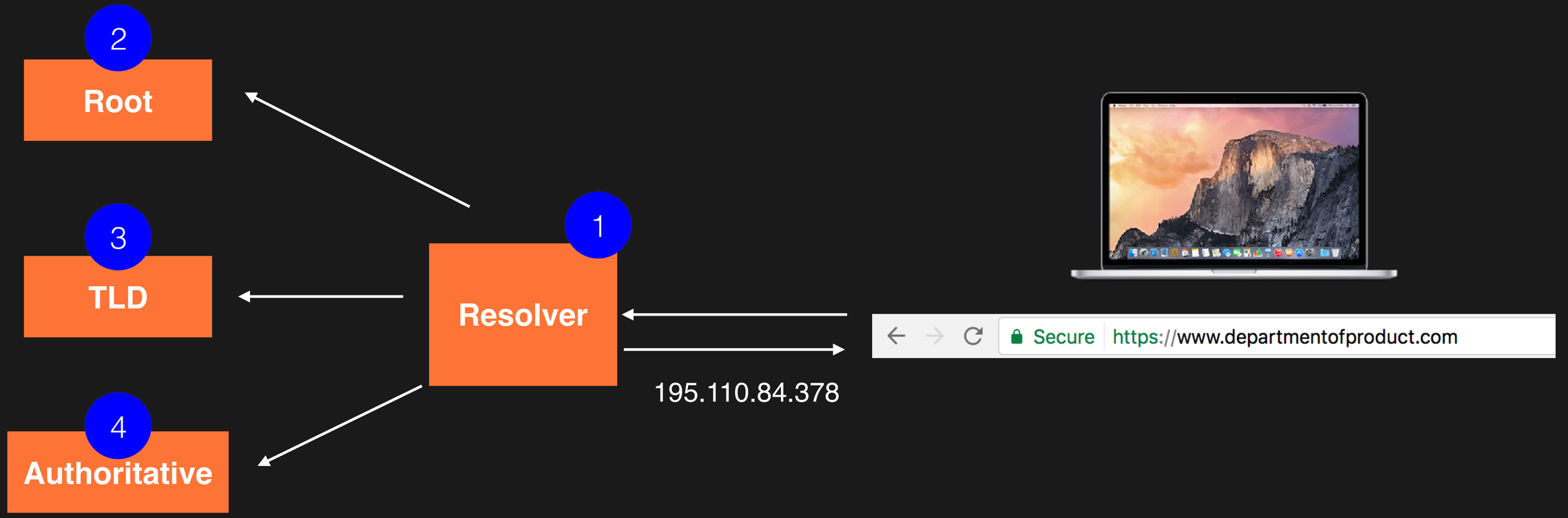
DNS



195.110.84.378

Domain name systems (DNS)

Making sense of web addresses



Example

Pointing a GoDaddy domain to a Shopify store

handsomelondon.com

DNS

leep.shopify.com

DNS records matching IP addresses to domain names

Example

Pointing a GoDaddy domain to a Shopify store

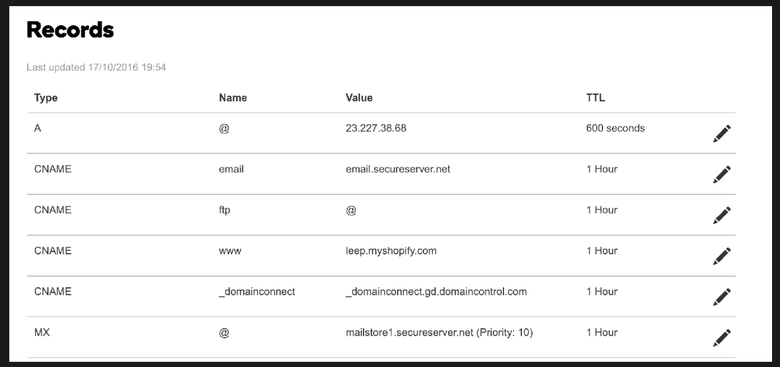
Records

Last updated 17/10/2016 19:54

Type	Name	Value	TTL	
A	@	23.227.38.68	600 seconds	
CNAME	email	email.secureserver.net	1 Hour	
CNAME	ftp	@	1 Hour	
CNAME	www	leep.myshopify.com	1 Hour	
CNAME	_domainconnect	_domainconnect.gd.domaincontrol.com	1 Hour	
MX	@	mailstore1.secureserver.net (Priority: 10)	1 Hour	

handsomelondon.com

DNS



Records

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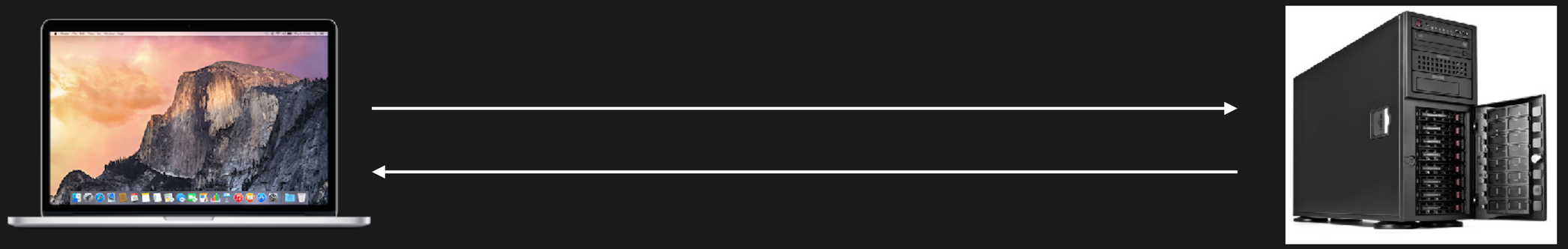
CNAME	email	email.secureserver.net	1 Hour
CNAME	ftp	@	1 Hour
CNAME	www	leep.myshopify.com	1 Hour
CNAME	_domainconnect	_domainconnect.gd.domaincontrol.com	1 Hour
MX	@	mailstore1.secureserver.net (Priority: 10)	1 Hour

leep.shopify.com

The client server relationship

Client server relationship



Client

Server

PHOTO CREDIT: WIKIPEDIA

HTTP requests

REQUEST

Can I have the picture of a dog please?

RESPONSE

Yep, here it is.

Client

Server

HTTP methods

HTTP methods

GET	Used to *read / retrieve* a representation of a resource
POST	Used to *create* new resources
PUT	Used to *update / replace* data
DELETE	Used to delete data

HTTP methods

GET	Used to *read / retrieve* a representation of a resource
POST	Used to *create* new resources
PUT	Used to *update / replace* data
DELETE	Used to delete data

Server response codes

200	Success. Everything’s fine.
301	The resource you’re looking for has been moved permanently.
400	There’s a problem on the client side. Most famous is the 404 error.
500	There’s a problem on the server side.

HTTP requests

Client

REQUEST

Can I have the picture of a dog please?

GET

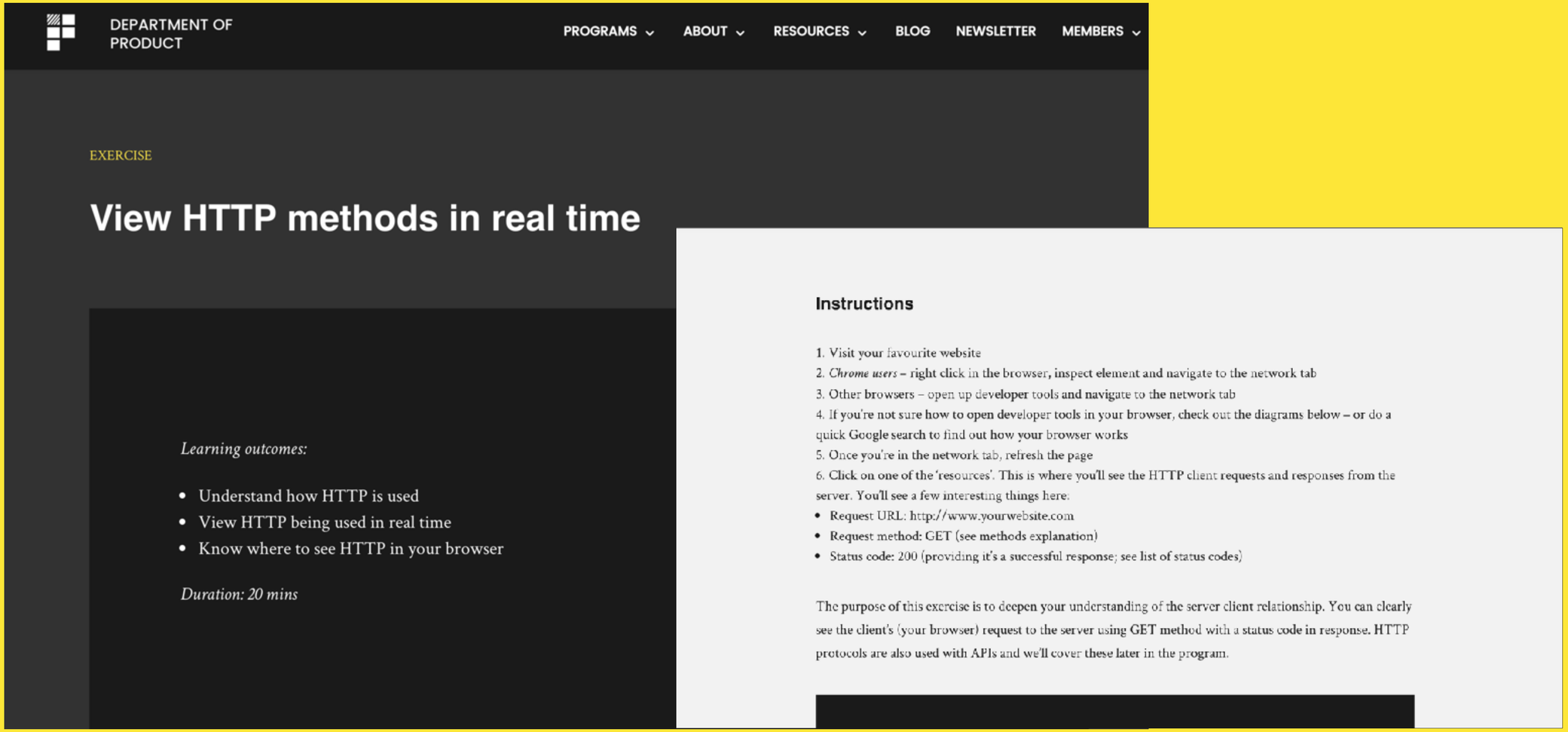
RESPONSE

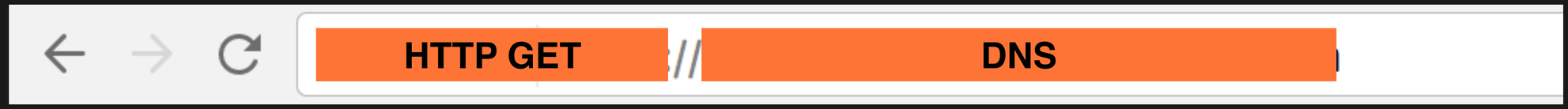
Yep, here it is.

200

Server

Exercise


DEPARTMENT OF PRODUCT
PROGRAMS
ABOUT
RESOURCES
BLOG
NEWSLETTER
MEMBERS
EXERCISE
View HTTP methods in real time
Learning outcomes:
Understand how HTTP is used
View HTTP being used in real time
Know where to see HTTP in your browser
Duration: 20 mins
Instructions
1. Visit your favourite website
2. Chrome users – right click in the browser, inspect element and navigate to the network tab
3. Other browsers – open up developer tools and navigate to the network tab
4. If you're not sure how to open developer tools in your browser, check out the diagrams below – or do a quick Google search to find out how your browser works
5. Once you're in the network tab, refresh the page
6. Click on one of the 'resources'. This is where you'll see the HTTP client requests and responses from the server. You'll see a few interesting things here:
Request URL: http://www.yourwebsite.com
Request method: GET (see methods explanation)
Status code: 200 (providing it's a successful response; see list of status codes)
The purpose of this exercise is to deepen your understanding of the server client relationship. You can clearly see the client's (your browser) request to the server using GET method with a status code in response. HTTP protocols are also used with APIs and we'll cover these later in the program.


HTTP GET
//
DNS


Secure
https://www.departmentofproduct.com

HTTPS

‘Our SSL certificate has expired and we’re unable to take payment’

- ENGINEER

Your connection is not private

Attackers might be trying to steal your information from **www.facebook.com** (for example, passwords, messages, or credit cards). NET::ERR_CERT_DATE_INVALID

Hide advanced

Reload

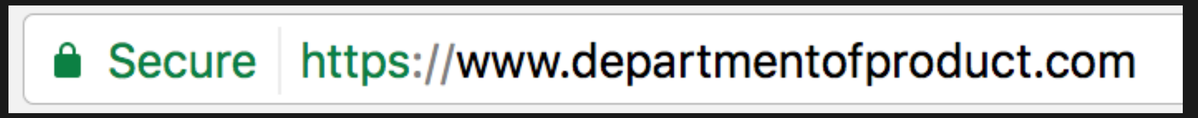
www.facebook.com normally uses encryption to protect your information. When Chromium tried to connect to www.facebook.com this time, the website sent back unusual and incorrect credentials. This may happen when an attacker is trying to pretend to be www.facebook.com, or a Wi-Fi sign-in screen has interrupted the connection. Your information is still secure because Chromium stopped the connection before any data was exchanged.

You cannot visit www.facebook.com right now because the website uses HSTS. Network errors and attacks are usually temporary, so this page will probably work later.

Certificate

REQUEST

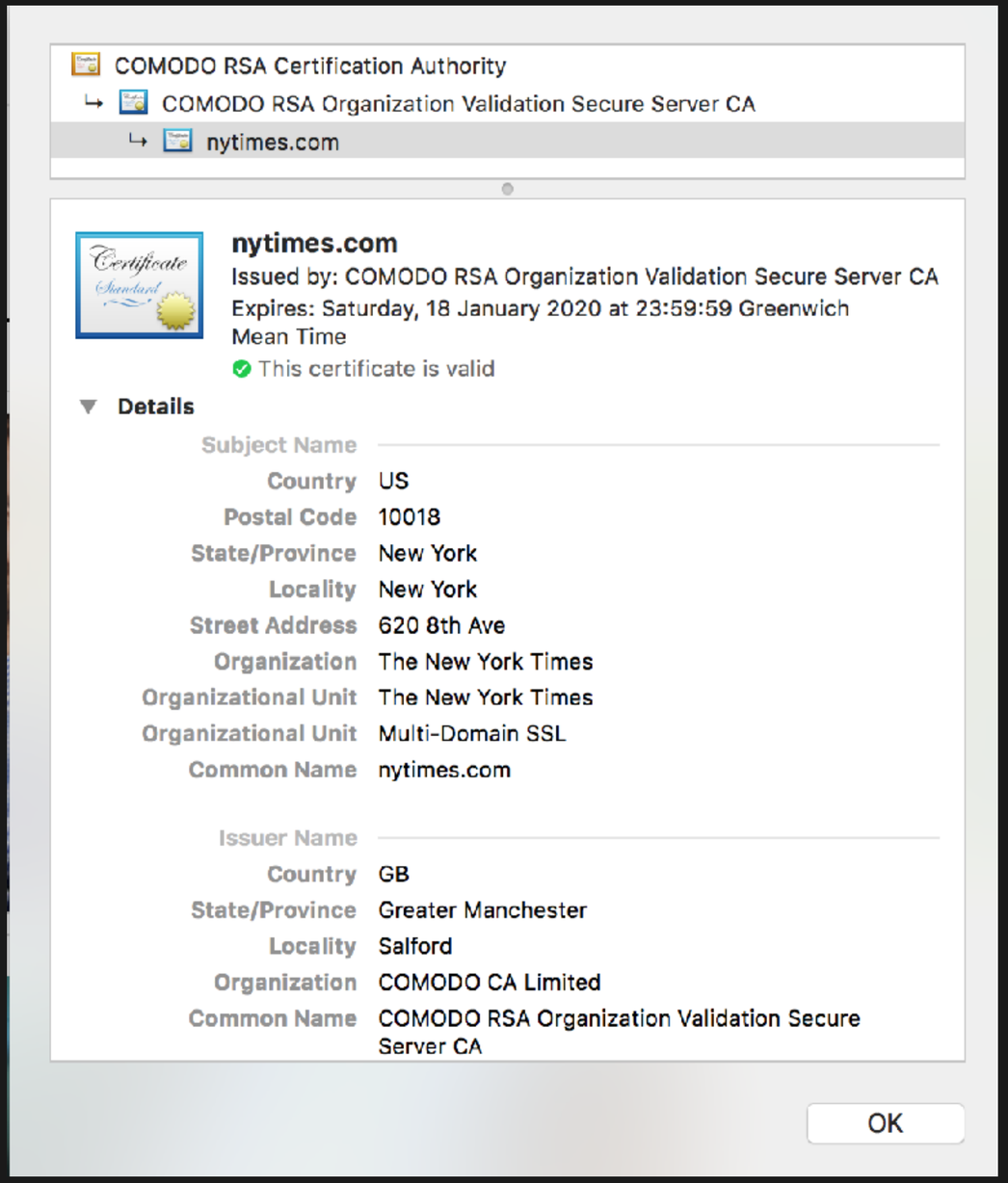
SSL / TLS



RESPONSE

Client

Server


COMODO RSA Certification Authority
COMODO RSA Organization Validation Secure Server CA
nytimes.com
nytimes.com
Issued by: COMODO RSA Organization Validation Secure Server CA
Expires: Saturday, 18 January 2020 at 23:59:59 Greenwich Mean Time
This certificate is valid
Details
Subject Name
Country US
Postal Code 10018
State/Province New York
Locality New York
Street Address 620 8th Ave
Organization The New York Times
Organizational Unit The New York Times
Organizational Unit Multi-Domain SSL
Common Name nytimes.com
Issuer Name
Country GB
State/Province Greater Manchester
Locality Salford
Organization COMODO CA Limited
Common Name COMODO RSA Organization Validation Secure Server CA
OK

HTTPS migration

SEJ SearchEngine Journal

SEO PPC CONTENT SOCIAL NEWS ADVERTISE MORE

NEWS WEB DEVELOPMENT | February 9, 2018

Google Sets Deadline for HTTPS and Warns Publishers to Upgrade Soon

STAFF

Roger Montti

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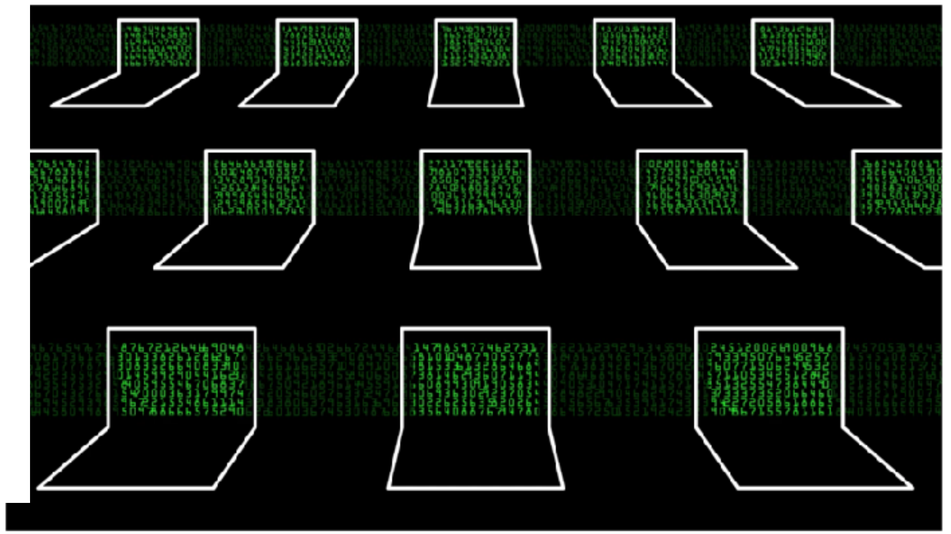
READS

Login / Sign up

TechCrunch has gone HTTPS

Nicole Wilke @niclauren / Jun 15, 2016

Comment



proud to announce we've become a part of the movement

HTTPS migration

Why bother?

1.Encryption

2. SEO

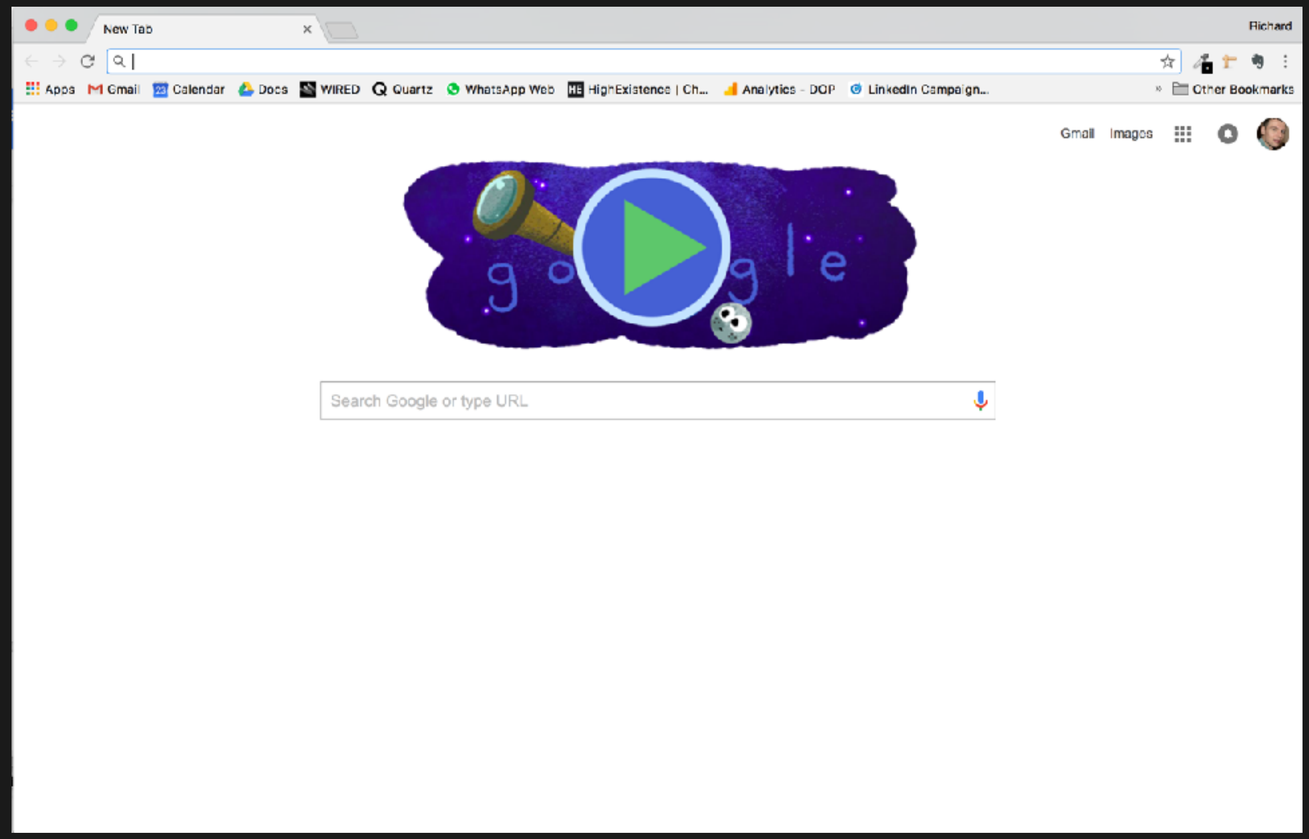
3. User experience / trust

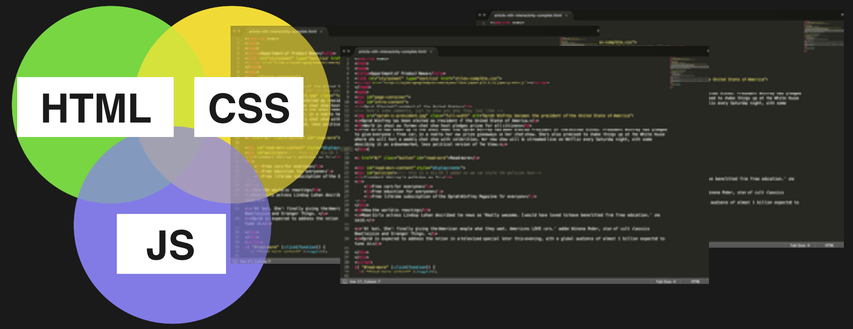
Migration guidelines

1. Crawl the site beforehand
2. Set up redirects
3. Update file references, sitemaps and analytics

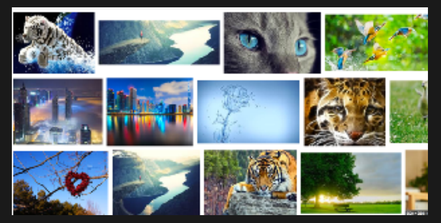
The browser’s role

Browser parsing

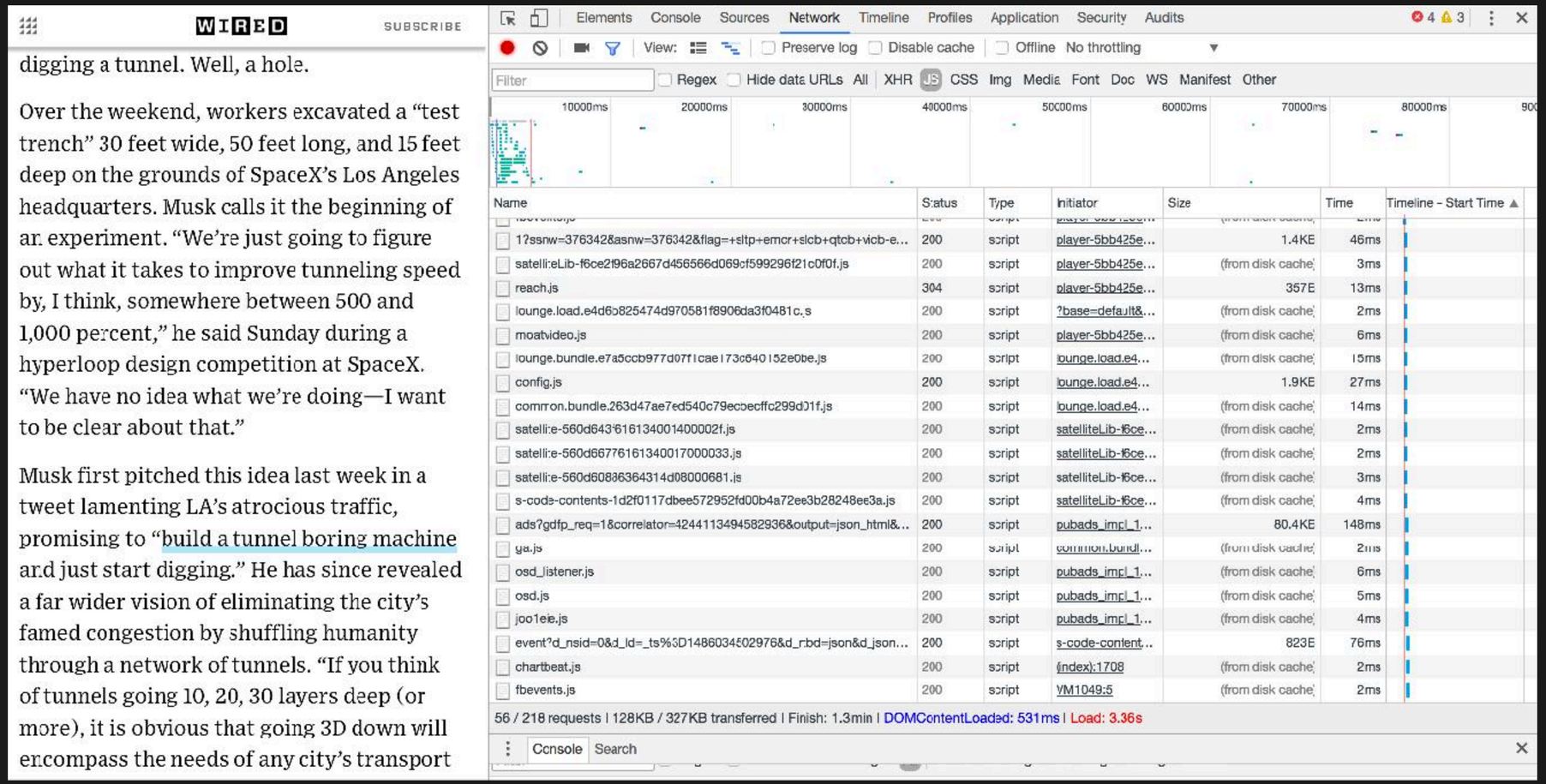




Code files



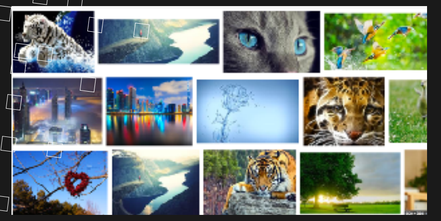
Assets

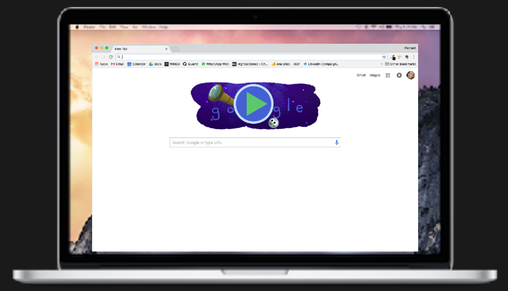


The asset files of wired.com

Code files

Assets

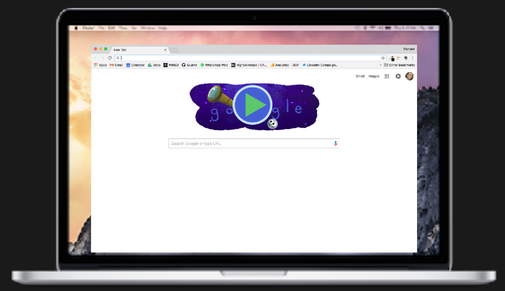




Client side

Server side

Browser caching



Client side

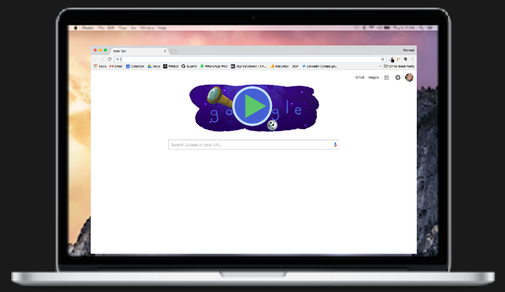
Cache

Server side

What about cookies?

What about cookies?

First visit



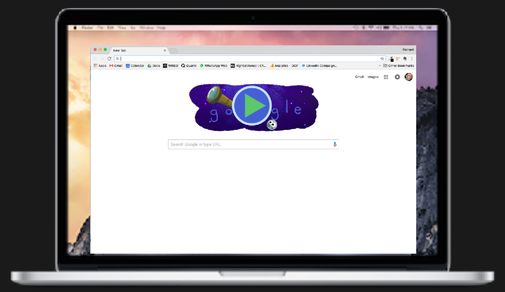
Client side

Cookie

Server side

Well hello again!

Second visit



Client side

Cookie

Server side

When are cookies used?

Examples

1. News
2. Shopping
3. Advertising

Cross browser tests

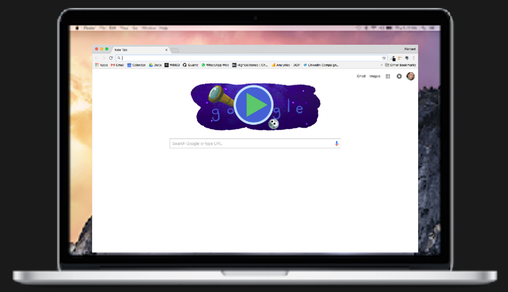
Client side vs. server side technologies

HTML, CSS, JS

APIs

Programming languages

Databases



Client side

Server side

Bringing it all together

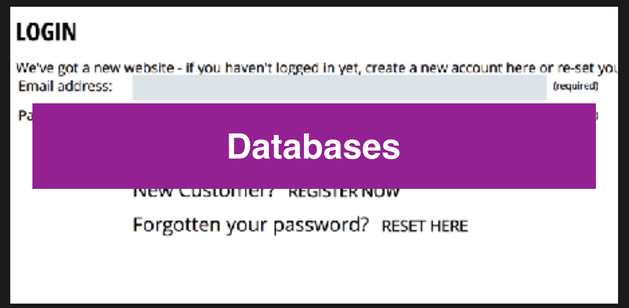
Example

Buying cinema tickets online

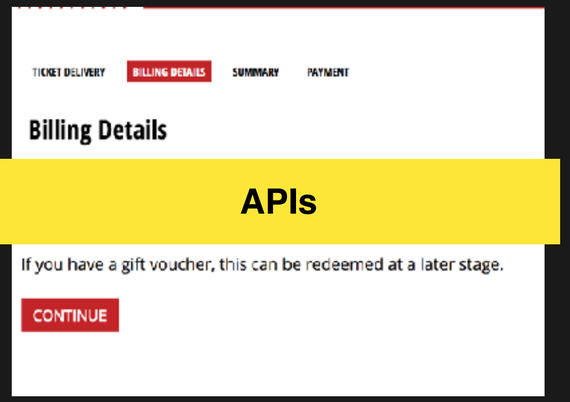
GET

1. Visit the cinema website

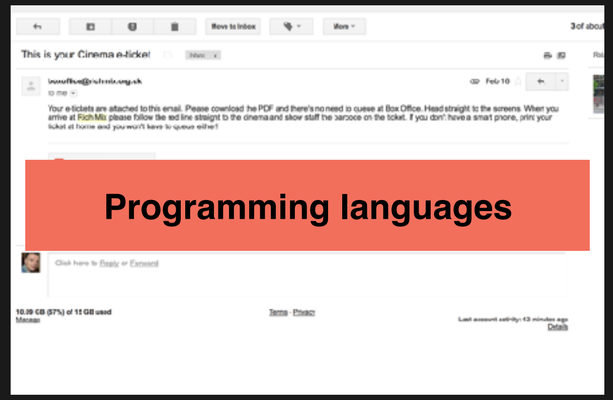
2. Pick a movie



3. Register account



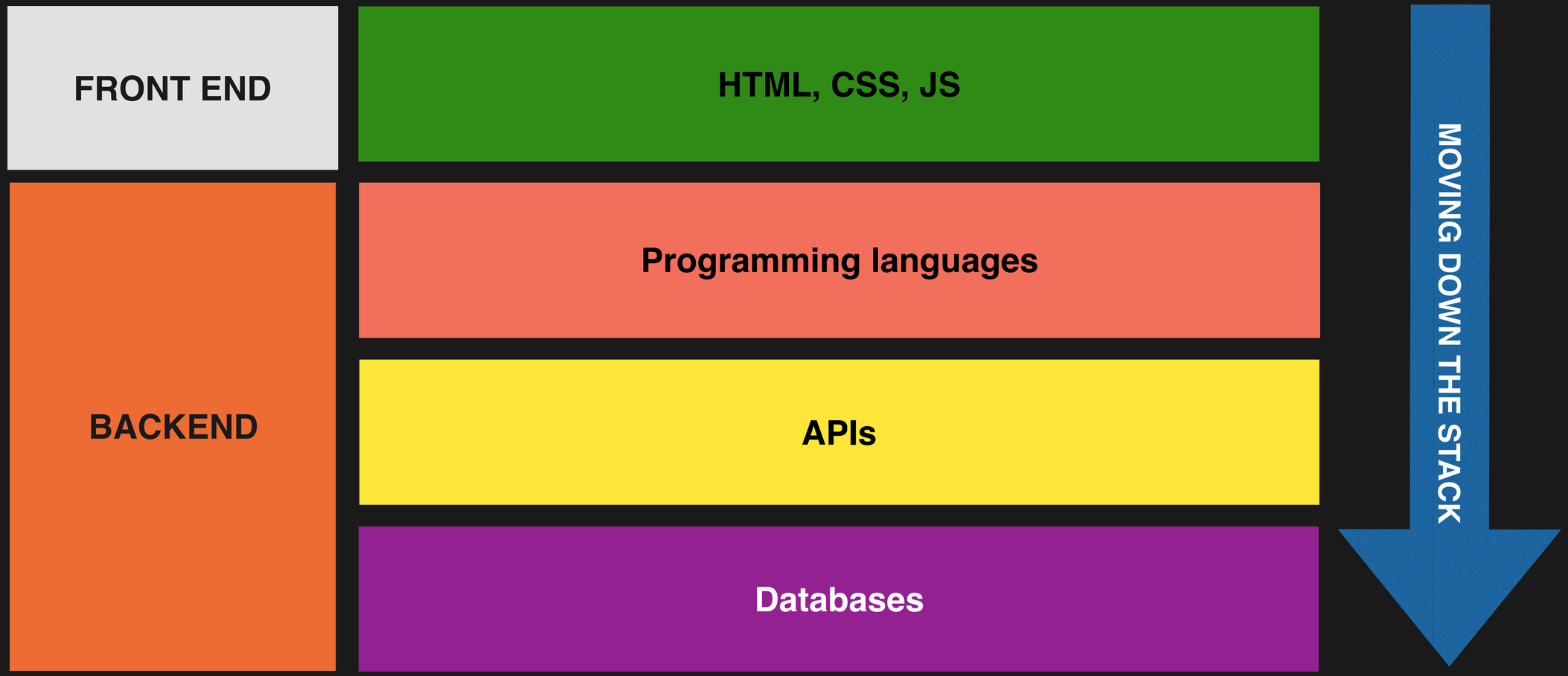
4. Purchase ticket



5. Receive a confirmation email

The Full Stack

An example of a typical product stack



A brief recap

1. Domain names point to *IP addresses* using DNS technology
2. The server *serves* content to the client (the browser) using HTTP protocols
3. Front end technologies run in the browser, backend technologies run on the server
4. *Tech stack - th*e tech stack refers to the layers of technologies that work together