Web Fundamentals

Session-01

Agenda- Web 101

Agenda

01 How Website works

02 Client-server architecture

03 HTTP Request and Response

04 Servers & Hosting

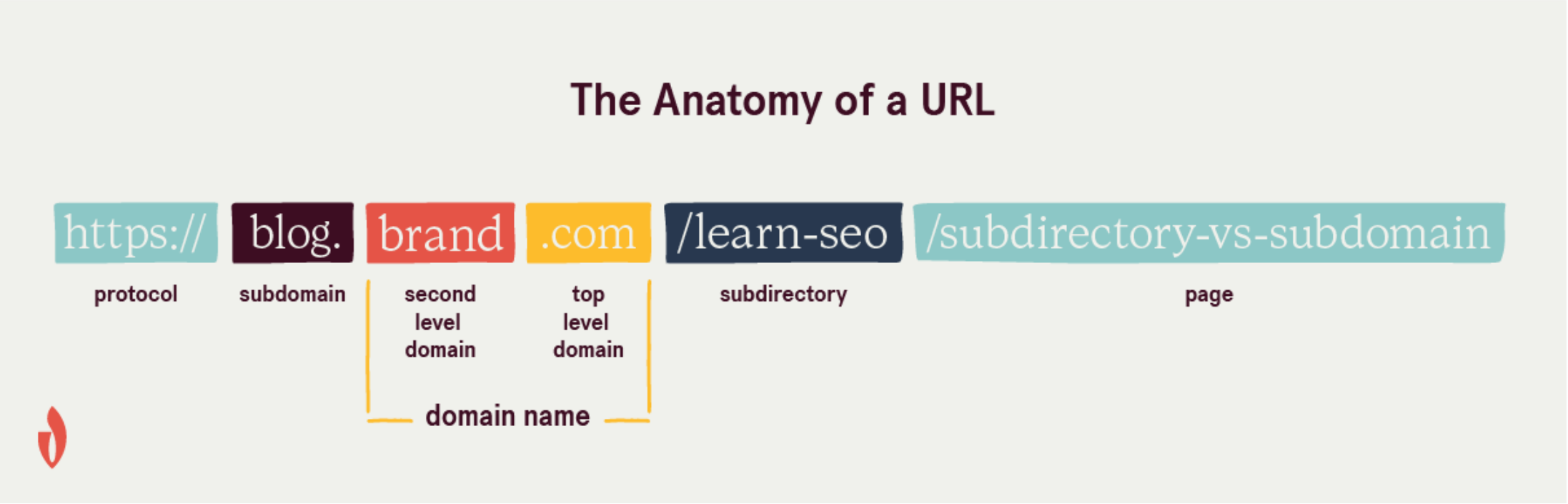
05 Scaling, Auto-Scaling

06 Site Stats, Popularity, SEO

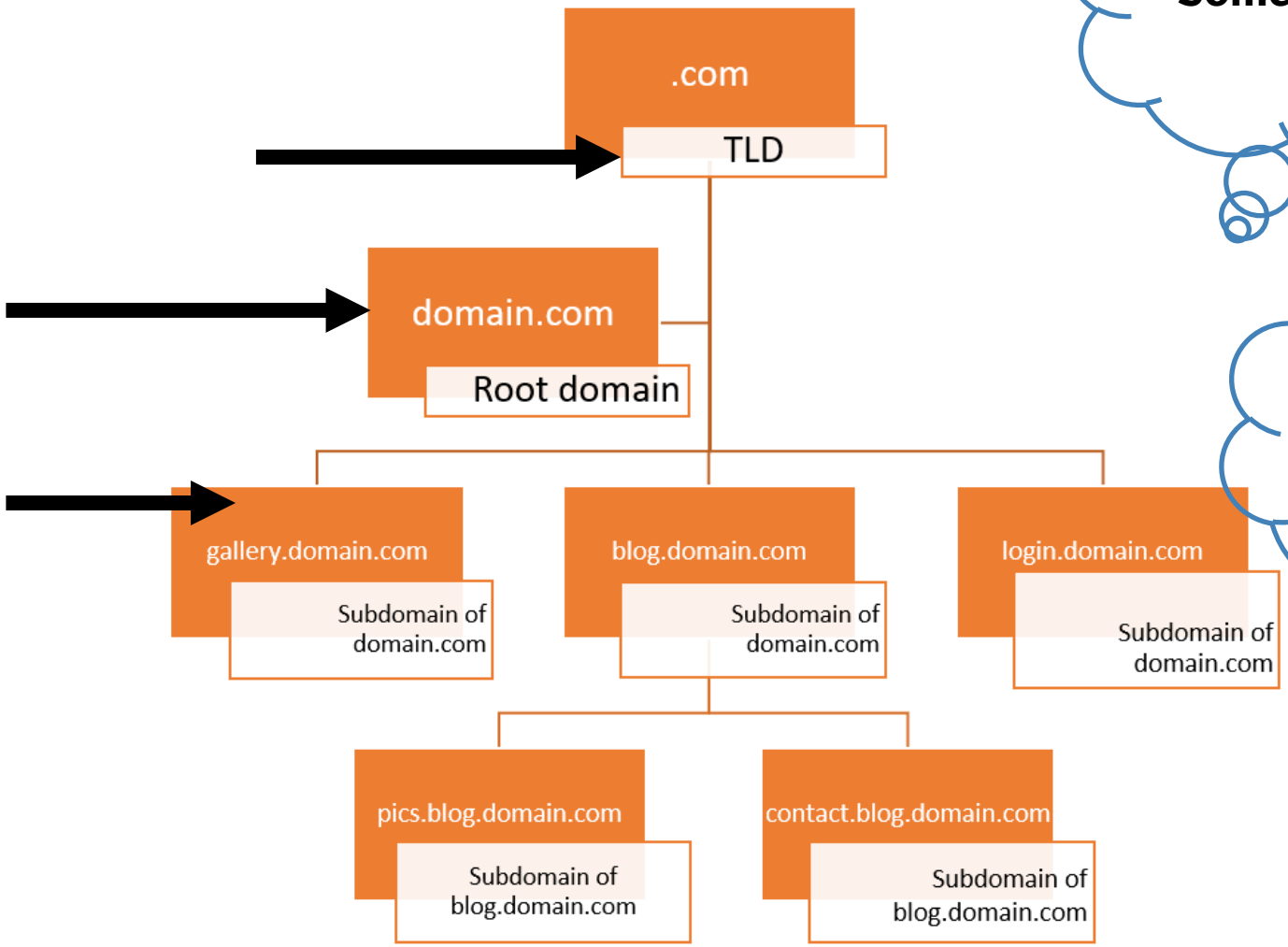
Why website?

"If a picture is worth a thousand words, then a website is worth a million."

Let’s Decode URL Parts



Domains/ Sub Domains



Some TLD examples

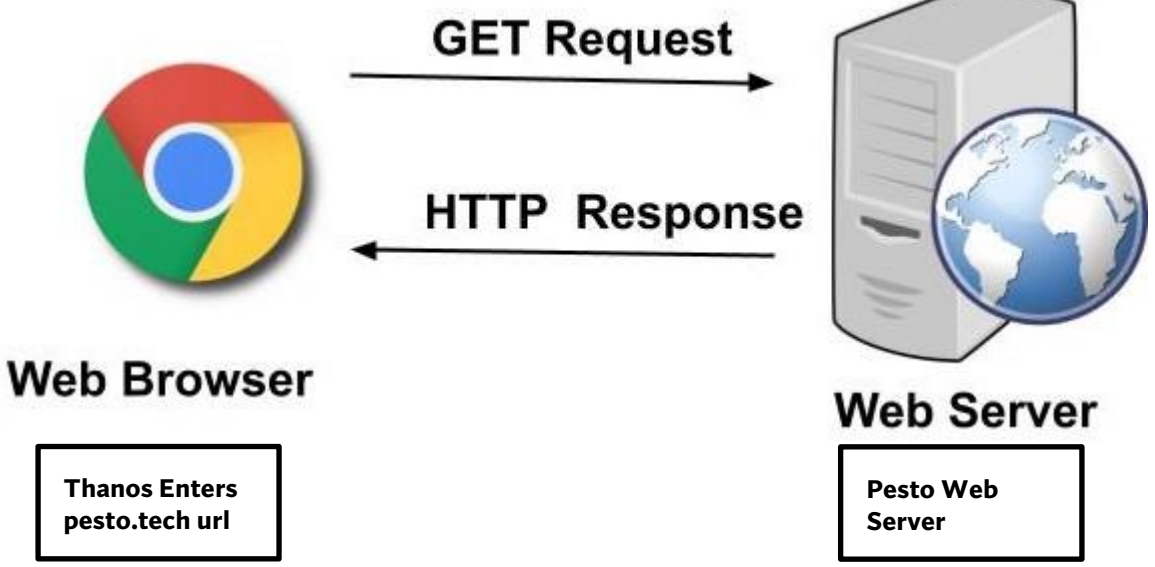
.in
.org
.co
.co.in
Etc
Also called Domain Extensions

Where can we register Domains?

Domain name providers
Godaddy
Name.com etc.

What happens when URL is entered in browser?

Client-server architecture



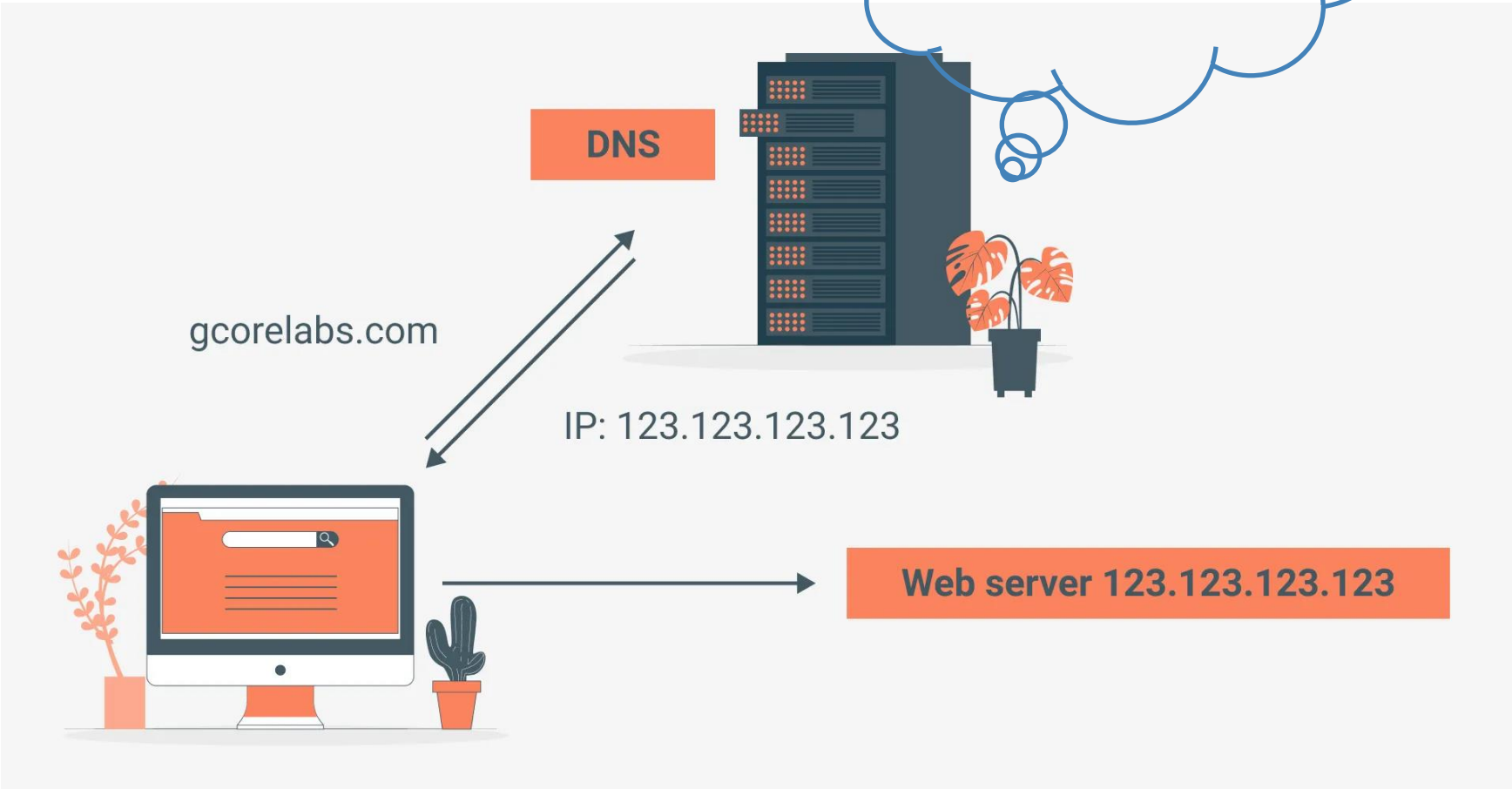
Thanos Enters pesto.tech url

Pesto Web Server

But How do browser know to reach Pesto server?

DNS Server

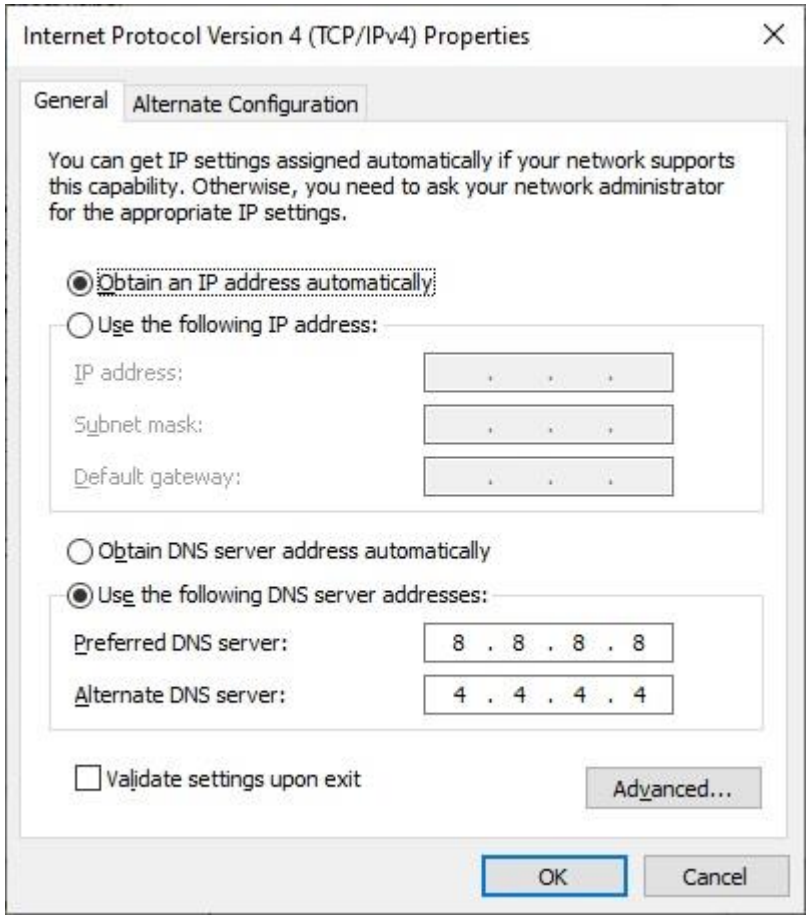
What are some Domain Examples?



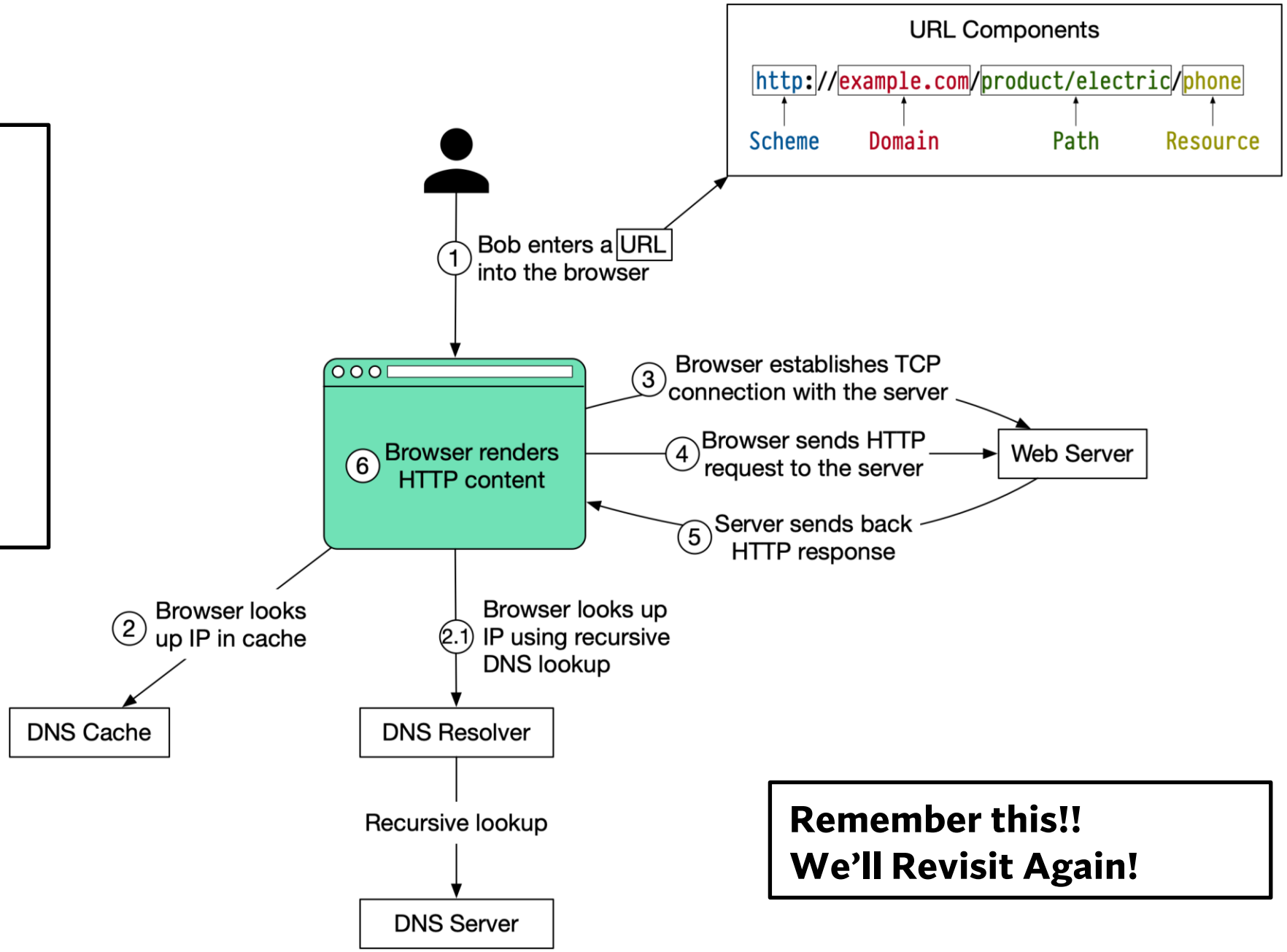
DNS Servers

Best Free & Public DNS Servers		
Provider	**Primary DNS**	**Secondary DNS**
Google	8.8.8.8	8.8.4.4
Control D	76.76.2.0	76.76.10.0
Quad9	9.9.9.9	149.112.112.112
OpenDNS Home	208.67.222.222	208.67.220.220
Cloudflare	1.1.1.1	1.0.0.1
CleanBrowsing	185.228.168.9	185.228.169.9
Alternate DNS	76.76.19.19	76.223.122.150
AdGuard DNS	94.140.14.14	94.140.15.15

Internet Options



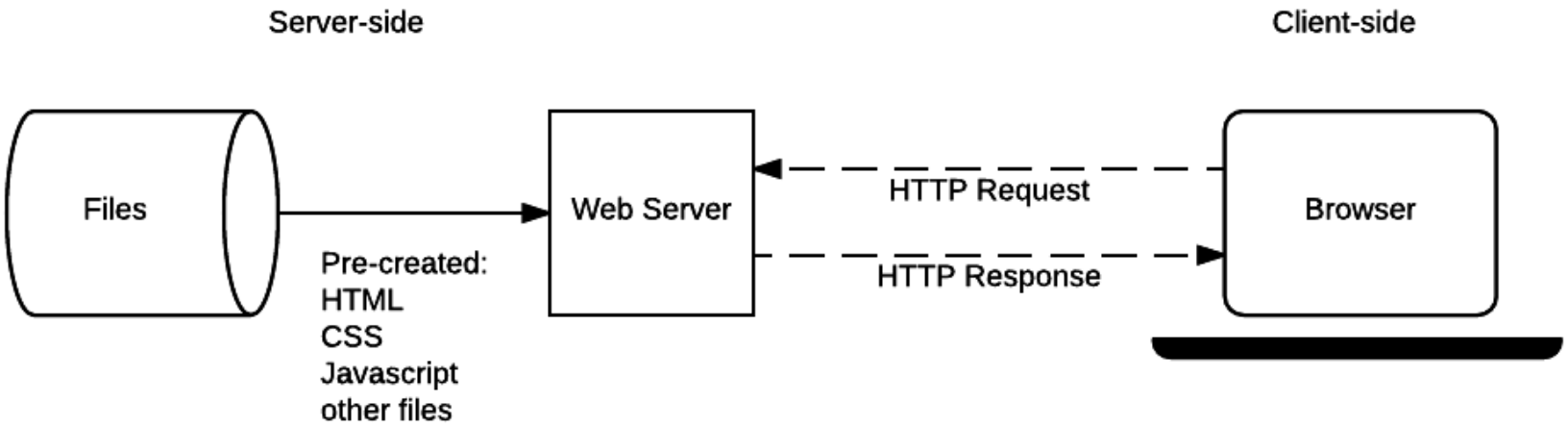
What happens when URL is entered in browser?

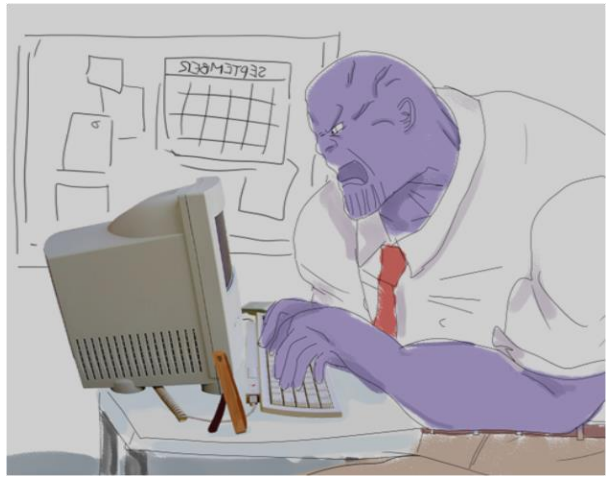


Remember this!!
We'll Revisit Again!

Client-server architecture

Demo





Pesto Web Server

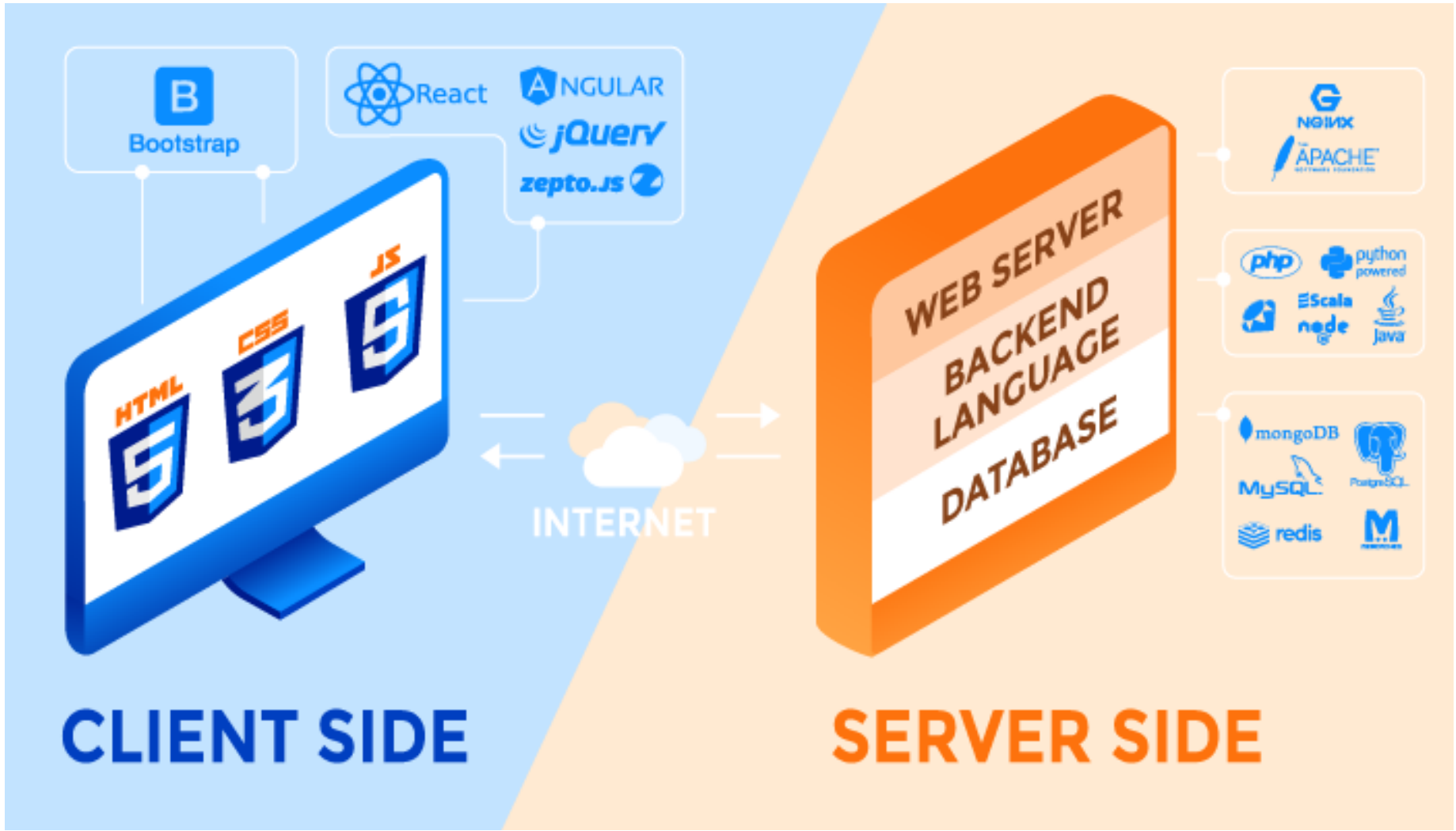
Thanos Enters pesto.tech url

Knowledge Check

- If we directly hit ip address of website instead of domain name, what will happen?
- Having a DNS server increase performance?

Client-server architecture

FRONTEND



BACKEND

Tech- Stacks Overview

FRONTEND Development?

FRONTEND TechStack Examples?

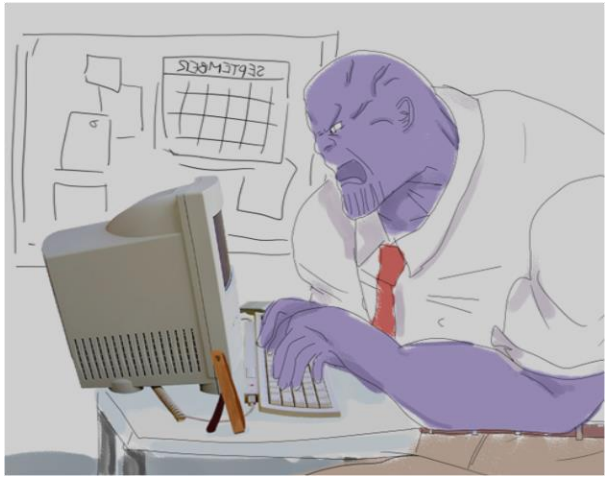
BACKEND Development

BACKEND TechStack Examples?

Full-Stack Development

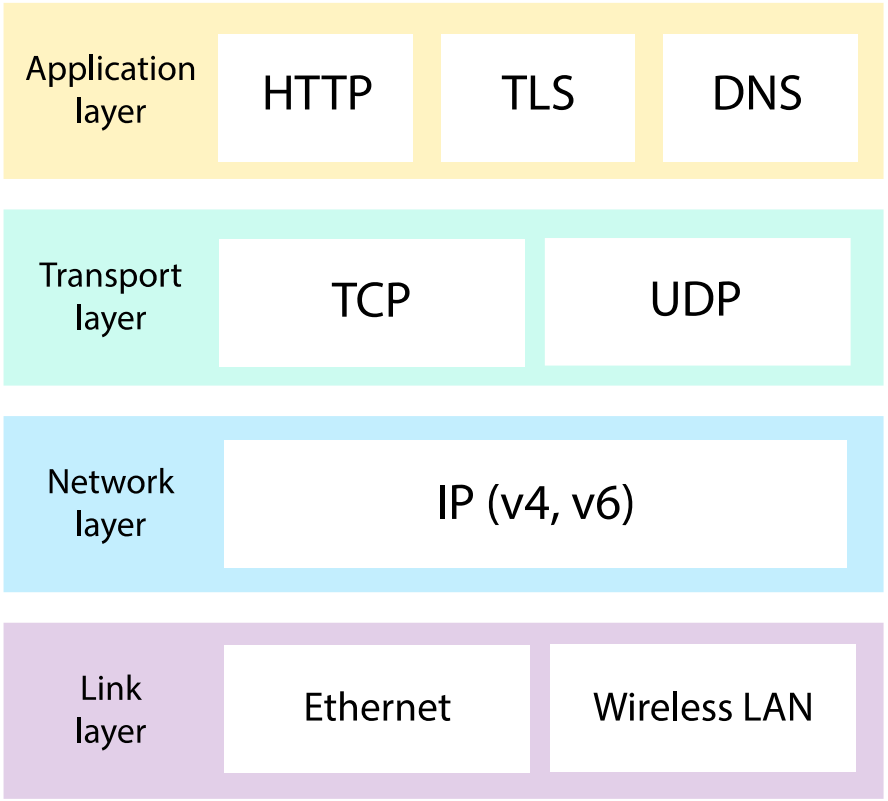
Full-Stack TechStack Examples?

How Communication Happens between Client & Server?



Client- Sever uses Protocols to communicate.

Protocols Stack

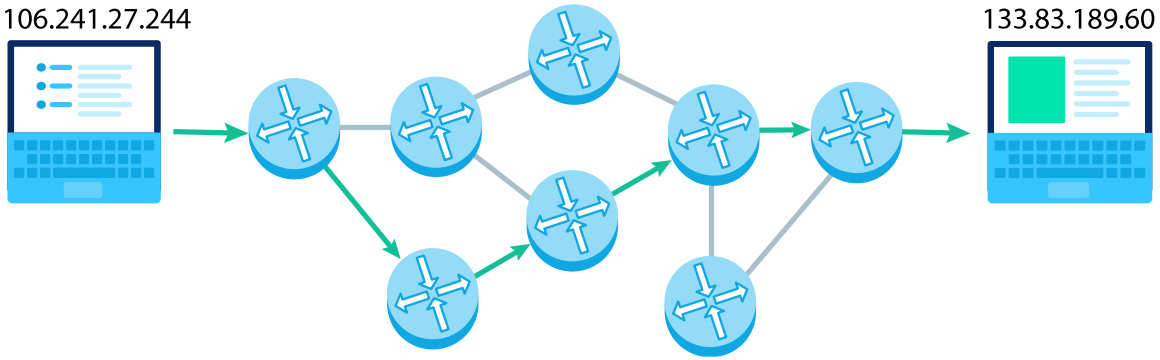


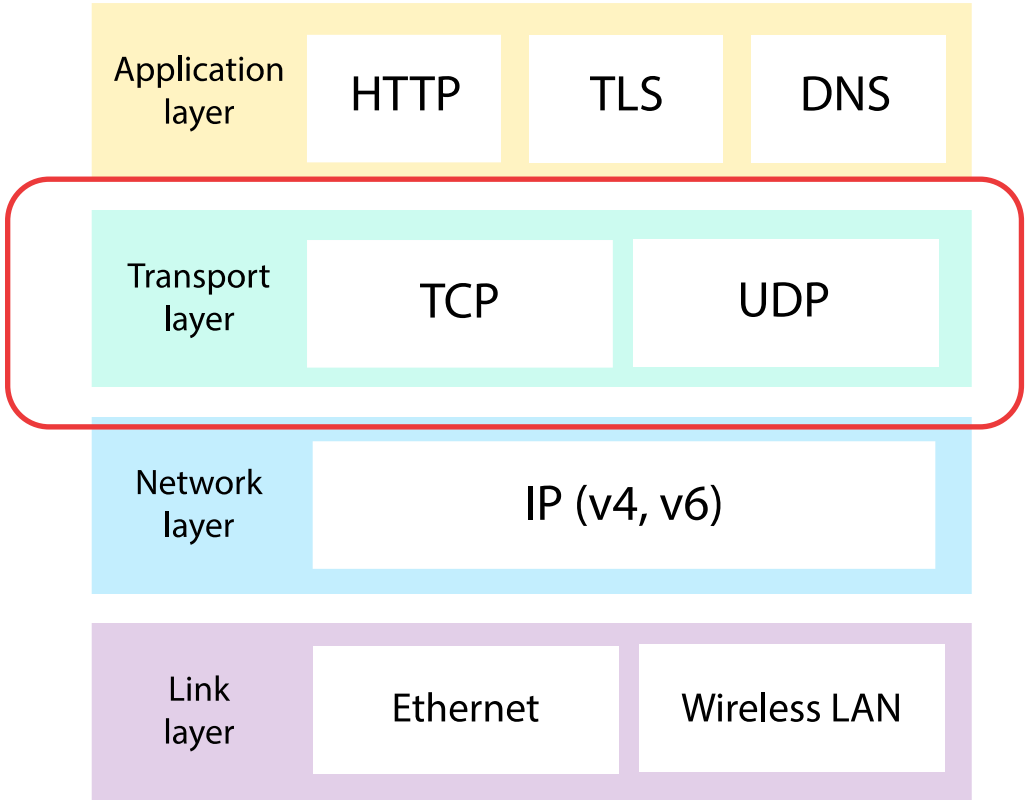
Only this?

There are other protocols such as FTP, SMTP

Transport Layer- TCP

- Data needs to be broken into small packets
- which are then reassembled at the destination by TCP
- A faster but less reliable transport protocol- UDP

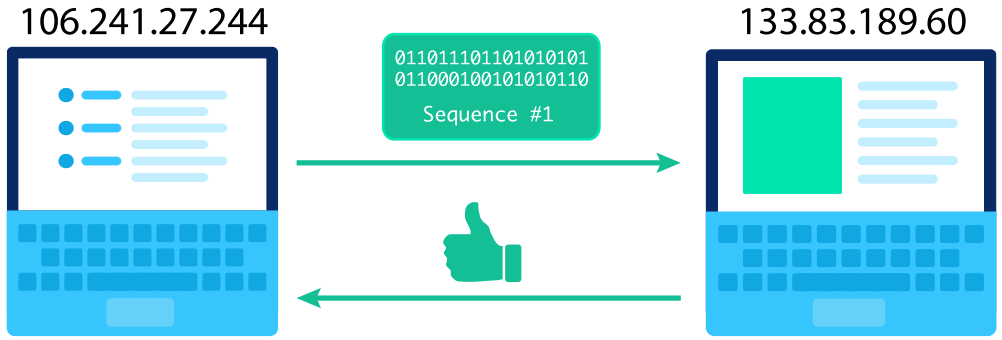


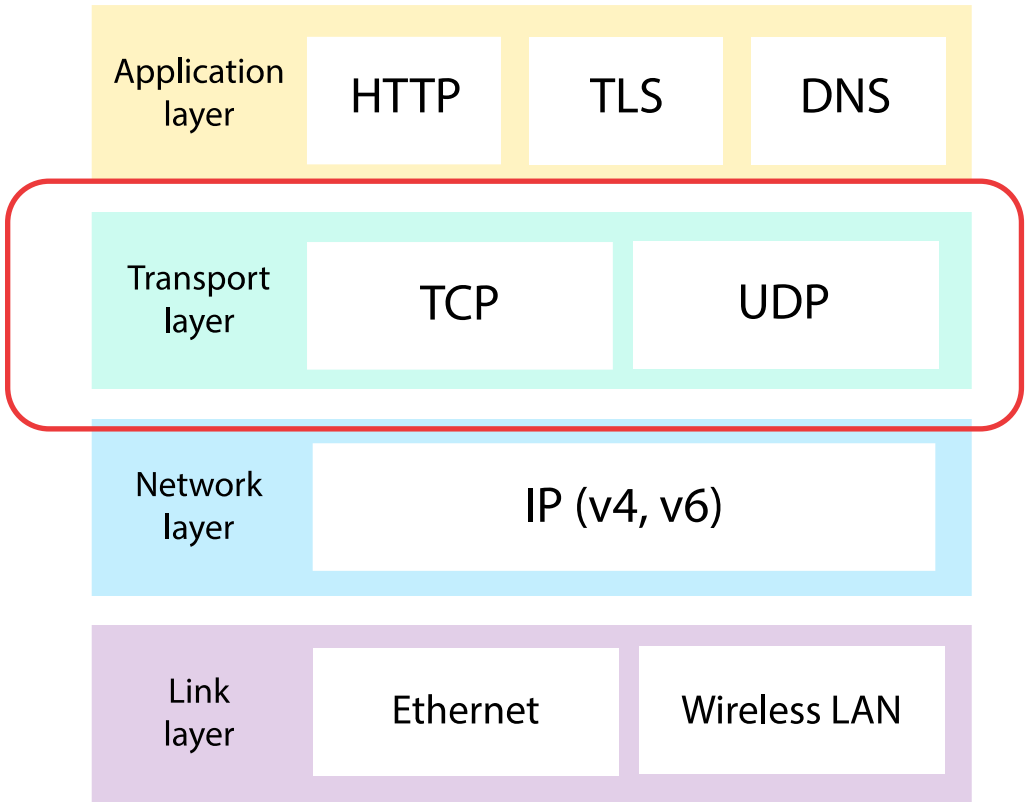


Transmission Control Protocol (TCP)

Transport Layer- TCP

- **TCP ensures the sequence**

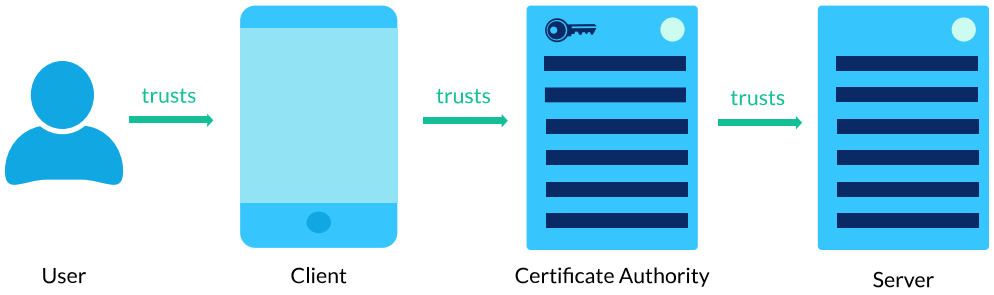


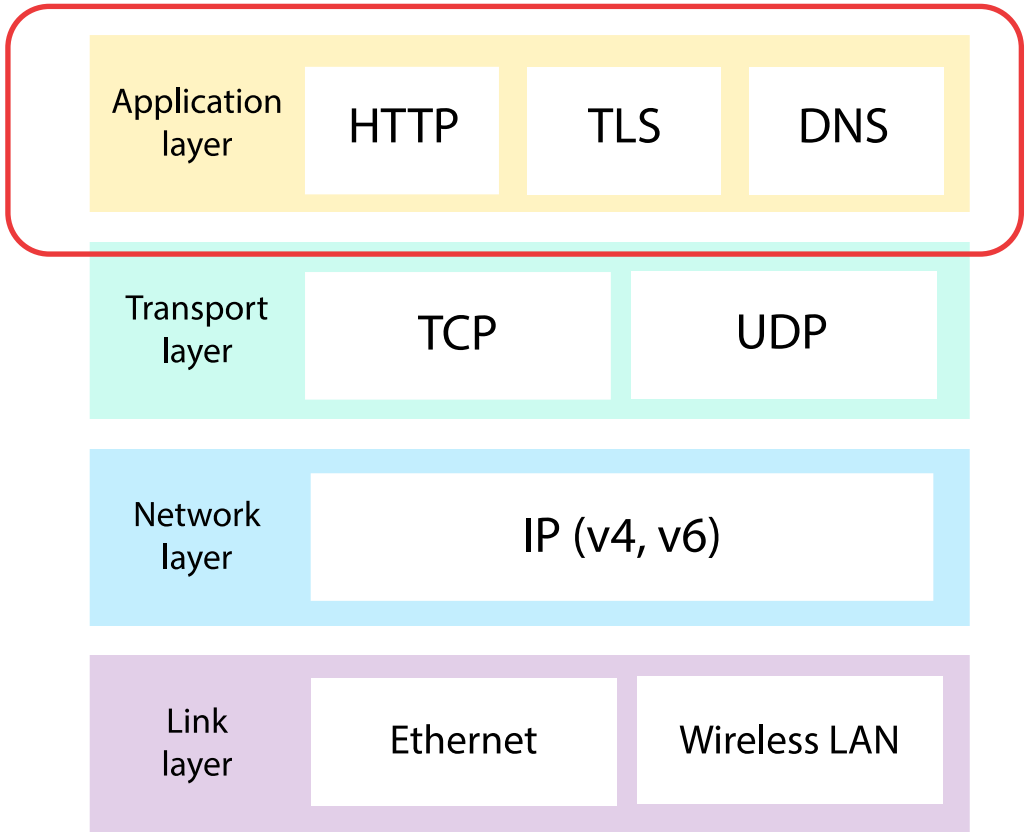


Transmission Control Protocol (TCP)

Application Layer- Security/Encryption

- **Uses HTTPS & TLS- to serve the website over a secure, encrypted connection.**





TLS- Transport Layer Security

Knowledge Check

- Which protocol is used to encrypt data sent over the internet in the protocol stack for a website?
- How does SSL/TLS work in the protocol stack for a website?

- The HTTPS protocol (HTTP Secure) is used to encrypt data sent over the internet
- SSL (Secure Sockets Layer) and TLS (Transport Layer Security) are used to encrypt data in the protocol stack for a website.

<|>esto

Different Clients??

Any device that uses your application from TV, Smart Watch, ATM Machine to regular devices

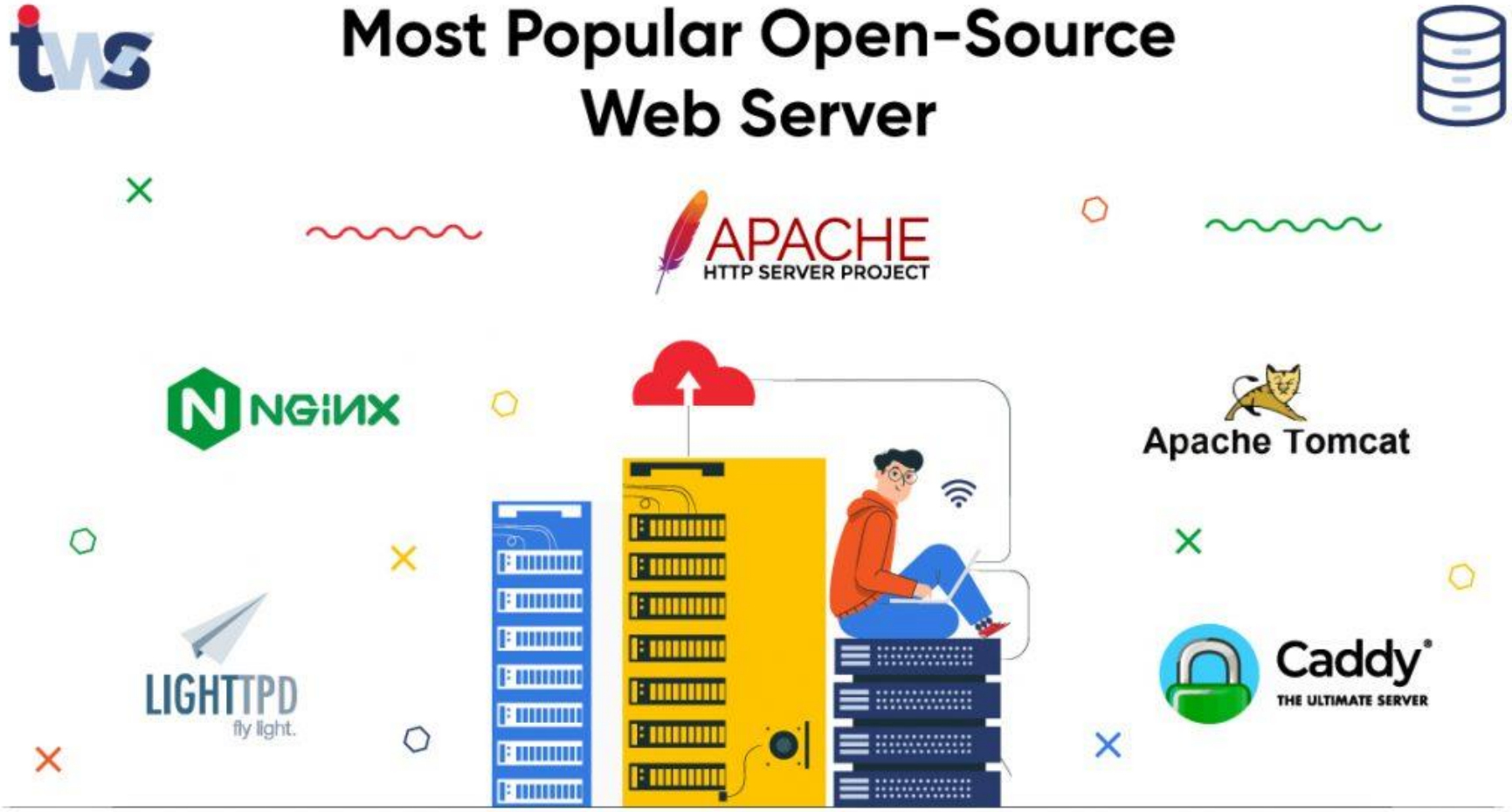
Let’s talk about Servers

What is Server?

Server is always connected to the internet

Different Type Of Servers

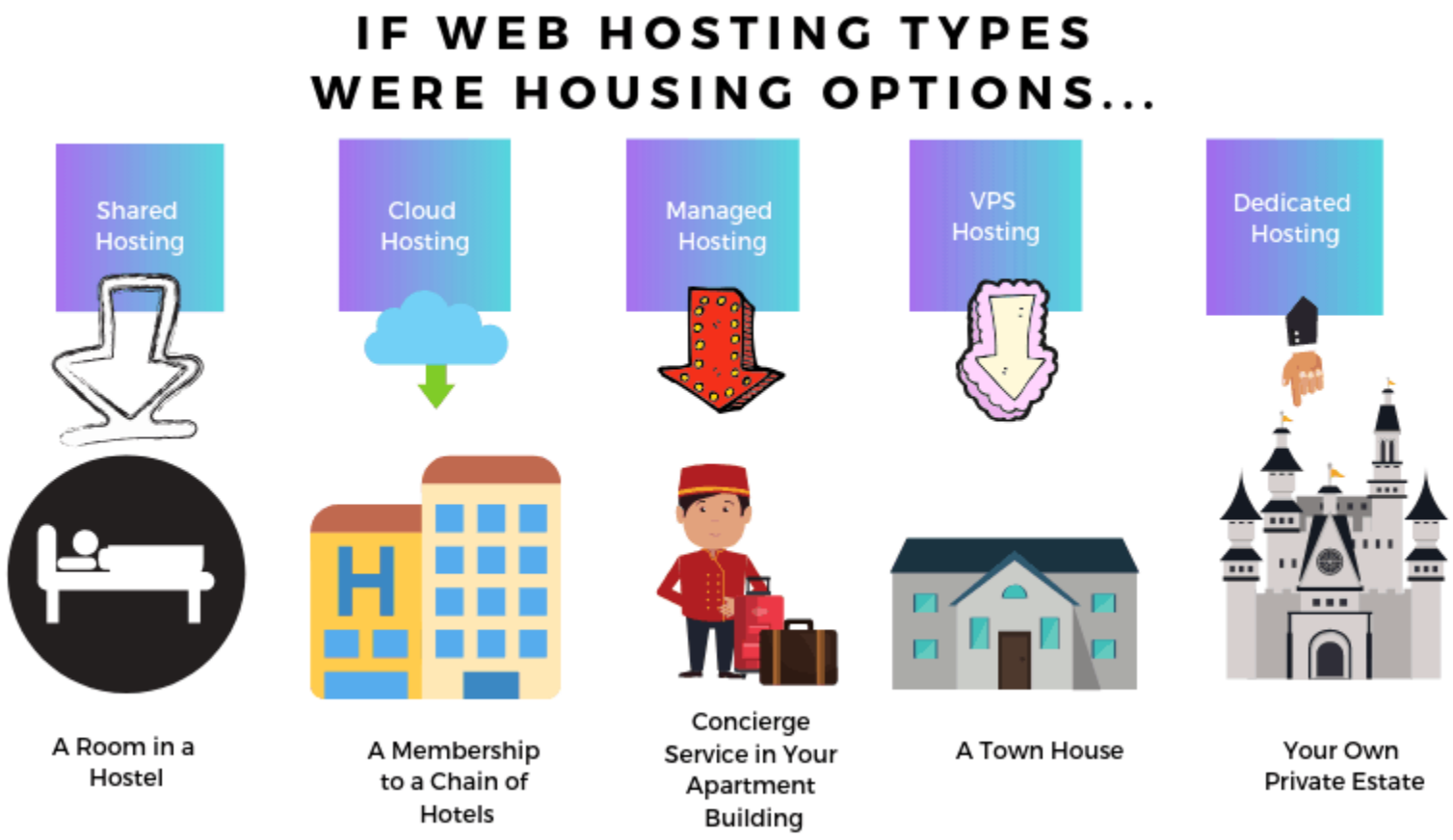
Open-Source Web Servers



Who provides this Web Servers?

Hosting Providers like GoDaddy!

Type of Hosting



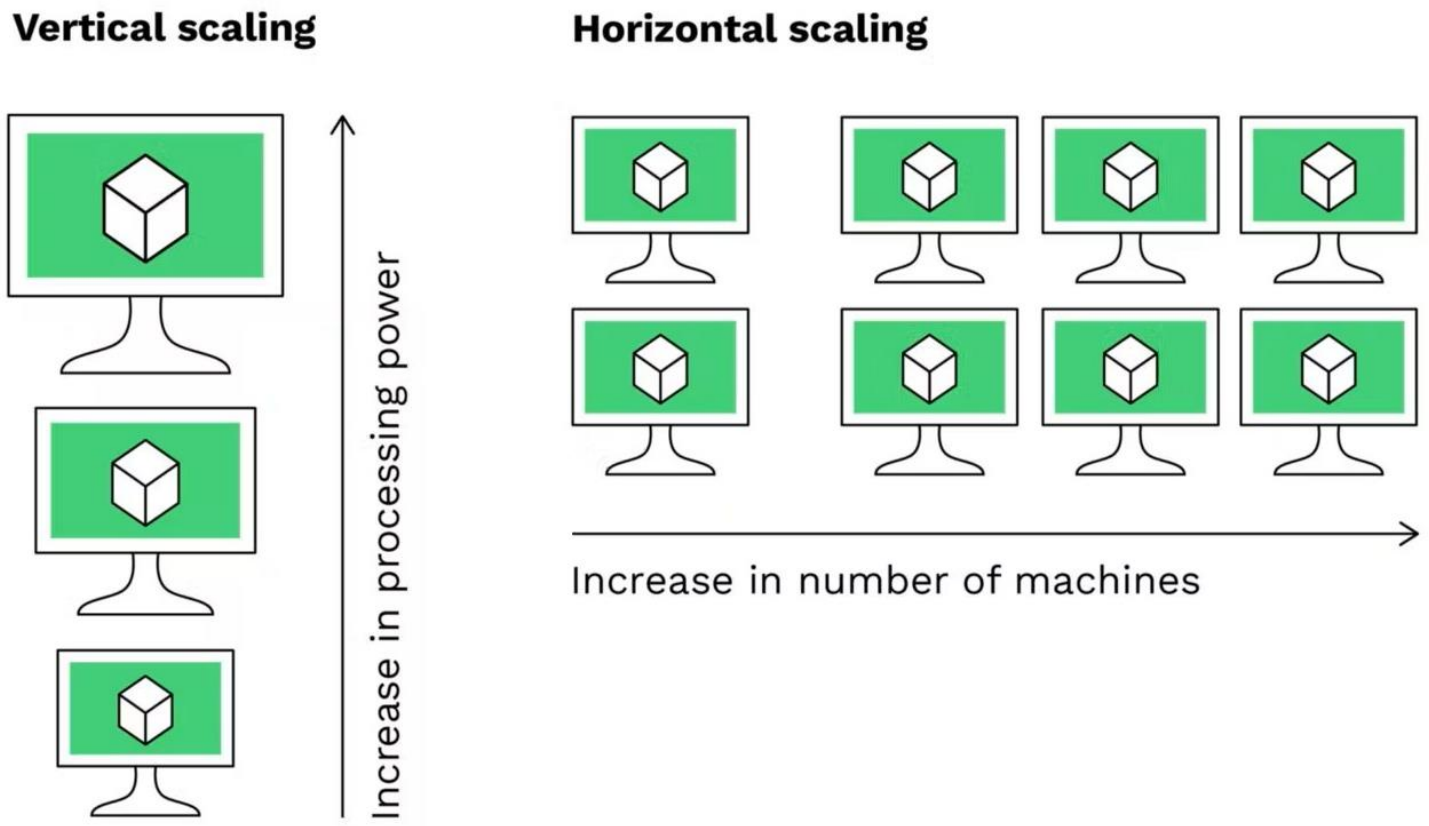
How to Choose?

Depends on your requirement and size

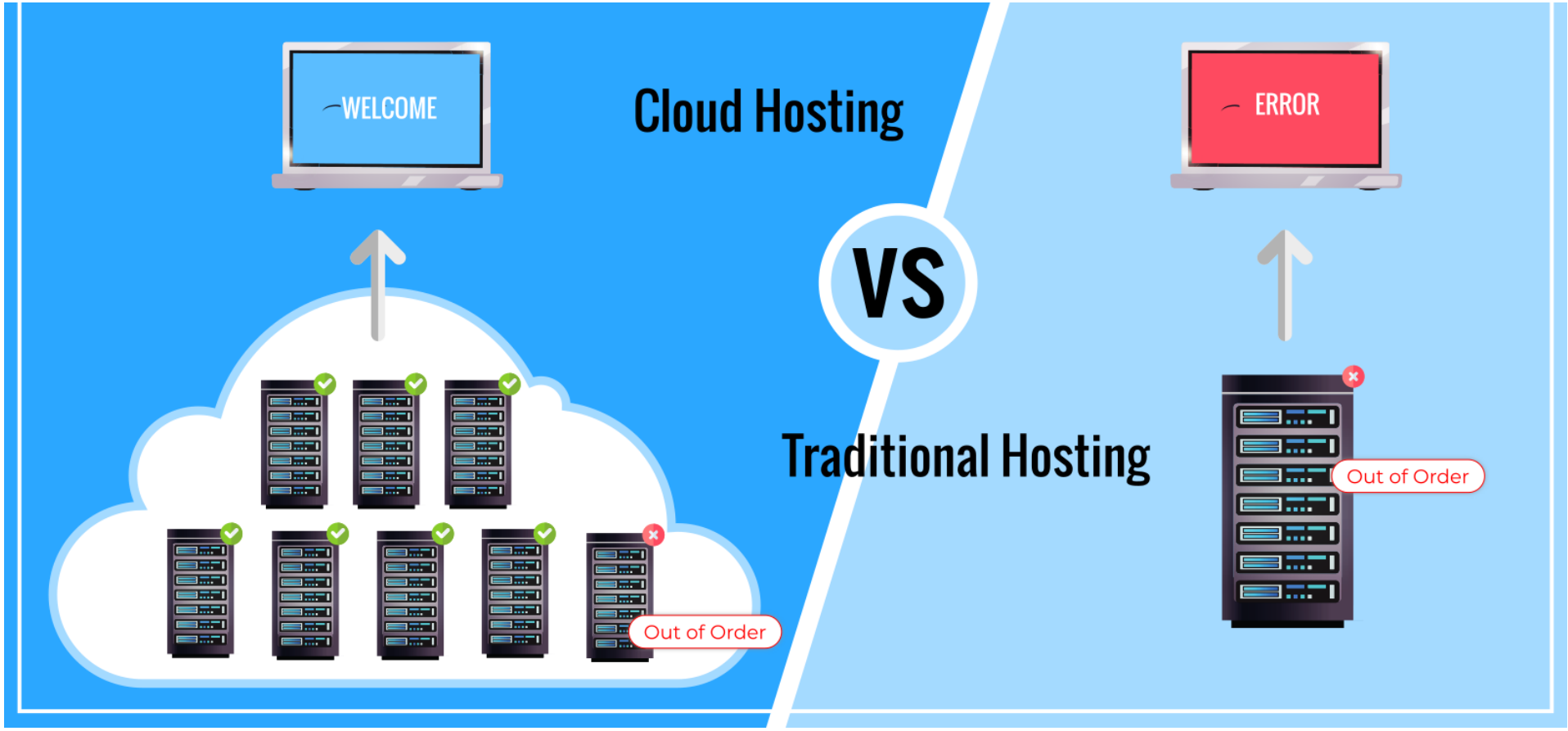
Is One server sufficient to serve all ?

Scalability

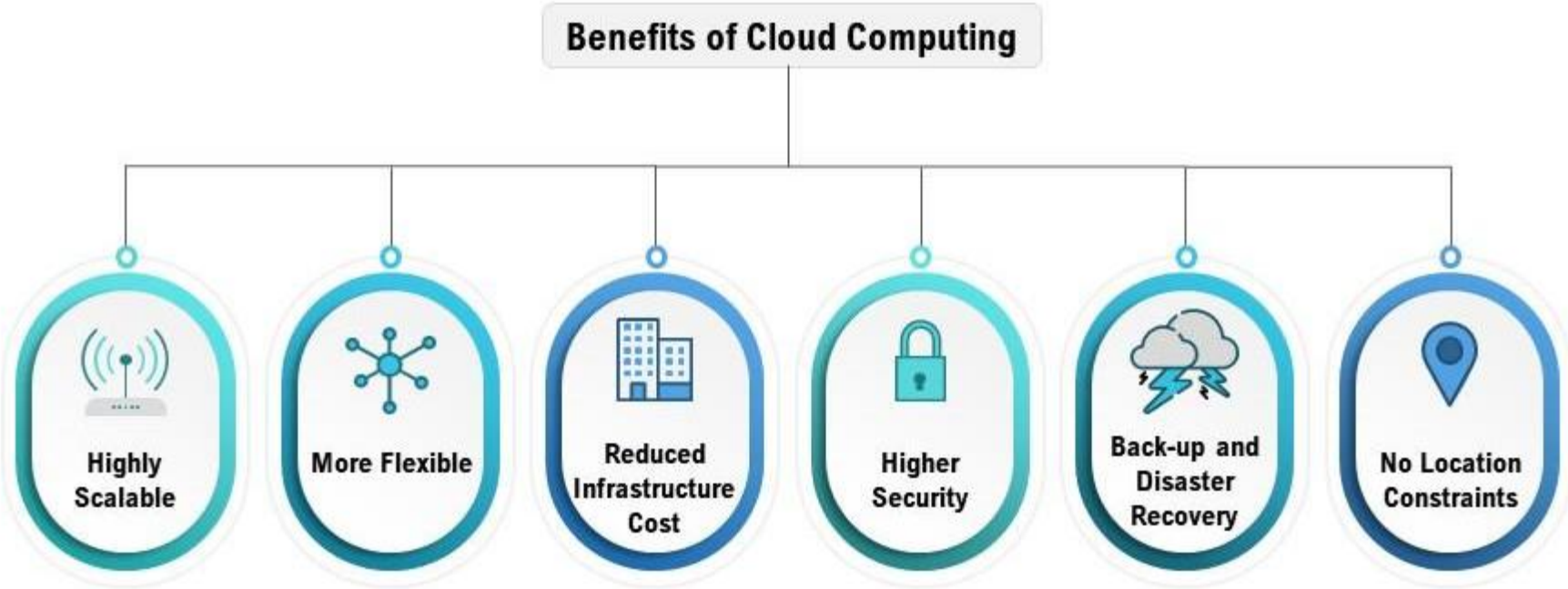
Into the picture



Cloud Hosting Vs Dedicated Hosting



Cloud Hosting Advantages



Knowledge Check

- A website is deployed on a single server and it cannot afford to failover to another server, if traffic is increased, Which scaling method is preferred?

- Horizontal Scaling, Since website cannot afford down-time

Thanos knows different types of hosting servers

How someone discovers website address?

Search Engines

How Search Engine knows website? (pesto.tech)

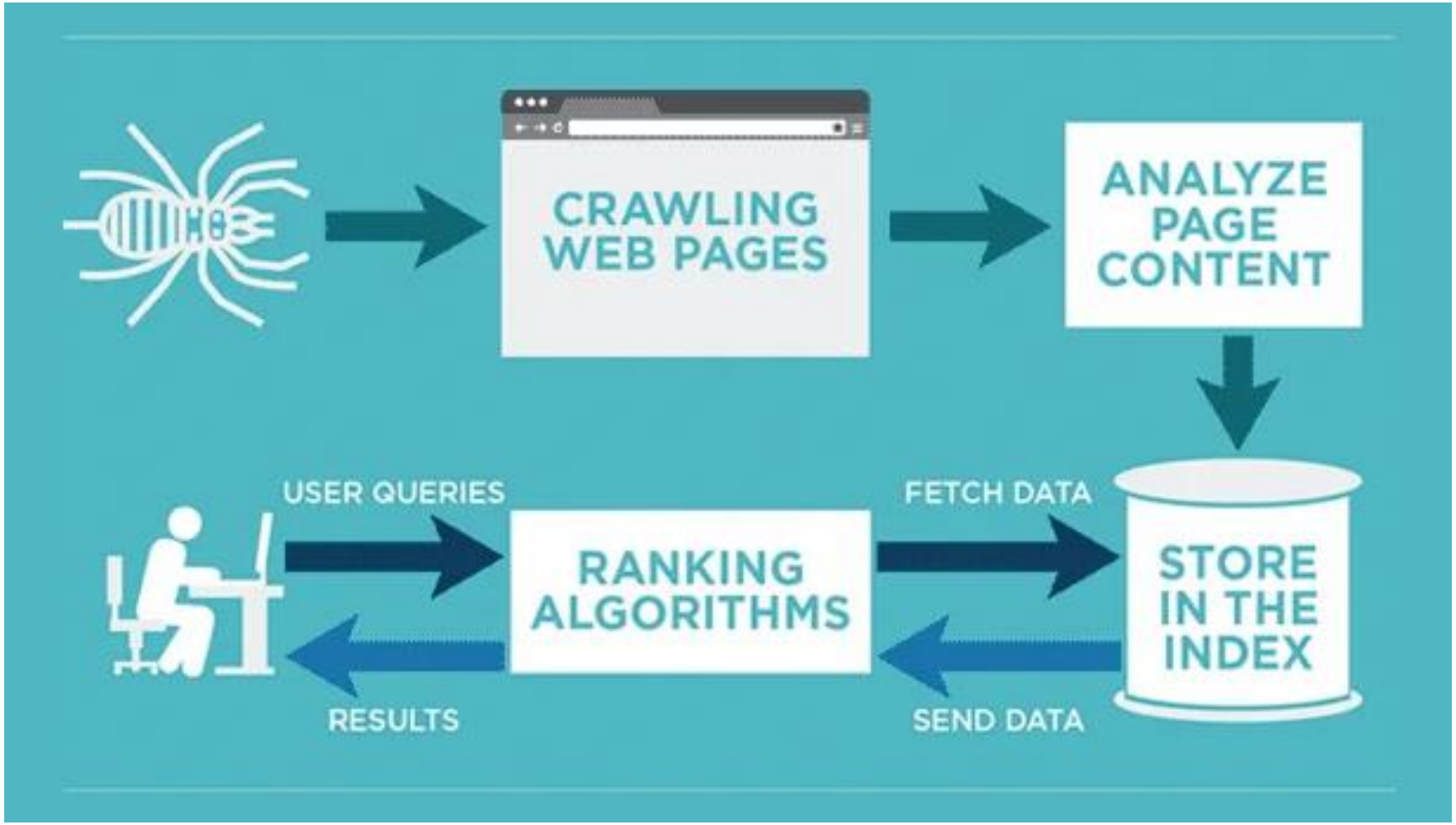
Search Engines – What are they?

Search engines allow users to search the internet for content using keywords

Search Engines - “what is this site about?”

How do they work on my website?

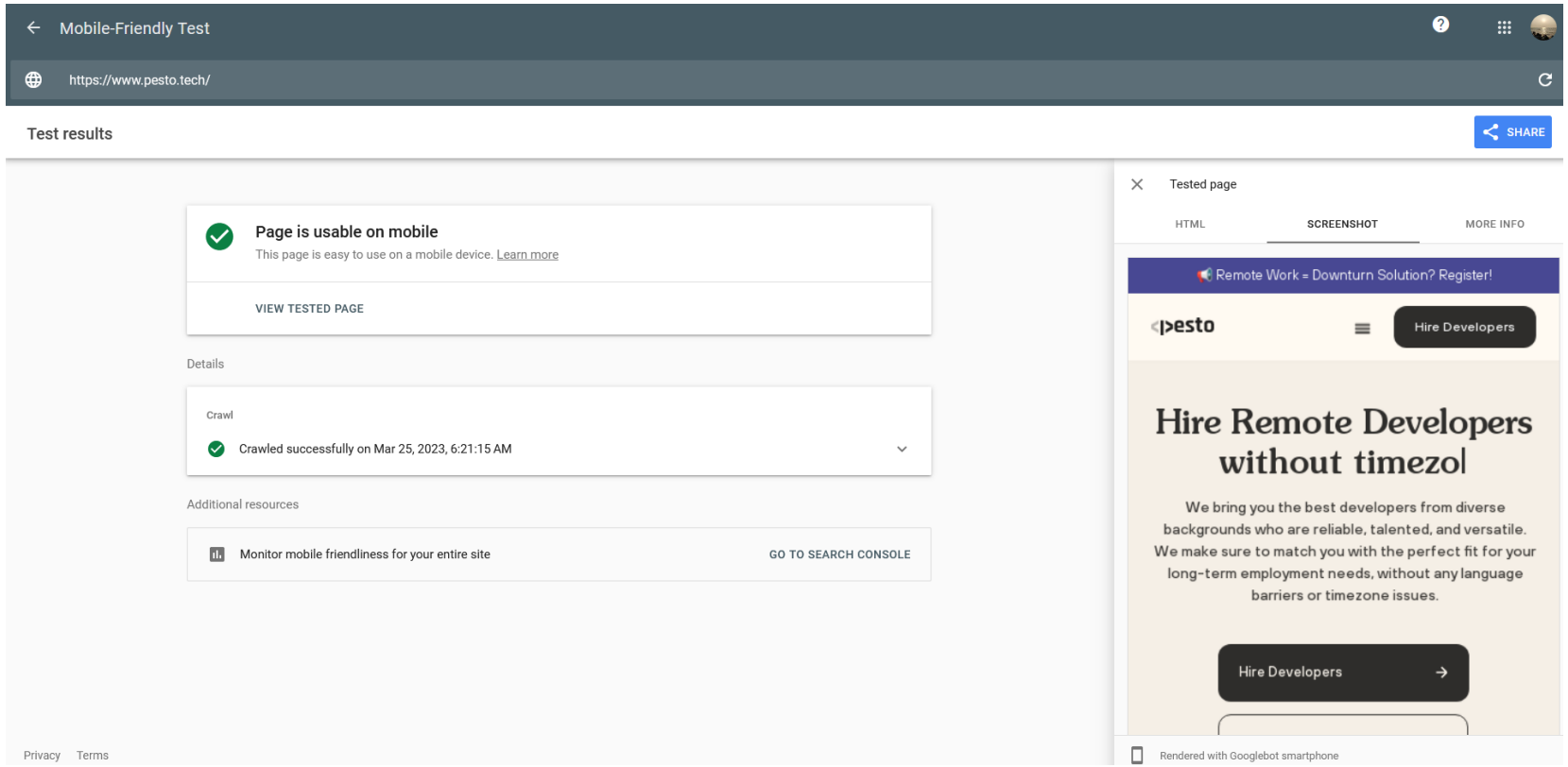
Search Engines



SEO – Best Practices

Mobile Friendly – SEO Factor Demo test

1. https://search.google.com/test/mobile-friendly
2. Developer Tools



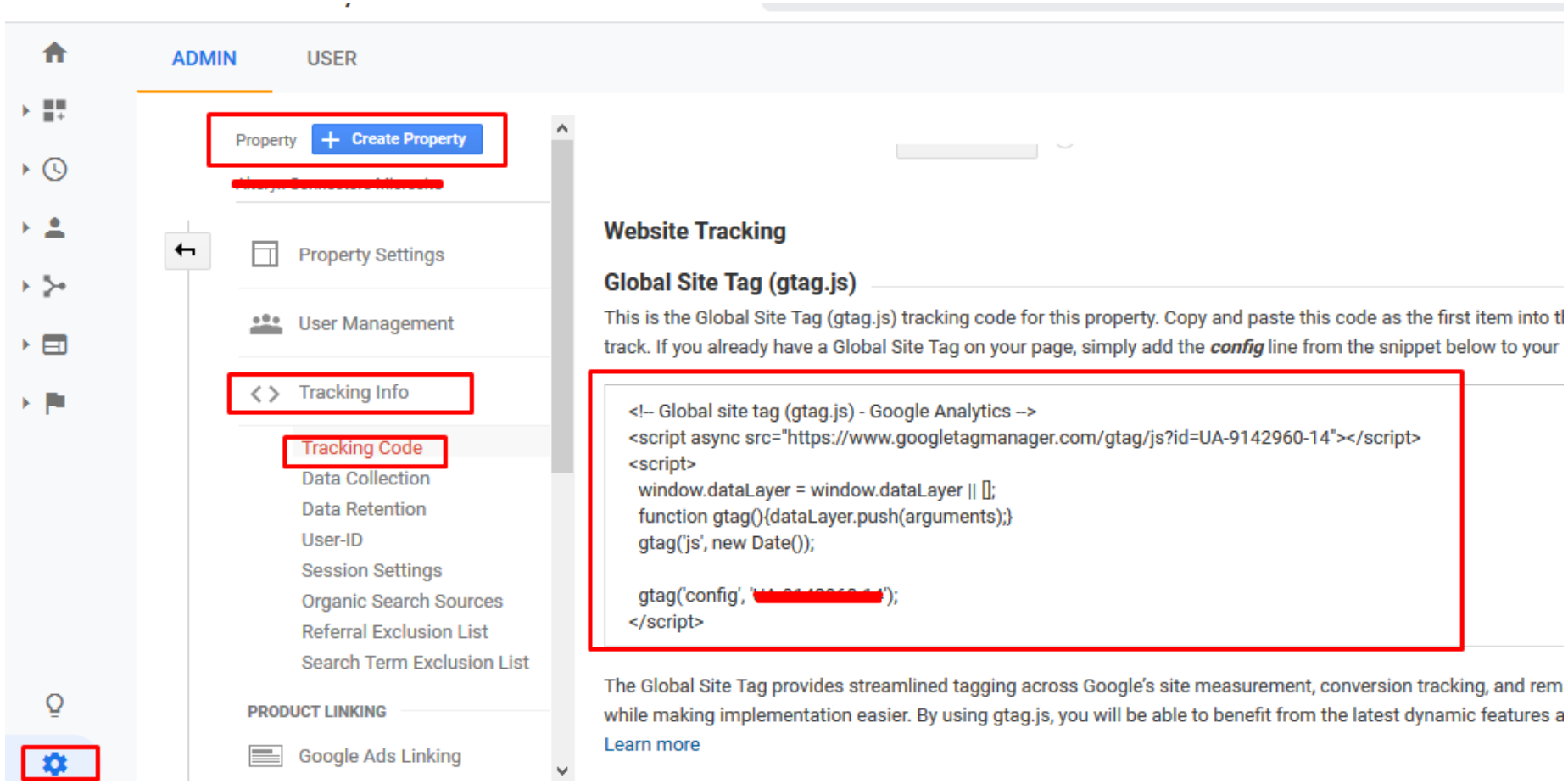
Site Stats, Popularity

Thanos wants to know!!!

Who is your visitor?
Visitors' Timestamp?
How visitors came?
How long do they stay?
Visitors' Browser

Stats tools such as Google Analytics, Weblyzer

Visitor Tracking – Google Analytics

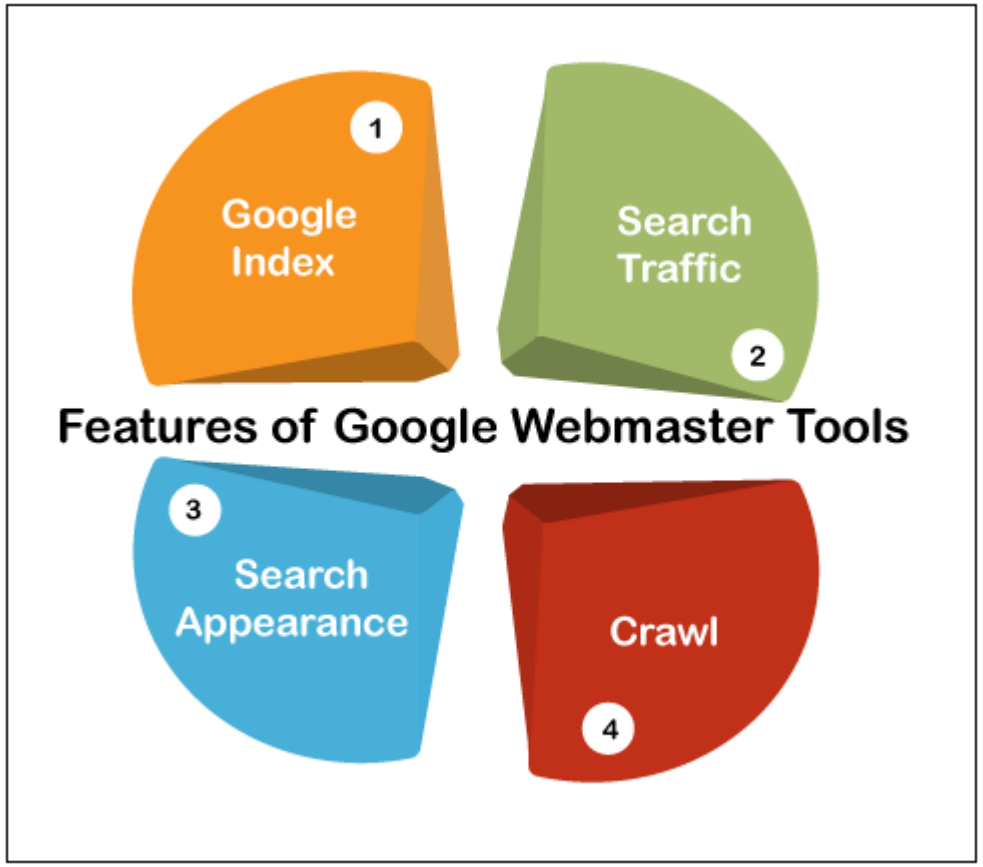


Add Tracking code to your website

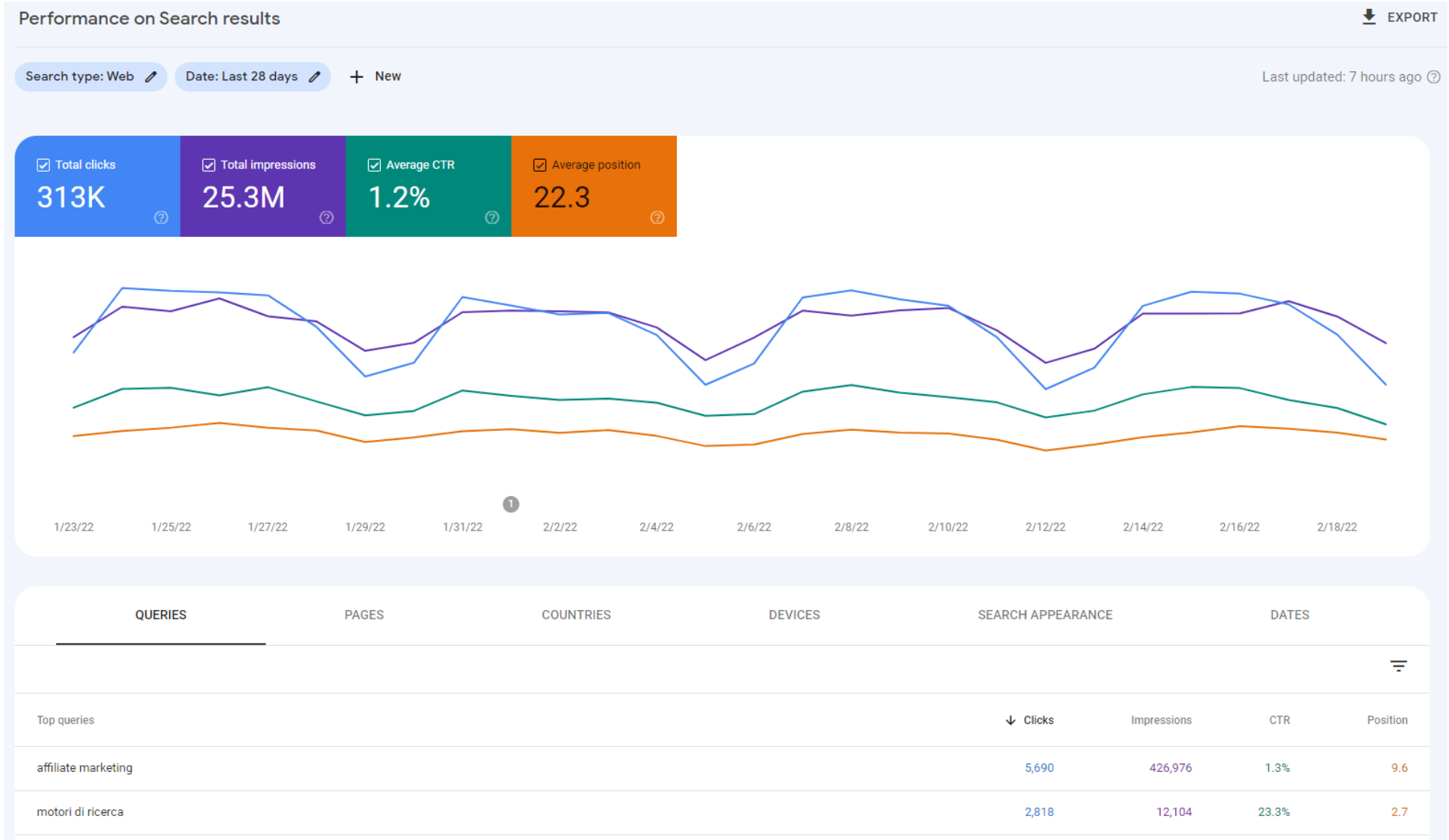
Search Tracking

Web Master Tools.

- **Google Web Master Tools**
- **Bing Web Master Tools**



Google Search Console- Search Tracking



Knowledge Check

- What is the tool to be used for search traffic analysis in google?
- What is the tool to be used for visitor traffic analytics in google?

- Google Search Console/Webmaster tools
- Google Analytics

Q & A