

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

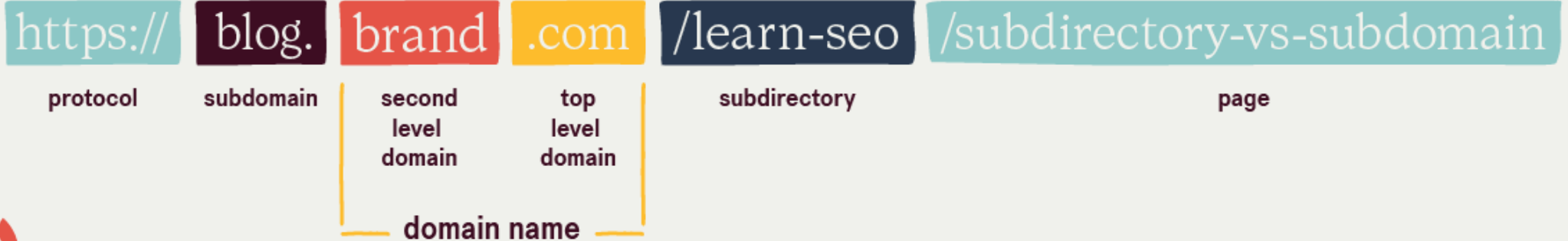
Why website?



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

Let's Decode URL Parts

The Anatomy of a URL



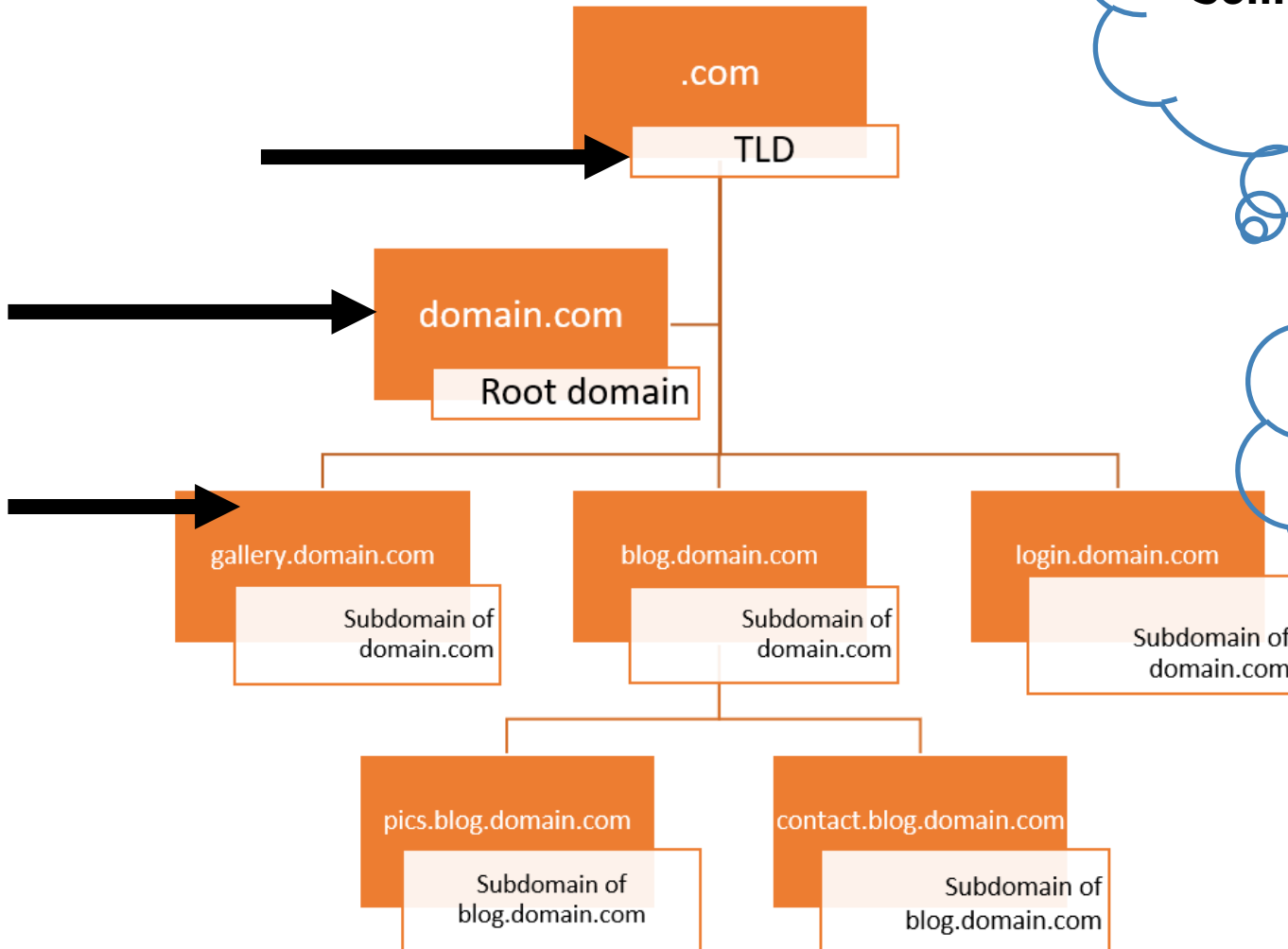
Domains/ Sub Domains

Some TLD examples

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

Where can we
register Domains?

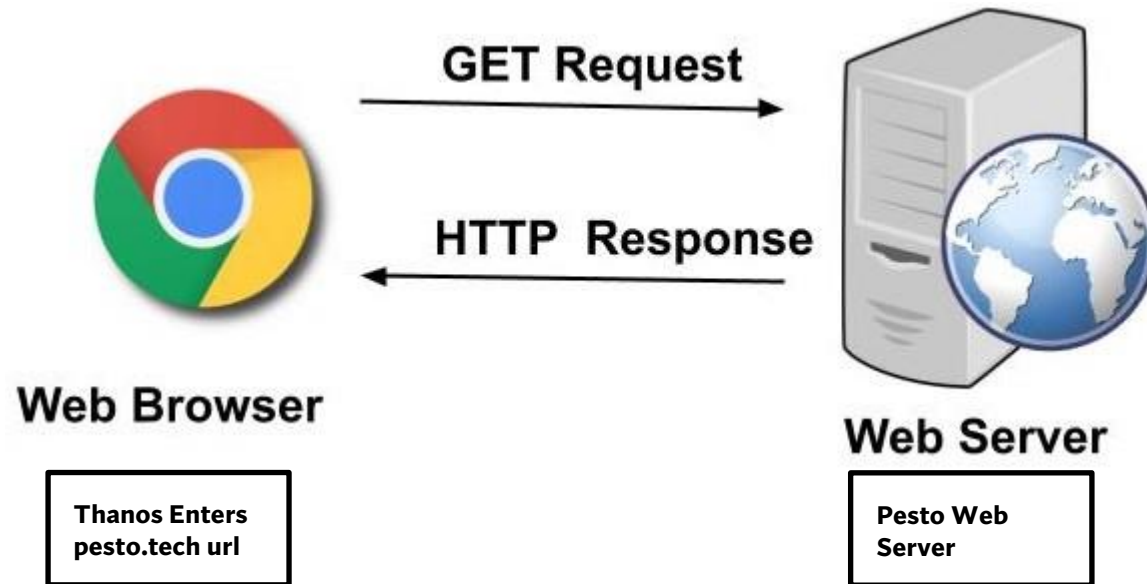
Domain name providers
Godaddy
Name.com etc.





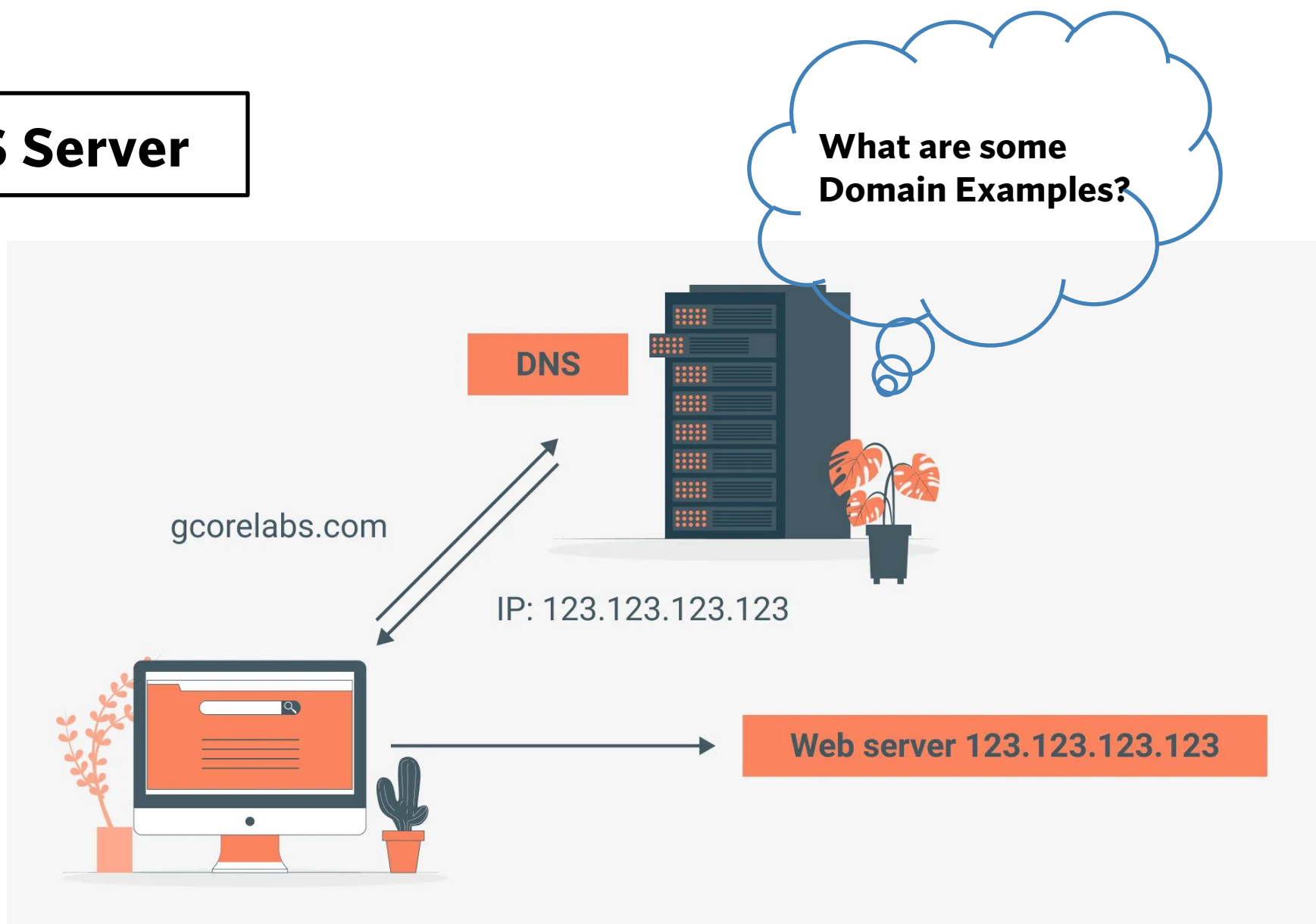
**What happens when
URL is entered in
browser?**

Client-server architecture



But How do browser know to reach Pesto server?

DNS Server



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

Internet Protocol Version 4 (TCP/IPv4) Properties

General Alternate Configuration

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☒ Obtain an IP address automatically:

☐ Use the following IP address:

IP address:

Subnet mask:

Default gateway:

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server:

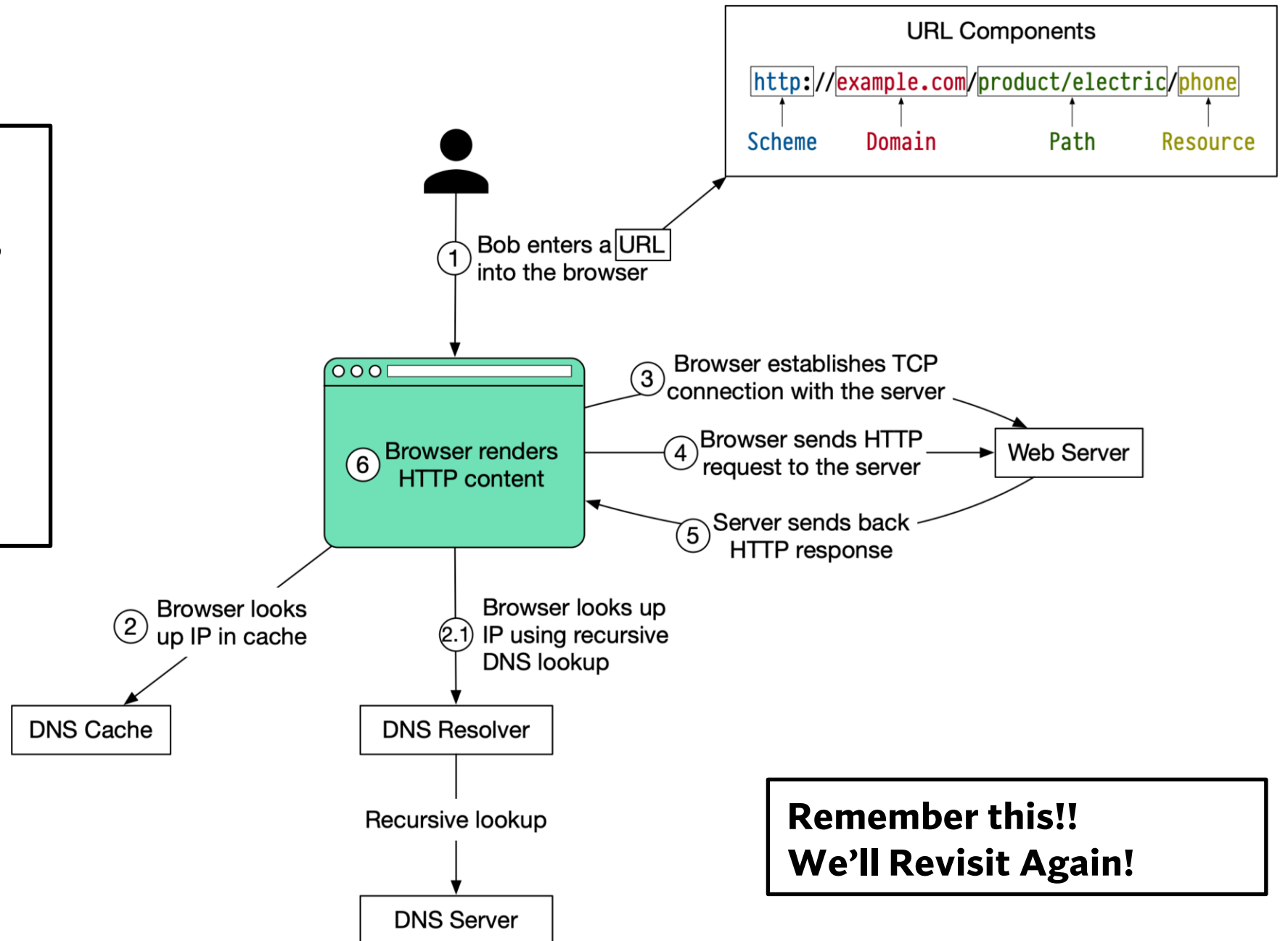
Alternate DNS server:

☐ Validate settings upon exit

Advanced...

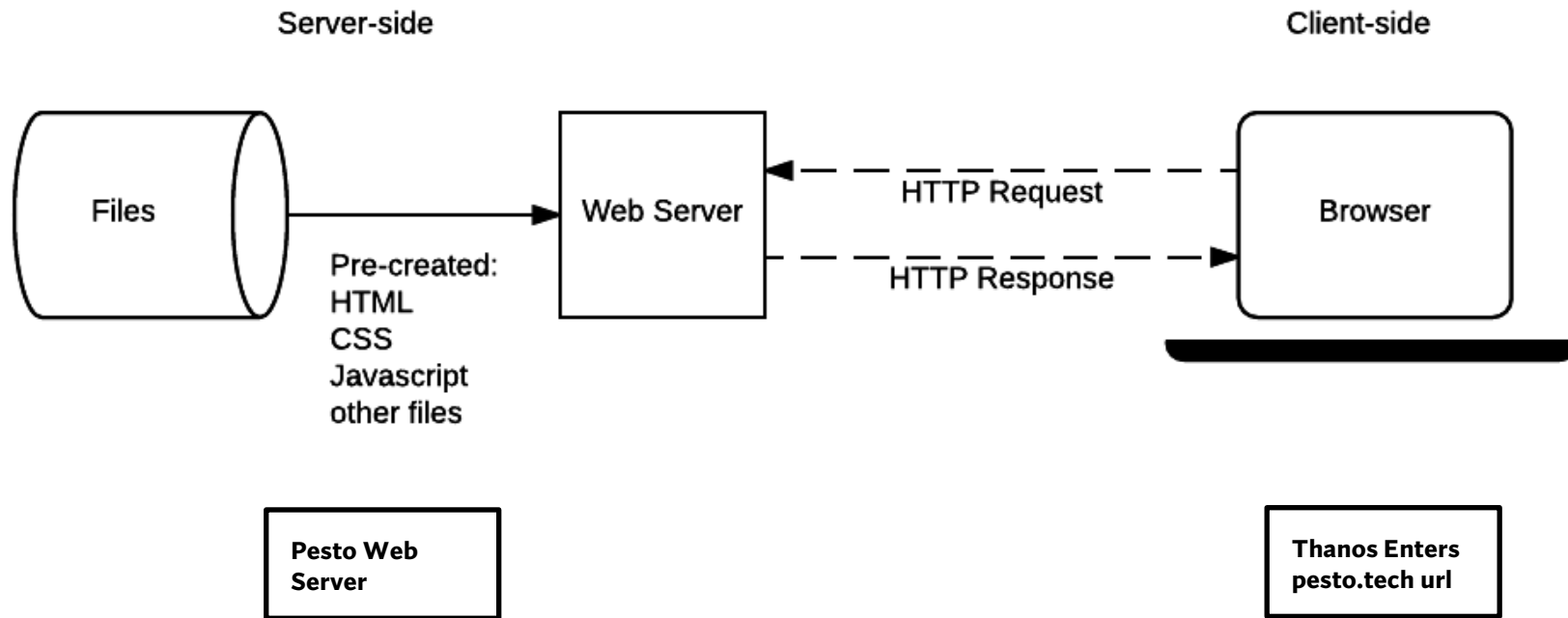
OK Cancel

What happens when URL is entered in browser?



Client-server architecture

Demo

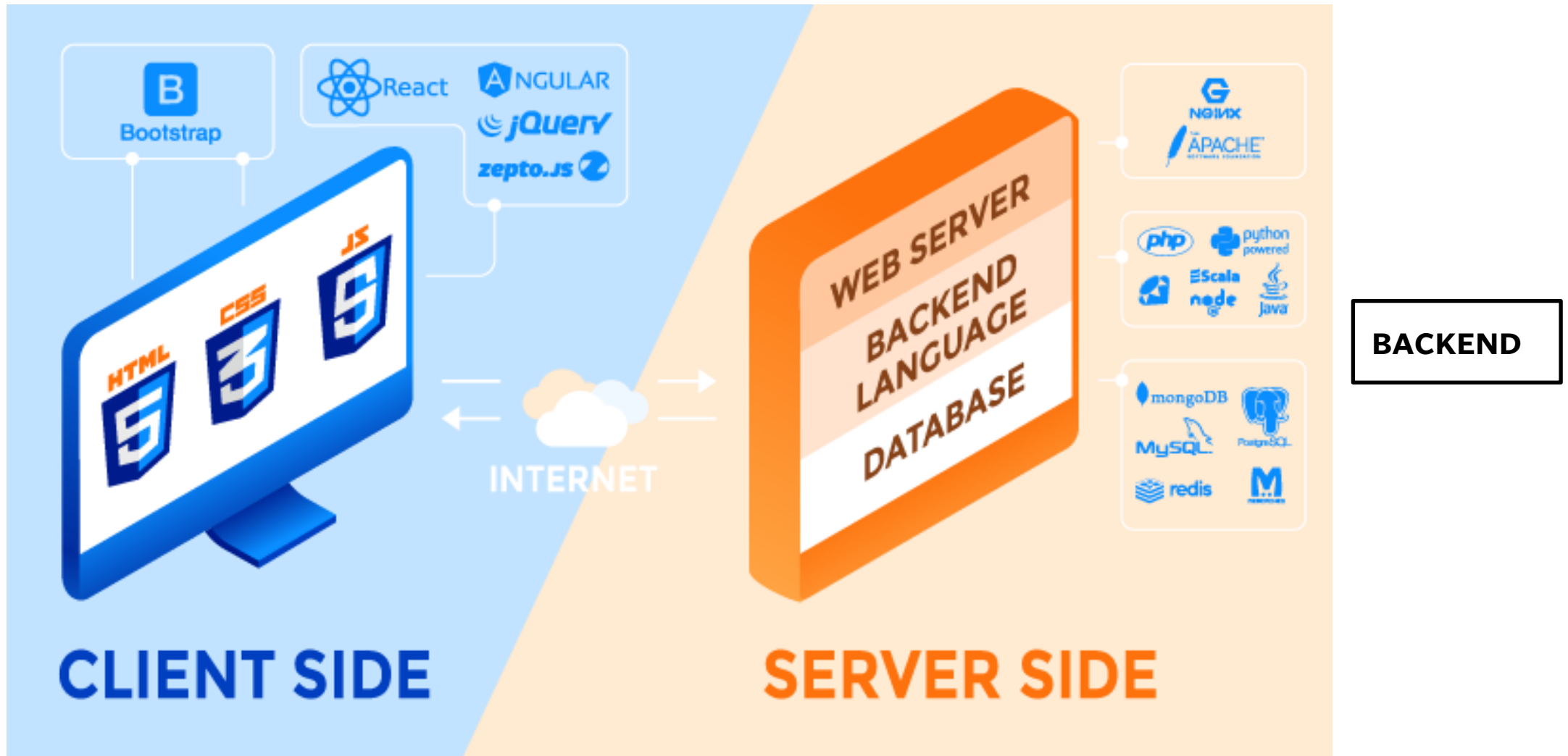


Knowledge Check

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



Client-server architecture



Tech- Stacks Overview

FRONTEND Development?

**FRONTEND TechStack
Examples?**

BACKEND Development

**BACKEND TechStack
Examples?**

Full-Stack Development

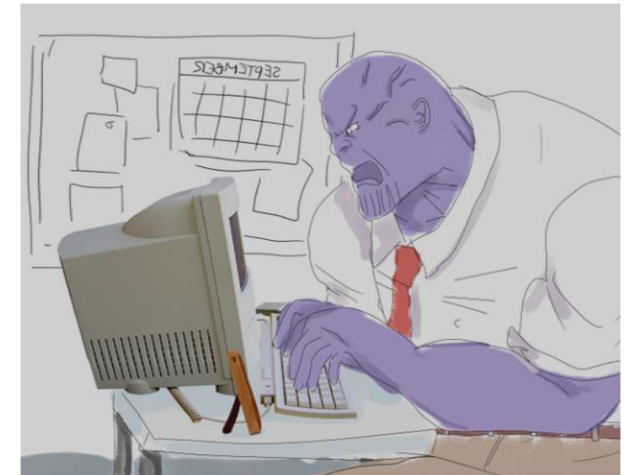
**Full-Stack TechStack
Examples?**

How Communication Happens between Client & Server?

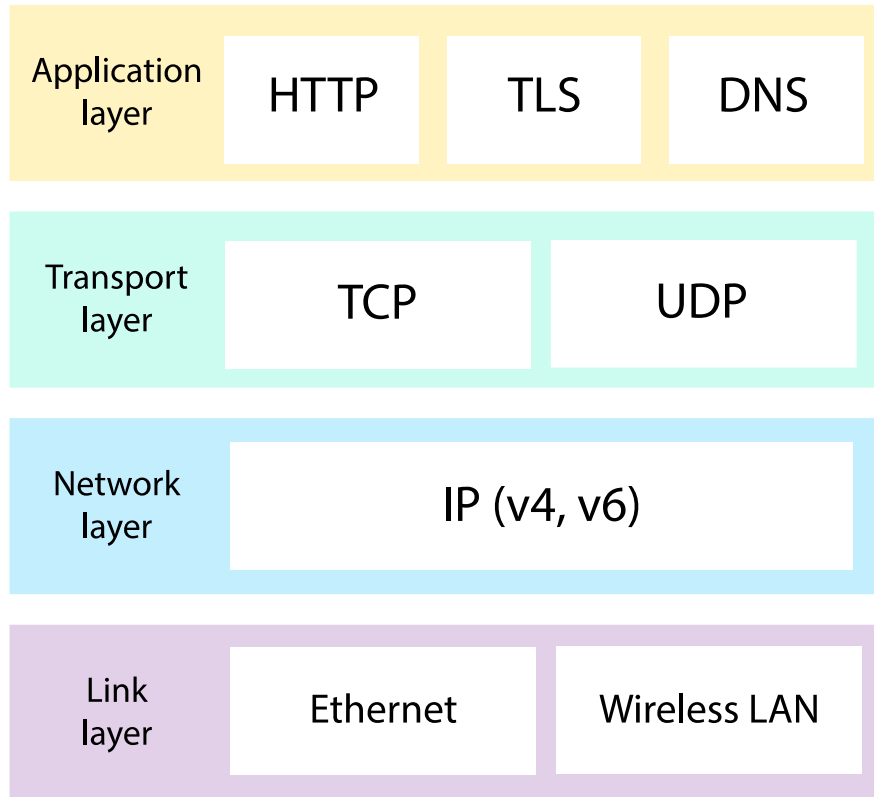
Client and server requests and responses



Client- Sever uses Protocols to communicate.



Protocols Stack

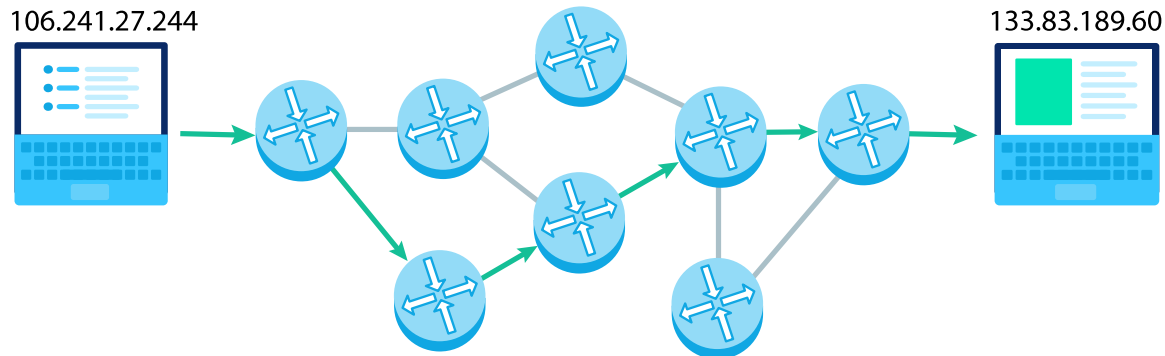


Only this?

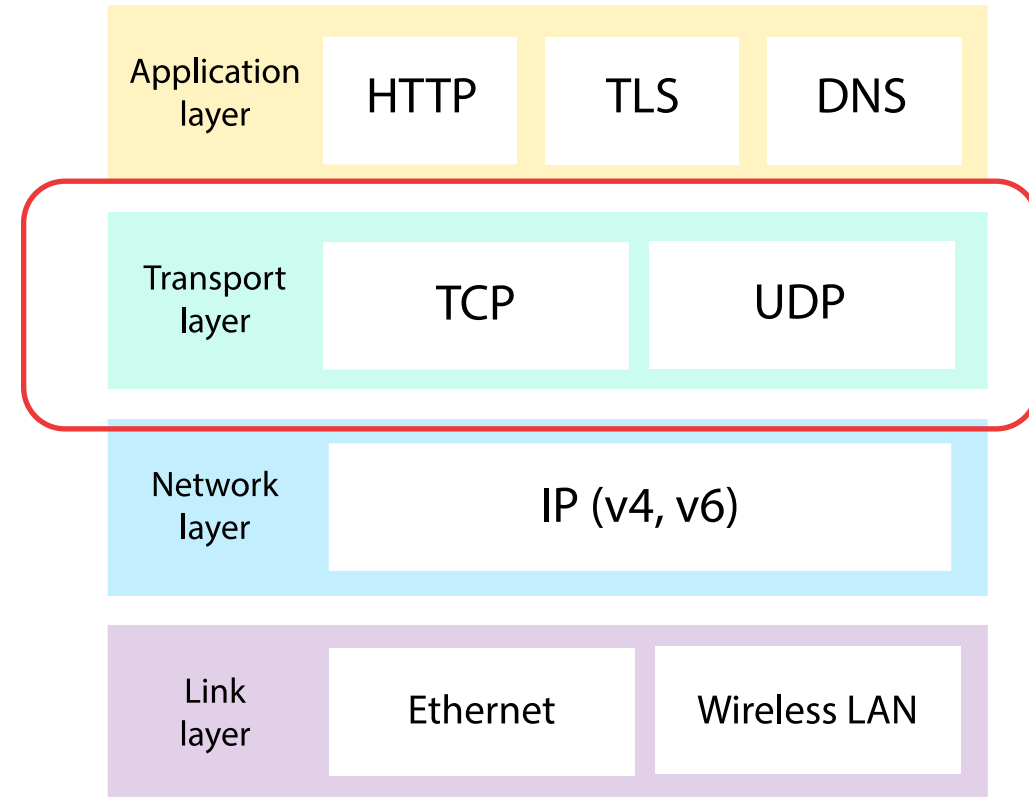
There are other protocols such as FTP, SMTP

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

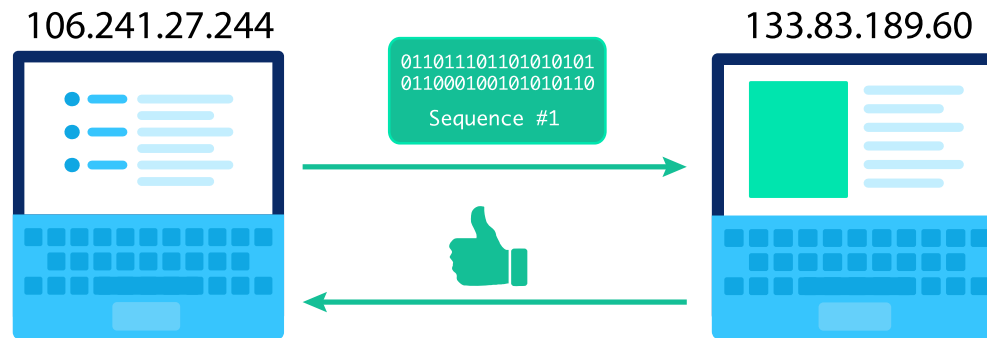


Transmission Control Protocol (TCP)

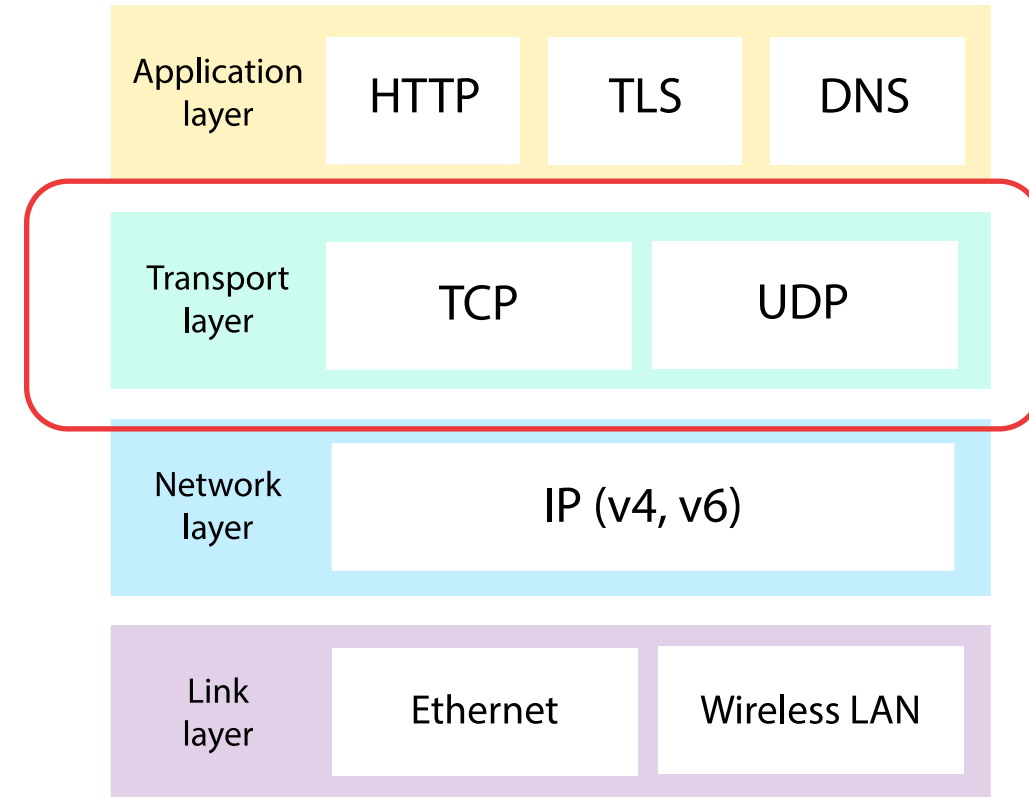


Transport Layer- TCP

- **TCP ensures the sequence**

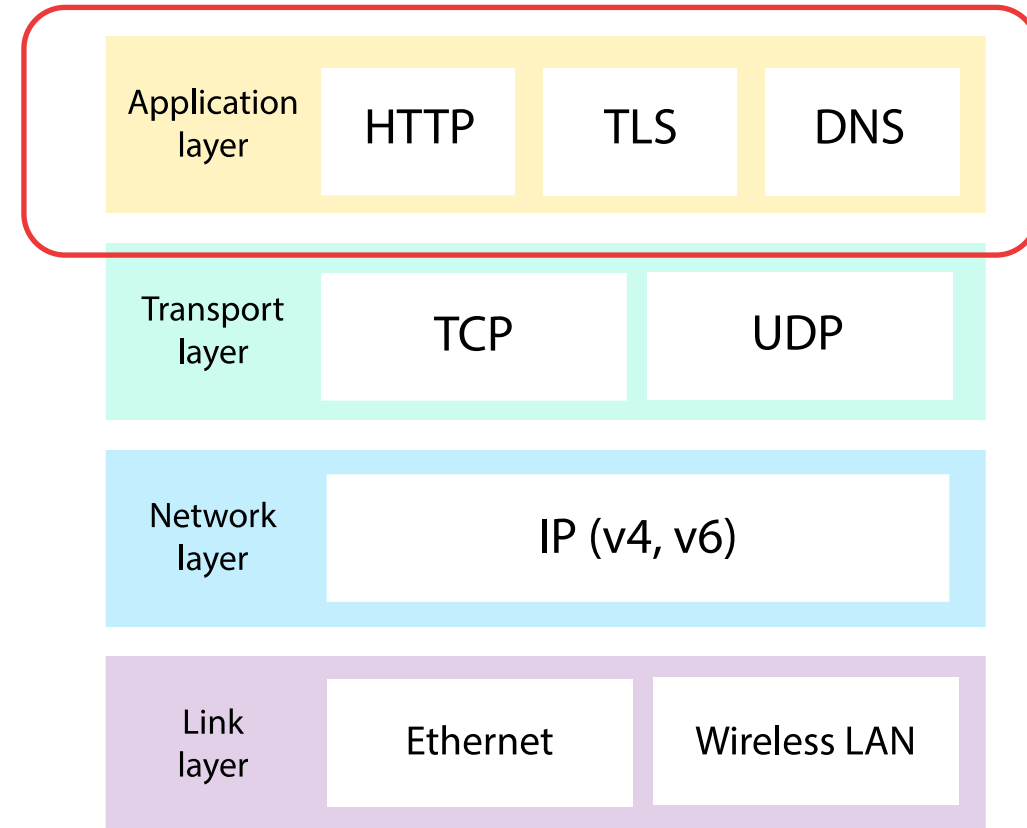
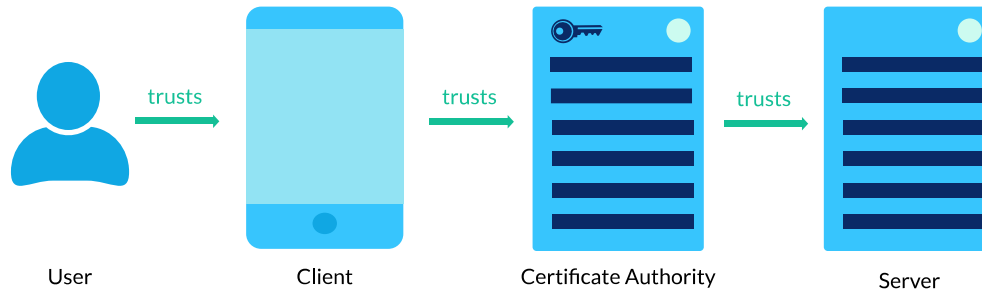


Transmission Control Protocol (TCP)



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.



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



Most Popular Open-Source Web Server



Who provides this Web Servers?

Hosting Providers like GoDaddy!

Type of Hosting

IF WEB HOSTING TYPES WERE HOUSING OPTIONS...



How to Choose?

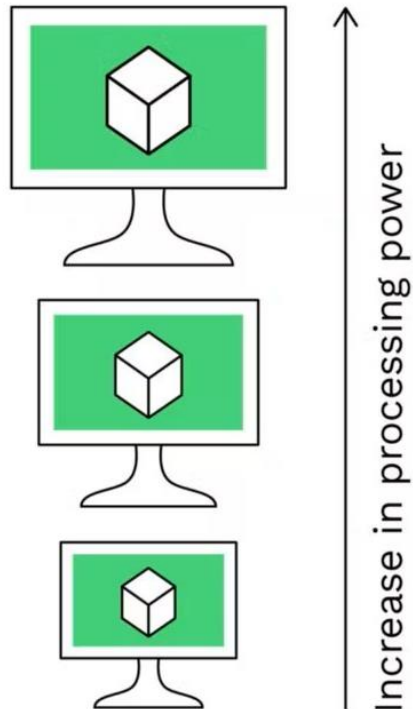
Depends on your requirement and size

Is One server sufficient to serve all ?

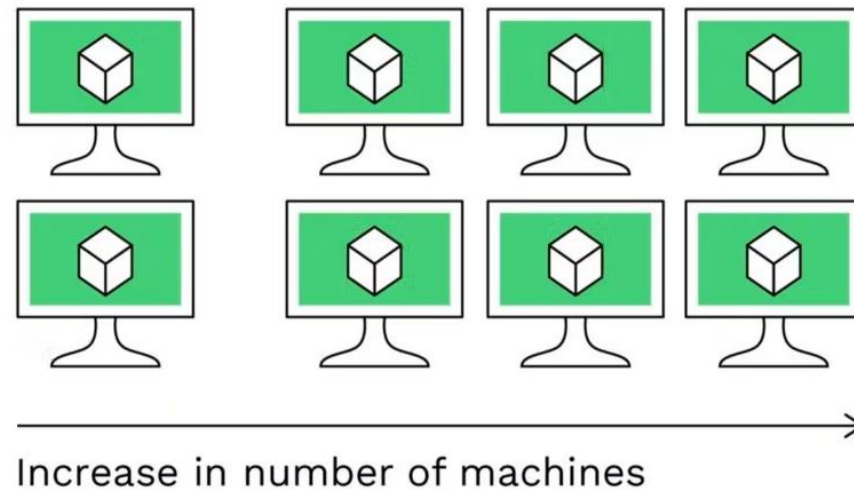
Scalability

Into the picture

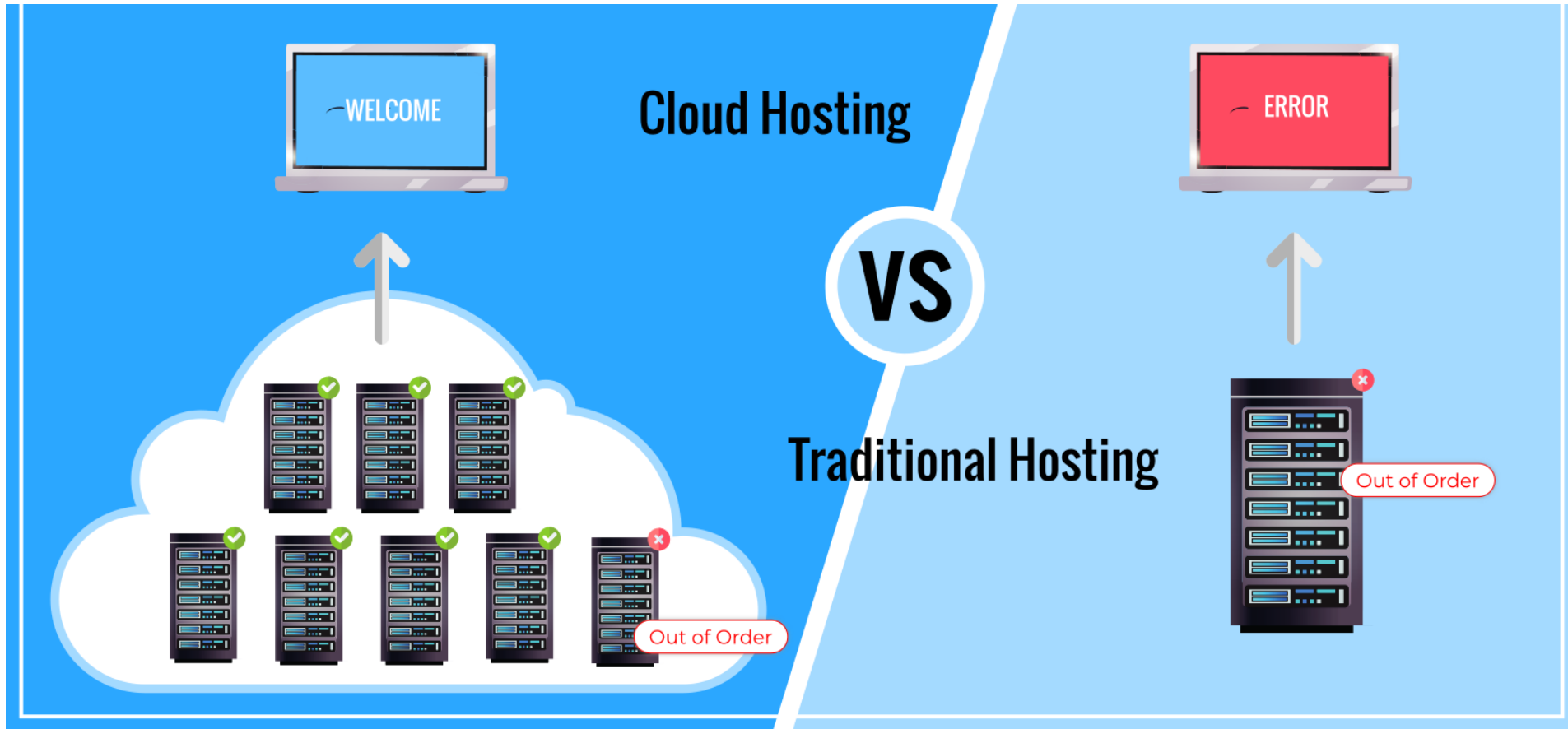
Vertical scaling



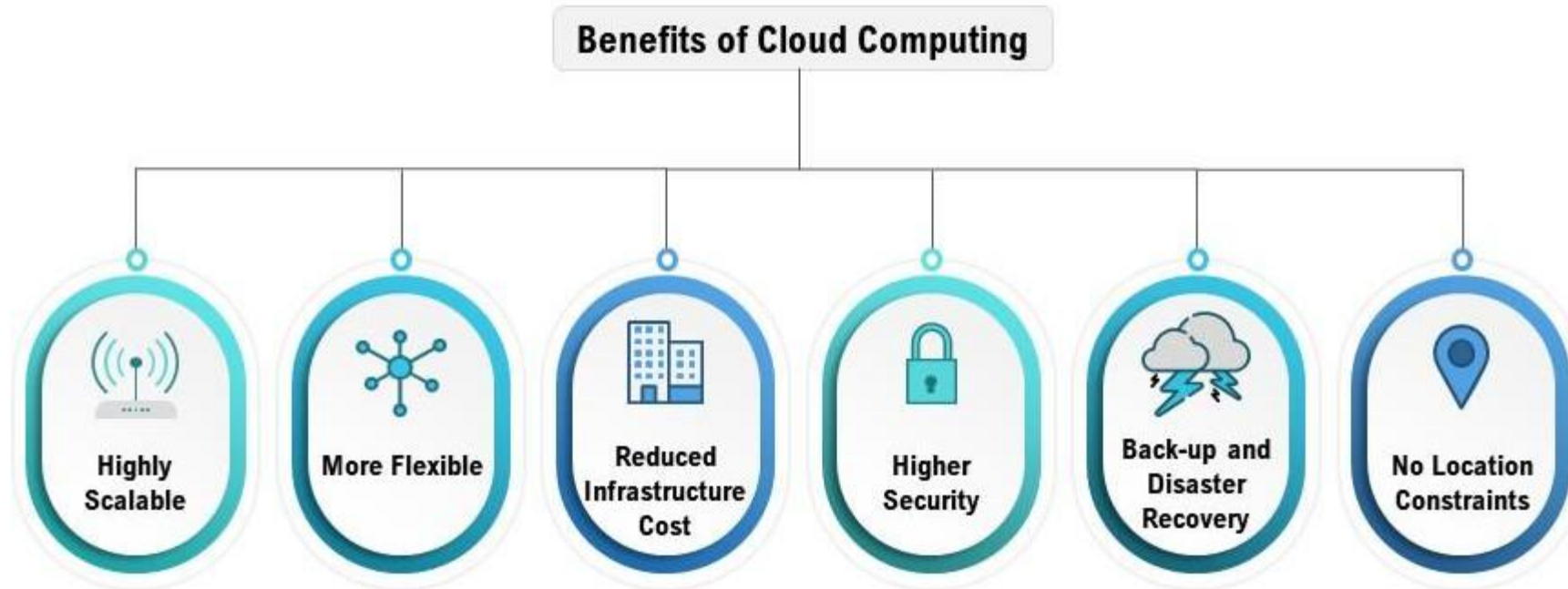
Horizontal scaling



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

Google

Bing

Ask

YAHOO!

Yandex



DuckDuckGo

Baidu 百度

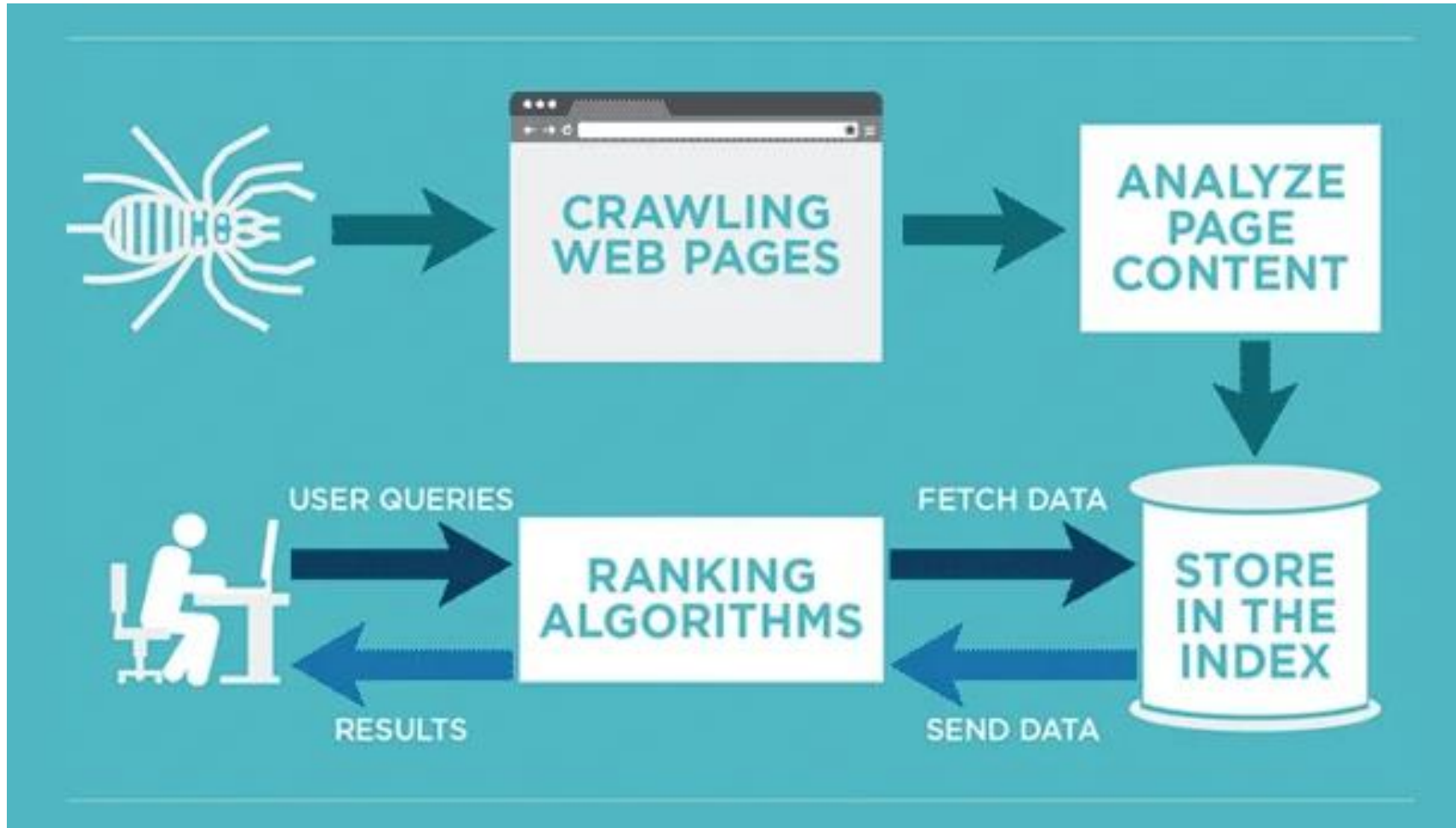
wow

Search Engines - “what is this site about?”

How do they work on my website?



Search Engines



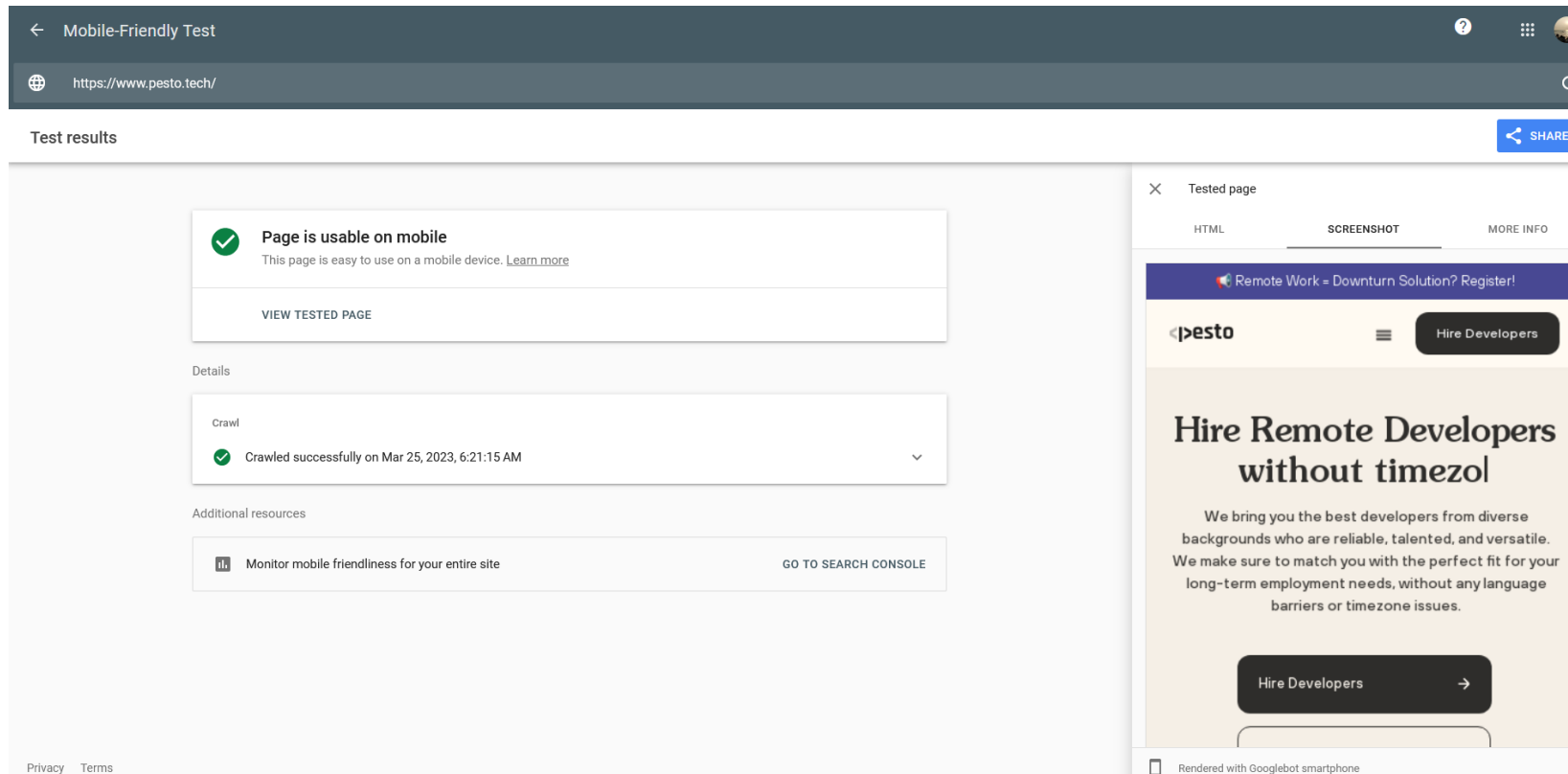
SEO – Best Practices



Mobile Friendly – SEO Factor

Demo test

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



The screenshot displays the Google Mobile-Friendly Test interface. At the top, the browser address bar shows the URL <https://www.pesto.tech/>. Below the address bar, the page title is "Mobile-Friendly Test". The main content area is titled "Test results" and features a green checkmark icon next to the heading "Page is usable on mobile". A subtext explains: "This page is easy to use on a mobile device. [Learn more](#)". A button labeled "VIEW TESTED PAGE" is positioned below this section. Under the "Details" heading, a "Crawl" status is shown with a green checkmark and the text "Crawled successfully on Mar 25, 2023, 6:21:15 AM". The "Additional resources" section includes a link to "Monitor mobile friendliness for your entire site" with a "GO TO SEARCH CONSOLE" button. On the right side, a "Tested page" panel shows a "SCREENSHOT" of the mobile page. The screenshot displays the pesto.tech website with the heading "Hire Remote Developers without timezol" and a "Hire Developers" button. At the bottom of the screenshot panel, it indicates "Rendered with Googlebot smartphone".

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

The screenshot displays the Google Analytics Admin interface. On the left sidebar, the 'ADMIN' tab is selected, and the 'Tracking Info' menu item is highlighted. Within 'Tracking Info', the 'Tracking Code' sub-item is selected. The main content area shows the 'Website Tracking' section for a specific property. It includes the 'Global Site Tag (gtag.js)' code snippet, which is highlighted with a red box. The code is as follows:

```
<!-- Global site tag (gtag.js) - Google Analytics -->
<script async src="https://www.googletagmanager.com/gtag/js?id=UA-9142960-14"></script>
<script>
  window.dataLayer = window.dataLayer || [];
  function gtag(){dataLayer.push(arguments);}
  gtag('js', new Date());

  gtag('config', 'UA-9142960-14');
</script>
```

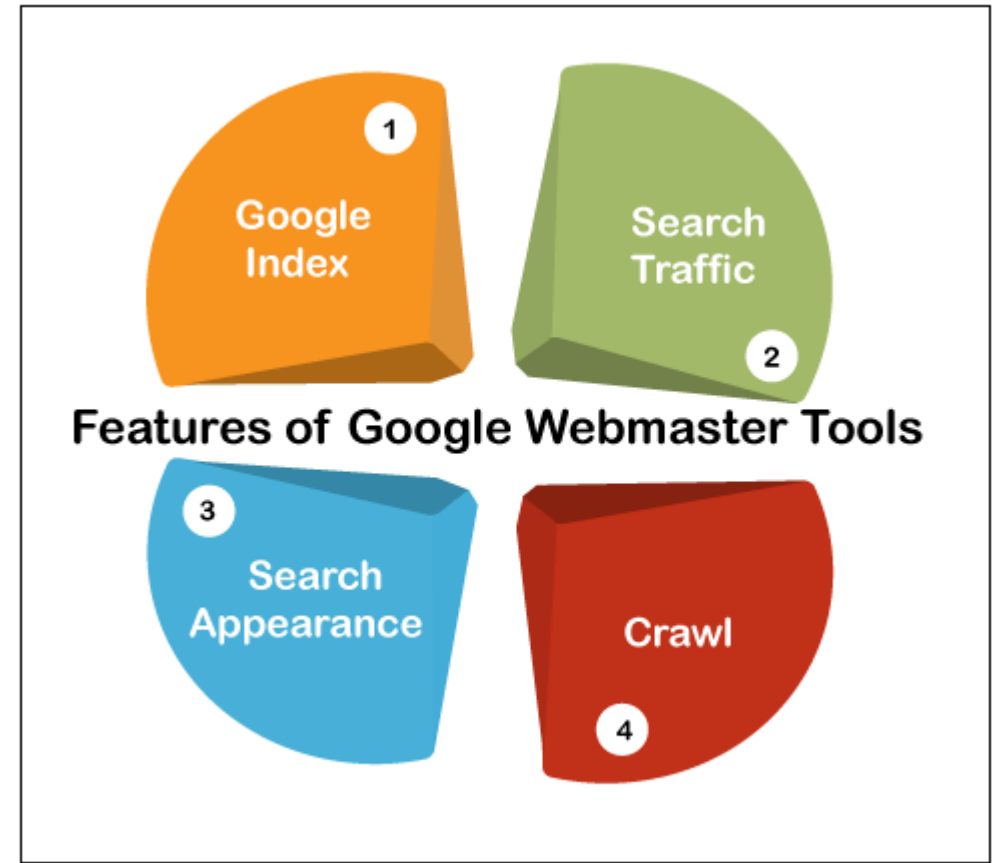
Below the code snippet, there is a brief explanation of the Global Site Tag and a link to 'Learn more'.

Add Tracking code to your website

Search Tracking

Web Master Tools.

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



Google Search Console- Search Tracking

Performance on Search results

EXPORT

Search type: Web

Date: Last 28 days

+ New

Last updated: 7 hours ago

Total clicks

313K

Total impressions

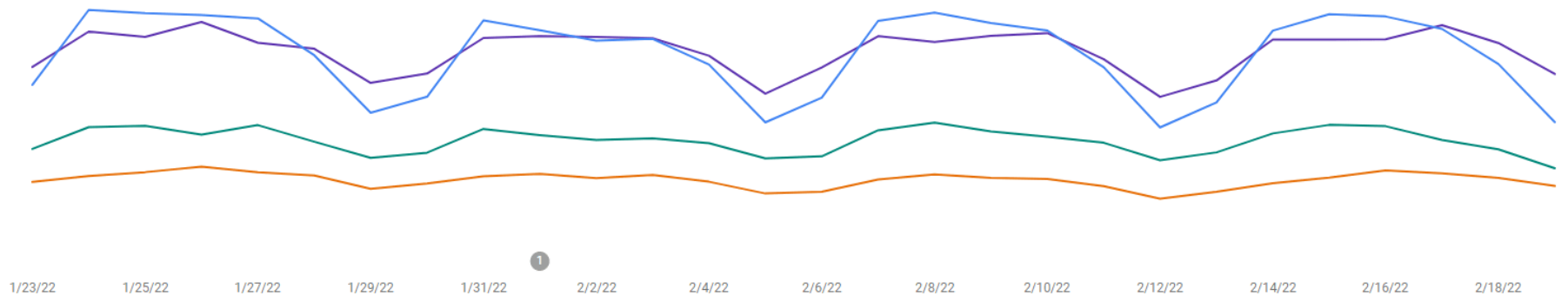
25.3M

Average CTR

1.2%

Average position

22.3



QUERIES

PAGES

COUNTRIES

DEVICES

SEARCH APPEARANCE

DATES

Top queries

Clicks

Impressions

CTR

Position

affiliate marketing

5,690

426,976

1.3%

9.6

motori di ricerca

2,818

12,104

23.3%

2.7

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