

# How Websites Work

- Websites are a way people access information on the internet. They are made up of **web pages**, which are documents formatted using a coding language called **HTML (HyperText Markup Language)**. Think of HTML as the structure or skeleton of a web page.
  - Websites can include **multimedia content** like text, images, audio, and video. These components make the web interactive and visually engaging.
- 

## Accessing Websites with URLs

- A **URL (Uniform Resource Locator)** is the address you type into a web browser to access a website, such as `www.reddit.com`.
    - The **www** stands for the **World Wide Web**, which is the collection of websites accessible through the internet.
    - The part after `www`, like `reddit.com`, is called the **domain name**.
    - The **domain name extension**, such as `.com`, `.net`, or `.edu`, tells us the type of organization:
      - `.com`: Commercial
      - `.org`: Organization (usually non-profits)
      - `.edu`: Educational institutions
      - `.gov`: Government websites
  - **Domain names** make it easier for humans to navigate the internet, replacing hard-to-remember numerical IP addresses.
- 

## Domain Names and ICANN

- All domain names are registered with **ICANN (Internet Corporation for Assigned Names and Numbers)**.
    - ICANN ensures that no two websites have the same domain name.
    - Once a domain name is registered, it cannot be used by anyone else unless it expires and becomes available again.
- 

## Understanding IP Addresses

- Computers identify each other on the internet using **IP addresses** (e.g., `172.217.6.46`).
    - Think of an IP address as a phone number for a computer. It allows computers to send and receive information.
  - Example: Typing `172.217.6.46` into a browser takes you to Google's homepage because that IP address is assigned to Google.
- 

## What is DNS (Domain Name System)?

- **DNS** is like a phonebook for the internet. It translates human-readable domain names (e.g., google.com) into machine-readable IP addresses (e.g., 172.217.6.46).
- Without DNS, you would have to remember the IP address of every website, which would be very inconvenient.

### How DNS Works:

1. When you type a domain name (e.g., google.com) into a browser, your computer sends a request to a **DNS server**.
  2. The DNS server looks up the domain name and finds its corresponding IP address.
  3. Your browser uses this IP address to connect to the website.
- 

### Troubleshooting with DNS and IP Addresses

- As an IT support professional, you'll encounter situations where DNS issues might prevent a website from loading.
    - **Scenario:** If you can access a website using its IP address but not its domain name, there's likely a DNS problem.
    - **Solution:** Check the DNS configuration on the user's network or device.
  - **Server Logs:**
    - IP addresses are often used to identify the source of requests in server logs.
    - These logs help IT support professionals track issues, such as unauthorized access or network traffic problems.
- 

### Practical Applications for IT Support

1. **Configuring IP Addresses:**
    - Many IT systems, such as printers, routers, and servers, need static or dynamic IP addresses to function.
    - Understanding IP addressing schemes (IPv4 vs. IPv6) and subnetting is essential.
  2. **DNS Diagnostics:**
    - Common tools like ping, tracert, and nslookup help diagnose connectivity and DNS issues.
  3. **Domain Management:**
    - IT professionals often manage domain registrations and ensure DNS records (e.g., A records, CNAMEs, MX records) are correctly configured.
- 

### Real-World Example

Imagine a client cannot access their website, example.com. You:

1. Check if the website is accessible via its IP address. If it works, DNS is likely the issue.

2. Use nslookup or similar tools to verify the DNS server is correctly mapping example.com to its IP address.
  3. Update or troubleshoot the DNS configuration if needed.
- 

### **The Bigger Picture**

- The **web** is just one way to use the internet. Other methods include email, file sharing, and streaming services.
  - As you continue your journey in IT support, you'll explore networking protocols (e.g., HTTP, HTTPS, FTP) and other tools that keep the web running smoothly.
- 

By understanding these fundamental concepts, you'll be equipped to troubleshoot common issues, assist clients effectively, and deepen your knowledge of how the internet operates. This foundational knowledge will set the stage for more advanced topics in IT support and networking.