Lesson:

Fundamentals of Internet

PW SKILLS

Topics to be covered

1. Basic of internet
2. Client vs Server

Basic of internet

Some important terminologies

Network: A network is a collection of devices, such as computers, servers, printers, mobiles, and other hardware devices, that are connected to each other and can communicate and share resources with each other.

World Wide Web (WWW): The World Wide Web, also known as the Web, is a collection of websites and web pages that are accessible via the Internet. The Web is an important part of the internet and is the primary way that people access and share information online.

IP Address: An IP address is a unique identifier that is assigned to every device connected to the internet. IP addresses allow devices to communicate with each other over the internet and are essential for transmitting data between different networks.

Domain Name: A domain name is a human-readable address that is used to identify a website or web page on the internet. Domain names are easier to remember than IP addresses and are typically made up of a name and a top-level domain (TLD), such as .com, .org, or .net. For example pwskills.com, pw.live etc

URL: A Uniform Resource Locator (URL) is a string of characters that identifies the location of a web page or other online resource. URLs are used to navigate the Web and typically include a protocol (such as HTTP or HTTPS), a domain name, and a path to the resource.

Web Browser: A web browser is a software application that is used to access and display websites and web pages on the Internet. Popular web browsers include Google Chrome, Mozilla Firefox, and Microsoft Edge.

Server: A server is a computer or other device that stores and manages data and applications that are accessible over the internet. When a user requests a web page or other resource, the server sends the data to the user's device such as a laptop, mobile, etc.

HTTP and HTTPS: Hypertext Transfer Protocol (HTTP) and Hypertext Transfer Protocol Secure (HTTPS) are protocols used for transmitting data over the Internet. HTTP is used for standard web traffic, while HTTPS is a secure version of HTTP that encrypts data to protect it from unauthorised access.

Search Engine: A search engine is a web-based tool that allows users to search for information on the internet. Popular search engines include Google, Bing, and Yahoo!

Internet

Introduction to internet

The Internet is a global network of interconnected computer networks that allows for communication and information exchange across the world. It is a vast and complex system of devices, computers, and servers that are linked together to enable the transfer of data, files, and other digital content. In simple terms, we can say that it is a network of networks.

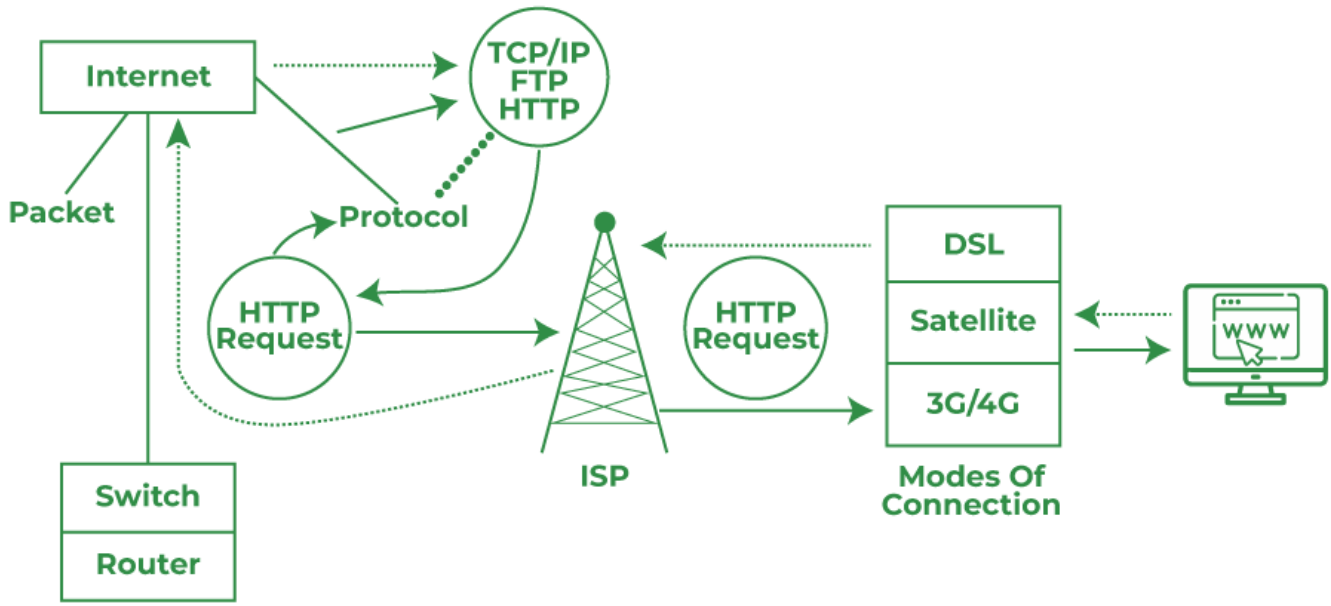
History of internet

The internet originated in the 1960s with **ARPANET**, a US Defense Department network. In the 1980s, computer scientists Tim Berners-Lee and Robert Cailliau developed the World Wide Web, which allowed for sharing of information and resources using hypertext links. Other notable figures who contributed to the growth of the internet include Vint Cerf and Bob Kahn, who developed the Transmission Control Protocol/Internet Protocol (TCP/IP) in the 1970s, and Marc Andreessen, who co-founded Netscape Communications and developed the first widely-used web browser. Today, the internet is an essential part of modern life, connecting people all over the world and revolutionising the way we live, work, and communicate.

How does internet works

The workflow of the internet is described in the following steps, this is a simple explanation of the step-by-step procedure of working on the internet

1. When you type a website address into your web browser, such as "www.pwskills.com", your computer sends a request to a server that hosts the website you want to visit.
2. The server responds to your request by sending the website's files back to your computer, which your web browser then uses to display the website's content.
3. This process of requesting and sending information happens through a system of connections and protocols that allow data to be transmitted between the client's devices and servers.
4. Data is broken up into small "packets" of information that are sent across the internet to their destination. Along the way, these packets travel through a series of routers that help them get to their final destination.
5. The Domain Name System (DNS) translates website addresses into IP addresses, which computers use to communicate with each other. For example, if we will type https://pwskills.com/ then it will be translated as 76.76.21.21
6. Internet Service Providers (ISPs) provide users with access to the Internet through various connection methods such as cable, fiber, or wireless signals.



What are Client and Server?

Client and server are two fundamental components of modern computer networks, used to facilitate communication and data exchange between devices. In this article, we will explore what client and server mean, how they work together, and why they are important in the modern era of computing.

Introduction to Client

In the context of computer networks, a client refers to any device or software application that requests services or resources from a server. Examples of clients include web browsers, email clients, and instant messaging applications.

When a client requests services from a server, it sends a message or request containing the specific details of what it is looking for. This request may include information such as the type of resource or service being requested, the format in which the data should be returned, and any authentication or security credentials that may be required.

Once the server receives the request from the client, it processes the request and returns a response containing the requested information or resources. This response may include data such as HTML pages, images, or other media content.

Client devices:- These refer to electronic devices such as computers, laptops, smartphones, tablets, and other computing devices that are used by individuals or organisations to access services or resources provided by a server or network.

Introduction to Server

Do you remember sometimes your favourite apps like Whatsapp and Instagram do not work? You are not able to send messages or see any new content in your feed. Sometimes the phrase **"server is down"** is also very common. Let us understand what a server is.

In contrast to clients, servers are devices or software applications that provide services or resources to clients. Servers are responsible for processing requests from clients, performing the necessary actions or calculations, and returning the results back to the client in the requested format.

Examples of servers include web servers, email servers, and file servers. Each type of server is designed to provide specific services or resources to clients, such as hosting websites, storing and retrieving files, or managing email communication.

Servers are typically connected to the internet or other computer networks, allowing them to communicate with clients located anywhere in the world. They are designed to be highly reliable and available, with advanced features such as redundancy and load balancing to ensure that they can handle high volumes of traffic and requests.

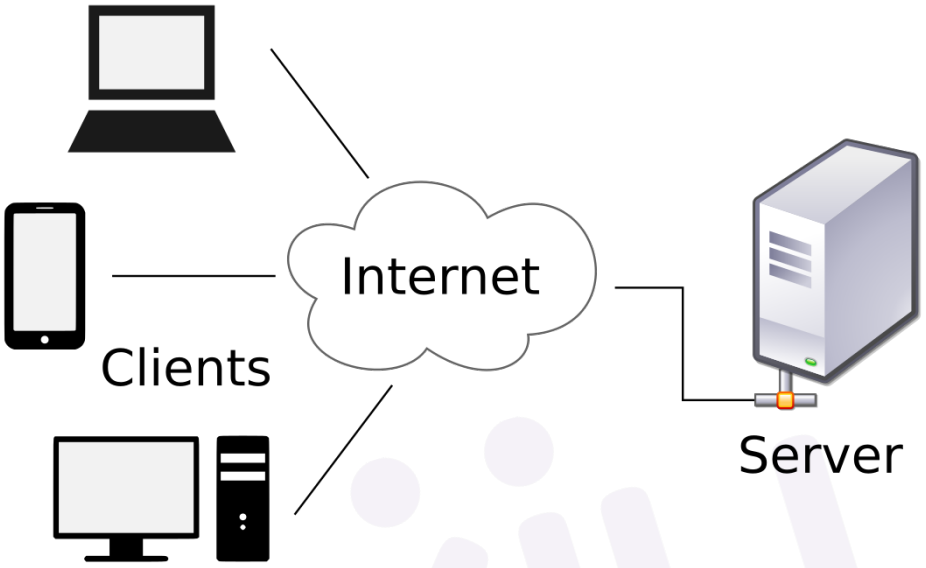
How do Clients and Servers Work Together?

Clients and servers work together in a request-response model, in which clients request resources or services from servers, and servers provide the requested resources or services back to the clients. This model is based on the principles of client-server architecture, which is a common design pattern used in modern computer networks.

In this model, clients initiate requests by sending messages or packets containing specific details of what they are looking for. Servers receive these requests, process them, and return a response containing the requested information or resources. This response is sent back to the client, which then processes the information and presents it to the user.

Why are Clients and Servers Important?

Clients and servers are important components of modern computer networks because they enable devices to communicate and exchange data in a structured and efficient manner. This enables users to access a wide range of services and resources, such as websites, email, and file sharing, from anywhere in the world through client devices like mobile phones and laptops.



In addition to their technical benefits, clients and servers also have significant social and economic implications. They have enabled the creation of new industries and businesses, such as online shopping, social media, and cloud computing, and have transformed the way we communicate, work, and live.

How do clients and servers communicate?

These are the steps involved in the communication between a client and server-

1. The client (such as a web browser) sends a request to the server (such as a web server) over the internet.
2. The request contains information such as the URL of the page being requested, any parameters or data being sent, and any headers such as authentication credentials or expected response type.
3. The server receives the request, processes it, and generates a response.
4. The response contains the requested data, such as the HTML code, images, and other media files needed to display the webpage.
5. The server sends the response back to the client over the Internet.
6. The client receives the response and processes the data, parsing the HTML code and rendering the images and other media files to display the webpage.
7. The client can then interact with the webpage by clicking on links, filling out forms, or navigating to other pages within the website.
8. Each interaction triggers a new request from the client to the server, and the process repeats.