3-Tier Architecture:

1. Presentation Tier (Client Layer)

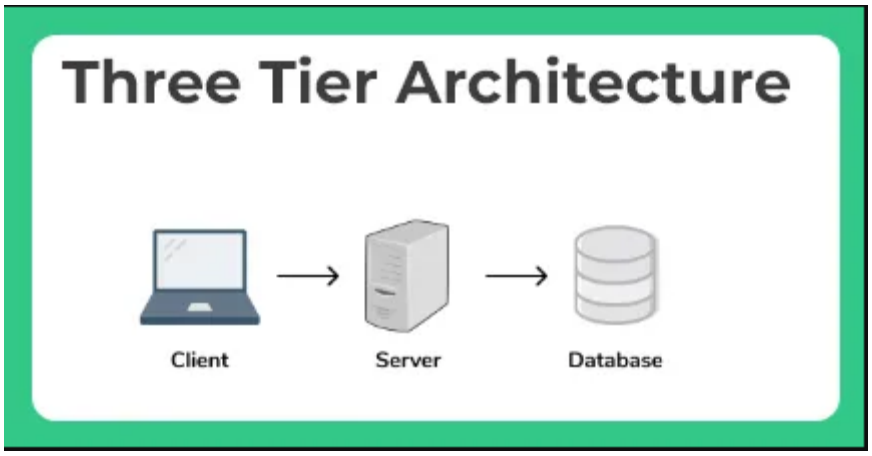
- **What it does:** This is the **user interface**—what the user sees and interacts with.
- **Examples:** Web browsers, mobile apps, front-end (HTML, CSS, JavaScript)
- **Responsibility:** Displays data and takes user input.

2. Application Tier (Logic Layer or Middle Tier)

- **What it does:** This contains the **business logic**—the rules and operations that process the data.
- **Examples:** Backend code (Python, Java, Node.js, etc.)
- **Responsibility:** Processes user input, communicates with the database, applies logic.

3. Data Tier (Database Layer)

- **What it does:** Stores and retrieves **data**.
- **Examples:** MySQL, PostgreSQL, MongoDB
- **Responsibility:** Manages access to data and responds to queries.



IN Data Tier the Following will be there:

Servers:

It is a system that provides resources, data, service to other computer known as clients, over a network.

Datacenter:

It is a place where large number of servers and storage systems are there to manage the process and manage data. They are 3 types:

1. Enterprise Data Center - Owned and used by single company.
2. Cloud Data Center – Used by cloud provides like AWS, Azure or GCP.
3. Colocation Data Center – Shared by many businesses who rent space.

Cloud:

The cloud refers to a network of remote servers that store and process data for other devices and computers.

IP address:

A unique numerical identifier assigned to each device connected to the internet or a local interenet

DNS:

Domain Name System, Translate human-friendly domain name into numerical IP address that computers use to communicate.

TCP:

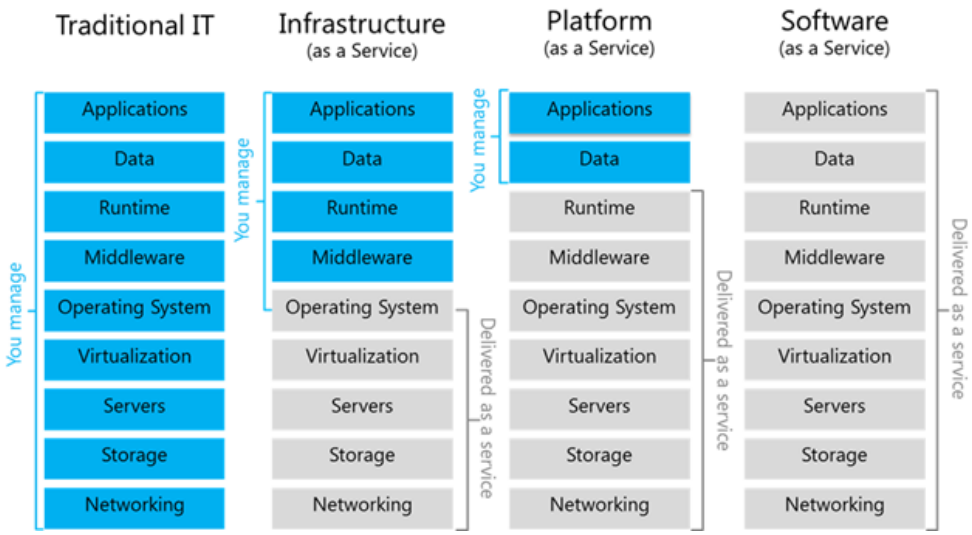
Transmission Control Protocol, it defines how data is transmitted over network, including the internet.

Cloud services:

1.IaaS – (Infrastructure as a services) provides virtualized computing resources like services and storage over the time.

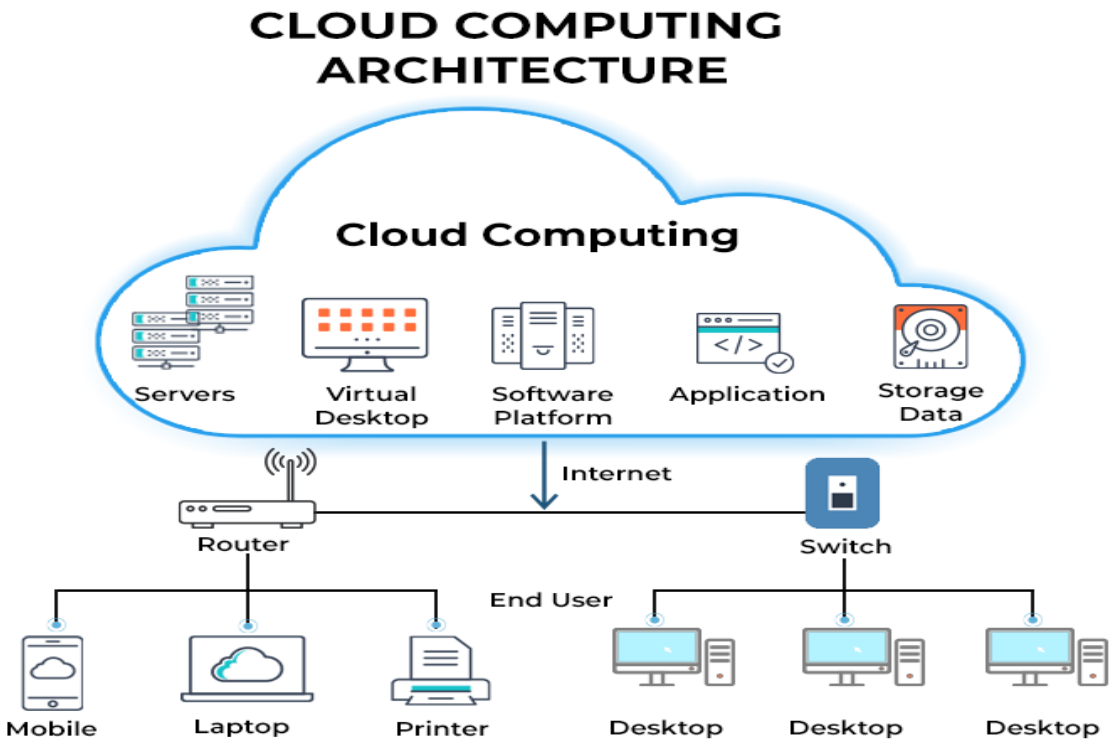
2. PaaS – (Platform as a services) Offers a platform with tools and environment to develop, test, and deploy applications without managing the underlying infrastructure.

3.SaaS – (Software as a Service) Delivery fully functional software applications accessible via the internet usually through a web browser



Cloud Computing:

A method of accessing and utilizing computing resources like servers, storage, database and software over the internet.



What happens when we search in google:

Step 1: URL Prasing:

- Your browser takes the URL (http://google.com) and breaks it down into parts.

(http: - protocol, Hostname: - www.google.com, path: /)

Step 2: DNS Look up:

- Browser cache
- Operating system cache
- It Translate the www.google.com to 142.250.190.68

Step 3 : TCP connection Establishment:

- It uses TCP to create a connection between your device and the google server.
- This involves 3 way handshake – SYN – SYN_ACK-ACK
- This handshake ensure a reliable connection

Step 4: HTTP Request Sent

- After TCP connection the browser send an HTTP GET request to ask for the webpage content.

Step 5 : Server Process Request

- Server receive the request
- Process the request runs any needed backend code and prepare HTML page for your borwser.

Step 6: HTTP Response Sent

- Servers sent back the HTTP response followed by HTML content.

Step 7 : Browser Renders the Page

- The browser receives the HTML response. And parses all additional resources.

Step 8 : Connection Closing or Keep-Alive

- HTTP/1.1 keeps the connection alive by default for further requests.
- The browser and server can close the connection when finished or keep it open for performance.

AWS:

It is a cloud computing platform

AWS Services:

Compute – EC2 (Elastic Compute Cloud) – Launch Virtual Servers

Storage – S3 (Simple Storage Service) – Store and Retrieve files

Networking – VPC (Virtual Private Cloud) – Isolate network in AWS Cloud

Content Delivery – CloudFront – Deliver content globally with low latency

Security – IAM (Identity Access Management) - Control access to AWS resources

Developer Tools – CodeDeploy, CodeBuild – Automate software deployment and testing.