

Unit 1

Internet & Web

- History of Internet and Web
- Uses of Internet and Services
- Introduction to WWW
- Component of WWW (Web, Webpage, Website, Homepage, Web Browsers, Web Servers, URL and Search Engines)
- Types of Web Pages & its Processing in WWW
- Internet protocols (TCP/IP, ARP, HTTP, FTP, SMTP, POP, SNMP) and applications.

History of Internet & Web:

1960s:

- The concept of the internet is born out of the need for a reliable communication network that could survive a nuclear attack.
- The United States Department of Defense establishes the Advanced Research Projects Agency Network (ARPANET) to develop a network of computers that can communicate with one another.

1970s:

- The first email is sent in 1971.
- TCP/IP (Transmission Control Protocol/Internet Protocol) is developed, which sets the standard for how data is transmitted over the internet.
- The term "internet" is coined to describe the interconnected network of computers.

1980s:

- The World Wide Web (WWW or Web) is invented by Tim Berners-Lee, a British computer scientist, at CERN in Switzerland.
- The first domain name, symbolics.com, is registered in 1985.
- The first web browser, called Worldwide Web, is developed in 1990.

1990s:

- The commercialization of the internet begins, and companies like AOL and CompuServe offer dial-up internet access to consumers.
- The first search engine, Archie, is developed in 1990.
- The first website, info.cern.ch, goes online in 1991.
- The first banner ad appears on HotWired.com in 1994.
- The first online purchase is made in 1994, a Sting CD on the website NetMarket.
- Google is founded in 1998.

2000s:

- The dot-com bubble bursts in 2000, leading to the collapse of many internet-based companies.
- 2001: Wikipedia is launched
- Facebook launched in 2004
- YouTube is founded in 2005.
- The first iPhone is released in 2007, revolutionizing the way people access the internet on mobile devices.
- Twitter is founded in 2006.
- 2007: The iPhone and the Mobile Web

2010s:

- The rise of smartphones and mobile apps leads to a shift in the way people use the internet.

- Social media becomes a dominant force, with platforms like Instagram, Snapchat, and TikTok gaining popularity.
- Online streaming services like Netflix, Hulu, and Amazon Prime Video become popular alternatives to traditional TV and movie watching.
- The General Data Protection Regulation (GDPR) is implemented in 2018 to protect user data and privacy.

2020s:

- The COVID-19 pandemic accelerates the shift to online activities, including remote work, online learning, and virtual events.
- Artificial intelligence and machine learning continue to advance, enabling more personalized and efficient online experiences.
- The development of 5G networks promises to further revolutionize internet connectivity and speed.

Uses of Internet and Services

The internet is a vast network of computers and servers that are connected globally. It has revolutionized the way we communicate, access information, and conduct business. Here are some common uses of the internet and services:

1. **Communication**: Real-time communication through email, social media, video conferencing, and instant messaging.
2. **Information access**: Access to vast amounts of information on various topics.
3. **Online shopping**: Purchase goods and services online from anywhere in the world.
4. **Online banking**: Access accounts, transfer funds, pay bills, and apply for loans online.
5. **Cloud storage**: Store and access data from anywhere in the world through cloud storage services.
6. **Entertainment**: Access music streaming, video streaming, gaming, and online forums.
7. **Social networking**: Connect and interact with people on a global scale through social media platforms.
8. **Online education**: Learn new skills and improve knowledge through online learning platforms.
9. **Telemedicine**: Consult and receive medical treatment remotely using digital technologies.
10. **Virtual meetings**: Conduct business remotely through virtual meetings, saving time and money.

Introduction to WWW

- English engineer and computer scientist Sir Timothy John Berners-Lee invented the World Wide Web in 1989.
- The World Wide Web commonly known as web is a system for displaying text, graphics, and audio retrieved over the Internet on a computer monitor.
- Each retrieval unit is known as a Web page, and such pages frequently contain “links” that allow related pages to be retrieved.

- The resources of the Web are transferred via the Hypertext Transfer Protocol (HTTP) and may be accessed by users by a software application called a web browser and are published by a software application called a web server.
- In WWW documents and other web resources are identified by Uniform Resource Locators (URLs, such as <https://example.com/>), which may be interlinked by hypertext, and are accessible over the Internet.

Component of WWW

- Web
 - Web, is a system of interconnected documents and resources that can be accessed over the internet.
 - The web is built on top of the internet.
- Webpage
 - Web page is a formatted page within a website that may contain text, graphics, video, multimedia etc.
 - Web page can be visited from a web browser.
 - These web pages provide information to the users.
- Website
 - Website is the location of the webpage created by any user or organization where people can find required information and can interact and communicate.
 - Website contains a collection of various pages written in HTML.
 - E.g., <http://ctevt.org.np>, www.facebook.com etc.
- Homepage
 - Homepage is the first page of the website that is displayed when the user visits the website.
 - Usually homepage contain introductory content, navigation links, search options etc.
- Web Browsers
 - A web browser (commonly referred to as a browser) is a software application for accessing information on the World Wide Web.
 - When a user requests a web page from a particular website, the web browser retrieves the necessary content from a web server and then displays the page on the user's device.
 - Web browsers are used on a range of devices, including desktops, laptops, tablets, and smartphones etc.

- The most used browser is Google Chrome.
- Some examples of web browsers are:
 - Google chrome
 - Mozilla Firefox
 - Microsoft Edge
 - Opera
 - Safari
 - Brave etc.

- **Web Servers**

- A web server is a computer that delivers web pages to users.
- Web servers are typically located on computers that are connected to the Internet and have a lot of storage space.
- The web server also handles other tasks related to websites, such as processing forms, sending email, and managing user accounts.

- **URL**

- URL stands for Uniform Resource Locator.
- It is used to specify address on the worldwide web
- URLs consist of several parts, including a protocol, a domain name, and a path.
- Here is an example of a URL:
 - <https://www.google.com/index.html>

- **Search Engines**

- A search engine is a software application that is designed to search information over the internet.
- It uses the keywords to search for the information that are related to that keyword and puts the found result in ordered relevance.
- The information may be a mix of links to web pages, images, videos, info-graphics, articles, research papers, and other types of files.
- Internet content that is not capable of being searched by a web search engine is generally described as the deep web.
- The widely used example of search engine is google search engine.
- The other popular examples are Quora, Ask.com, Baidu, Bing, DuckDuckGo, Yahoo etc.

Types of Web Pages & its Processing in WWW

There are various types of web pages that serve different purposes and provide distinct functionalities on the World Wide Web (WWW). Here are some common types of web pages and their processing in the WWW:

Static Web Pages:

- Static web pages are basic HTML documents that display consistent content to all users.
- These pages are created and stored on a web server.
- Their content remains fixed unless manually updated.
- When a user requests a static web page, the web server retrieves the file and sends it directly to the user's browser for display.

Dynamic Web Pages:

- Dynamic web pages are created in real-time based on user input or database queries.
- They have content that can change depending on factors like user preferences or real-time data.
- When a user asks for a dynamic web page, the server processes the request, gets the required data, generates HTML content, and sends it to the user's browser for display.

Interactive Web Pages:

- Interactive web pages enable users to interact with content through input, actions, and feedback.
- They use client-side scripting languages like JavaScript to create dynamic elements and enhance the user experience.
- When a user interacts with these pages, scripts run in their browser, handling input, performing computations, and updating the page in real-time.

E-commerce Web Pages:

- E-commerce web pages allow online shopping and transactions to take place.
- They typically have product listings, shopping carts, payment gateways, and order processing systems.
- When a user interacts with an e-commerce web page, the page connects with back-end systems to manage inventory, handle payments, and process orders.

Multimedia Web Pages:

- Multimedia web pages include images, videos, audio, and interactive media.
- They offer a captivating user experience by combining different media formats.
- When a user asks for a multimedia web page, the browser fetches and displays the embedded media elements within the page.

Responsive Web Pages:

- Responsive web pages are created to fit and look great on various devices and screen sizes.
- They employ responsive design techniques like flexible layouts and media queries to ensure proper rendering on desktops, tablets, and mobile devices.
- When a user visits a responsive web page, it automatically adjusts its layout and content presentation to match the user's device and screen size.

Web Page processing

- Web page processing in the WWW involves communication between the client (user's browser) and the server hosting the web page.
- The client sends an HTTP request to the server, specifying the desired web page.
- The server processes the request, retrieving the relevant file or generating dynamic content.
- Then, the server sends the web page's HTML, along with associated files like CSS, JavaScript, and images, back to the client's browser.
- The browser interprets and renders the web page, displaying it for the user to see and interact with.

Internet protocols

Internet protocols are set or rules or principles governing communication between computers over the networks.

The functions of internet protocols are:

- Identifying errors
- Compressing the data
- deciding how data is transmitted and received over the network
- addressing the data

TCP/IP

- It stands for Transmission Control Protocol/Internet Protocol
- is a set of networking protocols used for communication over the internet and most local area networks (LANs).
- TCP/IP provides reliable and connection-oriented communication between devices by breaking data into packets, ensuring their delivery, and handling error correction.

ARP

- It stands for Address Resolution Protocol
- It is a protocol used to map an IP address to a physical (MAC) address in a local network.
- ARP allows devices to discover and associate IP addresses with their corresponding MAC addresses by broadcasting requests on the network.

HTTP

- It stands for Hyper Text Transfer Protocol
- It governs how files such as text, graphics, sound, and video are exchanged on the World Wide Web (www).
- HTTP follows a client-server model, where a client sends requests to a server, and the server responds with the requested content.

FTP

- It stands for File Transfer Protocol
- is a standard network protocol used for transferring files between a client and a server on a computer network.
- FTP provides a set of commands for managing file operations, such as uploading, downloading, renaming, and deleting files.

SMTP

- It stands for Simple Mail Transfer Protocol.
- It is an internet standard for sending email messages between servers over an IP network.
- SMTP is the protocol that controls how email clients send messages to mail servers and how those servers forward messages to the right destination servers.

POP

- It stands for Post Office Protocol
- It is an internet standard protocol used by email clients to retrieve email messages from a mail server.
- It is also used to download e-mail from a remote mail server.

SNMP

- It stands for Simple Network Management Protocol
- It is an internet standard protocol used for managing and monitoring network devices and systems.
- SNMP allows network administrators to collect information, monitor network performance, and manage devices remotely.

Difference between Internet and Web

We usually use the terms 'internet' and 'World Wide Web' interchangeably but they're not same. The Internet is entirely different from WWW. It is a worldwide network of devices like computers, laptops, tablets, etc. It enables users to send emails to other users and chat with them online. For example, when you send an email or chat with someone online, you are using the internet.

Internet

- ✔ A global network of networks and computers.
- ✔ The network infrastructure.
- ✔ Information travels via network protocols.
- ✔ Can access through a variety of ways.

Web

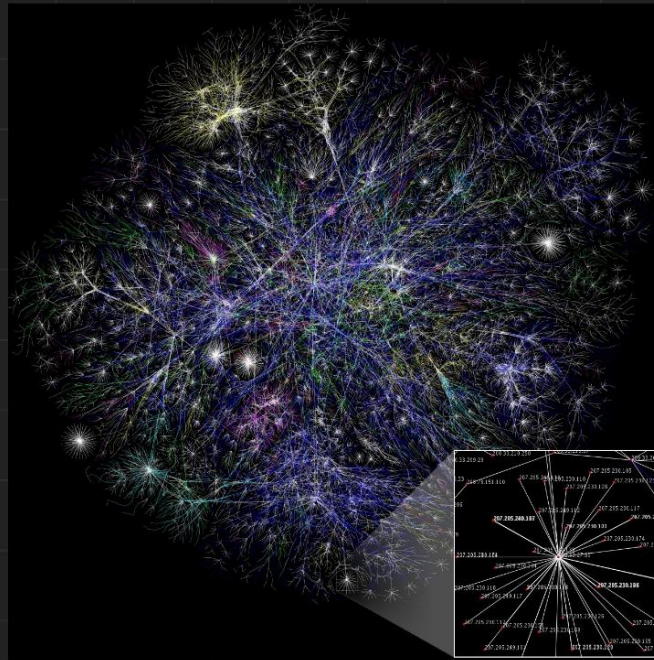
- A collection of information accessed through the internet.
- Information travels primarily through HTTP.
- Uses browsers to access documents and web pages.
- Navigation to other pages occurs through hyperlinks.

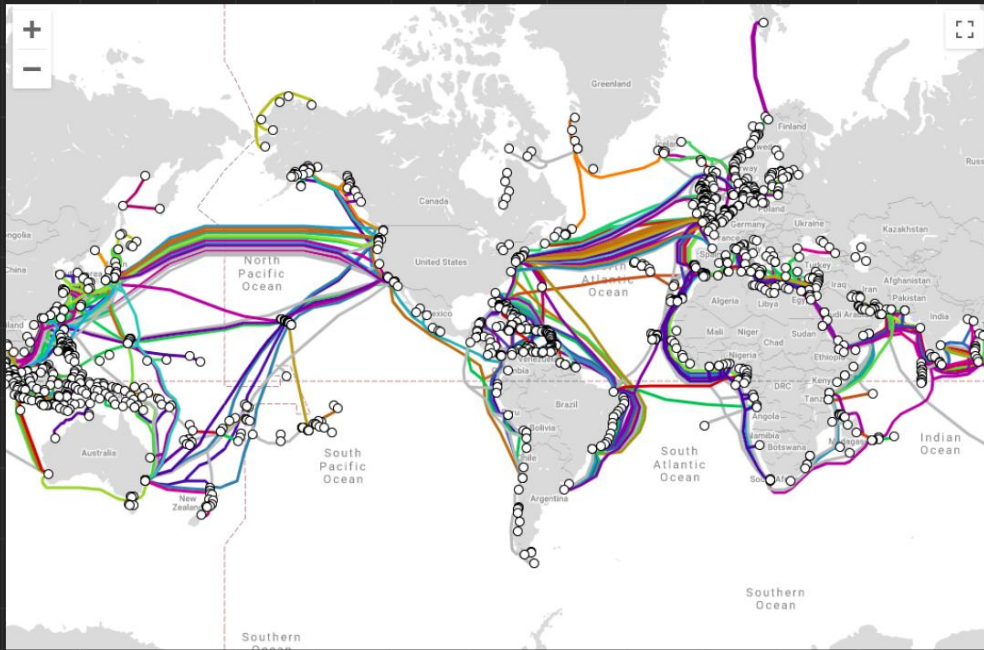
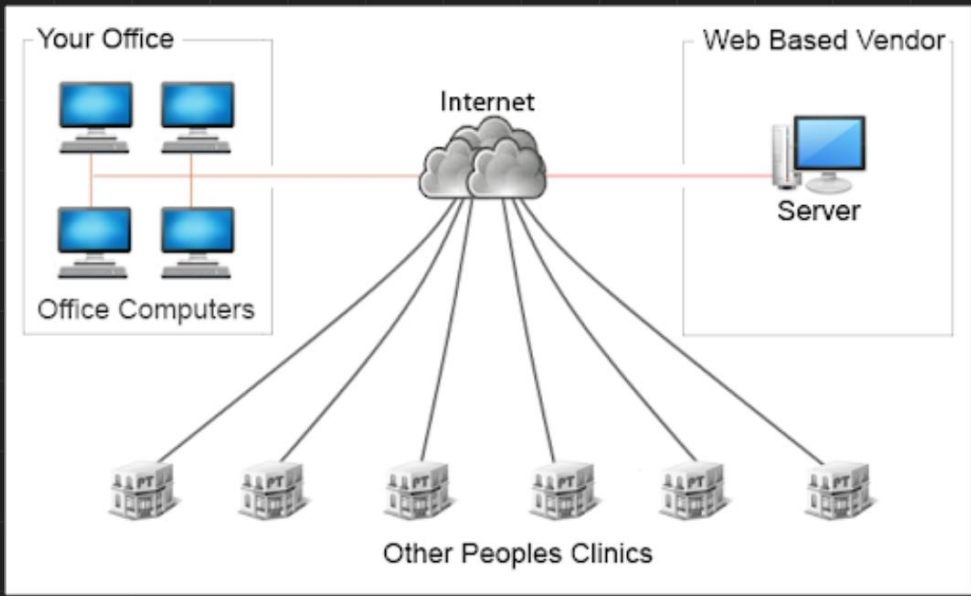


Internet

World Wide Web

Estimated year of Origin	1969, though opening of the network to commercial interests began only in 1988	1993
Name of the first version	ARPANET	NSFnet
Comprises	Network of Computers, copper wires, fibre-optic cables & wireless networks	Files, folders & documents stored in various computers
Governed by	Internet Protocol	Hyper Text Transfer Protocol
Dependency	This is the base, independent of the World Wide Web	It depends on Internet to work
Nature	Hardware	Software





Internet > Deep Web > Dark Web

