Prak-Shastri 2nd

Computer Science

Unit: 1st

Internet: World wide Web, Browsers, Electronic mail

Growth of Internet

The growth of the Internet has been rapid and continuous since it was first introduced to the public in the 1990s. This growth can be attributed to several factors, including:

- 1. **Technological advancements:** The development of new technologies such as fiberoptic cable, wireless networking, and mobile devices have greatly increased the speed and accessibility of the Internet.
- 2. **Increased demand:** As more and more people have come to rely on the Internet for communication, information, and entertainment, the demand for faster and more reliable Internet connections has grown.
- 3. **Government policies:** Government policies in many countries have encouraged the expansion of Internet infrastructure, particularly in rural and under-served areas.
- 4. **Economic factors:** The growth of the Internet has been driven by the economic benefits it provides, such as increased productivity and access to new markets.
- 5. **Social factors:** The Internet has become an integral part of modern society, connecting people and communities in new ways, and allowing for the sharing of information and ideas across borders.

As a result of these factors, the number of Internet users has grown exponentially, from around 16 million users in 1995 to over 4.9 billion users in 2021. The number of websites has also grown significantly, from a few thousand in the early days of the Internet to over 1.74 billion websites in 2021. The Internet has also become more mobile, with more people accessing it from smartphones and other mobile devices, and more people in developing countries are now connected to the Internet.

The growth of the Internet is expected to continue in the future, with more people and devices coming online and the development of new technologies such as 5G and the Internet of Things (IoT) that will increase the speed and capabilities of the Internet even further.

Owners of the Internet

The Internet is a decentralized network that is not owned by any single entity. It is made up of a complex web of interconnected networks and devices that are owned and operated by a wide range of organizations and individuals.

No single organization controls the entire Internet, but there are several organizations that play important roles in its operation and management:

- Internet Corporation for Assigned Names and Numbers (ICANN): ICANN is a nonprofit organization that is responsible for managing the global domain name system (DNS) and allocating IP addresses.
- 2. **Internet Engineering Task Force (IETF):** The IETF is a group of engineers and computer scientists who develop and publish the technical standards that govern the operation of the Internet.
- 3. World Wide Web Consortium (W3C): The W3C is a group of organizations that develop and promote standards for the World Wide Web (WWW) and web technologies.
- 4. **Regional Internet Registries (RIRs):** RIRs are organizations that are responsible for allocating IP addresses and managing the distribution of IP addresses within specific geographic regions.
- 5. **Internet Service Providers (ISPs):** ISPs are companies that provide Internet access to individuals and organizations.
- 6. **National governments:** Many national governments have laws and regulations that govern the use of the Internet within their borders, and some governments operate their own national networks.

It's worth noting that the Internet is a constantly evolving network, and the organizations and entities that play a role in its operation and management may change over time. The Internet is also becoming an important part of international relations, and countries are trying to exert control over the internet by exerting control over the infrastructure, access, and governance.

Anatomy of Internet

The Internet is a complex network made up of many different components that work together to provide users with access to online services and information. The main components of the Internet are:

1. **Devices**: These include personal computers, smartphones, tablets, servers, and other devices that connect to the Internet.

- 2. **Network infrastructure:** This includes the cables, routers, switches, and other hardware that connects devices to the Internet.
- 3. **Internet service providers (ISPs):** These are companies that provide Internet access to individuals and organizations. They connect users to the Internet via wired or wireless connections.
- 4. **Protocols:** These are the rules and standards that govern the operation of the Internet. The most important protocols include the Transmission Control Protocol (TCP) and the Internet Protocol (IP).
- 5. **Data centers:** These are large facilities that house servers and other computer equipment used to store and manage large amounts of data.
- 6. **Content providers:** These are the organizations and individuals that create and provide online content, such as websites, videos, and social media platforms.
- 7. **Domain name system (DNS):** The DNS is the system that translates domain names (such as www.abcd.com) into IP addresses, making it possible for users to access websites using easily remembered names.
- 8. **Content Delivery Networks (CDN):** These are a network of servers that distribute the content of a website to users based on their geographic location.
- 9. **Application layer:** This is the topmost layer of the Internet, and it includes the software applications and services that users interact with on the internet.

ARPANET (Advanced Research Projects Agency Network)

ARPANET (Advanced Research Projects Agency Network) was the first operational packet-switching network and the predecessor of the global Internet. It was created by the United States Department of Defense's Advanced Research Projects Agency (ARPA) in 1969. The goal of ARPANET was to create a communication network that would allow researchers at different locations to share information and collaborate on projects.

ARPANET used the concept of packet switching to transmit data, which allowed data to be sent in small packets that could take different routes to their destination, rather than being sent in a single stream of data. This made the network more robust and reliable, as data could still be transmitted even if one of the routes was unavailable.

ARPANET was initially used by a small number of universities and research institutions, but it quickly grew to include other organizations and government agencies. In the 1970s, the network was connected to other packet-switching networks, such as the National Physical Laboratory Network (NPL) in the United Kingdom, and the Cyclades network in France.

In the 1980s, the Internet Protocol (IP) was developed and adopted as the standard for data transmission on the Internet. This allowed ARPANET and other networks to be connected and interoperate, leading to the creation of the global Internet as we know it today.

ARPANET was decommissioned in 1990, but it played a crucial role in the development of the Internet and the technologies that make it possible. The concepts and technologies developed on ARPANET were the foundation for the modern Internet, and many of the key protocols and standards used on the Internet today have their roots in ARPANET.

World Wide Web

The World Wide Web (WWW or Web) is a system of interlinked hypertext documents that are accessed via the Internet. It was created by Sir Tim Berners-Lee in 1989 while he was working at CERN, the European physics research organization. The Web was designed to make it easier to share information between researchers, and it quickly grew to become one of the most widely used applications of the Internet.

The Web is based on the concept of hypertext, which allows users to click on links embedded in the text to jump to other documents or websites. These documents are written in a markup language called HTML (Hypertext Markup Language), which defines the structure and layout of the document.

The Web relies on a number of key technologies such as the Hypertext Transfer Protocol (HTTP) and the URL (Uniform Resource Locator) to provide users with access to a wide range of online services and information. HTTP is the protocol used to transfer data over the Web, and URLs are the addresses used to locate and access Web pages.

Web browsers, such as Google Chrome, Firefox, and Safari, are the software applications that users use to access the Web. They connect to web servers, which are the computers that store and serve up web pages, using HTTP. When a user types in a URL into their browser, the browser sends a request to the server to fetch the corresponding web page, which is then displayed on the user's device.

Basic Internet Terminology

Some basic Internet terminology that is commonly used:

- 1. **Internet:** A global network of interconnected computers and servers that communicate with each other using standardized protocols.
- 2. **IP address:** A unique numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication.

- 3. **URL:** A uniform resource locator, commonly known as a web address, is a reference to a web resource that specifies its location on the internet.
- 4. **DNS:** The Domain Name System is a hierarchical decentralized naming system for computers, services, or other resources connected to the internet or a private network.
- 5. **HTTP:** The Hypertext Transfer Protocol, is an application protocol for distributed, collaborative, hypermedia information systems.
- 6. **HTTPS:** HTTP Secure is an extension of the Hypertext Transfer Protocol for secure communication over the Internet, and uses SSL/TLS to secure the connection.
- 7. **Router:** A router is a networking device that forwards data packets between computer networks.
- 8. **Switch:** A network switch is a piece of hardware that connects devices together on a computer network.
- 9. **Modem:** A modem is a device that modulates an analog carrier signal to encode digital information and demodulates such a carrier signal to decode the transmitted information.

Client-server concept, Architecture, and Applications.

The client-server architecture is a model for distributed computing where a central server provides services to multiple clients over a network. In this model, the client is responsible for the user interface and user interaction, while the server is responsible for processing the requests and providing the requested services.

- 1. **Client:** The client is a device or software application that requests services from the server. Clients can be computers, smartphones, tablets, or other devices that are connected to the network. Clients are typically lightweight and rely on the server to perform complex processing tasks.
- 2. **Server**: The server is a device or software application that provides services to clients. Servers can be computers, servers, or other devices that are connected to the network. Servers are typically more powerful than clients and are responsible for processing requests and providing the requested services.
- 3. **Architecture**: The client-server architecture can be divided into three main components: the client, the server, and the network. The client and server communicate through the network, which can be a local area network (LAN), a wide area network (WAN), or the internet.

Net Etiquette.

Netiquette, short for "network etiquette," refers to the set of rules and guidelines that govern appropriate behavior when communicating and interacting with others online. It is important to follow netiquette to ensure that online communication is respectful, productive, and safe for all users. Here are a few examples of netiquette:

- 1. **Be respectful:** Treat others online with the same respect and courtesy that you would in person. Avoid using offensive language or making personal attacks.
- 2. **Be mindful of privacy:** Do not share personal information about yourself or others without permission. Also, be aware of the privacy settings on social media and other online platforms.
- 3. **Be concise:** When communicating online, be mindful of others' time and try to be as clear and concise as possible.
- 4. **Be aware of your tone:** It is easy to misinterpret tone when communicating online, so be aware of how your words may be perceived and try to be as clear as possible.
- 5. **Respect intellectual property:** Do not plagiarize or steal content online. Always give credit where credit is due.
- 6. **Be aware of cultural differences:** The Internet is a global community, and you may be interacting with people from different cultures with different norms and customs. Be aware of these differences and try to be respectful and understanding.
- 7. **Be aware of the context:** Be aware of the context of the conversation, forum, or group you're participating in, and adjust your tone and language accordingly.
- 8. **Be aware of technical issues:** Be aware of technical issues that may affect communication and try to be patient and understanding when these issues arise.

By following these guidelines, you can help create a positive and productive online community for all users.

Internet Applications-Commerce on the Internet

Internet commerce, also known as e-commerce, refers to buying and selling goods and services over the internet. This can include online retail stores, online marketplaces, and even digital products such as e-books and software. Online payment systems and shipping providers are also an important part of internet commerce, as they facilitate transactions and ensure the secure transfer of money and goods. E-commerce has grown rapidly in recent years, with many businesses now relying on it as a primary source of revenue, and it is expected to continue to grow in the future. Popular e-commerce platforms include Amazon, Alibaba, and Shopify.

Governance on the Internet

Governance on the internet refers to the various ways in which the internet is regulated, managed, and controlled. This can include issues such as online privacy, censorship, and intellectual property. Governance on the internet is complex, as it involves multiple stakeholders, including governments, private companies, and individual users.

One important aspect of internet governance is the management of internet infrastructure, such as the assignment of IP addresses and the management of domain names. This is done by organizations such as the Internet Corporation for Assigned Names and Numbers (ICANN).

Another important aspect of internet governance is the regulation of content on the internet. Governments and private companies can censor or block certain websites or types of content, often for reasons such as national security or to combat illegal activities such as piracy.

In addition, there is an ongoing debate about how to balance the right to free speech with the need to protect individuals from harmful or offensive content.

Internet governance also includes the protection of personal data and privacy of internet users. Many governments have enacted laws and regulations to protect the personal information of their citizens, such as the General Data Protection Regulation (GDPR) in the European Union.

Overall, internet governance is a constantly evolving field, as technology and societal norms change and require a balance between protecting the rights of users and protecting society from harm.

Impact of the Internet on Society-Crime on/through the Internet.

The internet has had a significant impact on society, including in the area of crime. The internet has made it easier for criminals to commit a wide range of crimes, such as identity theft, financial fraud, and the distribution of illegal goods and services. The anonymity and global reach of the internet also make it difficult for law enforcement to track down and prosecute criminals.

One of the most common forms of internet crime is online fraud, which can include scams such as phishing, where criminals attempt to trick people into giving away personal information or money. Online identity theft is also a major concern, as criminals can use stolen personal information to commit various types of fraud. Another significant area of crime on the internet is the distribution of illegal goods and services, such as drugs, weapons, and child pornography. Criminals can use the internet to buy and sell these goods and services, often using encryption and other technologies to evade detection.

Cybercrime is another area of concern, which includes hacking, spreading malware and DDoS attacks to disrupt or steal information from computer systems or networks.

The internet has also enabled the growth of organized crime groups that operate online, such as online marketplaces for illegal goods and services.

In response to these and other internet-related crimes, law enforcement agencies have developed specialized units to investigate and prosecute these crimes. Many countries have also passed laws specifically aimed at combating internet crime. However, the constant evolution of technology and the global nature of the internet make it difficult to effectively combat internet-related crime.

Evolution of WWW

The World Wide Web (WWW or Web) is a system of interconnected documents and other resources that are accessed via the internet. It was created by Sir Tim Berners-Lee in 1989 while working at CERN (the European Organization for Nuclear Research) in Switzerland.

The first version of the Web used a system called Hypertext Transfer Protocol (HTTP) to transfer information and the Hypertext Markup Language (HTML) to create and format documents. These documents could include text, images, and links to other documents, allowing users to easily navigate between them.

The first website went online in 1991, and by the mid-1990s, the Web had become widely adopted. This led to the development of new technologies such as JavaScript and Cascading Style Sheets (CSS), which allowed for more interactive and dynamic websites.

In the late 1990s and early 2000s, the rise of broadband internet access and the development of new technologies such as Flash and AJAX led to the creation of more complex and interactive websites. This allowed for features such as online videos, audio, and interactive games.

In recent years, there has been a shift towards mobile-friendly and responsive design, as more and more people access the Web using smartphones and tablets. There's also been a rise of social media, which has led to the development of new forms of online communication and collaboration. The Web is also becoming more "intelligent" with the incorporation of Artificial Intelligence (AI) and machine learning technologies, which allow for more personalized and interactive experiences for the user.

Basic features of www

The World Wide Web (WWW or Web) has several basic features that make it a powerful and easy-to-use system for accessing and sharing information. Some of the key features of the WWW include:

- 1. Hypertext: The Web is based on hypertext, a system of linking documents and other resources together. Hypertext links allow users to easily navigate between different documents and resources, creating a web of interconnected information.
- 2. **URLs:** The Web uses unique addresses called URLs (Uniform Resource Locators) to identify and locate documents and other resources on the internet.
- 3. **HTTP:** The Web uses the Hypertext Transfer Protocol (HTTP) to transfer information between servers and clients. HTTP is the foundation of the Web and enables the transfer of documents and other resources.
- 4. **HTML:** The Web uses the Hypertext Markup Language (HTML) to create and format documents. HTML is a simple markup language that allows the creation of text, images, and links.
- 5. **Web browsers:** Web browsers, such as Chrome, Firefox, and Safari, are the primary way that users interact with the Web. They display web pages and allow users to navigate the Web by following hyperlinks.
- 6. **Web servers:** Web servers are responsible for storing and serving web pages and other resources to users. When a user requests a web page, the browser sends a request to the server, which then sends the requested page back to the browser.
- 7. **Search engines:** Search engines are tools that help users find web pages and other resources on the Web. They use complex algorithms to index and rank web pages based on their relevance to a user's query.
- 8. **Multimedia:** The web also allows the integration of various multimedia elements like images, videos, audio, animations, etc.

Basic features of the WWW make it a powerful and flexible system for accessing and sharing information and have helped to drive its widespread adoption.

WWW Browsers, WWW Server

Web browsers and web servers are two key components of the World Wide Web (WWW or Web).

Web browsers are software programs that allow users to access and navigate the Web. They display web pages and other resources and allow users to follow hyperlinks to navigate between different documents and resources. Examples of popular web browsers include Chrome, Firefox, Safari, and Edge.

Web servers, on the other hand, are responsible for storing and serving web pages and other resources to users. When a user requests a web page, the browser sends a request to the server, which then sends the requested page back to the browser. The server also stores and manages files, handles requests and responses, and provides access to databases and other resources. Apache, IIS, and Nginx are examples of popular web servers.

Web browsers and web servers work together to deliver web pages and other resources to users. When a user enters a URL (Uniform Resource Locator) into a web browser, the browser sends a request to the server associated with that URL. The server then sends the requested resource back to the browser, which displays it to the user.

Web browsers and web servers have evolved over time. Browsers now support new technologies like HTML5, CSS3, JavaScript, and Web Assembly, which allow for more interactive and dynamic web pages. Web servers are also becoming more efficient, with features like load balancing and content delivery networks that improve the performance and scalability of web pages.

web browsers and web servers are the key components of the Web that allow users to access and navigate the Web and deliver web pages and other resources to users.

Hyper Text Transfer Protocol (HTTP)

HTTP (Hypertext Transfer Protocol) is the foundation of the World Wide Web (WWW or Web). It is a protocol that allows for the transfer of information between servers and clients.

HTTP is a request-response protocol, which means that a client sends a request to a server and the server sends a response back to the client. The request and response are both in the form of a message, which includes a set of headers and a message body. When a user enters a URL (Uniform Resource Locator) into a web browser, the browser sends an HTTP request to the server associated with that URL. The request includes a method, such as GET or POST, that specifies the type of action the browser is requesting. The request also includes headers, which provide additional information about the request, such as the type of browser making the request, the preferred language, and the format of the requested resource.

The server then sends an HTTP response back to the browser. The response includes a status code, which indicates the outcome of the request, such as 200 OK for a successful request or 404 Not Found for a resource that cannot be found. The response also includes headers, which provide additional information about the response, such as the type and size of the returned resource.

HTTP is a stateless protocol, which means that the server does not maintain any information about the client between requests. This means that each request and response is independent of any previous requests and responses.

However, the use of cookies and other technologies have been developed to establish sessions and maintain state across requests, allowing for personalization and other features.

HTTP is the foundation of the Web, allowing for the transfer of information between servers and clients, and the request-response model of communication is the backbone of the web.

Universal Resource Locator (URL)

A Universal Resource Locator (URL) is a string of text that identifies a specific resource on the World Wide Web (WWW or Web). It is a way to locate and access web pages and other resources on the Internet.

A URL consists of several parts, including:

- The scheme, which specifies the protocol used to access the resource, such as "http" or "https" for web pages, "ftp" for file transfers, and "mailto" for email addresses.
- The domain name, which identifies the server where the resource is located. For example, "<u>www.example.com</u>" is the domain name for the website "example.com".
- The path, which specifies the location of the resource within the server. For example, "/about" is the path for the "about" page of the website.

• The query string, which is an optional part of a URL that contains additional information to be passed to the server, such as search terms or form data.

An example of a URL is "<u>https://www.example.com/about?search=example</u>". In this example, the scheme is "https", the domain name is "<u>www.example.com</u>", the path is "/about" and the query string is "search=example"

URLs are typically entered into a web browser's address bar to access a specific resource on the Internet. They can also be included in hyperlinks to allow users to navigate between different resources.

URLs are an essential part of the Web that allows users to locate and access resources on the Internet and web pages. They allow web browsers to connect to the web-servers and request resources.

Search Engines and their Categories, Searching Criterion

Search engines are tools that allow users to find and access information on the Internet. They work by indexing and organizing the content of websites, and then providing a search interface for users to enter their queries and find relevant results.

There are several categories of search engines, including:

- **General search engines:** These search engines indexes and organize content from a wide range of websites and provide results for a wide range of queries. Examples include Google, Bing, and Yahoo.
- **Specialized search engines:** These search engines focus on a specific topic or type of content, such as shopping, news, or images. Examples include Amazon, Google News, and Google Images.
- Vertical search engines: These search engines focus on specific industries or markets, such as travel, real estate, or jobs. Examples include Kayak, Zillow, and LinkedIn.
- **Meta search engines:** These search engines use the results from multiple search engines to provide a wider range of results. Examples include Dogpile and MetaCrawler.

Searching Criteria are the factors that are used by search engines to determine the relevance and quality of search results. These criteria can include the following:

- **Keywords:** The search engine looks at the keywords in the query and matches them with the keywords on the website or page.
- Link structure: The search engine looks at the number and quality of links pointing to a website or page.
- **Content quality:** The search engine looks at the relevance and quality of the content on the website or page.
- **User behavior:** The search engine looks at how users interact with the website or page, including click-through rates, time on site, and bounce rates.
- **Social signals:** The search engine looks at the social media signals such as likes, shares, and mentions on social media platforms.

search engines play an important role in helping users find and access information on the Internet. The various categories of search engines and the search criteria used by them help users find the most relevant and useful information for their queries.

Basic features of Browser

Browsers are software programs that allow users to access and navigate the Internet. They are used to display web pages, run web-based applications, and perform other online tasks.

Some of the basic features of a browser include:

- **Navigation:** Browsers provide a user interface for navigating to different web pages and websites, including an address bar, forward and back buttons, and a bookmarks or history feature.
- **Rendering:** Browsers are able to interpret and display the code of web pages written in languages such as HTML, CSS, and JavaScript.
- **Network communication:** Browsers can request and receive web pages and other resources from web servers using protocols like HTTP and HTTPS.
- **Security:** Browsers include features to protect users from malware, phishing, and other malicious activities.
- **Multi- tabbing:** Browsers provide the feature to open multiple web pages in different tabs and switch between them easily.

- **Plug-ins/Extensions:** Browsers allow users to install additional software, called plug-ins or extensions, to enhance their browsing experiences, such as ad-blockers, password managers, and translation tools.
- **Developer tools:** Browsers have built-in developer tools that web developers can use to inspect, debug, and optimize their websites and web applications.
- **Privacy:** Browsers have the feature to set privacy options, like cookies, to protect the user's browsing experience.

browsers are essential tools for accessing and navigating the Internet. Their various features make it easy for users to find and view web pages, run web-based applications, and perform other online tasks, while also providing security, privacy, and developer support.

Bookmarks, history, Progress indicators

Bookmarks, history, and progress indicators are features commonly found in web browsers that help users navigate the Internet more efficiently.

- **Bookmarks:** Bookmarks allow users to save the URLs of web pages they want to visit again in the future and organize them into groups or folders. They are also known as favorites or shortcuts. Users can also add tags or notes to the bookmarks for easy searching.
- **History:** History allows users to see a list of the web pages they have visited recently, and quickly revisit them. It's also possible to search and filter through history.
- **Progress indicators:** Progress indicators are visual cues that inform the user of the progress of a task, such as loading a web page. These indicators can take the form of a loading bar, spinning icon, or percentage complete. They help users understand how long a task will take to complete and if there are any issues with loading the web page.

These features are very useful for users to keep track of the web pages they have visited, easily access the pages they want to visit in the future and understand the status of their current web browsing activities.

Customization of Browsers,

Browsers offer a variety of customization options that allow users to tailor their browsing experience to their preferences. Some of the ways in which browsers can be customized include:

- **Themes:** Many browsers offer a variety of themes or skins that allow users to change the appearance of their browser, from the colors and layout of the interface to the background images and icons.
- **Customizable home page:** Users can set their preferred web page as their home page, the page that will open automatically when the browser is launched. This page can also be customized to show specific content like bookmarks, history, and weather forecasts.
- **Toolbars and buttons:** Users can add or remove toolbars and buttons from the browser interface, such as a toolbar that displays bookmarks or a button that launches a specific web page.
- Add-ons and extensions: Many browsers allow users to install additional software, called add-ons or extensions, that enhance their browsing experience. These can include things like ad-blockers, password managers, and translation tools.

Saving and printing web pages

Saving and printing web pages: Browsers also allow users to save web pages to their local storage or print them out. This feature is usually found in the browser's menu or by right-clicking on the page. Users also have options to save the web page as a PDF, HTML or other formats.

Addressing the Internet: DNS, Domain Name, and their organization

Addressing the Internet refers to the process of identifying and locating devices and resources on the Internet. The two main components of addressing on the Internet are the Domain Name System (DNS) and domain names.

• **Domain Name System (DNS):** The DNS is a hierarchical, distributed system that translates domain names into IP addresses. It is often referred to as the "phonebook" of the Internet. When a user types a domain name into their browser, the browser sends a request to a DNS server to translate the domain name into an

IP address. The DNS server then looks up the IP address in its database and returns it to the browser, which uses it to connect to the appropriate web server.

- **Domain names:** A domain name is a human-friendly label that is associated with an IP address. They are used to identify and locate resources on the Internet, such as websites and email servers. Domain names are organized into a hierarchical structure, with the top-level domain (TLD) at the highest level and subdomains at lower levels. For example, in the domain name "<u>www.example.com</u>", "com" is the TLD, "example" is the second-level domain, and "www" is the subdomain.
- Domain Name Organizations: Organizations that are responsible for managing and maintaining the DNS are called domain name registries. They are responsible for managing the allocation of domain names and IP addresses and ensuring that the information in the DNS is accurate and up-to-date. There are several organizations that manage TLDs and they are called as Domain name registries. ICANN (Internet Corporation for Assigned Names and Numbers) is the organization that coordinates the global domain name system and is responsible for maintaining the root zone of the DNS.

The Domain Name System (DNS) and domain names are two important components of addressing the Internet. They work together to translate human-friendly domain names into IP addresses, allowing users to easily locate and access resources on the Internet. Domain Name Organizations are responsible for maintaining the DNS and ensuring that the information in it is accurate and up-to-date.

Introduction of e-mail, Email Networks, and Servers

Email, short for electronic mail, is a method of exchanging digital messages between people using electronic devices such as computers, smartphones, and tablets. Email is a way to send messages, documents, images, and other files over the internet.

Email networks and servers are the backbones of the email system. Email networks are the infrastructure that allows email messages to be sent and received across the internet. Email servers are the computer systems that manage the storage, delivery, and retrieval of email messages. An email server can be run on a single machine or on a network of machines.

There are two main types of email servers: incoming and outgoing. Incoming email servers, also known as mail transfer agents (MTAs), are responsible for receiving email messages from other email servers and delivering them to the appropriate

mailbox. Outgoing email servers, also known as mail submission agents (MSAs), are responsible for sending email messages from the user's mailbox to the appropriate email server for delivery.

Email is a way to communicate digitally, Email networks and servers are the backbones of the email system which allows for sending and receiving messages across the internet, and Email servers are the computer systems that manage the storage, delivery, and retrieval of email messages.

Email protocols - SM1P,

POP3, PMAP4, MIME6.

SMTP (Simple Mail Transfer Protocol) is a widely used protocol for sending and receiving email messages over the internet. It is responsible for sending email messages from the user's email client (such as Outlook or Gmail) to the appropriate email server and then forwarding the message to the recipient's email server.

POP3 (Post Office Protocol version 3) is a protocol that allows an email client to retrieve email messages from a remote email server. It is typically used by email clients that run on a user's personal computer or mobile device, such as Microsoft Outlook or Apple Mail.

IMAP (Internet Message Access Protocol) is another protocol that allows an email client to retrieve email messages from a remote email server. It is similar to POP3, but it provides more advanced features such as the ability to access multiple mailboxes, search for messages, and keep messages on the server.

MIME (Multipurpose Internet Mail Extensions) is an extension of the SMTP protocol that allows for sending multimedia content (such as images, videos, and audio files) in email messages. It also allows for sending messages in different character sets and encodings, which enables the sending of messages in different languages.

Structure of an Email-Email address

The structure of an email message is composed of several parts, including:

 The sender's email address: This is the address of the person who is sending the email. It typically includes a username and domain name, separated by an "@" symbol. For example, "<u>username@example.com</u>".

- 2. **The recipient's email address:** This is the address of the person or people to who the email is being sent to. It can include multiple addresses, separated by commas.
- 3. **The subject:** This is a brief summary of the email's content. It is typically displayed in the email client's inbox and is used to help identify the email's purpose.
- 4. **The message body:** This is the main content of the email. It can include text, images, videos, and other multimedia.
- 5. Attachments: These are additional files that are sent along with the email, such as documents, images, and audio files.
- 6. **Email headers:** These are additional fields that provide additional information about the email, such as the date it was sent, the email client used, and the email server it was sent from.

An email address is a unique identifier that is used to send and receive emails. It is composed of a username and a domain name, separated by the "@" symbol. An email message, in general, is composed of several parts like the sender's email address, recipient's email address, subject, message body, attachments, and email headers.

Email Clients: Netscape Mail Clients, Outlook Express, Web-based E-mail

Netscape Mail was an email client developed by Netscape Communications Corporation, which was popular in the late 1990s and early 2000s. Outlook Express was an email and news client developed by Microsoft, which was included in Internet Explorer versions 4.0 through 6.0. Web-based email, also known as webmail, is an email service that is accessed through a web browser, rather than through a dedicated email client program. Examples of popular web-based email services include Gmail, Yahoo Mail, and Outlook.com.

encryption-Address book Signature file.

Encryption is a method of protecting the confidentiality of digital information by converting it into a code that can only be deciphered by someone with the correct decryption key. Encryption is commonly used to protect sensitive information such as credit card numbers, personal identification numbers (PINs), and login credentials.

An address book is a collection of contacts that contain names, email addresses, and other information about individuals or businesses. An address book can be stored on a computer or device, or it can be stored remotely, such as on a web-based email service. A signature file is a small block of text or an image that is automatically appended to the end of an email message. Signature files are often used to include contact information, such as a phone number or physical address, or a quote or personal message. They can be created and edited for most email clients.

Practice Question

- 1. What is the Internet and how does it work?
- 2. How do browsers work and what are the most popular browsers available today?
- 3. What is the role of a search engine and how does it help users find information on the Internet?
- 4. How does email work and what are the most popular email providers available today?
- 5. What are the benefits and drawbacks of using a web-based email service?
- 6. How does the process of sending and receiving an email work?
- 7. What are the different types of email encryption methods available and how do they work?
- 8. How can users protect themselves from spam, phishing, and other email-based scams?
- 9. What are some best practices for creating and maintaining a professional email account?
- 10. How can users troubleshoot common issues related to email such as being unable to send or receive emails, and how do fix them?