Module – 1:

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Structure of URL:

protocol://servername.domainname.domaintype/mainfilename

Ex:

http://www.microsoft.com/software/solutions/main.htm

ISP's: (Internet Service Providers)

Factors to be considered while choosing the ISP's

- Speed
- Consistency
- Cost of the ISP // S Rajkumar
- Space

Types of ISPs: ISPs can be categorized based on the technology they use to deliver internet access. Some common types include:

1. Cable ISPs: Cable ISPs deliver internet access through the same coaxial cables that are used for cable television.
2. Fiber-optic ISPs: Fiber-optic ISPs use fiber-optic cables to transmit data, offering high-speed internet access with greater bandwidth capabilities.
3. Satellite ISPs: Satellite ISPs provide internet access via satellite communication. They are often used in rural or remote areas where other types of internet infrastructure are unavailable.

Services provided by ISP's:

Internet Access: The primary service offered by ISPs is internet access. ISPs provide customers with the means to connect to the internet using different technologies such as cable, fiber-optic, satellite, or wireless connections.

Email Hosting: Many ISPs offer email hosting services, providing customers with email accounts and the infrastructure to send, receive, and manage email messages. This may include features such as spam filtering, virus scanning, and customizable email addresses.

Web Hosting: Some ISPs offer web hosting services, allowing customers to publish websites and web applications on servers managed by the ISP. Web hosting services typically include features such as domain registration, website building tools, and technical support.

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Domain Registration: ISPs may offer domain registration services, allowing customers to register and manage domain names for their websites. This service often includes domain name availability checks, domain name renewal, and DNS management.

VoIP Services: ISPs may provide Voice over Internet Protocol (VoIP) services, enabling customers to make phone calls over the internet instead of traditional telephone networks. VoIP services may include features such as call forwarding, voicemail, and conference calling.

Cloud Storage: Some ISPs offer cloud storage services, allowing customers to store and access files and data remotely over the internet. Cloud storage services may include features such as file synchronization, file sharing, and data backup.

Security Services: ISPs may offer security services to protect customers' internet connections and devices from online threats such as malware, viruses, and hacking. This may include firewall protection, antivirus software, and network monitoring.

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Internet

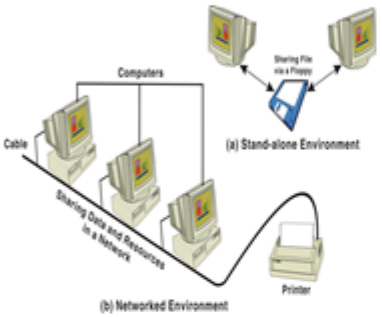
- Network of networks
- Networks-Sharing of information among the computers

Different types of networks: //S Rajkumar

LAN- Interconnecting Small Geographical area

MAN- City and suburbs

WAN- Interconnecting large area



www:

"WWW" stands for World Wide Web. It refers to an information system on the internet that allows documents to be connected to other documents by hypertext links, enabling the user to search for information by moving from one document to another.

Key components of the World Wide Web includes:

Web Pages: Documents written in languages such as HTML (Hypertext Markup Language), CSS (Cascading Style Sheets), and JavaScript, which are accessed and rendered by web browsers.

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URLs (Uniform Resource Locators): Addresses used to identify and locate resources on the Web. URLs consist of several components, including the protocol (e.g., "http://" or "https://"), the domain name (e.g., "example.com"), and the path to the specific resource.

Hyperlinks: Text or graphics within web pages that, when clicked, navigate the user to another web page or resource.

Web Browsers: Software applications used to access and view web pages. Examples include Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari.

Webserver Vs Application Server:

Web Server:

A web server is primarily responsible for handling HTTP requests from clients (typically web browsers) and delivering static content such as HTML, CSS, images, and client-side scripts.

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It's optimized to serve static content efficiently, usually through protocols like HTTP or HTTPS.

Examples of web servers include Apache HTTP Server, Nginx, Microsoft Internet Information Services (IIS), and LiteSpeed.

Application Server:

An application server is designed to execute application logic and process dynamic content. It hosts the business logic of the application and interacts with various components such as databases, messaging systems, or other services.

It often provides additional services such as transaction management, security, and scalability features.

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Application servers can execute server-side scripts, manage session states, and generate dynamic content based on client requests.

Examples of application servers include Apache Tomcat, JBoss/WildFly, IBM WebSphere, Oracle WebLogic, and Microsoft Azure App Service.

Key Differences:

Functionality:

Web servers mainly serve static content and handle HTTP requests.

Application servers execute application logic, manage business processes, and generate dynamic content.

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Dynamic Content Handling:

Web servers may have limited capabilities for generating dynamic content. They often rely on application servers or other backend systems to handle dynamic content generation.

Application servers are specifically designed to generate dynamic content and execute business logic.

Protocol Support:

Web servers mainly support HTTP and HTTPS protocols.

Application servers can support multiple protocols and often include additional communication protocols.

Scalability:

Web servers are typically easier to scale

Application servers may require more complex scaling strategies, especially when managing stateful sessions or complex business processes.

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Web browsers:

Graphical browsers: //S Rajkumar

Feature	Firefox	Chrome	Opera	Edge	Safari
Developer	Mozilla Foundation	Google	Opera Software AS	Microsoft	Apple Inc.
Rendering Engine	Gecko	Blink	Blink	Blink (formerly EdgeHTML) Chromium (Updated)	WebKit
Open Source	Yes	Yes	Partially (battery saver mode, and few customization options not available)	Partially	Partially
Privacy Features	Private Browsing Mode, (ctrl+shift+p) Enhanced Tracking Protection (Standard, Strict and Custom), Firefox Monitor	Safe Browsing(ctrl+shift+n), Security Protection	Built-in VPN, Ad blocker	InPrivate (ctrl+shift+n), Tracking Prevention (Basic, Balanced and strict)	Intelligent Tracking Prevention- Privacy Report (1. The number of trackers prevented from profiling you. 2. The number of cross-site trackers prevented from tracking you. 3. The number of websites contacted by trackers on the current page.)
Memory Usage	Generally consumes less memory than Chrome, particularly with many tabs open.	Known for higher memory usage, especially with multiple tabs open.	Relatively lightweight, but varies based on features used.	Improved memory management comparable to Chrome.	Efficient memory usage, especially on macOS, but can vary with usage patterns.

Client-side vs Server-side languages:

Client-Side Languages:

Definition: Client-side languages are executed on the user's web browser (client-side) and are responsible for creating interactive elements and handling user interactions within a web page.

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Examples: The most common client-side languages are:

HTML (Hypertext Markup Language): Defines the structure and content of web pages.

CSS (Cascading Style Sheets): Styles and formats the visual presentation of HTML elements.

JavaScript: Adds interactivity and client-side logic to web pages. It's the primary scripting language for client-side development.

Execution Environment: Client-side languages are executed within the user's browser environment, which means that the code is downloaded from the server and executed on the user's device.

Server-Side Languages:

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Definition: Server-side languages are executed on the web server (server-side) and are responsible for generating dynamic content, processing user requests, and interacting with databases.

Examples: Some popular server-side languages include:

PHP (Hypertext Preprocessor): A server-side scripting language commonly used for web development and dynamic content generation.

Python: A versatile programming language used for server-side web development, scripting, and other applications.

Java: Widely used for building enterprise-level web applications, Java runs on the Java Virtual Machine (JVM) and is often used in combination with frameworks like Spring.

Node.js (JavaScript): While JavaScript is primarily a client-side language, Node.js allows developers to use JavaScript on the server-side, making it possible to create full-stack JavaScript applications.

Search Engines: **//S Rajkumar**

Search engines are software systems designed to retrieve information from the internet based on specified search queries. They work by crawling and indexing web pages, organizing the information, and then providing relevant results to users when they enter search terms or queries.

Popular search engines include Google, Bing, Yahoo, and DuckDuckGo. These search engines employ various algorithms and ranking factors to determine the most relevant results for a given query, aiming to provide users with accurate and useful information.

Google search engine was founded by Sergey Brin and Larry. "I'm Feeling Lucky" button in google, takes the users directly to the first search result in Google search engine. DuckDuckGo is a privacy-focused search engine that prioritizes user privacy and does not track users' search history or personalize search results. It was founded in 2008 by Gabriel Weinberg and has gained popularity as an alternative to other search engines like Google, Bing, and Yahoo. Yahoo was founded by Jerry Yang and David Filo.

Bing, Microsoft's search engine, was founded by Microsoft Corporation itself. It was developed as a successor to Microsoft's previous search engines, including MSN Search and Live Search. Bing was officially launched by Microsoft in June 2009. While Bing doesn't have a specific individual founder like some startups do, it was developed by a team of engineers and researchers at Microsoft, led by Satya Nadella, who is currently the CEO of Microsoft Corporation.

Google is using Page ranking concept to rank the pages. Page ranking is a ranking algorithm that rates the importance of a website based on what the algorithm thinks the user wants the most. It was named after Larry Page, one of the founders of Google. This algorithm is the core of Google's search engine. But only Google but many other search engines like Bing by Microsoft also have developed their own different algorithms to rank pages. Google pioneered this algorithm for choosing the most relevant results for a search by taking into account how many other websites are linked to a given page and how important those other pages are. The basic idea was that if lots of websites link back to one single site then that website might be the

one the user might be looking for and that is the most probable one that the user wants in their search results. Also, the algorithm checks based on some other factors like relevance, authenticity, credibility, spam before determining importance.

It was first started by Larry Page in his university for determining how important a research paper is. if more other papers cited a paper then that paper has higher importance and that is one he is looking for. Page ranking works in a similar fashion by counting the number and quality of links directing to a page to roughly determine the importance of a website, assuming that more important websites are likely to receive more links from external websites. In Layman's terms page rank is the vote of all other websites about how important a website is. If a website links to another external site then it is simply voting for that website and a website receiving links then it is being voted from others. In technical terms, Page Rank(PR) is an analysis algorithm that assigns a numerical weighting to each element of hyperlinked documents on the web with the sole purpose of measuring the relative importance. This numerical weight is referred to as PR or Page rank. This represents the likelihood of a user randomly clicking on links. Having the highest page ranking, a website will be the first result to be shown in case of a relevant search done by the user.

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Example:

Let us assume in a situation where a user searches the book "A Brief History of Time" by Stephen Hawking. Consider the following websites like "amazon.com", "astroboy.com", "flipkart.com", "booky.com", "originalreviewer.com".

Let us assume the book the user wanted to buy was reviewed by many websites that routinely review books and suggest their users the best place to buy that book at the best price like "amazon.com". If other articles and blogs of famous reviewers recommend "amazon.com" by dropping a link for that on their website. Also, it is indirectly linked by other websites as they are linked to the websites of these review websites. Since many websites link to "amazon.com" it's weight or PageRank increases making it more important and relevant to the user. Hence when the user searches the book in the search engine the first result that is most likely to come up will be "amazon.com".

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Domain Name Server (DNS):

DNS stands for Domain Name System/Server. It's a decentralized naming system for computers, services, or any resource connected to the internet or a private network. DNS translates human-readable domain names (like www.example.com) into IP addresses (like 192.0.2.1) that computers understand and use to locate resources on the network.

Imagine if you had to remember the IP address of every website you visit - it would be incredibly challenging! Instead, DNS provides a hierarchical and distributed database that maps domain names to IP addresses, making it much easier for users to access websites and services.

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DNS operates through a network of servers distributed worldwide. These servers work together to resolve domain names to IP addresses quickly and efficiently. When you type a domain name into your web browser or click on a link, your device sends a DNS query to a DNS resolver, which then searches the corresponding IP address and returns it to your device. It is connecting with the default port no.: 53. This process happens behind the scenes, usually in a fraction of a second, allowing you to access websites and services with ease.

E-commerce:

//S Rajkumar

E-commerce, short for electronic commerce, refers to the buying and selling of goods and services over the internet. It involves conducting business transactions electronically, typically through online platforms such as websites and mobile apps. E-commerce encompasses a wide range of activities, including online retail, electronic payments, online auctions, digital supply chain management, and more.

In e-commerce, businesses and consumers interact virtually, without the need for physical storefronts or face-to-face interactions. Customers can browse products, make purchases, and arrange for delivery or pickup, all from the comfort of their homes or wherever they have internet access. Likewise, businesses can reach customers beyond their local markets and engage in cross-border trade, expanding their reach and customer base.

E-commerce has transformed the way businesses operate and how consumers shop, offering convenience, accessibility, and a global marketplace. It has become an integral part of the modern economy, shaping the way goods and services are bought and sold worldwide. The HTTPs is used in the e-commerce sites to facilitate the secure business.

Common e-commerce models: **//S Rajkumar**

1. Business-to-Consumer (B2C):

In B2C e-commerce, businesses sell products or services directly to consumers.

Examples include online retail stores like Amazon, Walmart, and Best Buy, as well as subscription services like Netflix and Spotify.

2. Business-to-Business (B2B):

B2B e-commerce involves transactions between businesses, where one business sells products or services to another business.

Examples include wholesale marketplaces, cloud services for businesses, and online procurement platforms.

3. Consumer-to-Consumer (C2C):

C2C e-commerce facilitates transactions between individual consumers.

Examples include online auction sites like eBay, classified ads platforms like Craigslist, and peer-to-peer marketplaces like Airbnb.

4. Consumer-to-Business (C2B): **//S Rajkumar**

C2B e-commerce occurs when individual consumers sell products or services to businesses.

Examples include freelance marketplaces like Upwork and Fiverr, where individuals offer their skills and services to businesses.

5. Business-to-Government (B2G):

B2G e-commerce involves businesses selling products or services to government agencies or departments.

Examples include government procurement portals and online licensing services.

6. Direct-to-Consumer (DTC):

DTC e-commerce refers to brands selling their products directly to consumers, bypassing traditional retail channels.

Warby Parker is an eyewear company that sells prescription glasses, sunglasses, and other eyewear accessories directly to consumers through its website.

Examples include digitally native brands that sell their products online and control the entire customer experience, from manufacturing to distribution.

7. Subscription-based Model: **//S Rajkumar**

This model involves offering products or services to customers on a subscription basis, where they pay a recurring fee for access.

Netflix offers a vast library of movies, TV shows, documentaries, and other content that users can stream on-demand for a monthly subscription fee.

Examples include subscription boxes, streaming services, and software-as-a-service (SaaS) platforms.