NETWORKING

Topologies: The arrangement or layout of a computer network, defining how nodes (devices or computers) are interconnected and how data is transmitted between them.

.**Bus Topology**:

-All devices share a single communication line (bus).
-Data is transmitted to all devices, and the intended recipient recognizes and accepts the data.
-Simple design but may face issues if multiple devices attempt to transmit simultaneously.

.**Star Topology**:

-All devices are connected to a central hub or switch.
-Communication between devices is routed through the central hub.
-Centralized control simplifies management, but the failure of the central hub can affect the entire network.

.Ring Topology:

-Devices are connected in a closed-loop or ring.
-Data circulates in one direction through the ring until it reaches the intended recipient.
-Reliable and predictable but can face challenges if a single device or connection fails.

.**Mesh Topology**:

-Each device is connected to every other device in the network.
-Offers redundancy and multiple paths for data transmission, increasing reliability.
-Complex and expensive to implement but provides high fault tolerance.

.**Hybrid Topology**:

-Combines two or more different types of topologies within a single network.
-Offers flexibility to meet specific needs, combining advantages of different topologies.
-Requires careful design and planning.

.**Tree Topology**:

-Hierarchical structure resembling an inverted tree, with a root node and branches.
-Often used in wide area networks (WANs) where a central hub connects to smaller subnetworks.
-Balances the advantages of star and bus topologies.

Computer Network: A set of interconnected computers that communicate with each other and share resources, using wired or wireless connections

Protocol: A set of rules and conventions that govern how data is transmitted and received between devices. These rules define the format, timing, sequencing, and error checking of data exchanged between computers or other devices on a network.

Internet: A global network of interconnected computer networks that use standardized communication protocols.

Search engines: A software system designed to retrieve information from the internet or a database based on user queries or keywords. They use Crawling (generations of new URLS), Indexing (The collection of information in an organized manner), and Ranking (The selection of URLS based on relevance).

Browser: A software application used for accessing and navigating the World Wide Web. Its primary function is to retrieve and display web pages from websites (HTML files).

Email: A communication method that uses electronic devices to deliver messages across computer networks.

Social Networking: Online platforms that enable individuals and groups to connect, communicate, and work together in a virtual environment.

Ecommerce: The buying and selling of goods and services over the internet.

CIA: A fundamental concept in security, ensuring that sensitive information is protected from unauthorized access, data remains unaltered by unauthorized parties, and systems and data are consistently available even during adverse conditions.

Threat: Potential security harm to an asset.

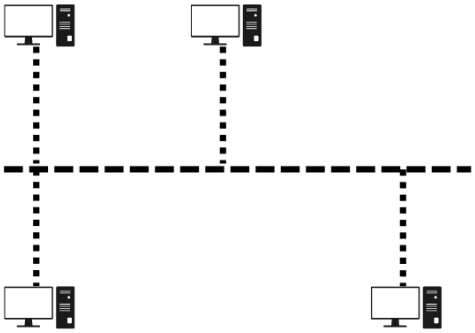
Vulnerability: A weakness or flaw in a system that exposes it to the risk of unauthorized access, data modification, or unavailability, compromising the integrity, confidentiality, and availability of the system.

IP Address: An IP address, or Internet Protocol address, is a numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication. IP addresses serve two main purposes: identifying the host or network interface and providing the location of the host in the network.

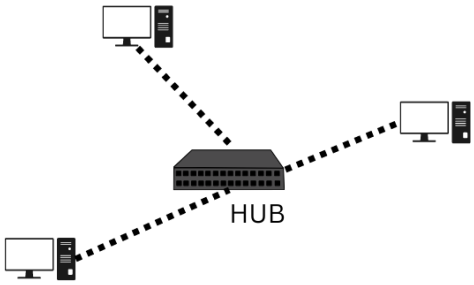
Subnetwork: A logical division of an IP network into smaller, more manageable segments. It involves dividing a larger IP network into smaller, more manageable segments, known as subnets, by allocating a portion of the original network IP address space to each subnet.

Router: A network device that connects different networks together and directs data traffic between them.

Switch: Connects multiple devices within the same network and facilitates the efficient communication of data between them.

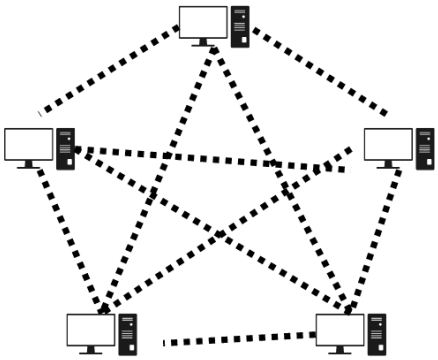


BUS

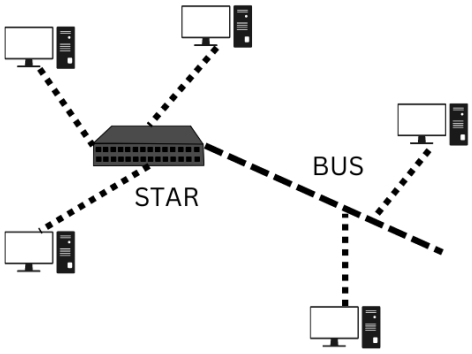


STAR

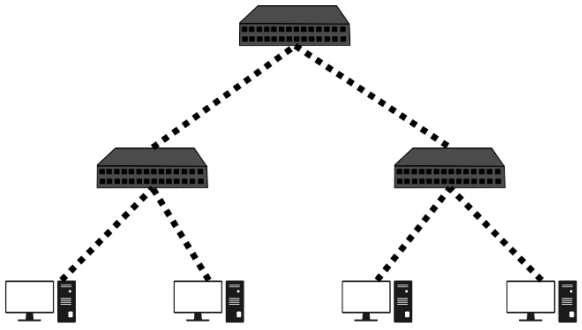
RING



MESH



HYBRID



TREE

PROMPT ENGINEERING

Prompt : The input or instruction provided to a language model to generate a specific response.

Language Model: A language model is a type of artificial intelligence (AI) model that is trained on vast amounts of textual data to understand and generate human-like language.

Applications of Language Model:

.**Text Generation**: Creating coherent and contextually relevant text.

.**Machine Translation**: Translating text from one language to another.

.**Text Summarization**: Generating concise summaries of longer texts.

.**Question Answering**: Providing relevant answers to user queries.

.**Chatbots**: Enabling natural language interactions in conversational agents.

Prompt Engineering: Prompt engineering refers to the practice of designing and refining the input prompts given to a language model or conversational system to achieve desired outputs.