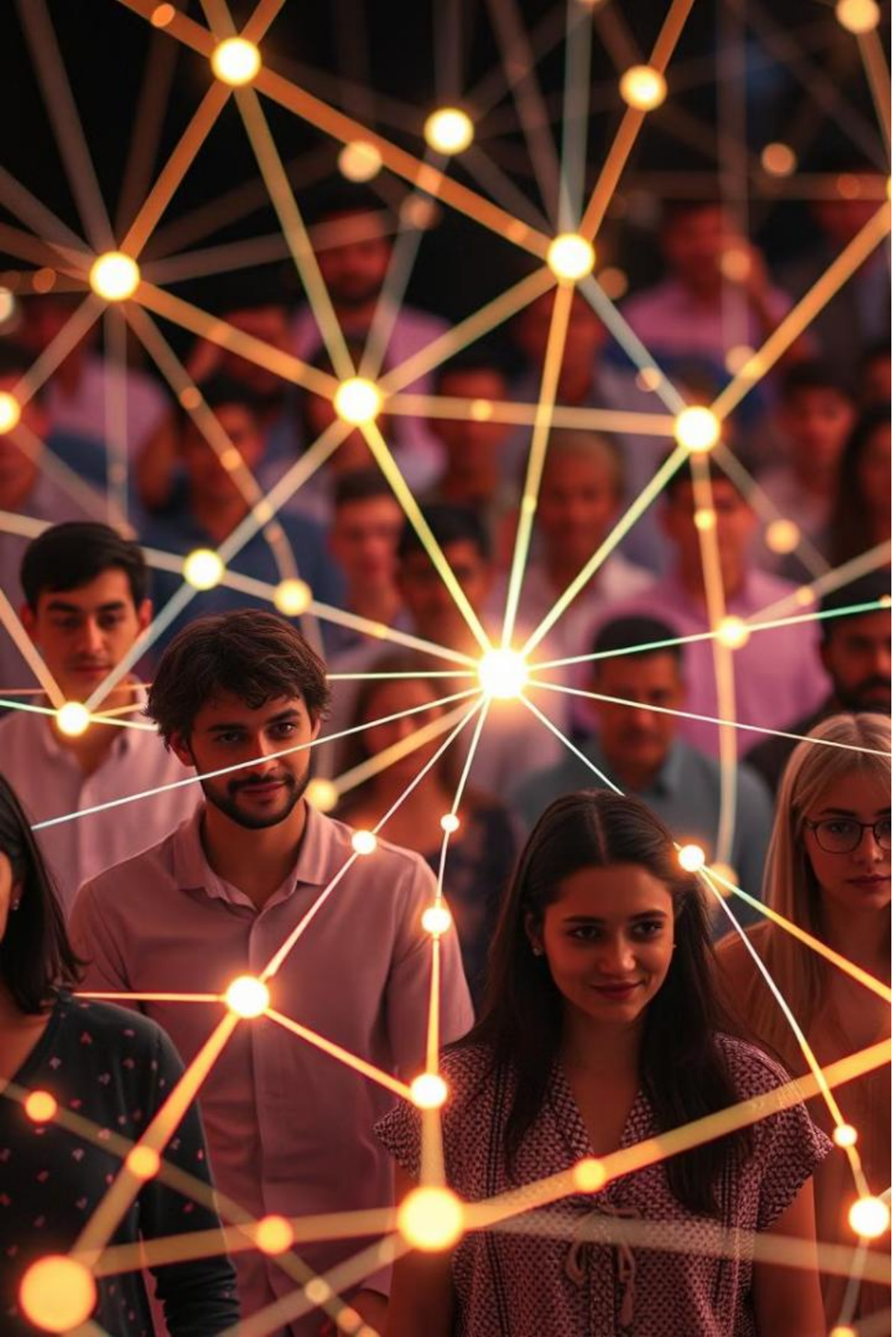


Computer Networks

Computer networks are systems of interconnected devices that allow for the exchange of data and communication between users and devices. They enable the sharing of resources, collaboration, and access to a wide range of information and services.

by John Rib A. Cananga

Types of Computer Networks

Local Area Network (LAN)

A LAN connects devices within a small geographic area, such as a home, office, or school.

Wide Area Network (WAN)

A WAN spans a large geographical area, such as a country or continent, and connects multiple LANs.

Wireless Network

Wireless networks use radio waves to connect devices, allowing for greater mobility and flexibility.

Network Topologies

1 Bus Topology

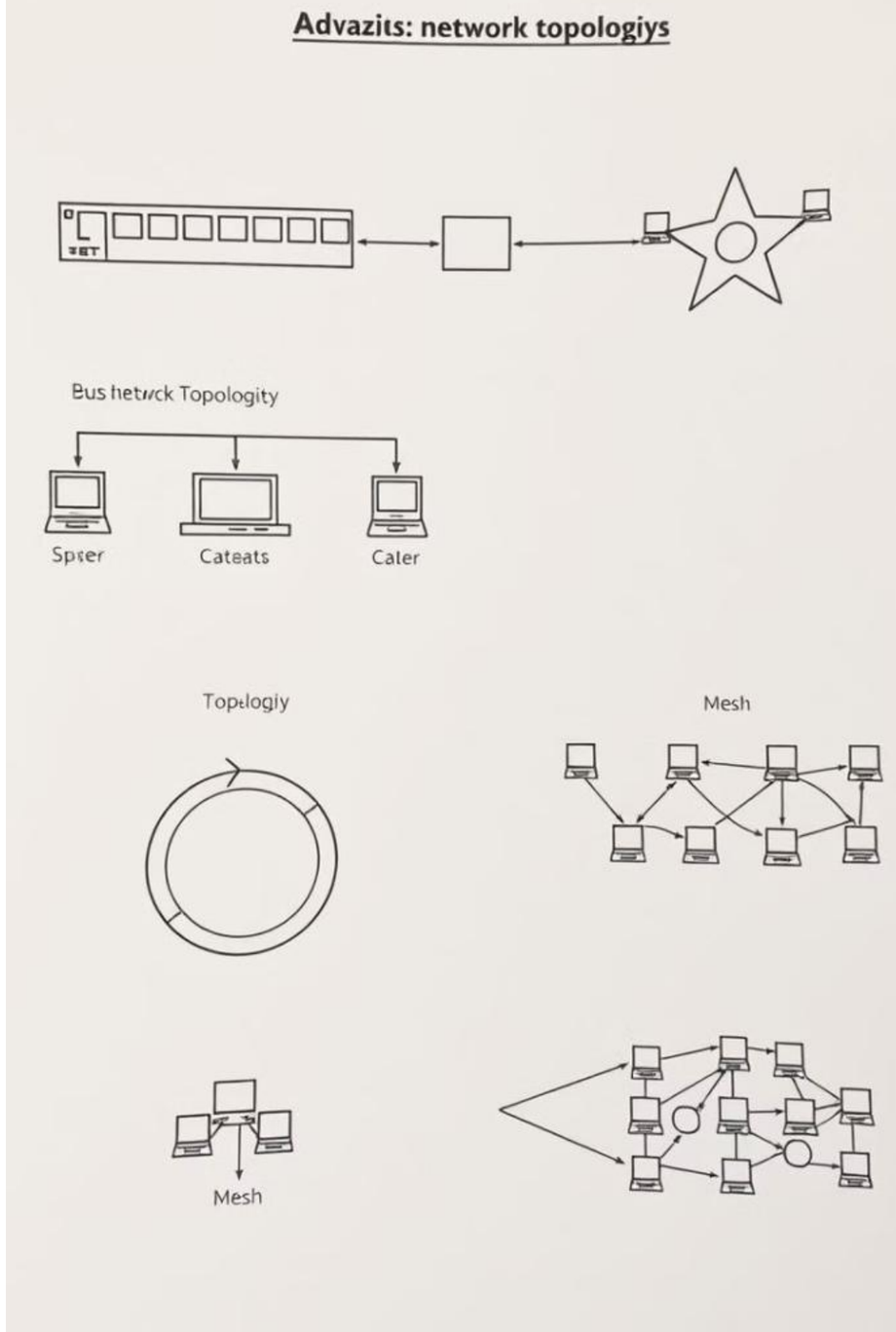
All devices are connected to a single cable or backbone, creating a linear structure.

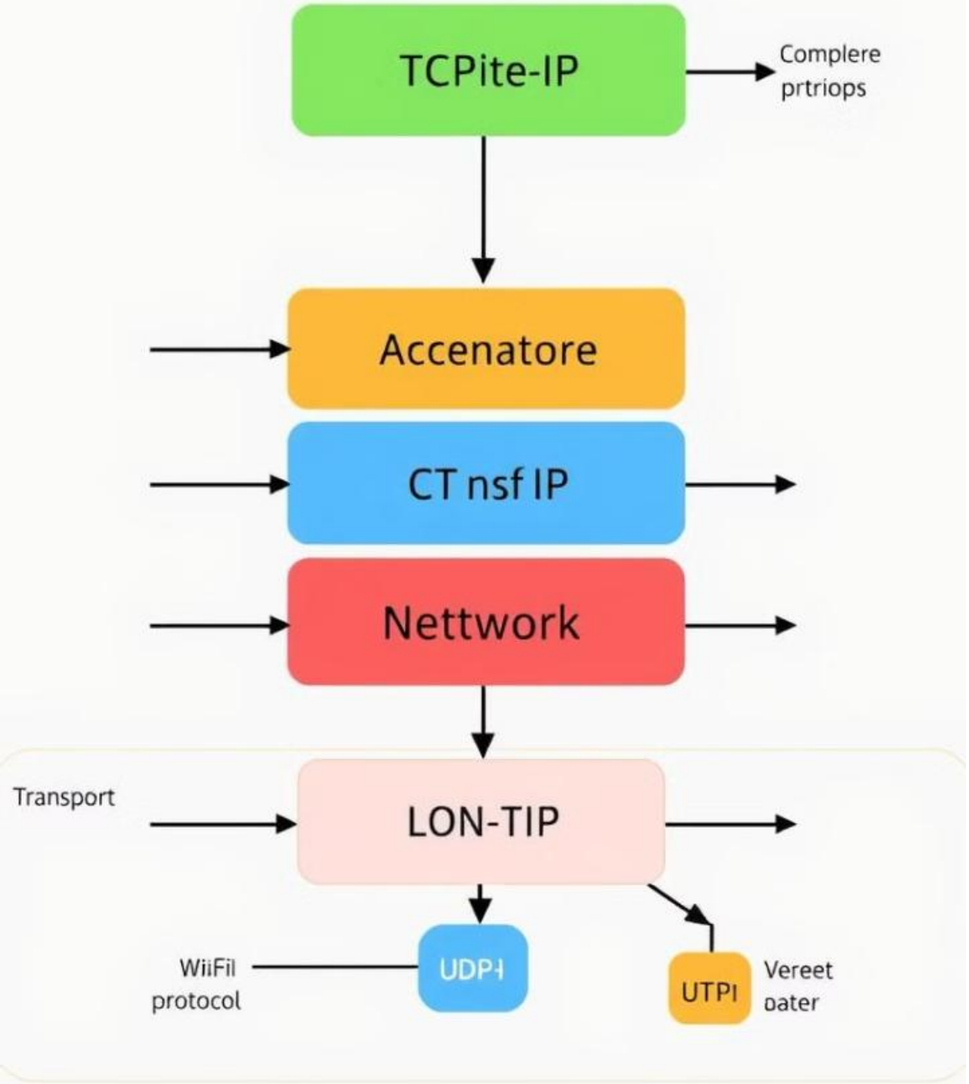
2 Star Topology

Devices are connected to a central hub, which controls and manages the network.

3 Mesh Topology

Devices are interconnected, allowing for multiple paths for data to travel.





Network Protocols and Standards

1 TCP/IP

The fundamental protocol suite that enables communication on the internet and other networks.

2 Ethernet

A widely used protocol for local area networks, defining how data is transmitted and accessed.

3 Wi-Fi

A wireless networking protocol that allows devices to connect to a network without cables.

Network Hardware Components

Router

Connects and directs traffic between networks, enabling communication between devices.

Switch

Connects devices within a local area network, facilitating data exchange between them.

Modem

Converts digital data into a form that can be transmitted over analog telephone lines.

NIC

Allows a device to connect to a network, providing a physical and logical interface.

Network Software and Services

Web Browsers

Enable users to access and navigate the World Wide Web, retrieving and displaying web content.

Email Clients

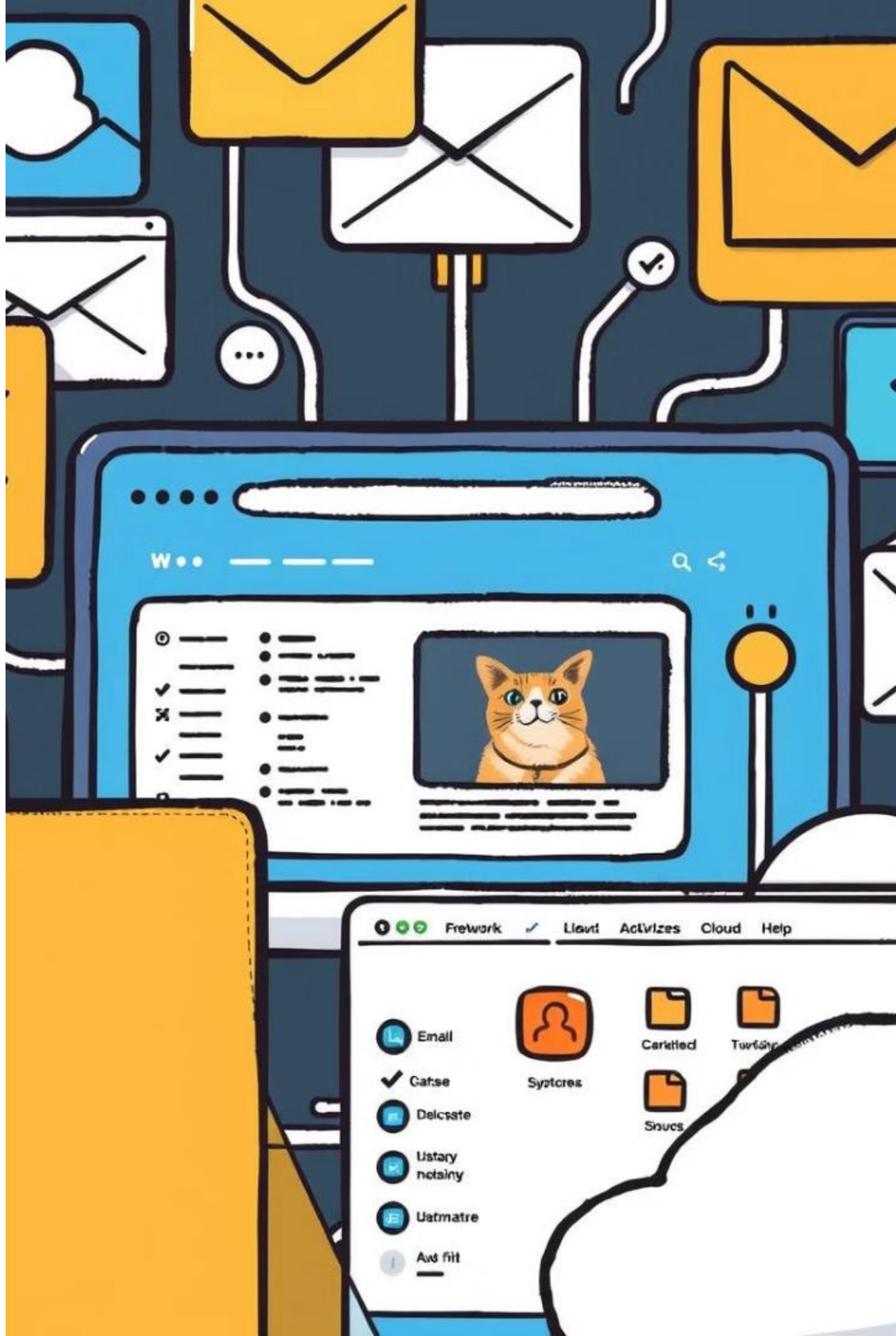
Facilitate the sending, receiving, and management of electronic mail messages over a network.

Cloud Storage

Allows users to store and access their data on remote servers, accessible from any device.

Collaboration Tools

Enable real-time collaboration, file sharing, and communication among users on a network.



Network Security Considerations

1

Firewalls

Protect networks by monitoring and controlling incoming and outgoing traffic based on defined security rules.

2

Encryption

Ensures the confidentiality of data by converting it into a secure, unreadable format during transmission.

3

Authentication

Verifies the identity of users, devices, or systems to grant them access to network resources.

The Future of Computer Networks

1 5G Technology

Faster, more reliable, and higher-capacity wireless networks, enabling new applications and services.

2 Internet of Things (IoT)

Interconnected devices and sensors that collect and share data, transforming how we live and work.

3 Cloud Computing

Increased reliance on remote servers and data centers for computing power and storage.