

CHAPTER ONE

Introduction to Computing Environment

Module Name: ICT Tools and Digital Media
Lecturer: Mrs Shameera Lauthan



Introduction to different parts of a computer and how they work by Shameera Lauthan is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/).

PREVIEW AND OBJECTIVES

- Analyse the various parts of a computer system and what each does.
- Differentiate between input and output devices.
- Distinguish among the various types of networks that exist (LAN/MAN/WAN).
- Explain what the Internet is and distinguish among the different browsers.

DEFINITION OF A COMPUTER

- By definition, a computer is an **electronic device** that inputs data, processes data(converting it into information that is useful to people), outputs and stores information.
- Computers are controlled by **programmed instructions** that transform the data into meaningful information.
- Generally, a Computer is a **device** that accepts **input**, **processes** it, **stores** data, and produces **output**.



INFORMATION PROCESSING CYCLE

Input

Information provided to the computer by a person, the environment, or another computer

- Words and symbols
- Numbers and pictures
- Audio signals
- Sensor data

Storage

Preserving data and information for future use

Processing

Manipulation of data through:

- Arithmetic calculations
- Sorting lists
- Modifying pictures
- Drawing graphs

Output

Results produced after processing:

- Images on monitor
- Printed documents
- Sounds
- Signals to devices





Computer Uses

Personal & Home

- Shopping online
- Gaming with others
- Working from home
- Entertainment (music, videos)
- Communication (emails, chats)

Business

- Managing large databases
- Resource tracking
- Remote meetings
- Information management
- Global communication

Educational

- Online research materials
- Quick correspondence
- Research data analysis
- Distance learning

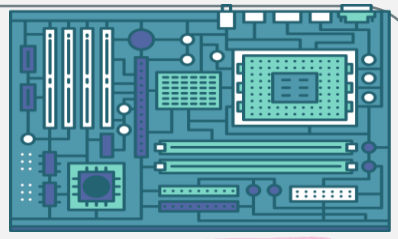
Essential Computer Hardware



Processor

The brain of the computer that organizes and carries out instructions

- Central Processing Unit (CPU)
- Manipulates data
- Most computers have several processors



CPU

Motherboard

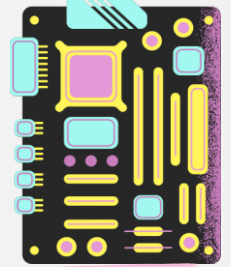
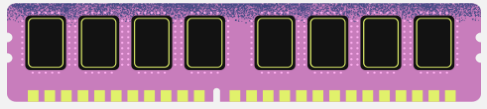
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Memory

Stores data temporarily or permanently

- RAM: Volatile, temporary storage
- ROM: Non-volatile, permanent storage



RAM

ROM

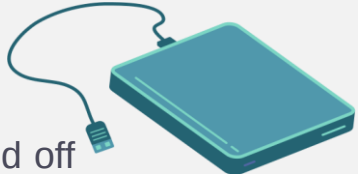
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Storage

Holds data permanently, even when powered off

- Hard drives, SSDs
- Optical media, flash drives



Hard Drive

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Input/Output

Devices that allow data to enter or exit the system

- Input: keyboard, mouse, scanner
- Output: monitor, printer, speakers



Input devices

Output devices

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PERIPHERALS

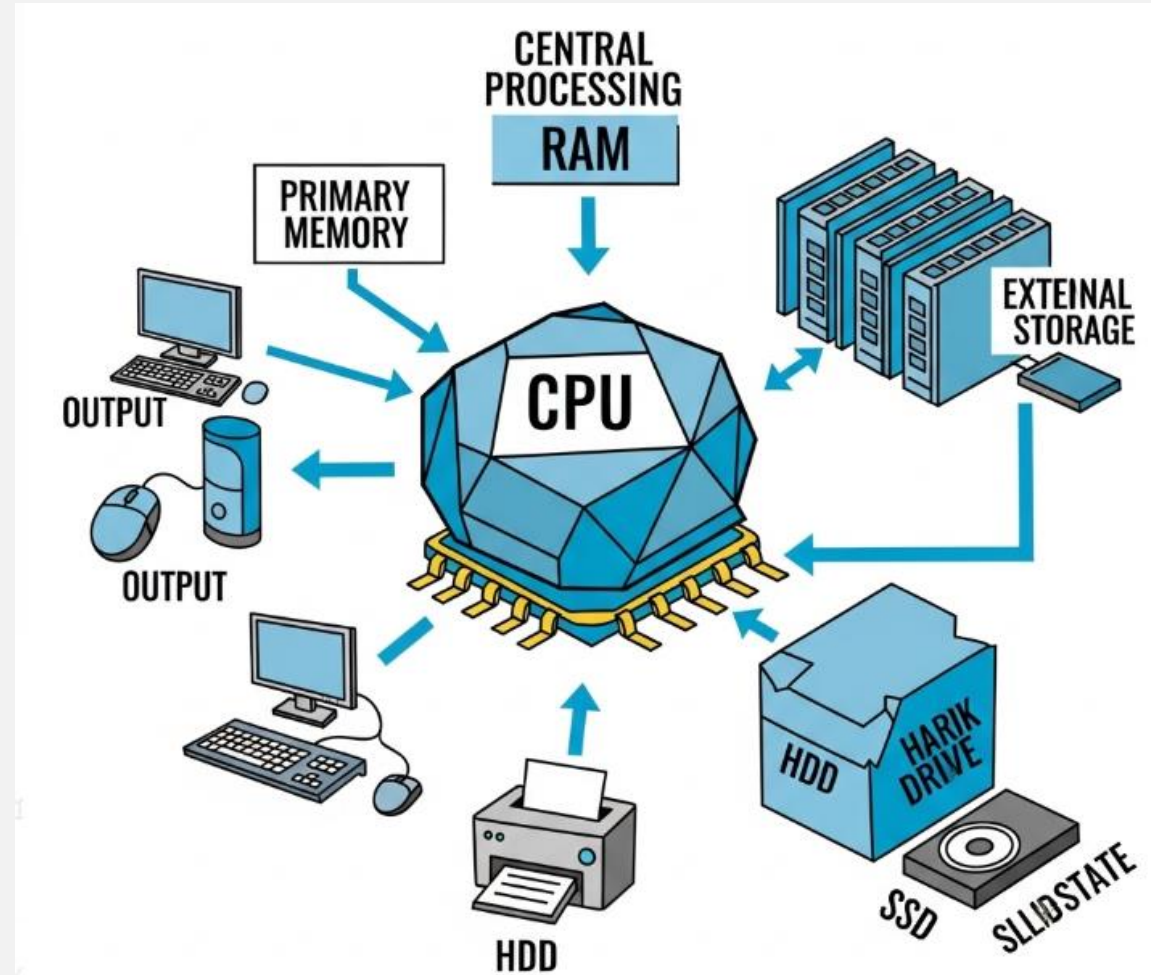
- A **peripheral device** designates equipment that might be added to a computer system to enhance its functionality.
- Examples:
 - Printer
 - Digital camera
 - Scanner
 - Joystick



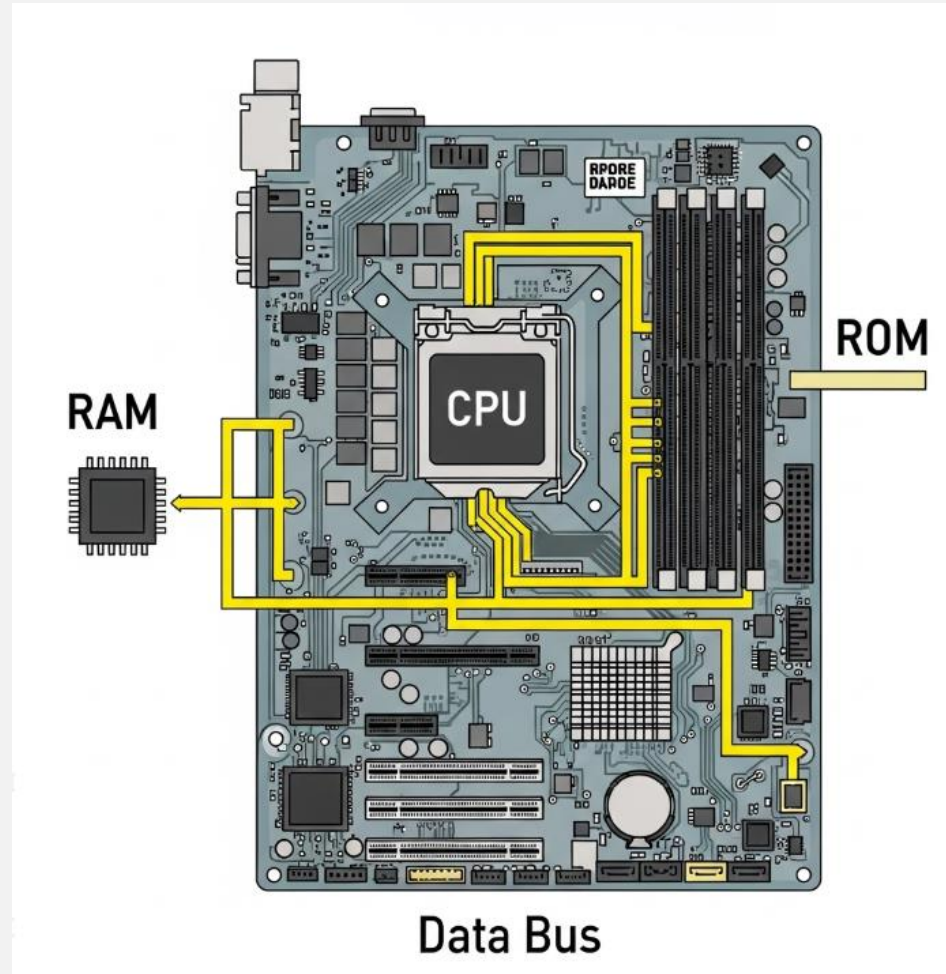
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ESSENTIAL COMPUTER HARDWARE

- A computer's hardware devices falls into one of the four categories;
 1. Processor
 2. Memory
 3. Input and Output
 4. Storage



POSITION OF RAM AND ROM ON THE MOTHERBOARD

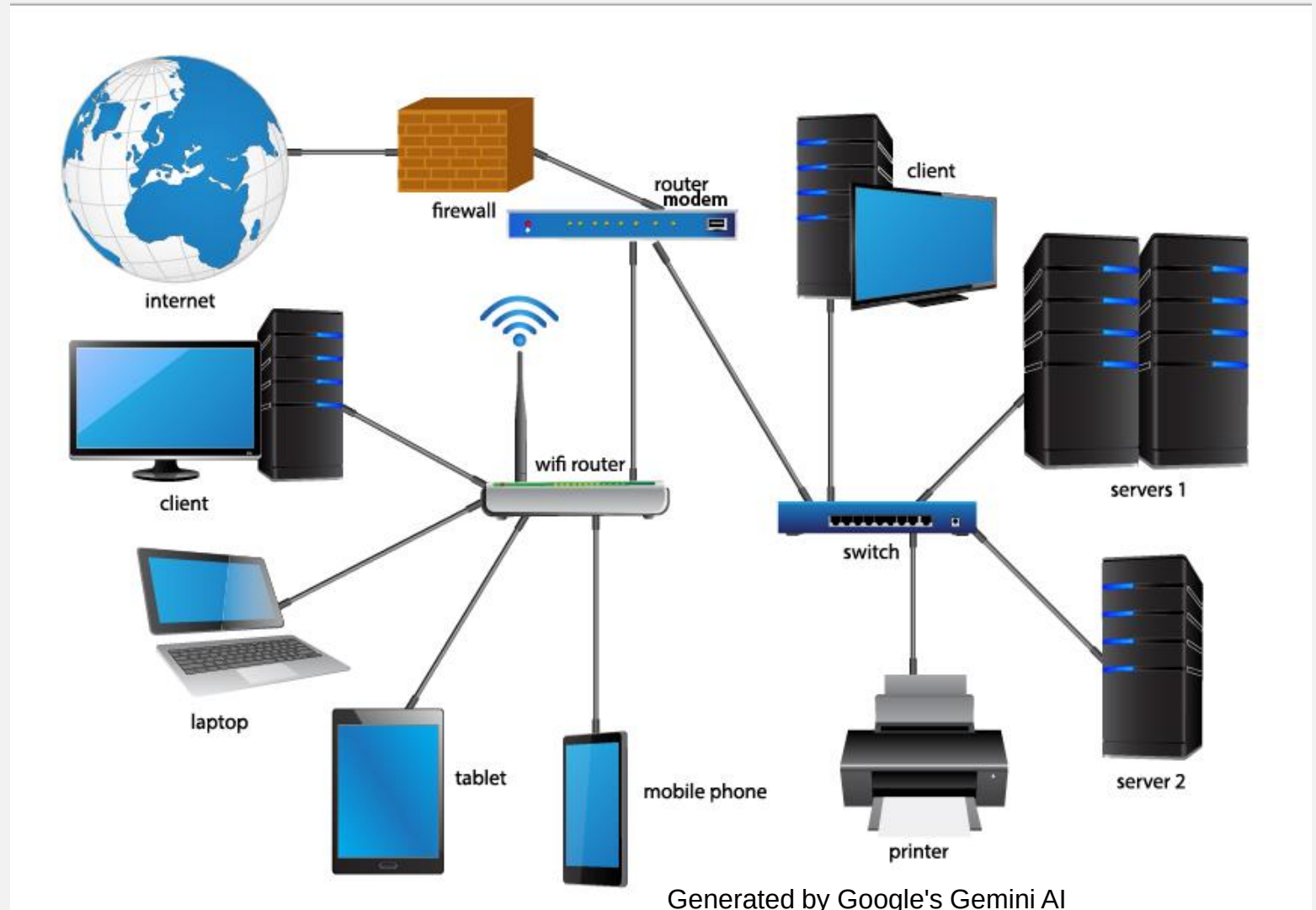


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What is a computer network?

A SET OF COMPUTERS CONNECTED TOGETHER FOR SHARING INFORMATION & RESOURCES

A **computer network** is a set of computers sharing resources located on or provided by network nodes. The computers use common communication protocols over. Collection of autonomous computers interconnected by a single technology. Two computers are set to be interconnected if they are able to exchange information. Connection can be through a **copper wire, fibre optics, microwaves, infrared or satellite.**



Computer Networks

A **computer network** is a set of computers connected together for sharing information and resources.

Computers are interconnected if they can exchange information through

- Copper wire
- Fibre optics
- Microwaves
- Infrared
- Satellite



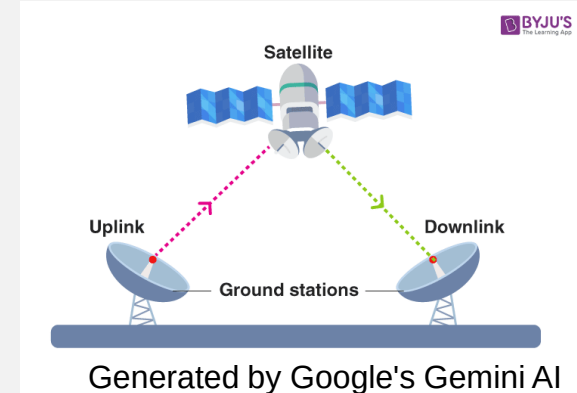
Copper wire



Fibre optics



By Tony Webster from Minneapolis, Minnesota - Microwave tower in the Mojave National Preserve, California, CC BY-SA 2.0, <https://commons.wikimedia.org/w/index.php?curid=54799825>



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Benefits of Networks:

Information sharing: Access and share information and data between authorized users

Hardware sharing: One device connected to a network can be shared by many users

Software sharing: Programs can be installed on a server and accessed by all users



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TYPES OF NETWORKS

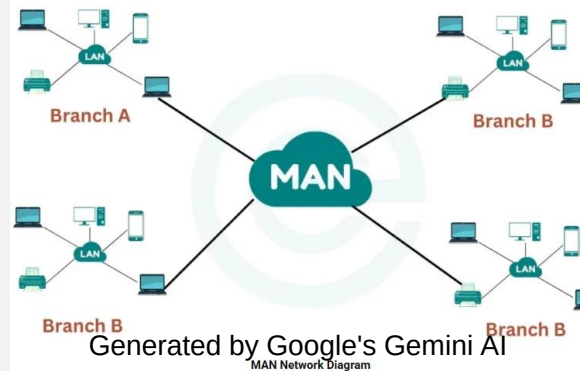
Local Area Network (LAN)

- Geographically close together (room, building)
- High-speed data transfer (100 Mbps to gigabit)
- Range: 1-10 km
- Low implementation cost
- Types: Wired LAN and Wireless LAN



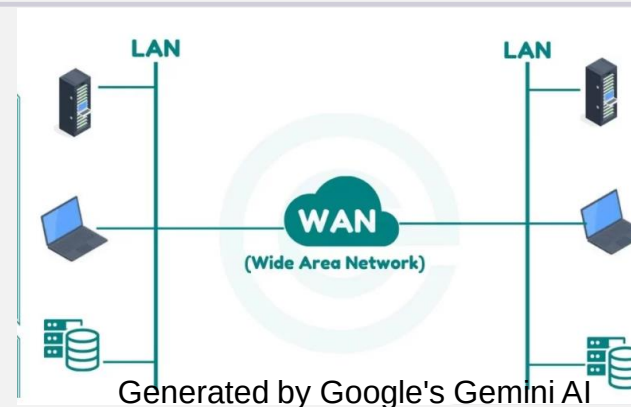
Metropolitan Area Network (MAN)

- Extends over an entire city
- May be a single network like cable TV
- Uses distributed queue dual bus
- Range: within 100 km



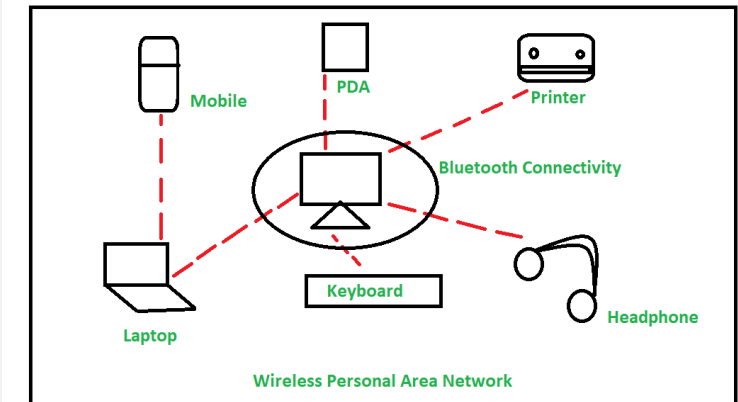
Wide Area Network (WAN)

- Covers large geographical areas
- Connects businesses over long distances
- Range: Beyond 100 km
- Uses unguided media
- More expensive to implement

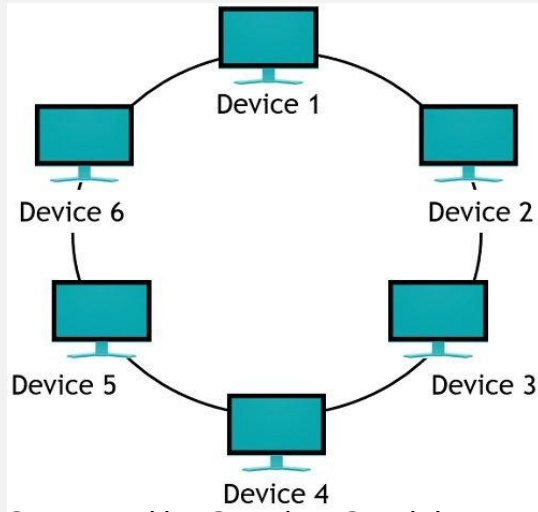


Personal Area Network (PAN)

- Covers a small geographical area
- Connects personal devices (e.g., smartphone to headphones)
- Range: Within 10 meters (approx. 33 feet)
- Uses both guided (e.g., USB) and unguided (e.g., Bluetooth) media
- Less expensive to implement (often built into devices)



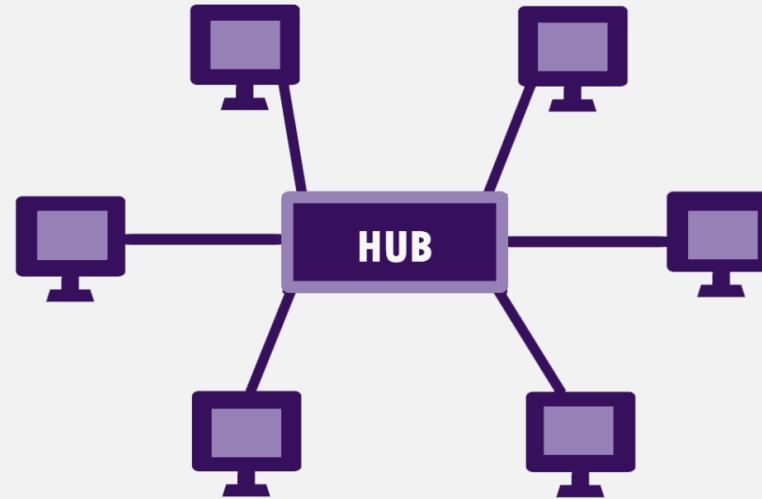
LAN Topologies



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Ring Topology

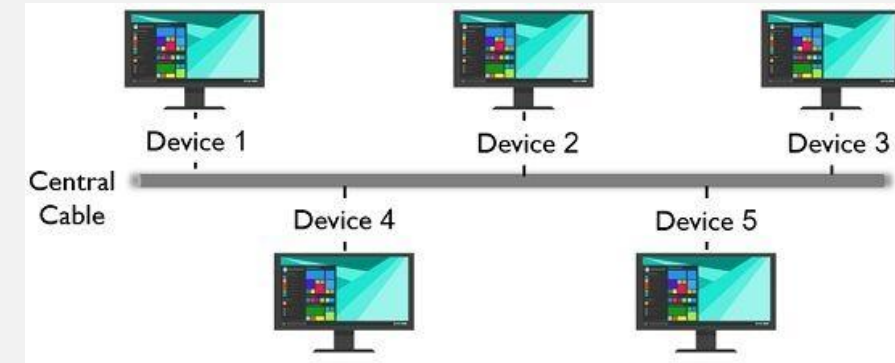
Each node connects to exactly two others, forming a single pathway for signals that resembles a ring.



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Star Topology

Devices connect to a central hub or controller. Messages must pass through a central point rather than being transmitted directly between devices.



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Bus Topology

All devices connect to a common link called the bus. Each node receives all network traffic. Requires less cabling, but cable failure affects the entire network.

[Link to Assignment on Evolution of Computers](#)