

TELECOMMUNICATION

FUNDAMENTALS COMPONENTS:

- ❖ Devices.
- ❖ Networks.
- ❖ Switching Systems.
- ❖ Transmission Media.
- ❖ Protocols.
- ❖ Services
- ❖ Infrastructure.

The components work together to enable the efficient and reliable communication over distances ,forming the foundation of modern telecommunication.

1.Devices: Phones, computers, smartphones, tablets, etc. that enable communication.

2. Networks: Physical infrastructure (wired or wireless) that connects devices, enabling communication. Examples include:

- Public Switched Telephone Network (PSTN)
- - Internet Protocol (IP) networks
- - Cellular networks
- - Wi-Fi networks

3.Switching Systems: Devices or software that connect and manage multiple networks, directing traffic between them. Examples include:

- Telephone exchanges -
- Routers
- Switches

4. Transmission Media: Channels through which data is transmitted, such as:

Copper wires

Fiber optic cables

Radio waves (wireless)

5. **Protocols:** Standardized rules governing data transmission and communication, such as:

- TCP/IP (Internet Protocol)
- HTTP (Hypertext Transfer Protocol)
- SMTP (Simple Mail Transfer Protocol)

6. **Services:** Applications and features enabled by telecom infrastructure, including:

Voice calls

Data transmission (internet)

Messaging (SMS, email)

Video conferencing

7. **Infrastructure:** Supporting elements, such as:

- Power supplies
- Cooling systems
- Physical structures (towers, buildings).

EVOLUTION OF TELECOM:

- ❖ **1G**-Voice Calling.
- ❖ **2G**-SMS,MMS.
- ❖ **3G**-Interenet,Emails,Videos.
- ❖ **4G**-Interenet,Application,Photos ,Apps
- ❖ **5G**-Massive broadband and Internet of things

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1. **Smoke signals** (ancient times): People used smoke to convey messages over long distances.
2. **Messengers** (ancient times): Runners or riders delivered messages by hand.
3. **Telegraph** (1837): Messages sent through wires using Morse code.
4. **Telephone** (1876): Voice calls over wires (landline).
5. **Radio** (1895): Wireless voice and music transmission.
6. **Television** (1927): Visual broadcasting.
7. **Satellite communication** (1960s): Signals sent via space satellites.
8. **Mobile phones** (1973): Wireless voice calls (cellular networks).
9. **Internet** (1983): Global network for data transmission (online).
10. **Broadband** (1990s): High-speed internet access.
11. **Social media** (2000s): Online platforms for communication and sharing.
12. **4G/5G networks** (2010s): Faster mobile data and voice connectivity.