Title: Bluetooth – Connecting Wireless Peripherals

Presented By

Iffate Jahan Nilima
ID : IT-21063
Session : 2020-21
Dept. of ICT,MBSTU

Supervised By

Dr. Nazrul Islam

Associate Professor
Dept. of ICT,MBSTU

TABLE OF CONTENTS

INTRODUCTION

Bluetooth is a short-range wireless communication technology used to connect devices like headphones, keyboards, mouse and speakers without cables.

HISTORY

- The idea of Bluetooth came from Dr. Jaap Haartsen at Ericsson in 1994.
- It was created to replace short data cables with wireless communication.
- The name “Bluetooth” comes from a 10th-century Viking king, Harald “Bluetooth” Gormsson, known for uniting Denmark and Norway — just like Bluetooth unites devices.
- The first Bluetooth-enabled devices appeared around 1999–2000 (headsets, phones, laptops).
- Today, Bluetooth is managed by the Bluetooth Special Interest Group (SIG) and used in billions of devices worldwide.

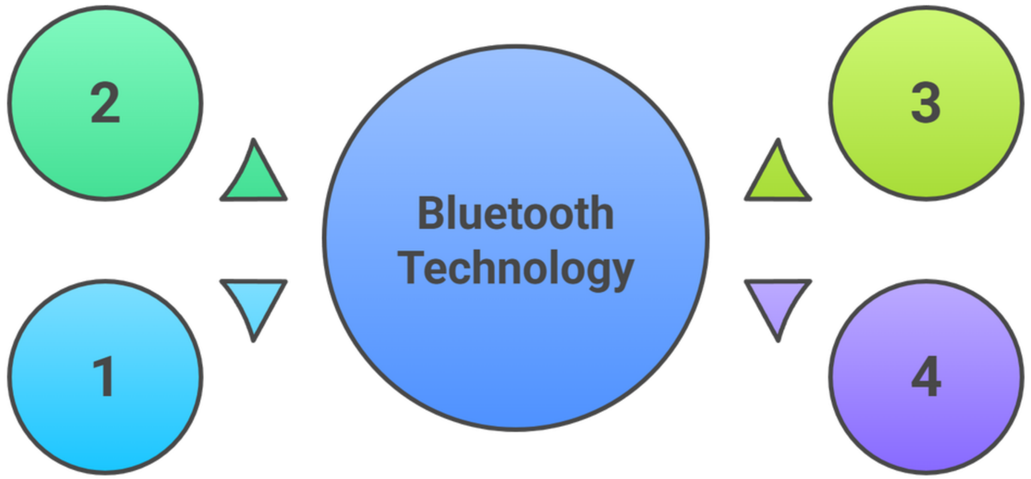
KEY FEATURES:

Range

Operates effectively up to 10 meters

Radio Waves

Uses 2.4 GHz frequency for communication



Power Consumption

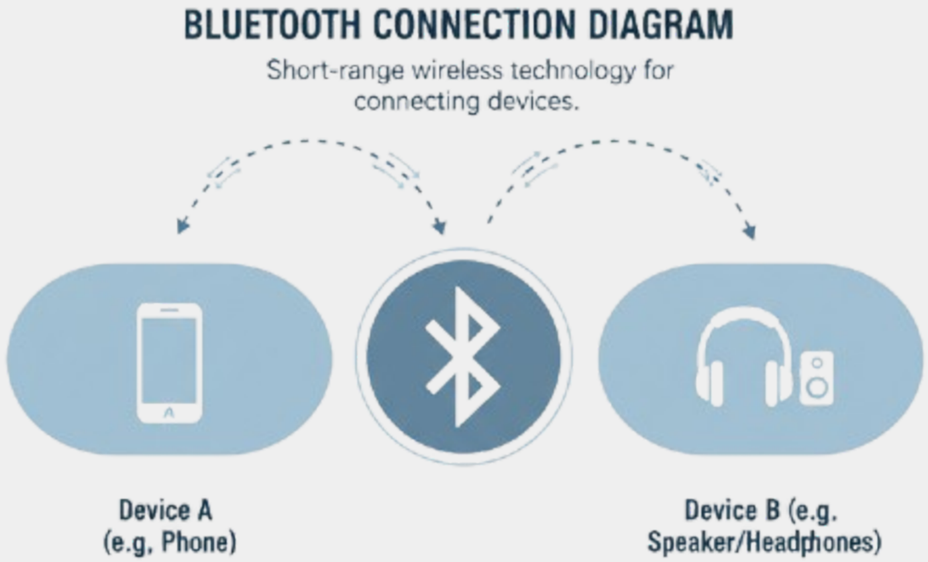
Consumes low power, suitable for portable devices

Device Support

Connects multiple devices simultaneously

HOW BLUETOOTH WORKS

- Bluetooth uses short-range radio waves instead of wires to connect devices.
- When two Bluetooth-enabled devices are close, they detect each other, pair securely, and start sharing data.
- It works on the 2.4 GHz frequency band and uses frequency hopping to avoid signal interference.
- Once connected, the devices form a small network called a piconet, where one acts as the main device and the others as connected devices.



APPLICATIONS

Audio & Entertainment:
Connects wireless headphones, earbuds, and speakers for music and calls.

Computer & Mobile Accessories:
Used in keyboards, mice, game controllers, and printers to remove cable clutter.

Automotive Systems:
Enables hands-free phone calls, audio streaming, and smart dashboard control in modern cars.

Healthcare & Fitness:
Links smartwatches, fitness bands, heart-rate monitors, and medical sensors to mobile apps.

COMPARISON WITH OTHER TECHNOLOGIES

Feature	Bluetooth	Wi-FI	Infared (IR)
Range	~10 meters	Up to 100 meters	Very short (line of sight)
Speed	Moderate (up to 2 Mbps)	High (up to 1 Gbps)	Very slow
Power Use	Low	Hight	Very Low
Use Case	Headphone,Keyboard	Internet Access,Data sharing	Tv remote,simple transfer

ADVANTAGES

- **Wireless freedom**: No need for tangled cables between devices.
- **Energy-efficient**: Consumes very little power — ideal for portable gadgets.
- **Universal compatibility**: Works across phones, laptops, cars, and IoT devices.
- **Easy connection**: Simple pairing and automatic reconnection once paired.
- **Secure communication**: Uses encryption to protect data transfer.

LIMITATIONS

- **Short range:** Usually up to 10 meters only.
- **Slower speed:** Not suitable for large-file transfers.
- **Signal interference:** Can be affected by Wi-Fi or other wireless devices.
- **Device dependency:** Both devices must support the same Bluetooth version.

THE FUTURE OF BLUETOOTH

- New versions like Bluetooth 5.0 and 5.3 offer faster speed and longer range.
- It can now connect multiple devices at once, such as two headphones.
- Plays a major role in IoT, smart homes, and wearable technology.
- Helps connect healthcare, automotive, and industrial devices more efficiently.

CONCLUSION

Bluetooth helps us connect different devices easily without using any wires. It works fast, saves energy, and keeps data safe while sharing. Today it is used in headphones, smartwatches, cars, and many other gadgets. As technology improves, Bluetooth is becoming even better, making our daily life smarter and more connected.

THANK YOU