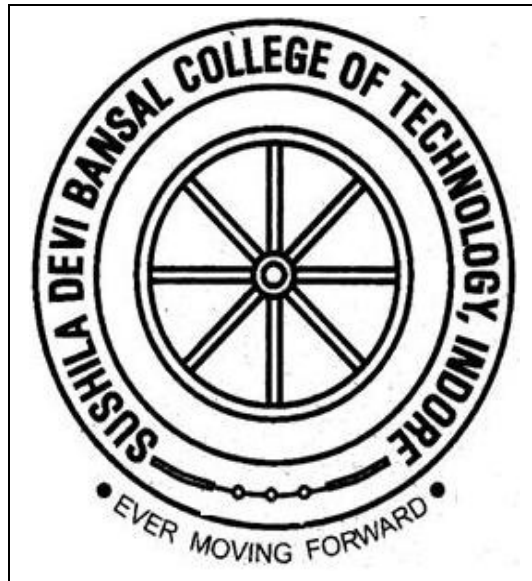


# Sushila Devi Bansal College Of Technology, Indore



Session 2008-09

Seminar Report On:

**BLUETOOTH**

**Submitted to:**

**Submitted by:**

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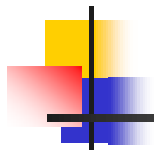
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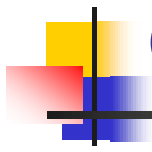
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- How to creates connection ?
- How a Bluetooth transfer data?



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# INTRODUCTION

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## **What actually Bluetooth technology is?**

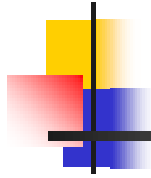
- It isn't some strange form of tooth decay as you might initially imagine. Bluetooth is the name of a technology that is now becoming commercially available. It promises to change significantly the way we use machines.
- Bluetooth technology is a wireless short-range communication system introduced to replace the cables connecting portable electronic devices.
- Bluetooth is a developing, world wide, open, short-range radio specification focused on communication between the Internet and Net devices, plus it defines communication protocols between devices and computers.



## The Name – Bluetooth?

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- Bluetooth was named after a 10<sup>th</sup> century king, Harald Bluetooth, king of Denmark & Norway.
- In 1994 Ericsson work on a wireless technology called Bluetooth. Since then many companies have adopted Bluetooth technology. Making it a small low power, low rate chip to wireless link.
- The Bluetooth logo merges the Germanic runes analogous to the modern Latin letter H and B: (for Harald Bluetooth) ᚼ (Hagall) and ᚱ (Berkanan) merged together, forming a bind rune.



## The Basic Idea

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- Bluetooth is a standard and communication protocol primarily designed for low power consumption.
- Communication within short range is possible via Bluetooth(power-class-dependent: 1m, 10m, 100ms).
- Bluetooth chip is designed to replace cables. Information normally carried by the cable, is transmitted at a special frequency to a receiver Bluetooth chip.


# How a creates connection ?

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For making a connection, a Bluetooth follows two procedures: -

- 1.) Inquiry (or Discovering) Procedure
- 2.) Paging (or Connecting) Procedure





## Inquiry (or Discovering) Procedure

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- Bluetooth enabled devices use the inquiry procedure to discover nearby devices or to be discovered devices in their locality.
- A Bluetooth enabled devices that tries to find other nearby devices is know as inquiry devices and actively send inquiry request.
- Bluetooth enabled devices in a piconet.  
**Piconet :** - It is a network in which upto eight Bluetooth enabled devices can be connected.





# REQUIREMENTS

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- **BLUETOOTH DEVICES:-** Bluetooth exists in many products, such as telephones, printers and headsets. The technology transfers data between two or more devices that are near each other in low-bandwidth situations. Bluetooth is commonly used to transfer sound data with telephones or byte data with hand-held computers.
- **COMPUTER REQUIREMENTS:-** A PC must have a Bluetooth adapter in order to be able to communicate with other Bluetooth devices (such as mobile phones, mice and keyboards). While some desktop computers and most recent laptops come with a built-in Bluetooth adapter, others will require an external one in the form of a dongle.
- **MOBILE PHONE REQUIREMENTS:-** A mobile phone that is Bluetooth enabled is able to pair with many devices. To ensure the broadest support of feature functionality together with legacy device support.



Class	Maximum Permitted Power <u>mW(dBm)</u>	Range (approximate)
Class 1	100 mW (20 dBm)	~100 meters
Class 2	2.5 mW (4 dBm)	~10 meters
Class 3	1 mW (0 dBm)	~1 meter
Version	Data Rate	
Version 1.2	1 <u>Mbit/s</u>	
Version 2.0 + EDR	3 <u>Mbit/s</u>	
<u>WiMedia Alliance</u> (proposed)	53 - 480 <u>Mbit/s</u>	



## How a Bluetooth transfer data ?

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- This networking transmit data via low power radio wave. The Bluetooth system is operating in the 2.4 GHz ISM (Industrial Scientific Medicine) band.
- It communicates on a frequency between 2.402 GHz to 2.480 GHz .
- It can connect up to eight devices simultaneously, with all of those devices in the 10 meter (32feet) radius, as each has it's own 48-bit address.
- It use a technique called spread spectrum frequency hopping that make it rare for more then one devices to be transmitting at the same time.



# Bluetooth security

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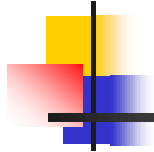
- In any wireless networking setup, security is a concern. Devices can easily grab radio waves out of the air, so people who send sensitive information over a wireless connection need to take precautions to make sure those signals aren't intercepted.
- With Bluetooth, though the automatic nature of the connection, which is a huge benefit in terms of time and effort, is also a benefit to people looking to send you data without your permission.
- It offers several security modes, and device manufacturers determine which mode to include in a Bluetooth-enabled gadget



# Bluetooth security

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- In almost all cases, Bluetooth users can establish "trusted devices" that can exchange data without asking permission. When any other device tries to establish a connection to the user's gadget, the user has to decide to allow it.
- Service-level security and Device-level security work together to protect Bluetooth devices from unauthorized data transmission. require that users make a conscious decision to open a file or accept a data transfer.



## BLUETOOTH Vs WI-FI

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- Bluetooth & Wi-Fi both are wireless communication tech.
- Both of them using same frequency range & are versions of unlicensed wireless technology, but employ different modulating techniques.
- Bluetooth is a replacement of cable in small scale app. where as Wi-Fi in LAN access.
- Wi-fi provides higher throughput & covers greater distances, but requires more expensive hardware & higher power consumption.

# Bluetooth Technology is Beneficial because of it's: -

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- Global Availability
- Ease of Use
- Globally Accepted Specification
- Range of Devices
- Secure Connections





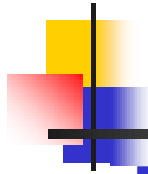
# APPLICATIONS

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More prevalent applications of Bluetooth include:

- Wireless control of and communication between a mobile phone and a hands-free headsets. This was one of the earliest applications to become popular.
- Wireless networking between PCs in a confined space and where little bandwidth is required.
- Wireless communications with PC input and output devices, the most common being the mouse, keyboard and printer.
- Sending small advertisements from Bluetooth enabled advertising hoardings to other, discoverable, Bluetooth devices.
- Two seventh-generation game console, Sony's playstation3 use Bluetooth for their respective wireless controllers.
- Dial-up internet access on personal computer or PDA using a data-capable mobile phone as a modem.
- For controls where infrared was traditionally used. Replacement of wired serial communications, GPS receivers, medical equipment and traffic control devices.

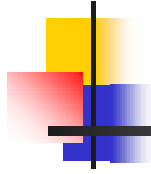




## ADVANTAGES:-

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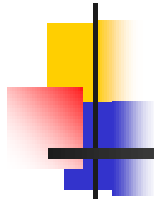
- Bluetooth has a lot to offer with an increasingly difficult market place. Bluetooth helps to bring with it the promise of freedom from the cables and simplicity in networking that has yet to be matched by LAN (Local Area Network).
- In the key marketplace, of wireless and handheld devices, the closest competitor to Bluetooth is infrared. Infrared holds many key features, although the line of sight it provides doesn't go through walls or through obstacles like that of the Bluetooth technology.
- Unlike infrared, Bluetooth isn't a line of sight and it provides ranges of up to 100 meters. Bluetooth is also low power and low processing with an overhead protocol. What this means, is that it's ideal for integration into small battery powered devices.



## DISADVANTAGES:-

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- Infrared can have data rates of up to 4 MBps, which provides very fast rates for data transfer, while Bluetooth only offers 1 MBps.
- For this very reason, infrared has yet to be dispensed with completely and is considered by many to be the complimentary technology to that of Bluetooth. Infrared has inherent security due to its line of sight.
- The greater range and radio frequency (RF) of Bluetooth make it much more open to interception and attack. For this reason, security is a very key aspect to the Bluetooth specification.



# ASPECTS USING BLUETOOTH

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- Although there are very few disadvantages, Bluetooth still remains the best for short range wireless technology. Those who have tried it love it, and they know for a fact that Bluetooth will be around for years to come.



## HAZARDS:-

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- First, though there has been a great deal of research, the evidence pointing to any health hazard from radiation in the 800 MHz to 2 GHz range at the power levels used by mobile phones is, at worst, equivocal. This suggests that if there is any risk at all, it is very small. Second, I have not seen any studies suggesting any risk from Bluetooth. This is not surprising. While a phone needs to transmit with enough power to reach a base station antenna that may be a couple of miles away, Bluetooth has a nominal range of 30 feet.



## References

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- 1.) [www.bluetooth.com](http://www.bluetooth.com)
- 2.) [www.google.com](http://www.google.com)
- 3.) [www.wikipedia.org](http://www.wikipedia.org)
- 4.) [www.palowireless.com](http://www.palowireless.com)