



## **About the Course**

The convergence between the worlds of Mobile and the Internet are driving the emergence of 3G and WLAN access technologies. This presents not only great opportunities for the future of "Telecomm unplugged", but also great challenges in understanding the relative position of different technologies in this future. Included here with cellular technologies would be Wireless LANs (802.11 from a to x), Bluetooth, Ultra-wideband and WiMax - the new broadband wireless access technologies. This course reviews the technical strength and weakness of these key radio access technologies and considers future applications and services that they might enable. It also looks at the economic value created in order to understand the relative position of each in the future roadmap of wireless access. A comprehensive understanding of this area positions the future for 4th generation mobility. The course provides a complete picture of the worldwide Bluetooth standard. It covers all protocol layers (Base-band, Link Manager, HCI, L2CAP, SDP, RFCOMM, TCS) and the most common profiles (GAP, GOEP, LAN Access, Headset and others). Security concepts within Bluetooth are also covered and the Bluetooth certification process is described. A comparison of Bluetooth with other wireless standards is included. We also discuss what is planned in the next version of the Bluetooth standard. Bluetooth wireless technology is finally here. This universal radio interface enables portable electronic devices to connect and communicate wirelessly via short-range, ad hoc networks. Originally designed to replace cables for interconnecting devices such as printers, keyboards, and mice, its perceived potential has evolved into far more sophisticated usage models. This seminar presents and explains the different components of the Bluetooth architecture and profiles. Adhoc networks, Piconets and Scatternets will be explained. The Bluetooth architecture protocols, Bluetooth security and the Bluetooth Profiles will be described in details. An overview of competing technologies such WiFi and Ultra Wide Band will be presented to conclude the seminar.

## **Objective**

To give the participants a deeper understanding of Bluetooth and its internals. The Participants will receive an insight into all protocol layers (Base-band, Link manager, HCI, L2CAP, SDP, RFCOMM, TCS) and the most common profiles (GAP, GOEP, LAN Access, Cordless Telephony, Headset and others) defined in the Bluetooth standard.

## **Who is it for?**

This course is aimed at those wishing to gain a complete overview of the entire range of wireless access technologies, in particular WLANs, Bluetooth, Ultra-wideband and Broadband Wireless Access. It also considers the current and future applications of each with techno-economic modeling to position the relative opportunities that they offer. In addition, the course will appeal to technical managers, analysts and strategists wishing to increase their technical understanding of the subject areas. Programmers, project managers and system designers. Even senior managers, executives and other who wish to know more about Bluetooth.

## **Course Content**

### **1. Wireless Personal Area Network**

- WPAN vs. WLAN
- Ad Hoc Network
- MANET

### **2. Bluetooth Mission/Requirements**

### **3. Bluetooth History**

#### **4. Bluetooth Usage Models**

#### **5. Bluetooth Protocol Architecture**

##### **5.1. Bluetooth Core Protocols**

##### **5.2. Radio Frequency Layer**

- Frequency Hopping
- CDMA-FH/TDD
- Radio Characteristics
- GFSK (Gaussian Frequency Shift Keying)

##### **5.3. Base-band**

Physical Channels

Piconet

Scatternet

Enhanced Data Rate

Synchronous Connection Oriented

Asynchronous Connection Oriented

Frame Format

Error Correction Schemes

Base-band Logical Channels

##### **5.4. Link Management**

Protocol

Device States

Establishing a Connection

Channel Control

    Inquiry Procedure

    Page Procedure

    Page Hopping

Bluetooth Audio

Bluetooth Pairing

Bluetooth Link Security

    Security Management

    Security Fundamentals

    Bluetooth Ciphering

##### **5.5. Host Controller Interface**

HCI Firmware

HCI Driver

HCI Commands

HCI Events/ Error Codes/ Flow Control

##### **5.6. L2CAP - Logical Link Control and Adaptation Protocol**

L2CAP Services.

L2CAP Logical Channels

L2CAP Signaling Commands

Flow Specification Parameters

L2CAP Services Primitives

**5.7. RFCOMM**

**5.8. Service Discovery Protocol**

SDP Services

**6.. Bluetooth profiles**

- LAN Access
- File transfer
- GAP (Generic Access Profile)
- GOEP (Generic Object Exchange Profile)
- Cordless Telephony
- Headset

**8. Competitive Technologies**

**8.1. 802.11 - WiFi**

802.11 & Bluetooth Coexistence

**8.2. Zigbee**

**8.3. 802.15.3a Ultra Wide Band**

**9. Conclusion**

**Course Fee:** 18000 Rs.

**Course Duration:** 8 Days (24 Hours)

**Venue**

Miracle Corporate Solutions Pvt. Ltd.

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