



NSCET E-LEARNING PRESENTATION

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

III YEAR / VI SEMESTER

EC8004– WIRELESS NETWORK

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UNIT I

WIRELESS LAN

INTRODUCTION

- *Wireless* means transmitting signals using radio waves as the medium instead of wires.
- Wireless technologies are used for tasks as simple as switching off the television or as complex as supplying the sales force with information from an automated enterprise application while in the field.
- Now cordless keyboards, mice and cellular phones have become part of our daily life.



WIRELESS TECHNOLOGIES

Wireless technologies can be classified in different ways depending on their range. Each wireless technology is designed to serve a specific usage segment.

The requirements for each usage segment are based on a variety of variables, including Bandwidth needs, Distance needs and Power.

Wireless Wide Area Network (WWAN)

- ❖ Enables to access the Internet via a wireless wide area network (WWAN) access card and a PDA or laptop.
- ❖ provide a very fast data speed compared with the data rates of mobile telecommunications technology, and their range is also extensive.
- ❖ Example - Cellular and mobile networks based on CDMA and GSM .

Wireless Personal Area Network (WPAN)

very similar to WWAN except their range is very limited.

WIRELESS LOCAL AREA NETWORK (WLAN)

- ❖ Enable to access the Internet in localized hotspots via a wireless local area network (WLAN) access card and a PDA or laptop.

- ❖ provide a very fast data speed compared with the data rates of mobile telecommunications technology

- ❖ Example - Wi-Fi

❖ WIRELESS METROPOLITAN AREA NETWORK (WMAN)

- ❖ Enables to access the Internet and multimedia streaming services via a wireless region area network (WRAN).

WLAN TECHNOLOGIES:

- INFRARED
- UHF(Narrow band)
- SPREAD SPECTRUM

IEEE 802.11

802.11 **Wi-Fi** **Wireless LAN Media Access Control and Physical Layer specification. 802.11a,b,g,etc. are amendments to the original 802.11 standard. Products that implement 802.11 standards must pass tests and are referred to as "Wi-Fi certified."**

Additional features of the WLAN should include the support of power management to save battery power, the handling of hidden nodes, and the ability to operate worldwide.

The 2.4 GHz ISM band, which is available in most countries around the world, was chosen for the original standard.

IEEE 802.11:

- System architecture
- Protocol architecture
- Physical layer
- MAC layer
- 802.11b
- 802.11a

HIPERLAN

(High Performance Local Area Network)

WLAN allowing for node mobility and supporting ad-hoc and infrastructure-based topologies

- ❖ Names have changed and the former HIPERLANs 2, 3, and 4 are now called HiperLAN2, HIPERACCESS, and HIPERLINK.
- ❖ The current focus is on HiperLAN2, a standard that comprises many elements from ETSI's **BRAN** (broadband radio access networks) and **wireless ATM** activities.
- ❖ Neither wireless ATM nor HIPERLAN 1 were a commercial success.

Wireless ATM

(Wireless Asynchronous Transfer Mode)

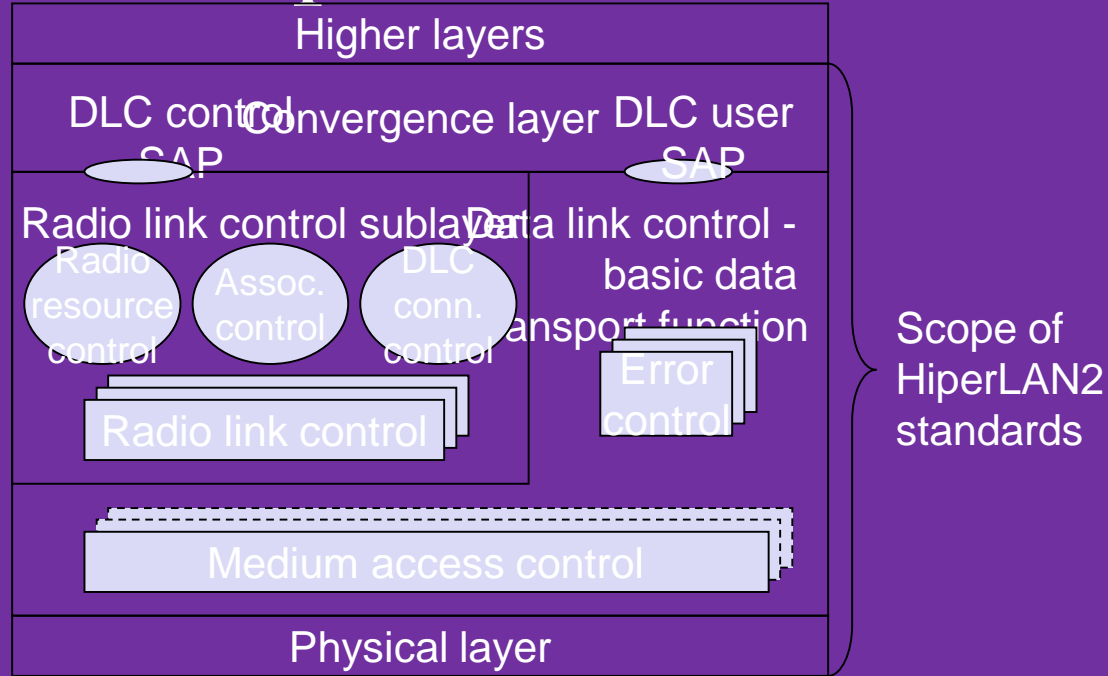
- ❖ WATM: sometimes also called wireless, mobile ATM, wmATM
- ❖ IEEE WLANs originate from the data communication community, many WATM aspects come from the telecommunication industry
- Motivation for WATM:
 1. The need for seamless integration of wireless terminals into an ATM network.
 2. ATM networks scale well from LANs to WANs – and mobility is needed in local and wide area applications.
 3. For ATM to be successful, it must offer a wireless extension.
 4. WATM could offer QoS for adequate support of multi-media data streams.

BRAN

Broadband Radio Access Networks

- The main motivation behind BRAN is the deregulation and privatization of the telecommunication sector in Europe.
- Many new providers experience problems getting access to customers because the telephone infrastructure belongs to a few big companies.
- One possible technology to provide network access for customers is radio. The advantages of radio access are high flexibility and quick installation.
- BRAN standardization has a rather large scope including indoor and campus mobility, transfer rates of 25–155 Mbit/s, and a transmission range of 50 m–5 km.
- TYPES -HIPERLAN/2 , HIPERACCESS , HIPERLINK

HiperLAN2



Bluetooth

Idea

- Universal radio interface for ad-hoc wireless connectivity
- Interconnecting computer and peripherals, handheld devices, PDAs, cell phones – replacement of IrDA
- Embedded in other devices, goal: 5€/device (2005: 40€/USB bluetooth)
- Short range (10 m), low power consumption, license-free 2.45 GHz ISM
- Voice and data transmission, approx. 1 Mbit/s gross data rate



One of the first modules (Ericsson).

802.15.4

- 802.15-4: Low-Rate, Very Low-Power
 - Low data rate solution with multi-month to multi-year battery life and very low complexity
 - Potential applications are sensors, interactive toys, smart badges, remote controls, and home automation
 - Data rates of 20-250 kbit/s, latency down to 15 ms
 - Master-Slave or Peer-to-Peer operation
 - Up to 254 devices or 64516 simpler nodes
 - Support for critical latency devices, such as joysticks
 - CSMA/CA channel access (data centric), slotted (beacon) or unslotted
 - Automatic network establishment by the PAN coordinator
 - Dynamic device addressing, flexible addressing format
 - Fully handshaked protocol for transfer reliability
 - Power management to ensure low power consumption
 - 16 channels in the 2.4 GHz ISM band, 10 channels in the 915 MHz US ISM band and one channel in the European 868 MHz band

ZIGBEE Technology

- Open global standard to address the unique needs to low cost , low power wireless IoT networks.
- Topologies :
 - ❖ Star Topology
 - ❖ Peer-to- peer Topology
 - ❖ Cluster Topology

Wireless USB (WUSB)

- WUSB is a form of Universal Serial Bus (USB) technology that uses radio frequency (RF) links rather than cables
- Provide interface between a computer and peripherals , such as monitors , printers etc
- Based on WiMedia ultra wideband common radio platform



THANKS!