TECHNOLOGY OVERVIEW

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AGENDA

- Public Switched Telephone Networks(PSTN)
- Integrated Services Digital Network(ISDN)
- Frame Relay
- DSL and ADSL
- VoIP
- Bluetooth
- Wi-fi
- WiMax
- GSM
- 3G
- 4G
- NFC

Public Switched Telephone Network

- Circuit switched Network.
- It is the aggregate of world's circuit- switched telephone network that are operated by national, regional or local telephone operators.
- It is now entirely digital in its core network and includes mobile and other networks.
- In relation to Internet, the PSTN actually furnishes much of the Internet's long distance infrastructures.

ISDN

- Set of CCITT/ITU standards for digital transmission over ordinary telephone copper wire as well as over other media.
- Requires adapters at both ends of the transmission.
- ISDN are two types.
  - B-Channel
  - D-channel

Frame Relay

- High performance WAN protocol that operates at the physical and data link layer of the OSI reference model.
- It is a packet switching telecommunication services designed for cost efficient data transmission for intermittent traffic between local area networks and between endpoints in wide area networks.
- It was designed for use across ISDN interfaces.
- Today, it is used over a variety of other network interfaces as well.
- Simplified form of packet switching.

DSL

- Technology for bringing high bandwidth information to homes and small business over ordinary copper telephone lines.
- xDSL refers to different variations of DSL, such as ADSL, HDSL and RADSL.
- Technology that assumes digital data does not require change into analog form and back.
- Many DSL technologies implement as Asynchronous Transfer Mode low level bitstream layer to enable the adaptation of a number of different technologies.
- DSL implementations may create bridged and or routed networks.

ADSL

- Type of DSL.
- Form of DSL that is most familiar to home and small business users.
- It is called “asymmetric” because most of its two-way or duplex bandwidth is devoted to the downstream direction, sending data to its user.
- Only small portion of bandwidth is available for upstream.

Voice Over Internet Protocol (VoIP)

- Form of communication that allows us to make phone calls over a Broadband internet connection.
- Method for routing voice calls across the internet, instead of the PSTN.
- It allows us to call others who are also receiving calls over the internet.
- Interconnected VoIP is a form of communication that allows us to make and receives call to and from traditional landline numbers.

Bluetooth

- Bluetooth is a similar radio-wave technology, but it's mainly designed for communicating over short distances less than about 10m to 30ft.
- We might use it to download photos from a digital camera to a PC, to hook up a wireless mouse to a laptop, to link a hands-free headset to your cellphone so you can talk and drive safely at the same time, and so on.
- Electronic gadgets that work this way have built-in radio antennas (transmitters and receivers) so they can simultaneously send and receive wireless signals to other Bluetooth gadgets.

Piconet

- A *piconet* is the type of connection that is formed between two or more Bluetooth-enabled devices such as modern cell phones or PDAs.
- when a piconet is formed between two or more devices, one device takes the role of 'master', and all other devices as a 'slave' role for synchronization reasons.
- A slave may only communicate with the master and may only communicate when granted permission by the master.
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Scatternet

- A *scatternet* is a number of interconnected piconets that supports communication between more than 8 devices.
- Scatternets can be formed when a member of one piconet (either the master or one of the slaves) elects to participate as a slave in a second, separate piconet.
- Scatternets have the potential to bring the interconnectivity of the Internet to the physical world through wireless devices.
- Scatternets can also be used to enable ad hoc communication and interaction between autonomous robots and other devices.

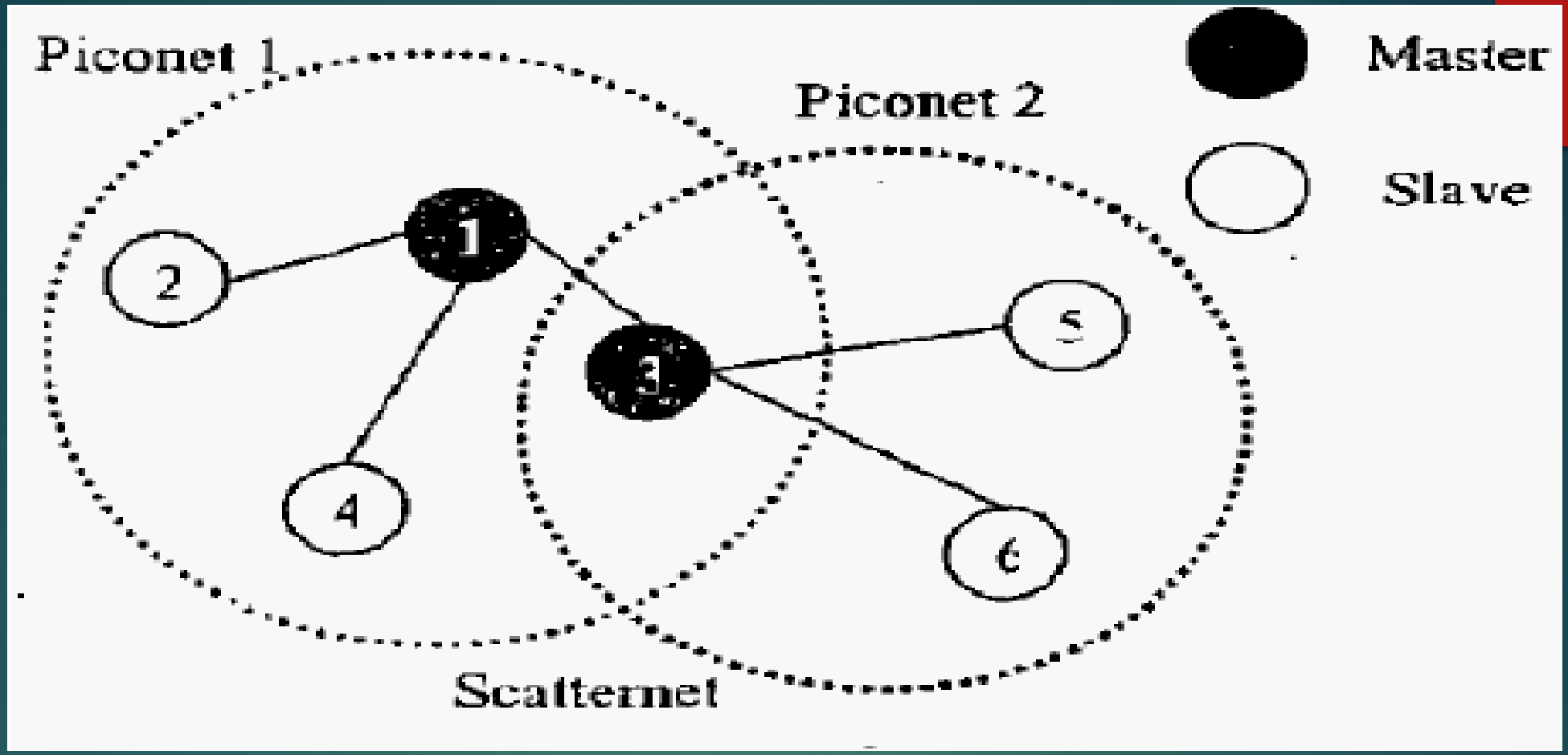


Fig : Piconet and Scatternet.

Wi-Fi.

- **WiFi** is a technology that uses radio waves to provide network connectivity.
- A **WiFi connection** is established using a wireless adapter to create **hotspots** - areas in the vicinity of a wireless router that are connected to the network and allow users to access internet services.
- WiFi provides wireless connectivity to your devices by emitting frequencies between 2.4GHz - 5GHz, based on the amount of data on the network.
- Many people us WiFi or 802.11 networking, to connect their computers at home, and some cities are trying to use the technology to provide free or low-cost Internet access to residents.
- Wireless networks are easy to set up and inexpensive.

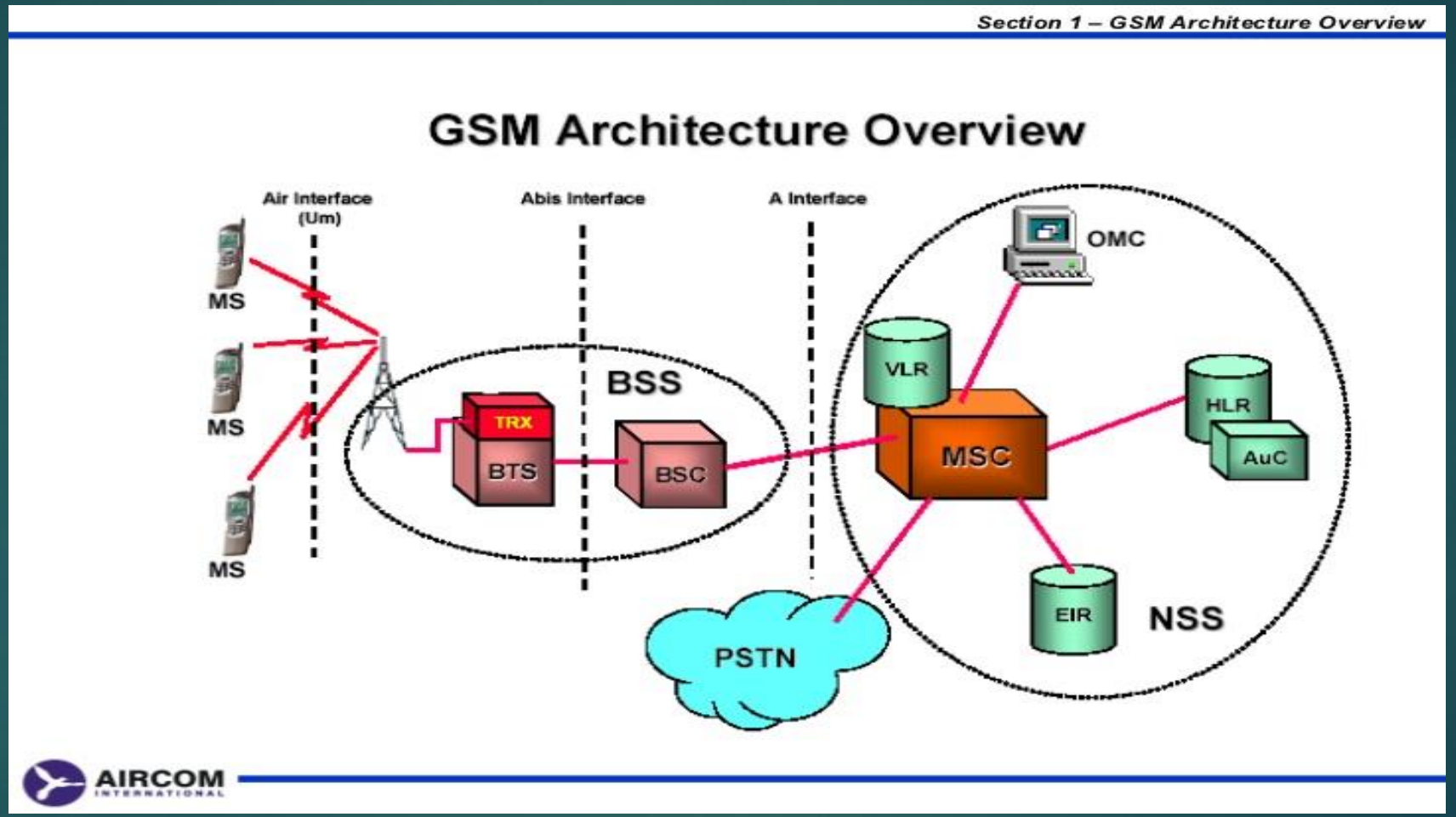
WiMax

- WiMAX is one of the hottest broadband wireless technologies around today.
- WiMAX systems are expected to deliver broadband access services to residential and enterprise customers in an economical way.
- WiMAX would operate similar to WiFi, but at higher speeds over greater distances and for a greater number of users.
- Based on Wireless MAN technology.

GSM (Global System for Mobile communication)

- GSM (Global System for Mobile communication) is a digitalmobile telephony system.
- GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot.
- It operates at either the 900 MHz or 1800 MHz frequency band.

GSM architecture overview



3G

- 3G is the mobile broadband revolution
- This network combines aspects of the 2Gnetwork with some new technology.
- The system also involves significant algorithmic and mathematical improvements in signal transmission.
- These protocols have an improved transport layer by a complex arrangement of physical layer channel.

4G

- 4G network is based on LTE-Advanced – 3GPP Long Term Evolution.
- This new network boosts peak downloads speeds up to 100Mbps and 50Mbps upload .
- 4G bandwidth is critical in supporting high speed and a high number of users.

NFC

- Very short range wireless technology aimed at transferring a small amount of data.
- It can transmit data at high speed.
- Based on contactless card and RFID technology and is to large extent compatible with them.
- Set of communication protocol that enable two electronic devices.
- Able to establish a peer-to-peer link with another device.

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THANK YOU !!!