



What is Bluetooth? 1/2

•A wireless LAN technology designed to connect devices of different functions such telephones, notebooks, computers, ...offering a *short-range connectivity* solution (cable replacement)

Eliminates line of sight requirements

•A Bluetooth LAN is an ad hoc network (devices find each other and make a network called a *piconet*)

•A Bluetooth LAN can be connected to the Internet if one of the devices has this capability

Applications

Bluetooth

Peripheral devices of a computer can connect with the computer through this technology (wireless mouse or keyboard)

>Monitoring devices can communicate with sensor devices in a small health care center

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What is Bluetooth? 2/2

•Originally started as a project by Ericsson

•Named for *Harald Blaatand*, King of Denmark (940-981) who united Denmark and Norway (*Blaatand* translates to *Bluetooth* in English)

▶Bluetooth aims at uniting personal computing devices

•Currently, Bluetooth is an Implementation of a protocol defined by 802.15 standard

> wireless personal-area network (PAN) operable in an area the size of a room or a hall

Bluetooth

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Bluetooth Architecture 1/7

•A Bluetooth network is called a piconet (small net)

•Up to eight stations, one of which is the master (only one master), while the rest are slaves (The master is usually the station initiating the connection)

•Master slave communication is one-to-one or one-to-many (no slave to slave communication)

•Additional eight slaves can be in parked state (in synch with master)

•Devices not associated with any piconet are in standby mode

•Piconets can be combined to form a *scatternet* (a slave can become a master in another piconet)

➤Receives messages from master in first piconet, and acting as a master deliver it to slaves in second piconet

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Radio Layer Baseband layer 1/5 •Roughly equivalent to physical layer of Internet model •Roughly equivalent to MAC sublayer in LANs •Devices are low-power and have a range of 10 m •Access method is TDMA (time slots) •Uses a frequency-hopping spread spectrum (FHSS) to avoid •A form of TDMA called TDD-TDMA (time-division duplexing interference from other devices or networks TDMA) Sender sends on one carrier frequency for a short amount of time, then >Half-duplex communication hops to another carrier frequency for the same amount of time, an so on ≻Communication for each direction uses different hops Sender and receiver agree on sequence of allocated bands •Single-slave communication (one slave in piconet) >Amount of time spent at each subband is called the dwell time ≻Time divided into slots of 625 microseconds Bluetooth hops 1600 times per second (a device uses a frequency for only 625 microseconds - dwell time is 625 microseconds) Master uses even-numbered slots, slaves use odd-numbered slots Slot 0: master sends and slave receives (half-duplex) Communications channel in piconet defined as the sequence of frequency hops followed by members in a synchronized manner Bluetooth 15 Bluetooth 16

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Profiles

•Bluetooth specifications comprises communications protocols and

•Specifications for building interoperable applications are called

·Generic access, service discovery, cordless telephony, and generic object exchange

>Audio video remote control, basic printing, and basic

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·Each profile selects a set of protocols

