DEVICES AND COMMUNICATION
BUSES FOR DEVICES NETWORK–

**Lesson-29: WIRELESS AND MOBILE
SYSTEM PROTOCOLS– ZigBee**

Wireless Personal Area Network (WPAN)

- IrDA (Infrared Data Association)

- Bluetooth 2.4 GHz

- 802.11 WLAN and 802.11b WiFi

- ZigBee 900 MHz

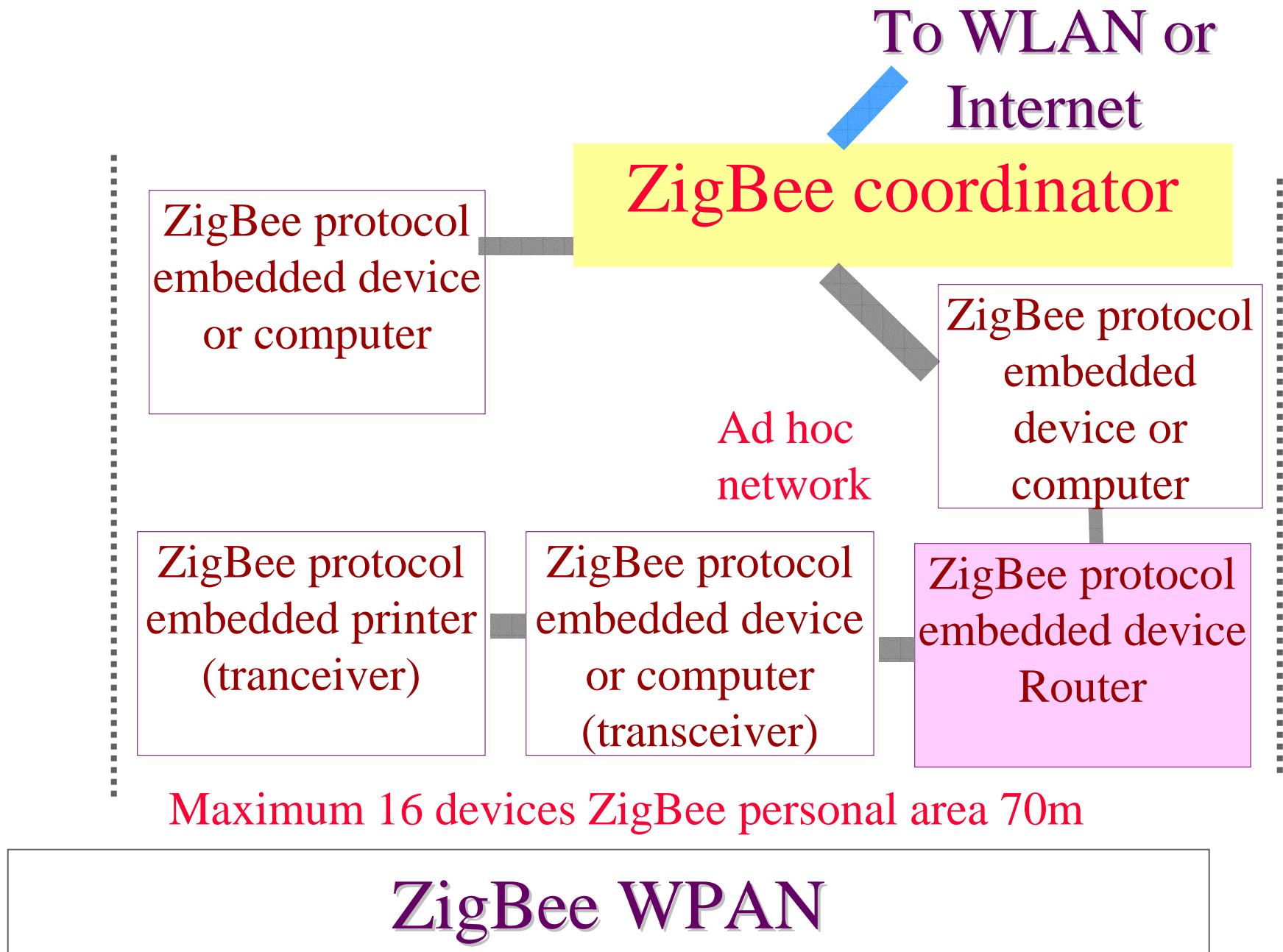# ZigBee Wireless Personal Area connected devices

- IEEE standard 802.15.4 protocol.

- Physical layer radio operates 2.4 GHz band carrier frequencies with DSSS (direct sequence spread spectrum).

- Supports range up to 70 m.

- Data transfer rate supported 250 kbps.

- Supports sixteen channels.

ZigBee network feature

- Self-organising and supports peer-to-peer and mesh networks.

- Self-organising means detects nearby Zigbee device and establishes communication and network.

Peer-to-peer and mesh networka

- Each node at network function as requesting device as well as responding device.

- Mesh network means the each nodes network function as a mesh.

- A node can connect to another directly or through mutually interconnected intermediate nodes. Data transfer is between two devices in Peer-to-Peer or between a device and multiple devices in the mesh network.

To WLAN or
Internet

ZigBee coordinator

ZigBee protocol
embedded device
or computer

ZigBee protocol
embedded
device or
computer

Ad hoc
network

ZigBee protocol
embedded printer
(tranceiver)

ZigBee protocol
embedded device
or computer
(transceiver)

ZigBee protocol
embedded device
Router

Maximum 16 devices ZigBee personal area 70m

ZigBee WPAN

ZigBee supporting devices

- ZigBee protocol supports large number of sensors, lighting devices, air conditioning, industrial controller and other devices for home and office automation and their remote control and formation of WPAN (wireless personal area network).

ZigBee network

- Zigbee router

- end devices

- coordinator

ZigBee router

- Transfers packets received from a neighboring source to nearby node in the path to destination.

ZigBee coordinator

- Connects one Zigbee network with another, or connects to WLAN or cellular network.

Zigbee end devices

- Transceiver of data.

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Publs.: McGraw-Hill Education

ZigBee features

- Communication latency 30 ms
- Protocol stack overhead 28 kB

Summary

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We learnt

- IEEE standard 802.15.4 protocol.

- 2.4 GHz band carrier frequencies with DSSS (direct sequence spread spectrum).

- range up to 70 m.

- 250 kbps.

- sixteen channels

We learnt

- Three type of device

- Transceiver

- Router

- Coordinator

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End of Lesson 29 of Chapter 3