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# Introduction

- Technological Standard Created for Control and Sensor Networks
- Based on the IEEE 802.15.4 Standard
- High level Communication
- Wireless Personal Area Networks (WPANs)
- Created by the ZigBee Alliance

# History

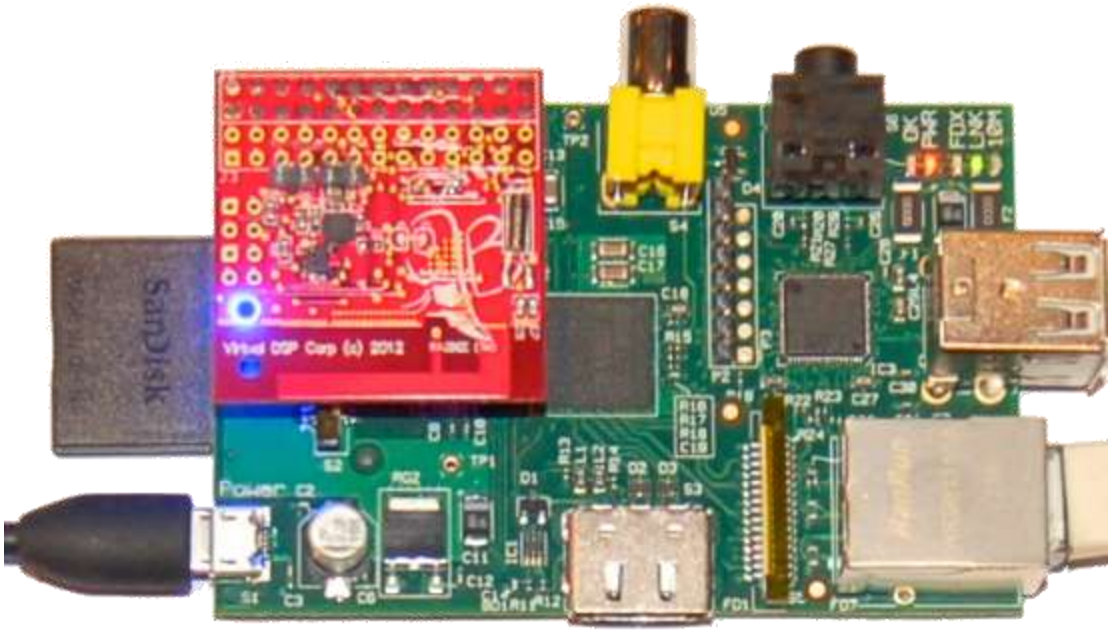
- ZigBee-style networks began to be conceived about 1998, when many engineers realized that both WiFi and Bluetooth were going to be unsuitable for many applications.

  In particular, many engineers saw a need for self-organizing ad-hoc digital radio networks.
- The IEEE 802.15.4 standard was completed in May 2003.
- The ZigBee specifications were ratified on 14 December 2004.
- The ZigBee Alliance announces public availability of Specification 1.0 on 13 June 2005.

# Device types

There are three different types of ZigBee device:

- **ZigBee coordinator (ZC)**
- ***ZigBee Router (ZR)***
- **ZigBee End Device (ZED)**



# Types Explained…

- **ZigBee coordinator (ZC):** The most capable device, the coordinator forms the root of the network tree and might bridge to other networks.

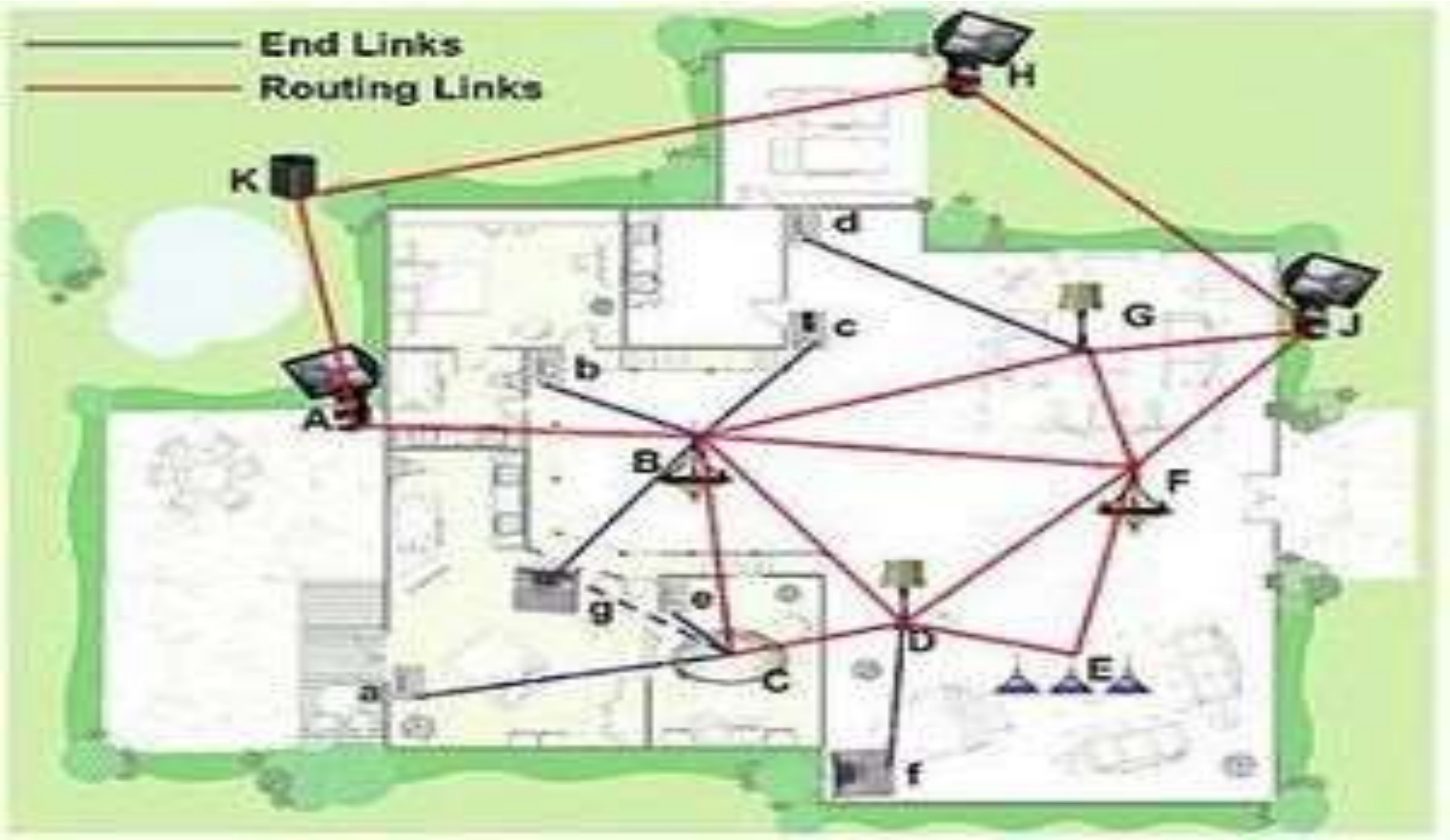
  There is exactly one ZigBee coordinator in each network. It is able to store information about the network, including acting as the repository for security keys.

# Types Explained…

- **ZigBee Router (ZR):** Routers can act as an intermediate router, passing data from other devices.

- **ZigBee End Device (ZED):** Contains just enough functionality to talk to its parent node (either the coordinator or a router); it cannot relay data from other devices. It requires the least amount of memory, and therefore can be less expensive to manufacture than a ZR or ZC.

# ZigBee Home Automation Example



# Why does Zigbee Do

- Operates in Personal Area Networks (PAN?s) and device-to-device networks
- Connectivity between small packet devices
- Control of lights, switches, thermostats, appliances, etc.
- Designed for wireless controls and sensors

# How Zigbee Works

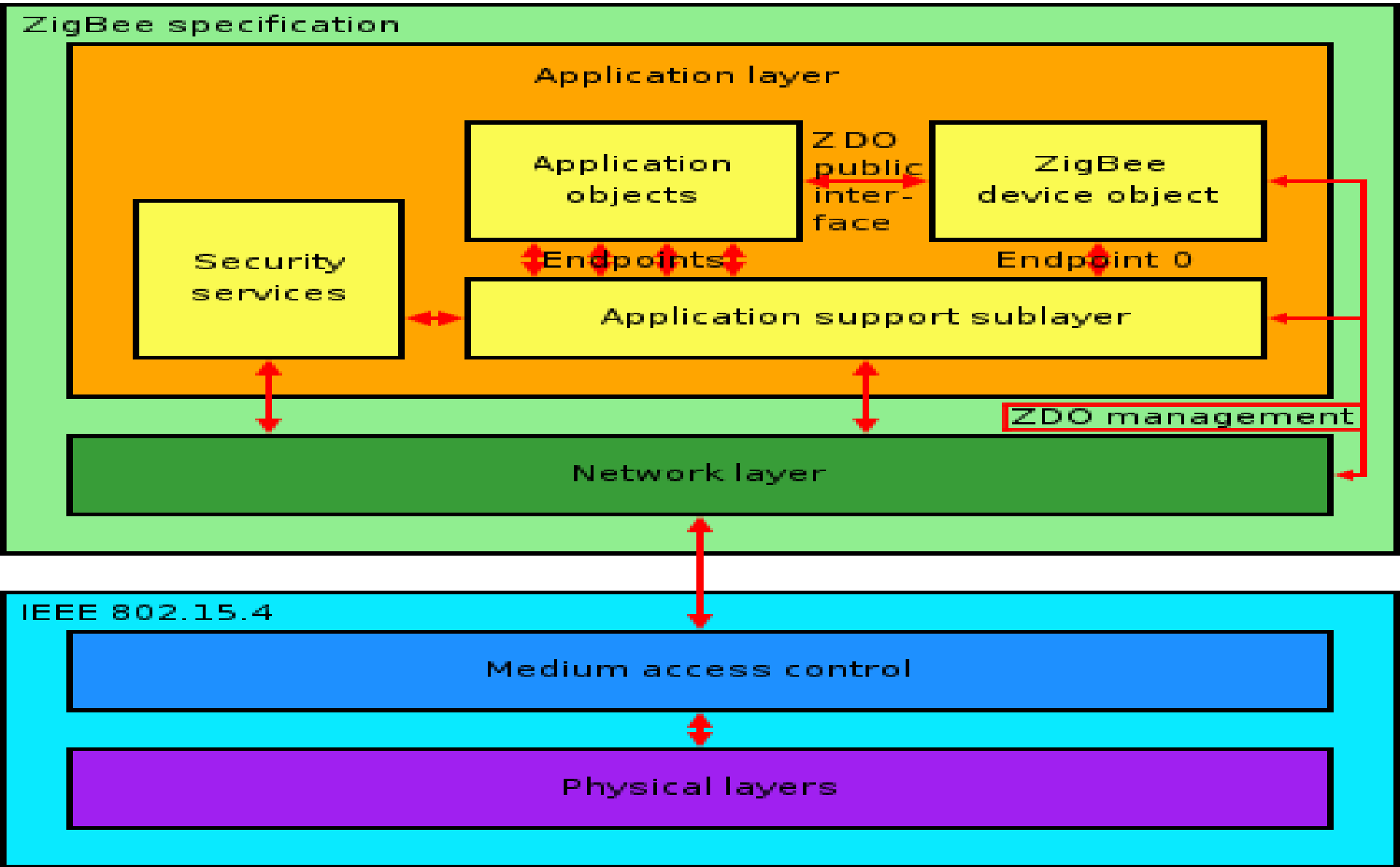
- Topology
  - Star
  - Cluster Tree
  - Mesh

- Network coordinator, routers, end devices

# Layers of zigbee network:

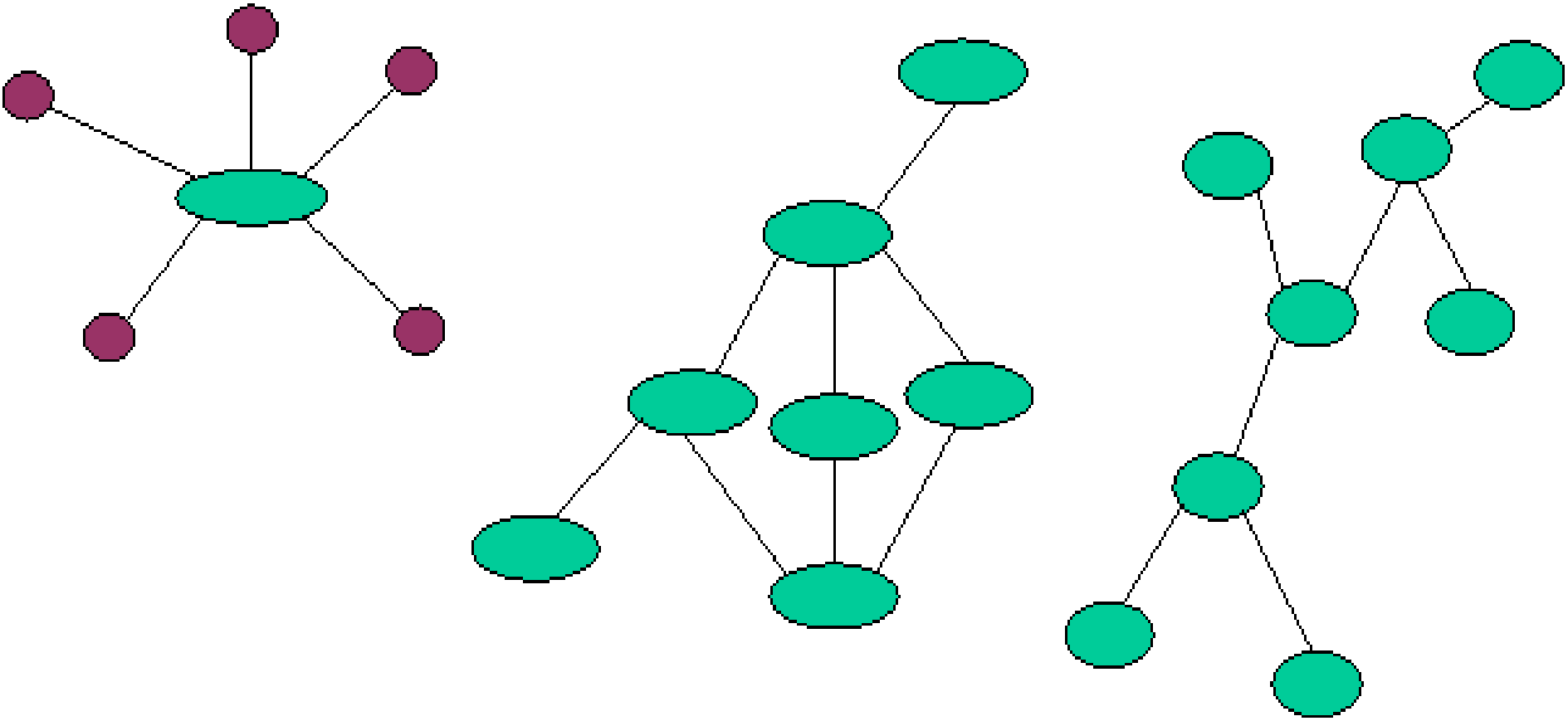
- **Network and Application Support layer**
- **Physical (PHY) layer**
- **Media access control (MAC) layer**

# Zigbee Protocol Stack



# Topologies

- Different topologies as illustrated below: star, peer-to-peer, mesh



# Uses

In all of its uses, zigbee offers four inherent, beneficial characteristics:

- **Low cost:**
- **Range and obstruction issue avoidance:**
- **Multisource products:**
- **Low power consumption:**

# Conclusion

- ZigBee is one of the global standards of communication protocol formulated by the relevant task force.

- ZigBee is the newest and provides specifications for devices that have low data rates, consume very low power and are thus characterized by long battery life.

# Referance


- www.wikipedia.com
- www.studymafia.org
- www.google.com
- www.zigbee.com

THANKS..!!!