Tip 1: ZigBee network basics

ZigBee network is well designed. When working with ZigBee network, you need to strictly follow the ZigBee specification to meet the standards (for devices and networks interoperability). If you are interested about the details of ZigBee, you can find it at ZigBee Alliance website: http://www.zigbee.org/

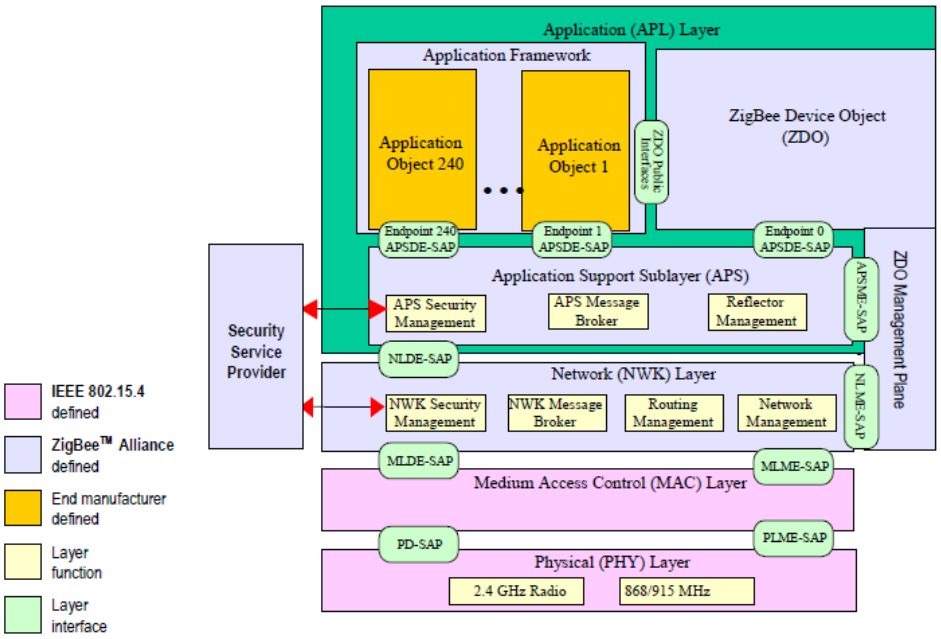

Figure 1. ZigBee Stack

The above is the ZigBee stack architecture. Not all the stack features are used in this project. Here just want to show you that your work will be located at those yellow blocks (Application Object 1-240). To get a general understanding of ZigBee stack we will use, you should read the Microchip's ZigBee 2006 Application Note - AN1232 (it is highly suggested).

Keep it in your mind: in this project, although your work will be at the application level, you will have to understand the routing mechanism of ZigBee in the network layer, to support your application layer work.

Tip 2: IEEE802.15.4 basics for the network layer

As you can see from the above, ZigBee is based on IEEE802.15.4 PHY&MAC. Therefore the upper layer design is relying on it, especially the network layer. Usually, the PHY&MAC is already in the silicon (the chips), and the upper layers are realized in the firmware. Here I have picked up very little basics of IEEE802.15.4:

- Type of nodes:

  - Full Function Device (FFD): - PAN coordinator
    - Routers
  - Reduced Function Device (RFD): End Devices

- Type of addresses:

  - Mac address: 64 bits; unique identity of a node.

- Network Address: 16 bits; used for communication within the network; allocated to the node when joining the network.

- Indication of channel quality

  - RSSI value: Received Signal Strength (can be wanted signal or noise) Indicator.

- Link of Quality Indicator (LQI): Used for route path cost calculation.

- Medium Access Control: CSMA/CA

Those 802.15.4 basics would be enough for you to work with the upper network layers in this project. (You can find all the details in the IEEE802.15.4 specification.)

Tip 3: Unicast, multicast & broadcast
In this project, multicasting is not necessary. So we will only use the unicast and broadcast features of the ZigBee stack. In the first lab, you will notice that we will skip the group addressing part when trying the HyperTerminal console.