

RF4CE

RF4CE referred as Radio Frequency for Consumer Electronics. This consortium has been formed in 2009. **RF4CE** consortium and **Zigbee** alliance agreed to work for a standard to take care of radio frequency remote control of various consumer devices such as TVs, Audio devices, set-top boxes and so on.

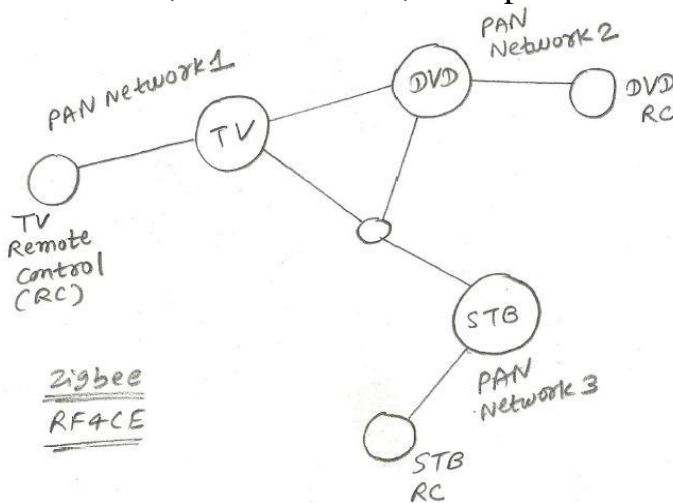


fig.1, Typical Zigbee based RF4CE network

Zigbee RF4CE protocol stack utilizes 2.4GHz transceiver compliant to 802.15.4 for remote control devices and their targets (audio and video devices). The second RF4CE application profile is introduced in 2012 compliant to zigbee standard. Figure-1 depicts the inside modules in a Zigbee RF4CE remote controller device used to control the TV/LCD. It also depicts control of DVD and Set Top Box(STB) using RC(Remote control).

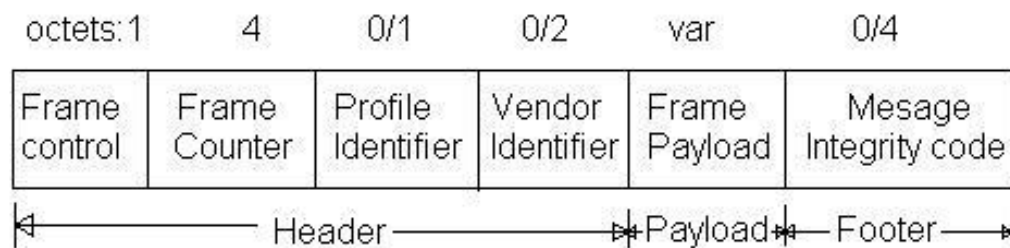


fig.2 Zigbee Frame



Zigbee frame composed of header, payload and footer. Header consists of frame control, frame counter, profile identifier, vendor identifier. Footer part carry message integrity code.

Silent features of ZigBee RF4CE:

- 2.4GHz frequency of operation over three channels
- compliant to IEEE 802.15.4
- power saving feature
- Multi star topology with Inter-PAN communication
- Utilizes AES-128 security standard
- simple RC control profile
- Transmission options viz. broadcast, unicast, unacknowledged , acknowledged, unsecured and secured are supported.
- Pairing mechanism supported
- The specialty-use-driven ZigBee RF4CE protocol has been designed for simple, two-way device-to-device control applications that do not require the full featured mesh networking capabilities offered by ZigBee.
- ZigBee RF4CE offers lower memory size requirements, thereby enabling lower cost implementations.
- RF4CE is based on ZigBee and was standardized in 2009 by four consumer electronics (CE) companies: Sony, Philips, Panasonic, and Samsung.
- The characteristics of ZigBee RF4CE include the following: – Operation in the 2.4 GHz frequency band according to IEEE 802.15.4; – Frequency agile solution operating over three channels; – Incorporates power-saving mechanisms for all device classes; – Discovery mechanism with full application confirmation; – Pairing mechanism with full application confirmation; – Multiple star topology with inter-PAN communication; – Various transmission options including broadcast; – Security key generation mechanism; – Utilizes the industry standard AES-128 security scheme; – Specifies a simple RC control profile for CE products; – Support alliance-developed standards or manufacturer-specific profiles.



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- RF4CE's intended use is as a device RC system, for example for television set-top-boxes. – The intention is that it overcomes the common problems associated with infrared (IR): interoperability, line-of-sight (LOS), and limited enhanced features.
- Vendors supported RF4CE is: Texas Instruments and Freescale Semiconductor, Inc.