IEEE P802.15

Wireless Personal Area Networks

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | 802.15.4 Draft Replacement Text for 5.2 | |
| Date Submitted | [16 Feb 2015] | |
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| Re: | [802.15 Revision] | |
| Abstract | [IEEE 802.15 Revision] | |
| Purpose | [] | |
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5.2 Special Application Spaces

Although this standard is intended address many diverse application spaces, some application spaces have unique requirements which required specific elements added to this standard. The following describes these application spaces:

* Smart metering utility network (SUN): SUNs enable multiple applications to operate over shared network resources, providing monitoring and control of a utility system. SUN devices are designed to operate in very large-scale, low-power wireless applications and often require using the maximum power available under applicable regulations, in order to provide long-range, point-to-point connections. Frequently, SUNs are required to cover geographically widespread areas containing a large number of outdoor devices. In these cases, SUN devices are able to employ mesh or peer-to-peer multihop techniques to communicate with an access point.
* Rail Communications and Control (RCC) refers to a wireless information exchange and sensor or control communications deployed in such areas as:
  + A wireless link between trains, locomotives, or other mobile rolling stock to fixed trackside or network infrastructure
  + A link between connected fixed, remote trackside infrastructure and fixed network infrastructure
  + A link between vehicles in the same train or between two or more trains

RCC devices are intended to support mobile rail vehicle communications at high speeds with data rates rendering practical ranges of over 50 km. The RCC PHYs are designed to take advantage of relatively small amounts of spectrum where spectrum is costly or scarce.

* Television White Space (TVWS): TVWS operation has the requirement to determine which TVWS frequency allocations are available for use at a given time and geographic location. Devices have access to TVWS channel availability information, such as via a database, for determination of available TVWS spectrum. A device that has no connection to the Internet must depend upon another device that has access to the TVWS database via the Internet to acquire channel availability information.
* Radio Frequency Identification (RFID):Active RFID devices are used to identify and often locate people or objects in industrial or commercial environments. Typical applications include asset management, inventory management, process control and automation, safety and accountability, and many others.

In its simplest form an active RFID system comprises a number of transmit-only tags that periodically transmit a packet containing a unique ID and a small amount of data. The packet is received by one or more readers that may simply register the tag as present, may employ further processing to determine the location of the tag, or forward data to an application server. More complex active RFID systems might employ two-way communications with the tag for control, communication, and coordination.

* Low Energy Critical Infrastructure Monitoring (LECIM): The LECIM portions of this standard form the MAC and PHY behaviors that implement a minimal network infrastructure, enables the collection of scheduled and event data from a large number of non-mains powered end points that are widely dispersed, or are in challenging propagation environments. To facilitate low energy operation necessary for multi-year battery life, MAC protocols minimize network maintenance traffic and device wake durations. In addition, LECIM addresses the changing propagation and interference environments encountered over many years.
* Medical body area network (MBAN) services: Some countries have allocated spectrum for MBAN services on a secondary basis such that MBAN devices are required to protect all primary users and accept possible interference from those users. MBAN devices operating within this allocated spectrum conform to a set of rules which restrict use of the band to only medical, non-voice use under direction of a healthcare practitioner, among other requirements. When a primary user is making use of a portion of the band, MBAN devices vacate that portion of the band. Use of the band by the primary user is, in general, scheduled well in advance allowing MBAN users to share the band in an orderly manner.