IEEE Std. 802.15.4

Data study for medical usage

David Cypher

NIST

Areas of study

- Data rates available
- Timing constraints
- Coexistence environment

Categories for Data Rates

Physical Medium
  Dependent (PMD)
  - 868 MHz
  - 902 MHz
  -2450 MHz

WPAN type
  - Unslotted
  - Slotted

Traffic type
  - asymmetric
  - symmetric

Packet delivery service
  - acknowledged
  -unacknowledged

Subcategories for Slotted WPAN

- Guaranteed Time Slots

- Beacon Order

- Superframe Order

IEEE 802.15.4 Service Data Rates

See separate file with tables

Simulation Progress

- Modeled 802.15.4 Medium Access Control (MAC) and Physical layer (2450 MHz) protocol for Carrier Sensed Multiple Access with Collision Avoidance (CSMA/CA) in an Unslotted WPAN

- Examining RF models

- Generating traffic models

- Generating user/usage scenarios

Sample Medical Data Rates

Data type	Sampling information	Compression ratio	Bit rate
Video	256 x 256 pel/plane 8-bit RGB/pel 1plane/20 s	10:1	8 kbit/s
Audio	8 bit/sample 6000 sample/s	4.8:1	10 kbit/s
ECG	3 channel 8 bit/sample 200 sample/s	8:1	600 bit/s
Blood pressure	16 bit/sample 1 sample/minute	1:1	0.3 bit/s

Questions

- What types of applications?

- What are the traffic characteristics?
  - packet/frame size
  - arrival rate
  - timing constraints

- What types of wireless technology?

Scenarios

- how many devices?

- Point to point / multipoint

Prioritize application selection