**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |
| --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **TG10 / Technical Guidance Document subsection 6** |
| Date Submitted | [ ] |
| Source | [Noriyuki Sato, Kiyoshi Fukui][ ][ ] | Voice: [ ]Fax: [ ]E-mail: [ ] |
| Re: | [TG10 TGD] |
| Abstract | [Subsection 6 of the TGD - Working document] |
| Purpose | [Sub-document of TGD] |
| Notice | This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein. |
| Release | The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15. |

# Overview

# Definitions

# Abbreviation and acronyms

# General requirements

## Summary of PAR

### Scope

### Purpose

## High level requirements

## Application requirements matrix

## Defined Behaviors Should Support the Following in 802.15.4

# Functional requirements

## Mesh Topology Discovery

## Mesh Routing Protocol

## Extensible Mesh Routing Architecture

## Mesh Broadcast Data Delivery

## Mesh Unicast Data Delivery

## Mesh Network Size

## Mesh Security

## Routing Metrics

### Radio-Aware

### Device-Aware

### Network-Aware

### Bridge-Aware

## Discovery and Association with a L2R network

## Changes to the MAC and PHY

# Performance requirements

## Required memory resource

Considering minimum implementation, the device shall work with hundreds bytes of inner memory of the processer.

## Calculation cost

Calculation costs affect to the energy consumption described in 6.3 and propagation delay of the application data. A device shall work with the network size and requirement of delay described in use case section. A device shall work with the requirement of energy consumption described in 6.3.

## Energy consumption

A proposal method shall work with the duty cycle described in 6.10.

## Control traffic overhead

To allow data traffic use bandwidth, the system should suppress control traffic as possible. The network shall work during network forming in the case big size of network; whatever situation it is supposed that more control traffic occurs.

## Route acquisition time

Route acquisition shall be done within the required time described in each use cases in section 4. For the proactive routing, the requirement may be necessary time for the all nodes to have route information. For the reactive routing, the requirement may be necessary time to send data from data traffic occurs. (Each use case described in section 4 needs to include parameters.)

## Recovery time of link failure

The network shall detect and recover with in the required time described in the section 4 when local link failure happens. (Each use case described in section 4 needs to include parameters.)

## Scalability to network size

The network shall work with a protocol on the network which size is described in the use case in section 4. If a protocol is applied to all each case, it shall suffice all requirements of all use cases. A protocol may be applied to a use case. (Proposed protocol shall say which use case requirement it suffices.)

## End to End packet loss rate

Packet loss rate and throughput have dependent relation. The combination of them should be appropriate to the use case requirement. These values are dependent to node density, link budget and environmental parameters. Thus a proposal shall include consideration of the End to End packet loss rate and these related parameters.

## End to End data throughput and delay

Packet loss rate and throughput have dependent relation. The combination of them should be appropriate to the use case requirement. These values are dependent to node density, link budget and environmental parameters. Thus a proposal shall include consideration of End to End data throughput, delay and these related parameters.

## Life time of battery operated network

The network shall work also with duty cycle which suffices network lifetime requirement described in section 4.

A typical parameters of RF and AA battery and the life times calculated with those parameters are as follows.

　　Consumption of RF+CPU： 40mA in active

　　 10µA in sleep

　　AA alkali battery：2000mAh

　　Duty life time

　　1% 0.5 years

　　　0.1% 4.5 years

　　　0.03% 10 years

# Regulatory Considerations/Aspects

# Evaluation methodology