**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |  |
| --- | --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | **TG10 Scenario Parameters** | |
| Date Submitted | 22 May, 2014 | |
| Source | \*[Verotiana Rabarijaona, Fumihide Kojima], †[Hiroshi Harada]  \*[NICT], †[Kyoto University] \*[3-4, Hikarino-oka, Yokosuka, 239-0847 Japan], †[36-1 Yoshida-Honmachi, Sakyo-ku, Kyoto 606-8501 Japan] | Voice: [+81-46-847-5075] Fax: [+81-46-847-5089] E-mail: [rverotiana@nict.go.jp] |
| Re: | [[TGD Scenario Parameters #319r0](https://mentor.ieee.org/802.15/dcn/14/15-14-0319-00-0010-tgd-scenario-parameters.docx)] | |
| Abstract | [Scenario Parameters for CfFP - Working Document.] | |
| Purpose | [Define the parameters to consider in the scenario for final proposals] | |
| 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. | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | **Scenarios** | | |
| **Parameter** | | | **Mostly Upstream:**  **Smart metering, infrastructure monitoring, Irrigation Optimization** | **Mostly Downstream:**  **Street lighting, smart lighting** | **Balanced upstream and downstream:**  **CEMS, BEMS, HEMS** |
| Packet size | | | 100 bytes | | |
| Data rate | | | 250kbps [1][2] | | |
| Packet birth rate | | | 1 packet every 30 min |  |  |
| Duty cycle | | | 100%, 1%, 0.1% | | |
| Node density | | | 8000 / km2 (household density in Tokyo) [3] |  |  |
| Mobile devices (Y/N) - speed | | | N | N | Y – 1.4m/s (human walking speed) |
| PAN Coord to Device | | Unicast (Y/N) | Y | | |
| Multicast (Y/N) | Y | | |
| Broadcast (Y/N) | Y | | |
| Device to PAN Coord | | | Y | Y | Y |
| Device to device | | Unicast (Y/N) | N | N | Y |
| Multicast (Y/N) | N | N | Y |
| Broadcast (Y/N) | N | N | Y |
| Linear Topology (Y/N) | | | N | Y | N |
| Energy consumption | TX | | 28 mA [1] | 30 mA [2] | |
| RX | | 11.2 mA [1] | 37 mA [2] | |
| Idle | | 1.5 uA [1] | 500 uA [2] | |
| Sleep | | 0.1 uA [1] | 0.2 uA [2] | |
| Tx power | | | 13 dBm [1] | 0 dBm | |
| Rx sensitivity | | | - 97 dBm [1] | -92 dBm [2] | |

**Definitions**:

Data rate: data rate at the physical layer

Packet birth rate: rate at which packets are being generated

Duty cycle: ratio of active/non-active state of device

Device: node other than the PAN coordinator

N: Number of nodes in the PAN

N = 121 (11x11), 999 (33x33), 10,000 (100x100)

For Linear Topology N = 999 (33x33), where the middle row or column has N=100

Unicast: transmission from 1 source to 1 destination

Multicast: transmission from 1 source to n destinations (n < N-1)

Broadcast: transmission from 1 source to N-1 destinations

**Other parameters**

Path Loss model: Two-Ray

**References**

1. <http://www.semtech.com/images/datasheet/sx1272.pdf>
2. MC13202, Low power transceiver for the IEEE 802.15.4 Standard, http://cache.freescale.com/files/rf\_if/doc/data\_sheet/MC13202.pdf?pspll=1&Parent\_nodeId=1141674020187711908069&Parent\_pageType=product
3. Tokyo statistical yearbook, Population and Households, http://www.toukei.metro.tokyo.jp/tnenkan/2012/tn12qa021000.xls