**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | **TG10 Scenario Parameters** | |
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| 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] | |
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|  | | | **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 | | 31 bytes, 255 bytes, 2047 bytes |
| Data rate | | | 100kpbs, 250kbps [1][2] | | 20kbps, 250kbps[5], 2Mbps[6] |
| Packet birth rate | | | 1 packet every 30 min |  | 1 packet/sec, 1 packet/min, 1 packet/30min |
| 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) |
| Number of entry points | | |  |  | 1, 3 |
| Number of exit points | | |  |  | 1, 3 |
| 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 |
| Multiple devices to device (Y) [4] | | |  |  | Y |
| Number of PAN coordinators [4] | | |  |  | 1, 3 |
| 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)

**n=11 for N=121, n=33 for N=999, and n=100 for N=10000**

Broadcast: transmission from 1 source to N-1 destinations

Multiple devices to device: transmission from n devices to one device

**n=11 for N=121, n=33 for N=999, and n=100 for N=10000**

**References**

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