

**WPAN/LPWAN IoT architectures**

**–TP1–**

**IEEE 802.15.4 a low-rate low-power WPAN standard**

# **Delivery Rate vs Traffic Load**

#  **Relation between traffic load and interval**

In the context of CBR (Constant Bit Rate), this relation is equal to:

$$trafficload=\frac{1}{interval}$$

# **2. Number of sent packets**

# **3. Packet delivery rate**

# **4. Packet error rate**

# **5. Relation between delivery rate and traffic load**

We can observe a kind of parabola. When the traffic load is very small, the interval between packets is very high: too few packets are sent. When the traffic load is higher, the interval is lower: too many packets are sent and the network is facing a congestion.

# **Duty cycle vs Beacon Order**

# **1. Relation between duty cycle and energy consumption**

More the duty cycle, or node’s activity, more the energy consumption. This relation may have a form like:

$$energyconsumption=a.dutycycle^{n}+k$$

# **Relation between duty cycle and Beacon Order**

Considering a slotted CSMA/CA, more the activity of all the nodes, less the availability of the medium. Indeed, as in Wi-Fi the medium access depends on the activity and the number of nodes: when the activity is dense, only a few slots are available.