Common patterns

Smart phones

Smart phones are a very common element in many IoT-related scenarios. They are on the one hand devices containing a multitude of sensors, but they also host apps (Active Digital Artefacts), services, and resources. E.g.: the GPS sensor is embedded in the phone itself. It is thus embedded sensor hardware. Its data is made accessible through the related On-Device Resource and the location service that exposes it. An app can be used to display the location information.

M2M interaction

Internet of things has been mostly associated to with machine-to-machine (M2M) communication in manufacturing and power, oil and gas utilities. Machine to Machine (M2M) is a term or label that can be used to describe any technology that enables networked devices to exchange information and perform actions without the manual assistance of humans. M2M communication is often used for remote monitoring. In product restocking, for example, a vending machine can message the distributor when a particular item is running low. M2M communication is an important aspect of warehouse management, remote control, robotics, traffic control, logistic services, supply chain management, fleet management and telemedicine. It forms the basis for a concept known as the Internet of Things (IoT).

Key components of an M2M system include sensors, RFID, a Wi-Fi or cellular communications link and autonomic computing software programmed to help a networked device interpret data and make decisions.

The most well-known type of M2M communication is telemetry, which has been used since the early part of the last century to transmit operational data. Pioneers in telemetrics first used telephone lines -- and later, on radio waves -- to transmit performance measurements gathered from monitoring instruments in remote locations. The Internet and improved standards for wireless technology have expanded the role of telemetry from pure science, engineering and manufacturing to everyday use in products like home heating units, electric meters and Internet connected appliances. Products built with M2M communication capabilities are often marketed to end users as being "smart."

RFID gates and cards

Historically, the IoT term was introduced in a presentation where RFID was used to demonstrate the possibilities lying in this filed. The most well-know use case was the goods tracking scenario during the supply chain. However, we have increased its usage scenarios not just relying on goods tracking and logistic but passing gates.

RFID card

The technology of RIFD (Radio Frequency IDentification) is simply using radio frequencies to identify objects. Its mainly similar for a barcode and its reader. A generic term for technologies that use transponders to identify an object. The technology has its origins in the first part of the twentieth century and was initially

used to identify military aircrafts as friend or foe. Today RFID technology has found various applications in security, logistics and maintenance, just to name a few of them.

How does it work?

We can separate the work and the ware, as two part. Tags and readers. The tag is looking like this:

RFID tag

The Reader may have many different forms but we can generalize it in such like this:

RFID reader

RFID readers are devices for reading out RFID tags via radio signals. Different versions of readers exist that are tailored to the targeted application. Examples are mobile reads or RFID gates for monitoring items that pass through a door. RFID tags consist of a chip for storage and computation and antenna for communication. We categorize RFID tags according to their energy supply, data storage capabilities and communication frequency. Tags without batteries are referred as passive tags. These tags harvest energy from the communication signal sent by the RFID reader to run their operations.