Internet der Dinge: ein einfaches Konzept - zahlreiche Herausforderungen

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http://www.iot-a.eu/

Der englischsprachige Artikel der VDI/VDE Innovation + Technik GmbH berichtet über das Forschungsprojekt IOT-A (Internet of Things - Architecture), das zum Ziel hat, die Verbindung aller Objekte mit dem Internet zu ermöglichen. IOT-A wird von der Europäischen Kommission im Rahmen des 7. Forschungsrahmenprogramms kofinianziert. Das Konsortium für das Projekt setzt sich aus Forschungseinrichtungen und Universitäten aus neun Ländern zusammen.

Connecting everyday objects to the internet can be reality soon. The partners of the European FP7 Research Project IoT-A (Internet of Things - Architecture) create an architecture reference model allowing all objects to connect to the Internet, regardless of the wireless technology and eliminating interoperability challenges. The expected benefits are extensive and may result in energy savings, improved healthcare, a reduction of traffic and safer supply chains.

“In our vision, IoT-A will expand the boundaries of today’s internet to encompass the physical world and enable identification, information gathering and understanding”, said Dr. Thorsten Kramp, computer scientist at IBM Research - Zurich. “Three years from now, the foundation will be laid for any object having a sensor to connect to the Internet securely and easily.”

To demonstrate the technology for an open, unified Internet of Things architecture two viable scenarios are used:

• At the in-house hospital of the University of Rome, Italy and at Telefonica’s Living Lab in Granada, Spain, scientists monitor and process patients’ vitals. The data is sent to local hospitals and checked for major physiological changes. Medical assistance will be alerted if deviations are analysed and a course of action becomes necessary.

• To improve customer retention at retailers, the IoT-A project includes research activities to let consumers enjoy a more personalized shopping experience. The Future Retail Center in Regensdorf, a SAP Research Living Lab, offers scientists the possibility to create such an advanced individual experience based on shopping recommendations on smart phones. By connecting the smart phone to wireless sensors attached to products throughout the Future Retail Center store, products are recommended according to the consumer’s preferences, shopping history and a certain price range. The shopping list on the smart phone makes consumers’ navigation through the store more efficient. Product details are also available such as ingredients, nutrition facts ,carbon footprint details, or the production site.

While the concept is simple, its application faces a number of challenges.

Many of today’s devices (from mobile phones to RFID tags) can connect to the Internet. As point-to-point connections and often closed off by firewalls or restricted – like corporate intranets – IoT-A establishes a common ground for sensors, which companies, public entities, and individuals can effortlessly connect to, similar to crowd-sourcing websites.

One of many possible examples is the environmental sensor network in a smart city. Using IoT-A, the sensor network can be used simultaneously by the controlling infrastructure of the smart city, out-of-town environmental agencies, local news agencies, and overseas research institutes. All of them query different subsets of the sensor network's real-time measurement data, including temperature, rainfall, and humidity.

Another challenge is the ease of use. Configuring objects to connect them to the Internet as well as to each other is highly complex, due to the variety of incompatible wireless technologies. The IoT-A scientist's aim is to create a homogeneous connection of sensors regardless of their wireless technology, such as Bluetooth, Wifi, WiMAX, or Zigbee. In addition, IBM's Mote Runner technology makes a new homogeneous run-time and development environment available across a wide diversity of hardware and application domains.

Finally, an open Internet of Things inevitably raises security and privacy issues. IoT-A will take into account control of produced and traceable user data. Hardware and security technology advancements will help avoid the usage of stored data without permission and the tracing of individuals through their sensors.

About IoT-A

IoT-A has a budget of EUR 19 million and is co-funded with EUR 12 million by the European Commission within the 7th Framework Programme. For the project a consortium of 18 European-based corporate research organizations, large research institutes and universities from nine countries is coordinated by VDI/VDE Innovation + Technik GmbH and includes Hitachi Europe Ltd. (UK); NXP Semiconductors (D and B); Siemens AG (D); University of St. Gallen (CH); SAP AG (D); University of Surrey (UK); Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. (D); Commissariat à l'Energie Atomique (F); NEC Europe Ltd. (UK); Telefonica Investigación y Desarrollo SA Unipersonal (E); IBM Research GmbH (CH); Università Sapienza di Roma (I); Consorzio Ferrara Ricerche (I), Creative Systems Engineering (GR); Julius-Maximilian-Universität Würzburg (D); Alcatel-Lucent Bell Labs (F and B).

The research project started in September 2010 and will be completed in 2013. Now first results of "Internet of Things – Architecture" (IoT-A) are announced to be showcased at the IoT-week 2011. Please find further information on the research project IoT-A online

First results of the project will be shown at the IoT-week 2011 June 6-9 in Barcelona.

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