AWARDS

- IEEE INFOCOM2014 Best Demo Runner-Up Award

- European Nanoelectronics Forum 2015 exhibition 2nd prize (ESEE project)

- ENIAC JU 2015 Innovation Award winner (E2SG project)

PROJECTS

IoTWORLD® has been partially supported by the following European and National projects:

| Energy To Smart Grid (E2SG) | Environmental Sensors for Energy Efficiency (ESEE) | COgnitive & Perceptive CAMeraS (COPCAMS) |

Every day more and more objects are connected to the Internet creating a hyper-connected world where humans, things, and machines live together. This is known as the Internet of Things. The realization of this vision has enabled applications such as Smart Cities, Smart Buildings, Smart Homes, eHealth, Smart Driving, Smart Grids, and many others. These innovations are changing our daily lives.
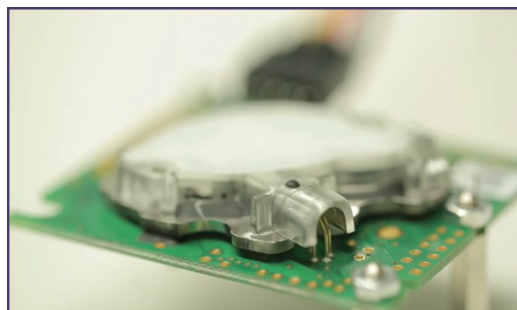
IoTWORLD® aims at fostering the collaboration of CTTC with academia, research, industrial partners... and you!

Let's bring together your idea to the real world!

iotworld@cttc.es

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IoTWORLD®

End-to-End Experimental Platform for the Internet of Things

http://iotworld.cttc.es

DESCRIPTION

IoTWORLD® is an End-to-End testbed for the Internet of Things (IoT). The main focus is on Wireless Communications systems and data analytics. IoTWORLD® is a unique testbed for the IoT. It features:

- Scalable design
- End-user involvement
- Integration with 5G technologies
- Heterogeneity of wireless technologies
- Traffic shaping using SDN
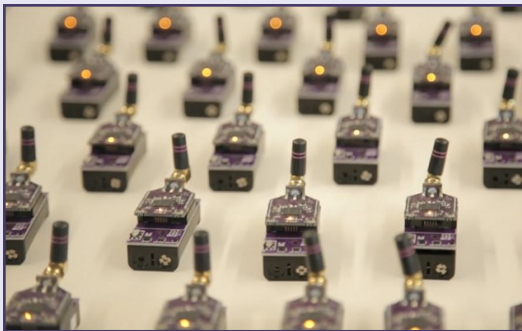
CAPABILITIES

- *Applied research*. IoTWORLD® testbed facilitates experimental research in the area of wireless communications and data analytics. IoTWORLD® has been used to demonstrate the potential of the Distributed Queuing (DQ) technology.

- *Heterogeneous implementations*. It allows several technologies to coexist and cooperate to achieve a common goal.

- *Commercial solutions integration*. Thanks to its flexibility, IoTWORLD® also allows the easy integration of off-the-shelf technologies.

ARCHITECTURE

IoTWORLD® relies on a 4-tier architecture. Sensors and actuators are connected to a set of gateways, either with a direct connection or via multiple hops. These gateways are then connected to the Internet providing the capability to retrieve and store data in the Cloud, among other functionalities, such as data fusion, compression and analytics. An innovative software middleware has been developed for these gateways. This software makes the integration of new wireless technologies very simple, thus overcoming the heterogeneity barrier. The data gathered by the sensors is stored in the Cloud which can be accessed from a web interface or a smartphone application.

IoTWORLD® permits to obtain valuable information from the data measurements by means of data analytics on the edge. For this purpose, Software-Defined Networking (SDN) is a key enabler to realize a flexible communication between the different computing entities. By leveraging the ability to gather network-wide information at a centralized SDN controller, IoTWORLD®'s gateway tier adapts the forwarding path according to each flow's predefined requirements. This opens the door to context-aware forwarding strategies, revealing different network resources according to the type of flow and current network conditions.

IoTWORLD® constitutes a fundamental part of the unique End-to-End 5G experimental platform available at CTTC. IoTWORLD® can be connected to other demonstrators devoted to the physical layer, optical networks, and wireless backhauling. Together, end-to-end research can be conducted towards a holistic definition and exploration of 5G technologies.
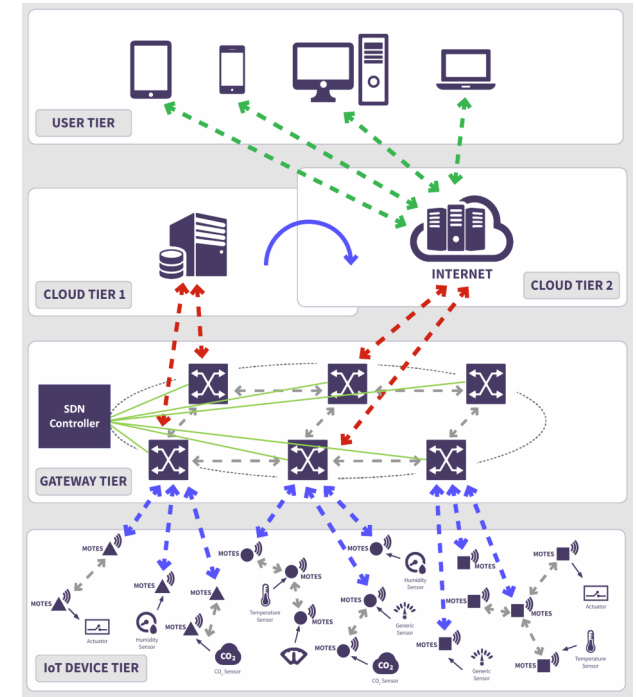
USE CASES

IoTWORLD® can be used to demonstrate any use case. For example:

- Indoor air quality and gas monitoring

- Smart energy grids: Distribution Automation (DA) and smart HVAC control

- Smart parking: presence detection

- Water and waste management

- Smart lighting

- Intrusion detection systems

- Remote robot control