TRANSPARENT TECHNOLOGY

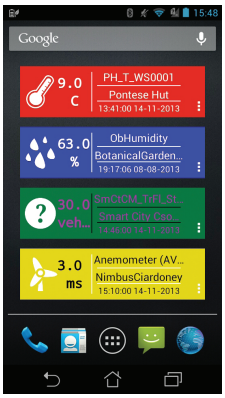
SENSOR WIDGETS

VISUALIZING DATA FROM SENSORS

The Internet of Things paradigm – IoT – involves using the web to connect objects of different kinds, probes, detection systems, actuators etc., enabling them to exchange data autonomously: the aim is to create cooperative mechanisms that function without the need for human intervention. In general these objects are designed to gather and deliver data or carry out operations on the basis of information gathered and processed on the web.
As part of its research and development activities CSP has developed a platform capable of gathering, managing and visualising the various different devices installed in a given area and the data harvested from them.

ABOUT THE APPLICATION

Sensor Widgets is a mini Android application accessible from the main screen of mobile devices such as smartphones, tablets or multitouch surfaces which visualises data transmitted from sensors in a given area. The application is one of the channels that can be used to access sensor data from the IoT platform developed by CSP, made accessible in real time also through the IotNet portal - www.iotnet.it – where past series can be downloaded in .csv format. The various sensors can also be followed on twitter at the hashtag #IoTNet.



Figures 1 and 2 - Sensor widgets on in use on a smartphone and a multitouch TV

THE MAIN FUNCTIONS

The Sensor Widgets system publishes data from various sensors and enables the user to:

- visualise the data from a single sensor in the platform in real time;
- automatically update the data according to the desired refresh rate, from 1 minute up to 24 hours;
- manually update a single widget using the standard tap gesture;
- place more than one widget on a single screen;

- configure text colours, background and icon to create personalised visual groupings of sensors and projects of different kinds.

TECHNICAL CHARACTERISTICS

The IoT platform developed by CSP, which is the cornerstone of the system for gathering sensor data, is based on a range of different components:

- sensors distributed in an area which gather data and dialogue with the gateway;
- a backend that receives the data, saves it in the DB and supplies the necessary input to the various front-ends to visualise the data and tweet it;
- a web frontend, the site www.iotnet.it, which groups the types of sensors and the subject area of the data gathered, publishes it in real time and enables it to be downloaded in .csv format.
- an Android widget front-end, based on Sensor Widgets, capable of visualizing the data on various different multitouch devices.

The system architecture can be represented with a number of basic elements. The sensors distributed throughout an area represent the sources of the data, and can be organised into homogeneous or heterogeneous Wireless Sensor Networks. These networks are connected to the IP network through gateway devices.

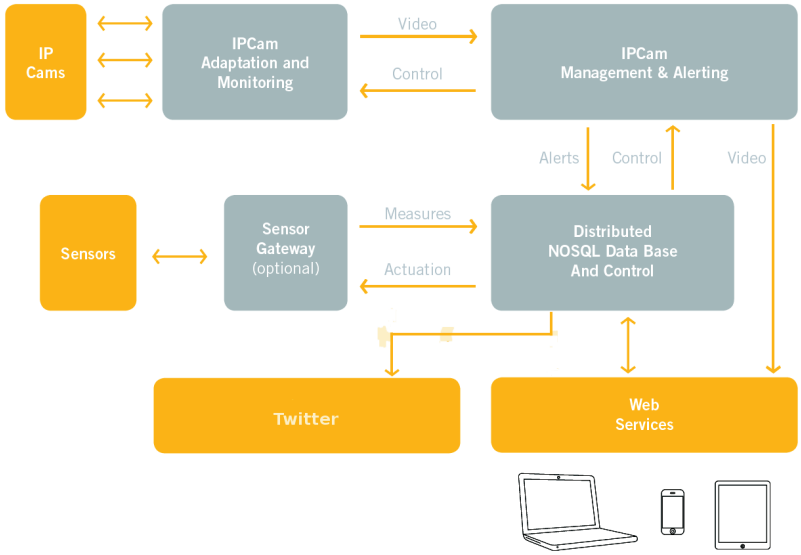


Figure 3 - IoT architecture

These gateways have the function of packeting the data from the WSN, which normally function using proprietary protocols on frequencies suited to the specific setting, and sending it to the network. Some nodes, however, access the IP network directly and do not need to use gateways. The data from the sensors is gathered on the IoTNet platform, which fulfils a number of functions, including saving the data, creating uniform visualisations, and flagging malfunctions and unreliable data. The data gathered is available in real time on different platforms, visualised on the web and retweeted each time it is refreshed.

CSP - innovazione nelle ICT
Via Nizza 150, 10126 Torino (entrance by Via Alassio, 11/c)
Phone +39 011 48.15.111 Fax +39 011 48.15.001
www.csp.it - innovazione@csp.it