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A Web of Things Based Industrial Monitoring System Design Using 32-Bit Microcontroller

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ABSTRACT:

Design of a Web Of Things Based Industrial Monitoring System Design Using 32-Bit Microcontroller is used to monitor things like Temperature, Humidity, Object and Gas in Industries and push same data to Cloud To achieve this we will using8051 microcontroller with UART and GPRS to transmit the things like (Temperature, Humidity, Object and Gas) and for receiving the things we designed GUI web based programming application using Microsoft visual basic and displayed Graphically on GUI and also same data is pushed to Cloud (like Dropbox) .we can see status of the things just by checking files in cloud The Web Based GUI is tested with varying values for Temperature, Humidity, Object and Gas in outdoor and is found to be successfully.

Introduction

A central concern in the area of pervasive computing has been the integration of digital artifacts with the physical world. In particular, the "Internet of Things" has essentially explored the development of applications built upon various networked physical objects [1]. Inhabitants of the physical world such as sensor and actuator networks, embedded devices, appliances and everyday digitally enhanced objects (subsequently called smart things) are, for the most part, disconnected from the Web and form a myriad of small incompatible islands. Increasingly, embedded devices and consumer electronics as for example Chumby,1 IoBridge,2 or Nabaztag3 get Internet (and sometimes Web) connectivity but, however, cannot be controlled and monitored without dedicated software and proprietary interfaces. As a consequence, smart things are hard to integrate into composite applications, which severely hinders the realization of a flexible ecosystem of devices that can be reused serendipitously.

The Internet of Things has mainly focused on establishing connectivity in a variety of constrained networking environments, and the next logical objective is to build on top of network connectivity by focusing on the application layer. In the Web of Things (WoT), we are considering smart things as first-class citizens of the Web. We position the Web of Things as a refinement of the Internet of Things by integrating smart things not only into the Internet (the network), but into the Web (the application layer). To achieve this goal, we propose to reuse and adapt patterns commonly used for the Web, and introduce an architecture for the Web of Things. We embed Web servers [2], [3], [4] on smart things and apply the REST architectural style [5], [6] to the physical world.

The essence of REST is to focus on creating loosely coupled services on the Web so that they can be easily reused [7]. REST is actually core to the Web and uses URIs for encapsulating and identifying services on the Web. In its Web implementation it also uses HTTP as a true application protocol. It finally decouples services from their presentation and provides mechanisms for clients to select the best possible formats. This makes REST an ideal candidate to build an "universal" API (Application Programming Interface) for smart things. As the "client-pull" interaction model of HTTP does not fully match the needs of event-driven applications, we further suggest the use of syndication techniques such as Atom and

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some of the recent real-time Web technologies to enable sensor push interactions

Linking the Web and physical objects is not a new idea. Early approaches started by attaching physical tokens (such as bar-codes) to objects to direct the user to pages on the Web containing information about the objects [10]. These pages were first served by static Web Servers on mainframes, then by early gateway system that enabled low-power devices to be part of wider networks [11]. The key idea of these work was to provide a virtual counterpart of the physical objects on the Web. URIs to Web pages were scanned by users e.g., using mobile devices and directed them to online representation of real things (e.g., containing status of appliances on HTML pages or user manuals). With advances in computing technology, tiny Web servers could be embedded in most devices [3], [2]. The Cooltown project pioneered this area of the physical Web by associating pages and URIs to people, places and things [8] and implementing scenarios where this information could by physically discovered by scanning infrared tags in the environment. We would like to go a step further and to propose an architecture to truly make smart things part of the Web so that they proactively serve their functionality as reusable Web services.

A number of projects proposed solutions to expose the functionality of smart things in order to build applications upon. Among them, JINI, UPnP, DNLA, etc. The advent of WS-* Web Services (SOAP, WSDL, etc.) led to a number of work towards deploying them on embedded devices and sensor networks [12], [13]. While helping towards the integration to enterprise applications, these solutions are often too heavy for devices with limited capabilities [4], do not directly expose the smart things' functionality on the Web as REST ful architectures do and are not truly loosely-coupled [7].

Several systems for integration of sensor systems with the Internet have been proposed — for example SenseWeb [14] and Pachube—which offer a platform for people to share their sensory readings using Web services to transmit data onto a central server. Unlike the Web of Things, these approaches are based on a centralized repository and devices are considered as passive actors only able to push data.

MOTIVATION

The recent innovations in the information and communication Technology (ICT) field are mainly focused on the development and dissemination of the so-called smart environments. They are characterized by many small and heterogeneous Smart objects, which are usually disconnected from the Internet and cannot be controlled without dedicated software and proprietary interfaces. To overcome these limitations, the IoT, or rather the WoT, has mainly focused on establishing Web connectivity and integration among smart things, but there is still no architecture able to provide a flexible and easy Access to their physical resources. Industrial monitoring system is one of such applications possible by embedding wireless sensor devices to 8051 controller The most of the state-of the-art technology uses GPRS to transmit to the data to Mobile or PC. The focus of the proposed industrial monitoring system is to track Temperature, Humidity, Object detection and Gas and pushing the same data to Cloud (Drop box) this paper, such a type of approach could be very useful in several Fields, ranging from academia to industrial worlds, also including everyday life of end users. From an academic point of view, it would simplify and speed up the implementation and testing of new protocols for constrained networks. In fact, the validation of new protocol solutions is increasingly being done via a test bed approach, i.e., by checking "on the field" the behaviour of real nodes.

This approach requires the execution of time-consuming operations, such as the frequent updating of the code on individual nodes, and heavy storing of data for successive processing. Therefore, a solution for rapid testing and evaluation of new protocols would optimize the research work. From an industrial point of view, companies could exploit this approach to continuously monitor and update their products and

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networks. For example, consider the postsales service of a company that sells electronic appliances. Taking advantage of the proposed solution, the company could deploy in the cloud the programs that manage its appliances. This way, if any malfunction occurs, the company's technicians are immediately notified and can solve the problem quickly, avoiding going to The user's home.

Similarly, any software update does not require any action on the product, but simply the replacement of the program running in the cloud. Last but not least, end users, more and more involved in the use of embedded devices (e.g., for home automation applications), could exploit a flexible and Intuitive software platform to deploy applications for their own needs. They could leverage applications already implemented by other developers or they could autonomously create their own applications.

Literature survey

Integration of different technologies potentially provides support to wide variety of applications and systems with vastly varying requirements and characteristics. Industrial monitoring system is one of such applications possible by embedding wireless sensor devices to 8051 controller The most of the state-of the-art technology uses GPRS to transmit to the data to Mobile or PC. The focus of the proposed industrial monitoring system is to track Temperature, Humidity, Object detection and Gas and pushing the same data to Cloud (Drop box) this paper, we present architecture for Industrial monitoring system using wireless sensor technology. We have defined the packet structure for communication between the nodes.

Certain issues that arise during implementation are discussed. To investigate our proposed design towards implementation, we have performed simulations for different scenarios under certain realistic conditions. The results from the analysis and evaluation through simulations provide general design guidelines to implement the proposed solution.

BLOCKDIAGRAM

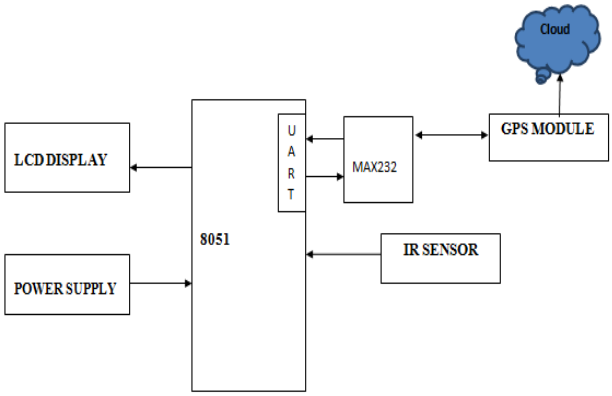

Figure 1 Transmitting section

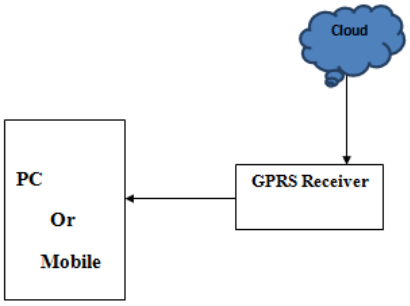

Figure 2 Receiving section

The block diagram consistsof power supply to give power to the entire components, LCD display to display the output, 8051 as the main component used to interface and control entire component,2 IR sensors to detect the obstacle and 8051 interfacing with GPS to read the location of the vehicle, temperature sensor to sense the temperature and transreceiver to update the network into PC.

The system consist of two modules
1. Transmitter section
2. Receiver section

Transmitter Section

The transmitter section does the function of controlling GSM and GPS,reading the location of vehicle and then transmit signal to the microcontroller.

Receiver Section

The receiver section consists of mobile

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Working principle:

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To achieve this we will using 8051 microcontroller with UART and GPRS to transmit the things like (Temperature, Humidity, Object and Gas) and for receiving the things we designed GUI web based programming application using Microsoft visual basic and displayed Graphically on GUI and also same data is pushed to Cloud (like Dropbox) .we can see status of the things just by checking files in cloud

The Web Based GUI is tested with varying values for Temperature, Humidity, Object and Gas in outdoor and is found to be successfully.

RESULTS

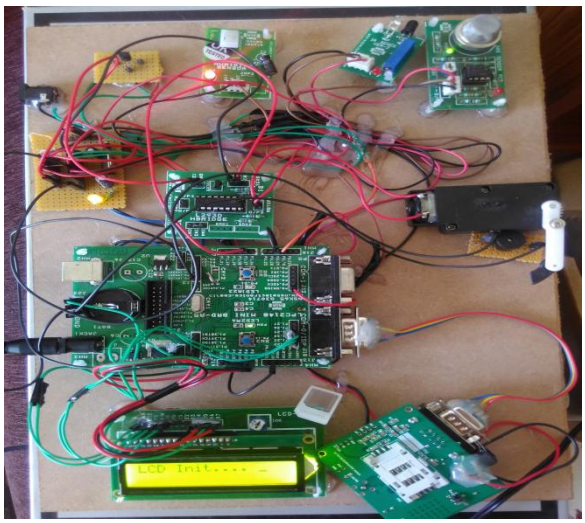

Figure 3 Implemented Circuit

Design of a Web Of Things Based Industrial Monitoring System Design Using 32-Bit Microcontroller is used to monitor things like Temperature, Humidity, Object and Gas in Industries and push same data to Cloud

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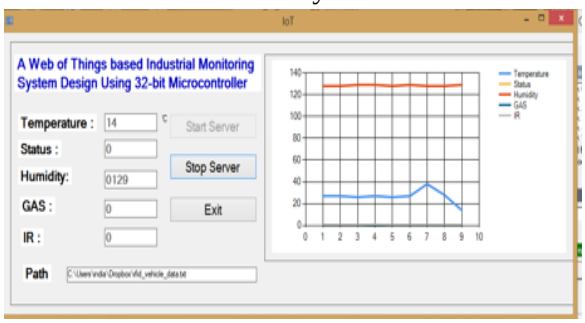

CONCLUSION

This project is useful to monitoring things from anywhere in the world

FUTURE SCOPE

We can implement this project by using RFID to provide more authentications

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