



WIRELESS SENSOR NETWORK TEST-BED FOR ENVIRONMENTAL MONITORING

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OUTLINE

- **Abstract**
- **Wireless Sensor Networks**
- **Case Study: WSN Test-Bed**
 - **Experimental Setup**
 - **Results Presentation**
- **Motivation for the Project**
 - **Problem Statement and System Design**
- **Conclusion**

ABSTRACT

- **Sensor networks consist of embedded devices deployed in different types of environments in order to sense its surroundings**
- **The development in embedded system has proved to a reliable solution in monitoring and controlling the environmental monitoring**
- **Environmental monitoring is the most important issue for everyday emergency situations**
- **An implementation of a wireless sensor network test-bed is presented as a case study. This test-bed is a reactive network for environmental monitoring and evaluates the effectiveness of the network for data gathering using both laboratory and field tests**
- **The project aims at building a system which can used on universally at any scale to monitor the parameters in a given environment**

WIRELESS SENSOR NETWORKS

- **Sensor nodes are typically deployed using battery-powered stationary sensor nodes equipped with sensing, computing and wireless communicating modules**
- **Network usually contains**
 - **sensing nodes (sources):**
 - **to route data about their environment to the base station**
 - **base station (sink):**
 - **collects and interprets the data from all the source nodes in the network**
 - **communicate on short distances**
 - **sense environmental data**
 - **perform data processing**
- **In a broad range of potential applications- sensors can be embedded into buildings or scattered into spaces to collect, process, store and send out relevant information for various civilian or military purposes**

CASE STUDY: WSN TEST-BED

- The wireless sensor network test-bed for environmental monitoring by combining Hmote (Hybus kit2420)
- The test-bed shows the two Hmote sensors sense temperature and humidity of its environment from about 3 m from base station and the two nodes are separated from 4 m apart in the test environment

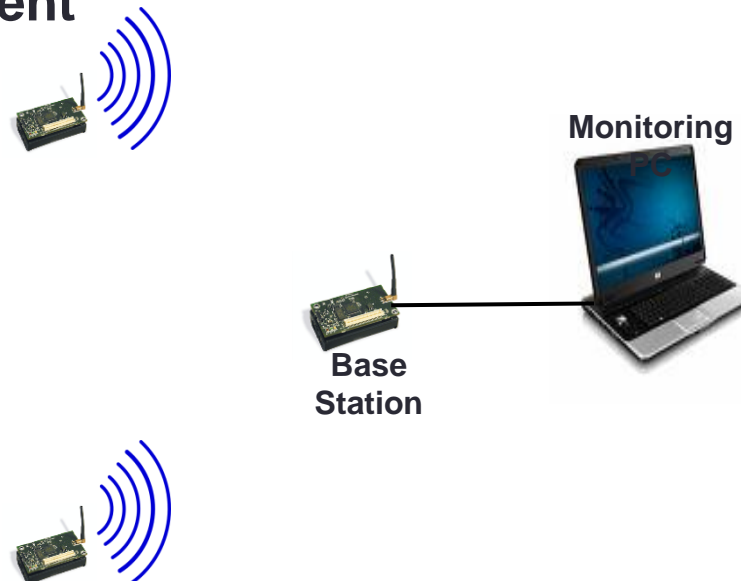
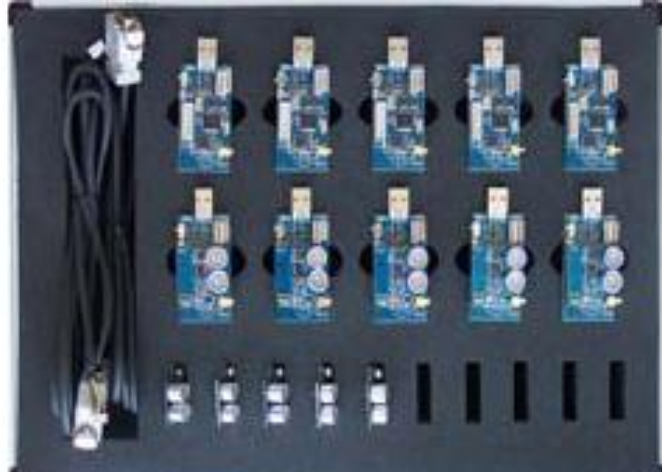
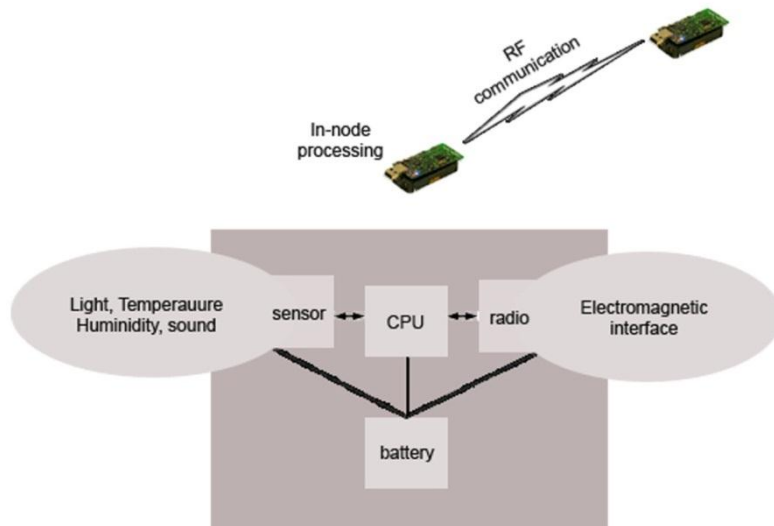


Fig: Architecture of WSN Test-Bed

Experimental Setup : Hardware Components & Verification of Sensor Nodes



- MSP430 Microprocessor & 512KB EEPROM
- A new platform for lower power research
 - Monitoring Applications
- Long lifetime, low power, low cost
- Robustness
 - Integrated Antenna
 - Integrated Sensors
- Standards Based
 - IEEE802.15.4
 - USB
- IEEE802.15.4
 - CC2420 T/R
 - 250kbps
 - 2.4GHz Band



Results Presentation: Changing values of Temperature and Humidity in reactive manner from the test-bed

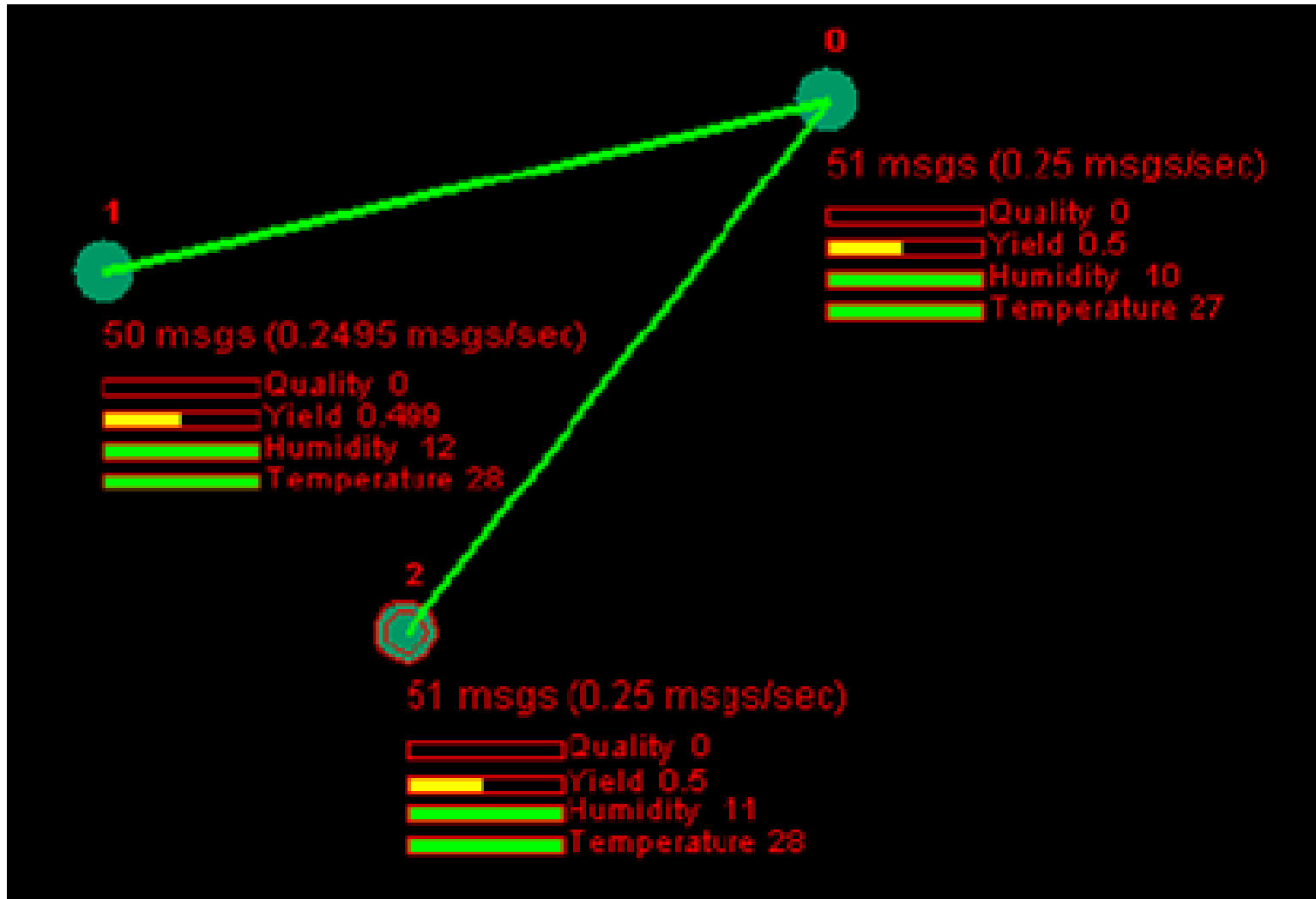


Fig .WSN test-bed output monitored from PC

MOTIVATION FOR THE PROJECT

Problem Statement and System Design

- The motivation for this project is that the outcomes from test-bed focused the development of wireless sensor technologies have provided for considering in monitoring and controlling in various parameters in real time
- This project will implemented on the design and implementation of environmental monitoring system using Raspberry-Pi which is interfaced with various sensors
- Real time data will be collected by all the sensors and will be fetched by the webserver. This data can be accessed by the users through the web.

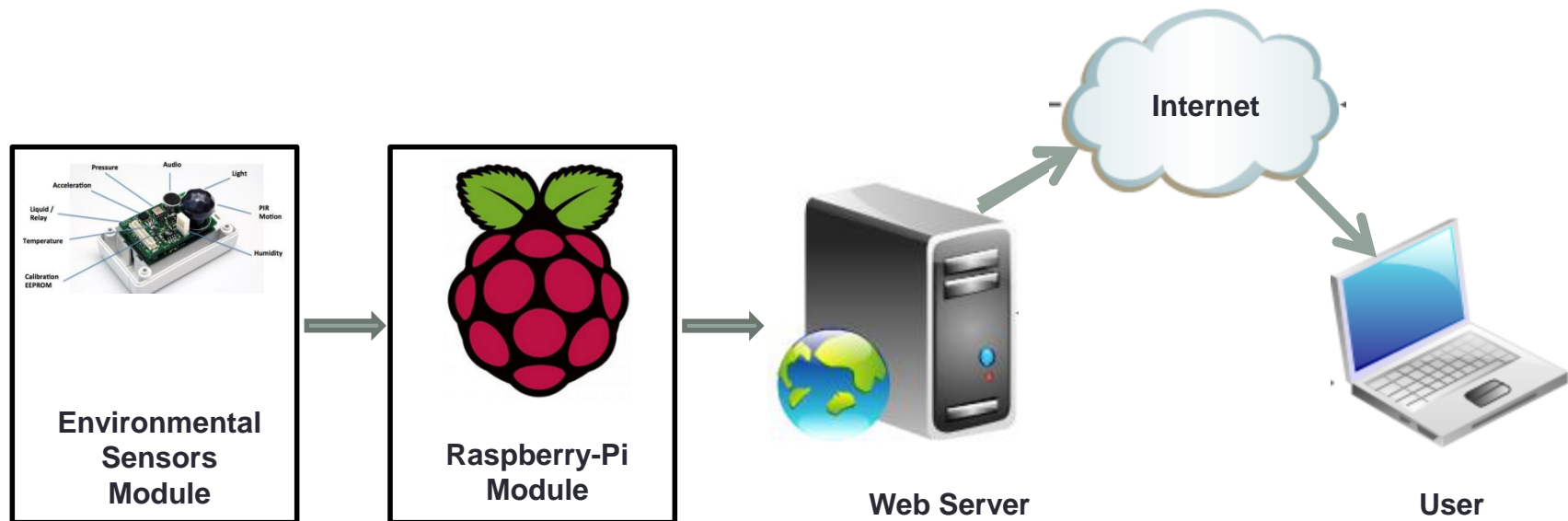


Fig: System Architecture for Environmental Monitoring

CONCLUSION

- **The case study test-bed can be further developed using more nodes and multi-hop communication through internet for early warning systems**
- **The future trends of wireless sensor networks is really the vision of “anytime, anywhere” communications for disaster management and rehabilitation process**

THANK YOU !!!!!