A Sensible Farm Watering Strategy Using Mud Humidity And Heat

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Abstract: **The aim of coordinator node would be to collect the parameters like soil moisture and soil temperature wirelessly. Each sensor node includes soil moisture and soil temperature sensor and something ZigBee RF antenna device for communication using the coordinator node. The Apache server crated on Raspberry Pi easily displaying the items in sensor data. Raspberry Pi stores collected data within the database and analyzes the stored data. The machine works based on the formula produced for watering the crop. The module includes, recognition probe, and sensor board. It's getting triple output mode, digital, analog, and serial with exact readings. Within this paper, Raspberry Pi can be used being an embedded Linux board that is designed in line with the arm 11 microcontroller architecture. Embedded Linux board helps make the communication with all of distributed sensor nodes put into the farm through ZigBee protocol and itself behave as a coordinated node within the wireless sensor network. The ZigBee protocol can be used for wireless communication it'll create network easily and mixture of Arduino, Xbee and sensor produce a low power affordable sensor node. More water contained in the soil helps make the soil conduct electrical current easier indicate less resistance, while dry soil getting less water conducts electricity poorly indicate more resistance. The board comes with an Ethernet interface and runs the straightforward data server.**

Keywords: **Raspberry Pi (RPi); Zigbee; Irrigation System; Water To Soil; WSN; Linux Board; Microcontroller;**

I. INTRODUCTION

Within this suggested system WSN is includes two nodes, coordinator node and Router/Finish device node. Each node mainly includes memory, processor as well as an RF transceiver. Therefore we require today's technology to solve this issue and support better irrigation management. Within our system Rpi connected Xbee device set as coordinator and sensor connected Xbee device set being a Finish device. Coordinate node is definitely running mode while Finish device after every minute using sleep mode. For we have suggested system that is Internet based automatic irrigation system using wireless sensor network and embedded Linux board [1]. The advantages of water towards the soil depend upon soil qualities like soil moisture and soil temperature. Additionally, it is determined by the crop which grows within the soil. There's challenging before every country to sustain the new food requirement and lowering the farm water consumption. This paper presents an automation of farm irrigation system utilizing a wireless sensor network and embedded Linux board. The machine supplies a web interface towards the user so the user can control and monitor the machine remotely. A ZigBee protocol for wireless communication which

is dependent on the actual protocol IEEE 802.15.4, which defines the network physical layer, and controlling layer for media access, while ZigBee protocol defines the network layer, application layer and specifications from the network security services [2]
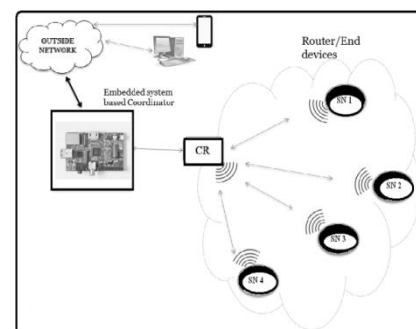
Fig.1.Proposed framework

II. IMPLEMENTATION

The machine includes three parts Coordinator node, Router/Finish device sensor node and server design. Coordinator node and Finish device sensor node is related by radio transceiver. It'll allow transmitting soil parameter data from Finish device sensor node to coordinator node and controlling signal from coordinator node to push node [3].

Within this suggested system we've used Raspberry Pi because the controller of coordinator node. Rpi may be the small, affordable minicomputer. Sensor node used here to sense the soil parameters. It's designed using Arduino 1 microcontroller board according to Atmega 328. It contains the ZigBee protocol based radio transceiver, power unit, and soil moisture and soil temperature. Additionally, the DS1822 can derive power from the information line, eliminating the requirement for an exterior power. Each DS1822 includes a unique 64-bit serial code, which enables multiple DS1822s to operate around the 1-Wirebus thus, it is possible to play one micro-processor to manage many DS1822s distributed more than a large area. Within this suggested system we've designed the database according to MySQL which is a component of Rpi. MySQL may be the popular selection of database inside a web application. The module includes, recognition probe, and sensor board. It's getting triple output mode, digital, analog, and serial with exact readings [4]. More water contained in the soil helps make the soil conduct electrical current easier indicate less resistance, while dry soil getting less water conducts electricity poorly indicate more resistance. The Raspberry may be the least expensive low power arm 11 based microcontroller operating at 700MHz frequency and getting the 512 megabytes of Random access memory. USB connection, an electrical jack. Arduino includes a microcontroller and Integrated Development Atmosphere. A ZigBee protocol for wireless communication which is dependent on the actual protocol IEEE 802.15.4, which defines the network physical layer, and controlling layer for media access, while ZigBee protocol defines the network layer, application layer and specifications from the network security services. IDE can be used to create and upload computer code towards the microcontroller [5]. The programming around the Arduino board is really method in which after every minute sensor node transmits soil parameter data to coordinator node through the ZigBee wireless communication protocol. Coordinate node contains Xbee transceiver, database, and Server. It collects the sensor data continuously and stores it inside a MySQL database. The python-serial programming can be used in raspberry Pi to spread out the serial port attached to the Xbee tool and read data regarding this. Within our system Rpi connected Xbee device set as coordinator and sensor connected Xbee device set being a Finish device. Coordinate node is definitely running mode while Finish device after every minute using sleep mode. Xbee device water pump node set like a router getting the destination address from the coordinator node. With respect to the moisture contain and temperature of soil the watering towards the crop is offered [6].

III. CONCLUSION

User could make the irrigation system Off or on remotely. The machine will lessen the water consumption and providing uniform water towards the crop leads to growing yield. The machine is watering towards the crop uniform by analyzing the soil parameters, it can help to lessen the new water consumption. By supplying the net interface and automation user can certainly monitor the machine and it'll minimize a person's intervention. More water contained in the soil helps make the soil conduct electrical current easier indicate less resistance while dry soil getting less water conducts electricity poorly indicate more resistance. This paper designs the automated wireless irrigation system using WSN and embedded Linux board. Within this we've used raspberry Pi being an embedded Linux board which enables collecting the sensor information from sensor node continuously, store it inside a database and supplying the net interface towards the user. Hence coordinator collects the information over ZigBee wireless communication protocol and permit user to watch the information from the internet browser. The module includes, recognition probe, and sensor board. It's getting triple output mode, digital, analog, and serial with exact readings.

IV. REFERENCES

[1] G. Levermore, Building Energy Management Systems: An Application to Heating, Natural Ventilation, Lighting and Occupant Satisfaction. Taylor & Francis, 2002.

[2] Yan Xijun; Lu Limei; Xu Lizhong, "The Application of Wireless Sensor Network in the Irrigation Area Automatic System," Networks Security, Wireless Communications and Trusted Computing, 2009. NSWCTC '09. International Conference on , vol.1, no., pp.21,24, 25-26 April 2009.

[3] Rani, M.U.; Kamalesh, S., "Web based service to monitor automatic irrigation system for the agriculture field using sensors," Advances in Electrical Engineering (ICAEE), 2014 International Conference on,vol., no., pp.1,5, 9-11 Jan. 2014.

[4] Zhang Feng, "Research on water-saving irrigation automatic control system based on internet of things," Electric Information and Control Engineering (ICEICE), 2011 International Conference on , vol., no., pp.2541,2544, 15-17 April 2011.

[5] Mirabella, O.; Brischetto, M., "A Hybrid Wired/Wireless Networking Infrastructure for Greenhouse Management,"

Instrumentation and Measurement, IEEE Transactions on , vol.60, no.2, pp.398,407, Feb. 2011.

[6] Gutierrez, J.; Villa-Medina, J.F.; Nieto-Garibay, A.; Porta-Gandara, M.A., "Automated Irrigation System Using a Wireless Sensor Network and GPRS Module," Instrumentation and Measurement, IEEE Transactions on , vol.63, no.1, pp.166,176, Jan. 2014.

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