

Research and Analysis Approach on Wireless Sensor Network System Based on Internet of Things: A Review

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Abstract. With the development of computer and related technology, makes the computing, communications, network and sensor, and other functions are integrated in wireless sensor network technologies. This article is precisely based on this research background, we have analyzed the overall design of wireless sensor networks and sensor nodes challenges, and puts forward the design of the wireless sensor network system based on Internet of things. At the same time, in the wireless sensor network (WSN) can also be carried out in the field of smart home application demonstration, through the information appliances connected to the sensor network, can provide people live with one of the most comfortable environment.

Introduction

Wireless sensor network has gradually become the industrial and academic research focus, in the military and civilian fields has a very broad application prospects. With the development of computer and related technology, making computing, communications, networks and sensors, as well as other functions are integrated in a single device, wireless sensor networks (WSN) is associated with these technologies [1]. People want to use computing resources and information services anywhere, anytime, pervasive computing, in order to adapt to the new model needs. Wireless sensor networks (WSN) is an important research area for pervasive computing. Integration of environmental data collection and monitoring tasks micro-sensor nodes sensor unit, a microprocessor and a communication module in the wireless sensor networks (WSN) by way of self-organization. Key technologies supported include support for sensor nodes for wireless sensor network operating system platform design work, and a wireless communication network system design between nodes [2]. Research Status Summary pervasive computing and wireless sensor networks as the background to solve the wireless sensor network key technology as the core, is proposed to design a new wireless sensor network application systems design, sensor nodes, network system design platform based on component model, network protocol stack design, wireless sensor network security.

Summary of wireless sensor network

As the underlying network an important part of the Internet, the US military initially proposed wireless sensor network research network (wireless sensor networks) theory and applications. Wireless sensor networks (WSN) deployed by a large number of sensor nodes communicate with each other in the monitoring area to form a multi-hop ad hoc network system [3]. Wireless communication, sensor technology, embedded applications and microelectronic technology, increasingly sophisticated wireless sensor networks at any time, any place, and any environmental condition for people to the information they need to lay the foundation for the development of the Internet. Because the network self-organization, deployment, fast, high fault tolerance and very subtle, and so on, making it ideal for battlefield targeting, planetary exploration, physiological data collection and monitoring, and many other fields. Internet network architecture shown in Figure 1.

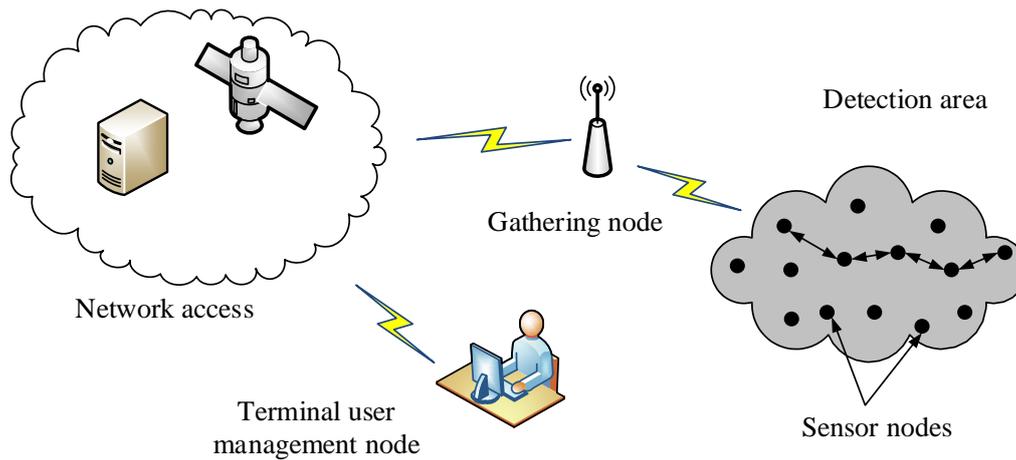


Figure 1. Architecture of wireless sensor network system

In the form of deploying a large number of sensor nodes are randomly distributed or manually placed in the control area, to build self-organizing network through [4]. Sensor nodes in the field of network monitoring data in transmission multihop routing node collection node, data of a plurality of nodes may be fusion and compression during transport, and finally, via satellite or wireless Internet access terminal management server node. The user can control other operations feedback secure network management node configuration management, release, and tasks.

The concepts of Internet of things

The Internet of things is just information collected by the sensor, the control node above also has the ability to intelligent processing. Things technology sensors and intelligent processing, and use of cloud computing technology, pattern recognition technology and other emerging technologies to broad range of applications. In practice, obtained through the analysis of large amounts of raw information from the sensor meaningful data for controlling different processes or response action to achieve intelligent processing in response to the request. The basic properties are shown in Figure 2.

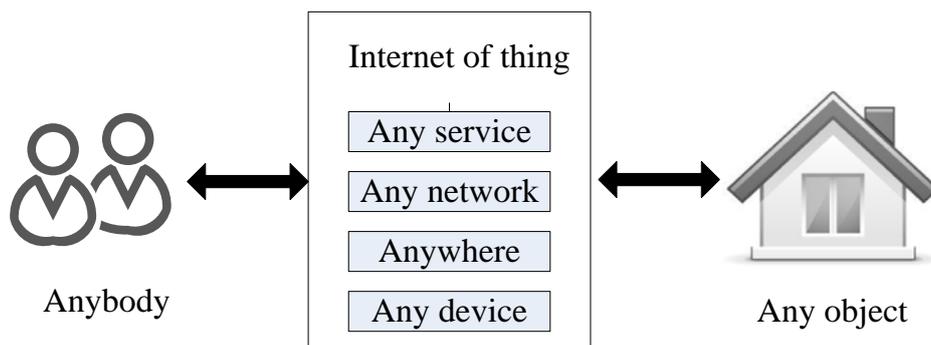


Figure 2. Basic attribute of Internet of things

With the Internet of things technology and innovation, the industry will develop at home and abroad as a new technology innovation and economic growth point. At the same time, the end user can affect the level of the network through the subjective behavior of different applications, so as to realize the information exchange between the people and the content, content and content of the alliance. The underlying distribution network including network, radio frequency identification, wireless local area network (LAN), such as heterogeneous networks, through a heterogeneous network information interaction from the physical environment of the objects of perception, allowing property of the system of object recognition and capture of information collection. From the network function, the underlying network should have a dual function of information gathering and routing, heterogeneous networks need to collaborate to complete specific tasks. A large number of the underlying network systems in the physical space are selected according to their

characteristics by means of a proper network distribution. The underlying network RFID technology, network, wireless local area network (LAN) exchange information gathering and dissemination to intelligence gathering gateway, accessed through a gateway to collect network information integration system, finally use, including radio and television networks, Internet, communication networks and other networks, enable the end user application system information.

Hardware structure design sensor node

Wireless sensor networks (WSN) are different from the traditional wireless network (WLAN and cellular mobile phone network, etc.). The design goal of the traditional wireless network is in highly mobile environments by optimizing the routing and resource management strategies, the maximum increase bandwidth utilization, at the same time for the user to provide quality of service guarantees. In wireless sensor networks, in addition to a small number of nodes need to go beyond, most nodes are static. Because they usually in people are unable to close not to run or even dangerous for a remote environment, energy cannot be replaced, the effective design strategies extended network lifetime becomes a key problem in wireless sensor networks (WSN), which is a design problem. Wireless sensor networks (WSN) are different from the traditional network of technical requirements, data center of the sensor network, the traditional network transmission data. We have a sensor node hardware structure design, as shown in figure 3.

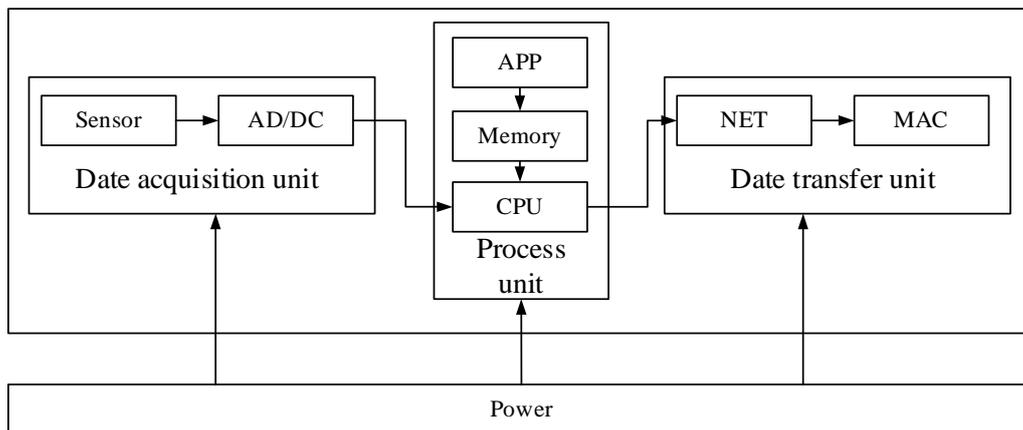


Figure 3. Hardware structure design sensor node

In different applications, the sensor nodes of different, but generally consists of data collection. Data processing, data transmission and the power of four parts (as shown in the figure below). Monitored physical form determines the type of sensor, signal processor usually choose embedded CPU or micro controller, data transmission unit mainly consists of low power consumption, short distance wireless communication module, the sensor node hardware structure design, the reference for the design of several kinds of sensor nodes in the industry, we have chosen in the design of the node has five main modules: the processor, RF communication, power management, expanding the I/O, and auxiliary storage.

The Application structure of wireless sensor network system based on Internet of things

In a dense sensor network, the distance between adjacent nodes is very short, multi hop communication mode of the low power save energy, increase the covert communication at the same time, but also to avoid the long distance wireless communication can be easily affected by external noise interference. These unique requirements and constraints for the design of sensor network architecture proposed new requirements. The application of wireless sensor network system based on the Internet of things, composed of sensor nodes. At the bottom it performs some common data acquisition, calculation and network function, the specific application of the sensing function. Usually sensor nodes are densely arranged in the area of interest, which is too far away. Sensor network application system structure as shown in Figure 4 below.

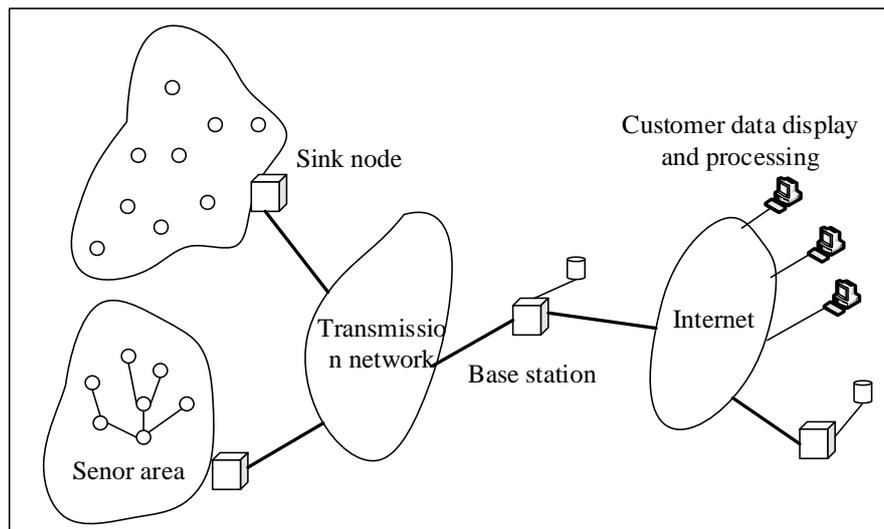


Figure 4. Application structure of wireless sensor network system based on Internet of things

In order to adapt to a wide range of applications, the emphasis on the design of the traditional network will all function related processing on the terminal system network, the intermediate node is responsible for the data packet forwarding, but it is not a reasonable choice for sensor networks.

Conclusion

With the emergence and development of low power micro computing devices, the development of organization and network technology makes the research of wireless sensor networks gradually focus on the industry and academia. Application space of wireless sensor networks in military and civilian areas. People need to use the environment, can be a large number of micro sensor nodes, sensor nodes responsible for specific data. With another leap in the development of science and technology, wireless sensor network technology by many institutions to predict the strength of the core technologies to change the world, has become an important area of research, both at home and abroad has been widely applied background. The advantages of wireless sensor network systems are especially in special circumstances, due to the special target area of the constraints. In this paper, through the difficult and the key technology of the research of wireless sensor network system design networking solution of wireless sensor network system, and gives a detailed description of each function module of the system in detail.

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