The Design of Mobile Terminal Monitoring System Based on B/S Architecture

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ABSTRACT

The mobile terminal monitoring method, combining with traditional monitoring technology, using B/S architecture technology, bring much convenience to equipment’s far-away monitoring, which being the hot spot of function expansion for monitoring system. This paper discusses the technical details of the mobile terminal monitoring system based on B/S architecture and the detection for mobile terminal and the controlling schema for equipment are studied in two parts respectively, among which B/S architecture mode is used to communicate with WEB server in the communication between mobile terminal and server and Socket programming is used to deliver the controlling message between WEB server and equipment.

INTRODUCTION

As the development of economy and society, various new demands pour out and promote the development of kinds of new technologies, the remote monitoring system coming into being. The remote monitoring technology allows operators of all walks of life being absent from working sites, saving much human and material resources and reducing much risks for high-risk workings. Though traditional monitoring system allows no one facing the working equipment, it is necessary for workers and equipment being within a limited distance, such as in the LAN, which restricts the freedom of related workers and the immediate appearance at site is required once there is abnormality in the device to modifying equipment’s working status.

The development of mobile communication technology makes the mobile equipment small in volume, fast in calculating and easy in taking, creating the advantage for the implements of monitoring system in mobile terminals. The application B/S architecture simplifies the functions in mobile terminals by setting main functions in the server side which makes it easier for system maintenance, system upgrading and the visiting way from the mobile terminal to the server site. All the above support the implement of controlling ways in mobile terminal in technology.

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OVERALL DESIGN OF SYSTEM

The remote monitoring systems are generally consistent in 3 parts, embedded control card, upper PC and remote mobile terminal. The mobile terminal connects the server site by browser and then sends or receives data to the server, after which the server sends control information to the embedded control card to control the equipment to work in normal status. The communication process is shown in Figure 1.

RELATED TECHNOLOGY INTRODUCTION

In this paper, related technologies include B/S architecture, Socket programming technology and HTTP protocol.

The B/S Architecture

The communication between the mobile terminal and the server site is usually deployed in two software architecture, that is B/S and C/S architecture. B/S is short for Browser/Server and C/S for Client/Server. Out of the consideration for easy maintenance and system upgrading, this design takes use of B/S architecture. Browser refers to the WEB browser installed at mobile terminal, with little realization of event logic (such as showing logic) compared with C/S and most of event logic is realized in server site. Server site is separated into two parts, WEB server and database, forming 3 layers together with the mobile terminal.

The software layout with B/S has the following advantages: (1) not necessary to install special APP; (2) B/S architecture can be directly placed on the WAN (3) no demand to upgrade several terminal software and the maintenance and upgrade can be done in server site only.

Socket Programming Technology

Socket is the most commonly used general application interface in TCP/IP network communication and Internet applications. In the early 1990s, Microsoft, combining several Internet companies, developed a set of network programming interface under WINDOWS, that’s Windows Socket specifications, which is a set of open, multi-protocol-supporting programming interface under Window. So far, there
are two versions of Windows Socket specifications, 1.1 and 2.0, within which the
difference being that only TCP/IP protocol is supported for 1.1 and multi-protocol for
2.0 with compatibility afterwards. The Internet software under Windows are all
developed based on WinSock.

In communication, the Socket binds specified port and can communicate with any
equipment with Socket. The communication information sent by application reaches
the destination port and is processed by the process bound to the port. The Socket is
divided into three styles: The Stream Socket, the Datagram Socket and the Raw
Socket. And TCP protocol uses the Stream Socket, using connection-oriented method
of packet delivery with the features of no errors in data packet transmission, being
consistent for sending, non-recording boundary and non-repetitive. UDP protocol
takes use of the Datagram Socket, using non-connection data packet transmission
method, which doesn’t guarantee sequential, reliability and non-repeatability and is
usually used for single packet transmission or in the occasion where demands
reliability in a small degree. The Raw Socket provides the way to visit the network
low layer communication protocol (such as IP protocol), which is usually used to
develop new protocol or extract much hidden functions.

Socket communication has the following advantages: 1. Transmitting data at byte
level with small data amounts and customizable data; 2. Transmitting data at a short
time with high performance; 3. encoding the data.

HTTP Protocol

As the most widely used protocol in the Internet, HTTP realizes the
communication between the mobile terminal and the server site through request-
response mode with the features of high efficiency, exact transmission and meanwhile
controlling the response sequence at mobile terminal of transmitted data. The mobile
terminal requests the server’s data by sending message and the message format is
shown below: request line—general message head—request head—entity head—
message body

The server site response to the clients’ request and sends responding message and
the responding message format is shown below: state line—general message head—
response head—entity head—message body.

Figure 2. WEB communication steps.
THE DESIGN OF SYSTEM FUNCTION

The Communication Way Based on B/S Architecture

The communication between user’s browser and the server generally experiences the following processes: the mobile terminal connects the server through domain name, packs and sends request using HTTP protocol; server’s application monitors, connects and solutes the request sent by mobile terminal.

The communication steps are shows by Figure 3: 1. user operates pages, applies for resources and mobile process reads necessary data; 2. user process packs the data from step 1 by HTTP protocol; 3. user process sends data picked above to the server through ajar or other; 4. server process solutes data package.

Socket Communication Process

Socket locates between transmit layer and application layer in network standard structure and belongs to a collection of a set of interfaces.

The function, socket, returns Socked descriptor in simple integer to which by reference the subsequent operations such as reading, and writing are done; The function, bind, is used to bind a specific address to Socket; The function listen is used to monitor Socket and the terminal uses function of connect to send connection signal; The server receives terminal’s request signal by function of accept; The function of read, write, close are used for reading from and writing to specific files and for closing the Socket open for communication.

The Socket communication process is shown in Figure 4:
4. SUMMARY

This paper designs remote detection and control system based on B/S architecture that makes sure the mobile terminal can be connected to the server site thus allowing the mobile port to examine equipment working condition and the submitted data and the action to check out the cause of failures. By this connection, the mobile terminal can send control message which can be used to control the equipment to work normally.

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REFERENCES


