Design and Research of Integrated Warehousing System Based on Cortex Processor

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Abstract. With the continuous development and refinement of the non-networked industry, each key node in its overall architecture will introduce the current mainstream technology according to the actual needs. The storage management system of the Federation of Things uses embedded Linux system as the core control platform, and realizes the existing remote control through the comprehensive use of key technologies such as real-time monitoring, wireless transmission, remote early warning and data analysis. Real-time warehouse scheduling and management further improve the work efficiency of the whole system of the Internet of Things to ensure the reliability of logistics security.

Introduction

At present, the market competition of manufacturing enterprises is increasingly fierce. It is very important for enterprises to improve production efficiency and reduce operating costs. How to integrate ZigBee technology, embedded Linux system, WEB server and Cortex-M0 technology to form an efficient logistics management system is particularly important. Based on this, we can realize warehouse goods entry and exit, inventory records, remote monitoring and real-time warehouse environment monitoring, and adjust the warehouse environment status in real time according to demand. At the same time, GPRS short message alarm is provided. Wake-up function greatly reduces the cost of manual sorting and registration of goods information, and real-time prevention of hazards. The system has powerful functions, simple and fast operation. Compared with the traditional warehousing system, it not only saves the labor, but also makes the system management more convenient. It plays a positive role in promoting the whole intelligent application industry.

System transplantation

This system realizes many functions, so it realizes the coordination and transplantation of various technologies. The main flow design of the system architecture is shown in Figure 1.
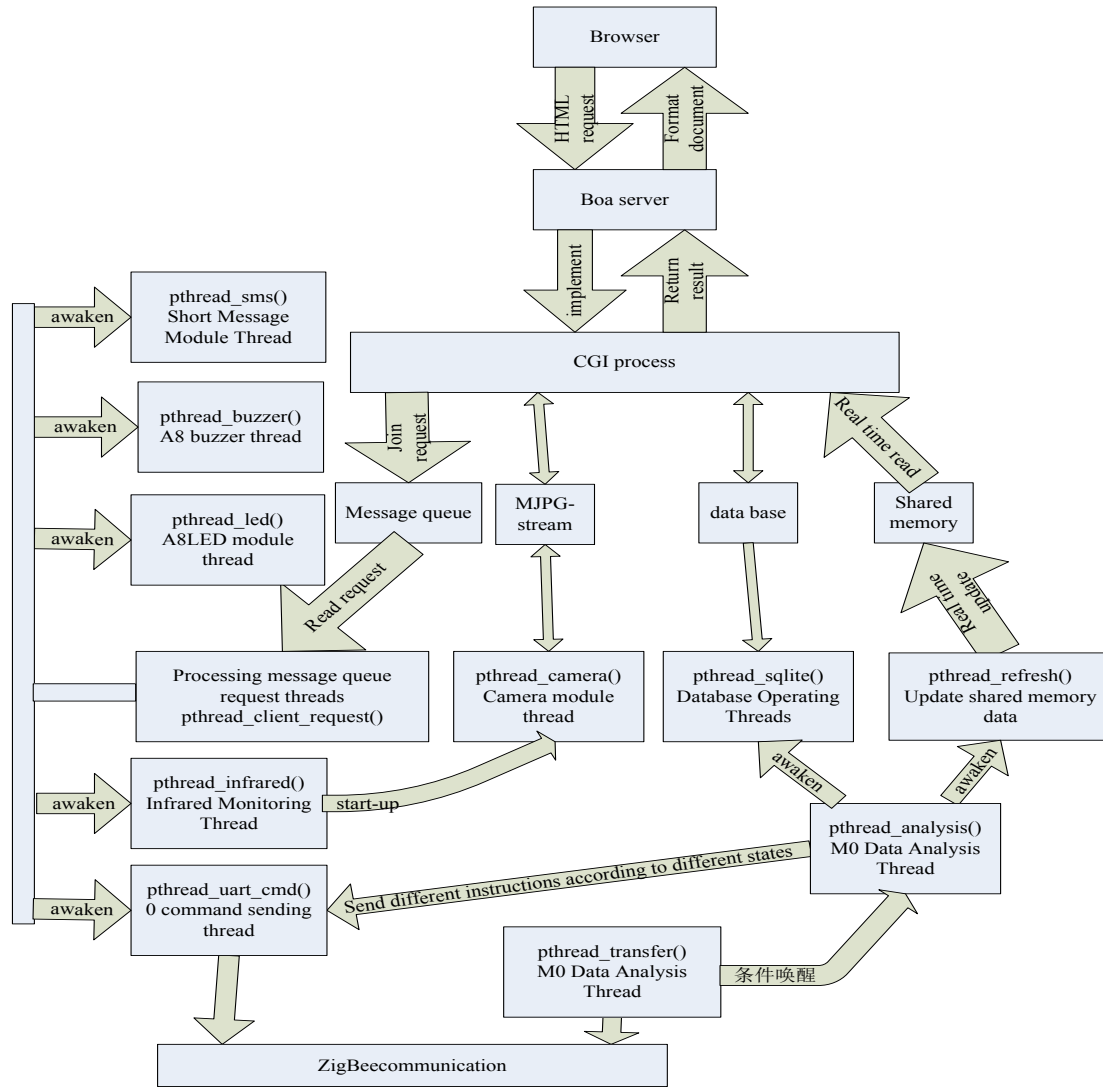
Figure 1. Main Body Architecture Design Process

The system designed in this paper belongs to the integrated application project of the storage system, which includes the real-time video acquisition, image processing module and network communication module of the designed area by the camera. When the camera captures the video image of the area to be measured, it first needs to convert the video format into a suitable video format for network transmission, and then open the BOA Web server. After that, HTML communication is carried out through CGI network management, and video data is sent to the main control platform.

Major Module Software Design

Video Acquisition and Format Conversion. The camera is used to view the scene in the warehouse. The camera used in this project is OV9650. Because the data collected by flat-panel camera is in YUV format, it is necessary to convert YUV into JPEG compressed image by using JPEG library. After porting the JPEG library, open the browser input:

    # mjpg_streamer -i   "/mjpg/input_uvc.so -y"   -o"/mjpg/output_http.so   -w 192.168.XXX.XXX:8080" &，Note that xxx. XXX should have the same Windows IP address as the computer. At this point, you will see the picture taken on the browser.

BOA Web Server Configuration. BOA is a very compact Web server, supporting CGI general gateway interface technology, especially suitable for application in embedded systems. The main function of BOA server is to exchange information between interconnected embedded devices, so as

to monitor embedded devices through the network and upload feedback information to the main control device automatically. It is based on HTTP hypertext transmission protocol. Web pages are the most basic transmission unit of Web services.

Running BOA: Running on the development board. / boa. The interface is ported successfully as shown in Figure 2.


```
[root@Motorolaboa]#./boa
[root@Motorolaboa]#[01/Jan/1970:00:00:40 +0000] boa: server version Boa/0.94.13
[01/Jan/1970:00:00:40 +0000] boa: server built Mar 19 2012 at 17:36:21.
[01/Jan/1970:00:00:40 +0000] boa: starting server pid=956, port 80
[01/Jan/1970:00:00:55 +0000] request from 192.168.1.237 "GET /favicon.ico HTTP/1.1" ("/ww
w/favicon.ico"): document open: No such file or directory
```

Figure 2. BOA server configuration

General Gateway Interface CGI. CGI is a program running on Server, which is used to provide the interface of HTML pages to the client. CGI program is used to interpret and process the input information from the form, and produce the corresponding processing on the server, or feed the corresponding information back to the browser.

CGI program deals with page requests, such as querying user information at login, querying whether user information in database matches, viewing environment information, setting IP of WIFI and setting alarm telephone number.

System debugging and functional verification

After the whole environment and program are written, the system is tested. Firstly, the BOA server is tested. The second section shows that the function of the server is to implement a CS model server and upload the underlying data to the web page. So when the BOA server is built on the A9 platform, the BOA server can be accessed by inputting the IP address 192.168.8.4 of the board into the Ubuntu system. The normal operation of the BOA in the platform is shown in Figure 3.

Then the C GI is transplanted and tested. At this time, the C language code is compiled into the executable file of. cgi. On the basis of BOA server, the login. C file is implemented. Its function is to login the user to the warehouse management interface in the above box. The IP address of the development platform is bound in login. c, so that the successful login can be achieved, as shown in Figure 3.
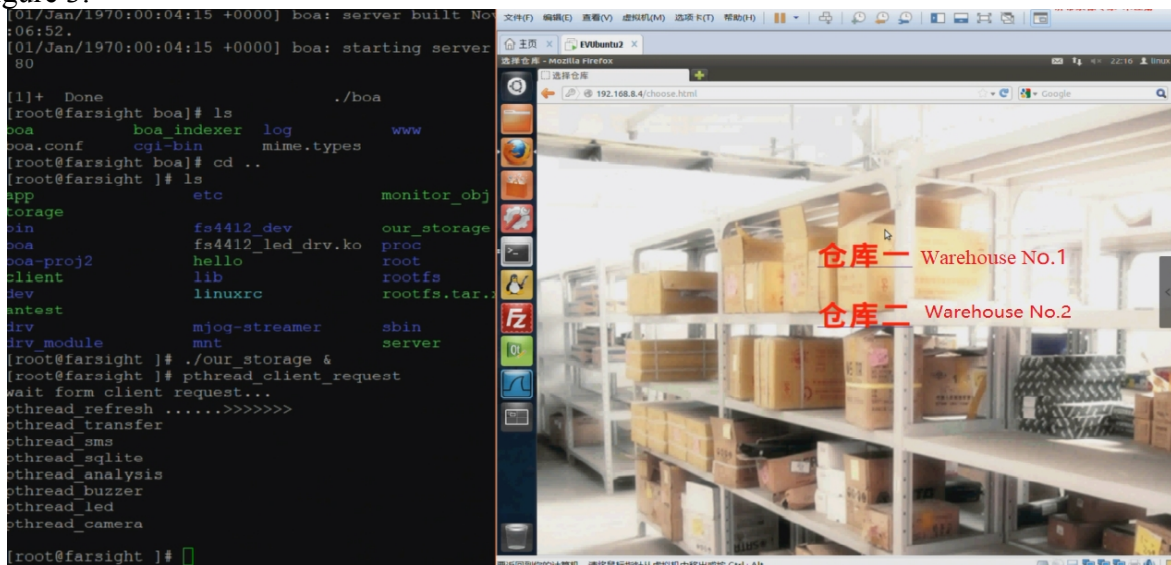

Figure 3. Warehouse Management Interface

The effect of the picture above is that the user chooses the warehouse after successful login and enters the warehouse management interface.

Conclusion

Based on the Linux operating system, this paper transplants and tailors it properly so that it can run smoothly on the A9 platform. Through the expansion of Cortex A9 main control chip, a large amount of peripheral expansion space is used, WIFI module is used for data interaction, and BOA is used for network communication. The information captured by the camera is sent to the main control platform in real time. The platform has abundant resources, and each module is easy to expand, so it is easy to upgrade and maintain the product in the future. At the same time, personalized customization can be realized.

Acknowledgements

Reference

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