Design of Network Information Management System Based on C/S Architecture

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Abstract. Due to the incomplete data preservation of traditional systems, the success rate of network information data update is reduced. Based on C/S architecture, a network information management system is designed. In terms of hardware design, the C/S architecture allows for the optimisation of the RFID circuitry to speed up the rapid conversion of data. In software design, information management model is established based on C/S architecture, protocol identification method deletes abnormal data in the transmission process, fuzzy method sets up data storage mode, centralizes control of network information, and completes the design of network information management system. The experimental results show that the new system has an average success rate of 98.96%, which is 9.16% and 10.46% higher than the traditional system, respectively, and can increase the update effect of network information.

1. Introduction
With the rapid development of computer technology, people's daily life has changed dramatically. Since the 21st century, global economic integration has accelerated the trend of information sharing. At present, how to make the best use of network information and fully develop network information resources is an important research direction for each country to master the future initiative on the world stage[1]. Network information management system is one of the current network applications. Network management system should not only be able to monitor the devices in the network, but also manage and configure the resources in the network system to ensure the smooth operation of the devices in the network. Essentially, it is the platform for users to consult information on the network. User groups can use this platform to get the network information they want to get for communication[2]. Foreign network management research started early. Not only has a lot of network management research been carried out for the new network, but now there are many mature network management systems abroad in the traditional network management system. It is a distributed network management system, which can intuitively monitor the entire network infrastructure and classify a large amount of data in a short time. The distributed management system also captures problem data quickly and ensures that problems are resolved in a timely manner, effectively combining the benefits of availability management and system management for assurance systems and forming a complete management system[3]. Although the domestic network management research started later, a batch of network information management systems have been formed in the active research. However, due to the traditional management systems can not distinguish duplicate information during the data storage process, the success rate of data network update has decreased. Therefore, this paper designs a network information management system based on CS architecture to improve the data update rate.
2. Hardware Design of Network Information Management System

The information management system mainly consists of router, server, information converter, power supply and other modules. User data is received from the receiver and sent to the router through RET. The router controls the server to convert information and input terminals. The structure of the information management system is shown in Fig. 1.

![Figure 1 Information Data Management System Architecture](image)

According to the structure of the system, it is understood that the information signal needs to be sent to the controller through serial communication in the process of transmitting, so that the router can complete the receiving. In order to optimize the rapid conversion of information data, the signal radio frequency identification circuit is designed. The original resistance is removed through the single-chip gyrod machine and power control circuit. The design circuit is shown in Figure 2.

![Figure 2 RFID circuit](image)

As shown in the figure, the power supply voltage of the RFID circuit is 3.2V, and the RF level is ty2000. After the identification circuit is designed, the software of the network information management system is designed.

3. Software Design of Network Information Management System Based on C/S Architecture

3.1. Establishing Information Management Model Based on C/S Architecture

Network information management will classify the data according to the type of network information, and the management interface is realized by different components. Based on the information management parameters, the information is classified according to the distribution of parameter values, and the information management model is established based on C/S architecture[4]. The information obtained in different stages is set to subset \( q_a \) in turn, where \( a = (1, 2, \ldots i) \); The parameter \( r_b \) is set in each subset, and the parameter value is controlled in \([-1, 1]\). The calculation formula of the parameter value of the subset is as follows:

\[
\lambda_{r_b} (q_a) = \frac{q_a - \lambda_{c_a}}{\mu_{c_a} - \lambda_{c_a}}
\]  

(1)

In the formula, the maximum value of critical point parameter of subset is expressed by \( \lambda_{c_a} \); The minimum value of critical point parameter of subset is expressed by \( \mu_{c_a} \); \( r_b \) is the proximity
parameter of subset $q_a$. If the value of the parameter in the subset $q_a$ is infinitely close to $-1$, the category of the information is closer, otherwise, the degree of the information is higher. When there are multiple categories of information data, a one-to-one classification method is adopted. The model parameters are set to $e$ to start from $q_0$ subset, and the data of the latter subset is added to the previous subset in turn to fill. The data feature space is divided into multiple regions, and the classification result is obtained by dividing the data $x(x-2)$ by the parameters of each region. Then the network information is set to view, delete, modify, add and update functions, so that the received network information can be directly adjusted in the model to complete the construction of information model.

3.2. Delete abnormal data during transmission

Network information in the process of data transmission will be affected by a variety of factors, making the final output of the data abnormal. Its occurrence and receiving time is very short, so it can not be easily removed, directly affect the data receiving results. In order to solve the problem of untrue and different data, the network mapping area is set based on the principle of the integration of heaven and earth of the identification protocol stack. In the initial design, the whole data transmission process is brought into mobility support. When the data information leaves a connected router, the corresponding receiving router will delete the signal that cannot be mapped and inform the identity mapping receiver, so that the original area is covered by the router when the data signal touches the mobile terminal[5]. In the original mapping area, three interfaces are divided into $YUO$, $YIO$ and $YIU$, and each interface will correspond to a mapping area: first, when the data flows through the first interface, the area where the interface is located will emit a new mapping access control router. When the interface area and the data signal cannot be fused, the relationship between the signal and the mapping interface is stored, assign directly to another interface. Secondly, the new access port will generate another mapping area, keep the mapping area at this time in touch with the previous interface, and control the mapping range of two points between $\pm 1$. If the signal parameters of data transmission are not in this range, the signal will flow directly to the last interface. In addition, the mapping relationship between data and interface will not be retained in the second interface, and the relationship can only be determined in the third interface, and finally the mobile exchange of data signal is completed. When the parameters of the mapping area of the last interface do not meet the signal parameters, it means that the data is abnormal data. If the original mapping of the interface area can be kept unchanged during the signal switching period, so that the communication of the access signal data in the logic will not be interrupted, then the abnormal data has been eliminated and the data can be output.

3.3. Setting data storage mode by fuzzy method

Network information can only flow along the time point in the process of transmission, so it is necessary to set data storage mode when integrating and collecting network information. Due to the complexity and intensive of network information, the network management storage mode is divided into two modes according to fuzzy method, which are relational information data and non relational information data. Among them, relational data means that the collected data information is related to each other, which can produce linkage effect. For example, the frequency and time of a user's online shopping can be used to correlate the user's shopping habits and the time of using the computer and mobile phone. The reading and writing of the associated data will not be very frequent. As long as the original data is not lost, the associated selection can be made directly. Second, non relational information data, which only plays the role of cache in network operation, is frequently output, read and written because it has no correlation with other data. Because the process of data reading is single thread operation, it can reduce the energy consumption in the process of acquisition and release. In these two storage modes, the same network resource is bound to be impacted by multiple groups of data when receiving signals at high frequency. In order to prevent the instantaneous loss of data, the importance selection is added in the partition mode, and the data persistence performance query is classified into the data list storage mode for group storage.
According to the characteristics of single thread, the thread safety problem caused by multi thread is solved, complete data storage.

3.4. Setting up centralized control mode of network information

According to the fuzzy method, the data are classified into two storage modes to control the network information. The control principle of network information mainly comes from the performance control form and interface value of the performance query list. When setting the control program, the data storage format is the lock interface mapping relationship when using the form \( \{lock, space\} \): lock as the database storage. It is the only data parameter that can be identified. space is the list space count value, Record how much data can be sorted and split. When starting to connect each group of data, the data parameters of the locked relationship are combined in turn according to the connection path, and the establishment and disconnection are switched to each other. When observing the spatial count value of each group of data in the performance query list, there will be a huge change. When the query list is frequently used, the increase or decrease of the count value indicates that the data in the mapping area is being processed centrally. The stored data will realize self connection through the parameters at the bottom of the port. The locked mapping relationship will be rewritten at this time, and a temporary docking relationship will be generated to complete the switch. When the established data cannot be disconnected, It means that the generated temporary docking relationship meets the storage format and can flow directly into the database without additional repeated combination. The design of network information management system is completed.

4. Analysis of experimental demonstration

4.1. Experimental preparation

In order to verify the system designed in this paper, the success rate of network information update can be improved. Comparing with the traditional system, the control experiment is set. Firstly, the system selects the network information data in a certain period of time in the information base, sets 50 groups of data information in the packet in different periods, with the interval of 2 days and the taking period of 10 days, As shown in Figure 3, the distribution of data samples taken to the network is shown in Figure 3.

![Graph](image)

**Figure 3** Distribution of network data samples

The graph distribution in the graph represents the information data distribution of each time interval. The graph distribution of the first and last time interval is scattered, and there may be abnormal data.

4.2. Experimental result

Input the sampling data into three groups of systems in turn to sort out the information data, and the processing results are shown in Figure 4.
In Figure 4, for the abnormal data in the first and last time interval, the traditional method 1 does not process and has the phenomenon of data loss, which is shown in a square frame; Traditional method 2 has a little processing, but it also has the phenomenon of data loss; This method can deal with the abnormal data effectively, and the data distribution is consistent with the original data. In order to better understand the data update success rate of the new system, the sample data is tested seven times to compare the success rate of three groups of system data update. The value can be obtained by the following formula:

$$Scu = \frac{Y}{Z} \times 100\%$$

In the formula, $Scu$ is the success rate of data update; $Y$ is the number of successful updates; $Z$ is the total number of attempts to update. The following table 1 shows the 7 groups of test results obtained by the above formula.

Table 1 The number of attempts to update and the number of successful attempts to update the network data information of the three groups of systems

| Experiment Round | Number of attempts | Conventional System 1 | Conventional System 2 | Text System |
|------------------|--------------------|-----------------------|-----------------------|-------------|
| 1                | 35412              | 29845                 | 29759                 | 35269       |
| 2                | 32451              | 29542                 | 28862                 | 32358       |
| 3                | 54721              | 52143                 | 49825                 | 54521       |
| 4                | 56423              | 54214                 | 55341                 | 56120       |
| 5                | 65428              | 59531                 | 56872                 | 65582       |
| 6                | 42153              | 38752                 | 38214                 | 42025       |
| 8                | 32457              | 28642                 | 30124                 | 32202       |

It can be seen from the table that the highest success rate of this system is 99.9%, and the highest success rate of the two groups of traditional systems is 96% and 92% respectively; The average success rate of this system is 98.96%, and that of traditional system is 89.8% and 88.5% respectively. Overall, the success rate of this system is higher than that of the traditional system, increased by 9.16% and 10.46% respectively, which can better complete the network information data update work.

5. Conclusion
In this paper, the design of network information management system is completed under the design concept of CS architecture, which has stronger applicability and convenience than the traditional management mode. The fuzzy method improves the information storage mode, improves the success rate of network data update, and makes the success rate of network data update reach more than 98.96%. However, due to the limited ability level, there are many defects in the whole management system, such as the unreasonable storage structure design of some databases. In the future, we will deepen the design for this problem in the research process, so that the network management system can be more perfect.
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