

Research on the Innovation of Blockchain Technology in the Field of Computer Monitoring of Hydropower Station

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Abstract: In the field of Internet, blockchain technology plays an important role. Blockchain technology is the core technology of computer science. The existence of blockchain technology enables people to reach a consensus when using the Internet. Ensure the safety of the network in use. At the same time, the computer monitoring system of hydropower station means that the control, measurement, monitoring and protection of the whole hydropower station equipment are completed by the computer system. It is an automatic control system, which can control, measure, monitor and protect all equipment. The implementation of block chain technology in the field of computer monitoring for hydropower station is described.

1. Introduction

In today's society, the prevalence of the network makes the network become the second world of people's life. On the Internet, people need some kind of agreement to restrict their behavior and protect their intellectual and cultural property rights and properties on the Internet [1]. The use of blockchain technology provides a guarantee for people to use the Internet. In addition to ensuring the normal use of the network, blockchain technology can also play an important role in real life. Most of the real life is in today's society. Without the Internet, promoting the use of blockchain technology can promote the development of other regions to a certain extent.

2. Principle of using Blockchain Technology

2.1. Composition Principle of Blockchain

We are now in the era of big data. In the era of big data, blockchain technology can be used more effectively. Block refers to the actual collection of data. The configuration formed by interconnection of many blocks is blockchain. However, in the process of connecting different blocks, various aspects need to be considered for system connection. In addition, in the composition of blockchain, it is necessary to consider the change to blockchain in order to improve its plasticity. This requires setting a timestamp on each block. When you change the blockchain, you can effectively distinguish different blocks according to the time stamp settings. The configuration of blockchain requires the block as the basic unit of system connection, and the block configuration includes block head and block body. These two roles have different roles. The block title is used to form the blockchain [2]. It plays an important role in guiding the connection of the blockchain, ensuring the flexible connection between the two blocks, and ensuring the regional consistency. The main part of block is the main part of data processing. The main part of the data can be recorded in the time of data information on the Internet, the information update of blockchain can be done, the role of blockchain can be played, and the structure of the whole blockchain can be improved to be more complete and more extensive.



Figure 1 Computer monitoring field of hydropower station

2.2. Characteristics of Blockchain

In today's society, the network contains a wide range of fields. The security of the network is an active topic of discussion in today's society. Internet security is mainly data and information security, and blockchain can effectively solve this problem[3]. The problem blockchain mainly reflects the system based on encryption, secure communication and consensus mechanism. If a block of data is changed in the blockchain, it will not affect the entire database. If it's a block, if you can't change more than half of the nodes at the same time, you can't change the database. Using blockchain can improve the security of the network. Blockchain is so common mainly because it has strong openness and transparency. Because people have been learning about the Internet, they know that the Internet threatens the security of their assets. Therefore, when people use the Internet, they must pay attention to that using blockchain can let users know their identity timely and accurately. In blockchain, all information is open and transparent, and different data information can be accessed through nodes. Continuous diffusion enables all users to understand the data information transmitted through the network. In addition, in the process of data information processing, whenever a node passes, the information data is copied to the node in an emergency[4]. If a security problem occurs, you can identify the problem and modify it in time.



Figure 2 H9000 hydropower station computer monitoring field

3. Overview of Computer Monitoring System for Hydropower Station

The research and development of computer monitoring technology for hydropower stations in China began in the early 1980s. Officially implemented in November 1984, it is the first computer monitoring system for hydropower stations in China. Since 1990s, in the automatic control of hydropower stations at home and abroad, computer monitoring technology has been widely used, or as the control system of power stations, the combination of control device and control device has been adopted. Alternatively, a computer monitoring system may be used to directly monitor the hydroelectric plant installation. The computer monitoring system of hydroelectric power station means that the control, measurement, monitoring and protection of the whole hydroelectric power station are completed by the computer system[5]. The monitoring and measurement of the original

control device, the start and stop control of the machine body, the control of the disconnecter, the completion of other switching devices, the best driving of the power station, the automatic generation control, the automatic voltage control, and the completion of various complete power generation equipment units are realized. The online monitoring of the parameters of the operating equipment of the transformer and the online equipment, and the recall of the resume parameters have always been based on the records of personalization and accident, report printing, and complete self-test of the monitoring system equipment, which is for the purpose of measurement control and automatic control. Please monitor and protect all equipment of the whole power station system. This function is shown in Fig. 1. The continuous development of computer monitoring technology has laid a foundation for the safe and reliable economic operation of hydropower stations. In the 1960s, the computer monitoring technology was adopted in foreign hydropower stations[6]. After the China Science and technology conference held in 1978, the spring of science began, and various industries actively carried out technological innovation.

3.1. Type of Computer Monitoring System of Hydropower Station

The computer monitoring system of hydropower station is usually classified according to the function, system structure, control level, function and operation mode of computer. The type of computer monitoring system for large, medium and small hydropower stations is called CBSC method. According to the existing devices, the computer-based monitoring system is improved. CACS method is called computer support. The simple computer monitoring system including the existing device monitoring system and the existing devices are called dual setting mode, CCSC mode. The existing devices completely cancel the computer control mode. Among them, the two control systems of CCSC mode can operate independently, with complex structure and high price. It is an extension of CBSC to eliminate the computer control method of existing equipment, which requires the improvement of redundancy and reliability of computer system, large investment and good application prospect.



Figure 3 Computer monitoring of hydropower station

3.2. Structure Mode of Computer Monitoring System for Hydropower Station

Centralized monitoring system centralized monitoring system is to monitor and control the operation of the whole hydropower station. All operation and control commands are sent out by the computer to perform the information processing of the hydropower station[7]. If the computer breaks down, the whole system will break down. At present, large and medium-sized hydropower stations have not adopted this mode. However, it is a small-scale water level monitoring system with small capacity, few units, fewer transmission devices and simple main wiring. The main feature of hierarchical distributed monitoring system is that the control object is scattered, and multiple corresponding devices are set as the unit of the control object to form the control object and complete the data collection and processing of the control object. In order to construct the hierarchical decentralized control system of the whole set of hydroelectric power equipment, the hierarchical control of the whole set of hydroelectric power equipment is combined. User portability; application software portability; the biggest advantage of interoperability between different systems is that the system is easy to expand, upgrade and update, and protect the interests of users. This

mode is widely used in hydropower stations at home and abroad. The main feature of the function distributed monitoring system is that the function is distributed, and the control system can realize the function, load, danger and geographical distribution[8]. It can set up corresponding groups of devices according to different system functions, and these devices can complete their own functions independently.

4. Realization of Monitoring System of Hydropower Station

4.1. Software Structure of Computer Monitoring System

The computer monitoring system NC 2000 with neoisoft NC 2000 software structure is based on UNIX, Linux and win dous system. NC 2000 system monitoring software is mainly composed of two parts. The human-computer interaction program mainly provides interactive graphic display and screen display, report, brief report, curve query and other operation functions. Two parts of the historical database management process program exchange data through multicast[9]. The human-computer interaction program of NC 2000 system is developed in Java language and deployed on various operating systems with Java virtual machine. Background program is a group of executable programs developed for C language based on UNIX or Linux operating system to complete specific functions.

4.2. Bit Computer Network Topology and Servers

The upper computer of the function monitoring system of the computing workstation, two main computers, and the monitoring and collecting data uploaded by the main terminals, the remote control and remote operation of the computing upper computer are realized. Historical data server and disk array (mainly used to monitor and store the historical data of the whole set of equipment). Three operator workstations (mainly to realize the data exchange between the client and the server, and complete the monitoring and automatic control of the whole set of equipment). A technical station for software maintenance of NC 2000 host and each LCU. A training workstation that completes the daily simulation training function of NC 2000 system. The communication server completes the data exchange between the monitoring system and other systems in the factory, and sends data to the analog screen display through the serial port. 2 before that, the dispatch communication server, through the Sichuan Province and the central government for China's songs on-line 104 transmission protocol, and uses a dedicated line through the Sichuan Province and the central government to log in to China's songs 101 protocol. A network data server for collecting monitoring data from a host and transmitting necessary monitoring data to a network public server [10]. The monitoring data needed to facilitate data connection to other systems of the power package is disclosed in the open network. Peripheral servers providing daily report printing and other peripheral services of the monitoring system. 1 voice alarm server, the timely voice alarm for changing the signal of monitoring system status, and the voice for generating alarm after the remote server changes, use this server. 1 historical data backup server. In order to prevent the loss of bad historical data of disk array, the data of disk array is compressed and stored in disk array server.

5. Conclusion

The design of computer monitoring system of hydropower station fully considers and uses advanced modern computer monitoring technology to achieve fault tolerance and redundancy function. Moreover, in order to ensure the stability and reliability of the hydropower station, the working load is reduced. Finally, the improvement of the automation level of hydropower station has established a solid foundation to ensure the safety of "nobody".

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