Computer Testing and Maintenance and Data Recovery Technology

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Abstract. With the high frequency application of computers, various network information security problems are common. Among them, data loss to a certain extent has a certain impact on people's normal work. In this paper, computer detection and maintenance technology is discussed and analyzed from two aspects of hardware and software, and then some specific data recovery technologies are put forward.

Keywords: Data recovery Technology, Computer Testing and Maintenance

1. Introduction

As a precise instrument, computer is not only prone to hardware failures, but also prone to software vulnerabilities and malicious attacks by hackers. Among them, hardware failure not only affects people's normal production and life, but also increases the probability of data loss, which has a negative impact on the development of enterprise and social security. In the current complex network environment, improving the importance of computer fault detection and maintenance, and increasing the research and development of data recovery technology have become the important basic skills of computer pervasive workers at this stage. At the same time, users may lose precious data due to operational errors, which brings great troubles to the actual work[1]. Therefore, it is necessary to discuss and analyze the technology of computer detection, maintenance and data recovery, which is of great significance to effectively solve the above problems and give full play to the value of computer.

2. Computer common hardware failure detection and maintenance

From the source of the failure, in the process of installation, computer hardware installation and system installation are the basic configuration content of the computer. At present, computer faults can be divided into hardware faults and non-hardware faults. Among them, hardware faults are all physical faults[2]. The main reasons for the failure are improper operation, too long service time of equipment and poor quality of components. Non-hardware failure means that the external equipment of the computer is not damaged, but it fails because of the influence of external factors. According to the relevant data survey, the current common hardware failures mainly include the following aspects, as shown in Figure 1 below.

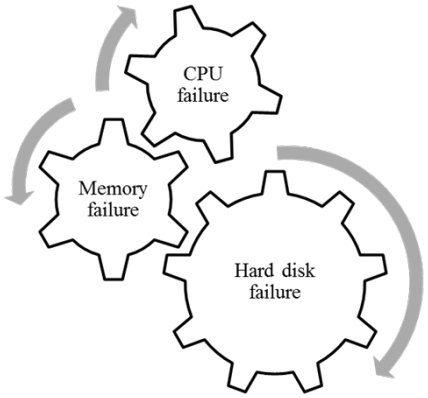

Figure 1. Computer common hardware failure

2.1. CPU failure and maintenance

In the process of computer operation, compared with other hardware, processor failure rate is low, but the impact of failure is great. According to the relevant data survey, the main types of CPU technical failures and solutions are heat dissipation failures and over-frequency failures[3]. The main reason for the heat dissipation failure of CPU is that the fan of CPU can't work properly or the fan can't touch the CPU in the process of running, which results in the symptoms of black screen, crash and automatic restart of the computer. In view of the heat dissipation failure of CPU, computer operators mainly adopt the way of replacing computer fans and smearing silicone grease between fans and CPUs. Secondly, the over-frequency fault occurs. The main reason for the over-frequency fault is that in the process of computer operation, the load runs too long, resulting in a large amount of heat generated by CPU, while the fan cannot discharge heat in time, resulting in a certain impact on normal work, and even the problem of not starting the computer normally. In view of the over-frequency fault, computer operators mainly adopt the way of restoring the normal operation frequency of CPU and using liquid nitrogen to cool down[4].

2.2. Memory failure and maintenance

In computer hardware, memory failure is the main category of computer hardware failure. According to the analysis of a large number of scientific research data, the causes of computer memory failure are mostly due to poor contact in graphics cards, or computer operators do not regularly clean up during the use of computers[5]. At present, computer memory failure will affect the normal operation of the computer system to a certain extent. At the same time, the running program is prone to errors. In view of the computer memory failure, the maintenance process adopted by the computer operators is mainly as follows: power off - check the memory of the chassis - clean the memory slot - install the computer.

2.3. Hard disk failure and maintenance

In the process of computer operation, hard disk is used to store various application information of computer. To some extent, the quality of hard disk has a direct impact on the operation of computer system. When the computer hard disk fails, it not only affects the working efficiency of the computer, but also leads to the loss of various information applications, which has negative impact on the development of enterprises. At present, in the process of using computers, the capacity of hard disk will decrease rapidly with the prolongation of using time[6]. The main reasons for this failure are as follows.

Firstly, bad paths or blocks may appear in the hard disk, which greatly reduces the available capacity of the hard disk. Computer operators can repair hard disks by repairing software. If hard disks cannot be repaired by repairing software, in order to fundamentally guarantee information security, they can only use the method of replacing hardware to ensure the normal operation of hard disks. Secondly, the system virus fills the hard disk by replication. Computer operators can use antivirus

software to solve the problem, but when the antivirus software cannot deal with the above problems, the normal operation of the hard disk can only be achieved by replacing the hardware. Finally, a large number of files are lost on the hard disk, but the capacity is not released. Computer operators can use the disk scanning program in the system to conduct comprehensive scan detection and recover the lost capacity space.

3. Computer data recovery technology

3.1. Definition of data recovery technology

Data recovery technology is a process of effectively reproducing data information when data stored in various hardware media is lost or data is inaccessible. Data recovery includes data backup recovery and data disaster recovery. Among them, data backup and recovery refers to the technical precautions of backup, loading or backup and reconstruction, that is, when the computer fails in the process of operation, computer operators can not only restore the backup data, but also restore it through the backup system, so as to ensure the efficiency and security of information. Data disaster recovery refers to the loss of system data due to external influence in the process of computer operation. In order to effectively guarantee the normal operation of enterprises and society, computer operators carry out post-disaster data reconstruction by analyzing the types of problems and taking the underlying technology of data structure as the support.

3.2. The basic technology of data recovery

Data recovery mainly depends on the combination of software technology and hardware technology. Software technology is generally divided into three categories: data storage software built-in data recovery function, anti-virus software built-in data recovery function and professional data recovery software. The first technology is achieved by backing up the software. The second one has limited data-bearing functions, which can only recover data loss caused by virus damage. The third technology is more professional and has stronger repair ability.

It has certain advantages to restore data with software, which has the characteristics of fast speed and low cost, and can be repaired in a wide range. However, the cost of data recovery by hardware technology is relatively expensive, and some very advanced equipment is needed to assist the work. When restoring important data, it is necessary to ensure that the data can be effectively restored and used. In order to improve the possibility of data recovery, we should shut down the system in time, stop using and protect the disk when the data of the computer is lost. Data recovery operation without professional quality and technology may lead to data re-destruction, resulting in serious consequences that important data cannot be repaired.

In addition, computer data recovery technology also includes three levels: data recovery based on file system, data recovery based on file data characteristics and incomplete data recovery, as shown in Figure 2 below.

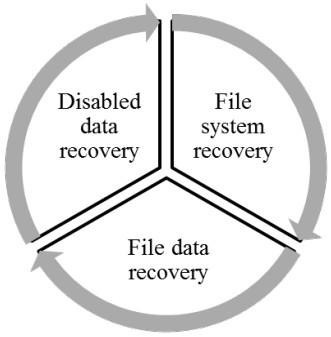

Figure 2. Levels of data recovery technology

Data recovery based on file system is the most common way of data recovery. Generally, data recovery can be completed directly by using data recovery software. Data recovery software is used to parse the file system, read the system partition, then read the lost data catalogue, and complete the recovery of lost data according to the catalogue. When the file system is damaged and cannot be recovered directly through the file system, it is necessary to adopt data recovery technology based on different file data characteristics. Even the data of different types of files have similar data characteristics. For example, each data file has a header, while the same type of file header is the same, which can be directly scanned from the data to restore data based on the characteristics of different file types. If the file size exceeds a cluster, and the head and tail of the file are incomplete, they are damaged, which requires the use of incomplete data recovery technology. In addition, there are some special areas in the hard disk, such as the space that has not been allocated. These spaces have not been allocated yet, but there may be some previous data residues. In order to recover the residue data of these special spaces, data sculpture recovery technology is also needed. In the practical application of this technology, some professional software is also needed to solve the above difficult data recovery problems.

4. Conclusion

Computer inspection, maintenance and data recovery is a relatively systematic process. In the actual application process, it is necessary to select appropriate technologies to apply them in accordance with actual needs, so as to effectively guarantee the safety and stability of computer operation. When computer transmits and stores information, it is vulnerable to external interference, which leads to the loss of computer data. Therefore, it is necessary to strengthen the research of computer data recovery technology to ensure the security of computer data.

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