

Analysis on Performance Optimization of Computer System

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Abstract: Nowadays, computer technology has been widely used in all walks of life. Computers bring great convenience to our study, life and work. But as we improve the overall performance requirements of computers, the optimization of computer system performance is particularly important. By optimizing the performance of the computer system, various unreasonable factors in the system are eliminated, the response time of the system is shortened, and the computer system can function better, thereby providing us with better services.

1. Cause analysis of poor operation of computer system

There are many reasons for the poor performance of computer systems. For example, the system platform structure is not good, the system configuration is not good or the parameters are not set correctly. The application system data structure design is unreasonable, which increases the input and output requirements of the system. There is a problem with the application system algorithm or logic processing, so that the computer system does not reach the optimal operating state.

Computer system operation process. The computer works according to the commands of the people. The commands issued by the people to the computer are implemented by programs. To perform a command, the computer generally does the following work. First, the program required to complete the command is loaded into memory and executed on the central processing unit. Then, according to the requirements of the program, the relevant data is read into the memory in the database or disk file, and the necessary logical operations are performed. Finally, the results are written to the database, disk files or displayed on the screen. This process involves the processing capacity of the CPU, the size of memory space, the difficulty of processing logic, the speed of disk reading and writing, and the number of disk reading and writing operations.

Performance analysis of computer system. The processing ability of the CPU and the difficulty of processing logic are contradictory. Assuming that the processing power of the CPU in the system is fixed, the processing result can be given in the expected time for the program with relatively simple processing logic. For programs with large amount of computation, it is necessary to use longer time. Disk read-write speed is a fixed data. If the number of disk read-write operations is small, the impact of disk read-write on system performance is not significant. If the number of read and write operations is large, disk reads and writes often have a large impact on system performance. The number of disk read and write operations is primarily determined by the processing logic. Disk data organization is good, and the read and write processing logic is appropriate, which can greatly reduce the number of disk reads and writes, which can significantly improve the performance of the system. On the contrary, the number of disk reads and writes will be greatly increased, which will seriously affect the performance of the system. The size of the memory and the correct use of memory space are also an important factor affecting system performance. For a given computer system, the processing power of the central processing unit, the size of the memory space, and the read and write speed of the disk are all certain. Therefore, the ease of processing logic and the amount of disk input and output can affect the performance of the system.

2. Computer system performance optimization measures

Adjust the input and output systems. In the application of computer systems, most of the operations we perform are input and output. Therefore, input and output operations are an important factor affecting computer performance. With the development of technology, the average addressing time of disks is getting shorter and shorter, but it is still much slower than that of central processing. While observing some system operations, it is often the case that the central processor is idle and the application is too late to complete. The reason is that the input and output speed of disk is too slow, and the data is not read (written) into memory. Therefore, in the actual application process, we can consider storing data files on different disks, allowing multiple disks to work in parallel, so as to solve the bottleneck problem of input and output. If the total number of inputs and outputs is obviously unreasonable, it is necessary to consider the reasons for the increase of the number of inputs and outputs, so as to optimize the application program, reduce the number of inputs and outputs, and improve the performance of the system.

Rationally configure various software to make the best use of computer system. Computer system is composed of hardware system and software system. They are interdependent, which requires us to use computer software in the process. Use some faster, higher version, and more complete software, and carefully read the instructions for each software to avoid conflicts during the application process. As a programmer, in the process of writing an application, the rationality of the application data structure design should be fully considered in order to achieve the optimal operation state of the computer system.

Use the central processor reasonably. In general, in a computer system, the speed of the central processor is much higher than the speed of input and output, so input and output speed are often the main factors affecting system performance. It must be pointed out, however, that this rule applies only to ordinary situations. If we do not know that CPU has certain limitations, blindly and unreasonably using CPU will also become the main factor affecting system performance.

Arrange processes of the same nature to run at the same time to ensure absolute unimpeded CPU and input and output. A computer can run multiple applications at the same time. From the perspective of using system resources, these applications can be divided into two types: input-oriented and output-oriented.

If two or more applications for input and output are running at the same time in the system, it will cause the CPU to be idle and a large number of disk input and output congestion and waiting, which will make the performance of each application worse. If two or more application-oriented applications are running at the same time in the system, the disk will be idling. Therefore, as far as possible, it is necessary to avoid having multiple Input-and-output-oriented applications or multiple operation-oriented applications run at the same time. The best arrangement is to match input-oriented and output-oriented applications with operation-oriented applications, so that each application can get enough system services without affecting each other.

By optimizing the performance of the computer system, all kinds of unreasonable factors in the system are eliminated, the response time of the system is shortened, and the computer system can play a better role, thus providing better service for us.

References

- [1] Chen Y, Ding M, Li J, et al. Probabilistic Small-Cell Caching: Performance Analysis and Optimization [J]. *IEEE Transactions on Vehicular Technology*, 2017, 66(5):4341-4354.
- [2] Ghommem M, Collier N, Niemi A H, et al. On the shape optimization of flapping wings and their performance analysis [J]. *Aerospace Science and Technology*, 2014, 32(1):274-292.
- [3] Song Q, Hamouda W. Performance Analysis and Optimization of Multi-Selective Scheme for Cooperative Sensing in Fading Channels [J]. *IEEE Transactions on Vehicular Technology*, 2016, 65(1):358-366.

- [4] S. Raghavendran P, Asokan R, Praveenkumar V. Improving Congestion Performance in WSN by using Enhanced Algorithm [J]. International Journal of Computer Applications, 2014, 96(3):18-23.
- [5] Jim Rapoza. SQL Server 2000 systems still insecure. eWeek, 2004,21(2): 50-50
- [6] Manuel Fahndrich, K. Rustan M. Leino. Declaring and Checking Non-null Types in an Object-Oriented Language. ACM SIGPLAN (Programming Languages): SIGPLAN Notices, 2013, 38(11):302-312
- [7] Scott Mitchell. Creating a Step-by-Step User Interface with the ASP.NET 2.0 Wizard Control: Improving and Customizing the User Experience. aspnet.4guysfromrolla.com/articles/062806-1.aspx, 2010-6-28.