Analysis of Software Simulation Technology of Computer Architecture

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ABSTRACT

With the development of social economy and the continuous advance of information construction, modern electronic computer technology has become an indispensable and important factor in people's daily work, study and life. People have a higher demand for the operation capability of computer systems at this stage; simulation technology of structure software is a computer technology to develop in this demand. The article mainly studies software simulation technology of computer architecture.

KEYWORDS

Computer technology, computer system, computer structure, software simulation

INTRODUCTION

The developments of computers facilitate people's work and life to a large extent, nowadays, computer technology is closely connected the various fields and all aspects of society. With the continuous progress of modern social economy, culture, science and technology, the drawbacks of existing computer technology has gradually exposed. In order to make computer technology better meet the needs of society, simulation technology of structure software emerges as the times require.

OVERVIEW OF SIMULATION TECHNOLOGY OF COMPUTER SOFTWARE

Computer is an electronic computing machine which can carry out fast operations; it is mainly composed of hardware and software. In recent years, with the development of social changes in all aspects, the computer system is facing greater operating pressure and work difficulties, structural defects gradually emerge, people also put forward new requirements for the functions and performance of computing system accordingly.
The software simulation technology of computer architecture is based on the social objective needs, the modern electronic computer technology develops combined with the development of modern technology, and its main significance is to improve the functions and overall performance of computer software. We must use the software to simulate the function and performance of the computer system in the design and manufacturing process of modern computer, on this account improve the systematic operability. Generally speaking, simulation technology of structural software has become an important means of system development of computer software.

It can be seen from the market application condition in current stage that software simulation technology has been widely promoted and applied in the field of computer development. The actual research data show that in the traditional computer software development, we not only need to invest a lot of manpower, financial resources, material resources and technical difficulties, and there are many difficulties in the all aspects of development, the design cycle is relatively long. The simulation technology of structural software can solve this problem better. Through the simulation of computer software, it can effectively reduce the cost of software development and improve the development efficiency; it is tantamount to provide a new opportunity for the computer system development. According to statistics, the software simulation technology can effectively reduce the 30%-40% cost, shorten the 50% development cycle in the practical application, in addition, the application of this technology, the systematic design is more flexible, achieve the optimal design of development program, and maximize the production value.

The software simulation technology of computer architecture has achieved good practical effect in the development of computer system at this stage, which can make the design and production of computer basically meet the needs of modern constantly-developing social reality for computer technology. However, the simulation technology of structural software bring new development direction to the software development work, meanwhile it bring a higher technical requirements, which is a prominent problem in the development field of computer systems at this stage, and it restricts the development of computer technology to a certain extent.

THE EXISTING PROBLEMS OF SOFTWARE SIMULATION TECHNOLOGY OF COMPUTER ARCHITECTURE

Difficult Technology Development

Computer is a very complex electronic structure computing machine, its internal contains a large number of circuits and transistors, and it has brought great difficulties to development of software. Due to the complexity of the computer structure, it is almost impossible to make a full simulation for it through simulation technology. In this case, the distribution is generally in accordance with the corresponding level, the corresponding structure inside the computer is simplified to a certain extent. However, although simplification can reduce the difficulty of part software simulation, but the simplified structure is still very complex; there is still a big difficulty for its simulation operation. In order to solve this problem, the relevant C programming language technicians try to use the language function of C programming language to correspond with the software simulation, so that reduce the difficulty of software development. Compared with other development methods, the error probability developed software
under this technology is low, which can greatly reduce the energy and cost consumption. At present, China's software simulation technology research is developed based on the traditional the simulator theory, the objective requirements are not strictly followed from the steps of software development, which results in confusion of software development, it causes a large number of developed software to cannot meet the needs of market development, it is questioned by the majority of users.

**Long Design Cycle of Simulator**

Simulator is a key program of modern computer on the host, which is of great significance for the operation of the computer system. Generally speaking, when the system in the simulation process, we generally select the recorder above the clock level to objectively record the operating state. Such a running state often contains a large amount of data information; it will negatively impact the systematic operational efficiency to a large extent. At this stage, fastest actual operating efficiency of China's simulator is slower compared to the operating efficiency of hardware, which greatly affects the development of computer software. At present, the relevant organizations and units have successively released standardized procedures on performance testing of software simulation technology, hope to use simulation technology of structural software, constantly improve the operational efficiency of the computer simulator, so that effectively solve the practical problems that simulator design cycle is too long, and promote the healthy development of computer technology.

**Reliability of Simulator Operation Results is Not High**

According to the objective situation of the technology development of modern computer, the development process of structural simulator can be divided into three stages. The first stage is the construction of the simulation system; the second stage is the design of the system structure; the third stage is the realization of the system. The development of first phase mainly orients the direction of small simulation software among them, which is an important part of the simulator development work. However, due to the technical level of the restrictions, the reliability of computation results cannot get more effective protection. There are mainly some problems in the details of structural design stage, although developers can more clearly understand the main object of structural system of software through this stage of operation, but the details problems still have larger impact on the development results. At present, after a long period of practice and exploration, the unreliable problems in running results of simulator have been highlighted. Although with the development of modern technology, our country has made some research results in this respect, but there are still some development obstacles in practical application.

**COUNTERMEASURE OF OPTIMIZING SOFTWARE SIMULATION TECHNOLOGY OF COMPUTER ARCHITECTURE**

**Reduce the Simulator Load**

Reduce test parameters
There are usually several fixed sets of testing manifold in a standard and scientific simulator test environment. For example, test parameters, training parameters,
reference parameters and so on. It can be found from experimental research that although the existence of these manifolds increases the reliability of the test results to a certain extent, meanwhile the running load of the simulator increases. We should be combined with the actual situation, properly reduce the input parameters in test procedures to ensure the normal working state of the system, and reduce the working pressure of the simulator.

Centralized testing

There are a large number of program contents in the entire test program system, for example: there are more than 20 point test and certificate test procedures. Although these programs have different work content, but there is still a certain objective connection inside it. Therefore, when running the test system, the characteristics and conditions of these programs can be analyzed systematically, and integrate representative program category to carry out centralized testing.

Instruction processing

In order to improve the simulation environment of the system and reduce the simulation time, the specific instructions in the test can be specifically simulated; this way can be understood from two aspects: on the one hand, a continuous phase of system instruction is selected. On the other hand, the instruction is selected by means of sample survey. The operating pressure of the simulator can be significantly reduced in this way, thereby improving the reliability of simulation data.

Reduce Simulation Instructions

Direct selection

Direct selection is to select instructions by the random way and then put it into the simulator. This method is used to select the instruction; we should take ten thousand as units, select the two parts of the instructions, respectively, and then the results of these two parts as a simulation results. The most prominent feature of this way is that after the implementation of instruction, the selected instruction will not be automatically saved, but it is directly lost, so that treatment effect after the instructions will not be influenced. We can get relatively accurate operation results and promote the efficiency of software development with this operation way. However, due to the constraints of data processing technology at this stage, this method is less adaptable to simulation environments with larger scale.

Statistical selection

The biggest advantage of this method is that the selected instruction has a very high representation. At this stage, there are mainly three ways in more mature statistical choice way of market: representative sampling, cycle sampling, and random sampling. These three sampling modes mainly use statistical means to sort and analyze a large number of simulator operation instructions, and select the most representative instructions to operate from them. This way cannot only reduce the running load of the simulator, but also can effectively improve the accuracy and reliability of the system operation results.

Task Mapping

Task mapping is an application of parallel simulators. At this stage, there are many mappings types in the parallel simulation; they can be divided into two basic...
categories: optimal solution and approximation. This operation method can get the best results, but it takes a lot of time, the operation cycle is too long. In order to solve the problem that the mapping time is too long, the current research community has two sets of response plan: the optimal algorithm and the heuristic method. With the development of modern science and technology, the mapping operation mode in parallel simulation environment is simplistic at present, it can both support cyclic mapping and block mapping two operation modes, and it is beneficial to the user's accurate analysis and objective evaluation.

Emulation and New Simulation Technology

At this stage, with the continuous improvement of social science and technology level, the application of new simulation technology has also achieved good practical results. At present, the simulation technologies with of prominent development performance mainly have simulation and computer model simulation. The simulation is computation means that simulates a part of the computer through the computer system. Through this technology, we can intuitively reflect the known performance of another computer in a computer body, thus achieving the simulation operation of computer architecture software; and improve the development efficiency of computer system. Computer model simulation is an operation process that briefly imitation a body through the computer software or hardware. This method is widely used in the development of computer software function and performance. These two technologies pay more attention to the computation process relative to the simulation results. In order to achieve better computer software development, relying solely on this computation is not enough; the development of the computer is a complex process.

CONCLUSION

In summary, with the development of social economy and the constant change of market demand, people have put forward new requirements for the performance and function of computer technology. The application of structural software simulation technology in computer development has effectively improved the quality and efficiency of computer development. In this regard, relevant research institutions and personnel should actively practice and realize the better development of computer technology.

REFERENCES