Research on Computer Network Service Quality Optimization Method Based on Integration of Multiple Artificial Intelligence Technologies

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Abstract. Computer network optimization refers to the design of network protocol according to the solution mechanism and implementation scheme given by optimization theory, so as to solve the problems of task scheduling, resource allocation, system parameter allocation and network resource deployment in the network. With the rapid expansion of the coverage of computer networks and the advent of the network era, the development of artificial intelligence has been promoted. Artificial intelligence has been widely used in computer network technology. In order to further improve the service quality of the network, not only the existing network protocols need to be evaluated, but also the network reconstruction project needs to be carried out. Based on the current situation of computer network service optimization, this paper analyzes the difficulties in the process of optimization and puts forward the corresponding countermeasures, and expounds the importance and necessity of the integration of artificial intelligence technology for the optimization of computer network service quality.

1. Introduction
Artificial intelligence, as a modern technology that brings many influences to people's life and even work, can not only improve people's work efficiency, but also improve people's quality of life [1]. In order to effectively optimize and perfect the service quality of the computer network, it is necessary not only to evaluate the existing network protocols, but also to analyze and model the computer network system through network reengineering engineering and optimization theory [2]. The biggest problem of the network protocol is that the subsequent maintenance cost is very high, so the existing network must be optimized, and its performance can reach the best state through modeling and analysis of the network [3]. Artificial intelligence has become an important content in the current scientific field. Whether at home or abroad, artificial intelligence has received extensive attention and has a very high utilization rate [4]. The demand for networks in various services is also constantly improving. To ensure the normal and effective deployment of network services, it is necessary to improve or guarantee the key service quality in specific services [5]. How to effectively improve the quality of computer network services has become one of the most important research topics in the network industry, and its development trend is also inevitable.

Artificial intelligence technology has been well developed and applied in the field of computer network technology, and the development of artificial intelligence also needs to be assisted by computer network technology [6]. Optimization theory can provide the greatest theoretical support for network protocols. From design to implementation, it is within the best theoretical framework. Once problems occur, it can be solved in time, thus minimizing the cost of network operations. In order to further improve the service quality of the network, it is necessary to evaluate not only the existing network protocols, but also the network reengineering project [7]. The addition of artificial
intelligence has effectively promoted the development of computer network technology. Remote network video conferencing, dedicated resource data downloading and network teaching have become indispensable computer network technologies in our lives, and are an important factor in people's daily lives [8]. How to grasp the current business content, rationalize resource allocation, try to avoid the delay effect of network services, and improve the overall service quality is the main direction of relevant research.

2. Main Problems Faced by Computer Network Technology

2.1 Security Issue
Computer network technology has become an indispensable part of people's current work and life and has been widely used in various fields. The goal of computer network operation is to provide users with high-quality network services. The current development of network technology is also evolving towards improving users' feelings and accepting more potential users. Resource allocation is the most important problem in network resource allocation, which can greatly improve the efficiency of network resource use. The whole network system can be regarded as a system with producers and consumers. Producers provide relatively limited resources corresponding to service subjects [9]. The main function of computer network service quality is to provide corresponding protection measures for the vast number of network data users, so that network users can be guaranteed when using the network. Artificial intelligence, as its name implies, is to assign some functions to machines, and then let the machines complete the actions or functions that human beings can complete, and perform some more dangerous or very complicated work instead of human beings. Data is often damaged due to path errors or other types of reasons during transmission, which should be resolved in a timely manner.

2.2 Data Complexity
Under the background of big data era, collecting and applying network data resources has become the main problem to be solved. Network data is not only irregular, but also has strong discontinuity. The problem of software placement to maximize resource utilization in server clusters, and the problem of coverage of servers with minimum cost, etc. Task scheduling can generally be divided into single task scheduling and multi-task scheduling. Different scheduling methods are suitable for different networks and serve different customer groups. After the artificial intelligence technology is added to the computer network technology, the computer technology can provide more humanized services for human beings and meet people's demand for artificial intelligence. The quality of computer network services has been greatly improved. Whether in terms of data transmission stability or efficiency, the increase in transmission efficiency is obvious [10]. In order to ensure the overall development of network supervision and control, it is necessary to find more accurate data in these complex and irregular network information. The network flow scheduling strategy to maximize network throughput is actually allocating network channel resources. It can also be regarded as a time-based resource allocation problem to minimize the allocated resources and maximize the utilization of resources.

The change of service quality optimization leads to the rapid growth of Internet data at a rate of millions of times. With the increasing degree of interconnection, the format and form of interactive data generated by online teaching are constantly updated. The research of network topology reliability needs a comprehensive, complete and reasonable analysis from the two aspects of network devices and service load. The algorithm flow chart is shown in Fig. 1.
With the advent of the network era, the number of network users has gradually increased in recent years, but the network resources are still maintaining the original number. How to effectively allocate network resources so that they can be restructured needs our careful consideration. Artificial intelligence technology has laid a good condition for network security operation, thus providing certain support for network applications. In the process of fuzzy processing, some new methods are added to network management, which can realize the processing of uncertain data and lay the foundation for the development of network span. In order to ensure the security performance of computer network users, computers need to be deeply developed. However, in this process, users' information security problems will be affected to some extent. When a computer receives network services, it can perform many different tasks in the same server at the same time, and properly adjust the tasks, which can effectively prevent the computer from congestion in the process of receiving network services. In the process of operation, try to reduce the scattered use of network resources. The network has already existed in our life as a carrier of information resources.

3. Optimization of Network Service Quality

Whether the network service can run normally and effectively is of great significance to users. Network quality of service optimization indicators include transmission bandwidth, data transmission delay calculation and data loss rate statistics. While computer network technology provides many conveniences for people's work and life, there are also some lawless elements who take network business opportunities as their main means of crime. In the optimization of network parameter configuration, when the range of parameters is continuous, it is continuous variable optimization, such as power control in wireless communication. In the computer network security management, the addition of artificial intelligence can help the computer network technology to effectively improve firewall technology, intrusion detection technology and so on. The purpose of task scheduling is consistent with resource allocation. Reasonable task scheduling can effectively save the bandwidth of the network, thus realizing the optimization of resource allocation. Consumers correspond to users and utilize resources allocated by producers. For wireless resources, the limited bandwidth cannot meet the needs brought by the increasing wireless services and users. The artificial intelligence of computer network technology is embodied in many aspects, which have promoted the application of computer
network technology.

For the non-directional dissemination of information and the release of personal information, they will form their own voice place on the network, and the expression of netizens' opinions will be smoother and more open than ever. Considering the symmetric demand of big data, when the network capacity is relatively large relative to the bandwidth demand, the symmetric traffic demand will be tree-shaped. When the traffic demand is lower than, the calculated total cost increases linearly, because the routes have not changed for different traffic demands. They are all tree-like routes, and only the reserved bandwidth of each link is changed. Corresponding parameters of different business items are shown in Table 1. The network cost of symmetric services is shown in Fig. 2.

| Business type   | 1    | 2    | 3    | 4    | 5    |
|-----------------|------|------|------|------|------|
| Genetic algorithm | 24.316 | 31.375 | 25.844 | 19.557 | 25.041 |
| Single Domain   | 35.215 | 33.263 | 24.868 | 21.382 | 26.315 |
| Hybrid          | 20.403 | 42.619 | 16.621 | 26.831 | 31.478 |

Figure 2 Network Cost Of Symmetric Services

The quality of network service should be measured by some criteria. The main contents should be practicability, delay and variable delay, throughput packet, etc. Although different types of network systems have great differences in operation mechanism, they are basically the same in optimization principle. If network service is considered as a kind of resource, then the optimization of network service quality is the optimization of resources. The application of artificial intelligence in computer network technology can enhance the effectiveness of network supervision, effectively supervise computer networks and strictly crack down on network illegal acts. With the development of network technology and solution technology, non-linear programming is widely used in broadband access, high-speed core network, coding and network topology models. The addition of artificial intelligence has effectively improved the performance of the intelligent firewall system, making it obviously different from other firewall systems. In order to optimize the service quality of computer network comprehensively, consideration should be given to the current network allocation. Intelligent firewall can solve the common problems in common defense software and effectively prevent network users' information from security problems.

4. Conclusion
With the continuous improvement of people's living standards and the continuous development of science and technology, people will have a new height for the quality of computer network services.
Computer network services need to be continuously optimized in the process of development. Network protocol mechanisms often start with heuristic design, and need to be patched continuously after real deployment. This is because there is no strict theoretical support at the beginning of network design. Quality of service routing is based on a variety of different metrics, which can meet the service quality requirements of the business and improve the utilization of network resources. In order to fully optimize the service quality of computer network fundamentally, it is necessary to scientifically and reasonably allocate network resources and establish a scientific resource allocation system. Optimization theory in network will become the basic starting point of network system design. It can not only strictly derive the optimal decision of resource allocation and task scheduling at the same level in the network, but also guide the emergence of artificial intelligence in cross-layer design of the network. It can better promote the popularization of computer network technology, and enable computer network technology to provide more help for people's life and work, thus improving people's quality of life and work efficiency.

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