Application of Computer Network Data Communication Technology in Production and Life

Jun Lu¹,*

¹Communication Engineering, Qinghai College of Architectural Technology, Qinghai, China, 810012

*Corresponding author e-mail: lujun@qhavtc.edu.cn

Abstract. With the rapid development of modern economy and science and technology, my country's computer technology has also been rapidly developed. In daily life, information technology has a great impact on people's lives, such as the large-scale use of mobile media. Essentially, mobile media is a kind of remote network communication technology. With this technology, real-time sharing of information in society can be realized. This article mainly analyzes the application of computer remote network communication technology from the current situation.

Keywords: Computer, Remote Network Communication Technology, Application

1. Introduction

Computer remote network communication technology refers to the use of operating systems, Internet technology, computer technology, and communication devices and realizes functions such as encoding, information storage, and switching [1-4]. For this technology, the core is the computer. The effective use of communication lines makes the terminal connection possible [5-6]. As far as computer remote network communication technology is concerned, the amount of data, functions and transmission efficiency in it are very huge, which will also have a direct impact on the production and life of the masses [7-10]. According to its own physical characteristics, the optical fiber can effectively carry out large-scale and long-distance data transportation. Its anti-interference ability, light weight, low transmission loss and high fidelity can greatly reduce the energy consumption of transportation.

2. Analysis of computer remote network communication technology

The development of computer technology has effectively increased the amount of information stored in computers, which has led to a rapid increase in the speed of information processing. Relevant data processed by computer technology can be effectively connected to the corporate LAN, thereby enabling effective sharing of information resources. In this way, relevant enterprises can choose computer communication technology according to their actual conditions to realize the sharing of enterprise resources.

2.1. Components
Computer network communication mainly includes computer terminals, host computers, data exchange devices and lines for data transmission. Companies can choose a microcomputer or a minicomputer when selecting a host computer based on the amount of communication and the scale of communication. Generally speaking, the computer used by enterprises is a microcomputer. When looking at the current various communication lines in the library transmission line, there are various types of options, such as wired lines, optical fiber lines, and so on. Among them, public lines are more common. In the public line, the data exchange device uses a modem. The function of the modem is mainly to use the data signal as an analog signal and transmit the signal to convert it into a data signal again.

2.2. Transmission direction
During data communication, it can be divided into simplex communication according to the difference between the transmission directions. There are several types of duplex communication and half-duplex communication. Half-duplex communication can be divided into two directions according to actual conditions, but can only be transmitted in one direction at a time. The simplex communication transmission can only be transmitted in one direction. For example, after the computer terminal transmits the information that needs to be transmitted to the host computer, the duplex communication can be directly transmitted in both directions. However, due to the complexity of the line structure, only a four-wire system can be used for transmission. After continuous practice, it is found that the network used can not only carry out two-way transmission after using the half-duplex communication method, but also can effectively simplify the communication line. In the connection between the computer terminal and the host computer, only a single circuit is required, which is both practical and economical.

2.3. Connection method
For remote network communication, there are four possible connection methods. They are: branch connection, hub connection, multi-channel multiple connection and point-to-point connection. According to the actual situation, when choosing the connection mode, you can choose the point-to-point connection mode. In the long-distance network communication, the core is the host computer, and the modem can be used to connect the telephone line when transmitting information. In a certain period of time, the main computer can only connect to the terminal of the mixing station to realize the transmission of information. At this time, if other mixing stations need to transmit information, the computer will display a busy state.

3. Distributed optical communication network energy consumption
With the rapid development of my country's science and technology, the scale of communication networks continues to expand, and more and more users are used, and its application scope involves all walks of life. The expansion of the scale of the communication network has increased the energy consumption, increased the operating cost of the communication network, and caused various problems such as a sharp rise in greenhouse gases, increased solar radiation, and frequent volcanic activity, which have a significant impact on global warming. Become the focus of attention of all walks of life in society. While enjoying the convenience that the optical communication network brings to our lives, we must also pay attention to the problems existing in the operation of the distributed optical communication network.

3.1. Analysis of energy consumption composition of distributed optical communication network
Due to the current limited level of technological development, the technology for processing huge data and information is not yet very developed, resulting in huge energy consumption. The ubiquitous communication network consumes energy all the time. Due to the improper design of the equipment, it is only designed for the maximum load or the worst case. If low utilization equipment and link sleep are used, it can be used in low traffic and idle times. Consumption of lower energy consumption is
conducive to saving energy consumption. If the distributed optical communication network is to support higher transmission data and transmission efficiency, its structure is mainly a core network, a metropolitan area network and an access network. The core network is at the center, and the metropolitan area network and the access network are located at the edge. As shown in Figure 1, the data center on the left is used to store network information and can be located in the core network or the edge network. The core network is the backbone of the communication network. It mainly uses the structure of the Internet to collect edge information and connect data information between a city, a country, or even a continent. The use of optical communication technology can meet the needs of realizing high-efficiency, large-capacity and scalability data transmission, and intelligently control and manage optical networks.

![Diagram](image)

**Figure 1.** Composition diagram of core network, metropolitan area network and edge network

### 3.2. Computer network data communication technology

The energy consumption of distributed optical communication network mainly has two aspects: the transmission part and the exchange part. The transmission system mainly uses an optical fiber for data transmission. Different wavelengths on the optical fiber are used as communication signals. Through Table 1 Secretary, you can more intuitively analyze the energy consumption status of each component in the core network:
Table 1. Typical energy consumption data of each device in the distributed optical communication network

| Network domain | Equipment | Capacity | Energy consumption |
|----------------|-----------|----------|--------------------|
| Core Network   | Core router (Cisco CRS-1 multi-rack system) | 92Tbps | 1024kw |
|                | Photoelectric switch (Alcatel-Lucent1675 Lambda Unite) | 1.2Tbps | 2.5kw |
|                | WDM transmission system (Ciena CoreStream Agility optical transmission system) | 3.2Tbps | 10.8kw |
|                | WDM modulator (Alcatel-Lucent WavaStar OLS WDM modulator) | 40Gbps | 73kw |
|                | Optical cross link (MRV optical cross link) | N/A | 228kw |
|                | EDFA(Ciena ONS 15501 EDFA) | N/A | 8kw |
|                | Edge router (Ciena12816 edge router) | 160Gbps | 4.2kw |
| Metropolitan Area Network | SONET ADM(Ciena CN 3600 Intelligent Optical Multiservice Switch) | 95Gbps | 1.2kw |
|                | OADM(Ciena Select OADM) | N/A | 450w |
|                | Gateway (Ciena 10008 Router) | 8Gbps | 1.1kw |
| Access Network | Ethernet switch (Ciena Catalyst 6513 Swich) | 720Gbps | 3.21kw |
|                | Optical line terminal (NEC CM7700S OLT) | 1Gbps | 100kw |
|                | Optical network unit (Wave 7ONT－E1000i ONU) | 1Gbps | 5kw |

In view of the difference in energy consumption of different components, a sleep energy-saving method based on network traffic prediction can be designed to aggregate network prevalence by predicting component traffic prediction. When the energy consumption is high, the link flow is automatically increased, and when the utilization rate is low, it is automatically adjusted to the dormant state to achieve the purpose of energy saving. Network information is used all the time. If the high energy consumption state is maintained for a long time to maintain the operation of the network, huge resources will be wasted and the environment will be polluted. This type of topology control strategy is helpful to save a lot of energy consumption and effectively control excessive energy consumption to the environment. Pollution. Secondly, in combination with the actual conditions of network capacity and energy consumption, the adaptive alliance game calculation method is adopted to select the appropriate transportation mode to improve the energy efficiency of network transportation and effectively extend the operating life of the network. In a hybrid network of all-optical network and wireless network, a large number of packet loss and retransmission problems are generally prone to occur in end-to-end transmission, which is not conducive to the smooth transmission of network information, and it also consumes a lot of energy. In order to control the consumption of energy due to packet loss and retransmission, it is necessary to estimate the energy consumption of the communication network, establish a corresponding digital model, and use the domain-by-domain transmission control strategy according to the characteristics of the data packet life cycle to connect the end-to-end TCP connection According to actual needs, it is divided into several parts to reduce the problems of congestion and packet loss and domain retransmission, and realize the high-speed operation of optical communication while saving energy and protecting the environment.

4. Application of computer remote network communication technology in practice
The use of computer remote network communication technology can effectively achieve the objectives of operation control and supervision and management. People are in a remote location, and they can control and operate the computer, which can realize the remote management in people's daily life. At present, computer remote network communication technology is mostly used in petroleum, chemical, industrial and other fields. In addition, precision agricultural technology is widely used in my country's
agriculture. It can be said that computer remote network communication technology has had a great impact on people's lives.

4.1. Demand analysis
When conducting farmland information management, it needs the assistance of a remote information management system. In the remote information system, through the realization of PDA wireless communication, the relevant data and information can be received. After the data is received, it can be placed in the information database for scientific processing. In this way, the various types of information obtained can be classified and analyzed, and corresponding decision-making information can be given accordingly. In the remote network communication technology, there are mainly sampling point distribution maps, attribute data and basic maps. For the generated sampling point distribution map, it is mainly related to the information management system, and it is also the main basis for PDA sampling point layout. After the sampling point is placed, it is necessary to return to the new sampling point and update the distribution map of the sampling point. The PDA can realize real-time transmission of attribute data to the information system, and then the information management system will output the data.

4.2. System design
When designing an information management system, it should be based on remote network communication technology, which can be divided into database design and software interface design. The software interface design is divided into user interface design and software interface design Leon. For software structure design, it belongs to a GIS system. In order to effectively guarantee the accuracy and real-time performance of data transmission, the TCP protocol can be used for remote transmission. The command actions involved here mainly include command-type messages and data-type messages. Command-type messages are simple system commands, such as requests and end actions during data transmission; data-type messages belong to their own information, such as attribute data and location data, among which the amount of data is relatively large. For PDA and remote information management system, its communication function is relatively simple. When designing the database, the information management system can store the information that the PDA has received in the database.

5. Conclusion
In summary, for remote network communication technology, its development is inseparable from the current environmental background. It is precisely because of the rapid development of the economy and society that remote network communication technology has achieved certain development. Moreover, with the development of remote network communication technology, its impact on people's daily production and life is also increasing.

References
[1] Smys, S., Bestak, R., Chen, I. Z., & Kotuliak, I. (2019). [lecture notes on data engineering and communications technologies] international conference on computer networks and communication technologies volume 15 (icncet 2018) || 6lowpan—performance analysis on low power networks. 10.1007/978-981-10-8681-6(Chapter 15), 145-156.
[2] Cevik, T., & Yilmaz, S. (2015). An overview of visible light communication systems. International Journal of Computer Networks & Communications, 7(6), 139-150.
[3] Tsu, W. & Pagidipati, S. (2015). Method and system for labeling and organizing data for summarizing and referencing content via a communication network, 4(37), 6546-6550.
[4] Joseph, O. (2015). Towards standardization of deregulated electricity market communications in nigeria. International Journal of Computer Applications, 130(8), 1-7.
[5] Mosher, M. (2015). Telecommunication device utilization based on heartbeat communication, 69(9), 1300-1303.
[6] Dong, F., X Guo, Zhou, P. & Shen, D. (2019). Task-aware flow scheduling with heterogeneous utility characteristics for data center networks. Tsinghua Science and Technology, 24(04), 32-43.

[7] Smys, S., Bestak, R. Chen, I. Z., & Kotuliak, I. (2019). [lecture notes on data engineering and communications technologies] international conference on computer networks and communication technologies volume 15 (iccnet 2018) || smart omnichannel architecture for air travel applications using big data techniques., 10.1007/978-981-10-8681-6(Chapter 60), 661-669.

[8] Smys, S., Bestak, R. Chen, I. Z. & Kotuliak, I. (2019). [lecture notes on data engineering and communications technologies] international conference on computer networks and communication technologies volume 15 (iccnet 2018) || air quality prediction data-model formulation for urban areas., 10.1007/978-981-10-8681-6(Chapter 12), 111-118.

[9] Giovanni, P. D. Martino, G. D. Zecca, I., Porfilio, I., & Staniscia, T. (2020). Trend in hospital admissions of drug addicts and associated factors from 2006 to 2015: an observational study on the hospitals' discharge registries from a region of central italy. Annali di Igiene: Medicina Preventiva e di Comunità, 32(4), 376-384.

[10] Argyriou, A. Brev, A. C. & Aoun, M. (2015). Optimizing data forwarding from body area networks in the presence of body shadowing with dual wireless technology nodes. Mobile Computing IEEE Transactions on, 14(3), 632-645.