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Development Strategies for New Network Industry

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Abstract: The new network industry is an innovation-led, cross-disciplinary frontier field. Therefore, it is crucial for promoting the innovation and application of new-generation information technology as well as the integrated development of industrialization and informatization in China. It is also a powerful means for establishing dominance in emerging industries and economic growth. This study examines the development demand for new network technologies and elaborates on solutions for various application scenarios, highlighting their industrial value. We conducted a detailed review of the development macrotrends and the current technology applications in the new network industry in China and abroad. We researched the development ideas of China's new network industry and studied the key development directions of related industries. Subsequently, we proposed specific development goals for each subdivision in the short-, medium-, and long-term phases. The study shows that a strategic planning system and cutting-edge innovation research on basic theory are urgently needed for China's new network industry. The key technology directions in this industry include new network architectures and basic theory, ultra-low-latency and deterministic-latency networks, network operating systems, cloud network convergence, and programmable networks.

Keywords: new network; consumer network; production Internet; space–ground integrated network; value analysis

1 Introduction

The Internet has spread from its initial use for military purposes to various applications in military, civilian, commercial, and other domains. Thus, the Internet has become a highly relevant information infrastructure for the economy and has a significant impact on social productivity. The rapid development of web technologies and applications has accelerated changes in the Internet. The adoption of new network system architecture and security technology can meet short-term market demand for new services. Moreover, it is required as a long-term, comprehensive solution to a series of problems in China's Internet architecture management system.

With the rapid popularization of the Internet, it faces many challenges, including security and credibility, network planning and performance predictability, perception and control under large connections, and ubiquitous mobility [1]. New applications such as holographic technology and industrial intelligent control are clearly different from traditional network applications, which increases performance demands to future networks in terms of bandwidth, latency, and jitter [2]. The traditional transmission control protocol/network protocol (TCP/IP) network design aims at efficient data transmission and provides best-effort services, which may introduce unpredictable time delays and jitter, and cannot guarantee quality-of-service requirements (e.g., throughput and transmission latency).

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The core of the future network is support for heterogeneous technology, large-scale scalability, and efficient network infrastructure [3]. To meet the new major needs of industrial Internet and space-ground integrated networks, we should explore the basic theory of frontier networks and investigate the frontier technologies and schemes of networks, such as high bandwidth flux, ultra-low delay, and large connection scale. The future network should renovate the current TCP/IP network operation mode and propose and apply new network architectures [4]. A variety of cutting-edge key technologies should also be included in the research, such as low-latency and deterministic networks, cloud–edge collaborative computing networks, and artificial intelligence (AI) networks. Future networks are expected to support trillions of secure connections and services and provide the all-time interconnection of people, machines, and objects. After years of development, the future network industry has formed a more mature ecological environment. Operators, equipment vendors, Internet companies, and other forces are developed in competition, jointly promoting the development and application of the future network industry and continuously boosting the globalization of products and services. As a key development direction of strategic emerging industries, the future network industry is expected to significantly impact global intelligent manufacturing, space–ground integrated networks, Internet of things (IoT), and other industrial fields.

Building China's strength in manufacturing and networks is the focus of our efforts. The strategic value of new network technologies is a cornerstone of a strong network nation. The global future network industry is growing rapidly in competition and cooperation, setting off a new round of industrial trends. Countries worldwide have different investment scales and achievements in the development of the future network industry. We should examine the historical development opportunities, accelerate the development of the new network industry, and comprehensively deploy the integrated application research of new network technology and industry. This study focuses on the development of a new network industry: it refines strategic needs, examines the development status quo, discusses the key directions, clarifies the stage objectives, and proposes countermeasures and suggestions to provide a theoretical reference for the research of new network technology and industry in China.

2 Demand analysis of new network development

2.1 Consumer Internet

The consumer Internet is a type of network created to meet consumers' needs on the Internet, such as reading, travel, entertainment, and living, which can provide a more convenient consumption experience. The consumer Internet is inextricably linked to the network and digital technology, it satisfies consumer demand by information and digital means, and even changes consumption habits. The development of the consumer Internet relies on applications of future network technology and deep integration with AI, blockchain, big data, and the fifth-generation mobile communication (5G) technology. This process can drive the digital transformation of business scenarios, help implement supply-side structural reform, and optimize the connection between supply and demand. This provides an underlying guarantee for consumption upgrades.

The consumer Internet mainly provides audio, data, video, and other network services and applications for end-users. As the scale of content (such as data and video) continues to grow, the demand for network bandwidth is increasing. With the emergence of services such as virtual reality/augmented reality (VR/AR), live and demand broadcast, and 4 K/8 K HD video, a good user experience depends on the data capacity of the network. For instance, the 4 K/8 K HD video is one of the most important services in future networks. A single user needs a 20 Mbps bandwidth to watch an ordinary 4 K video, whereas 100 Mbps and 800 Mbps are required to watch an extreme 4 K video and 8 K video, respectively. In the third quarter of 2019, the average download rate of China's fixed broadband network was only 37.69 Mbit/s, according to the broadband velocimetry report of the China Broadband Development Alliance. This is far from sufficient to popularize extreme 4 K and 8 K videos.

As a result, it is necessary to further optimize and enhance the existing communication networks. A new data communication network with ultra-high-speed bandwidth should be built to match the trend of the sharp increase in network traffic. Future consumer Internet should also be supported to enhance the demand for a large bandwidth for an immersive interactive experience. Technologies such as software-defined WAN and edge computing should be explored to reduce cross-network traffic and improve the overall utilization of network bandwidth resources [5].

2.2 Internet of production

The Internet of production is an industrial cloud network supporting ubiquitous resource connections, elastic supply, and effective allocation. This system aims to satisfy the needs of digitalization, networking, and intelligence

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in the manufacturing industry. A service system is built based on massive data collection, aggregation, and analysis. The core of the Internet of production is to form data-driven intelligent technology based on comprehensive interconnections. Networks, data, and security are the common foundation and support of industrial production and the Internet. The system supports the ubiquitous and deep interconnection of all elements and enterprise total factors. In recent years, the pattern of global industrial competition has changed significantly, which makes China's industrial development face new major challenges, such as information and communication technology, energy, and materials [6]. The basis of industrial system interconnection and data transmission and exchange is the network, which involves network connectivity, identity resolution, edge computing, and other key technologies.

In the context of the deep integration of the network and the real economy, the Internet of production should aim at the industrial application requirements of low delay, deterministic latency, network security, network customization, and trillion-level connection scale. New technology frameworks, such as software-defined networks, edge computing, and network AI, should be adopted to solve network challenges. Future network technology empowers the development of the industrial Internet. A software-defined network improves the centralized network control capability of the industrial Internet and supports the intelligence and differentiation of network resource scheduling. Edge computing addresses problems such as industrial Internet security and real-time control. Network AI enhances the intelligence of industrial systems for diagnosis, prediction, decision-making, and control. The Internet of production also involves an information technology/operation technology (IT/OT) integration system based on time-sensitive networks, integrated application systems in factories based on edge computing, low-power wide-area networks suitable for factories, industrial internet identification service systems, multilink interconnection technologies for heterogeneous identification, trusted analysis technology in an open environment, protocol conversion technology outside the factory, flexible networking technology within the workshop, etc.

2.3 5G and the IoT or vehicles

With the emergence of unmanned driving, industrial automation, and the IoT, the subject of communication is beginning to shift from people to people and things, even machines. The future is expected to be the era of the Internet of everything, where people, processes, data, and things are more closely connected, and new network technology plays an important role.

According to the requirements of wireless networks, 5G applications are mainly divided into three categories: enhanced mobile broadband (eMBB), ultra-reliable and low-delay communication (URLLC), and massive machine-based communication (mMTC).

(1) In the eMBB scenario, a 5G network is required to support high-speed data transmission. The 5G performance index of International Telecommunication Union (ITU) shows that the downlink and uplink peak data rates of 5G are 20 Gbps and 10 Gbps, respectively.

(2) In the URLLC scenario, higher requirements are proposed for the delay and reliability of 5G networks. For low-latency applications such as vehicle-to-everything (V2X) communications, 5G networks are expected to support access network latency of less than 1 ms and end-to-end latency of less than 10 ms. The ITU recommends that the reliability of 5G networks should be greater than 99% and even close to 99.999% for specific deployment scenarios and use cases.

(3) In the mMTC scenario, the connection ability of 5G networks supports the deep integration of various vertical industries, such as smart homes and smart cities. There are many devices connected to the network for the application of intelligent cities and industrial IoT. The ITU suggests that the equipment connection capacity of the 5G network should be 1×10^4 – 1×10^6 units/km.

2.4 Space–ground integrated network

To satisfy the needs of new information services, future networks must integrate multidimensional information, such as data on sky, ground, and space. The space–ground integrated network is important for building an omnidirectional and all-weather global information network [7]. It can effectively improve communication capacity and enhance the timeliness, reliability, and robustness of communication. The space–ground integrated network interconnects satellites of different orbits and types, near-space platforms, and ground application terminals according to the principle of maximum effective utilization of spatial information resources. This constitutes an intelligent system with optimized systems and complete functions, forming a network capable of integrating with sea, land, and air-based information systems for information acquisition, transmission, and integrated applications.

The space–ground integrated network can actively support demonstration applications in the following areas:

public security, emergency relief, emergency rescue, joint operations, transportation logistics, aviation management, marine rights protection, and smart cities. In this way, we can expand the emerging information service industry and promote the development and transformation of information industrialization. The development of a space–ground integrated network involves many key technologies: architecture design and optimization, satellite constellation design and optimization, network protocol design and optimization, network resource virtualization, on-demand networking, reliable information transmission, network security protection, network operation and maintenance management, high concurrency differentiated user access control, and simulation verification and evaluation [8].

3 Development trends of new network industry

3.1 Development status of new network industry abroad

In recent years, developed countries have formulated development plans, implemented special policies, and increased resources for the key directions of new network construction. They support in-depth research in academia and industry on network architecture and core technologies with a focus on long-term development.

In terms of national information infrastructure network research, projects in the United States are mainly funded by the National Science Foundation and the Defense Advanced Research Projects Agency. The representative projects are Global Environment for Network Innovations (GENI) [9], which focuses on various new network experiments, and the Named Data Network (NDN) [10], which develops new network architectures.

The research and development layout on new networks in Europe is mainly funded by the European Commission [11]. The plan aims to develop a new information-centric architecture [12] involving multiple subdivision directions for future networks. Representative projects are the Publish/Subscribe Internet Routing Paradigm (PSIRP) and Publish-Subscribe Internet Technology (PURSUIT). In addition, the European Union has implemented a public-private partnership to complement the validation of new network technologies.

In 2006, the National Institute of Information and Communications Technology (NICT) of Japan proposed the Future Internet Research Program (AKARI) to study new network architectures. In 2010, NICT integrated multiple related research projects in academia and industry to form the next-generation network research and development project, which enhanced the coverage of future network research and focused on the core technologies of future networks.

3.2 Development status of new network industry in China

The communications industry is a strategic industry with a high priority for development in China. Several policies have been introduced to strengthen the overall planning of the industry and to guide its development. According to the China Manufacturing 2025 strategy and the *National Informatization Development Strategic Outline*, China should promote the systematic development and large-scale application of core information and communication equipment, and strengthen the planning, construction, and management of information resources.

In recent years, the communication industry in China has entered a new stage of rapid development. The level of investment in research and development has continued to increase, and research teams and innovation capabilities have been enhanced. The development of the communications industry has increased the requirements for communication infrastructure service facilities. The advanced level of communication infrastructure determines the basic quality and capability of communication services. Emerging technologies such as satellite communication, optical fiber communications, 5G, multisensor synchronization [13], and AR/VR have expanded application scenarios, driving continuous innovation in the communications industry. The development of the communication industry has been integrated with the transformation and upgrading of the manufacturing industry, the construction of smart cities, blockchain, and other frontier directions, which has led to new applications. The communication industry has become an important field of convergence for industrial talents, funds, technology, and other elements, driving sustainable innovation and development of the communication industry.

3.3 Progress of new network industry subsectors

3.3.1 New architecture standards system

Network standardization organizations include ITU, the Internet Engineering Task Force (IETF), and the China Communications Standards Association (CCSA). The standardizations they have introduced are widely recognized by the industry for their scientific architecture, advanced content, demand predictability, and market adaptability. With the breakthrough of new network technology and the development of industrial applications, these

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organizations both compete and cooperate on technical standards in the area of new network architectures, offering a feasible guarantee to promote the application and development of new architectures.

The next-generation-network research group SG13 of the ITU Telecommunication Standardization Sector (ITU-T) first researched the combination of software-defined networks (SDNs) and telecommunication networks in 2012. They developed a series of SDN requirements and standardized protocols. Research groups such as SG15 and SG20 also have many contributions to the Internet-of-things and 5G bearer networks. The Focus Group on Technologies for Network 2030 (FG-NET-2030) was established in 2018 to focus on network architectures, requirements, applications, and capabilities beyond 2030.

As a global Internet technology standard organization, the IETF currently has six research projects and working groups related to SDN. The Information-Centric Networking Research Group (ICNRG) combines ongoing research on information center networks (ICN) with solutions related to the development of the Internet. ICNRG aims to improve the transmission efficiency of the network and enhance the scalability of the network and the robustness of communication. In the area of SDN and network function virtualization (NFV), the IETF has published new standards such as RFC8430 and RFC8431.

The CCSA is the main organization responsible for communication standards in China. CCSA established working groups such as the Future Data Networks and Software Virtualization Networks with SDN at the core. In recent years, many research projects addressed SDN/NFV standards. In January 2020, CCSA released the first 14 standards of 5G in China, completing and publishing the *White Paper on Cloud-based Virtual Reality Platform Technology under 5G Network*, *White Paper on Standardization of Industrial Internet Marking Resolution*, and *White Paper on Key Scenarios and Technologies of Cloud-based Augmented Reality*. Thus, CCSA provided key standardization recommendations to support the efficient development of China's telecommunication networks.

3.3.2 Network equipment industry

The traditional network structure is rigid, single-functional, and inflexible, making it difficult to satisfy the network requirements of emerging services. The introduction of concepts such as SDN and NFV has significantly enhanced network flexibility and controllability, which gained considerable attention. The emergence of new applications and scenarios, such as smart healthcare, smart agriculture, smart driving, industrial Internet, and smart homes, has further broadened the market demand for new network equipment. Network devices have evolved toward white-boxing [14]. Unlike traditional switches, white-box switches use a more open architecture to achieve decoupling of traditional switching hardware and software. As a result, network devices become generic, and it is easier to maintain the network open and flexible. Moreover, the devices become programmable, which effectively reduces their operating costs.

3.3.3 Network operating system industry

According to the International Data Corporation, over 70% of enterprises are expected to deploy unified hybrid and multicloud management technologies, tools, and processes by 2022. Information technology (IT) organizations aim to develop multicloud architectures, typically using at least two cloud service platforms. As key technical problems in multicloud interconnection scenarios have not been resolved, the vast majority of enterprises are still more likely to procure a single cloud platform service for their deployments. Currently, interoperability between multiple heterogeneous clouds is inadequate [15], and users face serious vendor lock-in problems when using the cloud.

3.3.4 Network test facility industry

The development of networks requires large-scale, real-life test environments to support the testing and validation of innovative architectures and technologies. China has constructed the China Environment for Network Innovations (CENI), the Yangtze River Delta regional integration network, and the Bay Area future network test and application environment. SDN/NFV technology is applied to future network test facilities [16]. Developed countries and regions are also working on national network innovation test environments. Examples include GENI (United States), Future Internet Research and Experimentation (European Union), JGN-X (Japan), and the Open Network for Research Environment KREONET-S (South Korea).

3.3.5 Key application scenarios and ecology

The future network technology represented by SDN continues to mature and has entered the small-scale test verification stage [17]. The future network should support the large-scale commercial deployment of operator networks, such as mobile backhaul networks, mobile core networks, backbone networks, and large-scale data centers.

By integrating new network reconfiguration technologies such as SDN, NFV, and cloud technology, IT-based network equipment and the separation of network forwarding and control layers should be implemented, and big data applications should be enhanced. An operationally integrated network with global on-demand scheduling of resources and fully open network capabilities is expected to be constructed.

4 Development focus of new network industry in China

The development of new network technologies and industries is of great strategic significance in accelerating the development of new industries in China. It improves the long-term momentum of innovation and development and brings new advantages in international competition. The industrial Internet, IoT, and consumer Internet are developed to broaden network functions and services, improving intelligence, generalization, and refinement. Thus, new systems should improve the overall utilization of network resources and promote the development and growth of the network industry.

In China, the network infrastructure is complete, network-related industry chains are well-developed, and basic research capabilities are strong. We should focus on the development of new applications, such as space–ground integrated networks, consumer Internet, industrial Internet, IoT, and 5G mobile communication. We should achieve breakthroughs in satellite communication, optical fiber communication, SDN, AI, deterministic networks, and other technologies, and implement the industrial promotion. Industrial promotion drives technological development, and technological breakthroughs provide feedback to the industrial promotion. Eventually, the network structure will be transformed from a simple link-based network to a smart functional network [18].

The strategic plan of the future network industry in China should start from three aspects: network, communication, and security. Technical research and application promotion should be implemented. We should focus on the construction of a service customization network platform and application, man–machine–object full-spectrum interconnected wireless mobile communication, network communication endogenous security platform, and applications.

The basic theory and key technology of future networks are researched according to the important needs of the industrial Internet, space–ground integration network, and civil–military function combination network. We should speed up the deployment of innovative demonstration applications with international influence to straighten the position of China in manufacturing and cyberspace.

In terms of future communications, we plan to address the development needs of 5G, the sixth generation of mobile communications (6G), and the key technologies of 5G millimeter-wave core chips and devices. Moreover, 6G research will be conducted at an appropriate pace. We should also achieve breakthroughs in the integration of large-scale wireless transmission technology, terahertz, and visible-light communication technology, and integrate intelligent communication and big data. We should build a world-class mobile communication integrated test platform.

In terms of network security, there is a major demand for the ability to defend against unknown threats. We should develop innovative network defense technologies with active immunity and research and develop disruptive technologies for network security. This corresponds to the global cybersecurity development trends, such as 5G network security, control system security, and architecture endogenous security [19].

5 Development goals of new network industry in China

The development of China’s new network industry is focused on the transformation and optimization of the network structure, the steady increase in network performance and quality of service, the increasing innovation capacity of the industry, and the application of concepts such as Internet Plus and the industrial Internet. We aim to achieve the long-term goal of balanced network infrastructure development, strong innovation in the network industry, and smart services for the public, taking advantage of the development opportunities within the next 10–15 years. Based on SDN and NFV technology, full cloudification of the network and transformation of the network architecture is expected. Thus, under scientific guidance, the technology with gradually shift into next-generation networks to improve network performance.

5.1 Development goals for 2025

With respect to the space–ground integrated networks, we should cover space, air, ground, and ocean according to the idea that the networks on Earth and in space should be interconnected. This approach provides information guarantees for all types of space-, land-, and sea-based user activities. China plans to launch batches of satellites to

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form constellation networks and build ground-based stations on a large scale to enable the effective application of scientific and technological achievements.

In terms of industrial Internet, more than three secondary nodes of industry identification services are planned, and independent enterprise-level platforms will be cultivated. An industrial Internet platform test and public service system is expected to be built to promote enterprise cloud. In addition, we should improve the top-level design of the industrial Internet system and upgrade the construction of an external network. We should also transform and construct the enterprise network and improve the deployment of the Internet Protocol version 6 (IPv6) applications. We should install dedicated lines to connect small- and medium-sized enterprises to improve speed and reduce costs, and we should allocate key resources such as radio spectrum in the field of industrial Internet on demand. We also need to set up the necessary industry research institutions to manage identification analysis in the regional industrial Internet.

In the IoT, industry application standards and key technical standards are met and gradually improved. The standardization system of IoT has gradually formed. We should use the amplification effect of the industrial scale to promote the technological innovation activity of key links, such as sensor perception.

In terms of 5G, we should plan 5G network construction, innovation, application, industrial development, and provide the 5G network coverage of national towns. We should also implement the principle of "same speed on the same network" in rural areas and cities as soon as possible, significantly reducing research and management costs. We should continuously promote the integration application of 5G with VR, industrial Internet, Internet of vehicles, smart cities, smart agriculture, and smart medical care. Further industry-spanning development initiatives should be implemented, such as accelerating the deployment of 5G basic industries, accelerating the development of the digital economy, building 5G industry arrays, and gathering 5G industry innovation capabilities.

5.2 Development goals for 2035

With regard to the space–ground integration network, we should deepen the communication and cooperation of all parties in new-generation IT and high-level talent. Moreover, we should promote the deep integration of new-generation IT and the real economy, working together to create a new model of digital economy development. We should actively guide enterprises to cooperate in-depth and jointly promote the operation and development of major projects of space–ground integration. We should expand network space, promote the progress of satellite communication technology, and interconnect and integrate with mobile communication networks and the ground Internet.

In the industrial Internet, the priorities are the development of core technologies and products for the industrial Internet, such as edge computing, deep learning, AR/VR, and blockchain for the industrial Internet. We should build a technology system with independent intellectual property rights, batch releases, and advanced industrial Internet hardware products. It is necessary to improve the innovation and application level of the industrial Internet in large enterprises and implement the underlying network and intelligent transformation. Another priority is to build interconnected factories and fully transparent digital workshops to form intelligent production, networked collaboration, personalized customization, service extension, and other application models.

As a conceptual wireless network mobile communication technology, 6G communication should support the needs of the future information society and implement the development vision of "anytime, anywhere, everything is connected as you wish." The 6G communication is expected to develop in the direction of low-altitude space satellite communication. An integrated network of air, space, ground, and sea connections with a unified standard protocol architecture and technical system is expected to be adopted. Efforts should be made to advance and explore the applications of terahertz technology, equipment, and network security [20].

Before 2035, we must plan future network-related industries ahead of time. We should focus on backward-compatible new concepts, architectures, protocols, and solutions. We should support new network technologies with existing and new applications as benchmark targets. Moreover, we should play a guiding role in the development of the future network and communication industry, and maintain the leading position of China in network-related industries and technology research.

6 Suggestions on the development of new network industry

The rapid development of the network and communication industry requires scientific demonstration and implementation of China's new network industry strategic planning. It is necessary to formulate sound policies and regulations to guide and regulate the industrial development of government agencies. We should create a good

market environment and optimize the allocation of technology, capital, talent, and other development factors. This should accelerate the implementation of major projects and promote industrial applications.

In the context of fierce global competition, improving the independent innovation ability of new network technology and industrial systems is the top priority for future work. It is suggested to strengthen basic and applied research of emerging network technologies to fundamentally reverse the situation in which the core technology of our industry is restricted by others. We need to promote the integration of technology research, development, and industrial applications. The key technical directions of the new network industry are as follows.

First, we propose a new network architecture and basic theory technology. We should focus on the open, flexible, and universal new network architecture to promote the transformation from "network-resource-centric" to "application-service-centric" architecture. It is necessary to support the intelligent dynamic distribution and on-demand connection coordination of various service resources, such as computing power, data, and content. We should build a future network infrastructure based on new network architectures. The relevant elements include ICN, expressive networks, mobile wired networks, service customization networks, full-dimensional definable networks, address-driven networks, intent networks, network 5.0, deterministic networks, programmable networks, blockchain networks, and computing networks.

The second is the ultra-low-delay and deterministic-delay network technology. Research undergoes on the software-defined deterministic network architecture, deterministic backbone network operating system, network traffic optimization scheduling mechanism, and strategy based on the centralized controller. Specifically, relevant topics include fast sensing technology supporting end-to-end bandwidth, delay and delay jitter of backbone networks, deterministic path algorithm supporting backbone level and traffic optimization, and scheduling algorithm with end-to-end bounded delay jitter guarantee ability.

The third is the network operating system technology. It is necessary to focus on the development of network resource convergence, network programmability, and the provision of network services for the business application layer to build a unified intelligent control platform. The network resources can be efficiently managed using fine management, vertical cross-layer intelligent scheduling, and highly intelligent network operation and maintenance control. Thus, an open core network system with on-demand serviceability can be constructed.

The fourth direction is cloud network convergence technology. It focuses on the study of cloud computing technology deployment information system which faces "multisystem, multiscene, and multibusiness" scenarios. The technology reflects the demand for an "enterprise cloud." We should clarify the demand for various types of cloud services and build a bearer network that adapts to the requirements of on-demand open networks. Using the agile connection and on-demand interconnection between the network and the cloud, we can form a cloud network integration technology system with the characteristics of intelligence, self-service, high speed, and flexibility.

The fifth is the programmable network technology. It focuses on technologies of SDNs, programmable chips, programmable intelligent network adapters, programmable languages, and software modular network functions to simplify the information conversion process. We should establish efficient parsing and forwarding modes for programming control packets. Finally, we should support top-down networks and equipment and open programmable functions to users, forming a programmable data plane.

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