

## **Preliminary Study of Our Country's Network and Information Security Strategy under the New Situation**

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**Abstract.** The internet innovation and development has already deeply penetrated into all aspects of economic world. The attaching problem-the network and information security problem becomes increasingly prominent, and the complexity and harmfulness of network security situation manifest themselves become more obvious. We analyze the situation and challenges in network and information security facing our country, and put forward some implementation measures and suggestions about the network and information security in our country in this paper.

### **Introduction**

At present, a new round of technological revolution and industrial revolution is breeding. Internet innovation and development has been deeply penetrated into all aspects of economic world. However, on the one hand, the national economic growth and social progress have been truly realized, on the other hand, the attaching network and information security problems are becoming increasingly prominent. The complexity and harmfulness of network security situation have become more obvious, which arouse the universal concern of the Central Party Committee and the international community. The central leading group lays stress on the network security and information on the first meeting, the general secretary Xi Jinping the first time makes it clear that the problems of network information security possess a major national strategic position-- "There is no national security without the network security". At the same time, he again makes it clear the relationship between network security and information and their orientation-- "Strive hard to turn our country into one with powerful network. Network security and information development are two wings of a powerful nation, and they just like two driving wheels."

Therefore, our country faces two big network and information security strategy problems. On the one hand, in the long-run, we should focus on the top design and overall planning of network and information security. We should work on the strategy, the organization, the law, the technology, the industry, the defense, the foreign affairs, the personnel, etc. simultaneously and establish and improve the autonomous control network and information security system. On the one hand, for the immediate future, we should focus on integrating the national force, with a small force to get a big win, and make certain the aspects of network information security in our country that need to be give emphasis on at the present stage, and to solve the current urgent information security problems facing our country important.

### **The Present Network and Information Security Situation Facing Our Country**

**The International Aspect.** From a global perspective, after three important historical development periods, the United States first completes the layout and the overall plan on the state network information security strategy. The US information security strategy has experienced three stages of development-Clinton, George W. Bush and Obama phases, and the national security strategy has also experienced core ideas of strategy change from homeland defense, anti-terror defense, to cyber warfare and network space invasion, and all the above three are comprehensive defense strategies. Up to now, the US has fully formed the world's leading network information security defense system, and its cyberspace hegemony advantages at the international stage are becoming more and more obvious. Following the United States closely, the European Union and the

rest of the world has entered the network space “latter strategic” period, and speed up to accelerate the core security strategy’s deployment in succession, especially through the construction of domestic defense system and the active cooperation with international world to deal with the threats of network information security.

**The Domestic Aspect.** The CPC central committee attaches great importance to information security problem in our country. Firstly, National Security Council and other important state administrative agencies are successively established. Make sure that the information is secured, and it has become an important part of national security strategy. The way to build a safe and reliable network environment, insure development with safety, and insure security through development are the major strategic issues facing the country and industry. Secondly, the relationship between former network security and information development and their positioning are re-clarified. Network security becomes the decisive element of achieving the strategic objective-realizing “powerful network nation” comprehensively. “Strive hard to turn our country into one with powerful network. Network security and information development are two wings of a powerful nation, just like two driving wheels.” The network information security work blueprint of China is undergoing profound changes.

**The Positioning of China in the Structure of Global Network and the Information Security World.** Compared with countries around the world, the strategic deployment in cyberspace of China just started, and has not yet formally launched national network information security defense system deployment. Therefore, a further wedge has been set between our country and the world's major developed countries about network and comprehensive information security offensive and defensive ability. So far, our country has not introduced a cyberspace strategy text getting international recognition, although our country has carried out a series of policy documents, and has formed the basic framework, but our country has not already released the national space strategy adopted internationally.

### **The Main Threats and Challenges Facing the Network and Information Security of China**

**The United States takes advantage of the information industry to accelerate the monopoly of global network infrastructure and information services, and ICT technology gap becomes the constraint factor of national security.** Five core areas of the global network infrastructures--computer with high performance, operating system, database technology, network exchange technology and information resource database are all monopolized by IT giants in the United States. According to statistics, 80.4% of the world’s super computers use Intel chips; 91.8% of the world’s personal computers use Microsoft operating system; 98% of the world's core technology of servers is in the hands of IBM and HP companies; 89.7% of the world’s database software is under the control of Oracle and Microsoft. Our country’s network equipment and core equipment of important industry information are monopolized by foreign manufacturers, and can’t be controlled independently. Cisco possesses about 73% of 163 backbone networks, and 81% of China Unicom 169 backbone networks; three data platform vendors of IOE account for more than 50% of China’s financial sector and even of the global finance database system supply. The practice is supported by government and corporate organizations aiming to vigorously promote the development of cloud computing, and the cloud server in America deploys global cloud services and data center. Amazon AWS cloud platform has currently set up eight data centers in North America, South America, Europe, Asia and other regions. And the data centers are distributed to more than 190 countries around the world connecting about 12 million websites. The websites number is about four times that of China. The cloud service provider in the United States accelerated its deployment into China. Microsoft Cooperation with Century Interconnected Domestic Operating Microsoft Cloud Service Platform Azure and Office365; Amazon cooperates with Web Host Technology Domestic AWS Platform Service; IBM build public cloud platform together with The Capital Online Collaboration.

**The traditional security vulnerabilities, continue the growth in cyber attacks, and the preset rear entrance on the network information infrastructure problems are gradually visible.** Network security vulnerabilities continue to grow in our country, and the overall situation is not optimistic. In the first half of 2013, CNVD included general hardware and software vulnerabilities about 3884, and achieved 26.8% growth compared with last year. These vulnerabilities include 1322 high risk vulnerabilities, namely an increase of 16.4%, and 1073 0day vulnerabilities, namely an increase of 6.6%. the number of network security incidents about stealing the key information resources as the goal will continue to grow. In 2012, inside of China there are at least 41 thousand hosts were infected with Trojans with APT characteristics, and multiple government agencies, important information system departments and high-tech enterprises are involved. The problem of presetting “rear entrance” on network information infrastructure in China is gradually visible. Between 19 March and 18 May in 2014, there are 2077 Trojans and Botnet control servers in the United States directly controlled 1.18 million hosts on the territory of China. And 2016 IP in the United States set rear entrances on 1754 websites on territory of China involving the back door attacks about 57000 times.

**The privacy disclosure and the network maintenance problems are serious, the national cross-border data security problems are intensified.** At present, our country’s information consumption becomes a new engine transforming and upgrading the national economic structure. The incident about foreign capital locating in China arouses new thinking about market opening. And the western ideology network penetration continues to grow. Therefore, our country faces multiple information security problems. Personal information leak happens frequently, and the privacy protection problem is urgent. The risk of cross-border information flows becomes more serious, and the pressure of security management of national data and content is growing; hostile forces makes disturbances frequently through the network, and the political stability maintenance work on the net is more serious in China.

### **The Domestic, Thinking Globally, the Problems of Network and Information Security in China and the Gap Between our Country and Others**

**The Information Technology and Industry Aspect.** There is a large gap between the overall level of information technology in China and that of abroad, especially in the national government and important industries, where the information construction urgently needs an information system and foundational software with high performance and reliability. Yet the system integration of three areas needs to accelerate breakthroughs in core technologies, and the key equipment and services rely heavily on the foreign imports, and the autonomous control level is generally low. The information industry in our country is still in the low-end of global value chain link, lacking of enterprise growth, and relying too much on technologies transferring and the introduced from overseas for a long time. As a whole, our country has not yet formed long-term competitiveness in comprehensive information industry internationally. Deep-seated problems behind the technology and industrial gap restrict the ICT technology innovation and industry development and the institutional environment hasn’t fundamentally solved the failures in ICT innovation market making our ICT enterprises obviously lagging behind in independent innovation consciousness, innovation and other aspects.

**The Technology Security and Industry Aspect.** Hardware security technology in China is still at the early development stage of imitating “fake autonomous” stage. There is a qualitative huge gap between Chinese security softening ability services that represents the future development trend and that of the world. At present, China’s security industry’s overall strength is obviously insufficient and lacks leading enterprises with international influence and competitiveness. In parts of China, the maturity of security products has roughly reached the international level of the same period, but because of the shortage of domestic commercial market security requirements, process of the application and promotion of the ethnic autonomous products to market becomes very slow, and market cultivation become one of the important bottlenecks of sustainable development of security industry in China. In terms of the external environment, the market competition law is not

sound, hidden costs of access to product certification are high and industry development policy problems are currently the three big background problems that hinders the development of security industry.

**The Network Infrastructure Aspect.** The existing protection system of network infrastructure in our country is mainly designed and deployed based on the idea of “escorting for the information construction development and ensuring the stable operation of society information”, which is clearly adapt not to the national security strategic positioning, and seriously lagging behind the latest safety development situation at home and abroad. Countries such as the US and other European countries have critical infrastructure protection promoted to national security strategic height. In the legal system, they adopt a series of effective measures in the security censorship and safety prevention system of administrative organizations. Compared with abroad, on the aspects of our country’s network information infrastructure security protection concept and system construction, there lies an obvious gap between ours and that of the abroad .

**The Information Service Aspect.** In terms of safety and management of knowledge and information service, our understanding of backbone network, access network infrastructure is abundant. But with the development of ICT integration, technology update and iteration, cloud computing, CDN, IDC and other platforms, the information service becomes more and more important. The knowledge of “the attributes of national important information infrastructure” being served by cloud computing, the CDN, IDC and other basic servers in China is seriously insufficient! Judging from the present situation, the information service management problems are mainly concentrated in the four aspects: open business, review of foreign capital, VIE equity structure and the actual control. In terms of data protection, there is a serious insufficiency in the knowledge of cross-border data flows and personal information protection in our country. Besides, legislation and management are just starting out, which need to be leaded and promoted as soon as possible by upper administrations.

**The Cyberspace Aspect.** In terms of network space international cooperation, the international hot issue “great security” in the network information is intensified, so strengthen the global governance of network space is an inevitable choice and the direction of the international community. In general, China is lack of top-level design in the international cooperation, the state-level network space international strategy has not yet been issued, there lacks consistency, continuity in participation in international cooperation, and the foreign discourse system is still incomplete. China’s international cooperation theory claims are not loud enough, and hasn’t yet put forward the international code of conduct widely accepted by international community. The image of a responsible power in maintaining network space with other countries is still on a subjective grip, the international credibility of “Chinese voice” is not strong enough. The strategy of China’s use of international cooperation platform is not clear, and the formalism of cooperation mechanism is greater than real cooperation. In terms of network defense system, at present, our country has certain defense capability of maintaining the network and information security, but has not yet fully set up the network space defense system with offensive and defensive capabilities. Our nation does not have the national level network with the pre-situational warning awareness ability, and the network defense technologies are in the stage of transformation.

## **The Implementation Measures and Suggestions of Our Country’ s Network and Information Security Strategy**

**The Principles, Objectives and Implementation Process of the Strategy.** The Basic principles of the strategy: First, we should have a clear understanding of the strategic position of network information security in our country, and in a certain period of time of the future, give priority to with positive defensive strategy deployment. Second, we should have a clear understanding of the recognition of the full implementation of network and overall information security deployment will be a long-time task waiting to be carried out. At the present stage (until 2030), the network and information security strategy of our country in China will take the soft

power defense construction as the main idea, such as how to strengthen the legislation, management system and foreign cooperation. Third, we should have a clear understanding that, in the short term, and it is difficult to realize the overall promotion of comprehensive information technologies in our country. Therefore, at this stage, the focus will be to improve the national security technology and the industry comprehensive strength and take the improvement of the ability about the security technology protection in the network infrastructure, information service industry and the main body of micro enterprises as the main methods.

**The Goals and implementation methods of the strategy.** In the aspect of information technology industry, by the Party has been founded 100 years (2021), we should strive to promote the localization process of the relevant national industries instead of making the information technology fully autonomous and to realize the situation that the alternatives of key infrastructures are reliable and have the demonstration effect. By 2030, we should strive to perfect and innovate the development environment of national information science and technology system, and promote the micro enterprises to become the main body among ICT innovation technologies. In security technology industry, by the Party has been founded 100 years (2021), we should strive to enhance the understanding of national security defense deployment and to build the security protection system in all directions. As for the information services, by the Party has been founded 100 years (2021), we should strive to review the positioning of national strategic information service, moderately limit and regulate China's foreign investment and opening business areas. By 2030, we should strive to establish and improve the double line system of data protection and information content management, and to gradually develop from "network data power" to "network data power". As for the international cooperation of network space, by the Party has been founded 100 years (2021), we should strive to take the initiative to promote the new proposition of security cooperation, and to put forward the idea-begins with me to promote the security cooperation and maximize the international security diplomatic interests. As for the offensive and defensive deployment in cyberspace, by the Party has been founded 100 years (2021) we should strive to basically form a fighting power, which is as strong as the strength of the international cyber arms.

**The Policy Suggestions.** About the information technology and industry: With the power of our country, we should try to realize the breakthroughs in core technologies and the rapid and independent research and the development of key equipments rapidly. First, we should pay more attention to make the breakthroughs in the technologies of producing key products within safe range, which are related to the important national areas. Besides, we should realize the rapid conversion of scientific research achievements. Second, we should speed up the deployment of independently controlled alternative strategy, and gradually promote the localization process in the government, communication and financial sectors. we should speed up the innovation in the improvement of institutional environment, and build an innovated security system dominated by the enterprise market. Finally, we should fundamentally solve the shortage problem of lacking the enterprise innovation initiative caused by the market adjustment failure. Gradually activate independent innovation of ICT enterprises is the fundamental guarantee of promoting the development of ICT technology leapfrogging in China in the long run. First, we should study and establish the Act of Technological Innovation, set up the state commission of technology innovation, coordinate the management of technical innovation and strengthen the protection of technological innovation. Second, we should build the venture investment of China's information technology innovation and national security mechanism, and let the venture capital and securities market be the primary source of innovation funds. Third, we should take the capital as a link to encourage technology innovation cooperation and resource integration between the enterprises, encourage the information technology innovation among the enterprises at home and abroad with the form of skill trade cooperation, joint venture, cooperative joint venture etc..Fourth, we should establish and perfect the market transformation mechanism of ICT innovation. We should improve the intermediary service system of innovation achievements. We should improve the authentication mechanism of the third-party evaluation of the innovations.

As for the international cooperation and defense construction of network space. We should

popularize the new international security cooperation with great force, and actively advocate the new order- “the international code of conduct of information security”. First, we should strengthen the participation in the international cooperation affairs, and put forward four new international security cooperation concepts- “peace, sovereignty, multi-governance and benefit to everyone”. Second, we should have a clear standing in our participation in international cooperation platform, and give the positive significance of the platform a full play to our advantage. Third, we should actively advocate the new network space order-“the international codes of conduct about information security” jointly put forward by our country and the SCO member states. We should actively practice the new way of thinking of China’s overall international cooperation in the network security, and improve the network space discourse power and influence of China. First, we should win over alliances, and push forward the all-round practical cooperation of Internet security with neighboring countries. Second, we should seek the common ground while put aside the differences, and further strengthen the bilateral diplomatic consultations with international powers. Third, we should announce actively of promoting the network space security cooperation among the governments, such as the United Nations, the International Telecommunication Union, the Asia-Pacific Economic Corporation, and the Shanghai Cooperation Organization.

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