

Office of the Central Cyberspace Affairs Commission

Notice on accelerating the deployment and application of the sixth edition (IPv6) of the Internet Protocol

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Print Correction of errors

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Provincial, autonomous regions, municipalities directly under the Central Government and Xinjiang Production and Construction Corps Party Committee Network Information Office, Development and Reform Commission, Industry and Information Technology Office (Bureau), Communications Administration:

The sixth edition of Internet Protocol (IPv6) is the inevitable trend of Internet upgrading and evolution, the important direction of network technology innovation, and the basic support of the construction of network power. In 2017, the CPC Central Committee, with Comrade Xi Jinping as its core, made a strategic decision to advance the IPv6 deployment. Over the past three years, various regions and departments have earnestly implemented the Action Plan for the Promotion of the Sixth Edition of the Internet Protocol (IPv6) Scale Deployment, and made significant progress in the deployment of IPv6 scale. The "14th Five-Year Plan" period is an important strategic opportunity period to speed up digital development, build a network power and digital China, and the development of IPv6 in China is in the key stage of overcoming difficulties and crossing the inflection point, facing the risk challenge of not moving forward and retreating slowly. In order to carry out General Secretary Xi Jinping's important ideas on cyber-power, and in accordance with the relevant requirements of the 14th Five-Year Plan for National Economic and Social Development and the Outline of Vision Goals for 2035, comprehensively and in-depth promotion of IPv6 scale deployment and application, and accelerated the promotion of Internet evolution and upgrading, with the consent of the Central Committee on Cybersecurity and

Information Technology, we hereby notify the following about matters related to accelerating the deployment and application of IPv6 scale:

First, the overall requirements

(i) Guiding ideology

Guided by Xi Jinping's new era of socialist thought with Chinese characteristics, we will fully implement the spirit of the Second, Third, Fourth and Fifth Plenary Sessions of the 19th CPC National Congress and the 19th CPC Central Committee, earnestly implement the decision-making and deployment of the CPC Central Committee and the State Council, adhere to the people-centered development idea, base on the new stage of development, implement the new development concept, build a new development pattern, implement high-quality development requirements, unswervingly promote the deployment and application of IPv6 scale, and comprehensively promote IPv6 technology innovation and integration applications. To improve the depth of application as the main direction of attack, focus on building an open and innovative technology system, advanced performance facilities system, comprehensive coverage of the application system, ecologically sound industrial system, complete system standard system, autonomous and controllable security system, to achieve IPv6 scale deployment and application from good use to good use, from quantity to quality transformation, from the outside to drive the transformation to endogenous drive, to create new advantages of innovation and development, for the construction of network power and digital China to provide a solid support.

(ii) Basic principles

- **Government-led, market-driven.** Give full play to the decisive role of the market in the allocation of resources, better play the role of the government, strengthen top-level planning, overall coordination, policy support, environmental construction, standard guidance and supervision and implementation, and vigorously promote the application of IPv6 integration innovation.

- **Innovation and empowerment, application landing.** Actively support IPv6 technology innovation, application innovation, service innovation, management innovation, fully

release IPv6 technology potential and advantages, continue to stimulate endogenous power, solid industrial ecological foundation, greatly enhance the breadth and depth of IPv6 application.

Problem-oriented, classification-oriented. Focus on solving the problems of poor key links, poor application, insufficient terminal support, strengthen classification guidance, demonstration guidance, verification testing, monitoring and notification, accurate and collaborative efforts, break through bottlenecks, and comprehensively improve the level of development.

- **System propulsion, security.** Strengthen forward-looking layout, overall planning, overall promotion, better play the central, local and all aspects of enthusiasm, form a joint effort to form a system to promote IPv6 technology, industry, network, terminals, applications, security construction, to achieve coordination and progress.

(iii) Work objectives

By the end of 2023, the advanced and autonomous IPv6 technology, industry, facilities, applications and security system will be basically built, forming a market-driven, coordinated and mutually beneficial development pattern. IPv6 has 700 million active users and IPv6 connectivity has reached 200 million. Mobile network IPv6 traffic accounted for 50%, metro network IPv6 traffic accounted for 15%. Domestic main content distribution network, data center, cloud service platform, domain name resolution system basically completed the IPv6 transformation. The newly launched home wireless router fully supports and turns on IPv6 by default. The support rate of IPv6, a government website at or above the county level, a major domestic commercial website and a mobile Internet application, has increased significantly. The IPv6 single stack pilot has made positive progress, with new network addresses no longer using private IPv4 addresses.

By the end of 2025, China will have built a leading IPv6 technology, industry, facilities, applications and security system, and China's IPv6 network size, user scale and traffic scale will rank first in the world. Network, platform, application, terminal and industry full support IPv6, new websites and applications, network and application

infrastructure scale deployment IPv6 single stack, forming an innovation-led, efficient and collaborative self-driven development trend. IPv6 has 800 million active users and IPv6 connectivity has reached 400 million. Mobile network IPv6 traffic accounted for 70%, metro network IPv6 traffic accounted for 20%. IPv6 is fully supported by government websites at or above the county level, major domestic commercial websites and mobile Internet applications. China has become an important driving force for global "IPv6 plus" technology and industrial innovation, and the independent innovation ability of network information technology has been significantly enhanced.

Then with another five years or so, to complete the evolution to IPv6 single stack transition, IPv6 and economic and social sectors of the comprehensive deep integration application. China has become an important force in the fields of global Internet technology innovation, industrial development, facility construction, application services, security, network governance and so on.

The main indicators for the deployment and application of the 14th Five-Year Plan IPv6 scale

The serial number	Metrics	2023	2025
1	IPv6 active users (billions).	7	8
2	Internet of Things IPv6 connections (billions).	2	4
3	Mobile network IPv6 traffic as a percentage (%).	50	70
4	Fixed network IPv6 traffic as a percentage (%).	15	20
5	Home wireless router IPv6 support rate (%).	30	50
6	Government website IPv6 support rate (%).	80	95
7	IPv6 support(%) for major business websites and mobile Internet applications	80	95
8	Number of innovative applications for "IPv6plus" (each).	100	500

Second, key tasks

(1) Strengthen the network carrying capacity

1. Improve IPv6 network performance and service levels. Deeply optimize the IPv6 network to ensure that the IPv6 network key performance and service metrics are the same as the fourth version of the Internet Protocol (IPv4) network. In-depth access network IPv6 transformation, improve access equipment IPv6 support capacity. Carry out the transformation of the core network of the mobile Internet of Things, with the ability to assign fixed IPv6 addresses to mobile IoT terminals. Promote the simultaneous planning and implementation of IPv6 and Gigabit Network and Fifth Generation Mobile Communication (5G). Continuously improve the operation and maintenance of IPv6 network, improve the IPv6 network service opening, troubleshooting and other service levels.

2. Enhance IPv6 network connectivity. We will accelerate the transformation of Internet exchange centers (including new Internet exchange centers), Internet direct link points IPv6, build new switching centers and direct links to fully support IPv6, give priority to upgrading the bandwidth of Internet international inlet and exit IPv6, and ensure effective transfer of domestic and international Internet IPv6 traffic.

3. Actively promote IPv6 single-stack network deployment. We will promote the 5G independent networking (SA), Internet of Things and other network IPv6 single-stack pilot, explore the pilot system no longer use private IPv4 addresses, and gradually realize the network hosting, control and management level of IPv6 single-stack deployment.

4. Speed up the transformation of IPv6, radio and television network. We will comprehensively promote the transformation of IPv6, broadcast and television transmission networks and broadband data networks, improve the service capabilities of IPv6 for broadband access networks, and promote the end-to-end connectivity of IPv6 service systems and platforms for radio and television networks. Speed up the transformation of IPv6, an integrated platform for Internet TV and interactive network TELEVISION, and build a new generation of business service platforms to support IPv6.

(2) Optimize the performance of application services

5. Strengthen the operational carrying capacity of the application infrastructure. Improve the IPv6 service capabilities of cloud service platform and content distribution network (CDN), promote data center, edge cloud and other support IPv6, expand IPv6 service coverage, increase the proportion of IPv6 bandwidth resources, and improve application service performance. Drive new on-line cloud products and new nodes to support IPv6.

6. Promote the integration of IPv6 with information infrastructure. Drive information infrastructure such as artificial intelligence, cloud computing, blockchain, hypercomputing centers, and intelligent computing centers to fully support IPv6.

(iii) Improve terminal support capabilities

7. Complement the home network terminal IPv6 access short board. Strengthen policy guidance and standard guidance, promote the wireless home terminal IPv6 support requirements into the radio transmission equipment model approval link, explore the implementation of wireless routers, smart set-top boxes, smart TVs and other home terminal equipment IPv6 support assessment certification, promote the new production of end products to fully enable IPv6 functions. Speed up stock of old home gateway upgrade replacements. Carry out home terminal IPv6 evaluation and evaluation, guide the release of support IPv6 terminal product catalog, guide users to accelerate the upgrade. Guide the domestic e-commerce platform to carry out IPv6 home terminal priority recommendation activities.

8. Improve the wisdom of family IPv6 industrial ecology. Improve the construction of the comprehensive standardization system for smart families and clarify the IPv6 support requirements. Promote the promotion of domestic enterprises smart home system platform, equipment products, applications and other IPv6 support capabilities, to create a smart home IPv6 industry ecology. Carry out a pilot demonstration of IPv6, a typical business scenario for smart families.

9. Strengthen IPv6 deployment applications for IoT terminals. Improve the Internet of Things terminal network detection standards and specifications, clear IPv6 network access requirements. Strengthen technology research and development to enhance the Internet of

Things terminal IPv6 network connectivity. Promote the new production of smart home, smart hardware and other consumer Internet of Things terminals, industrial networking equipment, sensor nodes and other production of Internet of Things terminals, as well as smart cities, smart security and other public Internet of Things terminals synchronous support IPv6, the default turn on IPv6 function. We will promote the upgrading and transformation of emergency command information networks and operational systems at all levels. The Drive Energy Related Information Network supports IPv6. Speed up the transformation of IPv6, an enterprise IoT application platform, and upgrade and replace the stock of old IoT terminals.

(4) Expand the application of industry integration

10. Deepen the transformation of IPv6, the central enterprise industry system. We will promote the comprehensive support of IPv6 for the headquarters of the Central Enterprise Group, the private network of key enterprises at the second level and below, data centers, portals, public online service windows, mobile Internet applications, production management business systems, etc. Encourage innovative applications in the industry and create an IPv6 industrial application ecosystem.

11. Drive the evolution and upgrade of IPv6, a financial industry system. We will further promote the transformation of IPv6 in financial institutions' WAN, branch networks and data centers. Continuously improve the support capabilities of IPv6, a public service application system for financial services institutions. Improve the IPv6 monitoring and operation system, improve the network security management system, promote the financial security protection system to fully support IPv6, and steadily promote the smooth evolution and upgrading of the information system of the financial industry.

12. Expand industrial Internet IPv6 applications. Promote the development of industrial Internet IPv6 applications in typical industries and key enterprises. Promote the industrial Internet identity analysis system to fully support IPv6. Carry out industrial Internet platform IPv6 upgrade, to create industry and regional IPv6 application benchmark.

13. Drive innovation in the application of IPv6 for digital rural construction. We will accelerate the construction of IPv6-based rural information infrastructure and promote

the wide application of IPv6 in the construction of modern agriculture, smart agriculture and agricultural rural big data platforms.

14. Promote the integration of IPv6 with new infrastructure for education. We will carry out capacity-building of IPv6 support for education informationization, promote the application of IPv6 in the public service system of digital educational resources, and deepen the transformation of IPv6, a commercial platform such as online education.

15. Promote the application of IPv6 information for digital medical health and social security. Promote telemedicine, hospital information, intelligent health care, social security information and other service platforms to support IPv6.

16. Promote the application of IPv6, a digital facility for transportation and water conservancy. Promote the application and deployment of IPv6 in the fields of integrated transportation data center system, intelligent transportation, intelligent logistics, smart railway, smart water conservancy and so on, and improve the level of intellectual development.

17. Promote the deployment and application of IPv6 informationization of natural resources and ecology. Promote the network and business systems in the fields of natural resource information, ecological environment information, forest and grass information support IPv6.

18. Accelerate IPv6 convergence applications in the media industry. Strengthen the integration and application of IPv6 in the whole media communication system, promote the simultaneous support of IPv6 in the construction of central media, provincial media, municipal media and county-level melt media center, deepen the transformation of IPv6, the central key news website, and promote the support of new communication platforms for IPv6.

(5) Speed up the transformation of the application of government affairs

19. Drive the transformation of IPv6, the public platform for e-government. Promote the transformation of IPv6, such as the national e-government extranet, the local government extranet, and the government affairs network. Promote the transformation of government data center, government cloud platform and smart city platform IPv6. We will promote the

full deployment of IPv6 in new government networks and application infrastructure, and explore the implementation of government affairs networks and the application of IPv6 single stacking pilot.

20. Deepen the transformation of the government website IPv6. Promote the upgrading and transformation of IPv6, a government-related mobile client, at all levels of government and its departments. Drive the optimization and upgrading of government service portal features to support IPv6 network access. Strengthen the guidance and inspection of government websites to ensure that IPv6 support requirements are in place.

(6) Deepen the deployment of commercial applications

21. Drive a comprehensive and deep transformation of the business platform IPv6. Comprehensively promote Internet video, games, information, social, e-commerce, life services and other high-traffic business platform IPv6 deep transformation, improve the concentration of Internet applications IPv6, promote the second and third-level links and other deep-seated content priority use of IPv6 access, to achieve full-service full-featured support, improve the size of IPv6 users, drive IPv6 traffic increase.

22. Strengthen IPv6 entry management for commercial applications. Encourage domestic mobile Internet application distribution platform related industry organizations, develop industry norms, require new mobile Internet applications on the shelves to support IPv6. Promote new online websites and applications to support IPv6, and guide the stock of websites and applications to gradually transition to IPv6.

(7) Cultivate the ecology of innovative industries

23. Promote collaborative innovation in the IPv6 industrial chain. Develop and publish guidance documents such as IPv6 technology evolution roadmap and implementation guide, and increase guidance support. Strengthen the organizational strength of IPv6 industry, integrate the strength of all parties involved in production, research and development, and build a collaborative innovation platform for IPv6 industrial chain. Improve the collaborative innovation ability of IPv6 technology, equipment, network, application,

service, security and other enterprises, optimize the structure of IPv6 industrial chain, and build a shared IPv6 industrial ecology.

24. Drive innovation in IPv6 applications. Select key regions and feature areas to pilot IPv6 applications. Carry out the construction of next-generation Internet demonstration city and IPv6 innovation base based on IPv6. Support IPv6 and 5G applications to promote 5G-oriented business and business model innovation.

(viii) Strengthen research and development of key technologies

25. Research and development of IPv6 key core technologies. Strengthen the research on the new network architecture technology based on IPv6. We will carry out the research and development and industrialization of "IPv6 plus" network products, strengthen the transformation of technological innovation achievements, and constantly demonstrate the technological advantages of IPv6.

26. Promote IPv6 technology convergence innovation. Drive protocol, technology and business innovation, break through key technologies such as network intelligence, virtualization, cloud, and build IPv6 technology innovation system. Actively carry out the test verification and application demonstration of new network technologies and applications, and constantly give birth to new technologies, new applications and new models.

(9) Promote standard-setting

27. Build the IPv6 standard system. We will promote the standardization of IPv6 scale deployment and application innovation, enhance the research and development strength of IPv6 standards, jointly promote the development of national standards, industry standards and group standards, and establish the IPv6 standard system.

28. Actively participate in the development of international standards. We will actively participate in the development of relevant international standards for IPv6 by strengthening cooperation with international standardization organizations such as the Internet Engineering Task Force (IETF) and the European Telecommunication Standardization Association (ETSI).

(10) Strengthen the ability to provide security

29. Build an IPv6 network security protection system. Implement the network security level protection system, clear IPv6 security protection requirements. Strengthen the construction of IPv6 security protection system in key areas, upgrade the security system, and strengthen IPv6 security capability in complex scenarios. Relying on the national network and information security information communication mechanism, IPv6 security monitoring system is constructed to improve IPv6 security situation awareness, notification early warning and emergency response capabilities.

30. Improve security capabilities in emerging areas. Strengthen the research of IPv6 security technology and carry out the core security technology of IPv6. Strengthen security technology, management and mechanism research in emerging fields such as industrial Internet, Internet of Things, auto networking, cloud computing, big data, artificial intelligence, etc. in IPv6 environment.

Safeguards

(1) Strengthen organizational leadership

All regions and departments should strengthen organizational leadership, compact their responsibilities, formulate specific work programmes and promote the implementation of tasks. The Central Network Information Office, together with the National Development and Reform Commission, the Ministry of Industry and Information Technology and other departments, will improve the overall coordination mechanism for promoting the deployment and application of IPv6 scale, strengthen overall coordination, promote and supervise the implementation of the overall, improve the system of expert consultation, and coordinate and solve major problems in the work in a timely manner. Develop and implement the annual work plan for IPv6 development, and press ahead with the implementation of the goals and tasks.

(2) Improve policy support

All relevant departments should improve policy measures, optimize the development environment, coordinate funds, increase support efforts, and guide social capital

investment. In the performance appraisal of basic telecommunication enterprises, support and encourage enterprises to actively carry out IPv6-related work. Innovation and promotion mechanism, strengthen the government-enterprise linkage, multi-participation, increase technology research and development, network upgrading, standard-setting, application promotion, security work, to achieve technology, industry, network, application coordination.

(iii) Conduct monitoring briefings

Optimize the IPv6 development monitoring index system and strengthen the research of IPv6 development index. Improve the national IPv6 development monitoring platform, expand the scope of monitoring, improve the IPv6 development monitoring capacity, fully grasp and timely release of IPv6 development data. Improve the IPv6 deployment application monitoring and notification system, regularly carry out departments, local, enterprises, industry IPv6 development monitoring and notification, to urge the implementation of progress.

(4) Organize pilot demonstrations

Focus on key areas, priority directions and bottlenecks, select a number of key enterprises with good basic conditions, high motivation, key industries, key departments, key regions and cities, organize IPv6 full chain, full business, full-scene deployment and application pilot, side pilot, side summary, side promotion, to promote the overall IPv6 scale deployment and application level.

(v) Strengthen publicity and promotion

Innovative forms of publicity, increase the promotion of IPv6 development results, and create a good atmosphere for the whole society to participate in promoting the deployment and application of IPv6 scale. Organize IPv6 industry exchange activities to build a platform for industry cooperation. Regularly publish outstanding cases of key enterprises, key industries and key regions to play a leading role in demonstration. Hold the IPv6 Technology Application Innovation Competition to promote the next generation of Internet talent development.

(vi) Deepen international cooperation

Actively participate in multilateral frameworks such as the United Nations, make full use of the Belt and Road Initiative, BRICS countries, the SCO and other mechanisms and platforms such as the World Internet Congress, the China-ASEAN Information Port Forum and the Online Silk Road Conference, and actively carry out international exchanges and cooperation on the deployment and application of IPv6 to build a better digital world.

Office of the Central Committee on Cybersecurity and Information Technology

National Development and Reform Commission

Ministry of Industry and Information Technology

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