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FOR ACTION

Question 18-1/2	**Implementation aspects of IMT-2000 and information-sharing on systems beyond IMT-2000 for developing countries**
SOURCE	**China Academy of Telecom Technology, MIIT, P.R.China**
TITLE	**The Trial Commercial Deployment and Industrial Chain Development of TD-SCDMA**

Action required: Member states of ITU, particularly developing countries, are invited to discuss this document and give their comments.

Abstract

This article briefly introduces the progress of trial commercial deployment and test of TD-SCDMA in China and other countries as well as the development of industrial chain of TD-SCDMA.

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1. INTRODUCTION

In May of 2000, TD-SCDMA technology provided by DaTang Telecom Group, who represented China government, was approved as 3rd Generation international mobile communication standard and became one of IMT-2000 technologies. In March of 2001,TD-SCDMA standard was accepted by 3GPP(3rd Generation Partnership Project).Since 2002,in order to verify the feasible and commercial abilities of TD-SCDMA system in every aspect, the administration department of government has organized a series of test activities, such as the MtNET test, TD-SCDMA industrialized test and scale network technology application trial. All these tests have proved that the TD-SCDMA system can be independently deployed on large-scale. Under the organization and push of TD-SCDMA Industrialization Alliance and TD-SCDMA Forum, several hundreds of enterprises participate in the research and products developing of TD-SCDMA, which cover all the industry tache, including operator, network equipment, terminal, chipset and services. The condition of multi-vendor of product providing has been achieved. In China, TD-SCDMA network being operated by China Mobile has covered 10 cities including Beijing, Shanghai and Tianjin in the first phase. The number of base stations exceeds 15,000.The second phase of network extension will start and cover above other 18 main cities of China, which are predicted to be complete in the beginning of 2009. In the following three years, it is anticipated that the number of TD-SCDMA customers will reach more than a hundred million. At the same time, the international trial application of TD-SCDMA is going on. Several international trial networks are being built or will be built. TD-SCDMA is becoming the extensively used 3rd generation international mobile communication standard.

2. THE APPLICATION OF TD-SCDMA IN CHINA

TD-SCDMA has adopted a series of innovational technology, including time division duplex, smart antenna, uplink synchronization, join detection and dynamic channel allocation, which notably promote system capacity and spectrum efficiency of TD-SCDMA. In order to verify and complete the TD-SCDMA system, a series of strictly test and trial has been done since 2002, which included air interface technology test, basic network technology test, network performance and interoperability test and products commercial test.

In January of 2007, based on above tests, TD-SCDMA started large-scale network application test. TD-SCDMA network was deployed in 10 big cities, including Beijing, Shanghai, Tianjin, Shenyang, Guangzhou and Shenzhen. In March of 2007, China Mobile started to purchase TD-SCDMA equipments. In October of 2007, the network was basically completely finished and deployed more than 15,000 base stations. The performance of network is verified well. Currently the networks have been transferred to China Mobile to operate.

In February of 2008, the optimization of TD-SCDMA trial network has been basically completed. TD-SCDMA network in the trial cities has covered 95 percent of the areas covered by GSM network in those cities. In April of 2008, social services test and the trial commercial use of TD-SCDMA officially started and the customers reached over 50,000 in short time. It is predicted that the number will reach to 260,000 during the Olympic Games period. All the trial commercial networks have been upgraded to HSDPA .Besides the voice service, from network to terminal, it can be provided typical service of 3G, including CS64kbps video phone, PS 384kbps video on demand, on line TV, Web browsing ,high speed FTP download, video conference and video message. The peak rate of data for data cards reaches 2.8Mbps in the bandwidth of 1.6MHz.

In order to explain the spirit of technology Olympic, TD-SCDMA will provide 3G services for 2008 Beijing Olympic Games. Besides the basically services of voice and video phone, China Mobile provides six kinds of wireless broadband feature Olympic services by taking the advantages of TD-SCDMA, such as wireless broadband internet access, Olympic Mobile TV, Olympic video on demand, Olympic information, Olympic MRBT and POC service. Meanwhile, China Mobile will provides 10 special Olympic services related to Olympic Games, including mobile Olympic official webside,Olympic 12580,Olympic mobile game, mobile map and mobile navigation.

The second round of larger scale TD-SCDMA network will be deployed after Beijing Olympic Games, including several tens of the country's municipalities and most provincial capitals in China.

3. THE APPLICATION OF TD-SCDMA IN OTHER COUNTRIES

Accompanying with the development of TD-SCDMA industry chain and scale network building in China, operators in other countries also pay high attention to the application of TD-SCDMA.

In April of 2007, SK Telecom, the first giant mobile communications operator in Korea, invested to build the TD-SCDMA 3G trial network in Korea, which was built by Datang Mobile and ZTE. During visiting in Korea, the Prime Minister of China, Mr. Wen Jiabao took the first international TD-SCDMA video phone. In May of 2008, when the Korean President, Mr. Lee Myung-bak, visited in China, he successfully took the first video cell phone through the link between Korea’s CDMA 1X and China’s TD-SCDMA.

On July 18th of 2008, China Potevio, one of TD-SCDMA network manufacture, and Italy My Wave signed a TD-SCDMA trial network contract in Beijing. According to the contract, Potevio will offer customized solutions and equipment to Mywave to build a TD-SCDMA trial network targeted at corporate users. This is the first time to build a TD-SCDMA trial network in Europe.

TD-SCDMA system uses many advanced technology, such as smart antenna, join detection and uplink synchronization, which lower the transmit power, reduce the multiple access interference, improves the system capacity and spectrum efficiency and reduces the network cost. The operators in developing countries are attracted by the above advantages. Currently, a country in Africa has signed a TD-SCDMA commercial network contract. The network equipments have begun to provide. There will be hundreds of base stations in first phase and will reach thousands of base stations at the end.

4. THE PROGRESS OF TD-SCDMA INDUSTRIAL CHAIN

By several years of development, TD-SCDMA industry chain has been completed, covering network equipment, chipset and terminal, auxiliary equipments, test instruments and service applications. TD-SCDMA Industry Alliance expands from early 8 enterprises to 51 enterprises. The number of TD-SCDMA forum members reaches above 300, which includes over 30 counties' and regions' telecom standard organizations, telecom operators, equipment vendors and services providers, economical investment institute and research institute.

Network equipments

Currently, the complete commercial deployment solutions and series of commercial products have been provided for TD-SCDMA system, by which the coverage under different environments can be perfectly achieved. Basing on variable remote technology, the distributed TD-SCDMA base stations can provide the high efficient indoors coverage. The series of outdoor fabric remote macro base stations can provide well outdoors coverage. The technical solution of wide rang coverage can resolve the problems of the sea coverage and rural coverage. In real ntework, the distance of sea coverage can reach over 40km.The capacity of base station varies from micro base station 3 carrier to super base stations of 144 carriers/sectors, which are deployed in trial commercial network. The trial commercial network operated by China Mobile has been upgrade to HSDPA, which peak data rate is 2.8Mbps/1.6MHz. It fully meets the requirement of all 3G services.

The main network manufactures include Datang Mobile, ZTE, Td-tech, China Potevio, Ericsson, NSN, ALCATEL LUCENT, Nortel and so on.

Terminal

For terminal products, there are tens of terminal companies to produce several hundreds of mobiles and data cards. The terminal can provide typical service of 3G, including video phone, video on demand, on line TV, Web browsing, high speed FTP download, video conference, video message and MRBT. The peak rate of data cards reaches 2.8Mbps/1.6MHz.The products have transferred from single TD-SCDMA model to TD-SCDMA/GSM dual model. In 2007, the mobile with HSDPA function was launched and met the large scale quantity of market.

The main terminal manufactures include Datang Mobile, lenovo, ZTE, Huawei, Samsung, LG, Motorola, Nokia, Yulong, Amoisonic, and Dopuda.

Chipsets

Now, there are many companies providing the terminal baseband chipset, which includes MTK, T3G, Spreadtrum and CYIT. The design of Datang mobile's chipset is based on the platform of ADI Company. T3G is join-stock Company by Datangmobile, Philip, Samsung and Motorola. The baseband chipsets realize the functions of voice and video and provide the 3G enhanced services of the automatic handover between dual models, HSDPA and MBMS. It can stability provide 3G services of CS64kbps，PS128kbps，PS384kps.

RF chipset has a great progress and been applied in many HSDPA terminals. The main companies are RD microelectircs, Rising micro electronics Co.Ltd, Freescale, Philip and ADI.

Application and others

Recently, the owner of TD-SCDMA core technology, DaTang Telecommunication Tech.&Industry Holding Co.Ltd and Microsoft have signed a memorandum in Beijing to promote their cooperation in various aspects from TD-SCDMA terminal solutions to application software. Datang will start deep cooperation with Microsoft in a series of key applications, including the application of the TD-SCDMA 3G data card driver in the next generation of Windows; the cooperation between Windows Mobile and TD-SCDMA in terminal solutions and application software; and the cooperation in other TD-SCDMA 3G value-added services and applications.

At the same time DaTang Telecommunication Tech.&Industry Holding Co.Ltd and Dell reached an agreement, which says the two sides will cooperate in such sectors as pre-inserted TD-SCDMA 3G data cards in Dell's products. As a main terminal of TD-SCDMA, the 3G data card can be inserted into laptops to realize data applications such as wireless access with seamless broadband and video download functions. It can also support functions that are specially designed for mobile phones, including voice communication and SMS.

5. CONCLUSION

In summary, with nearly ten years developing, TD-SCDMA industry chain is going from complete to abundant. TD-SCDMA products are going from function completing to performance promoting. The application of TD-SCDMA is going from internal to international. In China, the TD-SCDMA industry has entered a phase to deploy explosively. In the world, TD-SCDMA is being accepted by more and more countries. As one of 3rd generation international communication standard, TD-SCDMA will do contribute to the development of global mobile communication.