Booming Telecom Business in CIS
—An interview with Zeng Li, Vice President of ZTE’s Marketing Division I and President of ZTE CIS

CSL’s Next G™, the Shining Star in Hong Kong
Best Kungfu vs. Best Uni-RAN

Mobile broadband services have become essential revenue generators for today’s telecom operators, and with mobile data services becoming richer and richer, user demand has skyrocketed. This has led to a shift in focus for the entire telecommunications industry.

CSL, Hong Kong’s largest mobile operator, is at the forefront of this shift. Over just 11 months, CSL partnered with ZTE to complete the deployment of a GSM/UMTS hybrid network running leading Uni-RAN solutions based on SDR technology. With this network in place, CSL now has the power to evolve smoothly from 2G to 3G and then onto LTE. Most importantly, our partnership has enabled this forward-thinking operator to lower its TCO significantly and maximize customer value.

Now its subscribers in Hong Kong can enjoy a colorful range of high speed data services via the HSPA+ network.

As China’s 3G market leader and a leading global provider of telecommunications equipment and network solutions, ZTE delivers innovative, customized products and services to customers in more than 140 countries and regions.

To see how we can partner you and deliver real revenue growth for your business, visit www.zte.com.cn.
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LTE FDD and TD-LTE defined in 3GPP specifications have many similarities and the LTE FDD/TDD convergence is an inevitable trend in the telecom industry

ZTE Profile

ZTE is a leading global provider of telecommunications equipment and network solutions. It has the widest and most complete product range in the world—covering virtually every sector of the wireline, wireless, service and terminals markets. The company delivers innovative, custom-made products and services to over 500 operators in more than 140 countries, helping them achieve continued revenue growth and shape the future of the world’s communications.
ZTE Corporation ("ZTE" or the "Group") announced on October 27, 2009 its 3Q results ended 30 Sep 2009.

During the reporting period, ZTE succeeded in gaining further inroads in the market segment comprised of multi-national carriers with its LTE, UMTS and GSM products. This success was attributable in large part to leveraging opportunities presented by the need for network construction in emerging markets against the backdrop of an improving global economic environment. The Group reported 2009 revenue to-date from principal operations of RMB42,843 million, representing growth of 41.27% as compared to the same period last year, while net profit attributable to the parent company grew 46.13% to RMB1,192 million. Basic earnings per share amounted to RMB0.68.

In the third quarter, the Group reported revenue from principal operations of RMB15,136 million, representing growth of 42.81% as compared to the same period last year, while net profit attributable to the parent company grew 58.18% to RMB409 million. Basic earnings per share amounted to RMB0.23.

In terms of market development, the Group reported substantial growth in operating revenue largely attributable to large-scale 3G network construction in the domestic China market. In tandem with carrier requirements for fusion and complementary technologies, ZTE has placed more emphasis on integrated product and service strengths and superior price performance ratios, laying solid groundwork for overall business growth and further market share gains. Internationally, the Group was well-gearied for a stronger competitive position on the back of its cost advantage, financing resources and customization abilities. The changing competitive landscape also provided strong opportunities for breakthroughs in key markets and product areas.

Product-wise, ZTE’s carrier network segment reported year-on-year growth of 47.32%, which was driven mainly by revenue generated from sales of the Company’s 3G network equipment, optical transmission products and data communication products. Revenue from terminal products also grew by 38.67%, which was in line with sales growth for 3G products. Revenue from the Group’s telecommunications software systems, services and other products grew by 17.85%, reflecting primarily growth in the sales of fixed terminals.

Looking to the final quarter of the year, the Group will pursue its strategies in greater depth with a focus on enhancing its capabilities in strategic applications and operations. Continuing to leverage opportunities presented by the changing competitive landscape, ZTE will continue to strengthen cooperation with mainstream international carriers. Core to ZTE’s strategy will be to seek increased presence in key markets such as Western Europe and North America while reinforcing its position in the China 3G market, incorporating balanced and sustainable business development.

(ZTE Corporation)
ZTE and ASTRI Demonstrate Industry’s First Cross-Vendor LTE TDD IOT

ZTE, a leading global provider of telecommunications equipment and network solutions, and Hong Kong Applied Science and Technology Research Institute (ASTRI), a Hong Kong government founded research institute, jointly demonstrated Long Term Evolution Time Division Duplex (LTE TDD) wireless HD video Interoperability Test (IOT) calls during the ITU Telecom World 2009 in Geneva from 5 to 9 October. This is also the first cross-vendor LTE TDD IOT successfully completed in the industry.

The demonstration is made to public in ZTE’s exhibition booth (no.4011, hall 4) utilizing ZTE’s LTE TDD complete infrastructure system and the LTE TDD mobile device prototype designed by ASTRI and its industry partner, Innofidei. HD video test calls are transmitted over a 20MHz wireless channel at 2.3GHz radio frequency with advanced MIMO technologies. ZTE and ASTRI have collaborated to validate LTE TDD technologies and to ensure that their respective LTE TDD designs meet all the requirements of the latest LTE standard. The two companies have recently become the first in the industry as confirmed by Long Term Evolution/System Architecture Evolution Trial Initiative (LSTI) to have jointly submitted LTE TDD IOT report to LSTI. The LTE TDD test call demonstration was made debut in the P&T/Wireless & Networks Comm China in Beijing last month and received great attention from the industry. *(ZTE Corporation)*
ZTE and TMN Launch Two Windows® Phone Based 3.5G Smart Phones

SilverBelt and BlueBelt II handsets continue to re-define the smart phone market

ZTE, TMN and Microsoft have jointly launched two new 3.5G smart phones in Portugal on October 6, 2009. The SilverBelt and BlueBelt II handsets feature the Windows® phone operating system which brings together the mobile phone, the PC and the Internet.

The customized ZTE Bluebelt smart phone has been sold in Portugal by TMN since May and has captured 30% of the Portuguese smart phone market. The new 3.5G smart phones have been customized by ZTE specifically for the Portuguese market and will be available from TMN throughout Portugal. TMN is Portugal’s largest mobile operator with seven million subscribers from Portugal’s population of 10.7 million.

The BlueBelt II handset delivers the complete Windows phone experience. It is an ultra-slim candy bar style smart phone with a 5MP camera, and works with UMTS, GSM, Edge and GPRS networks. The handset has both touch screen and modified QWERTY keyboard data entry with dedicated keys especially customized for TMN users.

The SilverBelt handset is also a customized candy bar ultra-slim 3.5G smart phone running Windows® phone, but also features a G-Sensor motion sensor supporting functions such as MP3 player start/stop and horizontal/vertical screen switch. The Silverbelt also has a large 3.2 inch touch screen with 5MP camera. Both ZTE/TMN smart phones can provide high-speed data rates of up to 7.2Mbps on HSDPA/HSUPA networks. They are fully featured phones providing multi-media functions, fast connectivity and up to 8GB data storage capacity, giving a full phone and web experience combined with stylish design.

ZTE is now delivering handsets to mobile network operator 3 in the UK, Ireland and Sweden.

The recent agreement with 3 Scandinavia took ZTE into the Swedish mobile phone market for the first time. The first model to be delivered in all three countries is the ZTE F102 handset. This 3G and tri-band GSM phone has a 2.0 megapixel camera, MP3 player, colour screen, Bluetooth, USB and a Micro SD memory card.

It also includes social networking functions Skype and Windows Live Messenger.

The F102 is the fifth handset to be delivered to the UK mobile handset market by ZTE and will be of the same high standard as previous models. It will be available directly from 3 and through retailers across the UK.

In Sweden, the ZTE phones will initially be sold exclusively in the consumer electronics chain Media Market. Later this year they will also be sold in 3’s shops and through other retailers.

(ZTE Corporation)
ZTE Opens LTE Laboratory in North America

Richardson, TX-based lab tests CDMA/LTE dual-mode platform; showcases ZTE’s global LTE technology leadership

ZTE announced on October 20, 2009, that it has opened an LTE testing laboratory at its U.S. headquarters in Richardson, Texas. In the lab, ZTE will demonstrate and test its dual-mode CDMA/LTE platform, which enables carriers to lay the foundation for the delivery of LTE services in the U.S. Using the platform, ZTE can demonstrate an FTP downloading rate up to 52Mbps at 10MHz bandwidth and conduct CDMA voice service and LTE High Definition (HD) video demonstrations simultaneously.

ZTE’s LTE platform currently employs the CDMA and LTE bands, which provides carriers with a smooth equipment migration path from CDMA to LTE while keeping infrastructure costs down. ZTE also has the capability to customize the platform for other bands according to the requirements of the carriers—in particular, ZTE can create a multi-mode GSM/UMTS/LTE platform.

In the lab, ZTE’s team of local researchers will work closely with carriers to test and verify ZTE’s CDMA/LTE platform to the highest industry standards in order to ensure that it is poised for successful commercial deployment. The lab is designed and has been built in accordance with international tier one operator test requirements, and is equipped to test several features including throughput, latency, coverage, velocity vs. data rate, traffic quality, mobility management and OMM/SON. On a global scale, ZTE has rich experience in field trials, including the Xi’an R&D institute.

This CDMA/LTE dual-mode laboratory is based on the Uni-RAN solution on ZTE unified Software Defined Radio (SDR) platform, and the lab is equipped with several sets of distributed eNodeBs including ZXSDR B8200 (BBU), ZXSDR R8880 (RRU), a set of ZXUN uMAC (MME), a set of ZXUN xGW (SAE-GW), a set of ZXUN USPP (HSS), a set of NetNumen M31 (OSS) and the latest commercial version software.

(ZTE Corporation)

ZTE Wins Unitech Wireless’ GSM Network Infrastructure and Maintenance Contract in India

Company to supply Unitech Wireless with equipments to establish and maintain GSM infrastructure across key metro circles and cities

ZTE announced on October 16, 2009 the signing of a GSM Network infrastructure agreement with Unitech Wireless. Under the agreement, ZTE will provide GSM systems and core network equipment for a period of 5 years across the circles of Delhi, Madhya Pradesh, and Haryana. With this contract, ZTE has added a significant win to the growing list of telecom service providers deploying its GSM solutions in India.

Unitech Wireless, a joint venture between Norway’s Telenor Group and Unitech Group of India, holds the license to provide mobile phone services across all 22-telecom circles in India. The company is planning to roll out services in select circles by the end of 2009 under the brand name Uninor.

The GSM equipment from ZTE will allow Unitech Wireless to evolve its network infrastructure as required, thereby helping reduce network evolution cost, lower TCO and continuously enhance profitability.

ZTE’s GSM equipment is now deployed by over 60 operators in more than 50 countries worldwide, resulting in the installation of mobile capacity exceeding 200 million lines.

(ZTE Corporation)
Booming Telecom Business in CIS

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Zhao Lili

2009 is the 60th anniversary of the founding of People’s Republic of China as well as the 60th anniversary of the establishment of diplomatic relationship between China and Russia. Russia’s Prime Minister Putin paid an official visit to China on October 12, 2009. During his visit, entrepreneurs from both countries signed more than 30 agreements, with total contractual value exceeding USD 5.5 billion. The 30 agreements cover all fields of cooperation between the two nations, including finance, telecom, and mining. On October 13, Sistema (the largest telecom group in CIS), ZTE, and Bank of China signed a three-party agreement to satisfy the requirements in the telecom markets of CIS countries by using ZTE’s products and services financed by Bank of China.

ZTE has been exploring the markets of CIS countries for many years, and now its products have been extensively deployed in this region. To get to know ZTE’s achievements in CIS countries, we recently interviewed Mr. Zeng Li, Vice President of ZTE’s Marketing Division I and President of ZTE CIS.

Originally, we hoped that we could have enough time to interview Zeng Li after he returned from abroad. However, Zeng Li was always very busy with reception of major
Our interview started with the introduction to the situations in the telecom industry of CIS countries and the competition in the markets there. CIS is a Russian-speaking region with vast territory and a total population of only over 310 million. According to Zeng Li, telecom services in the CIS countries are unevenly developed and the gap in telecom infrastructure between different countries is very large. For example, in Russia and countries near the Baltic Sea, the telecom industry is well developed and the mobile penetration rate exceeds 100%; in middle Asian countries such as Turkmenistan, the telecom industry is relatively backward, broadband services are unavailable, and the mobile penetration rate is just over 10%.

Telecom operators in the CIS countries can be divided into three categories: the first category are large telecom groups from Russia such as Sistema and Alfa, who mainly invest in CIS as well as India and Southeast Asian countries including Vietnam, Laos, and Cambodia; the second category are Multinational Telecom Operators (MTOs) from Turkey and Northern Europe, who have investment in most of the CIS countries; the third category are local telecom operators from the CIS countries, who mainly operate fixed-line services.

The mobile networks in CIS are basically constructed by global MTOs, especially MTOs from western countries, such as Ericsson, Alcatel-Lucent, Nokia-Siemens, and Cisco. Over recent years, Chinese telecom vendors have set feet in the CIS countries and gradually become their major telecom equipment suppliers. In 2008-2009, ZTE’s business in CIS has experienced rapid development, with annual growth rate exceeding 100%.

The overwhelming financial crisis has tremendous impact on the global economy. As a part of the global economy, CIS is no exception. Zeng Li told us that in recent years, due to rapid economic growth in CIS (especially Russia), dramatic increase in mobile phone users, and reform in wired communication tariffs, the revenue of the telecom market in Russia increased at the annual growth rate of 15%, showing enormous development potential. The yearly investment in the telecom industry of CIS including the investment in mobile terminals could reach over USD10 billion. However, due to the global financial crisis, nearly a half of telecom operators stop investment in fixed assets. Several major telecom operators have cut their investment of 2009 by more than 50% compared with previous two years. The shortage in capital supply results in fierce competition, especially the competition for business opportunities and tariffs.

**Win-Win Cooperation**

Due to the global financial crisis...
and intensive market competition, governments and enterprises of every country are actively seeking a new cooperation mode to jointly resist the financial crisis and seize common development opportunities. To tackle this financial crisis, Chinese government has worked out many effective financial measures to help Chinese enterprises explore oversea markets. ZTE benefits considerably from these measures.

When talking about ZTE’s tactics for exploring the CIS telecom markets and fighting against the global financial crisis, Zeng Li said, “due to the impact of the global financial crisis, telecom operators in the CIS countries have substantially cut their investment, which directly affects business growth of the equipment vendors in this region. Most equipment vendors here have laid off more than 30% employees working in CIS. However, our business remains rapid growth despite the financial crisis, and we have increased our employees in CIS by more than 20%.”

How can ZTE achieve rapid business growth in CIS? “This is because we have put into full play our unique advantages of strong financial supports from Chinese government and banks. The favorable financing packages offered by Chinese government and banks have effectively alleviated the capital shortage facing many telecom operators in CIS and have also brought us and them many important opportunities. Our successful project delivery under the financial crisis also makes them believe the bright prospect, strong competitive edges, and powerful financial strength of Chinese enterprises. Some governments and operators in CIS have clearly expressed their determination to focus on cooperation with Chinese vendors and banks for future development”, Zeng Li added.

Zeng Li then introduced the successful cooperation between ZTE and Sistema, the largest telecom group in CIS. Owning some fixed-line operators and mobile operators like MTS (the largest MTO in CIS) and SSTL, Sistema boasts 100 million global subscribers and has invested in a nationwide network in India. As early as 2006, ZTE signed a strategic cooperation agreement with Sistema, covering joint research, joint production, and equipment supply. At the opening ceremony of the “Year of China” in Russia on March 26, 2007, Hou Weigui, Chairman of ZTE, signed a cooperation agreement with Sergei Aslanyan, President of Sitronics (a subsidiary under Sistema) in the presence of China’s President Hu Jingtao and Russia’s President Putin, as shown in the above figure. This agreement covers setup of joint ventures and joint construction of an electronic and telecom research institute. The signature of the agreement symbolizes the first cooperation between the two nations in the high-tech field, creating a new mode for delivering high technologies from Chinese enterprises to Russia.

On June 11, 2009, ZTE, Sistema, and China Development Bank jointly signed a memorandum of understanding on strategic cooperation, aiming at seeking common development under the current financial crisis. ZTE’s cooperation with Sistema to build a nationwide network in India was initiated right under the financial crisis. All these events indicate that ZTE has the strength to cooperate with large financial groups of CIS and to jointly promote the ICT development in this region. Additionally, ZTE has also provided financial supports for some state-owed telecom operators such as Beltelecom and Uzbektelecom to guarantee their business growth while expanding ZTE’s market presence.

**Extensive Product Deployment**

With the unremitting efforts and
Innovative modes of cooperation with partners in CIS, ZTE has extensively applied its advanced technologies and equipment in this region. While achieving the objective of global business expansion, ZTE can help operators in the CIS countries offer easy and convenient telecom services to the local people.

In recent years, ZTE’s terminals and infrastructure equipment have been gradually accepted by telecom operators in the CIS countries. Its wireless infrastructure equipment including WCDMA, CDMA2000 EV-DO, and WIMAX has been extensively deployed in many CIS countries, especially large countries such as Belarus, Uzbekistan, Ukraine, and Kazakhstan; its 2G GSM infrastructure equipment has also found large-scale applications in this region; it has become one of major WiMAX equipment vendors in CIS. In August 2009, Ukrainian telecom operator UHT selected ZTE as an exclusive equipment supplier for its 3.5GHz WiMAX project. The first phase of the WiMAX network covers the capital of Ukraine and its surrounding area. After the completion of the whole project, the network will cover the overall territory of Ukraine, becoming the largest WiMAX network in this country. In the fixed-line field, ZTE has widely deployed its traditional fixed infrastructure devices covering optical transmission, DSLAM, and NGN in the CIS countries, and has also announced the commercial use of its emerging IPTV products. As the major supplier for local telecom operators in their centralized terminal purchase, ZTE has done very well in the sales of terminals, especially its data cards, mobile phones, and fixed stations to all CIS countries.

In addition to product sales and network construction, ZTE’s business development in CIS also covers cooperation in other fields, such as technologies, talents, and capitals. In the second half of 2008, a joint venture between ZTE and Sistema was set up in Hangzhou of China for joint R&D and joint business exploration in the regions other than CIS. With the business expansion of Sistema in India, South Africa, Europe, Africa, and Middle East, ZTE will have more cooperation opportunities with Sistema in more extensive fields.

Looking Forward to the Future

When looking forward to the future, Zeng Li spoke with confidence, “CIS is a big strategic market for us. With the development of local technologies and economies, the business potential of the CIS is enormous. Currently, we are entering into the express way of development in CIS and will maintain such rapid growth momentum over the coming two to three years. ZTE’s image and prestige as leading telecom vendor is rising globally, and our customized services in CIS have convinced our clients that ZTE has strength and capabilities to offer them top-quality products and services. We have worked out medium- and long-term development strategies for the CIS countries, and believe that in the coming two to three years we will have much more cooperation with mainstream telecom operators in this region.”
Today, many people prefer to make friends or do shopping via the Internet at home. Susan Boyle, a 47-year-old unknown Scottish citizen, has become an overnight celebrity thanks to her sensational performance in Britain’s Got Talent. The clip of her appearance in the talent show has been viewed more than 100 million times on YouTube and other websites. The Susan Boyle’s success story once again proves that Internet has penetrated into people’s daily lives and can even change their destinies.

The huge business potential of data services has caught the attentions of both fixed-line operators and mobile operators. The objective of mobile operators is to deliver broadband data services over mobile networks. With the worldwide commercial application of HSPA networks, the QoS of mobile data services has been improved considerably and the revenue from them has also increased rapidly. According to Informa Telecoms & Media, the global mobile data revenues reached USD200 billion in 2008, an increase of 47.2% over 2007.

As mobile broadband services finally begin to demonstrate their distinctive advantages and enormous business potentials, mobile operators are becoming increasingly concerned about how to achieve higher data rate, larger system capacity and better user experience. HSPA+, an enhancement of HSPA, was introduced in 3GPP Release 7. It provides improved spectrum efficiency, higher data rate, and lower latency. Moreover, HSPA+ is backward compatible with HSPA and supports smooth evolution from HSPA, effectively protecting the telecom operator’s investment in 3G networks.

Since Telstra launched the first commercial HSPA+ network in Australia in February 2009, mobile operators around the world have been launching or deploying their HSPA+ systems one after another. In March this year, ZTE and Hong Kong’s
HSPA+, characterized by faster data speed, excellent QoS, and support of always-online subscribers, has become a driving force for the booming mobile broadband markets.

CSL announced the availability of the world’s first SDR based HSPA+ network; in August, ZAPP in Romania announced that its HSPA network constructed by ZTE had been upgraded into HSPA+. Additionally, AT&T, Softbank, and Vodafone are planning to deploy HSPA+ networks in the coming two years. Obviously, HSPA+ is an unavoidable stage in the 3G-to-4G evolution process.

Exploring the 3G Potential

HSPA+ features four key attributes: improved uplink and downlink data rates, increased system capacity, enhanced user experience, and flat architecture.

Improved uplink/downlink data rates

HSPA+ adopts the Multiple-Input Multiple-output (MIMO), high order modulation, and L2 enhancement techniques to improve the uplink and downlink data rates.

- **MIMO**: Adopting the multi-antenna technique at both the transmit and receive end, MIMO can suppress channel attenuation and improve channel capacity without increasing the bandwidth and transmit power. The MIMO technology can increase the HSPA+ downlink peak data rate to 28.8Mbps.

- **High order modulation**: 64QAM can be used to modulate 6 consecutive bits at a time, while 16QAM can be used to modulate 4 bits at a time. Therefore, the efficiency of 64QAM is 50% higher than that of 16QAM. When adopting the 64QAM modulation, HSPA+ can provide the peak data rate of 21.6Mbps for each user. To make the uplink data rate adaptive to the downlink data rate, HSPA+ introduces the 16QAM modulation to HSUPA, and the uplink peak data rate can be increased to 11.5Mbps.

- **L2 enhancement**: MIMO and 64QAM modulation can increase the downlink data rate. Before 3GPP Release 7, the PDU at the RLC layer has a fixed length, making it impossible to provide higher uplink peak data rate. Therefore, HSPA+ introduces the L2 enhancement technique that enables the RLC layer to support a flexible PDU length. In this way, the length of PDU is increased to match the high speed data rate of HSPA+.

In addition to above technologies, the dual-cell HSPA technology adopts dual cells in the uplink/downlink to receive and transmit data simultaneously. With dual-cell HSPA, uplink 16QAM, downlink 64QAM, and MIMO techniques, the HSPA+ system can provide the maximum uplink and downlink data rates of 23Mbps and 86Mbps respectively.

Increased system capacity

- **Continuous Connectivity for Packet Data Users (CPC)**: Most data services are characterized by always online and occasional or periodical data packet transmission. To reduce overhead of the control channel, the CPC function is thus designed, which can support more always-online subscribers.

- **Circuit Switched (CS) over HSPA**: Using the HSPA technology to carry CS voice service (CS over HSPA) can effectively reduce E2E call setup time. The HSPA+ DTX/DRX technology can effectively reduce the power consumption in mobile phones and thus double the battery life. Compared with the DCH channels used by Rel-99 for carrying voice services, CS over HSPA can improve spectrum efficiency and boost the system capacity by 50-100%.

Enhanced user experience

The UMTS system has defined four connection states: Cell-DCH, Cell-FACH, Cell-PCH, and URA-PCH. Based on the traffic flow, the UMTS system controls the handoff of User Equipment (UE) among different channels. If the
than R99 could allow users to enjoy broadband services through the mobile terminals. The improved user experience leads to growing subscriber base and the emergence of feature-rich mobile data services. HSPA+, characterized by faster data speed, excellent QoS, and support of always-online subscribers, has become an even stronger driving force for the booming mobile broadband markets.

To meet the needs for large-scale commercialization and high data throughput, ZTE launched its SDR based HSPA+ solution, in which ZXSDR 8000 series base station features large capacity and high integration, with a single base station supporting 960CE, 75Mbps in the uplink, and 216Mbps in the downlink. Using the MCPA technology, ZXSDR 8000 series base station has higher-efficiency power amplification and lower power consumption, and supports 80W output power. Moreover, ZTE’s all-IP UTRAN equipment supports IP/ATM dual-protocol stack and provides FE/GE ports on the Iu, Iur and Iub interfaces.

In the beginning of 2009, ZTE deployed the world’s first SDR based HSPA+ commercial network for CSL in Hong Kong. On 30 March, CSL and ZTE jointly announced the commercial availability of the Next G™ network featuring the fastest mobile speed, the widest coverage, and the highest reliability. CSL’s CEO Tarek Robbiati highly praised ZTE for its outstanding performance in the HSPA+ network project, “ZTE’s SDR based HSPA+ solution helps us build the first all-IP HSPA+ network in Hong Kong. We are happy to see it can solve many problems encountered in the conventional networks.”

**Flat architecture**

HSPA+ supports flat network architecture that incorporates all functions of the RNC into the NodeB. This can simplify network architecture and reduce service latency. The flat network architecture is not a compulsory function of HSPA+, and it is independent of other wireless functions of HSPA+.

**Benefits of HSPA+ for Operators**

**High data rate and good QoS help to expand mobile broadband market**

After investigation into the 3G market, major IT consulting companies such as Ovum found that HSPA rather than UMTS/HSPA for fast delivery of HSPA+ services that can bring high return at low cost. It helps operators offer services at more competitive tariffs while protecting their existing investment. Lower tariff is the key to rapid 3G network deployment.

ZXSDR 8000 series base station supports a smooth software upgrade to HSPA+, which can maximally reduce the evolution costs without interruption or impact to existing services. Adopting the Digital Pre-Distortion (DPD) and Doherty Power Amplifier (DPA) technologies, the SDR 8000 series base station can reach a PA efficiency of 40%. Being small in size, the distributed base stations (BBU+RRU) support zero-footprint deployment, and the RRU can be installed near the antenna to reduce the feeder loss.

Through software upgrade, ZTE helped ZAPP, a mobile operator in Romania, deploy the HSPA+ network without affecting the ongoing services. The HSPA+ network is the first commercial HSPA+ network in Romania or even Eastern Europe.

**Conclusion**

In the long run, LTE and future wireless technologies will finally replace GSM and UMTS. However, the process is a long journey that will experience several stages: standardization, scale commercialization, and gradual replacement. This long journey leaves a large room for us to develop UMTS networks. With its unique advantages, HSPA+ will play an important role in the long journey. At this exact stage, ZTE rolled out its high-performance and low-cost SDR based HSPA+ solution that can help operators explore the potential of 3G mobile broadband.
On 30 March 2009, the commercial promotion conference titled “Tomorrow’s Technology >>> Today” was held jointly by CSL, the largest mobile operator in Hong Kong, and ZTE in the Exhibition Center in Hong Kong. This conference symbolizes the commercial launch of Next G™, the fastest all-IP mobile broadband network in the world.

Next G™ supports a maximum download data rate of 21Mbps. Its mobile broadband services are characterized by the most extensive coverage, the highest data rate, and the most reliable performance of any broadband available. “The launch of Next G™ reaffirms CSL’s position as the leading mobile network operator in Hong Kong, demonstrating our ability and commitment to bring the most advanced mobile communication technologies and applications to Hong Kong. We believe that the fastest speed, superior capacity and quality of our network are what differentiate us from the competition and enable us...
to exceed our customers’ expectations,” said Tarek Robbiati, CEO of CSL at the launch ceremony. Just one year ago, CSL was confronted with serious challenges. Competition for the mobile telecom market in Hong Kong was extraordinarily fierce. Competitors with market shares lagging behind CSL were launching 3.6Mbps and 7.2Mbps HSPA data services to the market one after another, while CSL could only offer HSDPA data rate of 1.8Mbps. Moreover, CSL operated four networks of two modes (GSM/WCDMA) and three frequency bands. To upgrade the networks, CSL had to pay costly fees for software/hardware upgrade and engineering service, and the upgrade needed be accomplished within a very short period. Under such circumstances, CSL decided to choose a new vendor to help them replace the existing infrastructure and combine the four networks into one network that supports HSPA+ and the evolution towards LTE. This would resolve their predicament and restore CSL’s leading position for future development.

After an in-depth technological exchange, an onsite survey, and a comparison of solutions from different vendors, CSL eventually selected ZTE’s SDR based Uni-RAN solution that can combine multiple networks into one network through software radio technology so as to greatly improve network performance. The solution uses ZTE’s SDR base stations to replace the 2800 base stations in the network.

The implementation of the solution was divided into three stages: In the first stage, ZTE used the SDR base stations to replace the existing WCDMA equipment operating in 2100MHz and constructed some new base stations; In the second stage, ZTE swapped all GSM equipment operating in GSM 900MHz and 1800MHz and deployed a 900MHz WCDMA network; In the third stage, ZTE upgraded the network into one supporting 64QAM and MIMO, and deployed a high speed wireless network evolvable towards HSPA+ and LTE.

The Most Complicated Wireless Environment, the Fastest Engineering Construction

As the most prosperous economic entity in the world, Hong Kong is famous for its skyscraper forest and numerous downtown areas. The environment for wireless networks here is extremely complicated, bringing about tremendous challenges in wireless network construction. Hong Kong government’s approval procedures for property related construction are very mature, well regulated, and stringent. The property related tasks, including site entry, site acquisition, engineering survey and design, and construction permission acquisition, are indispensable to the overall project. These four tasks should be approved one by one rather than concurrently. As the partner of CSL, ZTE was responsible for the turnkey project. To guarantee the successful delivery of the project, ZTE transferred 1500 experienced engineers from around the world and hired dozens of senior project management experts especially for this project.

In the existing network, CSL adopted 2G/3G co-site construction. During the swapping process, the equipment in the existing network had to work for a certain period of time. Therefore, there was insufficient space in the equipment room for new network equipment. According to the SDR solution, the project adopts distributed BBU+RRU base stations, without occupying any equipment room. As a result, this networking mode substantially improved the utilization of equipment room and facilitated site acquisition and property negotiation.

At the same time, CSL definitely required that the RRU should be installed outdoors and near the rooftop for the purpose of reducing the loss in the feeder antenna and improving network coverage quality. In the actual engineering construction, the rooftop RRU is usually 8–10 floors away from the indoor BBU, and the average distance between the RRU and the BBU exceeds 60m. Therefore, the BBU is connected to the RRU through an optical fiber to reduce the loss in the feeder and the cost of the feeder antenna. According to the actual network test, the newly-constructed 3G network adopting BBU+RRU distributed base stations can increase its network coverage quality by 5 to 6 dBm.

To reduce frequent handoff and improve network key performance indicators in the densely populated urban areas, CSL adopted ZTE’s innovative multi-RRU cell combination technology and tackled many coverage problems, for example, coverage in a complicated environment, internal coverage in large buildings, and the coordination between internal coverage and external coverage. As a result, the coverage quality of the overall network has been improved considerably. To provide coverage for scenic spots in mountainous areas, the engineering team even used the helicopter to carry the materials necessary for quick project delivery (see Figure 1).

After 12 months of hard work, CSL had finished swapping, constructing, commissioning, and optimizing more
than 2000 2100MHz WCDMA base stations in the frist phase of the project. The Next G™ network built in a record of only 12 months is a miracle in the network construction history of Hong Kong.

With the commercial application of Next G™, the swap of users from the existing network to the new network was the next common challenge facing CSL and ZTE. After adequate discussion and sufficient analysis of the existing network, CSL adopted ZTE’s network cutover and user swap scheme for smooth network cutover, uninterrupted service provisioning, and high service quality. To realize these objectives, CSL and ZTE spent half a year on solution experimentation and testing, involving a thousand test items.

After careful and comprehensive preparation, CSL started to migrate its users to the new network in April 2009. On April 11, the first batch of 30,000 users were successfully cut over to the new network; On April 24, all prepaid users, a portion of postpaid users, and corporate users were successfully cut over; On May 23, the last batch of users were successfully migrated to the new network. So far, CSL’s 400,000 3G users have been completely migrated to the SDR based Next G™. CSL’s CTO Christian Daigneault highly praised ZTE for its achievements, “We have been operating wireless networks in Hong Kong for a long time. Our networks involve a wide variety of terminals, bringing many troubles to the network and user cutover process. ZTE’s cutover scheme was very suitable for CSL that can allow every user of CSL to be migrated to the new network without their knowledge.”

**SDR Based Green HSPA+ Network**

SDR is not just a technological innovation but a revolution in the development of mobile broadband network. CSL is the first mobile operator in the world to adopt the SDR technology. CSL’s selection of SDR not only embodies its unrelenting pursuit of advanced technology and excellent network quality, but also indicates its accurate forecast of future technological development trends.

CSL’s Next G™ can improve the HSPA capability of the overall network (14.4Mbps HSDPA and 5.76Mbps HSUPA). The actual tests showed that Next G™ reached an average HSUPA data rate of over 4.5Mbps in the outdoor vehicle-mounted condition, an outdoor average HSUPA data rate of 1Mbps, and an indoor average HSUPA data rate of 3Mbps, each of which is much higher than that of networks provided by other operators. In the beginning of 2009, CSL successfully upgraded its Next G™ to support HSPA+ that can increase the data rate to 21Mbps. This successful software upgrade made Next G™ the fastest mobile network in the world and enabled CSL to regain its leading position in the telecom industry. Currently, in CSL’s 1010 specialty store, users can enjoy the services of the fastest mobile broadband network in the world. Through the “HP connection manager” terminal, users can experience 15.27Mbps downloading.

In June 2009, CSL announced the successful cutover to the world’s fastest SDR-based HSPA+ commercial network. By adopting energy-saving SDR base stations and intelligent temperature control technology, and reducing the load on the power system, air conditioners and ventilation system, CSL has reduced the yearly energy consumption of the overall network by 39% and the emission of carbon dioxide by 7,187 tons, equivalent to the emissions from 1,000 automobiles in 3 years over 60,000 km. This green network not only reduces operational costs but also highlights the courage of CSL in shouldering social responsibilities.

Due to the advanced technologies and excellent performance of the Next G™ network, CSL and ZTE jointly won the National Mobile Services Award at the Global Telecoms Business Innovation Awards Ceremony held in London in June 2009.

In September 2009, ZTE and CSL revealed details of their plans to expand the Next G™ network capabilities with the roll-out of UMTS in the 900MHz band and the building of a 4G or LTE network in Hong Kong. In a successful live demonstration of new LTE technology, they demonstrated the fastest mobile speeds in Hong Kong with peak download speeds in excess of 100Mbps. This successful trial of LTE technology confirms CSL and ZTE’s position at the forefront of the global mobile communications industry.
The global financial crisis has seriously affected economic development and people’s livelihood in all countries around the world. Accordingly, it has inevitably affected individuals’ telecom consumption as well. With the development and popularization of the 3G technologies, the competition in wireless markets is becoming increasingly fierce. As a result, the mobile subscriber base keeps on growing while the wireless Average Revenue Per User (ARPU) is declining steadily. The telecom operators are under mounting cost pressure. In addition to exploring 3G services as a new source of revenue, they become more and more concerned about the network construction cost. Cutting the network’s Total Cost of Ownership (TCO) becomes a critical priority for the costs of site rental, transmission line rental, power consumption, technical evolution, and network maintenance. As OPEX accounts for a significant portion throughout the lifecycle of a wireless network, it is the key to the reduction of TCO.

**CAPEX and OPEX Analysis**

TCO consists of Capital Expenditure (CAPEX) and Operational Expenditure (OPEX). Figure 1 shows the cost makeup of a mobile operator’s wireless network, which may vary with the network architecture and infrastructure. The cost of auxiliary installations and engineering construction covers 78% of the total CAPEX. Therefore, the focus of the mobile operator is to lower the cost of auxiliary installations and engineering construction.

In addition to network construction cost, the control over OPEX is also an important means for increasing network profit. In wireless network operation, the emphasis should be put on reducing the costs of site rental, transmission line rental, power consumption, technical evolution, and network maintenance. As OPEX accounts for a significant portion throughout the lifecycle of a wireless network, it is the key to the reduction of TCO.

**Distributed Architecture for Flexible Networking**

Due to the ever-growing network scale and the scarcity in suitable site resources, site acquisition is usually the bottleneck of network construction and a major factor leading to cost increase. Because a traditional base station weighs about 200kg, the floor of the equipment room must be able to bear the weight of 350kg/m², and the integrated equipment must cover an area of above 1m², making equipment room acquisition very difficult.
Focus

ZTE provides a series of distributed base stations (including BBU and RRU) that enable zero-footprint deployment to effectively alleviate the difficulty in equipment room acquisition. The BBU can be mounted on the wall or embedded in the rack, making full use of the existing equipment room; the RRU can be wall mounted or pole mounted for indoor and outdoor applications. Since the BBU is separated from the RRU, it is greatly reduced in size and weight and has fewer requirements on the floor space and load-bearing of the equipment room. Therefore, the BBU can be flexibly installed in the areas that are easily acquired such as corridor, weak electricity well and basement, and it is unnecessary to build an equipment room. This brings a great saving in the cost of auxiliary facilities such as decoration, air conditioners and power supply, and also helps to speed up the engineering process. The distributed BBU and RRU solution can reduce the time spent on property lease negotiation by 3 months, making the site acquisition much easier.

Additionally, the distributed base stations can be transported and installed without special tools. They can be carried and installed by a single person. For a macro base station, the installation usually takes 9 person-days; for the BBU+RRU, the installation usually takes 4.5 person-days, reducing the engineering cost by more than 40% and the project duration by more than 40%.

In Hong Kong CSL’s SDR-based HSPA+ network project, ZTE has deployed over 2000 base stations in distributed BBU+RRU architecture that can be co-sited with existing base stations. Due to the flexible installation mode and low power consumption of BBU and RRU, the existing equipment room does not have to be reconstructed. The whole project took only 11 months, becoming a typical case for large-scale wireless network swapping.

Figure 2 shows the networking of distributed base stations (BBU+RRU). The RRU can be installed near the antenna; the BBU is connected to the RRU through an optical fiber. When installed on the top of the tower, the RRU is connected to the antenna through a several-meter-long jumper. Since the feeder is generally about 50m long, a shorter feeder can reduce the loss by about 3dB. By installing the RRU near the antenna, you can increase the uplink coverage radius of a cell by more than 20% and the coverage of a single site by more than 40%. Under the
same coverage, this installation mode can reduce the number of sites by 30%, thus effectively lowering the network construction cost.

**Low-Cost Operation Through Technical Innovations**

As the power amplifier on the radio side is responsible for about 65% of the overall system performance, the most effective way of reducing power consumption of the base station is to increase efficiency of the power amplifier. Based on the advanced Digital Pre-Distortion (DPD) and Doherty techniques and the innovative Dynamic Power Track (D-PT) technique, the efficiency of the power amplifier for ZTE’s UMTS base stations reaches up to world-class level of 40%. The power consumption of the site model S111 is less than 400W, 50% lower than the average standard in the industry. This site model can help operators save their expenditure on electricity by more than 50%, effectively reducing their network OPEX.

In the actual operation, the wireless equipment is loaded differently at different times. For example, during the peak traffic hours in daytime, multiple carriers (such as S333) must work simultaneously to satisfy the capacity requirements; at night when the traffic is very low, a single carrier may be enough. A traditional base station is usually configured in a way to satisfy the maximum load requirement, and multiple carriers usually work simultaneously, regardless of full load or low load. Each carrier needs to provide a pilot channel and a common channel, covering 20% of the transmit power. Obviously, this carrier configuration mode leads to a waste of energy during low-load working hours.

With the intelligent carrier adjustment technology, ZTE’s UMTS base station uses multiple carriers (such as S333) to handle the service load during peak traffic hours, and dynamically adjusts the number of carriers when the traffic volume is relatively low. To reduce the power consumption, it can disable one or more carriers and use one carrier to handle the service load. If the detected service load exceeds the processing capacity of the current carrier, it can enable the disabled carriers one by one to satisfy the requirement for capacity expansion.

The technical innovations help telecom operators effectively reduce their OPEX. In the CSL network swapping project, the power consumption of base stations was 3000W before the swapping and now lowers to 900W after the swapping. The cost saved in electricity can reach HKD36 million every year.

**Smooth Evolution Based on SDR Base Station**

With the rapid technological development and ever-increasing demands from customers, the wireless network is being upgraded more and more frequently. How to preserve the existing equipment investment and reduce the network evolution cost is crucial to the long-term development for telecom operators. To address this problem, ZTE’s SDR based new-generation base station adopts the software radio technology that allows wireless devices of different standards and working in different radio spectrums to share the same hardware platform. The BBU using the MicroTCA architecture provides large-capacity processing capability; the RRU with integrated design supports MCPA, 20MHz Radio Frequency (RF) bandwidth, and 80W power output.

The SDR base station supports 2G/3G multi-mode networking. In the case of co-frequency channel, a base station supports 2G and 3G simultaneously; in the case of different frequency channels, the base station supports baseband sharing, mixed insertion of RF parts, two-in-one networking, and auxiliary resources (equipment room, transmission line, and power supply) sharing. According to the analysis on the project of CSL, the SDR base station supports coexistence of GSM and UMTS, reduces the construction cost of transmission line by 30%, and saves the cost of power supply facilities by 40%.

Due to its technological advantages, the SDR base station enables smooth evolution. Through software upgrade, telecom operators can have their UMTS equipment support HSPA+ at a maximum download rate of 21.6Mbps. By adding few processing boards, the operators can smoothly evolve their SDR base stations towards LTE without changing the existing hardware architecture. In this way, the operators can improve their competitiveness and snatch more market share while preserving their existing equipment investment and reducing their network evolution cost.

**Conclusion**

Cost is the key to successful operation and development for mobile operators. But low cost does not mean low quality. The financial crisis not only puts the pressure on the operators but also provides a good opportunity for their development. Based on ZTE’s innovative technologies and solutions, the operators can constantly improve their equipment performance, achieve low-cost network operation, and provide diversified communication services to survive the competition.
In today’s 3G era, mobile communication is becoming increasingly popular. The global mobile subscriber base has reached over four billion and the mobile penetration rate in many developed countries has even surpassed 100%. The competition among mobile operators is getting more and more intense. To get ahead in the stiff competition, it is essential for the mobile operators to build their 3G networks at a fast speed. The vast user base of the incumbent 2G networks is the target of 3G networks. Whoever first completes the network construction and puts 3G services into commercial use will get a head start in the competition.

Quality and efficient delivery of a wireless network project is a challenging strategic objective that not only tests the capability of the equipment supplier but also has big impact on the development of the operator. Project delivery involves four major sectors: prompt shipment, fast commissioning, professional network optimization, and quality after-sales service.

Prompt Shipment Lays the Foundation for the Project

The most difficult thing to control in logistics is material preparation. Too few prepared materials may lead to delayed delivery after the market takes off, while too many prepared materials can heavily burden the enterprise by occupying a large amount of circulating capital and floor space as well as increase operational risk due to the failure to use up the materials when the market changes. To solve this dilemma, ZTE adopted three measures:

- Strictly implement the market demand prediction on a rolling basis to determine the quantity of prepared materials.
- Make sure each kind of materials is supplied by at least two suppliers so as to achieve the redundancy in supply chain.
- Leverage the advantages of ZTE’s unified SDR platform to allow the sharing of universal wireless components. The shared “resource pool” can effectively ease the adverse effects of market fluctuations on material preparation.

ZTE boasts a 100,000-square-kilometer production base for wireless products that can produce 15,000 sets of UMTS equipment per month. When a continuous and bulk supply of UMTS equipment is required, other wireless product lines can be used for production and the monthly production capacity of UMTS equipment is thus doubled. This ubiquitous “sharing mechanism” is a key guarantee for satisfying the operators’ needs for large-scale network construction.

As a great amount of materials, components and finished products come in and out of the production area each day, it is necessary to provide
a well-established logistics system. ZTE has set up two global logistics centers in Shenzhen and Hong Kong and over 20 logistics sub-centers across the world, and has established strategic partnerships with over 50 logistics suppliers including TNT and DHL. With such an extensive and responsive logistics system, ZTE can satisfy the operators’ requirements for delivery and after-sales repair service at the earliest possible time. In China Unicom’s UMTS project, ZTE, thanks to accurate market predictions and full logistical preparations, started the shipment just one week after winning the bid. It shipped over 10,000 base stations within one month and became the first vendor to complete all the shipments, saving precious time for China Unicom’s engineering construction.

**Fast Commissioning—The Key to Project Implementation**

Nowadays mobile operators find it increasingly difficult to acquire suitable base station sites. Due to the slow progress in negotiation for site acquisition, they have to delay the project construction period. To solve the difficulty in site acquisition, ZTE rolled out its distributed base stations (BBU+RRU) that enable simple and flexible zero-footprint deployment. The BBU can be mounted on the wall or embedded in the rack to make full use of the space; the RRU can be wall mounted or pole mounted for indoor and outdoor applications. Using the traditional macro base stations, only one to two sites can be installed each day; the installation speed can be doubled when using the distributed base stations. To vastly improve network construction efficiency, it is also necessary to break the conventional model of network construction and adopt the mechanism of multi-task parallel execution. In its nationwide UMTS network project, China Unicom had a close cooperation with vendors, which involved making engineering implementation plans and holding regular meetings to supervise the engineering progress and solve the problems. ZTE took the lead among all vendors in engineering progress.

When asked about the keys to ZTE’s success, Lu Yonglin, the Projects Director from ZTE explained, “We provide sufficient human resources, prompt logistical supply, and strict engineering management, which are the keys to ensuring China Unicom’s UMTS network construction. Besides, we adopt the mechanism for carrying out engineering, maintenance and optimization concurrently that can shorten by half the project delivery period.” In addition, ZTE improved the commissioning efficiency by over 60% by using its self-developed fast commissioning tools that could enable remote commissioning and batch handling of multiple base stations. ZTE helped China Unicom put through its first

**Professional Network Optimization—A Guarantee for Network QoS**

Fast deployment helps to grab customers, while high QoS helps to retain customers. A quality network with complete coverage can not be achieved without the constant effort made by a professional network planning and optimization team with the specialized tools. With years of experience in wireless network deployment, ZTE has cultivated a team of more than 2,000 engineers and 800 experts for network planning and optimization. After planning and optimizing over 500 wireless networks across the world, the team can offer industry-leading expertise in network planning and optimization and help mobile operators build quality networks.

ZXPOS, ZTE’s self-developed network planning and optimization software, supports multi-standard, multi-service network emulation. Its powerful Geographical Information System (GIS) can display two- and three-dimensional geographical information and output GoogleEarth and Mapinfo compatible maps; its Measurement Report (MR) can record the details of each call in the OMC without the drive test; its Call Detail Trace (CDT) can monitor and trace the performance of every user on a real-time basis that helps operators greatly cut their OPEX.

In the UMTS network optimization for Chongqing Unicom, a subsidiary of China Unicom, ZTE adopted the coverage solution of combined framework and special scenarios. The framework deals with basic network coverage, while special scenarios can be a supplement to the overall network coverage. In order to increase optimization efficiency and improve network performance, ZTE implemented intelligent and professional network optimization throughout every stage of project construction including optimization emulation, base station survey, single site verification, and overall network optimization.

**Quality After-Sales Service Alleviates Your Worries**

To guarantee the long-term stable network running and good maintenance management for mobile operators, ZTE set up a complete customer service system that comprises Global Customer Support Center (GCSC), ZTE University, and Repair and Return Center (RRC), offering quality and considerate after-sales service to customers.

ZTE GCSC, backed by 9 sub-centers, advanced labs in the R&D base, and a team of well-trained technical support engineers, can deliver 7/24 hours technical support and responsive on-site troubleshooting service to ZTE customers worldwide. With complete technical solutions and advanced lab simulation environments, it is able to quickly and effectively dispatch and utilize technical resources worldwide. Currently ZTE GCSC has 6 regional centers and 42 local centers all over the world, offering systematic and powerful operation support service including online support, version upgrade, remote diagnosis, on-site troubleshooting and patrol check.

ZTE University provides professional training and consulting services, specialized publications, and training solutions to its customers worldwide. The university has 26 multimedia classrooms, a 3,100-square-meter simulation lab as well as supporting facilities including catering, entertainment and accommodation. With a team of over 500 lecturers and management personnel, it can offer over 120 technical training courses in 10 categories and has trained 120,000 customers from over 70 countries around the world.

ZTE RRC delivers after-sales maintenance and spare parts service to its customers worldwide. To better meet the requirement of customers, ZTE has set up 12 local RRCs, 28 spare parts warehouses in China, and 2 spare parts warehouses abroad. The well-established spare parts management system enables the sharing of spare parts information, offering 7/24 online service to customers.

**Conclusion**

Project delivery is a race that tests a player’s overall capabilities. To win the competition, the player should have not only the ability to make a flying start and a final sprint in a short running race but also the physical strength and endurance required for a long running race. The objective each vendor strives for is to help operators quickly deploy a quality network. With over 10 years of rich experience in deploying wireless networks worldwide, ZTE has built up an efficient and innovative project delivery system. Through its fast logistics channel, global engineering and construction team, professional network planning and optimization group, and responsive customer support centers, ZTE is capable of offering satisfactory end-to-end project delivery and service solutions to its cooperative partners around the world.
ZTE Breaks the Mould on European Smart Phone Market

New business model makes latest mobile phone technologies available to all

October 7, 2009    Source: Reuters

ZTE and mobile network operator TMN have shaken up the Portuguese smart phone market with a business model that makes smart phones available to virtually all handset users, enabling anyone to enjoy mobile internet access and the latest mobile applications.

ZTE is now speaking to operators around Europe about the production of operator branded or joint-branded smart phones.

ZTE’s handset business is focused on customising phones in association with operators for each individual market—targeting specific market segments that the operator believes offer the best business opportunities.

“We cannot disclose any of the discussions currently under way with other operators, but we expect to be delivering smart phones into most Western European markets by the end of 2010,” said He Shiyou, ZTE Executive Vice President and Head of the Mobile Terminals Division.

Since its launch in May this year, the co-branded ZTE/TMN Bluebelt 3G handset has taken 30% of the Portuguese smart phone market, and is predicted to take over 40% by the end of the year.

ZTE and TMN have launched the new Bluebelt II and Silverbelt phones running Microsoft Windows® phone to maintain the momentum of the Bluebelt handset’s success, and expect to continue building market share.

“These are high specification handsets at a price that most mobile phone users can afford, making functions that were previously only available to business and premium customers available to almost everyone,” said He.

“ZTE’s approach also strongly supports the operator, with a larger percentage of the consumer’s spend going to the operator rather than the handset manufacturer.”

“Our association with ZTE has changed the face of the smart phone market in Portugal and opened up a huge new market for us,” said Mr. Luis Avelar, CMO of PT Group. “Tens of thousands of people now have smart phones and all the benefits they deliver, who could never have imagined that they could afford such a high specification phone.”

ZTE has invested heavily in the research and development of smart phones over the last five years and has focused on becoming the world leader in the development of customized mobile phones.

Demand for smart phones has reached the point where they are no longer seen as a luxury or a strictly work-related item. ZTE recognized this trend early on and invested in the development of smart phones that not only offer the sleek design, superior processing capabilities and attractive prices consumers desire, but that also work smoothly on each carrier’s network.
ZTE handset and data card shipments have been growing rapidly. With strength in China, leadership in TD-SCDMA and an operator-centric customization strategy, it aims to be a top-three handset provider by 2013. To achieve this goal it must continue to leverage its strengths, but this won’t be without challenges. Here we briefly assess ZTE’s devices strategy following a recent discussion with the vendor.

**ZTE Aims to Become a Top-Three Device Provider by 2013**

ZTE states that its total mobile handset shipments in 2008 were 45 million (up from 31 million in 2007 and 16 million in 2006). The company claims to have shipped 27 million devices in 1H09, and is targeting 60 million for the full year. Although much of the growth is from China, ZTE has also achieved growth in other regions including Western Europe with operators such as Vodafone and TMN, where a significant proportion of devices are co-branded.

Such growth is impressive, especially given that we expect the devices market to decline 9.1% globally in 2009. ZTE is clearly gaining volume share and it plans to be a top-five handset provider by 2011, and a top-three provider by 2013.

**Device Customization Is the Focus of ZTE’s Strategy**

ZTE believes it has a number of sustainable competitive advantages that will enable it to achieve these ambitious goals.

One point of differentiation with leading manufacturers is ZTE’s aim to be, ‘The best customized mobile phone manufacturer in the World’. It has already worked with operators for lower-end products but has achieved fewer wins for more sophisticated devices.

There are advantages of this customization strategy, including less reliance on the success of a few ‘hero’ products, but there are also potential drawbacks. For example, ZTE’s brand strength may not grow as strongly as otherwise. There is also the threat of operators moving away from this market as they focus on their core business of voice, messaging and data. Additionally, unlike leading vendors, this strategy makes it harder to develop a device services strategy to build both loyalty and potentially extra revenues. In addition, most distribution, even in developed markets, occurs independently of operator channels, so customization should only be part of a broader strategy.
ZTE Has Competitive Advantages It Must Leverage

ZTE has strong R&D capabilities across the organization. Scale is important and ZTE states that it has 7,000 employees in its handsets division, many of which are in R&D.

Being a wireless infrastructure provider also gives knowledge of the industry, technical expertise, and potentially the ability to sell devices to infrastructure clients.

Although international vendors have narrowed the gap, ZTE also still has price advantages, and will continue to be able to compete on this basis. Interestingly, ZTE has also shown willingness to break the model of manufacturing in China, with handset factories in Brazil, Venezuela, Zambia, Kazakhstan, Algeria and India.

Domestically in China, ZTE has strong relationships with China Mobile, China Telecom and China Unicom. This should lead to continued growth, enhanced by 3G rollouts and increasing handset subsidies.

ZTE has also shown strong integration capability in launching smartphones using Linux and Microsoft Windows Mobile. It states that it has the ability to deploy handsets with other operating systems including Android or LIMO, pending demand. ZTE must be aware that commitment to too broad a range of platforms may dilute scale advantages. Accordingly, its limited investment in Symbian is warranted.

ZTE Aims to Capture 30% of the Datacard Market

One of the fastest-growing device segments is datacards. According to Ovum’s recently published Big-screen mobile broadband devices forecast: 2009-14, global shipments of big-screen mobile broadband devices will grow from a base of 43 million shipments in 2008 to 180 million shipments by 2014, a CAGR of 27%.

ZTE’s goal is to capture 30% of this market in 2009, which equates to 16 million according to Ovum estimates. With over 7 million datacards shipped in 1H09 (it claims shipments of 10 million datacards in 2008), it is among leading vendors and on track to reach its goal.

As with handsets, ZTE has a strong position in China and in TD-SCDMA. However, it states that 40% of its datacard sales revenues in 1H09 were from developed markets in North America, Europe and Japan. It has delivered devices to T-Mobile, Telenor Group and Cosmote, amongst others.
The three mobile carriers have completed their first phase of 3G network deployment before August 2009. China Telecom’s CDMA2000 network now covers 342 cities and is expected to expand to 500 cities by the end of this year. China Unicom has conducted two phases of WCDMA network deployment, covering 284 cities. Due to the slow commercialization of TD-SCDMA technology, China Mobile’s TD-SCDMA network only has coverage in 38 cities, and will expand to a total of 238 cities at the end of this year.

During the first half year of 2009, we found CDMA and WCDMA market have developed rapidly. Meanwhile, domestic manufacturers gained more shares in the China 3G mobile infrastructure market.

**CDMA Market**
Since China Telecom got the CDMA license from government, it has finished two CDMA network tenders, involving 540,000 TRXs before August 2009. So far, China Telecom has constructed a 3G network on a massive scale, covering 342 cities and more than 2,000 counties, laying a solid foundation for seizing market opportunities. iSuppli expects the network expansion will be continued in the second half year of 2009 and we forecast China Telecom will purchase around 150,000 TRXs in this tender.

ZTE and Huawei are the greatest beneficiaries of CDMA network deployment. And because Nortel is bankrupt and Motorola is also struggling, ZTE and Huawei are destined to become winners in the CDMA market. According to our analysis, ZTE still seize the largest market share with 40.4%, followed by Huawei and Alcatel-Lucent, with 39.2% and 17.4% market share, respectively.

iSuppli believes that ZTE and Huawei will continue to gain more market share in China’s CDMA market, but the Average Selling Price (ASP) per TRXs will continue to decrease. We forecast the ASP will be decreased to $2800 per unit in the second half of 2009. But accompany with the end of outdoor deployment, we think the ASP will stable in 2010.

**TD-SCDMA Market**
China Mobile has deployed up to 309,000 TRXs in the 38 cities before Mar. 2009. Meanwhile, it has closed the third round tender in the August, involving 340,000 TRXs and covering 200 cities. After the three times TD-SCDMA tender, ZTE gained the largest share of the China Mobile TD-SCDMA market with its high performance and low price. ZTE now has 34.3% market share of the third contract, followed by Huawei and Datang with 22.6% and 14.6%, respectively. Combining the previous tenders, ZTE has 34.9% market share with 226,000 TRXs, followed by TD Tech (a joint venture of Huawei and Nokia-Siemens) and Datang.
During the third tender, Nokia Siemens Networks and Ericsson achieved substantial gains of 7.4% and 5% of the market, respectively. We believe international vendors’ market share will be stable in TD-SCDMA market.

The Average Selling Price (ASP) per TRXs is decreased significantly in 2009, from $3500 per unit to less than $2000. iSuppli believe the ASP has been the bottom now and will stable in future.

**WCDMA Market**

China Unicom has conducted two phases of WCDMA network deployment, covering 284 cities before August. During the WCDMA tender, domestic equipment vendors gained again. Huawei took the largest market share with 31%, followed by Ericsson and ZTE with 26% and 21% of the market, respectively. The result of the tender is consistent with our forecast that domestic vendors gained 50% of the market share in the WCDMA in the first tender.

Based on this analysis, iSuppli has ranked the wireless equipment vendors by transceivers in the 3G market before Q2 2009. ZTE gained the largest share in the domestic 3G market, with 610,000 TRXs deployed in all three 3G wireless technologies nationwide. Huawei ranked second nationwide, with 520,000 TRXs. ZTE took the No.1 position in both TD-SCDMA and CDMA2000. iSuppli projects that ZTE will continue to take leadership in TD-SCDMA because of its leading technology and on-time delivery. We also believe Huawei will benefit from China Unicom’s large scale WCDMA network deployment, and will take the No.1 position in this market.

In CDMA market, we think ZTE and Huawei will compete intensively in future.
Inevitable LTE FDD/TDD Convergence

It has been widely agreed in the mobile industry that LTE will become the dominant technology for mobile broadband. 3GPP has defined both LTE FDD standard operating in the paired spectrum and TD-LTE standard using the unpaired spectrum. Generally, the two standards adopt the same network architecture and key technologies and have similar technical performance. They can satisfy the technical requirements of 3GPP and NGMN for next generation mobile broadband technology.

Whether telecom operators will select LTE FDD or TD-LTE in the future depends on the conditions they face in the markets, for example, the available frequency bands, cost effectiveness of different frequency bands, and features of their target services. The operators may choose different LTE technologies to compete for their market shares. LTE FDD and TD-LTE can either work independently or cooperate with each other to adapt to the future complicated markets and meet the customers’ requirements.

It is inevitable to converge the two technologies that coexist for a long time due to their similar technical attributes. As shown in Figure 1, the convergence of LTE FDD and TD-LTE involves two aspects: technology and industry. From the technology perspective, they have realized the convergence in standards, key technologies, and network architecture, and their interoperability has been defined in the 3GPP specifications; from the industry perspective, their growth is driven by the same organization like NGMN, and they have the same chipset, terminal and equipment vendors. Therefore, the technical convergence paves the way for industrial convergence, while the industrial convergence turns the vision of technical convergence into reality.

Figure 1 LTE FDD/TDD convergence
Benefiting from the converged LTE FDD/TDD industrial chain, telecom operators will cut the maintenance costs in different networks; equipment vendors will reduce the R&D cost; the terminal and chip vendors will have a promising market prospect; and end users will purchase terminals at lower prices and enjoy international roaming. Therefore, the LTE FDD/TDD convergence is unavoidable.

Rapid Progress in LTE FDD/TDD Convergence

The LTE FDD and TD-LTE defined in the 3GPP specifications have many similarities. Except the slight difference in the physical layer of air interface, they have basically the same protocol layers. Currently, the standardization progress of TD-LTE has kept in step with that of LTE FDD. The physical layer, higher layers, interfaces, and Radio Frequency (RF) protocols of TD-LTE have been frozen in March 2009, and the specifications for terminal conformance will be frozen at the end of 2009. China Mobile has taken the initiative in the standardization of TD-LTE, and will complete the TD-LTE 3GPP R9 specification in step with the LTE FDD work at the end of 2009.

The LTE/SAE Trial Initiative (LSTI) Proof of Concept (PoC) M1/M2 testing has been completed for TD-LTE, and the subsequent IODT/IOT/Trial/PR tests for TD-LTE are in complete step with those for LTE FDD. Currently, almost all mainstream LTE chipset vendors claimed that they would provide uni-mode chipset to support both LTE FDD and TD-LTE. In the first half year of 2010, Qualcomm will launch its dual-mode LTE FDD/TDD chipsets on a trial basis, and will launch the commercial version in the second half of 2010. Besides, the certification progress of TD-LTE terminals has also kept in step with that of LTE FDD terminals, and major LTE equipment vendors have specifically defined the evolution roadmap for their dual-mode LTE FDD/TDD products.

China Mobile Depicts a Bright Future for TD-LTE

As the evolution path of TD-SCDMA, TD-LTE has received high attention from China Mobile. China Mobile has specifically announced that it will smoothly upgrade all its existing TD-SCDMA equipment to TD-LTE. China Mobile held a NGMN board meeting on May 12, 2009, and it invited senior executives and experts from 12 telecom operators to visit its TD-LTE laboratory and field test. The high performance and rapid industrialization progress of TD-LTE have deeply impressed the visitors.

To accelerate the speed of TD-LTE industrialization and globalization, China Mobile has worked out a specific play for TD-LTE system test and deployment. Its TD-LTE PoC test is divided into three phases: Phase I indoor test based on a single site, Phase II field test based on 1–2 sites, and Phase III multiple UEs and multiple cells field test based on multiple sites.

Figure 2 China Mobile’s TD-LTE test and construction schedule

Conclusion

The LTE FDD/TDD convergence is an inevitable trend in the telecom industry. The convergence in technical standards is driving the rapid industrial convergence in chipsets, terminals, and infrastructure equipment. Finally, the converged industry will allow telecom operators to fulfill the requirements in a more complex market, helping them stand out amid the increasingly fierce competition. As a strong supporter and active promoter of TD-LTE, China Mobile has effectively driven the industry forward through its well-defined network deployment targets and active test plans, depicting a promising future for the whole industry.
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