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Can’t make the space bigger?

Then make the equipment smaller.

ZTE launches the smallest base station in the world, ZXWR R8840.

The radio unit has a volume of only 19 litres and weighs just 16.5 kg. Easy to install and saves expensive space.

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Now, we are ready to serve you.

ZTE is China’s largest listed telecom vendor, providing comprehensive tele-communications equipment and network solutions all over the world.

We deliver innovative, custom-made products and services to customers in more than 120 countries, helping them achieve continued revenue growth and shape the future of the world’s communications.

Visit www.zte.com.cn or contact your local ZTE office to know more.
WiMAX: The Best Opportunity for China Vendors

Chinese local system telecom product vendors are looking at the emerging WiMAX market as a good opportunity to compete with leading system vendors.

ZTE’s All-IP Solution Improves Reliance’s CDMA Services

After the deployment of ZTE’s All-IP solution, the KPIs of Reliance’s CDMA network have been remarkably improved.

Bandwidth on Demand Service in ASON

BoD, a new feature provided by ASON, allows a user to dynamically change the amount of available bandwidth.

T-MPLS Packet Transport Technology and Its Latest Development

The future market needs a kind of packet transmission technology that can provide the effective transport of packet services and the carrier-class OAM and protection mechanisms.

ZTE is always willing to help every IPTV service provider successfully launch and grow their IPTV business.
A Discussion on the Interworking of WiMAX and 3GPP Networks

Network convergence can benefit both end users and operators.

ZTE’s CDMA2000 Mobile Softswitch Solution

ZTE’s CDMA2000 all-IP solution is an end-to-end solution that is based on its independently developed all-IP universal carrier-class platform and open standard.

A Record of CDMA WLL Project in Africa

The scientific after-sales project management and ZTE’s spirit of solidarity and enterprising are its magic weapons to success.

Operator-Customized Handsets Facilitate ZTE’s Growth

ZTE Unveils TD-SCDMA Handsets

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ZTE Profile
ZTE is a leading global provider of telecommunications equipment and network solutions. ZTE’s product range is the most complete in the world—covering virtually every sector of the wireline, wireless and handset markets. The company delivers products and services to customers in more than 120 countries.
ZTE received the prestigious InfoVision Award for the Access Network Technologies and Services category on 9th October, 2007 at Broadband World Forum Europe 2007 in Berlin, Germany. ZTE won the award for its GPON+VDSL2 technology, particularly the ZXA10 C220+ ZXDSL 9806H product series. This technology solution enables carriers to cost effectively deliver next-generation services to its customers, including Internet Protocol Television and high definition video-on-demand.

The InfoVision Award program recognizes technologies, applications, products, advances, and services judged to be the most unique and beneficial to the telecommunications industry. ZTE submitted two entries ZXA10 C220+ ZXDSL 9806H and ZXMP M800 Metro DWDM System and both qualified among the top finalists for the award.

As one of the pioneering telecom manufacturers committed to R&D of commercial application in the Access Network field, ZTE has an in-depth understanding of GPON and DSL technologies, and is strategically positioned in the international market.

“We are very proud to be given the prestigious InfoVision Award for our GPON+VDSL2 products,” said Ms Chen Jie, ZTE Vice President and General Manager of Wireline and Service products, after collecting the award from IEC Executive Vice President Mr Roger Plummer. “It is a great encouragement and recognition for our R&D efforts in developing superior Access Network products.”

Ms Chen Jie (R), ZTE Vice President and General Manager of Wireline and Service products, receives the 2007 Infovision Award

ZTE Storms Europe

October 8, 2007

ZTE Technologies’ major presence at this week’s Broadband World Forum in Berlin is sending out a bold message to the international market place–namely that Europe remains a key focus of a company set to show international sales outgrowing China market success for the first time in its history.

At the show, Mr Lin Cheng, President of ZTE Western Europe, advised that the company had established a presence in most European countries within the last few years and already this year successes in places like Bulgaria, Spain, the United Kingdom, Estonia, Poland, Georgia and the Czech Republic has seen the ZTE phenomenon getting ever closer to a more prominent European profile.

Backed by a huge range of solutions, phenomenal R&D resource and a real commitment to new issues like sustainability and lower power output, ZTE was making ground quickly.

“We are overcoming all our challenges, one by one, and I am very confident about the European market going forward,” said Mr Cheng.
At PT/Wireless & Networks Comm China 2007 held in Beijing, China, from 23-27 October 2007, ZTE showcased its four innovative product lines that are expected to serve the forthcoming 2008 Olympic Games. These product lines are TD-SCDMA, Anyservice value added services, Global open Trunking architecture (GoTa) system—a new-generation digital trunking system—and multiple mobile TV terminals.

This exhibition is not only Asia’s largest telecommunications event, but is also regarded as an important technical showcase prior to the 2008 Olympic Games.

The Olympic Games provides a good opportunity to accelerate the development of the new communications technologies. The 1996 Atlanta Olympics introduced Internet; at the 2000 Sydney Olympics, 2G mobile communications played a big part; and the 2004 Athens Olympic Games saw the widespread use of broadband services. 3G and mobile TV may probably become the new technology focus of the 2008 Beijing Olympics.
ZTE Unveils World’s First WCDMA Commercial Femto Cell ZXWR H8901

ZTE launched the world’s first WCDMA commercial Home NodeB, also known as femto cell, ZXWR H8901 at PT/Wireless & Networks Comm China 2007.

ZTE’s Home NodeB ZXWR H8901 supports communication of up to four users online, with user data transmission frequency up to 7.2 Mbps. The 3G Home NodeB technology optimizes the in-building 3G facility for the user within their home or workplace, thus enabling fixed-mobile convergence (FMC) communication service via one device while maintaining a reliable connection. The convergence of mobile business into Home NodeB usage also helps providers reduce significant investment and maintenance costs.

“This is a huge success for us as the device will play a vital role in enhancing indoor coverage in the industry by providing reliable network service to mobile users via a single device,” said Fang Hui, ZTE’s General Manager, WCDMA Products.

With its continuous and sustained R&D effort focusing on 3G WCDMA, ZTE has achieved significant breakthroughs and is now one of the telecom equipment providers with the most number of patent applications in the industry. ZTE also plays a key role in the standardization of 3GPP, as well as participated in the first femto forum panel in July this year where it convincingly delivered and shared an impressive technology report.

ZTE Showcases Capabilities of MBMS and HSDPA/UPA Solutions

ZTE demonstrated the capabilities of its Multimedia Broadcast/Multicast Service (MBMS) whole solution based on Third Generation Partnership Project (3GPP) R6 standard and HSDPA 7.2M/UPA 2M simultaneous transmission at PT/Wireless & Networks Comm China 2007 in collaboration with Qualcomm.

ZTE is the first to launch an MBMS Whole Solution and HSDPA/UPA Simultaneous Transmission in the industry.

At the show, ZTE demonstrated MBMS solution’s capability to achieve 128 and 256kbit/s high-speed transmission of MBMS television programs broadcast and multicast services over cellular networks. On the other hand, the HSDPA 7.2M/UPA 2M simultaneous transmission demonstrated that dataflow between the system and Qualcomm 7200A terminal is up to 7.2M in downlink and 2M in uplink simultaneously.

(ZTE Corporation)
ZTE announced on October 25 that it has inked a power supply purchase agreement with Telekom Malaysia.

According to the agreement, ZTE will provide 70 per cent of the purchase order for power products.

The deal calls for ZTE to supply telecom equipment such as mixed-base station power system, and embedded power systems, in line with Telekom Malaysia’s goal of improving their fixed-line telecom business to keep pace with the rapid and dynamic development in the local market.

“It is indeed a great opportunity to be the first Chinese company to forge a partnership with a Malaysian carrier company as large as Telekom Malaysia,” said Li Guangyong, ZTE’s general manager of Power Products.

ZTE announced on October 25 its 3rd-Quarter results.

The Group’s business recorded growth for the period in tandem with development in the global telecommunications market following active moves to explore the overseas market. For the nine months ended 30 September 2007, revenue from the Group’s operations amounted to RMB 23.448 billion, representing an increase of 46.95% compared to the same period last year. Net profit amounted to RMB 603 million, representing an increase of 45.92% compared to the same period last year. Earnings per share was RMB 0.63. In the third quarter, the revenue of ZTE climbed 53.07 percent to RMB 8,216 million as compared to the same period last year, and the net profit rises 116.46% to RMB 143 million as compared to the same period last year.

ZTE Wins China Mobile WAP Expansion Contract

ZTE announced on October 8 that it has clinched 85% of new nodes for the seventh expansion of China Mobile’s Multimedia Messaging Service and another 75% of new nodes during the latter’s WAP expansion.

China Mobile ranks tops in the world in terms of both users and innovative services, with SMS, MMS and WAP related services being its major value-added services. ZTE has now become one of the core partners of China Mobile on value-added services and previously won the bidding of China Mobile’s MMS web and related products.

Anyservice is a brand service of ZTE. By end of 2006, ZTE’s Anyservice had been used in more than 30 value-added service international areas. At present it is being used by top-end telecom operators including Vodafone, France Telecom, Norway Telecom and Singapore Telecom.

(ZTE Corporation)
New Objective of ZTE Corporation

—Maximizing the Value of Industrial Chain

(Selected from September/October 2007 issue of Global Telecoms Business magazine)

Wei Zaisheng, CFO of ZTE

Value Game

To realize maximum value of the business, does it mean that part of our customers’ values shall be put at sacrifice?

The capital market is merciless. An industry chain with upstream and downstream firms in competition with each other results in the exploitation of depleted profits.

And, since the upper and lower reaches of the value chain become extremely fragile and unpredictable due to excessive games, the value of the whole industry will continue to shrink, until emerging alternative industry quietly approaches.

Entrepreneurs should be rational about this. Building a more powerful industrial chain is one basis for sustainable development, that is, to maximize the value of the industrial chain is the prerequisite to maximize the value of individual enterprises.

From this perspective, the ideas of maximization of individual enterprise value shall be diverted into the concept of maximizing the value of industrial chain.

Industrial Chain and Ecosystem

In fact, the traditional telecom industry is undergoing such a profound change. The rapid development in the Internet industry shall greatly influence the traditional voice business, which may collapse in terms of revenue in the near future.

Data services, mobile business, IPTV and Internet will be further integrated.

The trends of industry development, fierce competition and the common interest mean the equipment manufacturers and telecom operators form alliances with each other, and “creating a powerful industrial chain”, and “building a harmonious ecosystem” should become the global
telecom entrepreneur’s consensus.

To live and develop, is an eternal topic for entrepreneurs. The concept of “creating a powerful industrial chain”, and “building a harmonious ecosystem” is what I further extend from the idea of “maximizing the industry value”.

The awareness of the importance of industrial chain and of the ecosystem has helped us to improve operating strategies and ideas.

We expanded the categories of “customers” and “suppliers”, and “customers” are no longer just for the definition of telecom operators, but the over two billion consumers already existing and those other two billion potential consumers whose basic communication needs to be met.

Correspondingly, our “suppliers” are no longer confined to traditional parts and raw materials suppliers, but also providers of capital, and human resource providers.

Our strategy is:

- build agile supply chains, global logistics, and achieve win-win with suppliers;
- pursue an investment strategy with resources sharing, information transparency, sharing the financial risk with banks and policy financial institutions in globalization process;
- adopt a “people-oriented” human resource strategy, effective option incentive policies, constantly tap the potential of our people, use maximum “talents” so that the individuals and the company can attain maximum value.

Abiding by these principles; we are doing a difficult and a great cause: to create a powerful industry chain, building a harmonious ecological environment. Yet, how to implement such a strategy? I will detail below.

Demographic Dividend, Capital Surplus and Tacticians

Human labor, capital and technological progress are three major macroeconomic elements. In the so-called “world factory” China, the majority of entrepreneurs, including ZTE, are ingeniously using these elements, quietly building its own competitive advantages.

China’s 1.3 billion populations has been a serious topic for a long time. The reality is that economists see its potential positive effects: an enormous labor supply and a huge consumer market, nurturing local Chinese enterprises to become multinational corporations. China’s “demographic dividend” phenomenon has become enthusiastic discussion by economists.

In addition, capital surplus directly results in a reduction in the costs of capital, which also provides Chinese enterprises a key factor of production. The “capital dividend” phenomenon in China acts as another variable for production function.

From the perspective of technological progress, ZTE seems to appreciate better the importance of the third element.

China is a latecomer in advanced technology. We are ahead of India in IT hardware manufacturing, but behind Japan. In software development, China is ahead of Japan benefiting from lower costs, but behind India.

Communication equipment manufacturing involves both hardware manufacturing and software development; our embedded software development is advanced than India, and more cost effective than Japan.
This has created ZTE its “blue ocean”. We can borrow the Tian Ji horse race queuing theory—an ancient case of operations research in China, see panel, communications industry will become China’s first to create the world’s leading high-tech industries.

The three elements are thoroughly utilized in ZTE. China’s comparative cost advantages are mostly reflected in the technology-based human resource cost advantages.

Compared with its international rivals, ZTE does best in applied and embedded system equipment. Because this field can maximize the use of our human resources and manufacturing capacity, we do not seek the lowest price, but we expect the same human resources to produce more value.

New Ideas, New Breakthroughs

How do we use China’s current three elements as competition advantages, and realize maximization of value of the whole telecom industrial chain? From theory to practice, we need to continue to make breakthroughs, constantly updated ideas.

We have long ago abandoned the concept of low-price competition, which is only a low level of competition means. Our strategy is: with the same factor inputs, to create more value than others; we have to take into consideration both the supplier and customer values, and set the business goals to maximize the common value of the members in the industry.

From our customer’s perspective, Capex and Opex, as well as value-added services to meet the needs of the ultimate consumer, are the most important factors to influence the customers’ value maximization.

How to lower Capex, Opex, and VAS costs and thereby improve the ARPU, shall be the effort by our R&D sector.

We implement a “market-driven R&D” and “customized R&D” strategy, to the better allocation of R&D inputs.

On the other hand, for suppliers, we design products in order to lower the price of our procurement and use, instead of simply demanding a reduction in the procurement price. We bring these views to customers to suppliers, so that they can embark on this path and together we can create a common value chain.

Low cost does not necessarily mean low value. ZTE assists Vodafone to realize value promotion in customized low-end cell phones. We help Sprint 4G in the forefront of WiMAX technology to create low-cost high-end products, and to help the operator to explore in the world’s most sophisticated telecom markets.

These are specific applications of the concept of “industrial chain value maximization”.

**Tian Ji horse race**

This is an ancient tale of the strategy used by General Tian Ji in his annual horse race with the Lord of Qi. The story goes that the Lord of Qi and General Tian Ji held a horse race every year. They each selected three horses that ran in pairs for three races. The owner of two out of three of the winners got a trophy.

The Lord of Qi would consistently win as each of his horses ran a little faster than the General’s. One year, shortly before the race, General Tian Ji was at a loss as to how he might win the trophy from his Lord. Well-known strategist, Sun Bin, called to see him, and his advice was to alter the racing sequence of his horses.

The General accordingly pitted his third horse against the Lord’s first—a race he was bound to lose. Then he raced his first horse against the Lord’s second, and won; and paired his second horse with the Lord’s third, winning again.

He thus won two of the three races and collected the trophy for the first time.
WiMAX Overview
WiMAX has become a viable option in the broadband wireless space not only because it addresses current industry issues but also because it provides an opportunity for players in the value chain to enter and succeed in a market that has historically been controlled by a select few incumbents.

Findings and Implications
- Chinese local system telecom products vendors are enjoying fantastic growth in the last ten years due to the brisk increase of China’s telecommunications market demand and large adoption by overseas customers. Now, they are looking at the emerging WiMAX market as a good opportunity to compete with global leading system vendors from same starting line. Although the WiMAX adoption progress is slow, the supply base is leading the charge toward transition to tier-one entry. It is also providing China vendors with the opportunity to elevate themselves to tier-one status. The Sprint-Nextel project provides the likes of ZTE with an opportunity to compete against traditional tier-one vendors from the same starting line.
- WiMAX will not be the “one technology that rules them all”, but will co-exist with one or both of the competing technologies.
developed by ecosystems that have considerable investments and positions in 3GPP and 3GPP2-based 2G and 3G technologies.

The penetration of the total addressable market by WiMAX depends on how much of a head start it can build up in the next two years. There is a narrow window of opportunity for WiMAX. The question now is to what extent WiMAX will be adopted. Timing is a crucial issue as farther delay in mass deployment will leave the door open for competing technologies such as LTE and UMB to catch up.

China-based vendors are actively participating in the WiMAX forum and the WPA project. In May 2007, the WiMAX Forum brought together 33 members of the equipment development and operator communities for the public mobile WiMAX Forum PlugFest. ZTE participated, and tested key mobility features such as MIMO, beamforming and handoffs.

WiMAX has an open environment due to the promotion efforts by Intel and the WiMAX Forum. A patent-pool system enables WiMAX to circumvent expensive intellectual property fees. Participation in the patent-pool gives China vendors a more competitive space in terms of technology and BoM costs.

Many telecom carriers, especially those in developed nations, have already made significant investments in their data-centric 3G and 3.5G cellular technologies. These carriers will be reluctant to transition to WiMAX in the immediate future.

iSuppli believes that in the next five years, WiMAX will find big opportunities in developing countries with low broadband penetration and rural areas of developed countries. But this will primarily be to provide fixed broadband access. Chinese vendors should focus on these areas for their potential markets.

Chinese local system telecom product vendors are looking at the emerging WiMAX market as a good opportunity to compete with leading system vendors such as Motorola and Ericsson from the same starting line. As members of WiMAX Forum, China-based vendors such as ZTE will have volume shipment of WiMAX equipment for commercial application by the end of 2007.

iSuppli expects that Chinese telecom product vendors such as ZTE will continuously strengthen and maintain their products’ advantages including: an open base station platform; an overall framework of module design; all IP architecture to facilitate integration with the network evolution of 2G/3G/IMS; innovative flexible network model to meet different demands; end-to-end products providing guarantees to operators on a large scale; a full range of services and applications.

Strength of and Challenge for WiMAX Offering

As concerns WiMAX system equipment suppliers, both traditional telecom system vendors (like Nokia-Siemens, Motorola, Samsung and Alcatel) and traditional BWA system vendors (like Alvarion and Airspan) will provide solutions for carriers.

To China’s telecom equipment vendors, WiMAX comprises not only a market opportunity for base stations and gateways, but also an opportunity to expand their sales of terminal products in overseas market, and especially in developing areas. For example, ZTE was chosen to provide WiMAX terminals including PC cards, modems and USB dongles in Sprint-Nextel projects.

However, there are some hurdles ahead for the massive deployment of WiMAX networks.

- Spectrum
- Interoperability
- Cost
- 4G competitors

In preparation for the WiMAX evolution, some questions need to be answered about keys for winning in the future WiMAX industry.

1. Can WiMAX establish enough of a stable footprint prior to the availability of LTE and UMB to ensure a significant place in the 4G world?

LTE and UMB are being developed by ecosystems that have considerable investments and positions in 3GPP and 3GPP2-based 2G and 3G technologies. The crux of the timing issue for mobile WiMAX is that most tier-one operators are considering it seriously only if their preferred 4G technologies have delays past 2010 in achieving carrier-grade
status. Most of these carriers are still trying to recoup their investments into 3G network infrastructure build-outs. However, if a major competitor decides to deploy 4G before LTE or UMB are ready and they are forced to make the transition early for competitive reasons, maximizing the penetration of the total addressable market for WiMAX will depend on how much of a head start it can build up in the next two years.

2. Can WiMAX get the endorsement of at least one more tire-one operator, outside of Sprint?

Currently, the much anticipated tier-one deployment of WiMAX has been delayed as the operators wait for 802.16e to be more widely available.

iSuppli believes that APAC will likely be the main area for WiMAX 802.16e industry with the leading firm from SingTel building wireless broadband access network for the Singapore government.

3. What are the intellectual property rights issues related to WiMAX? What impact will IPR royalties have on the cost of the equipment?

Intel is the promoter for the WiMAX industry and is leading the WPA project for WiMAX patent-pool exchange—in order to lower the cost of property fees for WiMAX equipment and terminals. China’s equipment vendors are actively participating the WiMAX standard issuance and adoption process. This participation gives Chinese equipment vendors an opportunity to have the same starting line with multinational equipment vendors.

According to the WiMAX Forum, there are currently 1550 patents owned by 330 companies and no single company has a dominant IPR position.

4. With spectrum allocation so disparate around the world, can the WiMAX supply base cost-efficiently deal with the requirements variability?

iSuppli believes the future market opportunity for WiMAX lies in the following regions: North America, Europe, APAC and Latin America.

Key WiMAX Case Study

Sprint-Nextel

Sprint-Nextel announced in August 2006 that it had designated WiMAX 802.16e as its choice for a nationwide 4G networking technology. This is a major endorsement for mobile WiMAX as a WWAN technology. The North American carrier will work with Intel, Motorola, Samsung, Nokia-Siemens and ZTE to deploy a nationwide data-centric mobile WiMAX network with planned capital expenditures of $1 billion in 2007 and an additional $2 billion in 2008. The carrier will use existing cell sites from its iDEN and CDMA2000 1X networks to deploy its WiMAX network.

As the third-largest mobile carrier in North America, Sprint-Nextel will support mobile WiMAX-enabled devices including laptops, handsets, PDAs, smart phones, portable multimedia devices and other consumer electronic equipment to offer broadband services on-demand, anywhere, and anytime.

Notably, ZTE gained some penetration in the North America as the main equipment vendor to provide WiMAX terminals including PC cards, modems and USB dongles. This is the first time that a Chinese telecom vendor has the same starting line as other multinational equipment vendors.

Project highlights:

■ Successful cooperation with Sprint-Nextel, which is the bellwether in the field of WiMAX, indicates that ZTE’s WiMAX is in the leading position in this field.

■ ZTE’s WiMAX products have successfully entered the North American market, which also indicates the high approval of tier-one customers to a Chinese vendor’s products.

■ The project of Sprint-Nextel is a benchmark to the follow-up network evolution of global 2G operators.

Future strategy for Chinese vendors:

■ The Sprint-Nextel project is the benchmark project for global tier-one operators. To maintain cooperation with the operator and market share will be critical for future penetration in the North America and other areas.

■ Seek contract manufacturing partners to lower product costs and diversify the range of products.

■ Seek partnership with local service providers and local channel retailers to strengthen the product image in retail channel markets.
Learnings and Observations from Global IPTV Deployments

Weijun Lee

Since TV is time-tested as the one-hundred-year-old “killer application”, Internet Protocol Television (IPTV), the newest member of the TV family, is well trusted by every fixed-line operator as a critical path to survive and thrive in this era of full convergence and open competition from the industries of cable, satellite, mobile, and Internet.

The IPTV industry is still in its infancy stage, although IPTV services have been trialed and initially deployed by multiple telecom carriers around the globe, with different scales and various levels of success. Therefore, many potential IPTV operators are wondering about what can be learned from the success secrets or pitiful mistakes of existing IPTV deployments.

With multiple international IPTV deployments and more than 50% share of China IPTV equipment market, ZTE is willing to share its first-hand learnings and non-subjective observations.

IPTV must offer distinct and attractive advantages over competing TV services (e.g., digital cable TV, satellite TV, and Internet videos).

IPTV will never succeed if it is just another me-too TV (e.g., TV-over-DSL or TV-over-fiber) because in that case, the end user has no strong incentive to switch to IPTV. In a worse case, an end user may actually receive negative and inferior experience because an IPTV network and system may not be as stable as other competing technologies.

Quality of Experience (QoE) is critical for user acceptance of IPTV.

An IPTV operator must endeavor to avoid a bad user experience from the very beginning because it is rather difficult to repair customer relationship if the initial IPTV service fails to meet end user expectations in terms of video quality and usability.

This implies careful service planning and network design in cooperation with a strong solution provider that has extensive deployment experience (i.e., know-how) and superior technical solutions to effectively manage the QoE.

For example, TR-069 is an industry standard protocol to remotely configure an IPTV Set-Top Box (STB) and monitor its QoE parameters (packet loss, jitter, delay, etc.). TR-069 enables proactive monitoring of QoE during normal operations and provides detailed trace data when diagnosis is needed in case of unsatisfactory user experience.

Service customization tools are needed for maximal deployment flexibility.

Besides offering a comprehensive
solution with a rich set of desirable services, an IPTV solution provider should also provide an IPTV operator with the necessary IPTV customization toolkits for developing Electronics Program Guides (EPGs), games, and Value-Added Services (VAS).

The customization toolkits enable the IPTV operator to quickly develop specialized EPGs, games, and VAS on demand in order to catch dynamic market opportunities like promotions on festivals or sports leagues.

The customization toolkits are needed to support both the centralized deployment model at the initial IPTV deployment stage and the distributed (regional) deployment model at later stages of large-scale IPTV deployments.

**IPTV solution must include strong support for enterprise and vertical markets**

Vertical markets (e.g., hospitals, schools and banks) and enterprise users may account for a large percentage of revenues at all stages of IPTV deployment.

This requires features like Virtual Content Delivery Network (VCDN), specialized EPG templates, VoD for training, video telephony, video conferencing, and video monitoring for offices, banks, schools, homes, and vehicles.

In addition, integration and convergence with existing IT infrastructure, for example, PBX and customer support system, have to be included in the IPTV solution for enterprise and vertical markets.

**CAPEX and OPEX must be minimized to ensure profitability**

In a typical IPTV deployment, the cost of STB accounts for more than half of the per-subscriber capital expenditure. As a result, an IPTV business case often heavily depends on how to lower the cost of STB while preserving all the desirable features.

Whenever permitted by digital rights laws, the Network-based Personal Video Recording (NPVR) feature may be adopted to reduce the cost of STB while offering PVR-related functions like TSTV and TVoD.

DRM license is another major cost factor. An IPTV solution should offer multiple DRM mechanisms so that an IPTV operator may select the most cost-effective DRM to meet the technical and business demands.

**An ever-decreasing subscription fee can be offset with rich VAS and intelligent advertisement insertions**

To profit, an IPTV operator must adopt multiple revenue streams, through not only subscription fees, but also pay channels, as well as through advertisements, and various value-added services.

VAS is a secret weapon for IPTV to compete favorably against cable, satellite and Internet videos. Value-added services may include televoting, e-commerce, photo/video hosting, video telephony, video conferencing, and a lot more of others.

At the era of PVR and TVoD (i.e., greater control by end users), the traditional advertising model is undoubtedly challenged since users can easily skip uninteresting advertisements. However, thanks to the powerfulness of IPTV middleware and the convenience of IP transport, it is much easier for each IPTV STB to collect and report a user’s viewing habits and service patterns enabling the IPTV system to perform intelligent data mining to deliver more relevant, thus more attractive, advertisement insertions. The privacy of each user must be respected in this case to avoid user resentment. A user must be able to indicate his or her choice of privacy levels.

**A significant mass of subscribers can be attracted through effective marketing**

When IPTV services are launched, creative and appealing market promotions (e.g., free STB for 2-year contracts, one-month free) play a key role in IPTV success. The rationale is to attract a significant mass of subscribers as quickly as possible to increase revenue streams from advertisements and value-added services.

Besides the above mentioned rules of thumb, many other important learnings and observations are probably worth sharing though they are not included in this article due to length limitations.

ZTE, as a global leader with superior IPTV solutions and extensive deployment experiences, is always willing to help every IPTV service provider successfully launch and grow their IPTV business.
Background

Reliance Communications (Reliance) is the largest CDMA mobile operator in India and the fourth largest CDMA operator in the world.

Reliance launched its mobile services on May 1, 2003, and becomes India’s largest mobile service provider within seven months of commercial launch. Reliance offers a complete range of telecom services including CDMA, GSM, fixed network, and broadband. As of August 2007, it already has as much as 34 million users, the largest user base in India.

Quality Wins Trust

Faced with India’s intense telecom market competition and explosive telecom growth, Reliance decided to expand its network by implementing IP GMSCs. ZTE’s unique IP GMSC gained favor from the operator for its large capacity, all-IP architecture and high performance ratio.

In October 2006, Reliance introduced six sets of ZTE’s IP GMSCs (GMSCs/GMGWs) to reduce traffic congestion of Ericsson’s TDM gateway. It was the first step taken by Reliance to implement a national IP network, and it opened the doors for a comprehensive cooperation between Reliance and ZTE.

At the beginning of 2007, when India was going to issue the 3G license, Reliance started massive network expansion. With full confidence in ZTE’s quality CDMA products, Reliance awarded ZTE the contract to supply 15 GMSCs, 25 MSCs, and more than 8,300 IP BSSs, symbolizing that Reliance entered the peak period of the national IP-based network construction. ZTE has built a long-term stable strategic partnership with Reliance and become its biggest supplier of All-IP core network equipment.

ZTE’s All-IP Technology Improves the CDMA Network Voice Quality

ZTE’s GMSC and MSC used in Reliance’s CDMA project are its CDMA2000 core network products (ZXC10-3GCN) based on the All-IP platform. The system has a large capacity and small size by employing the All-IP architecture. 3GCN products help operators save equipment rooms, thus minimizing the cost. Additionally, Enhanced Variable Rate Codec (EVRC) between the MGW and the BSC is used, which can save the bandwidth through voice compression. Transcoder Free Operation (TrFO) technology can be used when both ends of a voice call use the same codec, to save transcoder resources, reduce delay and improve voice quality.

Reliance has the world’s second largest centralized network management system—National Network Operations Center (NNOC). The NNOC collects information from all the nodes and generates an overall report. According to data collected by the NNOC from June to August 2007, the voice quality of Reliance’s CDMA network has been greatly improved as compared to the legacy system.

Take Bangalore as an example. This city’s voice KPIs collected by NNOC is illustrated in Table 1. Call Setup Success Rate mainly indicates the capability of the mobile switch network. Voice Origination Success Rate and Voice Paging Success Rate...
are two important parameters at the radio access side network, which represents the success rates of call origination and call termination. From Table 1, it can be seen that the paging success rate has remarkably improved from 82.27% to 94.37%. The handover success rate represents the direct voice handover coefficient when the user travels from one cell to another; or from a sector to a sector within a cell. The higher the coefficient is, the lower the call drop probability will be during the handover process.

<table>
<thead>
<tr>
<th>City</th>
<th>Call Setup Success Rate (%)</th>
<th>Voice Origination Success Rate (%)</th>
<th>Voice Paging Success Rate (%)</th>
<th>Voice Handoff Success Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZTE</td>
<td>99.39</td>
<td>98.69</td>
<td>94.37</td>
<td>99.86</td>
</tr>
<tr>
<td>Legacy</td>
<td>97.77</td>
<td>97.05</td>
<td>82.27</td>
<td>99.12</td>
</tr>
</tbody>
</table>

After the deployment of ZTE’s All-IP solution, it can be seen, from the available statistics, that the KPIs of Reliance’s CDMA network have been remarkably improved. This means reduced user call drop rate, increased call duration, improved voice quality, reduced customer complaint rate and enhanced customer loyalty, which are all critical for the operator to increase its market share.

**ZTE’s Network Planning and Optimization Services Ensure the Stable Running of the CDMA Network in Special Environments**

There are many challenges brought by the characteristics of India’s networks such as large traffic, high user sensitivity, and microwave transmission.

Due to a large population base, India has witnessed a fast development in the telecom industry with a fierce growth in mobile telephony in the past few years. According to Reliance’s statistics from April to July 2007, the number of new CDMA users increases by 4% every month. Besides, many busy cells have four carriers with over 33 Erl traffic load per carrier sector.

High traffic load presents a big challenge for network performance. Always bearing this in mind, ZTE’s network optimization team has made great efforts in extending the terminal standby time, improving voice quality, increasing the success rate of user access at the network edge, enhancing data service performance and solving complaints quickly.

**Reliance Keeps the Leading Position in the Market**

According to the statistics from India’s department of telecommunications, the Indian telecom market has sustained a growth rate of over 50% since 2000, and its cell phone users are expected to reach 278 million by 2010. By this October, CDMA2000 accounts for 30 percent of the total wireless subscriber base in the country. As the biggest operator in the Indian telecom market, Reliance continues to increase its investment and improve its network quality to attract customers, maintaining its leading position in the market.

ZTE is one of the leading CDMA equipment vendors in the world, and has a complete package of independently developed products ranging from base stations, switches to terminals. The company also has the competency in core R&D and commercialization of the CDMA system. Its differentiated and customized solutions as well as perfect customer service enable it to make remarkable breakthroughs in the market. Relying on its cutting-edge technology and rich commercial experience, ZTE will help Reliance continue its market leadership.
Overview

Bandwidth on demand (BoD) is a new feature provided by the Automatically Switched Optical Network (ASON), and it allows a user to dynamically change the amount of available bandwidth. BoD service is a new network value-added service that can adapt to the network service environment that is transforming from the traditional voice services to data services. Data services are bursty, diversified and uncertain, and they pose challenges to the service delivery mode of optical networks, requiring dynamic bandwidth adjustment.

BoD service can be implemented in two ways: the first is that the network timely provides bandwidth for point-to-point service connections when required by users; the second is that the network quickly responds to the bandwidth modification requests from users without interrupting the service.

These two types of BoD services should be performed via the User Network Interface (UNI) which is compliant to the UNI interface specifications as defined by the Optical Interworking Forum (OIF), an ASON standardization organization. The first type of BoD service is implemented through the switched connection (SC). This function specified in UNI 1.0 is mature. The second type of BoD service specified in UNI 2.0 involves bandwidth dynamic modification; thus, it is more complex than the first type. The OIF showed this function in the Worldwide Interoperability Demonstration at this year’s European Conference and Exhibition on Optical Communication (ECOC), indicating that the BoD service model is receiving increasing attention.

BoD Service Models

BoD service can be enabled either by the management plane or the control plane.

Management plane-enabled BoD is not the real BoD application mode. The real BoD application mode uses the ASON control plane, and is provided through the UNI functions. Control plane-enabled BoD provides three application models including SC-based BoD, schedule-based BoD and call modification-based BoD.

SC-based BoD

In this model, SCs via the UNI interface are used for the automatic creation and deletion of end-to-end BoD service. At present, all ASON vendors can deliver such a service.

An SC is initiated by the network edge device, and completed through the network-side control plane. While being consistent with the relevant SLA and carrier’s policies, the BoD connection should be established in as short a time as possible. It is usually completed in a matter of seconds. Therefore, this model is sometimes called just in time (JiT) BoD.

In this mode, the service connection is initiated through the call set-up process via the UNI interface, and it is deleted through the call release process. In the whole process, there is no connection bandwidth modification and call modification. It is a simple yet mature BoD application model.

Scheduled BoD

Scheduled BoD means that the bandwidth is adjusted according to the schedule. It is a kind of BoD service customized to the traffic amount...
of users, and performed under the precondition of the accurate traffic prediction by users. Users and carriers together set a bandwidth adjustment table (e.g., allocating different bandwidths at different periods of a day or a week), thus allowing on demand adjustment of the connection bandwidth.

The service connection is established through the call setup process via the UNI interface. The service bandwidth is modified in a fixed time period, and is then recorded by the network management system (NMS).

One characteristic of this model is the management of the bandwidth adjustment schedule. After the schedule is configured in NMS, NMS will automatically initiate the call modification procedure including the connection bandwidth modification.

Of course, it can perform creation or deletion of a service connection at a fixed time.

**Call modification-based dynamic BoD**

This model provides BoD service based on real-time changes of traffic load, and it is also called dynamic BoD.

Dynamic BoD is different from scheduled BoD mainly in two aspects. First, its bandwidth adjustment is initiated dynamically rather than at a fixed time, and it requires the client-side or network-side device to offer traffic detection function. Second, the subject initiating the call modification procedure in the dynamic BoD is the client device while it is the network-side NMS in the scheduled BoD.

Traffic detection function can be provided by either the client-side or network-side device. The client-side device is required to offer such a function in most current situations. The client device initiates call modification request via the UNI-C interface based on the traffic detection results, and completes the bandwidth modification in combination with the Link Capacity Adjustment Scheme (LCAS) function in the network-side device.

**Non-disruptive bandwidth modification**

specification in UNI 2.0 targets such application mode.

### Application of BoD Service

The BoD service models support such services as the remote backup of data servers (especially in situations of failure), timed Web contents updates, on-demand distribution between video servers, and dynamic calculation of photon grid, but it also supports carrier’s carrier services. These connections fall into the category of switched connections and can be more dynamic than fixed connections while also having shorter holding times. In addition, BoD service is more flexible and complex than the provisioned bandwidth service (PBS). With the PBS model, the average usage ratio is low, and the charging of the connection is independent of the usage of the connection. With the BoD service model, the user can increase or decrease the service bandwidth in certain time periods, or even take down and restore a connection, thus improving the resource utilization and reducing customers cost.
BoD service focuses on customers, such as ISPs, large intranet, and other data and SDH networks (carrier’s carrier model) that require dynamic bandwidth adjustment. If these customers can support UNI functions in their edge devices, and customer edge devices can be physically connected to the network with adequate bandwidth, implementing BoD service is desirable.

**ZTE’s BoD Solution**

BoD service is emerging with the introduction of ASON technology. The BoD service provisioning model depends on which layer in the transmission network the ASON technology is applied.

Currently, almost all commercialized ASON networks dispatch services at the VC4 level granularity, and ASON technology can maximize its advantages only in the mesh network architecture. Therefore, it is mainly adopted in the national/provincial backbone networks, and in metro core networks in large cities. The metro convergence layer and the core layer in small-to-medium cities interconnect with the ASON network via the UNI interface.

In the context of the above-mentioned network architecture, carriers are mostly concerned about how to rapidly configure connections for services. SC-based BoD service which can address such concern has found the widest application.

ZTE can deliver a total BoD solution for customers including the ASON equipment developed in conjunction with Ciena and the MSTP equipment that has the UNI interface.

The ASON equipment ZXMP C660/640 provide features such as a large cross-connecting capacity, large granularity dispatching (VC-4 and above), high integration, diversified interface units and good scalability. Meanwhile, they are compliant to the OIF UNI1.0R2, UNI2.0 and E-NNI1.0 specifications, and are capable of delivering ASON value-added services including BoD.

ZTE’s MSTP equipment (S385/S390) comply with the OIF UNI1.0R2, UNI2.0 specifications, and can initiate and complete the call setup and modification procedures for BoD service via the UNI interface.

BoD service enabled by ZTE through the call control and connection control components; on the management plane, the bandwidth is adjusted by the call management function. Through these three planes, the three BoD application models can be provided for Gigabit Ethernet services.

**Conclusion**

As BoD service can help operators deal with bursty and uncertain data traffic, it has gained increasing attention from both carriers and vendors. But in practical applications, many issues including security, policies, billing and authentication still remain unsolved, and nearly all commercial ASON networks haven’t deployed the UNI interface yet. With the deepening of relevant research, the maturity of ASON technology and an industry-wide effort, BoD service will give full play to its advantages, such as efficiency, flexibility and manageability, creating a win-win situation for both carriers and customers.
Background of T-MPLS

As telecom services are evolving towards IP-based, there is a shift in the transport network services from TDM to IP. SDH technology, which is originally developed for the transport of TDM services, is unsuitable for transmitting IP-based data services. SDH-based multiservice transport platform (MSTP) technology can be used, to some extent, to transport the carrier-class packet services, representing the evolutionary trend from the optical transmission network to packet transmission network. However, as MSTP still supports TDM at its core, it can hardly cater to the network traffic dominated by packet services. Therefore, the future market needs a kind of packet transmission technology that can provide the effective transport of packet services and the carrier-class Operations Administration and Management (OAM) and protection mechanisms. Driven by the demand, the industry put forward the concept of Packet Transmission Network (PTN) to build a transmission network for packet-dominated traffic. Three PTN technologies, namely Transport-Multi Protocol Label Switching (T-MPLS), Provider Backbone Bridging with Traffic Engineering (PBB-TE) and Provider VLAN Transport (PVT), are being standardized and implemented in the telecom networks, but T-MPLS technology is ahead of the other two technologies in the standardization process.

Introduction to T-MPLS

T-MPLS is a connection-oriented packet-switched technology defined by ITU-T. It simplifies and modifies MPLS/Pseudowire (PW) technology, and introduces such concepts as layered transport architecture, OAM and linear protection to meet transport network requirements.

T-MPLS technology consists of three planes: data plane, management plane and control plane. However, only some functions of the T-MPLS data plane are standardized at present, whereas the T-MPLS management and control planes still need further study. The T-MPLS standards are anticipated to be completed after 2008.

The following standards are now pre-published:

- G.8121: Characteristics of T-MPLS equipment functional blocks. It describes T-MPLS processes
and adaptation functions, as well as supervision of continuity, connectivity, maintenance signal, defect and performance.


Further standardization work is ongoing, including:

- G.8113/Y.1372: T-MPLS OAM requirements.
- G.8114/Y.1373: T-MPLS OAM mechanisms.
- Y. mrps (draft version): T-MPLS ring protection switching.

A T-MPLS network comprises many T-MPLS nodes through various types of network node interfaces (NNIs). Client services like E1/T1, FE, GE and 10GE access the network via user network interface (UNI); they select the corresponding T-MPLS Channels (TMCs) after being processed at the service layer. TMCs with the same route are aggregated within a TMP at the NNI side. T-MPLS layer network model in ITU-T G.8110.1 is shown in Figure 1.

ZTE’s Successful Participation in the T-MPLS Interoperability Test

ZTE developed T-MPLS function using its multi-service transmission equipment ZXMP S385. Its structure, designed to comply with the European standards, can meet the demands of the existing future services.

The ZXMP S385, embedded with T-MPLS, was successfully interconnected with the equipment from other vendors in the third global multi-vendor interoperability test of the packet transmission network equipment organized by the European Advanced Networking Test Center (EANTC). It successfully fulfilled transport and protection of client services.

In the test, a single equipment can realize the functions of both the edge NE node and the intermediate NE node at the same time; the operating staff may configure it into an edge NE node or intermediate NE node as required. When the service layer selects an Ethernet interface, and when the client service data are transferred from the edge node UNI to NNI, three adaptations need to be performed: adding the TMC, adding the TMP, and adding the MAC address and Protocol Data Unit (PDU) type domain.

The ZXMP S385 also implemented the GE interworking via UNI, GE interworking via NNI and SDH/SONET interworking via NNI. The equipment has passed all the T-MPLS test items, including label mapping, diff-serv, label switching, linear path protection switching and OAM. Among them, the T-MPLS path protection switching achieved the best performance indicators in the industry. Meanwhile, the ZXMP S385 provides redundancy backup of key boards, and powerful network and service link layer protection capability.

The success of ZTE’s T-MPLS equipment in this test proved that it can provide end-to-end carrier Ethernet services in a manageable and operatable way. The test verifies the feasibility of T-MPLS, and is helpful as well for furthering T-MPLS standardization and speeding up its commercialization.
Introduction

WiMAX has recently become one of the hottest technology topics in the telecommunications industry. After two years of rapid growth, the WiMAX industry chain is getting mature, and is expected to be commercially rolled out by 2008 to 2009. Since the market for WiMAX is relatively small, a study on the relationship between WiMAX and existing 3GPP and 3GPP2 networks, which will considerably affect the development of WiMAX and even the whole communication industry, is of great significance.

As a board member of the WiMAX Forum, ZTE has always been devoted to offering quality WiMAX products and total solutions.

Technical Advantages of WiMAX over 3GPP

WiMAX aims to deliver mobile broadband access service. The WiMAX air interface standards IEEE 802.16d (for fixed access) and IEEE 802.16e (for mobile access) were launched in 2004 and 2005 respectively. With the maturity of WiMAX terminals and systems, an increasing number of WiMAX 16e trials have been deployed, and more and more operators get to know the characteristics of WiMAX such as high bandwidth comparable to Wi-Fi, wide coverage and full mobility comparable to 2G and 3G cellular networks, and perfect security, billing and QoS guarantee. It is estimated that the 3GPP Long Term Evolution (LTE) system providing high bandwidth will be launched about one to two years later than WiMAX.

WiMAX and 3GPP have similar mobility and coverage. But WiMAX can reach 75 Mbit/s with a bandwidth of 20 MHz, far higher than 3GPP.

Requirements for Network Interworking

Network convergence can benefit both end users and operators. The user hopes to use the same account number, password and service platform, get the same account bill, extend services to the new system, and to be granted seamless service continuity between different systems. For operators, using the same accounting and billing system can significantly reduce their operation and maintenance and hardware costs while handover between different systems can both meet users’ requirements and keep the old system functioning.

In 2003, the 3GPP began to standardize the interconnection between 3GPP and WLAN networks, and introduced six scenarios for 3GPP and WLAN (WiMAX can be considered as a WLAN) interworking system in 3GPP TR 22.934. These scenarios describe six interconnection levels in WiMAX-3G interworking.

Methods of WiMAX-3G Interworking

Loosely coupled solution 1
(Common billing and provisioning)

WiMAX and 3GPP networks share the same provisioning and billing
systems; so, users only need to open one account. They will receive one bill for usage charges of both WiMAX and 3GPP services. This solution (Figure 1) avoids, to a great degree, the upgrade and reconstruction on either 3GPPP or WiMAX network, and is easy to implement. In this solution, the two systems are independent from each other.

Some alterations shall be made to the provisioning and billing systems of the existing 3GPP networks. The billing center needs to collect and combine the charging data records generated from the CG and AAA respectively. The provisioning system needs to break down the user account information and store it into the HLR and AAA respectively.

Loosely coupled solution 2
(Shared authentication)

The WiMAX network in this solution (Figure 2) is subordinate to the 3GPP network. The authentication, authorization and accounting associated with WiMAX users are provided by the 3GPP network elements such as AAA and HLR. The WiMAX user billing information is collected at the AGW and reported to the billing system of the 3GPP network.

Both the WiMAX and 3GPP terminals uniformly use the Network Access Identifier (NAI) for user identification, and use the EAP-AKA as the authentication method.

Loosely coupled solution 3
(Shared PS service)

This solution (Figure 3) is specified
in the TS 23.234. Introducing new network entities like WLAN Access Gateway (WAG) and Packet Data Gateway (PDG) into the 3GPP network makes the network architecture clearer and the WiMAX network interfaces more open, and the system security mechanisms more complete.

The WAG is equivalent to the SGSN user plane, which enforces routing user data to the PDG.

**Tightly coupled solution 1 (UMA)**

Generic Access Network (GAN), also known as Unlicensed Mobile Access (UMA), is defined in the 3GPP TS 44.318. From a protocol perspective, WiMAX is used as a Wireless Access Point (AP) in GAN to provide IP access point function. According to the 3GPP TSG GERAN, GAN only defines Generic Access to the A and Gb interfaces, and enhanced GAN (EGAN) has identified three potential solutions for the GAN enhancements: enhanced Up, A/Gn mode and GAN Iu mode.

**Tightly coupled solution 2 (Physically combining GGSN and AGW)**

In this solution uniquely proposed by ZTE, the GGSN/AGW network element integrates the 3GPP GGSN and WiMAX AGW functions. This enables easy networking and low investment cost. In essence, the solution only combines the functions of the AGW and GGSN, but these two network elements are still logically independent from each other.

We find from the comparison that the loosely and tightly coupled solutions have their own advantages and disadvantages. The practical deployment mode can be selected according to factors such as services, implementation environment and cost. Generally, WiMAX and 3GPP belong to networks at different stages of development. The best solution is various improvement works are now underway. Other solutions also have their advantages in certain application scenarios. With the deepening study on the interworking solutions, seamless handover of 3G services across heterogeneous networks will be finally achieved, thus bringing true convenience to end users.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Comparison of the 3GPP/WiMAX interworking solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution</td>
<td>Level of Technical Difficulty</td>
</tr>
<tr>
<td>Loosely coupled solution 1</td>
<td>Easy</td>
</tr>
<tr>
<td>Loosely coupled solution 2</td>
<td>Middle</td>
</tr>
<tr>
<td>Loosely coupled solution 3</td>
<td>Middle</td>
</tr>
<tr>
<td>Tightly coupled solution 1</td>
<td>Difficult</td>
</tr>
<tr>
<td>Tightly coupled solution 2</td>
<td>Middle</td>
</tr>
</tbody>
</table>

**Conclusion**

ZTE’s product range is the most complete in the world—from fixed line, 3GPP, 3GPP2 to WiMAX network products, its complete product range places it in an advantageous situation to study network convergence. ZTE leads the industry in network convergence products and solutions.
ZTE’s CDMA2000 Mobile Softswitch Solution

Chen Ji

Overview

ZTE’s CDMA2000 all-IP core network product series (ZXC10-3GCN) are carrier-class communication equipment, which the company has independently developed and owns the complete intellectual property right of. Compliant with the 3GPP2 standard, the system is based on IP technology and employs advanced NGN softswitch technology, providing operators with the core network functions of a CDMA2000 all-IP system. The ZXC10-3GCN provides the IOS V 5.0-based A/Ap interface between the core network and the radio access network, and is capable of smoothly evolving to the Multimedia Domain (MMD).

Advanced All-IP Universal Carrier-Class Platform

ZTE’s CDMA2000 all-IP solution is an end-to-end solution that is based on its independently developed all-IP universal carrier-class platform and open standard.

ZTE integrates multiple 3G technologies (e.g., CDMA2000, WCDMA, and TD-SCDMA) into a universal platform, providing operators a flexible and future-oriented 3G platform. The system adopts a standardized and modulated hardware and software design, and realizes independent service network elements or multi-service integrated network elements by stacking the functional modules, protecting operators’ current and future investments while offering flexibility.

ZTE’s all-IP universal carrier-class platform presents several advantages. The platform enables easy construction of CDMA2000, WCDMA, TD-SCDMA and fixed NGN networks. Various nodes in the system share much commonness, providing easy management and reducing backup costs. Based on a common platform, the interconnection and interworking between networks become easy, reducing services’ limitations. Moreover, the platform can, to some extent, alleviate operators’ pressure resulting from the unpredictability of network construction.

Featured Services

ZTE has always been dedicating itself to developing various applications through cooperation and discussion with operators. Besides the services stipulated in the protocol, ZTE’s CDMA2000 all-IP core network products can provide a variety of featured services like over the air (OTA) services, virtual MSC and roaming restriction according to operators’ requirements and network features.

Smooth Network Evolution

The IP Multimedia Subsystem (IMS) or MMD architecture is the evolution target of CDMA network.

ZTE can provide a whole set of IMS network equipment including CSCF, MRF, IM-MGW, and HSS while its CDMA2000 all-IP core network can be smoothly upgraded to an IMS domain.

Global Presence of ZTE CDMA Products

ZTE is not only the largest listed telecommunications equipment manufacturer in China, but also a world leader in CDMA technology. ZTE’s CDMA products have been deployed in more than 70 countries for over 120 operators. The total global capacity of ZTE CDMA softswitch products reaches 60 million lines.

Conclusion

ZTE has been devoting itself to the R&D and promotion of 3G equipment. The ZXC10-3GCN is another competitive product developed by ZTE. With the perfection of the 3G industry chain, diversification of 3G services and the increasing deployments of 3G networks, ZTE will continue to develop more and better products and service models according to customers’ requirements.
A Record of CDMA WLL Project in Africa

Li Yonghui

After ZTE signed the contract with an operator in a Northeastern African country for a CDMA Wireless Local Loop (WLL) network, ZTE’s mobile project team has overcome various difficulties to accomplish the original engineering work, as well as the replacement of all base stations in the construction area of another company, thus building up ZTE’s brand image in the local market.

Background

An African operator began to build the mobile network after getting the CDMA2000 license in 2005. During Phase I of its CDMA network, ZTE, with strong technical expertise, was awarded a deal to build the network in two large districts in the country’s capital city whereas another company was responsible for the construction of the network in another district.

It was the first turnkey project between ZTE and the operator. Under the contract, the number allocation should be started three months after the contract was signed.

ZTE promptly dispatched a well-chosen team with members from various departments to the project site.

A Sound Plan

The project team actively communicated with the customer, analyzed the contract terms in details, defined the project scope, and created the project plan in line with ZTE’s turnkey project design specifications. First, they created a work breakdown structure (WBS) and a general plan of the project. The plan divided the construction phase into eight steps namely: project initiation, network planning, site acquisition, civil engineering design, site license, civil construction, telecom equipment installation and system integration. 28 activities defined in the WBS would proceed orderly. Based on the general plan, the sub-plans have been made, covering five aspects (i.e., logistics, procurement outsourcing, quality, risks and human resources).

The logistics plan was important as far as the project period was concerned. Therefore, the project
A team established a logistics plan of air bridge service and partial shipments. In the first shipment, main equipment, power supply system and some diesel air conditioners were transported by air to the front, to ensure that the construction could be started ahead of time and there would be no supply bottleneck in the subsequent constructions.

The outsourcing plan was also critical to the project progress and quality. ZTE organized 10 construction teams, which consisted of many outstanding subcontractors from China, and several strong international subcontractors from local areas, to install central equipment rooms and base stations. This outsourcing team with a rational division of labor laid a good foundation for the project success.

During the construction, quality managers were especially appointed to conduct quality inspections to the base stations, and they identified and quickly rectified the construction quality problems.

**A Reversal of Situations**

ZTE completed the network deployment in two districts, with quality and speed far ahead of another company that was responsible for another district. The operator was unsatisfied with this company as the gap between it and ZTE, in terms of construction quality and network optimization, was wide. On the advent of the commercial application of the network, call drops caused by hard handoff failure frequently occurred on the boundaries between the two companies’ responsible districts. The operator was aware of the importance of the problem—it would directly affect the quality of the future commercial network if left unsolved. Considering a network quality report provided by a German acceptance company and ZTE’s outstanding engineering services during Phase I, the operator decided that ZTE would be responsible for replacing all 66 base stations in another company’s district and signed the Phase II equipment relocation contract.

**The Glory Continues**

With common efforts of the frontline and backline personnel, ZTE finally accomplished relocation/replacement of another company’s 66 base stations and network optimization on schedule after a month of hard work. The network quality has been much improved upon completion of the network. Furthermore, ZTE’s construction and after-sales project implementation competence and service quality were collectively praised by the operator’s engineers and leaders. By virtue of its outstanding performances in the project (both Phases I and II), ZTE was awarded a new Phase III capacity expansion contract.

**There is a saying from ZTE Chairman, Mr. Hou Weigui:** “intelligence brings a small victory, virtues bring a big victory”. Only by serving customers with absolute dedication and gaining their trust can an enterprise achieve sustained success. The scientific after-sales project management and ZTE’s spirit of solidarity and enterprising are its magic weapons to success.
At the China Mobile Market Annual Conference 2007 held this September, Zhou Zixue, Director of the Department of Economic System Reform & Economic Operation of the Ministry of Information Industry (MII) said Nokia, Motorola, Samsung and Sony-Ericsson took the top four spots in China’s mobile handset market, while ZTE ranked fifth and topped domestic brands with a market share of 4.8% at the end of June 2007. The statistics released earlier by GFK, Germany’s market research firm, showed that ZTE has outperformed Samsung, Motorola and LG Electronics to become the largest CDMA handset supplier in India, accounting for almost a 30% share by April 2007.

Why can ZTE perform outstandingly both at the domestic and international markets when domestic brands are loosing market share to foreign competitors? Xiong Hui, Deputy General Manager of ZTE’s handset division attributed this to the company’s R&D and innovation capabilities, as well as its operator-customized handset strategy.

“When many domestic handset makers were competing within traditional sales channels, ZTE chose to exit the area and seek for partnership with operators, facilitating them on customization of handset products.” Mr Xiong said. He further emphasized that the development of the company’s overseas market has reached the blowout and harvest period, and its quick response to demands for product customization and strong R&D strength make it very competitive in the market.

Mr Zhou expressed a positive opinion on ZTE’s strategy. “Once 3G went into operation in China, bundled sales with operators will become mainstream, which will pose a challenge on the retail model. The customization model will be the main direction of other domestic vendors. And a handset vendor’s powerful customization capability is deeply interrelated with its R&D and innovation capabilities.” In 2006 ZTE spent 12.3% of its total revenue on research and development. This is a relatively high proportion to spend on R&D.

ZTE’s handsets have been sold in over 70 countries and regions, and cover 2G, 2.5G, as well as the three international 3G standards—WCDMA, CDMA2000 and TD-SCDMA.
ZTE unveiled a series of industry’s first TD-SCDMA handset products at PT/ Wireless & Networks Comm China 2007 held in Beijing, China from 23-27 October 2007. These pioneering products include TD-SCDMA U80 handset, TD-SCDMA/EDGE dual-mode dual-stand by U980 handset, as well as TD-SCDMA USB Modem MU318.

ZTE U80 handset is the first TD-SCDMA handset in the industry with mobile TV function. Developed based on multimedia broadcast multicast service (MBMS) technology, it provides users smooth broadcast service for an unlimited period as well as multi-channel switch, allowing unique mobile experience. ZTE U80 is an integration of ZTE’s network, business and terminal product lines in one single product. Apart from ZTE U80, the MBMS function is already embedded in a variety of up and running products provided by ZTE.

ZTE U980 is also the first dual-mode dual-standby intelligent handset in the industry, supporting both TD-SCDMA and EDGE. The device has typical TD-SCDMA 3G functions including Internet access, downloading, mobile office, mobile investment, and EDGE capability, delivering the highest roaming frequency worldwide. The device meets the needs of demanding consumers for a high-performance handset to manage a variety of daily and office tasks. It also has a large mailbox capacity compared with 2G handsets available in the market today. By next year, ZTE plans to roll out a version of the unit that supports HSDPA, in order to deliver advanced performance with higher frequency.

In addition to the launch of U980, ZTE also unveiled the MU318 data card at the same show, the first TD-SCDMA USB modem in the industry that enables internet connection anytime and anywhere.

ZTE is a leading proponent of 3G device, initiating R&D efforts to successfully develop devices now widely used worldwide. To date, ZTE has sold 60 million handsets in over 70 countries and regions. It is one of the mainstream suppliers of many leading and large global telecom operators including Vodafone, Hutchison, Telefonica.
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