

ZTE TECHNOLOGIES

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EasyService™ : A Guarantee for FTTx Broadband Services

Pushing Forward LTE

An interview with Li Jian, general manager of ZTE's CDMA and LTE products, by Sina Science and Technology



CSL and ZTE Launch World's First Commercial Grade LTE/DC-HSPA+ Network

Driving Hong Kong to lead the world in mobile broadband innovation



From left to right: Tarek Robbiati, Group Managing Director of Telstra International Group, David Thodey, CEO of Telstra Corporation, Joseph O'Konek, CEO of CSL Limited, and Hou Weigui, Chairman of ZTE Corporation

25 November 2010, Hong Kong — CSL Limited (CSL), Hong Kong's leading mobile network operator in partnership with ZTE today announced the launch of the world's first LTE/DC-HSPA+ network, heralding a new era in global mobile communications. LTE is the next generation of mobile broadband networks

and dramatically increases capacity and speed, providing peak downlink speeds of 100Mbps with low latency. CSL's combined LTE/DC-HSPA+ network delivers unprecedented high-speed data with high accessibility and full coverage across Hong Kong.

At today's launch ceremony, CSL

demonstrated how the performance of the LTE/DC-HSPA+ network will 'go beyond' existing mobile technologies, building in partnership with ZTE Corporation.

"CSL is proud to be the pioneer of the world's first LTE/DC-HSPA+ network, which will ensure we continue to go beyond expectations, delivering the best coverage and user experience in Hong Kong while meeting the rapidly increasing demand for mobile data driven by the proliferation of smartphone and tablet devices," said Joseph O'Konek, Chief Executive Officer, CSL Limited.

"This revolutionary technology represents a quantum leap into a whole new era of mobile broadband for business and entertainment, putting Hong Kong at the forefront of global telecommunications innovation," he added.

ZTE and Cell C Recognized for "South Africa's Fastest Broadband Services"

4 November 2010, Shenzhen — ZTE today announced that Cell C, South Africa's cellular network operator was awarded the accolade of "South Africa's Fastest Broadband Services". This accolade was awarded through the 2010 Broadband Survey for Cell C's latest GSM/UMTS network, built and deployed by ZTE.

Following a total of nearly 2000 broadband users' responses from the completed survey, the performance of Cell C's network led by a clear margin. In a series of speed tests conducted, the

average download speed for all broadband services in South Africa was 2.17Mbps for local connectivity and 1.3Mbps for international speed tests. The newly launched Cell C HSPA+ offering had the highest downlink speeds of 7.21Mbps for local tests and 2.47Mbps for international tests. Cell C's HSPA+ achieved uplink speeds of 2.01Mbps locally and 1.03Mbps internationally.

Mr. Lars Reichelt, CEO of Cell C, noted that since the launch of the GSM/UMTS high-speed network at the beginning of September 2010, the network operator had

been reaping customer accolades for its sheer speed and connectivity. "If you want to be part of the future, you have to shape the future, and this is exactly what ZTE and Cell C have been doing for the past 10 months, through installing the most advanced mobile network on the African continent with HSPA+ 900, MSR and an all-IP platform," stated Lars.

The award for "South Africa's Fastest Broadband Services" came just seven weeks after the launch of its newly-built network, signaling the dawn of a new era in South Africa.

ZTE TECHNOLOGIES

A Monthly Publication

Vol. 12 No. 12 Issue 131 December/2010



P3

Interview

Pushing Forward LTE

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Focus



P7

EasyService™: A Guarantee for FTTx Broadband Services

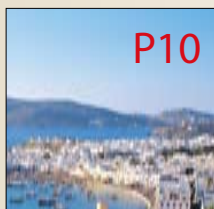
EasyService™ is a broadband service support system consisting of EasyOptical, EasyCopper, EasyGateway, EasyCSM, EasyAssistant, and EasyGuider



P12

The Road to FTTx O&M Specifications

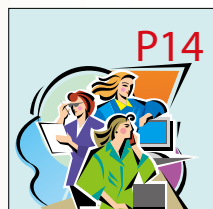
The key problem of direct SNMP access is that many details about NE interfaces are exposed to OSS, and OSS is extremely sensitive to interface changes



P10

ON Telecoms Boosts Broadband Services with EasyService™

Greek operator ON Telecoms adopted EasyService™ to cut over gateway data for 115,000 family users and to operate an automatic configuration server platform



P14

FTTx O&M Solution

ZTE provides an all-round FTTx service guarantee solution that allows interconnection among the service guarantee system, PON network management system, and fault handling system

CONTENTS

Case Study

Telenor Sets the Pace in Montenegro 16

Telenor Montenegro became the first operator in the country to deliver a cutting-edge, fast-rate HSPA+ network

A Miracle on the Top of Mt. Everest 18

ZTE deploys 3G stations at the world's highest point



Third Eye

IPTV Equipment Market Analysis 20

In Asian IPTV middleware market in 2010 H1, ZTE ranked No.1 in terms of its comprehensive factors including the financial situation, investment levels, and business prospects

Mobile Broadband Internet Hastens Development of the Cluster Router Market 24

Frost & Sullivan analyst's comment on ZTE's T8000 100G cluster router

Press Clipping

ZTE PEEL Brings Sprint's 3G Network Reliability to Apple iPod Touch; Creates Mobile Wi-Fi Hotspots 25

Unique form factor of ZTE PEEL™ cradles Apple® iPod touch® for easy access to Sprint's 3G data speeds

News Brief 27

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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中兴 ZTE CORPORATION

Pushing Forward LTE

An interview with Li Jian, general manager of ZTE's CDMA and LTE products,
by Sina Science and Technology

October 11, 2010 By Kang Zhao
Source: Sina Science and Technology



Li Jian, general manager of ZTE's CDMA and LTE products

LTE is the technology of choice for next-generation wireless networks and has drawn great attention from telecom vendors and operators worldwide. As of July 2010, ZTE had deployed seven commercial LTE networks and approximately 50 trial networks in conjunction with its partners. These networks span Europe, America, Asia-Pacific, and the Middle East. Li Jian, general manager of ZTE's CDMA and LTE products, was interviewed by Sina Science and Technology during P&T/EXPO COMM CHINA 2010. She talked about the development of LTE and ZTE's investment in LTE technology.

Reporter: Operators are now paying great attention to LTE. Could you tell us about ZTE's present investment in FDD-LTE?

Li Jian: FDD-LTE is considered an evolutionary path for most wireless technologies. ZTE has never hesitated to invest in FDD-LTE R&D. We started research into FDD-LTE in 2005 and have almost 4000 engineers dedicated to this work. Our R&D team comprises ZTE's best wireless technology experts from Xi'an, Shenzhen, Shanghai, Europe, and the U.S.

R: To date, what progress has ZTE made on the R&D of FDD-LTE?

Li: ZTE is now in the top tier of companies researching and developing FDD-LTE. This is reflected in two ways. First, from an operator's perspective, we have deployed nearly 50 LTE commercial trial networks for high-end operators, including those based in Europe and America. Seven commercial LTE contracts have been signed. The LTE network built for Hong Kong's CSL will be put into commercial operation soon.

Second, ZTE was named in the Top 3 of LTE infrastructure vendors by Gartner in 2009. In Gartner's industry report *Dataquest Insight: Scorecard for Vendors of LTE Network Infrastructure*, an item-by-item rating method was used to comprehensively evaluate the performance of LTE vendors. In 2010, research firm Current Analysis released a series of reports on commercial LTE products of global mainstream vendors.

ZTE was ranked among the top vendors in terms of SDR LTE eNodeB series. This was due to its powerful performance, good scalability, and multimode support.

In terms of the quantity and quality of operators deploying our products and in terms of assessments by third parties, ZTE's FDD-LTE is among the top three LTE products in the industry.

R: What data rate has ZTE achieved when building and testing LTE networks?

Li: In CSL's LTE commercial network, the theoretical data rate is 150Mbps using an emulator terminal. In actual practice, this rate is around 100Mbps due to restrictions in terminal commercialization.

R: ZTE has the biggest market share of installed CDMA equipment. How can ZTE help CDMA operators transition to LTE? At present there is no consensus

about the transition mode for CDMA to LTE. How does ZTE address this problem?

Li: In fact, the evolutionary route for CDMA to LTE is the same as that from GSM and UMTS to LTE. There is no difference between them in terms of technical evolution. CDMA is a patented technology exclusively owned by Qualcomm. Last year, Qualcomm definitively supported evolution from CDMA to LTE. There is no doubt that CDMA will evolve to LTE owing to the uniformity of technical standards and technical platform support. But CDMA operators will decide when and how to step into LTE depending on their own competition strategies.

ZTE has maintained a leading position in CDMA. Helping CDMA operators evolve smoothly into LTE is one of our biggest responsibilities. We have developed a CDMA/LTE dual-mode system on the Uni-RAN platform, and have made the world's



first call on the dual-mode system. We have built an open CDMA/LTE dual-mode laboratory in Dallas, and deployed CDMA/LTE dual-mode trial networks in many markets—including some in the U.S. ZTE is helping CDMA operators evolve to LTE by utilizing the most advanced Uni-RAN platform.

R: Are there any operators in the world that have started building trial networks for the transition from CDMA to LTE?

Li: Sure. We have contacted all CDMA operators in the industry, and many have started preparing. Some CDMA operators in the U.S. and Asia have already begun LTE testing. Together with China Telecom, we have completed the first phase of LTE laboratory testing, and the test results were excellent.

R: There are many LTE trial networks evolved from UMTS. When do you

think CDMA operators are expected to commercialize their LTE networks?

Li: Commercialization of LTE networks evolving from CDMA depends on product maturity. Our Uni-RAN is a GSM/CDMA/UMTS/LTE multimode platform, which also supports TD-SCDMA and WiMAX. Therefore, in ZTE's view, the maturity of GSM/UMTS/LTE is the same as that of CDMA/LTE. ZTE's Uni-RAN provides a very flexible, consistent, multimode evolution.

Samsung and Qualcomm are major suppliers of LTE chips. Qualcomm's strength in CDMA and GSM/UMTS/LTE is relatively balanced. The same can be said for Samsung, who has a huge share in the CDMA cell phone market. I think that CDMA/LTE terminals have matured to the same level as infrastructure equipment, and there is little difference compared with GSM/UMTS/LTE terminals.

Moreover, commercialization of LTE

networks that are evolved from CDMA also depends on efforts of operators and their competitive strategies.

R: ZTE has cooperated with China Telecom in building an EV-DO Rev.B trial network in Sichuan. How is that progressing?

Li: Testing has concluded. ZTE has consistently led in CDMA and was the first in the industry to make an EV-DO Rev.B VoIP call. We have built our unique competitive advantage on multi-carrier Rev.B performance optimization. Our field performance is also excellent.

R: What is the next step after testing is finished?

Li: This largely depends on a return on investment (ROI) assessment by China Telecom. EV-DO Rev.B is a very important step for CDMA operators before commercial deployment of LTE. This is because the advantage



of CDMA lies in data services, which is also the future of LTE, and also CDMA data services are competitively outstanding. Deploying data services on existing CDMA networks is easy and generates high ROI. 3G services are delivered simply by adding a functional board, while a 3G network needs to be built for other wireless modes. This is an incomparable cost advantage. Therefore, CDMA operators should accelerate and increase their Rev.B deployments to attract data users more quickly and at lower cost. They should also cultivate high-end client groups for future LTE.

R: Please talk about ZTE's LTE testing and trial networks around the world.

Li: We've been actively involved in LTE deployments for years. Currently, there are seven commercial networks and approximately 50 trial networks in operation. Nearly all high-end multinational operators, including those in Europe and America, own an LTE network of some description. Our equipment performs excellently in these networks. We ranked first in an LTE technical evaluation organized by a high-end operator; and in testing conducted by several other major operators, our LTE equipment ranks in the top two in terms of performance.

R: How is ZTE doing in CDMA patent submission? Will there be any problems with patent fees as there were with CDMA in the 2G era? There are more manufacturers involved in standard development in the LTE era.

Li: ZTE is devoted to standards and patent work, and we spare no effort on LTE. ZTE is a member of more than 70 international standards organizations. We hold leadership positions in more than 30 of those organizations; we hold

more than 80 editor positions; and have submitted more than 12,000 standards proposals out of a total 30,000 (including proposals from the U.S. and Europe). ZTE has also submitted more than 5,400 proposals to 3GPP and holds editor positions in 16 3GPP standard and protocol projects. In SAE/LTE, ZTE has submitted more than 3,300 proposals to 3GPP and applied for more than 2,600 patents.

Each year ZTE invests 10% of its income in R&D. We own a large number of core technologies and associated intellectual property rights, and we are determined that our LTE products will lead the industry worldwide.

As to patent fees, solving the problem through cross-licensing would benefit the development of the industry as a whole. Each company would have its own patents.

R: Please describe some of the advantages of ZTE's LTE products.

Li: One advantage of ZTE's LTE products is the excellent Uni-RAN platform. LTE networks have distinct characteristics of multiple modules, multiple frequency bands, multiple bandwidths, and multiple applications. Despite having numerous and complicated technology combinations, operators want to reduce CAPEX as much as possible, secure investments, maintain development, and smoothly evolve their technologies. So equipment manufacturers must provide products that are technologically advanced, flexible in their application, and can be smoothly upgraded. LTE products based on Uni-RAN are the best solution in the industry.

A second advantage lies in highly intelligent network planning and optimization. Multiple modules,

multiple frequency bands, multiple bandwidths, and multiple applications in LTE networks result in complex networking and difficult optimization. Furthermore, LTE is a kind of non-standard protocol, which gives manufacturers a lot of space for planning and optimization. With more than 20 years experience in the wireless field, and as an industry leader in the research of LTE commercial networks, ZTE provides not only the best equipment but also the best networks. Our self-developed network optimization and analysis software, such as CDT, automatically and intelligently analyzes the network. This helps operators greatly reduce OPEX and build a top quality network at minimal cost.

A third advantage lies in end-to-end solution. With large-scale investment in terminals and service application platforms, ZTE leads the industry in LTE development. Our end-to-end LTE solution helps operators deploy cutting-edge networks, launch terminals and applications that better fit user demands, and achieve operational success.

These advantages are the reason ZTE is rated in the Top 3 of LTE infrastructure vendors. And we will be even stronger in future.

R: What do you think of the proliferation of 3G users in China?

Li: In China, proliferation of 3G users is among the fastest in the world. Operator networks are also at the forefront of technical development. We believe LTE will be widely commercialized in China between 2010 and 2013. During this time, ZTE will build LTE products on the most advanced Uni-RAN platform, offering intelligent network planning and optimal end-to-end solutions.

ZTE TECHNOLOGIES

EasyService™:

A Guarantee for FTTx Broadband Services

By Yu Pingzhi



“ EasyGateway is an open, efficient, cross-platform terminal management module. When incorporated into a business operation and support system, EasyGateway enables the optical network terminal (ONT) to implement ‘zero touch’ service activation and routine remote O&M.”

Service Requirements

Broadband access is evolving from conventional DSL copper cable to PON fiber optic. As a consequence, the PON-based FTTx user base is expanding rapidly, and a vastly increased number of access nodes are being used. Business operation and support systems are struggling to meet the needs of service development, and many issues need to be solved:

- Activating FTTx services takes several hours. Automatic provision of FTTx services should be supported;
- FTTx troubleshooting is more complicated. An effective tool should be found to quickly diagnose and locate faults;
- The number of FTTx devices is increasing. Unified management should be implemented, especially for FTTH terminals.

For rapid development of FTTx services, a complete FTTx service support system should be built as soon as possible.

Emergence of Easyservice™

Easyservice™ is a broadband service support system consisting of xPON service support module (EasyOptical), xDSL service support

module (EasyCopper), remote terminal management module (EasyGateway), broadband pre-processing module (EasyCSM), home network service terminal software (EasyAssistant), and terminal installation navigation software (EasyGuider).

These modules can be flexibly combined to suit an operator’s needs. They support automatic service provisioning, fault diagnosis, performance alarm, bandwidth estimation and optimization, and statistical analysis, and can be easily incorporated into existing business operations. All this helps operators optimize broadband O&M flows, reduce O&M costs, and enhance user experience.

EasyOptical guarantees FTTx services

Broadband failures are caused by environmental issues such as power, temperature, or humidity; terminal issues such as power-off and improper configuration; or fiber and copper line issues. Most broadband failures occur in home networks.

EasyOptical is a broadband service support module specifically designed for xPON networks. It provides FTTx fault diagnosis, equipment monitoring, data analysis, and optical line optimization. It also allows automatic

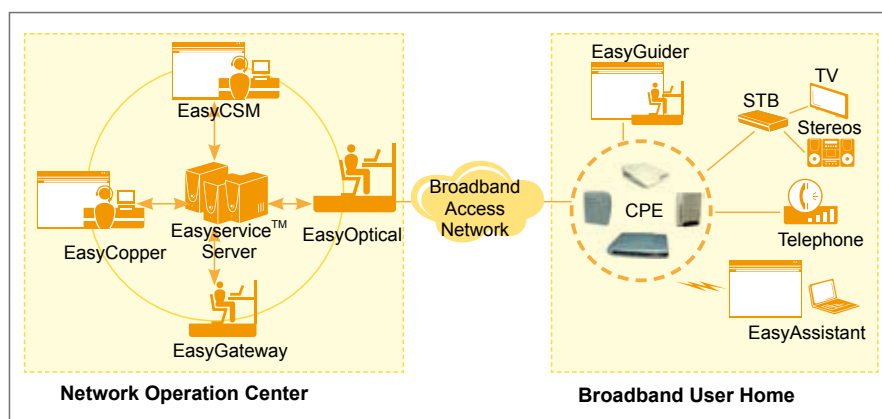


Figure 1. Uni-RAN (converged GSM/UMTS/LTE) solution.



and remote O&M for broadband services, fully meeting operational needs in various FTTx scenarios.

EasyCopper guarantees DSL services

EasyCopper is a broadband service support module for DSL networks. Assisted by an expert system, it provides performance analysis, quick fault diagnosis, automatic fault recovery, common fault alarm, performance change alarm, and performance optimization for ADSL or VDSL networks.

EasyCopper helps improve O&M efficiency, and shows exact line capacity so that new services can be introduced to customers on time.

EasyGateway manages home network devices in a unified manner

EasyGateway is an open, efficient, cross-platform terminal management module. It manages terminal devices such as integrated access device (IAD), home gateway (HGW), set-top box (STB), and optical network unit (ONU) in a unified manner.

When incorporated into a business operation and support system, EasyGateway enables the optical network terminal (ONT) to implement “zero touch” service activation and routine remote O&M. EasyGateway

creates a unified flow for FTTx service fulfillment in order to significantly speed up FTTx service provisioning. It also supports terminal pre-configuration, automatic terminal configuration, troubleshooting, software and firmware version management, file and log management, status and performance monitoring, and equipment management, all of which provide effective management for FTTx terminals.

EasyCSM facilitates handling of broadband complaints

EasyCSM works with EasyAssistant to help operators handle customer complaints. When a complaint is made about broadband failure, EasyCSM can determine the running status of the customer’s home network based on a diagnosis code generated by EasyAssistant. EasyCSM can judge whether the fault has occurred at the user end.

EasyAssistant gives rise to intelligent home broadband services

EasyAssistant software is installed on a user’s computer to detect or fix broadband failures.

EasyGuider enables fast service activation

EasyGuider shows users step-by-step how to install and configure terminals for broadband service.

Milestones

Since its introduction, Easyservice™ has been highly recognized by operators worldwide.

- February 2009: China Telecom (Quanzhou) established three new FTTH O&M procedures, employing EasyOptical, EasyCopper, and EasyGateway for service activation, fault diagnosis, and service enhancement. These procedures were designed to shorten service activation time, speed up fault diagnosis, and cut down O&M costs.
- February 2009: Venezuela CANTV deployed EasyGateway in its IPTV project to manage 1,270,000 CPEs.
- June 2009: Pakistan Telecom deployed EasyGateway, EasyAssistant, and EasyCSM to manage 200,000 CPEs. This helps operators and users maintain their home networks.
- December 2009: China Telecom (Huzhou) deployed EasyOptical that is 99% accurate in diagnosing faults.
- May 2010: Greece’s ON Telecoms deployed EasyGateway to manage 115,000 CPEs.

ZTE TECHNOLOGIES

ON Telecoms Boosts Broadband Services with Easyservice™

By Zhu Liangzheng and Du Xiao

As GPON-based access systems continue to be deployed around the world, operation and maintenance of the systems is an issue of concern. Greek operator ON Telecoms recently adopted ZTE's Easyservice™—a broadband service support system—to cut over gateway data for 115,000 family users and to operate an automatic configuration server platform. This represents a major step forward in Europe for ZTE's broadband value-added service support solution.

When a telecom market matures, product and service quality tend to have a greater affect on how customers view corporate brands. So telecom operators must provide better management services if they seek to expand their operations.

ON Telecoms operates cable broadband, IPTV, and VoIP. Since starting business in 2007, its optical fiber network has expanded to cover more than 1.3 million families. As an

emerging operator with an innovative spirit, ON Telecoms seeks to gain a competitive advantage by delivering brand new telecom services that dramatically change people's lives.

In 2010, ON Telecoms began cooperating with ZTE, and chose ZTE's Easyservice™ for guaranteed smooth operation and maintenance of its broadband networks and

terminals. This would deliver a far more satisfying broadband experience to users. Easyservice™ is a broadband operation support system designed for DSL, PON, and home networks. It contains a series of functional modules: EasyCSM, EasyCopper, EasyGateway, and EasyOptical. ON Telecoms uses EasyGateway for automatic service activation, remote version upgrade,

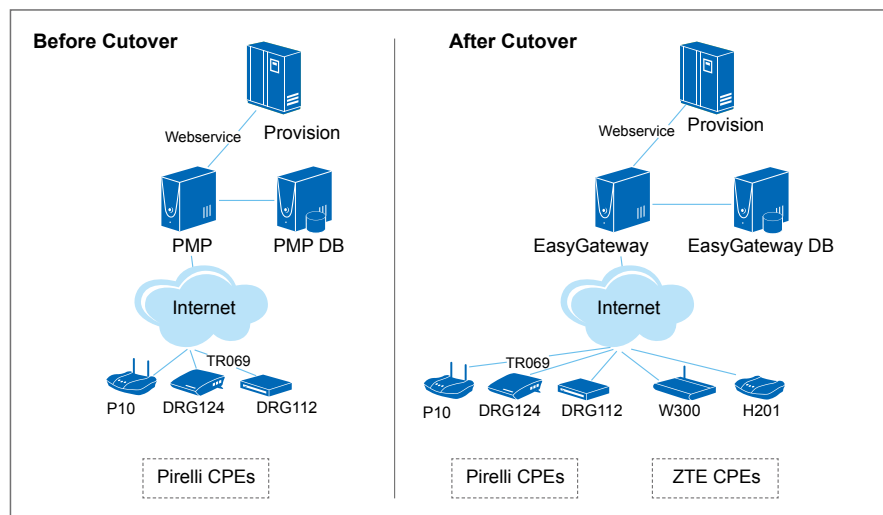


Figure 1. EasyGateway deployed for ON Telecoms.



end-to-end fault diagnosis, and user behavior analysis on home gateway terminals. EasyGateway creates a unified flow for broadband service fulfillment, allowing ON Telecoms to significantly speed up service provisioning and cut manpower costs.

To gain a competitive edge in the Greek telecom market, ON Telecoms requested ZTE to complete the cutover project in a short time without impacting existing services. ZTE established a special project team consisting of experienced staff with extensive knowledge of broadband access and home networking architecture. With close cooperation between all team members, ZTE completed requirement collection, customized development, debugging, and testing within 40 days. The requirements of ON Telecoms were fulfilled, and ZTE won high recognition for the job. “The system built by ZTE has been operating well, and we appreciate the devotion

shown by China’s leading provider of telecom equipment and network solutions. For its technical expertise and quality service, ZTE has proven to be a dedicated and reliable partner,” said Ioannis Karamitsos, technology director of ON Telecoms.

“Our Easyservice™ has passed stringent field tests by ON Telecoms and offers complete broadband support for operators in developed European countries,” said Xu Ming, ZTE vice president and fixed-line product line general manager. “We now attach greater importance to increasing customer value through quality service.”

ZTE was one of the earliest

developers and commercial manufacturers of xPON products in the world. By the second quarter of 2010, over 100 million lines of xPON products with more than 45 million broadband ports had been deployed in China—one of the world’s fastest-growing regions for xPON deployment. Currently, ZTE has a 43% share of the domestic market; and in terms of shipment volume, is ranked first in Asia Pacific and second worldwide. During its FTTx construction project for China Telecom, ZTE developed a complete broadband service guarantee solution, and took the lead in service provision by commercializing it throughout China and Europe.

ZTE Tackles OPEX

October 7, 2008 Source: Lightreading.com

ZTE today revealed its Broadband Easyservice™ that enables service providers to reduce the operation, administration, and maintenance (OA&M) costs of delivering broadband access, while also cutting energy consumption.

Studies conducted with Tier 1 customers using ZTE Easyservice™, including China Telecom—which has deployed ZTE’s EasyMaintenance and EasyGateway modules—has shown ZTE is delivering major reduction in the cost of OA&M of broadband services by optimizing management and failure diagnosis, while improving the overall efficiency of broadband maintenance.

ZTE Easyservice™ is a service-oriented and expert knowledge-based system, which provides end-to-end maintenance and support for broadband (DSL and PON) services. The system helps telecoms operators reduce the OPEX associated with providing broadband services by enabling automatic fault diagnosis and resolution, which reduces the engineering resource required to provide on-site maintenance and the number of customer service calls related to faults. ZTE is currently completing pilot Easyservice™ projects with major operators in Europe, Asia and South America.

ZTE TECHNOLOGIES

The Road to FTTx O&M Specifications

By Zhu Zhenghua

As xPON FTTx networks develop rapidly in China, users are experiencing higher bandwidth and better services. However, with fast-paced FTTx development, a number of issues arise relating to fast service provision, quick fault locating, and accurate performance testing.

Mature O&M specifications can boost xPON growth. Through years of effort, xPON O&M specifications have been drafted that cover four key modules: service provision, integrated test, integrated alarm, and resource query. Each module has well-defined functions and interfaces. Depending on actual interface requirements, a variety of application scenarios, procedures, and commands are also specified. Interface specifications cover management of Optical Line Terminal (OLT), Multi-Dwelling Unit (MDU), and Single Family Unit (SFU).

Different Interfaces Lead to Complicated O&M

Different Business Operation Support Systems (BOSSs) are being

deployed in cities throughout China, and northbound interfaces used for PON management are different. These northbound interfaces are supplied by different vendors and have different functions and protocols. This leads to:

- **Difficulty in system interconnection:** An Operation Support System (OSS) needs to interconnect with northbound interfaces supplied by different vendors.
- **Difficulty in interface development:** Vendors need to develop tailor-made northbound interfaces and conduct joint debugging.
- **Difficulty in equipment maintenance:** Vendors need to maintain customized northbound interfaces. If a northbound interface alters, OSS needs to be changed accordingly.
- **Difficulty in vendor coordination:** Vendors need to coordinate with one another for interconnection and joint debugging of their northbound interfaces. When a new interface is required, all vendors need to adjust their interfaces.

Choosing a Suitable Interconnection Mode

For automatic service provision, OSS may interact with EMS via a TL1 northbound interface and send orders to network elements (NEs) via EMS. It may also interact directly with NEs via the SNMP protocol.

For direct SNMP access, all NEs need to interface with OSS, which leads to heavy OSS interconnection and maintenance work. Because Management Information Base (MIB) varies from one vendor to another, and from one NE to another, OSS

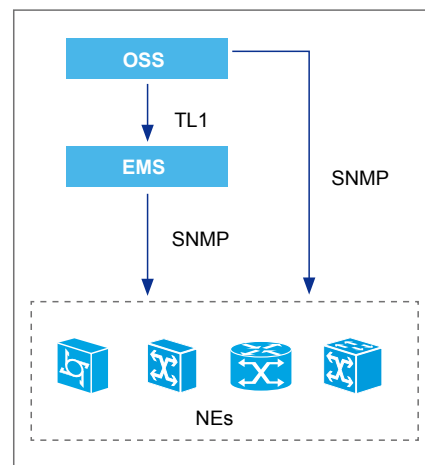


Figure 1. Interaction between OSS and NEs.



must interact with NEs independently. When an NE changes its function and MIB, OSS must be altered accordingly. The same kind of NEs may even have different versions. Therefore, it is necessary to maintain compatibility among different versions of NEs.

Because NEs fail to support SNMP access to functions with large volumes of data—such as 112 test, Single Ended Line Test (SELT), Double Ended Line Test (DELT), and signaling trace—OSS cannot access all NE functions directly through SNMP.

Moreover, there are restrictions to ONU networking. When ONU uses an IP address of a private network, managing ONU through a SNMP-proxy connection is difficult. Without an IP address, ONU cannot be managed directly.

The key problem of direct SNMP

access is that many details about NE interfaces are exposed to OSS, and OSS is extremely sensitive to interface changes. A minor change of interface requires alteration of the OSS version. This leads to frequent OSS maintenance and increased costs.

However, when a TL1 northbound interface is adopted, any change in the interface or difference among NEs can be well encapsulated by EMS. This ensures stability of the northbound interface.

Milestones of Standardization Work

ZTE played an active role in drafting the specifications for northbound interfaces. The company established a special team that was fully involved in standardizing, developing and testing of northbound interfaces. The team now runs interface trials in Shanghai

and Wuhan. Ranked first in interface tests, their standards have been highly recognized in the industry.

Benefits

A standard northbound interface for PON management screens the differences between NE functions supplied by different vendors. This simplifies FTTx O&M. Differences between access technologies can also be screened, allowing good compatibility with EPON, GPON, 10G xPON, XG PON, and WDM PON.

FTTx O&M specifications take into consideration interface requirements in various application scenarios, and give a clear operation procedure for OSS. Because OSS no longer needs joint debugging or a direct interface with all NEs, interaction between OSS and NEs is significantly improved.

Trials conducted in Shanghai, Wuhan, and Quanzhou with standard northbound interfaces for PON management have turned out great results. These standard interfaces make BOSS development easier and drive the widespread deployment of xPON networks.

ZTE TECHNOLOGIES

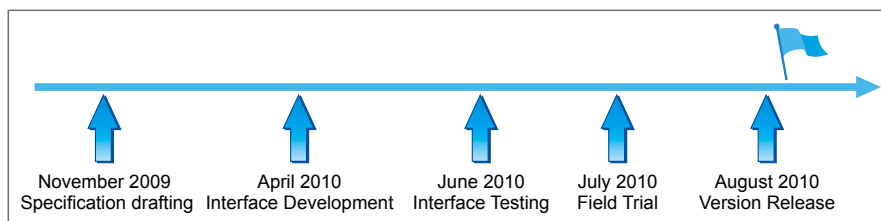


Figure 2. Milestones of standardization work.

FTTx O&M Solution

By Xue Qikang and Zhu Zhenghua



In the construction of broadband access networks around the world, PON is the technology of choice. EPON and 10G EPON have tended to dominate in Asia-Pacific countries, but most operators are now using GPON. Increased GPON deployment brings with it strong demands for broadband operation and maintenance.

Driven by a “fiber in copper out” strategy initiated by China Telecom, a large number of fixed-line access devices have been moved out of specialized equipment rooms and into buildings and residential premises. These devices require unattended operation and maintenance (O&M). A dramatic increase in the amount of equipment also increases maintenance difficulty. To meet the diverse service needs of subscribers, optimized broadband operation and management should be provided. As more optical fibers are used in the uplink, fiber maintenance has become a major concern.

With the robust growth of PON worldwide, many FTTx O&M issues have arisen. In particular, commissioning and maintenance of equipment is a critical issue. Commissioning involves configuration of equipment as well as service activation and provision. Maintenance involves routine maintenance and fault locating.

Through in-depth analysis of PON features, and with a view of reducing operational expenditure, ZTE has

developed an FTTx O&M solution to meet the needs of current and next-generation PON networks. This solution provides efficient operation, management, and maintenance for FTTB, FTTH, and FTTN access modes.

FTTx O&M Components

ZTE’s FTTx O&M solution consists of Business Operation Support System (BOSS), management layer, and equipment layer (see Figure 1). BOSS contains resource management system, service activation system, construction dispatch system, and automatic activation system, all of which are closely related to xPON operation and maintenance. Located in the management layer are EMS (N31), ITMS, and EasyGateway.

Equipment Commissioning

Equipment commissioning encompasses planning, deployment, number allocation, and construction.

The planning stage involves resource planning and engineering design of lines and equipment. An address database sheet and a line data sheet (from line to user) should be included in the design of lines, and an equipment sheet with information about equipment serial number, manufacturer, port number, port attributes, and port status should be included in equipment design. Resource planning involves ONU certification and identification, domain name, VLAN, IP address, voice service, and optical line coding.

After engineering design and resource planning has been completed, off-line

batch configuration, template configuration, planning sheet import, equipment installation (plug and play), remote zero touch, automatic management address configuration, equipment replacement (plug and play), and automatic service recovery are

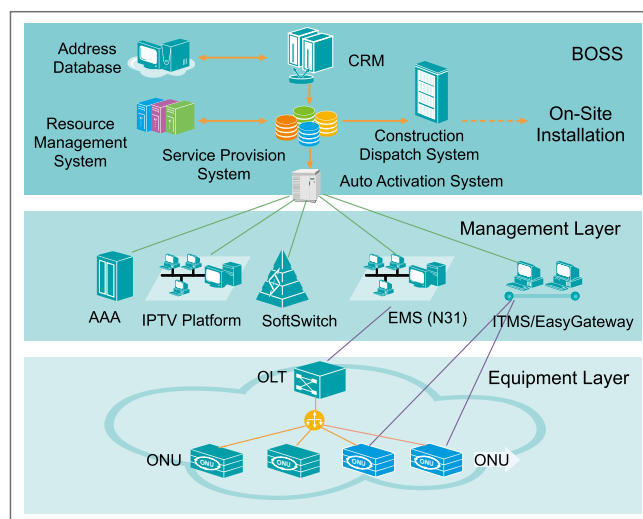


Figure 1. ZTE's FTTx O&M solution.

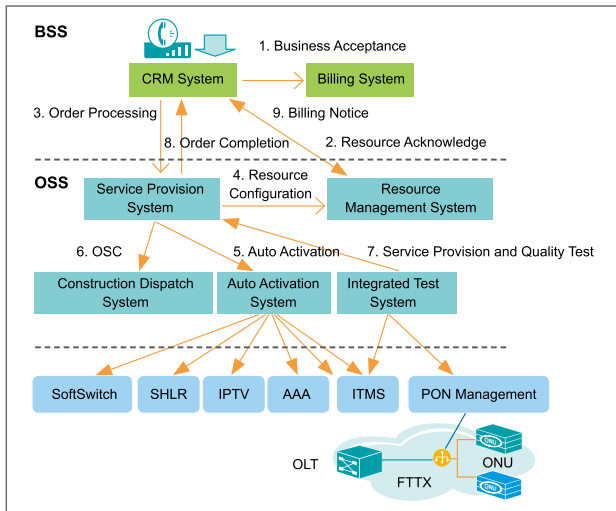


Figure 2. Equipment commissioning and service provision.

implemented.

Devices and systems that are deployed in the deployment stage include OLT, ONU, EMS/ITMS, resource management system, and softswitch management system. At the number allocation stage, FTTB and FTTH numbers for public, governments, and enterprises are allocated. At the construction stage, equipment installation and commissioning, as well as service provision and verification are completed. These stages ensure automatic provision of incumbent data, voice, and IPTV services.

ZTE participated in drafting FTTx O&M specifications and putting them into practice. The FTTx O&M solution facilitates easy interoperability between FTTx and BOSS. This allows the CRM system to handle orders, the resource management system to configure resources, the service provision system to coordinate service procedures, the auto work order system to dispatch and activate work orders, and the EMS system to automatically configure and provide end-to-end FTTx services without manual intervention. FTTx O&M shortens activation time of FTTx services from 2-3 hours to 20 minutes,

significantly speeding up service provision. It also supports large scale number allocation, which is beneficial when attracting a great number of FTTx subscribers.

Equipment Maintenance

Equipment maintenance includes routine maintenance and fault locating.

Routine maintenance conducted by the network management system involves network access domain and function access domain management, unified equipment management, flexible resource management, monitoring of performance statistics, and remote version upgrade. An intelligent system is also provided for optical power monitoring, ODN fault pre-warning, fault diagnosis, and remote fault recovery.

ZTE provides an all-round FTTx service guarantee solution that allows interconnection among the service guarantee system, PON network

management system, and fault handling system. When incorporated into an end-to-end O&M procedure, the FTTx service guarantee system automatically handles FTTx faults.

The FTTx service guarantee system also provides integrated optical and copper fault diagnosis as well as rapid end-to-end fault locating. When an FTTx network fails, the system obtains relevant information in the fastest time possible, and implements end-to-end fault diagnosis and locating. Diagnosis results are then sent to an automatic fault handling system. Finally, the automatic fault handling system sends these results to O&M personnel via a mobile phone or electronic work order. This not only ensures fast troubleshooting but also saves personnel effort in finding faults. As a result, maintenance efficiency is greatly improved, and user complaints are reduced.

Conclusion

GPON has aroused the interest of leading operators for its high bandwidth and high split ratio. As GPON networks are being deployed around the world, operation and maintenance has become the focus of attention. Today, market competition tends to be customer centred.

FTTx services offered by operators are similar in nature. So those with a complete FTTx O&M solution encompassing equipment commissioning, service provision, equipment maintenance, and fault locating will gain a competitive advantage in the marketplace.

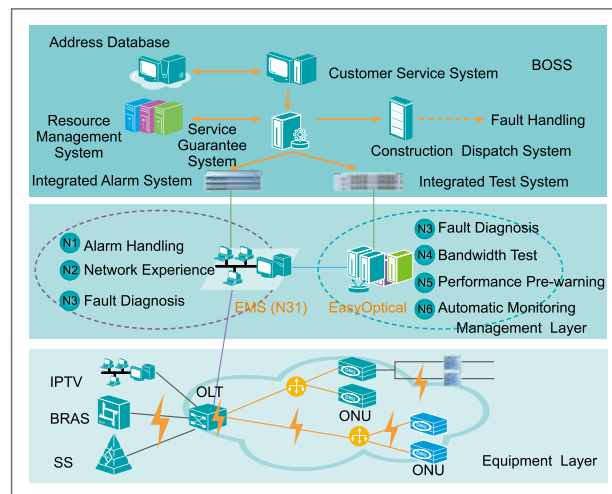


Figure 3. Equipment maintenance and fault locating.

Telenor Sets the Pace in Montenegro

By Chen Jing

Upon completion of the swap project on 6 May 2010, Mr. Vasiljevic, project director of Telenor Montenegro said: “Today we witness the integration of the entire network. Over the past six months, we have successfully swapped the core, radio, and transmission networks of Telenor Montenegro on schedule. This is the most complicated project ever undertaken since we started operation in 1996.”

Telenor Montenegro began developing its mobile business in 1996. With 98% wireless coverage in Montenegro, today it is the dominant local operator. However, the company’s rise has not been without problems. At a time when competition was intense, Telenor Montenegro met with technical bottlenecks. Their network equipment was supplied by different

manufacturers, and the network structures were complicated. The original equipment could not support smooth upgrade to HSPA+ and LTE, and operation came at a high cost. With other multinational competitors operating in Montenegro, building a simple, high-speed network became a major issue for Telenor Montenegro.

The First Operator to Provide HSPA+

Montenegro’s population is around 700,000, and the mobile penetration is around 200%. All multinational operators in Montenegro have now focused their attention on developing new networks and technologies to attract more subscribers.

To be more competitive, Telenor decided to modernize its existing networks. A decision was made to deploy an all-IP wireless network

that would have a simplified network structure and reduced operating cost.

After careful consideration, ZTE’s competitively priced Uni-RAN solution was chosen, and a new cooperative partnership was formed.

To overcome the problems associated with diverse and complicated equipment, ZTE adopted SDR base stations based on IP structure, set up an SME team, and developed an upgrade program. These base stations allow 2G and 3G network convergence and smooth software upgrade to HSPA+ and LTE. The project was a great success. Telenor Montenegro became the first operator in the country to deliver a cutting-edge, fast-rate HSPA+ network.

A New Network Created in 53 Days

Installing a new network was not the



“ I would like to say thanks to ZTE’s management and project teams for a job well done. It is obvious that ZTE has delivered a competitive, high-technology network and has provided very good service to Telenor. I believe ZTE will continue to succeed in the future. ”

—Kjell Nordbo, CTO of Telenor Montenegro

result of a few days effort. Most would agree that deploying a network on snow covered mountains at -25°C is a big challenge. After carefully assessing its logistics, engineering, and outsourcing capabilities, ZTE created an implementation plan.

Logistics was the first critical step of the project. 70% of the sites were located on mountaintops. Transporting equipment in extreme cold, mountainous terrain, and deep snow was a significant challenge that required careful planning. The technical and logistics teams worked together to create an efficient transportation program. This planning was critical for ensuring timely delivery of equipment and for completing the installation in 53 days.

With an understanding of the existing network, Telenor and ZTE

cooperated in designing an engineering program. Because of the tight schedule, ZTE swapped 15 clusters within 50 day. That meant one cluster was completed every three days. After swap, 3G voice and video call drop rate was 0.19%, HSDPA call drop rate was 0.25%, and soft handoff rate was 99.98%. The network’s performance was substantially improved, and the number of user complaints was significantly reduced.

ZTE has previous experience working in Europe and Montenegro and was able to cooperate with local outsourcing partners to meet the project’s requirements. The short timeframe of completion made Telenor more competitive and resulted in a larger market share for the operator. Several days after the project began, Telenor Montenegro sent the first letter

of thanks in recognition of ZTE’s rapid response and dedication.

Montenegro welcomed in a new era in the 3G wireless market, and Telenor Montenegro enhanced its leading position with the new network. This laid a solid foundation for an ongoing win-win partnership between Telenor and ZTE.

“I highly appreciate the delivery capabilities of ZTE. Despite difficulties due to harsh weather and heavy snow, you delivered the whole network in a timely and highly efficient manner and completed a task that was supposed to be impossible,” said Kjell Nordbo, CTO of Telenor Montenegro.

As of June 2010, the number of Telenor Montenegro subscribers was around 600,000, and the coverage rate of 2G and 3G were 100% and 97% respectively.

ZTE TECHNOLOGIES

A Miracle on the Top of Mt. Everest

ZTE deploys 3G stations at the world's highest point

By Chen Danni

With its mystical appearance and high altitude, Mt. Everest attracts tourists and climbers each year from all over the world. To ensure smooth communication for hikers on their way to Mt. Everest, Ncell teamed up with ZTE to build the first 3G network covering the hiking route to Mt. Everest. Ncell is a wholly owned subsidiary of European multinational,

TeliaSonera, and is the second largest mobile operator in Nepal.

Naturally, the weather conditions on Mt. Everest are extreme. In January, the coldest month, temperature on the summit averages -36°C but can drop as low as -60°C . In July, the warmest month, the average temperature on the summit is -19°C . Year round, the temperature on the summit does not rise above

freezing. From November to February, the global southwest jet stream moves in from the north, beating the summit with hurricane winds that exceed 285km/h. Even during the pre- and post-monsoon climbing seasons, strong winds may arise suddenly. When such storms develop, sand and small stones are thrown into the air and beating snow poses problems for climbers.





Innovative and Customized Solution

To withstand the high altitude and harsh natural environment of the Himalayas, ZTE provided a tailor-made solution with a strong ‘green’ focus for the Mt. Everest project. The micro base stations are based on ZTE’s SDR platform, which has low power consumption, a small footprint, and is easy to install. A one-piece mast and insulated shelter are used for the

stations, and this allows them to be installed quickly without the need for earthworks or foundation construction.

Solar panels are incorporated into the design to ensure that stations have power supply throughout the year and are environmentally friendly. These features allow each station to operate at optimal levels with minimal power usage even with outdoor temperatures as low as -30°C to -40°C .

was adopted and its foundation cage was filled with stones rather than construction blocks. Installation was completed without engineering civil work. A compact diet shelter with good heat preservation was used to ensure suitable operation environment for base stations.

“This was quite a challenging project. Our total turnkey solution is adaptable to limited resources in the field and also dramatically reduces construction time. So we were able to launch the stations one month earlier than would have been possible using a traditional solution,” said Luo Pingfan, president of ZTE South Asia.

More than 40 helicopters were used to transport equipment. Within two short months, ZTE successfully deployed eight 3G stations on Mt. Everest to provide quality voice and 3G broadband services for residents and mountaineers.

At the launch of the eight stations, Aigars Benders, CTO of Ncell, congratulated the teams involved via video, saying: “You are on the peak of the world. With the launch of the 3G station, visitors to the south side of Mt. Everest can share what they see, what they feel, and what they think during their trip to Mt. Everest.”

ZTE TECHNOLOGIES



Creating an Engineering Legacy

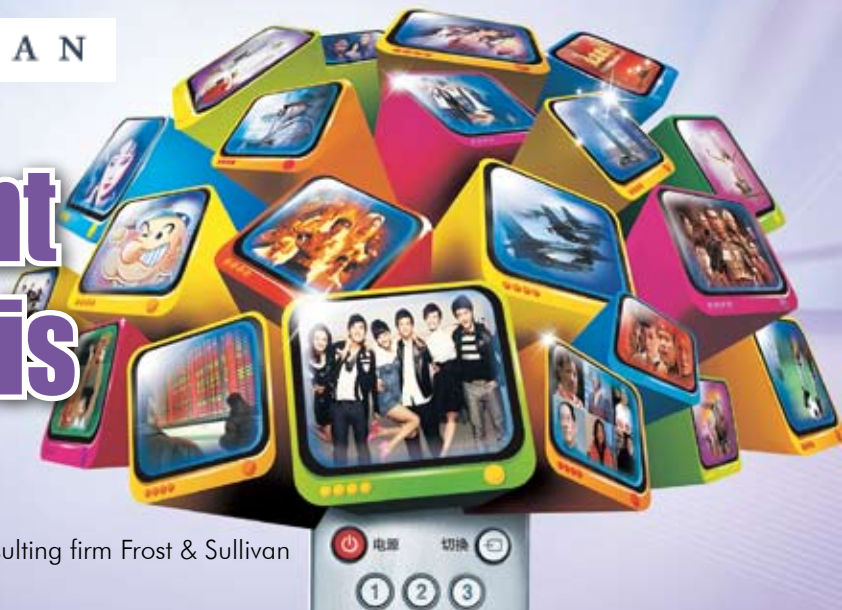
Deploying base stations on the world’s highest mountain presented big challenges to ZTE: a harsh environment for transportation and installation, and unbearably low temperatures.

Because the closest airport is thousands of kilometers from the base station site, equipment had to be delivered using donkeys and yaks. During the seven days and nights of transporting equipment, even the yaks were worn out. On site, ZTE engineers had to overcome altitude sickness and face shortages of water and construction materials. This would usually bring installation procedures to a complete standstill.

In extreme adversity, ZTE engineers made full use of local materials. An easy-to-install vertical ground tower

F R O S T & S U L L I V A N

IPTV Equipment Market Analysis



September 2010, selected from the global-growth consulting firm Frost & Sullivan

Global IPTV Industry Development

IPTV is regarded as a profitable sector in developed as well as developing markets. Unlike traditional cable or wireless TV, IPTV enables broadband Internet users to access TV broadcasting services on their computers or TV sets with a set-top box. Some advanced mobile phone subscribers can also be IPTV subscribers with the technological advancements.

Earlier, IPTV service launches were from large fixed network telecom operators in Western Europe and from PCCW in Asia Pacific. Today many providers around the globe offer IPTV services and are competing with traditional Pay TV providers.

As the IPTV market matures, many innovations are emerging, while service providers are turning to over-the-top video applications to supplement their video-on-demand offerings. Technical upgrades also contribute to growth, including DVRs, high-definition programming, MPEG-4/H.264, and first class system integration.

Asia Pacific and Western Europe have 61.8% of the global IPTV subscriber

base. The IPTV market is expected to experience rapid growth, as there are large numbers of broadband subscribers that can potentially take up IPTV service. In Western Europe, which is the oldest IPTV market, IPTV has already emerged a major Pay TV platform and has captured about 18.1% of the Pay TV market.

Global IPTV industry overview

Global IPTV subscriber base has been growing rapidly since 2005, at an average annual growth rate of 103.0%. Even during the global economic slowdown in 2008, IPTV subscriber base recorded a large increase. The global IPTV subscriber base reached 37.6 million by the end of 2009, and is forecast to 267.9 million by 2014. The global IPTV market revenues have increased from \$0.45 billion in 2005 to \$12.1 billion in 2009, at an average annual growth rate of 127.7%.

Analysis of major IPTV operators

The global IPTV market is dominated by a group of mainstream operators. As seen in Table 1, European

operators accounted for half of the Top ten operators. Accordingly, market concentration in Western Europe is higher than others. In Western Europe, FreeDSL and France Telecom from France ranked first and second, respectively, in terms of subscriber size.

In 2009, China Telecom experienced a two-fold growth in subscriber size. In 2010 H1, in terms of IPTV subscriber base, China has contributed 43.0% of the total incremental subscribers around the world.

As an example, China Telecom defined IPTV as a strategic emerging service and hoped to improve the sustainable development of broadband services by entering the business field of video services. As IPTV business in China is not regarded as telecommunication services, the licensing is handled by the National Broadcasting and TV Administration. Therefore, China Telecom entered into a joint venture with Shanghai Media Group (SMG) that owned IPTV license to develop IPTV business. In the video services, SMG had extensive experience in the content and operation.

Emerging IPTV market development analysis

The worldwide IPTV subscribers are forecast to reach to 95.9 million in 2011, in which Western Europe, North America, and Asia Pacific are expected to be the biggest markets in terms of revenues per user.

As seen in Figure 1, being a major source of IPTV subscriber, Western Europe accounted for about 43.5% of the total market in 2010 H1.

Currently, Europe is the largest and most active IPTV market, but in future, Asia Pacific is expected to outgrow Europe in terms of subscribers, service revenues, infrastructure, and so on. The broadband penetration of the region will fuel the growth.

The North American IPTV market is expected to be the most competitive

in the world largely due to high pay-TV penetration, stiff prices, and intense service competition.

Deployment of IPTV has been spurred by the explosion of broadband in various high growth markets across the globe, such as Asia Pacific. Along with this, innovation, convergence and changing consumer behavior in North America are working as driving forces for the IPTV industry.

Affected by the business opportunities including 2008 Beijing Olympics and Expo 2010 Shanghai, China's IPTV market maintains steady growth. With China Telecom's promotion, IPTV has favorable development in Shanghai, Jiangsu, Guangdong, Fujian, and Zhejiang provinces. However, affected by insufficient contents and low price promotion, China's IPTV

business was unable to grow as per the expectation, and the number of IPTV home subscribers has not increased significantly. Hence, many vendors have started to focus on IPTV industry application.

China had more than 700 million mobile phone subscribers, 170 million cable TV subscribers, and more than 100 million broadband subscribers until 2010 H1. The booming IPTV market is really an emerging big money-maker for telecom operators, equipment and software vendors and broadcasters.

IPTV Equipment Competitive Landscape

The global market has witnessed an increasing competition, especially for the equipment vendors. In terms of global IPTV subscribers until 2010 H1, Microsoft, Thomson, ZTE, Alcatel-Lucent, Netgem, and UTstarcom are expected to be the major IPTV equipment vendors around the world. Other leading IPTV vendors also provide diversified IPTV solutions.

Market share analysis of major IPTV equipment vendors

Due to its influence in North America and Europe, Microsoft was ranked first with 13.7% share in the world IPTV middleware market in 2009. Thomson benefited from development of FT's IPTV business and was ranked second with 12.2% share. ZTE surpassed Alcatel-Lucent and ranked third with 10.0% share, through its active market exploration in Asia, South America, and other emerging markets. Alcatel-Lucent and UTstarcom were ranked fourth and fifth, with market shares of 9.5% and 7.9%, respectively. Top five equipment vendors together held about 53.3% market share around the world, but none of them had gained overwhelming

Table 1. Major IPTV operators list (world), 2010 H1

Area	Vendors	Services	Start Time
Japan	Softbank	BBTV	2003
Hong Kong	PCCW	Now Broadband TV	2003
Taiwan	CHT	Big TV	2004
Singapore	SingTel	iTV	2001(Test)
China	China Telecom	BesTV	2005
The United Kingdom	Video Networks	Home Choice	1999
France	France Telecom	Maligne TV	2003
	FreeDSL	Free IPTV	2003
Spain	Telefonica	Telefonica TV	2002
Canada	Sask Tel	Max Front Row	2002

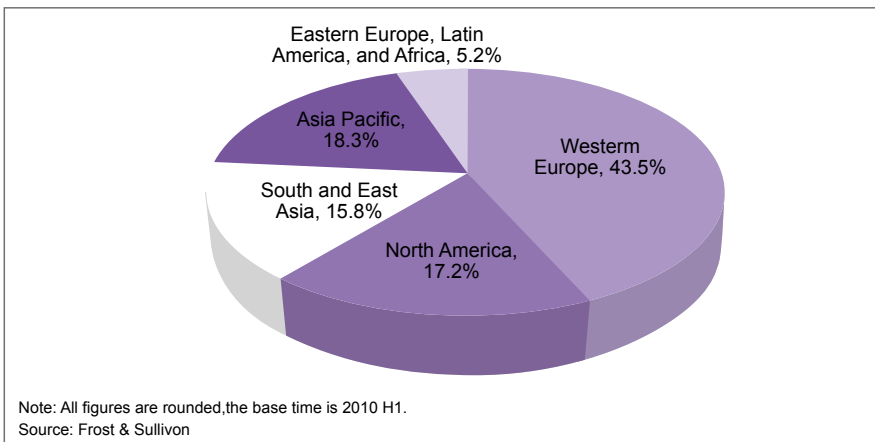


Figure 1. Region distribution percent of global IPTV subscriber, 2010 H1.

leadership of the global market.

As seen in Figure 2, in terms of subscribers, the top five IPTV equipment vendors were Microsoft, Thomson, ZTE, Alcatel-Lucent, and Netgem until 2010 H1.

Network providers, such as Alcatel-Lucent, Thomson, and ZTE, are in the first category. They offer end-to-end solution through self R&D effort or M&A of professional participants. Additionally, based on their broadband infrastructure business, they can provide integrated solution of triple-play to meet operators' demand of network upgrading and development of VAS. In the past two years, providers of this kind, such as Motorola, Cisco, and Ericsson, are active in IPTV market and they have been improving their whole solution capability through M&A and strategic alliance.

Microsoft is a typical representative of integrated solution providers. Initially it was involved in IPTV market from middleware provision and extended to provision of other infrastructure devices. Through cooperation with server providers (such as IBM and HP), and other participants in IPTV chain industry, Microsoft is able to provide pre-integrated solution and promote its business globally based on brand influence.

Others can be classified as professional middleware providers, such as Espial and Orca. They focus on software technology and provide open middleware framework. As relatively smaller providers, they form alliance with providers of DRM and VOD to improve their position in the market.

Regional analysis of major IPTV vendors

By 2014, the most of the new subscribers additions are also expected to come from the emerging markets. The markets of China, Indonesia, Vietnam, India, Thailand and Philippines will account for 62.0% of the subscriber additions from 2009 to 2014. In these markets IPTV will be restricted to the urban areas where high speed broadband networks are present.

The top IPTV middleware vendors, such as ZTE, UTstarcom, Cascade, Microsoft, and Huawei compete intensely in Asia Pacific. Asia Pacific has the distinction of having the most successful IPTV operators globally, and rollouts continue throughout the region, operators continue to face challenges in three key areas: regulatory constraints, content, and technology costs.

ZTE has great influence in some regional markets, such as Asia, South America and the Middle East. In Asian

IPTV middleware market in 2010 H1, ZTE ranked No.1 in terms of its comprehensive factors including the financial situation, investment levels, and business prospects. In China IPTV middleware market in 2010 H1, ZTE also ranked No.1 by achieving the leading edge according to its long-term R&D effort and market performance. On the basis of large scale IPTV deployment with China Telecom, ZTE has cooperated with many other operators, such as VNPT who is the largest operator in Vietnam, TelKOM Indonesia who is the largest operator in Indonesia, and CANTV who is the largest operator in Venezuela, and successfully increased their subscriber capability with low cost.

China has overtaken South Korea as the largest IPTV market in Asia Pacific and had 4.7 million subscribers at the end of 2009. The IPTV subscriber surge in China is happening due to push by fixed broadband providers to become multi play providers. In South Korea, broadcast content for IPTV was allowed by the regulator only at the end of 2009 and vast majority of the subscribers currently have VOD only service.

For example, Jiangsu Telecom started developing its IPTV business in 2005, with the view of exploiting its advantageous resources to retain old users and attract new ones. The company's IPTV business grew quickly after close cooperation with ZTE. With strong support from ZTE, Jiangsu Telecom IPTV system ensures the subscribers receive high Quality of Service (QoS) as well as Quality of Experience (QoE). Until June 2010, Jiangsu Telecom IPTV system reached a capacity of 2.52 million subscribers (including 1.58 million activated subscribers). IPTV has played a key role in driving Jiangsu Telecom towards full-

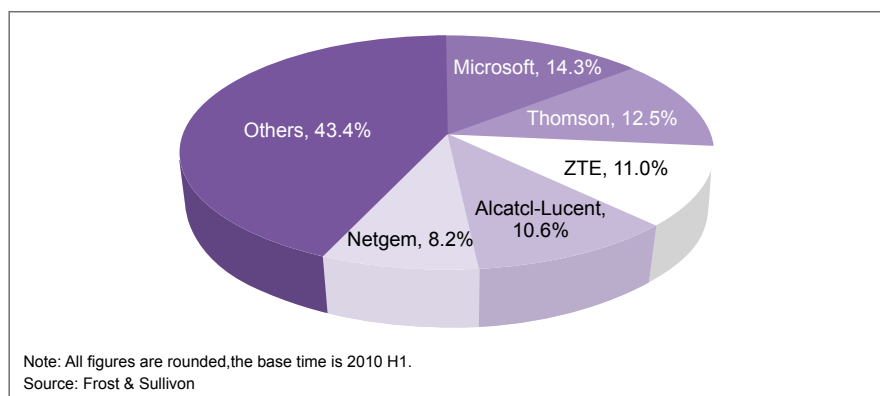


Figure 2. Market shares: Top 5 IPTV equipment vendors by subscriber (world), 2010H1.

service operation.

Forecasts of IPTV Market and Technologies

IPTV market trends analysis

The applications and services introduced by IPTV are changing the TV viewing experience. Network-based time shifting capabilities, video- and TV-on-demand, and real interactivity are expected to significantly affect consumers' viewing habits. For example, currently viewers can watch a TV program at their own convenient time. In a few years, it can be possible that only real-time events, such as recitals, sports matches and breaking news, and certain high audience TV shows will be watched in real time while everything else will be time-shifted.

As seen in Figure 3, in terms of subscriber base, the global IPTV market is expected to maintain high growth rate for the future four years. The global IPTV subscribers are likely to increase to 62.1 million until 2010, and will reach 267.9 million until 2014, growing at a CAGR of 44.1%.

The global IPTV market is valued \$17.5 billion in 2010 and is forecast to grow to \$46.5 billion in 2014, at a CAGR of 27.7%. By 2014, Europe and North America will generate a larger share of the global revenue, due to very low ARPUs in China and India, the fastest growing (as well as the largest) markets in Asia.

IPTV technology trends analysis

- TV: TVs with Internet capability and built-in widget engines are being launched. LED TVs are in the market and prices are expected to continue to fall. Internet capable TVs are also merging IPTV with Internet video services.

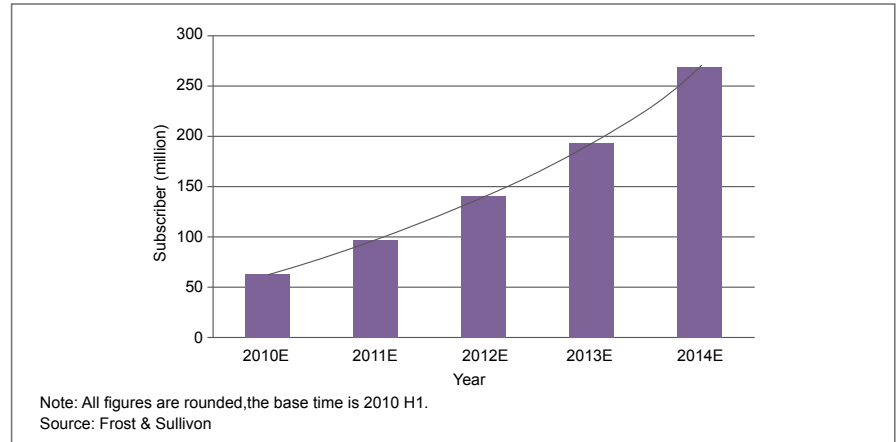


Figure 3. Forecasts: Total subscribers (world), 2010-2014.

- Set-Top Box (STB): STBs now support content storage. IPTV STB prices are expected to fall and TVs with integrated STBs are being launched. If STBs are completely standardized and can be bought off the self by consumers, IPTV service will get a major boost.
- The network: Increased demand for higher speeds because of video applications is increasing deployment of FTTH broadband networks.
- Applications: With convergence of IT and communications, innovation in communications applications is happening at a rapid pace.
- Innovative and interactive IPTV services: The first interactive services to be launched by IPTV providers were VOD and time shifted viewing. The interactive services being offered currently revolve mainly around online shopping/ticketing, gaming, Internet-on-TV, and phone handling from TV. Some providers are also planning to offer services for different verticals such as healthcare, transport, and education. The markets of South Korea and Hong Kong feature some of the most interactive IPTV services in

the world.

- Convergence and digital home: Multi play operators are deploying IMS architecture to offer converged services to their subscribers across multiple telecom service platforms. Providers such as SingTel and PCCW offer a converged IPTV and mobile TV offering. Providers are complementing their IPTV service with Internet TV and mobile TV. Pay TV is evolving to become a single service that can be enjoyed on the TV, mobile, or Internet by consumers. Digital home services are still at a concept stage in most markets. The popular services are basic networking of home PCs and computer accessories. Operators are planning to use IPTV and broadband network to digitize homes and connect various devices online.

With the development of global broadband market, IPTV content and application play more important roles nowadays. As one of new broadband applications, IPTV has attracted comprehensive attention around the industry. As Europe, Asia and North America begin to experiment and play TV programs through the IP transmission network, IPTV market growth is likely to accelerate from now on. **ZTE TECHNOLOGIES**

Mobile Broadband Internet Hastens Development of the Cluster Router Market

Frost & Sullivan analyst's comment on ZTE's T8000 100G cluster router

November 2010

Source: Frost & Sullivan

With the development of all-IP services, users today are showing a preference for mobile multimedia video rather than fixed voice service. This leads to increased traffic from terminals to the access layer, aggregation layer, core layer, and across the whole IP network. To satisfy market demands, operators are in the wings constructing 3G and 4G networks. Because mobile broadband Internet has heavy network traffic and multimedia applications requiring large-capacity, high-performance, and flat IP architecture, construction of a bearer network is challenging. A single-chassis device is restricted in terms of capacity and port density and cannot be used as a super large node in the backbone network or in the core layer of MAN.

“A cluster system integrates the hardware capabilities of multiple devices into one system. This means the core node device has the

necessary requirements for developing IP network architecture and for managing the IP network. There are no restrictions on switching capacity, port speed, or port density. The development of mobile multimedia and construction of 3G/4G networks has been dramatic, and the cluster router market will continue to develop rapidly,” said Fox Hu, consulting director of Information and Communication Technologies Practice, Frost & Sullivan.

ZTE's T8000 100G cluster router—one of the flagship data products in 2010—employs cloud computing, high-performance protocol distributed processing, and virtual cluster control technologies to form a non-stop cluster system. With its high-performance chip, the T8000 100G cluster router provides high-density 10G, 40G, and 100G high-speed interfaces. Many future-oriented technologies are now being developed, and operators

worldwide are showing great interest in the T8000 100G cluster router.

The T8000 100G cluster router has undergone a variety of tests organized by operators and third party organizations. Its outstanding performance in wire-speed, forwarding latency, large granularity service cache, IPv6, and interconnectivity has been highly approved by customers.

“Driven by the fast growth of all-IP services, a revolution is unfolding that involves the integration of bearer networks, boom in mobile Internet usage, and tri-network convergence in China. All these will raise requirements for performance and bandwidth in the backbone network. ZTE's T8000 100G cluster router has amazing capacity, performance, and reliability and is the benchmark for high-end routers,” said Cheney Ji, consultant of Information and Communication Technologies Practice, Frost & Sullivan.

ZTE TECHNOLOGIES

ZTE PEEL

Brings Sprint's 3G Network Reliability to Apple iPod Touch; Creates Mobile Wi-Fi Hotspots

Unique form factor of ZTE PEEL™ cradles Apple® iPod touch® for easy access to Sprint's 3G data speeds

November 10, 2010 Source: Reuters



Beginning on Nov. 14, Sprint customers can attach ZTE PEEL™ to their Apple iPod touch and connect to Sprint's 3G network. ZTE PEEL™ is a unique device that cradles the second- and third-generation iPod touch with a case-like form factor. With universal Wi-Fi compatibility and support for up to two Wi-Fi enabled devices, iPod touch users will have a virtually anywhere, anytime Internet connection that removes the reliance on a Wi-Fi hotspot for a data connection. Customers simply slide their iPod touch (touch-screen face out) into ZTE PEEL™, press down on both sides until it clicks into place, and then press the power button located on the back of ZTE PEEL™ to connect to Sprint's 3G network.

ZTE PEEL will be available beginning Sunday, Nov. 14, through Sprint retail stores and direct ship sales

channels, including Web sales and Telesales for \$79.99 (taxes excluded). The ZTE PEEL™ \$29.99 monthly service plan from Sprint allows up to 1GB of 3G data on the Sprint network (taxes and surcharges excluded) with no annual contract required.

“ZTE PEEL™ unlocks the wonderful user interface and Web experience of Apple’s popular iPod touch and transforms it into a powerful mobile device using the Sprint 3G network,” said Fared Adib, vice president, product development at Sprint. “When combined with Sprint’s 3G network, ZTE PEEL™ turns an iPod touch from a portable device limited by the availability of Wi-Fi to a mobility tool free to browse the Web and use applications anytime, anywhere while on Sprint’s 3G network.”

Key features of ZTE PEEL™ include advanced security through WEP, an internal antenna and compatibility with Windows® 7, Windows Vista®, Windows XP®, Macintosh® OS 10.5, 10.6. No software installation is required for use.

“ZTE is proud to continue to grow our relationship with Sprint, and we are excited to bring this groundbreaking product to Sprint’s already innovative portfolio,” said Joey Jia, general manager of ZTE USA. “We are committed to providing our partners with products that drive consumer demand and present a competitive edge.”

The nationwide Sprint 3G network provides access to a full range of applications that require internet connectivity to perform, including VoIP, gaming, streaming news and real-time sports updates. With ZTE Peel supporting up to two hotspot connections, users can also enable

laptops, tablets and other mobile devices with 3G data speeds.

Reliability from Sprint 3G

ZTE PEEL will operate on the Sprint 3G network, and customers can be confident in their ability to stay connected. According to the results of a 13-city test conducted by PC World on 3G performance, no one has a more reliable network than Sprint. For the second consecutive year, Sprint’s reliability rates were second-to-none.

PC World’s test involved Sprint, AT&T, Verizon and T-Mobile in 13 major cities in all regions of the country during December 2009 and January 2010. In all, roughly 9,000

individual tests of Sprint’s 3G service were conducted from 280 testing locations. Testing sessions were one minute in duration per location, and network performance can be highly variable from neighborhood to neighborhood. In laptop-based tests, Sprint tied with another carrier for first in 3G network reliability.

With the Sprint Free Guarantee, customers can take advantage of ZTE PEEL for 30 days. If not completely satisfied, customers may return the device within 30 days to get reimbursed for the device purchase and activation fee, get the restocking fees waived, and receive a full refund for the monthly service plan charges.

Strip Your iPod Touch of Restriction with the ZTE PEEL and Sprint

November 10, 2010 by Stefania Viscusi Source: TMCnet

Most iPod Touch users are lacking one main criterion to be more like their iPhone counterparts—a constant mobile connection and the ability to make phone calls.

Today, Sprint officially announced the availability of the much anticipated “ZTE Peel” which may change the way second and third generation subscribers use their iPod.

The ZTE Peel is a device that users slide their iPod into and click into place. Closely resembling a protective cover, the PEEL, once switched on, provides access to Sprint’s 3G network.

In essence, this now adds a lot of the same functionality of the iPhone to the device. Apps that require an Internet connection to function, like gaming, streaming news and sports updates, are now possible.

Also important, with an Internet connection, users can now take advantage of the cost savings associated with VoIP technology and use their iPods to make low cost and free phone calls.

China Unicom and ZTE Jointly Launch WoStore in Hong Kong

Multi-device online service built exclusively by ZTE will extend mobile applications to Hong Kong

17 November 2010, Hong Kong — ZTE today announced that it will jointly introduce China Unicom's multi-platform, multi-device application store called the "WoStore" into Hong Kong.

Launched earlier in Shanghai, China, the WoStore online application service is built entirely by ZTE and will support all open smartphone platforms except for iPhone, as



well as terminal devices such as tablet PCs and mobile Internet devices (MIDs). "Wo" is a 3G brand created by China Unicom to reach out to its mobile phone users.

The WoStore adopts mobile phone numbers as usernames and opens registration to all mobile phone users (including 2G or 3G users) of China Unicom's entire network. Upon successful registration, a user can browse, purchase, download, gift, recommend and add applications to their favorite folders on the WoStore portal.

The announcement was made at Mobile Asia Congress 2010, where China Unicom and ZTE demonstrated the availability of mobile phone applications via WoStore at their booth.

ZTE Wins "Leone D' Oro per la Comunicazione" (Golden Lion for Communications) Award

ZTE receives the award from Fondazione Italia Cina for brand development activities

25 November 2010, Milan — ZTE has received the "Leone D' Oro per la Comunicazione" award from the Fondazione Italia Cina.

Every year, the Fondazione organizes the "China Awards" with the aim of recognizing Italian companies that operate in China and Chinese organizations that operate in Italy. During the ceremony, prizes are awarded to organizations that have invested in the Chinese and Italian economy, citizens, businesses and services.

In the last two years, ZTE has increasingly invested and leveraged its communications strategy to increase business in Italy and internationalize the company. Through partnerships with key carriers and collaborations with qualified local and national consultancies, ZTE has invested in PR and media campaigns, developing co-branded equipment with companies such as Poste Mobile for entry level handset models PM1001, PM1002, PM1005, and with H3G for the MD Touch Mini mobile phone.

ZTE Deploys World's First Large-Scale Commercial GPON-based Mobile Backhaul Network for TELKOM Indonesia



23 November 2010, Jakarta — ZTE today announced it has successfully completed the world's first large-scale commercial GPON-based mobile backhaul network for TELKOM Indonesia, a full-service telecom operator in Indonesia. The project is the first such large-scale commercialization of GPON backhaul technology, and is based on ZTE's mobile network platform.

With Indonesia's strong growth in broadband demand in recent years, TELKOM Indonesia needed to meet traditional voice service demands and its current extensive range of broadband services such as high-speed Internet, IPTV and online games, while also considering the integration of fixed and mobile networks to cater for future bandwidth growth.

ZTE Deploys the First 4G/WiMAX Network for ZAPP.PT in Portugal



11 November 2010, Shenzhen — ZTE has signed a €30 million contract to supply 3G/4G equipment and services to ZAPP.PT in Portugal, including WiMAX and CDMA2000 EV-DO Rev.B network equipment, core network equipment, and Services, which will provide high-speed broadband wireless services across Portugal.

ZTE will provide ZAPP.PT with Uni-RAN mobile network equipment, Uni-Core core network equipment, and services to support the launch of the WiMAX 4G network over 3.5GHz frequencies with initial services being launched by mid-2011 across selected areas of the country, including Lisbon and Porto. It will also upgrade ZAPP.PT's 450MHz CDMA network to CDMA2000 Rev.B which will be the first EV-DO Rev.B commercial network in Europe, and install a state-of-the-art IMS to provide VoIP services for WiMAX and EV-DO subscribers.

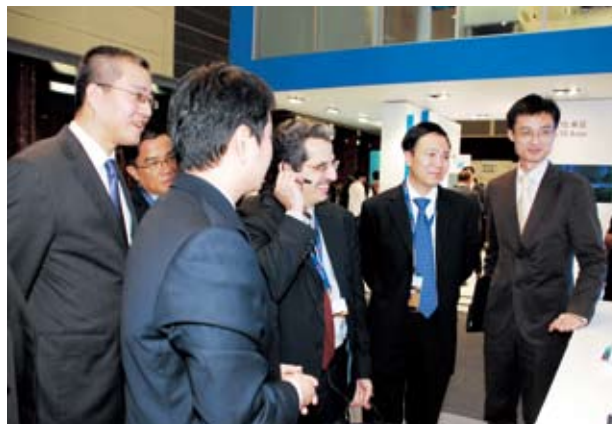
ZTE Showcases World's First VoLTE Call Based on IMS with Existing Mobile Networks at Mobile Asia Congress 2010

The successful demonstration of standards-based interoperability between LTE network and existing 2G/3G networks

17 November 2010, Hong Kong — ZTE today demonstrates successful IMS-based Voice over LTE (VoLTE) calls on CSL's LTE network and its existing mobile networks at Mobile Asia Congress 2010. The calls finished between IMS clients as well as IMS client and conventional 2G/3G handsets. This is the first time VoLTE calls are made to the industry based on the interoperability of LTE network and existing 2G/3G networks. In addition, supplementary services such as call forwarding, call

waiting were demonstrated.

VoLTE is the next step in developing a standard way of delivering voice for LTE. Through the use of its IMS-based solutions and LTE expertise, ZTE is able to demonstrate how voice will work seamlessly in the future.



ZTE Ranked Second in Global IMS Market by iLocus

9 November 2010, Shenzhen — ZTE today announced that it has been ranked as the No.2 IP Multimedia Subsystem (IMS) vendor by market share.

According to a report by industry analyst firm iLocus, ZTE had strong capabilities in wireless and terminals, and has also shown leadership with wireline IMS during 2009 and in the first half of 2010. The company's market share of wireline IMS during the first

half of 2010 reached 22.3%, helping it secure second place.

The report *Global IMS Market 2010* found the global IMS market showed a strong increase with a total of 207.9 million IMS subscriber lines sold across both wireline and wireless networks by the end of the first half of 2010. The report also ranked ZTE second in terms of overall performance.



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