

ZTE中兴

# ZTE CORE NETWORK SUCCESS STORIES



Core

# Core Network – Inner Beauty is the Real Beauty

Over 20 years ago, the global communication is on the starting line of high-speed development. Facing a huge communication industry market opportunity, ZTE, who just began its career, decided to take the heart of communication industry – core network product – digital program controlled switch as a breakthrough point and make independent innovations. Today, as a rapidly developing Chinese strength in the world, ZTE got leaping progress in the competition and is moving towards the leading group. Core network product is the starting point and the motivation.

As the only listed communication equipment manufacturer in both Hongkong and Shenzhen in China, ZTE has become the only core network equipment provider supporting all system in the industry. ZTE provides continuously innovated and refined CN solution and service based on wireless access of GSM/UMTS/CDMA/TD-SCDMA/PHS/WiMAX/LTE/WLAN, and wireline access of PSTN/MSAN/xDSL/xPON/LAN/ intelligent terminal. ZTE obtained over 590 million users around the world, covering more than 80 countries and regions. In the over 20 years' high-speed communication developing process, ZTE has shared success and delight with operators in the world, and kept the brilliant achievements in record by focusing on users' needs, providing best quality service, and paying attention to continuous customer value improvement.

As a core part representing the competitiveness in operator's network, core network products technology and development requirements are far beyond those for ordinary communication products. Facing the challenge, ZTE promoted its self-owned national digital program-controlled switch firstly in Nanjing in 1989. Subsequently it promoted the first NGN commercial network in the world, the new-generation innovative V3 core network platform and integrated IMS solution platform. During the rapid development, ZTE obtained a series of remarkable achievements all around the world. It successfully built the first softswitch commercial office in the world, constructed the largest fixed line softswitch long-distance network in the world, the largest mobile softswitch end office in the world, the first 3G TD-SCDMA core network in the world, the first Ap interface-based CDMA softswitch commercial office, and the largest CDMA softswitch long-distance gateway office in the world. As the biggest brand for Chinese IMS and global-leading IMS solution provider, ZTE constructed the largest IMS commercial network in China, deployed the first "three in one" IMS trial office in the world by integrating WCDMA, CDMA2000 and fixed line, by which a VoIP phone call based on IMS+EVDO RevA was successfully made.

Based on the analysis of Gartner, 2008-2011 will be the time window for high-speed development of core network product. North America, EMEA

(Europe, Middle East, and Africa) will still be the largest market for next-generation core network products. The progress of IMS will urge the operators to focus on the integration of core networks to provide users with Multi-Play multi-media service. Softswitch products increased rate is improved from 45% to 50% in Asia-Pacific in 2007. The needs for network innovation in the future become obvious. In South America and Japan, NGN evolvement has become the main need. Facing the development tendency of global core network market, ZTE proposed CORE<sup>2</sup> concept – by completely analyzing the core network products the operators need in each perspective of C (convergence), O (open), R (reliable), and E (effective/evolution), ZTE would be able to become the core value partner for operators.

Starting in Nanjing, rapidly developing in Shenzhen, carrying the great expectation of Chinese communication enterprise, ZTE core network products are soaring in the enormous global telecom industry. By providing global operators with professional services in network transformation, construction, evolution and integration, ZTE has become an important partner of the operators all around the world. Experiencing the hard work during these 20 years, ZTE believes that the inner beauty of core network, is the real beauty!

This paper presents successful cases of ZTE core network products. CORE<sup>2</sup>, value partner!

# CONTENTS

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**02 Portugal AR TELECOM “Customized” Success**  
ZTE Built Customized NGN/IMS Service System for AR

**04 ZTE Core Network Contributed to MobilKom Success**

**06 European MTO ZAPP Builds High Rate HSPA Network**  
ZTE PS Core Network Products Gained Favor of Customer

**08 China Unicom IMS Shines the Gold Coast of Europe**  
China Unicom and ZTE Develop IMS-based Convergent OSS/BSS Together



**10 Innovative Cooperation Brought New Aviation Communication**

**12 All-IP Interconnectivity, All-Service Operation**  
ETC Project Report

**14 ZTE Helps WANA Create “Africa Miracle”**

**16 Perfect Cooperation Makes Perfect Success**  
Libyana Established the Largest 2G/3G Hybrid Network in the World



**18 Build Quality Network Hand in Hand**  
India Reliance Communications CDMA Network

**20 Fly to Excellence**  
ZTE Helped China Mobile to Create Boundless Communication World

**22 14-year Cooperation, Sustaining Collaboration Leads to Success**  
ZTE and China Unicom Work Together to Win Brilliant Achievements



**24 Over 200 Million Users Uses Long-Distance Services over IP**  
China Telecom Built the Largest Fixed Network NGN Network in the World

# Portugal AR TELECOM “Customized” Success

—ZTE Built Customized NGN/IMS Service System for AR



“ *AR Telecom is commercially using the ZTE NGN system since September 2007. The system includes two SS10 SS1b soft switches, two MSGs 7200 one UP10 service’s platform and one MT-10 system for Lawful Interception.*

*Since the beginning of the project, AR Telecom put some requirements and opened several issues in order to customize the platform according Portuguese regulations and specifications.*

*Apart of some ongoing developments, the overall performance and stability have been considered satisfactory.* ”

—AR TELECOM NGN TEAM

By cooperating with ZTE in its NGN project, AR Telecom, carriers of Portugal successfully laid out its own network and picked up the most suitable services to fit more and more severe competitions in local telecom market. — You can customize your own success!

AR Telecom was set in 1999, and



mainly lived for providing enterprise and individual customers with digital TV service, broadband service, ADSL, VPN, dial-up access service, video conference, traditional voice and data service. In 2005, AR Telecom was purchased by Portugal SGC group, becoming its wholly-owned subsidiary telecom company for developing Portugal market. AR aims at becoming the first telecom carrier who uses its own network in Portugal.

As a medium-scale carrier, AR Telecom focuses on its business in Lisbon and Porto the bridgeheads of Europe high-end telecom market. After 2004, AR tired to further develop its service in Europe market, and then lots of problems occurred at the same time——Nortel’s PSTN switch and Moto’s CMTS used by AR can not meet the requirements of new user’s Triple-Play service, which directly leads to small market share. Therefore AR Telecom at that moment urgently needed cost-effective solutions to help them to develop new services and enlarge market share.

## “THE CLEARST PROPOSAL”

To get success in new competition, AR paid great attention to NGN technology since the end of 2004, and it expected a customized NGN solution helping its new service development. Europe is always the traditional market of transnational equipment suppliers, Portugal is not excluded. So lots of transnational equipment provider joined in the construction of Portugal national core network. ZTE participated in the bidding of AR NGN network, and entered AR short list after competing in the severe bidding response and clarification.

To get better understanding of network and service requirements, ZTE sent an expert team to introduce all the details to AR and show them IPcentrex service.

At that moment AR made such comments to ZTE: ZTE provided us with the clearest proposal we have ever read. This “clearest” proposal



introduces the solutions made by ZTE expert team based upon AR network situation and customer attribute.

## A EQUIPMENT PROVIDER OR A PARTNER?

For AR, NGN project is much more than implementing new services, it should be a complete analysis on its existing network, target user market and future market trend. So in this project, AR will choose a partner instead of a equipment provider.

After the first phase of bidding, AR modified the bidding document as per expert's suggestion, and released RFQ V2 (Bidding Document V2) to reorganize network and service solution. Again, ZTE entered the short list successfully. At this moment, because of the active suggestions ZTE shown in its bidding document and communication, AR considered ZTE more than a vendor and actively invited ZTE to extend its proposals to network construction. Meanwhile, ZTE customized more individualized and reasonable network suggestions to AR in terms of its rich experiences in NGN product deployment for nearly 20 years and the similar cases it once encountered. After the first round communication, AR realized the drawbacks in network layout again, and modified its bidding document again before arranging the third bidding. This time, ZTE flexibly changed its traditional clarification template, and focused on details and attributes of AR's new requirements, so that, the engineers from AR can find their concentration in ZTE's document at first glance. Finally, AR chose ZTE as its partner.

After this project, AR and ZTE keep communication with each other, and develop further cooperation in transmission products, data products and access products.

## CUSTOMIZED SUCCESS

As a local medium-scale carrier in Portugal, AR can get success in

the differentiated competition with local big carriers only by avoiding their advantages and developing its own way. In this process, a suitable partner who can customize AR a successful network is very important.

Customize new opportunities via new technologies. Before using NGN technology, AR is troubled by aging equipment and outdated technology, what is worse, major user adopted bronze cable and the infrastructure used leased cable from PT group. After NGN construction, currently AR is one of the most competitive Triple play service providers in Portugal. The extensive demands for multimedia service bring AR more opportunities.

Customize success via ZTE. ZTE started researching NGN since 1998, so with various experiences for more than 10 years, it deeply understands network architecture and service development. Its NGN products are serving for more than 100 worldwide carriers including China Telecom and PCCW. After cooperating with ZTE, AR get further understanding of its own requirements and specified bidding document for three times, in other words, it customized its own network and chose a suitable partner.

In addition, considering costs, it would cost AR fortune if it wants to develop users in the case of traditional telecom monopoly in western countries. But through IP-based NGN network, AR can interconnect with carriers of other countries. Currently AR uses have been extended to Brazil, U.K. and U.S.

Customized new services attract customers. As ZTE NGN use an open platform, it gives lots of conveniences for AR to customize services and use terminal equipment flexibly. In this cooperation, ZTE customized AR Europe-based NP service (Number Portability Service), ISDN supplementary service, Timeslot division, and 64K unlimited call services. In considering traditional SME customers, AR at the same time developed individual users as

well. As a matter of fact, the strategy of AR is correct. Half year after the services are implemented, with sound development trend, AR's local VOIP user number has exceeded the local biggest carrier PT (Portugal Telecom).

### ZTE Solution

- Individualized network solution
- End-to-end dual host backup, support multiple protocols, dual networks and planes, supporting multiple user terminals
- Customized multimedia service: NP service (Number Portability Service), etc

### AR Telecom Benefits

- Develop new services and user groups
- Enhance local market and achieving more markets
- Obviously enhance new service capability and provide triple play service
- Update equipment, reduce costs for operation and maintenance
- Share global NGN network deployment experience

### MILESTONE

- Until 2008, AR has cooperated with ZTE in transmission, data and EPON fields
- July 2007, first verification of the system is successful, which indicates a new milestone in cooperation
- September 2006, AR project started commercial operation
- July 2006, ZTE customized new services for AR
- From September 2005 to April 2006, ZTE started equipment installation and tests
- June 2005, after previous communication and tests, AR announced that ZTE achieved NGN project

# ZTE Core Network Contributed to MobilKom Success

“ With leading technology, ZTE All-IP CDMA2000 network saved a great deal of network construction cost, and laid a good foundation for us to provide users with high-quality and low cost services.

—MobilKom CEO Lubos Borik



Czechoslovakia MobilKom was founded in 1993. Positioned as private network cluster communication service provider, MobilKom users are mostly group users. MobilKom has stable user group after the network development of over 10 years. However, its single service becomes the dilemma of user increase. When Penta purchased MobilKom, it transformed the network

and added value to it by importing CDMA new technology and service. MobilKom gradually transformed from single cluster network user service to comprehensive service after the one year renovation. It positioned its brand serving for the public as Ufon, providing comprehensive service integrating CDMA20001X voice and data, EV-DO Rev.A high-speed data, and PTT cluster service for users in the whole Czechoslovakia.

Through this successful transformation, MobilKom became the fourth mobile operator next to T-Mobile, Telefonica O2 and Vodafone. MobilKom's successful operation became the business model of transformation from traditional cluster operator to CDMA comprehensive

operator. On one hand MobilKom kept original users' benefits and loyalty, on the other hand, MobilKom network upgrade attracted more individual users.

## VARIOUS SERVICES FACILITATE USER DEVELOPMENT

With a CDMA network covering the whole country, MobilKom provided users with a rich service platform combining high-capacity, wide-covering and multiple-service CDMA technology with CDMA-based professional cluster technology.

Based on the gradual network development, MobilKom provided ordinary users and enterprise users

with WLL voice service, 1X data service, EV-DO Rev.A data service, mobile voice service, short message, voice inbox, PTT (Push to Talk) service, prepaid/postpaid service, LBS service and MVNO cooperating with other operators, among which the key services are mobile voice, EVDO A data, WLL voice and cluster service.

MobilKom held a commercial press conference on May 14th, 2007 to announce that the system is put into official commercial use. Its subscribed user number exceeded 45000 by March 2008. With its original cluster operation experience and user basis, MobilKom plans to obtain around 30000 PTT users in the future 5 years and the market coverage of 20%.

## **COMPLETELY OPTIMIZED BY ALL-IP SOFTSWITCH CORE NETWORK**

MobilKom adopted advanced ZTE whole-set All-IP solution, which has flat network, flexible networking, economical transmission, European standard number portability, and smooth evolvement capability to MMD/IMS. In this way network quality and transmission efficiency were effectively guaranteed to satisfy the needs of service development. What's more, the solution greatly reduced network construction CAPEX and OPEX, improved MobilKom's competitiveness and profitability.

Multiple new technologies and new services have added wings to MobilKom in Czechoslovakia telecom market, made its competitiveness surpass traditional GSM operator and win the opportunity of future development.

### **ZTE Solution**

- High-capacity, wide coverage, and multiple service providing users with rich service platform
- Flat network, flexible networking, economical transmission, and smooth evolvement capability to MMD/IMS

### **Mobilkom Benefits**

- Transforming from single cluster network service towards comprehensive service, attracting more users
- Multiple service types including PTT services. Service development offers multiple choices
- Quality network improved its competitiveness and profitability



“ ZTE has been chosen over other potential vendors due to the fact that its solutions deliver the most cost-effective benefits, quality, and functionality. This will lead to higher operational and technological efficiency and will result in cost reduction, while still providing customers with the most advanced 3G services. ”

—Chris Bataillard, CEO of Zapp

# European MTO ZAPP Builds High Rate HSPA Network

—ZTE PS Core Network Products Gained Favor of Customer



THE NEXT GENERATION NETWORK

Being the third largest mobile operator in Romania, ZAPP successfully imported CDMA2000, involving mobile voice, fixed and mobile broadband services, WLL voice, as well as data service. ZAPP is the first operator in Romania to combine high rate CDMA2000 technology with high coverage of CDMA450. As one of the CDMA450 operators with the best operation in the world, ZAPP network covers around 90% population in Romania.

## FOCUSING ON CUSTOMERS' NEEDS,

### ALL-IP PROMOTES ZAPP IN COMPETITION

The competition in Romanian telecom market has become increasingly fierce. How to build network, distribute numbers, develop users and win the market became the chief problem after ZAPP obtained 15MHz 2.1GHz license at the end of 2006. To keep the competitiveness and to consolidate its dominant position, Romania ZAPP determined to attract more users to experience high-speed data service by importing WCDMA/HSPA network. At the end of 2007, ZAPP signed the official commercial contract with ZTE, selecting ZTE as the exclusive vendor to provide all the equipment and services in WCDMA newly-construction and CDMA expansion for ZAPP in the whole country of Romania. ZTE will build HSPA network

covering the whole country involving 5 PS core networks, on which HSDPA/HSUPA will be launched to provide quality high-speed wireless broadband service, so as to bring high-speed data service experience to users.

With perfect core network solution and excellent PS commercial capability, ZTE won favor and trust from ZAPP. ZTE customizes All-IP solution, which could save TCO, provide smooth evolution channel for the follow-up network developments, and provide service experience including voice and high-speed data service. All these could enhance ZAPP's competitiveness and network profit capability.

Compared with traditional networking, All-IP solution helps reduce much more CAPEX and OPEX, with more



flexible networking method to improve network comprehensive competitive power to the maximum for ZAPP. Adopting unified hardware platform and modular design, ZTE core network products satisfy the requirements of current HSPA, future expansion and consumption control with its large capacity and high integrity. A single SGSN resource frame, BGSN frame, supports up to 4.9Gbps throughput, and 0.9 million PDP context. A single GGSN BPSN frame supports up to 4.8Gbps throughput (no content-based billing). The maximal traffic for a single core node in this project reaches about 3Gbps. SGSN and SGSN and GGSN both adopt less than one rack, meeting the requirements of area occupied in the equipment room, as well as consumption control. High reliability of the mature equipment guarantees network security and stability. Integrated platform architecture makes it possible to implement smooth network evolution, and at the same time reduce operation and maintenance cost. Soft switching and IP transmission save transmission resource significantly, soundly protect customer investment, thus achieve wide recognition among customers.

ZTE All-IP solution helps ZAPP improve its comprehensive competitive power and present itself in the arena of Romania communication market. With large capacity, high integrity and high reliability, ZTE core network products have become the solid foundation of the whole network. They provide users with real information highway experience that brought about by HSPA.

**EFFICIENT IMPLEMENTATION LAYS GOOD FOUNDATION FOR NETWORK DEVELOPMENT**

ZTE has been always active in the communication with ZAPP since it obtained 3G license. Especially since September 2007, ZTE built a project team to negotiate with ZAPP on its CDMA/WCDMA commercial services. Finally ZTE gained the CDMA/WCDMA commercial network contract with full amount.

Romanian ZAPP WCDMA/HSPA network construction is divided into two phases. In the first phase, core networks in 3 regions will be built in 2008. In the second phase, core networks in the rest 2 regions will be built; and some expansion will be implemented in 2009.

Under the pressure of fierce competition, ZAPP has to build the network quickly and put it into commercial use as soon as possible to guarantee its superior position in the market. ZAPP plans to provide HSPA high-speed wireless data service in 19 major cities in Romania first in June 2008. To ensure ZAPP network quality and achieve the quick launch objective, with professional logistics team and rich project implementation experience, ZTE completed delivery in only 3 months since it got the contract in Dec. 2007. The project smoothly went to the next stage of commissioning and installation.

The project got great progress by close cooperation of the front and home. Romania Timisoara region services were successfully implemented in March 2008. The first PS phone call of ZAPP project was successfully made as schedule. Cluj region services were also successfully launched in April. By far ZTE has completed service commissioning and testing of two cities among the three in phase I for Romania project, which indicates powerful project implementation capability and fast

customer requirements responding capability of ZTE Corporation. In this project ZTE gets customer satisfaction and lays a good foundation for the follow-up network development.

ZTE All-IP solution and its efficient project implementation capability provide ZAPP with wings in Romania telecom market by greatly improving its competitiveness. Winning the future development opportunities, and providing HSPDA services for users, ZAPP strides towards the high-speed data road.

**ZTE Solution**

- All-IP solution
- Low TCO solution
- Excellent engineering and delivery capability

**ZAPP Benefits**

- All-IP network architecture; overall network construction and operation cost is reduced
- Protecting existing investment to the maximum; importing HSPA to increase network capacity and operation competitiveness
- Fast network deployment to win opportunities in market

**MILESTONE**

- Cluj region services are successfully launched; network construction in two cities has been completed in April 2008
- Delivery is completed and moved to tight commissioning and installation stage in March 2008. Timisoara region services were successfully launched. The first PS phone call for ZAPP project has been successfully made as schedule
- ZAPP selected ZTE to provide WCDMA and CDMA equipment, network construction and services for ZAPP Romania and ZAPP Portugal

# China Unicom IMS Shines the Gold Coast of Europe

—China Unicom and ZTE Develop IMS-based Convergent OSS/BSS Together



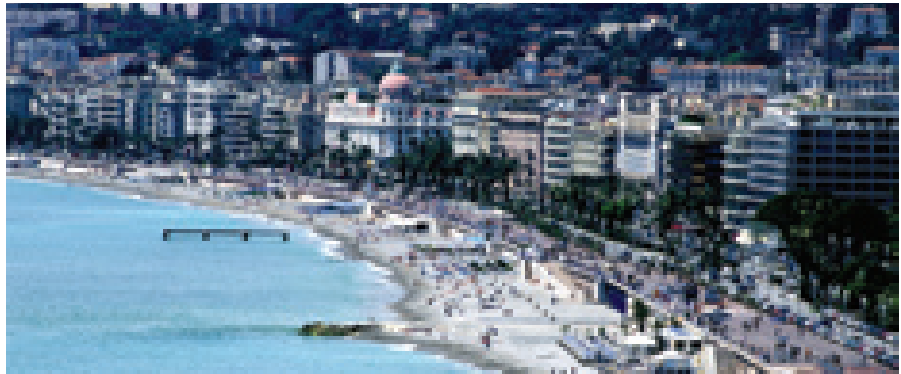
TeleManagement  
**FORUM**

“ *China Unicom proposed the research project of 'Seamless OSS/BSS for IMS Services' in 2007, and got support from some famous vendors in both OSS/BSS industry and IMS industry. ZTE provided IMS core equipment and played the important role in the project. Without ZTE, we can't make it!* ”

—Zhang Zhijiang, General Manager of Technology Department, China Unicom

“ *This catalyst is a perfect example of a second catalyst project being built on the solid foundation of a successful first phase. This excellent team continues to explore the subject matter and to further develop the ideas successfully demonstrated at Management World Americas in Dallas 2007.* ”

—Martin Creaner, Chief Technology Officer, TeleManagement Forum



From May 20<sup>th</sup> to 22<sup>nd</sup>, Management World 2008, the top conference in global telecom management field organized by TeleManagement Forum, is held in Nice Europe's famous gold coast in France. The conference displayed the most innovative philosophies and advanced technologies in global operation management field.

## FIELD BREAKTHROUGH, OUTSTANDING SIGNIFICANCE

In Management World 2008, China Unicom together with ZTE successfully demonstrated the industry's first IMS-based convergent OSS/BSS system. Customers lively experienced multiple IMS services deployment, provisioning, billing, as well as both online and offline charging. It is a big breakthrough in the industry.

OSS (Operations Support Systems)/ BSS (Business Support Systems) plays an important role in IMS commercial deployment. But, the current research on IMS is mainly focused on network level and service level, concerning less with OSS/BSS.

Under this background, China Unicom proposed the Catalyst project of “Seamless OSS/BSS for IMS Services” in TM Forum (TeleManagement Forum) in 2007. TM Forum is an authorized organization focusing on NGOSS(New Generation Operations Systems and Software) As an innovation, China Unicom's “Seamless OSS/BSS for IMS Services” project made a great breakthrough in telecommunication management field, and showed outstanding significances. Also, as a good exploration of IMS network's operation, it further accelerated the implementation of IMS network.

## GET THE HONORABLE INVITATION, DISPALY THE STRENGTH

As one of the leading IMS vendors in the world, ZTE shows its powerful strength in IMS field in the industry. Due to its experience in IMS implementation and deep understanding of IMS, early in 2006 ZTE successfully passed GMI(Global MultiService Forum Interoperability) 2006 organized by MSF(MultiService Forum) where global leading carriers

and vendors participated; at the same time, it was honored to be appointed by China Unicom to build its "3 in 1" IMS commercial trial network covering three kinds of access technologies (WCDMA, CDMA2000, and fixed network), which was the first "complicated" IMS network in the world.

In "Seamless OSS/BSS for IMS services" project, ZTE was again honorably invited to co-work on this project by China Unicom. In September 2007, ZTE officially joined in the project, and shared its advanced technologies and experiences in IMS field with all the parties in the project.

Totally the project includes two phases. The project phase I proposed the general architecture which showed how OSS/BSS seamlessly support IMS service. And in the project phase II, more IMS services were implemented according to real IMS operation scenario. On behalf of China Unicom, ZTE with deep understanding of project layout and technical requirements finished the designing of the scenarios with other parties in the project. Then ZTE's IMS equipment showed the excellent compatibility in the system interoperability tests, which saved a lot of time for overall schedule. In addition, ZTE due to its unbelievable capability in the industry independently undertook the project phase II's scenario 2 with its end-to-end IMS products.

## SUCCESSFUL DISPLAY, EXTENSIVE APPROVAL

In Dallas "TM World" held by TM Forum in 2007, the achievement of catalyst project "Seamless OSS/BSS for IMS Services (Phase I)" was successfully demonstrated.

With the success of Phase I, ZTE and China Unicom continued Phase II project – the seamless OSS/BSS for E2E (End to End) IMS system, and successfully gave the show at the Management World 2008, organized by TM Forum in Nice, France, in May 2008. The Phase II project provided more IMS services and more access types of IMS terminals, which

was closer to the real commercial operating circumstance. The most attractive point is, comparing to Phase I's offline charging, both online and offline charging function were supported by Phase II project.

There are two scenarios in Phase II project:

In scenario I, a total solution of "Seamless OSS/BSS for IMS services" was presented in a multi-vendor systems environment. ZTE provided IMS core equipment (CSCF, HSS, IMS-GWF,CG, etc.) and IMS terminals (fixed/mobile terminals, IMS client), co-working with Microsoft's service delivery platform, Amdocs's charging system, and Avaya's application server. It demonstrated the great interoperability, compatibility and flexibility of ZTE's IMS product portfolios.

In scenario II, ZTE provided end-to-end IMS system including IMS client/terminals, access network, unified core network, universal service platform and convergent OSS/BSS system. Currently, only very few vendors can provide such one-stop IMS solution. Based on this end-to-end system, IMS services deployment, provisioning, billing, as well as both online and offline charging were completely performed.

During the demonstration, customers lively experienced seven typical IMS services, which are IM (Instant Messaging), PS (Presence), VT (Video Telephony), DAB (Dynamic Address Book), MRBT (Multimedia Ring Back Tone), MMCI (MultiMedia Colorful Identity) and PBR (Presence-based Routing).

OSS/BSS plays an critical role in IMS commercial deployment. The project phase II provided the industry with a real "IMS services lifecycle management" model, and was the exploration of IMS network's operation. It was an important milestone in commercial IMS network deployment. China Unicom said: "providing IMS services via seamless OSS/BSS architecture is very important. 'Seamless OSS/BSS for

IMS services' project phase II offers a more operatable and complete operation support model to future IMS implementation. We get the precious experiences from this project."

## ZTE Solution

- The industry-first operational IMS-based OSS/BSS
- The first IMS + NGOSS seamless integration system in the industry
- An end-to-end IMS solution including fixed/mobile terminals, core network, service platform and OSS/BSS
- Excellent interoperability and compatibility with open interfaces

## China Unicom Benefits

- Provide the total solution of OSS/BSS for IMS services
- Provide a real and complete model of "IMS services lifecycle management"
- Realize convergent online & offline IMS charging
- Standardize the interfaces between IMS core and OSS/BSS

## MILESTONE

- May 20<sup>th</sup> 2008: the achievement of project phase II was demonstrated successfully in Management World 2008 in Nice, France
- April 2008: Finished the implementation of two scenarios in project phase II
- March 2008: Finished the development of project phase II
- February 2008: Finished the design of related service procedure in project phase II and the corresponding interface development files
- January 2008: Proposed the solution of project phase II
- December 2007: Officially initiated "Seamless OSS/BSS for IMS services" project phase II
- November 2<sup>nd</sup> 2007: the achievement of project phase I was demonstrated in "TM World" in Dallas, America
- October 29<sup>th</sup> 2007: Finished system development and system interoperability test of project phase I
- September 30<sup>th</sup> 2007: Proposed the solution of project phase I and finished the definition of interfaces
- September 10<sup>th</sup> 2007: Joined "Seamless OSS/BSS for IMS services" project

# Innovative Cooperation Brought New Aviation Communication



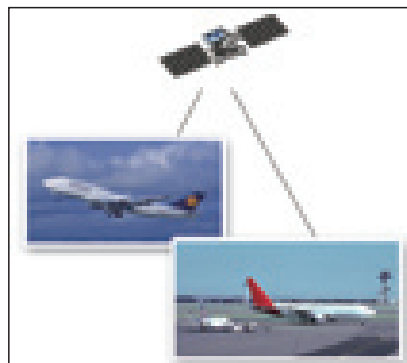
U.S. AirCell was founded in 90s, specializing in avian communication system research, development and services. As mainstream products of U.S. AirCell, aircraft-carried satellite communication transceiver and wireless phone are applied in multiple large airlines. They provide convenient communication services for avian passengers in the country and have been installed on over forty types of aircrafts including large passenger aircrafts of Airbus, Boeing/McDonnell Douglas; and small passenger aircrafts, commercial, private and military aircrafts manufactured by Raytheon, Embraer (Brazil), and Bombardier (Canada).

Satellite-based communication lines have been very expensive for many years. Although voice and data communication services are provided on many aircrafts, in fact the users are very few. With the rapid development of mobile communication technology,

direct communication between aircraft and ground site station has been practical. The research work indicates that compared with satellite communication; direct communication between aircraft and ground has distinguished advantages in network cost, bandwidth, and delay.

## INNOVATIVE COOPERATION BROUGHT NEW AVIATION COMMUNICATION

Customized ATG (Air-To-Ground) EVDO data network is not only the first application of CDMA technology in high air, filling the blank of ground system in avian communication field,



Traditional satellite communication solution for avian field

and substituting traditional avian satellite communication, but also introduces communication innovation of a new era for airline industry. Since ground CDMA system has high performance-price ratio compared with satellite communication, the introduction of it will definitely help communication service expansion in aviation flight and provide the passengers with good quality communication application with reasonable cost.

U.S. AirCell obtained the exclusive service right of air-to-ground communication. However, direct air-to-ground communication involves many new high-end technologies such as customized special frequency segment, fast switching of ground site station system, and Doppler effects caused by flight. To solve these problems a suitable equipment provider is needed to work together with, to implement development and research. It cannot be completed by U.S. AirCell or any equipment provider itself.

The sincerity and trust for each other between U.S. AirCell and ZTE finally





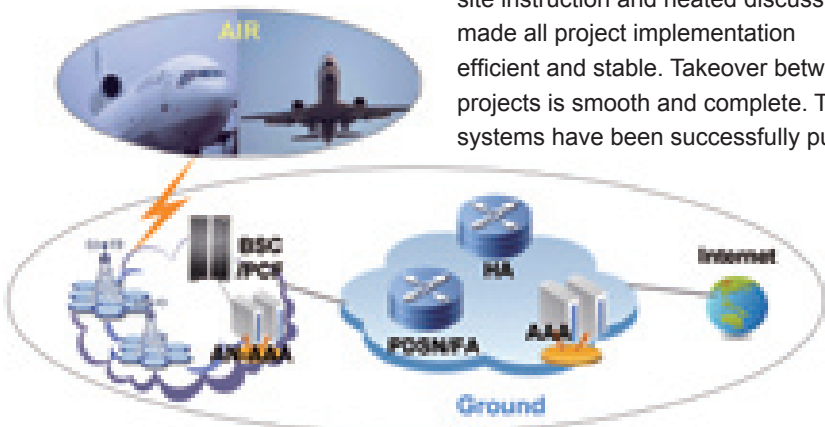
The aircraft for avian EVDO data communication test

made them determine the cooperation. They decided to together develop and research direct air-to-ground communication customized solution. Thus the two parties explored their innovative cooperation.

### New-generation ATG EVDO Data Network

U.S. AirCell adopted ground site station to provide EVDO data service for passengers on aircraft: firstly it provided EVDO data link for aircraft via ground site station; and then provided wireless LAN data service in the compartment via WIFI on the aircraft.

### FAST CUSTOMIZATION, ADVANCED EQUIPMENT AND SUPERIOR SERVICE



New generation EVDO avian communication data network

The powerful research and development strength, fast responding capability, and courageous exploration in new field of ZTE displayed one by one in the cooperation with U.S. AirCell. With the vigorous support from U.S. AirCell, the cooperation between them is smooth and successful.

The advanced technologies, equipment with high performance-price ratio, and diversified systems of ZTE satisfy the requirements of U.S. AirCell's large capacity data service. They could provide the passengers with high quality data service, meet the low TCO needs of U.S. AirCell, reduce its OPEX, improve its competitiveness, and consolidate its leading position in U.S. avian field. The two parties enjoy mutual benefits and achieve a win-win situation.

Customized professional training, on-site instruction and heated discussion made all project implementation efficient and stable. Takeover between projects is smooth and complete. The systems have been successfully put

into commercial use in just half a year, which shows that the cooperation between U.S. AirCell and ZTE is close and effective.

#### ZTE Solution

- Fast customization capability
- Keeping good relationship with chip provider Qualcomm
- Fast delivery
- Long-term on site support

#### AirCell Benefits

- Cost-effective and customized network
- Providing flight passengers with high quality data service
- Enjoying mutual benefits

#### MILESTONE

- U.S. AirCell has adopted new avian communication technology and put it into commercial use in U.S., April 2008
- With the witness of ZTE board chairman Mr. Hou Weigui, ZTE signed long-term exclusive equipment providing contract in June 2007. According to the contract, ZTE will customize and develop ground-to-air CDMA EVDO system for U.S., and provide EVDO data service for avian aircraft in the whole country
- AirCell, Qualcom and ZTE reached an agreement to develop protocol together and fixed their responsibilities in Dec. 2006. Qualcom provides the chips and software to solve Doppler effect in avian flight. ZTE provides CDMA EVDO system equipment for special frequency segment. AirCell is responsible for providing sites, Antenna-Feed system, and contacting airlines
- U.S. AirCell contacted ZTE and proposed customized solution requirements in Oct. 2006
- U.S. AirCell obtained ATG service frequency segment (Air-To-Ground) in June 2006



# All-IP Interconnectivity, All-Service Operation

—ETC Project Report



“ *Finally, ZTE’s real strength enabled us to become partners. ETC understands ZTE as a quick response provider and almighty problem conqueror. After cooperating with ZTE for 5 years, now we are working like one company.* ”

—Amare Amsalu, CEO of ETC

With a long history, ETC (Ethiopia Telecom Corporation) set up in 1894 is one of the earliest state-owned companies in Ethiopia. As an integrated carrier with GSM/DCMA/PSTN networks at the same time, ETC currently has got over 1.1 million mobile phone subscribers, 800 thousand fixed phone subscribers and 30 thousand Internet users. So compared with the total population which is up to over 70 million, the future development space of ETC is huge.

## CHALLENGE TO MISSION IMPOSSIBLE

As per the traditional calendar of

Ethiopia, September 12th 2007 is the Millennium of Ethiopia. Both the government and people including the Ethiopians living abroad attached great importance to this critical festival, and they also planned lots of celebrations. As a result, Ethiopia government required ETC to guarantee fluent mobile communication during festival to make sure all Millennium celebrations can be carried out successfully. To ease the pressure caused by newly increased over 500 thousand users coming back from other countries during the festival, and eliminate the congestion in its exiting network, ETC after careful evaluation decided to cooperate with ZTE exclusively to make its Millennium solution.

In order to provide people with more diversified multimedia services, Ethiopia government hoped that ZTE could extend its GSM mobile network to 2 million lines, and add another 250 thousand-line WCDMA network to fit high-end user’s requirement. As it only leaves ZTE 4 months to accomplish contract settlement, product manufacture, shipment, installation and commissioning, it becomes a well-known “Mission Impossible” in Millennium.

After signing the contract at the end of April 2007, ZTE accelerates the overall network construction by speeding up test procedure, project process, version scheduling, and attribute analysis. With all its effort in the whole project, ZTE conquered a lot of difficulties in the construction,

for example short duration, horrible monsoon which brings troubles to construction, and risks in system cutover, and finally ZTE finished the project in high quality on time. The prime minister of Ethiopia said: “ZTE created a unique miracle in Ethiopia telecommunication history.”

With 2G/3G hybrid network, Ethiopia Millennium project on one hand decreases the capacity pressure by avoiding the congestion in the existing GSM network, on the other hand, it brings in 3G service which provides both the local and emigrated high-end users with advanced HSPA service; in addition, it realizes the interconnectivity of GSM/WCDMA/CDMA/NGN networks over IP, and settles solid foundation to future network integration and development. The Most Precious Gifts in Millennium To guarantee the network stability during the festival, ZTE and ETC particularly set up a Millennium network security guard team. On September 16th 2007, good news came back from ETC: ETC network worked evenly with peak traffic during Ethiopia Millennium! Starting from September 10th, the traffic of ETC network kept increasing from 9000Erl per hour to the peak point 14000Erl in the night of September 12th, and the national network of ETC runs perfectly! To 6.00 pm September 13th, the traffic of the capital city of Ethiopia returned to normal, which shows ETC network successfully been tested by the busy traffic in Millennium. Currently, with extensive praise in ETC, the whole network

“ *At this exciting moment, I personally want to thank ZTE for their effective and fast reacting works. Today, it proves our decision and Ethiopian people had seen the bright future. ZTE Corporation kept their promise and presented our people such a great gift...* ”

—Amare Amsalu, CEO of ETC



The president of ZTE Yin Yimin and the president of ETC Amare Amusalu were exchanging gifts

works well, and all the performances are better than before. Besides, during Millennium, there are nearly 90 thousand new GSM users in only 4 days.

In the splendid night when the whole country were celebrating Millennium, people in Ethiopia received a celebration SMS from Amare Amsalu CEO of ETC. This is the first text Ethiopians received after SMS service has been suspended for 3 three years. It is also the most precious gift ZTE who built ETC Millennium project provided to Ethiopia people.

## SUPERIOR PROJECT FACILITATES NEW COOPERATION

Based upon the successful cooperation in Millennium(i.e. Project Phase I ), ZTE with deep understanding of ETC future development achieves the order for GSM project phase II ,helping ETC to build mobile network covering more than 700 main cities and roads in Ethiopia. In new project, ZTE who will provide ETC with full sets of GSM equipment on the basis of advanced V3 platform, build GSM core network with over 5 million lines increased is going to help ETC to offer qualified mobile services to Ethiopians and promote the development of Ethiopia telecommunication industry

## ALL-IP INTERCONNECTIVITY, ALL-SERVICE OPERATION

All-IP interconnectivity: Considering network maturity and future scalability, ZTE realized the interconnectivity of GSM/CDMA/NGN networks via SIP-I protocol, and it is also the first large-scaled all-IP network in the industry. In project phase II , ZTE offers GSM/WCDMA/CDMA/NGN core network devices and corresponding all-IP solutions based upon V3 all-IP unified hardware platform.

With rich experiences in mobile and IP fields, ZTE provides ETC integrated solutions for All-IP mobile network evolution, helping them to build complete All-IP multi-service network and realize maximum value of mobile network.

Step 1, Core network over IP. Adopting core network products based upon mobile softswitching architecture.

Step 2, Access network over IP. Realizing unified 2G/3G access.

Step 3, Smoothly migrating core network to IMS/FMC. Providing various access methods e.g. WIMAX to realize All-IP mobile broadband network with integrated fixed and mobile services.

All-Service Operation: As all-service carrier, ETC mainly focuses on how to realize all-service operation. In ETC project, ZTE provided a unified service platform offering WAP, CRBT, VMS, SMS, OCS and IP multimedia services to GSM/WCDMA/CDMA/NGN networks. It realizes all-service operation, provides carriers with

future-oriented creative environment integrating network and service, and offers terminal user highly qualified network service and various multimedia services.

## ZTE Solution

### 2/3G hybrid networking

- Industry-leading All-IP networking: includes interconnectivities of GSM/WCDMA/CDMA/NGN network over all IP, All-IP signaling network, All-IP service platform and All-IP wireless network
- To assure network security, MSCS uses N+1 disaster tolerance manner, HLR and GGSN adopts 1+1 active/standby disaster tolerance manner respectively
- Fast response to client's requirements and outstanding capability in carrying out project

### ETC Benefits

- Provide smooth services with peak traffic in Millennium
- Provide 3G service to both local and emigrated Ethiopians
- All-IP interconnectivity and All-IP operation service create a future-oriented creative environment integrating network and service, and realize the maximum value of mobile network

### MILESTONE

- September 17th 2007, ETC signed the contract for Project Phase II with ZTE
- September 12th 2007, the traffic of ETC network reached the peak point which is 14000Erl per hour. The whole network worked evenly, and was successfully tested by the huge traffic during Millennium
- September 11th 2007, ZTE completely finished the project
- April 2007, ETC and ZTE signed the contract for network migration and migration

# ZTE Helps WANA Create “Africa Miracle”



“ **ZTE provided us with reliable and innovative high-performance end-to-end solution, which greatly enhanced our competitiveness and our position in local telecom market. ZTE is not only the equipment provider that provides us with high-performance solution, but also our partner in the future development.** ”

—Wana CEO Karim Zaz

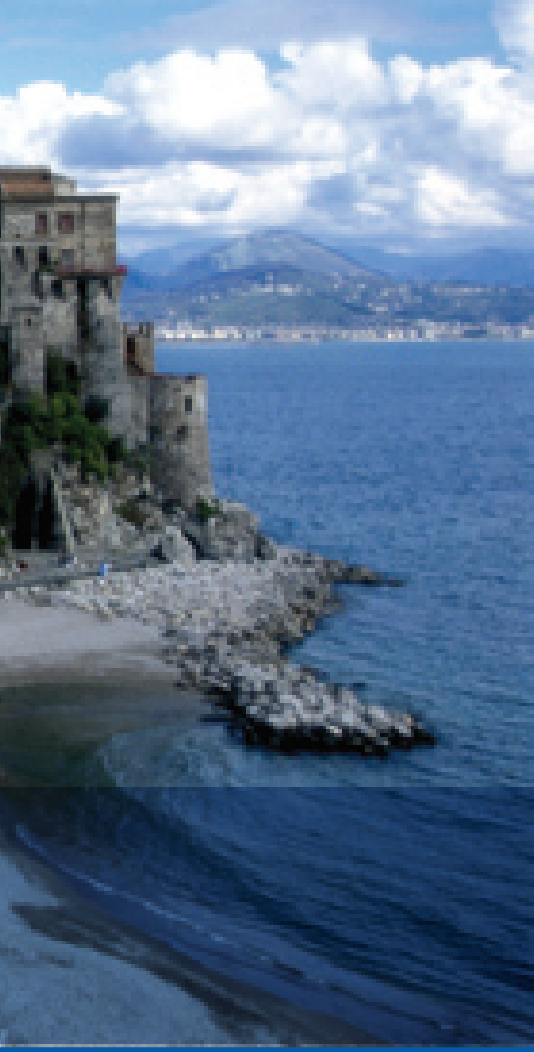
WANA is an emerging operator in Morocco founded in 1999. It is an enterprise invested by the largest royal ONA (invested by the king and bank), Omnium Nord Afrique, which is a commercial or financial enterprise in charge of all the economic sector branches.

WANA obtained fixed network license at the end of 2005. Since then WANA expedited its network construction. By the end of 2007, WANA launched its network smoothly covering users over 1.4 million. EV-DO Rev.A released user number in January 2008 and obtained 60,000 users in four months. During these two years, WANA built its network and won a surprising number of users. At present WANA has become a strong Morocco telecom operator with a prosperous development tendency. The achievements of WANA made an Africa miracle.

## FOLLOWING THE TREND, WANA TRANSFERRED TO ALL-MOBILE

The competition in Morocco telecom market is intense. Fixed network users decreased and mobile users dramatically increased. To keep a good developing tendency, WANA has to improve its competitiveness. Providing users with mobile service and high-speed wireless data service becomes WANA's goal.

At the beginning of network construction ZTE provided WANA with All-IP integrated solution which facilitates smooth upgrade towards All-Mobile network. WANA purchased 3G license and began to vigorously develop data and mobile service in July 2006. ZTE All-IP solution displays its powerful advantage: distributed network construction effectively controls network transmission cost



- All-IP softswitch equipment is equipped with open SIP service interface such as SIP WIN and SIP CRBT;
- Providing various services of number portability, and voice/data monitoring.
- Supporting OTA to improve operation efficiency.
- Supporting reliable networking solutions such as MGW dual-homing; 5.2 million capacity of HLRe disaster tolerance; and PDSN/AAA disaster tolerance, so as to guarantee network quality.

WANA network switching was completed by Jan. 9th 2008. With the launching of ZTE All-IP core network, WANA officially entered into All-Mobile era.

and operation & maintenance cost; supports smooth upgrade providing EV-DO high-speed data Internet service; supports smooth upgrade towards mobile network, which could help WANA to implement mobilization transformation of the whole network. ZTE completed WANA transformation from CDMA WLL to All-Mobile in over one month. During this period WANA fully experienced ZTE's strength in CDMA. Project implementation quality is far beyond WANA's expectation. The advancement of network satisfies the requirements of WANA to implement All-Mobile network to attract mobile users.

- Successfully transferred from V5 interface to Ap interface; substituted original equipment with advanced All-IP softswitch equipment; supported mobile and restricted mobile users at the same time;

### ZTE Solution

- Advanced All-IP network; and the solution meeting customer's needs
- Reliable networking solution
- The largest EV-DO RevA network in Africa
- Quick network deployment

### WANA Benefits

- Reasonable fee and flexible price
- Various service types
- Building network and developing users quickly

### MILESTONE

- Smoothly completed All-Mobile core network cutover, Jan. 2008
- User number reached 1.4 million, Nov. 2007
- Connection test, service test and test cutover in Phase I of All-Mobile transformation, June to Dec. 2007
- ZTE won WANA All-Mobile project, May 2007
- WANA WLL network released number officially, Feb. 2007
- WANA purchased a 3G license, June 2007
- ZTE and Alcatel obtained WANA 0.75 million cable CDMA WLL contract, May 2006
- WANA purchased the third fixed line license of Morocco, 2005
- WANA was founded to provide ISP service, 1999







# Perfect Cooperation Makes Perfect Success

—Libyana Established the Largest 2G/3G Hybrid Network in the World



“ *We granted ZTE to deploy our 1st WCDMA of North Africa because of the long term happiness cooperation and their satisfied service. Now, we see the achievements done by ZTE. Here, I honorable announce, Libyana new era is coming...* ”

—*In the WCDMA Launching Ceremony, by Mohammed Ben. Ayad, CEO Libyana*

Libya is a wealthy country in North Africa rich in oil, with a rapidly developing economy. Libyana is an emerging mobile operator founded in 2003. Its mobile network scale and impact rank No.1 in Libya, with GSM900/1800 network and WCDMA 3G network covering the whole country.

## PROSPEROUS VITALITY OF LIBYANA

There are four operators in Libya: mobile operator E1 Madar; Libyana, the new mobile operator founded at the end of 2003, broadband and data operator LTT (Libya Telecom and Technology), and fixed network operator GPTC.

As an emerging mobile operator,

Libyana only spent one year to become the largest communication service provider in Libya. It made many records and changed local people's life. For example, it reduced SIM card price from 600 to 5 Libyan Dinar; it was the first to provide SMS service in Libya; Its video-call and HSDPA covered the whole Tripoli and other major cities. As the chief provider of Libyana, ZTE created and experienced these records together with Libyana.

## ZTE WITNESSES LIBYANA'S GROWTH

From its operation in 2004, Libyana mobile network user number and impact has increased steadily and became No. 1 in nearly two years. It has total user number of 5.6 million,



with the penetration ratio of 90%, and implements 100% network coverage in the whole country. During this process, ZTE began to cooperate with Libyana to build GSM network since 2003. ZTE also worked together with Libyana to develop 2G/3G network since 2006, which shared ZTE core network based on IP integrated hardware platform, saving 40% spare parts cost and maintenance cost. During this period, ZTE signed multiple network expansion contracts with Libyana and provided 3.3 million GSM and 1 million WCDMA equipment, witnessing the progress of Libyana.

## VARIOUS SERVICES IMPROVE NETWORK COMPETITIVENESS

Libyana is one of the most successful 3G commercial networks of ZTE in overseas projects. With core network adopting R4 architecture, it implements 2G/3G hybrid networking. It covers 14 major cities and surrounding regions including capital of Libya – Tripoli. It is able to provide over 90% people with convenient and wonderful 3G mobile services. The services launched currently involve voice, WAP, SMS, VMS, USSD, PPS, GPRS, MMS, OTA, JAVA DOWNLOAD, STRAMING, and HSDPA. Libyana network users are developing fast and exceeded 0.3 million at the end of 2006. It has become one of the WCDMA commercial networks with the most users in Mediterranean regions. Its user number is still increasing rapidly.

“Such a large commercial network has changed the communication history of Libya.” said Libyana. Libyan users could experience full-dimensional multimedia service more than voice service. “It let Libyan people feel that high technologies were just around them.”

At present, the network is still being developed and expanded. Rich services not only raised Libyana’s operation income, attracted more users, but also made the network enter 2G/3G integration time smoothly.

## LARGEST 2G/3G HYBRID NETWORK IN THE WORLD

As the largest 2G/3G hybrid network in the world, Libyana’s 2G/3G users share HLR. They support card and number portability while switching between networks of GSM/WCDMA. The capital area supports GSM/WCDMA 2G/3G roaming switching, which provides powerful technical guarantee for the long-term continuous development of Libyana.

Meanwhile, the practical operation indexes for Libyana network are reliable. ZTE softswitch equipment CPU load remains low during busy hours with heavy traffic of 0.04Erl per user 3.4 calls. ZTE equipment has successfully stood the test of heavy traffic.

In the time when European and American vendors had monopoly in this market, the entrance of ZTE brought something like a shake to Libyan communication market. The superior network provided by ZTE made Libyana become the largest operator in Libya and take a road of continuous development.

### ZTE Solution

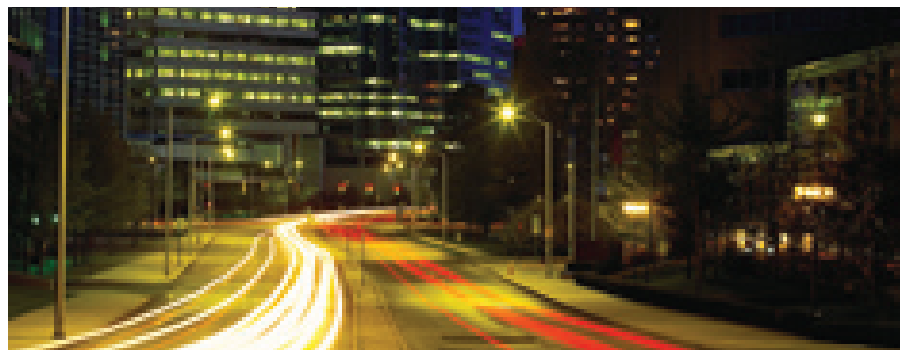
- 2G/3G large capacity hybrid networking, share the integrated core network
- 3G end office adopts highly reliable dual-homing disaster tolerance mechanism. Capital Tripoli and Gharyan implement mutual-aid disaster tolerance
- Mc/Nb/Nc interface adopts IP bearing in WCDMA network
- Providing various services; supporting keeping the card and number portability while switching between networks
- Supporting GSM/WCDMA 2G/3G roaming switching

### Libyana Benefits

- GSM/WCDMA users increase rapidly
- Network operation was stable; various indexes were excellent; stood multiple high traffic tests of big festivals
- Various services attracted users and improved network competitiveness

### MILESTONE

- WCDMA users broke through 0.3 million in Dec. 2007
- 1 million cable WCDMA commercial contract was signed on Nov. 18th, 2006
- Libyana selected ZTE exclusively to build GSM phase I project in Nov. 2003. Later ZTE implemented four phases expansions with its equipment expanded to 2.4 million.





# Build Quality Network Hand in Hand

—India Reliance Communications CDMA Network

**RELIANCE**  
**Communications**  
Anil Dhirubhai Ambani Group

Founded in 1999, Reliance Communication Corporation (Reliance for short hereafter) is the largest CDMA operator in India, and the third largest CDMA operator in the world.

Users rapidly increased in Indian telecom market. A lot of emerging operators appeared, which made market competition become fiercer. To keep competitiveness and win the market, Reliance decided to work together with ZTE to guarantee quick

user increase, consolidate dominant position, and create high-quality network.

## QUICKLY BUILD NETWORK TO DEVELOP USERS

Adopting flexible market policies and various price packages, Reliance got a favorable position in the intense competition of the Indian market. With dramatic increase of user quantity, traffic increased greatly. The existing network capacity has become the dilemma of user development. It's urgent to expand the network soon.

To achieve the goal of fast large-

scale capacity expansion for Reliance, ZTE went all out to improve network construction efficiency. The construction and customer acceptance of 38 sets of BSC, 20 sets of core networks and 15 sets of gateway only cost half a year. Stable and fast network construction increased users quickly for Reliance, and laid a solid foundation for competitiveness consolidation and improvement.

Reliance's CDMA users have reached 36 million by April 2008 with an increase of 1 million for each month.

## FORESEEING DESIGN REDUCES TCO



Reliance hopes that it could create a future-oriented All-IP network based on its rich IP transmission resource so as to reduce network OPEX and improve network competitiveness. ZTE All-IP equipment has large capacity, small volume and low consumption. ZTE solution is mature, stable, and smooth in evolvement towards future network. Besides, ZTE flat network architecture perfectly suits large-scale networking. All these features meet the requirements of Reliance by solving its problems of extremely high traffic, high user sensitivity and microwave transmission. ZTE All-IP solution could save up to 60% transmission resource and 30% vocoder coder, which distinctly decreased voice delay, won high user satisfaction and great appreciation from Reliance.

### ZTE customized a whole set of solution for Reliance, taking Reliance's features into consideration:

- Core network networking solution connects the switching end-office in Circle (official administration unit in India) with the gateway office. The whole

network architecture is clear and easy to manage by gateway interconnection between Circles.

- 21 sets of gateway offices are distributed in each telecom Circle in India, connecting equipment from other vendors, stably supporting the whole network and providing high quality services for users.
- Providing high quality network planning and optimization solution, which effectively extends terminal standby time, improves voice quality, improves edge user access rate, and guarantees stable implementation of the expanding network with high traffic.
- Considering Reliance's features of large coverage in remote areas, small capacity needs, and IP transmission requirement, ZTE customized highly integrated indoor/outdoor site. Compared with traditional site, ZTE-built site can reduce 50% consumption. Board number is greatly reduced. TCO is effectively reduced.

### ZTE Solution

- All-IP CDMA network and gateway office with the largest capacity in the world
- Industry-leading 3G All-IP solution saves up to 60% transmission resource and 30% vocoder coder.
- SIP-I is adopted between gateway GMSCe

### Reliance Benefits

- With the ability to evolve smoothly and the flat architecture, the core network has a clear architecture and easy to manage
- Network construction and implementation with low TCO enhances its competitiveness
- Long-term and stable strategic partnership between ZTE and Reliance

### MILESTONE

- ZTE established long-term and stable strategic partnership with Reliance in 2007. ZTE provided Reliance with customized solution and reduced network cost. Reliance obtained 25% CDMA wireless market and over 30% CDMA core network market by the end of 2007
- Reliance built the largest All-IP CDMA network and gateway office in the world in 2007, including 25 sets of All-IP end-office and 21 sets of gateway equipment. ZTE became the biggest equipment provider for Reliance All-IP core network
- Reliance began to cooperate with ZTE in 2006. Reliance imported ZTE large-capacity IP gateway to substitute original gateway. In this way Reliance made the first step to national network All-IP

# Fly to Excellence

—ZTE Helped China Mobile to Create Boundless Communication World



“ *We are proud of cooperating with ZTE to provide excellent 3G service for friends from all over the world. Based on what I have seen and half year of ZTE's hardworking for Beijing 3G network building, we think our choice to select ZTE is definitely right...* ”

—Wang Zhengwen, VP of Beijing CMCC

China Mobile set up on April 20th 2000 with a registered capital of 51.8 billion RMB. With over 4 trillion RMB assets, currently China Mobile is the biggest mobile carrier holding the largest network and user scales in the global market. China Mobile also the partner of Beijing Olympic Game 2008 was listed in World Fortune 500 consecutively in the last 6 years, and was ranked in No.202 in the latest record. Till the end of 2007, with 369

million subscribers, China Mobile operated the biggest GSM network in the world.

## FACILITATE THE SUSTAINING DEVELOPMENT OF CHINA MOBILE

As a world-leading listed comprehensive telecommunications equipment provider, ZTE keeps a good relationship with China Mobile, especially in the construction of mobile network. On one hand, ZTE provides advanced solutions for the existing GSM network of China Mobile; on the other hand, it also contributes itself to the development of China Mobile's next generation 3G TD-SCDMA network.

## QUALITY BRINGS IN SUSTAINING COOPERATION

Early in 1999, ZTE GSM products broke through Hebei Mobile, and mobile softswitching core network devices are primarily implemented in Baoding. In the construction of the softswitching project in Hebei Mobile, ZTE elaborately arranged every section including configuration, shipment, construction and system cutover to make sure the project can be carried out efficiently. In other words, in the case of short duration and heavy tasks, ZTE still kept pursuing perfect details and arranged careful and accurate commissioning

of the equipment, which lays a solid foundation to both system cutover and future stable operation. At the end of 2007, Hebei Mobile appointed ZTE again to build another 3 softswitching projects in Baoding. Currently, ZTE softswitching equipments with excellent and stable running record in Baoding Mobile have been tested by the huge traffics in China National Day and Spring Festival. In 2008 Spring Festival, the subscriber of Baoding softswitching network increased by 20% (The capacity is designed for 480 thousand/500 thousand valid users), and the SMS reached 860 thousand pieces /hour which are 8 times than usual; at the same time, the traffic of voice service exceeded by 40%, the maximum system load reached 43%, and ZTE equipment ensured the reliable network operation efficiently.

Regarding to the excellent performance and stable operation of ZTE equipment in previous softswitching project, in China Mobile 2008 centralized purchasing project ZTE again achieved the order for building three softswitching projects in Baoding and Hengshui respectively.

In only one year commencing from the commissioning of the first softswitching project in Baoding, there are totally 6 million-line ZTE core network devices adopted which won extensive praise in Hebei Mobile. ZTE core network equipment on one hand releases the pressure caused by fast development of Hebei



Mobile market, on the other hand it satisfies the increasing customers and provides complete standard for future ZTE softswitching equipment deployment in the whole province. At the same time, this project provides a powerful guarantee to bring in 3G telecom technology in Hebei Mobile, and indicates the bright future for the further cooperation between Hebei Mobile and ZTE.

## ZTE HELPED CHINA MOBILE TO BUILD THE WORLD'S FIRST ALL-IP TD-SCDMA NETWORK

As the partner of Beijing Olympic Game 2008, China Mobile will provide the world's first IP TD-SCDMA network. With historical meanings, it is the sinfonia of future 3G Times.

China Mobile will build TD-SCDMA network in 8 Olympic cities including Beijing, Shanghai, Qinhuangdao, Shenyang, Guanzhou, Shenzhen and Xiamen. Due to the excellent technology and equipment, ZTE with outstanding performances in severe market competition achieved orders for building core networks in Beijing, Guangzhou, Qin Huangdao and Xiamen with up to 50% market sharing. As the intimate partner of China Mobile in its TD project, ZTE provides full series of core network equipment based upon unified all-IP V3 platform and accumulates rich experiences in future China Mobile 3G network construction.

With all-IP networking mode, ZTE optimizes network architecture, saves transmission resource and further develops TD technology, so it makes the world's first TD-SCDMA perfect. Also, ZTE strictly arranged shipment, construction and service implementation on the basis of China Mobile's requirements, and achieved extensive agreement among customers. After starting construction for nearly one year, all TD devices from ZTE passed the acceptance evaluation successfully.

It is the first time for TD network providing 3G services including video telephone and multimedia CRBT services. It offers user fast wireless online service and enables China Mobile to become more charming.

With the increasing implementation of TD, China 3G standard has officially come to commercial use stage. As the leader in TD industry, ZTE on one hand contributes a lot to the process of TD industrialization; on the other hand, it devoted itself into the sustaining development of high-end network.

**China Mobile is an energetic company featuring sustaining development. In the future competition, China Mobile aims at becoming the top enterprise in the world and realizing a new flight from creating excellence to develop preeminence. As a result, China Mobile cooperates with ZTE to create miracles one after another. And as a reliable partner, ZTE tries its best to create boundless communication world for China Mobile.**

### ZTE Solution

- Based upon all-IP V3 platform
- Complete set of end-to-end solution
- Adopt all-IP networking mode, optimizes network architecture, and saves transmission resource
- Professional logistical team and qualified construction display ZTE's fast response to customer's requirements and outstanding engineering capability

### China Mobile Benefits

- Release the pressure caused by fast market growth and fit the increasing customers
- Provide guarantee to bring in 3G telecom technology, and offer powerful support for China Mobile in keeping advanced technology and providing sustaining development in high-end network market
- Qualified network is tested by huge traffic during festivals. Due to its stable operation, it won extensive customer satisfaction
- It is the first time for TD network providing 3G services including video telephone and multimedia CRBT services. It provides customers with faster wireless online service, brings in excellent user experience, and makes China Mobile network more charming

### MILESTONE

- In April 2007, ZTE achieve China Mobile TD project, with 50% core network market share, ZTE will build the world's first TD-SCDMA network for China Mobile
- In December 2006, ZTE exclusively provided China Mobile with IMS end-to-end solution
- In May 2006, ZTE V3 softswitch platform passed China Mobile 2 million capacity test. It is also the first vendor in the industry who passes this test
- In March 2006, ZTE won Guizhou GMSC project. It indicates the official implementation of softswitch GMSC in China Mobile GSM market
- In February 2006, ZTE softswitch VMSC is officially use by China Mobile GSM market in Qinghai
- In January 2005, ZTE V3 HLR system entered Qinghai and Sichuan. It is the first time for ZTE V3 unified platform used in China Mobile market
- In March 2003, ZTE successfully carried out HLR system cutover in Shandong. Currently, it has become the largest N+1 disaster tolerance center
- In 2001, ZTE GMSC equipment entered Chongqing, Guizhou and Yan'an markets
- In March 2000, ZTE GSM core network broke through China Mobile market via Hunan Jishou





# 14-year Cooperation, Sustaining Collaboration Leads to Success

—ZTE and China Unicom Work Together to Win Brilliant Achievements



China Unicom set up in 1994 is the only full-service carrier in China operating GSM, CDMA mobile communications, international/domestic long-distance communications, data communications and Internet services. China Unicom is also the unique carrier listed in New York, Hong Kong and Shanghai at the same time in China. Till December 31<sup>st</sup> 2007, the mobile subscriber number of China Unicom had reached 160.281 million where GSM users and CDMA users are 119.184 million and 41.097 million respectively. Currently, it is the second biggest CDMA carrier in the world.

## MULTI-NETWORK OPERATION, THE ONLY FULL-SERVICE CARRIER IN CHINA

China Unicom, the only full-service carrier, operates the most complicated network composed by mobile network and fixed network in China. Its mobile network consists of CDMA and GSM, and fixed network contains PSTN, VoIP and Internet, etc. How to achieve the smooth migration and development of the current multiple networks is a special challenge that China Unicom is facing.

Starting from the year 2000, China Unicom and ZTE worked together in GSM, CDMA, IMS and next generation mobile network fields. Now, ZTE is gradually becoming one of the most important partners of China Unicom in mobile network area. They

work together to create miracles one after another.

## EXCELLENT PRODUCTS AND SOLUTIONS BUILT THE SECOND BIGGEST CDMA NETWORK IN THE WORLD

The cooperation between China Unicom and ZTE in CDMA field can be traced back to 2001. In May 2001, China Unicom started the tendering for its CDMA network. Due to advanced technologies and excellent products, ZTE got success in the bidding and achieved orders for offering equipment to 10-province CDMA network. Then in later project phase and III, China Unicom chose ZTE again as its equipment provider.

Cooperating with ZTE in CDMA network construction for 8 years,

China Unicom keeps enhancing its competitiveness in wireless communication field including CDMA voice, data, LBS, WAP, SMS, CRBT, MMS and CPTT cluster services. Today, it has become the top 2 CDMA carrier in global market; and in return, the market share of ZTE in China Unicom CDMA network has increased from 7.55% to 33%. So far, ZTE has been the biggest equipment provider in China Unicom CDMA network.

## OUTSTANDING IMPLEMENTATION CAPABILITY ENABLES THE LARGEST INTEGRATED SOFTSWITCHING TANDEM NETWORK IN THE WORLD

There are four long-distance voice networks i.e. GSM, CDMA, 193 and VoIP running independently in China Unicom, the resources of these four networks not being shared. Also, the long-distance network of China Unicom is under the pressure of capacity extension and evolution to IP network.

Focusing on the network development and investment saving, ZTE analyzed the existing situation of China Unicom's long-distance network and made customized solutions. Finally, in June 2007, China Unicom chose ZTE as its exclusive provider in national softswitching tandem network project in which China Unicom will build 20 pairs of TMSCS and 36 TMGS in 30 provinces with a total capacity of 47 thousand equivalent E1. It is the largest integrated softswitching tandem network in the world. Strictly according to the requirements in the bidding document, ZTE only took 4 months to finish this project.

In spring festival of 2008, the network traffic reached 220 thousand ERL, which is 3 times higher than usual. ZTE's equipment worked well, and safely passed the test of the high traffic.

## ADVANCED TECHNOLOGY IS USED TO BUILD THE FIRST "3-IN-ONE" IMS COMMERCIAL TRIAL NETWORK GLOBALLY

To pursue the smooth migration and sustaining development of its multiple networks, in September 2006 China Unicom chose ZTE to solely build the world's first "3-in-1" IMS commercial trial network covering the three different access technologies of WCDMA, CDMA 2000 and fixed network. In this project, ZTE provided end-to-end IMS solution, including IMS terminals, IMS access/bearer equipment, IMS core control equipment and IMS service platform.

"ZTE was the first corporation chosen by China Unicom among all the competitors to undertake IMS trial project; ZTE offered the most full communications and complete solution; China Unicom said: ZTE provides the most comprehensive test specifications which completely meet our demands."; compared with the other two trial sites made by other vendors, ZTE offered earliest shipment and quickest construction. And due to this leading technical strength and powerful construction/service capability, ZTE keeps a good relationship with China Unicom and enables the sustaining development of its network.

### ZTE Solution

- CDMA/GSM network with complete solutions and integrated services
- Customized world's first GSM 1X gateway
- GSM softswitching tandem network with full series of IP unified platform equipment
- An end-to-end IMS solution

### China Unicom Benefits

- Fast network construction—the construction of CDMA network is 1/3 faster than other vendors, which helps China Unicom to achieve advantages in market competition
- Integrated CDMA network/service solution and customized products enhance the differentiated competitiveness of China Unicom
- Building the softswitching tandem network with the most diversified services in the industry enhances China Unicom's operability and enables its sustaining development
- The interconnection between IMS, 2G and 3G guarantees the current networks' smooth migration and development to the future network

### MILESTONE

- December 2007, ZTE built mobile softswitching networks for 16 provinces of China Unicom, with the market share of up to 35%. ZTE's GPRS core network were deployed in 15 provinces of China Unicom, and the market share reached 40%
- June 2007, ZTE exclusively achieved national GSM softswitching tandem network project of China Unicom
- 2007, ZTE completely replaced all the CDMA equipment from Ericsson with its market share in China Unicom CDMA market of up to 33%
- November 2006, IMS commercial trial network passed the acceptance evaluation of China Unicom's Headquarters
- September 2006, ZTE exclusively built the world's first "3-in-1" IMS commercial trial network
- January 2006, ZTE undertook the construction of 18-province CDMA2000 1x project in China Unicom CDMA project phase IV. And its market share reached 21.23%
- April 2005, ZTE customized GSM 1X gateway for China Unicom
- In 2003, ZTE successfully entered markets of China Unicom branches in 15 provinces in CDMA project phase III
- In 2002, ZTE raised C++ full-service and full-coverage solution. ZTE undertook the construction of CDMA2000 1x networks in 14 municipal cities in CDMA project phase II
- May 2001, ZTE achieved the order for purchasing equipment containing 1.1 million –line capacity and covering 10 provinces in CDMA project phase I
- In 1999, ZTE built GSM local network for Anhui China Unicom Liu An Branch
- In 1994, ZTE started cooperating with China Unicom



# Over 200 Million Users Uses Long-Distance Services over IP

—China Telecom Built the Largest Fixed Network NGN Network in the World



“ *The construction of this network helps China Telecom to reduce our OpEx, develop new services and enhance our competitiveness in market competition* ”

—Leng RongQuan, Vice General Manager of China Telecom Group

The world largest NGN long-distance network built by ZTE in May 2005 has been smoothly operated for over 2 years. It realizes 220 million users' long-distance service over IP.

China Telecom runs the biggest PSTN in the world. Until the end of 2007, it has 220 million users covering 31 provinces and municipalities. As the main source of China Telecom profit, its fixed voice service revenue takes about 60% of the total income.

## TRADITIONAL FIXED NETWORK ENCOUNTERS SEVERE COMPETITION AND EVOLUTION PRESSURE

Due to the convergence of telecommunication technology and IP technology, together with users' increasing requirements for multimedia communication. Evolution — building a brand-new service and management manner to face the new environment, has become the most important subject global mainstream

carriers are now thinking of. So lots of far-sighted telecom carriers especially some traditional PSTN carriers who are gradually stepping forwarding to network evolution are now launching a worldwide telecommunication revolution.

As the traditional fixed network carrier, China Telecom endured heavy pressure caused by network rebuilding, severe competition and evolution trend: TDM-based PSTN network is bothered by imbalanced network load, inconvenient relay deployment and aging equipment; the development of IP technology and more and more diversified service demands ask more for future China Telecom development; more and more severe competitions in telecom industry and the great impact to traditional fixed network by other

carrier's VOIP or mobile voice service become serious threatens to China Telecom's voice service. In 2005, China Telecom said it will change to an "Integrated Service Provider". The construction of "NGN Long-Distance Backbone Network" is an important mark which shows China Telecom service is now migrating to NGN network.

## CHINA TELECOM AND ZTE SET UP PARTNERSHIP TO BUILD THE LARGEST NGN NETWORK

As this project is the milestone in its overall evolution, China Telecom attached great importance to pick up a proper partner. So in the next four years, China Telecom arranged strict equipment test, examination and real commissioning among many vendors' NGN equipment, and finally decided to choose ZTE as its exclusive strategic partner and equipment provider in NGN network construction.

China Telecom NGN long-distance network is built in NGN stacking manner to enable the provincial long-distance traffic diffuence. In the first phase of the project, China Telecom planed to get 50% of the provincial long-distance traffic diffuent to help with DC1 switch rebuilding, capacity extension and avoid long-distance single-point fault in some DC1 cities. At the same time, the provision of voice, data and multimedia services set up a solid foundation to the integration of fixed network and 3G network.

NGN long-distance network is designed as per different big regions: 8 regional NGNs are deployed in Beijing, Zhengzhou, Shanghai, Guangzhou, Nanjing, Wuhan, Chengdu and Xi'an respectively, responsible for controlling TG service

in every big region, and configuring TG in each DC1 city. In phase II, as per the practical situation in every province, DC2 TG is configured to help with DC2 switch rebuilding, capacity extension and avoid long-distance single-point fault.

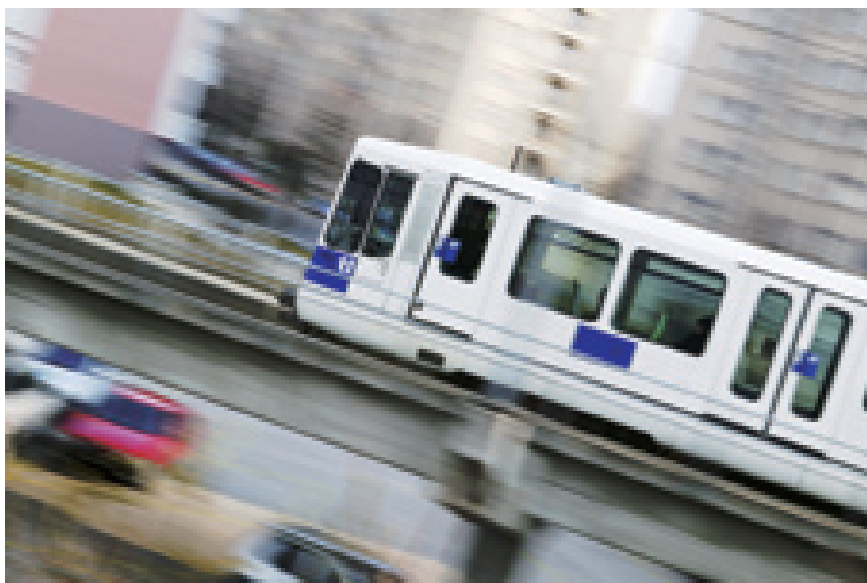
## 31 PROVINCES BUILD THE SUPER PROJECT AT THE SAME TIME

As NGN long-distance backbone network is carried out in 31 provinces in China at the same time, the coordination becomes very difficult. Besides, softswitching technology is new, and DC1-NGN is the biggest softswitching network in China, so all the related technical solutions, test specifications, acceptance criteria, operation and maintenance methods are still under developing. In addition, CN2 which will be used to implement DC1-NGN is built simultaneously, the total coordination between two projects is also important, for example, module purchase, equipment scheduling, and equipment test. For China Telecom, its provincial companies are short of experiences in softswitching construction, which makes the project become more difficult.

So, China Telecom set up NGN long-distance network project group headed by definite project manager who join in the project from construction design section to coordinate internal resources and build solid foundation for later construction. As the service provider, ZTE established specific project office with appointed project manager and technical manager in every province. Besides, senior technical engineers and background technical support engineers from ZTE are allocated to every big region to devote themselves into DC1-NGN long-distance project construction.

## THE CONSTRUCTION OF NGN LONG-DISTANCE NETWORK ENABLES CHINA TELECOM TO ENJOY THE ACHIEVEMENT OF NETWORK EVOLUTION

Currently, China Telecom NGN Long-Distance Backbone Network is the biggest fixed network NGN long-distance network in the world, realizing 220 million user long-distance services over IP. In accordance to the network evolution trend, the establishment of this network increases the access



success ration of telecom long-distance network, enhances the general network capacity and traffic processing capability, guarantees high profit of telecom long-distance voice service, and provides enterprise customers with voice, data and video integrated solutions.

At the same time, compared with the traditional PSTN network, NGN greatly reduces customer's OPEX and CAPEX. Take NGN long-distance network Nanjing region as an example, the space traditional switch requires is 4.2 times bigger than NGN equipment; and for power consumption, tradition switch is 2.8 times bigger; regarding to operation and maintenance, tradition switch asks for a complete set of maintenance team, while, NGN system features easy operation and maintenance which greatly reduces the number of people for maintenance.

For services, NGN inherits all the services of traditional switch and adds lots of value-added services, for example, WAN IP Centrex, multimedia video communication, SoftDa enterprise unified communication, one-number CRBT service and Web800, etc.

## MID-AUTUMN FESTIVAL, CHINA TELECOM KEEP FAMILIES TOGETHER

As a traditional Chinese festival, families always stay together in mid-autumn day, even if they can not enjoy the happiness together, they would call them to show their greetings in the festival. So mid-autumn day in which the traffic can be 4 times larger than usual, is also the fastigium of long-distance call service in China. In the mid-autumn day of 2006, it is really a big test to the NGN long-distance network which has just passed the acceptance evaluation. However, at last the fact is the network passed the test successfully — worked very well during fastigium and ensured customers a peaceful festival.

Dong Xiaozhuang, the General Manager of Network Operation Maintenance Division of China Telecom Group said;

“After signing the contract, this project (NGN long-distance network) processed well, and the network runs evenly with reliable quality and clear voice. Especially in China Mid-Autumn Festival, it successfully distributes all the traffic on the existing network during peak hour.”

Network evolution is a huge project, and NGN long-distance backbone network is only a small part of this project. In order to change from basic network provider to an integrated information service provider, besides softswitching long-distance project, China Telecom also carried out local network intelligentization, IPTV test based upon broadband network, and the optimization of access network for integrated services at the same time. And during the whole process, ZTE tried its best to cooperate and help China Telecom. At the end of 2006, ZTE got the biggest market share (60%) in China Telecom softswitching market, and becomes the chief partner of China Telecom evolution project.





- NGN technology provides China Telecom a reliable long-distance network

#### MILESTONE

- At the end of 2006, ZTE took the biggest market share (60%) in China Telecom Softswitching market; regarding to its integrated access product and broadband product, ZTE fully joined in the service construction of China Telecom and becomes the chief partner of China Telecom in its strategy evolution project
- In December 2006, China Telecom and ZTE organized "Celebration on the Stable Operation of China Telecom NGN Long-Distance Backbone Network". In the celebration, customers from 70 carries all over the world like Malaysia and South Africa witnessed the success of

#### NGN Long-Distance Backbone Network

- In November 2006, after one-year construction, NGN long-distance backbone network finally passed acceptance evaluation
- In April 2006, China Telecom NGN long-distance network starts commissioning. In the mid-autumn day, it provides stable network and smooth communication.
- In September 2005, China Telecom handled 48-hour continuous call test in project acceptance test. Among millions of calls, not one call loss happened.
- After 4 year test, in 2005 China Telecom officially raised its network evolution plan, and chose ZTE as its exclusive NGN long-distance provider.
- In 2001, China Telecom together with ZTE carried out NGN test.



# ZTE CORE NETWORK SUCCESS STORIES

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