Better Connection and Better User Experience: ZTE IMS Assists Telecom Operators in Improving Voice Communication Competiveness

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1 Voice Communication Enjoys the Best Development Opportunity in the New Era

As the Long Term Evolution (LTE) technology has been used on a large scale in China, more and more voice services have been carried on LTE networks, and the VoLTE service emerged. In the telecommunication industry, it is generally considered that SRVCC and eSRVCC are two sophisticated VoLTE solutions, where the IP MultiMedia Subsystem (IMS) is used to provide IP-based HD 4G voice services. As Apple started to integrate the VoWiFi function into the iPhone6, the VoWiFi solution has also been a focus in this industry. Telecommunications operators both in China and other countries have all launched VoLTE and VoWiFi services to provide better voice services and new user experience, thereby increasing user stickiness and attracting more users. Through service innovation, operators mine potential user values and weaken the serious impact that OTT service providers bring to the operators.

2 Future-Proof and Convergence-Oriented VoLTE/VoWiFi Solutions

Through the unified IMS platform, the ZTE CN VoLTE/VoWiFi solutions provide all types of access networks with unified services, and provide users with good-quality experience of services including HD voice services, differentiated end-to-end QoS guarantee and automatic service subscription. When a user uses a 4G terminal that supports VoLTE, the network automatically reminds the user to subscribe to the VoLTE service so that the user can enjoy seamless handovers among WiFi, 2G, 3G, and 4G networks. With low consumption, high efficiency, smooth system evolution, and future-oriented networks, operators’ investments can be fully protected.

Figure 1 Architecture of the ZTE IMS-Based VoLTE/VoWiFi Solutions
- **Unified platform and flexible network architecture to efficiently reduce OPEX**

All series of the ZTE CN products are based on the unified hardware platform—Enhanced TCA (ETCA), which ensures efficient OPEX reduction, and performance improvement in comparison with the standard ATCA architecture. The ETCA also supports flexible network architecture. All network elements of the entire IMS solution are designed based on the unified ETCA platform.

- **High integration, energy saving, emission reduction, and environmental-friendliness**

ZTE provides the best product integration options. For example, the SBC, P-CSCF, ATCF, and ATGW can be co-located, the MGCF, MGW, and eMSC can be co-located, the MMTEL AS, SCC AS, and IP-SM-GW can be co-located, and the IMS HSS, EPC HSS, and HLR can be co-located.

With the unified hardware platform, blades can be properly integrated, per unit power consumption can be reduced, and less installation space is required. With the intelligent power saving, fan design optimization, and other technologies, environmental friendliness is guaranteed with energy saved and emission reduced.

- **High reliability to ensure safe networks**

Network security is guaranteed due to multiple redundancy mechanisms and versatile disaster recovery. Blades can be configured to operate in active/standby mode and sites can be deployed by using the Pool method.

The ZTE IMS system provides real-time monitoring. Signaling messages can be traced, signaling storm risks can be predicted, storms can be prevented, storm causes, and recommended solutions are provided, so that network operation quality is improved and proper network operation is ensured.

Multiple load control methods are provided, for example, 6-level intelligent load control, smooth load control, and VIP user security protection. This makes Network Elements (NEs) more robust and comprehensively ensures the stability of the IMS system.

- **Improved VoLTE performance, service convergence, and user stickiness to meet OTT challenges**

The VoLTE uses the WB-AMR that provides HD voice and a much extended encoding range in comparison with narrow-band voice encoding. The extended low-frequency part allows the voice to be more real, natural, and comfortable. The fricatives f/s/th of the extended high-frequency part can be better recognized to ensure higher-fidelity voice. Therefore, the VoLTE is defined as the mainstream voice solution of the LTE network. As the upgrade and replacement of the traditional narrow-band voice solution, the VoLTE provides end-to-end QoS guarantee and smooth and continuous voice service. VoLTE serves as a good solution to meet the challenge posed by the OTT.

Meanwhile, VoLTE and VoWiFi networking convergence helps increase network coverage, provide lower CAPEX, achieve seamless handovers among WiFi, 2G, 3G, and 4G networks, reduce the user churn rate, guarantee the coverage
continuity of voice and data services, and provides multiple services such as multimedia conference, group video communication, and Rich Communication Service (RCS) to allow users to experience various services in a unified manner. The competitiveness of operators is thereby enhanced.

- **Optimized voice service experience with the original 2G/3G MSISDN still valid**

  ZTE provides a unique MSISDN for each user, and unified authentication and service experience. When a UE is attached to an EPC network during power-on, the EPC network automatically checks whether the UE is enabled with the 4G function. If yes, the network automatically informs the UE that the VoLTE service will be subscribed to. If the user agrees, the service is then automatically subscribed to. After that, the user can enjoy the subscribed 2G/3G services and VoLTE HD voice and other multimedia services without the need to change the MSISDN. If the UE supports the VoWiFi function, the user can enjoy the VoLTE/VoWiFi services without the need to download any app.

- **End-to-end intelligent maintenance to improve overall efficiency by 40%**

  The intelligent maintenance of the ZTE CN products helps operators to automatically deploy products, upgrade products by clicking only one key, perform preventive maintenance automatically, trace signaling messages of the entire network, analyze voice intelligently, and monitor end-to-end KPIs, to reduce manual operations, fault occurrence rate, and delivery difficulty, and save time and labor. The delivery efficiency can be increased by 50%, and the upgrade efficiency can be improved by 70%.

- **Future-oriented network that can smoothly evolve**

  The ZTE IMS network supports the convergence of fixed networks and mobile networks, to assist operators in developing full-service network. The ZTE CN products are designed based on the unified ETCA hardware platform. Hardware is shared and multiple NEs share the same blade. The network is based on the VoLTE/VoWiFi solutions of the vIMS to help operators smoothly switch from traditional networks to virtualized networks through Network Function Virtualization (NFV). All NEs are deployed in a unified cloud data center. NEs can be quickly deployed, services are open, resources can be quickly requested and released, and networks can be quickly restructured. Evolution from NFV to IaaS and from IaaS to PaaS is supported. ZTE also closely cooperates with main-stream component manufacturers to create a healthy industrial ecosystem.

  Main-stream operators in the telecommunications industry all choose IMS-based VoLTE/VoWiFi solutions. In 2015, ZTE, together with Apple, accomplished the E2E-based ePDG VoWiFi IOT test. The ZTE ePDG (ZXUN xGW) that provides T-bit level handover capability has helped ZTE become the prizewinner of the best LTE CN award. ZTE’s market share of the ZTE AAA (ZXUN USPP), which can be deployed through NFV, is the highest in the world.

3 **Industrial-leading Solutions Help Achieve Successful Network Transformation**

As a global-leading cloud CN solution provider, ZTE has provided customized IMS/VoLTE/VoWiFi solutions for the top three telecom operators in China. It is worth mentioning that ZTE has helped China Mobile build the world’s largest commercial
vIMS-based RCS network that is available for 100 million subscribers. In this network, there are over 16 million active subscribers. So far, this commercial network is not only the largest IMS and RCS commercial network all over the world but also the largest NFV network globally. ZTE also actively responds to the major strategic deployment of “One Belt and One Road” initiative, and promotes new-technology cooperation to use advanced technologies and solutions in the networks of all global major telecom operators. By September 2016, ZTE has signed over 210 contracts (over 50 VoLTE contracts and 26 vIMS contracts) for its IMS products to provide IMS/VoLTE/VoWiFi services for 250 million global subscribers in Italy, Austria, Spain, Poland, Saudi Arabia, Zambia, Cameroon, India, and other countries.

During the past 30 years, ZTE has been following the philosophy of network stability and reliability and committed to providing customers both in China and other countries with worry-free networks and customized solutions to secure the long-term development of the operators. Its CN IMS solutions have been put into commercial use globally. In 2016, ZTE built the VoLTE and VoWiFi networks in Africa and created Africa’s first campus communication service to provide local school students with inexpensive but high-speed Internet access and campus community services. ZTE is the first to provide cloud storage services and file sharing services for individuals, homes, and enterprises in Africa, thereby greatly improving operator competitiveness.

For its CN products, ZTE focuses on convergence evolution to future networks and enriches the scope of voice communication. ZTE is committed to providing advanced networks with the characteristics of Virtualization, Openness, Intelligence, Cloudization, and Internet of Everything, and repositioning the solutions to smartly connect everything and be poised for the future.

As one of the leaders in the CN field, ZTE Corporation is the only one that provides all-system solutions. Centering around the demand of operators, ZTE focuses on NFV/SDN virtualization technologies, 4G convergence communication evolution, subscriber data convergence, interface openness to communication networks, and cloud communication network infrastructure for its CN networks, and will be the most trustworthy strategic partner of operators when operators transform their networks to future-oriented ones.