

Unified Communications Overview

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Abstract:

Users, especially enterprise users have more requirements for services along with the fast development of communication technologies and the enterprises' communication infrastructure construction. Unified communications service provides a solution for the convergence of voice, data, and multimedia. It allows users to enjoy various communication services anytime and anywhere flexibly. A superior unified communications service platform has VoIP communication, status presence and Instant Messaging (IM) service capabilities, and supports a lot of services. Meanwhile, the unified communications service platform provides open service interfaces for the seamless convergence with enterprise infrastructure.

1 Background and Definition of Unified Communications

As viewed from user demands, users would like to communicate with each other anytime, anywhere and using any devices and networks. Enterprise users, especially, hope to merge various communication capabilities with their business intelligence and office facilities, thus optimizing their work flow and improving customer service capabilities.

With such the market requirement, unified communications becomes a focus spotlighted by the communications, IT, and Internet industries. However, there is no solid definition for unified communications, but unified communications must be able to provide users, anytime, anywhere and anyhow, with multimedia communication services through a variety of terminals (including new IP terminals) and the cooperation of networks. This can be achieved by leveraging advantages of the convergence of telecommunication network, the Internet, and the major service capabilities such as VoIP, video communication, instant communication, and office collaboration. Unified

communications enables people to "communicate freely anytime and anywhere using any devices and networks". It also provides a uniform user experience for fast discovery, communication and cooperation and thus facilitates enterprise innovation and service development.

There is a strong market demand and physical network basis for providing users with unified communications services along with the fast development of social informatization and the popularization of communication network. China ComputerWorld (CCW) Research predicted that China's unified communications market will enter the growing stage at the end of 2008 and reach the advanced stage in 2012, and the market scale will increase from RMB 315 million in 2007 to RMB 2,120 million in 2012, with a Compound Annual Growth Rate (CAGR) of 46.4%. Synergy predicted that the scale of the global unified communications market will reach USD10.7 billion in 2009.

2 Unified Communications Service Capability and Client

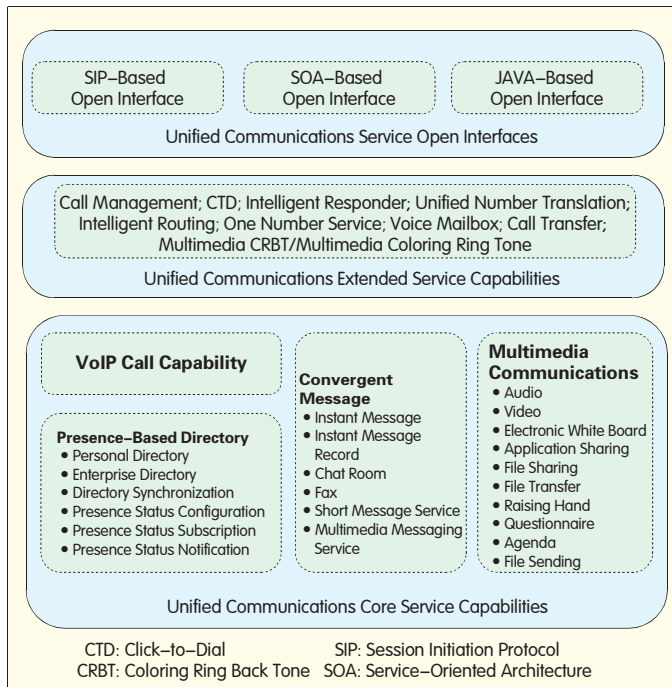
Unified communications integrates the

voice and data communication capabilities of the fixed and mobile networks as well as the instant messaging and presence services based on IP technologies. It combines these service capabilities and extends them to provide more communication capabilities.

Unified communications provide these service components: core service capabilities, extended service capabilities, and unified communications service open interfaces^[1], as illustrated in Figure 1.

Major service capabilities of unified communications include:

- Point-to-Point (P2P) and Point-to-Multipoint (P2MP) VoIP basic voice communication capabilities.
- Address book capability on the basis of presence. Users can access and configure the local and network address books flexibly and experience the smooth address-book service through the presence capability. Enterprise and group users can establish a unified internal address book flexibly.
- Convergent message service capability on the basis of IM. Besides the basic P2P and P2MP IM services, unified communications also allows the interworking of various message



◀ Figure 1.
Unified communications
service capabilities.

services, such as the interworking and conversion between IM and SMS, between IM and MMS, and between IM and fax, enabling users to send and receive messages easily at anytime and anywhere.

Multimedia communication service capabilities include:

- Multi-party audio conferencing;
- Multi-party video conferencing;
- Electronic white board;
- Application sharing;

The extended service capabilities of unified communications are combined service capabilities provided on the basis of the key service capabilities. Extended service capabilities include:

- Call management;
- Click-to-Dial (CTD);
- Multimedia Coloring Ring Back Tone (CRBT);
- Multimedia coloring ring tone.

One objective of unified communications is to converge the voice, data and multimedia communication capabilities of the communication services with the other communication, IT, and Internet applications, so a serial of full and effective service open is a necessary component of the communication service. Unified communications opens the core service capabilities and extended services through the service open interface so that

other systems can use them flexibly.

Unified communications uses three types of open service interfaces:

- SIP-based interface;
- Java-based interface;
- Service-Oriented Architecture (SOA) based interface.

As viewed from the actual application scope, SOA-based interface is ease of use and has a low requirement for service developers. It can be integrated with other web-based services (e.g., various internal management flows of an enterprise) seamlessly, so the SOA-based interface will be widely accepted and used.

Unified communications client is an interface through which users experience the unified services directly. It has user-friendly interfaces and a variety of functions, which greatly facilitate the use of unified communications services. Unified communications clients include PC client, Web client and mobile client (supports multiple mobile operating systems).

Meanwhile, various forms of service capability plug-ins are also a necessary

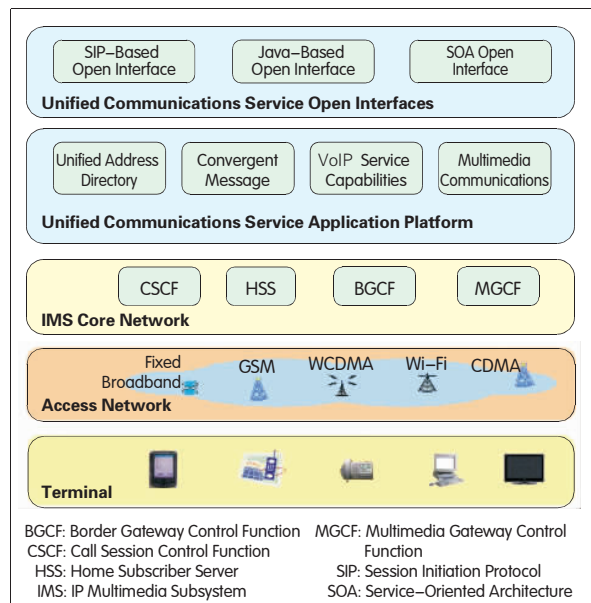
component of the unified communications service for integrating the service capabilities with other systems. Necessary plug-ins include IT system-oriented plug-in and application-oriented integrated application program interface (API)^[2].

3 Unified Communications System Solution and Enterprise Application

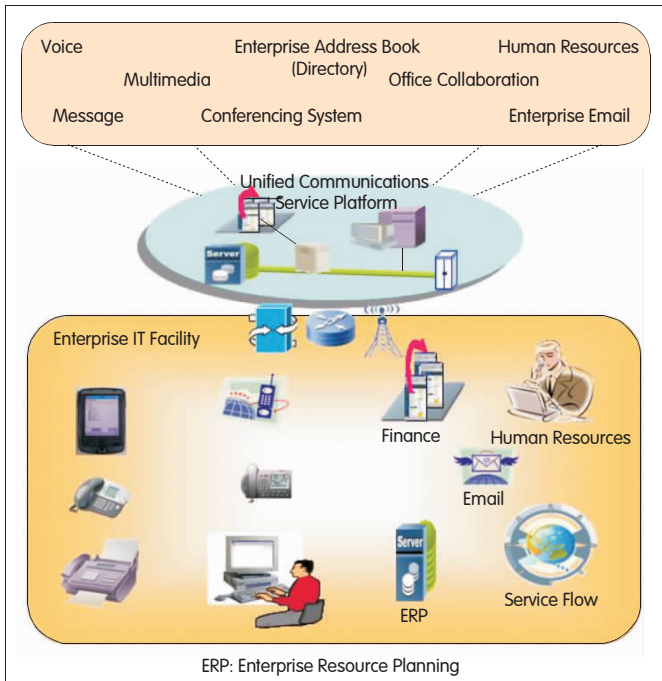
Telecommunication services are transforming from circuit-switching basis to packet-switching basis, and the communication protocols for the network elements in telecommunication networks are unified into the SIP basis. SIP is more and more widely used for IT applications and telecommunication networks because of its flexible support for multimedia services.

Figure 2 illustrates the architecture of an IP Multimedia Subsystem (IMS) network-based unified communications system solution.

One of the important applications of unified communications is for the enterprise and corporate users. Unified communications provides enterprises with communication capabilities such as enterprise address book (directory), enhanced voice call and multimedia conferencing, and, additionally, allows the enterprises to integrate the unified communication service capabilities with



▲ Figure 2. IMS network-based unified communications system.



▲ Figure 3. Unified communications solution for enterprise and corporate users.

their IT services seamlessly, such as human resource management and email system, thus improving their productivity, work efficiency and external service capabilities.

Figure 3 illustrates a unified communications solution for enterprise and corporate users.

Two modes of solutions can be used in actual deployment:

- Based on carrier network-side platform, which requires the carrier to establish a unified communications service platform to synchronize a part of user privacy data to the platform. This mode allows the carrier to enhance control and to cooperate with enterprises more closely.

- Based on enterprise-side platform. Enterprises achieve unified communications by deploying a small-size enterprise gateway. This mode provides enterprises with more autonomy, with little control by the carrier.

Each of the two modes has its characteristics but is complementary with each other.

4 Challenges of Unified Communications

The various service capabilities and

service opening and convergence capabilities for service users allow unified communications to attract wide attention and develop fast. But as viewed from the market application, unified communications are still in the developing stage, with major problems in interworking and security.

The major problem of unified communications at present is lack of standards. Different vendors have their own unified communications systems, making it

difficult for the unified communications services to interwork and to be interconnected. In this aspect, ZTE will throw itself into the work with both national and international standard organizations to prompt the standardization of unified communications. In the situation where the network-side platform coexists with the enterprise-side platform, the interworking between the services on the two platforms should also be standardized.

Unified communications can improve efficiency through application integration, which, however, may cause more potential security problems. When various applications are integrated, the entire system will be affected once the security defense is broken. In the situation without mature, overall security precautions, security is the key problem that needs to be focused on and solved for unified communications.

As an industry-leading value-added service provider, ZTE launched the industry-focused unified communications service platform, ZXUP10, which has been widely installed in the world, including the Enterprise Communications Portal (ECP) of Zhejiang Telecom, Sichuan Telecom and the

Integrated Information Network of China Mobile.

The ECP service platform for Zhejiang Telecom is used for the enterprise market. It achieves service-layer convergence of terminals including fixed phone, Personal Handheld System (PHS), mobile phone, PC and Personal Digital Assistant (PDA) based on directory through an ECP client, greatly improving users' communication experience. It has had more than 100,000 registered users, including government and enterprise users, large- and medium-sized corporations and student users, making it an important innovative service product of Zhejiang Telecom for differentiated competition. With the ECP service platform, Zhejiang Telecom has established a new marketing channel to extend fixed phone and PCS applications and accelerate the development of broadband applications. It further expands the market, improves user loyalty and increases the profit from fixed-network value-added services.

ZTE's unified communications solution is also used by ZTE itself successfully, making it an efficient tool for the communication between its sections all over the world.

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Biography

Qi Chen



Qi Chen received his master's degree from Optic and Electronic Instrument Department of Zhejiang University in 1997. As the chief architect of ZTE's service product line, he is engaged in the research, development and design of intelligent networks and value-added services. He mainly researches on IN

technology, signaling network, open service platform and IMS services. He participated in the drafting of national and international standards and protocols many times. The IN platform program he participated in has won the Science and Technology Progress awards of Shenzhen City, Guangdong province and Jiangsu province.