

Application of ZTE's Integrated Intelligent Network

Dai Shu

(Nanjing R&D Center of ZTE Corporation, Nanjing 210012, China)

The intention of Integrated Intelligent Platform (IIP) is to provide intelligent cross-network services to users of fixed-line network, GSM, CDMA and paging network. It also provides an integrated intelligent network system, making it possible to unify various network intelligent services and provide easy access to these services.

ZTE's ZXIN10 integrated intelligent network can provide many kinds of integrated intelligent services such as uniform account, virtual private number, location service, familiarity number service, free phone, conference telephone, and data service. The system has the capability to centralize these services and also functions in its own way for each individual intelligent network.

Since ZTE pushed out ZXIN10 products in 1999, it has undertaken many projects such as Cyprus national integrated intelligent network, the "All in One Card" service platform of China Unicom Jiangsu Branch, the integrated VPN system of China Unicom Hainan Branch, and the integrated service platform of China Unicom Beijing Branch, among others. ZTE has been, and will continue to be, undertaking provincial integrated service platforms. The potential provinces and major cities may include Jilin, Shandong, Shanxi, Anhui, Jiangxi, Hubei, Yunnan, Guizhou, and Sichuan.

1 Cyprus Integrated Intelligent Network

The Cyprus Integrated Intelligent Network was launched in June 1999. The project was open to international public bidding, and ZTE won

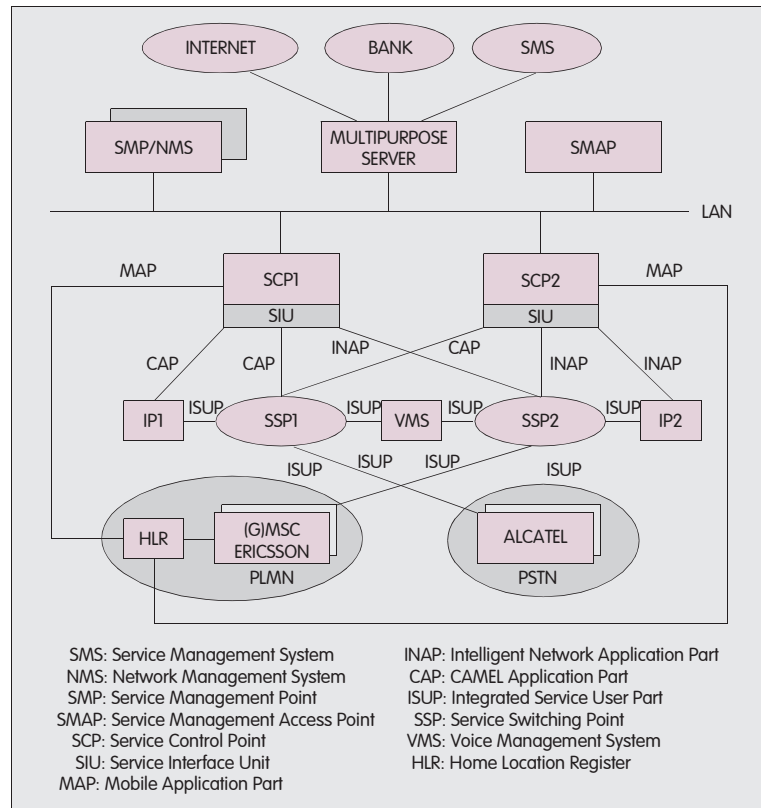


Figure 1. Architecture of the Cyprus integrated intelligent network.

the contract.

The system includes two sets of SCP, one set of SMP, two sets of IP, and two sets of SSP (as shown in Figure 1). The project was put into use in July 2000, simultaneously providing intelligent services for users of PSTN and GSM in Cyprus. By March 2002, the supporting service capacity reached 220 CAPS and the total number of all kinds of service users reached 1.2 million.

The national integrated intelligent system of

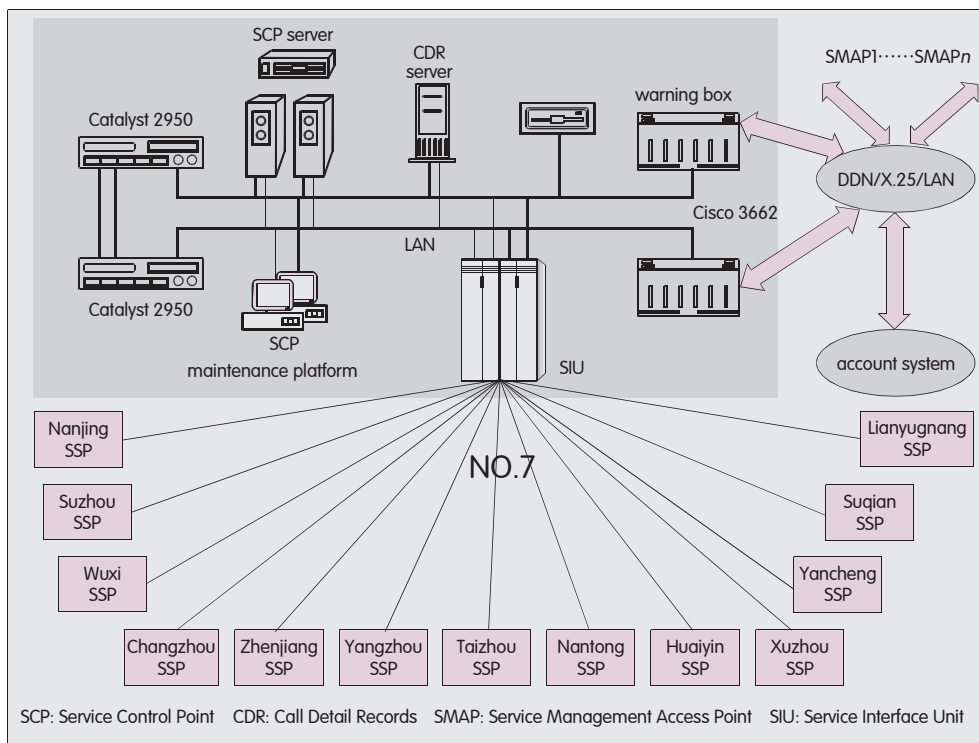


Figure 2. "All in One Card" service platform system of China Unicom Jiangsu Branch.

Cyprus has the following features:

- The system provides both fixed-line and mobile network intelligent service and uses a unified system of maintenance and management.
- The system provides interfaces to the Internet. It can set up WWW server and email server, and present the IN services with some Internet features, including modifying service data through the Internet and providing email notification.
- The system provides network management system (NMS) and takes responsibility for centralized network management.
- The system provides independent intelligent peripheral (IP) equipments and has large voice processing capability.
- The system supports part functions of CS-2, and realizes the interconnection and interworking between two SCP networks.
- The system supports INAP and CAP protocols simultaneously.

At present, the system supports the following services: universal access number, free phone service, premium rate service, automatic call back on busy, prepaid service for fixed telephony, home zone service, televoting, unified messaging service, prepaid Internet card,

split charge service, missed calls/last number called, number portability, prepaid card for mobile telephony GSM using VISA credit card, credit card calling, banking related service, and virtual private network.

2 The "All in One Card" Service Platform of China Unicom Jiangsu Branch

China Unicom provides many kinds of services such as the VoIP service through the data network, fixed-line network and mobile network, and toll communication service, mobile telephone prepaid service, Internet accessing network service, etc. While China Unicom

gives users numerous choices of services, however, each card service has individual account and password, which has caused a lot of inconvenience to both users and operators.

In order to solve this problem, China Unicom Jiangsu Branch put forward the idea that unifies its current services and provides users with a universal integrated telecom service, namely, "All in One Card" service. Upon its implementation, the service platform will integrate many services with a single card (as shown in Figure 2).

With the "All in One" card, users can access various services with a unified access number, a unified card number and a PIN number. The services include the following: 17910 twice-dial-up IP telephone service, 17911 dialing-authenticated once-dial-up IP telephone service, 193 DDD service, 193300 twice-dial-up long distance telephone service, 165 accounting card Internet accessing service, transferable account prepaid card (including transferring account within cards, transferring account between bank cards and "All in One" prepaid card and transferring value from "All in One" prepaid card to "As Your Wishes" card).

The "All in One Card" service platform fol-

lows the rationale of intelligent network. It is built in a centralized mode. The service control center and the data processing center in Nanjing, the capital of Jiangsu Province, serve all the users within the province. Through the unified authentication of the "All in One card" number (including the caller number), it is very easy for the cardholder to use the card while roaming around the province. The service switching function of "All in One Card" service is implemented by the switch parts at the front-end system in each city.

SCP uses two Cisco Catalyst 2950-24A Ethernet switchers to construct two sets of LAN (mutually used for hot standby) with all network elements connecting to each LAN, so as to avoid single point failure. The configuration of service processor and data server in SCP is a dual server system with the disk-array sharing mechanism. The server is HP 9000 N4000, which provides hot standby by using cluster technology. Each server accesses LAN through independent 10 M/100 M Ethernet network card. The disk array provides a RAID5 data backup mechanism.

The "All in One Card" service platform of China Unicom Jiangsu Branch has the following features:

- The card number has an unfixed length, ranging from 1 to 22 digits. One can choose card number according to his or her need.
- The whole system uses prepaid billing mode except that toll service 193 adopts post-paid billing mode.
- The length of caller number is different since the service covers the whole province. The system can process unfixed-length caller number.
- The system offers various account transferring methods, including transferring between prepaid cards, and from bankcard to prepaid card. Service flow is provided to users to transfer account by using a free 99135 call.
- One card can be registered along with one telephone number so that the initiation of call can be made without dialing the card number.
- The length of password is from 4 digits to 6 digits (6 digits in some banks).

The "All in One Card" Service Platform of China Unicom Jiangsu Branch started in

March 2001 and was put into use in Jiangsu province in July the same year. After about 10 months of running, the service platform turned out to be highly stable and profitable. There has been a steady increase of the number of the users, which came close to 1 000 000 according to the statistics issued in May 2002.

3 Integrated VPN System of China Unicom Hainan Branch

The Integrated VPN (iVPN) service is a logically virtual private network, which helps enterprises and groups use the resources of mobile networks (including GSM and CDMA) and fixed-line network. The enterprises using iVPN can give open services to their members, whether they are users of mobile networks or fixed-line networks. The end users can obtain some price rebate through the services and may use short-length number dialing mode. It becomes increasingly popular for both enterprises and individual users.

The iSCP (integrated SCP) of iVPN system has been upgraded from the SCP of CDMA intelligent network. The trigger mode for GSM and CDMA users lies in its subscription information. And iSCP interacts with MSC/SSP of CDMA network through standard MAP protocol and interacts with MSC/SSP of GSM network through CAP protocol, and interacts with SSP of fixed-line network through INAP protocol.

While roaming within a specified province, iVPN enterprise users can identify short number of the caller and directly dial back using the short number indicated. The iVPN enterprise has the flexibility in choosing whether showing the true number or the short number for inside network calling.

The iVPN system of China Unicom Hainan Branch started in January of 2002 and was put into use in May of the same year throughout the province.

4 Integrated Service Platform of China Unicom Beijing Branch

China Unicom Beijing Branch manages universal telecom services such as mobile (GSM, CDMA), fixed data services. Along with the development of service and increase of sub-

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Continued on Page 28