

Case Study
Telecom



Robust, Expandable Platform Added to Existing Network

Suntek Successfully Restructures Voice Messaging Platform

Case Summary

Challenge

Take an existing telecommunications network and enhance it by adding room for growth today, while providing additional room for tomorrow's enhanced voice services.

Solutions

Suntek created a tailored solution based on modular communications building blocks from Intel. These products provided flexible configuration options and were used to create a highly open, stable, reliable, and expandable system. The project was also cost-effective, as it decreased the total cost of system development by more than 30%.

Challenge

Implementing robust systems that provide high availability solutions is a key strategy for service providers. When starting from scratch, it is simple to develop a system that implements the latest features. However, it is far more challenging to add to an existing system, enhancing it with a subsystem that can provide new services, yet is easy to maintain and avoids any interruption in service.

Under fierce market competition, operators sometimes need to make timely adjustments to their business strategies and quickly launch new services. China Network Communications Group Corporation (CNC), located in Liaoning Province, the largest province in northeast China, found itself in this position in 2003. Besides deciding to enlarge the capacity of its existing voice message

platform, CNC wanted a system that would be flexible enough for adding enhanced voice services in the future. As a company whose communications networks cover all of China, CNC realized that even though its original telecommunications platform was a powerful dedicated system, expanding it in the future to include these additional voice services could be costly and difficult.

At the time, the company's business included various national and international fixed telecommunications network facilities and related services. CNC also had more supported telecom ports and more customers than its competitors. Wishing to continue that success and add support for up to 18,000 additional ports covering 14 cities including Anshan, Dalian, Jinzhou, and Shenyang, CNC wanted to make sure that once

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the initial enhancements were launched, new applications could be added later and the system would continue to run smoothly.

Requirements

CNC's main requirement was that its existing platform be re-used and adapted not only for its current application, but also for future uses. To successfully provide the company with the flexibility to expand to include new revenue-generating services like fixed short messaging service (SMS), fax, pre-paid calling, interactive voice response (IVR), and color ring back tone (CRBT), the upgraded system needed to be highly available and redundant. To ensure its success, CNC presented a list of specific requirements for the recommended platform solution.

Stability

Voice message service requires stable online service 24 hours a day, 7 days a week, regardless of unpredictable increases in call traffic. For example, when users call in to request results from a university entrance examination, the system must gracefully cope when the call volume abruptly reaches a new peak.

Flexibility

When compared to standard voice services such as those used in a call center, telecommunications networks require additional resources. CNC wanted the updated system to be able to take content from a variety of sources and various types of data and provide interactive, real-time answers to inquiries.

Expandability

For now, CNC's platform handles database queries. But in the future, it's possible the

company may launch multiple enhanced services to integrate voice, SMS, data, conferencing, or other diverse media services. So the system must expand easily to satisfy the increasing variety of services.

Quality Technology and Support

CNC was inclined to ally with a supplier that could ensure not only high-performance products, but a consistent service guarantee.

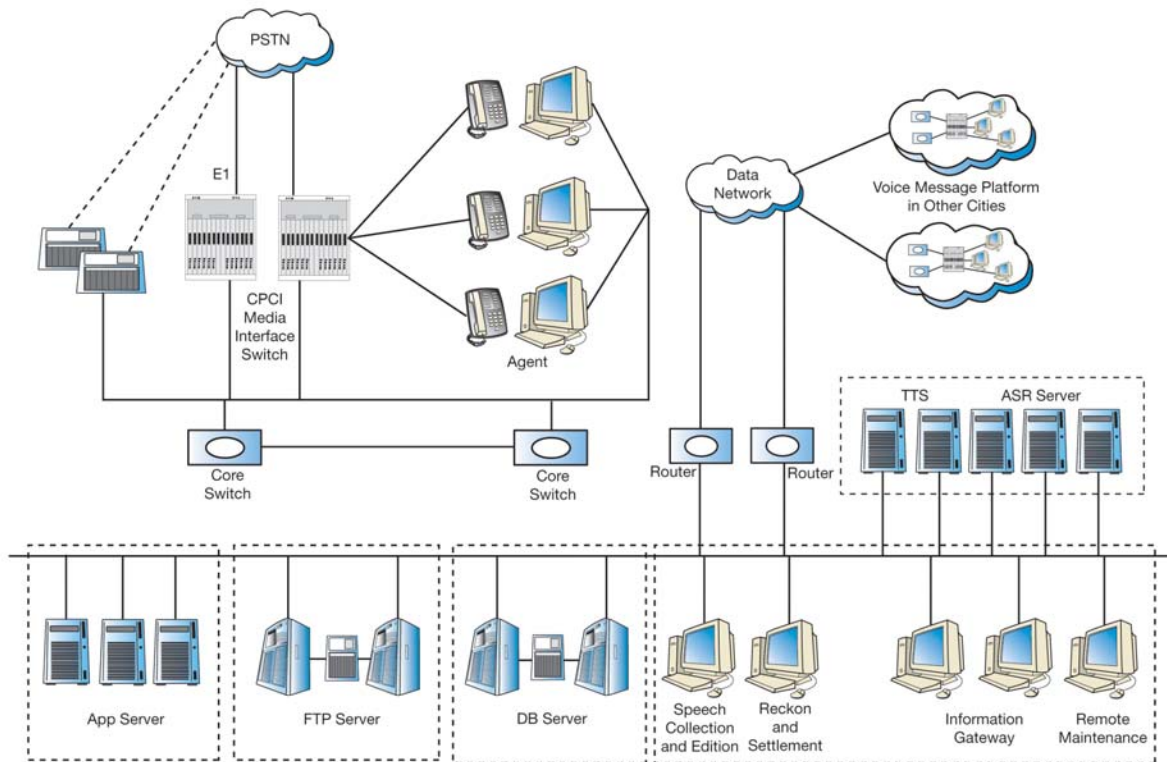
Price and Performance

Average revenue per unit (ARPU) of telecommunication operators has been experiencing a decrease in recent years. Deploying the changes in the system in a cost-effective manner became one of the key considerations when the company launched the project.

Solution

Suntek Technology (Guangzhou City in the Guangdong province of China), a company that designs, develops, integrates, and delivers cost-effective business applications and solutions to a variety of market segments in China, was chosen to build a high-availability solution based on Intel® components.

To create a high availability (HA) system, a provider may install two entire systems with one being "active" and the other on "standby", activated only if there is a problem with the active system. For instance, if a system includes one single-board computer (SBC) – and it fails – the entire system is lost. It cannot process calls, so the service provider can no longer use it to generate revenue or to support existing customers until a technician powers down the system to remove and replace the failed SBC.



In Suntek's redundant host (RH), the system contains two SBCs: one active (handling live traffic) and one standby. The active SBC handles all processing during normal operation. If the active SBC fails or problems are detected on it, then the standby (redundant) unit becomes active and takes over the processing. The failed SBC can then be removed without having to power down the system. This can drastically reduce downtime as the standby is already installed and can be brought online without having to dispatch someone and without having to power down the system. Up-time is increased (higher availability), thereby providing more robust solutions. Others may claim to have robust systems and do claim support for peripheral hot swap (PHS), but the ability to have redundant SBCs provides a much more robust system.

CNC's updated voice messaging platform is divided into two levels: a central platform and 14 local platforms. The provincial central platform in Liaoning Province (where the RH resides) houses the voice messaging service center, as well as business management, data storage, billing, and invoice management services.

Several companies bidding for this project were designing traditional solutions based on switches. They thought a large-scale voice messaging platform could not be implemented without a PBX switch-based solution. To understand the

construction demands of this project, technology experts from both Suntek and Intel visited CNC, conducting analysis and communicating with them many times. During these visits, two onsite seminars were held at CNC, comparing PBX switch-based systems with one based on modular components. Result: It was easier to add features to the "un-PBX" system, and it was less expensive as well.

Technologies

As the main component to the entire voice message platform, Suntek's IP-Switch was fully deployed on the provincial central and all the local platforms. This configuration permits the sharing of data and voice information among all 14 cities on the network by enabling the local platform to connect with the provincial central platform.

Besides the Microsoft Windows* 2000 Server operating system, these are the components of the basic system.

- **Intel® NetStructure™ CPM8 SS7 Board:** Combines onboard support for SS7 common channel signaling protocols and supports up to eight software programmable T-1/J-1 (1.544 Mb/s) or CEPT E-1 (2.048 Mb/s) digital line interfaces using an H.110 pulse code modulation (PCM) highway.

• **Intel NetStructure DM/IP601-2E1-100BT IP Board:**

Offers T-1 or E-1 spans plus VoIP and media processing in a single slot. This board lets Suntek provide clients with new businesses based on next generation network technology in a CompactPCI* form factor (i.e., IP telephone cafe, network instant message extending to PSTN network).

• **Intel NetStructure DMN160TEC Digital Telephony Interface Board:**

Provides 16 E-1 spans in a single slot. ISDN PRI access comes standard on this board, so applications can capitalize on the speed, power, and flexibility of ISDN. This board can run multiple versions of ISDN or channel associated signaling (CAS) protocols at the same time.

• **Intel NetStructure DM/V2400A Combined Media**

Board: Supports up to 240 ports of voice processing or 120 ports of voice, speech recognition, and conferencing in a single computer backplane slot, and multiple boards can be installed into a single chassis. Suntek can insert several DM/V2400A resource boards in a platform and support thousands of access and media service resources.

• **Intel NetStructure HDSI/480 Station Interface**

Board: Provides 48 station interfaces of service in both PCI and CompactPCI form factors. It can be used in open-architecture computer telephony platforms that integrate large-scale switching and voice processing resources under a single hardware and software architecture.

• **Intel NetStructure ZT 5085AC 12U Redundant Host Packet Switched Platform:**

Supports five-nines (99.999%) availability with built-in redundancy for active system components including Ethernet switches, chassis management modules, power supplies, and fan trays.

• **Intel NetStructure ZT 5524 High-Performance System Master Processor Board:**

Designed for carrier-grade telecom and Internet applications requiring exceptional processing power and high availability.

Another plus was that these boards use peripheral hot swap (PHS), another HA feature. PHS provides the ability to add or replace non-SBC communications boards within a system while the system is still online. Without the PHS feature, in order to add or replace boards, the system needs to power down, thereby stopping any/all calls into the system. With

PHS, replacement boards can be installed and brought online without downtime, resulting in more up-time, more service availability, and more revenue for service platforms.

Standardization, Modularization Increase Efficiency

Intel's modular telecommunications platform is based on open industry standards. And since Intel can provide all the necessary components for robust systems (chassis, single-board computers, communications boards, and system software), there is no need to go to multiple vendors to get the equipment. Intel's inclusion in the development of the solution helped Suntek augment its technical expertise and capital resources, reducing development time and cost: More than 30% of total cost of system development was decreased.

Results

Compared to the original platform, the new system achieved a rise in operational performance. It noticeably decreased the loss ratio of the original call service while also enhancing service quality. Additionally, it could connect with diverse information sources like SMS of China Mobile and China Unicom.

The restructuring of CNC's comprehensive value-added voice message platform was launched in May 2003 and was successfully verified and accepted in early 2004. This has been Suntek's largest voice message platform construction to date. The successful implementation of the project lets CNC benefit from additional revenues from new services that the new voice message system can provide.

Mr. He Haixin, Vice-general of Product Management of Suntek, said, "It was Intel's modular communications platform that provided CNC's voice message platform with reliability, stability, flexibility, openness, and cost-effectiveness. The improved voice message platform would not only satisfy the company's current requirements, but more importantly, it would create a sound foundation for future enhancements and growth."

As the communication hub in northeast China, CNC takes the leading position in network construction and business scale. Mr. He Haixin pointed out, that to some degree, CNC's voice message platform represents future trends of domestic voice message service. The success of the project is significant

because it sets the standard for the construction of similar systems.

Acronyms

ARPU	Average revenue per unit
CAS	Channel associated signaling
CRBT	Color ring back tone
HA	High availability
IVR	Interactive voice response
PCM	Pulse code modulation
PHS	Peripheral hot swap
PSTN	Public switched telephone network
SBC	Single-board computer
SMS	Short message service

References

Intel Modular Communications Platforms:

<http://www.intel.com/go/mcp>

Intel® Communications Alliance:

<http://www.intel.com/go/ica>

About Suntek

Suntek Technology Co. Ltd. is the backbone subsidiary company under Suntek Group, a privately run high-tech enterprise. Suntek is dedicated to providing comprehensive solutions integrating computer, telecommunication, and information sources for telecommunication operators, information providers, and financial and security companies. Suntek's software products have been awarded national level or provincial level awards many times. In 2004, Suntek respectively ranked 34th and 17th in *2004 Top 100 Largest Scale Companies in China Software Industry* and *2004 Top 30 Largest Scale Companies of Independently Developing Software in China* both issued by the Ministry of Information Industry. Suntek is also recognized as a pilot company of the Project of Chinese Software Exporting to Europe and the U.S. Ministry of Science and Technology. For more information, visit <http://en.suntektech.com/>.

About China Network Communications Group Corporation

China Network Communications Group Corporation (CNC) was established on the basis of the former China Telecom Group Corporation and its affiliated telecom companies in the 10 northern provinces (autonomous regions and municipalities). CNC owns well-structured modern communications networks that cover the whole country and reach the world. The networks are equipped with advanced technologies and provide comprehensive functions. CNC's business covers various national and international fixed telecommunications network facilities and related telecommunications services. In April 2004, the company had 100 million telephone users. For more information, visit <http://www.chinanetcom.com.cn/en/index.asp>.

About Intel

Intel, the world's largest chipmaker, is also a leading manufacturer of computer, networking, and telecommunications products. Intel telecom products offer developers, service providers, resellers, and communications system owners what they need to succeed in the world of converged voice and data communications. This includes a broad range of high-performance, open communication building blocks, a global network of solutions providers, and comprehensive support and consulting services. Ranging from silicon to software protocols, boards, middleware, and communications server platforms, these open, high-performance building blocks are available at various levels of integration to meet converged communications needs from the enterprise to the public network. They can enable a broad range of converged Web services including Internet voice browsing, IP-enabled contact centers, voice portals, unified messaging and communications, and more. For more information, visit <http://www.intel.com/go/telecom>.

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