

Case Study

Intel® Centrino®

Mobile Technology

Intel® Xeon® Processor MP

Manufacturing

VoIP



"The Intel® Centrino® mobile technology-based wireless VoIP system helps Shanghai GM reduce daily communication costs."

Gu Qihao

Network Architecture Manager
Information System Department
Shanghai GM

Seamless Communications

Shanghai General Motors extends traditional voice calls with IP Telephony to improve communications

Each leap of productive efficiency in history generally comes from the innovation of working methods. Shanghai General Motors (Shanghai GM) wireless network integrates Intel® Centrino® mobile technology-based notebooks with a Voice over IP (VoIP) system, enabling Shanghai GM to break through traditional communications methods to achieve seamless communications for a faster response to market changes and gaining a competitive advantage.

Challenge

- **More effective communications.** A large-scale enterprise like Shanghai GM requires highly effective communications to meet the requirements of a fast-developing market.
- **Decreasing high operation costs.** High communication costs are an increasing burden to the company.
- **Increasing efficiency.** The disadvantages of a traditional telephone system have become a bottleneck that is hindering Shanghai GM from enhancing employee productivity and efficiency.

Solution

- **Intel® Centrino® mobile technology-based notebooks** are employed as voice phone clients.
- **Cisco IP Communicator* software**, a softphone application is installed on the notebooks to enable VoIP communications.
- **Cisco voice gateways** are deployed to bridge the existing wireless network and public switched telephone network (PSTN) to enable seamless voice calls between them.
- **Cisco CallManager* software** running on a 4-way Intel® Xeon® Processor MP-based server provides enterprise IP telephony call processing for the entire system.

Assessing the Situation

Shanghai GM is one of the three top automobile makers in China and has manufacturing plants and offices in Shanghai, Shenyang and Yantai. The competition within the automotive industry in China is extremely intense, amidst a market environment that is changing rapidly.

"As the division that provides services and new technology for the company, we are constantly monitoring these changes to try and increase market share, as well as improve response times for client demands," says Chen Yingjian, senior IT manager at Shanghai GM.

Making voice calls via the telephone is one of the major methods of communicating important information quickly between offices and staff. For Shanghai GM staff, frequent phone calls, teleconferencing and network meetings are common in the course of their work. But the very nature of the traditional phone system became a hindrance to their efficiency, especially in an increasingly mobile work environment where staff make frequent business trips to coordinate and drive production and marketing activities—necessary to maintain the company's position in an aggressive and competitive marketplace.



Intel® building blocks provided Shanghai GM with an end-to-end VoIP solution for seamless communications.

"When away from the office and their desk-bound fixed-line telephones, our staff may miss important business opportunities as they cannot answer or make phone calls on their regular lines," explains Gu Qihao, network architecture manager of the Information System (IS) Department at Shanghai GM. With the traditional fixed-line telephone, staff also encountered the same problems when they moved between the meeting room and their desks, which happened frequently.

Although voice calls using mobile cellular phones were an easy alternative, calls are more costly and users would have to remember and keep track of multiple phone numbers of all their contacts—not an attractive proposal.

As Shanghai GM's business grew, it became clear that the traditional telephone system was unable to meet the company's increasingly mobile work environment. The traditional telephone system was hindering effective communications within the company, and the Shanghai GM's IS Department realized that it had to find a suitable alternative quickly.

Spotlight: Shanghai General Motors Company Limited

- Shanghai General Motors (Shanghai GM) is a joint venture between Shanghai Automotive Industry Corporation (Group) and General Motors (USA). It is the largest joint venture firm between Chinese and American enterprises. Its operations include manufacturing plants in 3 locations, namely Shanghai, Yantai and Shenyang.
- "In 2005, vehicle sales for Shanghai General Motors exceeded 320,000, making Shanghai GM the top selling automobile maker in China," says Shanghai Senior Manager Chen Yingjian, of the company's Information System Department.
- Shanghai GM owns three brands—including Cadillac*, Buick*, and Chevrolet*—and manufactures and markets vehicles, engines and transmissions. The company completed a plant expansion in 2005, increasing its annual production capacity to 450,000 vehicles.

A major concern Shanghai GM had for an alternative telephone system was cost. The company was already operating manufacturing plants and offices in three locations and by the end of 2005, had already sold over 320,000 vehicles. The costs incurred from traditional telephone communications are an increasing burden to the already high costs in maintaining a massive manufacturing and marketing operation. With intense market competition and the need to have a healthy bottom-line, saving operation expenses and improving efficiency were goals that Shanghai needed to address. And both Chen and Gu had to ensure that the alternative phone system would both save money and improve communications efficiency for the company.

The key to the solution was found in the wireless network environment that Shanghai GM had deployed in August 2005, together with Intel Centrino mobile technology-based notebooks that enable their staff to improve their working efficiency. As staff were always available online whenever they login to the corporate network on their notebooks, it made sense to take advantage of this work environment to enable voice calls to be made, as well. Using the existing wireless infrastructure and enabling voice calls over the corporate network meant Shanghai GM would be able to both reduce costs and achieve more seamless communications. Shanghai GM's IS Department sought help from Intel® Solution Services to conduct a strategic in-depth analysis of the company's environment and its requirements. This resulted in the initiation of a pilot project of a Voice over IP (VoIP) system.

Delivering the Solution

Intel Solution Services recommended a VoIP solution that not only delivers rich, reliable and cost-effective services, but is also scalable to adapt to future escalating requirements. The solution would build upon the existing wireless network infrastructure and the Intel Centrino mobile technology-based notebooks that Shanghai GM had previously deployed to its users.

The pilot project was carried out mainly with staff from Shanghai GM's IS Department, as this was an ideal control group who were IT savvy and able to provide feedback on usability and technical issues. Other staff were also included for end-user feedback. The solution



"With a wireless network-based VoIP system, we have significantly improved communication efficiency in our daily work and saved on operation cost."

Gu Qihao
Network Architecture Manager
Information System
Department
Shanghai GM



called for hardware and software to be installed or integrated into the Shanghai GM's IT and public switch telephone network infrastructure.

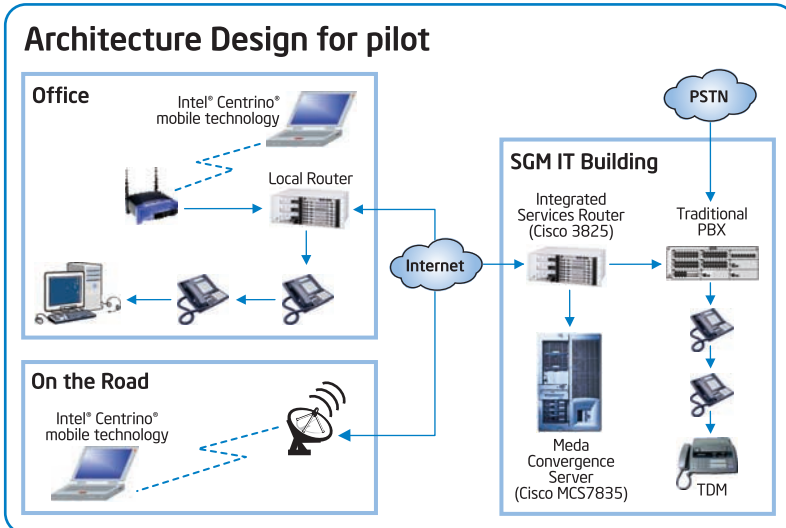
Seastar*, a local systems integrator, was brought in to help with the pilot deployment. Led by Intel Solution Services, the Shanghai GM IS Department and Seastar formed a project team that deployed the pilot project. Cisco IP Communicator*, a software-based IP Phone application was installed on 90 Intel Centrino

network. Users simply plug in a microphone headset in order to make or take voice calls.

The team also installed Cisco CallManager* onto an HP* 4-way server based on the Intel® Xeon® Processor MP. The server provides the VoIP-enabled notebooks with a call processing system to provide advanced telephony features and VoIP capabilities. This enables users with the ability to transfer calls, forward calls, and conference additional participants to an existing call.

A Cisco VoIP gateway was deployed to form a bridge between the traditional PSTN telephone system and the IP network, allowing calls to seamlessly pass between the two networks.

With the new VoIP system in place, any staff who logs onto the network with a VoIP-enabled notebook is instantly available for voice calls. Voice calling is simply another service available on the notebook, just like email and web access. The VoIP system gives every user a calling name and number that is integrated into the system. This allows users to easily see who is calling, or who to call without having to deal with remembering multiple phone numbers. With the wireless capability of the Intel Centrino mobile technology-based notebooks, staff can easily make or take calls wherever they are working in meeting rooms or traveling on the road as long as they are able to access the corporate network via a virtual private network (VPN) connection. With an interface that looks like a regular business desk telephone, the softphone has a low learning curve that users can master within minutes.



“In this pilot, we used VoIP software from Cisco installed on notebooks running on Intel® Centrino® mobile technology, and were treated to a much more effective way of communicating.”

Chen Yingjian
Senior Manager
Information System
Department, Shanghai GM

mobile technology-based notebooks. This endows the notebooks with the functionality of IP Phones. Together with the built-in wireless and high-performance features of Intel Centrino mobile technology, the notebooks become a media-rich communications device, providing its users with high-quality voice calls on the road, in the office, or from wherever users may have access to the corporate

Key Technologies

- Cisco IP Communicator* software installed on 90 Intel® Centrino® mobile technology-based notebooks provided all the functionality of IP phones.
- Cisco voice gateway processes digital and analog signals, providing interoperability between legacy telephones and VoIP-enabled notebooks.
- Cisco CallManager* installed on an HP* 4-way Intel® Xeon® processor MP-based server provides software-based IP telephony call processing for the entire VoIP system.

Integral Answers

- With the help of Intel® Solution Services, Shanghai GM decided to bridge the VoIP network to the PSTN phone system, to enable users to adapt to the new system gradually as well as make full use of its existing investment.
- The VoIP system utilizes the existing wireless network for wireless Internet telephony.
- Choosing a software-based VoIP solution takes advantage of existing Intel Centrino mobile technology-based notebooks, to reduce deployment and operation costs.

Chen says of the technology, "We see several advantages for this technology on several fronts including cost reduction, rapid deployment and integration into the overall systems infrastructure and increase in productivity for our workers."

The pilot project showed intangible productivity gains that include:

- Automated call routing when staff are on the move from one site to another
- Reduction of missed calls as the system can automatically detect a user's online presence
- Improved online collaboration environment with seamless voice communication
- Increase opportunities for joint problem solving, social bonding and learning
- Avoidance of distractions or interruptions by using the "Do not disturb" feature of the softphone

The project team also monitored and collected cost data during the running of the pilot project. The team compared the data against the Shanghai GM's Direct Distance Dialing (DDD, which is equivalent to Subscriber Trunk Dialing in U.S. and elsewhere) fees for several months prior to the pilot and for one month during the pilot, and this showed a savings of almost 12 percent per week. These cost saving came from converting DDD calls to local calls when those calls were routed through the VoIP system.

Chen, Gu and their team are pleased with the successful pilot of the VoIP system on the wireless network. The project demonstrated that a business can be empowered with affordable, standards-based platforms and applications that simplify VoIP integration and support business communications and collaborative functions. The building blocks provided by the Intel® architecture-based platform are a good start to building end-to-end VoIP solutions.

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The team plans to carry out more trials involving features such as video meetings and conferencing. In line with the company's objectives, strategy and future development plans, Shanghai GM may expand its trial to gradually phase in the VoIP system across the company and in time, replace the traditional telephone system.

Return on Investment

- The wireless network-based VoIP system can easily bridge to the traditional PSTN system to ensure the continuity of corporate infrastructure investment.
- Intel® Centrino® mobile technology-based notebooks enable the staff to log on to the Internet anywhere on campus and anytime, for voice phone calls through the wireless network that enhance working efficiency.
- The wireless network-based VoIP system can significantly reduce the deployment cost and daily operation cost of the traditional telephone system. The pilot project demonstrated a savings of almost 12 percent¹ per week on voice calls.



¹ Figures provided by Intel® Solution Services

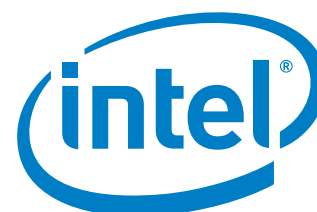
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