

SingTel Redefines International Wholesale Voice Services with VoicePlus Using Cisco Next-Generation Voice Technology

SingTel has redefined international wholesale voice services with VoicePlus, a new voice service built on next-generation VoIP technology, with premium quality assurance at a manageable cost.

In June 2002, SingTel introduced its VoicePlus service, a premium international wholesale voice service based on next-generation technologies, to best meet the growing demands of both the national and international markets. The service currently provides connectivity to more than 200 destinations with committed quality assurance to nine countries in the Asia-Pacific region—Australia, China, Hong Kong, Indonesia, Japan, Malaysia, Singapore, South Korea, and Taiwan—as well as the United States and Britain. Figure 1 illustrates VoicePlus termination points.

Figure 1
SingTel's VoicePlus Termination Points by Country



SingTel built VoicePlus around the Cisco Voice Infrastructure and Applications (VIA) solution, part of the next-generation solution suite at Cisco. The Cisco voice technology and Cisco end-to-end IP networking solutions and support provide for lower total cost of ownership and greater levels of functionality. This allows SingTel to offer more advanced voice features than was possible with traditional technologies.



Challenge

SingTel has been in the wholesale voice business for many years using networks that have consisted primarily of traditional time-division multiplexing (TDM) circuit-switched equipment. In the late 1990's, SingTel embarked on a strategy to start implementing voice-over-IP (VoIP) technologies in its networks to meet the increasingly complex and dynamic business requirements in the marketplace, to expand its international voice coverage in a cost-effective manner, and to curb its investment in older traditional technologies.

In addition, the solution SingTel chose on which to build the new VoicePlus network had to meet a wide range of requirements with the service spanning 11 countries and 4 continents where each country or region had its own set of challenging specifications. As such, the VoicePlus network had to interconnect seamlessly with both existing Public Switched Telephone Networks (PSTNs) as well as VoIP networks of other telecom carriers. Premium voice quality had to be maintained using state-of-the-art quality of service (QoS) technologies particularly for the demanding enterprise, small, and medium-sized business customers.

Table 1 Specific Requirements for SingTel's VoicePlus

- Support of multiple PSTN signaling protocols—R2, Primary Rate Interface (PRI), Signaling System 7 (SS7), Dual Tone Multifrequency (DTMF), and the variances for different countries
- Open interfaces for interoperability
- Advanced routing features including
 - Least-cost and priority routing capabilities
 - Trunk group, source-based, type of service routing capabilities
 - Alternate/overflow routing capabilities
 - Percentage-based routing capabilities (among different users and routes)
 - Time-of-day, day-of-week/year configuration capabilities
- Digit manipulation
- SS7 message handling and manipulation
- White lists/black lists
- Long-duration call monitoring

Solution

“VoicePlus, with its focus on quality and reliability, is an important service for SingTel because it enables us to push the envelope of packet-based technologies to deliver both traditional voice services as well as new value-added voice services. More importantly, the solution provides us with investment protection, as it is capable of performing the key functionalities of a traditional voice gateway or international switching center,” says Masagos Zulkifli, a senior director in SingTel's International Carrier Services Group.

The Cisco VIA solution interoperates with existing traditional TDM telephony networks and gives service providers the flexibility to migrate services to the next-generation packet-based networks, which provide lower infrastructure and operational costs.

The solution provides for a smooth migration of SingTel's voice infrastructure to next-generation voice technologies while leaving its traditional OSS/BSS systems unchanged. Using the Cisco Service Provider Solutions Ecosystem program, additional services such as pre-paid and post-paid calling card, IP-based audio conferencing, and voice mail services can also be delivered from the same network.



The initial phase of the VoicePlus solution is based on a distributed softswitch architecture with the Cisco AS5000 Family of universal gateways and Cisco 3600 Series multiservice platforms running ITU-T Recommendation H.323 protocol. H.323 is the most widely used protocol for international VoIP interconnection today. In addition, the Cisco gateways used in the application support SIP and MGCP, ensuring SingTel investment protection.

The Cisco solution is further enhanced with the inclusion of a centralized route server. It provides a suite of advanced features including intelligent hierarchical routing, calling line ID (CLI)/dialed-number identification service (DNIS) screening, automatic call rerouting, flexible announcement, and powerful number translation capabilities that are improvements over today's traditional voice switches. SS7 signaling transparency is supported in the solution with additional ability to provide SS7-based routing and billing.

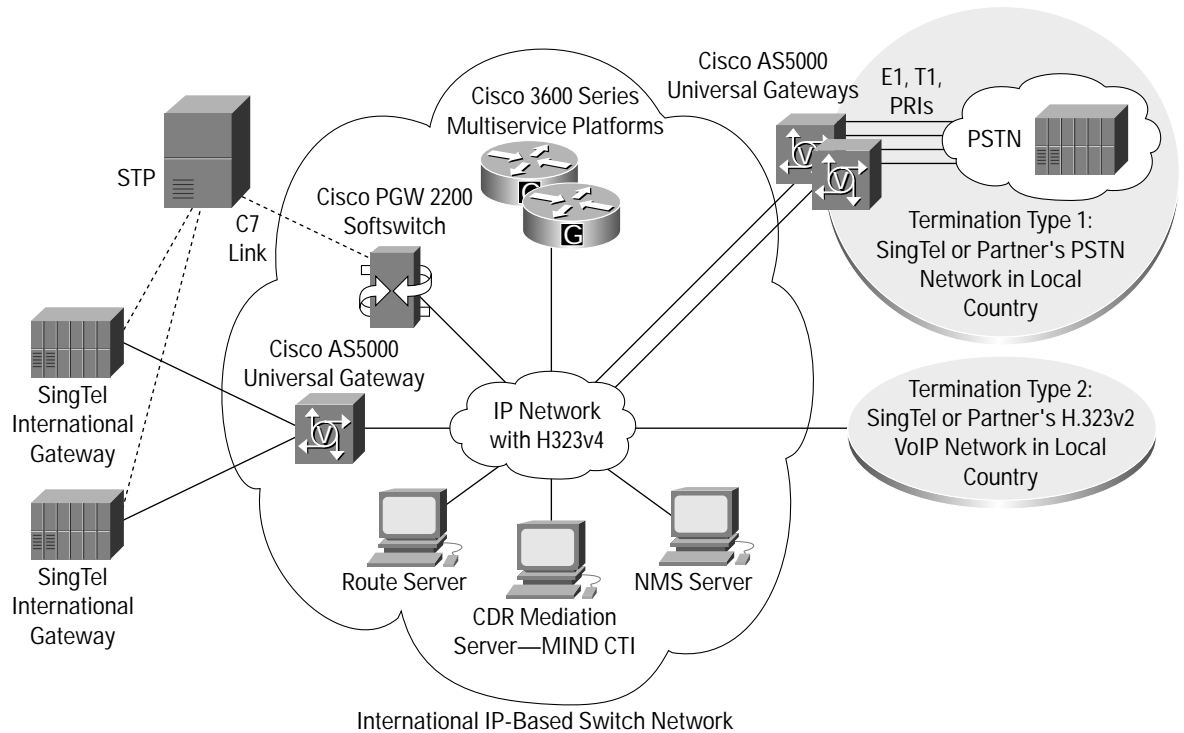
The Cisco solution enables SingTel to adopt modular components to reduce the initial and long-term costs of ownership, while providing a future-proof network that allows for migration to newer technologies, applications, and services. Moreover, this comprehensive and advanced voice solution enables SingTel to develop new and attractive wholesale service offerings, improve network efficiency and resiliency, and enhance quality of service.

Implementation

The solution was customized after thorough analysis of Singtel's existing network components and designed by a Cisco led team, comprising experts in the field of next-generation voice and IP networking. Depending on the country of termination, the VoicePlus network had to interconnect with either the local PSTN network via a Cisco AS5000 Family voice gateway or connect directly to the partner's H.323 VoIP network (see Figure 2). SingTel's international VoicePlus IP switching network makes use of additional capabilities of H.323v4. The Cisco solution, however, still enables transparent connectivity with H.323v2 networks. In addition, the deployment was faster than was possible with traditional TDM networks because the installation of the IP equipment (routers, gateways) was faster, simpler and less expensive than the installation of circuit-switched equipment (Class 4 and 5 switches).



Figure 2
SingTel's VoicePlus Network Using the Cisco VIA Solution.



Results

SingTel's international VoicePlus service built on Cisco next-generation VoIP technologies is now available to over 200 destinations with premium service available in 11 countries, with plans for further expansion. The key advantages of the Cisco VoIP solution over solutions based on traditional TDM technologies are:

- *Lower total costs of ownership*—IP equipment is less expensive to deploy than traditional circuit-switched equipment
- *Rapid revenue generation and deployment*—IP equipment is simpler and quicker to configure and deploy helping service providers more quickly offer new services and collect revenue
- *Increased network efficiencies and lower costs*—Advanced voice routing features of the Cisco voice solution enables selection of cheaper routes and compression functions
- *Worldwide interoperability and compatibility*—The Cisco voice solution is interoperable with traditional PSTN networks and other VoIP networks, providing transparent migration to new technologies and new markets
- *Field-proven and time tested*—The Cisco VIA solution has been deployed successfully by hundreds of carriers around the world, including the largest VoIP carriers

VoicePlus demonstrates that VoIP technology is a viable alternative to traditional circuit-switching. It increases the options for carriers to deliver voice services with the flexibility to interconnect to both TDM and VoIP based carriers, the latter allowing SingTel to benefit from rapidly growing trends without any compromise on quality. The Cisco next-generation voice solution has now allowed SingTel to strengthen its strategic position for more customer-focused services, world-class service infrastructure, and penetration into key regional markets.

“Cisco’s proven track record in providing solutions for reliable next-generation voice networks for not just SingTel but carriers around the world was a key factor in our decision to work with them on this VoicePlus service,” said Masagos Zulkifli, a senior director in SingTel’s International Carrier Services Group.



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