

CONVERGENCE WITH CLASS

SINGAPORE POLYTECHNIC BUILDS ONE OF NATION'S LARGEST IP PHONE NETWORKS WITH 1,500 CISCO IP PHONES TO REDUCE OPERATING COSTS AND INTRODUCE VALUE-ADDED SERVICES.

Singapore Polytechnic (SP), the country's oldest and most prestigious polytechnic, celebrates its 50th Anniversary in 2004. Over the last five decades, it has provided education and training for some 120,000 skilled personnel, supporting Singapore's drive to develop the skilled manpower needed to support the wide-ranging industries and businesses at home and abroad. Today, it has 16,500 full-time and part-time students enrolled in a total of 53 diplomas and post-diplomas in biotechnology & life sciences, business, computing, design, e-

commerce, aeronautical & other engineering, information technology, optometry, maritime studies, media & communication, and multimedia technology.

To achieve its vision of becoming a world-class institution and maintain its position as the most popular polytechnic in Singapore, SP invests in the constant renewal of its facilities and IT capabilities to provide an advanced infrastructure for the use of its students and faculty.

THE CHALLENGE

SP'S INTEGRATED NETWORK INFRASTRUCTURE PROVIDES A COMPLETE LEARNING EXPERIENCE WITH EASY ACCESS TO RESOURCES VIA A VARIETY OF CONNECTIVITY OPTIONS AND DEVICES.

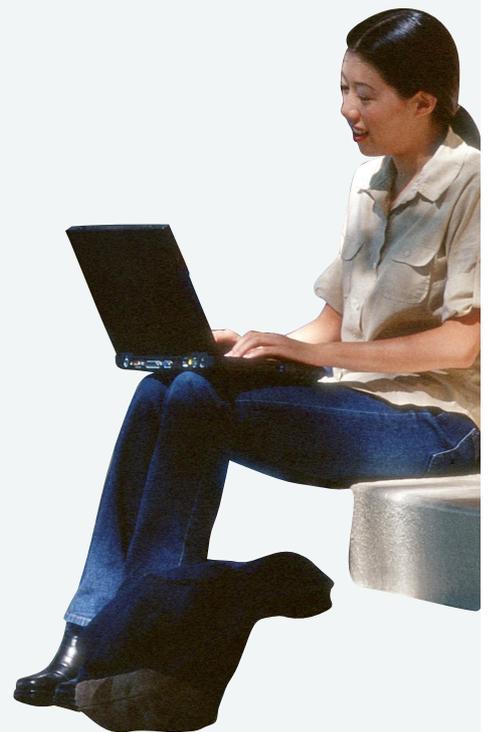
SP is a polytechnic like no other. It is the proud recipient of Singapore Quality Class, ISO 9000, ISO 14000 and SPRING Singapore's People Developer Standard certifications. Every year, it captures a high proportion of quality 'O' level students as more students put down SP as their first choice than for any other polytechnic.

Mr Chang Boon Hai, Director (Computer & Information Systems Dept), explained SP's main objectives. "We want to be able to continue to attract high calibre students. To do this, we have to find new ways to bring education on demand – or e-learning – to the growing Internet generation of students. A multimedia, multi-access environment becomes essential to providing learning in a mobile world. As a result, a highly reliable and scalable network is an absolute must-have."

SP knew that it had to take a holistic approach to network planning to make

this a reality. Today, SP has created an end-to-end and integrated network environment combining the best of wired and wireless technology from Cisco to provide connectivity to faculty and students alike from anywhere on the campus. Its high-speed Gigabit Ethernet network – based on Cisco Catalyst Series Switches – was built in 2000 and a wireless network of 500 Cisco Aironet Access Points was put in place in late 2003.

"At the same time, our PABX system was already more than 10 years old and it was becoming more complex and costly to operate and maintain. One option was to move to digital PABX, which would have involved very expensive cabling work that would have been hard to justify," added Mr Chang. "Another option was to go completely IP. This would involve combining all voice, data and fax traffic over a single network platform."



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THE SOLUTION

SP DEVELOPS A HIGHLY RELIABLE BUT COST-EFFECTIVE CONVERGED NETWORK TO DELIVER HIGH QUALITY VOICE, DATA AND VIDEO SERVICES TO ITS STAKEHOLDERS.

Leveraging on its existing investment in the Singapore Polytechnic Intelligent Computing Environment Gigabit Ethernet Network Backbone (SPICE 2), SP embarked on a project to replace the PABX system with IP telephony.

The contract was awarded to Radiance Communications Pte Ltd, a Cisco Systems partner, in December 2001, who then designed and implemented the Cisco IP Telephony solution for SP.

Mr Chang said, "SP has had good experience with Cisco products. Not only do they have the features and functionalities we need, they are also reliable.

"The Cisco IP Telephony solution was chosen as one of our main requirements was a seamless integration with our existing network infrastructure, which is largely based on Cisco solutions. The IP infrastructure now enables us to transmit all voice, data and video via SPICE2."

The project, which saw the deployment of 1,500 Cisco 7960G IP Phones in 50 buildings across the SP campus, was considered the largest IP telephony project in Singapore at that time. It was successfully completed in September 2002 with the support of a Cisco IP Telephony expert.

He added, "By combining and integrating voice, data and fax traffic over a single IP network, we save on the costs of maintaining two different networks. We put the same money into

building a robust, scalable and integrated IP network that would give us the return on investment and still deliver the voice quality we need."

The Cisco IP Phone 7960G is a fully featured IP phone with six programmable line and feature buttons, and a high quality speakerphone. It offers four dynamic soft keys that guide a user through call features and functions, with a built-in headset port and integrated Ethernet Switch. It also includes audio controls for full duplex speakerphone, handset and headset. The Cisco IP Phone 7960G also features a large, pixel-based LCD display. The display provides features such as date and time, calling party name, calling party number, and digits dialed.

SP'S PAST GOOD EXPERIENCES WITH CISCO SOLUTIONS CONVINCED THEM TO INVEST IN THE CISCO IP TELEPHONY SOLUTION.

In addition to the Cisco 7960G IP Phones, SP has an end-to-end Cisco network, with Cisco Catalyst 6500 Series Switches at the core and distribution layers, Cisco Catalyst 4500 Series Switches at the access layer, Cisco Aironet 1200 Access Points, Cisco Access Control Server (ACS) for remote users, Cisco Firewall Service Modules (FWSM), Cisco Call Manager Servers, Cisco Unity Voice Mail Servers and a Cisco IP/IVR (IP-based Interactive Voice Response) System.



THE RESULTS

SP SAVES COSTS AND SIMPLIFIES ADMINISTRATION WITH CISCO IP TELEPHONY SOLUTION. SP STAFF BENEFIT FROM NEW VALUE-ADDED SERVICES ACCESSIBLE FROM THEIR CISCO IP PHONES.

The results of the introduction of a converged network were immediate and obvious. Mr Chang described the main benefits. "The Cisco converged and integrated IP network solution offers us quality of service and a lower total cost of ownership. We estimate that our operating costs have been significantly reduced by at least 10 to 30 percent.

"Another major advantage is the ease of support and management.

Administration of various communications systems can now be centralised and simplified, and staff productivity has improved. We no longer have to maintain two separate teams to maintain a PABX system and the data network. Now, our network management team can support the converged network. Since it's all based on IP, we also save on training costs," he explained.

SP REDUCES OPERATING COSTS BY UP TO 30 PERCENT AND IMPROVES COMMUNICATION TO ITS STAFF AS A RESULT OF CISCO CONVERGED NETWORK SOLUTION.

"Dealing with move, add-ons and changes is much easier now too. When staff move from one department to another, they simply take their physical

IP phone and phone number with them. Wherever they plug in, the system will recognise them and the entire account will be activated immediately. We no longer have to assign new phone numbers. "

From a user perspective, the converged network and Cisco IP phones have opened up a whole new world of services. Mr Chang said, "Our staff, teaching faculty and students can now access useful information from anywhere using a variety of IP-enabled devices. In addition, the new network has made possible new value-added services we could not have introduced on a digital PABX system.

"For example, we can text broadcast urgent messages to all 1,500 Cisco IP Phones simultaneously. They can also be used for SMS or booking taxis or even getting weather information.

Basically, a lot of the Internet information that our staff used to access only via their PCs can now be accessed with their IP phones."

SP will continue to introduce new value-added services on top of the IP infrastructure. Among the advanced IP Telephony applications in the works is an IP-based Public Announcement (PA), which is being developed by the SP School of Engineering.



THE PARTNERSHIP

SP AND CISCO BUILD AN ONGOING ALLIANCE BASED ON MUTUAL TRUST AND SHARED BEST PRACTICES.

SP and Cisco have been working together since 2000 when the Polytechnic first introduced their Gigabit Ethernet network.

Said Mr Chang, "We are happy with the Cisco products we have used so far. The technology they come with is pretty advanced so we always have access to the latest and the best. We have also found Cisco to be a very progressive company. They do their absolute best to deliver solutions that meet our business needs."

To support SP's mission of becoming a world-class institution with a strong e-learning focus, Cisco organised an E-business Workshop for the SP team in September 2003. At this meeting, consultants from the Cisco Internet Business Solutions Group (IBSG) shared the e-business best practices gathered from multiple global customer engagements with SP to help them extend their business through the Internet to its current and potential stakeholders.

SP BENEFITS FROM ACCESS TO THE LATEST AND MOST ADVANCED TECHNOLOGY AS A RESULT OF PARTNERSHIP WITH CISCO.



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