AP Newsletter No. 21, April 2002

http://www.comsoc.org/~apb/

Editorial Message

Welcome to the 21st edition of the Comsoc AP Newsletter. I hope you will enjoy reading this latest update of IEEE Comsoc events in the Asia Pacific Region. As you may have noticed, this is the first issue by a new APB service team directed by Dr. Kwang Cheng Chen, Comsoc, 2002-2003. We would like to continue bringing you the latest updates on the development, activities and events in the AP region. From this issue, we will include a series of articles on 3G/wireless development in the Asia Pacific. Our first reports are from Korea, Hong Kong, and Taiwan. More are coming in the following issues. I would like to take this opportunity to thank the authors for contributing to the newsletter. To make our newsletter a truly AP newsletter, we invite you to contribute articles and news on your respective regions. We would also appreciate any comments you may have to improve the newsletter. Thanks in advance and enjoy reading!

Wanjiun Liao, Editor

1. APB Director's Message by Prof. Kwang-Cheng Chen

Dear Colleagues in the Asia Pacific Region:

It is another class (2002-2003) of Asia Pacific Board (APB) service team. It is also my greatest honor and pleasure to take such a challenging and exciting task to lead new IEEE ComSoc Asia Pacific Board service team.

Following a tremendous effort from earlier APB in the past two decades, today's activities in this region is getting into a new era. Thanks for all members in this region; APB activities are more and more exciting from all aspects. The membership keeps growing no matter economy direction goes. It is also very common to see technical session organizer/chair in leading ComSoc conferences from AP region, and to see editors and even editor-in-chiefs in ComSoc journals from AP region, in addition to a good portion of published papers in ComSoc conferences and journals.

In the next two years, I would expect APB continuing past excellent services to members (such as grants and awards, lecture tours, technical/service activities, etc.), with a concentration on

- ❑ Membership development and growth in AP region
- ❑ Active participation in ComSoc activities from AP region
- ❑ Chapter activities to serve local members

We would expect a more dynamic and pleasant atmosphere in these two years' APB, with appreciation of great achievements from AP pioneers. Most importantly, we would need our members' participation and devotion to make APB nicer and nicer.

Cheers and see you in APB meetings at every ICC/Globecom!

K.C. Chen

2. Previous COMSOC APB Director's Message by Dr. Naohisa Ohta

Dear colleagues,

From 2000-2001, I served as the Director for Asia Pacific, Communications Society, IEEE. During my term, I was so convinced by the value of IEEE member's volunteer activities. I would like to introduce and share COMSOC's Asia Pacific activities with you.

Indeed, AP regional activities in COMSOC have been quite successful. As you know, COMSOC itself is one of the most successful Societies in IEEE. In the last five years, COMSOC has increased its membership from 37 thousands to 61 thousands. About 1/3 of the total members are active in the Asia Pacific areas. Not only the number of membership but also technical contributions has been remarkable as well. At ICC 2001, for example, 1/3 of accepted papers came from AP region. Asia Pacific Board, APB, is part of COMSOC and consists of a Director (assigned by the President) and volunteer members. APB fosters provision of COMSOC's technical and information services to AP members and promote AP members participate in the COMSOC international activities. APB also reflects the interest of AP members in establishing policies and procedures of COMSOC. The APB actually has five committees working under the board and we have an office in Singapore to support our activities. Please visit APB Home Page at http://www.comsoc.org/~apb/.

COMSOC APB's major activities in 2000-2001 include; organizing Business Application Sessions in ICC 2000 and ICC 2001, coordinating 11 Distinguished Lecturer Tours (DLTs) in AP region, AP regional Chapter Chairs Congress (2000), Contribution to Global Chapter Chairs Congress (2001), APB Joint Award for Conference Best Papers in collaboration with APCC (2000 and 2001), and newly established APB's " Best Young Researcher Award " (2001), in addition to Student Travel Grants (STG) and other APB committees activities for regional COMSOC members. As for students travel grants, we have given the grants to as many as 47 and 56 students in 2000 and 2001 respectively. Last year, recipients are from 11 different countries/regions.

I would like to thank all AP COMSOC members and APB officers for their continuous support and voluntary work for successful COMSOC APB. I would also like to point out that AP office's support is indispensable to accomplish APB objectives. (Many thanks to Fanny and Jenny for their strong support…)

I believe that the new appointed Director for Asia Pacific (2002-2003), Dr. K-C Chen will follow the current APB activities and improve them for better services. Thank you in advance for your continuous support to APB directed by the new Director in 2002.

Sincerely,

Naohisa Ohta
Past Director for Asia Pacific, COMSOC (2000-2001)

3. APB Office Report -- TAB Colloquia Visit 24-30 March 2002 by Fanny Su

The TAB Colloquia to the Asia Pacific brought the IEEE delegates to Kuala Lumpur(Malaysia), Singapore and Taipei(Taiwan). Dr. Roberto Boisson deMarca (Past ComSoc President) led the TAB delegates that included our IEEE President, Dr. Ray Findlay, Dr. Mike Lightner (VP Technical Activities), Ms. Mary Ward-Callen(Managing Director TAB), Dr. Danny Sutanto(Power Engineering Representative), Dr. Low Teck Seng(Region 10 Director), and Dr. Chua Kee Chaing (Technical Speaker).

The technical presentations given at university and industry venues by the TAB delegates were well-attended and received in Malaysia and Singapore. Dr. C.K Mao(CEO of ChungHwa Telecom) joined the TAB Colloquia as an invited Speaker at the National Chiao Tung University. He gave a lecture on "The role of a professor in a high-technology industry."

Our local Section coordinators did an excellent job at arranging Industry and Institution visits which enabled the TAB delegates to meet many IEEE members and students. We would like to thank Dr. Norman Mariun(Malaysia), Dr. Rahim Leyman(Singapore) and Ms. Joanne Lai(Taiwan) in helping us organise and coordinate the TAB Colloquia to the Asia Pacific. Many thanks to our local volunteers and student members who made the TAB Colloquia a success.

We hope to continue to attract many more IEEE Executive visits to our region in anticipation of the 50th anniversary of the Communications Society which will be celebrated in conjunction with GLOBECOM 2002 (18-22 Nov) in Taiwan.

4. 3G Technology Boosts up Mobile Internet Services in Korea by Dr. Dongmyun Lee

Since the first successful commercialization of CDMA-based mobile services in 1996, Korea has seen faster-than-expected increase in mobile phone subscribers. As of the end of March 2000, the number of mobile phone subscribers in Korea is estimated to go over 30 million, defying the widespread belief that the market is saturated.

Initially started as voice-oriented devices, the mobile handsets are now becoming a mobile information device that can handle both voice and data. Over 80 percent of mobile handsets on the Korean market are now capable of delivering mobile Internet services, setting the stage for the much-anticipated growth of mobile Internet services including m-commerce in the coming months. The rate, one of the highest in the world, poses both challenges and opportunities for carriers.

Korea's wireless carriers could not be in a better position to ride a wave of the fast spread of high-powered mobile handsets that can deliver next generation services. To increase the information delivery capability through mobile network, Korea has made a very aggressive approach to introducing 3G services, which is expected to enable mobile phones to be used more like computers, with access to the Internet, video and email.

Three already established mobile phone companies – KTF, SK Telecom and LG Telecom – have upgraded their existing networks, based on Qualcomm's CDMA2000 1x technology, to allow data transmission speeds of up to 144kbps since October 2000. With this active introduction of faster mobile technology, Korea is expected to experience a more explosive growth in wireless Internet this year. At the end of last year, a total of 4.19 million people were estimated to have mobile phones equipped to access the 1x network. Major carriers are also rushing to upgrade their systems to offer CDMA2000 1x EV-DO (evolution data only) that can deliver data at up to 2.4Mbps. EV-DO, optimized to offer videophones and wireless multimedia services, is set to debut just ahead of the 2002 Korea Japan World Cup finals.

For 2GHz 3G services, the government awarded two 3G licenses in December 2000 to two consortia led by then Korea Telecom, now KT, and SK Telecom. The two plan to offer services using wideband-CDMA technology by the end of 2003. KT ICOM, a KT subsidiary in charge of 2GHz 3G services, plans to offer a testing-level service late this year. A full-fledged version is scheduled to start in the first quarter of 2003. SK IMT, a unit of SKT plans to introduce a testing-level and commercial version service in the second and third quarters of 2003, respectively. One runner-up LG Telecom has later won the license in last August. The LG Telecom-led consortium will use competing CDMA2000 technology, developed by Qualcomm.

Based on these current and future high-capacity, fast wireless Internet infrastructure in Korea, many mobile carriers and content providers are expecting to see fast-rising growth of wireless Internet services this year. It is predicted that the revenue from wireless Internet would likely double from last year. To further accelerate the wireless Internet usage, both mobile carriers and content providers are trying to provide an open network/service platform over which applications can run in a consistent way. Major applications include m-commerce solutions, mobile certification, billing and mobile coupons.

One of the major obstacles to wide-spread usage of wireless Internet services has been the relatively high cost for using the services. In April last year, mobile carriers adopted packet-based data rate that is lower than 2G circuit-switched rate. This rate can be acceptable for users using small-sized transaction-type services such as short messaging service. However, since the rate can still put too much financial pressure on users when it comes to downloading large-size information or viewing video clip over the wireless network, further efforts enabling lower rates and various subscription options are called for to have utility-level wireless Internet services in Korea.

5. Hong Kong 3G Licensing Framework by the Office of the Telecomm. Authority, Hong Kong

To prepare for the next generation of mobile services, the Hong Kong Government has adopted an innovative and unprecedented licensing method for 3G mobile services. Under the licensing framework in Hong Kong, the 3G

licenses were allocated by means of a process consisting of a light pre-qualification exercise followed by an auction of spectrum in September 2001. The adoption of a "hybrid" licensing framework is based on the rationale that pre-qualification exercise can ensure the quality of the bidders and network rollout, while spectrum auction can allocate spectrum in a fair and efficient manner.

Four applications were received in total and all of them were pre-qualified. As there were four applications for four licenses, the 3G auction concluded without the need for bids. The license winners are Hong Kong CSL Limited, Hutchsion 3G HK Limited, SmarTone 3G Limited, and SUNDAY 3G (Hong Kong) Limited. Each successful licensee has been assigned 2x14.8 MHz paired spectrum plus 5 MHz unpaired spectrum.

a. Spectrum Auctioning Approach

The auction in Hong Kong was designed to base on the bidding of royalty percentage. Royalty-based auction can encourage entry to the market and enhance market competition. The adoption of annual payment over the license period, instead of an upfront payment, can alleviate the financial burden on the licensees.

The spectrum utilization fee paid each year will be based on the royalty percentage subject to a minimum payment over the license period of 15 years. The minimum annual fees will be constant during the first five years, and will increase annually from the sixth year. The royalty percentage and the corresponding minimum annual fees are designed to deter irrational bidding. This chart compares the minimum annual fees when the royalty percentage equals to 5%, 10%, 15% and 20%.

Each licensee will need to maintain in force a rolling performance bond covering the next five years' minimum annual fees. Performance bond may be called in the event of early surrender of license, failure to pay royalty due to insolvency, cessation of service or revocation of license. The rationale of performance bond is to mitigate the government's credit risk. Compared to a guarantee of all minimum payments, a rolling performance bond covering the next five years' payments can alleviate the financial burden on licensees.

b. Open Network Access

3G licensees in Hong Kong are mandated to comply with the policy of open network access, which aims to introduce greater competition at the content, application and service level whilst preserving sufficient investment incentives for licensees to roll out the networks. The policy also enables parties who do not have the resources to bid for a license or who have failed to obtain a license to participate in the 3G market.

Under the framework of open network access, the 3G licensees must open up to 30% of their network capacity for the use by non-affiliated service providers, including mobile virtual network operator (MVNO), content or service providers (CSP). To ensure a fair environment for competition, the 3G licensees must provide access to non-affiliated service providers on a non-discriminatory basis. That means, service providers should have access to transmission and supporting capabilities same as the host mobile network operator when it serves its own customers. In addition, traffic associated with non-affiliated service providers has to be treated on a non-discriminatory basis compared to that of the licensee, or its affiliated service providers that use the network.

Licensees and service providers are encouraged to reach agreement on the terms of access through commercial arrangements. However, in the event that agreement to provide access is not reached, the regulator may intervene if necessary.

c. Technology-Neutral Approach

Under the technology-neutral regime adopted by the Hong Kong government, the existing 2G operators are free to use any technology in the spectrum assigned under their 2G licenses. In line with this regime, the existing 2G spectrum are allowed to be refarmed for 3G services, if the operators wish to, under the current terms and conditions of the 2G licenses for the remaining period of validity.

Indeed, the technology-neutral approach allows the licensees to use the spectrum licensed for any services other than 2G or 3G, e.g. 4G services or any other advanced mobile services, provided that the standard adopted is open and non-proprietary, and that there is sufficient choice of customer equipment available in the market.

With our 3G licensing method and regulatory regime that aim at promoting competition and encouraging the proliferation of innovative services, we have full confidence that Hong Kong will become one of the prominent

regions for 3G development.

6. The Auction of 3G Licenses in Taiwan by Prof. Zsehong Tsai

Along with Taiwan's initiative of constructing the country into a domestic wireless broadband island, Taiwan's regulator - Directorate General of Telecommunications (DGT), initiated its 3G licensing procedure in 2000 by setting up a committee for planning the third-generation (3G) mobile communications service and reported the committee's conclusions and suggestions regarding 3G licensing issues to the Ministry of Transportation and Communications (MOTC). The DGT also commissioned an international consulting firm, the Nomura Research Institute, to carry out planning for a competitive bidding mechanism for Taiwan's 3G frequency licensing and to analyze the reference model of Taiwan's domestic 3G market scale as well as the advantages of the auctioning system and the screening system, so as to enable Taiwan government to establish an scientific basis for the market value of 3G licenses. Based on this study and opinion polls, MOTC and DGT formally accepted the suggested new auction based licensing methods, instead of the existing beauty contest approaches used for other telecommunication licenses.

In accordance with the results of that study, Taiwan government finally issued policy directions for the opening up of the 3G mobile communications service on June 13, 2001, with the projected issuance of five nation-wide 3G licenses—four in the 2,000 MHz frequency range, which fit the ITU IMT-2000 spectrum allocation and is also the band for WCDMA, and one in the 800 MHz frequency range, for possible implementation of CDMA2000. The government also set a floor price for each 3G license and the floor price of these licenses ranges from NT$4.2 billion to NT$ 7.6 billion, depending on the total size of allocated bandwidth and the location of the spectrum. Most observers quickly noticed that such floor prices are much lower than the market value of these licenses estimated by Nomura Research Institute in their study, which ranges from 13.8 billion NT$ to 23.7 billion NT$ per license in a 5-License scenario. Many speculated that world wide economy recession in 2001 was the major reason for this decision.

The method adopted for the issuance of the licenses was a 2-stage process: qualification screening plus second-stage auctioning, with the bidding price of the winner including only the license fee but not the frequency fee. The winners are allowed to choose one-time payment or an initial payment of 30% of the bidding price, with the remainder of the price to be paid in installments. The licenses are valid for 15 years. All 3G carriers are required to install communications systems that meet the IMT-2000 standards of the International Telecommunications Union, and can offer broadband mobile Internet access and various applications, such as mobile e-commerce, Internet games, etc.

In total, six bidders responded and submitted their 3G license applications: 3GO Telecommunications, Asia Pacific Broadband Wireless, Taiwan PCS Network, Chunghwa Telecommuncations, Yuan-Ze Telecomm., and Taiwan Cellular. Among them, the first 3 are new players in the GSM market and the last 3 are incumbent GSM mobile operators themselves, or completely owned by an incumbent mobile operator. Notice that among Taiwan's 6 existing GSM operators, most either have launched or are ready for launching their GPRS services.

The formal auction procedure started on Jan. 16, 2002 and lasted for 180 rounds. All bids are submitted electronically via an isolated computer network in one of DGT's buildings and a set of specially designed software is used for safety protection and security. The auction procedure is closed on Feb. 6, 2002, when one bidder (3GO) decided to quit. The total amount of bids is close to 48.9 billion NT$, which is 45.5% higher than the sum of the floor prices. Not surprisingly, the only license (License E) for CDMA2000 was won by a bidder without the GSM heritage, the Asia Pacific Broadband Wireless Communications. Licenses A, C, D, each allocated 15MHz x 2 FDD spectrum for WCDMA and 5MHz for TDD use, were won by 3 operators with GSM/GPRS heritage. The licenses with only 10MHz x2 FDD spectrum was won by Taiwan PCS Network, which was a pager service provider.

So far no company has formally announced their exact target date to launch 3G services, because of uncertainty in the network deployment schedule, the maturity of mobile Internet market in Taiwan, and the availability of 3G handsets that can fit the need of local subscribers. Most analysts and reporters are expecting CDMA2000 to be adopted for commercial mobile service in Taiwan as early as 1H of 2003, while WCDMA-based 3G services may be made available at or after 2H of 2003.

Last but not least, no operators in Taiwan have expressed their urgency to use the TDD spectrum obtained during this auction, since they expect the development of products according to related standards, TDS-CDMA, or TDD-mode WCDMA, may still last for a few more years. To provide high-speed wireless Internet access at hop-spots

or public areas with potential high traffic density in the metropolitan, IEEE 802.11b/a Wireless LAN is being evaluated as an important alternative technology by these 3G mobile operators.

7. Greetings from Globecom 2002 at Taipei by Prof. Lin-shan Lee, TPC Chair, Globecom 2002

On behalf of the Organizing Committee of Globecom 2002 and the members of IEEE Communications Society in Taiwan, it is my great pleasure to welcome you all to visit the city of Taipei and to attend Globecom 2002, the annual flagship conference of IEEE Communications Society in year 2002, taking place Nov17-21, Sunday through Thursday, at the Taipei International Convention Center. This is the fourth time this conference is held in Asia Pacific Region, following Globecom 1987 at Tokyo, Globecom 1995 at Singapore, Globecom 1998 at Sydney. This is also the first time more than a thousand of researchers, industrial leaders, experts and engineers from all over the world working in the area of communications will get together here on the island of Taiwan. We would like to invite all of you to experience this modern oriental metropolis with hospitality in the Chinese style. We are sure you will find this conference to be an excellent forum for innovation and technical discussions, and a very natural environment for extending friendship and fellowship. Please join us for this very special event.

The dream of a global village is moving quickly towards reality. Various new technologies, new system solutions and new business opportunities have created a completely new horizon of communications, with which the world is actually converging. IEEE Communications Society and Globecom conferences have been at the very center of this trend for many years. When you'll attend Globecom at Taipei in November, you'll realize that in those few days the world of communications actually converges at Globecom 2002 at Taipei. This year we received a total of 1982 submissions (this number is record high) from 52 countries. The technical sessions will be carefully organized into 11 symposia on high interest areas, plus a General Symposium and special sessions and tutorials. In addition, IEEE Communications Society is going to celebrate its 50-year anniversary this year with two major events, ICC 2002 at New York and Globecom 2002 at Taipei on the two sides of the globe, to symbolize the globalization of the society. We've organized special programs and Grand Reunion banquet for this very unusual occasion. All these will certainly make Globecom 2002 not only a perfect opportunity for the exchange of knowledge and experiences, but a fountain of creativity and productivity.

Although Taiwan is an island off the eastern shore of China, it has been a very good heir to classical Chinese culture. Traditional Chinese flavor flourishes everywhere. Taipei is also the world capital for Chinese cuisine. Please join us at the General Chair's reception to be held on Nov 17, and at the Grand Reunion banquet featuring "real" Chinese cuisine on Nov 19. Several very interesting tours and spouse programs have also been arranged, including a visit to the world unique National Palace Museum with fabulous Chinese art treasures. We look forward to meeting you all here in Taipei in Nov 2002.

Lin-shan Lee,
TPC Chair, Globecom 2002

8. Activity about IEEE ISPACS 2002 by Prof. Shiunn-Jang Chern

The 10th International Symposium on Intelligent Signal Processing and Communication Systems (ISPACS) will be held in *Kaohsiung City*, Taiwan, from the 21st to the 24th of November 2002, immediately right after the GLOBECOM 2002 finishing on 21 November 2002 in Taipei, Taiwan. The symposium will include one-day tutorial sessions, three-day plenary sessions, technical sessions, and poster sessions. Papers describing original work in all aspects of emerging intelligent signal processing and communication systems are invited.

Kaohsiung City is located in the southern part of the country with the balmy climate year-round and beautiful scenery of coastal bay. The conference venue, *Ambassador Hotel* – Kaohsiung, is located in the heart of Kaohsiung's financial and commercial district with a striking view of *Kaohsiung Harbor* against the nearby romantic *Love River*. In fact, Kaohsiung Harbor is the third largest container port in the world. Moreover, the hotel offers *free shuttle services* between hotel and airport, Exporting/Industrial Zone, downtown shopping district. Also, you may spend approx. 20 minutes to have comfort jogging around the " Love River ", and take advantage of recreation facilities offered by the hotel**:** outdoors swimming pool, fitness center, sauna, beauty salon, etc. [See web site for the detail: http://ISPACS2002.nsysu.edu.tw/ispacs/index.html]