

Global Communications Newsletter

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Liberalization of the Polish Telecommunications Market

By Pawel Oleszak, Poland

Under the liberalization of the telecommunications market, the Polish national operator TP S.A. has to face newcomers entering the market. So far, TP S.A. is the market leader. However, the average telephone density in Poland is 19.32. Also, there is a big difference between rural and urban areas where these averages are 8.38 and 26.06, respectively. Evidence of large investment is the fact that last year TP S.A. connected 933,000 subscribers in urban areas and 244,000 subscribers in rural areas — 15 percent and 19 percent of the total number of subscribers there, respectively.

Local market deregulation — The other operators are already present in the local market. At the end of 1997 there were almost 170,000 subscribers connected to these networks. Moreover, the Polish Ministry of Communications has issued the bidding documents for building local telecommunications networks in the areas where TP S.A. has no competition. The government foresees that in the year 2000 even 3 million people could be connected to non-TP S.A. networks, which will make up one-fourth of the total number of subscribers. It seems that there are four potential private operators that can compete equally with TP S.A.: Netia, Poland Telecom Operators, Telefonía Lokalna (Local Telephony), and Polska Telefonía-Zach (Polish Telephony-West). Table 1 shows current and planned numbers of subscribers these operators expect to connect.

To realize these plans, private operators need about US\$3–4 billion until 2000, which is almost the amount that TP S.A. plans to invest in the same period. The funds for these investments come from financial instruments, mainly international bonds, loans, or shares. Other operators, in addition to the sources mentioned above, use money coming from subsidies of the European Union (EU), the PHARE program (aid program of the EU), or their own resources.

Deregulation of long distance communications — The market for long distance communications has not been deregulated yet. However, the bidding documents for the building of the network will be published this year, so the names of new operators will be known in December 1998. This part of the market is especially interesting for Tel-Energo (Power Energy Sector) and for PKP (Polish Railways), which have their own fiber networks already built that cover almost the whole country. The technology used in these networks is mainly SDH, but there are preliminary attempts to implement ATM technology. So far, they can use their networks almost exclusively for their own needs. After market deregulation, they will be able to offer capacities comparable with those offered by TP S.A. Given better conditions than those offered

	Netia	PTO	TL	TPZ
May 1998	90	50	0	2
2000	800	280	100	150

■ **Table 1.** Number of subscribers of Polish private telecommunications operators (in thousands).

by TP S.A., it will be interesting for the local operators to interconnect with the SDH or ATM networks of these new long distance operators.

International communications market deregulation — The Ministry of Communications plans to deregulate the market of international communications in 2003. However, there is a strong pressure from the EU to make it two years earlier, in 2001. Nevertheless, the final

decisions have not been made yet.

Deregulation in the packet networks area — For example, the Telbank network was activated by the Polish National Bank and several commercial banks to serve the needs of the banking system in Poland. The main services they offer are digital communications channels, multimedia services, national and international data services, VSAT data transfer services, frame relay, e-mail (X.400/X.500), Internet access, and wireless data network (Mobitex). Its clients are mainly banks, but also include insurance companies and large enterprises with activities throughout the country. Today, Telbank is not the only operator that serves the banking sector; it has to compete with a packet network of TP S.A. and with a packet network built by one of the banks (PKO BP).

Managing the New Telecommunications Paradigms:

APNOMS '98

By Masayoshi Ejiri,

General Chair of APNOMS '98, Japan

The second 1998 Asia-Pacific Network Operations and Management Symposium (APNOMS '98) will be held in Sendai, northern Japan, 16–18 September. It follows the successful APNOMS '97 held in Seoul, Korea (see the April 1998 *Global Communications Newsletter*). Rapid progress of technologies and sophisticated customer demands are making the telecommunication environment more globally competitive. Telecommunications companies are forced to face new paradigms, and network operations and management are becoming key issues for service providers and industries in order to realize business success as well as customer satisfaction. Focusing on telecommunications management issues, APNOMS '98 will be cosponsored by IEICE TM, Japan, and KICS KNOM, Korea, and supported by IEEE CNOM, IEEE Asia-Pacific Board (APB), Network Management Forum (NMF), and IEICE Tohoku Section. The three-day symposium features six tutorials, six keynote speeches, technical sessions with 40 presentations, exhibitions, and a panel session.

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NUSANTARA-21: Information Infrastructure in Indonesia

By Ismail and Dadang Gunawan, Indonesia

It is widely believed that the information infrastructure built by converging telecommunication, computer, and broadcasting technology is a major infrastructure to encourage national competitiveness. The information infrastructure continues to develop according to the development of global economic activities regardless of geographic borders. Global economic behavior, such as the growth of multinational corporations which manage remotely, or new investment paradigms require a reliable and modern information infrastructure.

On the other hand, the development of technology and the convergence of computers and telecommunications offers a great contribution to the development of the information infrastructure. Various services can be provided through broadband networks, particularly multimedia applications, to both residential and business areas. Multimedia technology innovations can channel information with huge capacity and at very high speeds.

Indonesia, as a developing country trying to emerge from regional economic crisis, has realized the vital importance of preparing its information infrastructure. This has been proven by the national commitment to establish the specific national information infrastructure which will be able to solve the problem. The name of this national information infrastructure, NUSANTARA-21, represents the effort of Indonesia to meet the challenge of the information era in the 21st century.

The concept of NUSANTARA-21 development is the best effort to create an information society given the existing various dimensions. This is where the challenge exists, due to the various Indonesian societal structures marked by levels of bandwidth consumption from telephony bandwidth in rural areas to broadband bandwidth consumption in the big cities such as Jakarta. Network development is concentrated on optimizing the existing telecommunication network; that is, the government is trying to benefit from all existing transmission networks such as satellite, digital microwave radio, optical fiber, and submarine cable. An important development concept of NUSANTARA-21 is also to concentrate on accessibility, not density, in order to create opportunity and ease of information access for all of society.

Principally, the NUSANTARA-21 network is established in three basic elements, namely, the transmission backbone element in a ring of rings structure, a multimedia cities element, and an access center element to improve accessibility. Choice of the technologies or systems to be utilized in establishing the NUSANTARA-21 network are prioritized in steps. Several aspects, such as Indonesian geographic conditions, anticipation of the amount of information to be channeled, the existing infrastructure, and the readiness of the domestic telecommunications industry, are important considerations in the choice of technology. It seems that ATM technology with optical fiber as the backbone network between regions is the major alternative; however, satellite technology is still necessary as the complement to serve rural areas.

The main challenge for NUSANTARA-21 network development to establish multimedia cities in the early 21st century is, in fact, access network development, which will require the

biggest investment. The choice of technology is also varied and will take time to master. It is evident that the existing access network is still inadequate for offering multimedia applications. Research in this area appropriate to the Indonesian environment should be continuously carried out. Combination of optical fiber (FTTC/FTTH), coaxial cable (HFC), and xDSL-technology-based copper wire is being tested in the field.

The initial step to establish NUSANTARA-21 is to set up committed regulations which will ensure security for investors. To accelerate the infrastructure development, private participation of both foreign and domestic investors is definitely needed. The monopoly paradigm is gradually being left behind, and the competition paradigm is evolving.

To accelerate NUSANTARA-21's development, the Indonesian government has issued Presidential Decree No. 30/1987 to establish nationally based suprastructure teamwork. This team is divided into three major fields: infrastructure, application, and resources. The team has produced guidelines to establish a master plan and more realistic detailed paces. The first service to be improved is the government multimedia network, called RI-NET, which is the information network interdepartment and regional offices managed at the Secretary of State's Office.

Finally, the purpose of the development of NUSANTARA-21 is to empower society. However, its success depends on how much the public needs the information.

Report from the Malaysia Communications Chapter

By Borhanuddin M. Ali,

IEEE Malaysia Communications Society Chapter Chair

The Communications Society Malaysian Chapter was only established recently at its first General Meeting held on 4 April, 1998 in Petaling Jaya, Selangor, West Malaysia. A committee headed by Dr. Borhanuddin Mohd Ali, of Universiti Putra Malaysia, was elected to lead the chapter and leverage the good work that has been done by the protem committee.

The Chapter has actually been active for some years already, and has organized many programs at the international and national levels. The most outstanding activity of the Chapter has been the Malaysia International Conference on Communications (MICC), first held in Kuala Lumpur in 1993, then on the island of Langkawi in 1995, and most recently in Kuala Lumpur again in 1997. The 1997 MICC was held in collaboration with ISPACS '97. MICC has grown each year, and has established a respectable reputation at the regional and international levels. Many high-quality papers have been presented at these conferences, and we hope that it will continue to grow stronger throughout the coming years.

Interspersed with MICC, the Chapter also organizes a national conference called the National Conference on Telecommunications Technology (NCTT). The first conference was held in Kuching, Sarawak, in 1996, and the next one will be held at Universiti Putra Malaysia, a university located within the boundaries of the much touted Multimedia Super Corridor (MSC). This conference will be a platform for local telecommunications professionals and researchers to exchange ideas on current issues of interest in telecommunications and present some of the work that has been conducted at local R&D centers.

Apart from conferences, the Chapter has also been organized in conjunction with these conferences or independently.

In coming years, apart from continuing the above programs, the Chapter plans to promote more tutorials and Distinguished Lecture

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Report from the IEEE ComSoc European Office

By Jacques Kevers, Brussels

Chapters – Italy

The petition for a Joint Communications Society and Vehicular Technology Society Chapter in Italy was accepted. This petition was undersigned by 41 members. The organizer of the chapter is Prof. Francesco Vatalaro of Università di Roma Tor Vergata.

Member Questions

We have recently received various inquiries about how to get photocopies of articles published in IEEE periodicals. Ask*IEEE is IEEE's official document delivery service for photocopies of articles. Documents can be provided via international airmail, fax, courier, or e-mail. Orders can be sent via fax (+1-303-458-1138), telephone (+1-303-759-2226), or the Web (<http://www.ieee.uncoverco.com>). To access the Web site you will need a registered user name and password (assigned by Ask*IEEE, but changable by you at any time). If you do not have the required user name and password, there is a "Customer Service" button to click on to begin the process. Former Ask*IEEE customers who have used this service through KR SourceOne need to contact the present supplier at the "Customer Service" button and reregister for a user name and password. Customers must have their bibliographic information available, which consists of an author, title, and source (where the article was published). IEEE members who have questions about the author, title, and/or source may contact the IEEE Library via telephone (+1-732-562-3974), fax (+1 732 981 1209), or e-mail (library@ieee.org). Full IEEE members can search the complete collection holdings from 1994 to the present and get IEEE bibliographies online at <http://www.biblio.ieee.org>.

Other questions recently received were related to the sub-

mission of articles to IEEE periodicals. Guidelines in this respect can be summarized as follows (for more details, please visit <http://ieee.org/pubs/authors>):

1. Files should be submitted via diskette. Files for some journals may also be e-mailed to the IEEE Staff Editor, but never without the prior knowledge and approval of the Transactions Editor-in-Chief, who will provide the author with specific instructions.

2. The operating system, software, and version number used to create the diskette has to be written on the disk label with a felt pen.

3. Graphics files should not be imported in the text file.

4. Files have to be self-contained, i.e., with no pointers to your system setup.

5. Check that your files are complete. Include: abstract, text, references, footnotes, biographies, and figure captions.

6. Please include your fax number, where proofs of the manuscript can be sent.

For the most accurate and efficient transferral of the manuscripts, especially those containing extensive mathematics, TeX, LaTeX, or Troff programs should be used. Instructions for obtaining an IEEE LaTeX style file can be obtained from help@ep.ieee.org

Manuscripts developed using other software like WordPerfect or Word programs are acceptable. If none of these programs are available, manuscripts can be sent in ascii format as well. Files should not be put in a page layout software (Ventura, Quark, Pagemaker, FrameMaker); nor should postscript files be sent.

Line art, graphs, charts, tables, drawings, photos, and gray scale diagrams will be scanned electronically for final produc-

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The Rapid Growth of the Internet in Korea

Dongmyun Lee and Youngmin Chin, Korea

Since its start as the System Development Network (SDN) in July 1982, the Internet in Korea has shown rapid increase in both its size and usage. In Korea the Internet was used mainly for sharing information among domestic and international research groups until 1994, when commercial service was introduced, providing Internet access to the general public. During the last five years, the number of domestic Internet hosts and users has shown a very sharp increase. Table 1 shows that the numbers of Internet hosts and users by the end of 1997 are almost 20 times those in 1994 [1]. Along with the increase of Internet users, Internet services are advancing from simple interconnection to on-demand news, Web hosting, Intranet, online contents service, Internet fax, and phone. Among these, Internet phone, Intranet, and Internet multicasting services are expected to emerge as market-leading services. The commercial Internet phone service, first introduced in March of this year, is increasing at the rate of 100 percent each month due to its much discounted rates on international calls. Also, international Internet phone services are expected to be available to mobile telecommunications service users through strategic alliances among Internet phone companies and mobile telecommunications service providers.

Domestic Internet traffic between Internet service providers (ISPs) is routed by three major Internet exchange points, and international Internet traffic through dedicated international lines owned by most of the ISPs. Domestic

	1993	1994	1995	1996	1997
Hosts	7650	13,856	36,644	73,191	131,005
Organizations	61	192	579	2664	8045
Users	76,000	146,000	386,000	731,000	1,310,000
ISPs	3	6	11	16	21

Internet domains are administrated by the Korea Network Information Center [2]. As Internet traffic shows sharp increases, Internet infrastructure and exchange capacity are being expanded. The Internet backbone is planned to be based on the ATM network that will be built as part of the Korea Information Infrastructure project. Also, commercial Internet access service based on cable modem is scheduled to be launched in 1998, and xDSL-based access service is expected to be provided by major network operators. It is expected that the Internet shall provide a unified communication layer to almost all social activities in the forthcoming information age. Also, the abundance of Internet services, combined with existing and emerging high-speed telecommunication/access network services, will accelerate the pace toward the true information age in Korea.

Results of the Mexican PCS and WLL Auctions

By Carlos Hirsch, Mexico

This report specifically addresses the outcome of the Mexican Wireless Access Auction. Regulatory background information can be found in the July 1997 *Global Communications Newsletter* report on the Mexican Spectrum Auctions.

Three different types of wireless local access bands for fixed and mobile services were auctioned at the same time. The country was divided into nine regions (consistent with the current cellular concessions), and 59 simultaneous auctions in several frequency bands started on November 17:

Band (Mhz)	Bandwidth	Definition
1850-1865, 1930-1945	30 MHz	PCS A
1870-1885, 1950-1965	30 MHz	PCS B
1865-1870, 1945-1950	10 MHz	PCS D
1885-1890, 1965-1970	10 MHz	PCS E
3400-3425, 3500-3525	50 MHz	Wireless Access A
3425-3450, 3525-3550	50 MHz	Wireless Access B
3450-3475, 3550-3575	50 MHz	Wireless Access C
3475-3500, 3575-3600	50 MHz	Wireless Access D
440-449, 485-494	14 MHz	Wireless Access

Licenses will be granted for 20 years, with the potential for renewal for a similar 20-year period. At the same time, there is no regulatory distinction between mobile and fixed services, and the technology definition is up to the carrier. The auction lasted for 128 rounds, ending on 8 May with total bids in excess of US\$1 billion. On average a national license in PCS for 30 MHz is worth US\$276 million (US\$3.03 per POP), a national license in PCS for 10MHz US\$156 million (US\$1.72 per POP), and a national WLL license US\$51 million (US\$0.56 per POP). The major winning companies were TV-Azteca affiliate SPC, a partnership between a TELEVISIA

affiliate and QUALCOMM, Korean-Telecom-backed MIDICELL, Telmex-Telcel, Bell Atlantic subsidiary IUSACELL, and Bell-Canada-supported TELINOR. All of them are looking for vendor suppliers and selecting the wireless technology to rapidly deploy in their networks. Local competition has not started until now in Mexico, and several key issues are pending, such as interconnection rates, reciprocal payments, and the geographic scope of local calling areas. Another relevant, as yet unsolved, issue is the expansion of the numbering plan to 10 digits, to which the government committed two years ago. Long distance competition began in Mexico in January 1997, and domestic rates have fallen to US\$0.16/min at peak time from US\$0.50 in 1995, but local service charges have increased steadily to compensate Telmex, the incumbent carrier. The Mexican cellular market currently has two carriers per region, with 2 million mobile users in total. Most current customers use AMPS technology, but digital technology has been introduced recently with CDMA and TDMA, and new services such as caller ID and short message service are being sold in the main cities to expand the market before PCS services arrive. In particular, prepaid cellular service has been offered for two years with extraordinary acceptance, covering at this time more than 50 percent of total cellular customers. Calling Party Pays (CPP), the normal worldwide standard which has been recognized as a trigger to expand service accessibility, has not yet been implemented in the Mexican market because of the reluctance of Telmex to sign reasonable billing and collection agreements.

REPORT FROM THE EUROPEAN OFFICE/(Continued from page 3)

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REPORT FROM MALAYSIA CHAPTER/(Continued from page 2)

Tours in collaboration with other regional Chapters. The Chapter also hopes to establish a strong expert group to present opinions on telecommunications and related issues as a source of professional input to the industry and government. The Chapter will foster cooperation with other professional groups such as the Institutions of Engineers Malaysia (IEM), Institute of Electrical Engineers (IEE), and other government and nongovernmental telecommunications fora such as the International Telecommunication Union, Malaysia, and the Malaysia National Information Infrastructure Forum (MNIIF).

APNOMS'98/(Continued from page 1)

APNOMS '98 is a global symposium with participants from around the world, but will strongly reflect Asia-Pacific activities and provide valuable opportunities to researchers, developers, and practitioners to learn and share their ideas, views, technologies, and experiences on network operations and management. You are cordially invited to attend this important upcoming symposium and visit northern Japan in its best season. For more information please visit <http://amazon.postech.ac.kr/knom/apnoms98/>.

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www.comsoc.org/pubs/gcn

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