Global
Communications
Newsletter

July 2001

APCC 2000 (Asia Pacific Conference on Communications)

By Tomo Taniguchi, Japan

The 6th Asia Pacific Conference on Communications (APCC 2000) was held in Seoul, Korea, at the Sheraton Walker Hill Hotel from October 30 to November 2, 2000. APCC 2000 was organized by the Korea Institute of Communications Science (KICS) and co-sponsored by Korea Telecom, Electronics and Telecommunications Research Institute (ETRI), IEEE Communications Society, and the Ministry of Information and Communication.

The conference general chairman was Dr. Yong Kyung Lee, president of Korea Telecom Freetel, and the co-chairman was Prof. Byeong Gi Lee (Seoul National University). The organizing committee was chaired by Dr. Sanghoon Lee (Korea Telecom), and the technical program committee was chaired by Dr. Chu Hwan Yim (ETRI).

A total of 252 outstanding technical papers were accepted out of 328 papers that came from 26 countries throughout the Asia-Pacific, Africa, Europe, and North America regions via electronic submission. Among all accepted papers, four highest-quality papers were chosen for three best paper awards presented by APCC and one jointly presented by APCC and the IEEE Asia Pacific Board. The award ceremony was held during the conference banquet.

There were 53 technical sessions organized to share the knowledge of participants, who are among the most prominent engineers and scientists in their telecommunications areas. Topics were on wireless and mobile communications, satellite communications, multimedia communications, Internet technology, signal processing, optical communication technologies, ATM networks, communication theory, network management, communication protocols, and various other network technologies.

In addition, five tutorials and four mini-workshops were planned to provide broad coverage in high-interest areas. Tutorial sessions included five topics: Digital Channel Modeling and Simulation, Wireless Location Services and Technologies, Multimedia Mobile Access Communication Systems, Web-Based Network and Systems Management, and Internet Multimedia Multicast. Mini-workshops were arranged to discuss the open issues of evolutional future networks, including Management of Internet Infrastructure, Evolution to the Next-Generation Network, Internet QoS and Telephony, and Wireless Internet.

In the opening plenary, three keynote speakers gave talks about the vision and advances on Internet technologies and applications. Dr. Steve Weinstein, IEEE ComSoc past President, gave the first speech, on Internet appliances. The second speaker was Dr. Minho Kang, a professor at Information & Communications University, who described the current status and future direction of optical Internet technologies. The last speaker was Dr. Laurent Mathy, a professor at Lancaster University. He gave a keynote speech on the Internet Vision.

During the conference, the Asia Pacific Regional Chapter Chairs Congress was held. The regional chapter chairs of IEEE ComSoc attending the meeting shared their experiences in each chapter's activities. An interim meeting of the IEEE ComSoc Asia Pacific Board and the 11th APCC Steering Committee meeting were also held during the conference.

Letter from the Popov Society
Tribute to Claude Shannon

Dear colleagues and friends:

Joel Snyder — IEEE President
Jose Roberto B. de Marca — President, IEEE Communications Society
Benjamin W. Wah — President, IEEE Computer Society
Vijay K.Bhargava — President, IEEE Information Theory Society

On behalf of the Russian Popov Society for Radioengineering, Electronics and Communications, IEEE Russia Section and Chapters, and the research community of Russia, let us express our deep sincere condolences on the loss of an outstanding scientist of our time, Prof. Claude Shannon. His name is well known in Russia, where he has been highly recognized for his fundamental contribution to information theory, communications, and computer science.

We are sure that Prof. Claude Shannon's name will be written forever in gold letters in the history of modern science and technology.

Please pass on our condolences to his family, colleagues, and friends.

Sincerely yours,

Prof. Yuri Gulyaev, President, Russian Popov Society; Chair, IEEE Russia Section; Member, Presidium of the Russian Academy of Sciences

Prof. Vladimir Kotelnikov, IEEE Life Fellow; Director Emeritus, Institute of Radioengineering and Electronics, Russian Academy of Sciences

Dr. Henrich Lantsberg, Vice-Chair, IEEE Russia Section; Member, Russian Popov Society Board

Prof.Yuri Zoubarev, Chair, IEEE Commmunications Society Russia Chapter

Prof. Vsevolod Burtsev, Chair, IEEE Computer Society Russia Chapter

Prof. Vyacheslav Prelov, Chair, IEEE Information Theory Society Russia Chapter

Report on IST 2000: The Information Society Technologies Event

By Paulo de Sousa, Belgium

Introduction

The IST event (http://www.cordis.lu/ist) is organized each year by the European Commission Information Society Directorate-General, to promote results of its Information Society Technologies (IST) Programme and present the main guidelines of the European Union regulatory activities in the information and communication technologies (ICT) field. Last year, the IST event was held in Nice, France, 6–8 November, in close cooperation with the Ministry of Research and the Ministry of Economy, Finances and Industry, in the framework of the French Presidency of the European Union.

New Generation Networks Session

Within the next five years a series of breakthroughs in IST technology — broadband, quality of service, mobility, agents, home networking — will deeply transform the very nature, architecture, and applications of the Internet. This revolution will give birth to a new innovation cycle, introducing new utilization patterns, business models, and online services. A whole new window of opportunity will open for Europe. This session looked at ways of capitalizing on these opportunities and deciding what was at stake for Europe. The speakers also examined the impact on the political, industrial, and societal objectives defined by the e-Europe plan.

As progress develops in the area of computing and communications, it is likely they will converge to create a networking fabric that is always on, accessible from anywhere, and supports various classes of intermittently connected devices and systems. This networking scenario presupposes a radically different technological landscape, not least a network infrastructure that will offer more than raw end-to-end communication to users — a so-called next-generation network.

Technological innovation over the past decade — most notably the deployment of mobile services, Internet protocol and high capacity optic fibers, alongside deregulation and competition — has pushed the communication industry toward development and deployment of an enhanced network.

The questions discussed in this session included questions of what further technological innovation would be required to implement the next generation network, and what further functions would be required from this network. It considered what new applications will appear in the near future to benefit from, or further transform, the next-generation network.

Daniel Kaplan, Director, Foundation for the New Internet Generation, France

The chairman said that the panel had debated whether the session title should be “Next Generation Internet” or “New Generation Networks” and decided it made no difference; they were one and the same thing. The Internet was essentially a matrix of networks and connected devices and, behind them, of people.

Andrew K. Bjerring, President and CEO, CANARIE, Canada

The speaker started with a background of Canarie, saying that it was set up in 1993 as a not-for-profit body to be a collaborative organization between the public and private sectors. They had a number of phases of support from Industry Canada, the government department responsible for industry development; a particular one in 1998 was for CAnet 3, a next-generation optical Internet. It was (is?) the closest thing to TCP/IP over glass without intervening layers. This interconnected every Canadian province, was mostly based on dark fiber and Ethernet technologies, and involved wavelength-division multiplexing (WDM). Dark fiber provided a very cost-effective network at an estimated better than one percent of the cost of classic networks. Relocating servers into server farms gave operating efficiencies.

Many communities and school boards were installing dark fiber networks which allowed the private sector to overprovision in order to be able to provide new services to the home. He showed a diagram of such an architecture with public and private fiber in a condominium fiber catering to public and home use. He described the Alberta experiment which installed a broadband consortium to every one of their 450 communities. He believed that dark fiber networks will replace bandwidth metering of Internet services with the implication of moving control to the edge.

The question everyone installing widespread broadband access will face is how to design a network core that scaled. He considered the only viable approach to be segmenting network clouds into smaller clouds and using peering linkages. The interior of the cloud could have considerable management and control capability using multiprotocol label switching (MPLS) and Interior Gateway Protocol (IGP). The new Internet revolution therefore comes from a combination of adequate bandwidth, Ethernet technology moving from the LAN into the wide area network, the use of fiber optics funded by the public purse for citizens and schools, and the development of competitive models at the level of infrastructure for the dark fiber markets and applications. It should an architecture that reflects the fundamental concept of the Internet, which is to move control to the edge and have the carrier network between be transparent; as transparent as glass.

Anthony Michael Rutkowski, Vice President Internet Strategy, VeriSign’s Network Solutions USA

The second speaker started by saying that he wanted to discuss a set of recent developments. The Internet protocol had provided the means to interoperate between everything and everywhere, producing an ever-evolving matrix of global resources. The challenge now was to discover and authenticate resource identifiers that allowed interoperability and nomadicity.

He reflected on how dynamic the Internet scene was. Nomadicity was a term coined to describe being able to plug in a device anywhere and at any time in order to access resources and alert others to your position. Another new term was *peer-to-peer*, a term invented in the last six months, for islands of peering Internet-based resources. An example, Napster, was unknown two years ago, but now accounted for the majority of traffic on some local networks.

ENUM is an emerging matrix solution that was evolved to facilitate the interoperation of IP with the public switched telephone network (PSTN). However, using the same method, it was possible to provide repositories for all the network identifiers and rapidly produce interrelated electronic number identifiers and their information using Internet domain name systems. ENUM was a powerful feature, allowing secure dynamic integration and management of all the networked capabilities. If one wanted to call someone else, it could be set it up so that at certain times of day the cells could be converted to text and sent by network messenger. This was operated on a network executable basis. He believed that PTP and ENUM would encourage an active, innovative developer community and should be supported by IST. The urgency of this area was shown by the fact that ENUM has become the fastest ever Internet Engineering Task Force (IETF) standard.

Gilles Gony, R&D Creative Studio, France Telecom, France

After a short address describing the objectives, activities, and outputs of his studio, the third presenter showed the world premiere of a video. This was produced by them for

(Continued on page 4)

Report on IST 2000 (continued)

Wanadoo, their Internet subsidiary, and gave an amusing view of the Internet of tomorrow.

His studio had 30 people who were generally engaged in producing and testing new services for France Telecom. They were obviously interested in the needs of the marketplace and even tried to anticipate them. Among their interests were new interfaces, smart homes, and the new-generation Internet. They considered divergence and convergence, and often cooperated with other suppliers to provide intelligent products.

Their design work is a combination of the engineer, the technician, and the social scientist. Observing the new products in the marketplace gives further ideas for more new products. The speaker was personally involved in developments for the intelligent home. Communication was an important part of daily home life, but had to be continued outside the home environment. He showed some examples of smart home products.

Bertil Thorngren, Director and Head of the Centre for Information and Communications Research (CID), Stockholm School of Economics, Sweden

The fourth and final speaker claimed that 60 percent of the population of Sweden was on the Internet. There was both push and pull; market demand and a number of interests providing improved infrastructures for communication systems with the big players including the traditional telecommunication companies joined by the energy companies, local authorities, and other private companies, including content providers.

In Sweden five carriers are providing dark fiber, high-bandwidth, and city-to-city services; in addition there were 173 municipal city carriers. There were also landlords, building companies, and owners who see a way to increase the attractiveness of their houses, which in total meant over 1000 suppliers. This created a new combination of actors: private and international telephone operators, together with energy utilities, system integrators, Web companies, and cable operators. About 50 percent of the population had access to cable TV.

The backbone was quite transparent, but competition was fierce, at the user end, to be the first (or only) firm to wire the home. This meant there was a lot of bundling of services with typical charges low: $200 upfront with a flat rate of $20 euro a month (giving high-bandwidth access all over the world) and telephony free. The bundling included mobile services, basic telephony, and so on. For the user this meant the system offered “always on,” which in his opinion was as important as bandwidth itself, with no setup time. The user also got the benefit of higher speeds.

This raised questions of security between all the different players. It was necessary to sort out the policy and research questions and the degree of interoperability. The Government had announced that it was willing to finance a part in the northern, sparsely populated areas only, but there remained the risk of a new kind of monopoly. Private companies would only build the infrastructure in the hope of gaining commercial advantage.

Customers, naturally, were used to paying for telephony prorated to the amount of use. The initial user reaction to flat rates was good, but it could create confusion and required a new assessment of value. Other questions were what was going to happen to the traditional telephony services and what would be the interaction between the fixed and wireless networks which could offer megabits-per-second communication. The innovations created policy problems.

Issues Raised

Mr. Gony was asked how he managed to anticipate customer behavior; he replied mainly through the users of their trial home of the future. The movement was toward smart home, cell phone, and smart clothes. He tried to create imaginary projects, and they were becoming a Net company offering universal mobility.

Martin Wise from the University of Pittsburgh asked the first speaker about maintaining quality of service when a network crossed domains. Mr. Bjerring replied that the essence of the model was wavelength routing, so the arrangement was for the edge to get the core to provide the direct wavelength connection.

To the same speaker, Peter Kirstein of University College London wondered if the costs were dependent on the network topology of long lines in Canada. Mr. Bjerring said that the cost quoted for point-to-point at 100 Mb/s of $1000 was a U.S. price and for a two-dimensional matrix .

Richard Youngmen of the Theseus Institute wanted AMR to comment on how it was possible to make money out of P2P networking. The answer given was that a lot of the business applications field were interested in the intranet, especially those that had numerous employees sharing resources. At the larger level it was what users were prepared to pay for; he gave the example that buying games could give the facility to make contact with others who had bought the game.

The chairman suggested that there was some talk about all next-generation Internet networks being connected to one central point (STAR TAP), and Europeans did not like the sound of this. AB made three points in reply:

- They had three peering points to New York and Seattle as well as STAR TAP.
- One corollary of this model was to find multiple peering points, a mesh topology, so several would appear in Europe.
- Even with research networks there is still the question of how to cross Atlantic and Pacific, possibly by wavelength sharing, which might be possible with GEANT and CAnet4.

AMR added that STAR TAP was only a transitory phenomenon among research networks that were funded and would not happen in the real commercial world.

Sahah Al Chalabi of Chartel wanted to know what the speakers considered to be the major drivers for next-generation networks.

BT felt that “always on” was crucial. Then there was the business demand for higher bandwidth rates.

AB said the reason to go into the new market was that it was cheaper. It was inexpensive to provide high-bandwidth connections, which made it possible for new applications, particularly in e-research or e-education, e-commerce or e-health, which were all pushing. It is not just the multimedia requirement but also response time. There is also a need for universality in order to cater to small communities.

AMR said that there was a lot going on in parallel, and it was already driven by demands and industry opportunities. Internet traffic is growing up to 50 times a year, and new technology and low prices always open up their own demands.

Neil Warman of DTI, United Kingdom, suggested that the Napster concept of asymmetry will not work. AMR agreed.

Conclusions

The chairman concluded by saying that one interesting perspective is that when one hears about mobile Internet or broadband Internet, it is often as part of a bundled integrated solution where the customer owns the pathway to content. It would be a simple way to manage, since it is interconnection that makes it complicated, but it has serious drawbacks. The discussion showed there was a perspective to get back to the original spirit of a decentralized, uncontrolled, unintelligent at its core Internet living in the broadband anytime-anywhere context. Europe is not as advanced industrially in terms of the power of the players; an open interconnected Internet is all for Europe’s benefit since it opens up exciting research and investment opportunities.

Report on Dallas Chapter Activities

By Diana Zhou, U.S.A

The Dallas Chapter of the IEEE Communications and Vehicular Technology Society (CVT) has been an active participant in the local telecommunications community since 1981, and is a key source of educational and professional development for its members and other professionals.

The Dallas Chapter was selected Chapter of the Year in 1997 and 2000, for achieving excellence in its Chapter operations and furthering the objectives of the Society.

Each year, we host nine monthly technical meetings during lunch hour featuring distinguished speakers. Lunchtime meetings are a convenient way to inform members and guests about leading communications issues and topics. It also provides a good networking opportunity and a good forum for local communication companies to gain recognition for their technical activities. The monthly technical meeting has been a highly successful program, which attracts 120 attendees on average. As part of services to IEEE members and students, the chapter subsidizes 50 percent of the lunch cost to members and offers free lunch to student attendees.

Each April, the Dallas Chapter hosts a full-day annual symposium with the theme Communications Technology Update, which was designed to educate members and the general public on emerging communications technologies. The registration fee is only $40 for IEEE members, which includes breakfast, lunch, and conference proceedings. Much positive feedback has been received from attendees. Besides its own annual symposium, the Dallas Chapter was also an important contributor to the highly successful two-day Emerging Technology Symposium in 2000 sponsored by the IEEE Dallas Section. The Dallas Chapter was responsible for the technical program, public relations, and Website development, drawn around several world-renowned speakers and 350 attendees.

The Dallas Chapter is also championing professional development activities. In response to a series of company mergers and layoffs in the local communications industry in 1999, the Dallas Chapter organized a half-day Job Search Workshop. Experts on technical recruiting and executive search were invited to give presentations on networking strategies, interview techniques, and resume preparation. The Dallas Chapter also supported the IEEE-USA Professional Development Conference held in Dallas in September 1999.

The Dallas Chapter maintains effective working relationships with many telecommunications companies for corporate sponsorship, which the chapter relies on for operating expenses. Each year, the Dallas Chapter has approximately 10 sponsors ranging from local and international powerhouses to startups who pledge different levels of financial commitment. The Dallas Chapter promotes the engineering profession and communications issues, and advertises a sponsor's new technology or hiring announcement to the chapter membership.

Additionally, the Dallas Chapter strives to encourage student participation. Apart from giving talks to IEEE Student Branch meetings at local universities, we held a Student Technical Paper Contest in 1999 with a theme of Wireless in the New Millennium: Future Applications and Developments. The chapter joined with EE Departments and Student Branches of local universities to broadcast the event and encourage student participation. Overwhelming response from the students and the universities was received from seven local universities. The first ($1,000) and second ($500) prize winners were invited to deliver presentations at a chapter-organized meeting.

Our Website (http://www.cvt-dallas.org) has been an effective method of public relations. The Website promptly posts meeting notices, which are also available by electronic subscription. Our effort to promote wide distribution of technical and educational programs for public awareness has generated more than 2500 subscribers. As part of efforts to improve communications with chapter membership, the Dallas Chapter Website posts a monthly Letter from the Chairman, which is a newsletter keeping members informed of public affairs, communications issues, and chapter activities.

The chapter continuously makes progress in membership development. In 1999 the chapter gained 410 new members, a 23 percent increase in chapter membership. We organized a ComSoc Membership Appreciation & Celebration event, welcoming new members, greeting old members, and encouraging visitors to become members. The Dallas Chapter member advancement includes an IEEE Fellow and 19 IEEE Senior Members. The Chapter nominated several officers for Outstanding Service Award at sectional and regional levels. The Dallas Chapter also endorses and campaigns for members running for IEEE offices during our monthly meeting.

Since 1981 the Dallas Chapter has consistently provided high-quality activities, attracted Dallas Metroplex area members to our organization, promoted engineering excellence, and strived to increase student involvement.

The momentum built from a strong precedence of leadership is evident in all aspects of our activities. We intend to continue this tradition by maintaining successful programs as well as identifying concise, achievable new goals to reach for each fiscal year.

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