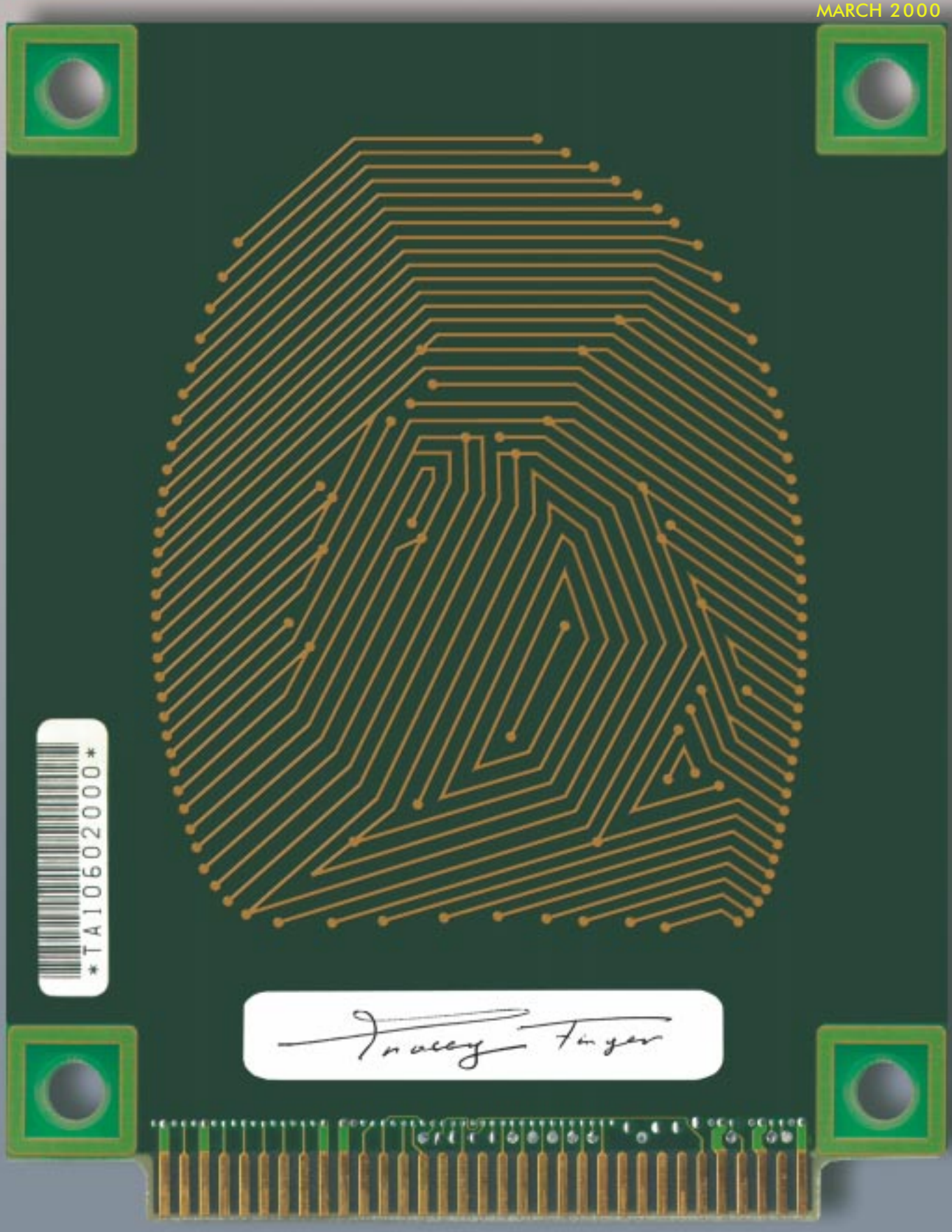
ITU NEWS

MARCH 2000



INTERNATIONAL TELECOMMUNICATION UNION - Issue No.2/2000 - ISSN 1020-4148 - http://www.itu.int/itunews/

Cover: Design: Nicolas Stäuble (ITU)

ITU News: ISSN 1020–4148
http://www.itu.int/itunews/
10 issues per year

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ITU NEWS

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No. 2 **MARCH 2000**

See you @ ITU TELECOM AMERICAS 2000… The wise choice for the new millennium

Four years have already come and gone. It is time once again for the largest telecommunications gathering in the Americas region. ITU AMERICAS TELECOM 2000, due to be staged in Rio de Janeiro from 10 to 15 April, will be hosted by the Government of Brazil. This will be the fourth telecommunications Exhibition and Forum to be organized in the Americas by the International Telecommunication Union as part of its programme of regional TELECOM events.

The ITU introduced these regional events in 1985 to bring the benefits of telecommunications closer to the peoples of all continents. Two of the earlier events, AMERICAS TELECOM 96 and AMERICAS TELECOM 88, were also held in Rio de Janeiro; while AMERICAS TELECOM 92 was held in Acapulco (Mexico).

What is the picture of telecommunications in the region today? Nearly 30 per cent of the world's main telephone lines are in the Americas region, with the vast majority in the United States and Canada. This leaves the remaining 490 million people in the Americas region with only 51 million telephone lines. Growth across the region, notably in the wireless and cellular markets, continues to be spectacular and the potential for all telecommunication services remains vast.

Since AMERICAS TELECOM 96, there have been staggering regulatory and commercial changes which have brought with them a variety of new opportunities in the Latin American telecommunications arena. The most staggering of all changes occurred in Brazil in mid-1998, with the privatization of the country's then State-run *Telebrás System*, which raised some USD 20 billion, making this privatization process one of the largest ever in Latin America.

Cellular growth has been explosive, with the number of cellular phones increasing from about 600 000 in 1994 to nearly 13 million by year-end 1999. These impressive figures show that the privatized system is achieving the targets set by the Brazilian Government, which also forecasts that by the year 2003 there will be about 37 million main telephone lines installed across the country, and a total of 24 million mobile subscribers.

It is therefore timely for the world community to turn its attention to the Exhibition and Forum at the Riocentro exhibition and conference centre, where those who were not at TELECOM 99 can catch a glimpse into the future. The Forum will be split into three streams.

The Policy and Regulatory Summit will bring together policy-makers, ministers, regulators, industry and market leaders, as well as investors and world renowned experts to share their views and identify the challenges facing Latin America and the Caribbean in the Information Age and networked economy.

The Infrastructure and Applications Summit will focus primarily on the opportunities of the Internet and wireless access, fixed access, satellite applications, customer support applications, quality of service, and next-generation networks.

The TELECOM Development Symposium will be organized in association with the Telecommunication Development Bureau (BDT) and will cover universal access and tele-applications.

Visit the ITU Stand, No. 3069, Hall 3.

The Editor

New initiatives

Electronic signatures and certification authorities

Issues for telecommunications

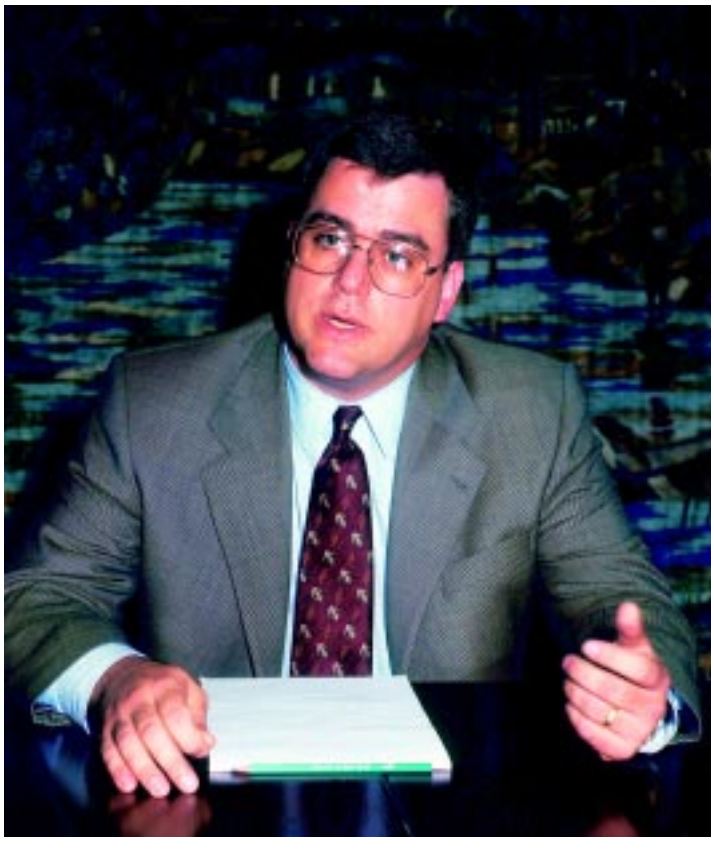
Interview with Fred Cate and Arthur Levin

■ ***When we talk about electronic signatures and authentication, what issues concern telecommunications?***

F. Cate: The issues we discussed in the High-Level Meeting of Experts can be subdivided into two sets: broad and narrow. The broad issues concern electronic authentication. How do you know who you are dealing with on the Internet? How do you know that a document is authentic, or that the signature is authentic? These questions apply no matter what industry or subset of the population we talk about.

Whether you are buying a book on the Internet or authenticating yourself so that you can vote electronically or whether you are purchasing something expensive, for example, a flat in Geneva (I could not think of anything more expensive) knowing who you are dealing with and knowing that the terms of the contract are what you agreed to are critical issues. But it is not just these broad issues. Neither is it simply making the technology work. It is also the broad ramifications linked to those issues. What about countries which have much lower Internet use than Western Europe or North America? What about economic disparity issues?

The narrow issues specifically concern telecommunications. In many instances, they are not all that different from those I have just mentioned, but they fall within the special purview of ITU. If ITU does not deal with them, who else will in the telecommunications industry? Let me give you some examples. Telecommunication companies provide the key link (i.e. the conduit) that most



Fred Cate: "How do you know who you are dealing with on the Internet?"
(ITU 000007)

people use to access the Internet and the World Wide Web. In addition, the telecommunications industry was one of the earliest providers of authentication measures, including serving as certification authorities. As a result, they have a lot of experience on what works and what does not. However, harnessing that experience so that it can be used in the telecommunications industry and elsewhere is a key issue.

Arthur Levin (left) and Fred Cate (ITU 000008)

As the main conduits for electronic commerce, telecommunication operators have a direct stake and critical role in the growth of e-commerce. But not enough attention has been given to such matters as the potential risks and liabilities of the operators for abuse of electronic signatures and digital certificates.

Finally, the telecommunications industry itself relies on authentication measures in its dealings with suppliers and customers. We can learn from that experience too, but a lot of international cooperation is needed because these companies literally span the globe.

■ ***Much has been said about a growing divergence in the national approaches to authentication and legislation regarding the recognition of digital signatures. In what ways are these approaches divergent?***

F. Cate: Many participants noted the wide variety of approaches to electronic signatures and certification authorities reflected in national and State and provincial law, including recent enactments by Argentina, Chile, Denmark, Germany, Italy, Malaysia, and in much of the United States. These enactments often differ on a number of important points, for example: in the definition of digital signatures, effect of meeting a statutory definition, purpose of digital signatures, scope of application, digital certificates, certification authorities and cross-border recognition.

Let me expand a little on some of these points. If we look at the question of definition, some legislation defines digital signatures by technology, while another defines them by attribute or functional criteria (such as "is unique to the person using it" or "is capable of verification").

If we look at the effect of meeting a statutory definition, some legislation requires that a digital signature conform to a specific definition to be valid; authentication measures not within that definition are invalid under such laws. Other legislation creates a presumption of validity if a digital signature meets the legislative definition, but recognizes that other authentication measures may also be valid.

Now, if we look at the purpose of digital signatures, legislation reflects many different purposes for digital signatures: verifying identity, authenticating the text of a document, ensuring the integrity of the text of a document, indicating consent, establishing the legal effectiveness of a document, etc.

Some legislation explicitly limits the scope of digital signatures to transactions with the government or to exclude wills and testamentary dispositions.

On the question of certification authorities, some legislation regulates these authorities: who can be a certification authority; how does one become a certification authority; what specific activities are required of, or prohibited by, a certification authority; what is the role of the government, if any, in registering, auditing, bonding, and otherwise monitoring certification authorities; and what is the liability (or limit on the liability) of a certification authority.

It should also be remembered that the majority of nations have taken no action to facilitate the use of electronic authentication measures.

■ ***How can these widely divergent approaches be harmonized globally?***

F. Cate: Let us step back a little and think about what we mean by "harmonize". One thing I do not think anybody is going to be able to do is to make all the different legal systems work in harmony. There are big differences between national legislation.

Even within the European Union there are very different approaches between, say, Germany and

the United Kingdom. But what we cannot probably do is make all of these laws work in harmony. What we *can* do is make the areas in which they differ less problematic. For example, if one law says "Here is how you authenticate identity" and another law says "Here is how you do it", ITU can serve as a clearing house to bridge the gap through technical standards. For example, if the German law says you have to do A, B and C, and the British law says you have to provide a technologically appropriate method, the ITU can say "here is something that satisfies both, here is a technological bridge between these two laws". This is important because in the next generation of laws, when countries come around to revising their laws, they will have learned from each other. They will ask the question: "what did we do well, what did we do wrong, what can we do better?"

While the two-day meeting did not provide sufficient time to reach consensus on precisely what form, if harmonization was desirable or achievable, many participants suggested that, at minimum, harmonization must include facilitating the use and recognition of authentication measures across borders. At the same time, many of the participants recognized that harmonization could not and should not entail efforts to achieve uniformity among authentication measures.

A. Levin: One aspect that ITU can look at is the issue of giving recognition to a certificate across a national border. This is not necessarily a question of harmonization, but rather one of hopefully reaching a global understanding of the conditions under which one country will give recognition to certificates issued in another. There is already some work under way on this issue at other organizations. However, the ITU is unusual among international and intergovernmental organizations. Its work is universal, as its membership includes almost every country in the world (189 Member States) and that means that ITU efforts have significantly broader coverage than those of others that are looking at these issues. Throughout its history, the ITU has developed extensive expertise establishing global standards for interoperability of networks and services and has facilitated telecommunications development throughout the world.

Also, the ITU is one of the few intergovernmental organizations where government and industry work closely together. Its accomplishments reflect this experience of working closely with industry as well as national governments and other multinational organizations. With this unique expertise and experience, ITU is well placed to help foster a global dialogue on authentication measures.

■ ***How would you sum up the results of the meeting?***

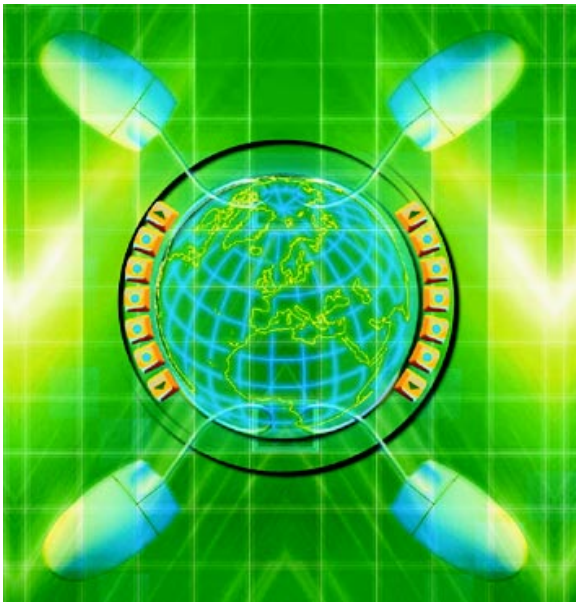
A. Levin: First of all, we were delighted and appreciative that many of the leading experts in the world, from the legal, policy and technical areas came to this meeting, and at their own expense. Many of these experts were new faces at the ITU, and they spent two days working hard to try to advise ITU on what it can do to facilitate the use of authentication as a tool for the growth of electronic commerce. At the end of the two days, the expert group agreed on a set of recommendations for what the ITU should be doing in this area. Of course, the ITU is already at work on some aspects of authentication in the area of technical standards. The Recommendation ITU–T X.509 constitutes one of the bases for certificates and there are other ITU recommendations in the process of development that address other technical issues. But one of the key questions discussed by the meeting was what can be done beyond the technical issues to ensure that these authentication measures can be used globally.

■ ***Could you comment on the recommendations of the experts?***

F. Cate: The fact that there was such broad consensus on so many important issues in only two days is noteworthy. Let me offer some additional recommendations that flow from our discussion and expand on the consensus recommendations.

The activities which ITU should pursue vigorously, with regard to authentication in the context of telecommunications should include efforts to better understand and facilitate the telecommunication industry's own use of authentication measures, not just in the context of the Internet but also related to other telecommunication services, such as authenticating the identity of a user of a mobile network.

The ITU is known throughout the world as the source of information about international telecommunication issues



They should also include the negotiation of flexible legal instruments, such as memoranda of understanding, to address pressing issues that threaten to restrict the development, provision, and use of authentication measures, as well as other digital information services, within the telecommunications industry.

Although this meeting addressed authentication issues, it is important to note (as many participants did), that the telecommunications industry provides many people's essential link to the Internet. Regulations and unresolved issues that threaten the viability of providing that link, such as the potential threat of liability for carriers for digital content of which they are not aware and over which they exercise no control, impose costs on service providers and users and threaten the availability of both authentication measures and information services more generally.

All of these reasons highlight the importance of ITU taking a leadership role in crafting the voluntary standards that can serve as the technical basis for national and regional enactments concerning the recognition of foreign digital certificates. Those standards, typical of ITU recommendations, would not address the legal effect of a digital certificate, but instead, would provide the essential technical foundation for the operation of those national laws.

While the ITU should pursue this activity in close co-operation with other organizations, it is important to recognize that the wide variety of international activities concerning authentication measures does not create a disincentive for ITU involvement. Rather, the wide array of disparate activities heightens the importance of active ITU participation to provide leadership and a truly global and inclusive forum.

One of the major obstacles to the harmonization of authentication systems is the lack of centralized information about technologies, national laws, international initiatives, model agreements, private sector initiatives, and the like. In addition, for current public key infrastructure systems to work, there needs to be reliable access to accurate information about certification authorities, digital certificates (valid and revoked), and public keys.

The ITU is well-placed to serve as a central repository of such data, making them available through the World Wide Web and other means, and incorporating them into the Union's own educational efforts concerning authentication and other digital information issues. The ITU is known throughout the world as *the* source of information about international telecommunication issues. Expanding that role would provide a great service to national governments, industry, other organizations and initiatives involved in this area, academics, and ultimately to the public. ■

Key definitions

by Fred Cate

The technologies for providing electronic signatures and certification are many and complex, exceeded perhaps only by the variety of terms used to describe the operations they perform. The concepts, however, are comparatively straightforward, and this brief introduction is intended to help clarify the subject of the High-Level Meeting of Experts.

Encryption

"Encryption" is a way of encoding a message to hide its content. In the context of computers, encryption is the process of applying a mathematical algorithm to a readable message to generate an unreadable, encoded message. The encoded or encrypted message will appear as gibberish to anyone who should intercept it, but it can be reconverted back to a readable message by anyone who has the appropriate mathematical algorithm. That algorithm is known as the "key" and is usually measured by its length in bits. A longer key (e.g., a 64-bit key) generates a more secure message than a shorter key (e.g., a 40-bit key).

Private key encryption

There are two primary forms of encryption systems in use today. "Private key encryption", also known as "symmetric" or "single key encryption", relies on a single key to both encode and decode the message. Therefore, anyone with the key can both create encrypted messages and read encrypted messages created with that key.

Public key encryption

"Public key encryption", also known as "symmetric" encryption, uses two different keys: one (the "public key") to encrypt the message, the other (the "private key") to decrypt it. The two keys are mathematically linked, but the public key cannot be used to discover the private key (much like two numbers can be multiplied to determine a third number, but knowing that third number does not necessarily make it possible to derive the original two numbers). In a public key system, if *A* wants to send *B* an encrypted message, *A* first obtains *B*'s public key from *B* or a directory of public keys. *A* then uses *B*'s public key to encrypt the message, which he/she sends to *B*. *B* uses his/her private key to decrypt the message.

Electronic signatures

An "electronic signature" or "digital signature" (these terms are often used interchangeably) is a way to authenticate the source and, in many cases, the text of an electronic message. One of the most common ways to do this today uses the public key encryption system ("public key infrastructure"), but in reverse order. If *A* wants to digitally sign a message that he/she is sending to *B*, *A* first runs the message through a "one-way hash function" — a mathematical algorithm that creates a unique "message digest" for the message. Every time that algorithm is applied to that message it will generate the same message digest. If, however, the message is altered, when the algorithm is applied it will generate a different message digest. As described above with public key encryption, however, knowing the message digest will not allow one to recreate either the message or the algorithm.

Having created the message digest, *A* then encrypts it with his/her private key, attaches the original message (which can be unencrypted or encrypted using *B*'s public key), and sends both to *B*. *A* has now digitally signed his/her message to *B*. *B* uses *A*'s

Key definitions *(continued)*

public key to decrypt the message digest. The fact that *A*'s public key decrypts the message digest shows *B* that *A*'s private key was used to encrypt the message digest: this helps *B* verify that *A* is in fact the sender of the message ("identity authentication"). *B* can perform the same one-way hash function on *A*'s message to verify that it generates the same message digest. If it does, then the text of the message has not been altered ("content authentication").

Other forms of electronic signatures are also in use and under development, such as the use of biometric identifiers (retinal scans, fingerprints, etc.). These can be used to authenticate the source of the message, but generally not the content.

Certification authorities and digital certificates

One critical issue with all current forms of electronic signature systems is establishing a physical connection between the sender (or the signor) and the signature. In the public key example above, the fact that *B* can use *A*'s public key to decrypt the message digest encrypted with *A*'s private key, tells *B* that the two keys are linked, but it does not actually tell *B* who *A* is (just as when a consumer countersigns a traveller's cheque, the fact that the signatures match only tells the merchant that the signor is the same person who signed originally, not who the signor is). This is where a "certification authority" comes in. A "certification authority" is a trusted third party that issues a "digital certificate" attesting to the fact that *A* is who he or she claims to be and verifying that *A*'s public key does in fact belong to *A*. Certification authorities must authenticate the identity of their customers (much like a notary must verify the identity of the person whose signature he is notarizing), and must themselves be perceived as reliable.

Repositories

For both public key encryption and electronic signatures to work in their current form, there must be one or more "repositories" where digital certificates and public keys can be found. Today, repositories are generally maintained by certification authorities. In addition to providing information about valid digital certificates, repositories also need to include information about revoked certificates to prevent the continued use of stolen public keys.

Summary

All of these functions may sound cumbersome, but they take place electronically, usually automatically, in real-time, and without any direct action by, or even knowledge of, the user. When used together, electronic signatures and certification authorities greatly facilitate e-commerce by making it possible to authenticate both the identity of the sender of a message and the content of that message. The ability to do both is critical to conducting high-value transactions via digital networks, especially between parties who have no pre-existing or face-to-face relationship.

Electronic signatures and certification authorities have other potential uses, for example, in facilitating electronic voting, or providing authentication of identity and/or message content in many other contexts. The methods described above are not the only ways available for authenticating identity and content. As a result, rather than focus on specific applications of electronic signatures and certification authorities, it is more accurate to speak of "authentication" measures generally — and that is how the participants in the expert's meeting generally conceived of their topic.

Working Group on ITU Reform

The debate continues

From 3 to 7 April 2000, the Working Group on ITU Reform (WGR) will hold its second meeting to continue the debate on reforming the International Telecommunication Union. Having laid the groundwork for this task at its first meeting (Geneva, 15–17 December 1999), WGR can now focus on the real mandate assigned by the Plenipotentiary Conference (Minneapolis, 1998). In broad terms, WGR is required to review the management, functioning and structure of the Union as well as the rights and obligations of Member States and Sector Members. It is also to review the contribution of Sector Members towards defraying the expenses of the Union.

In his opening remarks to the December meeting, ITU Secretary-General, Yoshio Utsumi, underlined some of the major changes transforming the industry, making reform imperative (see pages 11–13). These include:

- Market liberalization and the spread of competition, not just in the developed world, but now on a global scale.
- The phenomenal growth of the Internet.
- The convergence of the telecommunications sector with the computing and broadcasting sectors.
- The changing nature of the telecommunication development gap, which is now more about differences in the "quality" of services available in different parts of the world as much as their quantity.
- The accelerating pace of these changes and the challenges they pose for how ITU organizes its own work.

WGR's Chairperson, Lyndall Shope-Mafole, Plenipotentiary Minister of Communications at the Embassy of South Africa in Paris, said that the survival of ITU in the new millennium was not a luxury but an imperative, particularly for developing countries.

Ms Shope-Mafole called on the working group to recognize this imperative in interpreting its mandate so that its recommendations can help the Marrakesh Plenipotentiary Conference [scheduled for 2002] reach decisions that will make ITU not only "the focal point for all matters relating to telecommunications in the global information economy and society, but also, the tool for the elimination of the ever-deepening information gap between the haves and have-nots".

WGR used the first meeting to organize its work and has, to this end, set up three rapporteur groups (see box below) and a Bureau (see Table 1), which in their composition have very experienced members of the telecommunication

Rapporteur groups

■ **Analysis and synthesis of ITU activities:** Identifying strengths and weaknesses of ITU products and services, and options for strengthening the role of ITU

Rapporteur: Mr Bruce Gracie, Senior Adviser, International Organizations, Industry Canada

Associate rapporteurs: Ms Valerie D'Costa, Head, International Affairs, *Infocomm Development Authority* (Singapore), Messrs Pierre-André Probst, Director, External Relations, *Swisscom* and João Carlos Albernaz, Head, Technical Advisory Unit, *Agência Nacional de Telecomunicações* — ANATEL (Brazil)

■ **Management and structure of ITU**

Rapporteur: Ms Mette J. Konner, Head, International Section IT and International Relations Secretariat, *National Telecom Agency* (Denmark)

■ **Finance and budget**

Rapporteur: Mr Richard Thwaites, General Manager, National Office for the Information Economy, Department of Communications, Information Technology and the Arts (Australia)

sector in general, and the ITU in particular. All Member States and Sector Members shall participate in WGR on an equal footing.

The April meeting is expected to prepare an interim report to the ITU Council (Geneva, 19–28 July 2000). WGR plans to hold three other meetings, tentatively scheduled for November 2000 and April and November 2001. The conclusions of each meeting will be circulated to all Member States and Sector Members.

Table 1
Bureau of the Working Group on ITU Reform

chairperson		L. Shope-Mafole (South Africa)
vice-chairperson		Pierre-André Probst (Swisscom)
members of the Bureau		
United States	Region A	Richard Beaird, Senior Deputy Coordinator, Communications and Information Policy, Department of State
France	Region B	Patrick Olivier, Head, Office of Multilateral Affairs, State Secretariat for Industry (DIGITIP), Ministry of the Economy, Finance and Industry
ETNO*	Region B	Pierre-André Probst
Russia	Region C	Alexander I. Kushtuev, Vice-President, *Rostelecom*
Morocco	Region D	Abderrazak Berrada, Permanent Mission of Morocco
Senegal	Region D	Cheikh T. Ndiongue, Director, Studies and Regulation for Posts and Telecommunications
Japan	Region E	Manabu Kanaya, Director, International Organizations Office, International Affairs Department, Ministry of Posts and Telecommunications
Saudi Arabia	Region E	Fareed Y. Khashoggi, Director-General, International Affairs, Ministry of Post, Telegraph and Telephone
Jamaica		Ambassador Anthony Hill
chairperson TSAG*		Gary Fishman, Technical Standards Director, Lucent Technologies, Inc.
chairperson RAG*		Michael Goddard, Director, Spectrum Policy Radiocommunications Agency (United Kingdom)
chairperson TDAG*		Jong-Soon Lee, Executive Director of the Asia-Pacific Telecommunity (APT)

* ETNO = European Public Telecommunications Network Operators Association
TSAG = Telecommunication Standardization Advisory Group
RAG = Radiocommunication Advisory Group
TDAG = Telecommunication Development Advisory Group

Why ITU must change

Market liberalization and competition

Arguably, the most pervasive change which our industry is undergoing is the shift from a monopolistic to a competitive market. Back in 1992, just one third of international traffic originated in competitive markets. Today, that figure is more than three-quarters. Furthermore, the nature of competition has changed, from duopolies and triopolies to virtually unrestricted market entry in many domains.

For players in the market, there is little time to pause or reflect. Major competition is also coming from companies that barely existed a few years ago. As technological change has lowered the barriers to market entry, the new players do not generally have large skyscraper headquarters and five-year business plans; rather they are more likely to have "dot com" after their name and a market valuation which reaches the stratosphere.

A few years ago, it would have been possible to estimate the total of public telecommunication operators worldwide simply by counting the number of ITU Member States; now the number of operators is in the thousands. Many of them are active in the mobile and Internet sectors. If ITU's membership is to continue to be inclusive, we must make every effort to invite these new players to join the Union.

Along with market liberalization has come the requirement for separation between regulatory and operational functions. The majority of ITU Member States now have a clear separation between the functions of the policy-making and regulatory bodies on one hand, and the public telecommunication operators on the other. Regional bodies, such as the European Conference of Postal and Telecommunications Administrations (CEPT) in Europe, have also split the functions of operators (ETNO) and regulators (ECTRA — European Committee for Telecommunications Regulatory Affairs). However, this separation has not yet been fully implemented in the work of ITU.

ITU will increasingly need to reach out to the newly-formed regulatory agencies and enhance its role as a forum for coordinating policies and for tackling new regulatory issues

For instance, in the International Telecommunication Regulations, the term "administrations" is used with little precision as to whether this refers to operators or regulators, or both. An expert group has been established to advise on the reform of the Regulations.

Similarly, in Study Group 3 of ITU's Telecommunication Standardization Sector (ITU–T), which deals with tariff and accounting principles, regulatory bodies sit alongside the operators they regulate. This may no longer be appropriate.

If ITU is to change to serve the needs of this changing constituency, it will increasingly need to reach out to the newly-formed regulatory agencies and enhance ITU's role as a forum for coordinating policies and for tackling new

regulatory issues. The expert workshop held on 9 and 10 December 1999 on Electronic Signatures and Certification Authorities (see *ITU News*, No.1/2000, pages 16–19) as part of the "New Initiatives" programme, is a good example of this new role ITU can play.

The development of the Internet

A second change which is transforming the industry is the emergence of the Internet, not only as a new service in its own right, but increasingly also as the basic platform for existing telecommunication services. Within the last few years, a remarkable change has taken place whereby the volume of international voice telephone traffic has been overtaken by Internet traffic. Furthermore, an increasing share of voice traffic now passes over the Internet at some point, in order to gain from the cost savings which IP networks can generate.

The impact of the Internet is both vertical and horizontal, affecting all three sectors:

- For the Telecommunication Standardization Sector, the challenge is to develop the standards that will facilitate interworking between IP-based networks and the public switched telephone network. This interworking requires new standards not only for technical interfaces, but also for numbering, routing, tariffing, billing and cost-sharing.
- For the Radiocommunication Sector, the challenge is to stretch the already over-full spectrum to accommodate the new generation of wireless Internet services which were trumpeted so loudly at TELECOM 99. The work of ITU on third-generation mobile (IMT-2000) will be instrumental in fostering the development of this new market.
- For the Telecommunication Development Sector, the development of the Internet creates new possibilities for the efficient delivery of medical, educational and commercial services, but it also threatens the business model upon which the established public telecommunication operators are relying. The international settlement payments to developing countries which have facilitated the spread of international voice traffic are now in decline worldwide. Instead, developing country operators now find that they are having to pay for expensive international leased line charges, as well as for peering and transit arrangements. The net flow of cash is reversing. Here too there is much work for ITU to do in helping to prepare our membership for these changes and in negotiating more equitable cost-sharing arrangements.

Computing, communications and broadcasting convergence

In a recent vote by viewers of CNN as to the most important innovations of the 20th century, the telephone, the PC, the television, and the mobile phone all appeared in the top ten. In the 21st century, arguably those devices might merge into one. The Internet, which also appeared in the top ten, is likely to become the dominant service platform. By the end of the decade, there will be many more mobile phones than fixed-line ones. By that time, it is likely that a majority of the devices accessing the Internet will have wireless as well as wired capability. Furthermore, the Internet may well be the preferred delivery mechanism for the delivery of video and audio content.

It is important that the structures of ITU adapt to reflect the underlying changes in the structure of the industry. For instance, it may be more appropriate to have sectors which reflect the different roles of regulators and operators rather than ones which reflect outdated differences between fixed-line and radio-based technologies or, more boldly, to revisit the definition of the mission of ITU to include convergence of telecommunications with broadcasting and information technology.

The changing development gap

One of the most significant changes made in the 1992 reform of the ITU was the creation of the Telecommunication Development Sector. Since that time, there has been a significant narrowing of the gap between the developed world and middle-income developing countries, especially measured in terms of the statistical distribution of the world's telephones and mobile phones. However, there has been a widening of the gap between the middle-income developing countries and the very least developed countries. Furthermore, while the telecommunication

development gap may have narrowed in "quantitative" terms, it may have grown in a "qualitative" dimension. The gap between rich and poor is much wider in the distribution of Internet access than for other communication services.

New generation wireless Internet services which were trumpeted so loudly at TELECOM *99 (ITU 000010)*

While the Development Sector is the youngest of the three ITU Sectors, it is not immune from the requirement for change. There needs to be a closer focus on the needs of the very poorest countries. Furthermore, whereas ten years ago it may have been technical assistance that was requested from the Development Sector, today it is more likely to be regulatory assistance and information-sharing. This requires a shift in the skills base of the staff of ITU.

The speed of these changes

Recently, these changes have accelerated even more and to cope with them we have been called upon to radically change our working methods. While we are proud of the fact that we have reduced the average processing time for a new technical recommendation from four years to nine months, we need to go further still, notably through reform of the approval process itself.

The annual meeting of the ITU Council does not provide a role model for a lean, efficient and decisive organization. Equally, the failure to make decisions on key issues means that much important work is left to the Plenipotentiary which, itself, is often unable to make progress. While it is important to retain democratic and inclusive governance structures it is necessary to take a bold step forward towards greater efficiency.

In addition, if the ITU Secretariat itself is to become more effective and efficient so as to be able to meet the many great challenges before us, its fundamental structure must be seriously reviewed. ■

From official sources

CONSTITUTION AND CONVENTION OF THE ITU (GENEVA, 1992) INSTRUMENTS AMENDING THE CONSTITUTION AND THE CONVENTION OF THE ITU (GENEVA, 1992), KYOTO, 1994

The Government of the **Federal Republic of Nigeria** has ratified the above-mentioned Constitution and Convention as well as the amended Instruments.

The instrument of ratification was deposited with the General Secretariat of the Union on 24 December 1999.

INSTRUMENTS AMENDING THE CONSTITUTION AND THE CONVENTION OF THE ITU (MINNEAPOLIS, 1998)

The Governments of **Denmark** and the **Slovak Republic** have accepted the above-mentioned Instruments amending the Constitution and Convention.

The Governments of **Australia, Canada** and the **Kingdom of Tonga** have ratified the above-mentioned Instruments amending the Constitution and Convention.

The instruments of acceptance and ratification were deposited with the General Secretariat of the Union on 22 and 16 December 1999, 13 January, 8 February and 4 January 2000, respectively.

FINAL ACTS OF WRC-97

The Government of **Australia** has approved the above-mentioned Acts.

NEW MEMBERS

Development Sector

Egyptian High Tech Association (EHITA) (Cairo), FLAG Telecom Limited (London), Guyana Telephone & Telegraph Company Ltd. (Georgetown), InTouch Communications Services, S.A.E. (Cairo), Middle East Telecom & Electronics Co., Ltd. (METE) (Amman) and *TELECON Consultants (Cairo)* have been admitted to take part in the work of this Sector.

Radiocommunication Sector

Alcatel UK (Camberley, United Kingdom), and *Teledesic UK Limited (Horsham, United Kingdom)* have been admitted to take part in the work of this Sector.

Standardization Sector

8x8, Inc. (Santa Clara, CA), Capital One Services, Inc. (Glen Allen, VA), Covad Communications Company (Santa Clara, CA), Element 14 (Cambridge, United Kingdom), Guyana Telephone & Telegraph Company Ltd. (Georgetown), NeuStar, Inc. (Washington, D.C.) and *Nuera Communications (Farnborough, United Kingdom)* have been admitted to take part in the work of this Sector.

New denominations

Ascom Tech AG, which participates in the work of the Standardization Sector has changed its name. The new denomination is: **Ascom Management AG.**

Hewlett-Packard Company, Agilent Technologies, which participates in the work of the Radiocommunication Sector has changed its name. The new denomination is: **Agilent Technologies.**

LCC International, Inc., which participates in the work of the Standardization Sector has changed its name. The new denomination is: **Ericsson NetQual, Inc.**

Pan African Telecommunications Union (PATU), which participates in the work of the Development, Radiocommunication and Standardization Sectors has changed its name. The new denomination is: **African Telecommunications Union (ATU).**

SkyBridge L.L.C.C., which participates in the work of the Radiocommunication Sector has changed its name. The new denomination is: **SkyBridge LP.**

SOCRAT Equipements, which participates in the work of the Development Sector has changed its name. The new denomination is: **Groupe CIRCET S.A.**

SPT TELECOM, a.s., which participates in the work of the Development and Standardization Sectors has changed its name. The new denomination is: **CESKY TELECOM,a.s.**

Stanford Telecom, which participates in the work of the Radiocommunication Sector has changed its name. The new denomination is: **ITT Industries, Inc.**

Stentor Canadian Network Management (SCNM), which participates in the work of the Radiocommunication and Standardization Sectors has changed its name. The new denomination is: **Bell Canada.**

Telecommunications Techniques Company UK (TTC UK), which participates in the work of the Standardization Sector has changed its name. The new denomination is: **TTC UK.**

Wandel & Goltermann GmbH & Co., which participates in the work of the Standardization Sector has changed its name. The new denomination is: **Wavetek Wandel Goltermann Eningen GmbH & Co.**

Erratum

Telenor AS (Oslo), which participates in the work of the Development, Radiocommunication and Standardization Sectors has not changed its name (see *ITU News*, No. 1/2000, page 20).

VACANCY NOTICE

A circular letter (via facsimile) which has been sent to all Member States and Sector Members of the Union announces the following vacancy:

• one post of **Administrator, Voluntary Funds, grade P.1,** to be filled in the General Secretariat, Finance Department, as soon as possible for one year with possibility of extension (circular letter No. 44 of 17 February 2000; vacancy notice No. 1–2000 ITU; final date for submission of applications: 17 April 2000).

Detailed applications with ITU personal history form should be submitted to the General Secretariat of the ITU, Place des Nations, CH–1211 Geneva 20 (Switzerland), no later than the final dates mentioned above.

Vacancy notices and personal history forms are available on the ITU website, under the "ITU General Secretariat" section: http://www.itu.int/.

How to succeed in the wireless Internet market

The key drivers for adopting mobile data services are the benefits they can bring in terms of accessibility and efficiency gains. That said, operators and vendors are looking for the technologies and strategies needed to make such services a reality — and to invest accordingly. An independent research and consulting company Ovum, argues that investment in new technologies, changes in traditional market models and an increase in user adoption and personalized services are the key for this potentially USD 548 billion market.

According to its report, *Data over cellular: the road to third generation*, the first step relies on the shift to packet-switched networks. Users want higher speeds and lower prices. They are growing tired of waiting and watching as access speeds over fixed networks increase, leaving the wireless world looking pedestrian by comparison. The shift to packet will enable operators to begin offering affordably priced services at acceptable speeds. This will release the undoubted pent-up demand amongst wireless users today and will attract those who are currently priced out of the market.

Ovum breaks down its research into four categories, each representing a module within the report exploring both market drivers and barriers. The categories include:

- Operator case studies and analysis
- Business-user case studies and analysis
- Country profiles
- End-user survey and analysis.

All four modules highlight the Internet as the key factor in providing cellular data services. Operators see Internet access and Internet-based applications as the core application area. Business users agree, calling Internet access an immediate priority. Furthermore, Ovum's findings show that 77 per cent of the end users surveyed see Internet access as their main usage growth area. Messaging and Internet access are already the most widely-used applications. It is crucial for operators to move forward with Internet-based applications by defining their content strategies now and building relationships with third party providers.

However, operators will have to be very careful when developing pricing models. Users want to pay the same or less than voice services and prefer to be billed via a method they understand. This means charging by time not volume. Operators must also manage user expectations in terms of how content is delivered. Text alone

Creation of the first Centre of Excellence for wireless Internet innovation

Motorola, Inc. and Cisco Systems Inc. have announced the opening of the first Centre of Excellence for Invisix, their joint venture designed to drive the development of wireless Internet. Motorola predicts that 1.1 billion wireless users will access the Internet on a regular basis by 2004 — with half of these connections enabled via mobile wireless devices. The United Kingdom Invisix Centre will focus on the GSM digital standard for voice and data communications, driving the integration of innovative applications for the new general packet radio service (GPRS) high-speed data network. It will also be the first test centre for the introduction of third generation network services based on an all-IP platform. Initial activity will include trials of e-commerce, location-based services and voice browsing of Internet content.

Future solution integration will include third generation technologies such as the universal mobile telecommunications system (UMTS) and W-CDMA. — ***Motorola.***

is not enough. Consumer users want to replicate the image- and video-rich content common in the fixed environment. Operators will have to market wireless Internet very clearly and carefully to avoid disappointment in the end user experience.

For vendors, the report draws key conclusions for the terminal market. Almost 40 per cent of business users still prefer separate voice and data terminals, but expectations are rising and it is essential that these separate terminals integrate seamlessly. Smartphones and combined voice and data terminals are not well received in the corporate sector, but there is significantly greater demand for the single terminal in the consumer market. The Ovum research finds that corporate users see mobile computing as an extension of the "fixed" computing environment. This said, the importance of Internet and messaging will be key factors in both application and terminal development.

Ovum finds that what users do with cellular data is remarkably global, however there are regional market differences. The main differences are in usage levels, satisfaction with service provision and the relative importance of individual components of data services. Additionally, market segmentation is very difficult for data services — especially when it comes to consumer data applications. Considering these factors, operators will need to target their promotional messages and personalize their services according to each market. It is clear from the regional differences that mobile data is attractive globally, but must be marketed locally. — *Ovum*.

North America:
fibre-optic markets witness explosive growth

Fuelled by regulatory changes, stronger competition, and exploding bandwidth demand, long-distance carriers in North America will deploy 11 million km of fibre in 2000 — more than four times their annual fibre deployment in 1997, according to KMI Corporation's latest study, *Fiberoptic networks of long-distance carriers in North America*.

Regulatory changes in Canada, Mexico and the United States have accelerated competition in the long-distance industry. From 1997 to 1999, 13 new carriers lit up new fibre-optic networks. These new carriers as well as regional players and utilities have built out large national networks to compete with the traditional carriers. In the United States, for example, AT&T, MCI, Sprint, and WorldCom accounted for nearly three-quarters of cumulative fibre deployment in 1996; by 1999, their share of United States fibre assets slipped to just 30 per cent while new national carriers and utilities together accounted for 45 per cent of United States long-haul fibre. From January 1998 to June 1999, United States long-haul carriers provided more than 100 000 km of dark fibre, a multi-billion dollar industry.

This strong growth will not continue as major carriers with plans for large national networks will have completed their long-haul routes by the end of 2000. Annual long-distance fibre deployment in North America will slow from 11 million fibre km in 2000 to 8 million in 2004, as a result of sufficient long-distance capacity and as carriers focus on their metropolitan and access networks to bring fibre closer to the end user. — *KMI*.

Internet markets in Central and Eastern Europe

A look at the drivers, structures and issues faced by market players

According to a report published by telecommunications consultancy Analysys, Central and Eastern Europe is rapidly emerging as a significant growth market for Internet service provision. As more people gain access to basic voice services, there is huge demand to get online, with countries such as Poland already served by over 300 Internet service providers (ISP).

Many of the region's dominant incumbent telecommunication operators offering Internet services are finding their market shares threatened by a growing number of nimble independent ISPs

The report entitled *Internet service providers in Central and Eastern Europe* contains in-depth profiles of over 30 ISPs in the region (see box), along with a directory listing of over 350 companies active in the Internet service provision market. In addition, there are country profiles for the major Central and Eastern European markets — the Czech Republic, Hungary, Poland, Russia, Slovakia and Slovenia.

Each country profile contains: general market and Internet market indicators; an examination of the country's telecommunication infrastructure; the composition of the Internet market and the regulatory framework; a detailed look at the players active in the residential Internet market and their activities and competitive strategies; and a survey of ISPs that focus on the business market.

Many of the region's dominant incumbent telecommunication operators offering Internet services are finding their market shares threatened by a growing number of nimble independent ISPs, cable operators and foreign telecommunication companies, all with ambitions to increase their presence.

Some of the companies profiled in the report

ARNES
BPT Telebank
Cesnet
Comstar
Contactel
DataNet
Demos
Elender Informatikai
Elvis-Telecom
Eunet
Eurotel Bratislava
EuroWeb
GTS
Internet Partners
Intemetia Telekom
K2.net
Luko Czech-Net
MATAVnet
MTU-Inform
NASK
Online Resource Center
Polska OnLine
Relcom
Rostelecom
SiOL
SKnet
Slovenské Telekomunikácie
Sovam Teleport
SPT Telecom
TPSA

The report argues that as more and more telecommunication markets are liberalized and new entrants offer Internet services as well as voice, the battle for market share is likely to intensify. This trend could put severe pressure on tariff levels.

In many countries current connection and usage costs for business and residential consumers represent a major barrier to Internet take-up. Leased-line prices and dial-up subscription fees are generally far higher than in Western Europe. Dial-up subscribers also suffer high local call charges, which, although comparable in absolute terms to those in Western Europe, are relatively much more expensive given the low level of incomes.

In order to preserve existing customer bases and attract new users, Internet access providers will be forced to make aggressive price cuts

In order to preserve existing customer bases and attract new users, Internet access providers will be forced to make aggressive price cuts, eventually emulating the strategies of their Western European counterparts and offering subscription-free access and a wider range of services.

The report also says that general Internet penetration levels of Western Europe are clearly not yet replicated in the East — no country comes near to attaining the 25–30 per cent levels of Scandinavia.

However, continued improvements in teledensity, reductions in access costs and better services will attract more subscribers and fuel further growth, but there will remain a significant gap between countries. Where foreign investment has been substantial, such as in Hungary and Poland, penetration levels in major Western European countries are likely to be matched within the next five years.

In Hungary, the incumbent operator *Matáv* is majority owned by *MagyarCom*, a joint venture between *Deutsche Telekom* and Ameritech.

In Poland, the United States telecommunication operator GTS offers services as part of the ISP partnership Internet Partners and also owns 24.9 per cent stakes in the other two partners, *Internet Technologies Polska* and *ATOM*. — Analysys.

New online Case Library for **rural telecommunications**

A new focus group on rural applications has created a worldwide case study library accessible over the Internet (www7.itu.int/itudfg7) in a bid to promote the development of new technologies for rural communities. The new Case Library comes in the wake of growing concern that the efforts of private manufacturers to develop suitable technology for rural areas, particularly in the developing countries where the physical conditions are often harsh, will be limited without specific and active encouragement and support from the public sector.

Better known as Focus Group 7 or simply FG7, the group works under the auspices of Study Group 2 of ITU's Telecommunication Development Sector (ITU–D). FG7 was set up in April 1999 by the Telecommunication Development Advisory Group (TDAG) with the mandate to study ways of promoting the development of new telecommunication technologies for rural applications. The group's mission is supported by the Japanese Government, which is providing the voluntary financial contribution and the relevant experts.

Since September 1999, FG7 has been actively gathering case studies on rural telephony, information communication technologies (ICT) for economic development, tele-education, telemedicine, emergency support, disaster mitigation, and environmental monitoring in rural areas.

As the group's rapporteur, Yasuhiko Kawasumi, General Manager of *Japan Telecom Co. Ltd*, explains: "FG7 takes special notice of projects that have social or economic importance, but limited commercial profitability, so that ITU can lend special support to such projects."

FG7 was set up in April 1999 with the mandate to study ways of promoting the development of new telecommunication technologies for rural applications

Photo: South Africa

By making case studies freely and easily available on the Internet, the focus group aims to facilitate experience and information sharing among rural operators, telecentres and other organizations. The FG7 Case Library currently offers a collection of 26 case studies that may be searched by keyword, country, or type of application (see box).

Upon reading a report from the Case Library about the micro-financed "Village Phone" programme of *Grameen Telecom* in Bangladesh, Mansour Diouf of *Strategie Acacia* (Senegal) wrote: "Thank you for sending me the useful information about the new case studies from ITU. I have always only considered the economic aspects of the *Grameen Bank*; I can now see the link between the economic aspects and the ICT aspects. It is very important to be aware of the evolution of such projects in other areas to be able to compare."

In addition to the Case Library, the members of FG7 have recently begun a series of discussions about rural applications, with the participation of moderators. The discussions use e-mail lists and a Web-based discussion system to connect FG7 members in their respective countries around the world. Six topics are under discussion (see Table 1).

Table 1

discussion topic	moderator
community development	Guy Girardet, ITU/BDT
telehealth/telemedicine	Leonid Androuchko, ITU/BDT (retired)
developing support for small business	Jacques Rostenne, Perwit International Management Consultants
emergency support and disaster mitigation	Mark Wood, Disaster Relief Communications Foundation
tele-education	Yoshiyori Urano, Global Information and Telecommunication Institute
environmental monitoring/ protection	Habib Tebourbi, ITU/BDT

The FG7 discussion groups have gone beyond technical issues in order to identify the most effective applications in rural areas. These discussions have underlined the need for cooperation between telecommunication experts and business, health, environmental, and community development professionals. The moderator of the FG7 discussion on "developing support for small business", Jacques Rostenne, wrote about the additional sources of income generation that

FG7 Case Library: selected studies www7.itu.int/itudfg7

- Compact remote line concentrator system for rural applications in China *(Fujitsu Ltd.)*
- Grameen Telecom in Bangladesh (Asia-Pacific Telecommunity)
- Greenland's large remotely located satellite earth stations *(Tele Greenland)*
- Implementation of telemedicine in the Republic of Mauritius *(Mauritius Telecom)*
- The INTELSAT WLL/VSAT rural telephony trial in Peru (International Telecommunications Satellite Organization)
- Rural communications in India: demand considerations (Asia-Pacific Telecommunity)
- Strategy for the development of rural telecommunications and universal access in Peru *(FITEL)*
- Technology access community centers in Egypt: a mission for community empowerment *(Egypt Information Highway Project)*
- Togo Telecom: rural telephony project (Togo Telecom)
- "Type 0" community telecentres: results of Suriname case study (Rural Telecommunications Research Group)

could be enabled by bringing together multi-purpose community telecentres on a regional basis through a network.

"As long as telecentres operate as independent units, they are limited to selling telephone time and perhaps some additional services such as photocopies and access to the Net. My contention is that if we could 'franchise' them, we could help them generate substantial revenues from selling a completely new category of profitable goods and services. Without a managed network, these kinds of services could not work properly." said Mr Rostenne.

Based on the material from the case studies and the discussion groups, FG7 will prepare and submit recommendations to Study Group 2 on measures to be taken by ITU–D to effectively promote the development of new technologies for rural applications.

Meanwhile, the Telecommunication Development Bureau (BDT) is encouraging all interested companies and organizations to submit case studies to be considered for inclusion in the Case Library. For more information, please contact: "Rebecca Mayer, ITU/BDT. Tel.: +41 22 730 6314". ■

Frequency management seminar

The Telecommunication Development Bureau (BDT) organized a frequency management seminar (Nairobi, 6–10 December 1999) in partnership with Nortel Networks of Canada, a principal private sector partner in the Centres of Excellence initiative.

The seminar was held at the African Regional Advanced Level Telecommunication Training Institute (AFRALTI), one of the two African institutes which BDT and Nortel are transforming into Centres of Excellence in their initiative to provide practical solutions to the challenges of universal access and rural connectivity in Africa. The event brought together frequency managers of national spectrum management agencies from 11 English-speaking countries of East, Central, Southern and West Africa to discuss:

- The need for spectrum management
- National Spectrum Management Agency
- Spectrum planning process
- Spectrum engineering practices
- Spectrum Regulations
- National spectrum use
- Spectrum control and cases of interference
- Automation of spectrum management activities
- Radio Regulations and international notifications.

The seminar was conducted by Stephen Challo of the ITU's Radiocommunication Bureau, Muya Wachira of Nortel Networks and Stanley Kibe, a principal engineer at the Communications Commission of Kenya. Participants made thought-provoking presentations of their own national spectrum management regimes, the associated local legal instruments and the respective spectrum management environments. All presentations had to follow a pre-designed common structure based on the following questions:

- What are the existing radio laws in the country?
- What is the national agency responsible for the execution of these laws? How is it structured/ How does it function, monitor the use of the spectrum and enforce the regulations relating to the spectrum? How does it relate to the security organizations of the country?
- Is the telecommunication sector, including broadcasting, liberalized?
- What is the extent of utilization of the spectrum for the various services and the respective loading of bands allocated to each service? What is the criteria for the use of the spectrum by the various services and what licence fees are charged?
- What, if any, are the specific national constraints to the use of the spectrum?

Many of the presentations and the discussions that followed revealed the need to strengthen both the legal instruments and national standing of spectrum management agencies in order to satisfy and respond to national and international requirements.

Participants adopted a final report containing recommendations for follow-up action. ■

ITU–R Study Group 11: a distinguished history

For a little over half a century, Study Group 11 of ITU's Radiocommunication Sector has been making history with the production of authoritative recommendations (standards) and the preparation of the technical basis for several ITU conferences. As the international forum for broadcasting activities, the study group has dealt with television broadcasting services from end-to-end.

Even amid the difficult conditions of a multitude of television technologies at different technical levels and economic capabilities of individual countries, the study group has been able to develop recommendations for television broadcasting which have received worldwide acceptance.

The last of these recommendations is the newly revised ITU–R BT.1306, which addresses "Error correction, data framing, modulation and emission methods for digital terrestrial television broadcasting".

We say "the last" with some nostalgia as the meeting (Geneva, 10–11 February), where this new version of BT.1306 was unanimously endorsed, marked the last gathering for Study Group 11, which is to merge with Study Group 10 as announced in December 1999.

First adopted in 1997, Recommendation BT.1306 brought together the common elements of systems A and B, originally developed in North America (ATSC — Advanced Television Systems Committee) and in Europe (DVB-T — digital video broadcasting-terrestrial), respectively.

As the Chairperson of Study Group 11, Mark Krivocheev (Russia), explains: "The revised BT.1306 now includes system C (ISDB-T — integrated services digital broadcasting-terrestrial), developed recently by Japan to provide more features for digital terrestrial television broadcasting." It also includes an analysis of the environments when each of the modulation

In 1983, the CCIR received an "Emmy" for the development of a common world standard for digital television studios

options of systems A, B and C may be most useful, making the new recommendation of the highest value for broadcasters wishing to implement such a new technology, particularly in developing countries.

When endorsing the new BT.1306 on 11 February 2000, Study Group 11 also agreed to seek the recommendation's adoption by correspondence. Formal approval is expected to follow soon, through consultation of ITU Member States.

Study Group 11 leaves behind a "legacy" of more than 154 recommendations.

The study group leaves behind a "legacy" of more than 154 recommendations

Flashback

Founded in Stockholm on 30 July 1948, during the Vth Plenary Assembly of what was then CCIR*, Study Group 11's first success story was the development, in 1949, of Recommendation 29. It was in this recommendation known as "Television standards" that the general requirements for television systems were formulated, including some requirements for colour television.

Given the study group's legacy, it would be unjust to analyse all its fifty-year achievements in a few lines. The good news is that Mr Krivocheev, who has chaired the study group since 1972, is writing a report that confirms the group's leadership in the field of international standardization of television broadcasting systems and technology. The report includes references to official documents of CCIR and Study Group 11, as well as his personal archive collected over many years.

As Mr Krivocheev put it to *ITU News* "The total volume of this report constitutes more than 21 large files. I hope to have enough strength to be able to complete this work after the World Radiocommunication Assembly in Istanbul (1–5 May 2000). This report can then be truly called *International standardization of television*

* International Radio Consultative Committee.

Why 21 is so symbolic for ITU–R Study Group 11, according to Mark Krivocheev

The figure 21 is not only a lucky number in the blackjack game. In our activity we have several times met this value, for example the concept of 6 + 7 + 8 = 21 concerning the use of existing radio channels for digital television.

The meeting of Task Group 11/4 in which we started the study of extra-high resolution imagery was held in the Ritz Carlton Hotel on Massachusetts Avenue on 21st Street in Washington, D.C. During the Malaga-Torremolinos Conference in 1992 (the 1 + 9 + 9 + 2 equals 21) the bandwidth allocated for HDTV broadcasting was, as you remember in the 21 GHz band. In HDTV (Recommendation 709) common image format (CIF) — 1080 × 1920, adding these digits equals 21. Merging 10 and 11 also makes 21.

broadcasting in the second half of the 20th century."

Speaking of the proposed merger, which should result into a new single study group on broadcasting, Mr Krivocheev recounts vividly: "On the same day (30 July 1948) that Study Group 11 was established, what was known then as Study Group 6 (Broadcasting) was renamed Study Group 10. So one can say that Study Groups 10 and 11 were born twins. May be this is one of the reasons why we are merging now. During this period, Study Group 10 has elected five Chairmen, while Study Group 11 has only elected two. Erik Esping was the first. I am the second. Erik was a remarkable man, who made a great contribution to the group's foundation and its activities." The merger will be decided by the World Radiocommunication Assembly in May.

Some historical highlights

Recommendation 601 became a part of history as a common world standard for digital television studios. In 1983 the CCIR received an Emmy, the National Academy of Television Arts and Sciences Award of the United States, for the development of this standard.

In June 1999, a draft new version of Recommendation 709 was prepared and covers the requirements of high definition television (HDTV) broadcasting and the cinema industry. This has been a great success, and opens many doors. Academy award winner and film director George Lucas has announced that he plans to use electronic production equipment based on this ITU standard for his new movie in the "Star Wars" series. This may be a historic recommendation this millennium.

Study Group 11 was the first ITU body to become involved in the area of interactive television. In 1993, a new global approach to interactive television systems, aimed at mobilizing all possible communication facilities, primarily radio systems, for the establishment of return channels, was proposed. Worldwide interactivity calls for more than five billion return channels — this greatly exceeds the world's telephone capacity. Discussions at TELECOM INTERACTIVE 97, and more recently, TELECOM 99 supported the initiative of Study Group 11, and showed that interactivity will be a dominant component in telecommunications.

Other achievements

- Several advancements in the studies on broadcast-satellite systems and technology. Study Group 11 prepared the technical bases on the broadcasting-satellite service (television and sound) for several conferences. It is currently providing the technical support to the Inter-Conference Representative Group (IRG) and the Group of Technical Experts (GTE) for expanding the capacity of the broadcasting-satellite service plans.
- Progress on studies on digital multi-programme, HDTV, interactive and multimedia satellite broadcasting (sound and television).
- Solving the problems of digital television, in particular important work on formulating requirements for the MPEG standard, which led to its worldwide use in broadcasting.
- Research of protection ratios, and planning in terrestrial broadcasting, so crucial for every country.
- Fundamental contributions to recording and programme exchange: initiated coordination between format specifications of professional television and sound recording equipment and domestic equipment. Broadcasters and industry have done serious work here, with many millions of units manufactured.
- Major contributions to the introduction of information technology methods and equipment in sound broadcasting and television operation: always working with a tremendous overview of industry needs.
- Contributions to picture quality assessment.
- The development of an international strategy for the introduction of new digital television systems, while retaining the existing terrestrial and satellite channels.
- Progress in meeting the needs of broadcasting in developing countries, and established good cooperation with ITU's Telecommunication Development Sector (ITU–D) and the United Nations Educational Scientific and Cultural Organization (UNESCO), exemplified by joint pilot projects in distance learning. ■

Spectrum management

Bangalore ushers in new millennium for ITU–R

The astounding growth of radio-based services is putting tremendous pressure on ITU's Radiocommunication Sector to find innovative ways of coping with the demands on the scarce resource of spectrum and satellite orbits. This message was loud and clear in Bangalore (India), where ITU–R's Task Group 1/5 met from 6 to 14 January 2000. The meeting, which has taken on some historic importance as the first ITU–R event in the new millennium, was hosted by Indian Space Research Organisation (ISRO), on behalf of the Administration of India. The event was chaired by Mohan S. Dhamrait (United Kingdom) and attracted some 80 delegates from the Union's constituents.

In recent times, Task Group 1/5 has assumed significant importance in its studies on technical issues regarding unwanted (spurious and out-of-band) emissions from transmitters operating in space stations.

The Task Group's ongoing studies should result in the adoption of stringent technical parameters and standards that can provide protection to safety services, radio astronomy and space services against harmful interference and improve the efficiency of spectrum utilization.

Opening the Bangalore meeting, ISRO Chairman K. Kasturirangan declared: "With the tremendous growth in telecommunications, the world has really become a global village. The increased demand for communication services makes it imperative to use the limited spectrum resource judiciously."

Wireless adviser to the Government of India and Chairperson of ITU's Radio Regulations Board (RRB), Ravindra N. Agarwal said: "The new millennium is going to witness more and more new technologies at a much faster rate and there is going to be convergence of technologies. Spectrum sharing and co-existence will be key themes for the future use of the spectrum."

Task Group 1/5 has carried out many studies in this field. Results of the Bangalore meeting will be of great value to the forthcoming World Radiocommunication Conference to be held in Istanbul from 8 May to 2 June 2000, as well as to future conferences which will lay the foundation for technological innovations in this new millennium.

For more details on the results of the Bangalore meeting, please contact: "Albert Nalbandian, Counsellor ITU–R. Tel.: +41 22 730 5815. E-mail: albert.nalbandian@itu.int". ■

The Asia-Pacific region prepares for WTSA-2000

Towards a common regional view

The Asia-Pacific Telecommunity (APT)* will be holding its first preparatory meeting for the World Telecommunication Standardization Assembly on 22 and 23 March 2000 at the Regent Cha-am, Cha-am (Thailand).

APT is taking a leading role as the regional platform for harmonizing activities and views on telecommunication standardization in the Asia-Pacific region. With the establishment in February 1997 of the Asia-Pacific Telecommunications Standardization Program (ASTAP), regional standardization activities are being promoted dynamically (see ASTAP website at http://www.aptsec.org/astap/). In addition, APT has been conducting workshops to disseminate information on standardization to its members — the preparatory meeting is an outcome of this process.

Formerly known as World Telecommunication Standardization Conference (WTSC), WTSA is convened every four years by the ITU under the auspices of the Telecommunication Standardization Bureau (TSB) to consider matters related to telecommunication standardization. WTSA-2000 will be held at the headquarters of the International Civil Aviation Organization (ICAO) in Montreal (Canada) from 27 September to 6 October.

WTSA is convened every four years by the ITU under the auspices of the Telecommunication Standardization Bureau to consider matters related to telecommunication standardization

The preparatory meeting in Thailand will discuss issues such as the alternative approval process for ITU–T recommendations, the restructuring of ITU–T study groups, and the question of intellectual property rights (IPR). The aim is to form a common regional view on these and other issues on the WTSA-2000 agenda. This is a unique opportunity for Asia-Pacific industry players, associated with telecommunication standards, to be a part of APT's drive for a more proactive participation in regional and global standardization activities.

Details of the APT preparatory meeting can be found at: http://www.aptsec.org/astap/WTSA2000/apt_preparatory_meeting.htm. Interested parties can also contact: "Tel.: +66 2 573 0044. Fax: +66 2 573 7479. E-mail: porpan@aptec.org".

More details on WTSA-2000 and the issues mentioned in this article can be found on ITU's standardization website at: http://www.itu.int/ITU-T/index.html. ■

* APT, which has its headquarters in Bangkok, was established in May 1979 by an intergovernmental agreement. Its major activities include regional coordination in telecommunication standardization and radiocommunication, the transfer of technology, studies (through study groups) on telecommunication issues of concern to members, the promotion and development of Asia-Pacific information infrastructure, and human resources development.

❑ **The first GPRS network in Africa.** *Alcatel* and *Vodacom*, a GSM network operator in South Africa with over 2 million subscribers, are going to try out the Alcatel GPRS (general packet radio service) solution. This GPRS network, the first to be deployed in Africa, will be set up in Johannesburg during the first quarter of 2000.

It consists of all the infrastructure for the radio, switching and routing parts as well as dedicated terminals and software. The purpose of the network is to enable Vodacom to test in real conditions the GPRS, data services and IP services supported by this technology and, in particular, customer tests and traffic profile determination. — *Alcatel*.

❑ **EUTELSAT enters the American market.** The United States Federal Communications Commission (FCC) has announced that the first licences have been issued allowing direct access from the United States to the European Telecommunications Satellite Organization's satellite capacity, for services including contributions to broadband IP and video. BT North America Inc and Group W Network Services (CBS Broadcasting Inc) are the first two companies authorized to use this capacity.

This measure marks a new stage in the process of opening up the American market to satellites approved by other countries. The authorization granted to *Eutelsat-II F2* to serve the American market should encourage competition on the American fixed-satellite services market by offering customers a broader choice of communication providers and services. Increased competition may well also bring down prices for these services and promote technological innovation.

The FCC decision now allows EUTELSAT to meet the demand for transatlantic links of American customers seeking direct access to the European market in order to establish communications for companies and individuals. It also allows links to be set up from Europe to the American market. — *EUTELSAT*.

❑ **Mobile Internet ready for the general public.** *One Touch View W@p*, the latest in the *Alcatel* family of GSM mobiles, is the first dual-band WAP-compatible mobile telephone intended for the general public. One Touch View W@p uses WAP (wireless application protocol) version 1.1 with a *Phone.com* microbrowser and is designed for customers wishing to join the mobile Internet-surfing community.

With its wide, four-line screen, the mobile quickly displays a maximum of information downloaded from the Web. Thanks to its microbrowser, One Touch View W@p gives access to use of services such as online shopping, banking, travel guides, gift suggestions or travel and entertainment ticketing. — *Alcatel*.

❑ **Global Crossing supplies the first transatlantic optical wavelength IP link.** Global Crossing, which constructs and operates the global fibre-optic IP network, has announced the successful launch of the first transatlantic IP connection set up on an optical wavelength link. The connection can carry commercial traffic between New York and London at a rate of 2.5 Gbit/s.

This link represents considerable progress in high-speed Internet connection between North America and Europe. Atlantic Crossing-1 (AC-1), the Global Crossing transatlantic network, is a high-capacity fibre-optic network linking the United States, United Kingdom, Netherlands and Germany. AC-1 uses advanced wavelength-division multiplexing (WDM) technology to cope with the demand for capacity on the busy North Atlantic corridor. — *Global Crossing*.

❑ **ESA launches a multimedia programme for schools.** New digital media can work wonders in schools. In January, the *Espresso for Schools* project, developed under the European Space Agency multimedia programme, was awarded the innovation prize at the *BETT 2000* exhibition, a regular education event in the United Kingdom.

The Espresso environment is a multiservices solution grouping a very large number of multimedia resources, particularly interactive documents including video sequences and of interest for the teaching of languages, science and mathematics, as well as information sheets, educational television programme guides and selected Internet sites for schools: teachers and pupils can browse easily. All the documents are updated weekly via satellite and stored on the hard disks of schools' servers for off-line consultation.

The Espresso for Schools project was carried out in eighteen months and completed in December 1999. It involved the integration and pilot operation of a satellite payload transmitting educational documents to 50 primary schools in the United Kingdom in the form of multimedia support for the purpose of helping teachers to improve educational standards by intelligent and targeted use of new information and communication technologies. The project, developed by Espresso Productions Ltd, is currently being launched commercially in the United Kingdom. It may then be easily exported to other countries. — *ESA*.

❑ **Equant launches a worldwide voice over IP service.** Equant has announced the launch of the first global voice transmission network entirely managed by IP technology.

For the first time, companies will be able to integrate a high-quality voice service in all their applications using the Internet protocol. They will be able to use voice on their intranet and extranet networks, giving greater flexibility and strengthening their competitiveness, particularly in regard to booming electronic commerce applications.

Equant should introduce this new voice over IP service using multiservice modular routing and the IP voice transmission technology of Cisco Systems Inc. in 50 countries in February 2000, after having tested its network in 21 towns situated in 11 countries. — *Equant.*

❑ **Ozone-measuring campaign over the Arctic.** The European Space Agency (ESA) is participating in the largest worldwide campaign ever undertaken over the Arctic to measure ozone content and evolution. The objective of the international campaign is to obtain a better understanding of the low ozone values observed in the Arctic during recent winter and spring seasons as well as to establish possible links with the long-term decline in the ozone layer over Europe. This campaign, conducted above the Arctic circle in the region of Kiruna (Sweden), began in November 1999.

Throughout the campaign, 30 land-based instruments, European and American aircraft and some 600 sounding balloons equipped with ozone detectors will monitor the evolution of the high atmosphere over the Arctic and Northern Europe. These observations will be supplemented by measurements taken by instruments on board Earth-observation satellites, such as *GOME* (global ozone monitoring experiment) which equips the *ERS-2* satellite of ESA. — *ESA.*

❑ **Rohde & Schwarz to supply analysers to SES/Astra.** *Rohde & Schwarz* has received an order from European satellite operator *SES/Astra* for the supply of digital video quality (DVQ) analysers. With DVQ, digital television channels can, for the first time, be monitored for the quality of service in real-time and without a reference signal. SES/Astra with more than 400 digital television channels offered to the viewer will be using the DVQ units for safeguarding service quality through continuous monitoring.

DVQ determines the picture quality in relation to digital compression and evaluates the results according to subjective criteria of visual perception. It also registers typical impairments like picture freeze as well as picture and audio loss and records all results. DVQ comprises an MPEG2 decoder and can be extended with various modules to decode protected programmes. — *Rohde & Schwarz.*

❑ **Europe to build a series of satellites to help with world meteorological surveillance**. The European Space Agency (ESA) and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) are to sign a contract with *Matra Marconi Space* for the development and manufacture of three *METOP* satellites.

These satellites will constitute Europe's first polar-orbit system

BIHTEL 2000

Telecommunication networks

The Faculty of Electrical Engineering of the University of Sarajevo will organize the Third International Conference on Telecommunications (BIHTEL 2000), on the theme "Telecommunication networks". BIHTEL 2000 will be held in Sarajevo from 23 to 25 October.

Conference themes

- Convergence of stationary and mobile networks
- Terrestrial and satellite systems of mobile radiocommunications
- IP telephony
- New telecommunication services (CATV, VPN, in-service and Internet).

Call for papers

Authors are requested to apply to the organizer at the address below for the submission of papers for BIHTEL 2000 by 1 April.

The application should be accompanied by a summary of the paper (up to 150 words) in English.

Deadlines

- 15 April: acceptance of papers
- 15 July: submission of final papers
- 15 September: acceptance of papers
- 10 October: printing of the Proceedings of the Conference.

For all additional information, please contact the organizer: "The Faculty of Electrical Engineering, BIHTEL 2000, Skenderija 70, 71000 Sarajevo (Bosnia and Herzegovina)".

Contact persons: "Dragoljub Milatovic and Fatih Imamovic. Tel./fax: +387 71 654 972. E-mail: bihtel@etf.unsa.ba".

devoted to operational meteorology and climate monitoring. The first satellite is to be launched in 2003. It will orbit at around 840 km, which is much lower than the *Meteosat* geostationary meteorological satellites, whose equatorial orbit is at around 36 000 km. Meteosat satellites, which were also developed by ESA and now belong to and are operated by EUMETSAT, have been in space since the late 1970s. They are soon to be replaced by second-generation Meteosat satellites. The METOP satellites will provide additional sounding data as well as images, and will cover virtually the entire globe daily. — *ESA*.

❑ **Motorola and Logica launch GPRS billing solution.** At the GSM World Congress in Cannes (France) in February 2000, Motorola, Inc. and Logica plc launched their jointly developed *Smart Mediator*, a data billing solution for GSM and general packet radio service (GPRS) network operators. With the advent of mobile Internet access, it can be difficult to determine who earns what in providing applications and content. Smart Mediator addresses the operator-subscriber relationship from within the GSM/GPRS network by recording and analysing the subscriber call detail records from the data network. It then delivers compressed statistics to the operator's billing system for invoicing — by event, call duration, amount of data transferred, application accessed, time of network access, location of subscriber and type of subscriber device. — *Motorola*.

❑ **France Télécom creates the Business Angels network**. *France Télécom*, through its venture-capital subsidiary *Innovacom*, has launched an association called the "Innovacom Business Angels Circle", bringing together French businessmen who in recent years have successfully created international telecommunication or Internet companies and are now prepared to invest in new, innovative companies and provide advice to their founders.

In 1998, Innovacom became France's leading venture-capital company in terms of the number of companies financed, and it expects the new network to increase significantly the number of companies created as a result of research work carried out by public, private or industrial laboratories.

The association has 25 founding members, all of whom have succeeded in setting up a company in one of the fields of information technology, be it microelectronics, the Internet, or telecommunication networks. — *France Télécom*.

❑ **A new joint venture for European Internet and e-business.** BT has teamed up with United States-based companies VerticalNet, Inc., an owner and operator of Internet business-to-business trading communities and Internet Capital Group (ICG), an Internet holding company engaged in business-to-business e-commerce to form a joint venture named "VerticalNet Europe". The new venture is expected to create powerful Internet business communities across Europe and will be supported by more than USD 227 million in cash and assets from the three partners. The combined cash contribution of 107 million in financing is said to be one of the largest amounts raised for a business-to-business Internet company. BT will have a 33 per cent stake, valued at around 75 million and VerticalNet, Inc., will be a majority shareholder in the venture. As part of the deal, VerticalNet Europe and BT have agreed to create VerticalNet UK Ltd., as a joint venture to enable British companies to engage in e-commerce and auction activities. Within each distinct VerticalNet website, businesses will meet, seek and exchange information and buy and sell products and services. — *BT*.

❑ **Global One welcomes resolution of its ownership.** Global One, formerly a joint venture of *France Télécom*, *Deutsche Telekom* and Sprint, has announced that it has welcomed the clarification of its ownership issue and the announcement that France Télécom has become its sole owner.

Global One, which in 1999 had revenues of some USD 1.1 billion, constitutes a valuable operation for France Télécom. The company's other assets are its primary focus on multinational customers and their suppliers, a global network infrastructure to support global and converged services, and operating licences around the world. Based on a transition agreement, Sprint and Deutsche Telekom will continue supporting existing Global One customers under current conditions for up to two years. Also, all existing agreements will be fully supported under the terms and conditions of their original contract. Global One plans to set up a strong operational and sales presence in the United States and Germany in line with France Télécom's plans for these markets. — *Global One*.

❑ **Intelsat files application for United States licences.** Intelsat LLC, which was created recently as a result of the on-going efforts to privatize the International Telecommunications Satellite Organization (INTELSAT), has applied for authority from the United States Federal Communications Commission (FCC) to operate INTELSAT's

C- and Ku-band global satellite system. The application seeks United States licences for 17 in-orbit satellites, 10 replacement satellites, and 13 orbital redeployments.

The application was made in the light of INTELSAT's plan to privatize by 1 April 2001. In this connection, the orbital positions and frequencies now registered internationally for INTELSAT's use will become part of a national registry and licensed to INTELSAT's private successor company. Currently, INTELSAT, as an intergovernmental entity established by international treaty, is not directly licensed by the FCC or its counterpart in any other country. — *INTELSAT*.

❑ **Thuraya signs service provider agreement with Kuwait.** *Thuraya Satellite Telecommunications Company* has announced the conclusion of a service provision agreement with *Mobile Telecommunications Company* (MTC) of Kuwait.

As part of the agreement, MTC will have all rights to distribute and market Thuraya's services and products, including user terminals, SIM cards, as well as billing and customer care management, throughout Kuwait.

Thuraya will launch its satellite in mid-2000 and start services in the last quarter of the year. Services will include voice (comparable to GSM quality), fax, messaging (GSM short messaging service) and location determination (global positioning system — GPS) to 99 nations spanning Europe, North and Central Africa, the Middle East, Central Asia and the Indian subcontinent. — *Thuraya*.

❑ **Qantas launches new network to improve passenger service.** Based on the latest Internet technologies, Qantas — a member of the International Society for Aeronautical Telecommunications (SITA), actively involved in developing global telecommunication solutions for the air transport industry — has launched a new AUD 250 million telecommunication network to connect all of its airport and administrative offices around the world.

The international component of the new *QIPNet* (Qantas Internet Protocol Network) system has been designed, built and managed by SITA to connect more than 1200 workstations at 56 sites in 30 countries. — *SITA*.

❑ **PanAmSat selects Sea Launch for deployment of "Galaxy-IIIC".** PanAmSat Corporation has announced that it has inked a multi-launch agreement with Sea Launch Company to deploy up to five new spacecraft, including the advanced *Galaxy-IIIC* satellite. The agreement foresees the launch of the satellite during the second quarter of 2001 and provides PanAmSat with the option for four additional Sea Launch missions through 2003.

The satellite, which contains 24 C-band and 52 Ku-band transponders, will provide video, Internet and telecommunication services throughout the United States and Latin America from its orbital location at 95° W. — *PanAmSat*.

❑ **Bouygues Telecom and Alcatel sign MoU for 3G mobile networks in France.** To collaborate on the development of third generation (3G) digital mobile communication systems, *Bouygues Telecom* and *Alcatel* have signed a Memorandum of Understanding, which aims to boost the universal mobile telecommunications service (UMTS) market in France.

Alcatel will use its expertise in radiocommunications to help Bouygues prepare a comprehensive application for a UMTS licence from ART, *Autorité de régulation des télécommunications* (France's telecommunication regulatory authority). Alcatel will work on the architecture of the UMTS network and the radio measurement in the field, and also contribute to the business model and network design and planning. Bouygues will participate in the integration of Alcatel end-to-end systems during 2000. Alcatel will provide Bouygues with a pilot network for testing mobile multimedia and Internet services during 2001. — *Alcatel*.

❑ **"AsiaSat-3S" to expand satellite services within the Indian broad-cast industry.** *Asia Satellite Telecommunications Company Limited* (AsiaSat) and *Sahara TV* have entered into a lease agreement for a 36 MHz C-band transponder on *AsiaSat-3S*. Sahara TV will use the capacity to launch one analogue free-to-air variety entertainment channel in March 2000.

The new channel will carry distinctive programming ranging from serials, game shows, debates, talk shows, soap operas to news and current affairs catering for different segments of audience.

AsiaSat-3S's extensive regional coverage gives Sahara TV immediate access to numerous cable television operators across the Indian land mass as well as to a vast market of the Indian community in some 50 countries of the satellite's footprint. — *AsiaSat*.

❑ **Webraska and Alcatel demonstrate new street-level maps on WAP mobile phones.** Webraska Mobile Technologies and *Alcatel* unveiled at the GSM World Congress in Cannes (France) in February 2000, a new service that relies on positioning technology to display mobile phone users' location on a map.

Using advanced positioning technology by Alcatel and powered by the *HomeTop Solutions Internet* portal, mobile phone users can choose to have their phone located and then be able to visualize their position on a map and query the phone for a list of the nearest facilities (restaurants, hotels, parking spaces, etc.). Once they have chosen their destination, users will be guided to it with written directions, maps indicating the full itinerary as well as section-by-section maps that change as they move towards their destination. — *Alcatel*.

❑ **NTT Com expands international free dial service area.** *NTT Communications Corporation* has announced that it has added China to its international free dial service area. This service enables callers abroad to dial certain pre-designated telephone numbers in Japan, with the applicable charges billed to the receiver in Japan. — *NTT Com*.

❑ **Motorola and Telsim sign USD 1.5 billion GSM deal.** Motorola, Inc. and Turkish GSM operator *Telsim* have announced the signing of a contract worth USD 1.5 billion to provide infrastructure, handsets and associated services in order to expand GSM communications network countrywide. Motorola will also implement a full trial overlay general packet radio service (GPRS) core mobile data network.

At present, 2.8 million subscribers use the Telsim network, the new deal will expand coverage to over 5 million subscribers by year-end 2000. The contract includes supplying Telsim with Motorola's WAP-enabled mini-browser *Timeport P7389* handsets, expected to be available in the second quarter of 2000, on the GSM network. — *Motorola*.

❑ **Tele Danmark sets up infrastructure in Germany.** *Tele Danmark* has announced an agreement to establish a 2700-km fibre-optic network in Germany. The German company *Bresler Trassen Management* will be supplying this network to form an integral part of Tele Danmark's international infrastructure called TeamNet.

By expanding TeamNet in Germany, Tele Danmark hopes to strengthen its position in North-West, East and Central Europe. The fibre-optic network features high-capacity transmission infrastructure interconnecting the six large German cities of Hamburg, Berlin, Frankfurt, Düsseldorf, Stuttgart and Munich. With this new part of TeamNet, *Talkline* (Tele Danmark's fully-owned German subsidiary) will have access to cheaper and stronger capacity for its customers The network will be put into operation on an ongoing basis and will be completed by year-end 2000. — *Tele Danmark*.

❑ **Cable & Wireless HKT signs contract with Fujitsu for digital switching system.** *Fujitsu Limited* has signed a three-year contract valued at some USD 50 million for the supply of digital switching systems to Cable & Wireless HKT.

The contract covers deployment of Fujitsu's *FETEX-150* switching systems, including the enhanced *FETEX-150 E-cube* models capable of handling Internet Protocol switching. The E-cube system architecture is designed for both voice and data applications, making possible true voice/data convergence in the public network. — *Fujitsu*.

❑ **Jordan opts for intelligent network services from Siemens.** *Fastlink*, Jordan's sole GSM mobile communications carrier, has signed a contract with *Siemens Information and Communication Networks* (ICN) to add intelligent network services to carrier's mobile communications network. Under the terms of the agreement, ICN will supply a prepaid solution based on *INXpress*, the platform for intelligent network services from Siemens which will enable Fastlink to offer customers a whole range of state-of-the-art services. — *Siemens*.

❑ **PanAmSat granted new carrier licence in Peru.** PanAmSat Corporation has announced that Peru's Ministry of Transportation and Communications (MTC) has granted the company a new carrier licence the "Concession for the provision of public national and international long distance carrier services". This licence will enable PanAmSat to provide satellite-based Internet and telecommunication services directly to the Peruvian market for the first time. Previously, the company co-ordinated these services through *Telefónica del Perú*. The licence also provides PanAmSat the future option of offering switched telephony services throughout the country.

The company plans to deploy two more spacecraft in the region, the *PAS-1R* and *PAS-9* satellites, as part of its seven-satellite expansion and backup plan. Upon completion, the company's twelve-year investment in advanced satellite services for Latin America will approach USD 2 billion. — *PanAmSat*.

❑ **QUALCOMM acquires SnapTrack.** QUALCOMM Incorporated has announced that it will acquire SnapTrack, Inc., a developer of wireless position-location technology, to enable broad new applications for mobile location-based services and wireless Internet systems. QUALCOMM will pay USD 1 billion in stock for the acquisition of SnapTrack. Completion of the agreement,

which is subject to regulatory approval and other customary closing conditions, is expected by mid-March 2000.

The solution that will result from the combined technology of the two companies is targeted for wireless applications worldwide and will be designed to operate in existing CDMA, PDC, GSM, TDMA and iDEN networks, as well as in new third generation CDMA systems. — *QUALCOMM*.

❑ **Turkmenistan to host Telecommunications Trade Fair.** *TurkmenTel 2000*, the first Turkmenistan Telecommunications and Information Technology Exhibition, will be held in Ashgabat from 15–17 March with more than 40 international exhibitors, 10 000 trade visitors and specialists expected to attend the event.

TurkmenTel 2000 reflects the huge amount of investment currently taking place in telecommunications in the region and the Turkmenistan Government has announced a ten-year plan for the telecommunication sector. Furthermore, the Japanese Government has allocated an estimated USD 90 million towards developing communications in Turkmenistan which is due to be granted during the period 2000–2005. — *Turkmentelecom*.

❑ **ETSI to develop new standards for e-commerce.** In January 2000, some 20 companies and authorities from all over Europe joined a meeting of the Electronic Signature and Infrastructure Working Group of the European Telecommunications Standards Institute to start work on the second phase of activities aimed at developing four new standards as part of the European Electronic Signature Standardization Initiative (EESSI) work programme. This work programme supports the implementation of the European Union Directive on electronic signatures. The aim of this work is to create a common framework for electronic signatures, which is an essential condition for an open and secure electronic commerce environment.

The tasks for ETSI are to develop standards for policies for certificate service providers, electronic signature formats, a profile for qualified certificates, a profile for protocol and format for time stamps.

The ETSI Technical Committee is currently developing new standards in the electronic signature domain to prevent fraud and provide a secure and trustworthy e-commerce environment. — *ETSI*.

❑ Structural changes

in Cuba

The creation of the *Ministerio de la Informática y las Comunicaciones*. This Ministry will take over all the tasks and functions hitherto performed by the *Ministerio de Comunicaciones*, as well as all those relating to information technology and electronics hitherto performed by the *Ministerio de la Industria Sideromecánica y la Electrónica*.

in Mauritania

A new Telecommunication Regulatory Authority has been established which is independent from the OPT. This authority is empowered to represent Mauritania in regional, subregional and international telecommunication organizations and is invested with full regulatory powers in respect of the telecommunication sector.

❑ Personnel changes

in Bulgaria

Mr Antoni Slavinski has been appointed Minister of Transport and Communications.

in Cape Verde

Mr David Gomes has been appointed Director-General, *Direcção Geral das Comunicações*, Ministry of Infrastructure and Housing.

in Côte d'Ivoire

Mr Abdoulaye Coulibaly has been appointed Minister in charge of Infrastructure and Transports.

in Cuba

Mr Ignacio González Planas has been appointed Minister of Information Technology and Communications.

in Iran (Islamic Republic of)

Mr Ali Asghar Dolatabadi has been appointed Director-General of Telecommunications, Ministry of Posts, Telegraph and Telephone.

in Israel

Mr Asher Gil has been appointed Director, International Organizations Department, Ministry of Communications.

in Mauritania

Mr Sidi Abdallah Ould Kerkoub has been appointed Director-General, Telecommunication Regulatory Authority, Ministry of the Interior, Posts and Telecommunications. Mr Ahmedou Ould Mohamed El Kory has been appointed Director-General, *Société Mauritanienne des Télécommunications* (MAURITEL).

in Oman

Mr Suhail bin Mustahail bin Salem Shamas has been appointed Minister of Communications.

in Paraguay

Mr Victor Alcides Bogado González has been appointed Chairman, *Comisión Nacional de Telecomunicaciones* (CONATEL).

in Viet Nam

Mr Nguyen Thanh Hung and Ms Quan Duy Ngan Ha have been appointed Director-General and Deputy Director-General, Science-Technology and International Cooperation Department, DGPT-ITU Administration, respectively. — *ITU Notification Nos. 1386 and 1387*.

ITU Conferences

The calendar for all ITU conferences and meetings can be found on the Web at: http://www7.itu.int/events-public

2000

- **10–15 April (Rio de Janeiro) ITU TELECOM AMERICAS 2000**
- **1–5 May (Istanbul, Turkey) Radiocommunication Assembly (RA-2000)**
- **8 May–2 June (Istanbul) World Radiocommunication Conference (WRC-2000)**
- **19–28 July (Geneva) Council 2000 (C-2000)**
- **27 September–6 October (Montreal, Canada) World Telecommunication Standardization Assembly (WTSA-2000)**
- **4–9 December (Hong Kong) ITU TELECOM ASIA 2000**

General Secretariat

- 3–7 April (Geneva) Working Group on ITU Reform (second meeting)
- 19–28 July (Geneva) Council 2000 (C-2000)
- 6–10 November (Geneva) Working Group on ITU Reform (third meeting)

Telecommunication Development Sector

- 13–15 March (Djibouti) Subregional seminar on NICTs for the protection of the environment and the achievement of sustainable development
- 13–17 March (Chisinau, Moldova) User/supplier regional forum in digital switching for CEE and CIS countries
- 4–7 April (Bratislava) Regional seminar for CEE countries on interconnection, universal access and service issues for regulators
- 25–29 April (Banjul) Workshop on cost calculation for English-speaking West African countries
- 9–12 May (Budapest) Regional seminar for Europe on the regulation of telecommunication markets (optimal solutions in privatization)
- 22–26 May (Russia) Subregional workshop on tariffs for CIS countries
- 21–23 June (Bridgetown) CBU/ITU/FES/UNESCO seminar on challenges to broadcasting in the Caribbean
- 21–27 June (Ouagadougou) Regional meeting on HRD for French, Spanish and Portuguese speaking countries of Africa
- 5–9 September (Bishkek, Kyrgyzstan) Subregional seminar on international telecommunication law for the CIS
- 11–15 September (Geneva) Third meeting of Study Group 1
- 18–22 September (Geneva) Third meeting of Study Group 2
- 9–13 October (Geneva) Fourth meeting of the Telecommunication Development Advisory Group (TDAG) and related subgroups
- 23–27 October (Armenia) Pricing for frequency usage

Radiocommunication Sector

- 13–17 March (Geneva) Working Party 8A (Land mobile service excluding IMT-2000; amateur and amateur-satellite services)
- 13–17 March (Geneva) Joint Rapporteurs Group 8A-9B (Wireless access)
- 3–7 April (Islamabad) Regional Radiocommunication Seminar
- 1–5 May (Istanbul) Radiocommunication Assembly (RA-2000)
- 8 May–2 June (Istanbul) World Radiocommunication Conference (WRC-2000)
- 5–9 June (Istanbul)* Conference Preparatory Meeting (CPM)
- 5–9 June (Istanbul)* Radiocommunication Study Group Chairmen and Vice-Chairmen Meeting (CVC)
- 28 June–11 July (Geneva) Working Party 3K (Point-to-area propagation)
- 28 June–11 July (Geneva) Working Party 3M (Point-to-point and Earth-space propagation)
- 29 June–11 July (Geneva) Working Party 3J (Propagation fundamentals)
- 4–10 July (Geneva) Working Party 3L (Ionospheric propagation)
- 12–13 July (Geneva) Study Group 3 (Radiowave propagation)
- 1 August (Canada) Working Party 7B (Space radio systems)
- 1 August (Canada) Working Party 7C (Earth exploration satellite systems and meteorological elements)
- 1 August (Canada) Working Party 7D (Radio astronomy)
- 21–26 August (Atlanta, GA) Working Party 8F (IMT-2000 and systems beyond IMT-2000)
- 11–15 September (Geneva) Radio Regulations Board (RRB)
- 13–19 September (Geneva) Working Party 10B (Terrestrial sound broadcasting at frequencies above 30 MHz)
- 13–19 September (Geneva) Joint Working Party 10-11Q (Audio and video quality assessment)
- 13–19 September (Geneva) Joint Working Party 10-11R (Recording for broadcasting)

* CPM together with CVC meeting.

ITU Conferences *(continued)*

- 13–21 September (Geneva)
Working Party 11C (Terrestrial television (emission and planning parameters))
- 13–22 September (Geneva)
Joint Working Party 10-11S (Satellite broadcasting)
- 14–22 September (Geneva)
Working Party 11A (Television systems and data broadcasting)
- 18–21 September (Geneva)
Working Party 10C (Audio-frequency characteristics of sound broadcasting signals)
- 18–21 September (Geneva)
Task Group 11/5 (Interactive television broadcasting system)
- 18–21 September (Geneva)
Joint Task Group 10-11 (Multimedia broadcast evolution and common content format)
- 18–22 September (Geneva)
Working Party 10A (Sound broadcasting at frequencies below 30 MHz and antennas for sound broadcasting)
- 18–22 September (Geneva)
Working Party 11B (Digital television (source coding))
- 18–25 September (Geneva)
Working Party 9A (Performance and availability, interference objectives and analysis, effects of propagation, and terminology)
- 18–26 September (Geneva)
Working Party 9B (Radio-frequency channel arrangements, radio system characteristics, interconnection, maintenance and various applications)
- 18–26 September (Geneva)
Working Party 9D (Sharing with other services (except for the fixed-satellite service))
- 20–22 September (Geneva)
Working Party 4SNG (Satellite news gathering (SNG), outside broadcast via satellite)
- 20–26 September (Geneva)
Working Party 4B (Systems, performance, availability and maintenance)
- 25–26 September (Geneva)
Working Party 9C (HF systems)
- 25–27 September (Geneva)
Study Group 10 (Broadcasting service (sound))
- 25–27 September (Geneva)
Study Group 11 (Broadcasting service (television))
- 25 September–3 October (Geneva)
Working Party 4A (Efficient orbit/spectrum utilization)
- 27 September (Geneva)
Study Group 9 (Fixed service)
- 27 September–4 October (Geneva)
Working Party 4-9S (Frequency sharing between the fixed-satellite service and the fixed service)
- 4 October (Geneva)
Study Group 4 (Fixed-satellite service)
- 5 October (Geneva)
Joint Study Groups 4 and 9 meeting
- 9–17 October (Geneva)
Working Party 7A (Time signals and frequency standard emissions)
- 9–17 October (Geneva)
Working Party 7B (Space radio systems)
- 9–17 October (Geneva)
Working Party 7C (Earth exploration satellite systems and meteorological elements)
- 9–17 October (Geneva)
Working Party 7D (Radio astronomy)
- 9–18 October (Geneva)
Working Party 8A (Land mobile service excluding IMT-2000, amateur and amateur-satellite services)
- 17–27 October (Geneva)
Working Party 8D (All mobile satellite services and radiodetermination satellite service)
- 18–19 October (Geneva)
Study Group 7 (Science services)
- 18–27 October (Geneva)
Working Party 8B (Maritime mobile service including Global Maritime Distress and Safety System (GMDSS); aeronautical mobile service and radiodetermination service)
- 23–27 October (Geneva)
Working Party 8F (IMT-2000 and systems beyond IMT-2000)
- 23–31 October (Geneva)
Working Party 1A (Spectrum engineering techniques)
- 23–31 October (Geneva)
Working Party 1B (Spectrum management methodologies)
- 23–31 October (Geneva)
Working Party 1C (Monitoring spectrum)
- 23–31 October (Geneva)
Task Group 1/5 (Unwanted emissions and the modification of Recommendation ITU–R SM.328-8 concerning out-of-band emissions)
- 24–25 October (Geneva)
Task Group 10/6 (Digital sound broadcasting at frequencies below 30 MHz)
- 26 October (Geneva)
Study Group 10 (Broadcasting service (sound))
- 30–31 October (Geneva)
Study Group 8 (Mobile radiodetermination amateur and related satellite services)
- 1–2 November (Geneva)
Study Group 1 (Spectrum management)
- 6–10 November (Geneva)
Radiocommunication Seminar
- 20–24 November (Geneva)
Radio Regulations Board (RRB)

Telecommunication Standardization Sector

- 7–17 March (Geneva)
Study Group 2 (Network and service operation) and its Working Parties
- 8–9 March (Nairobi)
Regional Tariff Group for Africa
- 9 March (Kyoto, Japan)
Working Party 1/11 (Signalling for broadband and multimedia networks and services)

ITU Conferences *(continued)*

• 20–31 March (Geneva)
Study Group 7 (Data networks and open system communications) and its Working Parties

• 3–14 April (Geneva)
Study Group 15 (Transport networks, systems and equipment) and its Working Parties

• 12–18 April (Geneva)
Study Group 3 (Tariff and accounting principles including related telecommunications economic and policy issues) and its Working Parties

• 8–12 May (Geneva)
Study Group 6 (Outside plant) and its Working Parties

• 9–18 May (Geneva)
Study Group 12 (End-to-end transmission performance of networks and terminals) and its Working Parties

• 15–19 May (Geneva)
Study Group 9 (Television and sound transmission) and its Working Parties

• 7–14 June (Geneva)
Telecommunication Standardization Advisory Group (TSAG)

• 27 September–6 October (Montreal, Canada)
World Telecommunication Standardization Assembly (WTSA-2000)

Conferences external to the ITU

2000

• 13–14 March (London)
Data over mobile
Tel.: +44 171 252 2222
Fax: +44 171 252 2272

• 20–21 March (London)
Valuation and forecasting for telecoms
Tel.: +44 171 252 2222
Fax: +44 171 252 2272

• 20–21 March (Venice, Italy)
The European Telecoms Forum 2000
Tel.: +39 02 2845 7318
Fax: +39 02 2845 7313
http://www.idcresearch.it/forum/etf2000/

• 25–28 March (Beirut)
ARABCOM 2000 — Congress and exhibition on telecommunication development for the Arab States
Tel.: +961 5 450 212
Fax: +961 5 455 477
E-mail: ktayar@arabcom.com
http://www.arabcom.com

• 27–28 March (London)
Speech recognition for mobile
Tel.: +44 171 252 2222
Fax: +44 171 252 2272

• 27–30 March (Brussels)
International CBO Seminar — Reliability engineering in advanced technology and industry
Tel.: +31 10 413 9020
Fax: +31 10 411 8732

• 29–30 March (London)
Cable telephony
Tel.: +44 171 252 2222
Fax: +44 171 252 2272

• 4–5 April (Nice, France)
Wireless messaging
Tel.: +44 171 453 5495
Fax: +44 171 636 1976
E-mail: cust.serv@ibcuk.co.uk
http://www.ibctelecoms.com/eppa2000

• 10–14 April (Honolulu, HI)
NOMS 2000 — Network Operations and Management Symposium (IEEE/IFIP)
Tel.: +1 212 705 8941
Fax: +1 212 705 8999
E-mail: noms2000@comsoc.org
http://www.noms.org/2000

• 11–12 April (London)
IP Telephony 2000
Tel.: +44 171 453 5495
Fax: +44 171 636 1976
E-mail: cust.serv@ibcuk.co.uk
http://www.ibctelecoms.com/ip2000

• 12–13 April (London)
Customer Relationship Management in Telecoms
Tel.: +44 207 252 2222
Fax: +44 207 252 2272
http://www.smiconferences.co.uk

• 25–28 April (Helsinki)
Mobile Communications 2000 Conference
Tel.: +358 9 4315 5333
Fax: +358 9 4315 5300
E-mail: kurssit@tieturi.fi
http://www.tieturi.fi/

• 28–31 May (Rabat)
Challenges for public broadcasting in Africa
Tel.: +1 514 524 8223
Fax: +1 514 524 8858
E-mail: CMRTV@courriel.qc.ca
http://www.orbicom.uqam.ca

• 27–30 June (Wroclaw, Poland)
15th International Wroclaw Symposium on Electromagnetic Compatibility
E-mail: emc@il.wroc.pl
http://www.emc.wroc.pl

• 10–13 July (Guildford, United Kingdom)
Eighth International Conference on HF radio systems and techniques
Tel.: +44 171 344 5471
Fax: +44 171 240 8830
E-mail: hf2000@iee.org.uk
http://www.iee.org.uk/Conf/

• 23–25 October (Sarajevo)
BIHTEL 2000 — Telecommunication networks
Tel./fax: +387 71 654 972
E-mail: bihtel@etf.unsa.ba