ITU NEWS

JULY 2000

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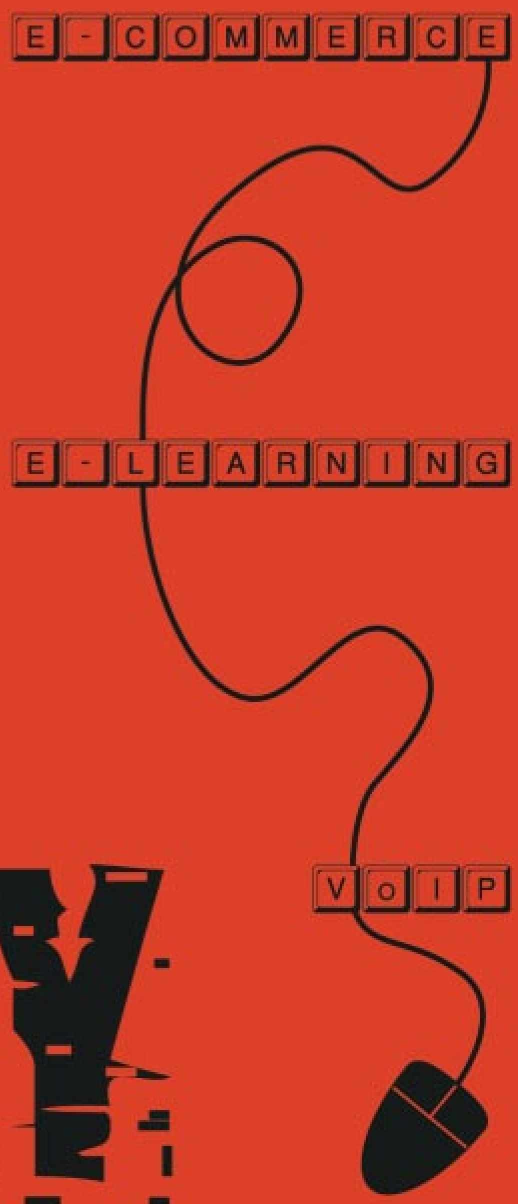

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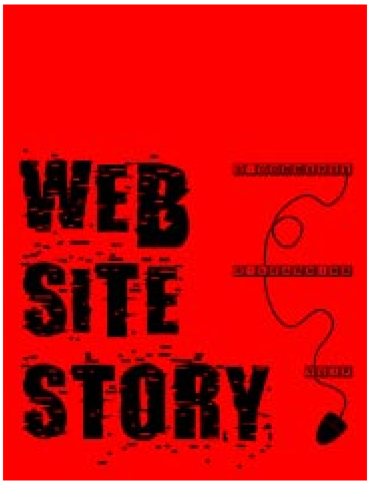

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ITU TELECOMMUNICATION INDICATORS UPDATE

We are all aware of the extraordinary changes taking place in the telecommunications world and the need for reliable, up-to-date and comparable indicators for analysing the industry and benchmarking the effectiveness of public policies. This includes measurements for comparing universal service, network progress and performance, as well as macro-economic indicators to gauge the impact of telecommunications on social and economic development. There is also an urgent need to evaluate the benefits and costs of liberalization, privatization, competition and globalization in the sector in order to inform policy-makers and others about these reform options and their effects.

It is, therefore, with great pleasure that we introduce a new four-page insert known as *ITU TELECOMMUNICATION INDICATORS UPDATE,* to be published four times a year in the centre pages of *ITU News*. The work of the International Telecommunication Union in telecommunication statistics goes back a long way. However, it is really since the establishment of the Telecommunication Development Bureau (BDT) in the early 1990s that the ITU begun to use data regularly in an analytical way to gauge network developments worldwide.

The ITU now produces a number of reports which track the information needed by governments and regulators to formulate suitable policies. The best known is, undoubtedly, the *World Telecommunication Development Report* (WTDR) which is published annually. Its popularity has led us to launch the *ITU TELECOMMUNICATION INDICATORS UPDATE,* designed to give you regular updates in key areas of growth in the interval between the publication of the WTDR.

Each insert will feature four main headings: a short review of one of the ITU indicators products, an update of the key telecommunication indicators, an overview of a specific, fast developing "hot topic", and a country profile.

In this first UPDATE, you will find an overview of a report launched by ITU at the recent TELECOM AMERICAS 2000 Exhibition and Forum in Rio de Janeiro, *Americas Telecommunication Indicators 2000*, which focuses on how the telecommunication reform programmes of the last decade are shaping the market of the coming decade and reviews telecommunication developments in the emerging economies of the western hemisphere.

The UPDATE also surveys the mobile sector as a key driver of growth for most telecommunication markets. In particular, it provides interesting data on mobile cellular subscribers worldwide from 1990 to 1999. The explosion of electronic messages sent via mobile telephones, particularly in Europe, is also reviewed, providing interesting findings on usage trends in relation to the cost structure.

Finally, Uganda is featured as a country profile. Uganda's telecommunications sector is now one of the most liberalized markets in Africa and its aggressive expansion policies are bearing fruit with a remarkable threefold increase in the country's teledensity in just four years.

We hope that these quarterly updates will meet your requirements for critical up-to-date information, adding to our palette of top-class products aimed at helping our Members make informed decisions.

Hamadoun I. Touré
Director, Telecommunication Development Bureau

Japan makes voluntary contribution to support ITU's strategic priorities

The Ministry of Posts and Telecommunications of Japan recently made a voluntary contribution to support efforts by the International Telecommunication Union to facilitate implementation of a series of new initiatives adopted by Council at its 1999 session.

Front row, Masato Shinagawa, Japan's Vice-Minister for International Affairs (left), and Roberto Blois, ITU Deputy Secretary-General (right). Back row, Mohamed Harbi, Head of Strategic Planning, External Affairs and Corporate Communications (left), and Gary Eidet, Head of the Finance Department (right)

Photo: A. de Ferron (ITU 000033)

Handing a donation of CHF 700 000 to ITU Deputy Secretary-General, Roberto Blois, Japan's Vice-Minister for International Affairs, Masato Shinagawa said: "We very much hope that our contribution will support the strategic activities of the ITU in response to the new era, as well as help to further the development of world telecommunications in the new millennium." The signing ceremony to receive the fund took place at the ITU headquarters in the presence of ITU Secretary-General, Yoshio Utsumi.

Mr Shinagawa made special reference to the revolutionary changes characterizing the new telecommunications era and the need to support ITU's efforts in bringing the benefits of these changes to the world at large. "In particular, the development of IP-based and mobile networks, as well as notable advances in information technologies are creating sophisticated multimedia applications and services that are helping to bring about the Global Information Society with worldwide economic and social benefits."

The donation was made in recognition of the key role that ITU should play in these challenging areas, including policy and regulatory aspects. Mr Shinagawa added that such a role was particularly crucial "in supporting the development of a framework for creating the common understanding and cooperation among Members and other international bodies that is essential in achieving progress in telecommunications".

Receiving the donation Mr Blois said: "I should like to extend to your Ministry our deep appreciation for this contribution that will truly enhance the activities of the Union. Your gesture clearly demonstrates your determination to support ITU to achieve its objectives. Let me assure you that this fund will be put to good use in the spirit of the ITU Strategic Plan 1999–2003."

Two workshops organized under the "New Initiatives" programme and funded from the donation, have already been carried out. The IP telephony workshop, held in Geneva from 14 to 16 June 2000, was the second in a series of expert meetings (see Chairperson's Report on pages 3 to 5). The first was the meeting of high-level experts held at year-end 1999 on the topic of electronic signatures and certification authorities and their implications for telecommunications*. Preparations are under way for another workshop in September 2000 on fixed/mobile interconnect.

* The group of experts discussed a range of issues covering the regulatory, technical and legal obstacles to the use of authentication technologies across borders and the role that ITU and other organizations can play in overcoming these obstacles. It agreed on a set of recommendations on areas where the ITU would have a useful role to play (see *ITU News*, January-February 2000, pages 16–19, and March 2000, pages 3–8).

New initiatives

IP telephony workshop

Chairperson's report

At the invitation of ITU Secretary-General, Yoshio Utsumi, a workshop was held in Geneva from 14 to 16 June 2000 to discuss the economic and regulatory implications of IP telephony and its likely impact on ITU Member States and Sector Members. The workshop was organized by the Strategies and Policy Unit (SPU) under the Secretary-General's "New Initiatives" programme. Some 34 experts from 21 ITU Member States participated in the meeting, representing a range of regulatory and policy-making agencies, public telecommunication operators, IP telephony service providers, equipment vendors, academic institutes and others. The two-day meeting was chaired by Anthony Wong, Director-General of the Hong Kong Special Administrative Region (SAR), office of the telecommunications authority.

A background paper along with a suggested list of questions for discussion had been prepared in advance by the secretariat. In addition, a number of country case studies had been commissioned, covering China, Colombia, Peru and Thailand*. These were presented, along with other country experiences. Other presentations covered the retail and wholesale businesses of IP telephony, technical standards, vendor perspectives, economic aspects and regulatory issues. This was the first ITU meeting on this emerging topic and it was agreed that the information provided and the discussion generated were extremely useful, especially to those currently involved in drafting national policies for IP telephony.

Divergent views were expressed over the definition of IP telephony, whether as a technology or as a service concept. For the purposes of the meeting, a distinction was drawn between "Internet telephony", which uses the public Internet, and "voice over IP" in which traffic travels over privately managed IP networks as well as over the public Internet. "IP telephony" was employed as a generic term covering both.

Several regulatory authorities had used measures of quality of service and delay to differentiate between IP telephony and public switched telephone network (PSTN) telephony. The consensus was that different definitions might be required for different market environments. Rapid technological change means that it may not be advisable to attempt precise definitions. In some IP voice applications, there is a clear trend towards a business model based upon free of charge use, funded by advertising.

Anthony Wong (ITU 000032)

At different levels of telecommunications development and market liberalization, the priorities in dealing with the issues raised by IP

* All of the meeting documents are available on the ITU website at http://www.itu.int/iptel.

telephony are likely to be different. Other important factors include:

- The type of service or application that is being offered.
- Whether it is a new entrant or an incumbent operator that is offering the service.
- The tariff structure of the incumbent operator, especially for access to the local loop.
- Whether or not the country concerned is a net recipient of international telecommunication settlement payments.
- Whether or not proportionate return of traffic is a regulatory requirement on international routes.

Categories of market environment

Several categories of market environment were identified, of which three are described below. These categories represent examples only and no attempt has been made either to fit specific countries into categories, nor to account for every situation.

■ In some countries, where long-distance and particularly international call tariffs are high, perhaps due to a lack of competition or due to cross subsidies to other services, the major opportunity for IP telephony service providers is for price arbitrage. Users may choose IP telephony offerings to avoid the high call tariffs levied by incumbent operators.

A concern for this group of countries relates to the use of IP telephony for incoming international calls that bypass the international accounting rate system. The case studies, and some reports from participants, have shown some evidence of a recent reduction in settlement payments due to the use of "compressed" or "packetised voice" on international IP circuits. However, the experience has been that it is very difficult to block incoming international IP telephony calls. The result has been lower net settlement payments, a dilution of the revenues of the incumbent operator and a possible loss of funds for network investment.

In some countries, outgoing IP telephony calls are banned. This precludes consumer benefits from lower-price IP telephony options and benefits to the operator in the form of cost savings.

Evidence from the case studies has suggested that, where IP telephony has been allowed, the competition introduced has contributed to a substantial reduction in the prices for international and long-distance calls, which in turn has brought about considerable consumer benefits. It is likely that the effect of lowering prices has been to stimulate demand, which will partially offset any possible revenue loss. Further research is required in this area.

■ A second group was identified of countries where call prices are already falling, for instance as part of a transition towards a more liberalized market. The case studies and evidence from other country contributions has shown that a decision not to prohibit IP telephony in such countries can facilitate the early introduction of a measure of competition to the markets for long-distance and international calls, leading to lower prices for consumers.

In some of these countries, IP telephony has been defined in such a way that it can be permitted without impinging upon existing carriers' licences and exclusivity periods. For instance, this could be done by defining IP telephony as a data service or a non-real-time voice service.

These regulatory distinctions may not be sustainable in the longer term but may be justified in the interests of extending consumer welfare, in advance of full market liberalization. The case studies demonstrated the high popularity of low-cost IP telephony services, and this has the effect of forcing the pace of tariff rebalancing by the incumbent. In several cases, incumbent operators have been encouraged as a result to invest in IP-based networks and to experiment with developing new IP-based services.

Until full liberalization, these regulatory distinctions may lead to anomalies, especially where technology is changing rapidly.

■ A third group was identified of countries where call prices are low, as a result of intense market competition. Here the arbitrage opportunities for IP telephony service providers are significantly reduced, though IP telephony may still offer carriers opportunities for cost reduction.

The volume of IP traffic has overtaken voice traffic in a number of these countries. Many carriers are creating or participating in global IP networks that will, in future, carry all of their voice and data traffic over the same network.

For consumers in countries where tariffs have already fallen sharply, quality of service and convenience of use are generally more important than in other countries where consumers may be more sensitive to price.

The main market opportunity for voice over IP applications in this group of countries is likely to be in the development of value-added applications, such as unified messaging and voice/Web integration.

Major issues for this group of countries include those related to interconnection and access, both between service providers and among operators of all types of communication networks. Examples include access to numbering resources, unbundling of local loops, sharing of directory information, offering of leased circuits at wholesale prices and number portability.

Further issues to be considered are the interworking and convergence between IP-based and circuit-switched networks, especially in view of the fact that it is anticipated that IP will be widely used in third generation (3G) mobile networks.

One regulatory question that is being addressed within countries in all market environments is whether or not IP telephony service providers should be required to meet universal service obligations, such as the provision of emergency calls, or to contribute towards universal service funds. The concept of functional equivalence between IP telephony and PSTN telephony was discussed as a possible analytical tool in countries which distinguish between reserved and non-reserved voice services.

In general, the impact of IP telephony on public telecommunication operators depends to a high degree on their underlying price structure. Where retail and wholesale tariff structures are cost-oriented, the possible negative impact on revenue is minimal, and incumbent carriers are better placed to exploit the possible opportunities for cost reduction and service innovation offered by IP-based networks. In economies where local calls are metered, a growing share of the local call traffic of public telecommunication operators is now coming from dial-up Internet use. However, the Internet has tended to grow fastest in environments where local call tariffs are unmetered or where local access networks are unbundled. Thus, pricing access to the local loop poses a dilemma for operators seeking to profit from the growth of the Internet as well as for regulators wishing to ensure the sustainability of investment in local access networks.

It was recognized that the rapid rate of technological change can easily overtake regulatory classifications. There was widespread support for the concept of technology-neutral regulatory treatment. A consistent approach to regulation may require that similar services be treated in the same way, independent of the underlying network or technology. However, in some environments, regulatory asymmetry will be an inevitable feature of transitional periods.

The group noted the important work being undertaken in ITU–T** Study Group 2 and the ETSI** TIPHON project on allocating an E.164 numbering resource and the IETF** ENUM project on interworking between IP networks and the international PSTN. A number reserved for UPT** (878) has been designated for the purposes of a trial, which does not interfere with national numbering plans.

There was considerable interest in further research on the factors influencing the cost structures of IP-based networks relative to circuit-switched networks. Available studies show divergent results. In some cases, it appears that IP-based networks can be more expensive as a solution for providing telephony. On the other hand, there are potential economies of scale to be gained from offering a unified voice and data network based on IP, bearing in mind the rapid growth of data traffic.

In considering IP telephony, it is important to set it in the context of the wider impact of the Internet on the economy. The Internet diffusion case studies being undertaken by the ITU have shown that the overall impact of the Internet on the economy has been positive. New IP infrastructures can support a variety of innovative services and applications, notably e-commerce. This would be a suitable topic for a future expert meeting.

** ITU–T = Telecommunication Standardization Sector of the ITU; ETSI = European Telecommunications Standardization Institute; IETF = International Engineering Task Force; UPT = Universal personal telecommunication.

WRC-2000 delivers on great expectations

The World Radiocommunication Conference (Istanbul, 8 May to 2 June 2000) took some ground-breaking decisions that will pave the way for the expansion of existing services and the development of new technologies and applications. WRC-2000 attracted some 2037 delegates from 150 countries, including 83 companies registered as part of their national delegations and 326 observers from 95 organizations (operators, manufacturers, international organizations and telecommunications-related organizations). This attendance represents a 30 per cent increase over WRC-97 and is a clear indication of the importance of the decisions made at such events.

IMT-2000 makes a giant leap to the mobile future

For the mobile industry, the stage is now set to deliver on its promise of International Mobile Telecommunications-2000, third generation (3G) mobile systems based on ITU Recommendations. Regarded by many delegations as the largest telecommunications project the ITU has ever undertaken, IMT-2000 is intended to bring high-quality mobile multimedia services to a worldwide mass market estimated to reach some two billion users by 2010.

One of the major outcomes of this world event was the identification of three additional terrestrial

WRC-2000 attracted some 2037 delegates from 150 countries and 178 companies and organizations
Photo: A. de Ferron (ITU 002041)

bands in the mobile service to complement the bands 1885–2025 and 2110–2200 MHz, initially identified for IMT-2000 by the World Administrative Radio Conference in 1992. The three new bands are: 806–960, 1710–1885 and 2500–2690 MHz. A number of bands were also identified for the satellite component of IMT-2000.

When the initial spectrum was identified for IMT-2000 back in 1992, voice services were considered to be the major source of traffic, and only low data rate services were additionally considered. With the passage of time and the advent of the Internet, intranet, e-mail, e-commerce and video services, the vision for IMT-2000 has significantly evolved. Users today have great expectations for multimedia services. It is this demand for higher bandwidth, coupled with the explosion in mobile penetration worldwide, that has given rise to a requirement for

Photo: A. de Ferron (ITU 002122)

an extra 160 MHz of common spectrum for IMT-2000 above and beyond what was foreseen in 1992.

Initial proposals tabled prior to WRC-2000 greatly differed both in national preferences and in approach. However, delegations at the Conference decided to work together to identify bands from which each country can determine the amount of spectrum to make available for IMT-2000 use. Seen by many as a giant leap forward for everyone's mobile future, the global consensus reached by ITU Members gives the flexibility to decide on the migration path towards 3G networks and services as well as the timescale for making use of these additional bands. At the same time, the agreement does not preclude the use of the additional bands for other types of mobile applications or by other services to which these bands are allocated — a key factor that paved the way for the consensus.

As ITU Secretary-General, Yoshio Utsumi put it: "The entire mobile industry was looking forward to

Delegations at the Conference decided to work together to identify bands from which each country can determine the amount of spectrum to make available for IMT-2000 use

Photo: A. de Ferron (ITU 002094)

clear signals from this Conference to overcome the last hurdle for global wireless systems. This landmark decision now provides a stable basis for investors to back up the industry and gives a clear go-ahead to manufacturers to start building equipment for IMT-2000 for their customers, operators, and consumers alike."

In summary, the outcome on IMT-2000 comprises:

- A new footnote to the Table of Frequency Allocations, and an associated resolution, identifying for IMT-2000 those parts of the band 806–960 MHz which are allocated to the mobile service on a primary basis.
- A second footnote, and an associated resolution, identifying the bands 1710–1885 and 2500–2690 MHz as additional frequency bands for IMT-2000.
- A third footnote and resolution identifying the mobile-satellite service bands below 3 GHz for possible use by the satellite component of IMT-2000.
- A fourth footnote and resolution contain provisions that will allow high altitude platform stations (HAPS) to be used as a platform for base stations for the terrestrial component of IMT-2000.

The Conference further requested the ITU to conduct a number of studies on the potential sharing and coordination between the satellite and terrestrial components of IMT-2000, between IMT-2000 and other mobile-satellite services operating in the same bands, broadcasting-satellite (television and sound), terrestrial mobile services and other high-density applications in other services such as point-to-multipoint communication and distribution systems.

In the next three years, ITU will conduct studies on the future evolution of IMT-2000, including the provision of IP-based applications and the impact on spectrum resources. It is also part of ITU's task in the coming years to complete signalling and communication protocols for IMT-2000 and to develop a common worldwide intersystem numbering plan and related network capabilities to facilitate worldwide roaming.

During the hard-fought negotiations, the Conference also addressed the requirements of developing countries and rural areas and requested ITU to provide guidance to ensure that IMT-2000 can meet those needs
Photo: A. de Ferron (ITU 002091)

During the hard-fought negotiations, the Conference also addressed the requirements of developing countries and rural areas in their efforts to join the global wireless information society. To this end, ITU has been asked to provide guidance to ensure that IMT-2000 can meet those needs.

The decision on IMT-2000 has come at a time when the licensing process, based on the initial IMT-2000 bands, is already gaining momentum in many countries throughout Europe, Asia and Latin America. Commercial operations in Europe and Asia are expected to commence between 2001 and 2002. More than 100 licences are expected to be awarded worldwide by 2002.

This decision also follows an earlier equally important milestone reached in May 2000 (also in Istanbul) when the ITU Radiocommunication Assembly unanimously approved the formal adoption of the first release of IMT-2000 radio interface specifications. Several senior government and industry officials expressed satisfaction shortly after the decision on IMT-2000 was taken.

UMTS Forum Chairman Bernd Eylert said: "It is an incredible milestone in the development of tomorrow's mobile networks, and a fantastic result for the entire global mobile industry. It is a clear and positive signal to all players." He remarked that for the UMTS Forum, which represents regulators, operators, manufacturers, media and IT players from all regions of the world, the decision was good news for the estimated two billion mobile users worldwide by 2010.

Mr Eylert added: "This decision is particularly welcome as it provides a solid basis for the regional introduction of 3G services, even in territories that were effectively blocked from the benefits of 3G in the past because of limited spectrum. This means that mobile users will be able to access their personal information services using affordable handheld terminals wherever they travel."

Vino Vinodrai, Director of Industry Relations and Research at Bell Mobility of Canada agreed that "the decision on spectrum now gives the assurance to operators that they can start building and deploying their IMT-2000 networks without capacity constraints. It definitely marks a major step in the IMT-2000 journey towards the global wireless information society and is a decision Bell Mobility applauds."

For Tim Hewitt, IMT-2000 Coordinator for Europe at WRC-2000: "The manufacturers worldwide now know the limits of the frequencies for which the terminals must be designed, within a clearly defined spectrum environment. By having a limited number of globally identified bands, the manufacturers have the best opportunity to reduce costs through economies of scale."

"Motorola is very pleased with the terrestrial IMT-2000 outcome and commends the efforts made in the spirit of compromise to reach the global objectives of IMT-2000", said Michael Kennedy, Corporate Vice-President and Director of Global Spectrum and Telecom Policy at Motorola. "The designation of global bands offers the flexibility that countries want and need in their implementation of IMT-2000 while allowing companies like Motorola to continue to develop ways of bringing low-cost, high-quality wireless Internet to the world", Mr Kennedy also said.

For Japan which has pioneered the mobile Internet, the decision is significant. "The decision taken by the Conference to provide additional spectrum for IMT-2000 is a major milestone", said Katsuya Watanabe, Director of Multimedia Mobile Communications at Japan's Ministry of Posts and Telecommunications. "The global mobile industry can now have the confidence to move ahead in developing 3G systems that will capture this new and exciting multimedia market. With the number of mobile Internet users growing roughly at a rate of 20 000 each day, this is very promising indeed for the rapid uptake of IMT-2000 in Japan", added Mr Watanabe.

"The flexibility built in the decision adopted by the Conference has been the key in rallying countries behind it", said Mofang Li, Chief Technical Officer at *China Mobile Communications Corporation*. "In China, we now have a customer base of over 50 million subscribers with a monthly growth of 2 to 3 million mobile subscribers. The choice of deployment strategies and flexibility in the use of spectrum were critical to China in meeting its particular market demands. With today's decision on harmonized additional spectrum worldwide, coupled with the decision earlier this month on a global standard for interoperable radio interfaces, consumers everywhere will soon reap the fruits of impressive economies of scale and enjoy the convenience of global roaming at affordable price", Mrs Li added.

Regions 1 and 3 get new BSS Plan

The Conference commended the Radiocommunication Bureau (BR) for developing a new broadcasting-satellite service Plan for Regions 1 (Africa and Europe) and 3 (Asia and Australasia) within less than three weeks. "The new BSS Plan is the jewel in the crown of achievements in this Conference. We have worked long and hard and are delighted with the outcome", said Ralph Zeitoun who chaired Working Group 1 of the Plenary that dealt with BSS replanning issues.

In particular, the new Plan accords generally one orbital position per country in Europe and Africa from which an equivalent of 10 analogue channels can be delivered. For Asia and Australasia, 12 analogue channels are available per country's orbital position. The decisions of WRC-2000 secure an economic capacity for each country to take up whenever market conditions are ripe without the fear of a shortage of spectrum in bands which are highly in demand by rapidly growing space-based systems and a host of other services.

Negotiations early in the day helped this agenda item on BSS replanning to make relatively smooth progress, except in the closing hours of the Conference when the delicate compromise reached earlier to address the concerns of all looked like it could be blown apart with a puff of wind. But in the end, the spirit of compromise and international cooperation prevailed.

The successful outcome of the negotiations on the BSS Plan is the result of a remarkable spirit of compromise and international cooperation
Photo: A. de Ferron (ITU 002093)

When the World Administrative Radio Conference developed the original BSS Plan for Regions 1 and 3 back in 1977, it allocated 5 channels of 27 MHz bandwidth to each country in those two Regions with a national service area. While some have regarded the original Plan as "a marvel of engineering ingenuity", critics have found it lacking in commercial viability, claiming that allocating five channels to a single satellite which beams to a single country was not a sound basis for business.

Be that as it may, until now, the use of these bands has been mostly through the application of the Plan modification procedure embodied in the Radio Regulations, which allowed a country to request more channels, a different service area or another orbital location. WRC-97, apart from allocating five channels to the 23 new countries created since 1977, updated parameters for the Plan in order to reflect the technological changes. While these new parameters facilitated entry of additional capacity in the Plan (through the modification procedure) they have led to a significant increase in the demand for additional channels.

By way of an example, more than 400 BSS systems had been filed with the BR by year-end 1997. These filings have to undergo a complex evaluation process and can become a part of the BSS Plan, if found acceptable. As experience showed at WRC-2000, very few of the systems filed under the modification procedures qualify to enter the BSS Plan.

The Conference noted that many countries that had applied the modification procedure experienced great difficulty in completing it and in entering additional channels in the Plan. These countries were therefore concerned that all their

Informal discussion among delegates
Photo: A. de Ferron (ITU 002089)

projects for an early implementation of economically viable BSS systems would be jeopardized by a replanning process that would only take into account systems having completed the procedure by the start of WRC-2000 while ignoring other systems. Furthermore, after replanning, the doubling of the capacity reserved by the Plan for national uses was expected to make future modifications even more difficult, since they would have to avoid and protect twice as many channels.

For many, the issue of whether or not to replan then boiled down to a question of either allowing viable systems now or enabling equitable access in the future. To make things more difficult, a number of countries requested the use of multinational beams. This resulted in drawing further spectrum/orbit resources into the new Plan.

In the end, WRC-2000 found a solution to all these concerns. Most of the additional systems (over 30) which had been entered in the Plan in the months and weeks preceding the Conference were taken into account, as were the multinational beams. At the same time, it was possible to provide 10 channels to Region 1 countries and 12 channels to Region 3 countries over a national service area. Thanks to the extraordinary work of BR, this was possible while ensuring full compatibility between all these networks.

WRC-2000 also managed to modify the technical criteria and the procedures so as to facilitate the compatibility with the other services using these bands and the future additional uses in the BSS in the three Regions, giving satisfaction to all parties involved. Additional studies will be conducted by ITU before WRC-2003 in order to refine these elements further.

GSO and non-GSO find a happy medium

Sharing between geostationary satellite (GSO) and non-geostationary satellite (non-GSO) systems in some specific frequency bands around 10–18 GHz was another tough battle that ended well. Intense private sector interest in the potential of satellite systems to deliver mobile voice and broadband data services has resulted in a large number of proposed new systems and services from non-GSOs. A number of these new non-GSO systems, soon to be deployed, and the new wave of GSO networks aim at providing high speed local access to global broadband communications services such as high speed Internet, corporate intranets/extranets, e-commerce, videoconferencing and interactive services.

In 1997, frequency spectrum was made available for the first time to enable the operation of the new non-GSO systems. At the time, it was decided to establish provisional power limits for the operation of these non-GSO systems so that they could share the frequencies with GSO networks. In the period between WRC-97 and WRC-2000, studies were conducted to determine whether those limits were suitable for sharing.

Despite the results of the studies, which seem favourable to the concept of shared use of the bands in question by non-GSO fixed-satellite service systems and GSO networks of the fixed-satellite service and the broadcasting-satellite service, an unexpected debate re-opened at the

Conference regarding the possibility to seek protection when there were power limits applicable to sharing between those systems. In the end, the conditions under which non-geostationary satellites will operate were agreed to the satisfaction of all parties. The agreement balances the need to protect GSO networks, ensuring that GSO operators can continue to deliver the highest quality communications services from long-distance and international telephony to television and broadband Internet applications, while allowing new non-GSO systems to operate without undue constraints.

"We are extremely happy with the outcome of the discussions on the global positioning systems", said Ambassador Gail Schoettler, Head of the US Delegation to WRC-2000

Photo: A. de Ferron (ITU 002103)

Mark MacGann, Vice-President of Strategic Affairs at non-GSO operator SkyBridge LLC, said: "These are very positive results as far as SkyBridge is concerned. WRC-97 allowed new broadband systems to go forward while ensuring that there would be no interference to existing GSO systems and the terrestrial fixed service. We have since worked through ITU–R Study Groups and demonstrated to countries and GSO operators that they have nothing to fear from non-GSO systems like SkyBridge. In our view, WRC-2000 has taken an historic decision to confirm its preliminary decision of 1997."

Kalpak Gude, Vice-President of Government and Regulatory Affairs and Associate General Counsel of US-based GSO operator PanAmSat Corporation said that his company was very pleased with the results of WRC-2000. "We started working on this issue more than two years ago. A lot of technical analysis has been done in the intervening time. We are confident that the pfd limits agreed by the Conference will protect the GSO networks. We think that WRC-2000 has put in place the right procedures and guidelines to assure that GSO operations will not be negatively affected and that our customers can continue to rely on and receive the same high quality service they have grown accustomed to over many years", he added.

The decisions of the Conference include some limits on earth stations of GSO networks and power limits on non-GSO systems to enable their co-existence without unacceptable interference. These power limits provide a quantitative measure of what is unacceptable and define the rules of sharing in the Ku-band (10–18 GHz). As a result, both GSO and non-GSO operators have the confidence to move ahead with the deployment of their systems to provide advanced services to their customers.

Room for all three: GPS, GLONASS and Galileo

Additional allocations were granted to the radionavigation-satellite service (RNSS) to allow Russia's Global Navigation Satellite System (GLONASS) and the United States' Global Positioning System (GPS) to develop into second-generation systems while providing room for Europe's new system, *Galileo*. The additional spectrum will ensure protection of the GPS and GLONASS signals and at the same time add competitiveness to a highly lucrative market in full expansion.

There are over eight million RNSS receivers in use today in a wide range of consumer and business applications: navigation aids in cars, handheld position location devices like street finders, positioning in sports activity (sailing, mountain trekking, expeditions), location of lost persons in rescue operations or safety-of-life such as air traffic control, fleet tracking, ships and aircraft positioning. Moreover, many telecommunication operators use the GPS, that provides accurate location and timing data to users worldwide, to improve the quality of their wireline and wireless networks.

European countries had sought to obtain 184 MHz of new spectrum for the RNSS so as to accommodate Galileo. A total of 171 MHz of new spectrum was finally allocated in the bands: 1164–1215, 1260–1300, 1300–1350, 5000–5010 and 5010–5030 MHz.

Of this spectrum, 24 MHz are said to be used for new generations of existing global positioning systems and 147 MHz for Galileo. In the band 1164–1215 MHz, the RNSS will be subject to power limits so as to protect terrestrial services. In addition, in the band 1559–1610 MHz, fixed service applications like microwave links will be phased out over a fifteen-year period to protect Galileo from any interference which could hinder its operation and accuracy.

The US Ambassador Gail Schoettler said: "We are extremely happy with the outcome of the discussions on the global positioning systems and Galileo. We hope the people who worked hard for Galileo feel the same. We were able to get everything we wanted in terms of GPS. Not only did we protect the existing system but we were able to get the spectrum to enhance the global positioning system and Galileo was able to achieve the same so that they can move forward in designing their system."

A jubilant Little LEO industry

WRC-2000 was the most successful conference for the Little LEO industry since WARC-92. "The support of developing and CIS countries who are seeking telecommunications 'equity' through affordable wireless data services largely contributed to the successful outcome at WRC-2000", said Mary Kay Williams, Vice-President, Corporate Relations at Final Analysis. "Through intense preparations in spectrum-related studies and advocacy work with various regulators worldwide, we have achieved the objectives we had set for ourselves at WRC-2000. The top priority of the Little LEO industry at WRC-2000 was the revision of Resolution 127 which provides for consideration of worldwide allocations for feeder links around 1.4 GHz at WRC-2003 in portions of the band 1390–1393 MHz for uplinks, and 1429–1432 MHz for downlinks. The advantage of placing feeder links above 1 GHz is that it would allow scarce spectrum below 1 GHz to be used for service links", she said.

The second priority item for the Little LEO industry, which also met with success at WRC-2000, was Resolution 214 which provides for consideration of worldwide allocations by WRC-2003 for additional spectrum below 1 GHz, concentrating on the 450–460 MHz band.

The Little LEO industry was also successful in getting a third proposal for allocations in the broadcasting band 470-862 MHz placed on the preliminary WRC-2006 agenda.

Thus, the Little LEO industry is now well positioned on the WRC-2003 agenda and beyond to obtain new global allocations to meet the urgent need for additional spectrum.

Cost recovery for processing satellite filings

This was another hotly debated issue. Following a policy decision of the Plenipotentiary Conference (Minneapolis, 1998) to introduce processing charges for network filings, the ITU Council, had, at its 1999 session, agreed on the methodology and fee schedules. These charges are applicable to filings (new network and modification to existing networks) for which advance publication information was received after 7 November 1998.

The BR is currently experiencing a marked growth in its workload and in the expectations of its membership as to the services it should be providing. This growth has been triggered by rapid technological change, in particular by the development of new digital and mobile communications technology and by a considerable growth in proposed fixed and mobile communication satellite services using geostationary and non-geostationary orbits. It is also attributable, in part, to the growing practice of overfiling for satellite networks.

A study by ITU in 1997 revealed that costs generated by the top 10 countries plus five international operating satellite organizations accounted for some 80 per cent of the total workload of the section of the Radiocommunication Bureau dealing with satellite notifications. Under the present arrangements, all countries fund this service, yet many nations, mostly from developing regions, have no demand for this service. A move to cost recovery was therefore thought to constitute a more equitable approach.

The application of cost recovery to space notifications was expected to bring benefits to the ITU membership in terms of equity and efficiency gains. Equity gains relate to the way in which the costs for the different services offered by the Radiocommunication Bureau are shared. Efficiency gains relate, for example, to the discipline to restrict somewhat the practice of overfiling of space notifications because of the costs involved.

Discussions at WRC-2000 focused on possible regulatory consequences of non-payment of such charges. Despite strong views expressed, the Conference adopted a regulatory provision on the possible cancellation of a filing in case of non-payment. However, this provision can only enter into force at a date to be determined by the forthcoming Plenipotentiary Conference in 2002. The decision was taken as a compromise to accommodate some delegations which felt that the rights and obligations of Member States are defined in the Constitution and that any modification of these rights, based on financial considerations, could only be decided by the Union's supreme body: the Plenipotentiary Conference.

Administrative due diligence, not yet truly tested

After long-drawn out debates, the Conference concluded that further experience was needed in the application of the administrative due diligence procedure before any sound judgement could be made on its impact and effectiveness in reducing, or eliminating, paper satellites. Alternative proposals by some countries to introduce financial due diligence to deter what they called "frivolous filings" failed to garner support.

The administrative due diligence procedure was introduced in November 1997, following a decision of WRC-97. This procedure aims at minimizing the number of paper satellites by requiring information which becomes available when systems have reached an advanced stage of development and are soon to be deployed.

Administrative due diligence requires disclosure of implementation data for satellite systems such as the identity of the satellite network, the name of the operator, name of the satellite, the name of the space manufacturer for each satellite, the date of execution of the contract, contractual "delivery window", number of satellites procured, name of the launch vehicle provider, date of execution of the contract, a launch or in-orbit delivery window and the name of the launch vehicle.

Experience so far shows that whenever they are asked to provide due diligence information, countries have generally requested the Radiocommunication Bureau to extend the regulatory period for bringing their satellites into use up to the maximum limit authorized by the Radio Regulations. As a result, the effect of administrative due diligence is not likely to be fully apparent until at least the end of 2003.

Measures for improving satellite filing procedures

There now exists a large backlog of satellite filings, 95 per cent of which concern geostationary-satellite networks.

In view of the processing delay which can go up to three years and, in the light of the five-year limit to place a network into operation, countries can be faced with a reduced time window in which to accomplish coordination.

The Conference concluded that extraordinary measures were needed to help eliminate the backlog in processing satellite network coordination requests. This was considered justified on account that the continued viability and credibility of the ITU satellite coordination process was at stake as the current situation seriously compromises the ability of several networks to provide services.

The Conference adopted a resolution that includes measures to help speed up the process such as the electronic submission of data for the advance publication, coordination and notification of all satellite networks, radio astronomy notices and due diligence information in electronic format compatible with the ITU software "SpaceCap". Countries will also be encouraged to submit all graphical data associated with the submissions electronically — although paper submissions will continue to be accepted. Developing countries making no more than three filings a year will be able to continue to submit filings on paper until 3 June 2001.

As from 3 September 2000, forms that are not submitted electronically will be considered as incomplete and returned without being processed. The same will apply to data initially submitted on paper that will not have been resubmitted electronically by 3 October 2000. While the BR will not compare the paper and electronic filings, both filings will be made available to countries who will have until 1 March 2001 to report any inconsistencies.

The resolution further instructs ITU to make available coordination and notification filings, "as received" on its International Frequency Information Circular (IFIC) CD-ROM, as well as on its website within 30 days of receipt.

A more detailed report on the outcome and key decisions made is available at http://www.itu.int/newsroom/wrc2000/releases/outcome.html. For those who do not have Web access, a copy can be requested from ITU Press Office. Tel.: +41 22 730 6039. Fax: +41 22 730 5939. E-mail: pressinfo@itu.int.

IP and next generation networks

Jerry Skene

ITU–T* Rapporteur for studies on voice over Internet protocol (VoIP) gateways, and Standards Director at Tellabs, Inc.

We are all aware of the impact that the Internet, through the World Wide Web, has had on our daily business and personal lives. This article will briefly examine the impact this technology is likely to have on traditional telephone services, and ITU's role in this area.

Electronic mail (e-mail) and the Web have made the world a different place, both from a business and a social perspective, allowing us through e-mail and our Web browser to stay in touch in a much more frequent and timely manner with our office, customers and family. Many of us shop online now without having physically to buy goods and services. An increasing number of traditional services, such as home mortgages, real estate and insurance are in the process of being completely transformed by e-business. Systems and information flow are being made much more efficient, comparison pricing is an order of magnitude easier, and the ultimate price to the consumer of many services is dropping.

Jerry Skene (ITU 000012)

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While this revolution is making major changes in many areas of business and life in general for much of the world, the Web has yet to have much impact on most of our telephone service. This, however, is about to change.

Voice over Internet protocol, or VoIP for short, will be responsible for this change. VoIP

* Telecommunication Standardization Sector of the ITU.

is a rapidly developing technical standard, in which the ITU is playing a major role, that allows the existing Internet, public and private data networks to carry telephone calls. By converting normal speech to data packets, VoIP enables voice to be transported and switched efficiently along with data that is already being carried by the Internet.

In its early days, before international standards were in place, VoIP technology was used mainly as a hobbyist's curiosity. Speech quality was poor and had considerable echo, there was no standardized method of finding the remote party's address, and both parties had to use specially configured personal computers with identical IP telephony software. It was very inexpensive though, in many cases free, and so was attractive for a small segment of users from an arbitrage perspective compared to the high long-distance tariffs in place at the time.

NTT calculates that in 1998, there were 240 million minutes of IP telephony traffic. They estimate that by 1999 this had grown over tenfold to 2.5 billion minutes. Frost & Sullivan estimates that VoIP traffic will be 2.7 trillion minutes in 2006, making up 25 per cent of all telephone traffic. Phillips Tarifica Ltd. estimates that VoIP will be 43 per cent of international traffic by 2003

Much has changed, however, in the four or five years since the first VoIP systems were introduced. The ITU, the Internet Engineering Task Force (IETF), and the European Telecommunications Standardization Institute (ETSI) have been busy solving these, and many more issues through global standards. Within the ITU, several study groups are involved in developing VoIP standards, and several questions are dedicated solely to ensuring that global standards are in place for such things as high-quality speech coders, universal addressing, voice gateway characteristics, call control, signalling, etc. What these standards have done is to establish VoIP as a legitimate, fully functional service offering, with a multitude of hardware, software and service providers ready to fulfil the market demand. And there is market demand.

As has happened in the past with several other telecommunication technologies, such as the fax machine, the 56K modem, and the cell phone, when global standards are fully in place, there soon follows an enormous increase in the size of the market. If forecasts are accurate about the size of the VoIP market, it will begin to have a significant effect on the traditional telephony market. *NTT* calculates that in 1998, there were 240 million minutes of IP telephony traffic. They estimate that by 1999 this had grown over tenfold to 2.5 billion minutes. Frost & Sullivan estimates that VoIP traffic will be 2.7 trillion minutes in 2006, making up 25 per cent of all telephone traffic. Phillips Tarifica Ltd. estimates that VoIP will be 43 per cent of international traffic by 2003. While it is always difficult making predictions, especially about the future, these numbers suggest that VoIP has already moved well beyond the trial phase.

In China, for example, the Ministry of Information Industry has recently approved IP telephony as a legitimate service offering. One operator sold over one million prepaid VoIP calling cards in its first few months of business, and the carrier *China Unicom* has announced access to over 300 cities through its VoIP network. Several traditional carriers in other parts of the world also have extensive VoIP service offerings, including AT&T, MCIWorldCom, NTT and BT.

There are several characteristics of VoIP networks that seem to justify this degree of interest. VoIP is a so-called next generation network that uses a radically different network architecture than that of the traditional switched circuit network. While the arbitrage advantage has been greatly diminished by a drop in long-distance tariffs in most regions, VoIP still has fundamentally lower platform and maintenance costs, and a much faster time to market than switched circuit network systems do. VoIP lends itself very well to new service offerings, such as "click to talk", where you click on a website link and your phone rings or your PC connects as a telephone, having been called through an IP connection by the information or goods provider whose Web page you are browsing. Innumerable new services are being dreamed up constantly, and are usually put into place in a few weeks rather than the years it typically takes the traditional public switched telephone network (PSTN) to roll out new services.

As has been true in the past with traditional telecommunications, a comprehensive telecommunication network infrastructure is essential for national economic growth. We have seen that new Web applications can increase business productivity as well as generate a whole new type of economy as has happened in the United States, and a little later but just as convincingly, in Europe. It appears that VoIP, with its new range of service offerings that are able to fully integrate voice and data, can also be helpful in improving a country's economy. While it is usually the more developed economies that are first to market such new services, developing economies may benefit from VoIP even more, as it can have a lower cost of entry, and, being new, does not give anyone an incumbent's advantage.

We have seen that new Web applications can increase business productivity as well as generate a whole new type of economy as has happened in the United States, and a little later but just as convincingly, in Europe. It appears that VoIP, with its new range of service offerings that are able to fully integrate voice and data, can also be helpful in improving a country's economy

The nature and culture of the Internet is such that it attracts many of the brightest and most creative minds, as evidenced by the explosive growth in Web development tools and applications. Through VoIP, this same force is now being applied to the global telephone market. Computer programmers are now becoming telecommunication programmers, and there are a lot of computer programmers out there.

Call quality within VoIP has now improved to the point where in many cases it is indistinguishable from that provided by the PSTN. Quality echo cancellers conforming to ITU–T Recommendation G.168 remove echo, better speech codecs described by ITU–T Recommendation H.323 standard improve speech quality, and common protocols such as H.248, jointly developed by ITU and IETF help ensure end-to-end interoperability.

What started out as an experiment with new technology has now become a fully legitimate, global business with a very promising future. There is, however, an enormous investment in traditional PSTN systems, including not only the switches and infrastructure hardware, but also the service, maintenance and network management functions. It will be some time before VoIP networks evolve to this same level of service, if indeed they ever do. Through careful grafting of the two systems, and the development of interoperability and quality of service standards, however, ITU can help ensure that the best of both worlds is available to all. ■

AMERICAS TELECOMMUNICATION INDICATORS 2000

A DECADE OF REFORMS

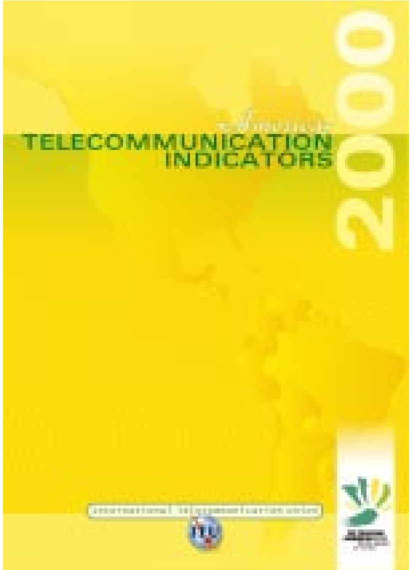
This new report by the International Telecommunication Union (ITU) focuses on how the telecommunication reform programmes of the last decade are shaping the market of the coming decade.

No region of the world has embraced the privatization of telecommunications as enthusiastically as Latin America. Of 89 incumbent public telephone operators worldwide that had been privatized by the end of 1999, one quarter were in the Americas region. Even more impressive is the degree of private participation in the sector. While more than two-thirds of the countries of the Americas region have either partially or fully privatized their telecommunication companies, in other regions like Africa and the Arab States, this percentage drops to 28 and 33 per cent respectively.

So begins the Executive Summary of the ITU's most recent regional indicators report, *Americas Telecommunication Indicators 2000*. The report was published on the occasion of the ITU TELECOM AMERICAS 2000 Exhibition and Forum, held in Rio de Janeiro in April of this year. The report reviews telecommunication developments in the emerging economies of the western hemisphere.

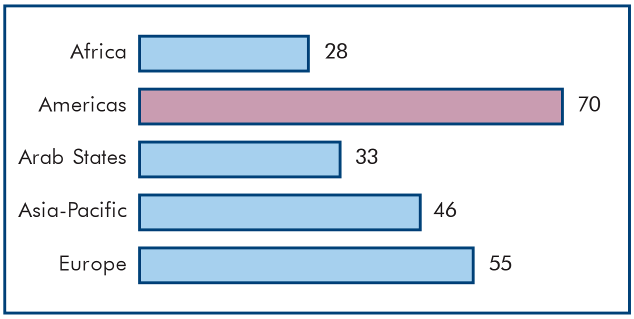
Mobile communications in Latin America has grown strongly over the last decade, rising from just 100 000 subscribers in 1990 to over 39 million in 1999. The number of new mobile users has exceeded new fixed telephone subscribers every year since 1997. Today, one in every four telephone users in the region depends on a mobile phone. In Paraguay and Venezuela, there are more mobile subscribers than traditional fixed telephone line customers. The rapid rise in mobile subscriptions is attributed to private ownership and competition, the implementation of calling party pays and the introduction of pre-paid cards.

Growth of the Internet in Latin America has been as equally, if not more, impressive than mobile. The number of Internet host computers grew faster there than in any other region of the world in 1999 and reached a significant milestone, surpassing one million during that year. The number of users is estimated at 9 million. Falling prices have contributed to increased Internet access in Latin America. Equally important has been the rise of Spanish Web content, the world's fourth largest linguistic group with some 300 million speakers.

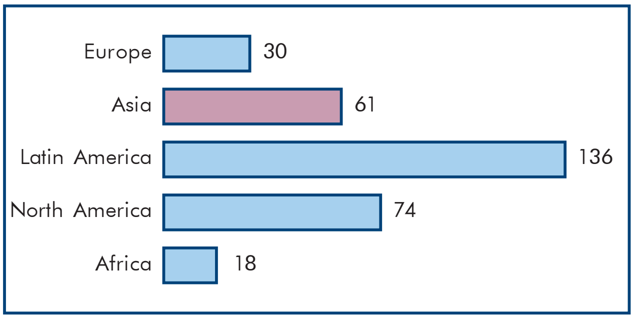


Americas Telecommunication Indicators 2000 contains 140 pages of text, reference information, statistics and directory of telecommunication operators in the region and is published in English and Spanish. Information about ordering the publication, including free access to the Executive Summary, is available at http://www.itu.int/ti/publications/americas/2000/index.htm.

PERCENTAGE OF COUNTRIES THAT HAVE PRIVATIZED, 1999



GROWTH IN INTERNET HOSTS (PERCENTAGE) IN 1999



TELECOMMUNICATION INDUSTRY AT A GLANCE

MOBILE DRIVING GROWTH OF TELECOMMUNICATION MARKETS

The world market for telecommunications (services and equipment) doubled between 1990 and 1999 and was worth over USD 1000 billion in 1999. The services segment accounted for almost three quarters of global telecommunication revenues or some USD 800 million.

Mobile communications is driving growth and now accounts for 24 per cent of the total service revenues, up from just 3 per cent in 1990. Although revenues from the fixed telephone network continue to dominate the total market, its share has fallen significantly, from 90 per cent in 1990 to 61 per cent in 1999.

KEY INDICATORS FOR THE WORLD TELECOMMUNICATION SERVICE SECTOR

(USD billions)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2002
Telecom market revenue (current prices and exchange rates)												
Services	396	419	461	491	530	615	673	702	744	792	840	925
Equipment	112	119	132	138	161	182	213	237	260	290	320	375
Total	508	539	593	630	691	797	885	939	1004	1082	1160	1300
Telecom services revenue breakdown (current prices and exchange rates)												
Services Telephone [1]	356	373	394	410	444	497	508	500	500	480	460	410
International [2]	33	37	43	46	47	53	53	54	56	58	60	60
Mobile	11	15	23	33	47	75	104	129	154	192	230	315
Other [3]	29	31	44	48	39	43	61	73	90	120	150	200
Telecom services capital expenditure (current prices and exchange rates)												
Total [4]	115	124	131	134	138	155	166	161	167	171	175	180
Other statistics												
Main telephone lines (millions)	520	546	574	606	644	691	740	792	844	905	970	1115
Mobile cellular subscribers (millions)	11	16	23	34	55	91	145	214	319	472	650	1000
International telephone traffic minutes (billions) [5]	33	38	43	48	56	62	71	80	90	100	110	130
Personal computers (millions)	120	130	150	170	190	230	260	320	370	430	500	670
Internet users (millions)	2.6	4.4	6.9	9.4	16	34	56	92	145	257	385	600

Notes: All data in millions of current USD converted by annual average exchange rates. Country fiscal year data aggregated to obtain calendar year estimates.

1 Revenue from installation, subscription and local, trunk and international call charges for fixed telephone service.
2 Retail revenue.
3 Including leased circuits, data communications, telex, telegraph and other telecom-related revenue.
4 Note that the data of the growing number of new market entrants are not always reflected in national statistics.
5 From 1994 including traffic between countries of former Soviet Union.

Source: ITU, 2000.

THE MOBILE MESSAGE EXPLOSION

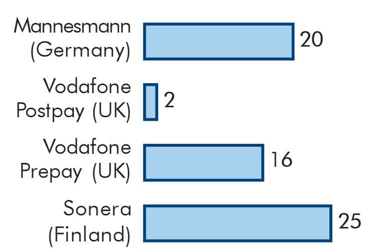
Electronic messages sent by mobile telephones are exploding in Europe. The GSM digital mobile system, the standard in Europe and also used in some 100 countries around the world, supports text exchange (up to 160 characters) between mobile handsets through the short message service (SMS) feature.

The GSM Association http://www.gsmworld.com/news/press_releases_55.html announced that "G-Mails" (GSM-Mail or SMS) totalled five billion around the world in the month of March 2000, with European nations accounting for the bulk of the mobile text traffic. The GSM Association predicts that 10 billion messages a month will be transmitted by year-end 2000.

In a recent report, *Cellular Mobile Pricing Structures and Trends*, http://www.oecd.org/dsti/sti/it/cm/prod/e_99-11.htm the Organisation for Economic Co-operation and Development (OECD), a grouping of the world's wealthiest economies, has reviewed and benchmarked SMS in its member countries. Most operators charge for each SMS message sent. The OECD found that the average price of an SMS message in the OECD is 16 US cents with the lowest being 3 cents and highest 25 cents.

Another interesting finding of the OECD report is the difference in SMS usage between postpay and prepay users with the latter using it significantly more. For example, the prepay customers of the UK mobile operator Vodafone send 8 times as many SMS messages a month as postpaid clients. This is because the heaviest SMS users tend to be young and thus more likely to not qualify for postpay service. This is confirmed by recent research from Amárach http://www.amarach.com/news/press7.htm in Ireland showing that 85 per cent of mobile users aged 15-19 use SMS compared to 40 per cent for those aged 35-49. The research also found that one third of those aged 15-24 years old sent over 20 SMS messages a week.

AVERAGE SMS PER CUSTOMER PER MONTH

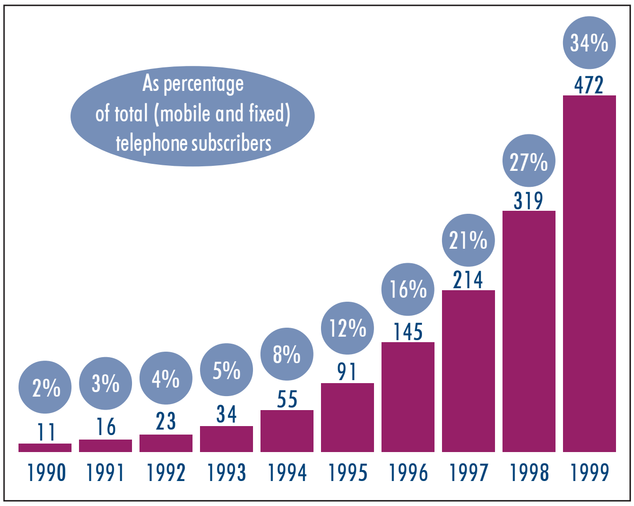


Source: OECD.

THE MOBILE CELLULAR BOOM

The global boom in mobile cellular communications has been truly astounding. At the end of 1999, there were more than 450 million subscribers around the world, up from just 11 million in 1990. That is a compound annual growth rate of more than 50 per cent per year. In other words, the number of mobile subscribers worldwide has been doubling every 20 months since the start of the decade.

WORLDWIDE MOBILE CELLULAR SUBSCRIBERS (MILLIONS)



Source: ITU, 2000.

TOP 20 ECONOMIES RANKED BY MOBILE CELLULAR PENETRATION, 1999

Rank	Economy	Penetration (%)	Mobile cellular subscribers (000s)
1	Finland	66.7	3 445
2	Norway	61.8	2 745
3	Sweden	57.8	5 125
4	Hong Kong SAR	57.7	3 973
5	Italy	52.8	30 296
6	Taiwan-China	52.1	11 541
7	Korea (Rep.)	50.4	23 443
8	Denmark	49.9	2 650
9	Austria	48.9	4 000
10	Luxembourg	48.7	209
11	Singapore	47.5	1 532
12	Portugal	46.8	4 671
13	Israel	45.9	2 800
14	Japan	44.9	56 849
15	Netherlands	43.5	6 900
16	Switzerland	42.0	3 000
17	United Kingdom	40.8	23 944
18	Iceland	39.2	109
19	Ireland	37.8	1 400
20	France	36.4	21 434
	TOP 20	46.1	210 066

Source: ITU, 2000.

MORE MOBILE THAN FIXED

Finland made headlines at the end of 1998 when it became the first nation to top 50 per cent mobile penetration. Along with Cambodia, it was one of only two countries in the world where the number of mobile subscri-bers surpassed that of fixed-line subscribers.

At the end of 1999, seven more countries joined the club. The most recent members are the Republic of the Congo (Brazzaville) and Hong Kong Special Administrative Region (SAR) where mobile surpassed fixed in the first half of 2000. The ITU forecasts that by the middle of this decade, there will be more cellular subscribers worldwide than fixed-line subscribers.

The mobile boom could be far from over. For example, in Nordic nations, where every other person now has a mobile phone, the cellular penetration rate is forecast to top 100 per cent. It is likely that other developed countries will follow this pattern. Meanwhile, in emerging economies, there is considerable pent-up demand for telecommunications. Mobile is a perfect fit since wireless networks can be installed quickly and pre-paid provides rapid access for those who would not normally qualify for a subscription service.

For more information on mobile cellular, see http://www.itu.int/ti/publications/wtdr_99/wtdr99.htm.

ECONOMIES WITH MORE MOBILE THAN FIXED TELEPHONE SUBSCRIBERS AT END OF 1999

Economy	Date mobile overtook fixed	Mobile subscribers (000s) in 1999	Fixed-line subscribers (000s) in 1999	Total telephone mobile subscribers (%)	Mobile density	Fixed density	Total density
Cambodia	1993	89	28	76	0.81	0.25	1.07
Finland	Dec. 1998	3 445	2 856	55	66.70	55.29	121.99
Paraguay	May 1999	436	297	59	8.13	5.54	13.67
Uganda	July 1999	87	59	59	0.40	0.27	0.68
Venezuela	Aug. 1999	3 400	2 586	57	14.34	10.91	25.25
Italy	Sept. 1999	30 296	26 500	53	52.83	46.21	99.05
Portugal	Sept. 1999	4 671	4 230	52	46.81	42.39	89.20
Côte d'Ivoire	Oct. 1999	257	219	54	1.77	1.51	3.28
Korea (Rep.)	Nov. 1999	23 443	21 250	52	50.44	45.72	96.16

Source: ITU, 2000.

COUNTRY PROFILE: UGANDA

The Republic of Uganda, covering an area of 235 885 km, is an agricultural country with a population of about 22 million. Over 85 per cent of its citizens live in rural areas; the capital Kampala has almost 900 000 inhabitants but accounts for just 4 per cent of the country's population. Although land-locked, Uganda is in the Great Lakes region of eastern Africa with some 15 per cent of its area consisting of water. A significant portion of Lake Victoria, the largest fresh water lake in Africa and source of the river Nile, is found in Uganda territory.

REFORMED, PRIVATIZED AND LIBERALIZED

Uganda's Gross Domestic Product (GDP) per capita is less than USD 300, making it a least developed country. It has historically had one of the lowest levels of telephone penetration in the world. However, government initiatives to boost the economy through privatization and foreign investment are starting to pay off. Nowhere is this more evident than the telecommunications sector, which is now one of the most liberal in Africa. Steps taken over the last five years to foster growth in telecommunications include:

- Licensing of a private GSM mobile operator, CelTel, in May 1995
- Creation of a regulator, the Uganda Communication Commission, in 1998
- Introduction of a second national operator, MTN Uganda, in October 1998
- Partial privatization of incumbent telecommunication operator, Uganda Telecom Limited (UTL), in February 2000.

MOBILE MANIA

The results of these changes have been dramatic. Uganda's overall telephone density tripled between 1995 and 1999 rising from 0.21 telephone subscribers per 100 people to 0.67. This rapid growth is a direct result of MTN's entry into the market. Although MTN full service licence allows it to offer all telecommunication services including fixed telephony, it has focused on mobile. One reason is that wireless networks are quick to install. Another is the use of prepaid cards since most Ugandans would not meet the financial criteria for a subscription-based service.

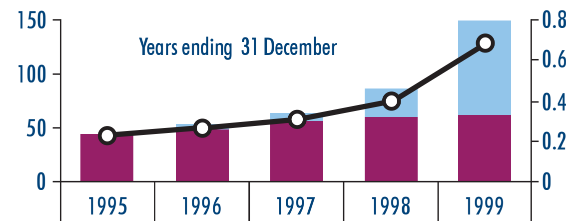
In a little over one year, MTN emerged as the largest network operator in Uganda surpassing not only CelTel but also the incumbent, UTL, in terms of number of clients. In July 1999, Uganda became the first African country and only one of a dozen in the world where there were more mobile than fixed telephone customers. MTN has not rested on its laurels. It has been aggressive in expanding the network into what Ugandans refer to as "up-country", that is the rural part of the nation. Over 50 per cent of the population is now covered by mobile cellular and some 40 towns have service. What is remarkable is that the number of mobile subscribers widely exceeds earlier forecasts of a potential mobile market of some 10 000! The planned entry of UTL into the mobile market should further spur growth with some estimates putting the potential mobile client base at half a million.

INTERNET CASE STUDY

The Internet market is also liberalized in Uganda. There is no limit on the number of Internet Service Provider (ISP) licences. Furthermore, ISPs can provide their own national and international infrastructure. Eight ISP licences had been issued as of February 2000. There are some 4000 Internet subscribers and an estimated 25 000 users in the country. Demand is high as evidenced by an explosion of cybercafés in Kampala over the last year. There is considerable scope to expand Internet usage in the country since almost all users are currently in Kampala. Furthermore, ISP charges of USD 50 a month for unlimited access are relatively high compared to income especially considering that telephone usage charges must be added to this.

Uganda is one of the countries participating in the ITU Internet Case Studies through its Ministry of Works, Transport and Communications. For more information on the case studies, please visit the website at www.itu.int/ti/casestudies.

TELEPHONE SUBSCRIBERS, UGANDA (000s)



	1995	1996	1997	1998	1999
Mobile	2	4	7	26	87
Fixed	39	46	54	57	59
Penetration	0.21	0.25	0.29	0.39	0.68

Source: ITU, 2000.

For more information or comments on the UPDATE, please contact: ITU/BDT, Telecommunication Data and Statistics, Place des Nations, CH-1211, Geneva 20 (Switzerland). Tel.: +41 22 730 6090. Fax: +41 22 730 6449. E-mail: indicators@itu.int

Human resources: distance learning

Manuel Zaragoza
GTU/GTTI Project Coordinator

The Human Resources Development (HRD) Division of the Telecommunication Development Bureau (BDT) has been providing distance courses over the Internet for several years. The platform currently being used is the virtual training centre (VTC). A number of the Division's projects use the platform for their training activities, principally the Centres of Excellence (CoE) and the Global Telecommunications University/Global Telecommunications Training Institute (GTU/GTTI). The idea of the GTU/GTTI project was officially put forward for the first time at the World Telecommunication Development Conference (Buenos Aires, 1994).

The VTC platform

VTC originated in the teleproject. In the early 1990s, the teleproject used the computer technology available at that time to produce courses. VTC was created in 1995, drawing on the teleproject's experience and computer-based training (CBT) courses.

Since then, the VTC platform has been evolving in the same way as the technology has developed. The CD-ROM has replaced the diskette.

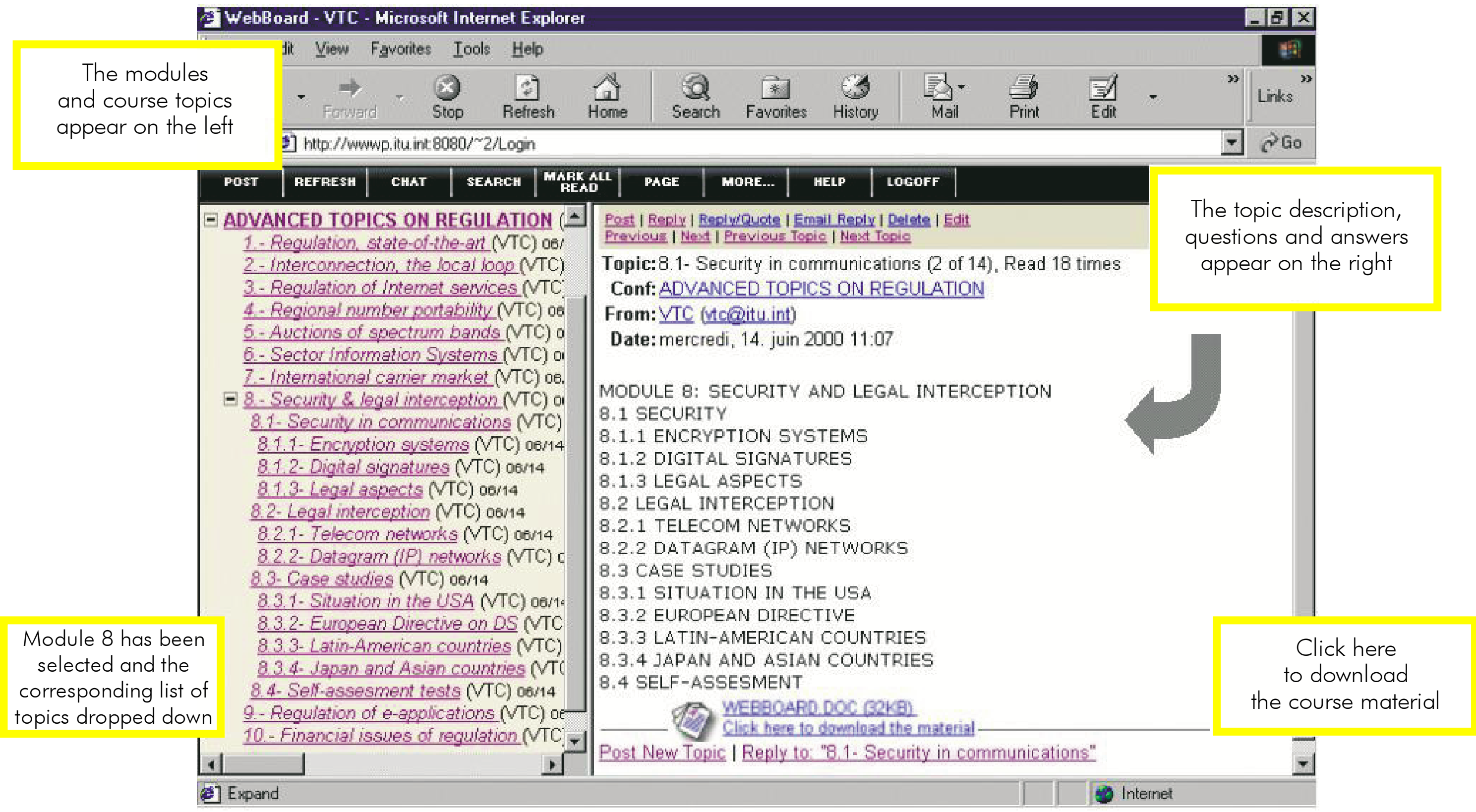


Figure 1 — Example of distance course screen

A first stab was taken at tele-education. Many possibilities were explored, such as the use of videoconferencing for distance courses. Videoconferencing was not, however, available in very many places. Even today, the use of video broadcasting over the Internet is not widespread and has yet to become as commonplace as e-mail and the Web.

The present VTC platform is a Web conference system. The user needs only a simple computer with access to the Internet and a Web navigator. The essential factor is the platform's simplicity. In many developing countries the means available are often very rudimentary and access to the Internet slow.

The platform is very economical, in keeping with BDT's always limited budget. Figure 1 shows a typical course screen. The list of course topics and points of discussion always appear on the left of the screen. The description of the topic selected or the questions and answers relating to the discussion selected are shown on the right.

Specialized systems now exist for teaching distance courses using the possibilities offered by the Web. It is also hoped that interactive video broadcast systems will become commonplace. VTC is always open to the incorporation of new technologies into its platform. More information on VTC may be found on http://www.itu.int/VTC/.

The VTC method is also very simple. A tutor is responsible for distributing a module every week. The tutor also assigns tasks to the participants, evaluates their participation, answers their questions, supplements the material distributed with references, and organizes and moderates debates. A BDT coordinator is in charge of organization and administrative control (checking attendance, following up the schedule and providing material).

At the end of the course, those students who were sufficiently active receive a "participation" certificate.

The courses require about eight weeks of part-time work, the participants spending about 20 per cent of their working hours on the course. Executives of telecommunication institutions are therefore able to attend to more urgent tasks while taking the course.

The method recognizes the importance of professional contacts and of face-to-face classes. Many distance courses include a short seminar (three to five days) attended by the participants at the end of the course. During the seminar, the participants consolidate and supplement what they have learned during the eight weeks of work on the Internet. A mix of face-to-face and distance sessions would seem the best way of getting the best out of each system.

Use of tele-education for the Centres of Excellence project

The CoE project helps make telecommunication training centres and other similar institutions (technological universities) true Centres of Excellence. The project relies on the support of its sponsors (administrations, operators, manufacturers, universities and financial institutions) to create regional networks of excellence. In such a network of training centres, each centre helps raise standards in the region in those areas in which it is most advanced.

The CoE project devotes much of its resources to training, most of which requires the physical presence of the participants. Nevertheless, the project is making increasing use of the VTC platform and its method, combining distance teaching and on-the-spot training.

For example, workshops were held in Minsk (Belarus) and Sofia (Bulgaria) on the "Impact of restructuring issues and the new technologies on business planning practices". While the organization and conduct of those workshops were not strictly speaking CoE project activities, all the material used had been prepared by the project. The workshops took place in late 1999 and both required personal attendance. The decision was nevertheless made to extend them by means of an additional virtual forum via the Internet and VTC. The forum took place at the beginning of 2000 and focused on the practical application of the knowledge acquired to the specific context of each participating country.

The CoE has recently experienced unprecedented success with distance-learning courses. One of them dealt with telecommunication regulation for the Americas region and was given in April and May 2000. The number of applicants was four times higher than VTC's capacity (30 participants). As a result, the decision was made to increase VTC's capacity and to repeat the course throughout the year. All the participants played a very active part during the course.

Another signal of CoE success, in terms of distance learning, was the course on Management with Leadership for Telecommunications. The course took place in May and June 2000, also for the Americas. In this case, the number of applications was twice the capacity of VTC.

Up-to-date information on the project may be found at: http://www.itu.int/ITU-D-HRD/Cexcellence/index.html.

Minsk workshop (ITU 000030)

GTU/GTTI, a specialized e-learning project

The idea of the GTU/GTTI has developed into a project over the years. A group of experts demonstrated that the project was viable and made major recommendations which led to a pilot phase involving the preparation and delivery of courses via the Internet and VTC. Over the past two years courses have been given successfully in English, French and Spanish on topics such as telecommunication marketing, quality management, wireless access, national spectrum management and frequency planning for broadcasting entities (see Figure 2).

It can now be said that GTU/GTTI has successfully concluded the pilot phase. From now on, over the next few years, the project should concentrate on:

- Broadening and diversifying the range of courses.
- Attracting new sponsors interested in the development of telecommunications and in the platform offered by the Global University.
- Developing an institutional structure incorporating the sponsors.

Sofia workshop (ITU 000031)

Information on GTU/GTTI's current activities may be found on: http://www.itu.int/ITU-D-HRD/gtugtti/. Several short courses will take place this year. Cable & Wireless, a project sponsor, is preparing a forty-week Master in Communication Management course for GTU/GTTI. The course will be taught first in English (2001) and subsequently in Spanish (2002) and French (2003).

As has already been pointed out, a combination of attended sessions and distance sessions can have the advantages of both methods. But that is not enough to ensure acceptance of distance learning. An e-learning "culture" must be created.

Various factors have contributed to the outstanding success of the CoE project's distance-learning courses in the Americas, among them:

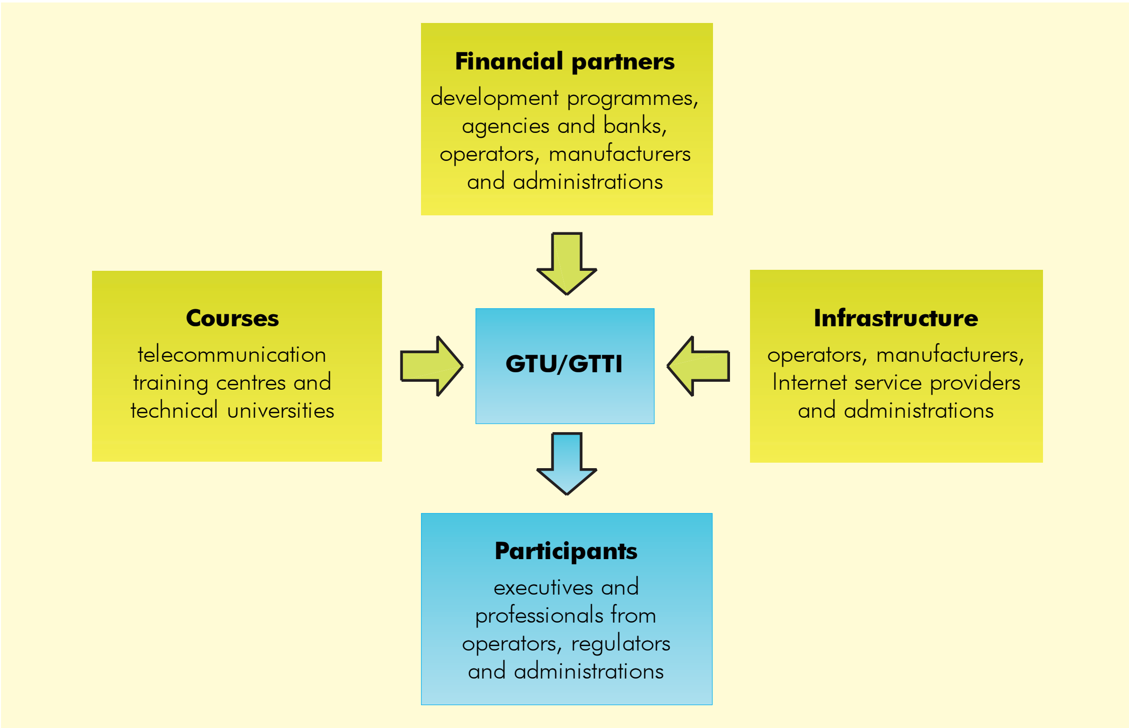


Figure 2 — GTU/GTTI sponsors

An urgent task: spreading the e-learning culture

E-learning methods and technology present many advantages over courses involving personal attendance. Distance learning means lower training costs, less travel and less absence from work. It is nevertheless not an easy task to ensure that a distance course will be successful. E-learning methods are not immediately accepted. Virtual communication is poorer than person-to-person communication. In addition, the participants have to work on their own with the self-study material sent to them by the tutor. All of this diminishes the motivation of many participants.

— careful selection and preparation of the topics;

— the VTC method, which encourages participation;

— the way in which the course is taught.

The most important factor has undoubtedly been, however, the well-developed e-learning culture that exists in the region. The VTC courses of the past few years have helped develop that culture. VTC, the CoE and GTU/GTTI now have the task of continuing to promote an e-learning culture in all regions. ■

The following missions have recently been undertaken by ITU experts:

- **Argentina (Buenos Aires)**
  Quero L. (Argentina)
  National consultant in project administration
  (2.5.00–1.6.00)
- **Bolivia (La Paz)**
  Osuna Suárez C. (Colombia)
  Consultant in basic technical synchronization plans
  (2.5.00–1.6.00)
  Jorge S. (Portugal)
  Senior expert in information and communication technology
  (12.5.00–20.5.00)
- **Chad (Ndjamena)**
  Alvárez Falcón C. (Peru)
  Senior expert in economic and financial studies
  (27.5.00–18.6.00)
- **Dem. Rep. of the Congo (Kinshasa)**
  Gnon B. (Côte d'Ivoire)
  Senior expert in network interconnection
  (29.5.00–5.6.00)
- **Kenya (Nairobi)**
  Weston S. (United States)
  Expert in HRM and activity-based costing
  (26.5.00–11.6.00)
- **Latvia (Riga)**
  Konvit M. (Slovakia)
  Senior expert in HRM/HRD
  (21.5.00–27.5.00)
- **Mauritius (Port Louis)**
  Johansson R. (Sweden)
  Senior expert in regulatory issues
  (11.5.00–10.11.00)
- **Nepal (Kathmandu)**
  Short G. (Australia)
  Consultant in multipurpose community telecentres
  (1.5.00–16.5.00)
- **Peru (Lima)**
  Rivera de Reyes M. (Colombia)
  Instructor for the telecommunication services marketing workshop
  (7.5.00–13.5.00)
- **Russia (Saint Petersburg)**
  Purwar S. (India)
  Consultant/Lecturer in universal service
  (20.5.00–26.5.00)
- **Senegal (Dakar)**
  Ogoussan C. (Benin)
  Management consultant/Expert in cost accounting systems
  (20.5.00–3.6.00)
  Henry M. (France)
  Consultant in training administration
  (21.5.00–3.6.00)
  Akouete B. (Benin)
  Management consultant/Expert in the operation of cost accounting systems
  (27.5.00–10.6.00)
- **Switzerland (Geneva)**
  Untila A. (Moldova)
  Consultant in regional presence
  (28.5.00–10.6.00)
- **Thailand (Bangkok)**
  Tran T. (Viet Nam)
  Database developer
  (11.5.00–10.8.00)
  Pavliouk A. (Russia)
  Senior expert radio spectrum management
  (13.5.00–10.6.00)
- **Zimbabwe (Harare)**
  Carrier C. (France)
  Training consultant
  (15.5.00–28.5.00)

Policy considerations for electronic commerce

ITU Member views

In 1999, the International Telecommunication Union issued a Discussion Paper on policy considerations for e-commerce, the theme chosen to commemorate World Telecommunication Day (17 May) that year. The paper, which was distributed to all ITU Member States, described the broad range of policy issues arising from the rapid growth of e-commerce services, applications, and technologies, with particular emphasis on telecommunications-related concerns. Through a survey questionnaire, the paper solicited the views of Members on these concerns in their countries.

A wide cross-section of ITU Members responded to the survey, and offered valuable insights into the state of policy development relating to e-commerce around the world. This article is excerpted from a report summarizing those responses, and highlights the most prominent trends and controversies that appear to be emerging in the realm of telecommunications and e-commerce policy.

The Discussion Paper was organized according to a framework established by the Organisation for Economic Co-operation and Development (OECD), which has identified four categories of policy objectives for promoting the development of e-commerce: enhancing infrastructure, building trust, establishing ground rules, and maximizing benefits.

Enhancing infrastructure

The need to enhance (or indeed introduce) national infrastructure to support e-commerce is the paramount concern of developing countries — far more so, for example, than in the developed world.

With basic telephone service penetration below 15 per cent for numerous countries, and access to computers and data services even lower, the sheer possibility of participating in the global electronic market-place is remote for much of the world's population.

The same is true of access to banking and financial services, which are equally necessary for consumers and small businesses to conduct commerce in a digital environment.

Information and communication technology (ICT) infrastructure

The traditional view of universal service seeks to bring voice telephone service to every home. For countries with well-developed infrastructure, this goal has essentially been achieved already, and the focus has shifted to advanced infrastructure, broadband transmission capacity, and questions of universal Internet access.

Among developing countries, however, there is a mix of opinions as to whether "community-based access to advanced communications and information services should take precedence" over universal voice telephony. About 35 per cent of respondents from developing countries disagree with such a shift of emphasis, and some (e.g., Mexico, Grenada) disagree strongly.

However, the fact that 65 per cent of developing countries do consider advanced ICT access to be a more important objective than universal voice *telephony reveals how rapidly views on this issue have been changing.*

It may be significant that many of the countries that agreed most strongly with this proposition are among those with the least developed communication networks (Rwanda, Azerbaijan, Cambodia, Tanzania, among others), and hence are farthest away from the vision of truly universal telephone service.

Nevertheless, there appears to be a strong majority position emerging that traditional universal service objectives for developing countries must be updated in the light of the prospects of e-commerce.

The survey also sought to gauge the degree to which countries are taking initiatives to pursue these objectives. In particular, it highlighted the strategy of establishing multipurpose community telecentres (MCT) to expand ICT access.

In spite of the broad-based agreement on the objectives and priorities, however, most respondents indicated that they have taken only small steps, if any at all, towards promoting community telecentre development.

Fewer than 20 per cent of developing countries indicated that they had at least some active telecentres in operation, although many claimed to be exploring options in this area.

More than a third responded that they currently have no significant telecentre initiatives at all. By contrast, virtually all of the more developed country respondents identified substantial telecentre activity, even though they already have nearly universal telephone service.

Another perspective on infrastructure development policies explored by the survey was the role of competition and private investment. Specifically, respondents were asked whether the "changing dynamics" of the industry will "accelerate" the need for such market-oriented policies in their countries. The responses were remarkably uniform: over 70 per cent agreed "strongly" with this view, and nearly all respondents agreed at least somewhat. It is worth noting that for an industry that was dominated by State-owned monopolies less than a decade ago, the overwhelming consensus in the year 2000 favours accelerated movement towards private investment and competitive markets. Although this trend may have been gaining momentum for some time, clearly the explosive arrival of the Internet and e-commerce have propelled it forward irreversibly.

Telecommunications market and pricing regulation

The Discussion Paper also addressed key regulatory issues surrounding the telecommunications sector, in the context of promoting e-commerce. In particular, it focused upon tariff or pricing regulation, recognizing the new importance of advanced services such as high-speed data connections, both domestic and international, as well as end-user data and Internet access services, to the success of e-commerce ventures. Traditionally, these more sophisticated services have often been overpriced relative to their costs, while basic voice telephony has been the principal focus of cross-subsidies and "affordability" concerns.

Respondents to the survey were asked their views on the need to revise the traditional regulatory emphasis and approach to tariffs, in light of the developments of e-commerce. On these questions, there is near unanimity among ITU survey participants. Nearly all agreed strongly that pricing priorities and methodologies for local and domestic data communication services "need to be revised, to help make e-commerce services more affordable".

Interestingly, the consensus is even stronger on the question of pricing policies for international data circuits. All respondents to the survey concur that "international interconnection and pricing policies need to be reviewed to seek more equitable pricing and service arrangements" for international connections to the Internet backbone.

Monthly price (USD)
for a 56 kbit/s (or equivalent)
local data circuit

- average price: 250
- low range: 80
- high range: 500

Monthly price (USD)
for a 56 kbit/s international circuit
to the United States

- average price: 5000
- low range: 1500
- high range: 10 000

Monthly subscription price (USD) for
Internet access, for an individual user

- average price: 31.75
- low range: 4 to 15
- high range: 100

Note that the United States, which is home to the overwhelming bulk of backbone capacity and service providers, did not respond to the survey. However, the preceding view is supported by, among others, Australia, Canada, France, and the United Kingdom.

The survey also inquired specifically about the current levels of pricing for data and Internet services in the responding countries. Responses tended to vary quite widely, but the approximate range of these prices is as shown in the box on this page.

Building trust

Among the main differences between e-commerce and traditional commerce are the fact that electronic transactions are far more impersonal, anonymous, and automated than transactions made between flesh-and-blood persons in a store, at a bank, or even over the telephone. This dehumanization of business relations is accompanied by a quantum increase in the technical means and opportunity for fraud and abuse of both individual consumers and large corporations alike. For all these reasons, a healthy sense of caution, if not outright distrust, has prevailed in the evolution of many aspects of e-commerce.

Consequently, for these new, globally impersonal technologies to advance to a more universal level of acceptance, business and government institutions must develop policies that build greater trust in these new transaction media.

Trust implies confidence that electronically-based purchases, fund transfers, and business deals will be as valid as traditional activities; that personal information and finances will be secure; that consumers will be protected from fraud and mistreatment; and that the world of online information and communication will be at least as accountable for the quality, reliability, and legality of products and services as is the in-person world.

Security of data transmissions

This topic addressed the ongoing policy debates and concerns regarding the security of data networks from misuse, sabotage, theft, and espionage. The principal policy issues revolve around treatment of cryptography in both domestic law and international agreements. Survey respondents were asked their countries' current views on the extent to which government should be able to restrict use of cryptography, and have access to public key codes, as well as their participation in international agreements on the issue.

Some 42 per cent of respondent countries take the position that there should be no restrictions on domestic businesses' use of cryptography in electronic transactions. These are primarily more developed countries, but this is also the view of Brazil, El Salvador, and Grenada.

On the other hand, 29 per cent require government approval of cryptography technology, while 13 per cent favour government participation in setting industry guidelines.

Concerning government access to public key codes of private cryptography, only 13 per cent take the position that there should be no such access for any government agencies. Almost half (48 per cent) permit access for national security authorities, and 35 per cent include police with a court order. A few countries (16 per cent) indicate that any law enforcement authorities can access public key codes (among them Slovakia, Thailand, Turkey, Australia, and Denmark).

Many countries (42 per cent) are unsure about whether they would join international agreements requiring mutual recognition of cryptography standards, although only one (France) specifically stated that it would be opposed to joining such an agreement. Some 16 per cent of respondents claim to be already party to international agreements, while 42 per cent are considering joining.

Privacy protection

Protection of personal privacy for online users is emerging as perhaps an even more critical element of trust in the digital environment than security of electronic financial transactions. However, as the survey showed, many countries have yet to come to grips with the issue, either through explicit privacy protection laws and regulations, or through policies to govern the use of personal data by online services and database owners.

Of the countries responding to the survey, 33 per cent claimed to have strong privacy laws already in place. Another 30 per cent have weaker privacy protections, while the remaining countries have little or no current privacy legislation or regulations.

The survey also asked Member States' policies (or opinions) on the obligations of database owners and online service providers concerning sale or disclosure of personal data. It suggested multiple options of increasing stringency. Many Members responded that their policies required a combination of these practices, although interestingly, no one policy was cited by more than 42 per cent of respondents.

The most common policies are to require written consent before personal data can be used, and also to require official registration of databases under public authority (both identified by 42 per cent of respondents). Relatively equal numbers of respondents (about 35 to 40 per cent) cited requirements to notify users of personal data use policies, and user access to the stored information. Only 32 per cent of countries suggested that they impose restrictions on the export of databases containing personal data.

These results do not suggest any particularly strong trends, at this time, in the area of privacy protection policies among ITU Member States. This is a relatively new area for many governments, with new laws just being brought into force, and apparently no clear consensus as to the scope and direction of personal data protection.

Digital signatures and electronic contracts

Legal implications of e-commerce are far reaching. The Discussion Paper described the need for sweeping revisions to contract laws, for example, to accommodate the digital environment. The leading prototype for new legal definitions and standards in this area is the United Nations Commission on International Trade Law (UNCITRAL) Model Law on Electronic Commerce.

The survey explored ITU Members' progress in revising domestic contract laws, in the light of e-commerce and related technology trends, and in particular the extent of reliance upon the Model Law.

In response, 33 per cent stated that new legislation on electronic transactions has already been drafted or revisions are under way. This is the status primarily in developed countries in Europe or the Pacific Rim.

Some 36 per cent of respondents indicated that a policy review is under way on contract laws, while 18 per cent identified no specific efforts to date in this area. As for the UNCITRAL Model Law, 44 per cent of countries replied that their current or pending legislation follows this model, either closely (17 per cent) or loosely (27 per cent).

Certification and Certification Authorities (CA)

The Discussion Paper identified the emerging role of CAs as institutions that can add credibility and security to e-commerce transactions, both domestic and international. Many of the practical questions surrounding CAs are just beginning to present themselves, among them the degree to which national governments should mandate or control such authorities, as well as cross-border jurisdiction issues.

The survey investigated Member views on the option of government-mandated CAs versus private industry initiatives. Opinions were very mixed on this question across a range of possible alternatives. Only 16 per cent supported the notion of government established and operated CAs, but another 25 per cent called for government requirements and licensing of these authorities.

Some 22 per cent were in favour of the option of government guidelines and general oversight for private CAs. Finally, 19 per cent preferred "industry self-regulation, with government intervention in cases of major abuse or neglect".

Interestingly, most countries favouring the pure self-regulation approach were either low, middle or upper middle income (the Philippines, Syria, Grenada, Nicaragua, Uganda and Brazil), while only Canada, Denmark and France among the more economically developed nations advocated this policy.

There is broad agreement that CAs should be established at both the national and international levels. About 72 per cent of respondents favoured this position, while only 19 per cent felt that only national authorities should be established. No country felt that certification jurisdiction should be entirely transferred to international bodies alone.

As to the present status of Certification Authorities, the majority of respondents indicated that there do not exist formal Certification Authorities in their countries at this time. Only 17 per cent responded that there are existing government agencies or offices within their countries that have certification responsibility, while another 13 per cent replied that there are industry-based private authorities, under government guidelines.

More than 60 per cent of Members indicated that, at best, there are informal industry standards loosely defined under the law, or indeed no initiatives whatsoever regarding CAs. It is unclear how high a priority this type of policy will be for many countries to promote trust in e-commerce, given the many other legal and policy concerns that they are seeking to address.

Establishing ground rules

In most respects, users of e-commerce should expect to follow the same laws, rules, and regulations as everyone else. The sense that there needs to be new rules to deal with unprecedented types of relationships and transactions does not mean that the old rules are irrelevant or need to be abolished. In fact, one of the stronger sentiments concerning the ground rules for e-commerce is that there perhaps *should not* be major new policies to apply to online transactions, such as "bit taxes" or new import duties on data transmissions.

Nevertheless, just as technology is changing consumer and business relationships, it is changing the nature of governments' oversight of, and intervention in, those relationships. The most profound manifestation of this change is in the globalization of commerce, which places national governments and international institutions in a quandary as to which jurisdiction, and hence which set of rules, should apply to which activities, by whom.

The success of worldwide e-commerce thus greatly depends upon a worldwide harmonization of certain basic policies, in areas such as taxation and duties, as well as treatment of intellectual property rights and other transjurisdictional concerns.

Intellectual property rights and domain names

The easy exchange of all forms of information across the Internet, from business documents and designs to music and films has brought questions of intellectual property rights to the forefront of global debates over e-commerce policies. These issues are being actively addressed by existing international treaties and institutions, specifically the World Intellectual Property Organization (WIPO) copyright treaties and the Agreement on Trade-Related aspects of Intellectual Property Rights (TRIPS). On the domestic level, not all countries have taken equivalent legislative steps to protect owners of intellectual property from piracy or unauthorized use.

The survey inquired as to the extent of such protection in Member States. Among them, 49 per cent claim either to have strong intellectual property protection laws and enforcement in place, or "reasonable enforcement" of laws that are generally consistent with the TRIPS and WIPO agreements. The other 51 per cent of countries do not have well-established intellectual property laws, or must still update those laws to account for changing technologies. This group includes countries such as Syria, Tanzania, Burkina Faso, as well as more advanced economies such as Australia, France, Singapore, and Switzerland.

It is apparent that trends have been moving so rapidly in this area that many countries have yet to come to grips with the complex issues of intellectual property rights in the context of e-commerce.

The specific subject of Internet domain names in relation to trademark protection has special significance in the e-commerce arena.

Examples of piracy or extortion of established international names by renegade websites are well known, and the problem has been growing as the Internet has spread rapidly across the world.

Conflicts can be just as difficult within countries, as domestic businesses seek to expand onto the Web and retain their name recognition. The Discussion Paper touched upon these and related challenges involving the domain naming system in particular, and asked whether Members have established active policies regarding domestic domain names.

In 28 per cent of responding countries, the government has active responsibility for the domain naming system. In another 21 per cent, domain names are handled by an industry association, with government guidance. But for nearly 52 per cent of Members, there is no formal domain name policy, and disputes are either handled on an ad hoc basis, or there is no government involvement in domain name issues at all. Clearly, this issue remains on the horizon for many countries, and is likely to become an increasing area of concern in the future.

Maximizing benefits

Most of the policy debates and proposals surrounding e-commerce are geared towards removing barriers and promoting opportunities for these new types of commercial activity to expand even more rapidly than they already are. A final category of issues can be seen as focusing more directly upon the immediate benefits that can be gained from e-commerce, particularly the benefits that developing countries might achieve with successful strategies.

It is apparent that most of the main developments in this field have sprung from the private sector, and will continue to do so in the future, with the role of government primarily oriented towards facilitating market access and business opportunities, especially for small and medium enterprises.

In the developing world, the advantages of e-commerce might not always be in the form of entry into competition on a global scale, or international distribution of products and services; domestic markets may themselves stand to gain tremendously from the efficiencies and expanded reach of information technologies.

At the same time as we are concentrating on promoting the greatest possible gains from e-commerce, it is important to recognize that there could be downsides as well. One key area that has gained attention is the impact of the shifting dynamics of the market-place upon the labour force, and the possibility that many jobs could be lost, either to foreign competition, or to changing means of doing business that simply eliminate many existing labour-intensive activities. While these types of impacts may be unavoidable, and more than compensated in the aggregate by job creation due to economic growth, there may be responses that government and industry can pursue to minimize such adverse impacts, and help ease the transition for workers and communities.

Development of market access and business opportunities

Respondents cited numerous instances of both public and private programmes aimed at supporting e-business opportunities, the most common being national training and support programmes for electronic trade (55 per cent), and websites promoting national trade, tourism, and online businesses (over 75 per cent of responding countries have such websites). Only 28 per cent claim to have targeted micro-financing programmes for new electronic businesses. Surprisingly, only 17 per cent of Members cited participation in international incubation programmes such as the Trade Point Network of the United Nations Conference on Trade and Development (UNCTAD), despite its widespread activities.

The survey asked Members what areas or types of business activity are likely to be sources of significant growth for their economies, by means of e-commerce, suggesting a variety of the most common industry segments.

Nearly every respondent identified tourism as a primary growth area (an interesting result that suggests either global tourism will increase everywhere, or some countries' expectations may be disappointed). Similarly, over 80 per cent believe that the financial services sector will grow via e-commerce technologies. Over 60 per cent also identified the information/entertainment sector, and the software/information technology sector as candidates for growth.

There was less broad optimism, however, for the prospects of indigenous arts, crafts, and products, an area that has received wide publicity as an example of the Internet opening new export opportunities. Only 35 per cent of responding countries foresee significant growth for these businesses due to information and communication technologies; these include Trinidad and Tobago, Uganda, Bhutan, and Guyana. Also, only 38 per cent of countries anticipate growth in legal and professional services through e-commerce channels, the majority of them being more developed countries.

The survey separately asked about public services that might be provided by governments of Member States to their citizens, making use of advanced communication technologies. By far the most common practices or plans involve electronic delivery of public education services and facilitation of trade efforts through electronic means (over 80 per cent each).

Given the wide publicity attached to the prospects for so-called "tele-health" programmes, it is perhaps surprising that only 37 per cent of Members anticipate supporting health care efforts partly via electronic means.

Similarly, less than 40 per cent identified public welfare services or electoral/political activities as candidates for applying communication technologies to public functions. As many of these countries become more accustomed to these technologies in the private sector through e-commerce, it remains to be seen whether they may pursue broader applications in the public sector as well.

The results of the full survey can be found at: http://www.itu.int/newsarchive/wtd/1999/index.html. ■

From official sources

CONSTITUTION AND CONVENTION OF THE ITU (MINNEAPOLIS, 1998)

The Governments of the Republic of Lithuania and Turkey have ratified the above-mentioned Constitution and Convention.

The instruments of ratification were deposited with the General Secretariat of the Union on 28 March and 3 May 2000, respectively.

OPTIONAL PROTOCOL

ON THE COMPULSORY SETTLEMENT OF DISPUTES RELATING TO THE CONSTITUTION AND CONVENTION OF THE ITU AND TO THE ADMINISTRATIVE REGULATIONS

The Government of **Turkey** has ratified the above-mentioned Protocol.

The instrument of ratification was deposited with the General Secretariat of the Union on 3 May 2000.

NEW MEMBERS

Development Sector

Cisco Systems, Inc. (Ocean, NJ), D-Link (India) Limited (Verna Plateau, Goa, India), E.T.B. — Empresa de Telecomunicaciones de Santafé de Bogotá S.A. (Santafé de Bogotá), National Telecommunication Institute (NTI) (Cairo), Nippon Telegraph and Telephone East Corporation (NTT EAST) (Tokyo), Nippon Telegraph and Telephone West Corporation (NTT WEST) (Osaka, Japan) and *UTA Telekom AG (Vienna)* have been admitted to take part in the work of this Sector.

Radiocommunication Sector

E.T.B. — Empresa de Telecomunicaciones de Santafé de Bogotá S.A. (Santafé de Bogotá) and *Thomson-CSF (Gennevilliers, France)* have been admitted to take part in the work of this Sector.

Standardization Sector

C-Cube Microsystems, Inc. (Milpitas, CA), E.T.B. — Empresa de Telecomunicaciones de Santafé de Bogotá S.A. (Santafé de Bogotá) and *Lightsand Communications, Inc. (Milpitas, CA)* have been admitted to take part in the work of this Sector.

New denomination

Omnipoint Corporation, which participates in the work of the Standardization Sector has changed its name. The new denomination is: **VoiceStream Wireless Corporation**.

VACANCY NOTICES

Circular letters (via facsimile) which have been sent to all Member States and Sector Members of the Union announce the following vacancies:

- one post of **Managing Editor, ITU Newsletter, grade P.3,** to be filled in the General Secretariat, Strategic Planning, External Affairs and Corporate Communication Unit (SEC), as soon as possible (circular letter No. 59 of 9 May 2000; vacancy notice No. 16-2000 ITU; final date for submission of applications: 10 July 2000);
- one post of **Radiocommunication Engineer, grade P.4,** to be filled in the Radiocommunication Bureau, Space Services Department (SSD), as soon as possible for a period of one year with possibility of extension (circular letter No. 60 of 9 May 2000; vacancy notice No. 17-2000 ITU; final date for submission of applications: 10 July 2000);
- one post of **Coordinator, Africa Regional Unit, grade P.5,** to be filled in the Telecommunication Development Bureau (BDT), Field Operations Department (FOP), as soon as possible for one year with possibility of extension (circular letter No. 61 of 23 May 2000; vacancy notice No. 18-2000 ITU; final date for submission of applications: 24 July 2000);
- one post of **Publications Administrator, grade P.3,** to be filled in the Radiocommunication Bureau, Informatics, Administration and Publications Department (IAP), as soon as possible (circular letter No. 62 of 5 June 2000; vacancy notice No. 19-2000 ITU; final date for submission of applications: 4 August 2000);
- one post of **Head, Fixed and Mobile Services Division, grade P.5,** to be filled in the Radiocommunication Bureau, Terrestrial Services Department (TSD), as soon as possible for up to two years with possibility of extension (circular letter No. 63 of 5 June 2000; vacancy notice No. 20-

From official sources (continued)

2000 ITU; final date for submission of applications: 4 August 2000);

- one post of **Legal Officer, grade P.4,** to be filled in the General Secretariat, Legal Affairs Unit (JUR), as soon as possible (circular letter No. 64 of 9 June 2000; vacancy notice No. 23-2000 ITU; final date for submission of applications: 9 August 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/.

PUBLICATIONS

The following letters indicate the languages in which documents are published:

F for French
E for English
S for Spanish
R for Russian
C for Chinese
A for Arabic

Prices (indicative only) are in Swiss francs (CHF).

A comprehensive list of all the publications of the Union will be supplied, free of charge, from the ITU Sales and Marketing Service, Place des Nations, CH–1211 Geneva 20 (Switzerland). Fax: +41 22 730 5194.

List of coast stations (List IV) (17th edition, Geneva 2000)
(92-71-11031-5)
Trilingual edition in F, E, S (CHF 64)

Telecommunication Development Sector

Issues in Telecommunications Development (First edition, May 1999)
Volume II (Part I) — Reforming the international accounting rate system: Overview
Volume II (Part II) — Reforming the international accounting rate system: Case Studies
(92-61-07721-8)
Separate editions in F, E, S (CHF 100)

Radiocommunication Sector

ITU–R Recommendations, 1997 BO Series — Supplement 2 (07.10.1999–16.10.1999–06.03.2000): Broadcasting-satellite service (sound and television)
(92-61-08401-X)
Separate editions in F, E, S (CHF 38)

Telecommunication Standardization Sector

Directives concerning the protection of telecommunication lines against harmful effects from electric power and electrified railway lines (1999) Volume II — Calculating induced voltages and currents in practical cases
(92-61-08001-4)
Separate editions in F, E, S (CHF 160)

ITU–T Recommendation G.116 (09/99)
Transmission performance objectives applicable to end-to-end international connections
Separate editions in F, E, S (CHF 12)

ITU–T Recommendation H.323 (09/99)
Packet-based multimedia communications systems
Separate editions in F, E, S (CHF 55)

ITU–T Recommendation H.323 Annex F (05/99)
Packet based multimedia communications systems
Annex F: Simple endpoint types
Separate editions in F, E, S (CHF 12)

ITU–T Recommendation P.50 (09/99)
Artificial voices
Separate editions in F, E, S (CHF 12)

ITU–T Recommendation P.79 (09/99)
Calculation of loudness ratings for telephone sets
Separate editions in F, E, S (CHF 17)

ITU–T Recommendation P.313 (09/99)
Transmission characteristics for cordless and mobile digital terminals
Separate editions in F, E, S (CHF 17)

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❑ **The International Space Station gets a boost from Europe.** Through a contract signed on 7 June 2000 with *Arianespace* at the ILA2000 aerospace exhibition in Berlin, the European Space Agency (ESA) has ordered the launch of nine automated transfer vehicles (ATV) by the European *Ariane-5* launcher. ESA's ATV, currently at an advanced stage of development by a consortium led by *Aerospatiale Matra Lanceurs* (Les Mureaux, France), will supply the International Space Station (ISS) with the necessary cargo and experiments, and will perform its critical orbit-raising manoeuvres (re-boost). The nine ATVs will cover Europe's operation of the ISS for ten years, the planned nominal lifetime of the station.

This contract is a critical step towards Europe meeting its commitments in the operation and utilization of the ISS as set forth in the agreements signed in January 1998 by all the space station's partners (Canada, Europe, Japan, Russia and the United States). In May 1999, the ministers responsible for space activities decided to proceed with the operational phase of the ATV during the period 2003 to 2013, with a launch by Ariane-5 approximately every fifteen months.

The ATV/Ariane-5 combination to perform these ISS logistical missions will also permit Europe to pay in kind rather than in cash its share of the system operation shared costs, which are divided among all the partners in the ISS programme. The nine ATV/Ariane-5 missions are intended to cover the European share of these costs, amounting to 8.3 per cent of the station's total costs, over its ten years of operation. — *ESA*.

❑ **Successful launch of W4 satellite by Atlas-III maiden flight.** On 24 May 2000, the European Telecommunications Satellite Organization (EUTELSAT) successfully launched its new *W4* satellite into geosynchronous transfer orbit using the maiden flight of the *Atlas-III* rocket supplied by International Launch Services (ILS).

With W4, EUTELSAT will be in a position to meet the very high demand for capacity for consumer digital television platforms and IP (Internet protocol) services in Russia and Africa.

W4 was supplied by *Alcatel Space* and is a key new component of the vast EUTELSAT satellite system which will carry out two specific functions.

Nineteen of its transponders will be connected to the high-power fixed beam over Russia. Sixteen of them, corresponding to the frequencies held by Russia (the RST-1/RITM network), will be used by the Russian group *Media Most* for direct digital television broadcasting.

One fixed and one steerable beam, each with six transponders, will be pointed over sub-Saharan Africa where they will be used for a whole range of services, especially digital pay television and broadband Internet access for an African customer. — *EUTELSAT*.

❑ **EU telecommunications deadline in danger of being missed warns ECTA.** European jobs are at risk if member States of the European Union fail to honour commitments made at the Lisbon e-Summit in March 2000, the European Competitive Telecommunications Association warned senior officials in the European Competition Directorate in Brussels in June. The Commission had invited ECTA to give its views on the current state of deregulation in Europe, following the EU recommendation on "unbundling local loops" which is due to be implemented by year-end 2000. The unbundling involves opening up access to traditional underground copper telephone lines to new competitors.

Failure to meet this agreed deadline will rob the EU's 16 million small- and medium-sized businesses of the high-speed Internet and e-commerce links they need to compete, ECTA warned. Affordable and fast Internet connections are an essential step in closing the yawning gap between the United States and Europe in Internet applications. Orders and jobs are at risk, and a fair market for local telecommunications must be put in place. The new economy in Europe is under threat from old attitudes.

Whilst the EU in March recommended that member governments implement local loop unbundling by year-end 2000, ECTA is concerned that incumbent operators may seek to delay implementation to protect their profitable and historically protected lease line, ISDN or digital subscriber line (DSL) businesses. The Commission has helpfully clarified the legal obligations on the incumbent local loop operators, and ECTA looks now to all member States to follow this up with determined political commitment.

ECTA is committed to creating open and competitive markets across Europe and is asking the EU and national governments and their regulators for consistent support to achieve this in the interests of domestic and business customers alike. — *ECTA.*

❑ **Level 3 and Viatel cooperate in a transatlantic cable network.** Viatel, Inc. recently bought into the transatlantic optical network of Level 3 Communications, Inc. Under the transaction which represents USD 150 million, Viatel holds 25 per cent of the shares in the cable network.

With a 1.28 Tbit capacity linking Europe and the United States, the network will be operational by September 2000. Level 3 and Viatel will be the joint owners and operators of the optic-fibre transatlantic cable. A third company, Global Crossings, which had already signed a contract with Level 3 is also involved in the project.

Level 3 is an active company in the field of information and telecommunication services. It was the first to establish an international network based 100 per cent on Internet protocol (IP). The network combines local, trunk and submarine networks providing its customers in the United States, Europe and Asia with end-to-end links. The Level 3 network installation leases a national network. — *Level 3.*

❑ **Alcatel finalizes Newbridge take-over.** *Alcatel* and Newbridge Networks Corporation have finalized the transaction announced in February 2000.

The take-over became effective on 25 May 2000, following approval by the Court of Appeal for Ontario (Canada), and all the competent regulatory authorities. Alcatel now holds all the shares and voting rights of Newbridge Networks.

This take-over allows Alcatel to extend its broadband access solutions, which constitute the cornerstone of the next generation of multimedia networks. It strengthens Alcatel's hold in ATM, which is a key technology in the field of voice/data convergence, and it places the group among the world's leaders in the LMDS (wireless local loop) group. — *Alcatel.*

❑ **European satellite "ECS-5" is decommissioned.** After almost twelve years of successful operation of the *ECS-5* satellite, its owner, the European Telecommunications Satellite Organization (EUTELSAT), has decided to bring the satellite's operations to a close. The European Space Agency (ESA), which was responsible for supplying the satellite and for the subsequent monitoring and command activities in orbit, has begun orbit transfer, end-of-life tests and decommissioning activities from its dedicated control centre and ground station at Redu (Belgium). In late May 2000, the satellite was to be put into its "graveyard" orbit at least 150 km above the geostationary orbit, so that no debris is left in that very busy orbit.

The ECS satellites were the operational successors of the orbital test satellites employed successfully by ESA in the 1970s. Designed to promote telecommunication traffic throughout Europe, the series of four ECS satellites (a fifth was lost due to launch vehicle failure) has provided services in digital telephony, international television broadcasting, cable television, trunk telephony, dedicated services, *Eurovision*-related broadcasts, and mobile services. Some of these services have even extended beyond Europe.

Since the first launch in 1983, the four satellites have occupied various positions in the geostationary orbit, from 48° E to 14.8° W. The ECS system has produced nearly 3 million channel-hours of payload operation, equivalent to some 340 channel-years.

The end of ECS-5 will be followed closely by the launch of the next ESA telecommunication satellite, *Artemis*, which will carry payloads designed to provide intersatellite data relay as well as ground-based mobile telecommunications; it will also form part of the European system providing improved navigation services. — *ESA.*

❑ **Reuters and Equant found Radianz.** Reuters, the news and information provider, and Equant, operator of an extensive communication network, have announced the creation of Radianz, a new, independent company that will operate in communications between financial markets.

Radianz envisages the establishment of a secure, open IP (Internet protocol) platform offering a choice of content along with the possibility of performing transactions in 120 countries. It will bring together Reuters' knowledge of financial services and information dissemination, and Equant's expertise and range of offers for the management of secure international IP networks. It will use Reuters' existing network, consisting of over 60 000 connected customer sites worldwide. Several companies have already agreed to call on the services of Radianz: Euroclear, Morgan Stanley Dean Witter, Knight Trading Group, Inc. and *Fimat* (a subsidiary of the *Société générale* group). — *Reuters*.

❑ **BT and SmarTone to establish joint venture for mainland China.** BT and SmarTone, Hong Kong's communications services provider, have announced plans to introduce a mobile Internet portal in Hong Kong and establish a joint venture company to provide services to mobile operators in mainland China.

The joint venture, which will become operational later this year, aims to form strategic relationships with mainland mobile operators and content providers to build a mobile portal that is customized to local needs.

The mainland China market is said to be one of the largest and fastest growing mobile markets globally, with 63 million users projected by year-end 2000.

Mobile portals are also likely to dominate access to the Internet as mobile penetration in the region will eventually exceed all other forms of connectivity.

BT Cellnet's *Genie* service has been a huge success in the United Kingdom, where it has attracted more than 750 000 subscribers and is growing by 4000 a day. It is also the United Kingdom's leading mobile Internet service provider, and is expected to serve as a basis for building a global footprint.

Similar to the Genie service, the Hong Kong and mainland portals will offer fixed and mobile global Internet access from any mobile device. Other planned offerings include up-to-the-minute news, entertainment services and interactive services which will allow users, for example, to sell shares, pay credit card bills, listen to music or check a bank balance. — *BT*.

❑ WAP's window of opportunity is closing, warns Ovum. As the first generation of wireless application protocol-enabled mobile phones finally comes to market, the industry has been warned: you do not have long to get this right. In a report released on 22 May 2000, independent research and consulting company Ovum tells players intending to jump on the WAP bandwagon that WAP is not the only technology available.

Now that users are beginning to see what all the fuss over WAP was about, there is a significant danger of disappointment and backlash against the technology says the report *WAP market strategies*, explaining that this gives players just a short time to come up with the goods.

As Ovum's report points out, the development of WAP was never going to be easy given the widely differing interests of the players involved in the "collision of the mobile world with the Internet world". This has resulted in slow progress and disappointing early releases of the technology. In fact, WAP may end up being squeezed, as next-generation technologies based on XML (extensible markup language) catch up during the next three years. In the meantime, although WAP has massive industry backing, the delays in decision-making are leading some players to hedge their bets. *Ericsson*, for example, is backing a dual-mode microbrowser.

Even worse, the development of WAP handsets has been out of step with the coming of "2G+" mobile network upgrades. This means that the early WAP user will need to buy yet another handset to take advantage of the faster speeds. "That will cause customer alienation, and marketing headaches for the handset vendors", predicts the report.

All of this serves to warn potential Internet players that the time to act is now rather than later. Operators and content providers cannot afford to wait for better technology they can act now by moving beyond the hype and playing to the strengths of WAP. They must become wireless data champions, and encourage adoption by delivering really compelling and innovative applications. Only by doing that can they hope to survive to fight tomorrow's battles.

Internet users are used to free content, and it could prove difficult to get them to pay for content unless it provides considerable added value in terms of convenience, mobility and location. Potential new revenue sources suggested by Ovum include using new applications to sell additional airtime and subscriptions, transaction-based fees, portal fees, e-commerce and advertising.

Ovum's core scenario predicts 1.5 billion mobile subscribers globally by 2006, 684 million of which will use microbrowser-enabled (based on WAP and/or other technologies) services. This compares with 500 million fixed Internet users. By 2006, 82 per cent of the installed base will be microbrowser-enabled. Annual data revenues from microbrowser users globally will be USD 337 billion by 2006. — *Ovum*.

❑ **New study forecasts massive deployment of dark fibre in Europe.** A new study from The Phillips Group forecasts that over 10 million kilometres of dark fibre will be deployed in Europe over the next eighteen months leading to a new market in dark wavelengths. According to the new study, *Dark fibre 2000*, dense wave division multiplexing (DWDM) is more commonly deployed, and as a result, capacity requirements for operators may be met by several wavelengths — as opposed to several fibres.

Re-equipping existing infrastructure with next-generation all-optical transmission systems is one of the key challenges facing operators in Europe today. Dark fibre is critical in this context, and the study suggests that in terms of long-haul routes in the nine countries surveyed, dark fibre availability will increase in the short to medium term. But the study warns that shortages in dark fibre are still foreseen on routes linking second and third tier cities, and routes extending into eastern and southern Europe.

Dark fibre reserves will still be held by a number of pan-European operators and the study has identified those who are unwilling to sell this capacity, reserving it for their own use, or who do not wish to provision networks to competitors. The study suggests that the all-optical network model is the next stage in the evolution of data centric fibre networks and that it will arrive sooner than anticipated. It also predicts that the first systems will appear as early as 2001 and will be in volume deployment by the end of that year. — *The Phillips Group*.

❑ **International benchmarking study shows the United Kingdom as low-cost country for Internet, fixed voice and mobile calls.** BT has welcomed a major independent report, which concludes that the United Kingdom phone and Internet customers are, on average, getting significantly better deals than consumers and businesses in the United States and major European countries.

The survey, which covers France, Germany, Sweden, the United Kingdom, the United States (not mobile) and Italy (mobile only), was commissioned by industry regulator Oftel and carried out by Teligen Limited, an independent consultancy based in Richmond (Surrey, United Kingdom). It looked at usage "baskets" which reflect a wide range of usage patterns for services. Key findings of the report include Internet access and mobile and conventional calls.

For Internet access, the United Kingdom has, on average, the lowest prices of the countries considered, including the United States, for residential consumers. Prices are within one per cent of the lowest priced country, Sweden, for business consumers.

For mobile telephones, considering both pre-paid and post-paid services, and including the cost of the mobile handset, the United Kingdom has, on average, the lowest prices of the countries considered.

For calls made on the conventional public switched telephone network (PSTN), the United Kingdom prices for residential consumers are found to be second lowest, only 2 per cent higher than the cheapest country, Sweden, and up to 20 per cent lower than the other countries considered. Price levels for the United Kingdom business consumers are found to be "about average".

According to BT, the report finally lays to rest some persistent myths about the competitiveness of United Kingdom industry. The report shows that, for mobile services in Europe, customers can be paying up to 74 per cent more in other countries than in the United Kingdom. For conventional fixed telephony at its simplest, only Sweden narrowly beats the United Kingdom, with customers in the United States and the other European countries paying between seven and 20 per cent more. — *BT*.

❑ **EUTELSAT and Telia launch digital platform.** *Telia* is joining forces with the European Telecommunications Satellite Organization to launch a new digital platform for television and multimedia services using EUTELSAT's *W3* satellite at 7° E — one of the key positions in Europe for reception of television, sound programme and multimedia services.

The new platform will deliver digital television to homes with satellite or cable links and will also be able to distribute continuous services, professional television and other broadband services with digital multimedia content. European broadcasters and major groups with extensive distribution areas will be able to use the digital platform at Stockholm for television and data transmission services.

The platform is based on the DVB (digital video broadcasting) standard which allows reception of multimedia content with the small antennas used for digital satellite television. — *EUTELSAT*.

❑ **Telefónica Móvil Chile selects Comverse for prepaid services deployment.** Comverse Network Systems, a division of Comverse Technology, Inc. has announced that it has successfully installed and launched systems enabling prepaid services for more than one million subscribers at *Telefónica Móvil Chile*, the country's largest mobile operator.

Comverse installed prepaid service solutions at two Telefónica Móvil Chile network sites near Santiago. The sites are interconnected using Comverse's distributed architecture and are integrated within Telefónica Móvil Chile's network via a trunk loop-around approach. The distributed architecture will enable subscribers to roam freely between the systems. This prepaid solution helps lay the foundation for continued expansion in Chile, where the wireless market is growing very rapidly. — *Comverse*.

❑ **Personnel changes**

in Belarus

Mr N. A. Krukovsky has been appointed Minister of Posts and Telecommunications.

in Central African Rep.

Mr Augustin Yamandjan has been appointed Director-General, *Société Centrafricaine de Télécommunications* (SOCATEL).

in Chile

Mr Carlos Cruz Lorenzen has been appointed Minister of Transports and Telecommunications.

in Greece

Messrs Christos Verelis and Alexandros Voulgaris have been appointed Minister and Deputy Minister of Transports and Communications, respectively.

in Niger

Mr Amadou Ehadji Salifou has been appointed Minister of Communication.

in Poland

Mr Tomasz Szyszko has been appointed Minister of Posts and Telecommunications.

in Tanzania

Mrs Asenath N. Mpatwa has been appointed Acting Managing Director, Tanzania Telecommunications Company Limited (TTCL).

in Turkey

Mr Ibrahim Hakki Alptürk has been appointed Director-General and Chairman of the Board, *Türk Telekomünikasyon A.S.* — ITU Notification No. 1390.

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

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

- 19–28 July (Geneva)
  Council 2000 (C-2000)
- 6–10 November (Geneva)
  Working Group on ITU Reform (third meeting)
- 4–9 December (Hong Kong)
  ITU TELECOM ASIA 2000

Telecommunication Development Sector

- 10–14 July (Issyk-Kul, Kyrgyzstan)
  Subregional seminar on Windows-based Basic Automated Spectrum Management System (WinBASMS) for the CIS countries
- 12–14 July (Geneva)
  Meeting of Focus Group 7
- 17–18 July (Geneva)
  Rapporteur's Group meeting on Question 10/2
- 17–21 July (Dakar)
  Management workshop for top-level managers
- 31 July–4 August (Kuala Lumpur)
  ABU/ITU seminar and workshop on Digital Sound Broadcasting (Managing the transition, policy issues)
- 7–12 August (Yaoundé)
  Seminar on spectrum management and the use of BASMS in Central Africa
- 4–6 September (Managua)
  Central American workshop on telecommunication policies (Blue Book)

ITU Conferences *(continued)*

• 11–15 September (Geneva)
Third meeting of Study Group 1

• 12–15 September (Budapest)
Regional seminar for Europe on the regulation of telecommunication markets (optimal solutions in privatization)

• 18–22 September (Geneva)
Third meeting of Study Group 2

• 26–29 September (Bishkek, Kyrgyzstan)
Subregional seminar on international telecommunication law for the CIS

• 3–5 October (Vientiane)
Seventh subregional telecommunication meeting for Cambodia, Lao P.D.R. and Viet Nam

• 4–6 October (Kyiv)
Interregional seminar on the transition from SECAM to digital broadcasting

• 9–10 October (Geneva)
Third meeting of the Task Force on Gender Issues

• 11 October (Geneva)
Fourth meeting of TDAG subgroup dealing with private sector issues

• 12–13 October (Geneva)
Fourth meeting of the Telecommunication Development Advisory Group (TDAG)

• 15–16 October (Egypt)
Arab telecommunication development meeting

• 16–19 October (Arusha, Tanzania)
HRD regional meeting — English-speaking countries of Africa

• 17–19 October (Egypt)
Preparatory meeting for the Arab States for WTDC-02

• 25–27 October (Tunis)
Regional seminar on trade of telecommunication services

• 5–9 November (Dubai, United Arab Emirates)
Regional seminar on electronic commerce

• 7–9 November (Hanoi)
Seminar on pricing and settlement reform in developing economies (Cambodia, Lao P.D.R. and Viet Nam)

• 20–22 November (Geneva)
Development symposium for regulators

• 20–22 November (Rabat)
Private-sector cooperation meeting related to equipment manufacturers in the Arab Region (telecommunications and information technology)

• 28–30 November (Yerevan, Armenia)
Seminar on pricing for frequency usage

Radiocommunication Sector

• 12–13 July (Geneva)
Study Group 3 (Radiowave propagation)

• 27–28 July (Vancouver, Canada)
Working Party 7E (Inter-service sharing and compatibility)

• 31 July–4 August (Vancouver)
Working Party 7B (Space radio systems)

• 31 July–4 August (Vancouver)
Working Party 7C (Earth exploration satellite systems and meteorological elements)

• 31 July–4 August (Vancouver)
Working Party 7D (Radio astronomy)

• 21–25 August (San Diego, CA)
Working Party 8F (IMT-2000 and systems beyond IMT-2000)

• 11–15 September (Geneva)
Radio Regulations Board (RRB)

• 13–19 September (Geneva)
Working Party 6Q (Quality assessment)

• 13–19 September (Geneva)
Working Party 6R (Recording for broadcasting)

• 13–21 September (Geneva)
Working Party 6B (Digital coding)

• 13–22 September (Geneva)
Working Party 6A (Broadcasting systems, production, baseband signals)

• 13–22 September (Geneva)
Working Party 6E (Terrestrial emission)

• 13–22 September (Geneva)
Working Party 6S (Satellite broadcasting)

• 18–22 September (Geneva)
Working Party 6M (Interactivity and multimedia)

• 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 (Radiofrequency 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 6 (Broadcasting service)

• 25 September–4 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)

ITU Conferences *(continued)*

- 5 October (Geneva)
Joint Study Groups 4 and 9 meeting
- 6 October (Geneva)
Study Group 4 (Fixed-satellite service)
- 9–13 October (Geneva)
Working Party 7A (Time signals and frequency standard emissions)
- 9–18 October (Geneva)
Working Party 8A (Land mobile service excluding IMT-2000, amateur and amateur-satellite services)
- 16–17 October (Geneva)
Study Group 7 (Science services)
- 17–27 October (Geneva)
Working Party 8D (All mobile satellite services and radio-determination satellite service)
- 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 6/6 (Recommendation for a digital broadcasting standard below 30 MHz)
- 26 October (Geneva)
Study Group 6 (Broadcasting service)
- 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

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

Conferences external to the ITU

2000

- 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.: +387 71 654 972
Fax: +387 71 654 972
E-mail: bihtel@etf.unsa.ba

2001

- 14–18 January (Honolulu, HI)
23rd Annual Pacific Telecommunications Conference — PTC2001: From convergence to emergence: will the user rule?
Tel.: +1 808 941 3789
Fax: +1 808 944 4874
E-mail: ptc2001@ptc.org
- 20–22 February (Zurich, Switzerland)
EMC Zurich '01 — The 14th International Zurich Symposium and Technical Exhibition on Electromagnetic Compatibility
Tel.: +411 632 2790
Fax: +411 632 1209
E-mail: gmeyer@nari.ee.ethz.ch
http://www.nari.ee.ethz.ch/emc/
- 1–4 March (Beirut)
ARABCOM 2001 — The 4th Annual Arab International Telecom Development Congress and Exhibition for the Middle East and Arab States
Tel.: +961 5 450 212
Fax: +961 5 455 477
E-mail: ktayar@arabcom.com
http://www.arabcom.com
- 21–23 March (Pragati Maidan, New Delhi)
Convergence India 2001
Tel.: +91 11 463 8680
Fax: +91 11 462 3320
E-mail: exhibitionsindia@vsnl.com
http://www.exhibitionsindia.org