

International Telecommunication Union: an Overview

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Agenda

- Mission
- Structure
- Understanding telecommunication trends
- ITU related activities
- Conclusion

International Telecommunication Union

- International organization where governments and private sector coordinate global telecom networks and services
- Founded in 1865, it is the oldest specialized agency of the UN system
- 189 Member States, 650 Sector Members, 75 Sector Associates

International Telecommunication Union

- Headquarters Geneva, 11 regional offices, 790 staff / 83 nationalities
- 2002 budget = circa USD 115m
- Secretary-General: Yoshio Utsumi (Japan)
Deputy Sec-General: Roberto Blois (Brazil)

ITU mission

- Maintain and extend international cooperation in telecommunications
- Technical and policy assistance to developing countries
- To harmonize actions of Member States and promote cooperation between Member States and Sector Members

ITU mission

- To promote at international level, the adoption of a broader approach to issues of telecommunications in the global information economy and society
- To extend the benefits of telecoms to all the world's inhabitants
- “Helping the world communicate”

But what does ITU actually do?

- Spectrum allocation and registration
- Coordination of national spectrum planning
- International telecoms/ICT standardization
- Collaboration in international tariff-setting
- Cooperation in telecoms development assistance
- Measures for ensuring safety of life
- Policy reviews, information exchange
- Extension of universal access

ITU structure: simple view

Radiocommunication Sector (ITU-R)

Management of the radio-frequency spectrum and satellite orbits used by services such as fixed, mobile, broadcasting, amateur, space research, meteorology, global positioning systems, environmental monitoring and safety of life at sea and in the skies.

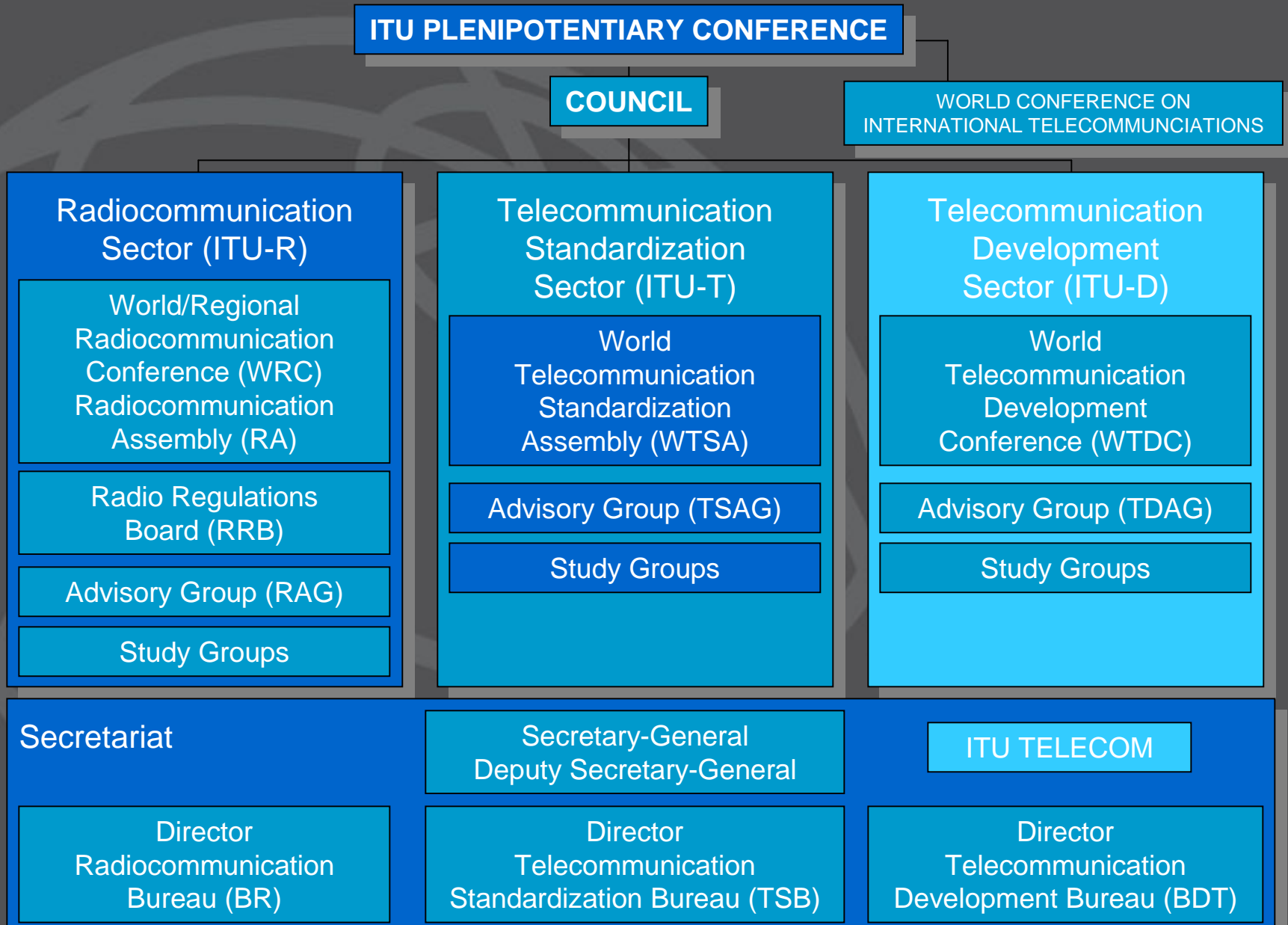
Telecommunication Standardization Sector (ITU-T)

Establish internationally agreed technical and operating standards
“Recommendations” for networks and services

Telecommunication Development Sector (ITU-D)

Assistance to developing countries to facilitate connectivity and access, foster policy, regulatory and network readiness, expand human capacity through training programmes, formulate financing strategies and e-enable enterprises in developing countries

ITU structure: complex view



Plenipotentiary 2002

Resolutions examples

- ITU Member States adopted two resolutions related to Internet names and addresses guiding ITU's activities in this area:
 - Resolution 102 on “Management of Internet Domain Names and Addresses”
 - Resolution 133 on “Role of administrations of Member States in the management of internationalized (multilingual) domain names”.
 - Resolutions give instructions to Secretary-General, TSB Director, the BDT Director and the ITU Council, as well as inviting Member States to contribute to certain activities
 - See www.itu.int/osg/spu/mina/

Treaties

- ITU Constitution and Convention
 - Two complementary treaties, containing mainly housekeeping and ITU structural details
 - Major update 1992; minor in 1994, 1998, 2002
- International Telecommunication Regulations
 - Thin (10 Articles) treaty concerning mainly accounting practices. Last update 1988 – under review...
- Radio Regulations
 - Thick (>10'000 pages) treaty governing use of radio spectrum, updated every World Radio Conference (next June 2003)

Who pays what?

- Each Member State chooses to pay a certain number contributory units e.g. US = 30, Malawi 1/16
- For Member States, 1 unit = CHF 315'000
- For Sector Members, 1 unit = CHF 63'000
- For Associates, 1 unit = CHF 10'500
- Main budget = CHF 172m in 2002, of which:
 - CHF 113m (65.7%) from Member States
 - CHF 22m (12.8%) from Sector Members & Associates
 - CHF 14m (8.1%) from sale of publications
 - CHF 15m (8.7%) from cost recovery, interest, etc
 - CHF 4m (2.3%) from funds-in-trust (for dev't)

Understanding telecommunication trends: 20 years of sector reform

- ~20 years ago, AT&T formally agreed to the break-up of the Bell system
- 10 years ago, around 10 countries had some measure of fixed-line competition
- 5 years ago, in concluding the WTO basic telecoms agreement, some 70 countries committed to telecoms market liberalization
- Now, countries with privatized operators and some degree of competition are in majority among ITU Member States

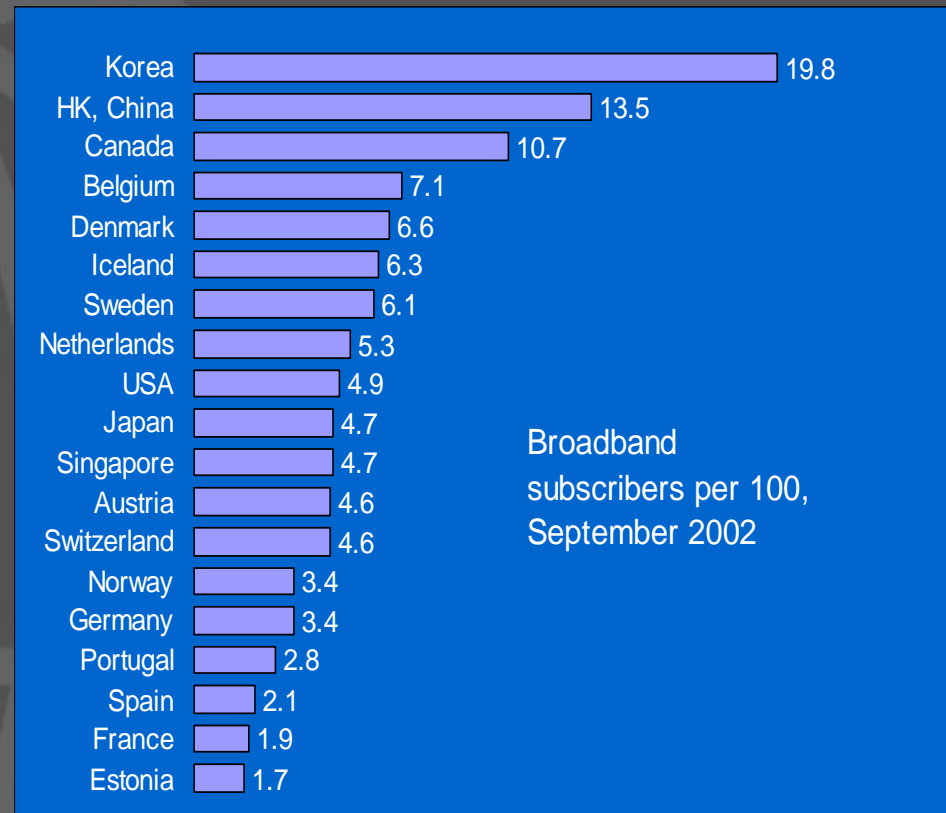


Understanding telecommunication trends

- Buzzwords: liberalization, competition, deregulation, globalization, convergence
- Changing regulatory environment
 - World now numbers 102 separate regulatory bodies, up from 30 in 1994
- Wide misunderstanding of “regulation” & “deregulation”:
 - “Deregulation” has become a political code phrase to excite the faithful, like "tax relief." When Powell points out, as he often does, that no implementation of the scores of rules set out in the Telecommunications Act could possibly be considered deregulation, he is met with blank stares.
 - From article on FCC Chairman Michael Powell at <http://slate.msn.com/id/2078879/>

More recent trends

- Birth of Broadband
- Growth in wireless networks and mobile data services
- Mobile overtakes fixed
 - LDCs have fastest growth in mobile (e.g. Africa)
 - Lower-income populations: access to telecoms
 - Mobile Internet and multimedia applications
- Rising sun of “ubiquitous networks”
- New generation of hundreds of millions of IP-enabled “appliances”



The regulatory environment

- Many tensions and indications that current regulatory models are “broken”
- All policy makers and regulators - both new and old - struggling to address changes resulting from convergence of information and communication (ICT) sectors
- Build-out of networked economies and national information societies have raised public policy stakes
- National telecommunication infrastructures are platform for deployment of advanced national information communications networks

How has the Internet impacted ITU?

- Support for IP-related technologies is now strategic element in design, development and use of most telecommunication networks;
- Has had major impact on ITU's core activities in radiocommunication, telecom standardization and development programmes
- Has broadened ITU's focus from coordination of global telephony and radiocommunication systems to info-communications networks services and technologies (which includes IP-based networks and the Internet)

Understanding telecommunication trends

- The growth of the Internet and other IP-based networks and their requirements for bandwidth and capacity are driving innovation in access and transport networks, examples:
 - leveraging copper wire “last-mile” networks through digital subscriber line (“DSL”) technologies
 - re-architecturing of cable networks to support IP services
 - advances in optical networking technologies

Understanding telecommunication trends

- Trend towards integration and interoperability of IP-based and PSTN network services and applications
- Emergence of differentiated Quality of Service (“QoS”) IP-based services
- Managed end-to-end performance needed for new applications requiring real-time traffic (e.g., video, voice)
- New network management, QoS, traffic engineering, pricing & accounting models emerging

Telephone networks and the Internet: what's the difference?

Telephone Network

- Hybrid analogue/digital
- Circuit-switched
- Highly regulated
- Priced per minute
- Distance-sensitive pricing
- Accounting rate system means cash flows from net traffic generating to net traffic receiving countries

Current Internet

- All digital
- IP (packet-switched)
- Largely unregulated
- Priced per megabyte
- Distance-insensitive pricing
- Peering and transit system means cash flows from net traffic receiving to net traffic generating countries

Telephone networks and the Internet: what's the difference? cont'd

Telephone Network

- 64 kbit/s circuit switching
- Well defined architecture, fixed and mobile
- Designed for high reliability and QoS
- Network establishes end-to-end connection for duration of each call
- Specified at national level growing to global
- Main area for national regulation

Current Internet

- Packet switching over diverse media
- Defined by protocols rather than architecture (TCP/IP)
- Specified at global level
- No end-to-end connection held
- Best effort network – no QoS guarantee
- Open interfaces support rapid innovation

In the future

- Telephone network (fixed and mobile) and Internet will converge to Next Generation Networks (NGN)
- Probably packet based (IP & ATM) with necessary extensions to give a level of service equal to or better than current PSTN carrier networks
- Telephony and multimedia may be just another application over the Internet but to make this happen, there needs to be:
 - Substantial standards work
 - Substantial resource investment

What is needed for “Carrier Grade IP”?

- What is the underlying demand, business case and the likely timing?
- International and national work based on open standards is needed to introduce interoperable NGN:
 - architecture and protocols
 - end to end QoS
 - service platforms
 - network management
 - lawful interception
 - Security
- Much current ITU standards work relates to NGN

ITU Telecom Standardization Sector (ITU-T)

- See www.itu.int/itu-t/
- Director: Houlin Zhao (China)
- Standardization activities are segmented into “Study Groups” that focus on different topic areas (e.g., security, access & transport networks, multimedia, signalling, numbering, naming and addressing, tariffing, IP and NGN)
- Unique forum for public-private partnership
- Cooperative activities with many organizations and forums including regional telecom forums, IETF, ISO, IEC, ETSI, etc.

ITU Telecom Standardization Sector (ITU-T) cont'd

- During last 4 years, large reorientation towards IP-related standardization and accelerated procedures
- Majority of ITU-T activities are now related to IP and NGN activities
 - www.itu.int/ITU-T/studygroups/com13/ip/ietf
- Common interest areas between ITU-T and IETF at:
 - www.itu.int/ITU-T/studygroups/com13/ip/documents/IPprojV7.pdf

How does the ITU-T work?

- In ITU-T, industry and governments work together to develop consensus-based “Recommendations”
- Work typically driven by private Sector Members
- Open (for members), transparent, bottoms-up process
- Sensitive to national sovereignty: will only cover matters not considered to be national
- Will not impose contractual terms or operating rules on private companies
- Recommendations are not binding, but tend to be followed because they represent true consensus

What the ITU-T does not do (despite common myth)

- World-wide regulation
- Make binding “Recommendations”
- Enforce compliance
- Have staff that decide policies
- Make “top-down decisions”
- Consider issues that are national matters
- Impose contractual terms or operating rules on private companies
- Collect fees other than membership fees (with exception of minor cost-recovery activities)

ITU-T Recommendations approval and publication times

	Before 1988	1988-1993	1993-1996	1997-2000	2001-2004
Approval time	4 years	2 years	18 months	9 months	2-9 months
Publication time	2-4 years	2 years	1-1.5 years	6-12 months	2-9 months

Pre-published Recommendations made available on ITU-T Website, from a few days to four weeks after approval of the text

All Recommendations in force, pre-published, superseded/obsolete available on ITU-T Website

All Recommendations published on electronically online, paper, CD-ROM

Free online access since January 2001 (one free access per member, 3 free downloads for public)

“Approval time” counted between “determination/consent” and final approval

ITU-T Study Group 2

- Lead study group on naming, numbering, addressing, and routing issues, examples:
 - E.164 international numbering plan
 - E.212 mobile (“IMSI”) codes
 - ENUM: mapping between the Internet Domain Name System (DNS) and the E.164 numbering plan
 - E.164 numbering resources for IP telephony (e.g. UPT 878 code allocated for testing)
 - ITU-T SG for ongoing activities related to management of Internet names and addresses (MINA) issues

ITU-T Study Group 3

- In 2000, SG 3 adopted draft recommendation “D.50” on the cost sharing of international Internet connection between administrations, and continues the study on applicability of principles contained in that Recommendation;
- Result of tensions over costs of full leased circuits to Internet “backbone” and argued lack of transparency over peering and interconnection rules
- Very short Recommendation that says “thou shall negotiate and agree in good faith”

Diverse views on Internet interconnection and peering rules

- One view from unnamed government policy maker:
 - “ITU is trying to apply legacy telephony interconnection rules to the Internet!”
- Another view from Internet technical community:
 - “when this situation has existed in other industries, gov't intervention has always resulted. even when the scope is international. i've not been able to puzzle out the reason why the world's gov'ts have not stepped in with some basic interconnection requirements for IP carriers.”
 - Paul Vixie, Author of DNS BIND, runs F root server
 - www.merit.edu/mail.archives/nanog/2002-06/msg00937.html

ITU-T Study Group 4

- Lead Study Group on telecommunication management network (“TMN”) issues
- Framework for unified management of integrated circuit-switched and packet-based networks (with initial emphasis on IP-based networks)
- Also active in IMT-2000 network management for service provisioning and security

ITU-T Study Group 8

- T.37: Procedures for the transfer of facsimile data via store-and-forward on the Internet
- T.38: Procedures for real-time Group 3 facsimile communication between terminals using IP networks

ITU-T Study Group 9

- “IPCablecom” project specifies architecture and protocols for delivery of time-critical IP-based interactive services over cable television networks
- J.122, J.112, and J.83 Recommendations define provisioning of IP-based services over cable networks using cable modems
- J.120, defining a transmission protocol and configuration for distribution of sound and television programs (webcasting) over IP networks

ITU-T Study Group 11

- Standardized signalling for IP and advanced network applications, Intelligent Networks (“IN”)
- Key role in:
 - Signalling support of mobility services (e.g., IMT-2000)
 - IP related signalling (e.g., bearer independent call control (BICC), see Q.1901)
 - Signalling transport over IP and Interactions between IN and IP-based networks
 - Use of SIP for user access and network-to-network interfacing

ITU-T Study Group 12

- Lead Study Group coordinating QoS
- End-to-end transmission performance of networks
- Transmission requirements for IP gateways and terminals
- Voiceband services via IP networks
- Perceptual appreciation of quality of speech
- QoS issues related to IP networks....(e.g. G.1010)
- Multimedia QoS/performance
- In-service non-intrusive assessment of VoIP

ITU-T Study Group 13

- ITU-T lead Study Group for Internet Protocol (IP), B-ISDN, GII and satellite matters, for example:
 - Y.1310: Transport of IP over ATM in Public Networks
 - Y.1221: Traffic control and congestion control in IP networks
 - Y.1310.2: IP-MPLS transfer and control protocols
 - Y.1541: Network performance objectives for IP-based services allocations (relates to QoS classes)
- See ITU IP Project at
 - www.itu.int/ITU-T/studygroups/com13/ip/documents/IPprojV7.pdf
- Next Generation Networks 2004 Project
 - www.itu.int/ITU-T/studygroups/com13/ngn2004

ITU-T Study Group 15

- Lead Study Group on Access Network Transport and related to the Optical Networking technologies
- Standardizes high-speed access over copper wire loops using Digital Subscriber Line (“DSL”)
- Standardizes optical access networks for delivery of broadband services
- Working on optical transport of Internet packets: IP over Wavelength Division Multiplexing (WDM), DWDM, CWDM
- Important work related to Fibre to the Home, SMEs

ITU-T Study Group 16

- Lead Study Group on multimedia services and systems
- Produced Recommendations that are widely used in IP-based and other (including mixed) network architectures.
- Examples include:
 - standards for IP telephony (e.g., H.323 series)
 - modems (e.g., V.90, V.92)
 - audio and video codecs (e.g., G.723.1 and G.729 series, H.260 series)
 - H.248 “media-gateway” series for interworking between IP networks & PSTN

ITU-T Study Group 16 cont'd

- H.264: advanced new video coding
 - Part of MPEG-4
 - half bandwidth requirement for same quality as MPEG-2 (e.g., used on DVD players)
 - Important for future streaming applications over IP-based networks and the Internet
- Emergency services
- Wideband voice codecs (killer app for 3G?)

ITU-T Study Group 17

- Lead Study Group on frame relay (fast packet), communication systems security and language description techniques (e.g., ASN.1)
- Responsible for X.509; reference standard for authentication services using asymmetric cryptography and Public Key Infrastructure (“PKI”) services
- X.509 is widely used in digital signature technologies and for E-commerce on IP-based networks

ITU-T Study Group 17 cont'd

- Some recent work:
 - X.85/Y.1321: IP over Synchronous Digital Hierarchy (SDH) Networks
 - New versions of frame relay standards offering improved support for IP networks
 - X.842: Information technology - Security techniques - Guidelines on the use and management of trusted third party services
 - X.843: Information technology - Security techniques - Specification of TTP services to support the application of digital signatures

ITU-T Study Group 17 cont'd

- Fostering security related activities, new work started in
 - Security management
 - Telebiometrics
 - Mobile security
 - www.itu.int/itu-t/studygroups/com17/cssecurity.html

Special Study Group (SSG) on IMT-2000 and Beyond

- ITU's IMT-2000 initiative is a cross-sector project with technology defined in interdependent set of ITU-R and ITU-T Recommendations
 - ITU-R standardized 3G radio transmission technology family:
e.g. CDMA 2000, W-CDMA, TD-SCDMA
- Interworking with IP networks
- Interworking with other fixed networks
- Multimedia terminals and services
- Emergency and priority calls
- Geographic position/location services

Telecommunication Development Sector (ITU-D)

- See www.itu.int/itu-d/
- Director: Hammadoun Touré (Mali)
- Regulatory assistance and technical cooperation
- Many IP and Internet related initiatives
- Internet Training Centres Initiative for Developing Countries (partnerships with Cisco, Alcatel)
- Produce well known telecommunication indicators reports and databases (used by World Economic Forum, World Bank and others)
- Regional offices (11)

Telecommunication Development

Sector cont'd

- Study Groups: some “Questions” related to Internet Protocol networks:
 - 19/1: Implementation of IP telephony in developing countries
 - 12-1/2: Examination of broadband communications over traditional copper wires, taking into account certain aspects of technologies, systems and applications
 - 19/2: Strategy for migration from circuit-switched networks to packet-switched networks
 - 20/2: Examination of access technologies for broadband communications

Examples of ITU-D activities related to IP networks

- IP Networking and IPv6 for Engineers working in PTOs in the framework of the Centre of Excellence (Mauritania, 19-23 May 2002);
- IP Technologies and Applications for Arab region (Tunisia, 17-19 June 2002);
- IP Symposium focused on IP-based Networks and VoIP (Switzerland, 18-22 November 2002);
- Internet for Central America (Guatemala, 27-29 November 2002)

Examples of future activities

- Within framework of Resolution 102 (instructions to BDT Director) and Istanbul Action Plan adopted at the World Telecommunication Development Conference (WTDC02)
- Symposia to address technology policy issues for IP addresses and DNS management, IP connectivity, IDN, Internet development strategies and harmonization of policies:
 - June 2003: Kigali, Rwanda
 - September 2003: Moscow, Russia

ITU-D Sector Reform Unit (SRU)

- See www.itu.int/ITU-D/treg/
- SRU organizes annual “Symposium for Regulators” allowing world’s regulators to share experiences
- Prepares reports on Trends in Telecommunication Reform

Effective regulation and Internet case studies

- Country Case Studies on Effective Regulation
 - ITU Member States request information and models with regard to independence and operation of regulatory agencies
 - With assistance of Member States, ITU prepares and publishes case studies on how administrations established regulatory bodies and the results
 - Morocco, Peru, Botswana, Brazil, Singapore
 - See www.itu.int/ITU-D/treg/Case_Studies/
- Internet case studies show how countries have fostered deployment of IP-based networks
 - See country case studies at www.itu.int/spu/ (with SPU)

Strategy and Policy Unit (SPU)

- Strategic research/workshops/publications on topical issues:
 - Promoting Broadband
 - Competition Policy in Telecommunications
 - Improving IP Connectivity in the Least Developed Countries
 - Trust in Critical Network Infrastructures
 - Multilingual Domain Names
 - 3G Licensing
 - Broadband
 - Fixed Mobile Interconnect
 - IP Telephony
 - Electronic Signatures and Certification Authorities

*ITU Council
Decision 496*

The main purpose .. is to advise the Secretary-General, in an informal manner on new topics of a regulatory, policy or other nature of high-current interest which cut across the work of the Sectors...”



- About SPU
- Workshops and Symposia
- Publications and Reports
- Statistics and Analysis
- ITU Strategic Plan
- Country Case Studies
- Telecom and Internet Policy
- Other SPU Activities



ITU Strategy and Policy Unit

- About the Unit
- About the New Initiatives Programme

Workshops and Symposia

- Main Page
- November 2002: [Competition Policy in Telecommunications](#)
- May 2002: [Creating Trust in Critical Network Infrastructures](#)
- April 2002: [Improving IP Connectivity in Least Developed Countries](#)
- [more...](#)

Publications and Reports

- Main Page
- [World Telecommunication Development Report 2002: Reinventing Telecoms](#)
- [ITU Internet Reports, 2001: IP Telephony](#)
- [more...](#)

Statistics and Analysis

- Main Page
- [ITU Telecommunication Indicators \(statistics and analysis\)](#)

Other SPU Activities

What's New

- [Policy and Strategy Trends](#) (Jan-March 2002) Click [here](#) to subscribe.
- June 12 2002:** [Proposed themes for the World Summit on the Information Society](#)
- June 7 2002:** [Results of Questionnaire on Possible Topics for New Initiatives Workshops in 2003](#)
- ITU announces a new publication, the [World Telecommunication Development Report 2002: Reinventing Telecoms](#) ([press release](#)).

ITU Strategic Plan

- Main Page
- [Preparation of the ITU Strategic Plan 2003-2007](#)

Country Case Studies

- Main Page
- [Case Studies by Topic](#)
- [Case Studies by Region](#)

Telecommunication and Internet Policy



**world summit
on the information society**
Geneva 2003 - Tunis 2005

- ITU has lead role in organizing WSIS
 - World Summit on the Information Society (Geneva, 2003 & Tunis, 2005)
 - Website: www.itu.int/wsis/
 - to develop “common vision and understanding of the information society and the adoption of a declaration and plan of action for implementation by Governments, international institutions and all sectors of civil society”



world summit
on the information society
Geneva 2003 - Tunis 2005

- Key issues for the Summit:
 - Mainstreaming ICTs into development
 - Promoting cultural and linguistic diversity
 - Building human capacity
 - Extending access, connectivity and infrastructure
 - Creating an enabling legal and policy environment
 - Building partnerships and mobilizing resources
 - Confidence and security in use of ICTs
 - Protecting fundamental freedoms

Conclusion

