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Thinking About
«Internet Governance»

ICT Trends and Challenges in a Global Era
Michigan State University, INT & Business School Lausanne
July 4, 2005, Geneva

Robert Shaw
ITU Internet Strategy and Policy Advisor
ITU Strategy and Policy Unit

Introduction

- **Subject of this talk**: Internet Governance in context of telecommunications technologies and policies

- **Objective**: to give historical and future perspective of interrelationships with telecom technologies and policies

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Agenda

- Why talk about "Internet Governance"?
- Brief introduction to the ITU
- Cycles of Technologies
- Cycles of Policy and Regulation
- Case Study: Spam and Phishing
- Conclusion

Why talk about Internet Governance?

- Unresolved issue from the first phase of the World Summit on the Information Society

- As a result, UN Working Group has prepared a report on this topic for delivery on July 18 2005 which will be considered in the preparation process for the 2nd Phase of WSIS (Tunis Nov 2005)

The ITU

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

- Headquarters Geneva, 11 regional offices, 790 staff / 83 nationalities

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

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ITU Mission

- To promote at international level, the adoption of a broader approach to issues of telecommunications in the global information economy and society

    ➢ WSIS originally proposed at ITU in 1998 and later endorsed by UN

- To extend the benefits of telecoms to all the world's inhabitants

- "Helping the world communicate"

Cycle of Technologies

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The Impact of New Communications Technologies

- Technology-driven industries like telecommunications historically characterized by steady growth punctuated by "giant leaps" forward, usually when "new" technology is introduced

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This has happened a number of times

- 1840's: telegraph
- 1870's: telephone

> 1865: ITU Created

- 1890's: radio telegraphy or "wireless"
- 1920's: radio broadcasting
- 1950's: television broadcasting
- 1960's: geostationary satellite communications
- 1970's: computer communications
- 1980's: optical communications
- 1990's: Internet and mobile

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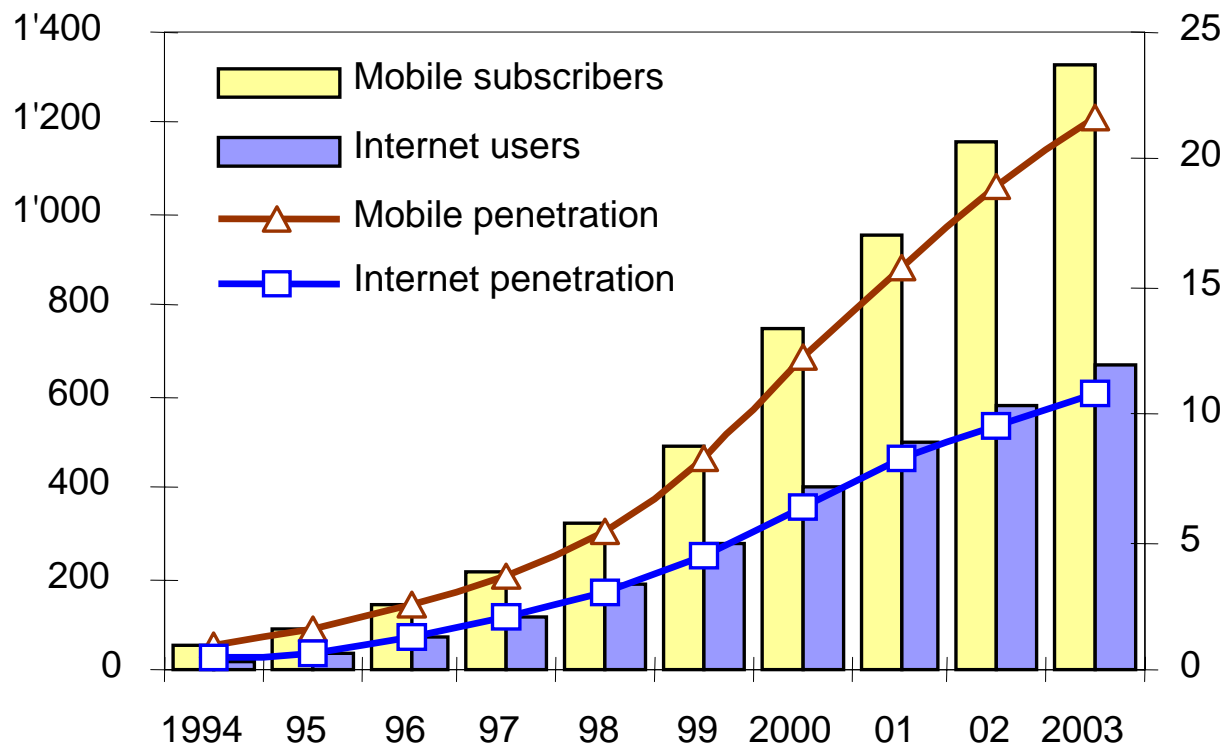Union
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Telecoms Reinvented

- In the last part of the twentieth century, the almost simultaneous arrival of two major innovations — mobile phones and the Internet — not only changed the face of communications, but also gave the impetus to dramatic economic growth

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Impact of New Technologies

Users (millions) and penetration per 100 pop.

"Virtually all of the growth in the global telecoms sector over the past decade has come from mobile communications and the Internet"

In the developing world, mobile has grown faster

Bridging the digital divide (millions)

Mobile

	1993	1998	2003
Developing	3	80	608
Developed	31	244	734

Internet users

	1993	1998	2003
Developing	0.4	20	239
Developed	10	161	499
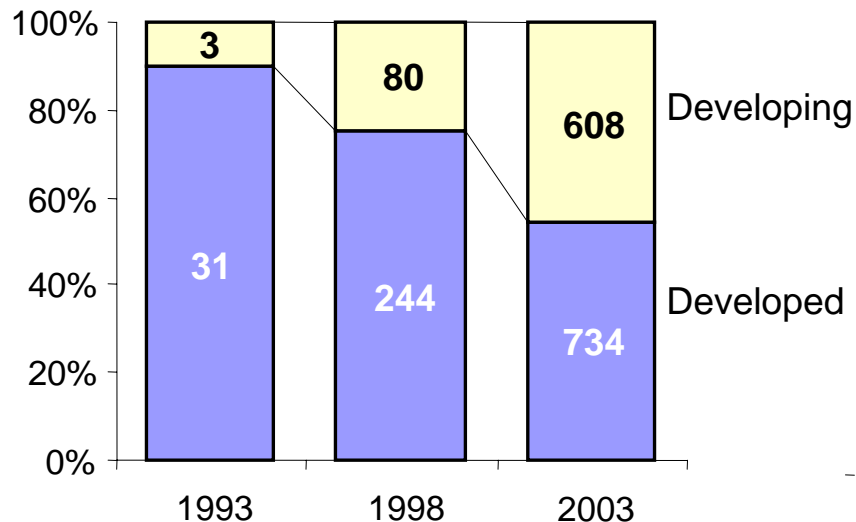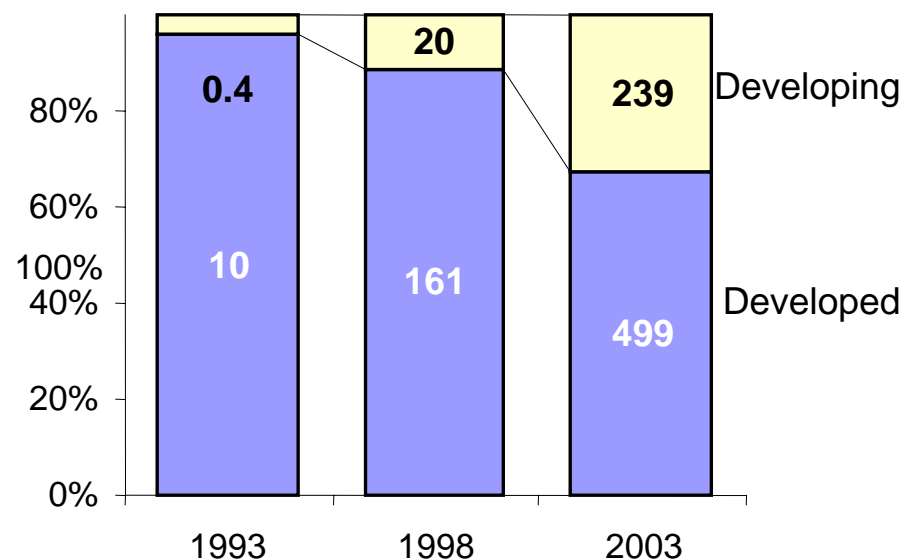
Source: ITU Internet Reports 2004: The Portable internet.

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Brief History of the Internet

- 15-20 years ago
- Focused around academia and research
- Primarily North American
- Not-for-profit
- Used primarily for email and file transfer (no www)
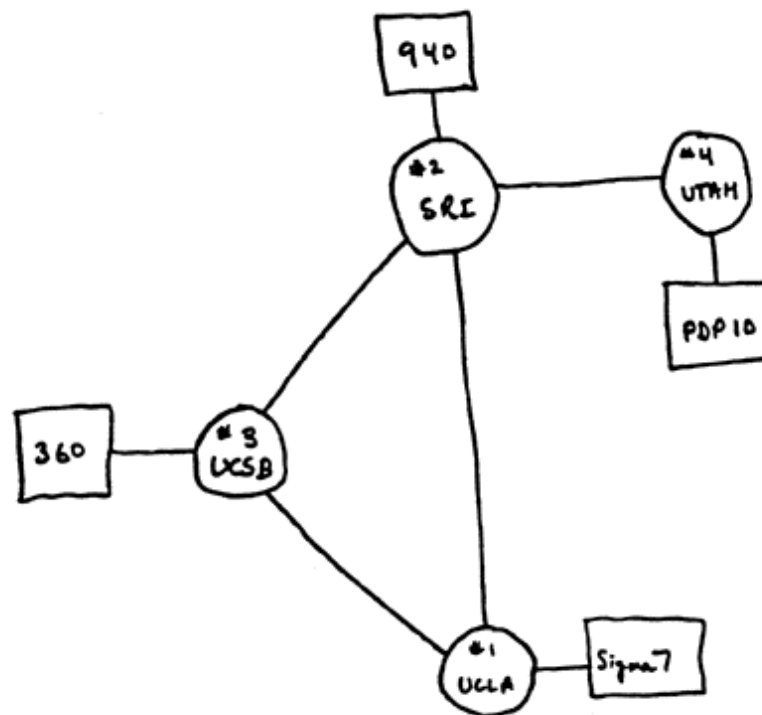
1989

- Tim Berners-Lee at CERN in Geneva addresses issue of dynamic change in information and turn-over of people on projects

- Proposes hypertext system that will run across the Internet on different operating systems.

- This becomes the World Wide Web...

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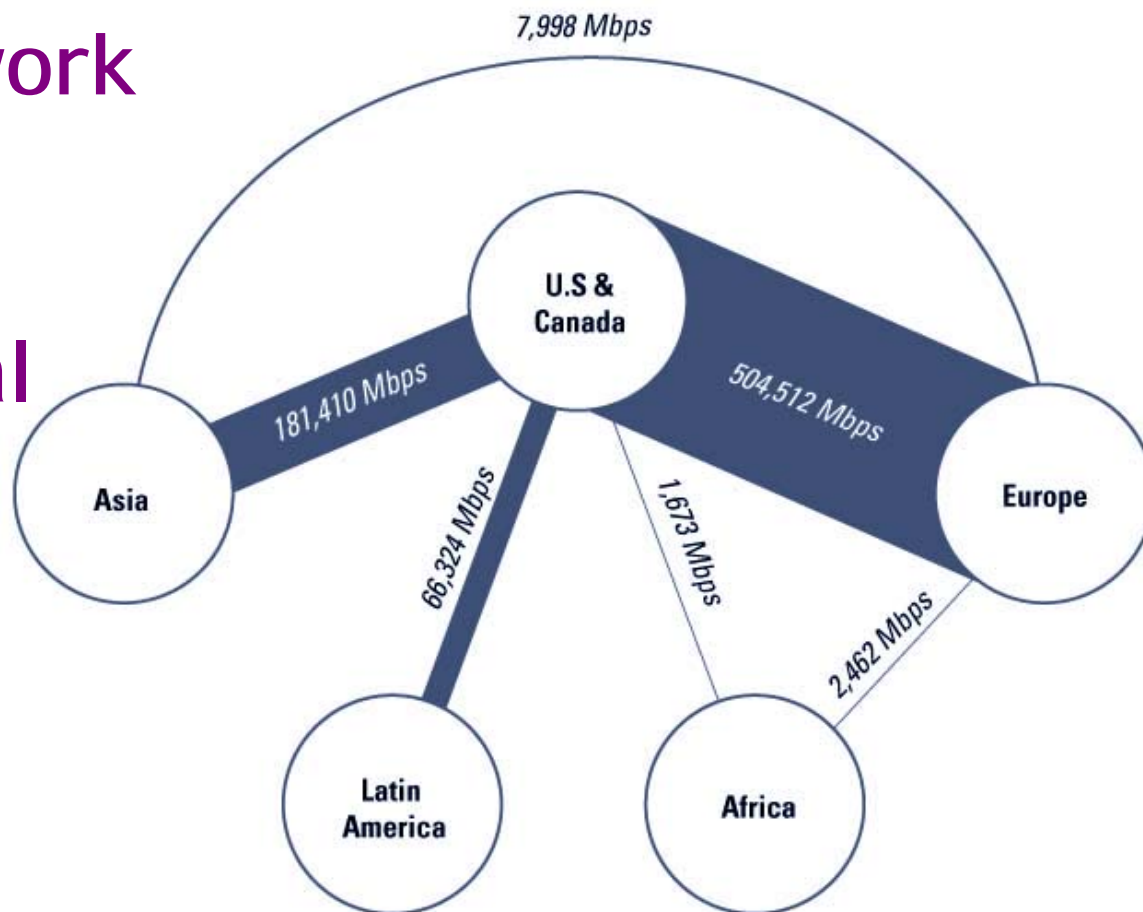
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1990's Internet

- Growth throughout OECD countries
- Begun "privatisation" of backbone
- Primarily a channel for the Web and email
- Wide disparity in connectivity

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Still much work needed to improve International Internet Bandwidth

7,998 Mbps

U.S & Canada

181,410 Mbps

504,512 Mbps

Asia

Europe

66,324 Mbps

1,673 Mbps

2,462 Mbps

Latin America

Africa

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International Internet Bandwidth
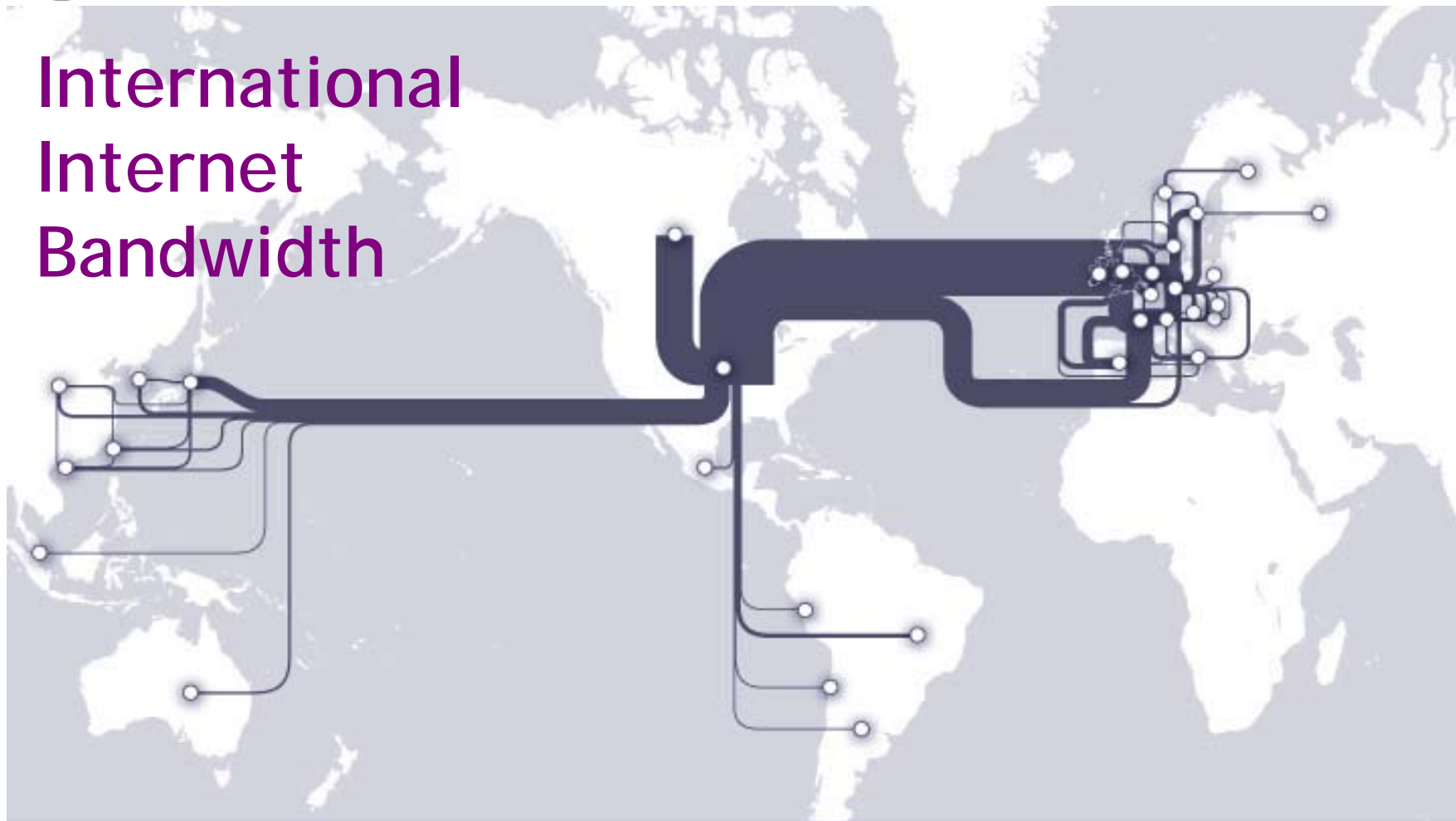
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Today (2005)

- Internet demographics shifting rapidly

- Asia-Pacific has the largest share of <u>Internet</u> and <u>mobile users</u> and leads in advanced Internet technologies, such as <u>broadband access</u> and <u>mobile data</u>

- China has overtaken the United States as the world's largest market for fixed-lines and mobile and soon for broadband

- Global telecommunications epicentre shifting from North America and Western Europe to Asia-Pacific region

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Predicting the future from the past...

- When we look back over history at any advancement in electronic communication networks, we tend to forget about the <u>highs and the lows</u>, the <u>boom-bust cycles</u> and the <u>failed predictions about likely usage</u>
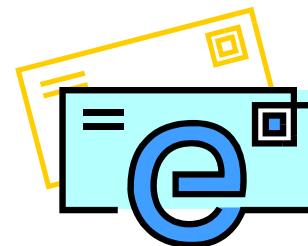
We often get it wrong: telephone

- "For the first 30 years of the telephone, promoters struggled to identify the killer application that would promote its wide adoption by home owners and businesses. ...

- Telephone promoters in the early years touted the telephone as new service to broadcast news, concerts, church services, weather reports, etc... The concept that someone would buy the telephone to chat was simply inconceivable at that time."

  - ➢ C. Fischer, *America Calling*

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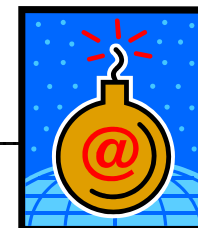Telecommunication
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We often get it wrong: email

- "The popularity of email was not foreseen by the ARPANET's planners. Roberts had not included electronic mail in the original blueprint for the network. In fact, in 1967 he had called the ability to send messages between users "not an important motivation for a network of scientific computers" . .
  - ➢ J. Abbate, Inventing the Internet

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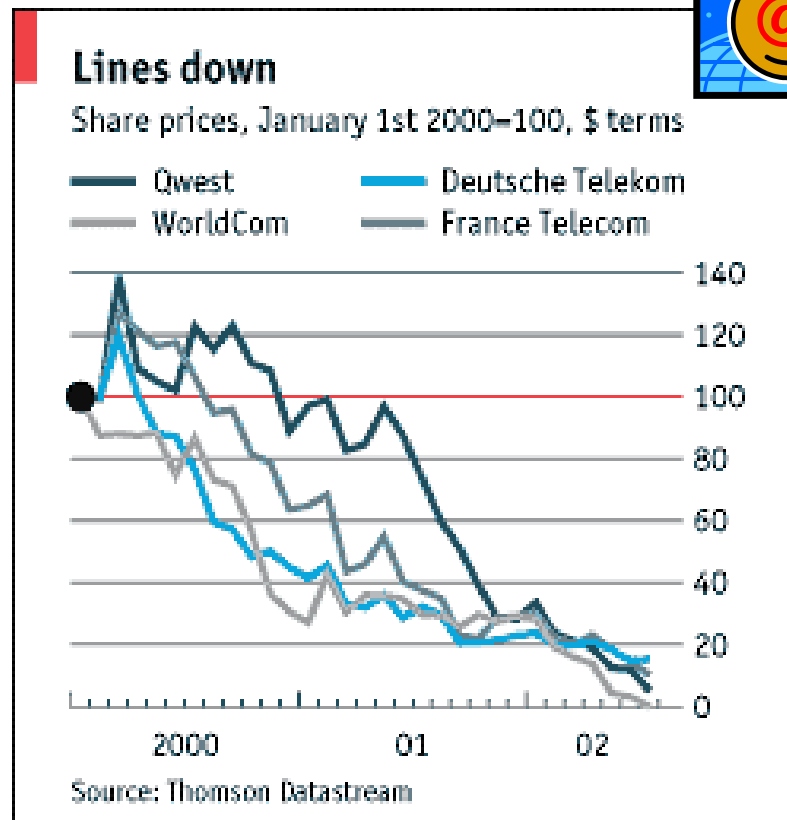
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We often get it wrong: dot.bomb

- Trillions of US Dollars lost in shareholder value
- Leading companies in heavy debt or bankruptcy
- Hundreds of thousands of jobs lost
- What does it mean for telecoms development?
  - ➢ Falling investment
  - ➢ No demand for privatisation share issues
  - ➢ Overcapacity

Lines down

Share prices, January 1st 2000=100, $ terms

— Qwest   — Deutsche Telekom
— WorldCom   — France Telecom

140
120
100
80
60
40
20
0

2000   01   02

Source: Thomson Datastream

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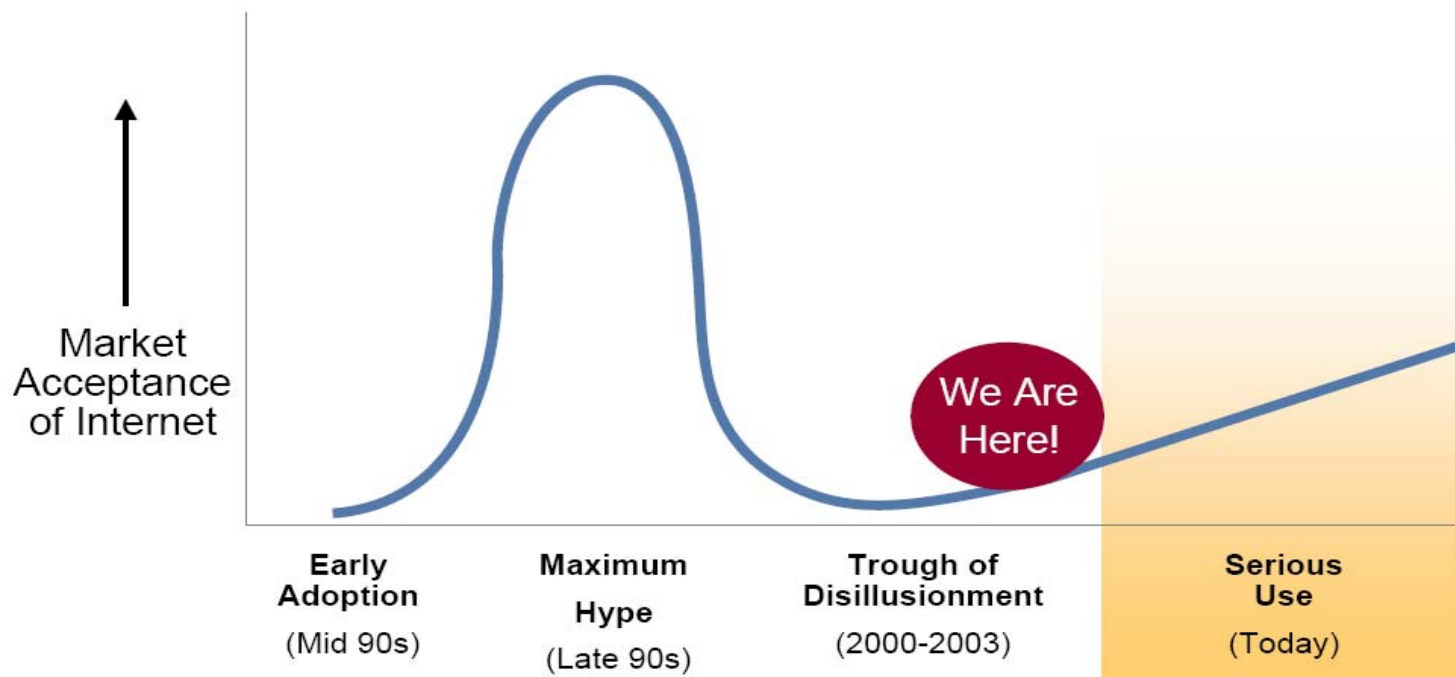
The Historical Perspective

- History demonstrates that deployment of new communications technologies can be seen as a series of relatively short cycles — typically of one or two decades' duration — beginning with an invention, continues through early stages of innovation and application (often over-hyped and not for the original purpose intended) and finally is deployed in a method that scales to support broad market acceptance and more serious use

- This final phase typically comes with new "governance" arrangements

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Welcome to the Right Side of the Curve

Over the Hill and Through the Valley

Market Acceptance of Internet

We Are Here!

| Early Adoption (Mid 90s) | Maximum Hype (Late 90s) | Trough of Disillusionment (2000-2003) | Serious Use (Today) |

Source: "The Transformation of Communications, Commerce & Society", Stratton Sclavos, Verisign, Progress and Freedom Foundation Aspen Summit — August 2004

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We are in a network paradigm shift...

The big picture trends

- Birth of Broadband
- Growth in wireless networks and mobile data services
- Mobile overtakes fixed
- Convergence of Internet Protocol-based networks with telephone & mobile networks
- Towards ubiquitous, pervasive, grid, mesh, wireless networks

First phase

- Growth of Internet and other IP-based networks with their requirements for bandwidth and capacity has driven rapid innovation in telecommunication 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 (e.g. PON)

  - advances in wireless technologies (e.g., Wi-Fi, WiMax)

Second phase

- Ongoing trend towards integration & interoperability of IP-based and PSTN network services and applications

- Impact on build-out of national telecommunications infrastructures
  - ➢ Global shift from PSTN build-out to broadband "converged" platform buildout
  - ➢ Enabling platform for voice, video, data

- Broadband
  - ➢ New ITU standards (DSL, cable) have brought broadband access to over 100 million new users since 1999
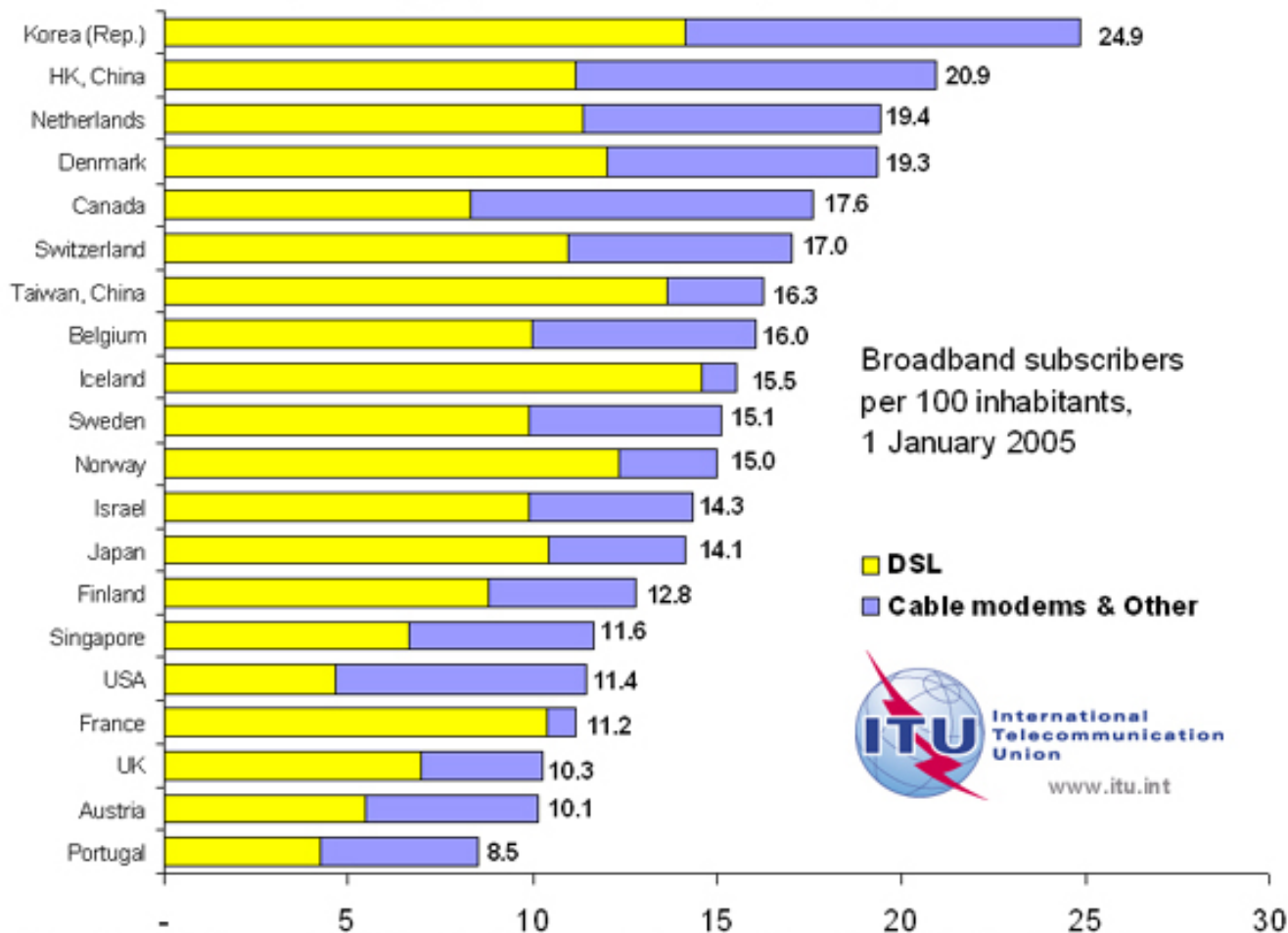
Broadband penetration by technology, top 20 economies worldwide, 1 January 2005

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What's ahead

- Telephone network (fixed and mobile) and Internet will converge into Next Generation Networks (NGN)

- Packet based with necessary extensions to give 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
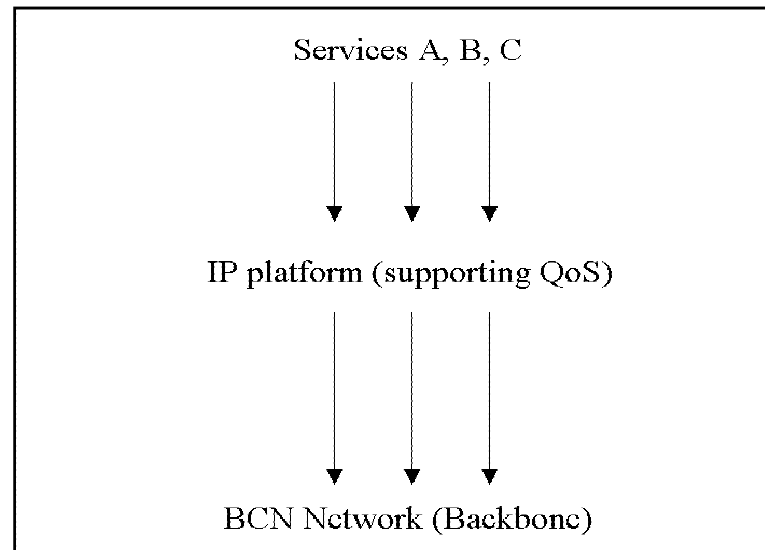 - ➢ Substantial resource investment

The paradigm shift

- In converged networks, services will no longer be tied to one type of network. A converged "Next Generation Network" will deliver all services.

Current
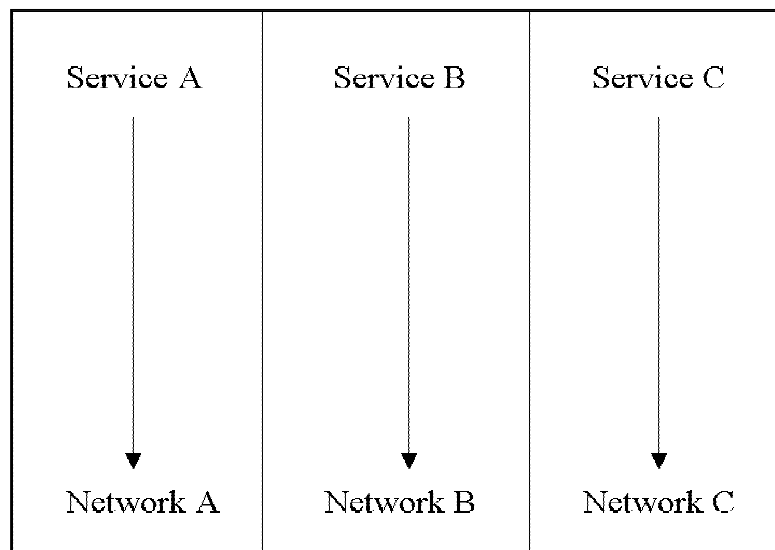
Future

What's ahead

- In coming years, there will be extensive technical developments and deployments of NGNs around the globe
- Need for global standards for NGN to provide access to worldwide markets is necessary as operators and equipment manufacturers make their shift to an all IP-based infrastructure.
- Multi-service networks operating across carriers on a global scale also need harmonized interfaces and protocols and international standardization
- Intensive area of work at ITU

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ITU-T Definition of NGN (Y.2001)

- **Next Generation Network (NGN)**: a packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies.

- It enables unfettered access for users to networks and to competing service providers and/or services of their choice.

- It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

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Cycles of Policy and Regulation

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Déjà vu all over again

- Telecommunications sector has always had a variety of interest groups who have clashed over its rules

- For those who know the history of telecommunications, there is little surprise that there are strongly felt debates as to how to address numerous policy and regulatory issues that emerge with new communications technologies

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25 years of policy & regulatory reform

- ~25 years ago, AT&T formally agreed to the break-up of the Bell system

- 15 years ago, around 10 countries had some measure of fixed-line competition

- about 7 years ago, in concluding the WTO basic telecoms agreement, some 70 countries committed to telecoms market liberalization

- Countries with privatized operators and some degree of competition are now in majority among ITU 189 Member States

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Convergence changes the game

- Converged networks will make new service offerings available on a wide range of devices

- Regulators currently regulate some of these services based on the network that delivers them

- The days when legislation and regulation could assume distinct services running over distinct technologies and networks are disappearing fast

- Policy and regulatory frameworks need to adapt

Example: "Battle Brews Over Rules for Phones on Internet"

- USA: "Fierce battle is emerging among rival companies and between federal and state regulators over the shape of the new government regulations and control of the service, which has the potential to be the most significant development in telecommunications since the breakup of the AT&T monopoly 20 years ago."

  - *New York Times, July 28 2004*

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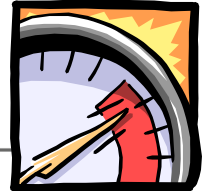Geneva 2003 - Tunis 2005

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A Case Study: Spam and Phishing

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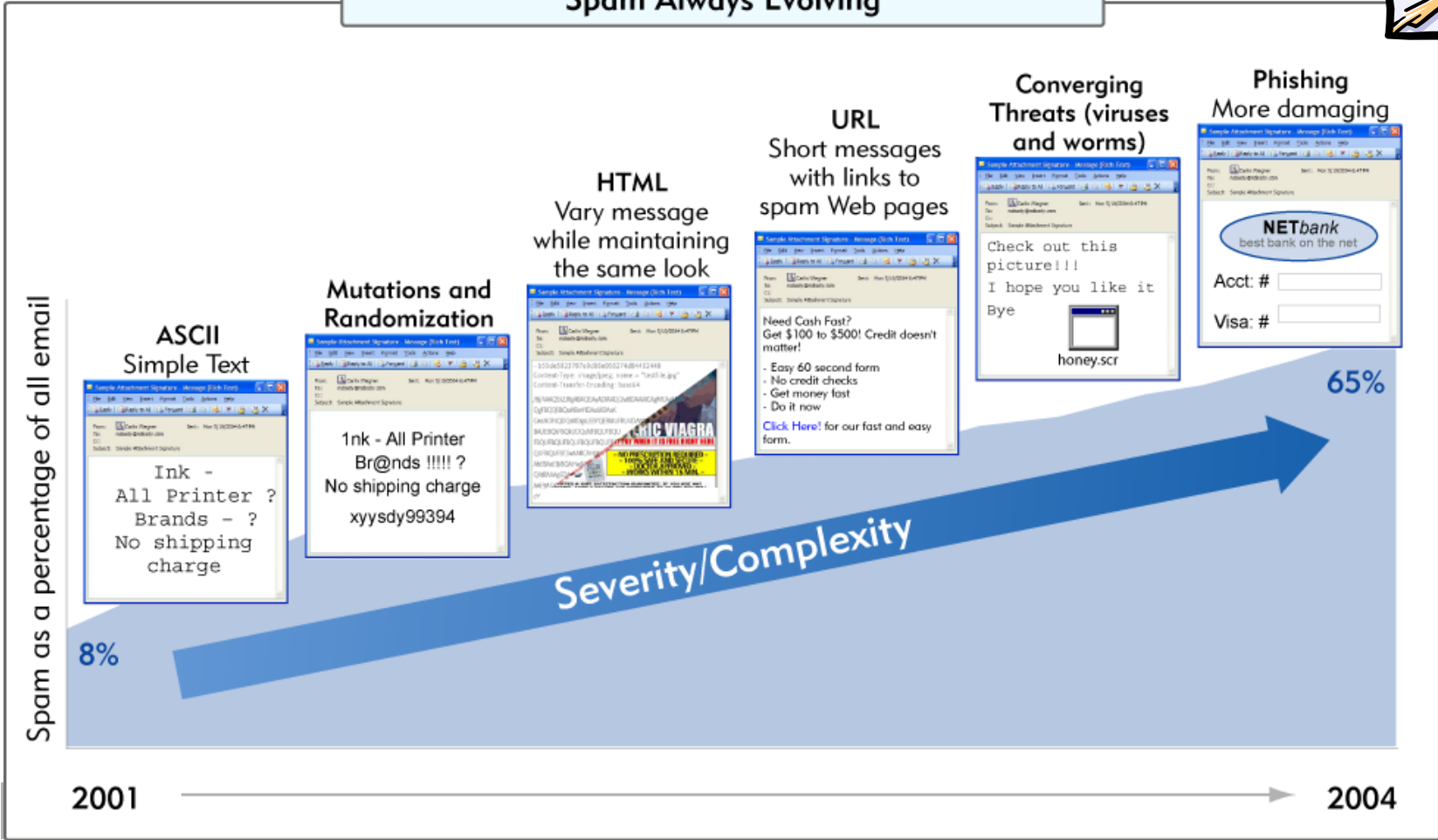Geneva 2003 - Tunis 2005

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Spam is not only growing, but is evolving to become broader threat to Internet security

Spam Always Evolving

Source: Symanthec

More bad news?

- Lack of consensus on technical solutions
  - ➢ E.g., clash of cultures between open source and proprietary software communities

- Authentication standards are really hard
  - ➢ Technologies based on asymmetric encryption standards has not been as successfully deployed as some thought

- SPIT: Spam over Internet Telephony

ITU WSIS thematic meeting on countering spam (July 2004)

- Objectives:
  - ➤ To serve as global forum for the different stakeholders to exchange experiences and share views on technical, legal and other solutions
  - ➤ To develop specific international cooperative measures to counter spam.
  - ➤ (See report online at www.itu.int/spam)

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Some points discussed:

- Spam is a cross-sector problem, therefore different stakeholders need to be involved in different countries.
- A network of authorities dealing with spam still does not exist.
- There is no unique solution to spam. A multi-layered approach is necessary:
  - ➢ technical solutions
  - ➢ user awareness
  - ➢ appropriate legislation and enforcement
  - ➢ industry initiatives
  - ➢ international cooperation

Cyberspace makes all countries border each other

- **International cooperation**, on both technical (standardization) and policy (legislation and enforcement) sides has been recognized as a key element to solving the problem.

- **Developing countries** are also dealing with the problem of spam, which has even more dramatic consequences on Internet access than in developed economies. They do not have technical, knowledge and financial resources to face it.
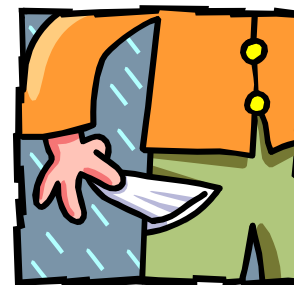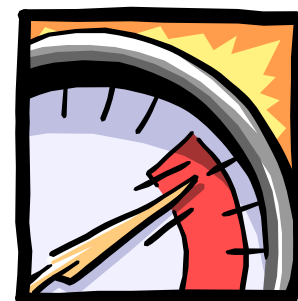
Views of Developing Countries

- Joint contribution from Kenya, Sudan, Tanzania and Zambia at ITU Spam Meeting:
  - ➢ "In some countries, the consumers begin to shun the Internet or just reduce their use of the Internet."
  - ➢ "It also causes a Denial of Service on our networks as well as a danger to development in the sector."
  - ➢ "spam is a global problem that should be resolved in collaboration with all other nations."

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ITU Global Symposium for Regulators (GSR)

- Global forum for national regulators to share views and experiences on best practices in regulation

- December 2003: GSR decides to launch discussion on frameworks for international cooperation on spam

- March 2004: Virtual conference among regulatory authorities on cooperation on countering spam

- December 2004: Annual GSR meeting breakout session on country experiences and international cooperation

Future Related Work

- **ITU WSIS Thematic Meeting on Cybersecurity**
  - ➢ June 28-July 1 2005 (Geneva)
  - ➢ Theme: Building a Global Culture of Cybersecurity
  - ➢ WSIS Phase I DoP: 5) Building confidence and security in the use of ICTs & AP: C5. Building confidence and security in the use of ICTs
  - ➢ Ref: UN Resolutions 58/199 (2004): Creation of a global culture of cybersecurity and the protection of critical information infrastructure
  - ➢ One day (June 28) dedicated to follow-up on WSIS Thematic Meeting on Countering Spam

- **Cooperative work between APEC, OECD and ITU**

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The challenge

- All policy makers and regulators - both new and old – both from developed and developing countries - struggling to address changes resulting from convergence of information and communication (ICT) sectors

- Growing public policy stakes
  - National telecommunication infrastructure has now become much more important than platform for voice
  - It is fundamental underpinning layer of networked economies and information societies

What rules will apply to Next Generation Networks?

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"List of 13" Public Interest and National Security Mandates?

- public safety needs
- disability assistance
- law enforcement support
- competition (Computer III/number portability/1996 Act requirements)
- fraud prevention
- reliability and reporting obligations
- restoration after failures
- call prioritization during emergencies
- privacy and data protection
- consumer protection against unwanted intrusions
- universal service and other contributory obligations
- intercarrier compensation
- nondiscriminatory regulatory treatment

Source: Tony Rutkowski, Verisign

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Conclusion and a hypothesis

- New generation of networks and convergence will introduce dramatic new wave of challenges for policy makers and regulators, both nationally and internationally

- Need development of an overall and enduring architecture based on national policy, legal and regulatory initiatives, with intergovernmental collaboration and capacity building

- A hypothesis: is this "Internet governance"?

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Thank you

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