



Trust and Confidence Online: Building a Safer and More Secure Internet

Privacy, Security, Trust
St. Andrew's, New Brunswick
October 12, 2005

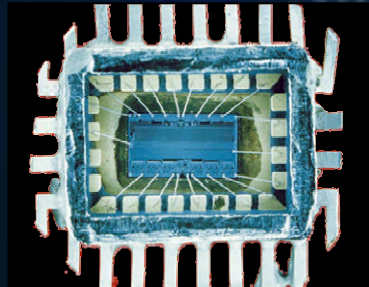
binder.michael@ic.gc.ca



We are in the Network Economy

“We should aim to make Canada a fully ICT-enabled economy — a world-leading e-Economy that will foster growth and wealth creation across and throughout the country.”

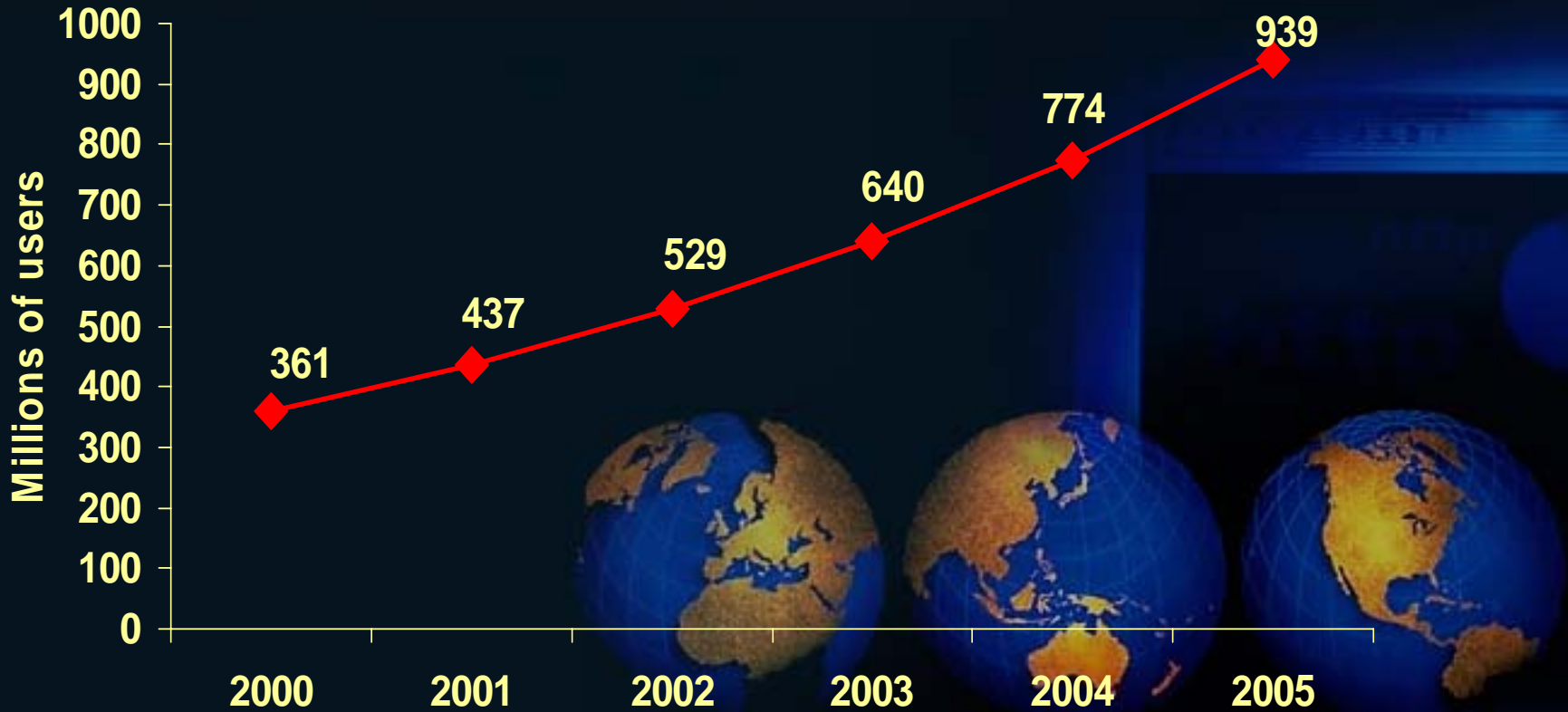
*David L. Emerson, Minister of Industry,
Address to e-Commerce to e-Economy: Strategies for the 21st Century
September 27, 2004*





Internet usage races ahead

Global Internet Use



Source: Internet World Statistics. July 23, 2005. Note: A CAGR of 21percent was assumed in calculating the numbers.



Superseding traditional media

Average
hrs/week

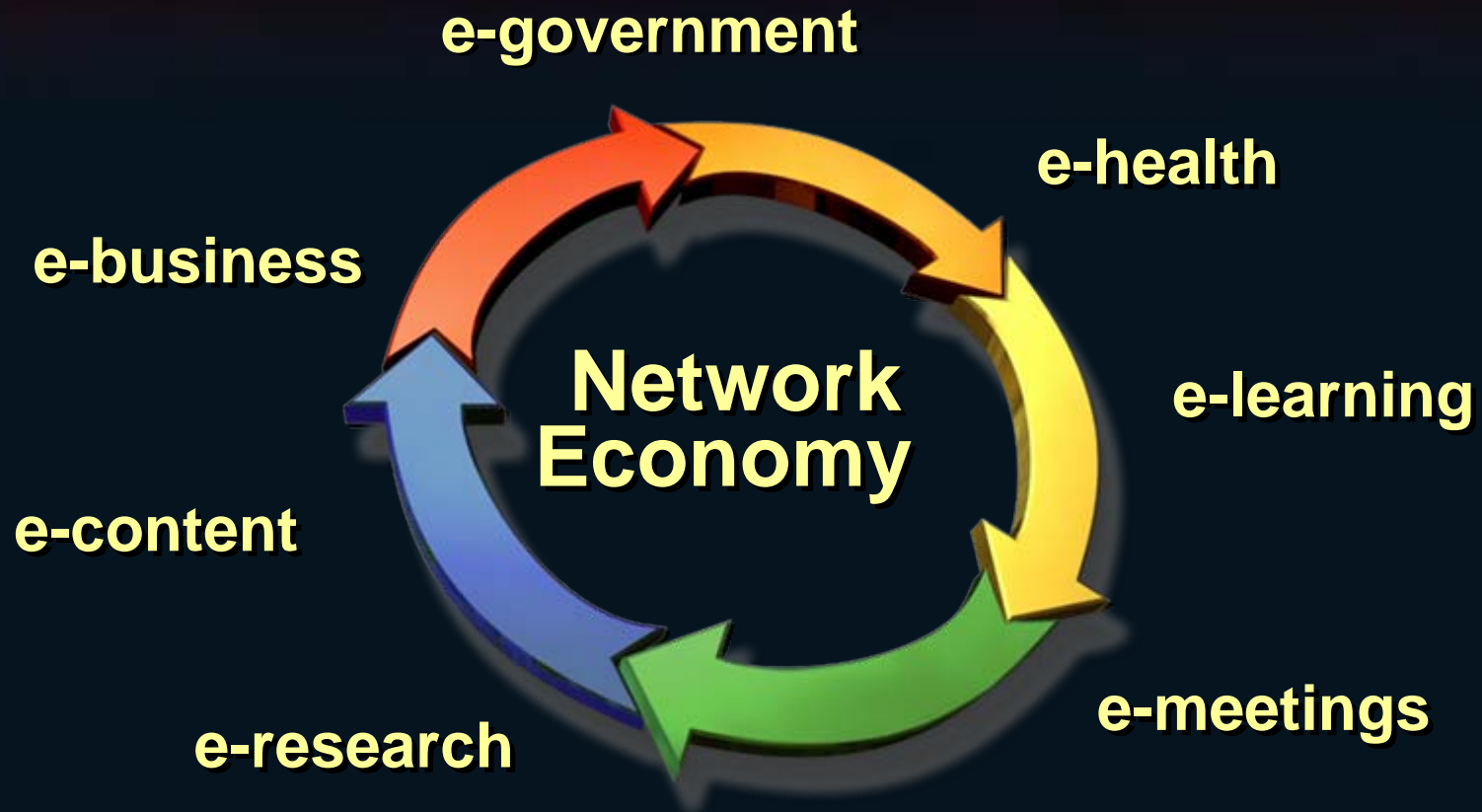
Time Spent using various media by Canadians



Source: The Canadian Inter@ctive Reid Report, 1st Quarter, Spring 2005



The Network Economy is the whole economy



New services and applications - on a daily basis



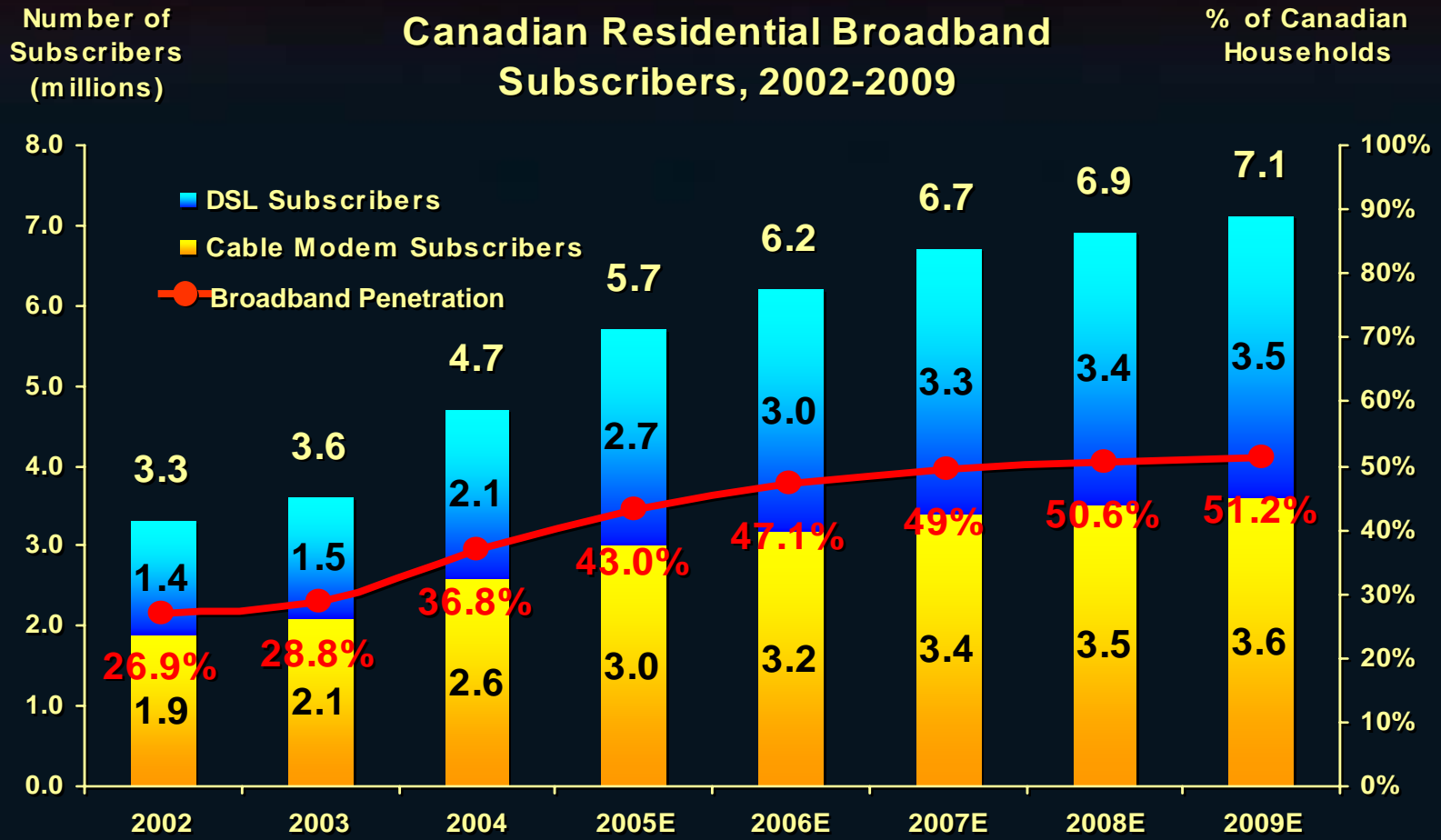
Canada has become an e-Society

- ★ **100% of schools and libraries connected by 1999**
- ★ **600,000 refurbished computers given to schools**
- ★ **Student-to-computer ratio (median) is 5 to 1** (Statistics Canada, 2004)
- ★ **Established 3,900 Internet access sites**
- ★ **CA*net 4: the world's first national optical research and education network**
- ★ **81% of households** (IPSOS-Reid 2005) **& 82% Firms use the Internet** (SECT 2004)
- ★ **One of the highest rates of broadband penetration** (OECD 2003)
- ★ **#1 in Government Online (GOL)** (Accenture 2001, 2002, 2003, 2004, 2005)

Citizens, businesses and governments are going online



Not only are Canadians moving online, they are demanding high-speed

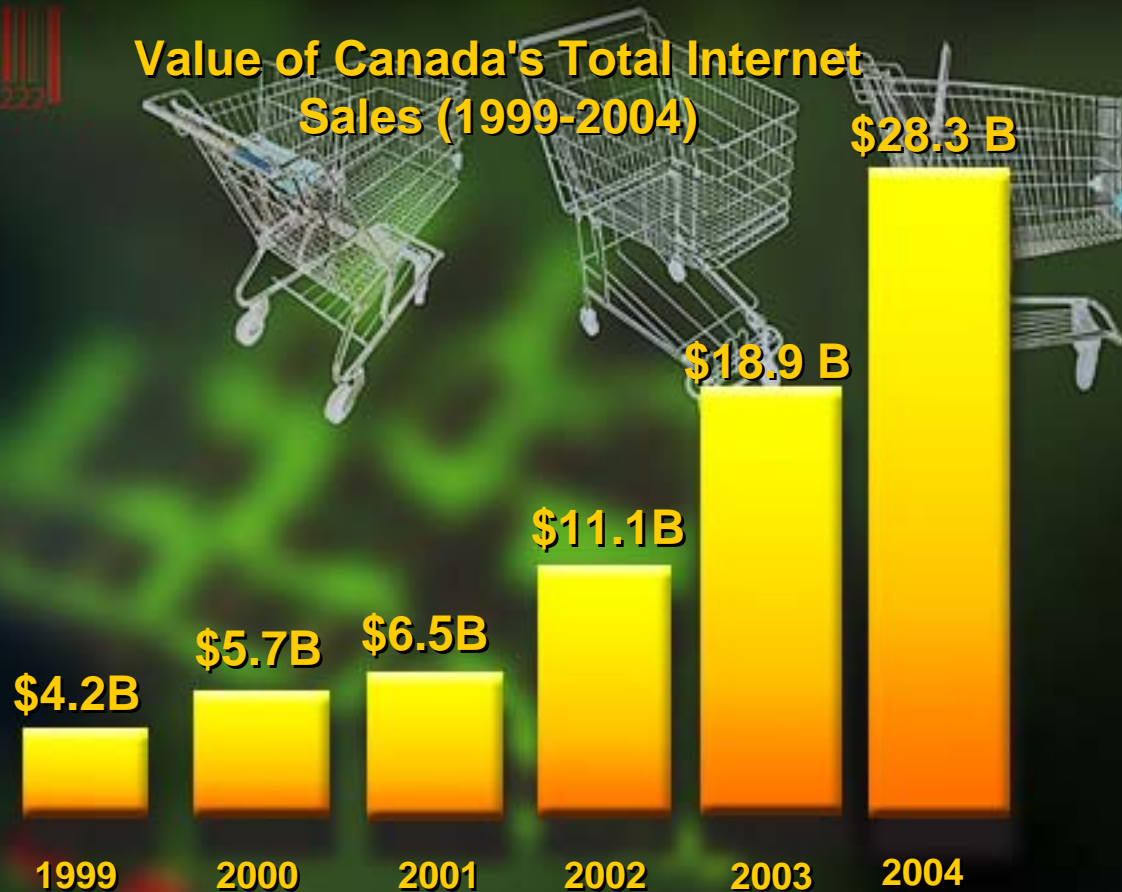


Source: Yankee Group, North America Consumer Fixed-Line & Media Forecast (March 2005)



So they can shop...

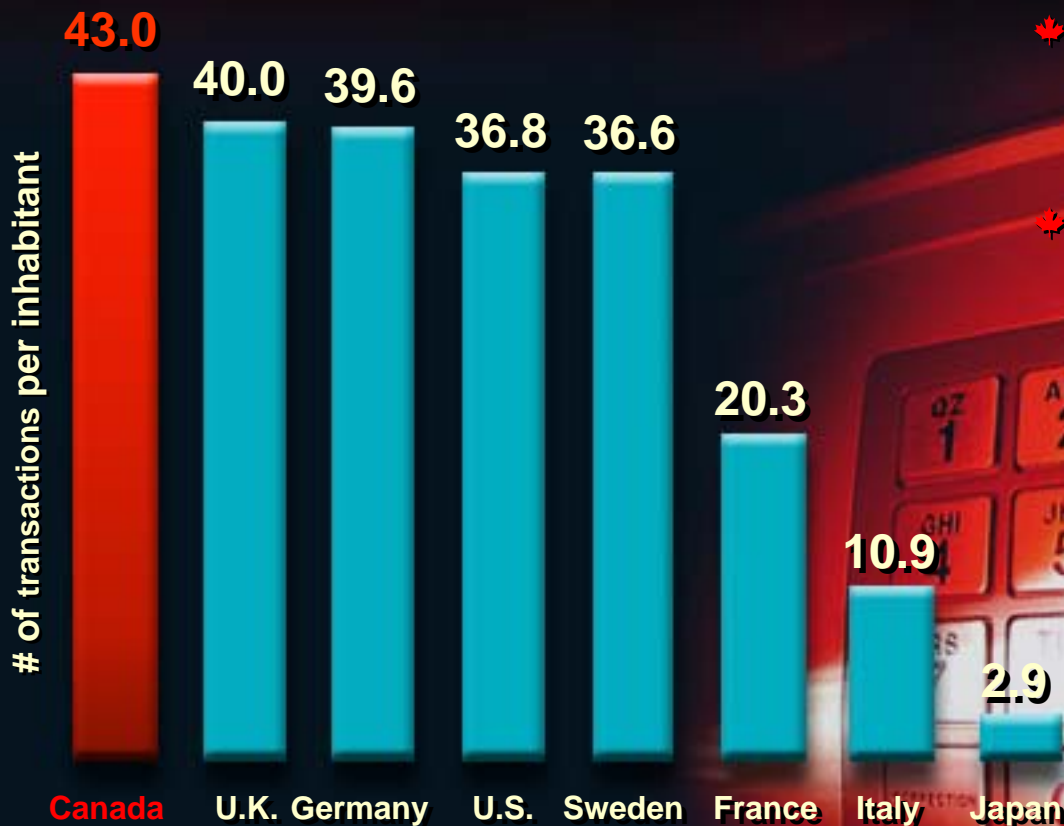
- Internet sales in Canada continued to grow in 2004 to \$28.3B, up 49.7% from 2003
- Domestic sales increased 45.5% to \$26.4 billion in 2004
- The dollar value of B2C sales rose 14% to \$6.6 billion in 2004
- B2B sales reached \$19.8 billion, up 60% in 2004



Source: Survey of Electronic Commerce and Technology 2004, Daily April 20, 2005, Statistics Canada



Bank...



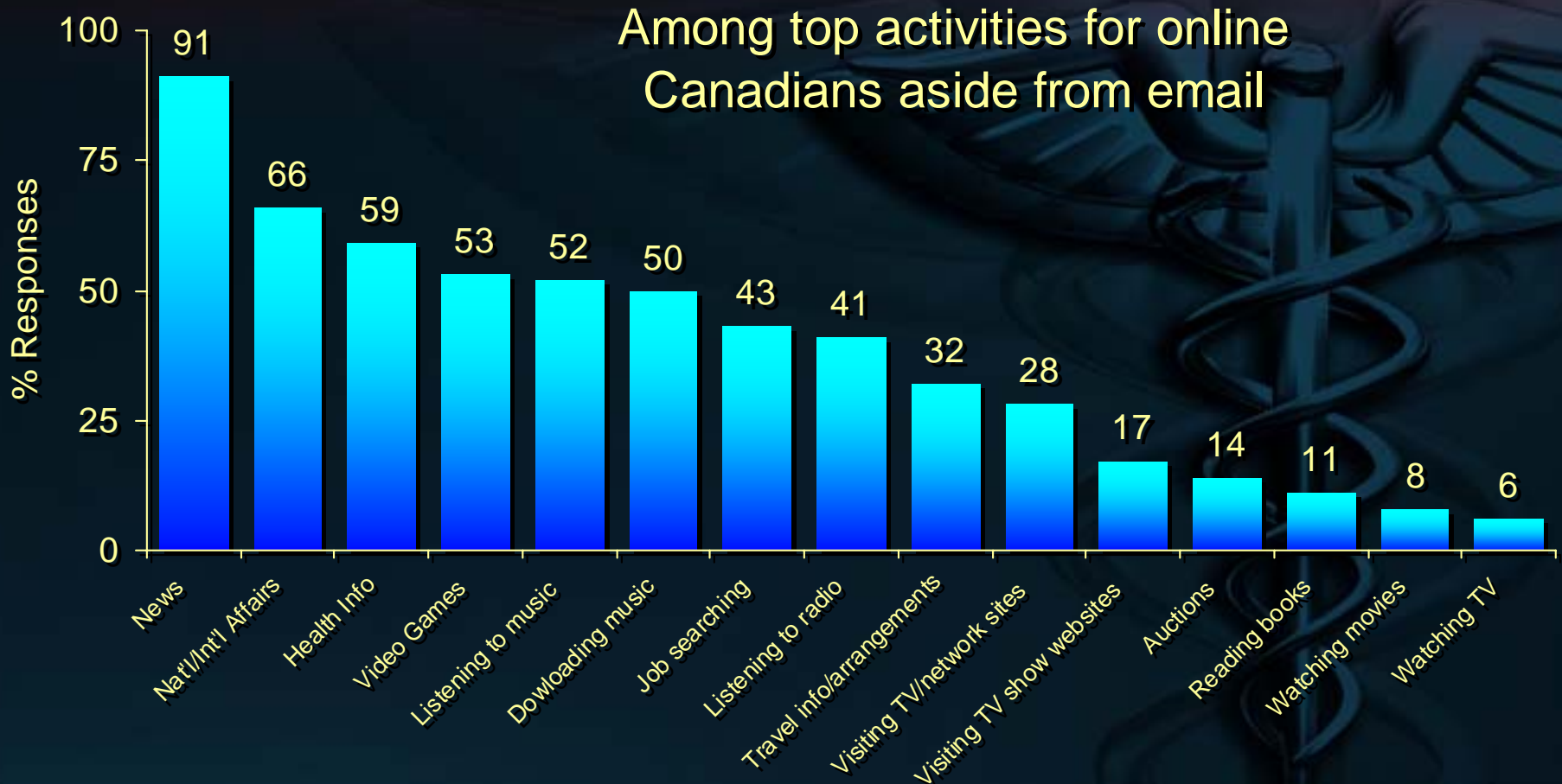
Use of cards with a cash function and ATMs – 2004

In 2005, more Canadians bank on-line (24.7%) than bank with a teller (23.3%)

Source: Bank for International Settlements, October 2004



Seek news and health information...

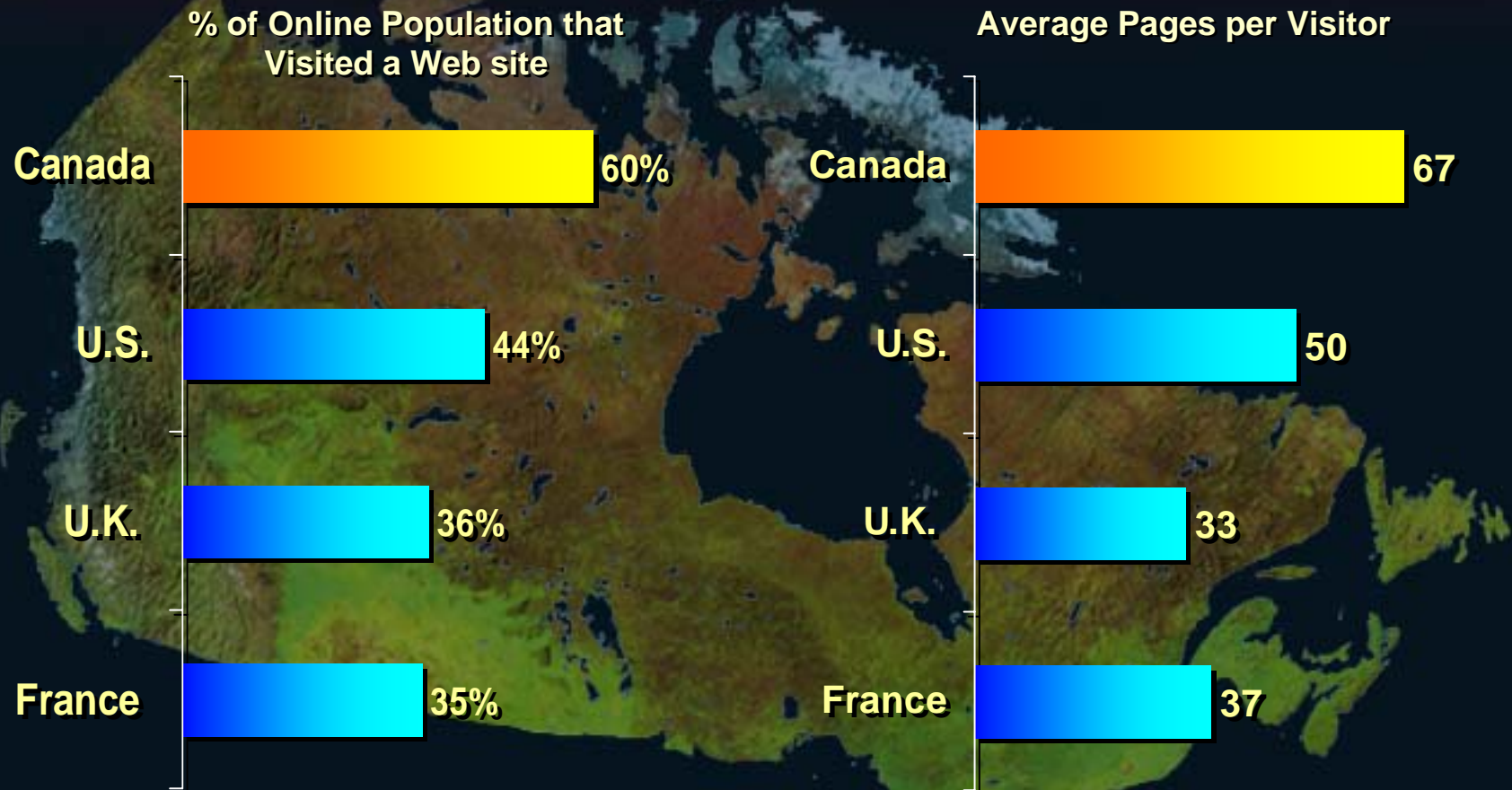


Source: Canadian Internet Project, May 2005



And interact with Government, all online

In March 2004:



Source: Canada NewsWire and comScore Media Metrix Canada, March 15, 2004.



They even like to pay taxes online

Tax returns filed electronically in Canada



Source: Canada Customs and Revenue Agency, May Tax Year 2004 – May 2005



New technologies = New challenges

- ✦ **Next Generation Networks**
- ✦ **Voice Over IP**
- ✦ **Peer to Peer**
- ✦ **Integrated GPS**
- ✦ **WiFi/WiMAX**
- ✦ **Mesh Networks**
- ✦ **3G and Systems Beyond**
- ✦ **Ultra Wide Band (UWB)**
- ✦ **Broadband Power Line (BPL)**
- ✦ **Software Defined Radio (SDR)**
- ✦ **Smart Dust / RFID**
- ✦ **New Satellites**
- ✦ **Satellite Radio / DAB**
- ✦ **Mobile TV / IP-TV**
- ✦ **DTV/HDTV**
- ✦ **PVR**
- ✦ **Video On Demand**
- ✦ **Grid Computing**
- ✦ **Quantum Computing**
- ✦ **Bio Computing**
- ✦ **Nanotechnology**



Telecom Policy Review Panel (September 15, 2005)

Supporting a strong telecommunications framework

- ✦ Panel Members:
 - Dr. Gerri Sinclair
 - Hank Intven
 - André Tremblay
- ✦ Forward looking review of 3 areas:
 - Regulatory framework
 - Ensuring access for all Canadians
 - Encouraging ICT adoption
- ✦ Comments received:
 - +100 submissions (1st round)
 - +80 replies (2nd round)
- ✦ 2 public meetings:
 - *Access Policy Forum*
(September 9th, 2005, Whitehorse, YK)
 - *Telecommunications Policy Forum*
(October 24-26th, 2005, Gatineau, QC)
- ✦ Recommendation due by end of 2005



www.telecomreview.ca

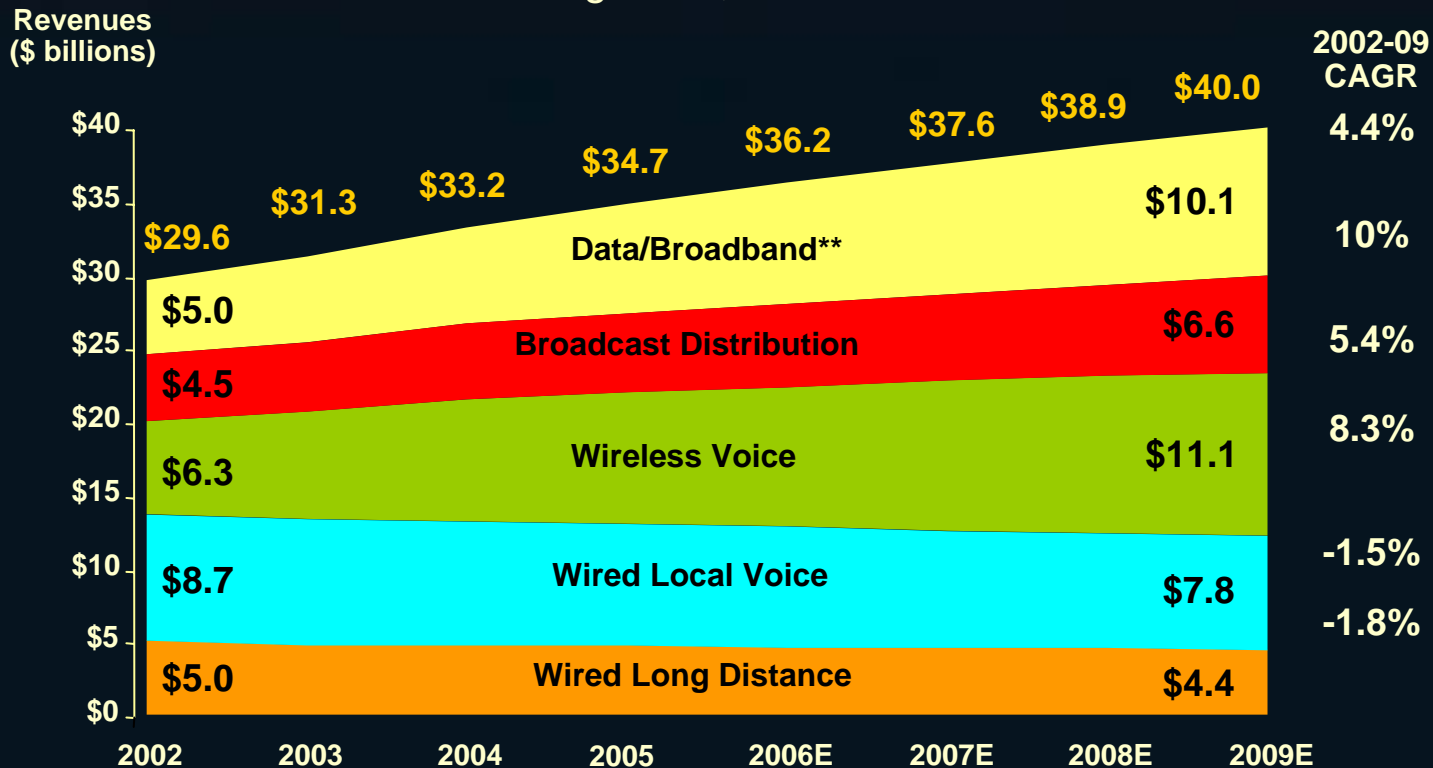
Challenges





A changing industrial structure

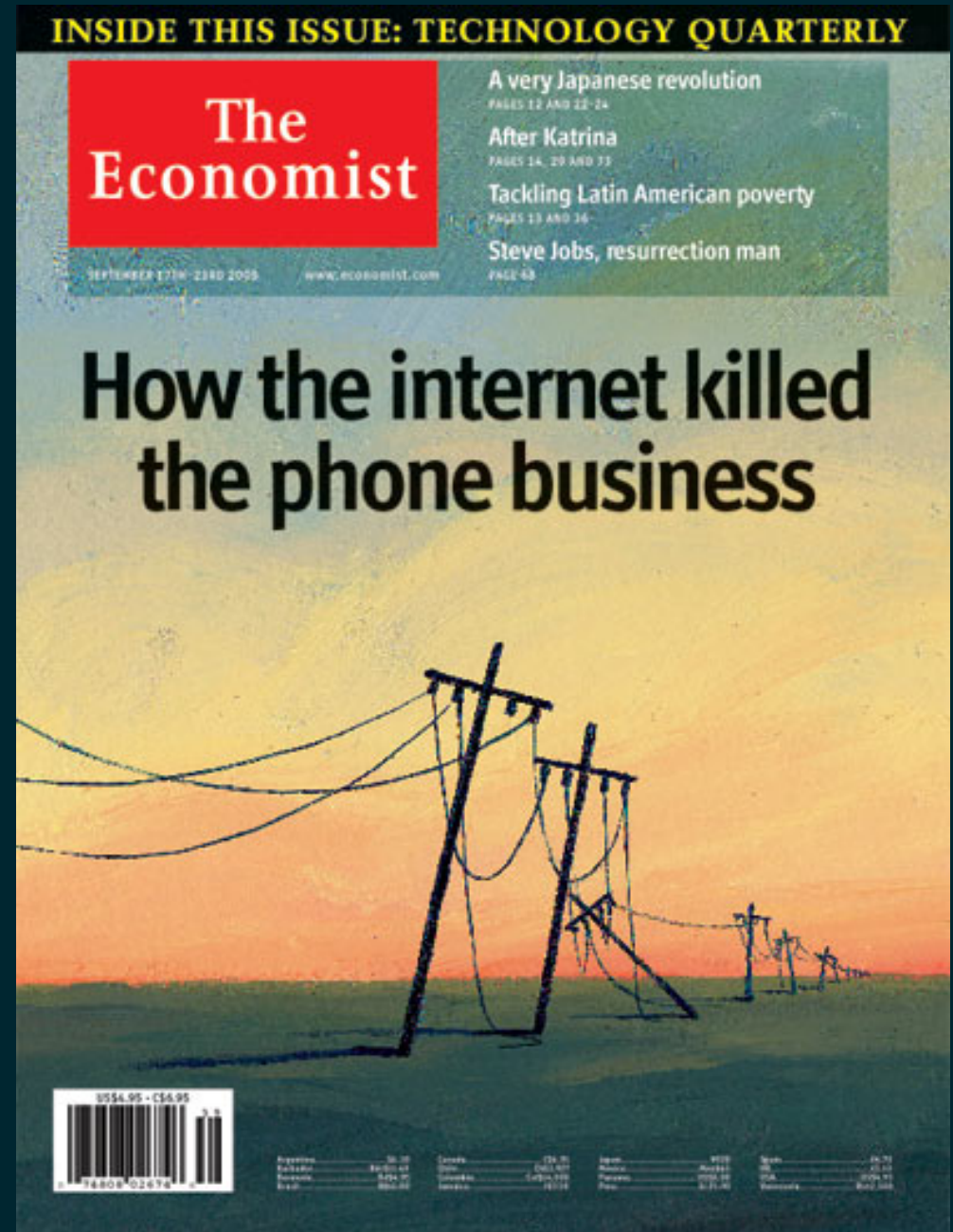
Communications Service Revenues by Segment*, 2002-2009



*Graphic depicts only selected industry segments and does not constitute the entire telecommunications industry.
 **Includes retail DSL, cable modem, corporate data and wireless data. Numbers may not add up due to rounding.
 Source: Yankee Group, North America Consumer Fixed-Line & Media, Business Fixed-Line, and Wireless/Mobile Forecasts (June 2005).

VoIP Challenge

- ✳ Voice over Internet Protocol (VoIP) separates *access* separate from *service*
- ✳ No longer need to own telephone network to offer phone service
- ✳ Surge of new competition coming:
 - Skype (eBay)
 - Vonage
 - Cable Companies
 - Microsoft, Yahoo, AOL, Google, IBM, EDS?





Productivity challenge

✦ ICT Sector Share

- Share of GDP is 1/2 US sector

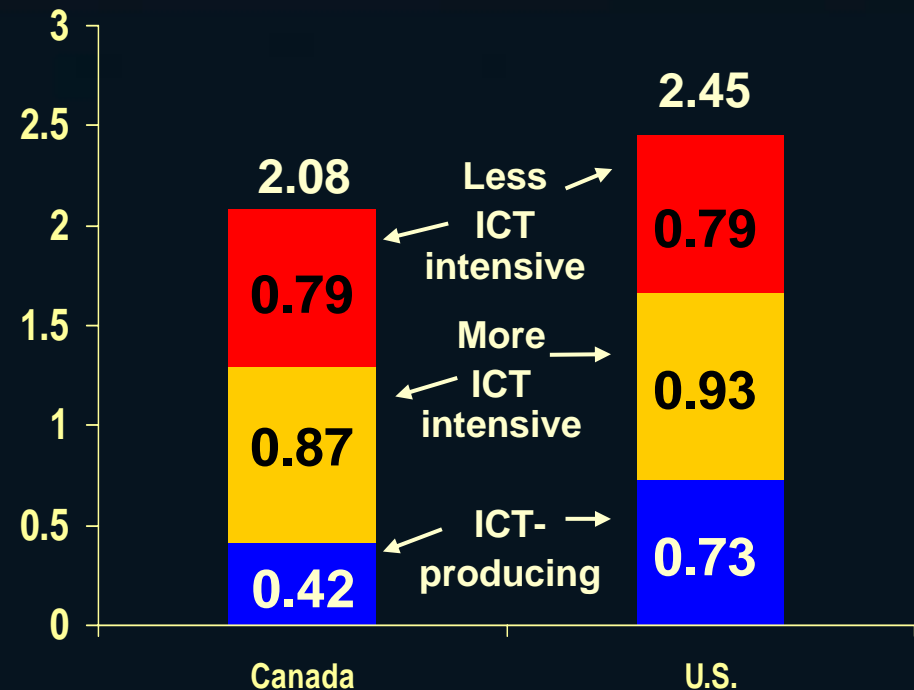
✦ ICT Sector productivity

- Less productive than US sector

✦ ICT Enabling Effect

- Canada benefits less from enabling effects of ICTs than US

Industry Contributions to Aggregate Labour Productivity* Growth in Canada and the U.S.: 1995-2000

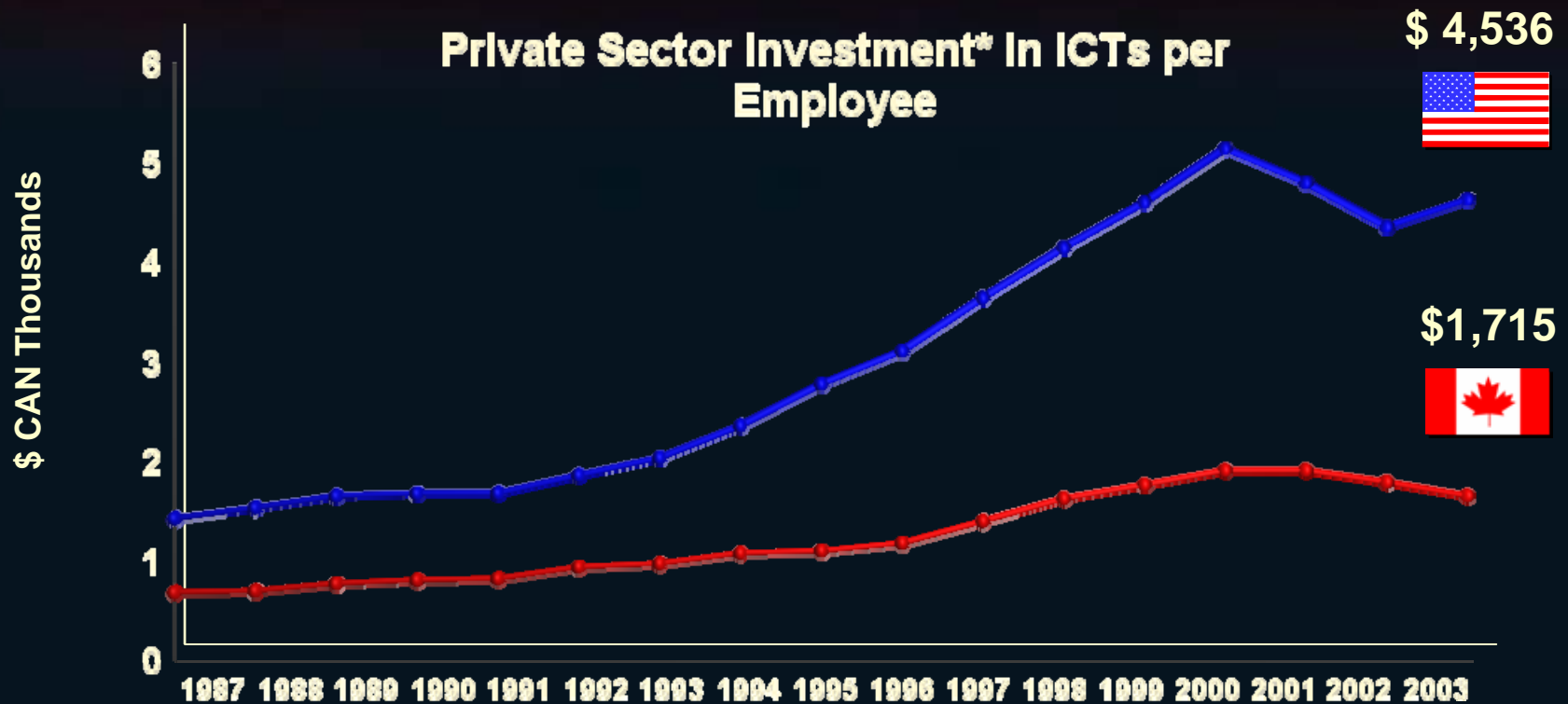


Canada continues to lag the U.S.

Source: "Sources of Output growth in Canadian and U.S. Industries in the Information Age" Ho, Rao and Tang (2004)
*The columns represent total labour productivity growth over the periods examined. Labour productivity is defined as value added per hour.



Canadian business lagging behind the U.S. in ICT investment



Canada's private investment in ICTs per employee only 38% of the U.S. in 2003

* ICT investment is in nominal value. U.S. numbers are converted to \$Can using the M&E PPP exchange rate
Source: Industry Canada's Compilation based on data from Statistics Canada and U.S. Bureau of Economic Analysis.



Emerging markets challenge

“We must make it our mission to keep Canada ahead of the curve.. I believe it is the responsibility of government to prepare the country for the world ahead.”

Prime Minister Paul Martin, Address Sept. 20th, 2005

The emerging “**BRIC**” markets:



Brazil



Russia

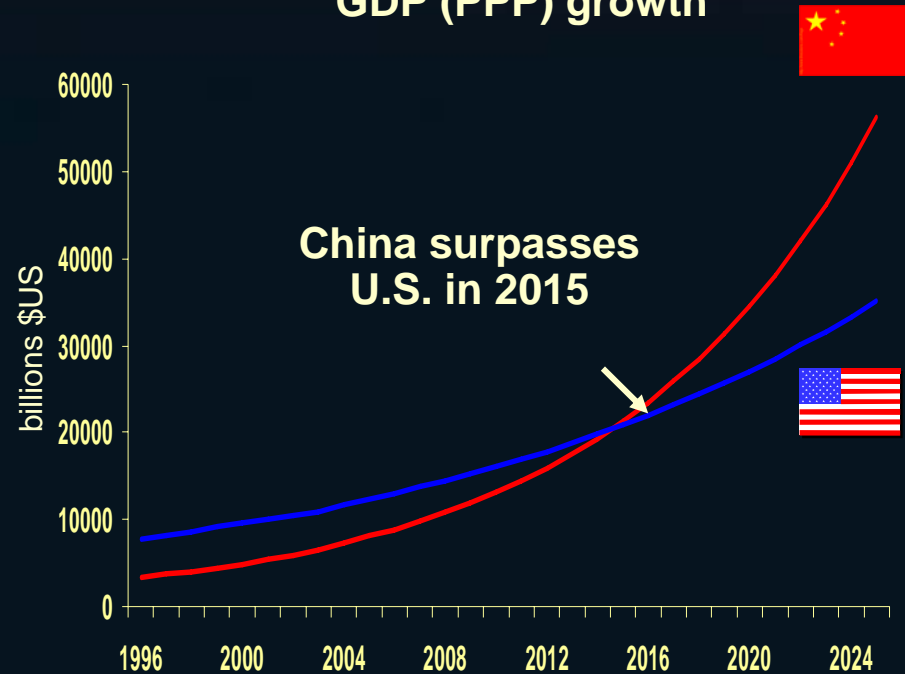


India



China

Projection of Chinese and American GDP (PPP) growth



U.S. GDP (PPP) projected by average annual rate of growth (1996 - 2005) 5.3%
Chinese GDP (PPP) projected by average annual rate of growth (1996 - 2005) 10.2%

Source: International Monetary Fund, World Economic Outlook Database, April 2005 and Industry Canada projections %



Skills Challenge

No. of ICT Employees in Canada



Demand

vs.

No. of N. American Computer Engineering/Science Majors



Supply

- ✳ The post Dot-Com perception the opportunities (low) of a career in the ICT Sector does not equal the reality (high)...
- ✳ Software engineers earned* \$80,000/yr in 2001 → \$101,000/yr in 2004
- ✳ Hardware engineers earned* \$81,000/yr in 2001 → \$97,000/yr in 2004

Sources: Industry Canada (2005); Computing Research Association (2005); Mercer Human Resource Consulting (2004)

*Average salaries



Spectrum Management Challenges

- ❖ Modernizing Spectrum Policy and Management
- ❖ Global and Regional Harmonization
- ❖ Opening new bands, accommodating new services
 - Ultra Wide Band (UWB)
 - Software Defined Radio (SDR)
 - Broadband over Power Lines (BPL)
 - Unlicensed Bands





Challenges for the disabled...

- ❖ **15% of Canadians have disabilities** (Statistics Canada)
- ❖ **32% of Canadians between age 64 and 75 have disabilities**
- ❖ **31% of Aboriginal Peoples have disabilities**
- ❖ **Web-4-All smart card technology**

...the Government of Canada is helping through accessible technology



Content challenge

Emerging digital copyright issues:

- ✦ P2P networks
 - **5.7 million Canadians have downloaded music files** (Ipsos-Reid, May 2004)
 - **More than 44 million full-length movie files and 1.3 billion songs available**
(BigChampagne LLC, Reported In Kansas City Star, October 2004)
- ✦ ISP liability
- ✦ Fair usage

Advancing technology is threatening cultural policy:

- ✦ Satellite TV
 - **Black Market/Grey Market**
 - **Access to foreign and ethnic programming**
- ✦ Satellite Radio
- ✦ Internet - movies, music, videos on demand



Illegal and Offensive Content

Child pornography, online luring, child prostitution, child sex tourism and other activities are of growing concern

- ✳ **Cyberwise Strategy**
- ✳ **Cybertip!ca**
- ✳ **National Strategy**
- ✳ **New Legislation**





Access Challenge

Using ICT and Networks To Address the Digital *Divides* ...

Individuals by income, education, and age

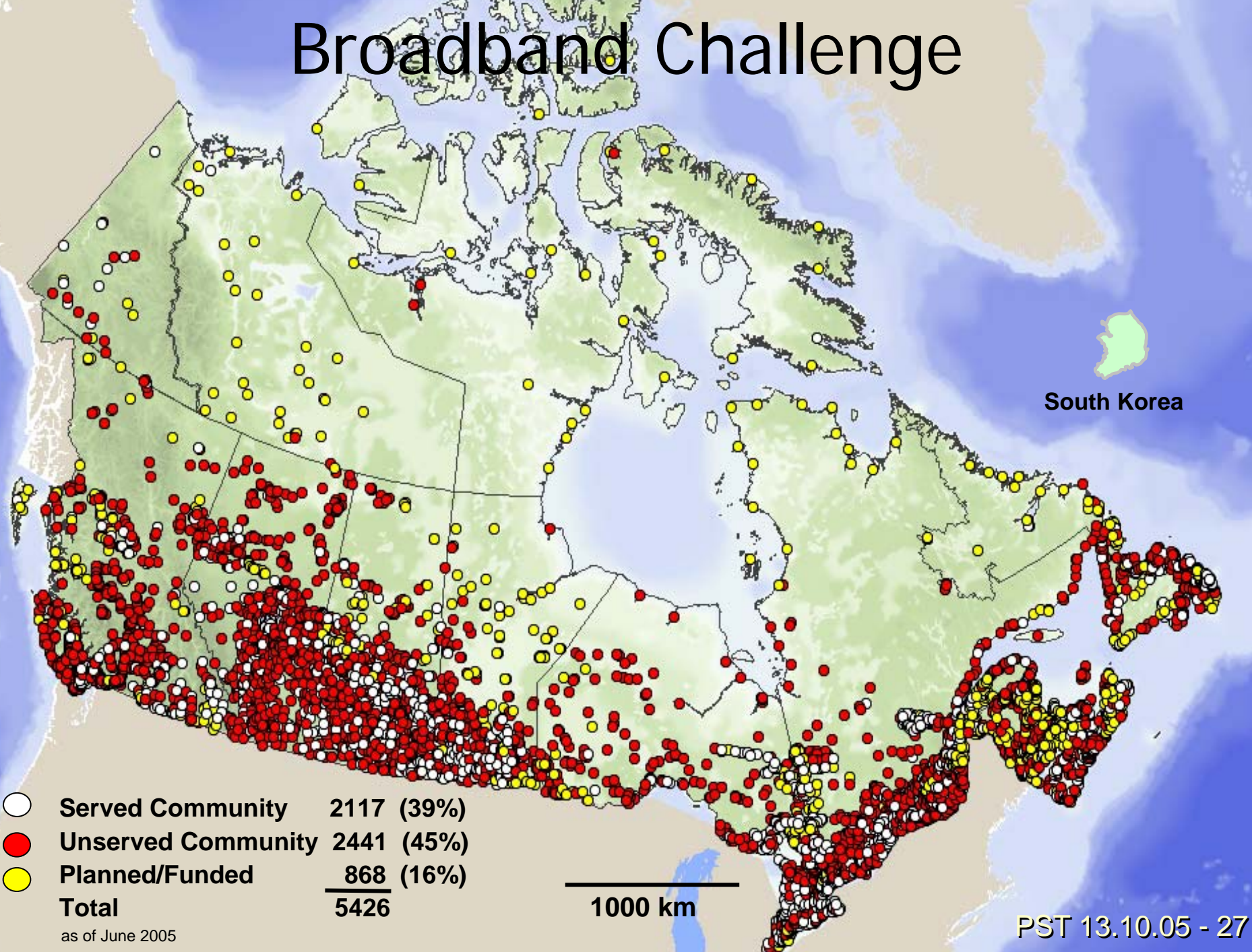
Businesses large and small

Regions urban and rural / remote

Countries developed and developing

**Universal Access is a Bridge
To Economic and Social Inclusion**

Broadband Challenge

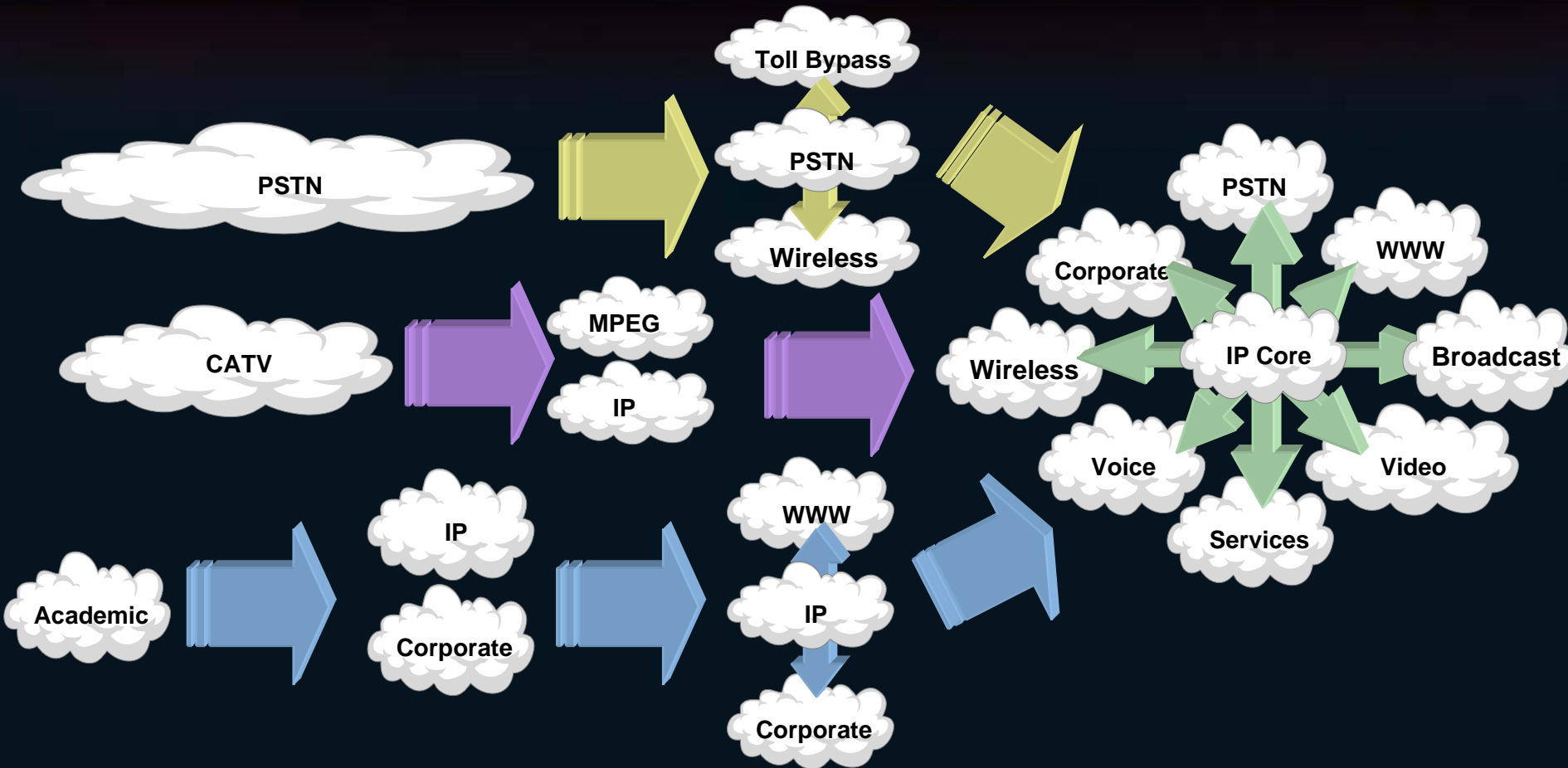


Trust and Confidence





Our Networks Are In Transition...



...complexity = new vulnerabilities



Key Public Policy Issues

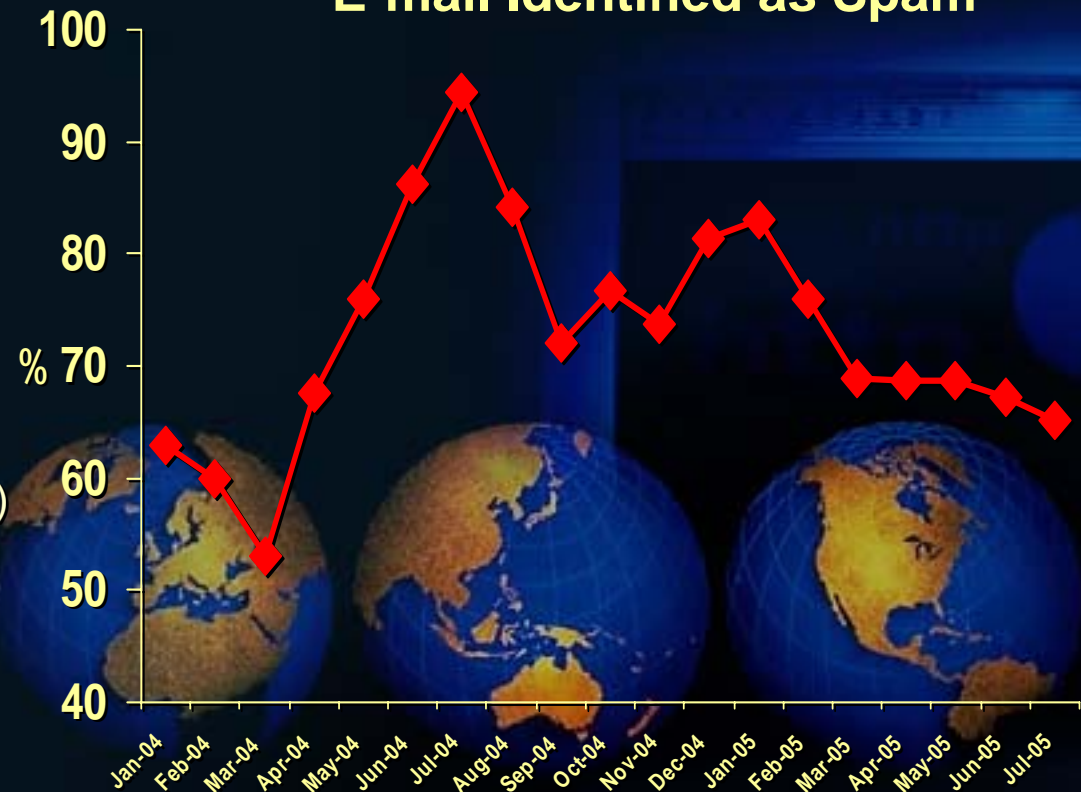
- ✳ Internet Threats
- ✳ Privacy & Security
- ✳ Ground rules for electronic markets
- ✳ Jurisdictional Issues



Spam, the “Killer” application

- ✦ Percent of total internet email identified as SPAM – 65% (Brightmail – July 04)
- ✦ Up to 80 percent of all emails entering a business is SPAM (Gartner Group - 8 Apr 04)
- ✦ 2004 - 73% of traffic was spam (MessageLabs, December 6, 2004)
- ✦ 23% annual growth rate (CIBC World Markets)
- ✦ HTML based SPAM becoming more prevalent

Percentages of Total Internet E-mail Identified as Spam



Source: MessageLabs, March 2005



Canada's Task Force on SPAM (May 17, 2005)

Task Force Lessons Learned

The need for:

- A Multifaceted, Multistakeholder Approach
- Communication and Cooperation Among Stakeholders
- A Comprehensive Strategy to Fight Threats to the Internet

Task Force Recommendations

Anti-spam action:

- Leadership and partnership
- New stand-alone legislation, regulation and enforcement
- Best practices for ISPs and other network operators
- Best practices for email marketing
- User awareness and education
- International cooperation
- Establishment of a central body



Source: *Stopping Spam Creating a Stronger, Safer Internet: Report of the Task Force on Spam* (May 2005)



Internet threats: Fraud, ID Theft, Extortion

PHISHING - PHARMING

- ✳ In September 2003 MessageLabs intercepted 279 phishing emails, by September 2004 that number rose to more than 2 million, a total of 18 million during 2004 (MessageLabs, December 6, 2004)
- ✳ 1.78 million have fallen victim to online fraud (Symantec)
- ✳ U.S. banks and credit card companies have paid almost \$1.2 billion in damages (Symantec)

EMAIL FRAUD

- ✳ High profile attacks include Visa, Bank of America, Bank of Montreal, eBay, Best Buy, Yahoo, MSNTV... (Symantec)

IDENTITY THEFT

- ✳ Cost in the last 5 years in the U.S. was \$60 billion (FTC)
- ✳ In Canada, 13,000 cases reported (ComputerWorld Canada)

E-COMMERCE ATTACKS/EXTORTION

- ✳ Almost 16% of attackers targeted e-commerce organizations, compared to 4% during the last six months of 2003 (Symantec)



Internet Threats: Spyware/Adware and Zombies...

- ❖ Four in five users in US, **or 80%, have spyware or adware** programs on their computer.
- ❖ 89% of users who were infected with spyware/adware said they didn't know the programs were on their computer.
(AOL-NCSA Online Safety Study, October 2004)
- ❖ **...Phishing attacks on the Internet were delivered via a different set of 1,000 zombies,** or computers that are maliciously taken over by viruses without the owners' knowledge; and **70 percent of those zombies were also used to send spam.**

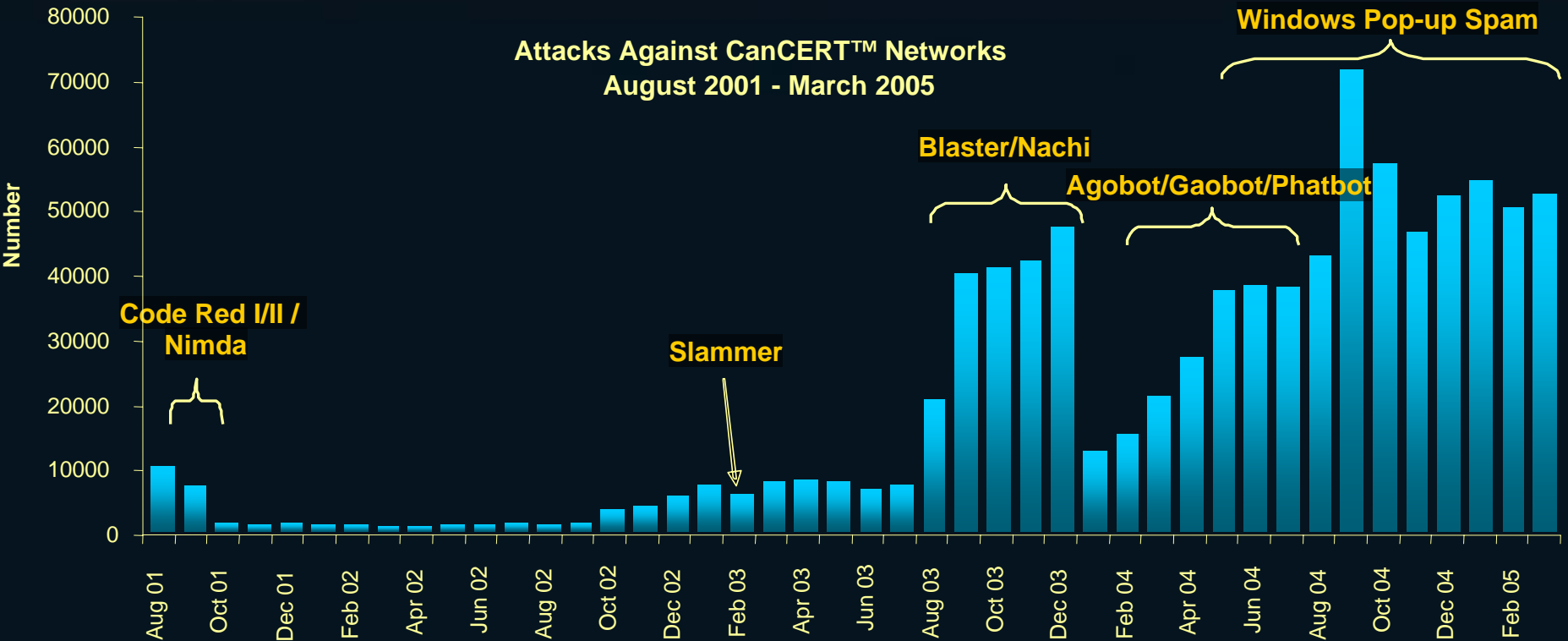
(CipherTrust, October 18, 2004)



Internet Threats: Malicious Attacks

In 2004, 1 in every 16 e-mails carried a virus

Source: MessageLabs, December 6, 2004

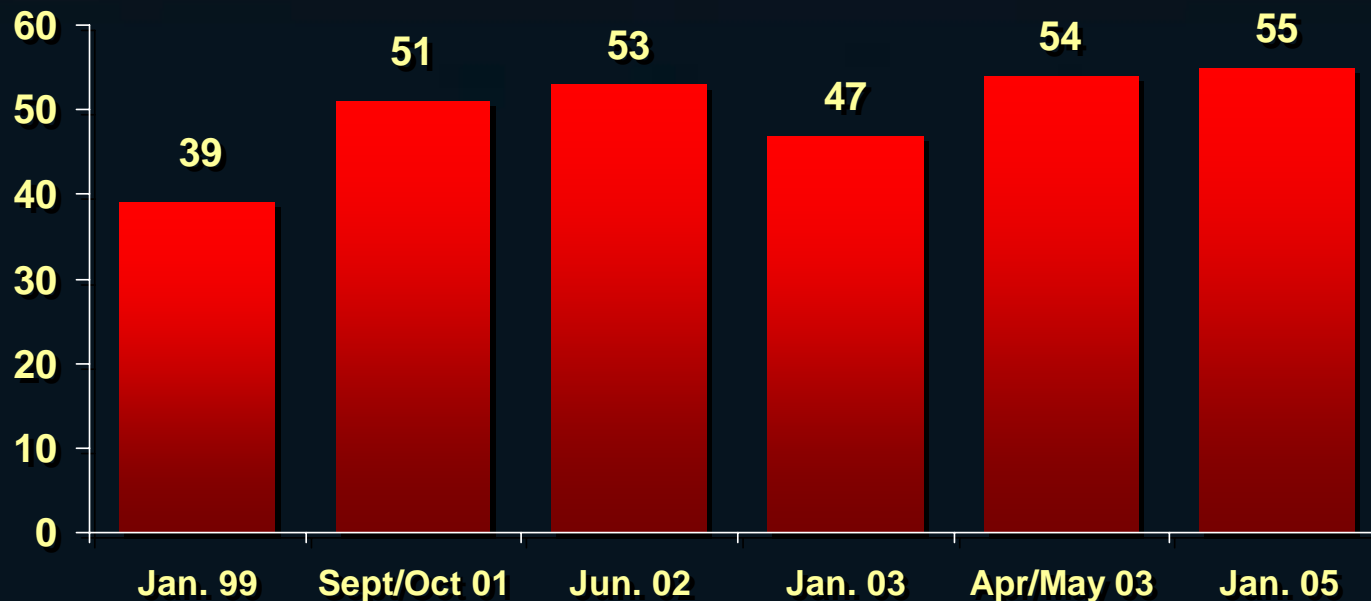


CanCERT™ is Canada's first national Computer Emergency Response Team (CERT) operated 24/7 by EWA-Canada since 1998. The above graph depicts the number of attacks per month against CanCERT™ networks during the period August 2001 to March 2005.



Ongoing concerns about privacy and security

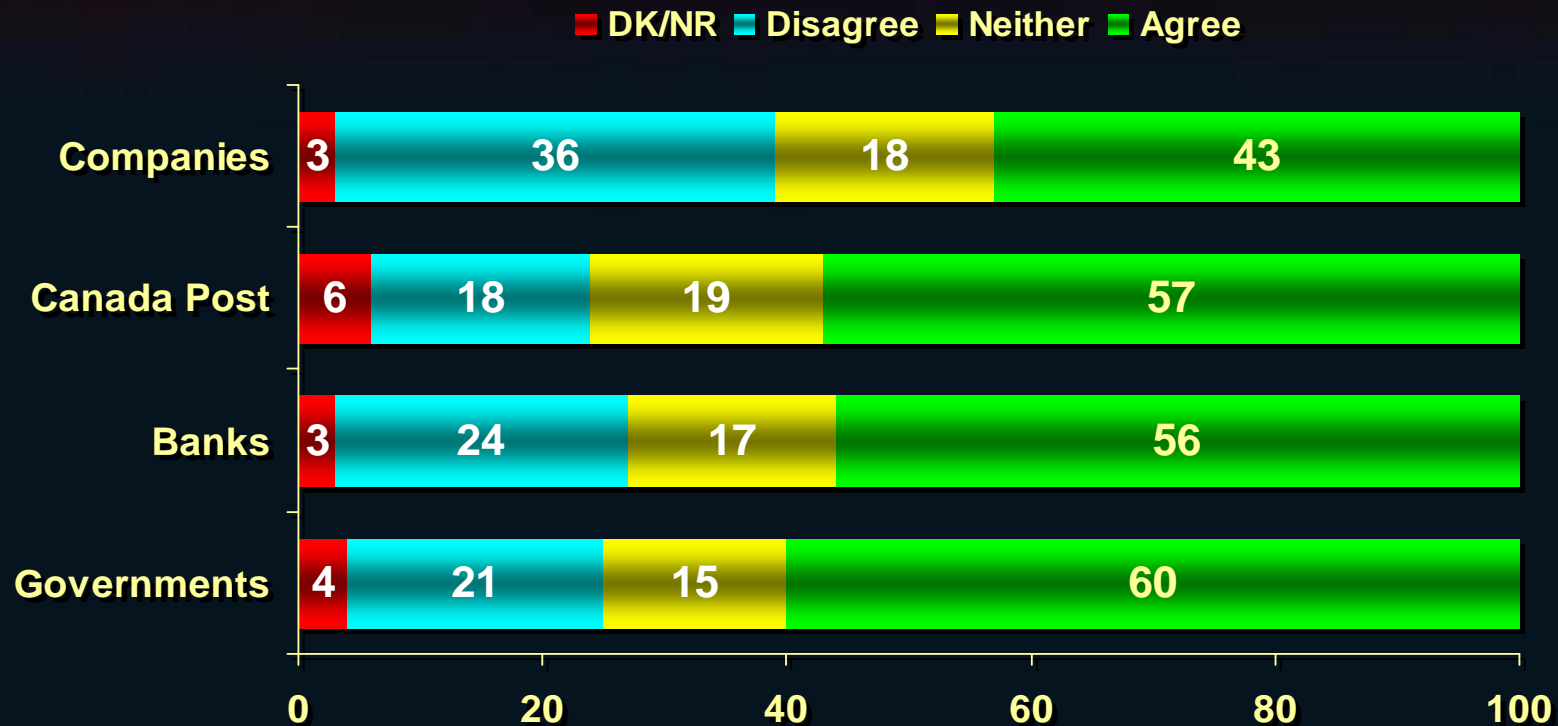
Erosion of Personal Privacy



Q: I feel I have less personal privacy in my daily life than I did five years ago?



Trust & perceived security



Q: (Above organizations) would not offer citizens the choice of doing activities over the Internet unless it was safe to do so.



Privacy vs. Security

- ❖ Lawful Access
- ❖ Biometrics, National ID cards
- ❖ Canadians Prefer
Strict Security: Poll
(Strategic Council, August 2005)





Impacts of Internet Threats

- ✿ 91% of Internet users in the US have **altered online behaviour**.
(Pew Internet and American Life Project – June 2005)
- ✿ 33% of online shoppers are buying fewer items due to **concerns about online fraud**. (Gartner Research – June 2005)
- ✿ 14 % of online consumers have stopped using online banking due to **concerns about phishing**. (Forrester Research – December 2004)
- ✿ 72% of Internet users who do not use Internet banking are **worried about identity theft**. (Entrust – October 2004)



Ground Rules for Electronic Markets

- ❖ Canada's *Cryptography Policy*
- ❖ Protection of Personal Information (PIPEDA, part 1)
- ❖ Electronic Records and e-Signatures (PIPEDA, Parts 2-5)
- ❖ Consumer Protection
- ❖ *Principles for Authentication*
- ❖ Spam – Legislation to come



Jurisdictional Issues

- ❖ International disputes:
Whose courts?
Whose laws?
- ❖ Cyber criminals:
How do we Find them?
- ❖ Transborder data flows
and national security





Current initiatives Cyber Security and Emergency Preparedness

- ❖ Improved Emergency Telecommunications
 - Priority Access to Dial
 - Wireless Priority Service
- ❖ Public Alerting
- ❖ Protocol Lab
 - Engineering analysis and scientific research
- ❖ Lawful Access
- ❖ Critical Infrastructure Protection
 - Canadian Telecommunications Cyber Protection Working Group
 - Canadian Telecommunications Emergency Preparedness Association
- ❖ North American Security and Prosperity Partnership



Collaboration ...

- ❖ Continue cooperation between all stakeholders: government, industry, cross-border partners
- ❖ Cooperate and collaborate on technical and operational safeguards that enhance the cyber security of networks
- ❖ Continue to address Internet privacy and security concerns
- ❖ Foster research interests amongst Canadian academia
 - Conduct engineering studies in advanced tools, techniques and methodologies for robust protocol design and network protection
 - Establish a consortium of expertise in telecom security between academia and Industry Canada

... The key to our continued success

Government of Canada

www.gc.ca

Industry Canada

www.ic.gc.ca

www.strategis.gc.ca

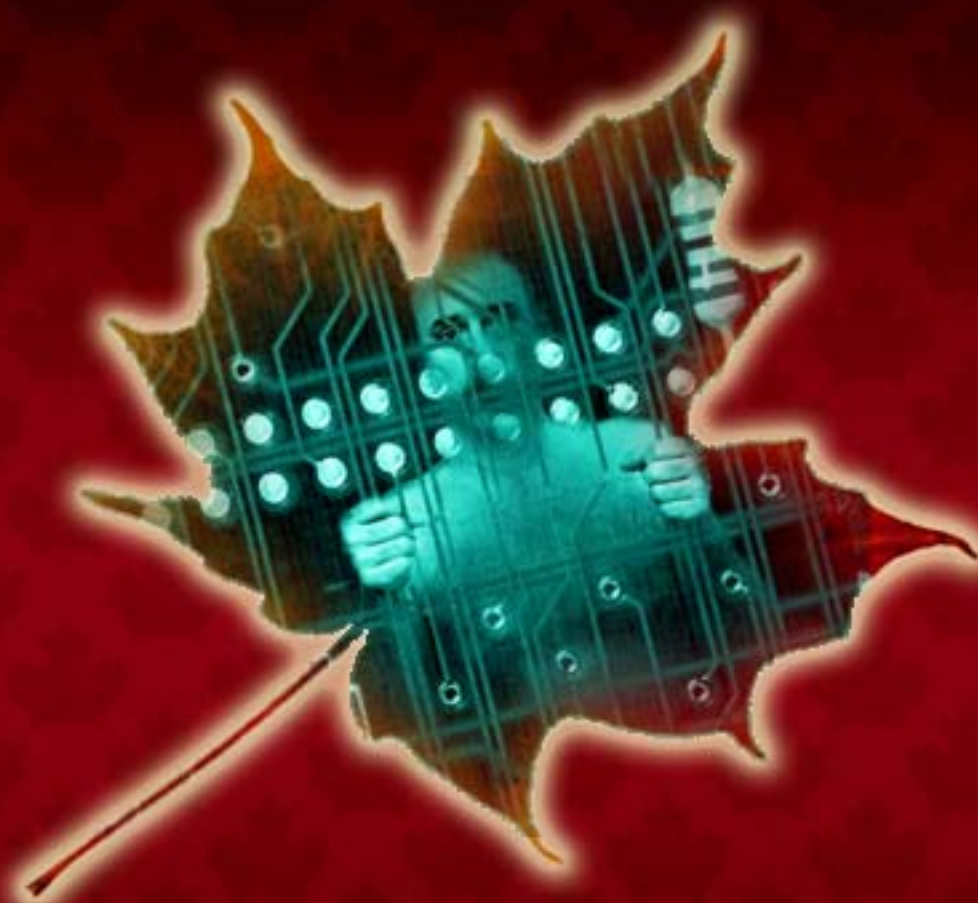
Telecommunications Policy

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