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

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

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“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

Millions of users

2000 2001 2002 2003 2004 2005

Time Spent using various media by Canadians

Average hrs/week

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

Superseding traditional media

Q2 2002

Q1 2005

TV
Radio
Internet
Newspapers
Magazines

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
Citizens, businesses and governments are going online

- 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)

Canada has become an e-Society
Not only are Canadians moving online, they are demanding high-speed.

Canadian Residential Broadband Subscribers, 2002-2009

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
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
Among top activities for online Canadians aside from email:

- News: 91%
- Health Info: 66%
- Video Games: 59%
- Listening to music: 53%
- Downloading music: 52%
- Job searching: 50%
- Listening to radio: 43%
- Travel info/arrangements: 41%
- Visiting TV/network sites: 32%
- Visiting TV show websites: 28%
- Auctions: 17%
- Reading books: 14%
- Watching movies: 11%
- Watching TV: 8%
- Music: 6%

Source: Canadian Internet Project, May 2005
In March 2004:

- **Canada**: 60% (67 pages)
- **U.S.**: 44% (50 pages)
- **U.K.**: 36% (33 pages)
- **France**: 35% (37 pages)

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

Number of Returns Filed Electronically

% of Total Tax Returns Filed


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
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](http://www.telecomreview.ca)
Challenges
A changing industrial structure

Communications Service Revenues by Segment*, 2002-2009

Revenues ($ billions)


Data/Broadband**

Broadcast Distribution

Wireless Voice

Wired Local Voice

Wired Long Distance

$0 $5 $10 $15 $20 $25 $30 $35 $40

$29.6 $31.3 $33.2 $34.7 $36.2 $37.6 $38.9 $40.0

$5.0 $4.5 $6.3 $8.7 $10.1

$5.0 $6.6 $11.1 $7.8

$4.4

4.4% 10% 5.4% 8.3% -1.5% -1.8%

2002-09 CAGR

*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.

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?
Canada continues to lag the U.S.

- **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


*The columns represent total labour productivity growth over the periods examined. Labour productivity is defined as value added per hour.*
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
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

China surpasses U.S. in 2015

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 %

PST 13.10.05 - 20
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


*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
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
Trust and Confidence

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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

Source: MessageLabs, March 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)
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.

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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?

EKOS – Understanding Privacy & Security (Wave 1 Preliminary Results) Winter 2005
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)
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)
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